

ZXTN25100BFH

100V NPN LOW SATURATION TRANSISTOR IN SOT23

Features

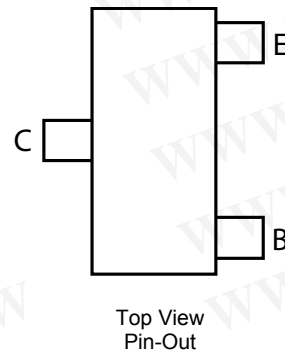
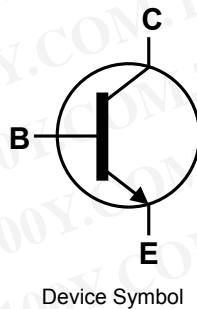
- $BV_{CEO} > 100V$
- $BV_{CEX} > 170V$ forward blocking voltage
- $BV_{ECO} > 6V$ reverse blocking voltage
- $I_C = 3A$ high Continuous Collector Current
- Low saturation voltage, $V_{CE(SAT)} < 80mV @ 1A$
- $R_{CE(SAT)} = 67m\Omega$ for a low equivalent On-Resistance
- 1.25W Power dissipation
- h_{FE} specified up to 3A for high current gain hold up
- Complementary PNP Type: ZXTP25100BFH
- **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 (E3)
- Weight 0.008 grams (approximate)

Applications

- Lamp relay and solenoid drivers
- General switching in automotive and industrial applications
- Motor drive and control

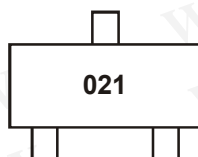


Ordering Information (Note 4)

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> 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



021 = Product Type Marking Code

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CB0}	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 (Note 5)	I _{CM}	9	A

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

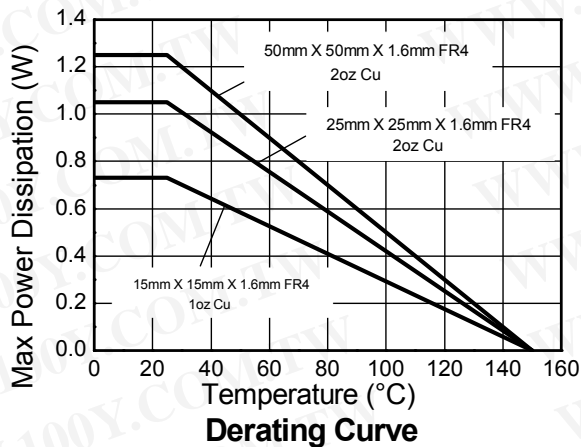
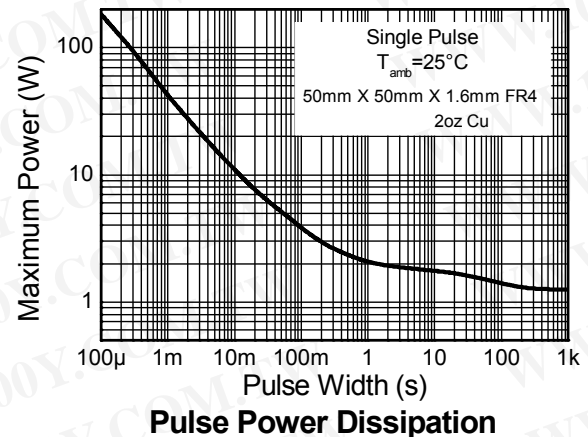
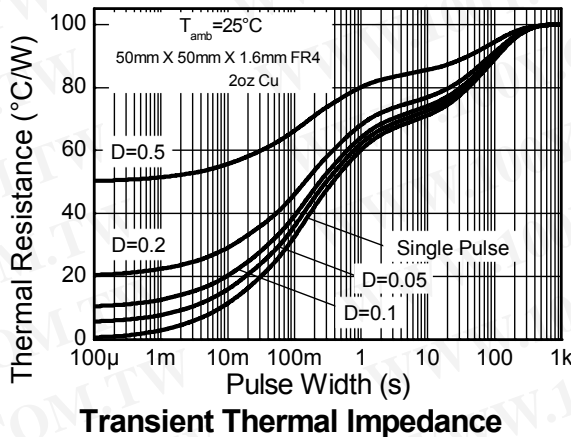
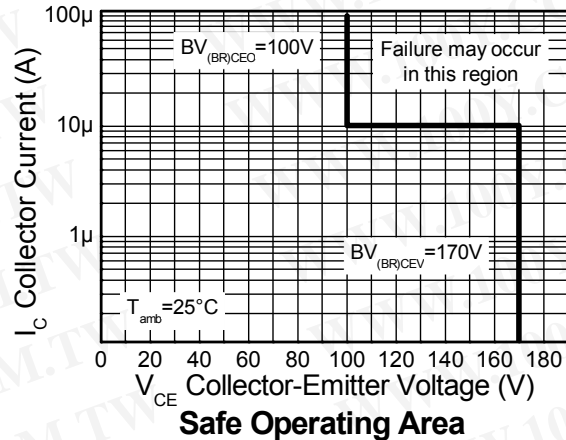
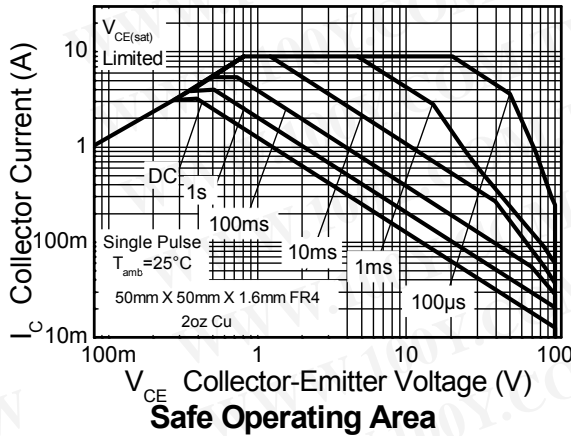
Characteristic	Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 5) P _D	0.73 5.84	mW
Power Dissipation Linear Derating Factor	(Note 6) P _D	1.05 8.4	mW
Power Dissipation Linear Derating Factor	(Note 7) P _D	1.25 9.6	mW
Power Dissipation Linear Derating Factor	(Note 8) P _D	1.81 14.5	mW
Thermal Resistance, Junction to Ambient	(Note 5) R _{θJA}	171	°C/W
Thermal Resistance, Junction to Ambient	(Note 6) R _{θJA}	119	°C/W
Thermal Resistance, Junction to Ambient	(Note 7) R _{θJA}	100	°C/W
Thermal Resistance, Junction to Ambient	(Note 8) R _{θJA}	69	°C/W
Thermal Resistance, Junction to Leads	(Note 9) R _{θJL}	74.96	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 10)

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 surface mounted on 15mm x 15mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
 - Same as note (5), except mounted on 25mm x 25mm x 1.6mm FR4 PCB with 2 oz copper.
 - Same as note (5), except mounted on 50mm x 50mm x 1.6mm FR4 PCB with 2 oz copper.
 - Same as note (7), except measured at t < 5secs.
 - 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



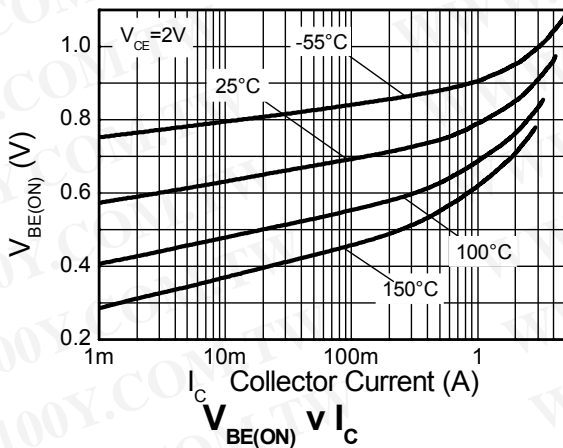
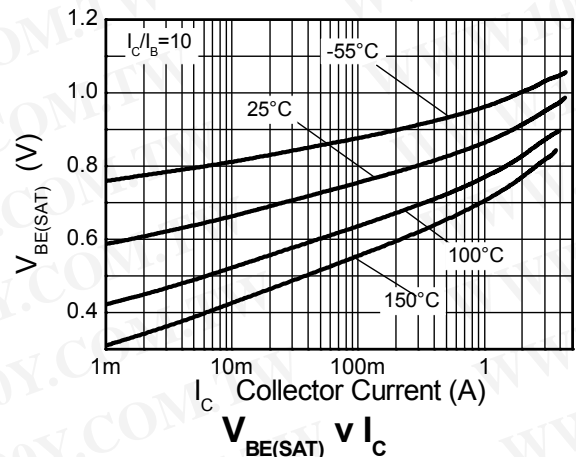
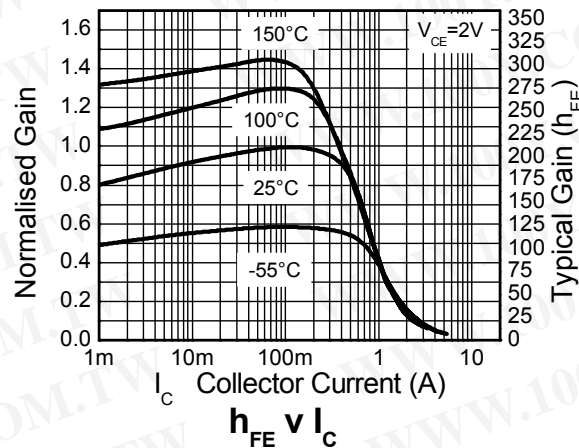
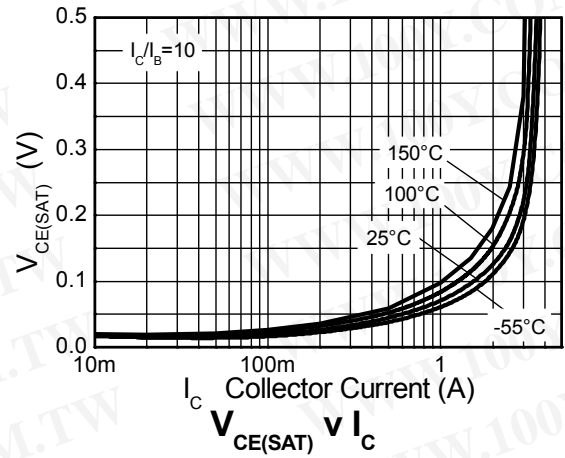
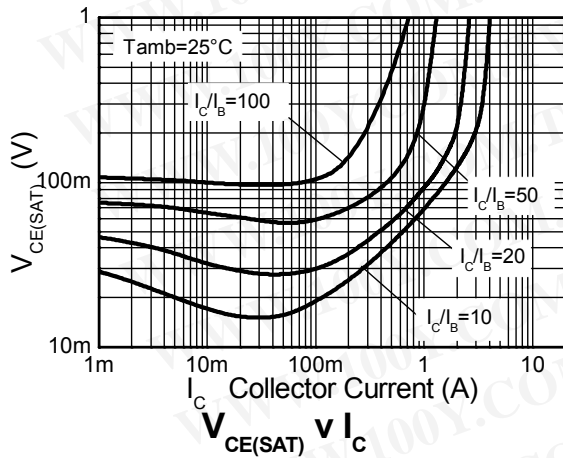
Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	170	220	-	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Forward Blocking) (Note 11)	BV_{CEX}	170	210	-	V	$I_C = 100\mu\text{A}$, $R_{BE} < 1\text{k}\Omega$ or $-1\text{V} < V_{BE} < 0.25\text{V}$
Collector-Emitter Breakdown Voltage (Note 11)	BV_{CEO}	100	120	-	V	$I_C = 1\text{mA}$
Emitter-Collector Breakdown Voltage (Reverse Blocking) (Note 11)	BV_{ECX}	6	7	-	V	$I_E = 100\mu\text{A}$, $R_{BC} < 1\text{k}\Omega$ or $0.25\text{V} > V_{BC} > -0.25\text{V}$
Emitter-Collector Breakdown Voltage	BV_{ECO}	6	8.4	-	V	$I_E = 100\mu\text{A}$
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8	-	V	$I_E = 100\mu\text{A}$
Collector Cut-off Current	I_{CBO}	-	<1	50 20	nA	$V_{CB} = 136\text{V}$ $V_{CB} = 136\text{V}$, $T_A = +100^\circ\text{C}$
Collector Emitter Cut-off Current	I_{CEX}	-	-	100	nA	$V_{CE} = 136\text{V}$, $R_{BE} < 1\text{k}\Omega$ or $-1\text{V} < V_{BE} < 0.25\text{V}$
Emitter Cut-off Current	I_{EBO}	-	<1	50	nA	$V_{EB} = 5.6\text{V}$
Static Forward Current Transfer Ratio (Note 11)	h_{FE}	100 50 -	200 85 20	300 -	-	$I_C = 10\text{mA}$, $V_{CE} = 2\text{V}$ $I_C = 1\text{A}$, $V_{CE} = 2\text{V}$ $I_C = 3\text{A}$, $V_{CE} = 2\text{V}$
Collector-Emitter Saturation Voltage (Note 11)	$V_{CE(sat)}$	- - - -	40 100 70 200	55 135 80 250	mV	$I_C = 0.5\text{A}$, $I_B = 50\text{mA}$ $I_C = 0.5\text{A}$, $I_B = 10\text{mA}$ $I_C = 1\text{A}$, $I_B = 100\text{mA}$ $I_C = 3\text{A}$, $I_B = 300\text{mA}$
Base-Emitter Saturation Voltage (Note 11)	$V_{BE(sat)}$	-	940	1050	mV	$I_C = 3\text{A}$, $I_B = 300\text{mA}$
Base-Emitter Saturation Voltage (Note 11)	$V_{BE(on)}$	-	890	1000	mV	$I_C = 3\text{A}$, $V_{CE} = 2\text{V}$
Transition Frequency	f_T	-	160	-	MHz	$I_C = 100\text{mA}$, $V_{CE} = 5\text{V}$, $f = 100\text{MHz}$
Collector Output Capacitance	C_{obo}	-	9.4	20	pF	$V_{CB} = 10\text{V}$, $f = 1\text{MHz}$
Delay Time	$t_{(d)}$	-	16	-	ns	$V_{CC} = 10\text{V}$, $I_C = 0.5\text{A}$, $I_{B1} = -I_{B2} = 50\text{mA}$
Rise Time	$t_{(r)}$	-	55	-	ns	
Storage Time	$t_{(s)}$	-	677	-	ns	
Fall Time	$t_{(f)}$	-	95	-	ns	

Notes: 11. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$

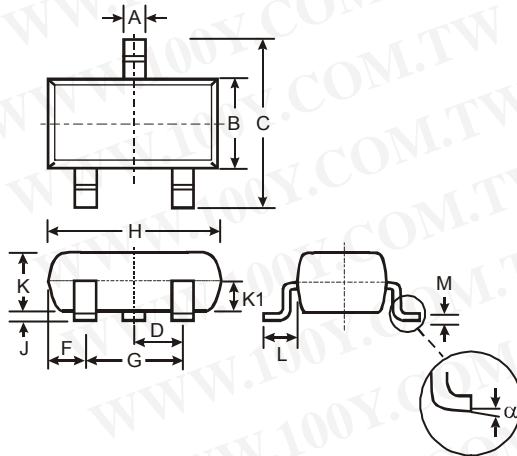
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Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



Package Outline Dimensions

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

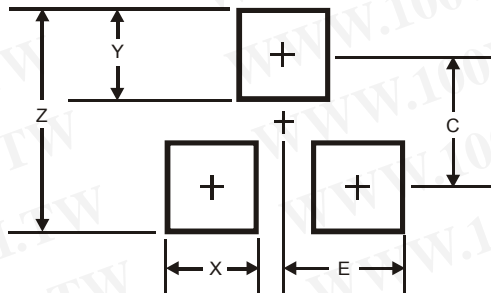


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.903	1.10	1.00
K1	-	-	0.400
L	0.45	0.61	0.55
M	0.085	0.18	0.11
α	0°	8°	-

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

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