NPN SILICON PLANAR MEDIUM POWER HIGH CURRENT TRANSISTOR

ZTX851

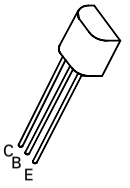
ISSUE 2 – AUGUST 94

FEATURES

* 60 Volt V_{CEO}
* 5 Amps continuous current
* Up to 20 Amps peak current
* Very low saturation voltage
* P_{tot}=1.2 Watts

APPLICATIONS

* Emergency lighting circuits



E-Line
TO92 Compatible

ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	V_{CBO}	150	V
Collector-Emitter Voltage	V_{CEO}	60	V
Emitter-Base Voltage	V_{EBO}	6	V
Peak Pulse Current	I_{CM}	20	A
Continuous Collector Current	I_C	5	A
Practical Power Dissipation*	P_{totp}	1.58	W
Power Dissipation at T_{amb}=25°C	P_{tot}	1.2	W
Operating and Storage Temperature Range	T_j:T_{stg}	-55 to +200	°C

*The power which can be dissipated assuming the device is mounted in a typical manner on a P.C.B. with copper equal to 1 inch square minimum

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	150	220		V	I_C=100µA
Collector-Emitter Breakdown Voltag	$V_{(BR)CER}$	150	220		V	IC=1µA, RB ≤1KΩ
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	60	85		V	I_C=10mA*
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	6	8		V	I_E=100µA
Collector Cut-Off Current	I_{CBO}			50 1	nA µA	V_{CB}=120V V_{CB}=120V, T_{amb}=100°C
Collector Cut-Off Current	I_{CER} R ≤1KΩ			50 1	nA µA	V_{CB}=120V V_{CB}=120V, T_{amb}=100°C
Emitter Cut-Off Current	I_{EBO}			10	nA	V_{EB}=6V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		10 50 100 200	50 100 150 250	mV mV mV mV	I_C=0.1A, I_B=5mA* I_C=1A, I_B=50mA* I_C=2A, I_B=50mA* I_C=5A, I_B=200mA*
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		920	1050	mV	I_C=4A, I_B=200mA*

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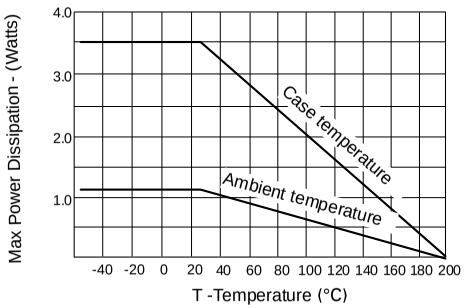
ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		840	950	mV	IC=4A, V_{CE}=1V*
Static Forward Current Transfer Ratio	h_{FE}	100 100 75 25	200 200 120 50	300		I_C=10mA, V_{CE}=1V I_C=2A, V_{CE}=1V* I_C=5A, V_{CE}=1V* I_C=10A, V_{CE}=1V*
Transition Frequency	f_T		130		MHz	I_C=100mA, V_{CE}=10V f=50MHz
Output Capacitance	C_{obo}		45		pF	V_{CB}=10V, f=1MHz
Switching Times	t_{on} t_{off}		45 1100		ns ns	I_C=1A, $I_{B!}$=100mA I_{B2}=100mA, V_{CC}=10V

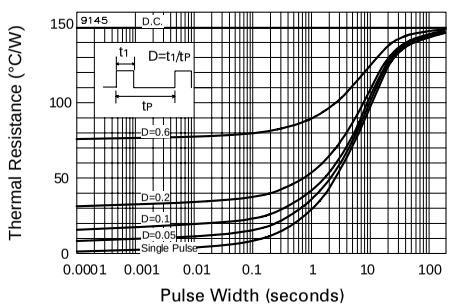
*Measured under pulsed conditions. Pulse width=300µs. Duty cycle ≤2%

THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	MAX.	UNIT
Thermal Resistance: Junction to Ambient Junction to Case	$R_{th(j-amb)}$ $R_{th(j-case)}$	150 50	°C/W °C/W



Derating curve



Maximum transient thermal impedance

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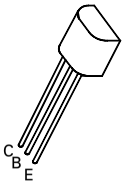

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ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C)

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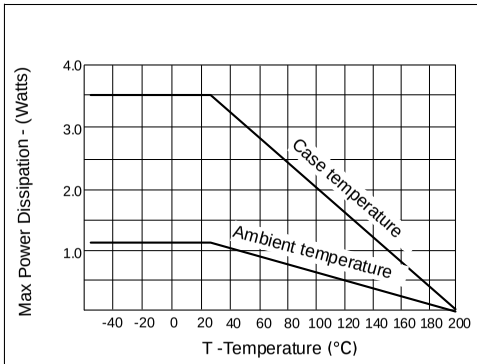
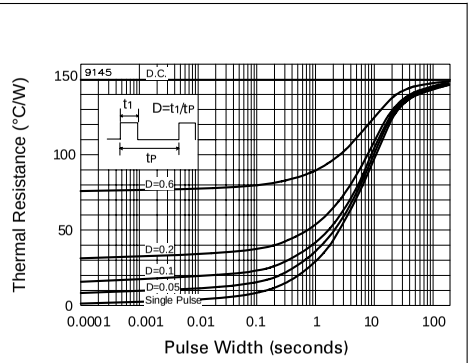


Derating curve



Maximum transient thermal impedance

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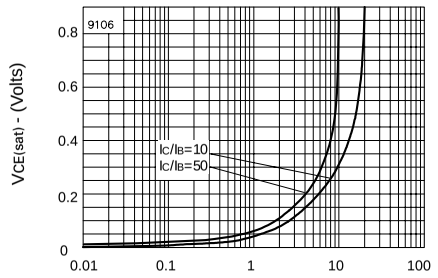
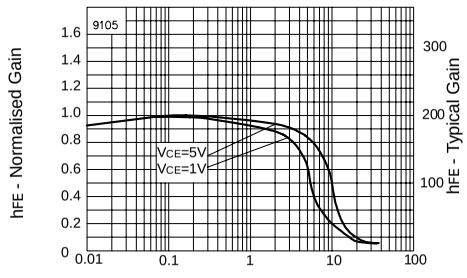
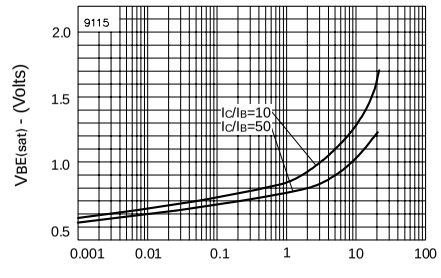
TYPICAL CHARACTERISTICS



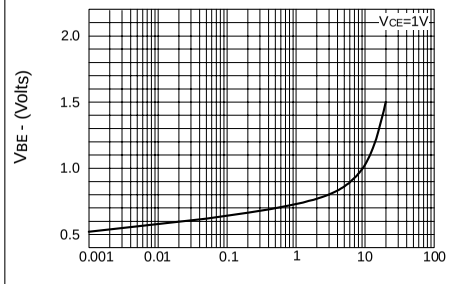
VCE(sat) v IC



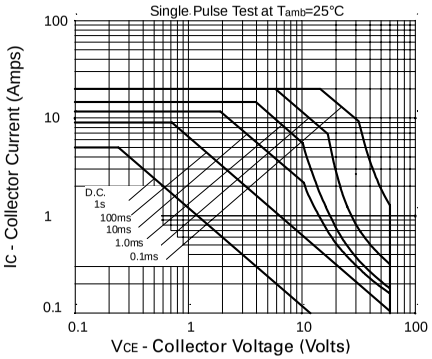
hFE v IC



VBE(sat) v IC



VBE(on) v IC



Safe Operating Area