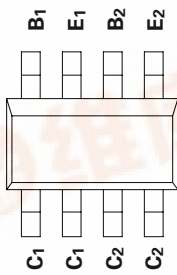
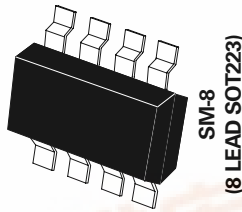


# SM-8 DUAL NPN MEDIUM POWER HIGH GAIN TRANSISTORS

ISSUE 11 NOVEMBER 1995



PARTMARKING DETAIL - T694



ZDT694

## ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	$V_{CBO}$	120	V
Collector-Emitter Voltage	$V_{CEO}$	120	V
Emitter-Base Voltage	$V_{EBO}$	5	V
Peak Pulse Current	$I_{CM}$	1	A
Continuous Collector Current	$I_C$	0.5	A
Operating and Storage Temperature Range	$T_j, T_{stg}$	-55 to +150	$^{\circ}C$

## THERMAL CHARACTERISTICS

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

\* 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.

ZDT694

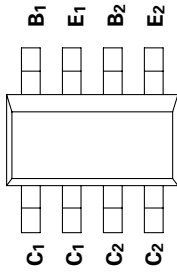
## ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}C$ ).

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	120			V	$I_C = 100\mu A$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	120			V	$I_C = 10mA$ *
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5			V	$I_E = 100\mu A$
Collector Cutoff Current	$I_{CBO}$			0.1	$\mu A$	$V_{CB} = 100V$
Emitter Cutoff Current	$I_{EBO}$			0.1	$\mu A$	$V_{EB} = 4V$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			0.25	V	$I_C = 0.1A, I_B = 0.5mA$ *
				0.5	V	$I_C = 0.4A, I_B = 5mA$ *
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				$I_C = 100mA, V_{CE} = 2V$ *
		400				$I_C = 200mA, V_{CE} = 2V$ *
		150				$I_C = 400mA, V_{CE} = 2V$ *
Transition Frequency	$f_T$	130			MHz	$I_C = 50mA, V_{CE} = 5V, f = 50MHz$
Input Capacitance	$C_{ibo}$		200		pF	$V_{EB} = 0.5V, f = 1MHz$
Output Capacitance	$C_{obo}$		9		pF	$V_{CB} = 10V, f = 1MHz$
Switching Times	$t_{on}, t_{off}$	80			ns	$I_C = 100mA, I_B = 10mA$
		2900			ns	$I_B = 10mA, V_{CC} = 50V$

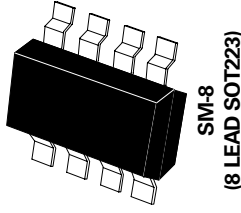
\*Measured under pulsed conditions. Pulse width=300 $\mu s$ . Duty cycle  $\leq 2\%$

**5M-8 DUAL NPN MEDIUM POWER  
HIGH GAIN TRANSISTORS**

ISSUE 1 - NOVEMBER 1995



**PARTMARKING DETAIL - T694**



**ZDT694**

**ZDT694**

**ABSOLUTE MAXIMUM RATINGS.**

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	$V_{CBO}$	120	V
Collector-Emitter Voltage	$V_{CEO}$	120	V
Emitter-Base Voltage	$V_{EBO}$	5	V
Peak Pulse Current	$I_{CM}$	1	A
Continuous Collector Current	$I_C$	0.5	A
Operating and Storage Temperature Range	$T_j, T_{stg}$	-55 to +150	$^{\circ}C$

**HERMAL 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/ $^{\circ}C$ mW/ $^{\circ}C$
Thermal Resistance - Junction to Ambient* Any single die "on" Both die "on" equally		55.6 45.5	$^{\circ}C/W$ $^{\circ}C/W$

\* 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.

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	120			V	$I_C = 100\mu A$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	120			V	$I_C = 10mA^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5			V	$I_E = 100\mu A$
Collector Cutoff Current	$I_{CBO}$			0.1	$\mu A$	$V_{CB} = 100V$
Emitter Cutoff Current	$I_{EBO}$			0.1	$\mu A$	$V_{EB} = 4V$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			0.25 0.5	V V	$I_C = 0.1A, I_B = 0.5mA^*$ $I_C = 0.4A, I_B = 5mA^*$
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	$h_{FE}$	500 400 150				$I_C = 100mA, V_{CE} = 2V^*$ $I_C = 200mA, V_{CE} = 2V^*$ $I_C = 400mA, V_{CE} = 2V^*$
Transition Frequency	$f_T$	130			MHz	$I_C = 50mA, V_{CE} = 5V$ $f = 50MHz$
Input Capacitance	$C_{ibo}$		200		pF	$V_{EB} = 0.5V, f = 1MHz$
Output Capacitance	$C_{obo}$		9		pF	$V_{CB} = 10V, f = 1MHz$
Switching Times	$t_{on}$ $t_{off}$		80 2900		ns ns	$I_C = 100mA, I_B = 10mA$ $I_B = 10mA, V_{CC} = 50V$

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

# ZDT694

## TYPICAL CHARACTERISTICS

