



BSX 19

BSX 20

NPN SILICON PLANAR EPITAXIAL TRANSISTORS



CASE T0-18

THE BSX19 AND BSX20 ARE NPN SILICON PLANAR EPITAXIAL TRANSISTORS DESIGNED FOR VERY HIGH SPEED SATURATED SWITCHING APPLICATIONS.



CBE

ABSOLUTE MAXIMUM RATINGS

Collector-Base Voltage	VCBO	40V
Collector-Emitter Voltage ($V_{BE}=0$)	VCES	40V
Collector-Emitter Voltage ($I_B=0$)	VCEO	15V
Emitter-Base Voltage	VEBO	4.5V
Collector Peak Current	ICM	500mA
Total Power Dissipation @ $T_A=25^\circ\text{C}$	P_{tot}	360mW
Operating Junction & Storage Temperature	T_j, T_{stg}	-65 to 200°C

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

PARAMETER	SYMBOL	BSX19		BSX20		UNIT	TEST CONDITIONS
		MIN	MAX	MIN	MAX		
Collector-Emitter Breakdown Voltage	BVCEO	15		15		V	$I_C=10\text{mA}$ $I_B=0$
Collector-Emitter Breakdown Voltage	BVCER	20		20		V	$I_C=10\text{mA}$ $R_{BE}=10\Omega$
Collector Cutoff Current	ICBO	400		400		nA	$V_{CB}=20\text{V}$ $I_E=0$ $V_{CB}=20\text{V}$ $I_E=0$ $T_j=150^\circ\text{C}$
		30		30		μA	
Collector Cutoff Current	ICES	0.4		0.4		μA	$V_{CE}=15\text{V}$ $V_{BE}=0$ $T_j=55^\circ\text{C}$
		1		1		μA	
Collector Cutoff Current	ICEV	0.6		0.6		μA	$V_{CE}=15\text{V}$ $V_{BE}=-3\text{V}$ $T_j=55^\circ\text{C}$
Emitter Cutoff Current	IEBO	10		10		μA	$V_{EB}=4.5\text{V}$ $I_C=0$
Collector-Emitter Saturation Voltage	VCE(sat)	0.25		0.25		V	$I_C=10\text{mA}$ $I_B=1\text{mA}$
		0.3				V	$I_C=10\text{mA}$ $I_B=0.6\text{mA}$
				0.3		V	$I_C=10\text{mA}$ $I_B=0.3\text{mA}$
				0.6		V	$I_C=100\text{mA}$ $I_B=10\text{mA}$

MICRO ELECTRONICS LTD.

38 HUNG TO ROAD, KWUN TONG, HONG KONG. TELEX 43510
 KWUN TONG P. O. BOX 69477 CABLE ADDRESS "MICROTRON"
 TELEPHONE: 3-430181-6 3-8933663 3-892423

FAX: 3-410321

1-2-BMP

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PARAMETER	SYMBOL	BSX19		BSX20		UNIT	TEST CONDITIONS
		MIN	MAX	MIN	MAX		
Base-Emitter Saturation Voltage	V _{BE(sat)}	0.7	0.85	0.7	0.85	V	I _C =10mA I _B =1mA
			1.5		1.5	V	I _C =100mA I _B =10mA
Base-Emitter Voltage	V _{BE}	0.35		0.35		V	I _C =30μA V _{CE} =20V T _j =100°C
D.C. Current Gain	H _{FE}	20	60	40	120		I _C =10mA V _{CE} =1V
		10		20			I _C =10mA V _{CE} =1V
		10		20			T _j =-55°C I _C =100mA V _{CE} =2V
Current Gain-Bandwidth Product	f _T	400		500		MHz	I _C =10mA V _{CE} =10V
Collector-Base Capacitance	C _{cb}		4		4	pF	V _{CB} =5V I _E =0 f=1MHz
Emitter-Base Capacitance	C _{eb}		4.5		4.5	pF	V _{EB} =1V I _C =0 f=1MHz
Turn-On Time	t _{on}		12		12	nS	I _C =10mA V _{CC} =3V I _{B1} =3mA
			7		7	nS	I _C =100mA V _{CC} =6V I _{B1} =40mA
Turn-Off Time	t _{off}		15		18	nS	I _C =10mA V _{CC} =3V I _{B1} =3mA -I _{B2} =1.5mA
			18		21	nS	I _C =100mA I _{B1} =40mA -I _{B2} =20mA
			10		13	nS	I _C =10mA V _{CC} =10V I _{B1} =-I _{B2} =10mA