BCY78
BCY79

CASE 22-03, STYLE 1
TO-18 (TO-206AA)

TRANSISTOR

PNP SILICON

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MAXIMUM RATINGS

Rating	Symbol	BCY 78	BCY 79	Unit
Collector-Emitter Voltage	V_{CEO}	32	45	Vdc
Collector-Emitter Voltage (R_{BE} = 10 Ohms)	V_{CES}	32	45	Vdc
Emitter-Base Voltage	V_{EBO}	5		Vdc
Collector Current – Continuous	I_C	0.2		Amp
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	0.6 2.28		Watt mW/°C
Total Device Dissipation @ T_C = 25°C T_C = 100°C Derate above 25°C	P_D	1 6.67		Watt mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +200		°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	150	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	450	°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_C = 0)	BCY7B BCY79	$V_{(BR)CEO}$	32 45			Vdc
Emitter-Base Breakdown Voltage (I_E = 2 μAdc, I_C = 0)	all	$V_{(BR)EBO}$	5			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} = 25 V, T_A = 150°) (V_{CE} = 35 V, T_A = 150°)	 BCY78 BCY79 BCY7B BCY79 BCY7B BCY79	 I_{CES} I_{CEX} I_{CES}		 0.2 0.2 0.2 0.5	 100 100 20 20 10 10	 nA μAdc μAdc
Emitter Base Cutoff Current (V_{EB} = 4 V)	all	I_{EBO}			20	nA
ON CHARACTERISTICS						
DC Current Gain		h_{FE}				
(I_C = 10 μAdc, V_{CE} = 5 Vdc)	BCY79-VII, BCY7B-VII BCY79-VIII, BCY7B-VIII BCY79-IX, BCY7B-IX BCY79-X, BCY7B-X		30 40 100	145 220 300		
(I_C = 2 mAdc, V_{CE} = 5 Vdc)	BCY79-VII, BCY7B-VII BCY79-VIII, BCY7B-VIII BCY79-IX, BCY7B-IX BCY79-X, BCY7B-X		120 180 250 380	170 250 350 500	220 310 460 630	
(I_C = 10 mAdc, V_{CE} = 1 Vdc)	BCY79-VII, BCY7B-VII BCY79-VIII, BCY7B-VIII BCY79-IX, BCY7B-IX BCY79-X, BCY7B-X		80 120 160 240	190 260 380 550	 400 630 1000	
(I_C = 100 mAdc, V_{CE} = 1 Vdc)	BCY79-VII, BCY7B-VII BCY79-VIII, BCY7B-VIII BCY79-IX, BCY7B-IX BCY79-X, BCY7B-X		40 45 60 60			
Collector-Emitter Saturation Voltage (I_C = 100 mAdc, I_B = 2.5 mAdc) (I_C = 10 mAdc, I_B = 0.25 mA)	all	$V_{CE(sat)}$	 0.15 0.05	 0.30 0.12	 0.80 0.25	Vdc
Base-Emitter Saturation Voltage (I_C = 10 mA, I_B = 0.25 mA) (I_C = 100 mA, I_B = 2.5 mA)	all	$V_{BE(sat)}$	 0.6 0.75	 0.70 0.90	 0.B5 1.2	Vdc
Base-Emitter on Voltage (I_C = 2 mAdc, V_{CE} = 5 Vdc)	all	$V_{BE(on)}$	0.60	0.62	0.75	Vdc

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

Characteristic	Type	Symbol	Min	Typ	Max	Unit
DYNAMIC CHARACTERISTICS SMALL SIGNAL CHARACTERISTICS						
Current Gain-Bandwidth Product (I_C = 10 mAdc, V_{CE} = 5 V, f = 100 MHz)	all	f_T	180	300		MHz
Output Capacitance (V_{CE} = 10 Vdc, I_C = 0, f = 1 MHz)	all	C_{ob}		3.5	7	pF
Input Capacitance (V_{BE} = 0.5 V, I_C = 0, f = 1 MHz)	all	C_{ib}		8	15	pF
Small Signal Current Gain (I_C = 2 mAdc, V_{CE} = 5 Vdc, f = 1 kHz)	BCY78-VII, BCY79-VII BCY78-VIII, BCY79-VIII BCY78-IX, BCY79-IX BCY78-X, BCY79-X	h_{fe} (h_{21e})		200 260 330 520		
Input Impedance (I_C = 2 mAdc, V_{CE} = 5 Vdc, f = 1 kHz)	BCY78-VII, BCY79-VII BCY78-VIII, BCY79-VIII BCY78-IX, BCY79-IX BCY78-X, BCY79-X	h_{ie} (h_{11e})	1.6 2.5 3.2 7.5		4.5 6 8.5 12	Kohms
Voltage Feedback Ratio (I_C = 2 mAdc, V_{CE} = 5 Vdc, f = 1 kHz)	BCY78-VII, BCY79-VII BCY78-VIII, BCY79-VIII BCY78-IX, BCY79-IX BCY78-X, BCY79-X	h_{re} (h_{12e})		1.5 2 2 3		$\times 10^{-4}$
Noise Figure (I_C = 0.2 mAdc, V_{CE} = 5 Vdc, R_S = 2 Kohms, f = 1 kHz)	all	N_F		2	6	dB
SWITCHING CHARACTERISTICS						
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 = 990 ohms *See test circuit.		t_d t_r t_{on} t_s t_f t_{off}		35 50 85 400 80 480	 150 800	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 50 55 250 200 450	 150 800	nS

TEST CIRCUIT

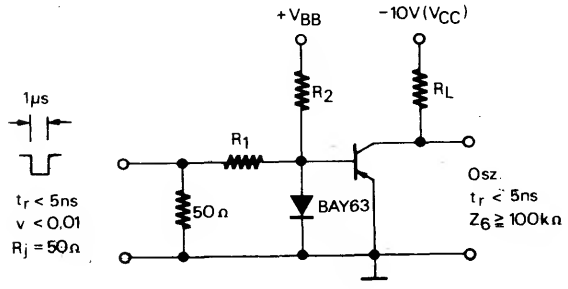

FIGURE 1 – CURRENT GAIN (BCY78-VII/BCY79-VII)

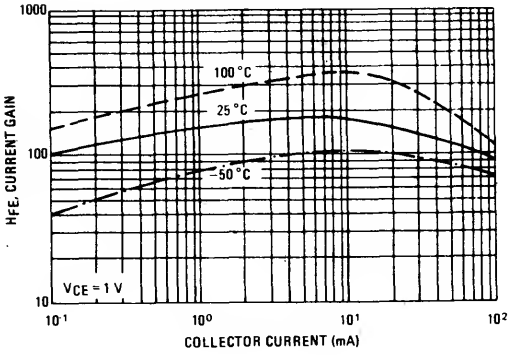

FIGURE 2 – CURRENT GAIN (BCY78-VIII/BCY79-VIII)

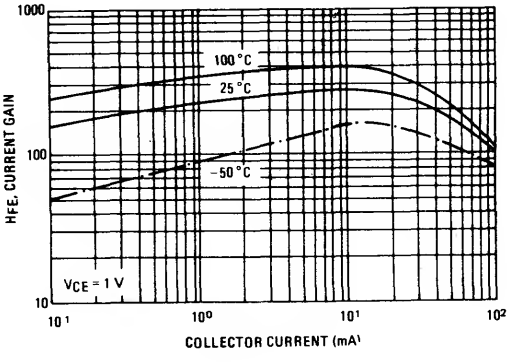

FIGURE 3 – CURRENT GAIN (BCY78-IX/BCY79-IX)

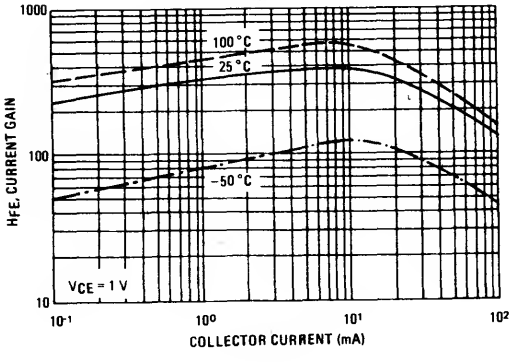

FIGURE 4 – CURRENT GAIN (BCY78-X/BCY79-X)

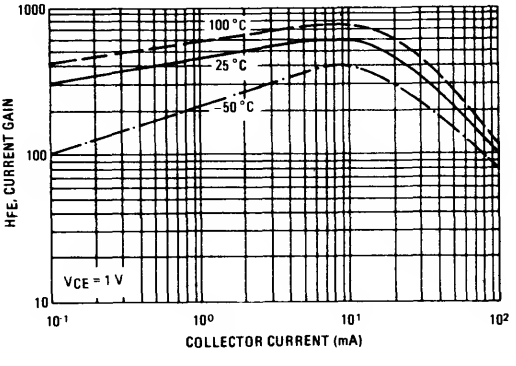

FIGURE 5 – SATURATION VOLTAGE

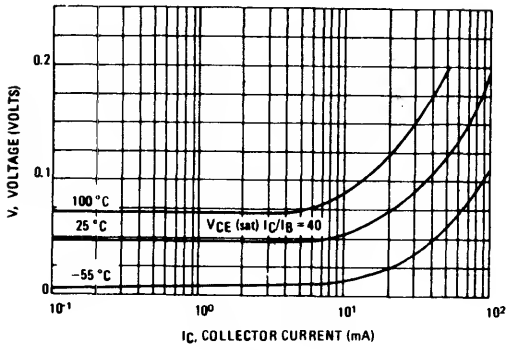

FIGURE 6 – SATURATION VOLTAGE

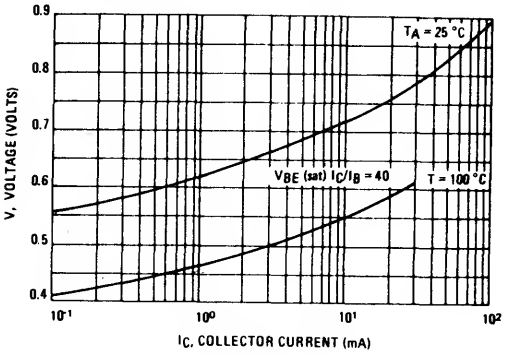

FIGURE 7 – INPUT CHARACTERISTIC (COMMON EMITTER CIRCUIT)

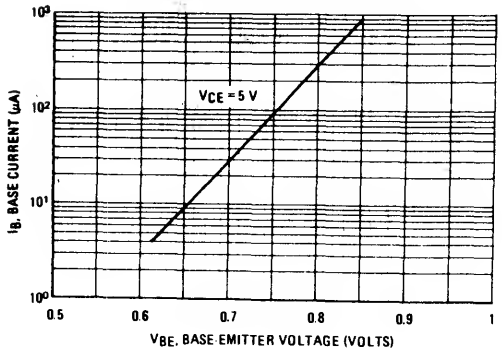

FIGURE 8 – TOTAL PERMISSIBLE POWER DISSIPATION (BCY78/BCY79)

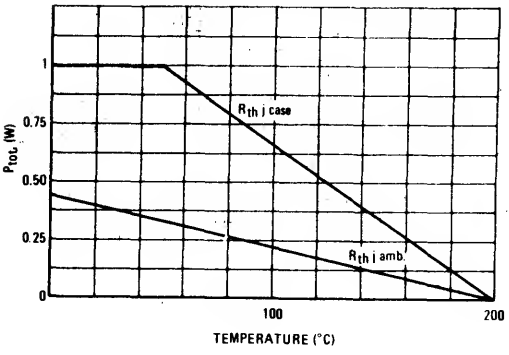

FIGURE 9 – CURRENT GAIN BANDWIDTH PRODUCT

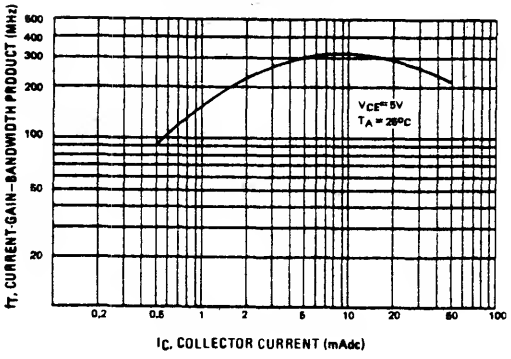

FIGURE 10 – CAPACITANCES