

MMBTA55LT1, MMBTA56LT1

MMBTA56LT1 is a Preferred Device

Driver Transistors

PNP Silicon

Features

- Pb-Free Packages are Available

MAXIMUM RATINGS

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

THERMAL CHARACTERISTICS

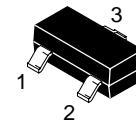
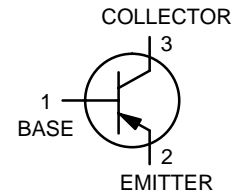
| Characteristic | Symbol | Max | Unit |
|---|-----------------|-------------|----------------------------|
| Total Device Dissipation FR–5 Board (Note 1) $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 225 1.8 | mW mW/ $^\circ\text{C}$ |
| Thermal Resistance, Junction–to–Ambient | $R_{\theta JA}$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

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

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

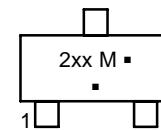


ON Semiconductor®



SOT-23
CASE 318
STYLE 6

MARKING DIAGRAM



2xx = Device Code
 x = H for MMBTA55LT1
 xx = GM for MMBTA56LT1
 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

See detailed ordering and shipping information in the package dimensions section on page 4 of this data sheet.

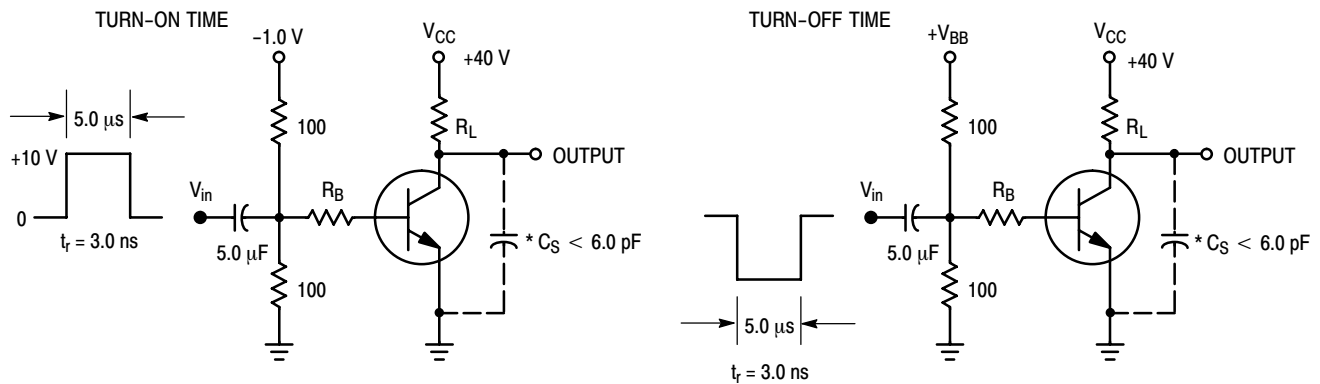
Preferred devices are recommended choices for future use and best overall value.

MMBTA55LT1, MMBTA56LT1

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

| Characteristic | Symbol | Min | Max | Unit |
|--|-------------------------------------|------------|--------------|---------------|
| OFF CHARACTERISTICS | | | | |
| Collector-Emitter Breakdown Voltage (Note 3) ($I_C = -1.0\text{ mA}$, $I_B = 0$) | $V_{(BR)CEO}$ MMBTA55 MMBTA56 | -60 -80 | - | Vdc |
| Emitter-Base Breakdown Voltage ($I_E = -100\ \mu\text{A}$, $I_C = 0$) | $V_{(BR)EBO}$ | -4.0 | - | Vdc |
| Collector Cutoff Current ($V_{CE} = -60\text{ Vdc}$, $I_B = 0$) | I_{CES} | - | -0.1 | μA |
| Collector Cutoff Current ($V_{CB} = -60\text{ Vdc}$, $I_E = 0$) ($V_{CB} = -80\text{ Vdc}$, $I_E = 0$) | I_{CBO} MMBTA55 MMBTA56 | - - | -0.1 -0.1 | μA |
| ON CHARACTERISTICS | | | | |
| DC Current Gain ($I_C = -10\text{ mA}$, $V_{CE} = -1.0\text{ Vdc}$) ($I_C = -100\text{ mA}$, $V_{CE} = -1.0\text{ Vdc}$) | h_{FE} | 100 100 | - - | - |
| Collector-Emitter Saturation Voltage ($I_C = -100\text{ mA}$, $I_B = -10\text{ mA}$) | $V_{CE(sat)}$ | - | -0.25 | Vdc |
| Base-Emitter On Voltage ($I_C = -100\text{ mA}$, $V_{CE} = -1.0\text{ Vdc}$) | $V_{BE(on)}$ | - | -1.2 | Vdc |
| SMALL-SIGNAL CHARACTERISTICS | | | | |
| Current-Gain - Bandwidth Product (Note 4) ($I_C = -100\text{ mA}$, $V_{CE} = -1.0\text{ Vdc}$, $f = 100\text{ MHz}$) | f_T | 50 | - | MHz |

- Pulse Test: Pulse Width $\leq 300\ \mu\text{s}$, 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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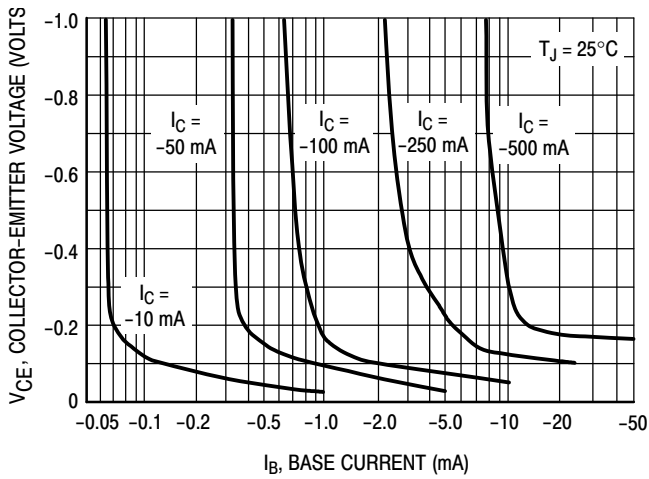


Figure 7. Collector Saturation Region

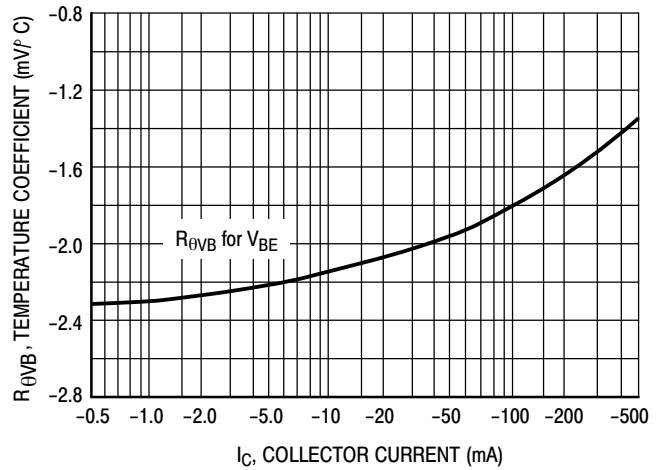


Figure 8. Base-Emitter Temperature Coefficient

ORDERING INFORMATION

| Device Order Number | Package Type | Shipping [†] |
|---------------------|---------------------|-----------------------|
| MMBTA55LT1 | SOT-23 | 3,000 / Tape & Reel |
| MMBTA55LT1G | SOT-23 (Pb-Free) | 3,000 / Tape & Reel |
| MMBTA55LT3 | SOT-23 | 10,000 / Tape & Reel |
| MMBTA55LT3G | SOT-23 (Pb-Free) | 10,000 / Tape & Reel |
| MMBTA56LT1 | SOT-23 | 3,000 / Tape & Reel |
| MMBTA56LT1G | SOT-23 (Pb-Free) | 3,000 / Tape & Reel |
| MMBTA56LT3 | SOT-23 | 10,000 / Tape & Reel |
| MMBTA56LT3G | 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.

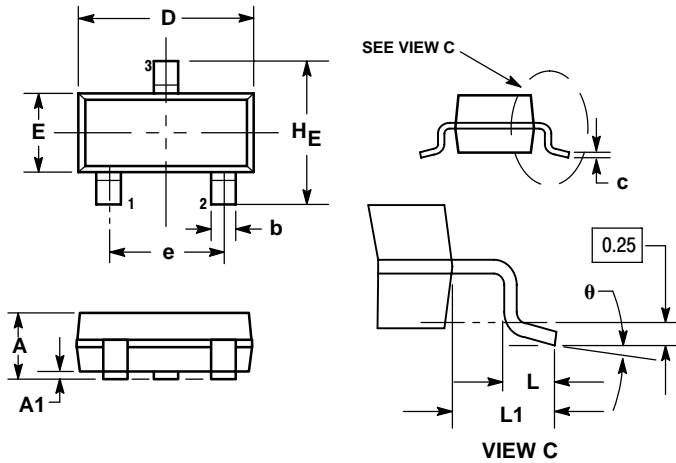
MMBTA55LT1, MMBTA56LT1

PACKAGE DIMENSIONS

SOT-23 (TO-236)

CASE 318-08

ISSUE AN



NOTES:

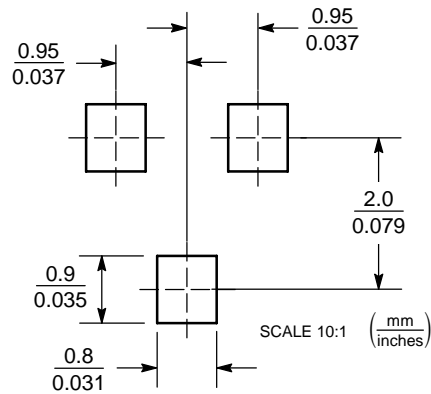
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318-01 THRU -07 AND -09 OBSOLETE, NEW STANDARD 318-08.

| 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
2. EMITTER
3. 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.