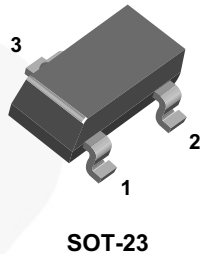


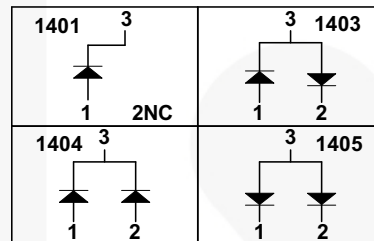


November 2014

# 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<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.

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

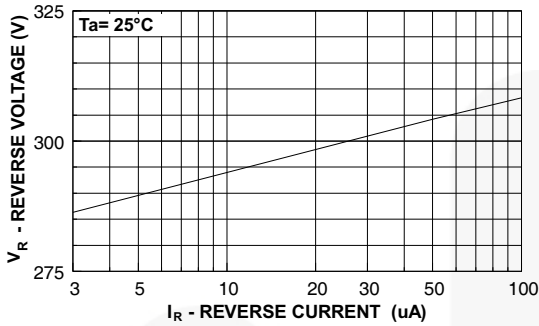


Figure 1. Reverse Voltage vs. Reverse Current  
BV - 1.0 to 100  $\mu$ A

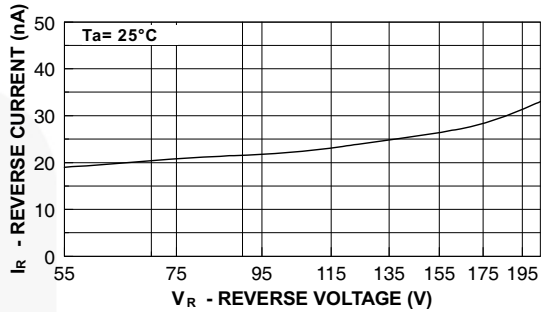


Figure 2. Reverse Current vs. Reverse Voltage  
 $I_R$  - 55 to 205 V

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

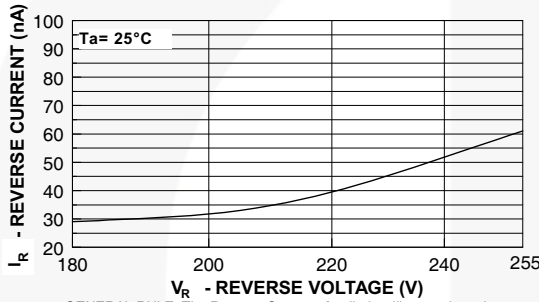


Figure 3. Reverse Current vs. Reverse Voltage  
 $I_R$  - 180 to 255 V

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

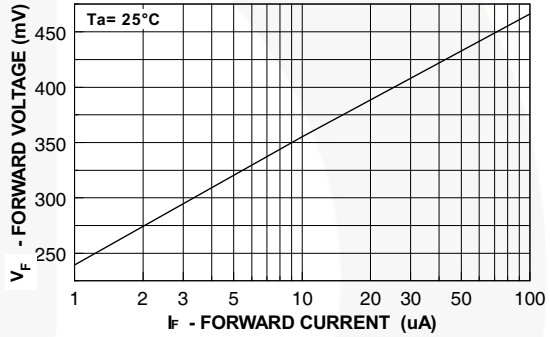


Figure 4. Forward Voltage vs. Forward Current  
 $V_F$  - 1.0 to 100  $\mu$ A

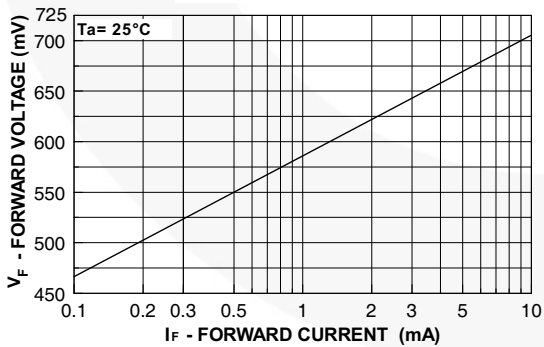


Figure 5. Forward Voltage vs. Forward Current  
 $V_F$  - 0.1 to 10 mA

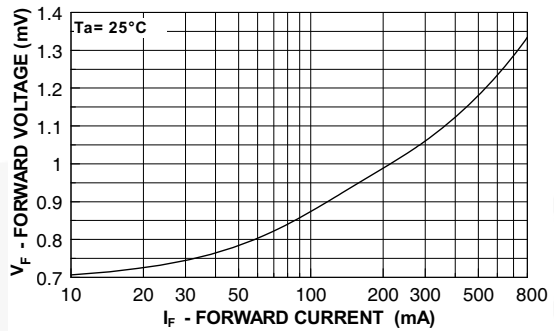


Figure 6. Forward Voltage vs. Forward Current  
 $V_F$  - 10 to 800 mA

Typical Performance Characteristics (Continued)

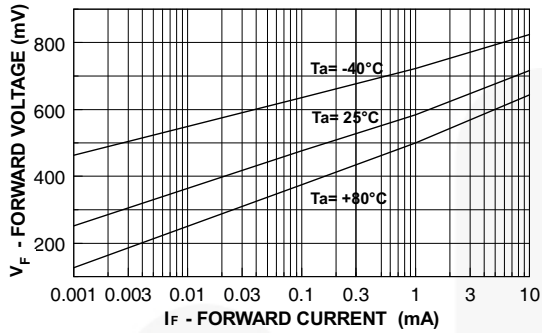


Figure 7. Forward Voltage vs. Ambient Temperature  
 $V_F$  - 1.0  $\mu$ A - 10 mA (- 40 to +80°C)

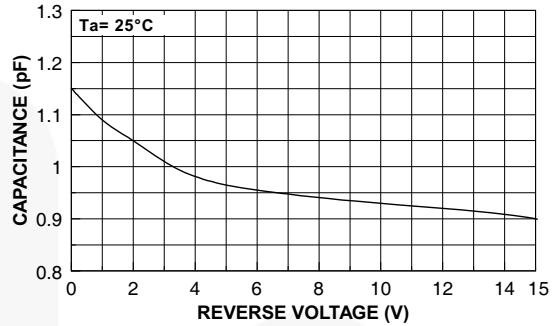


Figure 8. Capacitance vs. Reverse Voltage

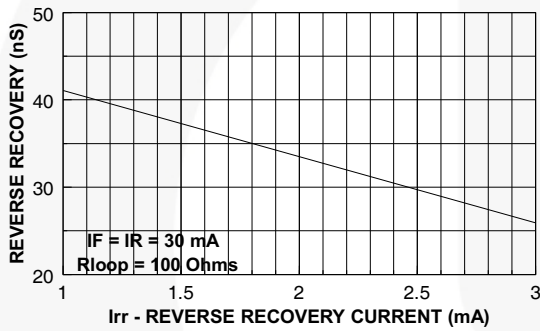


Figure 9. Reverse Recovery Time vs. Reverse Recovery Current ( $I_{rr}$ )

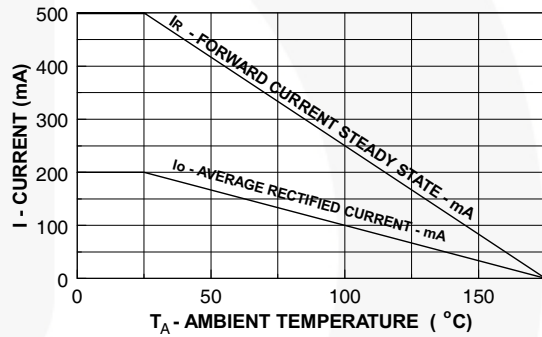


Figure 10. Average Rectified Current ( $I_O$ ) and Forward Current ( $I_F$ ) vs. Ambient Temperature ( $T_A$ )

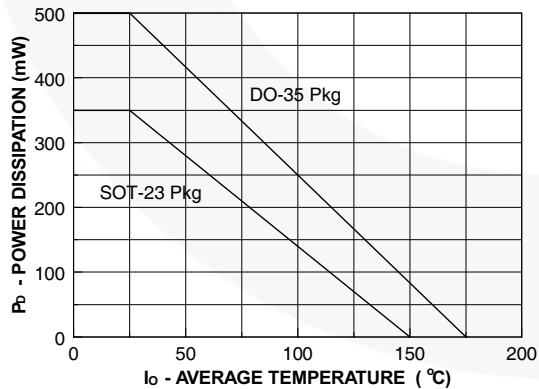
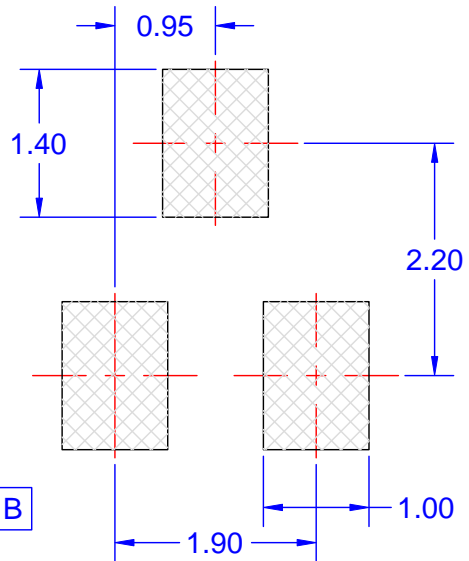
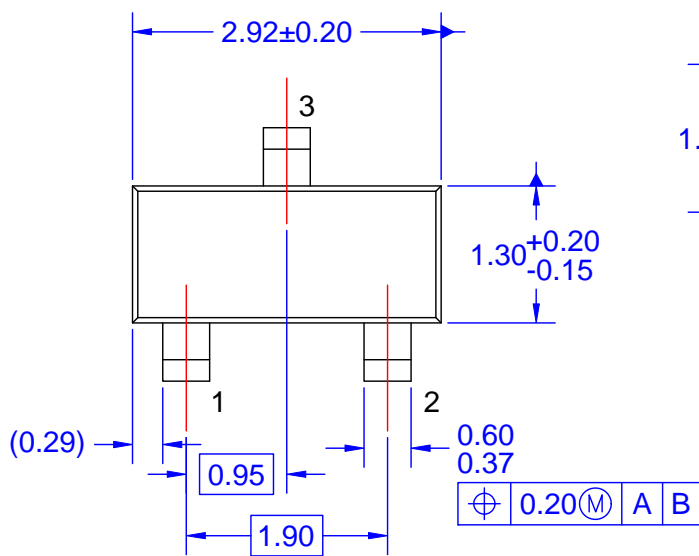
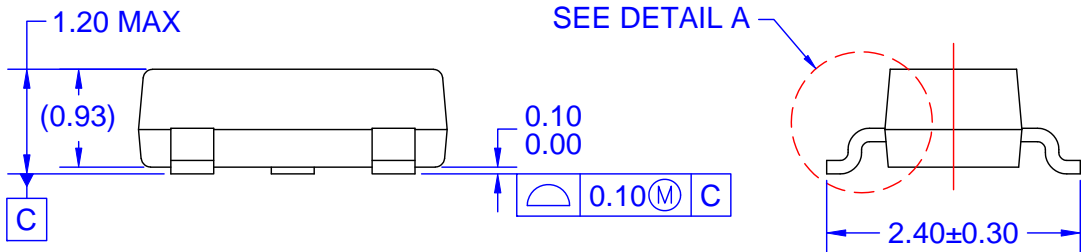


Figure 11. Power Derating Curve

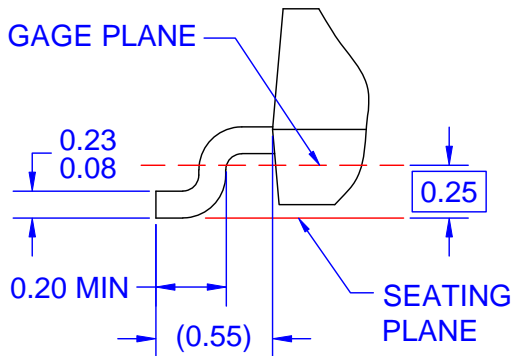


LAND PATTERN RECOMMENDATION



NOTES: UNLESS OTHERWISE SPECIFIED

- 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 - 1994.
- E) DRAWING FILE NAME: MA03DREV10








**DETAIL A**  
SCALE: 2X



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| CorePOWER™  | GTO™   | QS™   | TinyPWM™  |
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| EcoSPARK®   | MicroFET™                                      | SmartMax™   |  SerDes®         |
| EfficientMax™   | MicroPak™                                      | SMART START™  | UHC®  |
| ESBC™   | MicroPak2™                                     | Solutions for Your Success™   | Ultra FRFET™  |
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| FACT®   | MTX®   | SuperSOT™-6   | XS™   |
| FAST®   | MVN®   | SuperSOT™-8   | Xsens™  |
| FastvCore™  | mWSaver®                                       | SupreMOS®   | 仙童™   |
| FETBench™   | OptoHiT™                                       | SyncFET™  |   |
| FPS™  | OPTOLOGIC®                                     | Sync-Lock™  |   |

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