Product Introduction

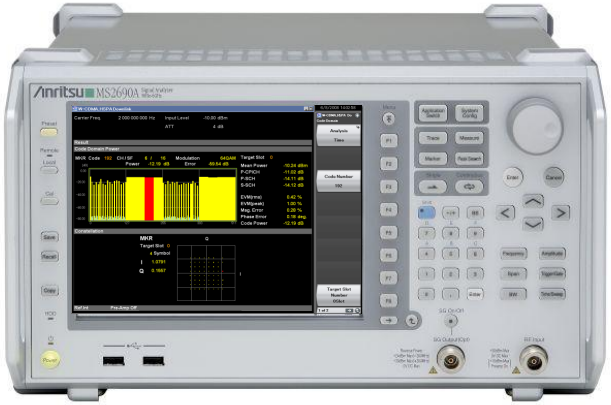
MX269011A

W-CDMA/HSPA Downlink Measurement Software

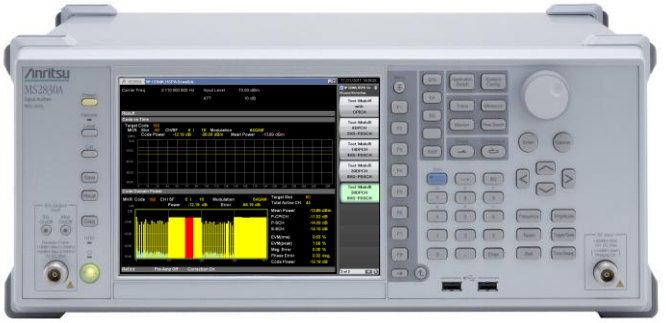
MS2690A/MS2691A/MS2692A/MS2830A

Signal Analyzer

MX269011A
W-CDMA/HSPA Downlink Measurement Software
Product Introduction



MS269xA



MS2830A

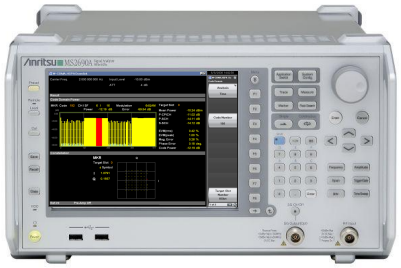
Version 3.00

Anritsu Corporation

W-CDMA/HSPA Downlink Measurement Software

The MX269011A W-CDMA/HSPA Downlink Measurement Software supports measurement of RF Tx characteristics of base stations supporting W-CDMA/HSDPA/HSUPA/HSPA Evolution.
Installation in the MS2690A/MS2691A/MS2692A/MS2830A Signal Analyzer offers Modulation Analysis, Code Domain and Code vs.Time measurement.

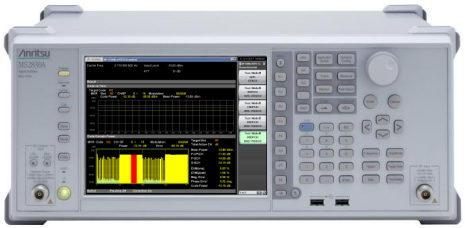
MS269xA



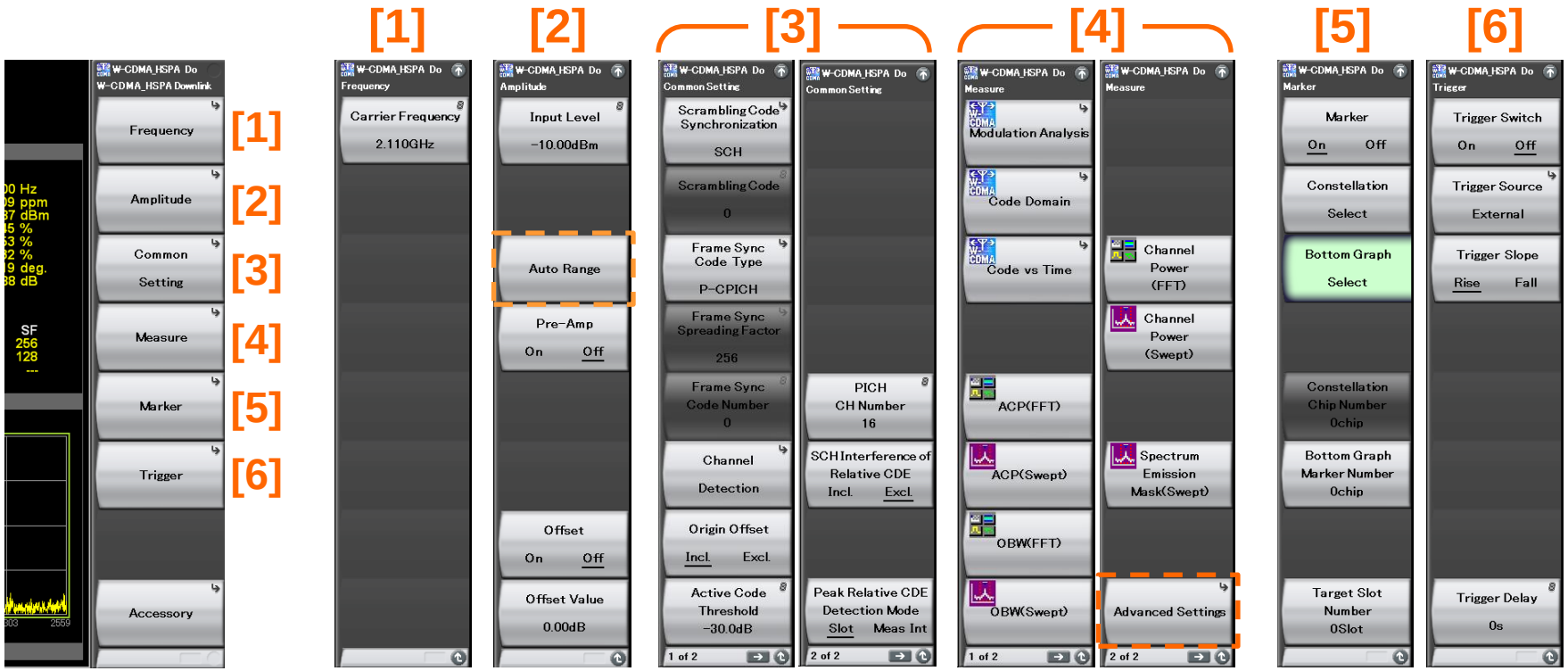
MX269011A
W-CDMA/HSPA Downlink Measurement Software

Install

MS2830A



Setting Parameter (1/2)



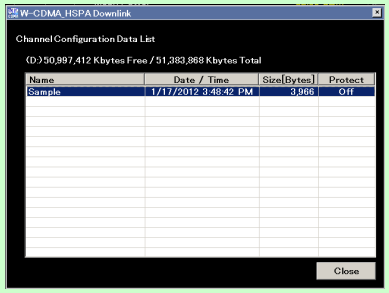
- **Auto Range:**
  This function adjusts input level according to input signal.
- **Advance Settings:**
  When function is switched among each measurement function using Signal Analyzer or Spectrum Analyzer function, this setting sets whether to inherit Reference Level and ATT settings.

Setting Parameter (2/2)

[3] Channel Detection

Channel Detection: User Defined

- **User Defined Select File:** Conducts analysis with the channel configuration selected in User Defined - Select File.
- **User Defined2 For Remote:** Conducts analysis with the channel configuration specified in the remote-controlled User Defined file.



Selecting Channel Configuration File

- **Scrambling Code Synchronization:**
  This sets the scrambling code specification method for the measured signal.
  SCH: Automatically specifies the scrambling code using SCH channel.
  User Defined: Manually enter the scrambling code.
- **Scrambling Code:**
  Input the scrambling code used for the measured signal.
- **Frame Sync Code Type:**
  Select the code to use for synchronizations detection.
  P-CPICH: Select when using a signal including P-CPICH.
  User Defined: Select when the signal to be measured does not include P-CPICH
- **Frame Sync Spreading Factor:**
  Select the sync detection channel spreading factor
- **Frame Sync Code Number:**
  Select the Channelization Code Number used at sync detection
- **Channel Detection:**
  The input signal is analyzed as a known signal.
  Select the Test Model or the User Defined file.
- **Origin Offset:**
  This specifies whether to include or exclude the origin offset in the EVM measurement.
  Incl. Calculates EVM, including origin offset.
  Excl. Calculates EVM, excluding origin offset.
- **Active Code Threshold:**
  This is used to set the channel detection level threshold value from the Mean Power.
- **PICH CH Number:**
  Set the PICH channelization code number to auto-detect PICH DTX.
- **SCH Interference of Relative CDE:**
  Sets whether to include or exclude the Relative CDE of the beginning 256 chips of each slot for analysis.
  Incl.: All 2560 chips of each slot are measured.
  Excl.: The beginning 256 chips of each slot are excluded and the rest will be measured.
- **Peak Relative CDE Detection Mode:**
  Set whether to calculate Peak Relative CDE in slot units or measurement interval units.
  Slot: Calculates in slot units.
  Meas Int: Calculates in measurement interval units.

Measurement Functions (1/2)

Supports fast and high-accuracy measurements, such as modulation analysis and Tx power required for development of W-CDMA/HSDPA/HSUPA/HSPA Evolution base stations.

Modulation Analysis

Text Display

- Frequency Error
- Mean Power
- EVM (rms)
- EVM (peak)
- Magnitude Error (rms)
- Phase Error (rms)
- Origin Offset
- Time Offset
- Peak Code Domain Error
- Peak Active CDE
- Peak Relative CDE
- IQ imbalance <Summary>
- P-CPICH Power <Summary>

Graph Display

- Constellation
- EVM vs Chip
- Magnitude Error vs Chip
- Phase Error vs Chip

Code Domain

Text Display

- Total Active CH
- Mean Power
- P-CPICH Code Power
- P-SCH Code Power
- S-SCH Code Power
- EVM (rms)
- EVM (peak)
- Magnitude Error (rms)
- Phase Error (rms)
- Code Power

Graph Display

- Code Domain Power
- Code Domain Error
- Constellation
- EVM vs Symbol
- Magnitude Error vs Symbol
- Phase Error vs Symbol
- Code Power vs Symbol

Measurement Functions (2/2)

Code vs. Time

Text Display

- CH/SF
- Modulation
- Code Power
- Total Active CH
- Mean Power
- P-CPICH Code Power
- P-SCH Code Power
- S-SCH Code Power
- EVM (rms)
- EVM (peak)
- Magnitude Error (rms)
- Phase Error (rms)
- Code Power

Graph Display

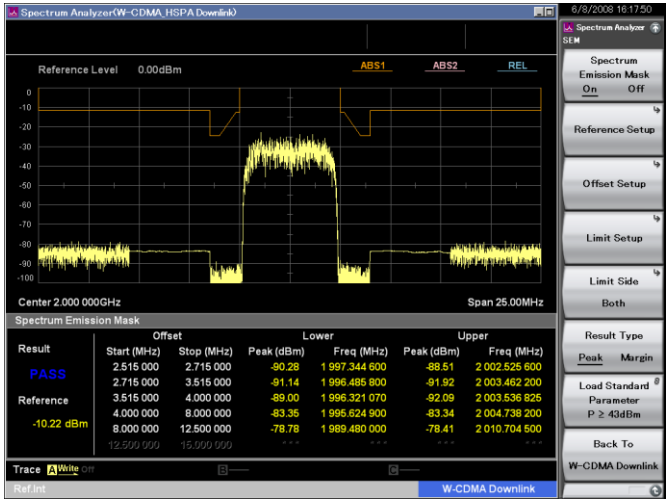
- Code vs Time
- Code Domain Power
- Code Domain Error

Adjacent channel leakage power (ACP)

Channel power

Occupied bandwidth (OBW)

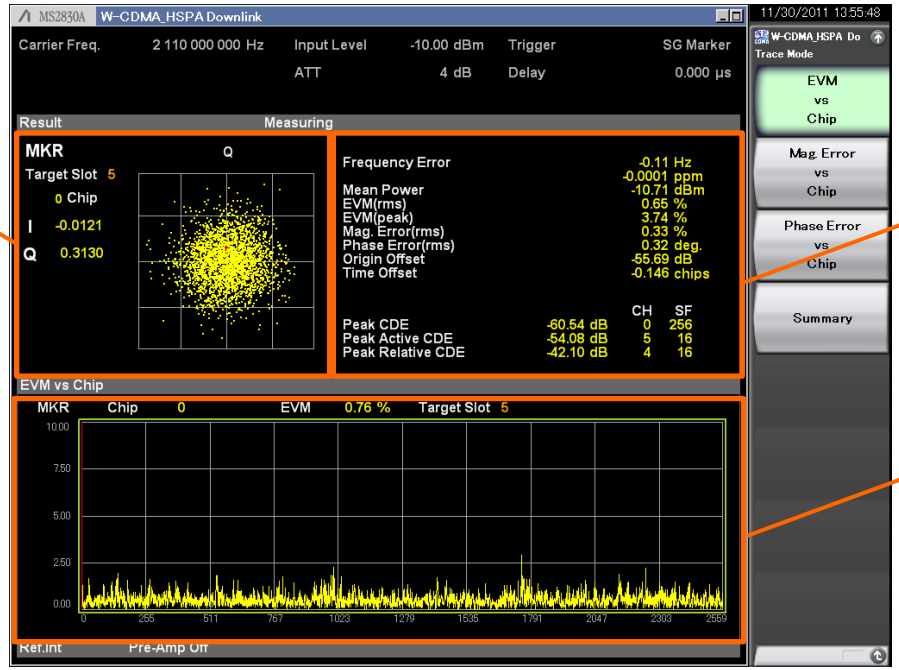
Spectrum emission mask



Modulation Analysis (1/4)

Supports modulation analysis of W-CDMA/HSDPA/HSUPA/HSPA Evolution downlink signals.
Efficient evaluation of DUT characteristic because max. and average values for frequency error, vector error, etc., measurements displayed simultaneously for 15 slots max.

Modulation Analysis Screen



Constellation

Text Display

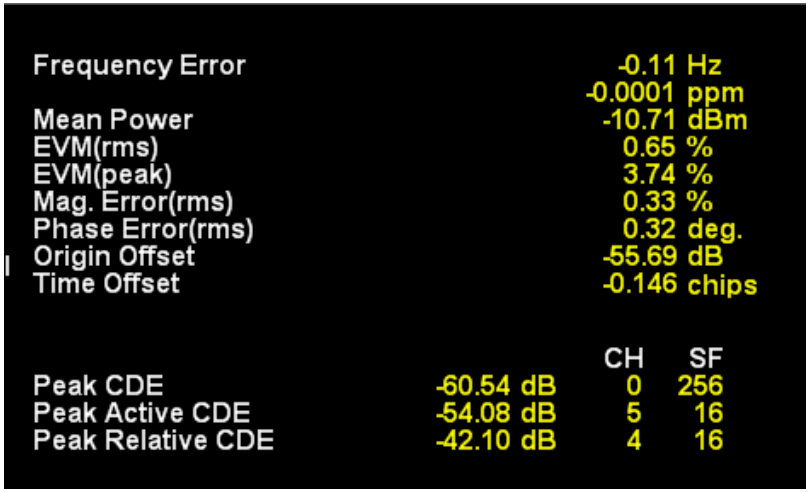
Graph Display

Summary

Modulation Analysis (2/4)

Text Display

The Result window shows the numerical results in the analysis time specified with the Starting Slot Number and Measurement Interval.



- Frequency Error: Displays frequency error in the analysis segment.
- Mean Power: Displays mean power in the analysis segment.
- EVM(rms): Displays vector error in RMS in the analysis segment.
- EVM(peak): Displays peak of vector error in each chip in the analysis segment.
- Mag. Error(rms): Displays magnitude error in RMS in the analysis segment.
- Phase Error(rms): Displays phase error in RMS in the analysis segment.
- Origin Offset: Displays origin offset in the analysis segment.
- Time Offset: Displays time offset between the triggered time and slot boundary of slot#0 of the signal measured. (This result is displayed when trigger switch is set to On.)
- Peak CDE: Displays peak of code domain error of the codes with spreading factor 256 in analysis time. The code number (CH), spreading factor (SF), and axis (IQ) of the code with peak value are also displayed.
- Peak Active CDE: Displays peak of code domain error of the active codes in analysis segment. The code number (CH) and spreading factor (SF) of the active code with peak value are also displayed.
- Peak Relative CDE: Displays peak value in analysis segment for code domain error at spreading factor of 16 AND 64QAM modulation method. The code number (CH) and spreading factor (SF) of the active code with peak value are also displayed.

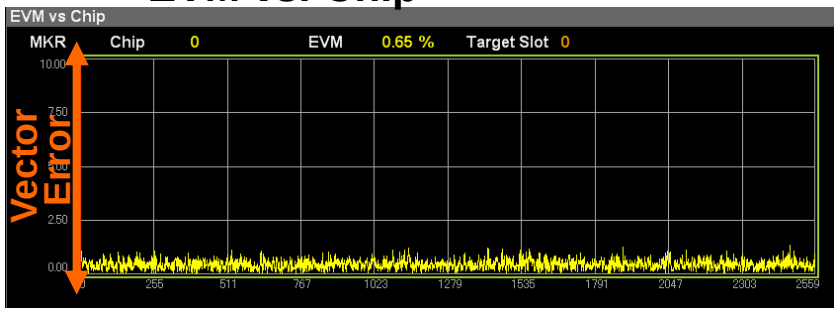
Modulation Analysis (3/4)

Graph Display

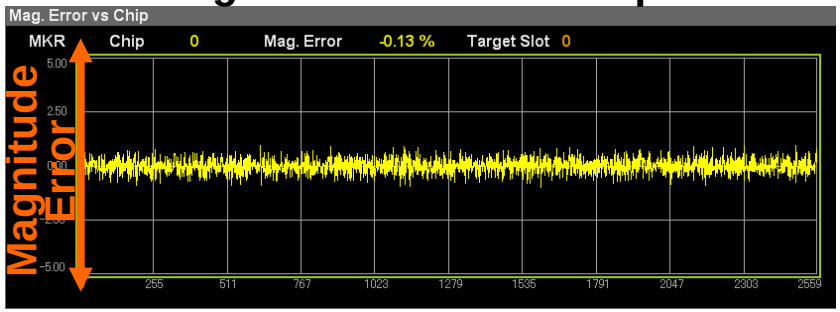
Each of vector error, amplitude error, and phase error can be displayed on the vertical axis. The time-dependent (chip unit) signal degradation can be found instantaneously.

Modulation Analysis Screen

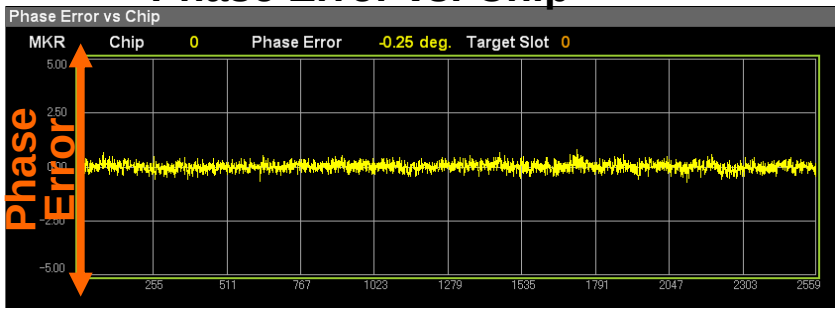
EVM vs. Chip



Magnitude Error vs. Chip



Phase Error vs. Chip



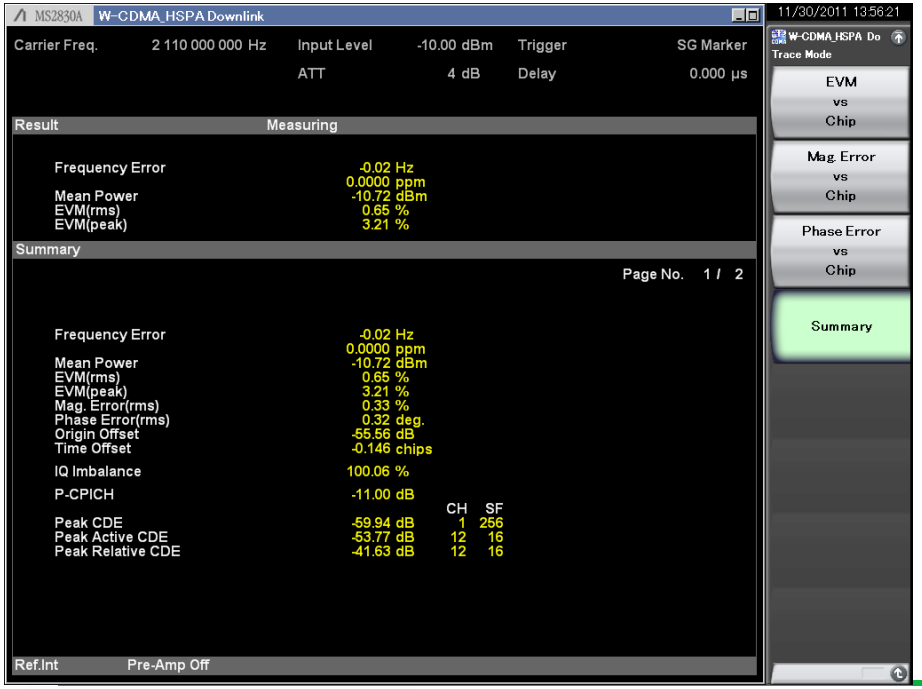
Modulation Analysis (4/4)

Summary

The Result window shows the numerical results in the analysis time specified with the Starting Slot Number and Measurement Interval.

- IQ imbalance: Displays the IQ amplitude balance value in the analysis segment.
- P-CPICH Power: Displays code power for P-CPICH in the analysis segment.
- Relative CDE:
  Relative CDE: Displays code domain error values in the analysis segment for codes that have the spreading factor of 16 and the 64QAM modulation method, according to the code number.

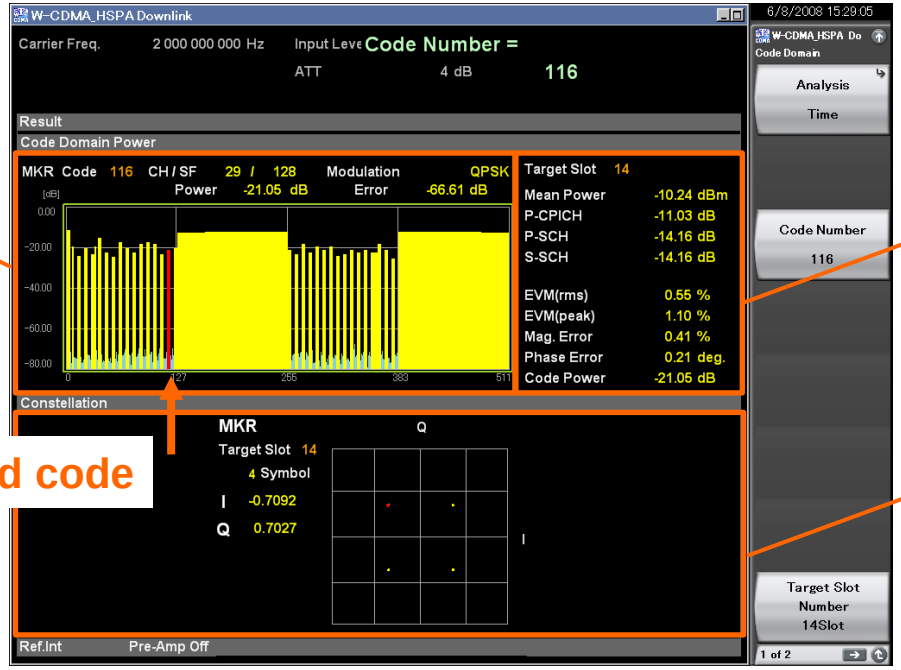
Refer to "text display" for other results



Code Domain (1/4)

Constellation and numeric results (vector error, amplitude error, phase error and code power) for each code are displayed. Code-dependent signal degradation can be found instantly.

Code Domain Screen



Graph Display

Text Display

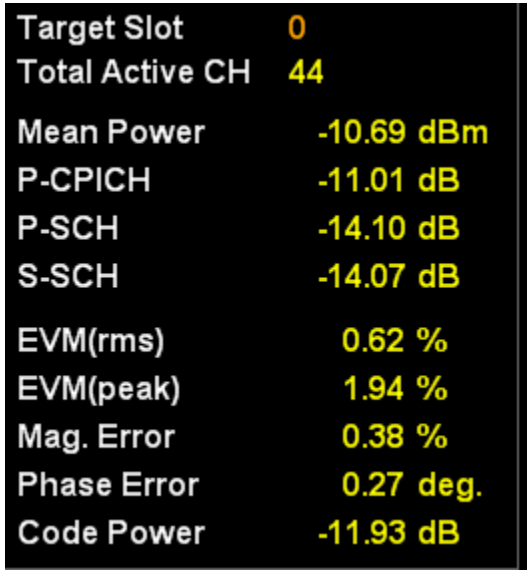
Specified code

Graph Display

Code Domain (2/4)

Text Display

The Result window shows the numerical results in the analysis time specified with the Starting Slot Number and Measurement Interval.



- Target Slot: Displays slot number specified with Target Slot Number.
- Total Active CH: Displays the number of active channels in the slot specified with Target Slot Number.
- Mean Power: Displays mean power in the slot specified with Target Slot Number.
- P-CPICH: Displays code power for P-CPICH of slot specified at Target Slot Number
- P-SCH: Displays code power for P-SCH of slot specified by Target Slot Number
- S-SCH: Displays code power for S-SCH of slot specified at Target Slot Number
- EVM (rms): Displays vector error in RMS of the specified code in the slot specified with Target Slot Number.
- EVM (peak): Displays peak of vector error in each symbol of the specified code in the slot specified with Target Slot Number.
- Mag. Error: Displays magnitude error in RMS of the specified code in the slot specified with Target Slot Number.
- Phase Error: Displays RMS amplitude error of Phase Error for slot specified at Target Slot Number and for specified analysis code
- Code Power: Displays mean power of the specified code in the slot specified with Target Slot Number.

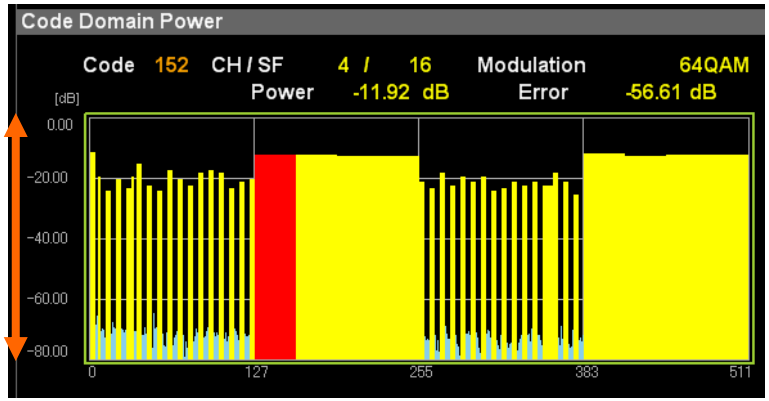
Code Domain (3/4)

Graph Display (1/2)

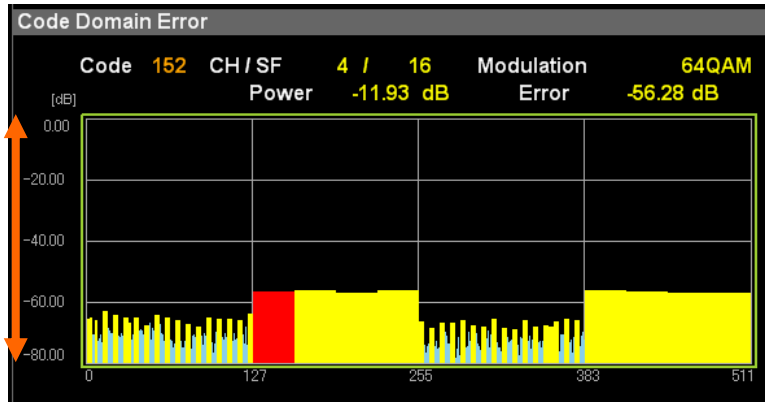
The code domain power in the slot specified with Target Slot Number is displayed in the upper Graph window. The code power at the marker-selected code is displayed in red.

Code Domain Screen

Code Domain Power



Code Domain Error

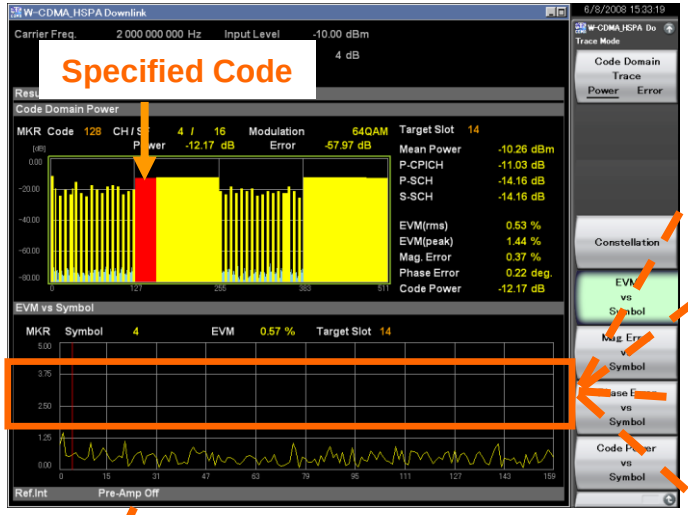


Code Domain (4/4)

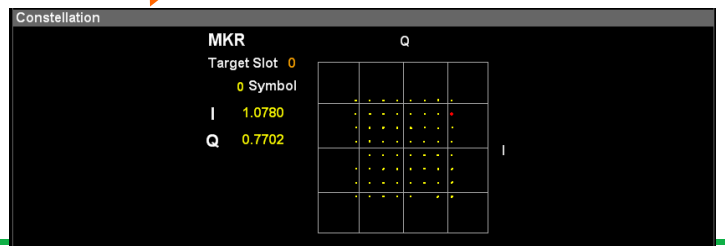
Graph Display (2/2)

Each of vector error, amplitude error, phase error, and code error can be displayed on the vertical axis. Time-dependent (chip unit) signal degradation for a specific code can be found instantly.

Code Domain Screen

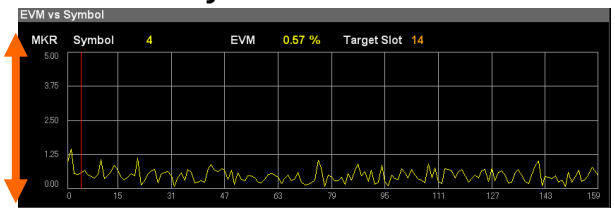


Constellation



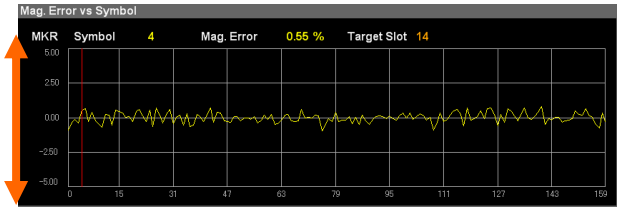
EVM vs Symbol

EVM



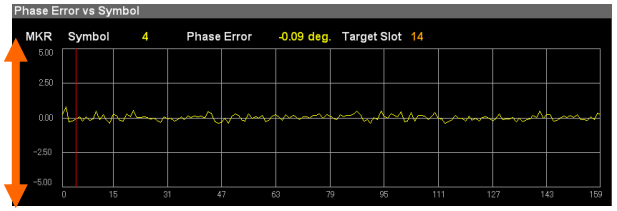
Magnitude Error vs Symbol

Mag. Error



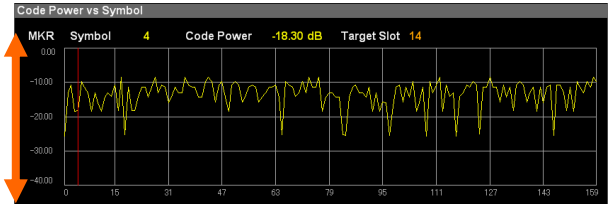
Phase Error vs Symbol

Phase Erro



Code Power vs Symbol

Code Power



Code vs Time (1/3)

Time-dependent variation in mean power for all codes and specified code power can be monitored for 300 slots max. This is convenient for executing 3GPP TS25.141-compliant 6.4.1 Inner Loop Power Control and 6.4.2 Power Control Steps tests.

Code vs Time Screen

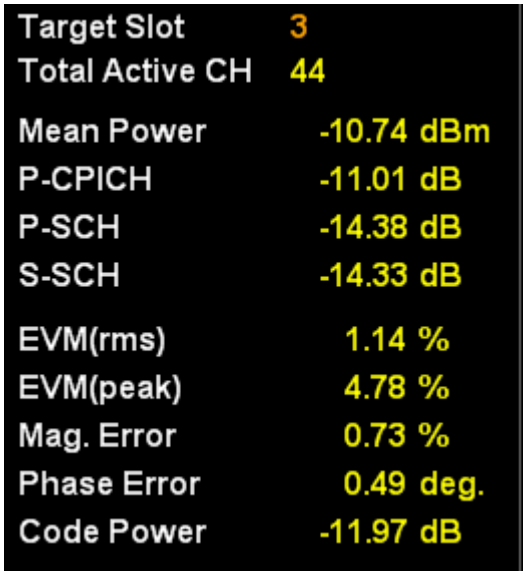
Graph Display

Text Display

Code vs Time (2/3)

Text Display

Display the numeric results for the slot specified by Code vs. Time Slot Number and for the code number specified by Bottom Graph Marker Number in the analysis segment (specified by Measurement Interval).



- Target Slot: Displays slot number specified by Code vs. Time Slot Number
- Total Active CH: Displays the number of active channels in the slot specified with Target Slot Number.
- Mean Power: Displays average power of slot specified by Code vs. Time Slot Number
- P-CPICH: Displays P-CPICH code power for slot specified by Code vs. Time Slot Number
- P-SCH: Displays P-SCH code power for slot specified by Code vs. Time Slot Number
- S-SCH: Displays S-SCH code power for slot specified by Code vs. Time Slot Number
- EVM (rms): Displays RMS vector error for slot specified by Code vs. Time Slot Number, and for code number specified by Bottom Graph Marker Number
- EVM (peak): Displays max. vector error for slot specified by Code vs. Time Slot Number and for code number specified by Bottom Graph Marker Number
- Mag. Error: Displays RMS amplitude error for slot specified by Code vs. Time Slot Number and for code number specified by Bottom Graph Marker Number
- Phase Error: Displays RMS amplitude error for Phase Error of slot specified by Code vs. Time Slot Number and for code number specified by Bottom Graph Marker Number
- Code Power: Displays power for slot specified by Code vs. Time Slot Number and for code number specified by Bottom Graph Marker Number

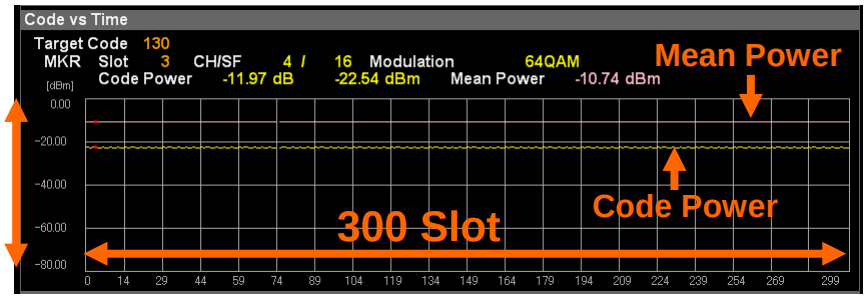
Code vs Time (3/3)

Graph Display

Display the Mean Power and Code Power for the specified code number for up to 10 frame segments. Display the code domain power for the slot specified by Code vs. Time Slot Number and the code domain error in the analysis segment (range specified by Measurement Interval) in the bottom graph window.

Code Domain Screen

Code vs Time



Code Domain Power

Code Domain Error

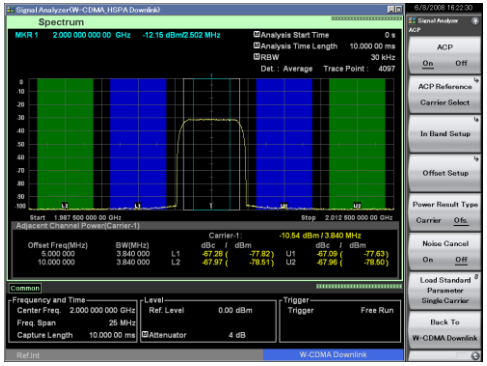
Spectrum

The W-CDMA/HSDPA/HSUPA/HSPA Evolution signal spectrum (ACLR, channel power, occupied bandwidth, and spectrum emission mask) can be measured with one touch of a button using the MS269xA/MS2830A spectrum analyzer/signal analyzer function.

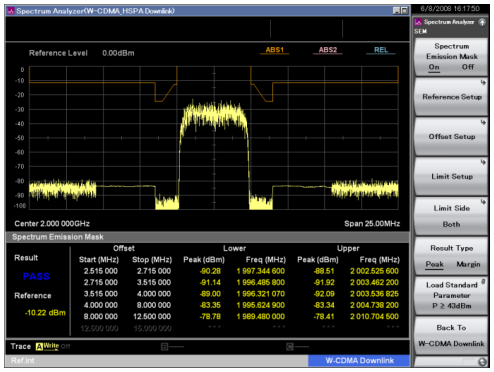
Channel Power

Occupied Bandwidth

ACLR



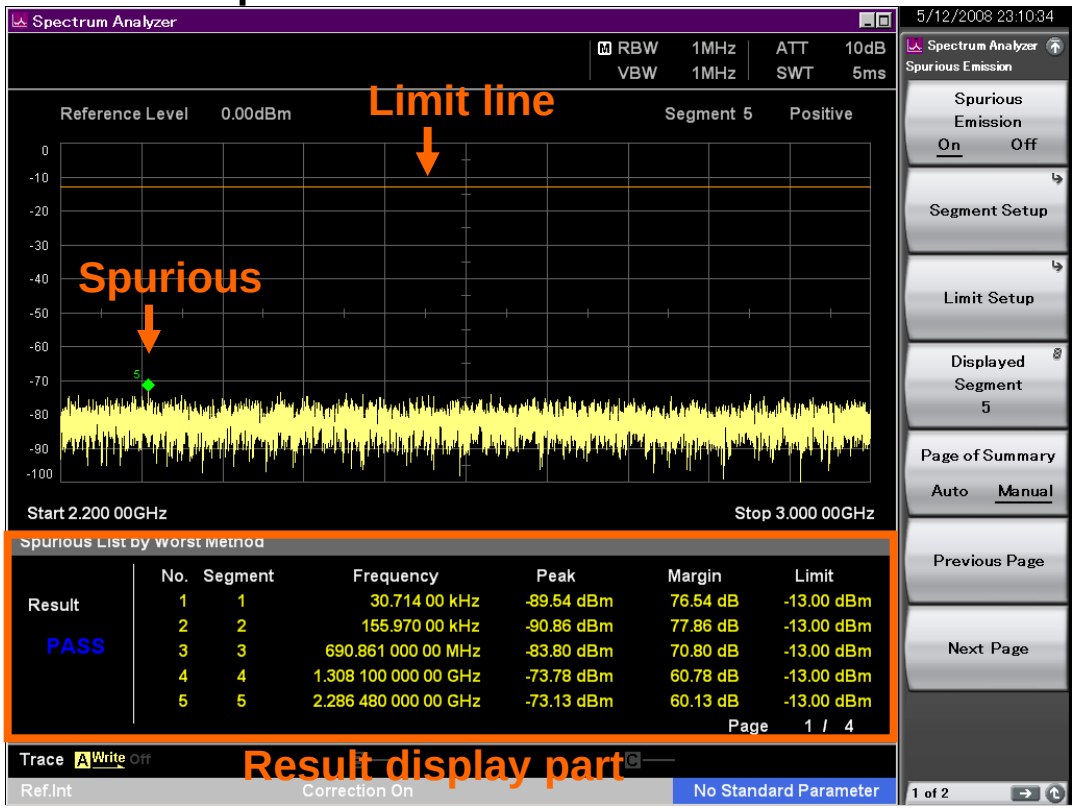
SEM



Spurious Emission (Mainframe Function)

The peak frequency and level in each segment and the standard margin are displayed; parts exceeding the limit line are indicated in red. Limit line and measurement methods for 20 segments max. can be set.

Spurious Emission Measurement



Appendix

Specifications

Easy RF Tests of 3GPP TS25.141 (Release 8)-compliant W-CDMA, HSDPA, HSUPA and HSPA Evolution Base Stations

3GPP TS25.141 Tx Characteristics		Software	SPA
6.2.1	Base Station Maximum Output Power	Yes	
6.2.2	CPICH Power Accuracy	Yes	
6.3	Frequency Error	Yes	
6.4.1	Inner Loop Power Control	Yes	
6.4.2	Power Control Steps	Yes	
6.4.3	Power Control Dynamic Range	Yes	
6.4.4	Total Power Dynamic Range	Yes	
6.4.5	IPDL Time Mask	No	
6.5.1	Occupied Bandwidth (OBW)	Yes	
6.5.2.1	Spectrum Emission Mask	Yes	
6.5.2.2	Adjacent Channel Leakage Power	Yes	
6.5.3	Spurious Emission	No	Yes
6.6	Transmit Intermodulation	No	Yes
6.7.1	Error Vector Magnitude (EVM)	Yes	
6.7.2	Peak Code Domain Error	Yes	
6.7.3	Time Alignment Error in Tx Diversity and MIMO Transmission	Yes	
6.7.4	Relative Code Domain Error	Yes	

***ATT, filters and amplifiers, etc., are required to perform the above tests.**
***Only Tx Diversity is supported at 6.7.3.**

Comparison table

3GPP TS25.141 Transmitter characteristics	MX269011A	MX269030A	MX860x01B
Support Measurement Items			
6.2.1 Base Station Maximum Output Power	Yes	Yes	Yes
6.2.2 CPICH Power Accuracy	Yes	Yes	Yes
6.3 Frequency Error	Yes	Yes	Yes
6.4.1 Inner Loop Power Control	Yes	Yes	Yes
6.4.2 Power Control Steps	Yes	No	Yes
6.4.3 Power Control Dynamic Range	Yes	Yes	Yes
6.4.4 Total Power Dynamic Range	Yes	Yes	Yes
6.4.5 IPDL Time Mask	No	No	No
6.5.1 Occupied Bandwidth (OBW)	Yes	Yes(Only numeric)	Yes
6.5.2.1 Spectrum Emission Mask	Yes	Yes(Only numeric)	Yes
6.5.2.2 Adjacent Channel Leakage Power	Yes	Yes(Only numeric)	Yes
6.5.3 Spurious Emission	Yes(SPA)	Yes(SPA)	Yes
6.6 Transmit Intermodulation	Yes(SPA)	Yes(SPA)	Yes(SPA)
6.7.1 Error Vector Magnitude (EVM)	Yes	Yes	Yes
6.7.2 Peak Code Domain Error	Yes	Yes	Yes
6.7.3 Time alignment error in Tx Diversity and MIMO Transmission	Yes	No	No
6.7.4 Relative Code Domain Error	Yes	No	No
Graphical function			
Constellation	Yes	Yes(ALL code only)	Yes
Eye Diagram	No	No	Yes
EVM/Phase Error/Magnitude Error vs. Chip	Yes	No	Yes
EVM/Phase Error/Magnitude Error Code Power vs. Symbol	Yes	No	No
Code Domain	Yes	Yes	Yes
Code vs. Time	Yes	No	Yes
Demodulation Data display	No	No	Yes
CCDF	Yes(SA)	Yes(SA)	Yes

Anritsu

Specifications are subject to change without notice.

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