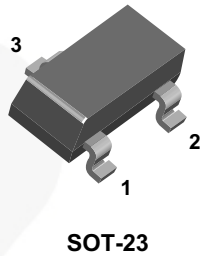


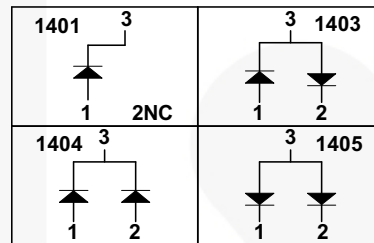


November 2014

MMBD1401 / MMBD1403 / MMBD1404 / MMBD1405 Small Signal Diodes



Connection Diagrams



Ordering Information

| Part Number | Top Mark | Package | Packing Method |
|-------------|----------|-----------|----------------|
| MMBD1401 | 29 | SOT-23 3L | Tape and Reel |
| MMBD1403 | 32 | SOT-23 3L | Tape and Reel |
| MMBD1404 | 33 | SOT-23 3L | Tape and Reel |
| MMBD1405 | 34 | SOT-23 3L | Tape and Reel |

Absolute Maximum Ratings^{(1), (2)}

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

| Symbol | Parameter | Value | Unit |
|-------------|---|-------------------------------|------------------|
| V_{RRM} | Maximum Repetitive Reverse Voltage | 200 | V |
| $I_{F(AV)}$ | Average Rectified Forward Current | 200 | mA |
| I_{FSM} | Non-Repetitive Peak Forward Surge Current | Pulse Width = 1.0 second | 1.0 |
| | | Pulse Width = 1.0 microsecond | 2.0 |
| T_{STG} | Storage Temperature Range | -55 to +150 | $^\circ\text{C}$ |
| T_J | Operating Junction Temperature | 150 | $^\circ\text{C}$ |

Notes:

1. These ratings are based on a maximum junction temperature of 150°C .
2. These are steady-state limits. Fairchild Semiconductor should be consulted on applications involving pulsed or low-duty-cycle operations.

MMBD1401 / MMBD1403 / MMBD1404 / MMBD1405 — Small Signal Diodes

Thermal Characteristics

Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

| Symbol | Parameter | Value | Unit |
|-----------------|---|-------|---------------------------|
| P_D | Power Dissipation | 350 | mW |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient | 357 | $^\circ\text{C}/\text{W}$ |

Electrical Characteristics

Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

| Symbol | Parameter | Conditions | Min. | Max. | Unit |
|----------|-----------------------|--|------|------|------|
| B_V | Breakdown Voltage | $I_R = 100 \mu\text{A}$ | 200 | | V |
| V_F | Forward Voltage | $I_F = 10 \text{ mA}$ | | 800 | mV |
| | | $I_F = 50 \text{ mA}$ | 760 | 920 | mV |
| | | $I_F = 200 \text{ mA}$ | | 1.0 | V |
| | | $I_F = 300 \text{ mA}$ | | 1.1 | V |
| I_R | Reverse Current | $V_R = 120 \text{ V}$ | | 40 | nA |
| | | $V_R = 175 \text{ V}$ | | 100 | nA |
| C_T | Total Capacitance | $V_R = 0, f = 1.0 \text{ MHz}$ | | 2.0 | pF |
| t_{rr} | Reverse Recovery Time | $I_F = I_R = 30 \text{ mA}, I_{RR} = 3.0 \text{ mA}, R_L = 100 \Omega$ | | 50 | nS |

Typical Performance Characteristics

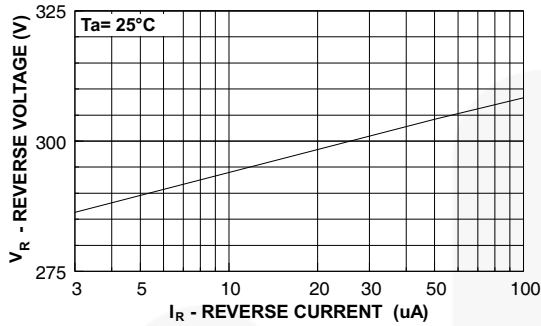


Figure 1. Reverse Voltage vs. Reverse Current
BV - 1.0 to 100 μ A

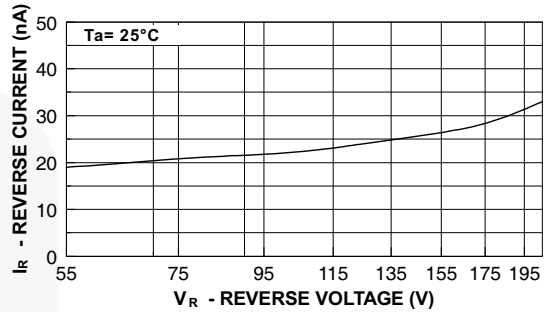


Figure 2. Reverse Current vs. Reverse Voltage
 I_R - 55 to 205 V

GENERAL RULE: The Reverse Current of a diode will approximately double for every ten (10) Degree C increase in Temperature

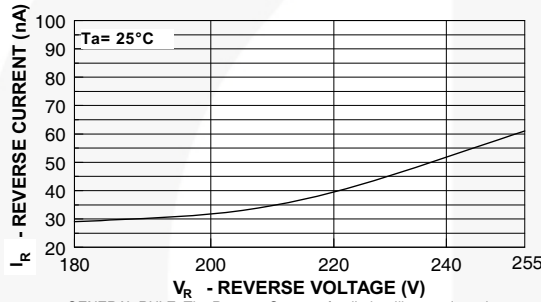


Figure 3. Reverse Current vs. Reverse Voltage
 I_R - 180 to 255 V

GENERAL RULE: The Reverse Current of a diode will approximately double for every ten Degree C increase in Temperature

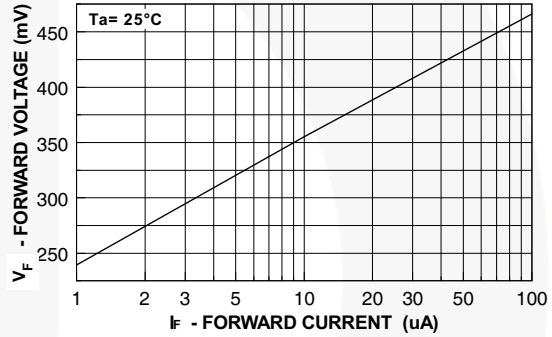


Figure 4. Forward Voltage vs. Forward Current
 V_F - 1.0 to 100 μ A

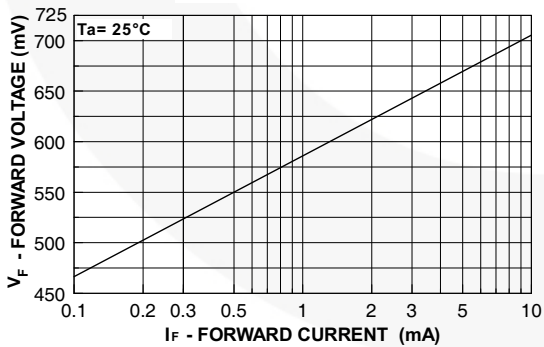


Figure 5. Forward Voltage vs. Forward Current
 V_F - 0.1 to 10 mA

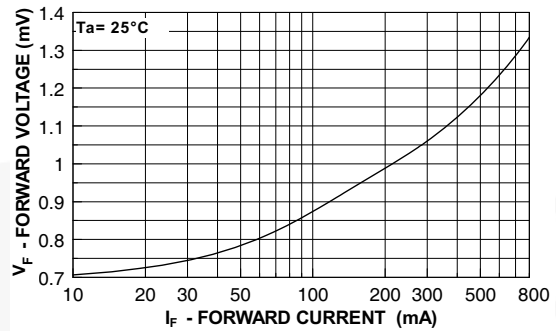


Figure 6. Forward Voltage vs. Forward Current
 V_F - 10 to 800 mA

Typical Performance Characteristics (Continued)

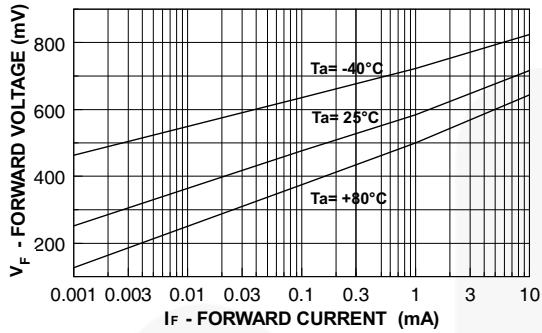


Figure 7. Forward Voltage vs. Ambient Temperature
 V_F - 1.0 μ A - 10 mA (- 40 to +80°C)

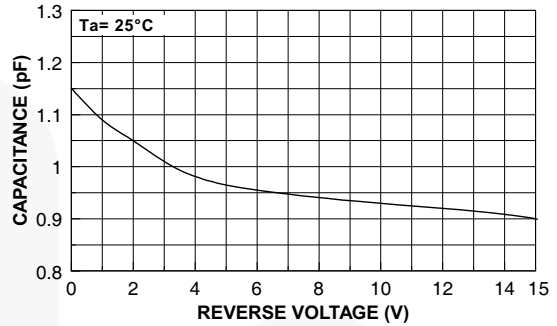


Figure 8. Capacitance vs. Reverse Voltage

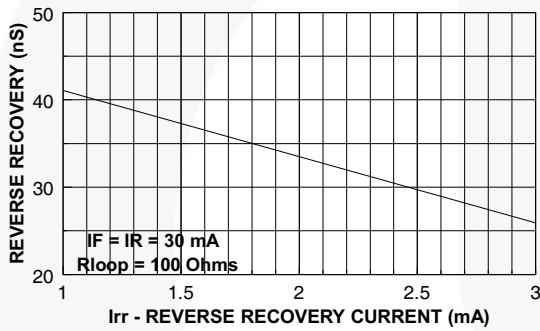


Figure 9. Reverse Recovery Time vs. Reverse Recovery Current (I_{rr})

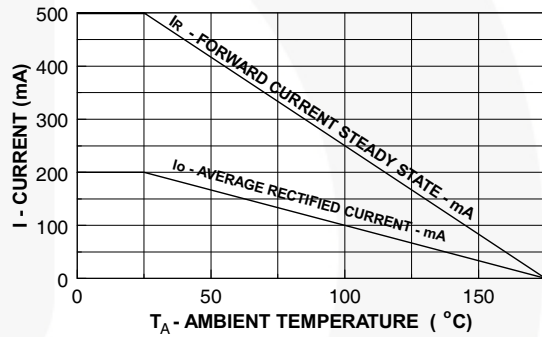


Figure 10. Average Rectified Current (I_O) and Forward Current (I_F) vs. Ambient Temperature (T_A)

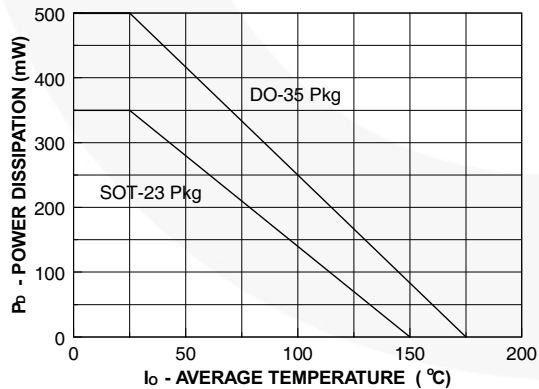
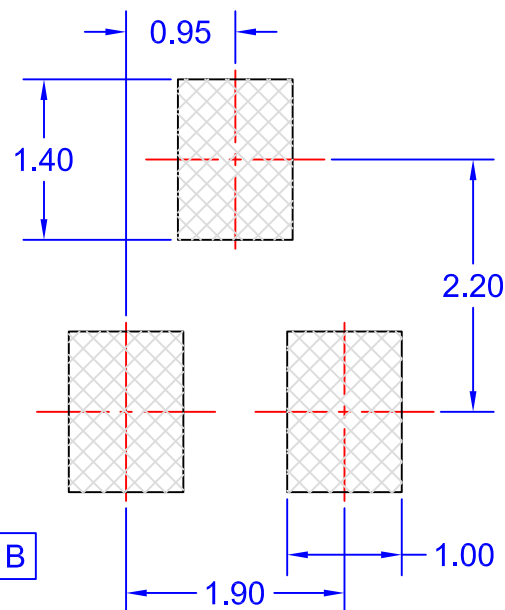
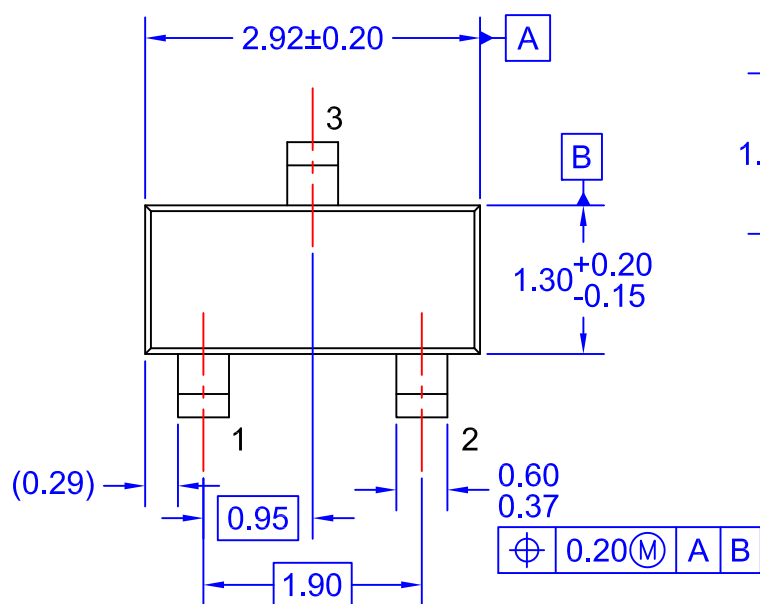
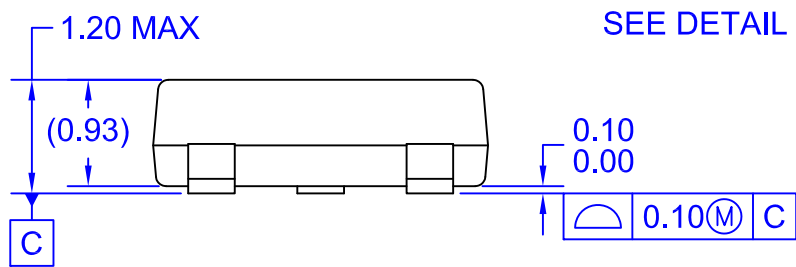


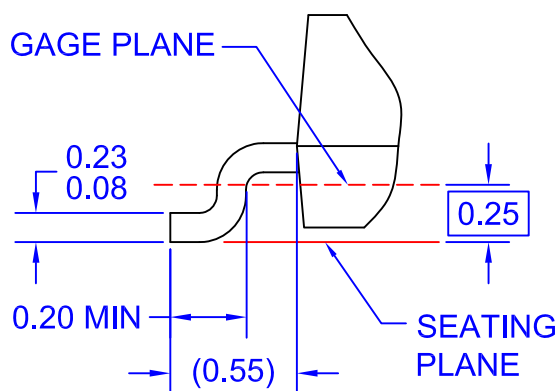
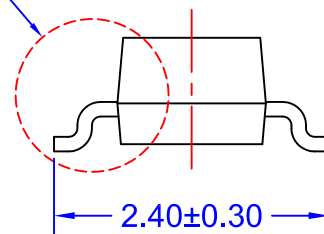
Figure 11. Power Derating Curve



LAND PATTERN
RECOMMENDATION



SEE DETAIL A



DETAIL A
SCALE: 2X

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- A) REFERENCE JEDEC REGISTRATION TO-236, VARIATION AB, ISSUE H.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DIMENSIONS ARE INCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR EXTRUSIONS.
- D) DIMENSIONING AND TOLERANCING PER ASME Y14.5M - 2009.
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