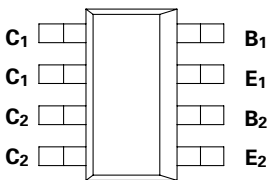


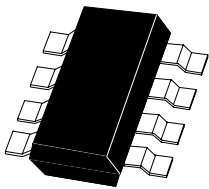
**SM-8 DUAL NPN MEDIUM POWER  
HIGH GAIN TRANSISTORS**

ISSUE 1 - NOVEMBER 1995

**ZDT690**



**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 $T_{amb} = 25^{\circ}C^*$ Any single die "on" Both die "on" equally	$P_{tot}$	2.25 2.75	W W
Derate above $25^{\circ}C^*$ Any single die "on" Both die "on" equally		18 22	mW/°C mW/°C
Thermal Resistance - Junction to Ambient* Any single die "on" Both die "on" equally		55.6 45.5	°C/W °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.

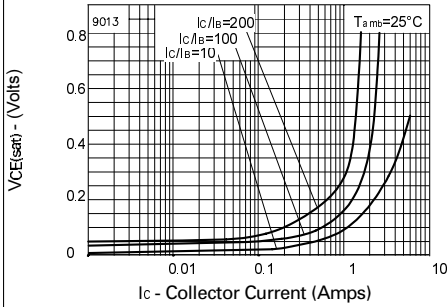
# ZDT690

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

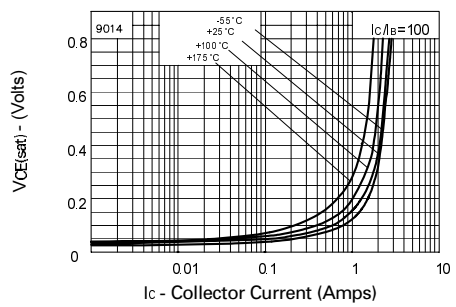
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	45			V	$I_C=100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	45			V	$I_C=10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5			V	$I_E=100\mu\text{A}$
Collector Cutoff Current	$I_{CBO}$			0.1	$\mu\text{A}$	$V_{CB}=35\text{V}$
Emitter Cutoff Current	$I_{EBO}$			0.1	$\mu\text{A}$	$V_{EB}=4\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			0.1 0.5	V V	$I_C=0.1\text{A}$ , $I_B=0.5\text{mA}^*$ $I_C=1\text{A}$ , $I_B=5\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$			0.9	V	$I_C=1\text{A}$ , $I_B=10\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$			0.9	V	$I_C=1\text{A}$ , $V_{CE}=2\text{V}^*$
Static Forward Current Transfer Ratio	$h_{FE}$	500 400 150				$I_C=100\text{mA}$ , $V_{CE}=2\text{V}^*$ $I_C=1\text{A}$ , $V_{CE}=2\text{V}^*$ $I_C=2\text{A}$ , $V_{CE}=2\text{V}^*$
Transition Frequency	$f_T$	150			MHz	$I_C=50\text{mA}$ , $V_{CE}=5\text{V}$ $f=50\text{MHz}$
Input Capacitance	$C_{ibo}$		200		pF	$V_{EB}=0.5\text{V}$ , $f=1\text{MHz}$
Output Capacitance	$C_{obo}$		16		pF	$V_{CB}=10\text{V}$ , $f=1\text{MHz}$
Switching Times	$t_{on}$ $t_{off}$		33 1300		ns ns	$I_C=500\text{mA}$ , $I_{B1}=50\text{mA}$ $I_{B2}=50\text{mA}$ , $V_{CC}=10\text{V}$

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

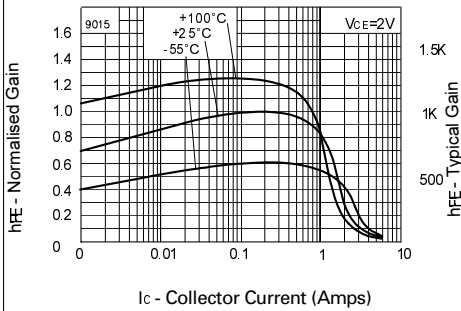
## TYPICAL CHARACTERISTICS



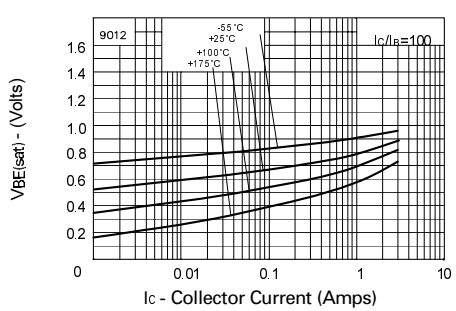
**$V_{CE(sat)}$  v  $I_C$**



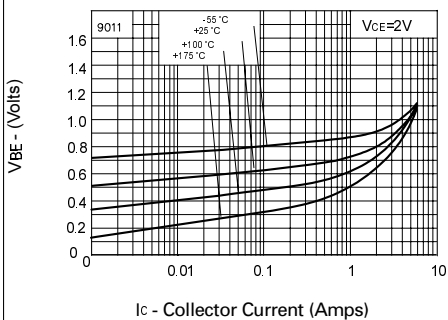
**$V_{CE(sat)}$  v  $I_C$**



**$h_{FE}$  v  $I_C$**



**$V_{BE(sat)}$  v  $I_C$**



**$V_{BE(on)}$  v  $I_C$**