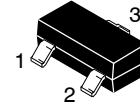


# Small Signal Diode

## MMBD4148SE, MMBD4148CC, MMBD4148CA



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

### Features

- These are Pb-Free Devices

### MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

| Rating  | Symbol      | Value       | Unit             |
|---|-------------|-------------|------------------|
| Maximum Repetitive Reverse Voltage  | $V_{RRM}$   | 100         | V                |
| Average Rectified Forward Current   | $I_{F(AV)}$ | 200         | mA               |
| Non-Repetitive Peak Forward Surge Current<br>Pulse Width = 1.0 s<br>Pulse Width = 1.0 $\mu\text{s}$ | $I_{FSM}$   | 1.0<br>2.0  | A                |
| Operating Junction Temperature Range  | $T_J$       | -55 to +150 | $^\circ\text{C}$ |
| Storage Temperature Range   | $T_{STG}$   | -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.

### THERMAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

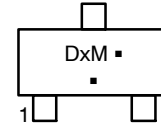
| Characteristic                          | Symbol          | Value | Unit                      |
|---|-----------------|-------|---------------------------|
| Power Dissipation                       | $P_D$           | 350   | mW                        |
| Thermal Resistance, Junction-to-Ambient | $R_{\theta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

### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic   | Symbol   | Min         | Typ         | Max             | Unit                                 |
|--|----------|-------------|-------------|-----------------|--------------------------------------|
| Breakdown Voltage<br>$I_R = 5.0 \mu\text{A}$<br>$I_R = 100 \mu\text{A}$  | $V_R$    | 75<br>100   | -<br>-      | -<br>-          | V                                    |
| Forward Voltage<br>$I_F = 10 \text{ mA}$   | $V_F$    | -           | -           | 1.0             | V                                    |
| Reverse Leakage Current<br>$V_R = 20 \text{ V}$<br>$V_R = 20 \text{ V}, T_A = 150^\circ\text{C}$<br>$V_R = 75 \text{ V}$ | $I_R$    | -<br>-<br>- | -<br>-<br>- | 25<br>50<br>5.0 | nA<br>$\mu\text{A}$<br>$\mu\text{A}$ |
| Total Capacitance<br>$V_R = 0 \text{ V}, f = 1.0 \text{ MHz}$  | $C_T$    | -           | -           | 4.0             | pF                                   |
| Reverse Recovery Time<br>$I_F = 10 \text{ mA}, V_R = 6.0 \text{ V},$<br>$I_{RR} = 1.0 \text{ mA}, R_L = 100 \Omega$      | $t_{rr}$ | -           | -           | 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.

### MARKING DIAGRAM

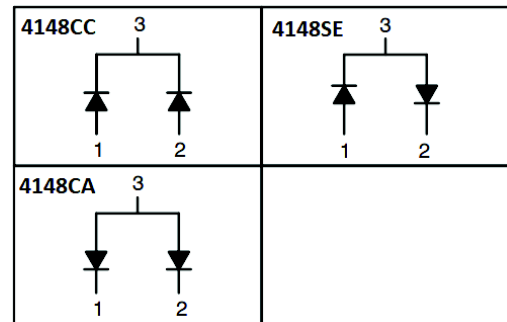


Dx = Device Code  
x = 4, 5, 6

M = Assembly Operation Month  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

### CONNECTION DIAGRAMS

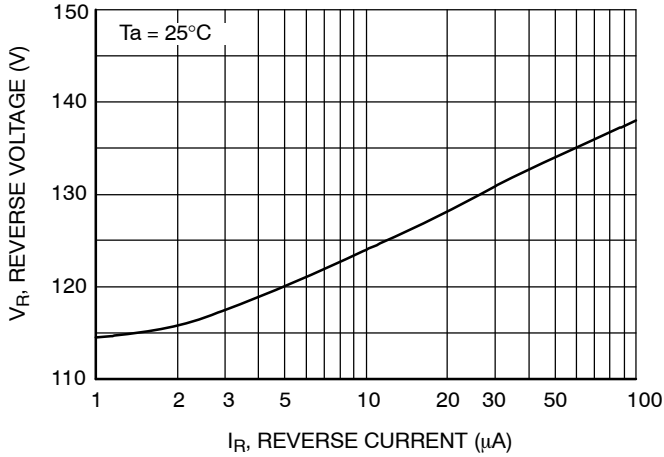


### ORDERING INFORMATION

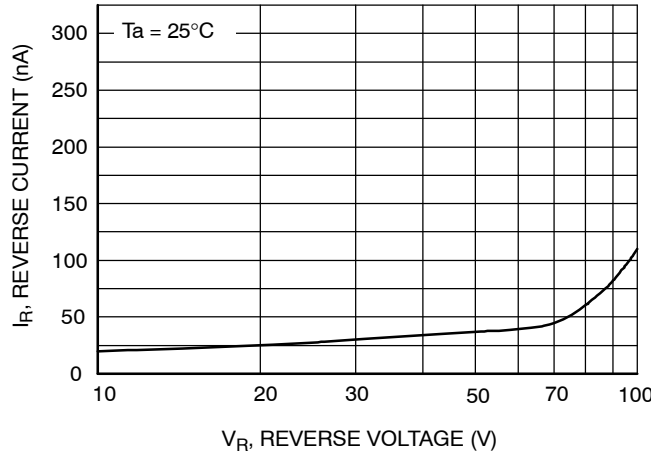
See detailed ordering and shipping information on page 4 of this data sheet.

# MMBD4148SE, MMBD4148CC, MMBD4148CA

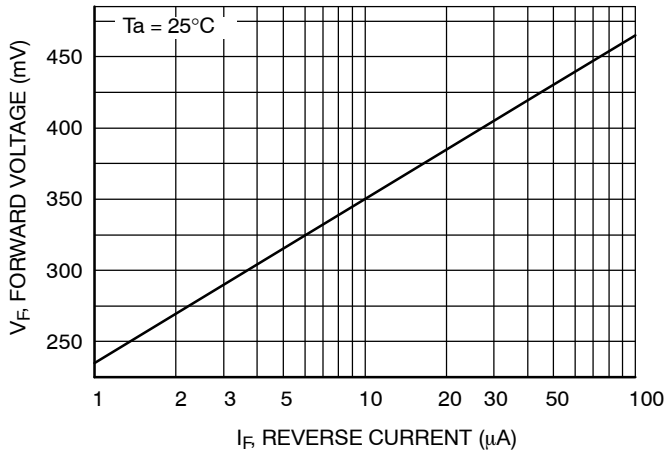
## TYPICAL PERFORMANCE CHARACTERISTICS



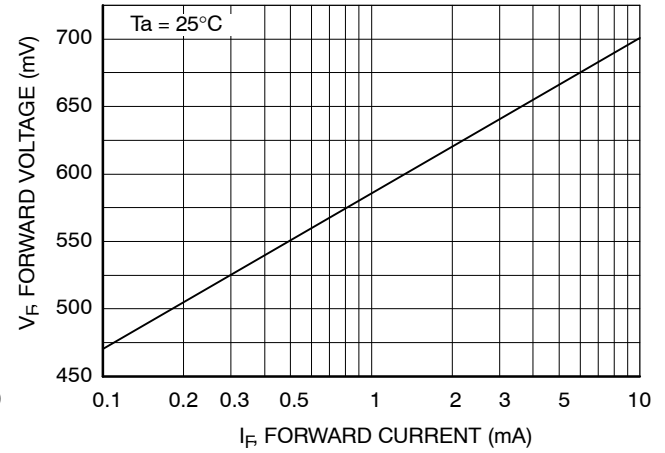
**Figure 1. Reverse Voltage vs. Reverse Current**  
BV – 1.0 to 100  $\mu$ A



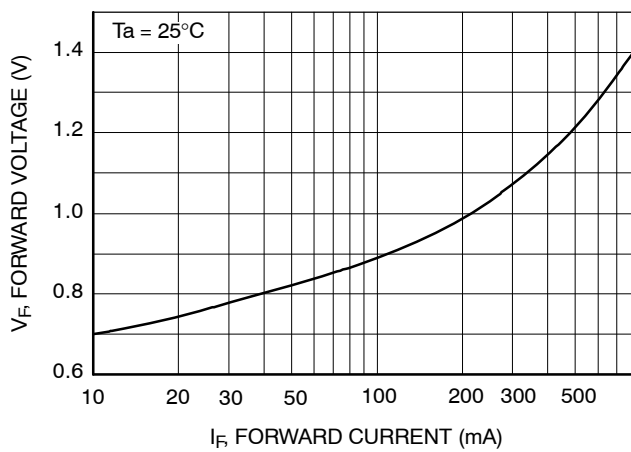
**Figure 2. Reverse Current vs. Reverse Voltage**  
IR – 10 to 100 V



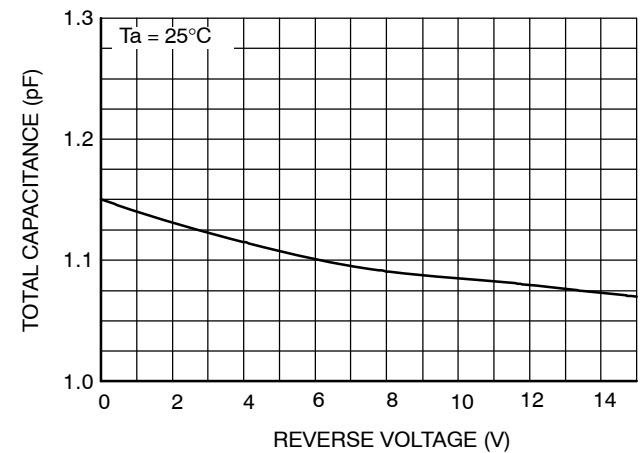
**Figure 3. Forward Voltage vs. Forward Current**  
VF – 1.0 to 100  $\mu$ A



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



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



**Figure 6. Total Capacitance vs. Reverse Voltage**

MMBD4148SE, MMBD4148CC, MMBD4148CA

TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

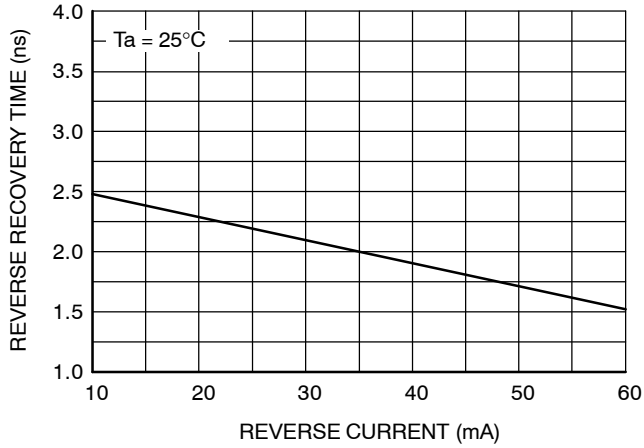


Figure 7. Reverse Recovery Time vs. Reverse Current  
TRR - IR 10 mA to 60 mA

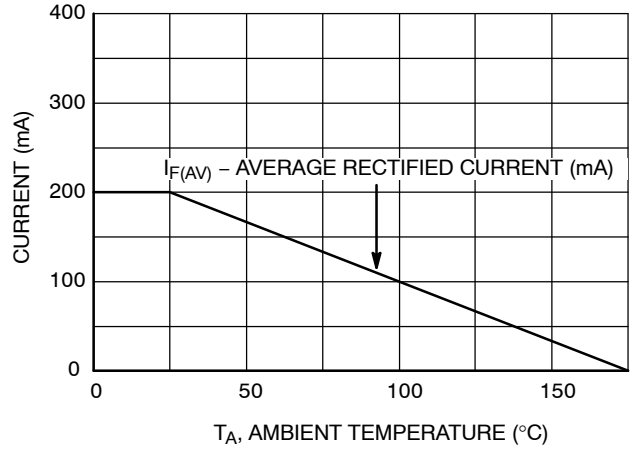


Figure 8. Average Rectified Current ( $I_{F(AV)}$ )  
vs. Ambient Temperature ( $T_A$ )

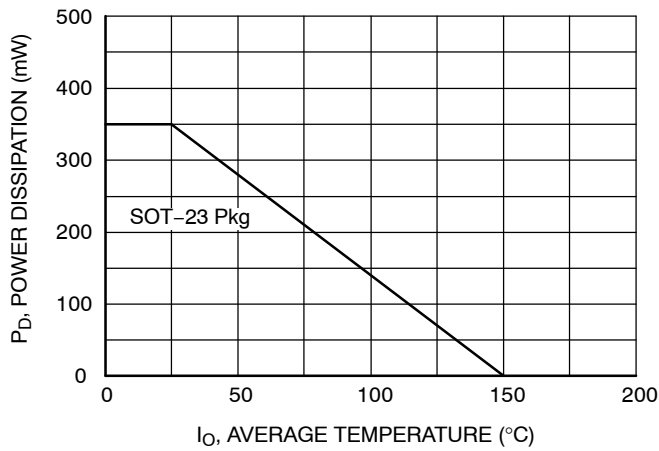


Figure 9. Power Derating Curve

## MMBD4148SE, MMBD4148CC, MMBD4148CA

### ORDERING INFORMATION

| Part Number | Top Mark | Package             | Pinout   | Pinout Style | Shipping†           |
|-------------|----------|---------------------|--|--------------|---------------------|
| MMBD4148SE  | D4       | SOT-23<br>(Pb-Free) | pin 1 = Anode, pin 2 = Cathode,<br>pin 3 = Cathode/Anode | Style 11     | 3,000 / Tape & Reel |
| MMBD4148CC  | D5       |                     | pin 1 = Anode, pin 2 = Anode,<br>pin 3 = Cathode         | Style 23     | 3,000 / Tape & Reel |
| MMBD4148CA  | D6       |                     | pin 1 = Cathode, pin 2 = Cathode,<br>pin 3 = Anode/Anode | Style 12     | 3,000 / Tape & Reel |

†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  
2. CATHODE  
3. CATHODE

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

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