

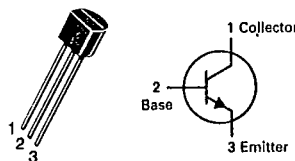
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MAXIMUM RATINGS

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		mA dc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	625 5.0		mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	1.5 12		Watt mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150		$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	83.3	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	200	$^\circ\text{C/W}$

BCX58-7, -8, -9, -10
BCX59-7, -8, -9, -10CASE 29-04, STYLE 17
TO-92 (TO-226AA)

AMPLIFIER TRANSISTORS

NPN SILICON

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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C = 10 \text{ mA dc}, I_B = 0$)	BCX58 Series BCX59 Series	$V_{(BR)CEO}$	32 45	— —	— —	Vdc
Emitter-Base Breakdown Voltage ($I_E = 1.0 \mu\text{A dc}, I_C = 0$)	All	$V_{(BR)EBO}$	7.0	8.7	—	Vdc
Collector Cutoff Current ($V_{CE} = 32 \text{ V}$)	BCX58 Series	I_{CES}	—	—	10	nA dc
($V_{CE} = 45 \text{ V}$)	BCX59 Series	I_{CES}	—	—	10	nA dc
($V_{CE} = 32 \text{ V}, T_A = 100^\circ\text{C}, V_{BE} = 0.2 \text{ V}$)	BCX58 Series	I_{CEX}	—	—	20	$\mu\text{A dc}$
($V_{CE} = 45 \text{ V}, T_A = 100^\circ\text{C}, V_{BE} = 0.2 \text{ V}$)	BCX59 Series	I_{CEX}	—	—	20	$\mu\text{A dc}$
($V_{CE} = 32 \text{ V}, T_A = 125^\circ\text{C}$)	BCX58 Series	I_{CES}	—	—	2.5	nA dc
($V_{CE} = 45 \text{ V}, T_A = 125^\circ\text{C}$)	BCX59 Series	I_{CES}	—	—	2.5	nA dc
Emitter-Cutoff Current ($V_{EBO} = 4.0 \text{ V}, I_C = 0$)		I_{EBO}	—	—	20	nA dc

ON CHARACTERISTICS

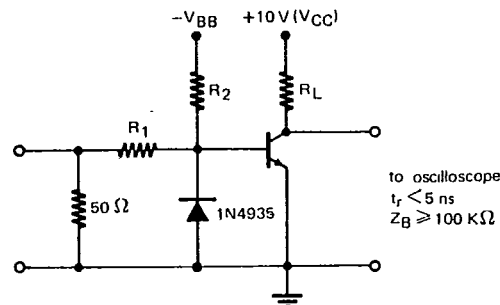
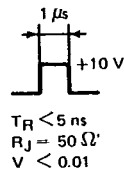
DC Current Gain ($I_C = 10 \mu\text{A dc}, V_{CE} = 5.0 \text{ Vdc}$)	BCX58-7, BCX59-7 BCX58-8, BCX59-8 BCX58-9, BCX59-9 BCX58-10, BCX59-10	h_{FE}	20 40 75 100	80 145 220 300	— — — —	—
($I_C = 2.0 \text{ mA dc}, V_{CE} = 5.0 \text{ Vdc}$)	BCX58-7, BCX59-7 BCX58-8, BCX59-8 BCX58-9, BCX59-9 BCX58-10, BCX59-10		120 180 250 380	170 250 350 500	220 310 460 630	
($I_C = 10 \text{ mA dc}, V_{CE} = 1.0 \text{ Vdc}$)	BCX58-7, BCX59-7 BCX58-8, BCX59-8 BCX58-9, BCX59-9 BCX58-10, BCX59-10		80 120 160 240	190 260 380 550	— 400 630 1000	
($I_C = 100 \text{ mA dc}, V_{CE} = 2.0 \text{ Vdc}$)	BCX58-7, BCX59-7 BCX58-8, BCX59-8 BCX58-9, BCX59-9 BCX58-10, BCX59-10		40 45 60 60	— — — —	— — — —	
Collector-Emitter Saturation Voltage ($I_C = 100 \text{ mA dc}, I_B = 5.0 \text{ mA dc}$)		$V_{CE(sat)}$	—	—	0.5	Vdc
Base-Emitter Saturation Voltage ($I_C = 100 \text{ mA}, I_B = 2.5 \text{ mA dc}$)		$V_{BE(sat)}$	—	—	1.0	Vdc
Base-Emitter On Voltage ($I_C = 2.0 \text{ mA dc}, V_{CE} = 5.0 \text{ Vdc}$)		$V_{BE(on)}$	0.55	—	0.7	Vdc

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

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

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



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FIGURE 1 - NORMALIZED DC CURRENT GAIN

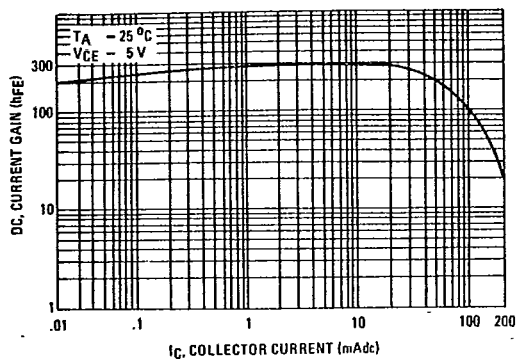


FIGURE 2 - "SATURATION" AND "ON" VOLTAGES

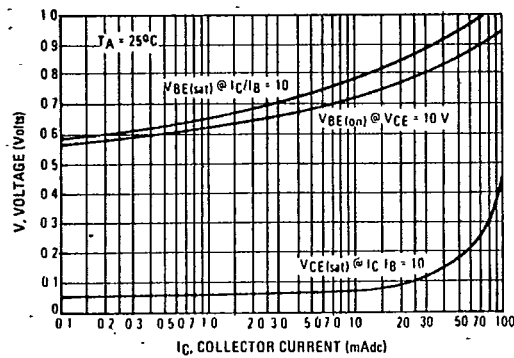


FIGURE 3 - COLLECTOR SATURATION REGION

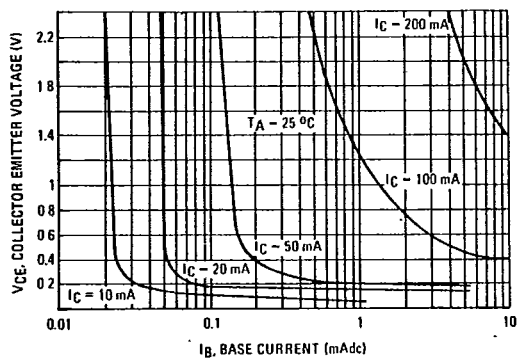


FIGURE 4 - BASE-EMITTER TEMPERATURE COEFFICIENT

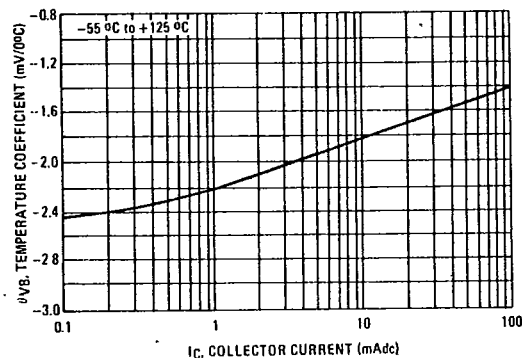


FIGURE 5 - CAPACITANCES

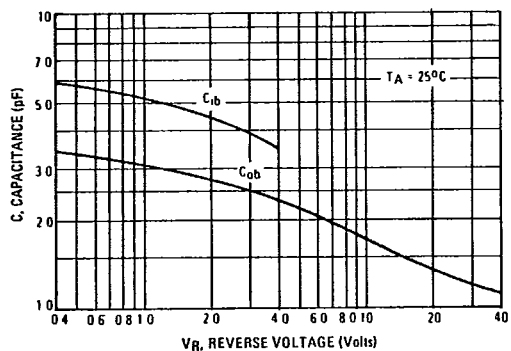


FIGURE 6 - CURRENT-GAIN-BANDWIDTH PRODUCT

