

ZXTN25100BFH

100V NPN LOW SATURATION TRANSISTOR IN SOT23

Features

- $BV_{CEO} > 100V$
- $BV_{CEX} > 170V$ Forward Blocking Voltage
- $BV_{ECO} > 6V$ Reverse Blocking Voltage
- $I_C = 3A$ high Continuous Collector Current
- Low Saturation Voltage, $V_{CE(SAT)} < 80mV @ 1A$
- $R_{CE(SAT)} = 67m\Omega$ for a Low Equivalent On-Resistance
- 1.25W Power Dissipation
- h_{FE} Specified up to 3A for High Current Gain Hold Up
- Complementary PNP Type: ZXTN25100BFH
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

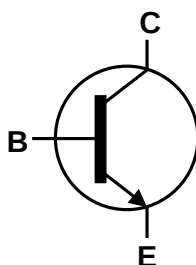
- Case: SOT23
- Case Material: molded plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208@3
- Weight 0.008 grams (Approximate)

Applications

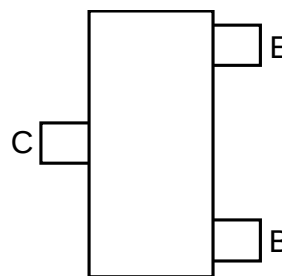
- Lamp Relay and Solenoid Drivers
- General Switching in Automotive and Industrial Applications
- Motor Drive and Control



Top View



Device Symbol



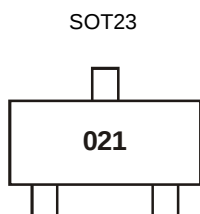
Top View
Pin-Out

Ordering Information (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN25100BFHTA	021	7	8	3,000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 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



021 = Product Type Marking Code

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	170	V
Collector-Emitter Voltage (Forward Blocking)	V _{CEX}	170	V
Collector-Emitter Voltage	V _{CEO}	100	V
Emitter-Base Voltage (Reverse Blocking)	V _{ECO}	6	V
Emitter-Base Voltage	V _{EBO}	7	V
Continuous Collector Current	I _C	3	A
Peak Pulse Current	I _{CM}	9	A

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

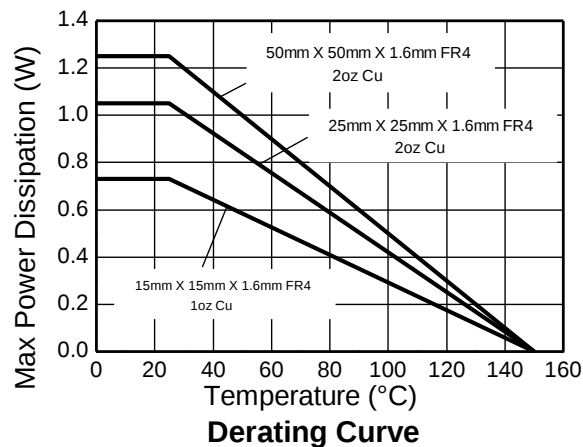
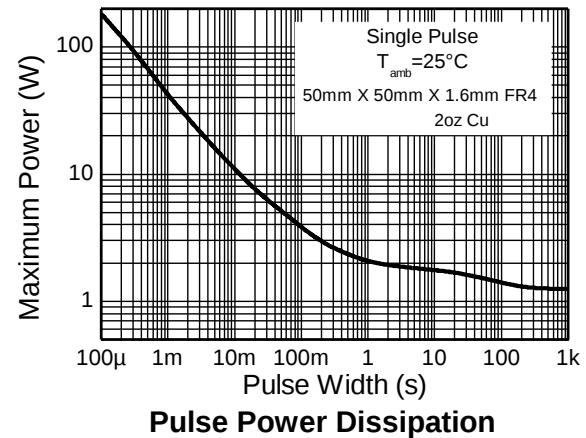
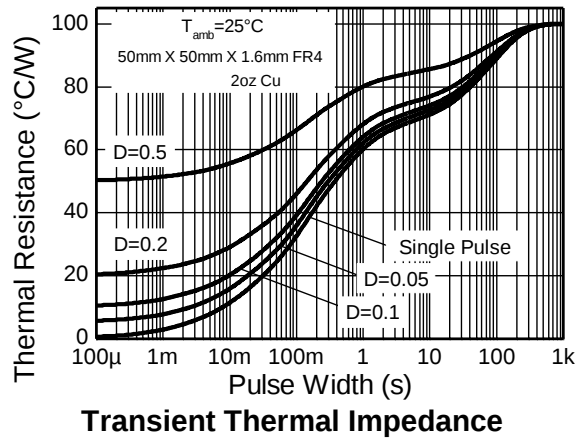
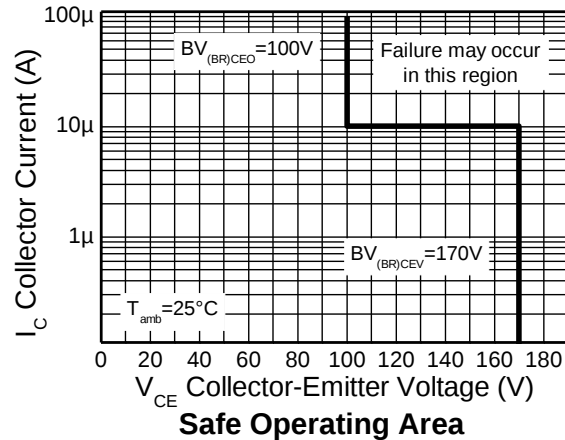
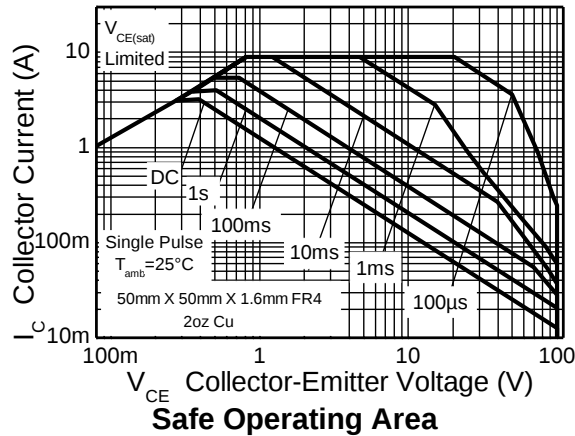
Characteristic	Symbol	Value	Unit
Power Dissipation Linear Derating Factor	P _D	0.60	W mW
		4.80	
		0.73	
		5.84	
		1.05	
		8.4	
		1.25	
		9.6	
		1.81	
		14.5	
Thermal Resistance, Junction to Ambient	R _{θJA}	209	°C/W
		171	
		119	
		100	
		69	
Thermal Resistance, Junction to Leads	R _{θJL}	75	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 11)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	8,000	V	3B
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
- For a device mounted on minimum recommended pad layout with 1oz 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 mounted with the collector lead on 15mm x 15mm 1oz copper.
 - Same as Note 5, except mounted with the collector lead on 25mm x 25mm 2oz copper.
 - Same as Note 5, except mounted with the collector lead on 50mm x 50mm 2 oz copper.
 - Same as Note 8, except measured at t < 5 seconds.
 - Thermal resistance from junction to solder-point (at the end of collector lead).
 - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating information

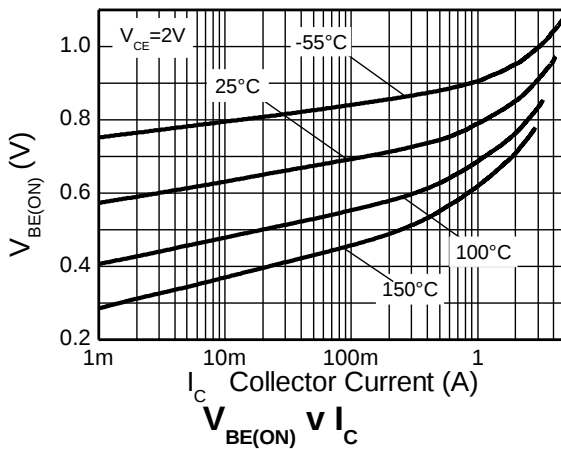
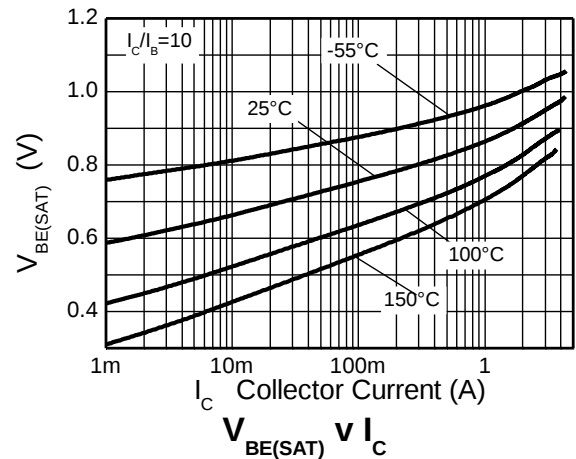
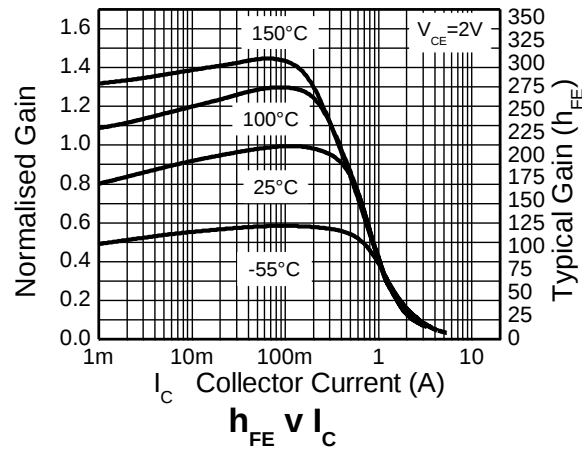
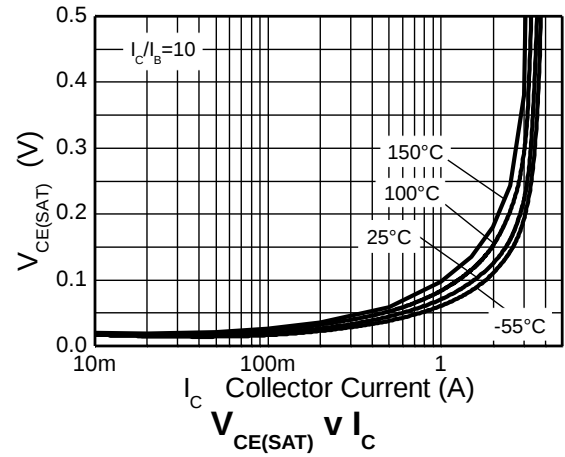
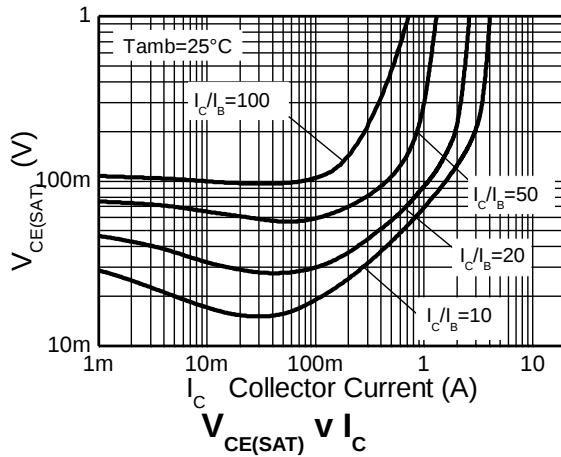


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	170	220	-	V	I _C = 100μA
Collector-Emitter Breakdown Voltage (Forward Blocking) (Note 12)	BV _{CEX}	170	210	-	V	I _C = 100μA, R _{BE} < 1kΩ or -1V < V _{BE} < 0.25V
Collector-Emitter Breakdown Voltage (Note 12)	BV _{CEO}	100	120	-	V	I _C = 1mA
Emitter-Collector Breakdown Voltage (Reverse Blocking) (Note 12)	BV _{ECX}	6	7	-	V	I _E = 100μA, R _{BC} < 1kΩ or 0.25V > V _{BC} > -0.25V
Emitter-Collector Breakdown Voltage	BV _{ECO}	6	8.4	-	V	I _E = 100μA
Emitter-Base Breakdown Voltage	BV _{EBO}	7	8	-	V	I _E = 100μA
Collector Cut-Off Current	I _{CBO}	-	<1	50 20	nA	V _{CB} = 136V V _{CB} = 136V, T _A = +100°C
Collector Emitter Cut-Off Current	I _{CEX}	-	-	100	nA	V _{CE} = 136V, R _{BE} < 1kΩ or -1V < V _{BE} < 0.25V
Emitter Cut-Off Current	I _{EBO}	-	<1	50	nA	V _{EB} = 5.6V
Static Forward Current Transfer Ratio (Note 12)	h _{FE}	100 50 -	200 85 20	300 - -	-	I _C = 10mA, V _{CE} = 2V I _C = 1A, V _{CE} = 2V I _C = 3A, V _{CE} = 2V
Collector-Emitter Saturation Voltage (Note 12)	V _{CE(sat)}	- - - -	40 100 70 200	55 135 80 250	mV	I _C = 0.5A, I _B = 50mA I _C = 0.5A, I _B = 10mA I _C = 1A, I _B = 100mA I _C = 3A, I _B = 300mA
Base-Emitter Saturation Voltage (Note 12)	V _{BE(sat)}	-	940	1050	mV	I _C = 3A, I _B = 300mA
Base-Emitter Saturation Voltage (Note 12)	V _{BE(on)}	-	890	1000	mV	I _C = 3A, V _{CE} = 2V
Transition Frequency	f _T	-	160	-	MHz	I _C = 100mA, V _{CE} = 5V, f = 100MHz
Collector Output Capacitance	C _{obo}	-	9.4	20	pF	V _{CB} = 10V, f = 1MHz
Delay Time	t _(d)	-	16	-	ns	V _{CC} = 10V, I _C = 0.5A, I _{B1} = -I _{B2} = 50mA
Rise Time	t _(r)	-	55	-	ns	
Storage Time	t _(s)	-	677	-	ns	
Fall Time	t _(f)	-	95	-	ns	

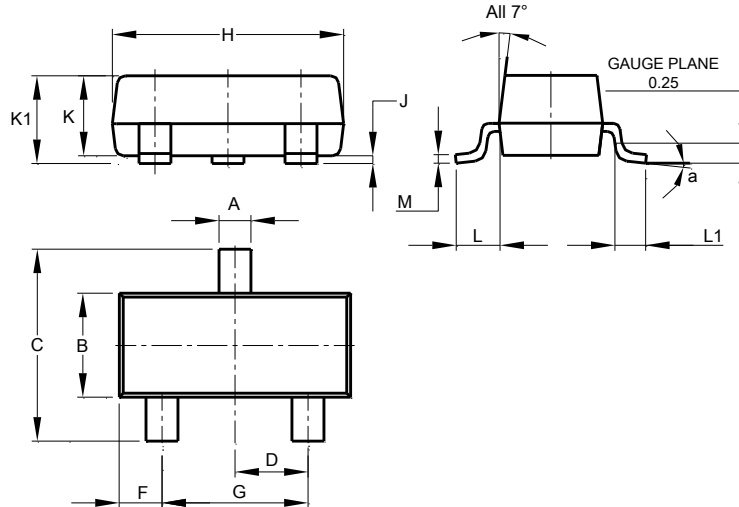
Note: 12. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%

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



Package Outline Dimensions

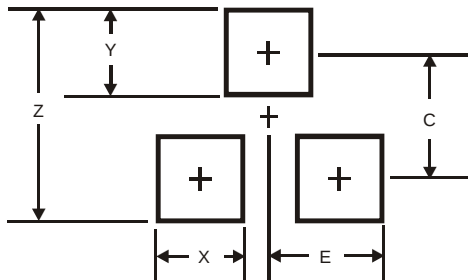
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	8°		
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)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

Note: 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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