

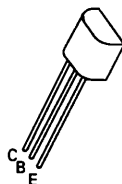
PNP SILICON PLANAR MEDIUM POWER TRANSISTORS

ISSUE 1 – MARCH 94

FEATURES

- * 100 Volt V_{CEO}
- * 1 Amp continuous current
- * P_{tot} = 1 Watt

ZTX552 ZTX553



E-Line
TO92 Compatible

ABSOLUTE MAXIMUM RATINGS.

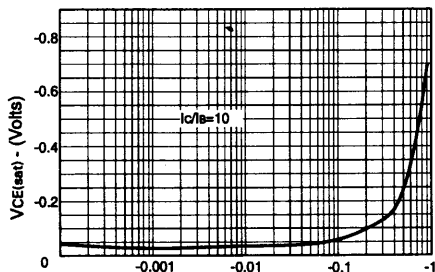
PARAMETER	SYMBOL	ZTX552	ZTX553	UNIT
Collector-Base Voltage	V_{CBO}	-100	-120	V
Collector-Emitter Voltage	V_{CEO}	-80	-100	V
Emitter-Base Voltage	V_{EBO}	-5		V
Peak Pulse Current	I_{CM}	-2		A
Continuous Collector Current	I_C	-1		A
Power Dissipation: at $T_{amb}=25^{\circ}C$ derate above $25^{\circ}C$	P_{tot}	1 5.7		W mW/°C
Operating and Storage Temperature Range	T_j, T_{stg}	-55 to +200		°C

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

PARAMETER	SYMBOL	ZTX552		ZTX553		UNIT	CONDITIONS.
		MIN.	MAX.	MIN.	MAX.		
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-100		-120		V	$I_C = -100\mu A$
Collector-Emitter Sustaining Voltage	$V_{CEO(sus)}$	-80		-100		V	$I_C = -10mA$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-5		-5		V	$I_E = -100\mu A$
Collector Cut-Off Current	I_{CBO}		-0.1		-0.1	μA	$V_{CB} = -80V$ $V_{CE} = -100V$
Emitter Cut-Off Current	I_{EBO}		-0.1		-0.1	μA	$V_{EB} = -4V$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		-0.25		-0.25	V	$I_C = -150mA, I_B = -15mA^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		-1.1		-1.1	V	$I_C = -150mA, I_B = -15mA^*$
Base-Emitter Turn-on Voltage	$V_{BE(on)}$		-1.0		-1.0	V	$I_C = -150mA, V_{CE} = -10V^*$
Static Forward Current Transfer Ratio	h_{FE}	40 10	150	40 10	200		$I_C = -150mA, V_{CE} = -10V^*$ $I_C = -1A, V_{CE} = -10V^*$
Transition Frequency	f_T	150		150		MHz	$I_C = -50mA, V_{CE} = -10V$ $f = 100MHz$
Output Capacitance	C_{obo}		12		12	MHz	$V_{CB} = -10V, f = 1MHz$

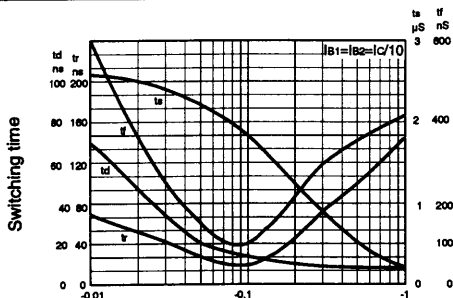
*Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$

TYPICAL CHARACTERISTICS



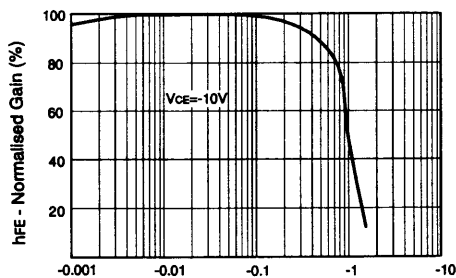
IC - Collector Current (Amps)

VCE(sat) v IC



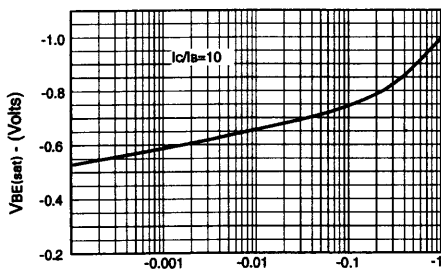
IC - Collector Current (Amps)

Switching Speeds



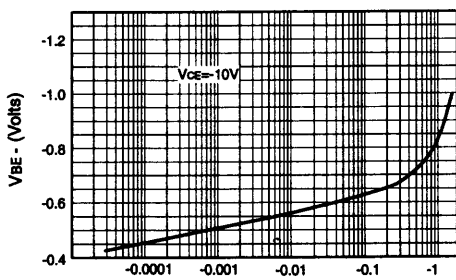
IC - Collector Current (Amps)

hFE v IC



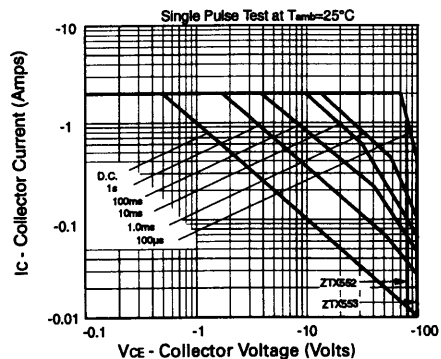
IC - Collector Current (Amps)

VBE(sat) v IC



IC - Collector Current (Amps)

VBE(on) v IC



Safe Operating Area

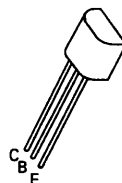
PNP SILICON PLANAR MEDIUM POWER TRANSISTORS

ISSUE 1 – MARCH 94

FEATURES

- * 150 Volt V_{CEO}
- * 1 Amp continuous current
- * $P_{tot} = 1$ Watt

ZTX554 ZTX555



E-Line

TO92 Compatible

ABSOLUTE MAXIMUM RATINGS.

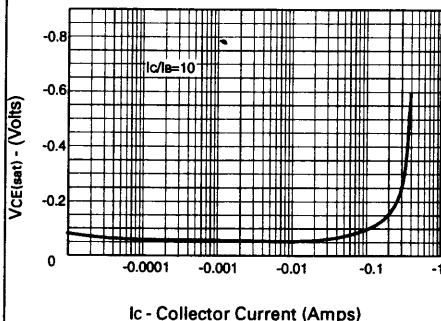
PARAMETER	SYMBOL	ZTX554	ZTX555	UNIT
Collector-Base Voltage	V_{CBO}	-140	-160	V
Collector-Emitter Voltage	V_{CEO}	-125	-150	V
Emitter-Base Voltage	V_{EBO}	-5		V
Peak Pulse Current	I_{CM}	-2		A
Continuous Collector Current	I_C	-1		A
Power Dissipation: at $T_{amb} = 25^\circ\text{C}$ derate above 25°C	P_{tot}	1 5.7		W mW/°C
Operating and Storage Temperature Range	T_j, T_{stg}	-55 to +200		°C

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

PARAMETER	SYMBOL	ZTX554		ZTX555		UNIT	CONDITIONS.
		MIN.	MAX.	MIN.	MAX.		
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-140		-160		V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-125		-150		V	$I_C = -10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-5		-5		V	$I_E = -100\mu\text{A}$
Collector Cut-Off Current	I_{CBO}		-0.1		-0.1	μA	$V_{CB} = -120\text{V}$ $V_{CE} = -140\text{V}$
Emitter Cut-Off Current	I_{EBO}		-0.1		-0.1	μA	$V_{EB} = -4\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		-0.3		-0.3	V	$I_C = -100\text{mA}$, $I_B = -10\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		-1		-1	V	$I_C = -100\text{mA}$, $I_B = -10\text{mA}^*$
Base-Emitter Turn-on Voltage	$V_{BE(on)}$		-1		-1	V	$I_C = -100\text{mA}$, $V_{CE} = -10\text{V}^*$
Static Forward Current Transfer Ratio	h_{FE}	50 50	300	50 50	300		$I_C = -10\text{mA}$, $V_{CE} = -10\text{V}^*$ $I_C = -300\text{mA}$, $V_{CE} = -10\text{V}^*$
Transition Frequency	f_T	100		100		MHz	$I_C = -50\text{mA}$, $V_{CE} = -10\text{V}$ $f = 100\text{MHz}$
Output Capacitance	C_{obo}		10		10	pF	$V_{CB} = -10\text{V}$, $f = 1\text{MHz}$

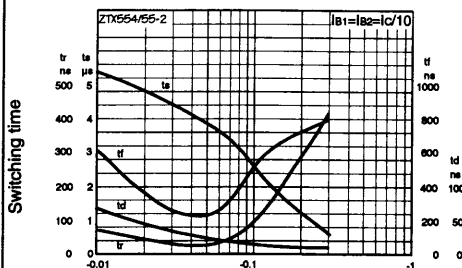
* Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$

TYPICAL CHARACTERISTICS



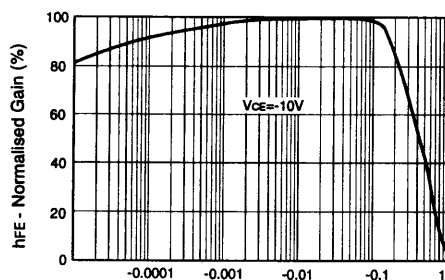
I_C - Collector Current (Amps)

$V_{CE(sat)}$ v I_C



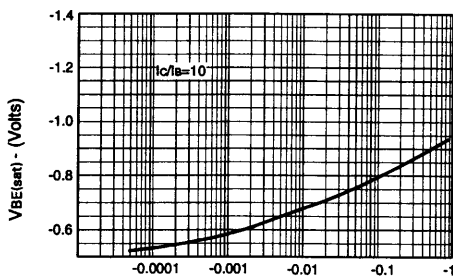
I_C - Collector Current (Amps)

Switching Speeds



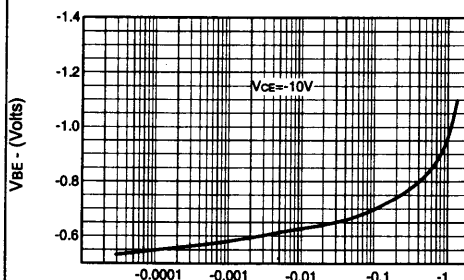
I_C - Collector Current (Amps)

h_{FE} v I_C



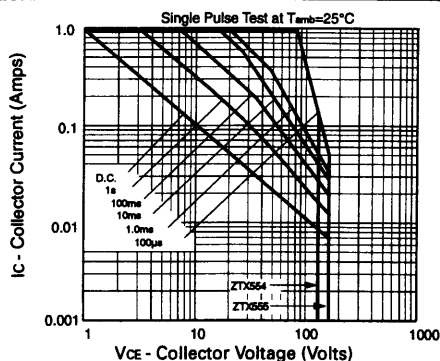
I_C - Collector Current (Amps)

$V_{BE(sat)}$ v I_C



I_C - Collector Current (Amps)

$V_{BE(on)}$ v I_C



Safe Operating Area

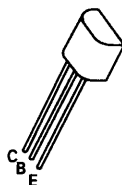
PNP SILICON PLANAR MEDIUM POWER HIGH VOLTAGE TRANSISTORS

ZTX556 ZTX557

ISSUE 1 – JULY 94

FEATURES

- * 300 Volt V_{CE0}
- * 0.5 Amp continuous current
- * $P_{tot} = 1$ Watt



E-Line
TO92 Compatible

ABSOLUTE MAXIMUM RATINGS.

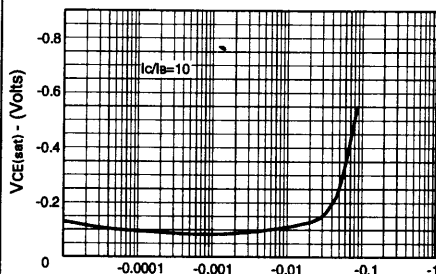
PARAMETER	SYMBOL	ZTX556	ZTX557	UNIT
Collector-Base Voltage	V_{CBO}	-200	-300	V
Collector-Emitter Voltage	V_{CEO}	-200	-300	V
Emitter-Base Voltage	V_{EBO}	-5		V
Peak Pulse Current	I_{CM}	-1		A
Continuous Collector Current	I_C	-0.5		A
Power Dissipation	P_{tot}	1.0		W
Operating and Storage Temperature Range	T_j, T_{stg}	-55 to +200		°C

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

PARAMETER	SYMBOL	ZTX556		ZTX557		UNIT	CONDITIONS.
		MIN.	MAX	MIN.	MAX		
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-200		-300		V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-200		-300		V	$I_C = -10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-5		-5		V	$I_E = -100\mu\text{A}$
Collector Cut-Off Current	I_{CBO}		-0.1		-0.1	μA	$V_{CB} = -160\text{V}$ $V_{CB} = -200\text{V}$
Emitter Cut-Off Current	I_{EBO}		-0.1		-0.1	μA	$V_{EB} = -4\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		-0.3		-0.3	V	$I_C = -50\text{mA}$, $I_B = -5\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		-1		-1	V	$I_C = -50\text{mA}$, $I_B = -5\text{mA}^*$
Base-Emitter Turn-on Voltage	$V_{BE(on)}$		-1		-1	V	$I_C = -50\text{mA}$, $V_{CE} = -10\text{V}^*$
Static Forward Current Transfer Ratio	h_{FE}	50 50	300	50 50	300		$I_C = -10\text{mA}$, $V_{CE} = -10\text{V}^*$ $I_C = -50\text{mA}$, $V_{CE} = -10\text{V}^*$
Transition Frequency	f_T	75		75		MHz	$I_C = -50\text{mA}$, $V_{CE} = -10\text{V}$ $f = 100\text{MHz}$
Output Capacitance	C_{obo}		10		10	pF	$V_{CE} = -10\text{V}$, $f = 1\text{MHz}$

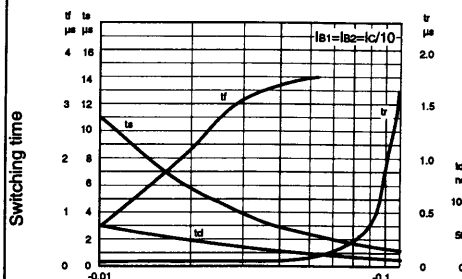
* Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$

TYPICAL CHARACTERISTICS



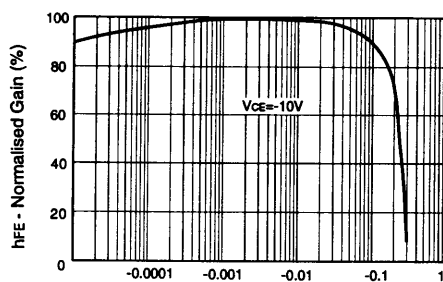
IC - Collector Current (Amps)

VCE(sat) v IC



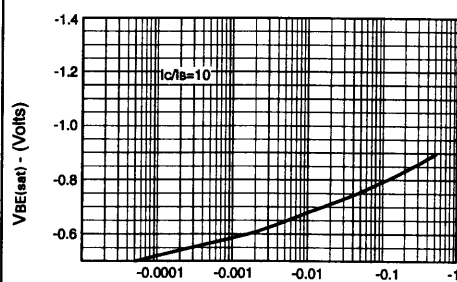
IC - Collector Current (Amps)

Switching Speeds



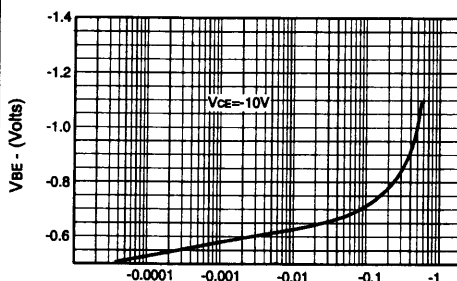
IC - Collector Current (Amps)

hFE v IC



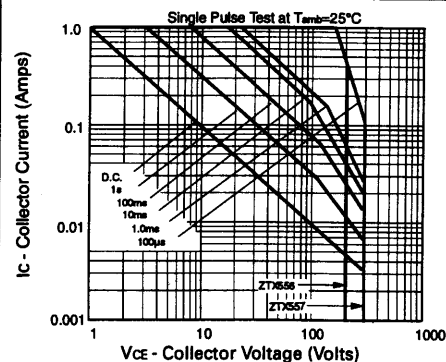
IC - Collector Current (Amps)

VBE(sat) v IC



IC - Collector Current (Amps)

VBE(on) v IC



Safe Operating Area

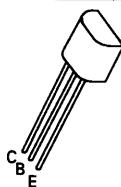
PNP SILICON PLANAR MEDIUM POWER HIGH VOLTAGE TRANSISTOR

ZTX558

ISSUE 1 - APRIL 94

FEATURES

- * 400 Volt V_{CEO}
- * 200mA continuous current
- * $P_{tot} = 1$ Watt



E-Line

TO92 Compatible

ABSOLUTE MAXIMUM RATINGS.

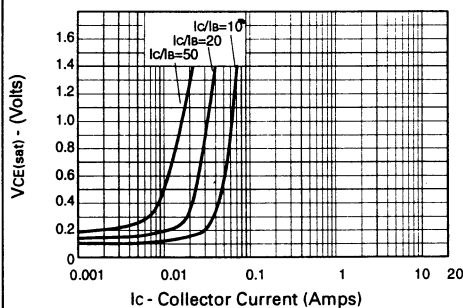
PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	V_{CBO}	-400	V
Collector-Emitter Voltage	V_{CEO}	-400	V
Emitter-Base Voltage	V_{EBO}	-5	V
Continuous Collector Current	I_C	-200	mA
Power Dissipation	P_{tot}	1	W
Operating and Storage Temperature Range	T_j, T_{stg}	-55 to +200	°C

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

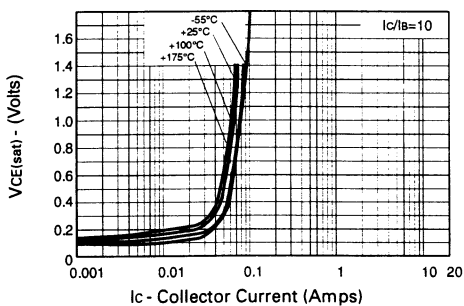
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-400			V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{BR(CEO)}$	-400			V	$I_C = -10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-5			V	$I_E = -100\mu\text{A}$
Collector Cut-Off Current	I_{CBO}			-100	nA	$V_{CB} = -320\text{V}$
Collector Cut-Off Current	I_{CES}			-100	nA	$V_{CE} = -320\text{V}$
Emitter Cut-Off Current	I_{EBO}			-100	nA	$V_{EB} = -4\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			-0.2 -0.5	V	$I_C = -20\text{mA}, I_B = -2\text{mA}$ $I_C = -50\text{mA}, I_B = -6\text{mA}$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$			-0.9	V	$I_C = -50\text{mA}, I_B = -5\text{mA}$
Base-Emitter Turn On Voltage	$V_{BE(on)}$			-0.9	V	$I_C = -50\text{mA}, V_{CE} = -10\text{V}$
Static Forward Current Transfer Ratio	h_{FE}	100 100 15		300		$I_C = -1\text{mA}, V_{CE} = -10\text{V}$ $I_C = -50\text{mA}, V_{CE} = -10\text{V}$ $I_C = -100\text{mA}, V_{CE} = -10\text{V}^*$
Transition Frequency	f_T	50			MHz	$I_C = -10\text{mA}, V_{CE} = -20\text{V}$ $f = 20\text{MHz}$
Collector-Base Breakdown Voltage	C_{obo}			5	pF	$V_{CB} = -20\text{V}, f = 1\text{MHz}$
Switching times	t_{on} t_{off}		95 1600		ns ns	$I_C = -50\text{mA}, V_{CE} = -100\text{V}$ $I_B = -5\text{mA}, I_{B2} = -10\text{mA}$

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

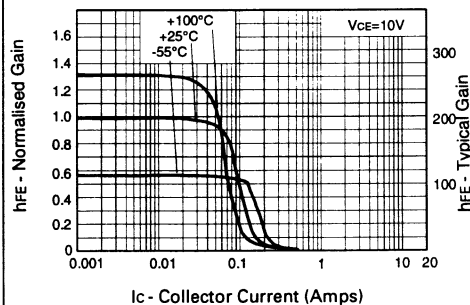
TYPICAL CHARACTERISTICS



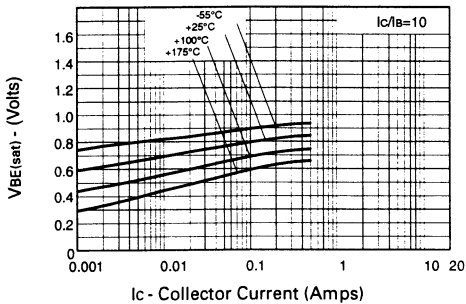
$V_{CE(sat)}$ v I_C



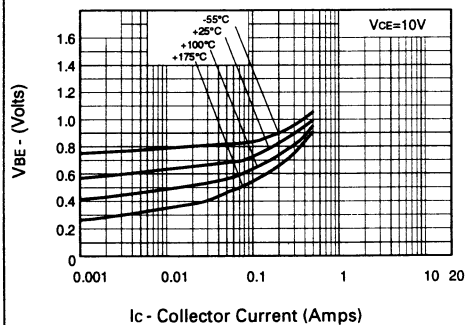
$V_{CE(sat)}$ v I_C



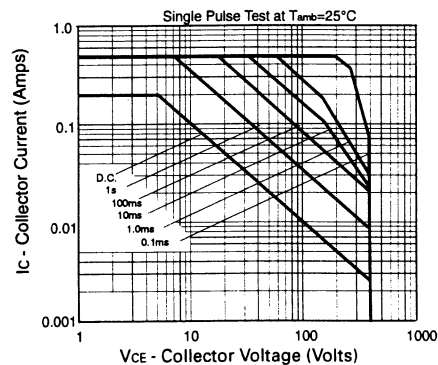
h_{FE} v I_C



$V_{BE(sat)}$ v I_C



$V_{BE(on)}$ v I_C



Safe Operating Area

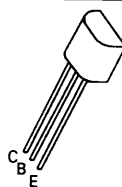
PNP SILICON PLANAR MEDIUM POWER HIGH VOLTAGE TRANSISTOR

ZTX576

ISSUE 1 – APRIL 94

FEATURES

- * 200 Volt V_{CEO}
- * 1 Amp continuous current
- * $P_{tot} = 1$ Watt



E-Line
TO92 Compatible

ABSOLUTE MAXIMUM RATINGS.

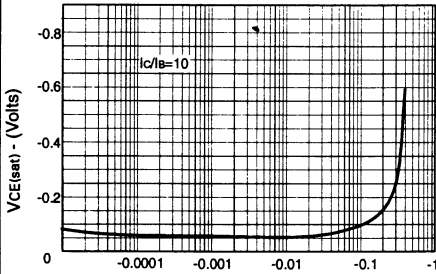
PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	V_{CBO}	-200	V
Collector-Emitter Voltage	V_{CEO}	-200	V
Emitter-Base Voltage	V_{EBO}	-5	V
Peak Pulse Current	I_{CM}	-2	A
Continuous Collector Current	I_C	-1	A
Power Dissipation at $T_{amb} = 25^\circ\text{C}$	P_{tot}	1	W
Operating and Storage Temperature Range	$T_j: T_{stg}$	-55 to +200	$^\circ\text{C}$

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-200			V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-200			V	$I_C = -10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-5			V	$I_E = -100\mu\text{A}$
Collector Cut-Off Current	I_{CBO}			-0.1	μA	$V_{CB} = -160\text{V}$
Emitter Cut-Off Current	I_{EBO}			-0.1	μA	$V_{EB} = -4\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			-0.3	V	$I_C = -100\text{mA}$, $I_B = -10\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$			-1	V	$I_C = -100\text{mA}$, $I_B = -10\text{mA}^*$
Base-Emitter Turn-on Voltage	$V_{BE(on)}$			-1	V	$I_C = -100\text{mA}$, $V_{CE} = -10\text{V}^*$
Static Forward Current Transfer Ratio	h_{FE}	50 50		300		$I_C = -10\text{mA}$, $V_{CE} = -10\text{V}^*$ $I_C = -300\text{mA}$, $V_{CE} = -10\text{V}^*$
Transition Frequency	f_T	100			MHz	$I_C = -50\text{mA}$, $V_{CE} = -10\text{V}$ $f = 100\text{MHz}$

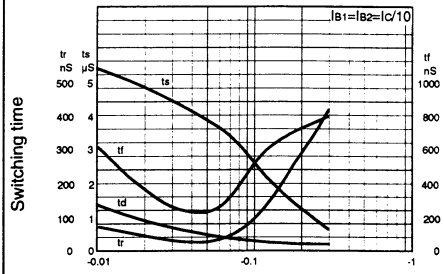
*Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$

TYPICAL CHARACTERISTICS



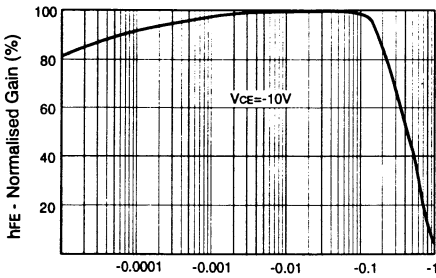
IC - Collector Current (Amps)

VCE(sat) v IC



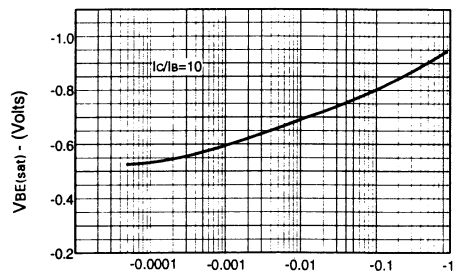
IC - Collector Current (Amps)

Typical Switching Speeds



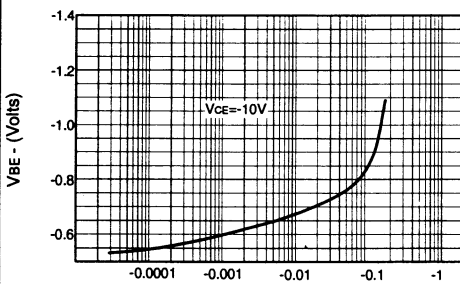
IC - Collector Current (Amps)

hFE v IC



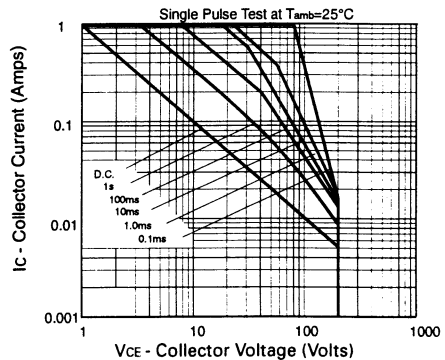
IC - Collector Current (Amps)

VBE(sat) v IC



IC - Collector Current (Amps)

VBE(on) v IC



Safe Operating Area

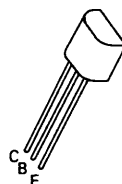
NPN SILICON PLANAR MEDIUM POWER DARLINGTON TRANSISTORS

ISSUE 2 – JUNE 94

ZTX600 ZTX601

FEATURES

- * 160 Volt V_{CE0}
- * 1 Amp continuous current
- * Gain of 5K at $I_C=1$ A rñp
- * $P_{tot}=1$ Watt



E-Line
TO92 Compatible

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 $T_{amb}=25^{\circ}\text{C}$ 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 $T_{amb} = 25^{\circ}\text{C}$ 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	$I_C=100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	140			160			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 μA μA μA	$V_{CB}=140\text{V}$ $V_{CB}=160\text{V}$ $V_{CB}=140\text{V}, T_a=100^{\circ}\text{C}$ $V_{CB}=160\text{V}, T_a=100^{\circ}\text{C}$
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 μA	$V_{CES}=140\text{V}$ $V_{CES}=160\text{V}$
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	$I_C=0.5\text{A}, I_B=5\text{mA}^*$ $I_C=1\text{A}, I_B=10\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		1.7	1.9		1.7	1.9	V	$I_C=1\text{A}, I_B=10\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		1.5	1.7		1.5	1.7	V	$I_C=1\text{A}, V_{CE}=5\text{V}^*$

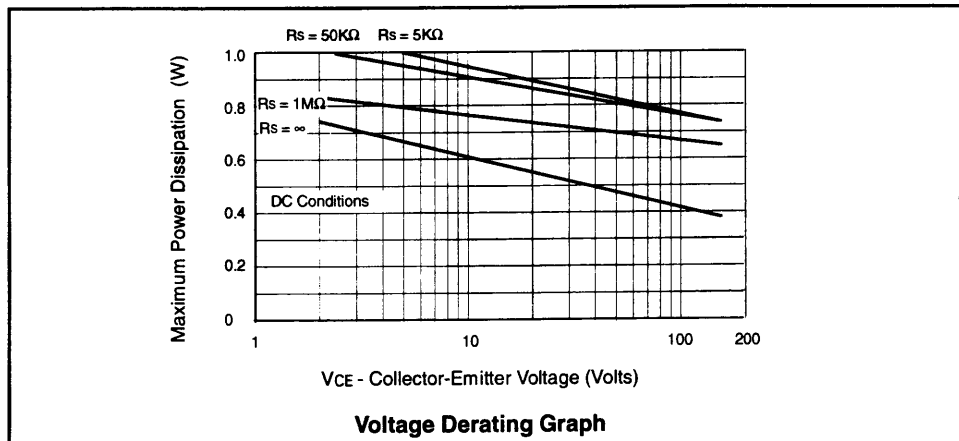
ZTX600

ZTX601

ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ 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		$I_C=50\text{mA}, V_{CE}=10\text{V}^*$ $I_C=0.5\text{A}, V_{CE}=10\text{V}^*$ $I_C=1\text{A}, V_{CE}=10\text{V}^*$
Group A		1K 2K 1K	2K 5K 3K	20K	1K 2K 1K	2K 5K 3K	20K		$I_C=50\text{mA}, V_{CE}=10\text{V}^*$ $I_C=0.5\text{A}, V_{CE}=10\text{V}^*$ $I_C=1\text{A}, V_{CE}=10\text{V}^*$
Group B		5K 10K 5K	10K 20K 10K	100K	5K 10K 5K	10K 20K 10K	100K		$I_C=50\text{mA}, V_{CE}=10\text{V}^*$ $I_C=0.5\text{A}, V_{CE}=10\text{V}^*$ $I_C=1\text{A}, V_{CE}=10\text{V}^*$
Transition Frequency	f_T	150	250		150	250		MHz	$I_C=100\text{mA}, V_{CE}=10\text{V}, f=20\text{MHz}$
Input Capacitance	C_{ibo}		60	90		60	90	pF	$V_{EB}=0.5\text{V}, f=1\text{MHz}$
Output Capacitance	C_{obo}		10	15		10	15	pF	$V_{CE}=10\text{V}, f=1\text{MHz}$
Switching Times	t_{on}		0.75			0.75		μs	$I_C=0.5\text{A}, V_{CE}=10\text{V}$ $I_{B1}=I_{B2}=0.5\text{mA}$
	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

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

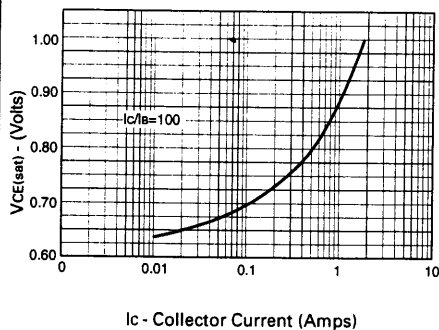
$T_{amb(max)}$ = Maximum operating ambient temperature

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

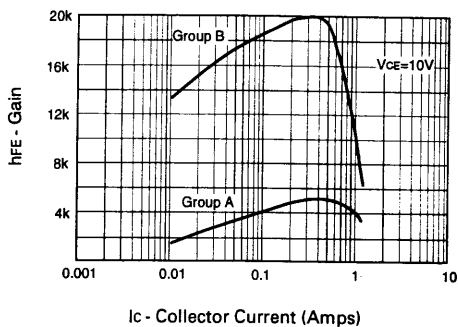
Power(actual) = Actual power dissipation in users circuit

ZTX600 ZTX601

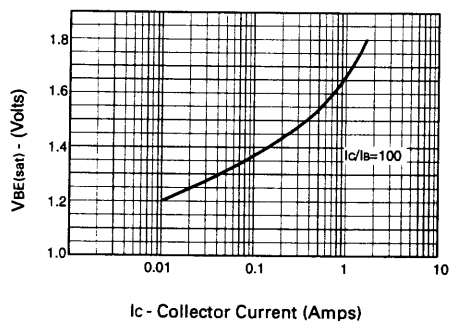
TYPICAL CHARACTERISTICS



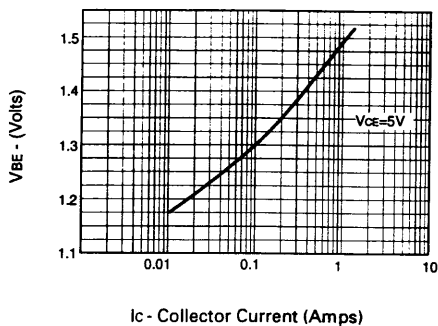
$V_{CE(sat)}$ v I_C



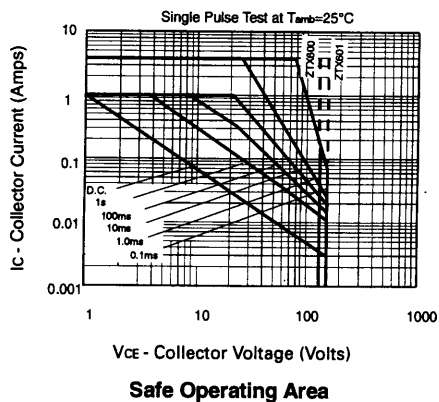
h_{FE} v I_C



$V_{BE(sat)}$ v I_C



$V_{BE(on)}$ v I_C



Safe Operating Area

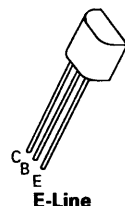
NPN SILICON PLANAR MEDIUM POWER DARLINGTON TRANSISTORS

ZTX602 ZTX603

ISSUE 1 – MARCH 94

FEATURES

- * 80 Volt V_{CEO}
- * 1 Amp continuous current
- * Gain of 2K at $I_C=1$ Amp
- * $P_{tot}=1$ Watt



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		V
Peak Pulse Current	I_{CM}	4		A
Continuous Collector Current	I_C	1		A
Power Dissipation at $T_{amb}=25^\circ\text{C}$ derate above 25°C	P_{tot}	1 5.7		W mW/ $^\circ\text{C}$
Operating and Storage Temperature Range	$T_j; T_{stg}$	-55 to +200		$^\circ\text{C}$

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

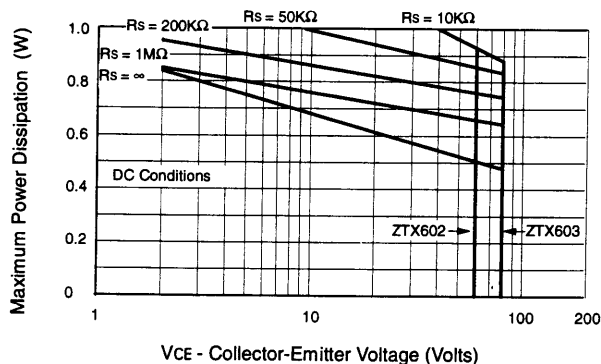
PARAMETER	SYMBOL	ZTX602		ZTX603		UNIT	CONDITIONS.
		MIN.	MAX.	MIN.	MAX.		
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	80		100		V	$I_C=100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	60		80		V	$I_C=10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	10		10		V	$I_E=100\mu\text{A}$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

ZTX602 ZTX603

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 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}	1.1 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

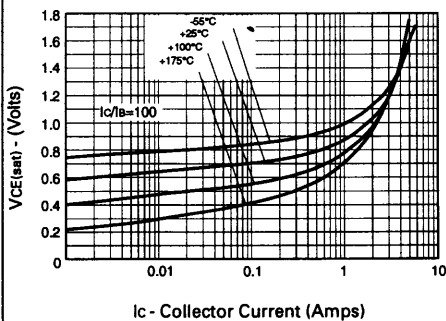
$$T_{amb(max)} = \frac{\text{Power(max)} - \text{Power(act)}}{0.0057} + 25^{\circ}\text{C}$$

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

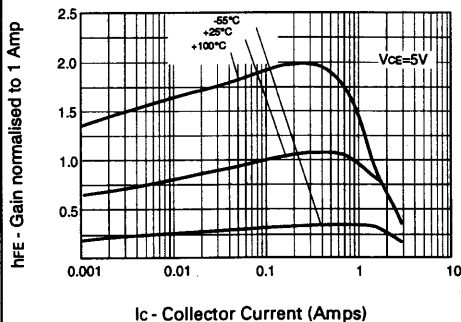
Power(max) = Maximum power dissipation figure, obtained from the above graph for a given V_{CE} and source resistance (R_S)

Power(actual) = Actual power dissipation in users circuit

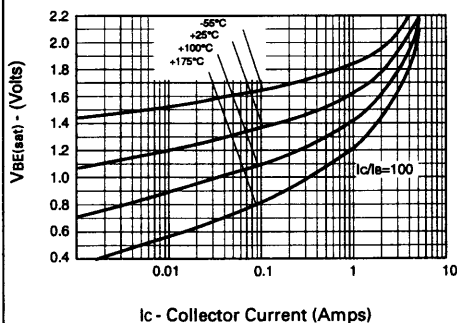
TYPICAL CHARACTERISTICS



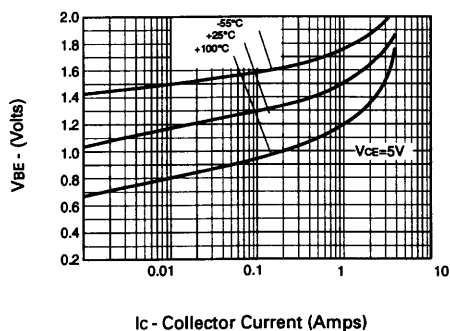
$V_{CE(sat)}$ v I_C



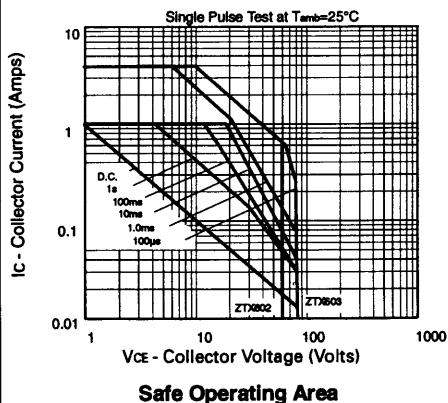
h_{FE} v I_C



$V_{BE(sat)}$ v I_C



$V_{BE(on)}$ v I_C



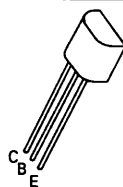
NPN SILICON PLANAR MEDIUM POWER DARLINGTON TRANSISTORS

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

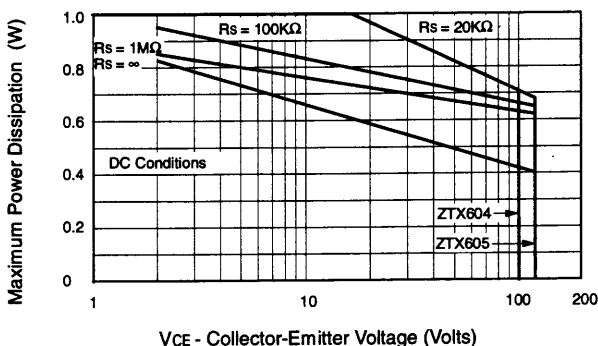
PARAMETER	SYMBOL	ZTX604		ZTX605		UNIT	CONDITIONS.
		MIN.	MAX.	MIN.	MAX.		
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	120		140		V	$I_C=100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	100		120		V	$I_C=10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	10		10		V	$I_E=100\mu\text{A}$
Collector Cut-Off Current	I_{CBO}		0.01 10		0.01 10	μA μA μA μA	$V_{CB}=100\text{V}$ $V_{CB}=120\text{V}$ $V_{CB}=100\text{V}, T_{amb}=100^\circ\text{C}$ $V_{CB}=120\text{V}, T_{amb}=100^\circ\text{C}$
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	$V_{CES}=100\text{V}$ $V_{CES}=120\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		1.0 1.5		1.0 1.5	V V	$I_C=250\text{mA}, I_B=0.25\text{mA}^*$ $I_C=1\text{A}, I_B=1\text{mA}^*$
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	$I_C=1\text{A}, V_{CE}=5\text{V}^*$

ZTX604 ZTX605

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 $\leq 2\%$



Voltage Derating Graph

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

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

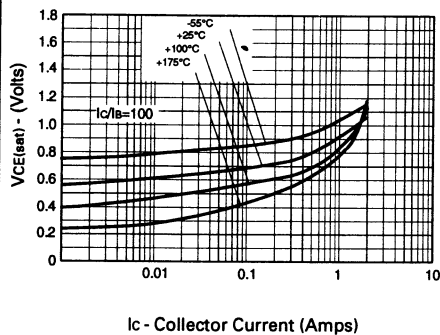
$T_{amb(max)}$ = Maximum operating ambient temperature

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

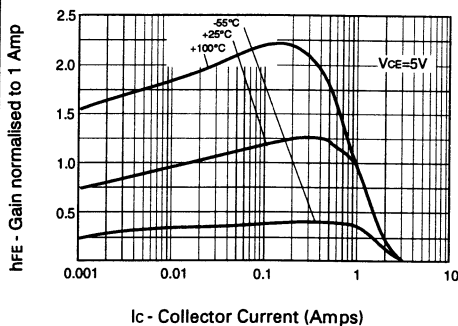
Power(actual) = Actual power dissipation in users circuit

ZTX604 ZTX605

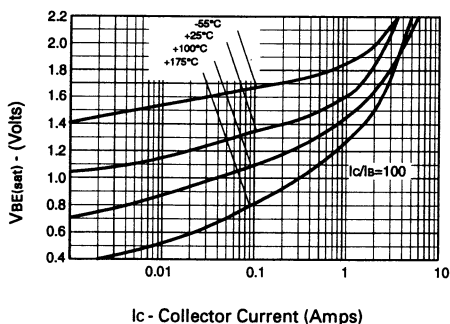
TYPICAL CHARACTERISTICS



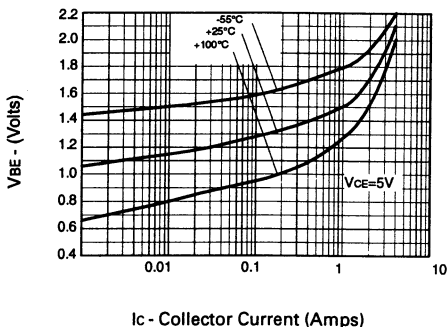
$V_{CE(sat)}$ v I_C



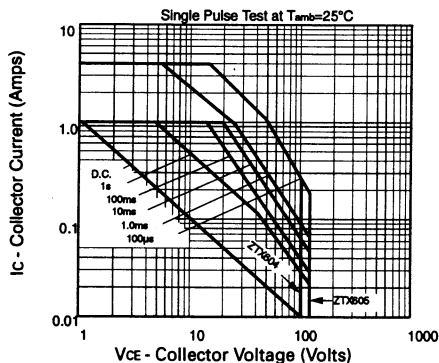
h_{FE} v I_C



$V_{BE(sat)}$ v I_C



$V_{BE(on)}$ v I_C



Safe Operating Area

NPN SILICON PLANAR MEDIUM POWER DARLINGTON TRANSISTOR

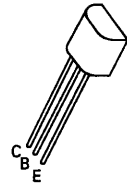
ISSUE 1 – APRIL 94

FEATURES

- * 100 Volt V_{CE0}
- * 800 mA continuous current
- * Gain of 10K at $I_C=500mA$
- * $P_{tot}=1$ Watt

REFER TO BCX38 FOR GRAPHS

ZTX614



E-line
TO92 Compatible

ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	V_{CBO}	120	V
Collector-Emitter Voltage	V_{CEO}	100	V
Emitter-Base Voltage	V_{EBO}	10	V
Continuous Collector Current	I_C	800	mA
Power Dissipation at $T_{amb}=25^{\circ}C$ derate above $25^{\circ}C$	P_{tot}	1.0 5.7	W mW/ $^{\circ}C$
Operating and Storage Temperature Range	$T_j; T_{stg}$	-55 to +200	$^{\circ}C$

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	120			V	$I_C=10\mu A, I_E=0$
Collector-Emitter Sustaining Voltage	$V_{CEO(sus)}$	100			V	$I_C=10mA, I_B=0^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	10			V	$I_E=10\mu A, I_C=0$
Collector Cut-Off Current	I_{CBO}			100	nA	$V_{CB}=60V, I_E=0$
Emitter Cut-Off Current	I_{EBO}			100	nA	$V_{EB}=8V, I_C=0$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			1.25	V	$I_C=800mA, I_B=8mA^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$			1.8	V	$I_C=800mA, V_{CE}=5V^*$
Static Forward Current Transfer Ratio	h_{FE}	5000 10000				$I_C=100mA, V_{CE}=5V^*$ $I_C=500mA, V_{CE}=5V^*$

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