

# MMDL301T1G

## Silicon Hot-Carrier Diodes

### Schottky Barrier Diode

These devices are designed primarily for high-efficiency UHF and VHF detector applications. They are readily adaptable to many other fast switching RF and digital applications. They are supplied in an inexpensive plastic package for low-cost, high-volume consumer and industrial/commercial requirements. They are available in a Surface Mount package.

#### Features

- Extremely Low Minority Carrier Lifetime – 15 ps (Typ)
- Very Low Capacitance – 1.5 pF (Max) @  $V_R = 15$  V
- Low Reverse Leakage –  $I_R = 13$  nAdc (Typ)
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

#### MAXIMUM RATINGS ( $T_J = 125^\circ\text{C}$ unless otherwise noted)

| Rating          | Symbol | Value | Unit |
|-----------------|--------|-------|------|
| Reverse Voltage | $V_R$  | 30    | V    |

#### THERMAL CHARACTERISTICS

| Characteristic  | Symbol          | Max         | Unit                       |
|---|-----------------|-------------|----------------------------|
| Total Device Dissipation FR-5 Board, (Note 1) @ $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$           | 200<br>1.57 | mW<br>mW/ $^\circ\text{C}$ |
| Thermal Resistance, Junction-to-Ambient   | $R_{\theta JA}$ | 635         | $^\circ\text{C}/\text{W}$  |
| Junction and Storage Temperature Range  | $T_J, T_{stg}$  | -55 to +150 | $^\circ\text{C}$           |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. FR-5 Minimum Pad

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

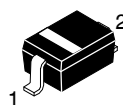
| Characteristic   | Symbol      | Min | Typ  | Max  | Unit |
|--|-------------|-----|------|------|------|
| Reverse Breakdown Voltage<br>( $I_R = 10 \mu\text{A}$ )      | $V_{(BR)R}$ | 30  | -    | -    | V    |
| Total Capacitance<br>( $V_R = 15$ V, $f = 1.0$ MHz) Figure 1 | $C_T$       | -   | 0.9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



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### 30 VOLTS SILICON HOT-CARRIER DETECTOR AND SWITCHING DIODES



PLASTIC  
SOD-323  
CASE 477  
STYLE 1

#### MARKING DIAGRAM



4T = Device Code  
M = Date Code\*  
▪ = Pb-Free Package

(Note: Microdot may be in either location)  
\*Date Code orientation may vary depending upon manufacturing location.

#### ORDERING INFORMATION

| Device     | Package              | Shipping <sup>†</sup> |
|------------|----------------------|-----------------------|
| MMDL301T1G | SOD-323<br>(Pb-Free) | 3000 / Tape & Reel    |

<sup>†</sup>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

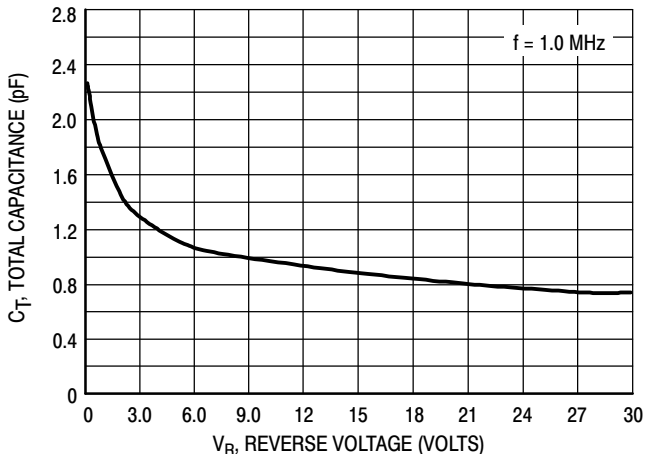


Figure 1. Total Capacitance

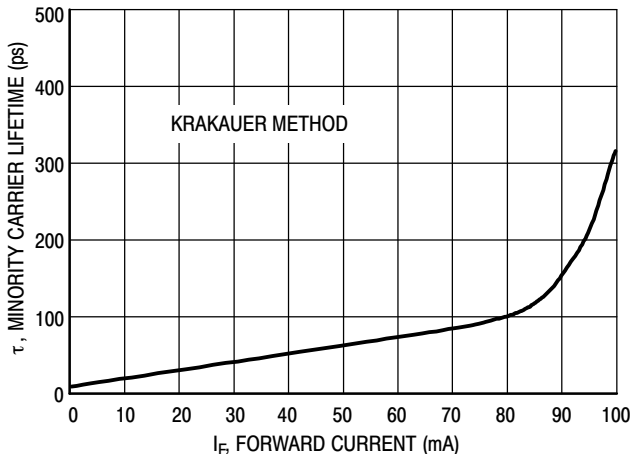


Figure 2. Minority Carrier Lifetime

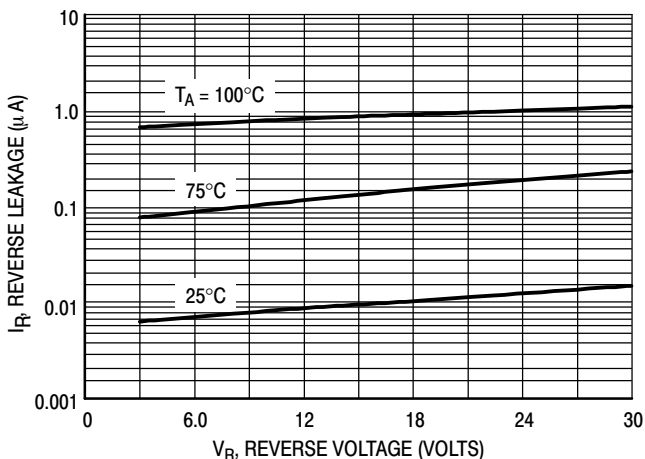


Figure 3. Reverse Leakage

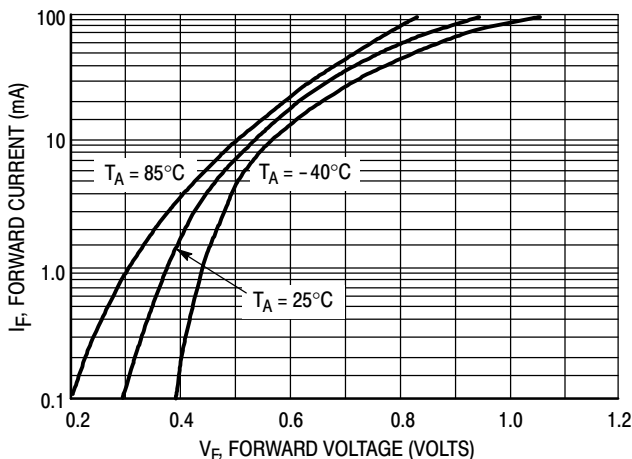


Figure 4. Forward Voltage

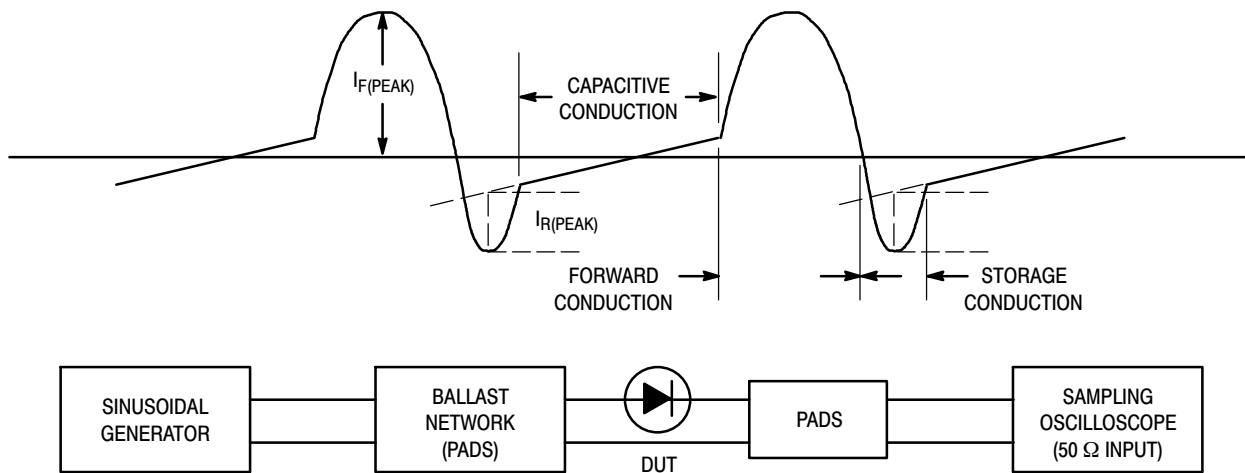


Figure 5. Krakauer Method of Measuring Lifetime

# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

ON Semiconductor®



SOD-323  
CASE 477-02  
ISSUE H

DATE 13 MAR 2007



SCALE 4:1



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. LEAD THICKNESS SPECIFIED PER L/F DRAWING WITH SOLDER PLATING.
4. DIMENSIONS A AND B DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.
5. DIMENSION L IS MEASURED FROM END OF RADIUS.

| DIM | MILLIMETERS |      |       | INCHES    |       |       |
|-----|-------------|------|-------|-----------|-------|-------|
|     | MIN         | NOM  | MAX   | MIN       | NOM   | MAX   |
| A   | 0.80        | 0.90 | 1.00  | 0.031     | 0.035 | 0.040 |
| A1  | 0.00        | 0.05 | 0.10  | 0.000     | 0.002 | 0.004 |
| A3  | 0.15 REF    |      |       | 0.006 REF |       |       |
| b   | 0.25        | 0.32 | 0.4   | 0.010     | 0.012 | 0.016 |
| C   | 0.089       | 0.12 | 0.177 | 0.003     | 0.005 | 0.007 |
| D   | 1.60        | 1.70 | 1.80  | 0.062     | 0.066 | 0.070 |
| E   | 1.15        | 1.25 | 1.35  | 0.045     | 0.049 | 0.053 |
| L   | 0.08        |      |       | 0.003     |       |       |
| HE  | 2.30        | 2.50 | 2.70  | 0.090     | 0.098 | 0.105 |

### GENERIC MARKING DIAGRAM\*



XX = Specific Device Code  
M = Date Code

\*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.

### SOLDERING 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.

STYLE 1:  
PIN 1. CATHODE (POLARITY BAND)  
2. ANODE

STYLE 2:  
NO POLARITY

|                  |             |  |
|------------------|-------------|--|
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| DESCRIPTION:     | SOD-323     | PAGE 1 OF 1  |

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