

# Medium power transistor (32V, 2A)

## 2SD1766 / 2SD1758 / 2SD1862

### ●Features

1) Low  $V_{CE(sat)}$ .

$$V_{CE(sat)} = 0.5V \text{ (Typ.)}$$

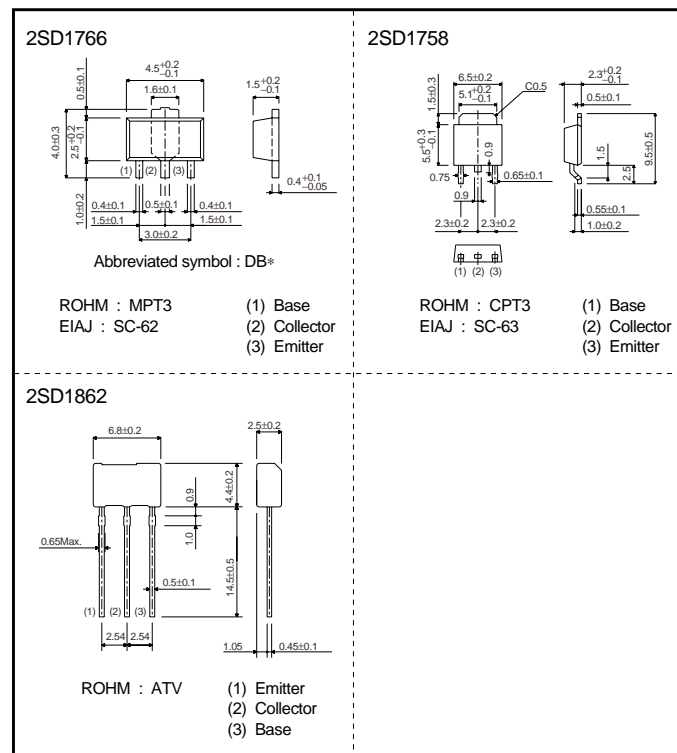
$$(I_C/I_B = 2A / 0.2A)$$

2) Complements the 2SB1188 /  
2SB1182 / 2SB1240

### ●Structure

Epitaxial planar type  
NPN silicon transistor

### ●External dimensions (Units : mm)



\* Denotes hFE

### ●Absolute maximum ratings ( $T_a=25^\circ\text{C}$ )

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)
		2.5	A (Pulse) *1
Collector power dissipation	$P_C$	0.5	W *2
		2	W ( $T_C=25^\circ\text{C}$ )
		1	W *3
Junction temperature	$T_J$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55~+150	$^\circ\text{C}$

\*1 Single pulse,  $P_w=20\text{ms}$

\*2 When mounted on a 40×40×0.7 mm ceramic board.

\*3 Printed circuit board: 1.7 mm thick, collector copper plating 1 cm<sup>2</sup> or larger.

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●Electrical characteristics (Ta=25°C)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage		BV <sub>CB0</sub>	40	-	-	V	I <sub>c</sub> =50μA
Collector-emitter breakdown voltage		BV <sub>CEO</sub>	32	-	-	V	I <sub>c</sub> =1mA
Emitter-base breakdown voltage		BV <sub>EB0</sub>	5	-	-	V	I <sub>E</sub> =50μA
Collector cutoff current		I <sub>cBO</sub>	-	-	1	μA	V <sub>CB</sub> =20V
Emitter cutoff current		I <sub>EBO</sub>	-	-	1	μA	V <sub>EB</sub> =4V
DC current transfer ratio	2SD1766,2SD1758	h <sub>FE</sub>	82	-	390	-	V <sub>CE</sub> =3V, I <sub>c</sub> =0.5A
	2SD1862		120	-	390		
Collector-emitter saturation voltage		V <sub>CE(sat)</sub>	-	0.5	0.8	V	I <sub>c</sub> /I <sub>B</sub> =2A/0.2A
Transition frequency		f <sub>T</sub>	-	100	-	MHz	V <sub>CE</sub> =5V, I <sub>E</sub> =-50mA, f=100MHz
Output capacitance		C <sub>ob</sub>	-	30	-	pF	V <sub>CB</sub> =10V, I <sub>E</sub> =0A, f=1MHz

\* Measured using pulse current.

●Packaging specifications and h<sub>FE</sub>

Type	h <sub>FE</sub>	Package	Taping		
		Code	T100	TL	TV2
		Basic ordering unit (pieces)	1000	2500	2500
2SD1766	PQR	○	-	-	-
2SD1758	PQR	-	○	-	-
2SD1862	QR	-	-	○	-

h<sub>FE</sub> values are classified as follows :

Item	P	Q	R
h <sub>FE</sub>	82~180	120~270	180~390

●Electrical characteristic curves

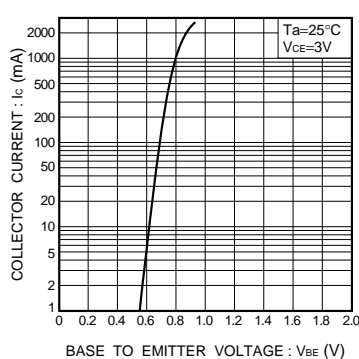


Fig.1 Grounded emitter propagation characteristics

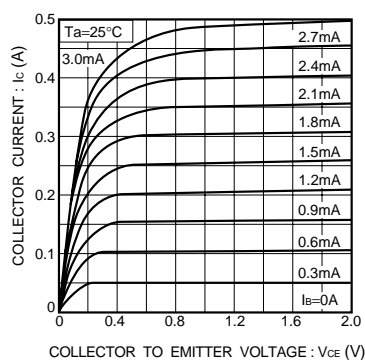


Fig.2 Grounded emitter output characteristics

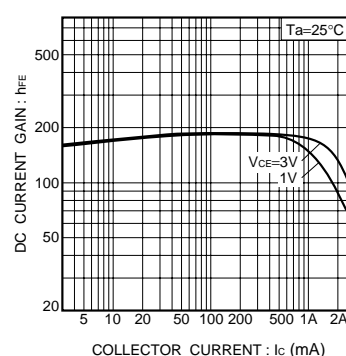


Fig.3 DC current gain vs. collector current

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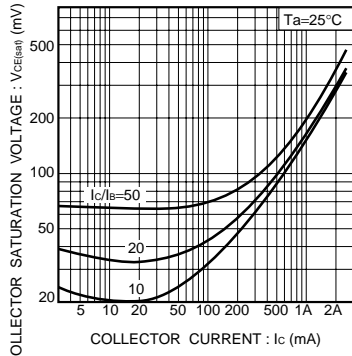


Fig.4 Collector-emitter saturation voltage vs. collector current

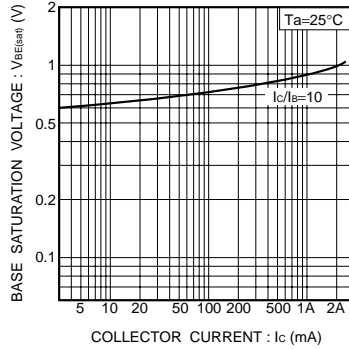


Fig.5 Collector-emitter saturation voltage vs. collector current

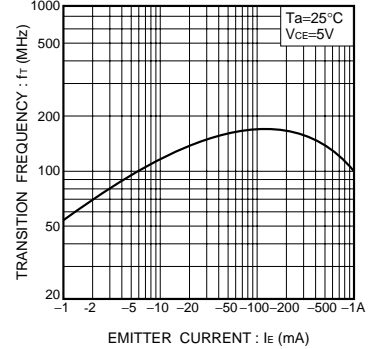


Fig.6 Transition frequency vs. emitter current

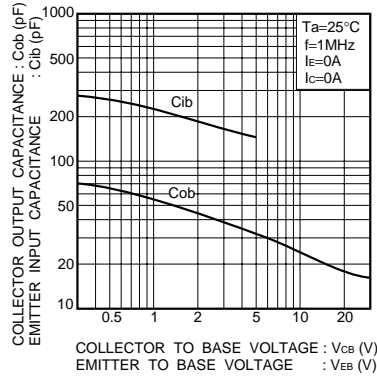


Fig.7 Collector output capacitance vs. collector-base voltage  
Emitter input capacitance vs. emitter-base voltage

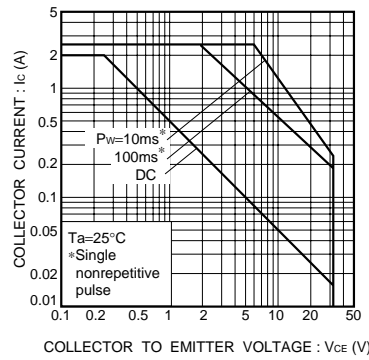


Fig.8 Safe operating area (2SD1766)

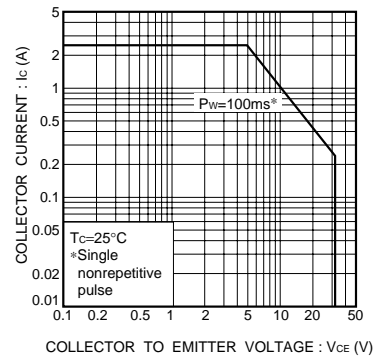


Fig.9 Safe operating area (2SD1758)

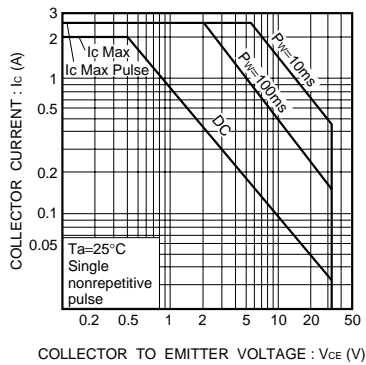


Fig.10 Safe operating area (2SD1862)