



### Features:

- NPN Silicon Planar epitaxial Transistors.
- Fast switching devices exhibiting short turn-off and low saturation voltage characteristics.
- High speed saturated switching application.

### Absolute Maximum Ratings

Description	Symbol	Value	Unit
Collector -Base Voltage	$V_{CBO}$	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 = 10us)	$I_{CM}$	0.5	A
Power Dissipation at $T_a = 25^\circ\text{C}$ at $T_a = 25^\circ\text{C}$	$P_{tot}$	360	mW
		1.20	W
Operating and Storage JunctionTemperature Range	$T_j, T_{stg}$	-65 to +200	$^\circ\text{C}$
Thermal ResistanceJunction to caseJunction to ambient	$R_{th(j-c)}$ $R_{th(j-c)}$	146	$^\circ\text{C/W}$
		486	

### Electrical Characteristics (Ta=25°C unless otherwise specified)

Description	Symbol	Test Condition	Value		Unit
			Minimum	Maximum	
Collector-Cut off Current	$I_{CBO}$	$V_{CB} = 20\text{V}, I_E = 0$		400	nA
		$V_{CB} = 20\text{V}, I_E = 0, T_a = 150^\circ\text{C}$		30	mA
	$I_{CES}$	$V_{CE} = 15\text{V}, V_{BE} = 0, T_a = 55^\circ\text{C}$ $V_{CE} = 40\text{V}, V_{BE} = 0$	-	400	nA
	$I_{CEX}$	$V_{CE} = 15\text{V}, V_{EB} = -3\text{V}, T_a = 55^\circ\text{C}$		1.0	mA
Emitter-Cut off Current	$I_{EBO}$	$V_{EB} = 4.5\text{V}, I_C = 0$		600	nA
Base-Cut off Current	$I_{BEX}$	$V_{CE} = 15\text{V}, V_{EB} = -3\text{V}, T_a = 55^\circ\text{C}$		10	mA
Collector -Emitter (sus) Voltage	$*V_{CER(sus)}$	$I_C = 10\text{mA}, R_{BE} = 10\text{W}$	20		
Collector -Emitter Voltage	$*V_{CEO}$	$I_C = 10\text{mA}, I_B = 0$	15		V
Collector -Emitter Saturation Voltage	$*V_{CE(sat)}$	$I_C = 10\text{mA}, I_B = 10\text{mA}$		0.60	V
Base Emitter on Voltage	$V_{BE(on)}$	$I_C = 30\text{mA}, V_{CE} = 20\text{V}, T_a = 100^\circ\text{C}$	0.35		V
Base -Emitter Saturation Voltage	$*V_{BE(sat)}$	$I_C = 10\text{mA}, I_B = 1\text{mA}$	0.70	0.85	V
		$I_C = 100\text{mA}, I_B = 10\text{mA}$		1.50	V
DC Current	$*h_{FE}$	$I_C = 10\text{mA}, V_{CE} = 1\text{V}$	40		
		$I_C = 100\text{mA}, V_{CE} = 2\text{V}$	20	120	
		$I_C = 10\text{mA}, V_{CE} = 1\text{V}, T_a = -55^\circ\text{C}$	20		

### Electrical Characteristics (Ta=25°C unless otherwise specified)

Dynamic Characteristics	Symbol	Test Condition	Minimum	Maximum	Unit
Transition Frequency	$f_t$	$V_{CE} = 10V, I_C = 10mA$	500	-	MHz
Emitter Base Capacitance	$C_{ebo}$	$I_C = 0, V_{EB} = 1V$	-	4.5	pF
Collector Base Capacitance	$C_{bo}$	$I_E = 0, V_{CB} = 5V$	-	4.0	pF
Storage Time	$t_s$	$I_C = 10mA, V_{CC} = 10V$ $I_{B1} = -I_{B2} = 10mA$	-	13.0	ns
Turn-on Time	$t_{on}$	$I_C = 10mA, V_{CC} = 3V, I_{B1} = 3mA$ $I_C = 100mA, V_{CC} = 6V, I_{B1} = 40mA$	-	12.0 7.0	ns
Turn-off Time	$t_{off}$	$I_C = 10mA, V_{CC} = 3V$ $I_{B1} = 3mA, I_{B2} = -1.5mA$  $I_C = 10mA, V_{CC} = 6V$ $I_{B1} = 40mA, I_{B2} = -20mA$	-	18  21	ns

\*Pulsed: Pulse Duration = 300µs, Duty Cycle = 1%

### Part Number

$V_{CEO}$ maximum (V)	$I_C$ maximum (A)	$V_{CE(sat)}$ maximum (V) at $I_C$ mA 10	$t_{off}$ maximum (ns) at $I_C$ mA 100	$h_{FE}$ minimum at $I_C$ mA 10	$P_{tot}$ at 25°C mW	Package and Pin Out	Part Number
15	0.5	0.6	21	40	360	TO-18	BSX20

Order Multiple = 1

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