Boonton

Data Sheet

4240 Series
RF Power Meter



Taking performance to a new peak

4240 Series RF Power Meter

The 4240 series of CW RF power meters provides the high speed measurement capability needed in a production environment, as well as the simplicity of operation required for bench top use. It provides very accurate measurements from -70 dBm to +44 dBm (sensor dependent) and has a rapid display update rate for tuning applications. The easy to read LCD displays both channels simultaneously with numeric and bar graph information.

Five digit resolution, 90 dB dynamic range

The 4240 series has a 5 digit resolution and can display the value in either logarithmic or linear units. The 4242 two channel model allows the simultaneous comparison of multiple inputs during testing and in difference and ratio measurements.

Sensor Compatibility

The 4240 series is compatible with all Boonton CW diode, thermocouple, and waveguide sensors from 10 kHz to 40 GHz. Older sensors can be upgraded with a data adaptor to use the convenient auto calibration feature on the meter eliminating the need for manual calibration data input. Standard IEEE-488 GPIB and RS232 ports allow convenient interface with an ATE system. The SCPI command set, or an available LabVIEW driver allow simple integration with your existing ATE system. The 4240 Series is capable of HP437, HP438, 4220A and 4230A emulation modes for additional compatibility in any ATE system.



Features

- -70 dBm to +44 dBm, depending on sensor
- 90 dB dynamic range, depending on sensor
- 10 kHz to 40 GHz measurement range
- Single or dual-channel display
- >200 measurements per second
- HP437, HP438, and Boonton 4220A/4230A emulation
- Automatically loads sensor data
- Simple software control via SCPI language
- 50 MHz step calibrator
- IEEE-488 and RS-232 interfaces standard



The 4240 Series offers a backlit LCD, which provides simultaneous readings of one or both channels, displayed with individually programmable units and resolution.

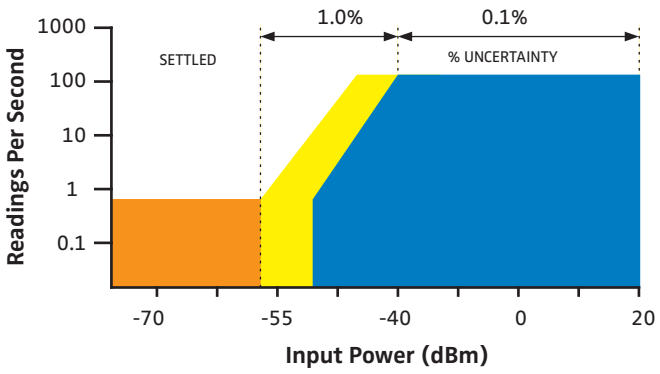


The instrument can measure gain and output power, and perform sum, difference, ratio and relative measurements. Selectable dual bar graphs assist with gain and peaking adjustments.

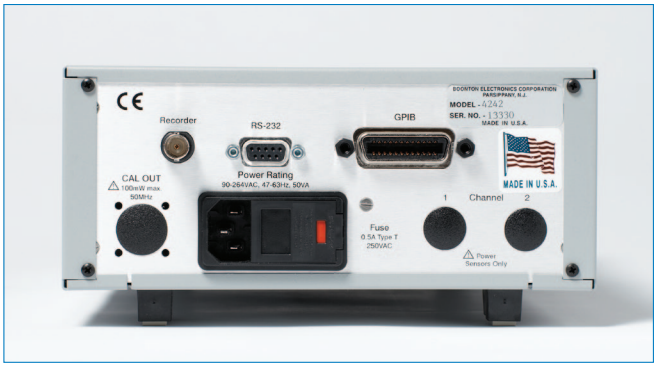


Automatic step calibration "AutoCal" function uses built-in 50 MHz sweep calibrator to offer best-in-class power linearity.

Fast-mode Throughput (60 Hz Operation)







Specifications

Frequency Range	10 kHz to 40 GHz Sensor dependent
Power Range	-70 dBm to +44 dBm Sensor dependent
Number of Channels	One or two
Measurement Speed	1 channel: 200 readings/sec 2 channels: 100 readings/sec
Power Sensors Accepts sensor data adapter with full-calibration data, including high-frequency calibration factors, stored in nonvolatile memory. Sensor menu accesses sensors displaying sensor serial number. Compatible with all Boonton CW power sensors. See Sensor Data Sheet.	
Dynamic Range Up to 90 dB with diode sensors, 50 dB with thermocouple sensors See Power Sensor Specifications	
Inputs Front panel sensor connectors standard, rear panel inputs optional	
Outputs Front panel CALOUT connector, 0 dBm, 50 MHz, -60 to 20 dBm Rear panel RECORDER BNC connector, 0 to 10 V into 1 MΩ Output impedance is 9.09 kΩ. May be operated into 1 kΩ for 1V fs Rear panel IEEE-488 and RS-232	
Emulation	4220A, 4230A & HP437, 438
Displays Menu-driven 20 character x 4 line LCD display. Simultaneous display of dual channels with bar graph proportional to data display.	
Display Units	Absolute: watts or dBm Relative: dBr
Display Resolution	5 digits; nW, µW, mW, and W 0.001 dB, dBm, and dBr
Calibration Factors +3.00 to -3.00 dB, stored in nonvolatile memory. Meter linearly interpolates between entries as required.	
Zeroing/AutoCal Automatic functions to calculate, store, and apply zero corrections and generate linearity calibration data for power sensors.	
Ranging	Automatic or manual
Filtering	0.05 to 20.00 seconds
Display Offset	-99.99 to 99.99 dB

Calibration Source

Operating Modes	Off, On CW
Frequency	50.025 MHz ± 0.1%
Level Range	-60 to +20 dBm
Resolution	0.1 dB
RF Connector	Type N (f)
Source VSWR	1.05 (reflection coeff. = 0.024)

Uncertainty

Total accuracy is the sum of the following uncertainties:
(errors are ±worst case)

Instrumentation Uncertainty	0.2% at full scale
Calibrator Uncertainty, 0C to 20C, NIST traceable	
0 dBm	±0.055 dB (1.27%)
+20 to -39 dBm	±0.075 dB (1.74%)
-40 to -60 dBm	±0.105 dB (2.45%)

Other Uncertainties
For sensor, noise, high-frequency calibration uncertainty, consult power sensor specifications.

Other Specifications

Power Consumption	85-260 VAC, 15 Watts, 25 VA
Operating Temperature	0° to +55 °C
Weight	5 lbs (2.3 kg)
Dimensions	8.26" (21.0 cm) wide 3.48" (8.9 cm) high 13.5" (34.3 cm) deep
IEEE-488 Interface	Complies with IEEE-488 and implements SH1, AH1, T6, L4, SR1, RL1, DC1, and DT1
RS-232 Interface	Complies with RS-232 (9-pin D-sub connector)

Power Sensors

Wide Dynamic Range Diode Sensors

Model Number	Frequency Range	Power (dBm)
51071A	10 MHz to 26.5 GHz	-70 to +20
51072A	30 MHz to 40.0 GHz	-70 to +20
51075A	500 kHz to 18.0 GHz	-70 to +20
51077A	500 kHz to 18.0 GHz	-60 to +30
51079A	500 kHz to 18.0 GHz	-50 to +40

Thermocouple Sensors

Model Number	Frequency Range	Power (dBm)
51100(9E)	10 MHz to 18.0 GHz	-20 to +20
51200	10 MHz to 18.0 GHz	0 to +37

Special Purpose Sensors

Model Number	Frequency Range	Power (dBm)
51011 (EMC)	10 kHz to 8.0 GHz	-60 to +20
51011 (4B)	100 kHz to 12.4 GHz	-60 to +20
51013 (4E)	100 kHz to 18.0 GHz	-60 to +20
51015 (5E)	100 kHz to 18.0 GHz	-50 to +30
51033 (6E)	100 kHz to 18.0 GHz	-40 to +33
51078	100 kHz to 18.0 GHz	-20 to +37

Diode Average Sensors

Model Number	Frequency Range	Power (dBm)
51085	500 kHz to 18 GHz	-30 to +20

Ordering Information

4241	Single Channel
4242	Dual Channel
-01	Rear sensor inputs
-02	Calibrator, rear panel output
-30	Warranty extended to 3 years

Accessories Required

One or more of the available power sensors, 5 ft power sensor cable Model 41-2A and one sensor data adapter (one per channel included)

Accessories Available

41-2A/10
Sensor/Probe Interconnecting Cable (10 ft). A special low-noise cable that connects the power sensor to the power meter.

41-2A/20	Sensor/Probe Interconnecting Cable (20 ft)
41-2A/50	Sensor/Probe Interconnecting Cable (50 ft)
41-2A/100	Sensor/Probe Interconnecting Cable (100 ft)
95004701A	F/F Adapter, 41-2A
95004901A	Bulkhead Connector F/F
95403001A	Rack Mounting Kit, 4240 Series
95109001A	Sensor Data Adapter
95006201A	Transit case Holds the 4240 series & up to 4 sensors

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