



**HIGH RELIABILITY
SCHOTTKY
SWITCHING DIODES**
(Generic 5082-2835)

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

T-07-15

Features

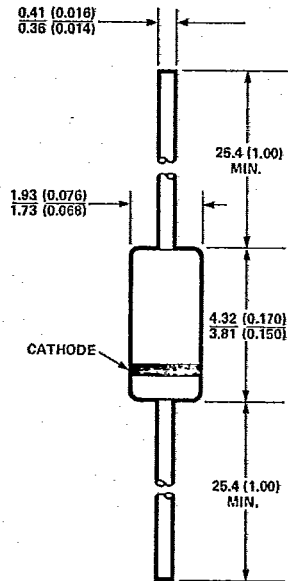
- SUITABLE FOR SPACE APPLICATIONS
- LOW TURN-ON VOLTAGE
- FAST SWITCHING
- PLANAR PASSIVATED
- LOW TEMPERATURE COEFFICIENT
- UNIFORM FORWARD TRACKING
- QUALITY PERFORMANCE TESTED
Test Program Patterned after MIL-S-19500

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).

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

Outline 15

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 μA |
| 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 |

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. $T_C = 150^\circ\text{C}$. $V_R = 4$ 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., $T_A = 25^\circ\text{C}$ |
| 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 |

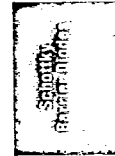


TABLE IV. GROUP A ACCEPTANCE TEST

| Test/Inspection | MIL-STD-750 Method | Conditions | LTPD |
|--|--------------------|-------------|------|
| Subgroup 1 D.C. Electrical Test I_{R1} , V_{BR} , V_{F1} , V_{F2} at $T_A = 25^\circ\text{C}$ | | See Table I | 5 |
| Subgroup 2 D.C. Electrical Test Reverse Leakage (I_R) at $T_A = 125^\circ\text{C}$ | | See Table I | 5 |
| Subgroup 3 A.C. Electrical Test at $T_A = 25^\circ\text{C}$ 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 Resistance to solvents | 2026 1022 | | 15 |
| Subgroup 2 Thermal Shock (Temperature Cycling) Hermetic Seal Fine Leak Gross Leak DC Electrical Tests (I_R , V_{BR} , V_{F1} & V_{F2}) | 1051 1071 | Condition F1 (25 cycles) Condition H Condition C See Table I. | 10 |
| Subgroup 3 Steady State Operating Life DC Electrical Tests (I_R , V_{BR} , V_{F1} & V_{F2}) | 1027 | $t = 340$ hours, $T_A = 25^\circ\text{C}$, PFM = 150 mW, $f = 60$ Hz, $V_{RM} = 5$ V (pk) See Table I. | 5 |
| Subgroup 4 Decap Internal Visual (Design Verification) | 2075 | One Device Only | |
| Subgroup 5 Thermal Resistance | 4081 | | 15 |
| Subgroup 6 High Temperature Life (Non-Operating) DC Electrical Tests (I_{RB} , V_{BR} , V_{F1} , and V_{F2}) | 1032 | $t = 340$ hours, $T_A = 150^\circ\text{C}$ See Table I. | 7 |

TABLE VI. GROUP C INSPECTION

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