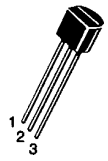
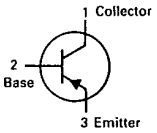
BCX78,-7,-8,-9,-10
BCX79,-7,-8,-9,-10

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





AMPLIFIER TRANSISTORS

PNP SILICON

2

MAXIMUM RATINGS

Rating	Symbol	BCX 78	BCX 79	Unit
Collector-Emitter Voltage	V_{CEO}	32	45	Vdc
Collector-Base Voltage	V_{CBO}	32	45	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	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

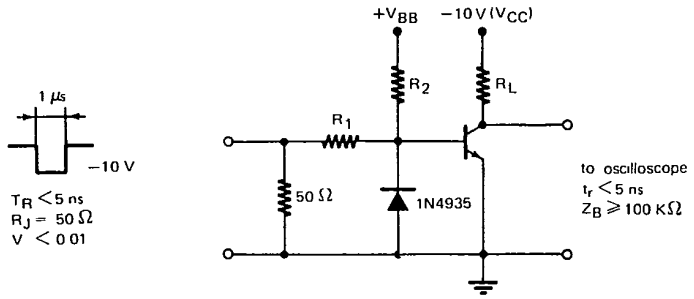
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector-Emitter Breakdown Voltage (I_C = 10 mAdc, I_B = 0)	BCX78	$V_{(BR)CEO}$	32	—	—	Vdc
	BCX79		45	—	—	
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)	All	$V_{(BR)EBO}$	5.0	6.8	—	Vdc
Collector Cutoff Current						
(V_{CE} = 32 V)	BCX78	I_{CES}	—	—	10	nAdc
(V_{CE} = 45 V)	BCX79	I_{CES}	—	—	10	
(V_{CE} = 32 V, T_A = 100°C, V_{BE} = 0.2 V)	BCX78	I_{CEX}	—	—	20	μAdc
(V_{CE} = 45 V, T_A = 100°C, V_{BE} = 0.2 V)	BCX79	I_{CEX}	—	—	20	
(V_{CE} = 32 V, T_A = 125°C)	BCX78	I_{CES}	—	—	2.5	
(V_{CE} = 45 V, T_A = 125°C)	BCX79	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)	BCX78-7, BCX79-7		20	140	—	
	BCX78-8, BCX79-8		40	200	—	
	BCX78-9, BCX79-9		75	270	—	
	BCX78-10, BCX79-10		100	340	—	
(I_C = 2.0 mAdc, V_{CE} = 5.0 Vdc)	BCX78-7, BCX79-7		120	170	220	
	BCX78-8, BCX79-8		180	250	310	
	BCX78-9, BCX79-9		250	350	460	
	BCX78-10, BCX79-10		380	500	630	
(I_C = 10 mAdc, V_{CE} = 1.0 Vdc)	BCX78-7, BCX79-7		80	180	—	
	BCX78-8, BCX79-8		120	260	400	
	BCX78-9, BCX79-9		160	360	630	
	BCX78-10, BCX79-10		240	500	1000	
(I_C = 100 mAdc, V_{CE} = 2.0 Vdc)	BCX78-7, BCX79-7		40	—	—	
	BCX78-8, BCX79-8		45	—	—	
	BCX78-9, BCX79-9		60	—	—	
	BCX78-10, BCX79-10		60	—	—	
Collector-Emitter Saturation Voltage (I_C = 100 mAdc, I_B = 5.0 mAdc)		$V_{CE(sat)}$	—	—	0.6	Vdc
Base-Emitter Saturation Voltage (I_C = 100 mA, I_B = 5.0 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

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	—	200	—	MHz
Output Capacitance (V_{CE} = 10 Vdc, I_C = 0, f = 1.0 MHz)		C_{ob}	—	2.6	4.5	pF
Input Capacitance (V_{BE} = 0.5 V, I_C = 0, f = 1.0 MHz)		C_{ib}	—	8.5	15	pF
Small-Signal Current Gain (I_C = 2.0 mAdc, V_{CE} = 5.0 Vdc, f = 1.0 kHz)	BCX78-7, BCX79-7	h_{fe}	125	200	250	—
	BCX78-8, BCX79-8		175	260	350	
	BCX78-9, BCX79-9		250	330	500	
	BCX78-10, BCX79-10		350	520	700	
Noise Figure (I_C = 0.2 mAdc, V_{CE} = 5.0 Vdc, R_g = 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)		T_d	—	17	—	nS
(V_{BB} = 3.6 V, R_1 = R_2 = 5.0 kΩ)		T_r	—	27	—	
(R_L = 999 ohms)		T_{on}	—	44	150	
*See test circuit		T_s	—	400	—	
		T_f	—	60	—	
		T_{off}	—	460	800	
(I_C = 100 mA, I_{B1} = 10 mA, I_{B2} = 10 mA)		t_d	—	5.0	—	ns
(V_{BB} = 5.0 V, R_1 = 500 Ω, R_2 = 700 Ω)		t_r	—	20	—	
(R_L = 98 ohms)		t_{on}	—	25	150	
*See test circuit		t_s	—	130	—	
		t_f	—	40	—	
		t_{off}	—	170	800	

TEST CIRCUIT



BCX78,-7,-8,-9,-10, BCX79,-7,-8,-9,-10

T-29-21

2

FIGURE 1 – NORMALIZED DC CURRENT GAIN

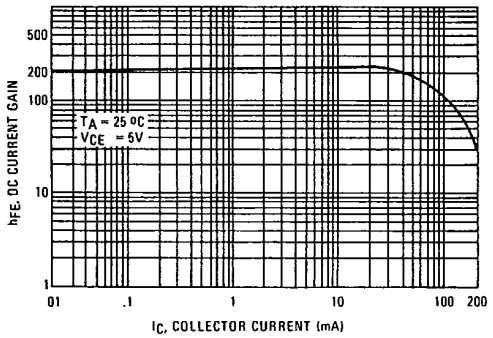


FIGURE 2 – "SATURATION" AND "ON" VOLTAGES

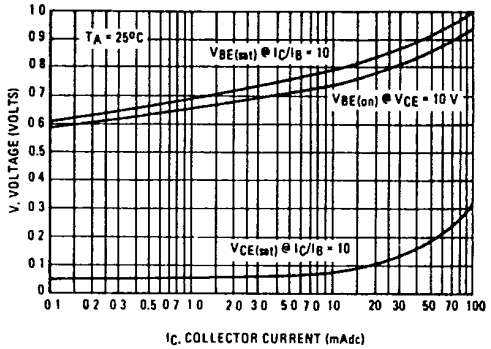


FIGURE 3 – COLLECTOR SATURATION REGION

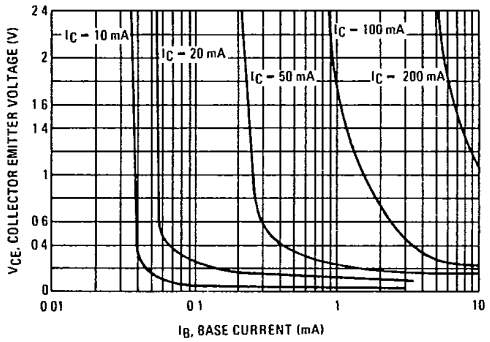


FIGURE 4 – BASE EMITTER TEMPERATURE COEFFICIENT

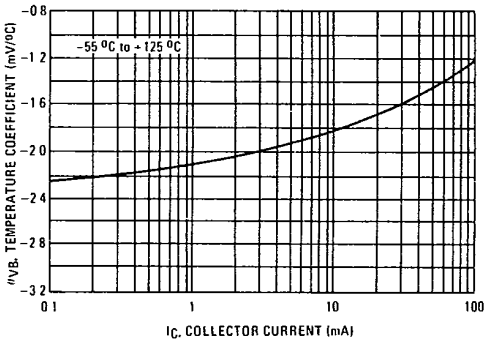


FIGURE 5 – CAPACITANCES

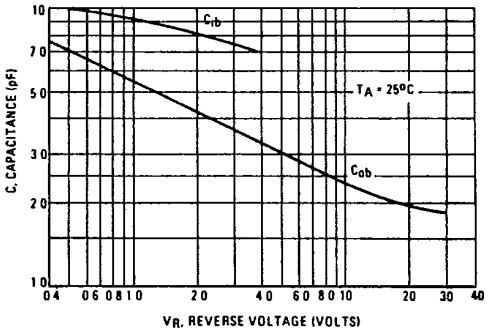


FIGURE 6 – CURRENT GAIN-BANDWIDTH PRODUCT