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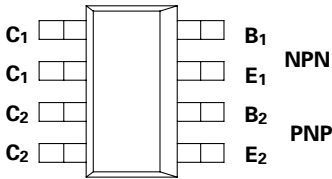
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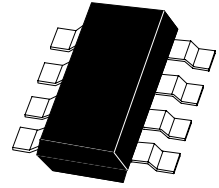
SM-8 COMPLEMENTARY MEDIUM POWER DARLINGTON TRANSISTORS

ISSUE 1 - NOVEMBER 1995

ZDT6705



PARTMARKING DETAIL – T6705



SM-8
(8 LEAD SOT223)

ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	NPN	PNP	UNIT
Collector-Base Voltage	V_{CBO}	140	-140	V
Collector-Emitter Voltage	V_{CEO}	120	-120	V
Emitter-Base Voltage	V_{EBO}	10	-10	V
Peak Pulse Current	I_{CM}	4	-4	A
Continuous Collector Current	I_C	1	-1	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}	2.25 2.75	W W
Derate above 25°C^* Any single die "on" Both die "on" equally		18 22	mW/°C mW/°C
Thermal Resistance - Junction to Ambient* Any single die "on" Both die "on" equally		55.6 45.5	°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.

ZDT6705

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	140			V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	120			V	$I_C = 10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	10			V	$I_E = 100\mu\text{A}$
Collector Cutoff Current	I_{CBO}			0.01 10	μA μA	$V_{CB} = 120\text{V}$ $V_{CB} = 120\text{V}, T_{amb} = 100^{\circ}\text{C}$
Emitter Cutoff Current	I_{EBO}			0.1	μA	$V_{EB} = 8\text{V}$
Collector-Emitter Cutoff Current	I_{CES}			10	μA	$V_{CES} = 120\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			1.0 1.5	V V	$I_C = 250\text{mA}, I_B = 0.25\text{mA}^*$ $I_C = 1\text{A}, I_B = 1\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$			1.8	V	$I_C = 1\text{A}, I_B = 1\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$			1.7	V	$I_C = 1\text{A}, V_{CE} = 5\text{V}^*$
Static Forward Current Transfer Ratio	h_{FE}	2K 5K 2K 0.5K		100K		$I_C = 50\text{mA}, V_{CE} = 5\text{V}$ $I_C = 500\text{mA}, V_{CE} = 5\text{V}^*$ $I_C = 1\text{A}, V_{CE} = 5\text{V}^*$ $I_C = 2\text{A}, V_{CE} = 5\text{V}^*$
Transition Frequency	f_T	150			MHz	$I_C = 100\text{mA}, V_{CE} = 10\text{V}$ $f = 20\text{MHz}$
Input Capacitance	C_{ibo}		90		pF	$V_{EB} = 500\text{mV}, f = 1\text{MHz}$
Output Capacitance	C_{obo}		15		pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$
Switching Times	t_{on}		0.5		μs	$I_C = 500\text{mA}, V_{CE} = 10\text{V}$ $I_{B1} = I_{B2} = 0.5\text{mA}$
	t_{off}		1.6		μs	

*Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$
For typical characteristics graphs see ZDT605 datasheet.

ZDT6705

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	$V_{(BR)CBO}$	-140			V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{CEO(SUS)}$	-120			V	$I_C = -10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-10			V	$I_E = -100\mu\text{A}$
Collector Cutoff Current	I_{CBO}			-0.1 -10	μA μA	$V_{CB} = -120\text{V}$ $V_{CB} = -120\text{V}$, $T_{amb} = 100^{\circ}\text{C}$
Collector-Emitter Cutoff Current	I_{CES}			-10	μA	$V_{CES} = -80\text{V}$
Emitter Cutoff Current	I_{EBO}			-0.1	μA	$V_{EB} = -8\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			-1.3 -2.5	V V	$I_C = -1\text{A}$, $I_B = -1\text{mA}^*$ $I_C = -2\text{A}$, $I_B = -2\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$			-1.8	V	$I_C = -1\text{A}$, $I_B = -10\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$			-1.7	V	$I_C = -1\text{A}$, $V_{CE} = -5\text{V}^*$
Static Forward Current Transfer Ratio	h_{FE}	3K 3K 3K 2K		30K		$I_C = -10\text{mA}$, $V_{CE} = -5\text{V}^*$ $I_C = -100\text{mA}$, $V_{CE} = -5\text{V}^*$ $I_C = -1\text{A}$, $V_{CE} = -5\text{V}^*$ $I_C = -2\text{A}$, $V_{CE} = -5\text{V}^*$
Transition Frequency	f_T		160		MHz	$I_C = -100\text{mA}$, $V_{CE} = -10\text{V}$ $f = 20\text{MHz}$
Input Capacitance	C_{ibo}		90		pF	$V_{EB} = -0.5\text{V}$, $f = 1\text{MHz}$
Output Capacitance	C_{obo}		15		pF	$V_{CE} = -10\text{V}$, $f = 1\text{MHz}$
Switching Times	t_{on}		0.6		μs	$I_C = -0.5\text{A}$, $V_{CE} = -10\text{V}$ $I_{B1} = I_{B2} = -0.5\text{mA}$
	t_{off}		0.8		μs	

*Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$
For typical characteristics graphs see ZDT705 datasheet.