SILICON EPICAP DIODES

. . . designed in the popular PLASTIC PACKAGE for high volume require-ments of FM Radio and TV tuning and AFC, general frequency control and tuning applications; providing solid-state reliability in replacement of mechanical tuning methods.

Also available in Surface Mount Package up to 33 pF.

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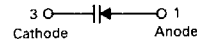- Standard Capacitance Tolerance — 10%
- Complete Typical Design Curves

MMBV2101LT1
MMBV2103LT1 thru
MMBV2105LT1
MMBV2107LT1 thru
MMBV2109LT1★
MV2101
MV2103 thru MV2105
MV2107 thru MV2109
MV2111
MV2113 thru MV2115★

CASE 318-07, STYLE 8
SOT-23 (TO-236AB)

3 ○ —|◀— ○ 1
Cathode   Anode

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

2 ○ —|◀— ○ 1
Cathode   Anode
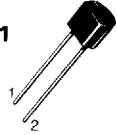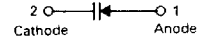
6.8–100 pF
30 VOLTS
VOLTAGE-VARIABLE
CAPACITANCE DIODES

★MMBV2101LT1, MMBV2105LT1,
MMBV2109LT1, MV2101, MV2104,
MV2108, MV2109, MV2111, MV2113
and MV2115 are Motorola
designated preferred devices.

MAXIMUM RATINGS

Rating	Symbol	MV21XX	MMBV21XXLT1	Unit
		Value		
Reverse Voltage	V_R	30		Volts
Forward Current	I_F	200		mA
Forward Power Dissipation @ T_A = 25°C Derate above 25°C	P_D	280 2.8	200 2.0	mW mW/°C
Junction Temperature	T_J	+125		°C
Storage Temperature Range	T_{stg}	−55 to +150		°C

DEVICE MARKING

MMBV2101LT1 = M4G	MMBV2105LT1 = 4U	MMBV2109LT1 = 4J
MMBV2103LT1 = 4H	MMBV2107LT1 = 4W	
MMBV2104LT1 = 4Z	MMBV2108LT1 = 4X	

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Reverse Breakdown Voltage (I_R = 10 µAdc)	$V_{(BR)R}$	30	—	—	Vdc
Reverse Voltage Leakage Current (V_R = 25 Vdc, T_A = 25°C)	I_R	—	—	0.1	µAdc
Diode Capacitance Temperature Coefficient (V_R = 4.0 Vdc, f = 1.0 MHz)	TC_C	—	280	—	ppm/°C

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6367255 0088098 T99

Device	C_T, Diode Capacitance V_R = 4.0 Vdc, f = 1.0 MHz pF			Q, Figure of Merit V_R = 4.0 Vdc, f = 50 MHz	TR, Tuning Ratio C_2/C_{30} 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/MV2103	9.0	10	11	400	2.5	2.9	3.2
MMBV2104LT1/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/MV2107	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
MV2113	61.2	68	74.8	150	2.6	3.0	3.3
MV2114	73.8	82	90.2	100	2.6	3.0	3.3
MV2115	90	100	110	100	2.6	3.0	3.3

MMBV2101LT1, MMBV2103LT1 thru MMBV2105LT1 and 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.

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PARAMETER TEST METHODS

1. C_T, DIODE CAPACITANCE

(C_T = C_C + C_J), C_T is measured at 1.0 MHz using a capacitance bridge (Boonton Electronics Model 75A or equivalent).

2. TR, TUNING RATIO

TR is the ratio of C_T measured at 2.0 Vdc divided by C_T measured at 30 Vdc.

3. Q, FIGURE OF MERIT

Q is calculated by taking the G and C readings of an admittance bridge at the specified frequency and sub-stituting in the following equations:

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

(Boonton Electronics Model 33AS8). Use Lead Length ≈ 1/16".

4. TC_C, DIODE CAPACITANCE TEMPERATURE COEFFICIENT

TC_C is guaranteed by comparing C_T at V_R = 4.0 Vdc, f = 1.0 MHz, T_A = −65°C with C_T at V_R = 4.0 Vdc, f = 1.0 MHz, T_A = +85°C in the following equation which defines TC_C:

$$TC_C = \frac{C_T(+85°C) - C_T(-65°C)}{85 + 65} \cdot \frac{10^6}{C_R(25°C)}$$

Accuracy limited by measurement of C_T to ± 0.1 pF.

■ 6367255 0088099 925 ■

TYPICAL DEVICE PERFORMANCE

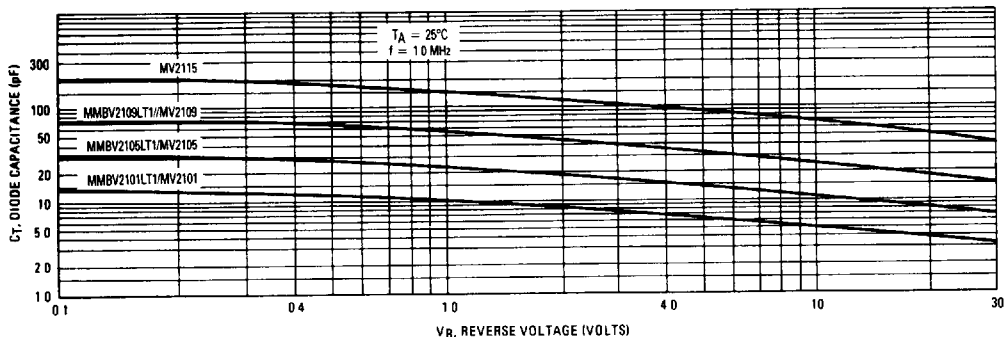**FIGURE 1 — DIODE CAPACITANCE versus REVERSE VOLTAGE**

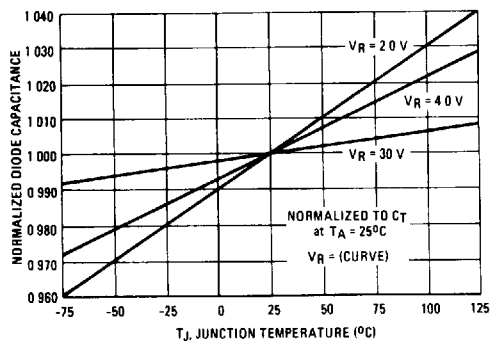**FIGURE 2 — NORMALIZED DIODE CAPACITANCE versus JUNCTION TEMPERATURE**

FIGURE 3 — REVERSE CURRENT versus REVERSE BIAS VOLTAGE
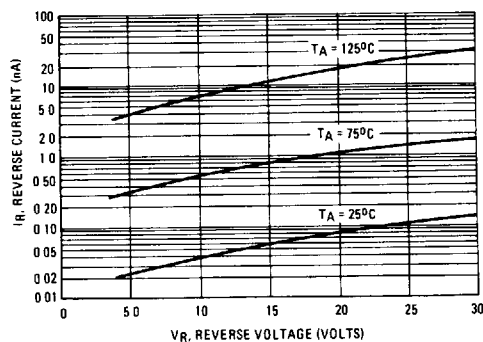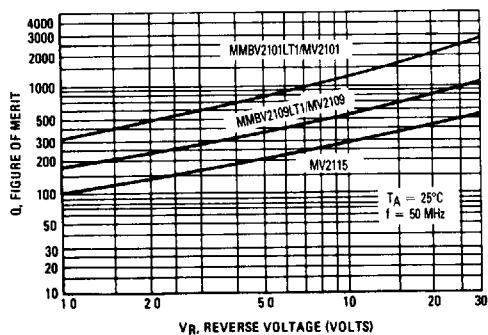

FIGURE 4 — FIGURE OF MERIT versus REVERSE VOLTAGE

FIGURE 5 — FIGURE OF MERIT versus FREQUENCY

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MOTOROLA SMALL-SIGNAL TRANSISTORS, FETs AND DIODES