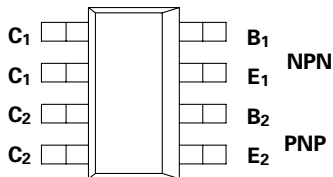


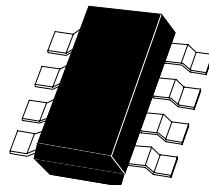
# SM-8 COMPLEMENTARY MEDIUM POWER DARLINGTON TRANSISTORS

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.

# ZDT6702

## 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

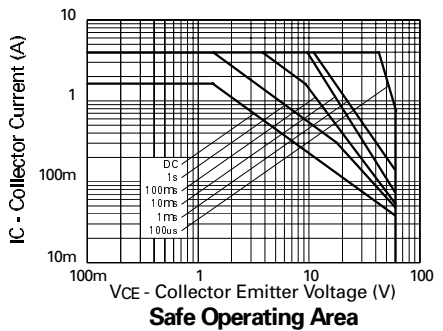
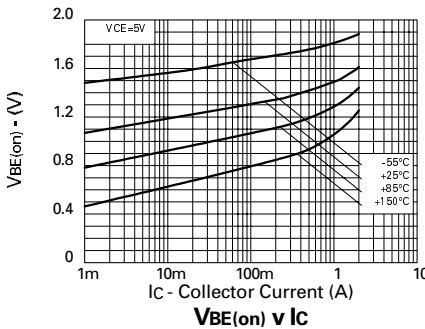
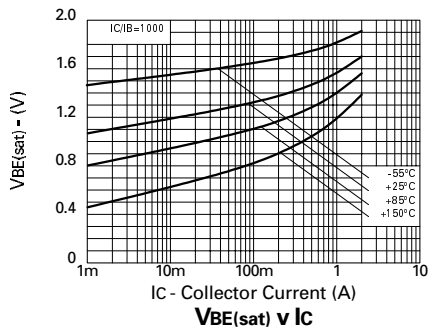
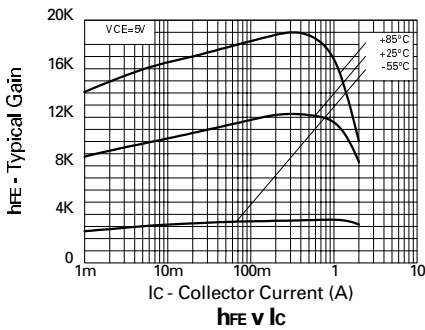
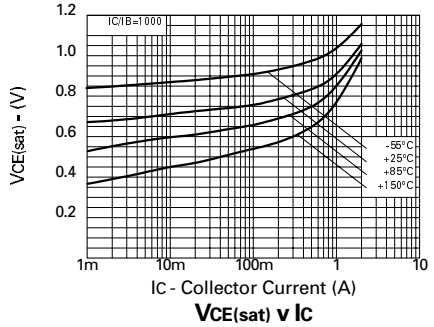
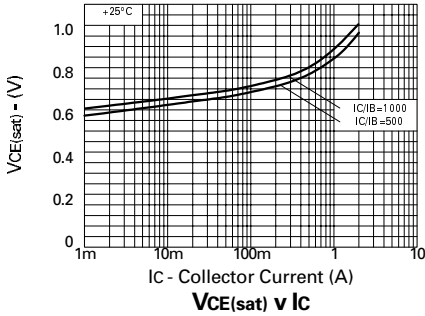
## PNP TRANSISTOR ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

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  $\leq 2\%$

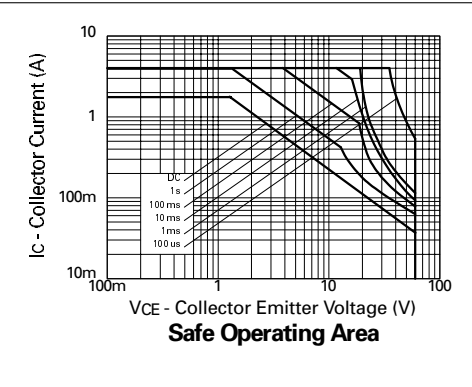
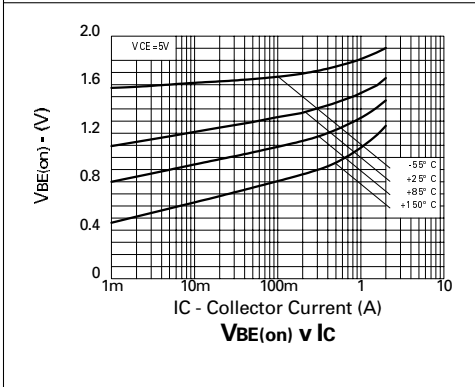
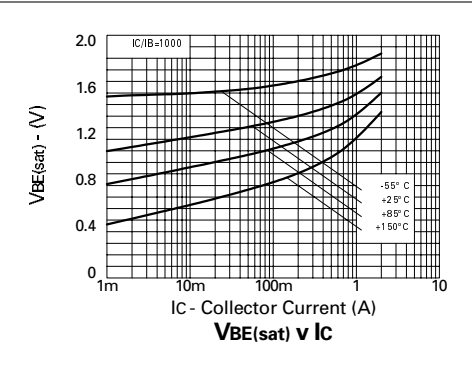
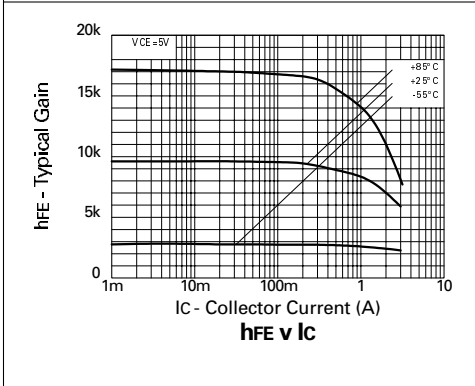
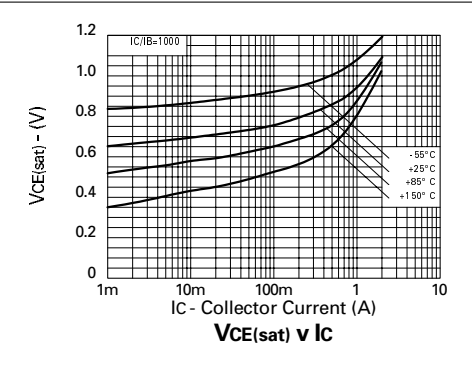
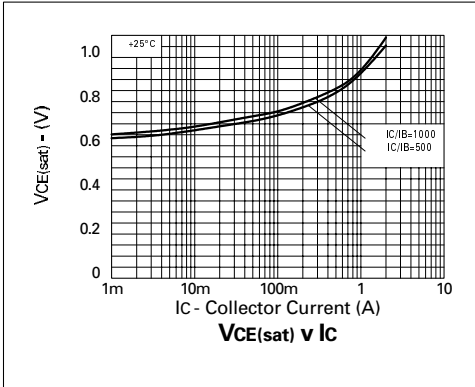
# ZDT6702

## TYPICAL CHARACTERISTICS (NPN TRANSISTOR)



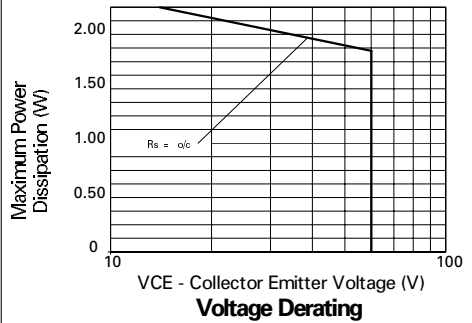
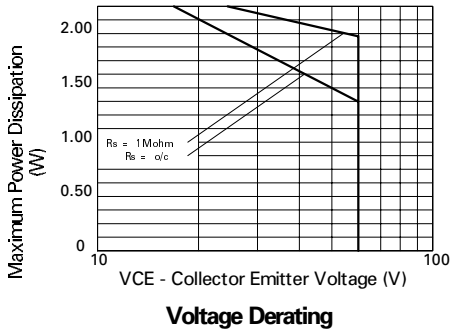
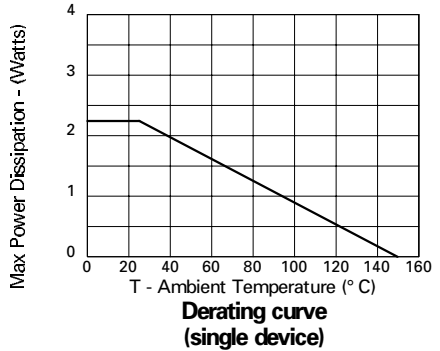
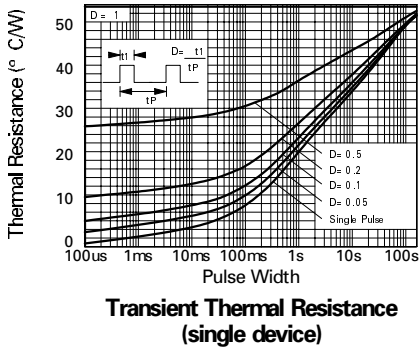
# ZDT6702

## TYPICAL CHARACTERISTICS (PNP TRANSISTOR)

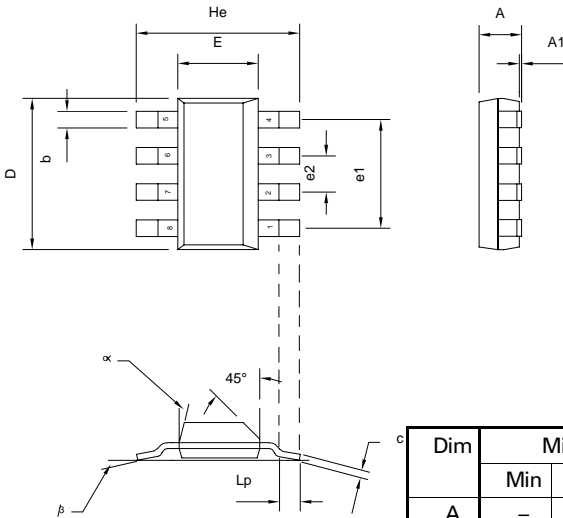


# ZDT6702

## 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°	-



Zetex plc.  
 Fields New Road, Chadderton, Oldham, OL9-8NP, United Kingdom.  
 Telephone: (44)161 622 4422 (Sales), (44)161 622 4444 (General Enquiries)  
 Fax: (44)161 622 4420

Zetex GmbH  
 Streifeldstraße 19  
 D-81673 München  
 Germany  
 Telefon: (49) 89 45 49 49 0  
 Fax: (49) 89 45 49 49 9

Zetex Inc.  
 47 Mall Drive, Unit 4  
 Commack NY 11725  
 USA  
 Telephone: (516) 543-7100  
 Fax: (516) 864-7630

Zetex (Asia) Ltd.  
 3510 Metroplaza, Tower 2  
 Hing Fong Road,  
 Kwai Fong, Hong Kong  
 Telephone: (852) 26100 611  
 Fax: (852) 24250 494

These are supported by  
 agents and distributors in  
 major countries world-wide  
 ©Zetex plc 1997  
**Internet:**  
<http://www.zetex.com>

This publication is issued to provide outline information only which (unless agreed by the Company in writing) may not be used, applied or reproduced for any purpose or form part of any order or contract or be regarded as a representation relating to the products or services concerned. The Company reserves the right to alter without notice the specification, design, price or conditions of supply of any product or service.