

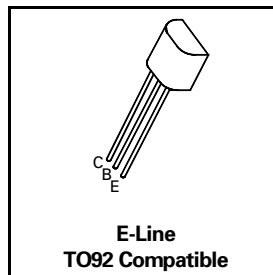
NPN SILICON PLANAR MEDIUM POWER DARLINGTON TRANSISTORS

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.

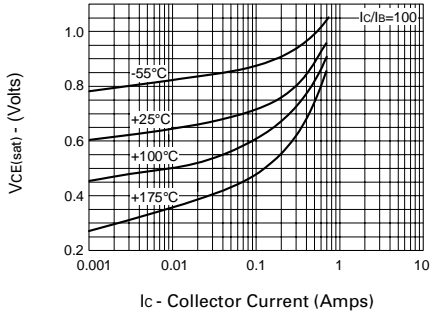
| PARAMETER | SYMBOL | VALUE | UNIT |
|--|----------------|-------------|-------------|
| Collector-Base Voltage | V_{CBO} | 80 | V |
| Collector-Emitter Voltage | V_{CEO} | 60 | V |
| Emitter-Base Voltage | V_{EBO} | 10 | V |
| Peak Pulse Current | I_{CM} | 2 | A |
| Continuous Collector Current | I_C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

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

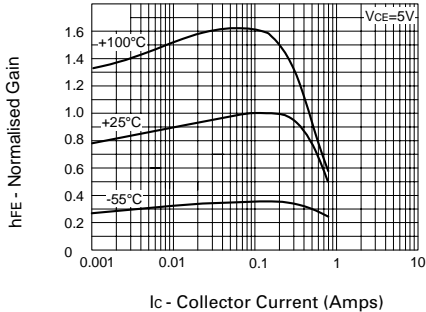
| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS. |
|---------------------------------------|----------------|----------|---------------|------|------|--|
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | 80 | | | V | $I_C=10\mu A, I_E=0$ |
| Collector-Emitter Sustaining Voltage | $V_{CEO(sus)}$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

BCX38A/B/C

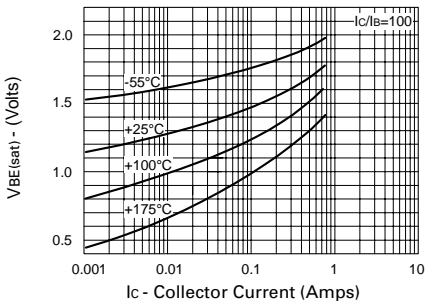
TYPICAL CHARACTERISTICS



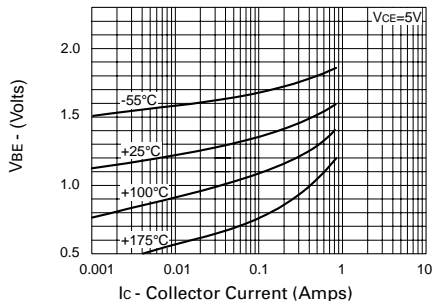
$V_{CE(sat)}$ v I_C



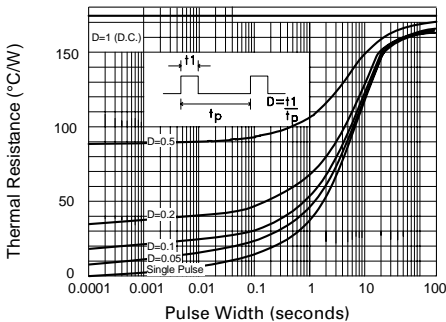
h_{FE} v I_C



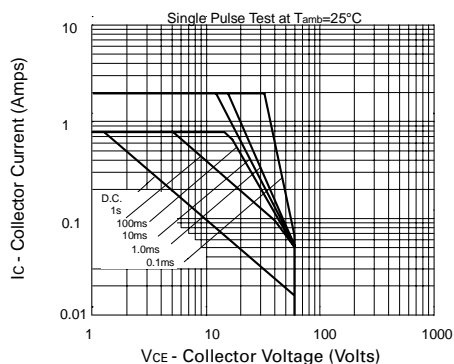
$V_{BE(sat)}$ v I_C



$V_{BE(on)}$ v I_C

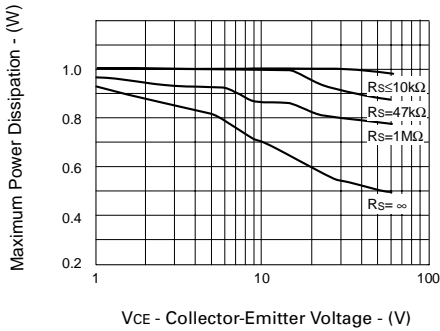


Maximum transient thermal impedance



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