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BCX78
BCX79

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

AMPLIFIER TRANSISTORS

PNP SILICON

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	Type	Symbol	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Collector-Emitter Breakdown Voltage (I_C = 10 mAdc, I_B = 0)	BCX78 BCX79	$V_{(BR)CEO}$	32 45			Vdc
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)	all	$V_{(BR)EBO}$	5	6.8		Vdc
Collector Cutoff Current (V_{CE} = 32 V (V_{CE} = 45 V) (V_{CE} = 32 V, T_A = 100°C, V_{BE} = 0,2 V) (V_{CE} = 45 V, T_A = 100°C, V_{BE} = 0,2 V) (V_{CE} = 32 V, T_A = 125°C) (V_{CE} = 45 V, T_A = 125°C)	 BCX78 BCX79 BCX78 BCX79 BCX78 BCX79	 I_{CES} I_{CES} I_{CEX} I_{CEX} I_{CES} I_{CES}			 10 10 20 20 2.5 2.5	 nAdc μAdc
ON CHARACTERISTICS						
DC Current Gain (I_C = 10 μAdc, V_{CE} = 5 Vdc)	BCX79-7, BCX78-7 BCX79-8, BCX78-8 BCX79-9, BCX78-9 BCX79-10, BCX78-10	h_{FE}	20 40 75 100	140 200 270 340		
(I_C = 2 mAdc, V_{CE} = 5 Vdc)	BCX79-7, BCX78-7 BCX79-8, BCX78-8 BCX79-9, BCX78-9 BCX79-10, BCX78-10		120 180 250 380	170 250 350 500	220 310 460 630	
(I_C = 10 mAdc, V_{CE} = 1 Vdc)	BCX79-7, BCX78-7 BCX79-8, BCX78-8 BCX79-9, BCX78-9 BCX79-10, BCX78-10		80 120 160 240	180 260 360 500	 400 630 1000	
(I_C = 100 mAdc, V_{CE} = 2 Vdc)	BCX79-7, BCX78-7 BCX79-8, BCX78-8 BCX79-9, BCX78-9 BCX79-10, BCX78-10		40 45 60 60			
Collector-Emitter Saturation Voltage (I_C = 100 mAdc, I_B = 5 mAdc) (I_C = 10 mAdc, I_B = see note 1)		$V_{CE(sat)}$			0.5 0.6	Vdc
Base-Emitter Saturation Voltage (I_C = 100 mA, I_B = 5 mA)		$V_{BE(sat)}$			1.1	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 mA on the constant base current characteristic which yield the point I_C = 11 mA, V_{CE} = 5 V

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

Characteristic	Type	Symbol	Min.	Typ.	Max.	Unit
SMALL SIGNAL CHARACTERISTICS						
Current Gain–Bandwidth Product (I_C = 10 mAdc, V_{CE} = 5 V, f = 100 MHz)		f_T	250	400		MHz
Output Capacitance (V_{CE} = 10 Vdc, I_C = 0, f = 1 MHz)		C_{ob}		2.6	4.5	pF
Input Capacitance (V_{BE} = 0,5 V, I_C = 0, f = 1 MHz)		C_{ib}		8.5	11	pF
Small Signal Current Gain (I_C = 2 mAdc, V_{CE} = 5 Vdc, f = 1 KHz)	BCX78-7, BCX79-7 BCX78-8, BCX79-8 BCX78-9, BCX79-9 BCX78-10, BCX79-10	h_{fe}	125 175 250 350	200 260 330 520	250 350 500 700	
Output Admittance (I_C = 2 mAdc, V_{CE} = 5 Vdc, f = 1 KHz)	BCX78-7, BCX79-7 BCX78-8, BCX79-8 BCX78-9, BCX79-9 BCX78-10, BCX79-10	h_{oe}			30 50 60 100	µmhos
Input Impedance (I_C = 2 mAdc, V_{CE} = 5 Vdc, f = 1 KHz)	BCX78-7, BCX79-7 BCX78-8, BCX79-8 BCX78-9, BCX79-9 BCX78-10, BCX79-10	h_{ie}	1.6 2.5 3.2	2.7 3.6 4.5 7.5	4.5 6 8.5	Kohms
Voltage Feedback Ratio (I_C = 2 mAdc, V_{CE} = 5 Vdc, f = 1 KHz)	BCX78-7, BCX79-7 BCX78-8, BCX79-8 BCX78-9, BCX79-9 BCX78-10, BCX79-10	h_{re}		1.5 2 2 3		$X10^4$
Noise Figure (I_C = 0.2 mAdc, V_{CE} = 5 Vdc, R_g = 2 KOhms, f = 1 KHz)		N_F		1	3	dB
(I_C = 10 mA, I_{B1} = 1 mA, I_{B2} = 1 mA) (V_{BB} = 3.6 V, R_1 = R_2 = 5 kΩ) (R_L = 999 ohms) *See test circuit		T_d T_r T_{on} T_s T_f T_{off}		17 27 44 400 60 460	 100 750	nS
(I_C = 100 mA, I_{B1} = 10 mA, I_{B2} = 10 mA) (V_{BB} = 5 V, R_1 = 500 Ω, R_2 = 700 Ω) (R_L = 98 ohms) *See test circuit		t_d t_r t_{on} t_s t_f t_{off}		5 20 25 130 40 170	 100 650	ns

TEST CIRCUIT

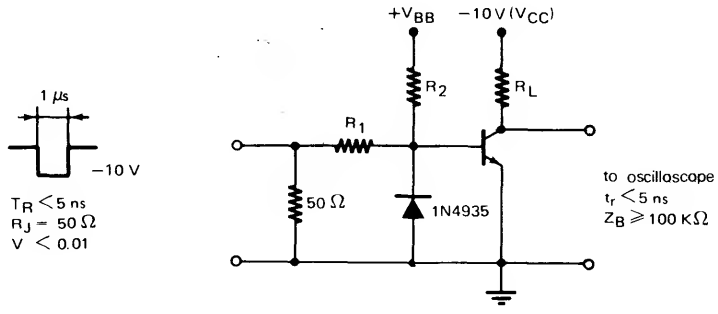

FIGURE 1 – NORMALIZED DC CURRENT GAIN

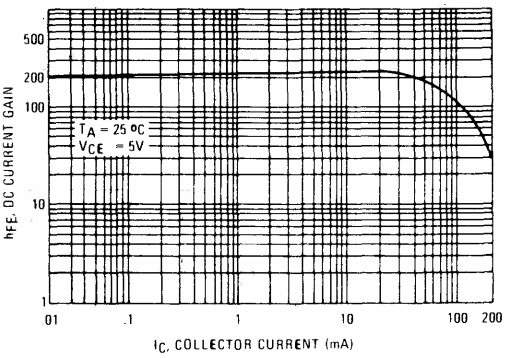

FIGURE 2 – "SATURATION" AND "ON" VOLTAGES

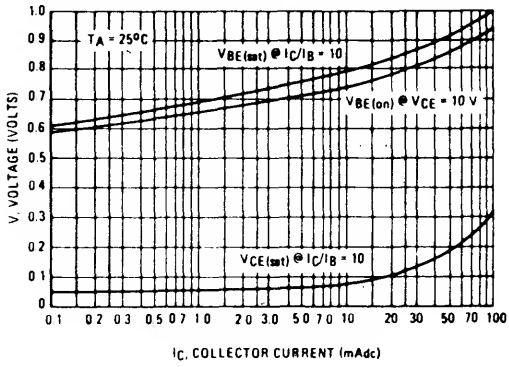

FIGURE 3 – COLLECTOR SATURATION REGION

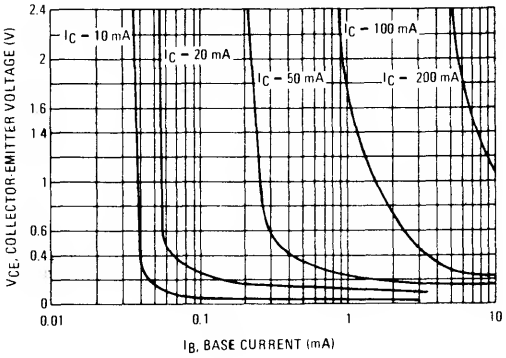

FIGURE 4 – BASE EMITTER TEMPERATURE COEFFICIENT

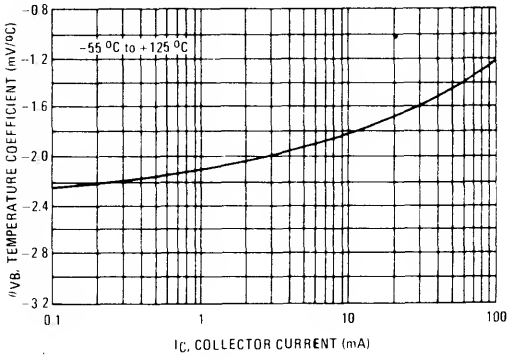

FIGURE 5 – CAPACITANCES

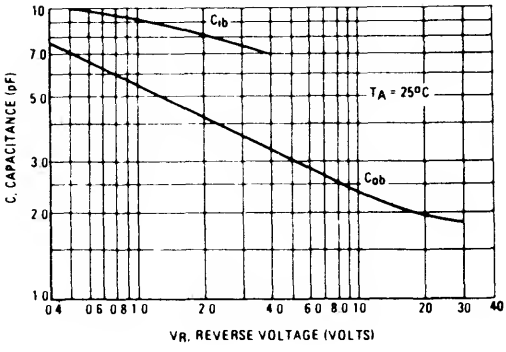

FIGURE 6 – CURRENT GAIN-BANDWIDTH PRODUCT