

2SB939, 2SB939A

Silicon PNP epitaxial planar type Darlington

For midium-speed power switching

Complementary to 2SD1262 and 2SD1262A

■ Features

- High foward 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 ($T_C=25^\circ\text{C}$)

Parameter	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	-60	V
Collector to emitter voltage	V_{CEO}	-80	V
Emitter to base voltage	V_{EBO}	-7	V
Peak collector current	I_{CP}	-12	A
Collector current	I_C	-8	A
Collector power dissipation	P_C	45	W
		1.3	W
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

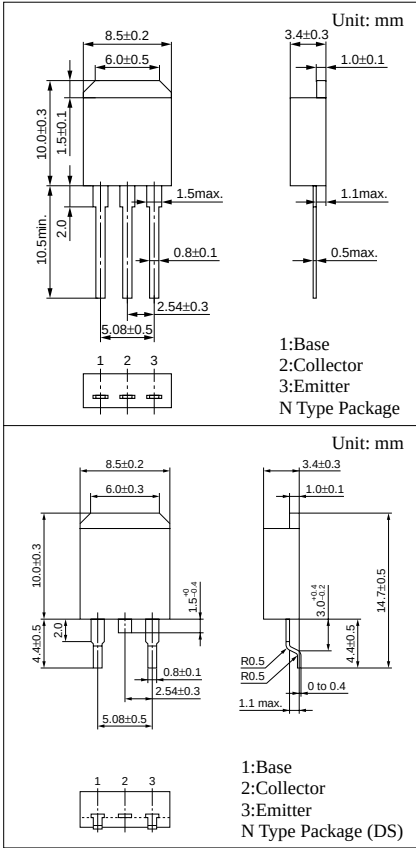
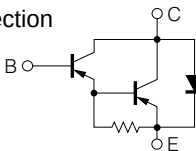
■ Electrical Characteristics ($T_C=25^\circ\text{C}$)

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

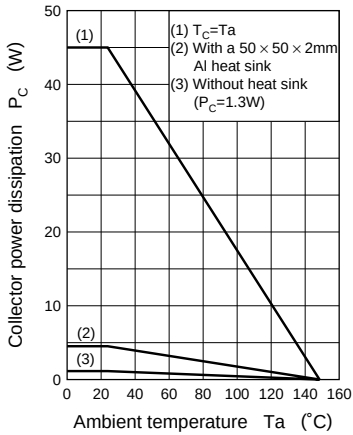
* h_{FE1} Rank classification

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

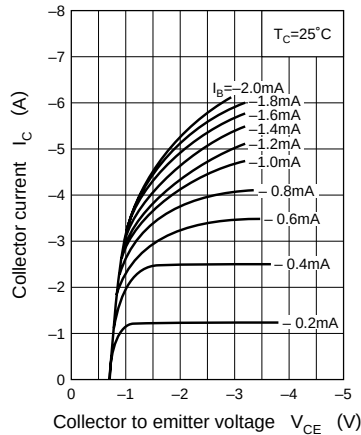
Internal Connection



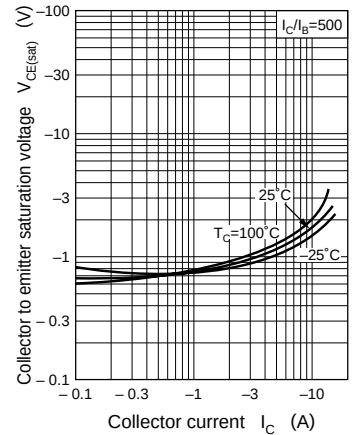
$P_C - T_a$



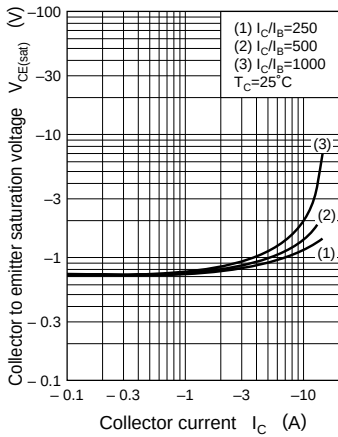
$I_C - V_{CE}$



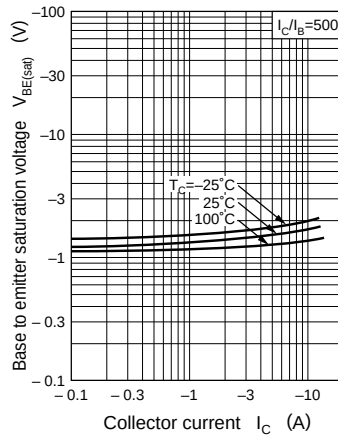
$V_{CE(sat)} - I_C$



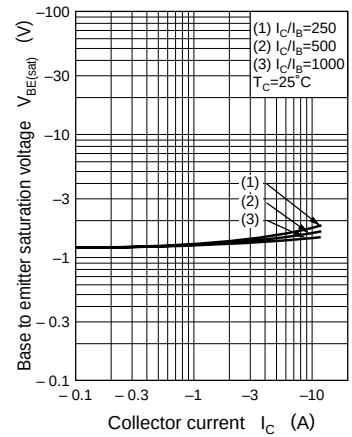
$V_{CE(sat)} - I_C$



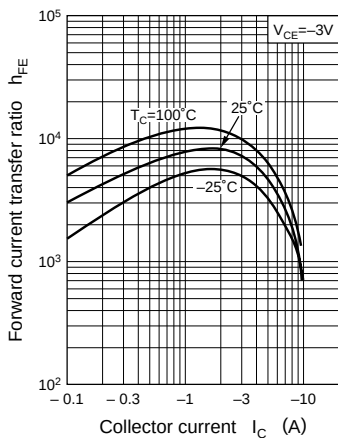
$V_{BE(sat)} - I_C$



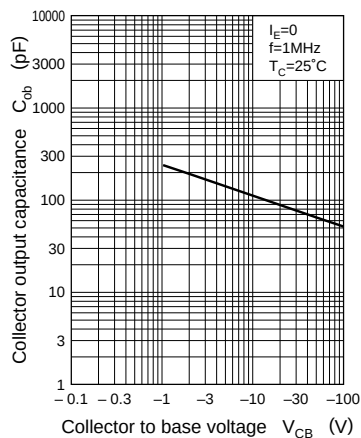
$V_{BE(sat)} - I_C$



$h_{FE} - I_C$



$C_{ob} - V_{CB}$



Area of safe operation (ASO)

