

Low frequency transistor (−20V, −5A)

2SB1386 / 2SB1412

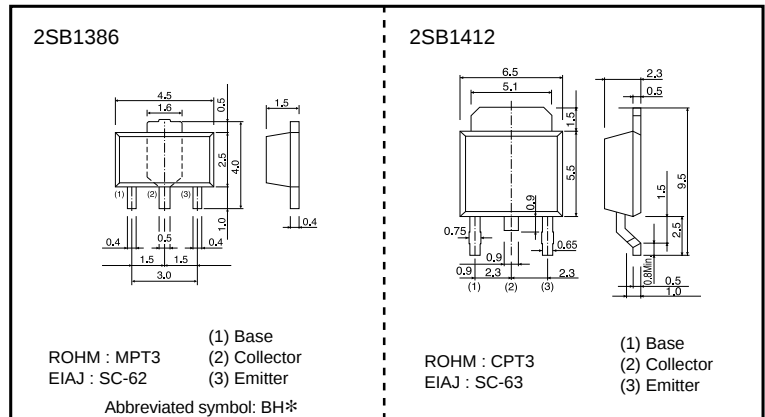
●Features

- 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 2SD2098 / 2SD2118.

●Structure

Epitaxial planar type
 PNP silicon transistor

●Dimensions (Unit : mm)



* Denotes h_{FE}

●Absolute maximum ratings ($T_a=25^\circ C$)

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	2SB1386	P _C	0.5	W
			2	W *2
	2SB1412		1	W
			10	W(T _C =25°C)
Junction temperature		T _j	150	°C
Storage temperature		T _{stg}	−55 to 150	°C

*1 Single pulse, $P_w=10ms$

*2 When mounted on a 40×40×0.7 mm ceramic board.

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●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	μA	$V_{CB} = -20V$
Emitter cutoff current	I_{EBO}	-	-	-0.5	μA	$V_{EB} = -5V$
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 h_{FE}

Type	h_{FE}	Package	Taping	
		Code	T100	TL
		Basic ordering unit (pieces)	1000	2500
2SB1386	PQR		○	-
2SB1412	PQR		-	○

 h_{FE} values are classified as follows :

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

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●Electrical characteristic curves

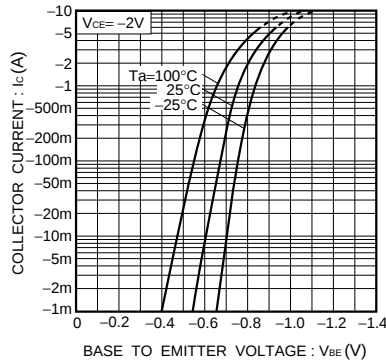


Fig.1 Grounded emitter propagation characteristics

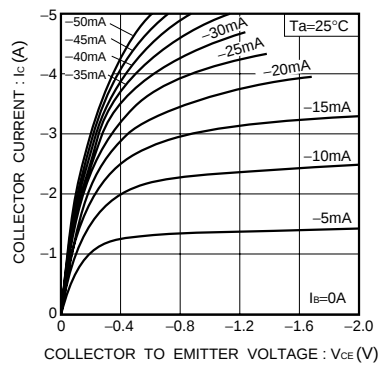


Fig.2 Grounded emitter output characteristics

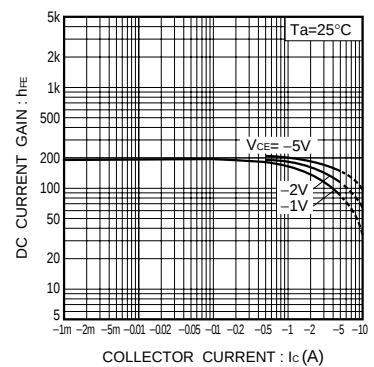


Fig.3 DC current gain vs. collector current (I)

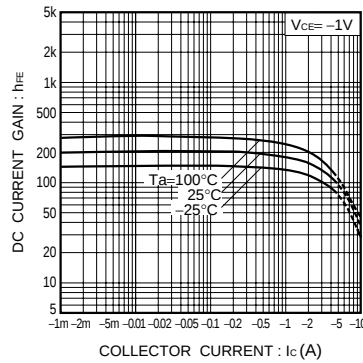


Fig.4 DC current gain vs. collector current (II)

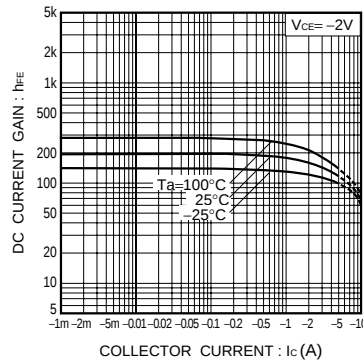


Fig.5 DC current gain vs. collector current (III)

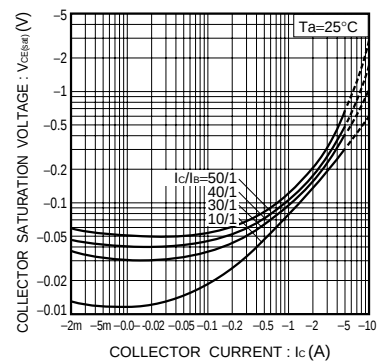


Fig.6 Collector-emitter saturation voltage vs. collector current (I)

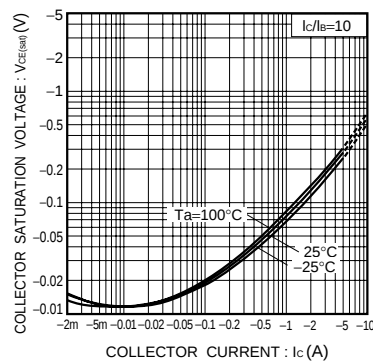


Fig.7 Collector-emitter saturation voltage vs. collector current (II)

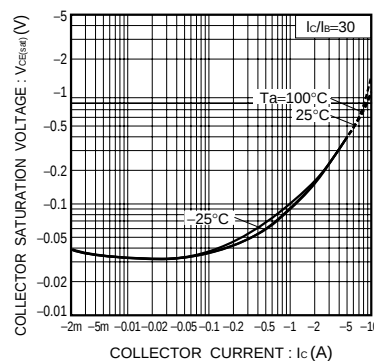


Fig.8 Collector-emitter saturation voltage vs. collector current (III)

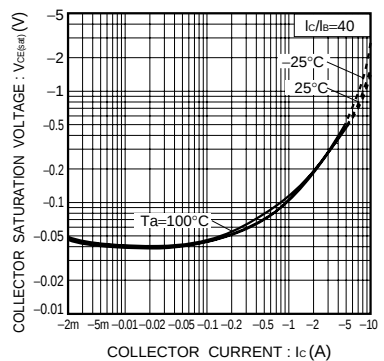


Fig.9 Collector-emitter saturation voltage vs. collector current (IV)

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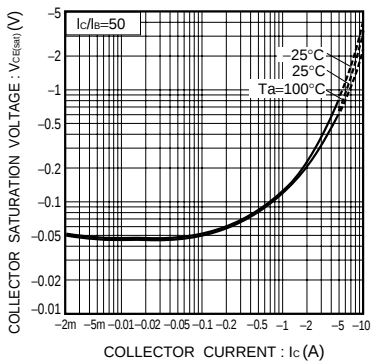


Fig.10 Collector-emitter saturation voltage vs. collector current (V)

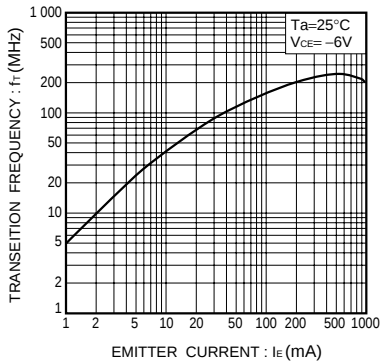


Fig.11 Gain bandwidth product vs. emitter current

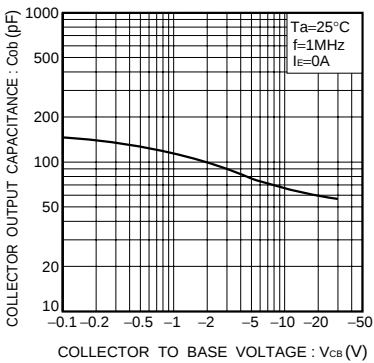


Fig.12 Collector output capacitance vs. collector-base voltage

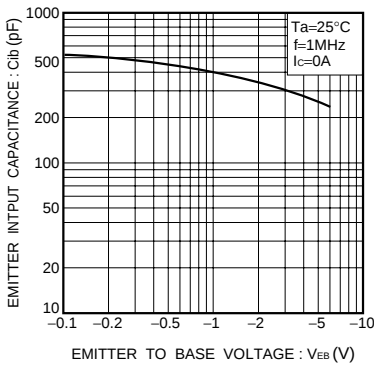


Fig.13 Emitter input capacitance vs. emitter-base voltage

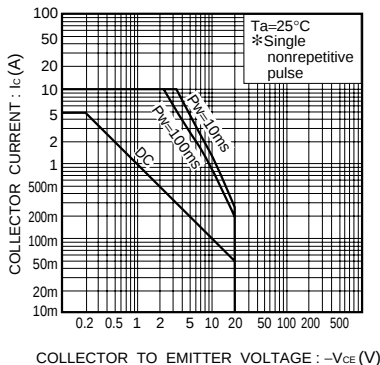


Fig.14 Safe operation area (2SB1412)

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