

# 2SB938, 2SB938A

## Silicon PNP epitaxial planar type Darlington

For power amplification and switching

Complementary to 2SD1261 and 2SD1261A

### 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 ( $T_C=25^\circ\text{C}$ )

Parameter	Symbol	Rated	Unit
Collector to base voltage	$V_{CBO}$	-60	V
Collector to emitter voltage		-80	
Collector to emitter voltage	$V_{CEO}$	-60	V
Emitter to base voltage		-80	
Emitter to base voltage	$V_{EBO}$	-5	V
Peak collector current	$I_{CP}$	-8	A
Collector current	$I_C$	-4	A
Collector power dissipation	$P_C$	40	W
		1.3	
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	$I_{CBO}$	$V_{CB} = -60\text{V}, I_E = 0$			-200	$\mu\text{A}$
Collector cutoff current		$V_{CB} = -80\text{V}, I_E = 0$			-200	
Collector cutoff current	$I_{CEO}$	$V_{CE} = -30\text{V}, I_B = 0$			-500	$\mu\text{A}$
Collector cutoff current		$V_{CE} = -40\text{V}, I_B = 0$			-500	
Emitter cutoff current	$I_{EBO}$	$V_{EB} = -5\text{V}, I_C = 0$			-2	mA
Collector to emitter voltage	$V_{CEO}$	$I_C = -30\text{mA}, I_B = 0$	-60			V
Collector to emitter voltage			-80			
Forward current transfer ratio	$h_{FE1}$	$V_{CE} = -3\text{V}, I_C = -0.5\text{A}$	1000			
Forward current transfer ratio	$h_{FE2}^*$	$V_{CE} = -3\text{V}, I_C = -3\text{A}$	2000		10000	
Base to emitter voltage	$V_{BE}$	$V_{CE} = -3\text{V}, I_C = -3\text{A}$			-2.5	V
Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_C = -3\text{A}, I_B = -12\text{mA}$			-2	V
Collector to emitter saturation voltage		$I_C = -5\text{A}, I_B = -20\text{mA}$			-4	
Transition frequency	$f_T$	$V_{CE} = -10\text{V}, I_C = -0.5\text{A}, f = 1\text{MHz}$		15		MHz
Turn-on time	$t_{on}$	$I_C = -3\text{A}, I_{B1} = -12\text{mA}, I_{B2} = 12\text{mA}$		0.3		$\mu\text{s}$
Storage time	$t_{stg}$			2		$\mu\text{s}$
Fall time	$t_f$				0.5	$\mu\text{s}$

\* $h_{FE2}$  Rank classification

Rank	Q	P
$h_{FE2}$	2000 to 5000	4000 to 10000

Internal Connection



