Small Signal Diodes

MMBD1201, MMBD1203, MMBD1204, MMBD1205



SOT-23
CASE 318-08

Features

- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

ABSOLUTE MAXIMUM RATINGS (Notes 1, 2)

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

Symbol	Parameter		Value	Unit
V_{RRM}	Maximum Repetitive Reverse Voltage		100	V
$I_{F(AV)}$	Average Rectified Forward Current		200	mA
I_{FSM}	Non-Repetitive Peak Forward Surge Current	Pulse Width = 1.0 s	1.0	A
		Pulse Width = 1.0 μs	2.0	
T_{STG}	Storage Temperature Range		−55 to + 150	°C
T_J	Operating Junction Temperature		150	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

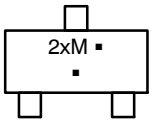
1. These ratings are based on a maximum junction temperature of 150°C.
2. These are steady-state limits. ON Semiconductor should be consulted on applications involving pulsed or low-duty-cycle operations.

THERMAL CHARACTERISTICS

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

Symbol	Parameter	Value	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

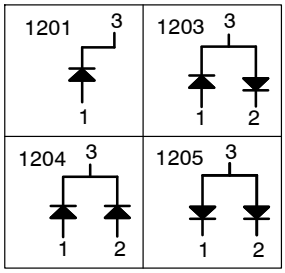
MARKING DIAGRAM



2x = Specific Device Code
x = 4, 5, 6, 7, 8
M = Date Code
▪ = Pb-Free Package

(Note: Microdot may be in either location)

CONNECTION DIAGRAM



ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

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ORDERING INFORMATION

Device	Marking	Package	Shipping†
MMBD1201 MMBD1201-NC	24	SOT-23 (Pb-Free)	3,000 / Tape & Reel
MMBD1203 MMBD1203-NC	26		
MMBD1204 MMBD1204-NC	27		
MMBD1205 MMBD1205-NC	28		

† For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

* S, V and NSV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

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

Symbol	Parameter	Conditions	Min	Max.	Unit
V_R	Breakdown Voltage	I_R = 100 μA	100	–	V
V_F	Forward Voltage	I_F = 1.0 mA	550	600	mV
		I_F = 10 mA	660	740	mV
		I_F = 100 mA	820	920	mV
		I_F = 200 mA	0.87	1.0	V
		I_F = 300 mA	–	1.1	V
I_R	Reverse Current	V_R = 20 V	–	25	nA
		V_R = 50 V	–	50	nA
		V_R = 50 V, T_A = 150 °C	–	100	μA
C_T	Total Capacitance	V_R = 0 V, f = 1.0 MHz	–	2.0	pF
t_{rr}	Reverse Recovery Time	I_F = I_R = 10 mA, I_{RR} = 1.0 mA, R_L = 100 Ω	–	4.0	ns

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

TYPICAL PERFORMANCE CHARACTERISTICS

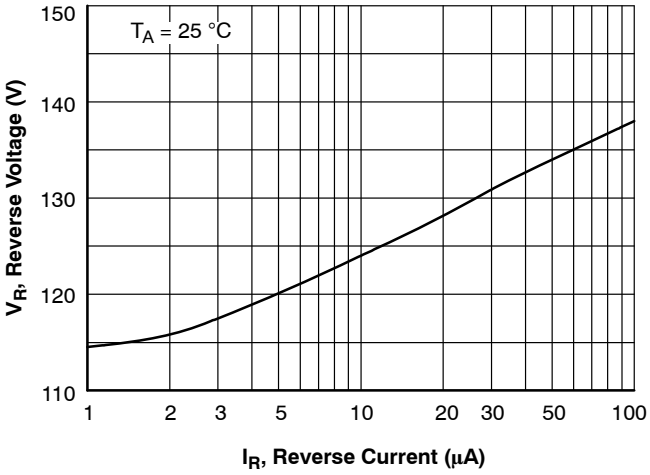


Figure 1. Reverse Voltage vs. Reverse Current
V_R @ I_R = 1.0 to 100 μA

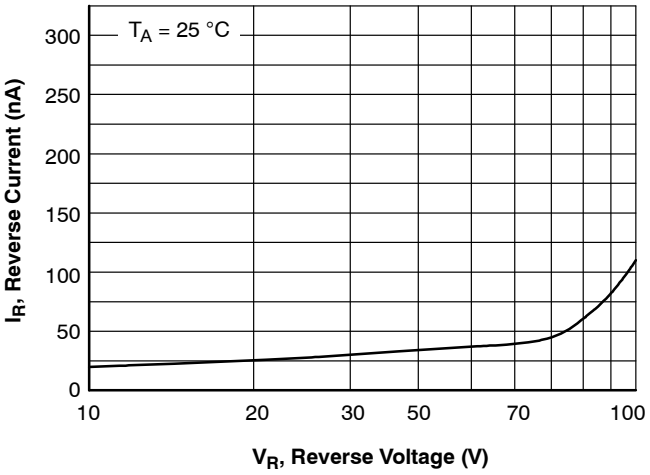


Figure 2. Reverse Current vs. Reverse Voltage
I_R @ V_R = 10 to 100 V

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TYPICAL PERFORMANCE CHARACTERISTICS (continued)

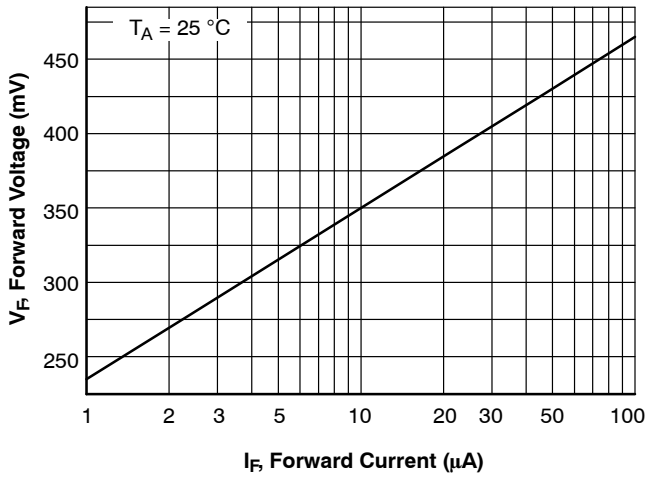


Figure 3. Forward Voltage vs. Forward Current V_F @ I_F = 1.0 to 100 μA

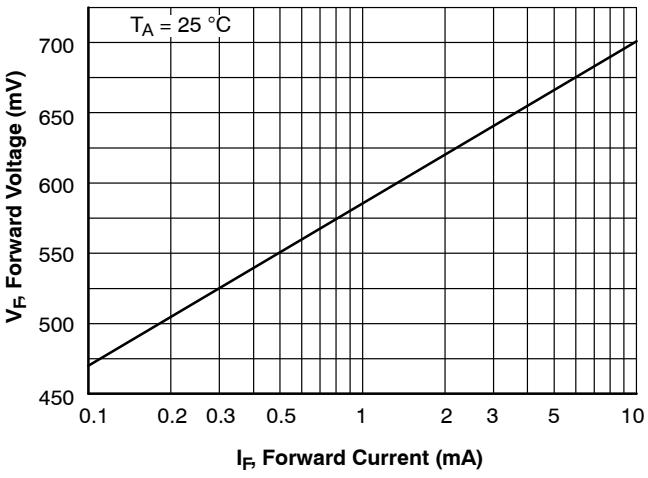


Figure 4. Forward Voltage vs. Forward Current V_F @ I_F = 0.1 to 10 mA

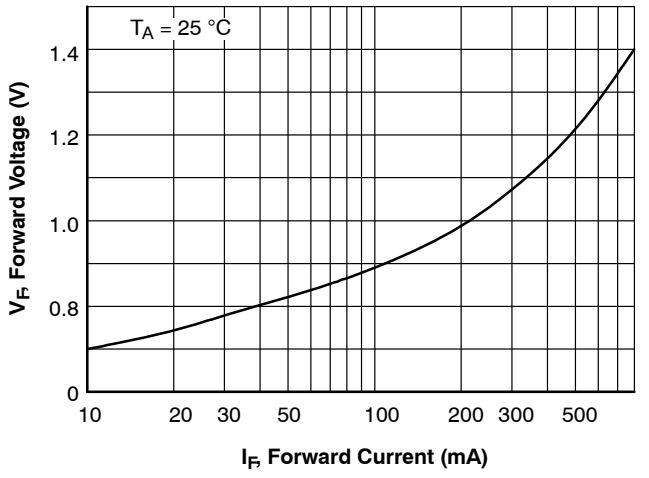


Figure 5. Forward Voltage vs. Forward Current V_F @ I_F = 10 to 800 mA

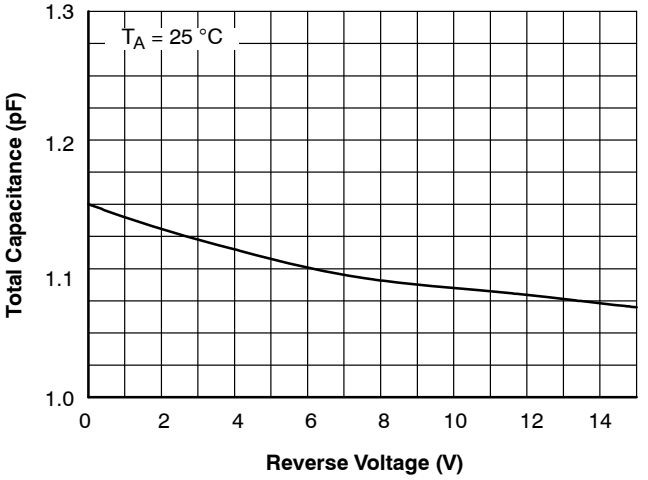


Figure 6. Total Capacitance vs. Reverse Voltage

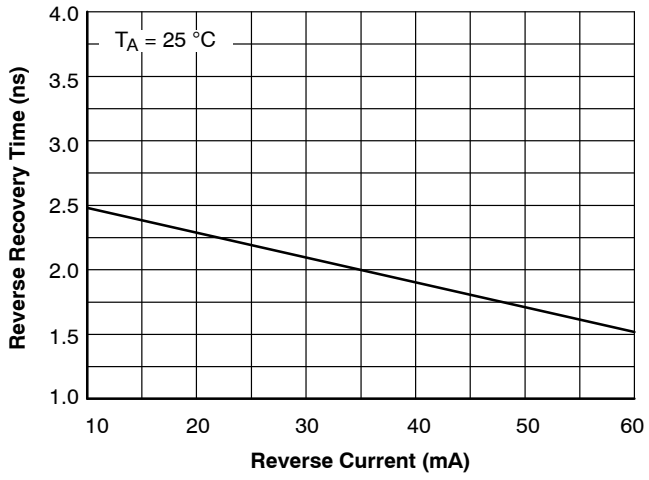


Figure 7. Reverse Recovery Time vs. Reverse Current

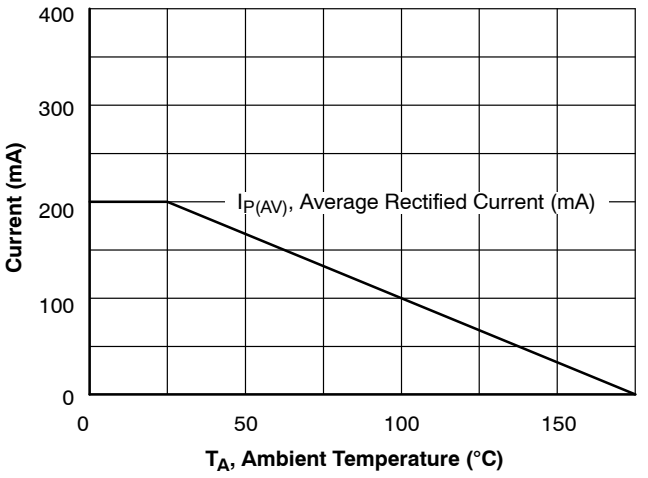


Figure 8. Average Rectified Current ($I_{F(AV)}$) vs. Ambient Temperature (T_A)

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TYPICAL PERFORMANCE CHARACTERISTICS (CONTINUED)

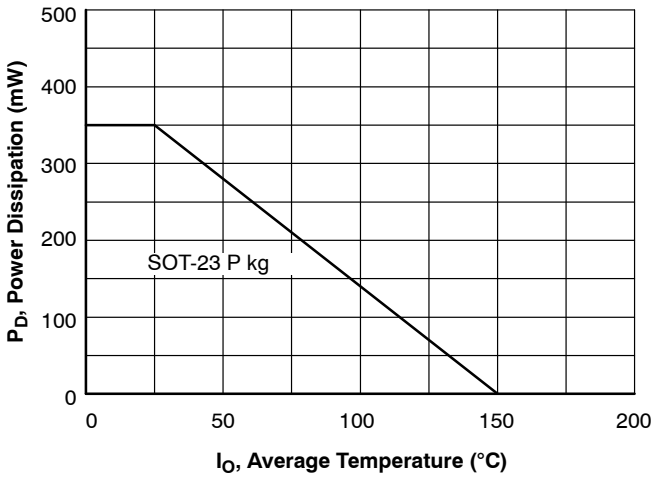


Figure 9. Power Derating Curve

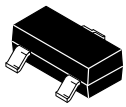
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REVISION HISTORY

Revision	Description of Changes	Date
5	Added “-NC” OPNs to order table.	10/7/2026

This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.

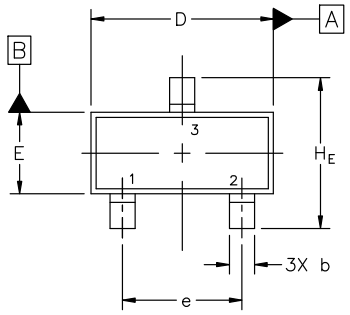
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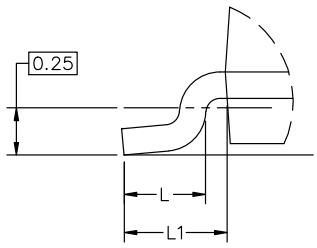
SCALE 4:1

SOT−23 (TO−236) 2.90x1.30x1.00 1.90P
CASE 318
ISSUE AU

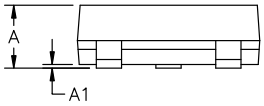
DATE 14 AUG 2024



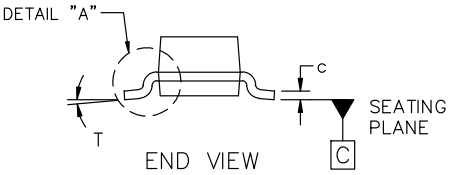
TOP VIEW



DETAIL "A"
Scale 3:1



SIDE VIEW

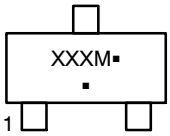


END VIEW

MILLIMETERS			
DIM	MIN	NOM	MAX
A	0.89	1.00	1.11
A1	0.01	0.06	0.10
b	0.37	0.44	0.50
c	0.08	0.14	0.20
D	2.80	2.90	3.04
E	1.20	1.30	1.40
e	1.78	1.90	2.04
L	0.30	0.43	0.55
L1	0.35	0.54	0.69
H_E	2.10	2.40	2.64
T	0°	−−−	10°

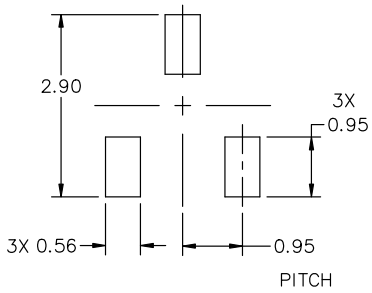
NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSIONS: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

GENERIC
MARKING DIAGRAM*



XXX = Specific Device Code
M = Date Code
▪ = Pb−Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.



RECOMMENDED
MOUNTING FOOTPRINT

* For additional information on our Pb−Free strategy and soldering details, please download the onsemi Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

STYLES ON PAGE 2

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CASE 318
ISSUE AU

DATE 14 AUG 2024

STYLE 1 THRU 5:
CANCELLED

STYLE 6:
PIN 1. BASE
2. EMITTER
3. COLLECTOR

STYLE 7:
PIN 1. EMITTER
2. BASE
3. COLLECTOR

STYLE 8:
PIN 1. ANODE
2. NO CONNECTION
3. CATHODE

STYLE 9:
PIN 1. ANODE
2. ANODE
3. CATHODE

STYLE 10:
PIN 1. DRAIN
2. SOURCE
3. GATE

STYLE 11:
PIN 1. ANODE
2. CATHODE
3. CATHODE−ANODE

STYLE 12:
PIN 1. CATHODE
2. CATHODE
3. ANODE

STYLE 13:
PIN 1. SOURCE
2. DRAIN
3. GATE

STYLE 14:
PIN 1. CATHODE
2. GATE
3. ANODE

STYLE 15:
PIN 1. GATE
2. CATHODE
3. ANODE

STYLE 16:
PIN 1. ANODE
2. CATHODE
3. CATHODE

STYLE 17:
PIN 1. NO CONNECTION
2. ANODE
3. CATHODE

STYLE 18:
PIN 1. NO CONNECTION
2. CATHODE
3. ANODE

STYLE 19:
PIN 1. CATHODE
2. ANODE
3. CATHODE−ANODE

STYLE 20:
PIN 1. CATHODE
2. ANODE
3. GATE

STYLE 21:
PIN 1. GATE
2. SOURCE
3. DRAIN

STYLE 22:
PIN 1. RETURN
2. OUTPUT
3. INPUT

STYLE 23:
PIN 1. ANODE
2. ANODE
3. CATHODE

STYLE 24:
PIN 1. GATE
2. DRAIN
3. SOURCE

STYLE 25:
PIN 1. ANODE
2. CATHODE
3. GATE

STYLE 26:
PIN 1. CATHODE
2. ANODE
3. NO CONNECTION

STYLE 27:
PIN 1. CATHODE
2. CATHODE
3. CATHODE

STYLE 28:
PIN 1. ANODE
2. ANODE
3. ANODE

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