

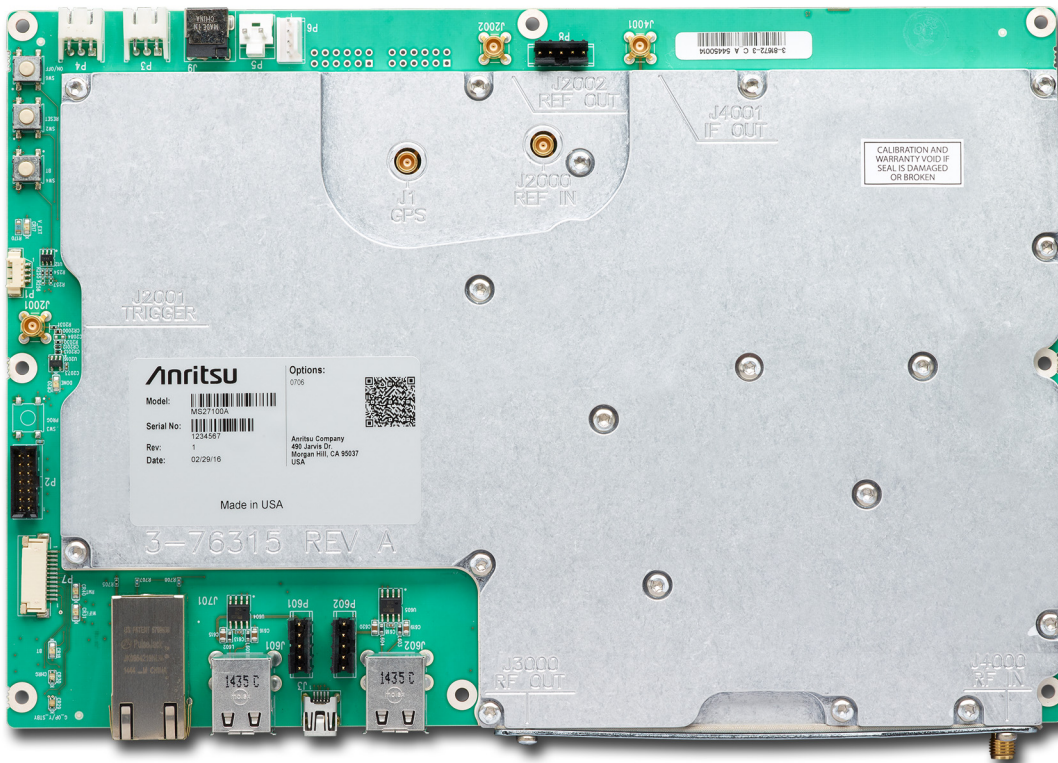
Anritsu envision : ensure

Spectrum Monitor Module

For Remote RF Signal Monitoring

MS27100A

9 kHz to 6 GHz



Introduction

The Anritsu platform of spectrum monitors provide high performance real-time monitoring of the radio spectrum. Designed to be stable over time under continuous operation, the MS27100A spectrum monitor module provides superior sweep speeds, high dynamic range, and low spurious levels for fast and accurate measurements. Applications include monitoring for interference, white space analysis, unlicensed transmission discovery, and signal coverage. The MS27100A spectrum monitor module is available as a single RF input port instrument with wired Ethernet for remote interface and USB ports for connecting accessories. The MS27100A can also be expanded to four RF input ports with an optional multiplexer accessory.

Remote Spectrum Monitor Highlights

- Sweep rates up to 24 GHz/s
- Integrated web server to view, control, and conduct measurements via a web browser (Chrome or Firefox)
- Remote firmware updates
- Watchdog timer to insure long-term stability for remotely deployed monitors
- Low spurious signals for accurate signal discovery
- 20 MHz IF bandwidth
- Low power consumption < 11 watts
- Integrated GPS receiver for monitoring location and time synchronization applications
- Gigabit Ethernet available for high speed communications
- Measurements: occupied bandwidth, channel power
- Interference analysis: spectrogram and signal strength
- Dynamic range: > 106 dB normalized to 1 Hz BW
- DANL: < -150 dBm referenced to 1 Hz BW, preamp On
- Phase noise: -98 dBc/Hz @ 10 kHz offset at 1 GHz
- Frequency accuracy: < ± 1.5 ppm, < ± 50 ppb with GPS High Accuracy Mode
- IQ block mode and streaming with time stamping for TDOA applications
- Remote control via SCPI commands

Table of Contents

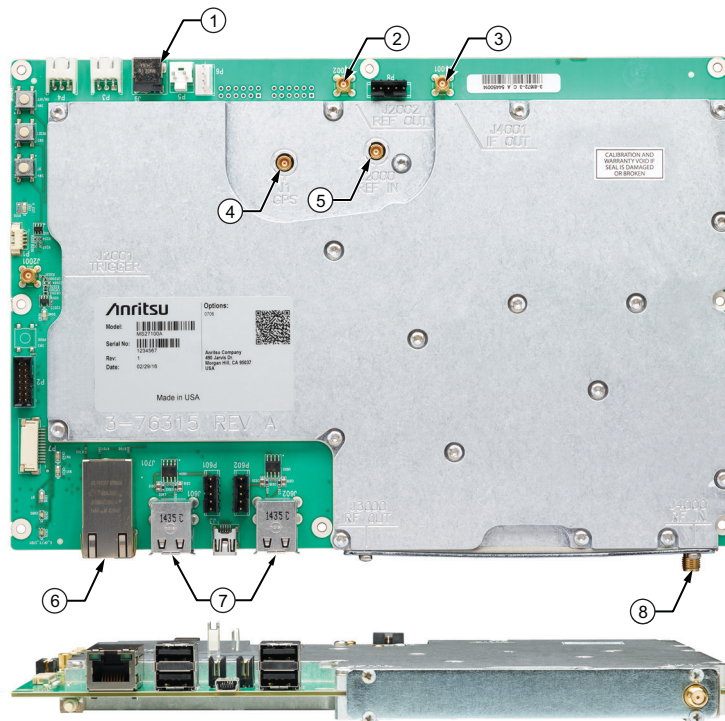
Definitions..... 3
 Connectors..... 3
 Remote Spectrum Monitor..... 4
 General Specifications 6
 Ordering Information..... 7

Definitions

All specifications and characteristics apply under the following conditions, unless otherwise stated:
 After 10 minutes of warm-up time, where the instrument is left in the on state.

Warm-Up Time	After 10 minutes of warm-up time, where the instrument is left in the on state.
Temperature Range	Over the 23 °C ±5 °C temperature range.
Typical Performance	Typical specifications in parenthesis () describe performance that will be met by a minimum of 80% of all products. They do not include guard bands and are not warranted. Typical specifications that are not in parenthesis are not tested and not warranted. They are generally representative of the nominal characteristic performance.
Uncertainty	A coverage factor of k = 2 is applied to the measurement uncertainties to facilitate comparison with other industry monitors. All specifications subject to change without notice. For the most current data sheet, please visit the Anritsu web site: www.anritsu.com

Connectors



MS27100A

- 1 External Power, 11.0 to 14.5 VDC, 11 W, 5.5 mm Barrel Connector
 - 2 10 MHz Reference Output, MCX(f)
 - 3 IF Output, MCX(f)
 - 4 GPS Antenna Input, MCX(f)
 - 5 10 MHz Reference Input, +10 dBm max, +5 VDC max, MCX(f)
 - 6 Gbit Ethernet, RJ45 connector
 - 7 USB Type A (4)
 - 8 RF Input, SMA(f), 50Ω
 RF In Damage Level: +30 dBm peak, ±50 VDC maximum continuous input (≥ 10 dB attenuation)
- Note: Other connectors and controls are not supported in this model.

Remote Spectrum Monitor

Frequency				
Frequency Range	9 kHz to 6 GHz (tunable to 0 Hz)			
Frequency Span	10 Hz to 6 GHz			
Tuning Resolution	1 Hz			
Frequency Reference Accuracy	±1.5 ppm (25 °C ± 25 °C) ±1.0 ppm/year aging, < ±50 ppb with GPS on			
Sweep Speed Typical (full span FFT mode)				
10 kHz RBW	5 GHz/s			
30 kHz RBW	12 GHz/s			
3 MHz RBW	24 GHz/s			
Bandwidth				
Resolution Bandwidth (RBW)	10 Hz to 3 MHz in 1–3 sequence (–3 dB bandwidth)			
Video Bandwidth (VBW)	10 Hz to 3 MHz in 1–3 sequence (–3 dB bandwidth) (auto or manually selectable)			
Spectral Purity				
SSB Phase Noise @ 1 GHz	(–98 dBc/Hz) @ 10 kHz offset (–98 dBc/Hz) @ 100 kHz offset			
Amplitude Ranges				
Dynamic Range	> 106 dB (2.4 GHz), 2/3 (TOI-DANL) in 1 Hz RBW			
Measurement Range	DANL to +30 dBm (≥ 100 MHz) DANL to +10 dBm (< 100 MHz)			
Reference Level Range	–150 dBm to +30 dBm			
Attenuator Range	0 dB to 50 dB in 5 dB steps			
Maximum Continuous Input	(100 MHz to 6 GHz) +30 dBm, ≥ 10 dB attenuation, ±50 VDC +10 dBm, < 10 dB attenuation, ±50 VDC –10 dBm, preamp on, ±50 VDC			
Amplitude Units	Log Scale Modes: dBm			
Amplitude Accuracy Attenuation ≤ 40 dB, preamp off for frequencies less than 100 kHz				
9 kHz to 100 kHz	± 2.5 dB			
> 100 kHz to 6 GHz	± 1.5 dB			
Displayed Average Noise Level (DANL) RBW normalized to 1 Hz, 0 dB attenuation				
	Preamp Off, Reference Level –20 dBm	Preamp On, Reference Level –50 dBm		
	Max (dBm)	Typical (dBm)	Max (dBm)	Typical (dBm)
10 MHz to 3.3 GHz	–145	–150	–162	–165
> 3.3 GHz to 4.1 GHz	–140	–145	–159	–162
> 4.1 GHz to 5 GHz	–138	–143	–156	–160
> 5 GHz to 6 GHz	–128	–136	–146	–154
Spurs Typical				
Residual Spurious	(< –80 dBm) RF input terminated, 0 dB input attenuation, preamp off, > 10 MHz (< –95 dBm)* RF input terminated, 0 dB input attenuation, preamp on, > 10 MHz * (< –88 dBm) for 16 MHz to 18 MHz			
Input-Related Spurious	< –60 dBc, 0 dB attenuation, –30 dBm input, carrier offset > 5 MHz			
Exceptions	< –60 dBc, input = 4140 MHz			
Second Harmonic Distortion Typical; 0 dB attenuation, –30 dBm input				
50 MHz	(–50 dBc)			
> 50 MHz to 200 MHz	< –60 dBc			
> 200 MHz to 3000 MHz	< –60 dBc			
Third-Order Intercept (TOI) Typical; preamp off, –20 dBm tones 100 kHz apart, 0 dB attenuation, reference level –20 dBm				
800 MHz	(+7 dBm)			
2400 MHz	(+17 dBm)			
200 to 2200 MHz	+10 dBm			
> 2.2 GHz to 5.0 GHz	+8 dBm			
> 5.0 GHz to 6.0 GHz	+14 dBm			

Remote Spectrum Monitor (continued)

VSWR < 2.5:1 typical

Signal Processing

Data Types	I/Q time series: 8, 10, 16 or 24 bit resolution Spectrum trace: 100 to 4000 points
Data Transfer Modes	I/Q time series or spectrum trace in streaming or block mode
I/Q Data Streaming Rate	Gapless on 100Base-T network, Up to 2.6 MHz signal bandwidth
I/Q Data Time Stamp Resolution	8.7 ns

I/Q Recording Time Typical

Signal Bandwidth	Output Data Rate MSPS	I/Q Bit Resolution			
		24 bits	16 bits	10 bits	8 bits
20 MHz	76.25 / 3	1.3 s	2.5 s	3.8 s	5 s
13.3 MHz	76.25 / 4	1.7 s	3.4 s	5 s	6.7 s
6.67 MHz	76.25 / 8	3.4 s	6.7 s	10.1 s	13.4 s
2.67 MHz	76.25 / 20	8.4 s	16.8 s	25.2 s	33.6 s
1.33 MHz	76.25 / 40	16.8 s	33.6 s	50.4 s	1.12 min
667 kHz	76.25 / 80	33.6 s	1.12 min	1.68 min	2.24 min
267 kHz	76.25 / 200	1.4 min	2.8 min	4.2 min	5.6 min
133 kHz	76.25 / 400	2.8 min	5.6 min	8.39 min	11.19 min
66.7 kHz	76.25 / 800	5.6 min	11.19 min	16.79 min	22.38 min
26.7 kHz	76.25 / 2000	13.99 min	27.98 min	41.97 min	55.96 min
13.3 kHz	76.25 / 4000	27.98 min	55.96 min	1.4 h	1.87 h
6.67 kHz	76.25 / 8000	55.96 min	1.87 h	2.8 h	3.73 h
2.67 kHz	76.25 / 20000	2.33 h	4.66 h	6.99 h	9.33 h
1.33 kHz	76.25 / 40000	4.66 h	9.33 h	13.99 h	18.65 h

General Specifications

Setup Parameters

System Status	Temperature, Serial Number, Firmware Version, Options Installed, Self Test, Application Self Test, GPS
System Options	Name, Date and Time, Reset (Factory Defaults, Master Reset, Update Firmware)
Directory Management	Sort Method (Name/Type/Date), Ascend/Descend, Internal/USB, Copy
Internal Trace/Setup Memory	4 GB internal memory available for storing files
Mode Switching	Automatically stores/recalls most recently used setup parameters in the mode

Warranty

Instrument	Standard three-year warranty
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Environmental

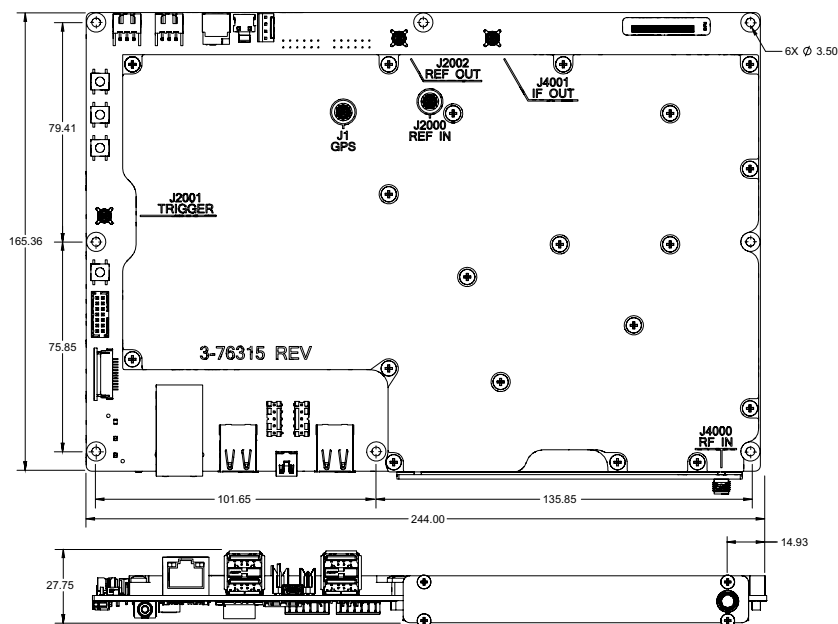
Operating Temperature	0 °C to +55 °C
Maximum Humidity	95 % RH (non-condensing) at 40 °C
Shock	MIL-PRF-28800F Class 2
Storage	-51 °C to +70 °C
Altitude	4600 meters, operating and non-operating
Explosive Atmosphere	MIL-PRF-28800F Section 4.5.6.3 MIL-STD-810G, Method 511.5, Procedure 1

ESD

RF Input Pin	Withstands up to ±4 kV
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Mechanical

Weight	0.93 kg (2.05 lb) without packaging
Dimensions (mm)	



Ordering Information

Standard Hardware

Model Number	Description
MS27100A	Spectrum Monitor Module with 1 RF IN Port (requires one frequency option)

Hardware Options

Option Number	Description
MS27100A-0706	9 kHz to 6 GHz Frequency Range, Option 706

Standard Accessories (included with instrument)

Part Number	Description
40-187-R	AC-DC Adapter

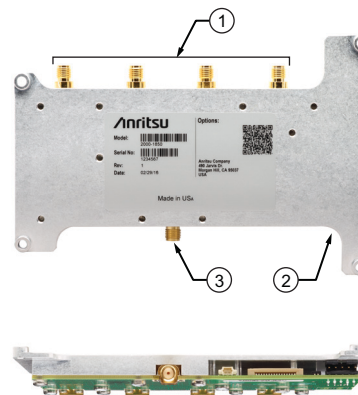
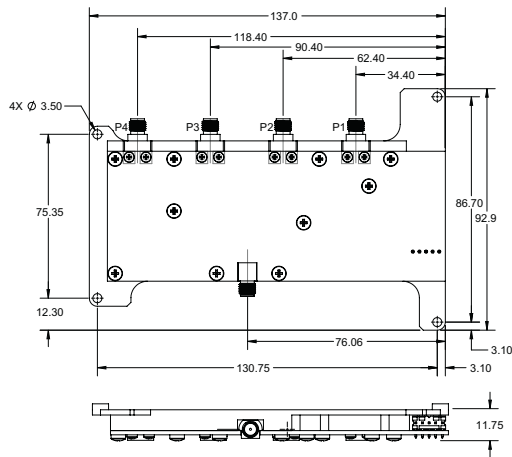
Optional Accessories

Part Number	Description
2000-1850-R	4-Port Multiplexer Module

2000-1850-R

An optional four-to-one multiplexer that is controlled via a USB-A to 5-pin connection to the MS27100A Spectrum Monitor Module. Switch insertion loss correction is linked to the MS27100A through this USB interface. All specifications typical.

Frequency	9 kHz to 6 GHz
Insertion Loss	2 dB at 1 GHz 5 dB at 6 GHz
Antenna Port Isolation	> 40 dB < 3 GHz > 30 dB ≥ 3 GHz
Max RF Input Power	22 dBm, ±50 VDC (100 MHz to 6 GHz)
DC Power	5 VDC via USB
Weight	0.18 kg (0.40 lb)
Dimensions (mm)	



- 1 RF Antenna Inputs, SMA(f) (x4)
- 2 5-pin connector (connects to the MS27100A with the provided 30 cm USB A to 5-pin cable)
- 3 RF Output SMA(f) (connects to MS27100A RF In, RF cable not included)

Training at Anritsu

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