# **Amplifier Transistors**

## **PNP Silicon**



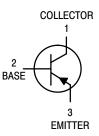
### http://onsemi.com

### **MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	VCEO	-45	Vdc
Collector-Base Voltage	VCBO	-50	Vdc
Emitter-Base Voltage	V <sub>EBO</sub>	-5.0	Vdc
Collector Current — Continuous	IC	-100	mAdc
Total Device Dissipation  @ T <sub>A</sub> = 25°C  Derate above 25°C	PD	350 2.8	mW mW/°C
Total Device Dissipation @ T <sub>C</sub> = 25°C Derate above 25°C	PD	1.0 8.0	Watts mW/°C
Operating and Storage Junction Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	–55 to +150	°C

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{ heta JA}$	357	°C/W
Thermal Resistance, Junction to Case	$R_{ heta JC}$	125	°C/W





CASE 29 TO-92 STYLE 17

### **ORDERING INFORMATION**

Device	Package	Shipping
BC307B	TO-92	5000 Units/Box
BC307BRL1	TO-92	2000/Tape & Reel
BC307BZL1	TO-92	2000/Ammo Pack
BC307C	TO-92	5000 Units/Box

## **ELECTRICAL CHARACTERISTICS** ( $T_A = 25^{\circ}C$ unless otherwise noted)

Characteristic		Symbol	Min	Тур	Max	Unit
OFF CHARACTERISTICS				1	•	1
Collector–Emitter Breakdown Voltage (I <sub>C</sub> = -2.0 mAdc, I <sub>B</sub> = 0)		V(BR)CEO	-45	_	_	Vdc
Emitter–Base Breakdown Voltage (I <sub>E</sub> = -100 μAdc, I <sub>C</sub> = 0)		V(BR)EBO	-5.0	_	_	Vdc
Collector–Emitter Leakage Current (VCES = -50 V, VBE = 0) (VCES = -50 V, VBE = 0) TA = 125°C		ICES	_	-0.2 -0.2	-15 -4.0	nAdc μA
ON CHARACTERISTICS				•		
DC Current Gain (I <sub>C</sub> = $-10 \mu$ Adc, V <sub>CE</sub> = $-5.0 V$ dc)	BC307B BC307C	hFE		150 270	_	_
$(I_C = -2.0 \text{ mAdc}, V_{CE} = -5.0 \text{ Vdc})$	BC307 BC307B BC307C		120 200 420	 290 500	800 460 800	
$(I_C = -100 \text{ mAdc}, V_{CE} = -5.0 \text{ Vdc})$	BC307B BC307C		<u>-</u>	180 300	_	
Collector–Emitter Saturation Voltage ( $I_C = -10$ mAdc, $I_B = -0.5$ mAdc) ( $I_C = -10$ mAdc, $I_B = \text{see Note 1}$ ) ( $I_C = -100$ mAdc, $I_B = -5.0$ mAdc)		VCE(sat)	_ _ _	-0.10 -0.30 -0.25	-0.3 -0.6 	Vdc
Base–Emitter Saturation Voltage ( $I_C = -100 \text{ mAdc}$ , $I_B = -0.5 \text{ mAdc}$ ) ( $I_C = -100 \text{ mAdc}$ , $I_B = -5.0 \text{ mAdc}$ )		VBE(sat)	_	-0.7 -1.0		Vdc
Base–Emitter On Voltage (I <sub>C</sub> = -2.0 mAdc, V <sub>CE</sub> = -5.0 Vdc)		V <sub>BE(on)</sub>	-0.55	-0.62	-0.7	Vdc
DYNAMIC CHARACTERISTICS		<u> </u>				
Current–Gain — Bandwidth Product (I <sub>C</sub> = -10 mAdc, V <sub>CE</sub> = -5.0 Vdc, f = 100 MHz)		fΤ	_	280	_	MHz
Common Base Capacitance (V <sub>CB</sub> = -10 Vdc, I <sub>C</sub> = 0, f = 1.0 MHz)		C <sub>cbo</sub>	_	_	6.0	pF
Noise Figure (I <sub>C</sub> = $-0.2$ mAdc, V <sub>CE</sub> = $-5.0$ Vdc, R <sub>S</sub> = $2.0$ k $\Omega$ , f = $1.0$ kHz)		NF	_	2.0	10	dB

<sup>1.</sup>  $I_C = -10$  mAdc on the constant base current characteristic, which yields the point  $I_C = -11$  mAdc,  $V_{CE} = -1.0$  V.

### **TYPICAL CHARACTERISTICS**

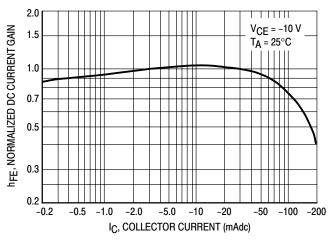


Figure 1. Normalized DC Current Gain

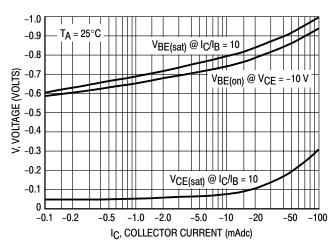


Figure 2. "Saturation" and "On" Voltages

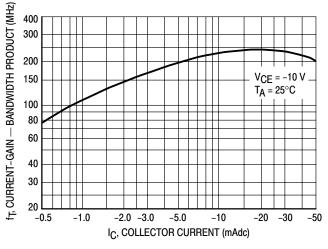


Figure 3. Current-Gain — Bandwidth Product

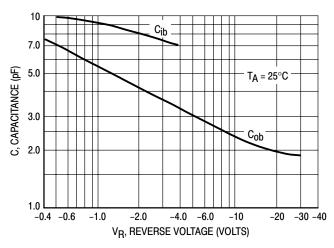


Figure 4. Capacitances

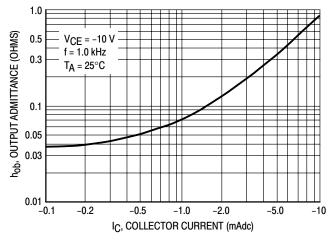


Figure 5. Output Admittance

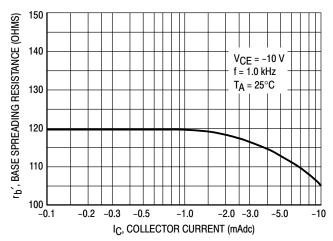
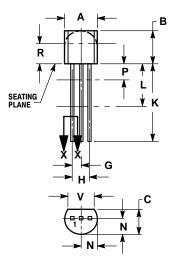


Figure 6. Base Spreading Resistance

#### PACKAGE DIMENSIONS

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





#### NOTES:

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

	INCHES		MILLIMETERS		
DIM	MIN	MAX	MIN	MAX	
Α	0.175	0.205	4.45	5.20	
В	0.170	0.210	4.32	5.33	
С	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	
Н	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:

PIN 1. COLLECTOR BASE EMITTER

ON Semiconductor and War are trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer.

#### **PUBLICATION ORDERING INFORMATION**

#### Literature Fulfillment:

Literature Distribution Center for ON Semiconductor P.O. Box 5163, Denver, Colorado 80217 USA

Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada

Email: ONlit@hibbertco.com

N. American Technical Support: 800-282-9855 Toll Free USA/Canada

JAPAN: ON Semiconductor, Japan Customer Focus Center 4-32-1 Nishi-Gotanda, Shinagawa-ku, Tokyo, Japan 141-0031

Phone: 81-3-5740-2700 Email: r14525@onsemi.com

ON Semiconductor Website: http://onsemi.com

For additional information, please contact your local

Sales Representative.