

## Features

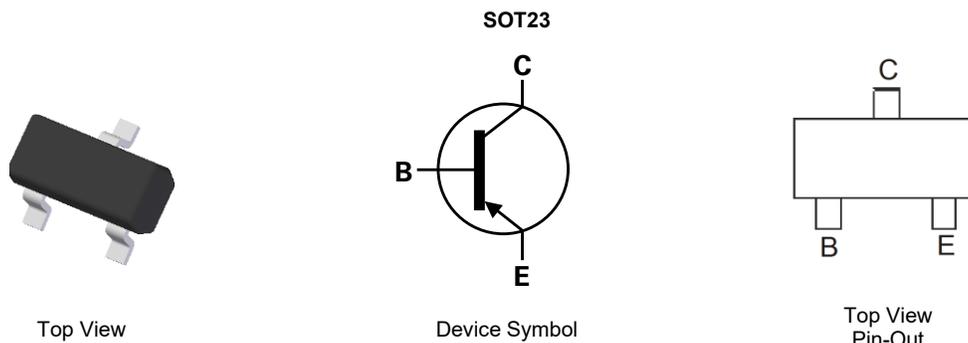
- $BV_{CEO} > -20V$
- $BV_{ECO} > -7V$
- $I_C = -4A$  Continuous Collector Current
- $V_{CE(sat)} < -55mV @ -1A$
- $R_{CE(sat)} = 34m\Omega$
- High Peak Current
- Complementary Part Number: ZXTN25020CFH
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e.: parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at <https://www.diodes.com/products/automotive/automotive-products/>.**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. <https://www.diodes.com/quality/product-definitions/>**

## Mechanical Data

- Package: SOT23
- Package 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

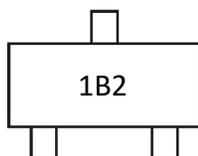


## Ordering Information (Note 4)

Orderable Part Number	Marking	Reel size (inches)	Tape width (mm)	Package	Packing	
					Quantity	Carrier
ZXTP25020CFHTA	1B2	7	8	SOT23	3,000	Reel

- 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 <http://www.diodes.com/products/packages.html>.

## Marking Information



1B2 = Product Type Marking Code

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	-25	V
Collector-Emitter Voltage (Forward Blocking)	$V_{CEO}$	-20	V
Emitter-collector voltage (Reverse Blocking)	$V_{ECO}$	-7	V
Emitter-Base Voltage	$V_{EBO}$	-7	V
Continuous Collector Current (Note 5)	$I_C$	-4	A
Base Current	$I_B$	-1	A
Peak Pulse Current	$I_{CM}$	-10	A

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation Linear derating factor	$P_D$	0.73	W
		5.84	
		1.05	
		8.4	
		1.25	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	9.6	$^{\circ}\text{C/W}$
		1.81	
		14.5	
		171	
Thermal Resistance, Junction to Lead	$R_{\theta JL}$	119	$^{\circ}\text{C/W}$
		100	
		69	
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^{\circ}\text{C}$

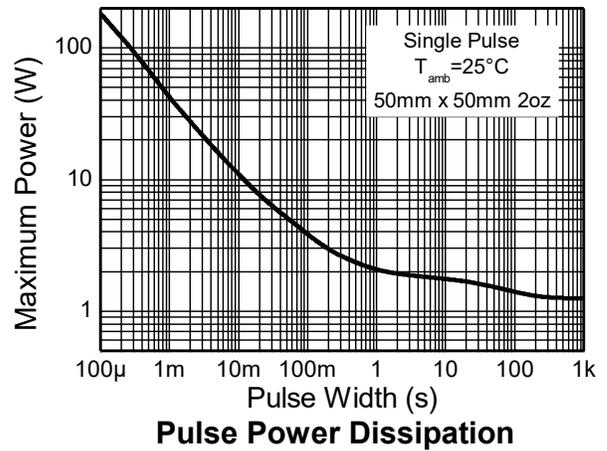
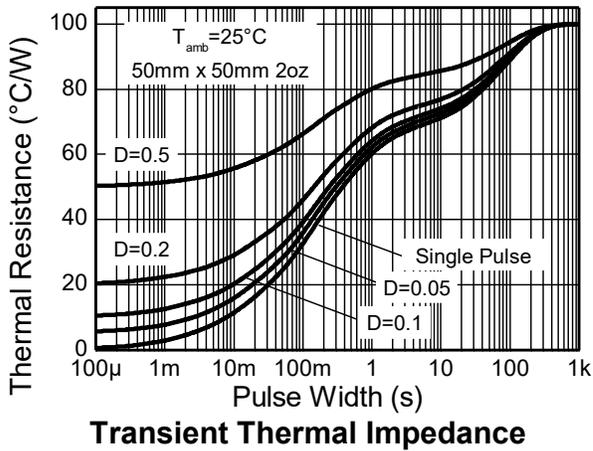
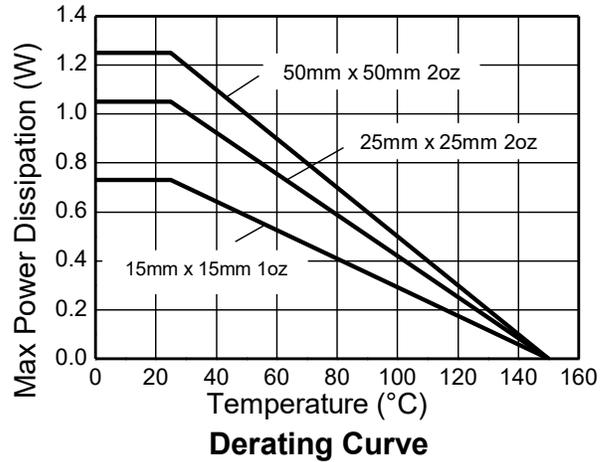
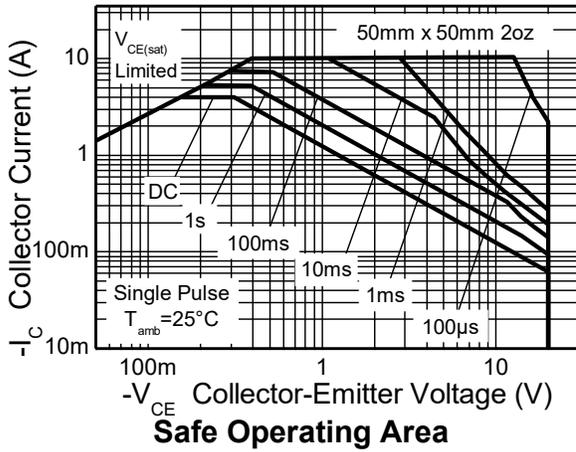
- Notes:
- For a device surface mounted on 15mm x 15mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
  - Same as note (5), except the device is surface mounted on 25mm x 25mm with 2 oz copper.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

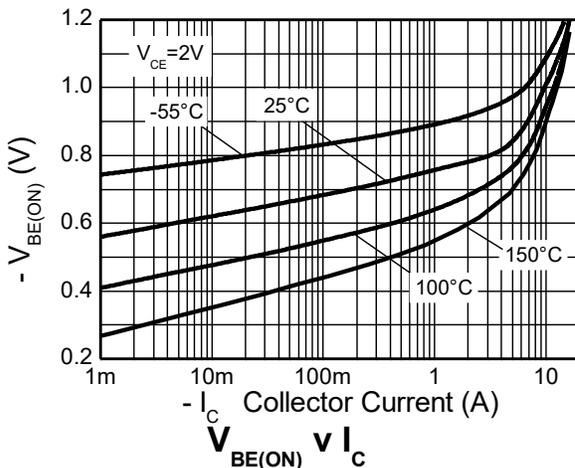
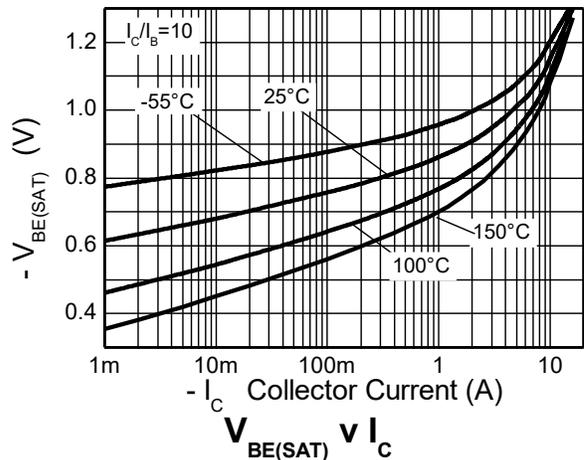
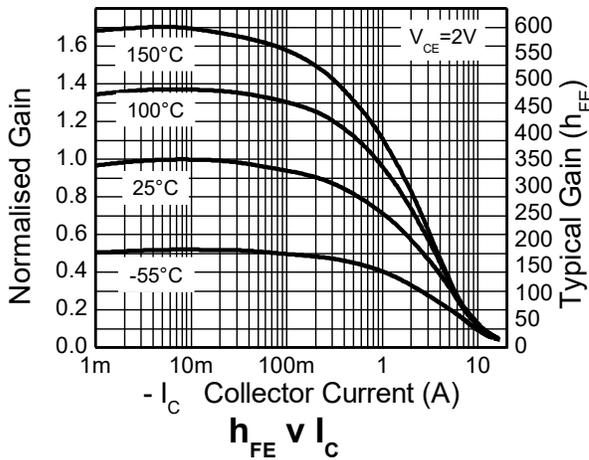
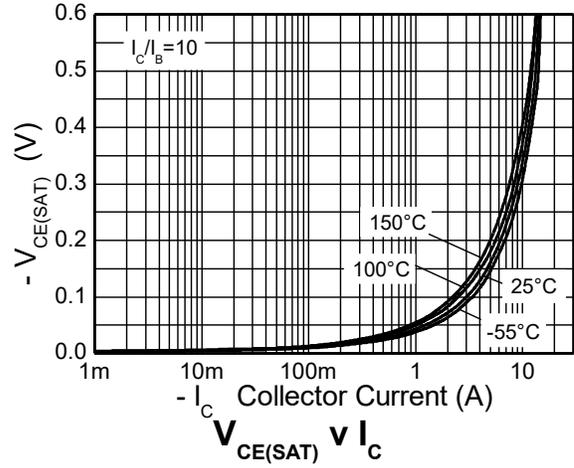
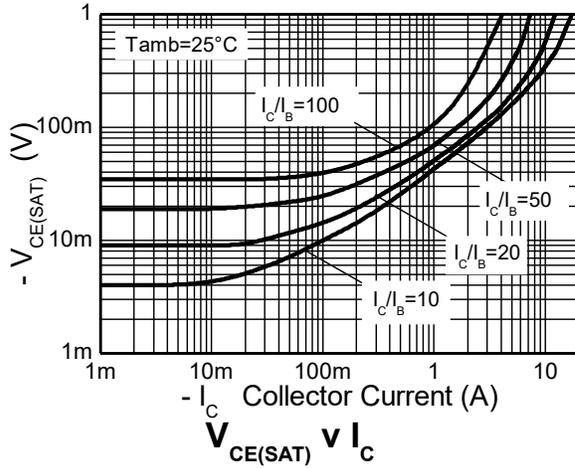


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-25	-50	—	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage (Note 11)	BV <sub>CEO</sub>	-20	-35	—	V	I <sub>C</sub> = -10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-7	-8.2	—	V	I <sub>E</sub> = -100μA
Emitter-Base Breakdown Voltage	BV <sub>ECO</sub>	-7	-8.8	—	V	I <sub>E</sub> = -100μA
Collector-Base Cutoff Current	I <sub>CBO</sub>	—	< -1	-50	nA	V <sub>CB</sub> = -20V
		—	—	-20	μA	V <sub>CB</sub> = -20V, T <sub>amb</sub> = +100°C
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>	200	350	500	—	I <sub>C</sub> = -10mA, V <sub>CE</sub> = -2V
		150	250	—		I <sub>C</sub> = -1A, V <sub>CE</sub> = -2V
		85	140	—		I <sub>C</sub> = -4A, V <sub>CE</sub> = -2V
		—	40	—		I <sub>C</sub> = -10A, V <sub>CE</sub> = -2V
Collector-Emitter Saturation Voltage (Note 11)	V <sub>CE(sat)</sub>	—	-43	-55	mV	I <sub>C</sub> = -1A, I <sub>B</sub> = -100mA
		—	-70	-100		I <sub>C</sub> = -1A, I <sub>B</sub> = -20mA
		—	-120	-170		I <sub>C</sub> = -2A, I <sub>B</sub> = -40mA
		—	-150	-210		I <sub>C</sub> = -4A, I <sub>B</sub> = -200mA
Base-Emitter Saturation Voltage (Note 11)	V <sub>BE(sat)</sub>	—	-930	-1050	mV	I <sub>C</sub> = -4A, I <sub>B</sub> = -200mA
Base-Emitter Saturation Voltage (Note 11)	V <sub>BE(on)</sub>	—	-810	-900	mV	I <sub>C</sub> = -4A, V <sub>CE</sub> = -2V
Output Capacitance	C <sub>obo</sub>	—	32.4	40	pF	V <sub>CB</sub> = -10V, f = 1MHz
Transition Frequency	f <sub>T</sub>	—	285	—	MHz	V <sub>CE</sub> = -10V, I <sub>C</sub> = -50mA, f = 100MHz
Delay Time	t <sub>(d)</sub>	—	38.4	—	nS	V <sub>CC</sub> = -15V, I <sub>C</sub> = -750mA, I <sub>B1</sub> = -I <sub>B2</sub> = -15mA
Rise Time	t <sub>(r)</sub>	—	49.2	—	nS	
Storage Time	t <sub>(s)</sub>	—	168	—	nS	
Fall Time	t <sub>(f)</sub>	—	55	—	nS	

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

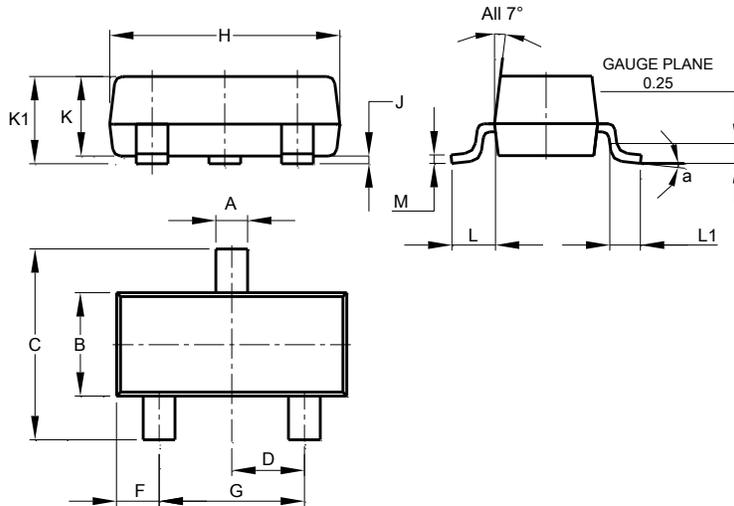
**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



## Package Outline Dimensions

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

**SOT23**

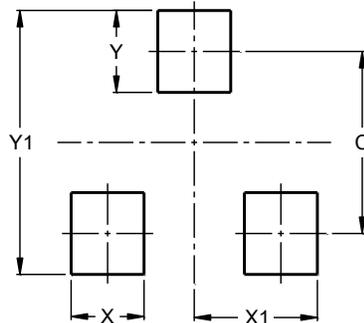


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

## 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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