

Agilent Power Meters and Sensors

Explore the latest power meters and power sensors for RF and microwave measurements

Selection Guide

Peak Power Measurement

8990B peak power analyzer



- 5 ns rise time/fall time
- 100 MSa/s sampling rate
- 15 inch XGA color and touchscreen display

N8262A P-Series modular power meter



- 1U half-rack size
- 100 MSa/s continuous sampling, single-shot 30 MHz VBW
- Wireless presets include WLAN, radar and MPCA
- Code-compatible with N1912A P-Series power meter

N1911A/2A P-Series power meters



- 100 MSa/s continuous sampling, single-shot 30 MHz VBW
- Includes time-gated and statistical (CCDF) power measurements
- Wireless presets include WiMAX™, HSDPA and DME

E4416A/7A EPM-P Series power meters



- 20 MSa/s continuous sampling, 5 MHz VBW
- Bundled analyzer software for pulse and statistical analysis
- Wireless presets include GSM, Bluetooth™ and W-CDMA

Average Power Measurement

N1913A/14A EPM Series power meters



- Single, dual or four-channel measurements
- Frequency range of 9 kHz to 110 GHz; power range of -70 dBm to +44 dBm (depending on power sensor)
- Fast measurement speed of 400 readings/s
- Code-compatible with legacy E4418B/9B EPM Series, 436A, 437B and 438A power meters (43X compatibility only with option N191xA-200)

N432A thermistor power meter



- High Accuracy ($\leq 0.2\% \pm 0.5 \mu\text{W}$), excellent for 1 mW transfer calibration (with 478A-H75/H76)
- Built-in 6.5-digit ADC eliminates the need for an external DMM
- Digital color LCD display, and user-friendly interface

Portable Power Measurement

V3500A handheld RF power meter



- Broad 10 MHz to 6 GHz frequency range
- Wide dynamic range (-63 dBm to +20 dBm)
- Absolute accuracy up to ± 0.21 dB
- Built-in display with backlight and integrated power sensor
- Internal power reference enables self-calibration before use
- 3-ways power up capability (via AA batteries, USB interface, and AC power adaptor)

U2000 Series USB power sensors



- -60 dBm to +44 dBm, 9 kHz to 26.5 GHz average power measurements without power meters
- Quick and easy set up with USB connectivity
- Internal zeroing without disconnecting from device under-test
- Bundled N1918A Power Analysis Manager software for easy monitoring and troubleshooting

Power Sensors

Peak and Average power sensors



N1921A/2A P-Series power sensors
E9320 E-Series power sensors

Average power sensors



E4410, E9300 E-Series power sensors
N8480 Series thermocouple power sensors
848xD Series, V/W8486A diode power sensors
478A, 8478B thermistor power sensors

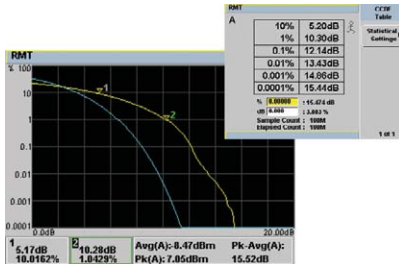


Agilent Technologies

Designed for Manufacturing



- **Up to 100 MSA/s sampling rate and 1500 readings/s** for high productivity
- **Code-compatible with legacy power meter** so you save time and effort in developing new codes
- **Backward-compatible with all legacy power sensors** to protect sensor investment
- **Wide selection of average and peak power sensors** for various applications
- **CCDF statistical measurement** in graphical and tabular formats for wireless component manufacturing

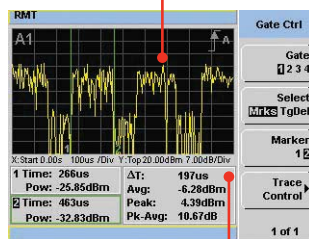


Designed for R&D



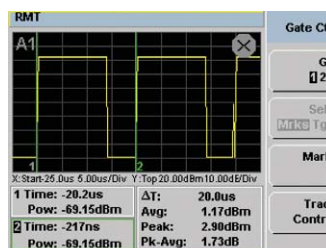
- **Calibration factors in EEPROM** ensures accurate measurements
- **Intuitive user interface** enables quick setup time
- **Graphical representation of delta measurements** eases visualization and analysis
- **Trace zoom** helps in investigating glitches, overshoot, and rise/fall time
- Capture wireless burst signals easily with P-Series power meter's **WLAN/GSM/LTE/WIMAX preset**

100 MSA/s continuous sampling ensures signal glitches are not missed



Time-gated peak, average and peak-to-average ratio power measurements

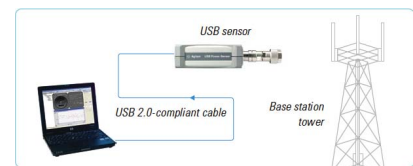
- Setting up faster and easier with **radar preset** in the P-Series power meter



Designed for Installation and Maintenance



- **Wide dynamic range** in E-Series, N8480 Series and 848xD Series power sensors allows high and low power measurements with a single sensor
- **Internal rechargeable battery option and operating case** add to the EPM Series power meter's portability
- **High resolution display with wide viewing angle and split-screen** eases reading in subdued lighting conditions
- **Light weight and palm size** V3500A and U2000 Series bring greater convenience in field tasks



When you need to take power measurements on the road or up a base station tower, smaller, lighter and fewer is better. With the U2000 Series USB power sensors, the only other thing you'll need is a laptop with the N1918A Power Analysis Manager installed.

Power Meters Selection Chart for Wireless Communication

Peak Power Measurement

EPM-P E4416A/17A
(VBW: 5 MHz)



Power sensor options

- E932x Peak-and-Average Sensors (300 kHz, 1.5 MHz, 5 MHz)

* Also compatible with all average power sensors

P-Series N1911A/12A
(VBW: 30 MHz)



P-Series modular N8262A
(VBW: 30 MHz)



Power sensor options

- N192x Wideband Sensors (30 MHz)
- E932x Peak-and-Average Sensors (300 kHz, 1.5 MHz, 5 MHz)

* Also compatible with all average power sensors

8990B peak power analyzer
(VBW: 150 MHz)



	Video BW	5 MHz	20 MHz	30 MHz	100 MHz	150 MHz
Cellular	GSM/GPRS/EDGE					
	W-CDMA					
	HSDPA/HSUPA (FDD)					
	LTE					
	TD-SCDMA					
	HSDPA (TD-SCDMA)					
	cdmaOne					
	cdma2000®					
1xEV-DO						
						LTE Advanced
Two-Way Trunked	iDEN/WiDEN					
	TETRA/TEDES					
	APCO 25					
Personal Area Network	RFID					
	ZigBee					
	Bluetooth 1.2 & EDR					
	Ultra-Wideband (Bluetooth Future)					
Mobile Broadcast	DVB-H					
	ISDB-T					
	MediaFLO					
	T-DMB					
Broadband	WiBro					
	WiMAX					
	WLAN					
	MMDS					
	LMDS					
	MIMO					
Navigation	GPS					
	Pt-Pt					
	Radar					

Average Power Measurement

EPM N1913A/14A



Power sensor options

- 848x Diode and Thermocouple Sensors
- N848x Thermocouple Sensors
- N848x and 848x Waveguide Sensors
- E441x 1-Path Diode CW-only Sensors
- E930x 2-Path Diode True-Average Sensors
- U200x USB Sensors

N432A Thermistor power meter



Power sensor options

- 478A Thermistor Sensor
- 8478B Thermistor Sensor

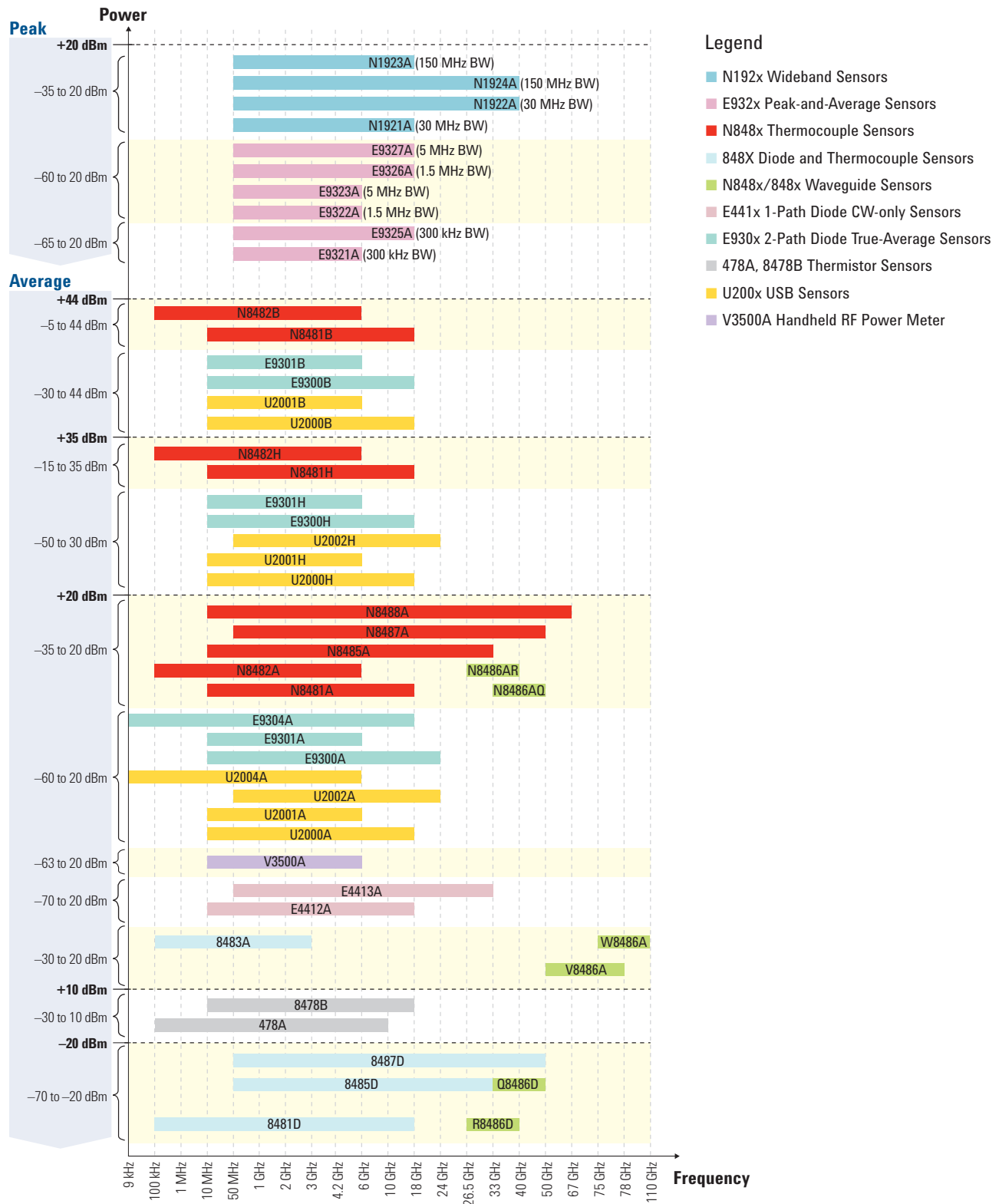
U2000 Series USB power sensors



V3500A handheld RF power meter



Power Sensors Selection Chart for Wireless Communication



Power Meters and Sensors Compatibility Table

		POWER METERS							Product Description / Sensor Tech.	Frequency Range	Power Range
		N432A/432A ¹	E4416A/17A EPM-P	N1913A/14A E4418B/9B EPM ²	E1416A VXI	N1911A/12A N8262A P-Series	8990B				
POWER SENSORS	Wideband power sensors	N1923A	-	-	-	-	-	√	Diode Power Sensor	50 MHz to 18 GHz	-35 dBm (316 nW) to +20 dBm (100 mW)
		N1924A	-	-	-	-	-	√	Diode Power Sensor	50 MHz to 40 GHz	-35 dBm (316 nW) to +20 dBm (100 mW)
	P-Series Wideband sensors	N1921A	-	-	-	-	√	√	Diode Power Sensor	50 MHz to 18 GHz	-35 dBm (316 nW) to +20 dBm (100 mW)
		N1922A	-	-	-	-	√	√	Diode Power Sensor	50 MHz to 40 GHz	-35 dBm (316 nW) to +20 dBm (100 mW)
	E-Series Peak-and-Average sensors	E9321A	-	√	-	-	√	-	Diode Power Sensor	50 MHz to 6 GHz	-65 dBm (320 pW) to +20 dBm (100 mW)
		E9322A	-	√	-	-	√	-	Diode Power Sensor	50 MHz to 6 GHz	-60 dBm (1 nW) to +20 dBm (100 mW)
		E9323A	-	√	-	-	√	-	Diode Power Sensor	50 MHz to 6 GHz	-60 dBm (1 nW) to +20 dBm (100 mW)
		E9325A	-	√	-	-	√	-	Diode Power Sensor	50 MHz to 18 GHz	-65 dBm (320 pW) to +20 dBm (100 mW)
		E9326A	-	√	-	-	√	-	Diode Power Sensor	50 MHz to 18 GHz	-60 dBm (1 nW) to +20 dBm (100 mW)
		E9327A	-	√	-	-	√	-	Diode Power Sensor	50 MHz to 18 GHz	-60 dBm (1 nW) to +20 dBm (100 mW)
	E-Series True Average sensors	E9300A	-	√	√	-	√	-	Diode Power Sensor	10 MHz to 18 GHz	-60 dBm (1 nW) to +20 dBm (100 mW)
		E9301A	-	√	√	-	√	-	Diode Power Sensor	10 MHz to 6 GHz	-60 dBm (1 nW) to +20 dBm (100 mW)
		E9304A	-	√	√	-	√	-	Diode Power Sensor	9 kHz to 6 GHz	-60 dBm (1 nW) to +20 dBm (100 mW)
		E9300B	-	√	√	-	√	-	Diode Power Sensor	10 MHz to 18 GHz	-30 dBm (1 μW) to +44 dBm (25 W)
		E9301B	-	√	√	-	√	-	Diode Power Sensor	10 MHz to 6 GHz	-30 dBm (1 μW) to +44 dBm (25 W)
		E9300H	-	√	√	-	√	-	Diode Power Sensor	10 MHz to 18 GHz	-50 dBm (10 nW) to +30 dBm (1 W)
	E-Series CW-only sensors	E4412A	-	√	√	-	√	-	Diode Power Sensor	10 MHz to 18 GHz	-70 dBm (100 pW) to +20 dBm (100 mW)
		E4413A	-	√	√	-	√	-	Diode Power Sensor	50 MHz to 26.5 GHz	-70 dBm (100 pW) to +20 dBm (100 mW)
	N8480 / 8480 Series Thermocouple and Diode sensors	N8481A	-	√	√	-	√	-	Thermocouple Power Sensor	10 MHz to 18 GHz	-35 dBm (316 nW) to +20 dBm (100 mW)
		N8482A	-	√	√	-	√	-	Thermocouple Power Sensor	100 kHz to 6 GHz	-35 dBm (316 nW) to +20 dBm (100 mW)
		8483A	-	√	√	√	√	-	Thermocouple Power Sensor	100 kHz to 2 GHz	-30 dBm (1 μW) to +20 dBm (100 mW)
		N8485A	-	√	√	-	√	-	Thermocouple Power Sensor	10 MHz to 26.5 GHz	-35 dBm (316 nW) to +20 dBm (100 mW)
		N8487A	-	√	√	-	√	-	Thermocouple Power Sensor	50 MHz to 50 GHz	-35 dBm (316 nW) to +20 dBm (100 mW)
		N8488A	-	√	√	-	√	-	Thermocouple Power Sensor	10 MHz to 67 GHz	-35 dBm (316 nW) to +20 dBm (100 mW)
N8481B		-	√	√	-	√	-	High Power Thermocouple Sensor	10 MHz to 18 GHz	-5 dBm (316 μW) to +44 dBm (25 W)	
N8482B		-	√	√	-	√	-	High Power Thermocouple Sensor	100 kHz to 6 GHz	-5 dBm (316 μW) to +44 dBm (25 W)	
N8481H		-	√	√	-	√	-	High Power Thermocouple Sensor	10 MHz to 18 GHz	-15 dBm (32 μW) to +35 dBm (3 W)	

1. The 432A model is superseded by the N432A.
2. The E4418B/19B models are superseded by the N1913A/14A.

* For the complete list of sensor options, please visit our Web site at www.agilent.com/find/powermeters.

Power Meters and Sensors Compatibility Table

		POWER METERS							Product Description / Sensor Tech.	Frequency Range	Power Range
		N432A/432A 1	E4416A/17A EPM-P	N1913A/14A E4418B/9B EPM 2	E1416A VXI	N1911A/12A N8262A P-Series	8990B				
POWER SENSORS	N8480 / 8480 Series Thermocouple and Diode sensors	N8482H	-	√	√	-	√	-	High Power Thermocouple Sensor	100 kHz to 6 GHz	-15 dBm (32 μW) to +35 dBm (3 W)
		8481D	-	√	√	√	√	-	Diode Power Sensor	10 MHz to 18 GHz	-70 dBm (100 pW) to -20 dBm (10 μW)
		8485D	-	√	√	√	√	-	Diode Power Sensor	50 MHz to 26.5 GHz	-70 dBm (100 pW) to -20 dBm (10 μW)
		8487D	-	√	√	√	√	-	Diode Power Sensor	50 MHz to 50 GHz	-70 dBm (100 pW) to -20 dBm (10 μW)
	Waveguide sensors	R8486D	-	√	√	√	√	-	Waveguide Power Sensor	26.5 GHz to 40 GHz	-70 dBm (100 pW) to -20 dBm (10 μW)
		Q8486D	-	√	√	√	√	-	Waveguide Power Sensor	33 GHz to 50 GHz	-70 dBm (100 pW) to -20 dBm (10 μW)
		N8486AR	-	√	√	-	√	-	Thermocouple Waveguide Power Sensor	26.5 GHz to 40 GHz	-35 dBm (316 μW) to +20 dBm (100 mW)
		N8486AQ	-	√	√	-	√	-	Thermocouple Waveguide Power Sensor	33 GHz to 50 GHz	-35 dBm (316 μW) to +20 dBm (100 mW)
		V8486A	-	√	√	√	√	-	V-band Power Sensor	50 GHz to 75 GHz	-30 dBm (1 μW) to +20 dBm (100 mW)
		W8486A	-	√	√	√	√	-	Waveguide Power Sensor	75 GHz to 110 GHz	-30 dBm (1 μW) to +20 dBm (100 mW)
	Thermistor mount sensors	478A	√	-	-	-	-	-	Coaxial Thermistor Mount	10 MHz to 10 GHz	-30 dBm (1 μW) to +10 dBm (10 mW)
		8478B	√	-	-	-	-	-	Coaxial Thermistor Mount	10 MHz to 18 GHz	-30 dBm (1 μW) to +10 dBm (10 mW)
	USB sensors	U2000A	-	-	√ ³	-	-	√	Diode Power Sensor	10 MHz to 18 GHz	-60 dBm (1 nW) to +20 dBm (100 mW)
		U2001A	-	-	√ ³	-	-	√	Diode Power Sensor	10 MHz to 6 GHz	-60 dBm (1 nW) to +20 dBm (100 mW)
		U2002A	-	-	√ ³	-	-	√	Diode Power Sensor	50 MHz to 24 GHz	-60 dBm (1 nW) to +20 dBm (100 mW)
		U2004A	-	-	√ ³	-	-	√	Diode Power Sensor	9 kHz to 6 GHz	-60 dBm (1 nW) to +20 dBm (100 mW)
		U2000B	-	-	√ ³	-	-	√	Diode Power Sensor	10 MHz to 18 GHz	-30 dBm (1 μW) to +44 dBm (25 W)
		U2001B	-	-	√ ³	-	-	√	Diode Power Sensor	10 MHz to 6 GHz	-30 dBm (1 μW) to +44 dBm (25 W)
		U2000H	-	-	√ ³	-	-	√	Diode Power Sensor	10 MHz to 18 GHz	-50 dBm (10 nW) to +30 dBm (1 W)
		U2001H	-	-	√ ³	-	-	√	Diode Power Sensor	10 MHz to 6 GHz	-50 dBm (10 nW) to +30 dBm (1 W)
		U2002H	-	-	√ ³	-	-	√	Diode Power Sensor	50 MHz to 24 GHz	-50 dBm (10 nW) to +30 dBm (1 W)
	Discontinued 848x sensors	8481/2/5/7A	-	√	√	√	√	-	Thermocouple Power Sensor	100 kHz to 50 GHz	-30 dBm (1 μW) to +20 dBm (100 mW)
		848xB/H	-	√	√	√	√	-	High Power Thermocouple Sensor	100 kHz to 18 GHz	-10 dBm (100 μW) to +44 dBm (25 W)
		R8486A	-	√	√	√	√	-	Thermocouple Waveguide Power Sensor	26.5 GHz to 40 GHz	-30 dBm (1 μW) to +20 dBm (100 mW)
		Q8486A	-	√	√	√	√	-	Thermocouple Waveguide Power Sensor	33 GHz to 50 GHz	-30 dBm (1 μW) to +20 dBm (100 mW)

1. The 432A model is superseded by the N432A.
2. The E4418B/19B models are superseded by the N1913A/14A.
3. Only with N1913A/14A.

* For the complete list of sensor options, please visit our Web site at www.agilent.com/find/powermeters.

Related Agilent Literature

Publication title	Pub number
Specifications	
<i>Agilent N432A Thermistor Power Meter Data Sheet</i>	5990-5740EN
<i>Agilent N8262A P-Series Modular Power Meter and Power Sensors Data Sheet</i>	5989-6605EN
<i>Agilent N1911A/N1912A P-Series Power Meters and N1921A/N1922A Wideband Power Sensors Data Sheet</i>	5989-2471EN
<i>Agilent U2000 Series USB Power Sensors Data Sheet</i>	5989-6278EN
<i>Agilent E4416A/E4417A EPM-P Series Power Meters and E-Series E9320 Peak and Average Power Sensors Data Sheet</i>	5980-1469E
<i>Agilent N1913A and N1914A EPM Series Power Meters Data Sheet</i>	5990-4019EN
<i>Agilent E4418B/E4419B EPM Series Power Meters, E-Series and 8480 Series Power Sensors Data Sheet</i>	5965-6382E
<i>Agilent N8480 Series Thermocouple Power Sensors Data Sheet</i>	5989-9333EN
<i>Agilent V3500A Handheld RF Power Meter Data Sheet</i>	5990-5483EN
<i>Agilent N1918A Power Analysis Manager Data Sheet</i>	5989-6612EN
<i>Agilent 8990B Peak Power Analyzer and N1923A/N1924A Wideband Power Sensors Data Sheet</i>	5990-8126EN
Application Notes	
<i>Agilent Choosing the Right Power Meter and Sensor Product Note</i>	5968-7150E
<i>Agilent Fundamentals of RF and Microwave Power Measurements Application Notes 1449-1/2/3/4</i>	5988-9213/4/5/6EN
<i>Agilent P-Series Power Sensor Internal Zeroing and Calibration for RF Power Sensors Application Note</i>	5989-6509EN
<i>Agilent N1911A/N1912A P-Series Power Meters For WiMAX™ Signal Measurements Demo Guide</i>	5989-6423EN
<i>Agilent 4 Steps for Making Better Power Measurements Application Note 64-4D</i>	5965-8167E
<i>Agilent EPM-P Series Power Meters Used in Radar and Pulse Applications Application Note 1438</i>	5988-8522EN
<i>Agilent Compatibility of the U2000 Series USB Power Sensors with Agilent Instruments Application Note</i>	5989-8743EN
<i>Agilent N1918A Radar Pulse Measurement Application Note</i>	5990-3415EN
<i>MIMO Measurement Tips with Agilent P-Series Power Meters and U2000 Series USB Power Sensors Application Note</i>	5990-3546EN
<i>Agilent P-Series and EPM-P Power Meters for Bluetooth Testing Technical Overview and Self-Guided Demonstration</i>	5989-8459EN
<i>Agilent Maximizing Measurement Speed Using P-Series Power Meters Application Note</i>	5989-7678EN
<i>Agilent Using Linux® To Control the U2000 Series USB Power Sensors Product Note</i>	5989-8744EN



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