

BSX20

Low Power Bipolar Transistors



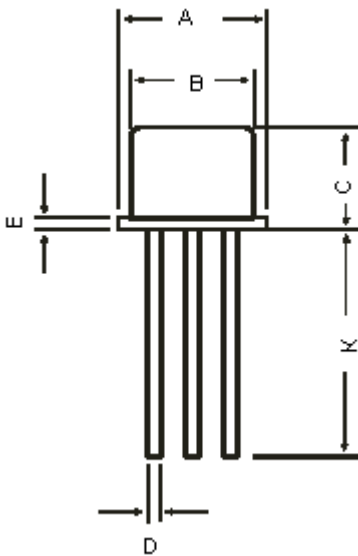
Feature:

- NPN Silicon Planar Switching Transistors.

Applications:

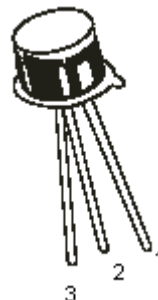
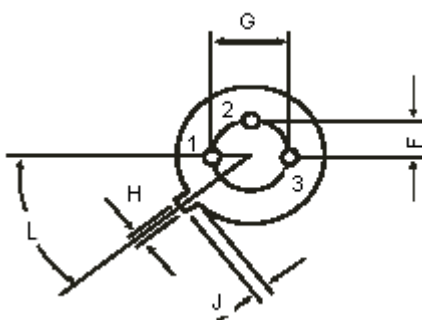
- High speed saturated switching applications.

TO-18 Metal Can Package



Dimensions	Minimum	Maximum
A	5.24	5.84
B	4.52	4.97
C	4.31	5.33
D	0.40	0.53
E	-	0.76
F	-	1.27
G	-	2.97
H	0.91	1.17
J	0.71	1.21
K	12.70	-
L	45°	

Dimensions : Millimetres



Pin Configuration:

1. Emitter
2. Base
3. Collector

Absolute Maximum Ratings

Description	Symbol	Value	Unit
Collector Base Voltage	V_{CB0}	40	V
Collector Emitter Voltage	V_{CES}	40	
Collector Emitter Voltage	V_{CEO}	15	
Emitter Base Voltage	V_{EBO}	4.5	
Collector Peak Current (t = 10 μ s)	I_{CM}	0.5	A
Power Dissipation at $T_a = 25^\circ\text{C}$ at $T_C = 25^\circ\text{C}$	P_{tot}	0.36 1.20	W
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	$^\circ\text{C}$
Thermal Resistance			
Junction to Case	$R_{th(j-c)}$	146	$^\circ\text{C/W}$
Junction to Ambient	$R_{th(j-a)}$	486	

Electrical Characteristics ($T_a = 25^\circ\text{C}$ unless otherwise specified)

Description	Symbol	Test Condition	Minimum	Maximum	Unit
Collector-Cut off Current	I_{CBO}	$V_{CB} = 20\text{V}, I_E = 0$		400	nA
	I_{CES}	$V_{CB} = 20\text{V}, I_E = 0, T_a = 150^\circ\text{C}$		30	μA
	I_{CEX}	$V_{CE} = 15\text{V}, V_{BE} = 0, T_a = 55^\circ\text{C}$	-	400	nA
	I_{CEX}	$V_{CE} = 40\text{V}, V_{BE} = 0$ $V_{CE} = 15\text{V}, V_{BE} = -3\text{V}, T_a = 55^\circ\text{C}$		1.0 600	μA nA
Emitter-Cut off Current	I_{EBO}	$V_{EB} = 4.5\text{V}, I_C = 0$	-	10	μA
Base-Cut off Current	I_{BEX}	$V_{CE} = 15\text{V}, V_{BE} = -3\text{V}, T_a = 55^\circ\text{C}$	-	600	nA
Collector-Emitter (sus) Voltage	$V_{CER(sus)}^*$	$I_C = 10\text{mA}, R_{BE} = 10\Omega$	20	-	V
Collector-Emitter Voltage	V_{CEO}^*	$I_C = 10\text{mA}, I_B = 0$	15	-	
Collector Emitter Saturation Voltage	$V_{CE(Sat)}^*$	$I_C = 10\text{mA}, I_B = 1\text{mA}$ $I_C = 100\text{mA}, I_B = 10\text{mA}$ $I_C = 10\text{mA}, I_B = 0.3\text{mA}$	-	0.25 0.60 0.30	
Base Emitter On Voltage	$V_{BE(on)}$	$I_C = 30\mu\text{A}, V_{CE} = 20\text{V}, T_a = 100^\circ\text{C}$	0.35	-	
Base Emitter Saturation Voltage	$V_{BE(Sat)}^*$	$I_C = 10\text{mA}, I_B = 1\text{mA}$ $I_C = 100\text{mA}, I_B = 10\text{mA}$	0.70 -	0.85 1.50	
DC Current	h_{FE}^*	$I_C = 10\text{mA}, V_{CE} = 1\text{V}$ $I_C = 100\text{mA}, V_{CE} = 2\text{V}$ $I_C = 10\text{mA}, V_{CE} = 1\text{V}, T_a = -55^\circ\text{C}$	40 20 20	-	-

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Low Power Bipolar Transistors



Electrical Characteristics ($T_a = 25^\circ\text{C}$ unless otherwise specified)

Description	Symbol	Test Condition	Minimum	Maximum	Unit
Dynamic Characteristics					
Transistion Frequency	f_t	$V_{CE} = 10\text{V}, I_C = 10\text{mA}$	500	-	MHz
Emitter Base Capacitance	C_{ebo}	$I_C = 0, V_{EB} = 1\text{V}$	-	4.5	pF
Collector Base Capacitance	C_{bo}	$I_E = 0, V_{CB} = 5\text{V}$	-	4.0	
Storage Time	t_s	$I_C = 10\text{mA}, V_{CC} = 10\text{V},$ $I_{B1} = -I_{B2} = 10\text{mA}$	-	13	ns
Turn on Time	t_{on}	$I_C = 10\text{mA}, V_{CC} = 3\text{V},$ $I_{B1} = 3\text{mA}$ $I_C = 100\text{mA}, V_{CC} = 6\text{V},$ $I_{B1} = 40\text{mA}$	-	12 7.0	
Turn off Time	t_{off}	$I_C = 10\text{mA}, V_{CC} = 3\text{V},$ $I_{B1} = 3\text{mA}, I_{B2} = -1.5\text{mA}$ $I_C = 100\text{mA}, V_{CC} = 6\text{V},$ $I_{B1} = 40\text{mA}, I_{B2} = -20\text{mA}$	-	18 21	

*Pulsed : Pulse duration = 300 μs , duty cycle = 1%.

Part Number Table

Package	Part Number
TO-18	BSX20

Notes:

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