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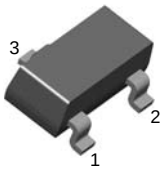
Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (_), the underscore (_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.onsemi.com. Please email any questions regarding the system integration to Fairchild_questions@onsemi.com.

November 2014

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

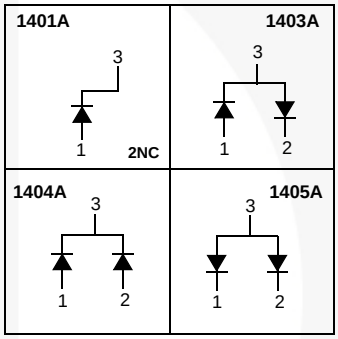
Descriptions

Sourced from process 2V.



SOT-23

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

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°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
$i_{f(surge)}$	Non-Repetitive Peak Forward Surge Current	Pulse Width = 1.0 second	1.0	A
		Pulse Width = 1.0 microsecond	2.0	
T_{STG}	Storage Temperature Range		-55 to +150	°C
T_J	Operating Junction Temperature		150	°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.

Thermal Characteristics(3)

Values are at T_A = 25°C unless otherwise noted.

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

Note:

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

Electrical Characteristics

Values are at T_A = 25°C unless otherwise noted.

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

Typical Performance Characteristics

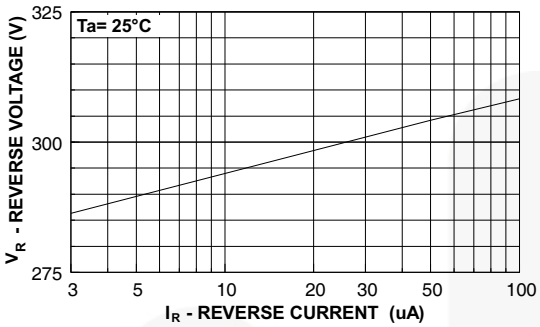


Figure 1. Reverse Voltage vs. Reverse Current
BV - 1.0 to 100 μA

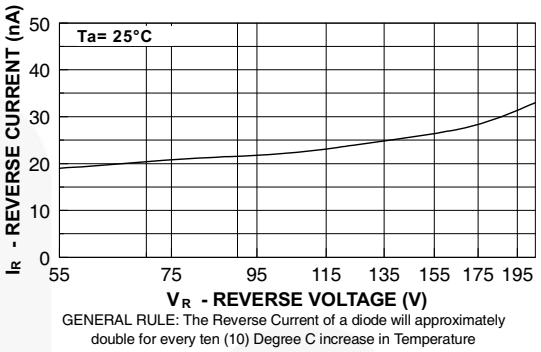


Figure 2. Reverse Current vs. Reverse Voltage
I_R - 55 to 205 V

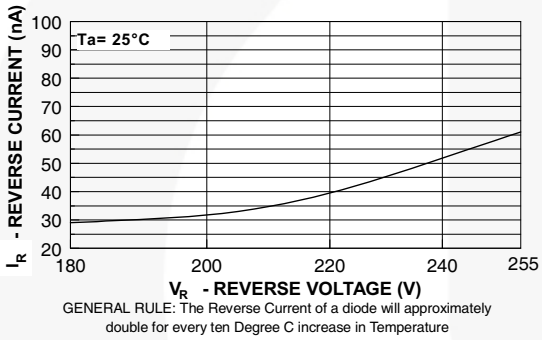


Figure 3. Reverse Current vs. Reverse Voltage
I_R - 180 to 255 V

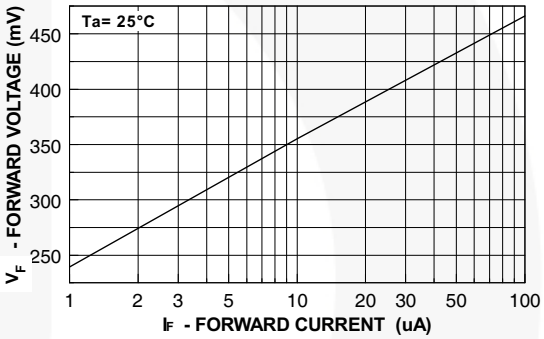


Figure 4. Forward Voltage vs. Forward Current
V_F - 1.0 to 100 μA

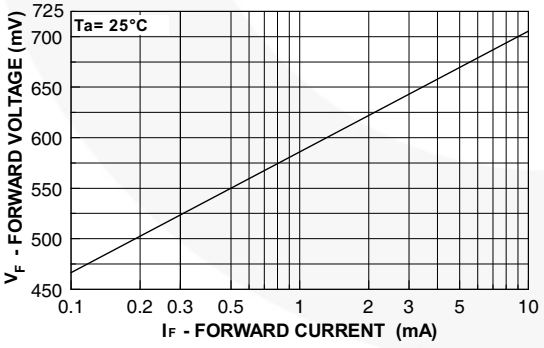


Figure 5. Forward Voltage vs. Forward Current
V_F - 0.1 to 10 mA

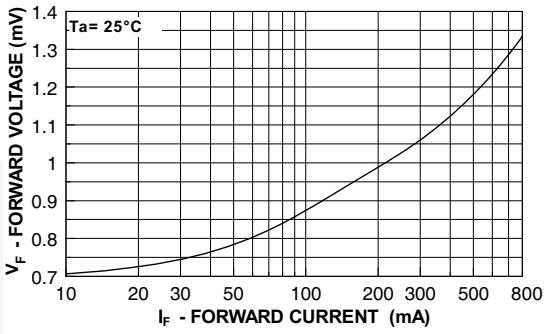


Figure 6. Forward Voltage vs. Forward Current
V_F - 10 to 800 mA

Typical Performance Characteristics (Continued)

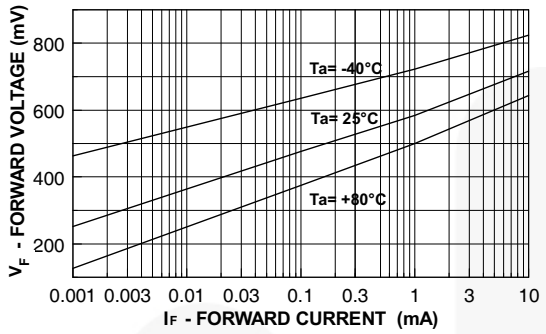


Figure 7. Forward Voltage vs. Ambient Temperature V_F - 1.0 μA - 10 mA (- 40 to +80°C)

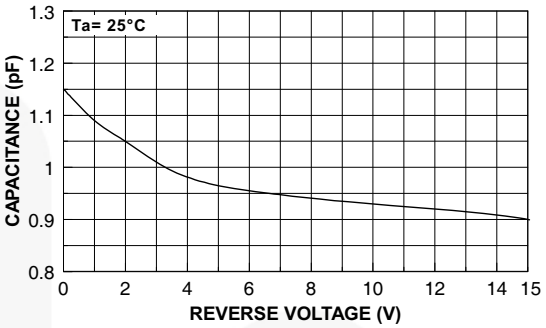


Figure 8. Capacitance vs. Reverse Voltage

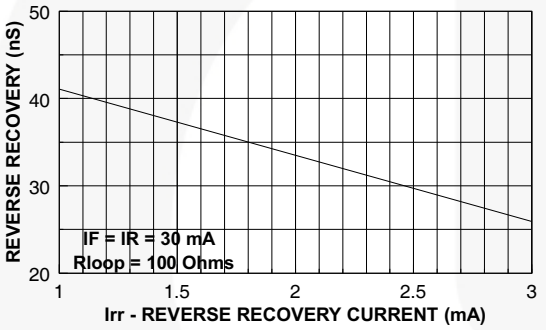


Figure 9. Reverse Recovery Time vs. Reverse Recovery Current (Irr)

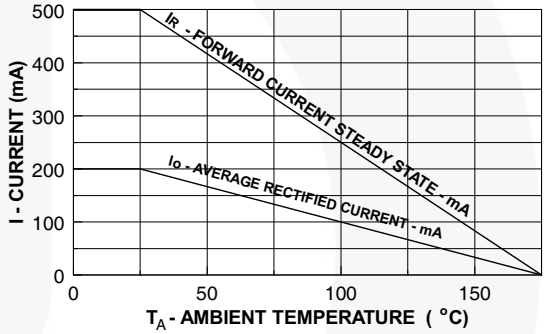


Figure 10. Average Rectified Current(I_O) and Forward Current (I_F) vs. Ambient Temperature(T_A)

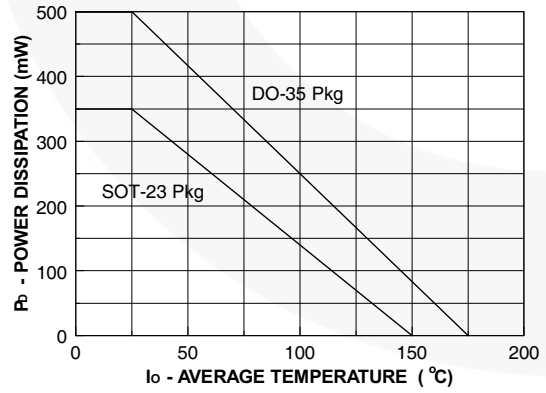
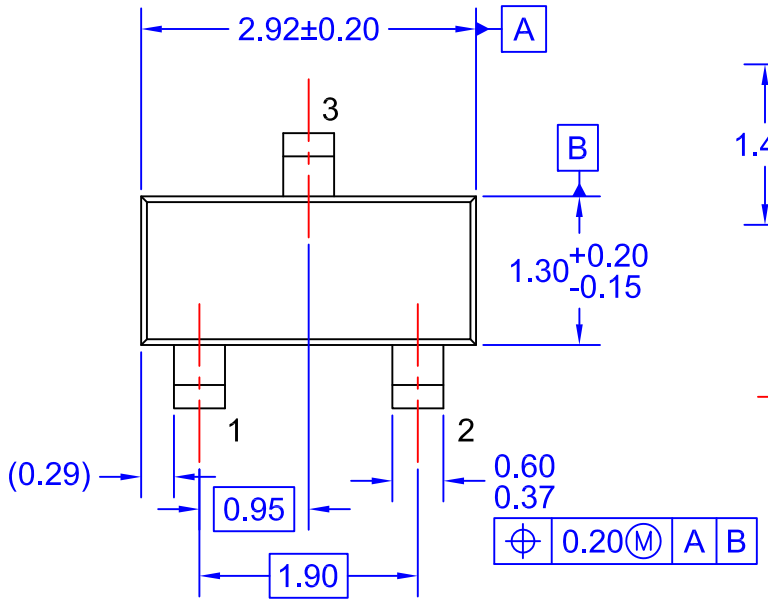
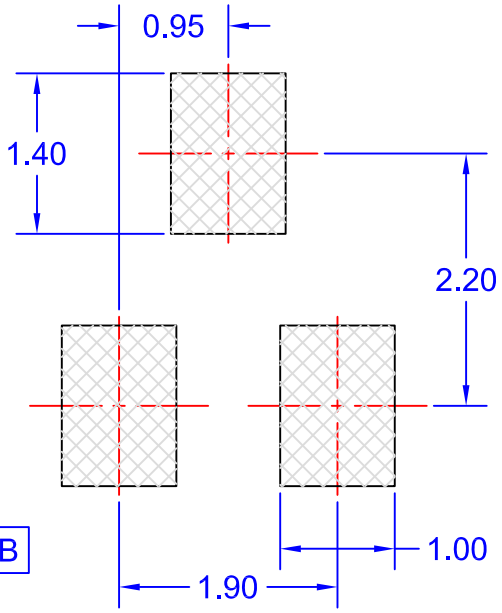
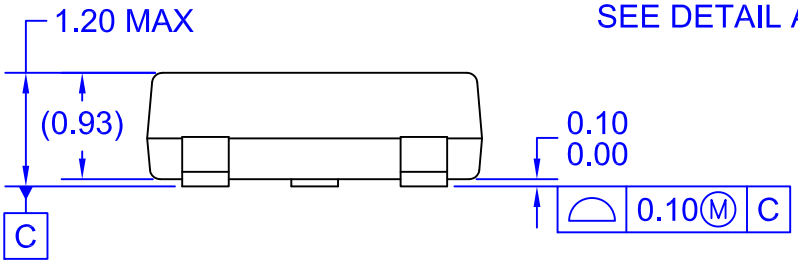


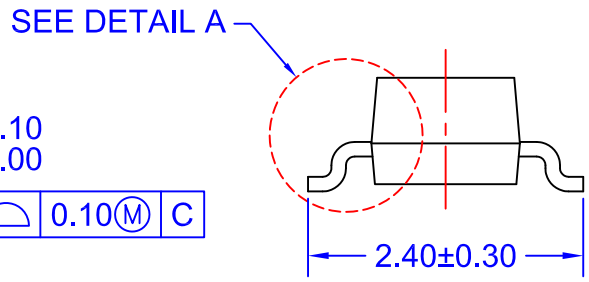
Figure 11. Power Derating Curve

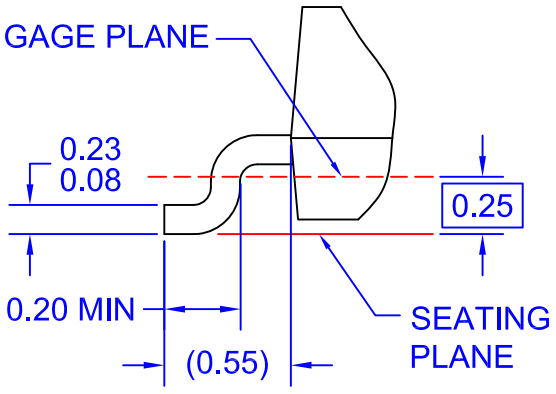




LAND PATTERN
RECOMMENDATION







DETAIL A
SCALE: 2X

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 - 2009.
E) DRAWING FILE NAME: MA03DREV12

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