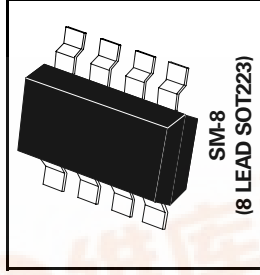
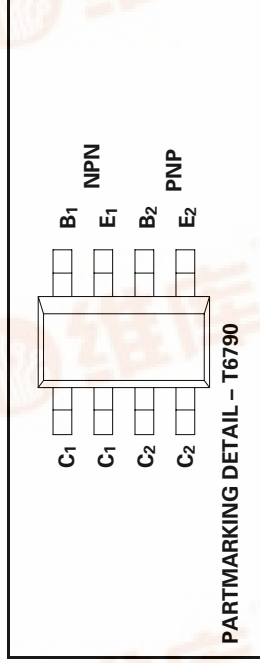


# SM-8 COMPLEMENTARY MEDIUM POWER HIGH GAIN TRANSISTORS

ISSUE 1 - NOVEMBER 1995

## ZDT6790



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### ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	NPN	PNP	UNIT
Collector-Base Voltage	$V_{CB0}$	45	-50	V
Collector-Emitter Voltage	$V_{CE0}$	45	-40	V
Emitter-Base Voltage	$V_{EB0}$	5	-5	V
Peak Pulse Current	$I_{CM}$	6	-6	A
Continuous Collector Current	$I_C$	2	-2	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 $T_{amb} = 25^{\circ}C^*$ 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.

[捷多邦, 专业PCB打样工厂, 24小时加急出货](#)



**NPN TRANSISTOR 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	$I_C = 0.1\text{A}, I_B = 0.5\text{mA}^*$ $I_C = 1\text{A}, I_B = 5\text{mA}^*$
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	$I_C = 500\text{mA}, I_B = 50\text{mA}$ $I_B = 50\text{mA}, V_{CC} = 10\text{V}$

\*Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$   
For typical characteristics graphs see FZT690 datasheet.

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-50			V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-40			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	$\mu\text{A}$	$V_{CB} = -30\text{V}$
Emitter Cutoff Current	$I_{EBO}$			-0.1	$\mu\text{A}$	$V_{EB} = -4\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			-0.25 -0.45 -0.75	V	$I_C = -500\text{mA}, I_B = -5\text{mA}^*$ $I_C = -1\text{A}, I_B = -10\text{mA}^*$ $I_C = -2\text{A}, I_B = -50\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$			-1.0	V	$I_C = -1\text{A}, I_B = -10\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$			-0.75	V	$I_C = -1\text{A}, V_{CE} = -2\text{V}^*$
Static Forward Current Transfer Ratio	$h_{FE}$	300 250 200 150		800		$I_C = -10\text{mA}, V_{CE} = -2\text{V}$ $I_C = -500\text{mA}, V_{CE} = -2\text{V}^*$ $I_C = -1\text{A}, V_{CE} = -2\text{V}^*$ $I_C = -2\text{A}, V_{CE} = -2\text{V}^*$
Transition Frequency	$f_T$	100			MHz	$I_C = -50\text{mA}, V_{CE} = -5\text{V}$ $f = 50\text{MHz}$
Input Capacitance	$C_{ibo}$		225		pF	$V_{EB} = -0.5\text{V}, f = 1\text{MHz}$
Output Capacitance	$C_{obo}$		24		pF	$V_{CB} = -10\text{V}, f = 1\text{MHz}$
Switching Times	$t_{on}$ $t_{off}$		35 600		ns	$I_C = -500\text{mA}, I_B = -50\text{mA}$ $I_B = -50\text{mA}, V_{CC} = -10\text{V}$

\*Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$   
For typical characteristics graphs see FZT790 datasheet.

**NPN TRANSISTOR  
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	$I_C = 0.1\text{A}, I_B = 0.5\text{mA}^*$ $I_C = 1\text{A}, I_B = 5\text{mA}^*$
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	$I_C = 500\text{mA}, I_B = 50\text{mA}$ $I_B = 50\text{mA}, V_{CC} = 10\text{V}$

\*Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$   
For typical characteristics graphs see FZT690 datasheet.

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-50			V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-40			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	$\mu\text{A}$	$V_{CB} = -30\text{V}$
Emitter Cutoff Current	$I_{EBO}$			-0.1	$\mu\text{A}$	$V_{EB} = -4\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			-0.25 -0.45 -0.75	V	$I_C = -500\text{mA}, I_B = -5\text{mA}^*$ $I_C = -1\text{A}, I_B = -10\text{mA}^*$ $I_C = -2\text{A}, I_B = -50\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$			-1.0	V	$I_C = -1\text{A}, I_B = -10\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$			-0.75	V	$I_C = -1\text{A}, V_{CE} = -2\text{V}^*$
Static Forward Current Transfer Ratio	$h_{FE}$	300 250 200 150		800		$I_C = -10\text{mA}, V_{CE} = -2\text{V}$ $I_C = -500\text{mA}, V_{CE} = -2\text{V}^*$ $I_C = -1\text{A}, V_{CE} = -2\text{V}^*$ $I_C = -2\text{A}, V_{CE} = -2\text{V}^*$
Transition Frequency	$f_T$	100			MHz	$I_C = -50\text{mA}, V_{CE} = -5\text{V}$ $f = 50\text{MHz}$
Input Capacitance	$C_{ibo}$		225		pF	$V_{EB} = -0.5\text{V}, f = 1\text{MHz}$
Output Capacitance	$C_{obo}$		24		pF	$V_{CB} = -10\text{V}, f = 1\text{MHz}$
Switching Times	$t_{on}$ $t_{off}$		35 600		ns	$I_C = -500\text{mA}, I_B = -50\text{mA}$ $I_B = -50\text{mA}, V_{CC} = -10\text{V}$

\*Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$   
For typical characteristics graphs see FZT790 datasheet.