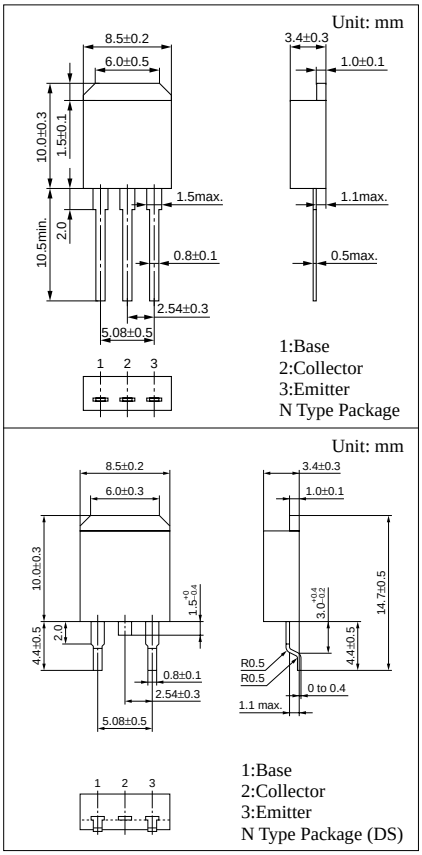
2SB933

Silicon PNP epitaxial planar type

For power switching
Complementary to 2SD1256



Features

- Low collector to emitter saturation voltage $V_{CE(sat)}$
- Satisfactory linearity of foward current transfer ratio h_{FE}
- Large collector current I_C
- N type package enabling direct soldering of the radiating fin to the printed circuit board, etc. of small electronic equipment.

Absolute Maximum Ratings (T_C=25˚C)

Parameter		Symbol	Ratings	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}	–10	A
Collector current		I_C	–5	A
Collector power dissipation	T_C=25°C	P_C	40	W
	Ta=25°C		1.3	
Junction temperature		T_j	150	˚C
Storage temperature		T_{stg}	–55 to +150	˚C

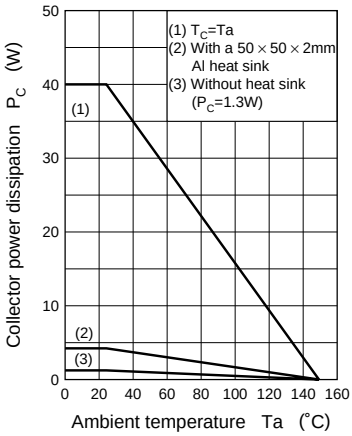
Electrical Characteristics (T_C=25˚C)

Parameter	Symbol	Conditions	min	typ	max	Unit
Collector cutoff current	I_{CBO}	V_{CB} = –100V, I_E = 0			–10	µA
Emitter cutoff current	I_{EBO}	V_{EB} = –5V, I_C = 0			–50	µA
Collector to emitter voltage	V_{CEO}	I_C = –10mA, I_B = 0	–80			V
Forward current transfer ratio	h_{FE1}	V_{CE} = –2V, I_C = – 0.1A	45			
	h_{FE2}*	V_{CE} = –2V, I_C = –2A	90		260	
Collector to emitter saturation voltage	$V_{CE(sat)}$	I_C = –4A, I_B = – 0.2A			– 0.5	V
Base to emitter saturation voltage	$V_{BE(sat)}$	I_C = –4A, I_B = – 0.2A			–1.5	V
Transition frequency	f_T	V_{CE} = –10V, I_C = – 0.5A, f = 10MHz		30		MHz
Turn-on time	t_{on}	I_C = –2A, I_{B1} = – 0.2A, I_{B2} = 0.2A		0.13		µs
Storage time	t_{stg}			1.5		µs
Fall time	t_f			0.13		µs

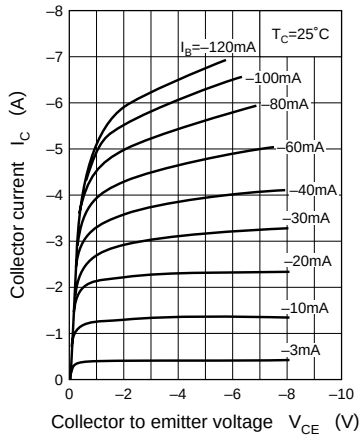
*h_{FE2} Rank classification

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

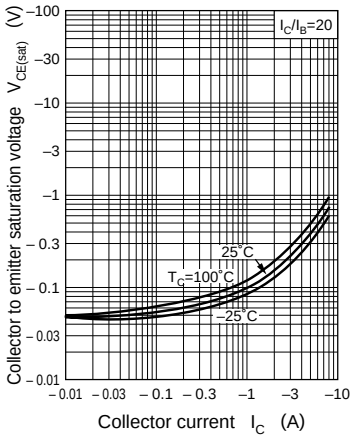
P_C — Ta



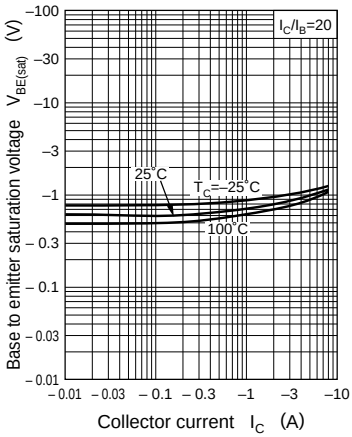
I_C — V_{CE}



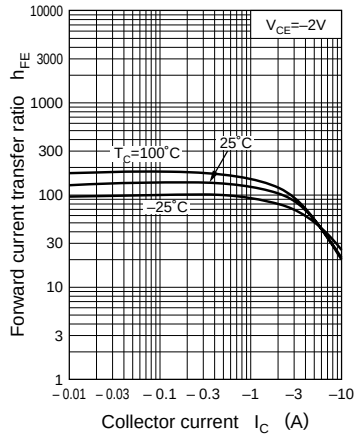
$V_{CE(sat)}$ — I_C



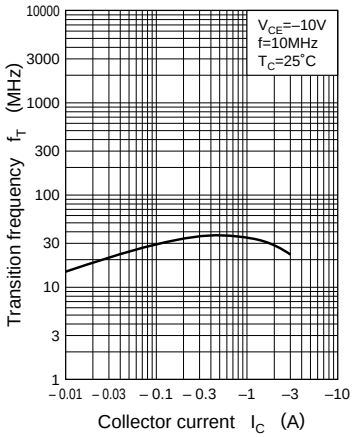
$V_{BE(sat)}$ — I_C



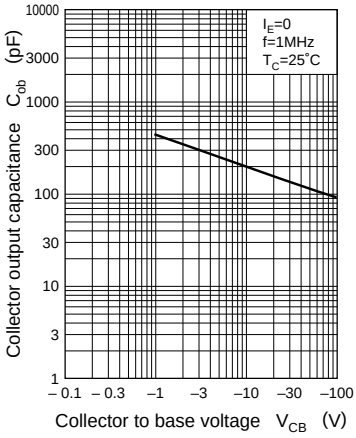
h_{FE} — I_C



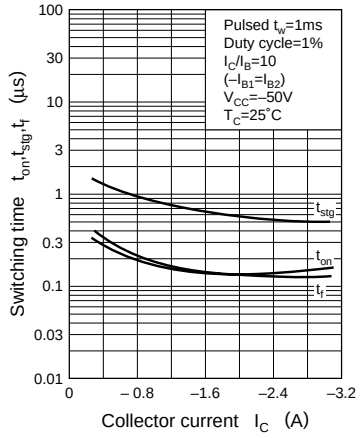
f_T — I_C



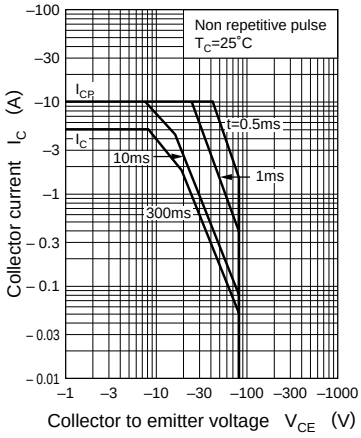
C_{ob} — V_{CB}



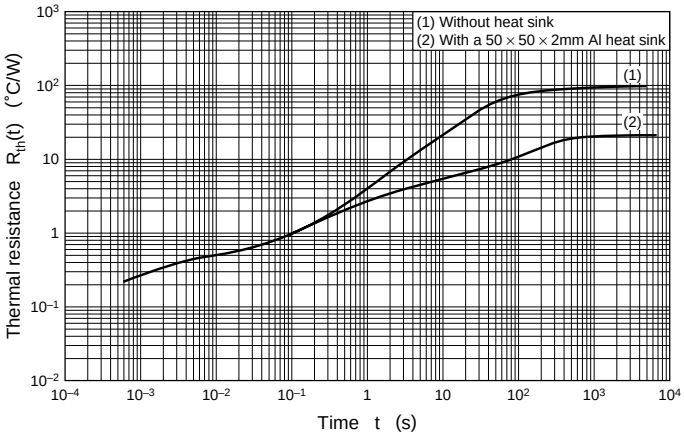
t_{on}, t_{stg}, t_f — I_C



Area of safe operation (ASO)



$R_{th(t)}$ — t


(1) Without heat sink
(2) With a 50 × 50 × 2mm Al heat sink
(1)
(2)
Thermal resistance $R_{th}(t)$ (°C/W)
10^3
10^2
10
1
10^{-1}
10^{-2}
10^{-4}
10^{-3}
10^{-2}
10^{-1}
1
10
10^2
10^3
10^4
Time t (s)