HEWLETT PACKARD

HIGH RELIABILITY SCHOTTKY SWITCHING DIODES
(Generic 5082-2835)

TX-2835
TXV-2835
TXB-2835
TXVB-2835

T-07-15

Features

SUITABLE FOR SPACE APPLICATIONS

LOW TURN-ON VOLTAGE

FAST SWITCHING

PLANAR PASSIVATED

LOW TEMPERATURE COEFFICIENT

UNIFORM FORWARD TRACKING

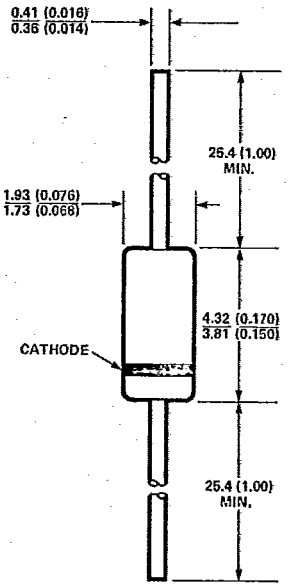
QUALITY PERFORMANCE TESTED
Test Program Patterned after MIL-S-19500

Description/Applications

The TX-2835 is an epitaxial, planar passivated diode whose construction utilizes a metal-to-silicon junction. This results in extremely low forward voltage drops and ultra high speed switching, for applications that require high reliability screening.

The low forward voltage drop, combined with fast switching and high temperature capability, makes these devices attractive as replacements for germanium and silicon P/N junction diodes in such applications as low level switching, clamping, sampling, reference circuits, and low noise UHF mixers.

The uniformity of forward characteristics with current over the temperature range also makes these units suitable for circuitry requiring tight matching of characteristics.



DIMENSIONS IN MILLIMETERS (INCHES).

Outline 15

Maximum Ratings

Power Dissipation at $T_{CASE} = 25°C$ ..... 150 mW
Derate linearly at 1.20 mW/°C to zero at 150°C
Operating Temperature Range ..... −60°C to +150°C
Storage Temperature Range ..... −60°C to +150°C

TABLE I. ELECTRICAL SPECIFICATIONS AT $T_A = 25°C$

Characteristics	Symbol	Min.	Max.	Units	Test Conditions
Breakdown Voltage	V_{BR}	8		volts	$I_R = 100\ \mu A$
Reverse Current	I_{R1}		100	nA	$V_R = 1\ V$
Reverse Current	I_{R2}		100	μA	$V_R = 1\ V$, $t = 125°C$
Forward Voltage	V_{F1}		0.34	volts	$I_F = 1\ mA$
Forward Voltage	V_{F2}		0.45	volts	$I_F = 10\ mA$
Capacitance	C_{TO}		1.0	pF	$V_R = 0$, $f = 1\ MHz$
Effective Minority Carrier Lifetime	τ		100	psec	$I_F = 20\ mA$

1113 C-02

T-07-15

High Reliability Program

Three basic levels of High-Rel testing are offered

1. The TX prefix indicates a part that is preconditioned and screened to the program shown in Table III and IV
2. The TXB prefix identifies a part that is preconditioned and screened to TX level with a Group B quality conformance test as shown in Table V.
3. The TXV and TXVB prefix indicates that an internal visual inspection per MIL-STD-750 Method 2074 is included as part of the preconditioning and screening

From these three basic levels, four combinations are available. Please refer to Table II as a guide.

TABLE II. PART NUMBER SYSTEM FOR ORDER AND RFQ INFORMATION

Part Number Prefix	Screening Level
5082-	Commercial
TX-	100% Screen (per Tables III and IV)
TXB-	100% Screen and Group B (per Tables III, IV, V and VI)
TXV-	100% Screen and Visual (per Tables III, and IV)
TXVB-	100% Screen and Group B (per Tables III, IV, V and VI with visual

TABLE III. 100% SCREENING PROGRAM

Screening Test/Inspection	MIL-STD-750 Method (Except as Noted)	Conditions
1. Internal Visual (TXV & TXVB only)	2074	
2. High Temperature Storage	1032	24 Hours minimum at 150°C
3. Temperature Cycling	1051	Condition F — 20 cycles, 10 minutes at extremes (-60°C to +150°C)
4. Constant Acceleration	2006	20 KG, Y_1 axis
5. Hermetic Seal Fine Leak Gross Leak	1071	Condition H. 5×10^{-8} cc/sec max. Condition C
6. Interim Electrical Test I_{R1}, V_{BR}, C_{TO}, V_{F1}, V_{F2}	—	Per Table I.
7. High Temperature Reverse Bias	1038	t = 48 hrs. T_C = 150°C. V_R = 4 V
8. Interim Electrical Test I_{R1}, V_{BR}, C_{TO}, V_{F1}, V_{F2}	—	Per Table I.
9. Burn-In	1038	Condition B, P_{FM} = 150 mW pk., V_{RM} = 5 V pk., f = 60 Hz, t = 96 hr. min., T_A = 25°C
10. Final Electrical Test and Delta parameters.	—	Same as Step 8 $\Delta I_{R1} \leq$ 50 nA or 100% of initial value, whichever is greater $\Delta V_{F1} \leq$ 10% of initial value

TABLE IV. GROUP A ACCEPTANCE TEST

Test/Inspection	MIL-STD-750 Method	Conditions	LTPD
Subgroup 1 D.C. Electrical Test I_{R1}, V_{BR}, V_{F1}, V_{F2} at T_A = 25°C		See Table I	5
Subgroup 2 D.C. Electrical Test Reverse Leakage (I_R) at T_A = 125°C		See Table I	5
Subgroup 3 A.C. Electrical Test at T_A = 25°C C_{TO} and Carrier Lifetime (τ)		See Table I	5

TABLE V. GROUP B PROGRAM

T-07-15

Test/Inspection	MIL-STD-750 Method	Conditions/Comments	LTPD
Subgroup 1			
Solderability	2026		15
Resistance to solvents	1022		
Subgroup 2			
Thermal Shock (Temperature Cycling)	1051	Condition F1 (25 cycles)	10
Hermetic Seal	1071		
Fine Leak		Condition H	
Gross Leak		Condition C	
DC Electrical Tests (I_R, V_{BR}, V_{F1} & V_{F2})		See Table I.	
Subgroup 3			
Steady State Operating Life	1027	t = 340 hours, T_A = 25°C, PFM = 150 mW, f = 60 Hz, V_{RM} = 5 V (pk).	5
DC Electrical Tests (I_R, V_{BR}, V_{F1} & V_{F2})		See Table I.	
Subgroup 4			
Decap Internal Visual (Design Verification)	2075	One Device Only	
Subgroup 5			
Thermal Resistance	4081		15
Subgroup 6			
High Temperature Life (Non-Operating)	1032	t = 340 hours, T_A = 150°C	7
DC Electrical Tests (I_{RB}, V_{BR}, V_{F1}, and V_{F2})		See Table I.	

TABLE VI. GROUP C INSPECTION

Test/Inspection	MIL-STD-750 Method	MIL-STD-750 Conditions	LTPD
Subgroup 1			
Physical Dimensions	2066	See Figure 1	15
Subgroup 2			
Thermal Shock (Glass Strain)	1056	Test condition A	10
Terminal Strength	2036	Test condition E with 1/16 inch lead restriction, Weight = 3 oz., 3 arcs of 90° each	
Hermetic Seal	1071		
Fine Leak		Test condition H	
Gross Leak		Test condition C	
Moisture Resistance	1021	Omit initial conditioning	
External Visual	2071		
D.C. Electrical Tests (I_{R1}, V_{BR}, V_{F1}, and V_{F2})	—	See Table I.	
Subgroup 3			
Shock	2016	5 blows each axis, X_1, Y_1, and Z_1; 1500 G, 0.5 m/sec.	10
Vibration Variable Frequency	2056		
Constant Acceleration	2006	20,000 G min., Y_1, Y_2, and X_1	
D.C. Electrical Tests (I_{R1}, V_{BR}, V_{F1} and V_{F2})	—	See Table I.	
Subgroup 4			
Salt Atmosphere (Corrosion)	1041		15
Subgroup 5			
Steady-state Operating Life	1038	Cond. B. P_{FM} = 150 mW Pk. V_{RM} = V Pk. f = 60 Hz t = 1000 hrs. T_A = 25°C	15
D.C. Electrical Tests (I_R, V_{BR}, V_{F1}, V_{F2})	—	See Table I.	