

## Features

- $BV_{CEO} > -100V$
- $BV_{ECO} > -7V$
- $I_C = -2A$  Continuous Collector Current
- $V_{CE(SAT)} < -130mV @ -1A$
- $R_{CE(SAT)} = 108m\Omega$  Typical
- $P_D = 1.25W$
- High Peak Current
- Complementary Part Number 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

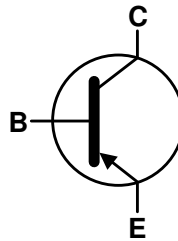
- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.008 grams (Approximate)

## Applications

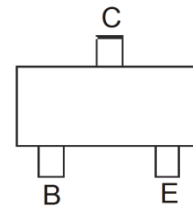
- MOSFET and IGBT Gate Driving
- DC-DC Converters
- Motor Drive
- Relay, Lamp and Solenoid Drive



Top View



Device Symbol



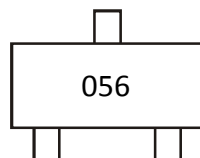
Top View  
Pin-Out

## Ordering Information (Note 4)

Part Number	Marking	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
ZXTP25100BFHTA	056	7	8	3,000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



056 = Product Type Marking Code

**Absolute Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	-140	V
Collector-Emitter Voltage (Forward Blocking)	V <sub>CEO</sub>	-100	V
Emitter-Collector Voltage (Reverse Blocking)	V <sub>ECO</sub>	-7	V
Emitter-Base Voltage	V <sub>EBO</sub>	-7	V
Continuous Collector Current (Note 5)	I <sub>C</sub>	-2	A
Peak Pulse Current	I <sub>CM</sub>	-5	A

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 5)	P <sub>D</sub>	0.73	W
	(Note 6)		5.84	
	(Note 7)		1.05	
	(Note 8)		8.4	
	(Note 8)		1.25	
Thermal Resistance, Junction to Ambient	(Note 5)	R <sub>θJA</sub>	9.6	°C/W
	(Note 6)		1.81	
	(Note 7)		14.5	
	(Note 8)		171	
Thermal Resistance, Junction to Lead	(Note 9)	R <sub>θJL</sub>	74.95	°C/W
Operating and Storage Temperature Range	—	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

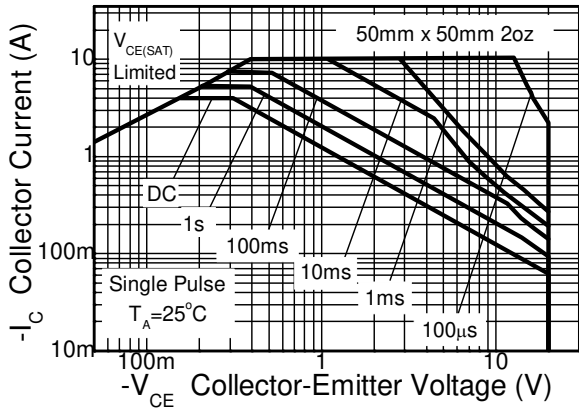
- Notes:
5. For a device surface mounted on 15mm x 15mm x 1.6mm FR-4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
  6. Same as note (5), except the device is surface mounted on 25mm x 25mm with 2 oz copper.
  7. Same as note (5), except the device is surface mounted on 50mm x 50mm with 2 oz copper.
  8. Same as note (6), except the device is measured at t<5secs.
  9. Thermal resistance from junction to solder-point (at the end of the collector lead).

**ESD Ratings** (Note 10)

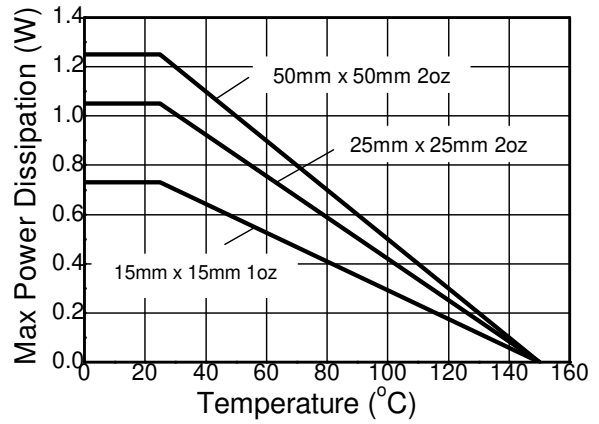
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Note: 10. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

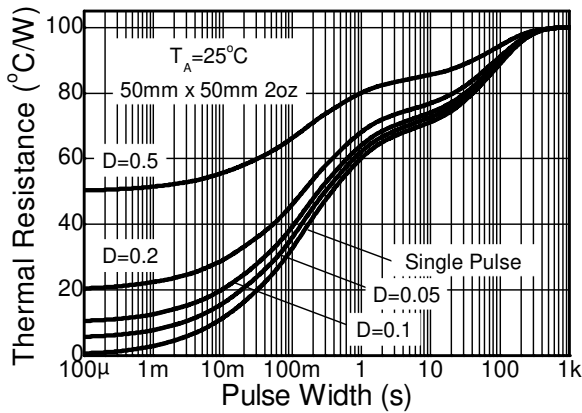
**Thermal Characteristics and Derating Information**



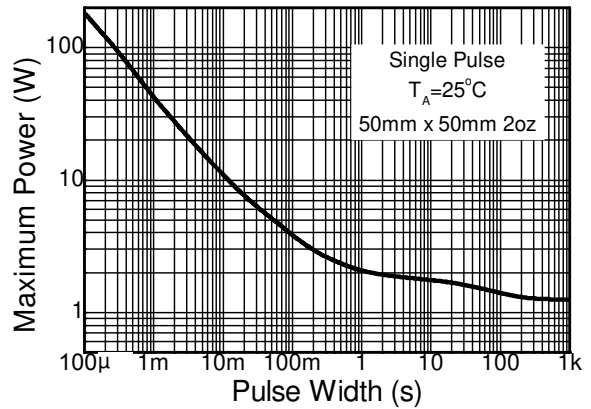
**Safe Operating Area**



**Derating Curve**



**Transient Thermal Impedance**



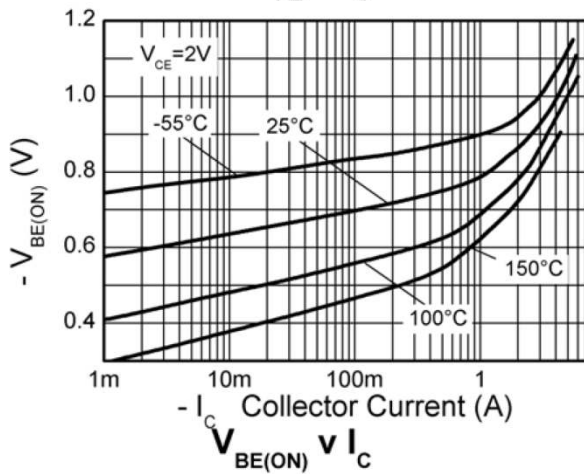
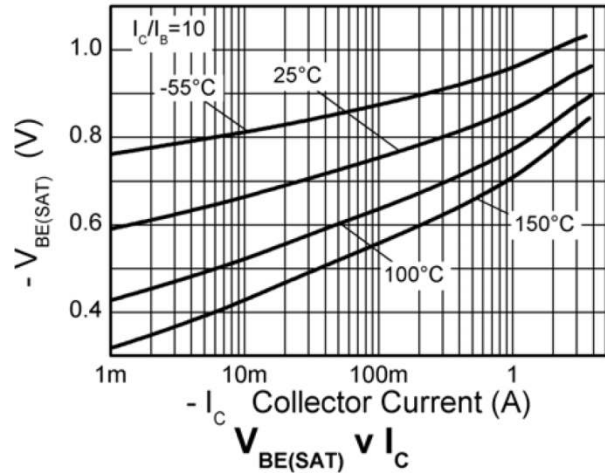
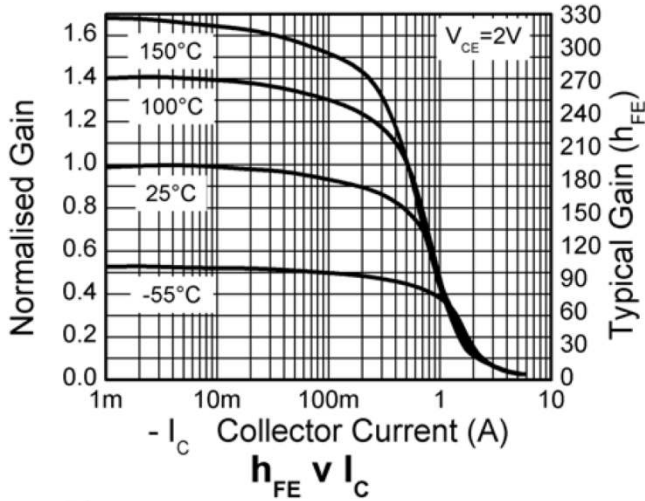
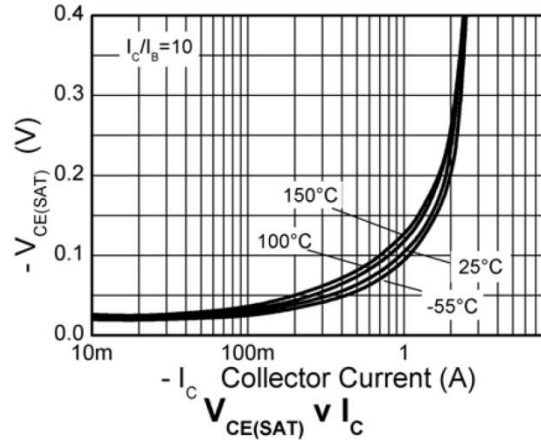
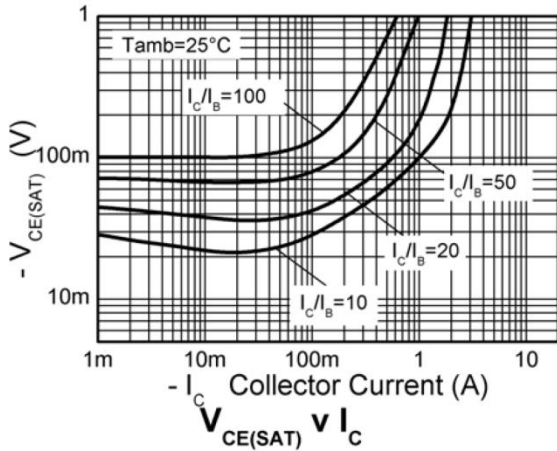
**Pulse Power Dissipation**

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-140	-165	—	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage (Note 11)	BV <sub>CEO</sub>	-100	-125	—	V	I <sub>C</sub> = -10mA
Collector-Emitter Breakdown Voltage	BV <sub>CEX</sub>	-140	-165	—	V	I <sub>E</sub> = -100μA, R <sub>BC</sub> < 1kΩ or -0.25 < V <sub>BE</sub> < 1V
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-7	-8.2	—	V	I <sub>E</sub> = -100μA
Collector-Base Cutoff Current	I <sub>CBO</sub>	—	< -1	-50	nA	V <sub>CB</sub> = -112V
Emitter-Base Cutoff Current	I <sub>EBO</sub>	—	< -1	-50	nA	V <sub>EB</sub> = -5.6V
Static Forward Current Transfer Ratio (Note 11)	h <sub>FE</sub>	100	200	300	—	I <sub>C</sub> = -10mA, V <sub>CE</sub> = -2V
		55	105	—		I <sub>C</sub> = -1A, V <sub>CE</sub> = -2V
		15	25	—		I <sub>C</sub> = -2A, V <sub>CE</sub> = -2V
Collector-Emitter Saturation Voltage (Note 11)	V <sub>CE(SAT)</sub>	—	-60	-90	mV	I <sub>C</sub> = -0.5A, I <sub>B</sub> = -50mA
		—	-240	-350		I <sub>C</sub> = -0.5A, I <sub>B</sub> = -10mA
		—	-100	-130		I <sub>C</sub> = -1A, I <sub>B</sub> = -100mA
		—	-215	-295		I <sub>C</sub> = -2A, I <sub>B</sub> = -200mA
Base-Emitter Saturation Voltage (Note 11)	V <sub>BE(SAT)</sub>	—	-900	-1000	mV	I <sub>C</sub> = -2A, I <sub>B</sub> = -200mA
Base-Emitter Voltage (Note 11)	V <sub>BE(ON)</sub>	—	-830	-950	mV	I <sub>C</sub> = -2A, V <sub>CE</sub> = -2V
Output Capacitance	C <sub>OBO</sub>	—	15	25	pF	V <sub>CB</sub> = -10V, f = 1MHz
Transition Frequency	f <sub>T</sub>	—	200	—	MHz	V <sub>CE</sub> = -5V, I <sub>C</sub> = -100mA, f = 100MHz
Turn-on Time	t <sub>(ON)</sub>	—	31	—	ns	V <sub>CC</sub> = -10V, I <sub>C</sub> = -500mA,
Turn-off Time	t <sub>(OFF)</sub>	—	384	—	ns	I <sub>B1</sub> = -I <sub>B2</sub> = -50mA

Note: 11. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

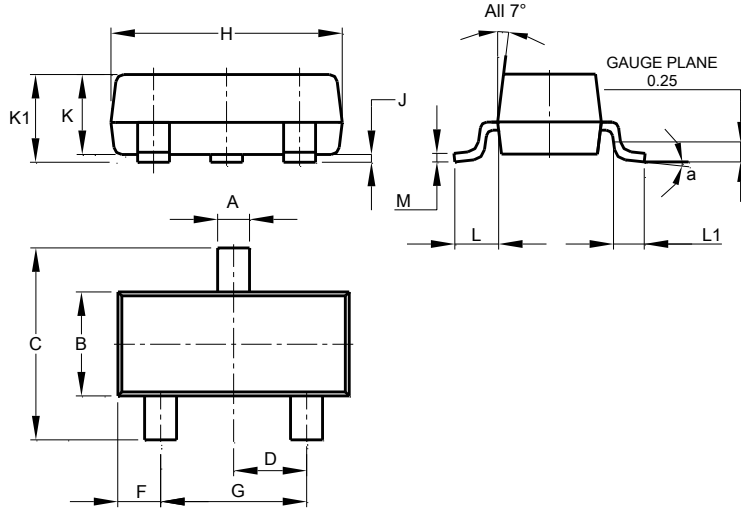
**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



**Package Outline Dimensions**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT23**

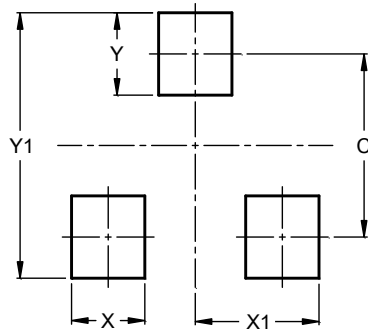


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

**Suggested Pad Layout**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT23**



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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