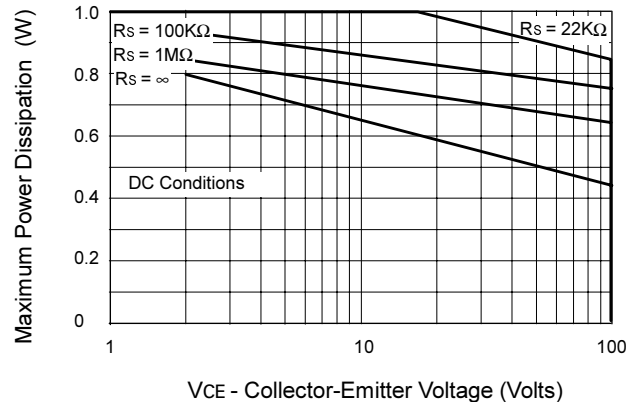


# ZTX704 ZTX705

## ELECTRICAL CHARACTERISTICS (at T<sub>amb</sub> = 25°C).

PARAMETER	SYMBOL	ZTX704		ZTX705		UNIT	CONDITIONS.
		MIN.	MAX.	MIN.	MAX.		
Static Forward Current Transfer Ratio	h <sub>FE</sub>	3K 3K 3K 2K	30K	3K 3K 3K 2K	30K		I <sub>C</sub> =-10mA, V <sub>CE</sub> =-5V* I <sub>C</sub> =-100mA, V <sub>CE</sub> =-5V* I <sub>C</sub> =-1A, V <sub>CE</sub> =-5V* I <sub>C</sub> =-2A, V <sub>CE</sub> =-5V*
Transition Frequency	f <sub>T</sub>	160 Typical		160 Typical		MHz	I <sub>C</sub> =-100mA, V <sub>CE</sub> =-10V f=20MHz
Input Capacitance	C <sub>ibo</sub>	90 Typical		90 Typical		pF	V <sub>EB</sub> =-0.5V, f=1MHz
Output Capacitance	C <sub>obo</sub>	15 Typical		15 Typical		pF	V <sub>CE</sub> =-10V, f=1MHz
Switching Times	t <sub>on</sub>	0.6 Typical		0.6 Typical		μs	I <sub>C</sub> =-0.5A, V <sub>CE</sub> =-10V I <sub>B1</sub> =I <sub>B2</sub> =-0.5mA
	t <sub>off</sub>	0.8 Typical		0.8 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

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

T<sub>amb(max)</sub> = Maximum operating ambient temperature

Power(max) = Maximum power dissipation figure, obtained from the above graph for a given V<sub>CE</sub> and source resistance (R<sub>S</sub>)

Power(actual) = Actual power dissipation in users circuit

# PNP SILICON PLANAR MEDIUM POWER DARLINGTON TRANSISTORS

ISSUE 3 – MAY 94

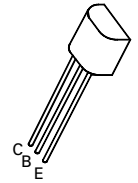
## FEATURES

- \* 120 Volt V<sub>CEO</sub>
- \* 1 Amp continuous current
- \* Gain of 3K at I<sub>C</sub>=1 Amp
- \* P<sub>tot</sub>=1 Watt

## APPLICATIONS

- \* Lamp, solenoid and relay drivers

# ZTX704 ZTX705



**E-Line  
T092 Compatible**

## ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	ZTX704	ZTX705	UNIT
Collector-Base Voltage	V <sub>CBO</sub>	-120	-140	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-100	-120	V
Emitter-Base Voltage	V <sub>EBO</sub>	-10		V
Peak Pulse Current	I <sub>CM</sub>	-4		A
Continuous Collector Current	I <sub>C</sub>	-1		A
Power Dissipation at T <sub>amb</sub> = 25°C derate above 25°C	P <sub>tot</sub>	1	5.7	W mW/°C
Operating and Storage Temperature Range	T <sub>j</sub> ; T <sub>stg</sub>	-55 to +200		°C

## ELECTRICAL CHARACTERISTICS (at T<sub>amb</sub> = 25°C unless otherwise stated).

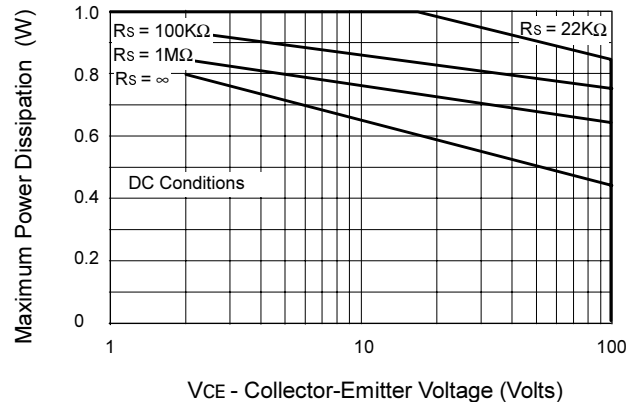
PARAMETER	SYMBOL	ZTX704		ZTX705		UNIT	CONDITIONS.
		MIN.	MAX.	MIN.	MAX.		
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	-120		-140		V	I <sub>C</sub> =-100μA
Collector-Emitter Breakdown Voltage	V <sub>CEO(SUS)</sub>	-100		-120		V	I <sub>C</sub> =-10mA*
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	-10		-10		V	I <sub>E</sub> =-100μA
Collector Cut-Off Current	I <sub>CBO</sub>		-0.1		-0.1	μA	V <sub>CB</sub> =-100V V <sub>CB</sub> =-120V V <sub>CB</sub> =-100V, T <sub>amb</sub> =100°C V <sub>CB</sub> =-120V, T <sub>amb</sub> =100°C
Collector Cut-Off Current	I <sub>CES</sub>		-10		-10	μA	V <sub>CE</sub> =-80V
Emitter Cut-Off Current	I <sub>EBO</sub>		-0.1		-0.1	μA	V <sub>EB</sub> =-8V
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	-1.3	-2.5	-1.3	-2.5	V	I <sub>C</sub> =-1A, I <sub>B</sub> =-1mA* I <sub>C</sub> =-2A, I <sub>B</sub> =-2mA*
Base-Emitter Saturation Voltage	V <sub>BE(sat)</sub>		-1.8		-1.8	V	I <sub>C</sub> =-1A, I <sub>B</sub> =-10mA*
Base-Emitter Turn-On Voltage	V <sub>BE(on)</sub>		-1.7		-1.7	V	I <sub>C</sub> =-1A, V <sub>CE</sub> =-5V*

# ZTX704 ZTX705

## ELECTRICAL CHARACTERISTICS (at T<sub>amb</sub> = 25°C).

PARAMETER	SYMBOL	ZTX704		ZTX705		UNIT	CONDITIONS.
		MIN.	MAX.	MIN.	MAX.		
Static Forward Current Transfer Ratio	h <sub>FE</sub>	3K 3K 3K 2K	30K	3K 3K 3K 2K	30K		I <sub>C</sub> =-10mA, V <sub>CE</sub> =-5V* I <sub>C</sub> =-100mA, V <sub>CE</sub> =-5V* I <sub>C</sub> =-1A, V <sub>CE</sub> =-5V* I <sub>C</sub> =-2A, V <sub>CE</sub> =-5V*
Transition Frequency	f <sub>T</sub>	160 Typical		160 Typical		MHz	I <sub>C</sub> =-100mA, V <sub>CE</sub> =-10V f=20MHz
Input Capacitance	C <sub>ibo</sub>	90 Typical		90 Typical		pF	V <sub>EB</sub> =-0.5V, f=1MHz
Output Capacitance	C <sub>obo</sub>	15 Typical		15 Typical		pF	V <sub>CE</sub> =-10V, f=1MHz
Switching Times	t <sub>on</sub>	0.6 Typical		0.6 Typical		μs	I <sub>C</sub> =-0.5A, V <sub>CE</sub> =-10V I <sub>B1</sub> =I <sub>B2</sub> =-0.5mA
	t <sub>off</sub>	0.8 Typical		0.8 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

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

T<sub>amb(max)</sub> = Maximum operating ambient temperature

Power(max) = Maximum power dissipation figure, obtained from the above graph for a given V<sub>CE</sub> and source resistance (R<sub>S</sub>)

Power(actual) = Actual power dissipation in users circuit

# PNP SILICON PLANAR MEDIUM POWER DARLINGTON TRANSISTORS

ISSUE 3 – MAY 94

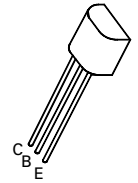
## FEATURES

- \* 120 Volt V<sub>CEO</sub>
- \* 1 Amp continuous current
- \* Gain of 3K at I<sub>C</sub>=1 Amp
- \* P<sub>tot</sub>=1 Watt

## APPLICATIONS

- \* Lamp, solenoid and relay drivers

# ZTX704 ZTX705



**E-Line  
T092 Compatible**

## ABSOLUTE MAXIMUM RATINGS.

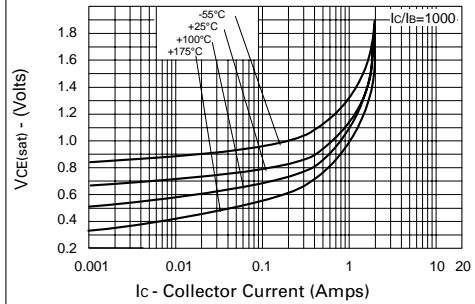
PARAMETER	SYMBOL	ZTX704	ZTX705	UNIT
Collector-Base Voltage	V <sub>CBO</sub>	-120	-140	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-100	-120	V
Emitter-Base Voltage	V <sub>EBO</sub>	-10		V
Peak Pulse Current	I <sub>CM</sub>	-4		A
Continuous Collector Current	I <sub>C</sub>	-1		A
Power Dissipation at T <sub>amb</sub> = 25°C derate above 25°C	P <sub>tot</sub>	1	5.7	W mW/°C
Operating and Storage Temperature Range	T <sub>j</sub> ; T <sub>stg</sub>	-55 to +200		°C

## ELECTRICAL CHARACTERISTICS (at T<sub>amb</sub> = 25°C unless otherwise stated).

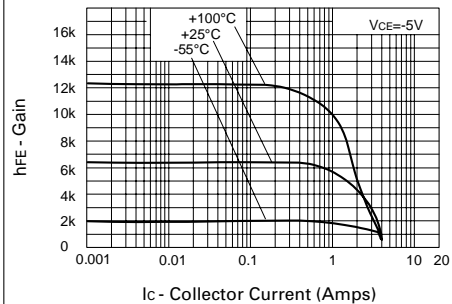
PARAMETER	SYMBOL	ZTX704		ZTX705		UNIT	CONDITIONS.
		MIN.	MAX.	MIN.	MAX.		
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	-120		-140		V	I <sub>C</sub> =-100μA
Collector-Emitter Breakdown Voltage	V <sub>CEO(SUS)</sub>	-100		-120		V	I <sub>C</sub> =-10mA*
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	-10		-10		V	I <sub>E</sub> =-100μA
Collector Cut-Off Current	I <sub>CBO</sub>		-0.1		-0.1	μA	V <sub>CB</sub> =-100V V <sub>CB</sub> =-120V V <sub>CB</sub> =-100V, T <sub>amb</sub> =100°C V <sub>CB</sub> =-120V, T <sub>amb</sub> =100°C
Collector Cut-Off Current	I <sub>CES</sub>		-10		-10	μA	V <sub>CE</sub> =-80V
Emitter Cut-Off Current	I <sub>EBO</sub>		-0.1		-0.1	μA	V <sub>EB</sub> =-8V
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	-1.3	-2.5	-1.3	-2.5	V	I <sub>C</sub> =-1A, I <sub>B</sub> =-1mA* I <sub>C</sub> =-2A, I <sub>B</sub> =-2mA*
Base-Emitter Saturation Voltage	V <sub>BE(sat)</sub>		-1.8		-1.8	V	I <sub>C</sub> =-1A, I <sub>B</sub> =-10mA*
Base-Emitter Turn-On Voltage	V <sub>BE(on)</sub>		-1.7		-1.7	V	I <sub>C</sub> =-1A, V <sub>CE</sub> =-5V*

# ZTX704 ZTX705

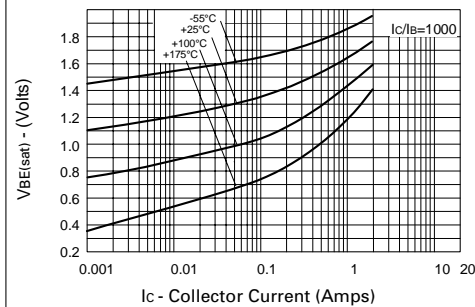
## TYPICAL CHARACTERISTICS



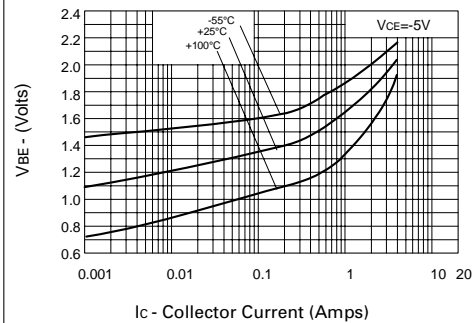
**$V_{CE(sat)}$  v  $I_C$**



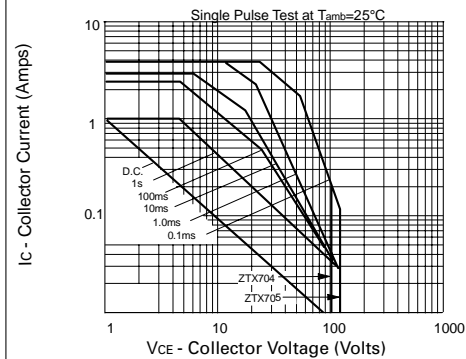
**$h_{FE}$  v  $I_C$**



**$V_{BE(sat)}$  v  $I_C$**



**$V_{BE(on)}$  v  $I_C$**



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