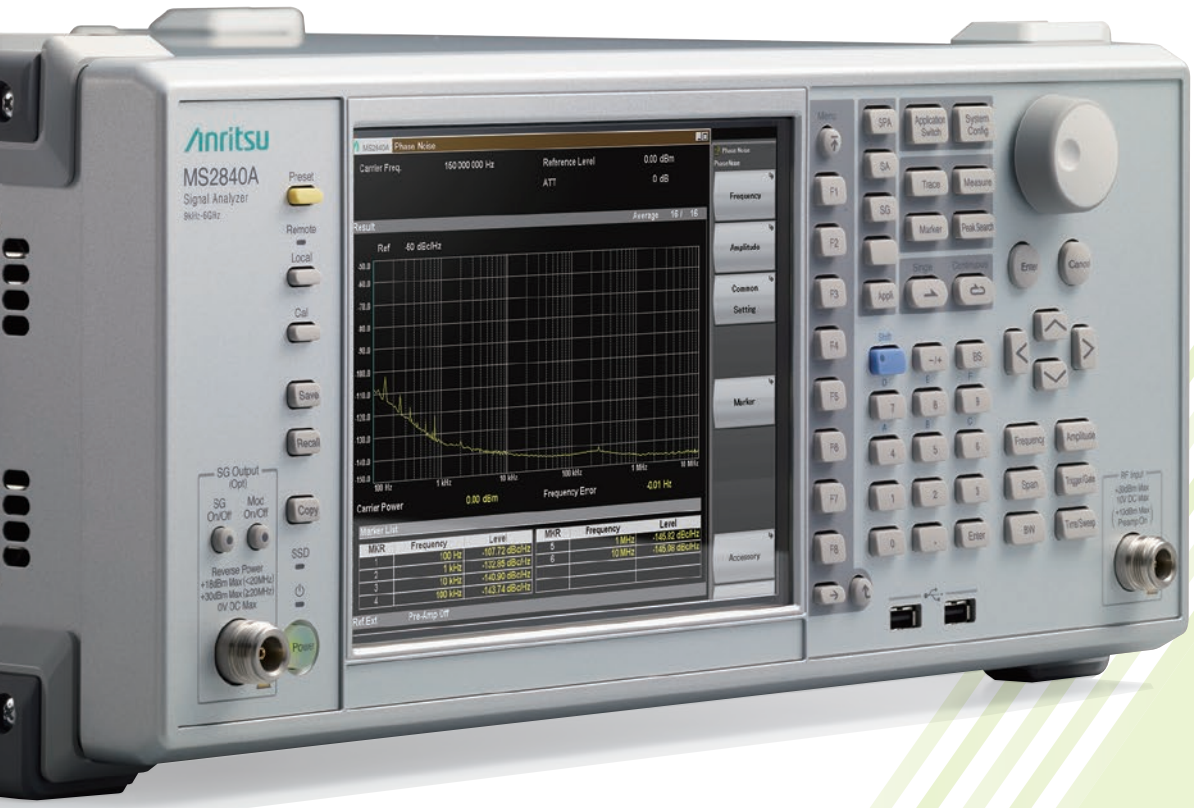
Anritsu Advancing beyond

Signal Analyzer

MS2840A

MS2840A-040: 9 kHz to 3.6 GHz
MS2840A-041: 9 kHz to 6.0 GHz
« MS2840A-044: 9 kHz to 26.5 GHz* »
« MS2840A-046: 9 kHz to 44.5 GHz* »

-140 dBc/Hz
Close-in Phase Noise
Measurement Frequency 150 MHz
10 kHz Offset
(meas.)



-138 dBc/Hz
Close-in Phase Noise
Measurement Frequency 1 GHz
10 kHz Offset
(meas.)

*: Refer to the separate brochure "MS2840A-044/046".

Excellent Eco Product

-140 dBc/Hz

Close-in Phase Noise Performance
Measurement Frequency 150 MHz 10 kHz Offset (meas.*)

As Pure
As Sapphire

The Pure Signal Analyzer

MS2840A

MS2840A-040：9 kHz to 3.6 GHz
MS2840A-041：9 kHz to 6.0 GHz

*Value measured at design but not guaranteed specification.

The Pure Signal Analyzer

Clear Low-Noise Signals

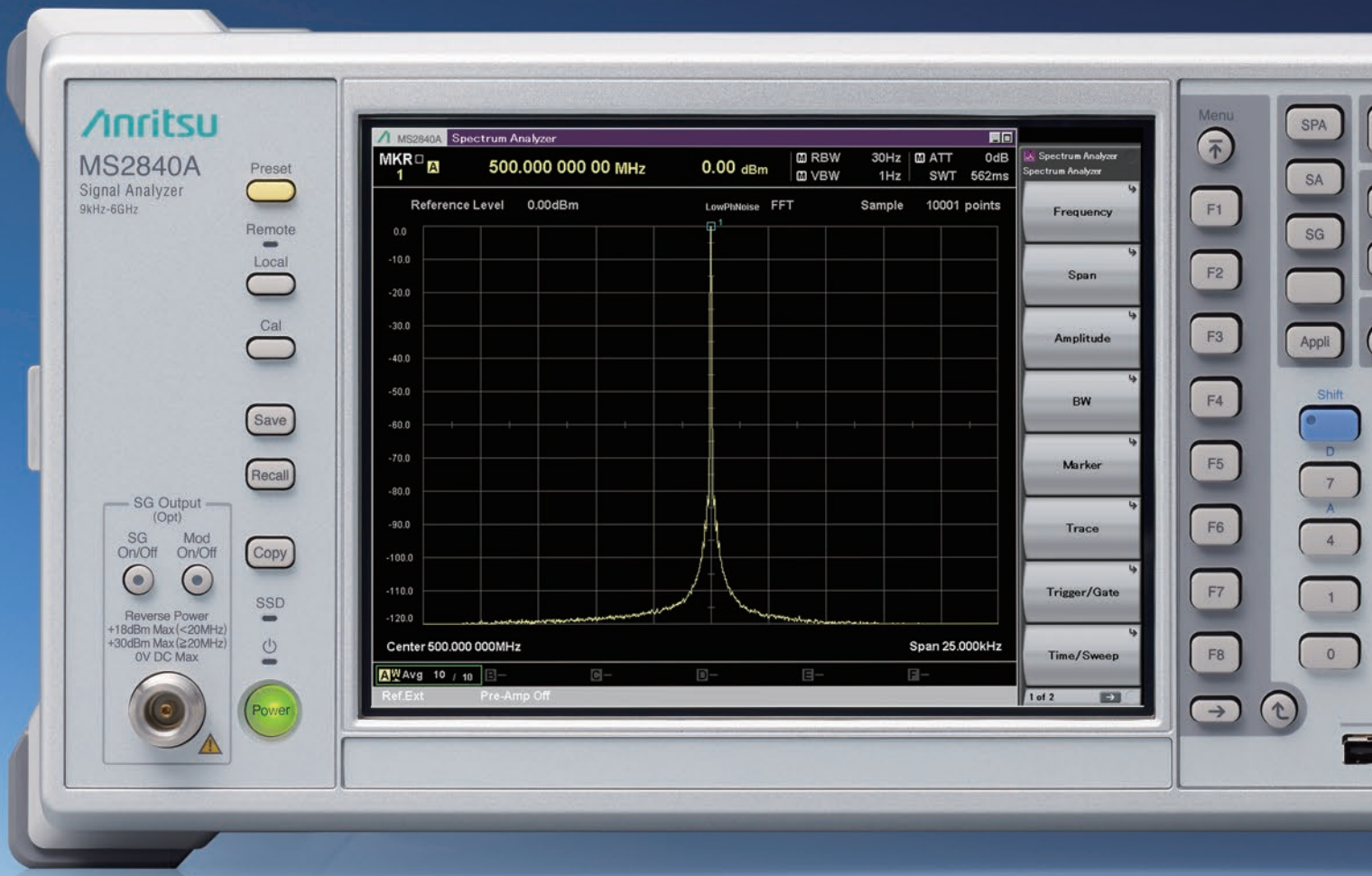
The new MS2840A synthesizer design is based on Anritsu's 120 year history of technical excellence to support world-beating, pure close-in phase noise performance.

For Wireless and Tx Device R&D

The MS2840A (3.6 GHz/6 GHz models) close-in phase noise performance is –123 dBc/Hz (10 kHz offset) at a measurement frequency of 1 GHz by new designed synthesizer. And installing a dedicated option (MS2840A-066) takes this already superior performance to the next level. For example, at a measurement frequency of 150 MHz with 10 kHz offset, the close-in phase noise performance is an incredible –140 dBc/Hz (meas.*); at a measurement frequency of 1 GHz with 10 kHz offset, it is –138 dBc/Hz (meas.*), beating even the performance of top-rank instruments.

The MS2840A (3.6 GHz/6 GHz models) is a spectrum/signal analyzer combining superior close-in phase noise performance with excellent cost-performance, making it the perfect measurement solution for both fundamental R&D and manufacturing of wireless equipment and Tx devices.

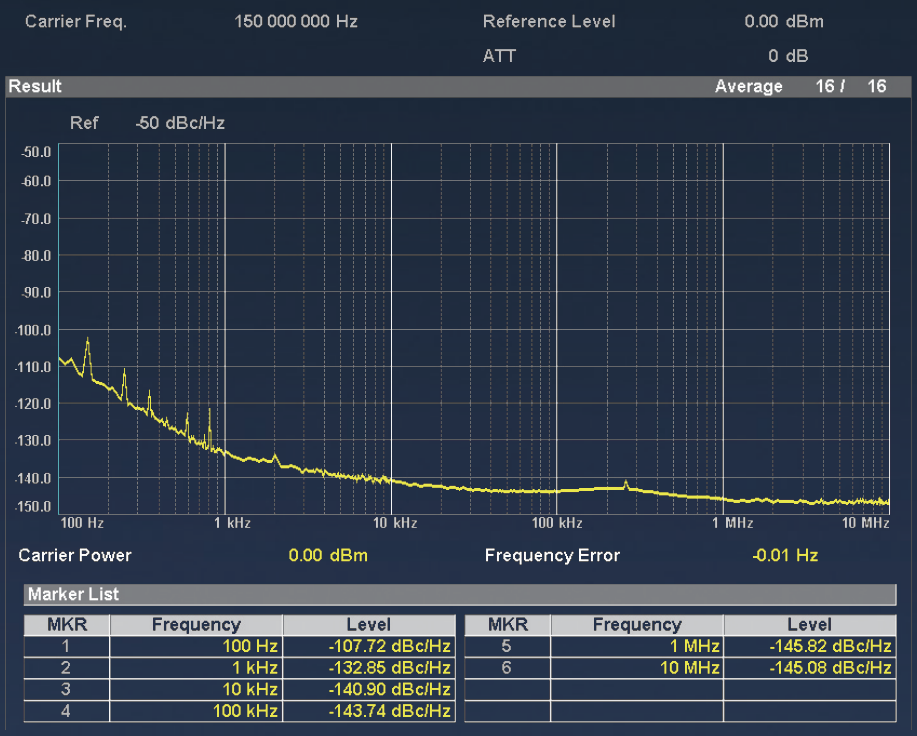
*Value measured at design but not guaranteed specification.


Anritsu
MS2840A
Signal Analyzer
9kHz-6GHz
Preset
Remote
Local
Cal
Save
Recall
SG Output
(Opt)
SG
On/Off
Mod
On/Off
Reverse Power
+18dBm Max (<20MHz)
+30dBm Max (≧20MHz)
0V DC Max
Copy
SSD
Power
MS2840A
Spectrum Analyzer
MKR 1
500.000 000 00 MHz
0.00 dBm
RBW 30Hz
VBW 1Hz
ATT 0dB
SWT 562ms
Reference Level 0.00dBm
LowPhNoise
FFT
Sample 10001 points
Center 500.000 000MHz
Span 25.000kHz
Avg 10 / 10
Ref.Ext
Pre-Amp Off
Frequency
Span
Amplitude
BW
Marker
Trace
Trigger/Gate
Time/Sweep
1 of 2
Menu
F1
F2
F3
F4
F5
F6
F7
F8
SPA
SA
SG
Appli
Shift

MS2840A

Unbelievable Close-in Phase Noise Performance

High Close-in Phase Noise Performance with Option-066



MKR	Frequency	Level	MKR	Frequency	Level
1	100 Hz	-107.72 dBc/Hz	5	1 MHz	-145.82 dBc/Hz
2	1 kHz	-132.85 dBc/Hz	6	10 MHz	-145.08 dBc/Hz
3	10 kHz	-140.90 dBc/Hz			
4	100 kHz	-143.74 dBc/Hz			

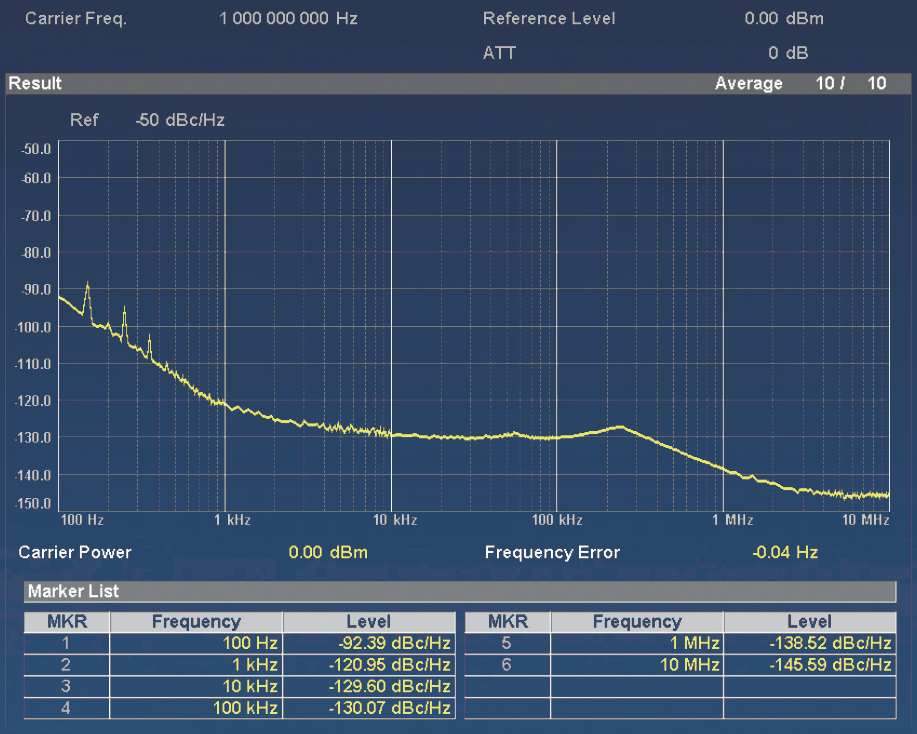
Measurement Examples*2

Measurement Frequency 150 MHz
10 kHz Offset

-140 dBc/Hz (meas.*1)

Installing Low Phase Noise Performance Option-066 in the MS2840A (3.6 GHz/6 GHz models) supports excellent close-in phase noise performance, surpassing other top-rank instruments and meeting the measurement needs for fundamental R&D into wireless equipment and TX devices.

High-Performance Standard Model



MKR	Frequency	Level	MKR	Frequency	Level
1	100 Hz	-92.39 dBc/Hz	5	1 MHz	-138.52 dBc/Hz
2	1 kHz	-120.95 dBc/Hz	6	10 MHz	-145.59 dBc/Hz
3	10 kHz	-129.60 dBc/Hz			
4	100 kHz	-130.07 dBc/Hz			

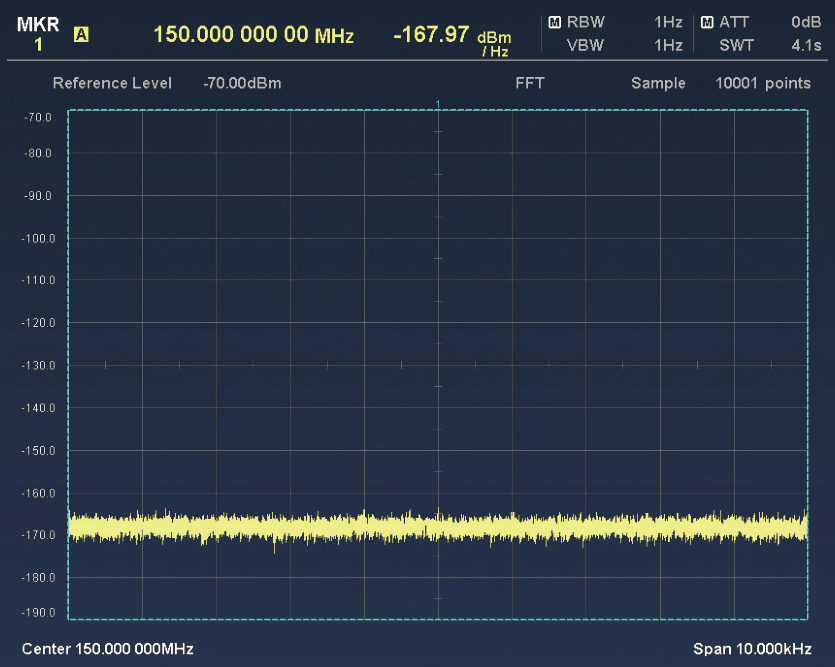
Measurement Examples*2

Measurement Frequency 1 GHz
10 kHz Offset

-123 dBc/Hz

The close-in phase noise performance of the standard-configuration MS2840A (3.6 GHz/6 GHz models) is world class with sufficient margins for narrowband wireless measurements, etc.

Display High Sensitivity Measurement



Measurement Examples*2

Display Average Noise Level

Measurement Frequency 150MHz

-166 dBm/Hz*3

The MS2840A series (3.6 GHz/6 GHz models) has excellent display average noise level (DANL) performance. High-accuracy measurement is achieved using this excellent DANL.

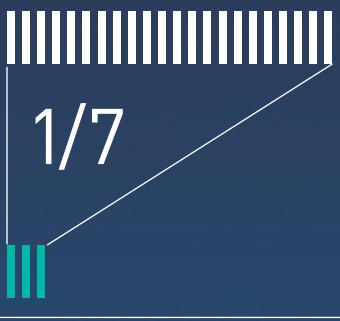
Faster Measurement Speed

With a built-in high-performance CPU and 8 GB of main memory, the MS2840A is much faster than its predecessor MS2830A, offering greatly improved averaging processing times for screen displays and much faster processing when displaying the results of signal analyzer and software analysis functions.

Spectrum Analyzer Functions (1000 averagings*4)

MS2830A*6

22 sec



3 sec

MS2840A*6

Signal Analyzer Functions (Spctrogram Display*5)

MS2830A*6

14 sec

2 sec

MS2840A*6

*1: Value measured at design but not guaranteed specification, and value measured by Phase Noise Measurement function.
*2: Value measured at design but not guaranteed specification.
*3: Preamp: ON
*4: Measurement Conditions: 1 GHz Frequency/SPAN; 1 MHz RBW/VBW; 1 ms Sweep Speed
*5: Measurement Conditions: 1 GHz Frequency; 25 MHz SPAN; Signal Capture Time:10 ms
*6: MS2830A: Windows XP model
MS2840A: Windows 10 model as of March 2023

MS2840A

Better Than Expected Close-in Phase Noise Performance

Since 2000 most spectrum analyzers have been designed for mobile communications and the phase noise performance has been optimized for offset frequencies of several MHz. Consequently, customers requiring good close-in phase noise performance have been limited to a narrow choice of usable spectrum analyzers, causing problems.
This new MS2840A series (3.6 GHz and 6 GHz models) has been designed with emphasis on offering a spectrum analyzer with excellent close-in phase noise performance at offset frequencies of just several kHz. This performance surpasses that of first-generation high-end spectrum analyzers and has sufficient margin for evaluating the close-in spurious of narrowband communications equipment in the short-wave, VHF, and UHF bands. Moreover, installing Low Phase Noise Performance MS2840A-066 option supports excellent phase noise performance surpassing that of current high-end instruments.
The high cost-performance of the MS2840A series (3.6 GHz and 6 GHz models) supporting not only development and production but also fundamental research for wireless and transmission equipment belies its mid-range price.

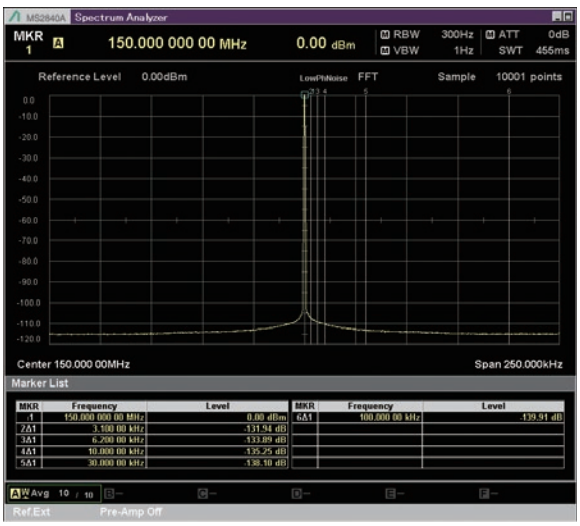
Close-in Phase Noise Performance (Spectrum Analyzer Function)

Carrier Offset	SSB Phase Noise		
	Standard	Low Phase Noise Performance MS2840A-066 Installed	
	Center Frequency: 1 GHz	Center Frequency: 1 GHz	Center Frequency: 500 MHz
10 Hz	–80 dBc/Hz (nom.)	—	—
100 Hz	–92 dBc/Hz (nom.)	–92 dBc/Hz (meas.*)	–98 dBc/Hz (nom.)
1 kHz	–117 dBc/Hz (nom.)	–125 dBc/Hz (meas.*)	–122 dBc/Hz
10 kHz	–123 dBc/Hz	–138 dBc/Hz (meas.*)	–133 dBc/Hz
100 kHz	–123 dBc/Hz	–142 dBc/Hz (meas.*)	–133 dBc/Hz
1 MHz	–135 dBc/Hz	–146 dBc/Hz (meas.*)	–148 dBc/Hz (nom.)
10 MHz	–148 dBc/Hz (nom.)	—	—

*: Value measured at design but not guaranteed specification, and value measured by Phase Noise Measurement function.

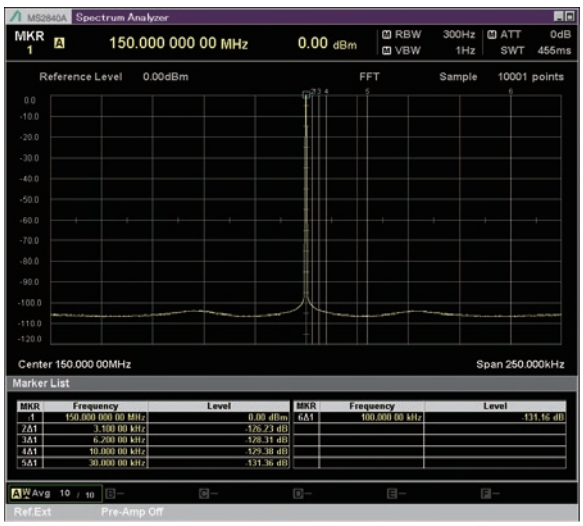
The Low Phase Noise Performance MS2840A-066 option greatly increases SSB phase noise performance for RF input signals of more than 130 MHz and less than 3.7 GHz at frequency offsets of 1 kHz to 1 MHz from the main carrier wave. Setting the span to a range of either 300 Hz to 1 MHz (spectrum analyzer function) or 1 kHz to 31.25 MHz (signal analyzer function) enables the function on Spectrum display.

Measurement Examples



Spectrum Display
Low Phase Noise Performance MS2840A-066 On
150 MHz Measurement Frequency, Preamp Off

Phase Noise Measurement
Low Phase Noise Performance MS2840A-066 On
150 MHz Measurement Frequency, Preamp Off

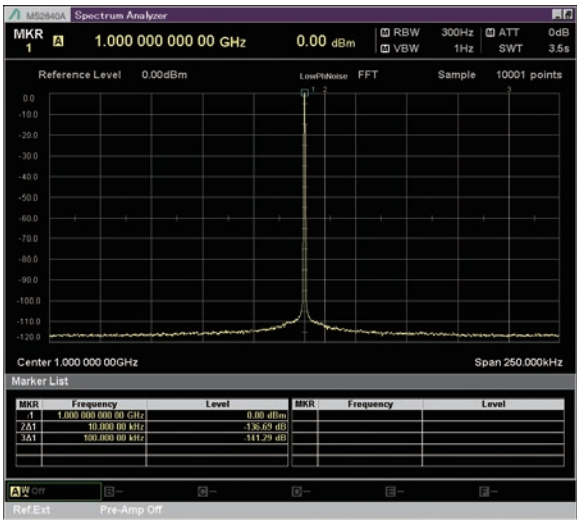


Spectrum Display
Low Phase Noise Performance MS2840A-066 Off
150 MHz Measurement Frequency, Preamp Off

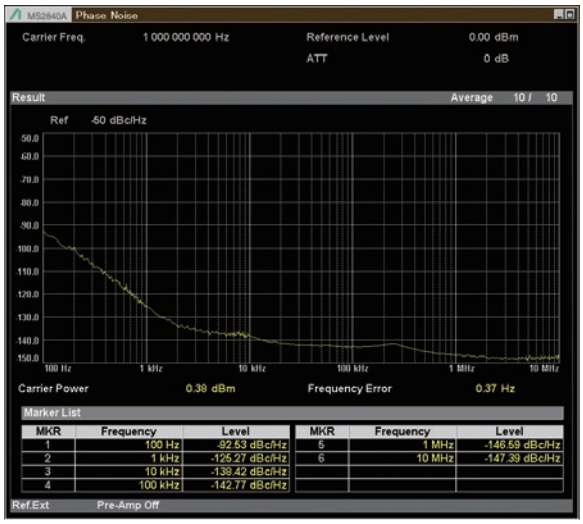
Phase Noise Measurement
Low Phase Noise Performance MS2840A-066 Off
150 MHz Measurement Frequency, Preamp Off

Better Than Expected Close-in Phase Noise Performance

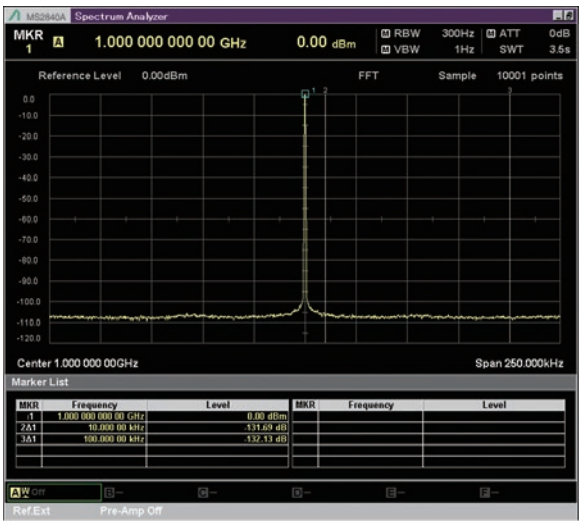
Measurement Examples



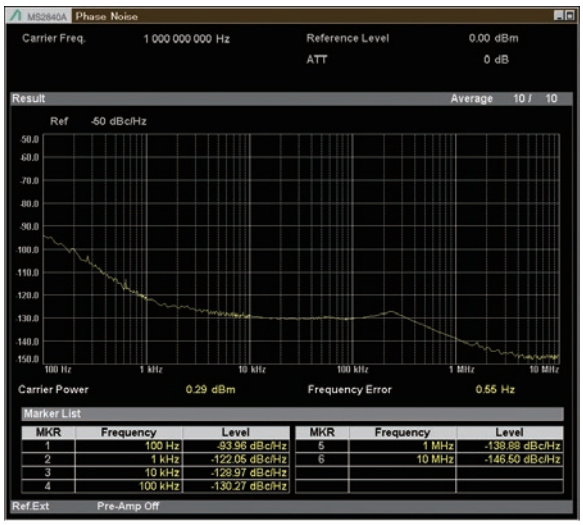
Spectrum Display
Low Phase Noise Performance MS2840A-066 On
1 GHz Measurement Frequency, Preamp Off



Phase Noise Measurement
Low Phase Noise Performance MS2840A-066 On
1 GHz Measurement Frequency, Preamp Off



Spectrum Display
Low Phase Noise Performance MS2840A-066 Off
1 GHz Measurement Frequency, Preamp Off



Phase Noise Measurement
Low Phase Noise Performance MS2840A-066 Off
1 GHz Measurement Frequency, Preamp Off

Signal Analyzer MS2840A series (3.6 GHz/6 GHz models) Features

High-Sensitivity Measurements

The MS2840A has excellent display average noise level (DANL) specifications. In particular, when the built-in preamplifier is on, it has a high sensitivity measurement performance of better than –160 dBm/Hz in the frequency range from 30 MHz to 6 GHz.

Displayed Average Noise Level (DANL)

Spectrum Analyzer Function

Preamp: None, Low Phase Noise Performance: None

Frequency	DANL
30 MHz	–153 dBm/Hz
400 MHz	–153 dBm/Hz
1 GHz	–151 dBm/Hz
3 GHz	–149 dBm/Hz
6 GHz	–146 dBm/Hz

Preamp: On, Low Phase Noise Performance : None

Frequency	DANL
30 MHz	–166 dBm/Hz
400 MHz	–166 dBm/Hz
1 GHz	–165 dBm/Hz
3 GHz	–164 dBm/Hz
6 GHz	–161 dBm/Hz

Dynamic Range

Preamp: None

Frequency	Dynamic Range	DANL/TOI
30 MHz	165 dB	Displayed Average Noise Level (DANL): –153 dBm/Hz Third Order Intercept (TOI): +12 dBm
1 GHz	167 dB	Displayed Average Noise Level (DANL): –151 dBm/Hz Third Order Intercept (TOI): +16 dBm
6 GHz	161 dB	Displayed Average Noise Level (DANL): –146 dBm/Hz Third Order Intercept (TOI): +15 dBm (nom.)

The dynamic range is assumed to be the simple difference between the TOI and DANL.

Noise Floor Reduction (MS2840A-051)

The Noise Floor Reduction (NFR) function increases the measurement accuracy for low-level signals. It subtracts the internal noise components (11 dB max. nominal) of the measuring instrument itself from the displayed measurement result.

Signal Analyzer MS2840A series (3.6 GHz/6 GHz models) Functions

Signal Analyzer MS2840A

The Signal Analyzer MS2840A is available as two series with two models in each series: 3.6 GHz and 6 GHz, and 26.5 GHz and 44.5 GHz; different options can be installed in each series. In addition to supporting installation of options offering various measurement functions needed both for evaluating the Tx characteristics of wireless and transmission equipment and for greatly improving phase noise performance, the 3.6 GHz/6 GHz models described in this brochure also provide all-in-one support for Rx measurements when the signal generator option is installed.

Standard Functions

Spectrum Analyzer
Signal Analyzer (31.25 MHz Analysis Bandwidth)
Power Meter (Connected to USB Power Sensor)

Options

Improved Phase Noise Performance
Signal Analyzer (extended analysis bandwidth: 62.5 MHz, 125 MHz)
Built-in Preamplifier
Phase Noise Measurement
Pre-compliance EMI Function
Noise Figure (NF) Measurement
BER Measurement
Modulation Analysis
Vector Signal Generator
Analog Signal Generator

Optional Parts

USB Power Sensor

Tx Measurement — Typical Measurement Items for Evaluating Tx Characteristics (3.6 GHz and 6 GHz models)

✓: Supported

Supported Standard Functions/Options / Typical Measurement	Standard Functions			Options/Optional Parts
	Spectrum Analyzer	Signal Analyzer	Others	
Spectrum Trace	✓	✓		
Channel Power	✓	✓		
Occupied Bandwidth	✓	✓		
Adjacent Channel Leakage Power	✓	✓		
Spectrum Emission Mask	✓			
Burst Average Power	✓	✓		
Spurious Emission	✓			
AM Depth		✓		✓ Analog Measurement Software MX269018A
FM Deviation		✓		✓ Analog Measurement Software MX269018A
Multi-marker & Marker List	✓	✓		
Highest 10 Markers	✓	✓		
Limit Line	✓			
Frequency Counter	✓			
TOI	✓			
Hide Settings and Numeric Results	✓			
Power Meter Function (connected to USB Power Sensor)			✓	
Phase Noise Measurement				✓ Phase Noise Measurement Function MS2840A-010
EMI Measurement				✓ Precompliance EMI Function MS2840A-016
Vector Modulation Analysis (EVM, etc.)				✓ Vector Modulation Analysis Software MX269017A
Analog Modulation Analysis (AM/FM/ΦM) (FM Deviation, Demodulation Frequency, etc.)				✓ Analog Measurement Software MX269018A
Improved Phase Noise Performance				✓ Low Phase Noise Performance MS2840A-066

Rx Measurement — Typical Measurement Items for Evaluating Rx Characteristics (3.6 GHz and 6 GHz models)

✓: Supported

Supported Standard Functions/Options / Typical Measurement	Standard Functions			Options/Optional Parts
	Spectrum Analyzer	Signal Analyzer	Others	
Vector Signal Generator				✓ Vector Signal Generator MS2840A-020/021, etc.
Analog Signal Generator				✓ Analog Signal Generator MS2840A-088, etc.
BER Measurement				✓ BER Measurement Function MS2840A-026

Others — Other Measurement Items (3.6 GHz and 6 GHz models)

✓: Supported

Supported Standard Functions/Options / Typical Measurement	Standard Functions			Options/Optional Parts
	Spectrum Analyzer	Signal Analyzer	Others	
Noise Figure Measurement				✓ Noise Figure Measurement Function MS2840A-017

Tx Measurement Versatile Standard Functions

The built-in spectrum and signal analyzer functions can be used to evaluate the Tx characteristics of wireless devices and transmitters by running easy tests, etc., in accordance with specifications.

Measure Function	Spectrum Analyzer (Standard)	Signal Analyzer (Standard)
Spectrum Trace	✓	✓
Channel Power	✓	✓
Occupied Bandwidth	✓	✓
Adjacent Channel Leakage Power	✓	✓
Spectrum Emission Mask	✓	
Burst Average Power	✓	✓
Spurious Emission	✓	
AM Depth		✓
FM Deviation		✓
Multi-marker & Marker List	✓	✓
Highest 10 Markers	✓	✓
Limit Line	✓	
Frequency Counter	✓	
TOI	✓	
Hide Settings and Numeric Results	✓	

Power Meter Function (USB Power Sensor Connection)

Connecting the optional USB Power Sensor to the MS2840A supports Power and Relative Power measurements.

Compatible USB power sensors.

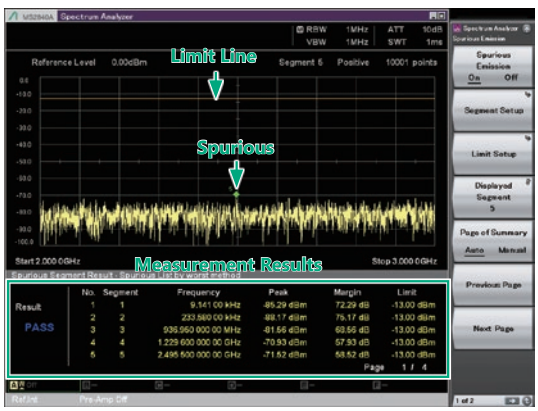
Model	Frequency Range	Dynamic Range
MA24104A*	600 MHz to 4 GHz	+3 to +51.76 dBm
MA24105A	350 MHz to 4 GHz	+3 to +51.76 dBm
MA24106A	50 MHz to 6 GHz	–40 to +23 dBm
MA24108A	10 MHz to 8 GHz	–40 to +20 dBm
MA24118A	10 MHz to 18 GHz	–40 to +20 dBm
MA24126A	10 MHz to 26 GHz	–40 to +20 dBm

Other power sensors, such as the USB Peak Power Sensor and Microwave CW USB Power Sensor, cannot use the Power Meter Function.

*: MA24104A has been discontinued.

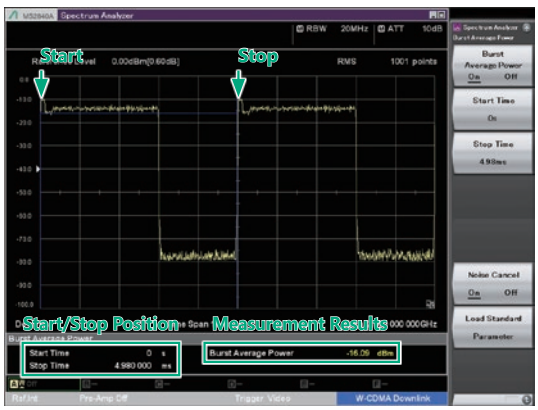
Spurious Emission

This function splits the frequency range into up to 20 segments for sweeping; the measurement parameters and limit lines can be specified to measure the peak power and margin for each segment.
The results are tabulated below the trace and marked PASS/FAIL.



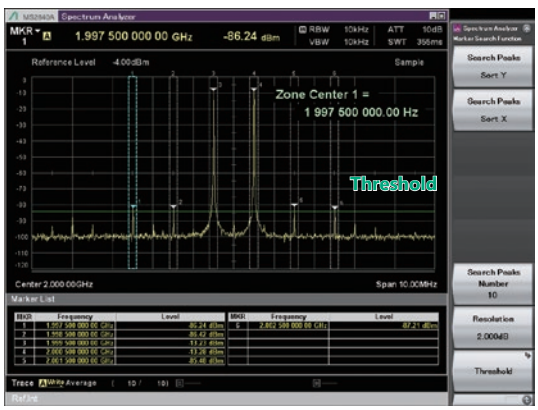
Burst Average Power

The average power for the range specified by two markers is displayed in the time domain. Measurement only requires setting the measurement start and stop positions on the screen. True performance is measured using the noise cancellation function to subtract main unit noise from the measurement result.
Pre-installed templates for each standard support easy parameter setting.



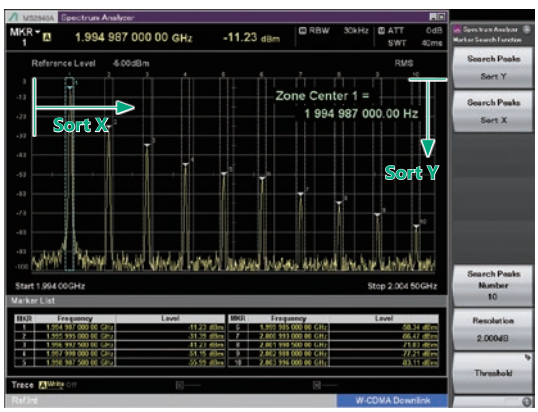
Multi-marker & Marker List

Up to 10 markers can be set for this function. Markers may be either a spot or a zone. Using a zone marker, the peak of a signal with an unstable variable frequency can be tracked and measured.
Not only can the 10 markers be listed below the trace but the differences between markers can be calculated and displayed using the delta setting.



Highest 10 Markers

This function sets the threshold level and auto-detects peaks in the X (frequency) and Y (level/time) directions.



Signal Analyzer MS2840A series (3.6 GHz/6 GHz models) Functions

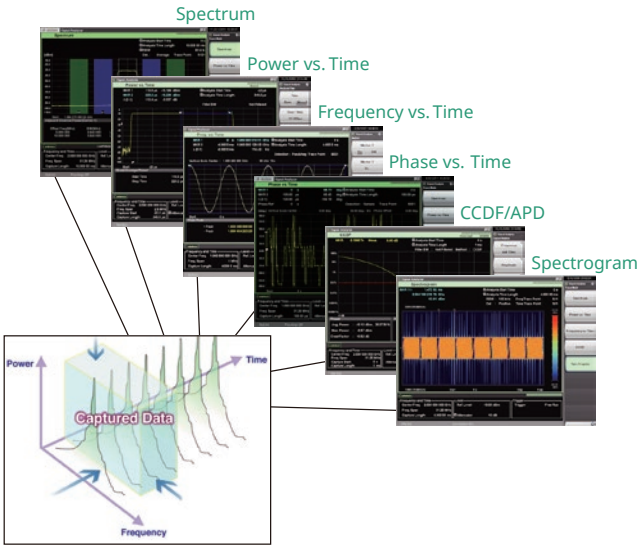
Tx Measurement

Signal Analyzer (Standard)

The MS2840A has a built-in 31.25 MHz bandwidth Fast Fourier Transformation (FFT) analysis function supporting multi-domain analysis of captured measured signals. Since it can capture phenomena such as spectrum transients that cannot be captured by conventional sweep-type spectrum analyzers, it improves the efficiency of troubleshooting.
The analysis bandwidth can be expanded to either 62.5 MHz or 125 MHz as options.

Measurement Functions

- Spectrum trace
- Frequency vs. Time
- CCDF/APD
- Power vs. Time
- Phase vs. Time
- Spectrogram



Analysis Bandwidth:

31.25 MHz (Standard)
50 MHz max. sampling rate = 20 ns resolution, ADC resolution 16 bits)
62.5 MHz (MS2840A-077)
(100 MHz max. sampling rate = 10 ns resolution, ADC resolution 14 bits)
125 MHz (MS2840A-077/078)
(200 MHz max. sampling rate = 5 ns resolution, ADC resolution 14 bits)

Max. Capture Time: 0.5 s to 2000 s

Max. Number of Samples: 100 Msamples

Note: An image response is received when setting the bandwidth to more than 31.25 MHz. This can be used when not inputting a signal frequency outside the MS2840A analysis bandwidth (125 MHz max.). The Signal Analyzer MS2850A is recommended for other measurement purposes.

Option

Analysis Bandwidth Extension to 62.5 MHz (MS2840A-077)
Extends analysis bandwidth to 62.5 MHz.

Analysis Bandwidth Extension to 125 MHz (MS2840A-078*)
Extends analysis bandwidth to 125 MHz.

*: Requires MS2840A-077.

Capture & Replay Function

Waveform data can be saved (captured) to the internal memory.
In addition, previously saved waveform data can be loaded (replayed) to reproduce result displays whenever necessary using measurement functions.

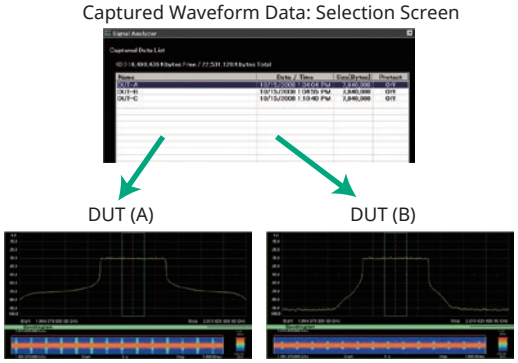
The following chart shows the maximum capture time per frequency span.

Span	Sampling Rate	Capture Time	Max. Sampling Data
1 kHz	2 kHz	2000 s	4M
2.5 kHz	5 kHz	2000 s	10M
5 kHz	10 kHz	2000 s	20M
10 kHz	20 kHz	2000 s	40M
25 kHz	50 kHz	2000 s	100M
50 kHz	100 kHz	1000 s	100M
100 kHz	200 kHz	500 s	100M
250 kHz	500 kHz	200 s	100M
500 kHz	1 MHz	100 s	100M
1 MHz	2 MHz	50 s	100M
2.5 MHz	5 MHz	20 s	100M
5 MHz	10 MHz	10 s	100M
10 MHz	20 MHz	5 s	100M
25 MHz	50 MHz	2 s	100M
31.25 MHz	50 MHz	2 s	100M
50 MHz	100 MHz	500 ms	50M
62.5 MHz	100 MHz	500 ms	50M
100 MHz	200 MHz	500 ms	100M
125 MHz	200 MHz	500 ms	100M

Replay Usage Examples

- Sharing data between development and manufacturing sections at separate locations
- Transferring signals captured onsite for later in-house analysis
- Saving product shipping data for later warranty-claim confirmation

Captured Waveform Data: Selection Screen



Tx Measurement

Signal Analyzer (Standard)

Spectrum trace

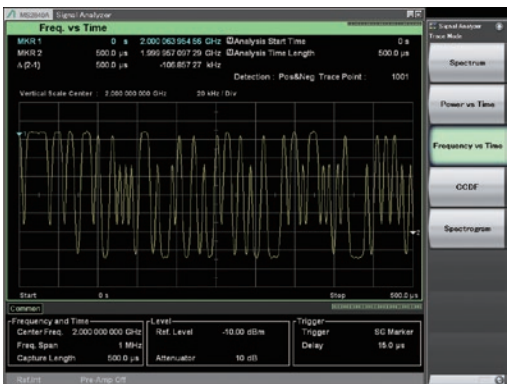
The CCDF trace displays the power variation probability on the y-axis and power variation on the y-axis to confirm the CCDF and APD of measured signals.

Power vs. Time

The Power vs. Time trace displays a graph with amplitude on the y-axis and time on the x-axis to confirm changes in power with time of measured signals.

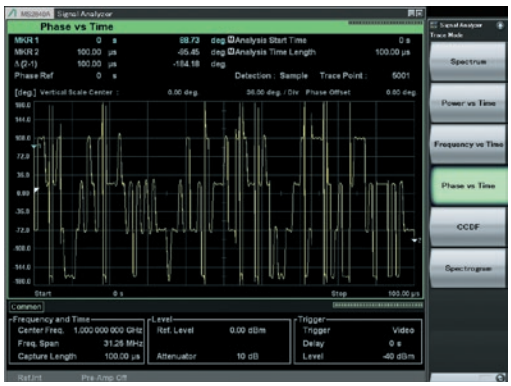
Frequency vs. Time

The Frequency vs. Time trace displays a graph with frequency on the y-axis and time on the x-axis to confirm time variation of the measured signal frequency.



Phase vs. Time

The Phase vs. Time trace displays a graph with phase on the y-axis and time on the x-axis to confirm time variation of the measured signal phase.



CCDF/APD

The CCDF trace displays the power variation probability on the y-axis and power variation on the y-axis to confirm the CCDF and APD of measured signals.

CCDF (Complementary Cumulative Distribution Function):
The CCDF display indicates the cumulative distribution of transient power variations compared to average power.

APD (Amplitude Probability Density):
The APD display indicates the probability distribution of transient power.

Spectrogram

The Spectrogram trace displays the level as color with frequency on the y-axis and time on the x-axis. The captured IQ data is FFT processed to confirm time variations in the continuous spectrum.
It is useful for monitoring frequency hopping and transient signals.

Signal Analyzer MS2840A series (3.6 GHz/6 GHz models) Functions

Tx Measurement Signal Analyzer (Standard)

Signal Analyzer Function Applications
~ Capture & Playback Function ~
Outputs Waveforms Captured by Signal Analyzer from Built-in Vector Signal Generator

The MS2840A provides Capture & Playback functionality that enables laboratory-grade testing of transceiver systems using real world signals. Using the optional integrated Signal Analyzer and Vector Signal Generator of the MS2840A, Capture & Playback allows users to conveniently capture up to 100 MHz of spectrum and play it back at any designated frequency and amplitude, making it easy to determine device performance margins.

Applications for Capture & Playback

Validation/Production Test

Captured signals can be used to initiate a communications link and perform receiver sensitivity testing with a device under test (DUT) using signals captured from a Golden Unit.

Device Characterization

Actual baseband signals captured from an RFIC can be used as simulation for characterizing amplifiers and other downstream devices or modules.

Electromagnetic Compatibility Test

Problematic RF environments or discrete signals can be captured and used to evaluate a device's susceptibility to RF interference, debug any problems found and validate the solution

Repeatably Test Device Performance
using "Real-World" RF Environments

Tx Measurement Other Measurement Functions

Phase Noise Measurement Function (MS2840A-010)

The excellent close-in phase noise performance of the MS2840A supports phase noise measurement of transmitters with a frequency offset range of 10 Hz to 10 MHz.

Measurement Results

- Carrier level
- Error between set frequency and carrier frequency
- Marker point phase noise level

There are four measurement modes using different loop filters, which are switched to match the DUT.

Auto:
This mode switches automatically to the best loop filter for measuring the carrier signal close-in and wide-offset phase noise characteristics

Best Close-in:
This mode uses the best loop filter for measuring the carrier signal close-in phase noise characteristics.

Best Wide-offset:
This mode uses the best loop filter for measuring the carrier signal wide-offset phase noise characteristics.

Balance
This mode uses the loop filter with a good balance for measuring both close-in and wide-offset phase noise characteristics of the carrier signal.

Measurement Screen

Precompliance EMI Function (MS2840A-016)

This option adds an EMI measurement detection mode and RBW to the spectrum analyzer function. Both the detection mode used for CISPR standards (Quasi-Peak, CISPR-AVG, RMS-AVG) and RBW (200 Hz (6 dB), 9 kHz (6 dB), 120 kHz (6 dB), 1 MHz (Imp)) as well as conventional settings can be selected.

Tx Measurement Measurement Software Options

Vector Modulation Analysis Software (MX269017A)

This software measures the modulation accuracy, carrier frequency, Tx power, etc., for each type of digital radio.

Supported Modulation Methods

Standard

BPSK, QPSK, O-QPSK, π/4DQPSK, 8PSK, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM, 2FSK, 4FSK, 2ASK, 4ASK, H-CPM*, MSK

*: Used for APCO-P25 Phase2 Inbound measurement

APSK Analysis (MX269017A-001)

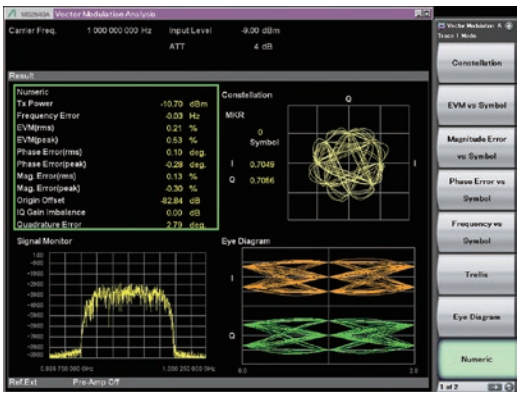
16APSK, 32APSK

Higher-Order QAM Analysis (MX269017A-011)

512QAM, 1024QAM, 2048QAM

Frequency Setting Range

100 kHz to Upper frequency limit
(300 MHz to Upper frequency limit depending on measured symbol rate and installed option)



Measurement Screen

Analog Measurement Software (MX269018A)

When this software is installed in the MS2840A, the Tx performance (carrier frequency, Tx power, modulation rate/frequency deviation, demodulation frequency, demodulation signal distortion rate, etc.) of analog radios can be measured.

* The Audio Analyzer cannot be installed in the MS2840A.
* This software cannot be installed in the MS2830A 26.5 GHz/43 GHz models, but can be installed in the MS2840A 26.5 GHz/44.5 GHz models.

Supported Modulations

AM, FM, ΦM

Frequency Setting Range

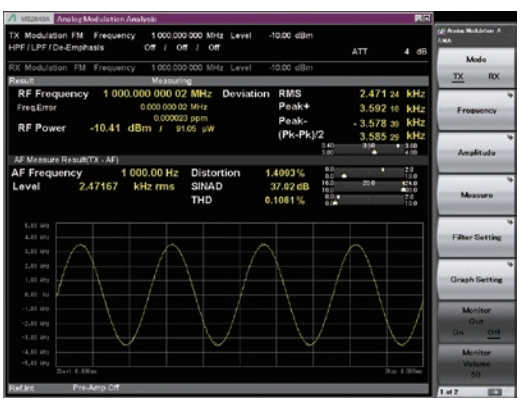
100 kHz to Upper frequency limit
(At Wide Band FM measurement: 10 MHz to Upper frequency limit)

Weighting Filter

CCITT, C-Message, CCIR 468, CCIR-ARM, A-Weighting

De-emphasis

25, 50, 75, 500, 750 µs



Measurement Screen

Refer to the MX2690xxA Series Measurement Software brochure for details.

Other Options

Preamplifier (MS2840A-008)

This option is for the 3.6 GHz/6 GHz models (MS2840A-040/041) and the 26.5 GHz/44.5 GHz models (MS2840A-044/046).
The gain of about 20 dB improves the Displayed Average Noise Level (DANL). This preamplifier is used to measure low-level signals such as noise and interference.

Frequency Range
With MS2840A-040: 100 kHz to 3.6 GHz
With MS2840A-041: 100 kHz to 6 GHz

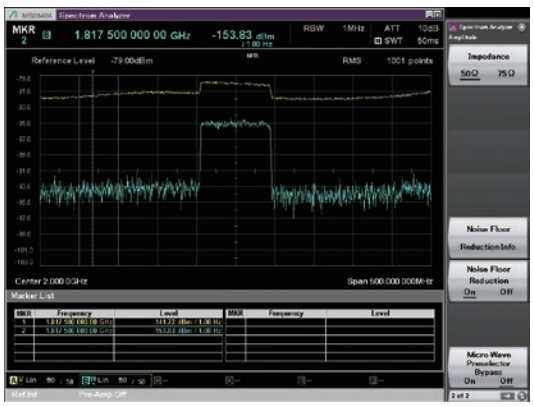
Noise Floor Reduction (MS2840A-051)

The Noise Floor Reduction (NFR) function increases the measurement accuracy for low-level signals. It subtracts the internal noise components (11 dB max. nominal) of the measuring instrument itself from the displayed measurement result.

<Main Applications>
- Spurious Emission
- Spectrum Mask
- Adjacent Channel Leakage Power (ACLR)
- Power ON/OFF ratio

Measurement times using the NFR function remain unchanged.
The NFR function eliminates the procedure of measuring the instrument noise floor each time like using the earlier noise cancelling function.
If the noise floor is measured once when an ambient temperature change affects the noise floor level, the NFR effect can be captured by the same operation as normal measurement, unless there is a change in these conditions.

[Notes]
The NFR function is enabled only by the Spectrum Analyzer function.
The design value is nominal and is not a guaranteed specification.



Measurement Screen

Tx Measurement

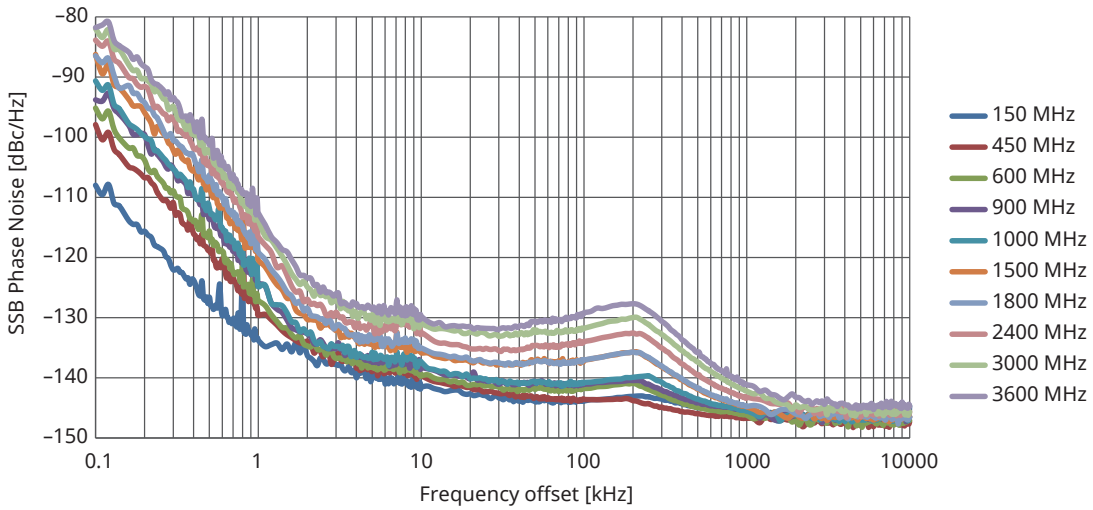
Other Options

Low Phase Noise Performance (MS2840A-066)

The Low Phase Noise Performance MS2840A-066 option greatly increases SSB phase noise performance for RF input signals of more than 130 MHz and less than 3.7 GHz at frequency offsets of 1 kHz to 1 MHz from the main carrier wave. Setting the span to a range of either 300 Hz to 1 MHz (spectrum analyzer function) or 1 kHz to 31.25 MHz (signal analyzer function) enables the function on Spectrum display.

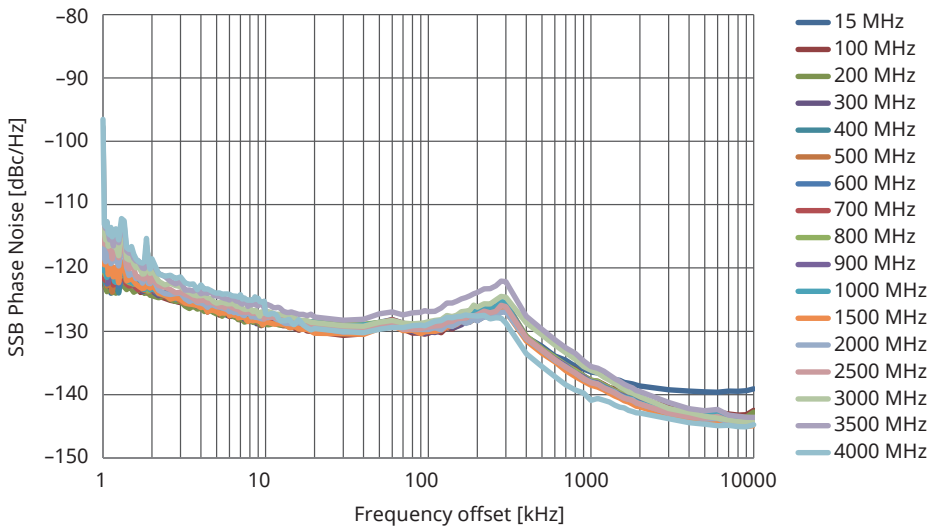
Phase Noise Performance (Spectrum Analyzer Function)

Carrier Offset	SSB Phase Noise			
	Standard	Low Phase Noise Performance MS2840A-066 Installed		
	Center Frequency: 1 GHz	Center Frequency: 1 GHz	Center Frequency: 500 MHz	Center Frequency: 150 MHz
10 Hz	–80 dBc/Hz (nom.)	—	—	—
100 Hz	–92 dBc/Hz (nom.)	–92 dBc/Hz (meas.*)	–98 dBc/Hz (nom.)	–107 dBc/Hz (meas.*)
1 kHz	–117 dBc/Hz (nom.)	–125 dBc/Hz (meas.*)	–122 dBc/Hz	–132 dBc/Hz (meas.*)
10 kHz	–123 dBc/Hz	–138 dBc/Hz (meas.*)	–133 dBc/Hz	–140 dBc/Hz (meas.*)
100 kHz	–123 dBc/Hz	–142 dBc/Hz (meas.*)	–133 dBc/Hz	–143 dBc/Hz (meas.*)
1 MHz	–135 dBc/Hz	–146 dBc/Hz (meas.*)	–148 dBc/Hz (nom.)	–145 dBc/Hz (meas.*)
10 MHz	–148 dBc/Hz (nom.)	—	—	—



Phase Noise Performance (meas.*), Low Phase Noise MS2840A-066 On

(Reference) Phase Noise Performance When MS2840A-066 Not Installed



Phase Noise Performance (meas.*), Low Phase Noise MS2840A-066 None

*: Value measured at design but not guaranteed specification, and value measured by Phase Noise Measurement function.

Rx Measurement

Built-in Signal Generator

A Vector Signal Generator and Analog Signal Generator can be installed in the MS2840A series (3.6 GHz/6 GHz models). Installing Tx and Rx (Signal Generator) measurement functions in one MS2840A makes it easy to configure a simple, small-footprint measurement system.

Vector Signal Generator

Vector Signal Generator (MS2840A-020/021)

The Vector Signal Generator MS2840A-020/021 covers a frequency range from 250 kHz to 3.6 GHz/6 GHz with a wide vector modulation bandwidth of 120 MHz and two waveform memory sizes of 64 Msamples (standard) and 256 Msamples (option).
A number of waveform patterns for various communications methods are built-in as standard. In addition, the IQproducer software for editing and generating waveform patterns is also supported. Waveform pattern files can be created using common Electronic Design Automation (EDA) tools, such as MATLAB.
The vector signal generator has various applications, such as Tx tests of equipment like amplifiers, and Rx tests of wireless equipment.

Frequency Range	250 kHz to 3.6 GHz (MS2840A-020) 250 kHz to 6 GHz (MS2840A-021)
Output Level	–40 to +20 dBm (>25 MHz) (Standard) –40 to +2 dBm (≤25 MHz) (Standard) –136 to +15 dBm (>25 MHz) (with MS2840A-022 installed) –136 to –3 dBm (≤25 MHz) (with MS2840A-022 installed)
Output Level Accuracy (at CW)	±0.5 dB (typ.) (–110 dBm ≤ Level ≤ +4 dBm, 100 MHz ≤ Frequency < 375 MHz) ±0.5 dB (–110 dBm ≤ Level ≤ +4 dBm, 375 MHz ≤ Frequency ≤ 3.6 GHz)
Waveform Memory	64 Msamples (Standard), 256 Msamples (with MS2840A-027 installed)
Vector Modulation Bandwidth	120 MHz
Internal Baseband Reference Clock	20 kHz to 160 MHz
Internal Waveform Pattern (Standard)*	WLAN (IEEE 802.11a/b/g), *Bluetooth*, GPS, GLONASS, QZSS, etc.
IQproducer Support*	TDMA IQproducer MX269902A Multi-Carrier IQproducer MX269904A

*: Refer to the MX269xxxA series Software (Waveform Pattern MX2690xxA, IQproducer MX2699xxA) brochure for details.

Options

Low Power Extension for Vector Signal Generator (MS2840A-022)

This option extends the lower limit of the output level from the standard value of –40 dBm to –136 dBm. Note that the upper limit drops by 5 dB.

ARB Memory Upgrade 256 MSa for Vector Signal Generator (MS2840A-027)

This option extends the ARB memory size from the standard value of 64 Msamples to 256 Msamples.

AWGN (MS2840A-028)

This option adds Additive White Gaussian Noise (AWGN) to the output wanted signal. It can be used for dynamic range tests of receivers, etc.

Analog Function Extension for Vector Signal Generator (MS2840A-029)

This option adds an analog signal generator function to the Vector Signal Generator MS2840A-020/021. The analog signal generator function frequency range and output level range are the same as the Analog Signal Generator MS2840A-088. Installing this option requires the Analog Measurement Software MX269018A, Vector Signal Generator Low Power Extension MS2840A-022 and USB Audio A0086D options. It is operated using the MX269018A.

Software for Vector Signal Generator

TDMA IQproducer MX269902A*

The IQproducer MX269902A is PC application software for generating waveform patterns using TDMA parameters. The generated waveform patterns are saved in the MS2840A to output TDMA modulation baseband signals and RF signals from the vector signal generator. Various signals, such as DMR, APCO-P25, NXDN, ARIB STD-T61/T79/T86/T98/T102, ETC, DSRC, etc., can be generated.

Multi-Carrier IQproducer MX269904A*

The Multi-Carrier IQproducer MX269904A is PC application software for generating multichannel waveform patterns for modulation signals and tone signals for various communications methods. The generated waveform patterns are saved in the MS2840A to output multi-carrier signals for various communication methods from the vector signal generator option.

*: Refer to the MX269xxxA series Software (Waveform Pattern MX2690xxA, IQproducer MX2699xxA) brochure for details.

Analog Signal Generator

Analog Signal Generator (MS2840A-088)

The Analog Signal Generator MS2840A-088 covers a frequency range of 100 kHz to 3 GHz and supports output of FM, ΦM, and AM signals. When used in combination with the Analog Measurement Software MX269018A, TRx tests of analog wireless equipment can be performed by one MS2840A set. The internal modulation output function outputs both AF tone and DCS (Digital Code Squelch) code signals for Rx tests of analog wireless equipment.

*: Refer to the MX2690xxA Series Measurement Software brochure for details.

Frequency Setting Range	100 kHz to 3 GHz (MS2840A-088)
Output Setting Level	–127 to +15 dBm (>25 MHz) –127 to –3 dBm (≤25 MHz)
Output Level Accuracy (at CW)	±0.5 dB (typ.) (–110 dBm ≤ Level ≤ +4 dBm, 100 MHz ≤ Frequency < 375 MHz) ±0.5 dB (–110 dBm ≤ Level ≤ +4 dBm, 375 MHz ≤ Frequency ≤ 3.6 GHz)
Output Modulation Signal	FM,ΦM, AM
Internal Modulation Signal Source	AF tone, DCS code

Options

Vector Function Extension for Analog Signal Generator Retrofit (MS2840A-189)

This option adds a vector signal generator function to the Analog Signal Generator MS2840A-088.
The specifications of this vector signal generator are the same as the Vector Signal Generator MS2840A-020 with a frequency range of 250 kHz to 3.6 GHz; the output level is the same as the Low Power Extension for Vector Signal Generator MS2840A-022.

Signal Analyzer MS2840A series (3.6 GHz/6 GHz models) Functions

Rx Measurement Other Measurement Functions

BER Measurement Function (MS2840A-026)

The MS2840A with the BER Measurement Function MS2840A-026 supports measurement up to 10 Mbps.
It supports Rx sensitivity tests by inputting the receiver-demodulated Data/Clock/Enable to the back of the MS2840A.

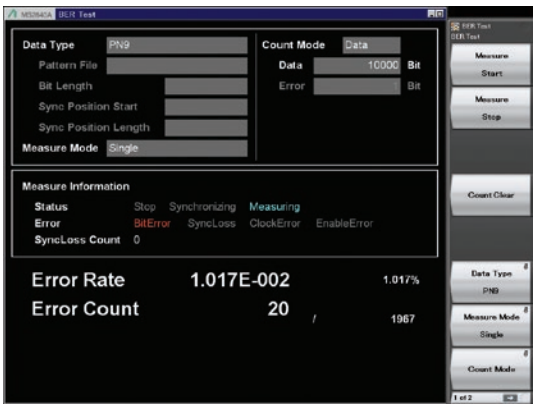
- Input Signal: Data, Clock, Enable (Polarity reversal supported)
- Input Bit Rate: 100 bps to 10 Mbps
- Input Level: TTL 3.3 V
- Connector: Rear panel, AUX connector*

  *: Can convert to BNC by connecting AUX conversion adapter (J1556A).
- Measured Patterns:

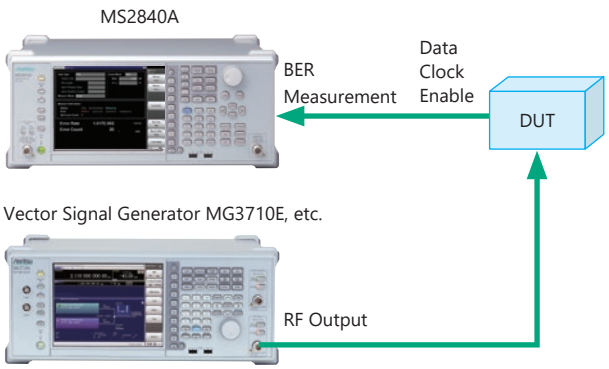
  PN9, PN11, PN15, PN20, PN23, ALL0, ALL1, Alternate (0101...), PN9Fix, PN11Fix, PN15Fix, PN20Fix, PN23Fix, UserDefine (4096 bits max.)
- Measurable Bit Count: 1000 to 4294967295 bits (2^{32} – 1 bits)
- Measurable Error Bit Count: 1 to 2147483647 bits (2^{31} – 1 bits)
- Count Mode

  Data: Measures until specified Data count
  Error: Measures until specified Error count
- Measurement Mode

  Single: Measures specified measurement bit count once
  Continuous: Repeats Single measurement
  Endless: Continues measurement to upper limit of measurement bits



BER Measurement Function Main Screen



BER Measurement Setup Example
(using external vector signal generator)

Others Other Measurement Functions

Rubidium Reference Oscillator (MS2840A-001)

This option is a 10-MHz reference crystal oscillator with excellent frequency stability startup characteristics of ±1 × 10^{-9} at 7 minutes after power-on.

Aging Rate: ±1 × 10^{-10}/month, ±1 × 10^{-9}/year
Start-up Characteristics:
±1 × 10^{-9} (7 minutes after power-on)

High Stability Reference Oscillator (MS2840A-002)

This 10-MHz reference crystal oscillator has excellent improved frequency stability with an aging rate of ±1 × 10^{-7}/year.

Aging Rate: ±1 × 10^{-7}/year
Start-up Characteristics: ±5 × 10^{-8} (5 minutes after power-on)

2ndary SSD (MS2840A-011)

This removable SSD is for storing user data.
It has no installed OS. It is shipped mounted in the Secondary SSD slot of the MS2840A main unit.

Removable SSD, Win10 (MS2840A-014)

This additional user-changeable SSD contains the same Windows OS and programs as the factory installed system SSD.
It supports a Windows 10 install for one specific MS2840A and is for use during service repair and calibration.

Noise Figure Measurement Function (MS2840A-017)

Noise Figure is measured with the measurement method of Y-factor method which uses a Noise Source.
The Noisecom NC346 series* of noise sources is supported.

*: Refer to the MS2840A Data Sheet for more details.
Operation is not guaranteed when using other noise sources.

Frequency Range (Noise sauce): 0.01 GHz to 40.0 GHz
Frequency Mode: Fixed, List, Sweep
DUT Mode: Amplifier, Down Converter, Up Converter
Screen Layout: Graph, Table

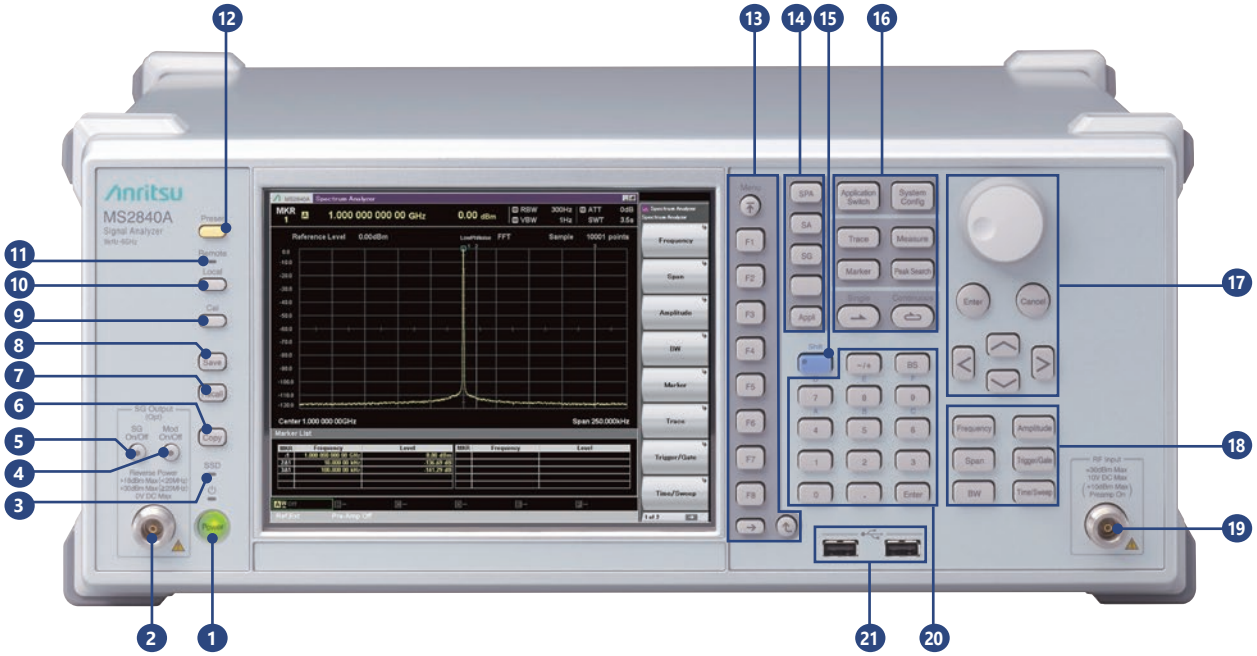
Measurement Results Display
- Graph/List/Spot

Displays measurement results for each trace (Trace1/Trace2).
- Noise Figure (NF) [dB]
- Noise Factor (F) [Linear]
- Gain
- Y-Factor: Power ratio when Noise Source is turned On/Off
- T effective: Effective noise temperature
- P Hot: Power measured when Noise Source is On.
- P Cold: Power measured when Noise Source is Off.

Measurement Result: Example of Graph display
(Frequency Mode: Sweep, Screen Layout: Graph)

Signal Analyzer MS2840A series (3.6 GHz/6 GHz models) Key Layout

Front Panel



1 Power switch
Press to switch between the standby state in which AC power is supplied and the Power On state in which the MS2840A is under operation. The Power lamp lights up orange in the standby state, and lights up green in the Power On state. Press the power switch for a reasonably long duration (for about two seconds).

2 SG Output connector
Outputs an RF signal, when the signal generator option is installed.

3 SSD lamp
Lights when the MS2840A internal solid state drive is being accessed.

4 Mod On/Off key
When the vector signal generator option is installed, RF signal modulation can be turned on and off by pressing . When modulation is on, the key lamp lights up green.

5 SG On/Off key
If the Vector Signal Generator option is installed, pressing enables (On) or disables (Off) the RF signal output. The lamp of the RF output control key lights up orange when the RF signal output is set to On.

6 Copy key
Press to capture a screen image from the display and save it to a file.

7 Recall key
Press to recall a parameter file.

8 Save key
Press to save a parameter file.

9 Cal key
Press to display the calibration execution menu.

10 Local key
Press to return to local operation from remote control operation through GPIB, Ethernet or USB (B), and enable panel settings.

11 Remote lamp
Lights up when the MS2840A is in a remote control state.

12 Preset key
Resets parameters to their initial settings.

13 Function keys
Used for selecting or executing function menu displayed on the right of the screen. The function menu contents are provided in multiple pages and layers.

14 Application key
Press to switch between applications.

15 Shift key
Used to operate any keys with functions described in blue characters on the panel. First press the Shift key, then press the target key when the Shift key lamp lights up green.

16 Main function keys 2
Used to set or execute main functions of the MS2840A. Executable functions vary depending on the application currently selected.

17 Rotary knob/Cursor keys/Enter key/Cancel key
The rotary knob and cursor keys are used to select display items or change settings.

18 Main function keys 1
Used to set or execute main functions of the MS2840A. Executable functions vary depending on the application currently selected.

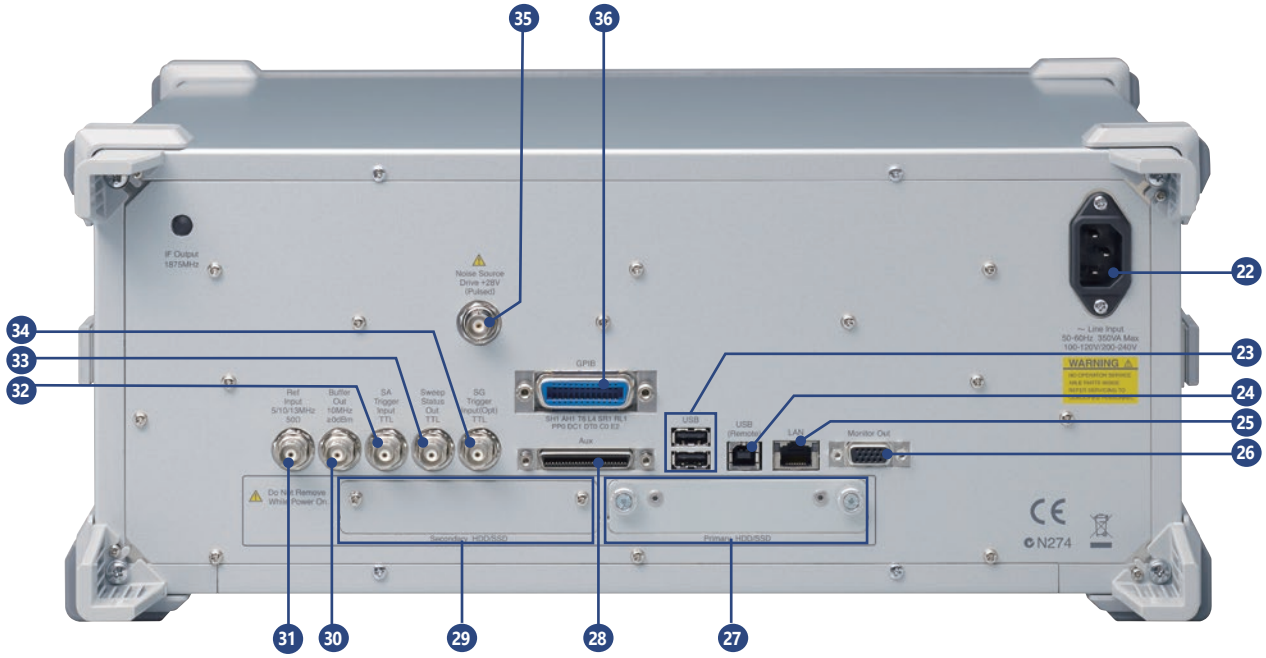
19 RF Input connector
Inputs an RF signal.

20 Numeric keypad
Used to enter numbers on parameter setup screens.

21 USB connector (type A)
Used to connect a USB keyboard or mouse or the USB memory supplied with the MS2840A.

Signal Analyzer MS2840A series (3.6 GHz/6 GHz models) Key Layout

Rear Panel



22 AC inlet
Used for supplying power.

23 USB connectors (type A)
Used to connect a USB keyboard or mouse or the USB memory supplied with the MS2840A.

24 USB connector (type B)
Used when controlling the MS2840A externally via USB.

25 LAN (Ethernet) connector
Used for connecting to a personal computer or for Ethernet connection. Used when controlling MS2840A externally.

26 Monitor Out connector
Used for connection with an external display.

27 Primary SSD slot
Slot for SSD for booting Windows OS and for saving data. Also supports Removable SSD, Win10 MS2840A-014/114 option.

28 AUX connector
Composite connector for Vector Signal Generator options and BER measurement function options with Marker 1 to 3 outputs, pulse modulation input, baseband reference clock signal input, and BER measurement Clock, Data, and Enable inputs. Converted to BNC using optional AUX Conversion Adaptor (J1556A).

*: The AUX Conversion Adapter J1556A is a standard accessory supplied with the BER Measurement Function MS2840A-026.

29 Secondary SSD slot
Slot for SSD for saving data. Also supports 2ndary SSD MS2840A-011/111 options.

30 Buffer Out connector
(reference frequency signal output connector)
Outputs the reference frequency signal (10 MHz) generated inside the MS2840A. It is used for synchronizing the frequencies between other devices and the MS2840A based on the reference frequency signal output from this connector.

31 Ref Input connector
(reference frequency signal input connector)
Inputs an external reference frequency signal (5/10/13 MHz). It is used for inputting reference frequency signals with accuracy higher than that of those inside the MS2840A, or for synchronizing the frequency of the MS2840A to that of other device.

32 SA Trigger Input connector
This is a BNC connector used to input the external trigger signal (TTL) for the Spectrum Analyzer or Signal Analyzer application.

33 Sweep Status Out connector
Outputs a signal that is enabled when an internal measurement is performed or measurement data is obtained.

34 SG Trigger Input connector
This is a BNC connector used to input the external trigger signal (TTL) for the vector signal generator option.

35 Noise Source Drive connector
Supply (+28 V) for the Noise Source Drive.
This is available when the MS2840A-017/117 is installed.

36 GPIB connector
Used when controlling the MS2840A externally via GPIB.

Signal Analyzer MS2840A series (3.6 GHz/6 GHz models) Configurations

Configuration List

Model	Name	Remarks
MS2840A	Signal Analyzer	Analysis Bandwidth 31.25 MHz installed as standard
MS2840A-040	3.6 GHz Signal Analyzer	
MS2840A-041	6 GHz Signal Analyzer	
MS2840A-001	Rubidium Reference Oscillator	Option
MS2840A-002	High Stability Reference Oscillator	Option
MS2840A-077	Analysis Bandwidth Extension to 62.5 MHz	Option
MS2840A-078	Analysis Bandwidth Extension to 125 MHz	Option, Requires MS2840A-077
MS2840A-008	Preamplifier	Option, Frequency Range: 100 kHz to 6 GHz
MS2840A-010	Phase Noise Measurement Function	Option
MS2840A-011	2ndary SSD	Option
MS2840A-014	Removable SSD, Win10	Option
MS2840A-016	Precompliance EMI Function	Option
MS2840A-017	Noise Figure Measurement Function	Option, Preamplifier MS2840A-008 (or 108) recommended
MS2840A-026	BER Measurement Function	Option, AUX Conversion Adapter J1566A as standard accessory
MS2840A-051	Noise Floor Reduction	Option
MS2840A-066	Low Phase Noise Performance	Option
MS2840A-020	3.6 GHz Vector Signal Generator	Option
MS2840A-021	6 GHz Vector Signal Generator	Option
MS2840A-022	Low Power Extension for Vector Signal Generator	Option
MS2840A-027	ARB Memory Upgrade 256 Msa for Vector Signal Generator	Option
MS2840A-028	AWGN	Option
MS2840A-029	Analog Function Extension for Vector Signal Generator	Option, Requires Analog Measurement Software MX269018A, USB Audio A0086D and Low Power Extension for Vector Signal Generator MS2840A-022
MS2840A-088	3.6 GHz Analog Signal Generator	Option, Requires Analog Measurement Software MX269018A and USB Audio A0086D

The following options are installed as standard and do not require separate orders when ordering the MS2840A-040/041.

Standard Software	MX269000A
Analysis Bandwidth 10 MHz	MS2840A-006
Bandwidth Extension to 31.25 MHz	MS2840A-005

Order the following combination when installing the Vector Signal Generator and Analog Signal Generator in a new order:
MS2840A-020 or 021 + MS2840A-022 + MS2840A-029

List of Retrofit Options

The following hardware options can be retrofitted. Add to the retrofit options at ordering and also order the Z1932A Retrofit Kit.
The M2840A main unit must be returned to Anritsu for retrofitting hardware options.

Model	Name	Remarks
MS2840A-101	Rubidium Reference Oscillator Retrofit	
MS2840A-102	High Stability Reference Oscillator Retrofit	
MS2840A-177	Analysis Bandwidth Extension to 62.5 MHz Retrofit	
MS2840A-178	Analysis Bandwidth Extension to 125 MHz Retrofit	Requires Analysis Bandwidth Extension to 62.5 MHz MS2840A-077 (or 177)
MS2840A-108	Preamplifier Retrofit	Frequency Range: 100 kHz to 6 GHz
MS2840A-110	Phase Noise Measurement Function Retrofit	
MS2840A-111	2ndary SSD Retrofit	
MS2840A-114 MS2840A-214	Removable SSD, Win10 Retrofit	When retrofitting the MS2840A-114/214, the MS2840A main unit without the removed SSD can be returned to Anritsu. The CPU/Windows10 Upgrade Retrofit MS2840A-182/282 option is required when the MS2840A OS is not Windows 10.
MS2840A-116	Precompliance EMI Function Retrofit	
MS2840A-117	Noise Figure Measurement Function Retrofit	Preamplifier MS2840A-008 (or 108) recommended
MS2840A-126	BER Measurement Function Retrofit	AUX Conversion Adapter J1566A as standard accessory
MS2840A-151	Noise Floor Reduction Retrofit	Option
MS2840A-166	Low Phase Noise Performance Retrofit	
MS2840A-120	3.6 GHz Vector Signal Generator Retrofit	
MS2840A-121	6 GHz Vector Signal Generator Retrofit	
MS2840A-122	Low Power Extension for Vector Signal Generator Retrofit	
MS2840A-127	ARB Memory Upgrade 256 Msa for Vector Signal Generator Retrofit	
MS2840A-128	AWGN Retrofit	
MS2840A-129	Analog Function Extension for Vector Signal Generator Retrofit	Requires Analog Measurement Software MX269018A, USB Audio A0086D and Low Power Extension for Vector Signal Generator MS2840A-022 (or 122)
MS2840A-188	3.6 GHz Analog Signal Generator Retrofit	Requires Analog Measurement Software MX269018A and USB Audio A0086D
MS2840A-189	Vector Function Extension for Analog Signal Generator Retrofit	
MS2840A-182 MS2840A-282	CPU/Windows10 Upgrade Retrofit	

Option 2xx is the option for customers to upgrade at their nearest local service center outside Japan.

Software

The following software can be retrofitted. Add to the required software at ordering and also order the Z1932A Retrofit Kit.

Model	Name	Remarks
MX269017A	Vector Modulation Analysis Software	
MX269017A-001	APSK Analysis	Requires Vector Modulation Analysis Software MX269017A
MX269017A-011	Higher-Order QAM Analysis	Requires Vector Modulation Analysis Software MX269017A
MX269018A	Analog Measurement Software	Requires USB Audio A0086D
MX269902A	TDMA IQproducer	
MX269904A	Multi-Carrier IQproducer	

Signal Analyzer MS2840A series (3.6 GHz/6 GHz models) Configurations

Hardware Configuration

Frequency range (MS2840A-040/041/044/046) not upgradable.

✓ = Can be installed, No = Cannot be installed, R = Require, U = Upgrade

Opt.	Name	Retrofit	Addition to Main unit				Combination with "Opt." (Refer to the left line)																																
			040 (3.6 GHz)	041 (6 GHz)	044 (26.5 GHz)	046 (44.5 GHz)	001	002	005 (standard install)	006 (standard install)	009 (standard install)	077	078	008	069	068	019	010	011	014	016	017	026	051	066	067	020	021	189	022	027	028	088	029	182
001	Rubidium Reference Oscillator	Yes	✓	✓	✓	✓		*5																											
002	High Stability Reference Oscillator	Yes	✓	✓	Equivalent function installed		*5				No				No	No	No									No									
005	Analysis Bandwidth Extension to 31.25 MHz	–	Standard install	Standard install	Standard install	No					No					No																		
006	Analysis Bandwidth 10 MHz	–	Standard install	Standard install	Standard install	Standard install																													
009	Bandwidth Extension to 31.25 MHz for Millimeter-wave	–	No	No	No	Standard install		No	No																No		No	No	No	No	No	No	No	No	No
077	Analysis Bandwidth Extension to 62.5 MHz*1	Yes	✓	✓	✓	✓																													
078	Analysis Bandwidth Extension to 125 MHz*1	Yes	✓	✓	✓	✓						R																							
008	Preamplifier	Yes	✓	✓	✓	✓									*6	*6																			
069	26.5 GHz Microwave Preamplifier	Yes	No	No	✓	No		No			No			*6		No									No		No	No	No	No	No	No	No	No	No
068	Microwave Preamplifier	Yes	No	No	No	✓		No		No				*6	No										No		No	No	No	No	No	No	No	No	No
019	2 dB Step Attenuator for Millimeter-wave	Yes	No	No	No	✓		No		No					No										No		No	No	No	No	No	No	No	No	No
010	Preamplifier	Yes	✓	✓	✓	✓																													
011	2ndary SSD	Yes	✓	✓	✓	✓																													
014	Removable SSD, Win10	Yes*7	✓	✓	✓	✓																													
016	Precompliance EMI Function	Yes	✓	✓	✓	✓																													
017	Noise Figure Measurement Function	Yes	✓	✓	✓	✓								U	U	U																			
026	BER Measurement Function	Yes	✓	✓	✓	✓																													
051	Noise Floor Reduction	Yes	✓	✓	✓	✓																													
066	Low Phase Noise Performance	Yes	✓	✓	No	No					No				No	No										No									
067	Microwave Preselector Bypass	Yes	No	No	✓	✓		No																	No		No	No	No	No	No	No	No	No	No
020	3.6 GHz Vector Signal Generator	Yes	✓	✓	No	No					No				No	No										No		No	No				No		
021	6 GHz Vector Signal Generator	Yes	✓	✓	No	No					No				No	No										No	No		No				No		
189	Vector Function Extension for Analog Signal Generator Retrofit	Yes	✓	✓	No	No					No				No	No										No	No	No		No			R	No	
022	Low Power Extension for Vector Signal Generator	Yes	✓	✓	No	No					No				No	No										No	R		No				No		
027	ARB Memory Upgrade 256 Msa for Vector Signal Generator*2	Yes	✓	✓	No	No					No				No	No										No		R							
028	AWGN*2	Yes	✓	✓	No	No					No				No	No										No		R							
088	3.6 GHz Analog Signal Generator*3	Yes	✓	✓	No	No					No				No	No										No	No	No		No				No	
029	Analog Function Extension for Vector Signal Generator*3	Yes	✓	✓	No	No					No				No	No										No	R		No	R			No		
182	CPU/Windows10 Upgrade Retrofit*4	Yes	✓	✓	✓	✓																													

*1: An image response is received when setting the bandwidth to more than 31.25 MHz.
This can be used when not inputting a signal frequency outside the MS2840A analysis bandwidth (125 MHz max.).
The Signal Analyzer MS2850A is recommended for other measurement purposes.

*2: The ARB Memory Upgrade 256 Msa for Vector Signal Generator (MS2840A-027) and AWGN (MS2840A-028) are non-functional in the Analog Signal Generator (MS2840A-029/088).

*3: Requires Analog Measurement Software (MX269018A).

*4: Replace the MS2840A CPU board with Windows Embedded Standard 7 (Windows 7) and upgrade the operating system to Windows 10 IoT Enterprise LTSC2019.
Windows 7 is installed in MS2840A units ordered until August 2020.
Windows 10 is installed in MS2840A units ordered from September 2020 and has a label indicating C2 attached near the serial number.

*5: The Rubidium Reference Oscillator can be retrofitted to the MS2840A-040/041 with installed High Stability Reference Oscillator.
In this case, the Rubidium Reference Oscillator is functional.

*6: The 26.5 GHz Microwave Preamplifier or Microwave Preamplifier can be retrofitted to the MS2840A-044/046 with installed Preamplifier.
In this case, the 26.5 GHz Microwave Preamplifier or Microwave Preamplifier are functional.

*7: The CPU/Windows10 Upgrade Retrofit MS2840A-182/282 option is required when the MS2840A OS is not Windows 10.

Software Configuration

✓ = Can be installed, No = Cannot be installed, R = Require, U = Upgrade

Model	Name	Addition to Main unit				Analysis Bandwidth	
		040 (3.6 GHz)	041 (6 GHz)	044 (26.5 GHz)	046 (44.5 GHz)	077 (62.5 MHz)	078 (125 MHz)
MX269017A	Vector Modulation Analysis Software	✓	✓	✓	✓	✓	✓
MX269017A-001	APSK Analysis	✓	✓	✓	✓	✓	✓
MX269017A-011	Higher-Order QAM Analysis	✓	✓	✓	✓	✓	✓
MX269018A	Analog Measurement Software*	✓	✓	✓	✓		
MX284059B	Pulse Radar Measurement Function	No	No	✓	✓		

*: Requires USB Audio A0086D

Refer to the MS2840A Data Sheet for more details.

Frequency Range
9 kHz to 3.6 GHz (MS2840A-040)
9 kHz to 6 GHz (MS2840A-041)

Aging Rate
$\pm 1 \times 10^{-6}$/year (Standard)
$\pm 1 \times 10^{-7}$/year
(with High Stability Reference Oscillator MS2840A-002 installed)
$\pm 1 \times 10^{-10}$/month, $\pm 1 \times 10^{-9}$/year
(with Rubidium Reference Oscillator MS2840A-001 installed)

Maximum Input Level
Average total power: +30 dBm
(Input attenuator: ≥10 dB, Preamp: Off)

Resolution Bandwidth (RBW)
Spectrum Analyzer Function
Setting Range:
1 Hz to 3 MHz (1–3 sequence), 500 Hz, 50 kHz, 2 MHz, 5 MHz, 10 MHz, 20 MHz
[At Zero SPAN: 30 Hz to 3 MHz (1–3 sequence), 50 kHz, 5 MHz, 10 MHz, 20 MHz, 31.25 MHz]
Signal Analyzer Function
Setting Range:
1 Hz to 1 MHz (1–3 sequence)

Video Bandwidth (VBW)
Spectrum Analyzer Function
Setting Range:
1 Hz to 3 kHz (1-3 sequence), 5 kHz, 10 kHz to 10 MHz (1-3 sequence), off
VBW Mode: Video Average, Power Average

SSB Phase Noise
Spectrum Analyzer Function

Carrier Offset	SSB Phase Noise	
	Standard	Low Phase Noise Performance MS2840A-066 installed
	Center Frequency: 1 GHz	Center Frequency: 500 MHz
10 Hz	–80 dBc/Hz (nom.)	—
100 Hz	–92 dBc/Hz (nom.)	–98 dBc/Hz (nom.)
1 kHz	–117 dBc/Hz (nom.)	–122 dBc/Hz
10 kHz	–123 dBc/Hz	–133 dBc/Hz
100 kHz	–123 dBc/Hz	–133 dBc/Hz
1 MHz	–135 dBc/Hz	–148 dBc/Hz (nom.)
10 MHz	–148 dBc/Hz (nom.)	—

Display Average Noise Level (DANL)
Spectrum Analyzer Function
Preamp: None, Low Phase Noise: None

Frequency	DANL
30 MHz	–153 dBm/Hz
400 MHz	–153 dBm/Hz
1 GHz	–151 dBm/Hz
3 GHz	–149 dBm/Hz
6 GHz	–146 dBm/Hz

Preamp: On, Low Phase Noise: None

Frequency	DANL
30 MHz	–166 dBm/Hz
400 MHz	–166 dBm/Hz
1 GHz	–165 dBm/Hz
3 GHz	–164 dBm/Hz
6 GHz	–161 dBm/Hz

Noise Floor Reduction: On

It subtracts the internal noise components (11 dB max. nominal) of the measuring instrument itself from the displayed measurement result.

Total Absolute Amplitude Accuracy
Preamp: None
±0.5 dB (300 kHz ≤ f < 4 GHz)
±1.8 dB (4 GHz ≤ f < 6 GHz)

The MS2840A supports level calibration over a wide range of 300 kHz to 4 GHz using its built-in level calibration oscillator.
The level accuracy standards include frequency characteristics, linearity and attenuator switching error. Consequently, the level including the above three errors can still be measured accurately even when the measurement frequency and built-in attenuator settings are changed.

2-tone 3rd-order Intermodulation Distortion
Preamp: None

Frequency	2-tone 3rd-order Intermodulation Distortion
30 GHz	≤–54 dBc (TOI = +12 dBm)
400 GHz, 1 GHz, 3 GHz	≤–62 dBc (TOI = +16 dBm)
6 GHz	≤–60 dBc (TOI = +15 dBm)

Second Harmonic Distortion
Preamp: None

Input Frequency	Harmonic Distortion	SHI	Mixer Input Level
30 GHz	≤–60 dBc	≥+30 dBm	–30 dBm
400 MHz, 1 GHz	≤–65 dBc	≥+35 dBm	–30 dBm
3 GHz	≤–80 dBc	≥+60 dBm	–20 dBm

Analysis Bandwidth (Signal Analyzer Function)
31.25 MHz (standard)
62.5 GHz (Option)
125 MHz (Option)

Built-in Signal Generator

Vector Signal Generator (MS2840A-020/021)

Frequency Range
250 kHz to 3.6 GHz (MS2840A-020)
250 kHz to 6 GHz (MS2840A-021)
Output Level
–40 to +20 dBm (>25 MHz) (Standard)
–40 to +2 dBm (≤25 MHz) (Standard)
–136 to +15 dBm (>25 MHz) (with MS2840A-022 installed)
–136 to –3 dBm (≤25 MHz) (with MS2840A-022 installed)

Analog Signal Generator (MS2840A-088)

Frequency Setting Range
100 kHz to 3 GHz
Output Setting Level
–127 to +15 dBm (>25 MHz)
–127 to –3 dBm (≤25 MHz)

Shared

Output Level Accuracy (at CW)
±0.5 dB (typ.)
(–110 dBm ≤ level ≤ +4 dBm, 100 MHz ≤ Frequency < 375 MHz)
±0.5 dB
(–110 dBm ≤ level ≤ +4 dBm, 375 MHz ≤ Frequency ≤ 3.6 GHz)

Connector

RF Input (Front panel)
N–J, 50Ω (nom.): 3.6 GHz and 6 GHz models (MS2840A-040/041)
RF Output (Front panel)
N–J, 50Ω (nom.): Built-in Signal Generator (MS2840A-020/021/088)

Dimensions and Mass

426 (W) × 177 (H) × 390 (D) mm (excluding projections)
≤14.5 kg (with either MS2840A-040 or -041 installed, and either MS2840A-020 or -021 installed, excluding other options)

Power Supply

Power voltage: 100 V(ac) to 120 V(ac)/200 V(ac) to 240 V(ac)
Frequency: 50 Hz to 60 Hz
Power consumption:
≤350 VA (including all options)
140 VA (nom.)
(with MS2840A-040 or -041 installed, excluding other options)
220 VA (nom.)
(with either MS2840A-040 or -041 installed, and either MS2840A-020 or -021 installed excluding other options)

CE Marking

EMC: 2014/30/EU, EN61326-1, EN61000-3-2
LVD: 2014/35/EU, EN61010-1
RoHS: 2011/65/EU, (EU) 2015/863, EN IEC 63000: 2018

UKCA Marking

EMC: S.I. 2016 No.1091, EN 61326-1, EN61000-3-2
LVD: S.I. 2016 No.1101, EN 61010-1
RoHS: S.I. 2012 No.3032, EN IEC 63000:2018

OS

Windows 10 (64 bits)

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Typical (typ.): Performance not warranted. Most products meet typical performance.
Nominal (nom.): Values not warranted. Included to facilitate application of product.
Measured (meas.): Performance not warranted. Data actually measured from randomly selected measuring instruments.

Ordering Information

Signal Analyzer MS2840A series (3.6 GHz/6 GHz models)

Please specify the model/order number, name and quantity when ordering.
The names listed in the chart below are Order Names. The actual name of the item may differ from the Order Name.

Model/Order No.	Name	
	Main Unit	
MS2840A	Signal Analyzer	
	Standard Accessories	
	Power Cord:	1 pc
P0031A	USB Memory (≥1 GB):	1 pc
Z0541A	USB Mouse:	1 pc
	Install DVD-ROM (Application software, instruction manual DVD-ROM):	1 pc
	Options	
MS2840A-040	3.6 GHz Signal Analyzer	
MS2840A-041	6 GHz Signal Analyzer	
MS2840A-001	Rubidium Reference Oscillator	
MS2840A-002	High Stability Reference Oscillator	
MS2840A-077	Analysis Bandwidth Extension to 62.5 MHz	
MS2840A-078	Analysis Bandwidth Extension to 125 MHz (Requires MS2840A-077)	
MS2840A-008	Preamplifier	
MS2840A-010	Phase Noise Measurement Function	
MS2840A-011	2ndary SSD	
MS2840A-014	Removable SSD, Win10	
MS2840A-016	Precompliance EMI Function	
MS2840A-017	Noise Figure Measurement Function	
MS2840A-026	BER Measurement Function (AUX Conversion Adapter J1556A as standard accessory)	
MS2840A-051	Noise Floor Reduction	
MS2840A-066	Low Phase Noise Performance	
MS2840A-020	3.6 GHz Vector Signal Generator	
MS2840A-021	6 GHz Vector Signal Generator	
MS2840A-022	Low Power Extension for Vector Signal Generator	
MS2840A-027	ARB Memory Upgrade 256 MSa for Vector Signal Generator	
MS2840A-028	AWGN	
MS2840A-029	Analog Function Extension for Vector Signal Generator	
MS2840A-088	3.6 GHz Analog Signal Generator	
	Retrofit Options	
MS2840A-101	Rubidium Reference Oscillator Retrofit	
MS2840A-102	High Stability Reference Oscillator Retrofit	
MS2840A-177	Analysis Bandwidth Extension to 62.5 MHz Retrofit	
MS2840A-178	Analysis Bandwidth Extension to 125 MHz Retrofit (Requires MS2840A-077 or 177)	
MS2840A-108	Preamplifier Retrofit	
MS2840A-110	Phase Noise Measurement Function Retrofit	
MS2840A-111	2ndary SSD Retrofit	
MS2840A-114*1	Removable SSD, Win10 Retrofit	
MS2840A-214*1	Removable SSD, Win10 Retrofit	
MS2840A-116	Precompliance EMI Function Retrofit	
MS2840A-117	Noise Figure Measurement Function Retrofit	
MS2840A-126	BER Measurement Function Retrofit (AUX Conversion Adapter J1556A as standard accessory)	
MS2840A-151	Noise Floor Reduction Retrofit	
MS2840A-166	Low Phase Noise Performance Retrofit	
MS2840A-120	3.6 GHz Vector Signal Generator Retrofit	
MS2840A-121	6 GHz Vector Signal Generator Retrofit	
MS2840A-122	Low Power Extension for Vector Signal Generator Retrofit	
MS2840A-127	ARB Memory Upgrade 256 MSa for Vector Signal Generator Retrofit	
MS2840A-128	AWGN Retrofit	
MS2840A-129	Analog Function Extension for Vector Signal Generator Retrofit	
MS2840A-188	3.6 GHz Analog Signal Generator Retrofit	
MS2840A-189	Vector Function Extension for Analog Signal Generator Retrofit	
MS2840A-182	CPU/Windows10 Upgrade Retrofit	
MS2840A-282	CPU/Windows10 Upgrade Retrofit	
	Software Options	
	DVD-ROM with License and Operation manuals	
MX269017A	Vector Modulation Analysis Software	
MX269017A-001	APSK Analysis	
MX269017A-011	Higher-Order QAM Analysis	
MX269018A	Analog Measurement Software (Requires USB Audio A0086D)	
MX269902A	TDMA IQproducer	
MX269904A	Multi-Carrier IQproducer	

Model/Order No.	Name
	Warranty Service
MS2840A-ES210	2 years Extended Warranty Service
MS2840A-ES310	3 years Extended Warranty Service
MS2840A-ES510	5 years Extended Warranty Service
	Manuals
	Following operation manuals provided as hard copy
W3812AE	MS2840A Operation Manual (Main Unit Operation)
W2851AE	MS2690A/MS2691A/MS2692A and MS2830A/MS2840A/MS2850A Operation Manual (Main Unit Remote Control)
W3335AE	MS2830A/MS2840A/MS2850A Operation Manual (Signal Analyzer Function Operation)
W2853AE	MS2690A/MS2691A/MS2692A and MS2830A/MS2840A/MS2850A Operation Manual (Signal Analyzer Function Remote Control)
W3336AE	MS2830A/MS2840A/MS2850A Operation Manual (Spectrum Analyzer Function Operation)
W2855AE	MS2690A/MS2691A/MS2692A and MS2830A/MS2840A/MS2850A Operation Manual (Spectrum Analyzer Function Remote Control)
W3117AE	MS2690A/MS2691A/MS2692A and MS2830A/MS2840A/MS2850A Operation Manual (Phase Noise Measurement Function Operation)
W3118AE	MS2690A/MS2691A/MS2692A and MS2830A/MS2840A/MS2850A Operation Manual (Phase Noise Measurement Function Remote Control)
W3655AE	MS2690A/MS2691A/MS2692A and MS2830A/MS2840A/MS2850A Operation Manual (Noise Figure Measurement Function Operation)
W3656AE	MS2690A/MS2691A/MS2692A and MS2830A/MS2840A/MS2850A Operation Manual (Noise Figure Measurement Function Remote control)
W3337AE	MS2830A/MS2840A -020/021 Vector Signal Generator Operation Manual (Operation)
W3338AE	MS2830A/MS2840A -020/021 Vector Signal Generator Operation Manual (Remote Control)
W2914AE	MS2690A/MS2691A/MS2692A and MS2830A/MS2840A Vector Signal Generator Operation Manual (IQproducer)
W2929AE	MS2690A/MS2691A/MS2692A and MS2830A/MS2840A Vector Signal Generator Operation Manual (Standard Waveform Pattern)
W3305AE	MX269017A Operation Manual (Operation)
W3306AE	MX269017A Operation Manual (Remote Control)
W3555AE	MX269018A Operation Manual (Operation)
W3556AE	MX269018A Operation Manual (Remote Control)
W2916AE	MX269902A Operation Manual
W2917AE	MX269904A Operation Manual

The following options are installed as standard and do not require separate orders when ordering the MS2840A-040/041.

Standard Software	MX269000A
Analysis Bandwidth 10 MHz	MS2840A-006
Bandwidth Extension to 31.25 MHz	MS2840A-005

Option 2xx is the option for customers to upgrade at their nearest local service center outside Japan.

Requires Installation Kit Z1932A when retrofitting options or installing software.

The instruction manuals are published on our website except some.

*1: The CPU/Windows10 Upgrade Retrofit MS2840A-182/282 option is required when the MS2840A OS is not Windows 10.

Ordering Information

Signal Analyzer MS2840A series (3.6 GHz/6 GHz models)

Model/Order No.	Name
	Application Parts
34AKNF50	Ruggedized K-to-Type N Adapter (DC to 20 GHz, 50Ω, Ruggedized K-M · N-F, SWR: 1.5 (max.), Insertion Loss: 0.4 dB (max.))
J1398A	N-SMA Adaptor (DC to 26.5 GHz, 50Ω, N-P · SMA-J)
J0004	Coaxial Adapter (DC to 12.4 GHz, 50Ω, N-P · SMA-J)
J1359A	Coaxial Adaptor (K-P · K-J, SMA)
J0576B	Coaxial Cord, 1 m (N-P · 5D-2W · N-P)
J0576D	Coaxial Cord, 2 m (N-P · 5D-2W · N-P)
J0127A	Coaxial Cord, 1 m (BNC-P · RG58A/U · BNC-P)
J0127B	Coaxial Cord, 2 m (BNC-P · RG58A/U · BNC-P)
J0127C	Coaxial Cord, 0.5 m (BNC-P · RG58A/U · BNC-P)
J0322A	Coaxial Cord, 0.5 m (DC to 18 GHz), (SMA-P · 50Ω SUCOFLEX104 · SMA-P)
J0322B	Coaxial Cord, 1 m (DC to 18 GHz), (SMA-P · 50Ω SUCOFLEX104 · SMA-P)
J0322C	Coaxial Cord, 1.5 m (DC to 18 GHz), (SMA-P · 50Ω SUCOFLEX104 · SMA-P)
J0322D	Coaxial Cord, 2 m (DC to 18 GHz), (SMA-P · 50Ω SUCOFLEX104 · SMA-P)
J0912	Coaxial Cable, 0.5 m for 40 GHz (DC to 40 GHz, approx. 0.5 m, SF102A, 11K254/K254/0.5M)
J0805	DC Block, N type (MODEL 7003) (10 kHz to 18 GHz, N-P · N-J)
J1555A	DC Block, SMA type (MODEL 7006-1) (9 kHz to 20 GHz, SMA-P · SMA-J)
K261	DC Block (10 kHz to 40 GHz, K-P · K-J)
K240B	Power Divider (K connector, DC to 26.5 GHz, 50Ω, K-J, 1 W max.)
J1640A	Resistive Power Tap (DC to 3000 MHz, Maximum Allowable Power: 16 W)
G0392A	High Pass Filter (PassBand >90 MHz)
G0393A	High Pass Filter (PassBand >225 MHz)
G0394A	High Pass Filter (PassBand >395 MHz)
1030-151-R	Filter, Hi-Pass, 700 MHz, N (m) to N (f), 50Ω
41KC-3	Fixed Attenuator (DC to 40 GHz, 3 dB)
J0395	FIXED ATTENUATOR FOR HIGH POWER (30 dB) (DC to 9 GHz, N-type, Maximum Allowable Power: 30 W)
B0472*2	FIXED ATTENUATOR FOR HIGH-POWER (30 dB, DC to 18 GHz, Maximum Allowable Power: 100 W)
J1750A	10 dB Fixed Attenuator (DC to 18 GHz, Input Power <5 W)
J1751A	20 dB Fixed Attenuator (DC to 18 GHz, Input Power <5 W)
J1752A	30 dB Fixed Attenuator (DC to 18 GHz, Input Power <5 W)
J1753A	3 dB Fixed Attenuator (DC to 18 GHz, Input Power <5 W)
J1754A	6 dB Fixed Attenuator (DC to 18 GHz, Input Power <5 W)
J1755A	Termination (50Ω, Type N, DC to 18 GHz)
J1261A	Ethernet Cable (Shield type, Straight, 1 m)
J1261B	Ethernet Cable (Shield type, Straight, 3 m)
J1261C	Ethernet Cable (Shield type, Cross, 1 m)
J1261D	Ethernet Cable (Shield type, Cross, 3 m)
J0008	GPIB Cable, 2.0 m
J1556A	AUX Conversion Adapter (AUX → BNC, for vector signal generator option and BER measurement function option, standard accessory with BER Measurement Function MS2840A-026)
A0086D	USB Audio (for MX269018A)
B0635A	Rack Mount Kit (EIA)
B0657A	Rack Mount Kit (JIS)
B0636C*3	Carrying Case (Hard type, with casters)
B0671A*3	Front Cover for 1MW4U

Model/Order No.	Name
MA24105A	Inline Peak Power Sensor (350 MHz to 4 GHz, with USB A to mini B cable)
MA24106A	USB Power Sensor (50 MHz to 6 GHz, with USB A to mini B cable)
MA24108A	Microwave USB Power Sensor (10 MHz to 8 GHz, with USB A to Micro-B cable)
MA24118A	Microwave USB Power Sensor (10 MHz to 18 GHz, with USB A to Micro-B cable)
MA24126A	Microwave USB Power Sensor (10 MHz to 26 GHz, with USB A to Micro-B cable)
Z1932A	Installation Kit

*2: RoHS non-compliant product
Cannot be shipped to the EU, UK and EFTA.
*3: The Carrying Case B0636C includes the Front Panel Protective Cover (B0671A).

AUX Conversion Adapter J1556A

Carrying Case B0636C (Hard type, with casters)

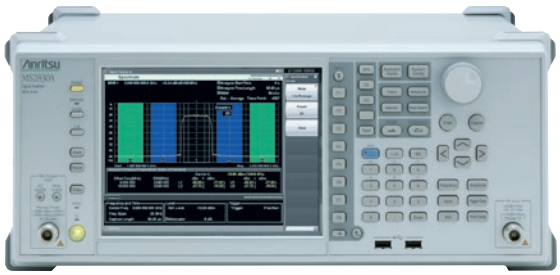
Front Cover for 1MW4U B0671A

USB Power Sensor MA24108A

Signal Analyzer MS2840A series (3.6 GHz/6 GHz models) Related Products

Signal Analyzer MS2830A
9 kHz to 3.6 GHz/6 GHz/13.5 GHz/26.5 GHz/43 GHz

This middle-range multi-function signal analyzer/spectrum analyzer has excellent cost performance.



Features
- Various measurement software for modulation analysis of digital (LTE/LTE-Advanced, WLAN, etc.) and analog (FM, ΦM, AM) devices.
- Built-in vector signal generator and analog signal generator options for all-in-one evaluations of digital and analog transmitters using Noise Factor (NF) measurement function, BER measurement function, audio analyzer, etc.
- Built-in vector signal generator for reproducing on-site waveform measurement environment using capture and playback functions.

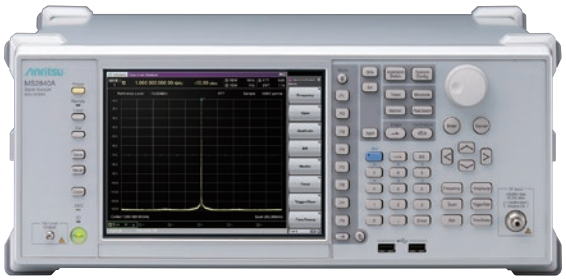
Signal Analyzer MS2850A
9 kHz to 32 GHz/44.5 GHz

The MS2850A is a spectrum analyzer/signal analyzer with 1 GHz (max.) analysis bandwidth and frequency range of 9 kHz to either 32 GHz or 44.5 GHz. The MS2850A contributes to reducing cost in R&D and manufacturing for micro/millimeter-wave and wideband communications systems, such as 5G and satellite communication.
The MS2850A is available with built-in 5G Measurement Software and it has 1 GHz (max.) analysis bandwidth, excellent amplitude/phase flatness and high measurement dynamic range. Moreover, it realizes shortening of measurement time by analyzing modulation bandwidth 800 MHz signal (1 carrier 100 MHz × 8 carriers) simultaneously.

Features
- Analysis bandwidth:
  255 MHz (Standard), 510 MHz (Option), 1 GHz (Option)
- EVM performance: <1% (100 MHz bandwidth of 5G single carrier at Center Frequency: 28 GHz)
- Phase flatness performance: (±500 MHz at Center Frequency: 28 GHz)
  In-band Frequency Characteristics: ±1.2 dB (nom.)
  In-band Phase Linearity: 5 deg. p-p (nom.)
- Measurement applications (option):
  5G measurement, LTE/LTE-Advanced, Vector Modulation, etc.

Signal Analyzer MS2840A (26.5 GHz/44.5 GHz models)
9 kHz to 26 .5 GHz/44.5 GHz

The MS2840A series (26.5 GHz/44.5 GHz models) is a mid-range spectrum analyzer/signal analyzer with excellent narrow-band performance for mm-Wave measurements.



Features
- Same excellent phase noise performance and display average noise level (DANL) as 3.6 GHz/6 GHz models
- Various options such as NF measurement function, phase noise measurement function, vector modulation analysis, analog modulation (FM,ΦM,AM) analysis, etc.

Note

Note

Note

Anritsu Advancing beyond

Specifications are subject to change without notice.

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