



**THE DATASHEET OF  
ZXT1053AKQTC**





**ZXT1053AK**

**75V NPN LOW SATURATION MEDIUM POWER TRANSISTOR**

**Features**

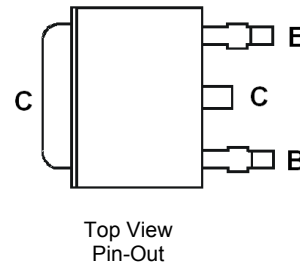
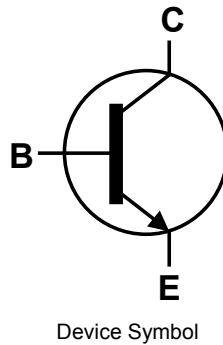
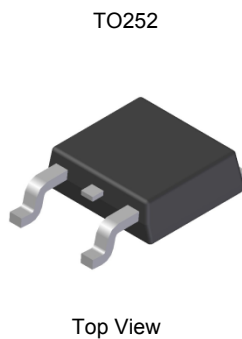
- $BV_{CEO} > 75V$
- $I_C = 5A$  high Continuous Collector Current
- Up to 10A Peak Current
- $R_{SAT} = 70m\Omega$  for a low equivalent On-Resistance
- Low Saturation Voltage
- $h_{FE}$  specified up to 10A for a high gain hold up
- **Lead-Free Finish; RoHS compliant (Note 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP capable (Note 4)**

**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
- Weight: 0.34 grams (approximate)

**Application**

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

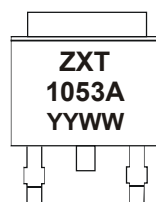


**Ordering Information** (Notes 4 & 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXT1053AKTC	AEC-Q101	ZXT1053A	13	16	2,500
ZXT1053AKQTC	Automotive	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/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) 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. Automotive products are AEC-Q10x qualified and are PPAP capable. Automotive, AEC-Q10x and standard products are electrically and thermally the same, except where specified. For more information, please refer to [http://www.diodes.com/quality/product\\_compliance\\_definitions/](http://www.diodes.com/quality/product_compliance_definitions/).
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>

**Marking Information**



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

### Absolute Maximum Ratings (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	150	V
Collector-Emitter Voltage	V <sub>CEO</sub>	75	V
Emitter-Base Voltage	V <sub>EBO</sub>	7	V
Continuous Collector Current	I <sub>C</sub>	5	A
Peak Pulse Collector Current	I <sub>CM</sub>	10	A

### Thermal Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

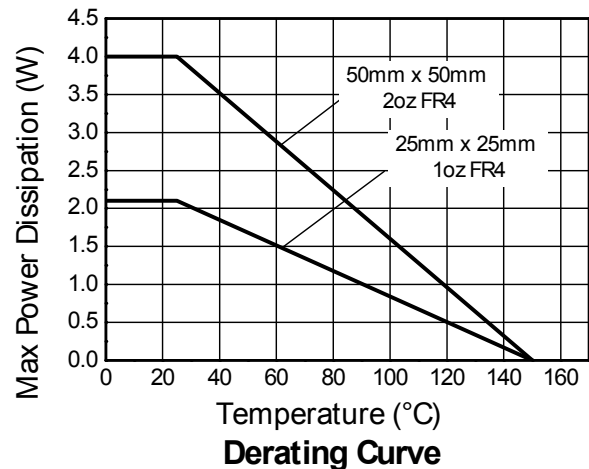
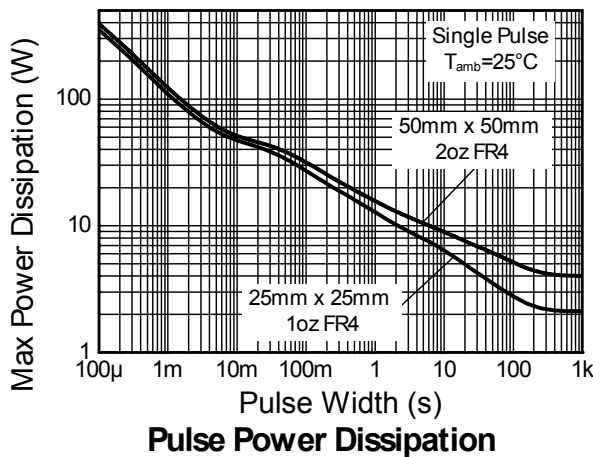
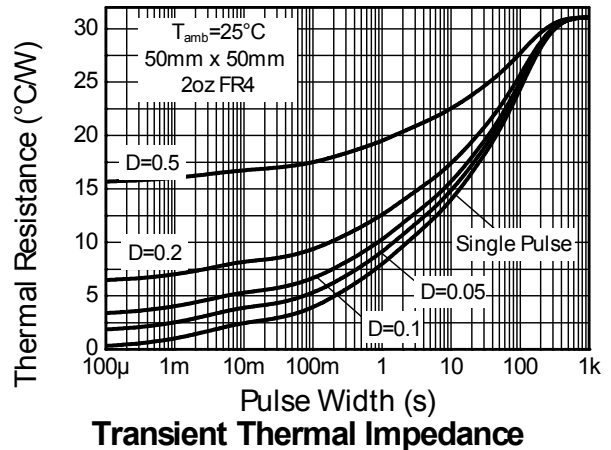
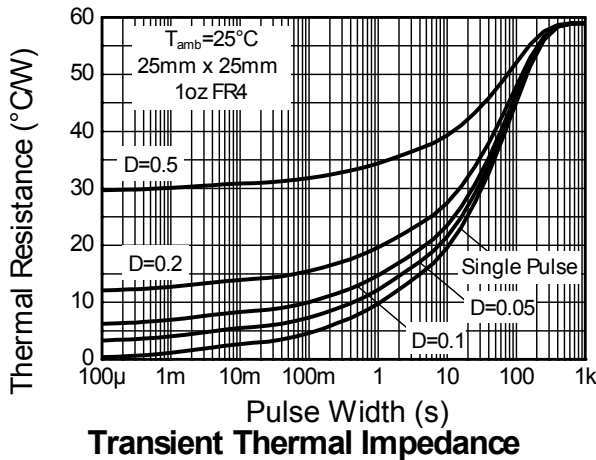
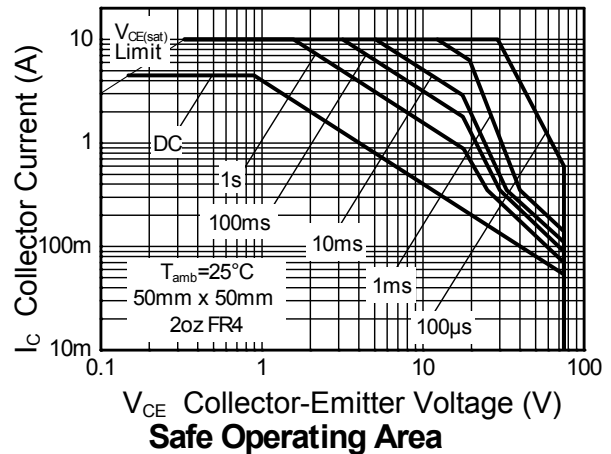
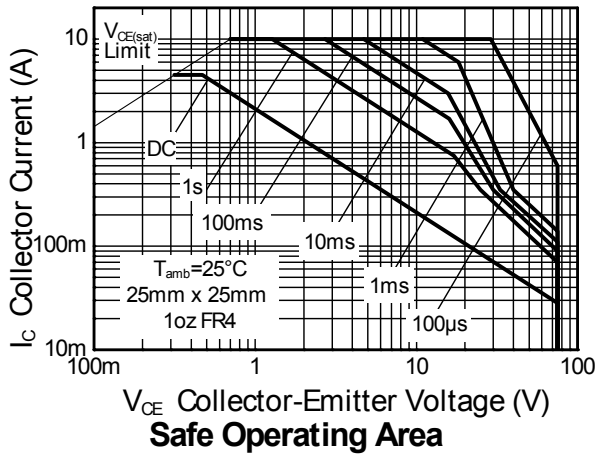
Characteristic	Symbol	Value	Unit
Power Dissipation	P <sub>D</sub>	(Note 6)	2.1
		(Note 7)	3.4
		(Note 8)	4.0
Thermal Resistance, Junction to Ambient Air	R <sub>θJA</sub>	(Note 6)	59
		(Note 7)	36
		(Note 8)	32
Thermal Resistance, Junction to Leads	R <sub>θJL</sub>	2.97	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

### ESD Ratings (Note 10)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
6. For a device mounted with the exposed collector pad on 25mm x 25mm 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
  7. Same as note (6), except the device is surface mounted on 25mm x 25mm with 2oz copper.
  8. Same as note (6), except the device is surface mounted on 50mm x 50mm with 2oz copper.
  9. Thermal resistance from junction to solder-point (at the end of the collector lead).
  10. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

**Thermal Characteristics and Derating Information**

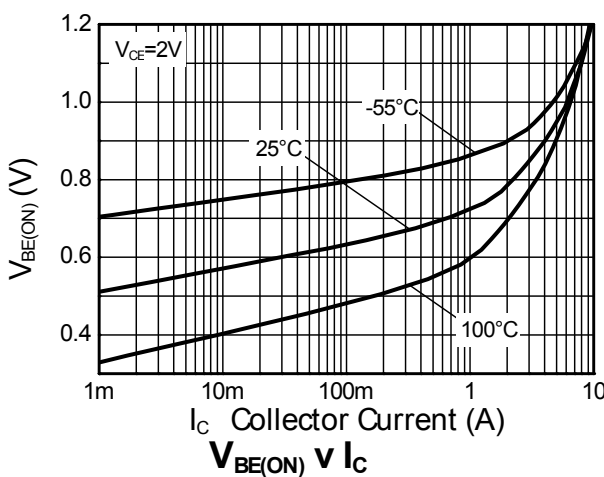
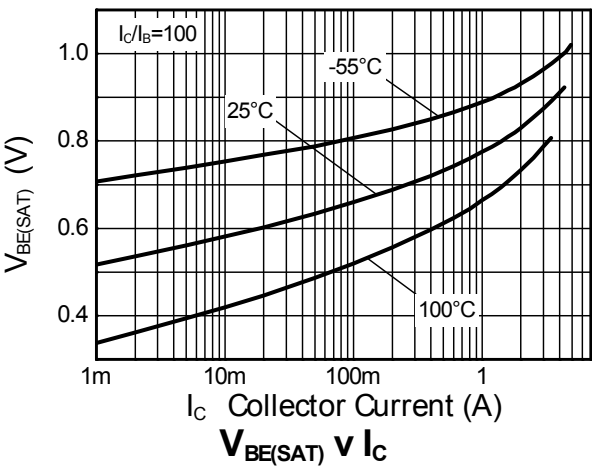
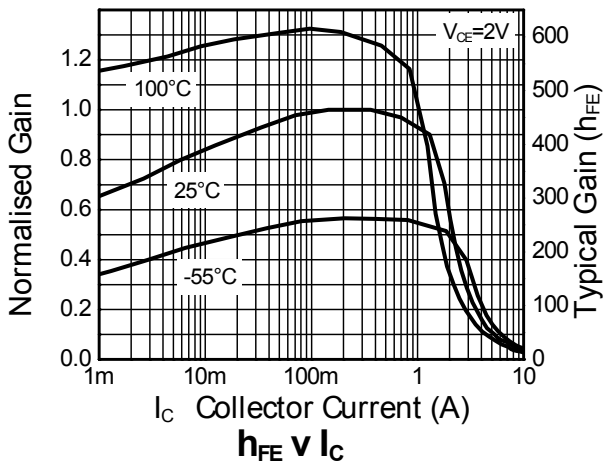
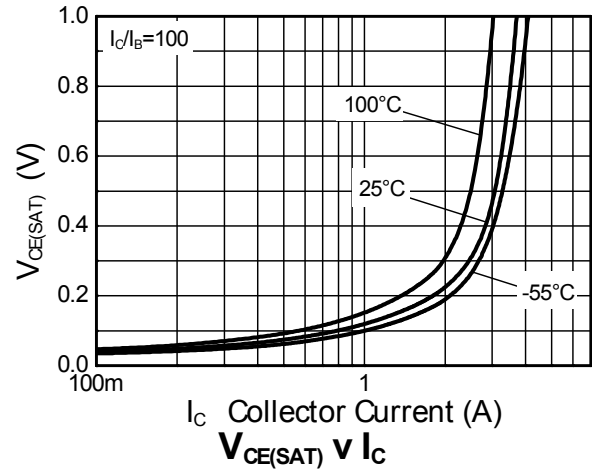
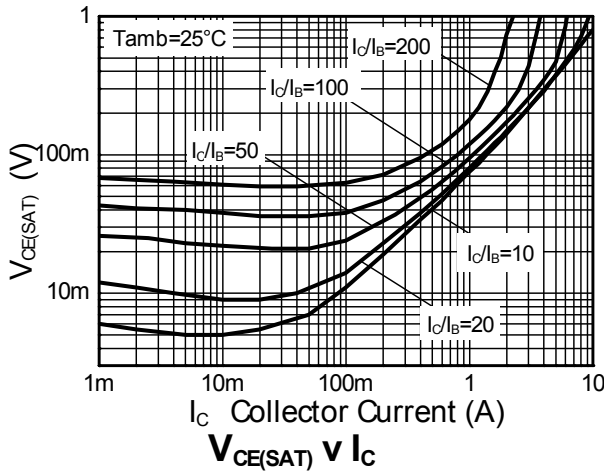


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	150	240	—	V	I <sub>C</sub> = 100μA
Collector-Base Breakdown Voltage	BV <sub>CES</sub>	150	240	—	V	I <sub>C</sub> = 100μA
Collector-Emitter Breakdown Voltage (Note 11)	BV <sub>CEO</sub>	75	90	—	V	I <sub>C</sub> = 10mA
Collector-Emitter Breakdown Voltage	BV <sub>CEV</sub>	150	240	—	V	I <sub>C</sub> = 1μA, V <sub>EB</sub> = 1V
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	7	8.7	—	V	I <sub>E</sub> = 100μA
Collector Cutoff Current	I <sub>CBO</sub>	—	<1	10	nA	V <sub>CB</sub> = 120V
Emitter Cutoff Current	I <sub>EBO</sub>	—	<1	10	nA	V <sub>EB</sub> = 6V
Emitter Cutoff Current	I <sub>CES</sub>	—	<1	10	nA	V <sub>CE</sub> = 120V
DC current transfer Static ratio (Note 9)	h <sub>FE</sub>	260	375	—	—	I <sub>C</sub> = 10mA, V <sub>CE</sub> = 2V
		300	450	1200		I <sub>C</sub> = 1A, V <sub>CE</sub> = 2V
		50	75	—		I <sub>C</sub> = 5A, V <sub>CE</sub> = 2V
		10	25	—		I <sub>C</sub> = 10A, V <sub>CE</sub> = 2V
Collector-Emitter Saturation Voltage (Note 11)	V <sub>CE(sat)</sub>	—	19	30	mV	I <sub>C</sub> = 0.2A, I <sub>B</sub> = 20mA
		—	70	95		I <sub>C</sub> = 1A, I <sub>B</sub> = 100mA
		—	120	160		I <sub>C</sub> = 1A, I <sub>B</sub> = 10mA
		—	140	190		I <sub>C</sub> = 2A, I <sub>B</sub> = 100mA
		—	350	460		I <sub>C</sub> = 5A, I <sub>B</sub> = 200mA
Base-Emitter Saturation Voltage (Note 11)	V <sub>BE(sat)</sub>	—	1.0	1.1	V	I <sub>C</sub> = 5A, I <sub>B</sub> = 200mA
Base-Emitter Turn-on Voltage (Note 11)	V <sub>BE(on)</sub>	—	0.925	1.05	V	I <sub>C</sub> = 5A, V <sub>CE</sub> = 2V
Transitional Frequency	f <sub>T</sub>	—	140	—	MHz	I <sub>C</sub> = 50mA, V <sub>CE</sub> = 10V f = 100MHz
Output capacitance	C <sub>OBO</sub>	—	21	30	pF	V <sub>CB</sub> = 10V, f = 1MHz,
Switching times	t <sub>ON</sub>	—	162	—	nS	I <sub>C</sub> = 2A, V <sub>CC</sub> = 50V, I <sub>B1</sub> = I <sub>B2</sub> = 20mA
	t <sub>OFF</sub>	—	900	—		

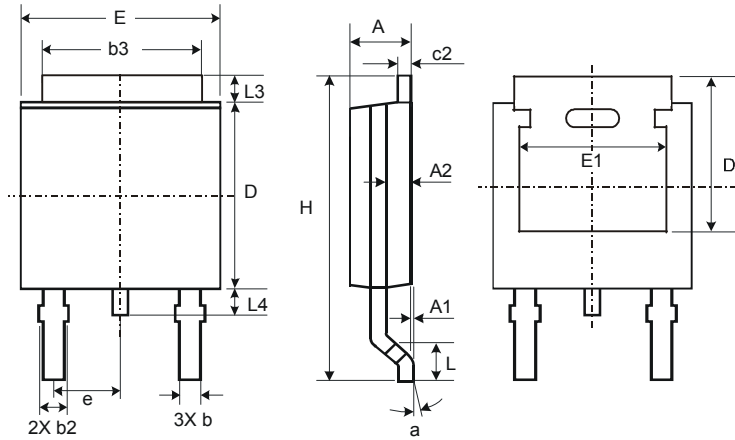
Notes: 11. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



## Package Outline Dimensions

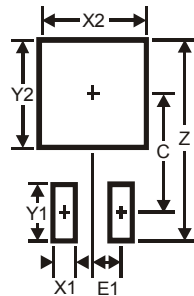
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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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