



THE DATASHEET OF 2SB1412 TLP



Low frequency transistor (-20V, -5A)

2SB1386 / 2SB1412 / 2SB1326

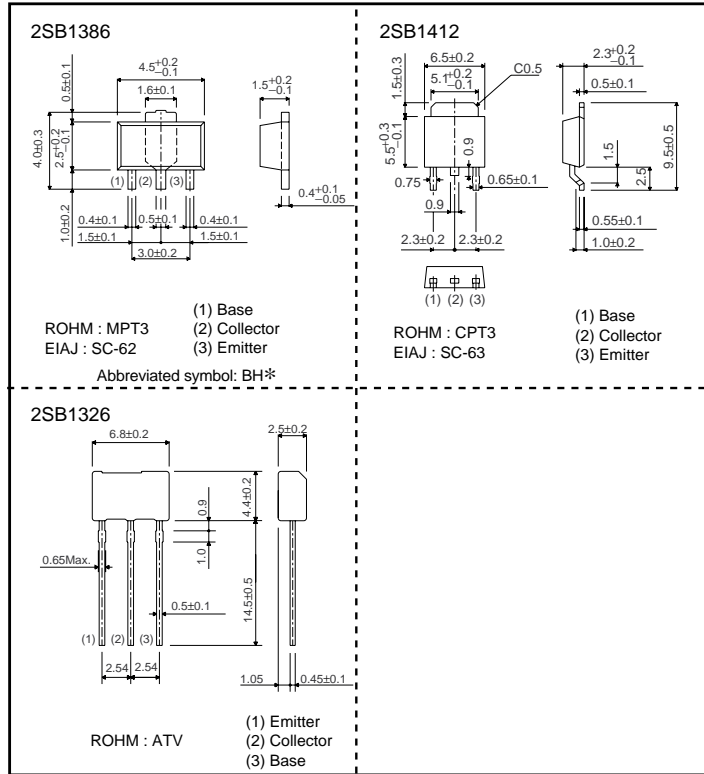
●Features

- 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 / 2SD2097.

●Structure

Epitaxial planar type
 PNP silicon transistor

●External dimensions (Unit : mm)



Transistors

●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit	
Collector-base voltage	V _{CB0}	-30	V	
Collector-emitter voltage	V _{CE0}	-20	V	
Emitter-base voltage	V _{EB0}	-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
			1	W
			10	W(Tc=25°C)
Collector power dissipation	2SB1412	P _c	1	W
			1	W *3
Junction temperature	T _j	150	°C	
Storage temperature	T _{stg}	-55 to 150	°C	

*1 Single pulse, Pw=10ms

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

*3 Printed circuit board glass epoxy board 1.6 mm thick with copper plating 100mm² or larger.

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions	
Collector-base breakdown voltage	BV _{CB0}	-30	-	-	V	I _c = -50μA	
Collector-emitter breakdown voltage	BV _{CE0}	-20	-	-	V	I _c = -1mA	
Emitter-base breakdown voltage	BV _{EB0}	-6	-	-	V	I _E = -50μA	
Collector cutoff current	I _{cB0}	-	-	-0.5	μA	V _{CB} = -20V	
Emitter cutoff current	I _{EB0}	-	-	-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	2SB1386,2SB1412	h _{FE}	82	-	390	-	V _{CE} = -2V, I _c = -0.5A
	2SB1326		120	-	390	-	
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	TV2
		Basic ordering unit (pieces)	1000	2500	2500
2SB1386	PQR	○	-	-	-
2SB1412	PQR	-	○	-	-
2SB1326	QR	-	-	○	-

h_{FE} values are classified as follows :

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

Transistors

●Electrical characteristic curves

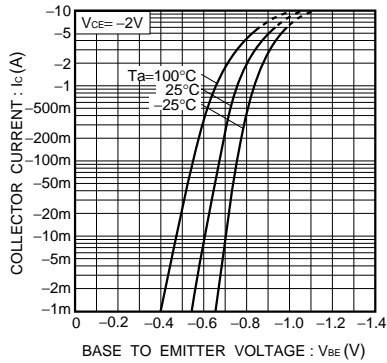


Fig.1 Grounded emitter propagation characteristics

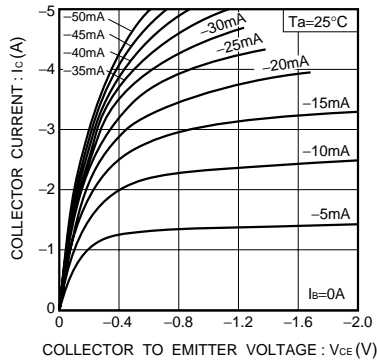


Fig.2 Grounded emitter output characteristics

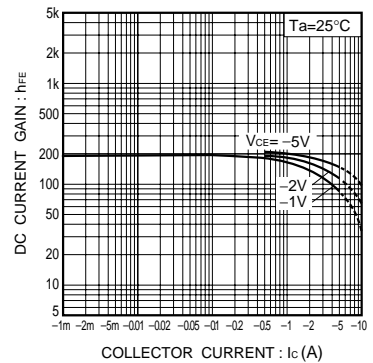


Fig.3 DC current gain vs. collector current (I)

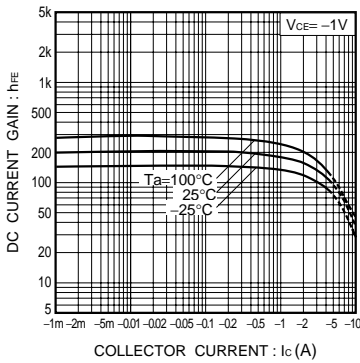


Fig.4 DC current gain vs. collector current (II)

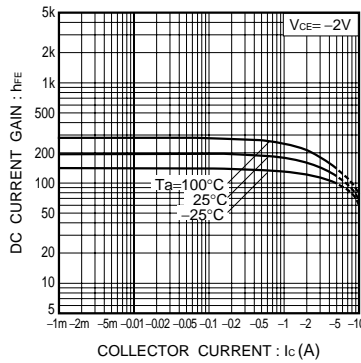


Fig.5 DC current gain vs. collector current (III)

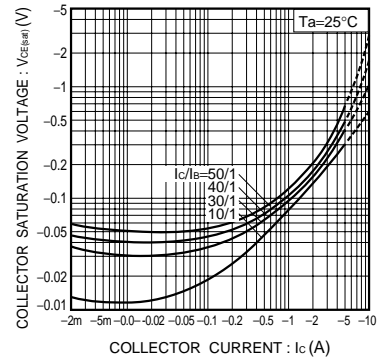


Fig.6 Collector-emitter saturation voltage vs. collector current (I)

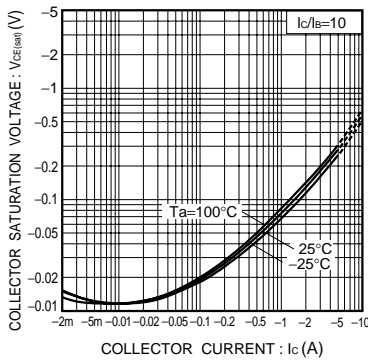


Fig.7 Collector-emitter saturation voltage vs. collector current (II)

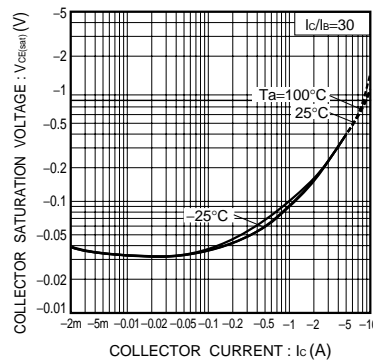


Fig.8 Collector-emitter saturation voltage vs. collector current (III)

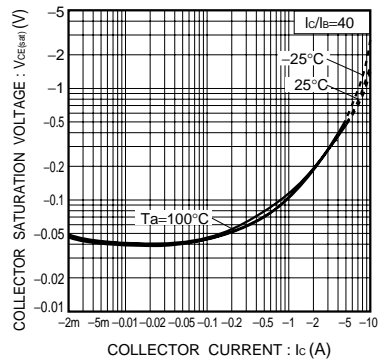


Fig.9 Collector-emitter saturation voltage vs. collector current (IV)

Transistors

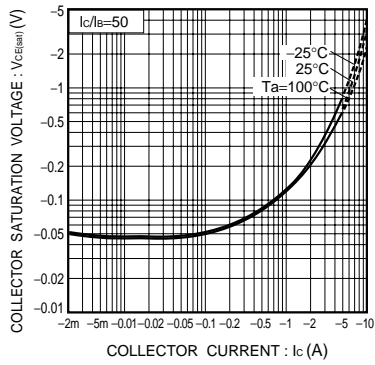


Fig.10 Collector-emitter saturation voltage vs. collector current (V)

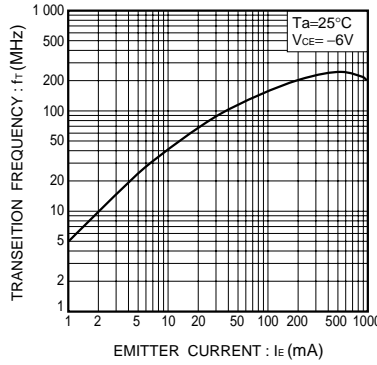


Fig.11 Gain bandwidth product vs. emitter current

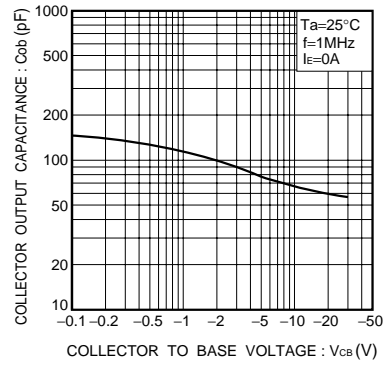


Fig.12 Collector output capacitance vs. collector-base voltage

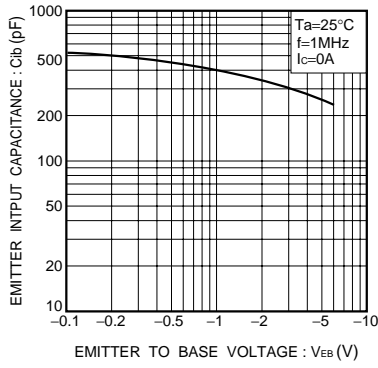


Fig.13 Emitter input capacitance vs. emitter-base voltage

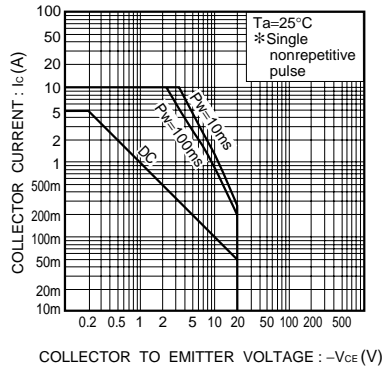


Fig.14 Safe operation area (2SB1412)

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