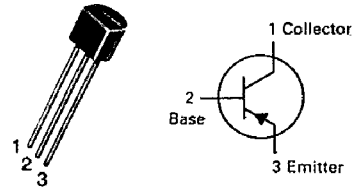


BC556,B BC557,A,B,C BC558B

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



AMPLIFIER TRANSISTORS

PNP SILICON

MAXIMUM RATINGS

Rating	Symbol	BC556	BC557	BC558	Unit
Collector-Emitter Voltage	V_{CEO}	-65	-45	-30	Vdc
Collector-Base Voltage	V_{CBO}	-80	-50	-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	625 5.0			mW mW/°C
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	1.5 12			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 Ambient	$R_{\theta JA}$	200	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	83.3	°C/W

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage ($I_C = -2.0$ mAdc, $I_B = 0$)	$V_{(BR)CEO}$	-65 -45 -30	— — —	— — —	V
Collector-Base Breakdown Voltage ($I_C = -100$ μ Adc)	$V_{(BR)CBO}$	-80 -50 -30	— — —	— — —	V
Emitter-Base Breakdown Voltage ($I_E = -100$ μ Adc, $I_C = 0$)	$V_{(BR)EBO}$	-5.0 -5.0 -5.0	— — —	— — —	V
Collector-Emitter Leakage Current ($V_{CES} = -40$ V) ($V_{CES} = -20$ V) ($V_{CES} = -20$ V, $T_A = 125^\circ\text{C}$)	I_{CES}	— — —	-2.0 -2.0 -2.0	-100 -100 -100	nA μ A

ON CHARACTERISTICS

DC Current Gain ($I_C = -10$ μ Adc, $V_{CE} = -5.0$ V) ($I_C = -2.0$ mAdc, $V_{CE} = -5.0$ V) ($I_C = -100$ mAdc, $V_{CE} = -5.0$ V)	Symbol	Min	Typ	Max	Unit
BC557A	h_{FE}	—	90	—	—
BC556B/557B/558B		—	150	—	
BC557C		—	270	—	
BC556		120	—	500	
BC557		120	—	800	
BC558		120	—	800	
BC557A		120	170	220	
BC556B/557B/558B		180	290	460	
BC557C		420	500	800	
BC557A		—	120	—	
BC556B/557B/558B		—	180	—	
BC557C		—	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)	$V_{CE(sat)}$	— — —	-0.075 -0.3 -0.25	-0.3 -0.6 -0.65	V

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

BC556,B BC557,A,B,C BC558B

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

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS (continued)					
Base-Emitter Saturation Voltage ($I_C = -10\text{ mAdc}$, $I_B = -0.5\text{ mAdc}$) ($I_C = -100\text{ mAdc}$, $I_B = -5.0\text{ mAdc}$)	$V_{BE(sat)}$	— —	-0.7 -1.0	— —	V
Base-Emitter On Voltage ($I_C = -2.0\text{ mAdc}$, $V_{CE} = -5.0\text{ Vdc}$) ($I_C = -10\text{ mAdc}$, $V_{CE} = -5.0\text{ Vdc}$)	$V_{BE(on)}$	-0.55 —	-0.62 -0.7	-0.7 -0.82	V
SMALL-SIGNAL CHARACTERISTICS					
Current-Gain Bandwidth Product ($I_C = -10\text{ mA}$, $V_{CE} = -5.0\text{ V}$, $f = 100\text{ MHz}$)	f_T	—	280	—	MHz
			BC556 BC557 BC558	— — —	
Output Capacitance ($V_{CB} = -10\text{ V}$, $I_C = 0$, $f = 1.0\text{ MHz}$)	C_{ob}	—	3.0	6.0	pF
Noise Figure ($I_C = -0.2\text{ mAdc}$, $V_{CE} = -5.0\text{ V}$, $R_S = 2\text{ k ohms}$, $f = 1.0\text{ kHz}$, $\Delta f = 200\text{ Hz}$)	NF	—	2.0	10	dB
			BC556 BC557 BC558	— — —	
Small-Signal Current Gain ($I_C = -2.0\text{ mAdc}$, $V_{CE} = -5.0\text{ V}$, $f = 1.0\text{ kHz}$)	h_{fe}	125	—	500	—
		125	—	900	
		125	220	260	
		240	330	500	
		450	600	900	

FIGURE 1 - NORMALIZED DC CURRENT GAIN

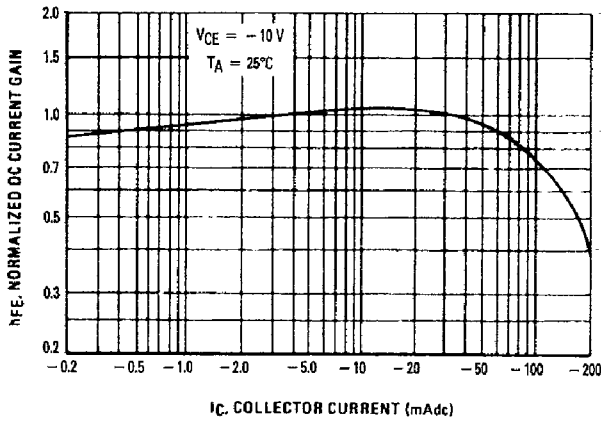


FIGURE 2 - "SATURATION" AND "ON" VOLTAGES

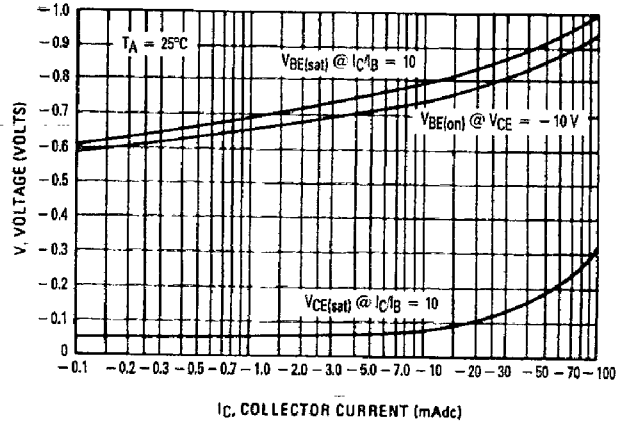


FIGURE 3 - COLLECTOR SATURATION REGION

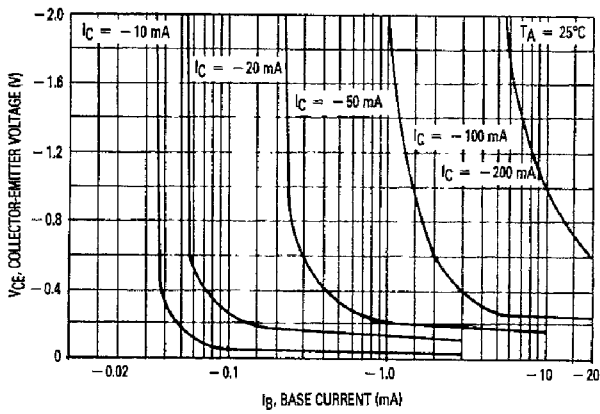


FIGURE 4 - BASE EMITTER TEMPERATURE COEFFICIENT

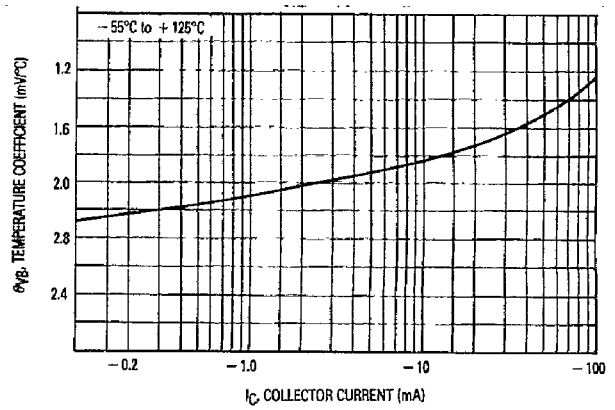


FIGURE 5 - CAPACITANCES

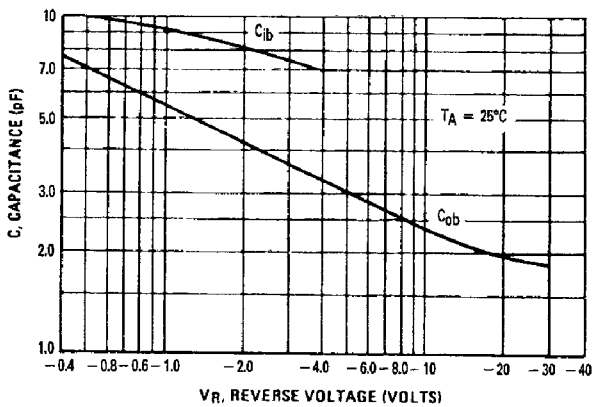
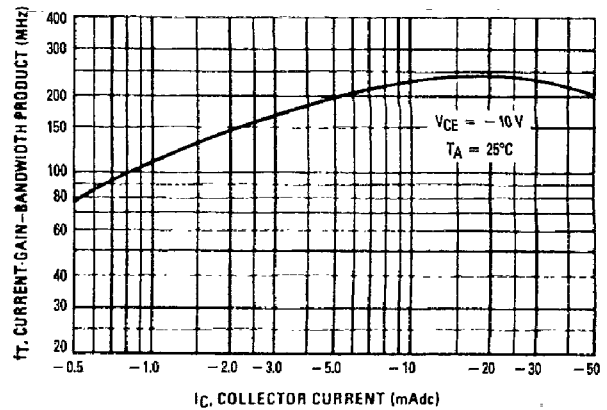


FIGURE 6 - CURRENT GAIN-BANDWIDTH PRODUCT



BC556

FIGURE 7 - DC CURRENT GAIN

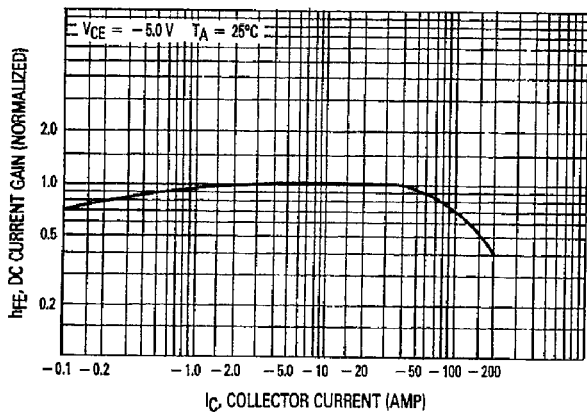


FIGURE 8 - "ON" VOLTAGE

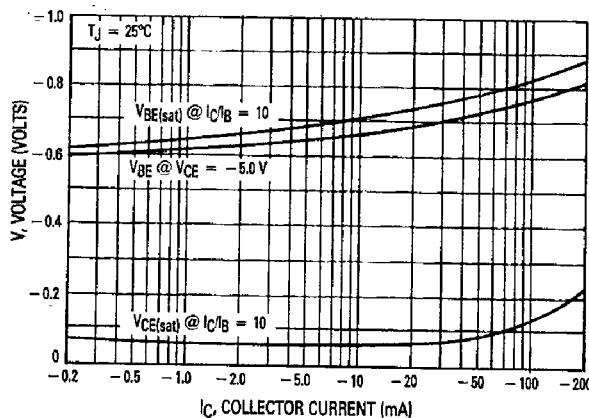


FIGURE 9 - COLLECTOR SATURATION REGION

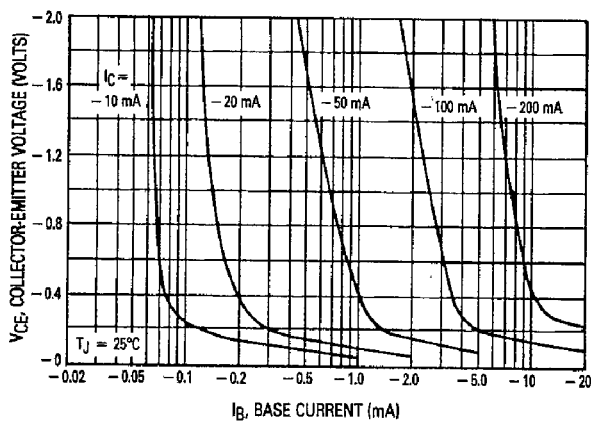


FIGURE 10 - BASE-EMITTER TEMPERATURE COEFFICIENT

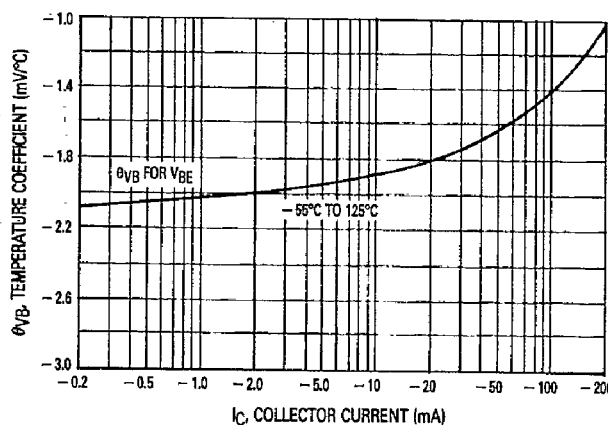


FIGURE 11 - CAPACITANCE

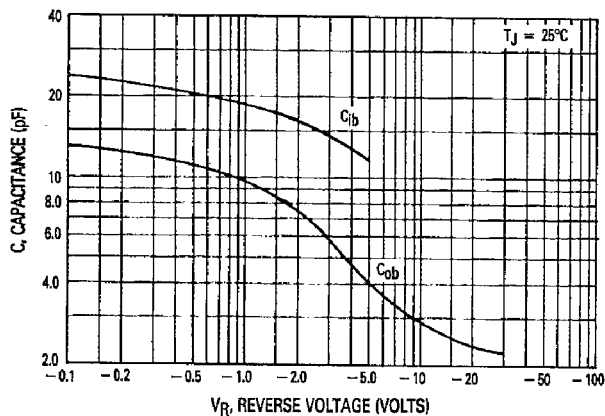
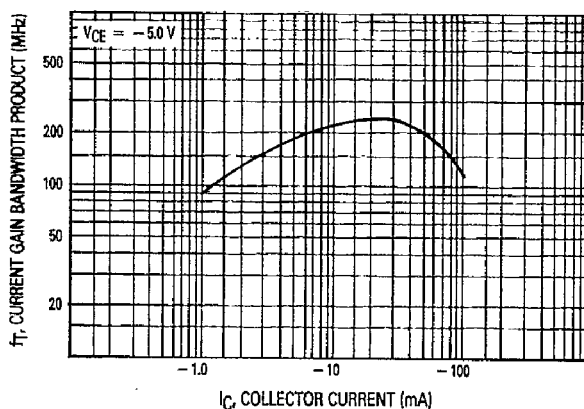


FIGURE 12 - CURRENT GAIN-BANDWIDTH PRODUCT



BC556,B BC557,A,B,C BC558B

FIGURE 13 – THERMAL RESPONSE

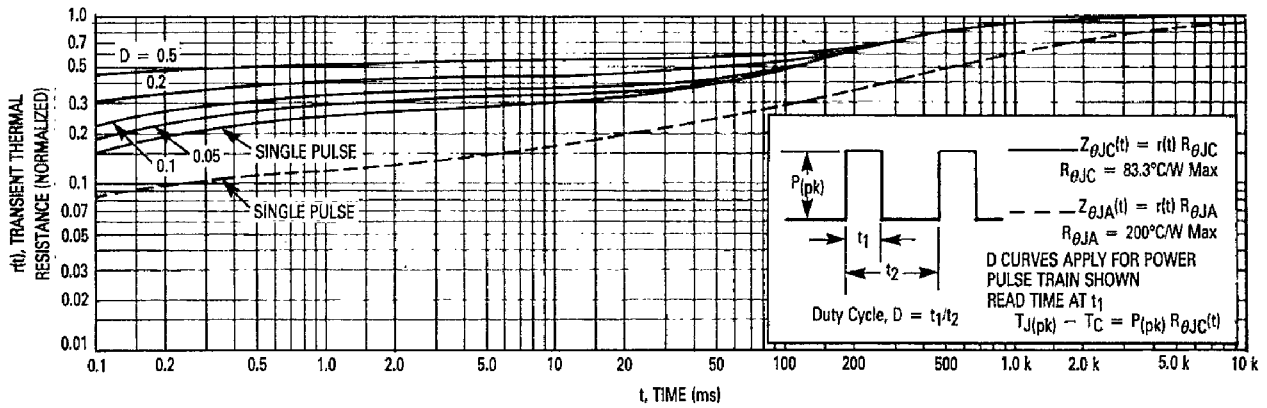
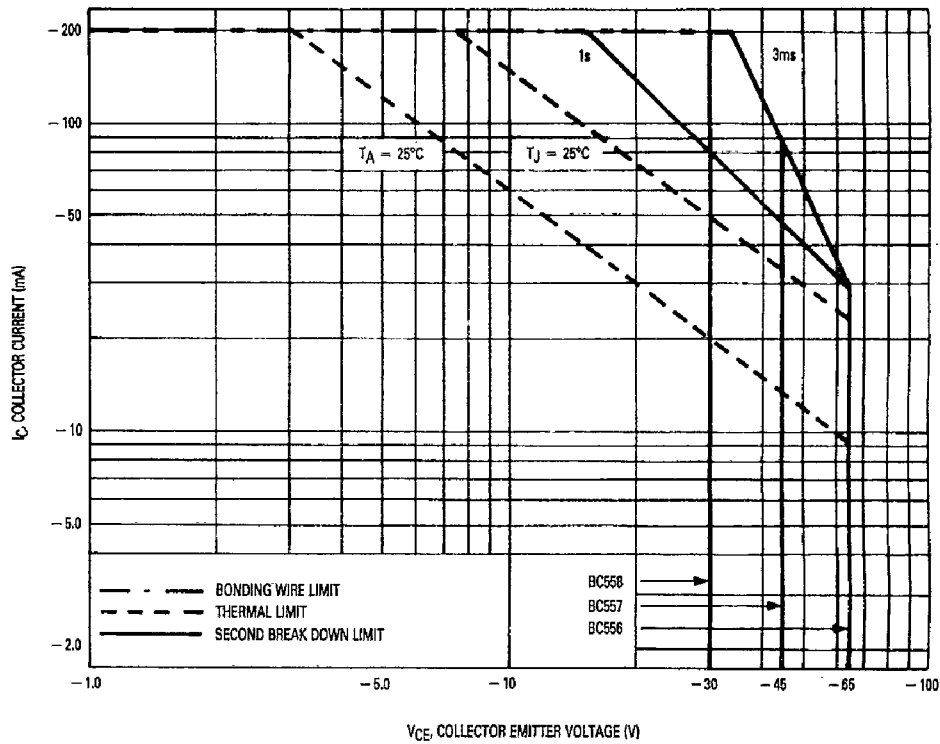


FIGURE 14 – ACTIVE REGION SAFE OPERATING AREA



The safe operating area curves indicate I_C - V_{CE} limits of the transistor that must be observed for reliable operation. Collector load lines for specific circuits must fall below the limits indicated by the applicable curve.

The data of Figure 14 is based upon $T_{J(pk)} = 150^{\circ}\text{C}$; T_C or T_A is variable depending upon conditions. Pulse curves are valid for duty cycles to 10% provided $T_{J(pk)} \leq 150^{\circ}\text{C}$. $T_{J(pk)}$ may be calculated from the data of Figure 13. At high case or ambient temperatures thermal limitations will reduce the power that can be handled to values less than the limitations imposed by the secondary breakdown.