

High Performance Handheld Spectrum Analyzer

MS2721A Spectrum Master™

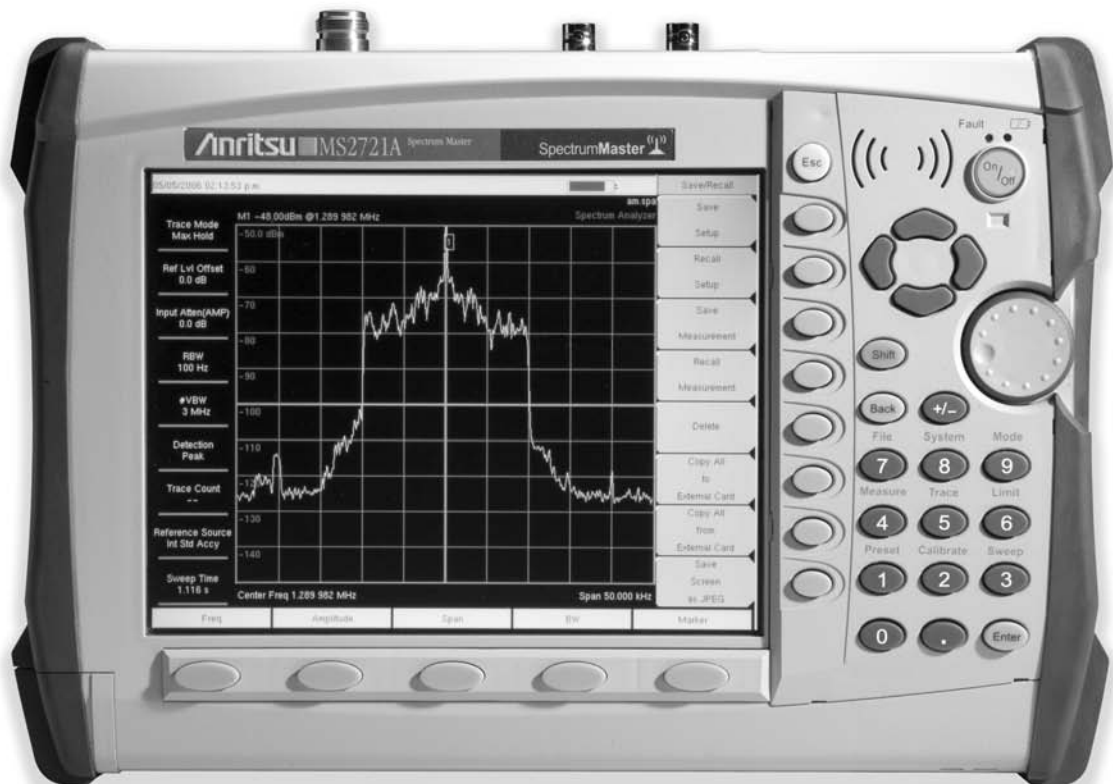
Introduction

Continuous frequency coverage from 100 kHz to 7.1 GHz gives the wireless professional the performance needed for the most demanding measurements in harsh RF and physical environments.

Whether you need spectrum monitoring, WiFi and WiFi5 installation and testing, RF and microwave signal measurements or cellular signal measurements, the MS2721A Spectrum Master is the tool to make your job easier and more productive.

High Performance Highlights

- 100 kHz to 7.1 GHz Input
- 10 Hz to 3 MHz RBW Range
- Very Low Phase Noise
(-100 dBc/Hz Maximum at 10 kHz offset at 100 kHz to 7.1 GHz)
- Built-in AM/FM/SSB Demodulator
- Built-in Preamplifier
- 65 dB Step Attenuator
- Input Protected to 20 Watts
- True RMS Detection
- 3+ Hours of Battery Life
- 3.1 kg (<6.9 lbs)



The Anritsu MS2721A is the most advanced ultra-portable spectrum analyzer on the market, featuring unparalleled performance at a modest price.

Features and Options

Functions

Multiple Marker: Display up to six markers on screen. Each marker includes a delta marker, effectively allowing up to 12 markers on screen.

Marker Table: Display a table of up to six marker frequency and amplitude values plus delta marker frequency offset and amplitude.

Upper/Lower Limit

Fixed and segmented: Each upper and lower limit can be made up of between one and 40 segments.

Smart Measurements

Occupied Bandwidth: Measures 99% to 1% power channel of a spectrum.

Channel Power: Measures the total power in a specified bandwidth.

C/I: Measures carrier to interference ratio.

ACPR: Measures power levels in the channels immediately above and below the center channel.

Field Strength: Uses antenna calibration tables to measure dBm/meter² or dBmV/meter².

Specifications

Frequency

Frequency Range: 100 kHz to 7.1 GHz (useable down to 9 KHz)

Tuning Resolution: 1 Hz

Frequency Reference:

Aging: ±1 ppm/yr.

Accuracy: ±1 ppm (25°C ± 25°C) + long term drift

Frequency Span: 10 Hz to 7.1 GHz plus 0 Hz (zero span)

Span Accuracy: Same as frequency reference accuracy

Sweep Time: Minimum 100 ms, 10 µs in zero span

Sweep Time Accuracy: ±2% in zero span

Sweep Trigger: Free run, Single, Video, External

Resolution Bandwidth: (-3 dB width) 10 Hz to 3 MHz in 1-3 sequence ±10%, 8 MHz demodulation bandwidth

Video Bandwidth: (-3 dB) 1 Hz to 3 MHz in 1-3 sequence

SSB Phase Noise:

-100 dBc/Hz max at 10, 20 and 30 kHz offset from carrier from 100 kHz to 7.1 GHz. -102 dBc/Hz max at 100 kHz offset from carrier.

Amplitude

Measurement Range: DANL to +30 dBm

Display Range: 1 to 15 dB/div in 1dB steps. Ten divisions displayed.

Amplitude Units:

Log Scale Modes: dBm, dBV, dBmV, dBµV,

Linear Scale Modes: nV, µV, mV, V, kV, nW, µW, mW, W, kW

Attenuator Range: 0 to 65 dB

Attenuator Resolution: 5 dB steps

Absolute Amplitude Accuracy:

Power levels:

≥-50 dBm, ≤35 dB input attenuation

100 kHz to ≤10 MHz ±1.5 dB

>10 MHz to 4 GHz ±1.25 dB

>4 to 7.1 GHz ±1.75 dB

40 to 55 dB input attenuation

100 kHz to ≤10 MHz ±1.5 dB

>10 MHz to 4 GHz ±1.75 dB

>4 to 6.5 GHz ±1.75 dB

>6.5 to 7.1 GHz ±2 dB

60 to 65 dB input attenuation

100 kHz to ≤10 MHz ±1.5 dB

>10 MHz to 6.5 GHz ±1.75 dB

>6.5 to 7.1 GHz ±3 dB

Preamplifier on, 0 or 10 dB input attenuation

100 kHz to 4 GHz ±1.5 dB

>4 to 7.1 GHz ±1.75 dB

Second Harmonic Distortion

(0 dB input attenuation, -30 dBm input):

0.05 to 0.75 GHz, -50 dBc

>0.75 to 1.05 GHz, -40 dBc

>1.05 to 1.4 GHz, -50 dBc

>1.4 to 2 GHz, -70 dBc

>2 GHz, -80 dBc

Third Order Intercept (TOI)

(preamplifier off):

-20 dBm tones 100 kHz apart

-20 dBm Ref level

0 dB attenuation

Frequency	Typical
50 MHz to 300 MHz	>8 dBm
>300 MHz to 2.2 GHz	>10 dBm
>2.2 to 2.8 GHz	>15 dBm
>2.8 to 4.0 GHz	>10 dBm
>4.0 to 7.1 GHz	>13 dBm

0 dB attenuation, -20 dBm reference level, -20 dBm tones, spaced 100 kHz

Displayed Average Noise Level: DANL in 10 Hz RBW:

Frequency	Preamplifier On		Preamplifier Off	
	Typical	Max	Typical	Max
10 MHz to 1 GHz	-153	-151	-130	-127
>1 GHz to 2.2 GHz	-150	-149	-126	-123
>2.2 to 2.8 GHz	-146	-143	-120	-116
>2.8 to 4.0 GHz	-150	-149	-129	-126
>4.0 to 7.1 GHz	-148	-144	-121	-117

Test conditions: Input attenuation: 0 dB, RMS detection, Reference level = -20 dBm for preamplifier off and -50 dBm for preamplifier on.

Note: Discrete spurious signals are not included in the measurement of DANL as they are covered by the residual spurious specification.

Noise Figure (derived from DANL measurement)

0 dB attenuation, 23°C: Preamplifier On

Frequency	Typical
10 MHz to 1 GHz	11 dB
>1 GHz to 2.2 GHz	14 dB
>2.2 to 2.8 GHz	18 dB
>2.8 to 4.0 GHz	14 dB
>4.0 to 7.1 GHz	16 dB

Input-Related Spurious: -60 dBc max*, (<-70 dBc typical), -30 dBm input, 0 dB RF attenuation

***Exceptions:**

Input Frequency	Spur Level
1674 MHz	-46 dBc max (-56 dBc typical), 0 to 2800 MHz
>1674 to 1774 MHz	-50 dBc max (-60 dBc typical) at (Finput -1674 MHz)

Residual Spurious, preamplifier off:

(RF input terminated, 0 dB RF attenuation)

-90 dBm max**, 100 kHz to <3200 MHz

-84 dBm max**, 3200 to 7100 MHz

****Exceptions:**

Frequency	Spur Level
250, 300, and 350 MHz	-85 dBm max
~4010 MHz	-80 dBm max (-90 dBm typical)
~5084 MHz	-70 dBm max (-83 dBm typical)
~5894 MHz	-75 dBm max (-87 dBm typical)
~7028 MHz	-80 dBm max (-92 dBm typical)

Residual Spurious, preamplifier on:

-100 dBm max (RF input terminated, 0 dB RF attenuation)

General

RF Input VSWR: 2.0:1 maximum, 1.5:1 typical (≥ 10 dB attenuation)

Maximum Continuous Input: (≥ 10 dB attenuation), +30 dBm

Input Damage Level*:

≥ 10 dB attenuation, $> +43$ dBm, ± 50 Vdc

< 10 dB attenuation, $> +23$ dBm, ± 50 Vdc

* Input protection relay opens at > 30 dBm with ≥ 10 dB input attenuation and at approximately 10 to 23 dBm with < 10 dB attenuation.

ESD Damage Level: ≥ 10 dB attenuation, > 10 kV

External Reference Frequencies: 1, 1.2288, 1.544, 2.4576, 4.8, 4.9152, 5, 9.8304, 10, 13 and 19.6608 MHz at -10 to $+10$ dBm

Display

Bright daylight-viewable color transmissive LCD: Full SVGA, 8 in.

Languages

Built-in English, Spanish, Italian, French, German, Japanese, Korean, and Chinese. The instrument also has the capability to have two customized languages installed from Master Software Tools.

Marker Modes

6 Markers, 7 Modes: Normal, Delta, Marker to Peak, Marker to Center, Marker to Reference Level, Next Peak Left, Next Peak Right, All Markers Off, Noise Marker, Frequency Counter Marker (1 Hz resolution).

Sweeps

Full span, Zero span, Span Up/Span Down

Detection

Peak, Negative, Sample, RMS

Memory

Trace and Setup storage is limited only by the capacity of the installed Compact Flash card. For a 64 MB card, storage is greater than 1000 traces and 1000 setups.

Traces

Displayed Traces: Three Traces with trace overlay. Trace A is always the live data; Traces B and C can be either stored data or traces which have been mathematically manipulated. Also Trace C can show max hold or min hold.

Interfaces

Type N female RF connector

BNC female connectors for ext. reference and ext. trigger

5-pin Mini-B USB 2.0 for data transfer to a PC

RJ45 connector for Ethernet 10/100 Base T

2.5 mm 3-wire headset connector

Size and Weight

Size: 313W x 211H x 77D mm (12W x 8H x 3D in.)

Weight: 3.1 kg (<6.9 lbs.) typical

Environmental

MIL-PRF-28800F class 2

Operating: -10°C to 55°C , humidity 85% or less

Storage: -51°C to 71°C

Altitude: 4600 meters, operating and non-operating

Safety

Conforms to EN 61010-1 for Class 1 portable equipment

Electromagnetic Compatibility

Meets European Community requirements for CE marking.

Ordering Information

Model

MS2721A Handheld Spectrum Analyzer

100 kHz to 7.1 GHz

Options

Option MS2721A-025 Interference Analysis

Option MS2721A-027 Channel Scanner

Standard Accessories Include:

10580-00103	User's Guide
61382	Soft Carrying Case
40-168	AC – DC Adapter
806-141	Automotive Cigarette Lighter/12 Volt DC Adapter
2300-498	CD ROM containing Master Software Tools
2000-1360	USB A-mini B cable
2000-1371	Ethernet Cable
633-44	Rechargeable battery, Li-Ion
2000-1358	64 MB Compact Flash
1091-27	Type-N male to SMA female adapter
1091-172	Type-N male to BNC female adapter
	One Year Warranty
64343	Tilt Bale Stand Accessory

Optional Accessories:

42N50A-30	30 dB, 50 watt, Bi-directional, DC to 18 GHz, N(m) to N(f) Attenuator
34NN50A	Precision Adapter, DC to 18 GHz, 50 Ω , N(m) to N(m)
34NFN50C	Precision Adapter, DC to 18 GHz, 50 Ω , N(f) to N(f)
15NNF50-1.5B	Test port cable, armored, 1.5 meter N(m) to N(f) 18 GHz
15NN50-1.5C	Test port cable armored, 1.5 meter, N(m) to N(m), 6 GHz
15NN50-3.0C	Test port cable armored, 3.0 meter, N(m) to N(m), 6 GHz
15NN50-5.0C	Test port cable armored, 5.0 meter, N(m) to N(m), 6 GHz
15NNF50-1.5C	Test port cable armored, 1.5 meter, N(m) to N(f), 6 GHz
15NNF50-3.0C	Test port cable armored, 3.0 meter, N(m) to N(f), 6 GHz
15NNF50-5.0C	Test port cable armored, 5.0 meter, N(m) to N(f), 6 GHz
15ND50-1.5C	Test port cable armored, 1.5 meter, N(m) to 7/16 DIN(m), 6.0 GHz
15NDF50-1.5C	Test port cable armored, 1.5 meter, N(m) to 7/16 DIN(f), 6.0 GHz
510-90	Adapter, 7/16 DIN (f) to N(m), DC to 7.5 GHz, 50 Ω
510-91	Adapter, 7/16 DIN (f)-N(f), DC to 7.5 GHz, 50 Ω
510-92	Adapter, 7/16 DIN(m)-N(m), DC to 7.5 GHz, 50 Ω
510-93	Adapter, 7/16 DIN(m)-N(f), DC to 7.5 GHz, 50 Ω
510-96	Adapter 7/16 DIN (m) to 7/16 DIN(m), DC to 7.5 GHz, 50 Ω

Optional Accessories (Continued):

1030-105	Band Pass Filters, 890-915 MHz, N(m) to N(f), 50Ω	2300-498 10580-00103	Anritsu Master Software Tools
1030-106	Band Pass Filters, 1710-1790 MHz, N(m) to N(f), 50Ω	10580-00104 10580-00105	Anritsu HHS User's Guide, Model MS2721A (spare)
1030-107	Band Pass Filters, 1910-1990 MHz, N(m) to N(f), 50Ω	663-44	Anritsu HHS Programming Manual, Model MS2721A
1030-109	Band Pass Filters, 824-849 MHz, N(m) to SMA(f), 50Ω	2000-1358 2000-1374	Anritsu HHS Maintenance Manual, Model MS2721A
1030-110	Band Pass Filters, 880-915 MHz, N(m) to SMA(f), 50Ω	2000-1411	Rechargeable battery, Li-Ion
1030-111	Band Pass Filters, 1850-1910 MHz, N(m) to SMA(f), 50Ω	2000-1412 2000-1413	64 MB Compact Flash Memory Module
1030-112	Band Pass Filters, 2400-2484 MHz, N(m) to SMA(f), 50Ω	2000-1414 2000-1415	Dual battery charger, Li-Ion with universal power supply
1030-114	Band Pass Filters, 806-869 MHz, N(m) to SMA(f), 50Ω	2000-1416	Portable Yagi Antenna, 10 dBd, N(f) 822-900 MHz
510-97	Adapter 7/16 DIN(f) to 7/16 DIN(f), 7.5 GHz	2000-1030	Portable Yagi Antenna, 10 dBd, N(f) 885-975 MHz
61382	Spare soft carrying case	2000-1031	Portable Yagi Antenna, 10 dBd, N(f) 1.71-1.88 GHz
64343	Tilt Bale Stand Accessory	2000-1032	Portable Yagi Antenna, 9.3 dBd, N(f) 1.85-1.99 GHz
40-168	Spare AC/DC adapter	2000-1035 2000-1200	Portable Yagi Antenna, 10 dBd, N(f) 2.4-2.5 GHz
806-141	Spare automotive cigarette lighter/12 Volt DC adapter	2000-1361	Portable Yagi Antenna, 10 dBd, N(f) 1.92-2.23 GHz
760-235	Transit case for Anritsu MS2721A Handheld Spectrum Analyzer	2000-1473 2000-1474 2000-1475	Portable antenna, SMA(m) 1.71-1.88 GHz, 50Ω
		61532	Portable antenna, SMA(m) 1.85-1.99 GHz, 50Ω
			Portable antenna, SMA(m) 2.4-2.5 GHz, 50Ω
			Portable antenna, SMA(m) 896-941 MHz, 50Ω
			Portable antenna, SMA(m) 806-869 MHz, 50Ω
			Portable Antenna, SMA(m) 5725-5825 MHz, 50Ω
			Portable Antenna, SMA(m) 870-960 MHz, 50Ω
			Portable Antenna, SMA(m) 1.71-1.88 GHz, 50Ω
			Portable Antenna, SMA(m) 2.11-2.17 GHz, 50Ω
			Antenna Kit: 2000-1030, 2000-1031, 2000-1032, 2000-1035, 2000-1200, and 2000-1361



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