

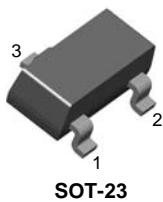


November 2014

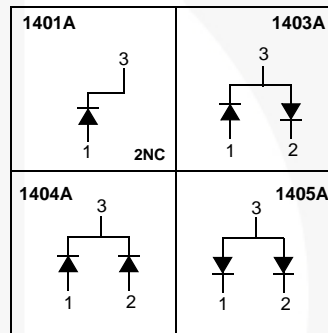
MMBD1401A / MMBD1403A / MMBD1404A / MMBD1405A High-Voltage General-Purpose Diode

Descriptions

Sourced from process 2V.



Connection Diagram



Ordering Information

Part Number	Top Mark	Package	Packing Method
MMBD1401A	A29	SOT-23 3L	Tape and Reel
MMBD1403A	A32	SOT-23 3L	Tape and Reel
MMBD1404A	A33	SOT-23 3L	Tape and Reel
MMBD1405A	A34	SOT-23 3L	Tape and Reel

MMBD1401A / MMBD1403A / MMBD1404A / MMBD1405A — High-Voltage General-Purpose Diode

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
W_{IV}	Working Inverse Voltage	175	V
I_O	Average Rectified Current	200	mA
I_F	DC Forward Current	600	mA
i_f	Recurrent Peak Forward Current	700	mA
$i_{f(\text{surge})}$	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:

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

Thermal Characteristics⁽³⁾

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

Symbol	Parameter	Max.	Unit
P_D	Power Dissipation	350	mW
	Derate above 25°C	2.8	mW/ $^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	357	$^\circ\text{C}/\text{W}$

Note:

- Device is mounted on glass epoxy PCB 1.6 inch x 1.6 inch x 0.06 inch, mounting pad for the collector lead minimum 0.93 in^2 .

Electrical Characteristics

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

Symbol	Parameter	Conditions	Min.	Max.	Unit
B_V	Breakdown Voltage	$I_R = 100 \mu\text{A}$	250		V
I_R	Reverse Current	$V_R = 120 \text{ V}$		40	nA
		$V_R = 175 \text{ V}$		100	nA
V_F	Forward Voltage	$I_F = 10 \text{ mA}$		800	mV
		$I_F = 50 \text{ mA}$	760	920	mV
		$I_F = 200 \text{ mA}$		1.1	V
		$I_F = 300 \text{ mA}$		1.25	V
C_O	Diode Capacitance	$V_R = 0, f = 1.0 \text{ MHz}$		2.0	pF
T_{RR}	Reverse Recovery Time	$I_F = I_R = 30 \text{ mA}$, $I_{RR} = 1.0 \text{ mA}, R_L = 100 \Omega$		50	nS

Typical Performance Characteristics

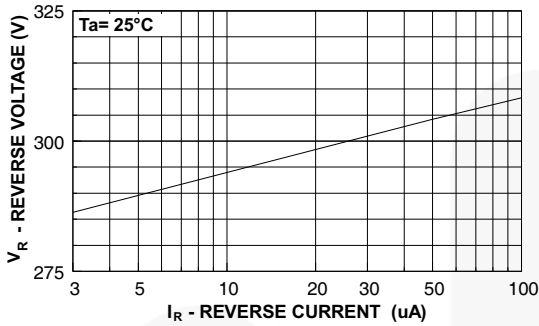


Figure 1. Reverse Voltage vs. Reverse Current
BV - 1.0 to 100 μ A

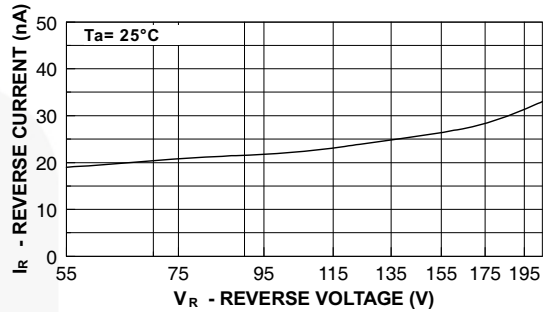


Figure 2. Reverse Current vs. Reverse Voltage
 I_R - 55 to 205 V

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

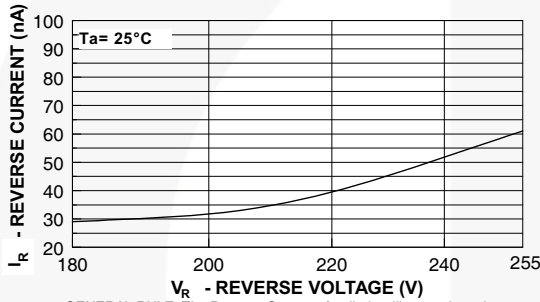


Figure 3. Reverse Current vs. Reverse Voltage
 I_R - 180 to 255 V

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

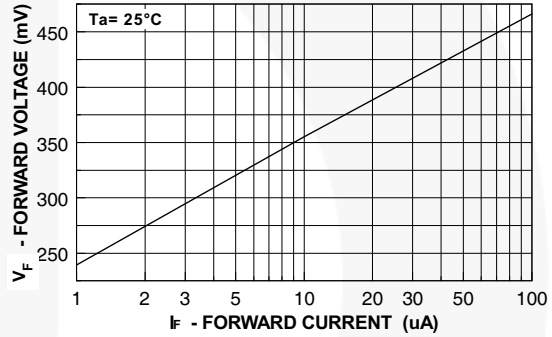


Figure 4. Forward Voltage vs. Forward Current
 V_F - 1.0 to 100 μ A

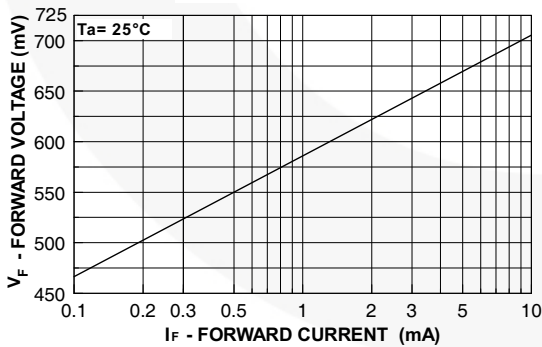


Figure 5. Forward Voltage vs. Forward Current
 V_F - 0.1 to 10 mA

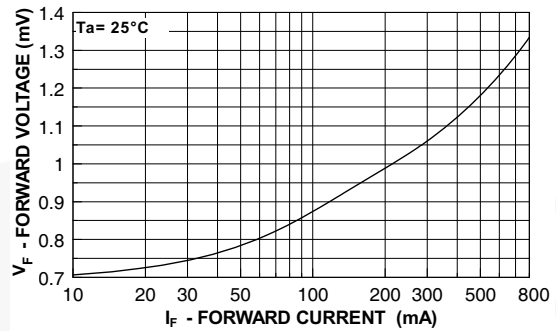


Figure 6. Forward Voltage vs. Forward Current
 V_F - 10 to 800 mA

Typical Performance Characteristics (Continued)

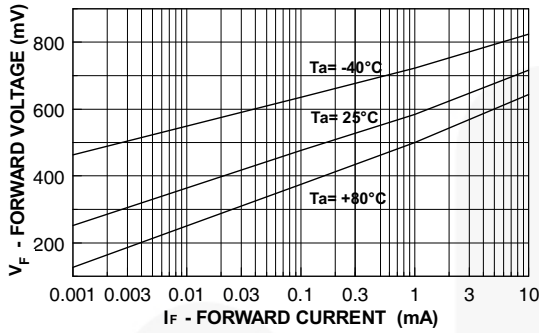


Figure 7. Forward Voltage vs. Ambient Temperature
 V_F - 1.0 μ A - 10 mA (- 40 to +80°C)

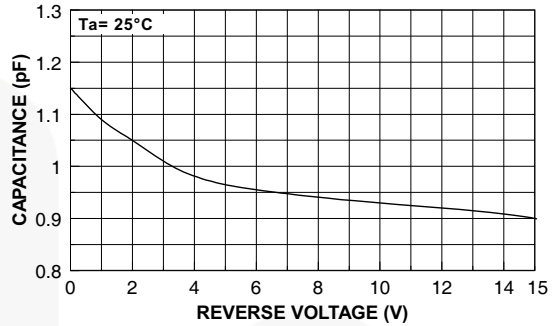


Figure 8. Capacitance vs. Reverse Voltage

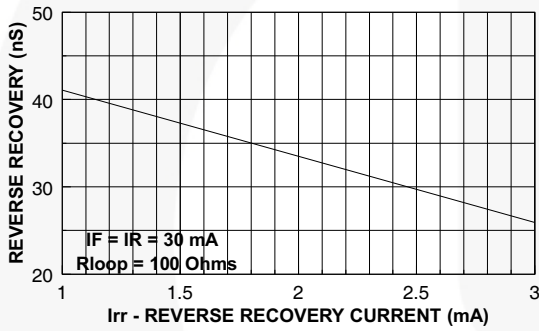


Figure 9. Reverse Recovery Time vs. Reverse Recovery Current (I_{rr})

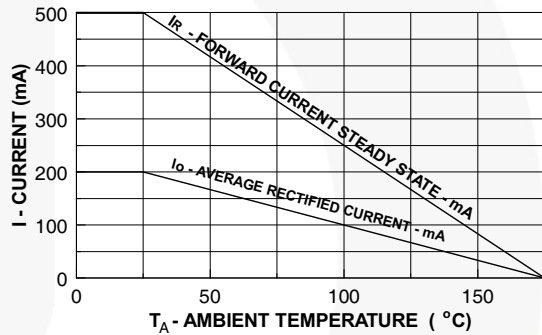


Figure 10. Average Rectified Current (I_O) and Forward Current (I_F) vs. Ambient Temperature (T_A)

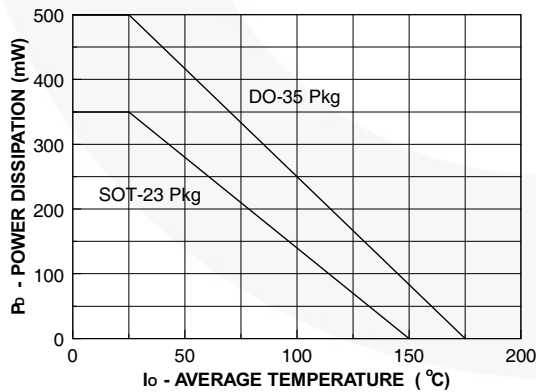
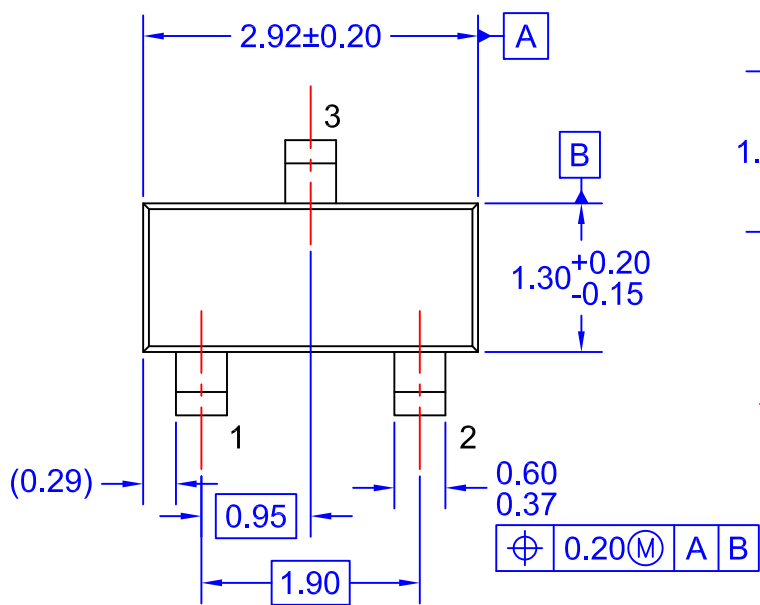


Figure 11. Power Derating Curve



LAND PATTERN
RECOMMENDATION



SEE DETAIL A



DETAIL A
SCALE: 2X

NOTES: UNLESS OTHERWISE SPECIFIED

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- 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.
- E) DRAWING FILE NAME: MA03DREV12





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Rev. I77