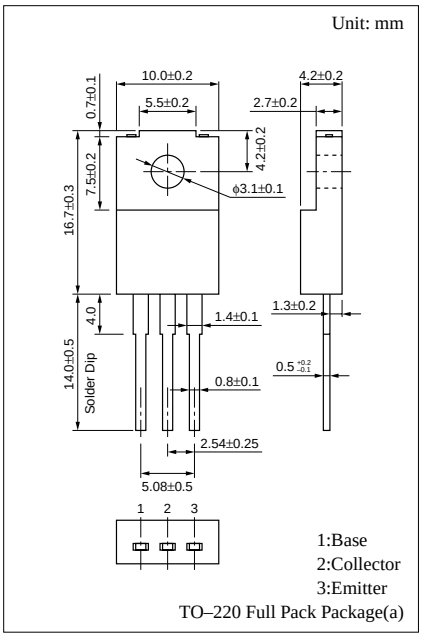
2SD2000

Silicon NPN triple diffusion planar type

For power switching



Features

- High-speed switching
- Satisfactory linearity of foward 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	Ratings	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
	Ta=25°C		2	
Junction temperature		T_j	150	˚C
Storage temperature		T_{stg}	–55 to +150	˚C

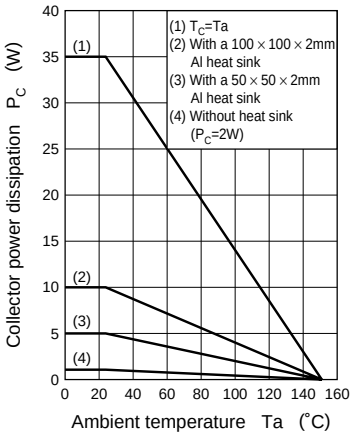
Electrical Characteristics (T_C=25˚C)

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

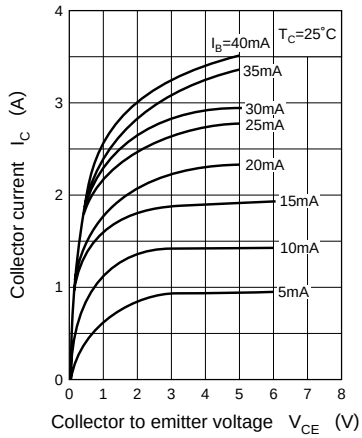
*h_{FE1} Rank classification

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

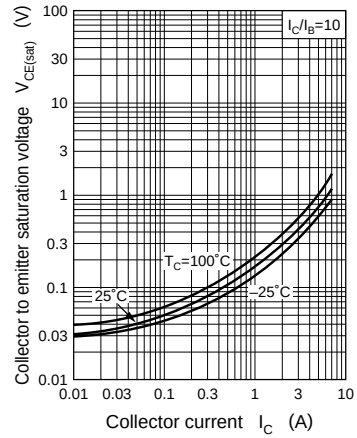
P_C — Ta



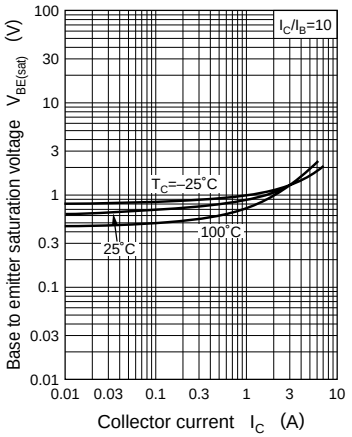
I_C — V_{CE}



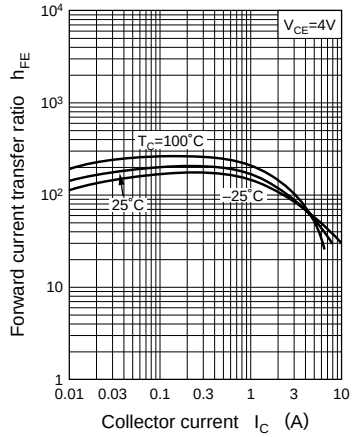
$V_{CE(sat)}$ — I_C



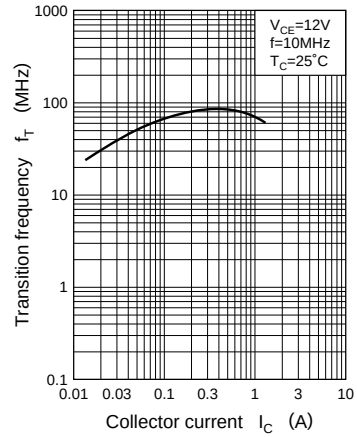
$V_{BE(sat)}$ — I_C



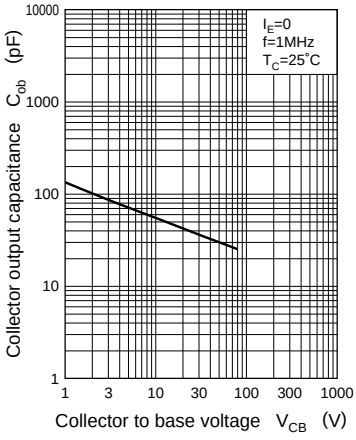
h_{FE} — I_C



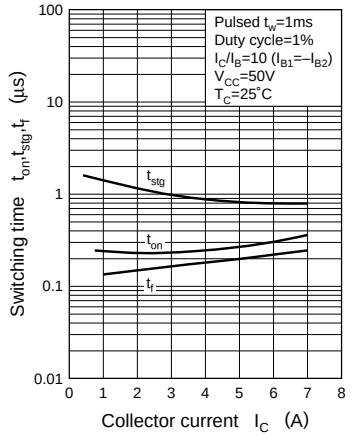
f_T — I_C



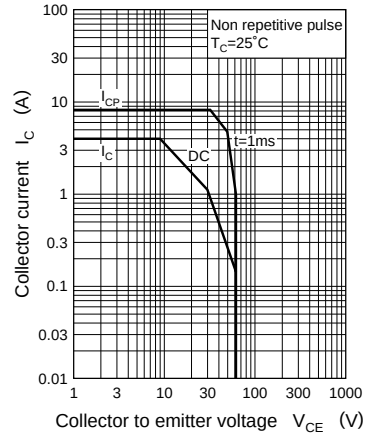
C_{ob} — V_{CB}



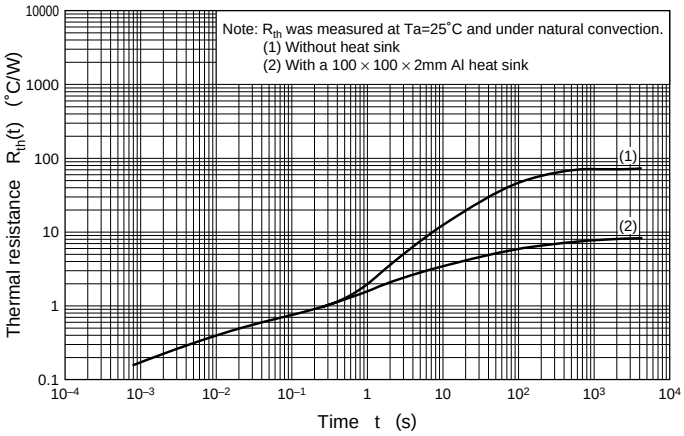
t_{on}, t_{stg}, t_f — I_C



Area of safe operation (ASO)



$R_{th(t)}$ — 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)