

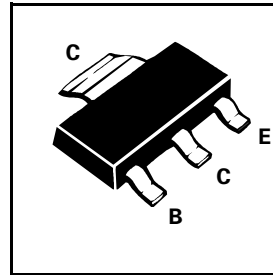
SOT223 PNP SILICON PLANAR HIGH CURRENT (HIGH PERFORMANCE) TRANSISTORS

FZT948
FZT949

ISSUE 2 - NOVEMBER 1995

FEATURES

- * Extremely low equivalent on-resistance; $R_{CE(sat)}$
- * 6 Amps continuous current
- * Up to 20 Amps peak current
- * Very low saturation voltage
- * Excellent h_{FE} characteristics specified upto 20 Amps



PARTMARKING DETAILS — DEVICE TYPE IN FULL

ABSOLUTE MAXIMUM RATINGS.

| PARAMETER | SYMBOL | FZT948 | FZT949 | UNIT |
|--|----------------|-------------|--------|-------------|
| Collector-Base Voltage | V_{CBO} | -40 | -50 | V |
| Collector-Emitter Voltage | V_{CEO} | -20 | -30 | V |
| Emitter-Base Voltage | V_{EBO} | -6 | | V |
| Peak Pulse Current | I_{CM} | -20 | | A |
| Continuous Collector Current | I_C | -6 | -5.5 | A |
| Power Dissipation at $T_{amb}=25^{\circ}C$ | P_{tot} | 3 | | W |
| Operating and Storage Temperature Range | $T_j; T_{stg}$ | -55 to +150 | | $^{\circ}C$ |

*The power which can be dissipated assuming the device is mounted in a typical manner on a P.C.B. with copper equal to 4 square inch minimum

FZT948

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

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS. |
|---------------------------------------|---------------------------------------|------------------------------|--------------------------------|------------------------------|----------------------|--|
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | -40 | -55 | | V | $I_C = -100\mu\text{A}$ |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CER}$ | -40 | -55 | | V | $I_C = -1\mu\text{A}$, $R_B \leq 1\text{k}\Omega$ |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | -20 | -30 | | V | $I_C = -10\text{mA}^*$ |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | -6 | -8 | | V | $I_E = -100\mu\text{A}$ |
| Collector Cut-Off Current | I_{CBO} | | | -50 -1 | nA μA | $V_{CB} = -30\text{V}$ $V_{CB} = -30\text{V}$, $T_{amb} = 100^{\circ}\text{C}$ |
| Collector Cut-Off Current | I_{CER} $R \leq 1\text{k}\Omega$ | | | -50 -1 | nA μA | $V_{CB} = -30\text{V}$ $V_{CB} = -30\text{V}$, $T_{amb} = 100^{\circ}\text{C}$ |
| Emitter Cut-Off Current | I_{EBO} | | | -10 | nA | $V_{EB} = -6\text{V}$ |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | | -60 -110 -200 -360 | -130 -180 -280 -450 | mV mV mV mV | $I_C = -0.5\text{A}$, $I_B = -10\text{mA}^*$ $I_C = -2\text{A}$, $I_B = -200\text{mA}^*$ $I_C = -4\text{A}$, $I_B = -400\text{mA}^*$ $I_C = -6\text{A}$, $I_B = -250\text{mA}^*$ |
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$ | | -1050 | -1200 | mV | $I_C = -5\text{A}$, $I_B = -300\text{mA}^*$ |
| Base-Emitter Turn-On Voltage | $V_{BE(on)}$ | | -870 | -1050 | mV | $I_C = -6\text{A}$, $V_{CE} = -1\text{V}^*$ |
| Static Forward Current Transfer Ratio | h_{FE} | 100 100 75 60 15 | 200 200 160 130 40 | 300 | | $I_C = -10\text{mA}$, $V_{CE} = -1\text{V}$ $I_C = -1\text{A}$, $V_{CE} = -1\text{V}^*$ $I_C = -5\text{A}$, $V_{CE} = -1\text{V}^*$ $I_C = -10\text{A}$, $V_{CE} = -1\text{V}^*$ $I_C = -20\text{A}$, $V_{CE} = -2\text{V}^*$ |
| Transition Frequency | f_T | | 80 | | MHz | $I_C = -100\text{mA}$, $V_{CE} = -10\text{V}$ $f = 50\text{MHz}$ |
| Output Capacitance | C_{obo} | | 163 | | pF | $V_{CB} = -10\text{V}$, $f = 1\text{MHz}$ |
| Switching Times | t_{on} t_{off} | | 120 126 | | ns ns | $I_C = -4\text{A}$, $I_{B1} = -400\text{mA}$ $I_{B2} = 400\text{mA}$, $V_{CC} = -10\text{V}$ |

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

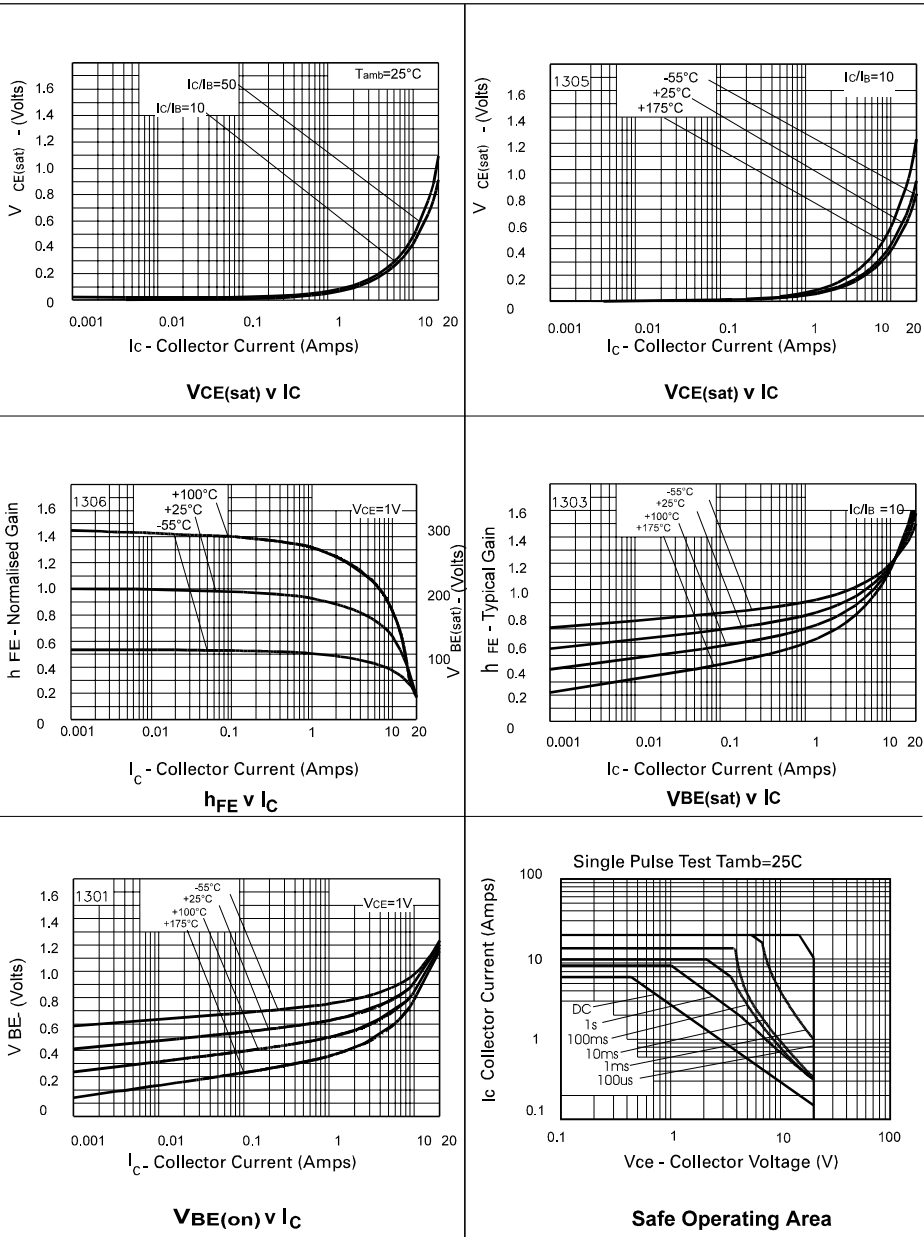
Spice parameter data is available upon request for this device

$R_{CE(sat)}$ 46m Ω at 5A



FZT948

TYPICAL CHARACTERISTICS



FZT949

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

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS. |
|---------------------------------------|---------------------------------------|------------------|----------------------------|-----------------------------|----------------------|--|
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | -50 | -80 | | V | $I_C = -100\mu\text{A}$ |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CER}$ | -50 | -80 | | V | $I_C = -1\mu\text{A}$, $R_B \leq 1\text{k}\Omega$ |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | -30 | -45 | | V | $I_C = -10\text{mA}^*$ |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | -6 | -8 | | V | $I_E = -100\mu\text{A}$ |
| Collector Cut-Off Current | I_{CBO} | | | -50 -1 | nA μA | $V_{CB} = -40\text{V}$ $V_{CB} = -40\text{V}$, $T_{amb} = 100^{\circ}\text{C}$ |
| Collector Cut-Off Current | I_{CER} $R \leq 1\text{k}\Omega$ | | | -50 -1 | nA μA | $V_{CB} = -40\text{V}$ $V_{CB} = -40\text{V}$, $T_{amb} = 100^{\circ}\text{C}$ |
| Emitter Cut-Off Current | I_{EBO} | | | -10 | nA | $V_{EB} = -6\text{V}$ |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | | -50 -85 -190 -350 | -75 -140 -270 -440 | mV mV mV mV | $I_C = -0.5\text{A}$, $I_B = -20\text{mA}^*$ $I_C = -1\text{A}$, $I_B = -20\text{mA}^*$ $I_C = -2\text{A}$, $I_B = -200\text{mA}^*$ $I_C = -5.5\text{A}$, $I_B = -500\text{mA}^*$ |
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$ | | -1100 | -1250 | mV | $I_C = -5.5\text{A}$, $I_B = -500\text{mA}^*$ |
| Base-Emitter Turn-On Voltage | $V_{BE(on)}$ | | -900 | -1060 | mV | $I_C = -5.5\text{A}$, $V_{CE} = -1\text{V}^*$ |
| Static Forward Current Transfer Ratio | h_{FE} | 100 100 75 | 200 200 140 35 | 300 | | $I_C = -10\text{mA}$, $V_{CE} = -1\text{V}$ $I_C = -1\text{A}$, $V_{CE} = -1\text{V}^*$ $I_C = -5\text{A}$, $V_{CE} = -1\text{V}^*$ $I_C = -20\text{A}$, $V_{CE} = -2\text{V}^*$ |
| Transition Frequency | f_T | | 100 | | MHz | $I_C = -100\text{mA}$, $V_{CE} = -10\text{V}$ $f = 50\text{MHz}$ |
| Output Capacitance | C_{obo} | | 122 | | pF | $V_{CB} = -10\text{V}$, $f = 1\text{MHz}$ |
| Switching Times | t_{on} t_{off} | | 120 130 | | ns ns | $I_C = -4\text{A}$, $I_{B1} = -400\text{mA}$ $I_{B2} = 400\text{mA}$, $V_{CC} = -10\text{V}$ |

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

Spice parameter data is available upon request for this device

$R_{CE(sat)}$ 44m Ω at 4.5A



FZT949

TYPICAL CHARACTERISTICS

