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
- $R_{CE(sat)}$ = 40mΩ 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**

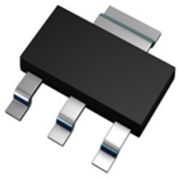
Mechanical Data

- 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 e3
- Weight: 0.112 grams (Approximate)

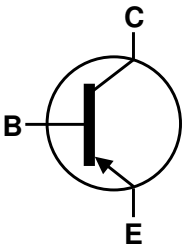
Applications

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

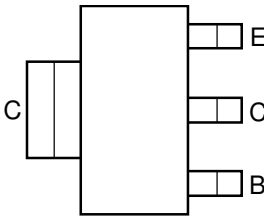
SOT223



Top View



Device Symbol



Top View
Pin-Out

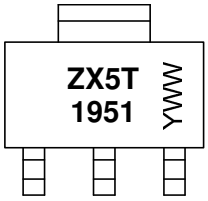
Ordering Information (Note 4)

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 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

SOT223



ZX5T1951 = Product Type Marking Code
YWW = Date Code Marking
Y or $\overline{Y}$ = Last Digit of Year (ex: 5= 2015)
WW or $\overline{W}W$ = Week Code (01~53)

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Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-90	V
Collector-Emitter Voltage	V_{CES}	-90	V
Collector-Emitter Voltage	V_{CEO}	-60	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current (Note 5)	I_C	-6	A
Peak Pulse Current	I_{CM}	-15	A
Base Current	I_B	-1	A

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

Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 5)	P_D	3.0 24	W mW /°C
	(Note 6)		1.6 12.8	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	42	°C/W
	(Note 6)	$R_{\theta JA}$	78	
Thermal Resistance Junction to Lead	(Note 7)	$R_{\theta JL}$	12.3	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

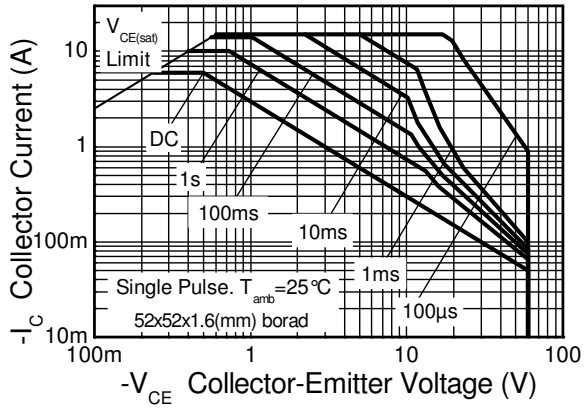
ESD Ratings (Note 8)

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

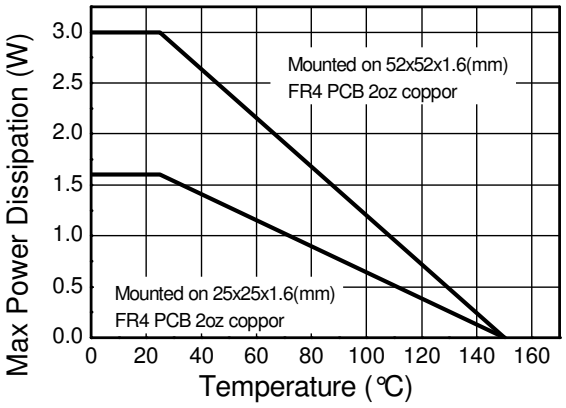
Notes:
5. For a device mounted with the collector lead on 52mm x 52mm 2oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
6. Same as Note 5, except the device is mounted on 25mm x 25mm 1oz copper.
7. Thermal resistance from junction to solder-point (at the end of the collector lead).
8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

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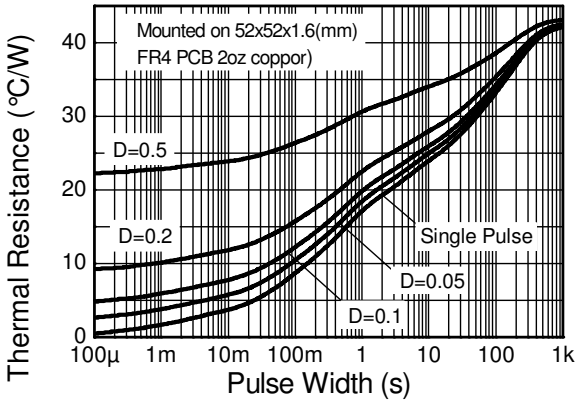
Thermal Characteristics



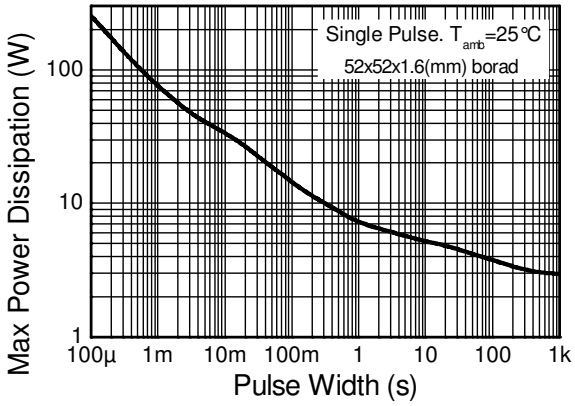
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

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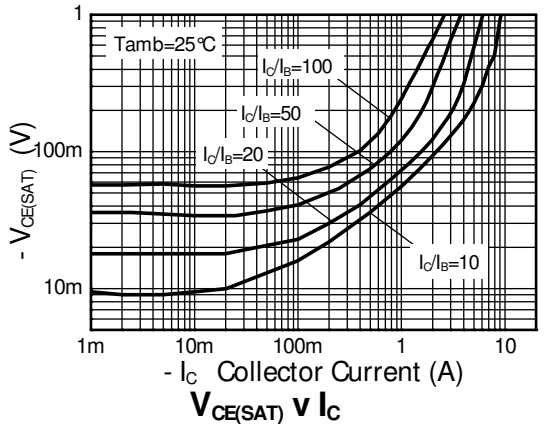
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-90	-120	-	V	I_C = -100µA
Collector-Emitter Breakdown Voltage	BV_{CES}	-90	-120	-	V	I_C = -100µA
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	-60	-80	-	V	I_C = -10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8	-	V	I_E = -100µA
Collector-Base Cut-Off Current	I_{CBO}	-	<1	-50	nA	V_{CB} = -72V
Collector-Emitter Cut-Off Current	I_{CES}	-	<1	-50	nA	V_{CB} = -72V
Emitter Cutoff Current	I_{EBO}	-	<1	-10	nA	V_{EB} = -6V
Static Forward Current Transfer Ratio (Note 9)	h_{FE}	100	240	-	-	I_C = -10mA, V_{CE} = -2V
		100	180	300		I_C = -2A, V_{CE} = -2V
		40	70	-		I_C = -5A, V_{CE} = -2V
		5	14	-		I_C = -10A, V_{CE} = -2V
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	-	-16	-30	mV	I_C = -100mA, I_B = -10mA
		-	-55	-95		I_C = -1A, I_B = -100mA
		-	-85	-130		I_C = -2A, I_B = -200mA
		-	-200	-260		I_C = -5A, I_B = -500mA
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(sat)}$	-	-1	-1.15	V	I_C = -5A, I_B = -500mV
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(on)}$	-	-0.89	-1.0	V	I_C = -5A, V_{CE} = -2V
Output Capacitance (Note 9)	C_{obo}	-	33	70	pF	V_{CB} = -10V. f = 1MHz
Transition Frequency	f_T	-	120	-	MHz	V_{CE} = -10V, I_C = -100mA f = 50MHz
Switching Time	t_{on}	-	33	80	ns	V_{CC} = -10V, I_C = -2A
	t_{off}	-	215	300		I_{B1} = -I_{B2} = -200mA

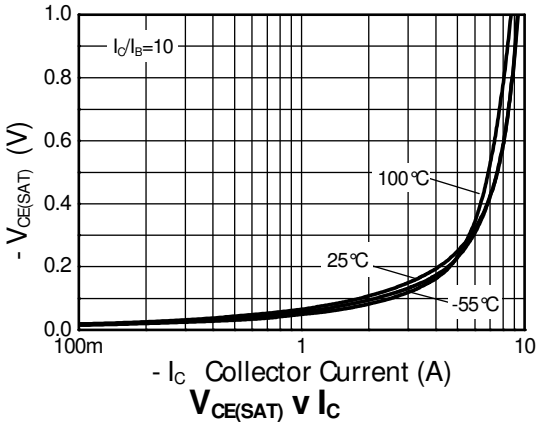
Note: 9. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

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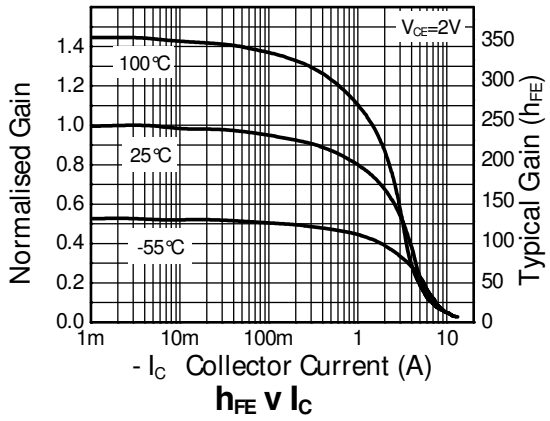
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



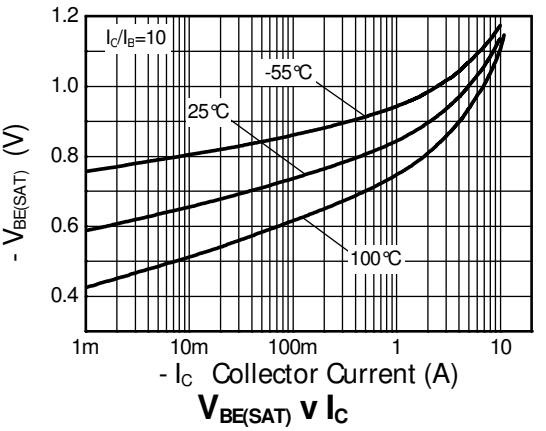
$V_{CE(SAT)}$ v I_C



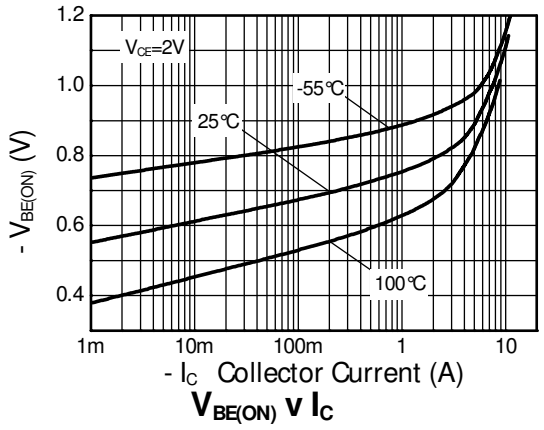
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



$V_{BE(SAT)}$ v I_C

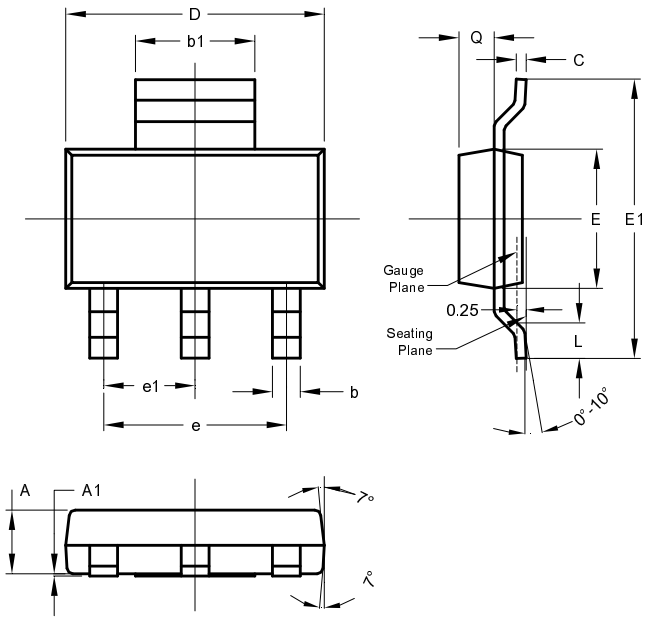


$V_{BE(ON)}$ v I_C

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Package Outline Dimensions

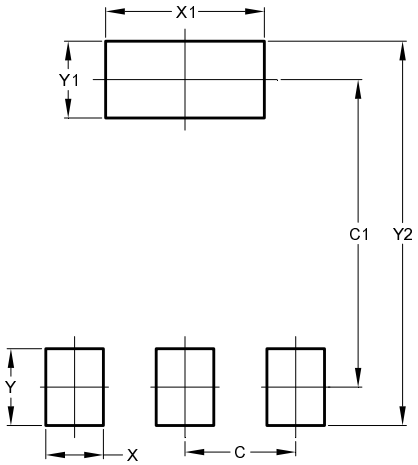
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



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
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)
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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