

100V PNP MEDIUM POWER LOW SATURATION TRANSISTOR IN SOT223
Features

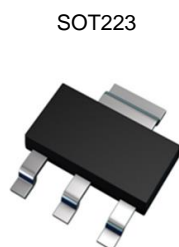
- $BV_{CEO} > -100V$
- $I_C = -5A$ High Continuous Collector Current
- $I_{CM} = -10A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(SAT)} < -90mV$ @ $-1A$
- $R_{SAT} = 60m\Omega$ for a Low Equivalent On-Resistance
- h_{FE} Specified Up to $-10A$ for a High Gain Hold-Up
- **Lead-Free Finish; RoHS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

Application

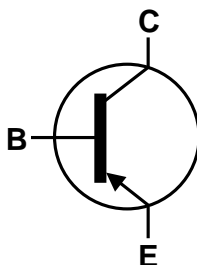
- Motor Driving
- Line Switching
- High Side Switches
- Subscriber Line Interface Cards (SLIC)

Mechanical Data

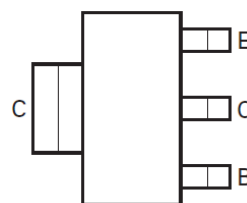
- Case: SOT223
- Case Material: Molded Plastic. "Green" Molding Compound; UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads; Solderable per MIL-STD-202, Method 208 (B3)
- Weight: 0.112 grams (Approximate)



Top View



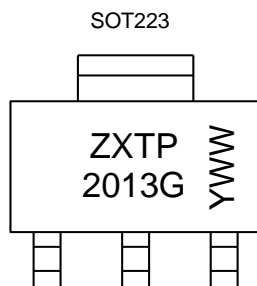
Device Symbol


 Top View
 Pin-Out

Ordering Information (Note 4)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTP2013GTA	AEC-Q101	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


ZXTP 2013G = Product Type Marking Code
 YWW = 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_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.)

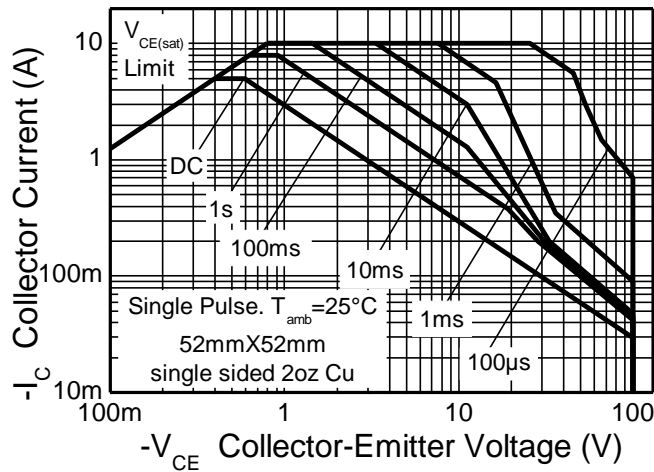
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P _D	3.0	W
Linear Derating Factor		24	mW/°C
Power Dissipation (Note 6)	P _D	1.6	W
Linear Derating Factor		12.8	mW/°C
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	42	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	78	°C/W
Thermal Resistance Junction to Lead (Note 7)	R _{θJL}	10.48	°C/W
Thermal Resistance Junction to Case (Note 8)	R _{θJC}	13.8	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 9)

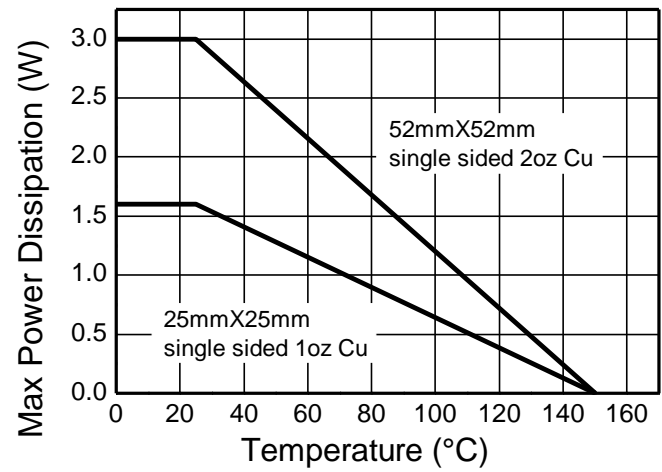
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
- For a device 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.
 - Same as Note 5, except the device is mounted on 25mm x 25mm 1oz copper.
 - Thermal resistance from junction to solder-point (at the end of the collector lead).
 - Thermal resistance from junction to top of the case.
 - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

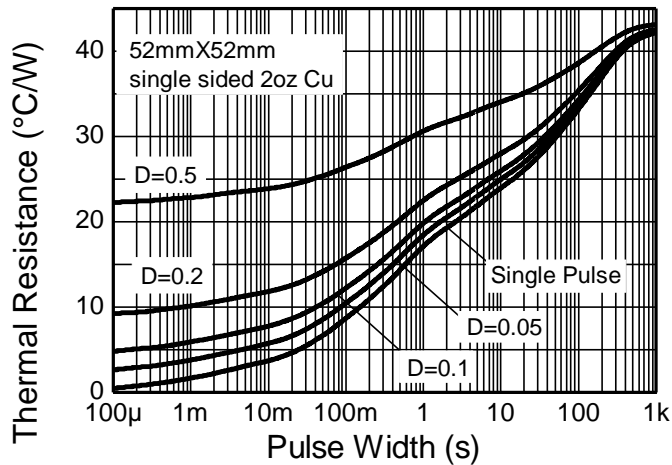
Thermal Characteristics and Derating Information



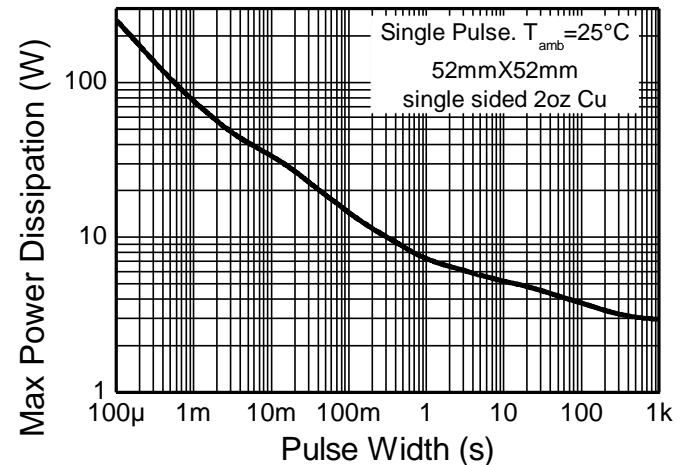
Safe Operating Area



Derating Curve



Transient Thermal Impedance



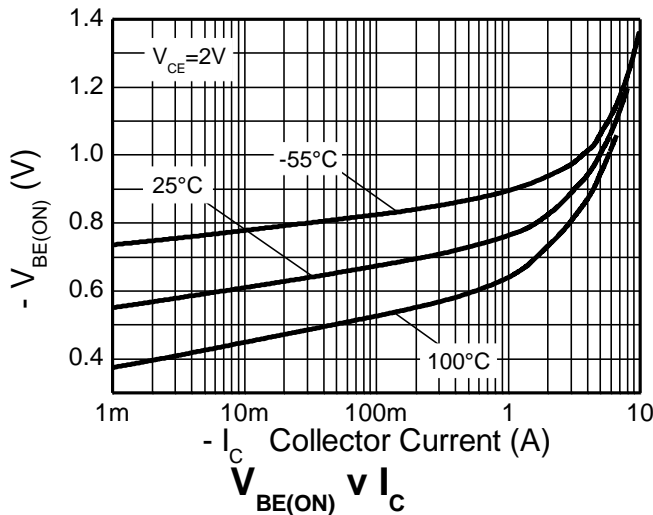
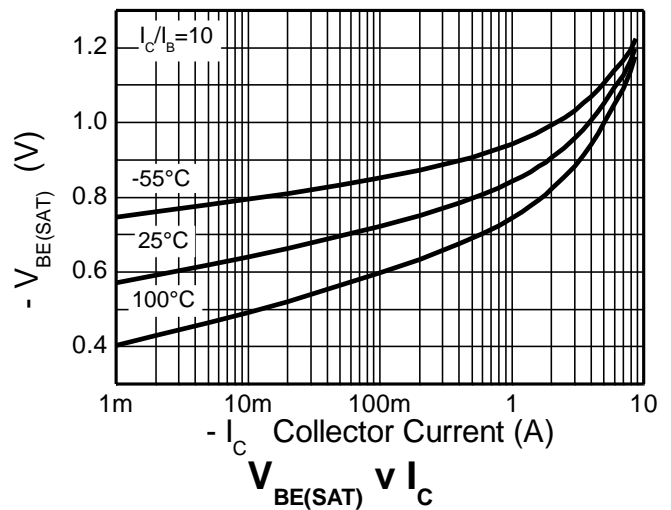
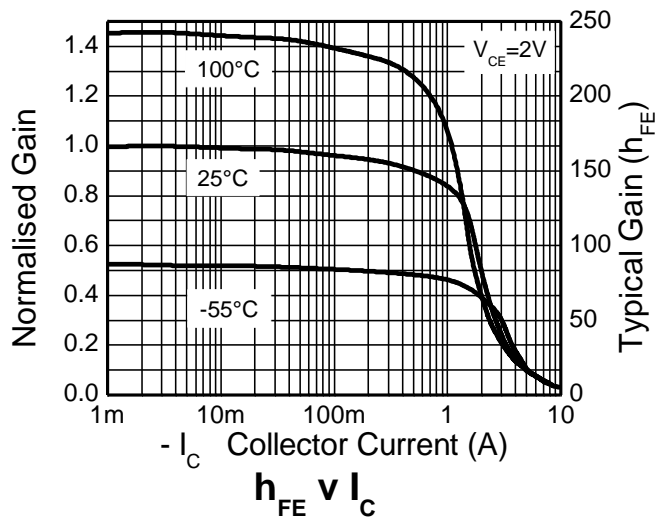
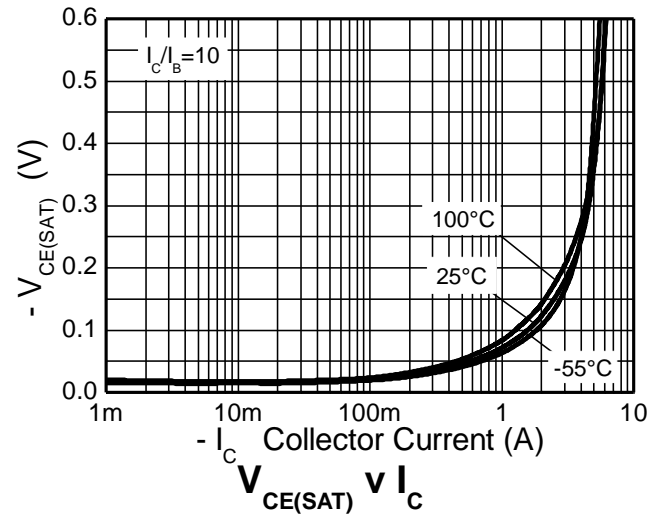
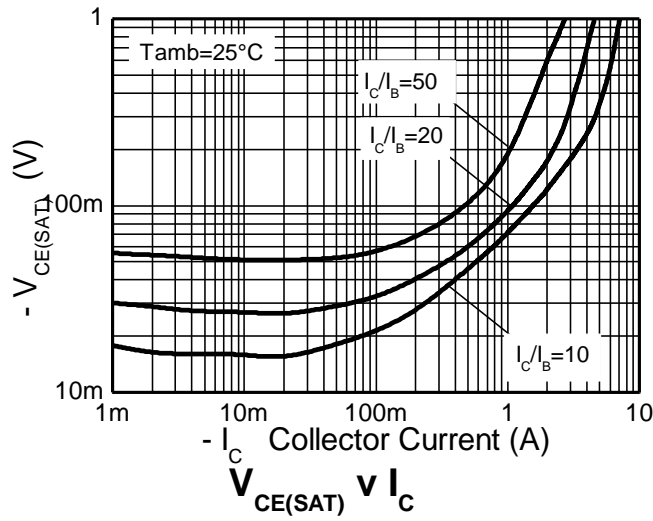
Pulse Power Dissipation

Electrical Characteristics (@T_A = +25°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 10)	BV _{CER}	-140	-160	—	V	I _C = -1μA, R _B ≤ 1kΩ
Collector-Emitter Breakdown Voltage (Note 10)	BV _{CEO}	-100	-115	—	V	I _C = -1mA
Emitter-Base Breakdown Voltage	BV _{EBO}	-7	-8.1	—	V	I _E = -100μA
Collector Cut-Off Current	I _{CBO}	—	< 1	-20 -500	nA nA	V _{CB} = -100V V _{CB} = -100V, T _A = +100°C
Collector Cut-Off Current	I _{CER} R ≤ 1kΩ	—	< 1	-20 -500	nA nA	V _{CB} = -100V V _{CB} = -100V, T _A = +100°C
Emitter Cut-Off Current	I _{EBO}	—	< 1	-10	nA	V _{EB} = -6V
DC Current Transfer Static Ratio (Note 10)	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 10)	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 10)	V _{BE(SAT)}	—	-985	-1,100	mV	I _C = -4A, I _B = -400mA
Base-Emitter Turn-On Voltage (Note 10)	V _{BE(ON)}	—	-920	-1,050	mV	I _C = -4A, V _{CE} = -1V
Transitional Frequency (Note 10)	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	—		

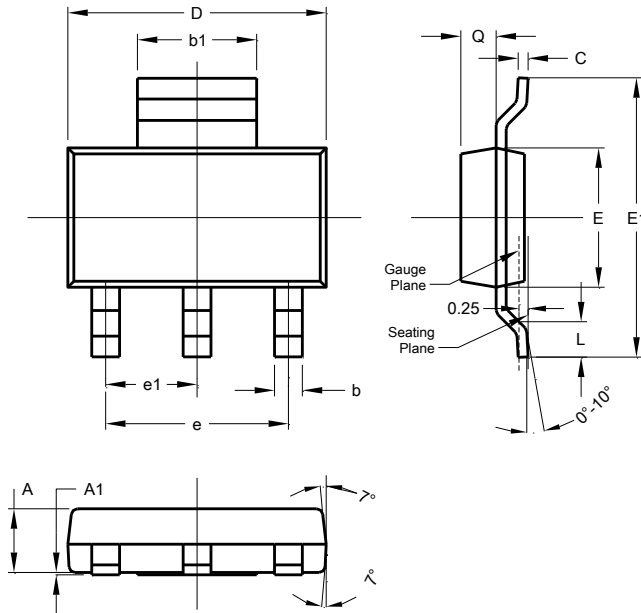
Note: 10. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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



Package Outline Dimensions

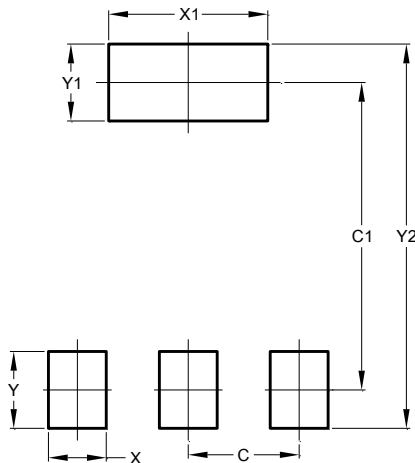
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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
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

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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