Anritsu envision : ensure

Signal Analyzer with 1 GHz Analysis Bandwidth

Signal Analyzer
MS2850A

9 kHz to 32 GHz/44.5 GHz

Signal Analyzer MS2850A

The **MS2850A** has the analysis bandwidth and excellent flatness performance needed for development and production of next-generation broadband communications systems in an all-in-one middle-price-range spectrum analyzer/signal analyzer platform. By holding down initial equipment capital costs, it meets the needs of customers developing new equipment in rapidly growing markets for broadband communications systems, such 5G mobile.

Frequency Range	9 kHz to 32 GHz or 44.5 GHz (two models)
	Supports up to 325 MHz by connecting High Performance Waveguide Mixer and External mixers
Analysis Bandwidth	255 MHz (Standard), 510 MHz (Option), 1 GHz (Option)
Measurement Options	Phase Noise, Noise Figure, Noise Floor Reduction function, etc.
Measurement Software	5G, LTE, LTE-Advanced, W-CDMA, TD-SCDMA, GSM, Vector Modulation Analysis

[Features]

- ✓ ***Excellent dynamic range and flatness support wideband signal analysis***
- ✓ ***5G Measurement Software (built-in option)***
  - ***All-at-one multi-carrier measurement***
  - ***Excellent EVM: <1%****
- ✓ ***Cuts capital investment***

*: At CP-OFDM modulation, 100 MHz bandwidth, 28 GHz

Features: MS2850A Main Frame

■ Analysis Bandwidth: 1 GHz

- Only middle-price-range model supporting 5G measurement
- Analyze frequency and phase, power changes over elapsed time using spectrum, spectrogram and Frequency/ Phase/ Power vs time displays
- Long-term digitizing using large memory (3 s at 1 GHz analysis bandwidth) MS2850A-053/054 can transfer big digitizing data to external PC at high speed.

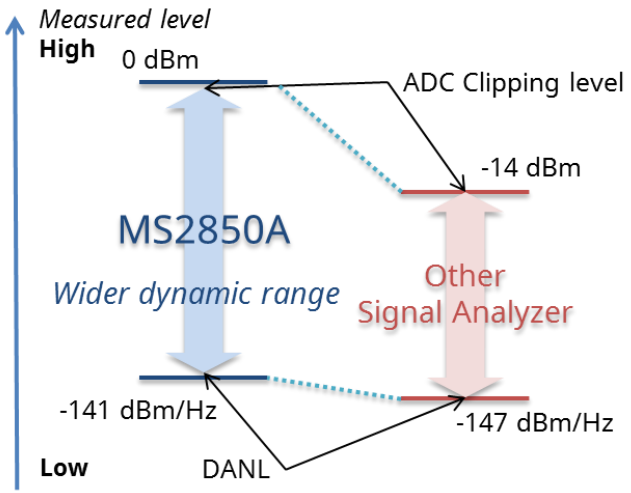
■ Excellent Flatness Performance

- Both excellent dynamic range and flatness required for evaluating wideband wireless signals
- Accurate evaluation of wireless communications equipment for better equipment quality

[Performance] Center Frequency: at 28 GHz, Center frequency ±500 MHz
In-band frequency characteristics (Amplitude flatness):
±1.2 dB (nom.)
In-band phase linearity (Phase flatness):
5° p-p (nom.)

■ Wide Dynamic Range

- ADC Clipping Level (0 dBm*) and DANL difference
  → 140 dB min.* (at 28 GHz)
- Wider difference between DANL increase and input level at wideband signal measurement
  → More accurate EVM measured value
- Wide SFDR (Spurious Free Dynamic range)
  → –70 dBc at 1 GHz analysis bandwidth (at 28 GHz)



*: Measured value

Features: 5G Measurement Software (1/2)

Detailed and accurate measurements are backed by the high-performance 1 GHz (max.) analysis bandwidth and high measurement dynamic range.

Standard	Model/Name	Channel Bandwidth(1CC)	Multi Carrier Measurement
V5G (Verizon 5GTF)	Pre-Standard CP-OFDM Downlink MX285051A-001 Pre-Standard CP-OFDM Uplink MX285051A-051	Up to 100 MHz	Support
5G NR (3GPP TS 38.211)	NR TDD sub-6GHz Downlink MX285051A-011 NR TDD sub-6GHz Uplink MX285051A-061	Up to 100 MHz	-
	NR TDD mmWave Downlink MX285051A-021 NR TDD mmWave Uplink MX285051A-071	Up to 400 MHz	Support (Downlink)

For these software, the 5G Standard Measurement Software (Base License) MX285051A is required.

■Features

- **All-in-One V5G/5G NR (sub-6 GHz/mmWave) Coverage**
  The MX285051A software measures the RF characteristics of both downlink and uplink signals proposed for applications ranging from 5G demonstration tests to actual 5G NR.
- **Excellent EVM Performance for Applications Ranging from R&D to Manufacturing**
  The residual EVM performance in combination with the MS2850A is better than 1%*, helping minimize the measuring instrument effect and improving the quality of 5G wireless systems at lower equipment cost.
- **Easy Operability Improves Measurement and Test Efficiency**
  The one-button Auto Range function optimizes the complex built-in attenuator settings required for more accurate EVM measurement.

▲ Measurement screen (EVM vs Subcarrier)

*: At 100 MHz, single carrier, 28 GHz (meas.)

Features: 5G Measurement Software (2/2)

■ Measurement Functions

<Single-Carrier Measurements>

Measures constellation, frequency error, Tx power, EVM of each PHY channel, etc.

<Multi-carrier Measurements>*

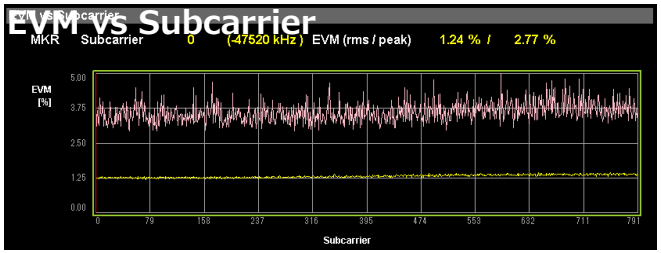
All-at-once analysis of up to eight 100 MHz bandwidth carriers by combining with 510 MHz or 1 GHz analysis option. Measures frequency error, Tx power, EVM, timing error, etc., for each carrier.

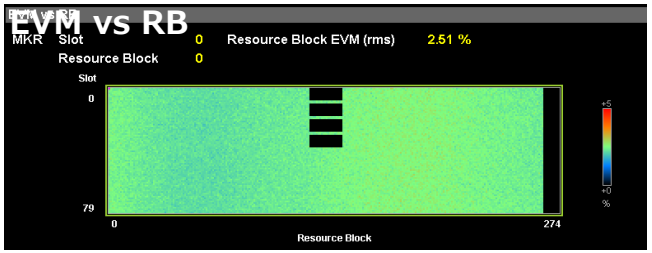
<Multiple graph mode (Trace Mode)>

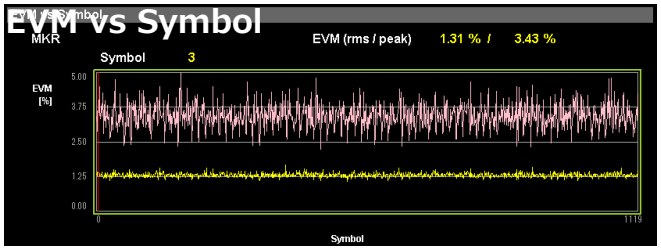
It contributes to development and debugging efficiency by verifying the analysis results diversely, such as frequency axis, time axis and numerical data for each physical channel.

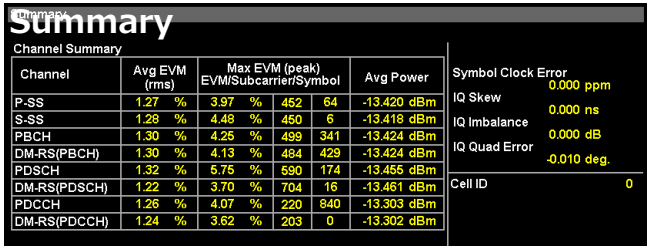
	Frequency Error	Transmit Power	EVM (rms)	EVM (peak)	Timing Difference
CC0 (Ref.)	1.19 Hz	-8.40 dBm	1.28 %	6.07 %	0.0 ns
CC1	1.19 Hz	-9.01 dBm	1.51 %	6.81 %	-0.8 ns
CC2	1.19 Hz	-9.56 dBm	1.70 %	7.57 %	0.0 ns
CC3	1.20 Hz	-10.95 dBm	1.89 %	25.41 %	-0.8 ns
CC4	1.20 Hz	-11.20 dBm	1.87 %	8.34 %	0.8 ns
CC5	1.20 Hz	-12.45 dBm	2.09 %	10.24 %	-0.8 ns
CC6	1.22 Hz	-12.40 dBm	1.98 %	9.88 %	0.0 ns
CC7	1.22 Hz	-14.65 dBm	2.42 %	10.91 %	0.0 ns

▲ Multicarrier measurement screen (Pre-Standard CP-OFDM)









◀ Single carrier measurement screen of each Trace Mode

*: It has been supported Pre-Standard CP-OFDM DL/UL and NR TDD mmWave DL.

Features: High Speed Data Transfer

■ Name/Model

External Interface for High Speed Data Transfer (PCIe)	MS2850A-053
External Interface for High Speed Data Transfer (USB3.0)	MS2850A-054

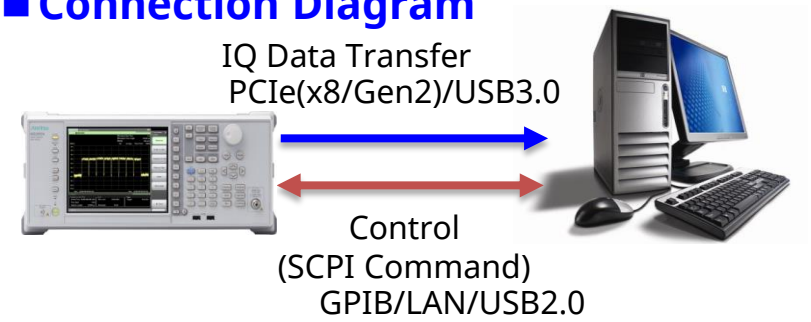
■ Features

- MS2850A can capture 1 GHz band signals in just 3 seconds.
- High speed transfer of large capacity digitized data to external PC(Transfer time is one-hundredth of Ethernet). Contribution to the efficiency of development and manufacturing cost cut.
- Possible to read digitized data through API (MATLAB, C #, Linux) we provide. Assist the effective use of programs created by customers and signal analysis on external PCs.

■ Application

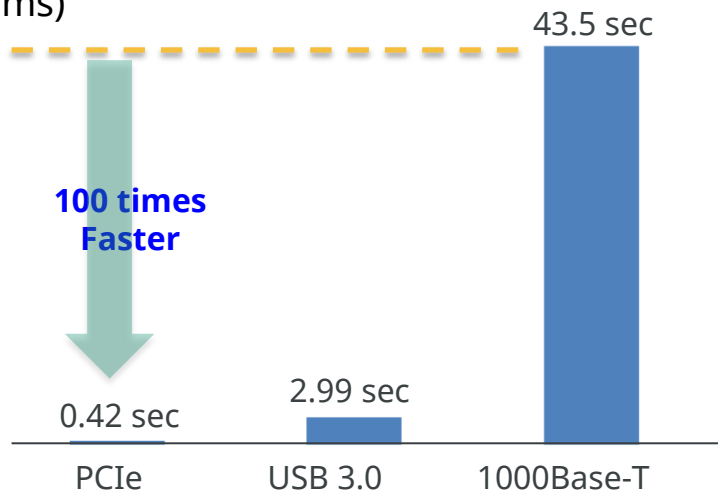
Development	Utilize MS2850A as a digitizer, and analyze data with in-house development software
Manufacture	Digitized data collected by much number of MS2850A can be transferred to a server or workstation in the customer's production line for intensive analysis and data management.
Field	Periodic monitoring of broadband signals.

■ Connection Diagram



■ Transfer Time Comparison (ave.*)

SPAN=1 GHz, IQ data of 5G at 10 Frame (100 ms)



*: It depends on the performance of the external PC.

Mixers Extended Measurement Functions

Increases Upper Frequency Limit by Connection to MA2850A LO/IF Port

- **High Performance Waveguide Mixer MA2806A/MA2808A**
  - MA2806A: 50 GHz to 75 GHz
  - MA2808A: 60 GHz to 90 GHz
  - Measure up to 7.5 GHz without image response effects

DANL	–150 dBm/Hz @ 75 GHz (meas.)
P1dB	>0 dBm (typ.)
Conversion Loss	<15 dB (typ.)

- **External Mixer MA2740C/MA2750C Series**
  - MA2747C: 90 GHz to 140 GHz
  - MA2749C:140 GHz to 220 GHz
  - MA2751C: 220 GHz to 325 GHz

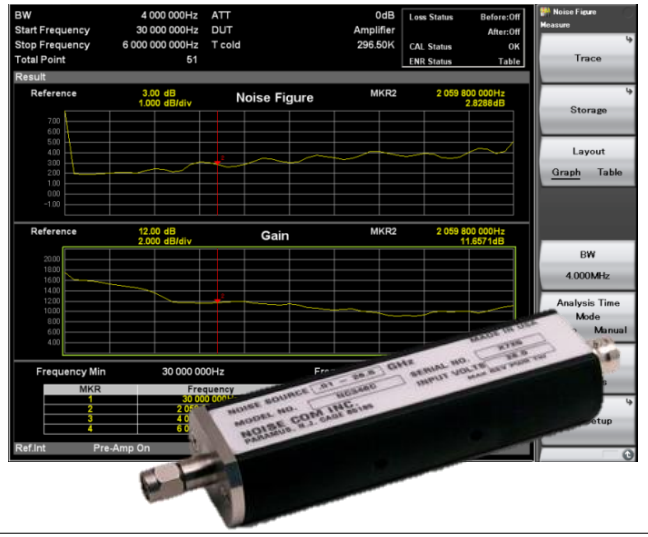
Accessories Extended Measurement Functions

- **USB Power Sensor MA241xx Series**
  - Connects to MA2850A USB port to use MA2850A as power meter

Main Sensors

Model	Frequency Range
MA24108A	10 MHz to 8 GHz
MA24118A	10 MHz to 18 GHz
MA24126A	10 MHz to 26 GHz

- **Noise Sources**
  - Uses Y-Factor method to measure receiver, amp and converter NF
  - Supported Noise Sources: Noisecom NC346 Series
  - NC346C: 0.01 GHz to 26.5 GHz
  - NC346Ka: 0.10 GHz to 40.0 GHz



MS2850A Measurement Functions

Measurement Function/Item	Signal Analyzer (255 MHz/510 MHz/1 GHz Analysis Bandwidth)	Spectrum Analyzer	Options/Application Parts
Spectrum Display	✓	✓	
Power/Frequency/Phase vs Time Display	✓		
Capture & Replay Function	✓		
CCDF/APD Display	✓		
Spectrogram Display	✓		
Sub-Trace Display	✓		
Gate View (for gate sweep function)		✓	
Channel Power	✓	✓	
Occupied Bandwidth	✓	✓	
Adjacent Channel Leakage Power	✓	✓	
Burst Average Power	✓	✓	
Multi-marker and List Display	✓	✓	
Highest 10 marker	✓	✓	
Spectrum Emission Mask		✓	
Limit Line		✓	
Frequency Counter		✓	
Two-Tone Third-Order Intermodulation Distortion		✓	
USB Power Sensor (sold separately)			✓
Modulation Analysis (5G, LTE, etc.)			✓
Phase Noise Measurement			✓
Noise Figure (NF) Measurement			✓
Millimeter waveband Spectrum Measurement* by Connecting External Mixer (Sold Separately)	✓	✓	✓

MS2850A Options

Model	Name	Remarks
MS2850A	Signal Analyzer	MS2850A-047: 9 kHz to 32 GHz MS2850A-046: 9 kHz to 44.5 GHz
MS2850A-033	Analysis Bandwidth Extension 510MHz	
MS2850A-034	Analysis Bandwidth Extension 1GHz	Requires MS2850A-033
MS2840A-068	Microwave Preamplifier	
MS2850A-010	Phase Noise Measurement Function	
MS2850A-017	Noise Figure Measurement Function	
MS2850A-051	Noise Floor Reduction	
MS2850A-053	External Interface for High Speed Data Transfer PCIe	x8/Gen2 Application Parts: U0088A PCIe HostAdapter J1749A PCIe x8 Cable (2m)
MS2850A-054	External Interface for High Speed Data Transfer USB3.0	
MS2850A-076	Low Second Harmonic Distortion	

The following options are installed as standard and do not require separate orders when ordering the MS2850A-046/047.

MX269000 A Standard Software
MS2840 A-032 Analysis Bandwidth 255 MHz
MS2850A-067 Microwave Preselector Bypass

MS2850A Measurement Software

Model	Name	Remarks
MX285051A MX285051A-001 MX285051A-051 MX285051A-011 MX285051A-061 MX285051A-021 MX285051A-071	5G Pre-Standard Measurement Software (Base License) Pre-Standard CP-OFDM Downlink Pre-Standard CP-OFDM Uplink NR TDD sub-6GHz Downlink NR TDD sub-6GHz Uplink NR TDD mmWave Downlink NR TDD mmWave Uplink	MX285051A does not support independent operation and requires Opt.001/051/011/061 /021/071
MX269011A MX269012A	W-CDMA/HSPA Downlink Measurement Software W-CDMA/HSPA Uplink Measurement Software	
MX269013A MX269013A-001	GSM/EDGE Measurement Software EDGE Evolution Measurement Software	
MX269015A	TD-SCDMA Measurement Software	
MX269020A MX269020A-001 MX269021A MX269021A-001	LTE Downlink Measurement Software LTE-Advanced FDD Downlink Measurement Software LTE Uplink Measurement Software LTE-Advanced FDD Uplink Measurement Software	
MX269022A MX269022A-001 MX269023A MX269023A-001	LTE TDD Downlink Measurement Software LTE-Advanced TDD Downlink Measurement Software LTE TDD Uplink Measurement Software LTE-Advanced TDD Uplink Measurement Software	
MX269017A MX269017A-001 MX269017A-011	Vector Modulation Analysis Software APSK Analysis Higher-Order Analysis	16APSK/32APSK 512QAM/1024QAM/2048 QAM

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