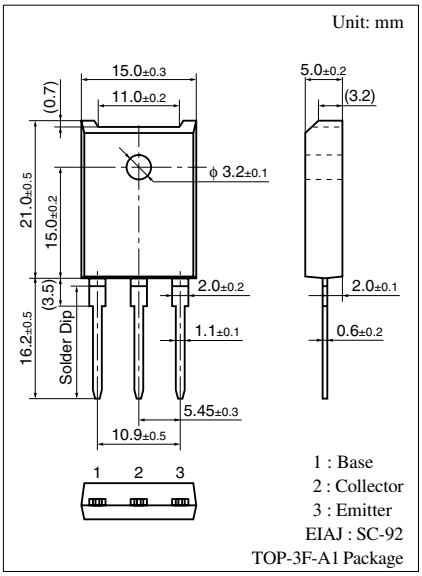
2SB1154

Silicon PNP epitaxial planar type

For power switching
Complementary to 2SD1705



■ 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}	−20	A
Collector current		I_C	−10	A
Collector power dissipation	$T_C = 25°C$	P_C	70	W
	$T_a = 25°C$		3	
Junction temperature		T_j	150	°C
Storage temperature		T_{stg}	−55 to +150	°C

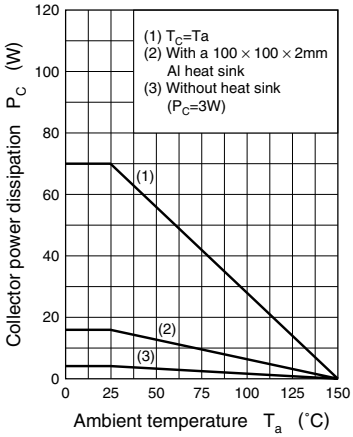
■ Electrical Characteristics $T_C = 25°C$

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, $I_C = -6$ A	30			
Collector to emitter saturation voltage	$V_{CE(sat)1}$	$I_C = -6$ A, $I_B = -0.3$ A			−0.5	V
	$V_{CE(sat)2}$	$I_C = -10$ A, $I_B = -1$ A			−1.5	V
Base to emitter saturation voltage	$V_{BE(sat)1}$	$I_C = -6$ A, $I_B = -0.3$ A			−1.5	V
	$V_{BE(sat)2}$	$I_C = -10$ A, $I_B = -1$ A			−2.5	V
Transition frequency	f_T	$V_{CE} = -10$ V, $I_C = -0.5$ A, f = 10 MHz		30		MHz
Turn-on time	t_{on}	$I_C = -6$ A, $I_{B1} = -0.6$ A, $I_{B2} = 0.6$ A, $V_{CC} = -50$ V		0.5		μs
Storage time	t_{stg}			1.0		μs
Fall time	t_f			0.2		μs

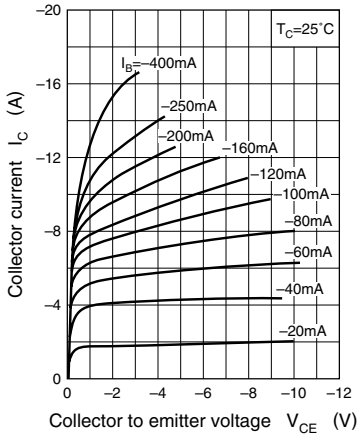
Note) *: Rank classification

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

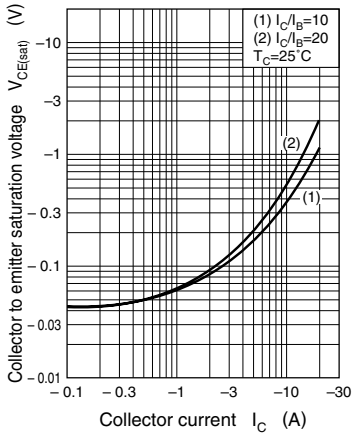
P_C — T_a



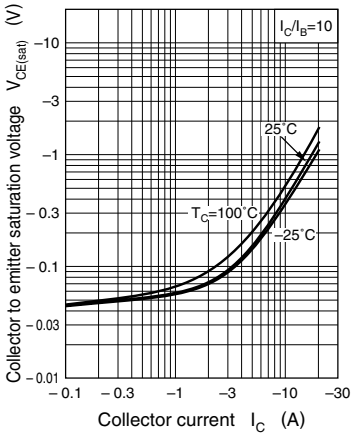
I_C — V_{CE}



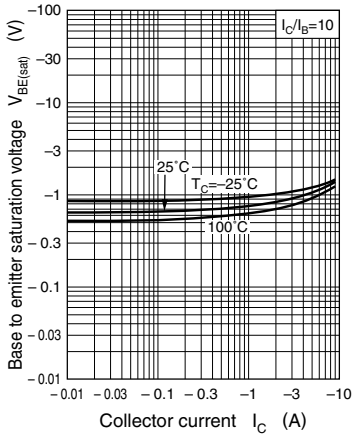
$V_{CE(sta)}$ — I_C



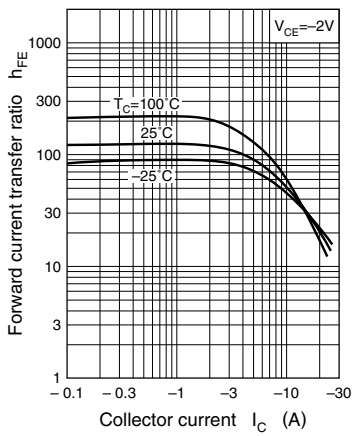
$V_{CE(sat)}$ — I_C



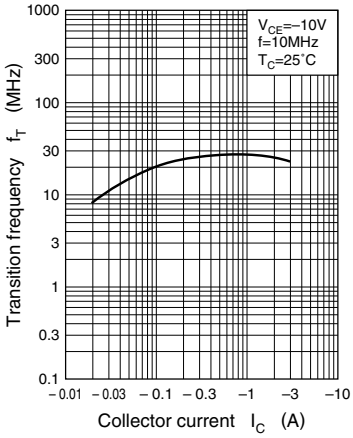
$V_{BE(sat)}$ — I_C



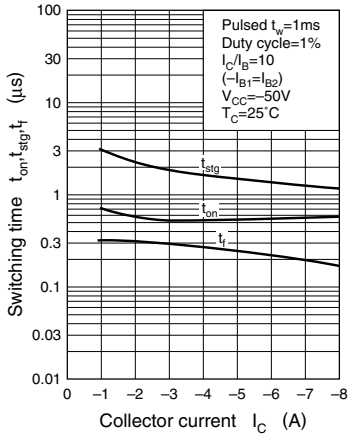
h_{FE} — I_C



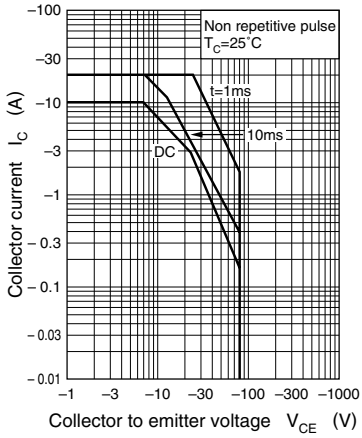
f_T — I_C



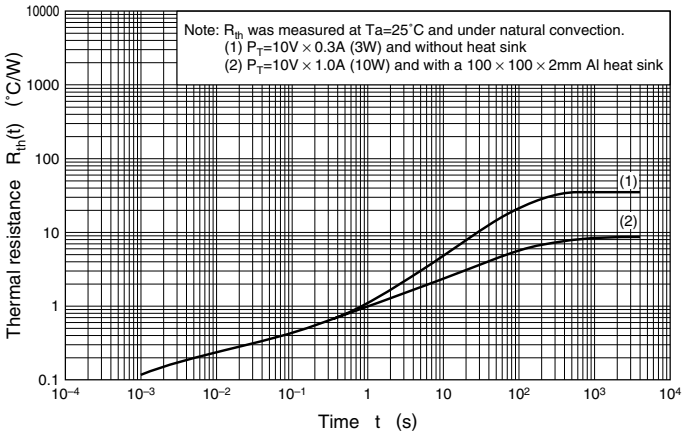
t_{on}, t_{stg}, t_f — I_C



Area of safe operation (ASO)



$R_{th(t)}$ — t


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
Thermal resistance R_{th}(t) (°C/W)
10000
1000
100
10
1
0.1
(1)
(2)
10^{-4}
10^{-3}
10^{-2}
10^{-1}
1
10
10^{2}
10^{3}
10^{4}
Time t (s)

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