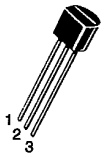
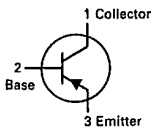
BC251,A,B,C
BC252,A,B,C
BC256,A,B

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





AMPLIFIER TRANSISTORS

PNP SILICON

Refer to BC556 for graphs.

MAXIMUM RATINGS

Rating	Symbol	BC 256	BC 251	BC 252	Unit
Collector-Emitter Voltage	V_{CEO}	65	45	25	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°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			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 mA, I_B = 0)	BC256 BC251 BC252	$V_{(BR)CEO}$	65 45 25			V
Emitter-Base Breakdown Voltage (I_E = 100 µA, I_C = 0)	BC256 BC251 BC252	$V_{(BR)EBO}$	5 5 5			V
Collector-Emitter Leakage Current (V_{CES} = 40 V) (V_{CES} = 20 V)	BC256 BC251 BC252	I_{CES}		2 2 2	100 100 100	nA
(V_{CES} = 20 V, T_A = 125°C)	BC256 BC251 BC252				4 4 4	µA
ON CHARACTERISTICS						
DC Current Gain (I_C = 10 µA, V_{CE} = 5 V)	BC251A/2A/6A BC251B/2B/6B BC252C	h_{FE}		90 150 270		
(I_C = 2 mA, V_{CE} = 5 V)	BC256 BC251 BC252 BC251A/2A/6A BC251B/2B/6B BC251C/BC252C		125 120 120 120 180 380	 170 290 500	500 800 800 220 460 800	
(I_C = 100 mA, V_{CE} = 5 V)	BC251A/2A/6A BC251B/2B/6B BC252C			120 180 300		
Collector-Emitter Saturation Voltage (I_C = 10 mA, I_B = 0.5 mA) (I_C = 100 mA, I_B = 5 mA)		$V_{CE(sat)}$		0.075 0.25	0.3 0.65	V
Base-Emitter Saturation Voltage (I_C = 10 mA, I_B = 0.5 mA) (I_C = 100 mA, I_B = 5 mA)		$V_{BE(sat)}$		0.70 1.00		V
Base-Emitter on Voltage (I_C = 2 mA, V_{CE} = 5 V)		$V_{BE(on)}$	0.55	0.62	0.70	V

BC251,A,B,C, BC252,A,B,C, BC256,A,B

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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 mA, V_{CE} = 5 V, f = 50 MHz)	BC256 BC251 BC252	f_T		280 320 360		MHz
Output Capacitance (V_{CB} = 10 V, I_C = 0, f = 1 MHz)		C_{ob}		3	6.0	pF
Noise Figure (I_C = 0.2 mA, V_{CE} = 5 V, R_S = 2 Kohms, f = 1 KHz, Δf = 200 Hz)	BC256 BC251 BC252	NF		2 2 2	10 10 10	dB

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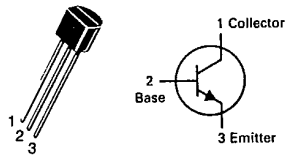
BCX58,-7,-8,-9,-10
BCX59,-7,-8,-9,-10

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



AMPLIFIER TRANSISTORS

NPN SILICON

MAXIMUM RATINGS

Rating	Symbol	BCX 58	BCX 59	Unit
Collector-Emitter Voltage	V_{CEO}	32	45	Vdc
Collector-Base Voltage	V_{CBO}	32	45	Vdc
Emitter-Base Voltage	V_{EBO}	7.0		Vdc
Collector Current — Continuous	I_C	100		mAdc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	625 5.0		mW mW/°C
Total Device Dissipation @ T_C = 25°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 Case	$R_{\theta JC}$	83.3	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JC}$	200	°C/W

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

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector-Emitter Breakdown Voltage (I_C = 10 mAdc, I_B = 0)	BCX58	$V_{(BR)CEO}$	32	—	—	Vdc
	BCX59		45	—	—	
Emitter-Base Breakdown Voltage (I_E = 1.0 μAdc, I_C = 0)	All	$V_{(BR)EBO}$	7.0	8.7	—	Vdc
Collector Cutoff Current						
(V_{CE} = 32 V)	BCX58	I_{CES}	—	—	10	nAdc
(V_{CE} = 45 V)	BCX59	I_{CES}	—	—	10	
(V_{CE} = 32 V, T_A = 100°C, V_{BE} = 0.2 V)	BCX58	I_{CEX}	—	—	20	μAdc
(V_{CE} = 45 V, T_A = 100°C, V_{BE} = 0.2 V)	BCX59	I_{CEX}	—	—	20	
(V_{CE} = 32 V, T_A = 125°C)	BCX58	I_{CES}	—	—	2.5	
(V_{CE} = 45 V, T_A = 125°C)	BCX59	I_{CES}	—	—	2.5	
Emitter-Cutoff Current (V_{EBO} = 4.0 V, I_C = 0)		I_{EBO}	—	—	20	nAdc
ON CHARACTERISTICS						
DC Current Gain		h_{FE}				—
(I_C = 10 μAdc, V_{CE} = 5.0 Vdc)	BCX58-7, BCX59-7		20	80	—	
	BCX58-8, BCX59-8		40	145	—	
	BCX58-9, BCX59-9		75	220	—	
	BCX58-10, BCX59-10		100	300	—	
(I_C = 2.0 mAdc, V_{CE} = 5.0 Vdc)	BCX58-7, BCX59-7		120	170	220	
	BCX58-8, BCX59-8		180	250	310	
	BCX58-9, BCX59-9		250	350	460	
	BCX58-10, BCX59-10		380	500	630	
(I_C = 10 mAdc, V_{CE} = 1.0 Vdc)	BCX58-7, BCX59-7		80	190	—	
	BCX58-8, BCX59-8		120	260	400	
	BCX58-9, BCX59-9		160	380	630	
	BCX58-10, BCX59-10		240	550	1000	
(I_C = 100 mAdc, V_{CE} = 2.0 Vdc)	BCX58-7, BCX59-7		40	—	—	
	BCX58-8, BCX59-8		45	—	—	
	BCX58-9, BCX59-9		60	—	—	
	BCX58-10, BCX59-10		60	—	—	
Collector-Emitter Saturation Voltage (I_C = 100 mAdc, I_B = 5.0 mAdc)		$V_{CE(sat)}$	—	—	0.5	Vdc
Base-Emitter Saturation Voltage (I_C = 100 mA, I_B = 2.5 mAdc)		$V_{BE(sat)}$	—	—	1.0	Vdc
Base-Emitter On Voltage (I_C = 2.0 mAdc, V_{CE} = 5.0 Vdc)		$V_{BE(on)}$	0.55	—	0.7	Vdc

BCX58,-7,-8,-9,-10, BCX59,-7,-8,-9,-10

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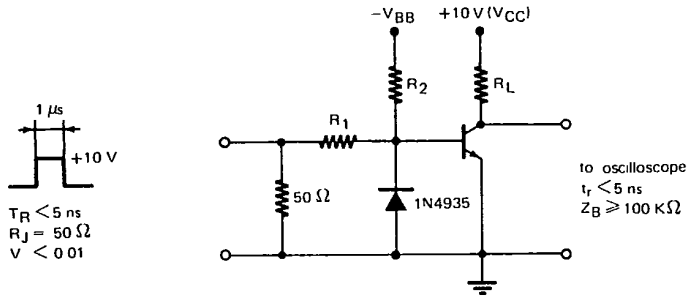
ELECTRICAL CHARACTERISTICS (continued) (T_A = 25°C unless otherwise noted.)

Characteristic		Symbol	Min	Typ	Max	Unit
SMALL-SIGNAL CHARACTERISTICS						
Current-Gain Bandwidth Product (I_C = 10 mAdc, V_{CE} = 5.0 V, f = 100 MHz)		f_T	125	250	—	MHz
Output Capacitance (V_{CE} = 10 Vdc, I_C = 0, f = 1.0 MHz)		C_{ob}	—	1.8	4.5	pF
Input Capacitance (V_{BE} = 0.5 V, I_C = 0, f = 1.0 MHz)		C_{ib}	—	5.2	15	pF
Small-Signal Current Gain (I_C = 2.0 mAdc, V_{CE} = 5.0 Vdc, f = 1.0 kHz)		h_{fe}				—
	BCX58-7, BCX59-7		125	—	250	
	BCX58-8, BCX59-8		175	—	350	
	BCX58-9, BCX59-9		250	—	500	
	BCX58-10, BCX59-10		350	—	700	
Noise Figure (I_C = 0.2 mAdc, V_{CE} = 5.0 Vdc, R_S = 2.0 kohms, f = 1.0 kHz)		NF	—	1.0	6.0	dB
(I_C = 10 mA, I_{B1} = 1.0 mA, I_{B2} = 1.0 mA) (V_{BB} = 3.6 V, R_1 = R_2 = 5.0 kΩ) (R_L = 999 ohms)		T_d	—	16	—	ns
		T_r	—	29	—	
		T_{on}	—	45	150	
*See test circuit		T_s	—	475	—	
		T_f	—	40	—	
		T_{off}	—	515	800	
(I_C = 100 mA, I_{B1} = 10 mA, I_{B2} = 10 mA) (V_{BB} = 5.0 V, R_1 = 500 Ω, R_2 = 700 Ω) (R_L = 98 ohms)		t_d	—	5.0	—	ns
		t_r	—	40	—	
		t_{on}	—	45	150	
*See test circuit		t_s	—	135	—	
		t_f	—	80	—	
		t_{off}	—	215	800	



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BCX58,-7,-8,-9,-10, BCX59,-7,-8,-9,-10

FIGURE 1 – NORMALIZED DC CURRENT GAIN

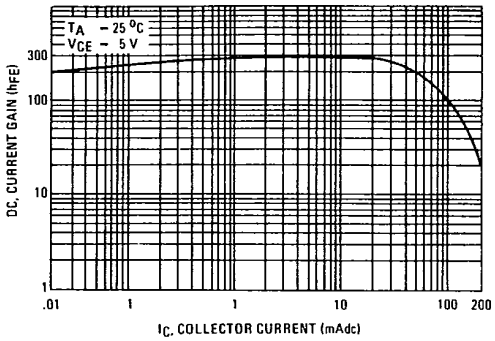

FIGURE 2 – "SATURATION" AND "ON" VOLTAGES

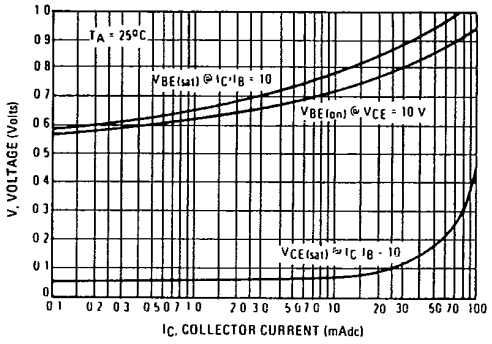

FIGURE 3 – COLLECTOR SATURATION REGION

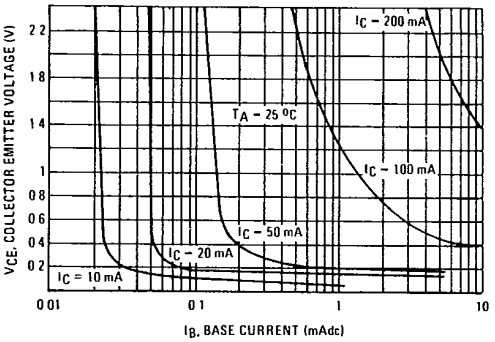

FIGURE 4 – BASE-EMITTER TEMPERATURE COEFFICIENT

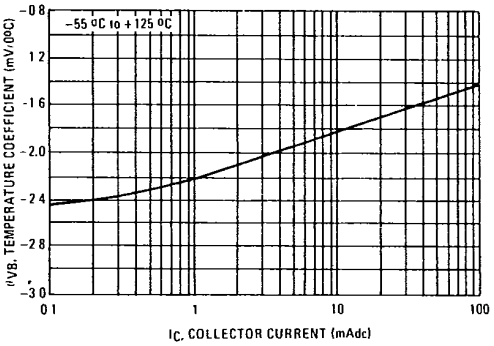

FIGURE 5 – CAPACITANCES

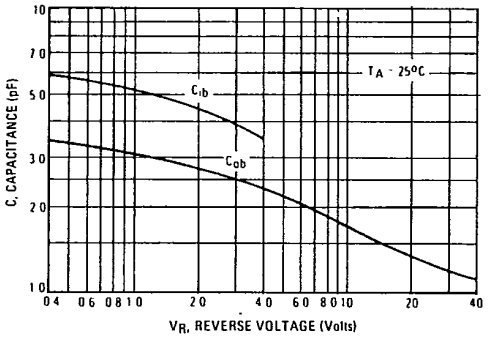

FIGURE 6 – CURRENT-GAIN-BANDWIDTH PRODUCT