

Features

- $BV_{CEO} > -30V$
- $I_C = -5.5A$ High Continuous Collector Current
- $I_{CM} = -20A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)}$
- Exceptional Gain Linearity down to $-10mA$
- **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)

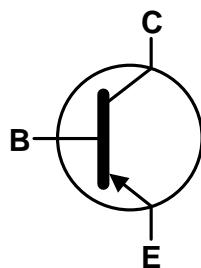
Applications

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

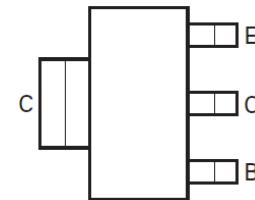
SOT223



Top View



Device Symbol



Top View
Pin-Out

Ordering Information (Notes 4)

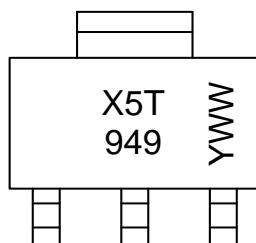
Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZX5T949GTA	AEC-Q101	X5T949	7	12	1,000

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



X5T 949 = Product Type Marking Code

YWW = Date Code Marking

Y or \overline{Y} = Last Digit of Year (ex: 5= 2015)

WW or \overline{WW} = Week Code (01~53)

Absolute Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-50	V
Collector-Emitter Voltage	V_{CEO}	-30	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-5.5	A
Peak Pulse Current	I_{CM}	-20	A

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	3.0	W mW /°C
		24	
Linear Derating Factor (Note 6)		1.6	°C/W
		12.8	
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	42	
		78	
Thermal Resistance Junction to Lead	$R_{\theta JL}$	8.84	
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

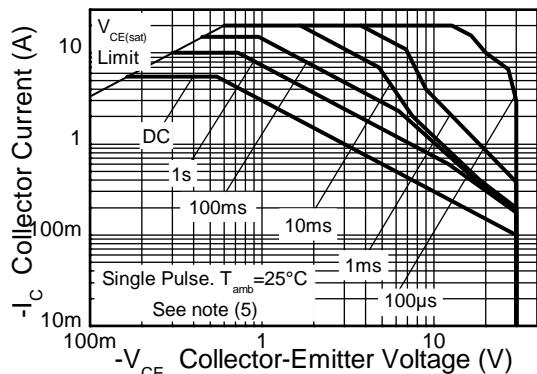
ESD Ratings (Note 8)

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

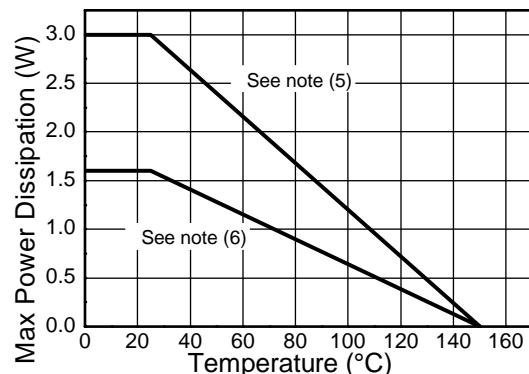
Notes:

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 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.

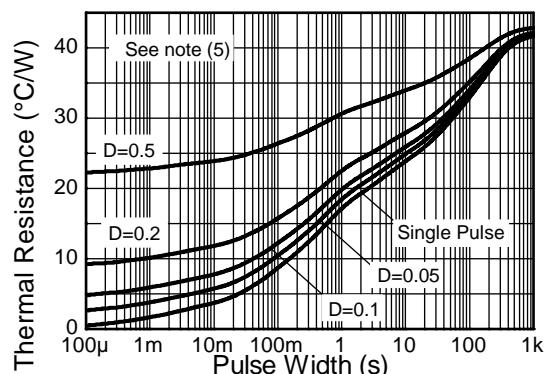
Thermal Characteristics and Derating Information



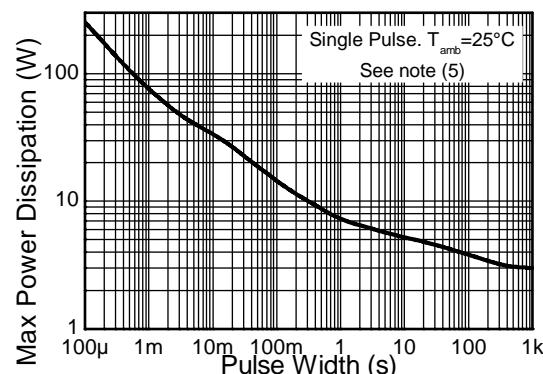
Safe Operating Area



Derating Curve



Transient Thermal Impedance



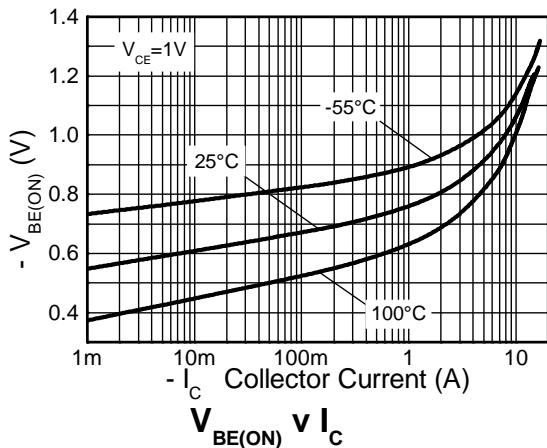
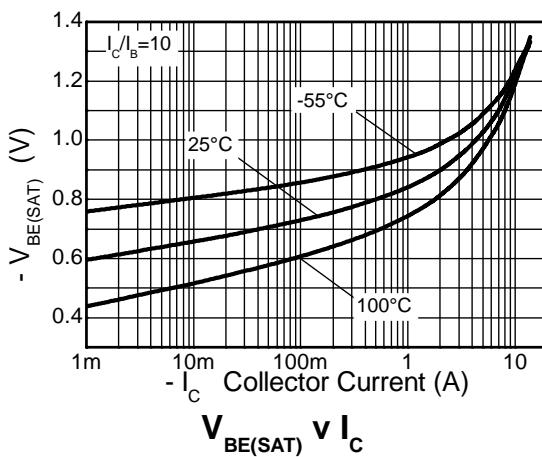
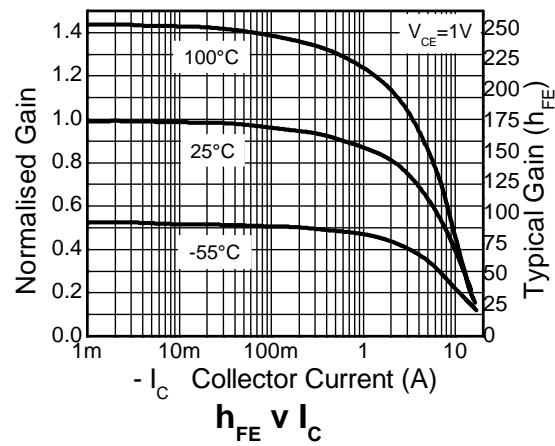
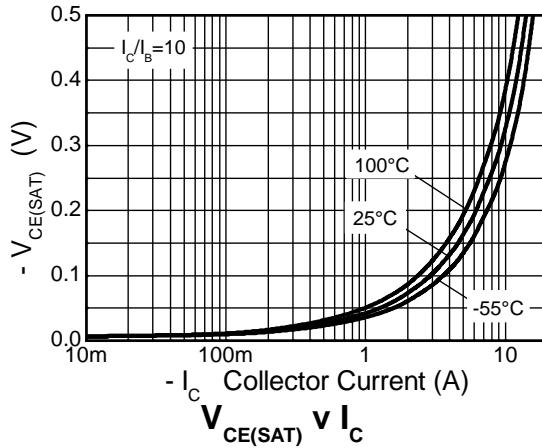
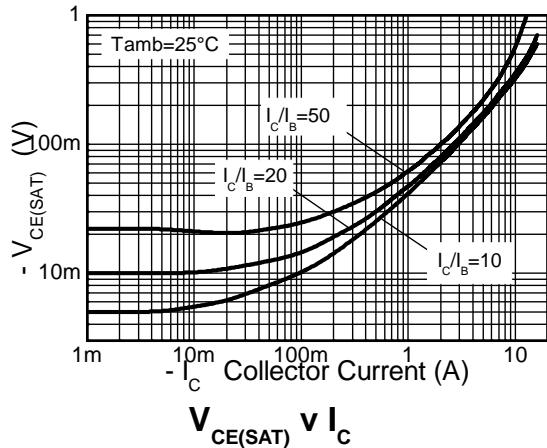
Pulse Power Dissipation

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

Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-50	-70	-	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CER}	-50	-70	-	V	$I_C = -1\mu\text{A}, R_B \leq 1\text{k}\Omega$
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	-30	-40	-	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8	-	V	$I_E = -100\mu\text{A}$
Collector Cut-Off Current	I_{CBO}	-	<1	-20	nA	$V_{\text{CB}} = -40\text{V}$
		-	-	-0.5	μA	$V_{\text{CB}} = -40\text{V}, T_A = +100^\circ\text{C}$
Collector Cut-Off Current	I_{CER} $R \leq 1\text{k}\Omega$	-	<1	-20	nA	$V_{\text{CB}} = -40\text{V}$
		-	-	-0.5	μA	$V_{\text{CB}} = -40\text{V}, T_A = +100^\circ\text{C}$
Emitter Cut-Off Current	I_{EBO}	-	<1	-10	nA	$V_{\text{EB}} = -6\text{V}$
DC Current Transfer Static Ratio (Note 9)	h_{FE}	100	225	-	-	$I_C = -10\text{mA}, V_{\text{CE}} = -1\text{V}$
		100	200	300		$I_C = -1\text{A}, V_{\text{CE}} = -1\text{V}$
		70	145	-		$I_C = -5\text{A}, V_{\text{CE}} = -1\text{V}$
		10	20	-		$I_C = -20\text{A}, V_{\text{CE}} = -1\text{V}$
Collector-Emitter Saturation Voltage (Note 9)	$V_{\text{CE}(\text{sat})}$	-	-30	-45	mV	$I_C = -0.5\text{A}, I_B = -20\text{mA}$
		-	-40	-60		$I_C = -1\text{A}, I_B = -100\text{mA}$
		-	-60	-85		$I_C = -1\text{A}, I_B = -20\text{mA}$
		-	-70	-90		$I_C = -2\text{A}, I_B = -200\text{mA}$
		-	-170	-210		$I_C = -5.5\text{A}, I_B = -500\text{mA}$
Base-Emitter Saturation Voltage (Note 9)	$V_{\text{BE}(\text{sat})}$	-	-1,030	-1,130	mV	$I_C = -5.5\text{A}, I_B = -500\text{mA}$
Base-Emitter Turn-On Voltage (Note 9)	$V_{\text{BE}(\text{on})}$	-	-900	-1,000	mV	$I_C = -5.5\text{A}, V_{\text{CE}} = -1\text{V}$
Transitional Frequency (Note 9)	f_T	-	110	-	MHz	$I_C = -100\text{mA}, V_{\text{CE}} = -10\text{V}, f = 50\text{MHz}$
Output Capacitance	C_{obo}	-	83	-	pF	$V_{\text{CB}} = -10\text{V}, f = 1\text{MHz}$
Switching Time	t_{ON}	-	43	-	ns	$V_{\text{CC}} = -10\text{V}, I_C = -1\text{A}, I_{B1} = -I_{B2} = -100\text{mA}$
	t_{OFF}	-	230	-		

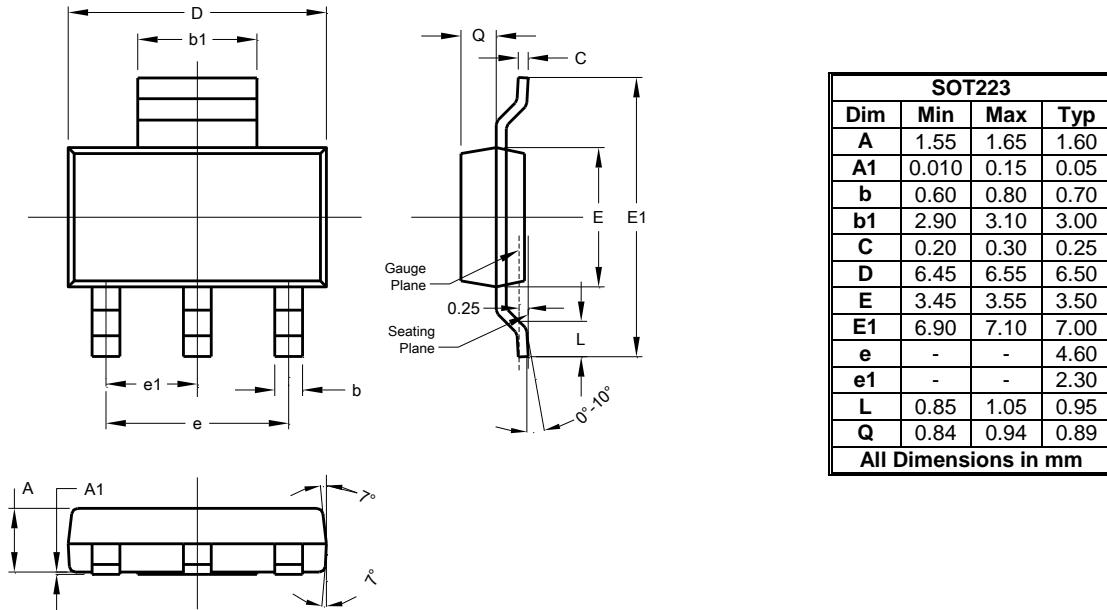
Note: 9. Measured under pulsed conditions. Pulse width $\leq 300\ \mu\text{s}$. Duty cycle $\leq 2\%$.

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



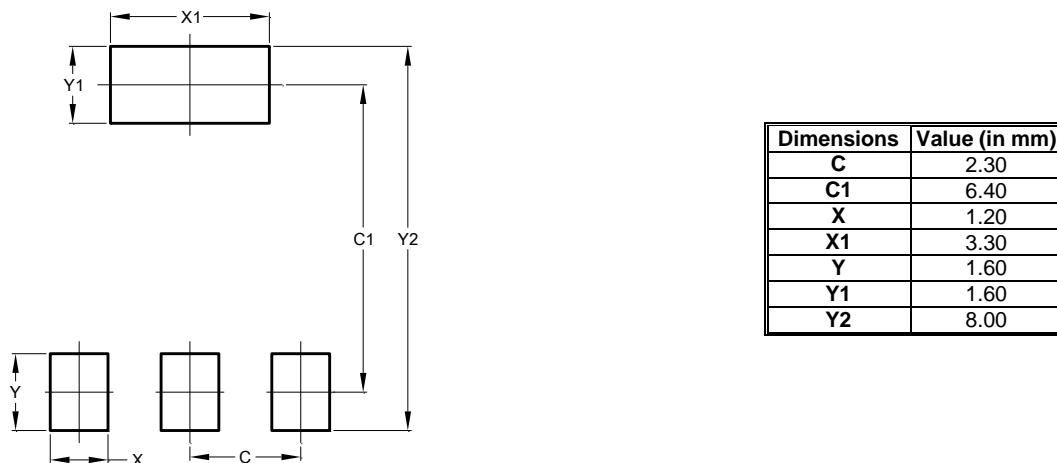
Package Outline Dimensions

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



Suggested Pad Layout

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



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