



# 2SB1302

## Bipolar Transistor -20V, -5A, Low VCE(sat) PNP Single PCP

ON Semiconductor®

<http://onsemi.com>

### Applications

- DC-DC converters, motor drivers, relay drivers, lamp drivers

### Features

- Adoption of FBET, MBIT processes
- Large current capacity
- Ultrasmall size making it easy to provide high-density, small-sized hybrid IC's
- Low collector to emitter saturation voltage
- Fast switching speed

### Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector to Base Voltage	V <sub>CB0</sub>		-25	V
Collector to Emitter Voltage	V <sub>CE0</sub>		-20	V
Emitter to Base Voltage	V <sub>EB0</sub>		-5	V
Collector Current	I <sub>C</sub>		-5	A
Collector Current (Pulse)	I <sub>CP</sub>		-8	A

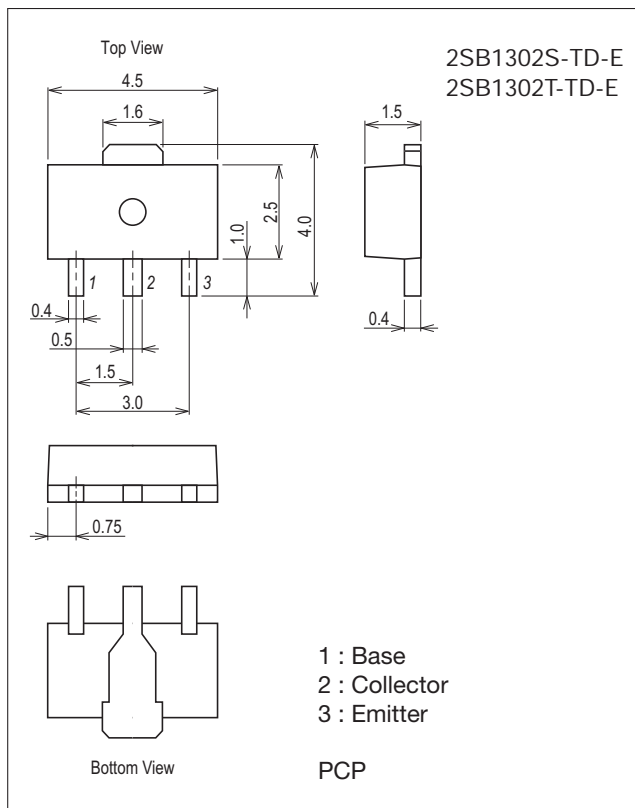
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Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

### Package Dimensions

unit : mm (typ)

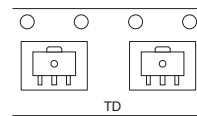
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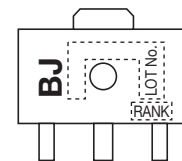
### Product & Package Information

- Package : PCP
- JEITA, JEDEC : SC-62, SOT-89, TO-243
- Minimum Packing Quantity : 1,000 pcs./reel

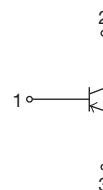
### Packing Type: TD



### Marking



### Electrical Connection



## 2SB1302

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Parameter	Symbol	Conditions	Ratings	Unit
Collector Dissipation	$P_C$	When mounted on ceramic substrate (250mm <sup>2</sup> ×0.8mm)	1.3	W
Junction Temperature	$T_j$		150	°C
Storage Temperature	$T_{stg}$		-55 to +150	°C

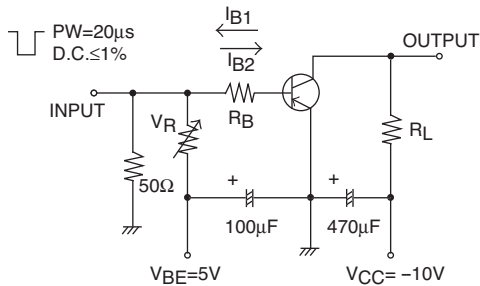
### Electrical Characteristics at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=-20\text{V}, I_E=0\text{A}$			-500	nA
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=-4\text{V}, I_C=0\text{A}$			-500	nA
DC Current Gain	$h_{FE1}$	$V_{CE}=-2\text{V}, I_C=-500\text{mA}$	140*		400*	
	$h_{FE2}$	$V_{CE}=-2\text{V}, I_C=-4\text{A}$	60			
Gain-Bandwidth Product	$f_T$	$V_{CE}=-5\text{V}, I_C=-200\text{mA}$		320		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=-10\text{V}, f=1\text{MHz}$		60		pF
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=-3\text{A}, I_B=-60\text{mA}$		-250	-500	mV
Base to Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=-3\text{A}, I_B=-60\text{mA}$		-1.0	-1.3	V
Collector to Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=-10\mu\text{A}, I_E=0\text{A}$	-25			V
Collector to Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=-1\text{mA}, R_{BE}=\infty$	-20			V
Emitter to Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=-10\mu\text{A}, I_C=0\text{A}$	-5			V
Turn-ON Time	$t_{on}$	See specified Test Circuit.		40		ns
Storage Time	$t_{stg}$			200		ns
Fall Time	$t_f$			10		ns

\* : 2SB1302 is classified by 500mA  $h_{FE}$  as follows :

Rank	S	T
$h_{FE}$	140 to 280	200 to 400

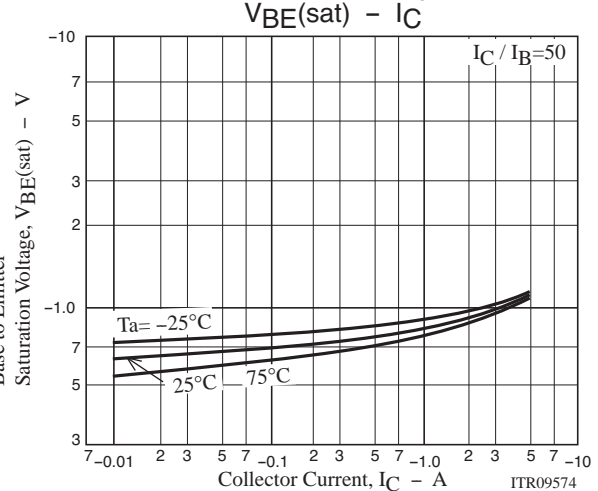
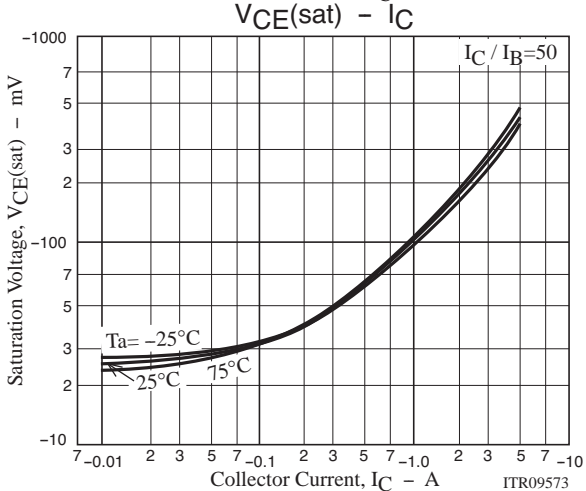
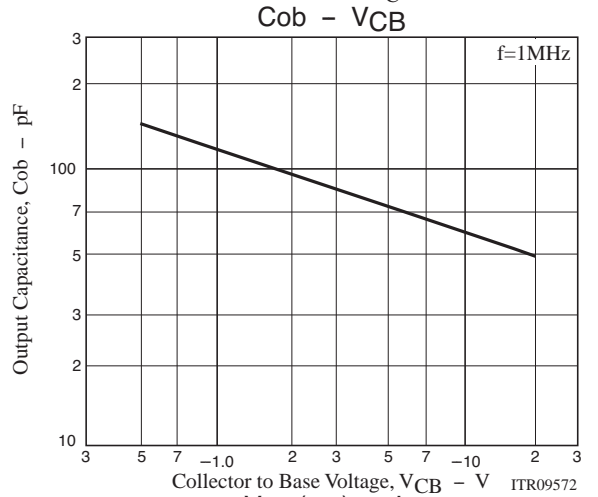
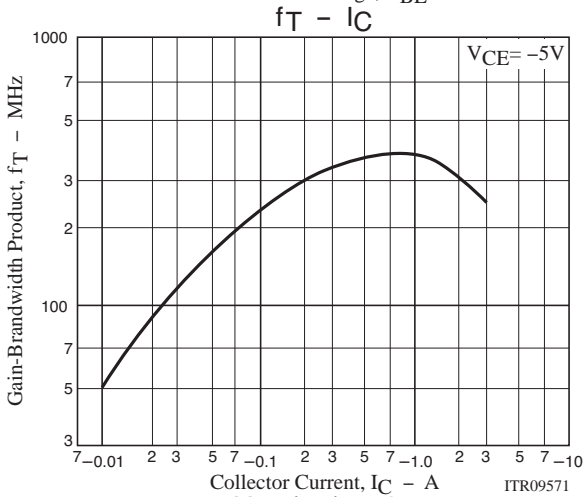
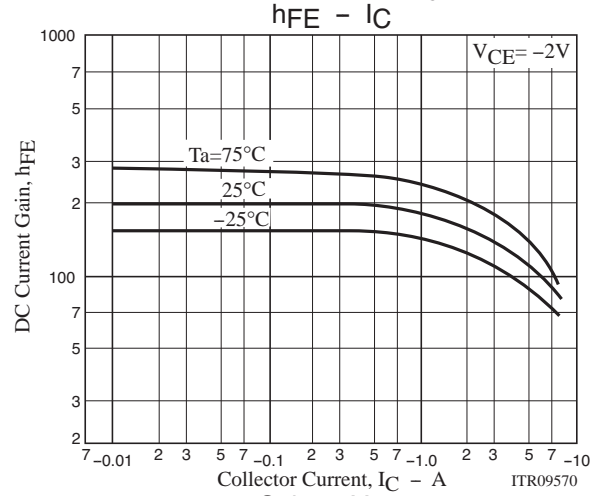
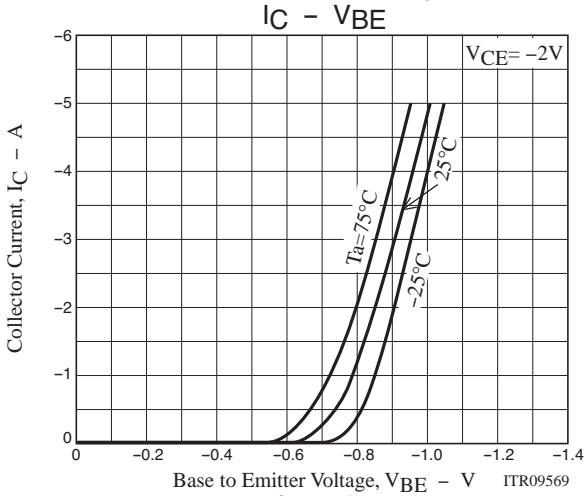
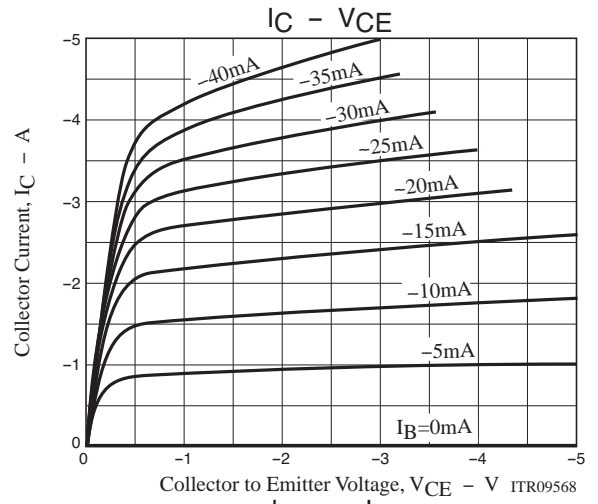
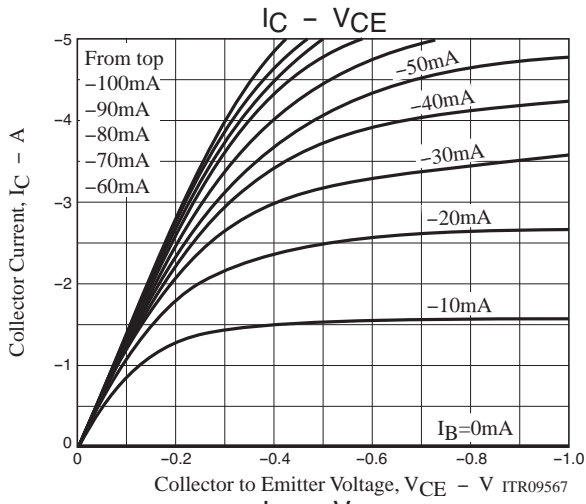
### Switching Time Test Circuit

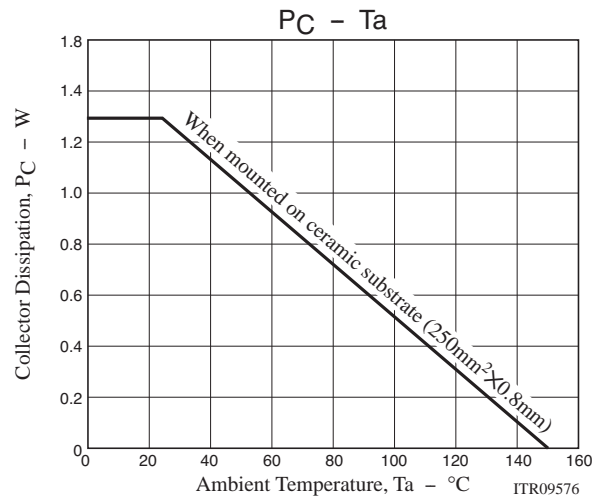
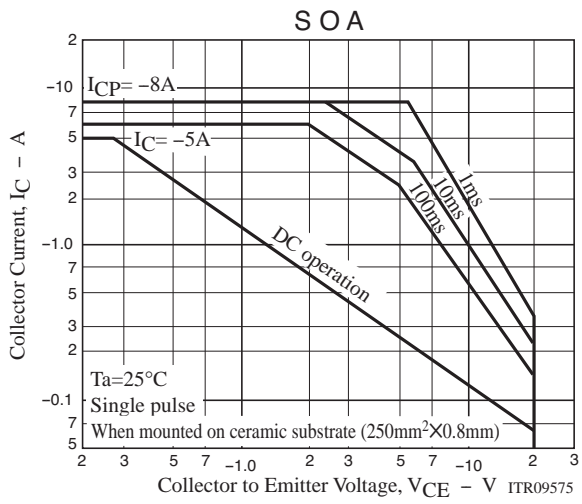


$$I_C = 10I_{B1} = -10I_{B2} = -2\text{A}$$

### Ordering Information

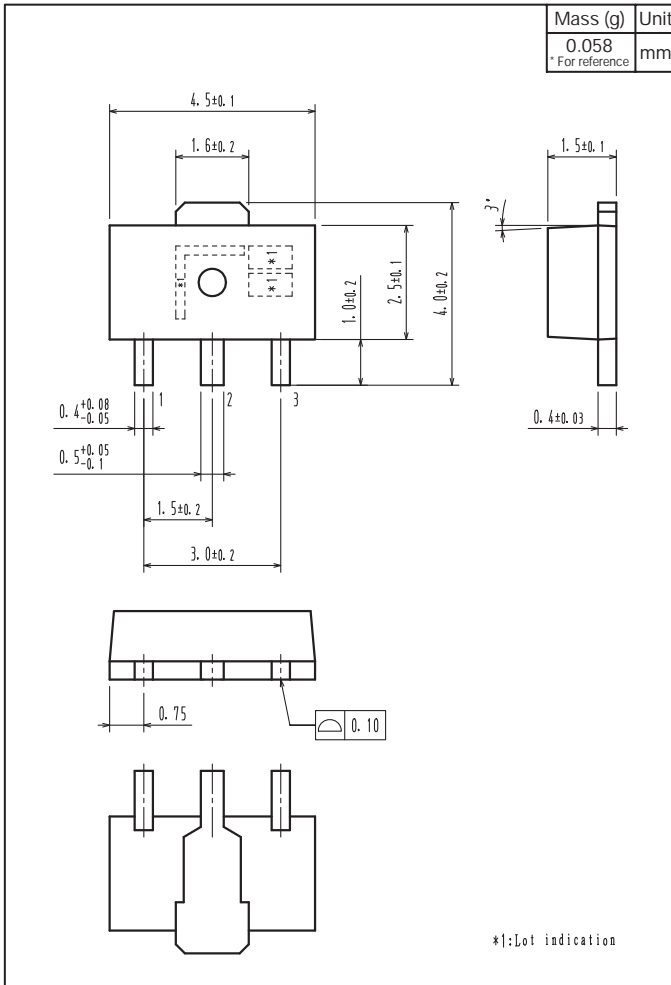
Device	Package	Shipping	memo
2SB1302S-TD-E	PCP	1,000pcs./reel	Pb Free
2SB1302T-TD-E	PCP	1,000pcs./reel	



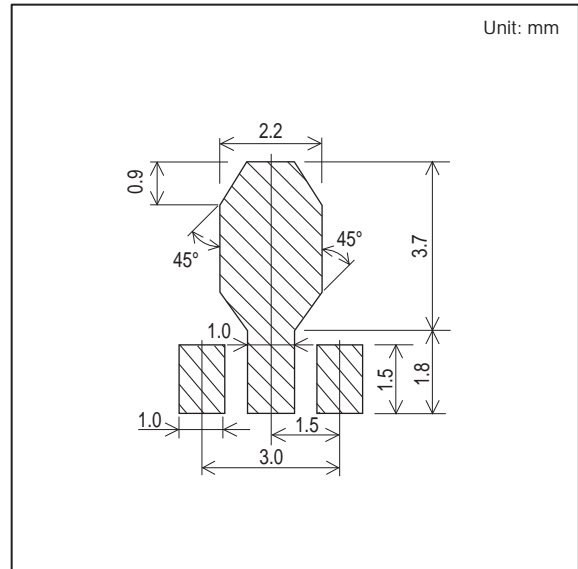


Outline Drawing

2SB1302S-TD-E, 2SB1302T-TD-E



Land Pattern Example



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