ZXT1053AK

75V NPN LOW SATURATION MEDIUM POWER TRANSISTOR

Features

- BV_{CEO} > 75V
- I_C = 5A high Continuous Collector Current
- Up to 10A Peak Current
- R_{SAT} = 70mΩ for a low equivalent On-Resistance
- Low Saturation Voltage
- h_{FE} specified up to 10A for a high gain hold up
- **Lead-Free Finish; RoHS compliant (Note 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

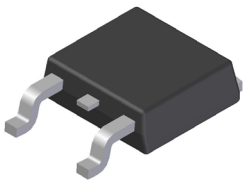
Mechanical Data

- Case: TO252 (DPAK)
- Case Material: Molded Plastic, "Green" Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads; Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.34 grams (approximate)

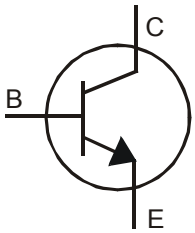
Application

- DC – DC converters
- Power Switches
- Motor Control
- Automotive Circuits
- Inverter Circuits

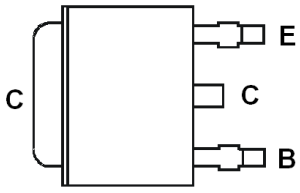
TO252



Top View



Device Schematic



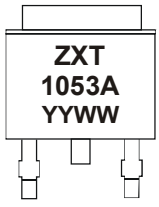
Pin Out Configuration
Top view

Ordering Information (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXT1053AKTC	ZXT1053A	13	16	2,500

Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
2. See http://www.diodes.com for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at http://www.diodes.com

Marking Information



ZXT1053AK = Product Type Marking Code
YYWW = Date Code Marking
YY = Last Digit of Year (ex: 09 = 2009)
WW = Week Code (01 – 53)

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

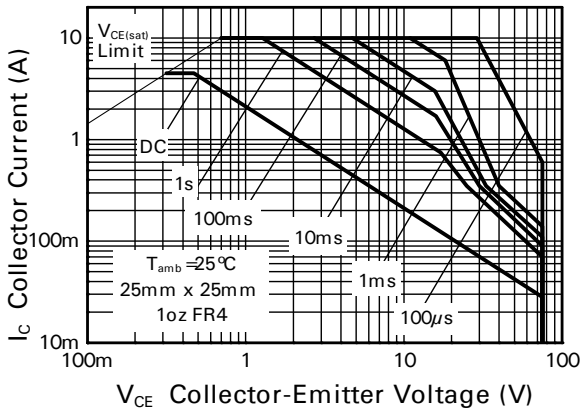
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	150	V
Collector-Emitter Voltage	V_{CEO}	75	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	5	A
Peak Pulse Collector Current	I_{CM}	10	A

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

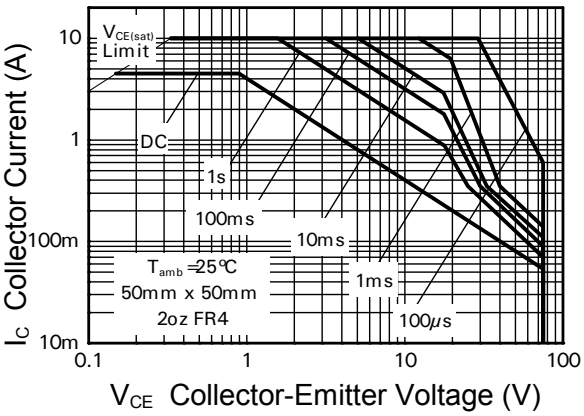
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	2.1	W
	(Note 6)		3.4	
	(Note 7)		4.0	
Thermal Resistance, Junction to Ambient Air	(Note 5)	$R_{\theta JA}$	59	°C/W
	(Note 6)		36	
	(Note 7)		32	
Thermal Resistance, Junction to Leads	(Note 8)	$R_{\theta JL}$	2.97	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Notes:
5. For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
6. Same as note (5), except the device is surface mounted on 25mm x 25mm with 2oz copper.
7. Same as note (5), except the device is surface mounted on 50mm x 50mm with 2oz copper.
8. Thermal resistance from junction to solder-point (at the end of the collector lead).

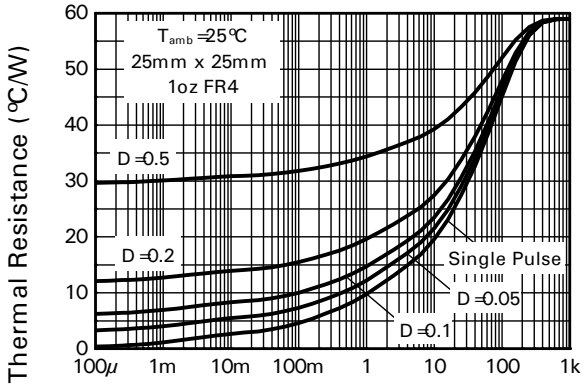
Thermal Characteristics and Derating Information



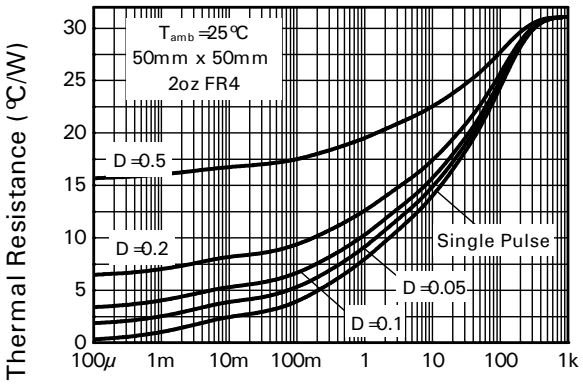
Safe Operating Area



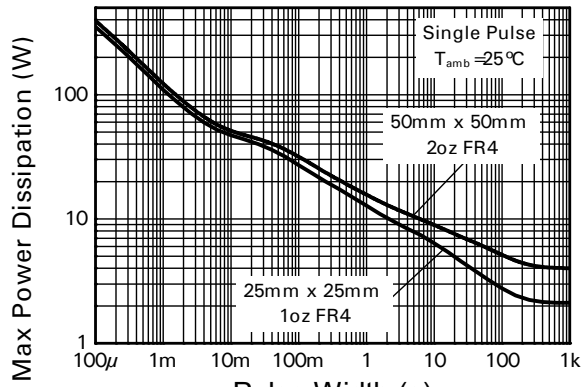
Safe Operating Area



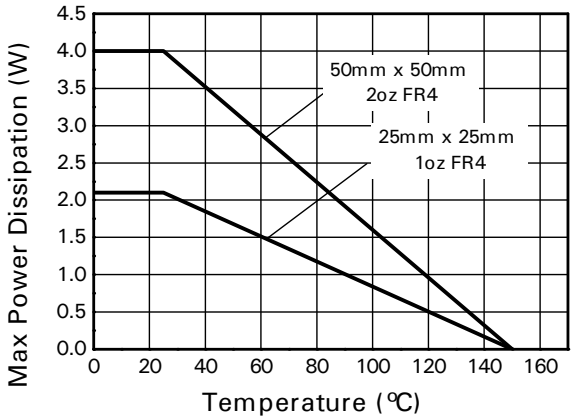
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



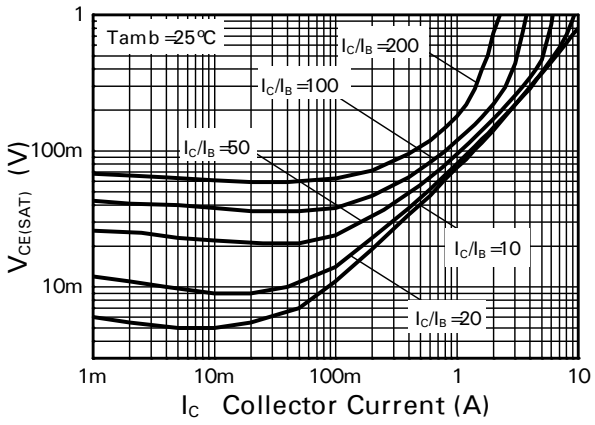
Derating Curve

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

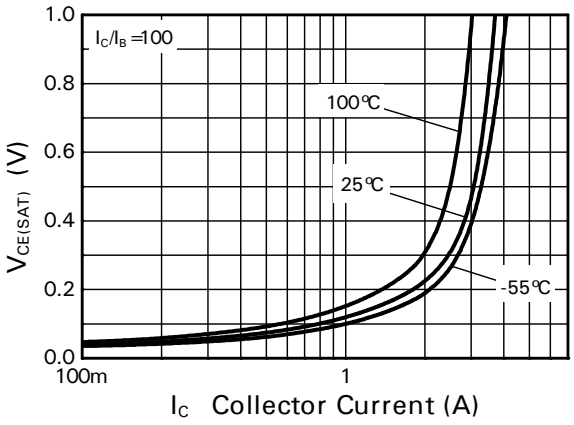
Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	150	240	-	V	I_C = 100µA
Collector-Base Breakdown Voltage	BV_{CES}	150	240	-	V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	75	90	-	V	I_C = 10mA
Collector-Emitter Breakdown Voltage	BV_{CEV}	150	240		V	I_C = 1µA, V_{EB} = 1V
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8.7	-	V	I_E = 100µA
Collector Cutoff Current	I_{CBO}	-	<1	10	nA	V_{CB} = 120V
Emitter Cutoff Current	I_{EBO}	-	<1	10	nA	V_{EB} = 6V
Emitter Cutoff Current	I_{CES}	-	<1	10	nA	V_{CE} = 120V
DC current transfer Static ratio (Note 9)	h_{FE}	260 300 50 10	375 450 75 25	- 1200 - -	-	I_C = 10mA, V_{CE} = 2V I_C = 1A, V_{CE} = 2V I_C = 5A, V_{CE} = 2V I_C = 10A, V_{CE} = 2V
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	- - - - -	19 70 120 140 350	30 95 160 190 460	mV	I_C = 0.2A, I_B = 20mA I_C = 1A, I_B = 100mA I_C = 1A, I_B = 10mA I_C = 2A, I_B = 100mA I_C = 5A, I_B = 200mA
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(sat)}$	-	1.0	1.1	V	I_C = 5A, I_B = 200mA
Base-Emitter Turn-on Voltage (Note 9)	$V_{BE(on)}$	-	0.925	1.05	V	I_C = 5A, V_{CE} = 2V
Transitional Frequency	f_T	-	140	-	MHz	I_C = 50mA, V_{CE} = 10V f = 100MHz
Output capacitance	C_{OBO}	-	21	30	pF	V_{CB} = 10V, f = 1MHz,
Switching times	t_{ON} t_{OFF}	-	162 900	-	nS	I_C = 2A, V_{CC} = 50V, I_{B1} = I_{B2} = 20mA

Notes: 9. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤2%.

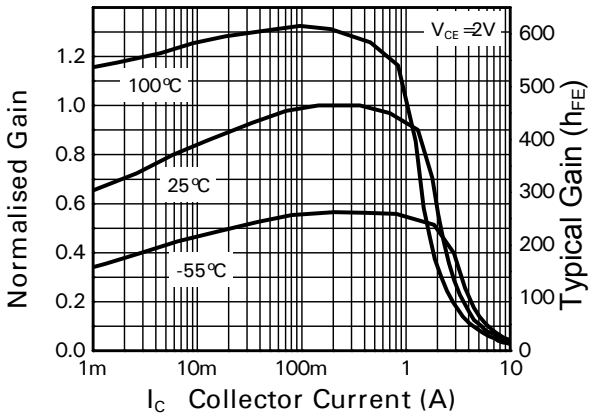
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



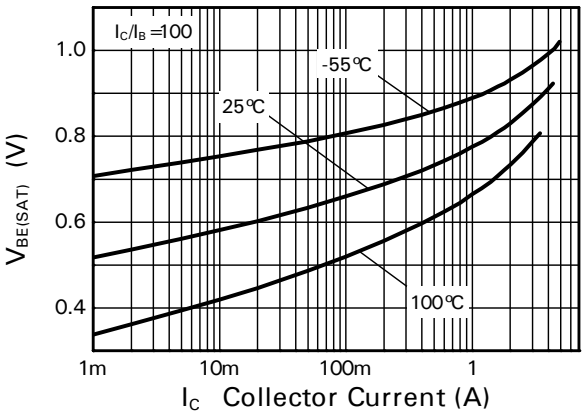
$V_{CE(SAT)}$ v I_C



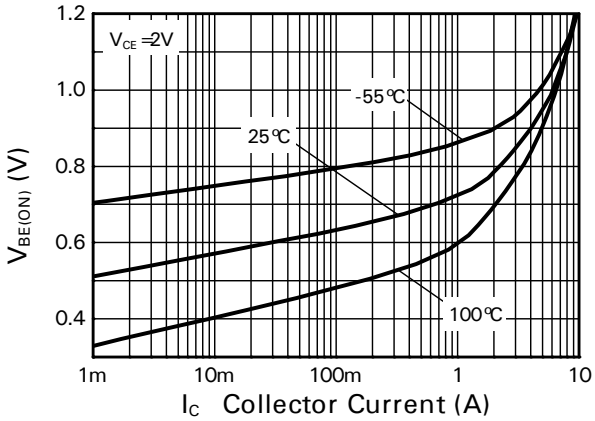
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



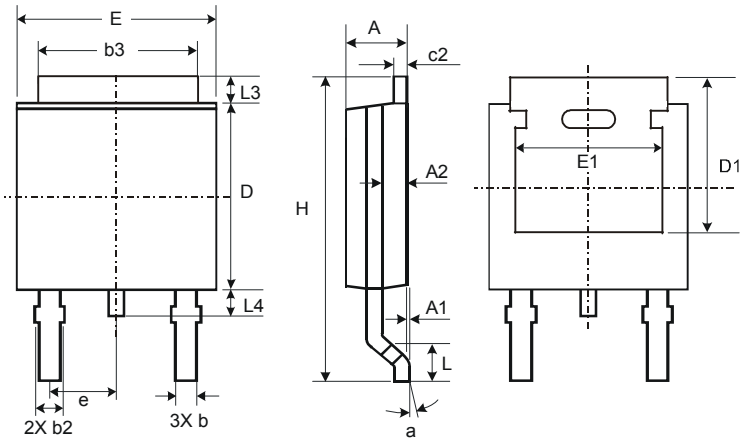
$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

Package Outline Dimensions

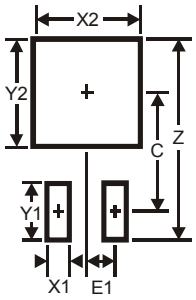
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



TO252			
Dim	**Min**	**Max**	**Typ**
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c2	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	–	–
e	–	–	2.286
E	6.45	6.70	6.58
E1	4.32	–	–
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°	10°	–
All Dimensions in mm			

Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



Dimensions	Value (in mm)
Z	11.6
X1	1.5
X2	7.0
Y1	2.5
Y2	7.0
C	6.9
E1	2.3

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