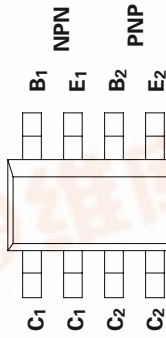
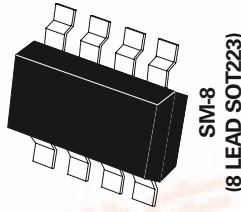


SM-8 COMPLEMENTARY MEDIUM POWER DARLINGTON TRANSISTORS

ISSUE 18 NOVEMBER 1995



PARTMARKING DETAIL - T6705



ZDT6705

ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	NPN	PNP	UNIT
Collector-Base Voltage	V_{CB0}	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		$^{\circ}C$

THERMAL CHARACTERISTICS

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

ZDT6705

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

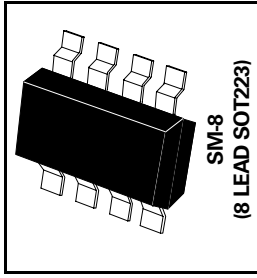
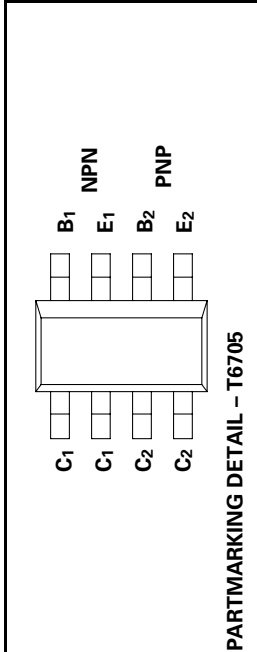
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	140			V	$I_C = 100\mu A$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	120			V	$I_C = 10mA^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	10			V	$I_E = 100\mu A$
Collector Cutoff Current	I_{CBO}			0.01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

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

SM-8 COMPLEMENTARY MEDIUM POWER DARLINGTON TRANSISTORS

ISSUE 1 - NOVEMBER 1995

ZDT6705



ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	NPN	PNP	UNIT
Collector-Base Voltage	V _{CB0}	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°C*	P _{tot}	2.25	W
	Any single die "on"	2.75	W
	Both die "on" equally		
Derate above 25°C*	Any single die "on"	18	mW/°C
	Any single die "on" Both die "on" equally	22	mW/°C
	Thermal Resistance - Junction to Ambient*		
Any single die "on"	55.6	°C/W	
Both die "on" equally	45.5	°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.

NPN TRANSISTOR ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C).

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	V _{(BR)CBO}	140			V	I _C =100μA
Collector-Emitter Breakdown Voltage	V _{(BR)CEO}	120			V	I _C =10mA*
Emitter-Base Breakdown Voltage	V _{(BR)EBO}	10			V	I _F =100μA
Collector Cutoff Current	I _{CBO}			0.01	μA	V _{CB} =120V
				10	μA	V _{CB} =120V, T _{amb} =100°C
Emitter Cutoff Current	I _{EBO}			0.1	μA	V _{EB} =8V
Collector-Emitter Cutoff Current	I _{CES}			10	μA	V _{CE} S=120V
Collector-Emitter Saturation Voltage	V _{CE(sat)}			1.0	V	I _C =250mA, I _B =0.25mA*
				1.5	V	I _C =1A, I _B =1mA*
Base-Emitter Saturation Voltage	V _{BE(sat)}			1.8	V	I _C =1A, I _B =1mA*
Base-Emitter Turn-On Voltage	V _{BE(on)}			1.7	V	I _C =1A, V _{CE} =5V*
Static Forward Current Transfer Ratio	h _{FE}	2K				I _C =50mA, V _{CE} =5V
		5K				I _C =500mA, V _{CE} =5V*
		2K		100K		I _C =1A, V _{CE} =5V*
		0.5K				I _C =2A, V _{CE} =5V*
Transition Frequency	f _T	150			MHz	I _C =100mA, V _{CE} =10V, f=20MHz
Input Capacitance	C _{ibo}		90		pF	V _{EB} =500mV, f=1MHz
Output Capacitance	C _{obo}		15		pF	V _{CB} =10V, f=1MHz
Switching Times	t _{on}		0.5		μs	I _C =500mA, V _{CE} =10V
			1.6		μs	I _{B1} =I _{B2} =0.5mA

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

ZDT6705

NPN 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 $\leq 2\%$ or typical characteristics graphs see ZDT705 datasheet.