

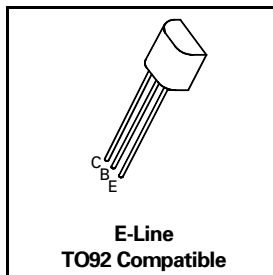
# NPN SILICON PLANAR MEDIUM POWER DARLINGTON TRANSISTORS

## BCX38A/B/C

ISSUE 1 – MARCH 94

### FEATURES

- \* 60 Volt  $V_{CEO}$
- \* Gain of 10K at  $I_C=0.5$  Amp
- \*  $P_{tot}=1$  Watt



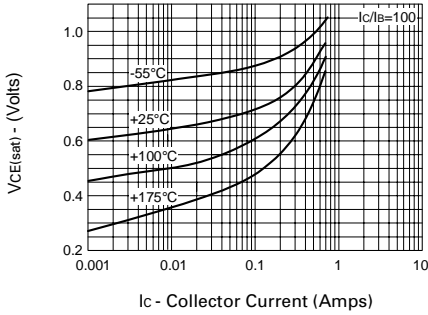
### ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	$V_{CBO}$	80	V
Collector-Emitter Voltage	$V_{CEO}$	60	V
Emitter-Base Voltage	$V_{EBO}$	10	V
Peak Pulse Current	$I_{CM}$	2	A
Continuous Collector Current	$I_C$	800	mA
Power Dissipation at $T_{amb}=25^\circ\text{C}$	$P_{tot}$	1	W
Operating and Storage Temperature Range	$T_j; T_{stg}$	-55 to +200	$^\circ\text{C}$

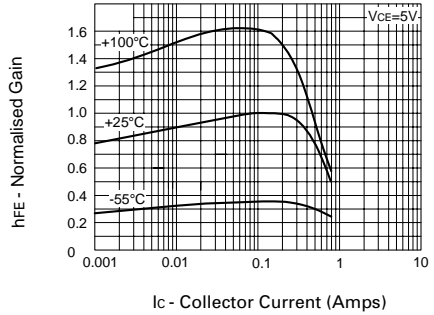
### ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^\circ\text{C}$ ).

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	80			V	$I_C=10\mu\text{A}, I_E=0$
Collector-Emitter Sustaining Voltage	$V_{CEO(sus)}$	60			V	$I_C=10\text{mA}, I_B=0$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	10			V	$I_E=10\mu\text{A}, I_C=0$
Collector Cut-Off Current	$I_{CBO}$			100	nA	$V_{CB}=60\text{V}, I_E=0$
Emitter Cut-Off Current	$I_{EBO}$			100	nA	$V_{EB}=8\text{V}, I_C=0$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			1.25	V	$I_C=800\text{mA}, I_B=8\text{mA}^*$
Base-Emitter Turn-on Voltage	$V_{BE(on)}$			1.8	V	$I_C=800\text{mA}, V_{CE}=5\text{V}^*$
Static Forward Current Transfer Ratio	BCX38A	$h_{FE}$	500 1000			$I_C=100\text{mA}, V_{CE}=5\text{V}^*$ $I_C=500\text{mA}, V_{CE}=5\text{V}^*$
	BCX38B		2000 4000			$I_C=100\text{mA}, V_{CE}=5\text{V}^*$ $I_C=500\text{mA}, V_{CE}=5\text{V}^*$
	BCX38C		5000 10000			$I_C=100\text{mA}, V_{CE}=5\text{V}^*$ $I_C=500\text{mA}, V_{CE}=5\text{V}^*$

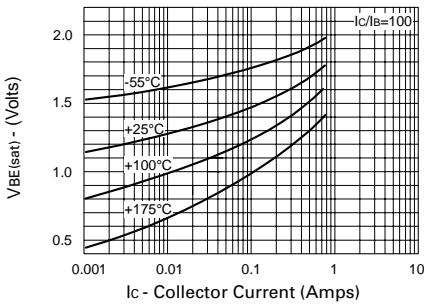
## TYPICAL CHARACTERISTICS



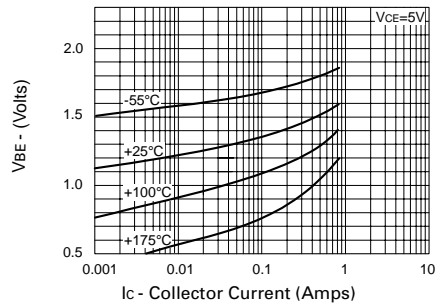
**$V_{CE(sat)}$  v  $I_C$**



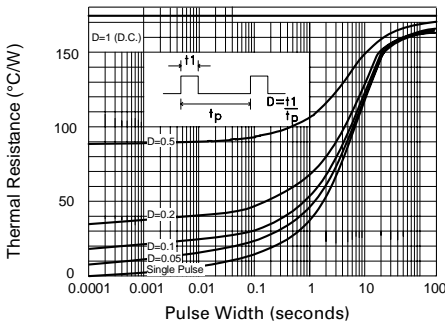
**hFE v  $I_C$**



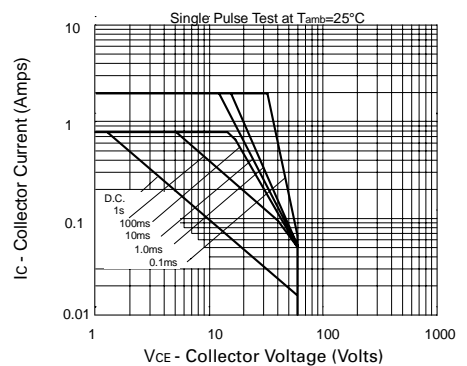
**$V_{BE(sat)}$  v  $I_C$**



**$V_{BE(on)}$  v  $I_C$**

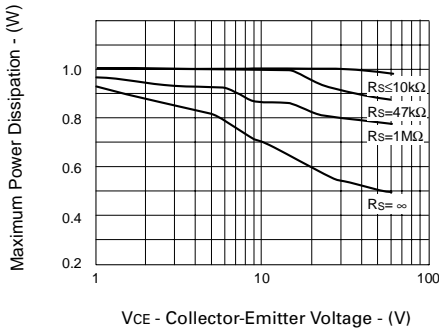


**Maximum transient thermal impedance**



**Safe Operating Area**

# BCX38A/B/C



The maximum permissible operational temperature can be obtained using the equation:

$$T_{amb(max)} = \frac{Power(max) - Power(actual)}{0.0057} + 25^{\circ}C$$

$T_{amb(max)}$  = Maximum operating ambient temperature

Power (max) = Maximum power dissipation figure, for a given  $V_{CE}$  and source resistance ( $R_S$ )

Power (actual) = Actual power dissipation in users circuit