HEWLETT PACKARD

SCHOTTKY BARRIER DIODES FOR GENERAL PURPOSE APPLICATIONS

1N5711
1N5712
5082-2800/10/11/35
5082-2301
5082-2302
5082-2303
5082-2900

T-07-23

Features

LOW TURN-ON VOLTAGE: AS LOW AS 0.34V AT 1mA

PICO-SECOND SWITCHING SPEED

HIGH BREAKDOWN VOLTAGE: UP TO 70V

MATCHED CHARACTERISTICS AVAILABLE

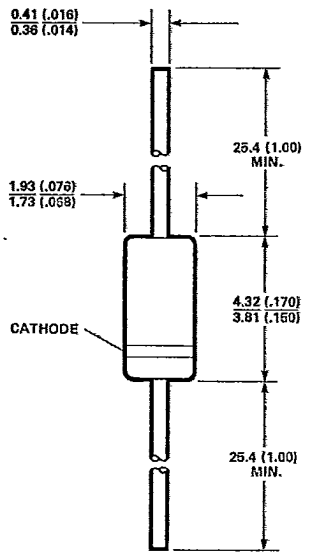
Description/Applications

The 1N5711, 1N5712, 5082-2800/10/11 are passivated Schottky barrier diodes which use a patented "guard ring" design to achieve a high breakdown voltage. Packaged in a low cost glass package, they are well suited for high level detecting, mixing, switching, gating, log or A-D converting, video detecting, frequency discriminating, sampling and wave shaping.

The 5082-2835 is a passivated Schottky diode in a low cost glass package. It is optimized for low turn-on voltage. The 5082-2835 is particularly well suited for the UHF mixing needs of the CATV marketplace.

The 5082-2300 and 2900 Series devices are unpassivated Schottky diodes in a glass package. These diodes have extremely low 1/f noise and are ideal for low noise mixing, and high sensitivity detecting. They are particularly well suited for use in Doppler or narrow band video receivers.

Application Note 942 describes applications in which these diodes are used for speed up of a transistor, clipping, clamping, and sampling.



DIMENSIONS IN MILLIMETERS AND (INCHES).

OUTLINE 15

Maximum Ratings

Junction Operating and Storage Temperature Range
5082-2301, 2302, 2303, 2900 ..... -60°C to +100°C
1N5711, 1N5712, 5082-2800/10/11, .. -65°C to +200°C
5082-2835 ..... -60°C to +150°C

DC Power Dissipation (Measured in an infinite heat sink at T_{CASE} = 25°C)
Derate linearly to zero at maximum rated temperature
5082-2301, 2302, 2303, 2900 ..... 100 mW
1N5711, 1N5712, 5082-2800/10/11 ..... 250 mW
5082-2835 ..... 150 mW

Peak Inverse Voltage ..... V_{BR}

Package Characteristics

	Outline 15
Lead Material:	Dumet
Lead Finish:	95-5% Tin Lead
Maximum Soldering Temperature:	260°C for 5 sec.
Minimum Lead Strength:	4 lb. Pull
Typical Package Inductance:	1N5711, 1N5712: 2.0 nH 2800 Series: 2.0 nH 2300, 2900 Series: 3.0 nH
Typical Package Capacitance:	1N5711, 1N5712: 0.2 pF 2800 Series: 0.2 pF 2300, 2900 Series: 0.07 pF

The leads on the Outline 15 package should be restricted so that the bend starts at least 1/16 inch from the glass body.

Outline 15 diodes are available on tape and reel.
The tape and reel specification is patterned after RS-296-D.

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Electrical Specifications at $T_A = 25°C$

GENERAL PURPOSE DIODES

Part Number 5082-	Package Outline	Minimum Breakdown Voltage V_{BR} (V)	Maximum Forward Voltage V_F (mV)	V_F = 1 V Max at Forward Current I_F (mA)	Maximum Reverse Leakage Current I_R (nA) at V_R (V)		Maximum Capacitance C_T (pF)
2800	15	70	410	15	200	50	2.0
1N5711	15	70	410	15	200	50	2.0
2810	15	20	410	35	100	15	1.2
1N5712	15	20	550	35	150	16	1.2
2811	15	15	410	20	100	8	1.2
2835	15	8*	340	10†	100	1	1.0
Test Conditions		I_R = 10 μA *I_R = 100 μA	I_F = 1 mA	†V_F = .45 V			V_R = 0 V f = 1.0 MHz

Note: Effective Carrier Lifetime (τ) for all these diodes is 100 ps maximum measured with Krakauer method at 5 mA except for 5082-2835 which is measured at 20 mA.

LOW 1/f (FLICKER) NOISE DIODES

Part Number 5082-	Package Outline	Minimum Breakdown Voltage V_{BR} (V)	Maximum Forward Voltage V_F (mV)	V_F = 1 V Max at Forward Current I_F (mA)	Maximum Reverse Leakage Current I_R (nA) at V_R (V)		Maximum Capacitance C_T (pF)
2301	15	30	400	50	300	15	1.0
2302	15	30	400	35	300	15	1.0
2303	15	20	400	35	500	15	1.0
2900	15	10	400	20	100	5	1.2
Test Conditions		I_R = 10 μA	I_F = 1 mA				V_R = 0 V f = 1.0 MHz

Note: Effective Carrier Lifetime (τ) for all these diodes is 100 ps maximum measured with Krakauer method at 20 mA.

Matched Pairs and Quads

Basic Part Number 5082-	Matched Pair Unconnected	Matched Quad Unconnected	Matched Ring Quad Encapsulated G-1 Outline	Matched Bridge Quad Encapsulated G-2 Outline	Batch Matched	Test Conditions
2301	5082-2306 ΔV_F = 20 mV ΔC_O = 0.2 pF					ΔV_F at I_F = 0.75, 20 mA ΔC_O at f = 1.0 MHz
2303	5082-2308 ΔV_F = 20 mV ΔC_O = 0.2 pF	5082-2370 ΔV_F = 20 mV ΔC_O = 0.2 pF	5082-2396 ΔV_F = 20 mV ΔC_O = 0.2 pF	5082-2356 ΔV_F = 20 mV ΔC_O = 0.2 pF		ΔV_F at I_F = 0.75, 20 mA ΔC_O at f = 1.0 MHz
2900	5082-2912 ΔV_F = 30 mV	5082-2970 ΔV_F = 30 mV		5082-2997 ΔV_F = 30 mV		ΔV_F at I_F = 1.0, 10 mA
2800	5082-2804 ΔV_F = 20 mV	5082-2805 ΔV_F = 20 mV			5082-2836* ΔV_F = 20 mV ΔC_O = 0.1 pF	ΔV_F at I_F = 0.5, 5 mA *I_F = 10 mA ΔC_O at f = 1.0 MHz
2811		5082-2815 ΔV_F = 20 mV ΔC_O = 0.2 pF	5082-2814 ΔV_F = 20 mV ΔC_O = 0.2 pF	5082-2813 ΔV_F = 20 mV ΔC_O = 0.2 pF	5082-2826 ΔV_F = 10 mV ΔC_O = 0.1 pF	ΔV_F at I_F = 10 mA ΔC_O at f = 1.0 MHz
2835					5082-2080 ΔV_F = 10 mV ΔC_O = 0.1 pF	ΔV_F at I_F = 10 mA ΔC_O at f = 1.0 MHz

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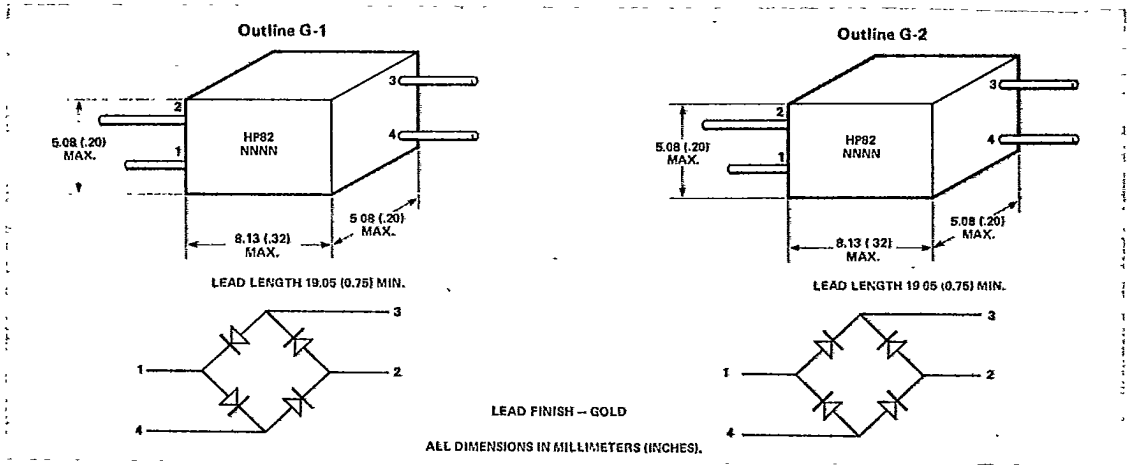

Typical Parameters

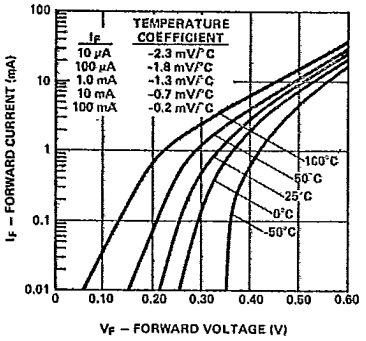

Figure 1. I-V Curve Showing Typical Temperature Variation for 5082-2300 and 5082-2900 Series Schottky Diodes.

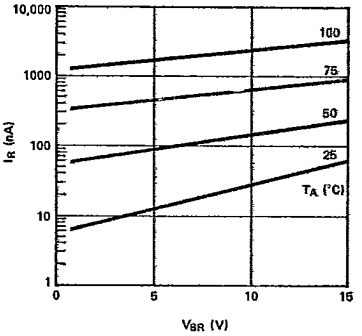

Figure 2. 5082-2300 Series Typical Reverse Current vs. Reverse Voltage at Various Temperatures.

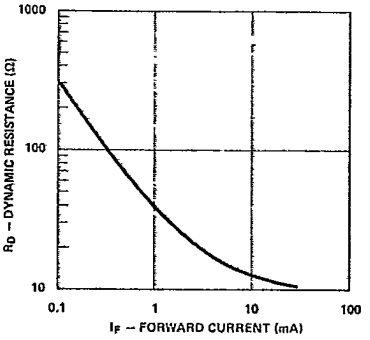

Figure 3. 5082-2300 Series and 5082-2900 Series Typical Dynamic Resistance (R_D) vs. Forward Current (I_F).

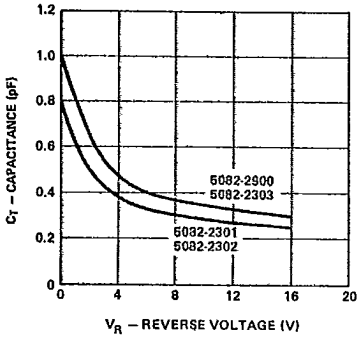

Figure 4. 5082-2300 and 5082-2900 Series Typical Capacitance vs. Reverse Voltage.

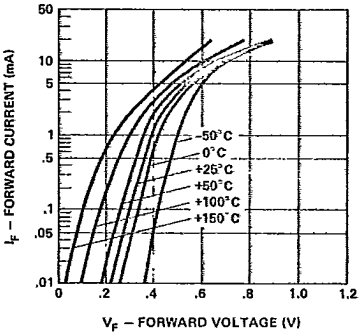

Figure 5. I-V Curve Showing Typical Temperature Variation for 5082-2800 or 1N5711 Schottky Diodes.

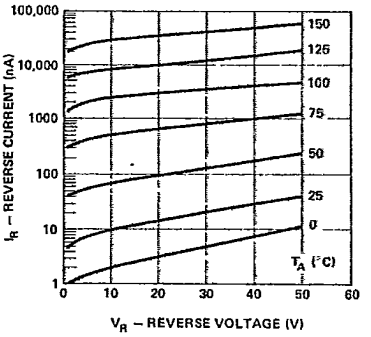

Figure 6. (5082-2800 or 1N5711) Typical Variation of Reverse Current (I_R) vs. Reverse Voltage (V_R) at Various Temperatures.

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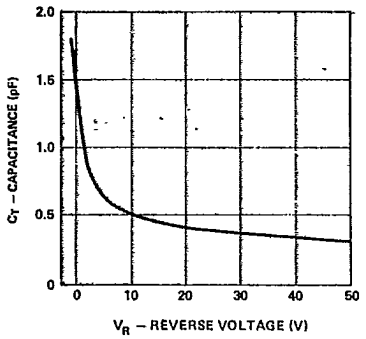

Figure 7. (5082-2800 or 1N5711) Typical Capacitance (C_T) vs. Reverse Voltage (V_R).

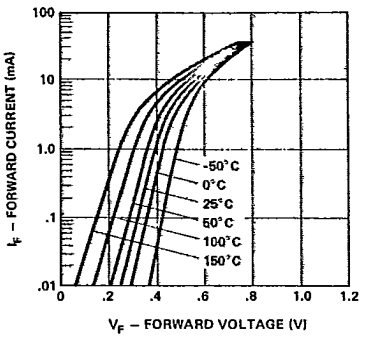

Figure 8. I-V Curve Showing Typical Temperature Variation for the 5082-2810 or 1N5712 Schottky Diode.

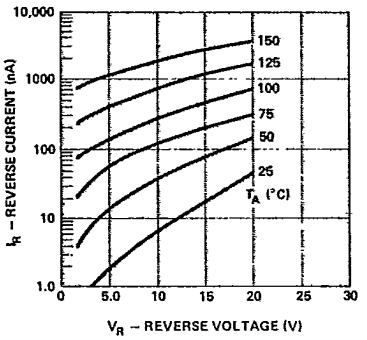

Figure 9. (5082-2810 or 1N5712) Typical Variation of Reverse Current (I_R) vs. Reverse Voltage (V_R) at Various Temperatures.

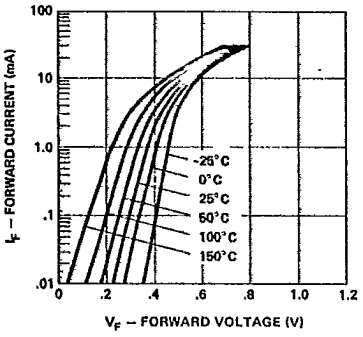

Figure 10. I-V Curve Showing Typical Temperature Variation for the 5082-2811 Schottky Diode.

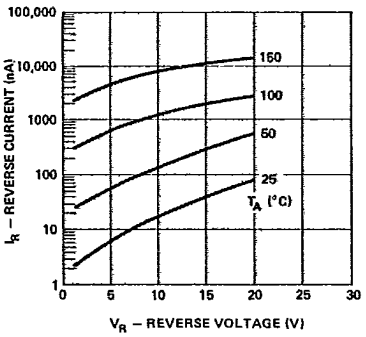

Figure 11. (5082-2811) Typical Variation of Reverse Current (I_R) vs. Reverse Voltage (V_R) at Various Temperatures.

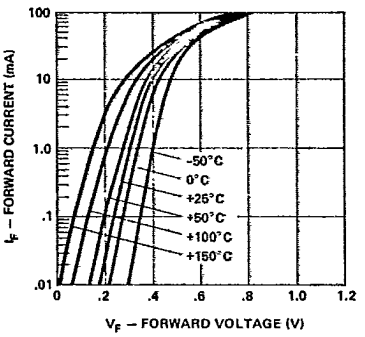

Figure 12. I-V Curve Showing Typical Temperature Variations for 5082-2835 Schottky Diode.

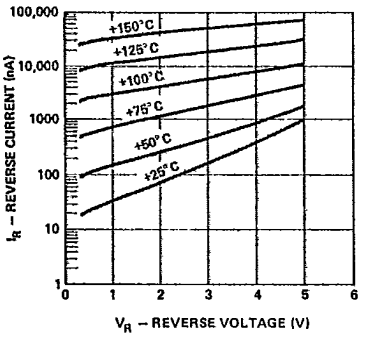

Figure 13. (5082-2835) Typical Variation of Reverse Current (I_R) vs. Reverse Voltage (V_R) at Various Temperatures.

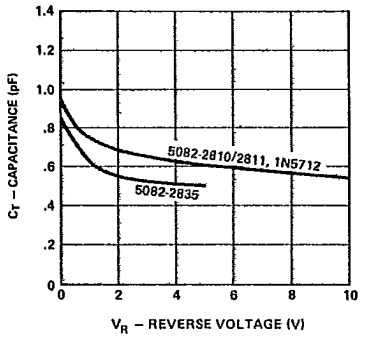

Figure 14. Typical Capacitance (C_T) vs. Reverse Voltage (V_R).

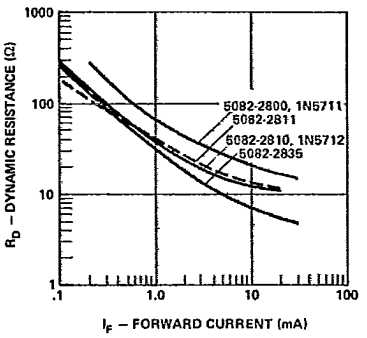

Figure 15. Typical Dynamic Resistance (R_D) vs. Forward Current (I_F).