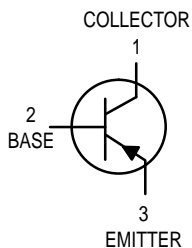


Amplifier Transistors

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°C	P_D	350			mW
		2.8			mW/°C
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°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 ($I_E = -100$ μ 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	μ 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
ON CHARACTERISTICS					
DC Current Gain ($I_C = -10\ \mu\text{Adc}$, $V_{CE} = -5.0\ \text{Vdc}$)	BC307B/309B BC307C/308C	h_{FE}	— —	150 270	— —
($I_C = -2.0\ \text{mAdc}$, $V_{CE} = -5.0\ \text{Vdc}$)	BC307 BC308C	120 120	— —	800 800	
($I_C = -100\ \text{mAdc}$, $V_{CE} = -5.0\ \text{Vdc}$)	BC307B/309B BC307C/308C	200 420	290 500	460 800	
	BC307B/309B BC307C/308C	— —	180 300	— —	
Collector–Emitter Saturation Voltage ($I_C = -10\ \text{mAdc}$, $I_B = -0.5\ \text{mAdc}$) ($I_C = -10\ \text{mAdc}$, $I_B = \text{see Note 1}$) ($I_C = -100\ \text{mAdc}$, $I_B = -5.0\ \text{mAdc}$)		$V_{CE(\text{sat})}$	— — —	-0.10 -0.30 -0.25	-0.3 -0.6 —
Base–Emitter Saturation Voltage ($I_C = -10\ \text{mAdc}$, $I_B = -0.5\ \text{mAdc}$) ($I_C = -100\ \text{mAdc}$, $I_B = -5.0\ \text{mAdc}$)		$V_{BE(\text{sat})}$	— —	-0.7 -1.0	— —
Base–Emitter On Voltage ($I_C = -2.0\ \text{mAdc}$, $V_{CE} = -5.0\ \text{Vdc}$)		$V_{BE(\text{on})}$	-0.55	-0.62	-0.7
DYNAMIC CHARACTERISTICS					
Current–Gain — Bandwidth Product ($I_C = -10\ \text{mAdc}$, $V_{CE} = -5.0\ \text{Vdc}$, $f = 100\ \text{MHz}$)	BC307 BC308C BC309B	f_T	— — —	280 320 360	— — —
Common Base Capacitance ($V_{CB} = -10\ \text{Vdc}$, $I_C = 0$, $f = 1.0\ \text{MHz}$)		C_{cbo}	—	—	6.0
Noise Figure ($I_C = -0.2\ \text{mAdc}$, $V_{CE} = -5.0\ \text{Vdc}$, $R_S = 2.0\ \text{k}\Omega$, $f = 1.0\ \text{kHz}$) ($I_C = -0.2\ \text{mAdc}$, $V_{CE} = -5.0\ \text{Vdc}$, $R_S = 2.0\ \text{k}\Omega$, $f = 1.0\ \text{kHz}$, $f = 200\ \text{Hz}$)	BC309 BC307 BC308C BC309B	NF	— — — —	2.0 2.0 2.0 2.0	4.0 10 10 4.0

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

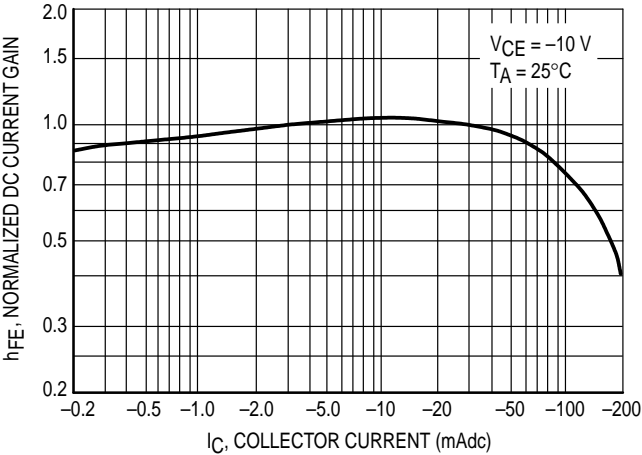


Figure 1. Normalized DC Current Gain

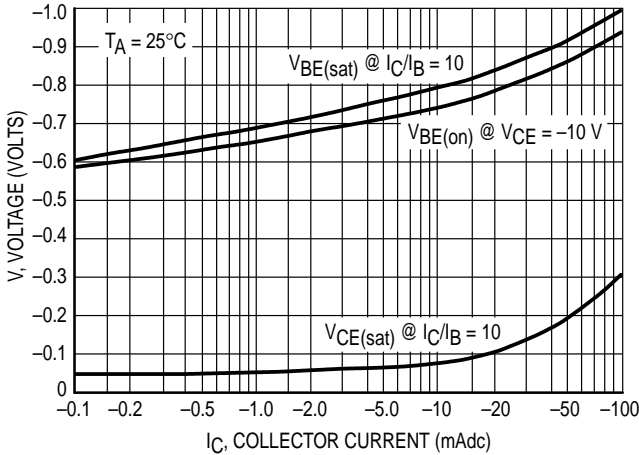


Figure 2. "Saturation" and "On" Voltages

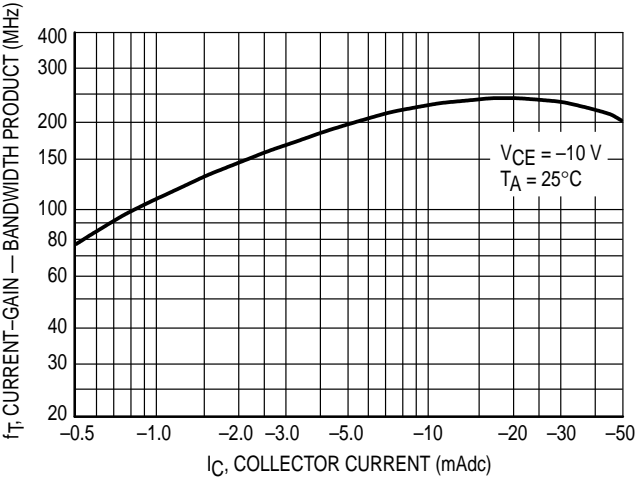


Figure 3. Current-Gain — Bandwidth Product

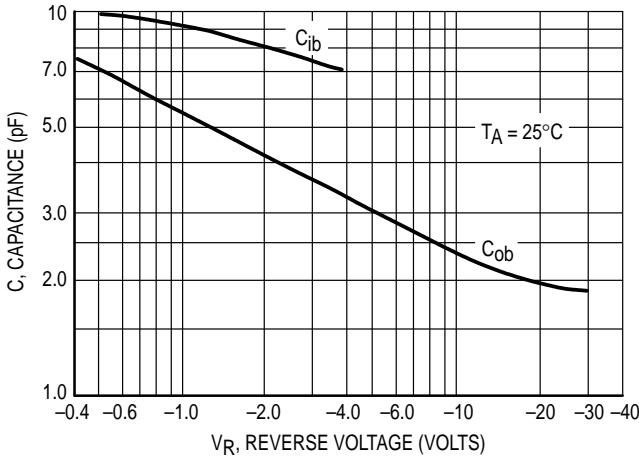


Figure 4. Capacitances

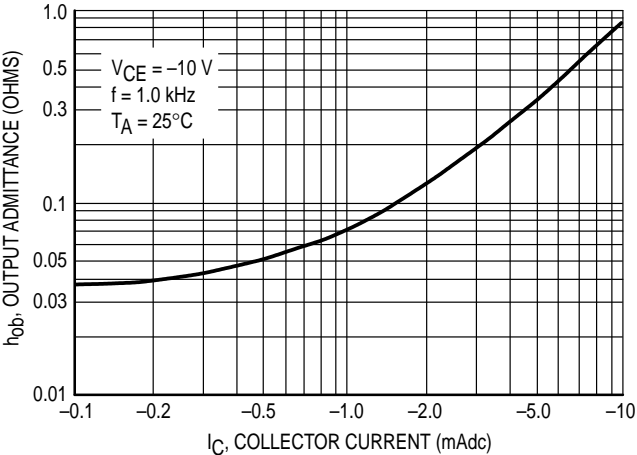


Figure 5. Output Admittance

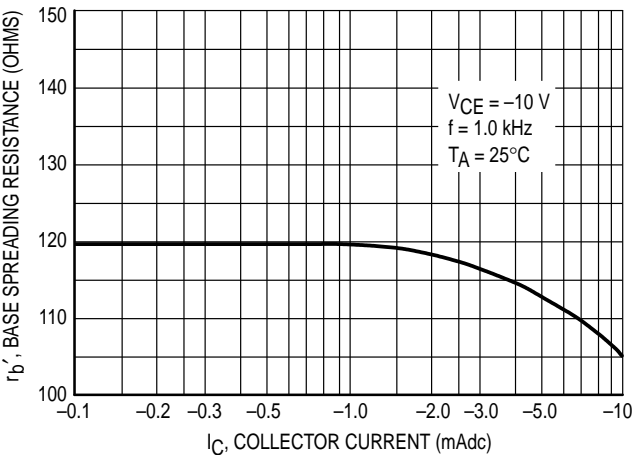


Figure 6. Base Spreading Resistance

PACKAGE DIMENSIONS



- 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	—

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

- STYLE 17:
1. COLLECTOR
 2. BASE
 3. EMITTER

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