

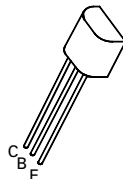
NPN SILICON PLANAR MEDIUM POWER DARLINGTON TRANSISTORS

ISSUE 1 – MARCH 94

ZTX604
ZTX605

FEATURES

- * 120 Volt V_{CE0}
- * 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 $T_{amb}=25^{\circ}C$ derate above $25^{\circ}C$	P_{tot}	1 5.7		W mW/ $^{\circ}C$
Operating and Storage Temperature Range	$T_j; T_{stg}$	-55 to +200		$^{\circ}C$

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

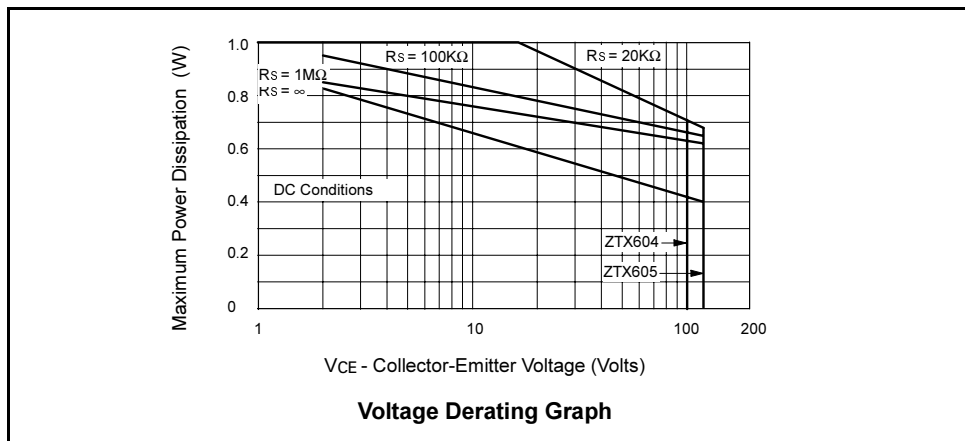
PARAMETER	SYMBOL	ZTX604		ZTX605		UNIT	CONDITIONS.
		MIN.	MAX.	MIN.	MAX.		
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	120		140		V	$I_C=100\mu A$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	100		120		V	$I_C=10mA^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	10		10		V	$I_E=100\mu A$
Collector Cut-Off Current	I_{CBO}		0.01 10		0.01 10	μA μA μA	$V_{CB}=100V$ $V_{CB}=120V$ $V_{CB}=100V, T_{amb}=100^{\circ}C$ $V_{CB}=120V, T_{amb}=100^{\circ}C$
Emitter Cut-Off Current	I_{EBO}		0.1		0.1	μA	$V_{EB}=8V$
Collector-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	$I_C=1A, V_{CE}=5V^*$

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ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ 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		$I_C=50\text{mA}$, $V_{CE}=5\text{V}$ $I_C=500\text{mA}$, $V_{CE}=5\text{V}^*$ $I_C=1\text{A}$, $V_{CE}=5\text{V}^*$ $I_C=2\text{A}$, $V_{CE}=5\text{V}^*$
Transition Frequency	f_T	150		150		MHz	$I_C=100\text{mA}$, $V_{CE}=10\text{V}$ $f=20\text{MHz}$
Input Capacitance	C_{ibo}	90 Typical				pF	$V_{EB}=500\text{mV}$, $f=1\text{MHz}$
Output Capacitance	C_{obo}	15 Typical				pF	$V_{CB}=10\text{V}$, $f=1\text{MHz}$
Switching Times	t_{on}	0.5 Typical				μs	$I_C=500\text{mA}$, $V_{CE}=10\text{V}$ $I_{B1}=I_{B2}=0.5\text{mA}$
	t_{off}	1.6 Typical				μs	

*Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$



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

$$T_{amb(max)} = \frac{Power(max) - Power(act)}{0.0057} + 25^{\circ}\text{C}$$

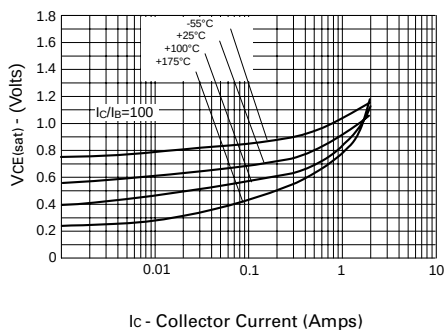
$T_{amb(max)}$ = Maximum operating ambient temperature

Power(max) = Maximum power dissipation figure, obtained from the above graph for a given V_{CE} and source resistance (R_S)

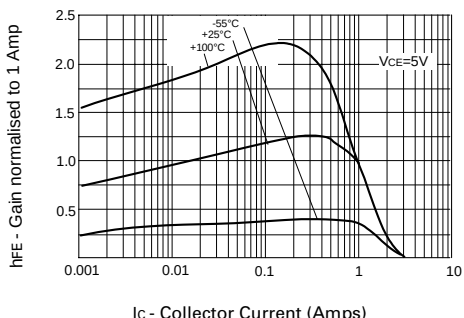
Power(actual) = Actual power dissipation in users circuit

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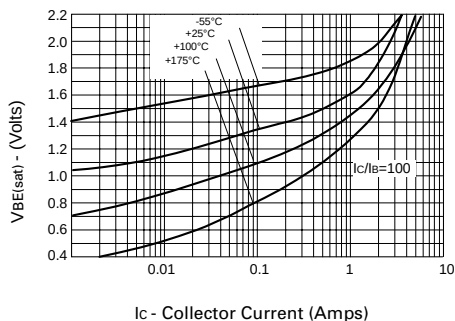
TYPICAL CHARACTERISTICS



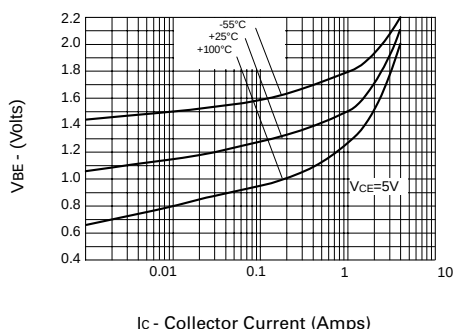
$V_{CE(sat)}$ v I_C



h_{FE} v I_C



$V_{BE(sat)}$ v I_C



$V_{BE(on)}$ v I_C

