

ISSUE 2 - JANUARY 1996

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

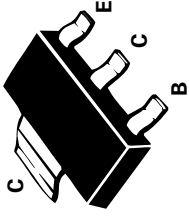
| PARAMETER                             | SYMBOL                                | MIN.                    | TYP.                     | MAX.                    | UNIT                 | CONDITIONS.                                                                                                                                                                           |
|---------------------------------------|---------------------------------------|-------------------------|--------------------------|-------------------------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Collector-Base Breakdown Voltage      | $V_{(BR)CBO}$                         | 60                      | 120                      |                         | V                    | $I_C = 100\mu\text{A}$                                                                                                                                                                |
| Collector-Emitter Breakdown Voltage   | $V_{(BR)CE}$                          | 60                      | 120                      |                         | V                    | $I_C = 1\mu\text{A}$ , $R_B \leq 1\text{k}\Omega$                                                                                                                                     |
| Collector-Emitter Breakdown Voltage   | $V_{(BR)CEO}$                         | 25                      | 35                       |                         | 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<br>1                 | nA<br>$\mu\text{A}$  | $V_{CE} = 50\text{V}$ , $T_{amb} = 100^{\circ}\text{C}$                                                                                                                               |
| Collector Cut-Off Current             | $I_{CER}$<br>$R \leq 1\text{k}\Omega$ |                         |                          | 50<br>1                 | nA<br>$\mu\text{A}$  | $V_{CE} = 50\text{V}$ , $T_{amb} = 100^{\circ}\text{C}$                                                                                                                               |
| Emitter Cut-Off Current               | $I_{EBO}$                             |                         |                          | 10                      | nA                   | $V_{EB} = 6\text{V}$                                                                                                                                                                  |
| Collector-Emitter Saturation Voltage  | $V_{CE(sat)}$                         |                         | 35<br>67<br>168          | 50<br>110<br>215<br>350 | mV<br>mV<br>mV<br>mV | $I_C = 0.5\text{A}$ , $I_B = 10\text{mA}^*$<br>$I_C = 1\text{A}$ , $I_B = 10\text{mA}^*$<br>$I_C = 2\text{A}$ , $I_B = 10\text{mA}^*$<br>$I_C = 6.5\text{A}$ , $I_B = 150\text{mA}^*$ |
| Base-Emitter Saturation Voltage       | $V_{BE(sat)}$                         |                         |                          | 1.2                     | V                    | $I_C = 6.5\text{A}$ , $I_B = 300\text{mA}$                                                                                                                                            |
| Base-Emitter Turn-On Voltage          | $V_{BE(on)}$                          |                         |                          | 1.13                    | V                    | $I_C = 6.5\text{A}$ , $V_{CE} = 1\text{V}^*$                                                                                                                                          |
| Static Forward Current Transfer Ratio | $h_{FE}$                              | 300<br>300<br>200<br>40 | 450<br>450<br>300<br>100 |                         |                      | $I_C = 10\text{mA}$ , $V_{CE} = 1\text{V}$<br>$I_C = 1\text{A}$ , $V_{CE} = 1\text{V}^*$<br>$I_C = 7\text{A}$ , $V_{CE} = 1\text{V}^*$<br>$I_C = 20\text{A}$ , $V_{CE} = 2\text{V}^*$ |
| Transition Frequency                  | $f_T$                                 |                         | 100                      |                         | MHz                  | $I_C = 100\text{mA}$ , $V_{CE} = 10\text{V}$<br>$f = 50\text{MHz}$                                                                                                                    |
| Output Capacitance                    | $C_{obo}$                             |                         | 70                       |                         | pF                   | $V_{CE} = 10\text{V}$ , $f = 1\text{MHz}^*$                                                                                                                                           |
| Switching Times                       | $t_{on}$<br>$t_{off}$                 | 60<br>680               |                          |                         | ns<br>ns             | $I_C = 1\text{A}$ , $I_B = 100\text{mA}$<br>$I_B = 100\text{mA}$ , $V_{CC} = 10\text{V}$                                                                                              |

\*Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$   
Spice parameter data is available upon request for this device

**FEATURES**

- \* Extremely low equivalent on-resistance;  $R_{CE(sat)} 36\text{m}\Omega$  at 5A
- \* **7 Amp** continuous collector current (20 Amp peak)
- \* Very low saturation voltages
- \* Excellent gain characteristics specified upto 20 Amp
- \*  **$P_{tot} = 3 \text{ Watts}$**

PARTMARKING DETAILS - FZT869

**ABSOLUTE MAXIMUM RATINGS.**

| PARAMETER                                           | SYMBOL         | VALUE       | UNIT               |
|-----------------------------------------------------|----------------|-------------|--------------------|
| Collector-Base Voltage                              | $V_{CBO}$      | 60          | V                  |
| Collector-Emitter Voltage                           | $V_{CEO}$      | 25          | V                  |
| Emitter-Base Voltage                                | $V_{EBO}$      | 6           | V                  |
| Peak Pulse Current                                  | $I_{CM}$       | 20          | A                  |
| Continuous Collector Current                        | $I_C$          | 7           | A                  |
| Power Dissipation at $T_{amb} = 25^{\circ}\text{C}$ | $P_{tot}$      | 3           | W                  |
| Operating and Storage Temperature Range             | $T_j, T_{stg}$ | -55 to +150 | $^{\circ}\text{C}$ |

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

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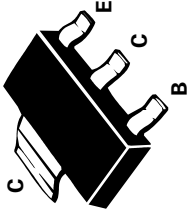
| PARAMETER                             | SYMBOL                                | MIN.                    | TYP.                     | MAX.                    | UNIT                 | CONDITIONS.                                                                                                                                                                           |
|---------------------------------------|---------------------------------------|-------------------------|--------------------------|-------------------------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Collector-Base Breakdown Voltage      | $V_{(BR)CBO}$                         | 60                      | 120                      |                         | V                    | $I_C = 100\mu\text{A}$                                                                                                                                                                |
| Collector-Emitter Breakdown Voltage   | $V_{(BR)CE}$                          | 60                      | 120                      |                         | V                    | $I_C = 1\mu\text{A}$ , $R_B \leq 1\text{k}\Omega$                                                                                                                                     |
| Collector-Emitter Breakdown Voltage   | $V_{(BR)CEO}$                         | 25                      | 35                       |                         | 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<br>1                 | nA<br>$\mu\text{A}$  | $V_{CE} = 50\text{V}$ , $T_{amb} = 100^{\circ}\text{C}$                                                                                                                               |
| Collector Cut-Off Current             | $I_{CER}$<br>$R \leq 1\text{k}\Omega$ |                         |                          | 50<br>1                 | nA<br>$\mu\text{A}$  | $V_{CE} = 50\text{V}$ , $T_{amb} = 100^{\circ}\text{C}$                                                                                                                               |
| Emitter Cut-Off Current               | $I_{EBO}$                             |                         |                          | 10                      | nA                   | $V_{EB} = 6\text{V}$                                                                                                                                                                  |
| Collector-Emitter Saturation Voltage  | $V_{CE(sat)}$                         |                         | 35<br>67<br>168          | 50<br>110<br>215<br>350 | mV<br>mV<br>mV<br>mV | $I_C = 0.5\text{A}$ , $I_B = 10\text{mA}^*$<br>$I_C = 1\text{A}$ , $I_B = 10\text{mA}^*$<br>$I_C = 2\text{A}$ , $I_B = 10\text{mA}^*$<br>$I_C = 6.5\text{A}$ , $I_B = 150\text{mA}^*$ |
| Base-Emitter Saturation Voltage       | $V_{BE(sat)}$                         |                         |                          | 1.2                     | V                    | $I_C = 6.5\text{A}$ , $I_B = 300\text{mA}$                                                                                                                                            |
| Base-Emitter Turn-On Voltage          | $V_{BE(on)}$                          |                         |                          | 1.13                    | V                    | $I_C = 6.5\text{A}$ , $V_{CE} = 1\text{V}^*$                                                                                                                                          |
| Static Forward Current Transfer Ratio | $h_{FE}$                              | 300<br>300<br>200<br>40 | 450<br>450<br>300<br>100 |                         |                      | $I_C = 10\text{mA}$ , $V_{CE} = 1\text{V}$<br>$I_C = 1\text{A}$ , $V_{CE} = 1\text{V}^*$<br>$I_C = 7\text{A}$ , $V_{CE} = 1\text{V}^*$<br>$I_C = 20\text{A}$ , $V_{CE} = 2\text{V}^*$ |
| Transition Frequency                  | $f_T$                                 |                         | 100                      |                         | MHz                  | $I_C = 100\text{mA}$ , $V_{CE} = 10\text{V}$<br>$f = 50\text{MHz}$                                                                                                                    |
| Output Capacitance                    | $C_{obo}$                             |                         | 70                       |                         | pF                   | $V_{CE} = 10\text{V}$ , $f = 1\text{MHz}^*$                                                                                                                                           |
| Switching Times                       | $t_{on}$<br>$t_{off}$                 | 60<br>680               |                          |                         | ns<br>ns             | $I_C = 1\text{A}$ , $I_B = 100\text{mA}$<br>$I_B = 100\text{mA}$ , $V_{CC} = 10\text{V}$                                                                                              |

\*Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$   
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