

# MBD101G, MMBD101LT1G

## Schottky Barrier Diodes

Designed primarily for UHF mixer applications but suitable also for use in detector and ultra-fast switching circuits. Supplied in an inexpensive plastic package for low-cost, high-volume consumer requirements. Also available in Surface Mount package.

### Features

- Low Noise Figure – 6.0 dB Typ @ 1.0 GHz
- Very Low Capacitance – Less Than 1.0 pF
- High Forward Conductance – 0.5 V (Typ) @  $I_F = 10$  mA
- These Devices are Pb-Free and are RoHS Compliant

### MAXIMUM RATINGS

| Rating                                                | Symbol    | Value       | Unit                 |
|-------------------------------------------------------|-----------|-------------|----------------------|
| Reverse Voltage                                       | $V_R$     | 7.0         | V                    |
| Forward Power Dissipation<br>$T_A = 25^\circ\text{C}$ | $P_F$     | 280<br>225  | mW                   |
| Derate above $25^\circ\text{C}$                       |           | 2.2<br>1.8  | mW/ $^\circ\text{C}$ |
| Junction Temperature                                  | $T_J$     | +150        | $^\circ\text{C}$     |
| Storage Temperature Range                             | $T_{stg}$ | -55 to +150 | $^\circ\text{C}$     |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

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

| Characteristic                                                       | Symbol      | Min | Typ  | Max  | Unit          |
|----------------------------------------------------------------------|-------------|-----|------|------|---------------|
| Reverse Breakdown Voltage<br>( $I_R = 10$ $\mu\text{A}$ )            | $V_{(BR)R}$ | 7.0 | 10   | –    | V             |
| Diode Capacitance<br>( $V_R = 0$ , $f = 1.0$ MHz,<br>Note 1, page 2) | $C_D$       | –   | 0.88 | 1.0  | pF            |
| Forward Voltage<br>( $I_F = 10$ mA)                                  | $V_F$       | –   | 0.5  | 0.6  | V             |
| Reverse Leakage<br>( $V_R = 3.0$ V)                                  | $I_R$       | –   | 0.02 | 0.25 | $\mu\text{A}$ |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

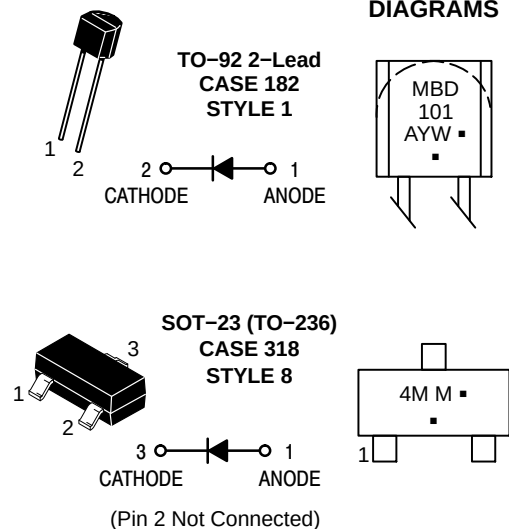


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## SILICON SCHOTTKY BARRIER DIODES

### MARKING DIAGRAMS



A = Assembly Location  
Y = Year  
W = Work Week  
4M = Device Code (SOT-23)  
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 <sup>†</sup> |
|-------------|---------------------|-----------------------|
| MBD101G     | TO-92<br>(Pb-Free)  | 5000 Units / Box      |
| MMBD101LT1G | SOT-23<br>(Pb-Free) | 3000 / 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.

# MBD101G, MMBD101LT1G

## TYPICAL CHARACTERISTICS

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

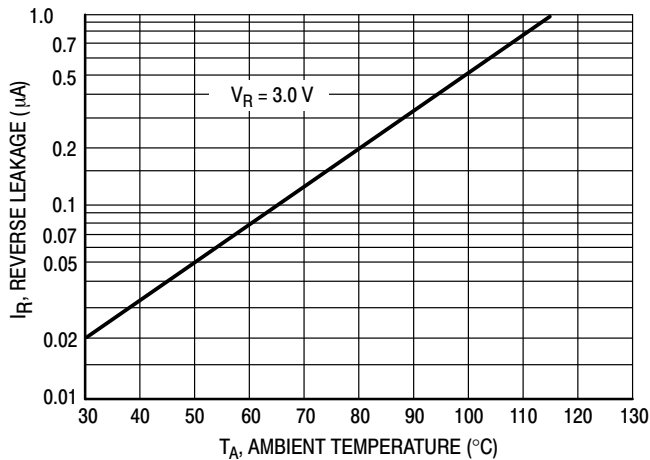


Figure 1. Reverse Leakage

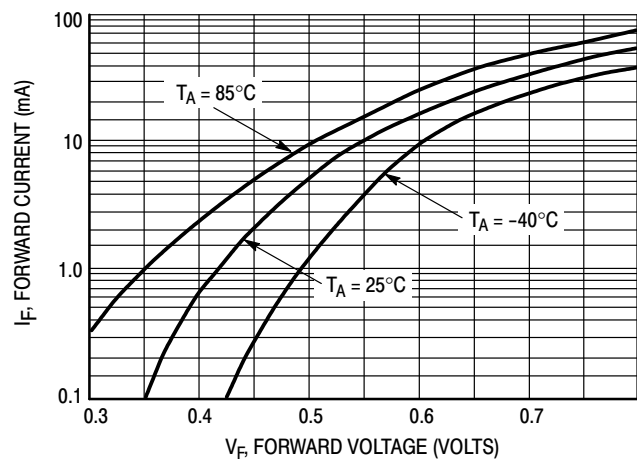


Figure 2. Forward Voltage

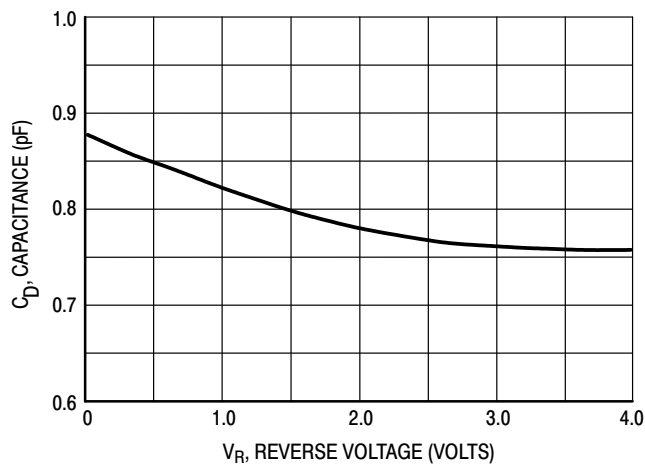


Figure 3. Capacitance

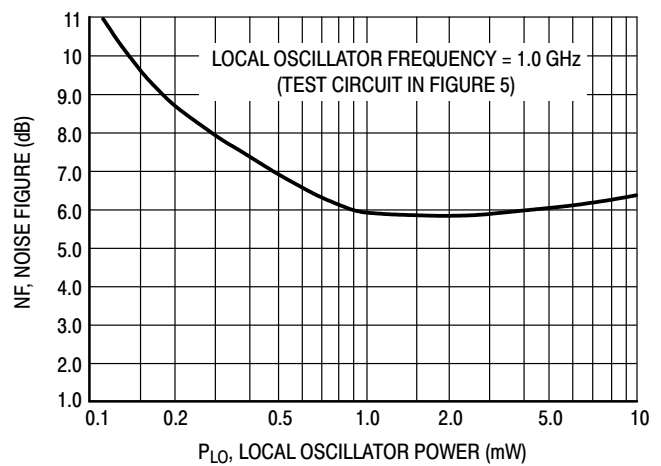


Figure 4. Noise Figure

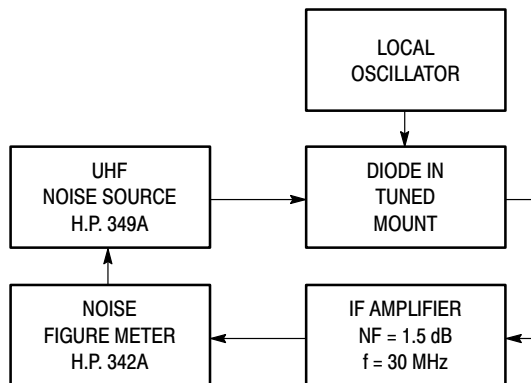


Figure 5. Noise Figure Test Circuit

## NOTES ON TESTING AND SPECIFICATIONS

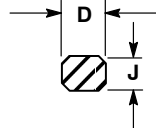
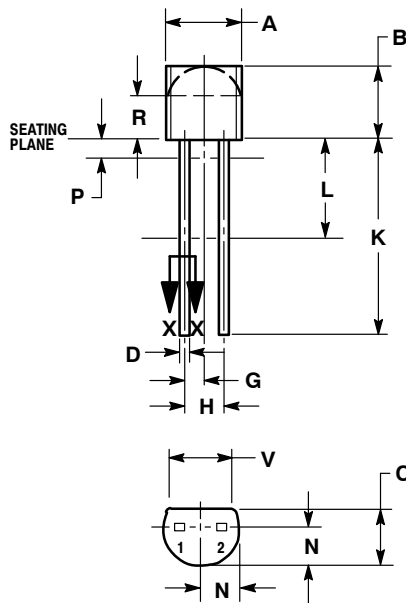
- Note 1 —  $C_D$  is measured using a capacitance bridge (Boonton Electronics Model 75A or equivalent).
- Note 2 — Noise figure measured with diode under test in tuned diode mount using UHF noise source and local oscillator (LO) frequency of 1.0 GHz. The LO power is adjusted for 1.0 mW. IF amplifier NF = 1.5 dB,  $f = 30$  MHz, see Figure 5.
- Note 3 —  $L_S$  is measured on a package having a short instead of a die, using an impedance bridge (Boonton Radio Model 250A RX Meter).



**SCALE 1:1**

**TO-92 (TO-226)  
CASE 182-06  
ISSUE L**

**DATE 04/18/1998**



## SECTION X-X

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND ZONE R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

| DIM | INCHES    |       | MILLIMETERS |       |
|-----|-----------|-------|-------------|-------|
|     | MIN       | MAX   | MIN         | MAX   |
| A   | 0.175     | 0.205 | 4.45        | 5.21  |
| B   | 0.170     | 0.210 | 4.32        | 5.33  |
| C   | 0.125     | 0.165 | 3.18        | 4.19  |
| D   | 0.016     | 0.021 | 0.407       | 0.533 |
| G   | 0.050 BSC |       | 1.27 BSC    |       |
| H   | 0.100 BSC |       | 2.54 BSC    |       |
| J   | 0.014     | 0.016 | 0.36        | 0.41  |
| K   | 0.500     | ---   | 12.70       | ---   |
| L   | 0.250     | ---   | 6.35        | ---   |
| N   | 0.080     | 0.105 | 2.03        | 2.66  |
| P   | ---       | 0.050 | ---         | 1.27  |
| R   | 0.115     | ---   | 2.93        | ---   |
| V   | 0.135     | ---   | 3.43        | ---   |

STYLE 1:  
PIN 1. ANODE  
2. CATHODE

STYLE 2:  
PIN 1. CATHODE  
2. ANODE

**STYLE 3:**  
PIN 1. MAIN TERMINAL 1  
2. MAIN TERMINAL 2

STYLE 4: CANCELLED

STYLE 5:  
PIN 1. INPUT  
2. OUTPUT

|                         |                       |                                                                                                                                                                                     |
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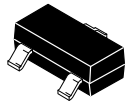
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# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

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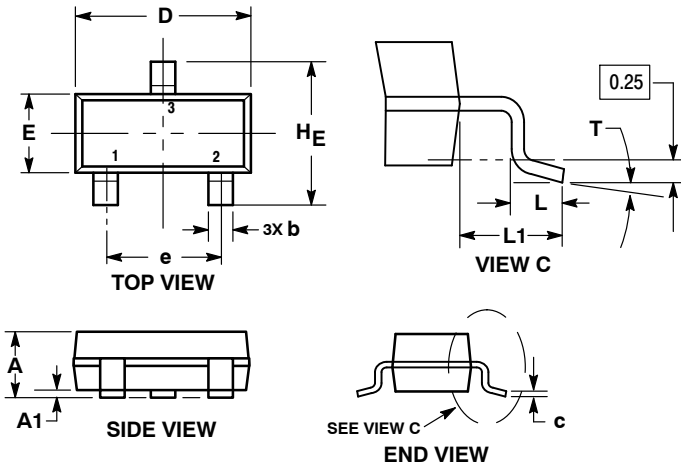
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### SOT-23 (TO-236) CASE 318-08 ISSUE AS

DATE 30 JAN 2018

SCALE 4:1

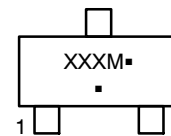


#### NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

| DIM | MILLIMETERS |      |      | INCHES |       |       |
|-----|-------------|------|------|--------|-------|-------|
|     | MIN         | NOM  | MAX  | MIN    | NOM   | MAX   |
| A   | 0.89        | 1.00 | 1.11 | 0.035  | 0.039 | 0.044 |
| A1  | 0.01        | 0.06 | 0.10 | 0.000  | 0.002 | 0.004 |
| b   | 0.37        | 0.44 | 0.50 | 0.015  | 0.017 | 0.020 |
| c   | 0.08        | 0.14 | 0.20 | 0.003  | 0.006 | 0.008 |
| 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 | 0.080 |
| L   | 0.30        | 0.43 | 0.55 | 0.012  | 0.017 | 0.022 |
| L1  | 0.35        | 0.54 | 0.69 | 0.014  | 0.021 | 0.027 |
| HE  | 2.10        | 2.40 | 2.64 | 0.083  | 0.094 | 0.104 |
| T   | 0°          | ---  | 10°  | 0°     | ---   | 10°   |

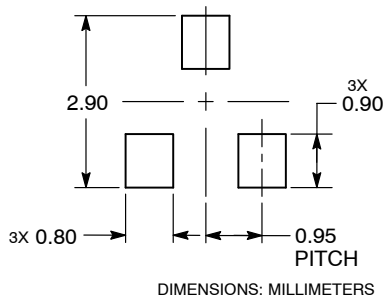
### GENERIC MARKING DIAGRAM\*



XXX = Specific Device Code  
M = Date Code  
■ = Pb-Free Package

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "■", may or may not be present.

### RECOMMENDED SOLDERING FOOTPRINT



DIMENSIONS: MILLIMETERS

STYLE 1 THRU 5:  
CANCELLED

STYLE 6:  
PIN 1. BASE  
2. EMITTER  
3. COLLECTOR

STYLE 7:  
PIN 1. EMITTER  
2. BASE  
3. COLLECTOR

STYLE 8:  
PIN 1. ANODE  
2. NO CONNECTION  
3. CATHODE

STYLE 9:  
PIN 1. ANODE  
2. ANODE  
3. CATHODE

STYLE 10:  
PIN 1. DRAIN  
2. SOURCE  
3. GATE

STYLE 11:  
PIN 1. ANODE  
2. CATHODE  
3. CATHODE-ANODE

STYLE 12:  
PIN 1. CATHODE  
2. CATHODE  
3. ANODE

STYLE 13:  
PIN 1. SOURCE  
2. DRAIN  
3. GATE

STYLE 14:  
PIN 1. CATHODE  
2. GATE  
3. ANODE

STYLE 15:  
PIN 1. GATE  
2. CATHODE  
3. ANODE

STYLE 16:  
PIN 1. ANODE  
2. CATHODE  
3. CATHODE

STYLE 17:  
PIN 1. NO CONNECTION  
2. ANODE  
3. CATHODE

STYLE 18:  
PIN 1. NO CONNECTION  
2. CATHODE  
3. ANODE

STYLE 19:  
PIN 1. CATHODE  
2. ANODE  
3. CATHODE-ANODE

STYLE 20:  
PIN 1. CATHODE  
2. ANODE  
3. GATE

STYLE 21:  
PIN 1. GATE  
2. SOURCE  
3. DRAIN

STYLE 22:  
PIN 1. RETURN  
2. OUTPUT  
3. INPUT

STYLE 23:  
PIN 1. ANODE  
2. ANODE  
3. CATHODE

STYLE 24:  
PIN 1. GATE  
2. DRAIN  
3. SOURCE

STYLE 25:  
PIN 1. ANODE  
2. CATHODE  
3. GATE

STYLE 26:  
PIN 1. CATHODE  
2. ANODE  
3. NO CONNECTION

STYLE 27:  
PIN 1. CATHODE  
2. CATHODE  
3. CATHODE

STYLE 28:  
PIN 1. ANODE  
2. ANODE  
3. ANODE

|                  |                 |                                                                                                                                                                                     |
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