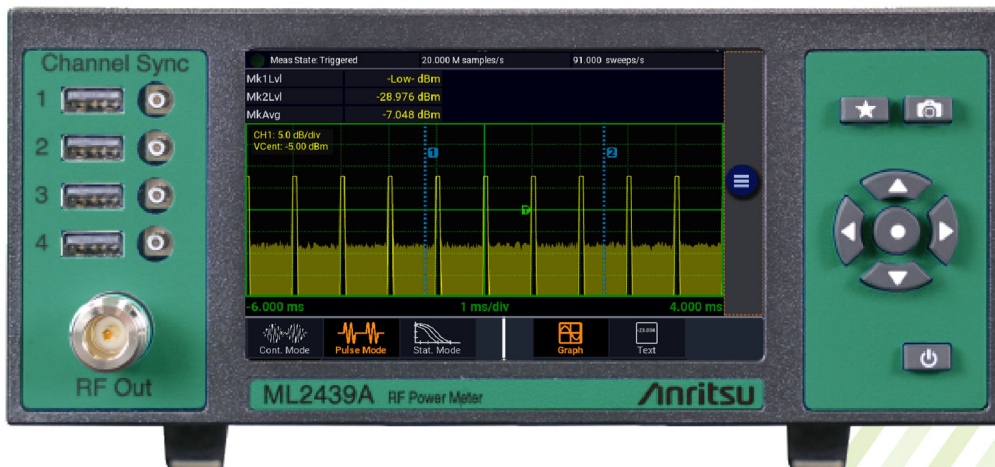


**Anritsu** Advancing beyond

# Power Meter

## ML2439A

10 MHz to 50 GHz



## Introduction

Anritsu offers the world's most comprehensive range of power meters. The ML2439A is a very versatile power meter that enables CW, RMS and peak power measurements. The ML2439A power meter is designed to deliver accuracy, speed, and flexibility in a small form factor.

Anritsu offers several families of power sensors with frequency coverage up to 50 GHz and dynamic range up to 80 dB which can be used with ML2439A. Anritsu power sensors work in either pulsed/modulated or CW mode. In choosing a power sensor for ML2439A, several factors must be considered, including frequency range, dynamic range, and modulation type. The rise time of the sensor should also be chosen to match the rise time of the modulation.

## Performance and Functional Highlights

- Frequency range from 10 MHz to 50 GHz
- Max Video Bandwidth (VBW): 195 MHz
- Min Rise Time: < 3 ns
- Supports GPIB and LAN interface for Remote monitoring
- Supports SCPI commands over GPIB and LAN interfaces
- Optional secure USB drive for additional security
- Measurement/Acquisition Speed: 100,000 measurements per second
- Time resolution: 100 ps
- Automatic Pulse Measurements: 16
- Max Effective Sample Rate: 10 GS/s
- Max Pulse Repetition Rate: 50 MHz
- Synchronous multi-channel measurements (up to 4 channels)
- Sensors can be used as standalone instruments

## Supported USB Power Sensors

- MA244xxA Peak Power Sensors
- MA243xxA CW Power Sensors
- MA242xxA True RMS Sensors
- MA241xxA True RMS Sensors<sup>1</sup>

1. Except MA24103A, MA24105A and MA24106A

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Definitions

	All specifications and characteristics apply under the following conditions, unless otherwise stated:
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 are not tested and are not warranted. They are generally representative of the nominal characteristic performance.
Uncertainty	A coverage factor of K=2 is applied to the measurement uncertainties.
Calibration Cycle	Recommended calibration cycle is 12 months.
	All specifications subject to change without notice. For the most current data sheet, please visit the Anritsu web site: <a href="http://www.anritsu.com">www.anritsu.com</a>

General

Channels	2 CH Standard, 4 CH with Option -0004
Sensors	MA2444xA, MA243xxA, MA242xxA and MA241xxA <sup>1</sup>
Display	5-inch WVGA multi-touch display with intuitive graphical user interface
Display Modes	Continuous, Pulse and Statistical (CCDF)
Display Format	Graph (Power vs time or CCDF), Text (Numeric Display)
Automatic measurements	Pulse, statistical, and markers measurements
Weight	4.8 lbs, 2.2 kg
Dimensions	(H x W x D) 3.5 x 8.3 x 11.2 (in), 89 x 211 x 284 (mm)
Warranty	1 year from shipment date

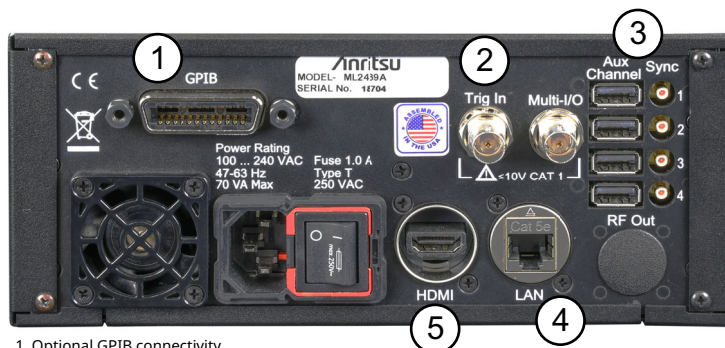
Inputs/Outputs

Front Panel Test Source RF OUT, 50 MHz, 0 dBm +/-0.1 dB typical  
 4 USB 2.0 ports, Type A receptacle  
 4 SMB(f) trigger ports (Only for MA244xxA Peak Power Sensors)



1. Four 2.0 USB Power Sensor Input Ports for multichannel measurements
2. Four Standard SMB Trigger Input Ports to source or receive triggers
3. Multi-touch Display with Intuitive User Interface
4. Favorites Key enables quick access to presets and favorite function
5. Measurement Modes and Formats
6. 50 MHz Test Source to verify sensor operation

Rear Panel LAN 10/100 Ethernet RJ 45 modular socket  
 4 USB 2.0 ports, Type A receptacle  
 4 SMB(f) trigger ports (Only for MA244xxA peak power sensors)  
 GPIB Port (Option 0005)  
 HDMI Port  
 External Trigger Input  
 Multi-I/O



1. Optional GPIB connectivity
2. External Trigger Input
3. Auxiliary Sensor and Sync Inputs
4. LAN Connectivity
5. HDMI Output for Remote Front Panel Display

1. Except MA24103A, MA24105A and MA24106A.

**AC Power**

Rated Voltage	100 to 240 VAC
Voltage Range	90 to 264 VAC
Rated Frequency	50/60 Hz
Frequency Range	47 to 63 Hz
Power Consumption	60 W (70 VA) max, 30 W (35 VA) nominal with no external peripheral devices attached

**Measurements**

**Marker Measurements** (in Trace View)

Markers (vertical cursors)	Settable in time relative to the trigger position
Marker Independently	Avg, Min and Max Power at a specified time offset
Interval Between Markers	Avg, Min and Max Power over the defined interval
Markers	Ratio of power values at each marker

**Automatic Measurements**

Pulse Mode	Pulse rise-time	Pulse fall-time	
	Pulse width	Pulse off-time	
	Pulse period	Pulse repetition frequency	
	Pulse duty cycle	Waveform average	
	Pulse peak	Pulse average	
	Pulse overshoot	Pulse droop	
	Top level power	Bottom level power	
	Edge delay	Pulse edge skew between channels	
	Statistical Mode	Peak power	Average power
		Minimum power	Peak to average ratio
Dynamic range		Percent at cursor	
Crest factor at cursor		Crest factor at various percents	

**Trigger**

Synchronization	Among MA244xxA series (internal trigger distribution)
Mode	Normal, Auto, Auto Pk-to-Pk, Free Run
Source	Any connected MA244xxA sensor via SMB or rear panel external trigger
Internal Level Range	-40 dBm to +20 dBm (sensor dependent)
External Level Range	±5 volts or TTL
Slope	Positive or Negative
Settings (sensor and timebase dependent)	Hold-off, Min Pulse Width, Max Trigger Rate

**Time Base**

Resolution	Sensor dependent
Range	Sensor dependent
Accuracy	Sensor dependent
Time Base Display	Sweeping or Roll Mode
Trigger Delay Range	Sensor dependent
Trigger Delay Resolution	0.02 divisions

**Remote Control**

Command Set	SCPI-1999.0
LAN	Ethernet:10/100/1000 BaseT; HiSLIP
GPIO	Optional (Option 0005)

**Regulatory Compliance**

European Union	EMC 2014/30/EU, EN 61326-1:2013 CISPR 11/EN 55011, IEC/EN 61000-4-2/3/4/5/6/8/11 Low Voltage Directive 2014/35/EU Safety EN 61010-1:2010 RoHS Directive 2011/65/EU & 2015/863 EN 63000:2018 (RoHS-3) WEEE Directive 2012/19/EU
United Kingdom	EMC SI 2016/1091; BS EN 55011 & BS 61000-4-2/3/4/5/6/8/11 Consumer Protection (Safety) SI 2016/1101; BS EN 61010-1:2010 Environmental Protection SI 2012/3032; 2011/65/EU & 2015/863
Australia and New Zealand	RCM AS/NZS 4417:2012

## Environmental

Operating Temperature	0 to 50 °C (32 to 122 °F)
Storage Temperature	-40 to +70 °C (-40 to 158 °F)
Humidity	95% maximum, non-condensing
Altitude	Operation up to 15,000 feet (4,575 m)

## Power Sensors

Description	MA244xxA Peak Power Sensor	MA243xxA CW Power Sensor	MA242xxA Microwave Universal Power Sensor	MA241xxA <sup>a</sup> Microwave Power Sensor
Measurements	Average (RMS), Peak, Pulse	Average Power (CW only)	Average Power (RMS)	Average Power (RMS)
Frequency	0.05 to 40 GHz	0.01 to 50 GHz	0.01 to 18 GHz	0.01 to 26 GHz
Dynamic Range	-50 to +20 dBm	-70 to +20 dBm	-60 to +20 dBm	-40 to +20 dBm
VBW	Up to 195 MHz	50 kHz	X	X
Average				
Peak Power and Crest Factor		X	X	X
CCDF and PDF		X	X	X
PAE Measurement		X	X	X
NIST Traceable Calibration	Up to 18 GHz			
Applications	CW, Pulse Profiling, Any Modulation	CW	CW, Pulse, Any Modulation	CW, Pulse, Any Modulation
Compatible Power Meters	ML2439A	ML2439A	ML2439A	ML2439A

a. Except MA24103A, MA24105A and MA24106A.

## Ordering Information

### Power Meter



#### Part Number Description

ML2439A Power Meter, 2-Channel

#### Options

ML2439A-0004	Add Two Active Channels
ML2439A-1004	Retrofit, Add Two Active Channels
ML2439A-0005	GPIB Interface
ML2439A-1005	Retrofit, GPIB Interface
ML2439A-0006	External USB boot
ML2439A-1006	Retrofit, External USB boot

### Standard Accessories

#### Part Number Description





11410-00976 Information Card (provides information on where to download the latest manual, software, utilities)

### Optional Accessories

#### Part Number Description

2000-2154-R	External USB drive (for Option -0006)
2000-2155-R	19" Rack Mount Kit

**USB Power Sensors** (for complete ordering information, see the respective data sheets of each sensor)

Accessory	Description	Accessory	Description
	MA24330A Microwave CW USB Power Sensor 10 MHz to 33 GHz, +20 dBm		MA24108A Microwave USB Power Sensor 10 MHz to 8 GHz, +20 dBm to -40 dBm
	MA24340A Microwave CW USB Power Sensor 10 MHz to 40 GHz, +20 dBm		MA24118A Microwave USB Power Sensor 10 MHz to 18 GHz, +20 dBm to -40 dBm
	MA24350A Microwave CW USB Power Sensor 10 MHz to 50 GHz, +20 dBm		MA24126A Microwave USB Power Sensor 10 MHz to 26 GHz, +20 dBm to -40 dBm
	MA24406A USB Peak Power Sensor 50 MHz to 6 GHz, -60 to +20 dBm		MA24208A Microwave Universal USB Power Sensor 10 MHz to 8 GHz, +20 dBm to -60 dBm
	MA24408A USB Peak Power Sensor 50 MHz to 8 GHz, -60 to +20 dBm -53 to +20 dBm for > 6 GHz		MA24218A Microwave Universal USB Power Sensor, 10 MHz to 18 GHz, +20 dBm to -60 dBm
	MA24418A USB Peak Power Sensor 50 MHz to 18 GHz, -34 to +20 dBm		
	MA24419A USB Peak Power Sensor 50 MHz to 18 GHz, -50 to +20 dBm		
	MA24440A USB Peak Power Sensor 50 MHz to 40 GHz, -34 to +20 dBm		
MA24441A USB Peak Power Sensor 50 MHz to 40 GHz, - 50 to +20 dBm			

## 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](http://www.anritsu.com/training).



### • United States

#### **Anritsu Americas Sales Company**

490 Jarvis Drive, Morgan Hill, CA 95037-2809, U.S.A.  
Phone: +1-800-Anritsu (1-800-267-4878)

### • Canada

#### **Anritsu Electronics Ltd.**

#### **Americas Sales and Support**

490 Jarvis Drive, Morgan Hill, CA 95037-2809, U.S.A.  
Phone: +1-800-Anritsu (1-800-267-4878)

### • Brazil

#### **Anritsu Eletronica Ltda.**

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

### • Mexico

#### **Anritsu Company, S.A. de C.V.**

Blvd Miguel de Cervantes Saavedra #169 Piso 1,  
Col. Granada, Mexico, Ciudad de Mexico,  
11520, MEXICO  
Phone: +52-55-4169-7104

### • United Kingdom

#### **Anritsu EMEA Limited**

900 Capability Green,  
Luton, Bedfordshire, LU1 3LU, U.K.  
Phone: +44-1582-433200  
Fax: +44-1582-731303

### • France

#### **Anritsu SA**

12 avenue du Québec, Immeuble Goyave,  
91140 VILLEBON SUR YVETTE, France  
Phone: +33-1-60-92-15-50

### • 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.**

Spaces Eur Arte, Viale dell'Arte 25, 00144 Roma, Italy  
Phone: +39-6-509-9711

List Revision Date: 20251202

### • Sweden

#### **Anritsu AB**

Kistagången 20 B, 2 tr, 164 40 Kista, Sweden  
Phone: +46-8-534-707-00

### • Finland

#### **Anritsu AB**

Technopolis Aviapolis, Teknobulevardi 3-5 (D208.5),  
FI-01530 Vantaa, Finland  
Phone: +358-20-741-8100

### • Denmark

#### **Anritsu A/S**

c/o Regus Winghouse, Ørestads Boulevard 73, 4th  
floor,  
2300 Copenhagen S, Denmark  
Phone: +45-7211-2200

### • Spain

#### **Anritsu EMEA Ltd.**

**Representation Office in Spain**  
Calle Manzanares 4, Primera planta, 28005  
Madrid, Spain  
Phone: +34-91-572-6761

### • Austria

#### **Anritsu Pty Ltd**

Am Belvedere 10, A-1100 Vienna, Austria  
Phone: +43-(0)1-717-28-710

### • United Arab Emirates

#### **Anritsu EMEA Ltd.**

#### **Anritsu A/S**

Office No. 164, Building 17, Dubai Internet City  
P.O. Box - 501901, Dubai, United Arab Emirates  
Phone: +971-4-3758479

### • India

#### **ANRITSU INDIA PRIVATE LIMITED**

6th Floor, Indiqube ETA, No.38/4, Adjacent to EMC2,  
Doddanekundi, Outer Ring Road,  
Bengaluru - 560048, India  
Phone: +91-80-6728-1300  
Fax: +91-80-6728-1301

### • Singapore

#### **ANRITSU PTE LTD**

1 Jalan Kilang Timor, #07-04/06 Pacific Tech Centre  
Singapore 159303  
Phone: +65-6282-2400  
Fax: +65-6282-2533

### • Vietnam

#### **ANRITSU COMPANY LIMITED**

16th Floor, Peakview Tower, 36 Hoang Cau Street,  
O Cho Dua Ward, Dong Da District, Hanoi, Vietnam  
Phone: +84-24-3201-2730  
Fax: +84-24-3201-2740

### • P.R. China (Shanghai)

#### **Anritsu (China) Co., Ltd.**

Room 2701-2705, Tower A, New Caohejing  
International Business Center No. 391 Gui Ping Road  
Shanghai, 200233, P.R. China  
Phone: +86-21-6237-0898  
Fax: +86-21-6237-0899

### • P.R. China (Hong Kong)

#### **ANRITSU COMPANY LIMITED**

Unit 1302, 13<sup>th</sup> Floor, New East Ocean Center,  
No.9 Science Museum Road, TsimShaTsui East,  
Kowloon, Hong Kong  
Phone: +852-2301-4980  
Fax: +852-2301-3545

### • Japan

#### **Anritsu Corporation**

8-5, Tamura-cho, Atsugi-shi, Kanagawa, 243-0016  
Japan  
Phone: +81-46-296-6509  
Fax: +81-46-225-8352

### • South Korea

#### **Anritsu Corporation, Limited**

8F, A TOWER, 20, Gwacheondaero 7-gil, Gwacheon-si,  
Gyeonggi-do, 13840, Republic of Korea  
Phone: +82-2-6259-7300  
Fax: +82-2-6259-7301

### • 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