

# MMBV109LT1, MV209

Preferred Devices

## Silicon Epicap Diodes

Designed for general frequency control and tuning applications; providing solid-state reliability in replacement of mechanical tuning methods.

### Features

- High Q with Guaranteed Minimum Values at VHF Frequencies
- Controlled and Uniform Tuning Ratio
- Available in Surface Mount Package
- Pb-Free Packages are Available

### MAXIMUM RATINGS ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

Rating	Symbol	Value	Unit
Reverse Voltage	$V_R$	30	Vdc
Forward Current	$I_F$	200	mAdc
Forward Power Dissipation MMBV109LT1 @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$ MV209	$P_D$	200 2.0	mW mW/ $^\circ\text{C}$
@ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$		200 1.6	mW mW/ $^\circ\text{C}$
Junction Temperature	$T_J$	+125	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55 to +150	$^\circ\text{C}$

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.

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

Characteristic	Symbol	Min	Typ	Max	Unit
Reverse Breakdown Voltage ( $I_R = 10 \mu\text{Adc}$ )	$V_{(BR)R}$	30	-	-	Vdc
Reverse Voltage Leakage Current ( $V_R = 25 \text{Vdc}$ )	$I_R$	-	-	0.1	$\mu\text{Adc}$
Diode Capacitance Temperature Coefficient ( $V_R = 3.0 \text{Vdc}$ , $f = 1.0 \text{MHz}$ )	$TC_C$	-	300	-	ppm/ $^\circ\text{C}$



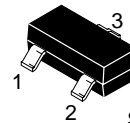
ON Semiconductor®

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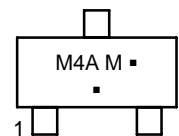
## 26–32 pF VOLTAGE VARIABLE CAPACITANCE DIODES



### MARKING DIAGRAMS



SOT-23 (TO-236)  
CASE 318-08  
STYLE 8



M4A = Device Code

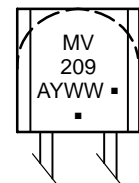
M = Date Code\*

▪ = Pb-Free Package

(Note: Microdot may be in either location)  
\*Date Code orientation and/or overbar may vary depending upon manufacturing location.



TO-92 (TO-226AC)  
CASE 182  
STYLE 1



MV209 = Device Code

A = Assembly Location

Y = Year

WW = Work Week

▪ = 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.

# MMBV109LT1, MV209

Device	Package	Shipping†	C <sub>t</sub> , Diode Capacitance V <sub>R</sub> = 3.0 Vdc, f = 1.0 MHz pF			Q, Figure of Merit V <sub>R</sub> = 3.0 Vdc f = 50 MHz	C <sub>R</sub> , Capacitance Ratio C <sub>3</sub> /C <sub>25</sub> f = 1.0 MHz (Note 1)	
			Min	Nom	Max	Min	Min	Max
MMBV109LT1	SOT-23	3,000 / Tape & Reel	26	29	32	200	5.0	6.5
MMBV109LT1G	SOT-23 (Pb-Free)	3,000 / Tape & Reel						
MMBV109LT3	SOT-23	10,000 / Tape & Reel						
MMBV109LT3G	SOT-23 (Pb-Free)	10,000 / Tape & Reel						
MV209	TO-92	1,000 Units / Bag						
MV209G	TO-92 (Pb-Free)	1,000 Units / Bag						

1. C<sub>R</sub> is the ratio of C<sub>t</sub> measured at 3 Vdc divided by C<sub>t</sub> measured at 25 Vdc.

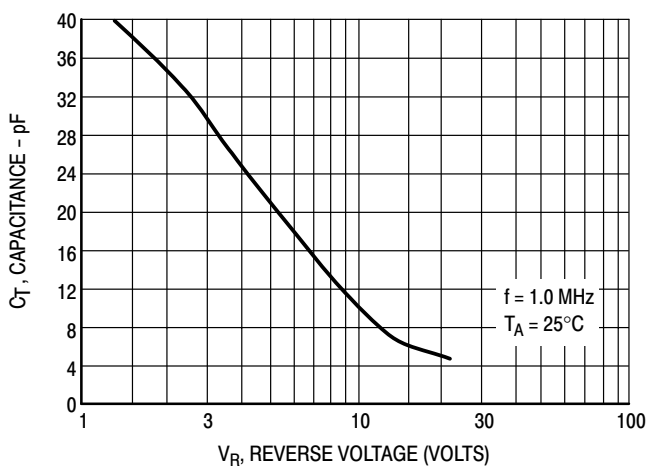


Figure 1. DIODE CAPACITANCE

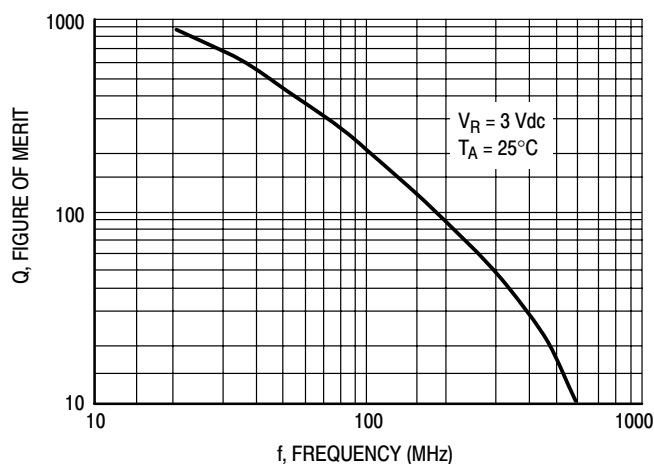


Figure 2. FIGURE OF MERIT

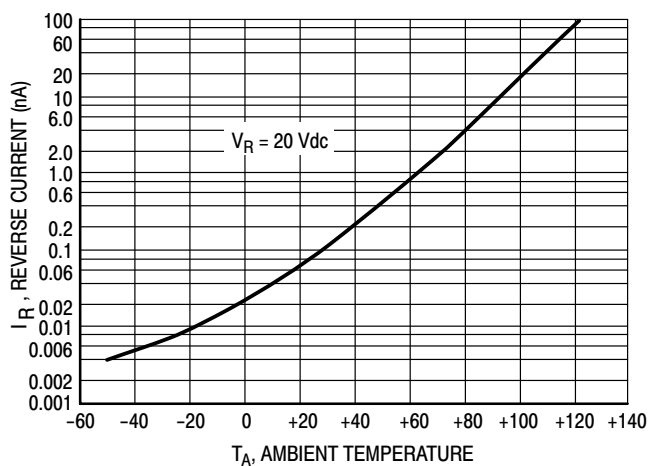


Figure 3. LEAKAGE CURRENT

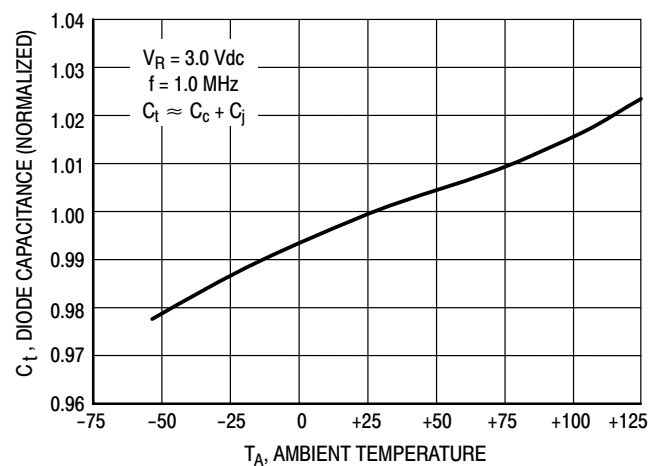


Figure 4. DIODE CAPACITANCE

## NOTES ON TESTING AND SPECIFICATIONS

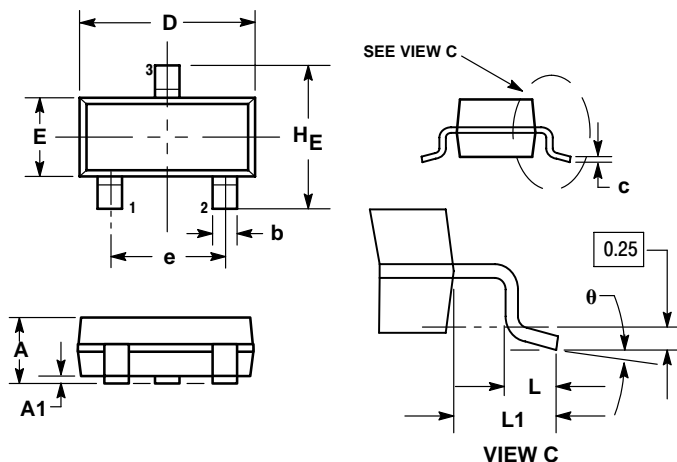
# MMBV109LT1, MV209

## PACKAGE DIMENSIONS

SOT-23 (TO-236)

CASE 318-08

ISSUE AN



NOTES:

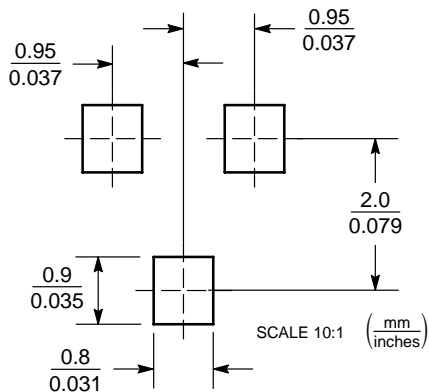
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318-01 THRU -07 AND -09 OBSOLETE, NEW STANDARD 318-08.

DIM	MILLIMETERS			INCHES		
	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	0.10	0.20	0.30	0.004	0.008	0.012
L1	0.35	0.54	0.69	0.014	0.021	0.029
HE	2.10	2.40	2.64	0.083	0.094	0.104

STYLE 8:

1. ANODE
2. NO CONNECTION
3. CATHODE

### SOLDERING FOOTPRINT\*

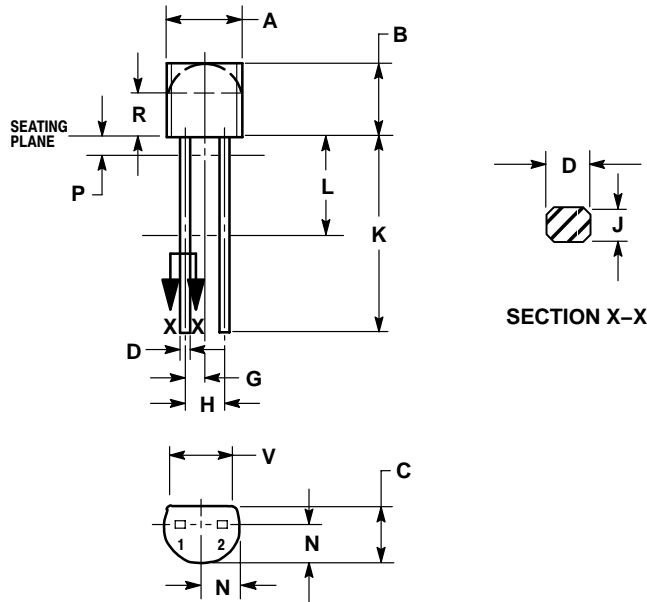


\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

# MMBV109LT1, MV209

## PACKAGE DIMENSIONS

TO-92 (TO-226AC)  
CASE 182-06  
ISSUE L



### 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.

DIM	INCHES		MILLIMETERS	
	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
- CATHODE

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