

60V NPN MEDIUM POWER LOW SATURATION TRANSISTOR IN SOT223

Features

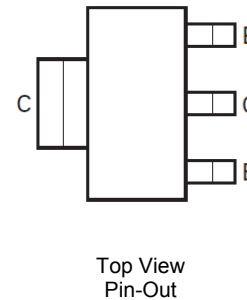
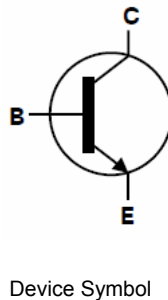
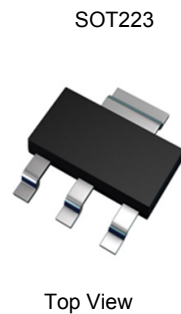
- $BV_{CEO} > 60V$
- $I_C = 6A$ high Continuous Collector Current
- $I_{CM} = 20A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)} < -60mV @ -1A$
- $R_{SAT} = 35m\Omega$ for a low equivalent On-Resistance
- h_{FE} specified up to 10A for a high gain hold up
- Complementary PNP Type: ZX5T951G
- **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 **Ⓔ**
- Weight: 0.112 grams (approximate)

Applications

- Emergency lighting circuits
- MOSFET & IGBT gate drivers
- Solenoid, relay and actuator drivers
- DC Modules
- Motor control

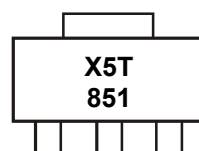


Ordering Information (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZX5T851GTA	X5T851	7	12	1,000
ZX5T851GTC	X5T851	13	12	4,000

- 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> 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>

Marking Information



X5T851 = Product Type Marking Code

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	150	V
Collector-Emitter Voltage	V_{CEO}	60	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	6	A
Peak Pulse Current	I_{CM}	20	A

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

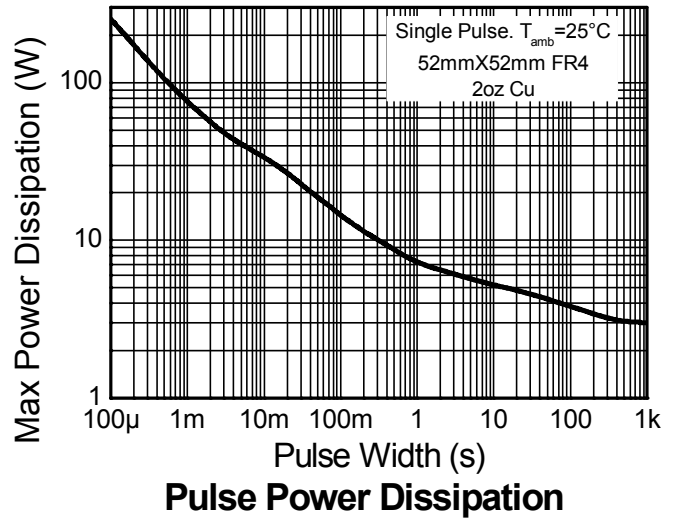
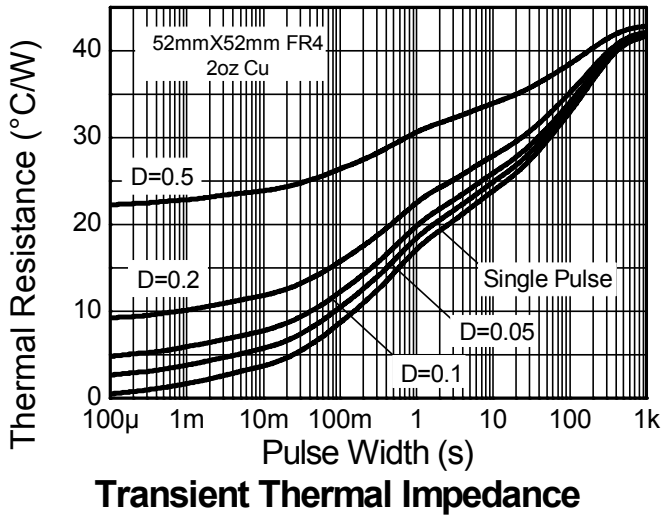
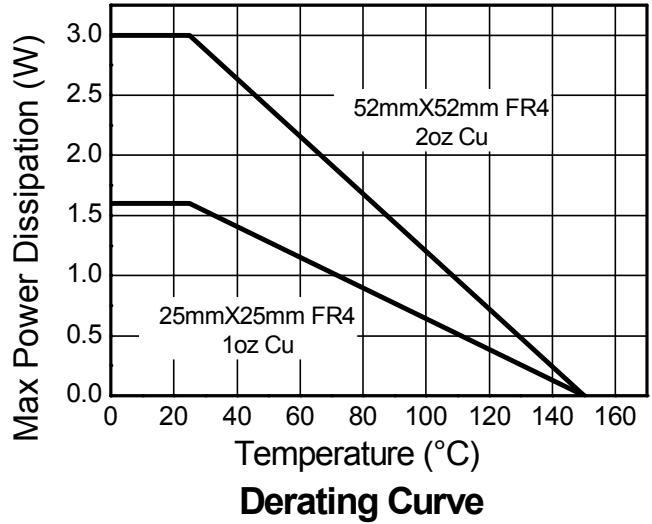
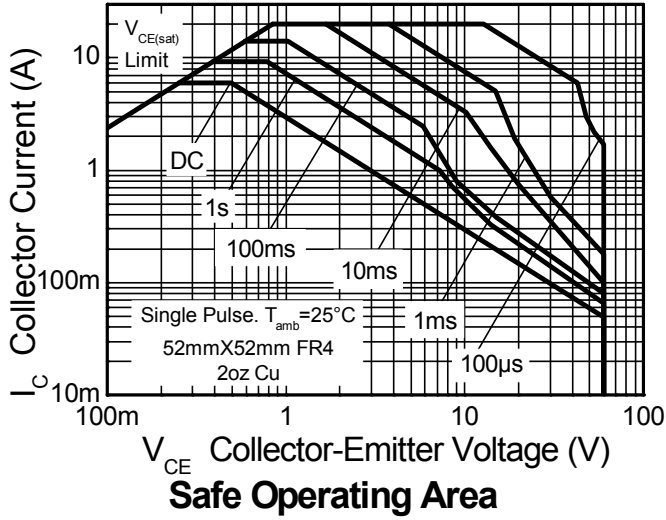
Characteristic	Symbol	Value	Unit
Power Dissipation Linear derating factor	P_D	3.0	W
		24	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	1.6	$\text{mW}/^\circ\text{C}$
		12.8	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	42	$^\circ\text{C}/\text{W}$
		78	
Thermal Resistance Junction to Lead	$R_{\theta JL}$	10.48	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

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

Thermal Characteristics and Derating Information

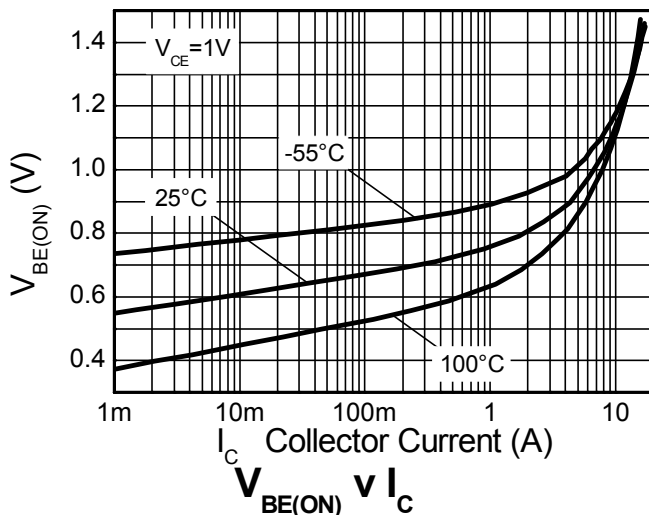
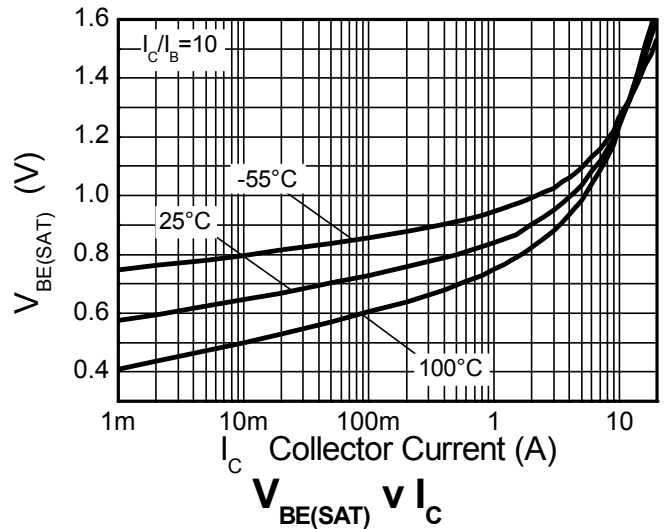
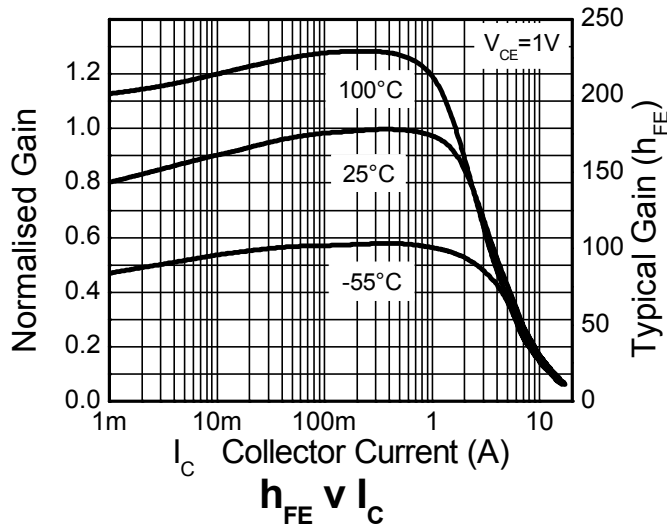
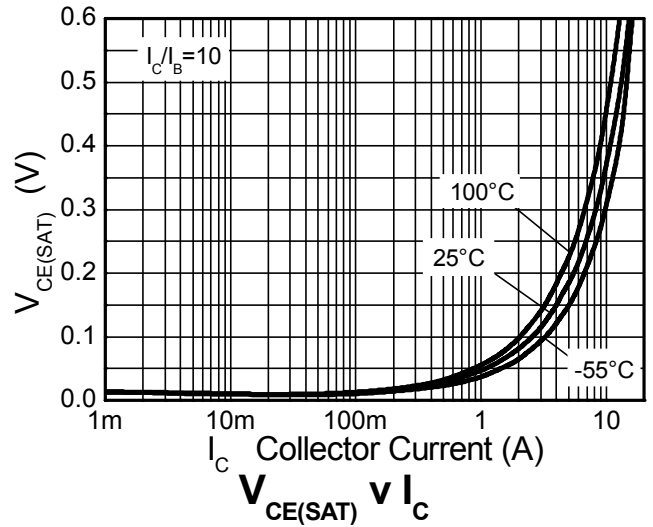
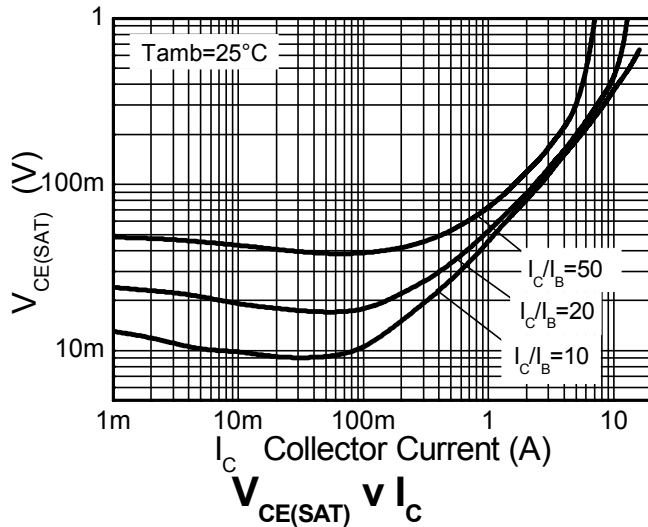


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	150	190	-	V	I _C = 100μA
Collector-Emitter Breakdown Voltage	BV _{CER}	150	190	-	V	I _C = -1μA, R _B ≤ 1kΩ
Collector-Emitter Breakdown Voltage (Note 9)	BV _{CEO}	60	80	-	V	I _C = 10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	7	8.1	-	V	I _E = 100μA
Collector Cut-off Current	I _{CBO}	-	<1	20	nA	V _{CB} = 120V
		-	-	0.5	μA	V _{CB} = 120V, T _A = +100°C
Collector Cut-off Current	I _{CER}	-	<1	20	nA	V _{CB} = 120V
	R _B ≤ 1kΩ	-	-	0.5	μA	V _{CB} = 120V, T _A = +100°C
Emitter Cut-off Current	I _{EBO}	-	<1	10	nA	V _{EB} = 6V
Collector-Emitter Saturation Voltage (Note 9)	V _{CE(sat)}	-	20	30	mV	I _C = 100mA, I _B = 5mA
		-	45	60		I _C = 1A, I _B = 100mA
		-	50	70		I _C = 1A, I _B = 50mA
		-	100	135		I _C = 2A, I _B = 50mA
		-	210	260		I _C = 6A, I _B = 300mA
Base-Emitter Saturation Voltage (Note 9)	V _{BE(sat)}	-	1000	1100	mV	I _C = 6A, I _B = 300mA
Base-Emitter Turn-On Voltage (Note 9)	V _{BE(on)}	-	940	1050	mV	I _C = 6A, V _{CE} = 1V
DC Current Gain (Note 9)	h _{FE}	100	200	-	-	I _C = 10mA, V _{CE} = 1V
		100	200	300		I _C = 2A, V _{CE} = 1V
		55	105	-		I _C = 5A, V _{CE} = 1V
		20	40	-		I _C = 10A, V _{CE} = 1V
Output Capacitance	C _{obo}	-	31	-	pF	V _{CB} = 10V, f = 1MHz
Current Gain-Bandwidth Product	f _T	-	130	-	MHz	V _{CE} = 5V, I _C = 100mA, f = 100MHz
Switching Times	t _{on}	-	42	-	ns	I _C = 1A, V _{CC} = 10V, I _{B1} = -I _{B2} = 100mA
	t _{off}	-	760	-		

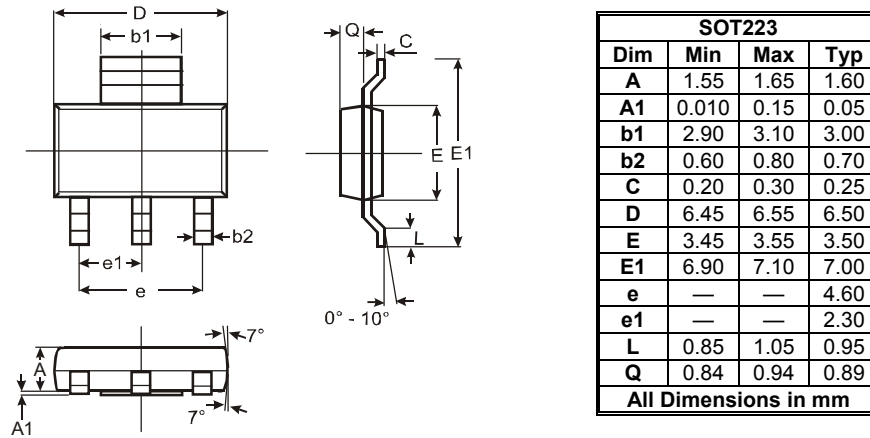
Notes: 9. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%

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



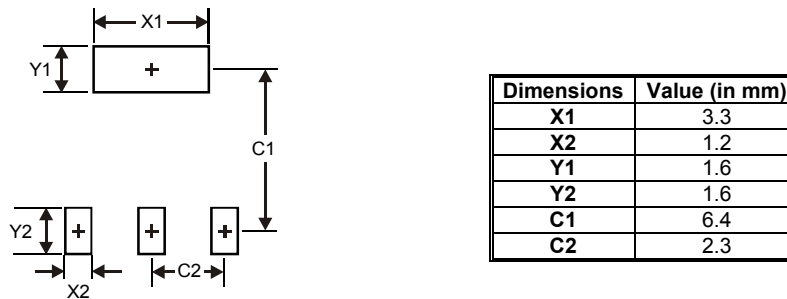
Package Outline Dimensions

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



Suggested Pad Layout

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



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