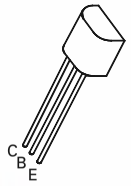
# PNP SILICON PLANAR MEDIUM POWER HIGH CURRENT TRANSISTOR

**ZTX957**

**ISSUE 3 – JUNE 94**

FEATURES

* 1 Amp continuous current
* Up to 2 Amps peak current
* Very low saturation voltage
* Excellent gain characteritics up to 1 Amp
* Spice model available




**E-Line**
**TO92 Compatible**

## ABSOLUTE MAXIMUM RATINGS.

| PARAMETER | SYMBOL | VALUE | UNIT |
|---|---|---|---|
| Collector-Base Voltage | $V_{CBO}$ | -330 | V |
| Collector-Emitter Voltage | $V_{CEO}$ | -300 | V |
| Emitter-Base Voltage | $V_{EBO}$ | -6 | V |
| Peak Pulse Current | $I_{CM}$ | -2 | A |
| Continuous Collector Current | $I_C$ | -1 | A |
| Practical Power Dissipation* | $P_{totp}$ | 1.58 | W |
| Power Dissipation at $T_{amb}$=25°C | $P_{tot}$ | 1.2 | W |
| Operating and Storage Temperature Range | $T_j$:$T_{stg}$ | -55 to +200 | °C |

*The power which can be dissipated assuming the device is mounted in a typical manner on a P.C.B. with copper equal to 1 inch square minimum

## ELECTRICAL CHARACTERISTICS (at $T_{amb}$ = 25°C unless otherwise stated)

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS. |
|---|---|---|---|---|---|---|
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | -330 | -440 | | V | $I_C$=-100µA |
| Collector-Emitter Breakdown Voltag | $V_{(BR)CER}$ | -330 | -440 | | V | IC=-1µA, RB ≤1KΩ |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | -300 | -400 | | V | $I_C$=-10mA* |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | -6 | -8 | | V | $I_E$=-100µA |
| Collector Cut-Off Current | $I_{CBO}$ | | | -50<br>-1 | nA<br>µA | $V_{CB}$=-300V<br>$V_{CB}$=-300V, $T_{amb}$=100°C |
| Collector Cut-Off Current | $I_{CER}$<br>R ≤1KΩ | | | -50<br>-1 | nA<br>µA | $V_{CB}$=-300V<br>$V_{CB}$=-300V, $T_{amb}$=100°C |
| Emitter Cut-Off Current | $I_{EBO}$ | | | -10 | nA | $V_{EB}$=-6V |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | | -60<br>-100<br>-140 | -100<br>-150<br>-200 | mV<br>mV<br>mV | $I_C$=-100mA, $I_B$=-10mA*<br>$I_C$=-500mA, $I_B$=-100mA*<br>$I_C$=-1A, $I_B$=-300mA* |
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$ | | -870 | -1000 | mV | $I_C$=-1A, $I_B$=-300mA* |







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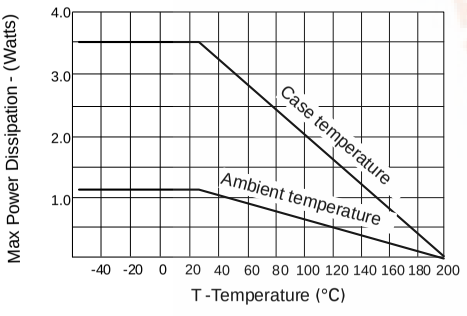
| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS. |
|---|---|---|---|---|---|---|
| Base-Emitter Turn-On Voltage | $V_{BE(on)}$ | | -710 | -850 | mV | IC=-1A, $V_{CE}$=-10V* |
| Static Forward Current Transfer Ratio | $h_{FE}$ | 100<br>100<br>90 | 200<br>200<br>170<br>10 | 300 | | $I_C$=-10mA, $V_{CE}$=-10V*<br>$I_C$=-0.5A, $V_{CE}$=-10V*<br>$I_C$=-1A, $V_{CE}$=-10V*<br>$I_C$=-2A, $V_{CE}$=-10V* |
| Transition Frequency | $f_T$ | | 85 | | MHz | $I_C$=-100mA, $V_{CE}$=-10V<br>f=50MHz |
| Output Capacitance | $C_{obo}$ | | 23 | | pF | $V_{CB}$=-20V, f=1MHz |
| Switching Times | $t_{on}$<br>$t_{off}$ | | 108<br>2500 | | ns<br>ns | $I_C$=-500mA, $I_{B1}$=-50mA<br>$I_{B2}$=50mA, $V_{CC}$=-100V |

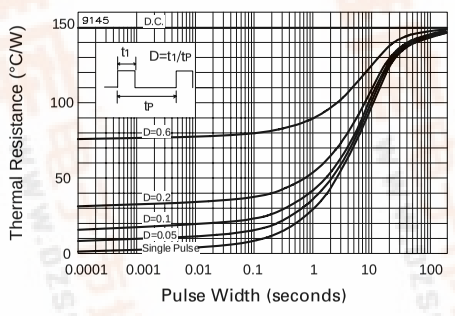
Measured under pulsed conditions. Pulse width=300µs. Duty cycle ≤2%

## THERMAL CHARACTERISTICS

| PARAMETER | SYMBOL | MAX. | UNIT |
|---|---|---|---|
| Thermal Resistance: Junction to Ambient<br>Junction to Case | $R_{th(j-amb)}$<br>$R_{th(j-case)}$ | 150<br>50 | °C/W<br>°C/W |




**Derating curve**




**Maximum transient thermal impedance**

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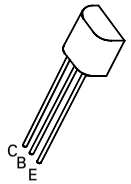


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| Collector Cut-Off Current | $I_{CBO}$ | | | -50<br>-1 | nA<br>μA | $V_{CB}$=-300V<br>$V_{CB}$=-300V, $T_{amb}$=100°C |
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| Emitter Cut-Off Current | $I_{EBO}$ | | | -10 | nA | $V_{EB}$=-6V |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | | -60<br>-100<br>-140 | -100<br>-150<br>-200 | mV<br>mV<br>mV | $I_C$=-100mA, $I_B$=-10mA*<br>$I_C$=-500mA, $I_B$=-100mA*<br>$I_C$=-1A, $I_B$=-300mA* |
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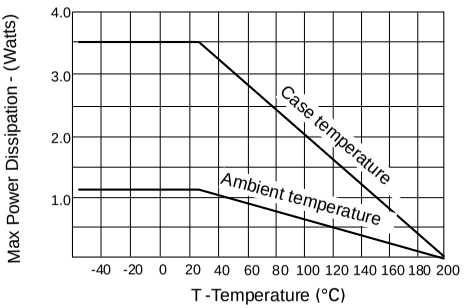
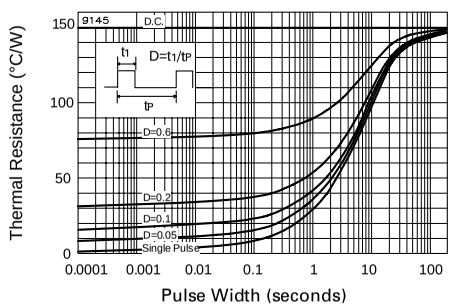
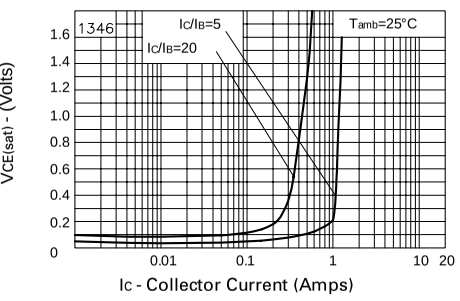



**Derating curve**

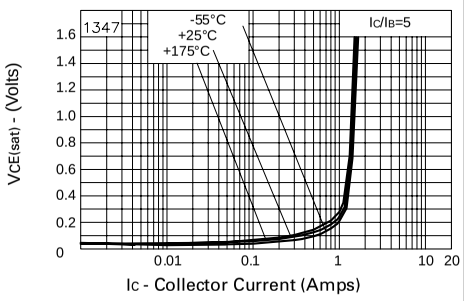



**Maximum transient thermal impedance**

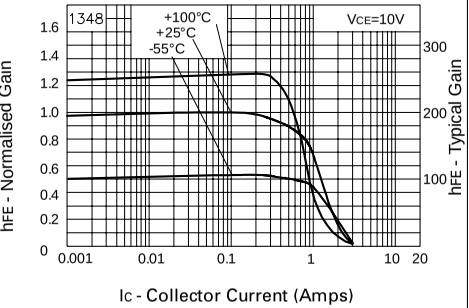
## TYPICAL CHARACTERISTICS



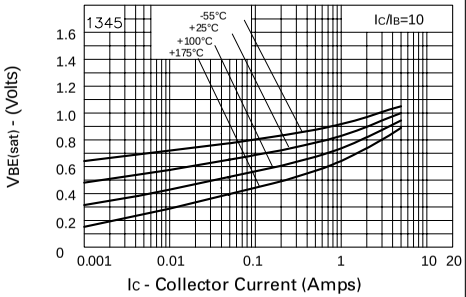

**VCE(sat) v IC**



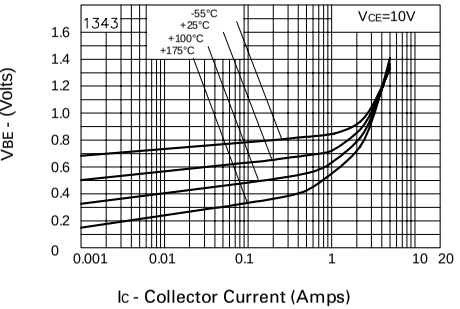

**VCE(sat) v IC**



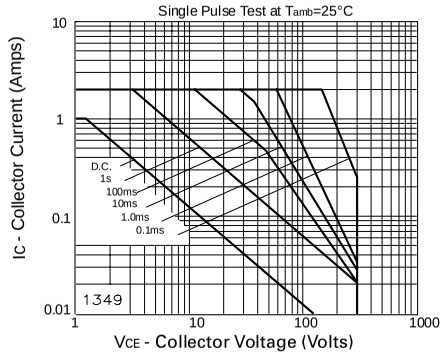

**hFE v IC**




**VBE(sat) v IC**




**VBE(on) v IC**




**Safe Operating Area**