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Anritsu

MX268104A/268304A/268704A CDMA2000 1xEV-DO Measurement Software (For MS2681A/MS2683A/MS2687B Spectrum Analyzer)



For evaluation of CDMA2000 1xEV-DO transmission

* CDMA2000® is a registered trademark of the Telecommunications Industry Association (TIA-USA).

Supporting CDMA2000 1xEV-DO

– Evaluation of CDMA2000 1X transmission system with single unit –

MX268104A/MX268304A/MX268704A CDMA2000 1xEV-DO Measurement Software is the application software used in the MS2681A/MS2683A/MS2687B Spectrum Analyzer. The installation in MX268104A/MX268304A/MX268704A enables evaluation of base station or mobile transmitters conforming to the 3GPP2C.S0024 standards.

• Items measured by MX268104A/MX268304A/MX268704A

Modulation analysis:

Carrier frequency, Vector error, Phase error, Magnitude error

Code domain analysis:

Code domain power, Code domain timing offset, Code domain phase offset

Amplitude measurement:

Transmission power measurement

Spurious close to the carrier measurement

Spurious measurement

Occupied bandwidth measurement

IQ level measurement

CCDF measurement

Parameter Setup

A setup screen is provided for the entry of required parameters for modulation accuracy and code domain power measurements in CDMA2000 1xEV-DO analysis. Measurement can be performed after parameter setup.

<< Setup Common Parameter (1xEV-DO) >>		Setup Parameter
Input Terminal	: [RF]	-
Reference Level & Offset	: [-6.00dB] [0.00dB]	
Frequency Channel & Frequency	: [1092CH] = [887.650000MHz]	Modulation Analysis
Channel Spacing	: [1.250000MHz]	-
Signal Filter	: [Filter#20]	RF Power
Measuring Object	: [Forward Link]	-
Slot Type	: [Active]	Occupied Bandwidth
Modulation Type	: [Auto]	-
Preamble Length	: [Auto]	Spurious close to the Carrier
Synchronization Offset Index (PN Offset)	: [01 * 64 Pchips]	-
Trigger	: [Free Run]	Spurious Emission
Ch : 1092CH Level : -6.00dB Power Cal : Off		1 2
Freq : 887.650000MHz Offset : 0.00dB Correction : Off		

Modulation Accuracy Measurement

Frequency error, modulation accuracy and code domain analysis are performed and then results are displayed on the screen. The measurement accuracy is 1% (typical value) of residual vector error (rms).

<< Modulation Analysis (1xEV-DO) >>		Modulation Analysis
Measure	: Single	Trace Format
Storage	: Normal	
Trace	: Non(Overall)	-
Frequency Carrier Frequency	: 887.649 977 1 MHz	Storage Mode
Carrier Frequency Error	: -22.9 Hz -0.026 ppm	-
Waveform Quality		Modulation Type
$\rho_{overall-1}$: 0.99977	-
$\rho_{overall-2}$: 0.98516	Analysis Mode
ρ_{pilot}	: 0.99963	-
Modulation(Overall)		Adjust Range
RMS & Peak EVM	: 0.88 % (rms) 2.27 %	-
Phase Error	: 0.35 deg. (rms)	Back Screen
Magnitude Error	: 0.63 % (rms)	1 2
Origin Offset(CFT)	: -35.13 dB	
Tx Power	: -0.11 dBm	
Analysis Start	: 0Pchips (Slot 0)	
Analysis Length	: 2048Pchips (15lots)	
Ch : 1092CH Level : -6.00dB Power Cal : Off		
Freq : 887.650000MHz Offset : 0.00dB Correction : Off		

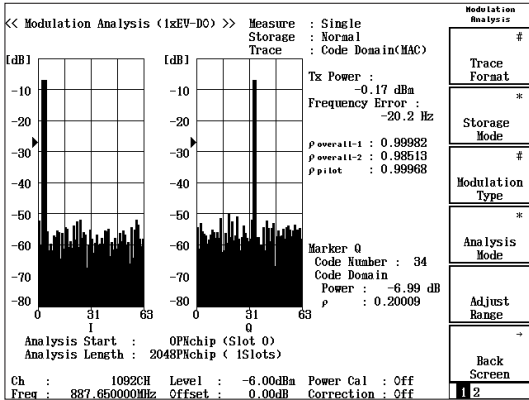
Constellation Display

Auto setup is available for modulation system and preamble length setup, simplifying operations by automated detection.

<< Modulation Analysis (1xEV-DO) >>		Analysis Mode
Measure	: Continuous	Analysis Start
Storage	: Normal	
Trace	: Constellation(Syn.)	Analysis Length
Frequency	: 887.649 978 5 MHz	-
Frequency Error	: -21.5 Hz -0.024 ppm	Trace Slot
EVM (RMS)	: 1.83 %	-
(Peak)	: 4.68 %	Marker : Code 15
Phase Error	: 0.74 deg. (rms)	95.00 Pchips
Magnitude Error	: 1.29 % (rms)	(1) : 0.3237
Origin Offset(CFT)	: -33.57 dB	(0) : 0.3306
Analysis Start	: 0Pchips (Slot 0)	return
Analysis Length	: 2048Pchips (15lots)	
Ch : 1092CH Level : -6.00dB Power Cal : Off		
Freq : 887.650000MHz Offset : 0.00dB Correction : Off		

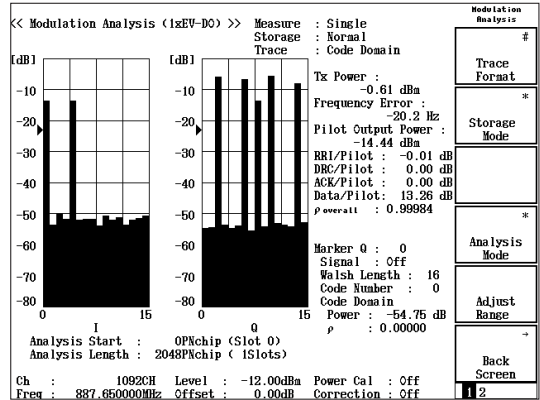
BTS Code Domain Analysis

Perform code domain analysis of forward link signals in approx. 2 seconds. Code domains of IQ phase are displayed on the screen.



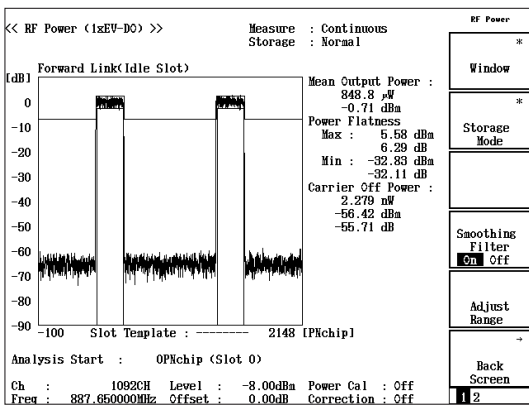
MS Code Domain Analysis

Perform code domain analysis of reverse link signals in approx. 2 seconds. Code domains of I Q phase are displayed on the screen.



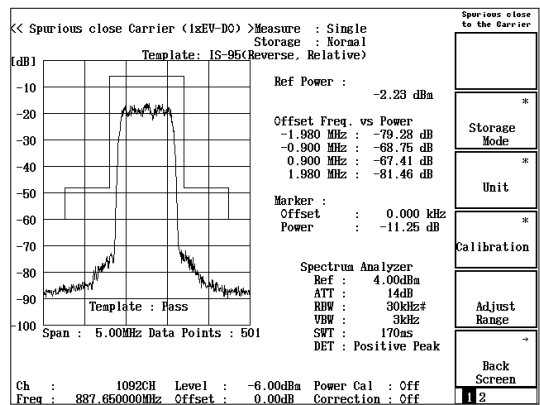
Transmission Power Measurement

When transmission power is measured both the value and signal waveform are displayed on the screen.



Spurious Close to the Carrier Measurement

Spurious close to the carrier is measured using the spectrum analyzer function. The PASS/FAIL result of a template judgement is displayed on the screen.



Specifications

Following specifications are guaranteed after optimized internal level (Range of internal receiver is automatically adjusted by pushing Adjust Range key).

“Pre-amp on” can be set when MS2681A-08/MS2683A-08 option is installed in the main frame.

Model	MS2681A	MS2683A	MS2687B
Modulation/ frequency measurement	Measurement frequency range	50 MHz to 2.3 GHz	
	Measurement level range	-40 to +30 dBm (average power within burst, pre-amp off) -60 to +10 dBm (average power within burst, pre-amp on)	-30 to +30 dBm (average power within burst)
	Carrier frequency accuracy	Input level: ≥ -30 dBm (pre-amp off), ≥ -40 dBm (pre-amp on), at 1 code channel \pm (reference oscillator accuracy + 10 Hz)	Input level: ≥ -30 dBm, at 1 code channel \pm (reference oscillator accuracy + 10 Hz)
	Modulation accuracy (residual vector error)	Input level: ≥ -30 dBm (pre-amp off), ≥ -40 dBm (pre-amp on), at 1 code channel <2.0 % (rms)	Input level: ≥ -30 dBm, at 1 code channel <2.0 % (rms)
	Origin offset accuracy	Input level: ≥ -30 dBm (pre-amp off), ≥ -40 dBm (pre-amp on), at 1 code channel, relative to signal with origin offset of -30 dBc ± 0.50 dB	Input level: ≥ -30 dBm, at 1 code channel, relative to signal with origin offset of -30 dBc ± 0.50 dB
	Waveform display	Forward link Displays the following items for each or entire domain of DATA, MAC and Pilot: Constellation, Eye pattern, Vector error vs. chip number, Phase error vs. chip number, Amplitude error vs. chip number Displays the symbol constellation of DATA domain Reverse link Displays the following items for 1CH to multi CH input signals: Constellation, Eye pattern, Vector error vs. chip number, Phase error vs. chip number, Amplitude error vs. chip number	
Code domain analysis	Frequency range	50 MHz to 2.3 GHz	
	Measurement level range	-40 to +30 dBm (average power within burst, pre-amp off) -60 to +10 dBm (average power within burst, pre-amp on)	-30 to +30 dBm (average power within burst)
	Code domain power accuracy	Input level: ≥ -10 dBm (pre-amp off), ≥ -20 dBm (pre-amp on) ± 0.2 dB (code power ≥ -10 dB) ± 0.4 dB (code power ≥ -25 dB)	Input level: ≥ -10 dBm ± 0.2 dB (code power ≥ -10 dB) ± 0.4 dB (code power ≥ -25 dB)
	Analysis signal	Forward link, Reverse link	
	Waveform display	Forward link Displays the code domain power for each DATA and MAC domain: Code domain power for DATA domain, Spread factor: IQ separate display for fixed 16 codes Code domain power for MAC domain, Spread factor: IQ separate display for fixed 64 codes Reverse link: Displays the code domain power for IQ separately, Detects the following channels	
Amplitude measurement	Frequency range	50 MHz to 2.3 GHz	
	Measurement level range	-40 to +30 dBm (average power within burst): pre-amp off -60 to +10 dBm (average power within burst): pre-amp on	-30 to +30 dBm (average power within burst)
	Tx power measurement range	-20 to +30 dBm (average power within burst): pre-amp off -20 to +10 dBm (average power within burst): pre-amp on	-20 to +30 dBm (average power within burst)
	Tx power measurement accuracy	± 2.0 dB typical	
	Power measurement linearity	Input level: ≥ 0 dBm (pre-amp off), ≥ -20 dBm (pre-amp on), unchanged reference level setup after range adjustment ± 0.20 dB (0 to -40 dB)	Input level: ≥ 0 dBm, unchanged reference level setup after range adjustment ± 0.20 dB (0 to -40 dB)
	Idle slot analysis	Rise/Fall characteristics and On/Off ratio analysis function are equipped.	
Occupied bandwidth measurement	Frequency range	50 MHz to 2.3 GHz	
	Measurement level range	-40 to +30 dBm (average power within burst): pre-amp off -60 to +10 dBm (average power within burst): pre-amp on	-30 to +30 dBm (average power within burst)
	Measurement method	Sweep method: Sweeps signal using spectrum analyzer and calculates result FFT Method: Analyzes signal with FFT and calculates result	

Model	MS2681A	MS2683A	MS2687B	
Spurious close carrier to the measurement	Frequency range	50 MHz to 2.3 GHz		
	Input level range	-10 to +30 dBm (average power within burst): pre-amp off		
	Measurement method	Calculates and displays the ratio of Tx power to the power measured by spectrum analyzer with sweep method.		
	Tx power measurement	Tx power method: Carrier power measured in 1.23 MHz bandwidth. SPA method: Carrier power measured in RBW: 3 MHz, VBW: 3 kHz, detection mode: sample, frequency span: 0 Hz.		
	Measurement range	Input level (average power within burst): ≥ 0 dBm (pre-amp off), RBW: 30 kHz, VBW: 3 kHz, detection mode: positive 750 kHz offset: ≥ 45 dBc, (at span 2 MHz) 1.98 MHz offset: ≥ 60 dBc		
Spurious measurement	Measurement frequency range	10 MHz to 3.0 GHz (except within ± 50 MHz of carrier frequency)	10 MHz to 7.8 GHz (except within ± 50 MHz of carrier frequency)	10 MHz to 7.9 GHz (except within ± 50 MHz of carrier frequency)
	Input level range (Tx power)	0 to +30 dBm (average power within burst): pre-amp off		0 to +30 dBm (average power within burst)
	Measurement method	Sweep method: Sweeps specified frequency range using spectrum analyzer and calculates ratio of carrier power and peak value detected during the sweep. Detection mode is average. Spot method: Measures average power of specified frequencies in time domain using spectrum analyzer and calculates ratio of carrier power and measured power of the frequencies. Detection mode is average. Search method: Sweeps specified frequency range using spectrum analyzer and detects frequency of peak spurious. Measures average power of the detected frequencies in time domain using spectrum analyzer and calculates ratio of carrier power and the measured power for the frequencies. Detection mode is Average.		
	Tx power measurement	Tx power method: Carrier power measured in 1.23 MHz bandwidth SPA method: Carrier power measured in RBW: 3 MHz, VBW: 3 kHz, detection mode: sample, frequency, span: 0 Hz		
	Measurement range (typical)	≥ 79 dB (RBW: 10 kHz, 10 MHz to 30 MHz) ≥ 79 dB (RBW: 100 kHz, 30 MHz to 1 GHz) Normal mode: $\geq 76 - f$ [GHz] dB (RBW: 1 MHz, 1 GHz to 3.0 GHz)	≥ 79 dB (RBW: 10 kHz, 10 MHz to 30 MHz, Band 0) ≥ 79 dB (RBW: 100 kHz, 30 MHz to 1 GHz, Band 0) Normal mode: $\geq 76 - f$ [GHz] dB (RBW: 1 MHz, 1 GHz to 3.15 GHz, Band 0) ≥ 76 dB (RBW: 1 MHz, 3.15 GHz to 7.8 GHz, Band 1) With MS2683A-03 option, at spurious mode ≥ 76 dB (RBW: 1 MHz, 1.6 GHz to 7.8 GHz, Band 1)	≥ 79 dB (RBW: 10 kHz, 10 MHz to 30 MHz, Band 0) ≥ 79 dB (RBW: 100 kHz, 30 MHz to 1 GHz, Band 0) Normal mode: $\geq 76 - f$ [GHz] dB (RBW: 1 MHz, 1 GHz to 3.15 GHz, Band 0) ≥ 76 dB (RBW: 1 MHz, 3.15 GHz to 7.9 GHz, Band 1)
CCDF measurement	Frequency range	50 MHz to 2.3 GHz		
	Measurement level range	-60 to +30 dBm: pre-amp off -80 to +10 dBm: pre-amp on		-50 to +30 dBm
	Measurement method	CCDF: Displays the cumulative distribution of the power difference between instantaneous power and average power. APD: Displays the distribution of the power difference between instantaneous power and average power.		
	Filter selection function	20 MHz, 10 MHz, 5 MHz, 3 MHz, 1.23 MHz		
Electric performance (IQ input)	Input impedance	1 M Ω (parallel capacitance: <100 pF), 50 Ω		
	Balance input	With MS2681A-17/MS2683A-17 Differential voltage: 0.1 to 1 Vp-p In-phase voltage: ± 2.5 V		—
	Unbalance Input	With MS2681A-18/MS2683A-18/MS2687B-18 0.1 to 1 Vp-p DC/AC coupling: Changeable		
	Measurement items	Modulation accuracy, code domain power, amplitude, occupied bandwidth (FFT method), IQ level		
	Modulation accuracy measurement	Input level: ≥ 0.1 V (rms) <2 % (rms), DC coupling		
	IQ level measurement	Measures input level of I and Q (rms, p-p)		
	IQ phase difference measurement	When the CW signal is inputted to I and Q input terminals, measures and displays the phase difference between I-phase and Q-phase signals.		

*1: When carrier frequency is in a 2030.354 to 2200 MHz range, spurious will be generated at the frequency below.
 f (spurious) = f (input) - 2030.345 MHz

Ordering Information

Please specify the model/order number, name, and quantity when ordering.

Model/Order No.	Name
	Main frame
MX268104A	1xEV-DO Measurement Software (for MS2681A)
MX268304A	1xEV-DO Measurement Software (for MS2683A)
MX268704A	1xEV-DO Measurement Software (for MS2687B)
	Standard accessories
JT32MA3-NT1	PC-ATA card (32 MB, for backup): 1 pc
W2090AE	CDMA2000 1xEV-DO Measurement Software operation manual: 1 copy

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Specifications are subject to change without notice.

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