## **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) @  $V_R = 15 \text{ V}$
- Low Reverse Leakage  $I_R = 13 \text{ nAdc (Typ)}$
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

#### MAXIMUM RATINGS (T<sub>J</sub> = 125°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 <sub>A</sub> = 25°C Derate above 25°C	P <sub>D</sub>	200 1.57	mW mW/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	635	°C/W
Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to +150	°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.

#### **ELECTRICAL CHARACTERISTICS** (T<sub>A</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Тур	Max	Unit
Reverse Breakdown Voltage (I <sub>R</sub> = 10 μA)	V <sub>(BR)R</sub>	30	-	-	V
Total Capacitance (V <sub>R</sub> = 15 V, f = 1.0 MHz) Figure 1	C <sub>T</sub>	-	0.9	1.5	pF
Reverse Leakage (V <sub>R</sub> = 25 V) Figure 3	I <sub>R</sub>	-	13	200	nAdc
Forward Voltage (I <sub>F</sub> = 1.0 mAdc) Figure 4	V <sub>F</sub>	-	0.38	0.45	Vdc
Forward Voltage (I <sub>F</sub> = 10 mAdc) Figure 4	V <sub>F</sub>	_	0.52	0.6	Vdc



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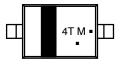
# 30 VOLTS SILICON HOT-CARRIER DETECTOR AND SWITCHING DIODES





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 (Pb-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 Specifications Brochure, BRD8011/D.

<sup>1.</sup> FR-5 Minimum Pad

#### MMDL301T1G

#### TYPICAL ELECTRICAL CHARACTERISTICS

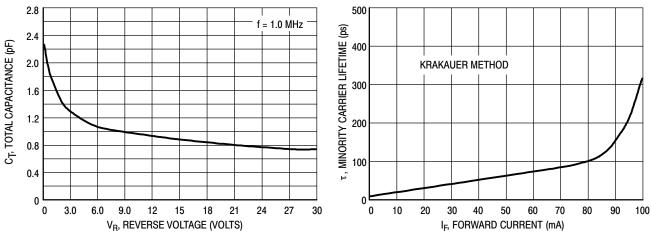


Figure 1. Total Capacitance

Figure 2. Minority Carrier Lifetime

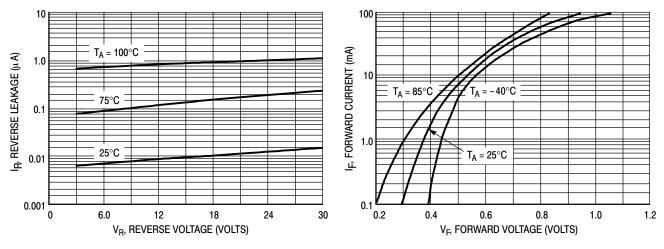


Figure 3. Reverse Leakage

Figure 4. Forward Voltage

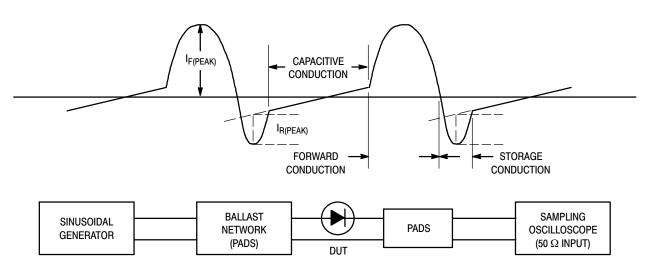
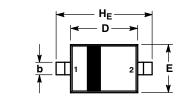


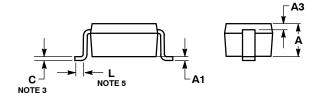
Figure 5. Krakauer Method of Measuring Lifetime

#### MMDL301T1G

#### PACKAGE DIMENSIONS

SOD-323 CASE 477-02 ISSUE H





#### NOTES

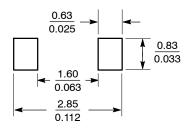
- 1. DIMENSIONING AND TOLERANCING PER ANSI
- Y14.5M. 1982.
- CONTROLLING DIMENSION: MILLIMETERS.
- LEAD THICKNESS SPECIFIED PER L/F DRAWING WITH SOLDER PLATING.
  DIMENSIONS A AND B DO NOT INCLUDE MOLD
- FLASH, PROTRUSIONS OR GATE BURRS.
  DIMENSION L IS MEASURED FROM END OF RADIUS.

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
Α	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		0.15 REF 0.006 REF		F	
b	0.25	0.32	0.4	0.010	0.012	0.016
С	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

#### STYLE 1:

PIN 1. CATHODE (POLARITY BAND)

#### **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.

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