

KEYSIGHT TECHNOLOGIES (AGILENT HP)

E9322A

The Keysight E9322A (formerly Agilent) is a high-performance peak and average power sensor operating from 50 MHz to 6 GHz. Featuring a 1.5 MHz video bandwidth and a wide dynamic range, the E9322A is optimized for time-gated measurements on TDMA and CDMA wireless formats such as Bluetooth and cdmaOne. It contains a built-in EEPROM for storing calibration data and works seamlessly with the EPM-P and P-Series power meters.

SPECIFICATIONS

General

Interfaces	Proprietary multi-pin connector for E-series power meters
Display	None (uses power meter display)
Warm-up Time	30 minutes

Physical

Power Supply	Powered via sensor cable from connected power meter
Operating Temperature	0 to 55 °C °C
Dimensions (W×H×D)	38 mm × 30 mm × 150 mm mm
Recommended RF Connector Torque	1.35 N-m (12 in-lb)

RF Performance

Frequency Range	50 MHz to 6 GHz
Power Measurement Range (Normal Mode)	-45 dBm to +20 dBm
Power Measurement Range (Average Only Mode)	-60 dBm to +20 dBm
Maximum Continuous Average Power	+23 dBm
Maximum Peak Power	+30 dBm (< 10 µs duration)
Video Bandwidth (High Setting)	1.5 MHz
Video Bandwidth (Medium Setting)	300 kHz
Video Bandwidth (Low Setting)	100 kHz
Rise Time (High Bandwidth Setting)	< 0.4 µs
Fall Time (High Bandwidth Setting)	< 0.4 µs
Rise Time (Medium Bandwidth Setting)	< 1.5 µs
Fall Time (Medium Bandwidth Setting)	< 1.5 µs
Rise Time (Low Bandwidth Setting)	< 5.0 µs
Fall Time (Low Bandwidth Setting)	< 5.0 µs
Minimum Pulse Width	1 µs (with High BW setting)
Measurement Speed	Up to 1000 corrected readings per second (via GPIB)

Impedance & Matching

Nominal Impedance	50 Ω
Maximum VSWR (50 MHz to 2 GHz)	1.12
Maximum VSWR (2 GHz to 6 GHz)	1.15
RF Connector Type	Precision Type-N (male)

Measurement Accuracy & Calibration

Internal EEPROM Storage	Yes (calibration factors, linearity, temperature, and bandwidth correction data)
System Calibration Cycle	1 year
Zero Set (Normal Mode, High BW)	< ± 12 nW
Zero Set (Normal Mode, Medium BW)	< ± 4 nW
Zero Set (Normal Mode, Low BW)	< ± 2 nW
Zero Set (Average Only Mode)	< ± 500 pW
Zero Drift (Normal Mode, High BW)	< ± 5 nW
Zero Drift (Normal Mode, Medium BW)	< ± 1.5 nW
Zero Drift (Normal Mode, Low BW)	< ± 0.8 nW
Zero Drift (Average Only Mode)	< ± 100 pW
Measurement Noise (Normal Mode, High BW, Free Run)	< 12 nW
Measurement Noise (Normal Mode, Medium BW, Free Run)	< 4 nW
Measurement Noise (Normal Mode, Low BW, Free Run)	< 2.5 nW
Measurement Noise (Average Only Mode)	< 330 pW

System Compatibility & Connectivity

Compatible Power Meters	Keysight E4416A, E4417A
Compatible Sensor Cables	E9288A (1.5 m), E9288B (3 m), E9288C (10 m)

Environmental & Compliance

Storage Temperature Range	-70 to +85 $^{\circ}\text{C}$
Relative Humidity Limit	95% RH at 40 $^{\circ}\text{C}$ (non-condensing)
Operating Altitude Limit	4600 m (15000 ft)
Storage Altitude Limit	15000 m (50000 ft)

Calibration & Uncertainty

Sensor Calibration Factor Uncertainty (50 MHz to 2 GHz)	1.8% (at 25 $\pm$ 5 $^{\circ}\text{C}$)
Sensor Calibration Factor Uncertainty (2 GHz to 6 GHz)	2.1% (at 25 $\pm$ 5 $^{\circ}\text{C}$)

Power Linearity

Power Linearity (Normal Mode, -32 to -20 dBm)	±4.0% (at 25 ± 5 °C)
Power Linearity (Normal Mode, -20 to -10 dBm)	±3.5% (at 25 ± 5 °C)
Power Linearity (Normal Mode, -10 to 0 dBm)	±2.5% (at 25 ± 5 °C)
Power Linearity (Normal Mode, 0 to +10 dBm)	±2.0% (at 25 ± 5 °C)
Power Linearity (Normal Mode, +10 to +20 dBm)	±2.5% (at 25 ± 5 °C)
Power Linearity (Average-Only Mode, -60 to -10 dBm)	±3.0% (at 25 ± 5 °C)
Power Linearity (Average-Only Mode, -10 to 0 dBm)	±2.5% (at 25 ± 5 °C)
Power Linearity (Average-Only Mode, 0 to +10 dBm)	±2.0% (at 25 ± 5 °C)
Power Linearity (Average-Only Mode, +10 to +20 dBm)	±2.5% (at 25 ± 5 °C)

Performance

Temperature Coefficient (Normal Mode, -20 to +20 dBm)	0.15% per °C (0 to 55 °C)
Temperature Coefficient (Average-Only Mode, -60 to +20 dBm)	0.25% per °C (-60 to -10 dBm), 0.15% per °C (-10 to +20 dBm)
Maximum Peak Power Duration	<10 µs (for +30 dBm peak power)

Calibration

EEPROM Calibration Points	At 50 MHz, 100 MHz intervals (50 MHz to 2 GHz), and 200 MHz intervals (2 GHz to 6 GHz)
---------------------------	--

Compliance & Safety

EMC Standards	IEC 61326-1:1997+A1:1998+A2:2000, EN 61326-1:1997+A1:1998+A2:2001, CISPR 11:1997+A1:1999+A2:2002 Class A, AS/NZS CISPR 11:2002, ICES/NMB-001:2004
Safety Standards	IEC 61010-1:2001, EN 61010-1:2001, CAN/CSA-C22.2 No. 61010-1-04, UL 61010-1:2004
Pollution Degree	Pollution Degree 2

Environmental

Operating Location	Indoor use only
--------------------	-----------------

TECHNOLOGY

Diode Power Sensor

APPLICATIONS

RF and microwave power measurements, Bluetooth and cdmaOne testing

