

# Power Transistor (50V, 3A)

## 2SD1864

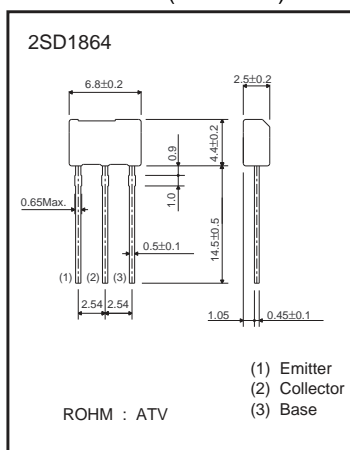
### ●Features

- 1) Low  $V_{CE(sat)}$ .  
 $V_{CE(sat)} = 0.5V$  (Typ.)  
 $(I_C/I_B = 2A / 0.2A)$
- 2) Complements the 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	$P_C$	1	W *2
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  $h_{FE}$ 

Type	$h_{FE}$	Package	Taping
		Code	TV2
		Basic ordering unit (pieces)	2500
2SD1864	QR		○

$h_{FE}$  values are classified as follows:

Item	Q	R
$h_{FE}$	120 to 270	180 to 390

## ●Electrical characteristic curves

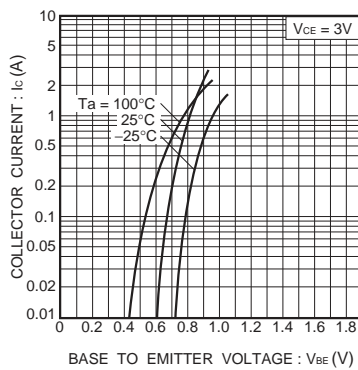


Fig.1 Grounded emitter propagation characteristics

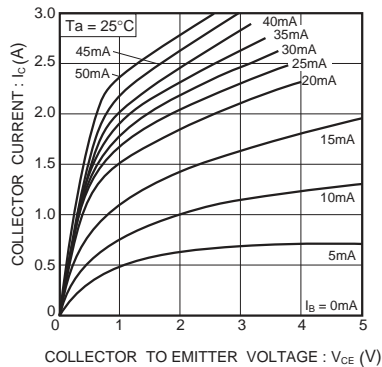


Fig.2 Grounded emitter output characteristics ( I )

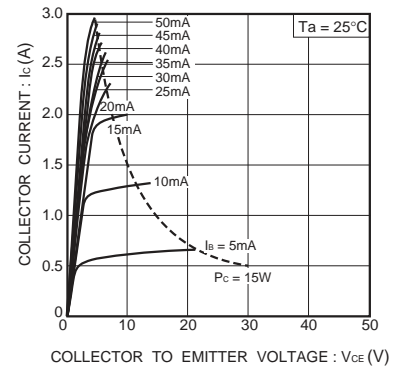


Fig.3 Grounded-emitter output characteristics( II )

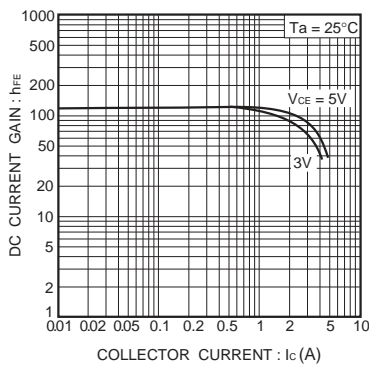


Fig.4 DC current gain vs. collector current( I )

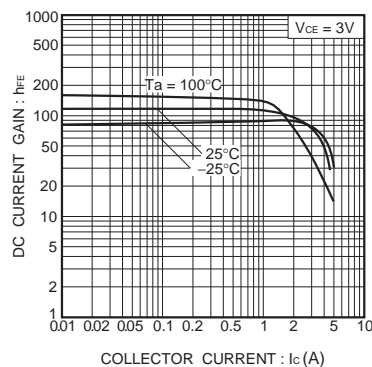


Fig.5 DC current gain vs. collector current( II )

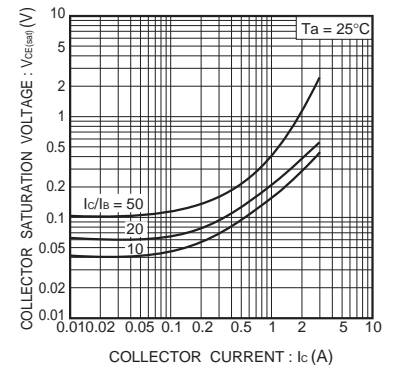


Fig.6 Collector-emitter saturation voltage vs. collector current

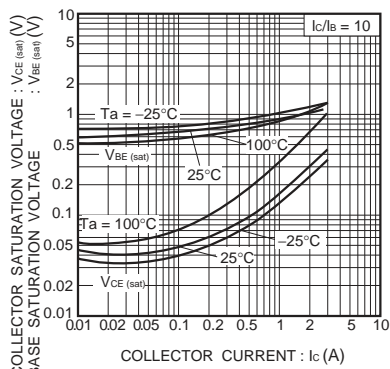


Fig.7 Collector-emitter saturation voltage vs. collector current  
Base-emitter saturation voltage vs. collector current

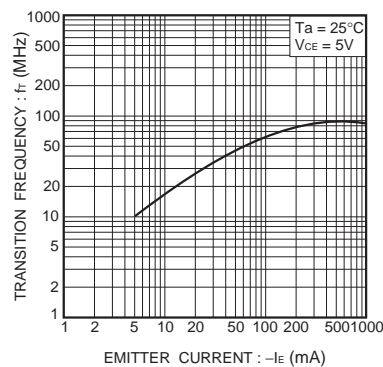


Fig.8 Gain bandwidth product vs. emitter current

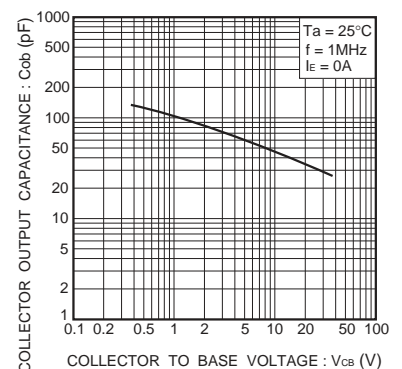


Fig.9 Collector output capacitance vs. collector-base voltage

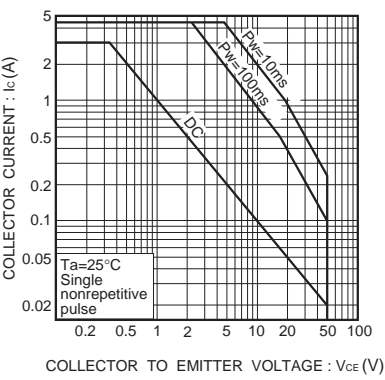


Fig.10 Safe operating area

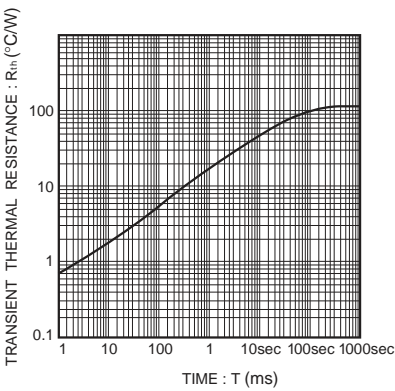


Fig.11 Transient thermal resistance

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