

# MMBT2484LT1G

## Low Noise Transistor

### NPN Silicon

#### Features

- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

#### MAXIMUM RATINGS

| Rating                         | Symbol    | Value | Unit             |
|--------------------------------|-----------|-------|------------------|
| Collector – Emitter Voltage    | $V_{CEO}$ | 60    | Vdc              |
| Collector – Base Voltage       | $V_{CBO}$ | 60    | Vdc              |
| Emitter – Base Voltage         | $V_{EBO}$ | 6.0   | Vdc              |
| Collector Current – Continuous | $I_C$     | 100   | mA <sub>dc</sub> |

#### 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         | $^\circ\text{C}/\text{W}$  |
| 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         | $^\circ\text{C}/\text{W}$  |
| Junction and Storage Temperature                                                                                    | $T_J, T_{stg}$  | -55 to +150 | $^\circ\text{C}$           |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

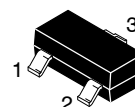
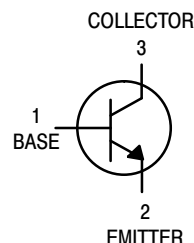
1. FR-5 = 1.0 x 0.75 x 0.062 in.

2. Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.



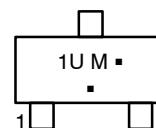
ON Semiconductor®

<http://onsemi.com>



SOT-23 (TO-236)  
CASE 318  
STYLE 6

#### MARKING DIAGRAM



1U = 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†           |
|--------------|---------------------|---------------------|
| MMBT2484LT1G | 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.

# MMBT2484LT1G

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

| Characteristic                                                                                                                                          | Symbol        | Min      | Max      | Unit                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------|----------|-------------------------|
| <b>OFF CHARACTERISTICS</b>                                                                                                                              |               |          |          |                         |
| Collector – Emitter Breakdown Voltage<br>( $I_C = 10\text{ mA}$ , $I_B = 0$ )                                                                           | $V_{(BR)CEO}$ | 60       | –        | Vdc                     |
| Collector – Base Breakdown Voltage<br>( $I_C = 10\text{ }\mu\text{A}$ , $I_E = 0$ )                                                                     | $V_{(BR)CBO}$ | 60       | –        | Vdc                     |
| Emitter – Base Breakdown Voltage<br>( $I_E = 10\text{ }\mu\text{A}$ , $I_C = 0$ )                                                                       | $V_{(BR)EBO}$ | 5.0      | –        | Vdc                     |
| Collector Cutoff Current<br>( $V_{CB} = 45\text{ Vdc}$ , $I_E = 0$ )<br>( $V_{CB} = 45\text{ Vdc}$ , $I_E = 0$ , $T_A = 150^\circ\text{C}$ )            | $I_{CBO}$     | –<br>–   | 10<br>10 | nAdc<br>$\mu\text{Adc}$ |
| Emitter Cutoff Current<br>( $V_{EB} = 5.0\text{ Vdc}$ , $I_C = 0$ )                                                                                     | $I_{EBO}$     | –        | 10       | nAdc                    |
| <b>ON CHARACTERISTICS</b>                                                                                                                               |               |          |          |                         |
| DC Current Gain<br>( $I_C = 1.0\text{ mA}$ , $V_{CE} = 5.0\text{ Vdc}$ )<br>( $I_C = 10\text{ mA}$ , $V_{CE} = 5.0\text{ Vdc}$ )                        | $h_{FE}$      | 250<br>– | –<br>800 | –                       |
| Collector – Emitter Saturation Voltage<br>( $I_C = 1.0\text{ mA}$ , $I_B = 0.1\text{ mA}$ )                                                             | $V_{CE(sat)}$ | –        | 0.35     | Vdc                     |
| Base – Emitter On Voltage<br>( $I_C = 1.0\text{ mA}$ , $V_{CE} = 5.0\text{ Vdc}$ )                                                                      | $V_{BE(on)}$  | –        | 0.95     | Vdc                     |
| <b>SMALL-SIGNAL CHARACTERISTICS</b>                                                                                                                     |               |          |          |                         |
| Output Capacitance<br>( $V_{CB} = 5.0\text{ Vdc}$ , $I_E = 0$ , $f = 1.0\text{ MHz}$ )                                                                  | $C_{obo}$     | –        | 6.0      | pF                      |
| Input Capacitance<br>( $V_{EB} = 0.5\text{ Vdc}$ , $I_C = 0$ , $f = 1.0\text{ MHz}$ )                                                                   | $C_{ibo}$     | –        | 6.0      | pF                      |
| Noise Figure<br>( $I_C = 10\text{ }\mu\text{A}$ , $V_{CE} = 5.0\text{ Vdc}$ , $R_S = 10\text{ k}\Omega$ , $f = 1.0\text{ kHz}$ , $BW = 200\text{ Hz}$ ) | NF            | –        | 3.0      | dB                      |

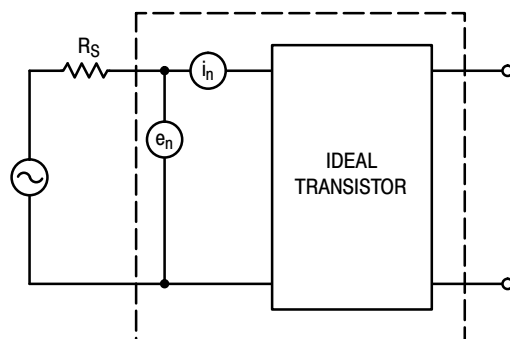


Figure 1. Transistor Noise Model

# MMBT2484LT1G

## NOISE CHARACTERISTICS

( $V_{CE} = 5.0 \text{ Vdc}$ ,  $T_A = 25^\circ\text{C}$ )

### NOISE VOLTAGE

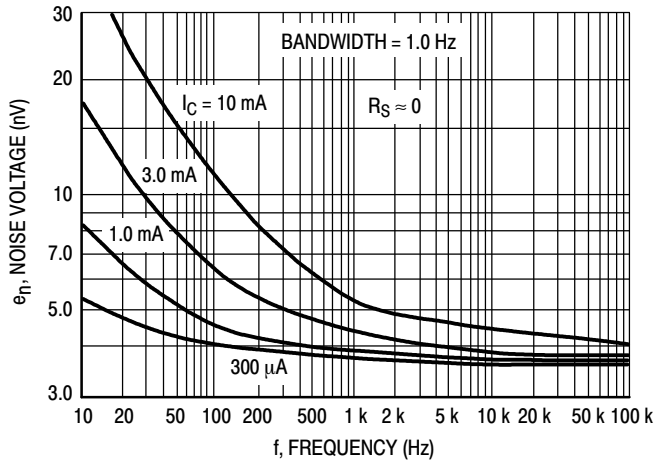


Figure 2. Effects of Frequency

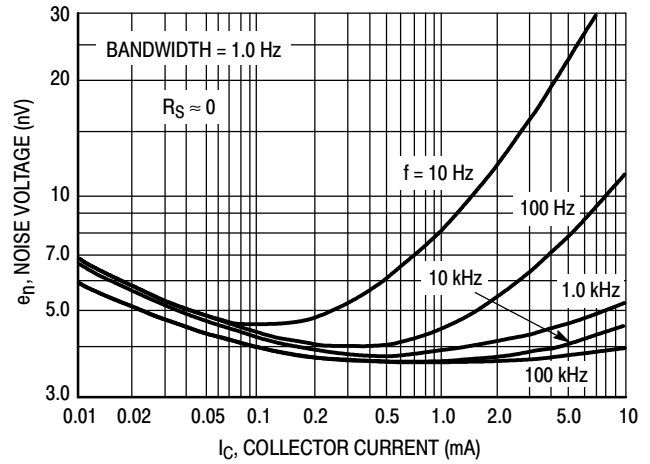


Figure 3. Effects of Collector Current

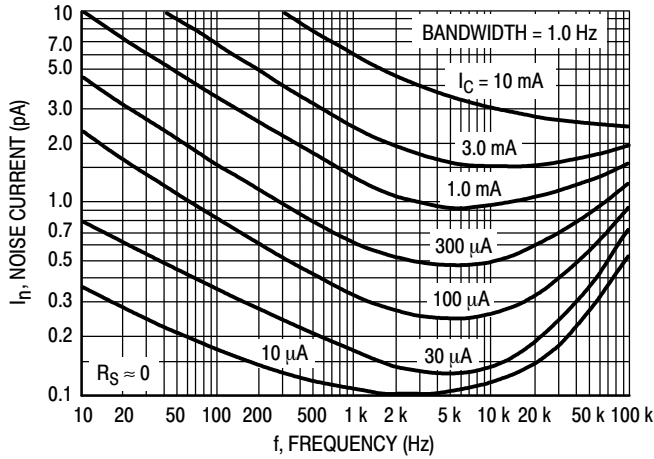


Figure 4. Noise Current

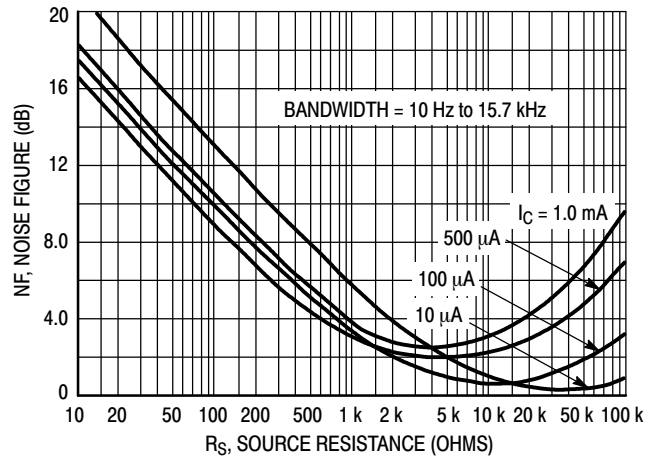


Figure 5. Wideband Noise Figure

### 100 Hz NOISE DATA

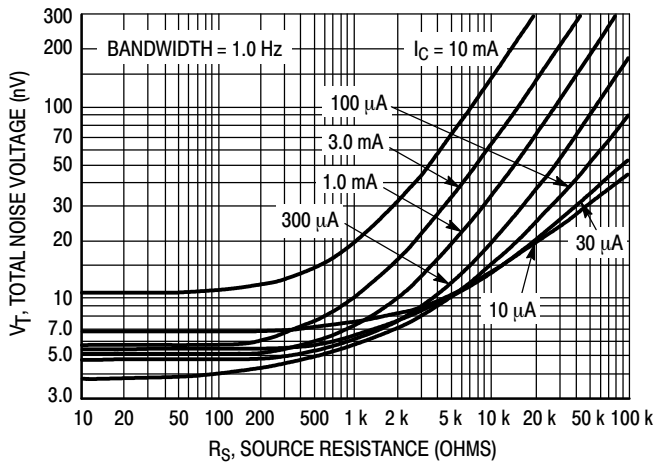


Figure 6. Total Noise Voltage

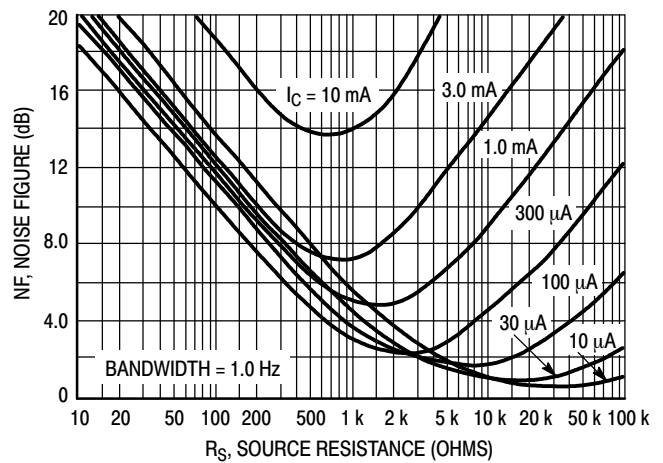


Figure 7. Noise Figure

# MMBT2484LT1G

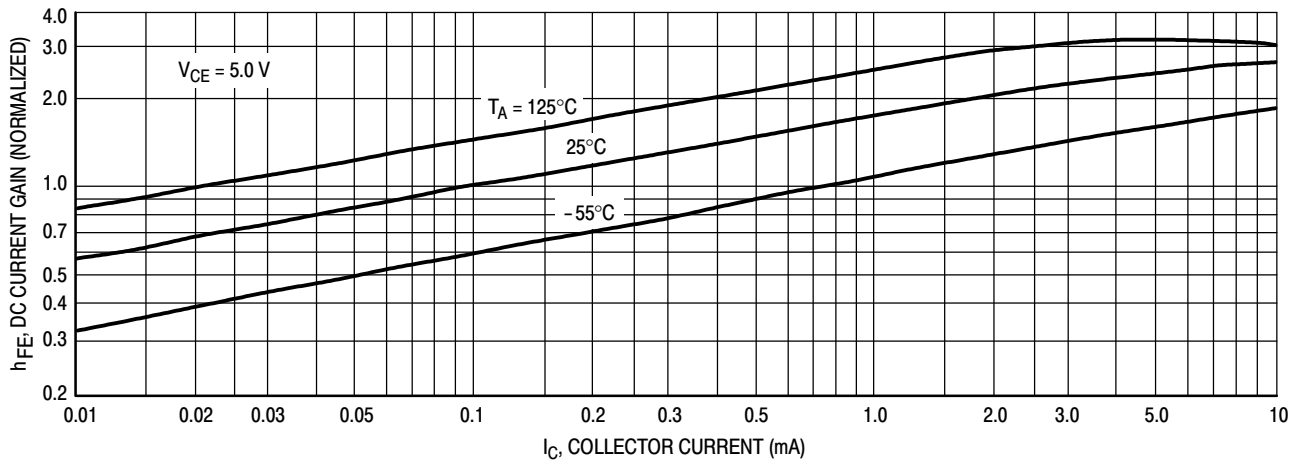


Figure 8. DC Current Gain

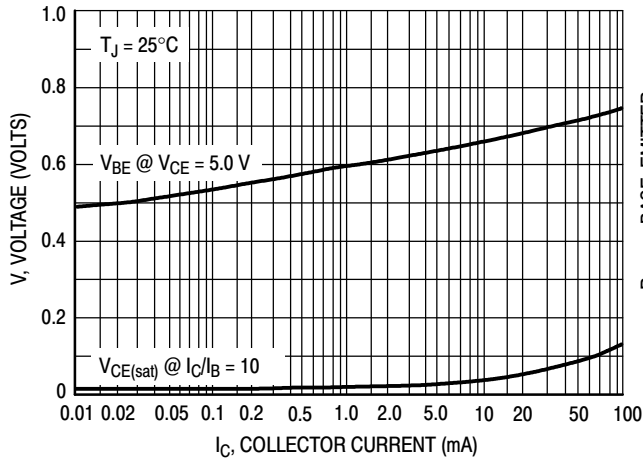


Figure 9. "On" Voltages

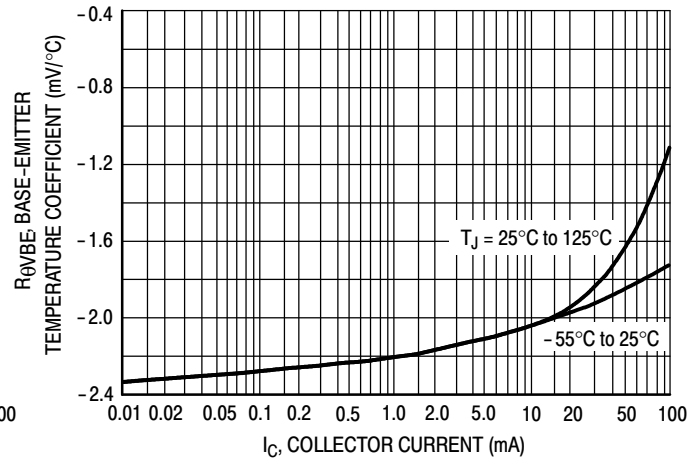


Figure 10. Temperature Coefficients

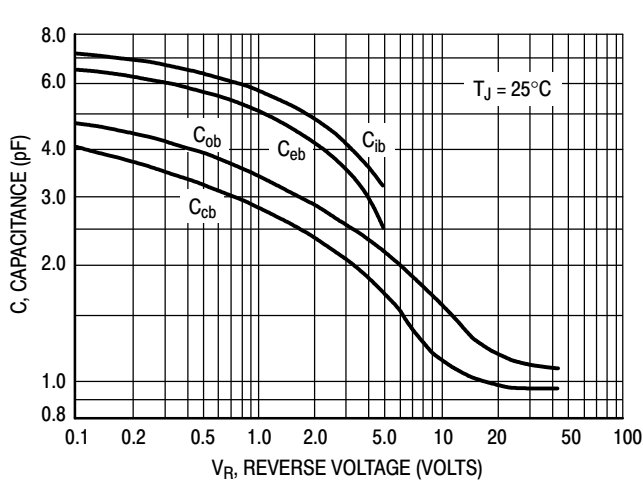


Figure 11. Capacitance

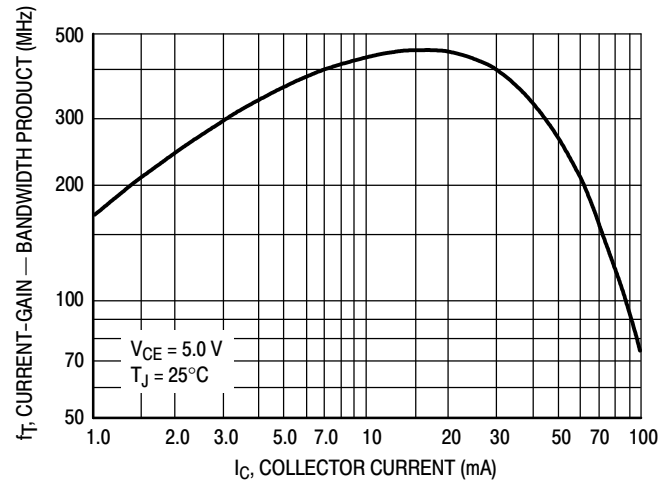
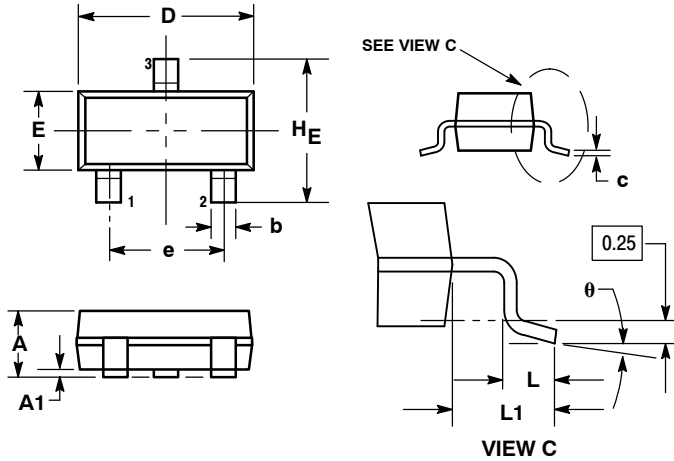


Figure 12. Current-Gain — Bandwidth Product

# MMBT2484LT1G

## PACKAGE DIMENSIONS

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



### NOTES:

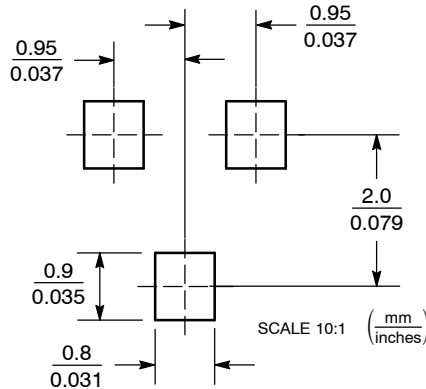
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318-01 THRU -07 AND -09 OBSOLETE, NEW STANDARD 318-08.

| 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 |
| H_E | 2.10        | 2.40 | 2.64 | 0.083  | 0.094 | 0.104 |

### STYLE 6:

1. BASE
2. EMITTER
3. COLLECTOR

## 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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