

100V PNP MEDIUM POWER LOW SATURATION TRANSISTOR IN SOT223
Features

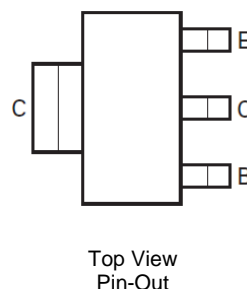
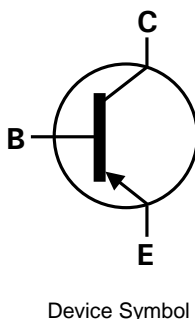
- $BV_{CEO} > -100V$
- $I_C = -5A$ High Continuous Collector Current
- $I_{CM} = -10A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(SAT)} < -90mV$ @ $-1A$
- $R_{SAT} = 60m\Omega$ for a Low Equivalent On-Resistance
- h_{FE} Specified Up to $-10A$ for a High Gain Hold Up
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Application

- Motor Driving
- Line Switching
- High Side Switches
- Subscriber Line Interface Cards (SLIC)

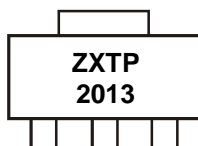
Mechanical Data

- 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)


Ordering Information (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTP2013GTA	ZXTP2013	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


ZXTP2013 = Product Type Marking Code

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	-140	V
Collector-Emitter Voltage	V _{CEO}	-100	V
Emitter-Base Voltage	V _{EBO}	-7	V
Continuous Collector Current	I _C	-5	A
Peak Pulse Current	I _{CM}	-10	A

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

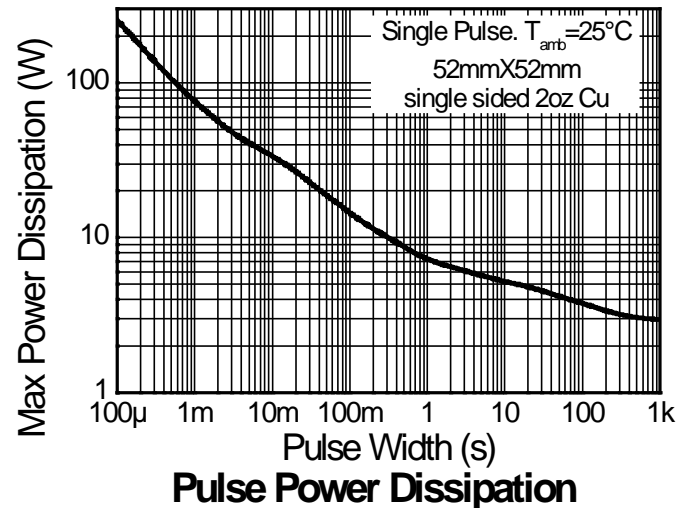
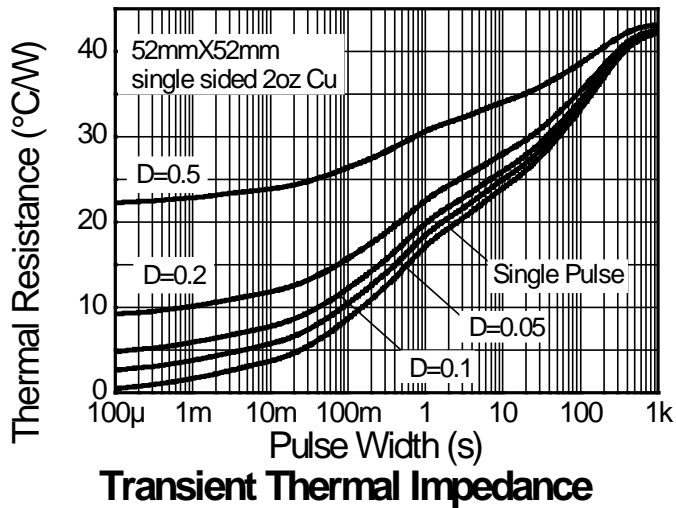
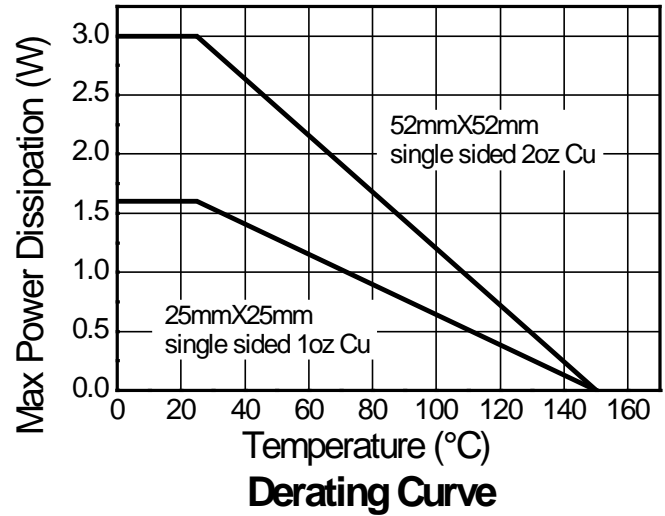
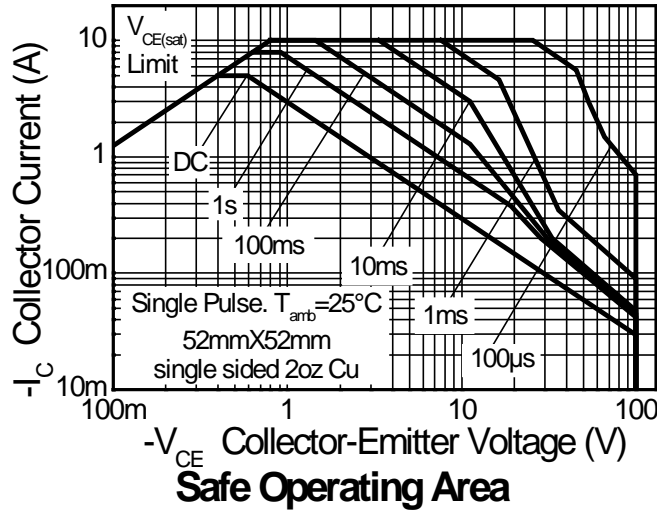
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P _D	3.0	W
Linear derating factor		24	mW/°C
Power Dissipation (Note 6)	P _D	1.6	W
Linear derating factor		12.8	mW/°C
Thermal Resistance, Junction to Ambient (Note 5)	R _{JA}	42	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	R _{JA}	78	°C/W
Thermal Resistance Junction to Lead (Note 7)	R _{JL}	10.48	°C/W
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 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.
 6. Same as note (5), except the device is surface mounted on 25mm x 25mm with 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

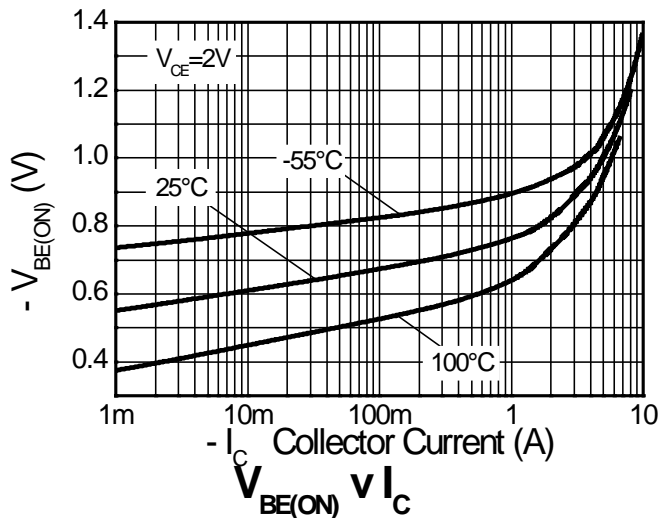
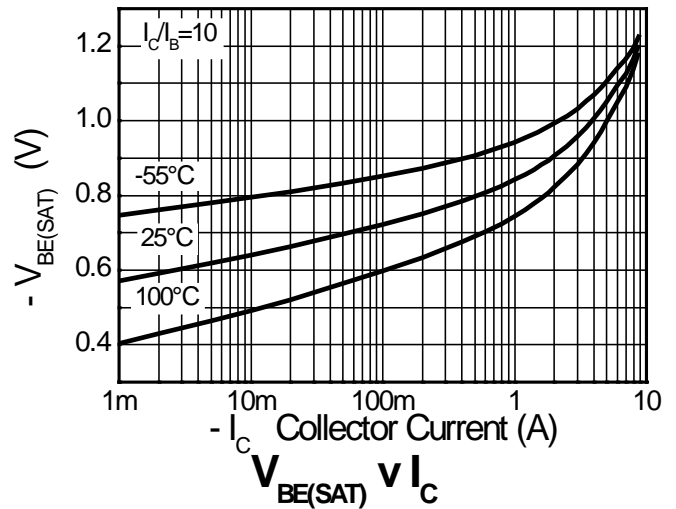
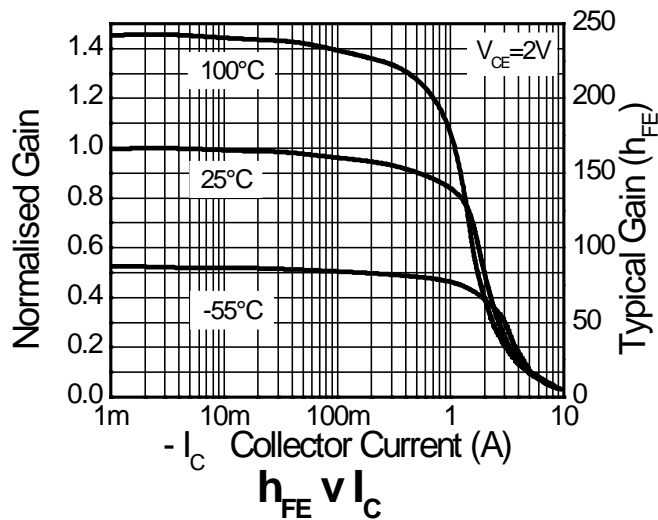
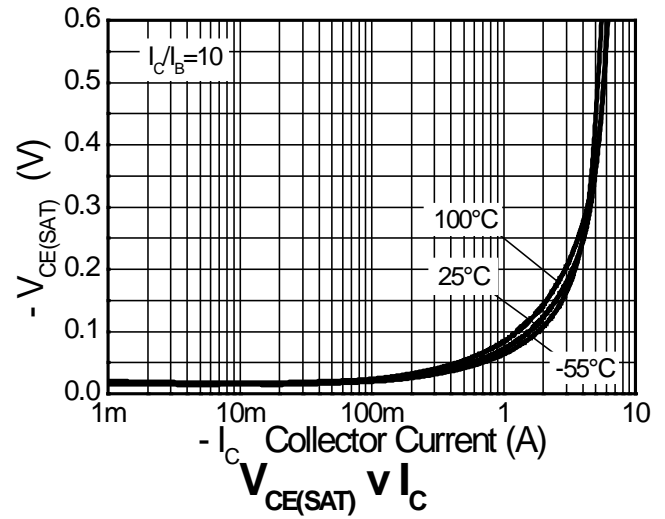
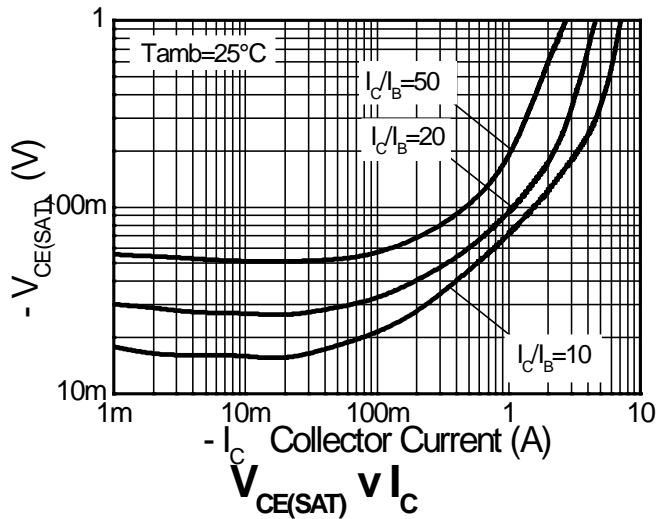


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	-140	-160	—	V	I _C = -100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV _{CER}	-140	-160	—	V	I _C = -1μA, R _B • 1k•
Collector-Emitter Breakdown Voltage (Note 9)	BV _{CEO}	-100	-115	—	V	I _C = -1mA
Emitter-Base Breakdown Voltage	BV _{EBO}	-7	-8.1	—	V	I _E = -100μA
Collector Cutoff Current	I _{CBO}	—	< 1	-20	nA	V _{CB} = -100V
		—	—	-500	nA	V _{CB} = -100V, T _A = +100°C
Collector Cutoff Current	I _{CER} R • 1k•	—	< 1	-20	nA	V _{CB} = -100V
		—	—	-500	nA	V _{CB} = -100V, T _A = +100°C
Emitter Cutoff Current	I _{EBO}	—	< 1	-10	nA	V _{EB} = -6V
DC Current Transfer Static Ratio (Note 9)	h _{FE}	100	250	—	—	I _C = -10mA, V _{CE} = -1V
		100	200	300		I _C = -1A, V _{CE} = -1V
		25	50	—		I _C = -3A, V _{CE} = -1V
		15	30	—		I _C = -4A, V _{CE} = -1V
		—	5	—		I _C = -10A, V _{CE} = -1V
Collector-Emitter Saturation Voltage (Note 9)	V _{CE(SAT)}	—	-20	-30	mV	I _C = -100mA, I _B = -10mA
		—	-70	-90		I _C = -1A, I _B = -100mA
		—	-120	-150		I _C = -2A, I _B = -200mA
		—	-240	-340		I _C = -4A, I _B = -400mA
Base-Emitter Saturation Voltage (Note 9)	V _{BE(SAT)}	—	-985	-1100	mV	I _C = -4A, I _B = -400mA
Base-Emitter Turn-on Voltage (Note 9)	V _{BE(ON)}	—	-920	-1050	mV	I _C = -4A, V _{CE} = -1V
Transitional Frequency (Note 9)	f _T	—	125	—	MHz	I _C = -100mA, V _{CE} = -10V, f = 50MHz
Output Capacitance	C _{obo}	—	42	—	pF	V _{CB} = -10V, f = 1MHz
Switching Time	t _{ON}	—	42	—	ns	V _{CC} = -50V, I _C = -1A, I _{B1} = -I _{B2} = -100mA
	t _{OFF}	—	540	—		

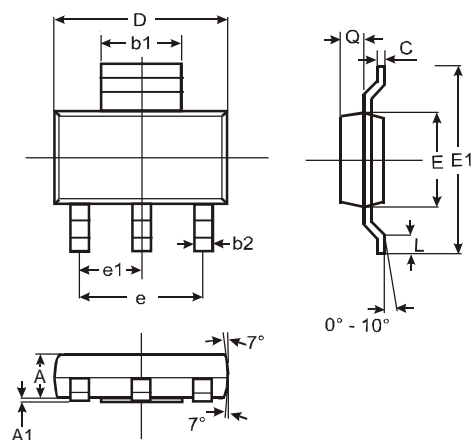
Note: 9. Measured under pulsed conditions. Pulse width • 300μs. Duty cycle • 2%.

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



Package Outline Dimensions

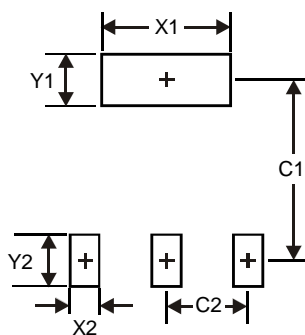
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b1	2.90	3.10	3.00
b2	0.60	0.80	0.70
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)
X1	3.3
X2	1.2
Y1	1.6
Y2	1.6
C1	6.4
C2	2.3

For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device terminals and PCB tracking.

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