

PNP SILICON PLANAR MEDIUM POWER HIGH GAIN TRANSISTOR

ZTX788B

ISSUE 2 – APRIL 94

FEATURES

- * 15 Volt V_{CE0}
- * Gain of 300 at $I_C=2$ Amps
- * Very low saturation voltage

APPLICATIONS

- * Darlington replacement
- * Flash gun convertors
- * Battery powered circuits
- * Motor drivers



E-Line
T092 Compatible

ABSOLUTE MAXIMUM RATINGS.

| PARAMETER | SYMBOL | VALUE | UNIT |
|------------------------------------------------------------------------------------|------------|-------------|---------------------------|
| Collector-Base Voltage | V_{CBO} | -15 | V |
| Collector-Emitter Voltage | V_{CEO} | -15 | V |
| Emitter-Base Voltage | V_{EBO} | -5 | V |
| Peak Pulse Current | I_{CM} | -8 | A |
| Continuous Collector Current | I_C | -3 | A |
| Practical Power Dissipation* | P_{totp} | 1.5 | W |
| Power Dissipation at $T_{amb}=25^\circ\text{C}$ derate above 25°C | P_{tot} | 1 5.7 | W mW/ $^\circ\text{C}$ |
| Operating and Storage Temperature Range | $t_j:tstg$ | -55 to +200 | $^\circ\text{C}$ |

*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 $T_{amb} = 25^\circ\text{C}$)

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS. |
|---------------------------------------|---------------|--------------------------|-------|-------------------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | -15 | | | V | $I_C=-100\mu\text{A}$ |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | -15 | | | V | $I_C=-10\text{mA}^*$ |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | -5 | | | V | $I_E=-100\mu\text{A}$ |
| Collector Cut-Off Current | I_{CBO} | | | -0.1 | μA | $V_{CB}=-10\text{V}$ |
| Emitter Cut-Off Current | I_{EBO} | | | -0.1 | μA | $V_{EB}=-4\text{V}$ |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | | | -0.15 -0.25 -0.45 | V | $I_C=-0.5\text{A}, I_B=-2.5\text{mA}^*$ $I_C=-1\text{A}, I_B=-5\text{mA}^*$ $I_C=-2\text{A}, I_B=-10\text{mA}^*$ |
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$ | | | -0.9 | V | $I_C=-1\text{A}, I_B=-5\text{mA}^*$ |
| Base-Emitter Turn-On Voltage | $V_{BE(on)}$ | | -0.75 | | V | $I_C=-1\text{A}, V_{CE}=-2\text{V}^*$ |
| Static Forward Current Transfer Ratio | h_{FE} | 500 400 300 150 | | 1500 | | $I_C=-10\text{mA}, V_{CE}=-2\text{V}^*$ $I_C=-1\text{A}, V_{CE}=-2\text{V}^*$ $I_C=-2\text{A}, V_{CE}=-2\text{V}^*$ $I_C=-6\text{A}, V_{CE}=-2\text{V}^*$ |

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

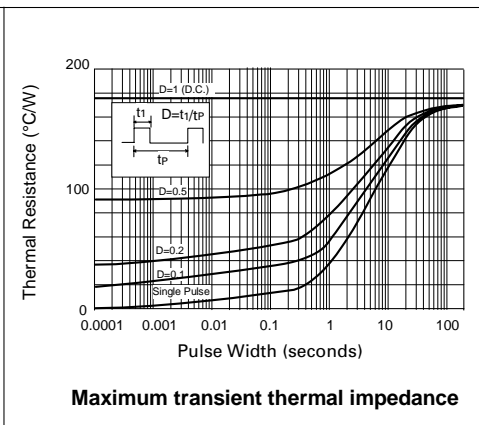
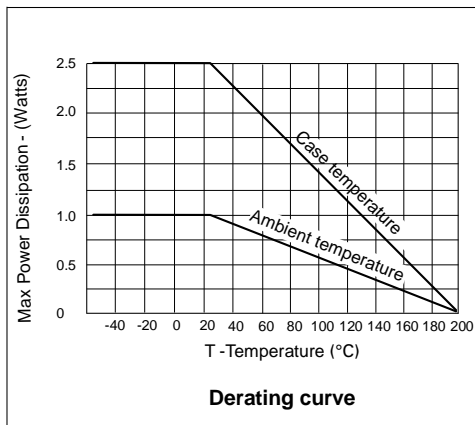
| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS. |
|----------------------|-----------------------|------|-----------|------|----------|-----------------------------------------------------------------------------------------------------|
| Transition Frequency | f_T | 100 | | | MHz | $I_C = -50\text{mA}$, $V_{CE} = -5\text{V}$ $f = 50\text{MHz}$ |
| Input Capacitance | C_{ibo} | | 225 | | pF | $V_{EB} = -0.5\text{V}$, $f = 1\text{MHz}$ |
| Output Capacitance | C_{obo} | | 25 | | pF | $V_{CB} = -10\text{V}$, $f = 1\text{MHz}$ |
| Switching Times | t_{on} t_{off} | | 35 400 | | ns ns | $I_C = -500\text{mA}$, $I_{B1} = -50\text{mA}$ $I_{B2} = -50\text{mA}$, $V_{CC} = -10\text{V}$ |

*Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$

THERMAL CHARACTERISTICS

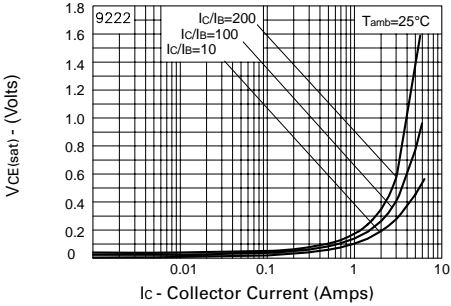
| PARAMETER | SYMBOL | MAX. | UNIT |
|------------------------------------------------------|----------------------------|------|----------------------|
| Thermal Resistance: Junction to Ambient ₁ | $R_{th(j-amb)1}$ | 175 | $^{\circ}\text{C/W}$ |
| Junction to Ambient ₂ | $R_{th(j-amb)2}^{\dagger}$ | 116 | $^{\circ}\text{C/W}$ |
| Junction to Case | $R_{th(j-case)}$ | 70 | $^{\circ}\text{C/W}$ |

\dagger Device mounted on P.C.B. with copper equal to 1 sq. Inch minimum.

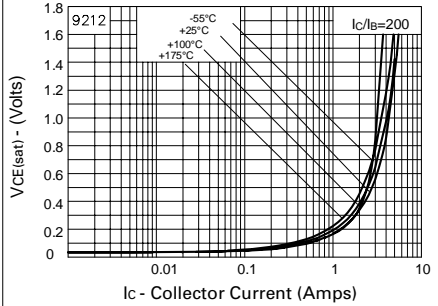


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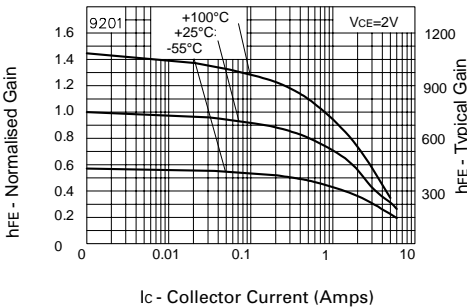
TYPICAL CHARACTERISTICS



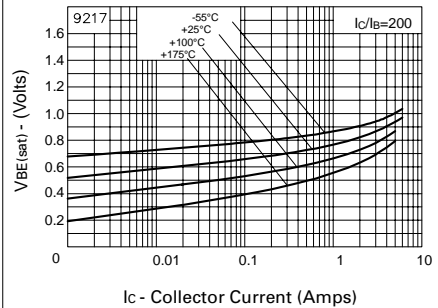
VCE(sat) v IC



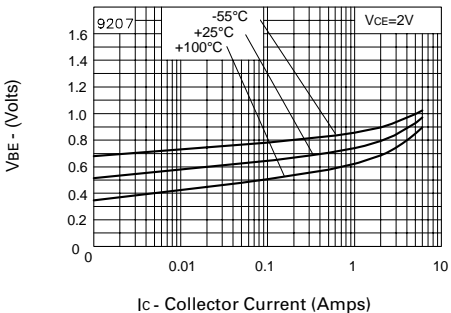
VCE(sat) v IC



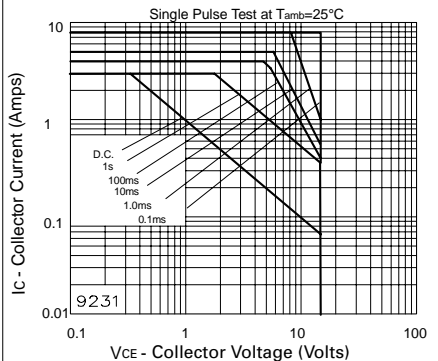
hFE v IC



VBE(sat) v IC



VBE(on) v IC



Safe Operating Area