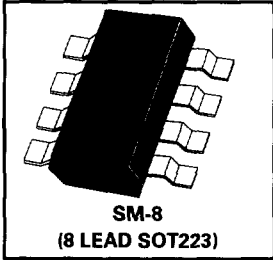
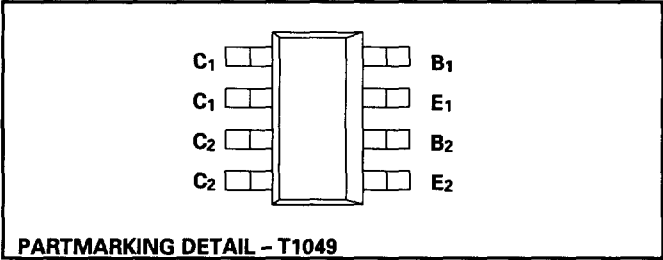


# SM-8 DUAL NPN MEDIUM POWER HIGH GAIN TRANSISTORS

ISSUE 1 - JANUARY 1996

## ZDT1049



### ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	$V_{CBO}$	80	V
Collector-Emitter Voltage	$V_{CEO}$	25	V
Emitter-Base Voltage	$V_{EBO}$	5	V
Peak Pulse Current	$I_{CM}$	20	A
Continuous Collector Current	$I_C$	5	A
Base Current	$I_B$	500	mA
Operating and Storage Temperature Range	$T_j; T_{stg}$	-55 to +150	°C

### THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	VALUE	UNIT
Total Power Dissipation at $T_{amb} = 25^\circ\text{C}^*$ Any single die "on" Both die "on" equally	$P_{tot}$	2.25	W
		2.75	W
Derate above $25^\circ\text{C}^*$ Any single die "on" Both die "on" equally		18	mW/°C
		22	mW/°C
Thermal Resistance - Junction to Ambient* Any single die "on" Both die "on" equally		55.6	°C/W
		45.5	°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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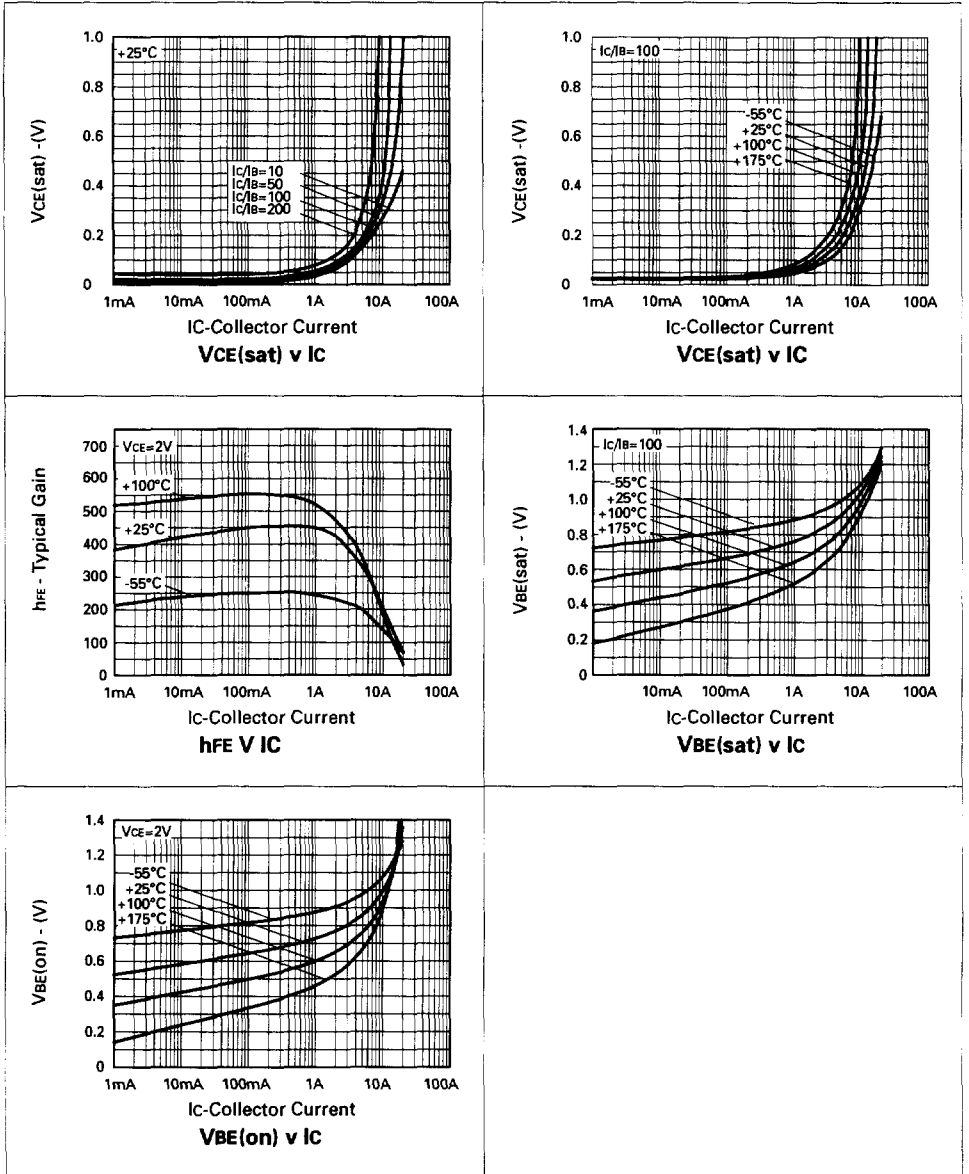
## ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	80	120		V	$I_C=100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{CES}$	80	120		V	$I_C=100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{CEO}$	25	35		V	$I_C=10\text{mA}$
Collector-Emitter Breakdown Voltage	$V_{CEV}$	80	120		V	$I_C=100\mu\text{A}$ , $V_{EB}=1\text{V}$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5	8.75		V	$I_E=100\mu\text{A}$
Collector Cut-Off Current	$I_{CBO}$		0.3	10	nA	$V_{CB}=50\text{V}$
Emitter Cut-Off Current	$I_{EBO}$		0.3	10	nA	$V_{EB}=4\text{V}$
Collector Emitter Cut-Off Current	$I_{CES}$		0.3	10	nA	$V_{CES}=50\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		30 60 125 155	45 80 180 220	mV mV mV mV	$I_C=0.5\text{A}$ , $I_B=10\text{mA}^*$ $I_C=1\text{A}$ , $I_B=10\text{mA}^*$ $I_C=2\text{A}$ , $I_B=10\text{mA}^*$ $I_C=4\text{A}$ , $I_B=50\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		890	950	mV	$I_C=4\text{A}$ , $I_B=50\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		820	900	mV	$I_C=4\text{A}$ , $V_{CE}=2\text{V}^*$
Static Forward Current Transfer Ratio	$h_{FE}$	250 300 300 200 35	430 450 450 350 70	1200		$I_C=10\text{mA}$ , $V_{CE}=2\text{V}^*$ $I_C=0.5\text{A}$ , $V_{CE}=2\text{V}^*$ $I_C=1\text{A}$ , $V_{CE}=2\text{V}^*$ $I_C=4\text{A}$ , $V_{CE}=2\text{V}^*$ $I_C=20\text{A}$ , $V_{CE}=2\text{V}^*$
Transition Frequency	$f_T$		180		MHz	$I_C=50\text{mA}$ , $V_{CE}=10\text{V}$ $f=50\text{MHz}$
Output Capacitance	$C_{obo}$		45	60	pF	$V_{CB}=10\text{V}$ , $f=1\text{MHz}$
Turn - On Time	$t_{on}$		125		ns	$I_C=4\text{A}$ , $I_B=40\text{mA}$ , $V_{CC}=10\text{V}$
Turn -Off Time	$t_{off}$		380		ns	$I_C=4\text{A}$ , $I_B=\pm 40\text{mA}$ , $V_{CC}=10\text{V}$

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

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## TYPICAL CHARACTERISTICS



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