

TOSHIBA Transistor Silicon NPN Triple Diffused Type (PCT Process)

# 2SC3963

High-Voltage General Amplifier Applications  
 Color TV Class B Sound Output Applications

- High voltage:  $V_{CE0} = 160\text{ V}$

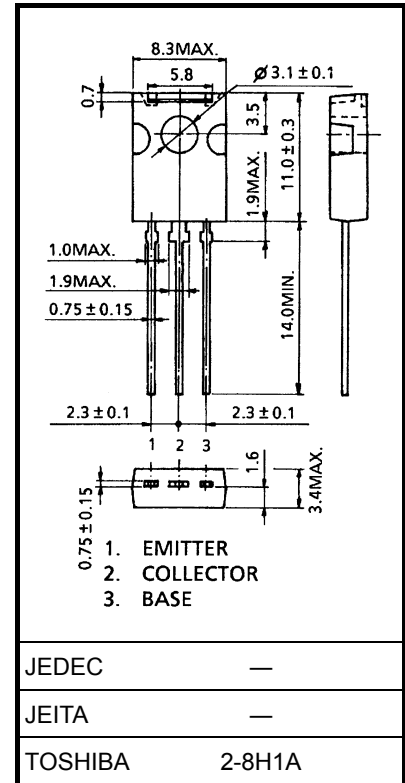
### Absolute Maximum Ratings ( $T_c = 25^\circ\text{C}$ )

Characteristics	Symbol	Rating	Unit
Collector-base voltage	$V_{CBO}$	200	V
Collector-emitter voltage	$V_{CEO}$	160	V
Emitter-base voltage	$V_{EBO}$	5	V
Collector current	$I_C$	200	mA
Base current	$I_B$	100	mA
Collector power dissipation	$P_C$	1.5	W
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature range	$T_{stg}$	-55 to 150	$^\circ\text{C}$

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).

Unit: mm



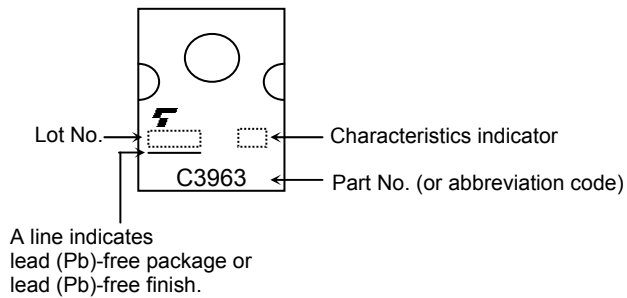
Weight: 0.82 g (typ.)

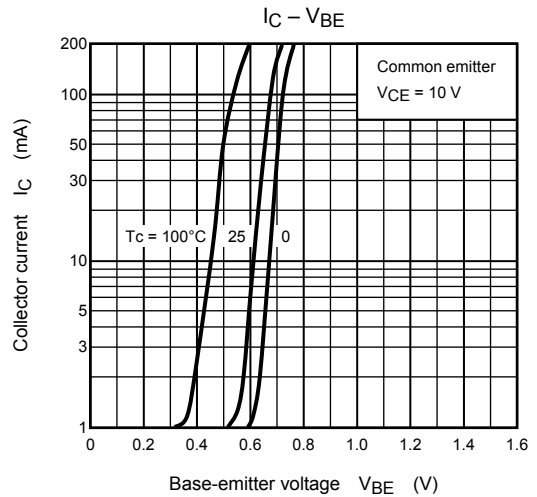
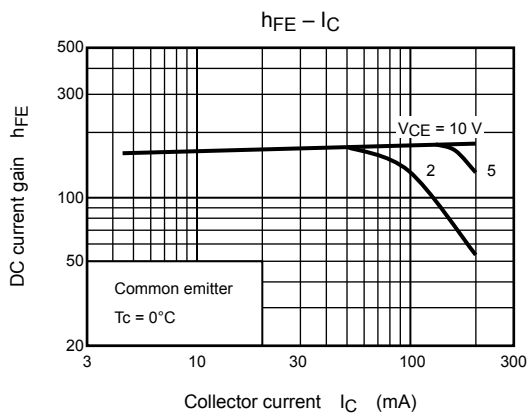
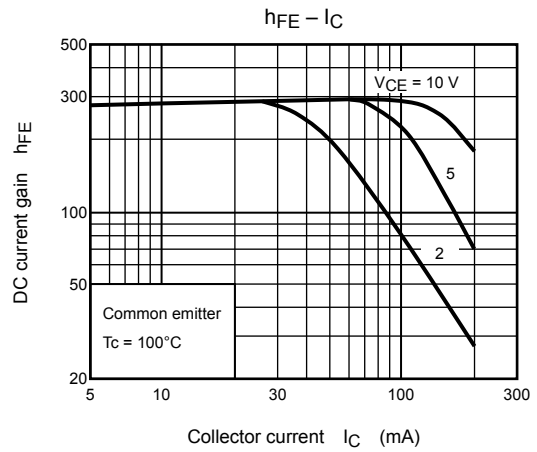
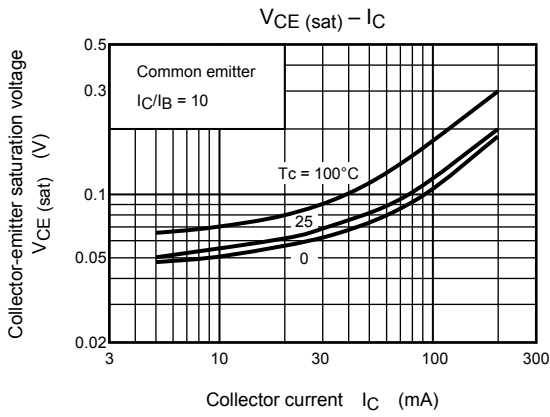
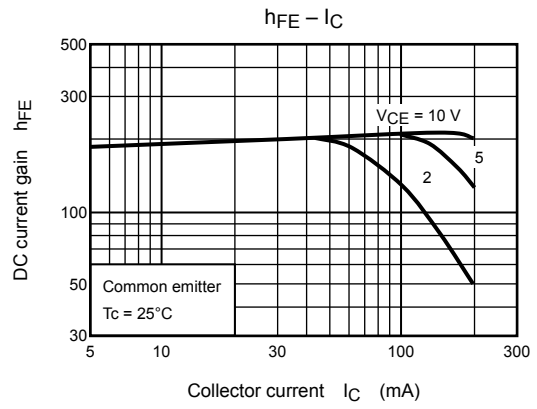
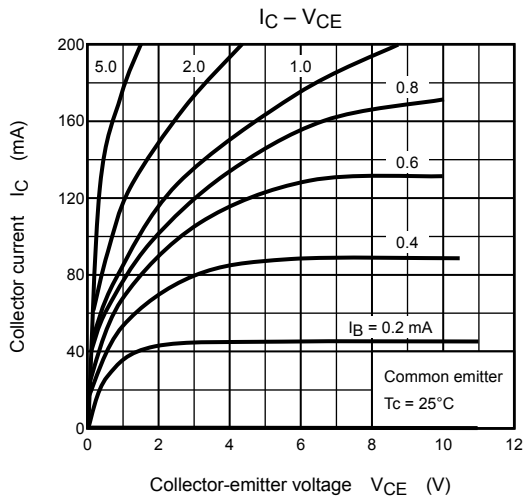
## Electrical Characteristics (Tc = 25°C)

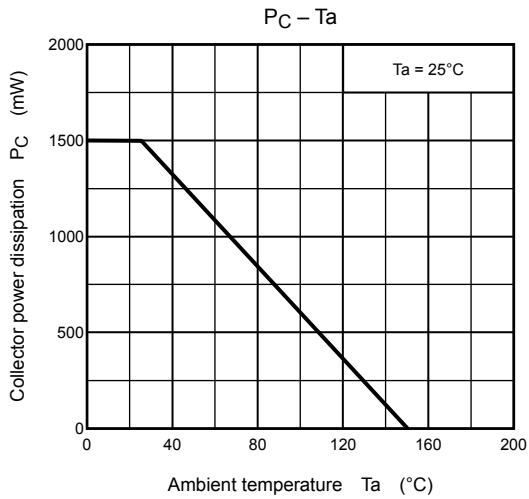
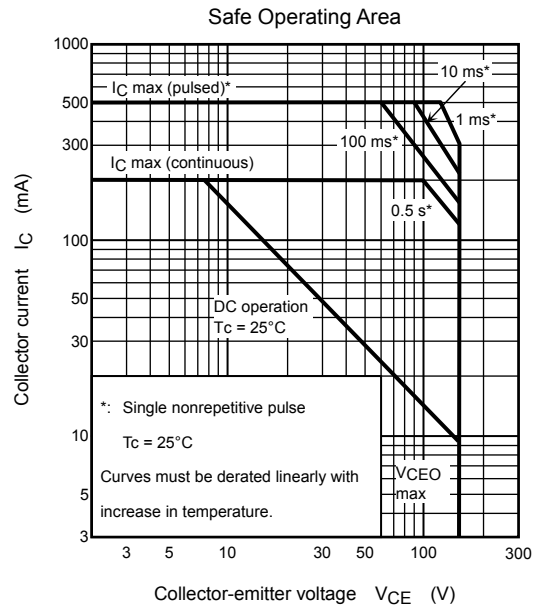
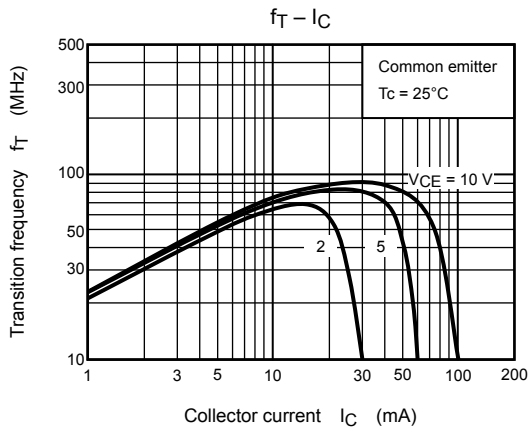
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	$I_{CBO}$	$V_{CB} = 200\text{ V}, I_E = 0$	—	—	0.1	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = 5\text{ V}, I_C = 0$	—	—	0.1	$\mu\text{A}$
DC current gain	$h_{FE} (1)$ (Note)	$V_{CE} = 10\text{ V}, I_C = 50\text{ mA}$	100	—	320	
	$h_{FE} (2)$	$V_{CE} = 10\text{ V}, I_C = 150\text{ mA}$	80	—	—	
Collector-emitter saturation voltage	$V_{CE} (\text{sat})$	$I_C = 200\text{ mA}, I_B = 20\text{ mA}$	—	—	1.0	V
Base-emitter voltage	$V_{BE}$	$V_{CE} = 10\text{ V}, I_C = 5\text{ mA}$	0.55	0.65	0.75	V
Transition frequency	$f_T$	$V_{CE} = 10\text{ V}, I_C = 50\text{ mA}$	50	—	—	MHz
Collector output capacitance	$C_{ob}$	$V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	—	10	pF

Note:  $h_{FE} (1)$  classification O: 100 to 200, Y: 160 to 320

## Marking







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20070701-EN

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