

MAXIMUM RATINGS

Rating	Symbol	BSX 45	BSX 46	BSX 47	Unit
Collector-Emitter Voltage	V _{CEO}	40	60	80	V _{dc}
Collector-Emitter Voltage	V _{CES}	80	100	120	V _{dc}
Emitter-Base Voltage	V _{EBO}	7			V _{dc}
Collector Current - Continuous	I _C	1			A _{dc}
Total Device Dissipation @ T _A = 25°C Derate above 25°C	P _D	1	5.71		Watt mW/°C
Total Device Dissipation @ T _A = 25°C Derate above 25°C	P _D	5	28.6		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 _{θJC}	35	°C/W
Thermal Resistance, Junction to Ambient	R _{θJA}	200	°C/W

**BSX45
BSX46
BSX47**

**CASE 79, STYLE 1
TO-39 (TO-205AD)**

AMPLIFIER TRANSISTOR

NPN SILICON

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Refer to 2N3019 for graphs.

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

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage(1) (I _C = 30 mA _{dc} , I _B = 0)	BSX45 BSX46 BSX47	V _{(BR)CEO}	40 60 80	V _{dc}
Collector-Emitter Breakdown Voltage (I _C = 100 μA _{dc} , V _{BE} = 0)	BSX45 BSX46 BSX47	V _{(BR)CES}	80 100 120	V _{dc}
Emitter-Base Breakdown Voltage (I _E = 100 μA _{dc} , I _C = 0)		V _{(BR)EBO}	7	V _{dc}
Emitter Cutoff Current (V _{BE} = 5.0 V _{dc} , I _C = 0)		I _{EBO}		10 nA _{dc}
Collector Cutoff Current (V _{CE} = 60 V, V _{BE} = 0) (V _{CE} = 80 V, V _{BE} = 0) (V _{CE} = 60 V, V _{BE} = 0, T _C = 150°C) (V _{CE} = 80 V, V _{BE} = 0, T _C = 150°C)	BSX45,46 BSX47 BSX45,46 BSX47	I _{CES}		10 10 10 10 μA _{dc}

ON CHARACTERISTICS

DC Current Gain (I _C = 0.1 mA _{dc} , V _{CE} = 1.0 V _{dc}) (I _C = 100 mA _{dc} , V _{CE} = 1.0 V _{dc})(1) (I _C = 500 mA _{dc} , V _{CE} = 1.0 V _{dc})(1)	Gr. 6 Gr. 10 Gr. 16 Gr. 6 Gr. 10 Gr. 16 Gr. 6 Gr. 10 Gr. 16	h _{FE}	10 15 25 40 63 100 15 25 35	100 160 250	
Base-Emitter On Voltage (I _C = 100 mA _{dc} , V _{CE} = 1.0 V _{dc}) (I _C = 500 mA _{dc} , V _{CE} = 1.0 V _{dc}) (I _C = 1 A, V _{CE} = 1.0 V _{dc})		V _{BE(on)}	0.75	1 1.5 2	V _{dc}
Collector-Emitter Saturation Voltage (I _C = 1 A _{dc} , I _B = 100 mA _{dc})		V _{EC(sat)}		1	V _{dc}

SMALL SIGNAL CHARACTERISTICS

Transition Frequency (I _C = 50 mA _{dc} , V _{CE} = 10 V _{dc} , f = 20 MHz)	f _T	50		MHz
Emitter-Base Capacitance (V _{BE} = 0.5 V, f = 1 MHz)	C _{ib}		80	pF

(1) Pulsed: Pulse Duration = 300 μs, Duty Cycle = 1%.

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

Characteristic		Symbol	Min	Max	Unit
Collector-Base Capacitance ($V_{CB} = 10\text{ V}$, $f = 1\text{ MHz}$)	BSX45 BSX46 BSX47	C_{ob}		25 20 15	pF
Turn On Time	See Figure 1 ($I_C = 100\text{ mA dc}$)	t_{on}		200	ns
Turn Off Time	$I_{B1} = -I_{B2} = 5\text{ mA dc}$	t_{off}		850	

FIGURE 1 – SWITCHING TIME TEST CIRCUIT

