

MX269024A CDMA2000 Forward Link Measurement Software MX269026A EV-DO Forward Link Measurement Software

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

MX269024A CDMA2000 Forward Link Measurement Software MX269026A EV-DO Forward Link Measurement Software **Product Introduction**



MS269xA

MS2830A

Version 2.00

Anritsu Corporation

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MX269024A/26A-E-L-1

MX269024A CDMA2000 Forward Link Measurement Software MX269026A EV-DO Forward Link Measurement Software

The MX269024A CDMA2000 Forward Link and MX269026A EV-DO Forward Link Measurement Software applications have been developed for measuring forward link RF Tx specifications.

Installing these software packages in the MS269xA/MS2830A Signal Analyzer supports various transmission evaluations, including the modulation analysis.



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MX269024A CDMA2000 Parameters



> Auto Range: This function adjusts input level according to input signal.

[3]	Radio Configuration:	Selects input signal RC1-2: When input signal is "Radio Configuration 1/2" RC3-5: When input signal is "Radio Configuration 3/4/5"
	PN Offset:	Sets offset index of input signal pilot PN offset (This does not affect the test result when "trigger switch" is OFF.)
	Active Code Threshold:	Sets threshold to judge active code

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MX269024A CDMA2000 Measurement Screen

Code Domain Graph

(MX269024A) [F4: Measure] > [F1: Code Domain]

🕱 CDMA2000 Forward	d link					4/24/2009 17:36:52
Carrier Freq.	1 000 000 000 Hz	Input Level	-10.00 dBm			CDMA2000 Forward 🕋
		ATT	4 dB			Analysis
Result				<u> </u> 2		Time
Code Domain Power	r CH/WL 8/ Power -10.27c	64 Modula IB ρ	tion BPSI 0.09394	 ✓ Target Slot 0 Total Active CH 9 Output Power 	-9.64 dBm	
-20.00				Pilot Power — Active CH Power Total	-6.97 dB 0.00 dB	Code Number 8
-40.00		_		Average Maximum Inactive CH Power	-9.54 dB -6.97 dB	
-60.00				Average Maximum	-64.47 dB -62.48 dB	
Medulation Analysia	15	31	4/	Average	10/ 10	
wodulation Analysis	Λ	valMax		Average Ave/Max/M	107 10	
Frequency Error	0.05 / 0.0000 /	0.27 Hz 0.0003 ppm	Output Power 🚽	9.63 / -9.63 / -9.6	64 dBm	
ρ	0.99998 / 0	.99998				
EVM(rms)	0.41 /	0.42 %				
Origin Offset	-52.56 /	-52.37 dB				Target Slot Number
Ref.Int Pre	-Amp Off					1 of 2 → 0

Code domain analysis results are displayed in the Code Domain Power window. The result of each such analysis is displayed, regardless of the storage mode. Note that the displayed result is the analysis result of the single slot specified for Target Number, not the average for the number of slots specified for Measurement Interval.

[1]

- > Code: Code number set with marker
- > CH/WL: Channel/Walsh Length of set code
- Modulation: Modulation of set code
- Power: Code power of set code
- P: p of set code
- \geq Timing:

Displays the time difference between the Pilot Channel and the code

> Phase:

Displays the phase difference between the Pilot Channel and the code specified for Code Number.

[2]

- Target Slot: Set slot number
- Total Active CH: Number of codes judged "Active"
- **Output Power:** Average RF level
- Pilot Power: Average pilot channel power
- Active CH Power: Power of each code judged "Active"
- Inactive CH Power: Power of each code judged "Inactive"

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MX269024A CDMA2000 Measurement Screen

Code Domain Graph

(MX269024A) [F4: Measure] > [F1: Code Domain]

🕱 CDMA2000 Forwar	rdlink				4/	24/2009 17:36:52
Carrier Freq.	1 000 000 000 Hz	Input Level	-10.00 dBm		Sec. 1	DMA2000 Forwardl 🕋
		ATT	4 dB		Code	la la
						Analysis
Result						Time
Code Domain Powe	r					
Code 8	CH/WL 8 / Power -10.27	<mark>64</mark> Modulatio dB ρ	on BPSK 0.09394	Target Slot 0 Total Active CH 9		
[@B]				Output Power -9	.64 dBm	
0.00				Pilot Power -	.97 dB	Code
-20.00				Active CH Power		Number
				Total 0	.00 dB	8
-40.00				Maximum -	.97 dB	
				Inactive CH Power		
-60.00				Total -47 Average -64	.07 dB	
				Maximum -62	48 dB	
-80.00	15	31	47 63			
Modulation Analysis	;			Average	10/ 10	
	ļ	Avg/Max		Avg/Max/Min		
Frequency Error	0.05 / 0.0000 /	0.27 Hz Ou 0.0003 ppm	tput Power -9.6	53 / -9.63 / -9.64 d	Bm	
ρ	0.99998 /	0.99998				
EVM(rms)	0.41 /	0.42 %				
Origin Offset	-52.56 /	-52.37 dB				
				3	4	
						Target Slot
						Number
						0Slot
Ref.Int Pre	-Amp Off				1.0	2

[3]

- Frequency Error: Average frequency error
- > Output Power: Average RF level
- ρ: Average ρ
- > EVM (rms): Average EVM
- Origin Offset: Average origin offset
- Output Power(Filtered Tx Inverse):

Average RF level. This is the power obtained after passing through an inverse characteristics filter of the baseband filter defined in 3GPP2 C.S0024 and an equalizing filter.

> Output Power(Filtered 1 Carrier):

Average RF level. This is the power obtained after passing through a filter that has a pass band width of about 1.23 MHz.

Pilot Power(Abs.):

Absolute value of the average pilot channel power

Pilot Power(Rel.):

Relative value of the average pilot channel power

Displays EVM analysis results on the Modulation Analysis window. According to the storage mode setting, displays the analysis results of every time for Off, the average of analysis results for On. When this setting is set to On, either Average, Max, or Min value is displayed according to the analysis result. Note that the displayed EVM result is the average for the number of slots specified for Measurement Interval, not the analysis result of the single slot specified for Target Number.



MX269024A CDMA2000 Measurement Screen

Switching Code Domain Graph Display

Set when Radio Configuration is RC-3-5

(MX269024A) [F4: Measure] > [F1: Code Domain] > Page 2 > [F1: Trace]



Displays horizontal axis in Walsh system

Displays horizontal axis in orthogonal system



MX269026A EV-DO Parameters



- Physical Layer Subtype:
 - Sets physical layer subtype of input signal Subtype0/1 (Rev. 0), Subtype2 (Rev. A)
- Slot Type: Selects slot of measured object Active, Idle
- Modulation Type: Selects modulation method Auto, QPSK, 8PSK, 16QAM

Preamble Length:

Selects preamble length in data area Auto, 0, 64, 128, 256, 512, 1024

PN Offset:

Sets offset index of pilot PN offset of input signal

Active Code Threshold: Sets threshold to judge active code

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Code Domain Graph 1/2 (MX269026A) [F4: Measure] > [F1: Code Domain]



[1]

- I Code "I" code number set with marker
- > Q Code: "Q" code number set with marker
- > CH: Channel number of set code
- > Power: Code power of set code
- ρ: ρ of set code

[2]

- > Branch: Sets axis (I/Q) of analyzed code
- > Total Pilot Power: Power of pilot area
- Total MAC Power: Power of MAC area
- > Total Data Power: Power of data area
- xxx Active CH: Power of each code judged "Active"
- xxx Inactive CH: Power of each code judged "Inactive"

Displays code domain analysis results in a graph. The result of each analysis is displayed if the storage mode is disabled (Storage: Mode = Off), and the average analysis result is displayed if the mode is enabled (Storage: Mode = On.)



Code Domain Graph 2/2

(MX269026A) [F4: Measure] > [F1: Code Domain]

requency Error	-0.12 Hz -0.0001 ppm	May MAC In active OIL				
D pilot	0.99998	Power	-60.73 dB (Q-	81	[2]	
о мас	0.99998	ρ	0.00000	· /		
O Data	0.99998	Max. Data Active CH				
) overall1	0.99998	Power	-14.52 dB(I-	13)		
overall2	0.99998	ρ	0.03533			
EVM(rms)	0.46 %	Min. Data Active CH				
Origin Offset	-62.72 dB	Power	-15.52 dB (Q -	1)		
Data Modulation Scheme	16QAM	ρ	0.02803			

- Frequency Error: Average frequency error of measurement interval set range
- ρ pilot/ρ MAC/ρ Data:
 ρ in pilot/MAC/Data channel
- ρ overall 1: ρ in 1st Half slot
- ρ overall 2: ρ of Half Slot centered on "1st chip" in 2nd Half slot
- > EVM (rms): Average EVM
- > Origin Offset: Average origin offset
- > Data Modulation Scheme: Modulation in Data area
- Timing Error: Difference between PN Offset setting position and trigger input

- Max. MAC Inactive CH: Maximum inactive channel value in MAC area
- Max. Data Active CH: Maximum active channel value in data area
- Min. Data Active CH: Minimum active channel value in data area

Displays the numerical code domain analysis results. The result of each analysis is displayed if the storage mode is disabled (Storage: Mode = Off), and the average analysis result is displayed if the mode is enabled (Storage: Mode = On).

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Switching code domain graph display

(MX269026A) [F4: Measure] > [F1: Code Domain] > Page2 > [F1: Trace]





Power vs. Time Graph (MX269026A) [F4: Measure] > [F2: Power vs. Time]

* EVDO Forwa	ardlink					4/27/2009	16:12:17
Carrier Freq.	1 000 000 000 Hz	Input Level	-10.00 dBm			EVDO Forw Power vs Time	ardlink (
		ATT	4 dB			Sele	ct
Result		easuring		Average & Max	500 / 500	Reference	ce Line
Power vs Tim	ne(Halfslot)	casaring		Average & max	0007 000		-
MKR	634.00 PNChips (515.95μs) Ανο	g. 1.15 / Max.	9.17 / Min36.	14 dB	Reference Lev	ce Line el
[dB] 10.00	ini da katika je na poslati se dite na poslati kati	بينه ايتبادة أنتجاب الكالاتجازة	and the second secon	ana hiying tayu kasharti ilaka tin daa	a de la calencia de l	0.00d	Bm
-10.00		ריין איזייענערעערערערערערערערערערערערערערערערערע		n a dada ya dana dalar tatin dina dana da		Select	Mask
-20.00 -30.00	his and the firm of the set of the state of the set of t	Le De Hutte de Hill de A		والمتعالية والمتعادية والمتعالية المقساس		Standard	User
-40.00	<u>──╢╴┢╶╢╶┫╶╢╢┍╴╢</u> ╗╖╢╶╢╸			┫╏╴╨╓╣╎╬╓╴╫┍╏╢╴			
-60.00						Mask S	etup
-70.00 -80.00							•
-90.00	-100				1124		L
Result						<u>dB</u>	dBm
	Δ	vg/Max/Min				Diaplay	Itom
Template .	Judge Pass	9				Display	Item
Reference	Power -10.95 dBm			[0]		Average	All
MeanPowe	er -10.95 / -10	.78 / -11.12 dBm					
OnPower	-10.95 / -10	.78 / -11.12 dBm					
						Filter	Type
						- Inter	
						Gauss	sian
Ref.Int	Pre-Amp Off					1 of 2	

[1]

- MKR: Marker position
- > Avg.: Power at marker position of Average graph
- > Max.: Power at marker position Max. graph
- > Min.: Power at marker position Min. graph

[2]

- > **Template Judge:** Result of template mask
- Reference Power: Power of 0 dB in graph
- > Mean Power: Power in 1st Half Slot
- > On Power: Power of ON area in 1st Half Slot

Displays Power vs Time analysis results in a graph. The result of each analysis is displayed if the storage mode is disabled (Storage: Mode = Off), and the average analysis result is displayed if the mode is enabled (Storage: Mode = On).

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Switching Power vs. Time Graph display

(MX269026A) [F4: Measure] > [F2: Power vs. Time] > Page 2 > [F1: Trace]



Displays Half Slot time

Displays Pilot/MAC

Displays Ramp Part of Pilot/MAC





MX269024A/26A Adjacent Channel Leakage Power



Spectrum Analyzer (SWEEP mode)

- Displays integral power in screen display band (When "ACP Reference" is "Span Total")
- Displays integral power in In-band (When "ACP Reference" is "Carrier Total")
- (1) Displays selected carrier power (When "ACP Reference" is "Carrier Select")
- (1) Displays carrier power on both sides
 (When "ACP Reference" is "Both Sides of Carriers")

Signal Analyzer (FFT mode)

(2) Offset Freq

Offset frequency set value [MHz]

(3) BW

Channel bandwidth set value [MHz]

(4) L1/L2/U1/U2

Relative value of total power of Offset Channel bandwidth around Offset-1 to -3 and reference power selected in "ACP Reference"

Also displays total power of Offset Channel bandwidth around Offset-1 to -3 in parentheses



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MX269024A/26A Occupied Bandwidth



Spectrum Analyzer (SWEEP Mode)

Signal Analyzer (FFT Mode)

(1) OBW: Occupied bandwidth

- (2) OBW Center: Center frequency of occupied bandwidth
- (3) OBW Lower: Lower frequency of occupied bandwidth
- (4) OBW Upper: Upper frequency of occupied bandwidth

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MX269024A/26A-E-L-1

MX269024A/26A Channel Power



Spectrum Analyzer (SWEEP Mode)

Signal Analyzer (FFT Mode)

- (1) Channel Center: Center frequency
- (2) Channel Width: Set bandwidth
- (3) Absolute Power: Power in channel bandwidth
 - xx/Hz: Absolute power at 1 Hz
 - xx/1.23 MHz: Integrated power in bandwidth

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MX269024A/26A-E-L-1

MX269024A/26A Spectrum Emission Mask



Spectrum Analyzer (SWEEP Mode)



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