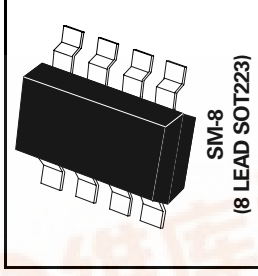
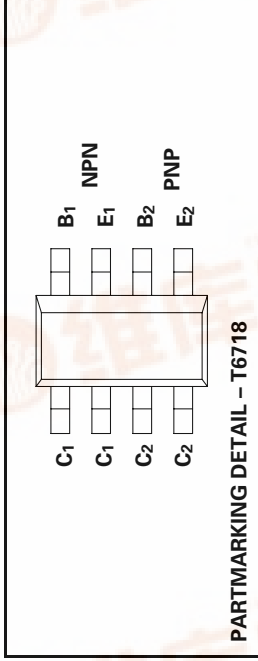


SM-8 COMPLEMENTARY MEDIUM POWER HIGH GAIN TRANSISTORS

ISSUE 1 - NOVEMBER 1995

ZDT6718



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ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	NPN	PNP	UNIT
Collector-Base Voltage	V _{CB0}	20	-20	V
Collector-Emitter Voltage	V _{CE0}	20	-20	V
Emitter-Base Voltage	V _{EB0}	5	-5	V
Peak Pulse Current	I _{CM}	6	-6	A
Continuous Collector Current	I _C	2	-1.5	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* Any single die "on" Both die "on" equally	P _{tot}	2 2.5	W W
Derate above 25°C* Any single die "on" Both die "on" equally		16 20	mW/°C mW/°C
Thermal Resistance - Junction to Ambient* Any single die "on" Both die "on" equally		62.5 50	°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.

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ZDT6718

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	20	100		V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	20	27		V	$I_C = 10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5	8.3		V	$I_E = 100\mu\text{A}$
Collector Cutoff Current	I_{CBO}			100	nA	$V_{CB} = 16\text{V}$
Emitter Cutoff Current	I_{EBO}			100	nA	$V_{EB} = 4\text{V}$
Collector Emitter Cutoff Current	I_{CES}			100	nA	$V_{CES} = 16\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		7 70 130	15 150 200	mV mV mV	$I_C = 0.1\text{A}, I_B = 10\text{mA}^*$ $I_C = 1\text{A}, I_B = 10\text{mA}^*$ $I_C = 2.5\text{A}, I_B = 50\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		0.89	1.0	V	$I_C = 2.5\text{A}, I_B = 50\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		0.79	1.0	V	$I_C = 2.5\text{A}, V_{CE} = 2\text{V}^*$
Static Forward Current Transfer Ratio	h_{FE}	200 300 200 100	400 450 360 180			$I_C = 10\text{mA}, V_{CE} = 2\text{V}^*$ $I_C = 200\text{mA}, V_{CE} = 2\text{V}^*$ $I_C = 2\text{A}, V_{CE} = 2\text{V}^*$ $I_C = 6\text{A}, V_{CE} = 2\text{V}^*$
Transition Frequency	f_T	100	140		MHz	$I_C = 50\text{mA}, V_{CE} = 10\text{V}$ $f = 100\text{MHz}$
Output Capacitance	C_{obo}		23	30	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$
Turn-On Time	t_{on}		170			$V_{CC} = 10\text{V}, I_C = 1\text{A}$ $I_{B1} = I_{B2} = 10\text{mA}$
Turn-Off Time	t_{off}		400			

*Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$ or typical characteristics graphs see SuperSOT FMMT618 datasheet.

ZDT6718

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	$V_{(BR)CBO}$	-20	-65		V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-20	-55		V	$I_C = 10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-5	-8.8		V	$I_E = 100\mu\text{A}$
Collector Cutoff Current	I_{CBO}			-100	nA	$V_{CB} = 15\text{V}$
Emitter Cutoff Current	I_{EBO}			-100	nA	$V_{EB} = 4\text{V}$
Collector Emitter Cutoff Current	I_{CES}			-100	nA	$V_{CES} = 15\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$		-16 -130 -145	-40 -200 -220	mV mV mV	$I_C = 0.1\text{A}, I_B = 10\text{mA}^*$ $I_C = 1\text{A}, I_B = 20\text{mA}^*$ $I_C = 1.5\text{A}, I_B = 50\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$		-0.87	-1.0	V	$I_C = 1.5\text{A}, I_B = 50\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(ON)}$		-0.81	-1.0	V	$I_C = 2\text{A}, V_{CE} = 2\text{V}^*$
Static Forward Current Transfer Ratio	h_{FE}	300 300 150 50 15	475 450 230 70 30			$I_C = 10\text{mA}, V_{CE} = 2\text{V}^*$ $I_C = 100\text{mA}, V_{CE} = 2\text{V}^*$ $I_C = 2\text{A}, V_{CE} = 2\text{V}^*$ $I_C = 4\text{A}, V_{CE} = 2\text{V}^*$ $I_C = 6\text{A}, V_{CE} = 2\text{V}^*$
Transition Frequency	f_T	150	180		MHz	$I_C = 50\text{mA}, V_{CE} = 10\text{V}$ $f = 100\text{MHz}$
Output Capacitance	C_{obo}		21	30	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$
Turn-On Time	t_{on}		40			$V_{CC} = 10\text{V}, I_C = 1\text{A}$ $I_{B1} = I_{B2} = 20\text{mA}$
Turn-Off Time	t_{off}		670			

*Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$ For typical characteristics graphs see SuperSOT FMMT718 datasheet.

ZDT6718

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	20	100		V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	20	27		V	$I_C = 10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5	8.3		V	$I_E = 100\mu\text{A}$
Collector Cutoff Current	I_{CBO}			100	nA	$V_{CB} = 16\text{V}$
Emitter Cutoff Current	I_{EBO}			100	nA	$V_{EB} = 4\text{V}$
Collector Emitter Cutoff Current	I_{CES}			100	nA	$V_{CES} = 16\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		7 70 130	15 150 200	mV mV mV	$I_C = 0.1\text{A}, I_B = 10\text{mA}^*$ $I_C = 1\text{A}, I_B = 10\text{mA}^*$ $I_C = 2.5\text{A}, I_B = 50\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		0.89	1.0	V	$I_C = 2.5\text{A}, I_B = 50\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		0.79	1.0	V	$I_C = 2.5\text{A}, V_{CE} = 2\text{V}^*$
Static Forward Current Transfer Ratio	h_{FE}	200 300 200 100	400 450 360 180			$I_C = 10\text{mA}, V_{CE} = 2\text{V}^*$ $I_C = 200\text{mA}, V_{CE} = 2\text{V}^*$ $I_C = 2\text{A}, V_{CE} = 2\text{V}^*$ $I_C = 6\text{A}, V_{CE} = 2\text{V}^*$
Transition Frequency	f_T	100	140		MHz	$I_C = 50\text{mA}, V_{CE} = 10\text{V}$ $f = 100\text{MHz}$
Output Capacitance	C_{obo}		23	30	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$
Turn-On Time	t_{on}		170			$V_{CC} = 10\text{V}, I_C = 1\text{A}$ $I_{B1} = I_{B2} = 10\text{mA}$
Turn-Off Time	t_{off}		400			

*Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$ or typical characteristics graphs see SuperSOT FMMT618 datasheet.

ZDT6718

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	$V_{(BR)CBO}$	-20	-65		V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-20	-55		V	$I_C = -10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-5	-8.8		V	$I_E = -100\mu\text{A}$
Collector Cutoff Current	I_{CBO}			-100	nA	$V_{CB} = -15\text{V}$
Emitter Cutoff Current	I_{EBO}			-100	nA	$V_{EB} = -4\text{V}$
Collector Emitter Cutoff Current	I_{CES}			-100	nA	$V_{CES} = -15\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		-16 -130 -145	-40 -200 -220	mV mV mV	$I_C = -0.1\text{A}, I_B = -10\text{mA}^*$ $I_C = -1\text{A}, I_B = -20\text{mA}^*$ $I_C = -1.5\text{A}, I_B = -50\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		-0.87	-1.0	V	$I_C = -1.5\text{A}, I_B = -50\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		-0.81	-1.0	V	$I_C = -2\text{A}, V_{CE} = -2\text{V}^*$
Static Forward Current Transfer Ratio	h_{FE}	300 300 150 50 15	475 450 230 70 30			$I_C = -10\text{mA}, V_{CE} = -2\text{V}^*$ $I_C = -100\text{mA}, V_{CE} = -2\text{V}^*$ $I_C = -2\text{A}, V_{CE} = -2\text{V}^*$ $I_C = -4\text{A}, V_{CE} = -2\text{V}^*$ $I_C = -6\text{A}, V_{CE} = -2\text{V}^*$
Transition Frequency	f_T	150	180		MHz	$I_C = -50\text{mA}, V_{CE} = -10\text{V}$ $f = 100\text{MHz}$
Output Capacitance	C_{obo}		21	30	pF	$V_{CB} = -10\text{V}, f = 1\text{MHz}$
Turn-On Time	t_{on}		40			$V_{CC} = -10\text{V}, I_C = -1\text{A}$ $I_{B1} = I_{B2} = 20\text{mA}$
Turn-Off Time	t_{off}		670			

*Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$ For typical characteristics graphs see SuperSOT FMMT718 datasheet.