BCX45
BCX47
BCX49

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

HIGH CURRENT TRANSISTORS

NPN SILICON

MAXIMUM RATINGS

Rating	Symbol	BCX 45	BCX 47	BCX 49	Unit
Collector-Emitter Voltage	V_{CEO}	45	60	80	Vdc
Collector-Base Voltage	V_{CBO}	45	60	80	Vdc
Emitter-Base Voltage	V_{EBO}	5.0			Vdc
Collector Current – Continuous	I_C	1.0			Adc
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

Refer to MPSA05 for graphs.

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) BCX45 BCX47 BCX49	$V_{(BR)CEO}$	 45 60 80			Vdc
Collector-Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0) BCX45 BCX47 BCX49	$V_{(BR)CBO}$	 45 60 80			Vdc
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)	$V_{(BR)EBO}$	5.0			Vdc
Collector Cutoff Current (V_{CB} = 30 Vdc – I_E = 0) BCX45 (V_{CB} = 40 Vdc – I_E = 0) BCX47 (V_{CB} = 60 Vdc – I_E = 0) BCX49	I_{CBO}			 100 100 100	nAdc
ON CHARACTERISTICS*					
DC Current Gain (I_C = 10 mAdc, V_{CE} = 2.0 Vdc) (I_C = 100 mAdc, V_{CE} = 2.0 Vdc) (I_C = 500 mAdc, V_{CE} = 2.0 Vdc) (I_C = 1 Adc, V_{CE} = 5.0 Vdc)	h_{FE}	 40 50 30 15	 130 140 60		
Collector-Emitter Saturation Voltage (I_C = 500 mAdc, I_B = 50 mAdc) (I_C = 1 Adc, I_B = 100 mAdc)	$V_{CE(sat)}$		 0.2 0.3	 0.5	Vdc
Base-Emitter Saturation Voltage (I_C = 500 mAdc, I_B = 50 mAdc)	$V_{BE(sat)}$		0.85		Vdc
Base-Emitter On Voltage (I_C = 500 mAdc, V_{CE} = 2.0 Vdc)	$V_{BE(on)}$		0.85	1.2	Vdc

*Pulse test–Pulse width ≤ 300 μs – Duty cycle 2%

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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 = 50 mAdc, V_{CE} = 2.0 Vdc, f = 100 MHz)	f_T	100	200		MHz
Output Capacitance - Common Base (V_{CB} = 10 Vdc, f = 1.0 MHz)	C_{ob}		7.0	12	pF
Input Capacitance - Common Base (V_{CB} = 0.5 Vdc, f = 1.0 MHz)	C_{ib}		50		pF
Input Impedance (I_C = 10 mAdc, V_{CE} = 2.0 Vdc, f = 1.0 KHz)	h_{ie}		530		ohms
Voltage Feedback Ratio (I_C = 10 mAdc, V_{CE} = 2.0 Vdc, f = 1.0 KHz)	h_{re}		$1.1 \cdot 10^{-4}$		
Small-Signal Current Gain (I_C = 10 mAdc, V_{CE} = 2.0 Vdc, f = 1.0 KHz)	h_{fe}		120		
Output Admittance (I_C = 10 mAdc, V_{CE} = 2.0 Vdc, f = 1.0 KHz)	h_{oe}		58		µmho
Turn - On delay Time ($V_{BE(off)}$ = 0.5 V, I_{B1} = 3 mA) (V_{CC} = 40 Vdc, I_C = 250 mAdc (see Figure 1)	t_d		10		ns
Rise Time ($V_{BE(off)}$ = 0.5 V, I_{B1} = 3 mA) (V_{CC} = 40 Vdc, I_C = 250 mAdc (see Figure 1)	t_r		20		ns
Storage Time (I_{B1} = I_{B2} = 3 mA) (V_{CC} = 40 Vdc, I_C = 250 mAdc (see Figure 1)	t_s		330		ns
Fall Time (I_{B1} = I_{B2} = 3 mA) (V_{CC} = 40 Vdc, I_C = 250 mAdc (see Figure 1)	t_f		50		ns

FIGURE 1 – SWITCHING TIME TEST CIRCUIT

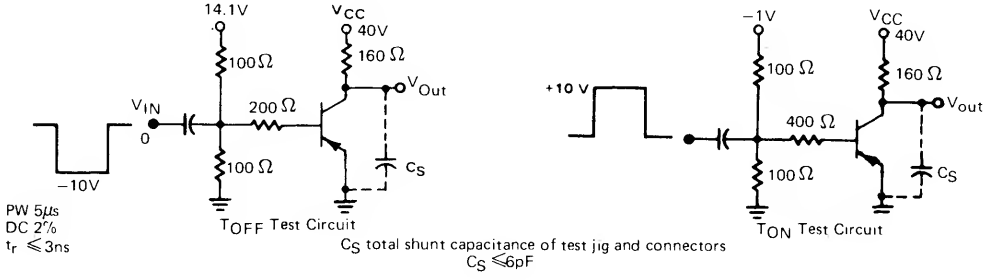

FIGURE 2 – DC CURRENT GAIN