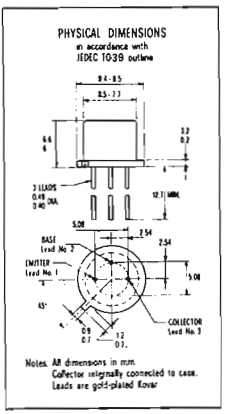
BSX 32

HIGH-VOLTAGE, HIGH-CURRENT SWITCH

NPN DIFFUSED SILICON PLANAR EPITAXIAL TRANSISTOR

GENERAL DESCRIPTION - The BSX 32 is an NPN silicon PLANAR epitaxial transistor suitable for high-voltage, high-current switching applications. The V_{CEO} (sust) of 40 V, V_{CE} (sat) of 0.85V at 1A together with 300 MHz minimum f_T and tight control of storage time make the BSX 32 ideal for use in fast high-current memory applications.



ABSOLUTE MAXIMUM RATINGS (Note 1)

Maximum Temperatures

T_{STG}	Storage Temperature	-55°C to + 200°C
T_J	Operating Junction Temperature	+ 200°C Maximum
T_L	Lead Temperature (Soldering, 10 sec. time limit)	+ 260°C Maximum

Maximum Power Dissipations (Notes 2 and 3)

P	Total Dissipation at 25°C Case Temperature	3.5 Watts
	at 25°C Ambient Temperature	0.8 Watt

Maximum Voltages and Current (25°C free air temperature unless otherwise noted)

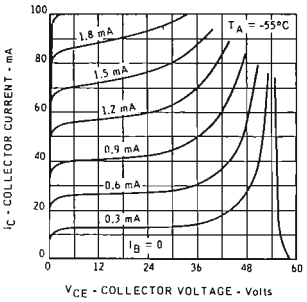
V_{CBO}	Collector to Base Voltage	65 Volts
V_{CEO}	Collector to Emitter Voltage (Note 4)	40 Volts
V_{EBO}	Emitter to Base Voltage	6 Volts
I_C	DC Collector Current	1 Amp.

ELECTRICAL CHARACTERISTICS (25°C free air temperature unless otherwise noted)

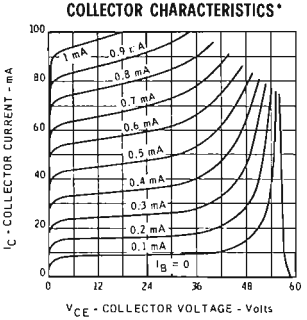
SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS	
h_{FE}	DC Pulse Current Gain (Note 5)	30	60			I_C = 10 mA	V_{CE} = 1 V
h_{FE}	DC Pulse Current Gain (Note 5)	60	90	150		I_C = 100 mA	V_{CE} = 1 V
h_{FE}	DC Pulse Current Gain (Note 5)	25	60			I_C = 500 mA	V_{CE} = 1 V
h_{FE}	DC Pulse Current Gain (Note 5)	20	60			I_C = 1 A	V_{CE} = 5 V
h_{FE} (-55°C)	DC Pulse Current Gain (Note 5)	30	45			I_C = 100 mA	V_{CE} = 1 V
h_{FE} (-55°C)	DC Pulse Current Gain (Note 5)	15	35			I_C = 500 mA	V_{CE} = 1 V
V_{BE} (sat)	Base-Emitter Saturation Voltage (Note 5)		0.8	0.9	V	I_C = 100 mA	I_B = 10 mA
V_{BE} (sat)	Base-Emitter Saturation Voltage (Note 5)			1.5	V	I_C = 500 mA	I_B = 50 mA
V_{BE} (sat)	Base-Emitter Saturation Voltage (Note 5)			2	V	I_C = 1 A	I_B = 100 mA
V_{CE} (sat)	Collector-Emitter Saturation Voltage (Note 5)		0.17	0.25	V	I_C = 100 mA	I_B = 10 mA
V_{CE} (sat)	Collector-Emitter Saturation Voltage (Note 5)		0.36	0.50	V	I_C = 500 mA	I_B = 50 mA
V_{CE} (sat)	Collector-Emitter Saturation Voltage (Note 5)		0.60	0.85	V	I_C = 1 A	I_B = 100 mA
I_{CBO}	Collector Cutoff Current		0.25	4	μA	V_{CB} = 50 V	I_E = 0
BV_{CBO}	Collector to Base Breakdown Voltage	65			V	I_C = 100 μA	I_E = 0
BV_{EBO}	Emitter to Base Breakdown Voltage	6			V	I_E = 100 μA	I_C = 0
V_{CEO} (sust)	Collector to Emitter Sustaining Voltage (Notes 4 and 5)	40			V	I_C = 10 mA	I_B = 0
h_{fe}	High Frequency Current Gain (f = 100 MHz)	3	4.5			I_C = 50 mA	V_{CE} = 10 V
C_{ob}	Output Capacitance		6	10	pF	V_{CB} = 10 V	
C_{TE}	Emitter Transition Capacitance		40	55	pF	V_{EB} = 0.5 V	
t_{on}	Turn On Time		22	35	nsec	I_C = 500 mA	I_{B1} = 50 mA
t_{off}	Turn Off Time		40	60	nsec	I_C = 500 mA	$I_{B1} = I_{B2}$ = 50mA

TYPICAL ELECTRICAL CHARACTERISTICS (25° C free air temperature unless otherwise noted)

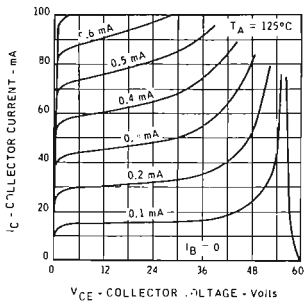
COLLECTOR CHARACTERISTICS*



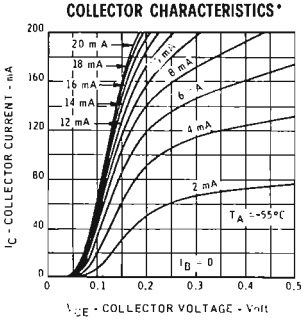
COLLECTOR CHARACTERISTICS*



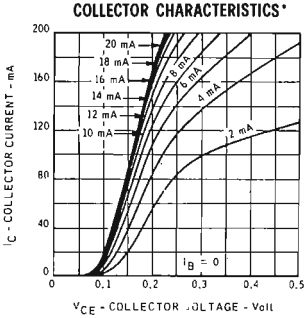
COLLECTOR CHARACTERISTICS*



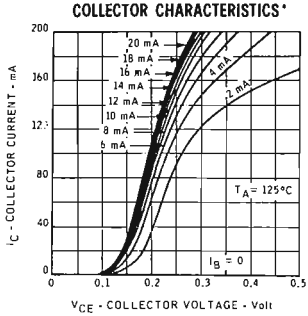
COLLECTOR CHARACTERISTICS*



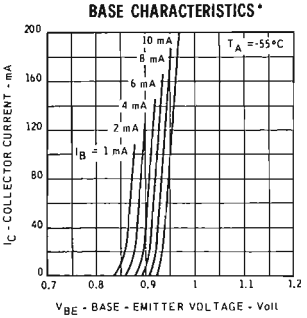
COLLECTOR CHARACTERISTICS*



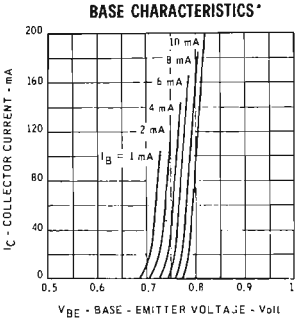
COLLECTOR CHARACTERISTICS*



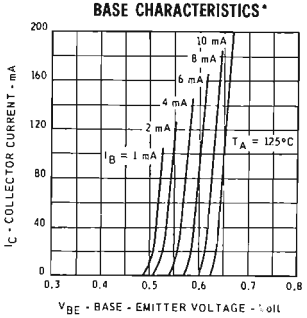
BASE CHARACTERISTICS*



BASE CHARACTERISTICS*



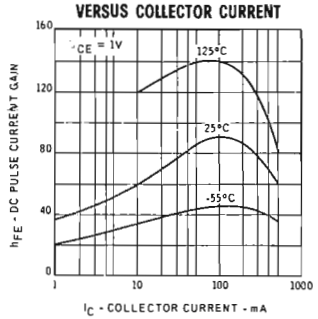
BASE CHARACTERISTICS*



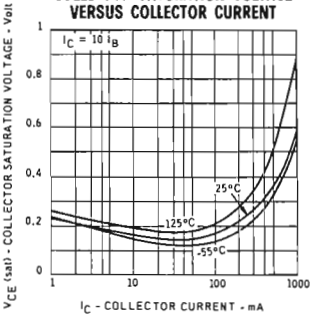
* Single family characteristics on Transistor Curve Tracer.

TYPICAL ELECTRICAL CHARACTERISTICS (25° C free air temperature unless otherwise noted)

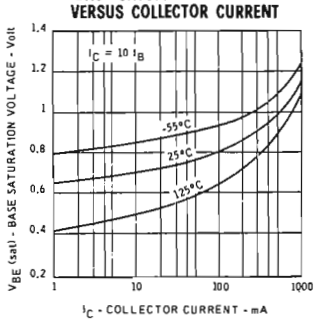
DC PULSE CURRENT GAIN VERSUS COLLECTOR CURRENT



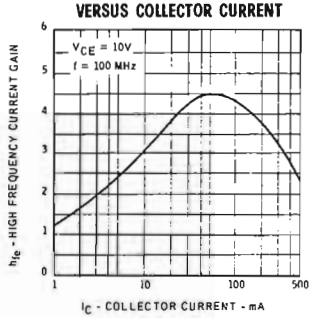
COLLECTOR SATURATION VOLTAGE VERSUS COLLECTOR CURRENT



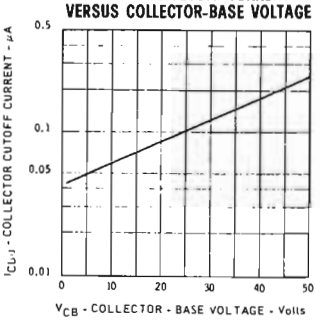
BASE SATURATION VOLTAGE VERSUS COLLECTOR CURRENT



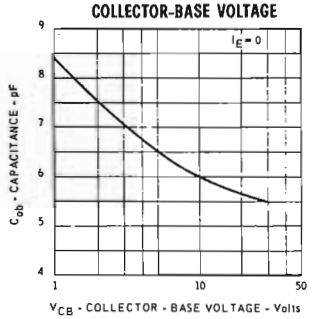
HIGH FREQUENCY CURRENT GAIN VERSUS COLLECTOR CURRENT



COLLECTOR CUTOFF CURRENT VERSUS COLLECTOR-BASE VOLTAGE



OUTPUT CAPACITANCE VERSUS COLLECTOR-BASE VOLTAGE



NOTES:

(1) These ratings are limiting values above which the serviceability of any individual semiconductor device may be impaired.

(2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

(3) These ratings give a maximum junction temperature of 200°C and junction-to-case thermal resistance of 50°C/watt (derating factor of 20 mW/°C); junction-to-ambient thermal resistance of 219°C/watt (derating factor of 4.56 mW/°C).

(4) These ratings refer to a high-current point where collector-to-emitter voltage is lowest. For more information send for SGS-AR 5.

(5) Pulse Conditions: length = 300 μsec; duty cycle = 1%.