

# MMBD352LT1, MMBD353LT1, MMBD354LT1, MMBD355LT1

## Dual Hot Carrier Mixer Diodes

These devices are designed primarily for UHF mixer applications but are suitable also for use in detector and ultra-fast switching circuits.

### Features

- Very Low Capacitance – Less Than 1.0 pF @ Zero V
- Low Forward Voltage – 0.5 V (Typ) @  $I_F = 10$  mA
- Pb-Free Packages are Available

### MAXIMUM RATINGS (EACH DIODE)

| Rating                     | Symbol | Value | Unit     |
|----------------------------|--------|-------|----------|
| Continuous Reverse Voltage | $V_R$  | 7.0   | $V_{CC}$ |

### THERMAL CHARACTERISTICS

| Characteristic                                                                                                      | Symbol          | Max         | Unit                       |
|---------------------------------------------------------------------------------------------------------------------|-----------------|-------------|----------------------------|
| Total Device Dissipation FR-5 Board,<br>(Note 1) $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$        | $P_D$           | 225<br>1.8  | mW<br>mW/ $^\circ\text{C}$ |
| Thermal Resistance, Junction-to-Ambient                                                                             | $R_{\theta JA}$ | 556         | $^\circ\text{C/W}$         |
| Total Device Dissipation Alumina<br>Substrate, (Note 2) $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$           | 300<br>2.4  | mW<br>mW/ $^\circ\text{C}$ |
| Thermal Resistance, Junction-to-Ambient                                                                             | $R_{\theta JA}$ | 417         | $^\circ\text{C/W}$         |
| Junction and Storage Temperature                                                                                    | $T_J, T_{stg}$  | -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.

1. FR-5 =  $1.0 \times 0.75 \times 0.062$  in.
2. Alumina =  $0.4 \times 0.3 \times 0.024$  in. 99.5% alumina.

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

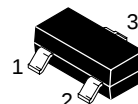
| Rating                                                                           | Symbol | Min    | Max        | Unit     |
|----------------------------------------------------------------------------------|--------|--------|------------|----------|
| Forward Voltage<br>( $I_F = 10$ mA)                                              | $V_F$  | –      | 0.60       | V        |
| Reverse Voltage Leakage Current (Note 3)<br>( $V_R = 3.0$ V)<br>( $V_R = 7.0$ V) | $I_R$  | –<br>– | 0.25<br>10 | $V_{CC}$ |
| Capacitance<br>( $V_R = 0$ V, $f = 1.0$ MHz)                                     | C      | –      | 1.0        | pF       |

3. For each individual diode while the second diode is unbiased.

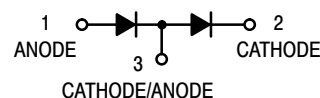


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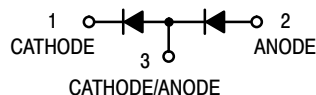
<http://onsemi.com>



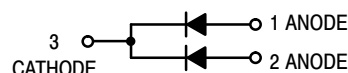
SOT-23 (TO-236)  
CASE 318



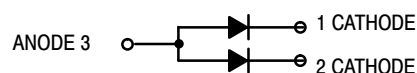
MMBD352LT1  
STYLE 11



MMBD353LT1  
STYLE 19

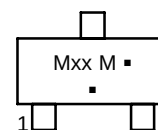


MMBD354LT1  
STYLE 9



MMBD355LT1  
STYLE 12

### MARKING DIAGRAM



Mxx = 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

See detailed ordering, marking, and shipping information in the package dimensions section on page 2 of this data sheet.

# MMBD352LT1, MMBD353LT1, MMBD354LT1, MMBD355LT1

## TYPICAL CHARACTERISTICS

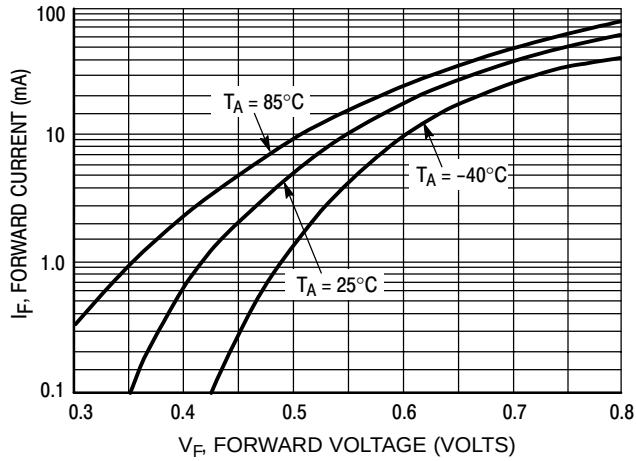


Figure 1. Forward Voltage

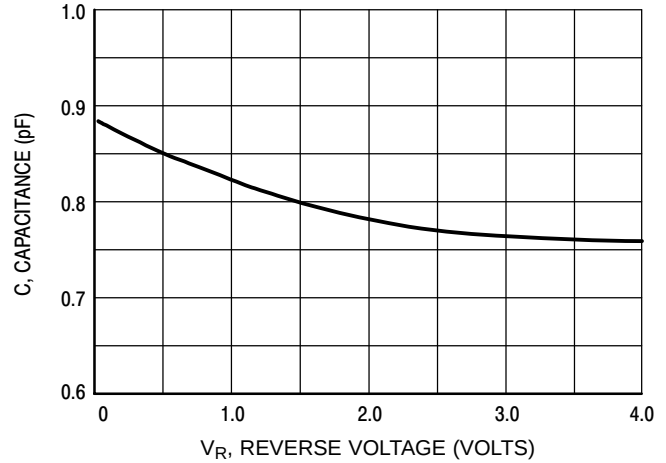


Figure 2. Capacitance

## ORDERING INFORMATION

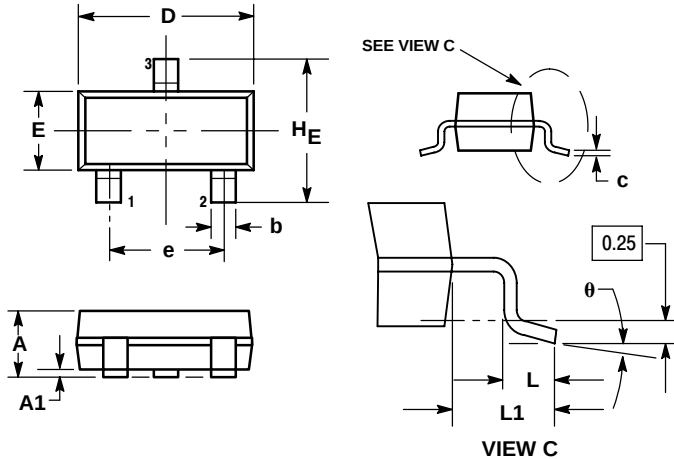
| Device      | Marking | Package          | Shipping <sup>†</sup>      |
|-------------|---------|------------------|----------------------------|
| MMBD352LT1  | M5G     | SOT-23           | 3,000 Units / Tape & Reel  |
| MMBD352LT1G |         | SOT-23 (Pb-Free) | 3,000 Units / Tape & Reel  |
| MMBD352LT3  |         | SOT-23           | 10,000 Units / Tape & Reel |
| MMBD352LT3G |         | SOT-23 (Pb-Free) | 10,000 Units / Tape & Reel |
| MMBD353LT1  | M4F     | SOT-23           | 3,000 Units / Tape & Reel  |
| MMBD353LT1G |         | SOT-23 (Pb-Free) | 3,000 Units / Tape & Reel  |
| MMBD353LT3  |         | SOT-23           | 10,000 Units / Tape & Reel |
| MMBD353LT3G |         | SOT-23 (Pb-Free) | 10,000 Units / Tape & Reel |
| MMBD354LT1  | M6H     | SOT-23           | 3,000 Units / Tape & Reel  |
| MMBD354LT1G |         | SOT-23 (Pb-Free) | 3,000 Units / Tape & Reel  |
| MMBD355LT1  | MJ1     | SOT-23           | 3,000 Units / Tape & Reel  |
| MMBD355LT1G |         | SOT-23 (Pb-Free) | 3,000 Units / Tape & Reel  |

<sup>†</sup>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.

# MMBD352LT1, MMBD353LT1, MMBD354LT1, MMBD355LT1

## 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 |

#### MMBD352LT1

##### STYLE 11:

- PIN 1. ANODE
- 2. CATHODE
- 3. CATHODE-ANODE

#### MMBD353LT1

##### STYLE 19:

- PIN 1. CATHODE
- 2. ANODE
- 3. CATHODE-ANODE

#### MMBD354LT1

##### STYLE 9:

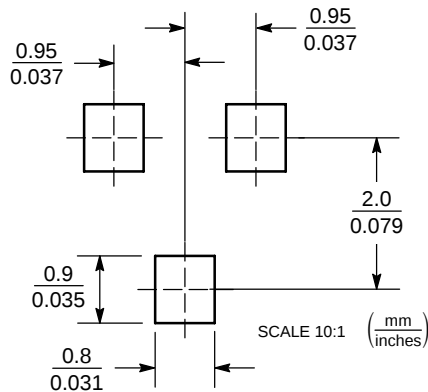
- PIN 1. ANODE
- 2. ANODE
- 3. CATHODE

#### MMBD355LT1

##### STYLE 12:

- PIN 1. CATHODE
- 2. CATHODE
- 3. ANODE

#### 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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