60V PNP LOW SATURATION MEDIUM POWER TRANSISTOR

Description

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

Features

- BV_{CEO} > -60V
- R_{SAT} = 53mΩ 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)**

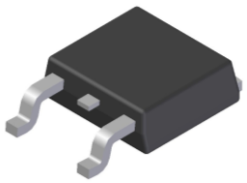
Application

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

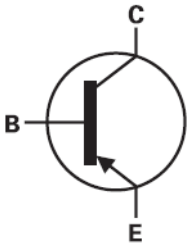
Mechanical Data

- 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 e3
- Weight: 0.34 grams (Approximate)

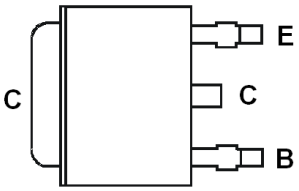
TO252 (DPAK)



Top View



Device Schematic



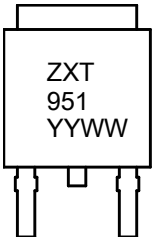
Pin Out Configuration
Top view

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 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/.
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_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	BV_{CBO}	-100	V
Collector-Base Voltage	BV_{CER}	-100	V
Collector-Emitter Voltage	V_{CEO}	-60	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-6	A
Base Current	I_B	-0.5	A
Peak Pulse Collector Current	I_{CM}	-15	A

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

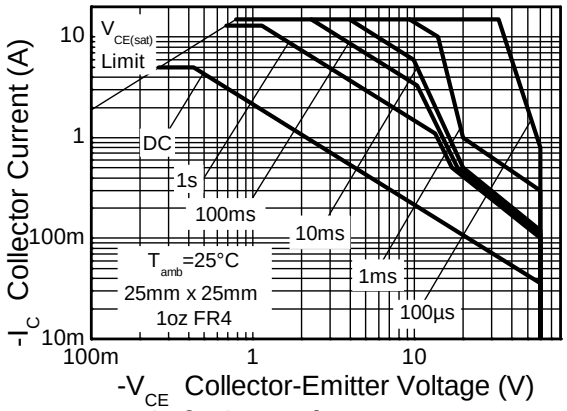
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 6)	P_D	2.1	W
	(Note 7)		3.2	
	(Note 8)		4.2	
Thermal Resistance, Junction to Ambient Air	(Note 6)	$R_{\theta JA}$	59	°C/W
	(Note 7)		39	
	(Note 8)		30	
Thermal Resistance, Junction to Leads	(Note 9)	$R_{\theta JL}$	1.77	°C/W
Operating and Storage Temperature Range		T_J,T_{STG}	-55 to +150	°C

ESD Ratings (Note 10)

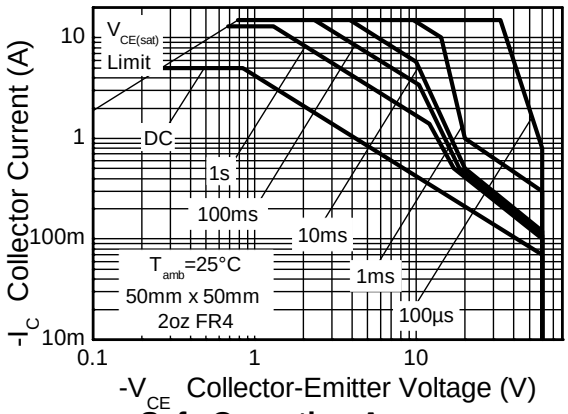
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge – Human Body Model	ESD HBM	8,000	V	3B
Electrostatic Discharge – Machine Model	ESD MM	400	V	C

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.

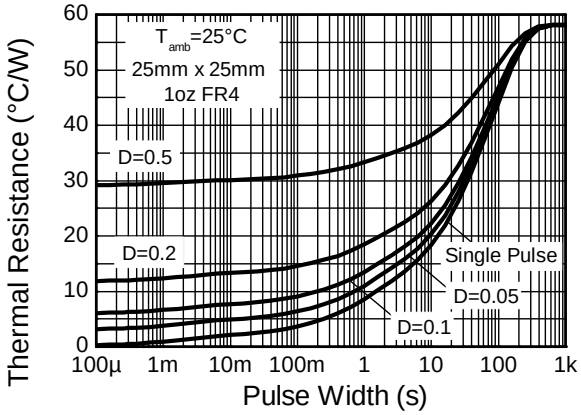
Typical Thermal Characteristics



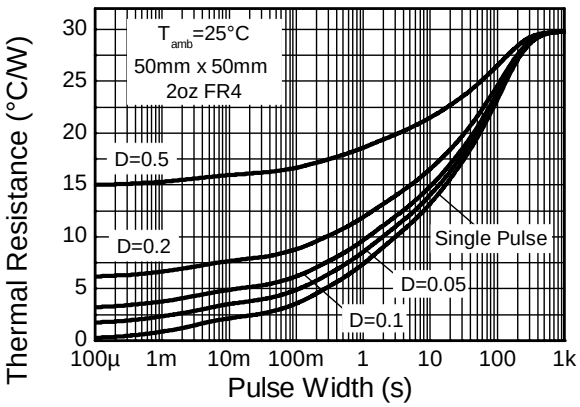
Safe Operating Area



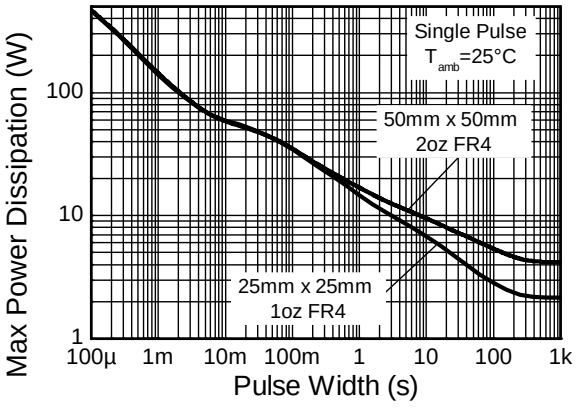
Safe Operating Area



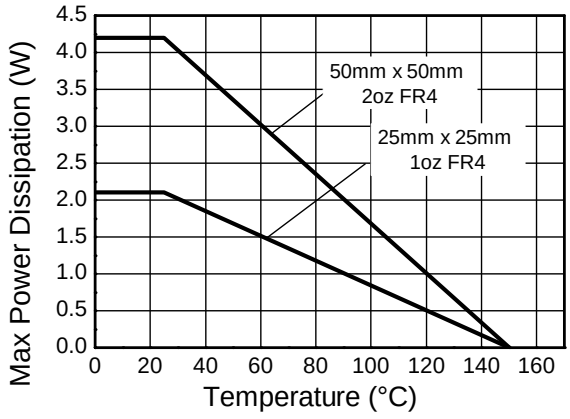
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



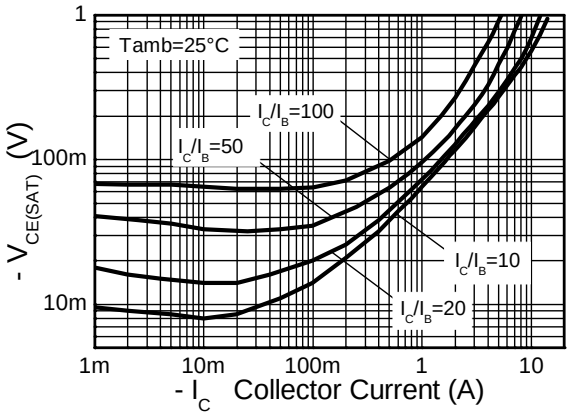
Derating Curve

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

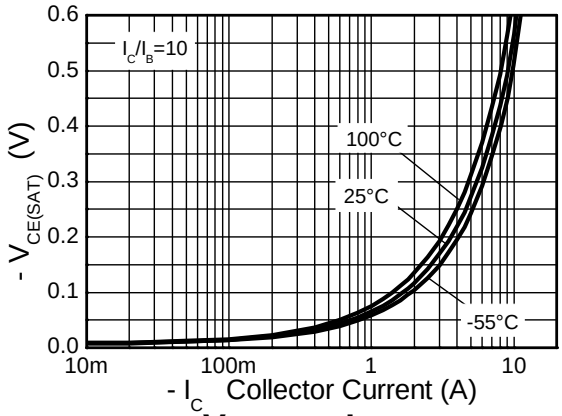
Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-100	-125	—	V	I_C = -100µA
Collector-Base Breakdown Voltage	BV_{CER}	-100	-125	—	V	I_C = -100µA, R_{BE} ≤1kΩ
Collector-Emitter Breakdown Voltage (Note 11)	BV_{CEO}	-60	-80	—	V	I_C = -10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.1	—	V	I_E = -100µA
Collector Cutoff Current	I_{CBO}	—	<1	-20	nA	V_{CB} = -80V
Emitter Cutoff Current	I_{EBO}	—	<1	-10	nA	V_{EB} = -6V
Emitter Cutoff Current	I_{CER}	—	<1	-20	nA	V_{CE} = -80V, R_{BE} ≤1kΩ
DC Current Transfer Static Ratio (Note 11)	h_{FE}	100 100 50 15	230 200 110 40	— 300 — —	—	I_C = -10mA, V_{CE} = -1V I_C = -2A, V_{CE} = -1V I_C = -6A, V_{CE} = -1V I_C = -10A, V_{CE} = -1V
Collector-Emitter Saturation Voltage (Note 11)	$V_{CE(SAT)}$	—	-13 -60 -115 -315	-25 -90 -165 -400	mV	I_C = -0.1A, I_B = -10mA I_C = -1A, I_B = -100mA I_C = -2A, I_B = -200mA I_C = -6A, I_B = -600mA
Base-Emitter Saturation Voltage (Note 11)	$V_{BE(SAT)}$	—	-1.05	-1.2	V	I_C = -6A, I_B = -600mA
Base-Emitter Turn-On Voltage (Note 11)	$V_{BE(ON)}$	—	-0.92	-1.05	V	I_C = -6A, V_{CE} = -1V
Transitional Frequency	f_T	—	120	—	MHz	I_C = -100mA, V_{CE} = -10V f = 50MHz
Output Capacitance	C_{OBO}	—	74	—	pF	V_{CB} = -10V, f = 1MHz,
Switching Times	t_{ON} t_{OFF}	—	82 350	—	ns	I_C = -2A, V_{CC} = -10V, I_{B1} = I_{B2} = -200mA

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

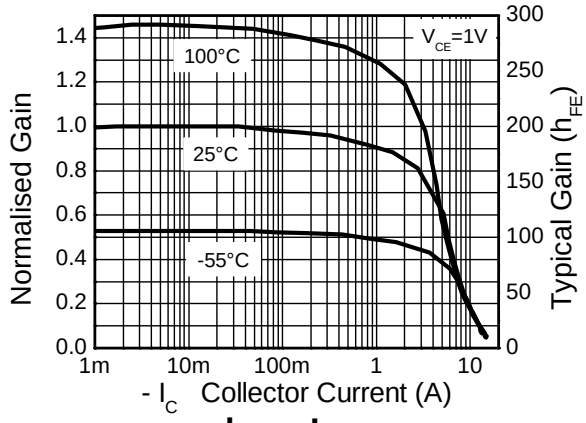
Typical Electrical Characteristics



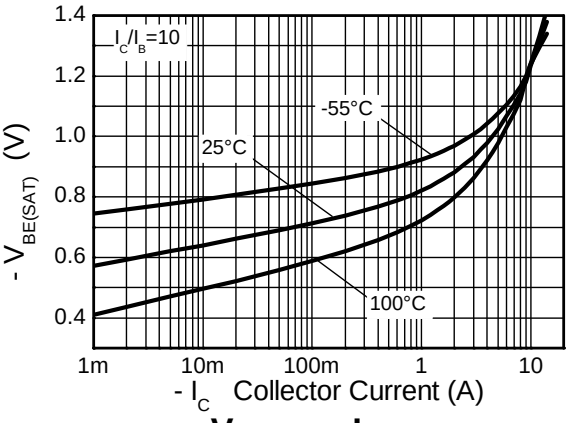
$V_{CE(SAT)}$ v I_C



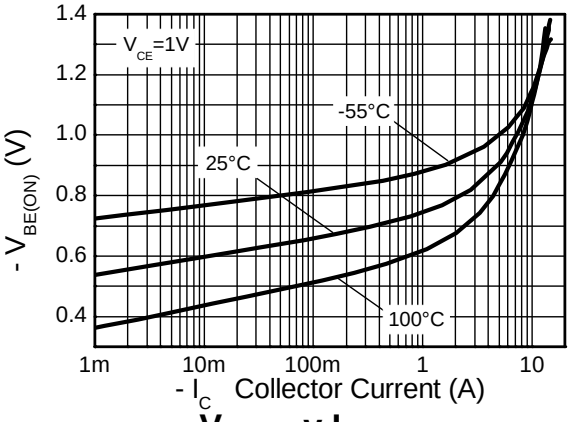
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



$V_{BE(SAT)}$ v I_C

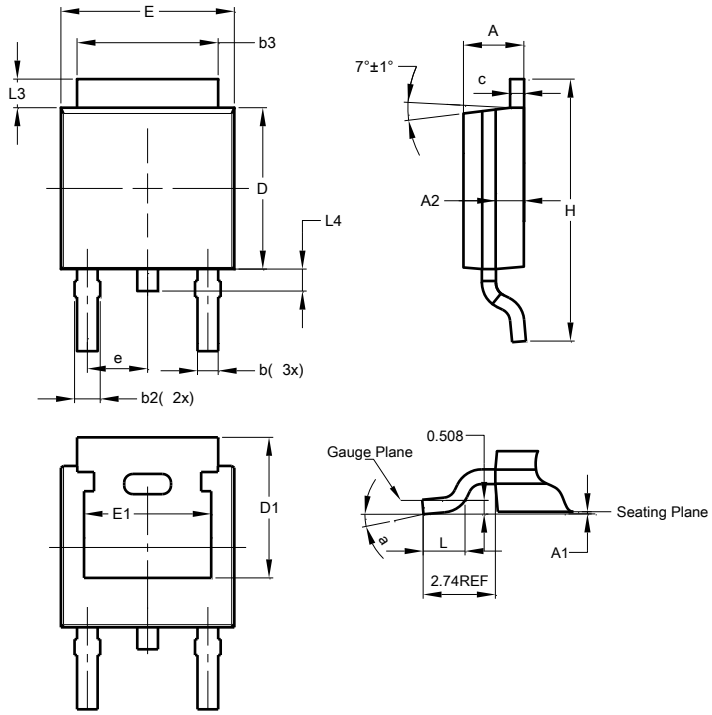


$V_{BE(ON)}$ v I_C

Package Outline Dimensions

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

TO252 (DPAK)

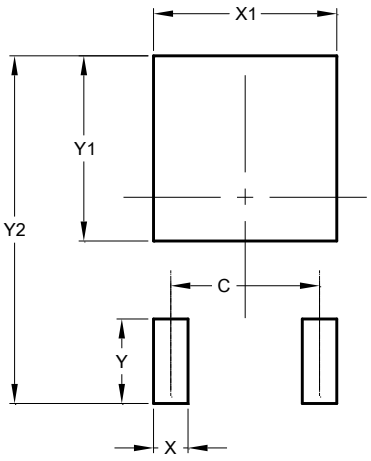


TO252 (DPAK)			
Dim	**Min**	**Max**	**Typ**
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	–	–
e	–	–	2.286
E	6.45	6.70	6.58
E1	4.32	–	–
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02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