

ZTX602
ZTX603

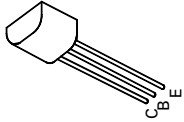
NPN SILICON PLANAR MEDIUM POWER
DARLINGTON TRANSISTORS

ISSUE 1 – MARCH 94

ZTX602
ZTX603

FEATURES

- * 80 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	ZTX602	ZTX603	UNIT
Collector-Base Voltage	V_{CBO}	80	100	V
Collector-Emitter Voltage	V_{CEO}	60	80	V
Emitter-Base Voltage	V_{EBO}	10	10	V
Peak Pulse Current	I_{CM}	4	4	A
Continuous Collector Current	I_C	1	1	A
Power Dissipation at $T_{amb} = 25^\circ\text{C}$ derate above 25°C	P_{tot}	1	5.7	W
Operating and Storage Temperature Range	T_j, T_{stg}	-55 to +200	-55 to +200	$^\circ\text{C}$

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

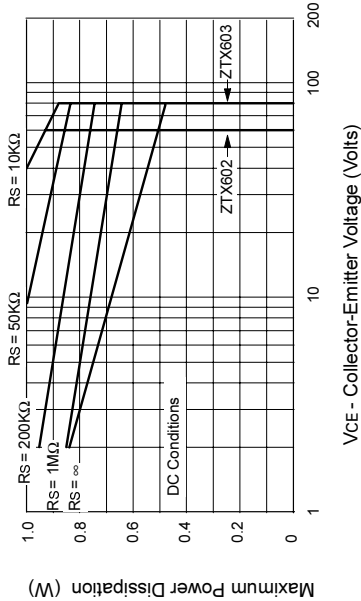
PARAMETER	SYMBOL	ZTX602		ZTX603		UNIT	CONDITIONS:
		MIN.	MAX.	MIN.	MAX.		
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	80		100		V	$I_C=100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	60		80		V	$I_C=10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	10		10		V	$I_E=100\mu\text{A}$
Collector Cut-Off Current	I_{CBO}	0.01	10	0.01	10	μA	$V_{CB}=60\text{V}$
						μA	$V_{CB}=80\text{V}$
						μA	$V_{CB}=60\text{V}, T_{amb}=100^\circ\text{C}$
						μA	$V_{CB}=80\text{V}, T_{amb}=100^\circ\text{C}$
Emitter Cut-Off Current	I_{EBO}	0.1		0.1		μA	$V_{EB}=8\text{V}$
Collector-Emitter Cut-Off Current	I_{CES}	10		10		μA	$V_{CES}=60\text{V}$
						μA	$V_{CES}=80\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	1.0	1.0	1.0	1.0	V	$I_C=400\text{mA}$
						V	$I_B=0.4\text{mA}^*, I_C=1\text{A}, I_B=1\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	1.8		1.8		V	$I_C=1\text{A}, I_B=1\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$	1.7		1.7		V	$I_C=1\text{A}, V_{CE}=5\text{V}^*$

3-209

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

PARAMETER	SYMBOL	ZTX602		ZTX603		UNIT	CONDITIONS.
		MIN.	MAX.	MIN.	MAX.		
Static Forward Current Transfer Ratio	h_{FE}	2K		2K			$I_C=50\text{mA}, V_{CE}=5\text{V}$
		5K		5K			$I_C=500\text{mA}, V_{CE}=5\text{V}^*$
		2K	100K	2K	100K		$I_C=1\text{A}, V_{CE}=5\text{V}^*$
		0.5K		0.5K			$I_C=2\text{A}, V_{CE}=5\text{V}^*$
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}		1.1 Typical			μs	

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



Voltage Derating Graph

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

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

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

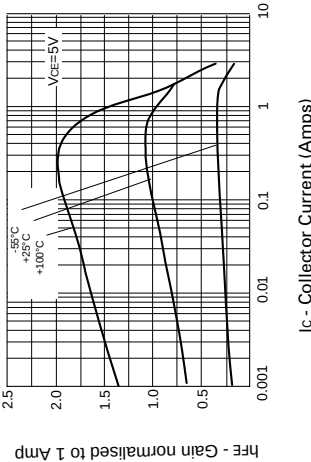
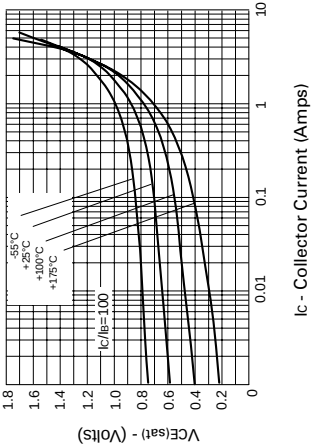
Power(max) = Maximum power dissipation figure, obtained from the above graph for a given V_{CE} and source resistance (R_S)

Power(actual) = Actual power dissipation in users circuit

3-210

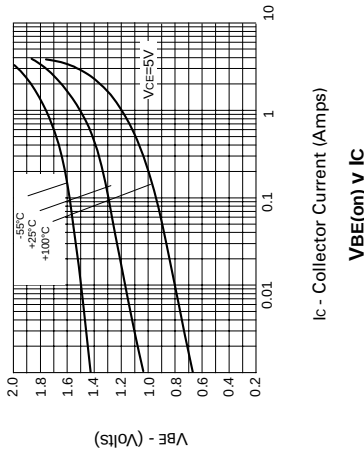
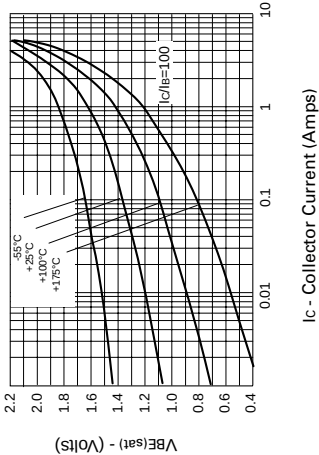
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TYPICAL CHARACTERISTICS



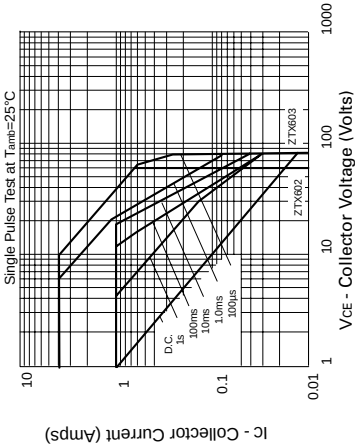
$V_{CE(sat)}$ v I_C

hFE v I_C



$V_{BE(sat)}$ v I_C

$V_{BE(on)}$ v I_C



Safe Operating Area