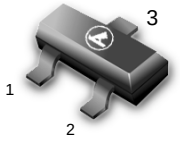
# Darlington Transistors

## PNP Silicon

We declare that the material of product compliance with RoHS requirements.

**LMBTA63LT1G**
**LMBTA64LT1G**




**CASE 318–08, STYLE 6**
**SOT–23 (TO–236AB)**

### MAXIMUM RATINGS

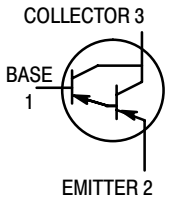
| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Collector–Emitter Voltage | $V_{CES}$ | –30 | Vdc |
| Collector–Base Voltage | $V_{CBO}$ | –30 | Vdc |
| Emitter–Base Voltage | $V_{EBO}$ | –10 | Vdc |
| Collector Current – Continuous | $I_C$ | –500 | mAdc |

### DEVICE MARKING

LMBTA63LT1G = 2U; LMBTA64LT1G = 2V

### THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|---|---|---|---|
| Total Device Dissipation FR–5 Board,(1) $T_A$ = 25°C<br>Derate above 25°C | $P_D$ | 225<br>1.8 | mW<br>mW/°C |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 556 | °C/W |
| Total Device Dissipation Alumina Substrate,(2) $T_A$ = 25°C<br>Derate above 25°C | $P_D$ | 300<br>2.4 | mW<br>mW/°C |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 417 | °C/W |
| Junction and Storage Temperature | $T_J$, $T_{stg}$ | –55 to +150 | °C |




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

| Characteristic | | Symbol | Min | Max | Unit |
|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | |
| Collector–Emitter Breakdown Voltage ($I_C$ = –100 μAdc) | | $V_{(BR)CEO}$ | –30 | – | Vdc |
| Collector Cutoff Current ($V_{CB}$ = –30 Vdc) | | $I_{CBO}$ | – | –100 | nAdc |
| Emitter Cutoff Current ($V_{EB}$ = –10 Vdc) | | $I_{EBO}$ | – | –100 | nAdc |
| **ON CHARACTERISTICS** | | | | | |
| DC Current Gain(3) | | $h_{FE}$ | | | – |
| ($I_C$ = –10 mAdc, $V_{CE}$ = –5.0 Vdc) | LMBTA63LT1G | | 5,000 | – | |
| ($I_C$ = –10 mAdc, $V_{CE}$ = –5.0 Vdc) | LMBTA64LT1G | | 10,000 | – | |
| ($I_C$ = –100 mAdc, $V_{CE}$ = –5.0 Vdc) | LMBTA63LT1G | | 10,000 | – | |
| ($I_C$ = –100 mAdc, $V_{CE}$ = –5.0 Vdc) | LMBTA64LT1G | | 20,000 | – | |
| Collector–Emitter Saturation Voltage ($I_C$ = –100 mAdc, $I_B$ = –0.1 mAdc) | | $V_{CE(sat)}$ | – | –1.5 | Vdc |
| Base–Emitter On Voltage ($I_C$ = –100 mAdc, $V_{CE}$ = –5.0 Vdc) | | $V_{BE(on)}$ | – | –2.0 | Vdc |
| **SMALL–SIGNAL CHARACTERISTICS** | | | | | |
| Current–Gain – Bandwidth Product ($I_C$ = –10 mAdc, $V_{CE}$ = –5.0 Vdc, f = 100 MHz) | | $f_T$ | 125 | – | MHz |

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

## LMBTA63LT1G LMBTA64LT1G

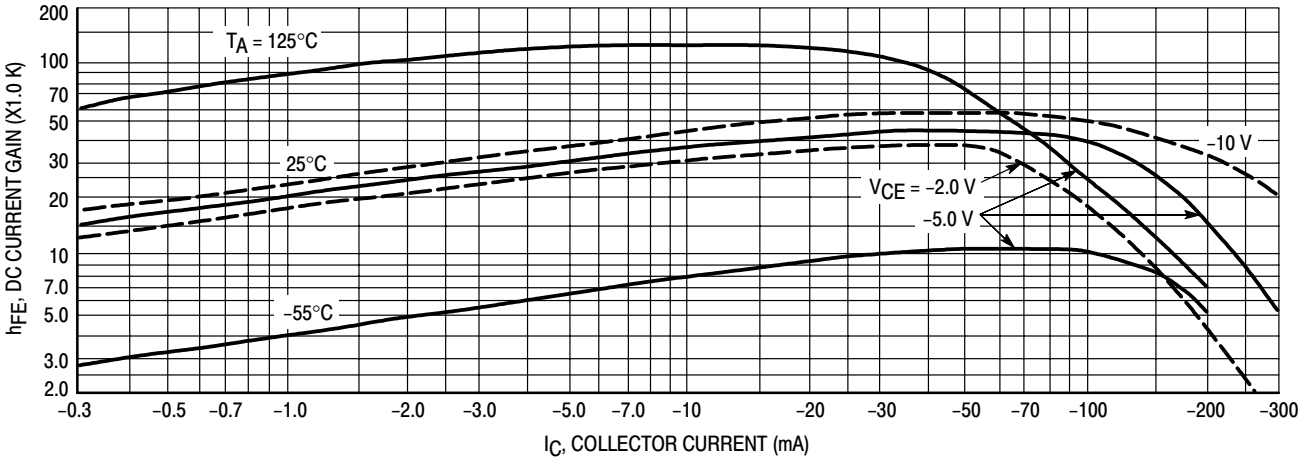



**Figure 1. DC Current Gain**

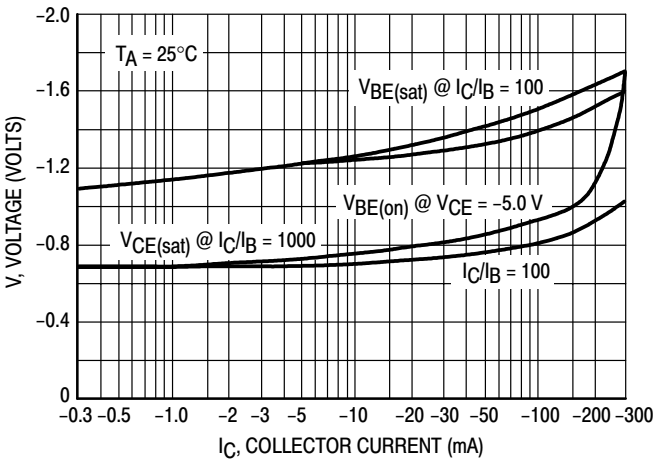



**Figure 3. "On" Voltage**

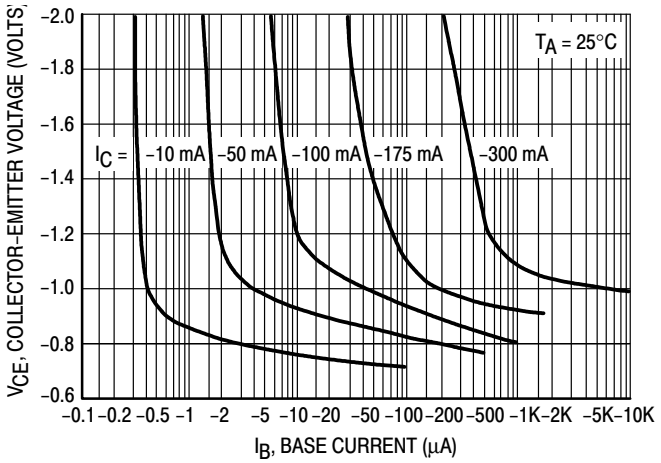



**Figure 2. Collector Saturation Region**

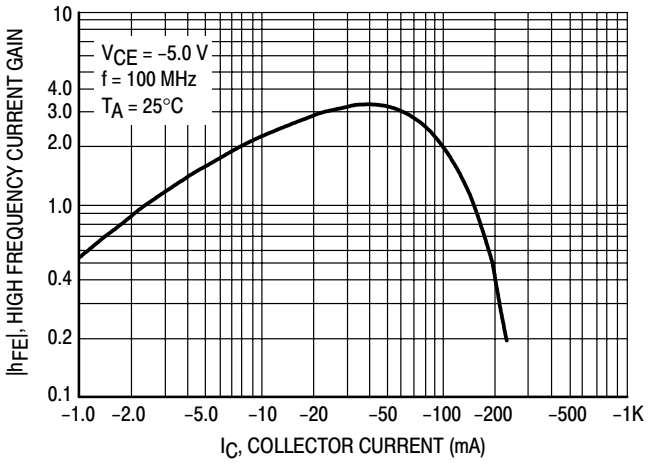
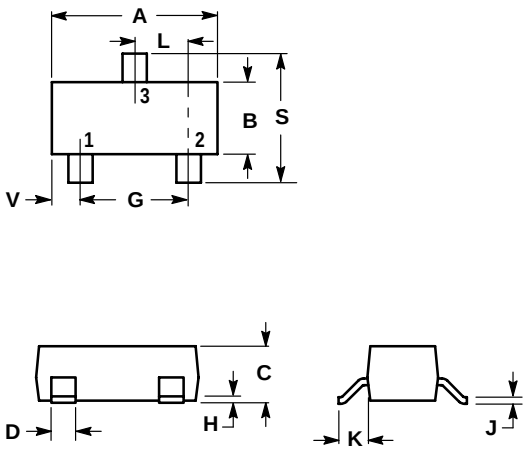



**Figure 4. High Frequency Current Gain**

**LMBTA63LT1G LMBTA64LT1G**

## SOT–23




NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M,1982
2. CONTROLLING DIMENSION: INCH.

| DIM | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | 0.1102 | 0.1197 | 2.80 | 3.04 |
| B | 0.0472 | 0.0551 | 1.20 | 1.40 |
| C | 0.0350 | 0.0440 | 0.89 | 1.11 |
| D | 0.0150 | 0.0200 | 0.37 | 0.50 |
| G | 0.0701 | 0.0807 | 1.78 | 2.04 |
| H | 0.0005 | 0.0040 | 0.013 | 0.100 |
| J | 0.0034 | 0.0070 | 0.085 | 0.177 |
| K | 0.0140 | 0.0285 | 0.35 | 0.69 |
| L | 0.0350 | 0.0401 | 0.89 | 1.02 |
| S | 0.0830 | 0.1039 | 2.10 | 2.64 |
| V | 0.0177 | 0.0236 | 0.45 | 0.60 |