

# Driver Transistors

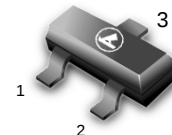
**LMBTA05LT1**  
**LMBTA06LT1**

## FEATURES

- Pb-Free Package May be Available. The G-Suffix Denotes a Pb-Free Lead Finish

## MAXIMUM RATINGS

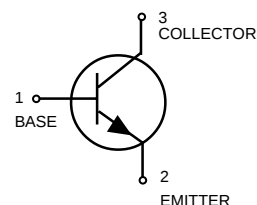
| Rating                         | Symbol    | Value   |         | Unit |
|--------------------------------|-----------|---------|---------|------|
|                                |           | LMBTA05 | LMBTA06 |      |
| Collector-Emitter Voltage      | $V_{CEO}$ | 60      | 80      | Vdc  |
| Collector-Base Voltage         | $V_{CBO}$ | 60      | 80      | Vdc  |
| Emitter-Base Voltage           | $V_{EBO}$ | 4.0     |         | Vdc  |
| Collector Current — Continuous | $I_C$     | 500     |         | mAdc |



**SOT-23**

## THERMAL CHARACTERISTICS

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



## DEVICE MARKING

LMBTA05LT1 = 1H, LMBTA06LT1 = 1GM

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

| Characteristic | Symbol | Min | Max | Unit |
|----------------|--------|-----|-----|------|
|----------------|--------|-----|-----|------|

## OFF CHARACTERISTICS

|                                                                                 |               |     |     |                 |
|---------------------------------------------------------------------------------|---------------|-----|-----|-----------------|
| Collector-Emitter Breakdown Voltage(3)<br>( $I_C = 1.0 \text{ mAdc}, I_B = 0$ ) | $V_{(BR)CEO}$ | 60  | —   | Vdc             |
|                                                                                 | LMBTA05       | 60  | —   |                 |
|                                                                                 | LMBTA06       | 80  | —   |                 |
| Emitter-Base Breakdown Voltage<br>( $I_E = 100 \mu\text{Adc}, I_C = 0$ )        | $V_{(BR)EBO}$ | 4.0 | —   | Vdc             |
| Collector Cutoff Current<br>( $V_{CE} = 60\text{Vdc}, I_B = 0$ )                | $I_{CES}$     | —   | 0.1 | $\mu\text{Adc}$ |
| Emitter Cutoff Current<br>( $V_{CB} = 60\text{Vdc}, I_E = 0$ )                  | $I_{CBO}$     | —   | 0.1 | $\mu\text{Adc}$ |
|                                                                                 | LMBTA05       | —   | 0.1 |                 |
|                                                                                 | LMBTA06       | —   | 0.1 |                 |

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.

3. Pulse Test: Pulse Width  $\leq 300 \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

## LMBTA05LT1 LMBTA06LT1

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

| Characteristic | Symbol | Min | Max | Unit |
|----------------|--------|-----|-----|------|
|----------------|--------|-----|-----|------|

#### ON CHARACTERISTICS

|                                                                                                                                  |               |            |        |     |
|----------------------------------------------------------------------------------------------------------------------------------|---------------|------------|--------|-----|
| DC Current Gain<br>( $I_C = 10\text{ mA}$ , $V_{CE} = 1.0\text{ Vdc}$ )<br>( $I_C = 100\text{ mA}$ , $V_{CE} = 1.0\text{ Vdc}$ ) | $h_{FE}$      | 100<br>100 | —<br>— | —   |
| Collector–Emitter Saturation Voltage<br>( $I_C = 100\text{ mA}$ , $I_B = 10\text{ mA}$ )                                         | $V_{CE(sat)}$ | —          | 0.25   | Vdc |
| Base–Emitter On Voltage<br>( $I_C = 100\text{ mA}$ , $V_{CE} = 1.0\text{ Vdc}$ )                                                 | $V_{BE(sat)}$ | —          | 1.2    | Vdc |

#### SMALL–SIGNAL CHARACTERISTICS

|                                                                                                                   |       |     |   |     |
|-------------------------------------------------------------------------------------------------------------------|-------|-----|---|-----|
| Current –Gain – Bandwidth Product(4)<br>( $V_{CE} = 2.0\text{ V}$ , $I_C = 10\text{ mA}$ , $f = 100\text{ MHz}$ ) | $f_T$ | 100 | — | MHz |
|-------------------------------------------------------------------------------------------------------------------|-------|-----|---|-----|

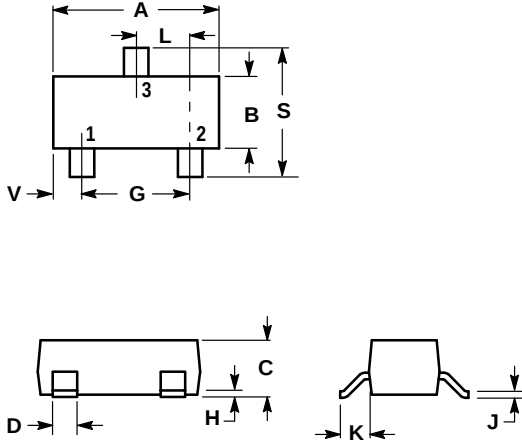
4.  $f_T$  is defined as the frequency at which  $|h_{fe}|$  extrapolates to unity.

#### ORDERING INFORMATION

| Device      | Package | Shipping         |
|-------------|---------|------------------|
| LMBTA05LT1  | SOT-23  | 3000/Tape & Reel |
| LMBTA05LT1G | SOT-23  | 3000/Tape & Reel |
| LMBTA06LT1  | SOT-23  | 3000/Tape & Reel |
| LMBTA06LT1G | SOT-23  | 3000/Tape & Reel |

LMBTA05LT1 LMBTA06LT1

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  |

- PIN 1. BASE  
2. EMITTER  
3. COLLECTOR

