

# Agilent 8471E Coaxial RF Microwave Detectors 0.01 GHz – 12 GHz

## Data Sheet

### Features and Description

- Zero bias
- Environmentally rugged
- SMA connector

The Agilent 8471E Detector is a Planar Doped Barrier (PDB) detector offering the characteristics of the Agilent 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.

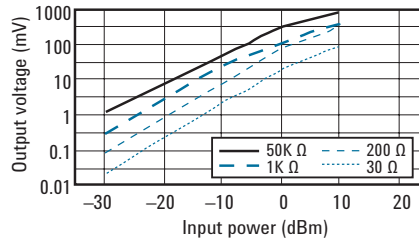


Figure 1. Typical transfer characteristics

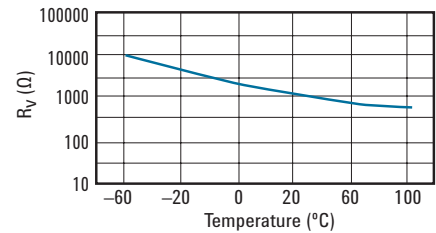


Figure 4. Typical video impedance variation with temperature.

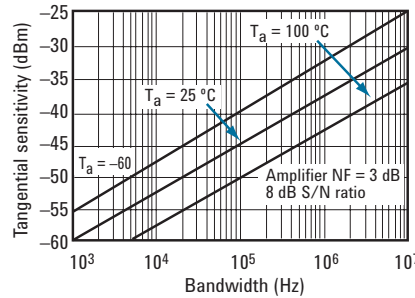


Figure 2. Typical tangential sensitivity

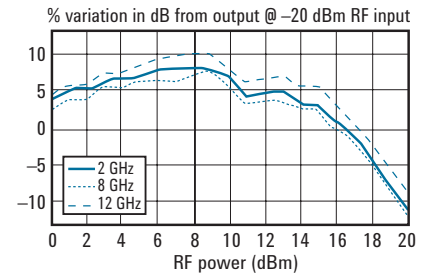


Figure 5. Typical square law deviation

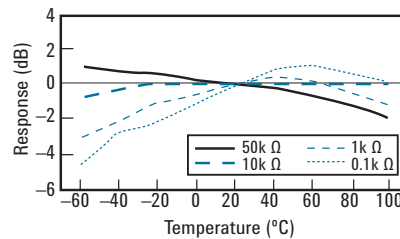


Figure 3. Typical output response with temperature ( $P_{IN} \leq 20$  dBm).



## Specifications

**Frequency range:** 0.01 - 12 GHz

**Frequency responses:**  $\pm 0.23$  dB (0.01 - 4 GHz);  $\pm 0.6$  dB (4 - 8 GHz);  $\pm 0.85$  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/ $\mu$ W

**Max. operating input:** 200 mW

**Typical short-term max. input:** 0.75 Watt

**Noise:**  $< 50$   $\mu$ V

( $\mu$ V peak-to-peak with CW power applied to produce 100 mV output, 400 kHz BW)

**Output polarity (STD):** negative

**(003):** positive

Note: Above specifications are at 25 °C and  $\leq 20$  dBm unless otherwise specified.

### Environmental

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

**Non-operating temperature:** MIL-STD 883, Method 1010: ( $-55^\circ$  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: ( $25^\circ$  to  $40^\circ$  °C, 95% RH)

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

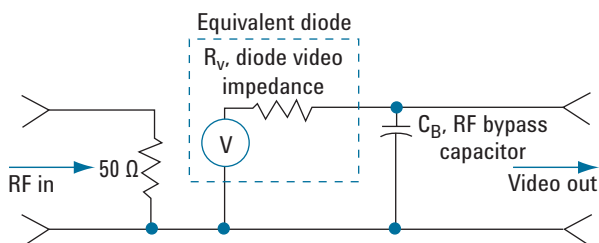


Figure 6. Equivalent circuit for Agilent 8471E with typical parameter values.

### Typical values:

$R_V$  (diode video impedance)  $\approx 1.5$  k $\Omega$ \*

$C_B$  (RF bypass capacitor)  $\approx 30$  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)

## Agilent 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.)

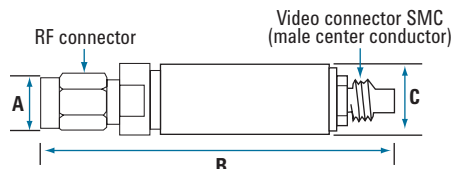


Figure 7. Agilent 8471E

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