

2SB939, 2SB939A

Silicon PNP epitaxial planar type Darlington

For medium-speed power switching

Complementary to 2SD1262 and 2SD1262A

Features

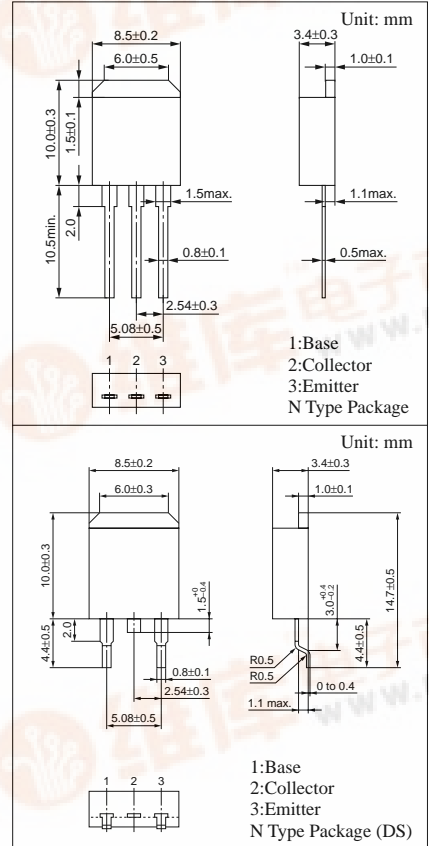
- High forward current transfer ratio h_{FE}
- High-speed switching
- N type package enabling direct soldering of the radiating fin to the printed circuit board, etc. of small electronic equipment.

Absolute Maximum Ratings ($T_C=25^\circ C$)

Parameter	Symbol	Rated	Unit
Collector to base voltage	2SB939	-60	V
	2SB939A	-80	
Collector to emitter voltage	2SB939	-60	V
	2SB939A	-80	
Emitter to base voltage	V_{EBO}	-7	V
Peak collector current	I_{CP}	-12	A
Collector current	I_C	-8	A
Collector power dissipation	$T_C=25^\circ C$	45	W
	$T_a=25^\circ C$	1.3	
Junction temperature	T_j	150	$^\circ C$
Storage temperature	T_{stg}	-55 to +150	$^\circ C$

Electrical Characteristics ($T_C=25^\circ C$)

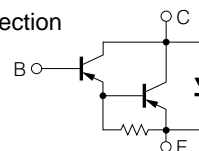
Parameter	Symbol	Conditions	min	typ	max	Unit
Collector cutoff current	2SB939	$V_{CB} = -60V, I_E = 0$			-100	μA
	2SB939A	$V_{CB} = -80V, I_E = 0$			-100	
Emitter cutoff current	I_{EBO}	$V_{EB} = -7V, I_C = 0$			-2	mA
Collector to emitter voltage	2SB939	$I_C = -30mA, I_B = 0$	-60			V
	2SB939A		-80			
Forward current transfer ratio	h_{FE1}^*	$V_{CE} = -3V, I_C = -4A$	2000		10000	
	h_{FE2}	$V_{CE} = -3V, I_C = -8A$	500			
Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_C = -4A, I_B = -8mA$			-1.5	V
Base to emitter saturation voltage	$V_{BE(sat)}$	$I_C = -4A, I_B = -8mA$			-2	V
Transition frequency	f_T	$V_{CE} = -10V, I_C = -0.5A, f = 1MHz$		15		MHz
Turn-on time	t_{on}	$I_C = -4A, I_{B1} = -8mA, I_{B2} = 8mA, V_{CC} = -50V$		0.5		μs
Storage time	t_{stg}				2	μs
Fall time	t_f				1	μs



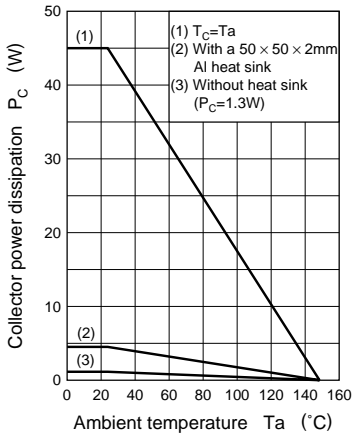
h_{FE1} Rank classification

Rank	Q	P
h_{FE1}	2000 to 5000	4000 to 10000

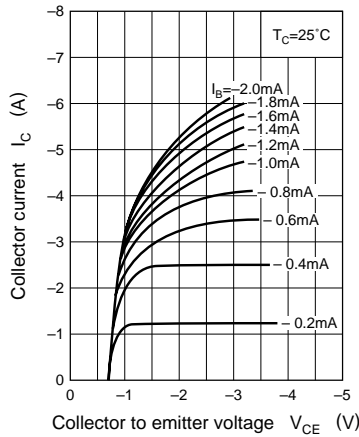
Internal Connection



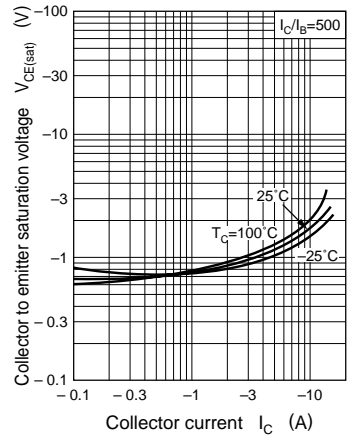
$P_C - T_a$



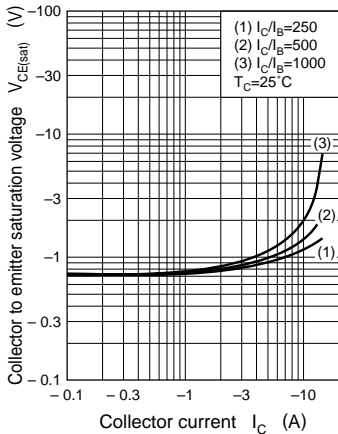
$I_C - V_{CE}$



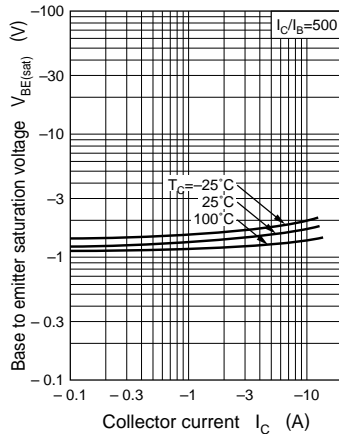
$V_{CE(sat)} - I_C$



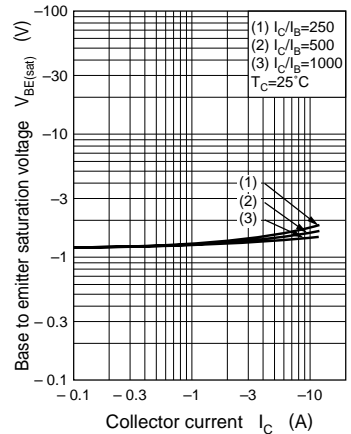
$V_{CE(sat)} - I_C$



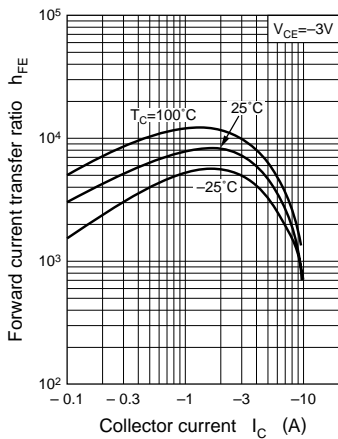
$V_{BE(sat)} - I_C$



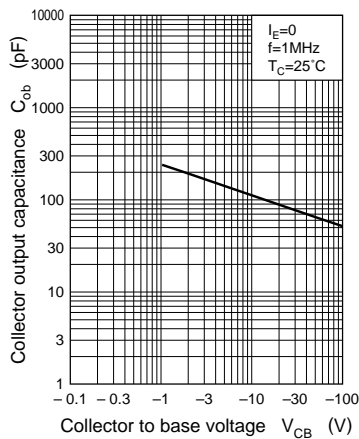
$V_{BE(sat)} - I_C$



$h_{FE} - I_C$



$C_{ob} - V_{CB}$



Area of safe operation (ASO)

