BC307
BC308
BC309

CASE 29-02, STYLE 17
TO-92 (TO-226AA)

AMPLIFIER TRANSISTORS

PNP SILICON

MAXIMUM RATINGS

Rating	Symbol	BC 307	BC 308	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°C Derate above 25°C	P_D		350 2.8		mW mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D		1.0 B.0		Watt 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 Case	$R_{\theta JC}$	125	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JC}$	357	°C/W

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Type	Symbol	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Collector-Emitter Breakdown Voltage (I_C = 2.0 mAdc, I_B = 0)	BC307 BC308 BC309	$V_{(BR)CEO}$	45 25 25	— — —	— — —	Vdc
Emitter-Base Breakdown Voltage (I_E = 100 μAdc, I_C = 0)	BC307 BC30B BC309	$V_{(BR)EBO}$	5 5 5	— — —	— — —	Vdc Vdc
Collector-Emitter Leakage Current (V_{CES} = 50 V, V_{BE} = 0) (V_{CES} = 30 V, V_{BE} = 0) (V_{CES} = 50 V, V_{BE} = 0) T_A = 125°C (V_{CES} = 30 V, V_{BE} = 0) T_A = 125°C	 BC307 BC30B BC309 BC307 BC308 BC309	I_{CES}		 0.2 0.2 0.2 0.2 0.2 0.2	 15 15 15 4.0 4.0 4.0	nA μA
ON CHARACTERISTICS						
DC Current Gain (I_C = 10 μAdc, V_{CE} = 5 Vdc) (I_C = 2 mAdc, V_{CE} = 5 Vdc) (I_C = 100 mAdc, V_{CE} = 5 Vdc) 	 BC307A/30BA/309A BC307B/30BB/309B BC307C/30BC/309C BC307 BC30B BC309 BC307A/30BA/309A BC307B/30BB/309B BC307C/30BC/309C BC307A/30BA/309A BC307B/30BB/309B BC307C/30BC/309C	h_{FE}	 — — — 120 120 120 120 1B0 3B0 — — —	 90 150 270 — — — 170 290 500 120 180 300	 — — — B00 800 800 220 460 B00 — — —	
Collector-Emitter Saturation Voltage (I_C = 10 mAdc, I_B = 0,5 mAdc) (I_C = 10 mAdc, I_B = see Note 1) (I_C = 100 mAdc, I_B = 5 mAdc)		$V_{CE(sat)}$	 — — —	 0.10 0.30 0.25	 0.30 0.60 —	Vdc
Base-Emitter Saturation Voltage (I_C = 10 mAdc, I_B = 0.5 mAdc) (I_C = 100 mAdc, I_B = 5 mAdc)		$V_{BE(sat)}$	 — —	 0.70 1.00	 — —	Vdc
Base-Emitter on Voltage (I_C = 2 mAdc, V_{CE} = 5 Vdc)		$V_{BE(on)}$	 0.55	 0.62	 0.70	Vdc

Note 1: I_C = 10 mAdc on the constant base current characteristic, which yields the point I_C = 11 mAdc, V_{CE} = 1 V

ELECTRICAL CHARACTERISTICS (continued) (T_A = 25°C unless otherwise noted)

Characteristic	Type	Symbol	Min.	Typ.	Max.	Unit
DYNAMIC CHARACTERISTICS						
Current-Gain Bandwidth Product (I_C = 10 mAdc, V_{CE} = 5 Vdc, f = 50 MHz)	BC307	f_T	—	280	—	MHz
	BC308		—	320	—	
	BC309		—	360	—	
Collector-Base Capacitance (V_{CB} = 10 Vdc, I_C = 0, f = 1 MHz)		C_{cbo}	—	—	6.0	pF
Noise Figure (I_C = 0.2 mAdc, V_{CE} = 5 Vdc, R_S = 2 Kohms, f = 30 Hz to 15 KHz)	BC309	NF	—	2	4	dB
(I_C = 0.2 mAdc, V_{CE} = 5 Vdc, R_S = 2 Kohms, f = 1 KHz, f = 200 Hz)	BC307		—	2	10	
	BC308		—	2	10	
	BC309		—	2	4	
Input Impedance (I_C = 2 mAdc, V_{CE} = 5 Vdc, f = 1 KHz)	BC307A/308A/309A	h_{ie}	1.2	2.7	4.5	kΩ
	BC307B/308B/309B		3.0	4.5	8.0	
	BC307C/308C/309C		5.0	8.0	15	
Voltage Feedback Ratio (I_C = 2 mAdc, V_{CE} = 5 Vdc, f = 1 KHz)	BC307A/308A/309A	h_{re}	—	3.0	—	10^{-4}
	BC307B/308B/309B		—	3.5	—	
	BC307C/308C/309C		—	4.0	—	
Small Signal Current Gain (I_C = 2 mAdc, V_{CE} = 5 Vdc, f = 1 KHz)	BC307A/308A/309A	h_{fe}	125	220	260	—
	BC307B/308B/309B		240	330	500	
	BC307C/308C/309C		450	600	900	
Output Admittance (I_C = 2 mAdc, V_{CE} = 5 Vdc, f = 1 KHz)	BC307A/308A/309A	h_{oe}	—	25	50	μmhos
	BC307B/308B/309B		—	30	70	
	BC307C/308C/309C		—	60	110	

FIGURE 1 – NORMALIZED DC CURRENT GAIN

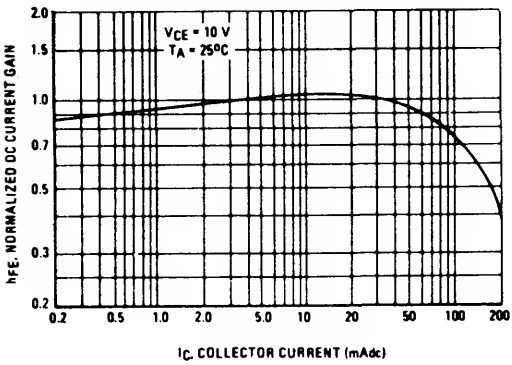

FIGURE 2 – "SATURATION" AND "ON" VOLTAGES

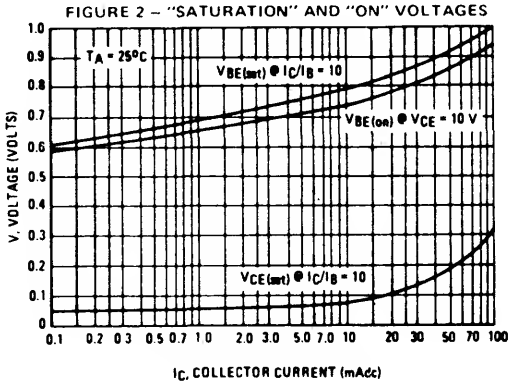

FIGURE 3 – CURRENT-GAIN–BANDWIDTH PRODUCT

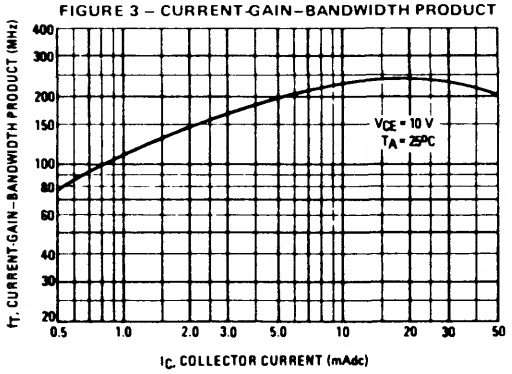

FIGURE 4 – CAPACITANCES

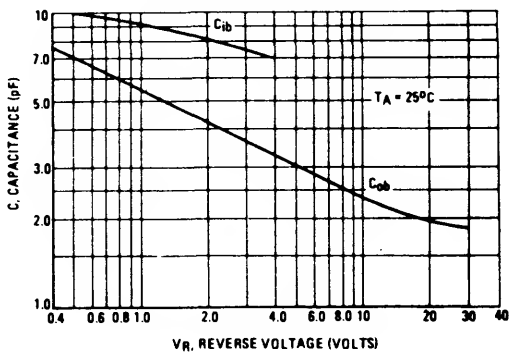

FIGURE 5 – OUTPUT ADMITTANCE

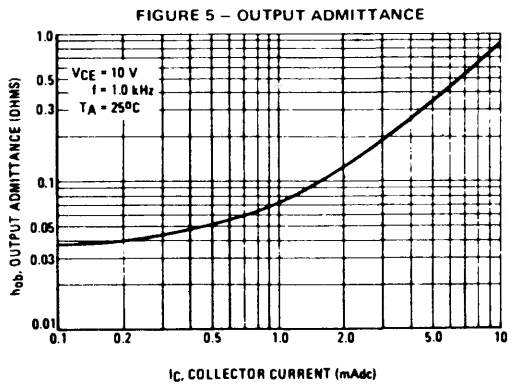

FIGURE 6 – BASE SPREADING RESISTANCE