

# MMBV409LT1

Preferred Device

## Silicon Tuning Diode

This device is designed in the Surface Mount package for general frequency control and tuning applications. It provides 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 Package is Available

### MAXIMUM RATINGS

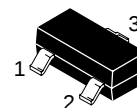
| Rating                                                                                  | Symbol    | Value       | Unit                       |
|-----------------------------------------------------------------------------------------|-----------|-------------|----------------------------|
| Reverse Voltage                                                                         | $V_R$     | 20          | Vdc                        |
| Forward Current                                                                         | $I_F$     | 200         | mAdc                       |
| Forward Power Dissipation @ $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$     | 225<br>1.8  | mW<br>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.



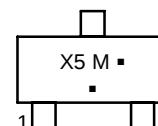
**ON Semiconductor®**

<http://onsemi.com>



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

### MARKING DIAGRAM



X5 = Specific 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.

### ORDERING INFORMATION

| Device      | Package             | Shipping†           |
|-------------|---------------------|---------------------|
| MMBV409LT1  | SOT-23              | 3,000 / Tape & Reel |
| MMBV409LT1G | SOT-23<br>(Pb-Free) | 3,000 / Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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

# MMBV409LT1

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

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

|            | $C_t$ Diode Capacitance<br>$V_R = 3.0\ \text{Vdc}$ , $f = 1.0\ \text{MHz}$<br>pF |     |     | $Q$ , Figure of Merit<br>$V_R = 3.0\ \text{Vdc}$<br>$f = 50\ \text{MHz}$ | $C_R$ , Capacitance Ratio<br>$C_3/C_8$<br>$f = 1.0\ \text{MHz}$ (Note 1) |     |
|------------|----------------------------------------------------------------------------------|-----|-----|--------------------------------------------------------------------------|--------------------------------------------------------------------------|-----|
| Device     | Min                                                                              | Nom | Max | Min                                                                      | Min                                                                      | Max |
| MMBV409LT1 | 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.

## TYPICAL CHARACTERISTICS

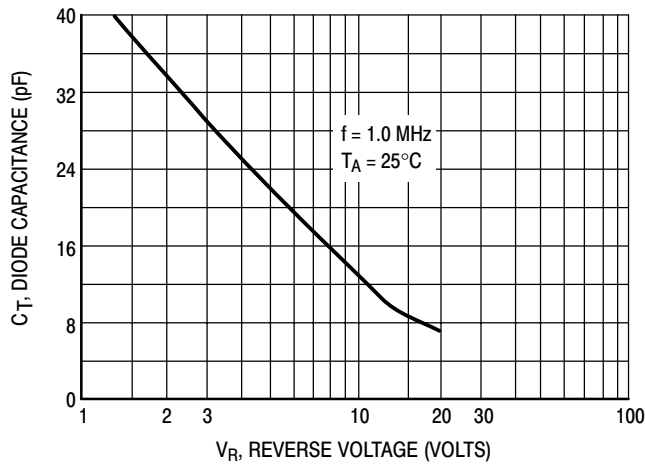


Figure 1. Diode Capacitance

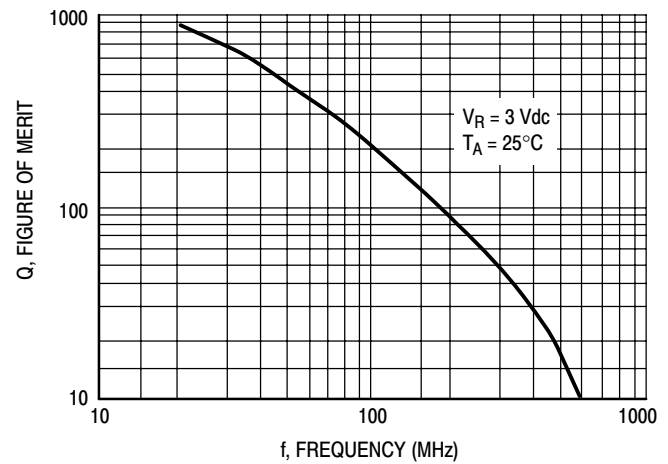


Figure 2. Figure of Merit

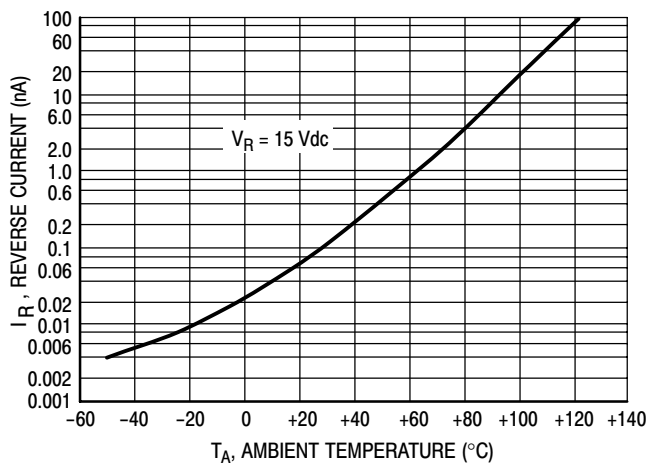


Figure 3. Leakage Current

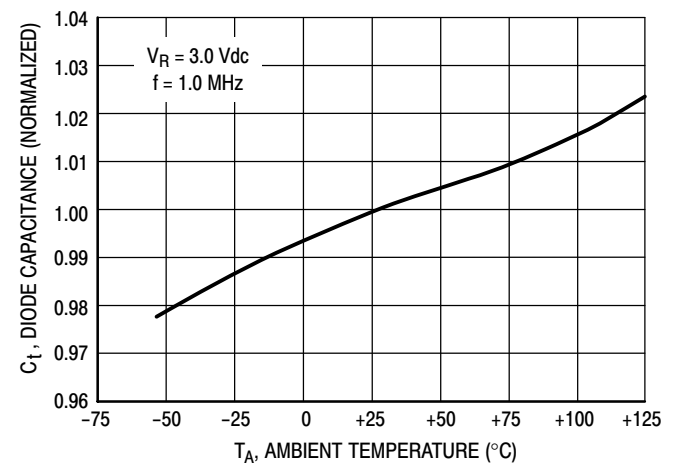
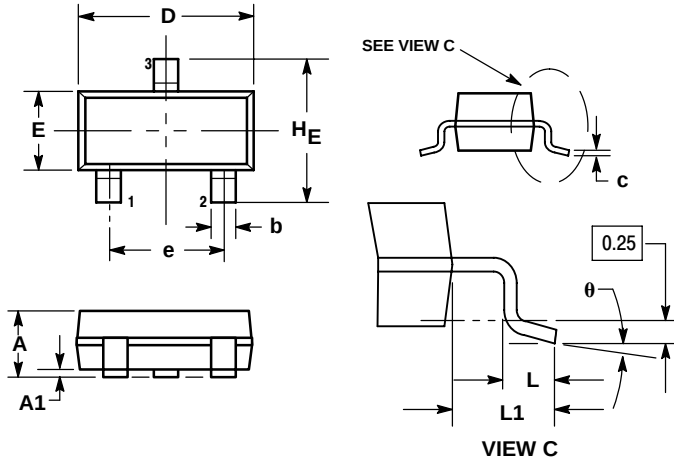


Figure 4. Diode Capacitance

# MMBV409LT1

## PACKAGE DIMENSIONS

### SOT-23 (TO-236) CASE 318-08 ISSUE AN



#### NOTES:

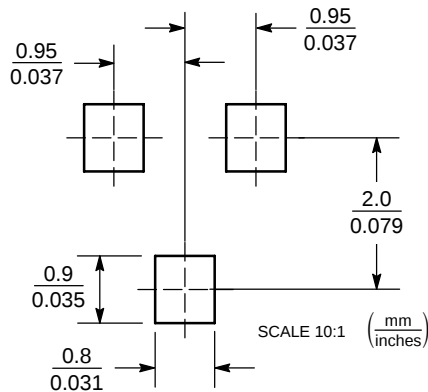
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318-01 THRU -07 AND -09 OBSOLETE, NEW STANDARD 318-08.

| 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.

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