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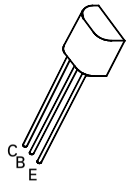
NPN SILICON PLANAR MEDIUM POWER DARLINGTON TRANSISTORS

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 Not Recommended for
New Design Please Use ZTX605

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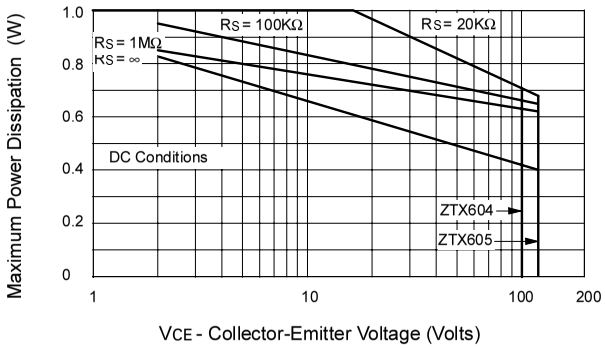
ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C unless otherwise stated).

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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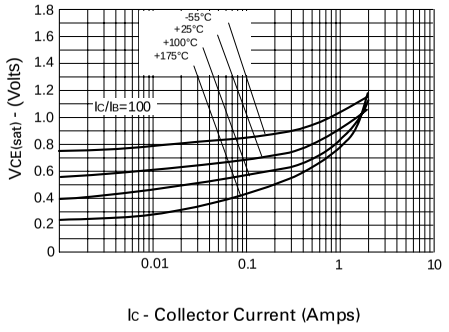
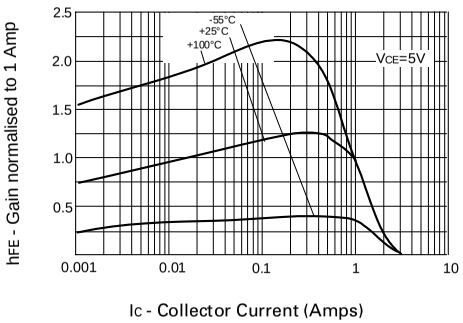
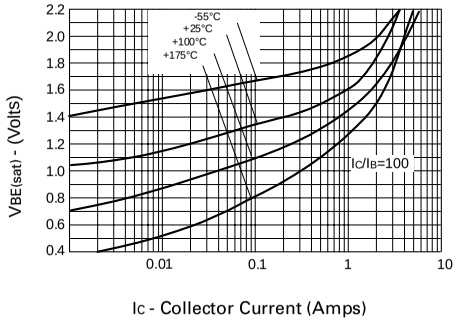
TYPICAL CHARACTERISTICS



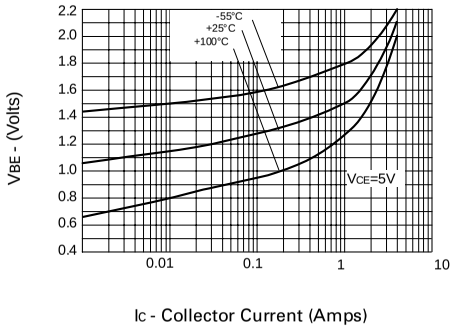
VCE(sat) v IC



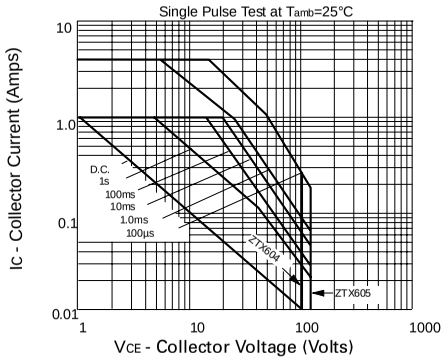
hFE v IC



VBE(sat) v IC



VBE(on) v IC



Safe Operating Area