/inritsu

3GPP LTE FDD Solution

MS2690A/MS2691A/MS2692A/MS2830A Signal Analyzer

MX269020A LTE Downlink Measurement Software MX269021A LTE Uplink Measurement Software MX269908A LTE IQproducer MS2690A/MS2691A/MS2692A Signal Analyzer MS2830A Signal Analyzer

3GPP LTE FDD Solution

MX269020A LTE Downlink Measurement Software MX269020A-001 LTE-Advanced FDD Downlink Measurement Software MX269021A LTE Uplink Measurement Software MX269908A LTE IQproducer MX269908A-001 LTE-Advanced FDD Option



MS269xA



MS2830A

Version 8.00

Anritsu Corporation

Slide 1 MS269xA_LTE-E-L-1



LTE FDD Measurement Solution

3GPP LTE Transmitter Measurement

MX269020A LTE Downlink Measurement Software MX269020A-001 LTE-Advanced FDD Downlink Measurement Software MX269021A LTE Uplink Measurement Software



The MX269020A/21A support measurement of RF Tx characteristics of 3GPP LTE (Long Term Evolution) downlink (FDD) and uplink (FDD) signals.

The MX269020A-001 is an option for the MX269020A to measure the RF Tx characteristics of LTE-Advanced downlink (FDD) signals. (Requires MX269020A)

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

LTE FDD Measurement Solution

3GPP LTE Receiver Measurement

MS269xA/MS2830A for Vector Signal Generator Option MX269908A LTE IQproducer[™] MX269908A-001 LTE-Advanced FDD Option





The MX269908A LTE IQproducer is PC application software with a GUI for generating waveform patterns in compliance with the LTE FDD 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 MX269908A-001 LTE-Advanced FDD option supports output of signals in compliance with the LTE-Advanced FDD standards. (Requires MX269020A)

Discover What's Possible™



MX269020A Downlink LTE Downlink Measurement Software

MX269021A Uplink LTE Uplink Measurement Software

Discover What's Possible™





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 Downlink
- -EVM vs Resource Block Downlink

-RE Map Downlink



-Time Based EVMUplink-EVM vs Demod-SymbolUplink-In-Band EmissionUplink

Discover What's Possible™

Slide 5 MS269xA_LTE-E-L-1

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.



Summary

Test Model Summary

Measurement Functions (3/3)

Channel Power^{*1}

Adjacent Channel Leakage Power^{*2}



Occupied Bandwidth



Spectrum Emission Mask*3

Spectrum Anal	yzer(LTE-TDD1	Downlink)					6/8/2009 09:50:2
							🔛 Spectrum Analyzer Trace
Reference	Level 30.00	dBm[40.00dB]		ABS1	ABS2	REL	Active Trace
30.0					Measuring		A .
20.0			وستتناصف فليو	ababin.			Trace Type
0.0							Write
			1	L			
30.0							Storage Mode
-10.0							Max Hold
-10.0			+				
50.0 (0)(5000)		وفيتأود لندر ومادر لنا	/ †	With Street Bar		an earling and the	Storage Coun
10.0	the second second	Traine and the second			and the second second		10
-70.0							
Center 2.110 00	Hz					Span 25.10MHz	
Spectrum Emiss	ion Mask						
	Off	set	L	ower	L	lpper	
Result	Start (MHz)	Stop (MHz)	Peak (dBm)	Freq (MHz)	Peak (dBm)	Freq (MHz)	
PASS	2.550 000	12,550,000	-18.68	2 107,425 000	-15.55	2 112.570 000	
Reference	3.515 000	4.000 000		2 033.000 000		2 120.020 000	
1101010100	4,000 000						
32.91 dBm	8.000 000						
	12.500 000						Detection
AWMax 10 / 10	B-	6-	0-	E-		E-	Pos & Neg
Ref.Int					LTE	TDD Downlink	

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

JL ∼

- Category A / Category B

- < 1GHz / > 1GHz

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

- General, JAPAN, 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

/inritsu

Discover What's Possible™

Slide 7 MS269xA_LTE-E-L-1

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

Measurement Results (text) Average & Max 10/1

AVE	era	geokiwiax 10710
		Avg/Max
0.24	I	2.17 Hz
0.000	I	0.001 ppm
-11.23	I	-11.23 dBm
-11.24	I	-11.23 dBm
0.26	I	0.26 %
1.03	I	1.17 %
		13
er		575
-54.66	I	-54.50 dB
	0.24 0.000 -11.23 -11.24 0.26 1.03 er -54.66	0.24 / 0.000 / -11.23 / -11.24 / 0.26 / 1.03 / er -54.66 /



Slide 8 MS269xA_LTE-E-L-1

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.

MKR Q Resource Element Number 0 Subcarrier 120 Symbol 85 Subframe Number 6 Resource Block Number 10 0.46148 -0.15419 Q

Constellation (Resource Block Number: 10)

/inritsu

Measurement Functions/ Graph Display (EVM vs Subcarrier)

Displays EVM graph per subcarrier targeting user-specified symbol or user-specified subframes (10 max). Displays Peak and Average (rms) on same screen. This enables measurement of instantaneous EVM.

EVM vs Subcarrier



/inritsu

Slide 10 MS269xA_LTE-E-L-1

Discover What's Possible™

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

Discover What's Possible™



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

Amplitude difference display



Discover What's Possible™



Phase display

Group delay display



/inritsu

Slide 12 MS269xA_LTE-E-L-1

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

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

Power vs RB (specified subframe display)

Downlink



*RB time axis in subframe units

Discover What's Possible™

Slide 13 MS269xA_LTE-E-L-1

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

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)

Resource Block

*RB time axis in subframe units

Slide 14 MS269xA_LTE-E-L-1

Measurement Functions/ Graph Display (EVM vs Resource Block)

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



EVM vs RB

Downlink

Resource Block

*RB time axis in subframe units

Discover What's Possible™

Slide 15 MS269xA_LTE-E-L-1

Measurement Functions/ Graph Display (RE MAP)

Displays physical channel in resource block (RB) and resource element (RE). The constellation for each RE and EVM result can be confirmed at the graphical display, supporting intuitive recognition of channel performance.



RE Constellation Display

Discover What's Possible™

Slide 16 MS269xA LTE-E-L-1



Measurement Functions/ Graph Display (Time Based EVM)



Displays PUSCH EVM of each symbol for all subcarriers as graph to observe temporal change in PUSCH EVM.



Time Based EVM

Slide 17 MS269xA LTE-E-L-1

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

Displays PUSCH EVM of demodulated symbol for up to 10 subframes for specified symbols or specified segments as graph.

EVM vs Demod-Symbol 0 EVM 0.28 % / 0.66 %

EVM vs Demod-Symbol



Slide 18 MS269xA_LTE-E-L-1

Measurement Functions/ Graph Display (In-Band Emission)

Measures In-Band Emission per resource block at each Tx band spurious, carrier leak and image. Displays power (RMS/Max./Min.) per resource block as well as subcarrier for easy understanding of in-band spurious.

Uplink



MS269xA_LTE-E-L-1

Measurement Functions/Summary Display (1/2)

Downlink

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

∕1 MS2830A 3	GLTE Downli	nk					_0	12/3/2011 18:00:36
Carrier Freq.	2 110 (000 000 Hz	Input l	Level	-10.00 dBm			n 3GLTE Downlink 👘
Test Model		E-TM3.1	ATT		4 dB			Trace Mode
Channel Ban	dwidth	10MH7						EVMus Subcarrier
Result		10141112						L VIVIVS Oubcarrier
	_	_	_					
PDSCHEV	vl (rms)				Frequency Error	0.81 Hz		
QPSK		***.** %				0.000 ppm		EVM VS SYMDOI
16QAM		***.** %			Output Power	-11.00 dBm		
64QAM		0.59 %			Mean Power	-11.00 dBm		
PDSCH EV	/ (peak) / Sub	ocarrier / Symi	bol		Total EVM (rms)	0.58 %		Spectral Flatness
QPSK		***.** %	**** 1	***	Total EVM (peak)	2.34 %		
16QAM		***.** %	**** 1	***	Symbol Numb	er 134		
64QAM		8.98 %	184 <i>I</i>	13	Subcarrier Nu	mber 535		Power ve RB
RS Power		-38.770 dBm			Origin Offset	-54.80 dB		T Ower Value
OSTP		-10.937 dBm						
Summary								
						Page No. 1 /	9	EVM vs RB
Channel Su	mmary							
Channel	Avg EVM (rms)	Max E EVM / Subca	VM (peal Irrier / Sy	<) /mbol	Avg Power	Symbol Clock Error 0.000 ppm		Summary
RS	0.51 %	1.65 %	235	14	-38.770 dBm	***.*** ns		
P-SS	0.61 %	1.27 %	308	6	0.001 dB	IQ Imbalance		T
S-SS	0.51 %	1.10 %	316	75	0.003 dB	IQ Quad Error		lest Model
PBCH	0.58 %	1.16 %	277	10	0.003 dB	deg.		Summary
PCFICH	0.57 %	1.59 %	309	14	-0.001 dB	Cell ID	1	
PHICH	0.50 %	1.13 %	18	56	0.004 dB	Num of PDCCH Symbols	1	
PDCCH	0.58 %	2.08 %	537	14	1.066 dB			RE Map
Ref.Ext	Pre-Amp (Off						

Summary										
						Pa	ge No.	2 /	9	
					EVM / Subca	rrier / Sy	mbol			
	Total	EVM High	<final< td=""><td>rms peak</td><td>0.58 % 2.34 %</td><td>535 I</td><td>134</td><td></td><td></td><td></td></final<>	rms peak	0.58 % 2.34 %	535 I	134			
		EVMLow		rms peak	0.57 % 2.46 %	535 /	134			
	PDSCH ALL	EVM High	<final< td=""><td>rms peak</td><td>0.59 % 8.98 %</td><td>184 <i>I</i></td><td>13</td><td></td><td></td><td></td></final<>	rms peak	0.59 % 8.98 %	184 <i>I</i>	13			
		EVM Low		rms peak	0.58 % 8.16 %	47 1	114			
	RS	EVM High	<final< td=""><td>rms peak</td><td>0.51 % 1.65 %</td><td>235 /</td><td>14</td><td></td><td></td><td>Page Number</td></final<>	rms peak	0.51 % 1.65 %	235 /	14			Page Number
		EVMLow		rms peak	0.50 % 1.73 %	397 I	56			2
Ref.Ext	Pre-Amp Off									-0



Measurement Functions/Summary Display (2/2)

Uplink

- > Total EVM (Time Based)
- > PUSCH QPSK EVM (Time Based)
- > PUSCH 16QAM EVM (Time Based)
- > PUSCH 64QAM EVM (Time Based)
- > Total EVM (Frequency Based)
- PUSCH ALL EVM
- PUSCH QPSK EVM
- PUSCH 16QAM EVM
- PUSCH 64QAM EVM
- > RS EVM
- Power vs Slot
- > Frequency Error vs Slot [Hz]
- > Frequency Error vs Slot [ppm]
- Origin Offset vs Slot
- In-Band Emisssion
- Spectral Flatness

1 MS2830A	3GLTE Uplink						12/3/2011 18:50
Carrier Freq.	1 920 000 000 F	lz Input Le	v∉Page Nur	nber = lge	r	External	🙀 3GLTE Uplink Trace
lodulation	AUT	O ATT	4	dB De 🖌	l	0.000 µs	
Channel Ban	ndwidth 10MH	z		Target	Ch	PUSCH	Trace Mode
lesult		Measuring		A	verage & Max	10/10	
		Avg/Max			Avg/Max		
USCH EVM	l (rms)	9	Frequency Err	or 0.77	1.96 Hz		
QPSK	***.** / ***.** %			0.000	0.001 ppm		
16QAM 54QAM	0.24 / 0.24 %		Output Power	-11.09 / -11.	09 / -11.09 dBm		
USCH EVM	l (peak) / Demod-Symbo	l / Symbol	Mean Power	-11.09 / -11.	09 / -11.09 dBm		
QPSK	***.**1 ***.** %	**** 1 ****	EVM(rms)	0.	24 / 0.24 %		Scale
	1.02 / 1.22 %	225 / 13	EVM(peak)	1.	027 1.22 %		
MRS EVM ((rms)		Symbol N	umper	10		
	0.23 / 0.24 %		Origin Offect	-55.00	225		Storage
MRS EVM ((peak) / Subcarrier / Syn	lodr	Time Offset	-00.00	10 0 ns		
	1.00 / 1.00 %	300 / 87		10.0			
ummary							
					Page No. 4	/ 11	
			Avg/Max	EVM / Subo	arrier / Symbol		
	PUSCH QPSK EVM	EVM Final	rms ***.** /	***.** %	**** 1 **		
		EVM High	rms ***.**/	*** ** %	· · · · · ·		
		EVM Low	peak ***.** /	***.** %	**** / **		
			peak ***.** /	***.** %	**** / **		
	PUSCH 16QAM EVM	EVM Final	rms 0.24 /	0.24 %	200 / 54		
		EVM High	rms 0.24 /	0.24 %	235 1 54		
		EVM Low	peak 0.97 / rms 0.24 /	1.32 %	299 / 54		Page Number
			peak 0.96 /	1.30 %	300 / 82		
							4
ef Ext	Pre-Amp Off						

Summar	y											
							Pag	ge No.	6 /	11		
	Power vs Slot							Avo	a/Max			
	Slot	0	-11.06 /	-11.06 dBm	Slot	10	-11.11 /	-11.11	dBm			
	Slot	1	-11.07 /	-11.07 dBm	Slot	11	-11.09 /	-11.09	dBm			
	Slot	2	-11.10 /	-11.09 dBm	Slot	12	-11.11 /	-11.11	dBm			
	Slot	3	-11.12 /	-11.12 dBm	Slot	13	-11.11 /	-11.11	dBm			
	Slot	4	-11.12 /	-11.12 dBm	Slot	14	-11.07 /	-11.07	dBm			
	Slot	5	-11.12 /	-11.12 dBm	Slot	15	-11.07 /	-11.07	dBm			
	Slot	6	-11.09 /	-11.08 dBm	Slot	16	-11.12 /	-11.12	dBm			
	Slot	7	-11.04 /	-11.04 dBm	Slot	17	-11.07 /	-11.07	dBm			
	Slot	8	-11.02 /	-11.02 dBm	Slot	18	-11.06 /	-11.05	dBm			
	Slot	9	-11.08 /	-11.08 dBm	Slot	19	-11.14 /	-11.14	dBm		Page N	umber
											6	_
Ref.Ext	Pre-Am	ıp Off									<u> </u>	C





Measurement Functions/Test Model Summary

Downlink

- 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



Discover What's Possible™



Downlink

Slide 22 MS269xA_LTE-E-L-1

Measurement Functions/MIMO Summary 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.

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.

1	MS2830A 3GLTE D	ownlink			_0	12/3/2011 19:39:58
С	arrier Freq. 2	2 110 000 000 Hz li	nput Level -10.0	0 dBm		SGLTE Downlink 🕋 MIMO Summary
Μ	odulation	AUTO A	ΔTT 4	4 dB		la a husia
С	hannel Bandwidth	10MHz		Reference S	Signal Auto	Analysis
R	esult			Average	e & Max 10 / 10	Time
		Tx0 / Rx (Reference)	Tx1/Rx	Tx2/Rx	Tx3/Rx	
	RS Power	0.00 dB	***.** dB	***.** dB	***.** dB	پ Channel Bandwidth
	RS EVM (rms)	0.22 %	*.** %	*.** %	*.** %	10141-
	RS Timing Offset	0.0 ns	****.* ns	****.* ns	*****.* ns	TUMHZ
	RS Freq	0.00 Hz	****.** Hz	*****.** Hz	*****.** Hz	
						8
						Detail Settings Active Antenna [®] Threshold –10.0dB
R	ef.Ext Pre-	Amp Off				1 of 2 🔿 🖒





Auto Measurement Function (DMRS Parameters)

Inputting broadcast and control information automatically calculates and sets physical layer parameters for DMRS (DeModulation Reference Signal) pattern generation.



Discover What's Possible™

/inritsu

Uplink

Slide 24 MS269xA_LTE-E-L-1

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.

Discover What's Possible™

Slide 25 MS269xA_LTE-E-L-1

Detail Setting Screen

Detailed parameters, such as channel estimation ON/OFF and pseudorandom sequence specification, recommended in 3GPP TS36.211, can be set.

MS2830A 3GLTE Downlink				12/3/2011 19:19:38	
Carrier F	f 🔽	On/Of	f Power Boosting	stail Settings	Selecting Test Model Name
Channel Synchronization Mode		PBCH 🔽	Manual 💌 0.000 🗧 dB	Restore	measures Test Model signals
Result Synchronization	n Signal 🗾	P-SS 🕅	Manual 💌 0.000 🗧 dB	Delault values	
MKR Reference Signal Mode A	to 💌	S−SS 🕅	Manual ▼ 0.000 🛱 dB		
Frequency Shift	0	PDCCH 🗹	Manual 🗾 1.065 🛱 dB		
Symbol Cell ID	0	PCFICH 🔽	Manual ▼ 0.000 🛱 dB		
Physical		PHICH 🔽	Manual ▼ 0.000 ₹ dB		
Reference Signal Power Boos	ing 0.000 🛨 dB	PDSCH	Auto 🔹 0.000 🗧 dB		
Number of Antenna Ports	1 💌	PHICH Ng	1/6 🔽		
Antenna Port	0 🗄	PHICH Duration	Normal		
		Number of PDCCI	HSymbols Auto 💌 1 📄		
M vs { Pseudo-Random Sequence		PDCCH Mapping	Easy		
MKF TS36.211 V8.3.0	2008–05)	PDCCHForm	at 1 🔽		
	Ν	Number of PE	DCCHs 5 🗄		
EVM Channel Estimation		PDSCHEVMCalc	ulation		
Moving Average Filter 19		3GPF			
		Virtual Resource I	Block Type Localized 🔻	Sat	
Measurement Filter Type	Normal			Jet	
Extended Freq Lock Range					
			Set Cancel	Cancel	
ef.Ext Fre-Amp On					Supports
	Suppor	rts new/o	old		Localized/Distributed virtual
	pseudo	orandom	sequence		resource block type
	TOOCO				
	1536.2	11(08.2.0)		
ver What's Possible™	TS36.2 ⁴	11(V8.3.0))		/inritsu
		N	IS269xA LTE-E-L-	1	2

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.

Slide 27 MS269xA_LTE-E-L-1

Replay Function for Troubleshooting Faults

Up to 200 frames of LTE signals can be captured as a file for replay by the LTE measurement software to perform analyses, such as EVM measurement.

Example of R&D use

Save data for comparing each DUT test version

 \Rightarrow Supports comparison of retrofitting improvement effects

Example of production line use

Save shipping inspection data

 \Rightarrow Supports rechecking of performance data for troubleshooting post-shipping faults

Discover What's Possible™

Slide 28 MS269xA_LTE-E-L-1

/Inritsu

MX269020A-001 LTE-Advanced FDD 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

0	00	0	0					y	
up to three frequency	/ bands	(one	band with	MS2830A)	and a tota	l of five carrie	er components	in one si	imple
operation.									

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

/ MS2692A 3GLT	E Downlink						_ 0	3/14/2013 19	14:03
								SGLTE Downli	nk 👘
								Baten Meassurem	an
									°
								Batch Set	tings
Result					Average &	Max	10/10		
Band	#0		a 🛛		#2				
Center Freq. [MHz]	2110.00		734.00		1495.90				
Status									
Storage Count	10	/10	10/	10	10	/ 10			
Modulation Analysis									
Freq. Error [Hz]	0.02	/ -0.35	0.11 /	0.30	-0.02	/ 0.	48		
PDSCH EVM [%]	0.48	/ 0.48	0.43 /	0.44	0.30	/ 0.3	31		
Band Power [dBm]	-18.59	/ -18.59	-17.88 /	-17.88	-15.35	/ -153	35		
RS Power [dBm]	-52.39	/ -52.39	-51.68 /	-51.68	-46.13	/ -46.	13		
OSTP [dBm]	-21.59	/ -21.58	-20.88 /	-20.88	-15.35	/ -15	35		
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]	-0.02 / -0.40	0.06 / 0.	.41 0.06 /	0.23 0	.16 / 0.36	-0.02 /	0.48		
PDSCH EVM[%]	0.47 / 0.47	0.49 / 0.	.50 0.41 /	0.42 0.	.45 / 0.46	0.30 /	0.31		
CC Power[dBm]	-21.10 / -21.10	-22.177 -22	.16 -20.18 /	-20.18 -21	.757 -21.74	-15.35 / -	15.35		
OSTP[dBm]	-21.06 / -21.06	-22.18 / -22	18 -2018/	-2018 -21	-52.53 72 / -21 72	-1535 /	15.35		
	21.007 21.00	22.107 22	20.107	20110 21					
Ref.Ext P	're-Amp Off							1 of 2	D) ()

 *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
 *2: MS2820A 078 Analysis Bandwidth Extension to 125 MHz

- *3: MS2830A-078 Analysis Bandwidth Extension to125 MHz
- *4: MS2830A-077 Analysis Bandwidth Extension to 62.5 MHz
 *5: MS2830A-005 Analysis Bandwidth Extension to 31.25 MHz

MS2830A-005 Analysis Bandwidth Extension to 31.25 MHz MS2830A-009 Analysis Bandwidth Extension to 31.25 MHz for Millimeter-wave

Discover What's Possible™

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.)

[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 + Offset Value) to (10.00 + Offset Value) dBm For Pre-Amp: Off: (-60.00 + Offset Value) to (30.00 + 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.)

Discover What's Possible™

Subframe Start/Interval 0 2 1 1 oframe Number) ement result is the value averaged at the interval set by this parameter.) **301TE Downlink** Batch Settings Common Settings Band Settings Carrier Component Settings F Band #0 Band #1 Band #2

Common Settings Bar	id Settings Carrier	·Component Set	tings		
	☑ Band #0	□ E	Band #1	🗆 Band	1 #2
Carrier Frequency	21100	00000 🕂 📔	1960000000 🗄	1	842500000 🕂
Input Level	-	-10.00 🗧	-10.00 🗧		-10.00 🗧
Pre-Amp	Off	🔽 Of	F 🔽	Off	~
Level Offset	Off	▼ Of	F 💽	Off	-
Offset Value		0.00 🕂	0.00 🗧		0.00 🗧
Contiguous Mode	On	 Or 	•	On	-

×

Slide 31

MS269xA_LTE-E-L-1

🟦 3GLTE Downlink	×
Batch Settings	
Common Settings Band Settings Carrier Component Settings	
Storage Mode/Count Off / 10+ Subframe Start/Interval 0+ / 1+	

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

Discover What's Possible™

🏦 3GLTE Downlink

Batch Settings

Common Settings Band Settii	ngs Carner Comp	Unent Settings			
	▼ CC #0	☑ CC #1	☑ CC #2	☑ CC #3	I 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 💌	Е-ТМЗ.1 💌
Synchronization Mode	SS	SS 💌	SS 💌	SS 💌	SS 🔽
Reference Signal Mode	Auto	Auto 💌	Auto	Auto 💌	Auto
Cell ID	0	0	0	0	
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 💌	AUT O	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
Measurement Filter Type	Normal	Normal 💌	Normal 💌	Normal 🔹	Normal 🗾
PBCH	🔽 On/Off	🔽 On/Off	🔽 On/Off	🔽 On/Off	🔽 On/Off
Power Boosting	Manual	Manual 💌	Manual 💌	Manual 🔽	Manual 🔽
	0.000	0.000	0.000 🗧	0.000 🗧	0.000 🗧 💌
				Set	Cancel

x

Batch Measurement FunctionParameter 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.

Discover What's Possible™

/inritsu

Slide 33 MS269xA_LTE-E-L-1

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.)

🖀 3GLTE Downlink											×
Batch Settings											
Common Settings Band Setti	ngs (Carrier Co	ompo	nent Setting	<u></u>							
	▼ CC #0		☑ CC #1		☑ CC #2		▼ CC #3		▼ CC #4	ŀ	-
Frequency Band	Band #0	•	Band #0	•	Band #1	•	Band #1	-	Band #2	2 🔽	
Frequency Offset	() :	198000	00 🕂		D 🕂	198000	00 🕂		0÷	
Bandwidth	20MHz	•	20MHz	•	20MHz	•	20MHz	•	20MHz	•	
Test Model	E-TM3.1	-	E-TM3.1	•	E-TM3.1	•	E-TM3.1	-	E-T M3.1	•	
Synchronization Mode	SS	-	SS	~	SS	-	SS	~	SS	~	
Reference Signal Mode	Auto	~	Auto	~	Auto	-	Auto	~	Auto	~	
Cell ID	(0 🕂	(0 🕂		0÷		0 🕂	
Power Boosting											
CRS	0.000) .	0.0	00 🕂	0.000	0 🕂	0.0	00 🕂	0	.000 🛨	
Number of Antenna Ports											
CRS	1	-	1	~	1	-	1	~	1	~	
CSI-RS	1	~	1	~	1	~	1	~	1	~	
Antenna Port											
CRS	0	\Box		0 🕂	(0 🕂		0÷	
OSI-RS	15	\square	1	15 🕂	15		1	5 🕂		15 🕂	
PDSCH Modulation Scheme	AUTO	-	AUTO	~	AUTO	~	AUTO	~	AUTO	~	
EVM Window Length	W	•	W	•	W	•	W	•	W	•]
Ts	136	i 🕂	1:	36 🗦	130	6 🕂	1:	36 🗦		136 🗄	
W	136	i 🕂	1	36 🕂	130	6 🛨	1:	36 🗦		136 🛨	
Channel Estimation	🔽 On/Off		🔽 On/Off		🔽 On/Off		🔽 On/Off		On/Of	f	
Measurement Filter Type	Normal	•	Normal	•	Normal	•	Normal	•	Normal	•	
PBCH	🔽 On/Off		🔽 On/Off		🔽 On/Off		🔽 On/Off		🔽 On/Of	f	
Power Boosting	Manual	-	Manual	~	Manual	-	Manual	~	Manual	~	
	0.000		0.0	00 🕂	0.000	D 🕂	0.0	00 🕂	0	.000 ÷	-
							S	et		Cancel	

Batch Measurement Function

PBCH

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	🗹 On/Off	🔽 On/Off	🔽 On/Off	🗹 On/Off	🗹 On/Off 📃
Power Boosting	Auto	Auto 💌	Auto 💌	Auto 💌	Auto 💌
	0.000	0.000 🗧	0.000 🗧	0.000 ÷	0.000 🗧
P-SS	🔽 On/Off	🔽 On/Off	🔽 On/Off	🔽 On/Off	On/Off
Power Boosting	Auto	Auto 💌	Auto 🔹	Auto 💌	Auto 💌
	0.000	0.000 🕂	0.000 🕂	0.000 🛨	0.000 🛨
S-SS	☑ On/Off	☑ On/Off	☑ On/Off	On/Off	On/Off
Power Boosting	Auto	Auto 💌	Auto 💌	Auto 💌	Auto
	0.000	0.000		0.000	0.000
PDCCH	I Un/Uff				I On∕ Uff
Power Boosting	Auto	Auto 💌	Auto	Auto	Auto
POFICH			0.000		
Power Boosting	Auto	Auto	Auto	Auto	Auto
1 Gwel Boosting	0.000	0.000	0.000	0.000	0.000
PHICH	I On∕Off	☑ On/Off	☑ On/Off		
Power Boosting	Auto	Auto	Auto	Auto 💌	Auto 💌
	0.000	0.000 🗧	0.000 🗧	0.000 🗧	0.000 🗧
PDSCH					
Power Boosting	Auto	Auto 💌	Auto 🔹	Auto 💌	Auto 💌
	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	Auto	Auto 🔹	Auto 💌	Auto 🔹	Auto 🔽
	1 🕂	1 🗄	1 🗧	1 🗧	1 🕂 🗖
PDCCH Mapping	Auto 💌	Auto 💌	Auto 🔽	Auto 🔹	Auto 🔻
PDCCH Format	0 🔻	0 🔻	0 🔽	0 🔽	0 -
Number of PDCCHs	1 🗄	1 🗄	1 🕂	1 🗄	1 🕂
CSI-RS	☑ On/Off	☑ On/Off	☑ On/Off	On/Off	☑ On/Off
Configuration	0	0 🗄	0 🗧	0 🗄	0 ÷
Periodicity T	5	5	5	5 •	5 •
Subframe Offset Delta	0	0 ÷	0 ÷	0 ÷	
				Set	Cancel

Slide 35 MS269xA LTE-E-L-1

Discover What's Possible™

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)

Discover What's Possible™

PBCH	☑ On/Off		🔽 On/(Off	🔽 On/	Off	🔽 On/	Off	🔽 On/	Off	
Power Boosting	Auto	•	Auto	•	Auto	-	Auto	•	Auto	•]
	0.0	00 🕂		0.000 🕂		0.000 🗧		0.000 🗧		0.000 🗧	}
P-SS	🔽 On/Off		🔽 On/(Dff	🔽 On/	Off	🔽 On/	Off	🔽 On/	Off	
Power Boosting	Auto	•	Auto	•	Auto	-	Auto	•	Auto	•]
	0.0	00 🕂		0.000 🗧		0.000 🗧		0.000 🗧		0.000 🗧	}
S-SS	🔽 On/Off		🔽 On/(Off	🔽 On/	Off	🔽 On/	Off	🔽 On/	Off	
Power Boosting	Auto	•	Auto	•	Auto	-	Auto	•	Auto	-	
	0.0	00 🕂		0.000 🛨		0.000 🗧		0.000 🗧		0.000 🕂	}
PDCCH	☑ On/Off		🗹 On/(Off	🔽 On/	Off	☑ On/	Off	☑ On/	Off	
Power Boosting	Auto	-	Auto	•	Auto	•	Auto	•	Auto	•	
	0.0	00 🗧		0.000 🛨		0.000 🛨		0.000 🛨		0.000 🛨	
PCFICH	☑ On/Off		🗹 On/(Off	🗹 On/	Off	☑ On/	Off	☑ On/	Off	
Power Boosting	Auto	-	Auto	•	Auto	-	Auto	-	Auto	•	
	0.0	00 🕂		0.000 🛨		0.000 🗧		0.000 🗧		0.000 🗧	1
PHICH	☑ On/Off		🔽 On/(Off	🔽 On/	Off	☑ On/	Off	☑ On/	Off	
Power Boosting	Auto	-	Auto	•	Auto	•	Auto	•	Auto	•	
	0.0	00 🕂		0.000 🛨		0.000 🗧		0.000 🗧		0.000 🕂	
PDSCH											
Power Boosting	Auto	-	Auto	•	Auto	•	Auto	•	Auto	-	
	0.0	00 🕂		0.000 🛨		0.000 🛨		0.000 🛨		0.000 🛨	
PHICH Ng	1/6	-	1/6	•	1/6	•	1/6	•	1/6	•	
PHICH Duration	Normal	•	Norma	•	Norma	al 🗾	Norm	al 💌	Norm	al 💌]
PDCCH Symbols	Auto	•	Auto	•	Auto	-	Auto	•	Auto	•]
		1 🕂		1 🕂		1 🕂		1 🕂		1 🗄] -
PDCCH Mapping	Auto	•	Auto	•	Auto	•	Auto	•	Auto	•	
PDCCH Format	0	~	0	~	0	~	0	~	0	v	
Number of PDCCHs		1 🕂		1 🗄		1 🕂		1 🗄		1 🗧]
CSI-RS	🔽 On/Off		🔽 On/C	Dff	🖸 On/	Off	🗹 On/	Off	🔽 On/	Off	
Configuration		0 🕂		0 🗧		0 ÷		0 🗧		0÷]
Periodicity T	5	•	5	•	5	•	5	•	5	•]
Subframe Offset Delta		0 ÷		0 🗧		0 🗧		0 🗧		0	۱÷
								Set	1	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.

Discover What's Possible™

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]		0.02 /	-0.35	0.11 /	0.30	-0.02 /	0.48
PDSCH EVM [%]		0.48 /	0.48	0.43 /	0.44	0.30 /	0.31
Band Power [dBm]		-18.59 /	-18.59	-17.88 /	-17.88	-15.35 /	-15.35
RS Power [dBm]		-52.39 /	-52.39	-51.68 /	-51.68	-46.13 /	-46.13
OSTP [dBm]		-21.59 /	-21.58	-20.88 /	-20.88	-15.35 /	-15.35
	Averag	ge Value	Maxim	um Value			
r What's Possible™							

Discove

Slide 38 MS269xA LTE-E-L-1

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]	0.0)0		19.80		0.00		19.80		0.00		
Freq. Error[Hz]		-0.02 /	-0.40	0.0	6 / 0.41	0.06 /	0.23	0.16 /	0.36	-0.02 /	0.48	
PDSCH EVM[%]		0.47 /	0.47	0.49	9 / 0.50	0.41 /	0.42	0.45 /	0.46	0.30 /	0.31	
CC Power[dBm]		-21.10 /	-21.10	-22.1	7 / -22.16	-20.18 /	-20.18	-21.75 /	-21.74	-15.35 /	-15.35	
RS Power[dBm]		-51.89 /	-51.89	-52.9	6 / -52.96	-50.96 /	-50.96	-52.53 /	-52.53	-46.13 /	-46.13	
OSTP[dBm]		-21.06 /	-21.06	-22.1	3 / -22.18	-20.18 /	-20.18	-21.72 /	-21.72	-15.35 /	-15.35	

Average Value

Maximum Value

Slide 39 MS269xA LTE-E-L-1

MX269908A LTE IQproducer MX269908A-001 LTE-Advanced FDD Option (MS269xA/MS2830A for Vector Signal Generator option)

Slide 40 MS269xA_LTE-E-L-1

LTE IQproducer

The MX269908A LTE IQproducer is PC application software with a GUI for generating waveform patterns in compliance with the LTE FDD specifications in the 3GPP TS 36.211, TS 36.212, and TS 36.213 standards.

Installing the MX269908A-001* LTE-Advanced FDD option supports output of signals in compliance with the LTE-Advanced FDD standards. *: Requires MX269908A

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

MS269xA_LTE-E-L-1

LTE IQproducer – Display Configuration

Excellent operability supports easy waveform generation

Discover What's Possible™

Slide 42 MS269xA_LTE-E-L-1

/incitsu

United States

Anritsu Company 1155 East Collins Blvd., Suite 100, Richardson, TX 75081, U.S.A. Toll Free: 1-800-267-4878 Phone: +1-972-644-1777 Fax: +1-972-671-1877

Canada

Anritsu Electronics Ltd. 700 Silver Seven Road. Suite 120. Kanata. Ontario K2V 1C3, Canada Phone: +1-613-591-2003 Fax: +1-613-591-1006

Brazil

Anritsu Eletrônica Ltda. Praça Amadeu Amaral, 27 - 1 Andar 01327-010 - Bela Vista - São Paulo - SP - Brazil Phone: +55-11-3283-2511 Fax: +55-11-3288-6940

Mexico

Anritsu Company, S.A. de C.V. Av. Ejército Nacional No. 579 Piso 9, Col. Granada 11520 México, D.F., México Phone: +52-55-1101-2370 Fax: +52-55-5254-3147

United Kingdom

Anritsu EMEA Ltd. 200 Capability Green, Luton, Bedfordshire, LU1 3LU, U.K. Phone: +44-1582-433200 Fax: +44-1582-731303

• France

Anritsu S.A. 12 avenue du Québec, Bâtiment Iris 1- Silic 612, 91140 VILLEBON SUR YVETTE, France Phone: +33-1-60-92-15-50 Fax: +33-1-64-46-10-65

• Germany

Anritsu GmbH Nemetschek Haus, Konrad-Zuse-Platz 1 81829 München, Germany Phone: +49-89-442308-0 Fax: +49-89-442308-55

Italy

Anritsu S.r.I. Via Elio Vittorini 129, 00144 Roma, Italy Phone: +39-6-509-9711 Fax: +39-6-502-2425

Sweden Anritsu AB

Borgarfjordsgatan 13A, 164 40 KISTA, Sweden Phone: +46-8-534-707-00 Fax: +46-8-534-707-30

• Finland

Anritsu AB Teknobulevardi 3-5, FI-01530 VANTAA, Finland Phone: +358-20-741-8100 Fax: +358-20-741-8111

Denmark

Anritsu A/S (Service Assurance) Anritsu AB (Test & Measurement) Kay Fiskers Plads 9, 2300 Copenhagen S, Denmark Phone: +45-7211-2200 Fax: +45-7211-2210

Russia

Anritsu EMEA Ltd. **Representation Office in Russia**

Tverskaya str. 16/2, bld. 1, 7th floor. Russia, 125009, Moscow Phone: +7-495-363-1694 Fax: +7-495-935-8962

United Arab Emirates Anritsu EMEA Ltd.

Dubai Liaison Office P O Box 500413 - Dubai Internet City Al Thuraya Building, Tower 1, Suit 701, 7th Floor Dubai, United Arab Emirates Phone: +971-4-3670352 Fax: +971-4-3688460

India

Anritsu India Private Limited

2nd & 3rd Floor, #837/1, Binnamangla 1st Stage, Indiranagar, 100ft Road, Bangalore - 560038, India Phone: +91-80-4058-1300 Fax: +91-80-4058-1301

Specifications are subject to change without notice.

Singapore

Anritsu Pte. Ltd. 60 Alexandra Terrace, #02-08, The Comtech (Lobby A) Singapore 118502 Phone: +65-6282-2400 Fax: +65-6282-2533

• P.R. China (Shanghai)

Anritsu (China) Co., Ltd. Room 1715, Tower A CITY CENTER of Shanghai, No.100 Zunyi Road, Chang Ning District, Shanghai 200051, P.R. China Phone: +86-21-6237-0898 Fax: +86-21-6237-0899

• P.R. China (Hong Kong)

Anritsu Company Ltd. Unit 1006-7, 10/F., Greenfield Tower, Concordia Plaza, No. 1 Science Museum Road, Tsim Sha Tsui East, Kowloon, Hong Kong, P.R. China Phone: +852-2301-4980 Fax: +852-2301-3545

Japan

Anritsu Corporation 8-5, Tamura-cho, Atsugi-shi, Kanagawa, 243-0016 Japan Phone: +81-46-296-1221 Fax: +81-46-296-1238

Korea

Anritsu Corporation, Ltd.

502, 5FL H-Square N B/D, 681 Sampyeong-dong, Bundang-gu, Seongnam-si, Gyeonggi-do, 463-400 Korea Phone: +82-31-696-7750 Fax: +82-31-696-7751

Australia

Anritsu Pty. Ltd. Unit 21/270 Fentree Gully Road, Notting Hill, Victoria 3168, Australia Phone: +61-3.9558-8177 Fax: +61-3-9558-8255

Taiwan

Anritsu Company Inc. 7F, No. 316, Sec. 1, NeiHu Rd., Taipei 114, Taiwan Phone: +886-2-8751-1816 Fax: +886-2-8751-1817

