

# Medium Power Transistor (32V, 1A)

## 2SD1664 / 2SD1858

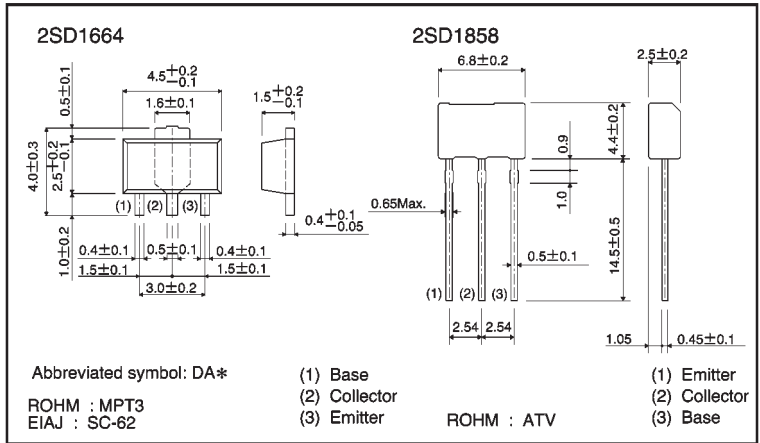
●Features

- 1) Low  $V_{CE(sat)}$ ,  $V_{CE(sat)} = 0.15V$  (typical).  
( $I_c/I_b = 500mA/50mA$ )
- 2) Complements the  
2SB1132 / 2SB1237.

●Structure

Epitaxial planar type  
NPN silicon transistor

●External dimensions (Units: mm)



\* Denotes hFE

●Absolute maximum ratings ( $T_a = 25^\circ C$ )

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	$I_c$	1	A (DC)
		2	A (Pulse) *1
Collector power dissipation	2SD1664	0.5	W *2
		2	
	2SD1858	1	*3
Junction temperature	$T_j$	150	$^\circ C$
Storage temperature	$T_{stg}$	-55~+150	$^\circ C$

\*1  $P_w=20ms$ ,  $duty=1/2$

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

\*3 When it is mounted on the copper clad PCB (1.7mm thick) with land size for collector 1 square CM or larger.

●Electrical characteristics (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV <sub>CBO</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>EBO</sub>	5	—	—	V	I <sub>E</sub> =50 μA
Collector cutoff current	I <sub>cBO</sub>	—	—	0.5	μA	V <sub>CB</sub> =20V
Emitter cutoff current	I <sub>EBO</sub>	—	—	0.5	μA	V <sub>EB</sub> =4V
DC current transfer ratio	h <sub>FE</sub>	82	—	390	—	V <sub>CE</sub> =3V, I <sub>c</sub> =100mA
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	—	0.15	0.4	V	I <sub>c</sub> /I <sub>B</sub> =500mA/50mA
Transition frequency	f <sub>r</sub>	—	150	—	MHz	V <sub>CE</sub> =5V, I <sub>E</sub> =-50mA, f=100MHz
Output capacitance	C <sub>ob</sub>	—	15	—	pF	V <sub>CB</sub> =10V, I <sub>E</sub> =0A, f=1MHz

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

Type	h <sub>FE</sub>	Package	Taping	
		Code	T100	TV2
		Basic ordering unit (pieces)	1000	2500
2SD1664	PQR	○	—	—
2SD1858	PQR	—	○	—

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

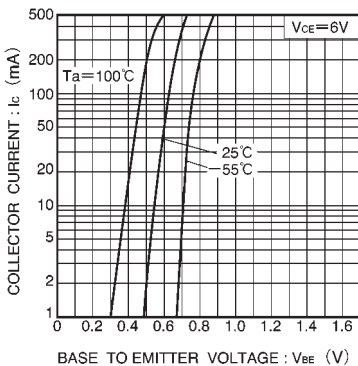


Fig.1 Grounded emitter propagation characteristics

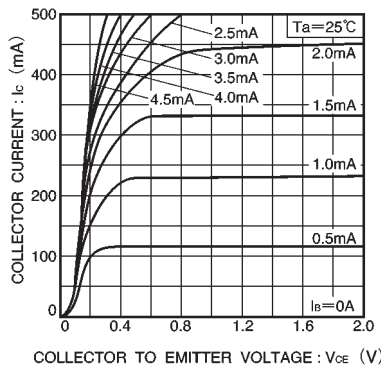


Fig.2 Grounded emitter output characteristics

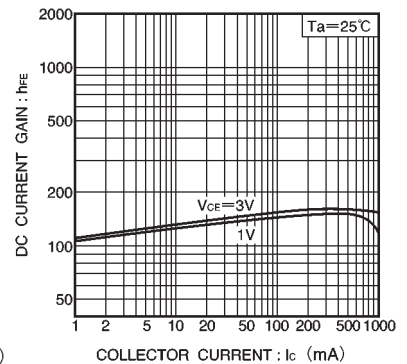


Fig.3 DC current gain vs. collector current ( I )

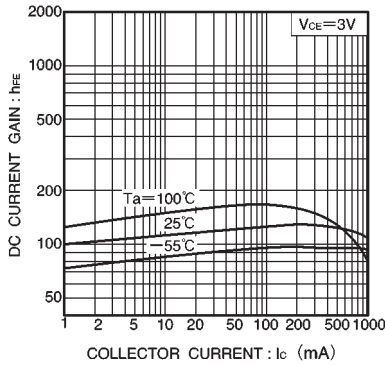


Fig.4 DC current gain vs. collector current ( II )

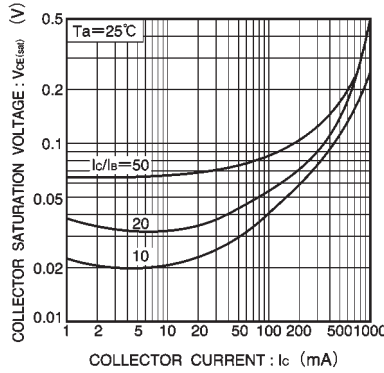


Fig.5 Collector-emitter saturation voltage vs. collector current ( I )

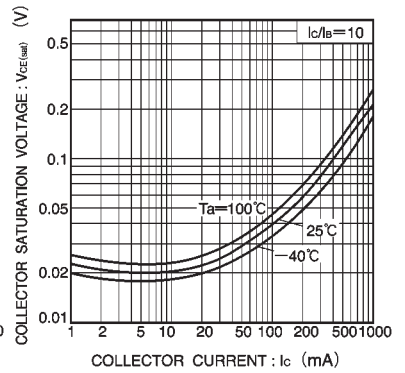


Fig.6 Collector-emitter saturation voltage vs. collector current ( II )

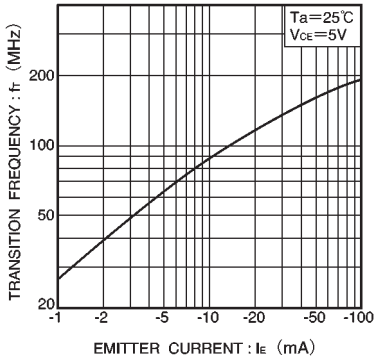


Fig.7 Gain bandwidth product vs. emitter current

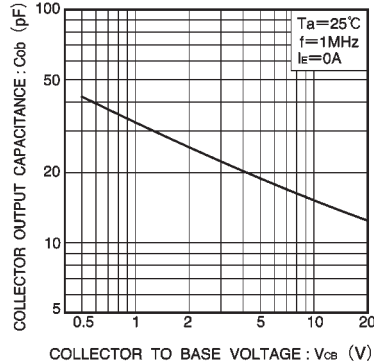


Fig.8 Collector output capacitance vs. collector-base voltage

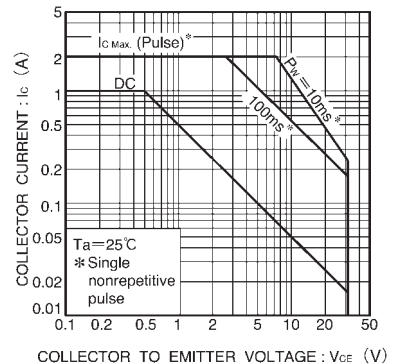


Fig.9 Safe operating area (2SD1664)

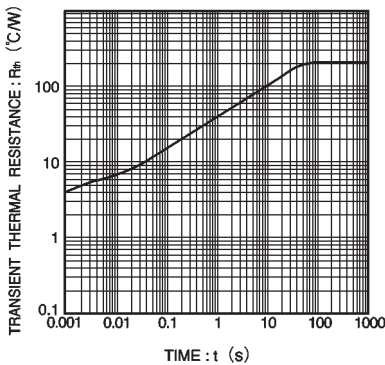


Fig.10 Transient thermal resistance (2SD1664)

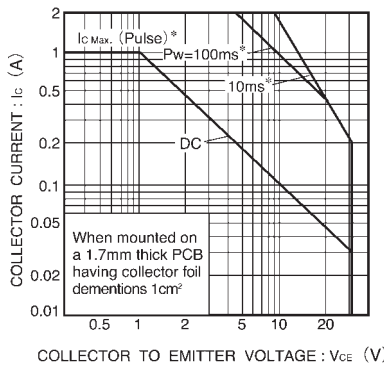


Fig.11 Safe operating area (2SD1858)

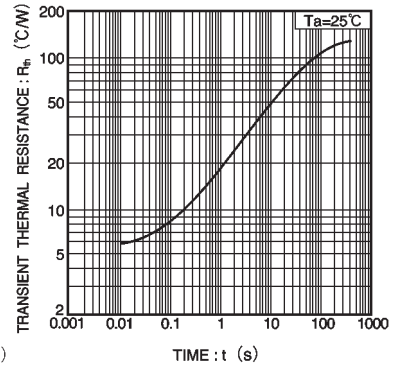


Fig.12 Transient thermal resistance (2SD1858)