

# MMBTA55LT1, MMBTA56LT1

MMBTA56LT1 is a Preferred Device

## Driver Transistors

### PNP Silicon

#### Features

- Pb-Free Package is Available

#### MAXIMUM RATINGS

| Rating  | Symbol    | Value      | Unit |
|---|-----------|------------|------|
| Collector-Emitter Voltage<br>MMBTA55<br>MMBTA56 | $V_{CEO}$ | -60<br>-80 | Vdc  |
| Collector-Base Voltage<br>MMBTA55<br>MMBTA56    | $V_{CBO}$ | -60<br>-80 | Vdc  |
| Emitter-Base Voltage                            | $V_{EBO}$ | -4.0       | Vdc  |
| Collector Current - Continuous                  | $I_C$     | -500       | mAdc |

#### THERMAL CHARACTERISTICS

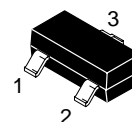
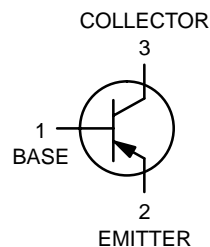
| Characteristic  | Symbol          | Max            | Unit                       |
|---|-----------------|----------------|----------------------------|
| Total Device Dissipation FR-5 Board<br>(Note 1) $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$         | $P_D$           | 225<br>1.8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

- FR-5 =  $1.0 \times 0.75 \times 0.062$  in.
- Alumina =  $0.4 \times 0.3 \times 0.024$  in. 99.5% alumina.



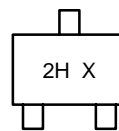
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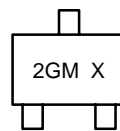


SOT-23  
CASE 318  
STYLE 6

#### MARKING DIAGRAMS



MMBTA55LT1



MMBTA56LT1

2H, 2GM = Specific Device Code  
X = Date Code

#### ORDERING INFORMATION

| Device                   | Package | Shipping†          |
|--------------------------|---------|--------------------|
| MMBTA55LT1               | SOT-23  | 3000/Tape & Reel   |
| MMBTA55LT3               | SOT-23  | 10,000/Tape & Reel |
| MMBTA56LT1               | SOT-23  | 3000/Tape & Reel   |
| MMBTA56LT1G<br>(Pb-Free) | SOT-23  | 3000/Tape & Reel   |
| MMBTA56LT3               | SOT-23  | 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.

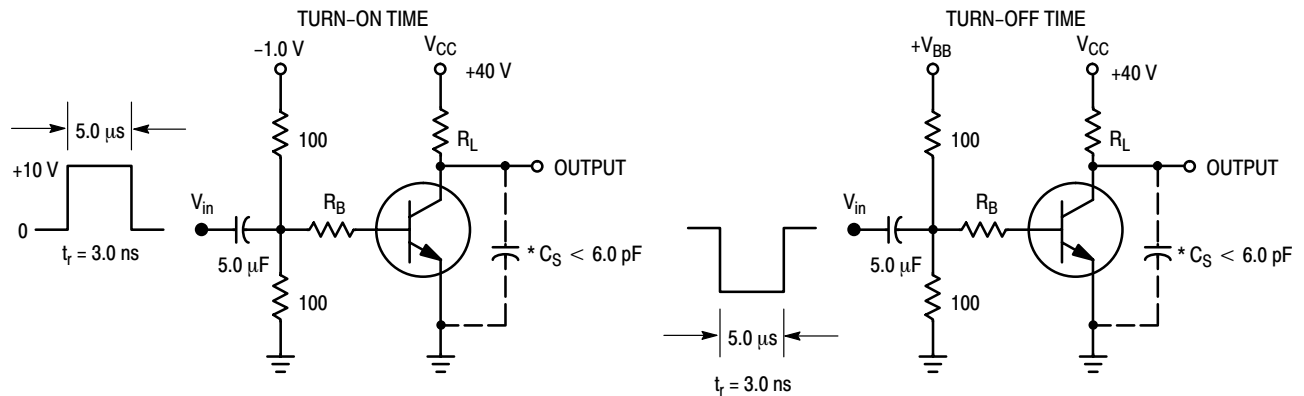
Preferred devices are recommended choices for future use and best overall value.

# MMBTA55LT1, MMBTA56LT1

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

| Characteristic   | Symbol        | Min        | Max          | Unit             |
|--|---------------|------------|--------------|------------------|
| <b>OFF CHARACTERISTICS</b>   |               |            |              |                  |
| Collector–Emitter Breakdown Voltage (Note 3)<br>( $I_C = -1.0\text{ mA}$ , $I_B = 0$ )   | $V_{(BR)CEO}$ | -60<br>-80 | -            | Vdc              |
| Emitter–Base Breakdown Voltage<br>( $I_E = -100\text{ }\mu\text{A}$ , $I_C = 0$ )  | $V_{(BR)EBO}$ | -4.0       | -            | Vdc              |
| Collector Cutoff Current<br>( $V_{CE} = -60\text{ Vdc}$ , $I_B = 0$ )  | $I_{CES}$     | -          | -0.1         | $\mu\text{A}$ dc |
| Collector Cutoff Current<br>( $V_{CB} = -60\text{ Vdc}$ , $I_E = 0$ )<br>( $V_{CB} = -80\text{ Vdc}$ , $I_E = 0$ )                   | $I_{CBO}$     | -<br>-     | -0.1<br>-0.1 | $\mu\text{A}$ dc |
| <b>ON CHARACTERISTICS</b>  |               |            |              |                  |
| 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>( $I_C = -100\text{ mA}$ , $V_{CE} = -1.0\text{ Vdc}$ )   | $V_{BE(on)}$  | -          | -1.2         | Vdc              |
| <b>SMALL–SIGNAL CHARACTERISTICS</b>  |               |            |              |                  |
| Current–Gain – Bandwidth Product (Note 4)<br>( $I_C = -100\text{ mA}$ , $V_{CE} = -1.0\text{ Vdc}$ , $f = 100\text{ MHz}$ )          | $f_T$         | 50         | -            | MHz              |

- Pulse Test: Pulse Width  $\leq 300\text{ }\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .
- $f_T$  is defined as the frequency at which  $|h_{fe}|$  extrapolates to unity.



\*Total Shunt Capacitance of Test Jig and Connectors  
For PNP Test Circuits, Reverse All Voltage Polarities

Figure 1. Switching Time Test Circuits

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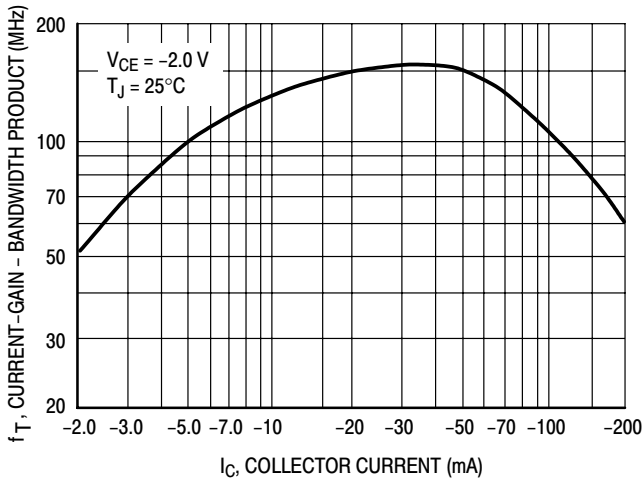


Figure 2. Current-Gain — Bandwidth Product

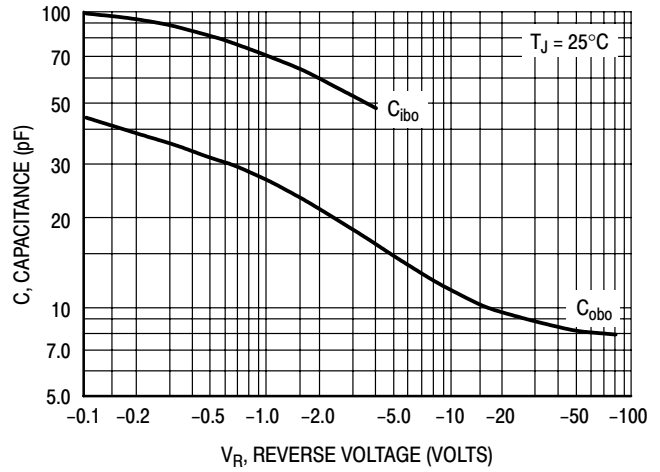


Figure 3. Capacitance

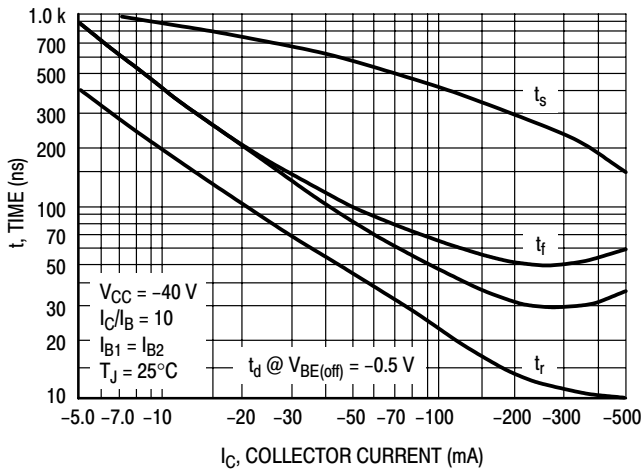


Figure 4. Switching Time

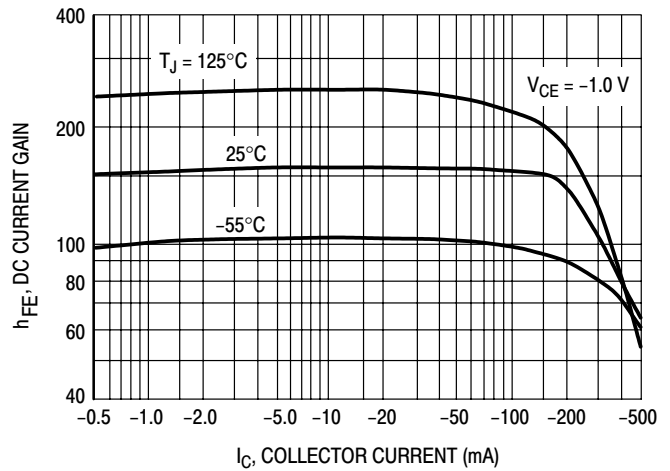


Figure 5. DC Current Gain

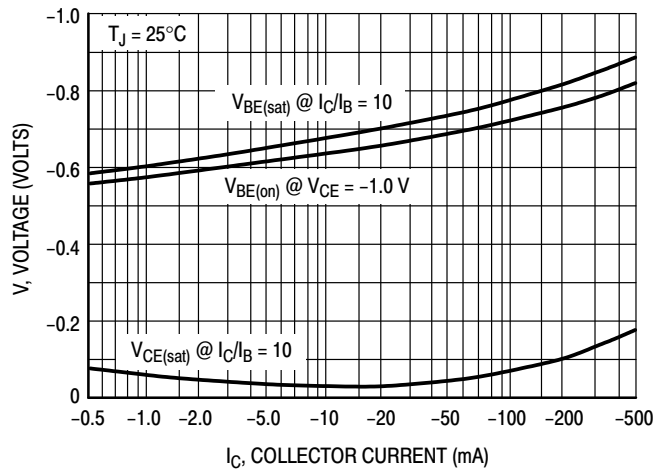


Figure 6. "ON" Voltages

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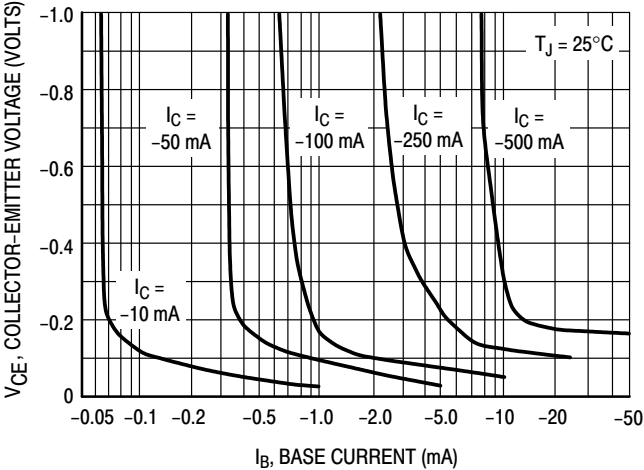


Figure 7. Collector Saturation Region

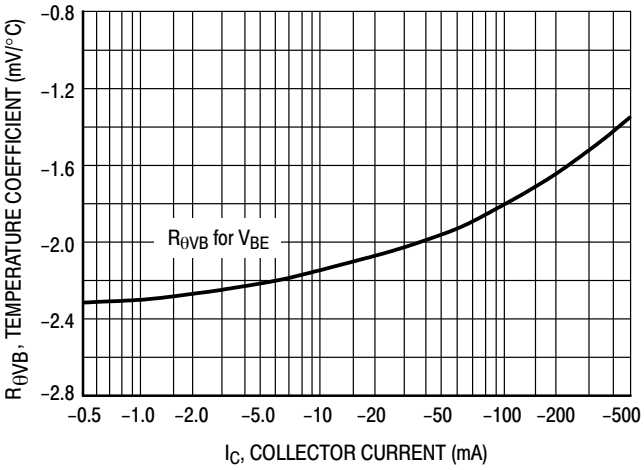



Figure 8. Base-Emitter Temperature Coefficient



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**MMBTA55LT1/D**