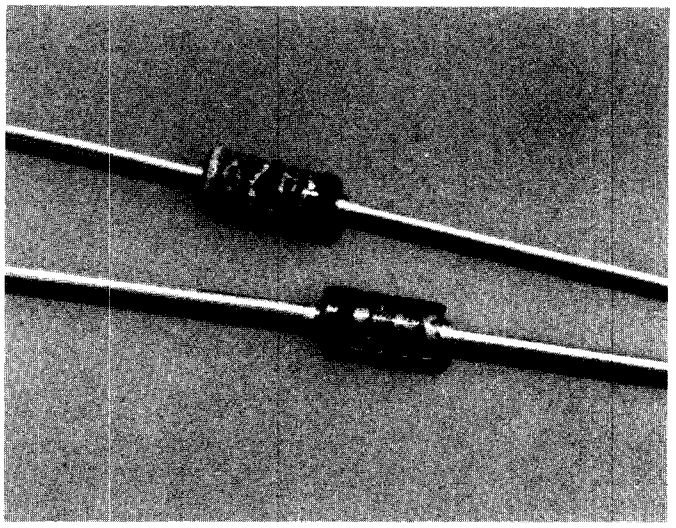
HEWLETT hp PACKARD
COMPONENTS

SCHOTTKY BARRIER DIODES FOR GENERAL PURPOSE APPLICATIONS

5082-2301/02/03/05
5082-2800(1N5711)
5082-2810(1N5712)
5082-2811(1N5713) NEW
5082-2835
5082-2900
HSCH-1001(1N6263)

Features

LOW TURN-ON VOLTAGE: .34V AT 1mA
PICO-SECOND SWITCHING SPEED
HIGH BREAKDOWN VOLTAGE: UP TO 70V
UNIFORM FORWARD TRACKING



Description/Applications

The 5082-2800, 2810, 2811 are passivated Schottky barrier diodes which use a patented "guard ring" design to achieve a high breakdown voltage. They are 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 UHF mixing.

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.

The HSCH-1001 is a Hybrid Schottky diode sealed in a rugged double stud Outline 12 glass package suitable for automatic insertion. The low turn-on voltage, fast switching speed, and low cost of these diodes make them ideal for general purpose switching.

Application Bulletins 13, 14, 15, and 16 describe applications in which these diodes are used for speed up of a transistor, clipping, clamping, and sampling, respectively.

Maximum Ratings at T_{CASE} = 25°C

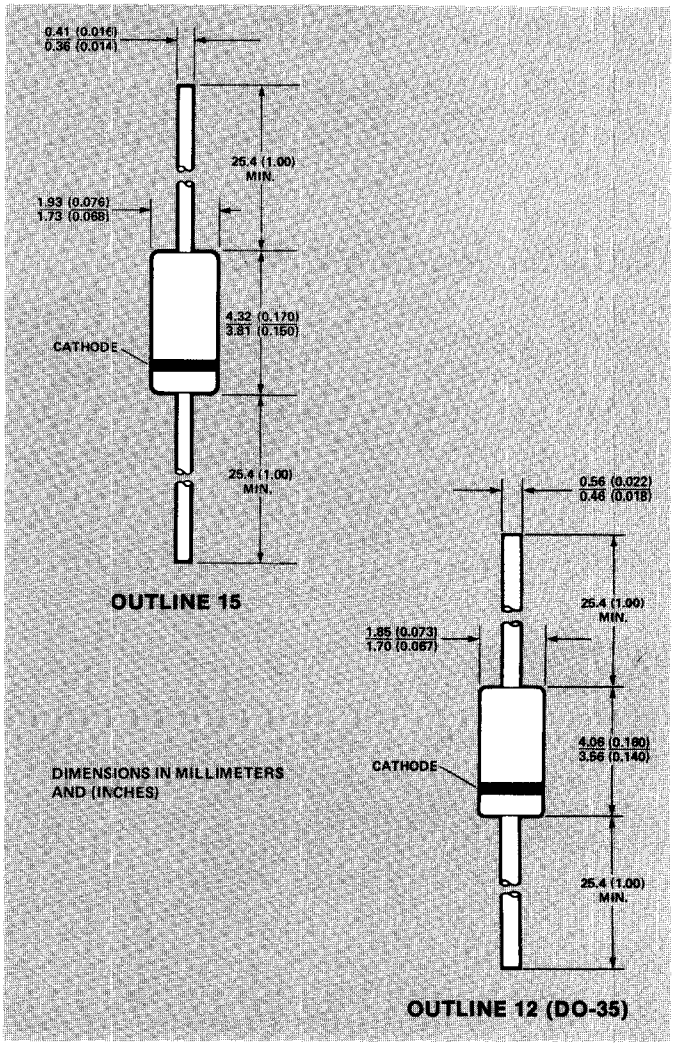
Junction Operating and Storage Temperature Range
5082-2305, 2301, 2302, 2303, 2900 . -60°C to +125°C
5082-2800, 2810, 2811, HSCH-1001 -65°C to +200°C
5082-2835 ..... -60°C to +150°C

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

DC Power Dissipation (Measured in an infinite heat sink)
Derate linearly to zero at maximum rated temperature
5082-2305, 2301, 2302, 2303, 2900 ..... 125 mW
5082-2800, 2810, 2811 ..... 250 mW
5082-2835 ..... 150 mW
HSCH-1001 ..... 400 mW

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

Package Dimensions



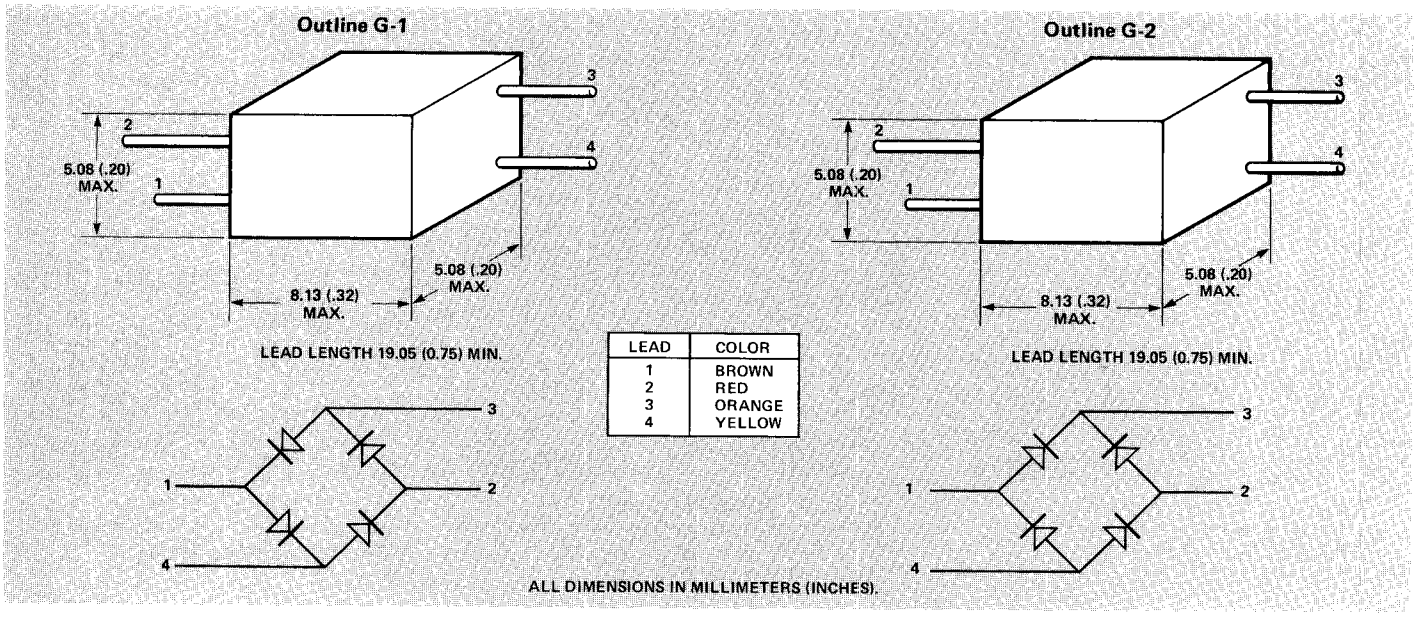
Electrical Specifications at T_A=25°C

Part Number 5082-	Package Outline	Minimum Breakdown Voltage V_{BR} (V)	Maximum Forward Voltage V_F (mV)	V_F=1V 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 at 50	2.0
1N5711[1]	15	70	410	15	200 at 50	2.0
2305	15	30	400	75	300 at 15	1.0
2301[2]	15	30	400	50	300 at 15	1.0
2302[2]	15	30	400	35	300 at 15	1.0
2303[2]	15	20	400	35	500 at 15	1.0
2810	15	20	410	35	100 at 15	1.2
1N5712[1]	15	20	550	35	150 at 16	1.2
2811	15	15	410	20	100 at 8	1.2
1N5713[1]	15	15	410	20	100 at 8	1.2
2900	15	10	400	20	100 at 5	1.2
2835	15	5*	340	10†	100 at 1	1.0
HSCH-1001[1] (1N6263)	12 (DO-35)	60	410	15	200 at 50	2.2
Test Conditions		I_R = 10 μA *I_R = 100 μA	I_F = 1 mA	†V_F = .45V		V_R = 0 V f = 1.0 MHz

Notes:
1. Effective Minority Carrier Lifetime (τ) for all these diodes is 100 ps maximum measured with Krakauer method at 20 mA except for HSCH-1001 (1N6263), 1N5711, 1N5712, and 1N5713 which are measured at 5 mA.
2. 5082-2301 = 1N5165, 5082-2302 = 1N5166, 5082-2303 = 1N5167.

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	5082-2996 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 ΔC_O at f = 1.0 MHz
2811		5082-2815 ΔV_F = 20 mV	5082-2814 ΔV_F = 20 mV	5082-2813 ΔV_F = 20 mV	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



LEAD	COLOR
1	BROWN
2	RED
3	ORANGE
4	YELLOW

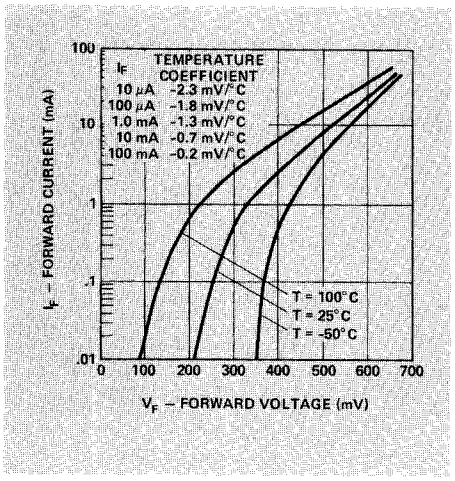


Figure 1. I-V Curve Showing Typical Temperature Variation for 5082-2300 Series Schottky Diodes.

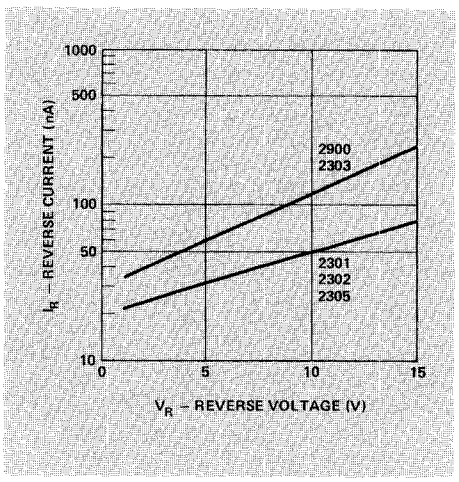


Figure 2. 5082-2300 and 5082-2900 Series Typical Reverse Current vs. Reverse Voltage at T_A = 25°C.

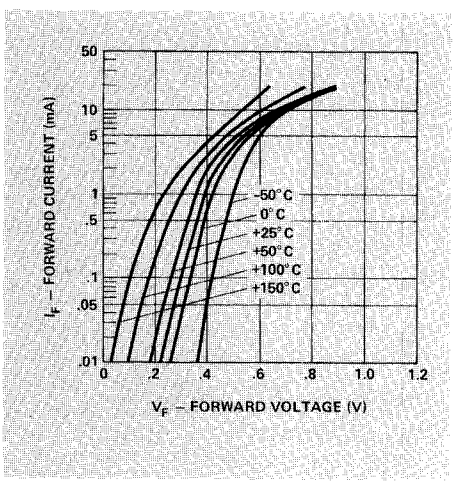


Figure 3. I-V Curve Showing Typical Temperature Variation for 5082-2800 or 1N5711 Schottky Diodes.

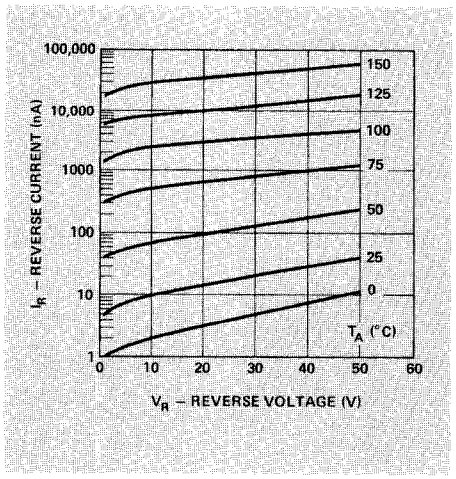


Figure 4. (5082-2800 or 1N5711) Typical Variation of Reverse Current (I_R) vs. Reverse Voltage (V_R) at Various Temperatures.

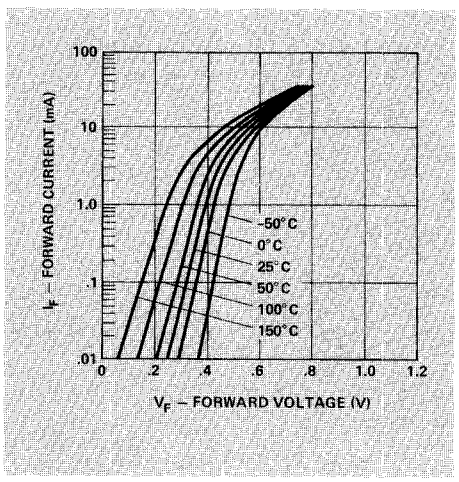


Figure 5. I-V Curve Showing Typical Temperature Variation for the 5082-2810 or 1N5712 Schottky Diode.

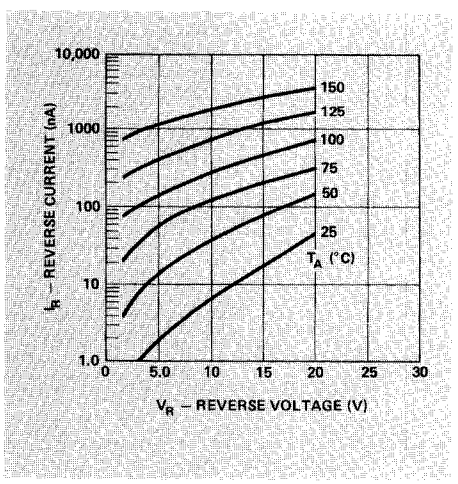


Figure 6. (5082-2810 or 1N5712) Typical Variation of Reverse Current (I_R) vs. Reverse Voltage (V_R) at Various Temperatures.

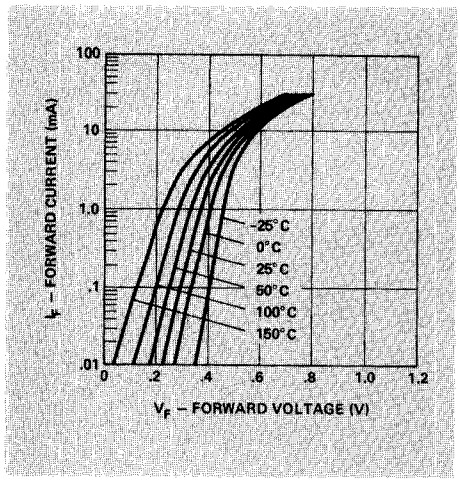


Figure 7. I-V Curve Showing Typical Temperature Variation for 5082-2811 Schottky Diode.

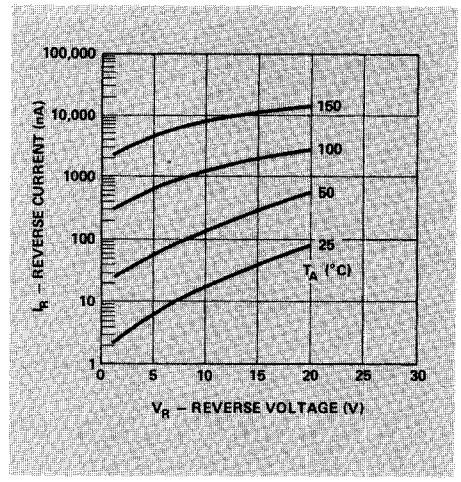


Figure 8. (5082-2811) Typical Variation of Reverse Current (I_R) vs. Reverse Voltage (V_R) at Various Temperatures.

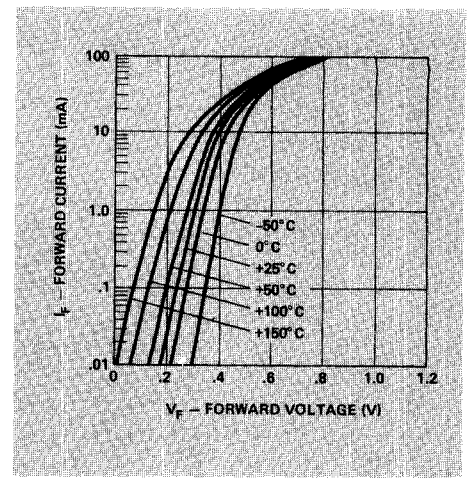


Figure 9. I-V Curve Showing Typical Temperature Variations for 5082-2835 Schottky Diode.

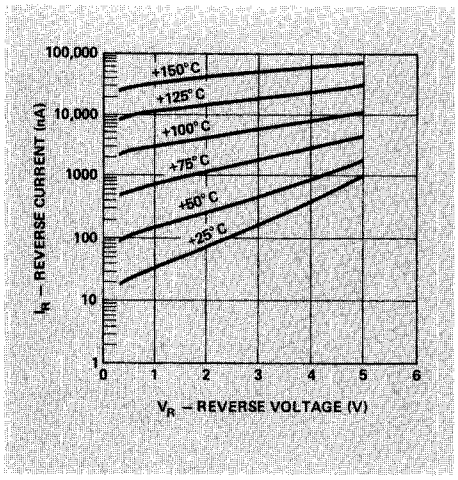


Figure 10. (5082-2835) Typical Variation of Reverse Current (I_R) vs. Reverse Voltage (V_R) at Various Temperatures.

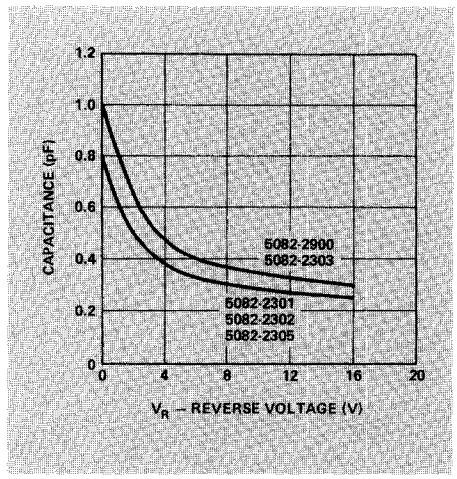


Figure 11. 5082-2300 and -2900 Series Typical Capacitance vs. Reverse Voltage.

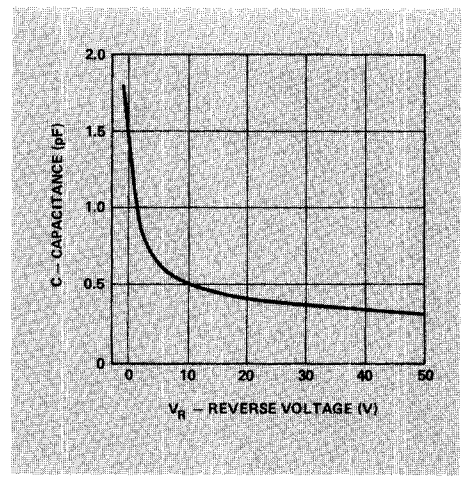


Figure 12. (5082-2800 or 1N5711) Typical Capacitance (C) vs Reverse Voltage (V_R).

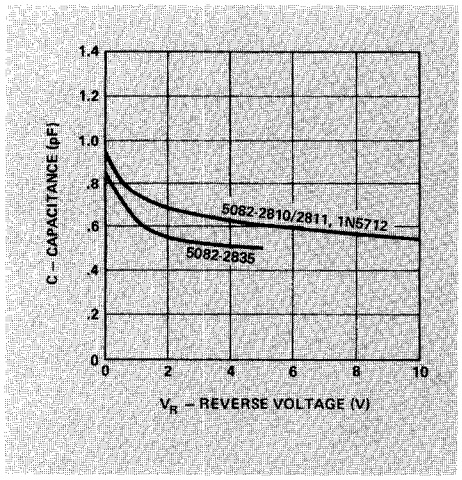


Figure 13. Typical Capacitance (C) vs. Reverse Voltage (V_R).

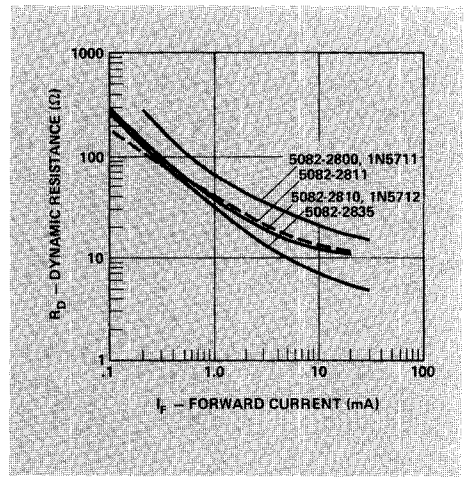


Figure 14. Typical Dynamic Resistance (R_D) vs. Forward Current (I_F).

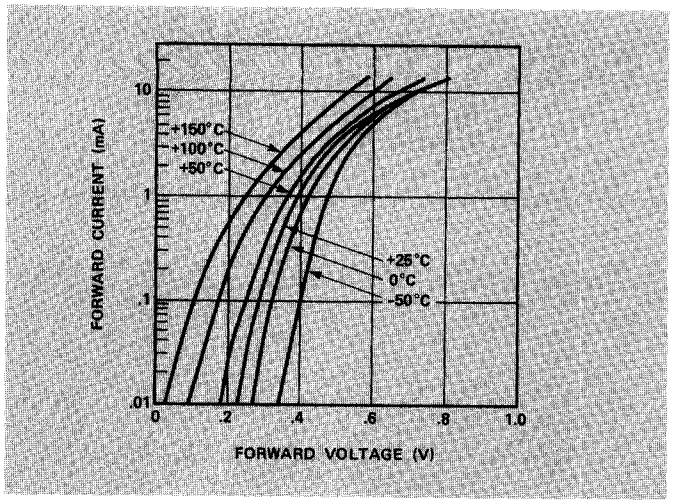


Figure 15. Typical Variation of Forward Current (I_F) vs. Forward Voltage (V_F) at Various Temperatures for the HSCH-1001.

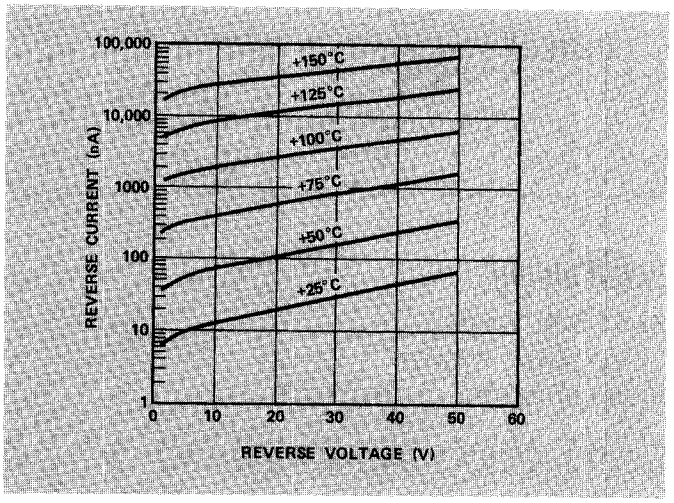


Figure 16. Typical Variation of Reverse Current (I_R) vs. Reverse Voltage (V_R) at Various Temperatures for the HSCH-1001.

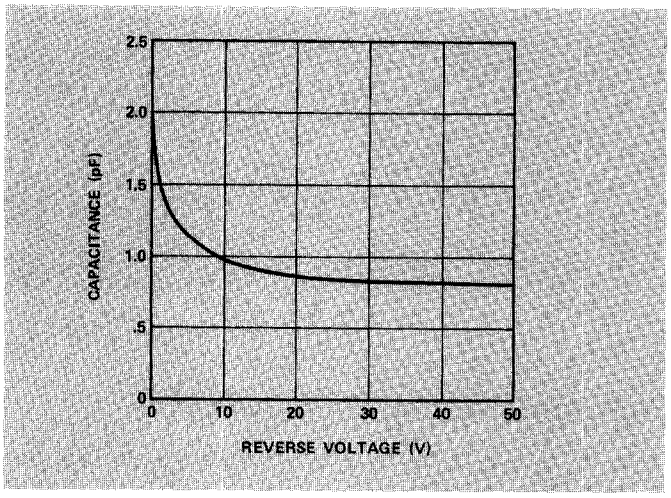


Figure 17. Typical Capacitance (C) vs. Reverse Voltage (V_R) for the HSCH-1001.

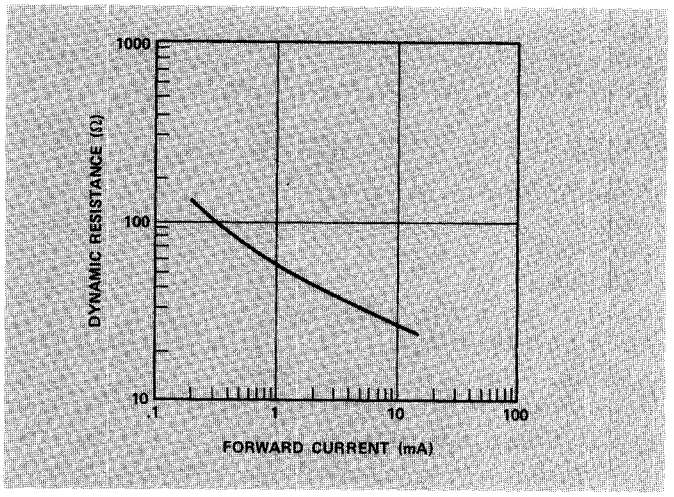


Figure 18. Typical Dynamic Resistance (R_D) vs. Forward Current (I_F) at T_A = 25° C for the HSCH-1001.

Mechanical Specifications

	Outline 15	Outline 12 (DO-35)
Lead Material:	Dumet	Dumet
Lead Finish:	2800 Series: Tin 2300, 2900 Series: Gold	Tin
Maximum Soldering Temperature:	230° C for 5 sec.	260° C for 10 sec.
Minimum Lead Strength:	4 lb. Pull	10 lb. Pull
Typical Package Inductance:	2800 Series: 2.0 nH 2300, 2900 Series: 3.0 nH	1.8 nH
Typical Package Capacitance:	2800 Series: 0.2 pF 2300, 2900 Series: 0.07 pF	0.25 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.	