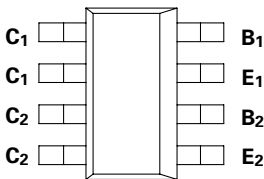


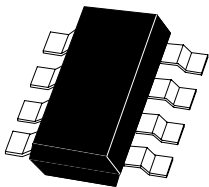
SM-8 DUAL PNP MEDIUM POWER  
DARLINGTON TRANSISTORS

ISSUE 1 - NOVEMBER 1995

ZDT705



PARTMARKING DETAIL – T705



SM-8  
(8 LEAD SOT223)

ABSOLUTE MAXIMUM RATINGS.

| PARAMETER                               | SYMBOL         | VALUE       | UNIT |
|-----------------------------------------|----------------|-------------|------|
| Collector-Base Voltage                  | $V_{CBO}$      | -140        | V    |
| Collector-Emitter Voltage               | $V_{CEO}$      | -120        | V    |
| Emitter-Base Voltage                    | $V_{EBO}$      | -10         | V    |
| Peak Pulse Current                      | $I_{CM}$       | -4          | A    |
| Continuous Collector Current            | $I_C$          | -1          | A    |
| Operating and Storage Temperature Range | $T_j; T_{stg}$ | -55 to +150 | °C   |

THERMAL CHARACTERISTICS

| PARAMETER                                                                                            | SYMBOL    | VALUE        | UNIT             |
|------------------------------------------------------------------------------------------------------|-----------|--------------|------------------|
| Total Power Dissipation at $T_{amb} = 25^{\circ}C^*$<br>Any single die "on"<br>Both die "on" equally | $P_{tot}$ | 2.25<br>2.75 | W<br>W           |
| Derate above $25^{\circ}C^*$<br>Any single die "on"<br>Both die "on" equally                         |           | 18<br>22     | mW/ °C<br>mW/ °C |
| Thermal Resistance - Junction to Ambient*<br>Any single die "on"<br>Both die "on" equally            |           | 55.6<br>45.5 | °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.

# ZDT705

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

| PARAMETER                             | SYMBOL         | MIN.                 | MAX.         | UNIT                           | CONDITIONS.                                                                                                                                                                           |
|---------------------------------------|----------------|----------------------|--------------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Collector-Base Breakdown Voltage      | $V_{(BR)CBO}$  | -140                 |              | V                              | $I_C = -100\mu\text{A}$                                                                                                                                                               |
| Collector-Emitter Breakdown Voltage   | $V_{CEO(SUS)}$ | -120                 |              | V                              | $I_C = -10\text{mA}^*$                                                                                                                                                                |
| Emitter-Base Breakdown Voltage        | $V_{(BR)EBO}$  | -10                  |              | V                              | $I_E = -100\mu\text{A}$                                                                                                                                                               |
| Collector Cutoff Current              | $I_{CBO}$      |                      | -0.1<br>-10  | $\mu\text{A}$<br>$\mu\text{A}$ | $V_{CB} = -120\text{V}$<br>$V_{CB} = -120\text{V}, T_{amb} = 100^{\circ}\text{C}$                                                                                                     |
| Collector Cutoff Current              | $I_{CES}$      |                      | -10          | $\mu\text{A}$                  | $V_{CE} = -80\text{V}$                                                                                                                                                                |
| Emitter Cutoff Current                | $I_{EBO}$      |                      | -0.1         | $\mu\text{A}$                  | $V_{EB} = -8\text{V}$                                                                                                                                                                 |
| Collector-Emitter Saturation Voltage  | $V_{CE(sat)}$  |                      | -1.3<br>-2.5 | V<br>V                         | $I_C = -1\text{A}, I_B = -1\text{mA}^*$<br>$I_C = -2\text{A}, I_B = -2\text{mA}^*$                                                                                                    |
| Base-Emitter Saturation Voltage       | $V_{BE(sat)}$  |                      | -1.8         | V                              | $I_C = -1\text{A}, I_B = -10\text{mA}^*$                                                                                                                                              |
| Base-Emitter Turn-On Voltage          | $V_{BE(on)}$   |                      | -1.7         | V                              | $I_C = -1\text{A}, V_{CE} = -5\text{V}^*$                                                                                                                                             |
| Static Forward Current Transfer Ratio | $h_{FE}$       | 3K<br>3K<br>3K<br>2K | 30K          |                                | $I_C = -10\text{mA}, V_{CE} = -5\text{V}^*$<br>$I_C = -100\text{mA}, V_{CE} = -5\text{V}^*$<br>$I_C = -1\text{A}, V_{CE} = -5\text{V}^*$<br>$I_C = -2\text{A}, V_{CE} = -5\text{V}^*$ |
| Transition Frequency                  | $f_T$          | 160 Typical          |              | MHz                            | $I_C = -100\text{mA}, V_{CE} = -10\text{V}$<br>$f = 20\text{MHz}$                                                                                                                     |
| Input Capacitance                     | $C_{ibo}$      | 90 Typical           |              | pF                             | $V_{EB} = -0.5\text{V}, f = 1\text{MHz}$                                                                                                                                              |
| Output Capacitance                    | $C_{obo}$      | 15 Typical           |              | pF                             | $V_{CE} = -10\text{V}, f = 1\text{MHz}$                                                                                                                                               |
| Switching Times                       | $t_{on}$       | 0.6 Typical          |              | $\mu\text{s}$                  | $I_C = -0.5\text{A}, V_{CE} = -10\text{V}$<br>$I_{B1} = I_{B2} = -0.5\text{mA}$                                                                                                       |
|                                       | $t_{off}$      | 0.8 Typical          |              | $\mu\text{s}$                  |                                                                                                                                                                                       |

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

TYPICAL CHARACTERISTICS

