

# Power Transistor (50V, 3A)

2SD1760 / 2SD1864

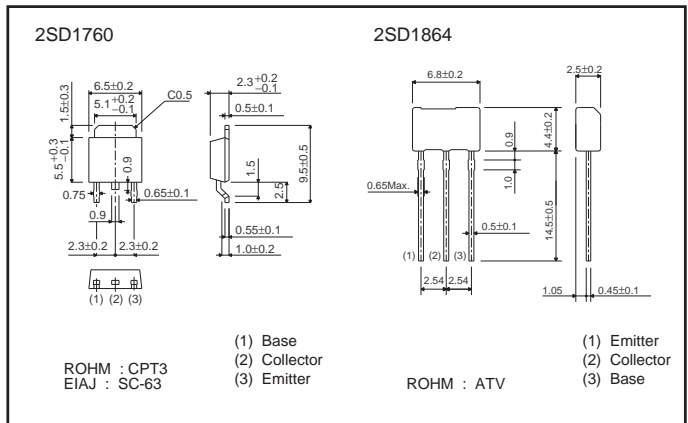
## ●Features

- 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

## ●Dimensions (Unit : mm)



## ●Absolute maximum ratings (Ta=25°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) *1
Collector power dissipation	2SD1760	15	W (Tc=25°C)*2
	2SD1864	1	W
Junction temperature	$T_j$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C

\*1 Single pulse,  $P_w=100ms$

\*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	$BV_{CBO}$	60	-	-	V	$I_C=50\mu A$
Collector-emitter breakdown voltage	$BV_{CEO}$	50	-	-	V	$I_C=1mA$
Emitter-base breakdown voltage	$BV_{EBO}$	5	-	-	V	$I_E=50\mu A$
Collector cutoff current	$I_{CBO}$	-	-	1	$\mu A$	$V_{CB}=40V$
Emitter cutoff current	$I_{EBO}$	-	-	1	$\mu A$	$V_{EB}=4V$
Collector-emitter saturation voltage	$V_{CE(sat)}$	-	0.5	1	V	$I_C/I_B=2A/0.2A$ *
DC current transfer ratio	$h_{FE}$	120	-	390	-	$V_{CE}=3V, I_C=0.5A$ *
Transition frequency	$f_T$	-	90	-	MHz	$V_{CE}=5V, I_E=-500mA, f=30MHz$ *
Output capacitance	$C_{ob}$	-	40	-	pF	$V_{CB}=10V, I_E=0A, f=1MHz$

\* Measured using pulse current.

●Packaging specifications and hFE

Type	hFE	Package	Taping	
		Code	TL	TV2
		Basic ordering unit (pieces)	2500	2500
2SD1760	QR		○	-
2SD1864	QR		-	○

hFE values are classified as follows:

Item	Q	R
hFE	120 to 270	180 to 390

●Electrical characteristic curves

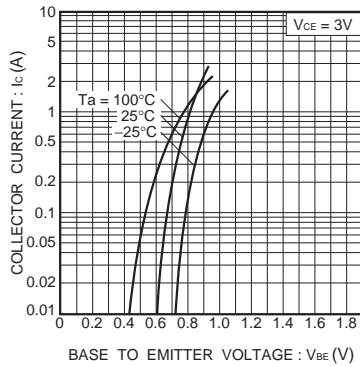


Fig.1 Grounded emitter propagation characteristics

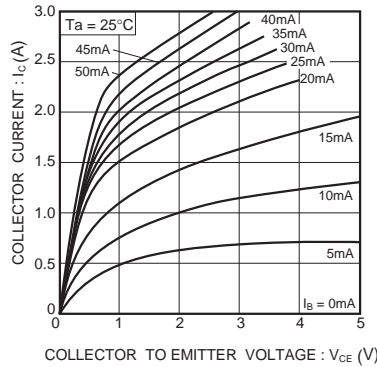


Fig.2 Grounded emitter output characteristics ( I )

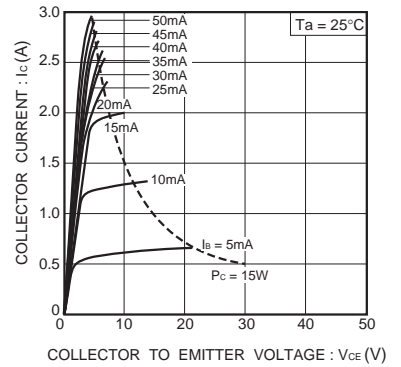


Fig.3 Grounded-emitter output characteristics ( II )

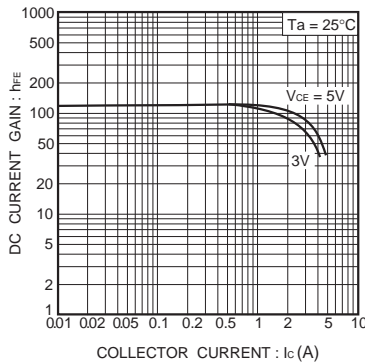


Fig.4 DC current gain vs. collector current ( I )

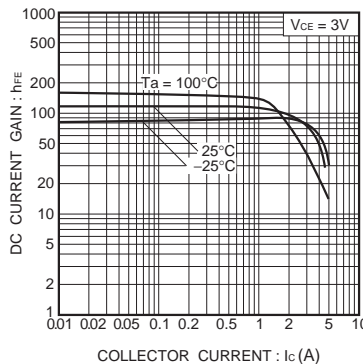


Fig.5 DC current gain vs. collector current ( II )

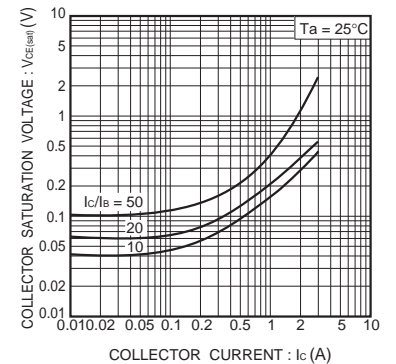


Fig.6 Collector-emitter saturation voltage vs. collector current

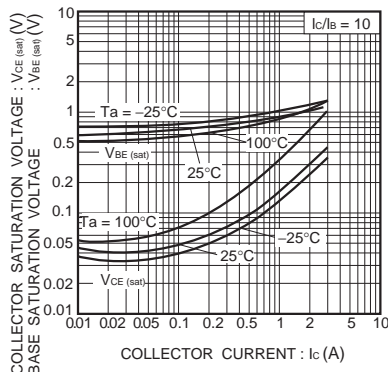


Fig.7 Collector-emitter saturation voltage vs. collector current  
Base-emitter saturation voltage vs. collector current

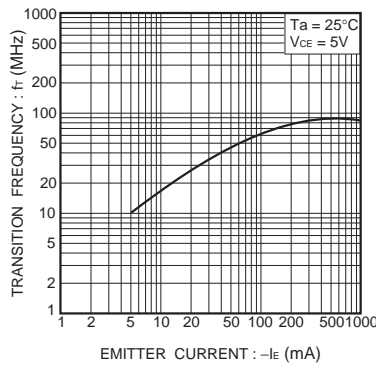


Fig.8 Gain bandwidth product vs. emitter current

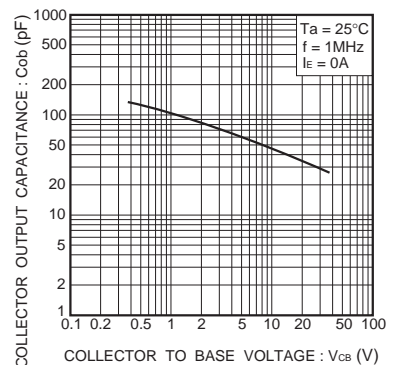


Fig.9 Collector output capacitance vs. collector-base voltage

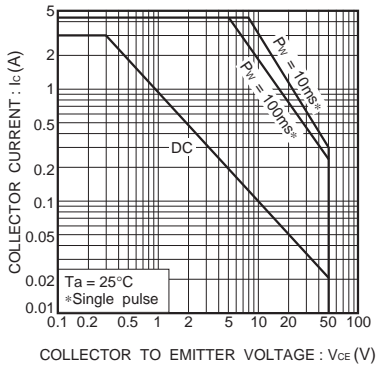


Fig.10 Safe operating area (2SD1760)

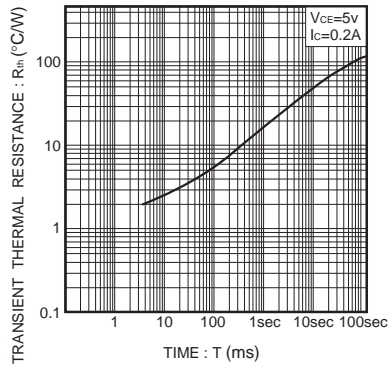


Fig.11 Transient thermal resistance (2SD1760)

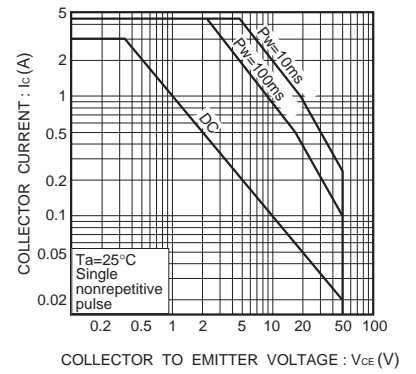


Fig.12 Safe operating area (2SD1864)

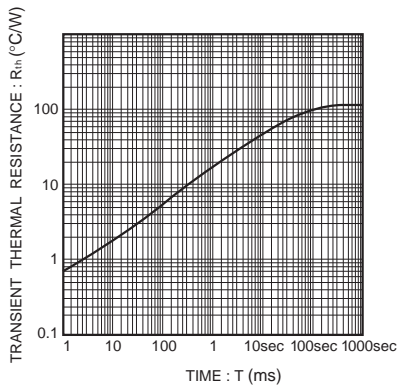


Fig.13 Transient thermal resistance (2SD1864)

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