

Power Transistor (50V, 3A)

2SD1760 / 2SD1864

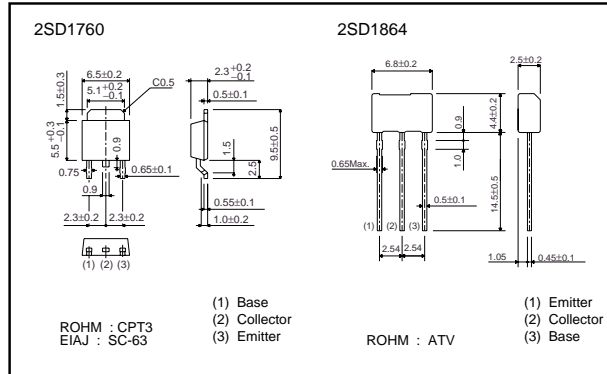
●Features

- 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 ($T_a=25^\circ C$)

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	P_c	15	W ($T_c=25^\circ C$)*2
	2SD1864		1	W
Junction temperature	T_j	150	$^\circ C$	
Storage temperature	T_{stg}	-55~+150	$^\circ C$	

*1 Single pulse, $P_w=100ms$

*2 Printed circuit board, 1.7mm thick, collector copper plating 100mm² or larger.

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● 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	μA	$V_{CB}=40V$
Emitter cutoff current	I_{EBO}	—	—	1	μA	$V_{EB}=4V$
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	0.5	1	V	$I_C/I_B=2A/0.2A$ *
DC current transfer ratio	h_{FE}	82	—	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 h_{FE}

Type	h_{FE}	Package	Taping	
		Code	TL	TV2
		Basic ordering unit (pieces)	2500	2500
2SD1760	PQR		○	—
2SD1864	PQR		—	○

h_{FE} values are classified as follows:

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

● Electrical characteristic curves

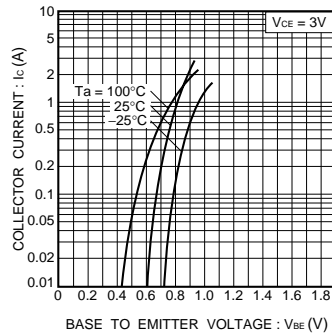


Fig.1 Grounded emitter propagation characteristics

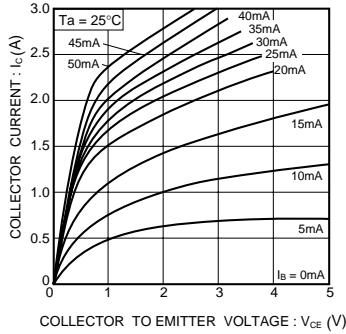


Fig.2 Grounded emitter output characteristics (I)

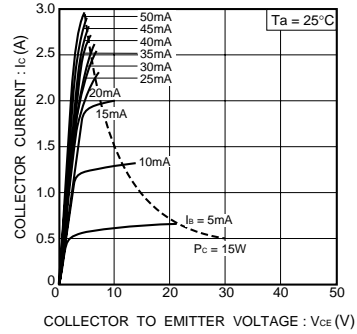


Fig.3 Grounded-emitter output characteristics(II)

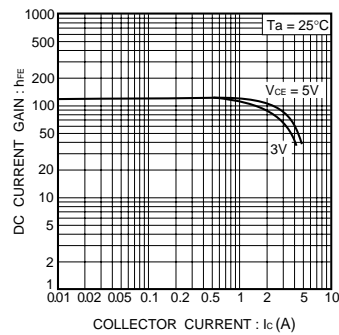


Fig.4 DC current gain vs. collector current(I)

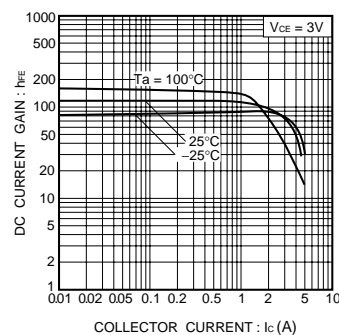


Fig.5 DC current gain vs. collector current(II)

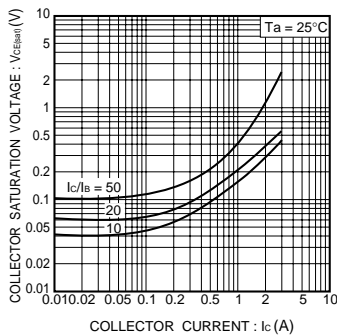


Fig.6 Collector-emitter saturation voltage vs. collector current



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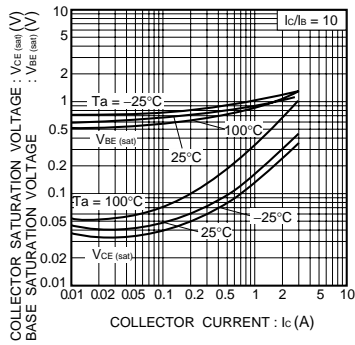


Fig.7 Collector-emitter saturation voltage vs. collector current
Base-emitter saturation voltage vs. collector current

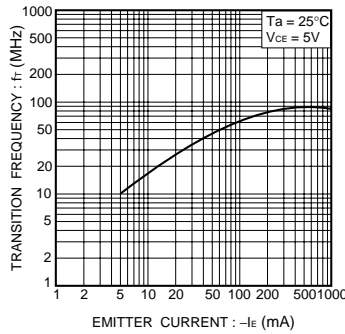


Fig.8 Gain bandwidth product vs. emitter current

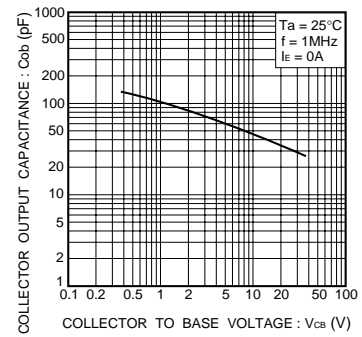


Fig.9 Collector output capacitance vs. collector-base voltage

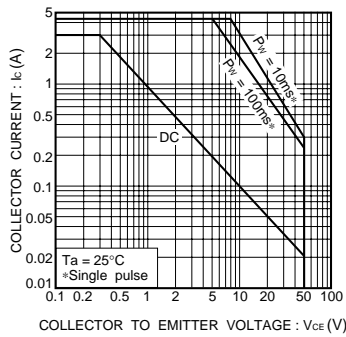


Fig.10 Safe operating area (2SD1760)

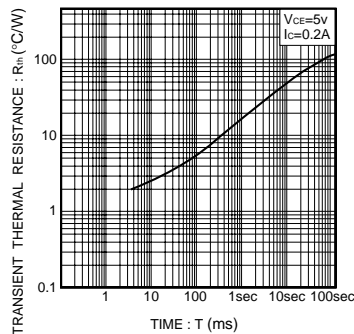


Fig.11 Transient thermal resistance (2SD1760)

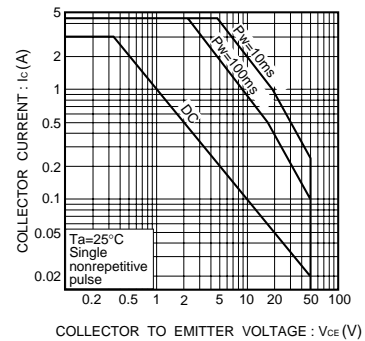


Fig.12 Safe operating area (2SD1864)

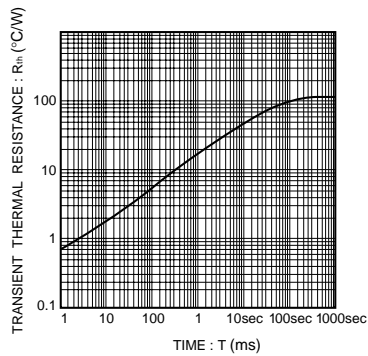


Fig.13 Transient thermal resistance (2SD1864)