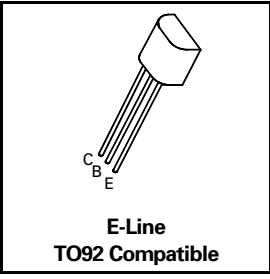# NPN SILICON PLANAR MEDIUM POWER DARLINGTON TRANSISTORS

ZTX604
ZTX605

ISSUE 1 – MARCH 94

FEATURES

* 120 Volt V_{CEO}
* 1 Amp continuous current
* Gain of 2K at I_C=1 Amp
* P_{tot}= 1 Watt

E-Line
TO92 Compatible

ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	ZTX604	ZTX605	UNIT
Collector-Base Voltage	V_{CBO}	120	140	V
Collector-Emitter Voltage	V_{CEO}	100	120	V
Emitter-Base Voltage	V_{EBO}	10		V
Peak Pulse Current	I_{CM}	4		A
Continuous Collector Current	I_C	1		A
Power Dissipation at T_{amb}=25°C derate above 25°C	P_{tot}	1 5.7		W mW/ °C
Operating and Storage Temperature Range	T_j:T_{stg}	-55 to +200		°C

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

PARAMETER	SYMBOL	ZTX604		ZTX605		UNIT	CONDITIONS.
		MIN.	MAX.	MIN.	MAX.		
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	120		140		V	I_C=100µA
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	100		120		V	I_C=10mA*
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	10		10		V	I_E=100µA
Collector Cut-Off Current	I_{CBO}		0.01 10		0.01 10	µA µA µA µA	V_{CB}=100V V_{CB}=120V V_{CB}=100V,T_{amb}=100°C V_{CB}=120V,T_{amb}=100°C
Emitter Cut-Off Current	I_{EBO}		0.1		0.1	µA	V_{EB}=8V
Colllector-Emitter Cut-Off Current	I_{CES}		10		10	µA	V_{CES}=100V V_{CES}=120V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		1.0 1.5		1.0 1.5	V V	I_C=250mA, I_B=0.25mA* I_C=1A, I_B=1mA*
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		1.8		1.8	V	I_C=1A, I_B=1mA*
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		1.7		1.7	V	IC=1A, V_{CE}=5V*

**ZTX604
ZTX605**

ELECTRICAL CHARACTERISTICS (at T$_{amb}$ = 25°C unless otherwise stated).

PARAMETER	SYMBOL	ZTX604		ZTX605		UNIT	CONDITIONS.
		MIN.	MAX.	MIN.	MAX.		
Static Forward Current Transfer Ratio	h$_{FE}$	2K 5K 2K 0.5K	100K	2K 5K 2K 0.5K	100K		I$_C$=50mA, V$_{CE}$=5V I$_C$=500mA, V$_{CE}$=5V* I$_C$=1A, V$_{CE}$=5V* I$_C$=2A, V$_{CE}$=5V*
Transition Frequency	f$_T$	150		150		MHz	I$_C$=100mA, V$_{CE}$=10V f=20MHz
Input Capacitance	C$_{ibo}$	90 Typical				pF	V$_{EB}$=500mV, f=1MHz
Output Capacitance	C$_{obo}$	15 Typical				pF	V$_{CB}$=10V, f=1MHz
Switching Times	t$_{on}$	0.5 Typical				μs	I$_C$=500mA, V$_{CE}$=10V I$_{B1}$=I$_{B2}$=0.5mA
	t$_{off}$	1.6 Typical				μs	

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

Voltage Derating Graph
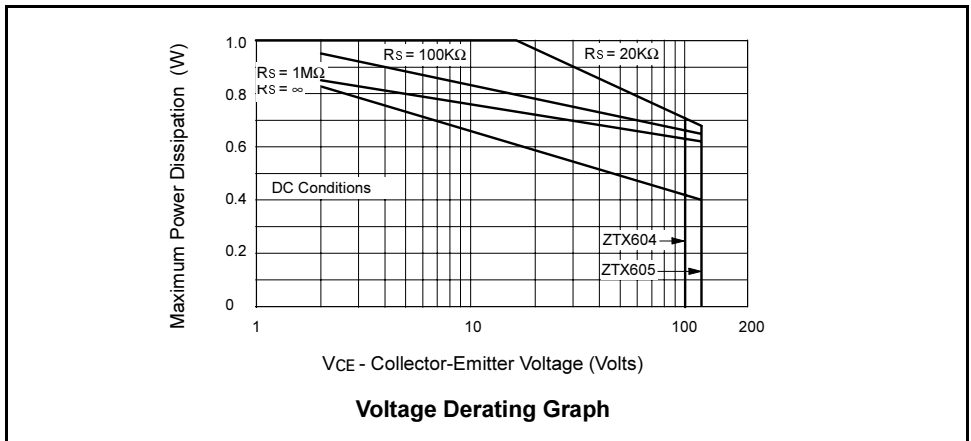
The maximum permissible operational temperature can be obtained from this graph using the following equation

$$T_{amb(max)} = \frac{Power_{(max)} - Power_{(act)}}{0.0057} + 25°C$$

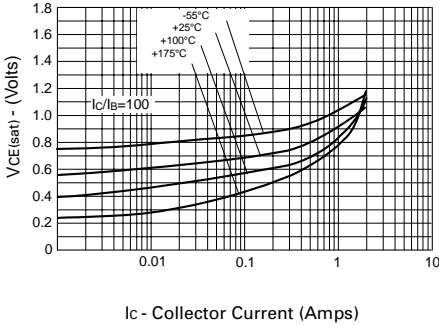T$_{amb(max)}$= Maximum operating ambient temperature

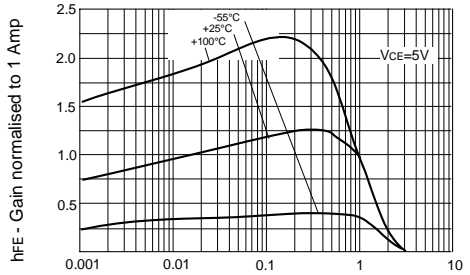Power(max) = Maximum power dissipation figure, obtained from the above graph for a given V$_{CE}$ and source resistance (R$_S$)

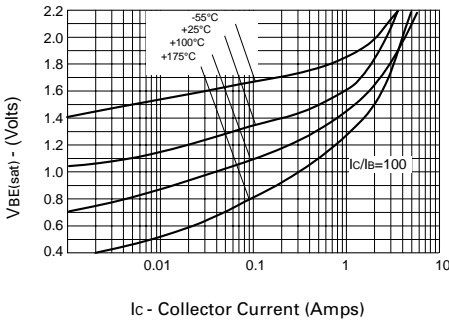Power(actual)= Actual power dissipation in users circuit
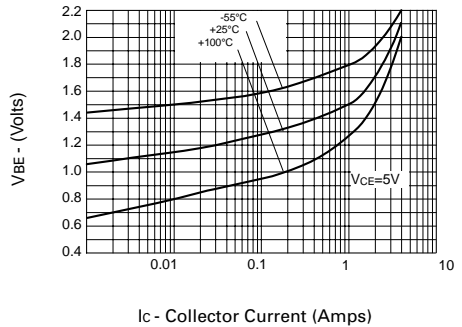
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TYPICAL CHARACTERISTICS

VCE(sat) v IC

hFE v IC

VBE(sat) v IC

VBE(on) v IC

Safe Operating Area