Ordering number : EN2555C

2SB1302

Bipolar Transisitor
−20V, −5A, Low V_{CE}(sat) PNP Single PCP

ON Semiconductor®
http://onsemi.com

Applicaitons
・ 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

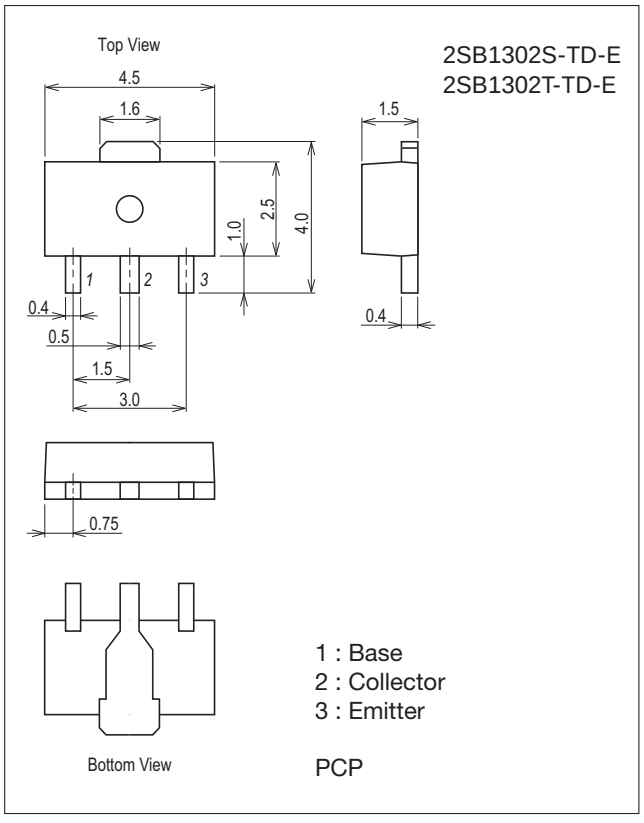
Specifications
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector to Base Voltage	V_{CBO}		−25	V
Collector to Emitter Voltage	V_{CEO}		−20	V
Emitter to Base Voltage	V_{EBO}		−5	V
Collector Current	I_C		−5	A
Collector Current (Pulse)	I_{CP}		−8	A

Continued on next page.

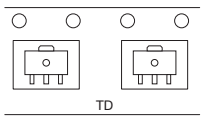
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Package Dimensions
unit : mm (typ)
7007B-004

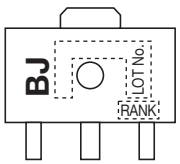


Product & Package Information
• Package : PCP
• JEITA, JEDEC : SC-62, SOT-89, TO-243
• Minimum Packing Quantity : 1,000 pcs./reel

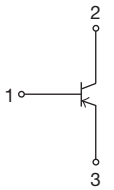
Packing Type: TD



Marking



Electrical Connection



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Parameter	Symbol	Conditions	Ratings	Unit
Collector Dissipation	P_C	When mounted on ceramic substrate (250mm^2×0.8mm)	1.3	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		−55 to +150	°C

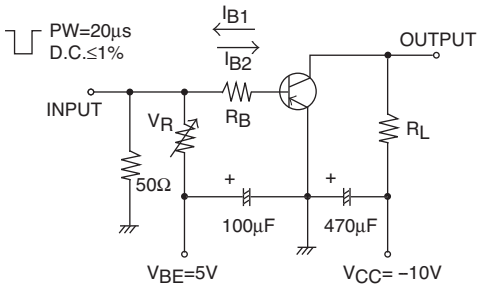
Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=−20V, I_E=0A			−500	nA
Emitter Cutoff Current	I_{EBO}	V_{EB}=−4V, I_C=0A			−500	nA
DC Current Gain	$h_{FE}1$	V_{CE}=−2V, I_C=−500mA	140*		400*	
	$h_{FE}2$	V_{CE}=−2V, I_C=−4A	60			
Gain-Bandwidth Product	f_T	V_{CE}=−5V, I_C=−200mA		320		MHz
Output Capacitance	Cob	V_{CB}=−10V, f=1MHz		60		pF
Collector to Emitter Saturation Voltage	V_{CE}(sat)	I_C=−3A, I_B=−60mA		−250	−500	mV
Base to Emitter Saturation Voltage	V_{BE}(sat)	I_C=−3A, I_B=−60mA		−1.0	−1.3	V
Collector to Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=−10μA, I_E=0A	−25			V
Collector to Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=−1mA, R_{BE}=∞	−20			V
Emitter to Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=−10μA, I_C=0A	−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

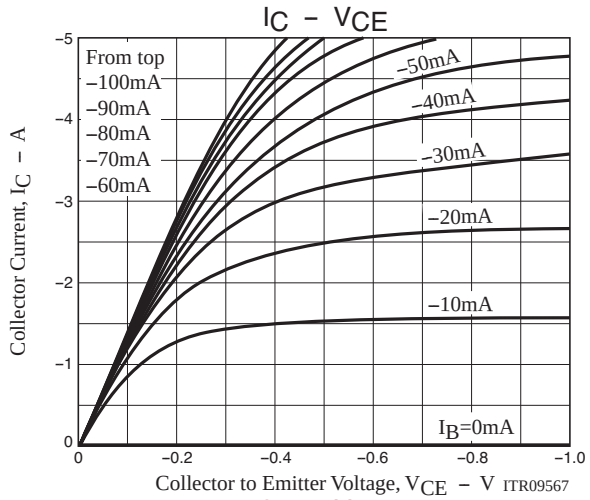
Switching Time Test Circuit

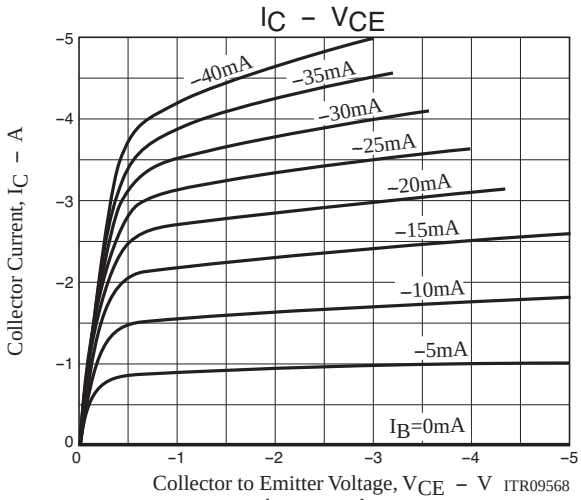


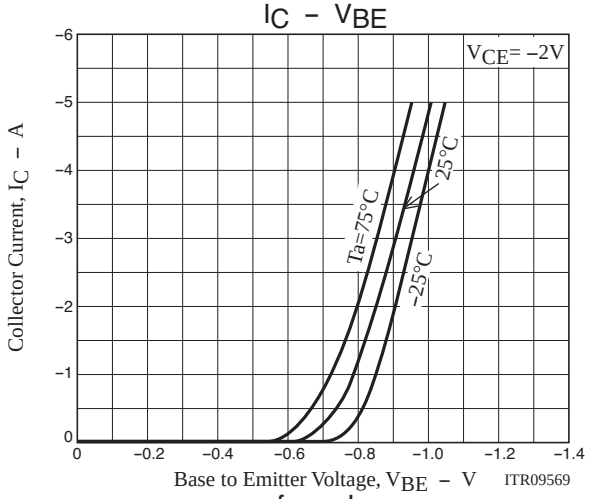
I_C=10I_{B1}= −10I_{B2}= −2A

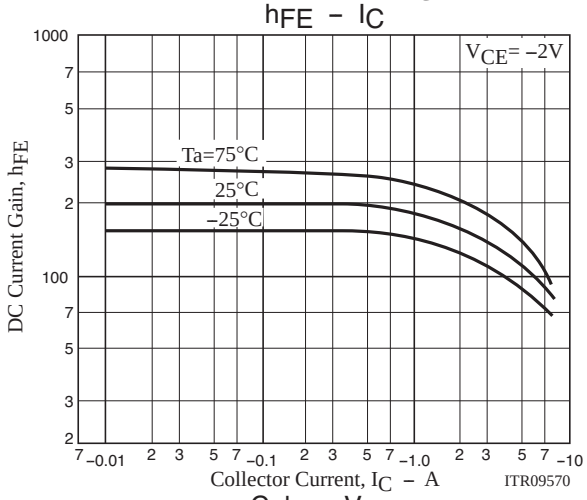
Ordering Information

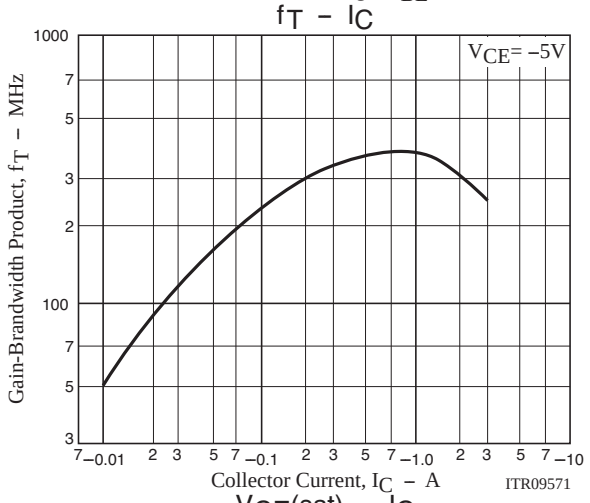
Device	Package	Shipping	memo
2SB1302S-TD-E	PCP	1,000pcs./reel	Pb Free
2SB1302T-TD-E	PCP	1,000pcs./reel	

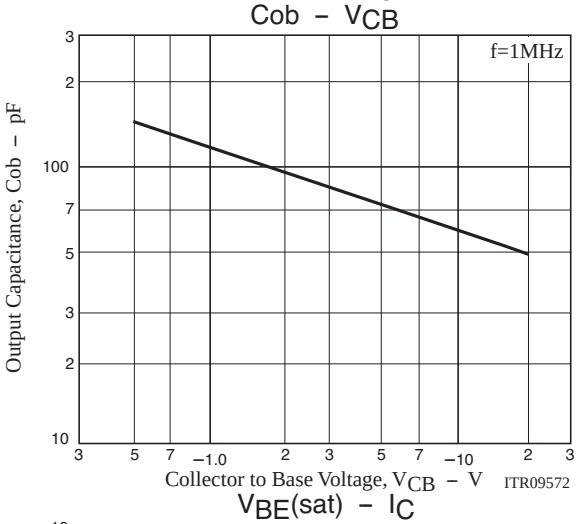

IC – VCE
From top
–100mA
–90mA
–80mA
–70mA
–60mA
–50mA
–40mA
–30mA
–20mA
–10mA
IB=0mA
Collector Current, IC – A
Collector to Emitter Voltage, VCE – V
ITR09567

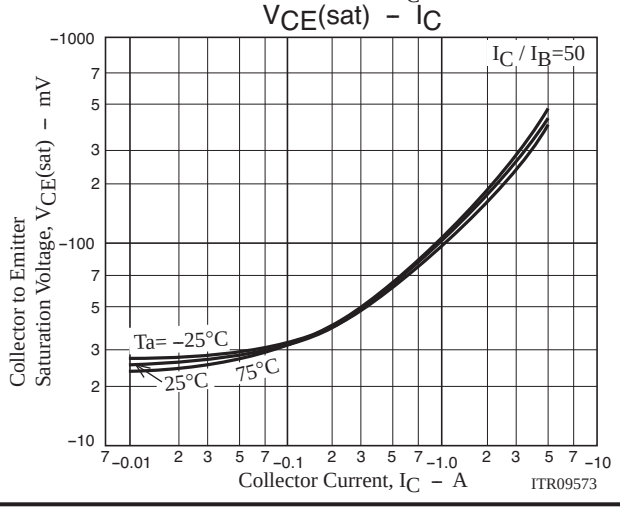

IC – VCE
–40mA
–35mA
–30mA
–25mA
–20mA
–15mA
–10mA
–5mA
IB=0mA
Collector Current, IC – A
Collector to Emitter Voltage, VCE – V
ITR09568

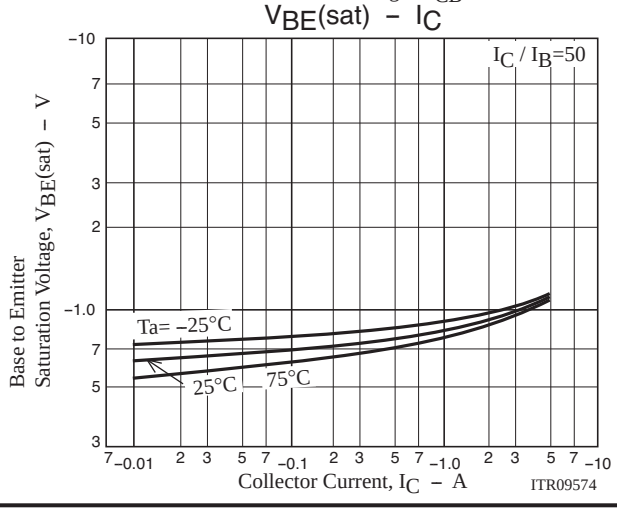

IC – VBE
VCE= –2V
Ta=75°C
25°C
–25°C
Collector Current, IC – A
Base to Emitter Voltage, VBE – V
ITR09569

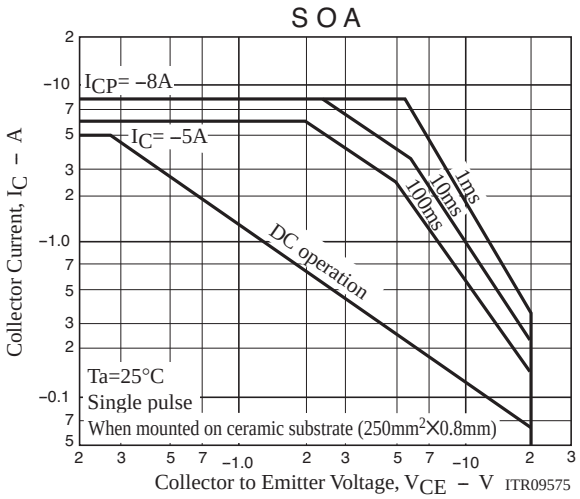

hFE – IC
VCE= –2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
ITR09570

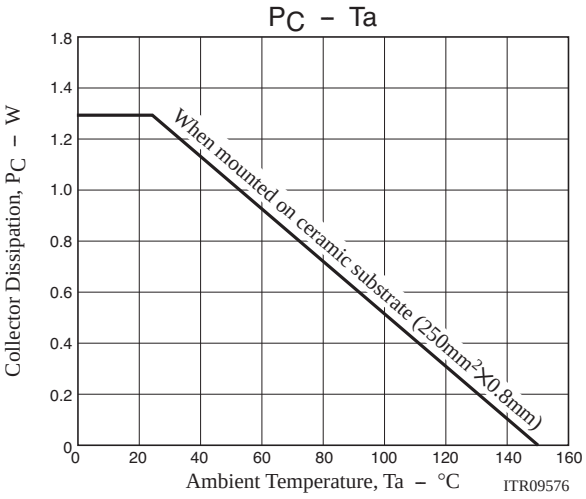

fT – IC
VCE= –5V
Gain-Brandwidth Product, fT – MHz
Collector Current, IC – A
ITR09571


Cob – VCB
f=1MHz
Output Capacitance, Cob – pF
Collector to Base Voltage, VCB – V
ITR09572


VCE(sat) – IC
IC / IB=50
Ta= –25°C
25°C
75°C
Collector to Emitter
Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
ITR09573

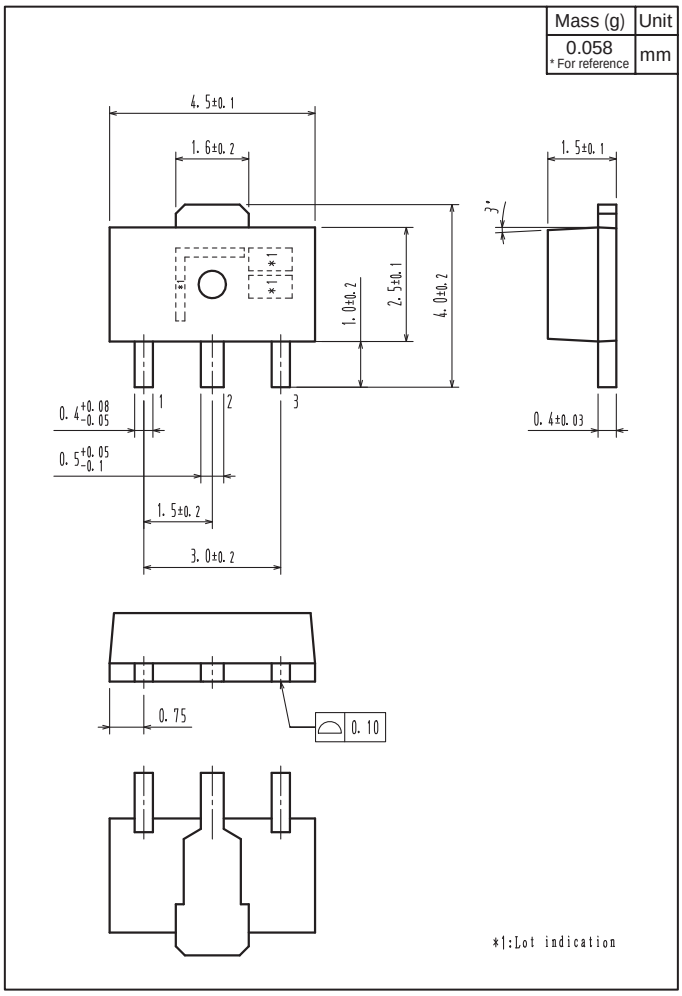

VBE(sat) – IC
IC / IB=50
Ta= –25°C
25°C
75°C
Base to Emitter
Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
ITR09574


S O A
Collector Current, I_C – A
I_{CP}= –8A
I_C= –5A
1ms
10ms
100ms
DC operation
Ta=25°C
Single pulse
When mounted on ceramic substrate (250mm²X0.8mm)
Collector to Emitter Voltage, V_{CE} – V
ITR09575


P_C – Ta
Collector Dissipation, P_C – W
When mounted on ceramic substrate (250mm²X0.8mm)
Ambient Temperature, Ta – °C
ITR09576

Outline Drawing

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



Land Pattern Example