Medium Power Transistor (32V, 2A)

2SD1766 / 2SD1758 / 2SD1862

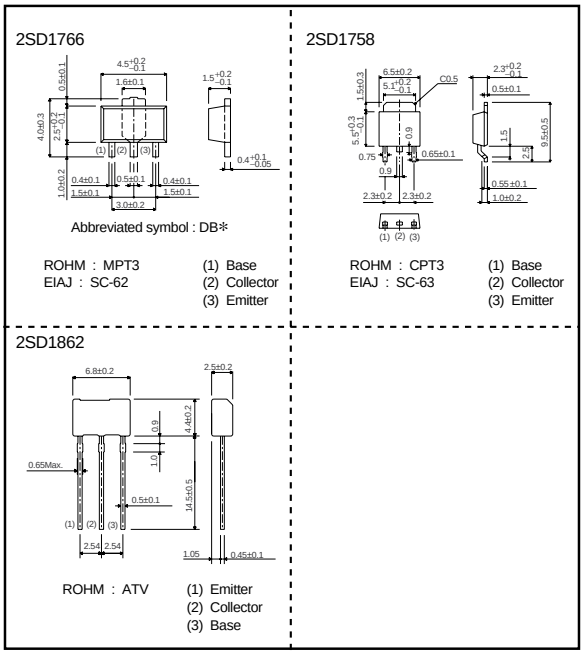
●Features

1) Low $V_{CE(sat)}$.
   $V_{CE(sat)}$ = 0.5V(Typ.)
   (I_C / I_B = 2A / 0.2A)
2) Complements the 2SB1188 / 2SB1182 / 2SB1240.

●Structure

Epitaxial planar type
NPN silicon transistor

●External dimensions (Unit : mm)



∗ Denotes h_{FE}

●Absolute maximum ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Collector-base voltage		V_{CBO}	40	V
Collector-emitter voltage		V_{CEO}	32	V
Emitter-base voltage		V_{EBO}	5	V
Collector current		I_C	2	A (DC)
		I_{CP}	2.5	A (Pulse) ∗1
Collector power dissipation	2SD1766	P_C	0.5	W
			2 ∗2	
	2SD1758		1	W
			10	W (Tc=25°C)
	2SD1862		1 ∗3	W
Junction temperature		Tj	150	°C
Storage temperature		Tstg	−55 to +150	°C

∗1 Single pulse, Pw=20ms
∗2 When mounted on a 40×40×0.7 mm ceramic board.
∗3 Printed circuit board: 1.7 mm thick, collector copper plating 1 cm² or lager.

●Electrical characteristics (Ta=25°C)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage		BV_{CBO}	40	–	–	V	I_C=50μA
Collector-emitter breakdown voltage		BV_{CEO}	32	–	–	V	I_C=1mA
Emitter-base breakdown voltage		BV_{EBO}	5	–	–	V	I_E=50μA
Collector cutoff current		I_{CBO}	–	–	1	μA	V_{CB}=20V
Emitter cutoff current		I_{EBO}	–	–	1	μA	V_{EB}=4V
DC current transfer ratio	2SD1766,2SD1758,	h_{FE}	82	–	390	–	V_{CE}=3V, I_C=0.5A ✻
	2SD1862		120	–	390		
Collector-emitter saturation voltage		$V_{CE(sat)}$	–	0.5	0.8	V	I_C/I_B=2A/0.2A ✻
Transition frequency		f_T	–	100	–	MHz	V_{CE}=5V, I_E= –500mA, f=100MHz ✻
Output capacitance		Cob	–	30	–	pF	V_{CB}=10V, I_E=0A, f=1MHz

✻ Measured using pulse current.

●Packaging specifications and h_{FE}

Type	h_{FE}	Package	Taping		
		Code	T100	TL	TV2
		Basic ordering unit (pieces)	1000	2500	2500
2SD1766	PQR		○	–	–
2SD1758	PQR		–	○	–
2SD1862	QR		–	–	○

h_{FE} values are classified as follows :

Item	P	Q	R
h_{FE}	82 to 180	120 to 270	180 to 390

●Electrical characteristic curves

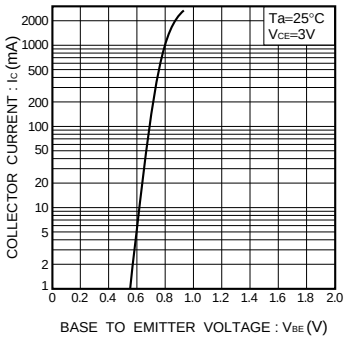


Fig.1 Grounded emitter propagation characteristics

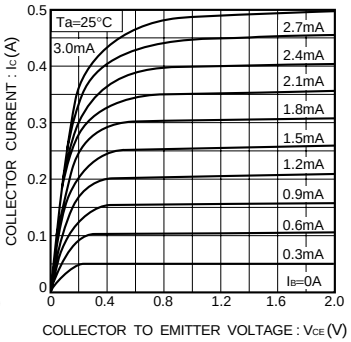


Fig.2 Grounded emitter output characteristics

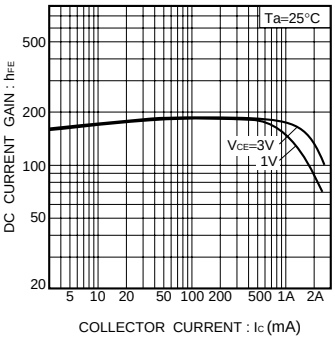


Fig.3 DC current gain vs. collector current

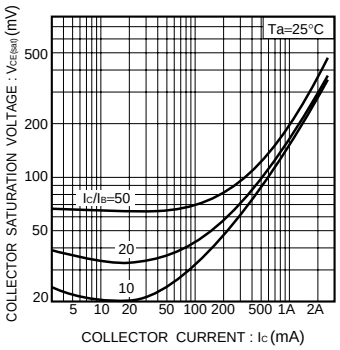


Fig.4 Collector-emitter saturation voltage vs. collector current

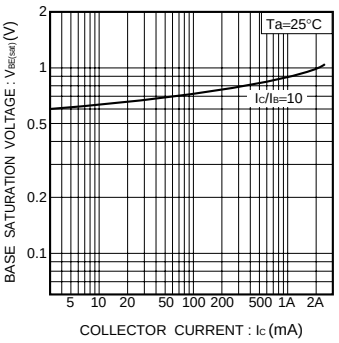


Fig.5 Collector-emitter saturation voltage vs. collector current

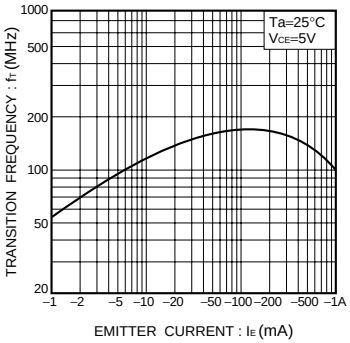


Fig.6 Transition frequency vs. emitter current

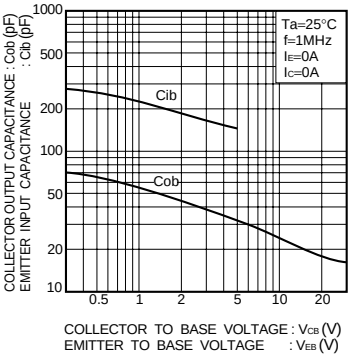


Fig.7 Collector output capacitance vs. collector-base voltage
Emitter input capacitance vs. emitter-base voltage

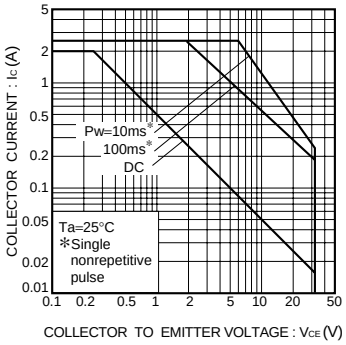


Fig.8 Safe operating area (2SD1766)

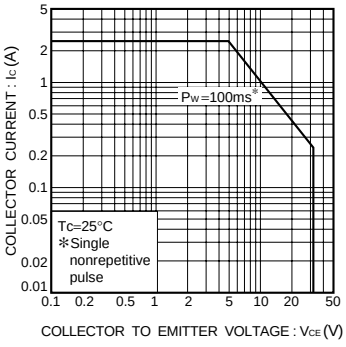


Fig.9 Safe operating area (2SD1758)

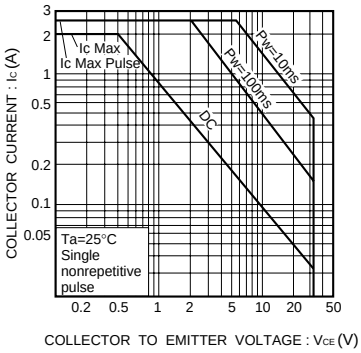


Fig.10 Safe operating area (2SD1862)

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