Keysight 8471E
# Coaxial RF Microwave Detector

0.01 – 12 GHz

The Keysight Technologies, Inc. 8471E Detector is a Planar Doped Barrier (PDB) detector offering the character- istics of the Keysight 8474 line of PDB detectors in an economical package. It is available with an SMA RF connector

The detector is designed for use in RF and microwave instrumentation and systems applications as the detecting element in leveling loops, for power monitoring and for wideband video detection.

Features and Description

- Zero bias

- Environmentally rugged

- SMA connector
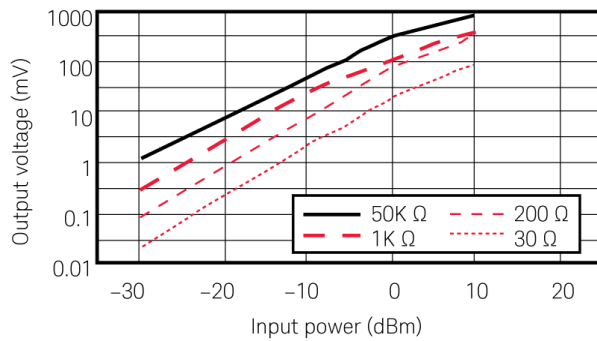

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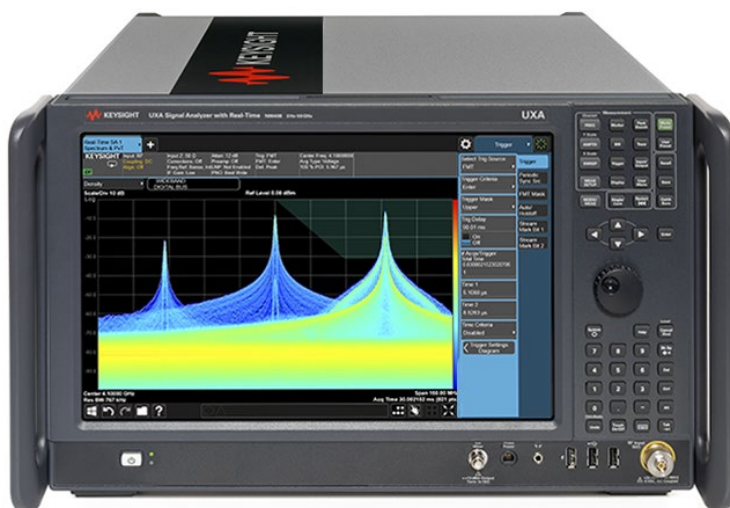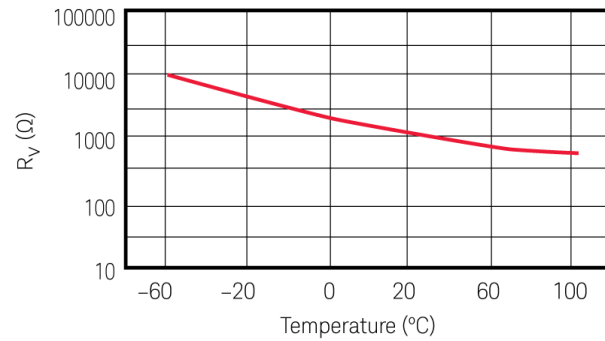
Figure 1. Typical transfer characteristics

Figure 3. Typical video impedance variation with temperature

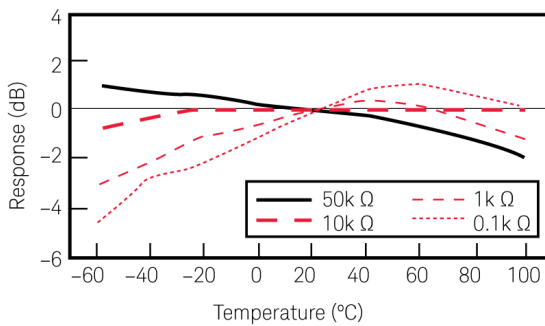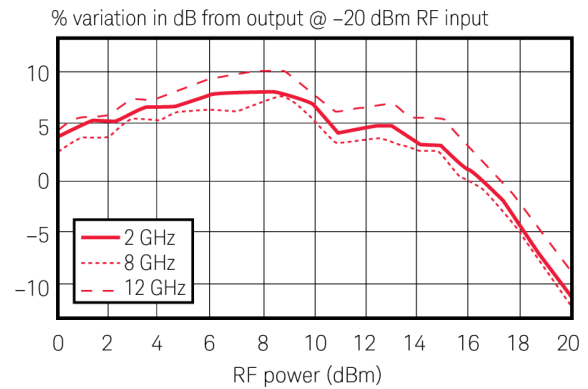Figure 2. Typical output response with temperature (P$_{IN}$ ≤ −20 dBm)

Figure 4. Typical square law deviation

Specifications

Frequency range	0.01 - 12 GHz
Frequency responses	±0.23 dB (0.01 - 4 Ghz); ±0.6 dB (4 - 8 GHz); ±0.85 dB (8 - 12 GHz)
SWR	< 1.2 (0.01 - 4 GHz); < 1.7 (4 - 8 GHz); < 2.4 (8 - 12 GHz)
Low level sensitivity	0.4 mV/µW
Max. operating input	200 mW
Typical short-term max. input	0.75 Watt
Noise	< 50 µV (µV peak-to-peak with CW power applied to produce 100 mV output, 400 kHz BW)
Output polarity (STD)	Negative
(103)	Positive

Note: Above specifications are at 25 ºC and ≤ −20 dBm unless otherwise specified.

Environmental

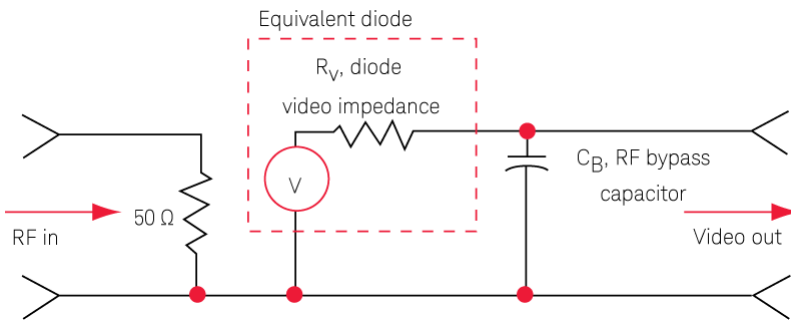|	
Operating temperature	–20º to +85 ºC
Non-operating temperature: MIL-STD 883, Method 1010	(–55º to +85 ºC)
Vibration: MIL-STD 883, Method 2007	(0.6" D.A. 20 to 80 Hz and 20 g, 80 to 2000 Hz)
Shock: MIL-STD 883, Method 2002.1	(500 g, 0.5 ms)
Altitude: MIL-STD 883, Method 1001	(50,000 ft, 15,240 m)
Moisture resistance: MIL-STD 883, Method 1004.1	(25º to 40 ºC, 95% RH)

Figure 5. Equivalent circuit for Keysight 8471E with typical parameter values

RFI: MIL-STD 461C (meets Part 7, degraded by 10 dB)
Typical values:
R_V (diode video impedance) ≈ 1.5 kΩ*
C_B (RF bypass capacitor) ≈ 30 pF nominal

$$T_R \left(10 \text{ to } 90\% \text{ risetime}\right) \approx 2.2 \frac{(R_{LOAD})(R_v)}{R_{LOAD} + R_v}(C_B + C_{LOAD}) = \frac{0.35}{BW}$$

*@ 25 ºC and PIN ≤ –20 dBm (see Figure 3)

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A: 7.9 (0.31)
B: 39.16 (1.54)
C: 9.26 (0.36)
Connector:
        SMA (m) input
        SMC (m) output
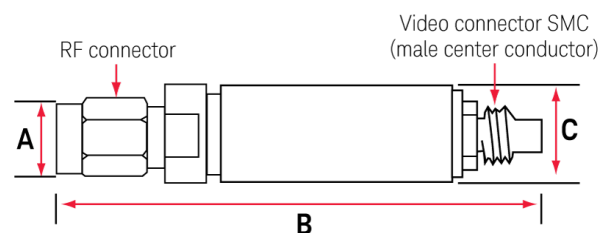Net weight: 38.8 grams (1.37 oz.)

Figure 6. Keysight 8471E

www.keysight.com/find/mta

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