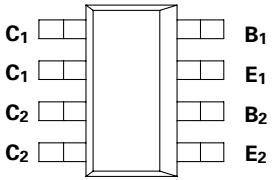
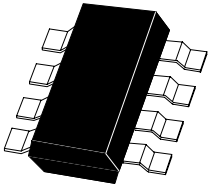
# SM-8 DUAL NPN MEDIUM POWER HIGH GAIN TRANSISTORS

# ZDT690

**ISSUE 1 - NOVEMBER 1995**




**PARTMARKING DETAIL – T690**



**SM-8**
**(8 LEAD SOT223)**

## ABSOLUTE MAXIMUM RATINGS.

| PARAMETER | SYMBOL | VALUE | UNIT |
|---|---|---|---|
| Collector-Base Voltage | $V_{CBO}$ | 45 | V |
| Collector-Emitter Voltage | $V_{CEO}$ | 45 | V |
| Emitter-Base Voltage | $V_{EBO}$ | 5 | V |
| Peak Pulse Current | $I_{CM}$ | 6 | A |
| Continuous Collector Current | $I_C$ | 2 | 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°C*<br>Any single die "on"<br>Both die "on" equally | $P_{tot}$ | <br>2.25<br>2.75 | <br>W<br>W |
| Derate above 25°C*<br>Any single die "on"<br>Both die "on" equally | | <br>18<br>22 | <br>mW/ °C<br>mW/ °C |
| Thermal Resistance - Junction to Ambient*<br>Any single die "on"<br>Both die "on" equally | | <br>55.6<br>45.5 | <br>°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.

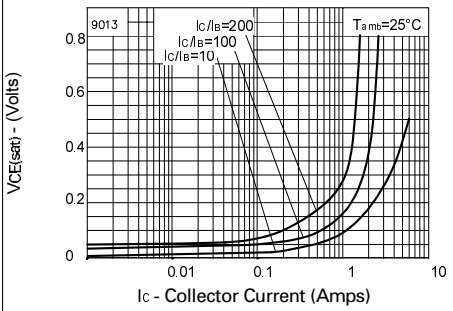
# ZDT690

## ELECTRICAL CHARACTERISTICS (at $T_{amb}$ = 25°C).

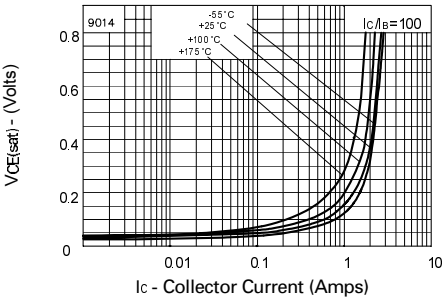
| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS. |
|---|---|---|---|---|---|---|
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | 45 | | | V | $I_C$=100μA |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | 45 | | | V | $I_C$=10mA* |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | 5 | | | V | $I_E$=100μA |
| Collector Cutoff Current | $I_{CBO}$ | | | 0.1 | μA | $V_{CB}$=35V |
| Emitter Cutoff Current | $I_{EBO}$ | | | 0.1 | μA | $V_{EB}$=4V |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | | | 0.1<br>0.5 | V<br>V | $I_C$=0.1A, $I_B$=0.5mA*<br>$I_C$=1A, $I_B$=5mA* |
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$ | | | 0.9 | V | $I_C$=1A, $I_B$=10mA* |
| Base-Emitter Turn-On Voltage | $V_{BE(on)}$ | | | 0.9 | V | $I_C$=1A, $V_{CE}$=2V* |
| Static Forward Current Transfer Ratio | $h_{FE}$ | 500<br>400<br>150 | | | | $I_C$=100mA, $V_{CE}$=2V*<br>$I_C$=1A, $V_{CE}$=2V*<br>$I_C$=2A, $V_{CE}$=2V* |
| Transition Frequency | $f_T$ | 150 | | | MHz | $I_C$=50mA, $V_{CE}$=5V<br>f=50MHz |
| Input Capacitance | $C_{ibo}$ | | 200 | | pF | $V_{EB}$=0.5V, f=1MHz |
| Output Capacitance | $C_{obo}$ | | 16 | | pF | $V_{CB}$=10V, f=1MHz |
| Switching Times | $t_{on}$<br>$t_{off}$ | | 33<br>1300 | | ns<br>ns | $I_C$=500mA, $I_{B!}$=50mA<br>$I_{B2}$=50mA, $V_{CC}$=10V |

*Measured under pulsed conditions. Pulse width=300μs. Duty cycle ≤ 2%

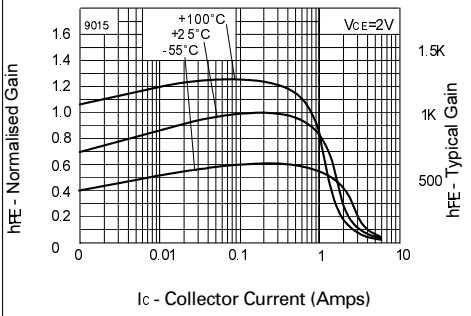
# TYPICAL CHARACTERISTICS



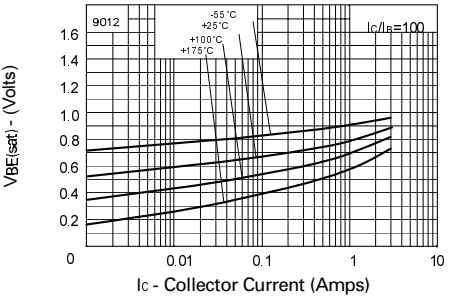

**VCE(sat) v IC**



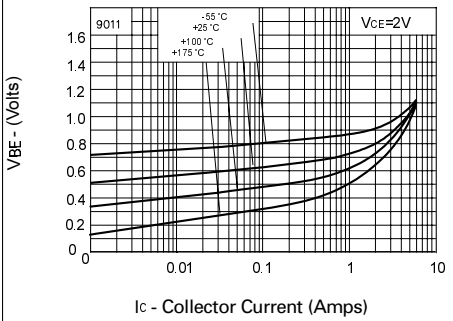

**VCE(sat) v IC**




**hFE v IC**




**VBE(sat) v IC**




**VBE(on) v IC**