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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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MMBT589LT1G, NSVMMBT589LT1G

High Current Surface Mount PNP Silicon Switching Transistor for Load Management in Portable Applications

Features

- NSV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

| Rating | Symbol | Value | Unit |
|--------------------------------|-----------|-------|------|
| Collector-Emitter Voltage | V_{CEO} | -30 | Vdc |
| Collector-Base Voltage | V_{CBO} | -50 | Vdc |
| Emitter-Base Voltage | V_{EBO} | -5.0 | Vdc |
| Collector Current - Continuous | I_C | -1.0 | Adc |
| Collector Current - Peak | I_{CM} | -2.0 | A |

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 | 310 2.5 | mW mW/ $^\circ\text{C}$ |
| Thermal Resistance Junction-to-Ambient (Note 1) | $R_{\theta JA}$ | 403 | $^\circ\text{C}/\text{W}$ |
| Total Device Dissipation Alumina Substrate, (Note 2) $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 710 5.7 | mW mW/ $^\circ\text{C}$ |
| Thermal Resistance Junction-to-Ambient (Note 2) | $R_{\theta JA}$ | 176 | $^\circ\text{C}/\text{W}$ |
| Total Device Dissipation (Ref. Figure 8) (Single Pulse < 10 sec.) | $P_{D\text{single}}$ | 575 | mW |
| Junction and Storage Temperature | T_J, 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.

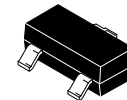
1. FR-4 @ Minimum Pad
2. FR-4 @ 1.0 X 1.0 inch Pad



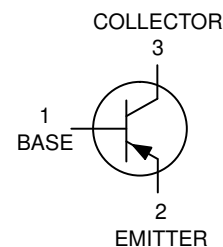
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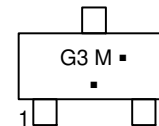
30 VOLTS, 2.0 AMPS
PNP TRANSISTORS



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



MARKING DIAGRAM



G3 = 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† |
|----------------|---------------------|------------------------|
| MMBT589LT1G | SOT-23 (Pb-Free) | 3,000 / Tape & Reel |
| NSVMMBT589LT1G | SOT-23 (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.

MMBT589LT1G, NSVMMBT589LT1G

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

| Characteristic | Symbol | Min | Max | Unit |
|--|---------------|------------------------|-------------------------|-----------------|
| OFF CHARACTERISTICS | | | | |
| Collector–Emitter Breakdown Voltage ($I_C = -10\text{ mA}$, $I_B = 0$) | $V_{(BR)CEO}$ | –30 | – | Vdc |
| Collector–Base Breakdown Voltage ($I_C = -0.1\text{ mA}$, $I_E = 0$) | $V_{(BR)CBO}$ | –50 | – | Vdc |
| Emitter–Base Breakdown Voltage ($I_E = -0.1\text{ mA}$, $I_C = 0$) | $V_{(BR)EBO}$ | –5.0 | – | Vdc |
| Collector Cutoff Current ($V_{CB} = -30\text{ Vdc}$, $I_E = 0$) | I_{CBO} | – | –0.1 | μAdc |
| Collector–Emitter Cutoff Current ($V_{CES} = -30\text{ Vdc}$) | I_{CES} | – | –0.1 | μAdc |
| Emitter Cutoff Current ($V_{EB} = -4.0\text{ Vdc}$) | I_{EBO} | – | –0.1 | μAdc |
| ON CHARACTERISTICS | | | | |
| DC Current Gain (Note 3) (Figure 1) ($I_C = -1.0\text{ mA}$, $V_{CE} = -2.0\text{ V}$) ($I_C = -500\text{ mA}$, $V_{CE} = -2.0\text{ V}$) ($I_C = -1.0\text{ A}$, $V_{CE} = -2.0\text{ V}$) ($I_C = 2.0\text{ A}$, $V_{CE} = -2.0\text{ V}$) | h_{FE} | 100 100 80 40 | – 300 – – | – |
| Collector–Emitter Saturation Voltage (Note 3) (Figure 3) ($I_C = -0.5\text{ A}$, $I_B = -0.05\text{ A}$) ($I_C = -1.0\text{ A}$, $I_B = 0.1\text{ A}$) ($I_C = -2.0\text{ A}$, $I_B = -0.2\text{ A}$) | $V_{CE(sat)}$ | – – – | –0.25 –0.30 –0.65 | V |
| Base–Emitter Saturation Voltage (Note 3) (Figure 2) ($I_C = -1.0\text{ A}$, $I_B = -0.1\text{ A}$) | $V_{BE(sat)}$ | – | –1.2 | V |
| Base–Emitter Turn–on Voltage (Note 3) ($I_C = -1.0\text{ A}$, $V_{CE} = -2.0\text{ V}$) | $V_{BE(on)}$ | – | –1.1 | V |
| Cutoff Frequency ($I_C = -100\text{ mA}$, $V_{CE} = -5.0\text{ V}$, $f = 100\text{ MHz}$) | f_T | 100 | – | MHz |
| Output Capacitance ($f = 1.0\text{ MHz}$) | C_{obo} | – | 15 | pF |

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.

3. Pulsed Condition: Pulse Width = 300 msec, Duty Cycle $\leq 2\%$

MMBT589LT1G, NSVMMBT589LT1G

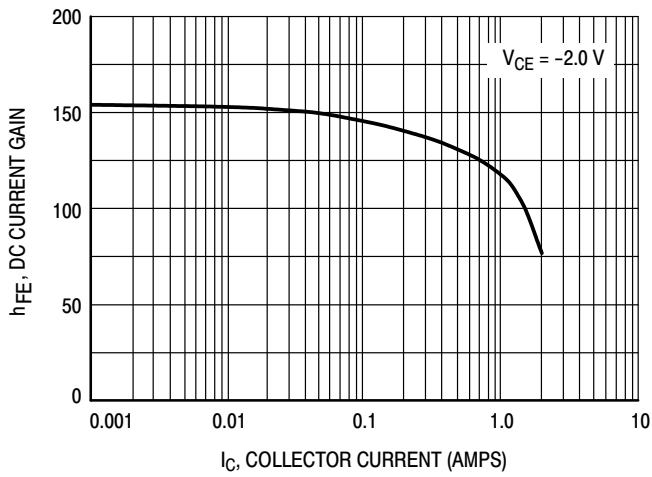


Figure 1. DC Current Gain versus Collector Current

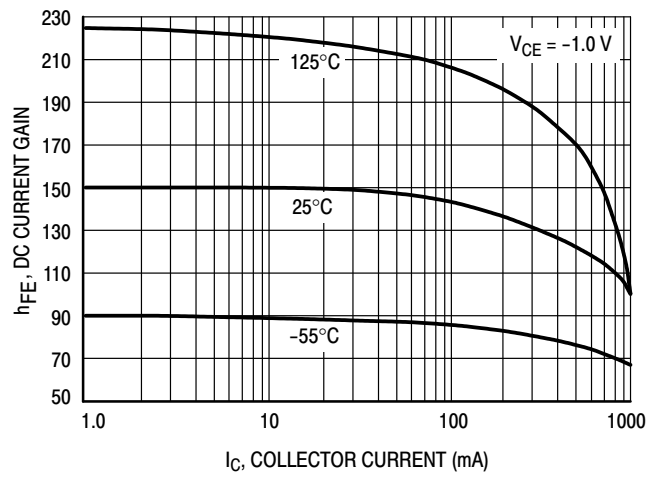


Figure 2. DC Current Gain versus Collector Current

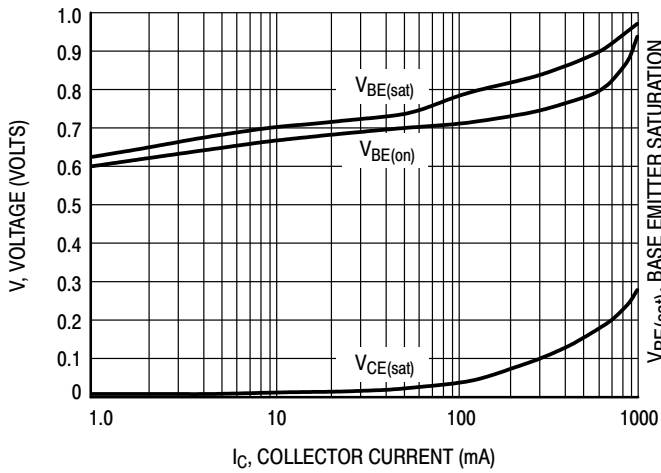


Figure 3. "On" Voltages

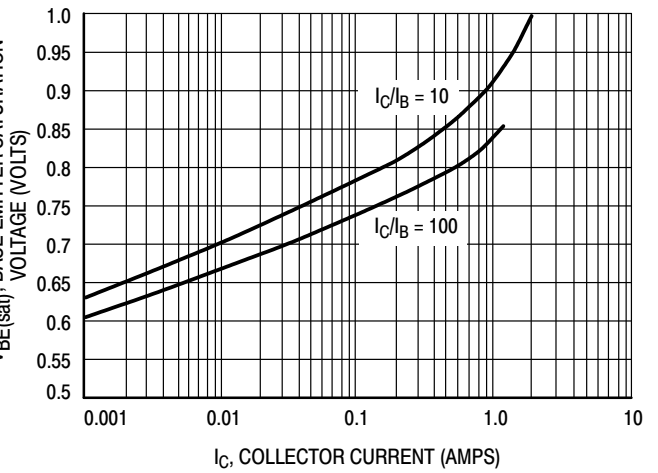


Figure 4. Base Emitter Saturation Voltage versus Collector Current

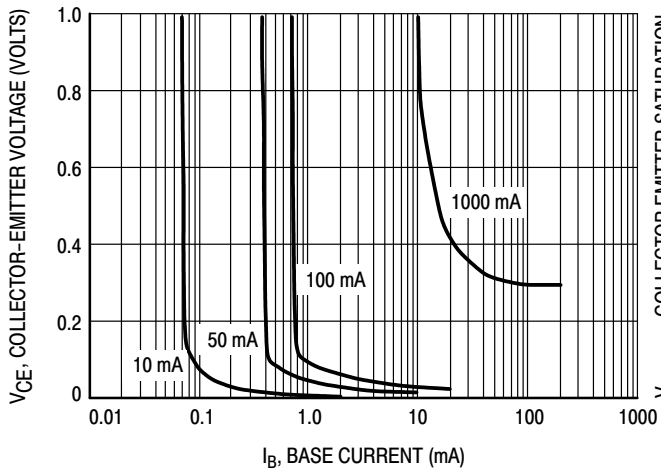


Figure 5. Collector Emitter Saturation Voltage versus Collector Current

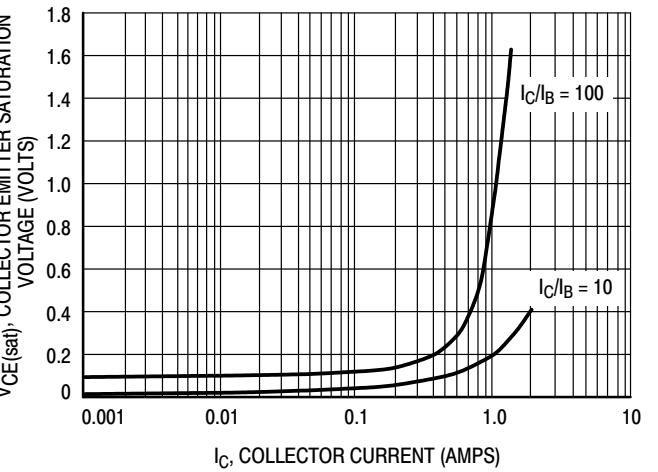


Figure 6. Collector Emitter Saturation Voltage versus Collector Current

MMBT589LT1G, NSVMMBT589LT1G

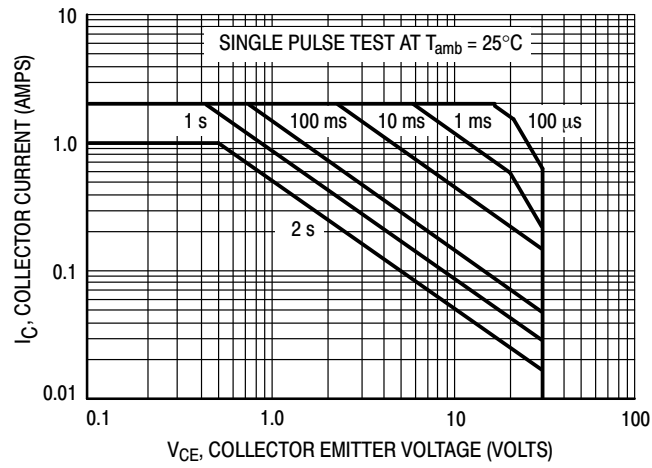


Figure 7. Safe Operating Area

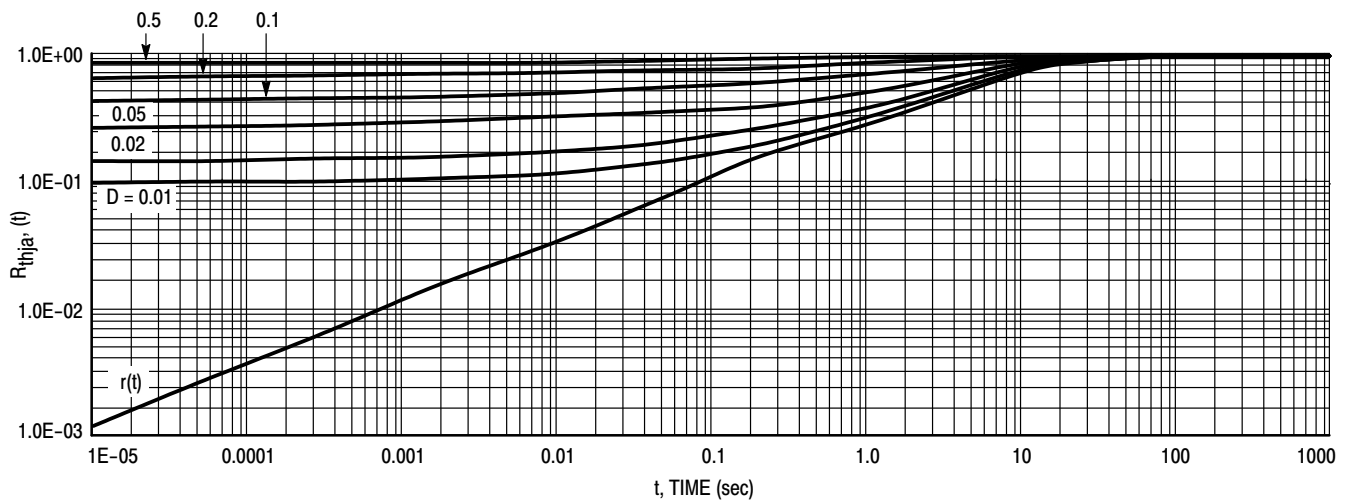
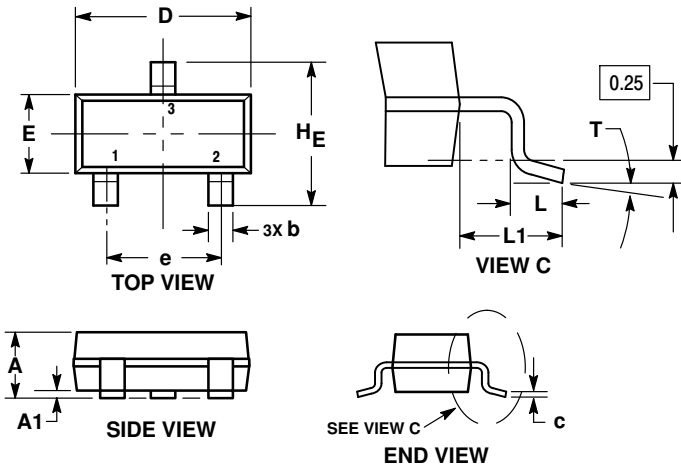


Figure 8. Normalized Thermal Response

MMBT589LT1G, NSVMMBT589LT1G

PACKAGE DIMENSIONS

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



NOTES:

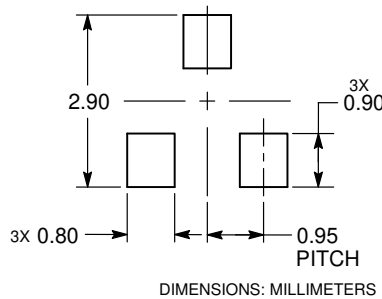
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

| 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° |

STYLE 6:

1. BASE
2. EMITTER
3. COLLECTOR

RECOMMENDED 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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