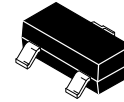
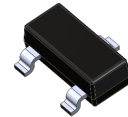


Diode – Small Signal

MMBD1501A, MMBD1503A, MMBD1504A, MMBD1505A



SOT-23 (TO-236)
CASE 318-08



SOT-23
CASE 318BM

ABSOLUTE MAXIMUM RATINGS

(Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.) (Notes 1, 2)

| 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 s | 1.0 |
| | | Pulse Width = 1.0 μs | 2.0 |
| T_{STG} | Storage Temperature Range | -55 to +150 | $^\circ\text{C}$ |
| T_J | Operating Junction Temperature | -55 to +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. onsemi 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 |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient | 357 | $^\circ\text{C}/\text{W}$ |

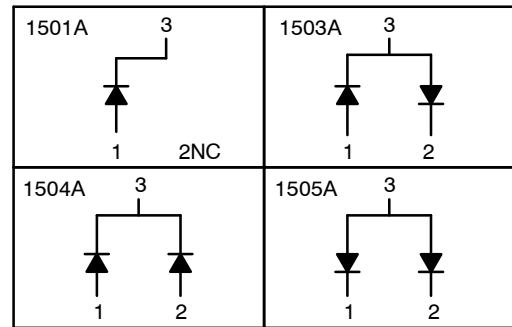
ELECTRICAL CHARACTERISTICS

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

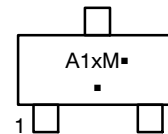
| Symbol | Parameter | Conditions | Min | Max | Unit |
|--------|-------------------|--|------|------|---------------|
| V_R | Breakdown Voltage | $I_R = 5.0 \mu\text{A}$ | 200 | - | V |
| V_F | Forward Voltage | $I_F = 1.0 \text{ mA}$ | 620 | 720 | mV |
| | | $I_F = 10 \text{ mA}$ | 720 | 830 | mV |
| | | $I_F = 50 \text{ mA}$ | 800 | 890 | mV |
| | | $I_F = 100 \text{ mA}$ | 830 | 930 | mV |
| | | $I_F = 200 \text{ mA}$ | 0.87 | 1.10 | V |
| | | $I_F = 300 \text{ mA}$ | 0.90 | 1.15 | V |
| I_R | Reverse Current | $V_R = 125 \text{ V}$ | - | 1.0 | nA |
| | | $V_R = 125 \text{ V}$, $T_A = 150^\circ\text{C}$ | - | 3.0 | μA |
| | | $V_R = 180 \text{ V}$ | - | 10.0 | nA |
| | | $V_R = 180 \text{ V}$, $T_A = 150^\circ\text{C}$ | - | 5.0 | μA |
| C_T | Total Capacitance | $V_R = 0$, $f = 1.0 \text{ MHz}$ | - | 4.0 | pF |

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.

CONNECTION DIAGRAMS



MARKING DIAGRAM



- A1x = Specific Device Code
x = 1, 3, 4, 5
- M = Date Code
- = Pb-Free Package

ORDERING INFORMATION

See detailed ordering and shipping information on page 3 of this data sheet.

TYPICAL CHARACTERISTICS

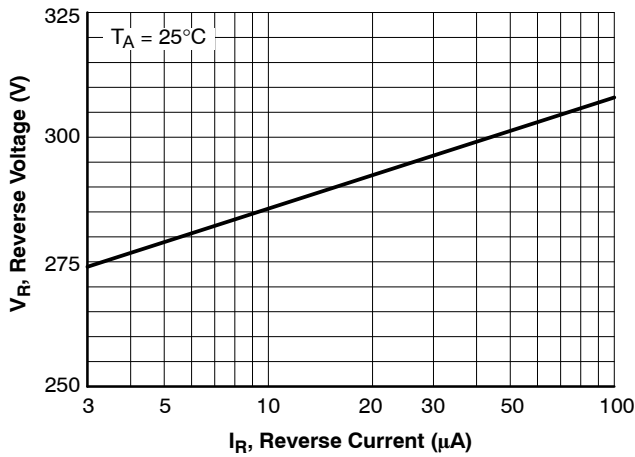


Figure 1. Reverse Voltage vs. Reverse Current
 I_R – 3.0 to 100 μA

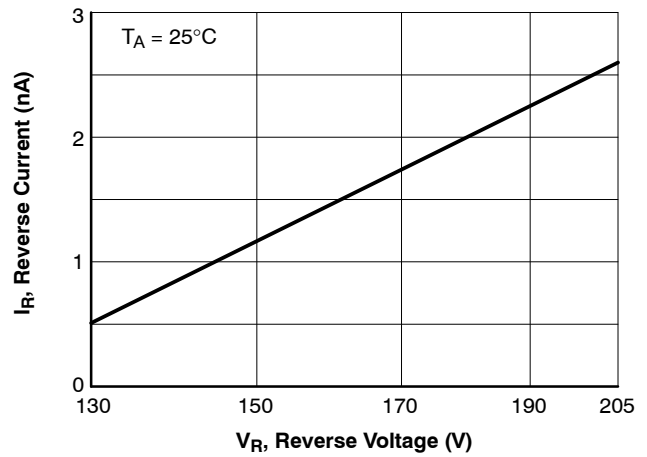


Figure 2. Reverse Current vs. Reverse Voltage
 V_R – 130 to 205 V

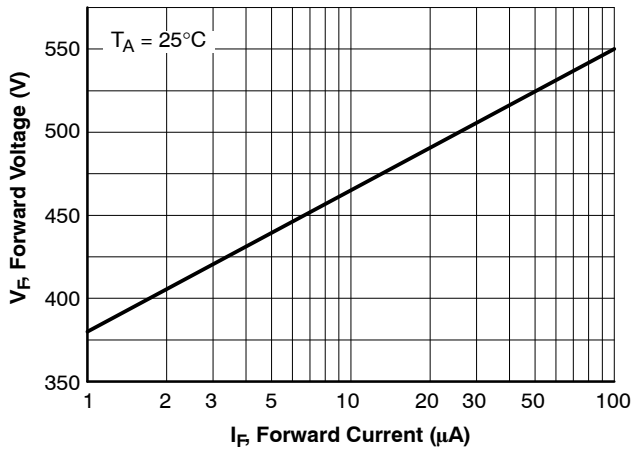


Figure 3. Forward Voltage vs. Forward Current
 I_F – 1 to 100 μA

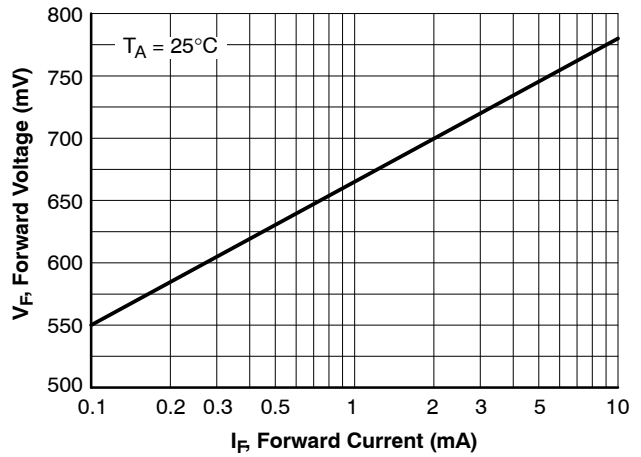


Figure 4. Forward Voltage vs. Forward Current
 I_F – 0.1 to 10 mA

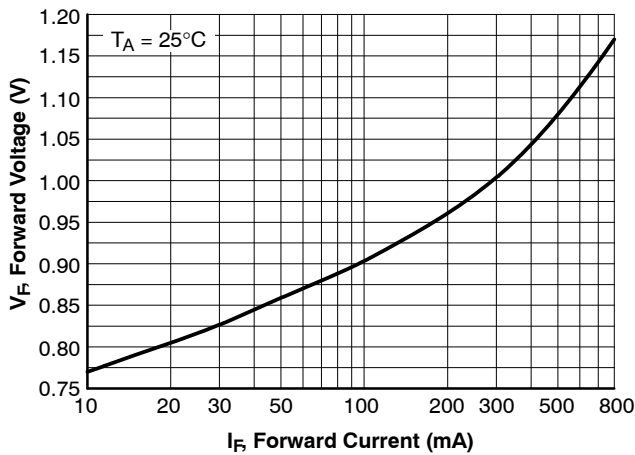


Figure 5. Forward Voltage vs. Forward Current
 I_F – 10 to 800 mA

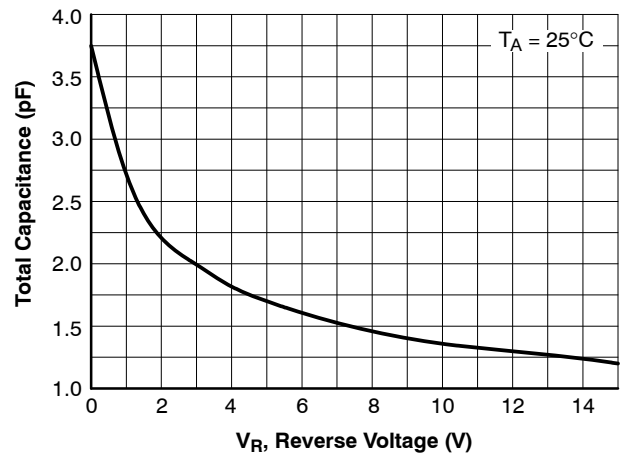


Figure 6. Total Capacitance vs. Reverse Voltage
 V_R – 0 to 15 V

MMBD1501A, MMBD1503A, MMBD1504A, MMBD1505A

TYPICAL CHARACTERISTICS (Continued)

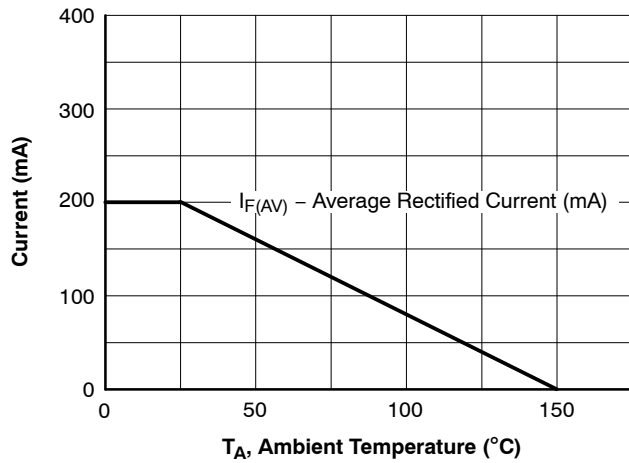


Figure 7. Average Rectified Current ($I_{F(AV)}$) vs. Ambient Temperature (T_A)

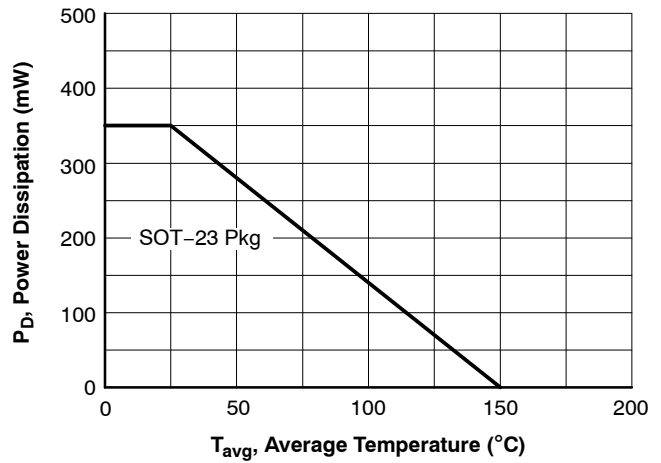


Figure 8. Power Derating Curve

ORDERING INFORMATION

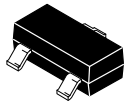
| Part Number | Specific Device Marking | Package Type | Shipping [†] |
|----------------|-------------------------|------------------------------|----------------------------|
| MMBD1501A | A11 | SOT-23 (TO-236) (Pb-Free) | 3,000 / Tape & Reel (7") |
| MMBD1503A | A13 | | |
| MMBD1503A_D87Z | A13 | SOT-23 (Pb-Free) | 10,000 / Tape & Reel (13") |
| MMBD1504A | A14 | SOT-23 (TO-236) (Pb-Free) | 3,000 / Tape & Reel (7") |
| MMBD1505A | A15 | | |

[†]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](#).

MECHANICAL CASE OUTLINE

PACKAGE DIMENSIONS

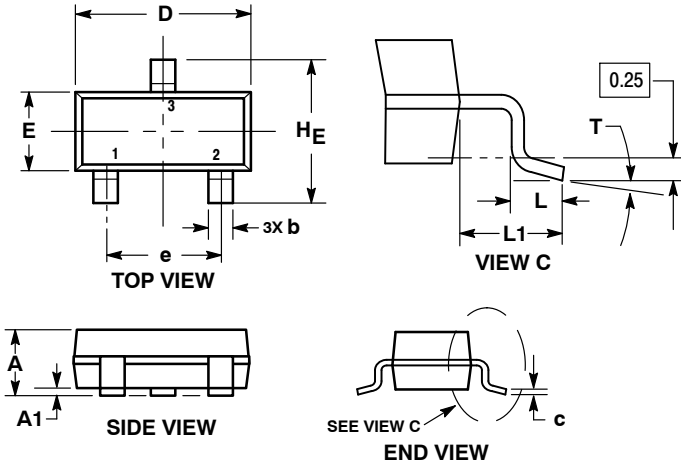
ON Semiconductor®



SOT-23 (TO-236)
CASE 318-08
ISSUE AS

DATE 30 JAN 2018

SCALE 4:1

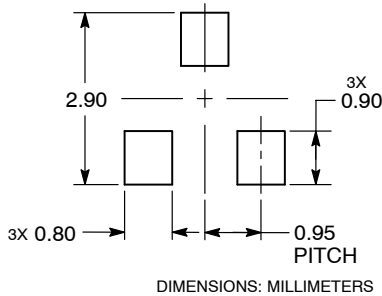


NOTES:

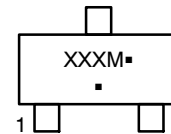
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

| 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 |
| HE | 2.10 | 2.40 | 2.64 | 0.083 | 0.094 | 0.104 |
| T | 0° | --- | 10° | 0° | --- | 10° |

RECOMMENDED SOLDERING FOOTPRINT



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.

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

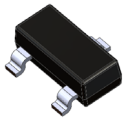
STYLE 27:
PIN 1. CATHODE
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3. CATHODE

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

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MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS

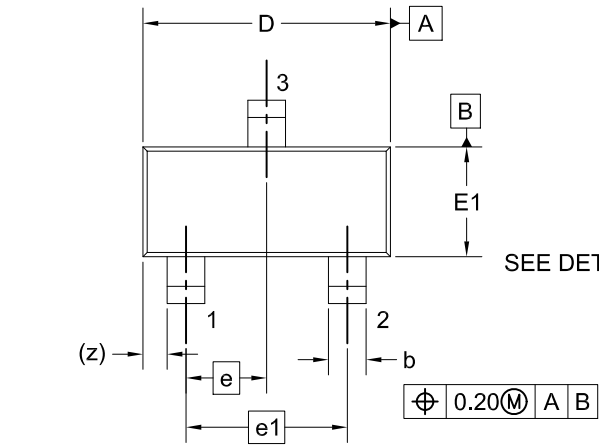


SOT-23
CASE 318BM
ISSUE A

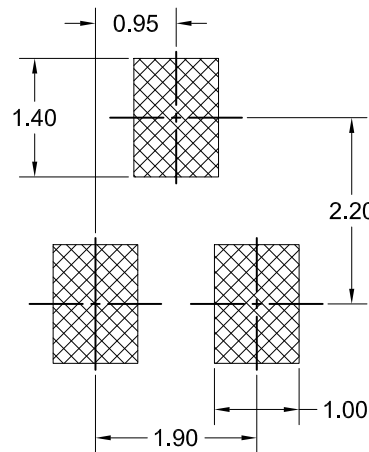
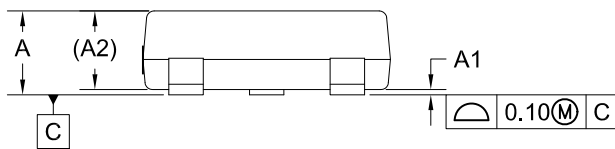
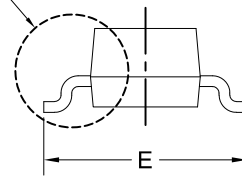
DATE 01 SEP 2021

NOTES: UNLESS OTHERWISE SPECIFIED

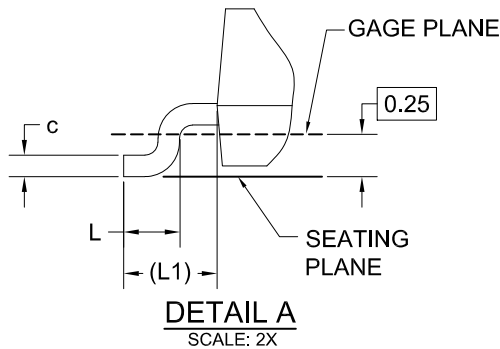
- A) REFERENCE JEDEC REGISTRATION TO-236, VARIATION AB, ISSUE H.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DIMENSIONS ARE INCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR EXTRUSIONS.
- D) DIMENSIONING AND TOLERANCING PER ASME Y14.5M - 2009.



SEE DETAIL A

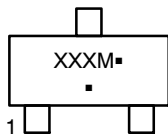


| DIM | MILLIMETERS | | |
|-----|-------------|------|------|
| | MIN. | NOM. | MAX. |
| A | --- | --- | 1.20 |
| A1 | 0.00 | 0.05 | 0.10 |
| A2 | 0.93 REF | | |
| b | 0.37 | 0.44 | 0.60 |
| c | 0.08 | 0.15 | 0.23 |
| D | 2.72 | 2.92 | 3.12 |
| E | 2.10 | 2.40 | 2.70 |
| E1 | 1.15 | 1.30 | 1.50 |
| e | 0.95 BSC | | |
| e1 | 1.90 BSC | | |
| L | 0.20 | --- | --- |
| L1 | 0.55 REF | | |
| z | 0.29 REF | | |



LAND PATTERN
RECOMMENDATION

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.

*FOR ADDITIONAL INFORMATION ON OUR PB-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ON SEMICONDUCTOR SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D.

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