

TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

# 2SC6078

- Power Amplifier Applications
- Power Switching Applications

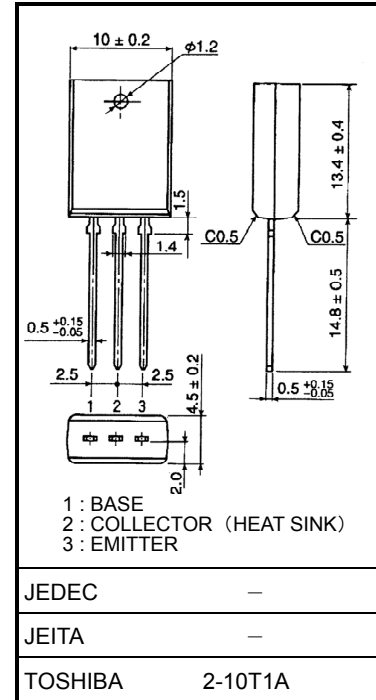
- Low collector saturation voltage:  $V_{CE(sat)} = 0.5\text{ V (max)}$  ( $I_C = 1\text{ A}$ )
- High-speed switching:  $t_{stg} = 0.4\ \mu\text{s (typ)}$

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

Characteristic	Symbol	Rating	Unit
Collector-base voltage	$V_{CBO}$	160	V
Collector-emitter voltage	$V_{CEX}$	160	V
	$V_{CEO}$	80	V
Emitter-base voltage	$V_{EBO}$	7	V
Collector current	DC	$I_C$	3 A
	Pulse	$I_{CP}$	5 A
Base current	$I_B$	1.0	A
Collector power dissipation	$P_C$	1.8	W
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature range	$T_{stg}$	-55~150	$^\circ\text{C}$

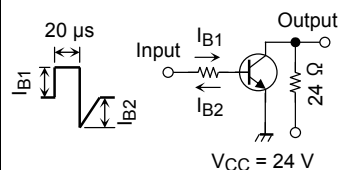
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) 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

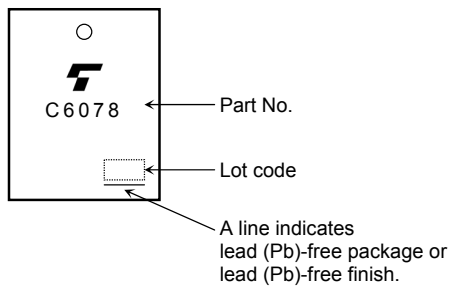


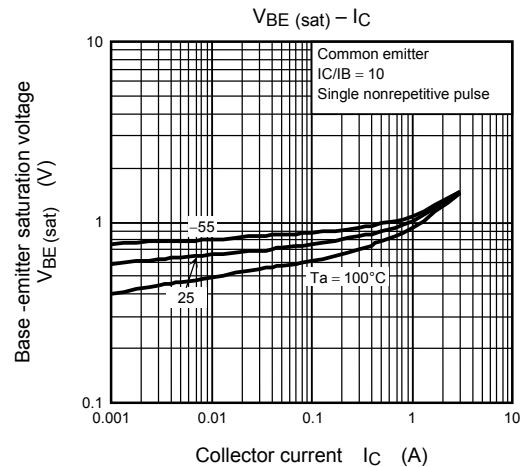
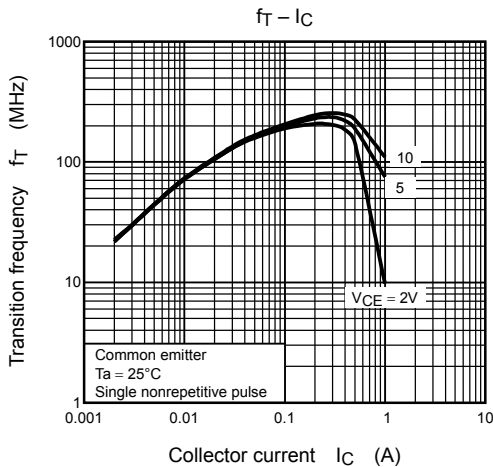
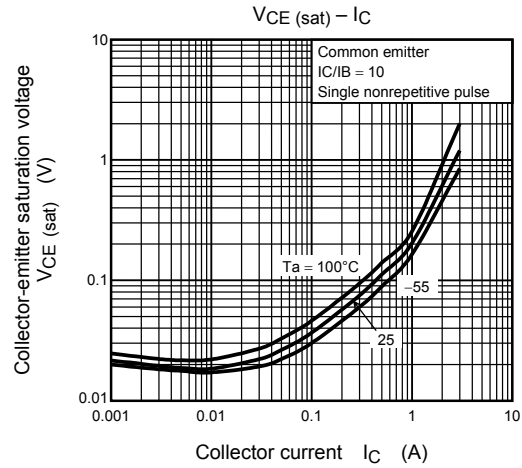
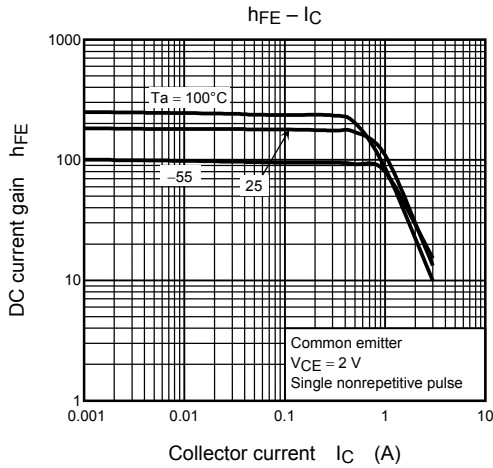
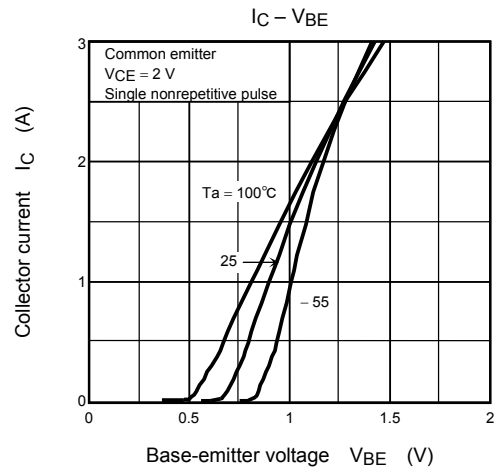
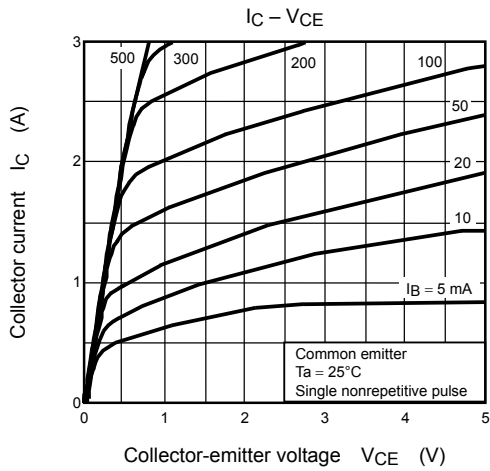
Weight: 1.5g(typ)

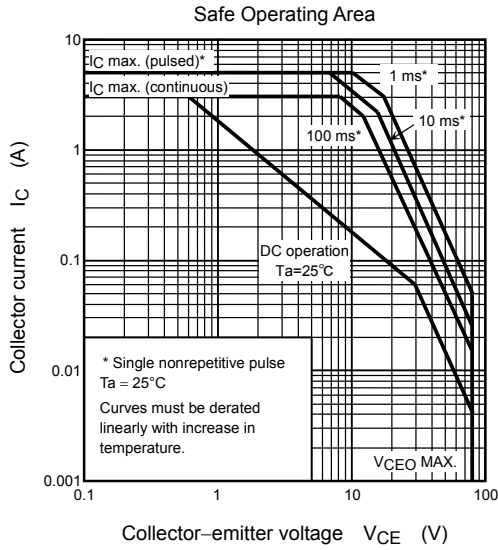
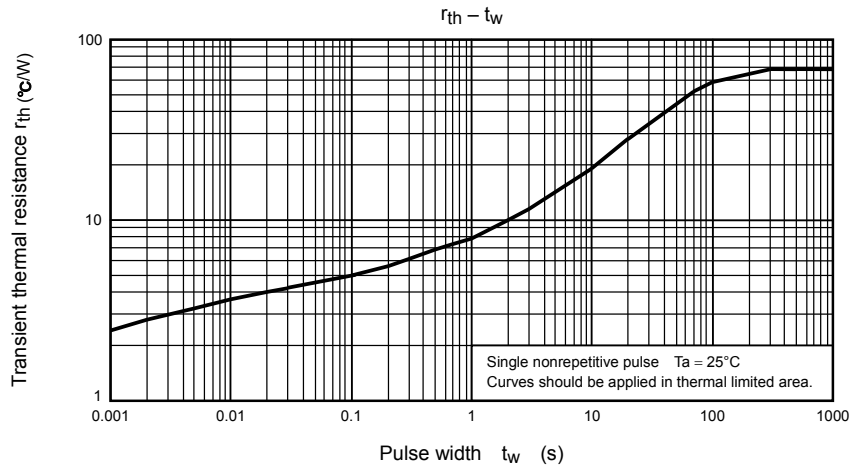
## Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Conditions	Min	Typ.	Max	Unit
Collector cut-off current	$I_{CBO}$	$V_{CB} = 160\text{ V}, I_E = 0$	—	—	1.0	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = 7\text{ V}, I_C = 0$	—	—	1.0	$\mu\text{A}$
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = 10\text{ mA}, I_B = 0$	80	—	—	V
DC current gain	$h_{FE(1)}$	$V_{CE} = 2\text{ V}, I_C = 1\text{ mA}$	80	—	—	
	$h_{FE(2)}$	$V_{CE} = 2\text{ V}, I_C = 0.5\text{ A}$	100	—	200	
	$h_{FE(3)}$	$V_{CE} = 2\text{ V}, I_C = 1\text{ A}$	60	—	—	
Collector emitter saturation voltage	$V_{CE(sat)(1)}$	$I_C = 0.5\text{ A}, I_B = 50\text{ mA}$	—	—	0.3	V
	$V_{CE(sat)(2)}$	$I_C = 1\text{ A}, I_B = 100\text{ mA}$	—	—	0.5	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = 1\text{ A}, I_B = 100\text{ mA}$	—	—	1.5	V
Transition frequency	$f_T$	$V_{CE} = 2\text{ V}, I_C = 0.5\text{ A}$	—	150	—	MHz
Collector output capacitance	$C_{ob}$	$V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	14	—	pF
Switching time	Rise time	$t_r$		—	0.05	us
	Storage time	$t_{stg}$		—	0.4	
	Fall time	$t_f$		$I_{B1} = -I_{B2} = 100\text{ mA}$ Duty cycle $\leq 1\%$	—	

## Marking







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20070701-EN

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