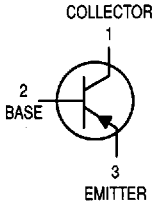
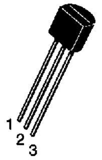
MOTOROLA
SEMICONDUCTOR TECHNICAL DATA

Amplifier Transistors

PNP Silicon

BC307
BC307B
BC307C
BC308C





CASE 29–04, STYLE 17
TO–92 (TO–226AA)

MAXIMUM RATINGS

Rating	Symbol	BC307, B, C	BC308C	Unit
Collector–Emitter Voltage	V_{CEO}	–45	–25	Vdc
Collector–Base Voltage	V_{CBO}	–50	–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 8.0		Watts 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°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector–Emitter Breakdown Voltage	BC307,B,C	$V_{(BR)CEO}$	–45	—	—	Vdc
(I_C = –2.0 mAdc, I_B = 0)	BC308C		–25	—	—	
Emitter–Base Breakdown Voltage	BC307,B,C	$V_{(BR)EBO}$	–5.0	—	—	Vdc
(I_E = –100 μAdc, I_C = 0)	BC308C		–5.0	—	—	
Collector–Emitter Leakage Current		I_{CES}				
(V_{CES} = –50 V, V_{BE} = 0)	BC307,B,C		—	–0.2	–15	nAdc
(V_{CES} = –30 V, V_{BE} = 0)	BC308C		—	–0.2	–15	
(V_{CES} = –50 V, V_{BE} = 0) T_A = 125°C	BC307,B,C		—	–0.2	–4.0	μA
(V_{CES} = –30 V, V_{BE} = 0) T_A = 125°C	BC308C		—	–0.2	–4.0	

REV 1

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

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

1. 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

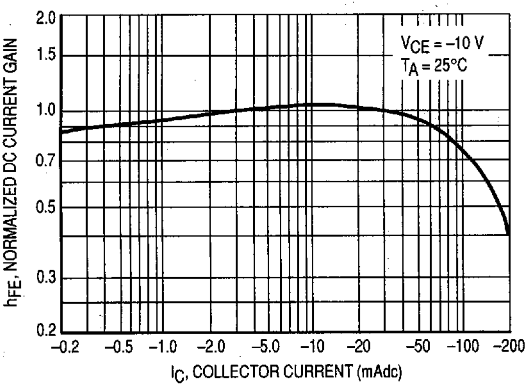


Figure 1. Normalized DC Current Gain

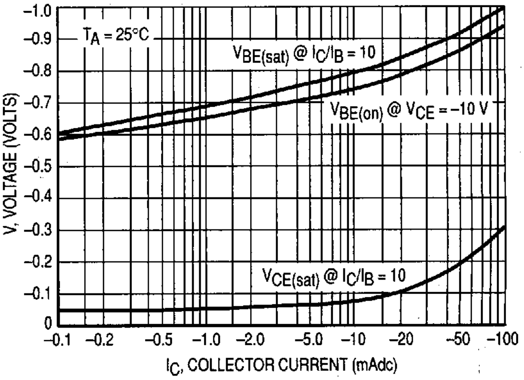


Figure 2. "Saturation" and "On" Voltages

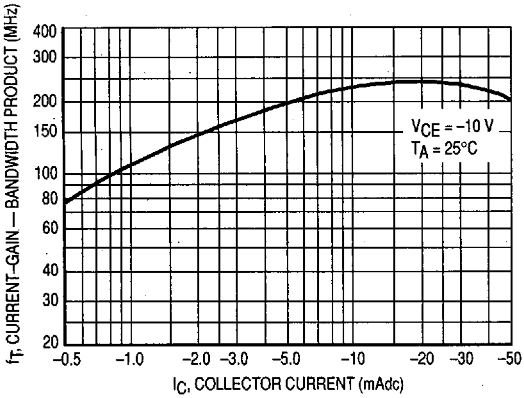


Figure 3. Current–Gain — Bandwidth Product

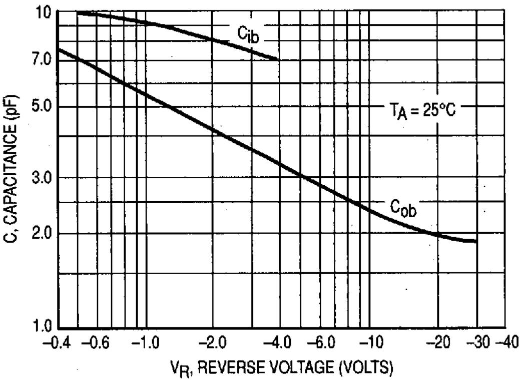


Figure 4. Capacitances

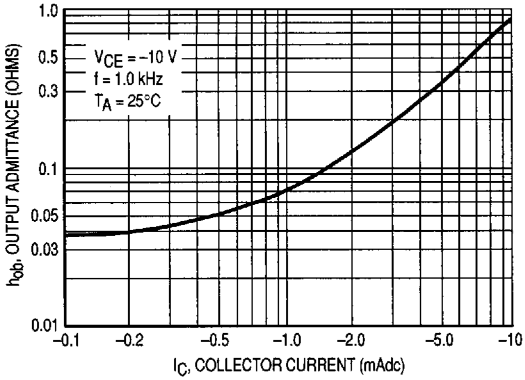


Figure 5. Output Admittance

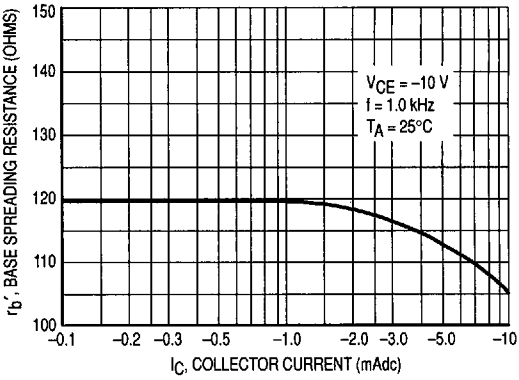


Figure 6. Base Spreading Resistance