

OBSOLETE

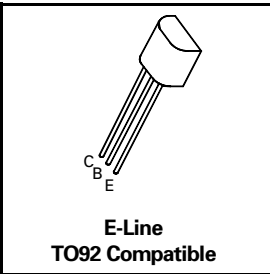
NPN SILICON PLANAR MEDIUM POWER DARLINGTON TRANSISTORS

ZTX600 ZTX601

ISSUE 2 – JUNE 94

FEATURES

- * 160 Volt V_{CEO}
- * 1 Amp continuous current
- * Gain of 5K at $I_C=1$ Amp
- * $P_{tot} = 1$ Watt



ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	ZTX600	ZTX601	UNIT
Collector-Base Voltage	V_{CBO}	160	180	V
Collector-Emitter Voltage	V_{CEO}	140	160	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/°C
Operating and Storage Temperature Range	$T_j:T_{stg}$	-55 to +200		°C

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

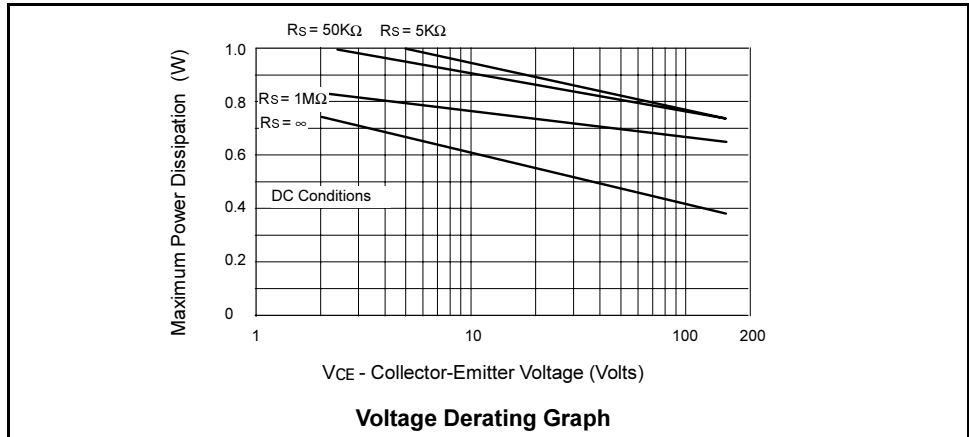
PARAMETER	SYMBOL	ZTX600			ZTX601			UNIT	CONDITIONS.	
		MIN.	TYP.	MAX.	MIN.	TYP.	MAX.			
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	160			180			V	$I_C=100\mu A$	
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	140			160			V	$I_C=10mA^*$	
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	10			10			V	$I_E=100\mu A$	
Collector Cut-Off Current	I_{CBO}			0.01 10			0.01 10	μA μA μA μA	$V_{CB}=140V$ $V_{CB}=160V$ $V_{CB}=140V, T_a=100^{\circ}C$ $V_{CB}=160V, T_a=100^{\circ}C$	
Emitter Cut-Off Current	I_{EBO}			0.1			0.1	μA	$V_{EB}=8V$	
Collector-Emitter Cut-Off Current	I_{CES}			10			10	μA μA	$V_{CES}=140V$ $V_{CES}=160V$	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		0.75 0.85	1.1 1.2			0.75 0.85 1.1 1.2	V V	$I_C=0.5A, I_B=5mA^*$ $I_C=1A, I_B=10mA^*$	
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		1.7	1.9			1.7	1.9	V	$I_C=1A, I_B=10mA^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		1.5	1.7			1.5	1.7	V	$I_C=1A, V_{CE}=5V^*$

ZTX600 ZTX601

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

PARAMETER	SYMBOL	ZTX600			ZTX601			UNIT	CONDITIONS.
		MIN.	TYP.	MAX.	MIN.	TYP.	MAX.		
Static Forward Current Transfer Ratio	h_{FE}	1K 2K 1K		100K	1K 2K 1K		100K		$I_C=50mA, V_{CE}=10V^*$ $I_C=0.5A, V_{CE}=10V^*$ $I_C=1A, V_{CE}=10V^*$
	Group A	1K 2K 1K	2K 5K 3K	20K	1K 2K 1K	2K 5K 3K	20K		$I_C=50mA, V_{CE}=10V^*$ $I_C=0.5A, V_{CE}=10V^*$ $I_C=1A, V_{CE}=10V^*$
	Group B	5K 10K 5K	10K 20K 10K	100K	5K 10K 5K	10K 20K 10K	100K		$I_C=50mA, V_{CE}=10V^*$ $I_C=0.5A, V_{CE}=10V^*$ $I_C=1A, V_{CE}=10V^*$
Transition Frequency	f_T	150	250		150	250		MHz	$I_C=100mA, V_{CE}=10V, f=20MHz$
Input Capacitance	C_{ibo}		60	90		60	90	pF	$V_{EB}=0.5V, f=1MHz$
Output Capacitance	C_{obo}		10	15		10	15	pF	$V_{CE}=10V, f=1MHz$
Switching Times	t_{on}		0.75			0.75		μs	$I_C=0.5A, V_{CE}=10V$ $I_{B1}=I_{B2}=0.5mA$
	t_{off}		2.2			2.2		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

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

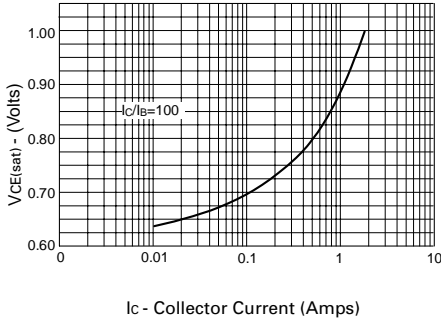
$T_{amb(max)}$ = Maximum operating ambient temperature

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

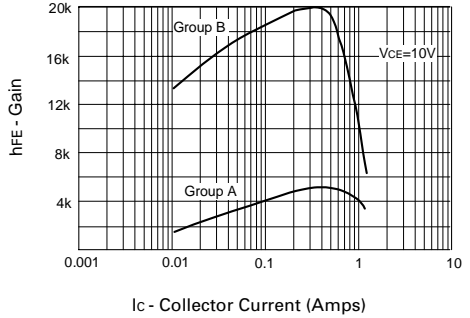
Power(actual) = Actual power dissipation in users circuit

ZTX600
ZTX601

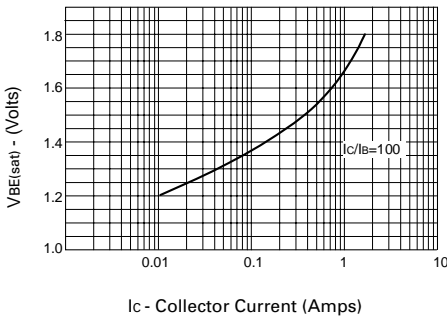
TYPICAL CHARACTERISTICS



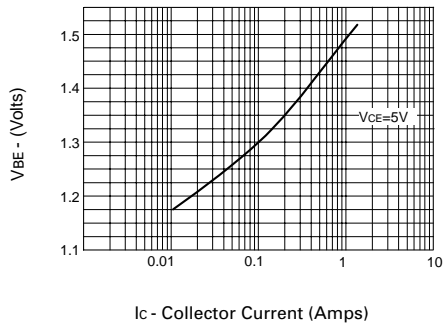
$V_{CE(sat)}$ v I_C



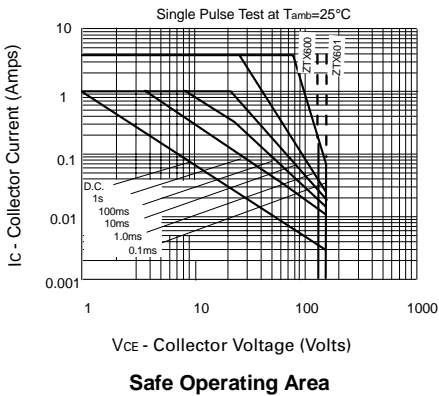
h_{FE} v I_C



$V_{BE(sat)}$ v I_C



$V_{BE(on)}$ v I_C



Safe Operating Area