MX860904A

CDMA2000 1xEV-DO Measurement Software

(For MS8609A Digital Mobile Radio Transmitter Tester)

For Evaluation of CDMA2000 1xEV-DO Transmission System

Supporting CDMA2000 1xEV-DO

MX860904A cdma Measurement Software is the application software used in the MS8609A Digital Mobile Radio Transmitter Tester. The installation of MX860904A enables evaluation of base station or mobile transmitters conforming to the 3GPP2 C.S0024 standards.

● **Items measured by MX860904A**

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
I/Q level measurement
CCDF measurement

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).

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.
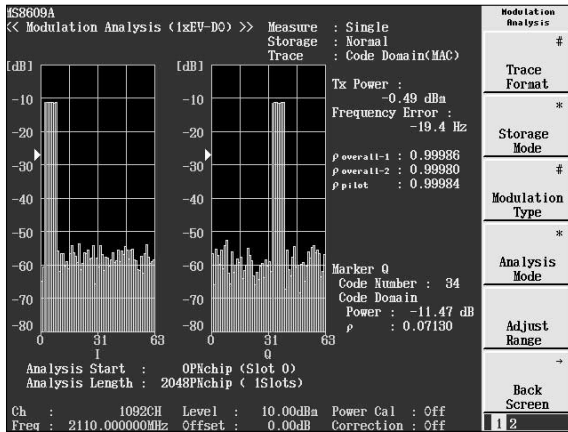Measurement can be performed after parameter setup.

Constellation Display

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

BTS Code Domain Analysis

Perform code domain analysis of forward link signals in approx. 2 seconds. Code domains of I/Q 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.
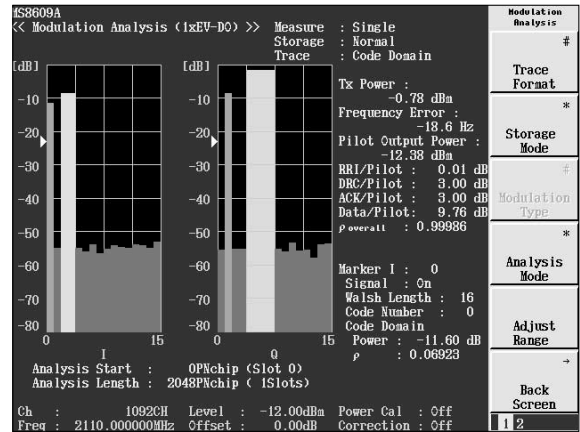
Transmission Power Measurement

When transmission power is measured both the value and signal waveform are displayed on the screen. High accuracy power measurements are achieved using the built-in power meter function.
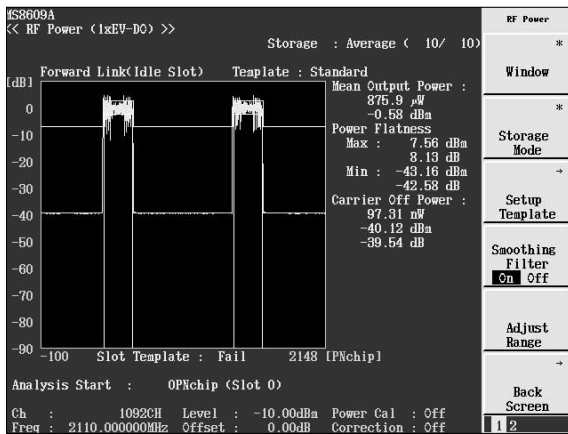
Spurious Close to the Carrier Measurement

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).

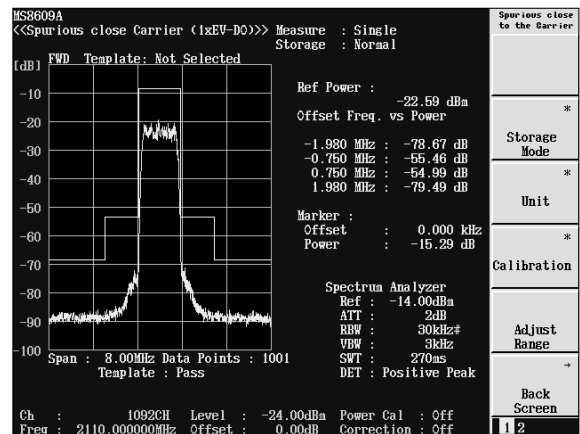|	

Modulation/frequency measurement	Measurement frequency range: 50 MHz to 2.3 GHz
	Measurement level range:
	  −40 to +20 dBm (average power within burst, pre-amp off)
	  −60 to +10 dBm (average power within burst, pre-amp on[*1])
	Carrier frequency accuracy: ±(reference oscillator accuracy +10 Hz)
	  ∗Input level: ≥−30 dBm (pre-amp off), ≥−40 dBm (pre-amp on[*1]), at 1 code channel
	Modulation accuracy (residual vector error): <2.0% (rms)
	  ∗Input level: ≥−30 dBm (pre-amp off), ≥−40 dBm (pre-amp on[*1]), at 1 code channel
	Origin offset accuracy: ±0.50 dB
	  ∗Input level: ≥−30 dBm (pre-amp off), ≥−40 dBm (pre-amp on[*1]), at 1 code channel, relative to signal with
	   origin offset of −30 dBc
	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	Measurement frequency range: 50 MHz to 2.3 GHz
	Measurement level range:
	  −40 to +20 dBm (average power within burst, pre-amp off)
	  −60 to +10 dBm (average power within burst, pre-amp on[*1])
	Code domain power accuracy: ±0.1 dB (code power: ≥−10 dBc), ±0.3 dB (code power: ≥−25 dBc)
	Input level: ≥−10 dBm (pre-amp off), ≥−20 dBm (pre-amp on[*1])
	Analysis signal: Forward link, Reverse link
	Display function
	  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 +20 dBm (average power within burst, pre-amp off)
	  −60 to +10 dBm (average power within burst, pre-amp on[*1])
	Tx power measurement: (after level calibration using built-in power meter, automatic operation by pushing key)
	  Measurement range:
	    −20 to +20 dBm (average power within burst, pre-amp off)
	    −20 to +10 dBm (average power within burst, pre-amp on[*1])
	  Accuracy: ±0.40 dB
	Power measurement linearity: ±0.20 dB (0 to −40 dB)
	  ∗Input level: ≥0 dBm (pre-amp off), ≥−20 dBm (pre-amp on[*1]) , unchanged reference level setup after range
	   adjustment
	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 +20 dBm (average power within burst, pre-amp off)
	  −60 to +10 dBm (average power within burst, pre-amp on[*1])
	Measurement method
	  Sweep method: Sweeps signal using spectrum analyzer and calculates result
	  FFT method: Analyzes signal with FFT and calculates result

Spurious close to the carrier measurement	Frequency range: 50 MHz to 2.3 GHz
	Input level range: –10 to +20 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: ≥50 dBc (900 kHz offset), ≥60 dBc (1.98 MHz offset)
	  ∗Input level (average power within burst): ≥0 dBm (pre-amp off), RBW: 30 kHz, VBW: 3 kHz, detection mode: positive

Spurious measurement	Measurement frequency range:
	  10 MHz to 12.75 GHz (except within ±50 MHz of carrier frequency)
	Input level range (Tx power): 0 to +20 dBm (average power within burst, pre-amp off)
	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 to 30 MHz, Band 0)
	  79 dB (RBW: 100 kHz, 30 to 1000 MHz, Band 0)
	  ∗Carrier frequency: 800 to 1000 MHz/1.8 to 2.2 GHz, reference value of power ratio in Tx power ∗2

CCDF measurement	Frequency range: 50MHz to 3GHz, 50MHz to 2.3GHz (when Option MS8609A-08 or MS8609A-30 is installed)
	Measurement level range
	  –60 to +20dBm (average power), +30dBm (peak power): Pre-amp off
	  –80 to +10dBm (average power), +20dBm (peak power): Pre-amp on ∗1
	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: 20MHz, 10MHz, 5MHz, 3MHz, 1.23MHz

Electric performance (I/Q input)	Input impedance:1 MΩ (parallel capacitance: <100 pF), 50 Ω
	Balance input
	  Differential voltage: 0.1 to 1 Vp-p, In-phase voltage: ±2.5 V
	Unbalance input: 0.1 to 1 Vp-p
	DC/AC coupling: Changeable
	Measurement items:
	  Modulation accuracy, code domain power, amplitude, occupied bandwidth (FFT method), I/Q level
	Modulation accuracy measurement: (residual vector error):
	  <2% (rms) ∗DC coupling, input level: ≥0.1V (rms)
	I/Q level measurement: Measures input level of I and Q (rms, p-p)
	I/Q phase defference 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: Can be set when MS8609A-08 option is installed in the main frame.
∗2: 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	Remarks
MX860904A	**Main frame** CDMA2000 1xEV-DO Measurement Software	For CDMA2000 1xEV-DO
JT32MA-NT1 W2090AE	**Standard accessories** PC-ATA card (32 MB): 1 pc CDMA2000 1xEV-DO measurement software operation manual (Vol. 1): 1 copy	MX860904A software for backup

/Anritsu

Specifications are subject to change without notice.

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