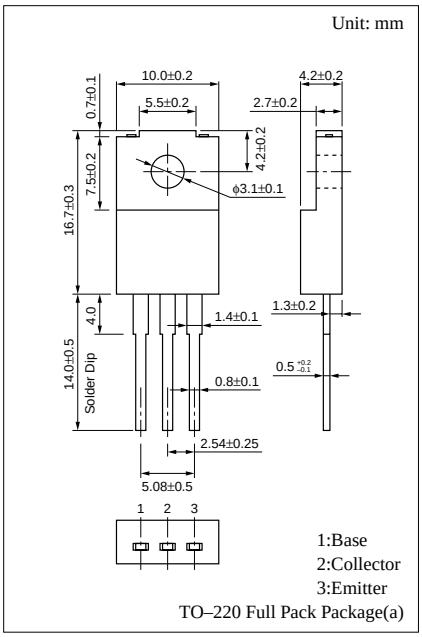
2SD1964

Silicon NPN epitaxial planar type

For power switching



Features

- Low collector to emitter saturation voltage $V_{CE(sat)}$
- Satisfactory linearity of foward current transfer ratio h_{FE}
- Large collector current I_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}	130	V
Collector to emitter voltage		V_{CEO}	80	V
Emitter to base voltage		V_{EBO}	7	V
Peak collector current		I_{CP}	25	A
Collector current		I_C	15	A
Collector power dissipation	T_C=25°C	P_C	50	W
	Ta=25°C		2	
Junction temperature		T_j	150	˚C
Storage temperature		T_{stg}	–55 to +150	˚C

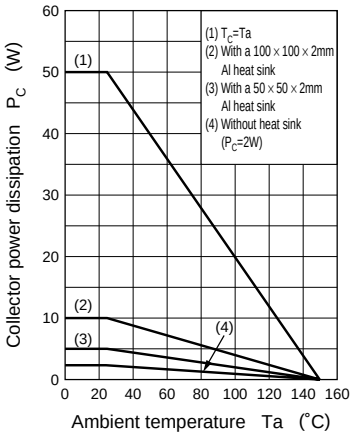
Electrical Characteristics (T_C=25˚C)

Parameter	Symbol	Conditions	min	typ	max	Unit
Collector cutoff current	I_{CBO}	V_{CB} = 100V, I_E = 0			10	μA
Emitter cutoff current	I_{EBO}	V_{EB} = 5V, I_C = 0			50	μA
Collector to emitter voltage	V_{CEO}	I_C = 10mA, I_B = 0	80			V
Forward current transfer ratio	h_{FE1}	V_{CE} = 2V, I_C = 0.1A	45			
	h_{FE2}*	V_{CE} = 2V, I_C = 3A	90		260	
	h_{FE3}	V_{CE} = 2V, I_C = 8A	30			
Collector to emitter saturation voltage	$V_{CE(sat)1}$	I_C = 7A, I_B = 0.35A			0.5	V
	$V_{CE(sat)2}$	I_C = 15A, I_B = 1.5A			1.5	V
Base to emitter saturation voltage	$V_{BE(sat)1}$	I_C = 7A, I_B = 0.35A			1.5	V
	$V_{BE(sat)2}$	I_C = 15A, I_B = 1.5A			2.5	V
Transition frequency	f_T	V_{CE} = 10V, I_C = 0.5A, f = 1MHz		20		MHz
Turn-on time	t_{on}	I_C = 7A, I_{B1} = 0.7A, I_{B2} = – 0.7A, V_{CC} = 50V		0.5		μs
Storage time	t_{stg}			2.0		μs
Fall time	t_f			0.2		μs

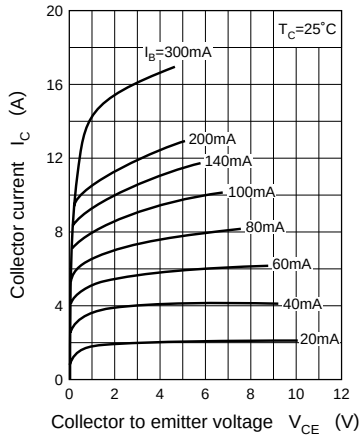
*h_{FE2} Rank classification

Rank	Q	P
h_{FE2}	90 to 180	130 to 260

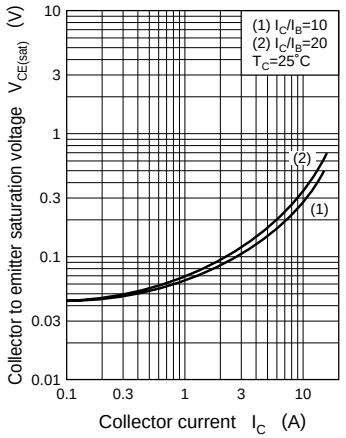
P_C — Ta



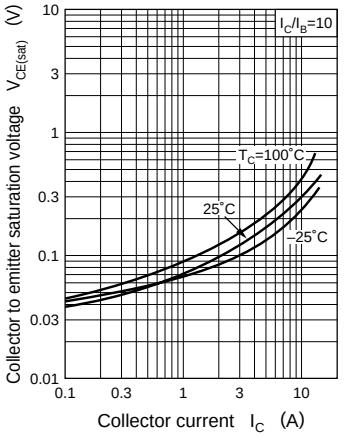
I_C — V_{CE}



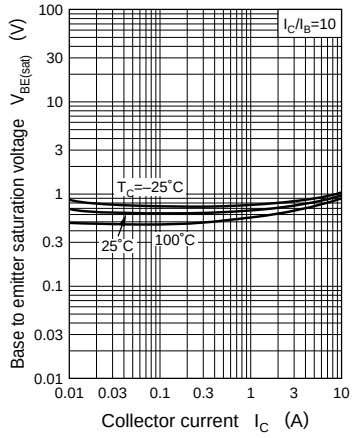
$V_{CE(sat)}$ — I_C



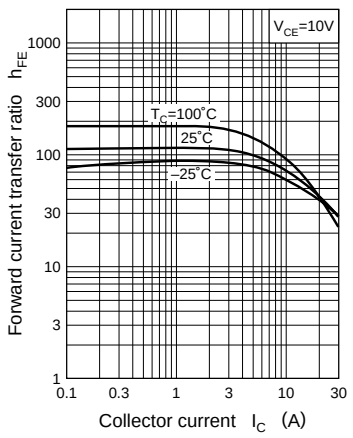
$V_{CE(sat)}$ — I_C



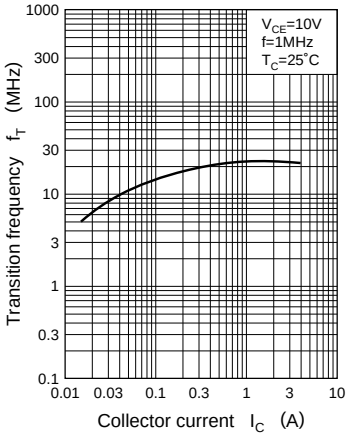
$V_{BE(sat)}$ — I_C



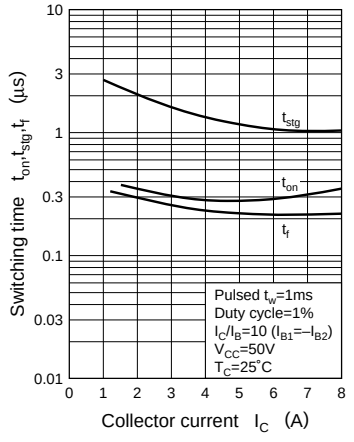
h_{FE} — I_C



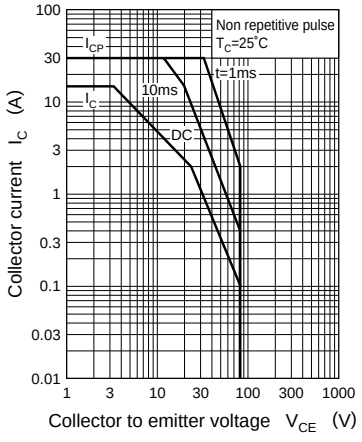
f_T — I_C



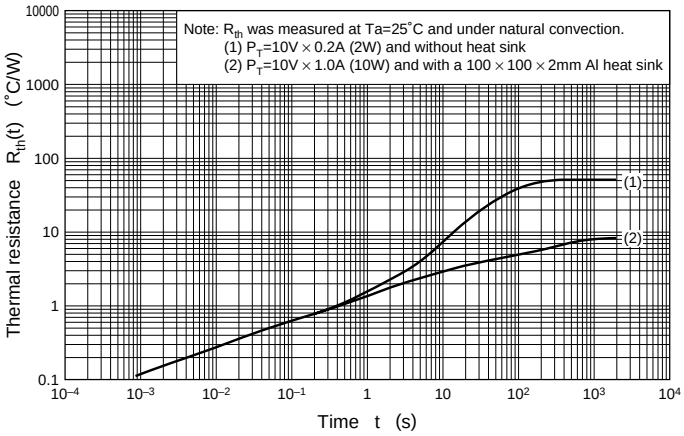
t_{on}, t_{stg}, t_f — I_C



Area of safe operation (ASO)



$R_{th(t)}$ — t


Note: R_{th} was measured at Ta=25°C and under natural convection.
(1) P_T=10V × 0.2A (2W) and without heat sink
(2) P_T=10V × 1.0A (10W) and with a 100 × 100 × 2mm Al heat sink
Thermal resistance $R_{th}(t)$ (°C/W)
10000
1000
100
10
1
0.1
(1)
(2)
10^{-4}
10^{-3}
10^{-2}
10^{-1}
1
10
10^{2}
10^{3}
10^{4}
Time t (s)