

**ZX5T1951G**

**60V PNP MEDIUM POWER TRANSISTOR IN SOT223**

**Features**

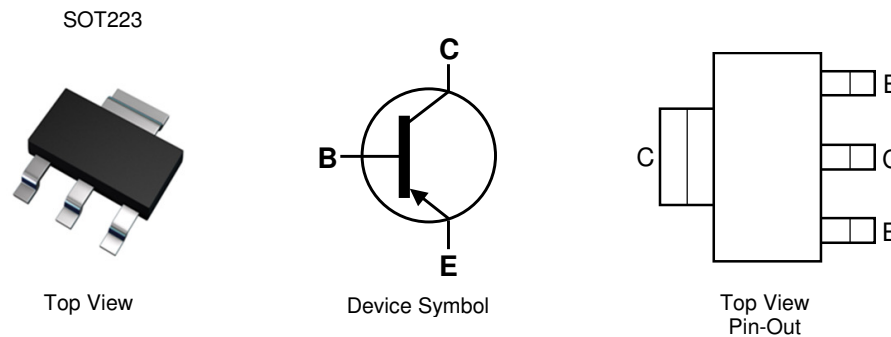
- $BV_{CEO} > -60V$
- $I_C = -6A$  Continuous Collector Current
- Low Saturation Voltage  $V_{CE(sat)} < -95mV$  max @ -1A
- $R_{CE(sat)} = 40m\Omega$  for a low Equivalent On-Resistance
- $h_{FE}$  Specified up to -10A for a High Gain Hold-Up
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

**Mechanical Data**

- Case: SOT223
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads; Solderable per MIL-STD-202, Method 208 ③
- Weight: 0.112 grams (Approximate)

**Applications**

- Motor Driving
- DC-DC Modules
- Backlight Inverters
- Actuator, Relay, and Solenoid Drivers

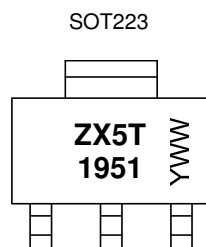


**Ordering Information** (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZX5T1951GTA	ZX5T1951	7	12	1,000

- 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**



ZX5T1951 = Product Type Marking Code  
 YYWW = Date Code Marking  
 Y or  $\bar{Y}$  = Last Digit of Year (ex: 5= 2015)  
 WW or  $\bar{W}W$  = 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>	-90	V
Collector-Emitter Voltage	V <sub>CES</sub>	-90	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-60	V
Emitter-Base Voltage	V <sub>EBO</sub>	-7	V
Continuous Collector Current (Note 5)	I <sub>C</sub>	-6	A
Peak Pulse Current	I <sub>CM</sub>	-15	A
Base Current	I <sub>B</sub>	-1	A

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

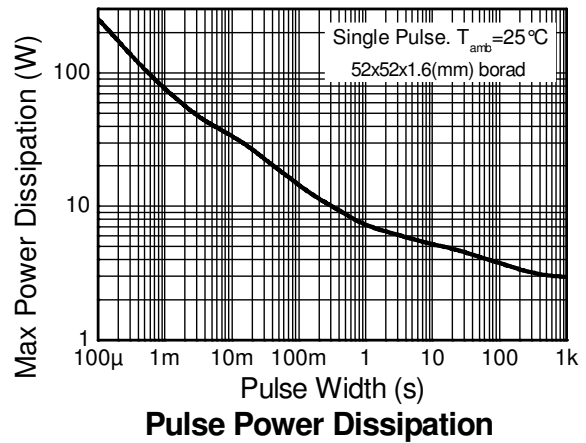
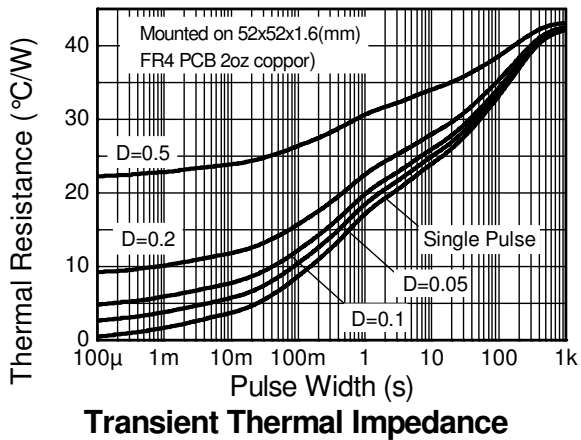
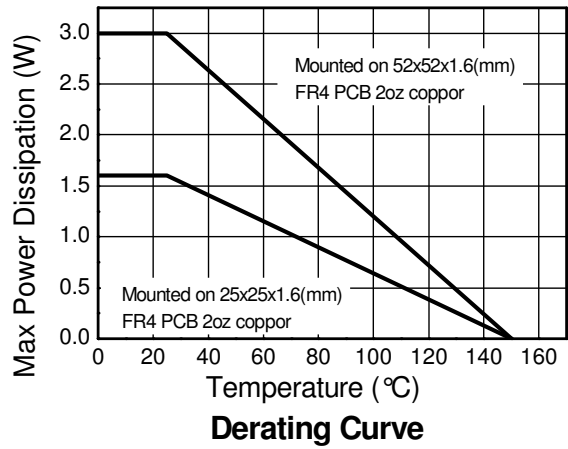
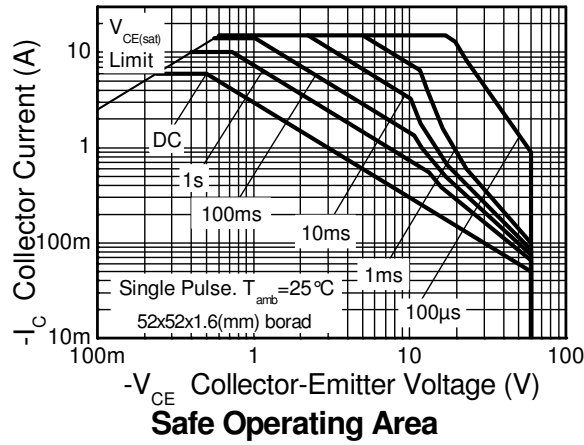
Characteristic	Symbol	Value	Unit
Power Dissipation Linear Derating Factor	P <sub>D</sub>	3.0 24	W mW / °C
		(Note 5)	
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	1.6 12.8	°C/W
		(Note 6)	
Thermal Resistance Junction to Lead	R <sub>θJL</sub>	42 78	°C/W
		(Note 7)	
Operating and Storage Temperature 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	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
5. For a device mounted with the collector lead on 52mm x 52mm 2oz 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 the device is mounted on 25mm x 25mm 1oz copper.
  7. Thermal resistance from junction to solder-point (at the end of the collector lead).
  8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

**Thermal Characteristics**

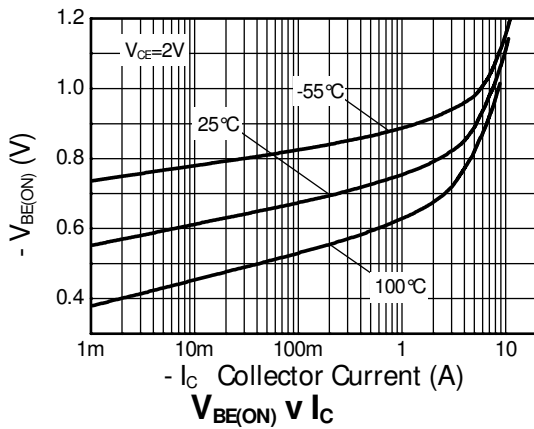
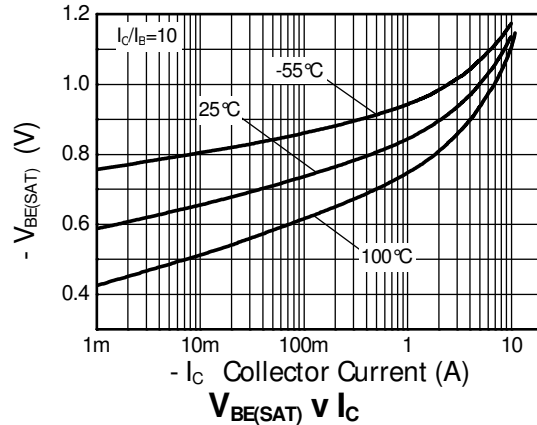
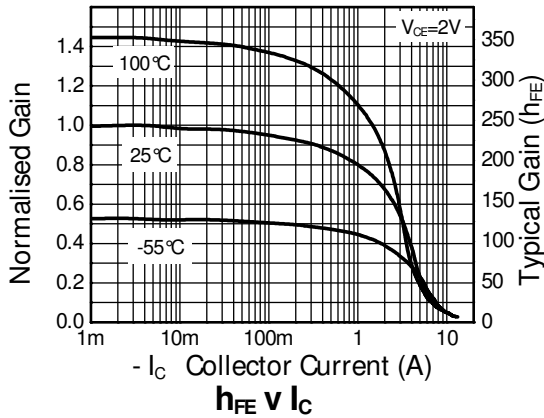
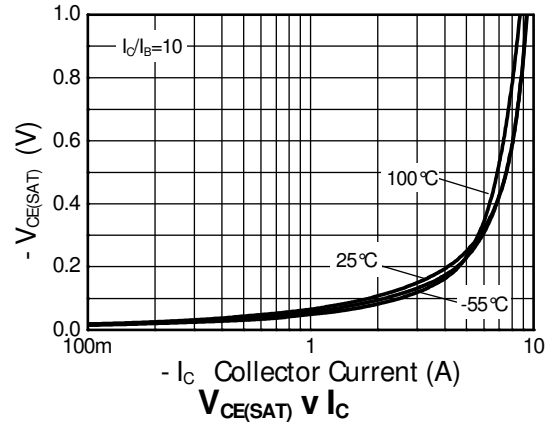
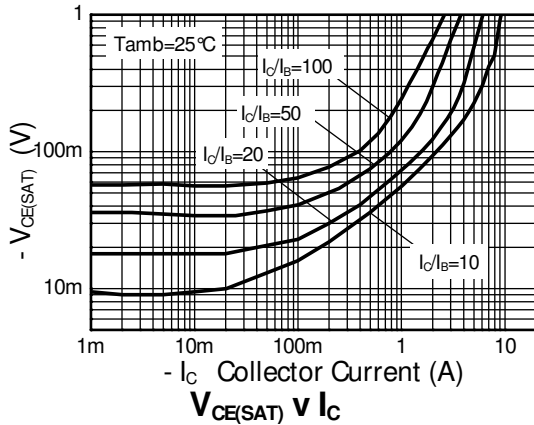


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-90	-120	-	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage	BV <sub>CES</sub>	-90	-120	-	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV <sub>CEO</sub>	-60	-80	-	V	I <sub>C</sub> = -10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-7	-8	-	V	I <sub>E</sub> = -100μA
Collector-Base Cut-Off Current	I <sub>CBO</sub>	-	<1	-50	nA	V <sub>CB</sub> = -72V
Collector-Emitter Cut-Off Current	I <sub>CES</sub>	-	<1	-50	nA	V <sub>CB</sub> = -72V
Emitter Cutoff Current	I <sub>EBO</sub>	-	<1	-10	nA	V <sub>EB</sub> = -6V
Static Forward Current Transfer Ratio (Note 9)	h <sub>FE</sub>	100	240	-	-	I <sub>C</sub> = -10mA, V <sub>CE</sub> = -2V
		100	180	300		I <sub>C</sub> = -2A, V <sub>CE</sub> = -2V
		40	70	-		I <sub>C</sub> = -5A, V <sub>CE</sub> = -2V
		5	14	-		I <sub>C</sub> = -10A, V <sub>CE</sub> = -2V
Collector-Emitter Saturation Voltage (Note 9)	V <sub>CE(sat)</sub>	-	-16	-30	mV	I <sub>C</sub> = -100mA, I <sub>B</sub> = -10mA
		-	-55	-95		I <sub>C</sub> = -1A, I <sub>B</sub> = -100mA
		-	-85	-130		I <sub>C</sub> = -2A, I <sub>B</sub> = -200mA
		-	-200	-260		I <sub>C</sub> = -5A, I <sub>B</sub> = -500mA
Base-Emitter Saturation Voltage (Note 9)	V <sub>BE(sat)</sub>	-	-1	-1.15	V	I <sub>C</sub> = -5A, I <sub>B</sub> = -500mA
Base-Emitter Turn-On Voltage (Note 9)	V <sub>BE(on)</sub>	-	-0.89	-1.0	V	I <sub>C</sub> = -5A, V <sub>CE</sub> = -2V
Output Capacitance (Note 9)	C <sub>obo</sub>	-	33	70	pF	V <sub>CB</sub> = -10V, f = 1MHz
Transition Frequency	f <sub>T</sub>	-	120	-	MHz	V <sub>CE</sub> = -10V, I <sub>C</sub> = -100mA f = 50MHz
Switching Time	t <sub>on</sub>	-	33	80	ns	V <sub>CC</sub> = -10V, I <sub>C</sub> = -2A I <sub>B1</sub> = -I <sub>B2</sub> = -200mA
	t <sub>off</sub>	-	215	300		

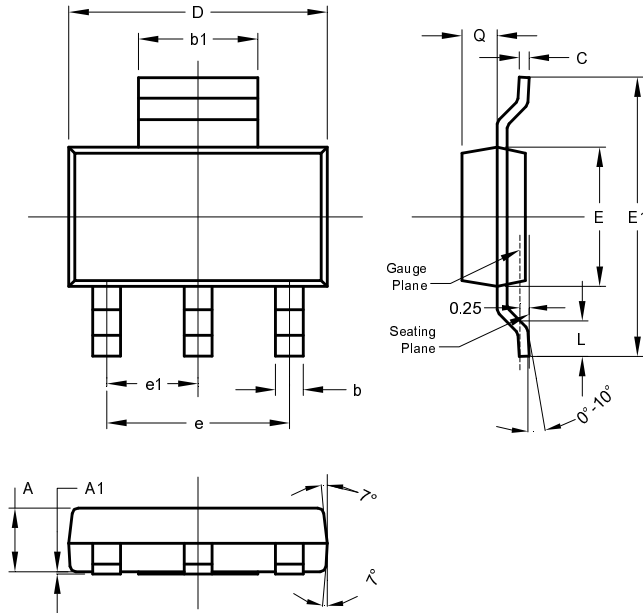
Note: 9. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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



**Package Outline Dimensions**

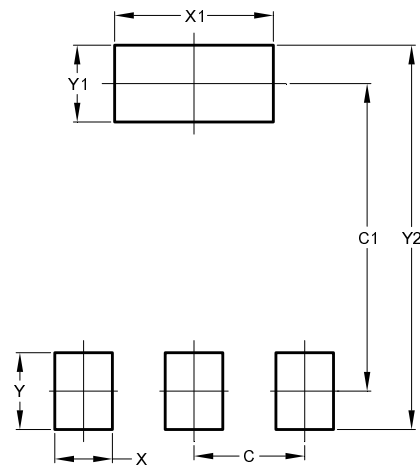
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	-	-	4.60
e1	-	-	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
<b>All Dimensions in mm</b>			

**Suggested Pad Layout**

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



Dimensions	Value (in mm)
C	2.30
C1	6.40
X	1.20
X1	3.30
Y	1.60
Y1	1.60
Y2	8.00

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