MMBTA55LT1, MMBTA56LT1

MMBTA56LT1 is a Preferred Device

Driver Transistors

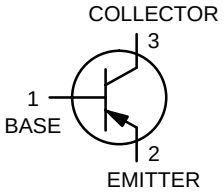
PNP Silicon

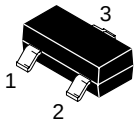
Features

- Pb−Free Packages are Available

ON Semiconductor®

http://onsemi.com





SOT−23
CASE 318
STYLE 6

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

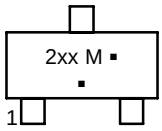
THERMAL CHARACTERISTICS

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

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.

1. FR−5 = 1.0 × 0.75 × 0.062 in.
2. Alumina = 0.4 × 0.3 × 0.024 in. 99.5% alumina.

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

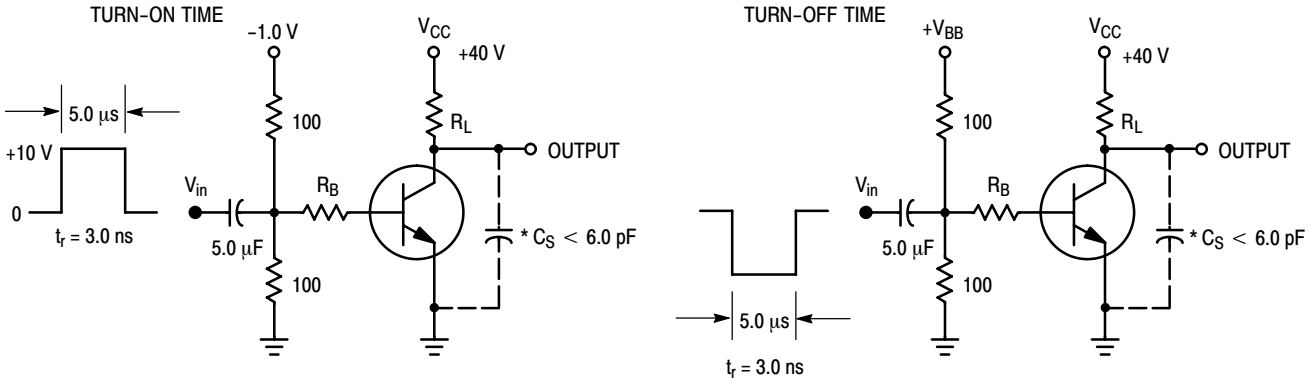
See detailed ordering and shipping information in the package dimensions section on page 4 of this data sheet.

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

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

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

3. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.
4. 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

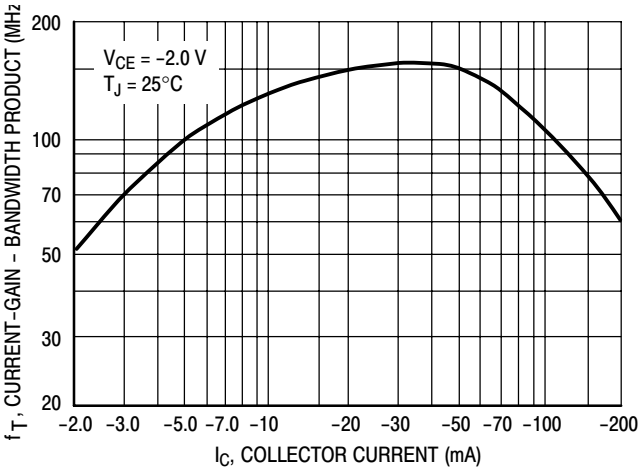


Figure 2. Current−Gain — Bandwidth Product

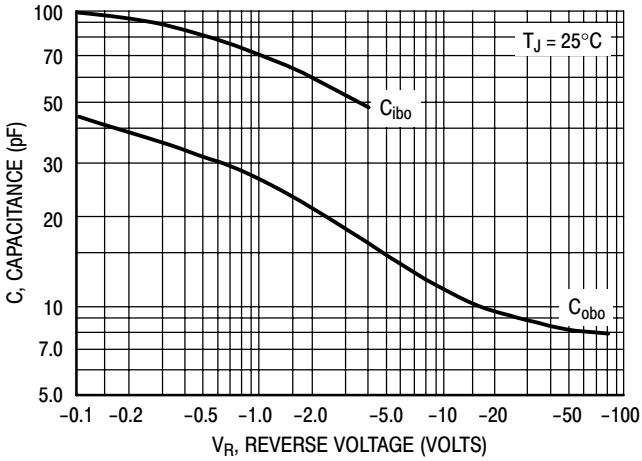


Figure 3. Capacitance

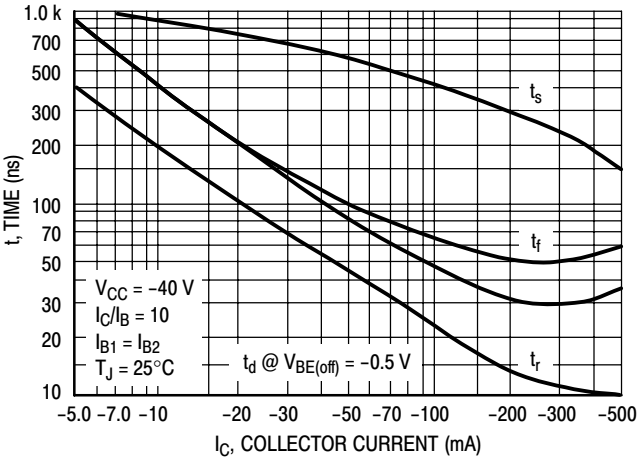


Figure 4. Switching Time

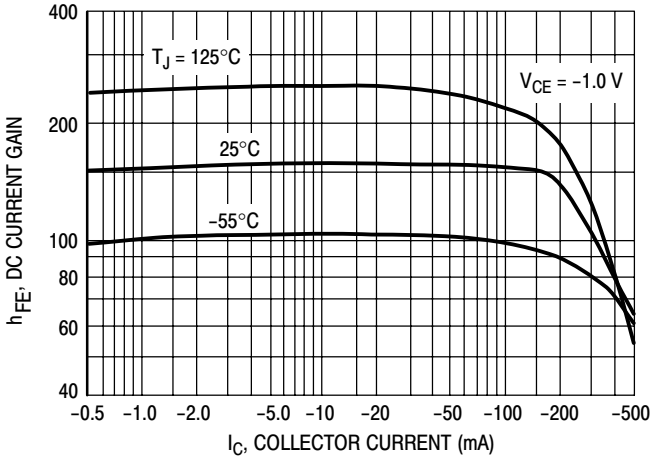


Figure 5. DC Current Gain

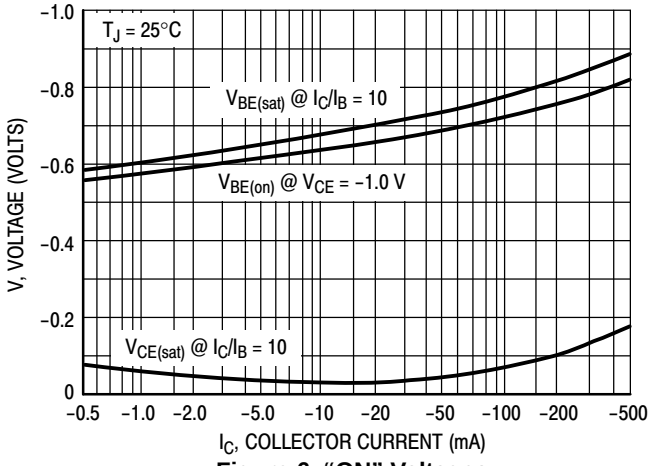


Figure 6. “ON” Voltages

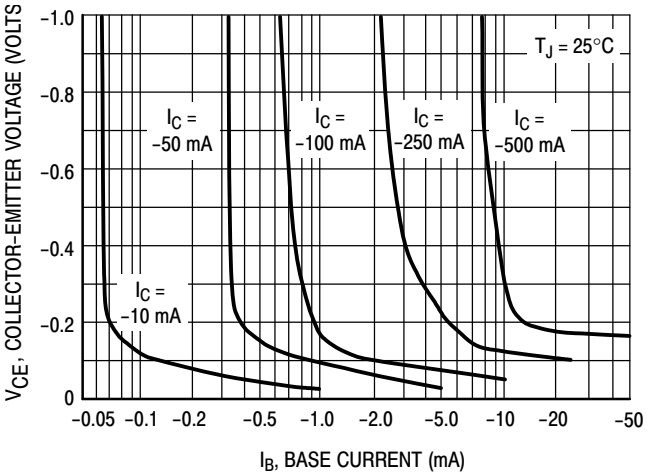


Figure 7. Collector Saturation Region

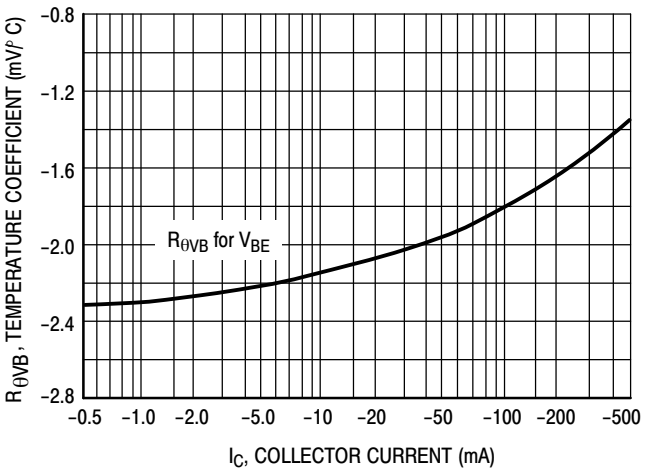


Figure 8. Base−Emitter Temperature Coefficient

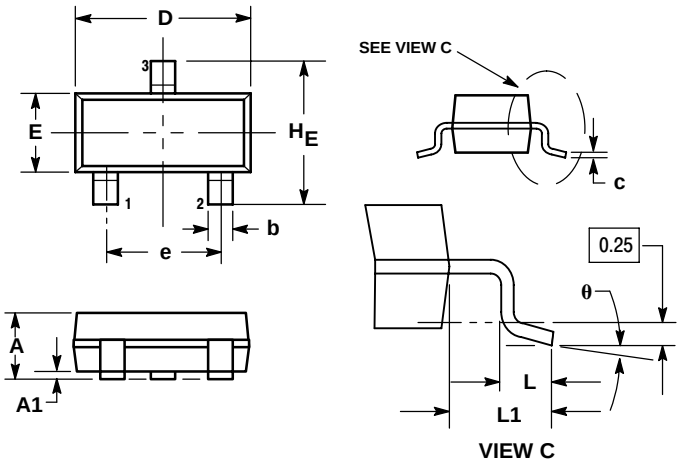
ORDERING INFORMATION

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.

PACKAGE DIMENSIONS

SOT−23 (TO−236)
CASE 318−08
ISSUE AN

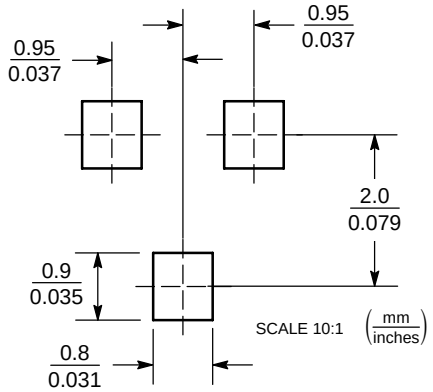


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318−01 THRU −07 AND −09 OBSOLETE, NEW STANDARD 318−08.

	MILLIMETERS			INCHES		
DIM	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
H_E	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.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 61312, Phoenix, Arizona 85082−1312 USA
Phone: 480−829−7710 or 800−344−3860 Toll Free USA/Canada
Fax: 480−829−7709 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800−282−9855 Toll Free USA/Canada

Japan: ON Semiconductor, Japan Customer Focus Center
2−9−1 Kamimeguro, Meguro−ku, Tokyo, Japan 153−0051
Phone: 81−3−5773−3850

ON Semiconductor Website: http://onsemi.com

Order Literature: http://www.onsemi.com/litorder

For additional information, please contact your local Sales Representative.

MMBTA55LT1/D