

# 3GPP LTE TDD Solution

MS2690A/MS2691A/MS2692A/MS2830A  
Signal Analyzer

MX269022A LTE TDD Downlink Measurement Software  
MX269023A LTE TDD Uplink Measurement Software  
MX269910A LTE TDD IQproducer

**MS2690A/MS2691A/MS2692A Signal Analyzer**  
**MS2830A Signal Analyzer**

# 3GPP LTE TDD Solution

**MX269022A LTE TDD Downlink Measurement Software**

**NEW**

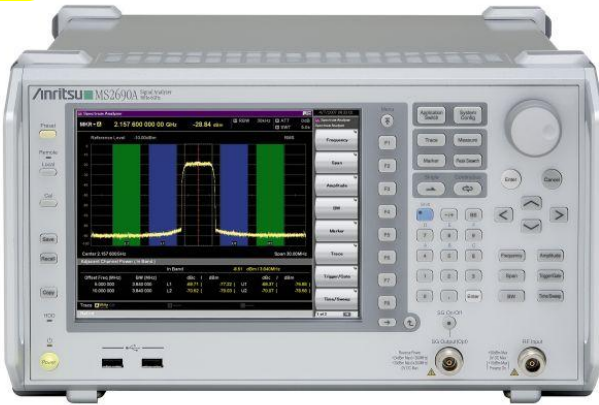
**MX269022A-001 LTE-Advanced TDD Downlink Measurement Software**

**MX269023A LTE TDD Uplink Measurement Software**

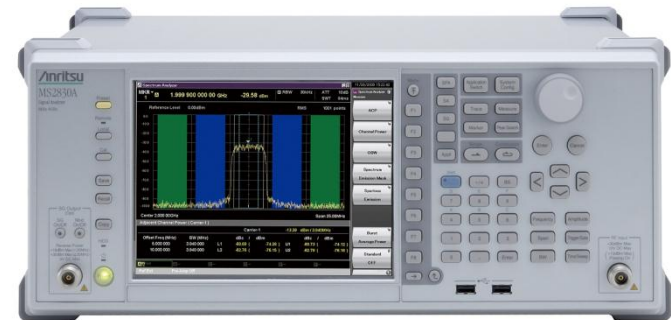
**MX269910A LTE TDD IQproducer**

**NEW**

**MX269910A-001 LTE-Advanced TDD Option**



**MS269xA**



**MS2830A**

**Version 4.00**

**ANRITSU CORPORATION**

# LTE TDD Measurement Solution

## 3GPP LTE Transmitter Measurement

### MX269022A LTE TDD Downlink Measurement Software

**NEW**

### MX269022A-001 LTE-Advanced TDD Downlink Measurement Software

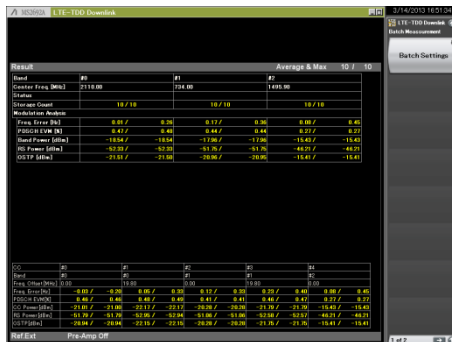
### MX269023A LTE TDD Uplink Measurement Software



The MX269022A/23A support measurement of RF Tx characteristics of 3GPP LTE (Long Term Evolution) downlink (TDD) and uplink (TDD) signals.

The MX269022A-001 is an option for the MX269022A to measure the RF Tx characteristics of LTE-Advanced downlink (TDD) signals. (Requires MX269022A)

MS269xA/MS2830A Signal Analyzer series supports various transmission evaluations, including modulation analysis.



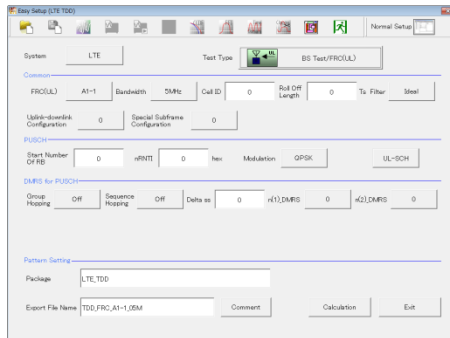
# LTE TDD Measurement Solution

## 3GPP LTE TDD Receiver Measurement

### MS269xA/MS2830A for Vector Signal Generator Option

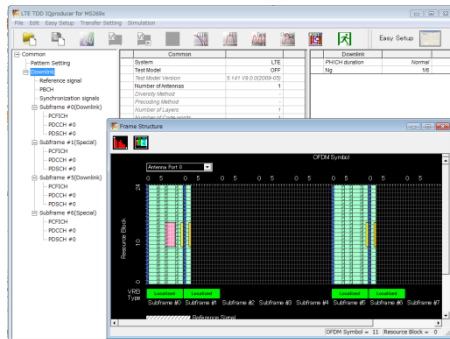
### MX269910A LTE TDD IQproducer™

### **NEW** MX269910A-001 LTE-Advanced TDD Option



The MX269910A LTE TDD IQproducer is PC application software with a GUI for generating waveform patterns in compliance with the LTE TDD specifications in the 3GPP TS 36.211, TS 36.212, and TS 36.213 standards.

The generated waveform patterns can be output from the Vector Signal Generator option for MS269xA/MS2830A.



Installing the MX269910A-001 LTE-Advanced TDD option supports output of signals in compliance with the LTE-Advanced TDD standards. (Requires MX269910A)

**MX269022A**

**Downlink**

**LTE TDD Downlink Measurement Software**

**MX269023A**

**Uplink**

**LTE TDD Uplink Measurement Software**

# Measurement Functions (1/3)

## ● Text Display

- Frequency Error
- Output Power
- EVM (Peak/rms)
- Origin Offset
- Timing Offset (External Trigger)

## ● Constellation Display

- Constellation

## ● Graphical Display

- EVM vs Subcarrier
- EVM vs Symbol
- Spectral Flatness
- Power vs Resource Block
- EVM vs Resource Block

Downlink

Downlink

-Time Based EVM

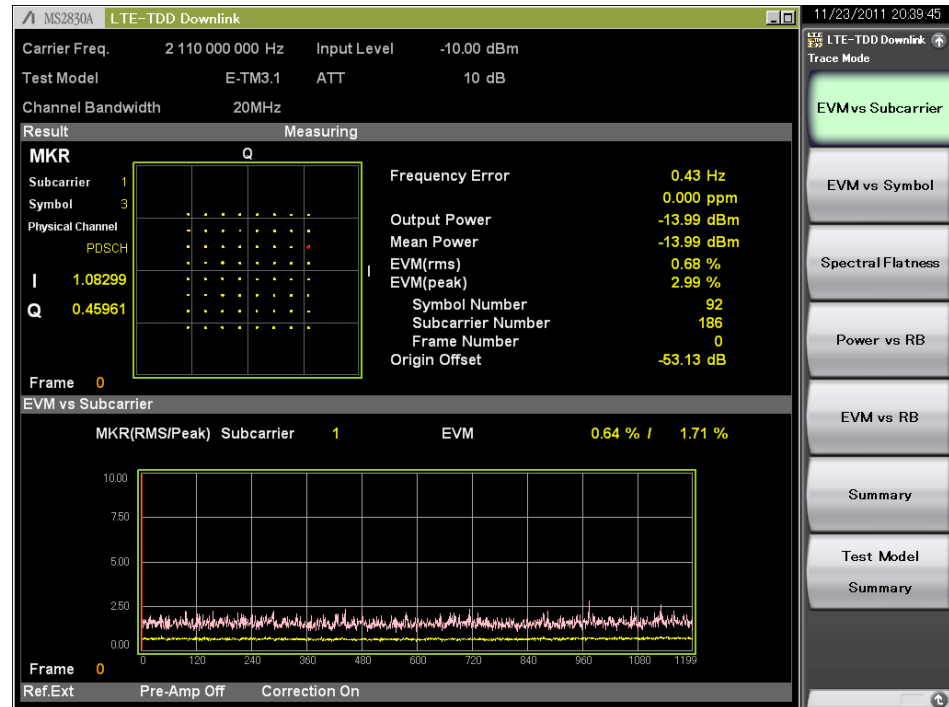
-EVM vs Demod-Symbol

-In-Band Emission

Uplink

Uplink

Uplink



# Measurement Functions (2/3)

## ● Summary Display

When the Trace Mode is set to Summary, this displays the numeric results on the multiple pages at the bottom of the screen.

## ● Test Model Summary Display

Downlink

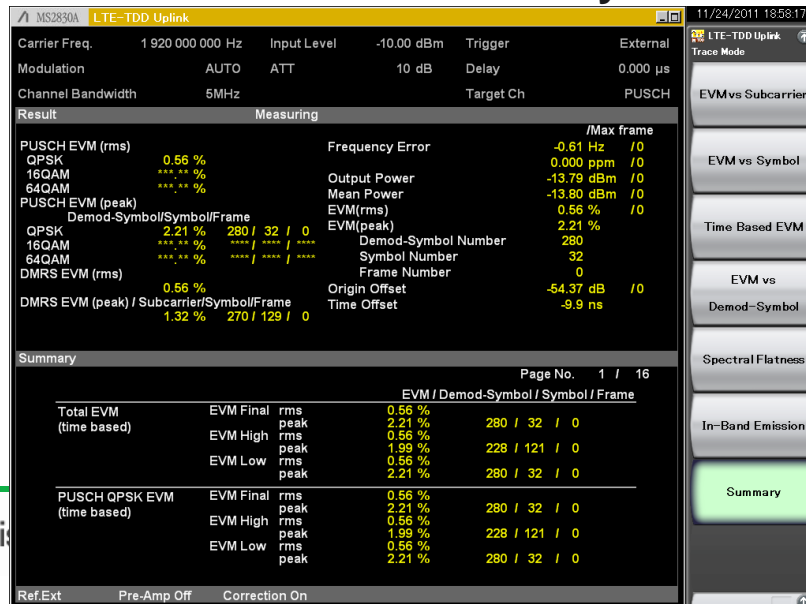
When the Trace Mode is set to Test Model Summary, this displays the numeric results on the multiple pages at the bottom of the screen. The pages are switched using Page Number.

## ● MIMO Display

Downlink

At MIMO Summary measurements for Tx Diversity and MIMO signals, the mixed signal from multiple antennas is input and the time difference between each antenna is measured.

### Test Model Summary



### MIMO Summary

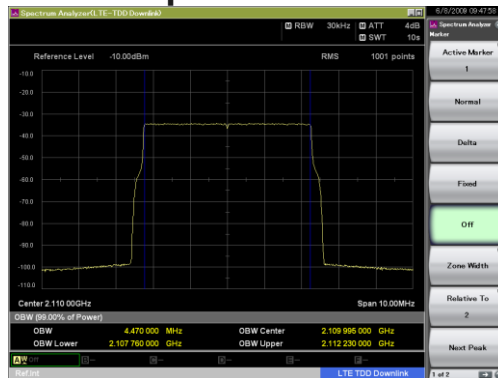


# Measurement Functions (3/3)

## Channel Power \*1



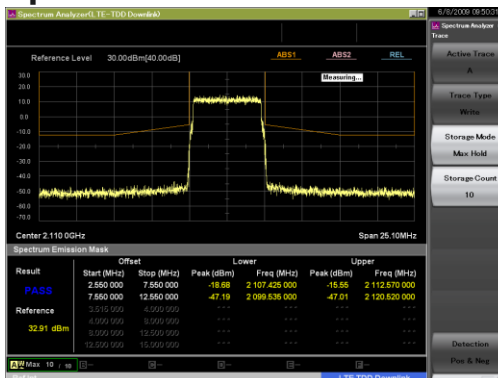
## Occupied Bandwidth



## Adjacent Channel Leakage Power \*2



## Spectrum Emission Mask \*3



## Kind of Template:

### - Channel Power

#### UL/DL

- Mean Power / Filtered Power
- 1.4 / 3 / 5 / 10 / 15 / 20MHz BW

### - OBW

#### UL/DL

- 1.4 / 3 / 5 / 10 / 15 / 20MHz BW

### - ACLR

#### UL/DL

- UTRA / E-UTRA
- 1.4 / 3 / 5 / 10 / 15 / 20MHz BW

### - SEM

#### DL

- Category A / Category B
  - < 1GHz / > 1GHz
  - 1.4 / 3 / 5 / 10 / 15 / 20MHz BW
- UL
- General, NS-03, NS-04, NS-06/07

- \*1: Requires Channel Power template for Mean Power or Filtered Power selecting
- \*2: Requires ACLR template for E-UTRA or UTRA selecting
- \*3: Requires SEM template for initial parameter setting



# Measurement Functions/ Text Display (Frequency Error, Tx Power, EVM)

Displays (text) all active subcarrier Frequency Error, Output Power, EVM (rms, peak) values in user-specified subframes (50 max.). Choosing Average & Max displays average and maximum values on same screen. This is useful for evaluating DUT dispersion.

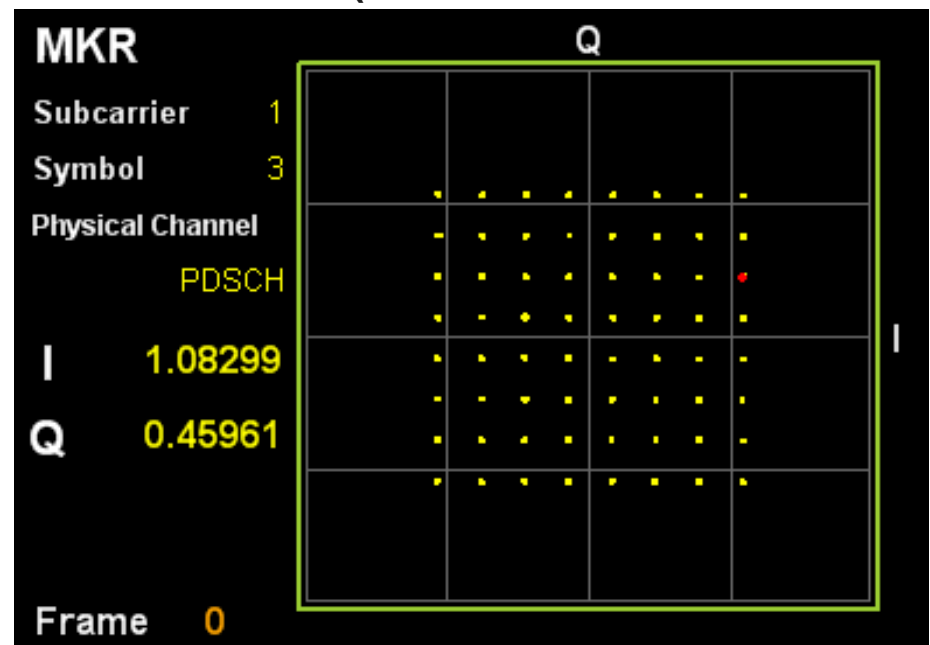
## Measurement Results (text)

Frequency Error	1.10 Hz
	0.001 ppm
Output Power	-13.98 dBm
Mean Power	-13.99 dBm
EVM(rms)	0.68 %
EVM(peak)	2.78 %
Symbol Number	83
Subcarrier Number	100
Frame Number	0
Origin Offset	-53.21 dB
Time Offset	0.0 ns

# Measurement Functions/ Constellation Display (Constellation)

Displays Constellation for all active subcarriers in user-specified symbol or in user-specified resource block (RB). Analyzes QPSK/16QAM/64QAM.

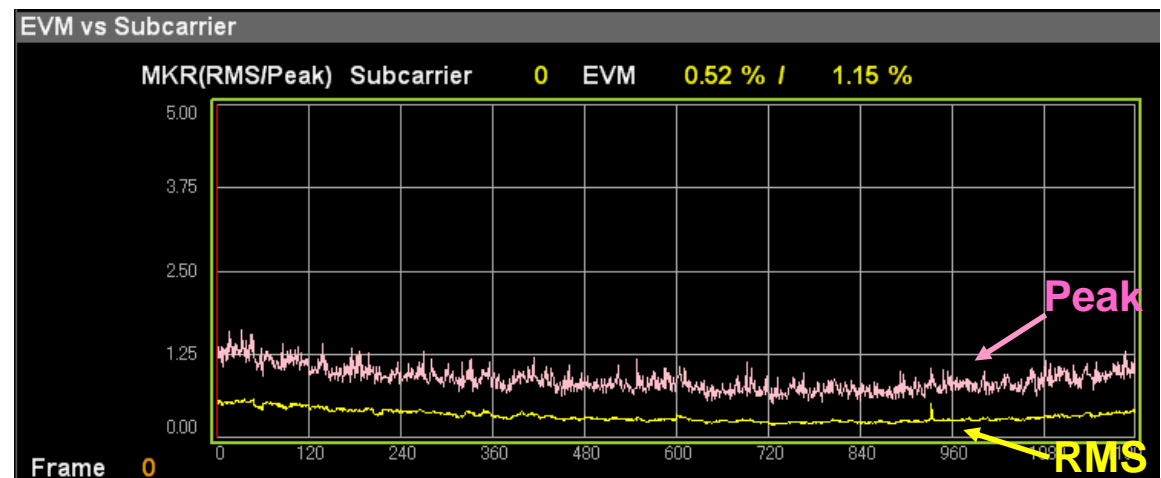
## Constellation (Resource Block Number: 10)



# Measurement Functions/ Graph Display (EVM vs Subcarrier)

Displays EVM graph per subcarrier targeting user-specified symbol or user-specified subframes (50 max). Displays Peak and Average (rms) on same screen. This enables measurement of instantaneous EVM.

## EVM vs Subcarrier

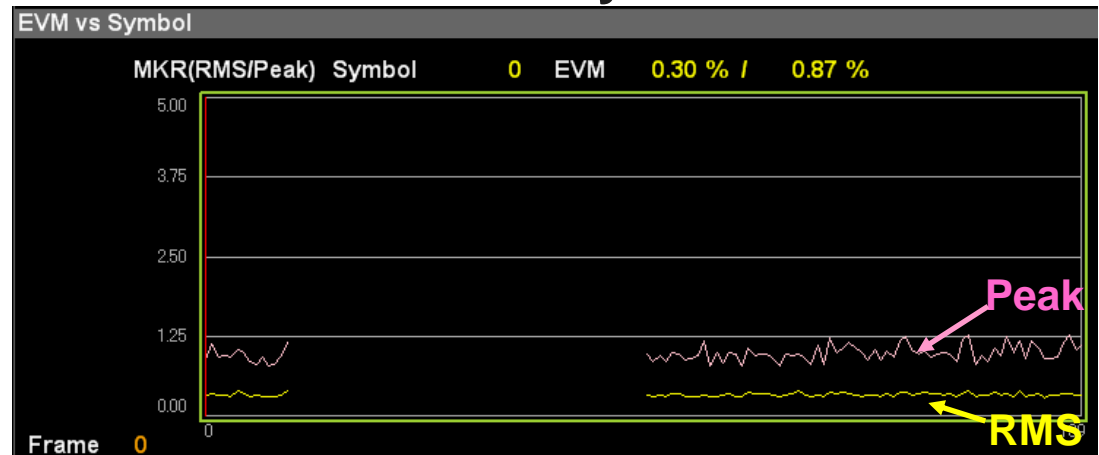


# Measurement Functions/ Graph Display (EVM vs Symbol)

Displays EVM graph per symbol targeting user-specified symbol or user-specified subframes.

Displays Peak and Average (rms) on same screen. This enables measurement of instantaneous EVM.

## EVM vs Symbol

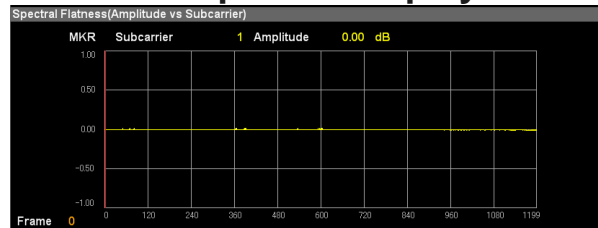


# Measurement Functions/ Graph Display (Spectral Flatness)

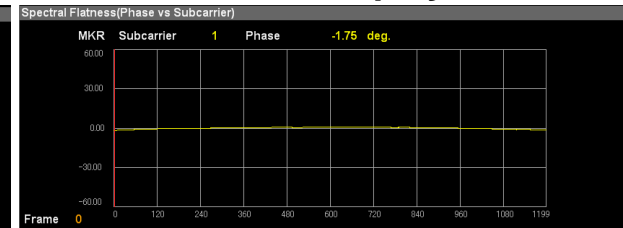
Displays amplitude/phase/group delay graph in user-specified subframes.

Detects OFDM-specific problems such as symbol timing error between subcarriers.

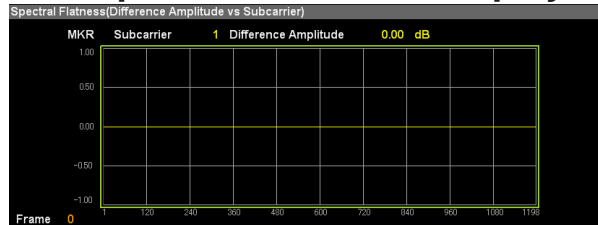
**Amplitude display**



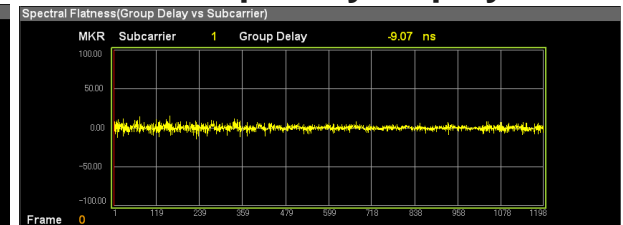
**Phase display**



**Amplitude difference display**



**Group delay display**

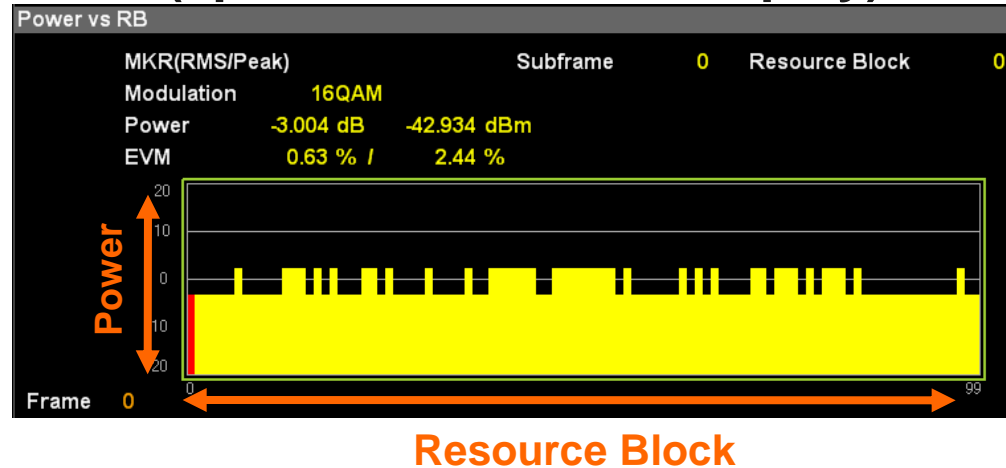


# Measurement Functions/ Graph Display (1/2) (Power vs Resource Block)

Downlink

Observes power distribution of each resource block of specified subframe. Checks power boosting at each resource block.

## Power vs RB (specified subframe display)



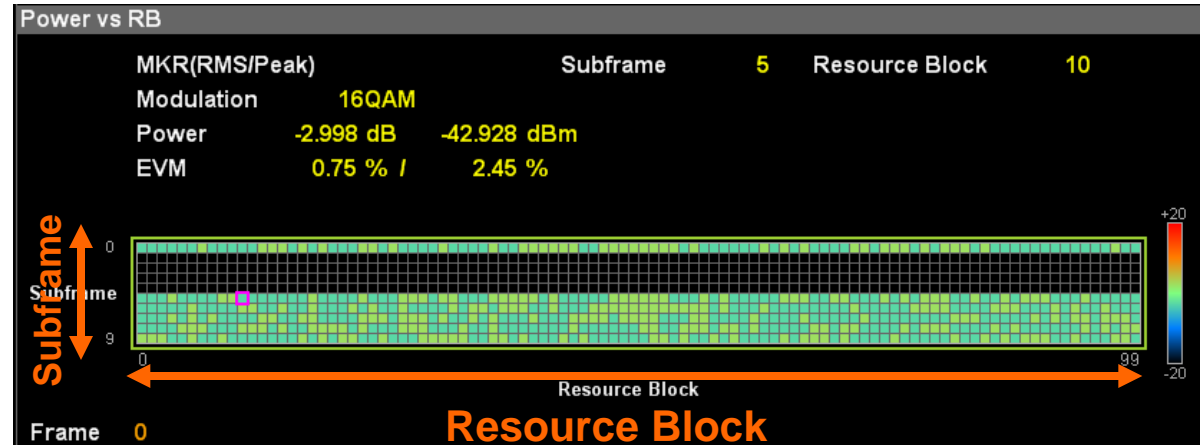
\*RB time axis in subframe units

# Measurement Functions/ Graph Display (2/2) (Power vs Resource Block)

Downlink

Displays power of each resource block of specified subframe segments as graph.  
The power distribution of each resource block can be seen instantly.

## Power vs RB (whole display)



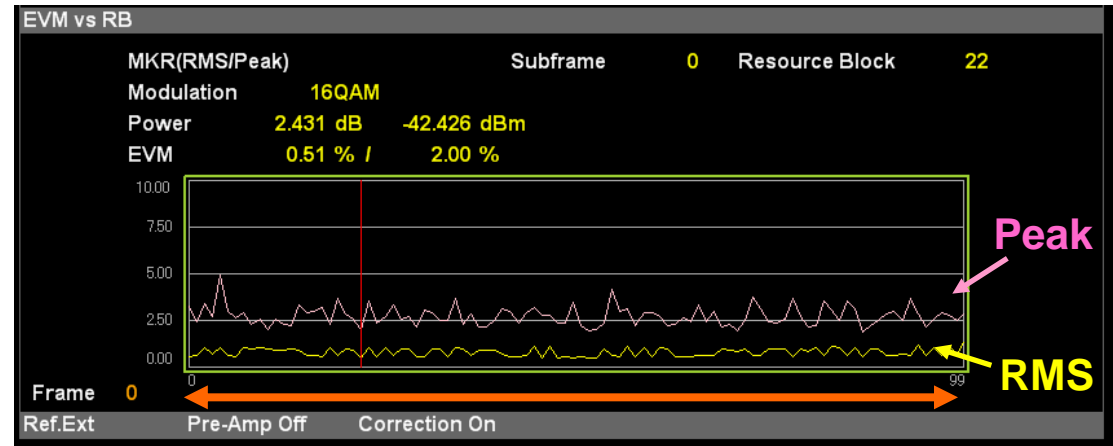
\*RB time axis in subframe units

# Measurement Functions/ Graph Display (EVM vs Resource Block)

Downlink

Displays EVM distribution for each resource block of specified subframe segments as graph.  
Identify EVM deterioration with resource block.

## EVM vs RB



Resource Block

\*RB time axis in subframe units



## Uplink

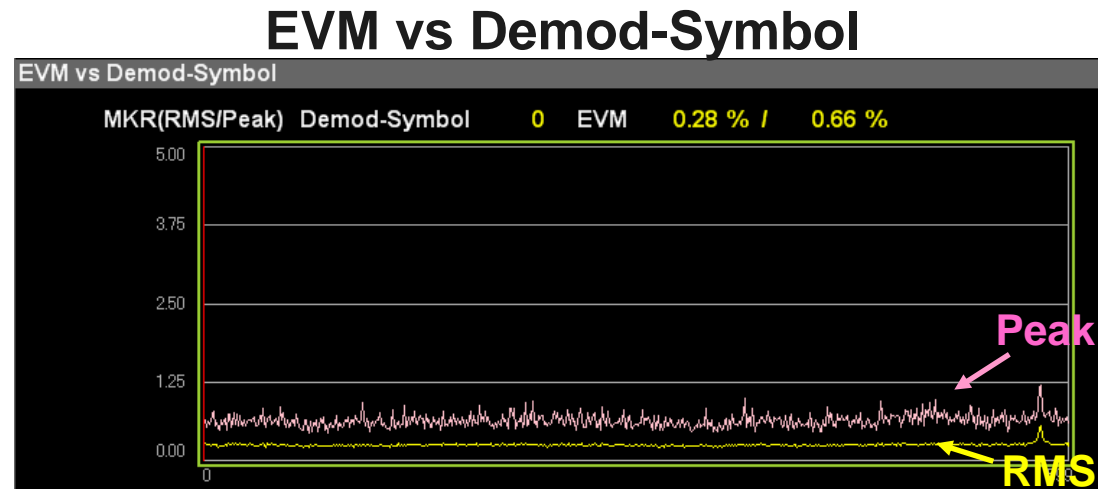
## Time Based EVM



# Measurement Functions/ Graph Display (EVM vs Demod-Symbol)

Uplink

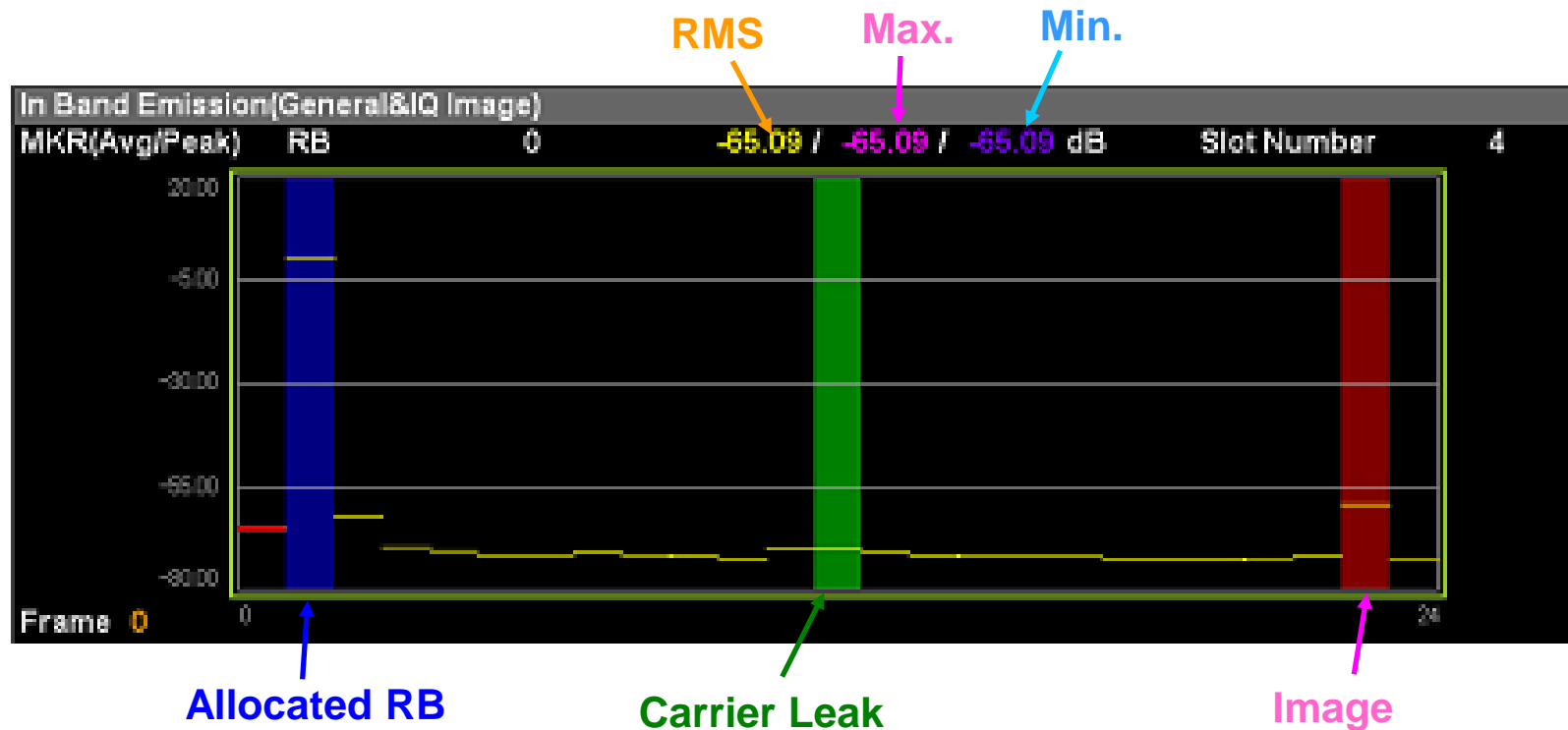
Displays PUSCH EVM of demodulated symbol for up to 50 subframes for specified symbols or specified segments as graph.



# Measurement Functions/ Graph Display (In-band Emissions)

Uplink

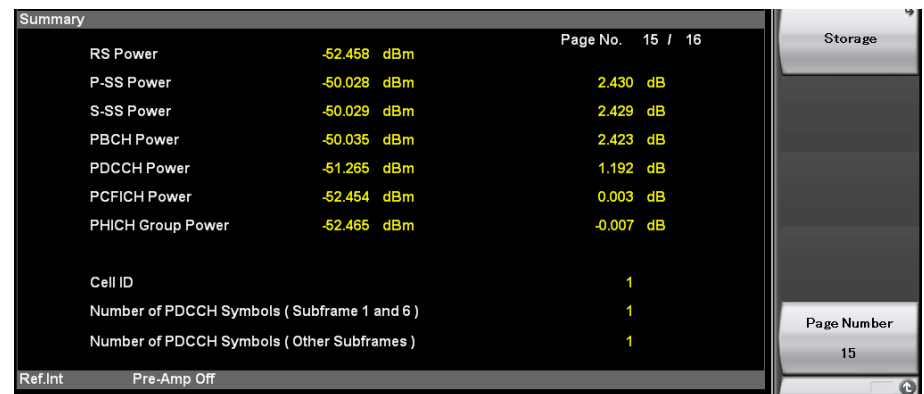
Measures in-band emissions per resource block at each Tx band spurious, carrier leak and image. Easy-to-understand display of in-band spurious.



# Measurement Functions/Summary Display (1/2)

## Downlink

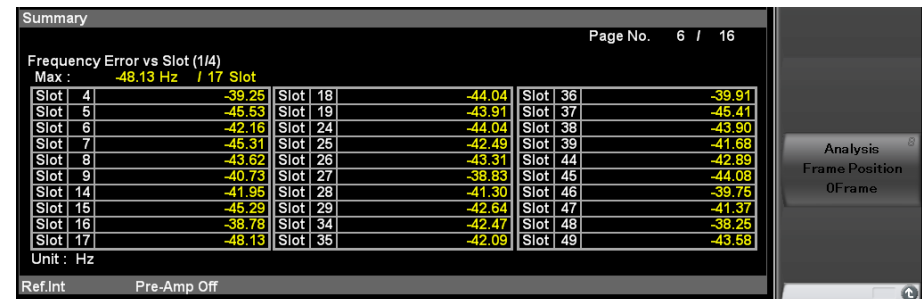
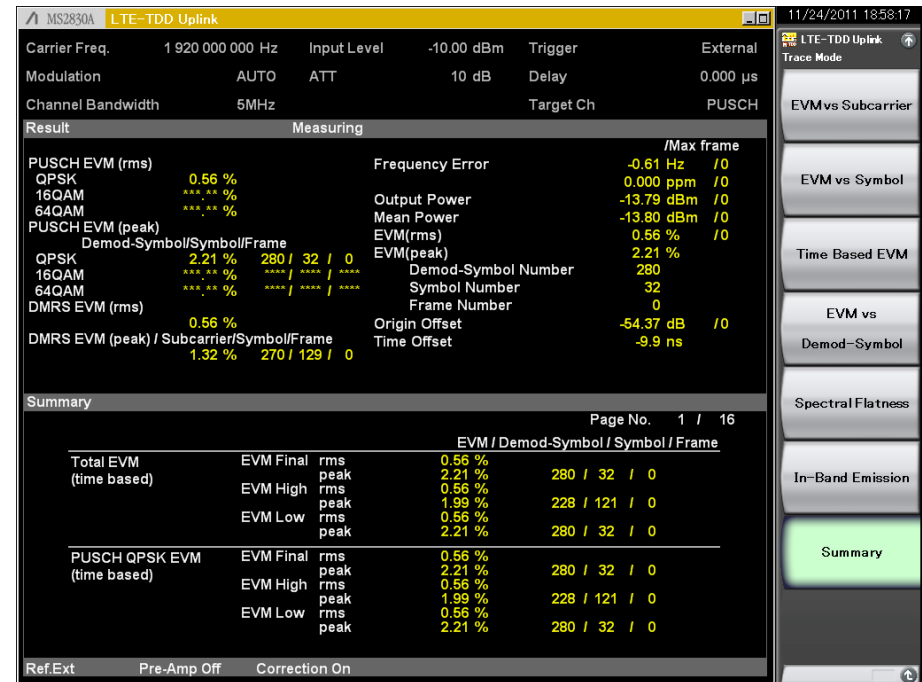
- EVM/Power of Each Channel
- Total EVM
- PDSCH (ALL/QPSK/16QAM/64QAM) EVM
- PDCCH EVM
- RS/P-SS/S-SS EVM
- PBCH/PCFICH/PHICH EVM
- Power vs Slot
- Cell ID
- Number of PDCCH Symbols
- RS power vs Subframe
- OFDM Symbol Tx Power vs Subframe
- RS/P-SS/S-SS/PBCH/PDCCH/  
PCFICH/PHICH Power



# Measurement Functions/Summary Display (2/2)

## Uplink

- PUSCH EVM(rms)/(peak)
- DMRS EVM(rms)/(peak)
- Frequency Error
- Output Power, Mean Power
- EVM(rms)/(peak)
- Origin Offset
- Time Offset
- Total EVM (Time Based)
- PUSCH QPSK/16QAM/64QAM EVM (Time Based)
- Total EVM (Frequency Based)
- PUSCH ALL/QPSK/16QAM/64QAM EVM
- DMRS EVM
- Frequency Error vs Slot
- Origin Offset vs Slot
- In-Band Emission
- Inside/Outside Flatness
- EVM equalizer spectrum flatness

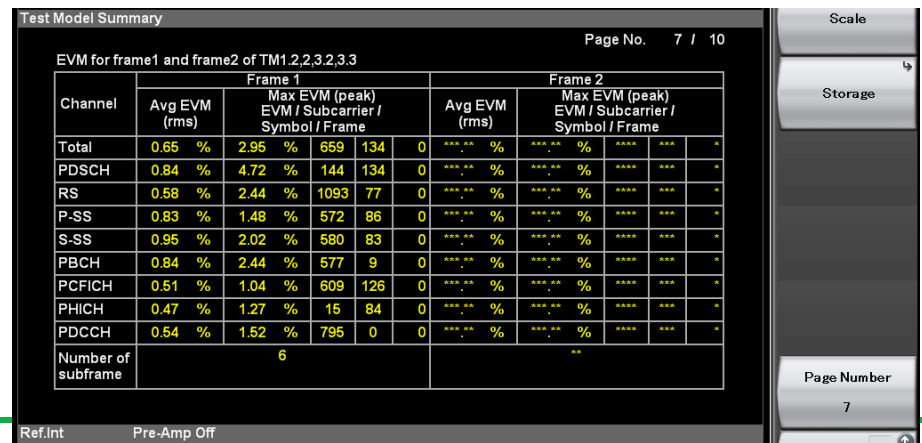
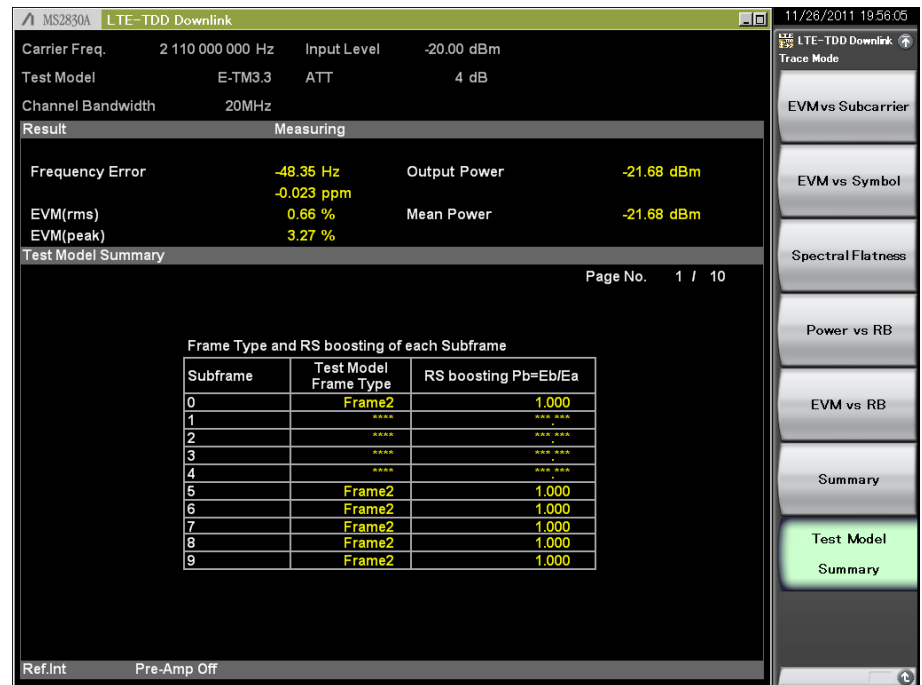


# Measurement Functions/Test Model Summary

Downlink

## Downlink

- Frame Type and RS boosting of each Subframe
- EPRE/Ers for each Subframe  
P-SS, S-SS, PBCH, PCFICH,  
PHICH group, PDCCH REG
- PDSCH EPRE/Ers QPSK/16QAM/64QAM
- EVM for frame1 and frame2 of TM1,2, 2.3, 3.3
- Power vs Slot for frame1 and frame2  
of TM1,2, 2.3, 3.3
- RS Power for frame1 and frame2  
of TM1,2, 2.3, 3.3
- OSTP for frame1 and frame2 of TM1,2, 2.3, 3.3



Discover What's Possible™

Slide 21

MS269xA/MS2830A-E-L-1

Anritsu

At MIMO Summary measurements for Tx Diversity and MIMO signals, the mixed signal from multiple antennas is input and the time difference between each antenna is measured.

## Downlink

### ➤ RS Power

The difference in the RS Power between the antenna signal specified at Antenna Port and the signal for each antenna specified at Number of Antenna Ports is displayed in dB units.

### ➤ RS EVM

This displays each RS EVM value for the number of antennas specified at Number of Antenna Ports.

### ➤ RS Timing Offset

This displays the RS time difference between the antenna signal specified at Antenna Port and each of the number of antennas specified at Number of Antenna Ports.

### ➤ RS Freq

This displays the frequency difference between the antenna signal specified at Antenna Port and each of the number of antennas specified at Number of Antenna Ports.



# Easy Measurement of Test Model Signals

[Downlink](#)

Test model signals defined in 3GPP TS36.141 as test patterns for BTS Tx tests are easily measured by selecting the test model name.



Easy measurement  
by selecting  
test model name



# Detail Setting Screen

Downlink

Detailed parameter settings, such as channel estimation ON/OFF.

Selecting Test Model Name measures Test Model signals

**Test Model** [Off] **On/Off** **Power Boosting**

Channel	On/Off	Power Boosting
PBCH	<input checked="" type="checkbox"/>	Manual 0.000 dB
P-SS	<input checked="" type="checkbox"/>	Manual 0.000 dB
S-SS	<input checked="" type="checkbox"/>	Manual 0.000 dB
PDCCH	<input checked="" type="checkbox"/>	Manual 1.195 dB
PCFICH	<input checked="" type="checkbox"/>	Manual 0.000 dB
PHICH	<input checked="" type="checkbox"/>	Manual 0.000 dB
PDSCH	<input type="checkbox"/>	Auto 0.000 dB

**PHICH Ng** [1/6] **PHICH Duration** [Normal] **Number of PDCCH Symbols** [Manual]

**Subframe 1 and 6** [1] **Other Subframes** [1]

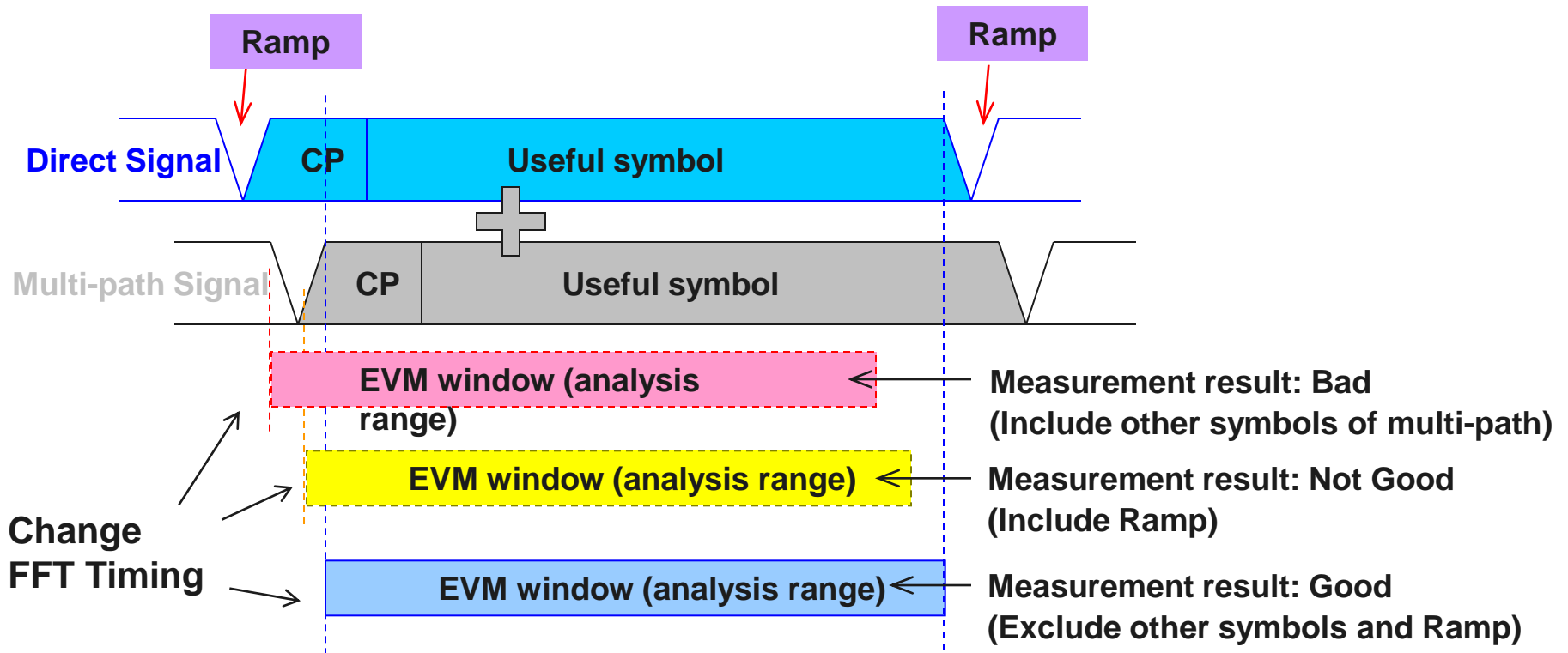
**PDCCH Mapping** [Easy] **PDCCH Format** [1] **Number of PDCCHs** [10]

☒ **Channel Estimation** **PDSCH EVM Calculation** [3GPP] **DwPTS** [Exclude]

**Set** **Cancel**

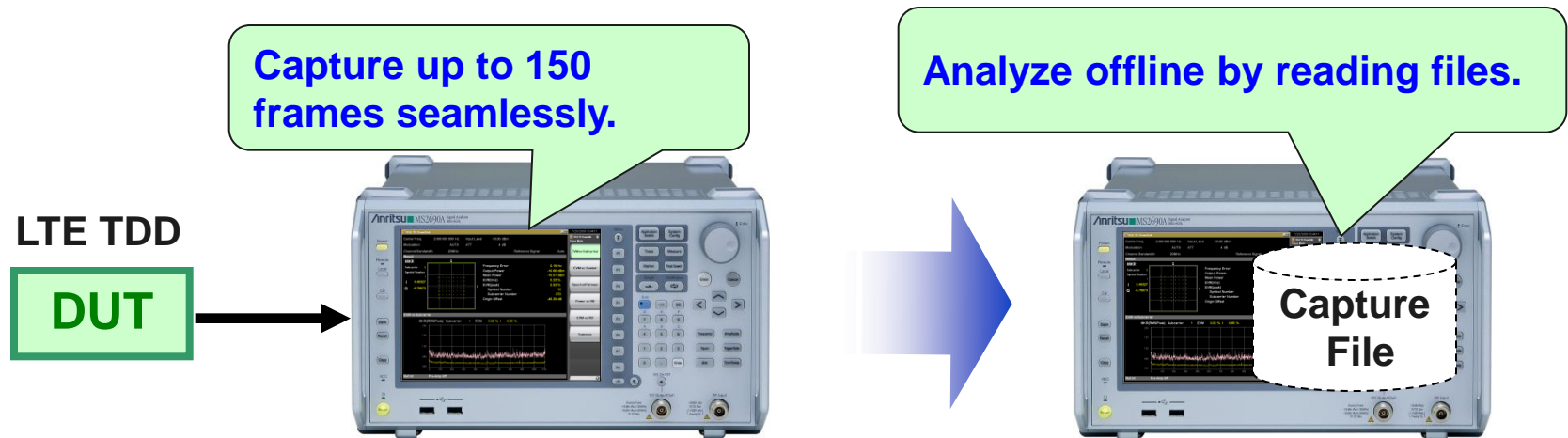
# EVM Window Length Function

The EVM Window Length function supports flexible changing of FFT timing, which is useful for verification, such as the effect of multi-paths and Ramps.



# Replay Function for Troubleshooting Faults

Up to 150 frames of LTE TDD signals can be captured as a file for replay by the LTE TDD measurement software to perform analyses, such as EVM measurement.



## Example of R&D use

Save data for comparing each DUT test version

⇒ Supports comparison of retrofitting improvement effects

## Example of production line use

Save shipping inspection data

⇒ Supports rechecking of performance data for troubleshooting post-shipping faults

**NEW**

**Downlink**

# **MX269022A-001**

## **LTE-Advanced TDD Downlink**

### **Measurement Software**

# Batch Measurement Function

## ●Batch Measurement Function

One measurement supports modulation analysis for all component carriers configuring carrier aggregation signals.

Measurement results, such as EVM and frequency errors for each band and component carriers, improves the efficiency.

The LTE-Advanced Carrier Aggregation measurement range varies as follows, depending on the Analysis Bandwidth Extension option configuration.

Using the 125-MHz analysis bandwidth hardware option (Opt-078) with the MS269xA/MS2830A enables presetting of the carrier aggregation signal to measure up to three frequency bands (one band with MS2830A) and a total of five carrier components in one simple operation.

Result		Average & Max 10 / 10			
Band	#0	#1	#2		
Center Freq [MHz]	2110.00	734.00	1495.90		
Status					
Storage Count	10 / 10	10 / 10	10 / 10		
Modulation Analysis					
Freq. Error [Hz]	0.01 / 0.26	0.17 / 0.36	0.08 / 0.45		
PDSCH EVM [%]	0.47 / 0.48	0.44 / 0.44	0.27 / 0.27		
Band Power [dBm]	-18.54 / -18.54	-17.96 / -17.96	-15.43 / -15.43		
RS Power [dBm]	-52.33 / -52.33	-51.75 / -51.75	-46.21 / -46.21		
OSTP [dBm]	-21.51 / -21.50	-20.96 / -20.96	-15.41 / -15.41		

CC	#0	#1	#2	#3	#4
Band	#0	#1	#1	#1	#2
Freq. Offset [MHz]	0.00	19.80	0.00	19.80	0.00
Freq. Error [Hz]	-0.03 / -0.20	0.05 / 0.33	0.12 / 0.33	0.23 / 0.40	0.08 / 0.45
PDSCH EVM [%]	0.46 / 0.46	0.48 / 0.49	0.41 / 0.41	0.46 / 0.47	0.27 / 0.27
CC Power [dBm]	-21.01 / -21.00	-22.17 / -22.17	-20.28 / -20.28	-21.79 / -21.79	-15.43 / -15.43
RS Power [dBm]	-51.79 / -51.79	-52.95 / -52.94	-51.06 / -51.06	-52.58 / -52.57	-46.21 / -46.21
OSTP [dBm]	-20.94 / -20.94	-22.15 / -22.15	-20.28 / -20.28	-21.75 / -21.75	-15.41 / -15.41

Ref.Ext Pre-Amp Off

1 of 2

Model		LTE-Advanced Carrier Aggregation Signal	
Main frame	Analysis Bandwidth Extension Option Configuration	Number of Band	Number of Component Carrier
MS269xA	Opt. 078/004*1 installed	3	5 max. (total of 3 bands)
	Opt. 077*2 installed	3	3 max. (1 component carrier per band)
	Standard	3	3 max. (1 component carrier per band)
MS2830A	Opt. 078*3 installed	1	5 max.
	Opt. 077*4 installed	3	3 max. (1 component carrier per band)
	Opt. 005/009*5 installed	3	3 max. (1 component carrier per band)

- \*1: MS269xA-078 Analysis Bandwidth Extension to 125 MHz  
MS269xA-004 Analysis Bandwidth Extension to 125 MHz
- \*2: MS269xA-077 Analysis Bandwidth Extension to 62.5 MHz
- \*3: MS2830A-078 Analysis Bandwidth Extension to 125 MHz
- \*4: MS2830A-077 Analysis Bandwidth Extension to 62.5 MHz
- \*5: MS2830A-005 Analysis Bandwidth Extension to 31.25 MHz  
MS2830A-009 Analysis Bandwidth Extension to 31.25 MHz  
for millimeter-wave

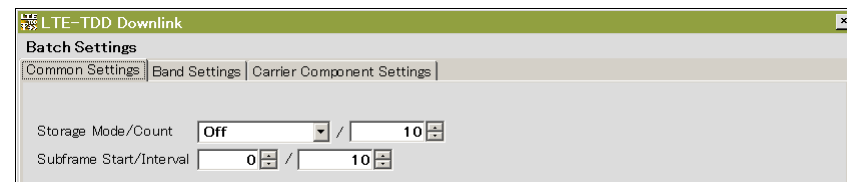
# Batch Measurement Function

## ●Parameter setting (1/6)

Simply selecting from a pull-down menu without numeric values sets measurement parameters for the carrier aggregation band and component carrier before measurement.

### [Common Settings]

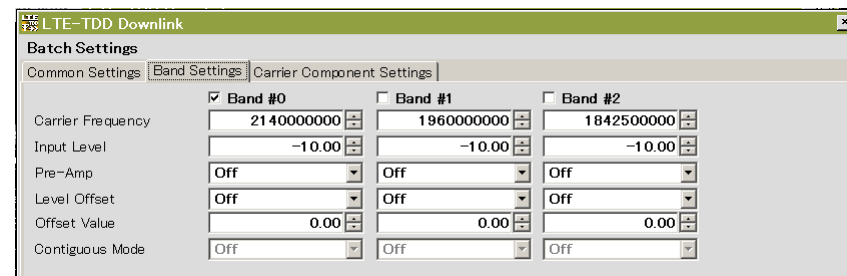
- **Storage Mode:** Off, Average, Average & MAX
- **Storage Count:** 2 to 9999
- **Starting Subframe Number:** 0 to 9 (Sets the analysis starting position.)
- **Measurement Interval:** 1 to (10 - Common Settings : Starting Subframe Number)  
(Sets the analysis subframe length (Measurement Interval). Each measurement result is the value averaged at the interval set by this parameter.)



The screenshot shows the 'Batch Settings' dialog box with the 'Common Settings' tab selected. The 'Storage Mode/Count' is set to 'Off' and '10'. The 'Subframe Start/Interval' is set to '0' and '10'.

### [Band Settings]

- **Measurement Item:** Band #0, Band #1, Band #2  
(When the MX269020A-001 is not installed, it is fixed to Band 0.  
When MS2830A and the wideband option (Opt.078) are installed to the mainframe, this is fixed to Band 0.)
- **Carrier Frequency:**  
30 MHz to the upper limit of the main unit (When the wideband option (x78) is not installed)  
100 MHz to the upper limit of the main unit (When MS269xA and the wideband option (Opt.078) are installed to the mainframe)  
300 MHz to the upper limit of the main unit (When MS2830A and the wideband option (Opt.078) are installed to the mainframe)
- **Input Level:**  
For Pre-Amp: On :  $(-80.00 + \text{Offset Value})$  to  $(10.00 + \text{Offset Value})$  dBm  
For Pre-Amp: Off:  $(-60.00 + \text{Offset Value})$  to  $(30.00 + \text{Offset Value})$  dBm
- **Pre-Amp:** On, Off
- **Level Offset:** On, Off
- **Offset Value:** -99.99 to +99.99 dB
- **Contiguous Mode:** On, Off (When the MX269020A-001 and the wideband option (Opt.078) is not installed, it is fixed to Off.)



The screenshot shows the 'Batch Settings' dialog box with the 'Band Settings' tab selected. It displays settings for three bands: Band #0 (checked), Band #1, and Band #2. For each band, the 'Carrier Frequency' is set to a specific value (2140000000, 1960000000, and 1842500000 respectively). The 'Input Level' is set to -10.00 dBm for all bands. The 'Pre-Amp' is set to Off, 'Level Offset' is set to Off, 'Offset Value' is set to 0.00 dB, and 'Contiguous Mode' is set to Off for all bands.

# Batch Measurement Function

## ●Parameter setting (2/6)

### [Carrier Component Settings]

#### - Measurement Item: CC#0 to #4

(1 component carrier per band for MS269xA with Opt-077, standard MS269xA, or M2830A with Opt-077/005/009.)

#### - Frequency Band: Band#0 to #2

(Fixed to Band 0 for MS2830A with Opt-078.)

#### - Frequency Offset:

-50000000 + (Channel Bandwidth/2) to  
50000000 - (Channel Bandwidth/2) Hz

Resolution: 300kHz (Contiguous Mode: On)

1Hz (Contiguous Mode: Off)

(When the MX269020A-001 and the wideband option  
(Opy.078) is not installed, it is fixed to 0 Hz.)

#### - Channel Bandwidth: 1.4/3/5/10/15/20MHz

#### - Test Model: Off/E-TM1.1/E-TM1.2/E-TM2/ E-TM3.1/E-TM3.2/E-TM3.3

#### - Synchronization Mode:

SS (Synchronization Signal)

RS (Reference Signal)

(If SS is selected, the input signal includes Primary Synchronization Signal (P-SS) and Secondary Synchronization Signal (S-SS).)

#### - Reference Signal Mode: Auto, Using Cell ID

#### - Cell ID: 0 to 503

**LTE-TDD Downlink**

**Batch Settings**

Common Settings | Band Settings | **Carrier Component Settings**

	CC #0	CC #1	CC #2	CC #3	CC #4
Frequency Band	Band #0	Band #0	Band #1	Band #1	Band #2
Frequency Offset	0	19800000	0	19800000	0
Bandwidth	20MHz	20MHz	20MHz	20MHz	20MHz
Test Model	E-TM3.1	E-TM3.1	E-TM3.1	E-TM3.1	E-TM3.1
Starting Frame Type	UnLock	UnLock	UnLock	UnLock	UnLock
UL-DL Configuration	3	3	3	3	3
Special SubF Configuration	8	8	8	8	8
Synchronization Mode	SS	SS	SS	SS	SS
Cell ID	1	1	1	1	1
Power Boosting					
CRS	0.000	0.000	0.000	0.000	0.000
Number of Antenna Ports					
CRS	1	1	1	1	1
CSI-RS	1	1	1	1	1
Antenna Port					
CRS	0	0	0	0	0
CSI-RS	15	15	15	15	15
PDSCH Modulation Scheme	AUTO	AUTO	AUTO	AUTO	AUTO
EVM Window Length	W	W	W	W	W
Ts	136	136	136	136	136
W	136	136	136	136	136
Channel Estimation	On/Off	On/Off	On/Off	On/Off	On/Off
DwPTS	Exclude	Exclude	Exclude	Exclude	Exclude
Measurement Filter Type	Normal	Normal	Normal	Normal	Normal

Set Cancel

# Batch Measurement Function

## ●Parameter setting (3/6)

### [Carrier Component Settings]

#### - Easy Measurement of Test Model Signals -

**E-TM1.1 / E-TM1.2 / E-TM2 / E-TM3.1 / E-TM3.2 / E-TM3.3**

Test model signals defined in 3GPP TS 36.141 as test patterns for BTS Tx tests are easily measured by selecting the test model name.

Easy measurement by selecting test model name

**LTE-TDD Downlink**

**Batch Settings**

Common Settings | Band Settings | **Carrier Component Settings**

	<input checked="" type="checkbox"/> CC #0	<input checked="" type="checkbox"/> CC #1
Frequency Band	Band #0	Band #0
Frequency Offset	0	19800000
Bandwidth	20MHz	20MHz
Test Model	E-TM3.1	E-TM3.1
Starting Frame Type	Off	UnLock
UL-DL Configuration	E-TM1.1	3
Special SubF Configuration	E-TM1.2	8
Synchronization Mode	E-TM2	SS
Cell ID	E-TM3.1	1
Power Boosting	E-TM3.2	
CRS	E-TM3.3	0.000



# Batch Measurement Function

## ●Parameter setting (4/6)

### [Carrier Component Settings]

- **CRS Power Boosting:** -20.000 to +20.000dB
- **CRS Number of Antenna Ports:** 1, 2, 4
- **CSI-RS Number of Antenna Ports:** 1, 2, 4, 8
- **CRS Antenna Port:**

0 to CRS Number of Antenna Ports - 1

- **CSI-RS Antenna Port:**

15 to CSI-RS Number of Antenna Ports+14

- **PDSCH Modulation Scheme:**

QPSK, 16QAM, 64QAM, AUTO

- **EVM Window Length:**

Ts : 0 to 142

W : 0 to 8 (Channel Bandwidth: 1.4MHz)

0 to 17 (Channel Bandwidth: 3MHz)

0 to 35 (Channel Bandwidth: 5MHz)

0 to 71 (Channel Bandwidth: 10MHz)

0 to 106 (Channel Bandwidth: 15MHz)

0 to 142 (Channel Bandwidth: 20MHz)

- **Channel Estimation:** On/Off

- **Measurement Filter Type:**

Normal (Use this when measuring single carrier signal.)

Narrow (Use this when measuring multi-carrier signal. This measures one carrier signal. )

(This can be set when Band Settings: Contiguous Mode is set to Off.)

	CC #0	CC #1	CC #2	CC #3	CC #4
Frequency Band	Band #0	Band #0	Band #1	Band #1	Band #2
Frequency Offset	0	19800000	0	19800000	0
Bandwidth	20MHz	20MHz	20MHz	20MHz	20MHz
Test Model	E-TM3.1	E-TM3.1	E-TM3.1	E-TM3.1	E-TM3.1
Starting Frame Type	UnLock	UnLock	UnLock	UnLock	UnLock
UL-DL Configuration	3	3	3	3	3
Special SubF Configuration	8	8	8	8	8
Synchronization Mode	SS	SS	SS	SS	SS
Cell ID	1	1	1	1	1
Power Boosting					
CRS	0.000	0.000	0.000	0.000	0.000
Number of Antenna Ports					
CRS	1	1	1	1	1
CSI-RS	1	1	1	1	1
Antenna Port					
CRS	0	0	0	0	0
CSI-RS	15	15	15	15	15
PDSCH Modulation Scheme	AUTO	AUTO	AUTO	AUTO	AUTO
EVM Window Length					
Ts	136	136	136	136	136
W	136	136	136	136	136
Channel Estimation	On/Off	On/Off	On/Off	On/Off	On/Off
DwPTS	Exclude	Exclude	Exclude	Exclude	Exclude
Measurement Filter Type	Normal	Normal	Normal	Normal	Normal

# Batch Measurement Function

## ●Parameter setting (5/6)

### [Carrier Component Settings]

- PBCH: On/Off
- PBCH Power Boosting: Auto, Manual
- PBCH Power Boosting: -20.000 to +20.000dB
- P-SS: On/Off
- P-SS Power Boosting: Auto, Manual
- P-SS Power Boosting: -20.000 to +20.000dB
- S-SS: On/Off
- S-SS Power Boosting: Auto, Manual
- S-SS Power Boosting: -20.000 to +20.000dB
- PDCCH: On/Off
- PDCCH Power Boosting: Auto, Manual
- PDCCH Power Boosting: -20.000 to +20.000dB
- PCFICH: On/Off
- PCFICH Power Boosting: Auto, Manual
- PCFICH Power Boosting: -20.000 to +20.000dB
- PHICH: On/Off
- PHICH Power Boosting: Auto, Manual
- PHICH Power Boosting: -20.000 to +20.000dB
- PDSCH Power Boosting: Auto, Manual
- PDSCH Power Boosting: -20.000 to +20.000dB
- PHICH Ng: 1/6, 1/2, 1, 2
- PHICH Duration: Normal, Extended
- PDCCH Symbols: Auto, Manual
- 0 to 4 (Channel Bandwidth : 1.4 MHz)
- 0 to 3 (Channel Bandwidth : other than 1.4 MHz)

PBCH	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off
Power Boosting	Manual	Manual	Manual	Manual	Manual
	0.000	0.000	0.000	0.000	0.000
P-SS	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off
Power Boosting	Manual	Manual	Manual	Manual	Manual
	0.000	0.000	0.000	0.000	0.000
S-SS	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off
Power Boosting	Manual	Manual	Manual	Manual	Manual
	0.000	0.000	0.000	0.000	0.000
PDCCH	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off
Power Boosting	Manual	Manual	Manual	Manual	Manual
	1.195	1.195	1.195	1.195	1.195
PCFICH	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off
Power Boosting	Manual	Manual	Manual	Manual	Manual
	0.000	0.000	0.000	0.000	0.000
PHICH	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off
Power Boosting	Manual	Manual	Manual	Manual	Manual
	0.000	0.000	0.000	0.000	0.000
PDSCH					
Power Boosting	Manual	Manual	Manual	Manual	Manual
	0.000	0.000	0.000	0.000	0.000
PHICH Ng	1/6	1/6	1/6	1/6	1/6
PHICH Duration	Normal	Normal	Normal	Normal	Normal
PDCCH Symbols	Manual	Manual	Manual	Manual	Manual
Subframe 1 and 6	1	1	1	1	1
Others	1	1	1	1	1
PDCCH Mapping	Easy	Easy	Easy	Easy	Easy
PDCCH Format	1	1	1	1	1
Number of PDCCHs	10	10	10	10	10
CSI-RS	<input type="checkbox"/> On/Off	<input type="checkbox"/> On/Off	<input type="checkbox"/> On/Off	<input type="checkbox"/> On/Off	<input type="checkbox"/> On/Off
Configuration	0	0	0	0	0
Periodicity T	5	5	5	5	5
Subframe Offset Delta	0	0	0	0	0

Set
Cancel

# Batch Measurement Function

## ●Parameter setting (6/6)

### [Carrier Component Settings]

#### - PDCCH Mapping:

Sets mapping of PDCCH and NIL (dummy PDCCH) to the control channel elements (CCEs).

Auto: Automatically evaluates and measures PDCCH and NIL

Full: Performs measurement assuming that only PDCCHs are mapped (no NIL). Even if REG is a value smaller than the CCE unit, measurement is performed assuming that PDCCHs are mapped.

Easy: Performs measurement for all subframes according to the PDCCH mapping that is determined by the PDCCH Format and Number of PDCCHs parameters. Measurement is performed assuming that PDCCHs are mapped sequentially from the first CCE for the number specified by Number of PDCCHs in the unit specified by PDCCH Format.

#### - PDCCH Format: 0 to 3

(This setting applies if CC Settings:PDCCH Mapping is set to Easy.)

#### - Number of PDCCHs: 1 to 88

(This setting applies if CCSettings: PDCCH Mapping is set to Easy.)

#### - CSI-RS: On/Off

#### - CSI-RS Configuration:

0 to 4 (CSI-RS Number of Antenna Ports :8)

0 to 9 (CSI-RS Number of Antenna Ports :4)

0 to 19 (CSI-RS Number of Antenna Ports :2)

0 to 19 (CSI-RS Number of Antenna Ports :1)

#### - CSI-RS Periodicity T: 5, 10

#### - CSI-RS Subframe Offset:

0 to 9 (CSI-RS Periodicity T: 10)

0 to 4 (CSI-RS Periodicity T: 5)

PBCH	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off
Power Boosting	Manual	Manual	Manual	Manual	Manual
	0.000	0.000	0.000	0.000	0.000
P-SS	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off
Power Boosting	Manual	Manual	Manual	Manual	Manual
	0.000	0.000	0.000	0.000	0.000
S-SS	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off
Power Boosting	Manual	Manual	Manual	Manual	Manual
	0.000	0.000	0.000	0.000	0.000
PDCCH	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off
Power Boosting	Manual	Manual	Manual	Manual	Manual
	1.195	1.195	1.195	1.195	1.195
PCFICH	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off
Power Boosting	Manual	Manual	Manual	Manual	Manual
	0.000	0.000	0.000	0.000	0.000
PHICH	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off	<input checked="" type="checkbox"/> On/Off
Power Boosting	Manual	Manual	Manual	Manual	Manual
	0.000	0.000	0.000	0.000	0.000
PDSCH					
Power Boosting	Manual	Manual	Manual	Manual	Manual
	0.000	0.000	0.000	0.000	0.000
PHICH Ng	1/6	1/6	1/6	1/6	1/6
PHICH Duration	Normal	Normal	Normal	Normal	Normal
PDCCH Symbols	Manual	Manual	Manual	Manual	Manual
Subframe 1 and 6	1	1	1	1	1
Others	1	1	1	1	1
PDCCH Mapping	Easy	Easy	Easy	Easy	Easy
PDCCH Format	1	1	1	1	1
Number of PDCCHs	10	10	10	10	10
CSI-RS	<input type="checkbox"/> On/Off	<input type="checkbox"/> On/Off	<input type="checkbox"/> On/Off	<input type="checkbox"/> On/Off	<input type="checkbox"/> On/Off
Configuration	0	0	0	0	0
Periodicity T	5	5	5	5	5
Subframe Offset Delta	0	0	0	0	0

Set
Cancel

# Batch Measurement Function

## ●Batch Measurement Result Display (1/3)

Measurement results, such as EVM and frequency errors for each band and component carriers, are displayed at one time.

Choosing Average & Max displays average and maximum values on same screen. This is useful for evaluating DUT dispersion.

### Band Measurement Result

Result		Average & Max				10 / 10	
Band	#0	#1		#2			
Center Freq. [MHz]	2110.00	734.00		1495.90			
Status							
Storage Count	10 / 10	10 / 10		10 / 10			
Modulation Analysis							
Freq. Error [Hz]	0.01 / 0.26	0.17 / 0.36		0.08 / 0.45			
PDSCH EVM [%]	0.47 / 0.48	0.44 / 0.44		0.27 / 0.27			
Band Power [dBm]	-18.54 / -18.54	-17.96 / -17.96		-15.43 / -15.43			
RS Power [dBm]	-52.33 / -52.33	-51.75 / -51.75		-46.21 / -46.21			
OSTP [dBm]	-21.51 / -21.50	-20.96 / -20.95		-15.41 / -15.41			

CC	#0	#1	#2	#3	#4
Band	#0	#0	#1	#1	#2
Freq. Offset [MHz]	0.00	19.80	0.00	19.80	0.00
Freq. Error [Hz]	-0.03 / -0.20	0.05 / 0.33	0.12 / 0.33	0.23 / 0.40	0.08 / 0.45
PDSCH EVM [%]	0.46 / 0.46	0.48 / 0.49	0.41 / 0.41	0.46 / 0.47	0.27 / 0.27
CC Power [dBm]	-21.01 / -21.00	-22.17 / -22.17	-20.28 / -20.28	-21.79 / -21.79	-15.43 / -15.43
RS Power [dBm]	-51.79 / -51.79	-52.95 / -52.94	-51.06 / -51.06	-52.58 / -52.57	-46.21 / -46.21
OSTP [dBm]	-20.94 / -20.94	-22.15 / -22.15	-20.28 / -20.28	-21.75 / -21.75	-15.41 / -15.41

Ref.Ext Pre-Amp Off

Average  
Value

Maximum  
Value

### Component Carrier Measurement Result

# Batch Measurement Function

## ●Batch Measurement Result Display (2/3)

### Band Measurement Result Display

- **Band:** Band #0 to #2
- **Frequency Error:** Displays the average frequency error of the CC included in Band.
- **PDSCH EVM:** Displays the average PDSCH EVM of the CC included in Band.
- **Band Power:** Displays the RF level of the Band.
  - When the wideband option (Opt.078) is not installed, no measurement results are displayed.
  - When the wideband option (Opt.078) is installed, the measurement result of 125 MHz bandwidth is displayed.
- **RS Power:** Displays the average RS power value of the CC included in Band.
- **OSTP:** Displays the average OSTP of the CC included in Band.

Result			Average & Max		10 / 10	
Band	#0	#1	#2			
Center Freq [MHz]	2110.00	734.00	1495.90			
Status						
Storage Count	10 / 10	10 / 10	10 / 10			
Modulation Analysis						
Freq. Error [Hz]	0.01 / 0.26	0.17 / 0.36	0.08 / 0.45			
PDSCH EVM [%]	0.47 / 0.48	0.44 / 0.44	0.27 / 0.27			
Band Power [dBm]	-18.54 / -18.54	-17.96 / -17.96	-15.43 / -15.43			
RS Power [dBm]	-52.33 / -52.33	-51.75 / -51.75	-46.21 / -46.21			
OSTP [dBm]	-21.51 / -21.50	-20.96 / -20.95	-15.41 / -15.41			

Average Value

Maximum Value

# Batch Measurement Function

## ●Batch Measurement Result Display (3/3)

### Component Carrier Measurement Result Display

- **Frequency Error:** Displays the average frequency error of the CC.
- **PDSCH EVM:** Displays the average PDSCH EVM of the CC.
- **CC Power:** Displays the average RF level of the CC.
- **RS Power:** Displays the RS power value of the CC.
- **OSTP:** Displays the OSTP of the CC

CC	#0	#1	#2	#3	#4
Band	#0	#0	#1	#1	#2
Freq. Offset[MHz]	0.00	19.80	0.00	19.80	0.00
Freq. Error[Hz]	-0.03 / -0.20	0.05 / 0.33	0.12 / 0.33	0.23 / 0.40	0.08 / 0.45
PDSCH EVM[%]	0.46 / 0.46	0.48 / 0.49	0.41 / 0.41	0.46 / 0.47	0.27 / 0.27
CC Power[dBm]	-21.01 / -21.00	-22.17 / -22.17	-20.28 / -20.28	-21.79 / -21.79	-15.43 / -15.43
RS Power[dBm]	-51.79 / -51.79	-52.95 / -52.94	-51.06 / -51.06	-52.58 / -52.57	-46.21 / -46.21
OSTP[dBm]	-20.94 / -20.94	-22.15 / -22.15	-20.28 / -20.28	-21.75 / -21.75	-15.41 / -15.41

Average Value

Maximum Value

# MX269910A LTE TDD IQproducer

**NEW**

## MX269910A-001 LTE-Advanced TDD Option

(MS269xA/MS2830A for Vector Signal Generator option)

Please see the product introduction of MX269910A LTE TDD IQproducer.

<http://www.anritsu.com/en-us/downloads/product-introductions/product-introduction/DWL8462.aspx>

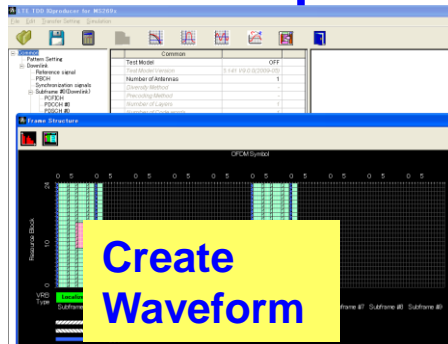
# LTE TDD IQproducer

The MX269910A LTE TDD IQproducer is PC application software with a GUI for generating waveform patterns in compliance with the LTE TDD specifications in the 3GPP TS 36.211, TS 36.212, and TS 36.213 standards.

Installing the MX269910A-001\* LTE-Advanced TDD option supports output of signals in compliance with the LTE-Advanced TDD standards. \*: Requires MX269910A

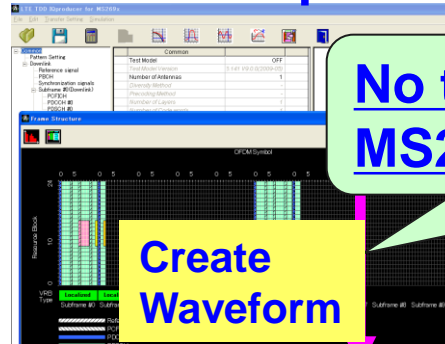
It runs on both the MS269xA/MS2830A Windows XP OS and on the external PC.

## LTE TDD IQproducer



Transfer

## LTE TDD IQproducer



No transfer when using in  
MS269xA and MS2830A

Create  
Waveform

Built-in  
HDD

Load

Waveform  
Memory

Select

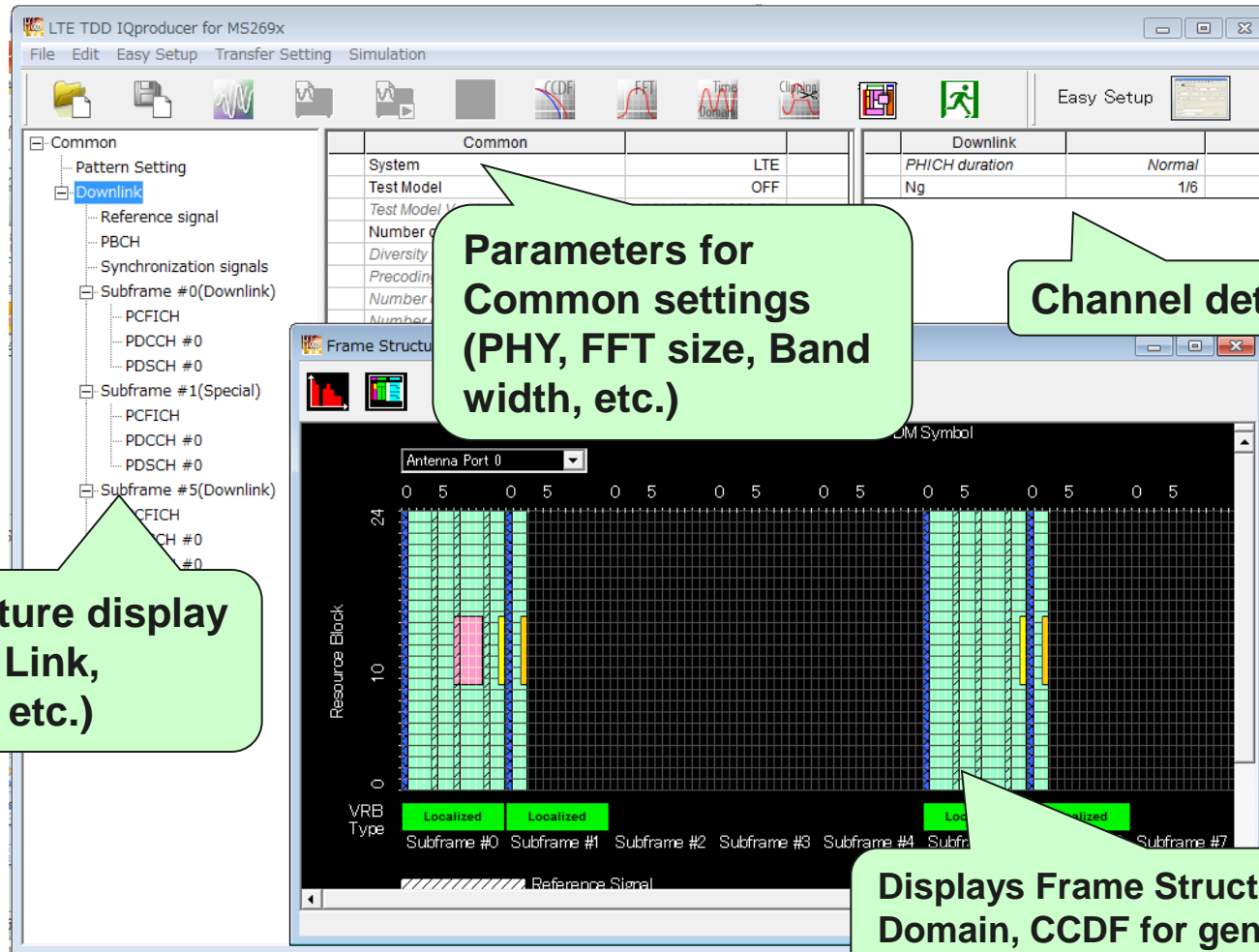
RF Output





# LTE TDD IQproducer – Display Configuration

Excellent operability supports easy waveform generation



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