



**THE DATASHEET OF  
ZXT790AKTC**



## Features

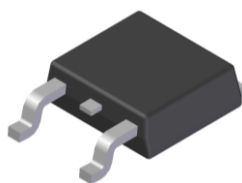
- $BV_{CEO} > -40V$
- $I_C = -3A$  High Continuous Collector Current
- $I_{CM} = -6A$  Peak Pulse Current
- High Gain Device  $>200 @ -1A$
- $R_{CE(SAT)} = 83m\Omega$  Typical
- Low Saturation Voltage
- **Lead-Free Finish; RoHS compliant (Note 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

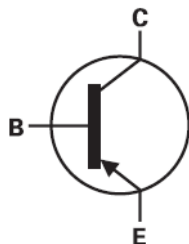
- Case: TO252 (DPAK)
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin; Solderable per MIL-STD-202, Method 208
- Weight: 0.34 grams (Approximate)

## Application

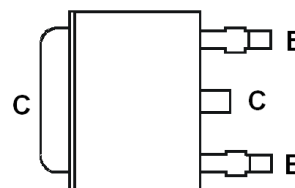
- DC-DC Converters
- MOSFET Gate Drivers
- Charging Circuits
- Power Switches
- Siren Drivers

**TO252 (DPAK)**


Top View



Device Schematic

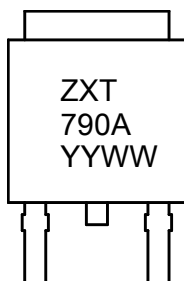

 Pin Out Configuration  
Top view

## Ordering Information (Note 4)

Product	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
ZXT790AKTC	ZXT790A	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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



ZXT790A = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY = Last Two Digits of Year (ex: 16 = 2016)  
 WW = Week Code (01 to 53)

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	BV <sub>CBO</sub>	-50	V
Collector-Emitter Voltage	BV <sub>CEO</sub>	-40	V
Emitter-Base Voltage	BV <sub>EBO</sub>	-7	V
Continuous Collector Current	I <sub>C</sub>	-3	A
Base Current	I <sub>B</sub>	-0.5	A
Peak Pulse Collector Current	I <sub>CM</sub>	-6	A

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

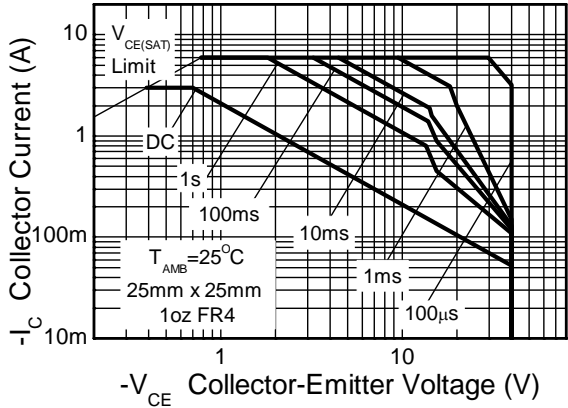
Characteristic	Symbol	Value	Unit
Power Dissipation	P <sub>D</sub>	(Note 5)	2.1
		(Note 6)	3.0
		(Note 7)	3.9
Thermal Resistance, Junction to Ambient Air	R <sub>θJA</sub>	(Note 5)	59
		(Note 6)	41
		(Note 7)	32
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**ESD Ratings** (Note 8)

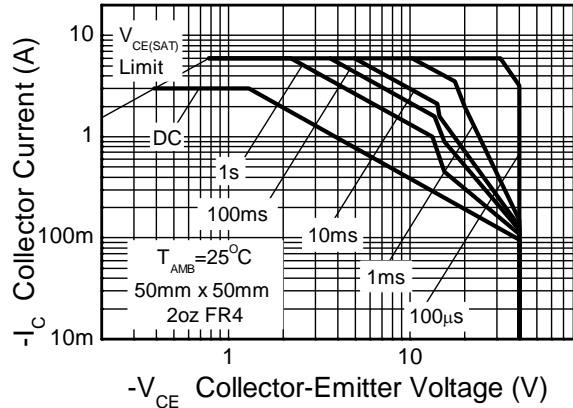
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge – Human Body Model	ESD HBM	4,000	V	3B
Electrostatic Discharge – Machine Model	ESD MM	400	V	C

- Notes:
5. 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.
  6. Same as note (5), except mounted on 50mm x 50mm 1oz copper.
  7. Same as note (5), except mounted on 50mm x 50mm 2oz copper.
  8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

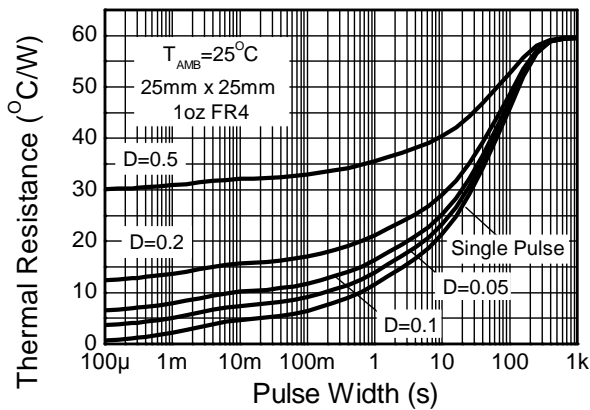
**Thermal Characteristics and Derating Information**



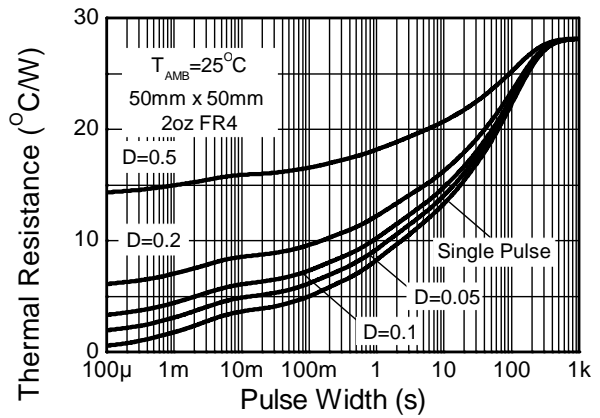
**Safe Operating Area**



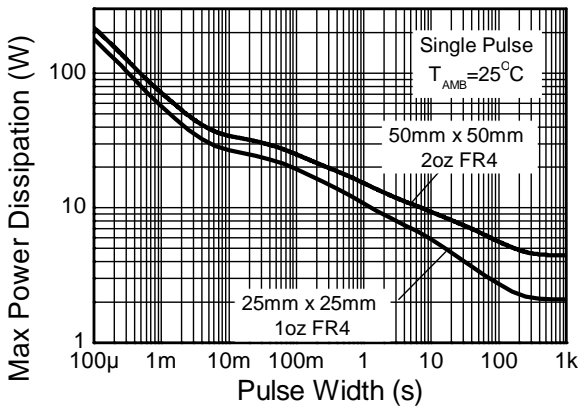
**Safe Operating Area**



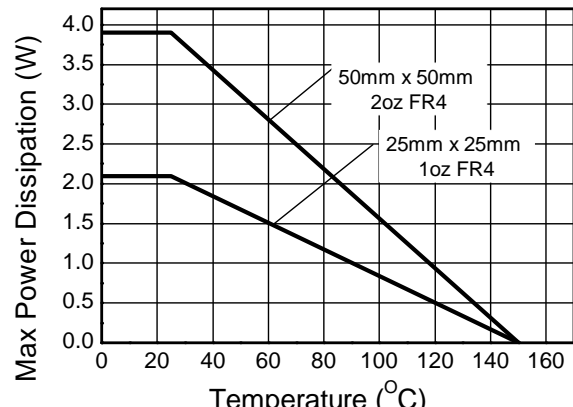
**Transient Thermal Impedance**



**Transient Thermal Impedance**



**Pulse Power Dissipation**



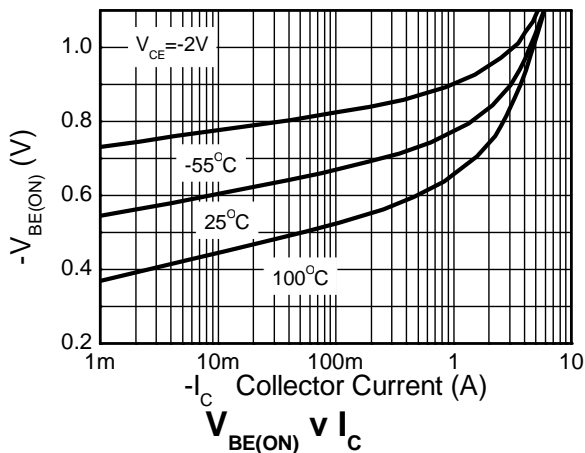
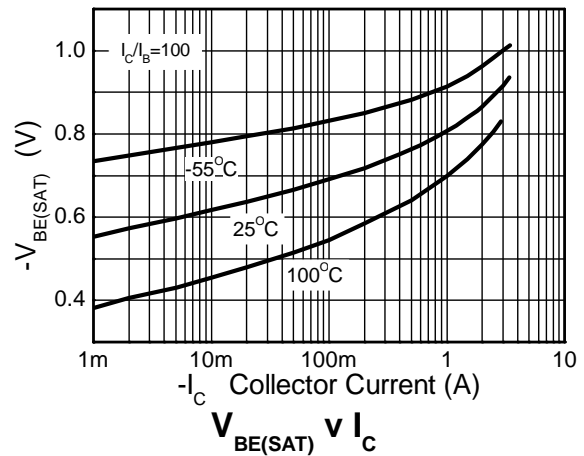
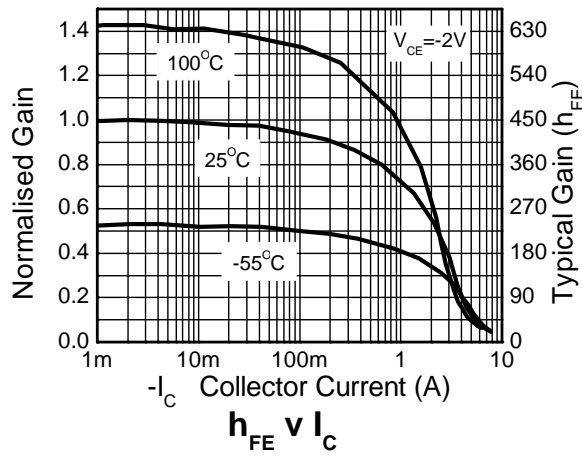
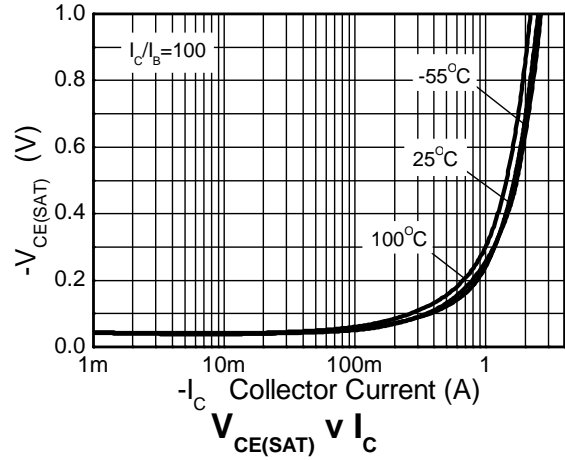
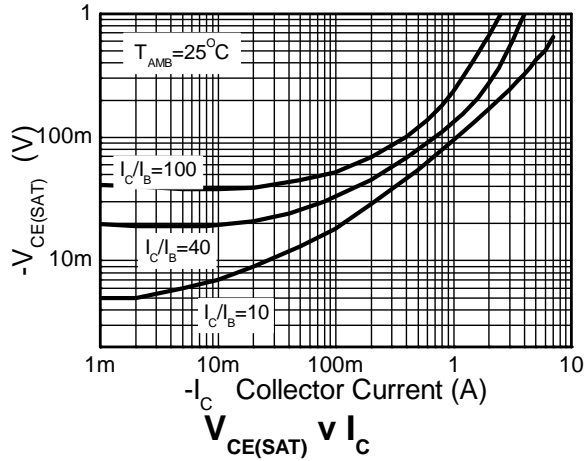
**Derating Curve**

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

Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-50	-70	—	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV <sub>CEO</sub>	-40	-60	—	V	I <sub>C</sub> = -10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-7	-8.3	—	V	I <sub>E</sub> = -100μA
Collector Cutoff Current	I <sub>CBO</sub>	—	<1	-20	nA	V <sub>CB</sub> = -30V
Emitter Cutoff Current	I <sub>EBO</sub>	—	<1	-20	nA	V <sub>EB</sub> = -6V
Emitter Cutoff Current	I <sub>CES</sub>	—	<1	-20	nA	V <sub>CB</sub> = -30V
DC Current Transfer Static Ratio (Note 9)	h <sub>FE</sub>	300 250 200 150 80	450 390 350 280 170	800 — — — —	—	I <sub>C</sub> = -10mA, V <sub>CE</sub> = -2V I <sub>C</sub> = -500mA, V <sub>CE</sub> = -2V I <sub>C</sub> = -1A, V <sub>CE</sub> = -2V I <sub>C</sub> = -2A, V <sub>CE</sub> = -2V I <sub>C</sub> = -3A, V <sub>CE</sub> = -2V
Collector-Emitter Saturation Voltage (Note 9)	V <sub>CE(SAT)</sub>	—	-110 -220 -260 -250	-170 -350 -450 -450	mV	I <sub>C</sub> = -0.5A, I <sub>B</sub> = -5mA I <sub>C</sub> = -1A, I <sub>B</sub> = -10mA I <sub>C</sub> = -2A, I <sub>B</sub> = -50mA I <sub>C</sub> = -3A, I <sub>B</sub> = -300mA
Base-Emitter Saturation Voltage (Note 9)	V <sub>BE(SAT)</sub>	—	-1.05	-1.15	V	I <sub>C</sub> = -3A, I <sub>B</sub> = -300mA
Base-Emitter Turn-On Voltage (Note 9)	V <sub>BE(ON)</sub>	—	-0.90	-1.0	V	I <sub>C</sub> = -3A, V <sub>CE</sub> = -2V
Transitional Frequency	f <sub>T</sub>	100	—	—	MHz	I <sub>C</sub> = -50mA, V <sub>CE</sub> = -5V f = 50MHz
Output Capacitance	C <sub>OBO</sub>	—	24	—	pF	V <sub>CB</sub> = -10V, f = 1MHz,
Switching Times	t <sub>ON</sub> t <sub>OFF</sub>	—	35 600	—	ns	I <sub>C</sub> = -500mA, V <sub>CC</sub> = -10V, I <sub>B1</sub> = -50mA I <sub>B2</sub> = 50mA

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

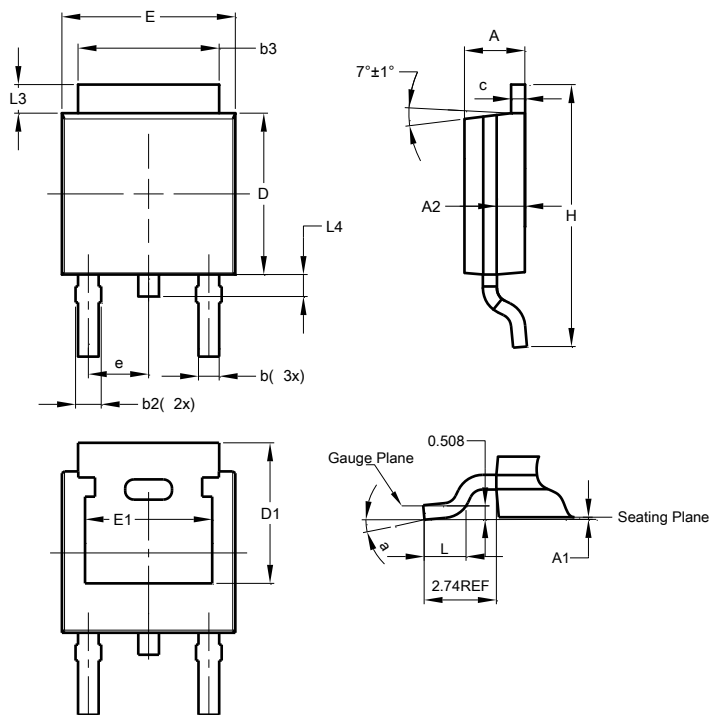
**Typical Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)



## Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**TO252 (DPAK)**

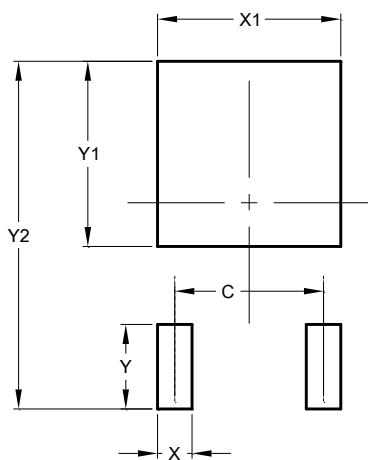


TO252 (DPAK)			
Dim	Min	Max	Typ
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	—	—
e	—	—	2.286
E	6.45	6.70	6.58
E1	4.32	—	—
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°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

## Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**TO252 (DPAK)**



Dimensions	Value (in mm)
C	4.572
X	1.060
X1	5.632
Y	2.600
Y1	5.700
Y2	10.700

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