NPN SILICON PLANAR MEDIUM POWER HIGH GAIN TRANSISTOR

ZTX1047A

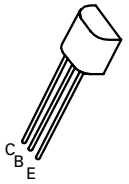
ISSUE 3 – JANUARY 1995

FEATURES

* Very Low Saturation Voltage
* High Gain
* 4 Amp Continuous Current

APPLICATIONS

* DC-DC Convertors
* Power Management - Supply Switching



E-Line
TO92 Compatible

ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	ZTX1047A	UNIT
Collector-Base Voltage	V_{CBO}	35	V
Collector-Emitter Voltage	V_{CEO}	10	V
Emitter-Base Voltage	V_{EBO}	5	V
Peak Pulse Current	I_{CM}	20	A
Continuous Collector Current	I_C	4	A
Base Current	I_B	500	mA
Power Dissipation at T_{amb}=25°C	P_{tot}	1	W
Operating and Storage Temperature Range	T_j:T_{stg}	-55 to +200	°C

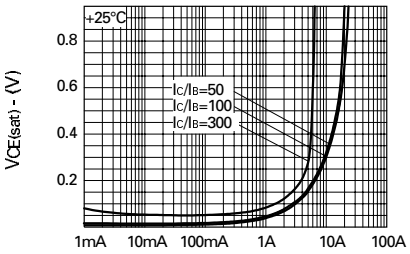
ZTX1047A

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	35	55		V	I_C=100μA
Collector-Emitter Breakdown Voltage	V_{CES}	35	55		V	IC=100μA
Collector-Emitter Breakdown Voltage	V_{CEO}	10	14		V	IC=10mA
Collector-Emitter Breakdown Voltage	V_{CEV}	35	55		V	IC=100μA, V_{EB}=1V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5	8.7		V	I_E=100μA
Collector Cut-Off Current	I_{CBO}		0.3	10	nA	V_{CB}=20V
Emitter Cut-Off Current	I_{EBO}		0.3	10	nA	V_{EB}=4V
Collector Emitter Cut-Off Current	I_{CES}		0.3	10	nA	VCES=20V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		23 44 120 130	40 70 185 190	mV mV mV mV	I_C=0.5A, I_B=10mA* I_C=1A, I_B=10mA* I_C=3A, I_B=10mA* I_C=4A, I_B=20mA*
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		860	950	mV	I_C=4A, I_B=20mA*
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		810	900	mV	IC=4A, V_{CE}=2V*
Static Forward Current Transfer Ratio	h_{FE}	280 300 240 150 60	440 450 380 230 110	1200		I_C=10mA, V_{CE}=2V* I_C=1A, V_{CE}=2V* I_C=4A, V_{CE}=2V* I_C=10A, V_{CE}=2V* I_C=20A, V_{CE}=2V*
Transition Frequency	f_T		150		MHz	I_C=50mA, V_{CE}=10V f=50MHz
Output Capacitance	C_{obo}		85	110	pF	V_{CB}=10V, f=1MHz
Switching Times	t_{on}		130		ns	I_C=4A, I_B=40mA, V_{CC}=10V
	t_{off}		180		ns	I_C=4A, I_B=±40mA, V_{CC}=10V

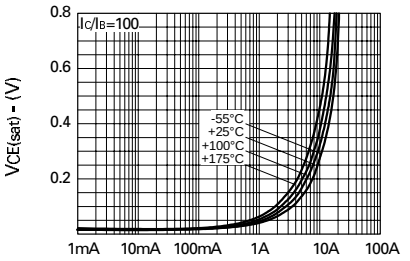
*Measured under pulsed conditions. Pulse width=300μs. Duty cycle ≤ 2%

TYPICAL CHARACTERISTICS



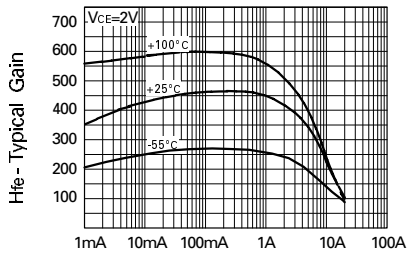
IC-Collector Current

VCE(sat) v IC



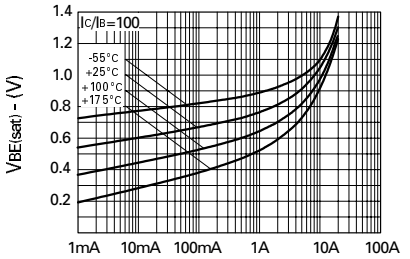
IC-Collector Current

VCE(sat) v IC



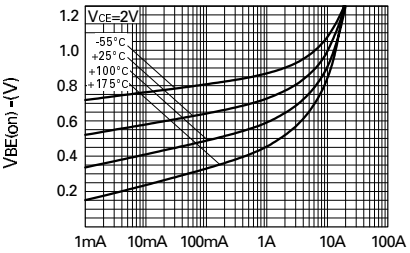
IC-Collector Current

hFE v IC



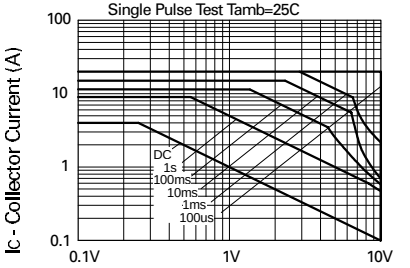
IC-Collector Current

VBE(sat) v IC



IC-Collector Current

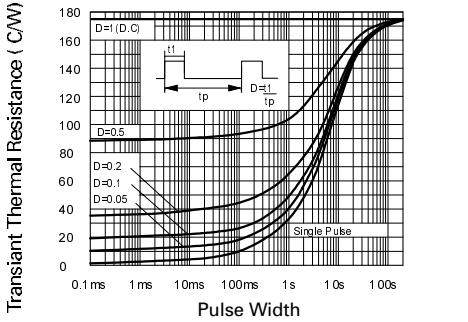
VBE(on) v IC



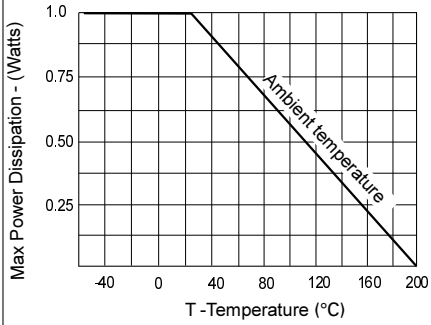
VCE - Collector Voltage

Safe Operating Area

ZTX1047A



Transient Thermal Resistance



Derating curve

SPICE PARAMETERS

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*ZETEX  ZTX1047A Spice model   Last revision 20/01/95
*
.MODEL   ZTX1047A  NPN IS=9.73E-13  NF=1.0  BF=550  IKF=8.0  VAF=120
+          ISE=2.6E-13  NE=1.38  NR=1.0  BR=400  IKR=5  VAR=15
+          ISC=8E-13  NC=1.4  RB=0.1  RE=0.017  RC=0.010
+          CJC=195.4E-12  CJE=540.4E-12  MJC=0.257  MJE=0.359
+          VJC=0.390  VJE=0.753  TF=450E-12  TR=1.2E-9
*
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