TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process)

2SC4667

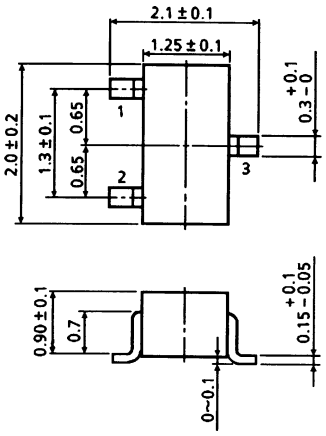
Ultra High Speed Switching Applications
Computer, Counter Applications

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

Maximum Ratings (Ta = 25°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	°C
Storage temperature range	T_{stg}	−55~125	°C

Unit: mm



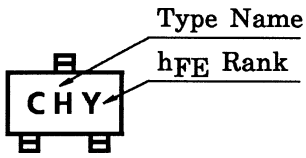
1. BASE
2. EMITTER
3. COLLECTOR

USM

JEDEC	—
JEITA	SC-70
TOSHIBA	2-2E1A

Weight: 0.006 g (typ.)

Marking

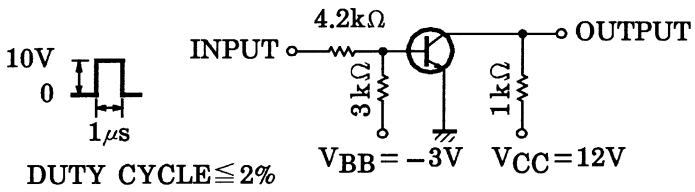


Electrical Characteristics (Ta = 25°C)

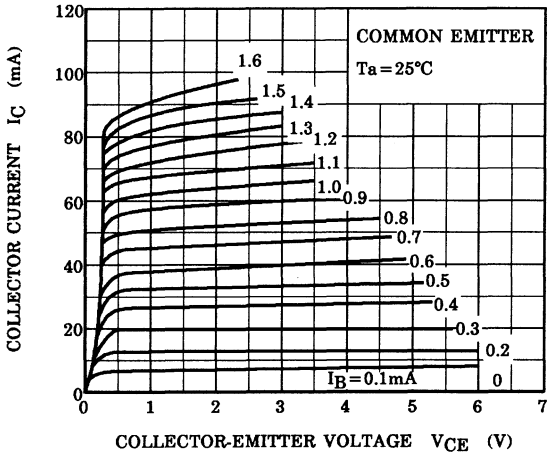
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	V_{CB} = 40 V, I_E = 0	—	—	0.1	μA
Emitter cut-off current		I_{EBO}	V_{EB} = 5 V, I_C = 0	—	—	0.1	μA
DC current gain		$h_{FE\ (1)}$ (Note 1)	V_{CE} = 1 V, I_C = 10 mA	40	—	240	
		$h_{FE\ (2)}$	V_{CE} = 1 V, I_C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

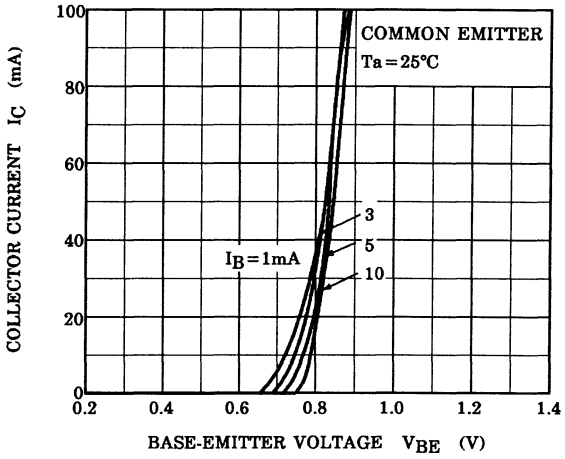
Note 2: Switching time test circuit



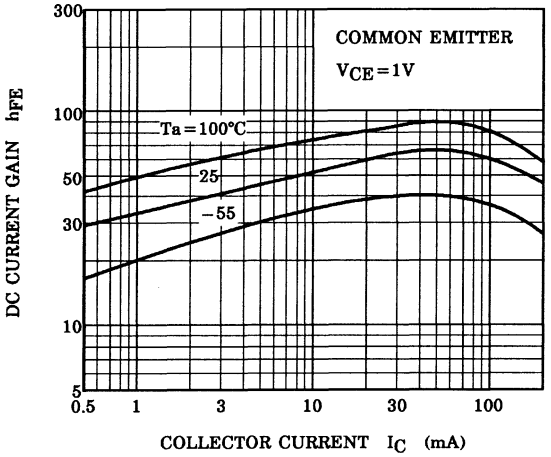
$I_C - V_{CE}$



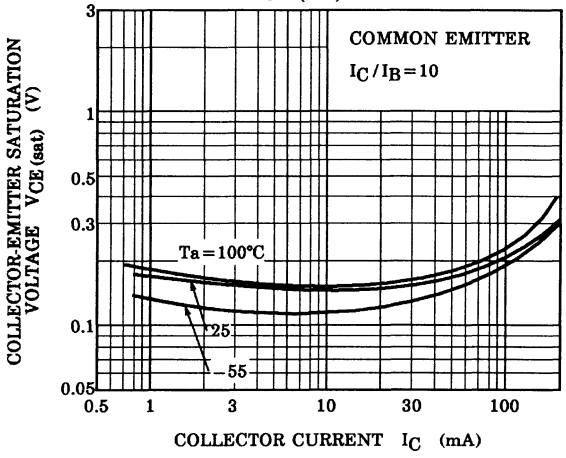
$I_C - V_{BE}$

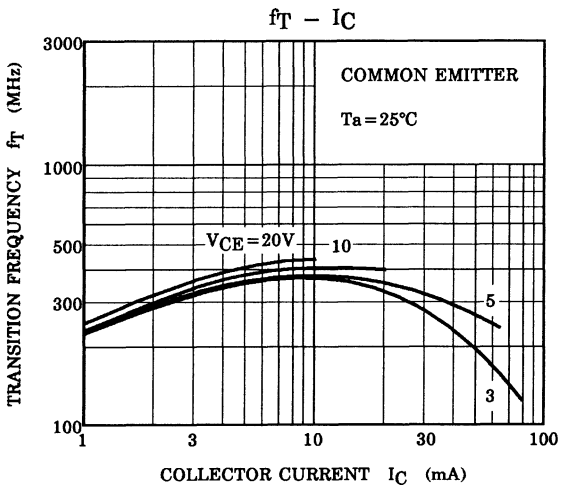


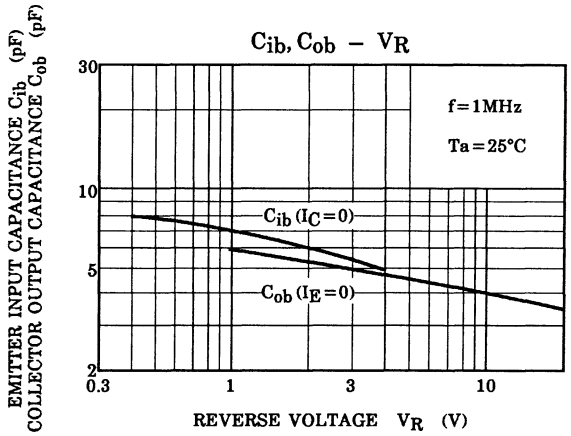
$h_{FE} - I_C$

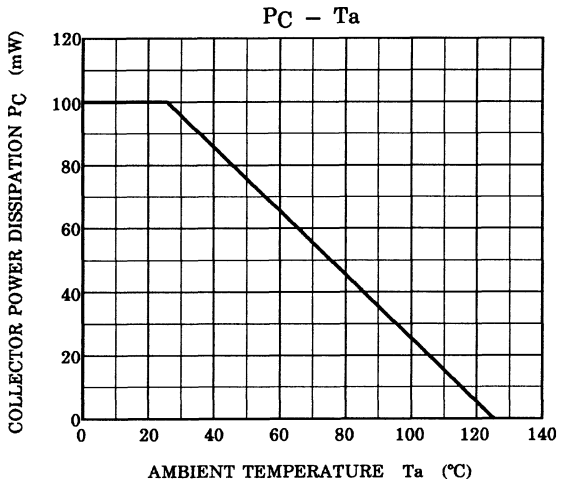


$V_{CE\,(sat)} - I_C$




f_T – I_C
COMMON EMITTER
Ta = 25°C
V_{CE} = 20V
10
5
3
TRANSITION FREQUENCY f_T (MHz)
COLLECTOR CURRENT I_C (mA)
3000
1000
500
300
100
1
3
10
30
100


C_{ib}, C_{ob} – V_R
f = 1MHz
Ta = 25°C
C_{ib} (I_C = 0)
C_{ob} (I_E = 0)
EMITTER INPUT CAPACITANCE C_{ib} (pF)
COLLECTOR OUTPUT CAPACITANCE C_{ob} (pF)
REVERSE VOLTAGE V_R (V)
30
10
5
2
0.3
1
3
10


P_C – Ta
COLLECTOR POWER DISSIPATION P_C (mW)
AMBIENT TEMPERATURE Ta (°C)
120
100
80
60
40
20
0
0
20
40
60
80
100
120
140

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