

TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process)

# 2SC4667

Ultra High Speed Switching Applications  
Computer, Counter Applications

- High transition frequency:  $f_T = 400 \text{ MHz (typ.)}$
- Low saturation voltage:  $V_{CE(sat)} = 0.3 \text{ V (max)}$
- High speed switching time:  $t_{stg} = 15 \text{ ns (typ.)}$

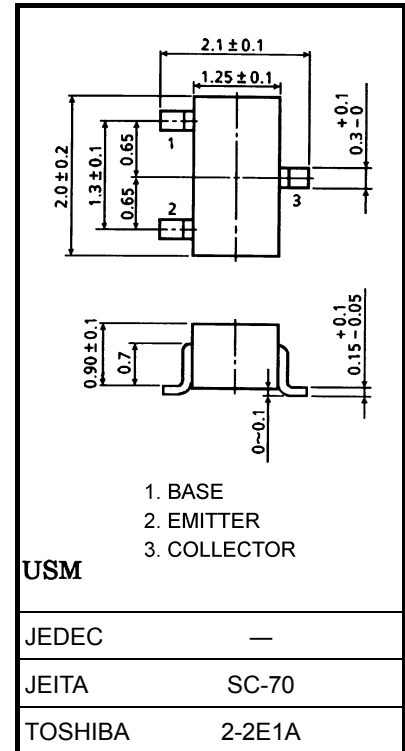
### Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

Characteristics	Symbol	Rating	Unit
Collector-base voltage	$V_{CBO}$	40	V
Collector-emitter voltage	$V_{CEO}$	15	V
Emitter-base voltage	$V_{EBO}$	5	V
Collector current	$I_C$	200	mA
Base current	$I_B$	40	mA
Collector power dissipation	$P_C$	100	mW
Junction temperature	$T_j$	125	$^\circ\text{C}$
Storage temperature range	$T_{stg}$	-55~125	$^\circ\text{C}$

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.

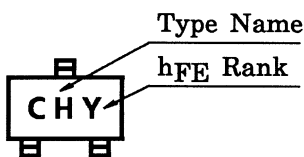
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Unit: mm



Weight: 0.006 g (typ.)

### Marking

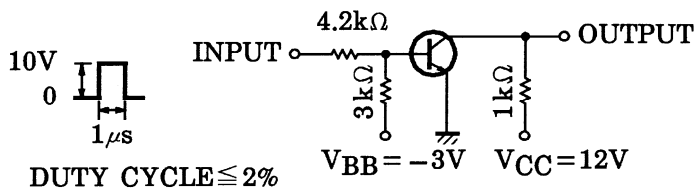


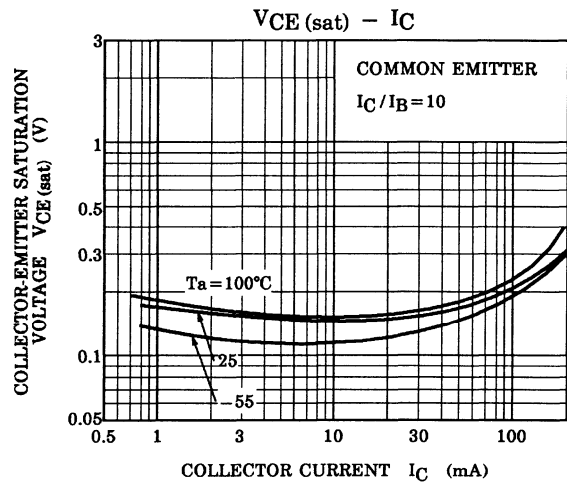
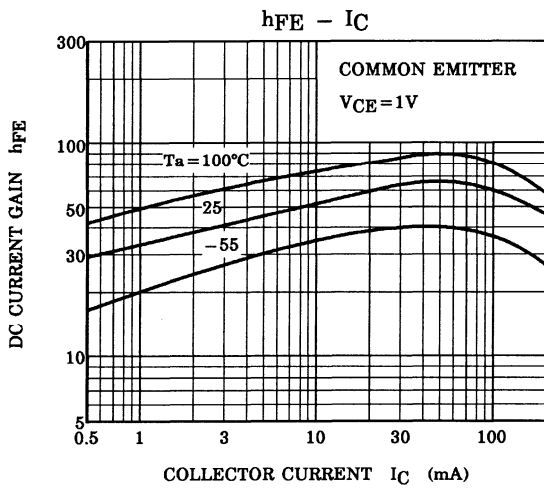
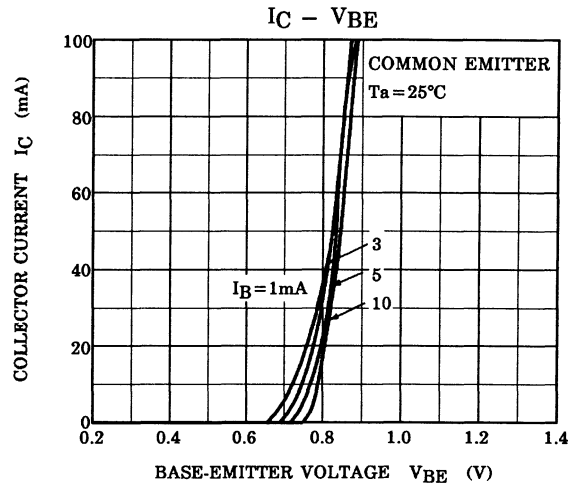
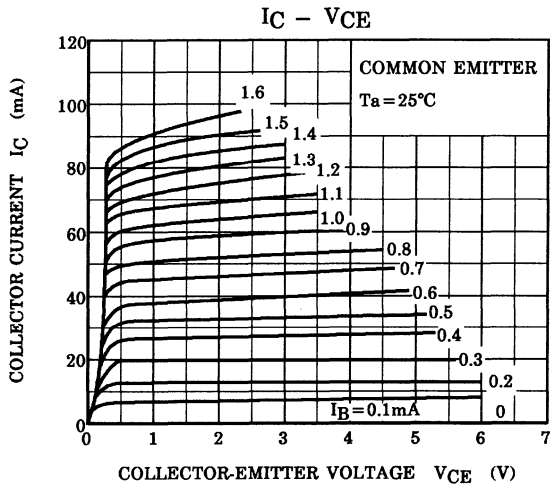
## Electrical Characteristics (Ta = 25°C)

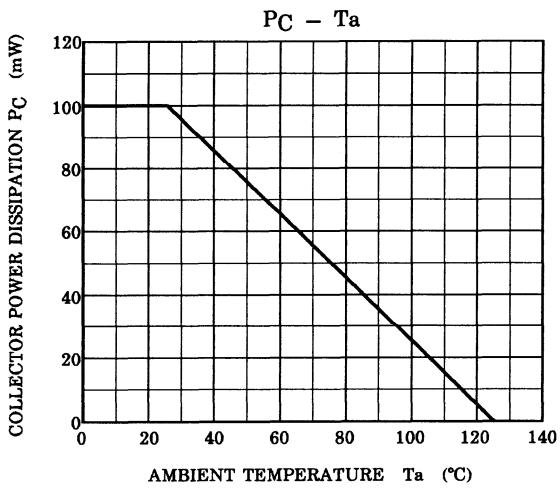
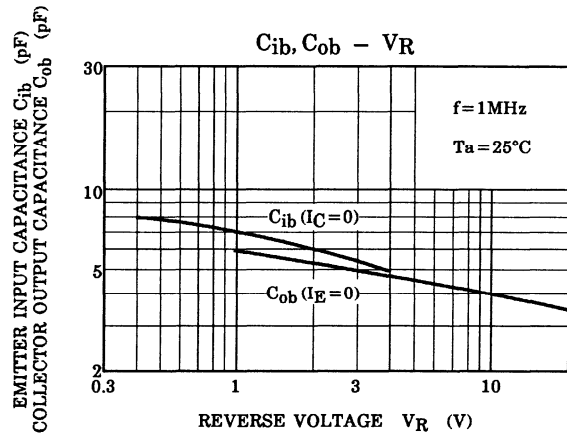
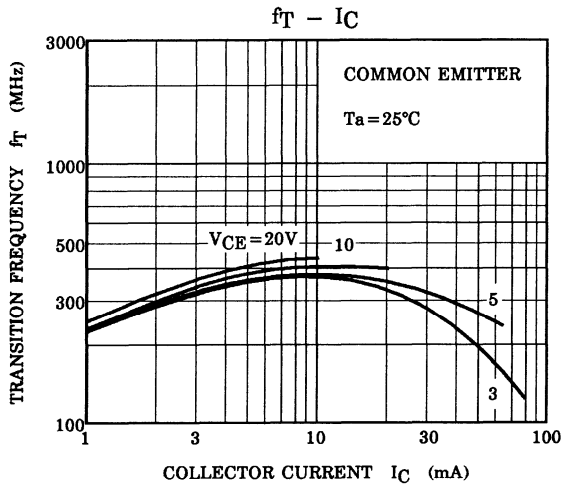
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	$I_{CBO}$	$V_{CB} = 40\text{ V}, I_E = 0$	—	—	0.1	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = 5\text{ V}, I_C = 0$	—	—	0.1	$\mu\text{A}$
DC current gain	$h_{FE} (1)$ (Note 1)	$V_{CE} = 1\text{ V}, I_C = 10\text{ mA}$	40	—	240	
	$h_{FE} (2)$	$V_{CE} = 1\text{ V}, I_C = 100\text{ mA}$	20	—	—	
Collector-emitter saturation voltage	$V_{CE} (\text{sat})$	$I_C = 20\text{ mA}, I_B = 1\text{ mA}$	—	—	0.3	V
Base-emitter saturation voltage	$V_{BE} (\text{sat})$	$I_C = 20\text{ mA}, I_B = 1\text{ mA}$	—	—	1.0	V
Transition frequency	$f_T$	$V_{CE} = 10\text{ V}, I_C = 10\text{ mA}$	200	400	—	MHz
Collector output capacitance	$C_{ob}$	$V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	4	6	pF
Switching time	Turn-on time	$t_{on}$	—	70	—	ns
	Storage time	$t_{stg}$	—	15	—	
	Turn-off time	$t_{off}$	—	30	—	

Note 1:  $h_{FE} (1)$  classification R: 40~80, O: 70~140, Y: 120~240

Note 2: Switching time test circuit







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