

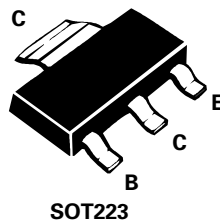
# NPN SILICON PLANAR MEDIUM POWER HIGH GAIN TRANSISTOR

ISSUE 1- FEBRUARY 1997

**FZT1048A**

## FEATURES

- \*  $V_{CEO} = 17.5V$
- \* 5 Amp Continuous Current
- \* 20 Amp Pulse Current
- \* Low Saturation Voltage
- \* High Gain
- \* Extremely Low Equivalent On-resistance;  $R_{CE(sat)} = 50m\Omega$  at 5A



## ABSOLUTE MAXIMUM RATINGS.

| PARAMETER                                    | SYMBOL         | VALUE       | UNIT        |
|----------------------------------------------|----------------|-------------|-------------|
| Collector-Base Voltage                       | $V_{CBO}$      | 50          | V           |
| Collector-Emitter Voltage                    | $V_{CEO}$      | 17.5        | V           |
| Emitter-Base Voltage                         | $V_{EBO}$      | 5           | V           |
| Peak Pulse Current                           | $I_{CM}$       | 20          | A           |
| Continuous Collector Current                 | $I_C$          | 5           | A           |
| Base Current                                 | $I_B$          | 500         | mA          |
| Power Dissipation at $T_{amb}=25^{\circ}C$ † | $P_{tot}$      | 2.5         | 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 typical manner on a PCB with copper equal to 2 inches x 2 inches.

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

| PARAMETER                             | SYMBOL        | VALUE |      |      | UNIT | CONDITIONS.                                                 |
|---------------------------------------|---------------|-------|------|------|------|-------------------------------------------------------------|
|                                       |               | MIN.  | TYP. | MAX. |      |                                                             |
| Collector-Base Breakdown Voltage      | $V_{(BR)CBO}$ | 50    | 85   |      | V    | $I_C=100\mu\text{A}$                                        |
| Collector-Emitter Breakdown Voltage   | $V_{CES}$     | 50    | 85   |      | V    | $I_C=100\mu\text{A}^*$                                      |
| Collector-Emitter Breakdown Voltage   | $V_{CEO}$     | 17.5  | 24   |      | V    | $I_C=10\text{mA}$                                           |
| Collector-Emitter Breakdown Voltage   | $V_{CEV}$     | 50    | 85   |      | V    | $I_C=100\mu\text{A}$ , $V_{EB}=1\text{V}$                   |
| Emitter-Base Breakdown Voltage        | $V_{(BR)EBO}$ | 5     | 8.7  |      | V    | $I_E=100\mu\text{A}$                                        |
| Collector Cut-Off Current             | $I_{CBO}$     |       | 0.3  | 10   | nA   | $V_{CB}=35\text{V}$                                         |
| Emitter Cut-Off Current               | $I_{EBO}$     |       | 0.3  | 10   | nA   | $V_{EB}=4\text{V}$                                          |
| Collector Emitter Cut-Off Current     | $I_{CES}$     |       | 0.3  | 10   | nA   | $V_{CE}=35\text{V}$                                         |
| Collector-Emitter Saturation Voltage  | $V_{CE(sat)}$ |       | 27   | 45   | mV   | $I_C=0.5\text{A}$ , $I_B=10\text{mA}^*$                     |
|                                       |               |       | 55   | 75   | mV   | $I_C=1\text{A}$ , $I_B=10\text{mA}^*$                       |
|                                       |               |       | 155  | 210  | mV   | $I_C=3\text{A}$ , $I_B=15\text{mA}^*$                       |
|                                       |               |       | 250  | 350  | mV   | $I_C=5\text{A}$ , $I_B=25\text{mA}^*$                       |
| Base-Emitter Saturation Voltage       | $V_{BE(sat)}$ |       | 920  | 1000 | mV   | $I_C=5\text{A}$ , $I_B=25\text{mA}^*$                       |
| Base-Emitter Turn-On Voltage          | $V_{BE(on)}$  |       | 880  | 970  | mV   | $I_C=5\text{A}$ , $V_{CE}=2\text{V}^*$                      |
| Static Forward Current Transfer Ratio | $h_{FE}$      | 280   | 440  | 1200 |      | $I_C=10\text{mA}$ , $V_{CE}=2\text{V}^*$                    |
|                                       |               | 300   | 450  |      |      | $I_C=0.5\text{A}$ , $V_{CE}=2\text{V}^*$                    |
|                                       |               | 300   | 450  |      |      | $I_C=1\text{A}$ , $V_{CE}=2\text{V}^*$                      |
|                                       |               | 180   | 300  |      |      | $I_C=5\text{A}$ , $V_{CE}=2\text{V}^*$                      |
|                                       |               | 50    | 80   |      |      | $I_C=20\text{A}$ , $V_{CE}=2\text{V}^*$                     |
| Transition Frequency                  | $f_T$         |       | 150  |      | MHz  | $I_C=50\text{mA}$ , $V_{CE}=10\text{V}$<br>$f=50\text{MHz}$ |
| Output Capacitance                    | $C_{obo}$     |       | 60   | 80   | pF   | $V_{CB}=10\text{V}$ , $f=1\text{MHz}$                       |
| Switching Times                       | $t_{on}$      |       | 120  |      | ns   | $I_C=4\text{A}$ , $I_B=40\text{mA}$ , $V_{CC}=10\text{V}$   |
|                                       | $t_{off}$     |       | 310  |      | ns   | $I_C=4\text{A}$ , $I_B=40\text{mA}$ , $V_{CC}=10\text{V}$   |

TYPICAL CHARACTERISTICS

