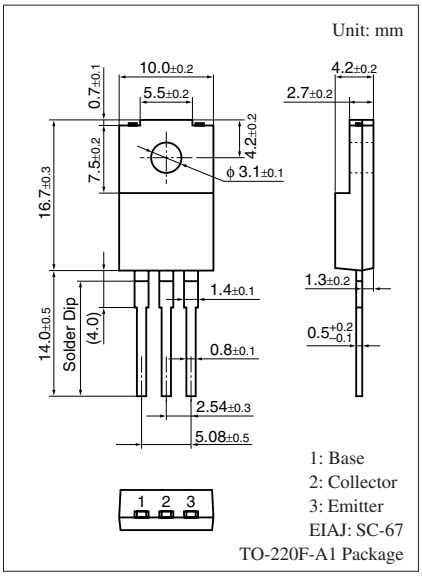
2SD1776A

Silicon NPN triple diffusion planar type

For power amplification with high forward current transfer ratio



■ Features

- High forward current transfer ratio h_{FE}
- 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 $T_C = 25°C$

Parameter		Symbol	Rating	Unit
Collector-base voltage (Emitter open)		V_{CBO}	100	V
Collector-emitter voltage (Base open)		V_{CEO}	80	V
Emitter-base voltage (Collector open)		V_{EBO}	6	V
Collector current		I_C	2	A
Peak collector current		I_{CP}	4	A
Base current		I_B	0.5	A
Collector power dissipation		P_C	25	W
	$T_a = 25°C$		2.0	
Junction temperature		T_j	150	°C
Storage temperature		T_{stg}	−55 to +150	°C

■ Electrical Characteristics $T_C = 25°C \pm 3°C$

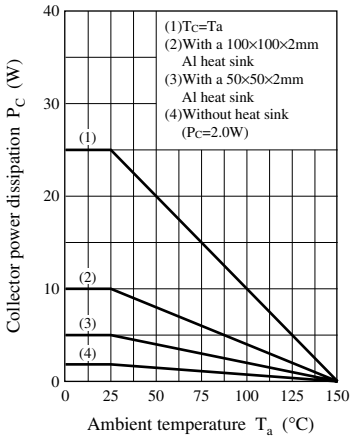
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-emitter voltage (Base open)	V_{CEO}	I_C = 25 mA, I_B = 0	80			V
Collector-base cutoff current (Emitter open)	I_{CBO}	V_{CB} = 100 V, I_E = 0			100	μA
Collector-emitter cutoff current (Base open)	I_{CEO}	V_{CE} = 40 V, I_B = 0			100	μA
Emitter-base cutoff current (Collector open)	I_{EBO}	V_{EB} = 6 V, I_C = 0			100	μA
Forward current transfer ratio *	h_{FE}	V_{CE} = 4 V, I_C = 300 mA	500		1 500	—
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C = 1 A, I_B = 25 mA			1.0	V
Base-emitter saturation voltage	$V_{BE(sat)}$	I_C = 1 A, I_B = 25 mA			1.2	V
Transition frequency	f_T	V_{CE} = 12 V, I_C = 200 mA, f = 10 MHz		40		MHz
Collector output capacitance (Common base, input open circuited)	C_{ob}	V_{CB} = 10 V, I_E = 0, f = 1 MHz		30		pF
Turn-on time	t_{on}	I_C = 1 A, I_{B1} = 25 mA, I_{B2} = −25 mA, V_{CC} = 50 V		0.6		μs
Storage time	t_{stg}			2.5		μs
Fall time	t_f			1.0		μs

Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

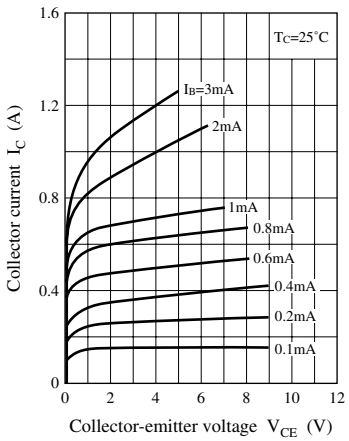
2. *: Rank classification

Rank	Q	P
h_{FE}	500 to 1 000	800 to 1 500

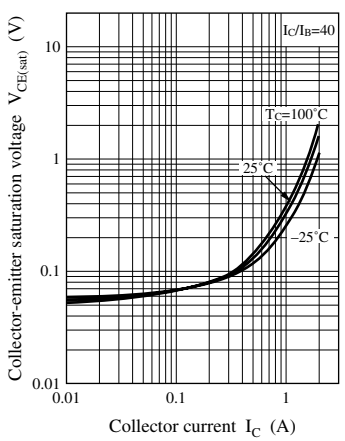
P_C — T_a



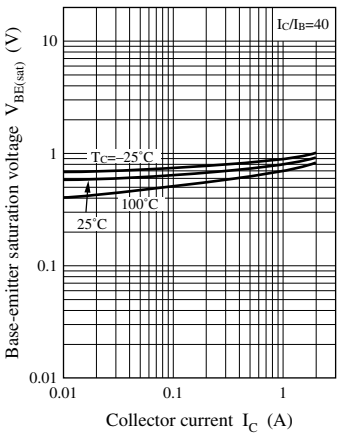
I_C — V_{CE}



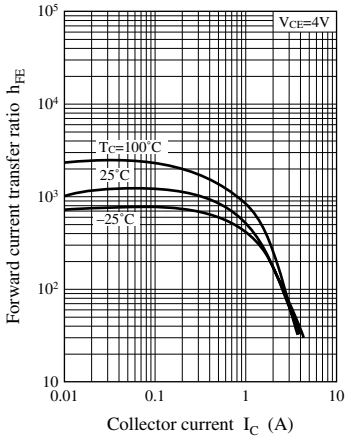
$V_{CE(sat)}$ — I_C



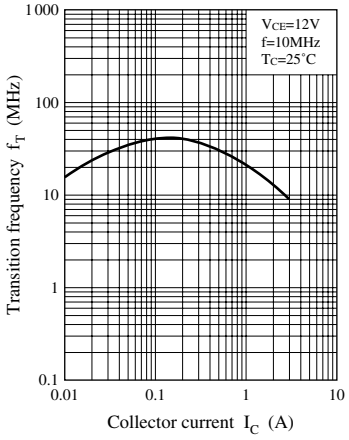
$V_{BE(sat)}$ — I_C



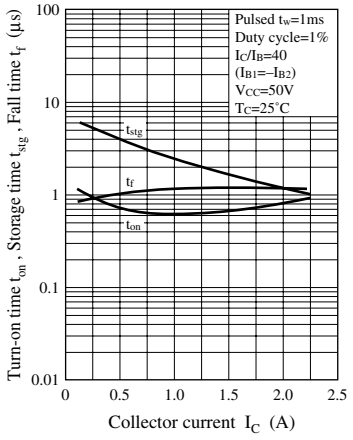
h_{FE} — I_C



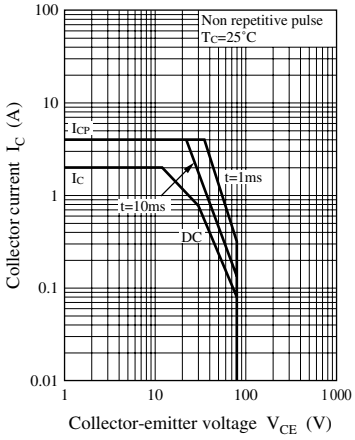
f_T — I_C

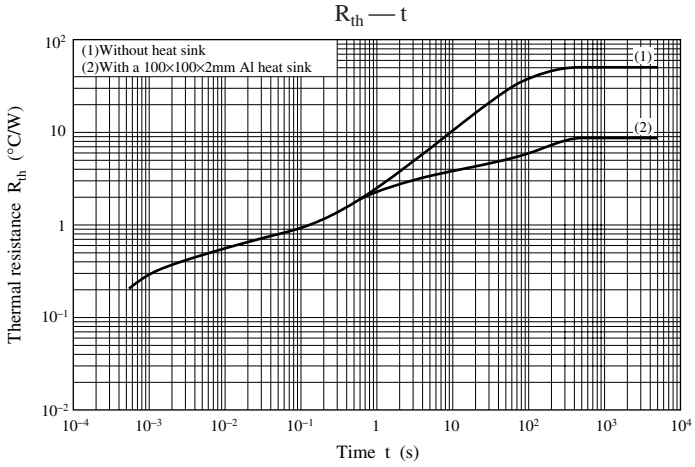


t_{on}, t_{stg}, t_f — I_C



Safe operation area




R_{th} — t
(1)Without heat sink
(2)With a 100×100×2mm Al heat sink
(1)
(2)
Thermal resistance R_{th} (°C/W)
10^2
10
1
10^{-1}
10^{-2}
10^{-4}
10^{-3}
10^{-2}
10^{-1}
1
10
10^2
10^3
10^4
Time t (s)

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