

MMBT6517LT1G

High Voltage 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} | 350 | V |
| Collector – Base Voltage | V_{CBO} | 350 | V |
| Emitter – Base Voltage | V_{EBO} | 5.0 | V |
| Base Current | I_B | 25 | mA |
| Collector Current – Continuous | I_C | 100 | mA |

THERMAL CHARACTERISTICS

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

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.

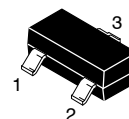
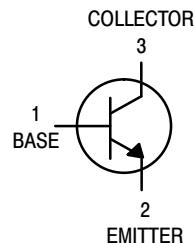
1. FR-5 = $1.0 \times 0.75 \times 0.062$ in.

2. Alumina = $0.4 \times 0.3 \times 0.024$ in. 99.5% alumina.



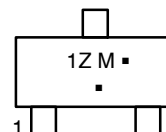
ON Semiconductor®

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

MARKING DIAGRAM



1Z = 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† |
|--------------|---------------------|--------------------|
| MMBT6517LT1G | SOT-23 (Pb-Free) | 3000 Tape & Reel |
| MMBT6517LT3G | SOT-23 (Pb-Free) | 10,000 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.

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

| Characteristic | Symbol | Min | Max | Unit |
|---|----------------------|----------------------------|-----------------------------|------|
| OFF CHARACTERISTICS | | | | |
| Collector–Emitter Breakdown Voltage (I _C = 1.0 mA) | V _{(BR)CEO} | 350 | – | V |
| Collector–Base Breakdown Voltage (I _C = 100 µA) | V _{(BR)CBO} | 350 | – | V |
| Emitter–Base Breakdown Voltage (I _E = 10 µA) | V _{(BR)EBO} | 6.0 | – | V |
| Collector Cutoff Current (V _{CB} = 250 V) | I _{CBO} | – | 50 | nA |
| Emitter Cutoff Current (V _{EB} = 5.0 V) | I _{EBO} | – | 50 | nA |
| ON CHARACTERISTICS | | | | |
| DC Current Gain (I _C = 1.0 mA, V _{CE} = 10 V) (I _C = 10 mA, V _{CE} = 10 V) (I _C = 30 mA, V _{CE} = 10 V) (I _C = 50 mA, V _{CE} = 10 V) (I _C = 100 mA, V _{CE} = 10 V) | h _{FE} | 20 30 30 20 15 | – – 200 200 – | – |
| Collector–Emitter Saturation Voltage (Note 3) (I _C = 10 mA, I _B = 1.0 mA) (I _C = 20 mA, I _B = 2.0 mA) (I _C = 30 mA, I _B = 3.0 mA) (I _C = 50 mA, I _B = 5.0 mA) | V _{CE(sat)} | – – – – | 0.30 0.35 0.50 1.0 | V |
| Base–Emitter Saturation Voltage (I _C = 10 mA, I _B = 1.0 mA) (I _C = 20 mA, I _B = 2.0 mA) (I _C = 30 mA, I _B = 3.0 mA) | V _{BE(sat)} | – – – | 0.75 0.85 0.90 | V |
| Base–Emitter On Voltage (I _C = 100 mA, V _{CE} = 10 V) | V _{BE(on)} | – | 2.0 | V |
| SMALL–SIGNAL CHARACTERISTICS | | | | |
| Current Gain – Bandwidth Product (I _C = 10 mA, V _{CE} = 20 V, f = 20 MHz) | f _T | 40 | 200 | MHz |
| Collector–Base Capacitance (V _{CB} = 20 V, f = 1.0 MHz) | C _{cb} | – | 6.0 | pF |
| Emitter–Base Capacitance (V _{EB} = 0.5 V, f = 1.0 MHz) | C _{eb} | – | 80 | pF |

3. Pulse Test: Pulse Width = 300 µs, Duty Cycle = 2.0%.

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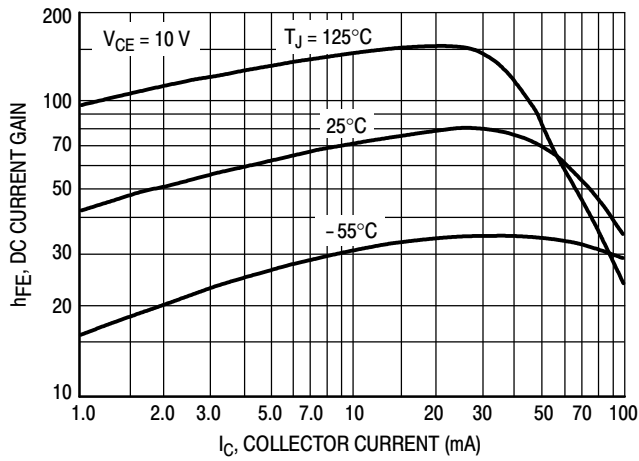


Figure 1. DC Current Gain

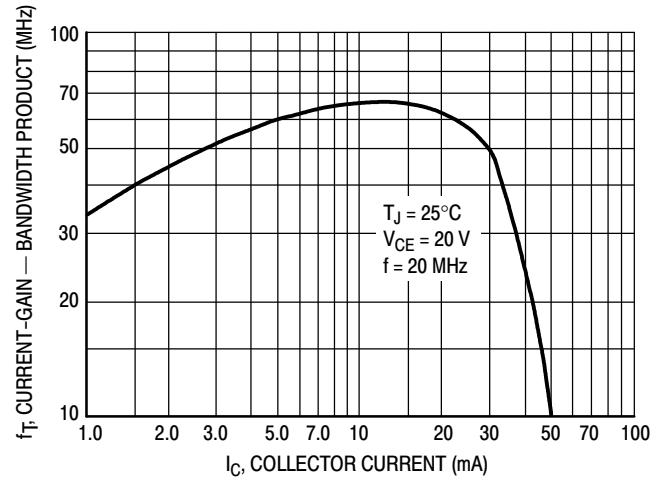


Figure 2. Current-Gain — Bandwidth Product

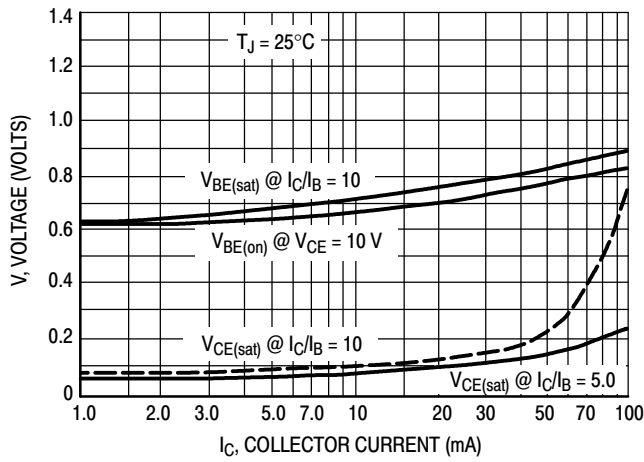


Figure 3. "On" Voltages

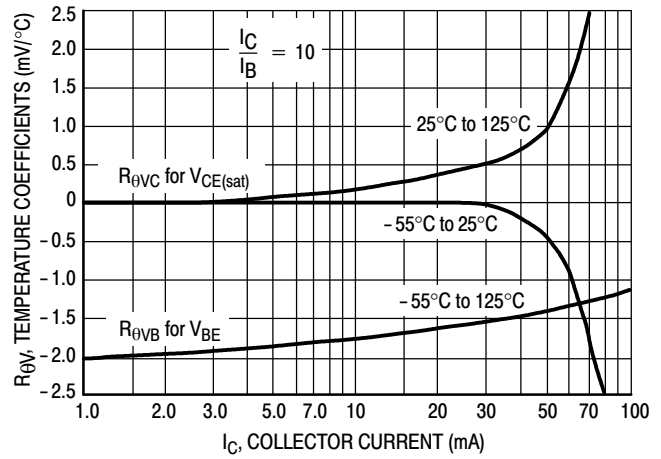


Figure 4. Temperature Coefficients

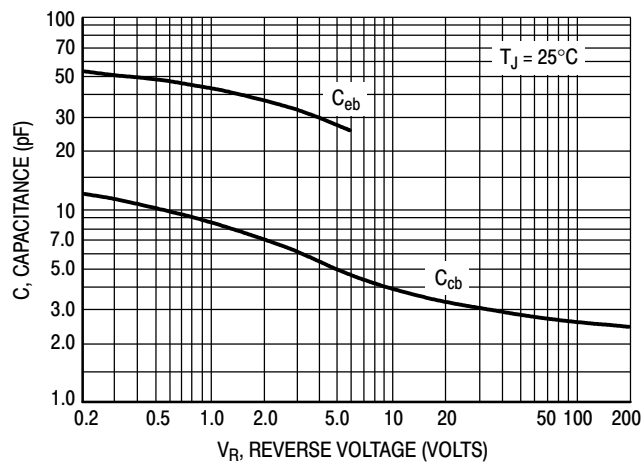
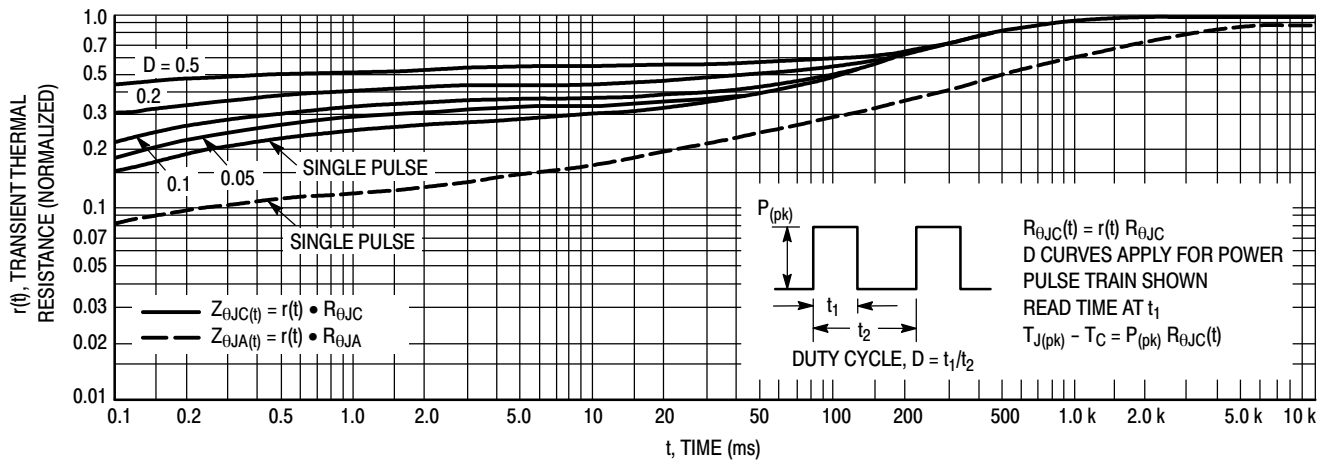
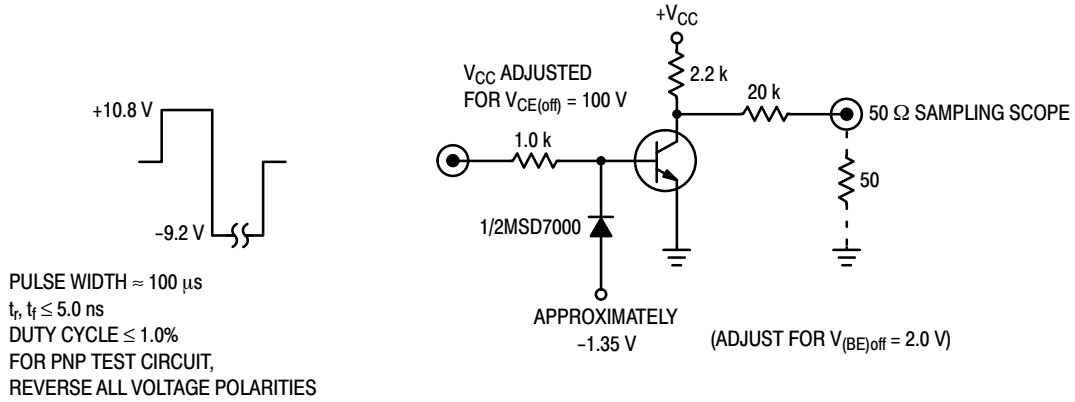
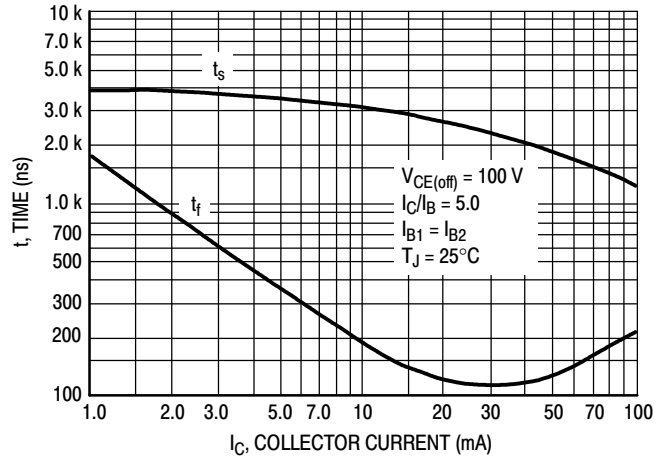
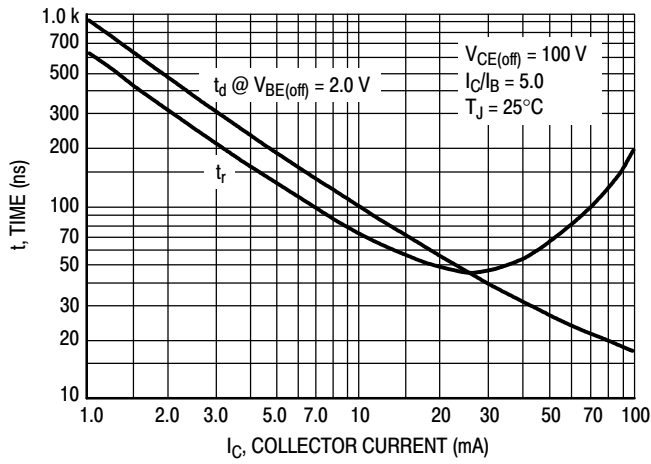


Figure 5. Capacitance

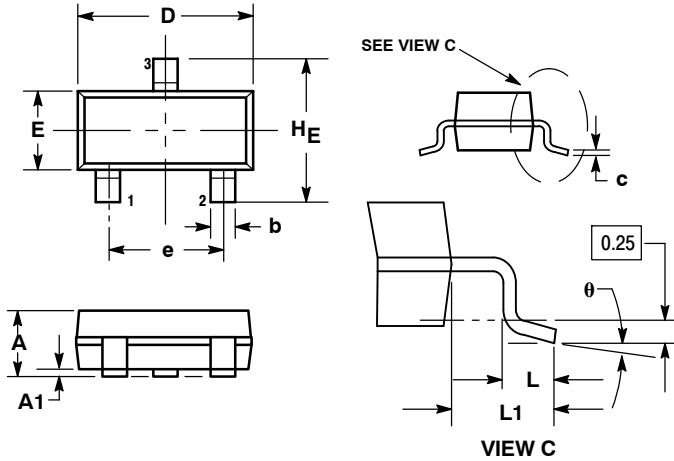
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PACKAGE DIMENSIONS

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



NOTES:

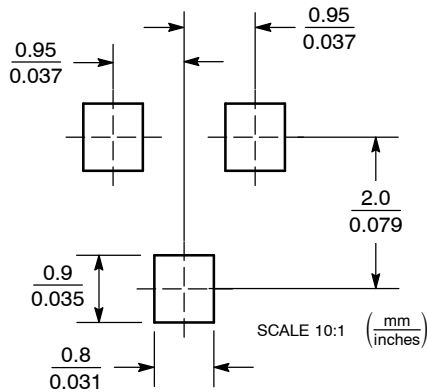
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318-01 THRU -07 AND -09 OBSOLETE, NEW STANDARD 318-08.

| 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 6:

- PIN 1. BASE
- EMITTER
- 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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