

# MMBV809LT1

Preferred Device

## Silicon Tuning Diode

This device is designed for 900 MHz frequency control and tuning applications. It provides solid-state reliability in replacement of mechanical tuning methods.

### Features

- Controlled and Uniform Tuning Ratio
- Available in Surface Mount Package
- Available in 8 mm Tape and Reel
- Pb-Free Packages are Available

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Reverse Voltage	$V_R$	20	Vdc
Forward Current	$I_F$	20	mAdc
Total Power Dissipation (Note 1) @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	225 1.8	mW mW/ $^\circ\text{C}$
Junction Temperature	$T_J$	+125	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55 to +125	$^\circ\text{C}$

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.

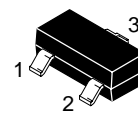
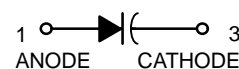
1. FR5 Board 1.0 x 0.75 x 0.62 in.



ON Semiconductor®

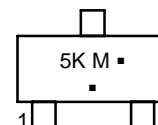
<http://onsemi.com>

## 4.5–6.1 pF VOLTAGE VARIABLE CAPACITANCE DIODE



SOT-23 (TO-236)  
CASE 318  
STYLE 8

### MARKING DIAGRAM



5K = Specific Device Code

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

Device	Package	Shipping†
MMBV809LT1	SOT-23	3,000 / Tape & Reel
MMBV809LT1G	SOT-23 (Pb-Free)	3,000 / Tape & Reel
MMBV809LT3	SOT-23	10,000 / Tape & Reel
MMBV809LT3G	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.

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

# MMBV809LT1

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

Characteristic – All Types	Symbol	Min	Typ	Max	Unit
Reverse Breakdown Voltage (I <sub>R</sub> = 10 μAdc)	V <sub>(BR)R</sub>	20	–	–	Vdc
Reverse Voltage Leakage Current (V <sub>R</sub> = 15 Vdc)	I <sub>R</sub>	–	–	50	nAdc

Device	C <sub>t</sub> , Diode Capacitance V <sub>R</sub> = 2.0 Vdc, f = 1.0 MHz pF			Q, Figure of Merit V <sub>R</sub> = 3.0 Vdc f = 500 MHz	C <sub>R</sub> , Capacitance Ratio C <sub>2</sub> /C <sub>8</sub> f = 1.0 MHz (Note 2)	
	Min	Typ	Max	Typ	Min	Max
MMBV809LT1	4.5	5.3	6.1	75	1.8	2.6

2. C<sub>R</sub> is the ratio of C<sub>t</sub> measured at 2.0 Vdc divided by C<sub>t</sub> measured at 8.0 Vdc.

## TYPICAL CHARACTERISTICS

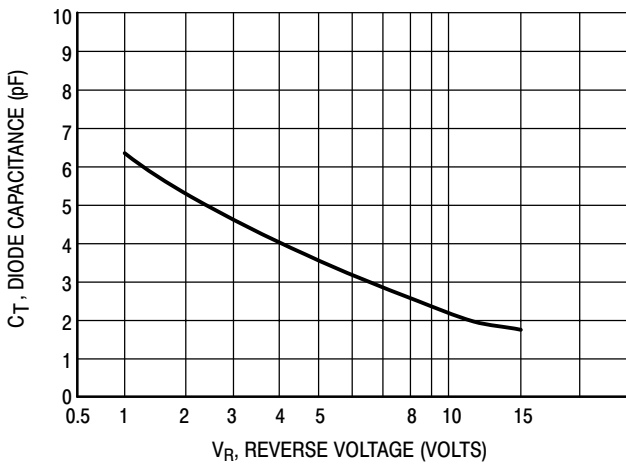


Figure 1. Diode Capacitance

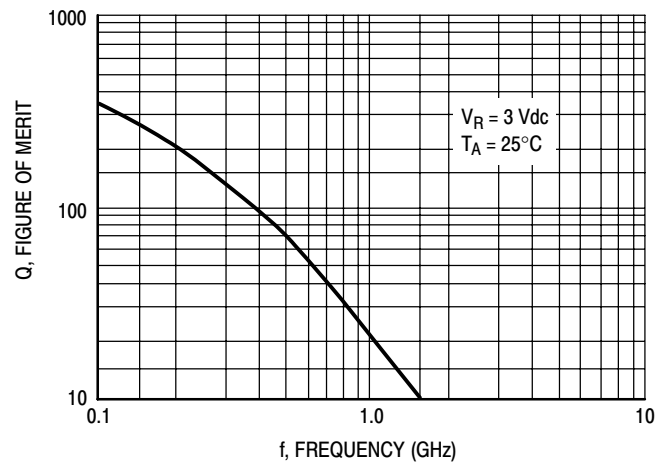


Figure 2. Figure of Merit

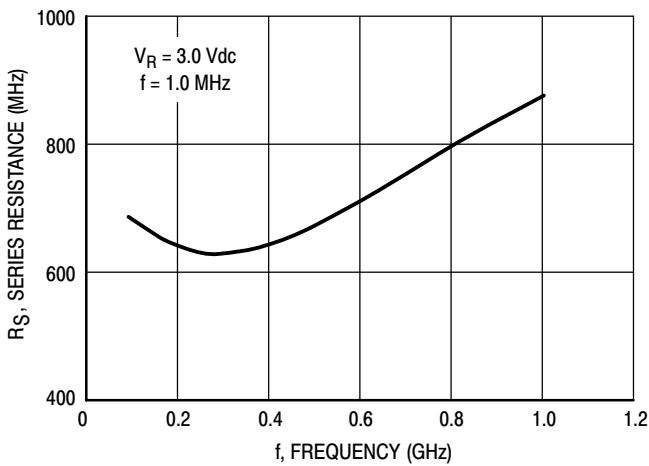


Figure 3. Series Resistance

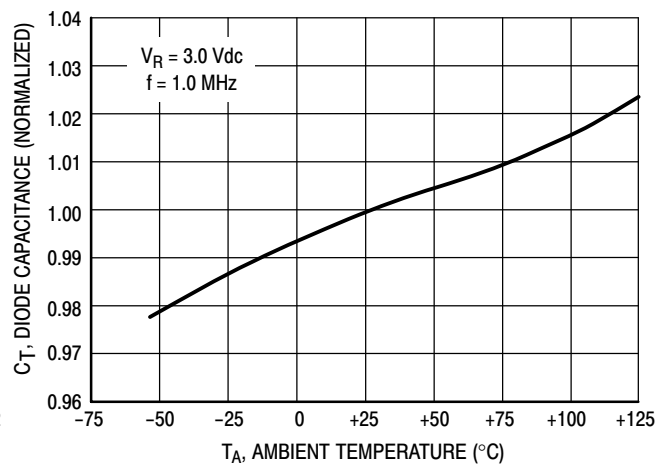
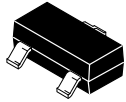


Figure 4. Diode Capacitance

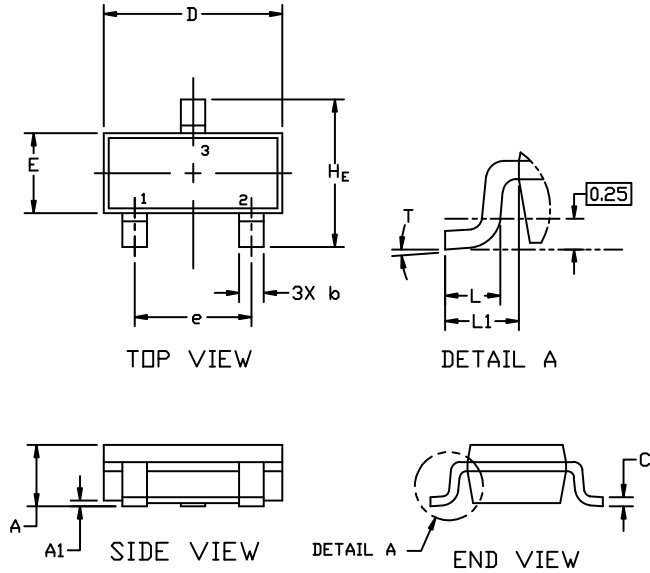
# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS



**SOT-23 (TO-236)**  
CASE 318  
ISSUE AT

DATE 01 MAR 2023

SCALE 4:1



**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.

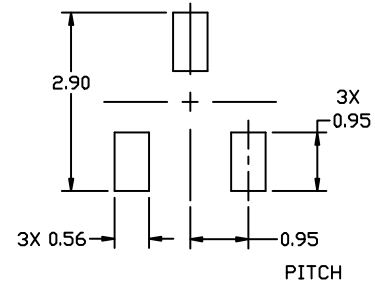
DIM	MILLIMETERS			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.89	1.00	1.11	0.035	0.039	0.044
A1	0.01	0.06	0.10	0.000	0.002	0.004
b	0.37	0.44	0.50	0.015	0.017	0.020
c	0.08	0.14	0.20	0.003	0.006	0.008
D	2.80	2.90	3.04	0.110	0.114	0.120
E	1.20	1.30	1.40	0.047	0.051	0.055
e	1.78	1.90	2.04	0.070	0.075	0.080
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 <sub>E</sub>	2.10	2.40	2.64	0.083	0.094	0.104
T	0°	---	10°	0°	---	10°

**GENERIC MARKING DIAGRAM\***



- XXX = Specific Device Code
- M = Date Code
- = Pb-Free Package

\*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. Some products may not follow the Generic Marking.



**RECOMMENDED MOUNTING 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.

**STYLES ON PAGE 2**

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**MECHANICAL CASE OUTLINE  
PACKAGE DIMENSIONS**



**SOT-23 (TO-236)  
CASE 318  
ISSUE AT**

DATE 01 MAR 2023

- STYLE 1 THRU 5:  
CANCELLED
- STYLE 6:  
PIN 1. BASE  
2. EMITTER  
3. COLLECTOR
- STYLE 7:  
PIN 1. EMITTER  
2. BASE  
3. COLLECTOR
- STYLE 8:  
PIN 1. ANODE  
2. NO CONNECTION  
3. CATHODE
- STYLE 9:  
PIN 1. ANODE  
2. ANODE  
3. CATHODE
- STYLE 10:  
PIN 1. DRAIN  
2. SOURCE  
3. GATE
- STYLE 11:  
PIN 1. ANODE  
2. CATHODE  
3. CATHODE-ANODE
- STYLE 12:  
PIN 1. CATHODE  
2. CATHODE  
3. ANODE
- STYLE 13:  
PIN 1. SOURCE  
2. DRAIN  
3. GATE
- STYLE 14:  
PIN 1. CATHODE  
2. GATE  
3. ANODE
- STYLE 15:  
PIN 1. GATE  
2. CATHODE  
3. ANODE
- STYLE 16:  
PIN 1. ANODE  
2. CATHODE  
3. CATHODE
- STYLE 17:  
PIN 1. NO CONNECTION  
2. ANODE  
3. CATHODE
- STYLE 18:  
PIN 1. NO CONNECTION  
2. CATHODE  
3. ANODE
- STYLE 19:  
PIN 1. CATHODE  
2. ANODE  
3. CATHODE-ANODE
- STYLE 20:  
PIN 1. CATHODE  
2. ANODE  
3. GATE
- STYLE 21:  
PIN 1. GATE  
2. SOURCE  
3. DRAIN
- STYLE 22:  
PIN 1. RETURN  
2. OUTPUT  
3. INPUT
- STYLE 23:  
PIN 1. ANODE  
2. ANODE  
3. CATHODE
- STYLE 24:  
PIN 1. GATE  
2. DRAIN  
3. SOURCE
- STYLE 25:  
PIN 1. ANODE  
2. CATHODE  
3. GATE
- STYLE 26:  
PIN 1. CATHODE  
2. ANODE  
3. NO CONNECTION
- STYLE 27:  
PIN 1. CATHODE  
2. CATHODE  
3. CATHODE
- STYLE 28:  
PIN 1. ANODE  
2. ANODE  
3. ANODE

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