MMBTA63LT1, MMBTA64LT1

Darlington Transistors

PNP Silicon

ON Semiconductor®

http://onsemi.com

Features

- Pb−Free Packages are Available

MAXIMUM RATINGS

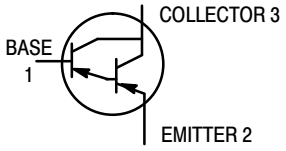
Rating	Symbol	Value	Unit
Collector − Emitter Voltage	V_{CES}	−30	Vdc
Collector − Base Voltage	V_{CBO}	−30	Vdc
Emitter − Base Voltage	V_{EBO}	−10	Vdc
Collector Current − Continuous	I_C	−500	mAdc

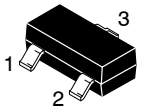
THERMAL CHARACTERISTICS

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

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

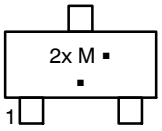
1. FR−5 = 1.0 x 0.75 x 0.062 in.
2. Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.





SOT−23 (TO−236)
CASE 318
STYLE 6

MARKING DIAGRAM



2x = Device Code
x = U for MMBTA63LT1
x = V for MMBTA64LT1
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

Device	Package	Shipping†
MMBTA63LT1G	SOT−23 (Pb−Free)	3,000 / Tape & Reel
MMBTA64LT1	SOT−23	3,000 / Tape & Reel
MMBTA64LT1G	SOT−23 (Pb−Free)	3,000 / 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.

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 (Note 3)		h_{FE}			–
(I_C = −10 mAdc, V_{CE} = −5.0 Vdc)	MMBTA63		5,000	–	
(I_C = −10 mAdc, V_{CE} = −5.0 Vdc)	MMBTA64		10,000	–	
(I_C = −100 mAdc, V_{CE} = −5.0 Vdc)	MMBTA63		10,000	–	
(I_C = −100 mAdc, V_{CE} = −5.0 Vdc)	MMBTA64		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

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

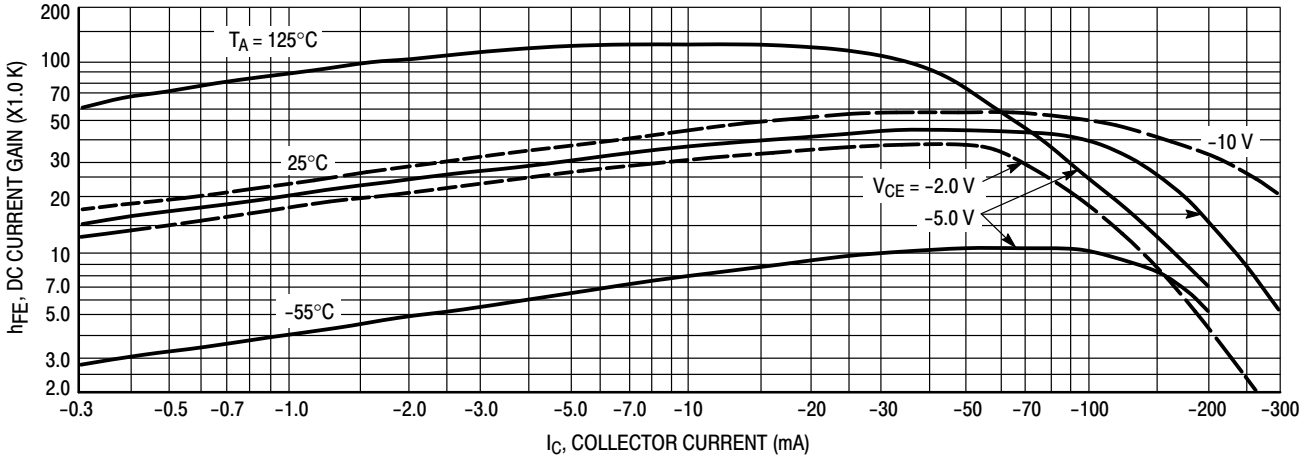


Figure 1. DC Current Gain

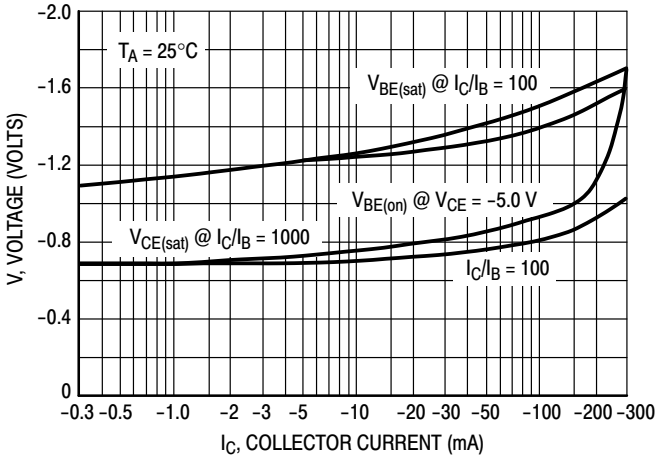


Figure 3. “On” Voltage

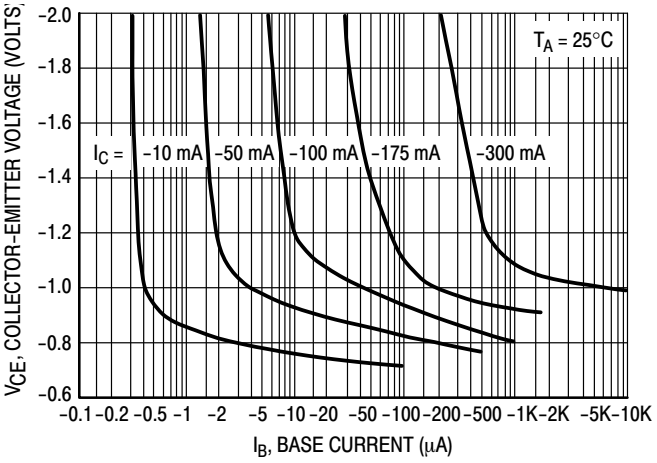


Figure 2. Collector Saturation Region

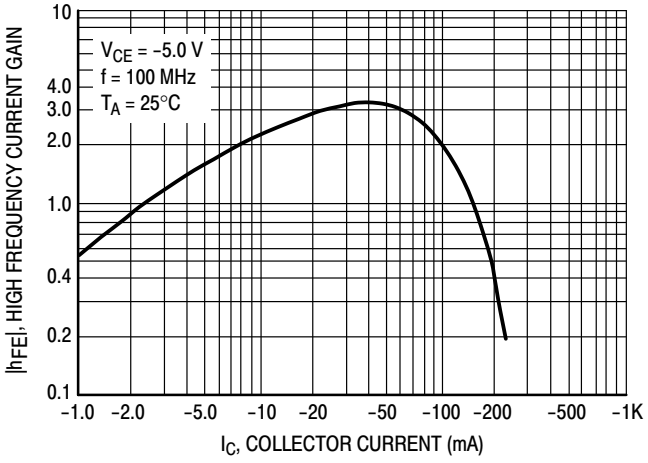


Figure 4. High Frequency Current Gain

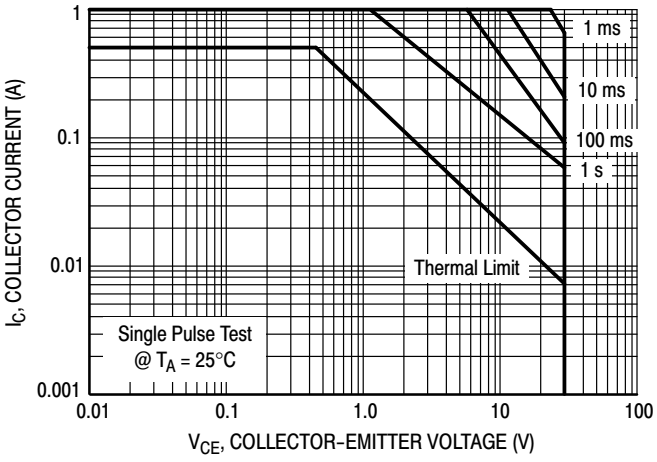
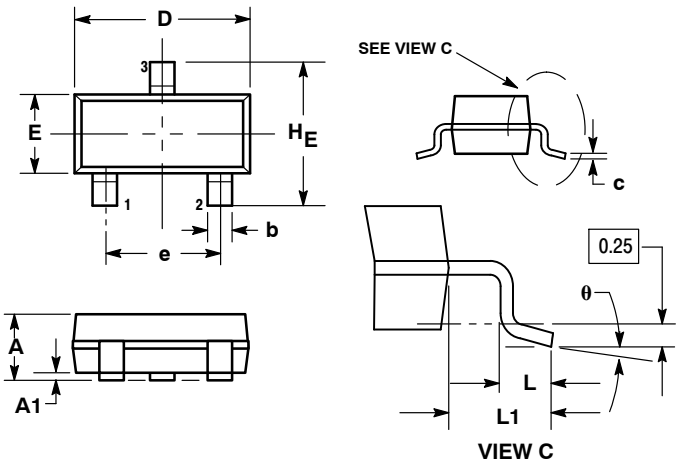


Figure 5. Safe Operating Area

PACKAGE DIMENSIONS

SOT−23 (TO−236)
CASE 318−08
ISSUE AN

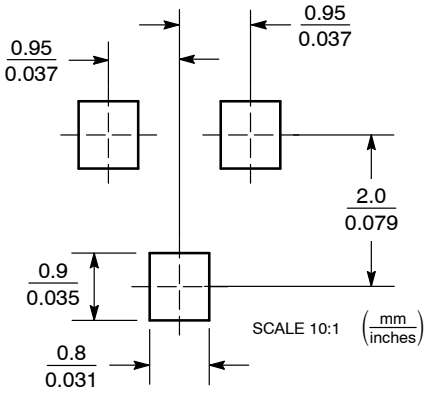


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318−01 THRU −07 AND −09 OBSOLETE, NEW STANDARD 318−08.

	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 5163, Denver, Colorado 80217 USA
Phone: 303−675−2175 or 800−344−3860 Toll Free USA/Canada
Fax: 303−675−2176 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800−282−9855 Toll Free USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81−3−5773−3850

ON Semiconductor Website: **www.onsemi.com**

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

For additional information, please contact your local Sales Representative