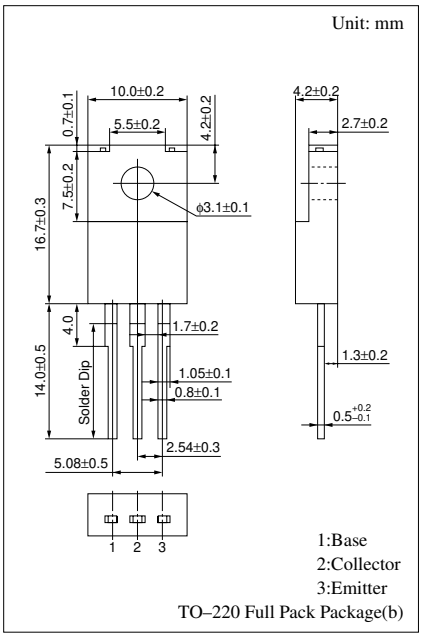
2SC4004

Silicon NPN triple diffusion planar type

For high breakdown voltage high-speed switching



Features

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

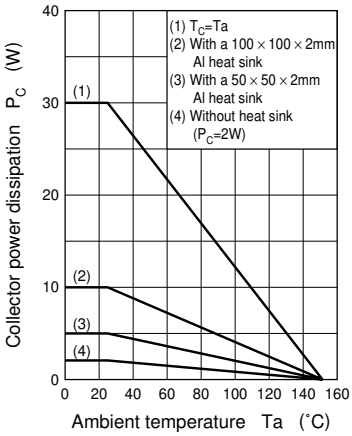
Absolute Maximum Ratings (T_C=25˚C)

Parameter		Symbol	Ratings	Unit
Collector to base voltage		V_{CBO}	900	V
Collector to emitter voltage		V_{CES}	900	V
		V_{CEO}	800	V
Emitter to base voltage		V_{EBO}	7	V
Peak collector current		I_{CP}	2	A
Collector current		I_C	1	A
Base current		I_B	0.3	A
Collector power dissipation	T_C=25°C	P_C	30	W
	Ta=25°C		2	
Junction temperature		T_j	150	˚C
Storage temperature		T_{stg}	–55 to +150	˚C

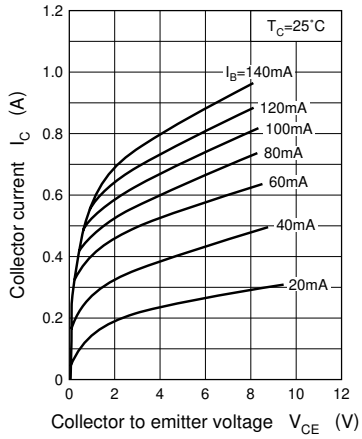
Electrical Characteristics (T_C=25˚C)

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

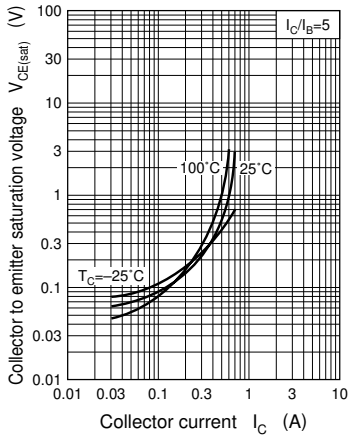
P_C — Ta



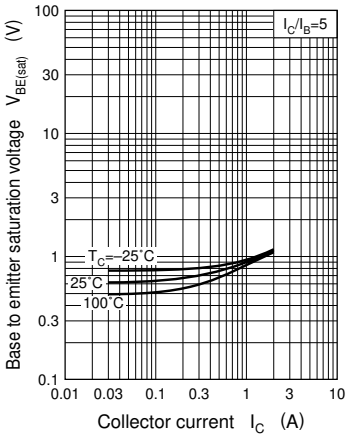
I_C — V_{CE}



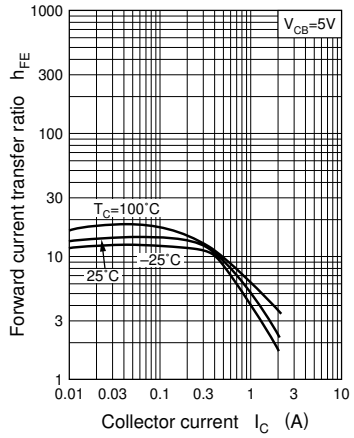
$V_{CE(sat)}$ — I_C



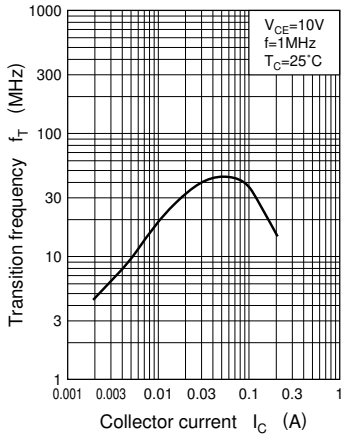
$V_{BE(sat)}$ — I_C



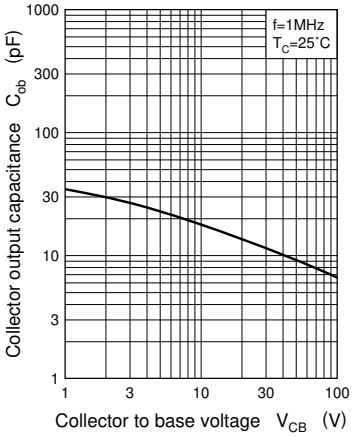
h_{FE} — I_C



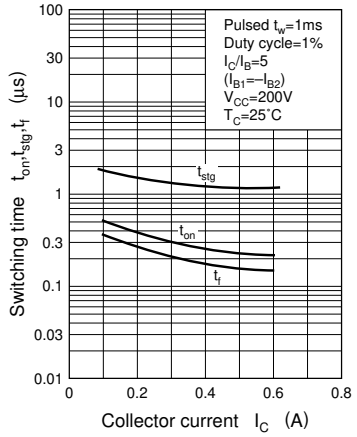
f_T — I_C



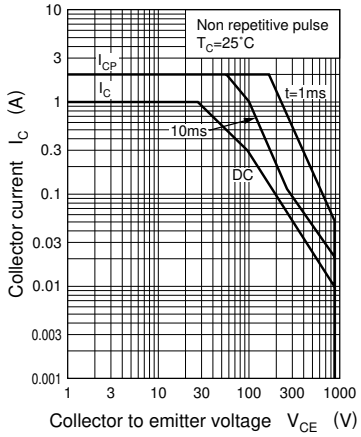
C_{ob} — V_{CB}



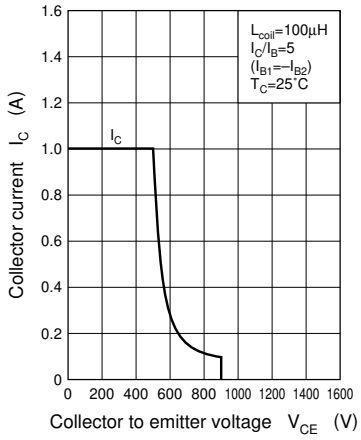
t_{on}, t_{stg}, t_f — I_C



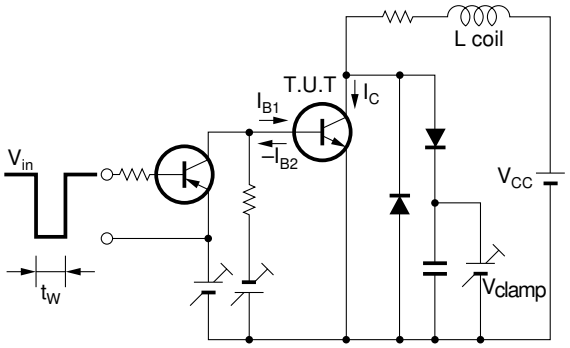
Area of safe operation (ASO)



Area of safe operation, reverse bias ASO



Reverse bias ASO measuring circuit



$R_{th(t)}$ — t