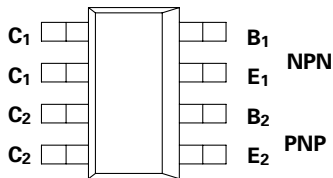


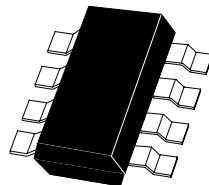
# SM-8 COMPLEMENTARY MEDIUM POWER DARLINGTON TRANSISTORS

ISSUE 2 – February 1997

## ZDT6702



PARTMARKING DETAIL – T6702



SM-8  
(8 LEAD SOT223)

### ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	NPN	PNP	UNIT
Collector-Base Voltage	$V_{CBO}$	80	-80	V
Collector-Emitter Voltage	$V_{CEO}$	60	-60	V
Emitter-Base Voltage	$V_{EBO}$	10	-10	V
Peak Pulse Current	$I_{CM}$	4	-4	A
Continuous Collector Current	$I_C$	1.75	-1.75	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 $25^\circ\text{C}^*$ 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.

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## 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	$V_{(BR)CBO}$	80	200		V	$I_C=100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	60	100		V	$I_C=10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	10	15		V	$I_E=100\mu\text{A}$
Collector Cutoff Current	$I_{CBO}$		0.5	10 10	nA $\mu\text{A}$	$V_{CB}=60\text{V}$ $V_{CB}=60\text{V}, T_{amb}=100^{\circ}\text{C}$
Emitter Cutoff Current	$I_{EBO}$		0.1	10	nA	$V_{EB}=8\text{V}$
Collector-Emitter Cutoff Current	$I_{CES}$		50	500	nA	$V_{CE}=60\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		0.83 1.0	0.95 1.28	V V	$I_C=0.5\text{A}, I_B=0.5\text{mA}^*$ $I_C=1.75\text{A}, I_B=2\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		1.68	1.85	V	$I_C=1.75\text{A}, I_B=2\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		1.55	1.75	V	$I_C=1.75\text{A}, V_{CE}=5\text{V}^*$
Static Forward Current Transfer Ratio	$h_{FE}$	5K 5K 3.5K 0.5K	13K 13K 9K 2K			$I_C=10\text{mA}, V_{CE}=5\text{V}$ $I_C=500\text{mA}, V_{CE}=5\text{V}$ $I_C=2\text{A}, V_{CE}=5\text{V}$ $I_C=4\text{A}, V_{CE}=5\text{V}^*$
Transition Frequency	$f_T$		140		MHz	$I_C=100\text{mA}, V_{CE}=10\text{V}$ $f=100\text{MHz}$
Input Capacitance	$C_{ibo}$		70		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		$\mu\text{s}$	$I_C=500\text{mA}, V_{CE}=10\text{V}$ $I_{B1}=I_{B2}=0.5\text{mA}$
	$t_{off}$		2.1		$\mu\text{s}$	

\*Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$

# ZDT6702

## PNP TRANSISTOR

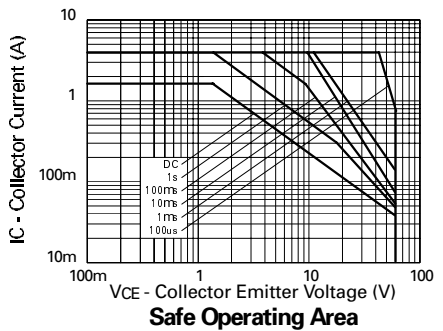
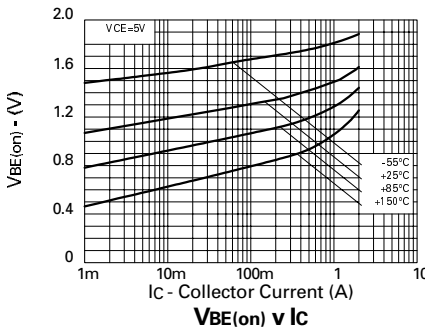
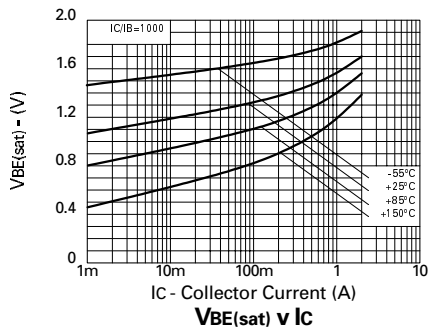
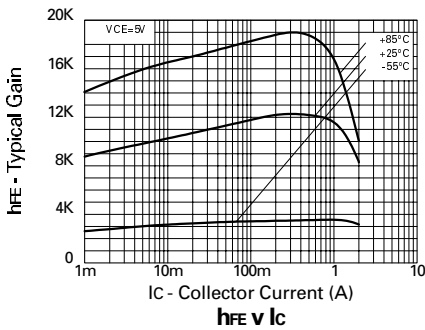
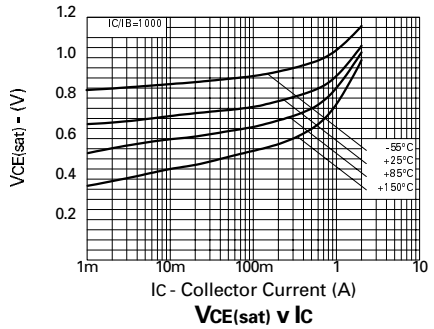
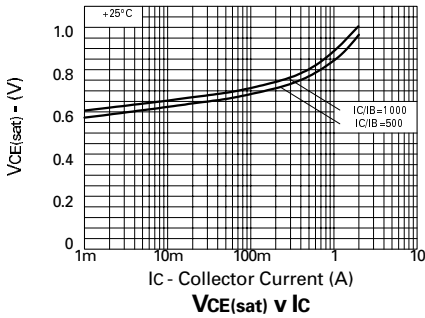
### ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-80	-120		V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{CEO(SUS)}$	-60	-90		V	$I_C = -10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-10	-15		V	$I_E = -100\mu\text{A}$
Collector Cutoff Current	$I_{CBO}$		-0.5	-10 -10	nA $\mu\text{A}$	$V_{CB} = -60\text{V}$ $V_{CB} = -60\text{V}$ , $T_{amb} = 100^{\circ}\text{C}$
Emitter Cutoff Current	$I_{EBO}$		-0.1	-10	nA	$V_{EB} = -8\text{V}$
Collector-Emitter Cutoff Current	$I_{CES}$		-50	-500	nA	$V_{CE} = -60\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		-0.86 -1.05	-1.0 -1.28	V V	$I_C = -0.5\text{A}$ , $I_B = -0.5\text{mA}^*$ $I_C = -1.75\text{A}$ , $I_B = -2\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		-1.7	-1.9	V	$I_C = -1.75\text{A}$ , $I_B = -2\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		-1.55	-1.85	V	$I_C = -1.75\text{A}$ , $V_{CE} = -5\text{V}^*$
Static Forward Current Transfer Ratio	$h_{FE}$	2K 2K 1.5K 1K	8K 8K 7K 4K			$I_C = -10\text{mA}$ , $V_{CE} = -5\text{V}^*$ $I_C = -500\text{mA}$ , $V_{CE} = -5\text{V}^*$ $I_C = -2\text{A}$ , $V_{CE} = -5\text{V}^*$ $I_C = -4\text{A}$ , $V_{CE} = -5\text{V}^*$
Transition Frequency	$f_T$		140		MHz	$I_C = -100\text{mA}$ , $V_{CE} = -10\text{V}$ $f = 100\text{MHz}$
Input Capacitance	$C_{ibo}$		90		pF	$V_{EB} = -0.5\text{V}$ , $f = 1\text{MHz}$
Output Capacitance	$C_{obo}$		25		pF	$V_{CE} = -10\text{V}$ , $f = 1\text{MHz}$
Switching Times	$t_{on}$		0.75		$\mu\text{s}$	$I_C = -0.5\text{A}$ , $V_{CE} = -10\text{V}$ $I_{B1} = I_{B2} = -0.5\text{mA}$
	$t_{off}$		1.2		$\mu\text{s}$	

\*Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$

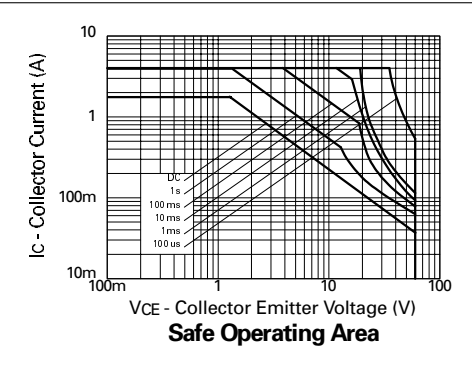
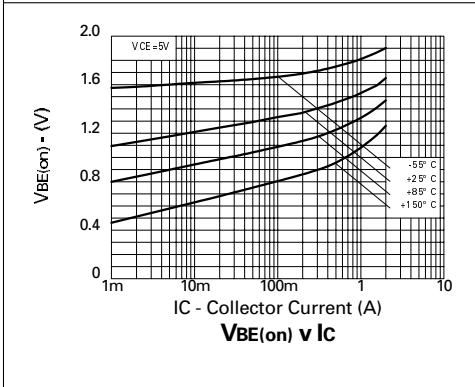
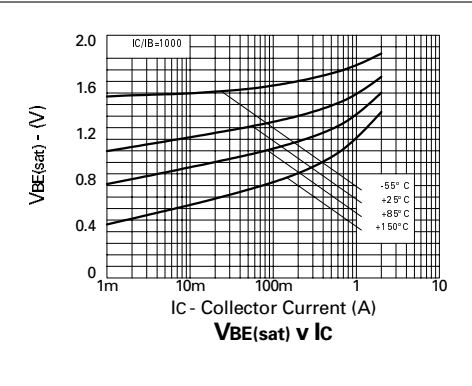
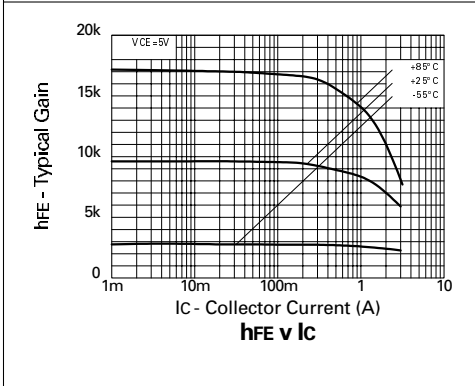
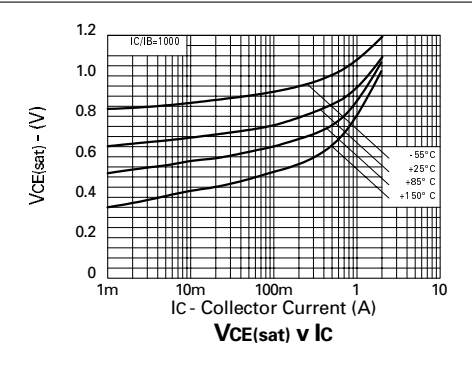
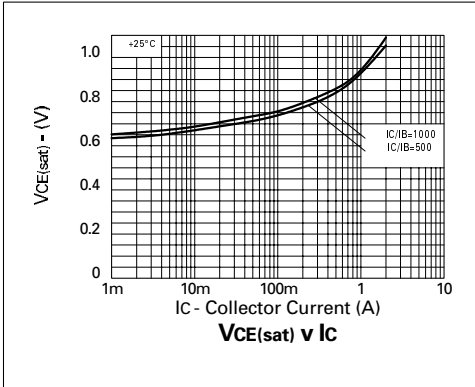
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## TYPICAL CHARACTERISTICS (NPN TRANSISTOR)



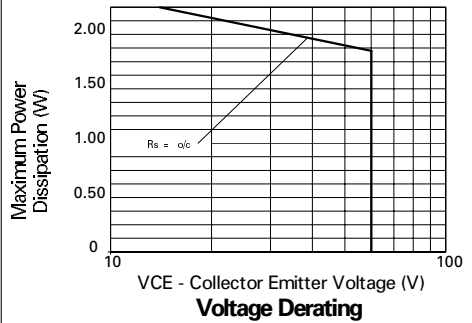
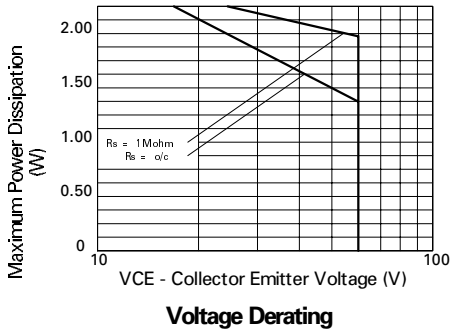
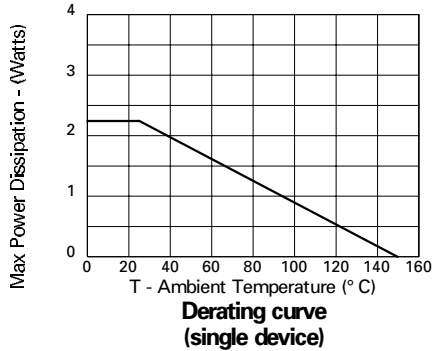
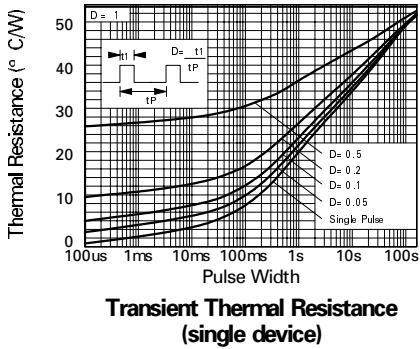
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## TYPICAL CHARACTERISTICS (PNP TRANSISTOR)

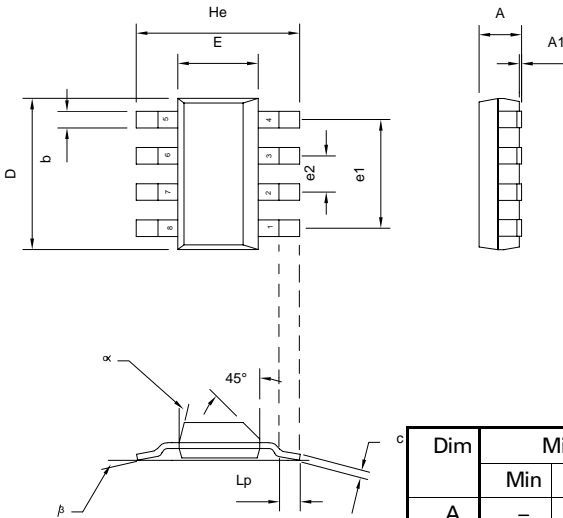


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## OTHER CHARACTERISTICS



# ZDT6702



Dim	Millimetres			Inches		
	Min	Typ	Max	Min	Typ	Max
A	-	-	1.7	-	-	0.067
A1	0.02	-	0.1	0.0008	-	0.004
b	-	0.7	-	-	0.028	-
c	0.24	-	0.32	0.009	-	0.013
D	6.3	-	6.7	0.248	-	0.264
E	3.3	-	3.7	0.130	-	0.145
e1	-	4.59	-	-	0.180	-
e2	-	1.53	-	-	0.060	-
He	6.7	-	7.3	0.264	-	0.287
Lp	0.9	-	-	0.035	-	-
α	-	-	15°	-	-	15°
β	-	10°	-	-	10°	-

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