

Schottky Barrier Diodes for Detectors

Technical Data

5082-2750/51
5082-2755
5082-2787
5082-2824

Features

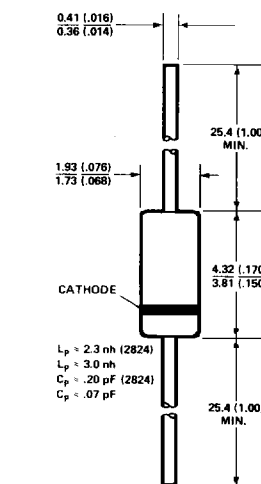
- **Improved Detection Sensitivity**
TSS of -55 dBm at 10 GHz
- **Low 1/f Noise**
Typical Noise-Temperature Ratio = 4 dB at 1 kHz
- **High Peak Power Dissipation**
4.5 W RF Peak Pulse Power

Description/ Applications

The low 1/f noise and high voltage sensitivity make these Schottky barrier diodes ideally suited for narrow bandwidth video detectors, and Doppler mixers as required in Doppler radar equipment, ECM receivers, and measurement equipment.

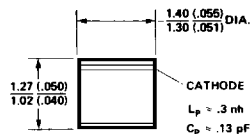
Package Characteristics

The HP Outline 15 package has a glass hermetic seal with plated Dumet leads which should be restricted so that the bend starts at least 1.16" (1.6 mm) from the glass body. With this restriction, it will meet MIL-STD-750, Method 2036, Condition A (4 lb. [1.8 kg] tension for 30 minutes). The maximum soldering tempera-



Outline 15

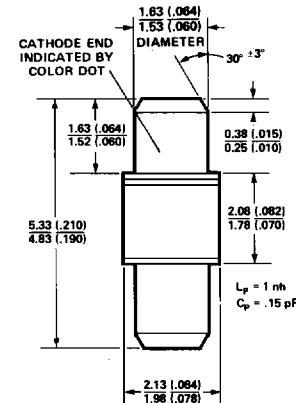
DIMENSIONS IN MILLIMETERS AND (INCHES).



Outline 44

ture is 230°C for 5 seconds. Marking is by digital coding with a cathode band.

The HP Outline 49 package has a metal-ceramic hermetic seal. The anode and cathode studs are gold-plated Kovar. The maximum soldering tempera-



Outline 49

ture is 230°C for 5 seconds. Stud-stud TIR is 0.010" max.

The HP Outline 44 package is a hermetically sealed ceramic package. The anode and cathode are gold-plated Kovar. The maximum soldering temperature is 230°C for 5 seconds.

Maximum Ratings

Junction Operating and Storage Temperature Range

5082-2824 -65°C to +200 °C
 All Others -60°C to +150 °C

DC Power Dissipation – Power Absorbed by Diode

Derate Linearly to Zero at Maximum Temperature

5082-2824 250 mW
 All Others 100 mW

Soldering Temperature 260°C for 5 sec.

RF Peak Pulse Power at $T_{CASE} = 25^\circ\text{C}$ (Pulse Width = 1 μs ,
 $D_u = 0.001$)

5082-2824 (Power Absorbed by Diode) 4.5 W
 All Others (Power Incident) 2.0 W

Maximum Peak Inverse Voltage (PIV) V_{BR}

Note: The 2700 series diodes are ESD sensitive. Handle with care to avoid static discharge through the diode.

Electrical Specifications at $T_A = 25^\circ\text{C}$

Part Number 5082-	Package Outline	Maximum Tangential Sensitivity TSS (dBm)	Voltage Sensitivity Minimum γ (mV/ μW)	Video Resistance R_V (k Ω)		Minimum Breakdown Voltage V_{BR} (V)	Noise Temperature Ratio at f (dB)	Junction Capacitance C_{JO} (pF)
				Min.	Max.			
2824	15	-56	6.0	1.2	1.5	15	2 at 20 kHz 8 at 1 kHz	1.0
2787*		-52	3.5		1.8	4	5.0 at 20 kHz 15.0 at 1 kHz	12
2755		-55	5		1.6			1
2751		49						
2750		44						
Test Conditions		Video Bandwidth = 2 MHz $f_{RF} = 2$ GHz for 5082-2824, 10 GHz for all others $I_{BIAS} = 20 \mu\text{A}$; Video Amp. Eq. Noise, $R_A = 500 \Omega$.	Same as for TSS at RF Signal Power Level of -40 dBm. Load Resistance = 100 k Ω			$I_R = 10 \mu\text{A}$	$R_V = 50 \Omega$	$V = 0$

Typical Parameters

*RF Parameters for the 5082-2787 are sample tested only.

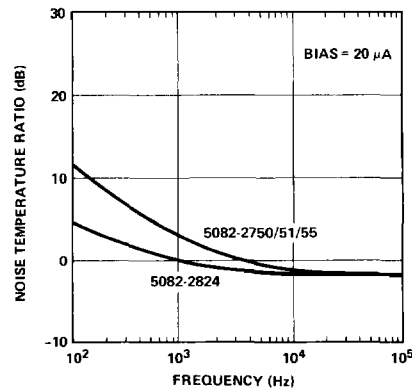


Figure 1. Typical Flicker (1/f) Noise vs. Frequency.

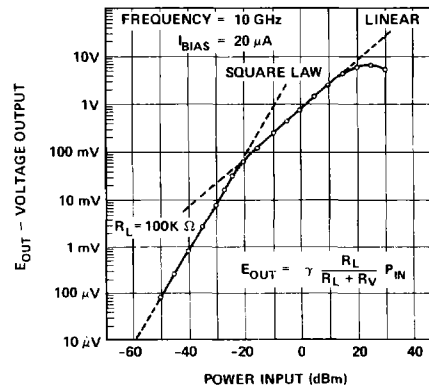


Figure 2. Typical Dynamic Transfer Characteristic. (5082-2750 Series).

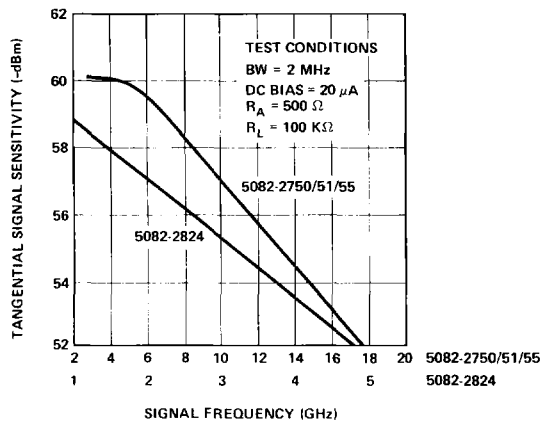


Figure 3. Typical TSS vs. Frequency.

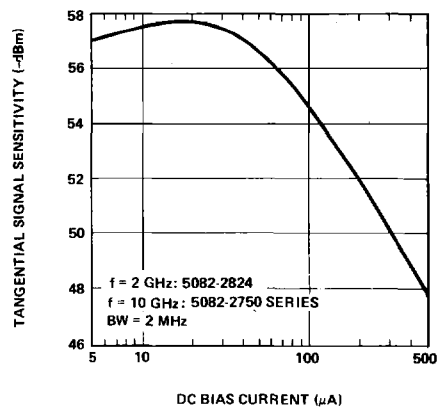


Figure 4. Typical TSS vs. Bias.

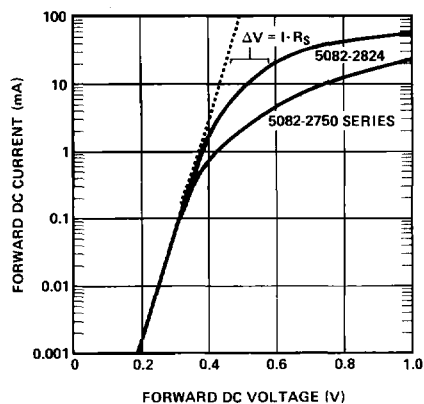


Figure 5. Typical Forward Characteristics at $T_A = 25^\circ\text{C}$.

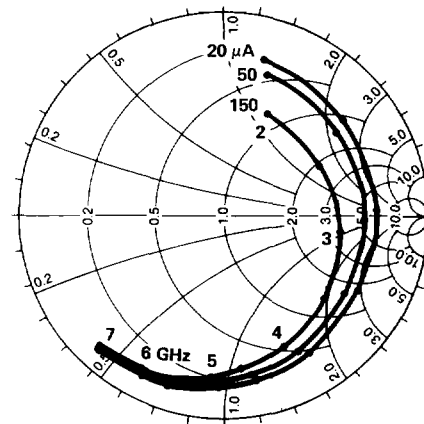


Figure 6. Typical Admittance Characteristics, 5082-2824 with External Bias.

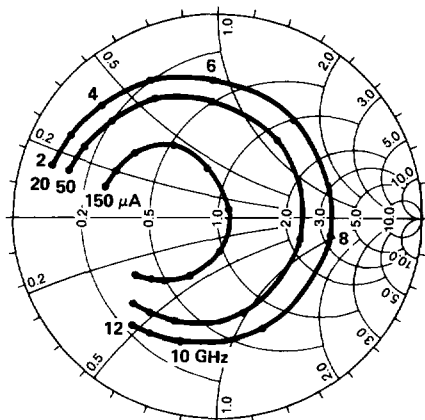


Figure 7. Typical Admittance Characteristics, 5082-2755 with External Bias.

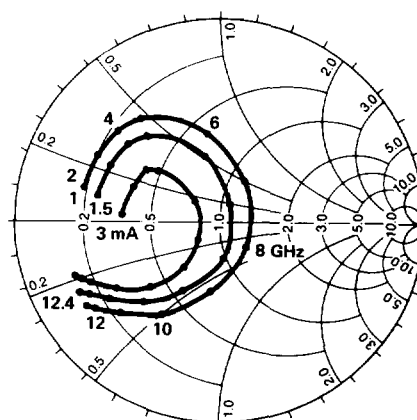


Figure 8. Typical Admittance Characteristics, 5082-2755 with Self Bias.

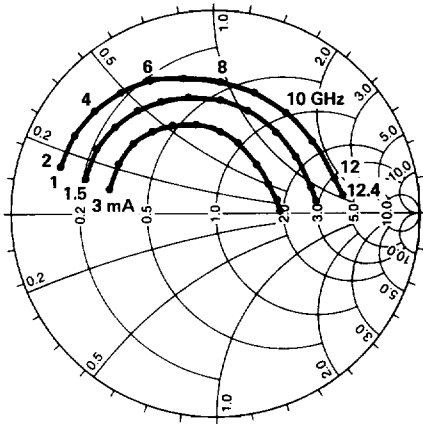


Figure 9. Typical Admittance Characteristics, 5082-2751 with Self Bias.

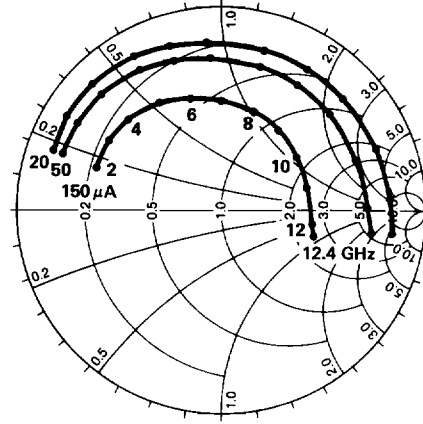


Figure 10. Typical Admittance Characteristics, 5082-2751 with External Bias.

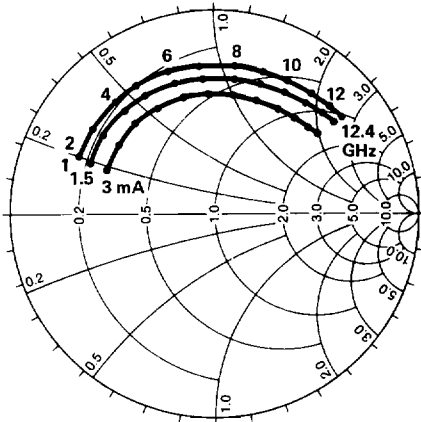


Figure 11. Typical Admittance Characteristics, 5082-2750 with Self Bias.

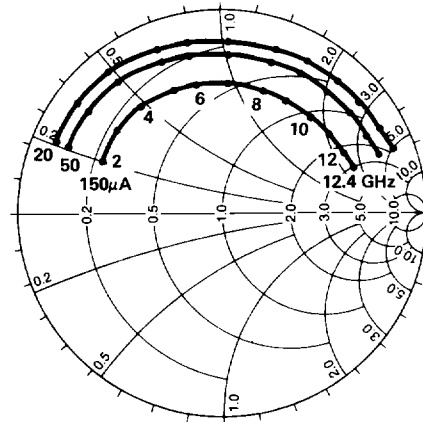


Figure 12. Typical Admittance Characteristics, 5082-2750 with External Bias.