

# MX882002C CDMA2000 Measurement Software MX882006C 1xEV-DO Measurement Software

MT8820B

Radio Communication Analyzer

# MX882002C

## CDMA2000 Measurement Software MX882006C

## 1xEV-DO Measurement Software Product Introduction

### MT8820B-003/-103, MT8820B-005/-105, MX882002C, MX882002C-001, MX882002C-002 MX882006C, MX882006C-002, MX882006C-011

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**Anritsu Corporation** 

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## Key Features of MX882002C CDMA2000 Measurement Software

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#### Key Features of MX882002C CDMA2000 Measurement Software

#### All-in-One Call Processing and RF Tx/Rx Testing of CDMA200 Mobiles

The MT8820B can easily test the basic RF Tx/Rx characteristics of CDMA2000 mobiles. It also supports call processing tests, such as origination and termination.



#### Key Features of MX882002C CDMA2000 Measurement Software Wide Range of Measurement Functions

In addition to supporting basic Tx/Rx measurements of CDMA2000 1x mobile terminals, the access probe send power and open loop power control time response can be measured. Adding software options supports tests of CDMA2001 1x mobile external servers and packet communications functions.

**Fundamental Measurement Screen (Tx Measurement)** 



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### Key Features of MX882002C CDMA2000 Measurement Software

#### **Functional Test of CDMA2000 Mobiles**

Both voice calling and PPP/IP connections tests with an external server (Packet Connection Test) are both supported.



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### Key Features of MX882002C CDMA2000 Measurement Software

### **High-speed Tx Measurement**

The Tx measurement times<sup>\*1</sup> (excluding Rx measurement and signalling) are shown below. The MT8820B is two times faster than the MT8820A.



\*1: The MT8820B can test faster than the MT8820A with core TX measurement item.

## MX882002C CDMA2000

## **Measurement Software**

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### **Key Specifications**

- Frequency range
- Maximum input level
- Amplitude measurement accuracy
- Residual waveform quality
- FER Measurement

- : 300 to 2700 MHz
- : +35 dBm
- : ±0.5 dB (-25 to +35 dBm) ±0.7 dB (-55 to -25 dBm) ±0.9 dB (-65 to -55 dBm) after calibration : >0.999

: Measurement at Service Option 2, 9, 55, and 32 (TDSO)

#### **Supported Tx Measurements**

3GPP2 C.S0011-C (Release C)	Item	
4. 1	Frequency Accuracy	Yes
4.3.4	Waveform Quality and Frequency Accuracy	Yes
4.3.5	Code Domain Power	Yes
4.4.2	Time Response of Open Loop Power Control	Yes
4.4.5	Maximum RF Output Power	Yes
4.4.6	Minimum Controlled Output Power	Yes
4. 5. 3	Occupied Bandwidth	Yes

\*Since Band Class 5 and Band Class 11 Forward Link and Reverse Link are separated by only 10 MHz, accurate Minimum Controlled Output Power measurement may not be possible if the call connection is cut for some reason.

#### **Supported Rx Measurements**

3GPP2 C.S0011-C (Release C)	Item	
3. 4. 1	Demodulation of Forward Traffic Channel in Additive White Gaussian Noise( Test 1 to 12, 16 to 21, 25 to 30, & 34 to 39 for FCH&SCH)	Yes
3. 5. 1	Receiver Sensitivity and Dynamic Range	Yes

Yes: Supported; Partially: Partly Yes; Sys: Requires external equipment (SPA or SG); No: Not Supported

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#### **Batch Measurements at Fundamental Measurement Screen**

The Tx measurement items below can be measured simultaneously (batch measurement), making measurement much faster.

Measurement item
Transmitter Characteristics
Time Reference
Waveform Quality and Frequency Accuracy
Code Domain Power
Maximum RF Output Power
Conducted Spurious Emissions
Occupied Bandwidth

\*The combination of batch measurement items varies with measurement conditions.

#### **Batch Measurements at Fundamental Measurement Screen**

The batch measurement results screens for both Tx characteristics are shown below. The results can be read simultaneously via GPIB.



#### **Batch Measurement Result Screens**

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#### **Graphical Spectrum Interface**

The graphical interface supports easy maintenance because the Tx characteristics of CDMA mobiles can be understood at a glance by viewing the spectrum.

### Efficient repair and maintenance



At-a-glance Pass/Fail evaluation because spectrum and template mask displayed simultaneously

Spectrum Display Function (Spectrum Emission Mask)

\*The spectrum can also be read via GPIB.

#### **Graphical Gated Power Measurement**

#### At gated Tx power measurement<sup>\*1</sup>, the Tx power of the mobile is measured in the gated condition. Template evaluation is also supported.

\*1: MS output becomes gating (burst) status when Radio Configuration is Fwd. RC 1 + Rev. RC 1 or Fwd. RC 2 + Rev. RC 2 while FCH data rate is 1/2. 1/4 or 1/8 rate.



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#### **Graphical Open Loop Time Response Measurement**

The mobile open loop Tx power control time response can be measured at the Open Loop Time Response screen.



#### **Handoff Function**

The parameters after handoff (Standard, Band Class Channel, Protocol Revision (P\_REV), Radio Configuration, Service Option) can be set at the Handoff pop-up window. Handoff is performed according to the set parameters.



### **MS Report Function**

This screen displays the periodically reported CDMA2000 1X terminal status.

RC Fwd3/Rev3 Connected (SO 55) Phone-2	Phone-1
<fundamental measurement=""> Output Main</fundamental>	CDMA2000
Parameter Fundamental <u>MS Report</u>	
CDMA2000 1X : End MS Power :-41.5 dBm	MS Report
Frame Error Rate	T M MS TD
Confidence Lovel FER For France Transmitted	G HIS ID
F-FCH 95.01% 0.001% 0 600 Pass	
MS ID	
ESN 30005784 (Hex) TMST (MCC_MNC_MSTN)	
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#### **MS Report Screen**

### **Call Processing Test Function**

#### Call processing can be tested.

Call Processing Test Items
 Location Registration
 Origination
 Termination
 Disconnect from UE
 Disconnect from Network
 Handoff

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## MX882002C-001 CDMA2000 Voice CODEC

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### MX882002C-001 CDMA2000 Voice Codec

#### **Overview**

The MX882002C-001 CDMA2000 Voice Codec software option adds real-time voice encoding/decoding to the CDMA2000 measurement software. Live end-to-end communication tests between a handset and CDMA2000 mobile are supported by installing the MT8820B-011 Audio Board.

#### MX882002C-001 CDMA2000 Voice Codec

#### Live End-to-End Communication Test

When a handset is connected to the MT8820B RJ11 connector, live end-to-end communication between the handset and a CDMA2000<sup>\*1</sup> mobile can be tested.

\*1: The CDMA2000 Voice Codec supports EVRC.



## MX882002C-002 CDMA2000

## **External Packet Data**

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#### MX882002C-002 CDMA2000 External Packet Data

#### **Overview**

End-to-end data transfer between an application server connected to the MT8820B and a CDMA2000 mobile or client PC connected to the CDMA2000 mobile can be tested using the MX882002C-002 CDMA2000 External Packet Data Option. The transferred PPP and IP packet data can be measured.

#### MX882002C-002 CDMA2000 External Packet Data

#### **IP Data Communication Mode**

As shown below, packet data transfer via the CDMA2000 mobile PPP connection can be tested by a client PC using a server PC service such as FTP, HTPP, etc. The CDMA2000 mobile operates as a modem for the client PC.



#### MX882002C-002 CDMA2000 External Packet Data

#### **Specifications**

Service Option	SO33
Radio Configuration	F-RC3+R-RC3, F-RC4+R-RC3
Signalling Ch	Encoding: Convolutional, Turbo
	Data Rates: 9.6,19.2, 38.4, 76.8,153.6 Kbps
RLP (Radio Link Protocol)	Interactive or background/UL: 64 DL: 384 Kbps/PS RAB
	RLP Loopback, PPP/IP
Packet Data Mode	RLP Loop: Mode for looping back RLP data unit received at Reverse Link to Forward Link
	PPP/IP: Mode for transferring IP packet data between mobile and server

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## CDMA2000 High-speed Adjustment (MT8820B-003, MX882002C)

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#### CDMA2000 High-speed Adjustment (MT8820B-003, MX882002C)

CDMA2000 High-speed Adjustment is a function for fast adjustment of the RF Tx part of CDMA2000 1X terminals. High-speed adjustment is performed in conjunction with the mobile adjustment function.

#### **Multi-power Measurement**

Adjustment of transmitter output power in one sweep



## Key Features of MX882006C 1xEV-DO Measurement Software

\*The MX882006C is compatible with the MX882003C measurement items; the MX882006C supports RF tests for 1xEV-DO (Rev. 0) mobiles. <u>To perform RF tests for 1xEV-DO Rev. A mobiles, add the MX882006-011</u> <u>software option</u>.

Model	Protocol Revision
MX882006C	IS-856-0 (1xEVDO Rev.0)
MX882006C-002	IS-856-0 (1xEVDO Rev.0)
MX882006C-011	IS-856-A (1xEVDO Rev.A)

#### **Measurement Software and Protocol Revision**

#### **Key Features of MX882006C 1xEV-DO Measurement Software**

#### All-in-One Call Processing and RF Tx/Rx Testing of 1xEV-DO Rev. 0 Mobiles

The MT8820B can easily test the basic RF Tx/Rx characteristics of 1xEV-DO (Rev. 0) mobiles. It also supports call processing tests, such as origination and termination.



#### Key Features of MX882006C 1xEV-DO Measurement Software Wide Range of Measurement Functions

In addition to supporting basic Tx/Rx measurements of CDMA2000 1xEV-DO (Rev. 0) mobile terminals, the access probe send power and open loop power control time response can be measured. Adding software options supports tests of CDMA2000 1xEV-DO (Rev. 0) mobile external servers and packet communications functions.

**Fundamental Measurement Screen (Tx Measurement)** 



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#### **Key Features of MX882006C 1xEV-DO Measurement Software**

#### **Functional Test of 1xEV-DO (Rev. 0) Mobiles**

Voice calling and PPP/IP connections tests with an external server (Packet Connection Test) are both supported.



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## **MX882006C 1xEV-DO**

## **Measurement Software**

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### **Key Specifications**

- Frequency range : 300 to 2700 MHz Maximum input level : +35 dBm Amplitude measurement accuracy : ±0.5 dB (-25 to +35 dBm) ±0.7 dB (-55 to -25 dBm) ±0.9 dB (-65 to -55 dBm) after calibration Residual waveform quality : >0.999 • PER Measurement : PER Measurement at F-TAP : FTAP, RTAP, FTAP+ RTAP
- Call Processing

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#### **Supported Tx Measurements**

3GPP2 C.S0033-B	Item	
4	Physical Layer Transmitter Minimum Standards	-
4.1	Frequency Requirements	-
4.1.1	Frequency Coverage	Yes
4.1.2	Frequency Accuracy	Yes
4.2	Modulation Requirements	-
4.2.1	Time Reference	Partially
4.2.2	Waveform Quality and Frequency Accuracy	Yes
4.3	RF Output Power Requirements	-
4.3.2	Time Response of Open Loop Power Control	Yes
4.3.4	Maximum RF Output Power	Yes
4.3.5	Minimum Controlled Output Power	Yes
4.3.7	RRI Channel Output Power	Yes
4.3.8	Code Domain Power	-
4.3.8.1	DRC Channel Output Power	Yes
4.3.8.2	ACK Channel Output Power	Yes
4.3.8.3	Data Channel Output Power	Partially
4.3.8.4	DSC Channel Output Power	Yes
4.4	Limitations on Emission	-
4.4.1	Conducted Spurious Emission	Partially
4.4.3	Occupied Bandwidth	Yes

\*Since Band Class 5 and Band Class 11 Forward Link and Reverse Link are separated by only 10 MHz, accurate Minimum Controlled Output Power measurement may not be possible if the call connection is cut for some reason.

Yes: Supported; Partially: Partly Yes; Sys: Requires external equipment (SPA or SG); No: Not Supported

#### **Supported Rx Measurements**

3GPP2 C.S0033-A	Item	
3	Physical Layer Receiver Minimum Standards	-
3.2	Demodulation Requirements	-
3.2.1	Demodulation of Forward Traffic Channel in AWGN	Partially
3.2.2	Demodulation of Forward Traffic Channel in Multipath Fading Channel	Sys
3.3	Reciver Performance	
3.3.1	Receiver Sensitivity and Dynamic Range	Yes
3.3.2	Single Tone Desensitization	Sys
3.3.3	Intermodulation Spurious Response Attenuation	Sys
3.3.4	Adjacent Channel Selectivity	Sys
3.3.5	Receiver Blocking Characteristics	Sys

Yes: Supported; Partially: Partly Yes; Sys: Requires external equipment (SPA or SG); No: Not Supported

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#### **Batch Measurements at Fundamental Measurement Screen**

The Tx measurement items below can be measured simultaneously (batch measurement), making measurement much faster.

Measurement item
Transmitter Characteristics
Time Reference
Waveform Quality and Frequency Accuracy
Maximum RF Output Power
Code Domain Power
RRI Channel Output Power
Maximum RF Output Power
DRC Channel Output Power
ACK Channel Output Power
Conducted Spurious Emissions
Occupied Bandwidth

\*The combination of batch measurement items varies with measurement conditions.

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#### **Batch Measurements at Fundamental Measurement Screen**

The batch measurement results screens for Tx characteristics are shown below. The results can be read simultaneously via GPIB.

Buton measurement							
Idle(Session <fundamental measurement=""> Output Main</fundamental>	Opened) Phone-2 Phone-1 CDMA2000						
Parameter <u>Fundamental</u> AT Repo	rt						
1xEV-D0 : End Tx Douvo	-66,6 dBm Fundamental						
Power Measurement	Fundamental Measurement	Idle(Se > Output Main	ession Opened) Phone	-2 Phone-1 CDMA2000			
Avg. Max. Min. TX Power -24.03 -24.03 -24.03	Parameter	Fundamental A	AT Report	Eurodamontal			
3.954 3.954 3.954	Code Domain Power	Code Do	omain Err				
Filtered Power -24.12 -	JBm/1,23MHz ⊔⊎/1_29MH <del>z</del>	Walsh Code		G Measurement	Table (Session D	nened) Phone-2	Phone_1
Modulation Analysis Frequency E	rror 1 Max Inactive Channel	No. Len Ph Power       8     16     I     -35.1	11 dB/Ion	undamental Measurement> Parameter <b>Fun</b>	Output Main		CDMA2000
Aug	Channel Walsh Code	Power		1xEV-DO : End		er :-66.6 dBm	Fundamental
Carrier Frequency 899, 249978 MHz	No. Len Ph Pilot 0 16 I	Avg. Max. -7.30 -7.3	Min. Oco 30 -7.30 dB/Ic	cupied Bandwidth	OBW	ount: 1/ 1)	T A Occupied C Renduidth
Avg. Max. Min.	BBT 0 16 T	-7.33 -7.3	00 33 -7.33 dB/To Ur	ccupied Bandwidth(99.0%)	1.288 MHz		
Carrier Frequency Error -0.0219 -0.0219 -0.021 -0.02 -0.02 -0.02	19 kHz 1997 1997 1997 1997 1997 1997 1997 199	-0.03 -0.0	03 -0.03 dB/Pi Lo	ower Frequency	-0.641 MHz		A Spurious G Emissions
	DRC 8 16 Q	-4.30 -4.3	30 -4.30 dB/Ic	enter(Upper+Lower)/2	Spectrum E	mission N	lack
Time Error         0.14         0.14         0.14	4 us	3.00 3.0	00 3.00 dB/Pi Spu	urious Emissions <mark>View</mark>	Spectrum E		lasn
EVM 3.93 3.93 3.93	73 % (nms) ACK 4 8 I	-43.08 -43.0 -35.77 -35.7	08 -43.08 dB/Ic Te 77 -35.77 dB/Pi	emplate Pass/Fail	dBc/30kHz Pass		
	Dete 2 4 0	2 55 2 5	이 2.55 이 7.5	ffset Frequency	Peak Power		
	bata 24 Q	3.75 3.7	75 3.75 dB/Pi	1.980 to 2.250 MHz	-60.09 dBc/30kHz		
				2.250 to 4.000 MHz	-59.95 dBc/30kHz		
			Pad	cket Error Rate			
				Confidence Level	PER Err Packets Tra	ansmitted	
			F	95.1%	0.00%	604 Pass	
							123

#### **Batch Measurement Result Screens**

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#### **Graphical Spectrum Interface**

The graphical interface supports easy maintenance because the Tx characteristics of CDMA mobiles can be understood at a glance by viewing the spectrum.

### **Efficient repair and maintenance**



At-a-glance Pass/Fail evaluation because spectrum and template mask displayed simultaneously

\*The spectrum can also be read via GPIB.

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### **Graphical Open Loop Time Response Measurement**

The mobile open loop Tx power control time response can be measured at the Open Loop Time Response screen.



### **AT Report Function**

This screen displays the periodically reported 1xEV-DO terminal status.

<pre><eundamental measurement=""> <u>Output M</u></eundamental></pre>	Idle(Session Opened) Phone-2	Phone-1 CDMA2000
Parameter Fundamental	AT Report	
1xEV-DO : End	AT Power :-73.7 dBm	AT Report
Power Measurement	(Meas. Count : 10/ 10) 🔼	
Aug	Michael	G G
TX Power -43.64 -43	.39 -43.81 dBm	
43.290 45.	801 41.586 n₩	
Hardware ID		
	000	
Hardware ID Type 0x010 Hardware ID Length 0x04	(Hex) 4 (Dec)	
Handware ID[0]-[7] 0x3CC	:05F84	
Handware ID[8]-[15]		
Handware ID[16]-[23] Handware ID[24]-[31]		
		123

#### **AT Report Screen**

#### **Call Processing Test Function**

Call processing can be tested.

#### **Call Processing Test Items**

Open Session Close Session AT Origination NW Origination AT Release NW Release Hard Handoff Softer Handoff

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## MX882006C-002 1xEV-DO External Packet Data

\*The MX882006C-002 is compatible with the MX882003C-002 measurement functions. <u>The MX882006C-002 supports the external Packet Function test for 1xEV-DO (Rev. 0) mobiles</u> <u>but not for 1xEV-DO Rev. A mobiles.</u>

#### MX882006C-002 1xEV-DO External Packet Data

### **Overview**

End-to-end data transfer between an application server connected to the MT8820B and a 1xEV-DO (Rev. 0) mobile or client PC connected to the 1xEV-DO (Rev. 0) mobile can be tested using the MX882006C-002 CDMA2000 External Packet Data Option. The transferred PPP and IP packet data can be measured.

#### MX882006C-002 1xEV-DO External Packet Data

#### **IP Data Communications Mode**

As shown below, packet data transfer via the 1xEV-DO (Rev. 0) mobile PPP connection can be tested by a client PC using a server PC service such as FTP, HTPP, etc. The 1xEV-DO (Rev. 0) mobile operates as a modem for the client PC.



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### MX882006C-002 1xEV-DO External Packet Data

#### **Specifications**

Application Protocol	Default Packet
Packet Data Mode	PPP/IP: Mode for transferring IP packet data between mobile and server

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## Key Features of MX882006C-011 1xEV-DO Rev. A Measurement Software

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### **Overview**

- Easy software upgrades and supports major RF Tx/Rx tests
- Supports Call Processing (ETAP) function

### **Key Specifications**

- Frequency range
- Maximum input level

• FER Measurement

Call Processing

Residual waveform quality

- Amplitude measurement accuracy
- : 300 to 2700 MHz : +35 dBm : ±0.5 dB (-25 to +35 dBm) ±0.7 dB (-55 to -25 dBm) ±0.9 dB (-65 to -55 dBm) after calibration : >0.999
- : Measurement at FETAP
  - : FETAP, RETAP, FETAP + RETAP



#### **Batch Measurements at Fundamental Measurement Screen**

The batch measurement results screens for both Tx characteristics are shown below. The results can be read simultaneously via GPIB. MX882006C-011 test items are same with MX882006C.

#### **Batch Measurement Result Screens**



#### Support Protocol Revision IS-856-A (1xEV-DO Rev. A)

The MX882006C-011 supports call processing (ETAP) with IS-865-A (1xEV-DO Rev. A) for the Tx/Rx signals under test.



**Call Processing Parameters setting view window** 

#### **Code Domain Power Measurement supports DSC and Aux Pilot**

The MT8820B can measure DSC and Aux Pilot added to 1xEV-DO Rev. A Code Domain Power Measurement.



#### **Packet Error Rate Measurement**

PER (Packet Error Rate) measurement and Pass/Fail evaluation can be performed in FETAP to display the PER, error packet count, transmission packet count, confidence level, and Pass/Fail results.

<fundamental measurement=""> Output Parameter <mark>Fundamenta</mark></fundamental>	Connected (FETAP) Phone-2 Main CDMA2000 AT Report	Phone-1 CDMA2000		
1xEV-DO : End	AT Power :-30.0 dBm	Fundamental		
Packet Error Rate FTC Confidence Level PER 95.0 % 0.00	Err Packets Transmitted * 0 598 Pass	APad et Enror G Rate	PER Measurement	
Rx Measurement Setup         Packet Error Rate       Dn         Specified PER       0.5         Sample Packets       10000         Meas. Stop Mode       Dn         Confidence Level       95.0         PER Limit       0.5         Packet Data Option       Item List Detail	packets			

\*PER Measurement can test with FETAP. However, Anritsu approves Rx measurement in the Non-Call processing mode.

### **RF test for 1xEV-DO terminal supporting multi carriers**<sup>\*1</sup>

The MT8820B tests RF measurement for 1xEV-DO terminal supporting multi carriers with test mode.



\*2: Forward Link signal does not support 64QAM. Forward Link signal outputs only one carrier.

## AMPS Measurement MT8820B-011 Audio Board MX882002C CDMA2000 Measurement Software

#### **Overview of AMPS Measurement**

#### **Overview**

When the MT8820B-002, MX882002C, and MT8820B-011 audio boards are installed in the MT8820B, the RF of AMPS (American Mobile Phone System) mobiles can be measured and the AF signal can be output and measured.

\*Call Processing not currently supported

#### **Tx and Audio Measurements**

In addition to measuring the fundamental RF Tx and Rx characteristics of AMPS mobiles, the Audio can be tested.

undamental Measurement> Output Main	none-2 Phone-1 CDMA2000						
AMPS: End MS Power :-44.4	dBm Fundamental						
wer Measurement (Meas, Count :	1/1) A Power G Measurement	Fundame	ntal Mea	suremen	t Screen	(FM Measurem	ent)
X Power -44.16 -44.16 dBm	(Fundemental Measuring	Of Continent Main	f	Phone-2 Phone	-1	-	-
38.349 38.349 38.349 nW	Parameter	Fundamental		GDMH2	2000		
	AMPS :	End	MS Power :-4	1.4 dBm Fur	ndamental Auro	lio Measureme	nt Scree
	FM Measurement		(Meas, Count :	1/ 1) 🔳 👖	Auc		
		Avg. Max.	Min.	<fundamental measu<="" td=""><td>rement≻ Output Main</td><td>Utt Phone-2</td><td>Phone-1 CDMA2000</td></fundamental>	rement≻ Output Main	Utt Phone-2	Phone-1 CDMA2000
	FM Deviation	5.6117 5.6117	5.6117 kHz (rms)	Parameter	Fundamental		<u> </u>
		8.3025 8.3025	8.3025 kHz (+P)	AMPS	: End	MS Power :-44.4 dBm	Fundamental
		-8.3613 -8.3613	-8.3613 kHz(-P)	(Source = AF Input	t)	(Meas, Lount : 1/ 1)	- Set
ndamental Measurement Parameters Item List Detail		Avg. Max.	Min.		Avg. Max.	Min.	Relative
	AF Level		5.6116 kHz (nms)	Frequency	1000.0 1000.	U   1000.0 Hz	
Measurement Setup ower Measurement On Meas, Count 1		8.3106 8.3106	8.3106 kHz(+P)	Level	117.50 117.5	0 117.50 mV(peak)	
requency Error Off Meas, Count 1		-8.3613 -8.3613	-8.3613 kHz(-P)	Helative	-0.01 -0.0	1   -0.01 dB	
Measurement <u>Off</u> Meas. Count <u>1</u>	AF Level(Relative)	0.00 0.00	0.00 dB(rms)	SINAD	43.59 43.5	9 43.59 dB	
		3.44 3.44	3.44 dB((P-P)	/2 Distortion	0.66 0.6	6 0.66 %	
		3.46 3.46	3.46 dB(-P)		-43.58 -43.5	8 –43.58 dB	
		Aur May	Min				
	Distortion	1.43 1.43	1.43 %				
				Filter	Off		
				De-Emphasis	Off		
				Expandor			
				Audio Measurement	<u>On</u> Meas.	Count 1	
				Frequency	v, Level, SINA	D (Signal to Noise And	J Distortion),

#### **Fundamental Measurement Screen (Tx Measurement)**



#### **Audio Measurement**

CDMA2000 1X: CDMA2000 Measurement hardware + audio board + CDMA2000 Measurement Software Option



<Audio Rx measurement including mobile speaker>



**/Inritsu** 



### **Specifications**

- AMPS Measurement
- Frequency : 800 to 960 MHz
- Input Level max. : +35 dBm
- Amplitude Measurement
- Accuracy

: ±0.5 dB (–25 to +35 dBm) ±0.7 dB (–55 to –25 dBm) ±0.9 dB (–65 to –55 dBm) after calibration

- Demodulation frequency range :
  - : 30 Hz to 20 kHz
- Residual FM : 10 Hz rms (at 300 Hz to 3 kHz demodulation frequency)

### **Specifications**

AF Measurement	
<ul> <li>Input frequency range</li> </ul>	: 50 Hz to 10 kHz
<ul> <li>Input level range</li> </ul>	: 1 mVpeak to 5 Vpeak (AF Input)
<ul> <li>Amplitude measurement</li> </ul>	
accuracy	: ±0.2 dB (≥–10mVpeak, ≥50 Hz),
	±0.4 dB (≥–1mVpeak, ≥1 kHz)
<ul> <li>Input impedance</li> </ul>	: <b>100 k</b> Ω
• Output frequency range	: 30 Hz to 10 kHz
<ul> <li>Output level range</li> </ul>	: 0 to 5 Vpeak (AF Output)
<ul> <li>Amplitude measurement</li> </ul>	
accuracy	: ±0.2 dB (≥–10 mVpeak, ≥50 Hz),
	±0.3 dB (≥10 mVpeak, <50 Hz)
<ul> <li>Output impedance</li> </ul>	: <b>&lt;1</b> Ω
<ul> <li>Output current max</li> </ul>	: 100 mA

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## CDMA2000 1x, 1xEV-DO Synchronous Mode (Hybrid)

**/Inritsu** 

#### **Overview of Synchronous Mode (Hybrid)**

#### **Overview**

By using the MX882002C and MX882006C, a Forward Link signal synchronized with system time can be output for cdma2000 1x and 1xEV-DO (Rev. 0) mobiles either using two MT8820B units or one MT8820B unit with the Parallelphone<sup>™</sup> option installed. This supports function testing of both cdma20001x and 1xEV-DO (Rev. 0) systems. Using the MX882002C, MX882006C, and MX882006C-011 supports UE-connection tests with ETAP only.

\*Parallelphone is a registered trademark of Anritsu Corporation.

### **Overview of Synchronous Mode (Hybrid)**

#### **Function Overview**



Supports CDMA2000 1X/1xEV-DO Hybrid mobiles

Finally, the 1X side becomes Idle (Regist), and the 1xEV-DO (Rev. 0) side becomes Idle (Session Opened) \*<u>Installing the MX882006C-011 option supports the UE-connection test with ETAP only.</u>

		Phone 1 side		
<pre><fundamental measurement=""> Output Main</fundamental></pre>	Idle(Session Opened)	<fundamental measurement=""></fundamental>	Output Mai	Idle(Regist)
Parameter Fundamental	AT Report	Parameter F	fundamental	MS Report
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### **Overview of Synchronous Mode (Hybrid)**

#### ■ Voice Call Test Function during 1xEV-DO Data Communications



(1) Use the hybrid mobile to start downloading data from the Server PC.

(2) Originate a voice call at the CDMA2000 1x side during the data download.

The hybrid mobile answers the call after steps (1) and (2).

#### Hand-down Function Test



Hybrid mobile

(1) Use the hybrid mobile to start downloading data from the Server PC.

After starting downloading, send the disconnect signal (off). (1) When a SO33 connection is made at the CDMA2000 1x side, data can continue to be downloaded from the Server PC.



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