

Modular Zero Bias Schottky Detectors

T-74-13-01

7744J and 7744N Series

Description

The 7744J series provides a minimized, hermetically sealable, 50 ohm module designed especially for TEM stripline and microstrip media. These detectors are ideal components for dense packaging requirements.

The 7744N series features additional circuit area for increased RF-to-video isolation (typically greater than 21 dB) as well as space for support functions, including RF limiting, matching and video protection. Consult the factory for custom requirements.

The usable RF input power range is from T_{SS} through +20 dBm, above which the detector is in saturation with permanent degradation or burn-out occurring at +23 dBm CW. Square law response falls between T_{SS} and -21 dBm with the linear response from -21 dBm through +20 dBm.

These zero bias Schottky detectors offer generally higher voltage sensitivities (K) over greater RF bandwidths, as compared with biased Schottky detectors, and require no external dc bias. However, RF impedance of the ZBD diode is substantially higher than biased Schottky or tunnel diodes resulting in diminished input match to 50 ohms. Further, these detectors are more temperature sensitive and performance severely degrades below -20°C.

Performance characteristics can be modified with certain trade-offs. RF input match can be enhanced with a reduction of sensitivity, T_{SS} and K. In narrow bandwidth applications, K can be substantially increased. Consult factory for recommendations and specifics.

Specifications*

Frequency Range (GHz)	Voltage ² Sensitivity (K) Min. (mV/mW)	Flatness Max. (dB)	T_{SS} ³ Typ. (-dBm)	RF Bypass Capacitance Typ. (pF)	Rise ⁴ Time Typ. (nS)	Video ⁵ Resistance Typ. (Ohms)	Part Number ¹
0.1-2.0	1800	±0.5	52	100	20	3000	7744J-0020
	1800	±0.5	52	100	20	3000	7744N-0020
2.0-8.0	2000	±0.6	52	20	10	3000	7744J-0021
	2000	±0.6	52	20	10	3000	7744N-0021
8.0-18.0	1800	±1.0	52	12	10	3000	7744J-0022
	1800	±1.0	52	12	10	3000	7744N-0022
2.0-18.0	1800	±1.5	52	20	10	3000	7744J-0023
	1800	±1.5	52	20	10	3000	7744N-0023

Notes:

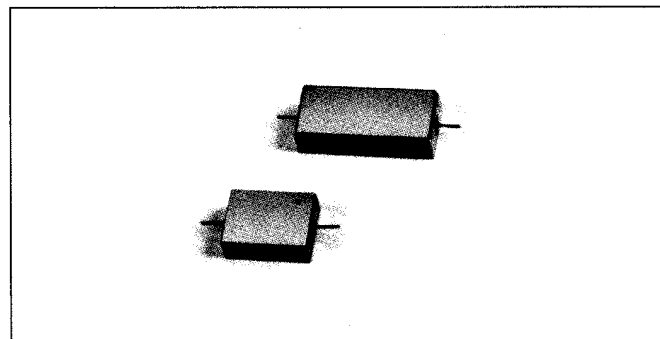
1. Detectors are normally supplied with negative (-) output voltage polarity, referenced to case ground. Positive (+) output polarity is available for most parts. To designate, add suffix "P" to end of part numbers.
2. Minimum open circuit voltage sensitivity (K) in mV/mW is measured with -20 dBm RF input power into 30K ohm, external video load resistance (R_L).
3. Tangential signal sensitivity (T_{SS}) is measured using a video amplifier restricted to 2 MHz bandwidth and having a noise contribution of 3 dB maximum.

4. Pulse rise time (t_r) in nanoseconds, is measured into an external load (R_L) of 100 ohms with 12 picofarads in parallel, and 0 dBm RF power applied.

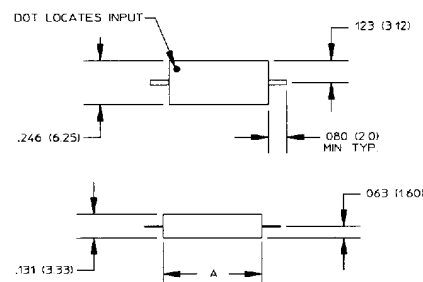
5. Video resistance is measured at -20dBm.

6. Video protection against ESD and transients is available. One or more shunt diodes clamp any reverse voltages present at video output port.

* Performance curves can be found at the end of the Detector section.



Mechanical Outline



Series	Dim. A Inches (mm)
7744J Series	.330 (8.4)
7744N Series	.532 (13.5)

Leads are $\pm .002$
 .012 (0.3) diameter (std.).
 May be supplied as optional tabs.

