Keysight E9320 E-Series Peak and Average Power Sensors

KEYSIGHT
TECHNOLOGIES

Operating and
Service Guide

Notices

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CAUTION

A CAUTION notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Certification

Keysight Technologies certifies that this product met its published specifications at the time of shipment from the factory. Keysight Technologies further certifies that its calibration measurements are traceable to the United States National Institute of Standards and Technology, to the extent allowed by the Institute's calibration facility, and to the calibration facilities of other International Standards Organization members.

Safety Symbols

The following symbols on the instrument and in the documentation indicate precautions which must be taken to maintain safe operation of the instrument.

	The Instruction Documentation Symbol. The product is marked with this symbol when it is necessary for the user to refer to the instructions in the supplied documentation.

Safety Notices

This guide uses warnings and cautions to denote hazards.

WARNING **A warning calls attention to a procedure, practice or the like, which, if not correctly performed or adhered to, could result in injury or loss of life. Do not proceed beyond a warning until the indicated conditions are fully understood and met.**

CAUTION **A caution calls attention to a procedure, practice or the like which, if not correctly performed or adhered to, could result in damage to or the destruction of part or all of the equipment. Do not proceed beyond a caution until the indicated conditions are fully understood and met.**

Safety Considerations

Read the information below before using this instrument.

The following general safety precautions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards for design, manufacture, and intended use of the instrument. Keysight Technologies assumes no liability for the customer's failure to comply with these requirements.

WARNING **BEFORE CONNECTING THE POWER SENSOR TO OTHER INSTRUMENTS ensure that all instruments are connected to the protective (earth) ground. Any interruption of the protective earth grounding will cause a potential shock hazard that could result in personal injury.**

Sound emission

Herstellerbescheinigung

Diese Information steht im Zusammenhang mit den Anforderungen der Maschinenlarminformationsverordnung vom 18 Januar 1991.

– Sound Pressure LpA <70 dB.

– Am Arbeitsplatz.

– Normaler Betrieb.

– Nach DIN 45635 T. 19 (Typprufung).

Manufacturers Declaration

This statement is provided to comply with the requirements of the German Sound DIN 45635 T. 19 (Typprufung).

– Sound Pressure LpA <70 dB.

– At operator position.

– Normal operation.

– According to ISO 7779 (Type Test).

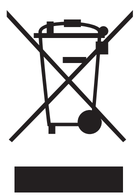
Waste Electrical and Electronic Equipment (WEEE) Directive

This instrument complies with the WEEE Directive marking requirement. This affixed product label indicates that you must not discard this electrical or electronic product in domestic household waste.

Product category

With reference to the equipment types in the WEEE directive Annex 1, this instrument is classified as a “Monitoring and Control Instrument” product.

The affixed product label is as shown below.



Do not dispose in domestic household waste.

To return this unwanted instrument, contact your nearest Keysight Service Center, or visit http://about.keysight.com/en/companyinfo/environment/takeback.shtml for more information.

Sales and Technical Support

To contact Keysight for sales and technical support, refer to the support links on the following Keysight websites:

– http://www.keysight.com/support/e9321a
(product-specific information and support, software and documentation updates)

– www.keysight.com/find/assist
(worldwide contact information for repair and service)

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1 Introduction

This chapter introduces you to the E-Series E9320 power sensors.

General Information

Welcome to the *E-Series E9320 Power Sensors Operating and Service Guide*. This guide contains information about the initial inspection, connection, and specifications of the E-Series E9320 power sensors.

To make best use of your sensor refer to the chapter “Using E-Series E9320 Sensors” in the *EPM-P Series Power Meters Operating and Service Guide*.

Initial inspection

Inspect the shipping container for damage. If the shipping container or packaging material is damaged, it should be kept until the contents of the shipment have been checked mechanically and electrically. If there is mechanical damage, notify the nearest Keysight office. Keep the damaged shipping materials (if any) for inspection by the carrier and a Keysight representative. For more information, see “Sales and Technical Support” on page 5.

Accessories shipped with the instrument

The following items are shipped with every purchase of E-Series E9320 power sensors:

– Certificate of Calibration

Verify that any options ordered are included with the shipment by checking the packing list included with the shipment.

Power meter and sensor cable requirements

The E-Series E9320 power sensors are compatible ONLY with the EPM-P Series power meters and with E9288 sensor cables. (The E9288 cables are color coded to help distinguish them from the 11730 Series cables.)

Interconnections

Connect one end of an E9288 sensor cable to the E-Series E9320 power sensor and connect the other end of the cable to the power meter's channel input. Allow a few seconds for the power meter to download the data contained in the power sensor.

Ensure that the power sensors and cables are attached and removed in an indoor environment.

Calibration

To carry out a zero and calibration cycle as requested by the power meter proceed as follows:

- Ensure the E-Series E9320 power sensor is disconnected from any signal source. On the power meter press Zero Cal, **Zero** (or **Zero A**/**Zero B**). During zeroing the wait symbol is displayed.

When the wait period is complete connect the E-Series E9320 power sensor to the power meter's POWER REF output.

- Press **Cal** (or **Cal A**/**Cal B**). The wait symbol is again displayed during calibration.

NOTE You can reduce the steps required to carry out the zero and calibration procedure as follows:

Connect the power sensor to the POWER REF output.

- Press Zero Cal and **Zero + Cal**. (For dual channel meters, press **Zero + Cal**, **Zero + Cal A**, or **Zero + Cal B** as required.)

On completion, the power meter and sensor are ready to connect to the device under test (DUT).

WARNING BEFORE CONNECTING THE POWER SENSOR TO OTHER INSTRUMENTS ensure that all instruments are connected to the protective (earth) ground. Any interruption of the protective earth grounding will cause a potential shock hazard that could result in personal injury.

CAUTION The measurement connector (for connection to DUT) is Type-N (male). A torque wrench should be used to tighten these connectors. Use a 3/4-inch open-end wrench and torque to 12 in-lb (135 N.cm) for the Type-N connector.

Recommended calibration interval

Keysight Technologies recommends a one-year calibration cycle for the E-Series E9320 peak and average power sensors.

The E-Series E9320 Power Sensors in Detail

The E-Series E9320 power sensors have two frequency ranges. The E9325A, E9326A, and E9327A have a frequency range of 50 MHz to 18 GHz while the 50 MHz to 6 GHz range of the E9321A, E9322A, and E9323A covers most wireless communication applications.

The sensors have two independent measurement paths as shown in Figure 1-1.

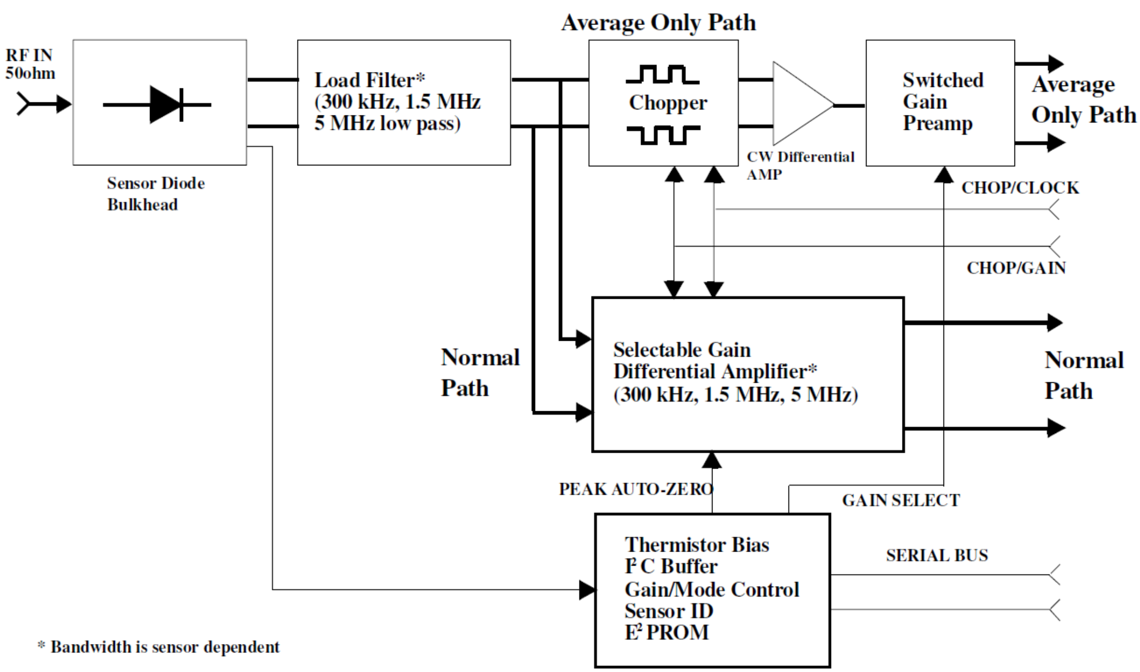

Figure 1-1 Simplified sensor block diagram

Use the default *normal* path for continuously sampled measurements of modulated signals and time gated measurements. For each frequency range there is a choice of sensors with three video (modulation) bandwidths.

- E9321A and E9325A sensors with 300 kHz bandwidth are suitable for measuring TDMA signals such as GSM.
- E9322A and E9326A sensors with 1.5 MHz bandwidth are suitable for measuring IS-95 CDMA signals.
- E9323A and E9327A sensors with 5 MHz bandwidth are suitable for measuring W-CDMA signals.

Note however, that the sensors with widest bandwidth have the smallest dynamic range (in *normal* mode). If dynamic range is an important factor, use the sensor model with just enough video bandwidth for the measurement you want to make.

The *average-only* path is suitable for average power measurements of Continuous Wave (CW) and constant amplitude signals between –65 dBm (sensor dependent) and +20 dBm. The *average-only* path can also be used to measure true average power of any complex modulated signal below –20 dBm.

Calibration factors, linearity, temperature, and bandwidth compensation data are stored in the sensor EEPROM during the manufacturing process. All the compensation data is downloaded to the EPM-P Series power meter at power-on or when the sensor is connected. You only need to enter the frequency of the RF signal you are measuring to achieve a high degree of accuracy.

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2 Specifications

This chapter describes the specifications of the E-Series E9320 power sensors.

Specifications

For the specifications of the E9320 E-Series E9320 power sensorss, refer to the data sheet at https://www.keysight.com/us/en/assets/7018-06790/data-sheets/5980-1469.pdf.

3 Service

This chapter introduces you to the general maintenance, performance tests, troubleshooting, and repair of the E-Series E9320 power sensors.

General Information

This chapter contains information about the general maintenance, performance tests, troubleshooting, and repair of E-Series E9320 power sensors.

Cleaning

Use a clean, damp cloth to clean the body of the E-Series E9320 power sensor.

Connector cleaning

The RF connector beads deteriorate when contacted by hydrocarbon compounds such as acetone, trichloroethylene, carbon tetrachloride, and benzene.

Clean the connector only at a static free workstation. Electrostatic discharge to the center pin of the connector will render the power sensor inoperative.

Keeping in mind its flammable nature; a solution of pure isopropyl or ethyl alcohol can be used to clean the connector.

Clean the connector face using a cotton swab dipped in isopropyl alcohol. If the swab is too big use a round wooden toothpick wrapped in a lint free cotton cloth dipped in isopropyl alcohol.

Performance Test

Voltage standing wave ratio (VSWR) performance verification

VSWR is a measure of how efficiently radio frequency (RF) power is transmitted from an RF power source. In real systems, mismatched impedances between the RF source and load can cause some of the power to be reflected towards the source and vary the VSWR.

This performance verification requires the following equipment:

– ENA Series Network Analyzer (E5071C)

– Calibration kit (85054B/D)

Procedure

1 Turn on the network analyzer and allow it to warm up for approximately an hour.

2 Set the start frequency of the network analyzer to 50 MHz and the stop frequency to one of the following:

Table 3-1 Stop frequency

Stop frequency	Model
6 GHz	E9321A, E9322A, and E9323A
18 GHz	E9325A, E9326A, and E9327A

3 Calibrate the network analyzer using the appropriate calibration kit. Perform calibration for the open, short, and load circuits of the network analyzer.

4 After calibration, connect the E-Series E9320 power sensor to the test port of the network analyzer. Set the format for data trace to SWR.

5 Compare the measured results to the specifications in the data sheet. If the verification fails, refer to “Adjustments” on page 42.

Power linearity performance verification

The power linearity performance verification measures the relative linearity error of the E-Series E9320 power sensor. All measurements are performed at 50 MHz. The reference power level for the linearity measurement is 0 dBm for the E9321A, E9322A, E9323A, E9325A, E9326A, and E9327A models.

This performance verification requires the following equipment:

- signal generator (N5182A)
- reference sensor (E4412A)
- power meter (E4416/7A)
- power splitter (11667A)
- amplifier
- step attenuators (8494H and 8496H)
- attenuator/switch driver (11713B)

Table 3-2 Linearity system verification specification

Sensor mode	Power	Specification
Average-only	-30 dBm to 9 dBm	±5.50%
	10 dBm to 20 dBm	±6.73%
Normal	-30 dBm to 9 dBm	±5.96%
	10 dBm to 20 dBm	±7.11%

Procedure

1. Turn on the signal generator and power meter (with the reference sensor connected). Connect the DUT (E9320 E-Series power sensor) to channel A of the power meter (E4416/7A), and channel B of the reference sensor (E4412A). Allow them to warm up for approximately an hour.
2. Zero and calibrate both the DUT and reference sensor.
3. Connect the power splitter (11667A) to the RF output of the signal generator (N5182A). The equipment setup is as shown in the following figure.

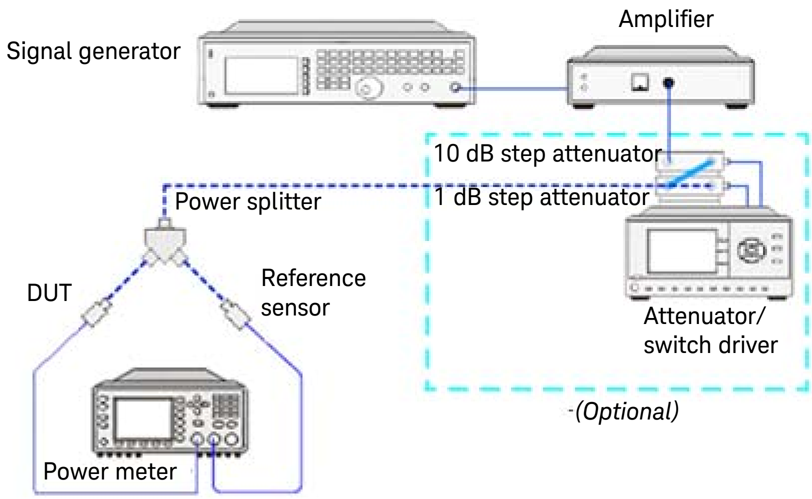


Figure 3-1 Power linearity performance verification equipment setup

4 Set the continuous wave signal frequency of the signal generator, DUT, and reference sensor to 50 MHz. Set the DUT to *average-only* mode.

5 Start tuning the signal generator and/or optionally tune the attenuator or switch driver until the DUT (channel A) measures the power level as close as 0 dBm. Record the values as P_{DUT} at 0 dBm and P_{ref} at 0 dBm.

CAUTION **Do not exceed the maximum input power (27 dBm) of the power splitter to avoid damage to the power splitter.**

6 Record the power measured by the power meter as P_{ref} for channel B and as P_{DUT} for channel A.

7 Normalize both P_{ref} and P_{DUT} to the power measured at 0 dBm, based on the following equations:

$$\text{Normalized } P_{ref} = \text{Measured power } (P_{ref}) - \text{Measured power at 0 dBm } (P_{ref} \text{ at 0 dBm})$$

$$\text{Normalized } P_{DUT} = \text{Measured power } (P_{DUT}) - \text{Measured power at 0 dBm } (P_{DUT} \text{ at 0 dBm})$$

8 Calculate the linearity error of the DUT for the power level using the following equations:

$$\text{Linearity error (dB)} = [P_{DUT}]_{\text{norm to 0 dBm}} - [P_{ref}]_{\text{norm to 0 dBm}}$$

$$\text{Linearity error (\%)} = \left[\text{Antilog}\left(\frac{[P_{DUT}]_{\text{norm to 0 dBm}} - [P_{ref}]_{\text{norm to 0 dBm}}}{10}\right) - 1\right] \times 100$$

9 Compare the calculated linearity error to the system specifications. If the verification fails, refer to “Adjustments” on page 42.

10 Repeat step 6 to step 9 by sweeping through the power levels from -30 dBm to 20 dBm with the same frequency of 50 MHz.

11 For the range of 16 to 20 dBm, add a 10 dB attenuator (8491B/8493C) before the reference sensor and repeat step 5 to step 9 once.

12 Repeat step 5 to step 11 for *normal* mode.

Zero set performance verification

This performance verification is carried out to verify that a minimal amount of residual offset error is present after zeroing has been performed. The offset error is caused by contamination from several sources including the noise of the DUT itself. Zero set is the difference between the power levels indicated by the DUT, after executing zeroing and the true zero power. Ideally, this difference should be zero.

This performance verification requires the following equipment:

– power meter (E4416/7A)

Procedure

1 Connect the DUT (E-Series E9320 power sensor) to the power meter as shown in the following figure.

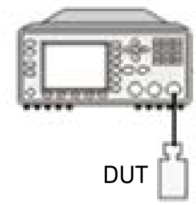


Figure 3-2 **Zero set performance verification equipment setup**

2 Warm up the DUT for approximately 30 minutes.

3 Connect the DUT to the power meter reference oscilloscope to perform zero and calibration.

4 Detach the DUT from the power meter reference oscilloscope.

5 Set the DUT to *average-only* mode.

6 Launch the Interactive IO on the Keysight IO Libraries Suite.

7 Set the frequency of the DUT to 50 MHz by sending “FREQ 50MHz”.

8 Enable auto-averaging for the DUT by sending “AVER:COUN:AUTO ON”.

9 Change the power measurement unit of the DUT to watt by sending “UNIT:POW W”.

10 Set the DUT to the single trigger mode by sending “INIT:CONT OFF”.

11 Perform zeroing for the DUT by sending “CAL:ZERO:AUTO ONCE” and wait for the power meter to complete the zeroing process.

12 Read the noise level of the DUT by sending “READ?” and then record the reading.

13 Repeat 10 times, step 11 to step 12 and then calculate the mean value of the readings.

14 Compare the calculated mean value to the system specification. If the verification fails, refer to “Adjustments” on page 42.

15 Set DUT to *normal* mode. Repeat step 7 to step 14.

Rise and fall time performance test

The rise and fall time performance of the instrument path must be quantified accurately. This test however, is more of a system-level verification, validating the rise and fall time using an actual RF pulse.

This performance verification requires the following equipment:

– Power meter (E4416/7A), E-Series E9320 power sensor, and sensor cable (E9288A)

– Function generator (33611A)

– Signal generator (N5182B)

Procedure

1 Turn on the signal generator (N5182B), function generator (33611A), and power meter (E4416/7A). Connect the E-Series E9320 power sensor (DUT) to the power meter (E4416/7A) through the sensor cable (E9288A).

2 Allow the system to warm up for approximately an hour before starting the measurement.

3 Set up the equipment as shown in the following figure.

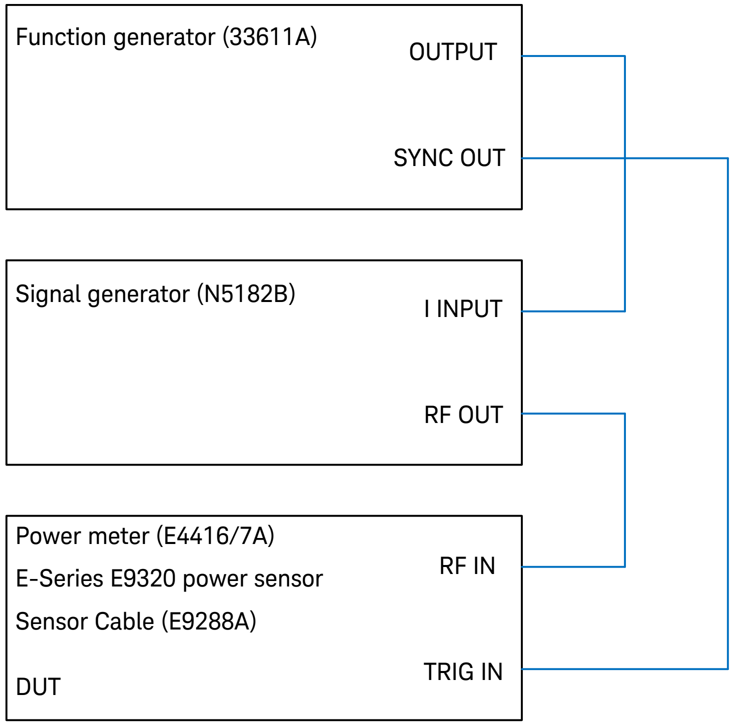


Figure 3-3 Rise and fall time performance test equipment setup

4 Perform sensor zero and calibration and connect the sensor to the signal generator (N5182B) RF output port once completed.

5 Set the following for signal generator (N5182B):

– Turn on IQ state

– Set IQ modulator source to EXTERNAL

– Set frequency to 1 GHz

– Set power level to 0 dBm

6 Set the following for 33611A:

– Output a PULSE signal with frequency 10 kHz

– Set amplitude to 0.5Vpp and offset to 0.25V

– Set pulse width to 50us

- Set pulse transition to 80ns
- Turn on output and synchronization

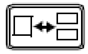
7 Set the following for power meter (E4416/7A):

- Set the following under Channel:
  - Sensor Mode: NORMAL
  - Range: UPPER
  - Filter: OFF
  - Offset: OFF
  - Frequency: 1GHz
  - FDO Table: OFF
  - Video Avg: OFF
  - Video B/W: OFF
  - Step Detect: OFF
- Set the following under Channel, in trace setup:
  - Start: 0 s
  - Length: 2 µs
  - Max: 1 mW
  - Min: 1 nW
  - Units: Watt
- Set the following under Trigger:
  - Sensor Acqn A: single trigger
  - Trigger source: EXT
- Set the following under Meas Setup, in Meas Select

  Feed: Chan A, Gate 1, Meas Peak
- Set Meas Display in Disp Type to Trace

8 Turn on **Mod On/Of**f and **RF output** on the signal generator (N5182B).

9 Trigger the sensor to capture the trace **Trigger** > **Run**.

10 Press  on the power meter front panel display to select the Gate Ctrl menu.

11 Set Marker 1 to 10% crossing, then record its time as T1 and Marker 2 to 90% crossing, then record its time as T2.

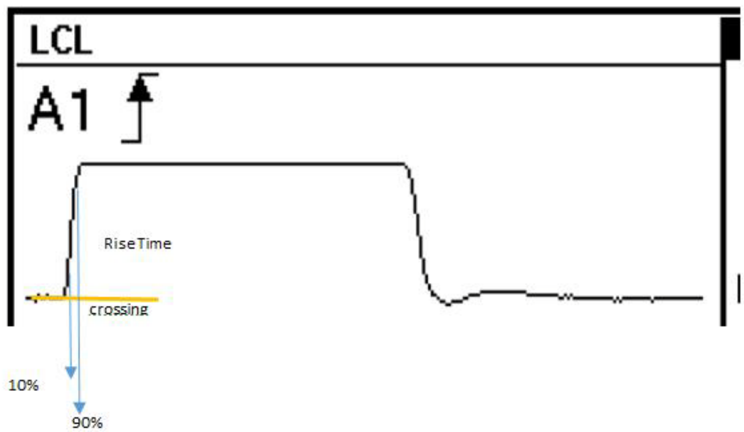


Figure 3-4 Rise time

12 Record the Rise Time = T2 - T1.

13 Change the E4416/7A trace setup start time to 50 µs.

14 Repeat step 7 to step 10.

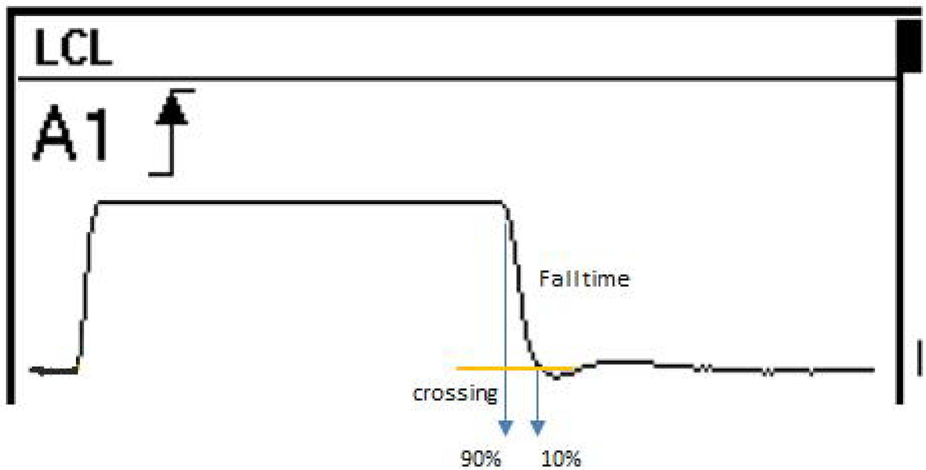


Figure 3-5 Fall time

15 Record the Fall Time = T2 - T1.

16 Compare the Rise Time and Fall Time to the specifications in the data sheet.

Replaceable parts

Table 3-3 is a list of replaceable parts. Figure 3-6 is the illustrated parts breakdown that identifies all of the replaceable parts. To order a part, quote the Keysight part number, specify the quantity required, and address the order to the nearest Keysight office.

NOTE Within the USA, it is better to order directly from the Keysight Parts Center in Roseville, California. Ask your nearest Keysight office for information and forms for the "Direct Mail Order System." Also your nearest Keysight office can supply toll free telephone numbers for ordering parts and supplies.

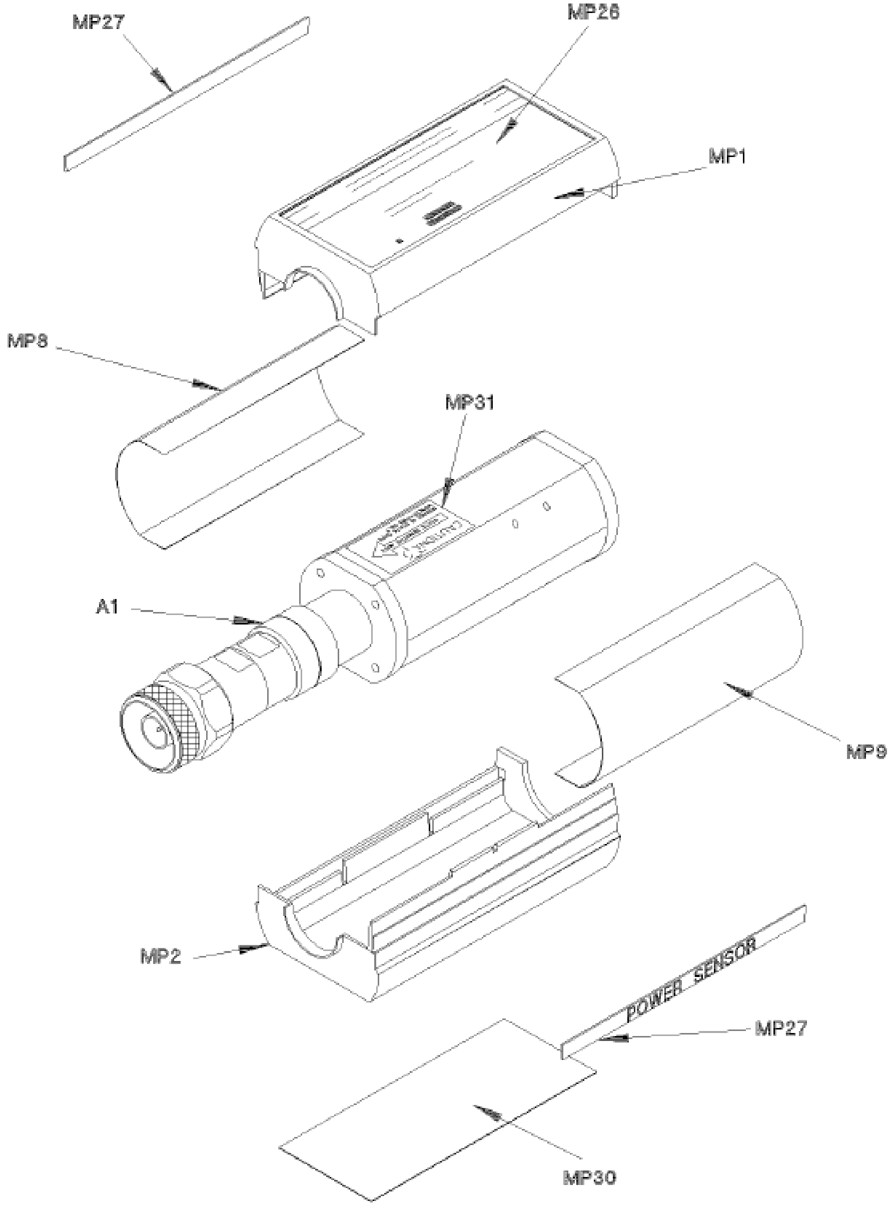


Figure 3-6 Illustrated parts break down

Table 3-3 Replaceable parts list

Reference designation	Part number	Qty	Description
A1/A2 E9321A	E9321-60011	1	SENSOR MODULE
A1/A2 E9321A	E9321-60011	1	RESTORED SENSOR MODULE
A1/A2 E9322A	E9322-60004	1	SENSOR MODULE
A1/A2 E9322A	E9322-60004	1	RESTORED SENSOR MODULE
A1/A2 E9323A	E9323-60002	1	SENSOR MODULE
A1/A2 E9323A	E9323-60002	1	RESTORED SENSOR MODULE
A1/A2 E9325A	E9325-60002	1	SENSOR MODULE
A1/A2 E9325A	E9325-60002	1	RESTORED SENSOR MODULE
A1/A2 E9326A	E9326-60002	1	SENSOR MODULE
A1/A2 E9326A	E9326-60002	1	RESTORED SENSOR MODULE
A1/A2 E9327A	E9327-60002	1	SENSOR MODULE
A1/A2 E9327A	E9327-60002	1	RESTORED SENSOR MODULE
MP1 and MP2	E9321-40001	2	SHELL-PLASTIC
MP3 and MP4	E9321-20002	2	CHASSIS
MP8 and MP9	E9321-00001	2	SHIELD
MP26	E9321-80001	1	LABEL, ID E9321A

Table 3-3 Replaceable parts list (continued)

Reference designation	Part number	Qty	Description
MP26	E9322-80001	1	LABEL, ID E9322A
MP26	E9323-80001	1	LABEL, ID E9323A
MP26	E9325-80001	1	LABEL, ID E9325A
MP26	E9326-80001	1	LABEL, ID E9326A
MP26	E9327-80001	1	LABEL, ID E9327A
MP27	E9321-80002	2	LABEL, POWER SENSOR
MP30	E9321-80003	1	LABEL, CAL/ESD

NOTE The A1/A2 parts are applicable only for the Keysight Service Center as calibration is required.

Service

Service instructions consist of principles of operation, troubleshooting, and repairs.

Principles of operation

The power sensor ‘bulkhead’ assembly converts input RF to a low frequency voltage signal representing the RF power envelope. The input is AC coupled to a 3 dB attenuator followed by a 50 ohm load resistor. Two diodes are connected to the load resistor, forming a pair of half-wave detectors with opposite polarity and complementary voltage output. The detected signal passes through a low-pass load filter. The cutoff frequency of the filter is 300 kHz, 1.5 MHz, or 5 MHz, depending on the model/ bandwidth specification of the sensor.

The detected signal can now follow one of two paths. The *average-only* signal path is optimized for high sensitivity and low drift at the expense of detector video bandwidth. This path chops the signal to a carrier frequency around 440 Hz to remove sensitivity to DC offsets, then amplifies the AC signal. Amplification and chopping parameters are much the same as in previous Keysight diode sensors, with typical dynamic power range of –65 to +20 dBm.

The chopper is a switch that connects the two balanced signals to the two inputs of a differential amplifier. Thus, the small DC signal from the detector is converted to an AC signal. The output of the differential amplifier is connected to a switched gain preamplifier.

The dynamic range of the sensor is greater than 80 dB in this mode, so the sensor has two power ranges. On the high power range the signal is attenuated before further amplification. The bandwidth of the chopped signal is limited to less than half the chop rate. So, this method cannot be used for wide (~5 MHz) bandwidth measurements.

The *normal* path is used to detect the instantaneous power of an RF signal and is optimized for a bandwidth of up to 5 MHz. The peak path trade off includes reduced dynamic range and increased temperature sensitivity.

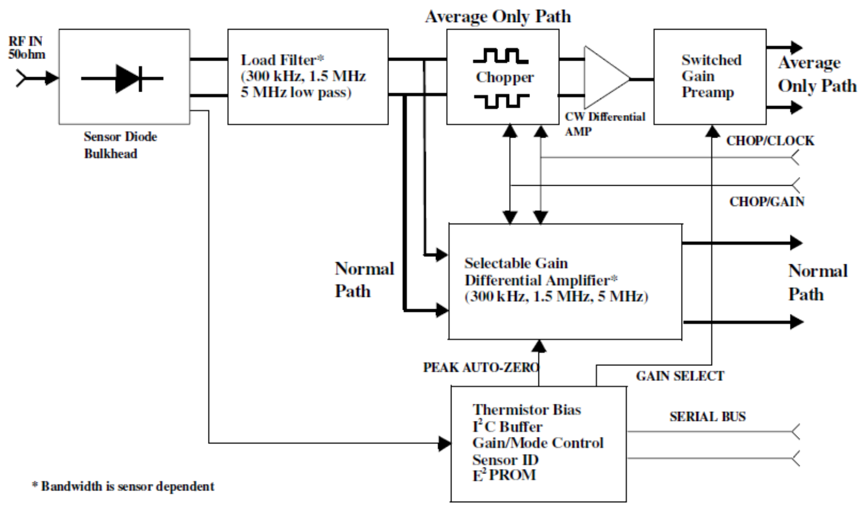


Figure 3-7 Simplified sensor block diagram

The output of the load filter is connected to a gain selectable amplifier with a bandwidth corresponding to the sensor model/ bandwidth spec. The differential configuration minimizes sensitivity to ground noise, DC offset and drift. In *normal* mode, the amplifier provides maximum bandwidths of 300 kHz, 1.5 MHz, or 5 MHz, allowing the user to match the test signal's modulation bandwidth to the sophisticated instrument data processing. This permits the meter to measure burst average and peak power, to compute peak-to-average ratios, and display other time-gated power profiles on the power meter's large LCD screen.

The three dimensional calibration data is stored in an EEPROM on the sensor PCA. This data is unique to each sensor and consists of frequency vs. input power vs. temperature. Upon power-up, or when the sensor cable is connected, these calibration factors are downloaded into the EPM-P (E4416A/17A) Series power meters. This means that the operator is not required to enter any calibration information when changing sensors, simply entering the frequency of the input signal is all that is required.

Troubleshooting

Troubleshooting information is intended to first isolate the power sensor, cable, or power meter as the defective component. When the power sensor is isolated, an appropriate sensor module must be used for repair. See Table 3-3.

If error message 241 or 310 is displayed on the power meter, suspect a power sensor failure. Error 241 will occur if the sensor is missing. An E9288 cable must be used to connect an E-Series E9320 power sensor to an EPM-P Series power meter.

If no error message is displayed, but a problem occurs when making a measurement, try replacing the cable from the power meter to the power sensor. If the problem still exists, try using a different power sensor to determine if the problem is in the power meter or in the power sensor.

Electrostatic discharge will render the power sensor inoperative. Do not, under any circumstances, open the power sensor unless you and the power sensor are in a static free environment.

The maximum measurable power of a power sensor varies depending on the sensor model. Incidentally, Keysight Technologies' service centers receive a high number of power sensor that have been damaged due to overpowering of the sensor bulkhead, resulting in the damage of the internal thin film circuit. Subjecting a power sensor module above its maximum allowable power rating is considered a misuse or self-abuse and is excluded from Keysight Technologies' standard warranty coverage.

Refer to the *Power Sensor Overpower Failure Verification Guideline* at https://literature.cdn.keysight.com/litweb/pdf/5992-4039EN.pdf

Repair of defective sensor

There are no serviceable parts inside the E-Series E9320 power sensors. If the sensor is defective, replace the entire “module” with the appropriate “Restored Sensor Module” listed in Table 3-3.

Disassembly procedure

Disassemble the power sensor by performing the following steps:

1. Disassemble the power sensor only in a static free workstation. Electrostatic discharge renders the power sensor inoperative.

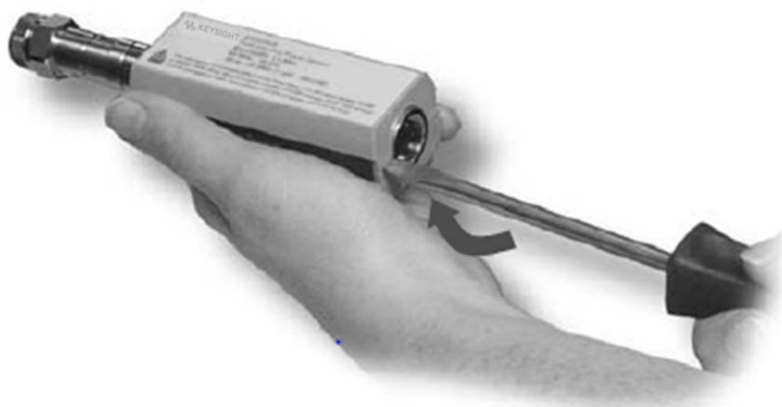


Figure 3-8 Removing the power sensor shell

2. At the rear of the power sensor, insert the blade of a screwdriver between the plastic shells (See Figure 3-8). To prevent damage to the plastic shells use a screwdriver blade as wide as the slot between the two shells.
3. Pry alternately at both sides of the connector J1 until the plastic shells are apart. Remove the shells and the magnetic shields.

Reassembly procedure

Replace the magnetic shields and the plastic shells. Snap the plastic shells together.

Adjustments

Adjustments are usually required on a yearly basis. They are normally performed only after a performance verification has indicated that some parameters are out of specification. Performance verification must be completed after any repairs that may have altered the characteristics of the E-Series E9320 power sensors.

The E-Series E9320 power sensors can be adjusted using the Keysight N7800 Series calibration software or can be returned to Keysight for adjustments. To arrange the return, contact the Keysight Service Center.

This information is subject to change without notice. Always refer to the Keysight website for the latest revision.

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