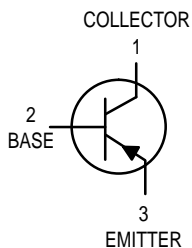
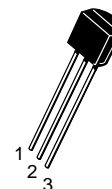


# Amplifier Transistors

## PNP Silicon



**BC307,B,C**  
**BC308C**  
**BC309B**



CASE 29-04, STYLE 17  
TO-92 (TO-226AA)

### MAXIMUM RATINGS

Rating	Symbol	BC 307	BC 308C	BC 309	Unit
Collector–Emitter Voltage	$V_{CEO}$	-45	-25	-25	Vdc
Collector–Base Voltage	$V_{CBO}$	-50	-30	-30	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			mW
		2.8			mW/°C
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1.0			Watts
		8.0			mW/°C
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to +150			°C

### THERMAL CHARACTERISTICS

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

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

Characteristic	Symbol	Min	Typ	Max	Unit
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### OFF CHARACTERISTICS

Collector–Emitter Breakdown Voltage ( $I_C = -2.0$ mAdc, $I_B = 0$ )	BC307 BC308C BC309B	$V_{(BR)CEO}$	-45 -25 -25	— — —	— — —	Vdc
Emitter–Base Breakdown Voltage ( $I_E = -100$ $\mu$ Adc, $I_C = 0$ )	BC307 BC308C BC309B	$V_{(BR)EBO}$	-5.0 -5.0 -5.0	— — —	— — —	Vdc
Collector–Emitter Leakage Current ( $V_{CES} = -50$ V, $V_{BE} = 0$ ) ( $V_{CES} = -30$ V, $V_{BE} = 0$ )	BC307 BC308C BC309B	$I_{CES}$	— — —	-0.2 -0.2 -0.2	-15 -15 -15	nAdc
( $V_{CES} = -50$ V, $V_{BE} = 0$ ) $T_A = 125^\circ\text{C}$	BC307		—	-0.2	-4.0	$\mu$ A
( $V_{CES} = -30$ V, $V_{BE} = 0$ ) $T_A = 125^\circ\text{C}$	BC308C BC309B		— —	-0.2 -0.2	-4.0 -4.0	

**BC307,B,C BC308C BC309B**
**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted) (Continued)

Characteristic		Symbol	Min	Typ	Max	Unit
<b>ON CHARACTERISTICS</b>						
DC Current Gain ( $I_C = -10 \mu\text{A}$ , $V_{CE} = -5.0 \text{ Vdc}$ )	BC307B/309B	$h_{FE}$	—	150	—	—
	BC307C/308C		—	270	—	—
	BC307		120	—	800	—
	BC308C		120	—	800	—
( $I_C = -2.0 \text{ mA}$ , $V_{CE} = -5.0 \text{ Vdc}$ )	BC307B/309B	200	290	460	—	
	BC307C/308C	420	500	800	—	
( $I_C = -100 \text{ mA}$ , $V_{CE} = -5.0 \text{ Vdc}$ )	BC307B/309B	—	180	—	—	
	BC307C/308C	—	300	—	—	
Collector–Emitter Saturation Voltage ( $I_C = -10 \text{ mA}$ , $I_B = -0.5 \text{ mA}$ ) ( $I_C = -10 \text{ mA}$ , $I_B = \text{see Note 1}$ ) ( $I_C = -100 \text{ mA}$ , $I_B = -5.0 \text{ mA}$ )		$V_{CE(\text{sat})}$	—	-0.10	-0.3	Vdc
			—	-0.30	-0.6	
			—	-0.25	—	
Base–Emitter Saturation Voltage ( $I_C = -10 \text{ mA}$ , $I_B = -0.5 \text{ mA}$ ) ( $I_C = -100 \text{ mA}$ , $I_B = -5.0 \text{ mA}$ )		$V_{BE(\text{sat})}$	—	-0.7	—	Vdc
			—	-1.0	—	
Base–Emitter On Voltage ( $I_C = -2.0 \text{ mA}$ , $V_{CE} = -5.0 \text{ Vdc}$ )		$V_{BE(\text{on})}$	-0.55	-0.62	-0.7	Vdc
<b>DYNAMIC CHARACTERISTICS</b>						
Current–Gain — Bandwidth Product ( $I_C = -10 \text{ mA}$ , $V_{CE} = -5.0 \text{ Vdc}$ , $f = 100 \text{ MHz}$ )	BC307	$f_T$	—	280	—	MHz
	BC308C		—	320	—	
	BC309B		—	360	—	
Common Base Capacitance ( $V_{CB} = -10 \text{ Vdc}$ , $I_C = 0$ , $f = 1.0 \text{ MHz}$ )		$C_{cbo}$	—	—	6.0	pF
Noise Figure ( $I_C = -0.2 \text{ mA}$ , $V_{CE} = -5.0 \text{ Vdc}$ , $R_S = 2.0 \text{ k}\Omega$ , $f = 1.0 \text{ kHz}$ ) ( $I_C = -0.2 \text{ mA}$ , $V_{CE} = -5.0 \text{ Vdc}$ , $R_S = 2.0 \text{ k}\Omega$ , $f = 1.0 \text{ kHz}$ , $f = 200 \text{ Hz}$ )	BC309	NF	—	2.0	4.0	dB
	BC307		—	2.0	10	
	BC308C		—	2.0	10	
	BC309B		—	2.0	4.0	

1.  $I_C = -10 \text{ mA}$  on the constant base current characteristic, which yields the point  $I_C = -11 \text{ mA}$ ,  $V_{CE} = -1.0 \text{ V}$ .

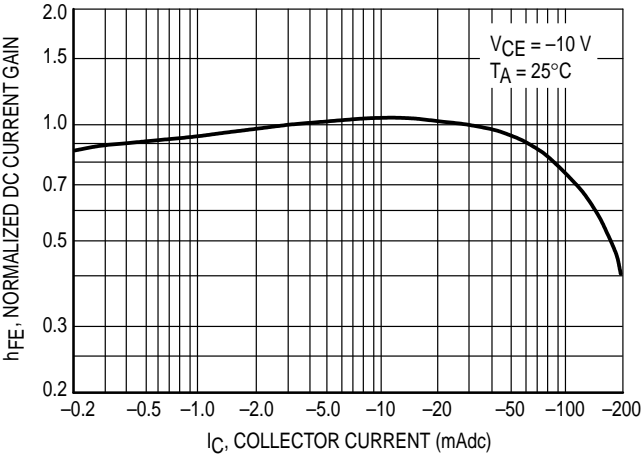


Figure 1. Normalized DC Current Gain

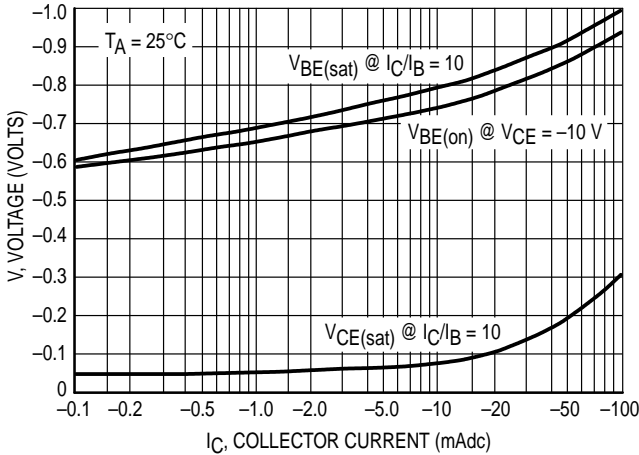


Figure 2. "Saturation" and "On" Voltages

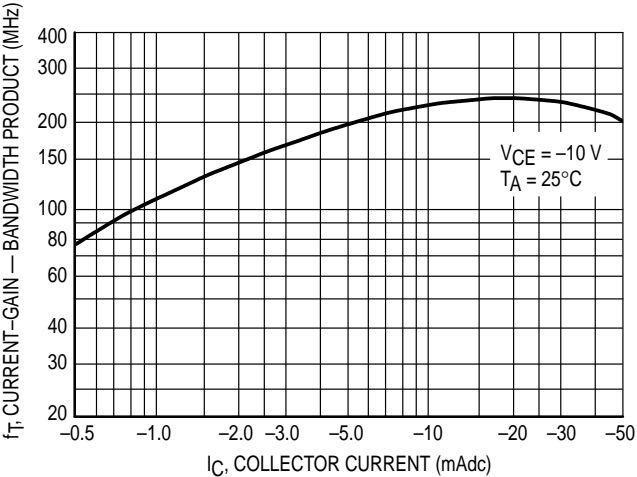


Figure 3. Current-Gain — Bandwidth Product

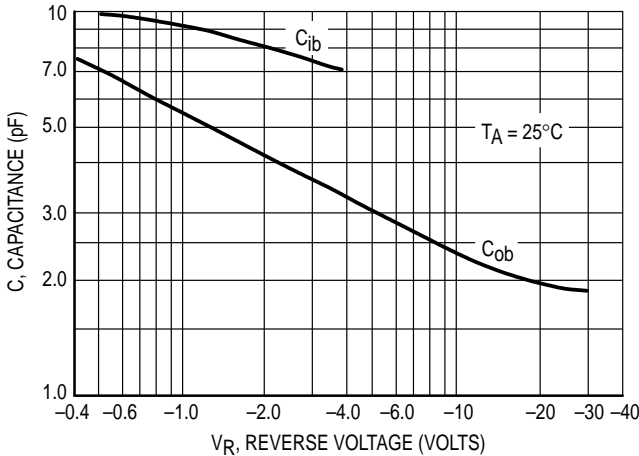


Figure 4. Capacitances

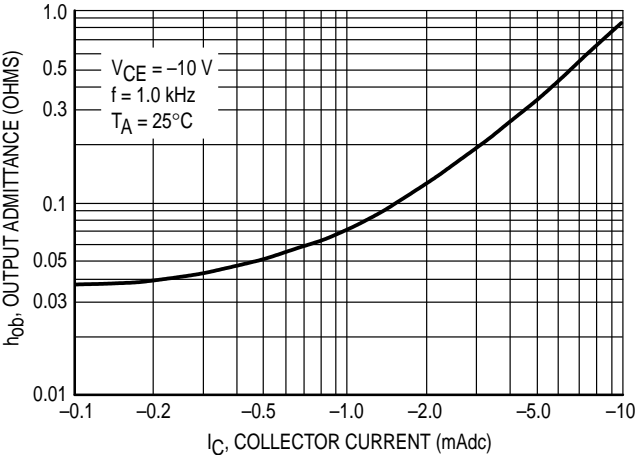


Figure 5. Output Admittance

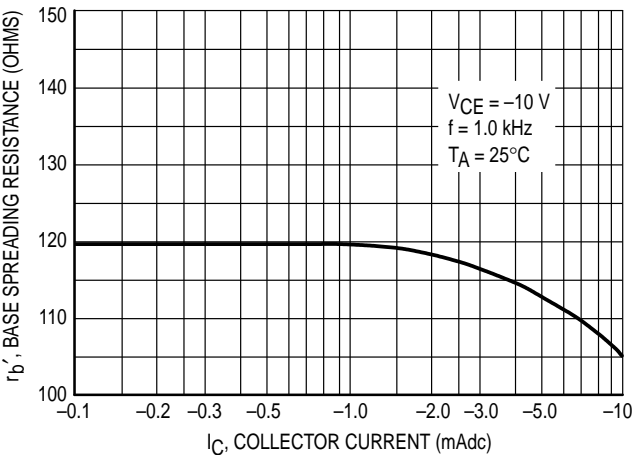


Figure 6. Base Spreading Resistance

PACKAGE DIMENSIONS



CASE 029-04  
(TO-226AA)  
ISSUE AD

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. DIMENSION F APPLIES BETWEEN P AND L. DIMENSION D AND J APPLY BETWEEN L AND K. MINIMUM 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	0.022	0.41	0.55
F	0.016	0.019	0.41	0.48
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:

- PIN 1. COLLECTOR
2. BASE
3. EMITTER

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