2SD2158, 2SD2158A

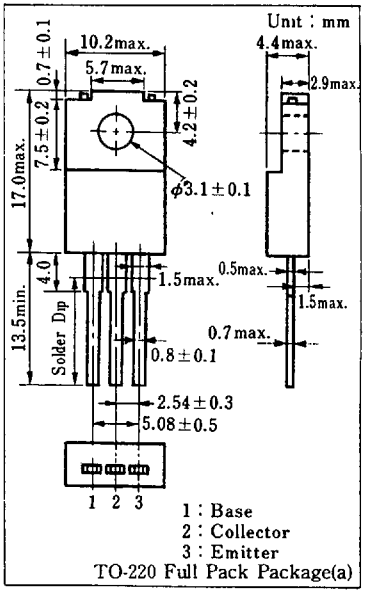
Silicon NPN Triple-Diffused Planar Type

High DC Current Gain (h_{FE}), Power Amplifier

■ Features

- High DC current gain (h_{FE})
- Good linearity of DC current gain (h_{FE})
- "Full Pack" package for simplified mounting on a heat sink with one screw

■ Package Dimensions



■ Absolute Maximum Ratings (Tc=25°C)

Item		Symbol	Value	Unit
Collector-base voltage	2SD2158	V_{CBO}	80	V
	2SD2158A		100	V
Collector-emitter voltage	2SD2158	V_{CEO}	60	V
	2SD2158A		80	V
Emitter-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	20	W
	Ta=25°C		2	
Junction temperature		T_j	150	°C
Storage temperature		T_{stg}	−55~+150	°C

■ Electrical Characteristics (Tc=25°C)

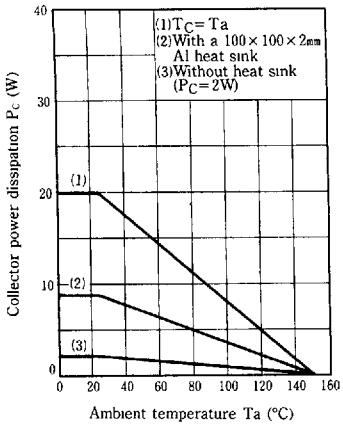
Item		Symbol	Condition	min.	typ.	max.	Unit
Collector cutoff current	2SD2158	I_{CBO}	V_{CB}=80V, I_E=0			100	μA
	2SD2158A		V_{CB}=100V, I_E=0			100	μA
Collector cutoff current		I_{CEO}	V_{CE}=40V, I_B=0			100	μA
Emitter cutoff current		I_{EBO}	V_{EB}=6V, I_C=0			100	μA
Collector-emitter voltage		V_{CEO}	I_C=25mA, I_B=0	85			V
Collector-emitter voltage	2SD2158	V_{CEO}	I_C=25mA, I_B=0	60			V
	2SD2158A			80			
DC current gain		h_{FE}*	V_{CE}=4V, I_C=300mA	500		2500	
Collector-emitter saturation voltage		$V_{CE\ (sat)}$	I_C=1A, I_B=25mA			1	V
Base-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
Collector current fall time		t_f			1		μs

*h_{FE} Classifications

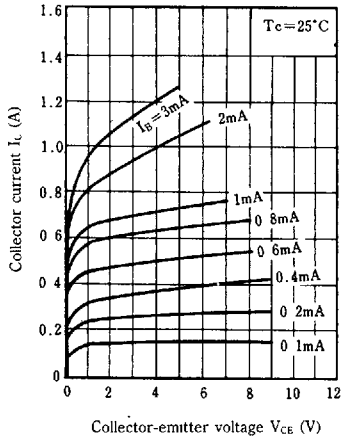
Class	Q	P	O
h_{FE}	500~1000	800~1500	1200~2500

Panasonic

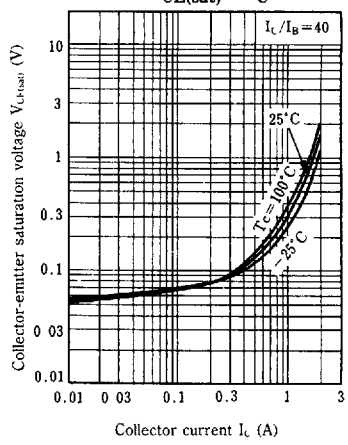
$P_C - Ta$



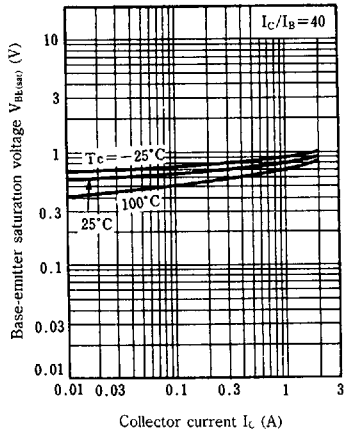
$I_C - V_{CE}$



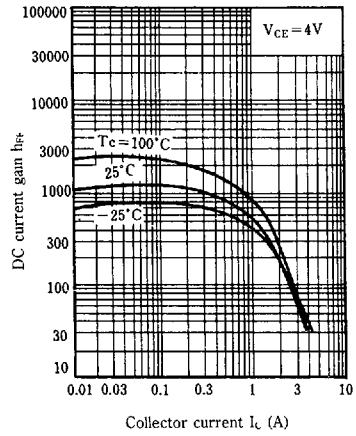
$V_{CE(sat)} - I_C$



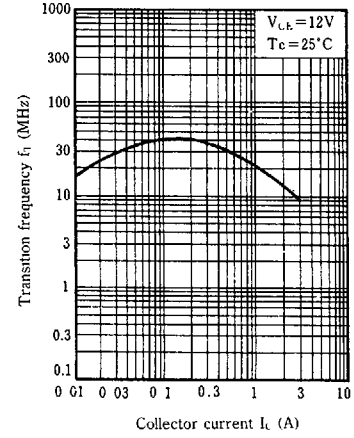
$V_{BE(sat)} - I_C$



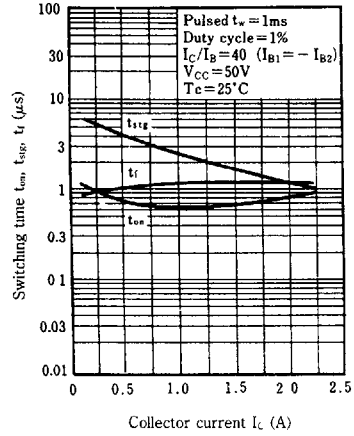
$h_{FE} - I_C$



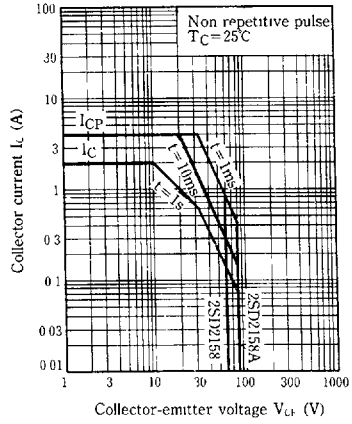
$f_T - I_C$

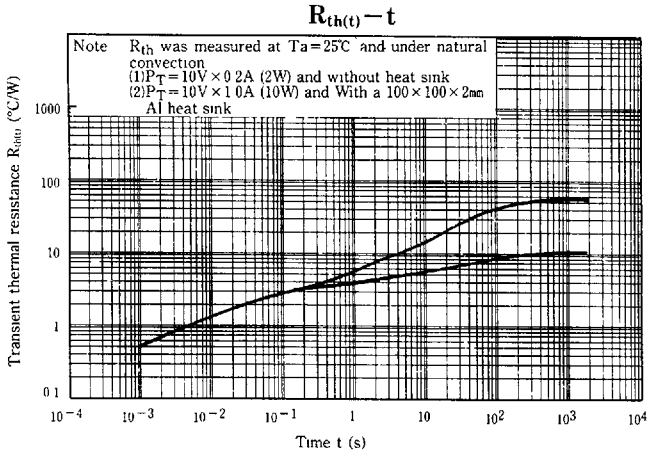


$t_{on}, t_{stg}, t_f - I_C$



Safety operation area-forward bias (ASO)




$R_{th(t)}-t$
Note R_{th} was measured at Ta=25℃ 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
Transient thermal resistance $R_{th(t)}$ (℃/W)
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)