Anritsu envision:ensure

Power Master™
Frequency Selectable mmWave Power Analyzer

MA24507A
9 kHz to 70 GHz

Introduction

Power Master is the world's first frequency selectable mmWave power analyzer. It is an ultraportable USB-powered instrument that measures the RF power of signals up to 70 GHz and as low as –90 dBm. Unlike spectrum analyzers that are bulky, expensive, and complex or power meters that are not frequency dependent and have limited dynamic range, Power Master enables simple, numeric, frequency-based amplitude measurements of up to six signals from 9 kHz to 70 GHz in a package slightly larger than a cell phone and at an extremely affordable price.

Features and Benefits

- Able to measure very low power signals as low as –100 dBm
- Excellent for over-the-air testing, especially with mmWave signals that have high propagation loss
- User settings to control measurement speeds and noise floor
- New Channel Monitor mode in PowerXpert for monitoring up to six frequency channels at once
- New Power Hunter mode in PowerXpert for searching up to six signals within a frequency range
- Mounting holes for direct mounting to probes for on-wafer testing

MA24507A mmWave Power Analyzer

Table of Contents

Definitions

All specifications and characteristics apply under the following conditions, unless otherwise stated:

Warm-Up Time	30 minutes
Operating Temperature Range	0 °C to 50 °C
Typical Performance	Typical performance indicates the measured performance of an average unit. Typical performance does not include guard-bands and is not covered by the product warranty. Typical specifications are shown in parenthesis, such as (-102 dB), or noted as Typical.
Characteristic Performance	Characteristic performance indicates a performance designed-in and verified during the design phase. Characteristic performance is not covered by the product warranty.
ISO GUM Measurement Uncertainty	Uncertainty expressed with coverage factor of k=2.
Calibration Cycle	Anritsu recommended calibration interval is 12 months.

All specifications subject to change without notice. For the most current data sheet, please visit the Anritsu web site: www.anritsu.com

Frequency

MA24507A

Range	9 kHz to 70 GHz, V(m) Connector (1.85 mm)
Internal Reference	Accuracy: ±0.1 ppm (0 °C to 50 °C) Aging: ±1.0 ppm/year aging
Continuous Mode Span	30 kHz to 2 GHz max in Channel Power Measurement 1 kHz to Full Span in CW Max Measurement
Channel Monitor Mode Span	1 kHz to 20 MHz

Power Measurement

Maximum Amplitude

Frequency	Max Power[a]
≤ 6.15 GHz	+15 dBm
> 6.15 GHz	+10 dBm

a. Characteristic

Average Noise Floor

Channel Power Measurement

Channel Span	Noise Floor[a]
30 kHz	–88 dBm
10 MHz	–64 dBm
1 GHz	–40 dBm

CW Max Measurement

Resolution	Noise Floor[b]
High	–100 dBm
Medium	–90 dBm
Low	–80 dBm

a. Measured at 1 GHz center frequency
b. Measured at 1 GHz center frequency; 3 MHz span

Damage Level

Continuous: +30 dBm CW, +/- 10 VDC max

Ranges[1]

Lower: ≤ –10 dBm
Upper: > –10 dBm

Input Match (max)

Frequency	VSWR
9 kHz to ≤ 12.4 GHz	1.29:1
> 12.4 GHz to 26.5 GHz	1.38:1
> 26.5 GHz to 40 GHz	1.50:1
> 40 GHz to 50 GHz	1.67:1
> 50 GHz to 70 GHz	2.10:1

Measurement Speed (readings/s, characteristic)

	Span[a]		
	300 kHz	20 MHz	1 GHz
Channel Power Measurement	7	20	10
CW Max Measurement (High)	0.8	15	6
(Medium)	4	25	10
(Low)	20	25	10

a. Measured at 1 GHz center frequency; no averages

Trigger Source

Bus
Continuous

1. Power Master allows the user to define the operating range. To avoid clipping or saturating signals, the upper range is recommended for signals above –10 dBm. Signals at or below –10 dBm will typically be able to use the lower range.

Measurement Uncertainty

Power Measurements

Amplitude Accuracy[1]

20 °C to 30 °C

Frequency	Maximum	Typical
9 kHz to < 6.15 GHz	±1.3 dB	±1.0 dB
6.15 GHz to < 40 GHz	±1.8 dB	±1.0 dB
40 GHz to ≤ 70 GHz	±2.0 dB	±1.0 dB

0 °C to 50 °C

9 kHz to < 6.15 GHz	±1.5 dB	±1.0 dB
6.15 GHz to < 40 GHz	±2.3 dB	±1.0 dB
40 GHz to ≤ 70 GHz	±2.5 dB	±1.0 dB

Relative Power Accuracy

Frequency	Accuracy
9 kHz to < 6.15 GHz	±0.3 dB
6.15 GHz to < 40 GHz	±0.3 dB
40 GHz to ≤ 70 GHz	±0.3 dB

PowerXpert™

PC Requirements (version 4.0 or greater)

Processor and RAM	Equivalent to Quad Core i5 fourth generation or higher CPU, 8 GB RAM
Operating System	Microsoft® Windows® 10, 8.1, or 7; 64-bit
Hard-Disk Free Space	100 MB minimum
Display Resolution	1024 × 768 minimum
Interface	USB 3.0

System

Measurand	Channel power, CW peak power
Measurement Resolution	0.01 dB max via PowerXpert, 0.01 dB max via remote command
Offset Correction[2]	–100 dB to +150 dB
Units	dBm, nW, µW, mW, W
Averaging	Manual
Averaging Type	Moving
Number of Averages	1 to 1,000

Continuous Mode

Measurements	Channel power, CW max
Center Frequency	9.5 kHz to (70 GHz – 500 Hz)
Span	30 kHz to 2 GHz (Channel power), 1 kHz to Full span (CW max)
Resolution	High, medium, low

Power Hunter Mode

Measurement	CW max only
Start Frequency	9 kHz to (70 GHz – 1 kHz)
Stop Frequency	10 kHz to 70 GHz
Set Minimum Power Range	–130 to 0 dBm

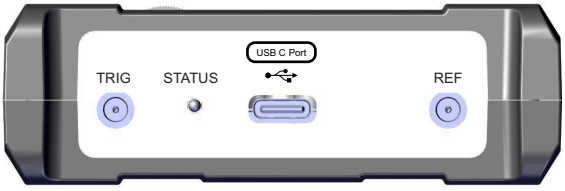
Channel Monitor Mode

Measurements	Channel power, CW max
Channel Frequencies	(9 kHz + Span/2) to (70 GHz – Span/2)
Span	1 kHz to 20 MHz
Number of Channels	Up to 6

1. Accuracy excludes effects of Noise and Mismatch uncertainty. Characteristic values between 67 and 70 GHz.
2. Offset correction feature is available only through the PowerXpert application. There is no remote command for it in the analyzer firmware.

General

RF Connector	V male (1.85 mm)
Interface to Host	USB 3.0
Current Consumption	900 mA max
Size	155 mm x 84 mm x 27 mm (6.1 in x 3.3 in x 1.1 in)
Weight	282 g (0.62 lb)
Warranty	1 year



Operational Requirements Tests were performed per MIL-PRF-28800F (Class 3).

Operating Temperature Range	0 °C to 50 °C
Storage Temperature Range	–40 °C to +71 °C
Relative Humidity (non-condensing)	45 % at 50 °C 75 % at 40 °C 95 % at 30 °C
Altitude	4600 m operational max
Shock	30 g half-sine, 11 ms duration
Vibration	Sinusoidal: 5 Hz to 55 Hz, 3 g max Random: 10 Hz to 500 Hz, 2.34 g rms Power Spectral Density: 0.01 g^2/Hz

Compliance

EMC	2014/30/EU
Safety	2014/35/EU
RoHS	2011/65/EU

Ordering Information

Available Models

MA24507A	9 kHz to 70 GHz mmWave Power Analyzer

Included Accessories

2000-1605-R	1.5 m BNC(m) to MCX(m) cable
2000-1859-R	1.0 m USB A to C port cable

Available Options

MA24507A-098	Option 98: Standard calibration ISO/IEC 17025 and ANSI/NCSL Z540-1
MA24507A-099	Option 99: Premium calibration ISO/IEC 17025 and ANSI/NCSL Z540-1 (includes test report and uncertainty data)

Optional Accessories

Calibrated Torque Wrenches

01-201	Calibrated torque wrench for K and V connectors

Precision Fixed Attenuators

41V-3	DC to 60 GHz, 3 dB, 50 Ω, V(m) to V(f)
41V-6	DC to 60 GHz, 6 dB, 50 Ω, V(m) to V(f)
41V-10	DC to 60 GHz, 10 dB, 50 Ω, V(m) to V(f)
41V-20	DC to 60 GHz, 20 dB, 50 Ω, V(m) to V(f)

Precision Coaxial Adapters

33VFVF50C	DC to 70 GHz, 50 Ω, V(f) to V(f)
33VVF50C	DC to 70 GHz, 50 Ω, V(m) to V(f)

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

Anritsu envision : ensure

• **United States**

Anritsu Company
1155 East Collins Blvd, Suite 100
Richardson, TX 75081, U.S.A.
Toll Free: 1-800-267-4878
Phone: +1-972-644-1777
Fax: +1-972-671-1877

• **Canada**

Anritsu Electronics Ltd.
700 Silver Seven Road, Suite 120
Kanata, Ontario K2V 1C3, Canada
Phone: +1-613-591-2003
Fax: +1-613-591-1006

• **Brazil**

Anritsu Electrônica Ltda.
Praça Amadeu Amaral, 27 - 1 Andar
01327-010 Bela Vista, São Paulo, SP, Brazil
Phone: +55-11-3283-2511
Fax: +55-11-3288-6940

• **Mexico**

Anritsu Company, S.A. de C.V.
Av. Ejército Nacional No. 579 Piso 9, Col. Granada
11520 México, D.F., México
Phone: +52-55-1101-2370
Fax: +52-55-5254-3147

• **United Kingdom**

Anritsu EMEA Ltd.
200 Capability Green
Luton, Bedfordshire LU1 3LU
United Kingdom
Phone: +44-1582-433280
Fax: +44-1582-731303

• **France**

Anritsu S.A.
12 Avenue du Québec
Bâtiment Iris 1-Silic 612
91140 Villebon-sur-Yvette, France
Phone: +33-1-60-92-15-50
Fax: +33-1-64-46-10-65

• **Germany**

Anritsu GmbH
Nemetschek Haus, Konrad-Zuse-Platz 1
81829 München, Germany
Phone: +49-89-442308-0
Fax: +49-89-442308-55

• **Italy**

Anritsu S.r.l.
Via Elio Vittorini 129
00144 Roma, Italy
Phone: +39-06-509-9711
Fax: +39-06-502-2425

• **Sweden**

Anritsu AB
Kistagången 20B
164 40 KISTA, Sweden
Phone: +46-8-534-707-00
Fax: +46-8-534-707-30

• **Finland**

Anritsu AB
Teknobulevardi 3-5
FI-01530 Vantaa, Finland
Phone: +358-20-741-8100
Fax: +358-20-741-8111

• **Denmark**

Anritsu A/S
Kay Fiskers Plads 9
2300 Copenhagen S, Denmark
Phone: +45-7211-2200
Fax: +45-7211-2210

• **Russia**

Anritsu EMEA Ltd.

Representation Office in Russia
Tverskaya str. 16/2, bld. 1, 7th floor
Moscow, 125009, Russia
Phone: +7-495-363-1694
Fax: +7-495-935-8962

• **Spain**

Anritsu EMEA Ltd.

Representation Office in Spain
Edificio Cuzco IV, Po. de la Castellana, 141, Pta. 8
28046, Madrid, Spain
Phone: +34-915-726-761
Fax: +34-915-726-621

• **United Arab Emirates**

Anritsu EMEA Ltd.

Dubai Liaison Office
902, Aurora Tower,
P O Box: 500311- Dubai Internet City
Dubai, United Arab Emirates
Phone: +971-4-3758479
Fax: +971-4-4249036

• **India**

Anritsu India Private Limited
2nd & 3rd Floor, #837/1, Binnamangla 1st Stage
Indiranagar, 100ft Road, Bangalore - 560038, India
Phone: +91-80-4058-1300
Fax: +91-80-4058-1301

• **Singapore**

Anritsu Pte. Ltd.
11 Chang Charn Road, #04-01, Shriro House
Singapore 159640
Phone: +65-6282-2400
Fax: +65-6282-2533

• **P.R. China (Shanghai)**

Anritsu (China) Co., Ltd.
27th Floor, Tower A
New Caohejing International Business Center
No. 391 Gui Ping Road Shanghai, Xu Hui Di District
Shanghai 200233, P.R. China
Phone: +86-21-6237-0898
Fax: +86-21-6237-0899

• **P.R. China (Hong Kong)**

Anritsu Company Ltd.
Unit 1006-7, 10/F., Greenfield Tower
Concordia Plaza
No. 1 Science Museum Road, Tsim Sha Tsui East
Kowloon, Hong Kong, P. R. China
Phone: +852-2301-4980
Fax: +852-2301-3545

• **Japan**

Anritsu Corporation
8-5, Tamura-cho, Atsugi-shi
Kanagawa, 243-0016 Japan
Phone: +81-46-296-1221
Fax: +81-46-296-1238

• **Korea**

Anritsu Corporation, Ltd.
5FL, 235 Pangyoyeok-ro, Bundang-gu, Seongnam-si
Gyeonggi-do, 13494 Korea
Phone: +82-31-696-7750
Fax: +82-31-696-7751

• **Australia**

Anritsu Pty. Ltd.
Unit 20, 21-35 Ricketts Road,
Mount Waverley, Victoria 3149, Australia
Phone: +61-3-9558-8177
Fax: +61-3-9558-8255

• **Taiwan**

Anritsu Company Inc.
7F, No. 316, Sec. 1, Neihu Rd, Taipei 114, Taiwan
Phone: +886-2-8751-1816
Fax: +886-2-8751-1817

List Revision Date: 20160317