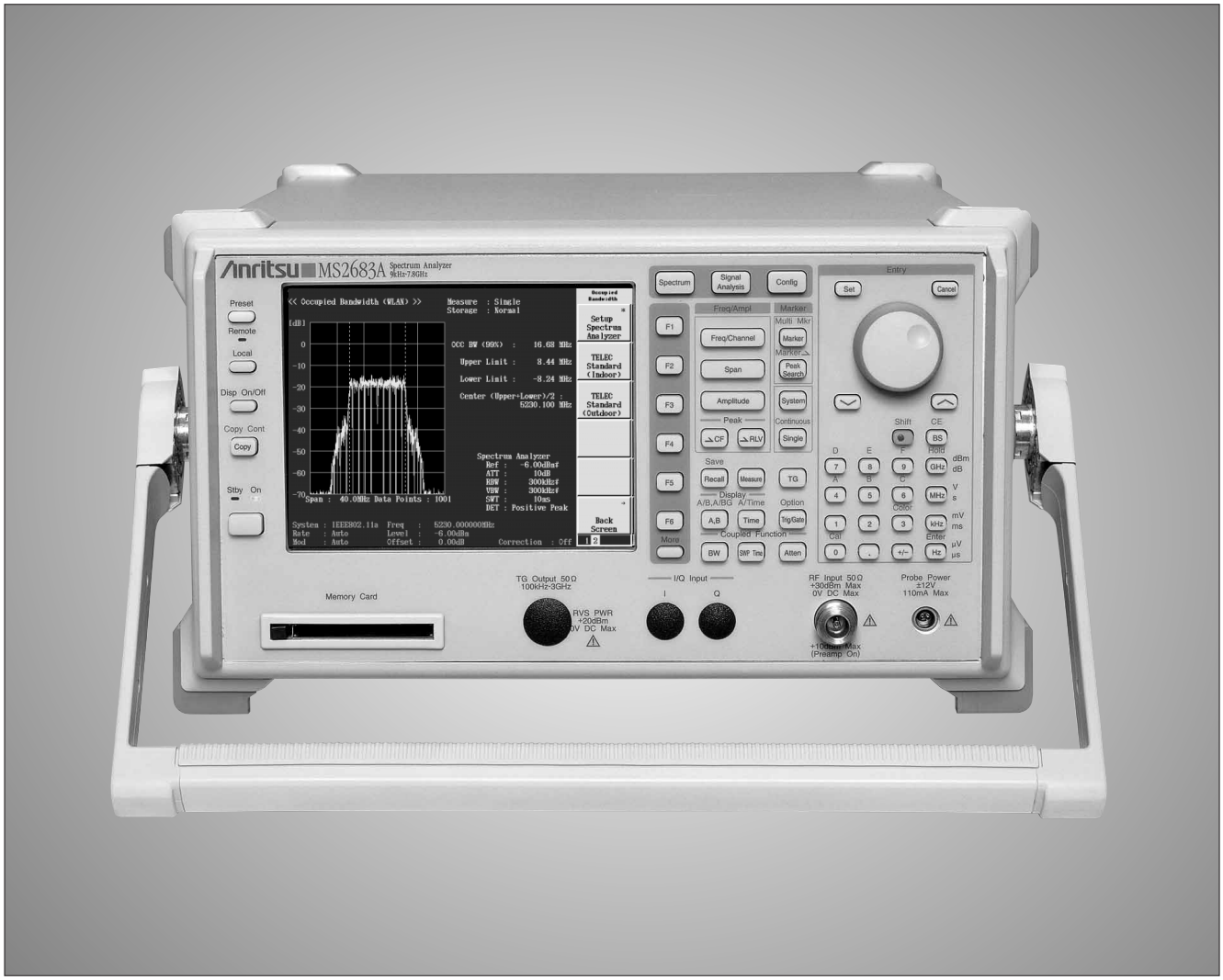
Discover What's Possible™

MX268130A/MX268330A/MX268730A

Wireless LAN Measurement Software

(For MS2681A/MS2683A/MS2687B Spectrum Analyzer)



For Evaluation of Wireless LAN Equipment and Devices

For evaluation of Wireless LAN equipment and Devices

Compatible with IEEE802.11a/b, HiperLAN2, HiSWANa

– From Development and Production to Construction and Maintenance –

The MX268130A/MX268330A/MX268730A Wireless LAN Measurement Software is application software used by the MS2681A/MS2683A/MS2687B spectrum analyzer. A transmission system conforming to the wireless LAN standards can be evaluated by installing this wireless LAN measurement software into the spectrum analyzer.

Features

- Supports the IEEE802.11a/b, HiSWANa and HiperLAN2 standards.
- Analyzes OFDM signals that implement a high-speed data transfer of 54 Mbps.
- Integrates a high-performance DSP, enabling high-speed and high-accuracy measurement using the fast A/D sampling (at 64 MHz). Modulation accuracy can be measured completely in 1 sec or less.
- Capable of measuring harmonics up to 5-time waves of the 5-GHz band wireless LAN (IEEE802.11a, HiSWANa, HiperLAN2) when the MS2687B is used.
- One-touch measurement of tests on transmission characteristics, including modulation analysis and spurious.
- Provides a batch measurement function that automatically measures items that were individually measured before, and displays judgement results for the specified reference value.

Measurement items

Modulation analysis:
[IEEE802.11a, HiSWANa, HiperLAN2]
- Modulation accuracy (EVM)
- Frequency
- Phase error
- Carrier leak
- Spectrum flatness
- Constellation
- Modulation accuracy (EVM) vs Sub-carrier
- Modulation accuracy (EVM) vs Symbol
- Phase error vs Symbol

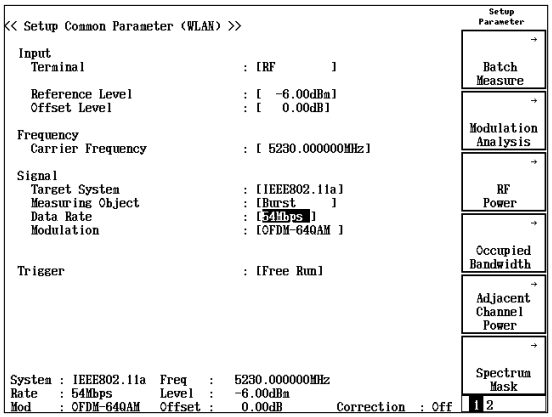
[IEEE802.11b]
- Modulation accuracy (EVM)
- Frequency
- Amplitude error
- Phase error
- Origin offset
- Constellation
- Modulation accuracy (EVM) vs Chip
- Phase error vs Chip
- Eye-diagram

Power
- Transmitter power
- Slot display
- Transient display

Occupied bandwidth
Adjacent channel power
Spectrum mask
Spurious, Outband leakage power
Frequency
Macro function (Batch processing)
CCDF

Setup Common Parameter

This screen is used to set common parameters such as signaling system, input level, frequency, data rate, target system and so on before starting an analysis. Setting these parameters simplifies measurement operations.

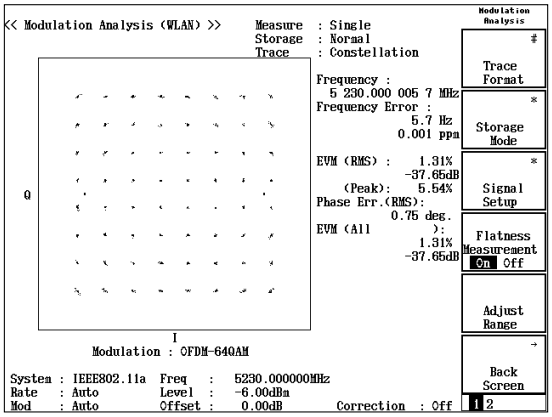


Modulation Analysis

Displays numeric results, including the frequency, execution value and maximum value of the modulation accuracy (EVM) and the execution value of the phase error.

Modulation Analysis: Constellation

Displays the constellation in a graph.



Modulation Analysis: Modulation Accuracy (EVM) vs Subcarrier

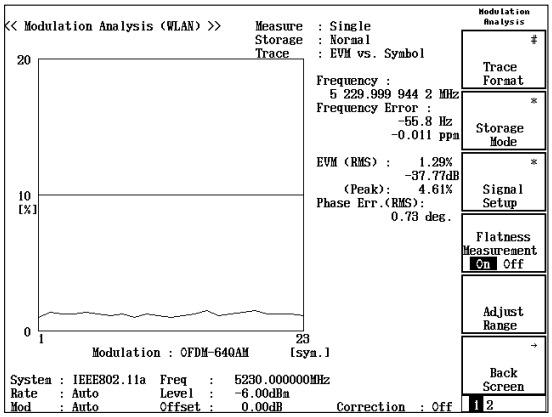
When the measured signal is OFDM, displays the modulation accuracy (EVM) for each subcarrier in a graph. A graph is displayed on the left and numeric results are on the right.

Modulation Analysis: Phase Error vs. Symbol/Chip

Displays the phase errors for each symbol/chip in a graph. A graph is displayed on the left and numeric results are on the right.

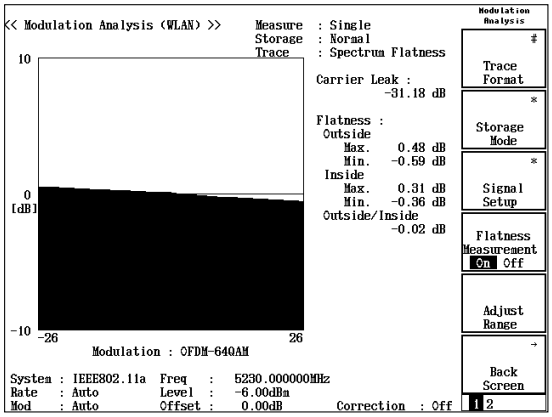
Modulation Analysis: Modulation Accuracy (EVM) vs. Symbol/Chip

Displays the modulation accuracy (EVM) for each symbol/chip in a graph.



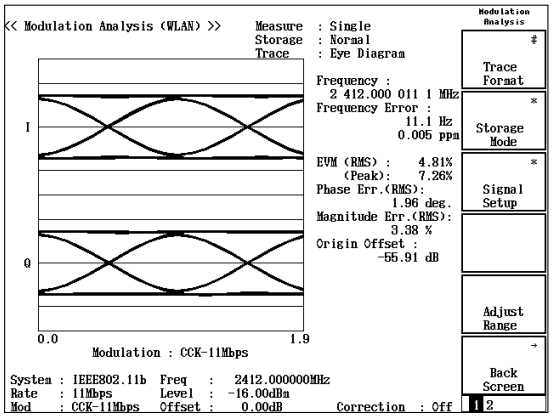
Modulation Analysis: Spectrum Flatness

Displays the spectrum flatness for each subcarrier in a graph (IEEE802.11a, HiSWANa, HiperLAN2).



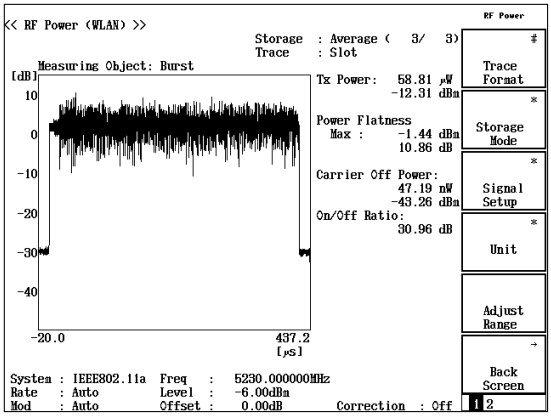
Modulation Analysis: Eye-Diagram

Displays the eye diagrams (IEEE802.11b).



Power: Slot display

Displays a burst waveform of one slot. Numeric results such as the average power and maximum transient power are also displayed.

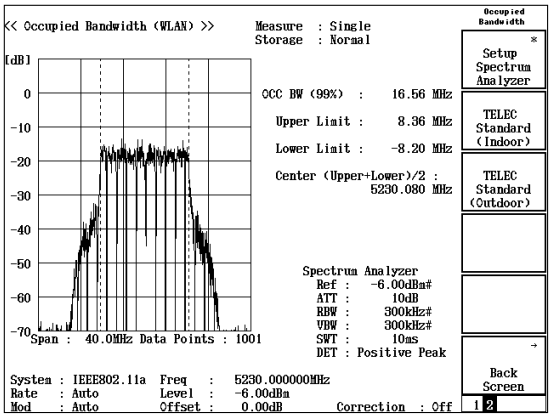


Power: Transient display

Displays an enlarged version of the rising/falling edge of the burst waveform of the slot. The transient time is also displayed. (IEEE802.11b)

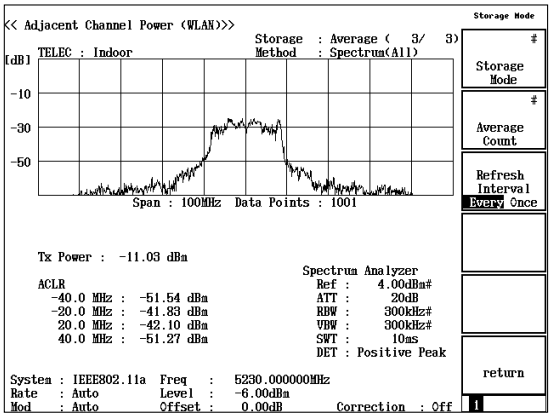
Occupied Bandwidth

Displays the occupied frequency bandwidth, which includes 99% of the total radiant power, in a graph and numeric results.



Adjacent Channel Power

Displays the adjacent channel power in a wide-range graph and its numeric results. It is also possible to display the power for each channel separately.



Spectrum Mask

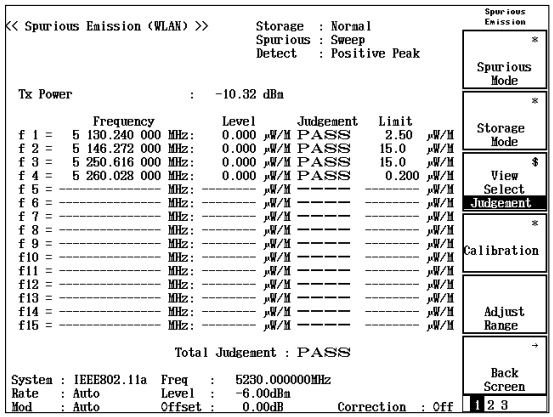
Executes pass/failure judgement using the standard line corresponding to each wireless LAN system. The level difference of the measurement value or the level measurement value is also displayed with its frequency.

CCDF

Displays the cumulative distribution for the difference between the transient power and the average value of the power that is band-limited by a filter.

Spurious

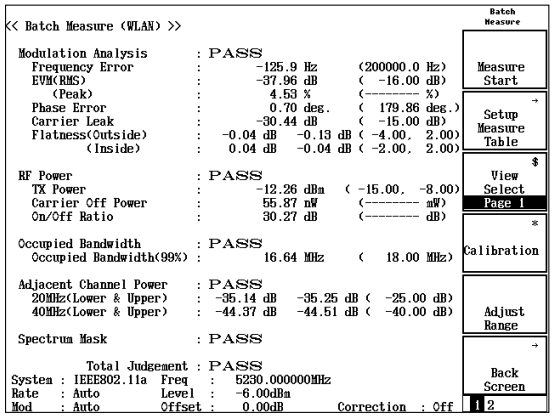
Displays the measured results for the spurious, including frequency, level, judgement result (PASS/FAIL), specifications, RBW and VBW in three sweep modes, on three separate screens.



Macro Function (Batch Processing)

By presetting the judgement values, simultaneous measurement and automatic judgement are executed for the following items. Measured results are displayed in three screens.

- Modulation analysis
- RF power
- Occupied bandwidth
- Adjacent channel power
- Spectrum mask
- Spurious



Specifications

Guaranteed specifications after Adjust Range and Power Calibration keys pressed.
Can be set when pre-amp on is installed MS2681A-08 and MS2683A-08 option in the main frame.

• IEEE802.11a

Model		MS2681A	MS2683A	MS2687B
Frequency range		100 MHz to 3 GHz	100 MHz to 6 GHz (at pre-amp off) 100 MHz to 3 GHz (at pre-amp on)	100 MHz to 6 GHz
Modulation type		OFDM-64QAM, OFDM-16QAM, OFDM-QPSK, OFDM-BPSK, AUTO		
Data rate		54 Mbps, 48 Mbps, 36 Mbps, 24 Mbps, 18 Mbps, 12 Mbps, 9 Mbps, 6 Mbps, AUTO		
Measurement level range		–26 to +26 dBm (at pre-amp off) –46 to +26 dBm (at pre-amp on, ≤3 GHz)		–26 to +24 dBm
Modulation analysis	Measurement items	Carrier frequency, modulation accuracy (RMS, Peak), phase error (RMS), carrier leak, spectrum flatness		
	Display waveform	Constellation, EVM vs symbol number, EVM vs Sub-carrier number Phase error vs symbol number, spectrum flatness		
	Measurement frequency intake range	+18˚ to +35˚C, setting frequency ±120 kHz		
	Carrier frequency accuracy	Frequency: 2 to 2.5 GHz	Frequency: 4.9 to 6 GHz	
		Input level: –10 dBm, averaging 30 times, +18˚ to +35˚C, ± (reference oscillator x setting frequency + 500 Hz)		
	Modulation accuracy	Frequency: 2 to 2.5 GHz	Frequency: 4.9 to 6 GHz	
		Input level: –10 dBm, averaging 30 times, +18˚ to +35˚C 1.5 %rms (typ.)		
	Constellation	Display format: All sub-carriers, 1 sub-carrier First symbol, Last symbol, Pilot only Both sides sub-carriers		
	EVM error vs symbol	Vertical line (full scale): 5%, 10%, 20%, 50%, 100% Horizontal line: Symbol number, 1 to 1367 symbol		
	Phase error vs symbol	Vertical line (full scale): 5 deg, 10 deg, 20 deg, 50 deg, 100 deg Horizontal line: Symbol number, 1 to 1367 symbol		
	EVM vs sub-carrier	Vertical line (full scale): 5%, 10%, 20%, 50%, 100% Horizontal line: Sub-carrier number		
	Spectrum flatness	Vertical line (full scale): 5 dB, 10 dB, 20 dB, 50 dB, 100 dB Horizontal line: Sub-carrier number		
RF power	Measurement items	Burst average power, carrier off power, burst on/off ratio		
	Slot display	Display burst wave Vertical line unit: dBm, dB, % Horizontal line: –20 to 5488 µs (max)		
	Transient display	Display rising/falling burst wave Vertical line: dBm, dB, % Horizontal line: –4 to +4 µs (rising edge), falling edge ±4 µs (falling edge)		
	Burst average power accuracy	Frequency: 2 to 2.5 GHz Input level: ±1.7 dB (pre-amp off, –18 to 0 dBm) Averaging 30 times ±2.0 dB (pre-amp on, –38 to 0 dB)	Frequency: 4.9 to 6 GHz Input level: –18 to 0 dBm Averaging 30 times ±2.7 dB	Frequency: 4.9 to 6 GHz Input level: –26 to 0 dBm Averaging 30 times ±2.9 dB
	Ramp down detection	Suitable waveform is displayed by detecting burst falling edge automatically.		
Storage mode	Normal	Refresh waveform/data for each measurement		
	Average	Waveform display is same as normal mode. Data display is averaged data by averaging number. Averaging number: 2 to 999		
	Overwrite	Waveform is overwritten without erasing previous waveform. Data display is same as normal.		

• HiSWANa, HiperLAN2

Model		MS2681A	MS2683A	MS2687B
Frequency range		100 MHz to 3 GHz	100 MHz to 6 GHz (at pre-amp off) 100 MHz to 3 GHz (at pre-amp on)	100 MHz to 6 GHz
Modulation type		OFDM-64QAM, OFDM-16QAM, OFDM-QPSK, OFDM-BPSK, AUTO		
Data rate		54 Mbps, 36 Mbps, 27 Mbps, 18 Mbps, 12 Mbps, 9 Mbps, 6 Mbps, AUTO		
Measurement level range		–26 to +26 dBm (at pre-amp off) –46 to +26 dBm (at pre-amp on, ≤3 GHz)		–26 to +24 dBm
Modulation analysis	Measurement items	Carrier frequency, modulation accuracy (RMS, Peak), phase error (RMS), carrier leak, spectrum flatness		
	Display waveform	Constellation, EVM vs symbol number, EVM vs Sub-carrier number Phase error vs symbol number, spectrum flatness		
	Measurement frequency intake range	+18˚ to +35˚C, setting frequency ±120 kHz		
	Carrier frequency accuracy	Frequency: 2 to 2.5 GHz	Frequency: 4.9 to 6 GHz	
		Input level: –10 dBm, averaging 30 times, +18˚ to +35˚C, ± (reference oscillator x setting frequency + 500 Hz)		
	Modulation accuracy	Frequency: 2 to 2.5 GHz	Frequency: 4.9 to 6 GHz	
		Input level: –10 dBm, averaging 30 times, +18˚ to +35˚C 1.5 %rms (typ.)		
	Constellation	Display format: All sub-carriers, 1 sub-carrier First symbol, Last symbol, Pilot only Both sides sub-carriers		
	EVM error vs symbol	Vertical line (full scale): 5%, 10%, 20%, 50%, 100% Horizontal line: symbol number 1 to 1367 symbol		
	Phase error vs symbol	Vertical line (full scale): 5 deg, 10 deg, 20 deg, 50 deg, 100 deg Horizontal line: symbol number 1 to 1367 symbol		
	EVM vs sub-carrier	Vertical line (full scale): 5%, 10%, 20%, 50%, 100% Horizontal line: Sub-carrier number		
	Spectrum flatness	Vertical line (full scale): 5 dB, 10 dB, 20 dB, 50 dB, 100 dB Horizontal line: Sub-carrier number		
RF power	Measurement items	Burst average power, carrier off power, burst on/off ratio		
	Slot display	Display burst wave Vertical line unit: dBm, dB, % Horizontal line: –20 to 5488 µs (max)		
	Transient display	Display rising/falling burst wave Vertical line: dBm, dB, % Horizontal line: –4 to +4 µs (rising edge), falling edge ±4 µs (falling edge)		
	Burst average power accuracy	Frequency: 2 to 2.5 GHz Input level: ±1.7 dB (pre-amp off, –18 to 0 dBm) Averaging 30 times ±2.0 dB (pre-amp on, –38 to 0 dB)	Frequency: 4.9 to 6 GHz Input level: –18 to 0 dBm Averaging 30 times ±2.7 dB	Frequency: 4.9 to 6 GHz Input level: –26 to 0 dBm Averaging 30 times ±2.9 dB
	Ramp down detection	Suitable waveform is displayed by detecting burst falling edge automatically.		
Storage mode	Normal	Refresh waveform/data for each measurement		
	Average	Waveform display is same as normal mode. Data display is averaged data by averaging number. Averaging number: 2 to 999		
	Overwrite	Waveform is overwritten without erasing previous waveform. Data display is same as normal.		

• IEEE802.11b

Model		MS2681A	MS2683A	MS2687B
Frequency range		100 MHz to 3 GHz		
Modulation type		CCK, DQPSK, DBPSK, AUTO		
Data rate		11 Mbps, 5.5 Mbps, 2 Mbps, 1 Mbps, AUTO		
Measurement level range		–26 to +26 dBm (pre-amp off) –46 to +26 dBm (pre-amp on, ≤3 GHz)		–26 to +24 dBm
Modulation analysis	Measurement items	Carrier frequency, modulation accuracy (RMS, Peak), phase error (RMS), amplitude error (RMS), origin offset		
	Display waveform	Constellation, EVM vs Chip, Phase error vs Chip, Eye-diagram		
	Measurement frequency intake range	+18˚ to +35˚C, setting frequency ±120 kHz		
	Carrier frequency accuracy	Frequency: 2.4 to 2.5 GHz, Input level: –10 dBm, averaging 30 times, +18˚ to +35˚C ± (reference oscillator x setting frequency + 200 Hz)		
	Modulation accuracy	Frequency: 2.4 to 2.5 GHz, Input level –10 dBm, averaging 30 times, +18˚ to +35˚C 2.3%rms (typ.)		
	Constellation	Error scale display: 5%, 10%, 20%, 35%, OFF		
	EVM vs Chip	Vertical line (full scale): 5%, 10%, 20%, 50%, 100% Horizontal line: Chip number 256 to 4096 chips		
	Phase error vs Chip	Vertical line (full scale): 5 deg, 10 deg, 20 deg, 50 deg, 100 deg Horizontal line: Chip number 256 to 4096 chips		
RF power	Measurement items	Burst average power, carrier off power, burst on/off ratio		
	Slot display	Display burst wave Vertical line unit: dBm, dB, % Horizontal line: –20 to 5488 µs (max)		
	Transient display	Display rising/falling burst wave Vertical line unit: dBm, dB, % Horizontal line: –4 to +4 µs (rising edge), falling edge ±4 µs (falling edge)		
	Burst average power accuracy	Frequency: 2.4 to 2.5 GHz, averaging 30 times ±1.7 dB (–18 to 0 dBm, pre-amp off) ±2.0 dB (–38 to 0 dBm, pre-amp on)		Frequency: 2.4 to 2.5 GHz Input level: –26 to 0 dBm Averaging 30 times ±1.9 dB
	Ramp down detection	Suitable waveform is displayed by detecting burst falling edge automatically.		
Storage mode	Normal	Refresh waveform/data for each measurement		
	Average	Waveform display is same as normal mode. Data display is averaged data by averaging number. Averaging number: 2 to 999		
	Overwrite	Waveform is overwritten without erasing previous waveform. Data display is same as normal.		

• CCDF

Model		MS2681A	MS2683A	MS2687B
Frequency range		100 MHz to 3 GHz	100 MHz to 6 GHz (pre-amp off) 100 MHz to 3 GHz (pre-amp on)	100 MHz to 6 GHz
Measurement method		CCDF: Measure complementary cumulative distribution of input signal APD: Measure amplitude probability distribution of input signal		
Data count number		10000 to 2000000000		
Analysis time		0.001 to 100 ms		
Filter		22 MHz, 20 MHz, 10 MHz, 5 MHz, 3 MHz, 3.84 MHz (RRC), 3.84 MHz (RC)		
Trigger	Free run	Input signal continuously regardless input signal condition		
	Wide IF	Input signal synchronized with video signal. Trigger edge: Rise, Fall Trigger delay: –10000 to +10000 µs Trigger level: High, Middle, Low		
	External	Input signal synchronized with trigger signal at TRIG/GATE IN connector. Trigger edge: Rise, Fall Trigger delay: –10000 to +10000 µs		

Ordering Information

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

Model/Order No.	Name	
	Main frame	
MX268130A	Wireless LAN Measurement Software (for MS2681A)	
MX268330A	Wireless LAN Measurement Software (for MS2683A)	
MX268730A	Wireless LAN Measurement Software (for MS2687B)	
	Standard accessories	
JT32MA3-NT1	PC-ATA card (32 MB, for backup):	1 pc
W2080AE	Wireless LAN Measurement Software operation manual (Vol. 1):	1 copy

Anritsu

Specifications are subject to change without notice.

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