



**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.

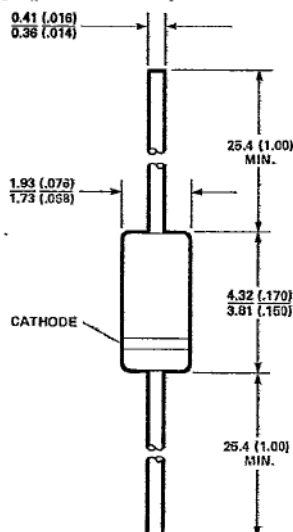
Application Note 942 describes applications in which these diodes are used for speed up of a transistor, clipping, clamping, and sampling.

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}



DIMENSIONS IN MILLIMETERS AND (INCHES).

OUTLINE 15

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.

T-07-23

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

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 | | Maximum Capacitance C_T (pF) |
|----------------------|-----------------|---|---------------------------------------|--|---------------------------------|--------------|-----------------------------------|
| | | | | | I_R (nA) | at V_R (V) | |
| 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 | | $I_R = 10 \mu\text{A}$ * $I_R = 100 \mu\text{A}$ | $I_F = 1$ 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/I (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 | | Maximum Capacitance C_T (pF) |
|----------------------|-----------------|---|---------------------------------------|--|---------------------------------|--------------|-----------------------------------|
| | | | | | I_R (nA) | at V_R (V) | |
| 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 | | $I_R = 10 \mu\text{A}$ | $I_F = 1$ mA | | | | $V_R = 0$ V $f = 1.0$ MHz |

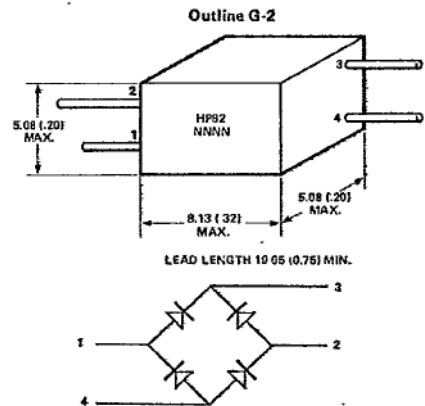
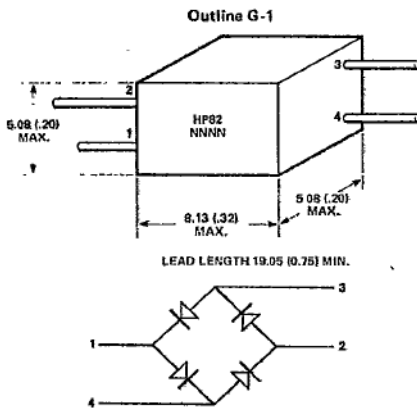
Note: Effective Carrier Lifetime (τ) for all these diodes is 100 ps maximum measured with Krakauer method at 20 mA.



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 $\Delta V_F = 20$ mV $\Delta C_O = 0.2$ pF | | | | | ΔV_F at $I_F = 0.75, 20$ mA ΔC_O at $f = 1.0$ MHz |
| 2303 | 5082-2308 $\Delta V_F = 20$ mV $\Delta C_O = 0.2$ pF | 5082-2370 $\Delta V_F = 20$ mV $\Delta C_O = 0.2$ pF | 5082-2396 $\Delta V_F = 20$ mV $\Delta C_O = 0.2$ pF | 5082-2356 $\Delta V_F = 20$ mV $\Delta C_O = 0.2$ pF | | ΔV_F at $I_F = 0.75, 20$ mA ΔC_O at $f = 1.0$ MHz |
| 2900 | 5082-2912 $\Delta V_F = 30$ mV | 5082-2970 $\Delta V_F = 30$ mV | | 5082-2997 $\Delta V_F = 30$ mV | | ΔV_F at $I_F = 1.0, 10$ mA |
| 2800 | 5082-2804 $\Delta V_F = 20$ mV | 5082-2805 $\Delta V_F = 20$ mV | | | 5082-2836* $\Delta V_F = 20$ mV $\Delta C_O = 0.1$ pF | ΔV_F at $I_F = 0.5, 5$ mA * $I_F = 10$ mA ΔC_O at $f = 1.0$ MHz |
| 2811 | | 5082-2815 $\Delta V_F = 20$ mV $\Delta C_O = 0.2$ pF | 5082-2814 $\Delta V_F = 20$ mV $\Delta C_O = 0.2$ pF | 5082-2813 $\Delta V_F = 20$ mV $\Delta C_O = 0.2$ pF | 5082-2826 $\Delta V_F = 10$ mV $\Delta C_O = 0.1$ pF | ΔV_F at $I_F = 10$ mA ΔC_O at $f = 1.0$ MHz |
| 2835 | | | | | 5082-2080 $\Delta V_F = 10$ mV $\Delta C_O = 0.1$ pF | ΔV_F at $I_F = 10$ mA ΔC_O at $f = 1.0$ MHz |

T-07-23



Typical Parameters

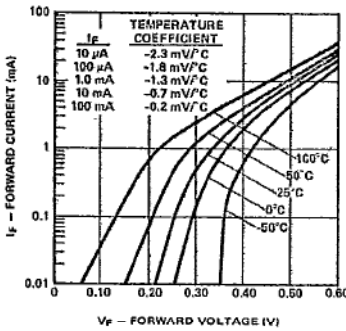


Figure 1. I-V Curve Showing Typical Temperature Variation for 5082-2300 and 5082-2900 Series Schottky Diodes.

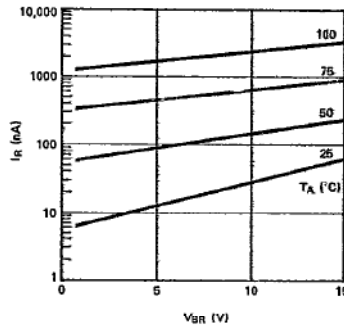


Figure 2. 5082-2300 Series Typical Reverse Current vs. Reverse Voltage at Various Temperatures.

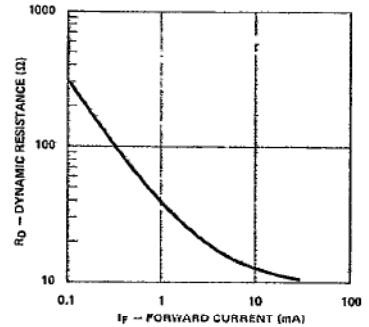


Figure 3. 5082-2300 Series and 5082-2900 Series Typical Dynamic Resistance (R_D) vs. Forward Current (I_F).

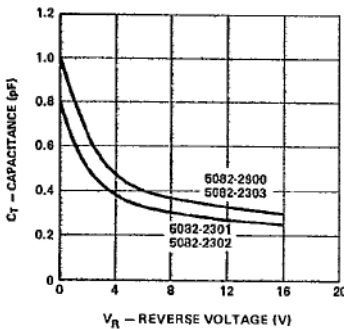


Figure 4. 5082-2300 and 5082-2900 Series Typical Capacitance vs. Reverse Voltage.

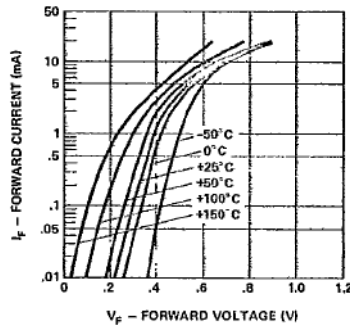


Figure 5. I-V Curve Showing Typical Temperature Variation for 5082-2800 or 1N5711 Schottky Diodes.

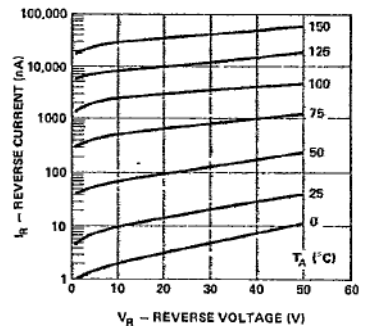


Figure 6. (5082-2800 or 1N5711) Typical Variation of Reverse Current (I_R) vs. Reverse Voltage (V_R) at Various Temperatures.

T-07-23

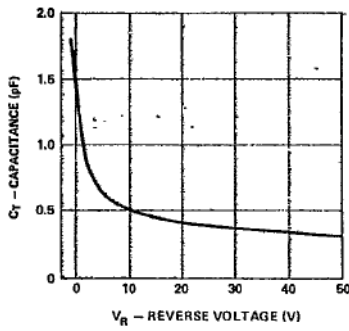


Figure 7. (5082-2800 or 1N5711) Typical Capacitance (C_T) vs. Reverse Voltage (V_R).

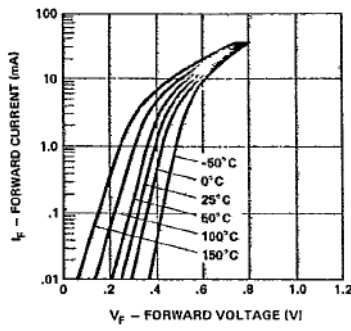


Figure 8. I-V Curve Showing Typical Temperature Variation for the 5082-2810 or 1N5712 Schottky Diode.

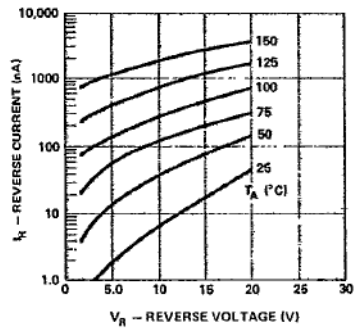


Figure 9. (5082-2810 or 1N5712) Typical Variation of Reverse Current (I_R) vs. Reverse Voltage (V_R) at Various Temperatures.

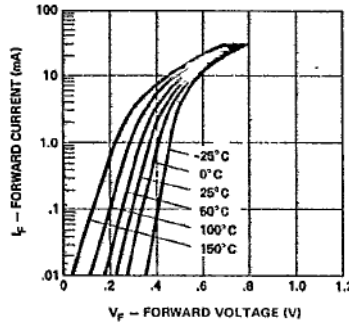


Figure 10. I-V Curve Showing Typical Temperature Variation for the 5082-2811 Schottky Diode.

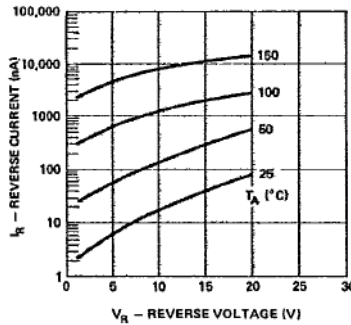


Figure 11. (5082-2811) Typical Variation of Reverse Current (I_R) vs. Reverse Voltage (V_R) at Various Temperatures.

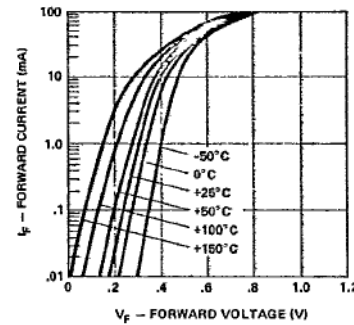


Figure 12. I-V Curve Showing Typical Temperature Variations for 5082-2835 Schottky Diode.

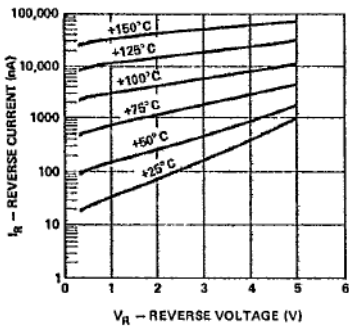


Figure 13. (5082-2835) Typical Variation of Reverse Current (I_R) vs. Reverse Voltage (V_R) at Various Temperatures.

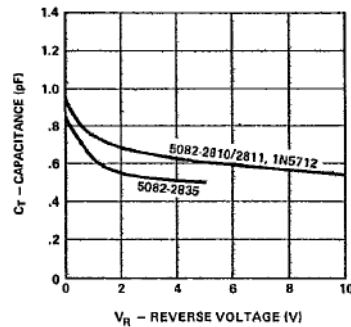


Figure 14. Typical Capacitance (C_T) vs. Reverse Voltage (V_R).

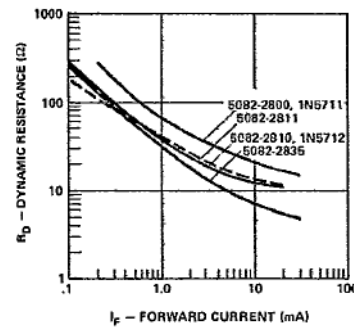


Figure 15. Typical Dynamic Resistance (r_D) vs. Forward Current (I_F).

