

# BC307B, BC307C

## Amplifier Transistors

### PNP Silicon

#### Features

- Pb-Free Packages are Available\*

#### 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	$^\circ\text{C}$

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

#### THERMAL CHARACTERISTICS

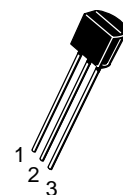
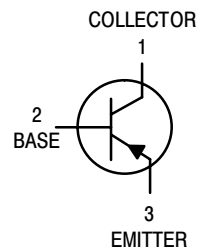
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	357	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	125	$^\circ\text{C}/\text{W}$

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



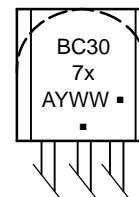
ON Semiconductor®

<http://onsemi.com>



TO-92  
CASE 29  
STYLE 17

#### MARKING DIAGRAM



BC307x = Device Code  
x = B or C  
A = Assembly Location  
Y = Year  
WW = Work Week  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

Device	Package	Shipping <sup>†</sup>
BC307B	TO-92	5000 Units / Box
BC307BG	TO-92 (Pb-Free)	5000 Units / Box
BC307BRL1	TO-92	2000 / Tape & Reel
BC307BRL1G	TO-92 (Pb-Free)	2000 / Tape & Reel
BC307BZL1	TO-92	2000 / Ammo Box
BC307BZL1G	TO-92 (Pb-Free)	2000 / Ammo Box
BC307C	TO-92	5000 Units / Box
BC307CG	TO-92 (Pb-Free)	5000 Units / Box

<sup>†</sup>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.

# BC307B, BC307C

## 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> S = –50 V, V <sub>BE</sub> = 0) (V <sub>CE</sub> S = –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

## ON CHARACTERISTICS

DC Current Gain (I <sub>C</sub> = –10 μA <sub>dc</sub> , V <sub>CE</sub> = –5.0 V <sub>dc</sub> )	h <sub>FE</sub>	–	150	–	–
BC307B BC307C		–	270	–	–
(I <sub>C</sub> = –2.0 mA <sub>dc</sub> , V <sub>CE</sub> = –5.0 V <sub>dc</sub> )	BC307	120	–	800	
	BC307B	200	290	460	
	BC307C	420	500	800	
(I <sub>C</sub> = –100 mA <sub>dc</sub> , V <sub>CE</sub> = –5.0 V <sub>dc</sub> )	BC307B	–	180	–	
	BC307C	–	300	–	
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>

## DYNAMIC CHARACTERISTICS

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.

# BC307B, BC307C

## TYPICAL CHARACTERISTICS

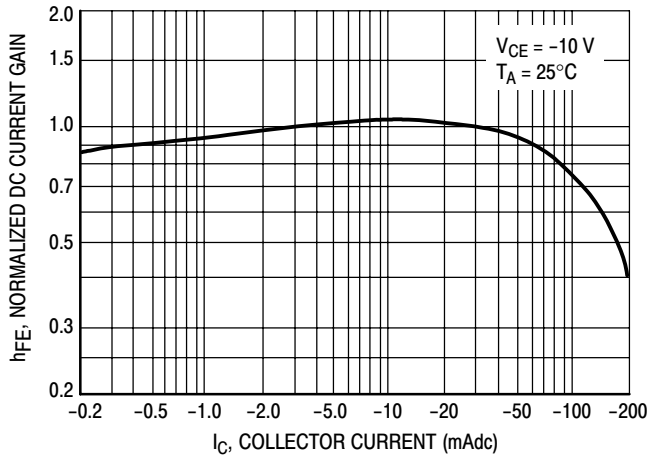


Figure 1. Normalized DC Current Gain

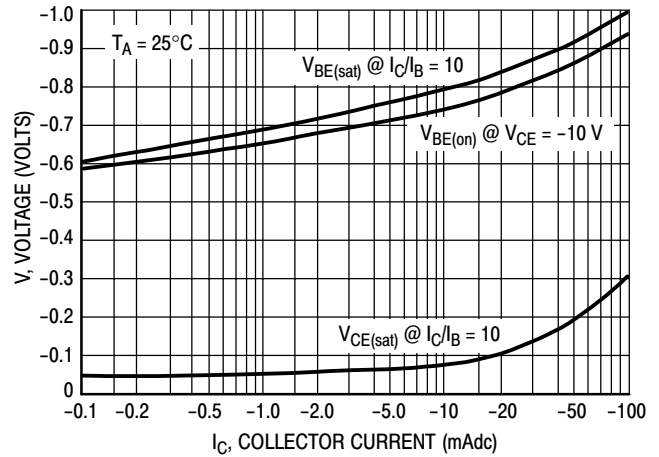


Figure 2. "Saturation" and "On" Voltages

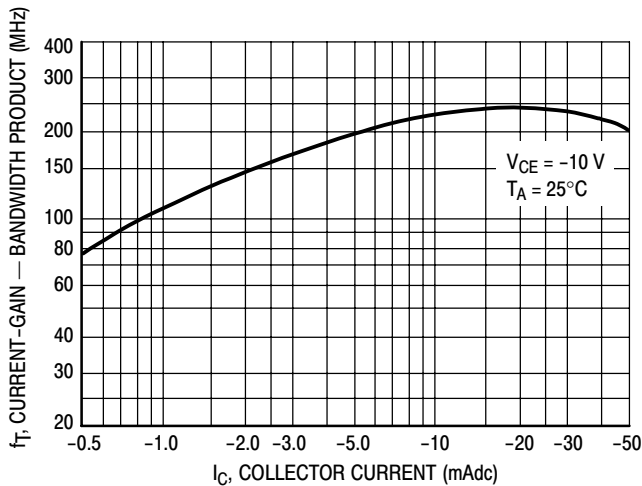


Figure 3. Current-Gain — Bandwidth Product

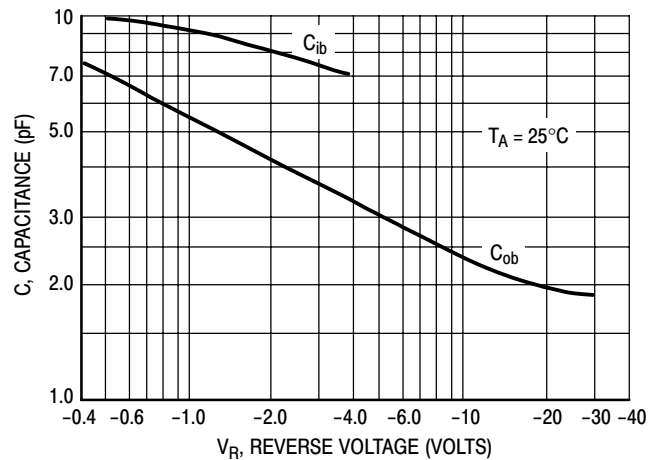


Figure 4. Capacitances

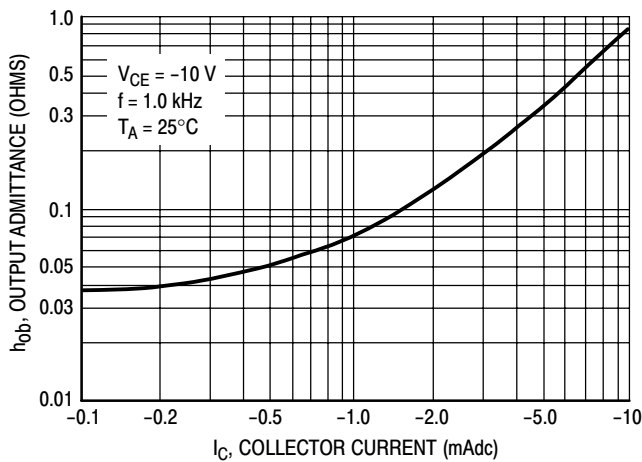


Figure 5. Output Admittance

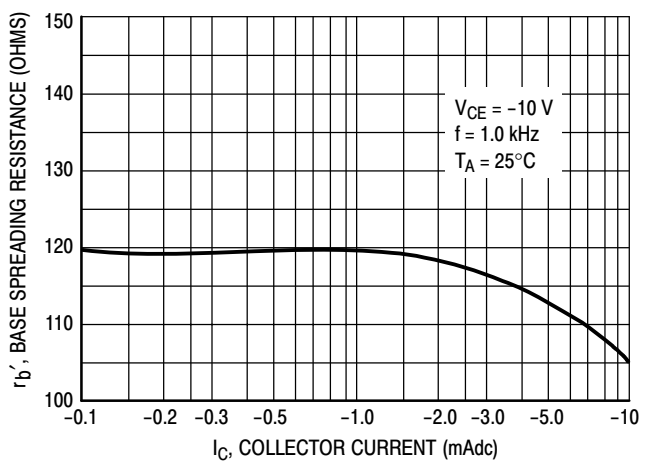
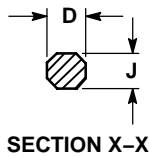
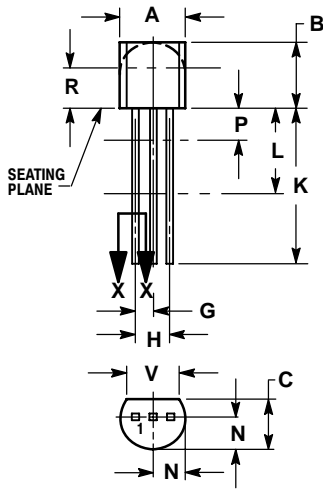


Figure 6. Base Spreading Resistance

# BC307B, BC307C

## PACKAGE DIMENSIONS

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



### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.021	0.407	0.533
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
K	0.500	---	12.70	---
L	0.250	---	6.35	---
N	0.080	0.105	2.04	2.66
P	---	0.100	---	2.54
R	0.115	---	2.93	---
V	0.135	---	3.43	---

### STYLE 17:

1. COLLECTOR
2. BASE
3. EMITTER

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**BC307/D**