

# Power Transistor (50V, 3A)

## 2SD1760 / 2SD1864

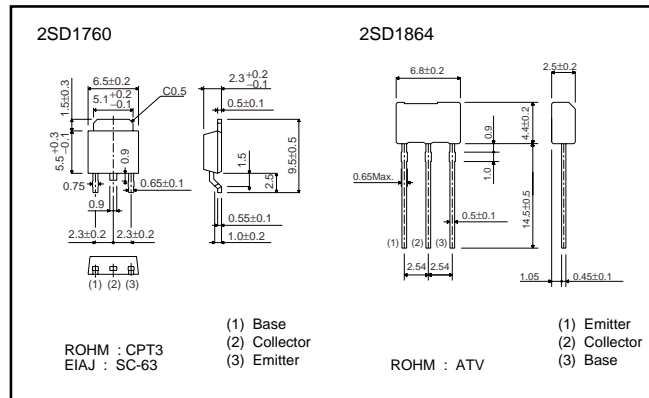
### ●Features

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

### ●Structure

Epitaxial planar type  
 NPN silicon transistor

### ●External dimensions (Units : mm)



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

Parameter	Symbol	Limits	Unit
Collector-base voltage	$V_{CBO}$	60	V
Collector-emitter voltage	$V_{CEO}$	50	V
Emitter-base voltage	$V_{EBO}$	5	V
Collector current	$I_c$	3	A (DC)
		4.5	A (Pulse) <sup>*1</sup>
Collector power dissipation	2SD1760	15	W ( $T_c=25^\circ\text{C}$ ) <sup>*2</sup>
	2SD1864	1	W
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55~+150	$^\circ\text{C}$

<sup>\*1</sup> Single pulse,  $P_w=100\text{ms}$

<sup>\*2</sup> Printed circuit board, 1.7mm thick, collector copper plating 100mm<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>	60	-	-	V	I <sub>c</sub> =50μA
Collector-emitter breakdown voltage	BV <sub>CE0</sub>	50	-	-	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>CB0</sub>	-	-	1	μA	V <sub>CB</sub> =40V
Emitter cutoff current	I <sub>EB0</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	h <sub>FE</sub>	82	-	390	-	V <sub>CE</sub> =3V, I <sub>c</sub> =0.5A
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	
		Code	TL	TV2
		Basic ordering unit (pieces)	2500	2500
2SD1760	PQR		○	-
2SD1864	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

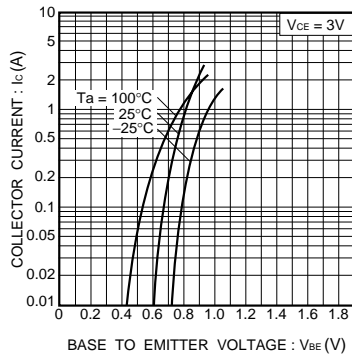


Fig.1 Grounded emitter propagation characteristics

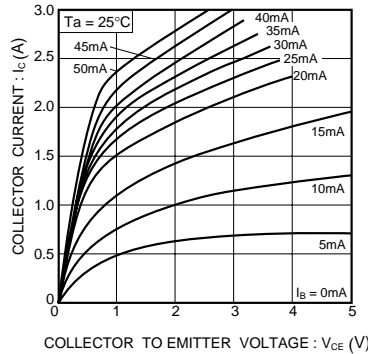


Fig.2 Grounded emitter output characteristics ( I )

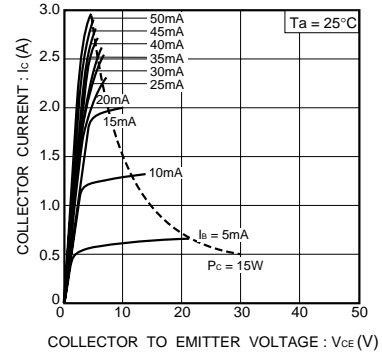


Fig.3 Grounded-emitter output characteristics( II )

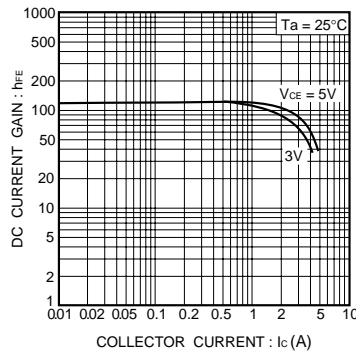


Fig.4 DC current gain vs. collector current( I )

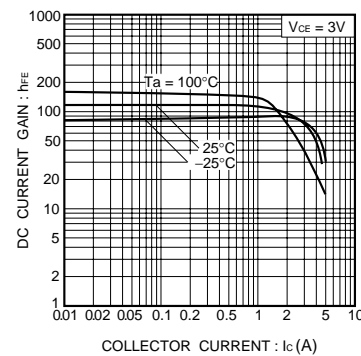


Fig.5 DC current gain vs. collector current( II )

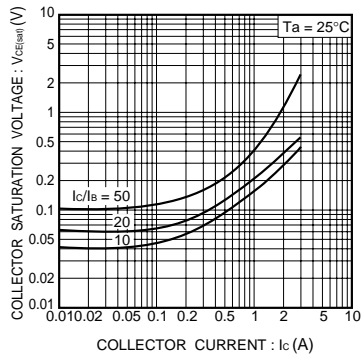


Fig.6 Collector-emitter saturation voltage vs. collector current

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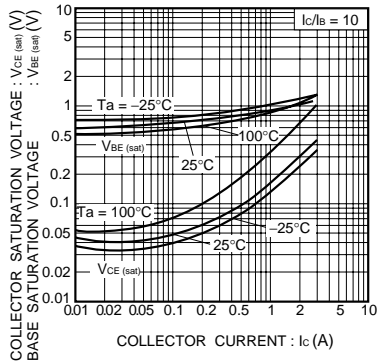


Fig.7 Collector-emitter saturation voltage vs. collector current  
Base-emitter saturation voltage vs. collector current

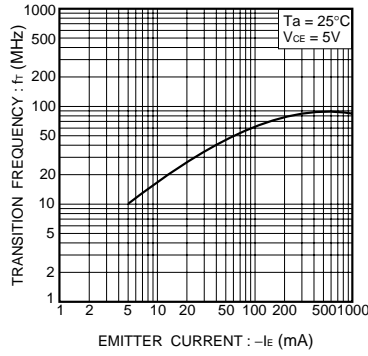


Fig.8 Gain bandwidth product vs. emitter current

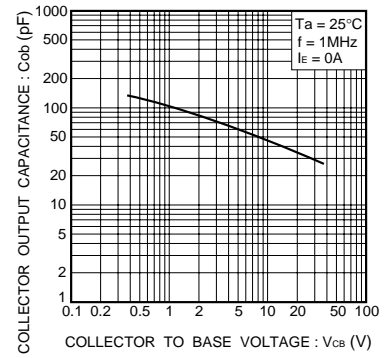


Fig.9 Collector output capacitance vs. collector-base voltage

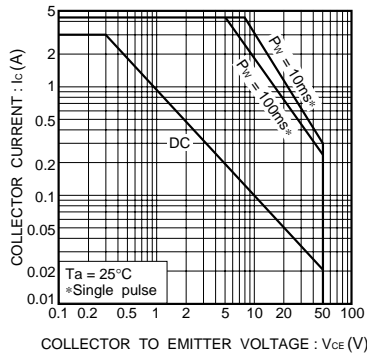


Fig.10 Safe operating area (2SD1760)

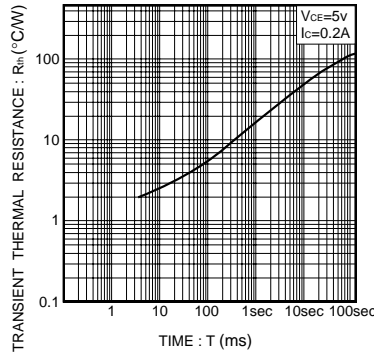


Fig.11 Transient thermal resistance (2SD1760)

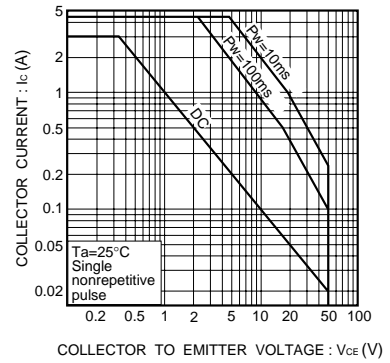


Fig.12 Safe operating area (2SD1864)

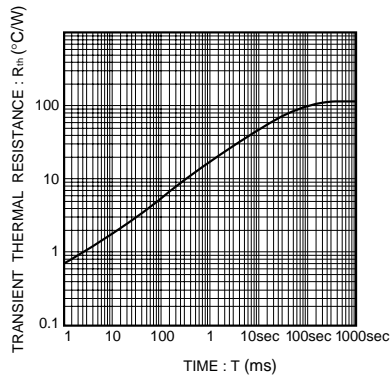


Fig.13 Transient thermal resistance (2SD1864)