

# BC307B

## Amplifier Transistors

### PNP Silicon

#### Features

- This is a Pb-Free Device\*

#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector – Emitter Voltage	$V_{CEO}$	-45	Vdc
Collector – Base Voltage	$V_{CBO}$	-50	Vdc
Emitter – Base Voltage	$V_{EBO}$	-5.0	Vdc
Collector Current – Continuous	$I_C$	-100	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	350 2.8	mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1.0 8.0	W mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to +150	$^\circ\text{C}$

#### THERMAL CHARACTERISTICS

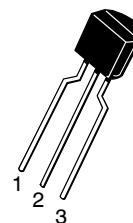
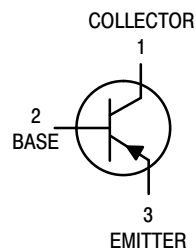
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	357	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	125	$^\circ\text{C}/\text{W}$

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.



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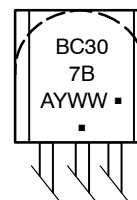
<http://onsemi.com>



TO-92  
CASE 29  
STYLE 17

BENT LEAD  
TAPE & REEL  
AMMO PACK

#### MARKING DIAGRAM



A = Assembly Location  
Y = Year  
WW = Work Week  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

Device	Package	Shipping†
BC307BRL1G	TO-92 (Pb-Free)	2000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

# BC307B

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector–Emitter Breakdown Voltage (I <sub>C</sub> = –2.0 mA <sub>dc</sub> , I <sub>B</sub> = 0)	V <sub>(BR)CEO</sub>	–45	–	–	V <sub>dc</sub>
Emitter–Base Breakdown Voltage (I <sub>E</sub> = –100 μA <sub>dc</sub> , I <sub>C</sub> = 0)	V <sub>(BR)EBO</sub>	–5.0	–	–	V <sub>dc</sub>
Collector–Emitter Leakage Current (V <sub>CE</sub> = –50 V, V <sub>BE</sub> = 0) (V <sub>CE</sub> = –50 V, V <sub>BE</sub> = 0) T <sub>A</sub> = 125°C	I <sub>CES</sub>	–	–0.2	–15	nA <sub>dc</sub> μA
–		–	–0.2	–4.0	
<b>ON CHARACTERISTICS</b>					
DC Current Gain (I <sub>C</sub> = –10 μA <sub>dc</sub> , V <sub>CE</sub> = –5.0 V <sub>dc</sub> ) (I <sub>C</sub> = –2.0 mA <sub>dc</sub> , V <sub>CE</sub> = –5.0 V <sub>dc</sub> ) (I <sub>C</sub> = –100 mA <sub>dc</sub> , V <sub>CE</sub> = –5.0 V <sub>dc</sub> )	h <sub>FE</sub>	– 200 –	150 290 180	– 460 –	–
Collector–Emitter Saturation Voltage (I <sub>C</sub> = –10 mA <sub>dc</sub> , I <sub>B</sub> = –0.5 mA <sub>dc</sub> ) (I <sub>C</sub> = –10 mA <sub>dc</sub> , I <sub>B</sub> = see Note 1) (I <sub>C</sub> = –100 mA <sub>dc</sub> , I <sub>B</sub> = –5.0 mA <sub>dc</sub> )	V <sub>CE(sat)</sub>	– – –	–0.10 –0.30 –0.25	–0.3 –0.6 –	V <sub>dc</sub>
Base–Emitter Saturation Voltage (I <sub>C</sub> = –10 mA <sub>dc</sub> , I <sub>B</sub> = –0.5 mA <sub>dc</sub> ) (I <sub>C</sub> = –100 mA <sub>dc</sub> , I <sub>B</sub> = –5.0 mA <sub>dc</sub> )	V <sub>BE(sat)</sub>	– –	–0.7 –1.0	– –	V <sub>dc</sub>
Base–Emitter On Voltage (I <sub>C</sub> = –2.0 mA <sub>dc</sub> , V <sub>CE</sub> = –5.0 V <sub>dc</sub> )	V <sub>BE(on)</sub>	–0.55	–0.62	–0.7	V <sub>dc</sub>
<b>DYNAMIC CHARACTERISTICS</b>					
Current–Gain–Bandwidth Product (I <sub>C</sub> = –10 mA <sub>dc</sub> , V <sub>CE</sub> = –5.0 V <sub>dc</sub> , f = 100 MHz)	f <sub>T</sub>	–	280	–	MHz
Common Base Capacitance (V <sub>CB</sub> = –10 V <sub>dc</sub> , I <sub>C</sub> = 0, f = 1.0 MHz)	C <sub>cbo</sub>	–	–	6.0	pF
Noise Figure (I <sub>C</sub> = –0.2 mA <sub>dc</sub> , V <sub>CE</sub> = –5.0 V <sub>dc</sub> , R <sub>S</sub> = 2.0 kΩ, f = 1.0 kHz)	NF	–	2.0	10	dB

1. I<sub>C</sub> = –10 mA<sub>dc</sub> on the constant base current characteristic, which yields the point I<sub>C</sub> = –11 mA<sub>dc</sub>, V<sub>CE</sub> = –1.0 V.

TYPICAL CHARACTERISTICS

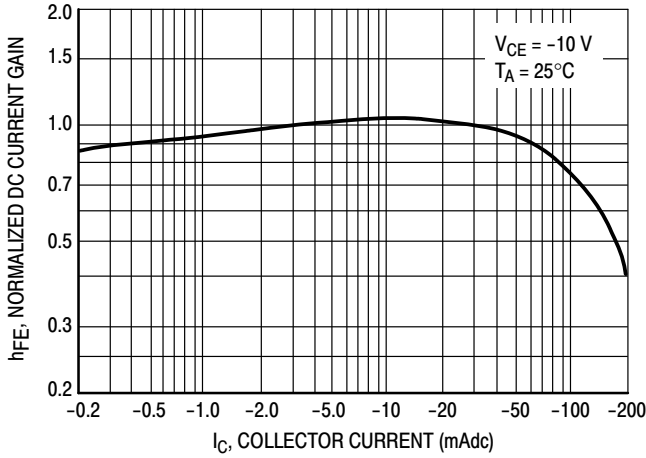


Figure 1. Normalized DC Current Gain

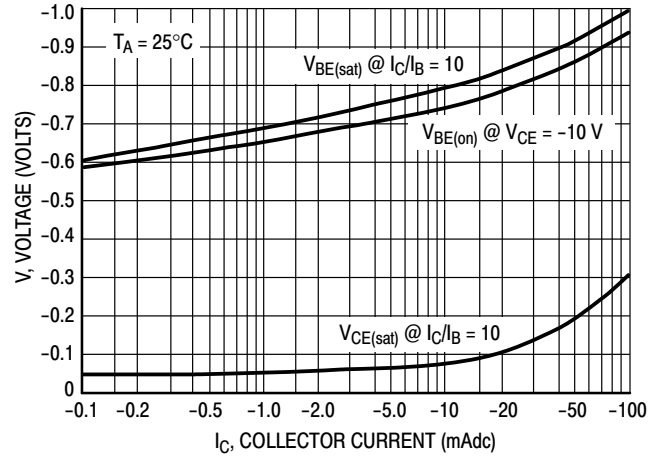


Figure 2. "Saturation" and "On" Voltages

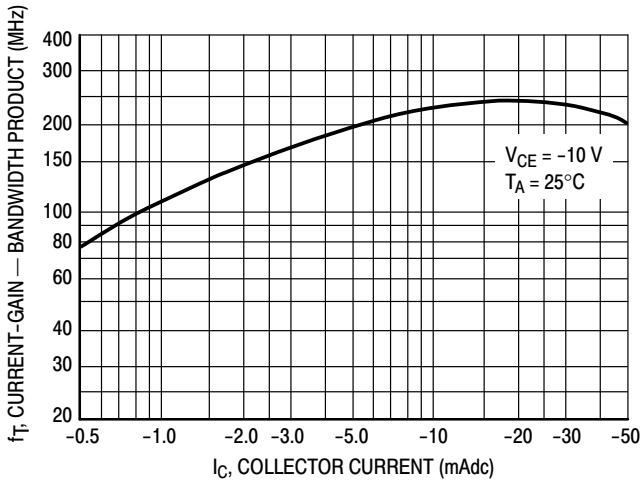


Figure 3. Current-Gain — Bandwidth Product

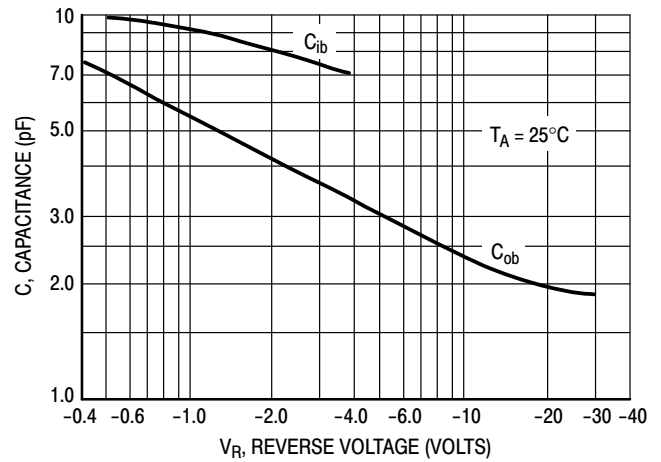


Figure 4. Capacitances

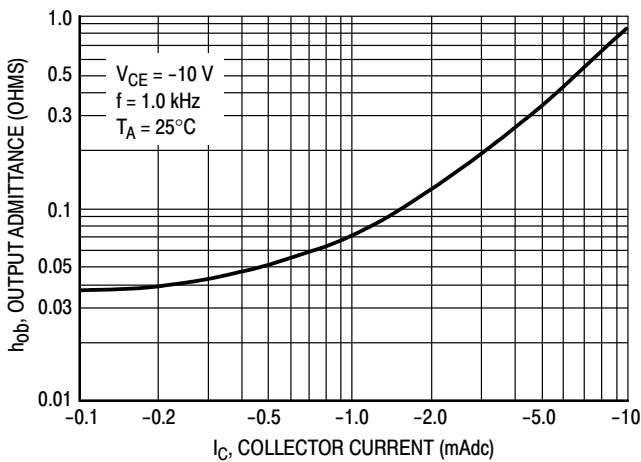


Figure 5. Output Admittance

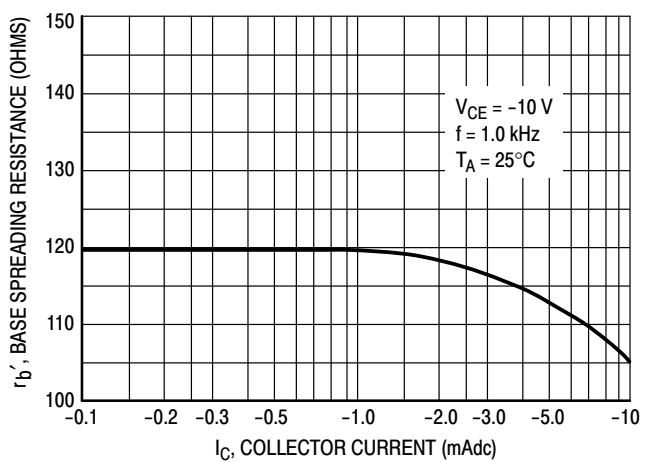
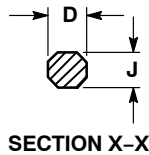
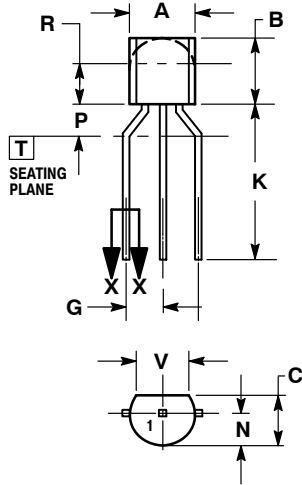


Figure 6. Base Spreading Resistance

# BC307B

## PACKAGE DIMENSIONS

TO-92 (TO-226)  
CASE 29-11  
ISSUE AM



**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	MILLIMETERS	
	MIN	MAX
A	4.45	5.20
B	4.32	5.33
C	3.18	4.19
D	0.40	0.54
G	2.40	2.80
J	0.39	0.50
K	12.70	---
N	2.04	2.66
P	1.50	4.00
R	2.93	---
V	3.43	---

**STYLE 17:**

1. COLLECTOR
2. BASE
3. EMITTER

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