

MMBD301M3

Silicon Hot-Carrier Diode

SCHOTTKY Barrier Diode

The MMBD301M3T5G device is a spin-off of our popular SOT-23 three-leaded device. It is designed primarily for high-efficiency UHF and VHF detector applications. It is readily adaptable to many other fast switching RF and digital applications and is housed in the SOT-723 surface mount package. This device is ideal for low-power surface mount applications where board space is at a premium.

Features

- Extremely Low Minority Carrier Lifetime – 15 ps (Typ)
- Very Low Capacitance – 1.5 pF (Max) @ $V_R = 15\text{ V}$
- Reduces Board Space
- These Devices are Pb-Free and Halogen Free/BFR Free

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|---|-----------|-------------|-------------|
| Reverse Voltage | V_R | 30 | V |
| Forward Current (DC) | I_F | 200 (Max) | mA |
| Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C | P_F | 200 2.0 | mW mW/°C |
| Operating Junction Temperature Range | T_J | -55 to +125 | °C |
| Storage Temperature Range | T_{stg} | -55 to +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.

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

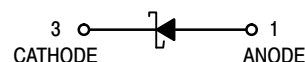
| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|-------------|-----|------|------|------|
| Reverse Breakdown Voltage ($I_R = 10\ \mu\text{A}$) | $V_{(BR)R}$ | 30 | - | - | V |
| Total Capacitance ($V_R = 15\text{ V}$, $f = 1.0\text{ MHz}$) Figure 1 | C_T | - | 0.9 | 1.5 | pF |
| Reverse Leakage ($V_R = 25\text{ V}$) Figure 3 | I_R | - | 13 | 200 | nAdc |
| Forward Voltage ($I_F = 1.0\text{ mAdc}$) Figure 4 | V_F | - | 0.38 | 0.45 | Vdc |
| Forward Voltage ($I_F = 10\text{ mAdc}$) Figure 4 | V_F | - | 0.52 | 0.6 | Vdc |



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30 VOLTS SILICON HOT-CARRIER DETECTOR AND SWITCHING DIODES



MARKING DIAGRAM



SOT-723
CASE 631AA
STYLE 2



AK = Specific Device Code
M = Date Code

ORDERING INFORMATION

| Device | Package | Shipping† |
|--------------|----------------------|------------------|
| MMBD301M3T5G | SOT-723 (Pb-Free) | 8000/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.

TYPICAL ELECTRICAL CHARACTERISTICS

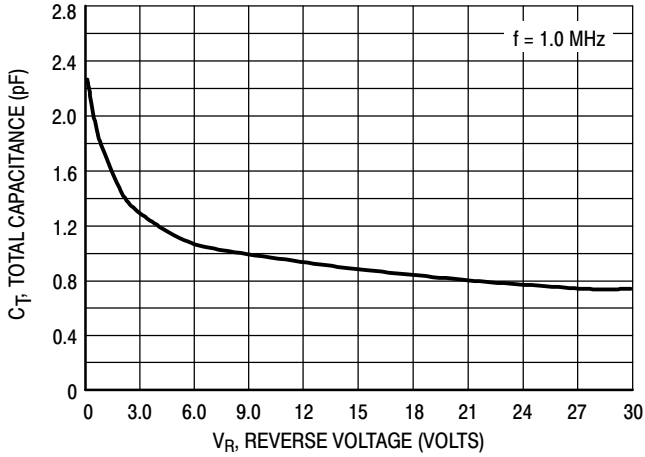


Figure 1. Total Capacitance

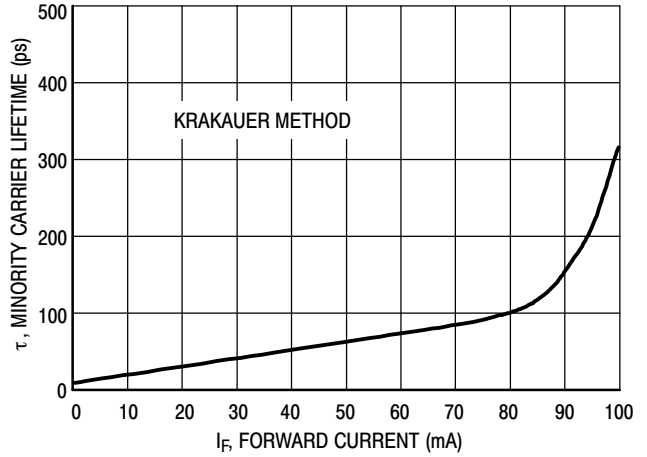


Figure 2. Minority Carrier Lifetime

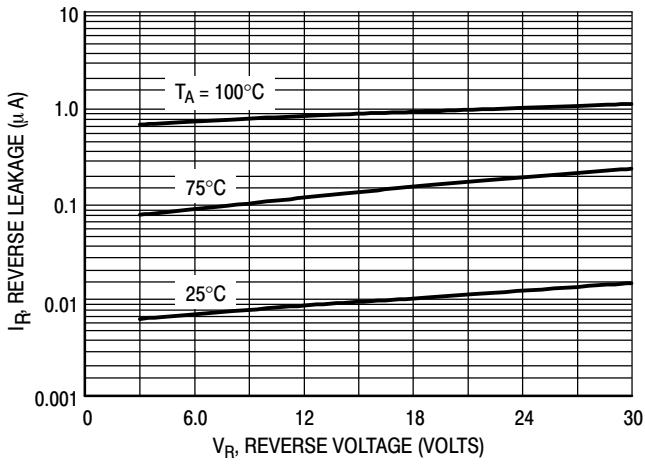


Figure 3. Reverse Leakage

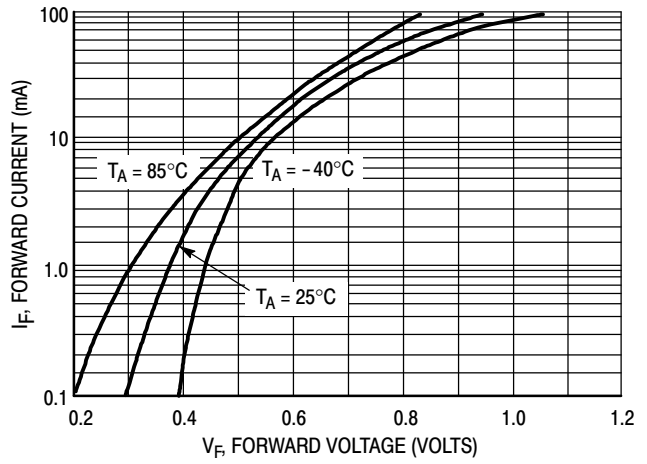


Figure 4. Forward Voltage

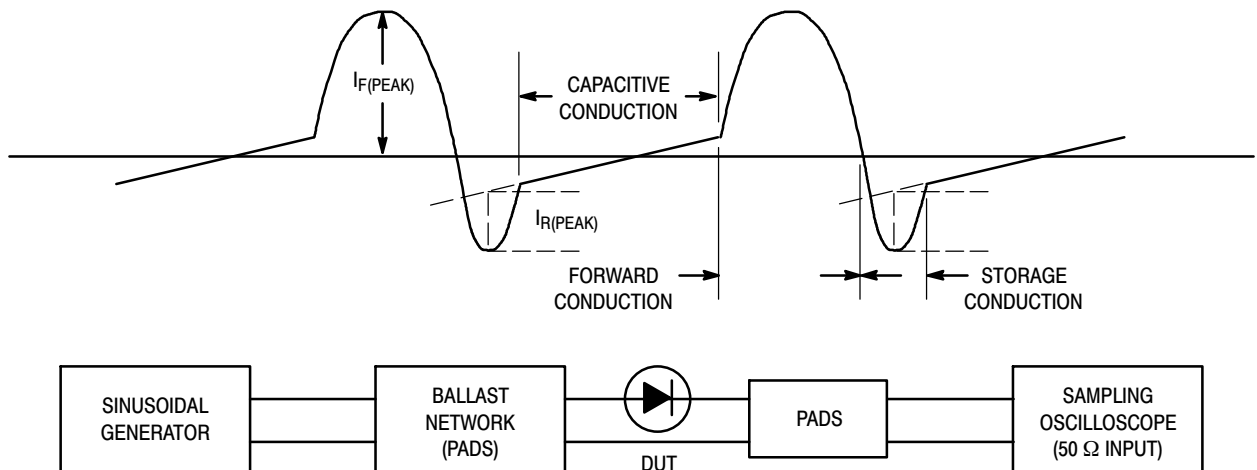


Figure 5. Krakauer Method of Measuring Lifetime

MECHANICAL CASE OUTLINE

PACKAGE DIMENSIONS

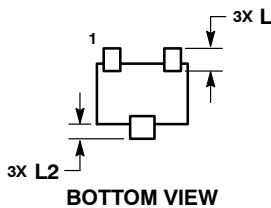
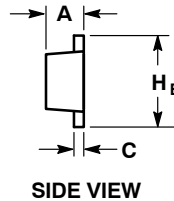
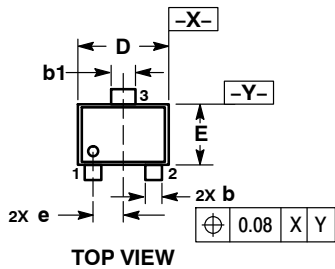
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SCALE 4:1

SOT-723
CASE 631AA-01
ISSUE D

DATE 10 AUG 2009

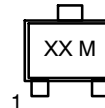


NOTES:

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 BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.

| MILLIMETERS | | | |
|-------------|----------|------|------|
| DIM | MIN | NOM | MAX |
| A | 0.45 | 0.50 | 0.55 |
| b | 0.15 | 0.21 | 0.27 |
| b1 | 0.25 | 0.31 | 0.37 |
| C | 0.07 | 0.12 | 0.17 |
| D | 1.15 | 1.20 | 1.25 |
| E | 0.75 | 0.80 | 0.85 |
| e | 0.40 BSC | | |
| H E | 1.15 | 1.20 | 1.25 |
| L | 0.29 REF | | |
| L2 | 0.15 | 0.20 | 0.25 |

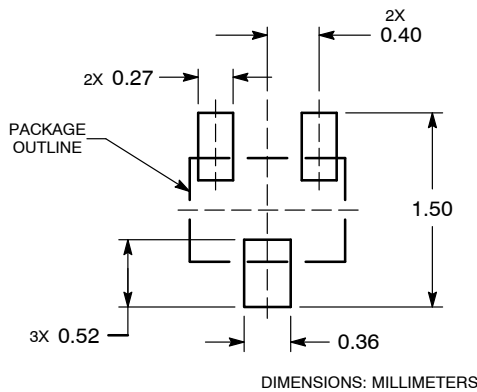
GENERIC MARKING DIAGRAM*



XX = Specific Device Code
M = Date Code

- | | | | | |
|---|--|--|--|--|
| STYLE 1: PIN 1. BASE 2. EMITTER 3. COLLECTOR | STYLE 2: PIN 1. ANODE 2. N/C 3. CATHODE | STYLE 3: PIN 1. ANODE 2. ANODE 3. CATHODE | STYLE 4: PIN 1. CATHODE 2. CATHODE 3. ANODE | STYLE 5: PIN 1. GATE 2. SOURCE 3. DRAIN |
|---|--|--|--|--|

RECOMMENDED SOLDERING FOOTPRINT*



*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G", may or not be present.

*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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| DESCRIPTION: | SOT-723 | PAGE 1 OF 1 |

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