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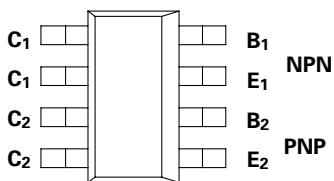
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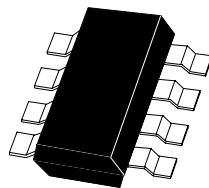
# SM-8 COMPLEMENTARY MEDIUM POWER HIGH GAIN TRANSISTORS

ISSUE 1 - NOVEMBER 1995

## ZDT6718



PARTMARKING DETAIL - T6718



SM-8  
(8 LEAD SOT223)

### ABSOLUTE MAXIMUM RATINGS.

| PARAMETER                               | SYMBOL         | NPN         | PNP  | UNIT |
|---|----------------|-------------|------|------|
| Collector-Base Voltage                  | $V_{CBO}$      | 20          | -20  | V    |
| Collector-Emitter Voltage               | $V_{CEO}$      | 20          | -20  | V    |
| Emitter-Base Voltage                    | $V_{EBO}$      | 5           | -5   | V    |
| Peak Pulse Current                      | $I_{CM}$       | 6           | -6   | A    |
| Continuous Collector Current            | $I_C$          | 2           | -1.5 | A    |
| Operating and Storage Temperature Range | $T_j; T_{stg}$ | -55 to +150 |      | °C   |

### THERMAL CHARACTERISTICS

| PARAMETER   | SYMBOL    | VALUE      | UNIT           |
|---|-----------|------------|----------------|
| Total Power Dissipation at $T_{amb} = 25^\circ\text{C}^*$<br>Any single die "on"<br>Both die "on" equally | $P_{tot}$ | 2<br>2.5   | W<br>W         |
| Derate above $25^\circ\text{C}^*$<br>Any single die "on"<br>Both die "on" equally                         |           | 16<br>20   | mW/°C<br>mW/°C |
| Thermal Resistance - Junction to Ambient*<br>Any single die "on"<br>Both die "on" equally                 |           | 62.5<br>50 | °C/W<br>°C/W   |

\* The power which can be dissipated assuming the device is mounted in a typical manner on a PCB with copper equal to 2 inches square.

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

| PARAMETER                             | SYMBOL        | MIN.                     | TYP.                     | MAX.             | UNIT           | CONDITIONS.   |
|---------------------------------------|---------------|--------------------------|--------------------------|------------------|----------------|---|
| Collector-Base Breakdown Voltage      | $V_{(BR)CBO}$ | 20                       | 100                      |                  | V              | $I_C=100\mu\text{A}$  |
| Collector-Emitter Breakdown Voltage   | $V_{(BR)CEO}$ | 20                       | 27                       |                  | V              | $I_C=10\text{mA}^*$   |
| Emitter-Base Breakdown Voltage        | $V_{(BR)EBO}$ | 5                        | 8.3                      |                  | V              | $I_E=100\mu\text{A}$  |
| Collector Cutoff Current              | $I_{CBO}$     |                          |                          | 100              | nA             | $V_{CB}=16\text{V}$   |
| Emitter Cutoff Current                | $I_{EBO}$     |                          |                          | 100              | nA             | $V_{EB}=4\text{V}$  |
| Collector Emitter Cutoff Current      | $I_{CES}$     |                          |                          | 100              | nA             | $V_{CES}=16\text{V}$  |
| Collector-Emitter Saturation Voltage  | $V_{CE(sat)}$ |                          | 7<br>70<br>130           | 15<br>150<br>200 | mV<br>mV<br>mV | $I_C=0.1\text{A}, I_B=10\text{mA}^*$<br>$I_C=1\text{A}, I_B=10\text{mA}^*$<br>$I_C=2.5\text{A}, I_B=50\text{mA}^*$  |
| Base-Emitter Saturation Voltage       | $V_{BE(sat)}$ |                          | 0.89                     | 1.0              | V              | $I_C=2.5\text{A}, I_B=50\text{mA}^*$  |
| Base-Emitter Turn-On Voltage          | $V_{BE(on)}$  |                          | 0.79                     | 1.0              | V              | $I_C=2.5\text{A}, V_{CE}=2\text{V}^*$   |
| Static Forward Current Transfer Ratio | $h_{FE}$      | 200<br>300<br>200<br>100 | 400<br>450<br>360<br>180 |                  |                | $I_C=10\text{mA}, V_{CE}=2\text{V}^*$<br>$I_C=200\text{mA}, V_{CE}=2\text{V}^*$<br>$I_C=2\text{A}, V_{CE}=2\text{V}^*$<br>$I_C=6\text{A}, V_{CE}=2\text{V}^*$ |
| Transition Frequency                  | $f_T$         | 100                      | 140                      |                  | MHz            | $I_C=50\text{mA}, V_{CE}=10\text{V}$<br>$f=100\text{MHz}$   |
| Output Capacitance                    | $C_{obo}$     |                          | 23                       | 30               | pF             | $V_{CB}=10\text{V}, f=1\text{MHz}$  |
| Turn-On Time                          | $t_{on}$      |                          | 170                      |                  |                | $V_{CC}=10\text{V}, I_C=1\text{A}$<br>$I_{B1}=-I_{B2}=10\text{mA}$  |
| Turn-Off Time                         | $t_{off}$     |                          | 400                      |                  |                |   |

\*Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$   
For typical characteristics graphs see SuperSOT FM6T618 datasheet.

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

| PARAMETER                             | SYMBOL        | MIN.                          | TYP.                          | MAX.                | UNIT           | CONDITIONS.  |
|---------------------------------------|---------------|-------------------------------|-------------------------------|---------------------|----------------|--|
| Collector-Base Breakdown Voltage      | $V_{(BR)CBO}$ | -20                           | -65                           |                     | V              | $I_C = -100\mu\text{A}$  |
| Collector-Emitter Breakdown Voltage   | $V_{(BR)CEO}$ | -20                           | -55                           |                     | V              | $I_C = -10\text{mA}^*$   |
| Emitter-Base Breakdown Voltage        | $V_{(BR)EBO}$ | -5                            | -8.8                          |                     | V              | $I_E = -100\mu\text{A}$  |
| Collector Cutoff Current              | $I_{CBO}$     |                               |                               | -100                | nA             | $V_{CB} = -15\text{V}$   |
| Emitter Cutoff Current                | $I_{EBO}$     |                               |                               | -100                | nA             | $V_{EB} = -4\text{V}$  |
| Collector Emitter Cutoff Current      | $I_{CES}$     |                               |                               | -100                | nA             | $V_{CES} = -15\text{V}$  |
| Collector-Emitter Saturation Voltage  | $V_{CE(SAT)}$ |                               | -16<br>-130<br>-145           | -40<br>-200<br>-220 | mV<br>mV<br>mV | $I_C = -0.1\text{A}, I_B = -10\text{mA}^*$<br>$I_C = -1\text{A}, I_B = -20\text{mA}^*$<br>$I_C = -1.5\text{A}, I_B = -50\text{mA}^*$   |
| Base-Emitter Saturation Voltage       | $V_{BE(SAT)}$ |                               | -0.87                         | -1.0                | V              | $I_C = -1.5\text{A}, I_B = -50\text{mA}^*$   |
| Base-Emitter Turn-On Voltage          | $V_{BE(ON)}$  |                               | -0.81                         | -1.0                | V              | $I_C = -2\text{A}, V_{CE} = -2\text{V}^*$  |
| Static Forward Current Transfer Ratio | $h_{FE}$      | 300<br>300<br>150<br>50<br>15 | 475<br>450<br>230<br>70<br>30 |                     |                | $I_C = -10\text{mA}, V_{CE} = -2\text{V}^*$<br>$I_C = -100\text{mA}, V_{CE} = -2\text{V}^*$<br>$I_C = -2\text{A}, V_{CE} = -2\text{V}^*$<br>$I_C = -4\text{A}, V_{CE} = -2\text{V}^*$<br>$I_C = -6\text{A}, V_{CE} = -2\text{V}^*$ |
| Transition Frequency                  | $f_T$         | 150                           | 180                           |                     | MHz            | $I_C = -50\text{mA}, V_{CE} = -10\text{V}$<br>$f = 100\text{MHz}$  |
| Output Capacitance                    | $C_{obo}$     |                               | 21                            | 30                  | pF             | $V_{CB} = -10\text{V}, f = 1\text{MHz}$  |
| Turn-On Time                          | $t_{on}$      |                               | 40                            |                     |                | $V_{CC} = -10\text{V}, I_C = -1\text{A}$<br>$I_{B1} = I_{B2} = 20\text{mA}$  |
| Turn-Off Time                         | $t_{off}$     |                               | 670                           |                     |                |  |

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

For typical characteristics graphs see SuperSOT FMMT718 datasheet.