MBD701, MMBD701L, SMMBD701L

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 − 1.0 pF @ V_R = 20 V
- High Reverse Voltage − to 70 V
- Low Reverse Leakage − 200 nA (Max)
- S Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC Qualified and PPAP Capable
- These Devices are Pb−Free and are RoHS Compliant

MAXIMUM RATINGS

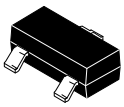
Rating	Symbol	Value	Unit
Reverse Voltage	V_R	70	V
Forward Power Dissipation @ T_A = 25°C MBD701 MMBD701L, SMMBD701L Derate above 25°C MBD701 MMBD701L, SMMBD701L	P_F	 280 200 2.8 2.0	mW mW/°C
Operating Junction Temperature Range	T_J	−55 to +125	°C
Storage Temperature Range	T_{stg}	−55 to +150	°C

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.

ON Semiconductor®

www.onsemi.com

TO−92 2−Lead
CASE 182
STYLE 1

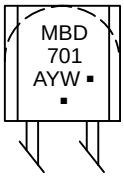


SOT−23 (TO−236)
CASE 318
STYLE 8

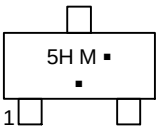
TO−92

SOT−23

MARKING DIAGRAMS



TO−92



SOT−23

A = Assembly Location
Y = Year
W = Work Week
5H = Device Code (SOT−23)
M = Date Code*
▪ = Pb−Free Package

(Note: Microdot may be in either location)

*Date Code orientation and/or overbar may vary depending upon manufacturing location.

ORDERING INFORMATION

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

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

Characteristic	Symbol	Min	Typ	Max	Unit
Reverse Breakdown Voltage (I_R = 10 μAdc)	$V_{(BR)R}$	70	–	–	V
Total Capacitance (V_R = 20 V, f = 1.0 MHz) Figure 1	C_T	–	0.5	1.0	pF
Reverse Leakage (V_R = 35 V) Figure 3	I_R	–	9.0	200	nAdc
Forward Voltage (I_F = 1.0 mAdc) Figure 4	V_F	–	0.42	0.5	Vdc
Forward Voltage (I_F = 10 mAdc) Figure 4	V_F	–	0.7	1.0	Vdc

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

ORDERING INFORMATION

Device	Package	Shipping†
MBD701G	TO−92 (Pb−Free)	1,000 Units / Bulk
MMBD701LT1G	SOT−23 (Pb−Free)	3,000 / Tape & Reel
SMMBD701LT1G	SOT−23 (Pb−Free)	3,000 / Tape & Reel
MMBD701LT3G	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

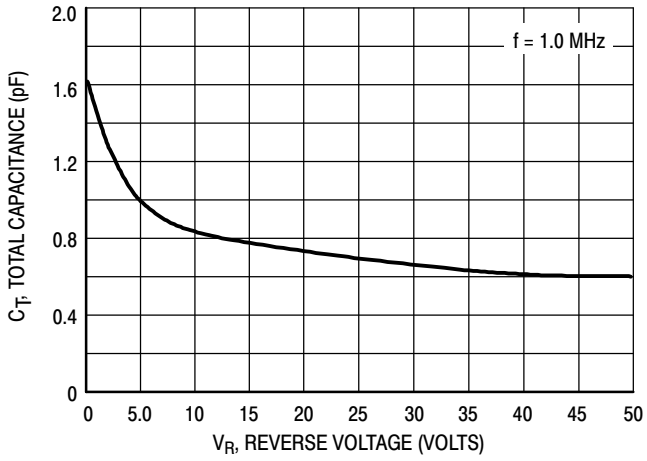


Figure 1. Total Capacitance

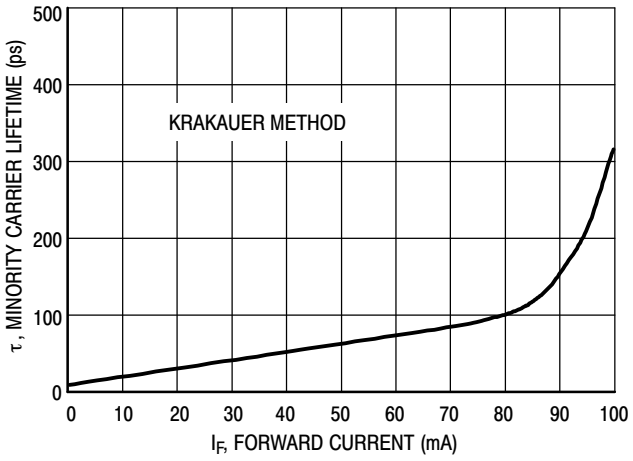


Figure 2. Minority Carrier Lifetime

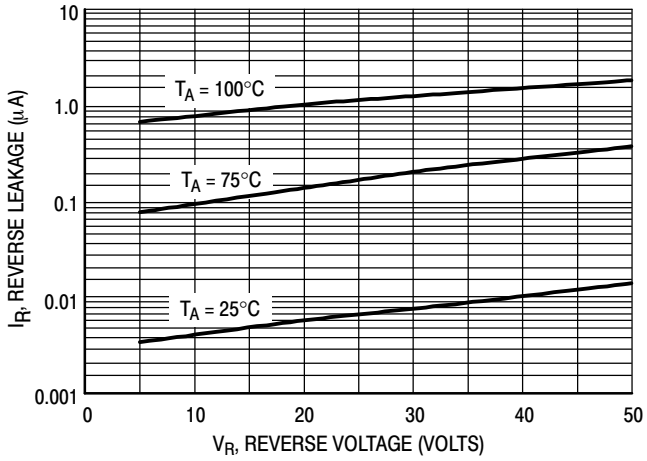


Figure 3. Reverse Leakage

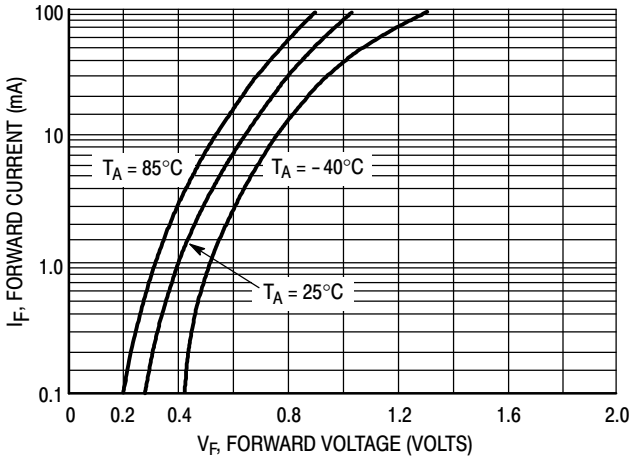


Figure 4. Forward Voltage

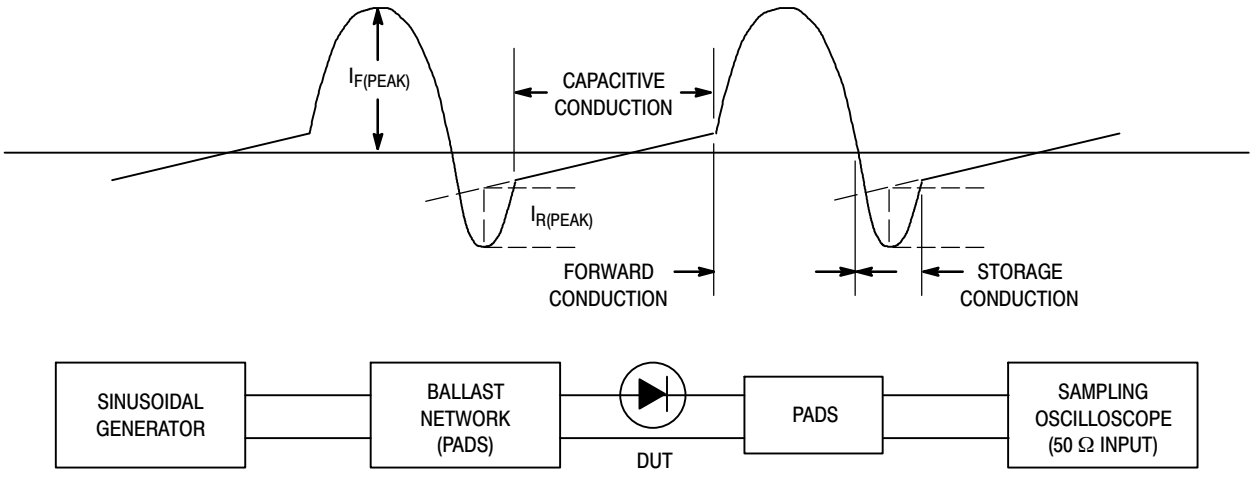
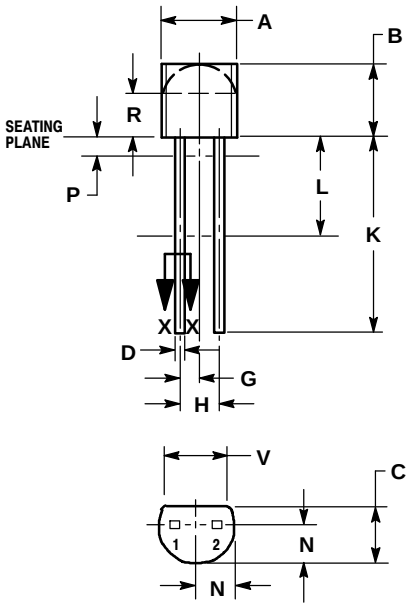
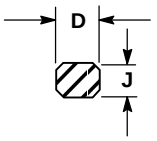


Figure 5. Krakauer Method of Measuring Lifetime

PACKAGE DIMENSIONS

TO−92 (TO−226AC)
CASE 182−06
ISSUE L





SECTION X−X

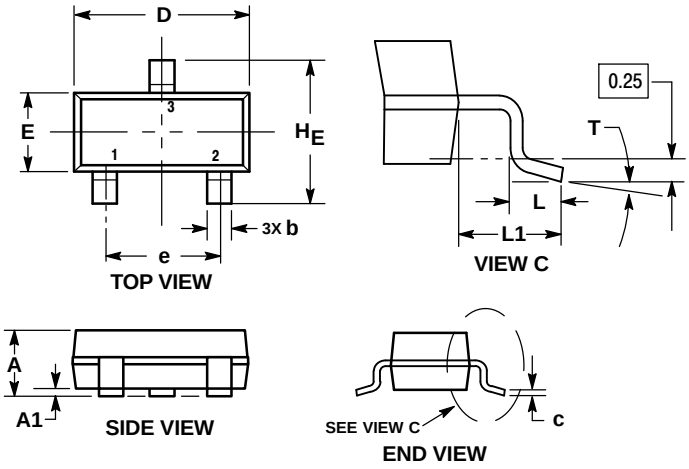
NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND ZONE R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

	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 AR

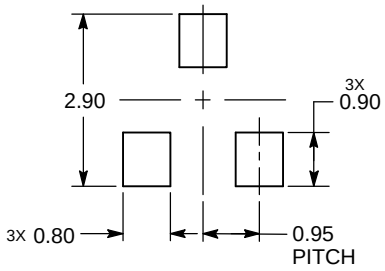


NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
A	0.89	1.00	1.11	0.035	0.039	0.044
A1	0.01	0.06	0.10	0.000	0.002	0.004
b	0.37	0.44	0.50	0.015	0.017	0.020
c	0.08	0.14	0.20	0.003	0.006	0.008
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	0.080
L	0.30	0.43	0.55	0.012	0.017	0.022
L1	0.35	0.54	0.69	0.014	0.021	0.027
H_E	2.10	2.40	2.64	0.083	0.094	0.104
T	0°	−−−	10°	0°	−−−	10°

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

RECOMMENDED SOLDERING FOOTPRINT*



DIMENSIONS: MILLIMETERS

*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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