

Silicon Hot-Carrier Diodes

Schottky Barrier Diode

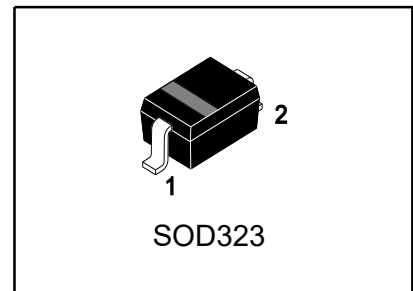
These devices are designed primarily for high-efficiency UHF and VHF detector applications. They are readily adaptable to many other fast switching RF and digital applications. They are supplied in an inexpensive plastic package for low-cost, high-volume consumer and industrial/commercial requirements.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

- 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)
- Device Marking: 4T
- We declare that the material of product compliance with RoHS requirements.
- S- Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.



MDL301
S-MDL301

30 VOLTS SILICON
HOT-CARRIER DETECTOR
AND SWITCHING DIODES



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

Symbol	Rating	Value	Unit
V_R	Reverse Voltage	30	Volts

THERMAL CHARACTERISTICS

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

*FR-5 Minimum Pad

ORDERING INFORMATION

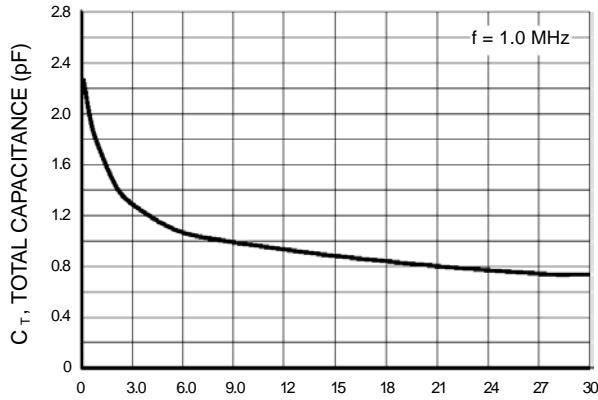
Device	Marking	Shipping
MDL301 S-MDL301	4T	3000 / Tape & Reel

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

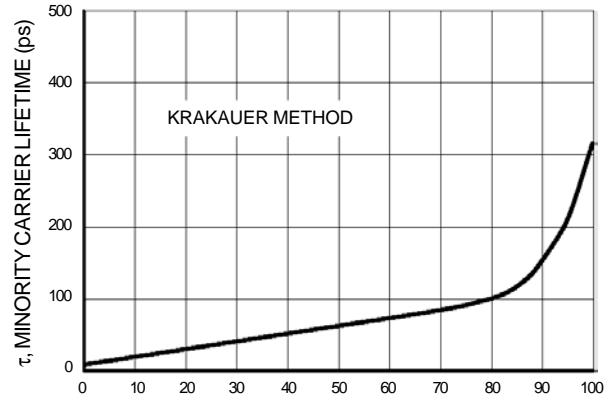
Characteristic	Symbol	Min	Typ	Max	Unit
Reverse Breakdown Voltage ($I_R = 10\ \mu\text{A}$)	$V_{(BR)R}$	30	—	—	Volts
Diode Capacitance ($V_R = 15\text{ V}, f = 1.0\text{MHz}$) Figure 1	C_T	—	0.9	1.5	pF
Reverse Leakage ($V_R = 25\text{ V}$) Figure 3	I_R	—	13	200	nAdc
Forward Voltage ($I_F = 1.0\text{ mAdc}$) 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



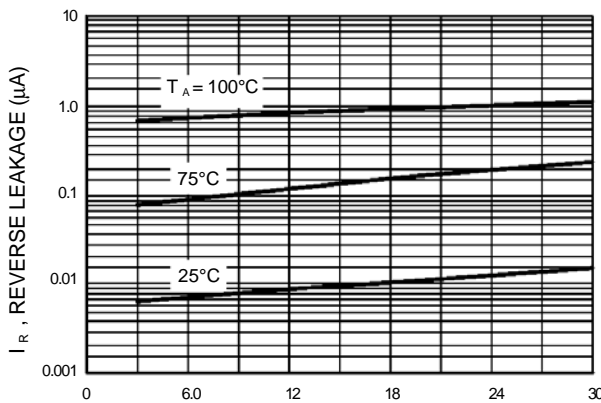
TYPICAL ELECTRICAL CHARACTERISTICS



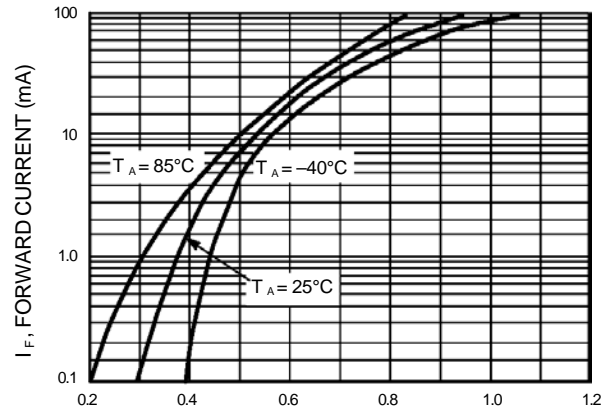
V_R , REVERSE VOLTAGE (VOLTS)
Figure 1. Total Capacitance



I_F , FORWARD CURRENT (mA)
Figure 2. Minority Carrier Lifetime



V_R , REVERSE VOLTAGE (VOLTS)
Figure 3. Reverse Leakage



V_F , FORWARD VOLTAGE (VOLTS)
Figure 4. Forward Voltage

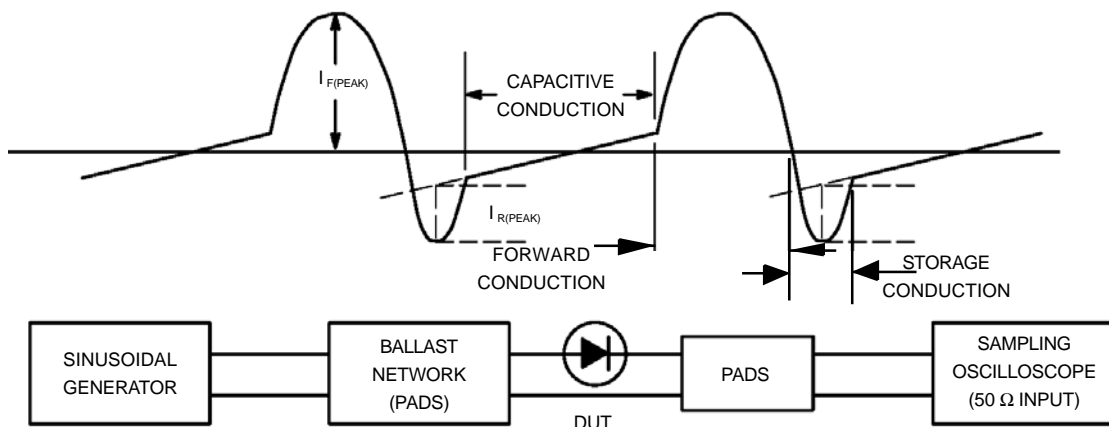
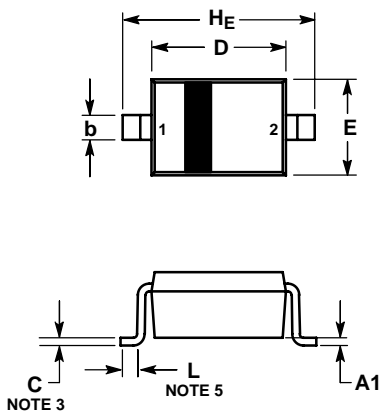


Figure 5. Krakauer Method of Measuring Lifetime



PACKAGE DIMENSIONS

SOD-323



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		
Hf	2.30	2.50	2.70	0.090	0.098	0.105

SOLDERING FOOTPRINT*

