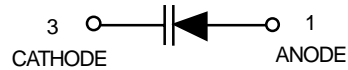


## Silicon Tuning Diode

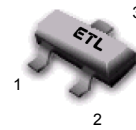
These devices are designed in the popular PLASTIC PACKAGE for high volumerequirements of FM Radio and TV tuning and AFC, general frequency control andtuning applications.They provide solid–state reliability in replacement of mechanical tuning methods. Also available in Surface Mount Package up to 33pF.

- High Q
- Controlled and Uniform Tuning Ratio
- Standard Capacitance Tolerance —10%
- Complete Typical Design Curves



**MMBV2101LT1**  
**MMBV2103LT1**  
**MMBV2105LT1**  
**MMBV2107LT1**  
**MMBV2108LT1**  
**MMBV2109LT1**

**6.8-100p**  
**30 VOLTS**  
**VOLTAGE VARIABLE**  
**CAPACITANCE DIODES**



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

### MAXIMUM RATINGS(EACH DIODE)

Rating	Symbol	MV21XX	MMBV21XXLT1	Unit
Reverse Voltage	$V_R$	30		Vdc
Forward Current	$I_F$	200		mAdc
Device Dissipation @ $T_A = 25^\circ\text{C}$	$P_D$	280	225	m W
Derate above $25^\circ\text{C}$		2.8	1.8	mW/ $^\circ\text{C}$
Junction Temperature	$T_J$	+150		$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55 to +150		$^\circ\text{C}$

### DEVICE MARKING

MMBV2101LT1=M4G	MMBV2107LT1=4W
MMBV2103LT1=4H	MMBV2108LT1=4X
MMBV2105LT1=4U	MMBV2109LT1=4J

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

Characteristic	Symbol	Min	Typ	Max	Unit
Reverse Breakdown Voltage ( $I_R=1.0\mu\text{Adc}$ )	$V_{(BR)R}$	30	—	—	Vdc
Reverse Voltage Leakage Current ( $V_R=25\text{Vdc}, T_A=25^\circ\text{C}$ )	$I_R$	—	—	0.1	$\mu\text{Adc}$
Diode Capacitance Temperature Coefficient ( $V_R=4.0\text{Vdc}, f=1.0\text{MHz}$ )	$T_{CC}$	—	280	—	ppm/ $^\circ\text{C}$

**MMBV2101LT1 MMBV2103LT1 MMBV2105LT1  
MMBV2107LT1 MMBV2108LT1 MMBV2109LT1**

Device	C <sub>T</sub> , Diode Capacitance V <sub>R</sub> = 4.0 Vdc, f = 1.0 MHz pF			Q, Figure of Merit V <sub>R</sub> = 4.0 Vdc, f = 50 MHz	T <sub>R</sub> , Tuning Ratio C <sub>2</sub> /C <sub>30</sub> f = 1.0 MHz		
	Min	Nom	Max	Typ	Min	Typ	Max
MMBV2101LT1/MV2101	6.1	6.8	7.5	450	2.5	2.7	3.2
MMBV2103LT1	9.0	10	11	400	2.5	2.9	3.2
MV2104	10.8	12	13.2	400	2.5	2.9	3.2
MMBV2105LT1/MV2105	13.5	15	16.5	400	2.5	2.9	3.2
MMBV2107LT1	19.8	22	24.2	350	2.5	2.9	3.2
MMBV2108LT1/MV2108	24.3	27	29.7	300	2.5	3.0	3.2
MMBV2109LT1/MV2109	29.7	33	36.3	200	2.5	3.0	3.2
MV2111	42.3	47	51.7	150	2.5	3.0	3.2
MV2115	90	100	110	100	2.6	3.0	3.3

MMBV2101LT1, MMBV2103LT1, MMBV2105LT1, MMBV2107LT1 thru MMBV2109LT1, are also available in bulk. Use the device title and drop the "T1" suffix when ordering any of these devices in bulk.

**PARAMETER TEST METHODS**

**1. C<sub>T</sub>, DIODE CAPACITANCE**

(C<sub>T</sub> = C<sub>C</sub> + C<sub>J</sub>). C<sub>T</sub> is measured at 1.0 MHz using a ca-pacitance bridge (Boonton Electronics Model 75A or equivalent).

**2. T<sub>R</sub>, TUNING RATIO**

T<sub>R</sub> is the ratio of C<sub>T</sub> measured at 2.0 Vdc divided by C<sub>T</sub> measured at 30 Vdc.

**3. Q, FIGURE OF MERIT**

Q is calculated by taking the G and C readings of an ad-mittance bridge at the specified frequency and substituting in the following equations:

$$Q = \frac{2\pi f C}{G}$$

(Boonton Electronics Model 33As8 or equivalent). Use Lead Length 1/16".

**4. T<sub>CC</sub>, DIODE CAPACITANCE TEMPERATURE**

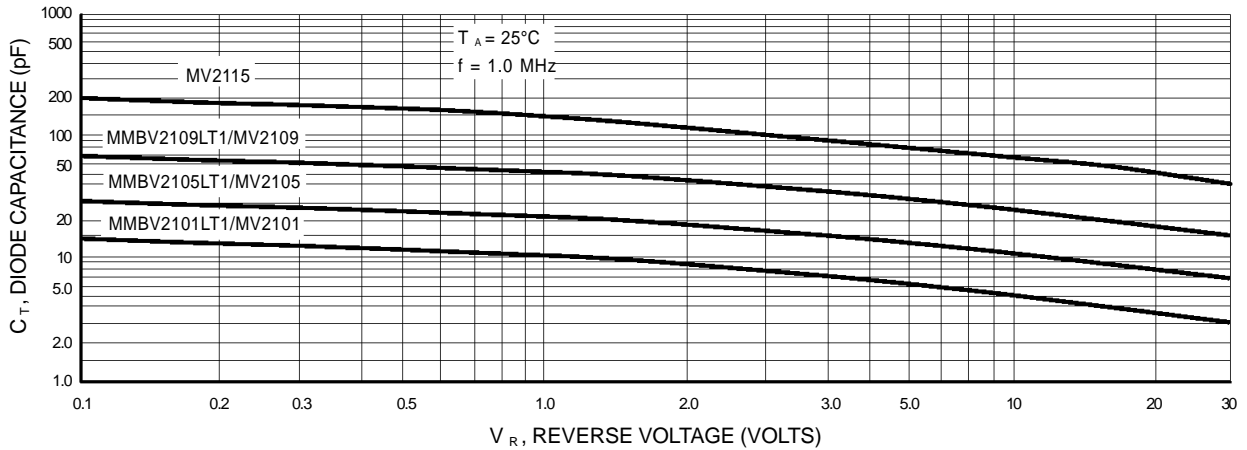
COEFFICIENT ≈ T<sub>CC</sub> is guaranteed by comparing C<sub>T</sub> at V<sub>R</sub>=4.0Vdc, f=1.0MHz, T<sub>A</sub>= -65°C with C<sub>T</sub> at V<sub>R</sub>=4.0Vdc, f=1.0MHz, T<sub>A</sub>= +85°C in the following equation, which defines TC<sub>C</sub>:

$$TC_C = \left| \frac{C_T(+85^\circ C) - C_T(-65^\circ C)}{85+65} \right| \cdot \frac{10^6}{C_T(25^\circ C)}$$

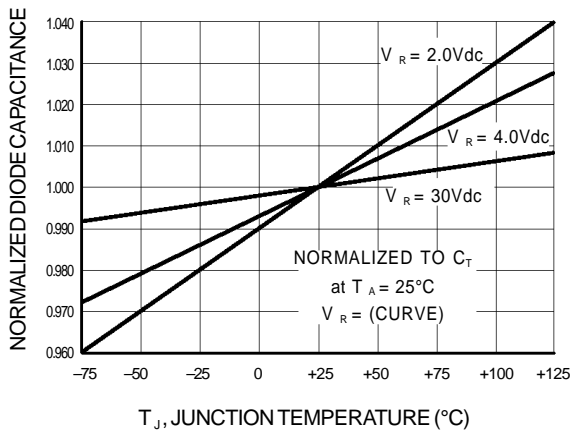
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**MMBV2101LT1 MMBV2103LT1 MMBV2105LT1  
MMBV2107LT1 MMBV2108LT1 MMBV2109LT1**

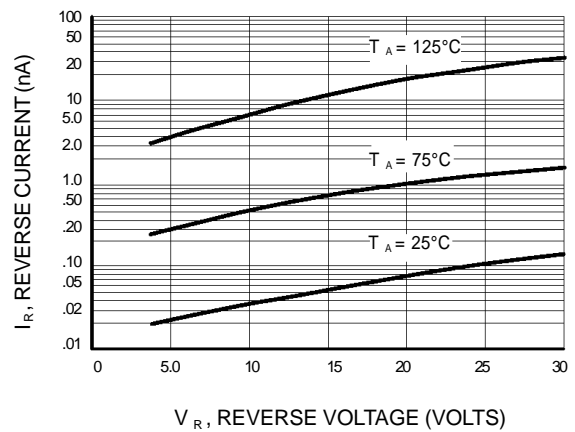
**TYPICAL DEVICE CHARACTERISTICS**



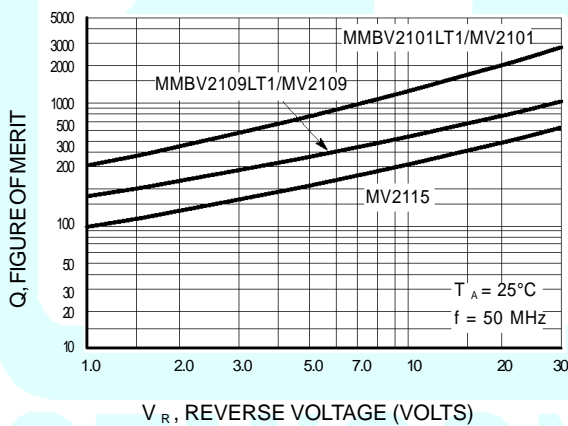
**Figure 1. Diode Capacitance versus Reverse Voltage**



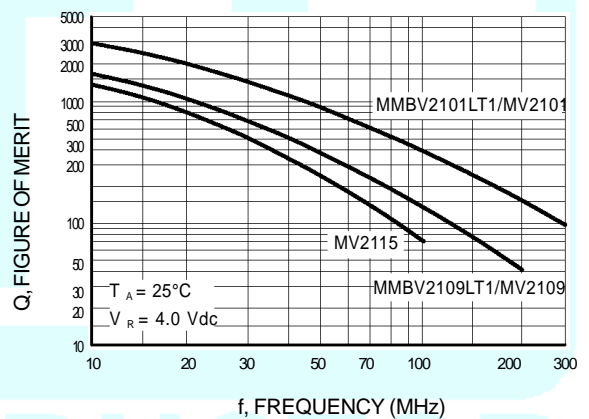
**Figure 2. Normalized Diode Capacitance versus Junction Temperature**



**Figure 3. Reverse Current versus Reverse Bias Voltage**



**Figure 4. Figure of Merit versus Reverse Voltage**



**Figure 5. Figure of Merit versus Frequency**