

140V PNP SILICON PLANAR MEDIUM POWER TRANSISTOR IN SOT223

Features

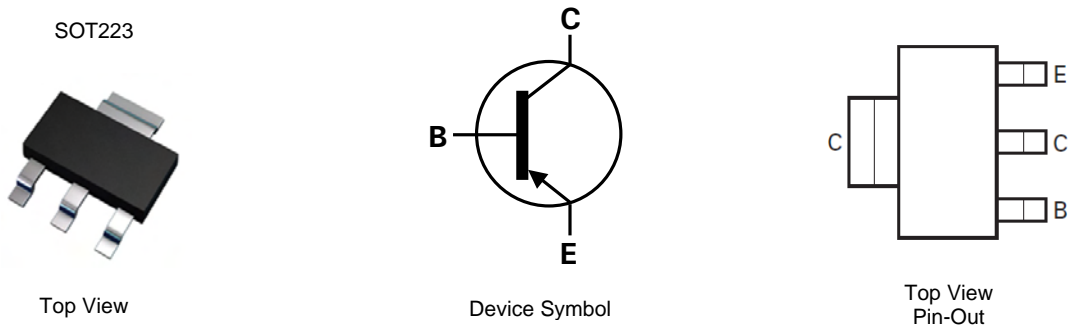
- $BV_{CEO} > -140V$
- $I_C = -4A$ high Continuous Collector Current
- $I_{CM} = -10A$ Peak Pulse Current
- Low saturation voltage $V_{CE(sat)} < -120mV @ I_C = -1A$
- $R_{SAT} = 92m\Omega$ for a low equivalent On-Resistance
- h_{FE} specified up to -10A for a high gain hold up
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

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)

Application

- Motor driving
- Line switching
- High side switches
- Subscriber line interface cards (SLIC)

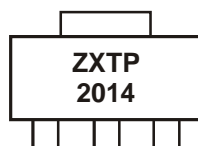


Ordering Information (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTP2014GTA	ZXTP2014	7	12	1,000
ZXTP2014GTC	ZXTP2014	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



ZXTP2014 = Product Type Marking Code

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CB0}	-180	V
Collector-Emitter Voltage	V_{CEO}	-140	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-4	A
Peak Pulse Current	I_{CM}	-10	A

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

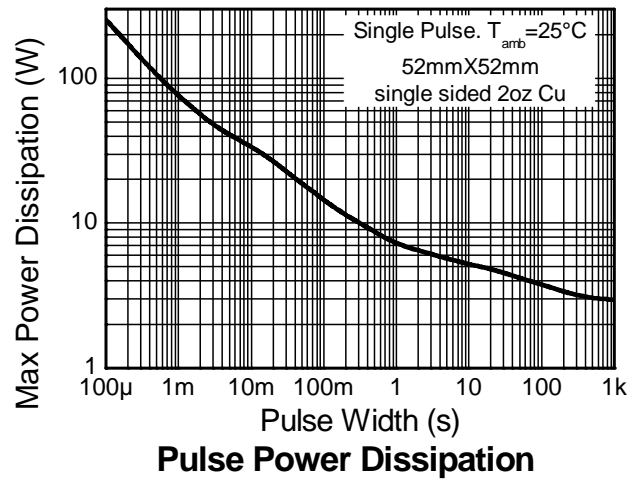
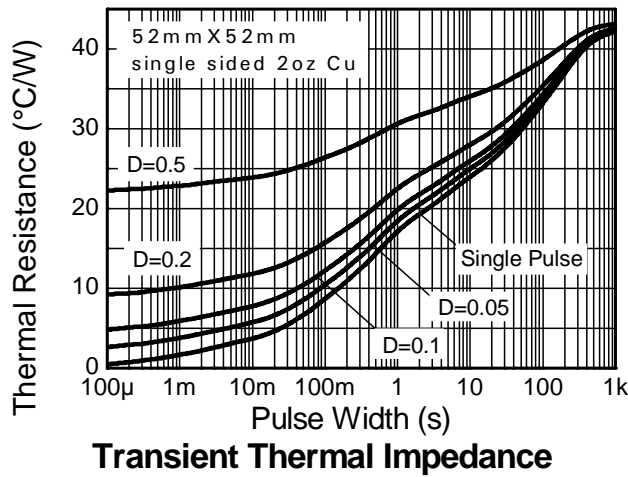
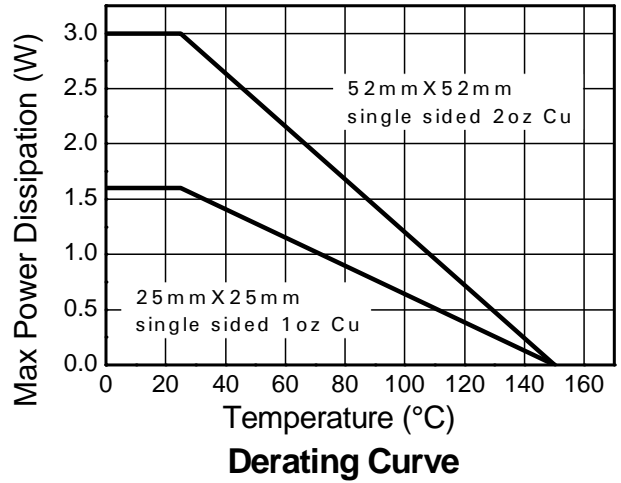
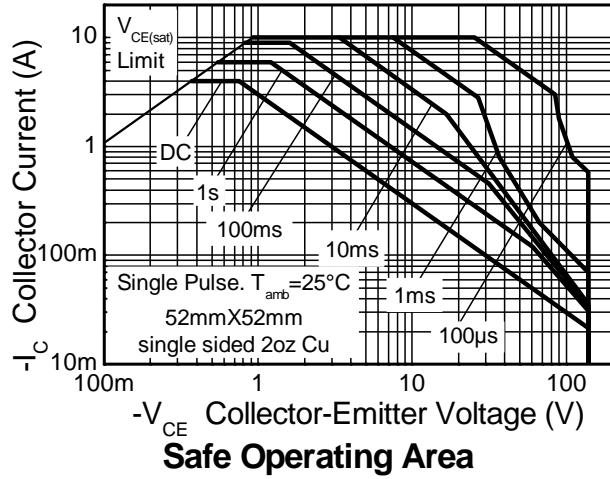
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	3.0	W
Linear derating factor		24	mW/ $^\circ\text{C}$
Power Dissipation (Note 6)	P_D	1.6	W
Linear derating factor		12.8	mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	42	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	78	$^\circ\text{C}/\text{W}$
Thermal Resistance Junction to Lead (Note 7)	$R_{\theta JL}$	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	$\geq 8,000$	V	3B
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

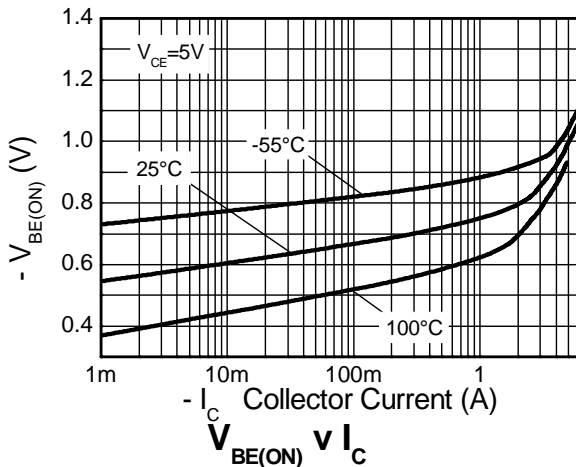
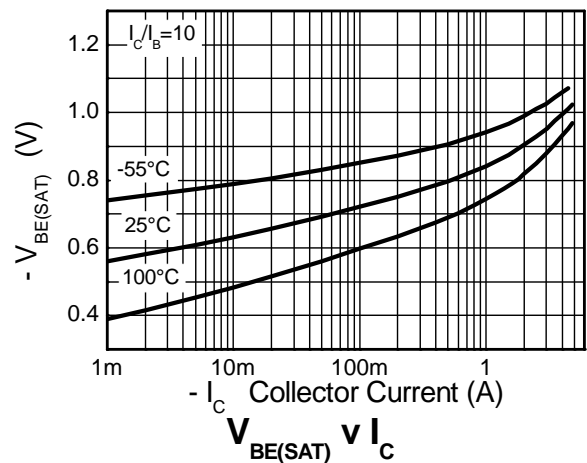
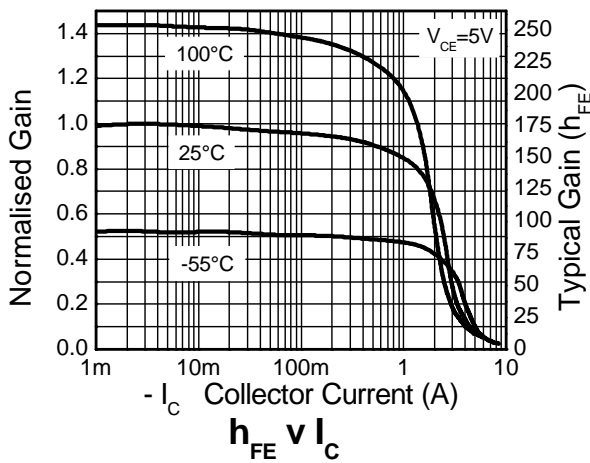
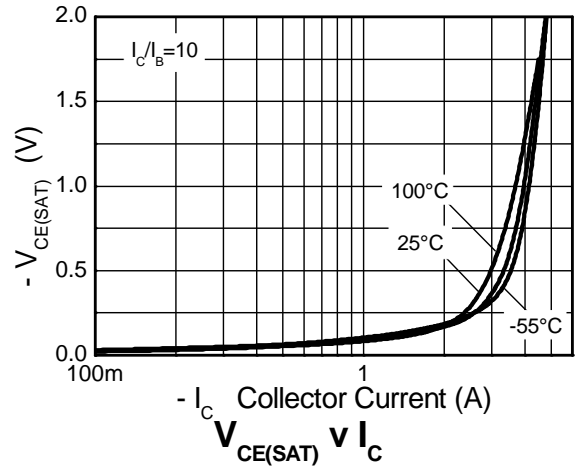
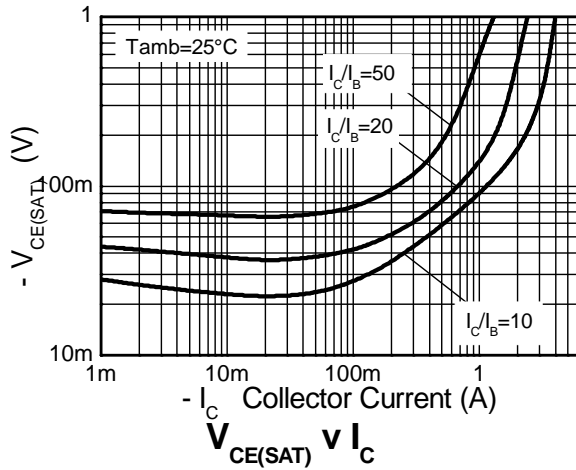


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CB0}	-180	-200	-	V	I _C = -100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV _{CER}	-180	-200	-	V	I _C = -1μA, R _B ≤ 1kΩ
Collector-Emitter Breakdown Voltage (Note 9)	BV _{CEO}	-140	-160	-	V	I _C = -1mA
Emitter-Base Breakdown Voltage	BV _{EBO}	-7	-8.3	-	V	I _E = -100μA
Collector Cutoff Current	I _{CB0}	-	< -1	-20	nA	V _{CB} = -150V
		-	-	-500	nA	V _{CB} = -150V, T _A = +100°C
Collector Cutoff Current	I _{CER} R ≤ 1kΩ	-	< -1	-20	nA	V _{CB} = -150V
		-	-	-500	nA	V _{CB} = -150V, 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	225	-	-	I _C = -10mA, V _{CE} = -5V
		100	200	300		I _C = -1A, V _{CE} = -5V
		45	100	-		I _C = -3A, V _{CE} = -5V
		-	5	-		I _C = -10A, V _{CE} = -5V
Collector-Emitter Saturation Voltage (Note 9)	V _{CE(sat)}	-	-40	-60	mV	I _C = -100mA, I _B = -5mA
		-	-55	-80		I _C = -0.5A, I _B = -50mA
		-	-85	-120		I _C = -1A, I _B = -100mA
		-	-275	-360		I _C = -3A, I _B = -300mA
Base-Emitter Saturation Voltage (Note 9)	V _{BE(sat)}	-	-940	-1040	mV	I _C = -3A, I _B = -300mA
Base-Emitter Turn-on Voltage (Note 9)	V _{BE(on)}	-	-830	-930	mV	I _C = -3A, V _{CE} = -5V
Transitional Frequency (Note 9)	f _T	-	120	-	MHz	I _C = -100mA, V _{CE} = -10V, f = 50MHz
Output capacitance	C _{obo}	-	33	-	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}	-	636	-		

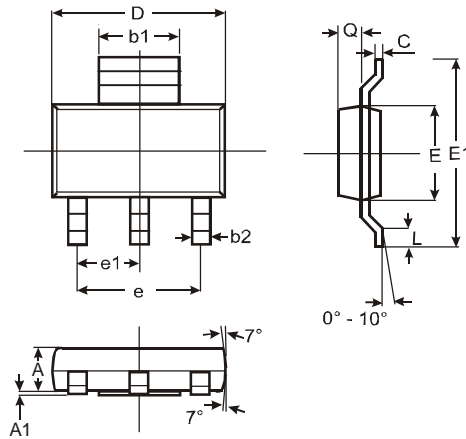
Notes: 9. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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



Package Outline Dimensions

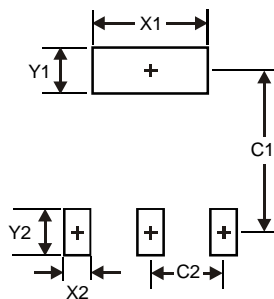
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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

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Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

moschip.ru_4

moschip.ru_6

moschip.ru_9