

TOSHIBA Transistor Silicon NPN Epitaxial Type

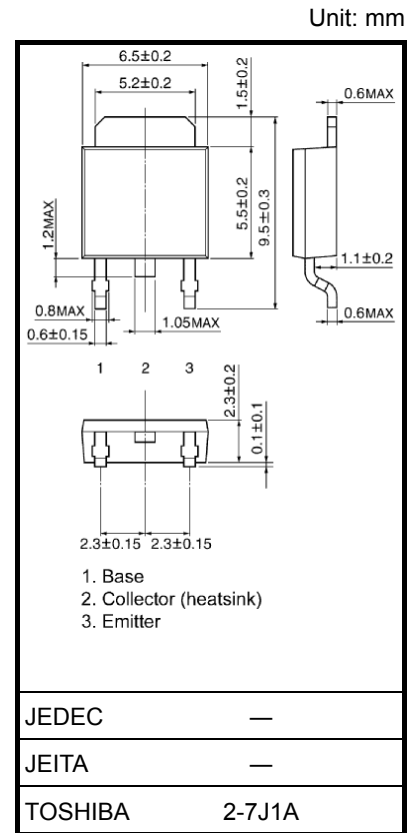
2SC6000

High Speed Switching Applications
DC-DC Converter Applications

- High DC current gain: $h_{FE} = 250$ to 400 ($I_C = 2.5$ A)
- Low collector-emitter saturation: $V_{CE(sat)} = 0.18$ V (max)
- High speed switching: $t_f = 13$ ns (typ)

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

Characteristics		Symbol	Rating	Unit
Collector-base voltage		V_{CBO}	120	V
Collector-emitter voltage		V_{CEX}	120	V
Collector-emitter voltage		V_{CEO}	50	V
Emitter-base voltage		V_{EBO}	6	V
Collector current	DC	I_C	7.0	A
	Pulse	I_{CP}	10.0	
Base current		I_B	0.5	A
Collector power dissipation	$T_c = 25^\circ\text{C}$	P_C	20	W
Junction temperature		T_j	150	$^\circ\text{C}$
Storage temperature range		T_{stg}	-55 to 150	$^\circ\text{C}$



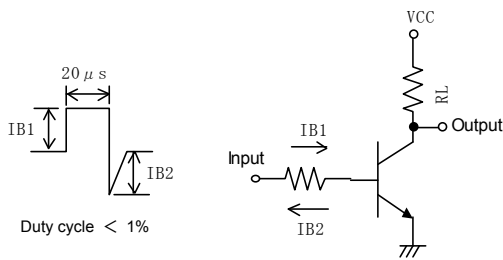
Weight: 0.36 g (typ.)

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).

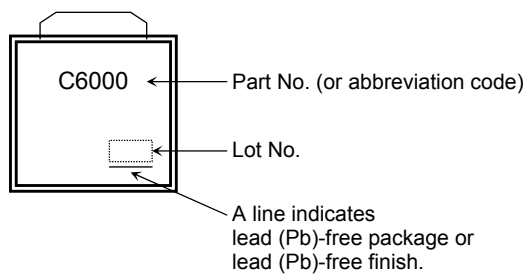
Electrical Characteristics (Ta = 25°C)

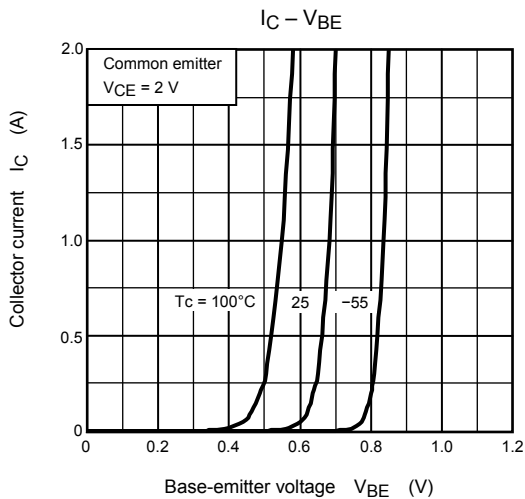
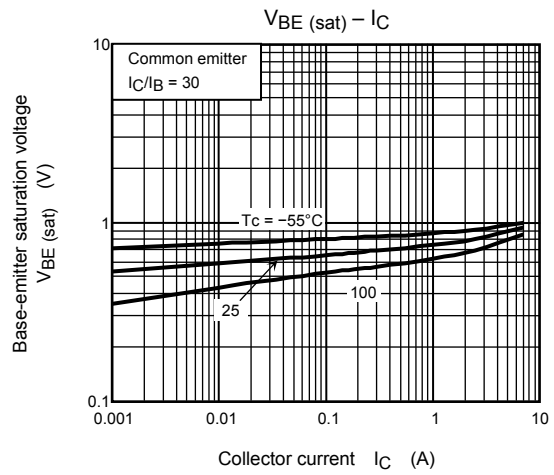
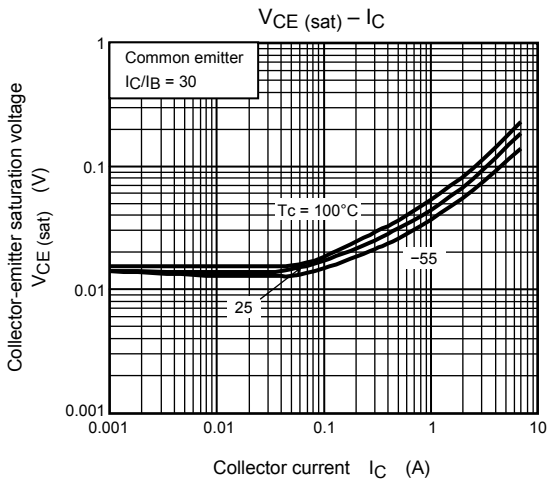
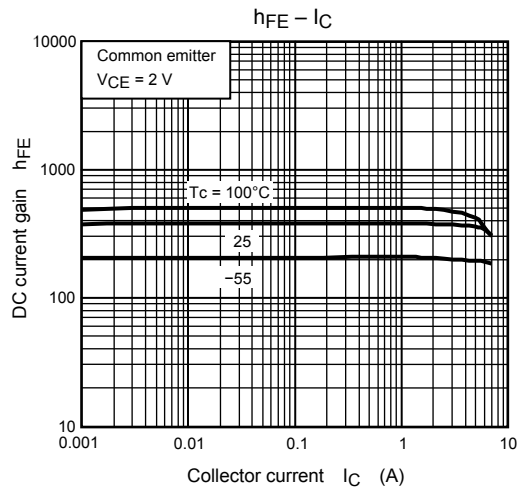
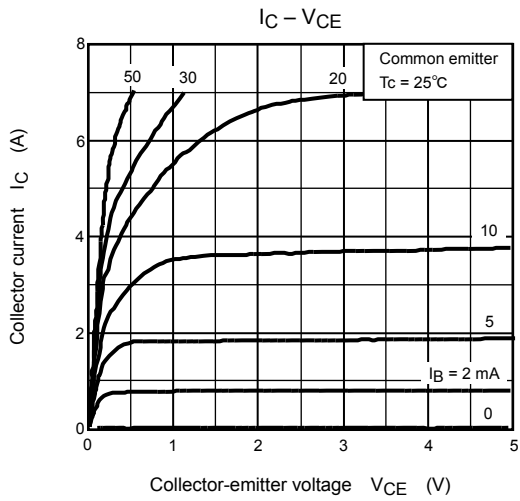
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	$V_{CB} = 120\text{ V}, I_E = 0$	—	—	100	nA
Emitter cut-off current		I_{EBO}	$V_{EB} = 6\text{ V}, I_C = 0$	—	—	100	nA
Collector-emitter breakdown voltage		$V_{(BR) CEO}$	$I_C = 10\text{ mA}, I_B = 0$	50	—	—	V
DC current gain		$h_{FE} (1)$	$V_{CE} = 2\text{ V}, I_C = 1\text{ mA}$	160	—	—	
		$h_{FE} (2)$	$V_{CE} = 2\text{ V}, I_C = 2.5\text{ A}$	250	—	400	
Collector emitter saturation voltage		$V_{CE (sat)}$	$I_C = 2.5\text{ A}, I_B = 83\text{ mA}$	—	—	0.18	V
Base-emitter saturation voltage		$V_{BE (sat)}$	$I_C = 2.5\text{ A}, I_B = 83\text{ mA}$	—	—	1.10	V
Switching time	Rise time	t_r	See Figure 1 circuit diagram $V_{CC} \approx 20\text{ V}, R_L = 8.0\ \Omega$ $I_{B1} = 83\text{ mA}, I_{B2} = -166\text{ mA}$	—	45	—	ns
	Storage time	t_{stg}		—	450	—	
	Fall time	t_f		—	13	—	

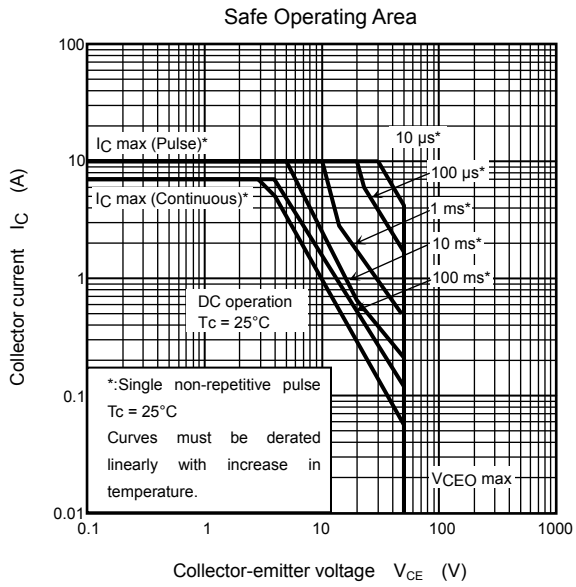
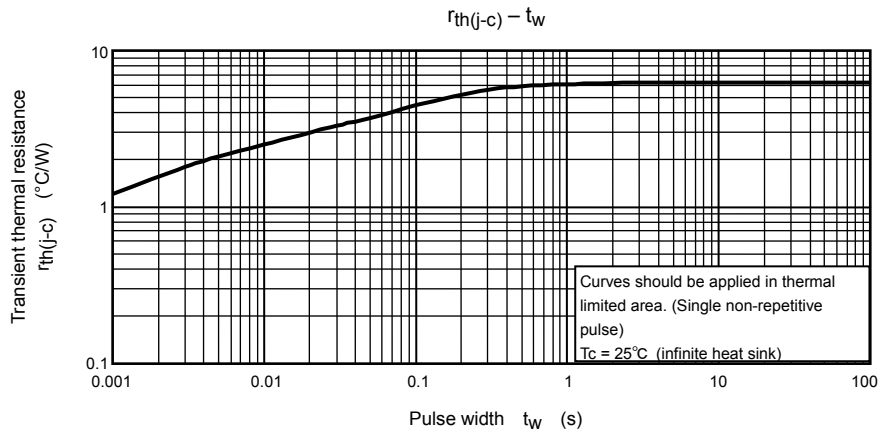
Figure 1 Switching Time Test Circuit & Timing Chart



Marking







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