

## Description

This Bipolar Junction Transistor (BJT) is designed to meet the stringent requirements of Automotive Applications.

## Features

- $BV_{CEO} > -60V$
- $R_{SAT} = 53m\Omega$  Typical
- Continuous Collector Current  $I_C = -6A$
- Up to -15A Peak Current
- Low Equivalent On Resistance
- Low Saturation Voltage
- High Gain Holds Up (100 Min @ -2A)
- **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)**

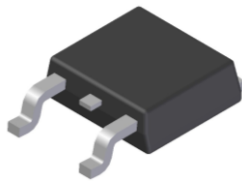
## Application

- DC-DC Converters
- Power Switches
- Motor Control
- Automotive Circuits
- Inverter Circuits

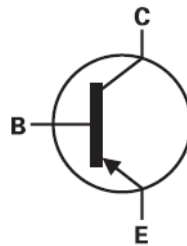
## Mechanical Data

- 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 (G3)
- Weight: 0.34 grams (Approximate)

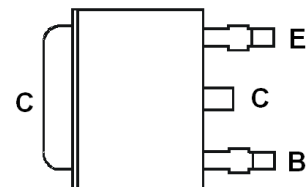
TO252 (DPAK)



Top View



Device Schematic



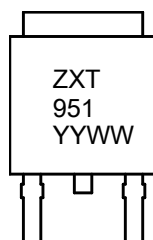
Pin Out Configuration  
Top view

## Ordering Information (Notes 4 & 5)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
ZXT951KQTC	Automotive	ZXT951	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-Q101 qualified and are PPAP capable. 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



ZXT951 = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY = Last Digit of Year (ex: 16 = 2016)  
 WW = Week Code (01 ~ 53)

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	BV <sub>CBO</sub>	-100	V
Collector-Base Voltage	BV <sub>CER</sub>	-100	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-60	V
Emitter-Base Voltage	V <sub>EBO</sub>	-7	V
Continuous Collector Current	I <sub>C</sub>	-6	A
Base Current	I <sub>B</sub>	-0.5	A
Peak Pulse Collector Current	I <sub>CM</sub>	-15	A

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

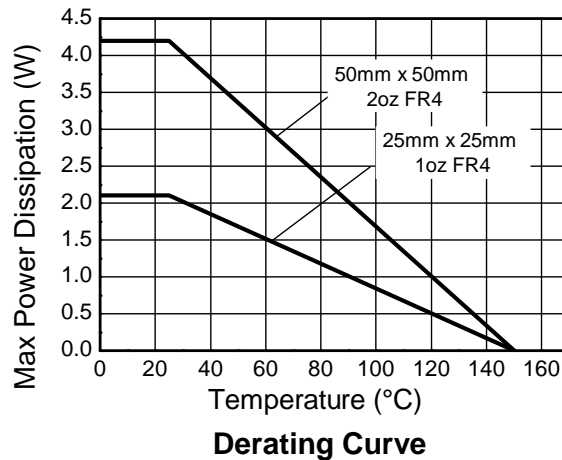
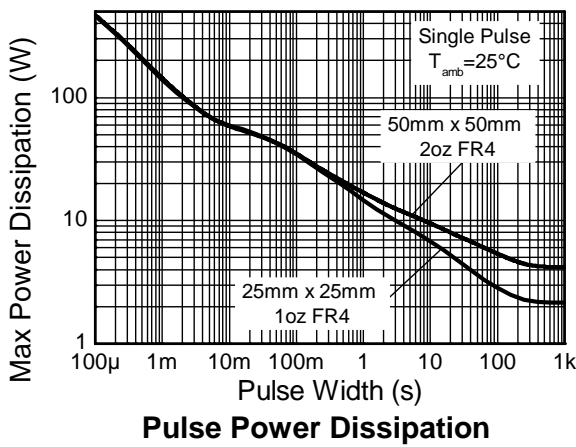
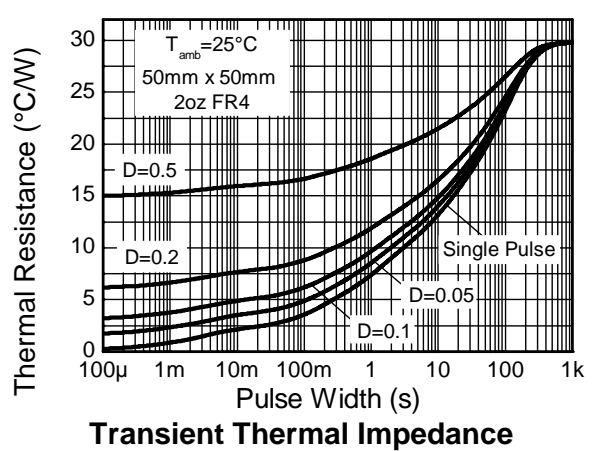
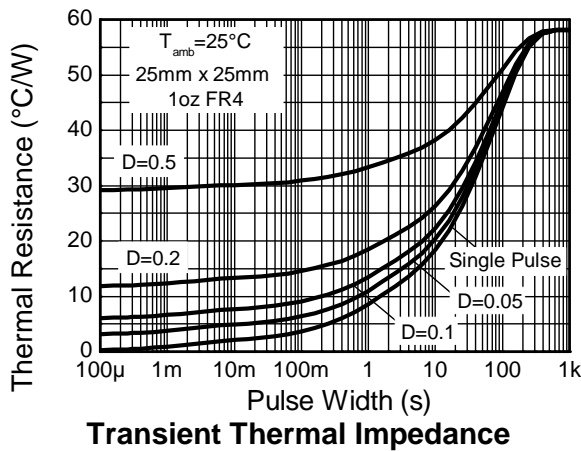
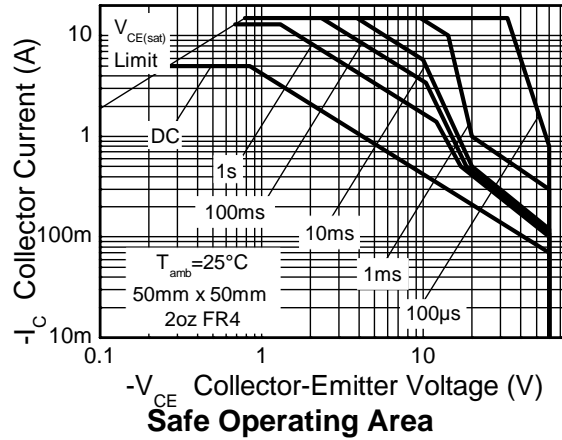
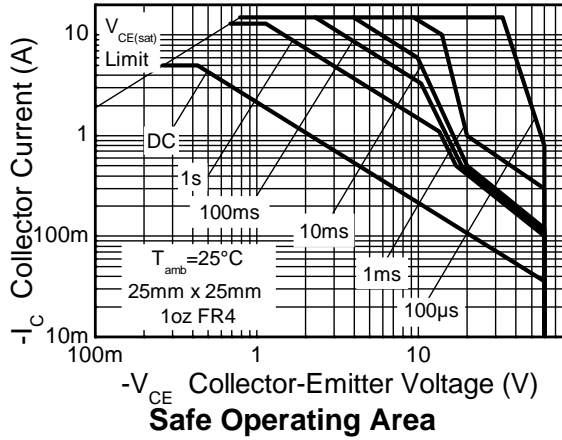
Characteristic	Symbol	Value	Unit
Power Dissipation	P <sub>D</sub>	(Note 6)	2.1
		(Note 7)	3.2
		(Note 8)	4.2
Thermal Resistance, Junction to Ambient Air	R <sub>θJA</sub>	(Note 6)	59
		(Note 7)	39
		(Note 8)	30
Thermal Resistance, Junction to Leads	R <sub>θJL</sub>	1.77	°C/W
Operating and Storage Temperature 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	8,000	V	3B
Electrostatic Discharge – Machine Model	ESD MM	400	V	C

- Notes:
6. For the device mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
  7. For the device mounted on 50mm x 50mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions
  8. For the device mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions
  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.

**Typical Thermal Characteristics**

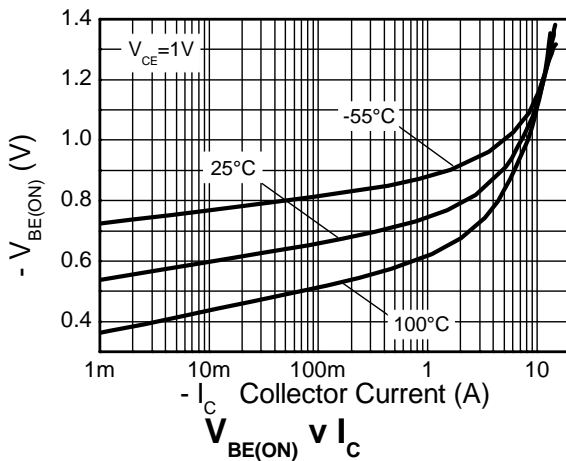
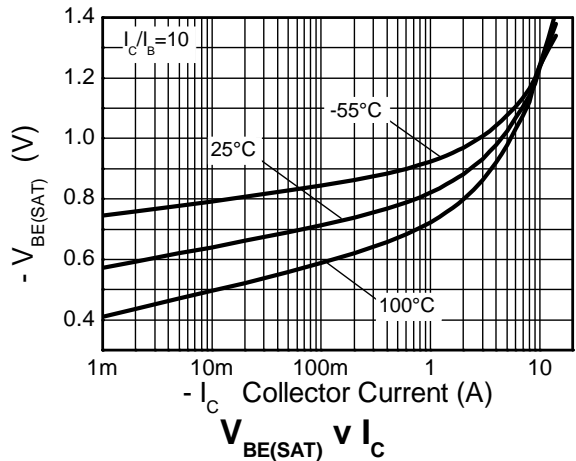
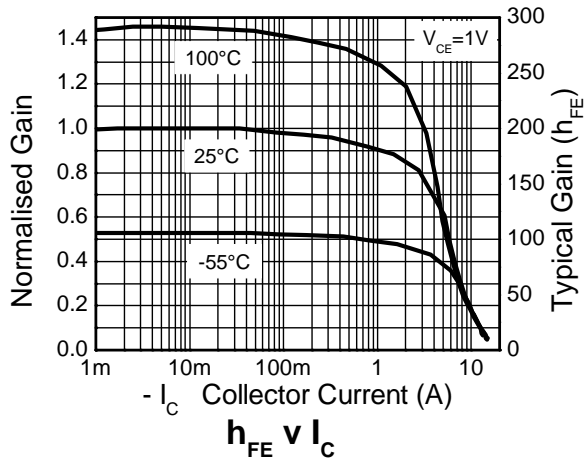
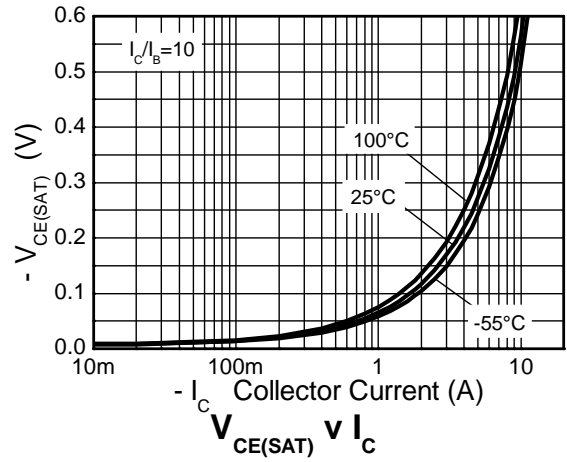
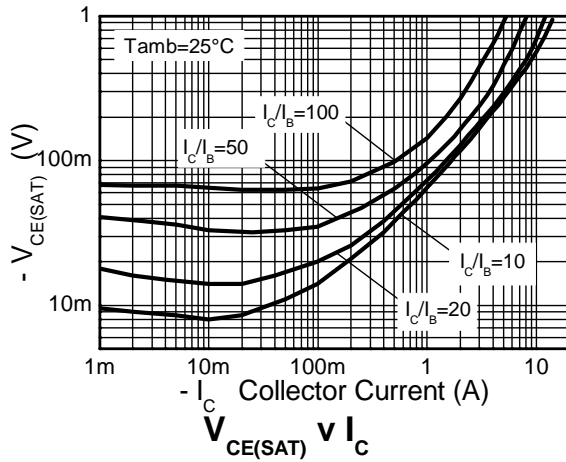


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-100	-125	—	V	I <sub>C</sub> = -100μA
Collector-Base Breakdown Voltage	BV <sub>CER</sub>	-100	-125	—	V	I <sub>C</sub> = -100μA, R <sub>BE</sub> ≤ 1kΩ
Collector-Emitter Breakdown Voltage (Note 11)	BV <sub>CEO</sub>	-60	-80	—	V	I <sub>C</sub> = -10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-7	-8.1	—	V	I <sub>E</sub> = -100μA
Collector Cutoff Current	I <sub>CBO</sub>	—	<1	-20	nA	V <sub>CB</sub> = -80V
Emitter Cutoff Current	I <sub>EBO</sub>	—	<1	-10	nA	V <sub>EB</sub> = -6V
Emitter Cutoff Current	I <sub>CER</sub>	—	<1	-20	nA	V <sub>CE</sub> = -80V, R <sub>BE</sub> ≤ 1kΩ
DC Current Transfer Static Ratio (Note 11)	h <sub>FE</sub>	100 100 50 15	230 200 110 40	— 300 — —	—	I <sub>C</sub> = -10mA, V <sub>CE</sub> = -1V I <sub>C</sub> = -2A, V <sub>CE</sub> = -1V I <sub>C</sub> = -6A, V <sub>CE</sub> = -1V I <sub>C</sub> = -10A, V <sub>CE</sub> = -1V
Collector-Emitter Saturation Voltage (Note 11)	V <sub>CE(SAT)</sub>	—	-13 -60 -115 -315	-25 -90 -165 -400	mV	I <sub>C</sub> = -0.1A, I <sub>B</sub> = -10mA I <sub>C</sub> = -1A, I <sub>B</sub> = -100mA I <sub>C</sub> = -2A, I <sub>B</sub> = -200mA I <sub>C</sub> = -6A, I <sub>B</sub> = -600mA
Base-Emitter Saturation Voltage (Note 11)	V <sub>BE(SAT)</sub>	—	-1.05	-1.2	V	I <sub>C</sub> = -6A, I <sub>B</sub> = -600mA
Base-Emitter Turn-On Voltage (Note 11)	V <sub>BE(ON)</sub>	—	-0.92	-1.05	V	I <sub>C</sub> = -6A, V <sub>CE</sub> = -1V
Transitional Frequency	f <sub>T</sub>	—	120	—	MHz	I <sub>C</sub> = -100mA, V <sub>CE</sub> = -10V f = 50MHz
Output Capacitance	C <sub>OBO</sub>	—	74	—	pF	V <sub>CB</sub> = -10V, f = 1MHz,
Switching Times	t <sub>ON</sub> t <sub>OFF</sub>	—	82 350	—	ns	I <sub>C</sub> = -2A, V <sub>CC</sub> = -10V, I <sub>B1</sub> = I <sub>B2</sub> = -200mA

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

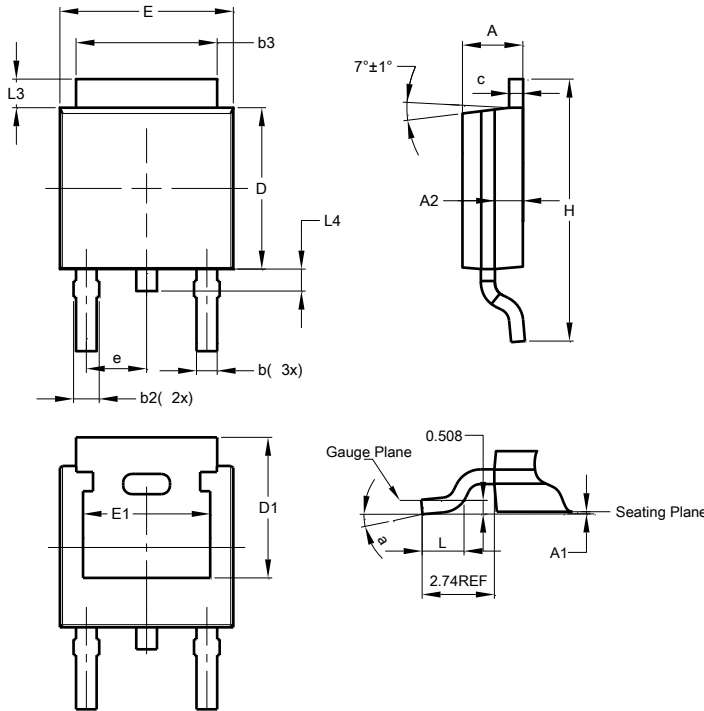
**Typical Electrical Characteristics**



**Package Outline Dimensions**

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

**TO252 (DPAK)**

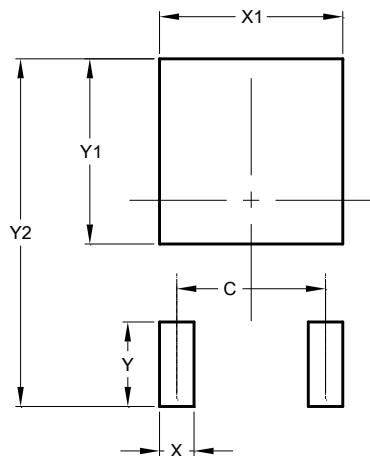


TO252 (DPAK)			
Dim	Min	Max	Typ
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	-	-
e	-	-	2.286
E	6.45	6.70	6.58
E1	4.32	-	-
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°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