

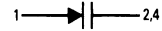
## Silicon Epicap Diodes

... designed for high-capacitance, high-tuning ratio applications.

- Guaranteed Capacitance Range
- Surface Mount Package
- Available in 12 mm Tape and Reel
- Hyper Abrupt Junction Process Provides High Tuning Ratio
- T1 is Tape and Reel 7", 1000 Units
- T3 is Tape and Reel 13", 4000 Units

**MV7005T1**  
**MV7005T3**

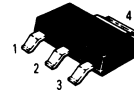
**HIGH CAPACITANCE**  
**VOLTAGE-VARIABLE**  
**DIODES**



DEVICE MARKING = V7005

MAXIMUM RATINGS (Each Diode)

Rating	Symbol	Value	Unit
Reverse Voltage	$V_R$	15	Volts
Forward Current	$I_F$	50	mA
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	280 2.8	mW mW/ $^\circ\text{C}$
Junction Temperature	$T_J$	+125	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55 to +125	$^\circ\text{C}$



CASE 318E-04, STYLE 2  
 SOT-223

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

Characteristic	Symbol	Min	Max	Unit
Reverse Breakdown Voltage ( $I_R = 10 \mu\text{A}$ )	$V_{(BR)R}$	15	—	Vdc
Reverse Voltage Leakage Current ( $V_R = 9.0 \text{ Vdc}$ )	$I_R$	—	100	nAdc
Diode Capacitance ( $V_R = 1.0 \text{ Vdc}$ , $f = 1.0 \text{ MHz}$ )	$C_T$	400	520	pF
Capacitance Ratio $C1/C9$ ( $f = 1.0 \text{ MHz}$ )	$C_R$	12	—	—
Figure of Merit ( $V_R = 1.0 \text{ Vdc}$ , $f = 1.0 \text{ MHz}$ )	$Q$	150	—	—

# MV7005T1, MV7005T3

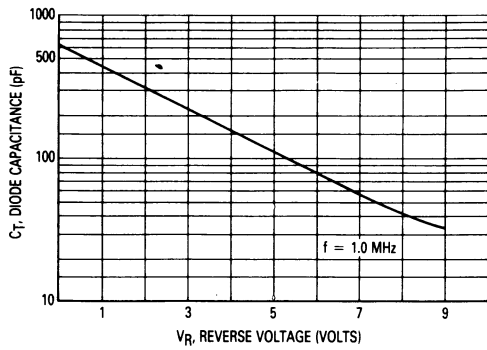


Figure 1. Diode Capacitance versus Reverse Voltage

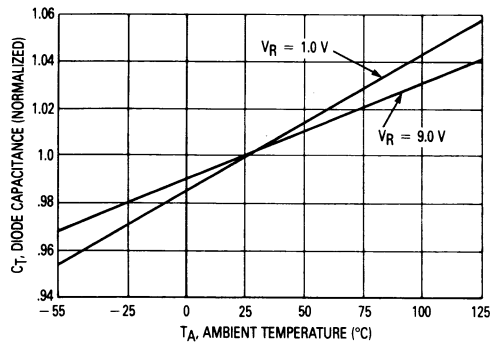


Figure 2. Diode Capacitance versus Ambient Temperature

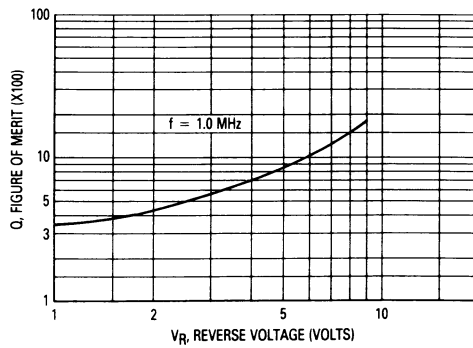
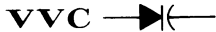


Figure 3. Figure of Merit

**MVAM108**  
**MVAM109**  
**MVAM115**  
**MVAM125**



**SILICON TUNING DIODE**

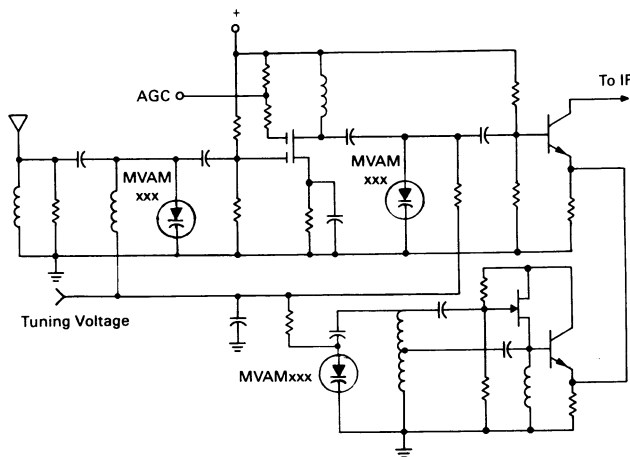
... designed for electronic tuning of AM receivers and high capacitance, high tuning ratio applications.

- High Capacitance Ratio —  $C_R = 15$  (Min), MVAM 108, 115, 125
- Guaranteed Diode Capacitance —  $C_T = 440$  pF (Min) — 560 pF (Max) @  $V_R = 1.0$  Vdc,  $f = 1.0$  MHz, MVAM108, MVAM115, MVAM125
- Guaranteed Figure of Merit —  $Q = 150$  (Min) @  $V_R = 1.0$  Vdc,  $f = 1.0$  MHz.

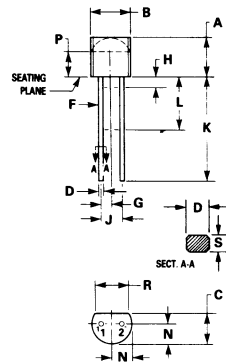
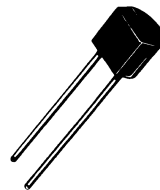
**MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Reverse Voltage	$V_R$	12 15 18 28	Volts
Forward Current	$I_F$	50	mA
Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate Above $25^\circ\text{C}$	$P_D$	280 2.8	mW mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to +125	$^\circ\text{C}$

**FIGURE 1 — TYPICAL AM RADIO APPLICATION**



**TUNING DIODES WITH VERY HIGH CAPACITANCE RATIO**



STYLE 1:  
 PIN 1. ANODE  
 PIN 2. CATHODE

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.32	5.33	0.170	0.210
B	4.45	5.21	0.175	0.205
C	3.18	4.19	0.125	0.165
D	0.41	0.56	0.016	0.022
F	0.407	0.482	0.016	0.019
G	1.27 BSC		0.050 BSC	
H	—	1.27	—	0.050
J	2.54 BSC		0.100 BSC	
K	12.70	—	0.500	—
L	6.35	—	0.250	—
N	2.03	2.66	0.080	0.105
P	2.93	—	0.115	—
R	3.43	—	0.135	—
S	0.36	0.41	0.014	0.016

**CASE 182-02**

# MVAM108, MVAM109, MVAM115, MVAM125

**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted, Each Device)

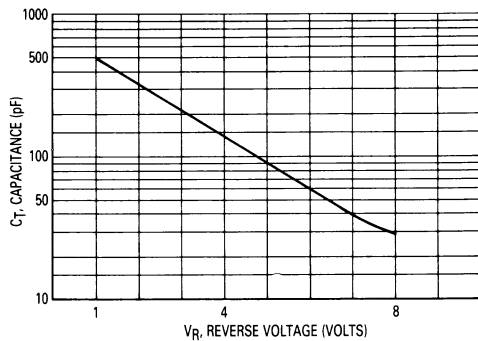
Characteristic — All Types		Symbol	Min	Typ	Max	Unit
Breakdown Voltage ( $I_R = 10 \mu\text{Adc}$ )	MVAM108 MVAM109 MVAM115 MVAM125	$V_{(BR)R}$	12 15 18 28	— — — —	— — — —	Vdc
Reverse Current ( $V_R = 8.0 \text{ V}$ ) ( $V_R = 9.0 \text{ V}$ ) ( $V_R = 15 \text{ V}$ ) ( $V_R = 25 \text{ V}$ )	MVAM108 MVAM109 MVAM115 MVAM125	$I_R$	— — — —	— — — —	100 100 100 100	nAdc
Diode Capacitance Temperature Coefficient (1) ( $V_R = 1.0 \text{ Vdc}$ , $f = 1.0 \text{ MHz}$ , $T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$ )		$TC_C$	—	435	—	ppm/ $^\circ\text{C}$
Case Capacitance ( $f = 1.0 \text{ MHz}$ , Lead Length $1/16''$ )		$C_C$	—	0.18	—	pF
Diode Capacitance (2) ( $V_R = 1.0 \text{ Vdc}$ , $f = 1.0 \text{ MHz}$ )	MVAM108, 115, 125 MVAM109	$C_t$	440 400	500 460	560 520	pF
Figure of Merit ( $f = 1.0 \text{ MHz}$ , Lead Length $1/16''$ , $V_R = 1.0 \text{ Vdc}$ )		Q	150	—	—	—
Capacitance Ratio ( $f = 1.0 \text{ MHz}$ )	MVAM108 MVAM109 MVAM115 MVAM125	C1/C8 C1/C9 C1/C15 C1/C25	15 12 15 15	— — — —	— — — —	—

**Notes:**

- (1) The effect of increasing temperature  $1.0^\circ\text{C}$ , at any operating point, is equivalent to lowering the effective tuning voltage 1.25 mV. The percent change of capacitance per  $^\circ\text{C}$  is nearly constant from  $-40^\circ\text{C}$  to  $+100^\circ\text{C}$ .
- (2) Upon request, diodes are available in matched sets. All diodes in a set can be matched for capacitance to 3% or 2.0 pF (whichever is greater) at all points along the specified tuning range.

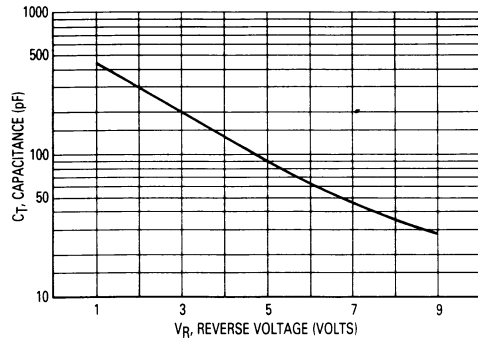
**MVAM108**

**Figure 2. Capacitance versus Reverse Voltage**



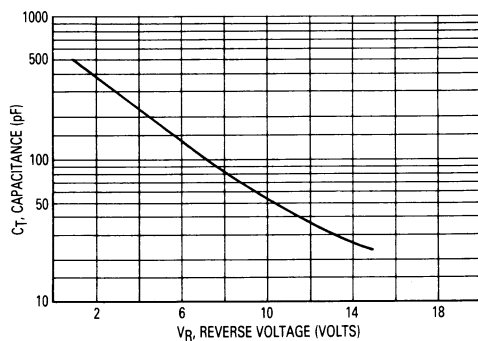
**MVAM109**

**Figure 3. Capacitance versus Reverse Voltage**



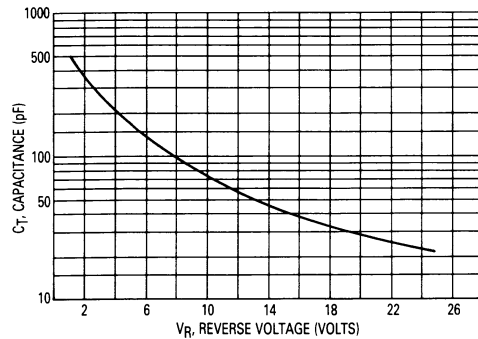
**MVAM115**

**Figure 4. Capacitance versus Reverse Voltage**



**MVAM 125**

**Figure 5. Capacitance versus Reverse Voltage**



6