

Anritsu Advancing beyond

Microwave Peak USB Power Sensors

Low Cost, Compact, and Highly Accurate Peak
Power Sensors for RF and Microwave Applications

MA24406A

Peak, 50 MHz to 6 GHz

MA24418A

Peak, 50 MHz to 18 GHz

MA24440A

Peak, 50 MHz to 40 GHz

MA24408A

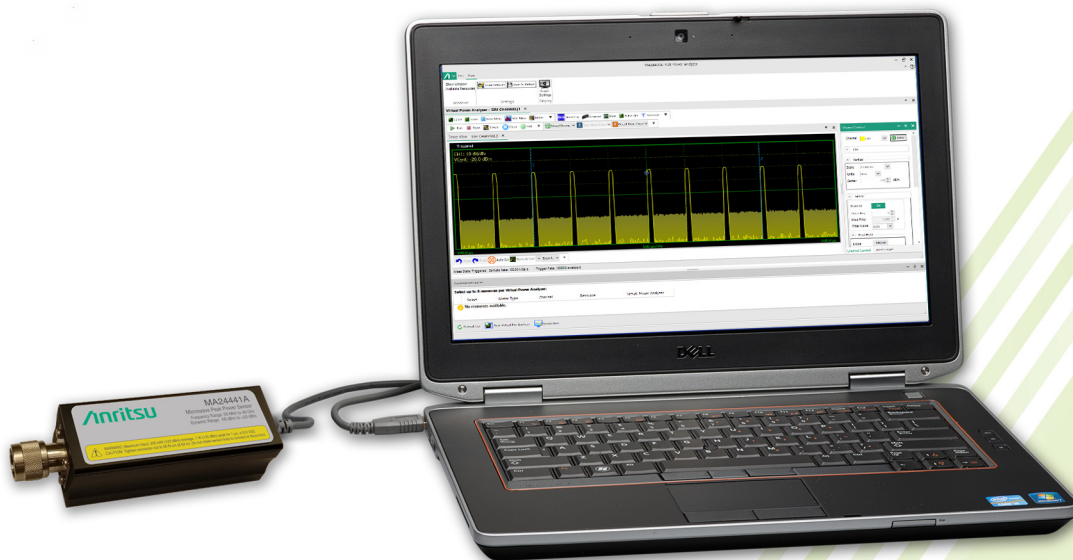
Peak, 50 MHz to 8 GHz

MA24419A

Peak, 50 MHz to 18 GHz

MA24441A

Peak, 50 MHz to 40 GHz



Introduction

The MA244xxA Series of Microwave Peak Power Sensors are designed to provide accurate, peak power measurements from 50 MHz to 6 GHz, 8 GHz, 18 GHz, and 40 GHz with up to 80 dB of dynamic range and 195 MHz of video bandwidth. The sensors employ a parallel processing methodology that performs the multi-step process of RF power measurement at incredible, unmatched speeds. While conventional power meters and USB sensors perform steps serially, resulting in long re-arm times and missed data, Anritsu sensors capture, display, and measure every pulse, glitch, and detail with virtually no gaps in data and zero latency.

Features and Benefits

- 6 GHz, 8 GHz, 18 GHz, and 40 GHz RF Power Sensors
- Up to 195 MHz video bandwidth with 3 ns rise time
- 100,000 measurements per second
- 10 GSa/s effective sample rate
- 100 MSa/s continuous sample rate
- Crest factor and statistical measurements (e.g. CCDF)
- Synchronized multi-channel measurements
- Microwave Peak Power Analyzer advanced measurement and analysis software



MA244xxA Microwave Peak Power Sensors

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Definitions

	All specifications and characteristics apply under the following conditions, unless otherwise stated:
Warm-Up Time	60 minutes
Operating Temperature Range	0 °C to 50 °C
Characteristic Performance	Characteristic specifications are not tested and are not warranted.
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

Performance Specifications

Measurement Range

Model	Frequency Range	Dynamic Range (Average)	Dynamic Range (Pulse)
MA24406A	50 MHz to 6 GHz	-60 dBm to +20 dBm	-50 dBm to +20 dBm
MA24408A	50 MHz to 8 GHz	-53 dBm to +20 dBm ^a	-43 dBm to +20 dBm ^b
MA24418A	50 MHz to 18 GHz	-34 dBm to +20 dBm	-24 dBm to +20 dBm
MA24419A	50 MHz to 18 GHz	-50 dBm to +20 dBm	-40 dBm to +20 dBm
MA24440A	50 MHz to 40 GHz	-34 dBm to +20 dBm	-24 dBm to +20 dBm
MA24441A	50 MHz to 40 GHz	-50 dBm to +20 dBm	-40 dBm to +20 dBm

a. -53 dBm >6 GHz, -60 dBm < 6 GHz

b. -43 dBm >6 GHz, -50 dBm < 6 GHz

Input Damage Level +23 dBm, ±10.0 VDC (+30 dBm peak for 1 µs), minimum

VSWR

Model	Frequency Range	VSWR
MA24406A	50 MHz to 6 GHz	1.25:1
MA24408A	50 MHz to 6 GHz	1.20:1
	>6.0 GHz to 8 GHz	1.25:1
MA24418A	50 MHz to 2 GHz	1.15:1
	>2.0 GHz to 16 GHz	1.28:1
	>16 GHz to 18 GHz	1.34:1
MA24419A	50 MHz to 2 GHz	1.15:1
	>2.0 GHz to 6 GHz	1.20:1
	>6.0 GHz to 16 GHz	1.28:1
	>16 GHz to 18 GHz	1.34:1
MA24440A	50 MHz to 4 GHz	1.25:1
	>4.0 GHz to 38 GHz	1.65:1
	>38 GHz to 40 GHz	2.00:1
MA24441A	50 MHz to 4 GHz	1.25:1
	>4.0 GHz to 38 GHz	1.65:1
	>38 GHz to 40 GHz	2.00:1

Response

Model	Single Channel Rise Time		Video Bandwidth		Single Shot Bandwidth
	Fast	Standard	Fast	Standard	
MA24406A	3 ns	<10 µs	195 MHz	350 kHz	35 MHz
MA24408A	4 ns	<10 µs	165 MHz	350 kHz	35 MHz
MA24418A	5 ns	<10 µs	70 MHz	350 kHz	35 MHz
MA24419A	<100 ns	<10 µs	6 MHz	350 kHz	6 MHz
MA24440A	5 ns	<10 µs	70 MHz	350 kHz	35 MHz
MA24441A	<100 ns	<10 µs	6 MHz	350 kHz	6 MHz
	Sampling Rate	100 MSa/s, characteristic			
	Effective Sampling Rate	10 GSa/s, characteristic			

Triggering

Source	Continuous, Internal, External TTL, Crossover (from another sensor)
Arm Type	Continuous, Single, Trigger Holdoff, Frame (gap) Holdoff
Slope	Positive or Negative
Trigger Hold Off	100 ns to 1 s with 10 ns resolution

Internal Trigger

Model	Dynamic Range	Minimum Pulse Width	
		Fast	Standard
MA24406A	-38 dBm to +20 dBm	10 ns	3 µs
MA24408A	-38 dBm to +20 dBm	10 ns	3 µs
MA24418A	-10 dBm to +20 dBm	10 ns	3 µs
MA24419A	-27 dBm to +20 dBm	200 ns	3 µs
MA24440A	-10 dBm to +20 dBm	10 ns	3 µs
MA24441A	-27 dBm to +20 dBm	200 ns	3 µs

External Trigger

External Trigger Input	SMB (female)
Impedance	10 k Ω
Type	TTL
High Level Input Voltage	2.4 V min, 5.5 V max
Low Level Input Voltage	-0.1 V min, 0.7 V max
Latency	< 10 ns (Latency is defined as the time delay between the defined edge of the applied trigger and the sensor switching into the triggered state.)
Trigger Pulse Width	10 ns min
Trigger Repetition Period	20 ns min

General**PC Requirements**

Processor	1.3 GHz or higher recommended
RAM	512 MB (1 GB or more recommended)
Operating System	Microsoft® Windows® 7 to 10 (32-bit and 64-bit)
Hard-Disk Free Space	Min 1.0 GB free space to install and run
Display Resolution	800 x 600 (1280 x 1024 or higher recommended)
Interface	USB 2.0 high speed
Interface to Host	USB 2.0 high speed

Connector Type

RF Connector	N male to 20 GHz K male (ruggedized) to 40 GHz
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Size and Weight

Size	145 mm x 43 mm x 43 mm, excluding N connector
Weight	363 g (0.80 lb)

Warranty

Warranty	3 year
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Environmental Requirements Tests were performed per MIL-28800F (Class3).

Operating Temperature Range	0 °C to 55 °C
Storage Temperature Range	-40 °C to +70 °C
Relative Humidity (non-condensing)	45 % at 50 °C 75 % at 40 °C 95 % at 30 °C
Altitude	3048 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

Regulatory Compliance

European Union	EMC Directive 2014/30/EU, EN 61326:2013 CISPR 11/EN 55011:2019+A1:2010 Class A Equipment IEC/EN 61000-4-2/3/4/6 Low Voltage Directive 2014/35/EU EN 61010-1:2001 RoHS Directive 2015/863/EU
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Ordering Information

Available Models

MA24406A	50 MHz to 6 GHz
MA24408A	50 MHz to 8 GHz
MA24418A	50 MHz to 18 GHz
MA24419A	50 MHz to 18 GHz
MA24440A	50 MHz to 40 GHz
MA24441A	50 MHz to 40 GHz

Available Options




MA24406A-097	Accredited Calibration to ISO/IEC 17025 and ANSI/NCSL Z540-1 or ANSI/NCSL Z540.3 (includes test report, uncertainty data, and accreditation symbol)
MA24408A-097	Accredited Calibration to ISO/IEC 17025 and ANSI/NCSL Z540-1 or ANSI/NCSL Z540.3 (includes test report, uncertainty data, and accreditation symbol)
MA24418A-097	Accredited Calibration to ISO/IEC 17025 and ANSI/NCSL Z540-1 or ANSI/NCSL Z540.3 (includes test report, uncertainty data, and accreditation symbol)
MA24419A-097	Accredited Calibration to ISO/IEC 17025 and ANSI/NCSL Z540-1 or ANSI/NCSL Z540.3 (includes test report, uncertainty data, and accreditation symbol)
MA24440A-097	Accredited Calibration to ISO/IEC 17025 and ANSI/NCSL Z540-1 or ANSI/NCSL Z540.3 (includes test report, uncertainty data, and accreditation symbol)
MA24441A-097	Accredited Calibration to ISO/IEC 17025 and ANSI/NCSL Z540-1 or ANSI/NCSL Z540.3 (includes test report, uncertainty data, and accreditation symbol)



Included Accessories

11410-00976	Information Card
806-390-R	0.9 m BNC (m) to SMB (m) cable
806-389-R	0.9 m SMB (m) to SMB (m) cable
806-391-R	1.8 m USB A (m) to USB B (m) cable



Optional Accessories


Attenuators

Accessory	Description
	3-1010-122 20 dB, 5 W, DC to 12.4 GHz, N(m) to N(f)
	3-1010-123 30 dB, 50 W, DC to 8.5 GHz, N(m) to N(f)
	3-1010-124 Attenuator, 40 dB, 100 W, DC-8.5 GHz, N(f) input to N(m) output, Unidirectional

Accessory	Description
	42N50-20 20 dB, 5 W, DC to 18 GHz, N(m) to N(f)
	42N50A-30 30 dB, 50 W, DC to 18 GHz, N(m) to N(f)

Fixed Attenuators

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

Accessory	Description
	43KC-3 Precision, DC to 26.5 GHz, 1W, 3 dB, K(m) to K(f)
	43KC-6 Precision, DC to 26.5 GHz, 1W, 6 dB, K(m) to K(f)
	43KC-10 Precision, DC to 26.5 GHz, 1W, 10 dB, K(m) to K(f)
	43KC-20 Precision, DC to 26.5 GHz, 1W, 20 dB, K(m) to K(f)

Coaxial Adapters

Accessory	Description
	34AN50 Precision Adapter, DC to 18 GHz, GPC-7 to N(m), 50 Ω
	34ANF50 Precision Adapter, DC to 18 GHz, GPC-7 to N(f), 50 Ω
	34NK50 Precision Adapter, DC to 18 GHz, N(m) to K(m), 50 Ω
	34NKF50 Precision Adapter, DC to 18 GHz, N(m) to K(f), 50 Ω
	33NFN50B Calibration Grade Adapter, DC to 18 GHz, N(f) to N(f), 50 Ω
	33NNF50B Calibration Grade Adapter, DC to 18 GHz, N(m) to N(f), 50 Ω
	34NN50A Calibration Grade Adapter, DC to 18 GHz, N(m) to N(m), 50 Ω
	34NFK50 Precision Adapter, DC to 18 GHz, N(f) to K(m), 50 Ω

Accessory	Description
	1091-26-R SMA(m) to N(m), DC to 18 GHz, 50 Ω
	1091-27-R SMA(f) to N(m), DC to 18 GHz, 50 Ω
	1091-80-R SMA(m) to N(f), DC to 18 GHz, 50 Ω
	1091-81-R SMA(f) to N(f), DC to 18 GHz, 50 Ω
	510-90-R 7/16 DIN(f) to N(m), DC to 7.5 GHz, 50 Ω
	510-91-R 7/16 DIN(f) to N(f), DC to 7.5 GHz, 50 Ω
	510-92-R 7/16 DIN(m) to N(m), DC to 7.5 GHz, 50 Ω
	510-93-R 7/16 DIN(m) to N(f), DC to 7.5 GHz, 50 Ω

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