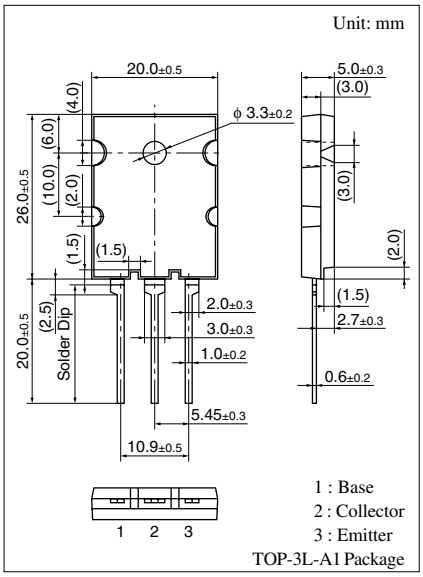
2SB1503

Silicon PNP epitaxial planar type Darlington

For power amplification
Complementary to 2SD2276



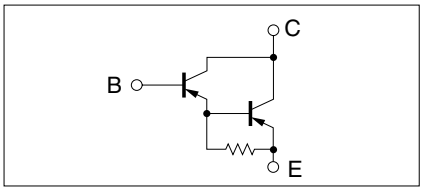
■ Features

- Optimum for 110 W Hi-Fi output
- High forward current transfer ratio h_{FE}: 5 000 to 30 000
- Low collector to emitter saturation voltage $V_{CE(sat)}$: < −2.5 V

■ Absolute Maximum Ratings $T_C = 25°C$

Parameter		Symbol	Rating	Unit
Collector to base voltage		V_{CBO}	−160	V
Collector to emitter voltage		V_{CEO}	−140	V
Emitter to base voltage		V_{EBO}	−5	V
Peak collector current		I_{CP}	−12	A
Collector current		I_C	−7	A
Collector power dissipation	T_C = 25°C	P_C	120	W
	T_a = 25°C		3.5	
Junction temperature		T_j	150	°C
Storage temperature		T_{stg}	−55 to +150	°C

Internal Connection



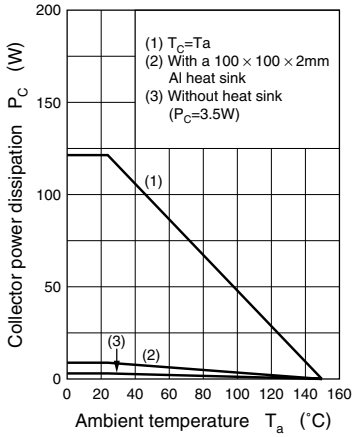
■ Electrical Characteristics $T_C = 25°C$

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector cutoff current	I_{CBO}	V_{CB} = −160 V, I_E = 0			−100	μA
	I_{CEO}	V_{CE} = −140 V, I_B = 0			−100	μA
Emitter cutoff current	I_{EBO}	V_{EB} = −5 V, I_C = 0			−100	μA
Collector to emitter voltage	V_{CEO}	I_C = −30 mA, I_B = 0	−140			V
Forward current transfer ratio	h_{FE1}	V_{CE} = −5 V, I_C = −1 A	2 000			
	h_{FE2} *	V_{CE} = −5 V, I_C = −7 A	5 000		30 000	
Collector to emitter saturation voltage	$V_{CE(sat)}$	I_C = −7 A, I_B = −7 mA			−2.5	V
Base to emitter saturation voltage	$V_{BE(sat)}$	I_C = −7 A, I_B = −7 mA			−3.0	V
Transition frequency	f_T	V_{CE} = −10 V, I_C = − 0.5 A, f = 1 MHz		20		MHz
Turn-on time	t_{on}	I_C = −7 A, I_{B1} = −7 mA, I_{B2} = 7 mA,		1.0		μs
Storage time	t_{stg}	V_{CC} = −50 V		1.5		μs
Fall time	t_f			1.2		μs

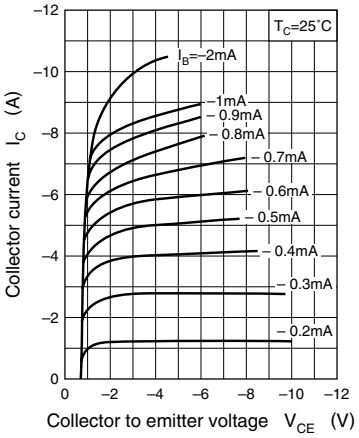
Note) ∗: Rank classification

Rank	Q	S	P
h_{FE2}	5 000 to 15 000	7 000 to 21 000	8 000 to 30 000

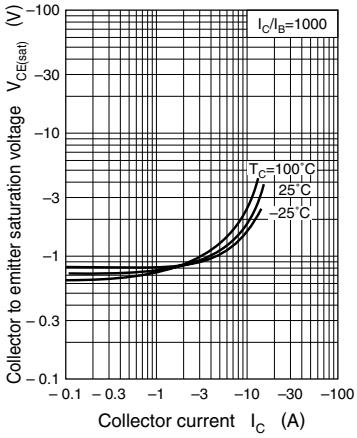
P_C — T_a



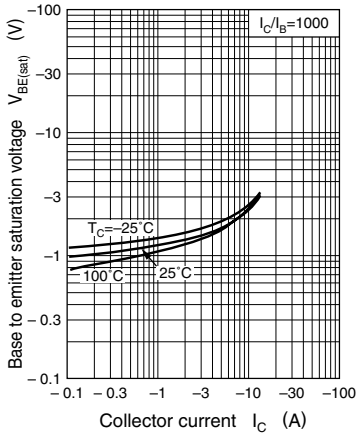
I_C — V_{CE}



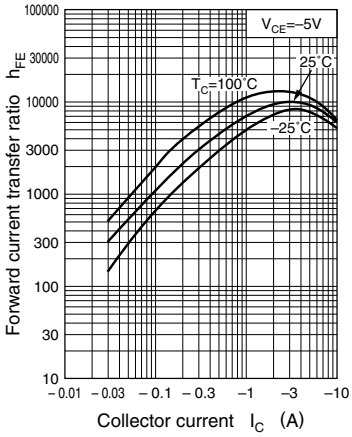
$V_{CE(sat)}$ — I_C



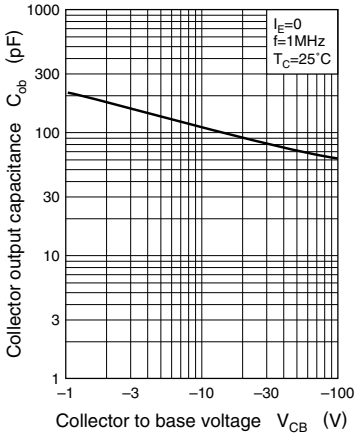
$V_{BE(sat)}$ — I_C



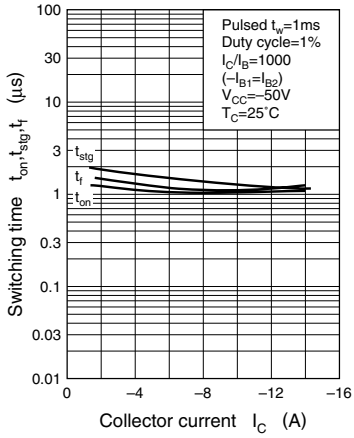
h_{FE} — I_C



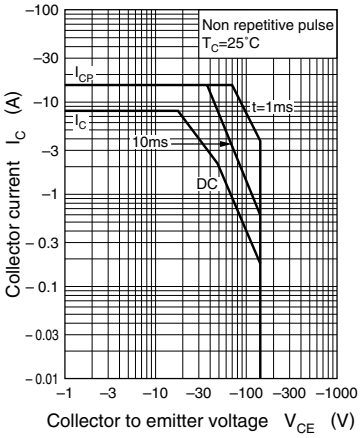
C_{ob} — V_{CB}



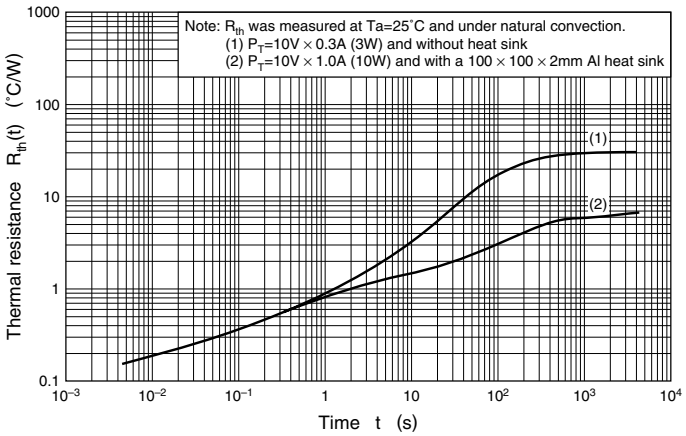
t_{on}, t_{stg}, t_f — I_C



Area of safe operation (ASO)



$R_{th(t)}$ — t


Note: R_{th} was measured at Ta=25°C and under natural convection.
(1) P_T=10V × 0.3A (3W) and without heat sink
(2) P_T=10V × 1.0A (10W) and with a 100 × 100 × 2mm Al heat sink
(1)
(2)
Thermal resistance R_{th}(t) (°C/W)
1000
100
10
1
0.1
10^{-3}
10^{-2}
10^{-1}
1
10
10^{2}
10^{3}
10^{4}
Time t (s)

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