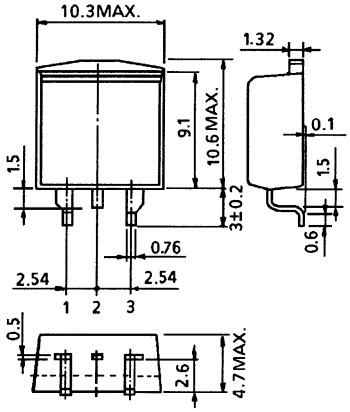
TOSHIBA Transistor Silicon PNP Triple Diffused Type

2SB1667(SM)

Audio Frequency Power Amplifier Applications

- Low saturation voltage: $V_{CE\ (sat)}$ = −1.7 V (max)
  (I_C = −3 A, I_B = −0.3 A)

Unit: mm



1. BASE
2. COLLECTOR (HEAT SINK)
3. EMITTER

JEDEC	—
JEITA	—
TOSHIBA	2-10S2A

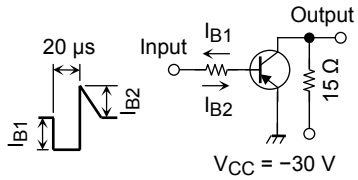
Weight: 1.4 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Collector-base voltage		V_{CBO}	−60	V
Collector-emitter voltage		V_{CEO}	−60	V
Emitter-base voltage		V_{EBO}	−7	V
Collector current		I_C	−3	A
Base current		I_B	−0.5	A
Collector power dissipation	Ta = 25°C	P_C	1.5	W
	Tc = 25°C		25	
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−55 to 150	°C

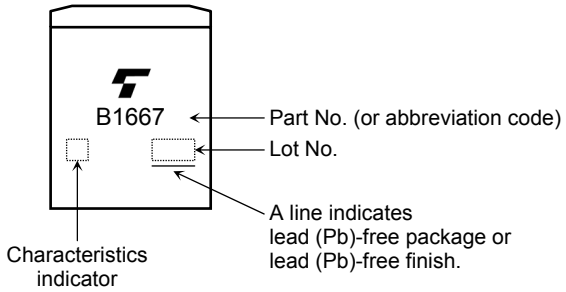
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) 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).

Electrical Characteristics (Ta = 25°C)

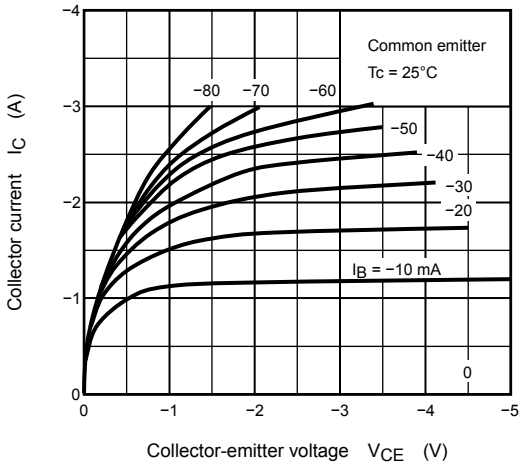
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	V_{CB} = −60 V, I_E = 0	—	—	−100	μA
Emitter cut-off current		I_{EBO}	V_{EB} = −7 V, I_C = 0	—	—	−100	μA
Collector-emitter breakdown voltage		$V_{(BR)\ CEO}$	I_C = −50 mA, I_B = 0	−60	—	—	V
DC current gain		$h_{FE\ (1)}$ (Note)	V_{CE} = −5 V, I_C = −0.5 A	60	—	300	
		$h_{FE\ (2)}$	V_{CE} = −5 V, I_C = −3 A	20	—	—	
Collector-emitter saturation voltage		$V_{CE\ (sat)}$	I_C = −3 A, I_B = −0.3 A	—	−0.5	−1.7	V
Base-emitter voltage		V_{BE}	V_{CE} = −5 A, I_C = −0.5 A	—	−0.7	−1.0	V
Transition frequency		f_T	V_{CE} = −5 V, I_C = −0.5 A	—	9	—	MHz
Collector output capacitance		C_{ob}	V_{CB} = −10 V, I_E = 0, f = 1 MHz	—	150	—	pF
Switching time	Turn-on time	t_{on}		—	0.4	—	μs
	Storage time	t_{stg}		—	1.7	—	
	Fall time	t_f	$-I_{B1} = I_{B2}$ = 0.2 A, duty cycle ≤ 1%	—	0.5	—	

Note: $h_{FE\ (1)}$ classification O: 60 to 120, Y: 100 to 200, GR: 150 to 300

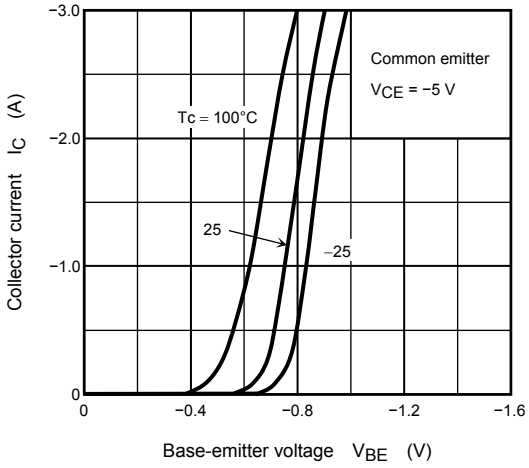
Marking



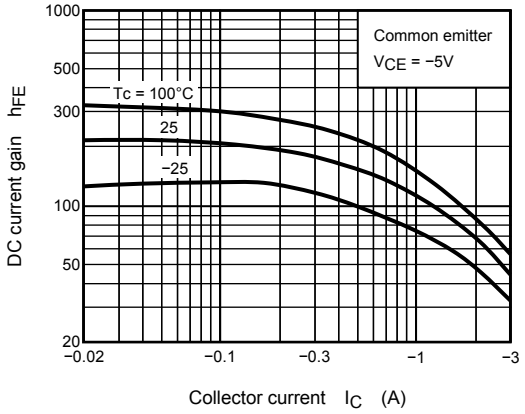
$I_C - V_{CE}$



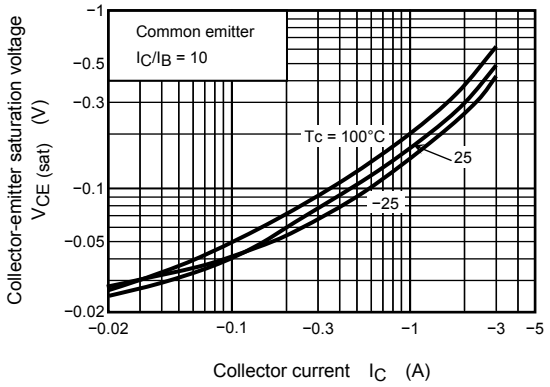
$I_C - V_{BE}$



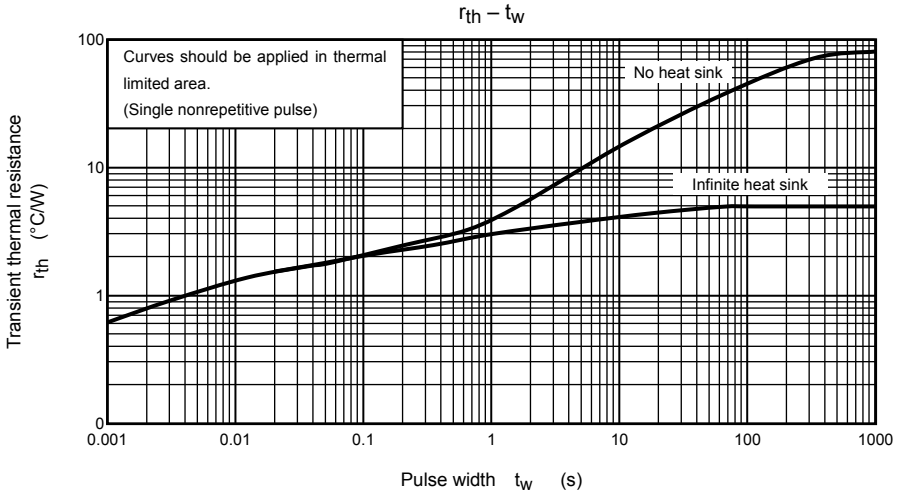
$h_{FE} - I_C$



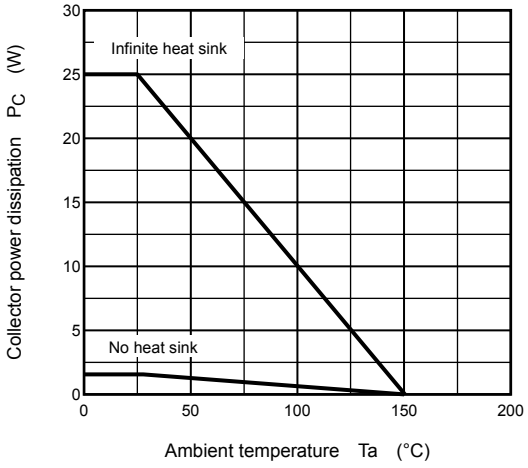
$V_{CE\ (sat)} - I_C$



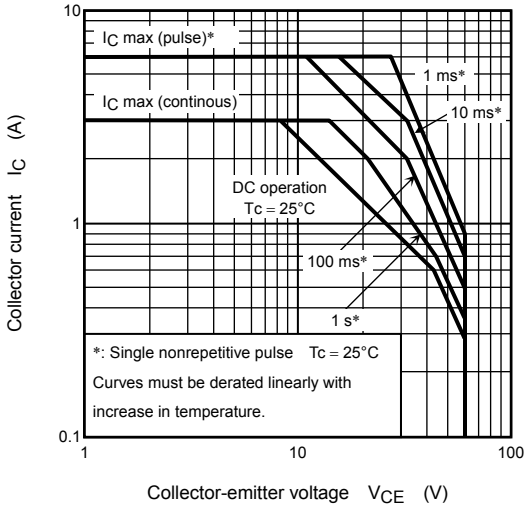
$r_{th} - t_w$



P_C – Ta



Safe operation area



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