

# Medium Power Transistor (32V, 2A)

## 2SD1766 / 2SD1758 / 2SD1862 / 2SD1055 / 2SD1919 / 2SD1227M

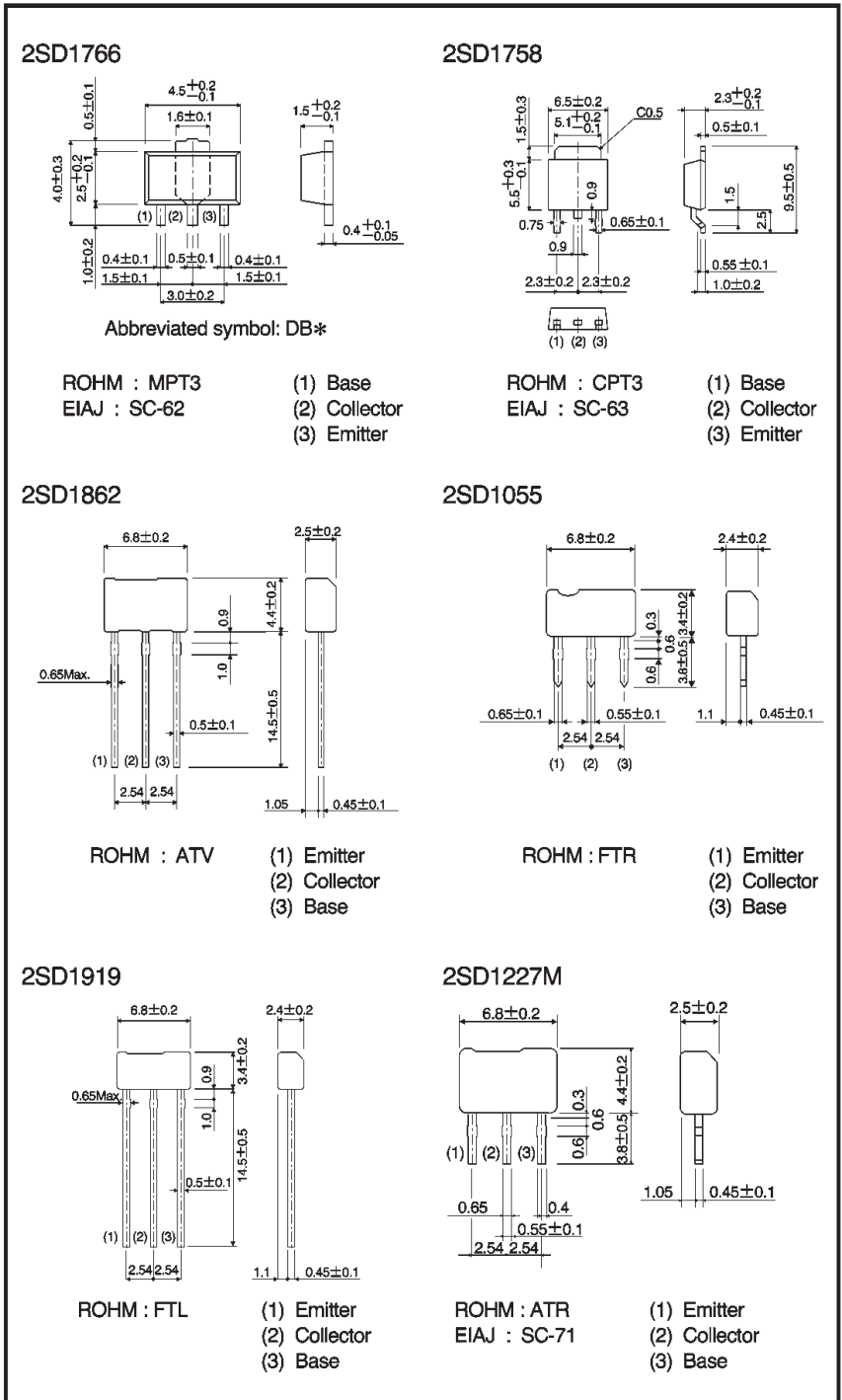
● Features

- 1) Low  $V_{CE(sat)}$ .  
 $V_{CE(sat)} = 0.5V$  (Typ.)  
 $(I_c / I_B = 2A / 0.2A)$
- 2) Complements the  
 2SB1188 / 2SB1182 / 2SB1240 /  
 2SB891F / 2SB822 / 2SB1277 /  
 2SB911M

● Structure

Epitaxial planar type  
 NPN silicon transistor

● External dimensions (Units: mm)



\* Denotes  $h_{FE}$

(96-217-B24)

● Absolute maximum ratings (Ta = 25°C)

Parameter		Symbol	Limits	Unit
Collector-base voltage		V <sub>CB0</sub>	40	V
Collector-emitter voltage		V <sub>CEO</sub>	32	V
Emitter-base voltage		V <sub>EB0</sub>	5	V
Collector current		I <sub>c</sub>	2	A (DC)
			2.5	A (Pulse) *1
Collector power dissipation	2SD1766	P <sub>c</sub>	0.5	W *2
	2SD1758		2	
	2SD1862, 2SD1227M		10	W (T <sub>c</sub> =25°C)
	2SD1055, 2SD1919		1	W *3
Junction temperature		T <sub>j</sub>	150	°C
Storage temperature		T <sub>stg</sub>	-55~+150	°C

\*1 Single pulse, P<sub>w</sub>=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 cm<sup>2</sup> or larger.

● 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> =50 μA
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> =50 μA
Collector cutoff current		I <sub>CB0</sub>	—	—	1	μA	V <sub>CB</sub> =20V
Emitter cutoff current		I <sub>EB0</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		
	2SD1055		180	—	390		
	2SD1919, 2SD1227M		120	—	270		
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  $h_{FE}$

Type	$h_{FE}$	Package	Taping			Bulk	
		Code	T100	TL	TV2	—	TL2
		Basic ordering unit (pieces)	1000	2500	2500	2000	2500
2SD1766	PQR	○	—	—	—	—	
2SD1758	PQR	—	○	—	—	—	
2SD1862	QR	—	—	○	—	—	
2SD1055	R	—	—	—	○	—	
2SD1919	Q	—	—	—	—	○	
2SD1227M	Q	—	—	—	○	—	

$h_{FE}$  values are classified as follows :

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

●Electrical characteristic curves

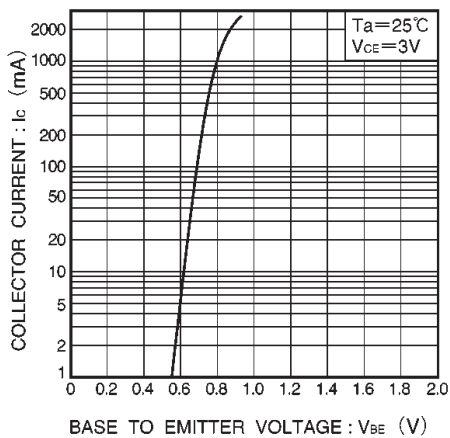


Fig.1 Grounded emitter propagation characteristics

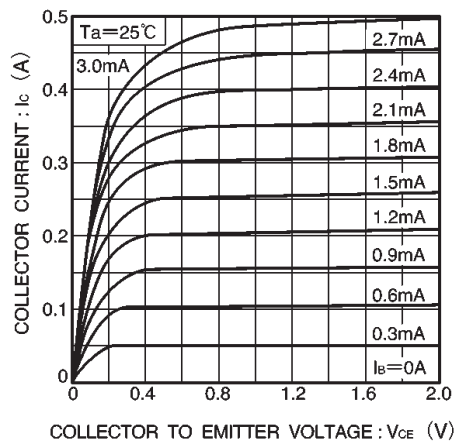


Fig.2 Grounded emitter output characteristics

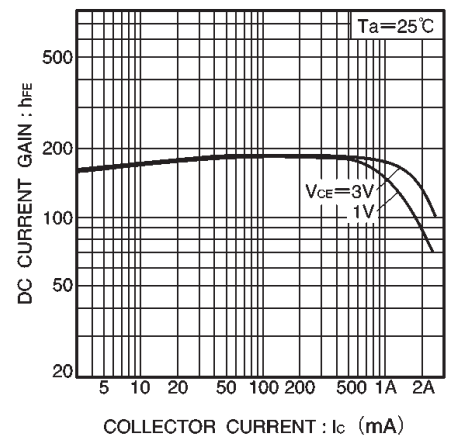


Fig.3 DC current gain vs. collector current

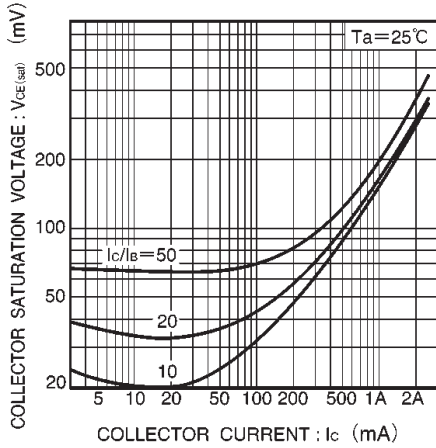


Fig.4 Collector-emitter saturation voltage vs. collector current

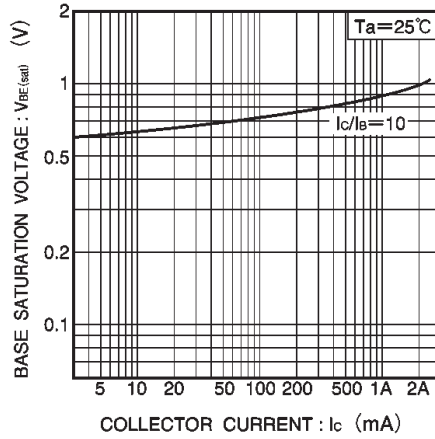


Fig.5 Collector-emitter saturation voltage vs. collector current

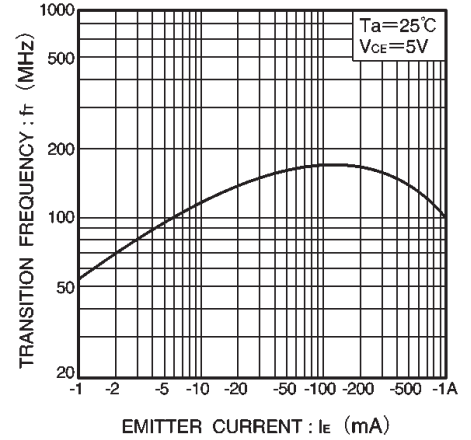


Fig.6 Transition frequency vs. emitter current

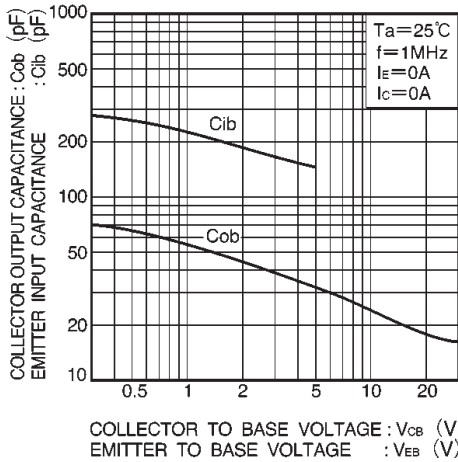


Fig.7 Collector output capacitance vs. collector-base voltage  
Emitter input capacitance vs. emitter-base voltage

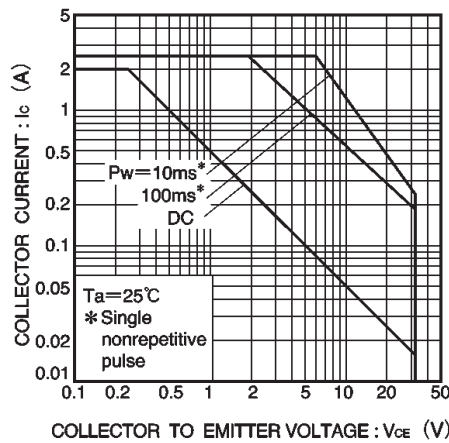


Fig.8 Safe operating area (2SD1766)

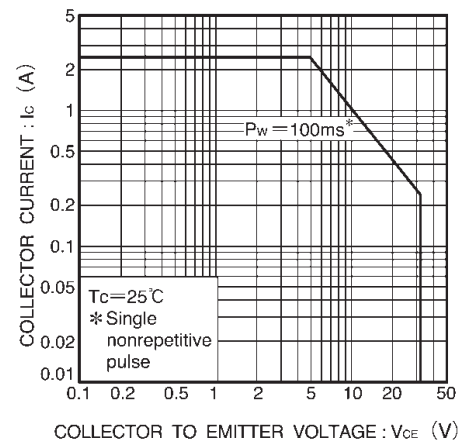


Fig.9 Safe operating area (2SD1758)

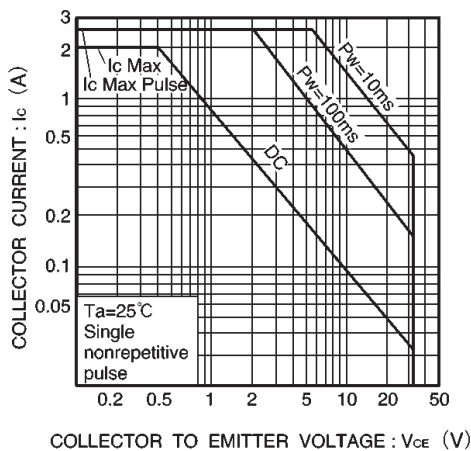


Fig.10 Safe operating area (2SD1862, 2SD1227M)

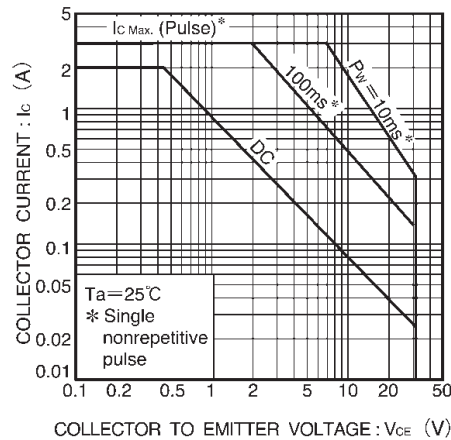


Fig.11 Safe operating area (2SD1055, 2SD1919)