Lead-free Green

20V PNP LOW POWER TRANSISTOR IN SOT23

Features

- BV_{CEO} > -20V
- BV_{ECO} > -7V
- I_C = -4A Continuous Collector Current
- $V_{CE(sat)}$ < -55mV @ -1A
- $R_{CE(sat)}$ = 34mΩ
- High Peak Current
- Complementary Part Number ZXTN25020CFH
- **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

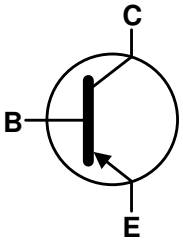
- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.008 grams (Approximate)

Applications

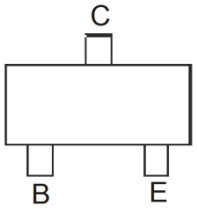
- MOSFET and IGBT Gate Driving
- DC-DC Converters

SOT23

Top View



Device Symbol



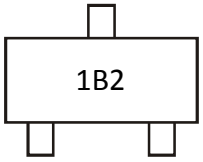
Top View
Pin-Out

Ordering Information (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTP25020CFHTA	1B2	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



1B2 = Product Type Marking Code

Absolute Maximum Ratings (@T_A = +25°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	(Note 5)	P_D	0.73 5.84	W
	(Note 6)		1.05 8.4	
	(Note 7)		1.25 9.6	
	(Note 8)		1.81 14.5	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	171	°C/W
	(Note 6)		119	
	(Note 7)		100	
	(Note 8)		69	
Thermal Resistance, Junction to Lead	(Note 9)	$R_{\theta JL}$	74.95	°C/W
Operating and Storage Temperature Range	—	T_J, T_{STG}	-55 to +150	°C

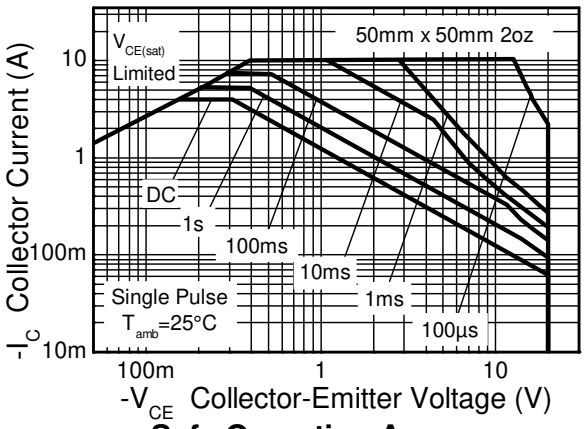
Notes:
5. For a device surface mounted on 15mm x 15mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
6. Same as note (5), except the device is surface mounted on 25mm x 25mm with 2 oz copper.
7.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

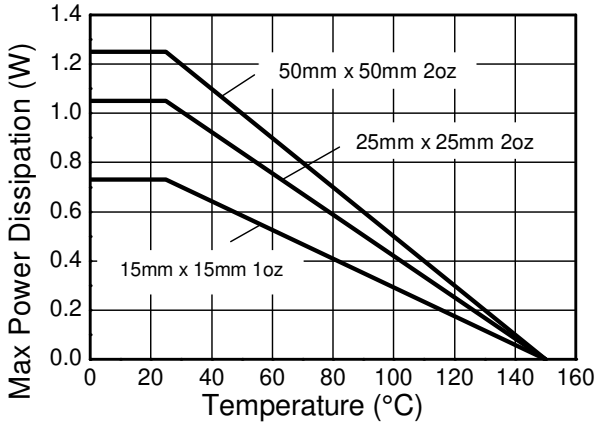
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

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

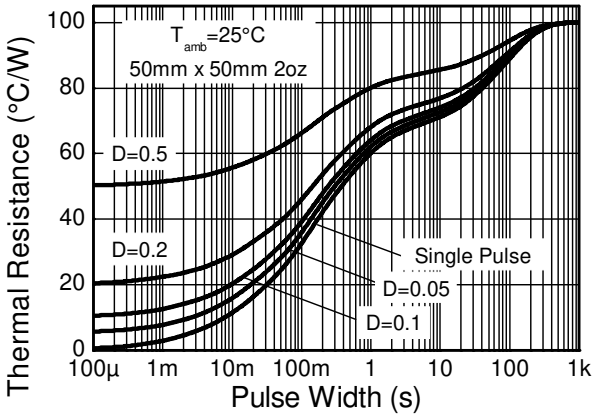
Thermal Characteristics and Derating Information



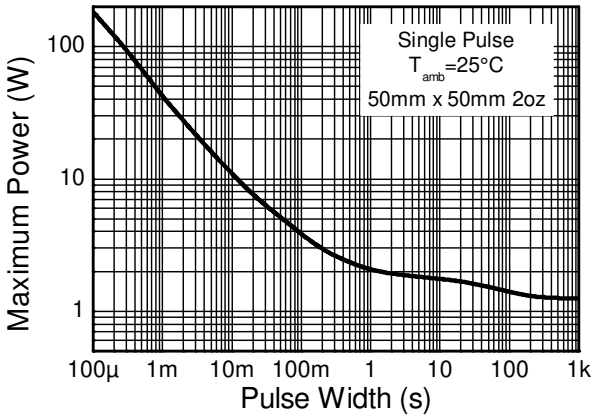
Safe Operating Area



Derating Curve



Transient Thermal Impedance



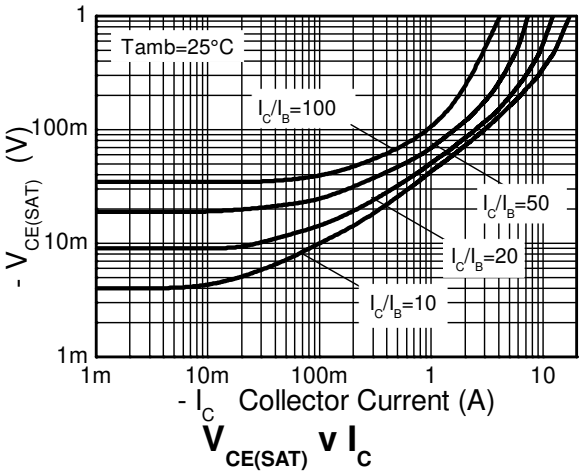
Pulse Power Dissipation

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

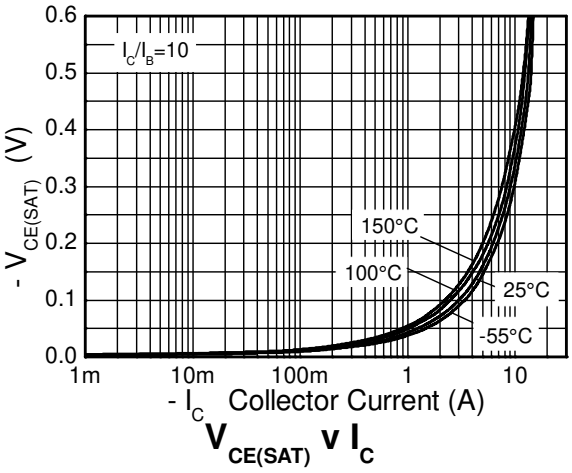
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-25	-50	—	V	I_C = -100µA
Collector-Emitter Breakdown Voltage (Note 11)	BV_{CEO}	-20	-35	—	V	I_C = -10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.2	—	V	I_E = -100µA
Emitter-Base Breakdown Voltage	BV_{ECO}	-7	-8.8	—	V	I_E = -100µA
Collector-Base Cutoff Current	I_{CBO}	—	< -1	-50	nA	V_{CB} = -20V
		—	—	-20	µA	V_{CB} = -20V, T_{amb} = +100°C
Emitter-Base Cutoff Current	I_{EBO}	—	< -1	-50	nA	V_{EB} = -5.6V
Static Forward Current Transfer Ratio (Note 11)	h_{FE}	200	350	500	—	I_C = -10mA, V_{CE} = -2V
		—	250	—		I_C = -1A, V_{CE} = -2V
		—	140	—		I_C = -4A, V_{CE} = -2V
		—	40	—		I_C = -10A, V_{CE} = -2V
Collector-Emitter Saturation Voltage (Note 11)	$V_{CE(sat)}$	—	-43	-55	mV	I_C = -1A, I_B = -100mA
		—	-70	-100		I_C = -1A, I_B = -20mA
		—	-120	-170		I_C = -2A, I_B = -40mA
		—	-150	-210		I_C = -4A, I_B = -200mA
Base-Emitter Saturation Voltage (Note 11)	$V_{BE(sat)}$	—	-930	-1050	mV	I_C = -4A, I_B = -200mA
Base-Emitter Saturation Voltage (Note 11)	$V_{BE(on)}$	—	-810	-900	mV	I_C = -4A, V_{CE} = -2V
Output Capacitance	C_{obo}	—	32.4	40	pF	V_{CB} = -10V, f = 1MHz
Transition Frequency	f_T	—	285	—	MHz	V_{CE} = -10V, I_C = -50mA, f = 100MHz
Delay Time	$t_{(d)}$	—	38.4	—	nS	V_{CC} = -15V, I_C = -750mA, I_{B1} = -I_{B2} = -15mA
Rise Time	$t_{(r)}$	—	49.2	—	nS	
Storage Time	$t_{(s)}$	—	168	—	nS	
Fall Time	$t_{(f)}$	—	55	—	nS	

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

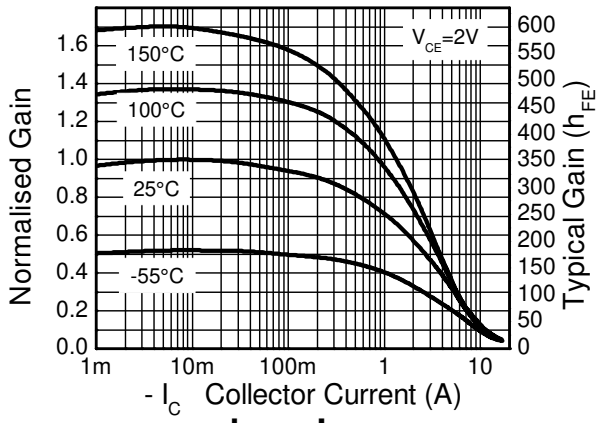
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



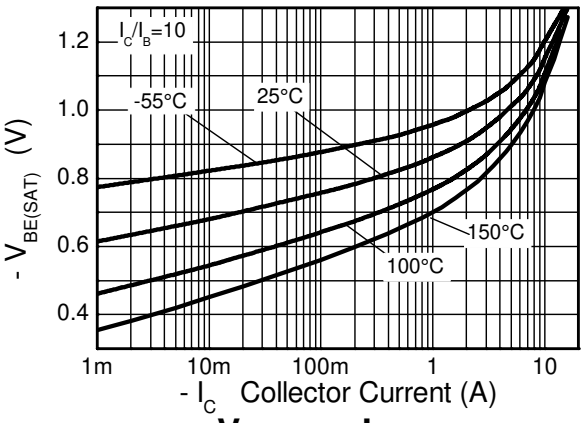
$V_{CE(SAT)}$ v I_C



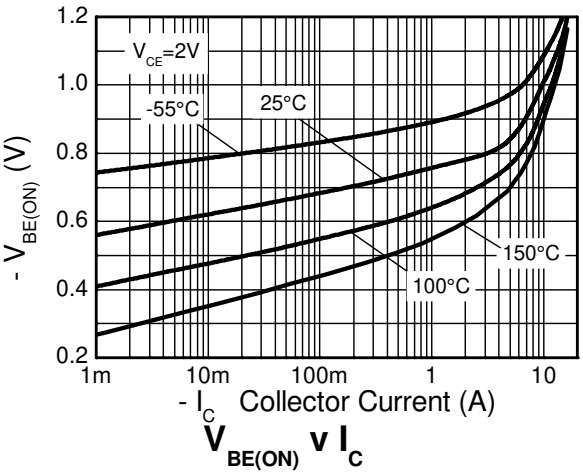
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



$V_{BE(SAT)}$ v I_C

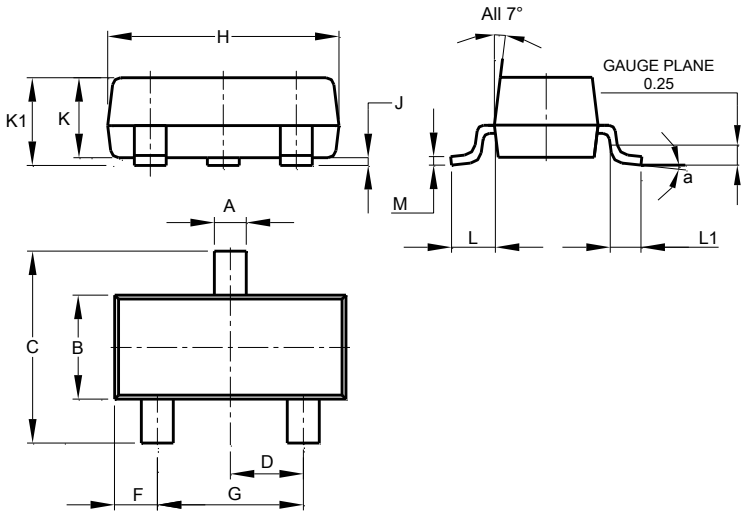


$V_{BE(ON)}$ v I_C

Package Outline Dimensions

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

SOT23

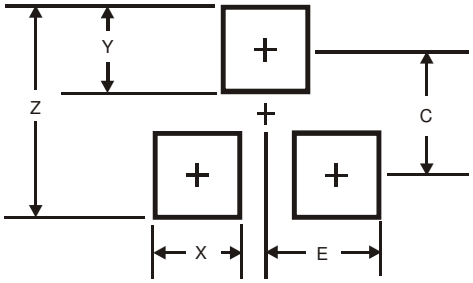


SOT23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	8°		
All Dimensions in mm			

Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.

SOT23



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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