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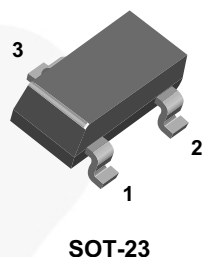
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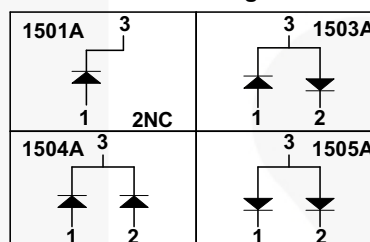


April 2016

# MMBD1501A / MMBD1503A / MMBD1504A / MMBD1505A Small Signal Diodes



Connection Diagrams



## Ordering Information

| Part Number    | Top Mark | Package   | Packing Method                          |
|----------------|----------|-----------|-----------------------------------------|
| MMBD1501A      | A11      | SOT-23 3L | Tape and Reel, 7 inch Reel, 3k pieces   |
| MMBD1503A      | A13      | SOT-23 3L | Tape and Reel, 7 inch Reel, 3k pieces   |
| MMBD1503A_D87Z | A13      | SOT-23 3L | Tape and Reel, 13 inch Reel, 10k pieces |
| MMBD1504A      | A14      | SOT-23 3L | Tape and Reel, 7 inch Reel, 3k pieces   |
| MMBD1505A      | A15      | SOT-23 3L | Tape and Reel, 7 inch Reel, 3k pieces   |

## Absolute Maximum Ratings<sup>(1), (2)</sup>

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  $150^\circ\text{C}$ .
2. These are steady-state limits. Fairchild Semiconductor should be consulted on applications involving pulsed or low-duty-cycle operations.

## Thermal Characteristics

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

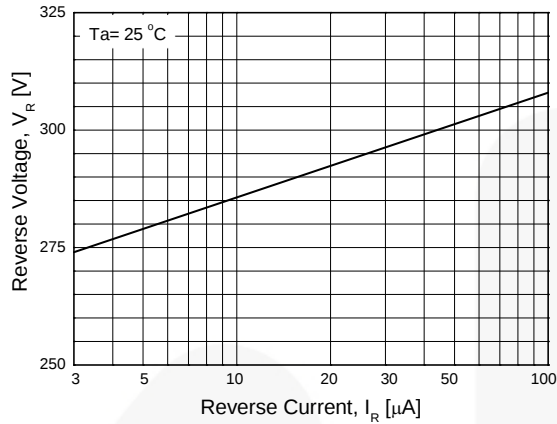
| Symbol          | Parameter                               | Value | Unit               |
|-----------------|-----------------------------------------|-------|--------------------|
| $P_D$           | Power Dissipation                       | 350   | mW                 |
| $R_{\theta JA}$ | Thermal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

## Electrical Characteristics

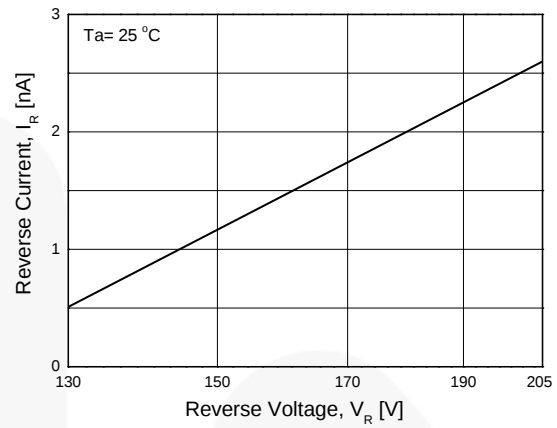
Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

| Symbol | Parameter         | Conditions                                     | Min. | Max. | Unit          |
|--------|-------------------|------------------------------------------------|------|------|---------------|
| $V_R$  | Breakdown Voltage | $I_R = 5.0\ \mu\text{A}$                       | 200  |      | V             |
| $V_F$  | Forward Voltage   | $I_F = 1.0\ \text{mA}$                         | 620  | 720  | mV            |
|        |                   | $I_F = 10\ \text{mA}$                          | 720  | 830  | mV            |
|        |                   | $I_F = 50\ \text{mA}$                          | 800  | 890  | mV            |
|        |                   | $I_F = 100\ \text{mA}$                         | 830  | 930  | mV            |
|        |                   | $I_F = 200\ \text{mA}$                         | 0.87 | 1.10 | V             |
|        |                   | $I_F = 300\ \text{mA}$                         | 0.90 | 1.15 | V             |
| $I_R$  | Reverse Current   | $V_R = 125\ \text{V}$                          |      | 1.0  | nA            |
|        |                   | $V_R = 125\ \text{V}, T_A = 150^\circ\text{C}$ |      | 3.0  | $\mu\text{A}$ |
|        |                   | $V_R = 180\ \text{V}$                          |      | 10.0 | nA            |
|        |                   | $V_R = 180\ \text{V}, T_A = 150^\circ\text{C}$ |      | 5.0  | $\mu\text{A}$ |
| $C_T$  | Total Capacitance | $V_R = 0, f = 1.0\ \text{MHz}$                 |      | 4.0  | pF            |

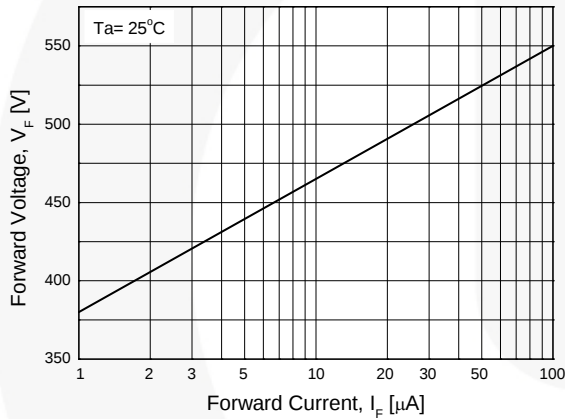
## Typical Performance Characteristics



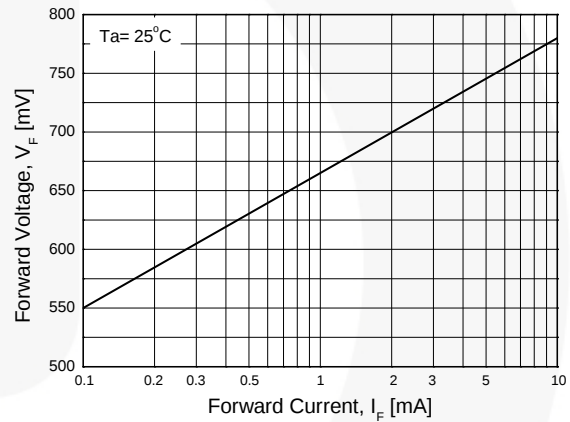
**Figure 1. Reverse Voltage vs. Reverse Current**  
BV - 3.0 to 100  $\mu$ A



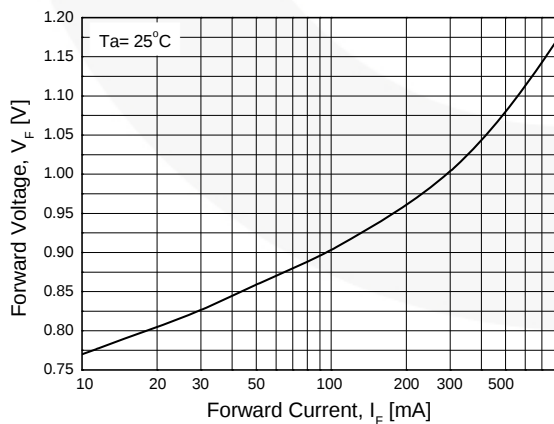
**Figure 2. Reverse Current vs. Reverse Voltage**  
IR - 130 to 205 V



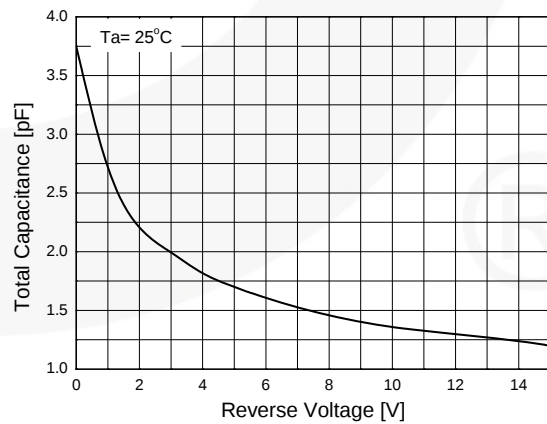
**Figure 3. Forward Voltage vs. Forward Current**  
VF - 1 to 100  $\mu$ A



**Figure 4. Forward Voltage vs. Forward Current**  
VF - 0.1 to 10 mA



**Figure 5. Forward Voltage vs. Forward Current**  
VF - 10 to 800 mA



**Figure 6. Total Capacitance vs. Reverse Voltage**  
VR - 0 to 15 V

## Typical Performance Characteristics (Continued)

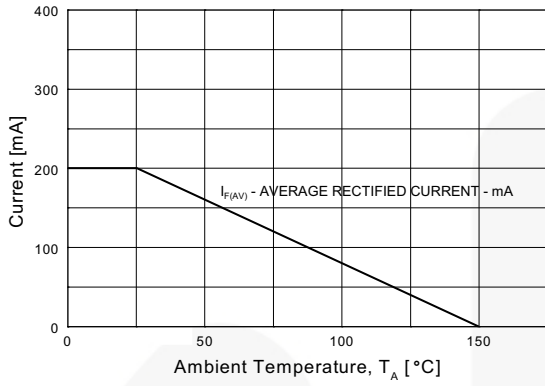


Figure 7. Average Rectified Current ( $I_{F(AV)}$ ) vs. Ambient Temperature ( $T_A$ )

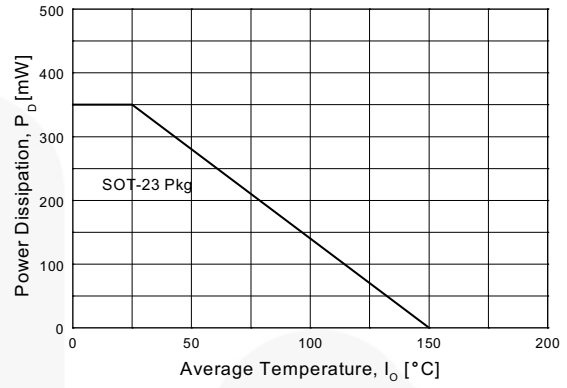
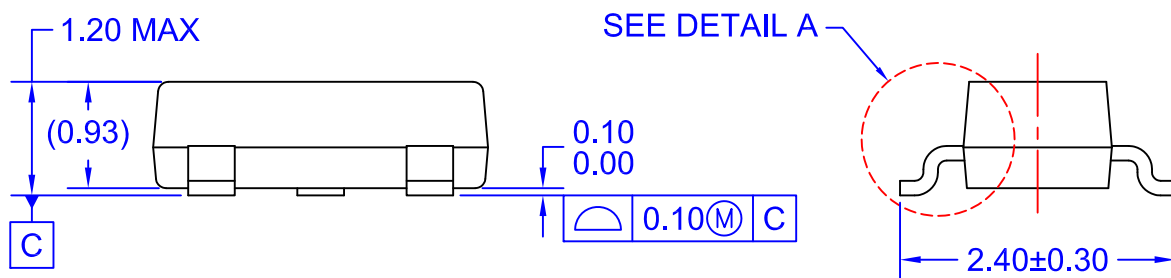


Figure 8. Power Derating Curve



- A) REFERENCE JEDEC REGISTRATION TO-236, VARIATION AB, ISSUE H.
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