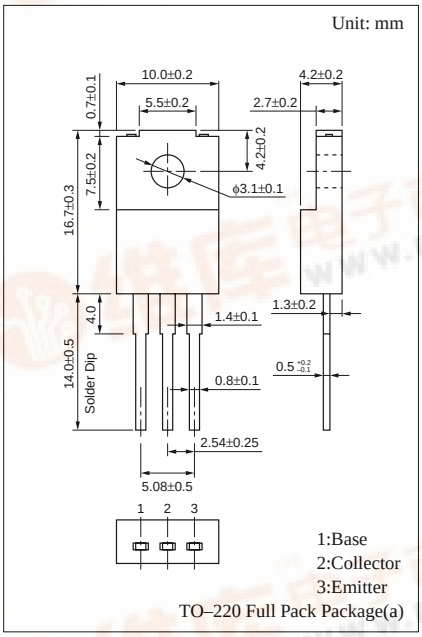
2SD1776, 2SD1776A

Silicon NPN triple diffusion planar type

For power amplification with high forward current transfer ratio

Features

- High foward current transfer ratio h_{FE}
- 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	2SD1776	V_{CBO}	80	V
	2SD1776A		100	
Collector to emitter voltage	2SD1776	V_{CEO}	60	V
	2SD1776A		80	
Emitter to base voltage		V_{EBO}	6	V
Peak collector current		I_{CP}	4	A
Collector current		I_C	2	A
Base current		I_B	0.5	A
Collector power dissipation	T_C=25°C	P_C	25	W
	Ta=25°C		2	
Junction temperature		T_j	150	˚C
Storage temperature		T_{stg}	–55 to +150	˚C

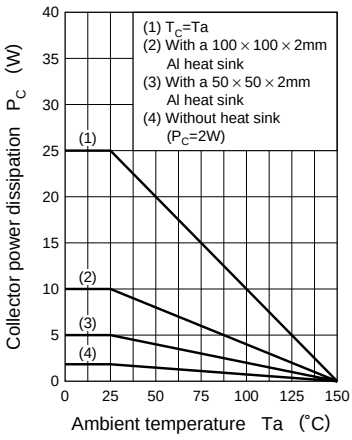
Electrical Characteristics (T_C=25˚C)

Parameter		Symbol	Conditions	min	typ	max	Unit
Collector cutoff current	2SD1776	I_{CBO}	V_{CB} = 80V, I_E = 0			100	μA
	2SD1776A		V_{CB} = 100V, I_E = 0			100	
Collector cutoff current		I_{CEO}	V_{CE} = 40V, I_B = 0			100	μA
Emitter cutoff current		I_{EBO}	V_{EB} = 6V, I_C = 0			100	μA
Collector to emitter voltage	2SD1776	V_{CEO}	I_C = 25mA, I_B = 0	60			V
	2SD1776A			80			
Forward current transfer ratio		h_{FE}*	V_{CE} = 4V, I_C = 300mA	500		1500	
Collector to emitter saturation voltage		$V_{CE(sat)}$	I_C = 1A, I_B = 25mA			1	V
Base to emitter saturation voltage		$V_{BE(sat)}$	I_C = 1A, I_B = 25mA			1.2	V
Transition frequency		f_T	V_{CE} = 12V, I_C = 200mA, f = 10MHz		40		MHz
Collector output capacitance		C_{ob}	V_{CB} = 10V, I_E = 0, f = 1MHz		30		pF
Turn-on time		t_{on}	I_C = 1A, I_{B1} = 25mA, I_{B2} = –25mA, V_{CC} = 50V		0.6		μs
Storage time		t_{stg}			2.5		μs
Fall time		t_f			1		μs

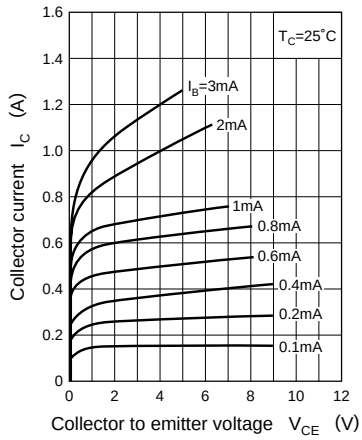
*h_{FE} Rank classification

Rank	Q	P
h_{FE}	500 to 1000	800 to 1500

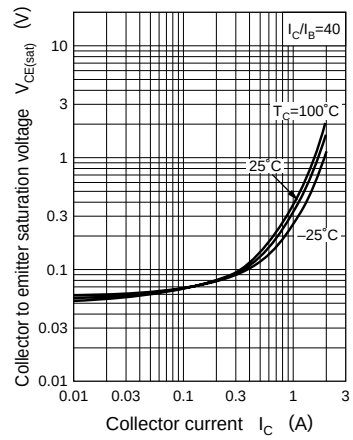
P_C — Ta



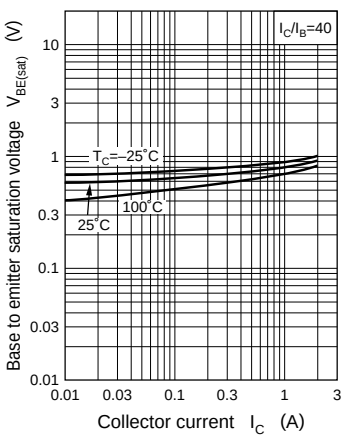
I_C — V_{CE}



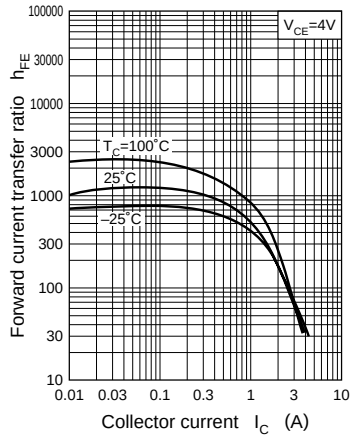
$V_{CE(sat)}$ — I_C



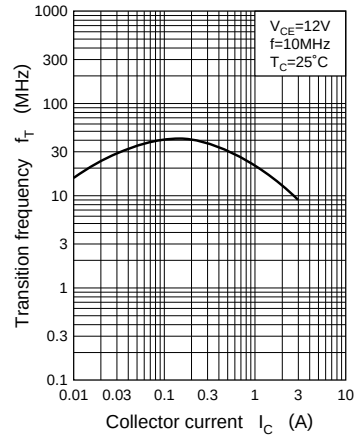
$V_{BE(sat)}$ — I_C



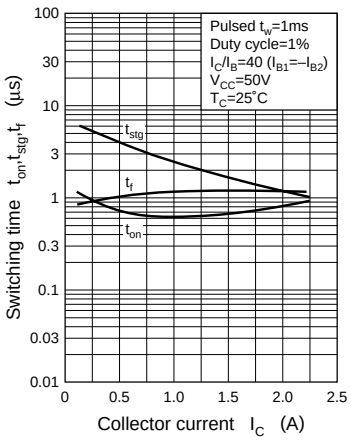
h_{FE} — I_C



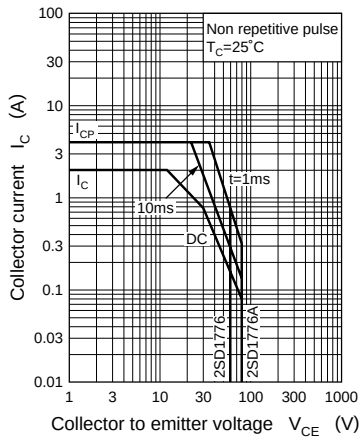
f_T — I_C



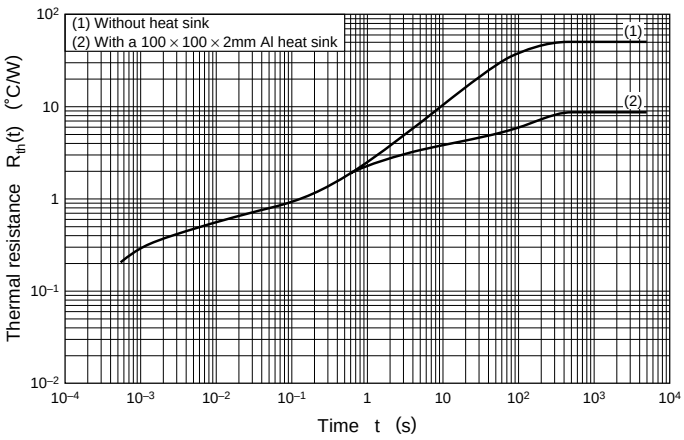
t_{on}, t_{stg}, t_f — I_C



Area of safe operation (ASO)



$R_{th(t)}$ — t


(1) Without heat sink
(2) With a 100 × 100 × 2mm Al heat sink
(1)
(2)
Thermal resistance $R_{th}(t)$ (°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)