

2SC4004

Silicon NPN triple diffusion planar type

For high breakdown voltage high-speed switching

■ Features

- High-speed switching
- High collector-base voltage (Emitter open) V_{CBO}
- Wide safe operation area
- Satisfactory linearity of forward current transfer ratio h_{FE}
- Full-pack package which can be installed to the heat sink with one screw

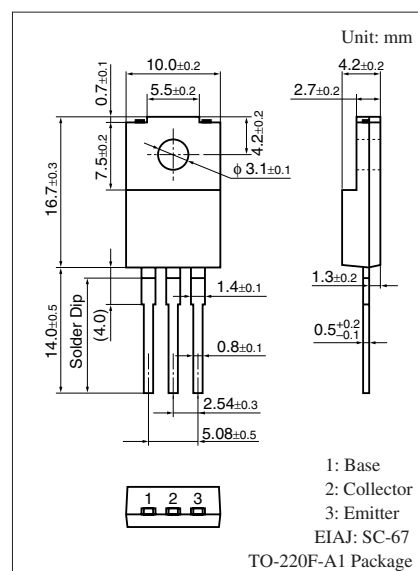
■ Absolute Maximum Ratings $T_C = 25^\circ\text{C}$

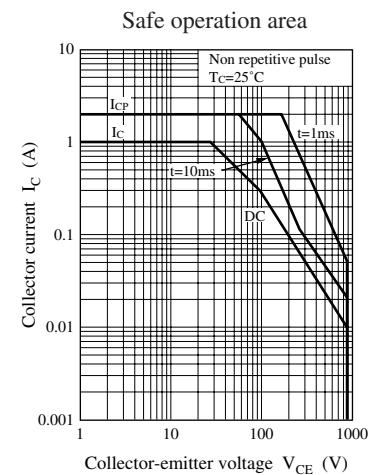
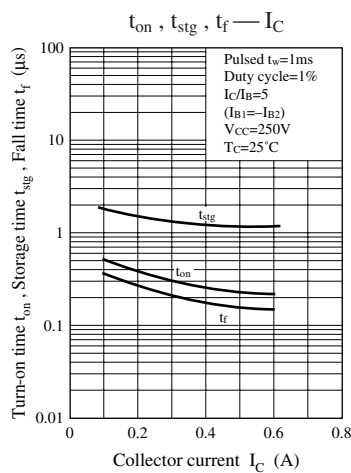
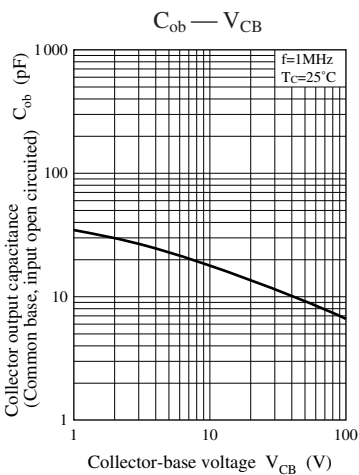
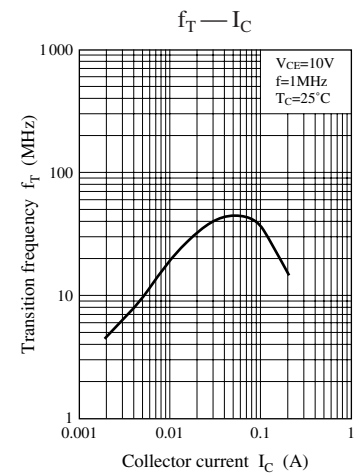
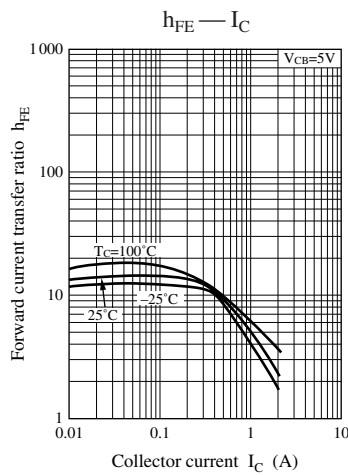
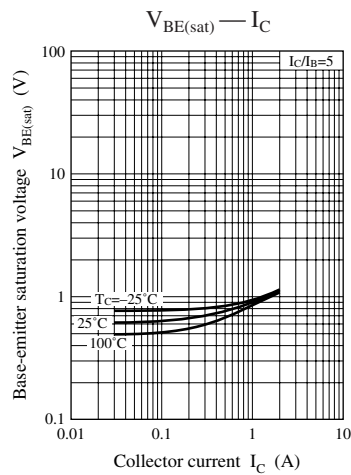
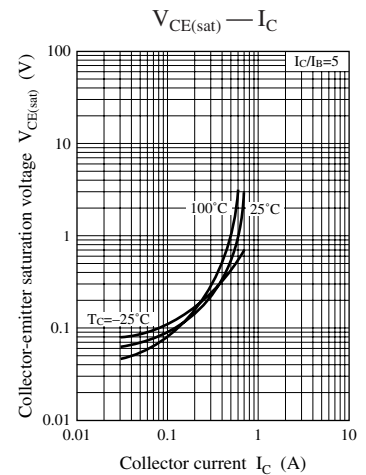
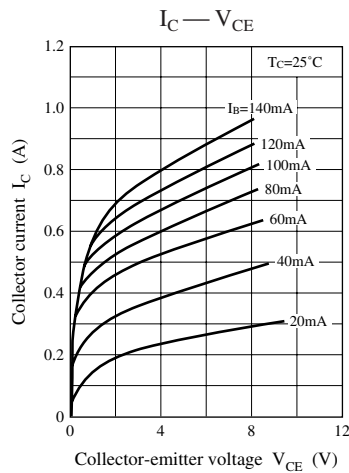
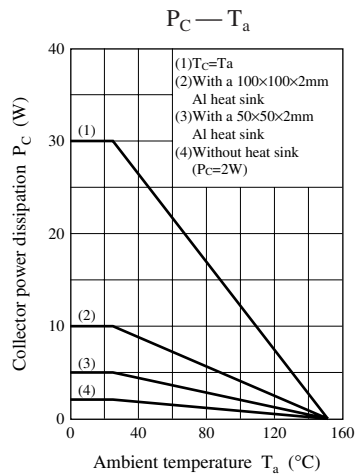
Parameter	Symbol	Rating	Unit
Collector-base voltage (Emitter open)	V_{CBO}	900	V
Collector-emitter voltage (E-B short)	V_{CES}	900	V
Collector-emitter voltage (Base open)	V_{CEO}	800	V
Emitter-base voltage (Collector open)	V_{EBO}	7	V
Base current	I_B	0.3	A
Collector current	I_C	1	A
Peak collector current	I_{CP}	2	A
Collector power dissipation	P_C	30	W
	$T_a = 25^\circ\text{C}$	2.0	
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

■ Electrical Characteristics $T_C = 25^\circ\text{C} \pm 3^\circ\text{C}$

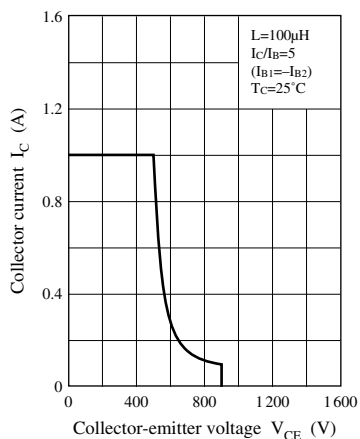
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-emitter voltage (Base open)	V_{CEO}	$I_C = 1\text{ mA}$, $I_B = 0$	800			V
Collector-base cutoff current (Emitter open)	I_{CBO}	$V_{CB} = 900\text{ V}$, $I_E = 0$			50	μA
Emitter-base cutoff current (Collector open)	I_{EBO}	$V_{EB} = 7\text{ V}$, $I_C = 0$			50	μA
Forward current transfer ratio	h_{FE1}	$V_{CE} = 5\text{ V}$, $I_C = 0.05\text{ A}$	6			—
	h_{FE2}	$V_{CE} = 5\text{ V}$, $I_C = 0.5\text{ A}$	3			
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 0.2\text{ A}$, $I_B = 0.04\text{ A}$			1.5	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = 0.2\text{ A}$, $I_B = 0.04\text{ A}$			1.0	V
Transition frequency	f_T	$V_{CE} = 10\text{ V}$, $I_C = 0.05\text{ A}$, $f = 1\text{ MHz}$		4		MHz
Turn-on time	t_{on}	$I_C = 0.2\text{ A}$			1.0	μs
Storage time	t_{stg}	$I_{B1} = 0.04\text{ A}$, $I_{B2} = -0.04\text{ A}$			3.0	μs
Fall time	t_f	$V_{CC} = 250\text{ V}$			1.0	μs

Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

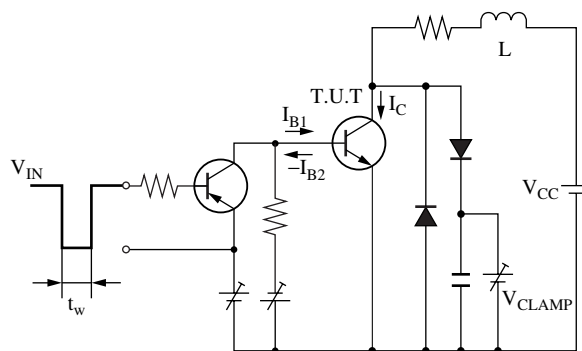




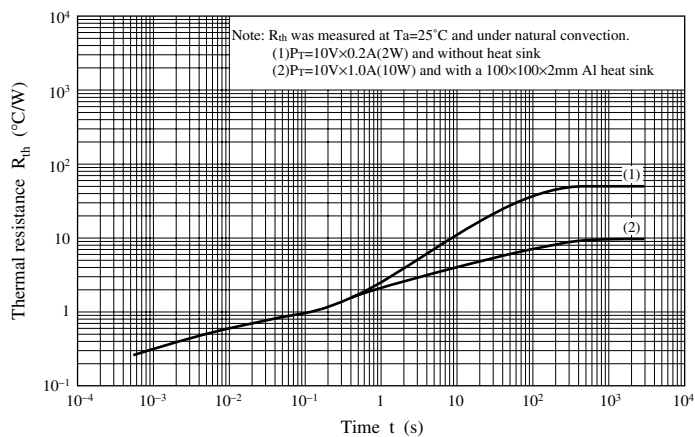
Safe operation area (Reverse bias)



Safe operation area (Reverse bias) measurement circuit



$R_{th} - t$



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