

Keysight 8471E

Coaxial RF Microwave Detector

0.01 GHz – 12 GHz

Data Sheet

Features and Description

- Zero bias
- Environmentally rugged
- SMA connector

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

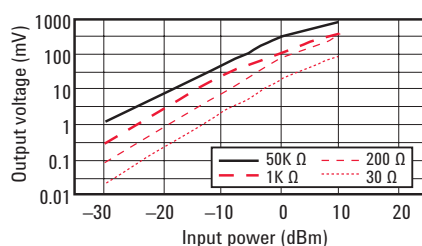


Figure 1. Typical transfer characteristics

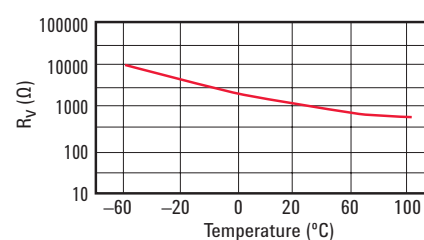


Figure 4. Typical video impedance variation with temperature

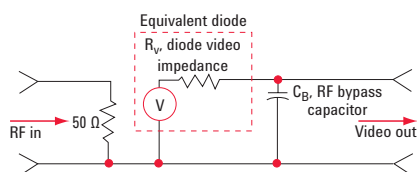


Figure 2. Typical tangential sensitivity

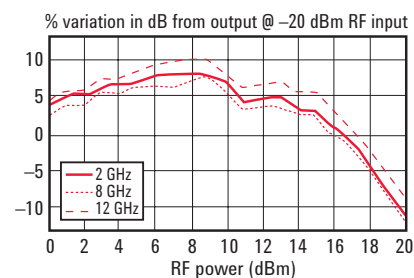


Figure 5. Typical square law deviation

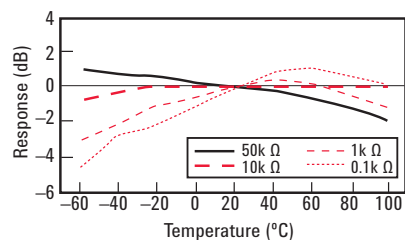


Figure 3. Typical output response with temperature ($P_{IN} \leq -20$ dBm)

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/ μ W

Max. operating input: 200 mW

Typical short-term max. input: 0.75 Watt

Noise: < 50 μ V

(μ V 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 °C and ≤ -20 dBm unless otherwise specified.

Environmental

Operating temperature: -20° to $+85^{\circ}$ °C

Non-operating temperature: MIL-STD 883, Method 1010: (-55° to $+85^{\circ}$ °C)

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: (25° to 40 °C, 95% RH)

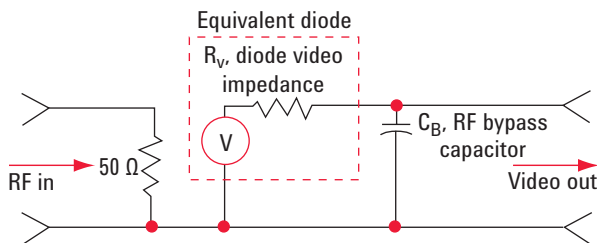


Figure 6. Equivalent circuit for Keysight 8471E with typical parameter values

RFI: MIL-STD 461C (meets Part 7, degraded by 10 dB)

Typical values:

R_V (diode video impedance) ≈ 1.5 k Ω *

C_B (RF bypass capacitor) ≈ 30 pF nominal

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

*@ 25 °C and $P_{IN} \leq -20$ dBm (see Figure 3)

Keysight 8471E

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.)

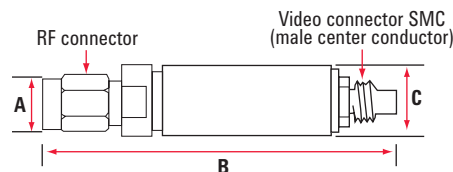


Figure 7. Keysight 8471E

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