

Small Signal Diodes

MMBD1201 - MMBD1205

Features

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

ABSOLUTE MAXIMUM RATINGS (Note 1, Note 2)

Values are at $T_A = 25^\circ\text{C}$ 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 | A |
| | | Pulse Width = 1.0 μs | |
| T_{STG} | Storage Temperature Range | -55 to + 150 | $^\circ\text{C}$ |
| T_J | Operating Junction Temperature | 150 | $^\circ\text{C}$ |

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.

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

THERMAL CHARACTERISTICS

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

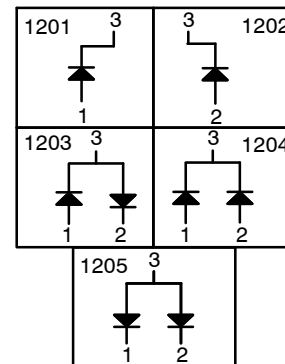
| Symbol | Parameter | Value | Unit |
|-----------------|---|-------|---------------------------|
| P_D | Power Dissipation | 350 | mW |
| | Derate Above 25°C | 2.8 | mW/ $^\circ\text{C}$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient | 357 | $^\circ\text{C}/\text{W}$ |



ON Semiconductor®

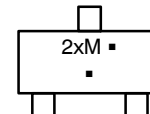
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CONNECTION DIAGRAM



SOT-23
CASE 318-08

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)

ORDERING INFORMATION

| Device | Package | Shipping† |
|--|------------------------------------|-----------------------|
| MMBD1201, MMBD1202, MMBD1203, MMBD1204, MMBD1205 | SOT-23 (Pb-Free Halide Free) | 3000 / Tape & Reel |

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

MMBD1201 – MMBD1205

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

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

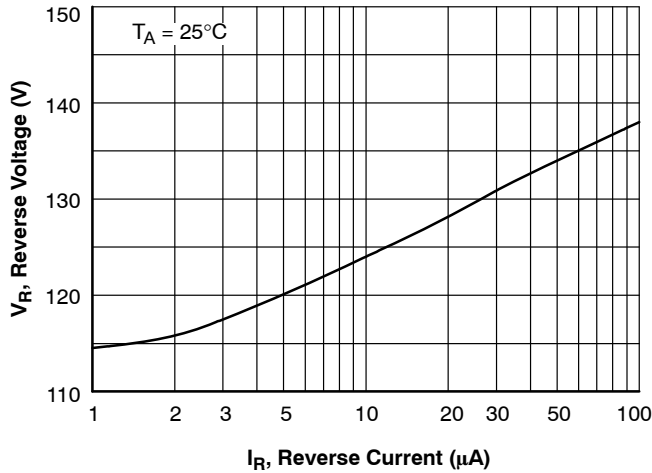


Figure 1. Reverse Voltage vs. Reverse Current
 V_R @ $I_R = 1.0$ to $100\ \mu\text{A}$

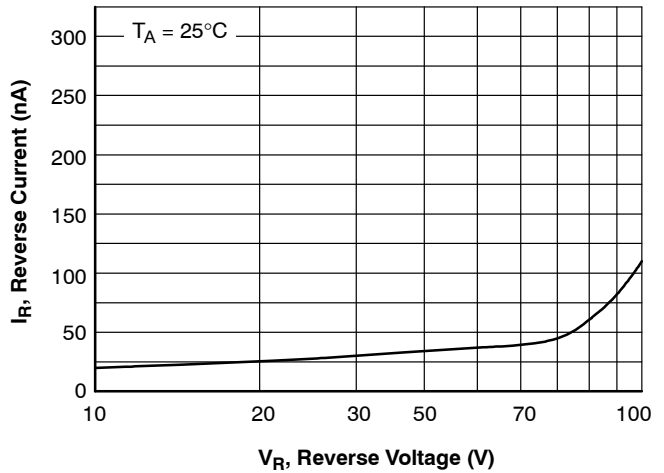


Figure 2. Reverse Current vs. Reverse Voltage
 I_R @ $V_R = 10$ to $100\ \text{V}$

TYPICAL PERFORMANCE CHARACTERISTICS (continued)

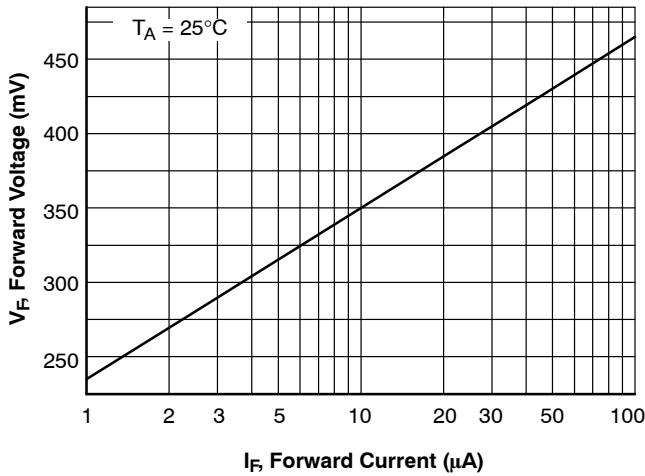


Figure 3. Forward Voltage vs. Forward Current
 V_F @ $I_F = 1.0$ to $100 \mu A$

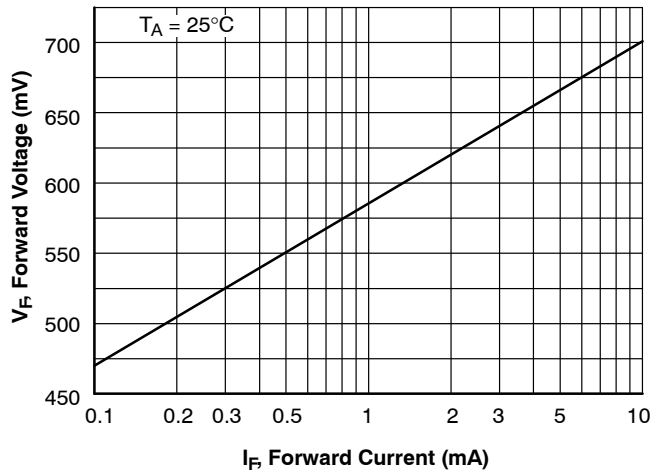


Figure 4. Forward Voltage vs. Forward Current
 V_F @ $I_F = 0.1$ to 10 mA

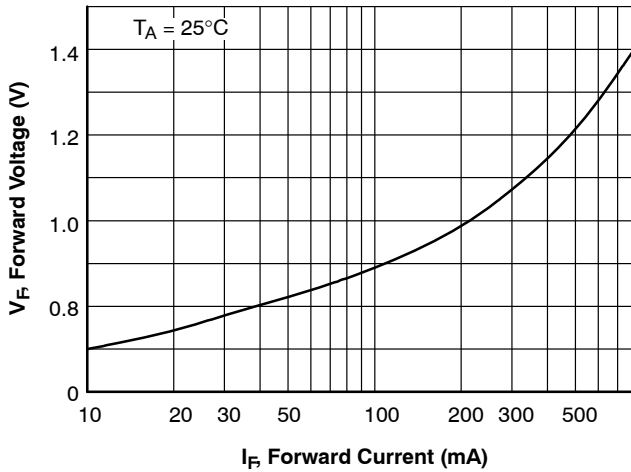


Figure 5. Forward Voltage vs. Forward Current
 V_F @ $I_F = 10$ to 800 mA

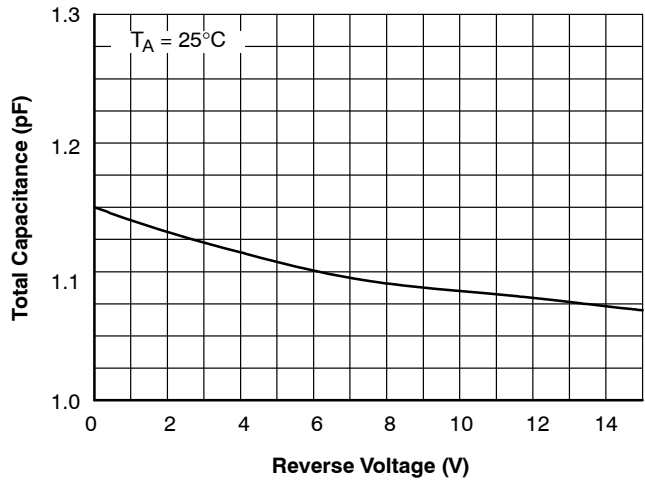


Figure 6. Total Capacitance vs. Reverse Voltage

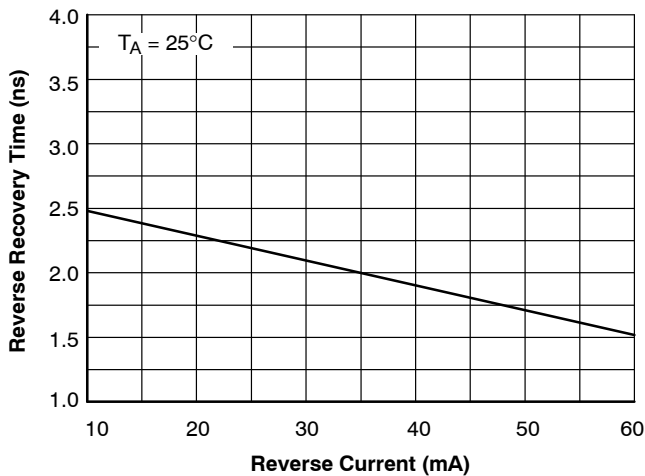


Figure 7. Reverse Recovery Time vs. Reverse Current

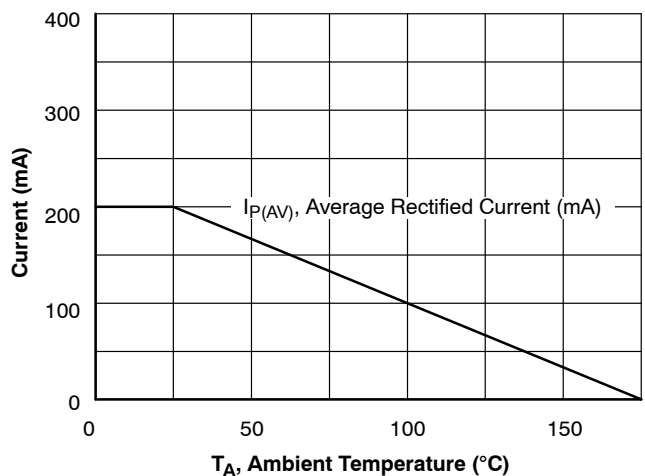


Figure 8. Average Rectified Current ($I_{F(AV)}$) vs. Ambient Temperature (T_A)

MMBD1201 – MMBD1205

TYPICAL PERFORMANCE CHARACTERISTICS (continued)

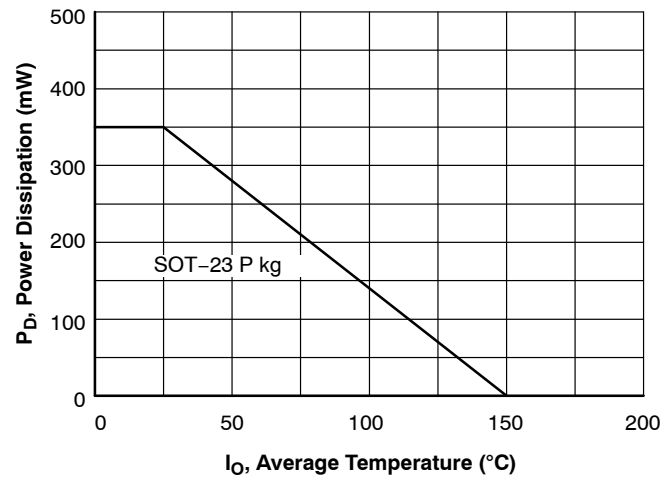
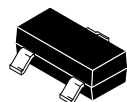


Figure 9. Power Derating Curve

MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS



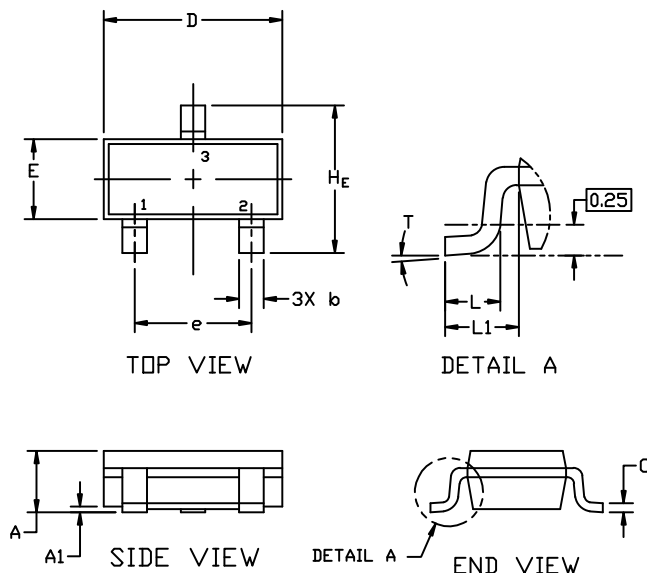
SCALE 4:1

SOT-23 (TO-236)

CASE 318

ISSUE AT

DATE 01 MAR 2023

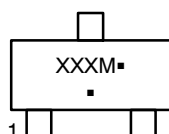


NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M,1994.
2. CONTROLLING DIMENSION: 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.

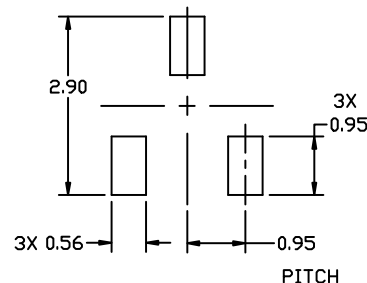
| DIM | MILLIMETERS | | | INCHES | | |
|----------------|-------------|------|------|--------|-------|-------|
| | MIN. | NOM. | MAX. | MIN. | NOM. | MAX. |
| A | 0.89 | 1.00 | 1.11 | 0.035 | 0.039 | 0.044 |
| A1 | 0.01 | 0.06 | 0.10 | 0.000 | 0.002 | 0.004 |
| b | 0.37 | 0.44 | 0.50 | 0.015 | 0.017 | 0.020 |
| c | 0.08 | 0.14 | 0.20 | 0.003 | 0.006 | 0.008 |
| D | 2.80 | 2.90 | 3.04 | 0.110 | 0.114 | 0.120 |
| E | 1.20 | 1.30 | 1.40 | 0.047 | 0.051 | 0.055 |
| e | 1.78 | 1.90 | 2.04 | 0.070 | 0.075 | 0.080 |
| L | 0.30 | 0.43 | 0.55 | 0.012 | 0.017 | 0.022 |
| L1 | 0.35 | 0.54 | 0.69 | 0.014 | 0.021 | 0.027 |
| H _E | 2.10 | 2.40 | 2.64 | 0.083 | 0.094 | 0.104 |
| T | 0° | --- | 10° | 0° | --- | 10° |

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 ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

STYLES ON PAGE 2

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MECHANICAL CASE OUTLINE

PACKAGE DIMENSIONS



SOT-23 (TO-236) CASE 318 ISSUE AT

DATE 01 MAR 2023

| | | | | | |
|---|---|---|---|---|---|
| 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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