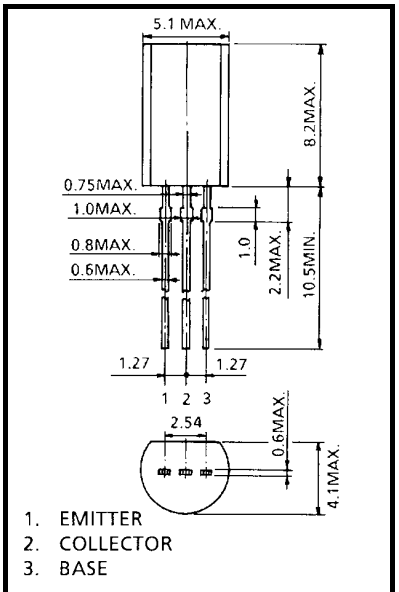
TOSHIBA Transistor Silicon PNP Epitaxial Type (Darlington)

2SB1457

Micro Motor Drive, Hammer Drive Applications
Power Switching Applications
Power Amplifier Applications

- High DC current gain: h_{FE} = 2000 (min) (V_{CE} = −2 V, I_C = −1 A)
- Low saturation voltage: $V_{CE\ (sat)}$ = −1.5 V (max)
  (I_C = −1 A, I_B = −1 mA)

Unit: mm



JEDEC	TO-92MOD
JEITA	—
TOSHIBA	2-5J1A

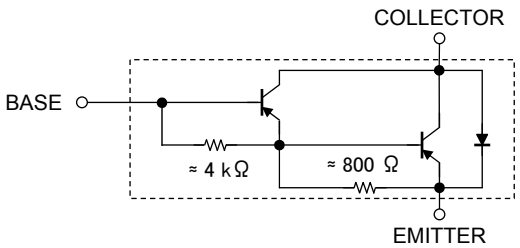
Weight: 0.36 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

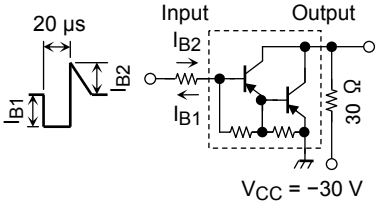
Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	−100	V
Collector-emitter voltage	V_{CEO}	−100	V
Emitter-base voltage	V_{EBO}	−8	V
Collector current	$I_{C\ (DC)}$	−2	A
Collector current	$I_{C\ (Pulse)}$	−3	A
Base current	I_B	−0.5	A
Collector power dissipation	P_C	900	mW
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	−55 to 150	°C

Note1: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook (“Handling Precautions”/Derating Concept and Methods) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

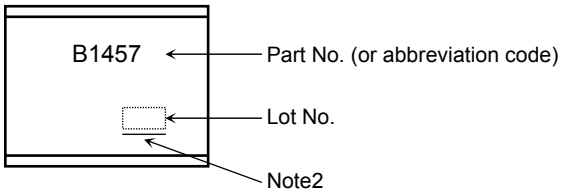
Equivalent Circuit



Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	V_{CB} = −80 V, I_E = 0	—	—	−10	μA
Emitter cut-off current		I_{EBO}	V_{EB} = −8 V, I_C = 0	—	—	−4	mA
Collector-emitter breakdown voltage		$V_{(BR)\ CEO}$	I_C = −10 mA, I_B =0	−100	—	—	V
DC current gain		h_{FE}	V_{CE} = −2 V, I_C = −1 A (pulse)	2000	—	—	
Collector-emitter saturation voltage		$V_{CE\ (sat)}$	I_C = −1 A, I_B = −1 mA (pulse)	—	—	−1.5	V
Base-emitter saturation voltage		$V_{BE\ (sat)}$	I_C = −1 A, I_B = −1 mA (pulse)	—	—	−2.0	V
Transition frequency		f_T	V_{CE} = −2 V, I_C = −0.5 A	—	50	—	MHz
Collector output capacitance		C_{ob}	V_{CB} = −10 V, I_E = 0, f = 1 MHz	—	27	—	pF
Switching time	Turn-on time	t_{on}		—	0.4	—	μs
	Storage time	t_{stg}		—	2.0	—	
	Fall time	t_f	I_{B1} = 1 mA, I_{B2} = 1 mA duty cycle ≤ 1%	—	0.4	—	

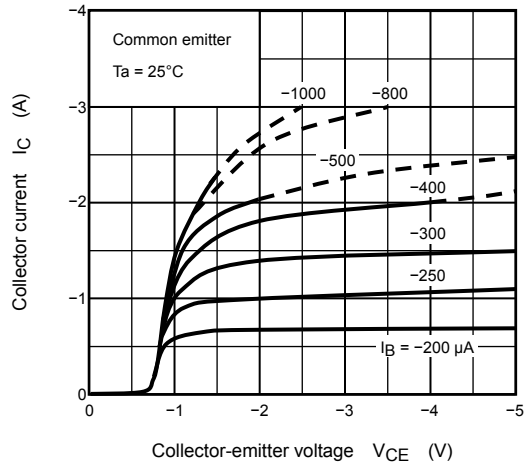
Marking



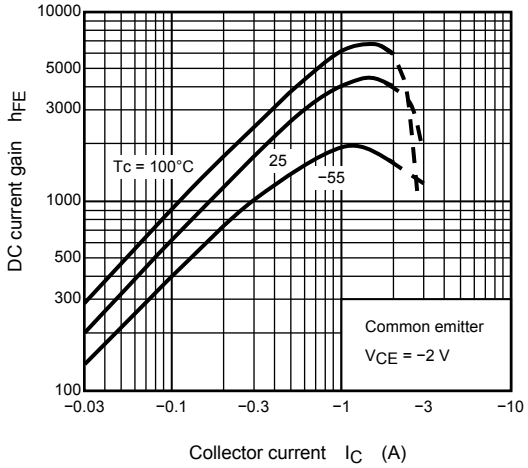
Note2: A line under a Lot No. identifies the indication of product Labels.
Not underlined: [[Pb]]/INCLUDES > MCV
Underlined: [[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product. The RoHS is the Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

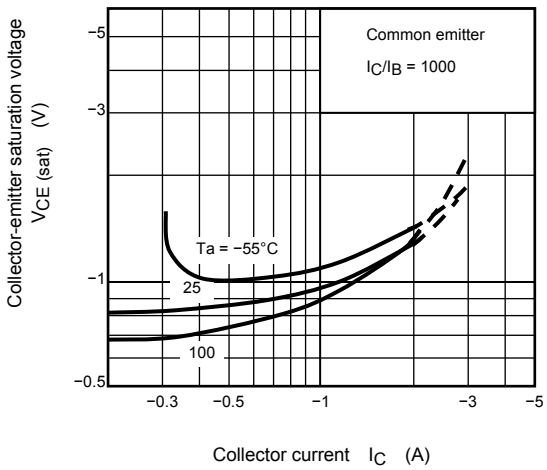
$I_C - V_{CE}$



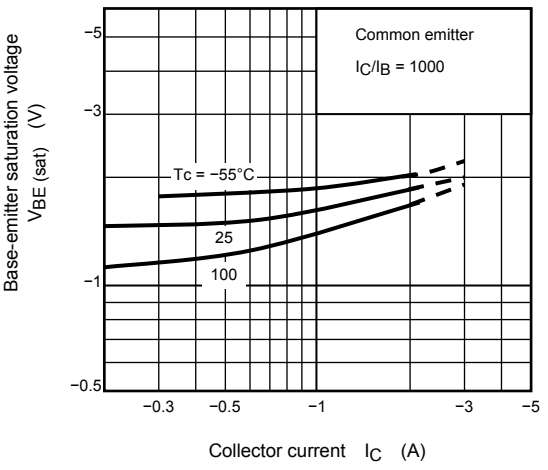
$h_{FE} - I_C$



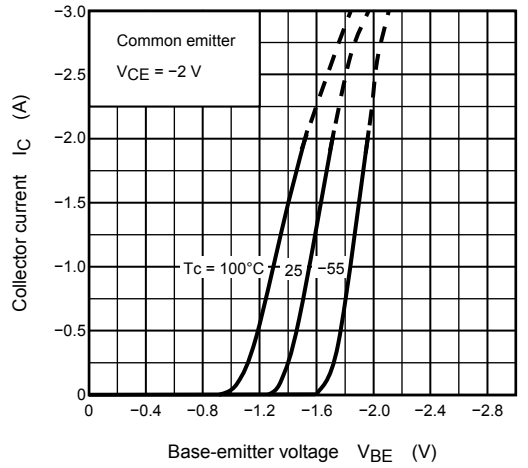
$V_{CE\ (sat)} - I_C$



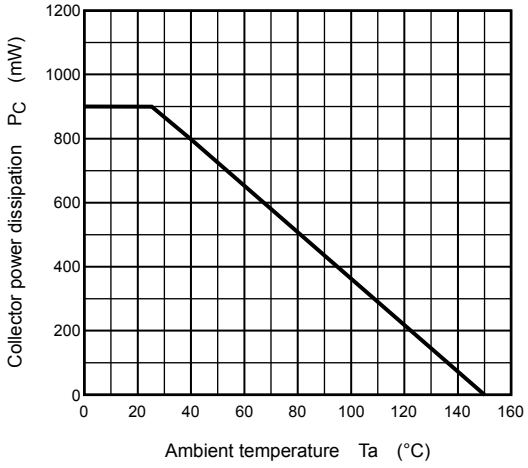
$V_{BE\ (sat)} - I_C$

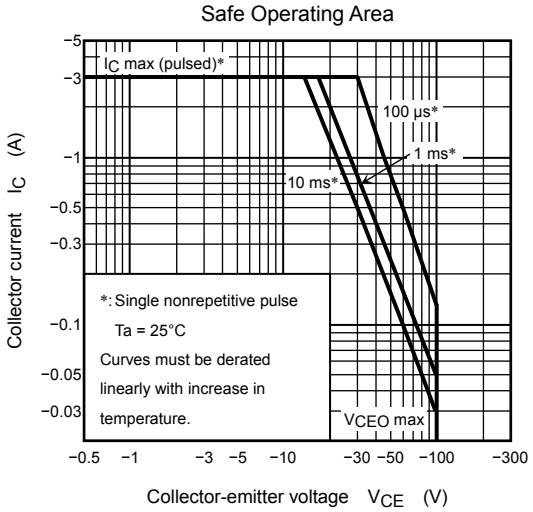


$I_C - V_{BE}$



$P_C - Ta$




Safe Operating Area
Collector current I_C (A)
−5
−3
−1
−0.5
−0.3
−0.1
−0.05
−0.03
I_C max (pulsed)*
100 μs*
1 ms*
10 ms*
*: Single nonrepetitive pulse
Ta = 25°C
Curves must be derated
linearly with increase in
temperature.
V_{CEO} max
−0.5 −1 −3 −5 −10 −30 −50 −100 −300
Collector-emitter voltage V_{CE} (V)

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