Keysight Technologies
Peak Power Solutions

Selection Guide

KEYSIGHT TECHNOLOGIES

Keysight Technologies, Inc. offers a complete portfolio of peak power measurement tools to best fit your needs - from system to bench use, from R&D to manufacturing applications within the aerospace/defense and wireless industries. Explore the latest power meters and power sensors for peak RF and microwave measurements.

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
- Frequency range of 50 MHz to 40 GHz (sensor dependent)
- Dynamic range of –35 to +20 dBm
- 4 channels (two RF, two video)
- Compatible with U2000 Series USB power sensors (connected through USB hosts)
- Internal zeroing and calibration

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 MCPA
- Code-compatible with N1912A P-Series power meter
- Online web browser for real time remote operations
- Equivalent to N1911/12A P-series bench instrument performance

N1911A/2A P-Series power meters

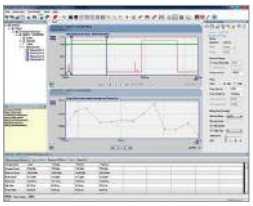
- 100 MSa/s continuous sampling, single-shot 30 MHz VBW
- Includes time-gated and statistical (CCDF) power measurements
- Wireless presets include WiMAX, HSDPA and DME
- Internal zeroing and calibration when connected to the device-under-test
- 2 year calibration cycle

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
- Time-gated and free run power measurements

Portable Power Measurement

U2020 X-series USB peak & average power sensors



- 35 dBm to + 20 dBm, 50 MHz to 18 GHz/40 GHz
- > 3500 readings/second measurement speed (buffer mode)
- Quick and easy set up with USB connectivity and internal zero and calibration
- Built-in trigger in/trigger out
- 30 MHz video bandwidth
- Internal zeroing and calibration
- Bundled with N1918A Power Analysis Manager software at no additional cost

Power Sensors

Peak and Average power sensors

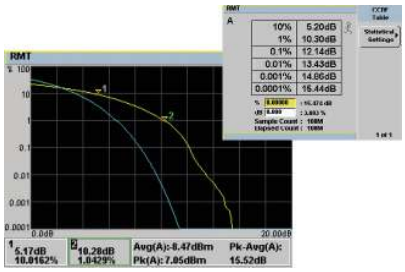
N1921A/2A P-Series power sensors

E9320 E-Series power sensors

N1923A/24A wideband power sensors

Designed for Manufacturing

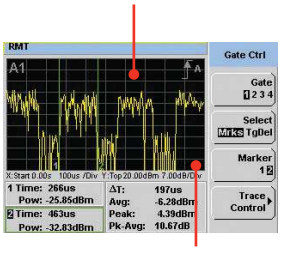
- Up to 100 MSa/s sampling rate and 3500 readings/s for high productivity
- Code-compatible with legacy power meter so you save time and effort in developing new codes
- Backward-compatible with all legacy power sensors to protect sensor investment
- Wide selection of average and peak power sensors for various applications
- CCDF statistical measurement in graphical and tabular formats for wireless component manufacturing



Designed for R&D

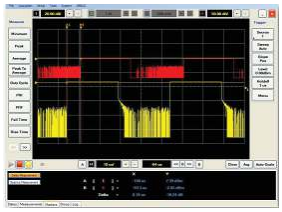
- Calibration factors in EEPROM ensures accurate measurements
- Intuitive user interface enables quick setup time
- Graphical representation of delta measurements eases visualization and analysis
- Trace zoom helps in investigating glitches, overshoot, and rise/fall time
- Capture wireless burst signals 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

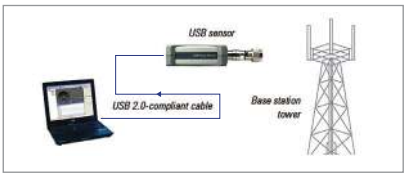
- Analyze full range of pulse signals with 15 pulse characterization measurements using the 8990B peak power analyzer



Measures the time delay between the two traces in radar analysis

Designed for Installation and Maintenance

- High resolution display with wide viewing angle and split-screen eases reading in subdued lighting conditions
- Light weight and palm size U2020 X-series brings 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 U2020 X-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)

U2020 X-Series
USB power sensors
(VBW: 30 MHz)

P-Series modular
N8262A
(VBW: 30 MHz)

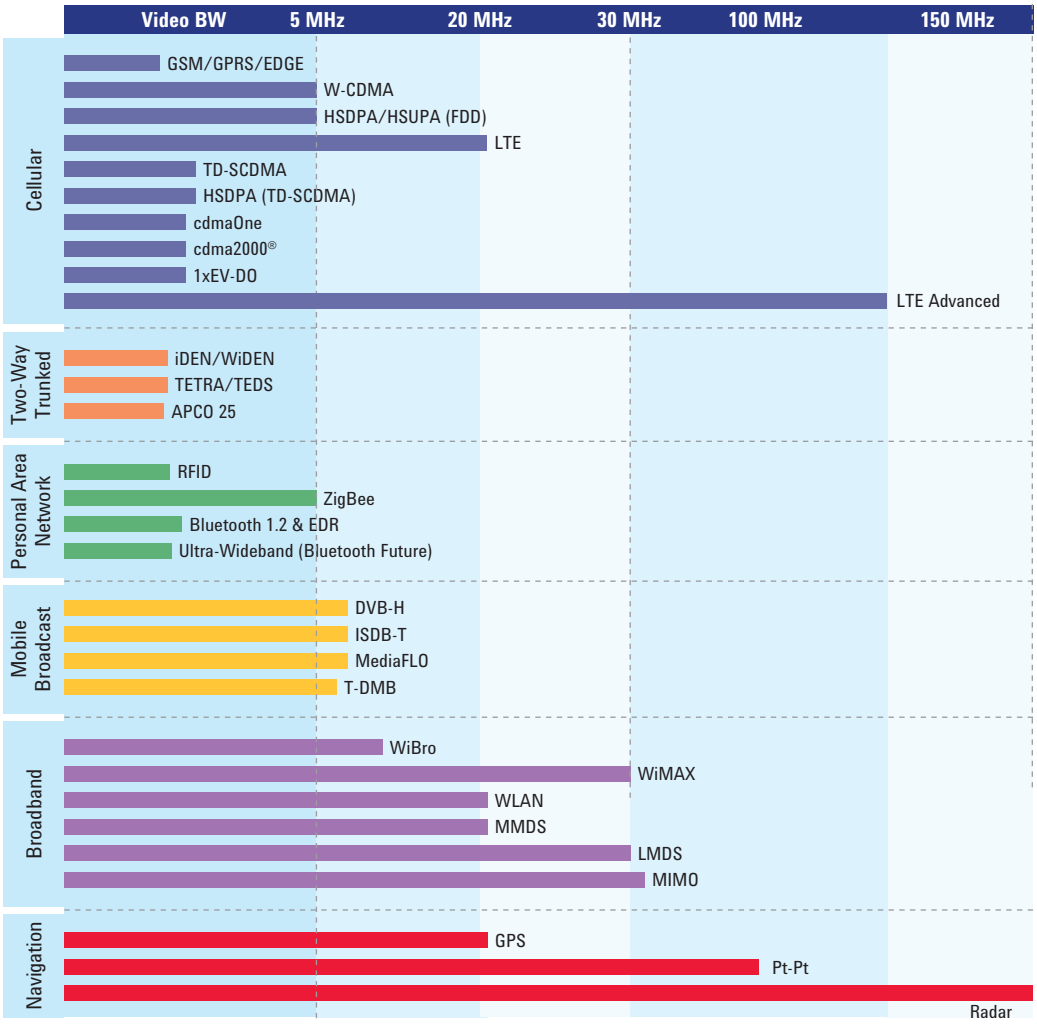
Power sensor options for
the P-series meters

- N1921A/22A Wideband Sensors (30 MHz)
- E932x Peak-and-Average Sensors (300 kHz, 1.5 MHz, 5 MHz)
- *Also compatible with all average power sensors*

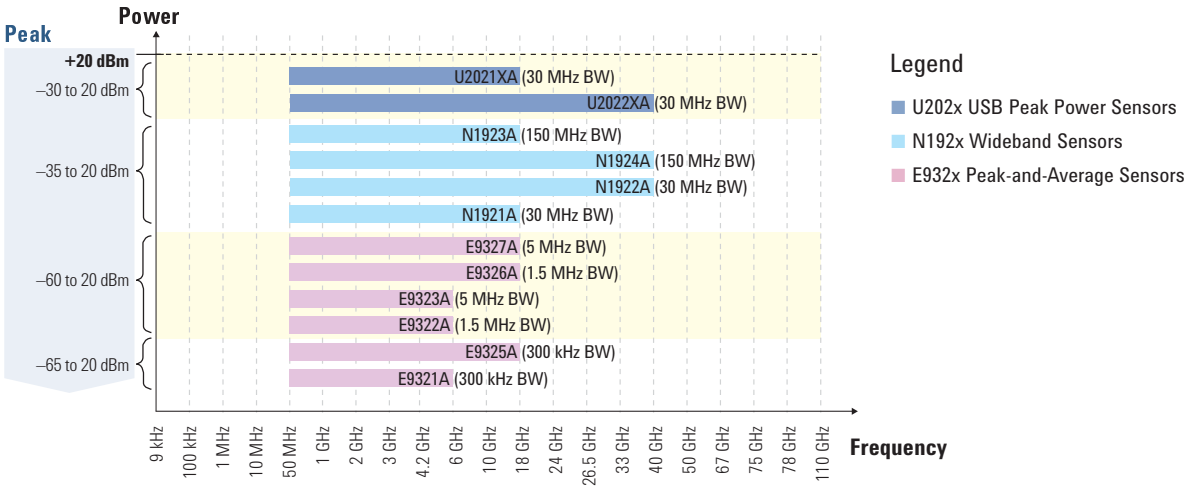
8990B peak power analyzer (VBW: 150 MHz)

Power sensor options

- N1923A/24A Wideband Sensors (150 MHz)
- N1921A/22A Wideband Sensors
- 30 MHz)



Power Sensors Selection Chart for Wireless Communication



Power Meters and Sensors Compatibility Table

Power Sensors			Power Meters					
			E4416A/17A EPM P	N1911A/12A N8262A P-Series	8990B	Product Description/ Sensor Tech.	Frequency Range	Power Range
	X-series USB peak and average sensors	U2021XA	—	—	√[1]	Diode Power Sensor	50 MHz to 18 GHz	–35 dBm (316 nW) to +20 dBm (100 mW)
		U2022XA	—	—	√[1]	Diode Power Sensor	50 MHz to 40 GHz	–35 dBm (316 nW) to +20 dBm (100 mW)
	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)
		E9301H	√	√	—	Diode Power Sensor	10 MHz to 6 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. Requires the N1918A Power Analysis Manager software

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

Power Meters and Sensors Compatibility Table

Power Sensors			Power Meters					
			E4416A/17A EPM-P	N1911A/12A N8262A P-Series	8990B	Product Description / Sensor Tech.	Frequency Range	Power Range
	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 average sensors	U2000A	—	—	√	Diode Power Sensor	10 MHz to 18 GHz	–60 dBm (1 nW) to +20 dBm (100 mW)
		U2001A	—	—	√	Diode Power Sensor	10 MHz to 6 GHz	–60 dBm (1 nW) to +20 dBm (100 mW)
		U2002A	—	—	√	Diode Power Sensor	50 MHz to 24 GHz	–60 dBm (1 nW) to +20 dBm (100 mW)
		U2004A	—	—	√	Diode Power Sensor	9 kHz to 6 GHz	–60 dBm (1 nW) to +20 dBm (100 mW)
		U2000B	—	—	√	Diode Power Sensor	10 MHz to 18 GHz	–30 dBm (1 µW) to +44 dBm (25 W)
		U2001B	—	—	√	Diode Power Sensor	10 MHz to 6 GHz	–30 dBm (1 µW) to +44 dBm (25 W)
		U2000H	—	—	√	Diode Power Sensor	10 MHz to 18 GHz	–50 dBm (10 nW) to +30 dBm (1 W)
		U2001H	—	—	√	Diode Power Sensor	10 MHz to 6 GHz	–50 dBm (10 nW) to +30 dBm (1 W)
		U2002H	—	—	√	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)

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

Related Keysight Literature

Publication title	Pub number
Specifications	
Keysight N8262A P-Series Modular Power Meter and Power Sensors Data Sheet	5989-6605EN
Keysight N1911A/N1912A P-Series Power Meters and N1921A/N1922A Wideband Power Sensors Data Sheet	5989-2471EN
Keysight E4416A/E4417A EPM-P Series Power Meters and E-Series E9320 Peak and Average Power Sensors Data Sheet	5980-1469E
Keysight N1913A and N1914A EPM Series Power Meters Data Sheet	5990-4019EN
Keysight N1918A Power Analysis Manager Data Sheet	5989-6612EN
Keysight 8990B Peak Power Analyzer and N1923A/N1924A Wideband Power Sensors Data Sheet	5990-8126EN
Keysight U2020 X-series Peak and Average Power Sensors - Data Sheet	5990-0310EN
Application Notes	
Keysight Choosing the Right Power Meter and Sensor Product Note	5968-7150E
Keysight Fundamentals of RF and Microwave Power Measurements	5988-9213/4/5/6EN
Keysight P-Series Power Sensor Internal Zeroing and Calibration for RF Power Sensors Application Note	5989-6509EN
Keysight N1911A/N1912A P-Series Power Meters For WiMAX Signal Measurements Demo Guide	5989-6423EN
Keysight 4 Steps for Making Better Power Measurements	5965-8167E
Keysight EPM-P Series Power Meters Used in Radar and Pulse Applications	5988-8522EN
Keysight N1918A Radar Pulse Measurement Application Note	5990-3415EN
MIMO Measurement Tips with Keysight P-Series Power Meters and U2000 Series USB Power Sensors Application Note	5990-3546EN
Keysight P-Series and EPM-P Power Meters for Bluetooth Testing Technical Overview and Self-Guided Demonstration	5989-8459EN
Keysight Maximizing Measurement Speed Using P-Series Power Meters Application Note	5989-7678EN

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www.lxistandard.org
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www.pxisa.org
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