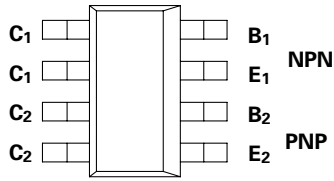
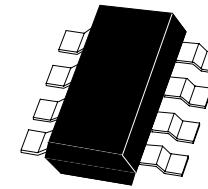
SM-8 COMPLEMENTARY MEDIUM POWER DARLINGTON TRANSISTORS

ZDT6702

ISSUE 2 – February 1997



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°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.

ZETEX

ZDT6702

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

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

*Measured under pulsed conditions. Pulse width=300μs. Duty cycle ≤ 2%

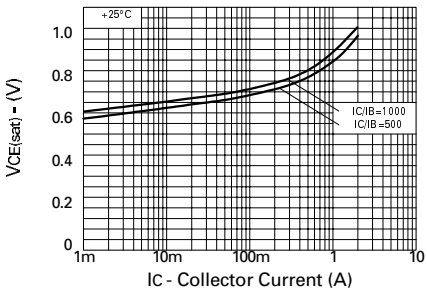
PNP TRANSISTOR
ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C unless otherwise stated).

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

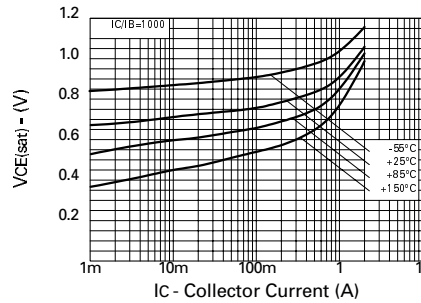
*Measured under pulsed conditions. Pulse width=300μs. Duty cycle ≤ 2%

ZDT6702

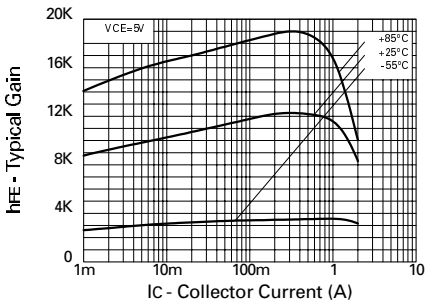
TYPICAL CHARACTERISTICS (NPN TRANSISTOR)



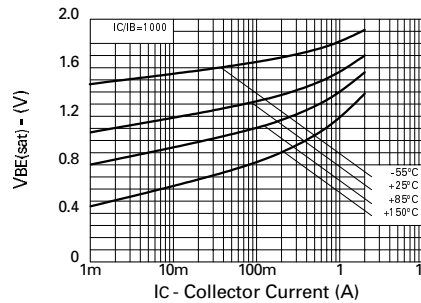
VCE(sat) v IC



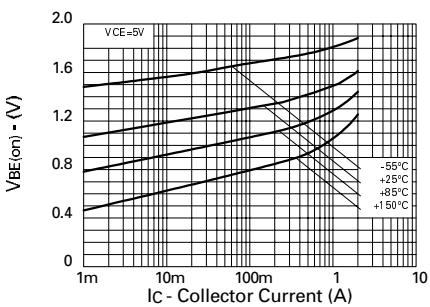
VCE(sat) v IC



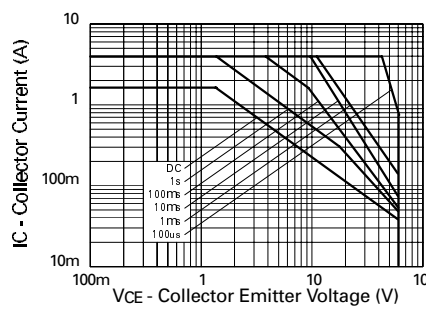
hFE v IC



VBE(sat) v IC

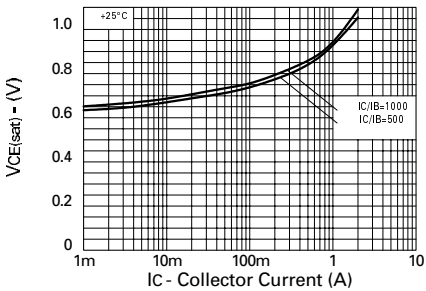


VBE(on) v IC

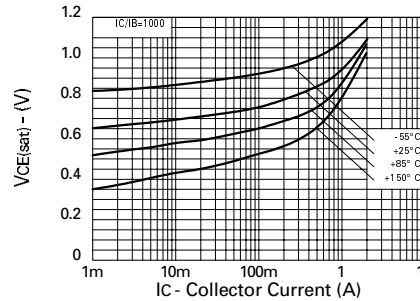


Safe Operating Area

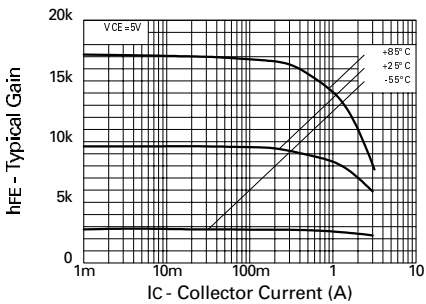
TYPICAL CHARACTERISTICS (PNP TRANSISTOR)



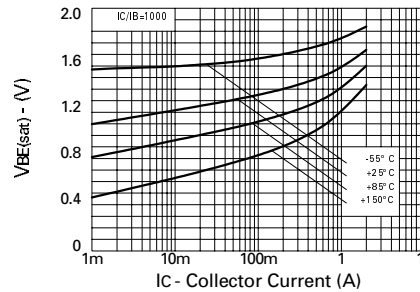
$V_{CE(sat)}$ v I_C



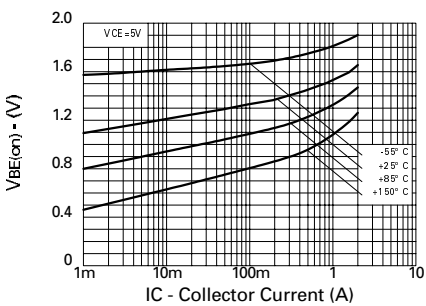
$V_{CE(sat)}$ v I_C



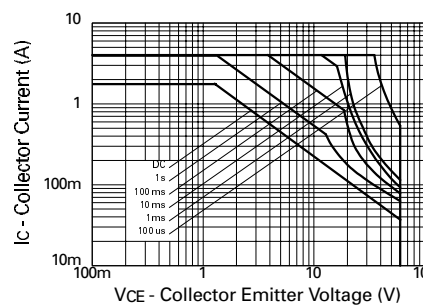
h_{FE} v I_C



$V_{BE(sat)}$ v I_C



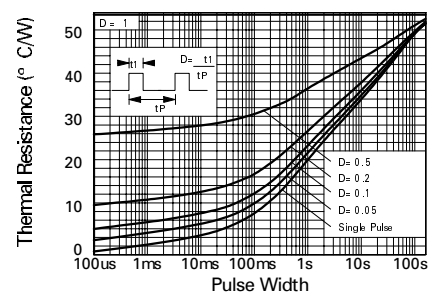
$V_{BE(on)}$ v I_C



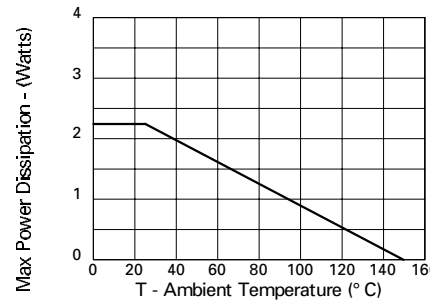
Safe Operating Area

ZDT6702

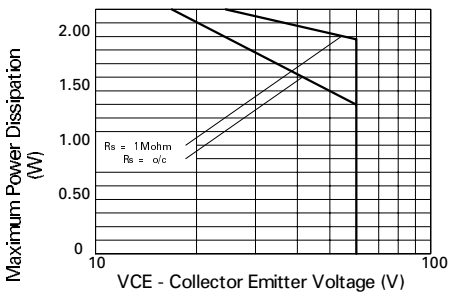
OTHER CHARACTERISTICS



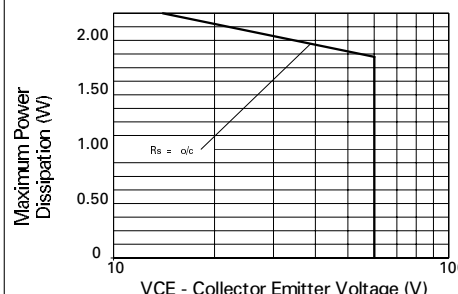
Transient Thermal Resistance (single device)



Derating curve (single device)

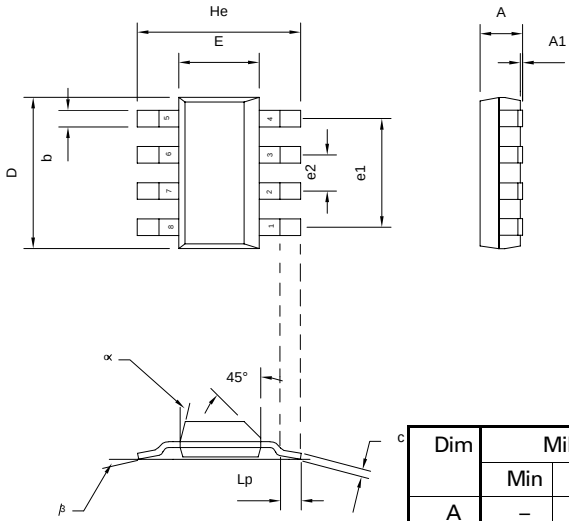


Voltage Derating



Voltage Derating

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
Streitfeldstraße 19
D-81673 München
Germany
Telefon: (49) 89 45 49 49 0
Fax: (49) 89 45 49 49 49

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.