TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process)

2SC5233

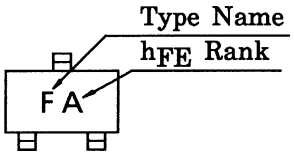
General Purpose Amplifier Applications
Switching and Muting Switch Application

- Low saturation voltage: $V_{CE\ (sat)}$ (1) = 15 mV (typ.)
  @I_C = 10 mA/I_B = 0.5 mA
- Large collector current: I_C = 500 mA (max)

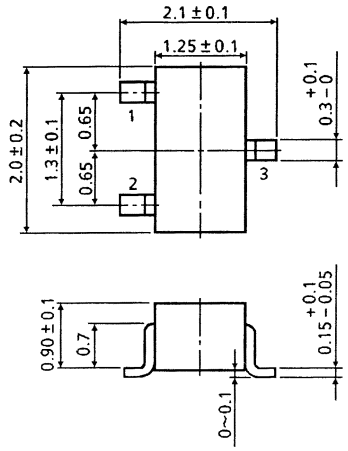
Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	15	V
Collector-emitter voltage	V_{CEO}	12	V
Emitter-base voltage	V_{EBO}	5	V
Collector current	I_C	500	mA
Base current	I_B	50	mA
Collector power dissipation	P_C	100	mW
Junction temperature	T_j	125	°C
Storage temperature range	T_{stg}	−55~125	°C

Marking



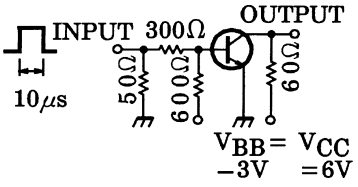
Unit: mm



JEDEC	—
JEITA	SC-70
TOSHIBA	2-2E1A

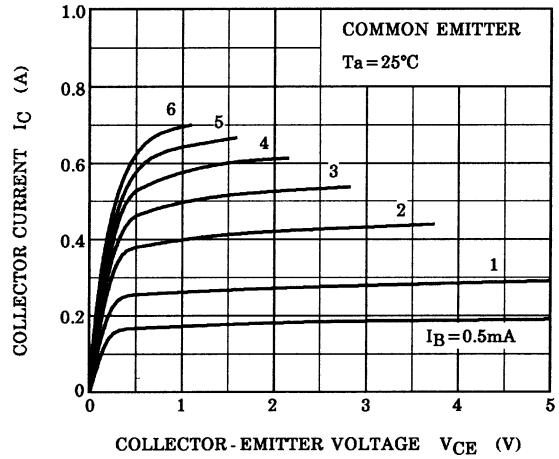
Weight: 0.006 g (typ.)

Electrical Characteristics (Ta = 25°C)

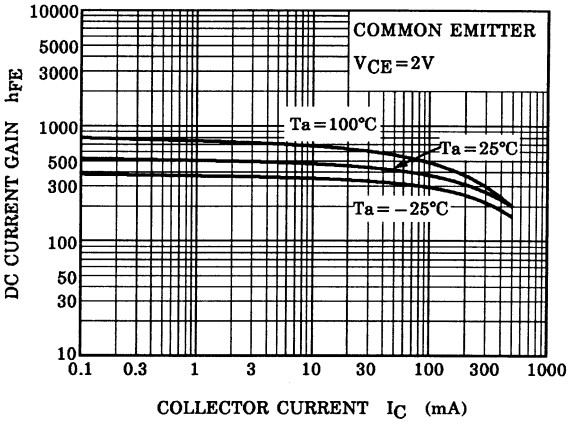
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	V_{CB} = 15 V, I_E = 0	—	—	0.1	μA
Emitter cut-off current		I_{EBO}	V_{EB} = 5 V, I_C = 0	—	—	0.1	μA
DC current gain		h_{FE} (Note)	V_{CE} = 2 V, I_C = 10 mA	300	—	1000	
Collector-emitter saturation voltage		$V_{CE\ (sat)\ (1)}$	I_C = 10 mA, I_B = 0.5 mA	—	15	30	mV
		$V_{CE\ (sat)\ (2)}$	I_C = 200 mA, I_B = 10 mA	—	110	250	
Base-emitter saturation voltage		$V_{BE\ (sat)}$	I_C = 200 mA, I_B = 10 mA	—	0.87	1.2	V
Transition frequency		f_T	V_{CE} = 2 V, I_C = 10 mA	80	130	—	MHz
Collector output capacitance		C_{ob}	V_{CB} = 10 V, I_E = 0, f = 1 MHz	—	4.2	—	pF
Collector-emitter on resistance		R_{on}	I_B = 1 mA, V_{in} = 1 V_{rms}, f = 1 kHz	—	0.9	—	Ω
Switching time	Turn-on time	t_{on}		—	85	—	ns
	Storage time	t_{stg}		—	170	—	
	Fall time	t_f	Duty cycle ≦ 2% $I_{B1} = -I_{B2}$ = 5 mA	—	40	—	

Note: h_{FE} classification A: 300~600, B: 500~1000

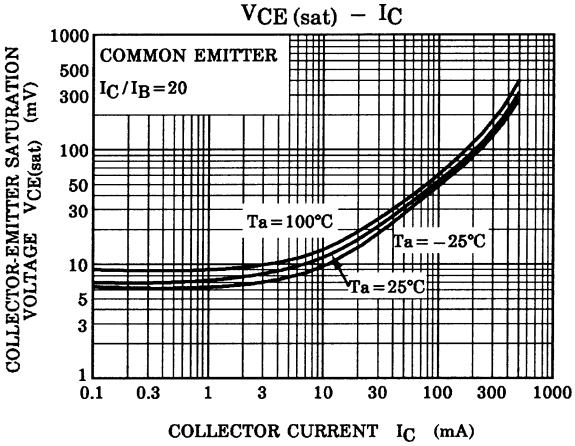
$I_C - V_{CE}$



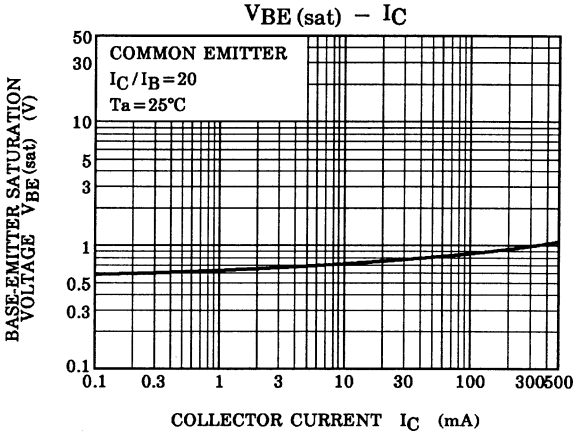
$h_{FE} - I_C$



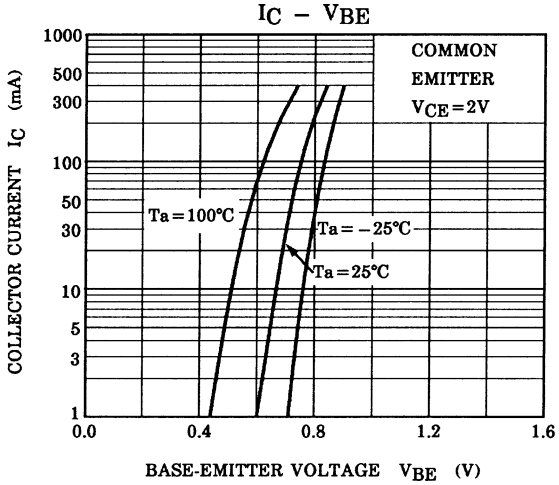
$V_{CE\,(sat)} - I_C$



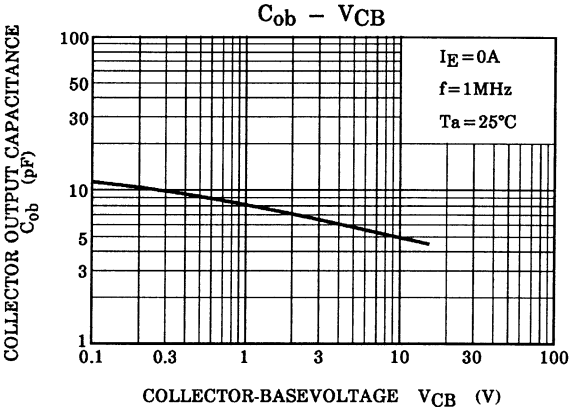
$V_{BE\,(sat)} - I_C$

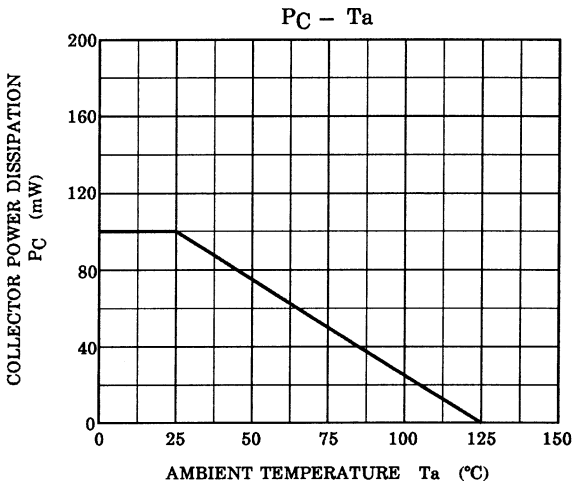


$I_C - V_{BE}$



$C_{ob} - V_{CB}$




P_C – Ta
COLLECTOR POWER DISSIPATION P_C (mW)
200
160
120
80
40
0
0
25
50
75
100
125
150
AMBIENT TEMPERATURE Ta (°C)

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