HEWLETT **hp** *PACKARD*

COMPONENTS

SCHOTTKY BARRIER DIODES FOR DETECTORS | 5082-2750/51
5082-2755
5082-2787
5082-2824

SCHOTTKY BARRIER DIODES & HIGH CONDUCTANCE DIODES

3

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 suitable for narrow bandwidth video detectors, and Doppler mixers as required in Doppler radar equipment, ECM receivers, and measurement equipment.

Maximum Ratings at $T_{CASE} = 25°C$

Junction Operating and Storage Temperature Range
5082-2824 .... -65°C to +200°C
All Others .... -60°C to +150°C

Operation of these devices within the above temperature ratings will assure a device Mean Time Between Failure (MTBF) of approximately 1×10^7 hours.

DC Power Dissipation — Power Absorbed by Diode
Derate Linearly to zero at Maximum Temperature
5082-2824 (Applied for 1 minute) .... 1 W
5082-2824 (Continuous) .... 250 mW
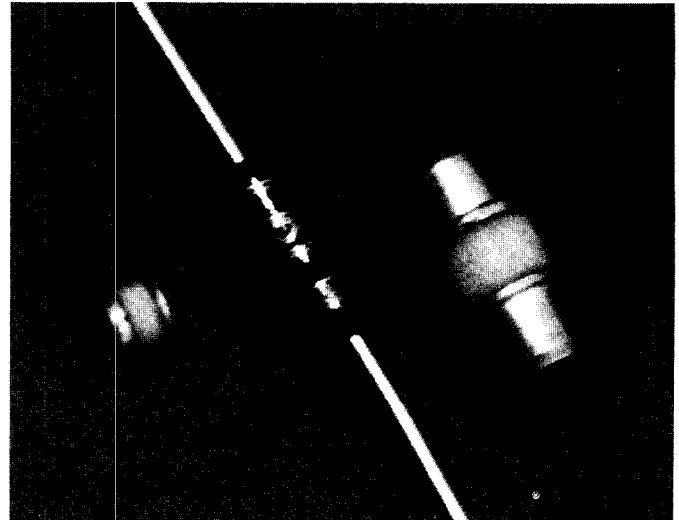All Others (Continuous) .... 100 mW

Soldering Temperature .... 230°C for 5 sec.

RF Peak Pulse Power
Pulse Width = 1 μs, Du = .001, R_L = 38KΩ
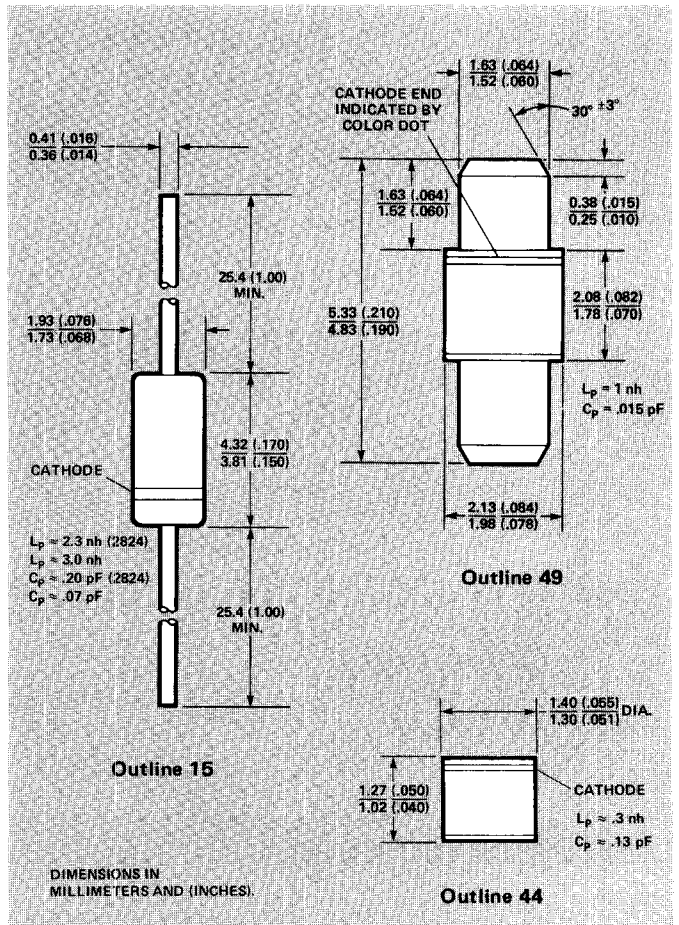(Applied for 1 minute)
5082-2824 (Power Absorbed by Diode) ..... 4.5 W
All Others (Power Incident) .... 2.0 W

Maximum Peak Inverse Voltage (PIV) .... V_{BR}

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

Package Dimensions

0.41 (.016)
0.36 (.014)

25.4 (1.00) MIN.

1.93 (.076)
1.73 (.068)

4.32 (.170)
3.81 (.150)

CATHODE

L_p ≈ 2.3 nh (2824)
L_p ≈ 3.0 nh
C_p ≈ .20 pF (2824)
C_p ≈ .07 pF

25.4 (1.00) MIN.

Outline 15

1.63 (.064)
1.52 (.060)

CATHODE END INDICATED BY COLOR DOT

30° ±3°

1.63 (.064)
1.52 (.060)

0.38 (.015)
0.25 (.010)

25.4 (1.00) MIN.

5.33 (.210)
4.83 (.190)

2.08 (.082)
1.78 (.070)

L_p ≈ 1 nh
C_p ≈ .015 pF

2.13 (.084)
1.98 (.078)

Outline 49

1.40 (.055) DIA.
1.30 (.051)

1.27 (.050)
1.02 (.040)

CATHODE

L_p ≈ .3 nh
C_p ≈ .13 pF

DIMENSIONS IN MILLIMETERS AND (INCHES).

Outline 44

Electrical Specifications at $T_A = 25°C$

Part Number 5082-	Package Outline	Maximum Tangential Sensitivity TSS (dBm)	Voltage Sensitivity Minimum γ (mV/μW)	Video Resistance R_V (kΩ) Min.	Max.
2824		−56	6.0	1.2	1.5
2787*	15	−52	3.5	1.2	1.6
2755		−55	5.0	1.2	1.6
2751	49	−55	5.0	1.2	1.6
2750	44	−55	5.0	1.2	1.6
Test Conditions		Video Bandwidth = 2 MHz f_{RF} = 2 GHz for 5082-2824, 10 GHz for all others I_{BIAS}=20 μA; Video Amp Eq. Noise, R_A = 500Ω.	Same as for TSS at RF Signal Power Level of −40 dBm Load Resistance = 100KΩ		

Typical Parameters

Noise Temperature Ratio at f (dB)	Breakdown Voltage V_{BR} (V)	Junction Capacitance C_{JO} (pF)
2 at 20 kHz 8 at 1 kHz	15	1.0
	4	.12
5.0 at 20 kHz 15.0 at 1 kHz	5	.12
	5	.12
	5	.12
R_V = 50Ω	I_R = 10 μA	V = 0

*RF Parameters for the 5082-2787 are sample tested only.
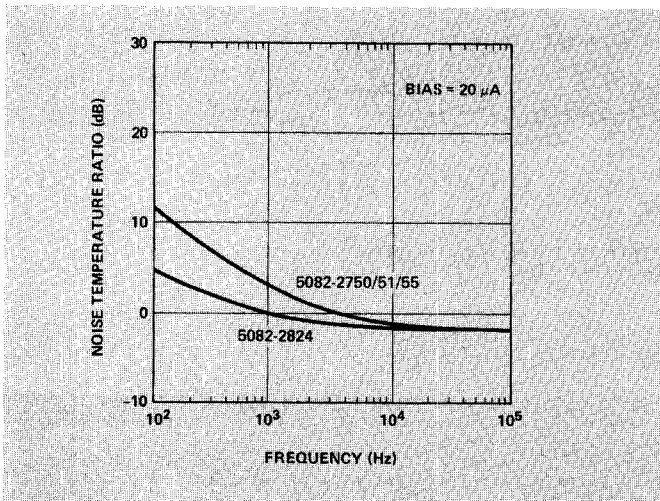
Figure 1. Typical Flicker (1/f) Noise vs. Frequency.
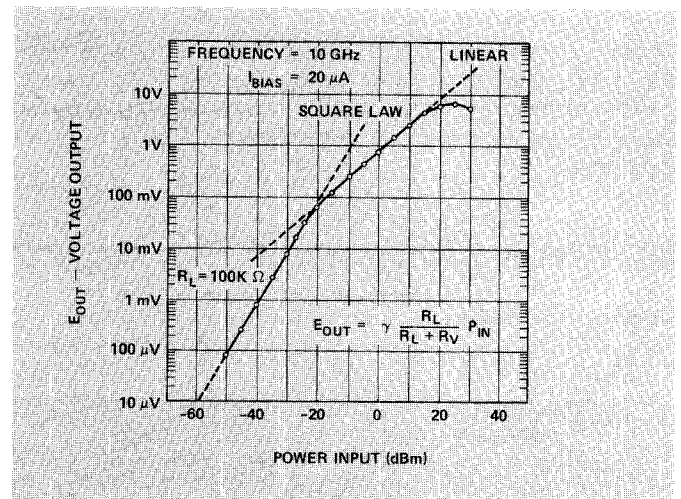
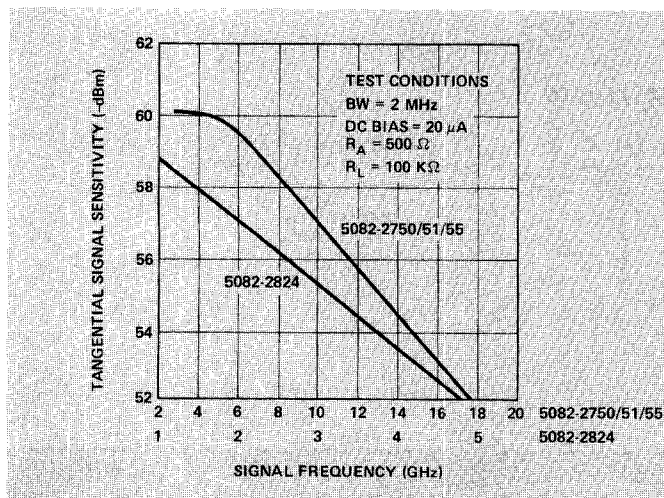Figure 2. Typical Dynamic Transfer Characteristic. (5082-2750 Series).
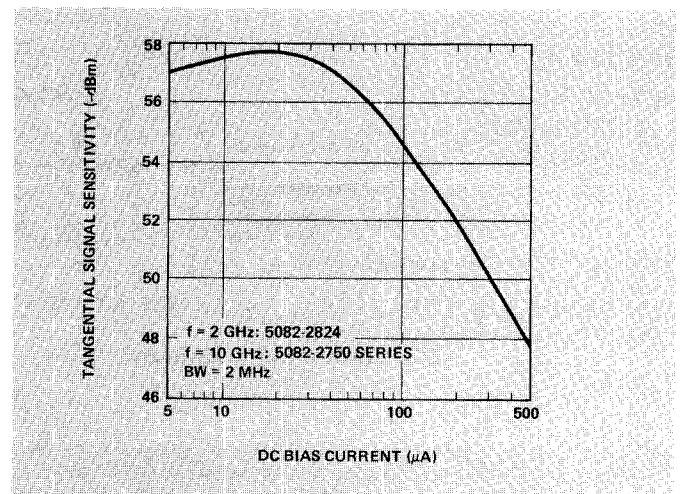

Figure 3. Typical TSS vs. Frequency.

Figure 4. Typical TSS vs. Bias.
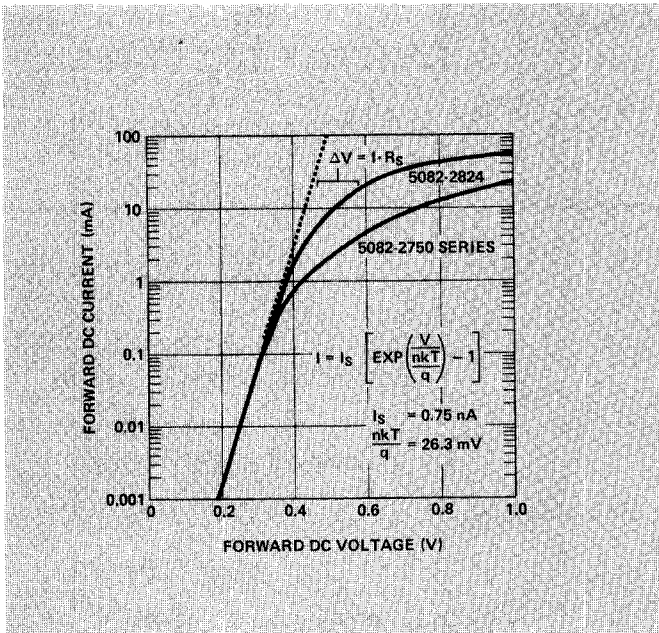
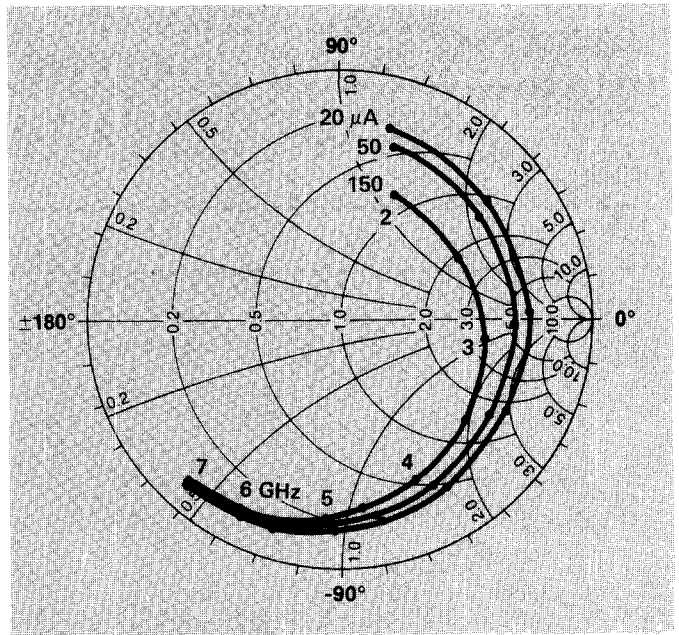Figure 5. Typical Forward Characteristics at $T_A = 25°C$.

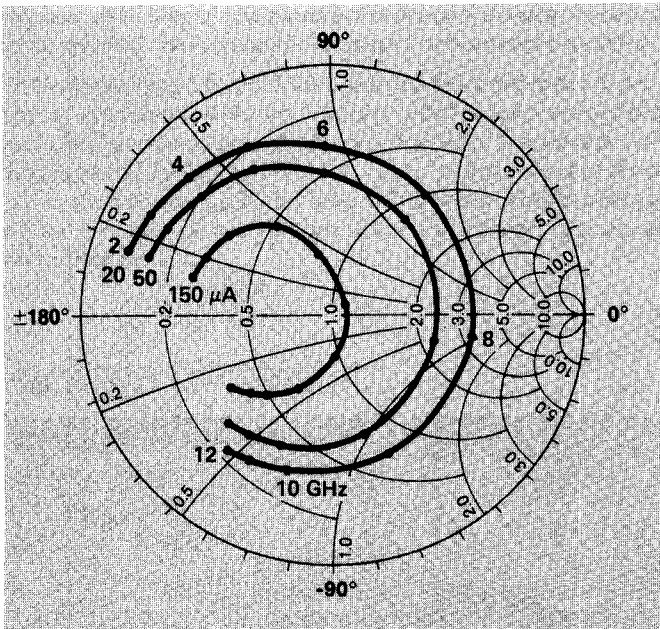Figure 6. Typical Admittance Characteristics, 5082-2824 with external bias.

Figure 7. Typical Admittance Characteristics, 5082-2755 with external bias.
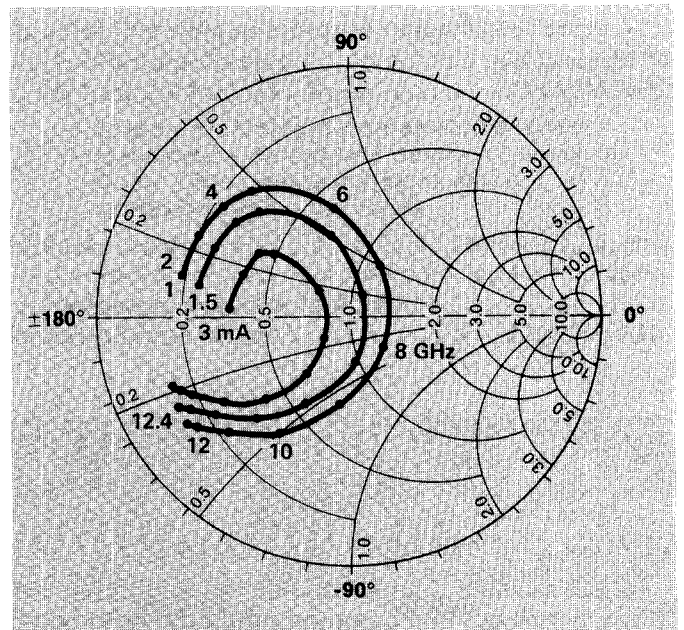
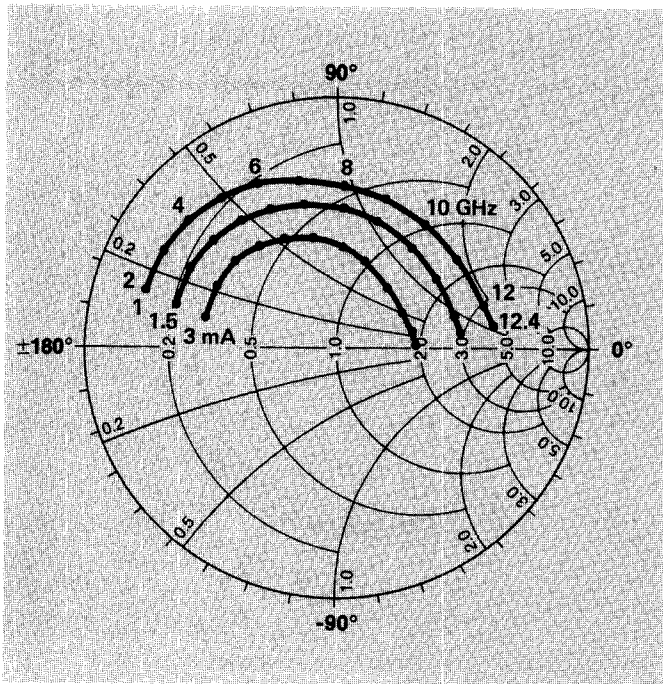Figure 8. Typical Admittance Characteristics, 5082-2755 with self bias.

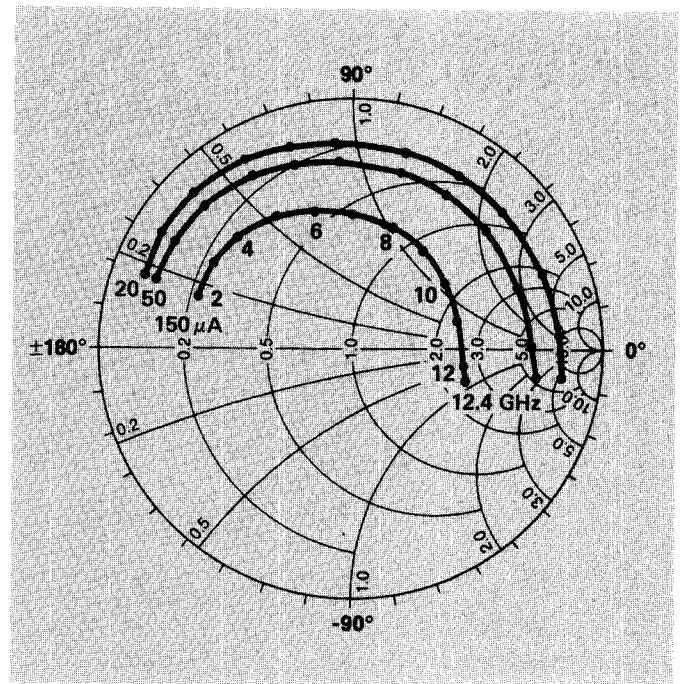Figure 9. Typical Admittance Characteristics, 5082-2751 with self bias.

Figure 10. Typical Admittance Characteristics, 5082-2751 with external bias.
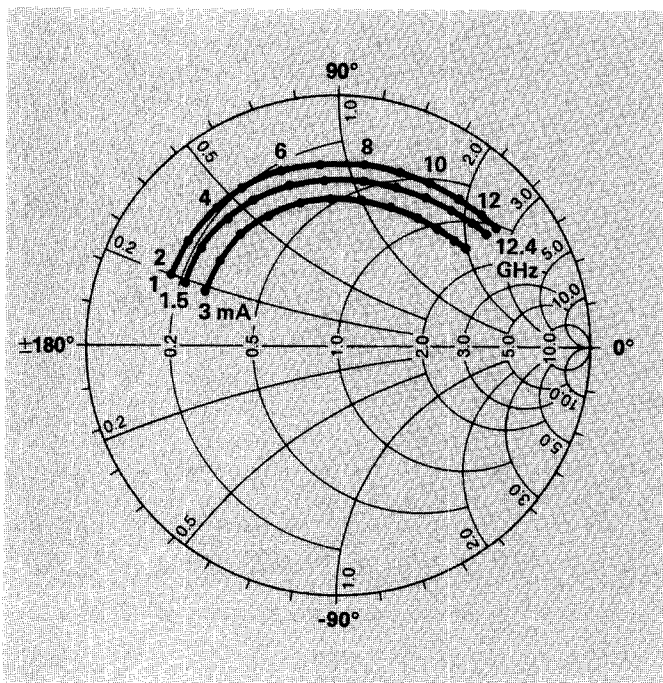

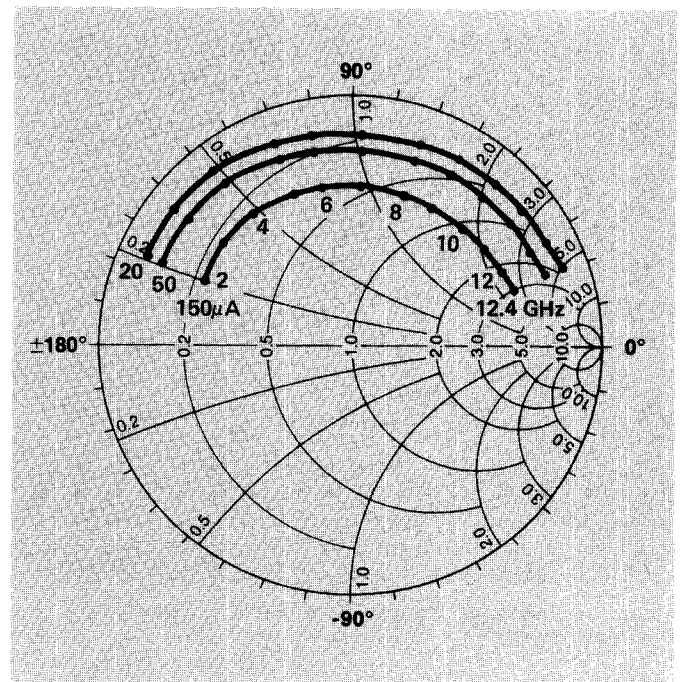Figure 11. Typical Admittance Characteristics, 5082-2750 with self bias.

Figure 12. Typical Admittance Characteristics, 5082-2750 with external bias.