MBD301, MMBD301LT1

Preferred Device

Silicon Hot-Carrier Diodes

SCHOTTKY Barrier Diodes

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 also 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) MBD301, MMBD301
- Pb−Free Packages are Available

ON Semiconductor®

http://onsemi.com

30 VOLTS
SILICON HOT−CARRIER DETECTOR AND SWITCHING DIODES

MAXIMUM RATINGS

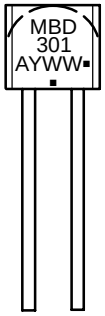
		MBD301	MMBD301LT1	
Rating	**Symbol**	**Value**		**Unit**
Reverse Voltage	V_R	30		V
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_F	280 2.8	200 2.0	mW mW/°C
Operating and Storage Junction Temperature Range	T_J	−55 to +125		°C
Storage Temperature Range	T_{stg}	−55 to +150		°C

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

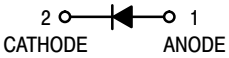
MBD301

MARKING DIAGRAM

TO−92
(TO−226AC)
CASE 182−06
STYLE 1

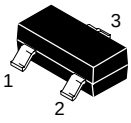


A = Assembly Location
Y = Year
WW = Work Week
▪ = Pb−Free Package
(Note: Microdot may be in either location)

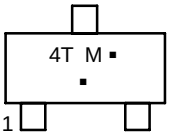


MMBD301LT1

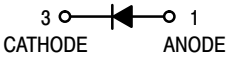
MARKING DIAGRAM



SOT−23
(TO−236)
CASE 318−08
STYLE 8



M = Date Code
▪ = Pb−Free Package
(Note: Microdot may be in either location)



ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

Preferred devices are recommended choices for future use and best overall value.

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

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

ORDERING INFORMATION

Device	Package	Shipping†
MBD301	TO−92	5,000 Units / Bulk
MBD301G	TO−92 (Pb−Free)	5,000 Units / Bulk
MMBD301LT1	SOT−23	3,000 / Tape & Reel
MMBD301LT1G	SOT−23 (Pb−Free)	3,000 / Tape & Reel
MMBD301LT3	SOT−23	10,000 / Tape & Reel
MMBD301LT3G	SOT−23 (Pb−Free)	10,000 / 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.

TYPICAL ELECTRICAL CHARACTERISTICS

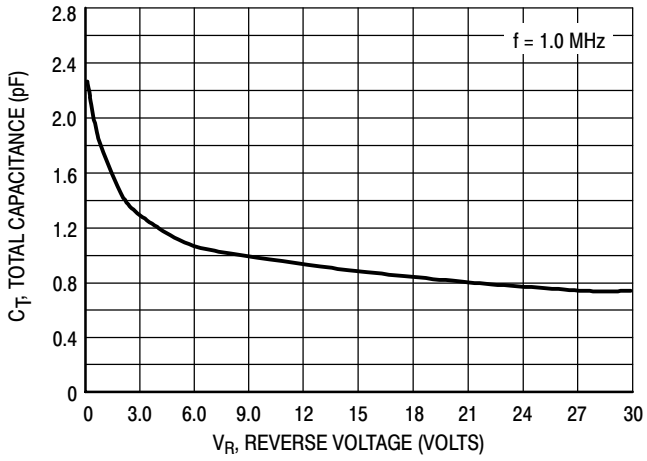


Figure 1. Total Capacitance

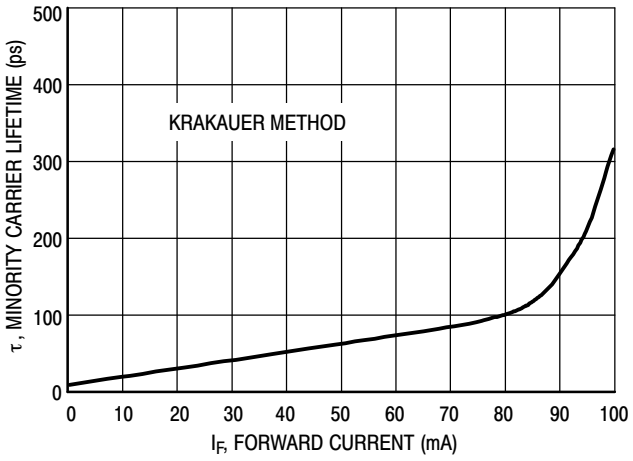


Figure 2. Minority Carrier Lifetime

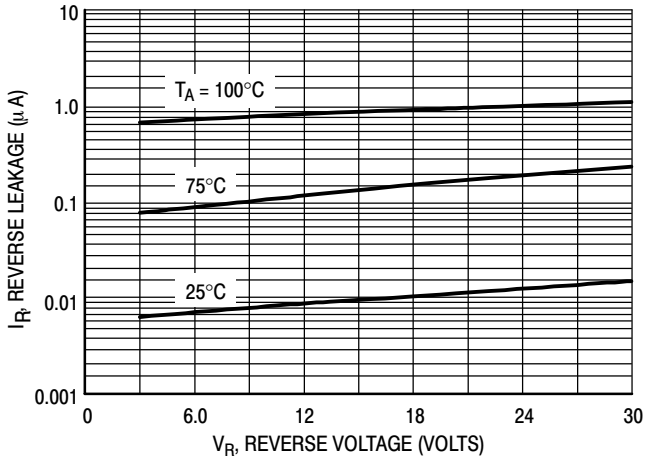


Figure 3. Reverse Leakage

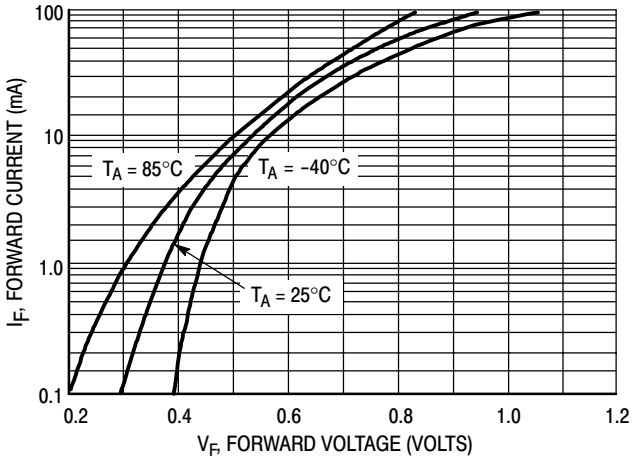


Figure 4. Forward Voltage

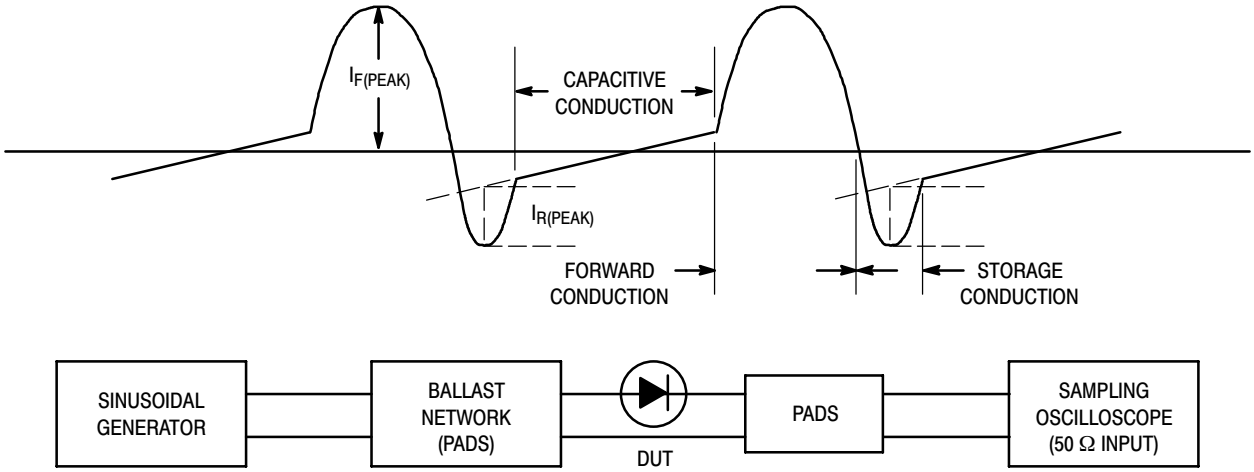
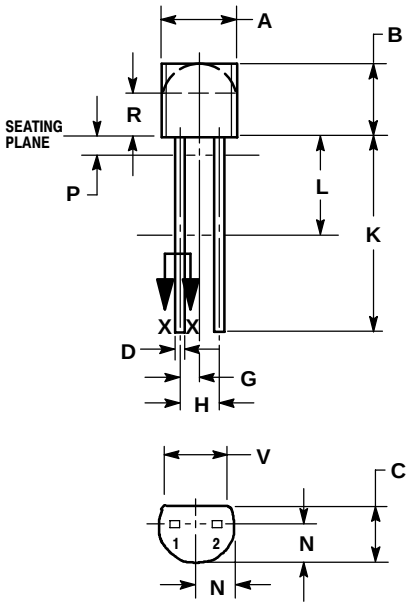
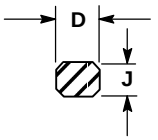


Figure 5. Krakauer Method of Measuring Lifetime

PACKAGE DIMENSIONS

TO−92 (TO−226AC)
CASE 182−06
ISSUE L





SECTION X−X

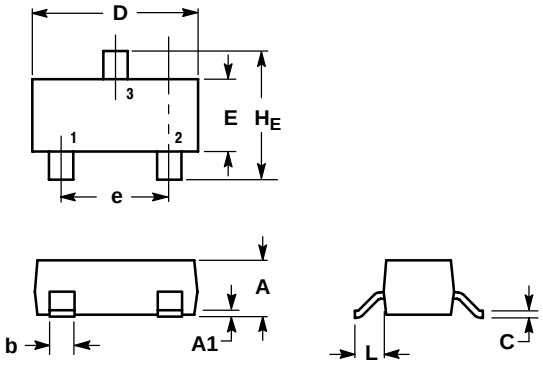
NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND ZONE R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.21
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.021	0.407	0.533
G	0.050 BSC		1.27 BSC	
H	0.100 BSC		2.54 BSC	
J	0.014	0.016	0.36	0.41
K	0.500	---	12.70	---
L	0.250	---	6.35	---
N	0.080	0.105	2.03	2.66
P	---	0.050	---	1.27
R	0.115	---	2.93	---
V	0.135	---	3.43	---

STYLE 1:
PIN 1. ANODE
2. CATHODE

PACKAGE DIMENSIONS

SOT−23 (TO−236)
CASE 318−08
ISSUE AL

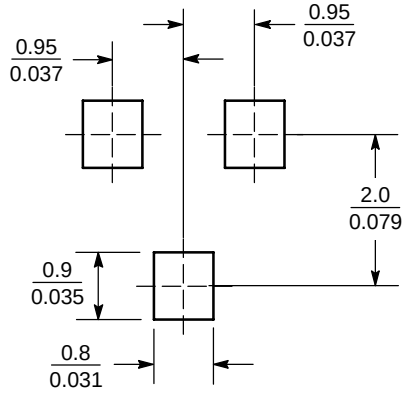


STYLE 8:
PIN 1. ANODE
2. NO CONNECTION
3. CATHODE

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318−01 THRU −07 AND −09 OBSOLETE, NEW STANDARD 318−08.

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
A	0.89	1.00	1.11	0.035	0.040	0.044
A1	0.01	0.06	0.10	0.001	0.002	0.004
b	0.37	0.44	0.50	0.015	0.018	0.020
c	0.09	0.13	0.18	0.003	0.005	0.007
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	0.081
L	0.35	0.54	0.69	0.014	0.021	0.029
H_E	2.10	2.40	2.64	0.083	0.094	0.104

SOLDERING FOOTPRINT*



SCALE 10:1 $\left(\frac{mm}{inches}\right)$

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 61312, Phoenix, Arizona 85082−1312 USA
Phone: 480−829−7710 or 800−344−3860 Toll Free USA/Canada
Fax: 480−829−7709 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800−282−9855 Toll Free USA/Canada

Japan: ON Semiconductor, Japan Customer Focus Center
2−9−1 Kamimeguro, Meguro−ku, Tokyo, Japan 153−0051
Phone: 81−3−5773−3850

ON Semiconductor Website: http://onsemi.com

Order Literature: http://www.onsemi.com/litorder

For additional information, please contact your local Sales Representative.