

# Low frequency transistor (−20V, −5A)

## 2SB1412

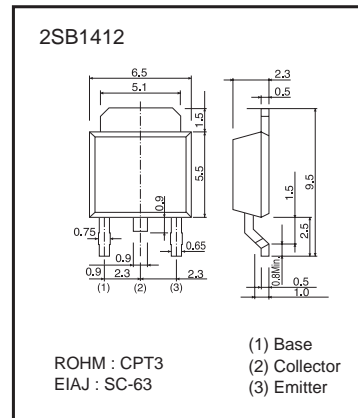
### ●Features

- 1) Low  $V_{CE(sat)}$ .  
 $V_{CE(sat)} = -0.35V$  (Typ.)  
 $(I_C/I_B = -4A / -0.1A)$
- 2) Excellent DC current gain characteristics.
- 3) Complements the 2SD2118.

### ●Structure

Epitaxial planar type  
 PNP silicon transistor

### ●Dimensions (Unit : mm)



\* Denotes  $h_{FE}$

### ●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-base voltage	$V_{CBO}$	−30	V
Collector-emitter voltage	$V_{CEO}$	−20	V
Emitter-base voltage	$V_{EBO}$	−6	V
Collector current	$I_C$	−5	A(DC)
		−10	A(Pulse) *1
Collector power dissipation	2SB1412 $P_C$	1	W
		10	W(Tc=25°C)
Junction temperature	$T_j$	150	°C
Storage temperature	$T_{stg}$	−55 to 150	°C

\*1 Single pulse, Pw=10ms

### ●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$BV_{CBO}$	−30	−	−	V	$I_C = -50\mu A$
Collector-emitter breakdown voltage	$BV_{CEO}$	−20	−	−	V	$I_C = -1mA$
Emitter-base breakdown voltage	$BV_{EBO}$	−6	−	−	V	$I_E = -50\mu A$
Collector cutoff current	$I_{CBO}$	−	−	−0.5	$\mu A$	$V_{CB} = -20V$
Emitter cutoff current	$I_{EBO}$	−	−	−0.5	$\mu A$	$V_{EB} = -5V$
Collector-emitter saturation voltage	$V_{CE(sat)}$	−	0.35	−1.0	V	$I_C/I_B = -4A / -0.1A$ *
DC current transfer ratio	$h_{FE}$	82	−	390	−	$V_{CE} = -2V, I_C = -0.5A$ *
Transition frequency	$f_T$	−	120	−	MHz	$V_{CE} = -6V, I_E = 50mA, f = 100MHz$
Output capacitance	$C_{ob}$	−	60	−	pF	$V_{CB} = -20V, I_E = 0A, f = 1MHz$

\* Measured using pulse current.

●Packaging specifications and hFE

Type	hFE	Package	Taping
		Code	TL
		Basic ordering unit (pieces)	2500
2SB1412	PQR		○

hFE values are classified as follows :

Item	P	Q	R
hFE	82 to 180	120 to 270	180 to 390

●Electrical characteristic curves

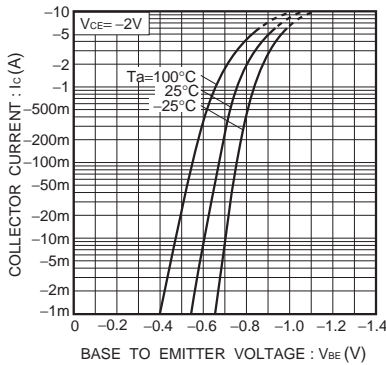


Fig.1 Grounded emitter propagation characteristics

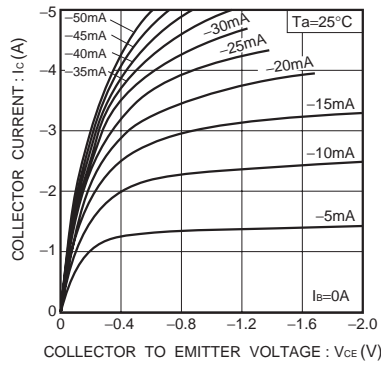


Fig.2 Grounded emitter output characteristics

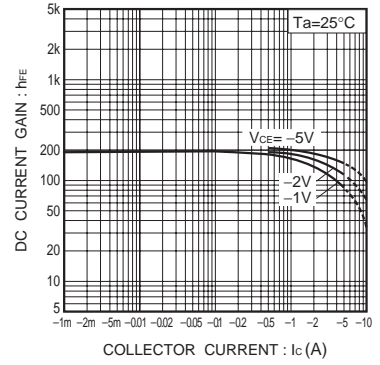


Fig.3 DC current gain vs. collector current ( I )

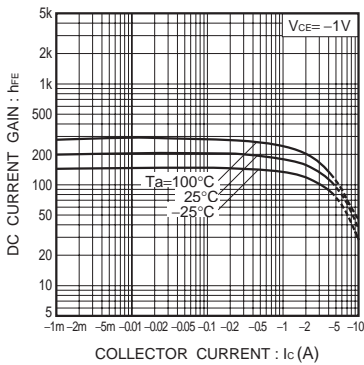


Fig.4 DC current gain vs. collector current (II)

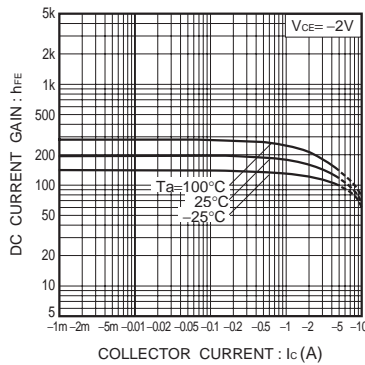


Fig.5 DC current gain vs. collector current (III)

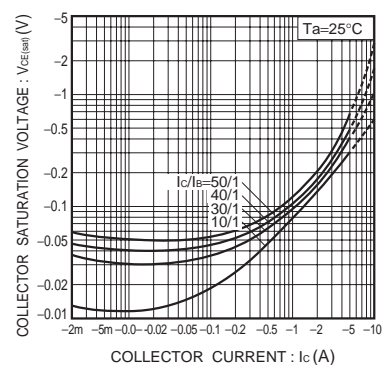


Fig.6 Collector-emitter saturation voltage vs. collector current ( I )

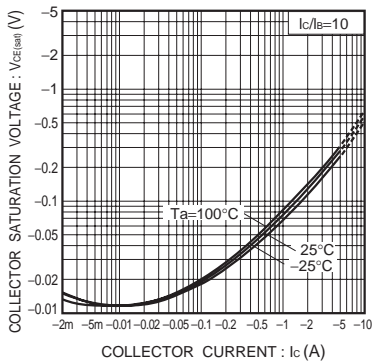


Fig.7 Collector-emitter saturation voltage vs. collector current (II)

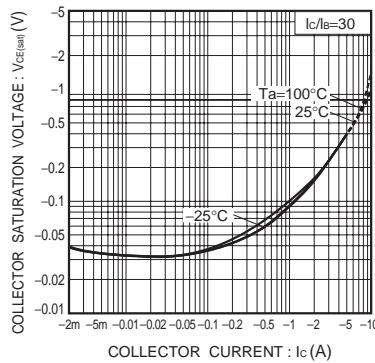


Fig.8 Collector-emitter saturation voltage vs. collector current (III)

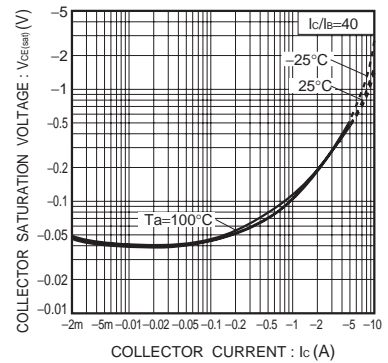


Fig.9 Collector-emitter saturation voltage vs. collector current (IV)

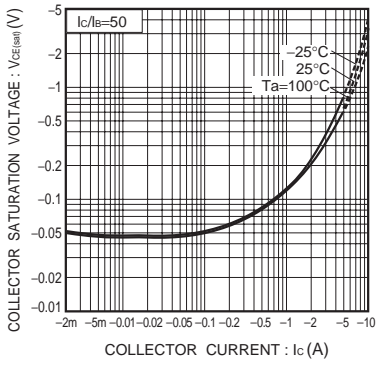


Fig.10 Collector-emitter saturation voltage vs. collector current (V)

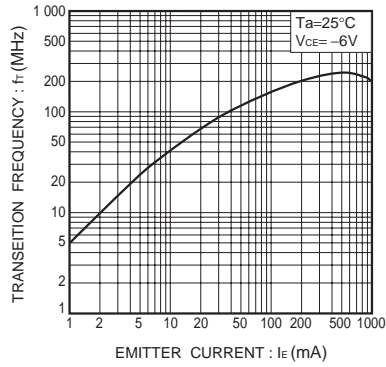


Fig.11 Gain bandwidth product vs. emitter current

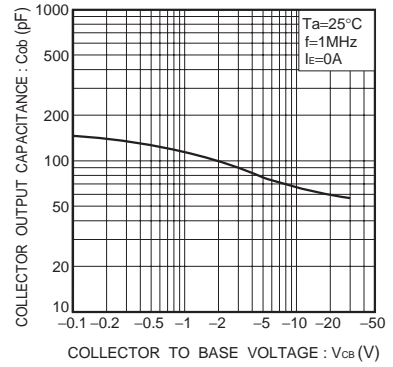


Fig.12 Collector output capacitance vs. collector-base voltage

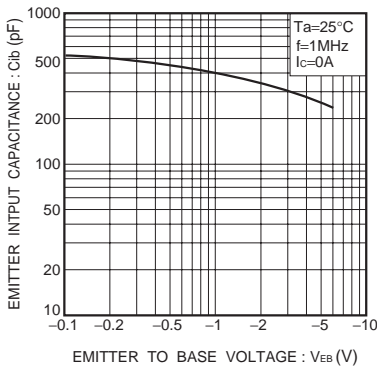


Fig.13 Emitter input capacitance vs. emitter-base voltage

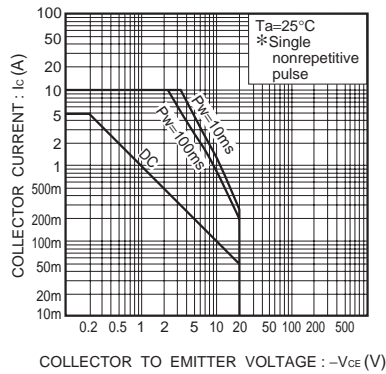


Fig.14 Safe operation area (2SB1412)

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