

TOSHIBA Multi-chip Device Silicon PNP Epitaxial Transistor Type

# 2SA2190

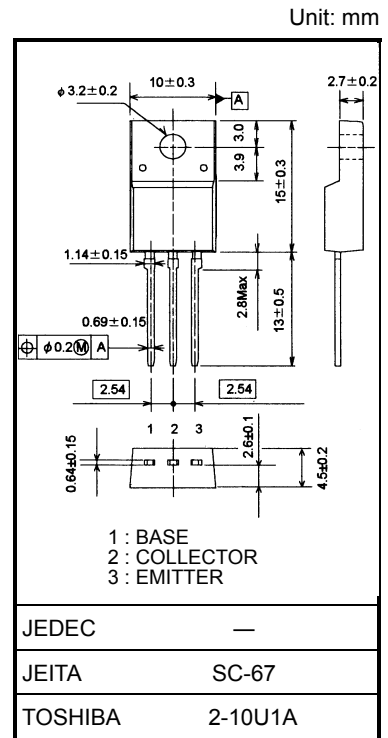
Power Amplifier Applications

Driver Stage Amplifier Applications

- High transition frequency:  $f_T = 200 \text{ MHz (typ.)}$

## Absolute Maximum Ratings ( $T_c = 25^\circ\text{C}$ )

Characteristic	Symbol	Rating	Unit	
Collector-base voltage	$V_{CB0}$	- 180	V	
Collector-emitter voltage	$V_{CE0}$	- 180	V	
Emitter-base voltage	$V_{EB0}$	- 5	V	
Collector current	$I_C$	- 2.0	A	
Base current	$I_B$	- 1.0	A	
Collector power dissipation	$P_C$	$T_a = 25^\circ\text{C}$	2.0	W
		$T_c = 25^\circ\text{C}$	20	W
Junction temperature	$T_j$	150	$^\circ\text{C}$	
Storage temperature range	$T_{stg}$	- 55~150	$^\circ\text{C}$	



Weight: 1.7 g (typ.)

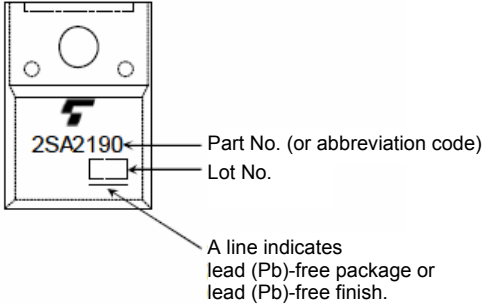
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

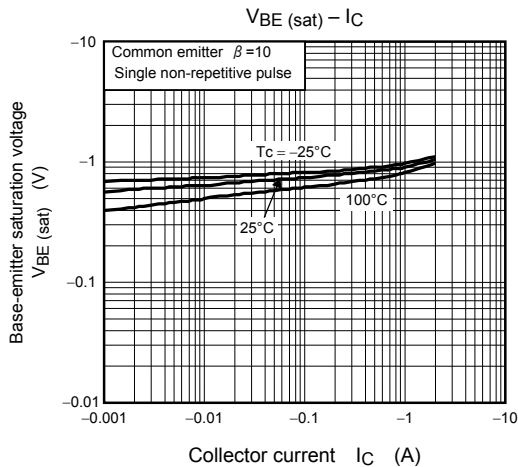
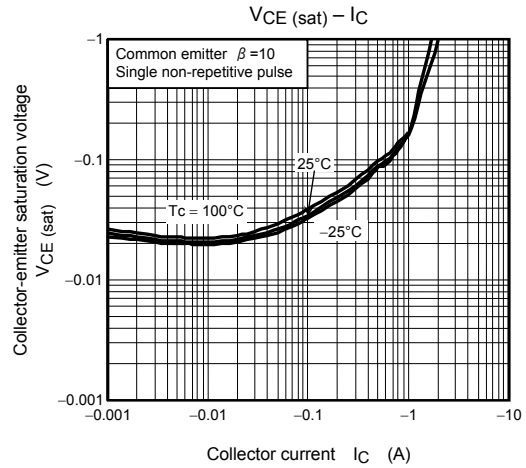
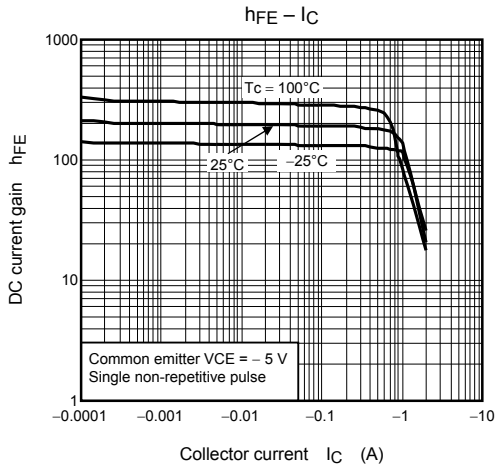
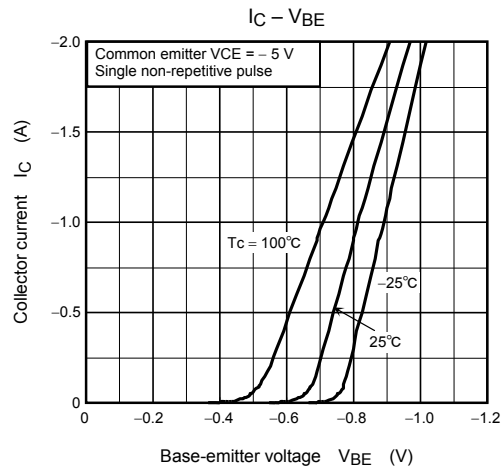
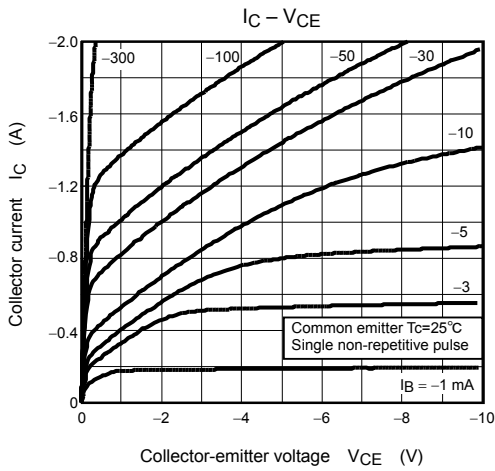
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/Derating Concept and Methods) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

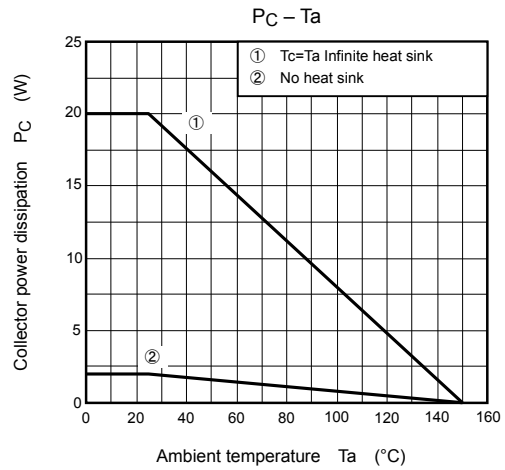
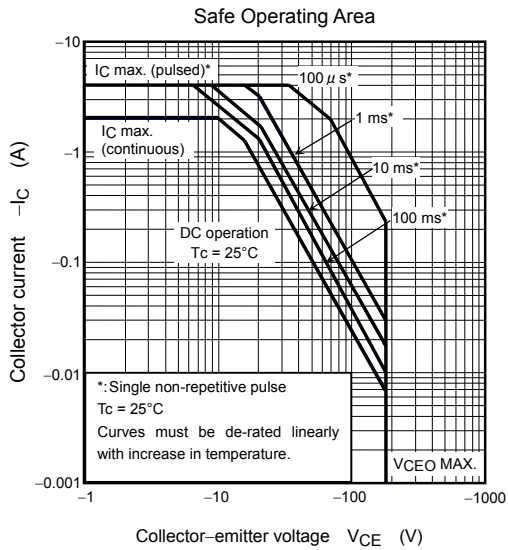
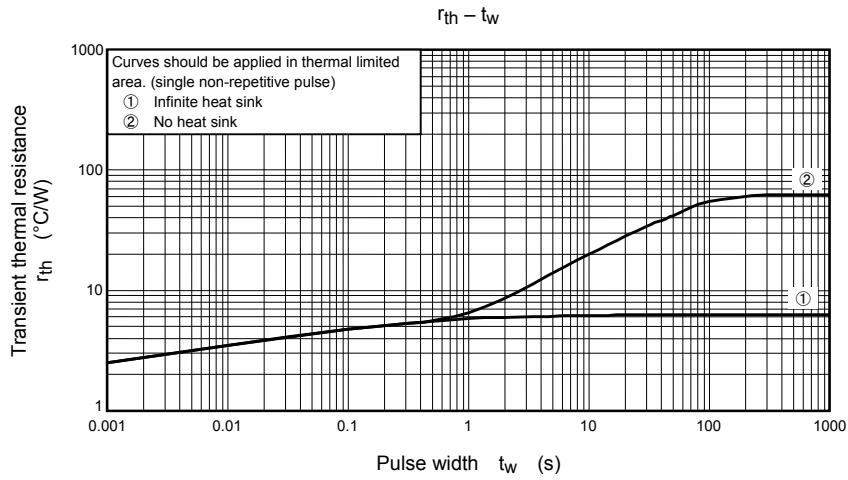
## Electrical Characteristics ( $T_c = 25^\circ\text{C}$ )

Characteristic	Symbol	Test Conditions	Min	Typ.	Max	Unit
Collector cut-off current	$I_{CBO}$	$V_{CB} = -180 \text{ V}, I_E = 0$	—	—	- 5.0	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = -5 \text{ V}, I_C = 0$	—	—	- 5.0	$\mu\text{A}$
Collector-emitter breakdown voltage	$V_{(BR)CE0}$	$I_C = -10 \text{ mA}, I_B = 0$	- 180	—	—	V
DC current gain	$h_{FE(1)}$	$V_{CE} = -5 \text{ V}, I_C = -0.1 \text{ A}$	100	—	320	
	$h_{FE(2)}$	$V_{CE} = -5 \text{ V}, I_C = -1 \text{ A}$	50	—	—	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = -1 \text{ A}, I_B = -0.1 \text{ A}$	—	- 0.24	- 1.0	V
Base-emitter voltage	$V_{BE}$	$V_{CE} = -5 \text{ V}, I_C = -1 \text{ A}$	—	—	- 1.5	V
Transition frequency	$f_T$	$V_{CE} = -5 \text{ V}, I_C = -0.3 \text{ A}$	—	200	—	MHz
Collector output capacitance	$C_{ob}$	$V_{CB} = -10 \text{ V}, I_E = 0, f = 1\text{MHz}$	—	26	—	pF

**Marking**







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20070701-EN

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