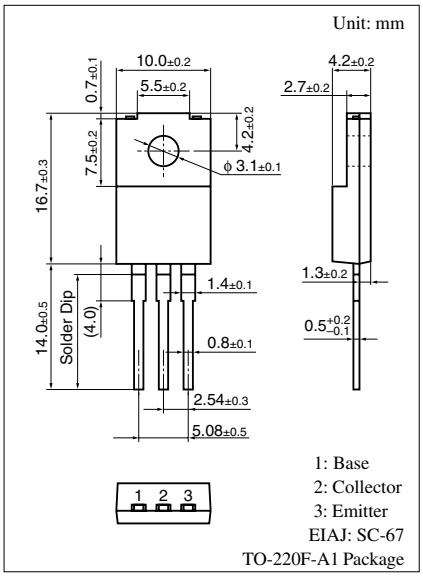
2SD2000

Silicon NPN triple diffusion planar type

For power switching



■ Features

- High-speed switching
- Satisfactory linearity of forward current transfer ratio h_{FE}
- Large collector power dissipation P_C
- Full-pack package which can be installed to the heat sink with one screw

■ Absolute Maximum Ratings $T_C = 25°C$

Parameter		Symbol	Rating	Unit
Collector to base voltage		V_{CBO}	80	V
Collector to emitter voltage		V_{CEO}	60	V
Emitter to base voltage		V_{EBO}	6	V
Peak collector current		I_{CP}	8	A
Collector current		I_C	4	A
Base current		I_B	1	A
Collector power dissipation	$T_C = 25°C$	P_C	35	W
	$T_a = 25°C$		2	
Junction temperature		T_j	150	°C
Storage temperature		T_{stg}	−55 to +150	°C

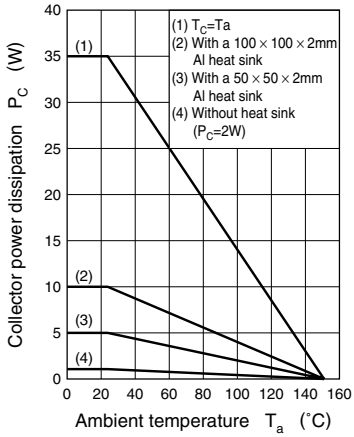
■ Electrical Characteristics $T_C = 25°C$

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector cutoff current	I_{CBO}	V_{CB} = 80 V, I_E = 0			100	µA
Emitter to base current	I_{EBO}	V_{EB} = 6 V, I_C = 0			100	µA
Collector to emitter voltage	V_{CEO}	I_C = 25 mA, I_B = 0	60			V
Forward current transfer ratio	h_{FE1} *	V_{CE} = 4 V, I_C = 1 A	70		250	
	h_{FE2}	V_{CE} = 4 V, I_C = 4 A	20			
Base to emitter saturation voltage	$V_{BE(sat)}$	V_{CE} = 4 V, I_C = 4 A			2.0	V
Collector to emitter saturation voltage	$V_{CE(sat)}$	I_C = 4 A, I_B = 0.4 A			1.5	V
Transition frequency	f_T	V_{CE} = 12 V, I_C = 0.2 A, f = 10 MHz		80		MHz
Turn-on time	t_{on}	I_C = 4 A, I_{B1} = 0.4 A, I_{B2} = − 0.4 A, V_{CC} = 50 V		0.3		µs
Storage time	t_{stg}			1.0		µs
Fall time	t_f			0.2		µs

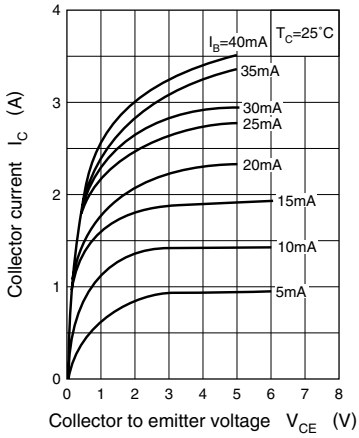
Note) *: Rank classification

Rank	Q	P
h_{FE1}	70 to 150	120 to 250

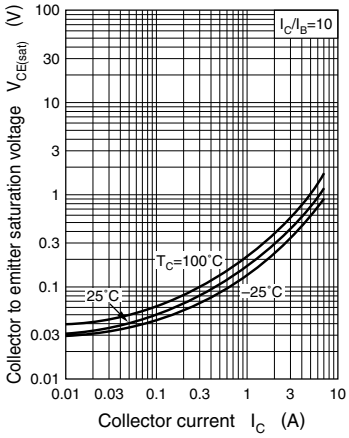
P_C — T_a



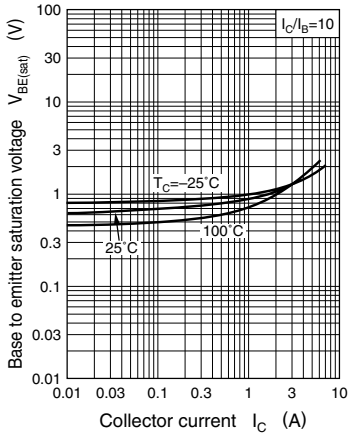
I_C — V_{CE}



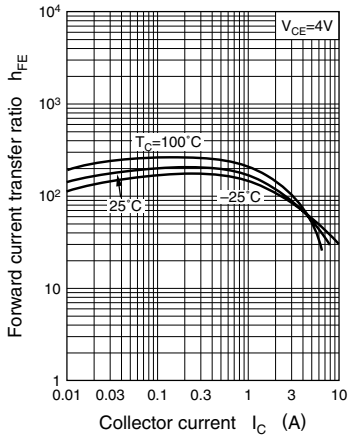
$V_{CE(sat)}$ — I_C



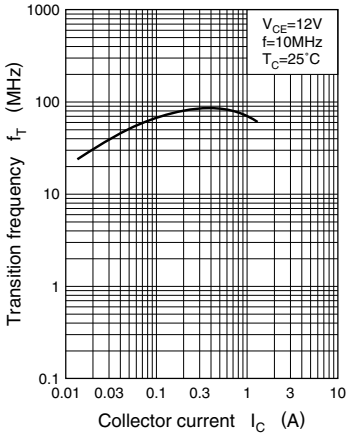
$V_{BE(sat)}$ — I_C



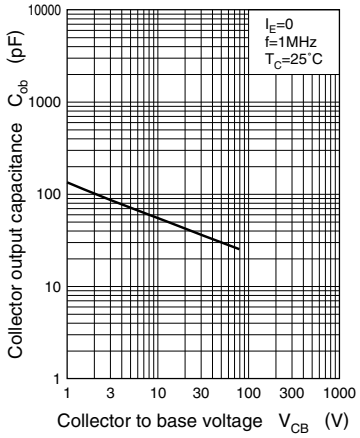
h_{FE} — I_C



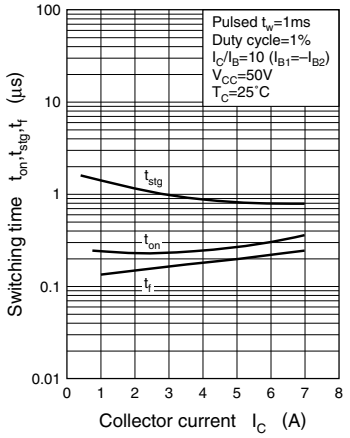
f_T — I_C



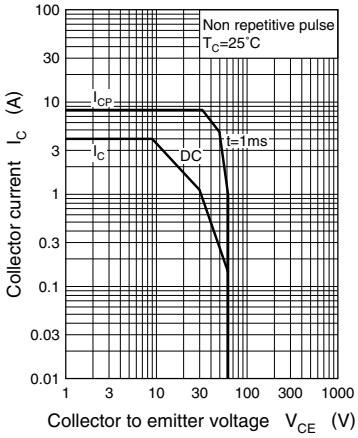
C_{ob} — V_{CB}



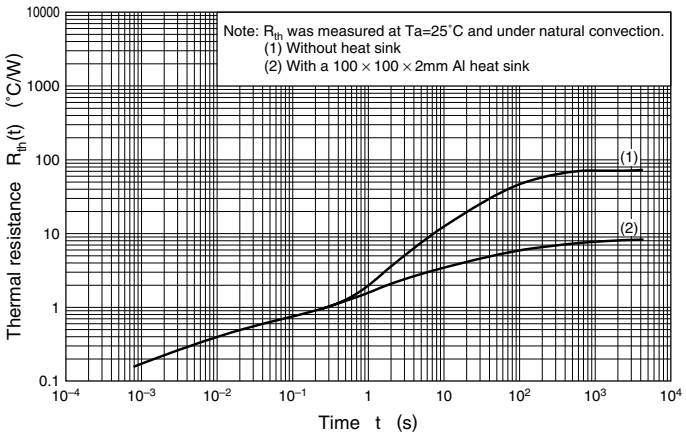
t_{on}, t_{stg}, t_f — I_C



Area of safe operation (ASO)



$R_{th(t)}$ — t


Note: R_{th} was measured at Ta=25˚C and under natural convection.
(1) Without heat sink
(2) With a 100 × 100 × 2mm Al heat sink
(1)
(2)
Thermal resistance R_{th}(t) (˚C/W)
10000
1000
100
10
1
0.1
10^{-4}
10^{-3}
10^{-2}
10^{-1}
1
10
10^{2}
10^{3}
10^{4}
Time t (s)

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