

TOSHIBA Transistor Silicon PNP Triple Diffused Type (PCT process)

# 2SA1384

High Voltage Control Applications  
 Plasma Display, Nixie Tube Driver Applications  
 Cathode Ray Tube Brightness Control Applications

- High voltage:  $V_{CBO} = -300\text{ V}$ ,  $V_{CEO} = -300\text{ V}$
- Low saturation voltage:  $V_{CE(sat)} = -0.5\text{ V (max)}$
- Small collector output capacitance:  $C_{ob} = 6\text{ pF (typ.)}$
- Complementary to 2SC3515
- Small flat package
- $P_C = 1.0\text{ to }2.0\text{ W}$  (mounted on a ceramic substrate)

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

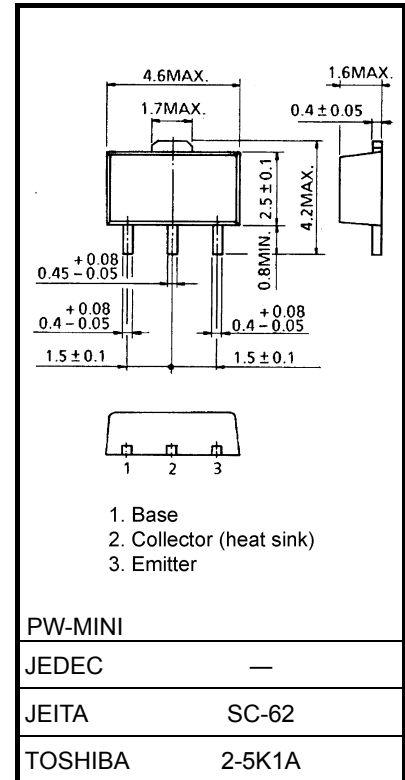
Characteristics	Symbol	Rating	Unit
Collector-base voltage	$V_{CBO}$	-300	V
Collector-emitter voltage	$V_{CEO}$	-300	V
Emitter-base voltage	$V_{EBO}$	-8	V
Collector current	$I_C$	-100	mA
Base current	$I_B$	-20	mA
Collector power dissipation	$P_C$	500	mW
	$P_C$ (Note 1)	1000	
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature range	$T_{stg}$	-55 to 150	$^\circ\text{C}$

Note 1: 2SA1384 mounted on a ceramic substrate ( $250\text{ mm}^2 \times 0.8\text{ t}$ )

Note 2: 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



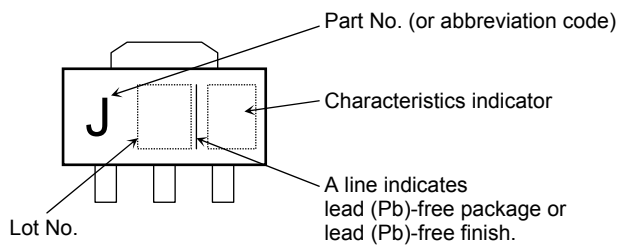
Weight: 0.05 g (typ.)

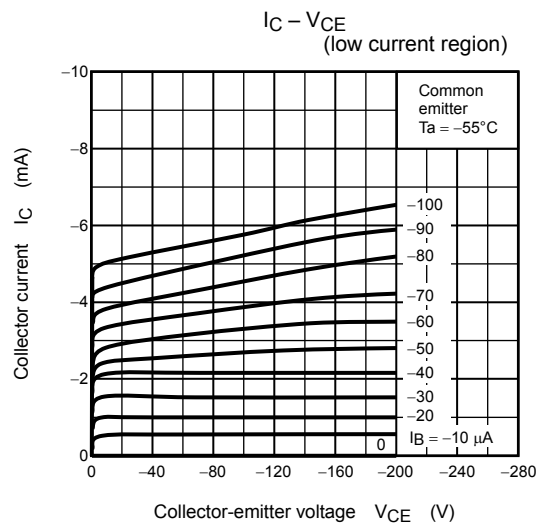
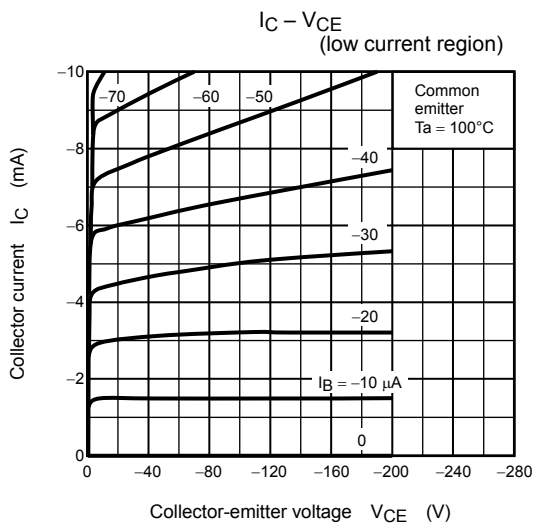
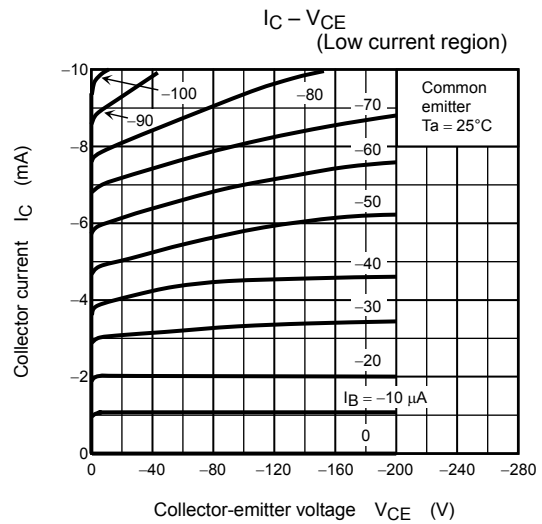
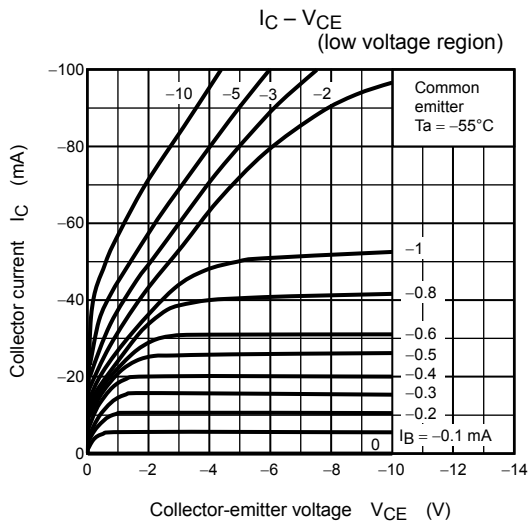
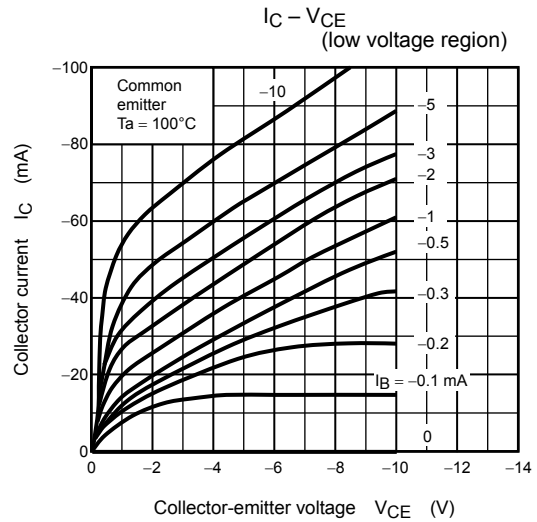
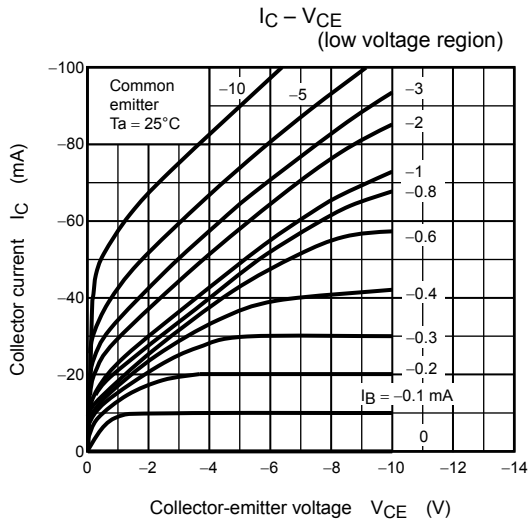
## Electrical Characteristics (Ta = 25°C)

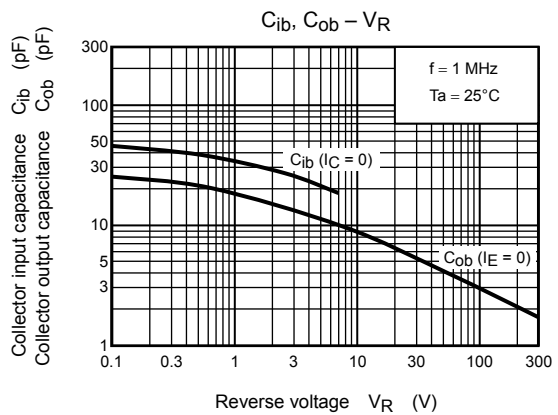
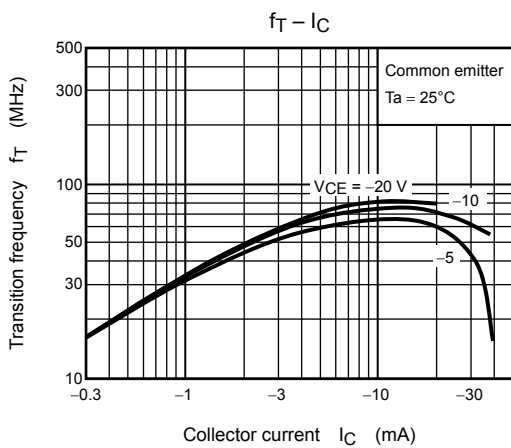
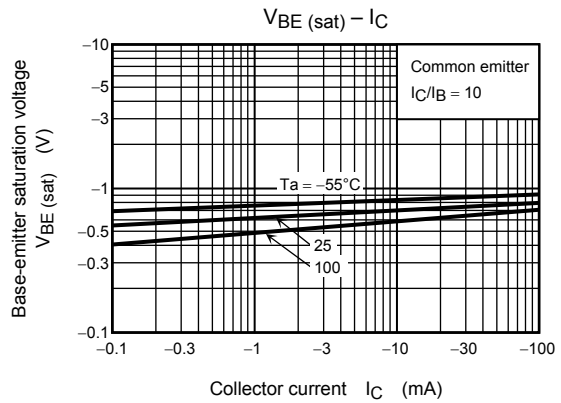
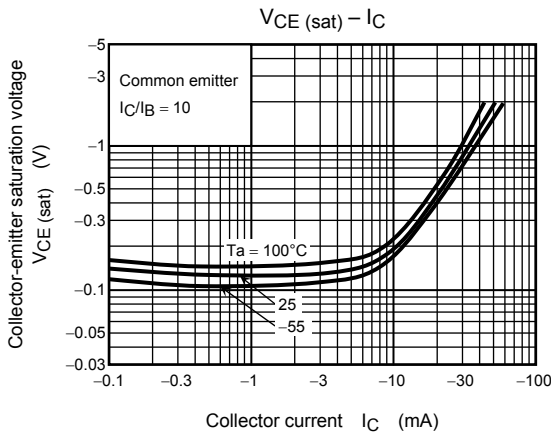
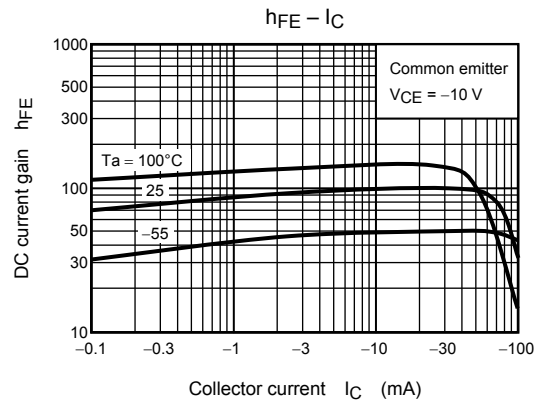
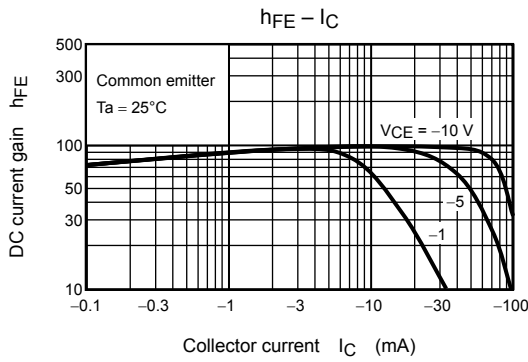
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	$I_{CBO}$	$V_{CB} = -300\text{ V}, I_E = 0$	—	—	-0.1	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = -8\text{ V}, I_C = 0$	—	—	-0.1	$\mu\text{A}$
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = -0.1\text{ mA}, I_E = 0$	-300	—	—	V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = -1\text{ mA}, I_B = 0$	-300	—	—	V
DC current gain	$h_{FE(1)}$ (Note 3)	$V_{CE} = -10\text{ V}, I_C = -20\text{ mA}$	30	—	150	
	$h_{FE(2)}$	$V_{CE} = -10\text{ V}, I_C = -1\text{ mA}$	20	—	—	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = -20\text{ mA}, I_B = -2\text{ mA}$	—	—	-0.5	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = -20\text{ mA}, I_B = -2\text{ mA}$	—	—	-1.0	V
Transition frequency	$f_T$	$V_{CE} = -10\text{ V}, I_C = -20\text{ mA}$	50	70	—	MHz
Collector output capacitance	$C_{ob}$	$V_{CB} = -20\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	6	8	pF

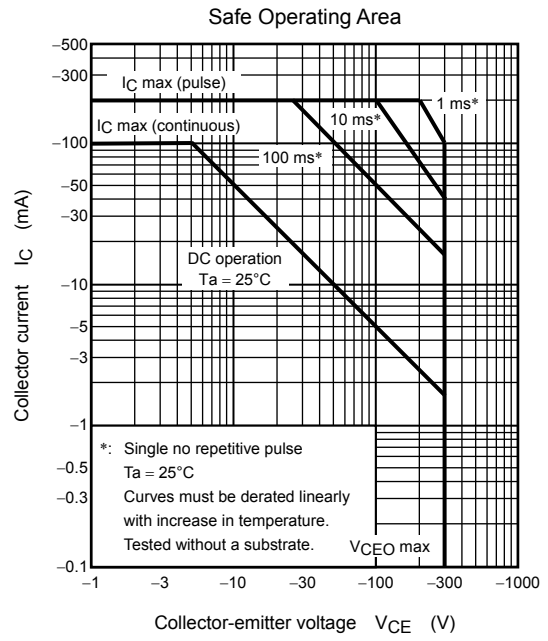
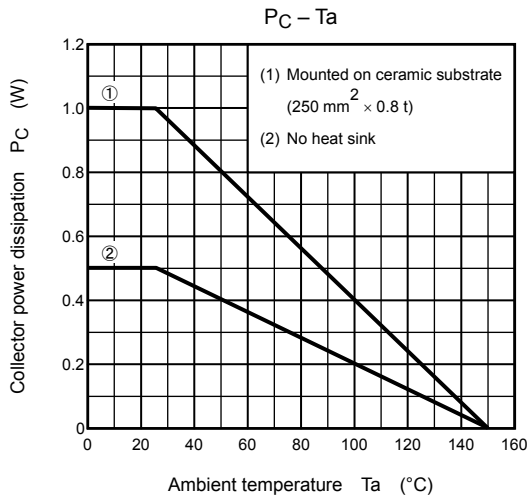
Note 3:  $h_{FE(1)}$  classification R: 30 to 90, O: 50 to 150

## Marking









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