

TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process)

2SC5233

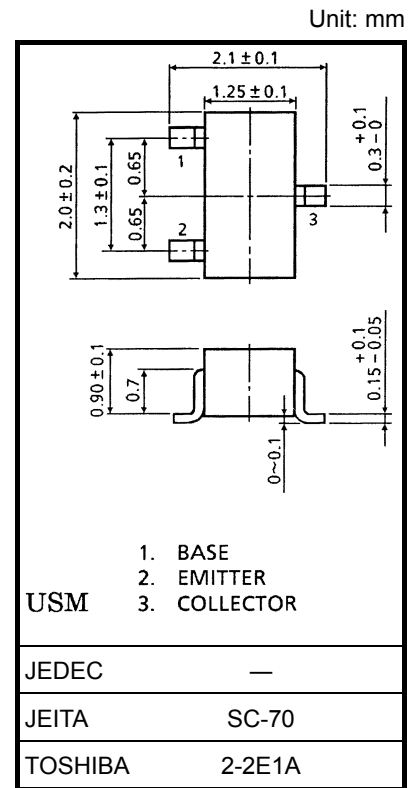
General Purpose Amplifier Applications
Switching and Muting Switch Application

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

Absolute Maximum Ratings (Ta = 25°C)

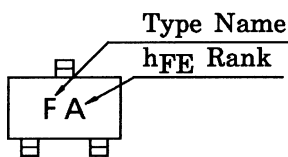
Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	15	V
Collector-emitter voltage	V_{CEO}	12	V
Emitter-base voltage	V_{EBO}	5	V
Collector current	I_C	500	mA
Base current	I_B	50	mA
Collector power dissipation	P_C	100	mW
Junction temperature	T_j	125	°C
Storage temperature range	T_{stg}	-55~125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

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).



Weight: 0.006 g (typ.)

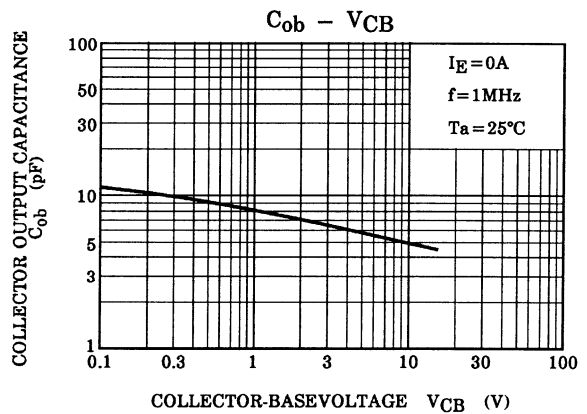
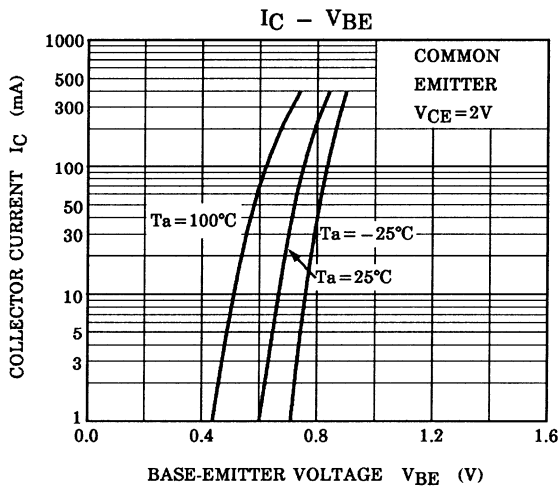
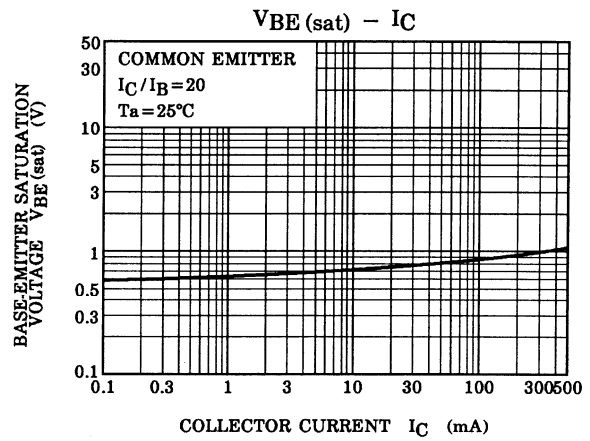
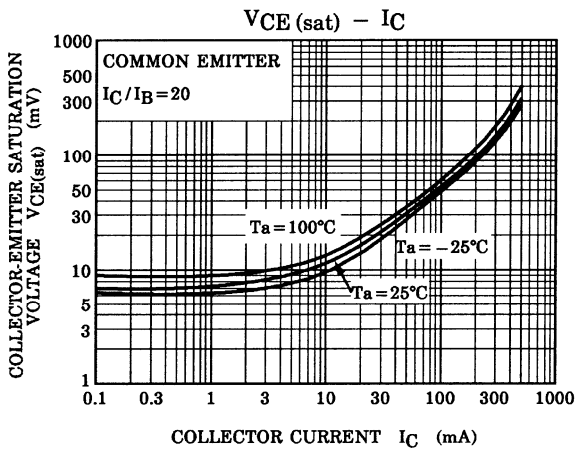
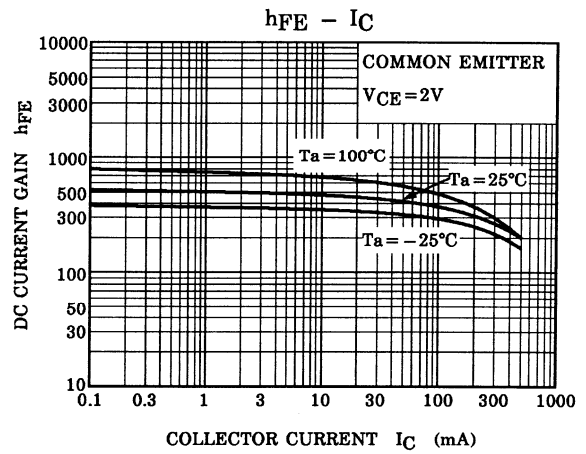
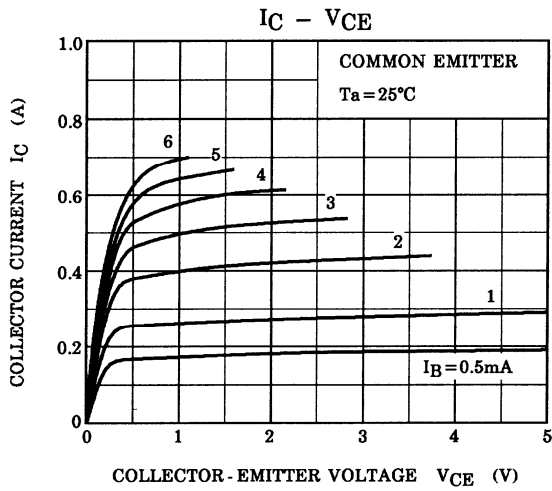
Marking

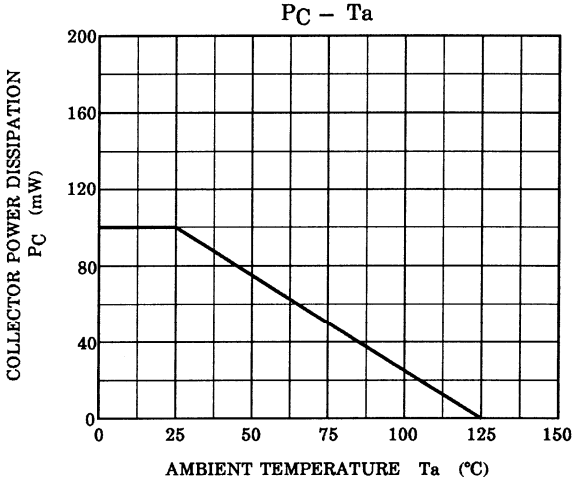


Electrical Characteristics (Ta = 25°C)

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

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





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