

# Silicon Tuning Diodes

These devices are designed for general frequency control and tuning applications. They provide solid-state reliability in replacement of mechanical tuning methods.

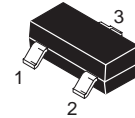
- High Q with Guaranteed Minimum Values at VHF Frequencies
- Controlled and Uniform Tuning Ratio
- Available in Surface Mount Package



## MMBV409LT1 MV409

Motorola Preferred Devices

### VOLTAGE VARIABLE CAPACITANCE DIODES



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



CASE 182-02, STYLE 1  
TO-92 (TO-226AC)

### MAXIMUM RATINGS

Rating	Symbol	MBV409	MMBV409LT1	Unit
Reverse Voltage	$V_R$	20		Vdc
Forward Current	$I_F$	200		mAdc
Forward Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	280 2.8	225 1.8	mW mW/ $^\circ\text{C}$
Junction Temperature	$T_J$	+125		$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55 to +150		$^\circ\text{C}$

### DEVICE MARKING

MMBV409LT1 = X5, MV409 = MV409

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

Characteristic	Symbol	Min	Typ	Max	Unit
Reverse Breakdown Voltage ( $I_R = 10 \mu\text{Adc}$ )	$V_{(BR)R}$	20	—	—	Vdc
Reverse Voltage Leakage Current ( $V_R = 15 \text{Vdc}$ )	$I_R$	—	—	0.1	$\mu\text{Adc}$
Diode Capacitance Temperature Coefficient ( $V_R = 3.0 \text{Vdc}$ , $f = 1.0 \text{MHz}$ )	$TC_C$	—	300	—	ppm/ $^\circ\text{C}$

Device	$C_t$ , Diode Capacitance $V_R = 3.0 \text{Vdc}$ , $f = 1.0 \text{MHz}$ pF			$Q$ , Figure of Merit $V_R = 3.0 \text{Vdc}$ $f = 50 \text{MHz}$	$C_R$ , Capacitance Ratio $C_3/C_8$ $f = 1.0 \text{MHz}$ (1)	
	Min	Nom	Max	Min	Min	Max
MMBV409LT1, MV409	26	29	32	200	1.5	1.9

1.  $C_R$  is the ratio of  $C_t$  measured at 3 Vdc divided by  $C_t$  measured at 8 Vdc.

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

TYPICAL CHARACTERISTICS

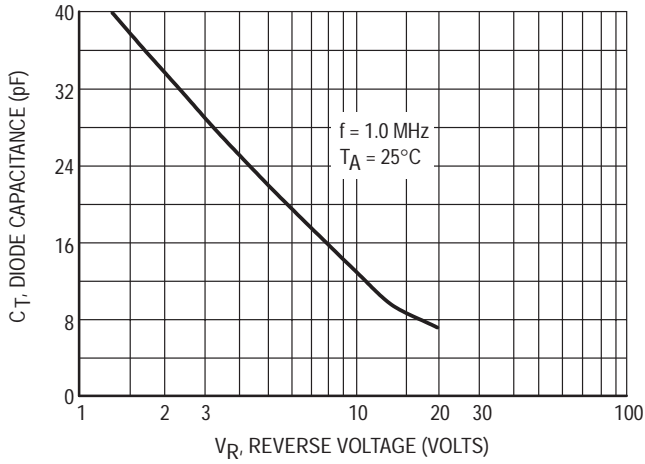


Figure 1. Diode Capacitance

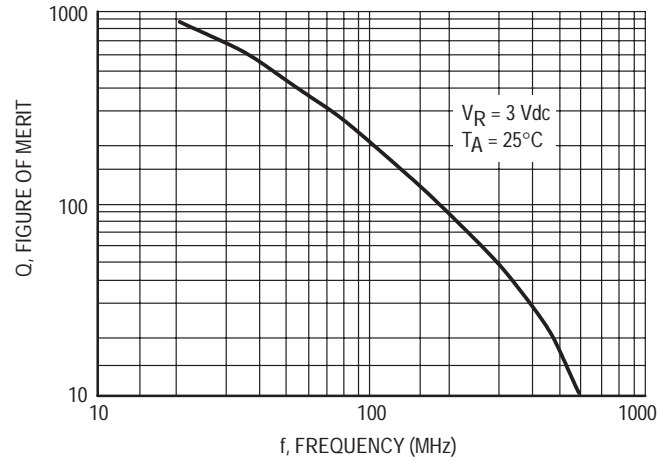


Figure 2. Figure of Merit

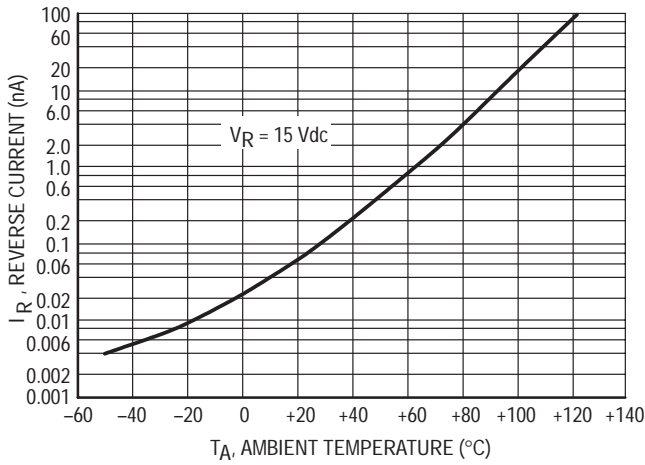


Figure 3. Leakage Current

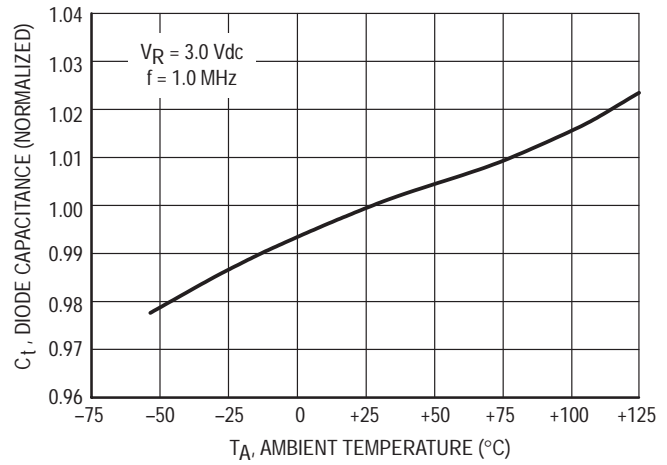


Figure 4. Diode Capacitance