

# Schottky Barrier Diodes for General Purpose Applications

## Technical Data

**1N5711**  
**1N5712**  
**5082-2300 Series**  
**5082-2800 Series**  
**5082-2900**

### Features

- **Low Turn-On Voltage**  
As Low as 0.34 V at 1 mA
- **Pico Second Switching Speed**
- **High Breakdown Voltage**  
Up to 70 V
- **Matched Characteristics Available**

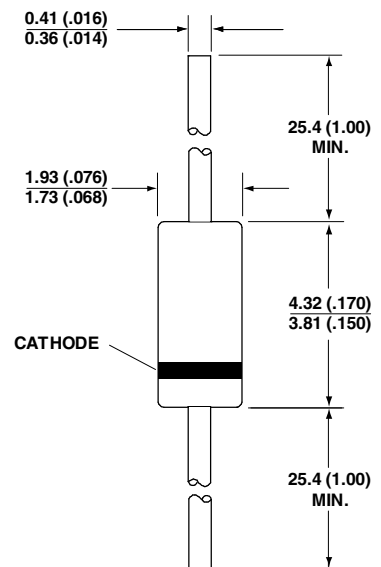
### Description/Applications

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 Series and 5082-2900 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.

### Outline 15



DIMENSIONS IN MILLIMETERS AND (INCHES).

### Maximum Ratings

#### Junction Operating and Storage Temperature Range

5082-2303, -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  $T_{CASE} = 25^{\circ}C$ )*

*Derate linearly to zero at maximum rated temperature*

5082-2303, -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
Max. Soldering Temperature .....	260°C for 5 sec
Min. Lead Strength .....	4 pounds pull
Typical Package Inductance	
1N5711, 1N5712: .....	2.0 nH
2800 Series: .....	2.0 nH
2300 Series, 2900: .....	3.0 nH
Typical Package Capacitance	
1N5711, 1N5712: .....	0.2 pF
2800 Series: .....	0.2 pF
2300 Series, 2900: .....	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.

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

### General Purpose Diodes

Part Number	Package Outline	Min. Breakdown Voltage $V_{BR}$ (V)	Max. Forward Voltage $V_F$ (mV)	$V_F = 1$ V Max. at Forward Current $I_F$ (mA)	Max. Reverse Leakage Current $I_R$ (nA) at $V_R$ (V)	Max. Capacitance $C_T$ (pF)
5082-2800	15	70	410	15	200 50	2.0
1N5711	15	70	410	15	200 50	2.0
5082-2810	15	20	410	35	100 15	1.2
1N5712	15	20	550	35	150 16	1.2
5082-2811	15	15	410	20	100 8	1.2
5082-2835	15	8*	340	10*	100 1	1.0
Test Conditions		$I_R = 10$ A * $I_R = 100$ A	$I_F = 1$ mA	* $V_F = 0.45$ V		$V_R = 0$ V $f = 1.0$ MHz

**Note:** Effective Carrier Lifetime ( ) 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	Min. Breakdown Voltage $V_{BR}$ (V)	Max. Forward Voltage $V_F$ (mV)	$V_F = 1$ V Max. at Forward Current $I_F$ (mA)	Max. Reverse Leakage Current $I_R$ (nA) at $V_R$ (V)	Max. Capacitance $C_T$ (pF)
2303	15	20	400	35	500 15	1.0
2900	15	10	400	20	100 5	1.2
Test Conditions		$I_R = 10$ A	$I_F = 1$ mA			$V_R = 0$ V $f = 1.0$ MHz

Note: Effective Carrier Lifetime ( $\tau$ ) 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	Batch Matched <sup>[1]</sup>	Test Conditions
2900				$V_F$ at $I_F = 1.0, 10$ mA
2800	5082-2804 $V_F = 20$ mV	5082-2805 $V_F = 20$ mV		$V_F$ at $I_F = 0.5, 5$ mA * $I_F = 10$ mA $C_O$ at $f = 1.0$ MHz
2811			5082-2826 $V_F = 10$ mV $C_O = 0.1$ pF	$V_F$ at $I_F = 10$ mA $C_O$ at $f = 1.0$ MHz
2835			5082-2080 $V_F = 10$ mV $C_O = 0.1$ pF	$V_F$ at $I_F = 10$ mA $C_O$ at $f = 1.0$ MHz

Note:

1. Batch matched devices have a minimum batch size of 50 devices.

### SPICE Parameters

Parameter	Units	5082-2800	5082-2810	5082-2811	5082-2835	5082-2303	5082-2900
$B_V$	V	75	25	18	9	25	10
$C_{J0}$	pF	1.6	0.8	1.0	0.7	0.7	1.1
$E_C$	eV	0.69	0.69	0.69	0.69	0.69	0.69
$I_{BV}$	A	10E-5	10E-5	10E-5	10E-5	10E-5	10E-5
$I_S$	A	2.2 x 10E-9	1.1 x 10E-9	0.3 x 10E-8	2.2 x 10E-8	7 x 1.0E-9	10E-8
N		1.08	1.08	1.08	1.08	1.08	1.08
$R_S$		25	10	10	5	10	15
$P_B$	V	0.6	0.6	0.6	0.56	0.64	0.64
$P_T$		2	2	2	2	2	2
M		0.5	0.5	0.5	0.5	0.5	0.5

### Typical Parameters

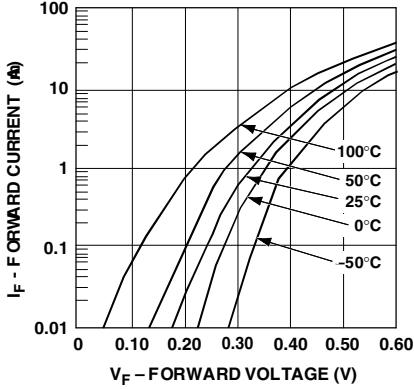


Figure 1. I-V Curve Showing Typical Temperature Variation for 5082-2300 Series and 5082-2900 Schottky Diodes.

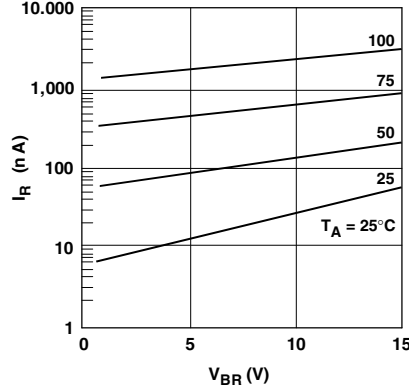


Figure 2. 5082-2300 Series Typical Reverse Current vs. Reverse Voltage at Various Temperatures.

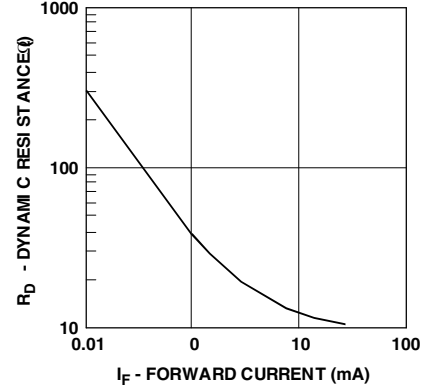


Figure 3. 5082-2300 Series and 5082-2900 Typical Dynamic Resistance ( $R_D$ ) vs. Forward Current ( $I_F$ ).

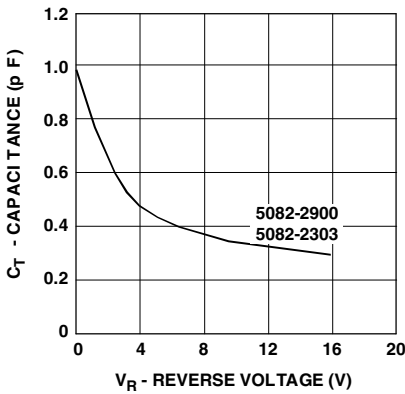


Figure 4. 5082-2300 and 5082-2900 Typical Capacitance vs. Reverse Voltage.

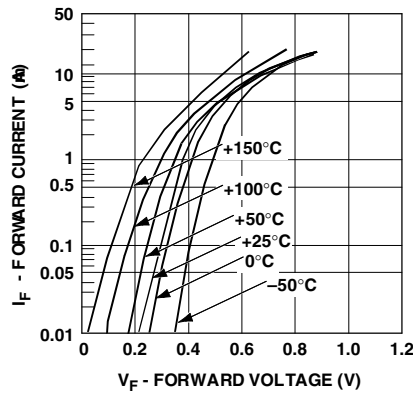


Figure 5. I-V Curve Showing Typical Temperature Variation for 5082-2800 or 1N5711 Schottky Diodes.

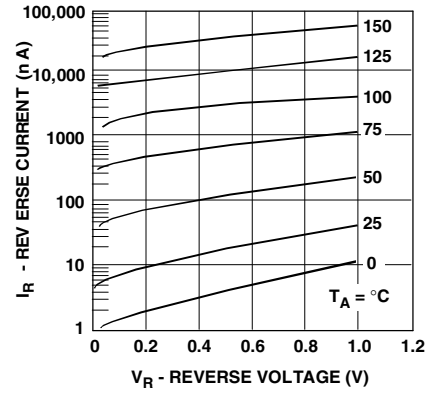


Figure 6. (5082-2800 OR 1N5711) Typical Variation of Reverse Current ( $I_R$ ) vs. Reverse Voltage ( $V_R$ ) at Various Temperatures.

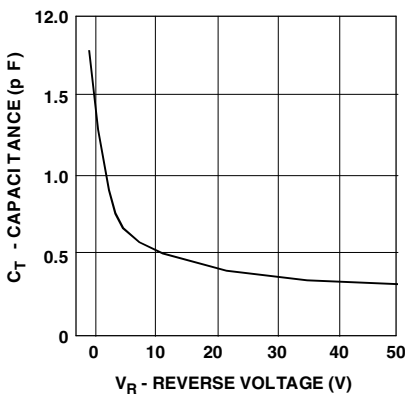


Figure 7. (5082-2800 or 1N5711) Typical Capacitance ( $C_T$ ) vs. Reverse Voltage ( $V_R$ ).

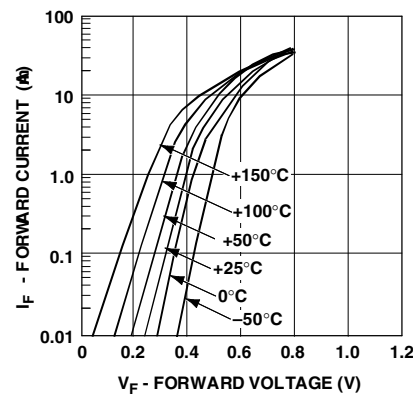


Figure 8. I-V Curve Showing Typical Temperature Variation for the 5082-2810 or 1N5712 Schottky Diode.

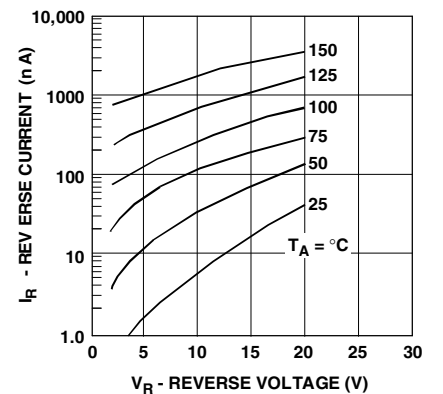


Figure 9. (5082-2810 or 1N5712) Typical Variation of Reverse Current ( $I_R$ ) vs. Reverse Voltage ( $V_R$ ) at Various Temperatures.

Typical Parameters, continued

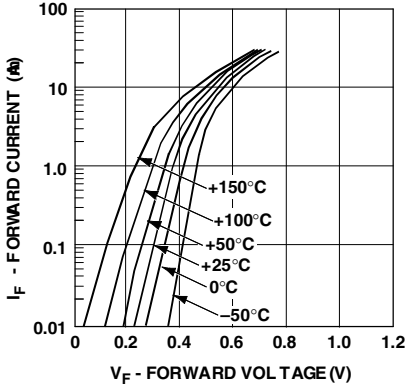


Figure 10. I-V Curve Showing Typical Temperature Variation for the 5082-2811 Schottky Diode.

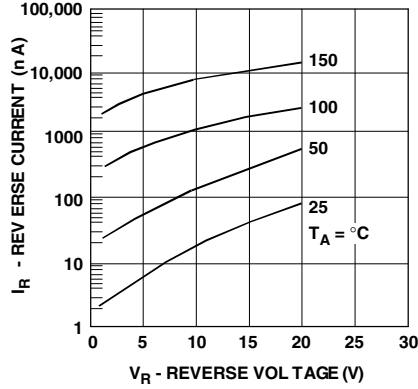


Figure 11. (5082-2811) Typical Variation of Reverse Current ( $I_R$ ) vs. Reverse Voltage ( $V_R$ ) at Various Temperatures.

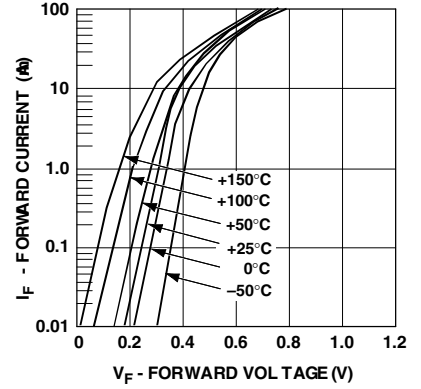


Figure 12. I-V Curve Showing Typical Temperature Variations for 5082-2835 Schottky Diode.

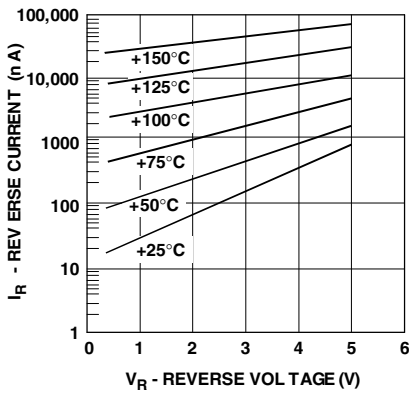


Figure 13. (5082-2835) Typical Variation of Reverse Current ( $I_R$ ) vs. Reverse Voltage ( $V_R$ ) at Various Temperatures.

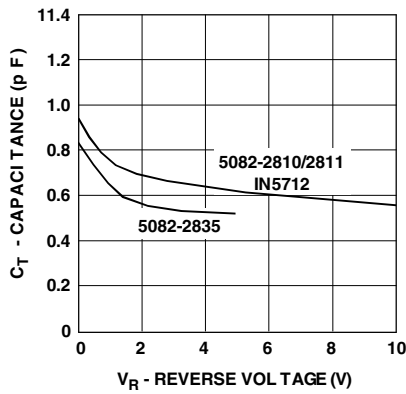


Figure 14. Typical Capacitance ( $C_T$ ) vs. Reverse Voltage ( $V_R$ ).

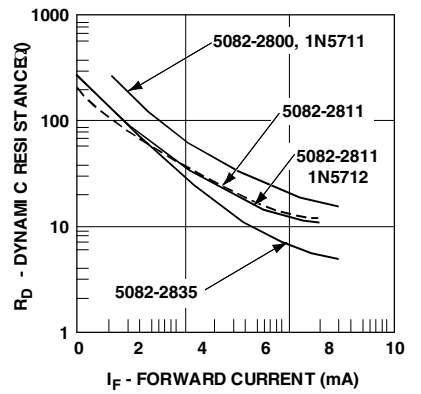
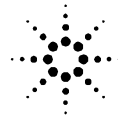


Figure 15. Typical Dynamic Resistance ( $R_D$ ) vs. Forward Current ( $I_F$ ).



## Diode Package Marking

1N5xxx                      5082-xxxx

would be marked:

1Nx	xx
xxx	xx
YWW	YWW

where xxxx are the last four digits of the 1Nxxxx or the 5082-xxxx part number. Y is the last digit of the calendar year. WW is the work week of manufacture.

Examples of diodes manufactured during workweek 45 of 1999:

1N5712                      5082-3080

would be marked:

1N5	30
712	80
945	945