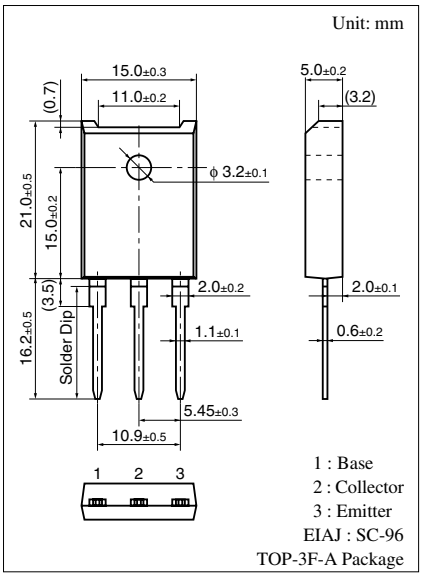
2SB1156

Silicon PNP epitaxial planar type

For power switching

Complementary to 2SD1707



■ Features

- Low collector to emitter saturation voltage $V_{CE(sat)}$
- Satisfactory linearity of forward current transfer ratio h_{FE}
- Large collector current I_C
- Full-pack package which can be installed to the heat sink with one screw

■ Absolute Maximum Ratings T_C= 25°C

Parameter		Symbol	Rating	Unit
Collector to base voltage		V_{CBO}	−130	V
Collector to emitter voltage		V_{CEO}	−80	V
Emitter to base voltage		V_{EBO}	−7	V
Peak collector current		I_{CP}	−30	A
Collector current		I_C	−20	A
Collector power dissipation	T_C = 25°C	P_C	100	W
	T_a = 25°C		3	
Junction temperature		T_j	150	°C
Storage temperature		T_{stg}	−55 to +150	°C

■ Electrical Characteristics T_C = 25°C

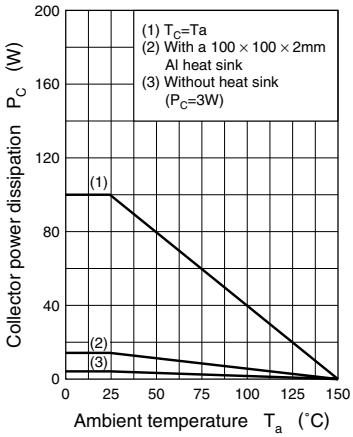
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector cutoff current	I_{CBO}	V_{CB} = −100 V, I_E = 0			−10	μA
Emitter cutoff current	I_{EBO}	V_{EB} = −5 V, I_C = 0			−50	μA
Collector to emitter voltage	V_{CEO}	I_C = −10 mA, I_B = 0	−80			V
Forward current transfer ratio	h_{FE1}	V_{CE} = −2 V, I_C = − 0.1 A	45			
	h_{FE2} *	V_{CE} = −2 V, I_C = −3 A	90		260	
	h_{FE3}	V_{CE} = −2 V, I_C = −10 A	30			
Collector to emitter saturation voltage	$V_{CE(sat)1}$	I_C = −8 A, I_B = − 0.4 A			− 0.5	V
	$V_{CE(sat)2}$	I_C = −20 A, I_B = −2 A			−1.5	V
Base to emitter saturation voltage	$V_{BE(sat)1}$	I_C = −8 A, I_B = − 0.4 A			−1.5	V
	$V_{BE(sat)2}$	I_C = −20 A, I_B = −2 A			−2.5	V
Transition frequency	f_T	V_{CE} = −10 V, I_C = − 0.5 A, f = 10 MHz		25		MHz
Turn-on time	t_{on}	I_C = −3 A, I_{B1} = − 0.8 A, I_{B2} = 0.8 A, V_{CC} = −50 V		0.5		μs
Storage time	t_{stg}			1.2		μs
Fall time	t_f			0.2		μs

Note) *: Rank classification

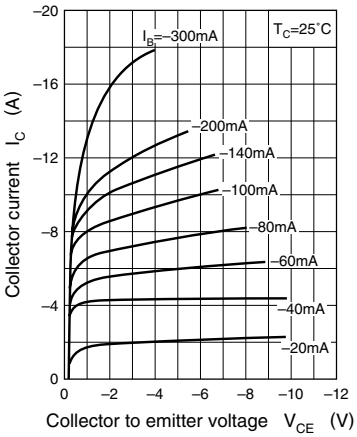
Rank	Q	P
h_{FE2}	90 to 180	130 to 260

Ordering can be made by the common rank (PQ rank h_{FE2} = 90 to 260) in the rank classification.

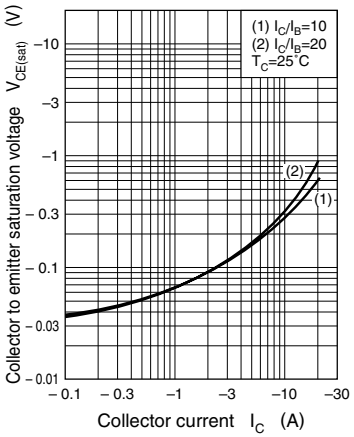
P_C — T_a



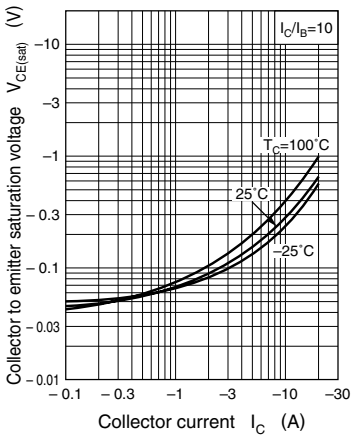
I_C — V_{CE}



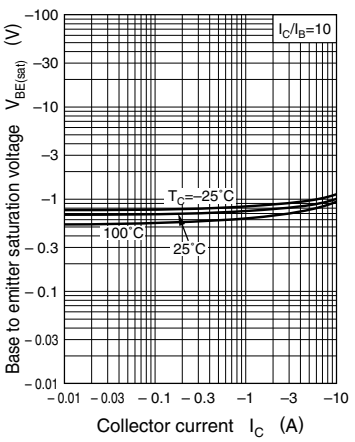
$V_{CE(sta)}$ — I_C



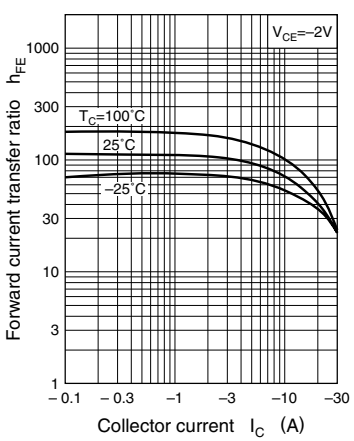
$V_{CE(sat)}$ — I_C



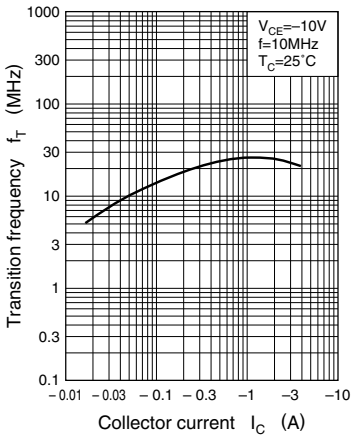
$V_{BE(sat)}$ — I_C



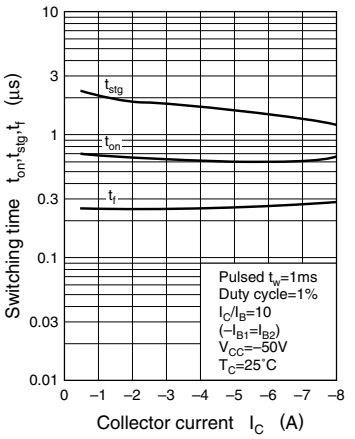
h_{FE} — I_C



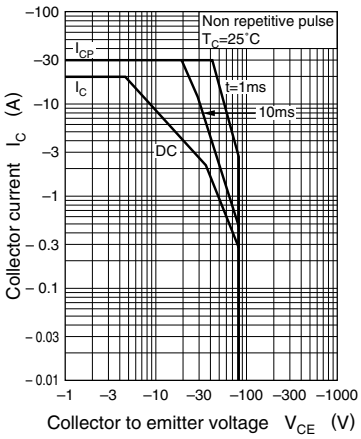
f_T — I_C



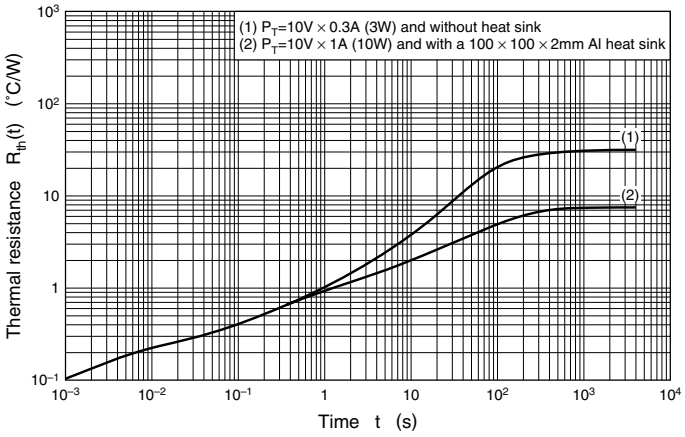
t_{on}, t_{stg}, t_f — I_C



Area of safe operation (ASO)



$R_{th(t)}$ — t


(1) P_T=10V × 0.3A (3W) and without heat sink
(2) P_T=10V × 1A (10W) and with a 100 × 100 × 2mm Al heat sink
Thermal resistance R_{th}(t) (°C/W)
10^3
10^2
10
1
10^{-1}
10^{-3}
10^{-2}
10^{-1}
1
10
10^2
10^3
10^4
Time t (s)
(1)
(2)

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