# MX887016A
# 1xEV-DO Reverse Link
# TX Measurement
# Operation Manual

**10th Edition**

- **For safety and warning information, please read this manual before attempting to use the equipment.**
- **Additional safety and warning information is provided in the MT8870A Universal Wireless Test Set Operation Manual. Please also refer to it before using the equipment.**
- **Keep this manual with the equipment.**

**ANRITSU CORPORATION**

Document No.: M-W3612AE-10.0

# Safety Symbols

To prevent the risk of personal injury or loss related to equipment malfunction, Anritsu Corporation uses the following safety symbols to indicate safety-related information. Ensure that you clearly understand the meanings of the symbols BEFORE using the equipment. Some or all of the following symbols may be used on all Anritsu equipment. In addition, there may be other labels attached to products that are not shown in the diagrams in this manual.

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This indicates a warning or caution. The contents are indicated symbolically in or near the triangle.



This indicates a note. The contents are described in the box.





These indicate that the marked part should be recycled.

MX887016A
1xEV-DO Reverse Link TX Measurement
Operation Manual

20 August 2012 (First Edition)
21 January 2022 (10th Edition)

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- The warranty period after repair or exchange will remain 6 months from the original purchase date, or 30 days from the date of repair or exchange, depending on whichever is longer.
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### Revision History:

February 29th, 2020
December 17th, 2021

## Cautions Against Computer Virus Infection

- Copying files and data
  Only files that have been provided directly from Anritsu or generated using Anritsu equipment should be copied to the instrument.
  All other required files should be transferred by means of USB flash drive or CompactFlash media after undergoing a thorough virus check.
- Adding software
  Do not download or install software that has not been specifically recommended or licensed by Anritsu.
- Network connections
  Ensure that the network has sufficient anti-virus security protection in place.

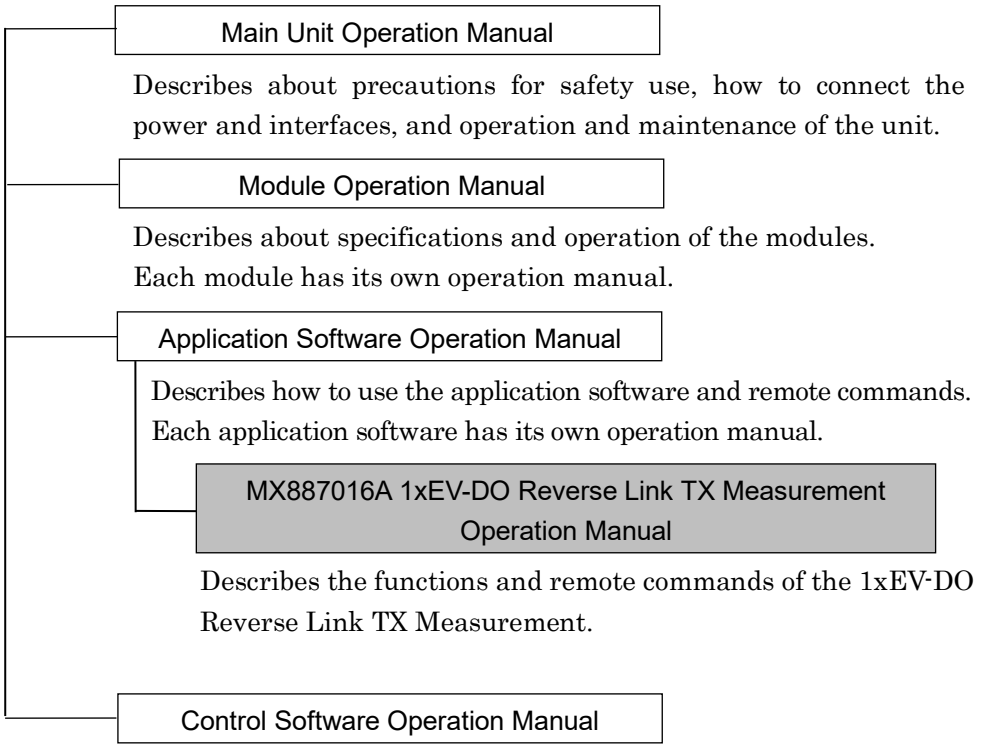
# About This Manual

This manual mainly describes the operation of the MX887016A 1xEV-DO Reverse Link TX Measurement.

Products related to the MT8870A Universal Wireless Test Set include:

- MT8870A Universal Wireless Test Set (main unit)
- Modules installed in the MT8870A
- Application software installed in the MT8870A
- Control software installed in a PC to control the MT8870A remotely

These products are referred to as the "Universal Wireless Test Set Series". The operation manuals for the Universal Wireless Test Set Series consist of separate documents for the main unit, module(s), application software, and control software, as shown below. ▭ represents this manual.

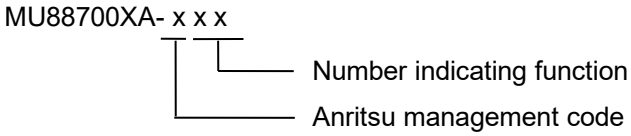


# Convention Used in This Manual

Except where there is a good reason to do otherwise, this manual assumes the use of MT8870A and MU887000A.
Note that the descriptions in this manual also apply to MT8872A, MU887001A, or MU887002A. MU887000A/01A means the MU887000A or MU887001A.

Additionally, the Anritsu management code of the options described in this manual is "0" unless there is a reason.

The option number: The option number is indicated by three digits.



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# Chapter 1 Outline



This chapter outlines the MX887016A 1xEV-DO Reverse Link Transmission Measurement. Refer to Appendix A Specifications for the software functions and performance.

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# 1.1 Outline

The MX887016A 1xEV-DO Reverse Link Transmission Measurement software (hereafter MX887016A) adds the 3GPP2-specified CDMA2000 1xEV-DO measurement function to the MU887000A TRX Test Module.

Forward Link RF signals are output from the MU887000A to the RF connector of the mobile station, and Reverse Link signals are output from the mobile station to the MU887000A.

***Note:***

The Signalling method, which detects Reverse Link signal information, such as call processing with the mobile station, and changes the Forward Link signal modulation, is not supported.

Reverse Link signals analyzed by the MX887016A are limited to patterns set to Long Code Mask = 0x00000000000.

The MX887016A supports setting of an arbitrary waveform file pattern for sending as the Forward Link signal. Regardless of the Reverse Link signal information, the modulated waveform pattern loaded from memory is sent as the Forward Link signal (Non-signalling method).

When performing RX measurement by the MX887015A, execute the FER measurement by the mobile station.

## 1.2 Features

The MX887016A software features:

(1) High-speed Measurement

The up-to-date processor and measurement algorithm support high-speed measurement.

(2) Sequence Measurement

Multiple measurements can be performed sequentially using preprogrammed measurement conditions. The Sequence Measurement mode helps cut mobile station test times.

## 1.3 Product Composition

The composition of MX887016A is shown in Table 1.3-1.

**Table 1.3-1 Composition**

| Item | Model/Code | Name | Qty | Remarks |
|---|---|---|---|---|
| Software | | Storage media (DVD, etc.) | 1 | |
| | MX887016A | 1xEV-DO Reverse Link TX Measurement | | On storage media (DVD, etc.) |
| | W3612AE | MX887016A 1xEV-DO Reverse Link TX Measurement Operation Manual | | English, on storage media (DVD, etc.) |

## 1.4 License Registration

Before the MX887016A software can be used, the software license must be registered in the MT8870A.

Refer to Chapter 8 “Utility Tool” in *the MU887000A TRX Test Module Operation Manual* for the license registration procedure.

# 1.5 Abbreviations

The abbreviations used in this manual are listed in Table 1.5-1.

**Table 1.5-1 Abbreviations**

| Abbreviation | Name |
|---|---|
| 3GPP2 | Third Generation Partnership Project 2 |
| ACK | Acknowledge |
| AVG | Average |
| CDP | Code Domain Power |
| DRC | Data Rate Channel |
| DSC | Data Source Channel |
| EV-DO | Evolution Data Only |
| FL | Forward Link |
| EVM | Error Vector Magnitude |
| IQ | In-phase and Quadrature-phase |
| NACK | Negative Acknowledge |
| OBW | Occupied Bandwidth |
| QPSK | Quadrature Phase Shift Keying |
| Rho | Waveform Quality Factor |
| RRI | Reverse Rate Indicator |
| SCPI | Standard Commands for Programmable Instruments |
| TTL | Total |
| RL | Reverse Link |
| WL | Walsh Code Length |

# Chapter 2 Fundamental Measurement

This chapter describes the fundamental functions and commands of the MX887016A. For details of the commands, refer to Chapter 4 “SCPI Command Reference” and Chapter 5 “Native Command Reference”.


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# 2.1 Common Operations

This section explains operations that are common to the measurements in Chapter 3 Sequence Measurement.
Both Native and SCPI commands are described in the introduction to commands.

## 2.1.1 Selecting application

Switch the MU887000A application software to cellular by setting the parameter to CELLULAR using the following command.

```
SYSSEL
:INSTrument[:SELect]
```

Switch the MU887000A measurement standard using the following command.
Set the parameter to EVDO when a function described in section 2.2 "Transmit Power" to section 2.7 "Capturing Waveform Data" is to be used.
Set the parameter to SEQUENCE when using a function described in Chapter 3 "Sequence Measurement".

```
STDSEL
:CONFigure:CELLular:MEASurement:STANdard
```

## 2.1.2 Setting ports

Set the MU887000A test ports to be used. The following command sets both the test port for outputting the Forward Link signal and the test port for inputting the Reverse Link signals.

```
PORT
:ROUTe:PORT:CONNect:DIRection
```

When setting the sequence table in sequence measurement, the sequence commands set the input and output test port.
The above-mentioned command sets the inputting test port.

## 2.1.3 Frequency and level

### Frequency

Use the following commands to set the frequency and channel of a signal to be measured.
The signal sent from the MU887000A to the mobile station is the Forward Link, and the signal sent from the mobile station to the MU887000A is the Reverse Link.

- Band Class
  BANDCLASS
  :CONFigure:CELLular:MEASurement:RFSettings:BCLass
- Channel
  CHAN
  :CONFigure:CELLular:MEASurement:RFSettings:CHANnel
- Reverse Link Frequency (mobile station Tx)
  TXFREQ
  :CONFigure:CELLular:MEASurement:RFSettings:FREQuency
- Forward Link Frequency (mobile station Rx)
  RXFREQ
  :CONFigure:CELLular:GENerator:RFSettings:FREQuency

### Level

Set the level of the signal sent from and received by the MU887000A using the following commands.

- Output Level
  OLVL
  :CONFigure:CELLular:GENerator:RFSettings:LEVel
- Input Level
  ILVL
  :CONFigure:CELLular:MEASurement:RFSettings:LEVel

### Cable loss correction

The loss of coaxial cables can be corrected for the output, input, and measured levels.
Refer to Chapter 3 “Fundamental Operation” in the “MU887000A TRX Test Module Operation Manual” for an explanation of the commands and loss correction data.

## 2.1.4 Setting transmission signal

To transmit the waveform pattern from MU887000A by using the Cellular application software, load the waveform file into the waveform memory, and then follow the procedure below:

1. Select the waveform file in the waveform memory.
2. Select the waveform pattern in the waveform file selected in step 1.
3. Set the Modulation On/Off and Output On/Off.

Use the following commands to select waveform file and waveform pattern and to set modulation and output On and Off.

- Output On/Off
  `LVL`
  `:CONFigure:CELLular:GENerator:RFSettings:STATe`
- Modulation On/Off
  `MOD`
  `:CONFigure:CELLular:GENerator:BBMode`
- Waveform File Select
  `PACKAGE`
  `:CONFigure:CELLular:GENerator:ARB:PACKage:SELect`
- Waveform Pattern Select
  `DLPAT`
  `:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect`
  `DLPAT_SYNC`
  `:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect:SYNC`
- Adding Noise
  `AWGNLVL`
  `:CONFigure:CELLular:GENerator:ARB:NOISE:STATe`
- Noise Level
  `AWGNPWR`
  `:CONFigure:CELLular:GENerator:ARB:NOISE:CN`

Use the following commands to load the waveform file into the waveform memory.
Refer to Chapter 5 "SCPI Command Reference" in *the MU887000A TRX Test Module Operation Manual*.

- To load waveform file into the waveform memory
  `:SOURce:GPRF:GENerator:ARB:FILE:LOAD`
- To query the file name in the waveform memory
  `:SOURce:GPRF:GENerator:ARB:WAVeform:NAME`
- To optimize the waveform memory capacity
  `:SOURce:GPRF:GENerator:ARB:WAVeform:DEFRag`

- To delete waveform file in the waveform memory
  `:SOURce:GPRF:GENerator:ARB:WAVeform:DELete`
- To query the waveform memory free space
  `:SOURce:GPRF:GENerator:ARB:WAVeform:FREE`



## 2.1.5 Waveform patterns

To send a 1xEV-DO waveform pattern, specify a file in the MV887016A EVDO Forward Link Waveform files as the waveform file.

Refer to Chapter 3, "Waveform File Details" in the *Waveform File for Cellular Application Operation Manual* for an explanation of the MV887016A EVDO Forward Link Waveform files.

## 2.1.6 Setting 1xEV-DO signals

Set the following items to configure the 1xEV-DO signal.

Channel Configuration

Select one of the Reverse Link signal channel configurations listed below. Measurement items vary with the Reverse Link signal channel configuration.

**Table 2.1.6-1 Protocol Revision Setting and Measurement Items**

| Measurement Item | Protocol Revision | |
|---|---|---|
| | Rev. 0 | Rev. A |
| **Power** | | |
| **Tx Power** | ✓ | ✓ |
| **Filtered Power** | ✓ | ✓ |
| **Occupied Bandwidth** | | |
| **Occupied Bandwidth** | ✓ | ✓ |
| **Upper Frequency** | ✓ | ✓ |
| **Lower Frequency** | ✓ | ✓ |
| **Center (Upper+Lower)/2** | ✓ | ✓ |
| **OBW Wave Data** | ✓ | ✓ |
| **Spurious Emissions** | | |
| **Level** | ✓ | ✓ |
| **Mask Margin** | ✓ | ✓ |
| **Frequency** | ✓ | ✓ |
| **Judge** | ✓ | ✓ |
| **Spurious Emissions Wave Data** | ✓ | ✓ |

**Table 2.1.6-1 Protocol Revision Setting and Measurement Items (Cont'd)**

| Measurement item | Protocol Revision | |
|---|---|---|
| | Rev.0 | Rev.A |
| **Modulation Analysis** | | |
| **Carrier Frequency** | ✓ | ✓ |
| **Carrier Frequency Error (Hz, ppm)** | ✓ | ✓ |
| **Worst Carrier Frequency Error (Hz, ppm)** | ✓ | ✓ |
| **Rho** | ✓ | ✓ |
| **EVM** | ✓ | ✓ |
| **Peak EVM** | ✓ | ✓ |
| **Phase Error** | ✓ | ✓ |
| **Magnitude Error** | ✓ | ✓ |
| **Origin Offset** | ✓ | ✓ |
| **Time Error** | ✓ | ✓ |
| **Code Domain Power** | | |
| **Max Inactive Channel Power** | ✓ | ✓ |
| **Pilot Channel Power** | ✓ | ✓ |
| **RRI Channel Power** | ✓ | ✓ |
| **DSC Channel Power** | – | ✓ |
| **DRC Channel Power** | ✓ | ✓ |
| **ACK Channel Power** | ✓ | ✓ |
| **Data Channel Power** | ✓ | ✓ |
| **AUX Pilot Channel Power** | – | ✓ |
| **Code Domain Power Wave Data** | ✓ | ✓ |

✓ Measurement supported

– Measurement not supported

### Long Span Code Search

The duration of Reverse Link synchronization signal detection varies with the Long Span Code Search setting.
Turning on Long Span Code Search lengthens the duration of the Reverse Link Reference Signal detection. It assures signal synchronization but lengthens the synchronization duration.
Turning off Long Span Code Search shortens the duration of the Reverse Link Reference Signal detection. If the Reverse Link and Forward Link signals are already synchronized, turn off Long Span Code Search to shorten the measurement time.

### Spurious Emission Limit Range

Set the band class to determine the Spurious Emission Limit range. Refer to Section 2.1.3 “Frequency and level” for the commands to set frequency.

### Protocol Revision

Set Rev. 0 (IS-856-0) or Rev. A (IS-856-A) as the Protocol Revision for 1xEV-DO.

### Data Channel Payload Size

When the Rev. A (IS-856-A) Protocol Revision is set, the amount of data carried on the data channel can be set.

### Long Code Mask - I

Set Long Code Mask for I-phase. Q-phase is automatically calculated when I-phase is decided.

Channels

Set the frequency of the MU887000A Tx and Rx signals using the channel numbers specified in 3GPP2 C.S0057-E v1.0.

Changing the channel number changes the related Forward Link and Reverse Link frequencies. However, changing the frequencies does not change the channel number.
The following table shows the relationship between the channel number and Forward Link and Reverse Link frequencies.

**Table 2.1.6-2 Channel Numbers and Center Frequency (Copied from 3GPP2 C.S0057-E v1.0, Table 2.1.1-2 and Others)**

| Band Class | Channel (N) | Step | Center Frequency for CDMA Channel (MHz) | |
|---|---|---|---|---|
| | | | Reverse Link | Forward Link |
| 0 | 1 to 799 | 1 | 0.030 N + 825.000 | 0.030 N + 870.000 |
| | 991 to 1023 | 1 | 0.030 (N – 1023) + 825.000 | 0.030 (N – 1023) + 870.000 |
| | 1024 to 1323 | 1 | 0.030 (N – 1024) + 815.040 | 0.030 (N – 1024) + 860.040 |
| 1 | 0 to 1199 | 1 | 1850.000 + 0.050 N | 1930.000 + 0.050 N |
| 2 | 0 to 1000 | 1 | 0.025 N + 889.9875 | 0.025 N + 934.9875 |
| | 1329 to 2047 | 1 | 0.025 (N – 1328) + 871.9875 | 0.025 (N – 1328) + 916.9875 |
| | 2048 to 2108 | 1 | 0.025 (N – 2048) + 894.000 | 0.025 (N – 2048) + 849.000 |
| 3* | 1 to 799 | 3 | 0.0125 N + 915.000 | 0.0125 N + 860.000 |
| | 801 to 1039 | 3 | 0.0125 (N – 800) + 898.000 | 0.0125 (N – 800) + 843.000 |
| | 1041 to 1199 | 3 | 0.0125 (N – 1040) + 887.000 | 0.0125 (N – 1040) + 832.000 |
| | 1201 to 1600 | 3 | 0.0125 (N – 1200) + 893.000 | 0.0125 (N – 1200) + 838.000 |
| 4 | 0 to 599 | 1 | 0.050 N + 1750.000 | 0.050 N + 1840.000 |
| 5 | 1 to 400 | 1 | 0.025 (N – 1) + 450.000 | 0.025 (N – 1) + 460.000 |
| | 472 to 871 | 1 | 0.025 (N – 472) + 410.000 | 0.025 (N – 472) + 420.000 |
| | 1039 to 1473 | 1 | 0.020 (N – 1024) + 451.010 | 0.020 (N – 1024) + 461.010 |
| | 1536 to 1715 | 1 | 0.025 (N – 1536) + 479.000 | 0.025 (N – 1536) + 489.000 |
| | 1792 to 2016 | 1 | 0.020 (N – 1792) + 479.000 | 0.020 (N – 1792) + 489.000 |
| | 2017 | 1 | 451.150 | 467.725 |
| | 2018 | 1 | 451.475 | 467.725 |
| 6 | 0 to 1199 | 1 | 1920.000 + 0.050 N | 2110.000 + 0.050 N |
| 7 | 0 to 240 | 1 | 776.000 + 0.050 N | 746.000 + 0.050 N |
| 8 | 0 to 1499 | 1 | 1710.000 + 0.050 N | 1805.000 + 0.050 N |
| 9 | 0 to 699 | 1 | 880.000 + 0.050 N | 925.000 + 0.050 N |
| 10 | 0 to 719 | 1 | 0.025 N + 806.000 | 0.025 N + 851.000 |
| | 720 to 919 | 1 | 0.025 (N – 720) + 896.000 | 0.025 (N – 720) + 935.000 |

*: N is valid only for even numbers in Band Class 3.

**Table 2.1.6-2 Channel Numbers and Center Frequency (Copied from 3GPP2 C.S0057-E v1.0, Table 2.1.1-2 and Others) (Cont'd)**

| Band Class | Channel (N) | Step | Center Frequency for CDMA Channel (MHz) | |
|---|---|---|---|---|
| | | | Reverse Link | Forward Link |
| 11 | 1 to 400 | 1 | 0.025 (N – 1) + 450.000 | 0.025 (N – 1) + 460.000 |
| | 472 to 871 | 1 | 0.025 (N – 472) + 410.000 | 0.025 (N – 472) + 420.000 |
| | 1039 to 1473 | 1 | Reserved | Reserved |
| | 1536 to 1715 | 1 | 0.025 (N – 1536) + 479.000 | 0.025 (N – 1536) + 489.000 |
| | 1792 to 2016 | 1 | Reserved | Reserved |
| 12 | 0 to 239 | 1 | 870.0125 + 0.025 N | 915.0125 + 0.025 N |
| 13 | 0 to 1399 | 1 | 2500.000 + 0.050 N | 2620.000 + 0.050 N |
| 14 | 0 to 1299 | 1 | 1850.000 + 0.050 N | 1930.000 + 0.050 N |
| 15 | 0 to 899 | 1 | 1710.000 + 0.050 N | 2110.000 + 0.050 N |
| 16 | 140 to 1459 | 1 | 2495.000 + 0.050 M | 2617.000 + 0.050 N |
| 18 | 0 to 240 | 1 | 787.000 + 0.050 N | 757.000 + 0.050 N |
| 19 | 0 to 360 | 1 | 698.000 + 0.050 N | 728.000 + 0.050 N |
| 20 | 0 to 680 | 1 | 1626.500 + 0.050 N | 1525.000 + 0.050 N |
| 21 | 0 to 200 | 1 | 2000.000 + 0.050 N | 2190.000 + 0.050 N |
| | 201 to 399 | 1 | 2010.000 + 0.050 (N – 200) | 2180.000 + 0.050 (N – 200) |

Use the following commands to set the 1xEV-DO signals:

- Band Class
  `BANDCLASS`
  `:CONFigure:CELLular:MEASurement:RFSettings:BCLass`
- Channel
  `CHAN`
  `:CONFigure:CELLular:MEASurement:RFSettings:CHANnel`
- Protocol Revision
  `PREV`
  `:CONFigure:CELLular:EVDO:PREVision`
- Long Span Code Search
  `LSCODESEARCH`
  `:CONFigure:CELLular:EVDO:FUNDamental:LSSearch`
- Data Channel Payload Size
  `PSIZE`
  `:CONFigure:CELLular:EVDO:PSIZe`
- Long Code Mask - I
  `RTCLCMI`
  `:CONFigure:CELLular:EVDO:LCMask:I`

## 2.1.7 Setting measurement conditions

Set the trigger conditions for starting measurement using the following commands.

- Trigger Source
  `FMEAS_TRGSRC`
  `:TRIGger:CELLular:EVDO:FUNDamental:SOURce`
- Trigger Level
  `FMEAS_TRGLVL`
  `:TRIGger:CELLular:EVDO:FUNDamental:LEVel`
- Trigger Delay
  `FMEAS_TRGDLY`
  `:TRIGger:CELLular:EVDO:FUNDamental:DELay`
- Trigger Timeout
  `FMEAS_TRGTOUT`
  `:TRIGger:CELLular:EVDO:FUNDamental:TOUT`

Use the following command when not measuring.

- All Measurement Items OFF
  `ALLMEASITEMS_OFF`
  `:CONFigure:CELLular:EVDO:FUNDamental:AMITems:OFF`

## 2.1.8 Starting/stopping measurement



### Starting measurement

To start measurement, send the following command.
The status indication lamp 3 of MU887000A is on during the execution of measurement or analysis. For the explanation of the status lamp, refer to Appendix D "Status Indication of lamps" in *the MU887000A TRX Test Module Operation Manual*.

```
SNGLS
:INITiate:CELLular:MEASurement:SINGle
```

### Stopping measurement

To stop measurement, send the following command.

```
MEASSTOP
:ABORt:CELLular:MEASurement
```

### Checking measurement status

To query the measurement status and errors, send the following command.

```
MSTAT
:FETCh:CELLular:MEASurement:STATe
```

**Table 2.1.8-1 Query Response**

| Value of response | Description |
|---|---|
| 0 | Measurement completed normally |
| 2 | Level exceeded<br>The MU887000A receive level is higher than the set input level. |
| 4 | Measurement failed<br>The signal could not be analyzed. |
| 5 | The frame synchronization failed when the Long Span Code Search was Off, because the correct downlink signal was not output. |
| 9 | Measurement is in progress or not executed |
| 12 | Tx measurement timeout<br>The signal could not be acquired within the measurement time. |

The measurement status and errors can be queried using the status registers.
Refer to Chapter 3 "Fundamental Operation" in the "MU887000A TRX Test Module Operation Manual" for an explanation of the status registers.

The allocations of MX887016A status registers are described in the following tables.

Native command mode

**Table 2.1.8-2 Bit Definition of End Event Status Register (Signal Generator)**

| Bit | Description |
|---|---|
| 7 to 1 | Not used and always set to 0 |
| 0 | Changed to 1 at end of reading waveform file |

**Table 2.1.8-3 Bit Definition of End Event Status Register (Measurement)**

| Bit | Description |
|---|---|
| 7 to 2 | Not used and always set to 0 |
| 1 | Changed to 1 after trigger prepared |
| 0 | Changed to 1 when measurement preparation completed |

**Table 2.1.8-4 Bit Definition of Error Event Status Register (Signal Generator)**

| Bit | Description |
|---|---|
| 7 to 1 | Not used and always set to 0 |
| 0 | Changed to 1 at error in read waveform file |

**Table 2.1.8-5 Bit Definition of Error Event Status Register (Measurement)**

| Bit | Description |
|---|---|
| 7 to 3 | Not used and always set to 0 |
| 2 | Changed to 1 at measurement timeout |
| 1 | Changed to 1 when measurement result under level |
| 0 | Changed to 1 when measurement result over level |

SCPI command mode:

**Table 2.1.8-6 Bit Definition of Signal Generator Status Register**

| Bit | Description |
|---|---|
| 16 to 1 | Not used and always set to 0 |
| 0 | Changed to 1 while reading file |

**Table 2.1.8-7 Bit Definition of Measurement Status Register**

| Bit | Description |
|---|---|
| 16 to 2 | Not used and always set to 0 |
| 1 | Changed to 1 while preparing trigger |
| 0 | Changed to 1 during measurement |

**Table 2.1.8-8 Bit Definition of Signal Generator Questionable Register**

| Bit | Description |
|---|---|
| 16 to 1 | Not used and always set to 0 |
| 0 | Changed to 1 at error in read file |

**Table 2.1.8-9 Bit Definition of Measurement Questionable Register**

| Bit | Description |
|---|---|
| 16 to 3 | Not used and always set to 0 |
| 2 | Changed to 1 at measurement timeout |
| 1 | Changed to 1 when measurement result under level |
| 0 | Changed to 1 when measurement result over level |

# 2.2 Transmit Power

The Tx power measurement measures the mobile station Tx power.

The Tx power measurement settings are:

Channel and frequency of input signals

Set the channel and frequency of RF signals input to the MU887000A using the commands in section 2.1.3 “Frequency and level”.

Input level

Specify the level of RF signals input to the MU887000A using the commands in section 2.1.3 “Frequency and level”.

Port

Set the input port for the MU887000A using the commands in section 2.1.2 “Setting ports”.

Starting measurement and measurement count

Start Tx power measurement and specify the measurement count within the range from 1 to 200 using the following command.

```
PWR_SET
:CONFigure:CELLular:EVDO:FUNDamental:POWer:SET
```

Fast Power Measurement Mode

If Fast Power Measurement Mode is turned On, the Tx power measurement time can be shortened by changing the hardware process. However, Occupied Bandwidth, Spectrum Emission, Modulation analysis, Code Domain Power cannot be measured.

```
FASTPWRMODE
:CONFigure:CELLular:EVDO:FUNDamental:POWer:FMODe
```

Use the following commands to query the Tx power measurement results. The minimum, average, maximum, standard deviation, and unique measurement values can be set as the measurement result type.

- Tx Power

  ```
  TXPWR
  :FETCh:CELLular:EVDO:FUNDamental:POWer:TXPower
  ```

- Filtered Power

  ```
  FILTPWR
  :FETCh:CELLular:EVDO:FUNDamental:POWer:FLTPower
  ```

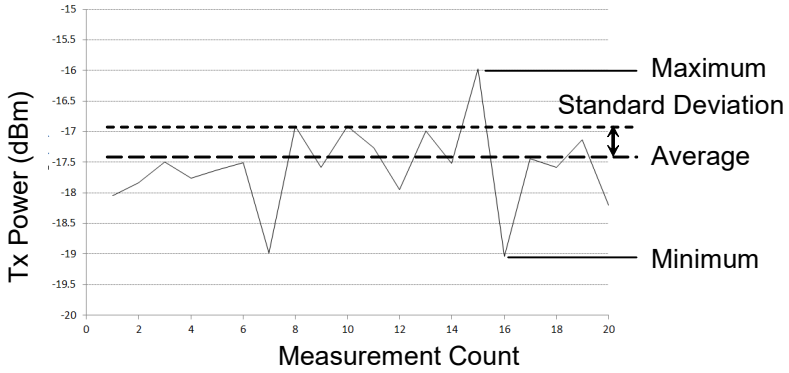



**Figure 2.2-1 Type of Measurement Results**

# 2.3 Occupied Bandwidth

The Occupied Bandwidth is the width of the measured spectrum with a specified proportion of the total power.
The following items are measured and displayed at Occupied Bandwidth measurement.

### Occupied Bandwidth (OBW)

This is the bandwidth with a specific proportion of the total power of the signal input to the MU887000A.

### Upper frequency

The frequency $f_{upper,}$ is found as the power of $\frac{100 - Occupation\_ratio}{2}$ % within the total power from the measured waveform upper limit. Upper frequency is the difference between this found frequency $f_{upper}$ and the set uplink frequency.

### Lower frequency

The frequency $f_{lower,}$ is found as the power of $\frac{100 - Occupation\_ratio}{2}$ % within the total power from the measured waveform lower limit. Lower frequency is the difference between this found frequency $f_{lower}$ and the set uplink frequency.

### Center Frequency

The center frequency is found from $\frac{f_{upper} + f_{lower}}{2}$.

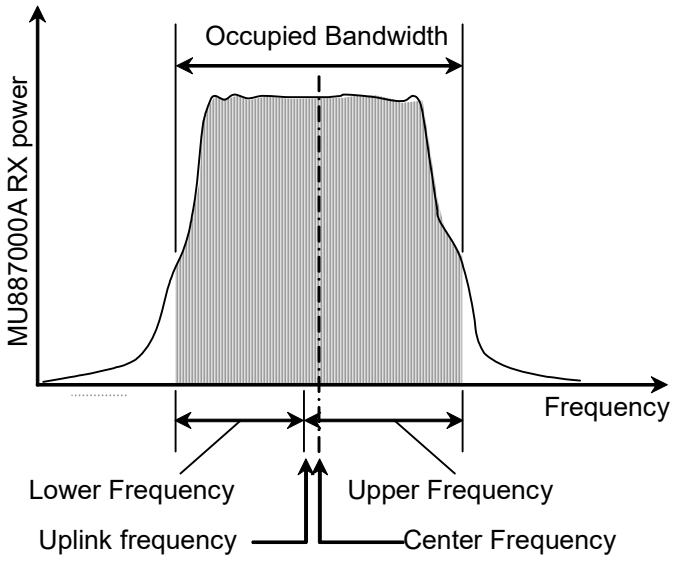



**Figure 2.3-1 Occupied Bandwidth**

The Occupied Bandwidth measurement settings are:

Channel and Frequency of input signals

Specify the channel and frequency of the RF signal input to the MU887000A by referring to the commands in section 2.1.3 “Frequency and level”.

Input level

Set the level of the RF signal input to the MU887000A by referring to the command in section 2.1.3 “Frequency and level”.

Port

Set the input port for the MU887000A by referring to the command in section 2.1.4 “Setting transmission signal”.

Occupation Ratio

Set the power ratio (occupation ratio) for determining the Occupied Bandwidth within the range from 80.0% to 99.9%.

```
OBW_RATIO
:CONFigure:CELLular:EVDO:FUNDamental:OBW:RATio
```

Measurement enable and measurement count

Use the following command to enable Occupied Bandwidth measurement and specify the measurement count from 1 to 200.

```
OBW_SET
:CONFigure:CELLular:EVDO:FUNDamental:OBW:SET
```

Use the following commands to query Occupied Bandwidth measurement results.
To query a frequency, select one of upper frequency, lower frequency and center frequency.

- Occupied Bandwidth
  ```
  OBW
  :FETCh:CELLular:EVDO:FUNDamental:OBW
  ```
- Occupied Bandwidth Frequency
  ```
  OBWFREQ
  :FETCh:CELLular:EVDO:FUNDamental:OBW:FREQuency
  ```

# 2.4 Spurious Emissions

Spurious Emissions measurement measures the peak level and margin at the conditions specified in C.S0033-B v1.0 4.4.1 Conducted Spurious Emissions.

**Table 2.4-1 Spurious Emissions Specifications (1)**

| Band Class | Spurious Emission Template | | | |
|---|---|---|---|---|
| | k = 1 | k = 2 | k = 3 | k = 4 |
| 0, 2, 3, 5, 7, 9, 10, 11, 12, 18, 19 | 885 kHz to 1.98 MHz<br>–42 dBc/30 kHz | 885 kHz to 1.98 MHz<br>–54 dBm/1.23 MHz | 1.98 to 4 MHz<br>–54 dBc/30 kHz | 1.98 to 4 MHz<br>–54 dBm/1.23 MHz |
| 1, 4, 6, 8, 13, 14, 15, 16, 20, 21 | 1.25 to 1.98 MHz<br>–42 dBc/30 kHz | 1.25 to 1.98 MHz<br>–54 dBm/1.23 MHz | 1.98 to 4 MHz<br>–50 dBc/30 kHz | 1.98 to 4 MHz<br>–54 dBm/1.23 MHz |

k: Frequency division

**Table 2.4-2 Spurious Emissions Specifications (2)**

| Band Class | Spurious Emission Template |
|---|---|
| | k = 5 |
| 6,8,13 | 2.25 to 4 MHz<br>–{13+(Δf−2.25 MHz)} dBm/1 MHz |
| 10 | 1.25 to 4 MHz<br>–13 dBm/30 kHz |
| Other than the above | NONE |

k: Frequency division

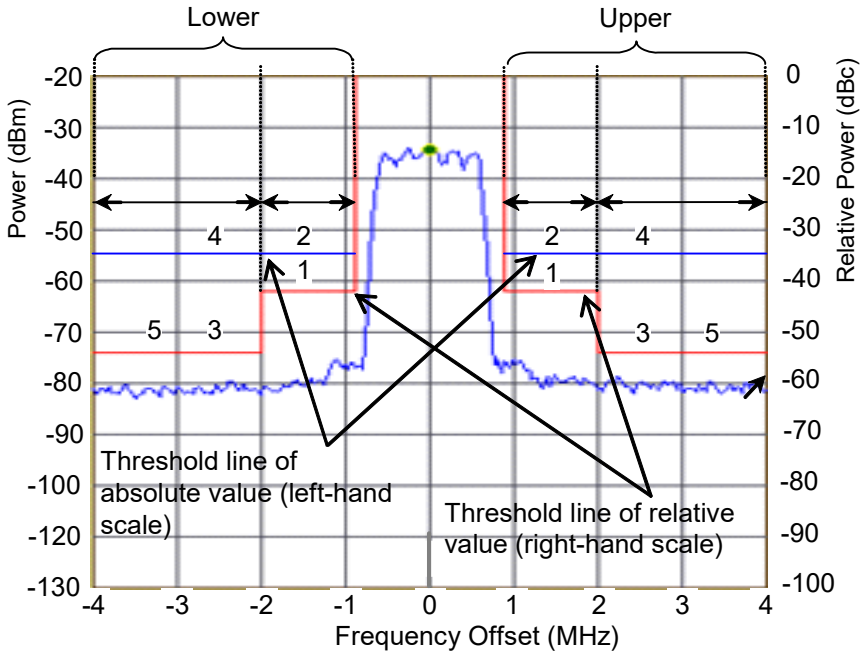



**Figure 2.4-1 Spurious Emissions Threshold Line**

The Spurious Emissions settings are as follows:

### Channel and frequency of input signals

Specify the channel and frequency of RF signals applied to the MU887000A using the commands for setting frequency and level described in Section 2.1.3 “Frequency and level”.

### Input level

Specify the level of RF signals applied to the MU887000A using the command for setting input level described in Section 2.1.3 “Frequency and Level”.

### Port

Specify the input port for the MU887000A using the command for setting ports described in Section 2.1.4 “Setting transmission signal”.

### Frequency Band

The Pass/Fail judgement standard depends on the frequency band specified in the 3GPP2 standard.

- Band Class (for Spurious Emission Limit)
  `BAND`
  `:CONFigure:CELLular:EVDO:FUNDamental:BAND`

### Start measurement and measurement count

Start Spurious Emissions measurement and specify the measurement count from 1 to 200 using the following command.

- Measurement count
  `SPR_SET`
  `:CONFigure:CELLular:EVDO:FUNDamental:SPURious:SET`

The Spurious Emissions measurement results are:

- Evaluation result
  If the spurious is below the threshold, it is evaluated as PASS; if it above, it is evaluated as FAIL.
- Peak level and frequency in lower frequency range
- Peak level and frequency in upper frequency range
- Worst value level and frequency in each frequency range
  Each frequency range varies with the Band class.
- Margin and frequency in lower frequency range
- Margin and frequency in upper frequency range
- Minimum level difference from threshold line in frequency range
  Each frequency range varies with the band class.

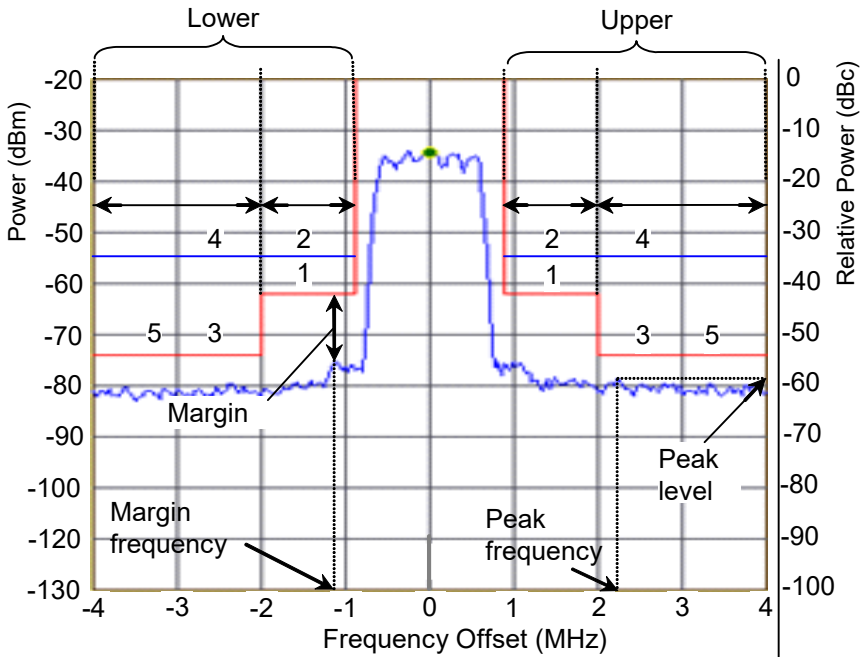



**Figure 2.4-2 Spurious Emissions Measurement Result**

Use the following commands to inquire results of the Spurious Emissions measurement:

- Judgement Result
  SEM
  `:FETCh:CELLular:EVDO:FUNDamental:SPURious:JUDGement`
- Peak Level and Frequency at Lower Side Frequency Range
  SEMLVL_LOWER
  `:FETCh:CELLular:EVDO:FUNDamental:SPURious:LOWer`

- Peak Level and Frequency at Upper Side Frequency Range
  SEMLVL_UPPER
  :FETCh:CELLular:EVDO:FUNDamental:SPURious:UPPer
- Margin and Related Point Frequency at Lower Side Frequency Range
  SEMMARGIN_LOWER
  :FETCh:CELLular:EVDO:FUNDamental:SPURious:MARGin:LOWer
- Margin and Related Point Frequency at Upper Side Frequency Range
  SEMMARGIN_UPPER
  :FETCh:CELLular:EVDO:FUNDamental:SPURious:MARGin:UPPer

# 2.5 Modulation Analysis

Modulation Analysis measures the following items:

- Carrier Frequency
- Carrier Frequency Error
- Worst Carrier Frequency Error
- Rho
- EVM
- Peak EVM
- Phase Error
- Magnitude Error
- Origin Offset
- Time Error

Use the following command to enable modulation analysis measurement and specify the measurement count from 1 to 200.

```
MOD_SET
:CONFigure:CELLular:EVDO:FUNDamental:MODulation:SET
```

## 2.5.1 Frequency Error

Frequency Error measurement measures the carrier frequency and frequency error of the Reverse Link carrier frequency.

Set the reference frequency for error measurement based on the Channel and Reverse Link frequency described in Section 2.1.3 “Frequency and level”.

Use the following commands to query frequency error measurement results:

- Carrier Frequency
  `CFREQ`
  `:FETCh:CELLular:EVDO:FUNDamental:MODulation:CFRequency`
- Frequency Error
  `CFERR`
  `:FETCh:CELLular:EVDO:FUNDamental:MODulation:FERRor`
- Worst Value of Frequency Error
  `CFERR_WORST`
  `:FETCh:CELLular:EVDO:FUNDamental:MODulation:FERRor:WORSt`

The types of frequency error measurement results are minimum, average, maximum, and standard deviation.
The worst value is either the maximum or minimum frequency error, whichever is the larger absolute value.

## 2.5.2 Rho

Use the following command to query Rho measurement results.
The types of frequency error measurement results are minimum, average, maximum, and standard deviation.

```
RHO
:FETCh:CELLular:EVDO:FUNDamental:MODulation:RHO
```

## 2.5.3 EVM

Error Vector Magnitude (EVM) is the magnitude ratio of the error vector to the reference vector. The error vector is the difference between the vector of the measured signal and the reference vector.
The difference in phase between the vector of the measured signal and the reference vector is called the phase error while the difference in magnitude is called the magnitude error.

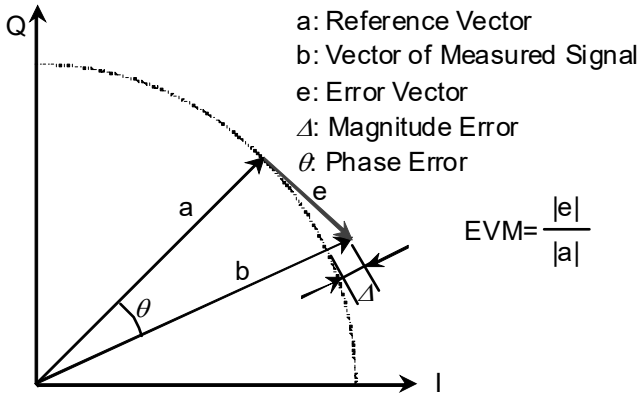



**Figure 2.5.3-1 EVM Definition**

EVM, phase error, and magnitude error are measured for each chip to obtain up to 2048 data. The rms of the data is regarded as one measurement result.
The peak EVM is the maximum value in the obtained EVM data.

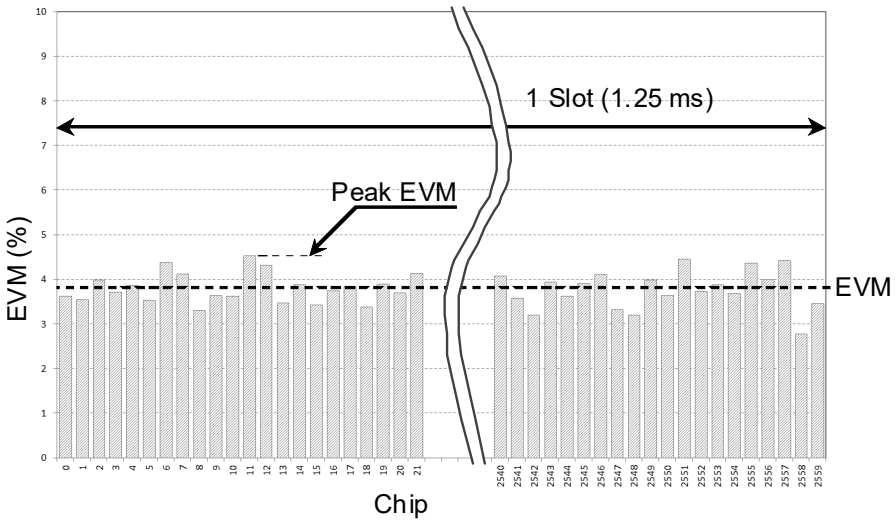



**Figure 2.5.3-2 Difference between EVM and Peak EVM**

Use the following commands to query the EVM measurement results. The types of measurement results are minimum, average, maximum, and standard deviation.

- EVM
  EVM
  :FETCh:CELLular:EVDO:FUNDamental:MODulation:EVM
- Peak EVM
  PEVM
  :FETCh:CELLular:EVDO:FUNDamental:MODulation:PEVM
- Phase Error
  PHASEERR
  :FETCh:CELLular:EVDO:FUNDamental:MODulation:PHERror
- Magnitude Error
  MAGERR
  :FETCh:CELLular:EVDO:FUNDamental:MODulation:MERRor

## 2.5.4 Origin Offset

The origin offset is the offset of the IQ vector origin calculated as:

$$offset = 20\log_{10}\left(\frac{|\,offset\_vector\,|}{|\,Reference\_vector\,|}\right) \quad \text{(dB)}$$

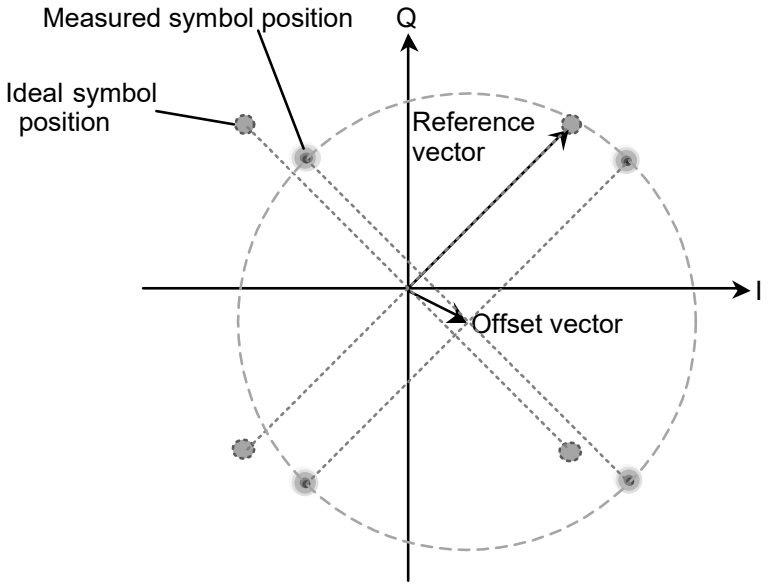



**Figure 2.5.4-1 Origin Offset Definition**

The types of measurement results are minimum, average, maximum, and standard deviation.

```
ORGNOFS
:FETCh:CELLular:EVDO:FUNDamental:MODulation:ORGNoffset
```

## 2.5.5 Time Error

Time error is measured as the time difference between arrival of the received slot and the ideal arrival in chip units.
If the slot is received later than the ideal arrival as shown below, the Time Error is a positive value.

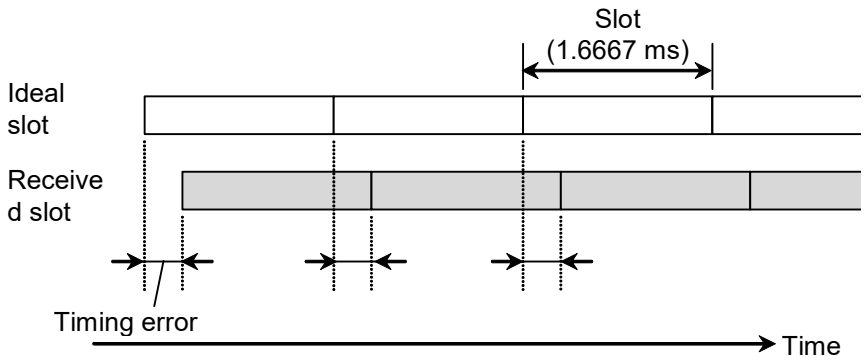



**Figure 2.5.5-1 Time Error Definition**

Use the following commands to query the Timing Error measurement results:

- Time Error
  `TAU`
  `:FETCh:CELLular:EVDO:FUNDamental:MODulation:TERRor`
- Time Error (Worst Value)
  `TAU_WORST`
  `:FETCh:CELLular:EVDO:FUNDamental:MODulation:TERRor:WORSt`

The types of measurement results are minimum, average, maximum, and standard deviation.

***Note:***

The MX887016A allows the Time Error measurement only when Long Span Code Search is Off.

# 2.6 Code Domain Power

Code Domain Power measurement measures the level of each code channel.

The Code Domain Power measurement settings are:

Start measurement and measurement count

Enable the Code Domain Power measurement and specify the measurement count from 1 to 200 using the following command.

```
CDP_SET
:CONFigure:CELLular:EVDO:FUNDamental:CDPower:SET
```

Use the following commands to query the Code Domain Power measurement results.
The types of measurement results are minimum, average, maximum, and standard deviation.

- Max Inactive Channel Power
  `MAXINACTCODE`
  `:FETCh:CELLular:EVDO:FUNDamental:CDPower:MICPower`
- Pilot Channel Power
  `CDP_PILOT`
  `:FETCh:CELLular:EVDO:FUNDamental:CDPower:PILot`
- RRI Channel Power (Reverse Rate Indicator)
  `CDP_RRI`
  `:FETCh:CELLular:EVDO:FUNDamental:CDPower:RRI`
- DSC Channel Power (Data Source Channel)
  `CDP_DSC`
  `:FETCh:CELLular:EVDO:FUNDamental:CDPower:DSC`
- DRC Channel Power (Data Rate Channel)
  `CDP_DRC`
  `:FETCh:CELLular:EVDO:FUNDamental:CDPower:DRC`
- ACK Channel Power
  `CDP_ACK`
  `:FETCh:CELLular:EVDO:FUNDamental:CDPower:ACK`
- DATA Channel Power
  `CDP_DATA`
  `:FETCh:CELLular:EVDO:FUNDamental:CDPower:DATA`
- Aux Pilot Channel Power
  `CDP_AUX`
  `:FETCh:CELLular:EVDO:FUNDamental:CDPower:APILot`

# 2.7 Capturing Waveform Data

The following command is used to capture the waveform data after measurement has been completed.

```
WAVEFMEAS
:FETCh:CELLular:EVDO:FUNDamental:TRACe
```

The query parameter, number of data and data interval for capturing the waveform data for each measurement item are listed in the following table.

**Table 2.7-1 Waveform Data Type and Data Interval**

| Measurement | Query Parameter | Number of Data | Data Interval |
|---|---|---|---|
| Occupied Bandwidth | 1 | 621 | 4.8828125 kHz |
| Spurious Emissions (RBW 30 kHz) | 2 | 1893 | 4.8828125 kHz |
| Spurious Emissions (RBW 1 MHz) | 3 | 1893 | 4.8828125 kHz |
| Spurious Emissions (RBW 1.23 MHz) | 4 | 1893 | 4.8828125 kHz |
| Code Domain Power (I) | 5 | 32 | 1 walsh code |
| Code Domain Power (Q) | 6 | 32 | 1 walsh code |

# 2.8 Sample Programs

## 2.8.1 Spurious Emissions

An example of Spectrum Spurious Emissions measurement using the Native command mode is described here.

The sample program on the following pages can be executed as a Tera Term macro. Refer to the Tera Term Help file for how to execute the macro.

### Processing Flow

1. Set the application software type to the MX887016A.
2. Set the following measurement conditions.

| | |
|---|---|
| Test Port | Port1 |
| Input level | –10 dBm |
| Reverse Link frequency | 1855 MHz |
| Frequency Band | 1 |
| Protocol Revision | Rev. A |
| Long Span Code Search | ON |
| Data Channel Payload Size | 128 kbps |
| Trigger Source | Power |
| Trigger Level | –10 |
| Trigger Delay | 1 ms |
| Trigger Timeout | 10 s |
| Tx Power Measurement | OFF |
| Occupied Bandwidth Measurement | OFF |
| Spurious Emissions Measurement | ON, 100 counts |
| Modulation Analysis | OFF |
| Code Domain Power | OFF |

3. Start measurement.
4. Read the measurement status.
5. Query the measurement results after measurement is completed.
6. Query the spectrum waveform data.

```
 Sample program for Spectrum Emission Mask
; Anritsu Corporation March,2012
; Macro for Tera Term Version 4.69
;
; set local echo to on
setecho 1
flushrecv
; time out 3 second
timeout=3

; Set language to "Native".
sendln 'SYST:LANG NAT'
call check_error_code

; Set application type to "Cellular".
sendln 'SYSSEL CELLULAR'
call check_error_code

; Set standard to "EVDO".
sendln 'STDSEL EVDO'
call check_error_code

; Set test port to "Port1".
sendln 'PORT PORT1,PORT1'
call check_error_code

; Set Input Range to "-10 dBm".
sendln 'ILVL -10'
call check_error_code

; Set center frequency to "1855 MHz".
sendln 'TXFREQ 1855MHZ'
call check_error_code

; Set Frequency Band to "1".
sendln 'BAND 1'
call check_error_code

; Set Protocol Revision to "Rev.A".
sendln 'PREV REVA'
call check_error_code
```

```
; Set Long Span Code Search for Synchronization to "ON".
sendln 'LSCODESEARCH ON'
call check_error_code

; Set Data Channel Payload Size to "128 kbps".
sendln 'PSIZE 128'
call check_error_code

; Set Trigger Source to "Power".
sendln 'FMEAS_TRGSRC PWR'
call check_error_code

; Set Trigger Level to "-10 dB".
sendln 'FMEAS_TRGLVL -10'
call check_error_code

; Set Trigger Delay to "1 ms".
sendln 'FMEAS_TRGDLY 1'
call check_error_code

; Set Trigger Timeout to "10 s".
sendln 'FMEAS_TRGTOUT 10'
call check_error_code

; Set Measurement of Tx Power to "OFF".
sendln 'PWR_SET OFF'
call check_error_code

; Set Measurement of Occupied Bandwidth to "OFF".
sendln 'OBW_SET OFF'
call check_error_code

; Set Measurement of Spurious Emission to "ON","100 times".
sendln 'SPR_SET ON,100'
call check_error_code

; Set Measurement of Modulation Analysis to "OFF".
sendln 'MOD_SET OFF'
call check_error_code

; Set Measurement of Code Domain Power to "OFF".
sendln 'CDP_SET OFF'
call check_error_code
```

```
; Start measurement
sendln 'SNGLS'
call check_error_code

; waiting measurement up to 10 second
for i 1 10

  sendln 'MSTAT?'
  pause 1; wait 1 second
  recvln
  recvln
  ;call check_response ; debug
  if result=0 goto _timeout
  if result=1 then
         break
  endif
  call check_error_code
next

; Query Judgement
sendln 'SEM?'
call check_error_code

; Query Peak level and frequency in each range
sendln 'SEMLVL_LOWER?'
call check_error_code
sendln 'SEMLVL_UPPER?'
call check_error_code

; Query Margin in each range
sendln 'SEMMARGIN_LOWER?'
call check_error_code
sendln 'SEMMARGIN_UPPER?'
call check_error_code

; Query Spectrum data
sendln 'WAVEFMEAS? 2,0,1641'
call check_error_code

messagebox  'Macro end successfully' 'Finish'
```

```
End

;       ------------ subroutines -----------

:check_error_code
  ; query error
  sendln 'SYSERR?'
  waitln 'No error'

  ; in case of timeout
  if result=0 goto _timeout
  ; in case of error occurring
  if result=2 then
         e_message='Error code = '
         strconcat e_message inputstr
         messagebox  e_message 'Command Error occurred'
         end
  endif

  ; in case of no error

return

:check_response

  ;for debug
  messagebox inputstr 'debug1'
  int2str result_str result
  messagebox result_str 'debug2'

  return

:_timeout
  messagebox  'No response from MT8870A.' 'Time out!'
  call check_error_code
  End
```

## 2.8.2 Modulation Analysis

An example of modulation analysis using the SCPI command mode is described here.

The sample program on the following pages can be executed as a Tera Term macro. Refer to the Tera Term Help file for how to execute the macro.



### Processing Flow

1. Set the application software type to the MX887016A.
2. Set the following measurement conditions.

| | |
|---|---|
| Test Port | Port2 |
| Input Level | –20 dBm |
| Reverse Link Frequency | 1855 MHz |
| Frequency Band | 1 |
| Protocol Revision | Rev.A |
| Long Span Code Search | ON |
| Data Channel Payload Size | 128 kbps |
| Trigger Source | Power |
| Trigger Level | –10 |
| Trigger Delay | 0 ms |
| Trigger Timeout | 5 s |
| Tx Power Measurement | OFF |
| Occupied Bandwidth Measurement | OFF |
| Spurious Emissions Measurement | OFF |
| Modulation Analysis | ON, 200 counts |
| Code Domain Power | OFF |

3. Start measurement.
4. Read the measurement status.
5. Query the following measurement results when measurement is completed.

   Frequency, Frequency Error (Worst), EVM, Peak EVM, Phase Error, Magnitude Error, Origin Offset, Rho, and Time Error (Worst)

```
; Sample program for Modulation Analysis
; Anritsu Corporation March,2012
; Macro for Tera Term Version 4.69
;
; set local echo to on
setecho 1
flushrecv
; time out 3 second
timeout=3

; Set language to "SCPI".
sendln 'SYST:LANG SCPI'
call check_error_code

; Set application type to "Cellular".
sendln ':INST CELLULAR'
call check_error_code

; Set standard to "EVDO".
sendln ':CONF:CELL:MEAS:STAN EVDO'
call check_error_code

; Set test port to "Port2".
sendln ':ROUT:PORT:CONN:DIR PORT2,PORT2'
call check_error_code

; Set Reverse Link Frequency to "1855 MHz".
sendln ':CONF:CELL:MEAS:RFS:FREQ 1855000000'
call check_error_code

; Set Input Level to "-20 dBm".
sendln ':CONF:CELL:MEAS:RFS:LEV -20'

; Set Frequency Band to "1".
sendln ':CONF:CELL:EVDO:FUND:BAND 1'
call check_error_code

; Set Protocol Revision to "Rev.A".
sendln ':CONF:CELL:EVDO:PREV REVA'
call check_error_code

; Set Long Span Code Search for Synchronization to "ON".
sendln ':CONF:CELL:EVDO:FUND:LSS OFF'
call check_error_code
```

```
; Set Data Channel Payload Size to "128 kbps".
sendln ':CONF:CELL:EVDO:PSIZ 128'
call check_error_code

; Set Trigger Source to "Power".
sendln ':TRIG:CELL:EVDO:FUND:SOUR PWR'
call check_error_code

; Set Trigger Level to "-10 dB".
sendln ':TRIG:CELL:EVDO:FUND:LEV -10'
call check_error_code

; Set Trigger Delay to "0 ms".
sendln ':TRIG:CELL:EVDO:FUND:DEL 0'
call check_error_code

; Set Trigger Timeout to "5 s".
sendln ':TRIG:CELL:EVDO:FUND:TOUT 5'
call check_error_code

; Set Measurement of Tx Power to "OFF".
sendln ':CONF:CELL:EVDO:FUND:POW:SET OFF'
call check_error_code

; Set Measurement of Occupied Bandwidth to "OFF".
sendln ':CONF:CELL:EVDO:FUND:OBW:SET OFF'
call check_error_code

; Set Measurement of Spurious Emission to "OFF".
sendln ':CONF:CELL:EVDO:FUND:SPUR:SET OFF'
call check_error_code

; Set Measurement of Modulation Analysis to "ON","200 times".
sendln ':CONF:CELL:EVDO:FUND:MOD:SET ON,200'
call check_error_code

; Set Measurement of Code Domain Power to "OFF".
sendln ':CONF:CELL:EVDO:FUND:CDP:SET OFF'
call check_error_code

; ! Note !
; Output the RF power of Device under test.
```

```
; Start measurement
sendln ':INIT:CELL:MEAS:SING'
call check_error_code

; waiting measurement up to 10 second
for i 1 10

  sendln ':FETC:CELL:MEAS:STAT?'
  pause 1; wait 1 second
  recvln
  recvln
  ;call check_response ; debug
  if result=0 goto _timeout
  if result=1 then
         break
  endif
  call check_error_code
next

; Query Frequency
sendln ':FETC:CELL:EVDO:FUND:MOD:CFR?'
call check_error_code

; Query Frequency Error (Worst)
sendln ':FETC:CELL:EVDO:FUND:MOD:FERR:WORS?'
call check_error_code

; Query EVM
sendln ':FETC:CELL:EVDO:FUND:MOD:EVM? TTL'
call check_error_code

; Query Peak EVM
sendln ':FETC:CELL:EVDO:FUND:MOD:PEVM? TTL'
call check_error_code

; Query Phase Error
sendln ':FETC:CELL:EVDO:FUND:MOD:PHER? TTL'
call check_error_code

; Query Magnitude Error
sendln ':FETC:CELL:EVDO:FUND:MOD:MERR? TTL'
call check_error_code

; Query Origin Offset
```

```
sendln ':FETC:CELL:EVDO:FUND:MOD:ORGN? TTL'
call check_error_code

; Query Rho
sendln ':FETC:CELL:EVDO:FUND:MOD:RHO? TTL'
call check_error_code

; Query Time Error (Worst)
sendln ':FETC:CELL:EVDO:FUND:MOD:TERR:WORS?'
call check_error_code

messagebox  'Macro end successfully' 'Finish'

End

;       ------------ subroutines -----------

:check_error_code
  ; query error
  sendln ':SYSTem:ERRor?'
  waitln 'No error'

  ; in case of timeout
  if result=0 goto _timeout
  ; in case of error occurring
  if result=2 then
         e_message='Error code = '
         strconcat e_message inputstr
         messagebox  e_message 'Command Error occurred'
         end
  endif

  ; in case of no error

return
```

```
:check_response

  ;for debug
  messagebox inputstr 'debug1'
  int2str result_str result
  messagebox result_str 'debug2'

  return

:_timeout
  messagebox  'No response from MT8870A.' 'Time out!'
  call check_error_code
  End
```

# Chapter 3 Sequence Measurement

This chapter explains the MX887016A Sequence Measurement function and commands. For a detailed description of the commands, refer to Chapter 4 “SCPI Command Reference” and Chapter 5 “Native Command Reference” in this manual.

A license for the MX887010A Cellular Standards Sequence Measurement is required to execute sequence measurement.


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# 3.1 Outline

The MX887016A 1xEV-DO Reverse Link transmission measurement option adds the following measurements to the Sequence Measurement mode. Refer to Chapter 2 “Fundamental Measurement” for details of each measurement.

- Tx Power
- Occupied Bandwidth
- Spurious Emissions
- Modulation Analysis
  Frequency Error, Rho, EVM, Origin Offset, Time Error
- Code Domain Power

The Sequence Measurement mode does not support the Waveform Data measurement.

1xEV-DO measurement can be allocated to any segment in the sequence table.
The segment duration depends on the measurement count. Each item of 1xEV-DO measurement takes 0.667 ms (≈10/15 ms).
When multiple measurements are specified in a segment, the largest measurement count determines the segment measurement duration.

Example:

| | | |
|---|---|---|
| Tx Power | 50 times | 50 × 10/15 ms = 33.3 ms |
| Occupied Bandwidth | 100 times | 100 × 10/15 ms = 66.7 ms |
| Spurious Emissions | 150 times | 150 × 10/15 ms = 100 ms |
| Modulation Analysis | 50 times | 50 × 10/15 ms = 33.3 ms |
| Code Domain Power | 200 times | 200 × 10/15 ms = 133.3 ms |

In this case, the measurement duration is 133.3 ms as determined by the Code Domain Power measurement duration.

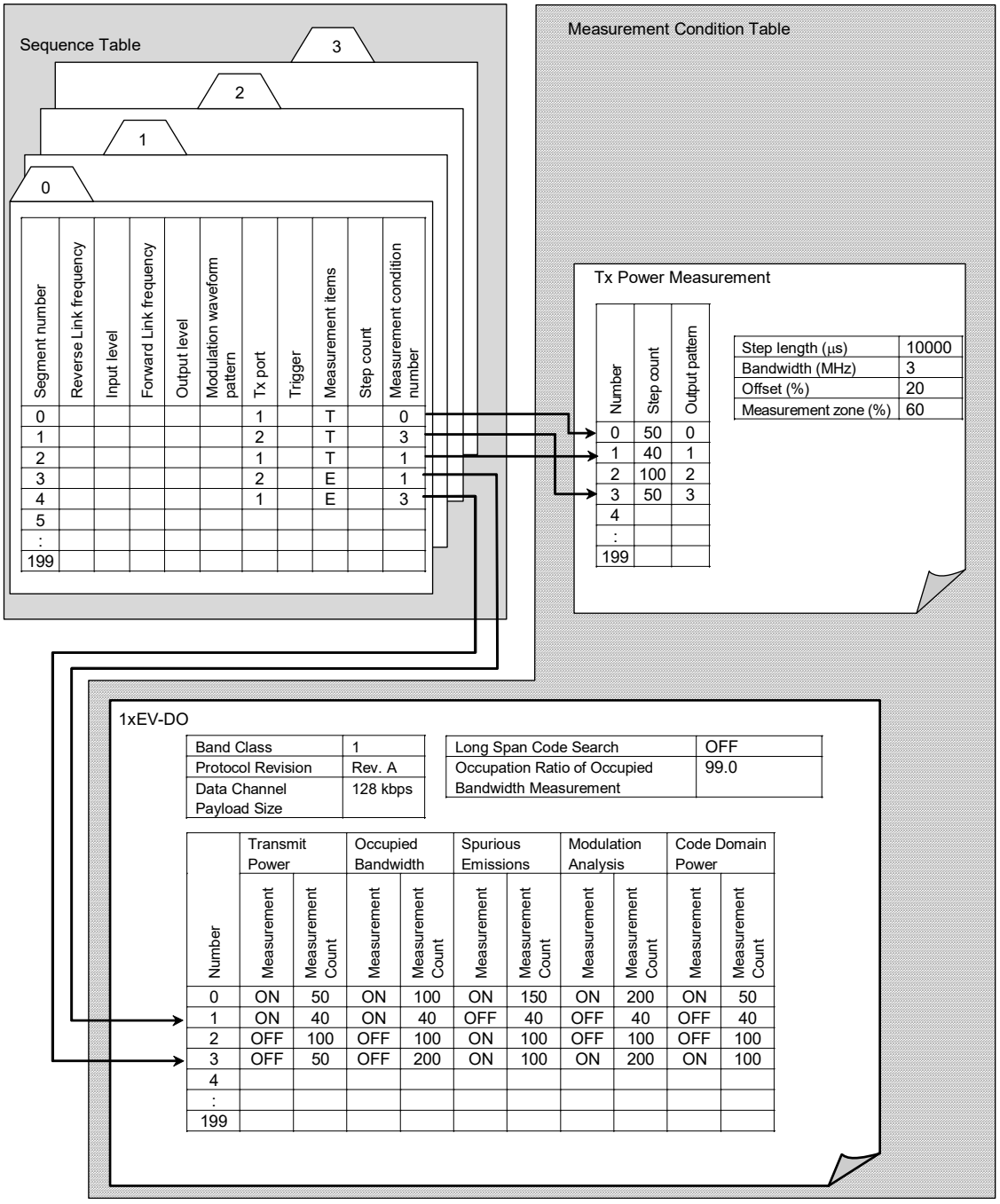



**Figure 3.1-1 Data Composition of Sequence Measurement Conditions with MX887016A Installed**

To switch to the Sequence Measurement mode, use the following command and specify SEQUENCE as the parameter.

```
STDSEL
:CONFigure:CELLular:MEASurement:STANdard
```

To modify the frequency, level or waveform pattern of Forward Link signals at sequence measurement, set the MU887000A vector signal generator to the Sequence Measurement mode. Set the parameter to SEQUENCE using the following command. For a detailed description, refer to Chapter 5 "SCPI Command Reference" in *the MU887000A TRX Test Module Operation Manual*.

```
:SOURce:GPRF:GENerator:MODE
```

Set the initial conditions of the Sequence Measurement mode to the following measurement items as described in Section 2.1 "Common Operations".
Individual values can be set as described in Chapter 2 "Fundamental Measurements" and Chapter 3 "Sequence Measurement".

- Input Frequency (Rev.) (mobile station Tx frequency)
  `TXFREQ`
  `:CONFigure:CELLular:MEASurement:RFSettings:FREQuency`
- Output Frequency (Fwd.) (mobile station Rx frequency)
  `RXFREQ`
  `:CONFigure:CELLular:GENerator:RFSettings:FREQuency`
- Output Level
  `OLVL`
  `:CONFigure:CELLular:GENerator:RFSettings:LEVel`
- Input Level
  `ILVL`
  `:CONFigure:CELLular:MEASurement:RFSettings:LEVel`
- Output On/Off
  `LVL`
  `:CONFigure:CELLular:GENerator:RFSettings:STATe`
- Modulation On/Off
  `MOD`
  `:CONFigure:CELLular:GENerator:BBMode`
- Waveform File
  `PACKAGE`
  `:CONFigure:CELLular:GENerator:ARB:PACKage:SELect`
- Waveform Pattern
  `DLPAT`
  `:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect`
  `DLPAT_SYNC`
  `:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect:SYNC`
- Ports
  `PORT`
  `:ROUTe:PORT:CONNect:DIRection`

# 3.2 Sequence Table Setup

## 3.2.1 Sequence table setting items

The sequence table setting items are:

- Table number
- Reverse Link frequency
- Input level
- Forward Link frequency
- Output level
- Modulated waveform pattern
- Output test port
- Input test port
- Trigger conditions
- Measurement items
- Step count
- Measurement condition number



### Table number

This is the number allocated to the edited sequence table. Four sequence tables are used and each table has a number between 0 and 3.

### Reverse Link Frequency, Input level, Forward Link frequency, Output level, Modulated waveform pattern

Each segment of the sequence table is configured with frequencies (MHz) and levels (dBm) and modulated waveform pattern number. The setting ranges are:

Frequency: 400.000000 to 3800.000000 MHz

Input level:

| | | |
|---|---|---|
| MU887000A | –65.0 to +35.0 dBm | (Test port 1, 2) |
| | –65.0 to +25.0 dBm | (Test port 3, 4) |
| MU887001A | –65.0 to +35.0 dBm | (Test port 1 to 4) |
| MU887002A | –65.0 to +35.0 dBm | (TRX 1/2 Test port 1 to 12) |

Output level:

| | | |
|---|---|---|
| MU887000A | –130.0 to –10.0 dBm | (Test port 1, 2) |
| | –120.0 to 0.0 dBm | (Test port 3, 4) |
| MU887001A | –130.0 to –10.0 dBm | (Test port 1 to 4) |
| MU887002A | –130.0 to 0.0 dBm | (TRX 1/2 Test port 1 to 12) |

Modulated Waveform pattern: PAT1 to PATn

n: waveform information file group range

For details of the modulated waveform patterns at 1xEV-DO measurement, refer to Section 2.1.5 “Waveform patterns”.

Output test port

This sets the RF signal output test port in each segment of the sequence table.

MU887000A: Test port 1 to 4 (When selecting test port 3 or 4, make sure the port number is not the same as the input port.)

MU887001A: Test port 1 to 4

MU887002A: TRX 1/2 Test port 1 to 12

Input test port

Specifies the segment number and sets the test port for inputting RF signals.

Trigger condition

This specifies the trigger condition at each segment of the sequence table.

The setting ranges are:

| | |
|---|---|
| Trigger Source: | Frame: When frame is detected<br>Free run: When measurement start command received<br>Power: When input level above (below) trigger level |
| Slope: | Rise: When input level exceeds trigger level |
| Trigger Level: | Level difference from input level<br>Set a value in the range of –40.0 to 0 dB. |
| Trigger Delay: | Delay time<br>Set a value in the range of 0 to 10.000 ms. |

Measurement item, number of steps and measurement condition number

Measurement item, Step count and Measurement condition

This sets the step count and measurement item for received signals in each segment of the sequence table. To execute the 1xEV-DO measurement described here, set 1xEV-DO as the measurement item.

***Note:***

If the license of other cellular application software is installed, the measurement mode supported by the license can be set.

In this case, the measurement mode can be changed up to 15 times during the sequence.

The 1xEV-DO measurement condition is specified in a separate table. A measurement item should be registered in a given segment with its measurement condition number specified in the related table.

Set the step count to the following values or more according to the contents of the 1xEV-DO measurement condition table.

- Measurement Count +2
- The step number of trigger segment* is 16 or above.

  *:A start segment of sequence measurement or a segment whose trigger source is not set to Freerun.

Step count setting examples are shown in the following table.

**Table 3.2.1-1 Examples of Step Count Settings**

| | Measurement | Example 1 | | Example 2 | |
|---|---|---|---|---|---|
| | | Measurement | Measurement count | Measurement | Measurement count |
| *1 | Tx Power | On | 50 | On | 50 |
| | Occupied Bandwidth | On | 100 | On | 100 |
| | Spurious Emissions | On | 60 | On | 60 |
| | Modulation Analysis | On | 200 | On | 200 |
| | Code Domain Power | On | 100 | Off | 100 |
| *2 | Step Count | | 202 | | 202 |

*1: Setup items specified in 1xEV-DO measurement condition table

*2: Setup items specified in sequence table

## 3.2.2 Sequence table commands

The following commands set and query items in the sequence table.

- Table Number
  SEQTBL
  :CONFigure:CELLular:SEQuence:TABLe
- Reverse Link frequency, Input Level, Forward Link frequency, Output Level, and Modulation Pattern
  SEQTRX
  :CONFigure:CELLular:SEQuence:RFSettings:TRX
- Reverse Link frequency and Input Level
  SEQTX
  :CONFigure:CELLular:SEQuence:RFSettings:TX
- Output port
  SEQSGPORT
  :CONFigure:CELLular:SEQuence:RXPort
  :CONFigure:CELLular:SEQuence:PORT:RX
- Input port
  SEQSAPORT
  :CONFigure:CELLular:SEQuence:PORT:TX
- Trigger
  SEQTRG
  :TRIGger:CELLular:SEQuence
- Measurement mode, Step Count and Measurement Condition Number
  SEQMEAS
  :CONFigure:CELLular:SEQuence:SETup

## 3.2.3 Setting item error check

Setting errors in the following items in the sequence table can be checked.

- Input level
- Output level
- Step count
- Waveform pattern
- Port
- Amount of capture memory
- Output level change count
- Waveform pattern change count
- Measurement mode change count

The following command is used to check for errors.

SEQERR
:FETCh:CELLular:SEQuence:ERRor
SEQERR2
:FETCh:CELLular:SEQuence:ERRor2

Capture memory is used to save the 1xEV-DO measurement results. One 1xEV-DO measurement uses about 0.017% of the memory, so 1.7% of the capture memory is required to execute 100 measurements for a specific segment.
The following table shows error causes.

**Table 3.2.3-1 Error Cause**

| Parameter | Cause |
|---|---|
| Input level* | Input level is out of range. |
| Output level* | Output level is out of range. |
| Step count | Fail to satisfy the step count conditions in Section 3.2.1. |
| Waveform pattern | The specified waveform file is not loaded in the waveform memory.<br>The specified waveform pattern does not exist in the waveform file. |
| Port | For MU887000A:<br>Port 3 is set for both input port and output port.<br>Or Port 4 is set for both input port and output port. |
| Amount of capture memory | Memory use rate is 100% or above |
| Output level change count | Output level change count is 3001 or above. |
| Waveform pattern change count | Waveform pattern change count is 101 or above. |
| Measurement mode change count | Measurement mode change count is 16 or above. |

*: The available level depends on the settings of port number and external loss.

Changing the waveform pattern to CW or NC is not counted as waveform pattern change. Some examples of how to count waveform pattern change are shown below.

| Parameter Setting Command | Waveform Pattern Change Count |
|---|---|
| `SEQTRX 0,1950.00,-10.00,869.20,-60.00,PAT1` | 1 |
| `SEQTRX 1,1950.00,-10.00,869.20,-60.00,CW` | 1 |
| `SEQTRX 2,1950.00,-10.00,869.20,-60.00,PAT2` | 2 |
| `SEQTRX 3,1950.00,-10.00,869.20,-60.00,NC` | 2 |
| `SEQTRX 4,1950.00,-10.00,869.20,-60.00,PAT3` | 3 |
| `SEQTRX 5,1950.00,-10.00,869.20,-60.00,PAT1` | 4 |

# 3.3 Setting Measurement Conditions Table

## 3.3.1 Setup 1xEV-DO measurement items

The items in the 1xEV-DO measurement condition table supporting sequence measurement are listed below.
Refer to Figure 3.1-1.

- Band Class*
- Protocol Revision
- Long Span Code Search
- Data Channel Payload Size
- Occupied Bandwidth Measurement Occupation Ratio
- Tx Power Measurement on/off and Count*
- Occupied Bandwidth measurement on/off and count*
- Spurious Emissions measurement on/off and count*
- Modulation Analysis measurement on/off and count*
- Code Domain Power measurement on/off and count*
- All measurement items Off*

*: Up to 2000 measurement conditions numbered 0 to 1999 can be set.

## 3.3.2 1xEV-DO measurement condition setting commands

The following commands set and query the 1xEV-DO measurement conditions.

- Band Class
  `EVDO_BAND`
  `:CONFigure:CELLular:SEQuence:EVDO:BAND`

- Protocol Revision
  `EVDO_PREV`
  `:CONFigure:CELLular:SEQuence:EVDO:PREVision`

- Long Span Code Search
  `EVDO_LSCODESEARCH`
  `:CONFigure:CELLular:SEQuence:EVDO:LSSearch`

- Data Channel Payload Size
  `EVDO_PSIZE`
  `:CONFigure:CELLular:SEQuence:EVDO:PSIZe`

- Occupation Ratio
  EVDO_OBW_RATIO
  :CONFigure:CELLular:SEQuence:EVDO:OBW:RATio

- Tx Power measurement on/off and count
  EVDO_PWR_SET
  :CONFigure:CELLular:SEQuence:EVDO:POWer:SET

- Occupied Bandwidth measurement on/off and count
  EVDO_OBW_SET
  :CONFigure:CELLular:SEQuence:EVDO:OBW:SET

- Spurious Emissions measurement on/off and count
  EVDO_SPR_SET
  :CONFigure:CELLular:SEQuence:EVDO:SPURious:SET

- Modulation Analysis measurement on/off and count
  EVDO_MOD_SET
  :CONFigure:CELLular:SEQuence:EVDO:MODulation:SET

- Code Domain Power measurement on/off and count
  EVDO_CDP_SET
  :CONFigure:CELLular:SEQuence:EVDO:CDPower:SET

- All measurement items Off
  EVDO_MEAS_OFF
  :CONFigure:CELLular:SEQuence:EVDO:AMITems:OFF

# 3.4 Controlling and Monitoring Sequence

## 3.4.1 Controlling and monitoring items

The following items can be set to control sequence measurement.

- Start and stop segments
- Initialization after completion of sequence measurement

Start and stop segments

Segment numbers from 0 to 199 can be set in the sequence table. The start and stop segments must be specified if part of a sequence table is executed. If they are not specified, all segments (0 to 199) are measured.

Initialization after completion of sequence measurement

Select whether the following items are set to the values described in Section 2.1.3 “Frequency and level”, when sequence measurement is completed.

- Receive frequency (mobile station Tx frequency)
- Input level
- Transmit frequency (mobile station Rx frequency)
- Output level

To start or stop the Sequence Measurement or monitor the measurement status, use the commands described in Section 2.1.8 “Starting/stopping measurement”.

In addition, the following items can be queried during sequence measurement.

- Number of measured segments
- Measurement status of each segment
- Measurement status of the specified segment
- Progress of sequence measurement

Number of measured segments and measurement status of each segment

The number of completed segment measurements and the status of segments can be monitored during sequence measurement.
The following table lists the response values and status of segments.

**Table 3.4.1-1 Segment Status**

| Response | Status |
|---|---|
| 0 | Measurement completed successfully |
| 2 | Over level |
| 4 | Measurement failed |
| 5 | Failed to detect synchronization word. |
| 9 | Measuring or no measurement |
| 10 | Segment not measured |
| 12 | Tx measurement timeout |

Measurement status of specified segments

Monitor the status of segments by specifying segment numbers from 0 to 1999.

Progress of sequence measurement

The progress can be measured as a proportion of the total number of segments between the start and stop numbers

## 3.4.2 Sequence control and monitor commands

The sequence measurement can be controlled and monitored using the following commands.
The status indication lamp 3 of MU887000A is on during the execution of measurement or analysis. For the explanation of the status lamp, refer to Appendix D "Status Indication of lamps" in *the MU887000A TRX Test Module Operation Manual*.

- Starting measurement and signal output
  This command sets the parameters for both specified measurement and signal transmission and executes measurement.
  `SNGLS`
  `:INITiate:CELLular:MEASurement:SINGle`
- Start segment and stop segment for measurement and signal transmission
  This command sets both start segment and end segment for sequence measurement and sets both measurement and signal transmission parameters.
  `SEQCTRL`
  `:CONFigure:CELLular:SEQuence:CONTrol`
- Start segment and stop segment for measurement
  This command sets both start segment and end segment for sequence measurement and sets the measurement parameters only, without affecting the signal transmission parameters.
  `SEQCTRLTX`
  `:CONFigure:CELLular:SEQuence:CONTrol:TX`
- Starting measurement
  This command sets only the parameters for the specified measurement and executes measurement, without affecting the signal transmission parameters.
  `SEQEXECTX`
  `:INITiate:CELLular:SEQuence:EXECute:TX`
- Stopping measurement
  `MEASSTOP`
  `:ABORt:CELLular:MEASurement`
- Initialization after completion of sequence measurement
  `SEQREINIT`
  `:CONFigure:CELLular:SEQuence:RFSettings:REINit`

The status of sequence measurement can be queried using the following commands

- Progress of sequence measurement
  SEQPROGRESS
  :FETCh:CELLular:SEQuence:PROGress
- Measurement status of specified segment
  SEQSEGSTAT
  :FETCh:CELLular:SEQuence:SEG:STATe
- Progress status of sequence measurement
  SEQMSTAT
  :FETCh:CELLular:SEQuence:STATe

# 3.5 Measurement Results

The 1xEV-DO measurement results are queried using the following commands.

### Tx Power

- Transmit Power
  `EVDO_TXPWR`
  `:FETCh:CELLular:SEQuence:EVDO:POWer:TXPower`
- Filter Power
  `EVDO_FILTPWR`
  `:FETCh:CELLular:SEQuence:EVDO:POWer:FLTPower`

### Occupied Bandwidth

- Occupied Bandwidth
  `EVDO_OBW`
  `:FETCh:CELLular:SEQuence:EVDO:OBW`
- Occupied Bandwidth Frequency
  `EVDO_OBWFREQ`
  `:FETCh:CELLular:SEQuence:EVDO:OBW:FREQuency`

### Spurious Emissions

- Judgement result
  `EVDO_SEM`
  `:FETCh:CELLular:SEQuence:EVDO:SPURious:JUDGement`
- Max. Level and Frequency in Each Range
  Lower Side of Channel Bandwidth
  `EVDO_SEMLVL_LOWER`
  `:FETCh:CELLular:SEQuence:EVDO:SPURious:LOWer`
  Upper Side of Channel Bandwidth
  `EVDO_SEMLVL_UPPER`
  `:FETCh:CELLular:SEQuence:EVDO:SPURious:UPPer`
- Margin in Each Range
  Lower Side of Channel Bandwidth
  `EVDO_SEMMARGIN_LOWER`
  `:FETCh:CELLular:SEQuence:EVDO:SPURious:MARGin:LOWer`
  Upper Side of Channel Bandwidth
  `EVDO_SEMMARGIN_UPPER`
  `:FETCh:CELLular:SEQuence:EVDO:SPURious:MARGin:UPPer`

Modulation Analysis

- Carrier Frequency
  EVDO_CFREQ
  :FETCh:CELLular:SEQuence:EVDO:MODulation:CFRequency
- Frequency Error (ppm, Hz)
  EVDO_CFERR
  :FETCh:CELLular:SEQuence:EVDO:MODulation:FERRor
- Frequency Error Worst Value (ppm, Hz)
  EVDO_CFERR_WORST
  :FETCh:CELLular:SEQuence:EVDO:MODulation:FERRor:WORSt
- Rho
  EVDO_RHO
  :FETCh:CELLular:SEQuence:EVDO:MODulation:RHO
- EVM
  EVDO_EVM
  :FETCh:CELLular:SEQuence:EVDO:MODulation:EVM
- Peak EVM
  EVDO_PEVM
  :FETCh:CELLular:SEQuence:EVDO:MODulation:PEVM
- Phase Error
  EVDO_PHASEERR
  :FETCh:CELLular:SEQuence:EVDO:MODulation:PHERror
- Magnitude Error
  EVDO_MAGERR
  :FETCh:CELLular:SEQuence:EVDO:MODulation:MERRor
- Origin Offset
  EVDO_ORGNOFS
  :FETCh:CELLular:SEQuence:EVDO:MODulation:ORGNoffset
- Time Error
  EVDO_TAU
  :FETCh:CELLular:SEQuence:EVDO:MODulation:TERRor
- Worst Value in Time Error Measurement Results
  EVDO_TAU_WORST
  :FETCh:CELLular:SEQuence:EVDO:MODulation:TERRor:WORSt

Code Domain Power

- Max Inactive Channel Power
  `EVDO_MAXINACTCODE`
  `:FETCh:CELLular:SEQuence:EVDO:CDPower:MICPower`
- Pilot Channel Power
  `EVDO_CDP_PILOT`
  `:FETCh:CELLular:SEQuence:EVDO:CDPower:PILot`
- RRI Channel Power (Reverse Rate Indicator)
  `EVDO_CDP_RRI`
  `:FETCh:CELLular:SEQuence:EVDO:CDPower:RRI`
- DSC Channel Power (Data Source Channel)
  `EVDO_CDP_DSC`
  `:FETCh:CELLular:SEQuence:EVDO:CDPower:DSC`
- DRC Channel Power (Data Rate Channel)
  `EVDO_CDP_DRC`
  `:FETCh:CELLular:SEQuence:EVDO:CDPower:DRC`
- ACK Channel Power
  `EVDO_CDP_ACK`
  `:FETCh:CELLular:SEQuence:EVDO:CDPower:ACK`
- DATA Channel Power
  `EVDO_CDP_DATA`
  `FETCh:CELLular:SEQuence:EVDO:CDPower:DATA`
- Aux Pilot Channel Power
  `EVDO_CDP_AUX`
  `:FETCh:CELLular:SEQuence:EVDO:CDPower:APILot`

# 3.6 Sample Program

This section describes an example of sequence measurement using the Native command mode.

### Processing Flow

1. Set the application type to Cellular.
2. Set the MX887016A Sequence Measurement as measurement standard.
3. Set measurement conditions listed in Tables 3.6-1 and 3.6-2.
4. Query the sequence table for errors and abort if errors found.
5. Set the following items.

| | |
|---|---|
| RF Signal Output | On |
| Start segment number | 0 |
| Stop segment number | 1 |
| Initialization after sequence measurement | On |

6. Start measurement.
7. Query the status of measurements.
8. When measurement is completed, query:
   Tx power and Occupied bandwidth at segment 0
   Spurious Emissions, Modulation Analysis, and Code Domain Power at segment 1

**Table 3.6-1 Sequence Table Setting 1**

| **Segment Number** | 0 | 1 | 2 | .... |
|---|---|---|---|---|
| **Forward Link Frequency (MHz)** | 1935 | 1940 | | |
| **Input Level (dBm)** | 0 | 0 | | |
| **Reverse Link Frequency (MHz)** | 1855 | 1860 | | |
| **Output Level (dBm)** | –50 | –55 | | |
| **Downlink Signal Pattern** | PAT1 | PAT2 | | |
| **Output Port** | 1 | 2 | | |
| **Trigger Source** | Free run | Free run | | |
| **Trigger Slope** | Rise | Rise | | |
| **Trigger Level** | –20 | –25 | | |
| **Trigger Delay Time (ms)** | 0 | 0 | | |
| **Measurement Item** | 1xEV-DO | 1xEV-DO | | |
| **Step Count** | 250 | 250 | | |
| **Measurement Condition Number** | 0 | 1 | | |

**Table 3.6-2 1xEV-DO Measurement Condition Settings**

| Item | Setting | | | |
|---|---|---|---|---|
| **Band Class** | 1 | | | |
| **Protocol Revision** | Rev.0 | | | |
| **Long Span Code Search** | ON | | | |
| **Occupation Ratio (%)** | 99.5 | | | |
| **Measurement Condition Number** | 0 | 1 | 2 | … |
| **Tx Power Measurement** | ON | OFF | | |
| **Tx Power Measurement Count** | 100 | 10 | | |
| **Occupied Bandwidth Measurement** | ON | OFF | | |
| **Occupied Bandwidth Measurement Count** | 50 | 5 | | |
| **Spurious Emissions Measurement** | OFF | ON | | |
| **Spurious Emissions Measurement Count** | 100 | 10 | | |
| **Modulation Analysis Measurement** | OFF | ON | | |
| **Modulation Analysis Measurement Count** | 200 | 20 | | |
| **Code Domain Power Measurement** | OFF | ON | | |
| **Code Domain Power Measurement Count** | 50 | 75 | | |

```
; Sample program for 1xEV-DO Sequence Measurement
; Anritsu Corporation March,2012
; Macro for Tera Term Version 4.69
;
; set local echo to on
setecho 1
flushrecv
; time out 3 second
timeout=3

; Set language to "Native".
sendln 'SYST:LANG NAT'
call check_error_code

; Set application type to "Cellular".
sendln 'SYSSEL CELLULAR'
call check_error_code

; Set standard to "Sequence".
sendln 'STDSEL SEQUENCE'
call check_error_code

; Set Sequence Table Parameters of "Segment 0".
sendln ' SEQTRX 0,1855,0,1935,-50,PAT1'
call check_error_code

sendln 'SEQSGPORT 0,PORT1'
call check_error_code

sendln 'SEQSAPORT 0,PORT1'
call check_error_code

sendln 'SEQTRG 0,FREERUN,RISE,-20,0'
call check_error_code

sendln 'SEQMEAS 0,EVDO,250,0'
call check_error_code

; Set Sequence Table Parameters of "Segment 1".
sendln ' SEQTRX 1,1860,0,1940,-55,PAT2'
call check_error_code

sendln 'SEQSGPORT 1,PORT2'
call check_error_code
```

```
sendln 'SEQSAPORT 1,PORT2'
call check_error_code

sendln 'SEQTRG 1,FREERUN,RISE,-25,0'
call check_error_code

sendln 'SEQMEAS 1,EVDO,250,1'
call check_error_code

; Set Measurement Condition of "1xEV-DO".
sendln 'EVDO_BAND 0,1'
call check_error_code

sendln 'EVDO_PREV REV0'
call check_error_code

sendln 'EVDO_LSCODESEARCH ON'
call check_error_code

sendln 'EVDO_OBW_RATIO 99.5'
call check_error_code

sendln 'EVDO_PWR_SET 0,ON,100'
call check_error_code

sendln 'EVDO_PWR_SET 1,OFF,10'
call check_error_code

sendln 'EVDO_OBW_SET 0,ON,50'
call check_error_code

sendln 'EVDO_OBW_SET 1,OFF,5'
call check_error_code

sendln 'EVDO_SPR_SET 0,OFF,100'
call check_error_code

sendln 'EVDO_SPR_SET 1,ON,10'
call check_error_code

sendln 'EVDO_MOD_SET 0,OFF,200'
call check_error_code
```

```
sendln 'EVDO_MOD_SET 1,ON,20'
call check_error_code

sendln 'EVDO_CDP_SET 0,OFF,50'
call check_error_code

sendln 'EVDO_CDP_SET 1,ON,75'
call check_error_code

; SET VSG PARAMETERS
sendln 'SOUR:GPRF:GEN:MODE NORMAL'
call check_error_code
sendln 'SOUR:GPRF:GEN:ARB:FILE:LOAD "MV887015A_C2K_0002"'
call check_error_code
sendln '*WAI'
call check_error_code
sendln 'SOUR:GPRF:GEN:ARB:FILE:LOAD? "MV887015A_C2K_0002"'
call check_error_code
sendln 'SOUR:GPRF:GEN:MODE SEQUENCE"'
call check_error_code
sendln 'SYSERRALL?'
call check_error_code

; Query error of Sequence table settings.
sendln 'SEQERR?'
  waitln '0,' '1,' '2,' '3,' '4,'
call check_seqerr_response

; Set Output State to "On".
sendln 'LVL ON'
call check_error_code

; Set Start Segment Number to "0",Stop Segment Number to "1".
sendln 'SEQCTRL 0,1'
call check_error_code

; Set Initialization to "On" when sequence finished.
sendln 'SEQREINIT ON'
call check_error_code

; Start measurement
sendln 'SNGLS'
call check_error_code
```

```
; waiting measurement up to 10 second
for i 1 10

  sendln 'MSTAT?'
  pause 1; wait 1 second
  recvln
  recvln
  ;call check_response ; debug
  if result=0 goto _timeout
  if result=1 then
         str2int m_code inputstr
         if m_code=0 break    ;Sequence finish normally.
         call check_error_code
  endif

next

; Query Tx power data of "Segment 0".
sendln 'EVDO_TXPWR? 0,IND'
call check_error_code

; Query Filtered power data of "Segment 0".
sendln 'EVDO_FILTPWR? 0,IND'
call check_error_code

; Query Occupied Bandwidth of "Segment 0"
sendln 'EVDO_OBW? 0'
call check_error_code

; Query Occupied Bandwidth Frequency of "Segment 0"
sendln 'EVDO_OBWFREQ? 0,UPPER'
call check_error_code
sendln 'EVDO_OBWFREQ? 0,LOWER'
call check_error_code
sendln 'EVDO_OBWFREQ? 0,CENTER'
call check_error_code

; Query Spurious Emission data of "Segment 1"
sendln 'EVDO_SEM? 1'
call check_error_code
sendln 'EVDO_SEMLVL_LOWER? 1'
call check_error_code
sendln 'EVDO_SEMLVL_UPPER? 1'
call check_error_code
```

```
sendln 'EVDO_SEMMARGIN_LOWER? 1'
call check_error_code
sendln 'EVDO_SEMMARGIN_UPPER? 1'
call check_error_code

; Query Frequency Error data of "Segment 1".
sendln 'EVDO_CFREQ? 1'
call check_error_code
sendln 'EVDO_CFERR_WORST? 1'
call check_error_code

; Query EVM data of "Segment 1".
sendln 'EVDO_EVM? 1,MAX'
call check_error_code
sendln 'EVDO_PEVM? 1,MAX'
call check_error_code
sendln 'EVDO_PHASEERR? 1,MAX'
call check_error_code
sendln 'EVDO_MAGERR? 1,MAX'
call check_error_code

; Query Original Offset of "Segment 1".
sendln 'EVDO_ORGNOFS? 1,MAX'
call check_error_code

; Query Rho of "Segment 1".
sendln 'EVDO_RHO? 1,TTL'
call check_error_code

; Query Time Error data of "Segment 1".
sendln 'EVDO_TAU? 1,AVG'
call check_error_code
sendln 'EVDO_TAU_WORST? 1'
call check_error_code

; Query Code Domain Power of "Segment 1"
sendln 'EVDO_MAXINACTCODE? 1'
call check_error_code
sendln 'EVDO_CDP_PILOT? 1,AVG'
call check_error_code
sendln 'EVDO_CDP_RRI? 1,AVG'
call check_error_code
sendln 'EVDO_CDP_DSC? 1,AVG'
call check_error_code
```

```
sendln 'EVDO_CDP_DRC? 1,AVG'
call check_error_code
sendln 'EVDO_CDP_ACK? 1,AVG'
call check_error_code
sendln 'EVDO_CDP_DATA? 1,AVG'
call check_error_code
sendln 'EVDO_CDP_AUX? 1,AVG'
call check_error_code

messagebox  'Macro end successfully' 'Finish'

End

;       ------------ subroutines -----------

:check_error_code
  ; query error
  sendln 'SYSERR?'
  waitln 'No error'

  ; in case of timeout
  if result=0 goto _timeout
  ; in case of error occurring
  if result=2 then

          e_message='Error code = '
          strconcat e_message inputstr
          messagebox  e_message 'Command Error occurred'
          end
  endif

  ; in case of no error

return

:check_seqerr_response

  ;for debug
  strsplit inputstr ','
  err_num=str2int groupmatchstr1
  if err_num then
          ; when error count is not 0.
          messagebox inputstr 'Sequence Table Error'
          End
```

```
  endif

  return

:check_response

  ;for debug
  messagebox inputstr 'debug1'
  int2str result_str result
  messagebox result_str 'debug2'

  return

:_timeout
  messagebox  'No response from MT8870A.' 'Time out!'
  call check_error_code
  End
```

# Chapter 4 SCPI Command Reference

This chapter describes the details of SCPI commands.
To switch to the SCPI command mode, send the command SYST:LANG SCPI.


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# 4.1 List of Commands

The following table shows the rules for describing messages.

| | |
|---|---|
| [ ] | Messages or parameters in square brackets can be omitted. |
| \| | Choose one of several choices.<br>A \| B \| C \| D indicates a choice of A, B, C, and D. |
| { } | Curly brackets are used to group options.<br>For A \| B({C \| D}), choose A, B(C), or B(D). |

### 4.1.1 Common commands

Operation Status Register

| Function | Command | Query | Response |
|---|---|---|---|
| Measurement Operation Status Register Query | ----- | :STATus:OPERation:MEASure[:EVENt]? | <mosr> |

Questionable Register

| Function | Command | Query | Response |
|---|---|---|---|
| Measurement Questionable Status Register Query | ----- | :STATus:QUEStionable:MEASure[:EVENt]? | <mqsr> |

Common

| Function | Command | Query | Response |
|---|---|---|---|
| Standard Select | :CONFigure:CELLular:MEASurement:STANdard <std> | :CONFigure:CELLular:MEASurement:STANdard? | <std> |
| Set Connect Port Direction | :ROUTe:PORT:CONNect:DIRection <input>,<output>[,<output>,…,<output>] | :ROUTe:PORT:CONNect:DIRection? | <input>,<output>[,<output>,…,<output>] |

Measurements

| Function | Command | Query | Response |
|---|---|---|---|
| Measurement Start | :INITiate:CELLular:MEASurement:SINGle | ----- | ----- |
| Measurement Stop | :ABORt:CELLular:MEASurement | ----- | ----- |
| Measurement Status | ----- | :FETCh:CELLular:MEASurement:STATe? | <m_status> |

Common Parameters

| Function | Command | Query | Response |
|---|---|---|---|
| Output Level On/Off | :CONFigure:CELLular:GENerator:RFSettings:STATe <on_off> | :CONFigure:CELLular:GENerator:RFSettings:STATe? | <on_off> |
| Output Signal Modulation | :CONFigure:CELLular:GENerator:BBMode <on_off> | :CONFigure:CELLular:GENerator:BBMode? | <on_off> |
| Waveform File Select | :CONFigure:CELLular:GENerator:ARB:PACKage:SELect <pac> | :CONFigure:CELLular:GENerator:ARB:PACKage:SELect? | <pac> |
| Waveform Pattern Select | :CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect <pat> | :CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect? | <pat> |
| Waveform Pattern Select (SYNC) | :CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect:SYNC <pat> | :CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect:SYNC? | <pat> |

System

| Function | Command | Query | Response |
|---|---|---|---|
| Application Select | :INSTrument[:SELect] <app> | :INSTrument[:SELect]? | <app> |
| Language Selection of Remote Command | :SYSTem:LANGuage <mode> | :SYSTem:LANGuage? | <mode> |

## 4.1.2 Fundamental measurement commands

Common Parameters

| Function | Command | Query | Response |
|---|---|---|---|
| AWGN Level On/Off | :CONFigure:CELLular:GENerator:ARB:NOISe:STATe <on_off> | :CONFigure:CELLular:GENerator:ARB:NOISe:STATe? | <on_off> |
| AWGN Level | :CONFigure:CELLular:GENerator:ARB:NOISe:CN <level> | :CONFigure:CELLular:GENerator:ARB:NOISe:CN? | <level> |
| Input Level | :CONFigure:CELLular:MEASurement:RFSettings:LEVel <level> | :CONFigure:CELLular:MEASurement:RFSettings:LEVel? | <level> |
| Output Level | :CONFigure:CELLular:GENerator:RFSettings:LEVel <level> | :CONFigure:CELLular:GENerator:RFSettings:LEVel? | <level> |
| Output Frequency (Fwd.) | :CONFigure:CELLular:GENerator:RFSettings:FREQuency <freq> | :CONFigure:CELLular:GENerator:RFSettings:FREQuency? | <freq> |
| Input Frequency (Rev.) | :CONFigure:CELLular:MEASurement:RFSettings:FREQuency <freq> | :CONFigure:CELLular:MEASurement:RFSettings:FREQuency? | <freq> |
| Band Class | :CONFigure:CELLular:MEASurement:RFSettings:BCLass <band> | :CONFigure:CELLular:MEASurement:RFSettings:BCLass? | <band> |
| Channel | :CONFigure:CELLular:MEASurement:RFSettings:CHANnel <channel> | :CONFigure:CELLular:MEASurement:RFSettings:CHANnel? | <channel> |

Fundamental Measurement Parameters

| Function | Command | Query | Response |
|---|---|---|---|
| Turn Off All Measurement Items | :CONFigure:CELLular:EVDO :FUNDamental:AMITems:OFF | ----- | ----- |
| Band Class for Spurious Emissions Limit | :CONFigure:CELLular:EVDO :FUNDamental:BAND <band> | :CONFigure:CELLular:EVDO :FUNDamental:BAND? | <band> |
| Code Domain Power Enable and Count | :CONFigure:CELLular:EVDO :FUNDamental:CDPower:SET <on_off>[,<count>] | :CONFigure:CELLular:EVDO :FUNDamental:CDPower:SET ? | <on_off>,<count> |
| Trigger Delay | :TRIGger:CELLular:EVDO:F UNDamental:DELay <delay> | :TRIGger:CELLular:EVDO:F UNDamental:DELay? | <delay> |
| Trigger Level | :TRIGger:CELLular:EVDO:F UNDamental:LEVel <level> | :TRIGger:CELLular:EVDO:F UNDamental:LEVel? | <level> |
| Trigger Source | :TRIGger:CELLular:EVDO:F UNDamental:SOURce <source> | :TRIGger:CELLular:EVDO:F UNDamental:SOURce? | <source> |
| Trigger Timeout | :TRIGger:CELLular:EVDO:F UNDamental:TOUT <time> | :TRIGger:CELLular:EVDO:F UNDamental:TOUT? | <time> |
| Long Span Code search | :CONFigure:CELLular:EVDO :FUNDamental:LSSearch <on_off> | :CONFigure:CELLular:EVDO :FUNDamental:LSSearch? | <on_off> |
| Modulation Analysis Enable and Count | :CONFigure:CELLular:EVDO :FUNDamental:MODulation: SET <on_off>[,<count>] | :CONFigure:CELLular:EVDO :FUNDamental:MODulation: SET? | <on_off>,<count> |

Fundamental Measurement Parameters (Cont'd)

| Function | Command | Query | Response |
|---|---|---|---|
| Occupied Bandwidth Ratio | :CONFigure:CELLular:EVDO :FUNDamental:OBW:RATio <ratio> | :CONFigure:CELLular:EVDO :FUNDamental:OBW:RATio? | <ratio> |
| Occupied Bandwidth Enable and Count | :CONFigure:CELLular:EVDO :FUNDamental:OBW:SET <on_off>[,<count>] | :CONFigure:CELLular:EVDO :FUNDamental:OBW:SET? | <on_off>,<count> |
| Long Code Mask - I | :CONFigure:CELLular:EVDO :LCMask:I <lcm> | :CONFigure:CELLular:EVDO :LCMask:I? | <lcm> |
| Protocol Revision | :CONFigure:CELLular:EVDO :PREVision <rev> | :CONFigure:CELLular:EVDO :PREVision? | <rev> |
| Data Channel Payload Size | :CONFigure:CELLular:EVDO :PSIZe <size> | :CONFigure:CELLular:EVDO :PSIZe? | <size> |
| Fast Power Measurement Mode | :CONFigure:CELLular:EVDO :FUNDamental:POWer:FMODe <on_off> | :CONFigure:CELLular:EVDO :FUNDamental:POWer:FMODe ? | <on_off> |
| Tx Power Measurement Enable and Count | :CONFigure:CELLular:EVDO :FUNDamental:POWer:SET <on_off>[,<count>] | :CONFigure:CELLular:EVDO :FUNDamental:POWer:SET? | <on_off>,<count> |
| Spurious Emissions Enable and Count | :CONFigure:CELLular:EVDO :FUNDamental:SPURious:SE T <on_off>[,<count>] | :CONFigure:CELLular:EVDO :FUNDamental:SPURious:SE T? | <on_off>,<count> |

Results

| Function | Command | Query | Response |
|---|---|---|---|
| ACK Channel Power | ----- | :FETCh:CELLular:EVDO:FUNDamental:CDPower:ACK? <mode>[,<unit>] | {<avg>,<max>,<min>}\|<pwr> |
| Auxiliary Pilot Channel Power | ----- | :FETCh:CELLular:EVDO:FUNDamental:CDPower:APILot? <mode>[,<unit>] | {<avg>,<max>,<min>}\|<pwr> |
| DATA Channel Power | ----- | :FETCh:CELLular:EVDO:FUNDamental:CDPower:DATA? <mode>[,<unit>] | {<avg>,<max>,<min>}\|<pwr> |
| DRC Channel Power | ----- | :FETCh:CELLular:EVDO:FUNDamental:CDPower:DRC? <mode>[,<unit>] | {<avg>,<max>,<min>}\|<pwr> |
| DSC Channel Power | ----- | :FETCh:CELLular:EVDO:FUNDamental:CDPower:DSC? <mode>[,<unit>] | {<avg>,<max>,<min>}\|<pwr> |
| R-PICH Power | ----- | :FETCh:CELLular:EVDO:FUNDamental:CDPower:PILot? <mode> | {<avg>,<max>,<min>}\|<pwr> |
| RRI Channel Power | ----- | :FETCh:CELLular:EVDO:FUNDamental:CDPower:RRI? <mode>[,<unit>] | {<avg>,<max>,<min>}\|<pwr> |
| Carrier Frequency Error Result | ----- | :FETCh:CELLular:EVDO:FUNDamental:MODulation:FERRor? <mode> | {<avg_ppm>,<avg_Hz>,<max_ppm>,<max_Hz>,<min_ppm>,<min_Hz>}\|{<freq_ppm>,<freq_Hz>} |
| Worst Carrier Frequency Error Result | ----- | :FETCh:CELLular:EVDO:FUNDamental:MODulation:FERRor:WORSt? | <freq_ppm>,<freq_Hz> |

Results (Cont'd)

| Function | Command | Query | Response |
|---|---|---|---|
| Carrier Frequency Result | ----- | :FETCh:CELLular:EVDO:FUNDamental:MODulation:CFRequency? | <freq> |
| EVM Result | ----- | :FETCh:CELLular:EVDO:FUNDamental:MODulation:EVM? <mode> | {<avg>,<max>,<min>}\|<evm> |
| Filtered Power Result | ----- | :FETCh:CELLular:EVDO:FUNDamental:POWer:FLTPower? <mode> | {<avg>,<max>,<min>}\|<pwr>\|{<s>,<pwr(1)>,<pwr(2)>,…,<pwr(s)>} |
| Magnitude Error Result | ----- | :FETCh:CELLular:EVDO:FUNDamental:MODulation:MERRor? <mode> | {<avg>,<max>,<min>}\|<merr> |
| Max Inactive Channel Power | ----- | :FETCh:CELLular:EVDO:FUNDamental:CDPower:MICPower? | <pwr>,<ph>,<wn>,<wl> |
| OBW Result | ----- | :FETCh:CELLular:EVDO:FUNDamental:OBW? | <bw> |
| OBW Frequency Result | ----- | :FETCh:CELLular:EVDO:FUNDamental:OBW:FREQuency? <pos> | <freq> |
| Origin Offset Result | ----- | :FETCh:CELLular:EVDO:FUNDamental:MODulation:ORGNoffset? <mode> | {<avg>,<max>,<min>}\|<origin> |
| Peak EVM Result | ----- | :FETCh:CELLular:EVDO:FUNDamental:MODulation:PEVM? <mode> | {<avg>,<max>,<min>}\|<pevm> |
| Phase Error Result | ----- | :FETCh:CELLular:EVDO:FUNDamental:MODulation:PHERror? <mode> | {<avg>,<max>,<min>}\|<perr> |







Results (Cont'd)

| Function | Command | Query | Response |
|---|---|---|---|
| Rho Result | ----- | :FETCh:CELLular:EVDO:FUNDamental:MODulation:RHO? <mode> | <avg>,<max>,<min>,<rho> |
| Spurious Emissions Judgement | ----- | :FETCh:CELLular:EVDO:FUNDamental:SPURious:JUDGement? | <judgement> |
| Spurious Emissions Peak Value (Lower) | ----- | :FETCh:CELLular:EVDO:FUNDamental:SPURious:LOWer? | <bc>,<f>,<l> |
| Spurious Emissions Peak Value (Upper) | ----- | :FETCh:CELLular:EVDO:FUNDamental:SPURious:UPPer? | <bc>,<f>,<l> |
| Spurious Emissions Template Margin (Lower) | ----- | :FETCh:CELLular:EVDO:FUNDamental:SPURious:MARGin:LOWer? | <bc>,<f>,<l> |
| Spurious Emissions Template Margin (Upper) | ----- | :FETCh:CELLular:EVDO:FUNDamental:SPURious:MARGin:UPPer? | <bc>,<f>,<l> |

Results (Cont'd)

| Function | Command | Query | Response |
|---|---|---|---|
| Time Error Result | ----- | :FETCh:CELLular:EVDO:FUNDamental:MODulation:TERRor? <mode> | {<avg>,<max>,<min>}\|<time> |
| Worst Time Error Result | ----- | :FETCh:CELLular:EVDO:FUNDamental:MODulation:TERRor:WORSt? | <time> |
| Tx Power Result | ----- | :FETCh:CELLular:EVDO:FUNDamental:POWer:TXPower? <mode> | {<avg>,<max>,<min>}\|<pwr>\|{<s>,<pwr(1)>,<pwr(2)>,…,<pwr(s)>} |
| Waveform | ----- | :FETCh:CELLular:EVDO:FUNDamental:TRACe? <format>,<position>,<length>[,<wl>] | <data[n]> |

## 4.1.3 Sequence measurement commands

Sequence Common Parameters

| Function | Command | Query | Response |
|---|---|---|---|
| Input Level | :CONFigure:CELLular:MEASurement:RFSettings:LEVel <level> | :CONFigure:CELLular:MEASurement:RFSettings:LEVel? | <level> |
| Output Level | :CONFigure:CELLular:GENerator:RFSettings:LEVel <level> | :CONFigure:CELLular:GENerator:RFSettings:LEVel? | <level> |
| Output Frequency (Fwd.) | :CONFigure:CELLular:GENerator:RFSettings:FREQuency <freq> | :CONFigure:CELLular:GENerator:RFSettings:FREQuency? | <freq> |
| Sequence Measurement Status | ----- | :FETCh:CELLular:SEQuence:STATe? | <m_status>,<n>,<s(n-1)> |
| Sequence Progress | ----- | :FETCh:CELLular:SEQuence:PROGress? | <p>,<cur>,<start>,<stop> |
| Trigger Timeout | :TRIGger:CELLular:MEASurement:TOUT <time> | :TRIGger:CELLular:MEASurement:TOUT? | <time> |
| Specified Segment Status | ----- | :FETCh:CELLular:SEQuence:SEG:STATe? <seg> | <stat> |
| Input Frequency (Rev.) | :CONFigure:CELLular:MEASurement:RFSettings:FREQuency <freq> | :CONFigure:CELLular:MEASurement:RFSettings:FREQuency? | <freq> |

Sequence Control Parameters

| Function | Command | Query | Response |
|---|---|---|---|
| Sequence Control Parameter - Sequence Control | :CONFigure:CELLular:SEQuence:CONTrol <start>,<end> | :CONFigure:CELLular:SEQuence:CONTrol? | <start>,<end> |
| Sequence Control Parameter - Sequence Control | :CONFigure:CELLular:SEQuence:CONTrol:TX <start>,<end> | :CONFigure:CELLular:SEQuence:CONTrol:TX? | <start>,<end> |
| Sequence Control Parameter - Sequence End State Reinitialization | :CONFigure:CELLular:SEQuence:RFSettings:REINit <sw> | :CONFigure:CELLular:SEQuence:RFSettings:REINit? | <sw> |
| Sequence Control Parameter - Sequence Table | :CONFigure:CELLular:SEQuence:TABLe <table> | :CONFigure:CELLular:SEQuence:TABLe? | <table> |
| Start Signal Analyzer Measurement Only | :INITiate:CELLular:SEQuence:EXECute:TX | ----- | ----- |

Sequence Parameter Information

| Function | Command | Query | Response |
|---|---|---|---|
| Sequence Parameter Information - Error Check | ----- | :FETCh:CELLular:SEQuence:ERRor? [item] | <n>,<err(n-1)>,<ns>,<seg(ns-1)>,<e>,<mem>,<exe>,<set> |
| Sequence Parameter Information - Error Check | ----- | :FETCh:CELLular:SEQuence:ERRor2? <format> | <n>,<err(n-1)> |

Sequence Table Parameters

| Function | Command | Query | Response |
|---|---|---|---|
| Sequence Table Parameter - Measurement | :CONFigure:CELLular:SEQuence:SETup <seg>,<system>,<step>,<mcond> | :CONFigure:CELLular:SEQuence:SETup? <seg> | <mode>,<step>,<mcond> |
| Sequence Table Parameter - SG Output Port | :CONFigure:CELLular:SEQuence:RXPort <seg>,<port>[,<port>,…,<port>] | :CONFigure:CELLular:SEQuence:RXPort? <seg> | <port>[,<port>,…,<port>] |
| | :CONFigure:CELLular:SEQuence:PORT:RX <seg>,<port>[,<port>,…,<port>] | :CONFigure:CELLular:SEQuence:PORT:RX? <seg> | <port>[,<port>,…,<port>] |
| Sequence Table Parameter - SA Input Port | :CONFigure:CELLular:SEQuence:PORT:TX <seg>,<port> | :CONFigure:CELLular:SEQuence:PORT:TX? <seg> | <port> |
| Sequence Table Parameter - Trigger | :TRIGger:CELLular:SEQuence <seg>,<src>,<slope>,<level>,<delay> | :TRIGger:CELLular:SEQuence? <seg> | <src>,<slope>,<level>,<delay> |
| Sequence Table Parameter - TRX Control | :CONFigure:CELLular:SEQuence:RFSettings:TRX <seg>,<ul_freq>,<ref,dl_freq>,<level>,<pat> | :CONFigure:CELLular:SEQuence:RFSettings:TRX? <seg> | <ul_freq>,<ref>,<dl_freq>,<level>,<pat> |
| Sequence Table Parameter - Reverse Link Frequency, Input Level | :CONFigure:CELLular:SEQuence:RFSettings:TX <seg>,<ul_freq>,<ref> | :CONFigure:CELLular:SEQuence:RFSettings:TX? <seg> | <ul_freq>,<ref> |

Measurement Parameters

| Function | Command | Query | Response |
|---|---|---|---|
| Turn Off All Measurement Items | :CONFigure:CELLular:SEQuence:EVDO:AMITems:OFF <mcond> | ----- | ----- |
| Band Class for Spurious Emissions Limit | :CONFigure:CELLular:SEQuence:EVDO:BAND <mcond>,<band> | :CONFigure:CELLular:SEQuence:EVDO:BAND? <mcond> | <band> |

Measurement Parameters (Cont'd)

| Function | Command | Query | Response |
|---|---|---|---|
| Code Domain Power Enable and Count | :CONFigure:CELLular:SEQuence:EVDO:CDPower:SET <mcond>,<on_off>[,<count>] | :CONFigure:CELLular:SEQuence:EVDO:CDPower:SET? <mcond> | <on_off>,<count> |
| Long Span Code Search | :CONFigure:CELLular:SEQuence:EVDO:LSSearch <on_off> | :CONFigure:CELLular:SEQuence:EVDO:LSSearch? | <on_off> |
| Modulation Analysis Enable and Count | :CONFigure:CELLular:SEQuence:EVDO:MODulation:SET <mcond>,<on_off>[,<count>] | :CONFigure:CELLular:SEQuence:EVDO:MODulation:SET? <mcond> | <on_off>,<count> |
| Occupied Bandwidth Ratio | :CONFigure:CELLular:SEQuence:EVDO:OBW:RATio <ratio> | :CONFigure:CELLular:SEQuence:EVDO:OBW:RATio? | <ratio> |
| Occupied Bandwidth Enable and Count | :CONFigure:CELLular:SEQuence:EVDO:OBW:SET <mcond>,<on_off>[,<count>] | :CONFigure:CELLular:SEQuence:EVDO:OBW:SET? <mcond> | <on_off>,<count> |
| Protocol Revision | :CONFigure:CELLular:SEQuence:EVDO:PREVision <rev> | :CONFigure:CELLular:SEQuence:EVDO:PREVision? | <rev> |
| Data Channel Payload Size | :CONFigure:CELLular:SEQuence:EVDO:PSIZe <size> | :CONFigure:CELLular:SEQuence:EVDO:PSIZe? | <size> |
| Tx Power Measurement Enable and Count | :CONFigure:CELLular:SEQuence:EVDO:POWer:SET <mcond>,<on_off>[,<count>] | :CONFigure:CELLular:SEQuence:EVDO:POWer:SET? <mcond> | <on_off>,<count> |

Measurement Parameters (Cont'd)

| Function | Command | Query | Response |
|---|---|---|---|
| Spurious Emissions Enable and Count | :CONFigure:CELLular:SEQuence:EVDO:SPURious:SET <mcond>,<on_off>[,<count>] | :CONFigure:CELLular:SEQuence:EVDO:SPURious:SET? <mcod> | <on_off>,<count> |

Results

| Function | Command | Query | Response |
|---|---|---|---|
| ACK Channel Power | ----- | :FETCh:CELLular:SEQuence:EVDO:CDPower:ACK? <seg>,<mode>[,<unit>] | {<avg>,<max>,<min>}\|<pwr> |
| Auxiliary Pilot Channel Power | ----- | :FETCh:CELLular:SEQuence:EVDO:CDPower:APILot? <seg>,<mode>[,<unit>] | {<avg>,<max>,<min>}\|<pwr> |
| DATA Channel Power | ----- | :FETCh:CELLular:SEQuence:EVDO:CDPower:DATA? <seg>,<mode>[,<unit>] | {<avg>,<max>,<min>}\|<pwr> |
| DRC Channel Power | ----- | :FETCh:CELLular:SEQuence:EVDO:CDPower:DRC? <seg>,<mode>[,<unit>] | {<avg>,<max>,<min>}\|<pwr> |
| DSC Channel Power | ----- | :FETCh:CELLular:SEQuence:EVDO:CDPower:DSC? <seg>,<mode>[,<unit>] | {<avg>,<max>,<min>}\|<pwr> |
| R-PICH Power | ----- | :FETCh:CELLular:SEQuence:EVDO:CDPower:PILot? <seg>,<mode> | {<avg>,<max>,<min>}\|<pwr> |
| RRI Channel Power | ----- | :FETCh:CELLular:SEQuence:EVDO:CDPower:RRI? <seg>,<mode>[,<unit>] | {<avg>,<max>,<min>}\|<pwr> |

Results (Cont'd)

| Function | Command | Query | Response |
|---|---|---|---|
| Carrier Frequency Error Result | ----- | :FETCh:CELLular:SEQuence :EVDO:MODulation:FERRor? <seg>,<mode> | {<avg_ppm>,<avg_Hz>,<max_ppm>,<max_Hz>,<min_ppm>,<min_Hz>}\|{<freq_ppm>,<freq_Hz>} |
| Worst Carrier Frequency Error Result | ----- | :FETCh:CELLular:SEQuence :EVDO:MODulation:FERRor: WORSt? <seg> | <freq_ppm>,<freq_Hz> |
| Carrier Frequency Result | ----- | :FETCh:CELLular:SEQuence :EVDO:MODulation:CFRequency? <seg> | <freq> |
| EVM Result | ----- | :FETCh:CELLular:SEQuence :EVDO:MODulation:EVM? <seg>,<mode> | {<avg>,<max>,<min>}\|<evm> |
| Filtered Power Result | ----- | :FETCh:CELLular:SEQuence :EVDO:POWer:FLTPower? <seg>,<mode> | {<avg>,<max>,<min>}\|<pwr>\|{<s>,<pwr(1)>,<pwr(2)>,…,<pwr(s)>} |
| Magnitude Error Result | ----- | :FETCh:CELLular:SEQuence :EVDO:MODulation:MERRor? <seg>,<mode> | {<avg>,<max>,<min>}\|<merr> |
| Max Inactive Channel Power | ----- | :FETCh:CELLular:SEQuence :EVDO:CDPower:MICPower? <seg> | <pwr>,<ph>,<wn>,<wl> |
| OBW Result | ----- | :FETCh:CELLular:SEQuence :EVDO:OBW? <seg> | <bw> |
| OBW Frequency Result | ----- | :FETCh:CELLular:SEQuence :EVDO:OBW:FREQuency? <seg>,<pos> | <freq> |

Results (Cont'd)

| Function | Command | Query | Response |
|---|---|---|---|
| Origin Offset Result | ----- | :FETCh:CELLular:SEQuence :EVDO:MODulation:ORGNoffset? <seg>,<mode> | {<avg>,<max>,<min>}\|<origin> |
| Peak EVM Result | ----- | :FETCh:CELLular:SEQuence :EVDO:MODulation:PEVM? <seg>,<mode> | {<avg>,<max>,<min>}\|<pevm> |
| Phase Error Result | ----- | :FETCh:CELLular:SEQuence :EVDO:MODulation:PHERror? <seg>,<mode> | {<avg>,<max>,<min>}\|<perr> |
| Rho Result | ----- | :FETCh:CELLular:SEQuence :EVDO:MODulation:RHO? <seg>,<mode> | {<avg>,<max>,<min>}\|<rho> |
| Spurious Emissions Judgement | ----- | :FETCh:CELLular:SEQuence :EVDO:SPURious:JUDGement? <seg> | <judgement> |
| Spurious Emissions Peak Value (Lower) | ----- | :FETCh:CELLular:SEQuence :EVDO:SPURious:LOWer? <seg> | <bc>,<f>,<l> |
| Spurious Emissions Peak Value (Upper) | ----- | :FETCh:CELLular:SEQuence :EVDO:SPURious:UPPer? <seg> | <bc>,<f>,<l> |
| Spurious Emissions Template Margin (Lower) | ----- | :FETCh:CELLular:SEQuence :EVDO:SPURious:MARGin:LOWer? <seg> | <bc>,<f>,<l> |
| Spurious Emissions Template Margin (Upper) | ----- | :FETCh:CELLular:SEQuence :EVDO:SPURious:MARGin:UPPer? <seg> | <bc>,<f>,<l> |









Results (Cont'd)

| Function | Command | Query | Response |
|---|---|---|---|
| Time Error Result | ----- | :FETCh:CELLular:SEQuence :EVDO:MODulation:TERRor? <seg>,<mode> | {<avg>,<max>,<min>}\|<time> |
| Worst Time Error Result | ----- | :FETCh:CELLular:SEQuence :EVDO:MODulation:TERRor: WORSt? <seg> | <time> |
| Tx Power Result | ----- | :FETCh:CELLular:SEQuence :EVDO:POWer:TXPower? <seg>,<mode> | {<avg>,<max>,<min>}\|<pwr>\|{<s>,<pwr(1)>,<pwr(2)>,…,<pwr(s)>} |

# 4.2 Details of Commands

This section describes the commands in alphabetical order.

■ Terms in this command list

EX ..... Command name (header)

Example ..... Command function name

Function ..... Command function

Command..... Programming command syntax

Query ..... Query syntax

Response ..... Response syntax

Parameter..... Parameter definition

Details ..... Command restrictions and others

Example of Use ..... Command usage example

Related Commands ..... Introduction of related commands

■ Suffix code list

| Suffix code | Unit | Suffix code | Unit |
|---|---|---|---|
| % | % | KZ | kHz |
| DB | dB | MHZ | MHz |
| DBM | dBm | MS | ms |
| GHZ | GHz | MZ | MHz |
| GZ | GHz | NS | ns |
| HZ | Hz | S | s |
| KHZ | kHz | US | μs |

### 4.2.1 Common commands

## :ABORt:CELLular:MEASurement

Measurement Stop

Function

Stops current measurement.

Command

```
:ABORt:CELLular:MEASurement
```

Example of Use

To stop current measurement:
:ABOR:CELL:MEAS

## :CONFigure:CELLular:GENerator:ARB:PACKage:SELect

Waveform File Select

### Function

Selects or queries waveform file for arbitrary waveform signal used at Forward Link signal.

### Command

```
:CONFigure:CELLular:GENerator:ARB:PACKage:SELect <pac>
```

### Query

```
:CONFigure:CELLular:GENerator:ARB:PACKage:SELect?
```

### Response

<pac>

### Parameter

| | |
|---|---|
| <pac> | Waveform file |

### Details

The name of the file used from the waveform files loaded into waveform memory is set by this command.

### Example of Use

To set the waveform file 1 from the waveform files loaded in memory:
:CONF:CELL:GEN:ARB:PACK:SEL “PAC1”
:CONF:CELL:GEN:ARB:PACK:SEL?
> PAC1

### Related Command

Use the following command to load the waveform file into waveform memory.
:SOURce:GPRF:GENerator:ARB:FILE:LOAD
For details of the command, refer to Chapter 5 “SCPI Command Reference” in the *MU887000A TRX Test Module Operation Manual*.
The following command can be used to query the names of waveform files that have been loaded into waveform memory.
:SOURce:GPRF:GENerator:ARB:WAVeform:NAME?
For details of the command, refer to Chapter 5 “SCPI Command Reference” in the *MU887000A TRX Test Module Operation Manual*.

Use the following commands to select a waveform pattern to use from the waveform patterns included in the waveform file configured using the command described in this section
:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect,
:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect:SYNC
:CONFigure:CELLular:SEQuence:RFSettings:TRX

## :CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect

Waveform Pattern Select

### Function

Selects waveform pattern to use from patterns included in waveform file.
When the command received, the signal is immediately switched regardless of the frame cycle of signal, so the frame cycle is not continued.
This command is also used to query the currently selected waveform pattern

### Command

```
:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect <pat>
```

### Query

```
:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect?
```

### Response

<pat>

### Parameter

| | | |
|---|---|---|
| <pat> | | Waveform Pattern |
| | PAT1 to PATn | Waveform pattern number (n: waveform information file group range) |
| | Default | PAT1 |

### Details

Select the waveform pattern for RF output signal in waveform file.
The pattern number is the same as the group number. Refer to Chapter 3, "Waveform File Details" in the *Waveform Files for Cellular Application Operation Manual*.

### Example of Use

To set the waveform pattern to 1:
:CONF:CELL:GEN:ARB:WAV:PATT:SEL PAT1
:CONF:CELL:GEN:ARB:WAV:PATT:SEL?
> PAT1

### Related Command

Waveform file for arbitrary waveform signal selection or query
`:CONFigure:CELLular:GENerator:ARB:PACKage:SELect`

### Remarks

The group range depends on the selected waveform file.
For details of the waveform pattern, refer to Chapter 3, "Waveform File Details" in the *Waveform Files for Cellular Application Operation Manual*.

# :CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect:SYNC

Waveform Pattern Select (SYNC)

## Function

Selects waveform pattern to use from patterns included in waveform file.
When the command received, the signal is switched according to the frame cycle of signal so that the frame cycle is continued.
This command is also used to query the currently selected waveform pattern

## Command

```
:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect:SYNC <pat>
```

## Query

```
:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect:SYNC?
```

## Response

<pat>

## Parameter

| | | |
|---|---|---|
| <pat> | | Waveform Pattern |
| | PAT1 to PATn | Waveform pattern number (n: waveform information file group range) |
| | Default | PAT1 |

## Details

Select the waveform pattern for RF output signal in waveform file.
The pattern number is the same as the group number. Refer to Chapter 3, "Waveform File Details" in the *Waveform Files for Cellular Application Operation Manual*.

## Example of Use

To set the waveform pattern to 1:
:CONF:CELL:GEN:ARB:WAV:PATT:SEL:SYNC PAT1
:CONF:CELL:GEN:ARB:WAV:PATT:SEL:SYNC?
> PAT1

## Related Command

Waveform file for arbitrary waveform signal selection or query
`:CONFigure:CELLular:GENerator:ARB:PACKage:SELect`

## Remarks

The group range depends on the selected waveform file.
For details of the waveform pattern, refer to Chapter 3, "Waveform File Details" in the *Waveform Files for Cellular Application Operation Manual*.

## :CONFigure:CELLular:GENerator:BBMode

Output Signal Modulation

### Function

Sets or queries RF signal output modulation.

### Command

```
:CONFigure:CELLular:GENerator:BBMode <on_off>
```

### Query

```
:CONFigure:CELLular:GENerator:BBMode?
```

### Response

<on_off>

### Parameter

| | |
|---|---|
| <on_off> | Enables/disables modulation |
| ON | Enables RF output signal modulation |
| OFF | Disables RF output signal modulation |
| Default | ON |

### Example of Use

To modulate the RF signal:

:CONF:CELL:GEN:BBM ON

:CONF:CELL:GEN:BBM?

> ON

## :CONFigure:CELLular:GENerator:RFSettings:STATe

Output Level On/Off

### Function

Sets or queries RF signal output ON/OFF.

### Command

```
:CONFigure:CELLular:GENerator:RFSettings:STATe <on_off>
```

### Query

```
:CONFigure:CELLular:GENerator:RFSettings:STATe?
```

### Response

<on_off>

### Parameter

| | |
|---|---|
| <on_off> | Enables/disables RF signal output |
| ON | Enables RF signal output |
| OFF | Disables RF signal output |
| Default | ON |

### Example of Use

To enable output of RF signals at Test port:

:CONF:CELL:GEN:RFS:STAT ON

:CONF:CELL:GEN:RFS:STAT?

ON

## :CONFigure:CELLular:MEASurement:STANdard

Standard Select

### Function

Sets or queries measurement standard.

### Command

```
:CONFigure:CELLular:MEASurement:STANdard <std>
```

### Query

```
:CONFigure:CELLular:MEASurement:STANdard?
```

### Response

<std>

### Parameter

| <std> | Measurement standard | |
|---|---|---|
| COMMON | Common Measurement | (requires MX887010A) |
| WCDMA | W-CDMA | (requires MX887011A) |
| GSM | GSM | (requires MX887012A) |
| LTE | LTE | (requires MX887013A or MX887014A) |
| CDMA2000 | CDMA2000 1x | (requires MX887015A) |
| EVDO | CDMA2000 1xEVDO | (requires MX887016A) |
| TDSCDMA | TD-SCDMA | (requires MX887017A) |
| NR | NR sub-6GHz | (requires MX887018A or MX887019A) |
| CATM | Category M | (requires MX887065A) |
| NBIOT | NB-IoT | (requires MX887067A) |
| LTEV2X | LTE-V2X | (requires MX887068A) |
| SEQUENCE | Sequence | (requires MX887010A) |
| SEQ | Sequence | (requires MX887010A) |
| Default | COMMON | |

### Example of Use

To switch the measurement standard to SEQUENCE:
:CONF:CELL:MEAS:STAN SEQUENCE
:CONF:CELL:MEAS:STAN?
> SEQUENCE

### Remarks

To execute the measurements described in section 4.2.2 “Fundamental measurement commands”, set the parameter to EVDO.
To execute the measurements described in section 4.2.3 “Sequence measurement commands”, set the parameter to SEQUENCE.
If this command is sent during measurement, measurement stops to prepare for the new standard.
Common hardware settings, such as Downlink Frequency and Input Level, can be set for each measurement standard.

## :FETCh:CELLular:MEASurement:STATe?

Measurement Status

### Function

Queries measurement status.

### Query

```
:FETCh:CELLular:MEASurement:STATe?
```

### Response

<m_status>

### Parameter

| <m_status> | Measurement status |
|---|---|
| 0 | Completed measurement |
| 2 | Over level |
| 3 | Under level |
| 4 | Measurement failed |
| 5 | Synchronization word not detected |
| 9 | Measurement in progress or not measured |
| 12 | Tx measurement timeout |
| 13 | Rx measurement failed |

### Details

This command can be used while measurement is stopped or executing.
The value received from MX887016A is 0, 2, 4, 5, 9, or 12.

### Example of Use

To query the measurement status:
:FETC:CELL:MEAS:STAT?
> 0

## :INITiate:CELLular:MEASurement:SINGle

Measurement Start

### Function

Sets the parameters for both specified measurement and signal transmission and executes measurement.

### Command

`:INITiate:CELLular:MEASurement:SINGle`

### Example of Use

To start measurement:
:INIT:CELL:MEAS:SING

### Related Command

:STATus:QUEStionable:MEASure[:EVENt]
For the details of the questionable register, refer to Chapter 3 “Fundamental Operation” in the *MU887000A TRX Test Module Operation Manual*.

## :INSTrument[:SELect]

Application Select

### Function

Sets or queries type of application software to execute.

### Command

```
:INSTrument[:SELect] <app>
```

### Query

```
:INSTrument[:SELect]?
```

### Response

<app>

### Parameter

| | | |
|---|---|---|
| <app> | | Type of application software |
| | CELLULAR | Cellular application<br>When using MX887010A, MX887011A, MX887012A, MX887013A, MX887014A, MX887015A, MX887016A, MX887017A, MX887018A, MX887019A, MX887065A, MX887067A, or MX887068A |
| | SRW | Short Range Wireless application<br>When using MX887030A, MX887031A, MX887032A, MX887033A, MX887040A, or MX887050A |
| | LRWPAN | IEEE 802.15.4 application<br>When using MX887060A |
| | ZWAVE | Z-Wave application<br>When using MX887061A |
| | FMAUDIO | FM AUDIO application<br>When using MX887070A |

*Note:* MU887002A does not support MX887070A.

### Details

Set the parameter to CELLULAR and send the command before using the MX887016A.

### Example of Use

To set the application software to CELLULAR:
:INST CELLULAR
:INST?
> CELLULAR

### Remarks

When using the MX887016A, set the application to CELLULAR using
`:INSTrument[:SELect]`
and then set the standard to EVDO or SEQUENCE using
`:CONFigure:CELLular:MEASurement:STANdard`.

# :ROUTe:PORT:CONNect:DIRection

Set Connect Port Direction

## Function

Sets or queries the test ports for inputting and outputting RF signals.
Multiple output test port can be set for MU887002A.

## Command

`:ROUTe:PORT:CONNect:DIRection <input>,<output>` MU887000A, MU887001A

`:ROUTe:PORT:CONNect:DIRection <input>,<output>[,<output>,…,<output>]` MU887002A

## Query

`:ROUTe:PORT:CONNect:DIRection?`

## Response

| | |
|---|---|
| <input>,<output> | MU887000A, MU887001A |
| <input>,<output>[,<output>,…,<output>] | MU887002A |

## Parameters

| | | |
|---|---|---|
| <input> | Input Test Port No. | |
| Range | Test Port 1 to 4 | (MU887000A) |
| | Test Port 1 to 4 | (MU887001A) |
| | OFF, Test Port 1 to 12 | (MU887002A) |
| PORT1 | Test Port 1 | |
| … | … | |
| PORT12 | Test Port 12 | |
| OFF | No any Input Test Ports | (MU887002A) |
| Default | PORT1 | |
| <output> | Output Test Port No. | |
| Range | Test Port 1 to 4 | (MU887000A) |
| | Test Port 1 to 4 | (MU887001A) |
| | Test Port 1 to 12 | (MU887002A) |
| PORT1 | Test Port 1 | |
| … | … | |
| PORT12 | Test Port 12 | |
| Default | PORT1 | |

## Details

For MU887000A,
Test Port 1 and Test Port 2 can be set for both input and output.
Test Port 3 and Test Port 4 can be set for either input or output.
For MU887001A, Test Port 1 to Test Port 4 can be set for both input and output.
For MU887002A, Test Port 1 to Test Port 12 can be set for both input and output.

Example of Use

To set Test Port 1 as RF signal input test port and Test Port 2 as RF signal output test port:
:ROUT:PORT:CONN:DIR PORT1,PORT2
:ROUT:PORT:CONN:DIR?
> PORT1,PORT2

To set No any Input Test Ports and Test Port 4, Test Port 6, Test Port 10 as RF signal output test ports:
:ROUT:PORT:CONN:DIR OFF,PORT10,PORT4,PORT6
:ROUT:PORT:CONN:DIR?
> OFF,PORT4,PORT6,PORT10

## :STATus:OPERation:MEASure[:EVENt]?

Measurement Operation Status Register Query

### Function

Queries content of measurement operation status register.
The event occurrence can be identified using the retrieved value.

### Query

```
:STATus:OPERation:MEASure[:EVENt]?
```

### Response

<mosr>

Value = bit0 + bit1 + ... + bit15

| | |
|---|---|
| bit0 = $2^0$ = 1 | Measurement in progress |
| bit1 = $2^1$ = 2 | Preparing trigger |
| bit2 = $2^2$ = 4 | Unused |
| bit3 = $2^3$ = 8 | Unused |
| bit4 = $2^4$ = 16 | Unused |
| bit5 = $2^5$ = 32 | Unused |
| bit6 = $2^6$ = 64 | Unused |
| bit7 = $2^7$ = 128 | Unused |
| bit8 = $2^8$ = 256 | Unused |
| bit9 = $2^9$ = 512 | Unused |
| bit10 = $2^{10}$ = 1024 | Unused |
| bit11 = $2^{11}$ = 2048 | Unused |
| bit12 = $2^{12}$ = 4096 | Unused |
| bit13 = $2^{13}$ = 8192 | Unused |
| bit14 = $2^{14}$ = 16384 | Unused |
| bit15 = $2^{15}$ = 32768 | Unused |

### Parameter

| | |
|---|---|
| <mosr> | Measurement operation status register |
| Range | 0 to 65535 |

### Details

The sum of the values for bits of the occurring event from the values $2^0$ = 1, $2^1$ = 2 to $2^{15}$ = 32768, that correspond to the measurement operation status register bits 0, 1 to 15 becomes the response.

### Example of Use

To query content of measurement operation status register:
:STAT:OPER:MEAS?
> 1

## :STATus:QUEStionable:MEASure[:EVENt]?

Measurement Questionable Status Register Query

### Function

Queries content of measurement questionable status register.
The event occurrence can be identified using the retrieved value.

### Query

```
:STATus:QUEStionable:MEASure[:EVENt]?
```

### Response

<mqsr>
Value = bit0 + bit1 + ... + bit15

| | |
|---|---|
| bit0 = $2^0$ = 1 | Level over |
| bit1 = $2^1$ = 2 | Level under |
| bit2 = $2^2$ = 4 | Timeout |
| bit3 = $2^3$ = 8 | Unused |
| bit4 = $2^4$ = 16 | Unused |
| bit5 = $2^5$ = 32 | Unused |
| bit6 = $2^6$ = 64 | Unused |
| bit7 = $2^7$ = 128 | Unused |
| bit8 = $2^8$ = 256 | Unused |
| bit9 = $2^9$ = 512 | Unused |
| bit10 = $2^{10}$ = 1024 | Unused |
| bit11 = $2^{11}$ = 2048 | Unused |
| bit12 = $2^{12}$ = 4096 | Unused |
| bit13 = $2^{13}$ = 8192 | Unused |
| bit14 = $2^{14}$ = 16384 | Unused |
| bit15 = $2^{15}$ = 32768 | Unused |

### Parameter

| | |
|---|---|
| <mqsr> | Measurement questionable status register |
| Range | 0 to 65535 |

### Details

The sum of the values for bits of the occurring event from the values $2^0$ = 1, $2^1$ = 2 to $2^{15}$ = 32768, that correspond to the measurement questionable status register bits 0, 1 to 15 becomes the response.

### Example of Use

To query content of measurement questionable status register:
:STAT:QUES:MEAS?
> 0

## :SYSTem:LANGuage

Language Selection of Remote Command

### Function

Switches language mode of remote control command.

### Command

```
:SYSTem:LANGuage <mode>
```

### Query

```
:SYSTem:LANGuage?
```

### Response

<mode>

### Parameter

| | |
|---|---|
| <mode> | Language mode |
| NAT | Native |
| SCPI | SCPI |
| Default | NAT |

### Example of Use

To switch the remote control command language mode to Native:

:SYST:LANG NAT

:SYST:LANG?

> NAT

### 4.2.2 Fundamental measurement commands

## :CONFigure:CELLular:EVDO:FUNDamental:AMITems:OFF

Turn Off All Measurement Items

Function

Disables all measurement items.

Command

```
:CONFigure:CELLular:EVDO:FUNDamental:AMITems:OFF
```

Details

This command operation is similar to the following commands
:CONFigure:CELLular:EVDO:FUNDamental:POWer:SET,
:CONFigure:CELLular:EVDO:FUNDamental:OBW:SET,
:CONFigure:CELLular:EVDO:FUNDamental:SPURious:SET,
:CONFigure:CELLular:EVDO:FUNDamental:MODulation:SET,
:CONFigure:CELLular:EVDO:FUNDamental:CDPower:SET

Example of Use

To disable all measurement items:
:CONF:CELL:EVDO:FUND:AMIT:OFF

## :CONFigure:CELLular:EVDO:FUNDamental:BAND

Band Class for Spurious Emissions Limit

### Function

Sets or queries band class to determine Spurious Emissions Limit range.

### Command

```
:CONFigure:CELLular:EVDO:FUNDamental:BAND <band>
```

### Query

```
:CONFigure:CELLular:EVDO:FUNDamental:BAND?
```

### Response

<band>

### Parameter

| | |
|---|---|
| <band> | Band class |
| Range | 0 to 16, 18 to 21 |
| Resolution | 1 |
| Default | 0 |

### Details

This parameter sets the band class to determine the Spurious Emissions Limit range.

### Example of Use

To set the band class to determine Spurious Emissions Limit range 10:
:CONF:CELL:EVDO:FUND:BAND 10
:CONF:CELL:EVDO:FUND:BAND?
> 10

### Remarks

Use the following command to set the band class to determine the frequency:
:CONFigure:CELLular:MEASurement:RFSettings:BCLass

## :CONFigure:CELLular:EVDO:FUNDamental:CDPower:SET

Code Domain Power Enable and Count

### Function

Enables Code Domain Power measurement and sets measurement count, and queries settings.

### Command

```
:CONFigure:CELLular:EVDO:FUNDamental:CDPower:SET <on_off>[,<count>]
```

### Query

```
:CONFigure:CELLular:EVDO:FUNDamental:CDPower:SET?
```

### Response

<on_off>,<count>

### Parameters

| | |
|---|---|
| <on_off> | Enables/disables measurement |
| ON | Enables measurement |
| OFF | Disables measurement |
| Default | OFF |
| <count> | Measurement count |
| Range | 1 to 200 |
| Resolution | 1 |
| Suffix code | None |
| Default | 1 |

### Example of Use

To enable Code Domain Power measurement and set the measurement count to 10:
:CONF:CELL:EVDO:FUND:CDP:SET ON,10
:CONF:CELL:EVDO:FUND:CDP:SET?
> ON,10

## :CONFigure:CELLular:EVDO:FUNDamental:LSSearch

Long Span Code Search

### Function

Enables and queries Long Span Code Search function.

### Command

```
:CONFigure:CELLular:EVDO:FUNDamental:LSSearch <on_off>
```

### Query

```
:CONFigure:CELLular:EVDO:FUNDamental:LSSearch?
```

### Response

<on_off>

### Parameter

| | |
|---|---|
| <on_off> | Enables/disables Long Span Code Search |
| ON | Enables Long Span Code Search |
| OFF | Disables Long Span Search |
| Default | OFF |

### Details

Set this parameter to OFF when the Reverse Link and Forward Link signals are synchronized; set it to ON when they are not synchronized.

### Example of Use

To enable Long Span Code Search:
:CONF:CELL:EVDO:FUND:LSS ON
:CONF:CELL:EVDO:FUND:LSS?
> ON

# :CONFigure:CELLular:EVDO:FUNDamental:MODulation:SET

Modulation Analysis Enable and Count

## Function

Enables Modulation Analysis Measurement and sets or queries measurement count.

## Command

```
:CONFigure:CELLular:EVDO:FUNDamental:MODulation:SET <on_off>[,<count>]
```

## Query

```
:CONFigure:CELLular:EVDO:FUNDamental:MODulation:SET?
```

## Response

<on_off>,<count>

## Parameters

| | |
|---|---|
| <on_off> | Enables/disables measurement |
| ON | Enables measurement |
| OFF | Disables measurement |
| Default | OFF |
| <count> | Measurement count |
| Range | 1 to 200 |
| Resolution | 1 |
| Suffix code | None |
| Default | 1 |

## Example of Use

To enable Modulation Analysis measurement and set the measurement count to 10:
:CONF:CELL:EVDO:FUND:MOD:SET ON,10
:CONF:CELL:EVDO:FUND:MOD:SET?
> ON,10

## :CONFigure:CELLular:EVDO:FUNDamental:OBW:RATio

Occupied Bandwidth Ratio

### Function

Sets or queries Occupied Bandwidth measurement occupation ratio.

### Command

```
:CONFigure:CELLular:EVDO:FUNDamental:OBW:RATio <ratio>
```

### Query

```
:CONFigure:CELLular:EVDO:FUNDamental:OBW:RATio?
```

### Response

<ratio>

### Parameter

| | |
|---|---|
| <ratio> | Occupation Ratio |
| Range | 80.0% to 99.9% |
| Resolution | 0.1% |
| Suffix code | % (uses % when omitted) |
| Default | 99.0% |

### Example of Use

To set the Occupied Bandwidth occupation ratio to 99.0%:

:CONF:CELL:EVDO:FUND:OBW:RAT 99.0

:CONF:CELL:EVDO:FUND:OBW:RAT?

> 99.0

# :CONFigure:CELLular:EVDO:FUNDamental:OBW:SET

Occupied Bandwidth Enable and Count

## Function

Enables Occupied Bandwidth measurement and sets or queries measurement count.

## Command

```
:CONFigure:CELLular:EVDO:FUNDamental:OBW:SET <on_off>[,<count>]
```

## Query

```
:CONFigure:CELLular:EVDO:FUNDamental:OBW:SET?
```

## Response

<on_off>,<count>

## Parameters

| | |
|---|---|
| <on_off> | Enables/disables measurement |
| ON | Enables measurement |
| OFF | Disables measurement |
| Default | OFF |
| <count> | Measurement count |
| Range | 1 to 200 |
| Resolution | 1 |
| Suffix code | None |
| Default | 1 |

## Example of Use

To enable Occupied Bandwidth measurement and set the measurement count to 10:
:CONF:CELL:EVDO:FUND:OBW:SET ON,10
:CONF:CELL:EVDO:FUND:OBW:SET?
> ON,10

## :CONFigure:CELLular:EVDO:FUNDamental:POWer:FMODe

Fast Power Measurement Mode

### Function

Enables Fast Power Measurement mode or queries setting.

### Command

```
:CONFigure:CELLular:EVDO:FUNDamental:POWer:FMODe <on_off>
```

### Query

```
:CONFigure:CELLular:EVDO:FUNDamental:POWer:FMODe?
```

### Response

<on_off>

### Parameter

| <on_off> | Fast Power Measurement Mode |
|---|---|
| ON | Executes Fast Power measurement. |
| OFF | Executes normal power measurement. |
| Default | OFF |

### Details

When Fast Power Measurement mode is set to On, only Tx Power is measured.

Use the following command to enable/disable power measurement and to set measuring times.

:CONFigure:CELLular:EVDO:FUNDamental:POWer:SET

### Example of Use

To set Fast Power Measurement mode to On.

:CONF:CELL:EVDO:FUND:POW:FMOD ON

:CONF:CELL:EVDO:FUND:POW:FMOD?

> ON

## :CONFigure:CELLular:EVDO:FUNDamental:POWer:SET

Tx Power Measurement Enable and Count

### Function

Enables Tx power measurement and sets or queries measurement count.

### Command

```
:CONFigure:CELLular:EVDO:FUNDamental:POWer:SET <on_off>[,<count>]
```

### Query

```
:CONFigure:CELLular:EVDO:FUNDamental:POWer:SET?
```

### Response

<on_off>,<count>

### Parameters

| | |
|---|---|
| <on_off> | Enables/disables measurement |
| ON | Enables measurement |
| OFF | Disables measurement |
| Default | ON |
| <count> | Measurement count |
| Range | 1 to 200 |
| Resolution | 1 |
| Suffix code | None |
| Default | 1 |

### Example of Use

To enable Tx power measurement and set the measurement count to 10:

:CONF:CELL:EVDO:FUND:POW:SET ON,10

:CONF:CELL:EVDO:FUND:POW:SET?

> ON,10

# :CONFigure:CELLular:EVDO:FUNDamental:SPURious:SET

Spurious Emissions Enable and Count

### Function

Enables Spurious Emission measurement and sets or queries measurement count.

### Command

```
:CONFigure:CELLular:EVDO:FUNDamental:SPURious:SET <on_off>[,<count>]
```

### Query

```
:CONFigure:CELLular:EVDO:FUNDamental:SPURious:SET?
```

### Response

<on_off>,<count>

### Parameters

| | |
|---|---|
| <on_off> | Enables/disables measurement |
| ON | Enables measurement |
| OFF | Disables measurement |
| Default | OFF |
| <count> | Measurement count |
| Range | 1 to 200 |
| Resolution | 1 |
| Suffix code | None |
| Default | 1 |

### Example of Use

To enable Spurious Emission measurement and set measurement count to 10:
:CONF:CELL:EVDO:FUND:SPUR:SET ON,10
:CONF:CELL:EVDO:FUND:SPUR:SET?
> ON,10

## :CONFigure:CELLular:EVDO:LCMask:I

Long Code Mask - I

### Function

Sets or queries Long Code Mask for I-phase.

### Command

```
:CONFigure:CELLular:EVDO:LCMask:I <lcm>
```

### Query

```
:CONFigure:CELLular:EVDO:LCMask:I?
```

### Response

<lcm>

### Parameters

| <lcm> | Long Code Mask - I |
|---|---|
| 00000000000 | 0x00000000000 |
| 3FF00000000 | 0x3FF00000000 |
| Default | 00000000000 |

### Example of Use

To set Long Code Mask - I to 0x00000000000.

CONF:CELL:EVDO:LCM:I 00000000000

CONF:CELL:EVDO:LCM:I?

> 00000000000

## :CONFigure:CELLular:EVDO:PREVision

Protocol Revision

### Function

Sets or queries Protocol Revision.

### Command

```
:CONFigure:CELLular:EVDO:PREVision <rev>
```

### Query

```
:CONFigure:CELLular:EVDO:PREVision?
```

### Response

<rev>

### Parameter

| | |
|---|---|
| <rev> | Protocol Revision |
| REV0 | Rev.0 |
| REVA | Rev.A |
| Default | REV0 |

### Example of Use

To set Protocol Revision to Rev.0:

:CONF:CELL:EVDO:PREV REV0

:CONF:CELL:EVDO:PREV?

> REV0

## :CONFigure:CELLular:EVDO:PSIZe

Data Channel Payload Size

### Function

Sets or queries Data Channel Payload Size.

### Command

```
:CONFigure:CELLular:EVDO:PSIZe <size>
```

### Query

```
:CONFigure:CELLular:EVDO:PSIZe?
```

### Response

<size>

| | |
|---|---|
| Unit | kbps |

### Parameter

| | |
|---|---|
| <size> | Data channel payload size |
| Range | 128, 256, 512, 768, 1024, 1536, 2048, 3072, 4096, 6144, 8192, 12288 |
| Suffix code | None |
| Default | 128 |

### Details

This is only enabled when the Protocol Revision is Rev. A.

### Example of Use

To set Data Channel Payload Size to 128 kbps:
:CONF:CELL:EVDO:PSIZ 128
:CONF:CELL:EVDO:PSIZ?
> 128

## :CONFigure:CELLular:GENerator:ARB:NOISe:CN

AWGN Level

### Function

Sets or queries AWGN (Additive White Gaussian Noise) output level ratio vs carrier.

### Command

```
:CONFigure:CELLular:GENerator:ARB:NOISe:CN <level>
```

### Query

```
:CONFigure:CELLular:GENerator:ARB:NOISe:CN?
```

### Response

<level>

| | |
|---|---|
| Unit | dB |

### Parameter

| | |
|---|---|
| <level> | AWGN output level |
| Range | –40 to +12 dB |
| Resolution | 1 dB |
| Default | –20 dB |

### Example of Use

To set AWGN output level ratio vs the carrier to –40 dB

:CONF:CELL:GEN:ARB:NOIS:CN -40

:CONF:CELL:GEN:ARB:NOIS:CN?

> -40

## :CONFigure:CELLular:GENerator:ARB:NOISe:STATe

AWGN Level On/Off

### Function

Enables AWGN output, and queries setting.

### Command

```
:CONFigure:CELLular:GENerator:ARB:NOISe:STATe <on_off>
```

### Query

```
:CONFigure:CELLular:GENerator:ARB:NOISe:STATe?
```

### Response

<on_off>

### Parameter

| | |
|---|---|
| <on_off> | Enables/disables AWGN output |
| ON | Enables AWGN output |
| OFF | Disables AWGN output |
| Default | OFF |

### Example of Use

To enable the AWGN output:
:CONF:CELL:GEN:ARB:NOIS:STAT ON
:CONF:CELL:GEN:ARB:NOIS:STAT?
> ON

### Related Command

To set and query AWGN output level ratio vs carrier:
:CONFigure:CELLular:GENerator:ARB:NOISe:CN

## :CONFigure:CELLular:GENerator:RFSettings:FREQuency

Output Frequency (Fwd.)

### Function

Sets or queries Forward Link center frequency.

### Command

```
:CONFigure:CELLular:GENerator:RFSettings:FREQuency <freq>
```

### Query

```
:CONFigure:CELLular:GENerator:RFSettings:FREQuency?
```

### Response

<freq>

| | |
|---|---|
| Unit | Hz |

### Parameter

| | |
|---|---|
| <freq> | Output Frequency (Fwd,) |
| Range | 400 000 000 to 3800 000 000 Hz |
| Resolution | 1 Hz |
| Suffix code | HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz when omitted) |
| Default | 873 660 000 Hz |

### Detail

The input frequency is changed to a value determined by the combination of the Band Class and channel after the channel number is changed.
Changing the output frequency does not change the channel number.

### Example of Use

To set the Forward Link frequency to 873.66 MHz:
:CONF:CELL:GEN:RFS:FREQ 873.66MHZ
:CONF:CELL:GEN:RFS:FREQ?
> 873660000

## :CONFigure:CELLular:GENerator:RFSettings:LEVel

Output Level

### Function

Sets or queries RF output level.

### Command

```
:CONFigure:CELLular:GENerator:RFSettings:LEVel <level>
```

### Query

```
:CONFigure:CELLular:GENerator:RFSettings:LEVel?
```

### Response

<level>

| | |
|---|---|
| Unit | dBm |

### Parameter

<level> Output level

| | |
|---|---|
| Range | |
| MU887000A | –130.0 to –10.0 dBm (Port 1/Port 2) |
| | –120.0 to 0.0 dBm (Port 3/Port 4) |
| MU887001A | –130.0 to –10.0 dBm (Port 1 to Port 4) |
| MU887002A | –130.0 to 0.0 dBm (TRX 1/2, Port 1 to Port 12) |
| Resolution | 0.1 dB |
| Suffix code | DBM (uses dBm when omitted) |
| Default | –55.0 dBm |

### Details

For MU887000A, the setting range varies with the output test port setting.
If cable loss correction is set to ON, the setting range of the output level is the range of values with subtracted cable loss.
If the cable loss is 5 dB, the MU887000A Port 1/Port 2 setting range is –135.0 to –15.0 dBm.

### Example of Use

To set the output level to –50.0 dBm:

```
:CONF:CELL:GEN:RFS:LEV -50.0
:CONF:CELL:GEN:RFS:LEV?
> -50.0
```

### Related Commands

[:ROUTe]:EXTLoss:TABLe:SWITch
:CALCulate:EXTLoss:TABLe:SETTing
:CALCulate:EXTLoss:TABLe:VALue
For details of the commands, refer to Chapter 5 “SCPI Command Reference” in the *MU887000A TRX Test Module Operation Manual*.

## :CONFigure:CELLular:MEASurement:RFSettings:BCLass

Band Class

### Function

Sets or queries band class.

### Command

```
:CONFigure:CELLular:MEASurement:RFSettings:BCLass <band>
```

### Query

```
:CONFigure:CELLular:MEASurement:RFSettings:BCLass?
```

### Response

<band>

### Parameter

| | |
|---|---|
| <band> | Band class |
| Range | 0 to 16, 18 to 21 |
| Resolution | 1 |
| Default | 0 |

### Example of Use

To set the band class to 10:
:CONF:CELL:MEAS:RFS:BCL 10
:CONF:CELL:MEAS:RFS:BCL?
> 10

### Remarks

Use the following command to set the band class to determine the Spurious Emission Limit range:
:CONFigure:CELLular:EVDO:FUNDamental:BAND

## :CONFigure:CELLular:MEASurement:RFSettings:CHANnel

Channel

### Function

Sets or queries channel.

### Command

```
:CONFigure:CELLular:MEASurement:RFSettings:CHANnel <channel>
```

### Query

```
:CONFigure:CELLular:MEASurement:RFSettings:CHANnel?
```

### Response

<channel>

### Parameter

| | |
|---|---|
| <channel> | Channel |
| Range | Band Class0: 1 to 799, 991 to 1323<br>Band Class1: 0 to 1199<br>Band Class2: 0 to 1000, 1329 to 2108<br>Band Class3: 1 to 799, 801 to 1039, 1041 to 1199, 1201 to 1600<br>Band Class4: 0 to 599<br>Band Class5: 1 to 400, 472 to 871, 1039 to 1473, 1536 to 1715, 1792 to 2018<br>Band Class6: 0 to 1199<br>Band Class7: 0 to 240<br>Band Class8: 0 to 1499<br>Band Class9: 0 to 699<br>Band Class10: 0 to 919<br>Band Class11: 1 to 400, 472 to 871, 1039 to 1473, 1536 to 1715, 1792 to 2016<br>Band Class12: 0 to 239<br>Band Class13: 0 to 1399<br>Band Class14: 0 to 1299<br>Band Class15: 0 to 899<br>Band Class16: 140 to 1459<br>Band Class18: 0 to 240<br>Band Class19: 0 to 360<br>Band Class20: 0 to 680<br>Band Class21: 0 to 399 |
| Resolution | 1 (other than Band Class3)<br>2 (Band Class3) |
| Default | 122 |

Details

The setting range of this parameter varies with the Band Class setting.
Changing the channel number changes the related output frequency (Forward Link frequency) and input frequency (Reverse Link frequency).

Example of Use

To set the channel to 100:
:CONF:CELL:MEAS:RFS:CHAN 100
:CONF:CELL:MEAS:RFS:CHAN?
> 100

## :CONFigure:CELLular:MEASurement:RFSettings:FREQuency

Input Frequency (Rev.)

### Function

Sets or queries Reverse Link center frequency.

### Command

```
:CONFigure:CELLular:MEASurement:RFSettings:FREQuency <freq>
```

### Query

```
:CONFigure:CELLular:MEASurement:RFSettings:FREQuency?
```

### Response

<freq>

| | |
|---|---|
| Unit | Hz |

### Parameter

| | |
|---|---|
| <freq> | Input Frequency (Rev.) |
| Range | 400 000 000 to 3800 000 000 Hz |
| Resolution | 1 Hz |
| Suffix code | HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (used Hz when omitted) |
| Default | 828 660 000 Hz |

### Details

The input frequency is changed to a value determined by the combination of the Band Class and channel after the channel number is changed.
Changing the input frequency does not change the channel number.

### Example of Use

To set the Reverse Link center frequency to 828.66 MHz:
:CONF:CELL:MEAS:RFS:FREQ 828.66MHZ
:CONF:CELL:MEAS:RFS:FREQ?
> 828660000

## :CONFigure:CELLular:MEASurement:RFSettings:LEVel

Input Level

### Function

Sets or queries input level of the input test port.

### Command

```
:CONFigure:CELLular:MEASurement:RFSettings:LEVel <level>
```

### Query

```
:CONFigure:CELLular:MEASurement:RFSettings:LEVel?
```

### Response

<level>

| | |
|---|---|
| Unit | dBm |

### Parameter

| | |
|---|---|
| <level> | Input level |
| Range | |
| MU887000A | –65.0 to +35.0 dBm (Port 1/Port 2) |
| | –65.0 to +25.0 dBm (Port 3/Port 4) |
| MU887001A | –65.0 to +35.0 dBm (Port 1 to Port 4) |
| MU887002A | –65.0 to +35.0 dBm (TRX 1/2, Port 1 to Port 12) |
| Resolution | 0.1 dB |
| Suffix code | DBM (uses dBm when omitted) |
| Default | –23.7 dBm |

### Details

For MU887000A, the setting range varies with the input test port setting.
If cable loss correction is set to ON, the setting range of the input level is the range of values with added cable loss.
If the cable loss is 5 dB, the MU887000A Port 1/Port 2 setting range is –60.0 to +40.0 dBm.

### Example of Use

To set the input level to –10.0 dBm:
:CONF:CELL:MEAS:RFS:LEV -10.0
:CONF:CELL:MEAS:RFS:LEV?
> -10.0

### Related Commands

[:ROUTe]:EXTLoss:TABLe:SWITch
:CALCulate:EXTLoss:TABLe:SETTing
:CALCulate:EXTLoss:TABLe:VALue
For details of the commands, refer to Chapter 5 “SCPI Command Reference” in the *MU887000A TRX Test Module Operation Manual*.

# :FETCh:CELLular:EVDO:FUNDamental:CDPower:ACK?

ACK Channel Power

## Function

Queries Reverse ACK Channel Power measurement result.

## Query

```
:FETCh:CELLular:EVDO:FUNDamental:CDPower:ACK? <mode>[,<unit>]
```

## Response

When <mode> = TTL

<avg>,<max>,<min>

When <mode> is other than TTL

<pwr>

| | |
|---|---|
| Unit | Depends on parameter unit |
| Resolution | 0.01 dB |

## Parameters

| | |
|---|---|
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <unit> | Query unit |
| IOR | Ior (Total Power) reference value (dB/Ior) |
| PILOT | Pilot Channel reference value (dB/Pilot) |
| | (uses Ior when <unit> omitted) |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <pwr> | Measurement result in specified Storage mode |

## Example of Use

To query the ACK Channel Power measurement result average value:

:FETC:CELL:EVDO:FUND:CDP:ACK? AVG

> 0.01

## :FETCh:CELLular:EVDO:FUNDamental:CDPower:APILot?

Auxiliary Pilot Channel Power

### Function

Queries Reverse Auxiliary Pilot Channel Power measurement result.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:CDPower:APILot? <mode>[,<unit>]
```

### Response

When <mode> = TTL

<avg>,<max>,<min>

When <mode> is other than TTL

<pwr>

| | |
|---|---|
| Unit | Depends on parameter unit |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <unit> | Query unit |
| IOR | Ior (Total Power) reference value (dB/Ior) |
| PILOT | Pilot Channel reference value (dB/Pilot) |
| | (uses Ior when <unit> omitted) |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <pwr> | Measurement result in specified Storage mode |

### Details

A valid data is acquired only when the Protocol Revision is Rev. A.

### Example of Use

To query the Auxiliary Pilot Channel Power measurement result average value:

:FETC:CELL:EVDO:FUND:CDP:APIL? AVG

> 0.01

# :FETCh:CELLular:EVDO:FUNDamental:CDPower:DATA?

DATA Channel Power

### Function

Queries Reverse DATA Channel Power measurement result.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:CDPower:DATA? <mode>[,<unit>]
```

### Response

When <mode> = TTL

<avg>,<max>,<min>

When <mode> is other than TTL

<pwr>

| | |
|---|---|
| Unit | Depends on parameter unit |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <unit> | Query unit |
| IOR | Ior (Total Power) reference value (dB/Ior) |
| PILOT | Pilot Channel reference value (dB/Pilot) |
| | (uses Ior when <unit> omitted) |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <pwr> | Measurement result in specified Storage mode |

### Example of Use

To query the average value of the DATA Channel Power measurement result

:FETC:CELL:EVDO:FUND:CDP:DATA? AVG

> 0.01

# :FETCh:CELLular:EVDO:FUNDamental:CDPower:DRC?

DRC Channel Power

### Function

Queries Reverse DRC Channel (Data Rate Channel) Power measurement result.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:CDPower:DRC? <mode>[,<unit>]
```

### Response

When <mode> = TTL

<avg>,<max>,<min>

When <mode> is other than TTL

<pwr>

| | |
|---|---|
| Unit | Depends on parameter unit |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <unit> | Query unit |
| IOR | Ior (Total Power) reference value (dB/Ior) |
| PILOT | Pilot Channel reference value (dB/Pilot) |
| | (uses Ior when <unit> omitted) |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <pwr> | Measurement result in specified Storage mode |

### Example of Use

To query the DRC Channel Power measurement result average value

:FETC:CELL:EVDO:FUND:CDP:DRC? AVG

> 0.01

## :FETCh:CELLular:EVDO:FUNDamental:CDPower:DSC?

DSC Channel Power

### Function

Queries Reverse DSC Channel (Data Source Channel) Power measurement result.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:CDPower:DSC? <mode>[,<unit>]
```

### Response

When <mode> = TTL

<avg>,<max>,<min>

When <mode> is other than TTL

<pwr>

| | |
|---|---|
| Unit | Depends on parameter unit |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <unit> | Query unit |
| IOR | Ior (Total Power) reference value (dB/Ior) |
| PILOT | Pilot Channel reference value (dB/Pilot) |
| | (uses Ior when <unit> omitted) |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <pwr> | Measurement result in specified Storage mode |

### Details

An valid data is acquired only when the Protocol Revision is Rev. A.

### Example of Use

To query the DSC Channel Power measurement result average value

:FETC:CELL:EVDO:FUND:CDP:DSC? AVG

> 0.01

## :FETCh:CELLular:EVDO:FUNDamental:CDPower:MICPower?

Max Inactive Channel Power

### Function

Queries channel outputting maximum power among inactive code channels, and power measurement result.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:CDPower:MICPower?
```

### Response

<pwr>,<ph>,<wn>,<wl>

<pwr>
  Unit dB
<wn>
  Unit None
<wl>
  Unit None

### Parameters

| | |
|---|---|
| <pwr> | Max Inactive Channel Power |
| Resolution | 0.01 dB |
| <ph> | Phase (I/Q) of measured channel |
| I | I-phase |
| Q | Q-phase |
| <wn> | Walsh Code Number of measured channel |
| Resolution | 1 |
| <wl> | Walsh Code Length of measured channel |
| Resolution | 1 |

### Details

When executing more than two measurements using a single measurement start, the result of the last measurement is returned for (Meas. Count ≥ 2).

### Example of Use

To query the channel outputting the maximum power among inactive code channels and the power measurement result:
:FETC:CELL:EVDO:FUND:CDP:MICP?
> 3.00,Q,2,8

## :FETCh:CELLular:EVDO:FUNDamental:CDPower:PILot?

R-PICH Power

### Function

Queries R-PICH (Reverse Pilot Channel) power measurement result.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:CDPower:PILot? <mode>
```

### Response

When <mode> = TTL

<avg>,<max>,<min>

When <mode> is other than TTL

<pwr>

| | |
|---|---|
| Unit | dB/Ior |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <pwr> | Measurement result in specified Storage mode |

### Example of Use

To query the R-PICH power measurement result average:

:FETC:CELL:EVDO:FUND:CDP:PIL? AVG

> 0.01

## :FETCh:CELLular:EVDO:FUNDamental:CDPower:RRI?

RRI Channel Power

### Function

Queries Reverse RRI Channel (Reverse Rate Indicator Channel) Power measurement result.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:CDPower:RRI? <mode>[,<unit>]
```

### Response

When <mode> = TTL

<avg>,<max>,<min>

When <mode> is other than TTL

<pwr>

| | |
|---|---|
| Unit | Depends on parameter unit |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <unit> | Query unit |
| IOR | Ior (Total Power) reference value (dB/Ior) |
| PILOT | Pilot Channel reference value (dB/Pilot) |
| | (uses Ior when <unit> omitted) |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <pwr> | Measurement result in specified Storage mode |

### Example of Use

To query the RRI Channel Power measurement result average value:

:FETC:CELL:EVDO:FUND:CDP:RRI? AVG

> 0.01

## :FETCh:CELLular:EVDO:FUNDamental:MODulation:CFRequency?

Carrier Frequency Result

### Function

Queries carrier frequency measurement result.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:MODulation:CFRequency?
```

### Response

<freq>

| | |
|---|---|
| Unit | Hz |
| Resolution | 1 Hz |

### Parameter

| | |
|---|---|
| <freq> | Carrier Frequency |

### Example of Use

To query the carrier frequency measurement result:

:FETC:CELL:EVDO:FUND:MOD:CFR?

> 862200000

## :FETCh:CELLular:EVDO:FUNDamental:MODulation:EVM?

EVM Result

### Function

Queries EVM measurement result.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:MODulation:EVM? <mode>
```

### Response

When <mode> = TTL

<avg>,<max>,<min>

When <mode> is other than TTL

<evm>

| | |
|---|---|
| Unit | % |
| Resolution | 0.01% |

### Parameters

| | |
|---|---|
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <evm> | Measurement result in specified Storage mode |

### Example of Use

To query the EVM measurement result average:

:FETC:CELL:EVDO:FUND:MOD:EVM? AVG

> 0.01

## :FETCh:CELLular:EVDO:FUNDamental:MODulation:FERRor?

Carrier Frequency Error Result

### Function

Queries Carrier Frequency Error measurement result.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:MODulation:FERRor? <mode>
```

### Response

When <mode> = TTL

```
<avg_ppm>,<avg_Hz>,<max_ppm>,<max_Hz>,<min_ppm>,<min_Hz>
```

When <mode> is other than TTL

```
<freq_ppm>,<freq_Hz>
```

<xxx_ppm>

| | |
|---|---|
| Unit | ppm |
| Resolution | 0.01 ppm |

<xxx_Hz>

| | |
|---|---|
| Unit | Hz |
| Resolution | 0.1 Hz |

### Parameters

| | |
|---|---|
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <avg_ppm> | Measurement result in ppm (Average) |
| <avg_Hz> | Measurement result in Hz (Average) |
| <max_ppm> | Measurement result in ppm (Maximum) |
| <max_Hz> | Measurement result in Hz (Maximum) |
| <min_ppm> | Measurement result in ppm (Minimum) |
| <min_Hz> | Measurement result in Hz (Minimum) |
| <freq_ppm> | Measurement result in ppm in specified Storage mode |
| <freq_Hz> | Measurement result in Hz in specified Storage mode |

### Example of Use

To query the frequency error measurement result average value:

:FETC:CELL:EVDO:FUND:MOD:FERR? AVG

> 0.50,431.1

## :FETCh:CELLular:EVDO:FUNDamental:MODulation:FERRor:WORSt?

Worst Carrier Frequency Error Result

### Function

Queries worst value of Carrier Frequency Error measurement results.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:MODulation:FERRor:WORSt?
```

### Response

<freq_ppm>,<freq_Hz>

<freq_ppm>

| | |
|---|---|
| Unit | ppm |
| Resolution | 0.01 ppm |

<freq_Hz>

| | |
|---|---|
| Unit | Hz |
| Resolution | 0.1 Hz |

### Parameters

| | |
|---|---|
| <freq_ppm> | Worst value in Frequency Error measurement results in ppm |
| <freq_Hz> | Worst value in Frequency Error measurement results in Hz |

### Example of Use

To query the frequency error worst value measurement result:

:FETC:CELL:EVDO:FUND:MOD:FERR:WORS?

> 1.00,862.2

## :FETCh:CELLular:EVDO:FUNDamental:MODulation:MERRor?

Magnitude Error Result

### Function

Queries Magnitude Error measurement result.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:MODulation:MERRor? <mode>
```

### Response

When <mode> = TTL

<avg>,<max>,<min>

When <mode> is other than TTL

<merr>

| | |
|---|---|
| Unit | % |
| Resolution | 0.01% |

### Parameters

| | |
|---|---|
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <merr> | Measurement result in specified Storage mode |

### Example of Use

To query the Magnitude Error measurement result average:

:FETC:CELL:EVDO:FUND:MOD:MERR? AVG

> 0.01

## :FETCh:CELLular:EVDO:FUNDamental:MODulation:ORGNoffset?

Origin Offset Result

### Function

Queries Origin Offset measurement result.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:MODulation:ORGNoffset? <mode>
```

### Response

When <mode> = TTL

<avg>,<max>,<min>

When <mode> is other than TTL

<origin>

| | |
|---|---|
| Unit | dB |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <origin> | Measurement result in specified Storage mode |

### Example of Use

To query the Origin Offset measurement result average:

:FETC:CELL:EVDO:FUND:MOD:ORGN? AVG

> 0.01

## :FETCh:CELLular:EVDO:FUNDamental:MODulation:PEVM?

Peak EVM Result

### Function

Queries Peak EVM measurement result.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:MODulation:PEVM? <mode>
```

### Response

When <mode> = TTL

<avg>,<max>,<min>

When <mode> is other than TTL

<pevm>

| | |
|---|---|
| Unit | % |
| Resolution | 0.01% |

### Parameters

| | |
|---|---|
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <pevm> | Measurement result in specified Storage mode |

### Example of Use

To query the Peak EVM measurement result average:

:FETC:CELL:EVDO:FUND:MOD:PEVM? AVG

> 0.01

## :FETCh:CELLular:EVDO:FUNDamental:MODulation:PHERror?

Phase Error Result

### Function

Queries Phase Error measurement result.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:MODulation:PHERror? <mode>
```

### Response

When <mode> = TTL

<avg>,<max>,<min>

When <mode> is other than TTL

<perr>

| | |
|---|---|
| Unit | degree |
| Resolution | 0.01 degree |

### Parameters

| | |
|---|---|
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <perr> | Measurement result in specified Storage mode |

### Example of Use

To query the Phase Error measurement result average value

:FETC:CELL:EVDO:FUND:MOD:PHER? AVG

> 0.01

## :FETCh:CELLular:EVDO:FUNDamental:MODulation:RHO?

Rho Result

### Function

Queries Rho (Waveform Quality) measurement result.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:MODulation:RHO? <mode>
```

### Response

When <mode> = TTL

<avg>,<max>,<min>

When <mode> is other than TTL

<rho>

| | |
|---|---|
| Unit | None |
| Resolution | 0.00001 |

### Parameters

| | |
|---|---|
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <rho> | Measurement result in specified Storage mode |

### Example of Use

To query the Rho measurement result average:

:FETC:CELL:EVDO:FUND:MOD:RHO? AVG

> 0.00100

## :FETCh:CELLular:EVDO:FUNDamental:MODulation:TERRor?

Time Error Result

### Function

Queries Time Error measurement result.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:MODulation:TERRor? <mode>
```

### Response

When <mode> = TTL

<avg>,<max>,<min>

When <mode> is other than TTL

<time>

| | |
|---|---|
| Unit | μs |
| Resolution | 0.01 μs |

### Parameters

| | |
|---|---|
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <time> | Measurement result in specified Storage mode |

### Example of Use

To query the Time Error measurement result average:

:FETC:CELL:EVDO:FUND:MOD:TERR? AVG

> 0.01

## :FETCh:CELLular:EVDO:FUNDamental:MODulation:TERRor:WORSt?

Worst Time Error Result

### Function

Queries Time Error worst value measurement result.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:MODulation:TERRor:WORSt?
```

### Response

<time>

| | |
|---|---|
| Unit | μs |
| Resolution | 0.01 μs |

### Parameter

| | |
|---|---|
| <time> | Time Error worst value |

### Example of Use

To query the Time Error measurement result worst value:

:FETC:CELL:EVDO:FUND:MOD:TERR:WORS?

> 0.01

## :FETCh:CELLular:EVDO:FUNDamental:OBW?

OBW Result

### Function

Queries Occupied Bandwidth measurement result.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:OBW?
```

### Response

<bw>

| | |
|---|---|
| Unit | MHz |
| Resolution | 1 kHz |

### Parameter

| | |
|---|---|
| <bw> | Occupied Bandwidth [MHz] |

### Example of Use

To query the Occupied Bandwidth measurement result:

:FETC:CELL:EVDO:FUND:OBW?

> 0.100

## :FETCh:CELLular:EVDO:FUNDamental:OBW:FREQuency?

OBW Frequency Result

### Function

Queries upper, lower and center frequency of Occupied Bandwidth measurement.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:OBW:FREQuency? <pos>
```

### Response

<freq>

| | |
|---|---|
| Unit | MHz |
| Resolution | 1 kHz |

### Parameters

| | |
|---|---|
| <pos> | Offset type |
| UPPER | Upper frequency |
| LOWER | Lower frequency |
| CENTER | Center frequency |
| <freq> | Offset frequency [MHz] |

### Example of Use

To query the center frequency measurement result:
:FETC:CELL:EVDO:FUND:OBW:FREQ? CENTER
> 862.200

## :FETCh:CELLular:EVDO:FUNDamental:POWer:FLTPower?

Filtered Power Result

### Function

Queries Filtered Power measurement result.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:POWer:FLTPower? <mode>
```

### Response

When <mode> = TTL
<avg>,<max>,<min>
When <mode> = AVG,MAX,MIN or DVT,
<pwr>
When <mode> = IND,
<s>,<pwr(1)>,<pwr(2)>,…,<pwr(s)>

| | |
|---|---|
| Unit | dBm |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| IND | Value at each measurement |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <pwr> | Measurement result in specified Storage mode |
| <pwr(s)> | Power of sth measurement |
| s | Measurement count |
| Range | 1 to 200 |

### Example of Use

To query the Filtered Power measurement result average, maximum, and minimum:
:FETC:CELL:EVDO:FUND:POW:FLTP? TTL
> -10.05,-9.60,-10.50

## :FETCh:CELLular:EVDO:FUNDamental:POWer:TXPower?

Tx Power Result

### Function

Queries Tx power measurement result.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:POWer:TXPower? <mode>
```

### Response

When <mode> = TTL
<avg>,<max>,<min>
When <mode> = AVG,MAX,MIN or DVT,
<pwr>
When <mode> = IND,
<s>,<pwr(1)>,<pwr(2)>,...,<pwr(s)>

| | |
|---|---|
| Unit | dBm |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| IND | Value at each measurement |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <pwr> | Measurement result in specified Storage mode |
| <pwr(s)> | Power of sth measurement |
| s | Measurement count |
| Range | 1 to 200 |

### Example of Use

To query the Tx power measurement result average, maximum, and minimum:

:FETC:CELL:EVDO:FUND:POW:TXP? TTL
> -10.05,-9.60,-10.50

## :FETCh:CELLular:EVDO:FUNDamental:SPURious:JUDGement?

Spurious Emissions Judgement

### Function

Queries judgement about whether or not Spurious Emissions within template.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:SPURious:JUDGement?
```

### Response

<judgement>

### Parameter

| | |
|---|---|
| <judgement> | Judgement |
| PASS | Pass |
| FAIL | Fail |

### Example of Use

To query the Spurious Emissions judgement measurement result:

:FETC:CELL:EVDO:FUND:SPUR:JUDG?

> PASS

## :FETCh:CELLular:EVDO:FUNDamental:SPURious:LOWer?

Spurious Emissions Peak Value (Lower)

### Function

Queries worst level and frequency of spectrum in each lower frequency range.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:SPURious:LOWer?
```

### Response

<bc>,<f_1>,<l_1,<f_2>,<l_2>,<f_3>,<l_3>,<f_4>,<l_4>,<f_5>,<l_5>

<l_k>

| | |
|---|---|
| Unit | dBc or dBm |
| Resolution | 0.01 dB |

<f_k>

| | |
|---|---|
| Unit | MHz |
| Resolution | 0.001 MHz |

### Parameters

| | |
|---|---|
| <bc> | Band Class |
| Range | 0 to 16, 18 to 21 |
| <l_k> | Worst level at offset frequency section k<br>999.99 is returned for out of target. |
| <f_k> | Offset frequency for worst value acquired by l<br>99999.999 is returned for out of target. |
| k | Offset frequency section |
| Range | 1, 2, 3, 4, 5 |

### Details

For the offset frequency points, refer to Table 2.4-1 “Spurious Emissions Specifications (1)” and Table 2.4-2 “Specifications of Spurious Emissions (2)”.

### Example of Use

To query the worst level and frequency of the spectrum in each lower frequency range in band class 6:

:FETC:CELL:EVDO:FUND:SPUR:LOW?

> 6,1.000,-43.21,1.000,-54.32,2.000,-65.43,2.000,-76.54,3.000,-87.65

## :FETCh:CELLular:EVDO:FUNDamental:SPURious:MARGin:LOWer?

Spurious Emissions Template Margin (Lower)

### Function

Queries margin level from template for worst value and frequency of spectrum in each lower frequency range.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:SPURious:MARGin:LOWer?
```

### Response

<bc>,<f_1>,<l_1>,<f_2>,<l_2>,<f_3>,<l_3>,<f_4>,<l_4>,<f_5>,<l_5>

<l_k>

| | |
|---|---|
| Unit | dB |
| Resolution | 0.01 dB |

<f_k>

| | |
|---|---|
| Unit | MHz |
| Resolution | 0.001 MHz |

### Parameters

| | |
|---|---|
| <bc> | Band Class |
| Range | 0 to 16,18 to 21 |
| <l_k> | Margin level for worst value at offset frequency section k<br>999.99 is returned for out of target. |
| <f_k> | Offset frequency of worst value acquired by l<br>99999.999 is returned for out of target. |
| k | Offset frequency section |
| Range | 1, 2, 3, 4, 5 |

### Details

For the offset frequency points, refer to Table 2.4-1 “Spurious Emissions Specifications (1)” and Table 2.4-2 “Spurious Emissions Specifications (2)”.

### Example of Use

To query the margin level from the template for worst value and frequency of the spectrum in each lower frequency range in band class 6:

:FETC:CELL:EVDO:FUND:SPUR:MARG:LOW?

> 6,1.000,20.00,1.000,21.00,2.000,22.00,2.000,23.00,3.000,24.00

## :FETCh:CELLular:EVDO:FUNDamental:SPURious:MARGin:UPPer?

Spurious Emissions Template Margin (Upper)

### Function

Queries margin level from template for worst value and frequency of spectrum in each upper frequency range.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:SPURious:MARGin:UPPer?
```

### Response

<bc>,<f_1>,<l_1>,<f_2>,<l_2>,<f_3>,<l_3>,<f_4>,<l_4>,<f_5>,<l_5>

<l_k>

| | |
|---|---|
| Unit | dB |
| Resolution | 0.01 dB |

<f_k>

| | |
|---|---|
| Unit | MHz |
| Resolution | 0.001 MHz |

### Parameters

| | |
|---|---|
| <bc> | Band Class |
| Range | 0 to 16, 18 to 21 |
| <l_k> | Margin level for worst value at offset frequency section k<br>999.99 is returned for out of target. |
| <f_k> | Offset frequency of worst value acquired by l<br>99999.999 is returned for out of target. |
| k | Offset frequency section |
| Range | 1, 2, 3, 4, 5 |

### Details

For the offset frequency points, refer to Table 2.4-1 “Spurious Emissions Specifications (1)” and Table 2.4-2 “Spurious Emissions Specifications (2)”.

### Example of Use

To query the margin level from the template for worst value and frequency of the spectrum in each upper frequency range in band class 6:

:FETC:CELL:EVDO:FUND:SPUR:MARG:UPP?

> 6,1.000,20.00,1.000,21.00,2.000,22.00,2.000,23.00,3.000,24.00

## :FETCh:CELLular:EVDO:FUNDamental:SPURious:UPPer?

Spurious Emissions Peak Value (Upper)

### Function

Queries worst value level and frequency of spectrum in each upper frequency range.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:SPURious:UPPer?
```

### Response

<bc>,<f_1>,<l_1>,<f_2>,<l_2>,<f_3>,<l_3>,<f_4>,<l_4>,<f_5>,<l_5>

<l_k>

| | |
|---|---|
| Unit | dBc or dBm |
| Resolution | 0.01 dB |

<f_k>

| | |
|---|---|
| Unit | MHz |
| Resolution | 0.001 MHz |

### Parameters

| | |
|---|---|
| <bc> | Band Class |
| Range | 0 to 16, 18 to 21 |
| <l_k> | Worst value level at offset frequency section k<br>999.99 is returned for out of target. |
| <f_k> | Offset frequency of worst value acquired by l<br>99999.999 is returned for out of target. |
| k | Offset frequency section |
| Range | 1, 2, 3, 4, 5 |

### Details

For the offset frequency points, refer to Table 2.4-1 “Spurious Emissions Specifications (1)” and Table 2.4-2 “Spurious Emissions Specifications (2)”.

### Example of Use

To query the worst value level and frequency of the spectrum in each upper frequency range in band class 6:

:FETC:CELL:EVDO:FUND:SPUR:UPP?

> 6,1.000,-43.21,1.000,-54.32,2.000,-65.43,2.000,-76.54,3.000,-87.65

## :FETCh:CELLular:EVDO:FUNDamental:TRACe?

Waveform

### Function

Queries waveform data for each measurement result.

### Query

```
:FETCh:CELLular:EVDO:FUNDamental:TRACe? <format>,
<position>,<length>[,<wl>]
```

### Response

<data[0]>,<data[1]>,<data[2]>,...,<data[length–1]>

When <format> = 2, 3, or 4

| | |
|---|---|
| Unit | dBm |
| Resolution | 0.01 dB |

When <format> = 1, 5 or 6

| | |
|---|---|
| Unit | dB |
| Resolution | 0.01 dB |

### Parameters

| | | |
|---|---|---|
| <format> | Format | |
| 1 | OBW Wave Data | |
| 2 | Spurious Emissions Wave Data (RB 30 kHz) | |
| 3 | Spurious Emissions Wave Data (RB 1 MHz) | |
| 4 | Spurious Emissions Wave Data (RB 1.23 MHz) | |
| 5 | Code Domain Power Wave Data (I) | |
| 6 | Code Domain Power Wave Data (Q) | |
| <position> | Starting point of waveform data | |
| Range | When format = 1 | 0 to 620 (–1.5 to 1.5 MHz) |
| | When format = 2, 3, or 4 | 0 to 1892 (–4.615 to 4.615 MHz) |
| | When format = 5 or 6 | 0 to (wl–1) |
| Resolution | 1 | |
| <length> | Number of data read | |
| Range | When format = 1 | 1 to (621–position) |
| | When format = 2, 3, or 4 | 1 to (1893–position) |
| | When format = 5 or 6 | 1 to (wl–position) |
| Resolution | 1 | |
| <wl> | Walsh Code Length | |
| Range | 2, 4, 8, 16 | |
| <data[length–1]> | Waveform Data | |

### Details

<wl> cannot be set when <format> is 1 to 4. (An error is returned at input.)

<wl> cannot be omitted when <format> is 5 or 6. (An error is returned if it is omitted.)

Example of Use

To query the Code Domain Power Q phase measurement result waveform data:
:FETC:CELL:EVDO:FUND:TRAC? 6,0,8,8
> 0.10,0.11,0.12,0.13,0.14,0.15,0.16,0.17

## :TRIGger:CELLular:EVDO:FUNDamental:DELay

Trigger Delay

Function

Sets or queries trigger delay.

Command

```
:TRIGger:CELLular:EVDO:FUNDamental:DELay <delay>
```

Query

```
:TRIGger:CELLular:EVDO:FUNDamental:DELay?
```

Response

<delay>
Unit ms

Parameter

| | |
|---|---|
| <delay> | Trigger delay |
| Range | 0 to 10.000 ms |
| Resolution | 0.001 ms |
| Suffix code | S, MS, US (uses ms when omitted) |
| Default | 0.000 ms |

Details

The trigger delay setting is enabled when the trigger source is set to PWR.

Example of Use

To set trigger delay to 0.5 ms:
:TRIG:CELL:EVDO:FUND:DEL 0.5MS
:TRIG:CELL:EVDO:FUND:DEL?
> 0.500

# :TRIGger:CELLular:EVDO:FUNDamental:LEVel

Trigger Level

## Function

Sets or queries trigger level.

## Command

```
:TRIGger:CELLular:EVDO:FUNDamental:LEVel <level>
```

## Query

```
:TRIGger:CELLular:EVDO:FUNDamental:LEVel?
```

## Response

<level>

| | |
|---|---|
| Unit | dB |

## Parameter

| | |
|---|---|
| <level> | Trigger level |
| Range | –40 to 0 dB |
| Resolution | 1 dB |
| Suffix code | DB (uses dB when omitted) |
| Default | –40.0 dB |

## Details

The trigger level setting is enabled when the trigger source is set to PWR.

## Example of Use

To set the trigger level to input signal –40 dB:

:TRIG:CELL:EVDO:FUND:LEV -40

:TRIG:CELL:EVDO:FUND:LEV?

> -40

## :TRIGger:CELLular:EVDO:FUNDamental:SOURce

Trigger Source

### Function

Sets or queries trigger source.

### Command

```
:TRIGger:CELLular:EVDO:FUNDamental:SOURce <source>
```

### Query

```
:TRIGger:CELLular:EVDO:FUNDamental:SOURce?
```

### Response

```
<source>
```

### Parameter

| | |
|---|---|
| <source> | Trigger source |
| FREERUN | Free run |
| PWR | Input signal power |
| Default | FREERUN |

### Example of Use

To set the input signal power as the trigger source:

:TRIG:CELL:EVDO:FUND:SOUR PWR

:TRIG:CELL:EVDO:FUND:SOUR?

> PWR

# :TRIGger:CELLular:EVDO:FUNDamental:TOUT

Trigger Timeout

## Function

Sets or queries trigger timeout.

## Command

```
:TRIGger:CELLular:EVDO:FUNDamental:TOUT <time>
```

## Query

```
:TRIGger:CELLular:EVDO:FUNDamental:TOUT?
```

## Response

<time>

| | |
|---|---|
| Unit | s |

## Parameter

| | |
|---|---|
| <time> | Timeout |
| Range | 1 to 10 s |
| Resolution | 1 s |
| Suffix code | S (uses s when omitted) |
| Default | 10 s |

## Details

The trigger timeout setting is enabled when the trigger source is set to PWR.

## Example of Use

To set the trigger timeout to 5 s:

:TRIG:CELL:EVDO:FUND:TOUT 5S

:TRIG:CELL:EVDO:FUND:TOUT?

> 5

## 4.2.3 Sequence measurement commands

### :CONFigure:CELLular:GENerator:RFSettings:FREQuency

Output Frequency (Fwd.)

**Function**

Sets or queries Forward Link center frequency.

**Command**

```
:CONFigure:CELLular:GENerator:RFSettings:FREQuency <freq>
```

**Query**

```
:CONFigure:CELLular:GENerator:RFSettings:FREQuency?
```

**Response**

<freq>

| | |
|---|---|
| Unit | Hz |

**Parameter**

| | |
|---|---|
| <freq> | Output Frequency (Fwd.) |
| Range | 400 000 000 to 3800 000 000 Hz |
| Resolution | 1 Hz |
| Suffix code | HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz when omitted) |
| Default | 873 660 000 Hz |

**Detail**

The input frequency is changed to a value determined by the combination of the Band Class and channel after the channel number is changed.
Changing the output frequency does not change the channel number.

**Example of Use**

To set the Forward Link Frequency to 873.66 MHz:
:CONF:CELL:GEN:RFS:FREQ 873.66MHZ
:CONF:CELL:GEN:RFS:FREQ?
> 873660000

## :CONFigure:CELLular:GENerator:RFSettings:LEVel

Output Level

### Function

Sets or queries RF output level.

### Command

```
:CONFigure:CELLular:GENerator:RFSettings:LEVel <level>
```

### Query

```
:CONFigure:CELLular:GENerator:RFSettings:LEVel?
```

### Response

<level>
Unit dBm

### Parameter

| | |
|---|---|
| <level> | Output level |
| Range | |
| MU887000A | –130.0 to –10.0 dBm (Port 1/Port 2) |
| | –120.0 to 0.0 dBm (Port 3/Port 4) |
| MU887001A | –130.0 to –10.0 dBm (Port 1 to Port 4) |
| MU887002A | –130.0 to 0.0 dBm (TRX 1/2, Port 1 to Port 12) |
| Resolution | 0.1 dB |
| Suffix Code | DBM (uses dBm when omitted) |
| Default | –55.0 dBm |

### Details

For MU887000A, the setting range depends on the output test port settings.
If cable loss correction is set to ON, the setting range of the output level is the range of values with subtracted cable loss.
If the cable loss is 5 dB, the MU887000A Port 1/Port 2 setting range is –135.0 to –15.0 dBm.

### Example of Use

To set the output level to –50.0 dBm:
:CONF:CELL:GEN:RFS:LEV -50.0
:CONF:CELL:GEN:RFS:LEV?
> -50.0

### Related Commands

[:ROUTe]:EXTLoss:TABLe:SWITch
:CALCulate:EXTLoss:TABLe:SETTing
:CALCulate:EXTLoss:TABLe:VALue
For details of the commands, refer to Chapter 5 “SCPI Command Reference” in the *MU887000A TRX Test Module Operation Manual*.

## :CONFigure:CELLular:MEASurement:RFSettings:FREQuency

Input Frequency (Rev.)

### Function

Sets or queries the Reverse Link center frequency.

### Command

```
:CONFigure:CELLular:MEASurement:RFSettings:FREQuency <freq>
```

### Query

```
:CONFigure:CELLular:MEASurement:RFSettings:FREQuency?
```

### Response

<freq>

| | |
|---|---|
| Unit | Hz |

### Parameter

| | |
|---|---|
| <freq> | Input Frequency (Rev.) |
| Range | 400 000 000 to 3800 000 000 Hz |
| Resolution | 1 Hz |
| Suffix code | HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (used Hz when omitted) |
| Default | 828 660 000 Hz |

### Details

The input frequency is changed to a value determined by the combination of the Band Class and channel after the channel number is changed.
Changing the input frequency does not change the channel number.

### Example of Use

To set the Reverse Link center frequency to 828.66 MHz:
:CONF:CELL:MEAS:RFS:FREQ 828.66MHZ
:CONF:CELL:MEAS:RFS:FREQ?
> 828660000

## :CONFigure:CELLular:MEASurement:RFSettings:LEVel

Input Level

### Function

Sets or queries input level of the input test port.

### Command

```
:CONFigure:CELLular:MEASurement:RFSettings:LEVel <level>
```

### Query

```
:CONFigure:CELLular:MEASurement:RFSettings:LEVel?
```

### Response

<level>

Unit dBm

### Parameter

| | | |
|---|---|---|
| <level> | | Input level |
| Range | | |
| MU887000A | –65.0 to +35.0 dBm (Port 1/Port 2) | |
| | –65.0 to +25.0 dBm (Port 3/Port 4) | |
| MU887001A | –65.0 to +35.0 dBm (Port 1 to Port 4) | |
| MU887002A | –65.0 to +35.0 dBm (TRX 1/2, Port 1 to Port 12) | |
| Resolution | 0.1 dB | |
| Suffix code | DBM (uses dBm when omitted) | |
| Default | –23.7 dBm | |

### Details

For MU887000A, the setting range varies with the input test port setting.
If cable loss correction is set to ON, the setting range of the input level is the range of values with added cable loss.
If the cable loss is 5 dB, the MU887000A Port 1/Port 2 setting range is –60.0 to +40.0 dBm.

### Example of Use

To set the input level to –10.0 dBm:

```
:CONF:CELL:MEAS:RFS:LEV -10.0
:CONF:CELL:MEAS:RFS:LEV?
> -10.0
```

### Related Commands

[:ROUTe]:EXTLoss:TABLe:SWITch
:CALCulate:EXTLoss:TABLe:SETTing
:CALCulate:EXTLoss:TABLe:VALue
For details of the commands, refer to Chapter 5 “SCPI Command Reference” in the *MU887000A TRX Test Module Operation Manual*.

# :CONFigure:CELLular:SEQuence:CONTrol

Sequence Control Parameter - Sequence Control

### Function

Sets start and stop segments of Sequence Table, and queries set value in Sequence Measurement mode.

### Command

```
:CONFigure:CELLular:SEQuence:CONTrol <start>,<end>
```

### Query

```
:CONFigure:CELLular:SEQuence:CONTrol?
```

### Response

<start>,<end>

### Parameters

| | |
|---|---|
| <start> | Start segment |
| Range | 0 to 1999 |
| Resolution | 1 |
| Default | 0 |
| <end> | Stop segment |
| Range | <start> to 1999 |
| Resolution | 1 |
| Default | 199 |

### Details

<start> = 0 to 1999, <end> = 0 to 1999 where <end> ≥ <start>

Whether the set sequence table can be executed is evaluated.

Use the :FETCh:CELLular:SEQuence:ERRor? command to query the error details.

### Example of Use

To set the start segment to 20 and the stop segment to 55:

:CONF:CELL:SEQ:CONT 20,55

:CONF:CELL:SEQ:CONT?

> 20,55

# :CONFigure:CELLular:SEQuence:CONTrol:TX

Sequence Control Parameter - Sequence Control

### Function

Sets or queries start and stop segments in sequence table.

Sets the measurement parameters only, without affecting the signal transmission parameters.

### Command

```
:CONFigure:CELLular:SEQuence:CONTrol:TX <start>,<end>
```

### Query

```
:CONFigure:CELLular:SEQuence:CONTrol:TX?
```

### Response

```
<start>,<end>
```

### Parameters

| | |
|---|---|
| <start> | Start segment |
| Range | 0 to 1999 |
| Resolution | 1 |
| Default | 0 |
| <end> | Stop segment |
| Range | <start> to 1999 |
| Resolution | 1 |
| Default | 199 |

### Details

<start> = 0 to 1999, <end> = 0 to 1999 where <end> ≥ <start>

Whether the set sequence table can be executed is evaluated.

Use the :FETCh:CELLular:SEQuence:ERRor? command to query the error details.

### Examples of Use

To set the start and stop segments to 20 and 55, respectively:

:CONF:CELL:SEQ:CONT 20,55

:CONF:CELL:SEQ:CONT?

> 20,55

# :CONFigure:CELLular:SEQuence:EVDO:AMITems:OFF

Turn Off All Measurement Items

## Function

Sets all measurement items to Off collectively.

## Command

```
:CONFigure:CELLular:SEQuence:EVDO:AMITems:OFF <mcond>
```

## Parameters

| | |
|---|---|
| <mcond> | Measurement condition number |
| Range | 0 to 1999 |
| Resolution | 1 |

## Examples of Use

To set all measurement items of condition number 0 in the sequence measurement to Off.

:CONF:CELL:SEQ:EVDO:AMIT:OFF 0

## Remarks

This is equivalent to setting all the commands below to Off.

:CONFigure:CELLular:SEQuence:EVDO:POWer:SET,
:CONFigure:CELLular:SEQuence:EVDO:OBW:SET,
:CONFigure:CELLular:SEQuence:EVDO:SPURious:SET,
:CONFigure:CELLular:SEQuence:EVDO:MODulation:SET,
:CONFigure:CELLular:SEQuence:EVDO:CDPower:SET

# :CONFigure:CELLular:SEQuence:EVDO:BAND

Band Class for Spurious Emissions Limit

### Function

Sets or queries band class to determine Spurious Emissions Limit range.

### Command

```
:CONFigure:CELLular:SEQuence:EVDO:BAND <mcond>,<band>
```

### Query

```
:CONFigure:CELLular:SEQuence:EVDO:BAND? <mcond>
```

### Response

<band>

### Parameters

| | |
|---|---|
| <mcond> | Measurement Condition Number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <band> | Band class |
| Range | 0 to 16, 18 to 21 |
| Resolution | 1 |
| Default | 0 |

### Details

This parameter sets the band class to determine the Spurious Emissions Limit range.

### Example of Use

To set the band class to determine Spurious Emissions Limit range 10 for Measurement Condition Number 3 in the Sequence Measurement mode

:CONF:CELL:SEQ:EVDO:BAND 3,10

:CONF:CELL:SEQ:EVDO:BAND? 3

> 10

### Remarks

Use the following command to set the band class to determine the frequency:

:CONFigure:CELLular:MEASurement:RFSettings:BCLass

# :CONFigure:CELLular:SEQuence:EVDO:CDPower:SET

Code Domain Power Enable and Count

### Function

Enables Code Domain Power measurement and sets measurement count, and queries settings.

### Command

```
:CONFigure:CELLular:SEQuence:EVDO:CDPower:SET <mcond>,<on_off>[,<count>]
```

### Query

```
:CONFigure:CELLular:SEQuence:EVDO:CDPower:SET? <mcond>
```

### Response

<on_off>,<count>

### Parameters

| | |
|---|---|
| <mcond> | Measurement Condition Number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <on_off> | Enables/disables measurement |
| ON | Enables measurement |
| OFF | Disables measurement |
| Default | OFF |
| <count> | Measurement count |
| Range | 1 to 200 |
| Resolution | 1 |
| Suffix code | None |
| Default | 1 |

### Example of Use

To enable Code Domain Power measurement for Measurement Condition Number 3 in the Sequence Measurement mode and set the measurement count to 10:

:CONF:CELL:SEQ:EVDO:CDP:SET 3,ON,10

:CONF:CELL:SEQ:EVDO:CDP:SET? 3

> ON,10

## :CONFigure:CELLular:SEQuence:EVDO:LSSearch

Long Span Code Search

### Function

Enables and queries Long Span Code Search function in Sequence Measurement mode.

### Command

```
:CONFigure:CELLular:SEQuence:EVDO:LSSearch <on_off>
```

### Query

```
:CONFigure:CELLular:SEQuence:EVDO:LSSearch?
```

### Response

<on_off>

### Parameter

| | |
|---|---|
| <on_off> | Enables/disables Long Span Code Search |
| ON | Enables Long Span Code Search |
| OFF | Disables Long Span Search |
| Default | OFF |

### Details

Set this parameter to OFF when the Reverse Link and Forward Link signals are synchronized; set it to ON when they are not synchronized.

### Example of Use

To enable the Long Span Code Search in the Sequence Measurement mode:
:CONF:CELL:SEQ:EVDO:LSS ON
:CONF:CELL:SEQ:EVDO:LSS?
> ON

# :CONFigure:CELLular:SEQuence:EVDO:MODulation:SET

Modulation Analysis Enable and Count

## Function

Enables Modulation Analysis Measurement and sets or queries measurement count in Sequence Measurement mode.

## Command

```
:CONFigure:CELLular:SEQuence:EVDO:MODulation:SET
<mcond>,<on_off>[,<count>]
```

## Query

```
:CONFigure:CELLular:SEQuence:EVDO:MODulation:SET? <mcond>
```

## Response

<on_off>,<count>

## Parameters

| | |
|---|---|
| <mcond> | Measurement Condition Number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <on_off> | Enables/disables measurement |
| ON | Enables measurement |
| OFF | Disables measurement |
| Default | OFF |
| <count> | Measurement count |
| Range | 1 to 200 |
| Resolution | 1 |
| Suffix code | None |
| Default | 1 |

## Example of Use

To enable Modulation Analysis measurement in the Sequence Measurement mode with measurement condition number 3 and set the measurement count to 10:

:CONF:CELL:SEQ:EVDO:MOD:SET 3,ON,10

:CONF:CELL:SEQ:EVDO:MOD:SET? 3

> ON,10

## :CONFigure:CELLular:SEQuence:EVDO:OBW:RATio

Occupied Bandwidth Ratio

### Function

Sets or queries Occupied Bandwidth measurement occupation ratio in Sequence Measurement mode.

### Command

```
:CONFigure:CELLular:SEQuence:EVDO:OBW:RATio <ratio>
```

### Query

```
:CONFigure:CELLular:SEQuence:EVDO:OBW:RATio?
```

### Response

<ratio>

### Parameter

| | |
|---|---|
| <ratio> | Occupation Ratio |
| Range | 80.0 to 99.9% |
| Resolution | 0.1% |
| Suffix code | % (uses % when omitted) |
| Default | 99.0% |

### Example of Use

To set the Occupied Bandwidth occupation ratio in the Sequence Measurement mode to 99.0%:

:CONF:CELL:SEQ:EVDO:OBW:RAT 99.0

:CONF:CELL:SEQ:EVDO:OBW:RAT?

> 99.0

# :CONFigure:CELLular:SEQuence:EVDO:OBW:SET

Occupied Bandwidth Enable and Count

## Function

Enables Occupied Bandwidth measurement and sets or queries measurement count in Sequence Measurement mode.

## Command

```
:CONFigure:CELLular:SEQuence:EVDO:OBW:SET <mcond>,<on_off>[,<count>]
```

## Query

```
:CONFigure:CELLular:SEQuence:EVDO:OBW:SET? <mcond>
```

## Response

<on_off>,<count>

## Parameters

| | |
|---|---|
| <mcond> | Measurement Condition Number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <on_off> | Enables/disables measurement |
| ON | Enables measurement |
| OFF | Disables measurement |
| Default | OFF |
| <count> | Measurement count |
| Range | 1 to 200 |
| Resolution | 1 |
| Suffix code | None |
| Default | 1 |

## Example of Use

To enable Occupied Bandwidth measurement and set the measurement count to 10 in the Sequence Measurement mode with the measurement condition number 3:

:CONF:CELL:SEQ:EVDO:OBW:SET 3,ON,10

:CONF:CELL:SEQ:EVDO:OBW:SET? 3

> ON,10

## :CONFigure:CELLular:SEQuence:EVDO:POWer:SET

Tx Power Measurement Enable and Count

### Function

Enables Tx power measurement and sets or queries measurement count in Sequence Measurement mode.

### Command

```
:CONFigure:CELLular:SEQuence:EVDO:POWer:SET <mcond>,<on_off>[,<count>]
```

### Query

```
:CONFigure:CELLular:SEQuence:EVDO:POWer:SET? <mcond>
```

### Response

<on_off>,<count>

### Parameters

| | |
|---|---|
| <mcond> | Measurement Condition Number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <on_off> | Enables/disables measurement |
| ON | Enables measurement |
| OFF | Disables measurement |
| Default | OFF |
| <count> | Measurement count |
| Range | 1 to 200 |
| Resolution | 1 |
| Suffix code | None |
| Default | 1 |

### Example of Use

To enable the Tx power measurement and set the measurement count to 10 in the Sequence Measurement mode with the measurement condition number 3:

:CONF:CELL:SEQ:EVDO:POW:SET 3,ON,10

:CONF:CELL:SEQ:EVDO:POW:SET? 3

> ON,10

## :CONFigure:CELLular:SEQuence:EVDO:PREVision

Protocol Revision

### Function

Sets or queries Protocol Revision.

### Command

```
:CONFigure:CELLular:SEQuence:EVDO:PREVision <rev>
```

### Query

```
:CONFigure:CELLular:SEQuence:EVDO:PREVision?
```

### Response

<rev>

### Parameter

| | |
|---|---|
| <rev> | Protocol Revision |
| REV0 | Rev. 0 |
| REVA | Rev. A |
| Default | REV0 |

### Example of Use

To set Protocol Revision to Rev. 0.

:CONF:CELL:SEQ:EVDO:PREV REV0

:CONF:CELL:SEQ:EVDO:PREV?

> REV0

# :CONFigure:CELLular:SEQuence:EVDO:PSIZe

Data Channel Payload Size

### Function

Sets or queries Data Channel Payload size.

### Command

```
:CONFigure:CELLular:SEQuence:EVDO:PSIZe <size>
```

### Query

```
:CONFigure:CELLular:SEQuence:EVDO:PSIZe?
```

### Response

<size>

| | |
|---|---|
| Unit | kbps |

### Parameter

| | |
|---|---|
| <size> | Data Channel Payload size |
| Range | 128,256,512,768,1024,1536,2048,3072,4096,6144,8192,12288 |
| Suffix code | None |
| Default | 128 |

### Details

This is supported only when the Protocol Revision is Rev. A.

### Example of Use

To set Data Channel Payload size to 128 kbps:
:CONF:CELL:SEQ:EVDO:PSIZ 128
:CONF:CELL:SEQ:EVDO:PSIZ?
> 128

## :CONFigure:CELLular:SEQuence:EVDO:SPURious:SET

Spurious Emissions Enable and Count

### Function

Enables Spurious Emission measurement and sets or queries measurement count in Sequence Measurement mode.

### Command

```
:CONFigure:CELLular:SEQuence:EVDO:SPURious:SET <mcond>,<on_off>[,<count>]
```

### Query

```
:CONFigure:CELLular:SEQuence:EVDO:SPURious:SET? <mcod>
```

### Response

<on_off>,<count>

### Parameters

| | |
|---|---|
| <mcond> | Measurement Condition Number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <on_off> | Enables/disables measurement |
| ON | Enables measurement |
| OFF | Disables measurement |
| Default | OFF |
| <count> | Measurement count |
| Range | 1 to 200 |
| Resolution | 1 |
| Suffix code | None |
| Default | 1 |

### Example of Use

To enable the Spurious Emissions measurement and set the measurement count to 10 in the Sequence Measurement mode with the measurement condition number 3:

:CONF:CELL:SEQ:EVDO:SPUR:SET 3,ON,10

:CONF:CELL:SEQ:EVDO:SPUR:SET? 3

> ON,10

# :CONFigure:CELLular:SEQuence:PORT:RX

Sequence Table Parameter - SG Output Port

## Function

Specifies the segment number and sets or queries the test port number for outputting RFsignals.

## Command

`:CONFigure:CELLular:SEQuence:PORT:RX <seg>,<port>` MU887000A, MU887001A

`:CONFigure:CELLular:SEQuence:PORT:RX <seg>,<port>[,<port>,…,<port>]` MU887002A

## Query

`:CONFigure:CELLular:SEQuence:PORT:RX? <seg>`

## Response

| | |
|---|---|
| <port> | MU887000A, MU887001A |
| <port>[,<port>,…,<port>] | MU887002A |

## Parameters

| | | |
|---|---|---|
| <seg> | Segment number | |
| Range | 0 to 1999 | |
| <port> | Output test port number | |
| Range | Test Port 1 to 4 | (MU887000A) |
| | Test Port 1 to 4 | (MU887001A) |
| | Test Port 1 to 12 | (MU887002A) |
| PORT1 | Test Port 1 | |
| … | … | |
| PORT12 | Test Port 12 | |
| Default | PORT1 | |

## Details

For MU887000A,
Test Port 3 cannot be set when Test Port 3 is selected for RF signal input test port.
Test Port 4 cannot be set when Test Port 4 is selected for RF signal input test port.

For MU887001A and MU887002A, there are no restrictions as above.

## Examples of Use

To set the test port number of segment 5 to Test Port 2
:CONF:CELL:SEQ:PORT:RX 5,PORT2
:CONF:CELL:SEQ:PORT:RX? 5
> PORT2
To set the test port number of segment 5 to Test Port 2, Test Port 11, and Test Port 5:
:CONF:CELL:SEQ:PORT:RX 5,PORT2,PORT11,PORT5
:CONF:CELL:SEQ:PORT:RX? 5
> PORT2,PORT5,PORT11

# :CONFigure:CELLular:SEQuence:PORT:TX

Sequence Table Parameter - SA Input Port

## Function

Specifies the segment number and sets or queries the test port number for inputting RF signals.

## Command

```
:CONFigure:CELLular:SEQuence:PORT:TX <seg>,<port>
```

## Query

```
:CONFigure:CELLular:SEQuence:PORT:TX? <seg>
```

## Response

<port>

## Parameters

| | | |
|---|---|---|
| <seg> | Segment number | |
| Range | 0 to 1999 | |
| <port> | Input test port number | |
| Range | COMMON, Test Port 1 to 4 | (MU887000A) |
| | COMMON, Test Port 1 to 4 | (MU887001A) |
| | OFF, COMMON, Test Port 1 to 12 | (MU887002A) |
| PORT1 | Test Port 1 | |
| … | … | |
| PORT12 | Test Port 12 | |
| OFF | No any Input Test Ports | (MU887002A) |
| COMMON | Input test port specified by :ROUTe:PORT:CONNect:DIRection command. | |
| Default | COMMON | |

## Details

For MU887000A,
Test Port 3 cannot be set when Test Port 3 is selected for RF signal output test port.
Test Port 4 cannot be set when Test Port 4 is selected for RF signal output test port.

For MU887001A and MU887002A, there are no restrictions as above.

## Examples of Use

To set the test port number of segment 5 to Test Port 2
:CONF:CELL:SEQ:PORT:TX 5,PORT2
:CONF:CELL:SEQ:PORT:TX? 5
> PORT2

## :CONFigure:CELLular:SEQuence:RFSettings:REINit

Sequence Control Parameter - Sequence End State Reinitialization

### Function

Enables automatic initialization of following items at end of Sequence Measurement mode operation, and queries settings.

- Forward Link frequency
- Output Level
- Output signal pattern
- Reverse Link frequency
- Input level

### Command

```
:CONFigure:CELLular:SEQuence:RFSettings:REINit <sw>
```

### Query

```
:CONFigure:CELLular:SEQuence:RFSettings:REINit?
```

### Response

<sw>

### Parameter

| | |
|---|---|
| <sw> | Automatic initialization after sequence measurement completion |
| ON | Resets target parameters |
| OFF | Holds last segment setting |
| Default | ON |

### Details

If the parameter is set to ON, the settings are initialized to the values configured by the following commands after sequence measurement completion.

| | |
|---|---|
| Forward Link frequency | :CONFigure:CELLular:GENerator:RFSettings:FREQuency |
| Output level | :CONFigure:CELLular:GENerator:RFSettings:LEVel |
| Output signal pattern | :CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect |
| Reverse Link frequency | :CONFigure:CELLular:MEASurement:RFSettings:FREQuency |
| Input level | :CONFigure:CELLular:MEASurement:RFSettings:LEVel |

If the parameter is set to OFF, the settings remain those of the sequence measurement stop segment.

### Example of Use

To enable automatic initialization after completion of the Sequence Measurement mode:

:CONF:CELL:SEQ:RFS:REINIT ON

:CONF:CELL:SEQ:RFS:REINIT?

> ON

# :CONFigure:CELLular:SEQuence:RFSettings:TRX

Sequence Table Parameter - TRX Control

## Function

Sets following items in specific segment of sequence table, and queries settings

- Forward Link frequency.
- Output Level
- Output signal pattern
- Reverse Link frequency
- Input level

## Command

```
:CONFigure:CELLular:SEQuence:RFSettings:TRX
<seg>,<ul_freq>,<ref>,<dl_freq>,<level>,<pat>
```

## Query

```
:CONFigure:CELLular:SEQuence:RFSettings:TRX? <seg>
```

## Response

<ul_freq>,<ref>,<dl_freq>,<level,pat>

## Parameters

| | | |
|---|---|---|
| <seg> | | Segment number |
| | Range | 0 to 1999 |
| | Resolution | 1 |
| <ul_freq> | | Reverse Link frequency |
| | Range | 400.000000 to 3800.000000 MHz |
| | Resolution | 0.000001 MHz |
| | Suffix code | HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted) |
| | Default | 1950.000000 MHz |
| <ref> | | Input level |
| | Range | |
| | MU887000A | –65.0 to +35.0 dBm (Port 1/Port 2) |
| | | –65.0 to +25.0 dBm (Port 3/Port 4) |
| | MU887001A | –65.0 to +35.0 dBm (Port 1 to Port 4) |
| | MU887002A | –65.0 to +35.0 dBm (TRX 1/2, Port 1 to Port 12) |
| | Resolution | 0.1 dB |
| | Suffix code | DBM (uses dBm when omitted) |
| | Default | –10.0 dBm |
| <dl_freq> | | Forward Link Frequency |
| | Range | 400.000000 to 3800.000000 MHz |
| | Resolution | 0.000001 MHz |
| | Suffix code | HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted) |
| | Default | 2140.000000 MHz |
| <level> | | Output level |
| | Range | |

| | |
|---|---|
| MU887000A | –130.0 to –10.0 dBm (Port 1/Port 2)<br>–120.0 to 0.0 dBm (Port 3/Port 4) |
| MU887001A | –130.0 to –10.0 dBm (Port 1 to Port 4) |
| MU887002A | –130.0 to 0.0 dBm (TRX 1/2, Port 1 to Port 12) |
| Resolution | 0.1 dB |
| Suffix code | DBM (uses dBm when omitted) |
| Default | –60.0 dBm |
| <pat> | Waveform pattern |
| PAT1 to PATn | Pattern number (n: Waveform information file group range) |
| CW | Modulation disabled |
| OFF | Output level disabled |
| NC | Transmission signal pattern not configured in this segment<br>(holds current transmission signal pattern) |
| Default | CW |

Details

For MU887000A, the setting range varies with the input/output test port setting.
If cable loss correction is set to ON, the setting range of the input level is the range of values with added cable loss and the setting range of the output level is the range of values with subtracted cable loss.
If the cable loss is 5 dB, the input and output levels are as follows:
MU887000A Port 1/Port 2 Input level –60.0 to +40.0 dBm
MU887000A Port 1/Port 2 Output level –135.0 to –15.0 dBm
In this case, if the output level is set to –10.0 dBm, an out-of-parameter setting range error occurs. (The response to :SYSTem:ERRor? returns 220, Parameter error).
Whether an out-of-parameter setting range error has occurred is determined during execution of the following commands:
:CONFigure:CELLular:SEQuence:CONTrol,:INITiate:CELLular:MEASurement:SINGle,
:INITiate:CELLular:SEQuence:EXECute:TX
A measurement execution error occurs when an out-of-range error occurs.
:FETCh:CELLular:SEQuence:ERRor? is used to query the error details.

The pattern number is the same as the group number. Refer to Chapter 3, "Waveform File Details" in the *Waveform Files for Cellular Application Operation Manual*.

Example of Use

To set segment 0 as follows:
Reverse Link frequency set to 1950.0 MHz, input level to –10.0 dBm, Forward Link to 2140.0 MHz, output level to –60.0 dBm, no modulation:

```
SEQTRX 0,1950.000000,-10.0,2140.000000,-60.0,CW
SEQTRX 0?
> 1950.000000,-10.0,2140.000000,-60.0,CW
```

Related Command

The group range depends on the selected waveform file.

For details of the waveform patterns, refer to Chapter 3, “Waveform File Details” in the *Waveform Files for Cellular Application Operation Manual*.

# :CONFigure:CELLular:SEQuence:RFSettings:TX

Sequence Table Parameter - Reverse Link Frequency, Input Level

### Function

Sets or queries Reverse Link frequency and input level of segments in sequence table.

### Command

```
:CONFigure:CELLular:SEQuence:RFSettings:TX <seg>,<ul_freq>,<ref>
```

### Query

```
:CONFigure:CELLular:SEQuence:RFSettings:TX? <seg>
```

### Response

```
<ul_freq>,<ref>
```

### Parameter

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <ul_freq> | Reverse Link frequency |
| Range | 400.000000 to 3800.000000 MHz |
| Resolution | 0.000001 MHz |
| Suffix code | HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted) |
| Default | 1950.000000 MHz |
| <ref> | Input level |
| Range | |
| MU887000A | –65.0 to +35.0 dBm (Port 1/Port 2) |
| | –65.0 to +25.0 dBm (Port 3/Port 4) |
| MU887001A | –65.0 to +35.0 dBm (Port 1 to Port 4) |
| MU887002A | –65.0 to +35.0 dBm (TRX 1/2, Port 1 to Port 12) |
| Resolution | 0.1 dB |
| Suffix code | DBM (uses dBm when omitted) |
| Default | –10.0 dBm |

### Details

This command sets only the Reverse Link frequency and input level among the parameters that are set by :CONFigure:CELLular:SEQuence:RFSettings:TRX.
For MU887000A, the setting range varies with the input test port setting.
If cable loss correction is set to ON, the setting range of the input level is the range of values with added cable loss.
If the cable loss is 5 dB, the MU887000A Port 1/Port 2 setting range is –60.0 to +40.0 dBm.
Whether an out-of-parameter setting range error has occurred is determined during execution of the following commands:
:CONFigure:CELLular:SEQuence:CONTrol,:INITiate:CELLular:MEASurement:SINGle,
:INITiate:CELLular:SEQuence:EXECute:TX

Example of Use

To set the parameters for segment 1 as follows:
Reverse Link frequency: 1950 MHz, Input level: -10.0 dBm
:CONF:CELL:SEQ:RFS:TX 1,1950,-10.0
:CONF:CELL:SEQ:RFS:TX? 1
> 1950.000000,-10.0

## :CONFigure:CELLular:SEQuence:RXPort

Sequence Table Parameter - SG Output Port

### Function

Specifies the segment number and sets or queries the test port number for outputting RF signals.

### Command

`:CONFigure:CELLular:SEQuence:RXPort <seg>,<port>` MU887000A,MU887001A

`:CONFigure:CELLular:SEQuence:RXPort <seg>,<port>[,<port>,…,<port>]` MU887002A

### Query

`:CONFigure:CELLular:SEQuence:RXPort? <seg>`

### Response

| | |
|---|---|
| <port> | MU887000A,MU887001A |
| <port>[,<port>,…,<port>] | MU887002A |

### Parameters

| | | |
|---|---|---|
| <seg> | Segment number | |
| Range | 0 to 1999 | |
| <port> | Output test port number | |
| Range | Test Port 1 to 4 | (MU887000A) |
| | Test Port 1 to 4 | (MU887001A) |
| | Test Port 1 to 12 | (MU887002A) |
| PORT1 | Test Port 1 | |
| … | … | |
| PORT12 | Test Port 12 | |
| Default | PORT 1 | |

### Details

For MU887000A,

Test Port 3 cannot be set when Test Port 3 is selected for RF signal input test port.

Test Port 4 cannot be set when Test Port 4 is selected for RF signal input test port.

For MU887001A and MU887002A, there are no restrictions as above.

### Example of Use

To set the test port number in segment 5 to Test Port 2:

:CONF:CELL:SEQ:RXP 5, PORT2

:CONF:CELL:SEQ:RXP? 5

>PORT2

To set the test port number of segment 5 to Test Port 2, Test Port 11, and Test Port 5:

:CONF:CELL:SEQ:RXP 5,PORT2,PORT11,PORT5

:CONF:CELL:SEQ:RXP? 5

> PORT2,PORT5,PORT11

# :CONFigure:CELLular:SEQuence:SETup

Sequence Table Parameter - Measurement

## Function

Sets or queries measurement conditions of specified segment.

## Command

```
:CONFigure:CELLular:SEQuence:SETup <seg>,<system>,<step>,<mcond>
```

## Query

```
:CONFigure:CELLular:SEQuence:SETup? <seg>
```

## Response

<mode>, <step>, <mcond>

## Parameters

| | | |
|---|---|---|
| <seg> | Segment number | |
| Range | 0 to 1999 | |
| <mode> | Measurement mode | Required software license |
| TXP | Transmit power measurement mode | MX887010A |
| WCDMA | W-CDMA measurement mode | MX887010A and MX887011A |
| GSM | GSM measurement mode | MX887010A and MX887012A |
| CDMA2K | CDMA2000 1x measurement mode | MX887010A and MX887015A |
| EVDO | CDMA2000 1xEVDO measurement mode | MX887010A and MX887016A |
| TDSCDMA | TD-SCDMA measurement mode | MX887010A and MX887017A |
| LTE | LTE measurement mode | MX887010A and MX887013A, or MX887010A and MX887014A |
| NR | NR sub-6GHz measurement mode | MX887010A and MX887018A or MX887010A and MX887019A |
| Default | TXP | |
| <step> | Number of Steps | |
| Range | 2 to 3000 | |
| Resolution | 1 | |
| Default | 2 | |
| <mcond> | Measurement Condition Number | |
| Range | 0 to 1999 | |
| Resolution | 1 | |
| Default | 0 | |

## Details

To use the commands described in Chapter 3 Sequence Measurement, set the command parameter to EVDO

Example of Use

To set the measurement conditions for segment 1 as follows:
Measurement mode: EVDO,Step count: 100,Measurement condition number: 2
:CONF:CELL:SEQ:SET 1,EVDO,100,2
:CONF:CELL:SEQ:SET? 1
> EVDO,100,2

## :CONFigure:CELLular:SEQuence:TABLe

Sequence Control Parameter - Sequence Table

Function

Sets or queries sequence table number to execute.

Command

```
:CONFigure:CELLular:SEQuence:TABLe <table>
```

Query

```
:CONFigure:CELLular:SEQuence:TABLe?
```

Response

<table>

Parameter

| | |
|---|---|
| <table> | Sequence table number |
| Range | 0 to 3 |
| Resolution | 1 |
| Default | 0 |

Example of Use

To select sequence table 1:
:CONF:CELL:SEQ:TABL 1
:CONF:CELL:SEQ:TABL?
> 1

# :FETCh:CELLular:SEQuence:ERRor?

Sequence Parameter Information - Error Check

## Function

Queries error status of sequence table.

## Query

```
:FETCh:CELLular:SEQuence:ERRor? [item]
```

## Response

| Query parameter | Response |
|---|---|
| None: | <n>,<err(0)>,..,<err(n–1)> |
| ILVL,OLVL,STEP, DLPAT, PORT: | <ns>,<seg(0)>,..,<seg(ns–1)> |
| LEN: | <e>,<mem>,<exe>,<set> |
| OLVLNUM,PATNUM,STDNUM: | <e>,<exe>,<set> |

If no error is found in the sequence table, the response returns 0.

## Parameters

| | | |
|---|---|---|
| <item> | Parameter in sequence table | |
| ILVL | Input level | |
| OLVL | Output level | |
| STEP | Step count | |
| DLPAT | Waveform pattern | |
| PORT | Test port | |
| LEN | Capture memory length | |
| OLVLNUM | Output level change count | |
| PATNUM | Waveform pattern change count | |
| STDNUM | Measurement mode change count | |
| <n> | Number of errors | |
| Range | 0 to 4 | |
| <err(n–1)> | Parameter with error | |
| ILVL | Input level | |
| OLVL | Output level | |
| STEP | Step count | |
| LEN | Capture memory length | |
| <ns> | Number of segments with errors | |
| Range | 0 to 2000 | |
| <seg(ns–1)> | Segment number with errors | |
| Range | 0 to 1999 | |
| <e> | Presence of errors | |
| Range | 0 | No error, executable |
| | 1 | Errors found, not executable |
| <mem> | Memory occupation ratio | |
| Range | 0.0 to 100.0% | |
| Resolution | 0.1% | |

| | |
|---|---|
| <exe> | Number of capture executable segments in number of configured segments |
| Range | 0 to 2000 |
| <set> | Number of segments with capture configured |
| Range | 0 to 2000 |

Details

This command can check error presence of input level, output level, step count, and capture memory length
Waveform pattern, test port, output level change count, waveform pattern change count, measurement mode change count

To set parameters for sequence table using the following commands, errors are not checked.
:CONFigure:CELLular:SEQuence:RFSettings:TRX
:CONFigure:CELLular:SEQuence:RFSettings:TX
:CONFigure:CELLular:SEQuence:SETup

Example of Use

To query the presence of errors:
:FETC:CELL:SEQ:ERR?
>1,ILVL

To query the input level setting error information:
:FETC:CELL:SEQ:ERR? ILVL
> 2,3,12

To query the capture memory error information:
:FETC:CELL:SEQ:ERR? LEN
> 0,25.0,20,20
Here, the capture memory utilization is 25.0%, so all captures configured in 20 segments are executable.

Remarks

The Sequence Measurement mode cannot be started if there is an error.
However, the sequence can be started by using the :CONFigure:CELLular:SEQuence:CONTrol command to detect any segment with an error and exclude it from the executable range.

# :FETCh:CELLular:SEQuence:ERRor2?

Sequence Parameter Information - Error Check

### Function

Queries setting error information of sequence table.

### Query

```
:FETCh:CELLular:SEQuence:ERRor2? <format>
```

### Response

<n>,<err(0)>,..,<err(n-1)>

If no error is found in the sequence table, the response returns 0.

### Parameters

| | |
|---|---|
| <format> | Format |
| 1 | Error Check 1 |
| <n> | Number of errors |
| Range | 0 to 7 |
| <err(n-1)> | Parameter with errors |
| ILVL | Input level |
| OLVL | Output level |
| STEP | Step count |
| DLPAT | Waveform pattern |
| PORT | Test port |
| LEN | Capture memory length |
| OLVLNUM | Output level change count |
| PATNUM | Waveform pattern change count |
| STDNUM | Measurement mode change count |

### Details

Parameter setting errors can be checked up to seven types.
Only one of output level change count, waveform pattern change count, or measurement mode change count has an error.
Two or three of them cannot have an error simultaneously.

To set parameters for sequence table using the following commands, errors are not checked.

:CONFigure:CELLular:SEQuence:RXPort
:CONFigure:CELLular:SEQuence:RFSettings:TRX
:CONFigure:CELLular:SEQuence:RFSettings:TX
:CONFigure:CELLular:SEQuence:SETup

To query error details per parameter, use :FETCh:CELLular:SEQuence:ERRor command.

### Example of Use

To query the presence of errors:
:FETC:CELL:SEQ:ERR2? 1
> 2,ILVL,DLPAT

Remarks

Sequence measurement cannot be started if there are errors.
However, sequence measurement can be started if segment numbers with errors are excluded from the execution range using the :CONFigure:CELLular:SEQuence:CONTrol command.

# :FETCh:CELLular:SEQuence:EVDO:CDPower:ACK?

ACK Channel Power

## Function

Queries Reverse ACK Channel Power measurement result in the Sequence Measurement mode.

## Query

```
:FETCh:CELLular:SEQuence:EVDO:CDPower:ACK? <seg>,<mode>[,<unit>]
```

## Response

When <mode> = TTL
<avg>,<max>,<min>
When <mode> is other than TTL
<pwr>

| | |
|---|---|
| Unit | Depends on parameter unit |
| Resolution | 0.01 dB |

## Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <unit> | Query Unit |
| IOR | Ior (Total Power) reference value (dB/Ior) |
| PILOT | Pilot Channel reference value (dB/Pilot) (uses Ior when <unit> omitted) |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <pwr> | Measurement result in specified Storage mode |

## Example of Use

To query the ACK Channel Power measurement result average value for segment number 3 in the Sequence Measurement mode:
:FETC:CELL:SEQ:EVDO:CDP:ACK? 3,AVG
> 0.01

## :FETCh:CELLular:SEQuence:EVDO:CDPower:APILot?

Auxiliary Pilot Channel Power

### Function

Queries Reverse Auxiliary Pilot Channel Power measurement result in Sequence Measurement mode.

### Query

```
:FETCh:CELLular:SEQuence:EVDO:CDPower:APILot? <seg>,<mode>[,<unit>]
```

### Response

When <mode> = TTL
<avg>,<max>,<min>
When <mode> is other than TTL
<pwr>

| | |
|---|---|
| Unit | Depends on parameter unit |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <unit> | Query Unit |
| IOR | Ior (Total Power) reference value (dB/Ior) |
| PILOT | Pilot Channel reference value (dB/Pilot) (uses Ior when <unit> omitted) |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <pwr> | Measurement result in specified Storage mode |

### Details

A valid data is acquired only when the Protocol Revision is Rev. A.

### Example of Use

To query the Auxiliary Pilot Channel Power measurement result average value for segment number 3 in the Sequence Measurement mode:
:FETC:CELL:SEQ:EVDO:CDP:APIL? 3,AVG
> 0.01

# :FETCh:CELLular:SEQuence:EVDO:CDPower:DATA?

DATA Channel Power

## Function

Queries Reverse DATA Channel Power measurement result in Sequence Measurement mode.

## Query

```
:FETCh:CELLular:SEQuence:EVDO:CDPower:DATA? seg,mode[,unit]
```

## Response

When <mode> = TTL

<avg>,<max>,<min>

When <mode> is other than TTL

<pwr>

| | |
|---|---|
| Unit | Depends on parameter unit |
| Resolution | 0.01 dB |

## Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <unit> | Query Unit |
| IOR | Ior (Total Power) reference value (dB/Ior) |
| PILOT | Pilot Channel reference value (dB/Pilot) (uses Ior when <unit> omitted) |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <pwr> | Measurement result in specified Storage mode |

## Example of Use

To query the average value of the DATA Channel Power measurement result segment number 3 in the Sequence Measurement mode:

:FETC:CELL:SEQ:EVDO:CDP:DATA? 3,AVG

> 0.01

## :FETCh:CELLular:SEQuence:EVDO:CDPower:DRC?

DRC Channel Power

### Function

Queries Reverse DRC Channel (Data Rate Channel) Power measurement result in Sequence Measurement mode.

### Query

```
:FETCh:CELLular:SEQuence:EVDO:CDPower:DRC? <seg>,<mode>[,<unit>]
```

### Response

When <mode> = TTL
<avg>,<max>,<min>
When <mode> is other than TTL
<pwr>

| | |
|---|---|
| Unit | Depends on parameter unit |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <unit> | Query Unit |
| IOR | Ior (Total Power) reference value (dB/Ior) |
| PILOT | Pilot Channel reference value (dB/Pilot) (uses Ior when <unit> omitted) |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <pwr> | Measurement result in specified Storage mode |

### Example of Use

To query the DRC Channel Power measurement result average value for segment number 3 in the Sequence Measurement mode:
:FETC:CELL:SEQ:EVDO:CDP:DRC? 3,AVG
> 0.01

# :FETCh:CELLular:SEQuence:EVDO:CDPower:DSC?

DSC Channel Power

## Function

Queries Reverse DSC Channel (Data Source Channel) Power measurement result in Sequence Measurement mode.

## Query

```
:FETCh:CELLular:SEQuence:EVDO:CDPower:DSC? <seg>,<mode>[,<unit>]
```

## Response

When <mode> = TTL
<avg>,<max>,<min>
When <mode> is other than TTL
<pwr>

| | |
|---|---|
| Unit | Depends on parameter unit |
| Resolution | 0.01 dB |

## Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <unit> | Query Unit |
| IOR | Ior (Total Power) reference value (dB/Ior) |
| PILOT | Pilot Channel reference value (dB/Pilot) (uses Ior when <unit> omitted) |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <pwr> | Measurement result in specified Storage mode |

## Details

A valid data is acquired only when Protocol Revision is Rev. A.

## Example of Use

To query the DSC Channel Power measurement result average value for segment number 3 in the Sequence Measurement mode:
:FETC:CELL:SEQ:EVDO:CDP:DSC? 3,AVG
> 0.01

## :FETCh:CELLular:SEQuence:EVDO:CDPower:MICPower?

Max Inactive Channel Power

### Function

Queries channel outputting maximum power among inactive code channels, and power measurement result in Sequence Measurement mode.

### Query

```
:FETCh:CELLular:SEQuence:EVDO:CDPower:MICPower? <seg>
```

### Response

<pwr>,<ph>, <wn>, <wl>

<pwr>
Unit dB
<wn>
Unit None
<wl>
Unit None

### Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <pwr> | Max Inactive Channel Power |
| Resolution | 0.01 dB |
| <ph> | Phase (I/Q) of measured channel |
| I | I-phase |
| Q | Q-phase |
| <wn> | Walsh Code Number of measured channel |
| Resolution | 1 |
| <wl> | Walsh Code Length of measured channel |
| Resolution | 1 |

### Details

When executing more than two measurements using a single measurement start, the result of the last measurement is returned for (Meas. Count ≥ 2).

### Example of Use

To query the channel outputting the maximum power among inactive code channels and the power measurement result for segment number 3 in the Sequence Measurement mode:
:FETC:CELL:SEQ:EVDO:CDP:MICP? 3
> 3.00,Q,2,8

## :FETCh:CELLular:SEQuence:EVDO:CDPower:PILot?

R-PICH Power

### Function

Queries R-PICH (Reverse Pilot Channel) Power measurement result in Sequence Measurement mode.

### Query

```
:FETCh:CELLular:SEQuence:EVDO:CDPower:PILot? <seg>,<mode>
```

### Response

When <mode> = TTL

<avg>,<max>,<min>

When <mode> is other than TTL

<pwr>

| | |
|---|---|
| Unit | dB/Ior |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <pwr> | Measurement result in specified Storage mode |

### Example of Use

To query the R-PICH power measurement result average for segment number 3 in the Sequence Measurement mode:

:FETC:CELL:SEQ:EVDO:CDP:PIL? 3,AVG

> 0.01

## :FETCh:CELLular:SEQuence:EVDO:CDPower:RRI?

RRI Channel Power

### Function

Queries Reverse RRI Channel (Reverse Rate Indicator Channel) Power measurement result in Sequence Measurement mode.

### Query

```
:FETCh:CELLular:SEQuence:EVDO:CDPower:RRI? <seg>,<mode>[,<unit>]
```

### Response

When <mode> = TTL
<avg>,<max>,<min>
When <mode> is other than TTL
<pwr>

| | |
|---|---|
| Unit | Depends on parameter unit |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <unit> | Query Unit |
| IOR | Ior (Total Power) reference value (dB/Ior) |
| PILOT | Pilot Channel reference value (dB/Pilot) (uses Ior when <unit> omitted) |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <pwr> | Measurement result in specified Storage mode |

### Example of Use

To query the RRI Channel Power measurement result average value for segment number 3 in the Sequence Measurement mode:
:FETC:CELL:SEQ:EVDO:CDP:RRI? 3,AVG
> 0.01

## :FETCh:CELLular:SEQuence:EVDO:MODulation:CFRequency?

Carrier Frequency Result

### Function

Queries Carrier Frequency measurement result in Sequence Measurement mode.

### Query

```
:FETCh:CELLular:SEQuence:EVDO:MODulation:CFRequency? <seg>
```

### Response

<freq>

| | |
|---|---|
| Unit | Hz |
| Resolution | 1 Hz |

### Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <freq> | Carrier Frequency |

### Example of Use

To query the carrier frequency measurement result for segment number 3 in the Sequence Measurement mode:

:FETC:CELL:SEQ:EVDO:MOD:CFR? 3

> 862200000

## :FETCh:CELLular:SEQuence:EVDO:MODulation:EVM?

EVM Result

### Function

Queries EVM measurement result in Sequence Measurement mode.

### Query

```
:FETCh:CELLular:SEQuence:EVDO:MODulation:EVM? <seg>,<mode>
```

### Response

When <mode> = TTL

<avg>,<max>,<min>

When <mode> is other than TTL

<evm>

| | |
|---|---|
| Unit | % |
| Resolution | 0.01% |

### Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <evm> | Measurement result in specified Storage mode |

### Example of Use

To query the EVM measurement result average for segment number 3 in the Sequence Measurement mode:

:FETC:CELL:SEQ:EVDO:MOD:EVM? 3,AVG

> 0.01

## :FETCh:CELLular:SEQuence:EVDO:MODulation:FERRor?

Carrier Frequency Error Result

### Function

Queries Carrier Frequency Error measurement result in Sequence Measurement mode.

### Query

```
:FETCh:CELLular:SEQuence:EVDO:MODulation:FERRor? <seg>,<mode>
```

### Response

When <mode> = TTL

```
<avg_ppm>,<avg_Hz>,<max_ppm>,<max_Hz>,<min_ppm>,<min_Hz>
```

When <mode> is other than TTL

```
<freq_ppm>,<freq_Hz>
```

<xxx_ppm>

| | |
|---|---|
| Unit | ppm |
| Resolution | 0.01 ppm |

<xxx_Hz>

| | |
|---|---|
| Unit | Hz |
| Resolution | 0.1 Hz |

### Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <avg_ppm> | Measurement result in ppm (Average) |
| <avg_Hz> | Measurement result in Hz (Average) |
| <max_ppm> | Measurement result in ppm (Maximum) |
| <max_Hz> | Measurement result in Hz (Maximum) |
| <min_ppm> | Measurement result in ppm (Minimum) |
| <min_Hz> | Measurement result in Hz (Minimum) |
| <freq_ppm> | Measurement result in ppm in specified Storage mode |
| <freq_Hz> | Measurement result in Hz in specified Storage mode |

### Example of Use

To query the frequency error measurement result average value for segment number 3 in the Sequence Measurement mode:

:FETC:CELL:SEQ:EVDO:MOD:FERR? 3,AVG

> 0.50,431.1

## :FETCh:CELLular:SEQuence:EVDO:MODulation:FERRor:WORSt?

Worst Carrier Frequency Error Result

### Function

Queries worst value of Carrier Frequency Error measurement result in Sequence Measurement mode.

### Query

```
:FETCh:CELLular:SEQuence:EVDO:MODulation:FERRor:WORSt? <seg>
```

### Response

<freq_ppm>, <freq_Hz>

<freq_ppm>

| | |
|---|---|
| Unit | ppm |
| Resolution | 0.01 ppm |

<freq_Hz>

| | |
|---|---|
| Unit | Hz |
| Resolution | 0.1 Hz |

### Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <freq_ppm> | Worst value in Frequency Error measurement results in ppm |
| <freq_Hz> | Worst value in Frequency Error measurement results in Hz |

### Example of Use

To query the worst value of the frequency error measurement result for segment number 3 in the Sequence Measurement mode:

:FETC:CELL:SEQ:EVDO:MOD:FERR:WORS? 3

> 1.00,862.2

# :FETCh:CELLular:SEQuence:EVDO:MODulation:MERRor?

Magnitude Error Result

### Function

Queries Magnitude Error measurement result in Sequence Measurement mode.

### Query

```
:FETCh:CELLular:SEQuence:EVDO:MODulation:MERRor? <seg>,<mode>
```

### Response

When <mode> = TTL

<avg>,<max>,<min>

When <mode> is other than TTL

<merr>

| | |
|---|---|
| Unit | % |
| Resolution | 0.01% |

### Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <merr> | Measurement result in specified Storage mode |

### Example of Use

To query the Magnitude Error measurement result average value for segment number 3 in the Sequence Measurement mode:

:FETC:CELL:SEQ:EVDO:MOD:MERR? 3,AVG

> 0.01

## :FETCh:CELLular:SEQuence:EVDO:MODulation:ORGNoffset?

Origin Offset Result

### Function

Queries Origin Offset measurement result in Sequence Measurement mode.

### Query

```
:FETCh:CELLular:SEQuence:EVDO:MODulation:ORGNoffset? <seg>,<mode>
```

### Response

When <mode> = TTL

<avg>,<max>,<min>

When <mode> is other than TTL

<origin>

| | |
|---|---|
| Unit | dB |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <origin> | Measurement result in specified Storage mode |

### Example of Use

To query the Origin Offset measurement result average value for segment number 3 in the Sequence Measurement mode:

:FETC:CELL:SEQ:EVDO:MOD:ORGN? 3,AVG

> 0.01

## :FETCh:CELLular:SEQuence:EVDO:MODulation:PEVM?

Peak EVM Result

### Function

Queries Peak EVM measurement result in Sequence Measurement mode.

### Query

```
:FETCh:CELLular:SEQuence:EVDO:MODulation:PEVM? <seg>,<mode>
```

### Response

When <mode> = TTL

<avg>,<max>,<min>

When <mode> is other than TTL

<pevm>

| | |
|---|---|
| Unit | % |
| Resolution | 0.01% |

### Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <pevm> | Measurement result in specified Storage mode |

### Example of Use

To query the Peak EVM measurement result average value for segment number 3 in the Sequence Measurement mode:

:FETC:CELL:SEQ:EVDO:MOD:PEVM? 3,AVG

> 0.01

## :FETCh:CELLular:SEQuence:EVDO:MODulation:PHERror?

Phase Error Result

### Function

Queries Phase Error measurement result in Sequence Measurement mode.

### Query

```
:FETCh:CELLular:SEQuence:EVDO:MODulation:PHERror? <seg>,<mode>
```

### Response

When <mode> = TTL

<avg>,<max>,<min>

When <mode> is other than TTL

<perr>

| | |
|---|---|
| Unit | degree |
| Resolution | 0.01 degree |

### Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <perr> | Measurement result in specified Storage mode |

### Example of Use

To query the Phase Error measurement result average value for segment number 3 in the Sequence Measurement mode:

:FETC:CELL:SEQ:EVDO:MOD:PHER? 3,AVG

> 0.01

# :FETCh:CELLular:SEQuence:EVDO:MODulation:RHO?

Rho Result

## Function

Queries Rho (Waveform Quality) measurement result in Sequence Measurement mode.

## Query

```
:FETCh:CELLular:SEQuence:EVDO:MODulation:RHO? <seg>,<mode>
```

## Response

When <mode> = TTL

<avg>,<max>,<min>

When <mode> is other than TTL

<rho>

| | |
|---|---|
| Unit | None |
| Resolution | 0.00001 |

## Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <rho> | Measurement result in specified Storage mode |

## Example of Use

To query the Rho measurement result average for segment number 3 in the Sequence Measurement mode:

:FETC:CELL:SEQ:EVDO:MOD:RHO? 3,AVG

> 0.00100

## :FETCh:CELLular:SEQuence:EVDO:MODulation:TERRor?

Time Error Result

### Function

Queries Time Error measurement result in Sequence Measurement mode.

### Query

```
:FETCh:CELLular:SEQuence:EVDO:MODulation:TERRor? <seg>,<mode>
```

### Response

When <mode> = TTL

<avg>,<max>,<min>

When <mode> is other than TTL

<time>

| | |
|---|---|
| Unit | μs |
| Resolution | 0.01 μs |

### Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <time> | Measurement result in specified Storage mode |

### Example of Use

To query the Time Error measurement result average for segment number 3 in the Sequence Measurement mode:

:FETC:CELL:SEQ:EVDO:MOD:TERR? 3,AVG

> 0.01

## :FETCh:CELLular:SEQuence:EVDO:MODulation:TERRor:WORSt?

Worst Time Error Result

### Function

Queries worst value of Time Error measurement result in Sequence Measurement mode.

### Query

```
:FETCh:CELLular:SEQuence:EVDO:MODulation:TERRor:WORSt? <seg>
```

### Response

<time>

| | |
|---|---|
| Unit | μs |
| Resolution | 0.01 μs |

### Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <time> | Worst value of Time Error |

### Example of Use

To query the worst value of the Time Error measurement result for segment number 3 in the Sequence Measurement mode:

:FETC:CELL:SEQ:EVDO:MOD:TERR:WORS? 3

> 0.01

## :FETCh:CELLular:SEQuence:EVDO:OBW?

OBW Result

### Function

Queries Occupied Bandwidth measurement result in Sequence Measurement mode.

### Query

```
:FETCh:CELLular:SEQuence:EVDO:OBW? <seg>
```

### Response

<bw>

| | |
|---|---|
| Unit | MHz |
| Resolution | 1 kHz |

### Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <bw> | Occupied Bandwidth [MHz] |

### Example of Use

To query the Occupied Bandwidth measurement result for segment number 3 in the Sequence Measurement mode:

:FETC:CELL:SEQ:EVDO:OBW? 3

> 0.100

## :FETCh:CELLular:SEQuence:EVDO:OBW:FREQuency?

OBW Frequency Result

### Function

Queries upper, lower and center frequency of Occupied Bandwidth measurement in Sequence Measurement mode.

### Query

```
:FETCh:CELLular:SEQuence:EVDO:OBW:FREQuency? <seg>,<pos>
```

### Response

<freq>

| | |
|---|---|
| Unit | MHz |
| Resolution | 1 kHz |

### Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <pos> | Offset type |
| UPPER | Upper frequency |
| LOWER | Lower frequency |
| CENTER | Center frequency |
| <freq> | Offset frequency [MHz] |

### Example of Use

To query Occupied Bandwidth center frequency measurement result for segment number 3 in the Sequence Measurement mode

:FETC:CELL:SEQ:EVDO:OBW:FREQ? 3,CENTER

> 862.200

## :FETCh:CELLular:SEQuence:EVDO:POWer:FLTPower?

Filtered Power Result

### Function

Queries Filtered Power measurement result in Sequence Measurement mode.

### Query

```
:FETCh:CELLular:SEQuence:EVDO:POWer:FLTPower? <seg>,<mode>
```

### Response

When <mode> = TTL

```
<avg>,<max>,<min>
```

When <mode> = AVG, MAX, MIN or DVT

```
<pwr>
```

When <mode> = IND,

<s>,<pwr(1)>,<pwr(2)>,...,<pwr(s)>

| | |
|---|---|
| Unit | dBm |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| Storage mode | |
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| IND | Value at each measurement |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <pwr> | Measurement result in specified Storage mode |
| <pwr_s> | Power of sth |
| <pwr(s)> | Power of sth measurement |
| s | Measurement count |
| Range | 1 to 200 |

### Example of Use

To query the Filtered Power measurement result average, maximum, and minimum for segment number 3 in the Sequence Measurement mode:

:FETC:CELL:SEQ:EVDO:POW:FLTP? 3,TTL

> -10.05,-9.60,-10.50

## :FETCh:CELLular:SEQuence:EVDO:POWer:TXPower?

Tx Power Result

### Function

Queries Tx power measurement result in Sequence Measurement mode.

### Query

```
:FETCh:CELLular:SEQuence:EVDO:POWer:TXPower? <seg>,<mode>
```

### Response

When <mode> = TTL
<avg>,<max>,<min>
When <mode> = AVG, MAX, MIN or DVT
<pwr>
When <mode> = IND,
<s>,<pwr(1)>,<pwr(2)>,…,<pwr(s)>

| | |
|---|---|
| Unit | dBm |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <mode> | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| IND | Value at measurement |
| <avg> | Measurement result (Average) |
| <max> | Measurement result (Maximum) |
| <min> | Measurement result (Minimum) |
| <pwr> | Measurement result in specified Storage mode |
| <pwr_s> | Power of sth |
| <pwr(s)> | Power of sth measurement |
| s | Measurement count |
| Range | 1 to 200 |

### Example of Use

To query the Tx power measurement result average, maximum, and minimum for segment number 3 in the Sequence Measurement mode:
:FETC:CELL:SEQ:EVDO:POW:TXP? 3,TTL
> -10.05,-9.60,-10.50

## :FETCh:CELLular:SEQuence:EVDO:SPURious:JUDGement?

Spurious Emissions Judgement

### Function

Queries judgement about whether or not Spurious Emissions within template in Sequence Measurement mode.

### Query

```
:FETCh:CELLular:SEQuence:EVDO:SPURious:JUDGement? <seg>
```

### Response

<judgement>

### Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <judgement> | Judgement |
| PASS | Pass |
| FAIL | Fail |

### Example of Use

To query the Spurious Emissions judgement measurement result for segment number 3 in the Sequence Measurement mode:

:FETC:CELL:SEQ:EVDO:SPUR:JUDG? 3

> PASS

## :FETCh:CELLular:SEQuence:EVDO:SPURious:LOWer?

Spurious Emissions Peak Value (Lower)

### Function

Queries worst level and frequency of spectrum in each lower frequency range in Sequence Measurement mode.

### Query

```
:FETCh:CELLular:SEQuence:EVDO:SPURious:LOWer? <seg>
```

### Response

<bc>,<f_1>,<l_1>,<f_2>,<l_2>,<f_3>,<l_3>,<f_4>,<l_4>,<f_5>,<l_5>

<l_k>

| | |
|---|---|
| Unit | dBc or dBm |
| Resolution | 0.01 dB |

<f_k>

| | |
|---|---|
| Unit | MHz |
| Resolution | 0.001 MHz |

### Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <bc> | Band Class |
| Range | 0 to 16, 18 to 21 |
| <l_k> | Worst level at offset frequency section k<br>999.99 is returned for out of target. |
| <f_k> | Offset frequency for worst value acquired by l<br>99999.999 is returned for out of target. |
| k | Offset frequency section |
| Range | 1, 2, 3, 4, 5 |

### Details

For the offset frequency points, refer to Table 2.4-1 “Spurious Emissions Specifications (1)” and Table 2.4-2 “Spurious Emissions Specifications (2)”.

### Example of Use

To query the worst level and frequency of the spectrum in each lower frequency range in band class 6 for segment number 3 in the Sequence Measurement mode:

:FETC:CELL:SEQ:EVDO:SPUR:LOW? 3

> 6,1.000,-43.21,1.000,-54.32,2.000,-65.43,2.000,-76.54,3.000,-87.65

## :FETCh:CELLular:SEQuence:EVDO:SPURious:MARGin:LOWer?

Spurious Emissions Template Margin (Lower)

### Function

Queries margin level from template for worst value and frequency of spectrum in each lower frequency range.

### Query

```
:FETCh:CELLular:SEQuence:EVDO:SPURious:MARGin:LOWer? <seg>
```

### Response

<bc>,<f_1>,<l_1>,<f_2>,<l_2>,<f_3>,<l_3>,<f_4>,<l_4>,<f_5>,<l_5>

<l_k>

| | |
|---|---|
| Unit | dB |
| Resolution | 0.01 dB |

<f_k>

| | |
|---|---|
| Unit | MHz |
| Resolution | 0.001 MHz |

### Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <bc> | Band Class |
| Range | 0 to 16, 18 to 21 |
| <l_k> | Margin level for worst value at offset frequency section k<br>999.99 is returned for out of target. |
| <f_k> | Offset frequency of worst value acquired by l<br>99999.999 is returned for out of target. |
| k | Offset frequency section |
| Range | 1, 2, 3, 4, 5 |

### Details

For the offset frequency points, refer to Table 2.4-1 “Spurious Emissions Specifications (1)” and Table 2.4-2 “Spurious Emissions Specifications (2)”.

### Example of Use

To query the margin level from the template for worst the value and frequency of the spectrum in each lower frequency range in band class 6 for segment number 3 in the Sequence Measurement mode:

:FETC:CELL:SEQ:EVDO:SPUR:MARG:LOW? 3

> 6,1.000,20.00,1.000,21.00,2.000,22.00,2.000,23.00,3.000,24.00

## :FETCh:CELLular:SEQuence:EVDO:SPURious:MARGin:UPPer?

Spurious Emissions Template Margin (Upper)

### Function

Queries margin level from template for worst value and frequency of spectrum in each upper frequency range in Sequence Measurement mode.

### Query

```
:FETCh:CELLular:SEQuence:EVDO:SPURious:MARGin:UPPer? <seg>
```

### Response

<bc>,<f_1>,<l_1>,<f_2>,<l_2>,<f_3>,<l_3>,<f_4>,<l_4>,<f_5>,<l_5>

<l_k>

| | |
|---|---|
| Unit | dB |
| Resolution | 0.01 dB |

<f_k>

| | |
|---|---|
| Unit | MHz |
| Resolution | 0.001 MHz |

### Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <bc> | Band Class |
| Range | 0 to 16, 18 to 21 |
| <l_k> | Margin level for worst value at offset frequency section k<br>999.99 is returned for out of target. |
| <f_k> | Offset frequency of worst value acquired by l<br>99999.999 is returned for out of target. |
| k | Offset frequency section |
| Range | 1, 2, 3, 4, 5 |

### Details

For the offset frequency points, refer to Table 2.4-1 “Spurious Emissions Specifications (1)” and Table 2.4-2 “Spurious Emissions Specifications (2)”.

### Example of Use

To query the margin level from the template for the worst value and frequency of the spectrum in each upper frequency range in band class 6 for segment number 3 in the Sequence Measurement mode:

:FETC:CELL:SEQ:EVDO:SPUR:MARG:UPP? 3

> 6,1.000,20.00,1.000,21.00,2.000,22.00,2.000,23.00,3.000,24.00

## :FETCh:CELLular:SEQuence:EVDO:SPURious:UPPer?

Spurious Emissions Peak Value (Upper)

### Function

Queries worst value of level and frequency of spectrum in each upper frequency range in Sequence Measurement mode.

### Query

```
:FETCh:CELLular:SEQuence:EVDO:SPURious:UPPer? <seg>
```

### Response

<bc>,<f_1>,<l_1>,<f_2>,<l_2>,<f_3>,<l_3>,<f_4>,<l_4>,<f_5>,<l_5>

<l_k>

| | |
|---|---|
| Unit | dBc or dBm |
| Resolution | 0.01 dB |

<f_k>

| | |
|---|---|
| Unit | MHz |
| Resolution | 0.001 MHz |

### Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| <bc> | Band Class |
| Range | 0 to 16, 18 to 21 |
| <l_k> | Margin level for worst value at offset frequency section k<br>999.99 is returned for out of target. |
| <f_k> | Offset frequency of worst value acquired by l<br>99999.999 is returned for out of target. |
| k | Offset frequency section |
| Range | 1, 2, 3, 4, 5 |

### Details

For the offset frequency points, refer to Table 2.4-1 “Spurious Emissions Specifications (1)” and Table 2.4-2 “Spurious Emissions Specifications (2)”.

### Example of Use

To query the margin level from the template for the worst value and frequency of the spectrum in each upper frequency range in band class 6 for segment number 3 in the Sequence Measurement mode:

:FETC:CELL:SEQ:EVDO:SPUR:UPP? 3

> 6,1.000,-43.21,1.000,-54.32,2.000,-65.43,2.000,-76.54,3.000,-87.65

## :FETCh:CELLular:SEQuence:PROGress?

Sequence Progress

### Function

Queries progress ratio and executing sequence number in Sequence Measurement mode.

### Query

```
:FETCh:CELLular:SEQuence:PROGress?
```

### Response

<p>,<cur>,<start>,<end>

### Parameters

| | |
|---|---|
| <p> | Progress ratio in Sequence Measurement mode |
| Range | 0 to 100% |
| <cur> | Current segment number being executed |
| Range | 0 to 1999 |
| <start> | First segment number |
| Range | 0 to 1999 |
| <stop> | Last segment number |
| Range | 0 to 1999 |

### Example of Use

To query the progress ratio and executing sequence number in the Sequence Measurement mode:
:FETC:CELL:SEQ:PROG?
> 65,23,11,30

### Remarks

The first and last segment numbers are the same as the start and end segment numbers specified using the:CONFigure:CELLular:SEQuence:CONTrol command.

## :FETCh:CELLular:SEQuence:SEG:STATe?

Specified Segment Status

### Function

Queries measurement status of specified segment in Sequence Measurement mode.

### Query

```
:FETCh:CELLular:SEQuence:SEG:STATe? <seg>
```

### Response

<stat>

### Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| <stat> | Segment status |
| 0 | Measurement completed successfully |
| 2 | Over level |
| 3 | Under level |
| 4 | Measurement failed |
| 5 | Failed to detect synchronization word |
| 9 | Measurement in progress or not measured |
| 10 | Segment not measured |
| 12 | Tx measurement timeout |

The value received from MX887016A is 0, 2, 4, 5, 9, 10, or 12.

### Example of Use

To query the measurement status of segment 16:

:FETC:CELL:SEQ:SEG:STAT? 16

> 0

# :FETCh:CELLular:SEQuence:STATe?

Sequence Measurement Status

### Function

Queries status of Sequence Measurement execution.

### Query

```
:FETCh:CELLular:SEQuence:STATe?
```

### Response

<m_status>,<n>,<s(0)>,<s(1)>,..,<s(n–1)>

### Parameters

| | |
|---|---|
| <m_status> | Segment status |
| 0 | Measurement completed successfully |
| 2 | Over level |
| 3 | Under level |
| 4 | Measurement failed |
| 5 | Failed to detect synchronization word |
| 9 | Measurement in progress or not measured |
| 12 | Tx measurement timeout |

The value received from MX887016A is 0, 2, 4, 5, 9, or 12.

| | |
|---|---|
| <n> | Number of measured segments |
| Range | 0 to 2000 |
| <s> | Segment status |
| 0 | Measurement completed successfully |
| 2 | Over level |
| 3 | Under level |
| 4 | Measurement failed |
| 5 | Failed to detect synchronization word |
| 9 | Measurement in progress or not measured |
| 10 | Segment not measured |
| 12 | Tx measurement timeout |

The value received from MX887016A is 0, 2, 4, 5, 9, 10, or 12.

### Example of Use

To query the status of Sequence Measurement execution:

:FETC:CELL:SEQ:STAT?

> 2,6,0,0,0,0,2,0

The number of measured segments is 6 and an over level error occurred in the fifth segment.

### Related Command

:FETCh:CELLular:MEASurement:STATe

:FETCh:CELLular:SEQuence:SEG:STATe

## :INITiate:CELLular:SEQuence:EXECute:TX

Start Signal Analyzer Measurement Only

### Function

Sets only the parameters for the specified measurement and executes measurement, without affecting the signal transmission parameters.

### Command

```
:INITiate:CELLular:SEQuence:EXECute:TX
```

## :TRIGger:CELLular:MEASurement:TOUT

Trigger Timeout

### Function

Sets or queries trigger timeout.

### Command

```
:TRIGger:CELLular:MEASurement:TOUT <time>
```

### Query

```
:TRIGger:CELLular:MEASurement:TOUT?
```

### Response

<time>

| | |
|---|---|
| Unit | s |

### Parameters

| | |
|---|---|
| <time> | Timeout time |
| Range | 1 to 60 s |
| Resolution | 1 s |
| Suffix code | NS,US,MS,S (uses s when omitted) |
| Default | 10 s |

### Example of Use

To set the Trigger timeout to 10 seconds:

:TRIG:CELL:MEAS:TOUT 10

:TRIG:CELL:MEAS:TOUT?

> 10

# :TRIGger:CELLular:SEQuence

Sequence Table Parameter - Trigger

### Function

Sets or queries trigger condition for starting Sequence Measurement.

### Command

```
:TRIGger:CELLular:SEQuence <seg>,<src>,<slope>,<level>,<delay>
```

### Query

```
:TRIGger:CELLular:SEQuence? <seg>
```

### Response

<src>, <slope>, <level>, <delay>

### Parameters

| | |
|---|---|
| <seg> | Segment number |
| Range | 0 to 1999 |
| <src> | Trigger source |
| FRAME | Frame |
| FREERUN | Free run |
| PWR | Input signal power |
| Default | FREERUN |
| <slope> | Trigger slope |
| RISE | Rising edge trigger |
| Default | RISE |
| <level> | Trigger level |
| Range | –40 to 0 dB |
| Resolution | 1 dB |
| Suffix Code | DB (uses dB when omitted) |
| Default | –30 dB |
| <delay> | Delay time |
| Range | 0 to 1000.000 ms |
| Resolution | 0.001 ms |
| Default | 0.000 ms |

### Details

The trigger slope and trigger level are enabled when trigger source is set to PWR.

### Example of Use

To set the trigger condition of segment 2 as follows:
Trigger source: PWR, Trigger slope: RISE, Trigger level: -30 dB, and Delay time: 0
:TRIG:CELL:SEQ 2,PWR,RISE,-30,0
:TRIG:CELL:SEQ? 2
> PWR,RISE,-30, 0.000

Remarks

The trigger level is defined as the level difference from the input level specified by the following commands:
:CONFigure:CELLular:MEASurement:RFSettings:LEVel,
:CONFigure:CELLular:SEQuence:RFSettings:TRX

# Chapter 5 Native Command Reference

This chapter describes the details of Native commands.
To switch to the Native command mode, send the command SYST:LANG NAT.


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# 5.1 List of Commands

The following table shows the rules for describing messages.

| | |
|---|---|
| [ ] | Messages or parameters in square brackets can be omitted. |
| \| | Choose one of several choices.<br>A \| B \| C \| D indicates a choice of A, B, C, and D. |
| { } | Curly brackets are used to group options.<br>For A \| B({C \| D}), choose A, B(C), or B(D). |

## 5.1.1 Common commands

Common

| Function | Command | Query | Response |
|---|---|---|---|
| Standard Select | STDSEL std | STDSEL? | std |
| Set Connect Port Direction | PORT input,output[,output,…,output] | PORT? | input,output[,output,…,output] |

Measurements

| Function | Command | Query | Response |
|---|---|---|---|
| Measurement Start | SNGLS | ----- | ----- |
| Measurement Stop | MEASSTOP | ----- | ----- |
| Measurement Status | ----- | MSTAT? | m_status |
| End Event Status (Measurement) Register Query | ----- | ESR2? | register |
| Error Event Status (Measurement) Register Query | ----- | ESR3? | register |

Common Parameters

| Function | Command | Query | Response |
|---|---|---|---|
| Output Level On/Off | LVL on_off | LVL? | on_off |
| Output Signal Modulation | MOD on_off | MOD? | on_off |
| Waveform File Select | PACKAGE pac | PACKAGE? | pac |
| Waveform Pattern Select | DLPAT pat | DLPAT? | pat |
| Waveform Pattern Select (SYNC) | DLPAT_SYNC pat | DLPAT_SYNC? | pat |

System

| Function | Command | Query | Response |
|---|---|---|---|
| Application Select | SYSSEL app | SYSSEL? | App |
| Language Selection of Remote Command | SYST:LANG mode | SYST:LANG? | Mode |

## 5.1.2 Fundamental measurement commands

Common Parameters

| Function | Command | Query | Response |
|---|---|---|---|
| AWGN Level On/Off | AWGNLVL on_off | AWGNLVL? | on_off |
| AWGN Level | AWGNPWR level | AWGNPWR? | Level |
| Input Level | ILVL level | ILVL? | Level |
| Output Level | OLVL level | OLVL? | Level |
| Output Frequency (Fwd.) | RXFREQ freq | RXFREQ? | Freq |
| Input Frequency (Rev.) | TXFREQ freq | TXFREQ? | Freq |
| Band Class | BANDCLASS band | BANDCLASS? | Band |
| Channel | CHAN channel | CHAN? | Channel |

Fundamental Measurement Parameters

| Function | Command | Query | Response |
|---|---|---|---|
| Turn Off All Measurement Items | ALLMEASITEMS_OFF | ----- | ----- |
| Band Class for Spurious Emissions Limit | BAND band | BAND? | Band |
| Code Domain Power Enable and Count | CDP_SET on_off[,count] | CDP_SET? | on_off,count |
| Fast Power Measurement Mode | FASTPWRMODE on_off | FASTPWRMODE? | on_off |
| Trigger Delay | FMEAS_TRGDLY trgdelay | FMEAS_TRGDLY? | trgdelay |
| Trigger Level | FMEAS_TRGLVL trglevel | FMEAS_TRGLVL? | trglevel |
| Trigger Source | FMEAS_TRGSRC source | FMEAS_TRGSRC? | source |
| Trigger Timeout | FMEAS_TRGTOUT trgtime | FMEAS_TRGTOUT? | trgtime |
| Long Span Code search | LSCODESEARCH on_off | LSCODESEARCH? | on_off |
| Modulation Analysis Enable and Count | MOD_SET on_off[,count] | MOD_SET? | on_off,count |
| Occupied Bandwidth Ratio | OBW_RATIO ratio | OBW_RATIO? | Ratio |
| Occupied Bandwidth Enable and Count | OBW_SET on_off[,count] | OBW_SET? | on_off,count |
| Protocol Revision | PREV rev | PREV? | Rev |
| Data Channel Payload Size | PSIZE size | PSIZE? | Size |
| Tx Power Measurement Enable and Count | PWR_SET on_off[,count] | PWR_SET? | on_off,count |
| Long Code Mask - I | RTCLCMI lcm | RTCLCMI? | lcm |
| Spurious Emissions Enable and Count | SPR_SET on_off[,count] | SPR_SET? | on_off,count |

Results

| Function | Command | Query | Response |
|---|---|---|---|
| ACK Channel Power | ----- | CDP_ACK? mode[,unit] | {avg,max,min}\|pwr |
| Auxiliary Pilot Channel Power | ----- | CDP_AUX? mode[,unit] | {avg,max,min}\|pwr |
| DATA Channel Power | ----- | CDP_DATA? mode[,unit] | {avg,max,min}\|pwr |
| DRC Channel Power | ----- | CDP_DRC? mode[,unit] | {avg,max,min}\|pwr |
| DSC Channel Power | ----- | CDP_DSC? mode[,unit] | {avg,max,min}\|pwr |
| R-PICH Power | ----- | CDP_PILOT? mode | {avg,max,min}\|pwr |
| RRI Channel Power | ----- | CDP_RRI? mode[,unit] | {avg,max,min}\|pwr |
| Carrier Frequency Error Result | ----- | CFERR? mode | {avg_ppm,avg_Hz,max_ppm, max_Hz,min_ppm,min_Hz}\|{ freq_ppm,freq_Hz} |
| Worst Carrier Frequency Error Result | ----- | CFERR_WORST? | freq_ppm,freq_Hz |
| Carrier Frequency Result | ----- | CFREQ? | freq |
| EVM Result | ----- | EVM? mode | {avg,max,min}\|evm |
| Filtered Power Result | ----- | FILTPWR? mode | {avg,max,min}\|pwr\|{s,pwr (1),pwr(2),…,pwr(s)} |
| Magnitude Error Result | ----- | MAGERR? mode | {avg,max,min}\|merr |
| Max Inactive Channel Power | ----- | MAXINACTCODE? | pwr,ph,wn,wl |
| OBW Result | ----- | OBW? | Bw |
| OBW Frequency Result | ----- | OBWFREQ? pos | freq |
| Origin Offset Result | ----- | ORGNOFS? mode | {avg,max,min}\|origin |
| Peak EVM Result | ----- | PEVM? mode | {avg,max,min}\|pevm |
| Phase Error Result | ----- | PHASEERR? mode | {avg,max,min}\|perr |
| Rho Result | ----- | RHO? mode | {avg,max,min}\|rho |
| Spurious Emissions Judgement | ----- | SEM? | Judgement |
| Spurious Emissions Peak Value (Lower) | ----- | SEMLVL_LOWER? | bc,l,f |

Results (Cont'd)

| Function | Command | Query | Response |
|---|---|---|---|
| Spurious Emissions Peak Value (Upper) | ----- | SEMLVL_UPPER? | bc,l,f |
| Spurious Emissions Template Margin (Lower) | ----- | SEMMARGIN_LOWER? | bc,l,f |
| Spurious Emissions Template Margin (Upper) | ----- | SEMMARGIN_UPPER? | bc,l,f |
| Time Error Result | ----- | TAU? mode | {avg,max,min}\|time |
| Worst Time Error Result | ----- | TAU_WORST? | Time |
| Tx Power Result | ----- | TXPWR? mode | {avg,max,min}\|pwr\|{s,pwr(1),pwr(2),…,pwr(s)} |
| Waveform | ----- | WAVEFMEAS? format,position,length[,wl] | data[n] |

### 5.1.3 Sequence measurement commands

Sequence Common Parameters

| Function | Command | Query | Response |
|---|---|---|---|
| Input Level | `ILVL level` | `ILVL?` | `Level` |
| Output Level | `OLVL level` | `OLVL?` | `Level` |
| Output Frequency (Fwd.) | `RXFREQ freq` | `RXFREQ?` | `Freq` |
| Downlink Frequency | `DLFREQ dl_freq` | `DLFREQ?` | `dl_freq` |
| Sequence Measurement Status | `-----` | `SEQMSTAT?` | `m_status,n,s(n-1)` |
| Sequence Progress | `-----` | `SEQPROGRESS?` | `p,cur,start,end` |
| Specified Segment Status | `-----` | `SEQSEGSTAT? seg` | `Stat` |
| Input Frequency (Rev.) | `TXFREQ freq` | `TXFREQ?` | `Freq` |
| Uplink Frequency | `ULFREQ ul_freq` | `ULFREQ?` | `ul_freq` |
| Trigger Timeout | `TRGTOUT time` | `TRGTOUT?` | `time` |

Sequence Control Parameters

| Function | Command | Query | Response |
|---|---|---|---|
| Sequence Control Parameter - Sequence Control | SEQCTRL start,end | SEQCTRL? | start,end |
| Sequence Control Parameter - Sequence Control | SEQCTRLTX start,end | SEQCTRLTX? | start,end |
| Start Signal Analyzer Measurement Only | SEQEXECTX | ----- | ----- |
| Sequence Control Parameter - Sequence End State Reinitialization | SEQREINIT sw | SEQREINIT? | sw |
| Sequence Control Parameter - Sequence Table | SEQTBL table | SEQTBL? | table |

Sequence Parameter Information

| Function | Command | Query | Response |
|---|---|---|---|
| Sequence Parameter Information - Error Check | ----- | SEQERR? [item] | n,err(n-1),ns,seg(ns-1),e,mem,exe,set |
| Sequence Parameter Information - Error Check | ----- | SEQERR2? format | n,err(n-1) |

Sequence Table Parameters

| Function | Command | Query | Response |
|---|---|---|---|
| Sequence Table Parameter - Measurement | SEQMEAS seg,mode,step,mcond | SEQMEAS? seg | mode,step,mcond |
| Sequence Table Parameter - SG Output Port | SEQSGPORT seg,port[,port,…,port] | SEQSGPORT? seg | port[,port,…,port] |
| Sequence Table Parameter - SA Input Port | SEQSAPORT seg,port | SEQSAPORT? seg | port |
| Sequence Table Parameter - Trigger | SEQTRG seg,src,slope,level,delay | SEQTRG? seg | src,slope,level,delay |

Sequence Table Parameters (Cont'd)

| Function | Command | Query | Response |
|---|---|---|---|
| Sequence Table Parameter - TRX Control | SEQTRX seg,ul_freq,ref,dl_freq, level,pat | SEQTRX? seg | ul_freq,ref,dl_freq,level,pat |
| Sequence Table Parameter - Uplink Frequency, Input Level | SEQTX seg,ul_freq,ref | SEQTX? seg | ul_freq,ref |

Measurement Parameters

| Function | Command | Query | Response |
|---|---|---|---|
| Band Class for Spurious Emissions Limit | EVDO_BAND mcond,band | EVDO_BAND? mcond | Band |
| Code Domain Power Enable and Count | EVDO_CDP_SET mcond,on_off[,count] | EVDO_CDP_SET? mcond | on_off,count |
| Long Span Code Search | EVDO_LSCODESEARCH on_off | EVDO_LSCODESEARCH? | on_off |
| Turn Off All Measurement Items | EVDO_MEAS_OFF mcond | ----- | ----- |
| Modulation Analysis Enable and Count | EVDO_MOD_SET mcond,on_off[,count] | EVDO_MOD_SET? mcond | on_off,count |
| Occupied Bandwidth Ratio | EVDO_OBW_RATIO ratio | EVDO_OBW_RATIO? | ratio |
| Occupied Bandwidth Enable and Count | EVDO_OBW_SET mcond,on_off[,count] | EVDO_OBW_SET? mcond | on_off,count |
| Protocol Revision | EVDO_PREV rev | EVDO_PREV? | rev |
| Data Channel Payload Size | EVDO_PSIZE size | EVDO_PSIZE? | size |
| Tx Power Measurement Enable and Count | EVDO_PWR_SET mcond,on_off[,count] | EVDO_PWR_SET? mcond | on_off,count |
| Spurious Emissions Enable and Count | EVDO_SPR_SET mcond,on_off[,count] | EVDO_SPR_SET? mcond | on_off,count |

Results

| Function | Command | Query | Response |
|---|---|---|---|
| ACK Channel Power | ----- | EVDO_CDP_ACK? seg,mode[,unit] | {avg,max,min}\|pwr |
| Auxiliary Pilot Channel Power | ----- | EVDO_CDP_AUX? seg,mode[,unit] | {avg,max,min}\|pwr |
| DATA Channel Power | ----- | EVDO_CDP_DATA? seg,mode[,unit] | {avg,max,min}\|pwr |
| DRC Channel Power | ----- | EVDO_CDP_DRC? seg,mode[,unit] | {avg,max,min}\|pwr |
| DSC Channel Power | ----- | EVDO_CDP_DSC? seg,mode[,unit] | {avg,max,min}\|pwr |
| R-PICH Power | ----- | EVDO_CDP_PILOT? seg,mode | {avg,max,min}\|pwr |
| RRI Channel Power | ----- | EVDO_CDP_RRI? seg,mode[,unit] | {avg,max,min}\|pwr |
| Carrier Frequency Error Result | ----- | EVDO_CFERR? seg,mode | {avg_ppm,avg_Hz,max_ppm, max_Hz,min_ppm,min_Hz}\|{ freq_ppm,freq_Hz} |
| Worst Carrier Frequency Error Result | ----- | EVDO_CFERR_WORST? seg | freq_ppm,freq_Hz |
| Carrier Frequency Result | ----- | EVDO_CFREQ? seg | freq |
| EVM Result | ----- | EVDO_EVM? seg,mode | {avg,max,min}\|evm |
| Filtered Power Result | ----- | EVDO_FILTPWR? seg,mode | {avg,max,min}\|pwr\|{s,pwr (1),pwr(2),…,pwr(s)} |
| Magnitude Error Result | ----- | EVDO_MAGERR? seg,mode | {avg,max,min}\|merr |
| Max Inactive Channel Power | ----- | EVDO_MAXINACTCODE? seg | pwr,ph,wn,wl |
| OBW Result | ----- | EVDO_OBW? seg | bw |
| OBW Frequency Result | ----- | EVDO_OBWFREQ? seg, pos | freq |
| Origin Offset Result | ----- | EVDO_ORGNOFS? seg,mode | {avg,max,min}\|origin |
| Peak EVM Result | ----- | EVDO_PEVM? seg,mode | {avg,max,min}\|pevm |
| Phase Error Result | ----- | EVDO_PHASEERR? seg,mode | {avg,max,min}\|perr |

Results (Cont'd)

| Function | Command | Query | Response |
|---|---|---|---|
| Rho Result | ----- | EVDO_RHO? seg,mode | {avg,max,min}\|rho |
| Spurious Emissions Judgement | ----- | EVDO_SEM? seg | judgement |
| Spurious Emissions Peak Value (Lower) | ----- | EVDO_SEMLVL_LOWER? seg | bc,l,f |
| Spurious Emissions Peak Value (Upper) | ----- | EVDO_SEMLVL_UPPER? seg | bc,l,f |
| Spurious Emissions Template Margin (Lower) | ----- | EVDO_SEMMARGIN_LOWER? seg | bc,l,f |
| Spurious Emissions Template Margin (Upper) | ----- | EVDO_SEMMARGIN_UPPER? seg | bc,l,f |
| Time Error Result | ----- | EVDO_TAU? seg,mode | {avg,max,min}\|time |
| Worst Time Error Result | ----- | EVDO_TAU_WORST? seg | time |
| Tx Power Result | ----- | EVDO_TXPWR? seg,mode | {avg,max,min}\|pwr\|{s,pwr(1),pwr(2),…,pwr(s)} |

# 5.2 Details of Commands

This section describes the commands in alphabetical order.

■ Terms in this command list

EX ..... Command name (header)

Example ..... Command function name

Function ..... Command function

Command..... Programming command syntax

Query ..... Query syntax

Response ..... Response syntax

Parameter..... Parameter definition

Details ..... Command restrictions and others

Example of Use ..... Command usage example

Related Commands ..... Introduction of related commands

■ Suffix code list

| Suffix code | Unit | Suffix code | Unit |
|---|---|---|---|
| % | % | KZ | kHz |
| DB | dB | MHZ | MHz |
| DBM | dBm | MS | ms |
| GHZ | GHz | MZ | MHz |
| GZ | GHz | NS | ns |
| HZ | Hz | S | s |
| KHZ | kHz | US | µs |

## 5.2.1 Details of common commands

### DLPAT

Waveform Pattern Select

**Function**

Selects waveform pattern to use from patterns included in waveform file.
When the command received, the signal is immediately switched regardless of the frame cycle of signal, so the frame cycle is not continued.
This command is also used to query the currently selected waveform pattern.

**Command**

```
DLPAT pat
```

**Query**

```
DLPAT?
```

**Response**

pat

**Parameter**

| | |
|---|---|
| pat | Waveform Pattern |
| PAT1 to PATn | Waveform pattern number (n: waveform information file group range) |
| Default | PAT1 |

**Details**

Select the waveform pattern for RF output signal in waveform file.
The pattern number is the same as the group number. Refer to Chapter 3, "Waveform File Details" in the *Waveform Files for Cellular Application Operation Manual*.

**Example of Use**

To set the waveform pattern to 1:
DLPAT PAT1
DLPAT?
> PAT1

**Related Command**

Waveform file for arbitrary waveform signal selection or query
`PACKAGE`

**Remarks**

The group range depends on the selected waveform file.
For details of the waveform pattern, refer to Chapter 3, "Waveform File Details" in the *Waveform Files for Cellular Application Operation Manual*.

## DLPAT_SYNC

Waveform Pattern Select (SYNC)

### Function

Selects waveform pattern to use from patterns included in waveform file.
When the command received, the signal is switched according to the frame cycle of signal so that the frame cycle is continued.
This command is also used to query the currently selected waveform pattern.

### Command

```
DLPAT_SYNC pat
```

### Query

```
DLPAT_SYNC?
```

### Response

pat

### Parameter

| | | |
|---|---|---|
| pat | | Waveform Pattern |
| | PAT1 to PATn | Waveform pattern number (n: waveform information file group range) |
| | Default | PAT1 |

### Details

Select the waveform pattern for RF output signal in waveform file.
The pattern number is the same as the group number. Refer to Chapter 3, "Waveform File Details" in the *Waveform Files for Cellular Application Operation Manual*.

### Example of Use

To set the waveform pattern to 1:
DLPAT_SYNC PAT1
DLPAT_SYNC?
> PAT1

### Related Command

Waveform file for arbitrary waveform signal selection or query
PACKAGE

### Remarks

The group range depends on the selected waveform file.
For details of the waveform pattern, refer to Chapter 3, "Waveform File Details" in the *Waveform Files for Cellular Application Operation Manual*.

# ESR2?

End Event Status (Measurement) Register Query

## Function

Queries end event status register (measurement).
The event occurrence can be identified using the retrieved value.

## Query

```
ESR2?
```

## Response

| | |
|---|---|
| register | Value = bit0 + bit1 + ... + bit7 |
| bit0 = $2^0$ = 1 | End of measurement |
| bit1 = $2^1$ = 2 | Trigger preparation completed |
| bit2 = $2^2$ = 4 | Unused (reserved for application use) |
| bit3 = $2^3$ = 8 | Unused (reserved for application use) |
| bit4 = $2^4$ = 16 | Unused (reserved for application use) |
| bit5 = $2^5$ = 32 | Unused (reserved for application use) |
| bit6 = $2^6$ = 64 | Unused (reserved for application use) |
| bit7 = $2^7$ = 128 | Unused (reserved for application use) |

## Parameter

| | |
|---|---|
| register | End event status register (measurement) |
| Range | 0 to 255 |

## Details

The sum of the values for bits of the occurring event from the values $2^0$ = 1, $2^1$ = 2, $2^2$ = 4, $2^3$ = 8, $2^4$ = 16, $2^5$ = 32, $2^6$ = 64, and $2^7$ = 128, that correspond to the end event status register (measurement) bits 0, 1, 2, 3, 4, 5, 6, and 7 becomes the response.

## Example of Use

To query the end event status register (measurement) value:
ESR2?
> 0

## ESR3?

Error Event Status (Measurement) Register Query

### Function

Queries error event status register (measurement).
The event occurrence can be identified using the retrieved value.

### Query

```
ESR3?
```

### Response

| | |
|---|---|
| register | Value = bit0 + bit1 + ... + bit7 |
| bit0 = $2^0$ = 1 | Over level |
| bit1 = $2^1$ = 2 | Under level |
| bit2 = $2^2$ = 4 | Timeout |
| bit3 = $2^3$ = 8 | Unused (reserved for application use) |
| bit4 = $2^4$ = 16 | Unused (reserved for application use) |
| bit5 = $2^5$ = 32 | Unused (reserved for application use) |
| bit6 = $2^6$ = 64 | Unused (reserved for application use) |
| bit7 = $2^7$ = 128 | Unused (reserved for application use) |

### Parameter

| | |
|---|---|
| register | Error event status register (measurement) |
| Range | 0 to 255 |

### Details

The sum of the values for bits of the occurring event from the values $2^0$ = 1, $2^1$ = 2, $2^2$ = 4, $2^3$ = 8, $2^4$ = 16, $2^5$ = 32, $2^6$ = 64, and $2^7$ = 128, that correspond to the error event status register (measurement) bits 0, 1, 2, 3, 4, 5, 6, and 7 becomes the response.

### Example of Use

To query the error event status register (measurement) value:
ESR3?
> 4

## LVL

Output Level On/Off

### Function

Sets or queries RF signal output ON/OFF.

### Command

```
LVL on_off
```

### Query

```
LVL?
```

### Response

on_off

### Parameter

| | |
|---|---|
| on_off | Enables/disables RF signal output |
| ON | Enables RF signal output |
| OFF | Disables RF signal output |
| Default | ON |

### Example of Use

To output the RF signal at Test port:
LVL ON
LVL?
ON

## MEASSTOP

Measurement Stop

### Function

Stops current measurement.

### Command

```
MEASSTOP
```

### Example of Use

To stop current measurement:
MEASSTOP

# MOD

Output Signal Modulation

### Function

Sets or queries RF signal output modulation.

### Command

```
MOD on_off
```

### Query

```
MOD?
```

### Response

on_off

### Parameter

| | | |
|---|---|---|
| on_off | | Enables/disables RF output signal modulation |
| | ON | Enables RF output signal modulation |
| | OFF | Disables RF output signal modulation |
| | Default | ON |

### Example of Use

To modulate the RF signal:

MOD ON

MOD?

> ON

# MSTAT?

Measurement Status

### Function

Queries status of current measurement.

### Query

```
MSTAT?
```

### Response

m_status

### Parameter

| | |
|---|---|
| m_status | Measurement status |
| 0 | Measurement completed normally |
| 2 | Over level |
| 3 | Under level |
| 4 | Measurement failed |
| 5 | Synchronization word not detected |
| 9 | Measurement in progress or not measured |
| 12 | Tx measurement timeout |
| 13 | Rx measurement failed |

### Details

This command can be used while measurement is stopped or executing.
The value received from MX887016A is 0, 2, 4, 5, 9, or 12.

### Example of Use

To query the measurement status:
MSTAT?
> 0

# PACKAGE

Waveform File Select

### Function

Selects or queries waveform file for arbitrary waveform signal used at Forward Link signal.

### Command

```
PACKAGE pac
```

### Query

```
PACKAGE?
```

### Response

pac

### Parameter

| | |
|---|---|
| pac | Waveform file |

### Details

The name of the file used from the waveform files loaded into waveform memory is set by this command.

### Example of Use

To set the waveform file 1 from the waveform files loaded in memory:
PACKAGE “PAC0”
PACKAGE?
> PAC1

### Related Command

Use the following command to load the waveform file into waveform memory.
SOUR:GPRF:GEN:ARB:FILE:LOAD
For details of the command, refer to Chapter 5 “SCPI Command Reference” in the *MU887000A TRX Test Module Operation Manual*.
:SOURce:GPRF:GENerator:ARB:FILE:LOAD
The following command can be used to query the names of waveform files that have been loaded into waveform memory.
SOUR:GPRF:GEN:ARB:WAV:NAME?
For details of the command, refer to Chapter 5 “SCPI Command Reference” in the *MU887000A TRX Test Module Operation Manual*.
:SOURce:GPRF:GENerator:ARB:WAVeform:NAME?

Use the following commands to select a waveform pattern to use from the waveform patterns included in the waveform file configured using the command described in this section.
DLPAT, DLPAT_SYNC, SEQTRX

# PORT

Set Connect Port Direction

## Function

Sets or queries the test ports for inputting and outputting RF signals.
Multiple output test port can be set for MU887002A.

## Command

| | |
|---|---|
| `PORT input,output` | MU887000A, MU887001A |
| `PORT input,output[,output,…,output]` | MU887002A |

## Query

```
PORT?
```

## Response

| | |
|---|---|
| input, output | MU887000A, MU887001A |
| input,output[,output,…,output] | MU887002A |

## Parameters

| | | |
|---|---|---|
| input | Input test port number | |
| Range | Test Port 1 to 4 | (MU887000A) |
| | Test Port 1 to 4 | (MU887001A) |
| | OFF, Test Port 1 to 12 | (MU887002A) |
| PORT1 | Test Port 1 | |
| … | … | |
| PORT12 | Test Port 12 | |
| OFF | No any Input Test Ports | (MU887002A) |
| Default | PORT1 | |
| output | Output test port number | |
| Range | Test Port 1 to 4 | (MU887000A) |
| | Test Port 1 to 4 | (MU887001A) |
| | Test Port 1 to 12 | (MU887002A) |
| PORT1 | Test Port 1 | |
| … | … | |
| PORT12 | Test Port 12 | |
| Default | PORT1 | |

## Details

For MU887000A,
Test Port 1 and Test Port 2 can be set for both input and output.
Test Port 3 and Test Port 4 can be set for either input or output.
For MU887001A, Test Port 1 to Test Port 4 can be set for both input and output.
For MU887002A, Test Port 1 to Test Port 12 can be set for both input and output.

Example of Use

To set Test Port 1 as RF signal input test port and Test Port 2 as RF signal output test port:
PORT PORT1,PORT2
PORT?
> PORT1,PORT2

To set No any Input Test Ports and Test Port 4, Test Port 6, Test Port 10 as RF signal output test ports:
PORT OFF,PORT10,PORT4,PORT6
PORT?
> OFF,PORT4,PORT6,PORT10

## SNGLS

Measurement Start

Function

Sets the parameters for both specified measurement and signal transmission and executes measurement.

Command

SNGLS

Example of Use

To start measurement
SNGLS

Related command

ESR2
For the details of the event status register, refer to Chapter 3 “Fundamental Operation” in the *MU887000A TRX Test Module Operation Manual*.

# STDSEL

Standard Select

### Function

Sets or queries measurement standard.

### Command

```
STDSEL std
```

### Query

```
STDSEL?
```

### Response

std

### Parameter

| | | |
|---|---|---|
| std | Measurement standard | |
| COMMON | Common Measurement | (requires MX887010A) |
| WCDMA | W-CDMA | (requires MX887011A) |
| GSM | GSM | (requires MX887012A) |
| LTE | LTE | (requires MX887013A or MX887014A) |
| CDMA2000 | CDMA2000 1x | (requires MX887015A) |
| EVDO | CDMA2000 1xEVDO | (requires MX887016A) |
| TDSCDMA | TD-SCDMA | (requires MX887017A) |
| NR | NR sub-6GHz | (requires MX887018A or MX887019A) |
| CATM | Category M | (requires MX887065A) |
| NBIOT | NB-IoT | (requires MX887067A) |
| LTEV2X | LTE-V2X | (requires MX887068A) |
| SEQUENCE | Sequence | (requires MX887010A) |
| SEQ | Sequence | (requires MX887010A) |
| Default | COMMON | |

### Example of Use

To switch the measurement standard to SEQUENCE:
STDSEL SEQUENCE
STDSEL?
> SEQUENCE

### Remarks

To execute the measurements described in section 5.2.2 “Fundamental measurement commands”, set the parameter to EVDO.
To execute the measurements described in section 5.2.3 “Sequence measurement commands” , set the parameter to SEQUENCE.
If this command is sent during measurement, measurement stops to prepare for the new standard. Common hardware settings, such as Downlink Frequency and Input Level, can be set for each measurement standard.

## SYSSEL

Application Select

### Function

Sets or queries type of application software to execute.

### Command

```
SYSSEL app
```

### Query

```
SYSSEL?
```

### Response

app

### Parameter

| | | |
|---|---|---|
| app | | Type of application software |
| | CELLULAR | Cellular Application<br>When using MX887010A, MX887011A, MX887012A, MX887013A, MX887014A, MX887015A, MX887016A MX887017A, MX887018A, MX887019A, MX887065A, MX887067A, or MX887068A |
| | SRW | Short Range Wireless application<br>When using MX887030A, MX887031A, MX887032A, MX887033A, MX887040A, or MX887050A |
| | LRWPAN | IEEE 802.15.4 application<br>When using MX887060A |
| | ZWAVE | Z-Wave application<br>When using MX887061A |
| | FMAUDIO | FM AUDIO application<br>When using MX887070A |

*Note:* MU887002A does not support MX887070A.

### Details

Set the parameter to CELLULAR and send the command before using the MX887016A.

### Example of Use

To set the applications software to be executed on the MU887000A to CELLULAR
SYSSEL CELLULAR
SYSSEL?
> CELLULAR

### Remarks

Set the parameter to CELLULAR and send the command before using the MX887016A and then set the standard to EVDO or SEQUENCE using the STDSEL command.

## SYST:LANG

Language Selection of Remote Command

### Function

Switches language mode of remote control commands.

### Command

`SYST:LANG mode`

### Query

`SYST:LANG?`

### Response

mode

### Parameter

| | |
|---|---|
| mode | Language mode |
| NAT | Native |
| SCPI | SCPI |
| Default | NAT |

### Example of Use

To switch the remote control command language mode to Native:

SYST:LANG NAT

SYST:LANG?

> NAT

## 5.2.2 Fundamental measurement commands

### ALLMEASITEMS_OFF

Turn Off All Measurement Items

**Function**

Disables all measurement items.

**Command**

```
ALLMEASITEMS_OFF
```

**Details**

This command operation is similar to the following commands.
PWR_SET,OBW_SET,SPR_SET,MOD_SET,CDP_SET

**Example of Use**

To disable all measurement items:
ALLMEASITEMS_OFF

# AWGNLVL

AWGN Level On/Off

### Function

Enables AWGN output, and queries setting.

### Command

```
AWGNLVL on_off
```

### Query

```
AWGNLVL?
```

### Response

on_off

### Parameter

| | |
|---|---|
| on_off | Enables/disables AWGN output |
| ON | Enables AWGN output |
| OFF | Disables AWGN output |
| Default | OFF |

### Example of Use

To enable the AWGN output:

AWGNLVL ON

AWGNLVL?

> ON

### Related Command

To set and query AWGN output level ratio vs carrier:

AWGNPWR

# AWGNPWR

AWGN Level

### Function

Sets or queries AWGN (Additive White Gaussian Noise) output level ratio vs carrier.

### Command

```
AWGNPWR level
```

### Query

```
AWGNPWR?
```

### Response

level

| | |
|---|---|
| Unit | dB |

### Parameter

| | |
|---|---|
| level | AWGN output level |
| Range | –40 to +12 dB |
| Resolution | 1 dB |
| Default | –20 dB |

### Example of Use

To set AWGN output level ratio vs the carrier to –40 dB:

AWGNPWR -40

AWGNPWR?

> -40

# BAND

Band Class for Spurious Emissions Limit

### Function

Sets or queries band class to determine Spurious Emissions Limit range.

### Command

```
BAND band
```

### Query

```
BAND?
```

### Response

band

### Parameter

| | |
|---|---|
| band | Band class |
| Range | 0 to 16, 18 to 21 |
| Resolution | 1 |
| Default | 0 |

### Details

This parameter sets the band class determining the Spurious Emissions Limit range.

### Example of Use

To set the band class determining the Spurious Emissions Limit range to 10:

BAND 10

BAND?

> 10

### Remarks

Use the following command to set the band class to determine the frequency:

```
BANDCLASS
```

# BANDCLASS

Band Class

### Function

Sets or queries band class.

### Command

```
BANDCLASS band
```

### Query

```
BANDCLASS?
```

### Response

band

### Parameter

| | |
|---|---|
| band | Band class |
| Range | 0 to 16, 18 to 21 |
| Resolution | 1 |
| Default | 0 |

### Example of Use

To set the band class to 10:

BANDCLASS 10

BANDCLASS?

> 10

### Remarks

Use the following command to set the band class to determine the Spurious Emission Limit range:

```
BAND
```

# CDP_ACK?

ACK Channel Power

### Function

Queries Reverse ACK Channel Power measurement result.

### Query

```
CDP_ACK? mode[,unit]
```

### Response

When mode = TTL

avg,max,min

When mode = other than TTL

pwr

| | |
|---|---|
| Unit | Depends on parameter unit |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| unit | Query unit |
| IOR | Ior (Total Power) reference value (dB/Ior) |
| PILOT | Pilot Channel reference value (dB/Pilot) (uses Ior when unit omitted) |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| pwr | Measurement result in specified Storage mode |

### Example of Use

To query the ACK Channel Power measurement result average value:

CDP_ACK? AVG

> 0.01

## CDP_AUX?

Auxiliary Pilot Channel Power

### Function

Queries Reverse Auxiliary Pilot Channel Power measurement result.

### Query

```
CDP_AUX? mode[,unit]
```

### Response

When mode = TTL

avg,max,min

When mode = other than TTL

pwr

| | |
|---|---|
| Unit | Depends on parameter unit |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| unit | Query unit |
| IOR | Ior (Total Power) reference value (dB/Ior) |
| PILOT | Pilot Channel reference value (dB/Pilot) (uses Ior when unit omitted) |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| pwr | Measurement result in specified Storage mode |

### Details

A valid data is acquired only when the Protocol Revision is Rev. A.

### Example of Use

To query the Auxiliary Pilot Channel Power measurement result average value:

CDP_AUX? AVG

> 0.01

# CDP_DATA?

DATA Channel Power

### Function

Queries Reverse DATA Channel Power measurement result.

### Query

```
CDP_DATA? mode[,unit]
```

### Response

When mode = TTL

avg,max,min

When mode = other than TTL

pwr

| | |
|---|---|
| Unit | Depends on parameter unit |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| unit | Query unit |
| IOR | Ior (Total Power) reference value (dB/Ior) |
| PILOT | Pilot Channel reference value (dB/Pilot) |
| | (uses Ior when unit omitted) |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| pwr | Measurement result in specified Storage mode |

### Example of Use

To query the average value of the DATA Channel Power measurement result:

CDP_DATA? AVG

> 0.01

## CDP_DRC?

DRC Channel Power

### Function

Queries Reverse DRC Channel (Data Rate Channel) Power measurement result.

### Query

```
CDP_DRC? mode[,unit]
```

### Response

When mode = TTL

avg,max,min

When mode = other than TTL

pwr

| | |
|---|---|
| Unit | Depends on parameter unit |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| unit | Query unit |
| IOR | Ior (Total Power) reference value (dB/Ior) |
| PILOT | Pilot Channel reference value (dB/Pilot) |
| | (uses Ior when unit omitted) |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| pwr | Measurement result in specified Storage mode |

### Example of Use

To query the DRC Channel Power measurement result average value:

CDP_DRC? AVG

> 0.01

# CDP_DSC?

DSC Channel Power

### Function

Queries Reverse DSC Channel (Data Source Channel) Power measurement result.

### Query

```
CDP_DSC? mode[,unit]
```

### Response

When mode = TTL

avg,max,min

When mode = other than TTL

pwr

| | |
|---|---|
| Unit | Depends on parameter unit |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| unit | Query unit |
| IOR | Ior (Total Power) reference value (dB/Ior) |
| PILOT | Pilot Channel reference value (dB/Pilot) |
| | (uses Ior when unit omitted) |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| pwr | Measurement result in specified Storage mode |

### Details

A valid data is acquired only when the Protocol Revision is Rev. A.

### Example of Use

To query the DSC Channel Power measurement result average value:

CDP_DSC? AVG

> 0.01

# CDP_PILOT?

R-PICH Power

### Function

Queries R-PICH (Reverse Pilot Channel) Power measurement results.

### Query

```
CDP_PILOT? mode
```

### Response

When mode = TTL

avg,max,min

When mode = other than TTL

pwr

| | |
|---|---|
| Unit | dB/Ior |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| pwr | Measurement result in specified Storage mode |

### Example of Use

To query the R-PICH power measurement result average:

CDP_PILOT? AVG

> 0.01

# CDP_RRI?

RRI Channel Power

### Function

Queries Reverse RRI Channel (Reverse Rate Indicator Channel) Power measurement result.

### Query

```
CDP_RRI? mode[,unit]
```

### Response

When mode = TTL

avg,max,min

When mode = other than TTL

pwr

| | |
|---|---|
| Unit | Depends on parameter unit |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| unit | Query unit |
| IOR | Ior (Total Power) reference value (dB/Ior) |
| PILOT | Pilot Channel reference value (dB/Pilot) |
| | (uses Ior when unit omitted) |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| pwr | Measurement result in specified Storage mode |

### Example of Use

To query the RRI Channel Power measurement result average value:

CDP_RRI? AVG

> 0.01

# CDP_SET

Code Domain Power Enable and Count

### Function

Enables Code Domain Power measurement and sets measurement count, and queries setting.

### Command

```
CDP_SET on_off[,count]
```

### Query

```
CDP_SET?
```

### Response

on_off,count

### Parameters

| | |
|---|---|
| on_off | Enables/disables measurement |
| ON | Enables measurement |
| OFF | Disables measurement |
| Default | OFF |
| count | Measurement count |
| Range | 1 to 200 |
| Resolution | 1 |
| Suffix code | None |
| Default | 1 |

### Example of Use

To enable the Code Domain Power measurement and set the measurement count to 10:
CDP_SET ON,10
CDP_SET?
> ON,10

## CFERR?

Carrier Frequency Error Result

### Function

Queries Carrier Frequency Error measurement result.

### Query

```
CFERR? mode
```

### Response

When mode = TTL

avg_ppm,avg_Hz,max_ppm,max_Hz,min_ppm,min_Hz

When mode = other than TTL

freq_ppm,freq_Hz

xxx_ppm

| | |
|---|---|
| Unit | ppm |
| Resolution | 0.01 ppm |

xxx_Hz

| | |
|---|---|
| Unit | Hz |
| Resolution | 0.1 Hz |

### Parameters

| | |
|---|---|
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| avg_ppm | Measurement result in ppm (Average) |
| avg_Hz | Measurement result in Hz (Average) |
| max_ppm | Measurement result in ppm (Maximum) |
| max_Hz | Measurement result in Hz (Maximum) |
| min_ppm | Measurement result in ppm (Minimum) |
| min_Hz | Measurement result in Hz (Minimum) |
| freq_ppm | Measurement result in ppm in specified Storage mode |
| freq_Hz | Measurement result in Hz in specified Storage mode |

### Example of Use

To query the frequency error measurement result average;

CFERR? AVG

> 0.50,431.1

## CFERR_WORST?

Worst Carrier Frequency Error Result

### Function

Queries worst value of Carrier Frequency Error measurement result.

### Query

```
CFERR_WORST?
```

### Response

freq_ppm,freq_Hz

freq_ppm

| | |
|---|---|
| Unit | ppm |
| Resolution | 0.01 ppm |

freq_Hz

| | |
|---|---|
| Unit | Hz |
| Resolution | 0.1 Hz |

### Parameters

| | |
|---|---|
| freq_ppm | Worst value in frequency error measurement results in ppm |
| freq_Hz | Worst value in frequency error measurement results in Hz |

### Example of Use

To query the worst value of the frequency error measurement result:

CFERR_WORST?

> 1.00,862.2

# CFREQ?

Carrier Frequency Result

### Function

Queries Carrier Frequency measurement result.

### Query

`CFREQ?`

### Response

freq

| | |
|---|---|
| Unit | Hz |
| Resolution | 1 Hz |

### Parameter

| | |
|---|---|
| freq | Carrier Frequency |

### Example of Use

To query the carrier frequency measurement result:

CFREQ?

> 862200000

## CHAN

Channel

### Function

Sets the queries channel.

### Command

```
CHAN channel
```

### Query

```
CHAN?
```

### Response

channel

### Parameter

| | |
|---|---|
| channel | Channel |
| Range | Band Class0: 1 to 799, 991 to 1323<br>Band Class1: 0 to 1199<br>Band Class2: 0 to 1000, 1329 to 2108<br>Band Class3: 1 to 799, 801 to 1039, 1041 to 1199, 1201 to 1600<br>Band Class4: 0 to 599<br>Band Class5: 1 to 400, 472 to 871, 1039 to 1473, 1536 to 1715, 1792 to 2018<br>Band Class6: 0 to 1199<br>Band Class7: 0 to 240<br>Band Class8: 0 to 1499<br>Band Class9: 0 to 699<br>Band Class10: 0 to 919<br>Band Class11: 1 to 400, 472 to 871, 1039 to 1473, 1536 to 1715, 1792 to 2016<br>Band Class12: 0 to 239<br>Band Class13: 0 to 1399<br>Band Class14: 0 to 1299<br>Band Class15: 0 to 899<br>Band Class16: 140 to 1459<br>Band Class18: 0 to 240<br>Band Class19: 0 to 360<br>Band Class20: 0 to 680<br>Band Class21: 0 to 399 |
| Resolution | 1 (other than Band Class3)<br>2 (Band Class3) |
| Default | 122 |

### Details

The setting range of this parameter varies with the Band Class setting.

Changing the channel number changes the related output frequency (Forward Link frequency) and input frequency (Reverse Link frequency).

### Example of Use

To set the channel to 100:

CHAN 100

CHAN?

> 100

## EVM?

EVM Result

### Function

Queries EVM result

### Query

`EVM? mode`

### Response

When mode = TTL

avg,max,min

When mode = other than TTL

evm

| | |
|---|---|
| Unit | % |
| Resolution | 0.01% |

### Parameters

| | |
|---|---|
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| evm | Measurement result in specified Storage mode |

### Example of Use

To query the EVM measurement result average:

EVM? AVG

> 0.01

# FASTPWRMODE

Fast Power Measurement Mode

### Function

Enables Fast Power Measurement mode or queries setting.

### Command

```
FASTPWRMODE on_off
```

### Query

```
FASTPWRMODE?
```

### Response

on_off

### Parameters

| | | |
|---|---|---|
| on_off | | Fast Power Measurement Mode |
| | ON | Executes Fast Power measurement. |
| | OFF | Executes normal power measurement. |
| | Default | OFF |

### Details

When Fast Power Measurement mode is set to On, only Tx Power is measured.

Use the following command to enable/disable power measurement and to set measuring times.

PWR_SET

### Example of Use

To set Fast Power Measurement mode to On.

FASTPWRMODE ON

FASTPWRMODE?

> ON

# FILTPWR?

Filtered Power Result

### Function

Queries Filtered Power measurement result.

### Query

```
FILTPWR? mode
```

### Response

When mode = TTL
avg,max,min
When mode = AVG, MAX, MIN or DVT,
pwr
When mode = IND,
s,pwr(1), pwr(2),..., pwr(s)

| | |
|---|---|
| Unit | dBm |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| IND | The value in each measurement |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| pwr | Measurement result in specified Storage mode |
| pwr(s) | Power of sth measurement |
| s | Measurement count |
| Range | 1 to 200 |

### Example of Use

To query the Filtered Power measurement result average, maximum, and minimum:
FILTPWR? TTL
> -10.05,-9.60,-10.50

# FMEAS_TRGDLY

Trigger Delay

### Function

Sets or queries trigger delay.

### Command

```
FMEAS_TRGDLY trgdelay
```

### Query

```
FMEAS_TRGDLY?
```

### Response

trgdelay

| | |
|---|---|
| Unit | ms |

### Parameter

| | |
|---|---|
| trgdelay | Trigger delay |
| Range | 0 to 10.000 ms |
| Resolution | 0.001 ms |
| Suffix code | S, MS, US (uses ms when omitted) |
| Default | 0.000 ms |

### Details

The trigger delay setting is enabled when the trigger source is set to PWR.

### Example of Use

To set trigger delay to 0.5 ms:

FMEAS_TRGDLY 0.5MS

FMEAS_TRGDLY?

> 0.500

# FMEAS_TRGLVL

Trigger Level

### Function

Sets or queries trigger level.

### Command

```
FMEAS_TRGLVL trglevel
```

### Query

```
FMEAS_TRGLVL?
```

### Response

trglevel

| | |
|---|---|
| Unit | dB |

### Parameter

| | |
|---|---|
| trglevel | Trigger level |
| Range | –40 to 0 dB |
| Resolution | 1 dB |
| Suffix code | DB (uses dB when omitted) |
| Default | –40.0 dB |

### Details

The trigger level setting is enabled when trigger source is set to PWR.

### Example of Use

To set the input signal trigger level to –40 dB:

FMEAS_TRGLVL -40

FMEAS_TRGLVL?

> -40

# FMEAS_TRGSRC

Trigger Source

### Function

Sets or queries trigger source.

### Command

```
FMEAS_TRGSRC source
```

### Query

```
FMEAS_TRGSRC?
```

### Response

source

### Parameter

| | |
|---|---|
| source | Trigger source |
| FREERUN | Free run |
| PWR | Input signal power |
| Default | FREERUN |

### Example of Use

To set the input signal power as the trigger source:

FMEAS_TRGSRC PWR

FMEAS_TRGSRC?

> PWR

# FMEAS_TRGTOUT

Trigger Timeout

## Function

Sets or queries trigger timeout.

## Command

```
FMEAS_TRGTOUT trgtime
```

## Query

```
FMEAS_TRGTOUT?
```

## Response

trgtime

| | |
|---|---|
| Unit | s |

## Parameter

trgtime Timeout

| | |
|---|---|
| Range | 1 to 10 s |
| Resolution | 1 s |
| Suffix code | S (uses s when omitted) |
| Default | 10 s |

## Details

The trigger timeout setting is enabled when trigger source is set to PWR.

## Example of Use

To set the trigger timeout to 5 s:

FMEAS_TRGTOUT 5S

FMEAS_TRGTOUT?

> 5

## ILVL

Input Level

### Function

Sets or queries input level of the input test port.

### Command

```
ILVL level
```

### Query

```
ILVL?
```

### Response

level

| | |
|---|---|
| Unit | dBm |

### Parameter

| | |
|---|---|
| level | Input Level |
| Range | |
| MU887000A | –65.0 to +35.0 dBm (Port 1/Port 2) |
| | –65.0 to +25.0 dBm (Port 3/Port 4) |
| MU887001A | –65.0 to +35.0 dBm (Port 1 to Port 4) |
| MU887002A | –65.0 to +35.0 dBm (TRX 1/2 Port 1 to Port 12) |
| Resolution | 0.1 dB |
| Suffix code | DBM (uses dBm when omitted) |
| Default | –23.7 dBm |

### Details

For MU887000A, the setting range varies with the input test port setting.
If cable loss correction is set to ON, the setting range of the input level is the range of values with added cable loss.
If the cable loss is 5 dB, the MU887000A Port 1/Port 2 setting range is –60.0 to +40.0 dBm.

### Example of Use

To set the input level to –10.0 dBm:

```
ILVL -10.0
ILVL?
> -10.0
```

### Related Commands

EXTLOSSW
LOSSTBL
LOSSTBLVAL
For details of the commands, refer to Chapter 6 “Native Command Reference” in the *MU887000A TRX Test Module Operation Manual*.

# LSCODESEARCH

Long Span Code Search

### Function

Enables and queries Long Span Code Search function.

### Command

```
LSCODESEARCH on_off
```

### Query

```
LSCODESEARCH?
```

### Response

on_off

### Parameter

| | |
|---|---|
| on_off | Enables/disables Long Span Code Search |
| ON | Enables Long Span Code Search |
| OFF | Disables Long Span Search |
| Default | OFF |

### Details

Set this parameter to OFF when the Reverse Link and Forward Link signals are synchronized; set it to ON when they are not synchronized.

### Example of Use

To enable the Long Span Code Search:
LSCODESEARCH ON
LSCODESEARCH?
> ON

## MAGERR?

Magnitude Error Result

### Function

Queries Magnitude Error measurement result.

### Query

```
MAGERR? mode
```

### Response

When mode = TTL

avg,max,min

When mode = other than TTL

merr

| | |
|---|---|
| Unit | % |
| Resolution | 0.01% |

### Parameters

| | |
|---|---|
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| merr | Measurement result in specified Storage mode |

### Example of Use

To query the Magnitude Error measurement result average:

MAGERR? AVG

> 0.01

# MAXINACTCODE?

Max Inactive Channel Power

## Function

Queries channel outputting maximum power among inactive code channels, and power measurement result.

## Query

```
MAXINACTCODE?
```

## Response

pwr,ph,wn,wl

pwr
- Unit dB

wn
- Unit None

wl
- Unit None

## Parameters

| | |
|---|---|
| pwr | Max Inactive Channel Power |
| Resolution | 0.01 dB |
| ph | Phase (I/Q) of target channel |
| I | I-phase |
| Q | Q-phase |
| wn | Walsh Code Number of target channel |
| Resolution | 1 |
| wl | Walsh Code Length of target channel |
| Resolution | 1 |

## Details

When executing more than two measurements using a single measurement start, the result of the last measurement is returned for (Meas. Count ≥ 2).

## Example of Use

To query the channel outputting the maximum power among inactive code channels and the power measurement result:

MAXINACTCODE?

> 3.00,Q,2,8

# MOD_SET

Modulation Analysis Enable and Count

## Function

Enables Modulation Analysis Measurement and sets or queries measurement count.

## Command

```
MOD_SET on_off[,count]
```

## Query

```
MOD_SET?
```

## Response

on_off,count

## Parameters

| | |
|---|---|
| on_off | Enables/disables measurement |
| ON | Enables measurement |
| OFF | Disables measurement |
| Default | OFF |
| count | Measurement count |
| Range | 1 to 200 |
| Resolution | 1 |
| Suffix code | None |
| Default | 1 |

## Example of Use

To enable Modulation Analysis measurement and set the measurement count to 10:
MOD_SET ON,10
MOD_SET?
> ON,10

# OBW?

OBW Result

### Function

Queries Occupied Bandwidth measurement result.

### Query

`OBW?`

### Response

bw

| | |
|---|---|
| Unit | MHz |
| Resolution | 1 kHz |

### Parameter

| | |
|---|---|
| bw | Occupied Bandwidth [MHz] |

### Example of Use

To query the Occupied Bandwidth measurement result:

OBW?

> 0.100

# OBWFREQ?

OBW Frequency Result

## Function

Queries upper, lower and center frequency of Occupied Bandwidth measurement.

## Query

```
OBWFREQ? pos
```

## Response

freq

| | |
|---|---|
| Unit | MHz |
| Resolution | 1 kHz |

## Parameters

| | |
|---|---|
| pos | Offset types |
| UPPER | Upper frequency |
| LOWER | Lower frequency |
| CENTER | Center frequency |
| freq | Offset frequency [MHz] |

## Example of Use

To query the Occupied Bandwidth measurement center frequency result:

OBWFREQ? CENTER

> 862.200

# OBW_RATIO

Occupied Bandwidth Ratio

### Function

Sets or queries Occupied Bandwidth measurement occupation ratio.

### Command

```
OBW_RATIO ratio
```

### Query

```
OBW_RATIO?
```

### Response

ratio

### Parameter

| | |
|---|---|
| ratio | Occupied Bandwidth occupation ratio |
| Range | 80.0 to 99.9% |
| Resolution | 0.1% |
| Suffix code | % (uses % when omitted) |
| Default | 99.0% |

### Example of Use

To set the Occupied Bandwidth occupation ratio to 99.0%:

OBW_RATIO 99.0

OBW_RATIO?

> 99.0

# OBW_SET

Occupied Bandwidth Enable and Count

### Function

Enables Occupied Bandwidth measurement and sets measurement count, or queries settings.

### Command

```
OBW_SET on_off[,count]
```

### Query

```
OBW_SET?
```

### Response

on_off,count

### Parameters

| | |
|---|---|
| on_off | Enables/disables measurement |
| ON | Enables measurement |
| OFF | Disables measurement |
| Default | OFF |
| count | Measurement count |
| Range | 1 to 200 |
| Resolution | 1 |
| Suffix code | None |
| Default | 1 |

### Example of Use

To enable the Occupied Bandwidth measurement and set the measurement count to 10:
OBW_SET ON,10
OBW_SET?
> ON,10

# OLVL

Output Level

### Function

Sets or queries RF output level.

### Command

```
OLVL level
```

### Query

```
OLVL?
```

### Response

level

| | |
|---|---|
| Unit | dBm |

### Parameter

level — Output level

| | |
|---|---|
| Range | |
| MU887000A | –130.0 to –10.0 dBm (Port 1/Port 2) |
| | –120.0 to 0.0 dBm (Port 3/Port 4) |
| MU887001A | –130.0 to –10.0 dBm (Port 1 to Port 4) |
| MU887002A | –130.0 to 0.0 dBm (TRX 1/2 Port 1 to Port 12) |
| Resolution | 0.1 dB |
| Suffix code | DBM (uses dBm when omitted) |
| Default | –55.0 dBm |

### Details

For MU887000A, the setting range varies with the output test port setting.
If cable loss correction is set to ON, the setting range of the output level is the range of values with subtracted cable loss.
If the cable loss is 5 dB, the MU887000A Port 1/Port 2 setting range is –135.0 to –15.0 dBm.

### Example of Use

To set the output level to –50.0 dBm:

```
OLVL -50.0
OLVL?
> -50.0
```

### Related Commands

EXTLOSSW
LOSSTBL
LOSSTBLVAL
For details of the commands, refer to Chapter 6 “Native Command Reference” in the *MU887000A TRX Test Module Operation Manual*.

## ORGNOFS?

Origin Offset Result

### Function

Queries Origin Offset measurement result.

### Query

```
ORGNOFS? mode
```

### Response

When mode = TTL

avg,max,min

When mode = other than TTL

origin

| | |
|---|---|
| Unit | dB |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| origin | Measurement result in specified Storage mode |

### Example of Use

To query the Origin Offset measurement result average:

ORGNOFS? AVG

> 0.01

# PEVM?

Peak EVM Result

### Function

Queries Peak EVM measurement result.

### Query

```
PEVM? mode
```

### Response

When mode = TTL

avg,max,min

When mode = other than TTL

pevm

| | |
|---|---|
| Unit | % |
| Resolution | 0.01% |

### Parameters

| | |
|---|---|
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| pevm | Measurement result in specified Storage mode |

### Example of Use

To query the Peak EVM measurement result average:

PEVM? AVG

> 0.01

## PHASEERR?

Phase Error Result

### Function

Queries Phase Error measurement result.

### Query

```
PHASEERR? mode
```

### Response

When mode = TTL

avg,max,min

When mode = other than TTL

perr

| | |
|---|---|
| Unit | degree |
| Resolution | 0.01 degree |

### Parameters

| | |
|---|---|
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| perr | Measurement result in specified Storage mode |

### Example of Use

To query the Phase Error measurement result average:

PHASEERR? AVG

> 0.01

# PREV

Protocol Revision

### Function

Sets or queries Protocol Revision.

### Command

```
PREV rev
```

### Query

```
PREV?
```

### Response

rev

### Parameter

| | |
|---|---|
| rev | Protocol Revision |
| REV0 | Rev.0 |
| REVA | Rev.A |
| Default | REV0 |

### Example of Use

To set Protocol Revision to Rev. 0.

PREV REV0

PREV?

> REV0

# PSIZE

Data Channel Payload Size

### Function

Sets or queries Data Channel Payload size.

### Command

```
PSIZE size
```

### Query

```
PSIZE?
```

### Response

size

| | |
|---|---|
| Unit | kbps |

### Parameter

| | |
|---|---|
| size | Data Channel Payload size |
| Range | 128, 256, 512, 768, 1024, 1536, 2048, 3072, 4096, 6144, 8192, 12288 |
| Suffix code | None |
| Default | 128 |

### Details

This is supported only when the Protocol Revision is Rev. A.

### Example of Use

To set Data Channel Payload size to 128 kbps:
PSIZE 128
PSIZE?
> 128

# PWR_SET

Tx Power Measurement Enable and Count

### Function

Enables Tx power measurement and sets or queries measurement count.

### Command

```
PWR_SET on_off[,count]
```

### Query

```
PWR_SET?
```

### Response

on_off,count

### Parameters

| | |
|---|---|
| on_off | Enables/disables measurement |
| ON | Enables measurement |
| OFF | Disables measurement |
| Default | ON |
| count | Measurement count |
| Range | 1 to 200 |
| Resolution | 1 |
| Suffix code | None |
| Default | 1 |

### Example of Use

To enable the Tx power measurement and set the measurement count to 10:
PWR_SET ON,10
PWR_SET?
> ON,10

# RHO?

Rho Result

## Function

Queries Rho (Waveform Quality) measurement result.

## Query

```
RHO? mode
```

## Response

When mode = TTL

avg,max,min

When mode = other than TTL

rho

| | |
|---|---|
| Unit | None |
| Resolution | 0.00001 |

## Parameters

| | |
|---|---|
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| rho | Measurement result in specified Storage mode |

## Example of Use

To query the Rho measurement result average:

RHO? AVG

> 0.00100

# RTCLCMI

Long Code Mask - I

### Function

Sets or queries Long Code Mask for I-phase.

### Command

```
RTCLCMI lcm
```

### Query

```
RTCLCMI?
```

### Response

lcm

### Parameters

| <lcm> | Long Code Mask - I |
|---|---|
| 00000000000 | 0x00000000000 |
| 3FF00000000 | 0x3FF00000000 |
| Default | 00000000000 |

### Example of Use

To set Long Code Mask - I to 0x00000000000.

RTCLCMI 00000000000

RTCLCMI?

> 00000000000

# RXFREQ

Output Frequency (Fwd.)

### Function

Sets or queries Forward Link center frequency.

### Command

```
RXFREQ freq
```

### Query

```
RXFREQ?
```

### Response

freq

| | |
|---|---|
| Unit | Hz |

### Parameter

| | |
|---|---|
| freq | Output Frequency (Fwd.) |
| Range | 400 000 000 to 3800 000 000 Hz |
| Resolution | 1 Hz |
| Suffix code | HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz when omitted) |
| Default | 873 660 000 Hz |

### Detail

The input frequency is changed to a value determined by the combination of the Band Class and channel after the channel number is changed.
Changing the output frequency does not change the channel number.

### Example of Use

To set the Forward Link frequency to 873.66 MHz:
RXFREQ 873.66MHZ
RXFREQ?
> 873660000

## SEM?

Spurious Emissions Judgement

### Function

Queries judgement about whether or not Spurious Emissions within template.

### Query

`SEM?`

### Response

judgement

### Parameter

| | |
|---|---|
| judgement | Judgement |
| PASS | Pass |
| FAIL | Fail |

### Example of Use

To query the Spurious Emissions judgement measurement result:

SEM?

> PASS

# SEMLVL_LOWER?

Spurious Emissions Peak Value (Lower)

## Function

Queries worst level and frequency of spectrum in each lower frequency range.

## Query

```
SEMLVL_LOWER?
```

## Response

bc,f_1,l_1,f_2,l_2,f_3,l_3,f_4,l_4,f_5,l_5

l_k

| | |
|---|---|
| Unit | dBc or dBm |
| Resolution | 0.01 dB |

f_k

| | |
|---|---|
| Unit | MHz |
| Resolution | 0.001 MHz |

## Parameters

| | |
|---|---|
| bc | Band Class |
| Range | 0 to 16, 18 to 21 |
| l_k | Worst level at offset frequency section k<br>999.99 is returned for out of target. |
| f_k | Offset frequency for worst value acquired by l<br>99999.999 is returned for out of target. |
| k | Offset frequency section |
| Range | 1, 2, 3, 4, 5 |

## Details

For the offset frequency points, refer to Table 2.4-1 “Spurious Emissions Specifications (1)” and Table 2.4-2 “Spurious Emissions Specifications (2)”.

## Example of Use

To query the worst value level and frequency of the spectrum in each lower frequency range in band class 6:

SEMLVL_LOWER?

> 6,1.000,-43.21,1.000,-54.32,2.000,-65.43,2.000,-76.54,3.000,-87.65

# SEMLVL_UPPER?

Spurious Emissions Peak Value (Upper)

### Function

Queries worst level and frequency of spectrum in each upper frequency range.

### Query

```
SEMLVL_UPPER?
```

### Response

bc,f_1,l_1,f_2,l_2,f_3,l_3,f_4,l_4,f_5,l_5

l_k

| | |
|---|---|
| Unit | dBc or dBm |
| Resolution | 0.01 dB |

f_k

| | |
|---|---|
| Unit | MHz |
| Resolution | 0.001 MHz |

### Parameters

| | |
|---|---|
| bc | Band Class |
| Range | 0 to 16, 18 to 21 |
| l_k | Worst level at offset frequency section k<br>999.99 is returned for out of target. |
| f_k | Offset frequency for worst value acquired by l<br>99999.999 is returned for out of target. |
| k | Offset frequency section |
| Range | 1, 2, 3, 4, 5 |

### Details

For the offset frequency points, refer to Table 2.4-1 “Spurious Emissions Specifications (1)” and Table 2.4-2 “Spurious Emissions Specifications (2)”.

### Example of Use

To query the worst value level and frequency of the spectrum in each upper frequency range in band class 6:

SEMLVL_UPPER?

> 6,1.000,-43.21,1.000,-54.32,2.000,-65.43,2.000,-76.54,3.000,-87.65

## SEMMARGIN_LOWER?

Spurious Emissions Template Margin (Lower)

### Function

Queries margin level from template for worst value and frequency of spectrum in each lower frequency range.

### Query

```
SEMMARGIN_LOWER?
```

### Response

bc,f_1,l_1,f_2,l_2,f_3,l_3,f_4,l_4,f_5,l_5

l_k

| | |
|---|---|
| Unit | dB |
| Resolution | 0.01 dB |

f_k

| | |
|---|---|
| Unit | MHz |
| Resolution | 0.001 MHz |

### Parameters

| | |
|---|---|
| bc | Band Class |
| Range | 0 to 16, 18 to 21 |
| l_k | Margin level for worst value at offset frequency section k<br>999.99 is returned for out of target. |
| f_k | Offset frequency of worst value acquired by l<br>99999.999 is returned for out of target. |
| k | Offset frequency section |
| Range | 1, 2, 3, 4, 5 |

### Details

For the offset frequency points, refer to Table 2.4-1 “Spurious Emissions Specifications (1)” and Table 2.4-2 “Spurious Emissions Specifications (2)”.

### Example of Use

To query the margin level from the template for the worst value and frequency of the spectrum in each lower frequency range in band class 6:

SEMMARGIN_LOWER?

> 6,1.000,20.00,1.000,21.00,2.000,22.00,2.000,23.00,3.000,24.00

# SEMMARGIN_UPPER?

Spurious Emissions Template Margin (Upper)

### Function

Queries the margin level from the template and frequency for the worst value of the spectrum in each upper frequency range.

### Query

```
SEMMARGIN_UPPER?
```

### Response

bc,f_1,l_1,f_2,l_2,f_3,l_3,f_4,l_4,f_5,l_5

l_k

| | |
|---|---|
| Unit | dB |
| Resolution | 0.01 dB |

f_k

| | |
|---|---|
| Unit | MHz |
| Resolution | 0.001 MHz |

### Parameters

| | |
|---|---|
| bc | Band Class |
| Range | 0 to 16, 18 to 21 |
| l_k | Margin level for the worst value among offset frequency section k<br>Returns 999.99 if it does not meet the condition. |
| f_k | The offset frequency of the worst value obtained with l<br>Returns 99999.999 if it does not meet the condition. |
| k | Offset frequency section |
| Range | 1, 2, 3, 4, 5 |

### Details

For the offset frequency points, refer to Table 2.4-1 “Spurious Emissions Specifications (1)” and Table 2.4-2 “Spurious Emissions Specifications (2)”.

### Example of Use

To query the margin level from the template and frequency for the worst value of the spectrum in each upper frequency range of the band class 6

SEMMARGIN_UPPER?

> 6,1.000,20.00,1.000,21.00,2.000,22.00,2.000,23.00,3.000,24.00

## SPR_SET

Spurious Emissions Enable and Count

### Function

Enables Spurious Emission measurement and sets or queries measurement count.

### Command

```
SPR_SET on_off[,count]
```

### Query

```
SPR_SET?
```

### Response

on_off,count

### Parameters

| | |
|---|---|
| on_off | Enables/disables |
| ON | Enables measurement |
| OFF | Disables measurement |
| Default | OFF |
| count | Measurement count |
| Range | 1 to 200 |
| Resolution | 1 |
| Suffix code | None |
| Default | 1 |

### Example of Use

To enable Spurious Emission measurement and set the measurement count to 10:
SPR_SET ON,10
SPR_SET?
> ON,10

## TAU?

Time Error Result

### Function

Queries Time Error measurement result.

### Query

```
TAU? mode
```

### Response

When mode = TTL

avg,max,min

When mode = other than TTL

time

| | |
|---|---|
| Unit | μs |
| Resolution | 0.01 μs |

### Parameters

| | |
|---|---|
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| time | Measurement result in specified Storage mode |

### Example of Use

To query the Time Error measurement result average:

TAU? AVG

> 0.01

## TAU_WORST?

Worst Time Error Result

### Function

Queries worst value of Time Error measurement result.

### Query

```
TAU_WORST?
```

### Response

time

| | |
|---|---|
| Unit | μs |
| Resolution | 0.01 μs |

### Parameter

| | |
|---|---|
| time | Worst value of Time Error |

### Example of Use

To query the worst value of the Time Error measurement result:

TAU_WORST?

> 0.01

# TXFREQ

Input Frequency (Rev.)

### Function

Sets or queries Reverse Link center frequency.

### Command

```
TXFREQ freq
```

### Query

```
TXFREQ?
```

### Response

freq

| | |
|---|---|
| Unit | Hz |

### Parameter

| | |
|---|---|
| freq | Input Frequency (Rev.) |
| Range | 400 000 000 to 3800 000 000 Hz |
| Resolution | 1 Hz |
| Suffix code | HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (used Hz when omitted) |
| Default | 828 660 000 Hz |

### Details

The input frequency is changed to a value determined by the combination of the Band Class and channel after the channel number is changed.
Changing the input frequency does not change the channel number.

### Example of Use

To set the Reverse Link center frequency to 828.66 MHz:
TXFREQ 828.66MHZ
TXFREQ?
> 828660000

## TXPWR?

Tx Power Result

### Function

Queries Tx power measurement result.

### Query

```
TXPWR? mode
```

### Response

When mode = TTL
avg,max,min
When mode = AVG,MAX,MIN or DVT
pwr
When mode = IND,
s,pwr(1), pwr(2),..., pwr(s)

| | |
|---|---|
| Unit | dBm |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| IND | The value in each measurement |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| pwr | Measurement result in specified Storage mode |
| pwr(s) | Power of sth measurement |
| s | Measurement count |
| Range | 1 to 200 |

### Example of Use

To query the Tx power measurement result average, maximum, and minimum:
TXPWR? TTL
> -10.05,-9.60,-10.50

# WAVEFMEAS?

Waveform

## Function

Queries waveform data for each measurement result.

## Query

```
WAVEFMEAS? format,position,length[,wl]
```

## Response

data[0],data[1],data[2],…,data[length–1]

When format = 2, 3, or 4

| | |
|---|---|
| Unit | dBm |
| Resolution | 0.01 dB |

When format = 1, 5 or 6

| | |
|---|---|
| Unit | dB |
| Resolution | 0.01 dB |

## Parameters

| | | |
|---|---|---|
| format | Format | |
| 1 | OBW Wave Data | |
| 2 | Spurious Emissions Wave Data (RB 30 kHz) | |
| 3 | Spurious Emissions Wave Data (RB 1 MHz) | |
| 4 | Spurious Emissions Wave Data (RB 1.23 MHz) | |
| 5 | Code Domain Power Wave Data (I) | |
| 6 | Code Domain Power Wave Data (Q) | |
| position | Starting point of waveform data | |
| Range | When format = 1, | 0 to 620 (–1.5 to 1.5 MHz) |
| | When format = 2, 3, or 4, | 0 to 1892 (–4.615 to 4.615 MHz) |
| | When format = 5 or 6, | 0 to (wl–1) |
| Resolution | 1 | |
| length | Number data read | |
| Range | When format = 1, | 1 to (621–position) |
| | When format = 2, 3, or 4, | 1 to (1893–position) |
| | When format = 5 or 6, | 1 to (wl–position) |
| Resolution | 1 | |
| wl | Walsh Code Length | |
| Range | 2, 4, 8, 16 | |
| data[length–1] | Waveform data | |

## Details

wl cannot be set when format is 1 to 4. (An error is returned at input.)

wl cannot be omitted when format is 5 or 6. (An error is returned if it is omitted.)

Example of Use

To query the Code Domain Power Q phase measurement result waveform data:
WAVEFMEAS? 6,0,8,8
> 0.10,0.11,0.12,0.13,0.14,0.15,0.16,0.17

## 5.2.3 Sequence measurement commands

### DLFREQ

Downlink Frequency

#### Function

Sets or queries the downlink frequency.

#### Command

```
DLFREQ dl_freq
```

#### Query

```
DLFREQ?
```

#### Response

dl_fleq

| | |
|---|---|
| Unit | Hz |

#### Parameter

| | |
|---|---|
| dl_freq | Downlink frequency |
| Range | 400 000 000 to 3800 000 000 Hz |
| Resolution | 1 Hz |
| Suffix code | HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz when omitted) |
| Default | 2140 000 000 Hz |

#### Details

The Rx frequency for the mobile station is set.
Changing the setting of downlink frequency does not change the setting of the downlink channel.

#### Example of Use

To set the Downlink Frequency to 2050 MHz:
DLFREQ 2050MHZ
DLFREQ?
> 2050000000

# EVDO_BAND

Band Class for Spurious Emissions Limit

## Function

Sets or queries band class to determine Spurious Emissions Limit range in the Sequence Measurement mode.

## Command

```
EVDO_BAND mcond,band
```

## Query

```
EVDO_BAND? mcond
```

## Response

band

## Parameters

| | |
|---|---|
| mcond | Measurement condition number |
| Range | 0 to 1999 |
| Resolution | 1 |
| band | Band class |
| Range | 0 to 16, 18 to 21 |
| Resolution | 1 |
| Default | 0 |

## Details

This parameter sets the band class determining the Spurious Emissions Limit range.

## Example of Use

To set the band class determining the Spurious Emissions Limit range to 10 in the Sequence Measurement mode with measurement condition number 3:

EVDO_BAND 3,10

EVDO_BAND? 3

> 10

## Remarks

Use the following command to set the band class to determine the frequency.

```
BANDCLASS
```

# EVDO_CDP_ACK?

ACK Channel Power

## Function

Queries Reverse ACK Channel Power measurement result in the Sequence Measurement mode.

## Query

```
EVDO_CDP_ACK? seg,mode[,unit]
```

## Response

When mode = TTL

avg,max,min

When mode = other than TTL

pwr

| | |
|---|---|
| Unit | Depends on parameter unit |
| Resolution | 0.01 dB |

## Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| unit | Query Unit |
| IOR | Ior (Total Power) reference value (dB/Ior) |
| PILOT | Pilot Channel reference value (dB/Pilot) (uses Ior when unit omitted) |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| pwr | Measurement result in specified Storage mode |

## Example of Use

To query the ACK Channel Power measurement result average value for segment number 3 in the Sequence Measurement mode:

EVDO_CDP_ACK? 3,AVG

> 0.01

# EVDO_CDP_AUX?

Auxiliary Pilot Channel Power

### Function

Queries Reverse Auxiliary Pilot Channel Power measurement result in Sequence Measurement mode.

### Query

```
EVDO_CDP_AUX? seg,mode[,unit]
```

### Response

When mode = TTL

avg,max,min

When mode = other than TTL

pwr

| | |
|---|---|
| Unit | Depends on parameter unit |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| unit | Query Unit |
| IOR | Ior (Total Power) reference value (dB/Ior) |
| PILOT | Pilot Channel reference value (dB/Pilot) (uses Ior when unit omitted) |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| pwr | Measurement result in specified Storage mode |

### Details

A valid data is acquired only when the Protocol Revision is Rev. A.

### Example of Use

To query the Auxiliary Pilot Channel Power measurement result average value for segment number 3 in the Sequence Measurement mode:

EVDO_CDP_AUX? 3,AVG

> 0.01

# EVDO_CDP_DATA?

DATA Channel Power

## Function

Queries Reverse DATA Channel Power measurement result in Sequence Measurement mode.

## Query

```
EVDO_CDP_DATA? seg,mode[,unit]
```

## Response

When mode = TTL

avg,max,min

When mode = other than TTL

pwr

| | |
|---|---|
| Unit | Depends on parameter unit |
| Resolution | 0.01 dB |

## Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| unit | Query Unit |
| IOR | Ior (Total Power) reference value (dB/Ior) |
| PILOT | Pilot Channel reference value (dB/Pilot)<br>(uses Ior when unit omitted) |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| pwr | Measurement result in specified Storage mode |

## Example of Use

To query the average value of the DATA Channel Power measurement result segment number 3 in the Sequence Measurement mode:

EVDO_CDP_DATA? 3,AVG

> 0.01

# EVDO_CDP_DRC?

DRC Channel Power

## Function

Queries Reverse DRC Channel (Data Rate Channel) Power measurement result in Sequence Measurement mode.

## Query

```
EVDO_CDP_DRC? seg,mode[,unit]
```

## Response

When mode = TTL

avg,max,min

When mode = other than TTL

pwr

| | |
|---|---|
| Unit | Depends on parameter unit |
| Resolution | 0.01 dB |

## Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| unit | Query Unit |
| IOR | Ior (Total Power) reference value (dB/Ior) |
| PILOT | Pilot Channel reference value (dB/Pilot) (uses Ior when unit omitted) |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| pwr | Measurement result in specified Storage mode |

## Example of Use

To query the DRC Channel Power measurement result average value for segment number 3 in the Sequence Measurement mode:

EVDO_CDP_DRC? 3,AVG

> 0.01

# EVDO_CDP_DSC?

DSC Channel Power

## Function

Queries Reverse DSC Channel (Data Source Channel) Power measurement result in Sequence Measurement mode.

## Query

```
EVDO_CDP_DSC? seg,mode[,unit]
```

## Response

When mode = TTL

avg,max,min

When mode = other than TTL

pwr

| | |
|---|---|
| Unit | Depends on parameter unit |
| Resolution | 0.01 dB |

## Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| unit | Query Unit |
| IOR | Ior (Total Power) reference value (dB/Ior) |
| PILOT | Pilot Channel reference value (dB/Pilot) |
| | (uses Ior when unit omitted) |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| pwr | Measurement result in specified Storage mode |

## Details

A valid data is acquired only when the protocol Revision is Rev. A.

## Example of Use

To query the DSC Channel Power measurement result average value for segment number 3 in the Sequence Measurement mode:

EVDO_CDP_DSC? 3,AVG

> 0.01

# EVDO_CDP_PILOT?

R-PICH Power

## Function

Queries R-PICH (Reverse Pilot Channel) Power measurement result in Sequence Measurement mode.

## Query

```
EVDO_CDP_PILOT? seg,mode
```

## Response

When mode = TTL

avg,max,min

When mode = other than TTL

pwr

| | |
|---|---|
| Unit | dB/Ior |
| Resolution | 0.01 dB |

## Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| pwr | Measurement result in specified Storage mode |

## Example of Use

To query the R-PICH power measurement result average in segment number 3 in the Sequence Measurement mode:

EVDO_CDP_PILOT? 3,AVG

> 0.01

# EVDO_CDP_RRI?

RRI Channel Power

## Function

Queries Reverse RRI Channel (Reverse Rate Indicator Channel) Power measurement result in Sequence Measurement mode.

## Query

```
EVDO_CDP_RRI? seg,mode[,unit]
```

## Response

When mode = TTL

avg,max,min

When mode = other than TTL

pwr

| | |
|---|---|
| Unit | Depends on parameter unit |
| Resolution | 0.01 dB |

## Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| unit | Query Unit |
| IOR | Ior (Total Power) reference value (dB/Ior) |
| PILOT | Pilot Channel reference value (dB/Pilot) (uses Ior when unit omitted) |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| pwr | Measurement result in specified Storage mode |

## Example of Use

To query the RRI Channel Power measurement result average value for segment number 3 in the Sequence Measurement mode:

EVDO_CDP_RRI? 3,AVG

> 0.01

# EVDO_CDP_SET

Code Domain Power Enable and Count

## Function

Enables Modulation Analysis Code Domain Power Measurement and sets or queries measurement count in Sequence Measurement mode.

## Command

```
EVDO_CDP_SET mcond,on_off[,count]
```

## Query

```
EVDO_CDP_SET? mcond
```

## Response

on_off,count

## Parameters

| | |
|---|---|
| mcond | Measurement condition number |
| Range | 0 to 1999 |
| Resolution | 1 |
| on_off | Enables/disables measurement |
| ON | Enables measurement |
| OFF | Disables measurement |
| Default | OFF |
| count | Measurement count |
| Range | 1 to 200 |
| Resolution | 1 |
| Suffix code | None |
| Default | 1 |

## Example of Use

To enable the Code Domain Power measurement and set the measurement count to 10 in the Sequence Measurement mode with measurement condition number 3:

EVDO_CDP_SET 3,ON,10

EVDO_CDP_SET? 3

> ON,10

# EVDO_CFERR?

Carrier Frequency Error Result

### Function

Queries Carrier Frequency Error measurement result in Sequence Measurement mode.

### Query

```
EVDO_CFERR? seg,mode
```

### Response

When mode = TTL

avg_ppm,avg_Hz,max_ppm,max_Hz,min_ppm,min_Hz

When mode = other than TTL

freq_ppm,freq_Hz

xxx_ppm

| | |
|---|---|
| Unit | ppm |
| Resolution | 0.01 ppm |

xxx_Hz

| | |
|---|---|
| Unit | Hz |
| Resolution | 0.1 Hz |

### Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| avg_ppm | Measurement result in ppm (Average) |
| avg_Hz | Measurement result in Hz (Average) |
| max_ppm | Measurement result in ppm (Maximum) |
| max_Hz | Measurement result in Hz (Maximum) |
| min_ppm | Measurement result in ppm (Minimum) |
| min_Hz | Measurement result in Hz (Minimum) |
| freq_ppm | Measurement result in ppm in specified Storage mode |
| freq_Hz | Measurement result in Hz in specified Storage mode |

### Example of Use

To query the Carrier Frequency Error measurement result average in segment number 3 in the Sequence Measurement mode:

EVDO_CFERR? 3,AVG

> 0.50,431.1

# EVDO_CFERR_WORST?

Worst Carrier Frequency Error Result

## Function

Queries worst value of Carrier Frequency Error measurement result in the Sequence Measurement mode.

## Query

```
EVDO_CFERR_WORST? seg
```

## Response

freq_ppm,freq_Hz

freq_ppm

| | |
|---|---|
| Unit | ppm |
| Resolution | 0.01 ppm |

freq_Hz

| | |
|---|---|
| Unit | Hz |
| Resolution | 0.1 Hz |

## Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| freq_ppm | Worst value in frequency error measurement results in ppm |
| freq_Hz | Worst value in frequency error measurement results in Hz |

## Example of Use

To query the worst value in the Carrier Frequency Error measurement result in segment number 3 in the Sequence Measurement mode:

EVDO_CFERR_WORST? 3

> 1.00,862.2

# EVDO_CFREQ?

Carrier Frequency Result

## Function

Queries Carrier Frequency measurement result in Sequence Measurement mode.

## Query

```
EVDO_CFREQ? seg
```

## Response

freq

| | |
|---|---|
| Unit | Hz |
| Resolution | 1 Hz |

## Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| freq | Carrier frequency |

## Example of Use

To query the Carrier Frequency measurement result in segment number 3 in the Sequence Measurement mode:

EVDO_CFREQ? 3

> 862200000

# EVDO_EVM?

EVM Result

## Function

Queries EVM measurement result in Sequence Measurement mode.

## Query

```
EVDO_EVM? seg,mode
```

## Response

When mode = TTL

avg,max,min

When mode = other than TTL

evm

| | |
|---|---|
| Unit | % |
| Resolution | 0.01% |

## Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| evm | Measurement result in specified Storage mode |

## Example of Use

To query the EVM measurement result average in segment number 3 in the Sequence Measurement mode:

EVDO_EVM? 3,AVG

> 0.01

# EVDO_FILTPWR?

Filtered Power Result

### Function

Queries Filtered Power measurement result in Sequence Measurement mode.

### Query

```
EVDO_FILTPWR? seg,mode
```

### Response

When mode = TTL
avg,max,min
When mode = AVG, MAX, MIN or DVT
pwr
When mode = IND,
s,pwr(1), pwr(2),..., pwr(s)

| | |
|---|---|
| Unit | dBm |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| IND | Value at each measurement |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| pwr | Measurement result in specified Storage mode |
| pwr(s) | Power of sth measurement |
| s | Measurement count |
| Range | 1 to 200 |

### Example of Use

To query the Filtered Power measurement result average, maximum, and minimum in segment number 3 in the Sequence Measurement mode:
EVDO_FILTPWR? 3,TTL
> -10.05,-9.60,-10.50

# EVDO_LSCODESEARCH

Long Span Code Search

### Function

Enables and queries Long Span Code Search function in Sequence Measurement mode.

### Command

```
EVDO_LSCODESEARCH on_off
```

### Query

```
EVDO_LSCODESEARCH?
```

### Response

on_off

### Parameter

| | |
|---|---|
| on_off | Enables/disables Long Span Code Search |
| ON | Enables Long Span Code Search |
| OFF | Disables Long Span Search |
| Default | OFF |

### Details

Set this parameter to OFF when the Reverse Link and Forward Link signals are synchronized; set it to ON when they are not synchronized.

### Example of Use

To enable the Long Span Code Search in the Sequence Measurement mode:
EVDO_LSCODESEARCH ON
EVDO_LSCODESEARCH?
> ON

# EVDO_MAGERR?

Magnitude Error Result

### Function

Queries Magnitude Error measurement result in Sequence Measurement mode.

### Query

```
EVDO_MAGERR? seg,mode
```

### Response

When mode = TTL

avg,max,min

When mode = other than TTL

merr

| | |
|---|---|
| Unit | % |
| Resolution | 0.01% |

### Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| merr | Measurement result in specified Storage mode |

### Example of Use

To query the Magnitude Error measurement result average in segment number 3 in the Sequence Measurement mode:

EVDO_MAGERR? 3,AVG

> 0.01

# EVDO_MAXINACTCODE?

Max Inactive Channel Power

## Function

Queries channel outputting maximum power among inactive code channels, and power measurement result in Sequence Measurement mode.

## Query

```
EVDO_MAXINACTCODE? seg
```

## Response

pwr,ph,wn,wl

pwr
- Unit dB

wn
- Unit None

wl
- Unit None

## Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| pwr | Max Inactive Channel Power |
| Resolution | 0.01 dB |
| ph | Phase (I/Q) of target channel |
| I | I-phase |
| Q | Q-phase |
| wn | Walsh Code Number of target channel |
| Resolution | 1 |
| wl | Walsh Code Length of target channel |
| Resolution | 1 |

## Details

When executing more than two measurements using a single measurement start, the result of the last measurement is returned for (Meas. Count ≥ 2).

## Example of Use

To query the channel outputting the maximum power among inactive code channels and the power measurement result in segment number 3 in the Sequence Measurement mode:
EVDO_MAXINACTCODE? 3
> 3.00,Q,2,8

# EVDO_MEAS_OFF

Turn Off All Measurement Items

### Function

Sets all measurement items to Off collectively.

### Command

```
EVDO_MEAS_OFF mcond
```

### Parameters

| | |
|---|---|
| mcond | Measurement condition number |
| Range | 0 to 1999 |
| Resolution | 1 |

### Example of Use

To set all measurement items of condition number 0 in the sequence measurement to Off.
EVDO_MEAS_OFF 0

### Remarks

This is equivalent to setting all the commands below to Off.
EVDO_PWR_SET
EVDO_OBW_SET
EVDO_SPR_SET
EVDO_MOD_SET
EVDO_CDP_SET

# EVDO_MOD_SET

Modulation Analysis Enable and Count

## Function

Enables Modulation Analysis Measurement and sets or queries measurement count in Sequence Measurement mode.

## Command

```
EVDO_MOD_SET mcond,on_off[,count]
```

## Query

```
EVDO_MOD_SET? mcond
```

## Response

on_off,count

## Parameters

| | |
|---|---|
| mcond | Measurement condition number |
| Range | 0 to 1999 |
| Resolution | 1 |
| on_off | Enables/disables measurement |
| ON | Enables measurement |
| OFF | Disables measurement |
| Default | OFF |
| count | Measurement count |
| Range | 1 to 200 |
| Resolution | 1 |
| Suffix code | None |
| Default | 1 |

## Example of Use

To enable the Modulation Analysis measurement in the Sequence Measurement mode with the measurement condition number 3 and set the measurement count to 10:

EVDO_MOD_SET 3,ON,10

EVDO_MOD_SET? 3

> ON,10

# EVDO_OBW?

OBW Result

## Function

Queries Occupied Bandwidth measurement result in Sequence Measurement mode.

## Query

```
EVDO_OBW? seg
```

## Response

bw

| | |
|---|---|
| Unit | MHz |
| Resolution | 1 kHz |

## Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| bw | Occupied Bandwidth [MHz] |

## Example of Use

To query the Occupied Bandwidth measurement result in segment number 3 in the Sequence Measurement mode:

EVDO_OBW? 3

> 0.100

# EVDO_OBWFREQ?

OBW Frequency Result

## Function

Queries upper, lower, and center frequencies of Occupied Bandwidth measurement result in Sequence Measurement mode.

## Query

```
EVDO_OBWFREQ? seg,pos
```

## Response

freq

| | |
|---|---|
| Unit | MHz |
| Resolution | 1 kHz |

## Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| pos | Offset type |
| UPPER | Upper frequency |
| LOWER | Lower frequency |
| CENTER | Center frequency |
| freq | Offset frequency [MHz] |

## Example of Use

To query the Occupied Bandwidth measurement center frequency result in segment number 3 in the Sequence Measurement mode:

EVDO_OBWFREQ? 3,CENTER

> 862.200

# EVDO_OBW_RATIO

Occupied Bandwidth Ratio

### Function

Sets or queries Occupied Bandwidth measurement occupation ratio in Sequence Measurement mode.

### Command

```
EVDO_OBW_RATIO ratio
```

### Query

```
EVDO_OBW_RATIO?
```

### Response

ratio

### Parameter

| | |
|---|---|
| ratio | Occupied Bandwidth occupation ratio |
| Range | 80.0 to 99.9% |
| Resolution | 0.1% |
| Suffix code | % (uses % when omitted) |
| Default | 99.0% |

### Example of Use

To set the Occupied Bandwidth occupation ratio to 99.0% in the Sequence Measurement mode:

EVDO_OBW_RATIO 99.0

EVDO_OBW_RATIO?

> 99.0

# EVDO_OBW_SET

Occupied Bandwidth Enable and Count

## Function

Enables Occupied Bandwidth measurement and sets or queries measurement count in Sequence Measurement mode.

## Command

```
EVDO_OBW_SET mcond,on_off[,count]
```

## Query

```
EVDO_OBW_SET? mcond
```

## Response

on_off,count

## Parameters

| | |
|---|---|
| mcond | Measurement condition number |
| Range | 0 to 1999 |
| Resolution | 1 |
| on_off | Enables/disables measurement |
| ON | Enables measurement |
| OFF | Disables measurement |
| Default | OFF |
| count | Measurement count |
| Range | 1 to 200 |
| Resolution | 1 |
| Suffix code | None |
| Default | 1 |

## Example of Use

To enable the Occupied Bandwidth measurement and set the measurement count to 10 in the Sequence Measurement mode with measurement condition number 3:

EVDO_OBW_SET 3,ON,10

EVDO_OBW_SET? 3

> ON,10

# EVDO_ORGNOFS?

Origin Offset Result

### Function

Queries Origin Offset measurement result in the Sequence Measurement mode.

### Query

```
EVDO_ORGNOFS? seg,mode
```

### Response

When mode = TTL

avg,max,min

When mode = other than TTL

origin

| | |
|---|---|
| Unit | dB |
| Resolution | 0.01 dB |

### Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| origin | Measurement result in specified Storage mode |

### Example of Use

To query the Origin Offset measurement result average in segment number 3 in the Sequence Measurement mode:

EVDO_ORGNOFS? 3,AVG

> 0.01

## EVDO_PEVM?

Peak EVM Result

### Function

Queries Peak EVM measurement result in Sequence Measurement mode.

### Query

```
EVDO_PEVM? seg,mode
```

### Response

When mode = TTL

avg,max,min

When mode = other than TTL

pevm

| | |
|---|---|
| Unit | % |
| Resolution | 0.01% |

### Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| pevm | Measurement result in specified Storage mode |

### Example of Use

To query the Peak EVM measurement result average in segment number 3 in the Sequence Measurement mode:

EVDO_PEVM? 3,AVG

> 0.01

# EVDO_PHASEERR?

Phase Error Result

### Function

Queries Phase Error measurement result in Sequence Measurement mode.

### Query

```
EVDO_PHASEERR? seg,mode
```

### Response

When mode = TTL

avg,max,min

When mode = other than TTL

perr

| | |
|---|---|
| Unit | degree |
| Resolution | 0.01 degree |

### Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| perr | Measurement result in specified Storage mode |

### Example of Use

To query the Phase Error measurement result average in segment number 3 in the Sequence Measurement mode:

EVDO_PHASEERR? 3,AVG

> 0.01

# EVDO_PREV

Protocol Revision

### Function

Sets or queries Protocol Revision.

### Command

```
EVDO_PREV rev
```

### Query

```
EVDO_PREV?
```

### Response

rev

### Parameter

| | |
|---|---|
| rev | Protocol Revision |
| REV0 | Rev.0 |
| REVA | Rev.A |
| Default | REV0 |

### Example of Use

To set Protocol Revision to Rev.0:

EVDO_PREV REV0

EVDO_PREV?

> REV0

# EVDO_PSIZE

Data Channel Payload Size

### Function

Sets or queries Data Channel Payload Size.

### Command

```
EVDO_PSIZE size
```

### Query

```
EVDO_PSIZE?
```

### Response

size

| | |
|---|---|
| Unit | kbps |

### Parameter

| | |
|---|---|
| size | Data channel payload size |
| Range | 128, 256, 512, 768, 1024, 1536, 2048, 3072, 4096, 6144, 8192, 12288 |
| Suffix code | None |
| Default | 128 |

### Details

This is only enabled when the Protocol Revision is Rev. A.

### Example of Use

To set Data Channel Payload Size to 128 kbps:
EVDO_PSIZE 128
EVDO_PSIZE?
> 128

# EVDO_PWR_SET

Tx Power Measurement Enable and Count

### Function

Enables Tx power measurement and sets or queries measurement count in the Sequence Measurement mode.

### Command

```
EVDO_PWR_SET mcond,on_off[,count]
```

### Query

```
EVDO_PWR_SET? mcond
```

### Response

on_off,count

### Parameters

| | |
|---|---|
| mcond | Measurement Condition Number |
| Range | 0 to 1999 |
| Resolution | 1 |
| on_off | Turns on or off the measurement |
| ON | Executes the measurement |
| OFF | Does not execute the measurement |
| Default | ON |
| count | Measurement count |
| Range | 1 to 200 |
| Resolution | 1 |
| Suffix code | None |
| Default | 1 |

### Example of Use

To enable Tx power measurement and set the measurement count to 10 in the Sequence Measurement mode with measurement condition number 3:

EVDO_PWR_SET 3,ON,10

EVDO_PWR_SET? 3

> ON,10

# EVDO_RHO?

Rho Result

### Function

Queries Rho (waveform quality) measurement result in Sequence Measurement mode.

### Query

```
EVDO_RHO? seg,mode
```

### Response

When mode = TTL

avg,max,min

When mode = other than TTL

rho

| | |
|---|---|
| Unit | None |
| Resolution | 0.00001 |

### Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| rho | Measurement result in specified Storage mode |

### Example of Use

To query the Rho measurement result average in segment number 3 in the Sequence Measurement mode:

EVDO_RHO? 3,AVG

> 0.00100

## EVDO_SEM?

Spurious Emissions Judgement

### Function

Queries judgement whether or not Spurious Emissions within template in Sequence Measurement mode.

### Query

```
EVDO_SEM? seg
```

### Response

judgement

### Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| judgement | Judgement |
| PASS | Pass |
| FAIL | Fail |

### Example of Use

To query the Spurious Emissions judgement result in segment number 3 in the Sequence Measurement mode:

EVDO_SEM? 3

> PASS

# EVDO_SEMLVL_LOWER?

Spurious Emissions Peak Value (Lower)

### Function

Queries worst level and frequency of spectrum in each lower frequency range in Sequence Measurement mode.

### Query

```
EVDO_SEMLVL_LOWER? seg
```

### Response

bc,f_1,l_1,f_2,l_2,f_3,l_3,f_4,l_4,f_5,l_5

l_k

| | |
|---|---|
| Unit | dBc or dBm |
| Resolution | 0.01 dB |

f_k

| | |
|---|---|
| Unit | MHz |
| Resolution | 0.001 MHz |

### Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| bc | Band Class |
| Range | 0 to 16, 18 to 21 |
| l_k | Worst level at offset frequency section k<br>999.99 is returned for out of target. |
| f_k | Offset frequency for worst value acquired by l<br>99999.999 is returned for out of target. |
| k | Offset frequency section |
| Range | 1, 2, 3, 4, 5 |

### Details

For the offset frequency points, refer to Table 2.4-1 “Spurious Emissions Specifications (1)” and Table 2.4-2 “Spurious Emissions Specifications (2)”.

### Example of Use

To query the worst value level and frequency of the spectrum in each lower frequency range in band class 6 and segment number 3 in the Sequence Measurement mode:
EVDO_SEMLVL_LOWER? 3
> 6,1.000,-43.21,1.000,-54.32,2.000,-65.43,2.000,-76.54,3.000,-87.65

# EVDO_SEMLVL_UPPER?

Spurious Emissions Peak Value (Upper)

## Function

Queries worst level and frequency of spectrum in each upper frequency range in Sequence Measurement mode.

## Query

```
EVDO_SEMLVL_UPPER? seg
```

## Response

bc,f_1,l_1,f_2,l_2,f_3,l_3,f_4,l_4,f_5,l_5

l_k

| | |
|---|---|
| Unit | dBc or dBm |
| Resolution | 0.01 dB |

f_k

| | |
|---|---|
| Unit | MHz |
| Resolution | 0.001 MHz |

## Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| bc | Band Class |
| Range | 0 to 16, 18 to 21 |
| l_k | Worst level at offset frequency section k<br>999.99 is returned for out of target. |
| f_k | Offset frequency for worst value acquired by l<br>99999.999 is returned for out of target. |
| k | Offset frequency section |
| Range | 1, 2, 3, 4, 5 |

## Details

For the offset frequency points, refer to Table 2.4-1 “Spurious Emissions Specifications (1)” and Table 2.4-2 “Spurious Emissions Specifications (2)”.

## Example of Use

To query the worst value level and frequency of the spectrum in each upper frequency range in band class 6 and segment number 3 in the Sequence Measurement mode:

EVDO_SEMLVL_UPPER? 3

> 6,1.000,-43.21,1.000,-54.32,2.000,-65.43,2.000,-76.54,3.000,-87.65

# EVDO_SEMMARGIN_LOWER?

Spurious Emissions Template Margin (Lower)

### Function

Queries margin level from template for worst value and frequency of spectrum in each lower frequency range in Sequence Measurement mode.

### Query

```
EVDO_SEMMARGIN_LOWER? seg
```

### Response

bc,f_1,l_1,f_2,l_2,f_3,l_3,f_4,l_4,f_5,l_5

l_k

| | |
|---|---|
| Unit | dB |
| Resolution | 0.01 dB |

f_k

| | |
|---|---|
| Unit | MHz |
| Resolution | 0.001 MHz |

### Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| bc | Band Class |
| Range | 0 to 16, 18 to 21 |
| l_k | Margin level for worst value at offset frequency section k<br>999.99 is returned for out of target. |
| f_k | Offset frequency of worst value acquired by l<br>99999.999 is returned for out of target. |
| k | Offset frequency section |
| Range | 1, 2, 3, 4, 5 |

### Details

For the offset frequency points, refer to Table 2.4-1 “Spurious Emissions Specifications (1)” and Table 2.4-2 “Spurious Emissions Specifications (2)”.

### Example of Use

To query the margin level from the template for worst value and frequency of the spectrum in each lower frequency range in band class 6 in the Sequence Measurement mode:
EVDO_SEMMARGIN_LOWER? 3
> 6,1.000,20.00,1.000,21.00,2.000,22.00,2.000,23.00,3.000,24.00

## EVDO_SEMMARGIN_UPPER?

Spurious Emissions Template Margin (Upper)

### Function

Queries margin level from template for worst value and frequency of spectrum in each upper frequency range in Sequence Measurement mode.

### Query

```
EVDO_SEMMARGIN_UPPER? seg
```

### Response

bc,f_1,l_1,f_2,l_2,f_3,l_3,f_4,l_4,f_5,l_5

l_k

| | |
|---|---|
| Unit | dB |
| Resolution | 0.01 dB |

f_k

| | |
|---|---|
| Unit | MHz |
| Resolution | 0.001 MHz |

### Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| bc | Band Class |
| Range | 0 to 16, 18 to 21 |
| l_k | Margin level for worst value at offset frequency section k<br>999.99 is returned for out of target. |
| f_k | Offset frequency of worst value acquired by l<br>99999.999 is returned for out of target. |
| k | Offset frequency section |
| Range | 1, 2, 3, 4, 5 |

### Details

For the offset frequency points, refer to Table 2.4-1 “Spurious Emissions Specifications (1)” and Table 2.4-2 “Spurious Emissions Specifications (2)”.

### Example of Use

To query the margin level from the template for worst value and frequency of the spectrum in each lower frequency range in band class 6 in the Sequence Measurement mode:

EVDO_SEMMARGIN_UPPER? 3

> 6,1.000,20.00,1.000,21.00,2.000,22.00,2.000,23.00,3.000,24.00

# EVDO_SPR_SET

Spurious Emissions Enable and Count

### Function

Enables Spurious Emission measurement and sets or queries measurement count in Sequence Measurement mode.

### Command

```
EVDO_SPR_SET mcond,on_off[,count]
```

### Query

```
EVDO_SPR_SET? mcond
```

### Response

on_off,count

### Parameters

| | |
|---|---|
| mcond | Measurement Condition Number |
| Range | 0 to 1999 |
| Resolution | 1 |
| on_off | Enables/disables |
| ON | Enables measurement |
| OFF | Disables measurement |
| Default | OFF |
| count | Measurement count |
| Range | 1 to 200 |
| Resolution | 1 |
| Suffix code | None |
| Default | 1 |

### Example of Use

To enable the Spurious Emissions measurement and set the measurement count to 10 in the Sequence Measurement mode with the measurement condition number 3:

EVDO_SPR_SET 3,ON,10

EVDO_SPR_SET? 3

> ON,10

# EVDO_TAU?

Time Error Result

## Function

Queries Time Error measurement result in Sequence Measurement mode.

## Query

```
EVDO_TAU? seg,mode
```

## Response

When mode = TTL

avg,max,min

When mode = other than TTL

time

| | |
|---|---|
| Unit | μs |
| Resolution | 0.01 μs |

## Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| time | Measurement result in specified Storage mode |

## Example of Use

To query the Time Error measurement result average for segment number 3 in the Sequence Measurement mode:

EVDO_TAU? 3,AVG

> 0.01

# EVDO_TAU_WORST?

Worst Time Error Result

### Function

Queries worst value of Time Error measurement result in Sequence Measurement mode.

### Query

```
EVDO_TAU_WORST? seg
```

### Response

time

| | |
|---|---|
| Unit | μs |
| Resolution | 0.01 μs |

### Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| time | Worst value of Time Error |

### Example of Use

To query the worst value of the Time Error measurement result for segment number 3 in the Sequence Measurement mode:

EVDO_TAU_WORST? 3

> 0.01

# EVDO_TXPWR?

Tx Power Result

## Function

Queries Tx power measurement result in Sequence Measurement mode.

## Query

```
EVDO_TXPWR? seg,mode
```

## Response

When mode = TTL

avg,max,min

When mode = AVG, MAX, MIN or DVT

pwr

When mode = IND,

s,pwr(1), pwr(2),..., pwr(s)

| | |
|---|---|
| Unit | dBm |
| Resolution | 0.01 dB |

## Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| mode | Storage mode |
| AVG | Average |
| MAX | Maximum |
| MIN | Minimum |
| TTL | Average・Maximum・Minimum |
| DVT | Standard deviation |
| IND | The value in each measurement |
| avg | Measurement result (Average) |
| max | Measurement result (Maximum) |
| min | Measurement result (Minimum) |
| pwr | Measurement result in specified Storage mode |
| pwr(s) | Power of sth measurement |
| s | Measurement count |
| Range | 1 to 200 |

## Example of Use

To query the Tx power measurement result average, maximum, and minimum for segment number 3 in the Sequence Measurement mode:

EVDO_TXPWR? 3,TTL

> -10.05,-9.60,-10.50

# ILVL

Input Level

## Function

Sets or queries input level of the input test port.

## Command

```
ILVL level
```

## Query

```
ILVL?
```

## Response

level

| | |
|---|---|
| Unit | dBm |

## Parameter

| | |
|---|---|
| level | Input level |
| Range | |
| MU887000A | –65.0 to +35.0 dBm (Port 1/Port 2) |
| | –65.0 to +25.0 dBm (Port 3/Port 4) |
| MU887001A | –65.0 to +35.0 dBm (Port 1 to Port 4) |
| MU887002A | –65.0 to +35.0 dBm (TRX 1/2 Port 1 to Port 12) |
| Resolution | 0.1 dB |
| Suffix code | DBM (uses dBm when omitted) |
| Default | –23.7 dBm |

## Details

For MU887000A, the setting range varies with input test port setting.
If cable loss correction is set to ON, the setting range of the input level is the range of values with added cable loss.
If the cable loss is 5 dB, the MU887000A Port 1/Port 2 setting range is –60.0 to +40.0 dBm.

## Example of Use

To set the input level to –10.0 dBm:
ILVL -10.0
To query the set input level
ILVL?
> -10.0

## Related Commands

EXTLOSSW
LOSSTBL
LOSSTBLVAL
For details of the commands, refer to Chapter 6 “Native Command Reference” in the *MU887000A TRX Test Module Operation Manual*.

## OLVL

Output Level

### Function

Sets or queries RF signal output level.

### Command

```
OLVL level
```

### Query

```
OLVL?
```

### Response

level

| | |
|---|---|
| Unit | dBm |

### Parameter

level Output level

| | | |
|---|---|---|
| Range | | |
| MU887000A | –130.0 to –10.0 dBm | (Port 1/Port 2) |
| | –120.0 to 0.0 dBm | (Port 3/Port 4) |
| MU887001A | –130.0 to –10.0 dBm | (Port 1 to Port 4) |
| MU887002A | –130.0 to 0.0 dBm | (TRX 1/2 Port 1 to Port 12) |
| Resolution | 0.1 dB | |
| Suffix code | DBM (uses dBm when omitted) | |
| Default | –55.0 dBm | |

### Details

For MU887000A, the setting range varies with the output test port setting.
If cable loss correction is set to ON, the setting range of the output level is the range of values with subtracted cable loss.
If the cable loss is 5 dB, the MU887000A Port 1/Port 2 setting range is –135.0 to –15.0 dBm.

### Example of Use

To set the output level to –50.0 dBm:

```
OLVL -50.0
OLVL?
> -50.0
```

### Related Commands

EXTLOSSW
LOSSTBL
LOSSTBLVAL
For details of the commands, refer to Chapter 6 “Native Command Reference” in the *MU887000A TRX Test Module Operation Manual*.

# RXFREQ

Output Frequency (Fwd)

### Function

Sets or queries Forward Link center frequency.

### Command

```
RXFREQ freq
```

### Query

```
RXFREQ?
```

### Response

freq

| | |
|---|---|
| Unit | Hz |

### Parameter

| | |
|---|---|
| freq | Output Frequency (Fwd.) |
| Range | 400 000 000 to 3800 000 000 Hz |
| Resolution | 1 Hz |
| Suffix code | HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz when omitted) |
| Default | 873 660 000 Hz |

### Detail

The input frequency is changed to a value determined by the combination of the Band Class and channel after the channel number is changed.
Changing the output frequency does not change the channel number.

### Example of Use

To set the Forward Link Frequency to 873.66 MHz:
RXFREQ 873.66MHZ
RXFREQ?
> 873660000

# SEQCTRL

Sequence Control Parameter - Sequence Control

### Function

Sets or queries start and stop segments in sequence table.
Sets the parameters for both measurement and signal transmission.

### Command

```
SEQCTRL start,end
```

### Query

```
SEQCTRL?
```

### Response

start,end

### Parameters

| | |
|---|---|
| start | Start segment |
| Range | 0 to 1999 |
| Resolution | 1 |
| Default | 0 |
| end | Stop segment |
| Range | start to 1999 |
| Resolution | 1 |
| Default | 199 |

### Details

Start = 0 to 1999, end = 0 to 1999 where end ≥ start
Whether the set sequence table can be executed is evaluated. Use the SEQERR? command to query the error details.

### Example of Use

To set the start segment to 20 and the stop segment to 55:
SEQCTRL 20,55
SEQCTRL?
> 20,55

# SEQCTRLTX

Sequence Control Parameter - Sequence Control

### Function

Sets or queries start and stop segments in sequence table.
Sets the measurement parameters only, without affecting the signal transmission parameters.

### Command

```
SEQCTRLTX start,end
```

### Query

```
SEQCTRLTX?
```

### Response

```
start,end
```

### Parameters

| | |
|---|---|
| start | Start segment |
| Range | 0 to 1999 |
| Resolution | 1 |
| Default | 0 |
| end | Stop segment |
| Range | start to 1999 |
| Resolution | 1 |
| Default | 0 |

### Details

Start = to 1999, end = 0 to 1999 where end ≥ start
Whether the set sequence table can be executed is evaluated. Use the SEQERR? command to query the error details.

### Examples of Use

To set the start and stop segments to 20 and 55, respectively:
SEQCTRLTX 20,55
SEQCTRLTX?
> 20,55

## SEQERR?

Sequence Parameter Information - Error Check

### Function

Queries error status of sequence table.

### Query

```
SEQERR? [item]
```

### Response

| Query parameter | Response |
|---|---|
| None: | n,err(0),..,err(n–1) |
| ILVL,OLVL,STEP, DLPAT, PORT: | ns,seg(0),..,seg(ns–1) |
| LEN: | e,mem,exe,set |
| OLVLNUM, PATNUM, STDNUM: | e,exe,set |

In case of no error in the sequence table, the response is 0.

### Parameters

| | | |
|---|---|---|
| item | Parameter in sequence table | |
| ILVL | Input level | |
| OLVL | Output level | |
| STEP | Step count | |
| DLPAT | Waveform Pattern | |
| PORT | Test port | |
| LEN | Capture memory length | |
| OLVLNUM | Output level change count | |
| PATNUM | Waveform pattern change count | |
| STDNUM | Measurement mode change count | |
| n | Number of errors | |
| Range | 0 to 4 | |
| err(n–1) | Parameter with error | |
| ILVL | Input level | |
| OLVL | Output level | |
| STEP | Step count | |
| LEN | Capture memory length | |
| ns | Number of segments with errors | |
| Range | 0 to 2000 | |
| seg(ns–1) | Segment number with errors | |
| Range | 0 to 1999 | |
| e | Presence of errors | |
| Range | 0 | No error, executable |
| | 1 | Errors found, not executable |
| mem | Memory occupation ratio | |
| Range | 0.0 to 100.0% | |
| Resolution | 0.1% | |

| | |
|---|---|
| ex | Number of capture executable segments in number of configured segments |
| Range | 0 to 2000 |
| set | Number of segments with capture configured |
| Range | 0 to 2000 |

### Details

This command can check error presence of input level, output level, step count, and capture memory length.

To query error presence of the following parameters, use SEQERR2? command.

Waveform pattern, test port, output level change count, waveform pattern change count, measurement mode change count.

To set parameters for sequence table using the following commands, errors are not checked.

SEQTRX, SEQTX, SEQMEAS

### Example of Use

To query the presence of errors:

SEQERR?

> 1,ILVL

To query the error information of input level

SEQERR? ILVL

> 2,3,12

To query the input level setting error information:

SEQERR? LEN

> 0,25.0,20,20

Here, the capture memory utilization is 25.0%, so all captures configured in 20 segments are executable.

### Remarks

The Sequence Measurement mode cannot be started if there is an error.

However, the sequence can be started by using the SEQCTRL command to detect any segment with an error and exclude it from the executable range.

# SEQERR2?

Sequence Parameter Information - Error Check

## Function

Queries setting error information of sequence table.

## Query

```
SEQERR2? format
```

## Response

n,err(0),..,err(n-1)

If no error is found in the sequence table, the response returns 0.

## Parameters

| | |
|---|---|
| format | Format |
| 1 | Error check 1 |
| n | Number of errors |
| Range | 0 to 7 |
| err(n-1) | Parameter with errors |
| ILVL | Input level |
| OLVL | Output level |
| STEP | Step count |
| DLPAT | Waveform Pattern |
| PORT | Test port |
| LEN | Capture memory length |
| OLVLNUM | Output level change count |
| PATNUM | Waveform pattern change count |
| STDNUM | Measurement mode change count |

## Details

Parameter setting errors can be checked up to seven types.

Only one of output level change count, waveform pattern change count, or measurement mode change count has an error.

Two or three of them cannot have an error simultaneously.

To set parameters for sequence table using the following commands, errors are not checked.

SEQTRX, SEQTX, SEQMEAS, SEQSGPORT

To query error details of each parameter, use SEQERR command.

## Examples of Use

To query the presence of errors:

SEQERR2? 1

> 2,ILVL,DLPAT

## Remarks

Sequence measurement cannot be started if there are errors.

However, sequence measurement can be started if segment numbers with errors are excluded from the execution range using the SEQCTRL command.

# SEQEXECTX

Start Signal Analyzer Measurement Only

## Function

Sets only the parameters for the specified measurement and executes measurement, without affecting the signal transmission parameters.

## Command

```
SEQEXECTX
```

# SEQMEAS

Sequence Table Parameter - Measurement

## Function

Sets or queries measurement conditions of specified segment.

## Command

```
SEQMEAS seg,mode,step,mcond
```

## Query

```
SEQMEAS? seg
```

## Response

mode,step,mcond

## Parameters

| | | |
|---|---|---|
| seg | Segment number | |
| Range | 0 to 1999 | |
| mode | Measurement mode | Required software license |
| TXP | Transmit power measurement mode | MX887010A |
| WCDMA | W-CDMA measurement mode | MX887010A and MX887011A |
| GSM | GSM measurement mode | MX887010A and MX887012A |
| CDMA2K | CDMA2000 1x measurement mode | MX887010A and MX887015A |
| EVDO | CDMA2000 1xEVDO measurement mode | MX887010A and MX887016A |
| TDSCDMA | TD-SCDMA measurement mode | MX887010A and MX887017A |
| LTE | LTE measurement mode | MX887010A and MX887013A, or MX887010A and MX887014A |
| NR | NR sub-6GHz measurement mode | MX887010A and MX887018A or MX887010A and MX887019A |
| Default | TXP | |
| step | Step count | |
| Range | 2 to 3000 | |
| Resolution | 1 | |
| Default | 2 | |
| mcond | Measurement condition number | |
| Range | 0 to 1999 | |
| Resolution | 1 | |
| Default | 0 | |

## Details

To use the commands described in Chapter 3 Sequence Measurement, set the command parameter to EVDO.

Example of Use

To set measurement conditions for segment 1 as follows:
Measurement mode: EVDO, Step count: 100, Measurement condition number: 2
SEQMEAS 1,EVDO,100,2
SEQMEAS? 1
> EVDO,100,2

# SEQMSTAT?

Sequence Measurement Status

## Function

Queries status of Sequence Measurement execution

## Query

SEQMSTAT?

## Response

m_status,n,s(0),s(1),..,s(n–1)

## Parameters

| | | |
|---|---|---|
| m_status | | Measurement execution status |
| | 0 | Measurement completed successfully |
| | 2 | Over level |
| | 3 | Under level |
| | 4 | Measurement failed |
| | 5 | Synchronization word not detected |
| | 9 | Measurement in progress or not measured |
| | 12 | Tx measurement timeout |
| | The value received from MX887016A is 0, 2, 4, 5, 9, or 12. | |
| n | | Number of measured segments |
| | Range | 0 to 2000 |
| s | | Measurement status of specified segment |
| | 0 | Measurement completed successfully |
| | 2 | Over level |
| | 3 | Under level |
| | 4 | Measurement failed |
| | 5 | Synchronization word not detected |
| | 9 | Measurement in progress or not measured |
| | 10 | Segment not measured |
| | 12 | Tx measurement timeout |
| | The value received from MX887016A is 0, 2, 4, 5, 9, 10, or 12. | |

## Example of Use

To queries the status of the Sequence Measurement execution:

SEQMSTAT?

> 2,6,0,0,0,0,2,0

The number of the measured segments is 6 and an over level error occurred in the fifth segment.

## Related Command

MSTAT

SEQSEGSTAT

# SEQPROGRESS?

Sequence Progress

### Function

Queries progress ratio and executing sequence number in Sequence Measurement mode.

### Query

`SEQPROGRESS?`

### Response

p,cur,start,end

### Parameters

| | |
|---|---|
| p | Progress ratio in Sequence Measurement mode |
| Range | 0 to 100% |
| cur | Current segment number being executed |
| Range | 0 to 1999 |
| start | First segment number |
| Range | 0 to 1999 |
| stop | Last segment number |
| Range | 0 to 1999 |

### Example of Use

To query the progress ratio and executing sequence number in the Sequence Measurement mode:

SEQPROGRESS?

> 65,23,11,30

### Remarks

The first and last segment numbers are the same as the start and end segment numbers specified using the SEQCTRL command.

# SEQREINIT

Sequence Control Parameter - Sequence End State Reinitialization

### Function

Enables automatic initialization of following items at end of Sequence Measurement mode operation, and queries settings.

- Forward Link frequency
- Output level
- Output signal pattern
- Reverse Link frequency
- Input level

### Command

```
SEQREINIT sw
```

### Query

```
SEQREINIT?
```

### Response

sw

### Parameter

| | | |
|---|---|---|
| sw | | Automatic initialization after sequence measurement completion |
| | ON | Resets target parameters |
| | OFF | Holds last segment setting |
| | Default | ON |

### Details

If the parameter is set to ON, the settings are initialized to the values configured by the following commands after sequence measurement completion.

| | |
|---|---|
| Forward Link frequency | RXFREQ |
| Output level | OLVL |
| Output signal pattern | DLPAT |
| Reverse Link frequency | TXFREQ |
| Input level | ILVL |

If the parameter is set to OFF, the settings remain those of the sequence measurement stop segment.

### Example of Use

To set automatic initialization at the end of the Sequence Measurement mode operation:

SEQREINIT ON

SEQREINIT?

> ON

# SEQSAPORT

Sequence Table Parameter - SA Input Port

### Function

Specifies the segment number and sets or queries the test port number for inputting RF signals.

### Command

```
SEQSAPORT seg,port
```

### Query

```
SEQSAPORT? seg
```

### Response

port

### Parameter

| | | |
|---|---|---|
| seg | Segment number | |
| Range | 0 to 1999 | |
| port | Input test port number | |
| Range | COMMON, Test Port 1 to 4 | (MU887000A) |
| | COMMON, Test Port 1 to 4 | (MU887001A) |
| | OFF, COMMON, Test Port 1 to 12 | (MU887002A) |
| PORT1 | Test Port 1 | |
| … | … | |
| PORT12 | Test Port 12 | |
| OFF | No any Input Test Ports | (MU887002A) |
| COMMON | Input test port specified by PORT command. | |
| Default | COMMON | |

### Details

For MU887000A,
Test port 3 cannot be set when Test port 3 is selected for RF signal output test port.
Test port 4 cannot be set when Test port 4 is selected for RF signal output test port.

For MU887001A and MU887002A, there are no restrictions as above.

### Example of Use

To set the test port number of segment 5 to Test Port 2
SEQSAPORT 5, PORT2
SEQSAPORT? 5
> PORT2

# SEQSEGSTAT?

Specified Segment Status

## Function

Queries measurement status of specified segment.

## Query

```
SEQSEGSTAT? seg
```

## Response

stat

## Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| stat | Segment status |
| 0 | Measurement completed successfully |
| 2 | Over level |
| 3 | Under level |
| 4 | Measurement failed |
| 5 | Synchronization word not detected |
| 9 | Measurement in progress or not measured |
| 10 | Segment not measured |
| 12 | Tx measurement timeout |

The value received from MX887016A is 0, 2, 4, 5, 9, 10, or 12.

## Example of Use

To query the measurement status of segment 16:

SEQSEGSTAT? 16

> 0

# SEQSGPORT

Sequence Table Parameter - SG Output Port

## Function

Specifies the segment number and sets or queries the test port number for outputting RF signals.

## Command

| | |
|---|---|
| `SEQSGPORT seg,port` | MU887000A, MU887001A |
| `SEQSGPORT seg,port[,port,…,port]` | MU887002A |

## Query

`SEQSGPORT? seg`

## Response

| | |
|---|---|
| port | MU887000A, MU887001A |
| port[,port,…,port] | MU887002A |

## Parameters

| | | |
|---|---|---|
| seg | Segment number | |
| Range | 0 to 1999 | |
| port | Output test port number | |
| Range | Test Port 1 to 4 | (MU887000A) |
| | Test Port 1 to 4 | (MU887001A) |
| | Test Port 1 to 12 | (MU887002A) |
| PORT1 | Test Port 1 | |
| … | … | |
| PORT12 | Test Port 12 | |
| Default | PORT1 | |

## Details

For MU887000A,
Test Port 3 cannot be set when Test Port 3 is selected for RF signal input test port.
Test Port 4 cannot be set when Test Port 4 is selected for RF signal input test port.

For MU887001A and MU887002A, there are no restrictions as above.

## Example of Use

To set the test port number of segment 5 to Test Port 2:
SEQSGPORT 5, PORT2
SEQSGPORT? 5
> PORT2
To set the test port number of segment 5 to Test Port 2, Test Port 11, and Test Port 5:
:CONF:CELL:SEQ:RXP 5,PORT2,PORT11,PORT5
:CONF:CELL:SEQ:RXP? 5
> PORT2,PORT5,PORT11

# SEQTBL

Sequence Control Parameter - Sequence Table

### Function

Sets or queries sequence table number to execute.

### Command

```
SEQTBL table
```

### Query

```
SEQTBL?
```

### Response

table

### Parameter

| | |
|---|---|
| table | Sequence table number |
| Range | 0 to 3 |
| Resolution | 1 |
| Default | 0 |

### Example of Use

To select sequence table 1:

SEQTBL 1

SEQTBL?

> 1

# SEQTRG

Sequence Table Parameter - Trigger

### Function

Sets or queries trigger condition for starting Sequence Measurement.

### Command

```
SEQTRG seg,src,slope,level,delay
```

### Query

```
SEQTRG? seg
```

### Response

src,slope,level,delay

### Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| src | Trigger source |
| FRAME | Frame |
| FREERUN | Free run |
| PWR | Input signal power |
| Default | FREERUN |
| slope | Trigger slope |
| RISE | Rising edge trigger |
| Default | RISE |
| level | Trigger level |
| Range | –40 to 0 dB |
| Resolution | 1 dB |
| Suffix code | DB (uses dB when omitted) |
| Default | –30 dB |
| delay | Delay time |
| Range | 0 to 1000.000 ms |
| Resolution | 0.001 ms |
| Suffix code | NS, US, MS, S (uses ms when omitted) |
| Default | 0.000 ms |

### Details

The trigger slope and trigger level are enabled when trigger source is set to PWR.

### Example of Use

To set the trigger condition of segment 2 as follows;
Trigger source: PWR, Trigger slope: RISE, Trigger level: –30 dB, Delay time: 0
SEQTRG 2,PWR,RISE,-30,0
SEQTRG? 2
> PWR,RISE,-30,0.000

Remarks

The trigger level is defined as the level difference from the input level specified by the following commands:
ILVL,SEQTRX

# SEQTRX

Sequence Table Parameter - TRX Control

## Function

Sets following items in specific segment of sequence table, and queries settings.

- Forward Link frequency
- Output level
- Output signal pattern
- Reverse Link frequency
- Input level

## Command

```
SEQTRX seg,ul_freq,ref,dl_freq,level,pat
```

## Query

```
SEQTRX? seg
```

## Response

ul_freq,ref,dl_freq,level,pat

## Parameters

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| ul_freq | Reverse Link frequency |
| Range | 400.000000 to 3800.000000 MHz |
| Resolution | 0.000001 MHz |
| Suffix code | HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted) |
| Default | 1950.000000 MHz |
| ref | Input level |
| Range | |
| MU887000A | –65.0 to +35.0 dBm (Port 1/Port 2) |
| | –65.0 to +25.0 dBm (Port 3/Port 4) |
| MU887001A | –65.0 to +35.0 dBm (Port 1 to Port 4) |
| MU887002A | –65.0 to +35.0 dBm (TRX 1/2 Port 1 to Port 12) |
| Resolution | 0.1 dB |
| Suffix code | DBM (uses dBm when omitted) |
| Default | –10.0 dBm |
| dl_freq | Forward Link Frequency |
| Range | 400.000000 to 3800.000000 MHz |
| Resolution | 0.000001 MHz |
| Suffix code | HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted) |
| Default | 2140.000000 MHz |
| level | Output level |
| Range | |
| MU887000A | –130.0 to –10.0 dBm (Port 1/Port 2) |

| | | |
|---|---|---|
| | –120.0 to 0.0 dBm | (Port 3/Port 4) |
| MU887001A | –130.0 to –10.0 dBm | (Port 1 to Port 4) |
| MU887002A | –130.0 to 0.0 dBm | (TRX 1/2 Port 1 to Port 12) |
| Resolution | 0.1 dB | |
| Suffix code | DBM (uses dBm when omitted) | |
| Default | –60.0 dBm | |

pat — Waveform pattern

| | |
|---|---|
| PAT1 to PATn | Pattern number (n: Waveform information file group range) |
| CW | Modulation disabled |
| OFF | Output level disabled |
| NC | Transmission signal pattern not configured in this segment (holds current transmission signal pattern) |
| Default | CW |

### Details

For MU887000A, the setting range varies with the input/output test port setting.
If cable loss correction is set to ON, the setting range of the input level is the range of values with added cable loss and the setting range of the output level is the range of values with subtracted cable loss.
If the cable loss is 5 dB, the input and output levels are as follows:
MU887000A Port 1/Port 2 Input level –60.0 to +40.0 dBm
MU887000A Port 1/Port 2 Output level –135.0 to –15.0 dBm
In this case, if the output level is set to –10.0 dBm, an out-of-parameter setting range error occurs. (The response to SYSERR? returns 220, Parameter error).
Whether an out-of-parameter setting range error has occurred is determined during execution of the following commands:
SEQCTRL, SNGLS, SEQEXECTX
A measurement execution error occurs at out-of-range errors.
SEQERR? is used to query the details of errors.

The pattern number is the same as the group number. Refer to Chapter 3, "Waveform File Details" in the *Waveform Files for Cellular Application Operation Manual*.

### Example of Use

To set segment 0 as follows:
Reverse Link frequency: 1950.0 MHz, Input level: –10.0 dBm, Forward Link frequency: 2140.0 MHz, Output level: –60.0 dBm, and Modulation: Disabled

```
SEQTRX 0,1950.000000,-10.0,2140.000000,-60.0,CW
SEQTRX 0?
> 1950.000000,-10.0,2140.000000,-60.0,CW
```

### Remark

The group range depends on the selected waveform file.
For details of the waveform patterns, refer to Chapter 3, "Waveform File Details" in the *Waveform Files for Cellular Application Operation Manual*.

# SEQTX

Sequence Table Parameter - Uplink Frequency, Input Level

### Function

Sets or queries uplink frequency and input level of segments in sequence table.

### Command

```
SEQTX seg,ul_freq,ref
```

### Query

```
SEQTX? seg
```

### Response

```
ul_freq,ref
```

### Parameter

| | |
|---|---|
| seg | Segment number |
| Range | 0 to 1999 |
| Resolution | 1 |
| ul_freq | Reverse Link frequency |
| Range | 400.000000 to 3800.000000 MHz |
| Resolution | 0.000001 MHz |
| Suffix code | HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted) |
| Default | 1950.000000 MHz |
| ref | Input level |
| Range | |
| MU887000A | –65.0 to +35.0 dBm (Port 1/Port 2) |
| | –65.0 to +25.0 dBm (Port 3/Port 4) |
| MU887001A | –65.0 to +35.0 dBm (Port 1 to Port 4) |
| MU887002A | –65.0 to +35.0 dBm (TRX 1/2 Port 1 to Port 12) |
| Resolution | 0.1 dB |
| Suffix code | DBM (uses dBm when omitted) |
| Default | –10.0 dBm |

### Details

This command sets only the uplink frequency and input level among the parameters that are set by SEQTRX.
For MU887000A, the setting range varies with the input test port setting.
If cable loss correction is set to ON, the setting range of the input level is the range of values with added cable loss.
If the cable loss is 5 dB, the MU887000A Port 1/Port 2 setting range is –60.0 to +40.0 dBm.
Whether an out-of-parameter setting range error has occurred is determined during execution of the following commands:
SEQCTRL, SNGLS, SEQEXECTX

Example of Use

To set the parameters for segment 1 as follows:
Reverse Link frequency: 1950 MHz, Input level: –10.0 dBm
SEQTX 1,1950,-10.0
SEQTX? 1
> 1950.000000,-10.0

## TRGTOUT

Trigger Timeout

Function

Sets or queries trigger timeout.

Command

```
TRGTOUT time
```

Query

```
TRGTOUT?
```

Response

time
Unit s

Parameter

| | |
|---|---|
| time | Timeout time |
| Range | 1 to 60 s |
| Resolution | 1 s |
| Suffix code | NS, US, MS, S (uses s when omitted) |
| Initial Value | 10 s |

Example of Use

To set the Trigger timeout time to 10 seconds:
TRGTOUT 10
TRGTOUT?
> 10

# TXFREQ

Input Frequency (Rev.)

### Function

Sets or queries Reverse Link center frequency.

### Command

```
TXFREQ freq
```

### Query

```
TXFREQ?
```

### Response

freq

| | |
|---|---|
| Unit | Hz |

### Parameter

| | |
|---|---|
| freq | Input Frequency (Rev.) |
| Range | 400 000 000 to 3800 000 000 Hz |
| Resolution | 1 Hz |
| Suffix code | HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (used Hz when omitted) |
| Default | 828 660 000 Hz |

### Details

The input frequency is changed to a value determined by the combination of the Band Class and channel after the channel number is changed.
Changing the input frequency does not change the channel number.

### Example of Use

To set the Reverse Link center frequency to 828.66 MHz:
TXFREQ 828.66MHZ
TXFREQ?
> 828660000

# ULFREQ

Uplink Frequency

### Function

Sets or queries the uplink (Rx) frequency.

### Command

```
ULFREQ ul_freq
```

### Query

```
ULFREQ?
```

### Response

ul_fleq

| | |
|---|---|
| Unit | Hz |

### Parameter

ul_freq Uplink Frequency

| | |
|---|---|
| Range | 400 000 000 to 3800 000 000 Hz |
| Resolution | 1 Hz |
| Suffix code | HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz when omitted) |
| Default | 1950 000 000 Hz |

### Details

This setting corresponds to the mobile station Tx frequency.

Changing the uplink frequency setting does not change the uplink channel setting.

### Example of Use

To set the uplink frequency to 1950 MHz:

ULFREQ 1950MHZ

ULFREQ?

> 1950000000

# Chapter 6 Performance Test

This chapter explains how to setup the measuring instruments required for the MX887016A 1xEV-DO performance tests as well as the test procedures.


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# 6.1 Outline

The performance tests are performed to assure that the MU887000A performance does not deteriorate. Test the performance of the MU887000A at the initial acceptance inspection, at periodic inspections, and after repairs. Test important items periodically to assure the performance. This chapter explains the following test items.

- Output EVM
- Tx Power measurement accuracy (CW)
- Tx Power measurement linearity
- Frequency/modulation measurement — Carrier frequency accuracy, Rho

We recommend testing the performance periodically once or twice a year. If the test results do not meet the specifications, contact an Anritsu Service and Sales office. Contact information can be found on the last page of the printed version of this manual, and is available in a separate file on the PDF version.

**⚠ CAUTION**

**Warm-up the MU887000A and the required measuring instruments for at least 30 minutes (except when specified otherwise) to stabilize them. To achieve the highest accuracy, the test should be performed at room temperature using a power supply with as little voltage fluctuation as possible in an environment free from noise, vibration, dust and humidity.**

# 6.2 Instruments for Testing Performance

The following table lists the measuring instruments required for testing the MU887000A performance and the specifications for each instrument.

**Table 6.2-1 Measuring Instruments for Performance Tests**

| Performance Test Item | Required Specifications* | Recommended Devices (Anritsu model name) |
|---|---|---|
| Output EVM | Signal Analyzer<br>● Frequency Range: 400 to 2700 MHz<br>● Resolution: 1 Hz<br>● Measured Power Range: –130 to +30 dBm<br>● Measurement Accuracy: ±0.05 dB<br>● External Reference Input: (10 MHz) | Signal Analyzer (MS269xA or MS2830A)<br>Preamplifier (MS269xA-008 or MS2830A-008)<br>EVDO Measurement Software (MX269026A) |
| Tx Power Measurements<br>● Measurement Accuracy<br>● Linearity | Signal Generator<br>● Frequency Range: 400 to 2700 MHz<br>● Resolution: 1 Hz<br>● Output Level Range<br>Unmodulated: –110 to +17 dBm<br>Resolution: 0.01 dB | Vector Signal Generator (MG3710E)<br>Upper freq. 2.7 GHz (MG3710E-032) |
| | Signal Analyzer<br>Same as above | Same as above |
| | Power Meter<br>● Main Frame Accuracy: ±0.02 dB<br>● Frequency Range: 400 to 2700 MHz<br>● Resolution: 0.01 dB | Power Meter (ML2437A) |
| | Power Sensor<br>● Frequency Range: 400 to 2700 MHz<br>● Measured Power Range: –40 to +20 dBm<br>● Input Connector: N type | Power Sensor (MA2442D) |
| Frequency/Modulation Measurements<br>● Carrier Frequency Accuracy<br>● Rho | Signal generator supporting output of 3GPP 1xEV-DO modulation signals<br>Same as above | Same as above |
| | Power Meter<br>Same as above | Same as above |
| | Power Sensor<br>● Frequency Range: 400 to 2700 MHz<br>● Measured Power Range: –30 to +20 dBm<br>● Input Connector: N type | Power Sensor (MA24002A) |
| Common | Attenuator (for MU887000A/01A) | 3-dB Attenuator (AT-103) |
| | Attenuator (for MU887002A) | 3-dB Attenuator (BW-N3W5+)<br>6-dB Attenuator (BW-N6W5+) |

*: The performance covers the test item measurement range.

# 6.3 Performance Tests

Common test items

The following list shows the common settings for each measurement at the MU887000A.

| | |
|---|---|
| Application: | Cellular |
| Standard: | CDMA2000 1xEVDO |
| Protocol Revision: | REV0 |
| Trigger Source: | FREERUN |
| Trigger Level: | –10 dB |
| Trigger Delay: | 0.00 |
| Trigger Timeout: | 1 s |
| OBW Ratio: | 99.0% |
| Long Span Code Search: | ON |

## 6.3.1 Calibrating signal generator (CW)

This procedure captures the calibration value for measurements using an unmodulated waveform (CW).

(1) Measuring instruments

- Vector signal generator: MG3710E
- Power meter: ML2437A
- Power sensor: MA2442D
- Attenuator:

| | | | |
|---|---|---|---|
| For MU887000A/01A | 3 dB: | AT-103 | 2 sets |
| For MU887002A | 3 dB: | BW-N3W5+ | |
| | 6 dB: | BW-N6W5+ | |

(2) Setup

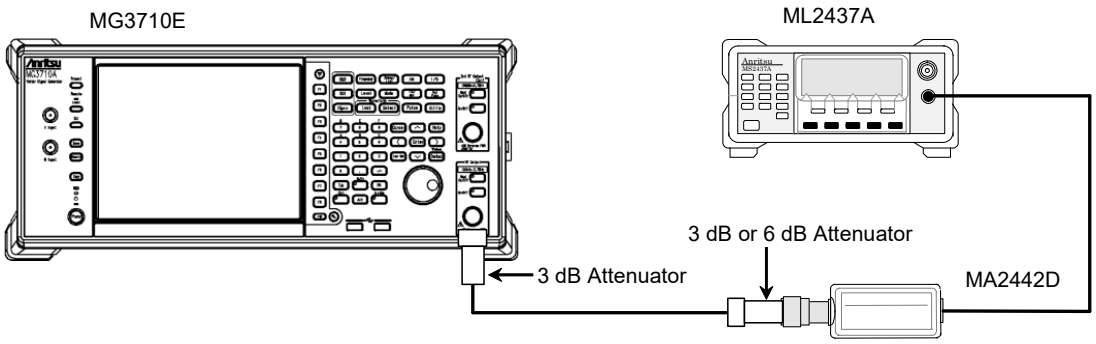



**Figure 6.3.1-1 Signal Generator Calibration Setup (CW)**

(3) Procedure

1. Setup the instruments as shown in Figure 6.3.1-1.
2. Output the following CW signal from the Vector signal generator (SG).
   MU887000A/01A: 399.99 MHz +6 dBm
   MU887002A: 402.49 MHz +9 dBm
3. Measure the level with the ML2437A power meter and adjust the SG so that the output level is 0 dBm.
4. Change the frequency as shown in Table 6.3.1-1 "Measurement Point and Frequency" and perform the same measurement to obtain the calibration value.
5. Repeat steps 3 and 4 over while changing the output level (value measured with power meter) to –10, –25 dBm, successively to measure and obtain the calibration value.

**Table 6.3.1-1 Measurement Point and Frequency**

| Meas. Point | Frequency (MHz) |
|---|---|
| 1 | 400 (MU887000A/01A)<br>402.5 (MU887002A) |
| 2 | 460 |
| 3 | 780 |
| 4 | 840 |
| 5 | 1000 |
| 6 | 1500 |
| 7 | 1760 |
| 8 | 1900 |
| 9 | 2200 |
| 10 | 2500 |
| 11 | 2700 |

***Note:***

Add an offset of −10 kHz to the frequency in the above table and set the frequency as SG output frequency, except for the measurement described in section 6.3.7.

## 6.3.2 Calibrating signal generator (MOD)

This procedure captures the calibration value for measurements using a modulated waveform.

(1) Measuring instruments

- Vector signal generator: MG3710E
- Power meter: ML2437A
- Power sensor: MA24002A
- Attenuator:

| | | | |
|---|---|---|---|
| For MU887000A/01A | 3 dB: | AT-103 | 2 sets |
| For MU887002A | 3 dB: | BW-N3W5+ | |
| | 6 dB: | BW-N6W5+ | |

(2) Setup

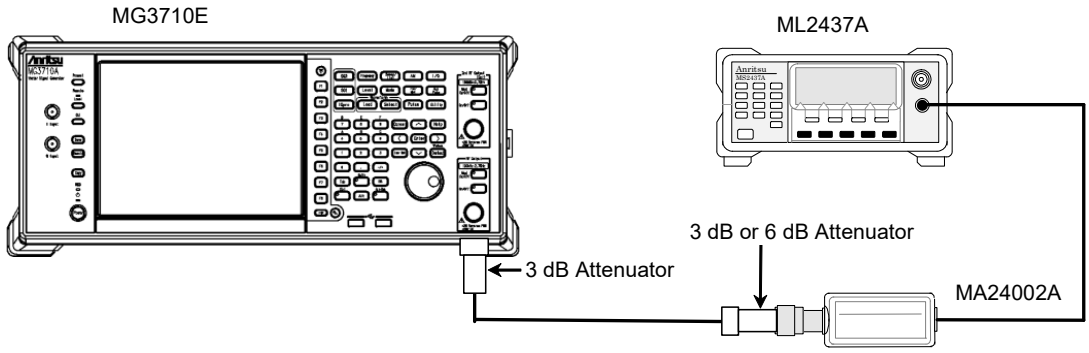



**Figure 6.3.2-1 Signal Generator Calibration Setup (MOD)**

(3) Procedure

1. Setup the instruments as shown in Figure 6.3.2-1.
2. Output the following modulated signal from the Vector signal generator (SG) with Waveform pattern name RVS_153_6_kbps_TX_LC0
   MU887000A/01A: 399.99 MHz −4 dBm
   MU887002A: 402.49 MHz −1 dBm
3. Measure the level with the ML2437A Power Meter and adjust the SG so that the output level is –10 dBm.
4. Change the frequency as shown in Table 6.3.1-1 “Measurement Point and Frequency” and perform the same measurements to obtain the calibration value.

## 6.3.3 Calibrating linearity

This procedure captures the calibration value for measurements related to linearity.

(1) Measuring instruments

- Vector signal generator: MG3710E
- Signal analyzer: MS269xA or MS2830A
- Attenuator:

| | | | |
|---|---|---|---|
| For MU887000A/01A | 3 dB: | AT-103 | 2 sets |
| For MU887002A | 3 dB: | BW-N3W5+ | |
| | 6 dB: | BW-N6W5+ | |

(2) Setup

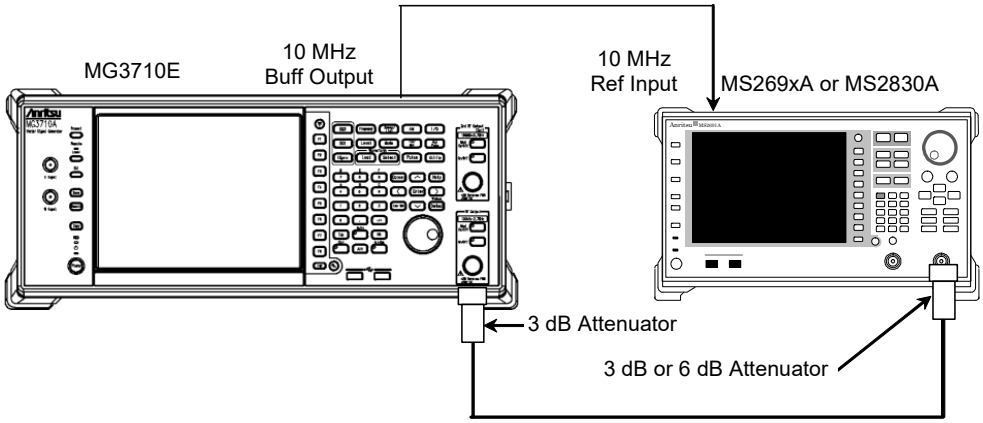



**Figure 6.3.3-1 Linearity Calibration Setup**

(3) Procedure

1. Setup the instruments as shown in Figure 6.3.3-1.
2. Set the signal analyzer (SA) as shown in #1 of Table 6.3.3-1 "Signal Analyzer Settings".
3. Output the following signal from the Vector signal generator (SG) (output level reference). This output level reflects the calibration value for item 6.3.1.
   MU887000A/01A: 399.99 MHz 0 dBm
   MU887002A: 402.49 MHz 0 dBm
4. Connect the output of the SG to the SA and measure the SG output level with the SA (A dBm)
5. Decrease the SG output level in 10-dB steps down to 40 dB and measure the level at each step (B dBm). (The calibration value is B – A.)

6. Change the frequency as shown in Table 6.3.1-1" Measurement Point and Frequency" and perform the same measurements to obtain the calibration value.
7. Set the SA as shown in #2 of Table 6.3.3-1 Signal Analyzer Settings.
8. Change the SG output reference level to –25 dBm and repeat the measurements over in the same way down to a level of –40 dBm. Use the same frequency range/steps. (This output level reflects the calibration value for item 6.3.1.)

**Table 6.3.3-1 Signal Analyzer Settings**

| | MS269xA or MS2830A | | | | | | |
|---|---|---|---|---|---|---|---|
| | Application Switch | RBW | Zone Width | Time Length | ATT | Preamp | Ref Lev |
| #1 | Signal Analyzer | 100 Hz | 781.3 Hz | AUTO | 20 dB | OFF | 0 dBm |
| #2 | Signal Analyzer | 100 Hz | 781.3 Hz | AUTO | 0 dB | OFF | –20 dBm |

## 6.3.4 Output Rho

This test measures the output signal Rho.

(1) Test specifications

| Rho | Remarks |
|---|---|
| > 0.990 | |

BW: Signal bandwidth, $f_0$: Center frequency

400 MHz ≤ $f_0$ ≤ 2700 MHz (MU887000A/01A)

400 MHz ≤ $f_0$ – BW/2, $f_0$ ≤ 2700 MHz (MU887002A)

(2) Measuring instruments

- Signal Analyzer: MS269xA or MS2830A

(3) Setup

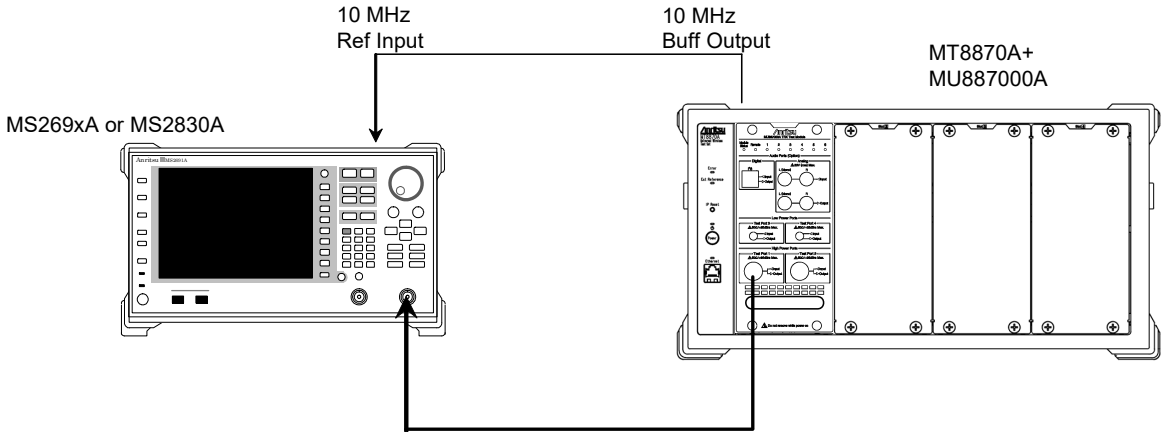



**Figure 6.3.4-1 Output Rho Measurement Setup**

(4) Procedure

This test is measured at the following Test Ports.
When testing other than Test Port 1, read "Test Port 1" in the following procedure as the port to be tested.

MU887000A: Test Port 1, 3
MU887001A: Test Port 1, 3
MU887002A: TRX 1: Test Port 1, 2, TRX 2: Test Port 1, 2

1. Setup the instruments as shown in Figure 6.3.4-1.

2. Select the signal analyzer (SA) measurement software and set the following:

   Measurement software: MX269026A

   Input level: Output level of step 4
   Level offset: 0 dB
   Trigger: Free run

3. Select the MU887000A application software.

4. Set the MU887000A input and output levels.

   MU887000A

   | | | |
   |---|---|---|
   | Test Port 1 | Output Level: | –10.9 dBm |
   | | Input Level: | +35 dBm |
   | Test Port 3 | Output Level: | –0.9 dBm |
   | | Input Level: | +25 dBm |

   MU887001A

   | | | |
   |---|---|---|
   | Test Port 1/3 | Output Level: | –10.9 dBm |
   | | Input Level: | +35 dBm |

   MU887002A

   | | | |
   |---|---|---|
   | TRX 1/2 Test Port 1/2 | Output Level: | –5.0 dBm |
   | | Input Level: | +35 dBm |

5. Set the MU887000A output frequency and output the test pattern.

   Download package select: MV887016A_EVDO_0002
   Downlink pattern name: Group No. 1
   Connect port: MU887000A Test Port 1 or 3
   MU887001A Test Port 1 or 3
   MU887002A TRX 1/2 Test Port 1 or 2
   Output level ON/OFF: ON
   Downlink frequency: MU887000A/01A 400 MHz
   MU887002A 402.5 MHz

6. Measure the Rho at the SA.

7. In the same manner, change the MU887000A output frequency 900, 2000, 2700 MHz and measure the Rho at each frequency.

8. Change the Test Port in steps 4 and 5 and repeat steps 4 to 7 over.

## 6.3.5 Tx power measurement accuracy (CW)

This test is related to the accuracy of Tx power measurements.

(1) Test specifications

MU887000A Test Port 1/2
MU887001A Test Port 1 to 4

| Measurement Accuracy | Input Level | Temperature |
|---|---|---|
| ±0.5 dB | –25 dBm ≤, ≤ +35 dBm | 10° to 40°C |
| ±0.7 dB | –55 dBm ≤, < –25 dBm | 10° to 40°C |
| ±0.9 dB | –65 dBm ≤, < –55 dBm | 10° to 40°C |

MU887000A Test Port 3/4

| Measurement Accuracy | Input Level | Temperature |
|---|---|---|
| ±0.7 dB | –25 dBm ≤, ≤ +25 dBm | 10° to 40°C |
| ±0.9 dB | –55 dBm ≤, < –25 dBm | 10° to 40°C |
| ±1.1 dB | –65 dBm ≤, < –55 dBm | 10° to 40°C |

MU887002A TRX 1/2 Test Port 1 to 12

| Measurement Accuracy | Input Level | Temperature |
|---|---|---|
| ±0.5 dB | –25 dBm ≤, ≤ +35 dBm | 20 to 30°C |
| ±0.7 dB | –55 dBm ≤, < –25 dBm | 20 to 30°C |
| ±0.9 dB | –65 dBm ≤, < –55 dBm | 20 to 30°C |

(2) Measuring instruments

- Vector signal generator: MG3710E
- Attenuator:
  For MU887000A/01A 3 dB: AT-103 2 sets
  For MU887002A 3 dB: BW-N3W5+
  6 dB: BW-N6W5+

(3) Setup

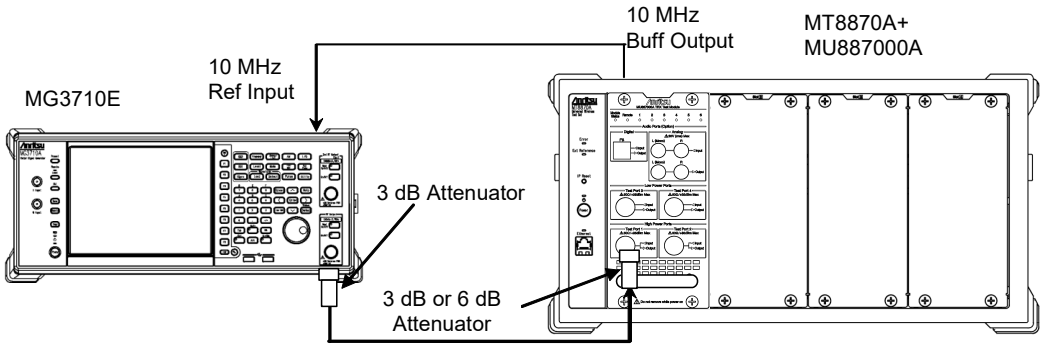



**Figure 6.3.5-1 Setup for Measuring Amplitude Measurement Accuracy**

(4) Procedure

This test is measured at the following Test Ports.
When testing other than Test Port 1, read "Test Port 1" in the following procedure as the port to be tested.
MU887000A: Test Port 1, 2, 3, 4
MU887001A: Test Port 1, 2, 3, 4
MU887002A: TRX 1: Test Port 1, 2, TRX 2: Test Port 1, 2

1. Setup the instruments as shown in Figure 6.3.5-1.
2. Set the MU887000A as follows:

| | | |
|---|---|---|
| Connect port: | Test Port 1 | |
| Output level ON/OFF: | OFF | |
| Input level: | –10 dBm | |
| Uplink frequency: | MU887000A/01A | 400 MHz |
| | MU887002A | 402.5 MHz |
| Turn Off All measurement: | | OFF |
| Tx Power measurement: | | ON, 10 times |

3. Set the Vector signal generator (SG) as follows:

| | | |
|---|---|---|
| Modulation: | OFF | |
| Output frequency: | MU887000A/01A | 399.99 MHz |
| | MU887002A | 402.49 MHz |
| Output level: | –10 dBm (This output level reflects the calibration value for item 6.3.1.) | |

4. Change the frequency of the MU887000A and SG according to Table 6.3.1-1 "Measurement Point and Frequency" and measure the Tx power.

   Tx Power Measurement Results: Average value
5. Change the SG output level and MU887000A input level each to –55, and –65 dBm and repeat steps 2 to 4 over and measure the Tx power. (This output level reflects the calibration value for item 6.3.1.)
6. Change the Connect port setting for the connection with the MU887000A successively, and repeat steps 2 to 5 over.

## 6.3.6 Tx power measurement linearity

This test is related to the linearity of Tx power measurements.

(1) Test specifications

| Linearity | Input Level, Range |
|---|---|
| ±0.2 dB | –55 dBm ≤, –40 to 0 dB |
| ±0.4 dB | –65 dBm ≤, –40 to 0 dB |

(2) Measuring instruments

- Vector signal generator: MG3710E
- Attenuator:

  For MU887000A/01A 3 dB: AT-103 2 sets

  For MU887002A 3 dB: BW-N3W5+

  6 dB: BW-N6W5+

(3) Setup

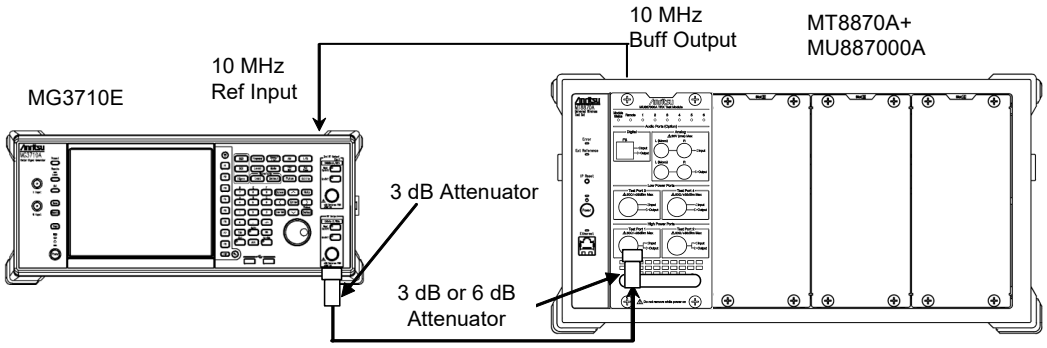



**Figure 6.3.6-1 Setup for Measuring Tx Power Measurement Linearity**

(4) Procedure

This test is measured at the following Test Ports.
When testing other than Test Port 1, read "Test Port 1" in the following procedure as the port to be tested.
MU887000A: Test Port 1, 2, 3, 4
MU887001A: Test Port 1, 2, 3, 4
MU887002A: TRX 1: Test Port 1, 2, TRX 2: Test Port 1, 2

1. Setup the instruments as shown in Figure 6.3.6-1.

2. Set the MU887000A as follows:

| | | |
|---|---|---|
| Connect port: | Test Port 1 | |
| Output level ON/OFF: | OFF | |
| Input level: | 0 dBm | |
| Reverse Link frequency: | MU887000A/01A | 400 MHz |
| | MU887002A | 402.5 MHz |
| Turn Off All measurement: | | OFF |
| Tx Power measurement: | | ON, 1 time |

3. Set the Vector signal generator (SG) as follows:

| | | |
|---|---|---|
| Modulation: | OFF | |
| Output frequency: | MU887000A/01A | 399.99 MHz |
| | MU887002A | 402.49 MHz |
| Output level: | 0 dBm (This output level reflects the calibration value for item 6.3.1.) | |

4. Measure the Tx Power and make this value the reference level (REF dBm).

   Tx Power Measurement Results: Average value

5. Set the SG output level to –10 dB and measure the Tx power, making this value D dBm.

6. Calculate the difference between REF dBm and D dBm using the following equation.

   Linearity error = D – REF – (calibration value of section 6.3.3)

7. Similarly, change the SG output level successively from –20 dB to –40 dB in –10 dB steps and measure the Tx power. Calculate the linearity as described in step 6 and check that the results meet the specifications.

8. Change the MU887000A and SG frequencies according to Table 6.3.1-1 “Measurement Point and Frequency” and repeat steps 2 to 7 over.

9. Change the SG output level and the MU887000A input level to –25 dBm and repeat steps 2 to 8 over to measure the Tx Power. (This output level reflects the calibration value for item 6.3.1.)

10. Change the Connect port setting for the connection with the MU887000A successively, and repeat steps 2 to 9 over.

## 6.3.7 Frequency/Modulation measurement

This test is related to the following modulation analyses.

- Carrier frequency accuracy
- Waveform quality

(1) Test specifications

MU887000A Test Port 1/2
MU887001A Test Port 1 to 4
MU887002A TRX 1/2 Test Port 1 to 12

| | |
|---|---|
| Carrier frequency accuracy | ±(Set frequency × Reference oscillator accuracy + 10 Hz) |
| Waveform quality (Rho) | > 0.999 |

Input level: –30 dBm ≤, ≤ +35 dBm

MU887000A Test Port 3/4

| | |
|---|---|
| Carrier frequency accuracy | ±(Set frequency × Reference oscillator accuracy + 10 Hz) |
| Waveform quality (Rho) | > 0.999 |

Input level: –30 dBm ≤, ≤ +25 dBm

(2) Measuring instruments

- Vector signal generator: MG3710E
- Attenuator:

| | | |
|---|---|---|
| For MU887000A/01A | 3 dB: | AT-103 2 sets |
| For MU887002A | 3 dB: | BW-N3W5+ |
| | 6 dB: | BW-N6W5+ |

(3) Setup

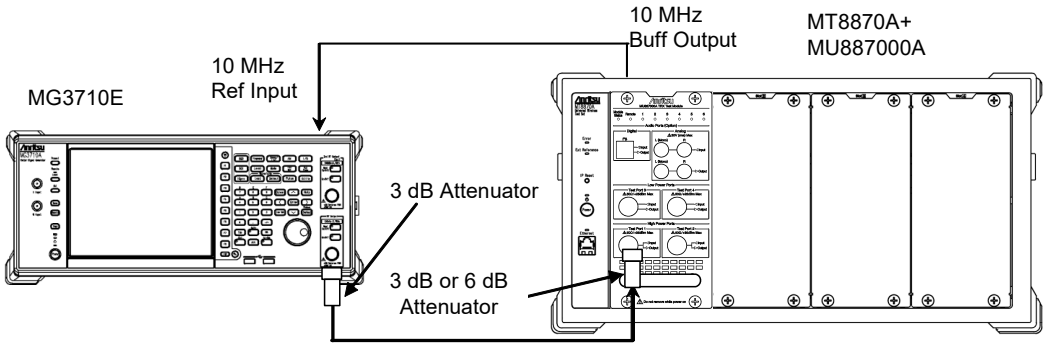



**Figure 6.3.7-1 Setup for Measuring Frequency/Modulation**

(4) Procedure

This test is measured at the following Test Ports.
When testing other than Test Port 1, read "Test Port 1" in the following procedure as the port to be tested.
MU887000A: Test Port 1, 2, 3, 4
MU887001A: Test Port 1, 2, 3, 4
MU887002A: TRX 1: Test Port 1, 2, TRX 2: Test Port 1, 2

1. Setup the instruments as shown in Figure 6.3.7-1.
2. Set the MU887000A as follows:

| | | |
|---|---|---|
| Connect port: | Test Port 1 | |
| Output level ON/OFF: | OFF | |
| Input level: | –10 dBm | |
| Reverse Link frequency: | MU887000A/01A | 400 MHz |
| | MU887002A | 402.5 MHz |
| Turn Off All measurement: | | OFF |
| Modulation Analysis measurement: | | ON, 20 times |

3. Set the Vector signal generator (SG) as follows:

| | | |
|---|---|---|
| Modulation: | ON | |
| Waveform pattern: | RVS_153.6_kbps_TX | |
| Output frequency: | MU887000A/01A | 400 MHz |
| | MU887002A | 402.5 MHz |
| Output level: | –10 dBm (This output level reflects the calibration value for item 6.3.2.) | |

4. Measure the frequency error, Rho, and EVM.

| | |
|---|---|
| Carrier Frequency Error Result: | Average value |
| Rho Result: | Average value |

5. Change the MU887000A and SG frequencies according to Table 6.3.1-1 "Measurement Point and Frequency" and repeat steps 2 to 4 over.
6. Change the SG output level and the MU887000A input level to –30 dBm and measure by repeating steps 2 to 5 over. (This output level reflects the calibration value for item 6.3.2.)
7. Change the Connect port setting for the connection with the MU887000A successively and repeat steps 2 to 6 over.

## 6.3.8 Sample format for test result sheets

Use the following test result sheets when testing the MX887016A performance. Duplicate these sheets as necessary for tests.

Test location _____ Report No. _____

Date _____

Person-in-charge _____

Model:

Serial No. _____ Ambient temperature _____ °C

Power source frequency _____ Hz Relative humidity _____ %

Remarks _____

SG Calibration (CW)

**SG Calibration Value (CW)**

MG3710E Unmodulated Wave

| Frequency (MHz) | SG Setting (dBm) | | |
|---|---|---|---|
| | 0 dBm | –10 dBm | –25 dBm |
| 400 / 402.5 | | | |
| 460 | | | |
| 780 | | | |
| 840 | | | |
| 1000 | | | |
| 1500 | | | |
| 1760 | | | |
| 1900 | | | |
| 2200 | | | |
| 2500 | | | |
| 2700 | | | |

SG Calibration (MOD)

**SG Calibration Value (MOD)**

MG3710E Modulated Wave

| Frequency (MHz) | SG Setting (dBm) |
|---|---|
| | –10 dBm |
| 400 / 402.5 | |
| 460 | |
| 780 | |
| 840 | |
| 1000 | |
| 1500 | |
| 1760 | |
| 1900 | |
| 2200 | |
| 2500 | |
| 2700 | |

Linearity Calibration

**Linearity Calibration**

| Frequency (MHz) | SG Level (dBm) | SA Measured Value (dBm) | Calibration Value (C) (B) – (A) (dB) | SG Level (dBm) | SA Measured Value (dBm) | Value (C) (B) – (A) (dB) |
|---|---|---|---|---|---|---|
| 400 / 402.5 | 0 | (A) | | –25 | (A) | |
| | –10 | (B) | | –35 | (B) | |
| | –20 | (B) | | –45 | (B) | |
| | –30 | (B) | | –55 | (B) | |
| | –40 | (B) | | –65 | (B) | |
| 460 | 0 | (A) | | –25 | (A) | |
| | –10 | (B) | | –35 | (B) | |
| | –20 | (B) | | –45 | (B) | |
| | –30 | (B) | | –55 | (B) | |
| | –40 | (B) | | –65 | (B) | |
| 780 | 0 | (A) | | –25 | (A) | |
| | –10 | (B) | | –35 | (B) | |
| | –20 | (B) | | –45 | (B) | |
| | –30 | (B) | | –55 | (B) | |
| | –40 | (B) | | –65 | (B) | |
| 840 | 0 | (A) | | –25 | (A) | |
| | –10 | (B) | | –35 | (B) | |
| | –20 | (B) | | –45 | (B) | |
| | –30 | (B) | | –55 | (B) | |
| | –40 | (B) | | –65 | (B) | |
| 1000 | 0 | (A) | | –25 | (A) | |
| | –10 | (B) | | –35 | (B) | |
| | –20 | (B) | | –45 | (B) | |
| | –30 | (B) | | –55 | (B) | |
| | –40 | (B) | | –65 | (B) | |
| 1500 | 0 | (A) | | –25 | (A) | |
| | –10 | (B) | | –35 | (B) | |
| | –20 | (B) | | –45 | (B) | |
| | –30 | (B) | | –55 | (B) | |
| | –40 | (B) | | –65 | (B) | |

Linearity Calibration (continued)

**Linearity Calibration (continued)**

| Frequency (MHz) | SG Level (dBm) | SA Measured Value (dBm) | Calibration Value (C) (B) – (A) (dB) | SG Level (dBm) | SA Measured Value (dBm) | Calibration Value (C) (B) – (A) (dB) |
|---|---|---|---|---|---|---|
| 1760 | 0 | (A) | | –25 | (A) | |
| | –10 | (B) | | –35 | (B) | |
| | –20 | (B) | | –45 | (B) | |
| | –30 | (B) | | –55 | (B) | |
| | –40 | (B) | | –65 | (B) | |
| 1900 | 0 | (A) | | –25 | (A) | |
| | –10 | (B) | | –35 | (B) | |
| | –20 | (B) | | –45 | (B) | |
| | –30 | (B) | | –55 | (B) | |
| | –40 | (B) | | –65 | (B) | |
| 2200 | 0 | (A) | | –25 | (A) | |
| | –10 | (B) | | –35 | (B) | |
| | –20 | (B) | | –45 | (B) | |
| | –30 | (B) | | –55 | (B) | |
| | –40 | (B) | | –65 | (B) | |
| 2500 | 0 | (A) | | –25 | (A) | |
| | –10 | (B) | | –35 | (B) | |
| | –20 | (B) | | –45 | (B) | |
| | –30 | (B) | | –55 | (B) | |
| | –40 | (B) | | –65 | (B) | |
| 2700 | 0 | (A) | | –25 | (A) | |
| | –10 | (B) | | –35 | (B) | |
| | –20 | (B) | | –45 | (B) | |
| | –30 | (B) | | –55 | (B) | |
| | –40 | (B) | | –65 | (B) | |

Output Rho

**Output Rho**

| Frequency (MHz) | Rho | | | Rho | | |
|---|---|---|---|---|---|---|
| | Test Port | | Output Level | Test Port | | Output Level |
| | MU887000A Test Port 1 | | –10.9 dBm | MU887000A Test Port 3 | | –0.9 dBm |
| | MU887001A Test Port 1 | | –10.9 dBm | MU887001A Test Port 3 | | –10.9 dBm |
| | MU887002A TRX 1 / 2 Test Port 1 | | –5.0 dBm | MU887002A TRX 1 / 2 Test Port 2 | | –5.0 dBm |
| | Measured Value | Spec. | Measurement uncertainty | Measured Value | Spec. | Measurement uncertainty |
| 400 / 402.5 | | > 0.990 | 0.001 | | > 0.990 | 0.001 |
| 900 | | | | | | |
| 2000 | | | | | | |
| 2700 | | | | | | |

Tx Power Measurement Accuracy (CW)

**Tx Power Measurement Accuracy**

**MU887000A Port 1/2, MU887001A Port 1/2/3/4, MU887002A TRX 1/2 Port 1/2**

**Input Level: –10 dBm (Item 6.3.1 Calibration Value)**

| Frequency (MHz) | Measured Value (P) (dBm) | Measurement Accuracy (dB) | | | |
|---|---|---|---|---|---|
| | | Lo Limit | Measurement Accuracy –10 – (P) | Hi Limit | Measurement uncertainty |
| 400 / 402.5 | | –0.5 | | +0.5 | ±0.15 |
| 460 | | | | | |
| 780 | | | | | |
| 840 | | | | | |
| 1000 | | | | | |
| 1500 | | | | | |
| 1760 | | | | | |
| 1900 | | | | | |
| 2200 | | | | | |
| 2500 | | | | | |
| 2700 | | | | | |

**Tx Power Measurement Accuracy**

**MU887000A Port 1/2, MU887001A Port 1/2/3/4, MU887002A TRX 1/2 Port 1/2**

**Input Level: –55 dBm (Item 6.3.3 Calibration Value)**

| Frequency (MHz) | Item 6.3.3 –55 dBm Calibration Value (C) (dB) | Measured Value (P) (dBm) | Measurement Accuracy (dB) | | | |
|---|---|---|---|---|---|---|
| | | | Lo Limit | Measurement Accuracy –25 + (C) – (P) | Hi Limit | Measurement uncertainty |
| 400 / 402.5 | | | –0.7 | | +0.7 | ±0.13 |
| 460 | | | | | | |
| 780 | | | | | | |
| 840 | | | | | | |
| 1000 | | | | | | |
| 1500 | | | | | | |
| 1760 | | | | | | |
| 1900 | | | | | | |
| 2200 | | | | | | |
| 2500 | | | | | | |
| 2700 | | | | | | |

Tx Power Measurement Accuracy (CW) (continued)

**Tx Power Measurement Accuracy**

**MU887000A Port 1/2, MU887001A Port 1/2/3/4, MU887002A TRX 1/2 Port 1/2**

**MU887000A, MU887001A Input Level: –65 dBm (Item 6.3.3 Calibration Value)**

| Frequency (MHz) | Item 6.3.3 –65 dBm Calibration Value (C) (dB) | Measured Value (P) (dBm) | Measurement Accuracy (dB) | | | |
|---|---|---|---|---|---|---|
| | | | Lo Limit | Measurement Accuracy –25 + (C) – (P) | Hi Limit | Measurement uncertainty |
| 400 / 402.5 | | | –0.9 | | +0.9 | ±0.13 |
| 460 | | | | | | |
| 780 | | | | | | |
| 840 | | | | | | |
| 1000 | | | | | | |
| 1500 | | | | | | |
| 1760 | | | | | | |
| 1900 | | | | | | |
| 2200 | | | | | | |
| 2500 | | | | | | |
| 2700 | | | | | | |

Tx Power Measurement Accuracy (CW) (continued)

**Tx Power Measurement Accuracy MU887000A Port 3/4**

**Input Level: –10 dBm (Item 6.3.1 Calibration Value)**

| Frequency (MHz) | Measured Value (P) (dBm) | Measurement Accuracy (dB) | | | |
|---|---|---|---|---|---|
| | | Lo Limit | Measurement Accuracy –10 – (P) | Hi Limit | Measurement uncertainty |
| 400 / 402.5 | | –0.7 | | +0.7 | ±0.17 |
| 460 | | | | | |
| 780 | | | | | |
| 840 | | | | | |
| 1000 | | | | | |
| 1500 | | | | | |
| 1760 | | | | | |
| 1900 | | | | | |
| 2200 | | | | | |
| 2500 | | | | | |
| 2700 | | | | | |

**Tx Power Measurement Accuracy MU887000A Port 3/4**

**Input Level: –55 dBm (Item 6.3.3 Calibration Value)**

| Frequency (MHz) | Item 6.3.3 –55 dBm Calibration Value (C) (dB) | Measured Value (P) (dBm) | Measurement Accuracy (dB) | | | |
|---|---|---|---|---|---|---|
| | | | Lo Limit | Measurement Accuracy –25 + (C) – (P) | Hi Limit | Measurement uncertainty |
| 400 / 402.5 | | | –0.9 | | +0.9 | ±0.14 |
| 460 | | | | | | |
| 780 | | | | | | |
| 840 | | | | | | |
| 1000 | | | | | | |
| 1500 | | | | | | |
| 1760 | | | | | | |
| 1900 | | | | | | |
| 2200 | | | | | | |
| 2500 | | | | | | |
| 2700 | | | | | | |

Tx Power Measurement Accuracy (CW) (continued)

**Tx Power Measurement Accuracy MU887000A Port 3/4**

**Input Level: –65 dBm (Item 6.3.3 Calibration Value)**

| Frequency (MHz) | Item 6.3.3 –65 dBm Calibration Value (C) (dB) | Measured Value (P) (dBm) | Measurement Accuracy (dB) | | | |
|---|---|---|---|---|---|---|
| | | | Lo Limit | Measurement Accuracy –25 + (C) – (P) | Hi Limit | Measurement uncertainty |
| 400 / 402.5 | | | –1.1 | | +1.1 | ±0.14 |
| 460 | | | | | | |
| 780 | | | | | | |
| 840 | | | | | | |
| 1000 | | | | | | |
| 1500 | | | | | | |
| 1760 | | | | | | |
| 1900 | | | | | | |
| 2200 | | | | | | |
| 2500 | | | | | | |
| 2700 | | | | | | |

Tx Power Measurement Linearity

**Linearity (Reference Level 0 dBm)**

| Frequency (MHz) | SG Level (dBm) | Item 6.3.3 Calibration Value (dB) | MX887016A Measured Value (dBm) | Linearity (D) – (REF) – (C) (dB) | Spec. (dB) | Measurement uncertainty |
|---|---|---|---|---|---|---|
| 400 / 402.5 | +10 | | (REF) | | | |
| | 0 | (C) | (D) | | ±0.2 | ±0.05 |
| | –10 | (C) | (D) | | | |
| | –20 | (C) | (D) | | | |
| | –30 | (C) | (D) | | | |
| 460 | +10 | | (REF) | | | |
| | 0 | (C) | (D) | | ±0.2 | ±0.05 |
| | –10 | (C) | (D) | | | |
| | –20 | (C) | (D) | | | |
| | –30 | (C) | (D) | | | |
| 780 | +10 | | (REF) | | | |
| | 0 | (C) | (D) | | ±0.2 | ±0.05 |
| | –10 | (C) | (D) | | | |
| | –20 | (C) | (D) | | | |
| | –30 | (C) | (D) | | | |
| 840 | +10 | | (REF) | | | |
| | 0 | (C) | (D) | | ±0.2 | ±0.05 |
| | –10 | (C) | (D) | | | |
| | –20 | (C) | (D) | | | |
| | –30 | (C) | (D) | | | |
| 1000 | +10 | | (REF) | | | |
| | 0 | (C) | (D) | | ±0.2 | ±0.05 |
| | –10 | (C) | (D) | | | |
| | –20 | (C) | (D) | | | |
| | –30 | (C) | (D) | | | |
| 1500 | +10 | | (REF) | | | |
| | 0 | (C) | (D) | | ±0.2 | ±0.05 |
| | –10 | (C) | (D) | | | |
| | –20 | (C) | (D) | | | |
| | –30 | (C) | (D) | | | |

Tx Power Measurement Linearity (continued)

**Linearity (Reference Level 0 dBm)**

| Frequency (MHz) | SG Level (dBm) | Item 6.3.3 Calibration Value (dB) | MX887016A Measured Value (dBm) | Linearity (D) – (REF) – (C) (dB) | Spec. (dB) | Measurement uncertainty |
|---|---|---|---|---|---|---|
| 1760 | +10 | | (REF) | | | |
| | 0 | (C) | (D) | | ±0.2 | ±0.05 |
| | –10 | (C) | (D) | | | |
| | –20 | (C) | (D) | | | |
| | –30 | (C) | (D) | | | |
| 1900 | +10 | | (REF) | | | |
| | 0 | (C) | (D) | | ±0.2 | ±0.05 |
| | –10 | (C) | (D) | | | |
| | –20 | (C) | (D) | | | |
| | –30 | (C) | (D) | | | |
| 2200 | +10 | | (REF) | | | |
| | 0 | (C) | (D) | | ±0.2 | ±0.05 |
| | –10 | (C) | (D) | | | |
| | –20 | (C) | (D) | | | |
| | –30 | (C) | (D) | | | |
| 2500 | +10 | | (REF) | | | |
| | 0 | (C) | (D) | | ±0.2 | ±0.05 |
| | –10 | (C) | (D) | | | |
| | –20 | (C) | (D) | | | |
| | –30 | (C) | (D) | | | |
| 2700 | +10 | | (REF) | | | |
| | 0 | (C) | (D) | | ±0.2 | ±0.05 |
| | –10 | (C) | (D) | | | |
| | –20 | (C) | (D) | | | |
| | –30 | (C) | (D) | | | |

Tx Power Measurement Linearity (continued)

**Linearity (Reference Level –25 dBm)**

| Frequency (MHz) | SG Level (dBm) | Item 6.3.3 Calibration Value (dB) | MX887016A Measured Value (dBm) | Linearity (D) – (REF) – (C) (dB) | Spec. (dB) | Measurement uncertainty |
|---|---|---|---|---|---|---|
| 400 / 402.5 | –25 | | (REF) | | | |
| | –35 | (C) | (D) | | ±0.2 | ±0.05 |
| | –45 | (C) | (D) | | | |
| | –55 | (C) | (D) | | | |
| | –65 | (C) | (D) | | ±0.4 | ±0.05 |
| 460 | –25 | | (REF) | | | |
| | –35 | (C) | (D) | | ±0.2 | ±0.05 |
| | –45 | (C) | (D) | | | |
| | –55 | (C) | (D) | | | |
| | –65 | (C) | (D) | | ±0.4 | ±0.05 |
| 780 | –25 | | (REF) | | | |
| | –35 | (C) | (D) | | ±0.2 | ±0.05 |
| | –45 | (C) | (D) | | | |
| | –55 | (C) | (D) | | | |
| | –65 | (C) | (D) | | ±0.4 | ±0.05 |
| 840 | –25 | | (REF) | | | |
| | –35 | (C) | (D) | | ±0.2 | ±0.05 |
| | –45 | (C) | (D) | | | |
| | –55 | (C) | (D) | | | |
| | –65 | (C) | (D) | | ±0.4 | ±0.05 |
| 1000 | –25 | | (REF) | | | |
| | –35 | (C) | (D) | | ±0.2 | ±0.05 |
| | –45 | (C) | (D) | | | |
| | –55 | (C) | (D) | | | |
| | –65 | (C) | (D) | | ±0.4 | ±0.05 |
| 1500 | –25 | | (REF) | | | |
| | –35 | (C) | (D) | | ±0.2 | ±0.05 |
| | –45 | (C) | (D) | | | |
| | –55 | (C) | (D) | | | |
| | –65 | (C) | (D) | | ±0.4 | ±0.05 |

Tx Power Measurement Linearity (continued)

**Linearity (Reference Level –25 dBm) (continued)**

| Frequency (MHz) | SG Level (dBm) | Item 6.3.3 Calibration Value (dB) | MX887016A Measured Value (dBm) | Linearity (D) – (REF) – (C) (dB) | Spec. (dB) | Measurement uncertainty |
|---|---|---|---|---|---|---|
| 1760 | –25 | | (REF) | | | |
| | –35 | (C) | (D) | | ±0.2 | ±0.05 |
| | –45 | (C) | (D) | | | |
| | –55 | (C) | (D) | | | |
| | –65 | (C) | (D) | | ±0.4 | ±0.05 |
| 1900 | –25 | | (REF) | | | |
| | –35 | (C) | (D) | | ±0.2 | ±0.05 |
| | –45 | (C) | (D) | | | |
| | –55 | (C) | (D) | | | |
| | –65 | (C) | (D) | | ±0.4 | ±0.05 |
| 2200 | –25 | | (REF) | | | |
| | –35 | (C) | (D) | | ±0.2 | ±0.05 |
| | –45 | (C) | (D) | | | |
| | –55 | (C) | (D) | | | |
| | –65 | (C) | (D) | | ±0.4 | ±0.05 |
| 2500 | –25 | | (REF) | | | |
| | –35 | (C) | (D) | | ±0.2 | ±0.05 |
| | –45 | (C) | (D) | | | |
| | –55 | (C) | (D) | | | |
| | –65 | (C) | (D) | | ±0.4 | ±0.05 |
| 2700 | –25 | | (REF) | | | |
| | –35 | (C) | (D) | | ±0.2 | ±0.05 |
| | –45 | (C) | (D) | | | |
| | –55 | (C) | (D) | | | |
| | –65 | (C) | (D) | | ±0.4 | ±0.05 |

Frequency/Modulation Measurement

**Carrier Frequency Accuracy/Waveform Quality**

Input Level: –10 dBm

| Frequency (MHz) | Rho (Waveform Quality) | | | Carrier Frequency Accuracy (Hz) | | |
|---|---|---|---|---|---|---|
| | Measured Value | Spec. | Measurement uncertainty | Measured Value | Spec. | Measurement uncertainty |
| 400 / 402.5 | | > 0.999 | 0.00001 | | ±10.0 | ±0.6 |
| 460 | | | | | | |
| 780 | | | | | | |
| 840 | | | | | | |
| 1000 | | | | | | |
| 1500 | | | | | | |
| 1760 | | | | | | |
| 1900 | | | | | | |
| 2200 | | | | | | |
| 2500 | | | | | | |
| 2700 | | | | | | |

**Carrier Frequency Accuracy/Waveform Quality**

Input Level: –30 dBm

| Frequency (MHz) | Rho(Waveform Quality) | | | Carrier Frequency Accuracy (Hz) | | |
|---|---|---|---|---|---|---|
| | Measured Value | Spec. | Measurement uncertainty | Measured Value | Spec. | Measurement uncertainty |
| 400 / 402.5 | | > 0.999 | 0.00001 | | ±10.0 | ±0.6 |
| 460 | | | | | | |
| 780 | | | | | | |
| 840 | | | | | | |
| 1000 | | | | | | |
| 1500 | | | | | | |
| 1760 | | | | | | |
| 1900 | | | | | | |
| 2200 | | | | | | |
| 2500 | | | | | | |
| 2700 | | | | | | |

# 6.4 Servicing

If any unit is found to be broken or does not operate as described in the specifications, contact an Anritsu Service and Sales office. Contact information can be found on the last page of the printed version of this manual, and is available in a separate file on the PDF version.

When requesting repair, supply the following information:

(a) Model name and serial number marked on rear panel

(b) Failure symptoms

(c) Person to contact about nature of failure and repair completion notification

(d) Software version

# Appendix A Specifications

This appendix lists the specifications of the MX887016A 1xEV-DO Reverse Link TX Measurement. Refer to section 1.3 “Product Composition” for details of the product configuration.

These specifications assume use of the system at a constant temperature after warming-up the instruments for 30 minutes. The abbreviation (typ.) indicates the reference data at 20 to 30°C and is not a guaranteed value.
For MU887002A, when the ports 1 and 2 of TRX 1 or TRX 2 satisfy the specifications, the specifications of the ports 3 to 12 of the same TRX are guaranteed by design.
BW: Signal Bandwidth, $f_0$: Center frequency

**Table A-1 MX887016A Specifications**

<table>
<tr><th>Item</th><th>Specification</th></tr>
<tr><td>Common Items</td><td></td></tr>
<tr><td>Frequency</td><td>400 ≤ $f_0$ ≤ 2700 MHz (MU887000A/01A)<br>400 MHz ≤ $f_0$ – BW/2, $f_0$ ≤ 2700 MHz (MU887002A)</td></tr>
<tr><td>Measuring Object</td><td>1xEV-DO Rev. 0, Rev. A Reverse Link signals</td></tr>
<tr><td>RF Power</td><td></td></tr>
<tr><td>Input Level Range</td><td>MU887000A Port 1, Port 2: –65.0 to +35.0 dBm<br>Port 3, Port 4: –65.0 to +25.0 dBm<br>MU887001A Port 1 to 4: –65.0 to +35.0 dBm<br>MU887002A TRX 1/2 Port 1 to 12: –65.0 to +35.0 dBm</td></tr>
<tr><td>Measurement Accuracy</td><td>MU887000A Port 1, Port 2: After calibration, 20 to 30°C<br>MU887001A Port 1 to 4: After calibration, 20 to 30°C<br>MU887002A TRX 1/2 Port 1 to 12: After calibration, 20 to 30°C
<table>
<tr><th>Input Level</th><th>Measurement Accuracy</th></tr>
<tr><td>–25 to +35 dBm</td><td>±0.3 dB (typ.)</td></tr>
</table>
MU887000A Port 1, Port 2: After calibration, 10 to 40°C<br>MU887001A Port 1 to 4: After calibration, 10 to 40°C<br>MU887002A TRX 1/2 Port 1 to 12: After calibration, 20 to 30°C
<table>
<tr><th>Input Level</th><th>Measurement Accuracy</th></tr>
<tr><td>–25 to +35 dBm</td><td>±0.5 dB</td></tr>
<tr><td>–55 to –25 dBm</td><td>±0.7 dB</td></tr>
<tr><td>–65 to –55 dBm</td><td>±0.9 dB</td></tr>
</table>
MU887000A Port 3, Port 4: After calibration, 10 to 40°C
<table>
<tr><th>Input Level</th><th>Measurement Accuracy</th></tr>
<tr><td>–25 to +25 dBm</td><td>±0.7 dB</td></tr>
<tr><td>–55 to –25 dBm</td><td>±0.9 dB</td></tr>
<tr><td>–65 to –55 dBm</td><td>±1.1 dB</td></tr>
</table></td></tr>
<tr><td>Linearity</td><td>
<table>
<tr><th>Input Level</th><th>Linearity</th></tr>
<tr><td>≥ –55 dBm, 0 to 40 dB</td><td>±0.2 dB</td></tr>
<tr><td>≥ –65 dBm, 0 to 40 dB</td><td>±0.4 dB</td></tr>
</table></td></tr>
</table>

**Table A-1 MX887016A Specifications (Cont'd)**

| Item | Specification | | |
|---|---|---|---|
| Modulation Analysis | | | |
| Input Level Range | MU887000A | Port 1, Port 2: | –30.0 to +35.0 dBm |
| | | Port 3, Port 4: | –30.0 to +25.0 dBm |
| | MU887001A | Port 1 to 4: | –30.0 to +35.0 dBm |
| | MU887002A | TRX 1/2 Port 1 to 12: | –30.0 to +35.0 dBm |
| Carrier Frequency Accuracy | ±(Set frequency × Reference oscillator accuracy + 10 Hz) | | |
| Waveform Quality | >0.999 | | |
| Code Domain Power | | | |
| Input Level Range | MU887000A | Port 1, Port 2: | –30.0 to +35.0 dBm |
| | | Port 3, Port 4: | –30.0 to +25.0 dBm |
| | MU887001A | Port 1 to 4: | –30.0 to +35.0 dBm |
| | MU887002A | TRX 1/2 Port 1 to 12: | –30.0 to +35.0 dBm |
| Measurement Accuracy | ±0.2 dB (Code Power ≥ –15.0 dBc) | | |
| | ±0.4 dB (Code Power ≥ –23.0 dBc) | | |
| Occupied Bandwidth | | | |
| Input Level Range | MU887000A | Port 1, Port 2: | –10.0 to +35.0 dBm |
| | | Port 3, Port 4: | –10.0 to +25.0 dBm |
| | MU887001A | Port 1 to 4: | –10.0 to +35.0 dBm |
| | MU887002A | TRX 1/2 Port 1 to 12: | –10.0 to +35.0 dBm |
| OBW Ratio | 80.0 to 99.9% | | |

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