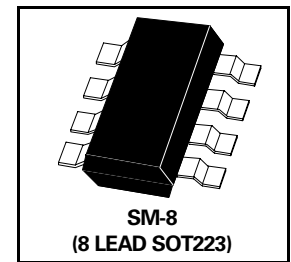
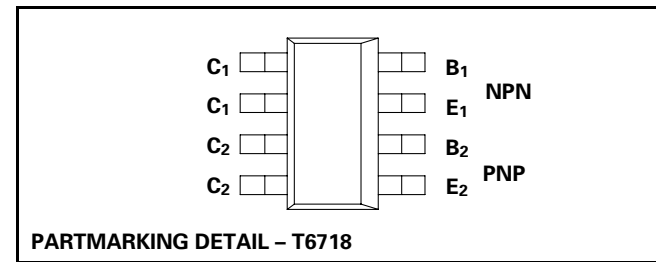


# SM-8 COMPLEMENTARY MEDIUM POWER HIGH GAIN TRANSISTORS

ISSUE 1 - NOVEMBER 1995

## ZDT6718



### ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	NPN	PNP	UNIT
Collector-Base Voltage	$V_{CBO}$	20	-20	V
Collector-Emitter Voltage	$V_{CEO}$	20	-20	V
Emitter-Base Voltage	$V_{EBO}$	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 $T_{amb} = 25^\circ\text{C}^*$ Any single die "on" Both die "on" equally	$P_{tot}$	2 2.5	W W
Derate above $25^\circ\text{C}^*$ 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.

# 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 $\mu\text{s}$ . Duty cycle  $\leq 2\%$   
For 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 $\mu\text{s}$ . 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 $\mu\text{s}$ . Duty cycle  $\leq 2\%$   
For 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 $\mu\text{s}$ . Duty cycle  $\leq 2\%$   
For typical characteristics graphs see SuperSOT FMMT718 datasheet.

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