

# Power Transistor (50V, 3A)

## 2SD1760 / 2SD1864 / 2SD1762

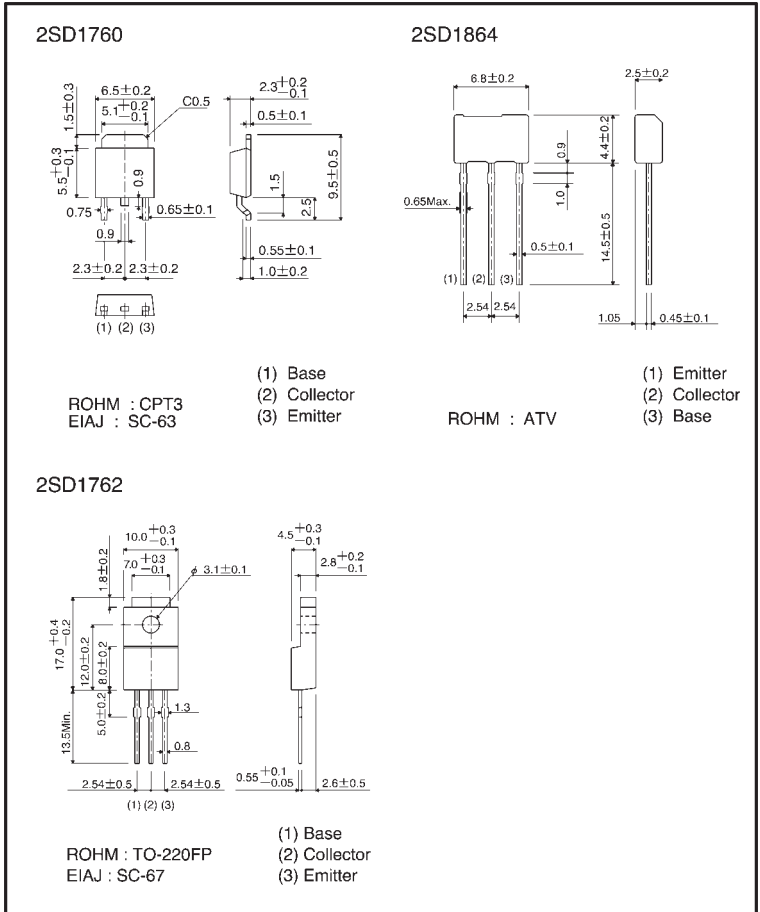
●Features

- 1) Low  $V_{CE(sat)}$ ,  
 $V_{CE(sat)} = 0.5V$  (Typ.)  
 $(I_c/I_B = 2A/0.2A)$
- 2) Complements the  
 2SB1184 / 2SB1243 / 2SB1185.

●Structure

Epitaxial planar type  
 NPN silicon transistor

●External dimensions (Units: mm)



● Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Collector-base voltage	V <sub>CB0</sub>	60	V
Collector-emitter voltage	V <sub>CE0</sub>	50	V
Emitter-base voltage	V <sub>EBO</sub>	5	V
Collector current	I <sub>c</sub>	3	A (DC)
		4.5	A (Pulse) *1
Collector power dissipation	2SD1760	P <sub>c</sub>	15
	2SD1864		1
	2SD1762		25
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55~+150	°C

\*1 Single pulse, P<sub>w</sub>=10ms

\*2 Printed circuit board, 1.7mm thick, collector copper plating 100mm<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>	60	—	—	V	I <sub>c</sub> =50 μA
Collector-emitter breakdown voltage	BV <sub>CE0</sub>	50	—	—	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>	—	—	1	μA	V <sub>CB</sub> =40V
Emitter cutoff current	I <sub>EBO</sub>	—	—	1	μA	V <sub>EB</sub> =4V
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	—	0.5	1	V	I <sub>c</sub> /I <sub>B</sub> =2A/0.2A *
DC current transfer ratio	2SD1760, 2SD1864	h <sub>FE</sub>	82	—	390	V <sub>CE</sub> =3V, I <sub>c</sub> =0.5A *
	2SD1762	60	—	320		
Transition frequency	f <sub>T</sub>	—	90	—	MHz	V <sub>CE</sub> =5V, I <sub>E</sub> =-500mA, f=30MHz *
Output capacitance	C <sub>ob</sub>	—	40	—	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		Bulk
		Code	TL	TV2	—
		Basic ordering unit (pieces)	2500	2500	200
2SD1760	PQR	○	—	—	—
2SD1864	PQR	—	○	—	—
2SD1762	DEF	—	—	○	—

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

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

Item	D	E	F
h <sub>FE</sub>	60~120	100~200	160~320

●Electrical characteristic curves

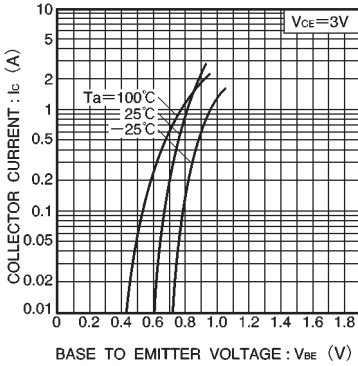


Fig.1 Grounded emitter propagation characteristics

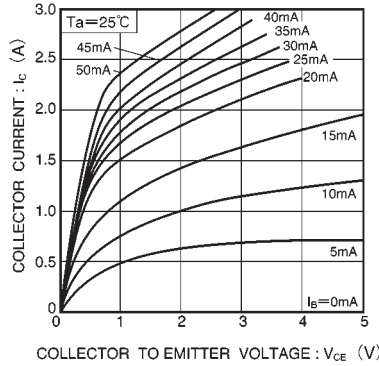


Fig.2 Grounded emitter output characteristics ( I )

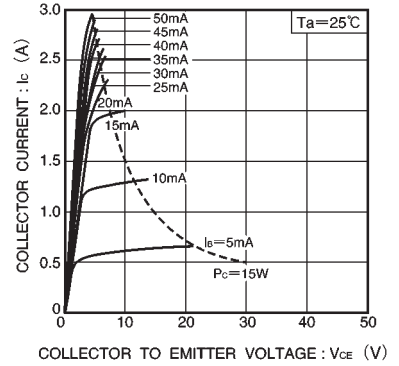


Fig.3 Grounded-emitter output characteristics ( II )

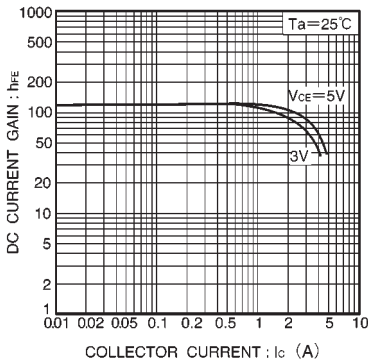


Fig.4 DC current gain vs. collector current ( I )

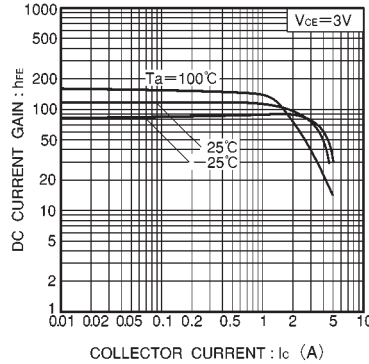


Fig.5 DC current gain vs. collector current ( II )

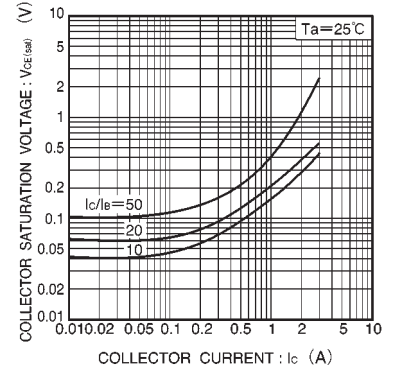


Fig.6 Collector-emitter saturation voltage vs. collector current

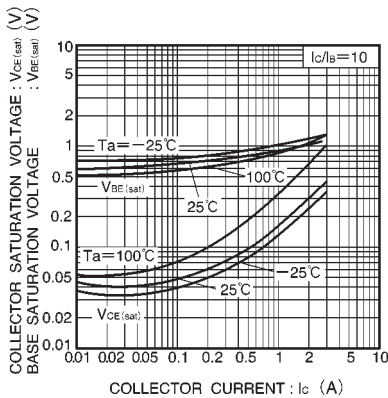


Fig.7 Collector-emitter saturation voltage vs. collector current  
Base-emitter saturation voltage vs. collector current

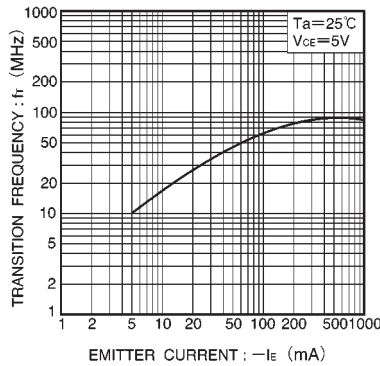


Fig.8 Gain bandwidth product vs. emitter current

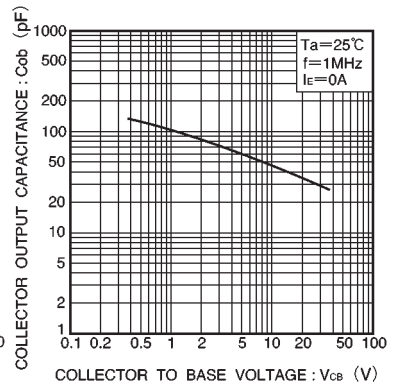


Fig.9 Collector output capacitance vs. collector-base voltage

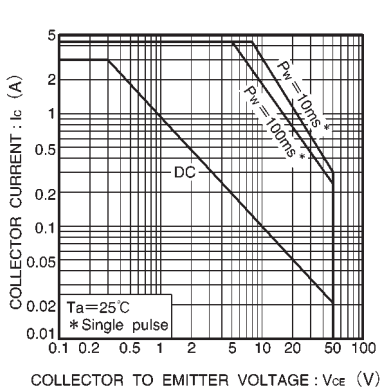


Fig.10 Safe operating area (2SD1760)

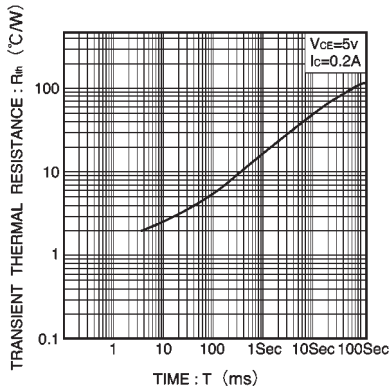


Fig.11 Transient thermal resistance (2SD1760)

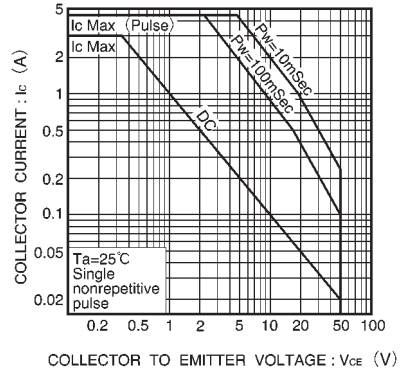


Fig.12 Safe operating area (2SD1864)

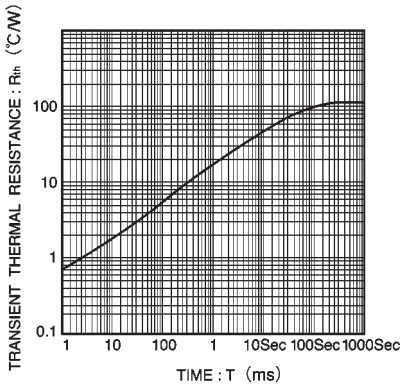


Fig.13 Transient thermal resistance (2SD1864)

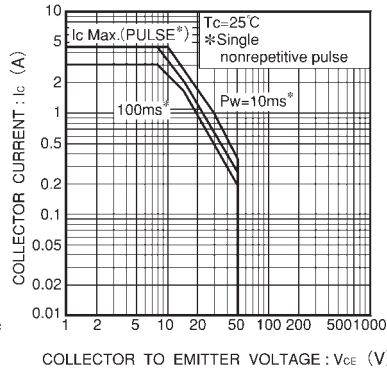


Fig.14 Safe operating area (2SD1762)

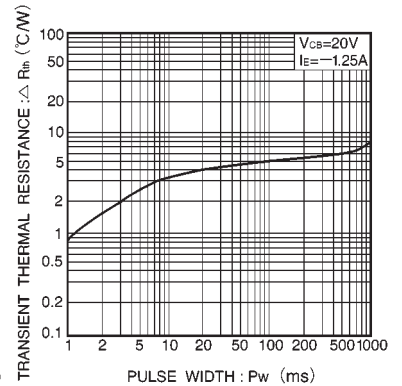


Fig.15 Transient thermal resistance (2SD1762)