

Anritsu envision : ensure

Spectrum Master™ Ultraportable Spectrum Analyzer

MS2760A

9 kHz up to 110 GHz



Introduction

From Anritsu, the inventor of the handheld spectrum analyzer first introduced in 1999, we are proud to introduce our first generation MS2760A Spectrum Master – Ultraportable Spectrum Analyzer. By utilizing Anritsu's patented shockline nonlinear transmission line (NLTL) technology, the MS2760A shatters the cost, size, and performance barriers associated with traditional large form-factor instruments to more efficiently advance technology development. The MS2760A is truly pocket sized, but big on performance with industry leading dynamic range, sweep speed, and amplitude accuracy.

Its ultraportable size enables direct connect to almost any DUT, eliminating the need for lossy, expensive cables or antennas. The MS2760A is the world's first handheld millimeter-wave spectrum analyzer to provide continuous coverage from 9 kHz up to 110 GHz, positioning it perfectly for growing millimeter-wave applications like 5G, 802.11ad, satellite communications, automotive radar, and more. The MS2760A is USB-powered and controlled from a Windows-based PC, laptop, or tablet, making it uniquely flexible for use in the lab, on the manufacturing floor, or in the field.

Spectrum Analyzer Highlights

- Measure: Channel Power, Adjacent Channel Power, Occupied Bandwidth
- Dynamic Range: > 103 dB from 6.15 GHz up to 110 GHz
- DANL: -124 dBm up to 110 GHz
- Resolution Bandwidth (RBW): 10 Hz to 3 MHz
- Phase Noise: -116 dBc/Hz @ 1GHz
- Up to Six Traces, Three Trace Detectors, 12 Markers
- I/O: External 10 MHz Frequency Reference

US Patents

The MS2760A is protected by the following US patents: 6,894,581; 7,683,633; 8,417,189; 9,287,604

Specifications

MS2760A

Table of Contents

Definitions.....	3
Spectrum Analyzer	4
Smart Measurements	4
Setup Parameters	4
Sweep Functions	4
Trace Functions	4
Marker Functions.....	4
Limit Line Functions	4
Frequency	4
Bandwidth.....	4
Spectral Purity – SSB Phase Noise.....	5
Amplitude Ranges	5
Amplitude Accuracy.....	5
Displayed Average Noise Level (DANL)	5
Spurs	5
Third-Order Intercept (TOI)	5
Second Harmonic Distortion	5
Input Match	5
General Specifications	6
Setup Parameters	6
Connectors	6
Computer Requirement	6
Environmental	6
Electromagnetic Compatibility	6
Warranty.....	6
Size and Weight	6
Ordering Information – Options.....	7
Standard Accessories	7
Manuals.....	7
Optional Accessories.....	8
Coaxial Adapters	8
Precision Fixed Attenuators	8
Precision Waveguide Coaxial Adapters	8
Waveguide to Coaxial End Launch Adapters.....	8
Directional Horn Antennas.....	9
Test Port Cables (Armored, Semi-rigid)	9
USB Cable Extender.....	9

Definitions

All specifications and characteristics apply to Revision 1 instruments under the following conditions, unless otherwise stated:

- After 5 minutes of warm-up time, where the instrument is left in the ON state
- When using the internal reference signal

Typical Specifications	Typical specifications are not tested and not warranted. They are generally representative of characteristic performance. The following models have typical specifications in the following ranges: MS2760A-0044: 40 GHz to 44 GHz typical. MS2760A-0070: 67 GHz to 70 GHz typical.
Preliminary Specifications	All specifications above 70 GHz are preliminary. Preliminary specifications are not warranted and are subject to change.
Calibration Cycle	Recommended calibration cycle is 12 months.
Time Base Error	Input Frequency × Frequency Reference Error All specifications subject to change without notice. For the most current data sheet, please visit www.anritsu.com

MS2760A

Specifications



Spectrum Analyzer

Smart Measurements

Channel Power	Measures the total power in a specified bandwidth
Occupied Bandwidth	Measures 99 % to 1 % power channel of a signal
Adjacent Channel Power	Measures channel power of the adjacent channel

Setup Parameters

Frequency	Center/Start/Stop, Span, Span Up/Down (1-2-5), Frequency Step, Frequency Offset
Span	Span, Span Up/Down (1-2-5), Full Span, Last Span
Bandwidth	RBW, Auto RBW, VBW, Auto VBW, RBW/VBW, Span/RBW
Amplitude	Reference Level, Scale / Division, Ref Level Offset

Sweep Functions

Sweep	Single/Continuous, Restart, Sweep Once, Sweep to N
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Trace Functions

Traces	Up to six traces
Trace Type	Clear / Write, Trace Average, Max Hold, Min Hold, Rolling Average, Rolling Max Hold, Rolling Min Hold
Trace Mode	Active, Hold / View, Blank
Detector Type per Trace	Peak, RMS / Avg, Negative

Marker Functions

Markers	Up to 12 Markers
Marker Mode	Normal, Delta, Fixed
Delta Marker	Relative to any Normal or Fixed Marker
Marker Trace	Assign Marker to any Trace
Peak Search	Peak Search, Next Peak, Next Peak Left, Next Peak Right, Next Point Left, Next Point Right
Peak Search Setup	Peak Threshold, Peak Excursion
Marker →	Mkr → Center, Mkr → Ref Level

Limit Line Functions

Limit Setup	Upper/Lower, Limit On/Off, Limit Alarm On/Off, Set Default Limit Line, Absolute/Relative, Mirror On/Off
Limit Line Edit	Frequency, Amplitude, Add Point, Add Vertical, Delete Point, Next Point Left/Right
Limit Line Move	To Current Center Frequency, By dB or Hz, To Marker 1, Offset from Marker 1
Limit Line Envelope	Create Envelope, Update Envelope, Points (41 max), Offset, Shape Square/Slope

Frequency

Frequency Range	(usable to 0 Hz)
MS2760A-0032	9 kHz to 32 GHz
MS2760A-0044	9 kHz to 44 GHz
MS2760A-0050	9 kHz to 50 GHz
MS2760A-0070	9 kHz to 70 GHz
MS2760A-0090	9 kHz to 90 GHz
MS2760A-0110	9 kHz to 110 GHz
Tuning Resolution	1 kHz
Internal 10 MHz Frequency Reference	Aging: ±1.0 ppm/year Accuracy: ±0.2 ppm (25 °C ± 25 °C) + aging
Frequency Span	10 Hz to maximum frequency range of instrument

Bandwidth

Resolution Bandwidth (RBW)	10 Hz to 3 MHz
Video Bandwidth (VBW)	10 Hz to 3 MHz
VBW/Average Type	Linear / Log

Specifications

MS2760A



Spectrum Analyzer (continued)

Spectral Purity – SSB Phase Noise	(dBc/Hz, 20 °C to 30 °C)							
	Offset	1 GHz (typical)	6 GHz (maximum)	6 GHz (typical)	30 GHz (maximum)	30 GHz (typical)	60 GHz (maximum)	60 GHz (typical)
	1 kHz	-100	-80	-88	-66	-74	-60	-69
	10 kHz	-110	-95	-104	-81	-88	-75	-84
	100 kHz	-116	-95	-104	-81	-88	-75	-84

Amplitude Ranges

Dynamic Range	> 103 dB typical at 70 GHz, 2/3 (TOI – DANL) in 1 Hz RBW
Measurement Range	DANL to +20 dBm
Display Range	1 dB to 15 dB/div in 1 dB steps, ten divisions displayed
Reference Level Range	-120 dBm to +30 dBm
Amplitude Units	dBm
Maximum Safe Level Input	+20 dBm peak, ±10 VDC

Amplitude Accuracy

Frequency	20 °C to 30 °C (after 30 minute warm-up)		0 °C to 50 °C (after 60 minute warm-up)	
	maximum (dB)	typical (dB)	maximum (dB)	typical (dB)
9 kHz to 644 MHz	±1.3	±0.5	±2.5	±0.5
> 644 MHz to 40 GHz	±1.8	±0.5	±2.5	±0.5
> 40 GHz to 70 GHz	±2.0	±0.5	±2.5	±0.5
> 70 GHz to 90 GHz	±2.2	-	-	-
> 90 GHz to 110 GHz	±2.5	-	-	-

Displayed Average Noise Level (DANL) (RMS detection, VBW/Avg type = Log, IF Gain On)

Frequency	maximum (dBm)	typical (dBm)
10 MHz to 644 MHz	-131	-134
> 644 MHz to 4 GHz	-136	-140
> 4 GHz to 40 GHz	-131	-134
> 40 GHz to 70 GHz	-128	-132
> 70 GHz to 90 GHz	-127	-130
> 90 GHz to 110 GHz	-124	-127

Spurs

Residual Spurs	maximum (dBm)	typical (dBm)
10 MHz to 70 GHz	-85	-95
70 MHz to 90 GHz	-84	-95
90 MHz to 110 GHz	-81	-95
Input-related Spurious	(< -60 dBc, -10 dBm input, carrier offset > 5 MHz)	
28 MHz	-50 dBc @ 70 MHz	
35 MHz	-50 dBc @ 133 MHz	
770 MHz	-40 dBc @ 3430, 4970, 7630 MHz	
910 MHz	-40 dBc @ 4970, 6790 MHz	

Third-Order Intercept (TOI) (typical, 0 dBm tones 1 MHz apart, 0 dBm reference level)

2 GHz	+35 dBm
18 GHz	+35 dBm

Second Harmonic Distortion (at 1 GHz input)

0 dBm Input	-50 dBc maximum
-20 dBm Input	-60 dBc maximum

Input Match (typical)

Frequency	VSWR	Return Loss
9 kHz to 12.4 GHz	1.29:1	18 dB
> 12.4 GHz to 26.5 GHz	1.43:1	15 dB
> 26.5 GHz to 40 GHz	1.58:1	13 dB
> 40 GHz to 50 GHz	1.67:1	12 dB
> 50 GHz to 70 GHz	2.10:1	9 dB
> 70 GHz to 110 GHz	2.10:1	9 dB

MS2760A

Specifications

General Specifications

Setup Parameters		
System Status	Connected Port, Model, Serial Number, Software Version, Frequency, Options	
Preset	Preset Traces, Preset Markers, Preset Limit Lines, Preset Meas Setup, Preset All	
Save/Recall	Save As, Save (Measurement, Set-up PNG, Limit Line), Recall, Save on Event (Crossing Limit, Sweep Complete, Save at Interval)	
Connectors		
RF In	32 GHz and 44 GHz Instruments: K Connector (2.92 mm), male 50 Ω 50 GHz and 70 GHz Instruments: V Connector (1.85 mm), male 50 Ω 90 GHz and 110 GHz Instruments: W Connector (1.0 mm), male 50 Ω	
USB Interface	USB 3.0, Type C Connector	
External Reference In (Future Use)	MCX(f), 50 Ω , 10 MHz MCX(f), 50 Ω	
Computer Requirement		
Display Resolution	16:9 / 16:10 Aspect Ratio (>1280 x 720 / 1280 x 800)	
Operating System	Windows® 7, 8.1, 10	
Minimum Configuration	Quad Core i7 fourth generation or higher CPU, 16 GB RAM, 128 GB Data Storage, USB 3.0	
Environmental (not including Windows Tablet/Laptop/PC)		
Operating Temperature	-10 °C to 50 °C	
Maximum Humidity	95 % non-condensing	
Vibration, Shock, Temperature, Humidity	MIL-PRF-28800F Class 3	
Storage	-40 °C to 71 °C	
Altitude	4600 meters, operating and non-operating	
Electromagnetic Compatibility (not including Windows Tablet/Laptop/PC)		
European Union	EMC 2014/30/EU, EN 61326-1:2013 RoHS 2011/65/EU Low Voltage 2014/35/EU Safety EN 61010-1:2010	
Australia and New Zealand	RCM AS/NZS 4417.1:2012	
South Korea	KCC-REM-A21-0004	
Warranty		
Duration	Standard three-year warranty	
Size and Weight (not including Windows Tablet/Laptop/PC)		
Size	155 mm x 84 mm x 27 mm (6.1 in x 3.3 in x 1.1 in)	
Weight	255 g (9.0 oz)	

Specifications

MS2760A

Ordering Information – Options

Model Number Description

MS2760A-0032	Ultraportable Spectrum Master, Frequency Range 9 kHz to 32 GHz
MS2760A-0044	Ultraportable Spectrum Master, Frequency Range 9 kHz to 44 GHz
MS2760A-0050	Ultraportable Spectrum Master, Frequency Range 9 kHz to 50 GHz
MS2760A-0070	Ultraportable Spectrum Master, Frequency Range 9 kHz to 70 GHz
MS2760A-0090	Ultraportable Spectrum Master, Frequency Range 9 kHz to 90 GHz
MS2760A-0110	Ultraportable Spectrum Master, Frequency Range 9 kHz to 110 GHz

General Options

MS2760A-0032-0098	
MS2760A-0044-0098	
MS2760A-0050-0098	Standard Calibration (ISO/IEC 17025 and ANSI/NCSL Z540-1)
MS2760A-0070-0098	
MS2760A-0090-0098	
MS2760A-0110-0098	
MS2760A-0110-0098	
MS2760A-0032-0099	
MS2760A-0044-0099	
MS2760A-0050-0099	Premium Calibration (ISO/IEC 17025 and ANSI/NCSL Z540-1 plus test data)
MS2760A-0070-0099	
MS2760A-0090-0099	
MS2760A-0110-0099	
MS2760A-0110-0099	

Standard Accessories (Included with instrument)

Part Number Description

2300-1859-R	USB 3.0 Type C to Type A Cable
2300-1605-R	BNC(m) to MCX(m) Cable (qty 2)
	Certificate of Calibration and Conformance

Manuals (available at www.anritsu.com)

Part Number Description

10580-00427	User Guide
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Optional Accessories

Coaxial Adapters



Part Number Description

- 2000-1880-R DC to 18 GHz, N(m) to V(f), 50 Ω
- 2000-1881-R DC to 18 GHz, N(f) to V(f), 50 Ω
- 34VFK50 DC to 40 GHz, V(f) to K(m), 50 Ω
- 34VFKF50 DC to 40 GHz, V(f) to K(f), 50 Ω
- 34VV50 DC to 65 GHz, V(m) to V(m), 50 Ω
- 34VVF50 DC to 65 GHz, V(f) to V(m), 50 Ω
- 34VVF50 DC to 65 GHz, V(f) to V(f), 50 Ω

Precision Fixed Attenuators



Part Number Description

- 41KB-3 DC to 26.5 GHz, 1W, 3 dB, K(m) to K(f)
- 41KB-6 DC to 26.5 GHz, 1W, 6 dB, K(m) to K(f)
- 41KB-10 DC to 26.5 GHz, 1W, 10 dB, K(m) to K(f)
- 41KB-20 DC to 26.5 GHz, 1W, 20 dB, K(m) to K(f)
- 41KC-3 DC to 40 GHz, 1W, 3 dB, K(m) to K(f)
- 41KC-6 DC to 40 GHz, 1W, 6 dB, K(m) to K(f)
- 41KC-10 DC to 40 GHz, 1W, 10 dB, K(m) to K(f)
- 41KC-20 DC to 40 GHz, 1W, 20 dB, K(m) to K(f)
- 41V-3 DC to 65 GHz, 1W, 3 dB, V(m) to V(f)
- 41V-6 DC to 65 GHz, 1W, 6 dB, V(m) to V(f)
- 41V-10 DC to 65 GHz, 1W, 10 dB, V(m) to V(f)
- 41V-20 DC to 65 GHz, 1W, 20 dB, V(m) to V(f)

Precision Waveguide Coaxial Adapters



Part Number Description

- 35WR22VF 33.0 to 50.0 GHz, WR22 to V(f)
- 35WR19VF 40.0 to 60.0 GHz, WR19 to V(f)
- 35WR15VF 50.0 to 65.0 GHz, WR15 to V(f)

Waveguide to Coaxial End Launch Adapters



Part Number Description

- 1091-460-R 17.6 to 26.7 GHz, WR42 to V(f)
- 1091-459-R 26.4 - 40.1 GHz, WR28 to V(f)
- 1091-458-R 33.0 - 50.1 GHz, WR22 to V(f)
- 1091-457-R 39.3 to 59.7 GHz, WR19 to V(f)
- 1091-456-R 49.9 to 75.8 GHz, WR15 to V(f)

Specifications

MS2760A

Optional Accessories (continued)

Directional Horn Antennas



Part Number	Description
2000-1867-R	17.6 to 26.7 GHz, WR42, 25 dBi gain
2000-1868-R	26.4 to 40.1 GHz, WR28, 25 dBi gain
2000-1869-R	33.0 to 50.1 GHz, WR22, 25 dB gain
2000-1870-R	39.3 to 59.7 GHz, WR19, 25 dBi gain
2000-1871-R	49.9 to 75.8 GHz, WR15, 25 dBi gain
2000-1872-R	60.0 to 90.0 GHz, WR12, 25 dBi gain
2000-1873-R	75.0 to 110.0 GHz, WR10, 25 dBi gain

Test Port Cables (Armored, Semi-rigid)



Part Number	Description
3670K50-1	DC to 40 GHz, K(f) to K(m), 30.5 cm (1 ft)
3670K50-2	DC to 40 GHz, K(f) to K(m), 61.0 cm (2 ft)
3670V50A-1	DC to 70 GHz, V(f) to V(m), 30.5 cm (1 ft)
3670V50A-2	DC to 70 GHz, V(f) to V(m), 61.0 cm (2 ft)

USB Cable Extender



Model Number	Description
2000-1818-R	USB 3.0 Powered Cable Extender, 10 m, (32 ft)

Notes

Specifications

MS2760A

Notes

Training at Anritsu

Anritsu has designed courses to help you stay up to date with technologies important to your job. For available training courses, visit: www.anritsu.com/training



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