

## Features

- $BV_{CE0} = 20V$
- Low Saturation Voltage  $V_{CE(sat)} < 12mV @ 100mA$
- $I_C = 2.5A$  Continuous Current
- $R_{sat} = 40m\Omega$  for a Low Equivalent On-Resistance
- **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 [contact us](mailto:contact@diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

## Mechanical Data

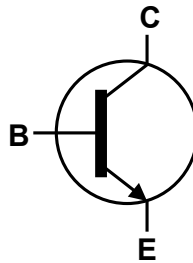
- Case: SOT23
- Case Material: Molded plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208
- Weight: 0.008 grams (Approximate)

## Application

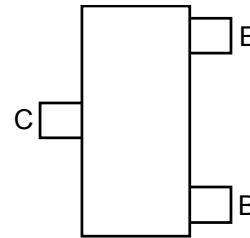
- DC - DC converters
- Power management functions
- Power switches
- Motor control



Top View



Device Symbol



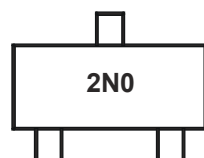
Top View  
Pin Out

## Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
ZXT11N20DFTA	Standard	2N0	7	8	3000

- 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



2N0 = Product Type Marking Code

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

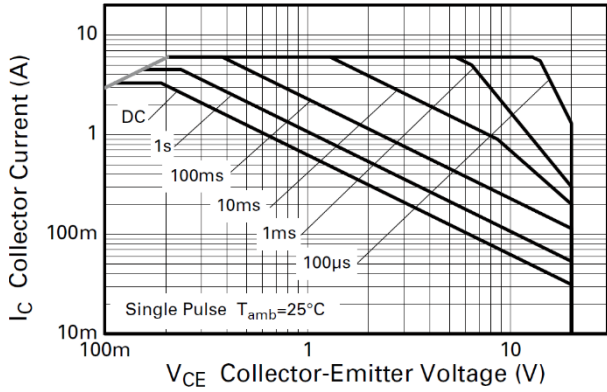
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	40	V
Collector-Emitter Voltage	$V_{CEO}$	20	V
Emitter-Base Voltage	$V_{EBO}$	7.5	V
Continuous Collector Current	$I_C$	2.5	A
Peak Pulse Collector Current (single pulse)	$I_{CM}$	5	A
Base Current	$I_B$	500	mA

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

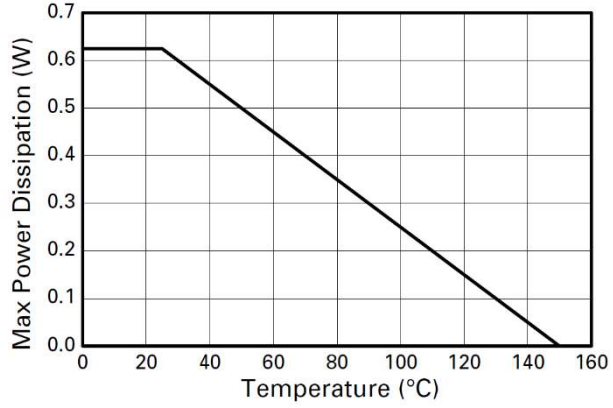
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	$P_D$	625	W
Linear Derating Factor		5	mW/ $^\circ\text{C}$
Power Dissipation (Note 6)	$P_D$	806	W
Linear Derating Factor		6.4	mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	200	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	155	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

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

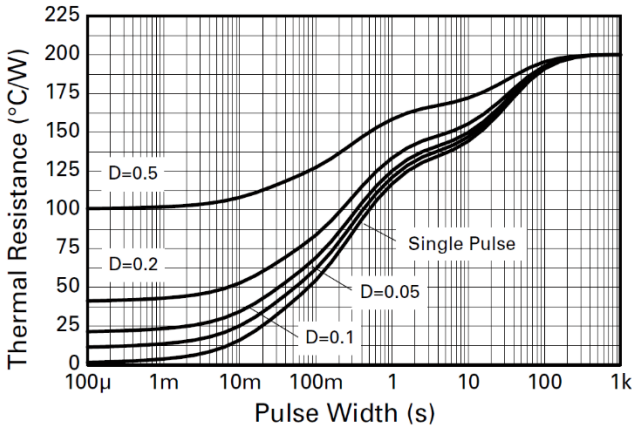
**Thermal Characteristics and Derating Information**



**Safe Operating Area**



**Derating Curve**



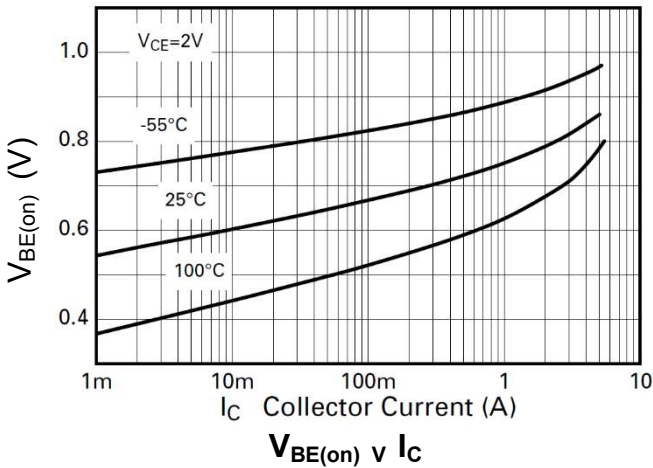
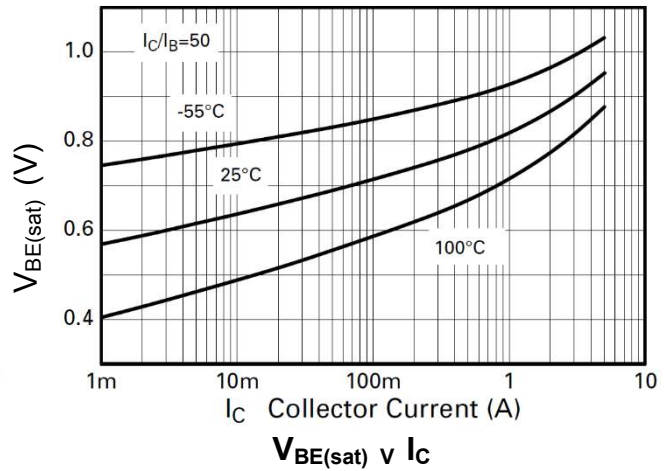
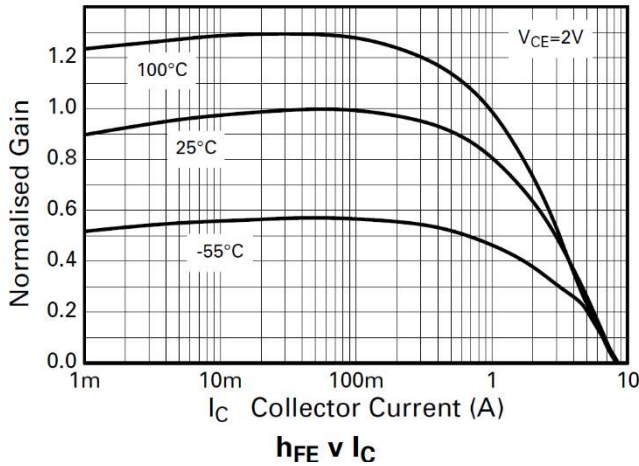
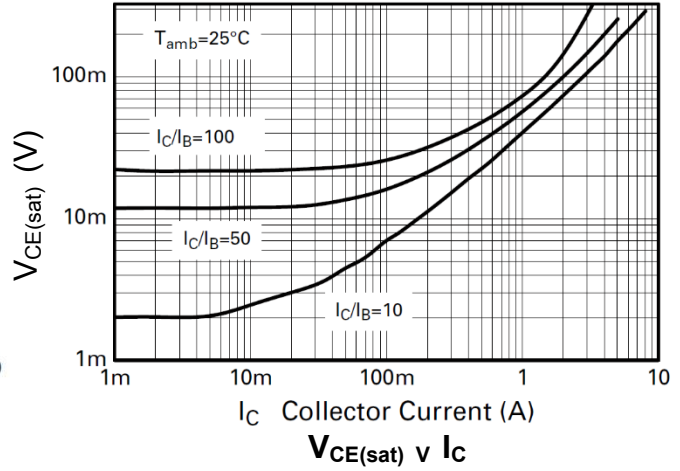
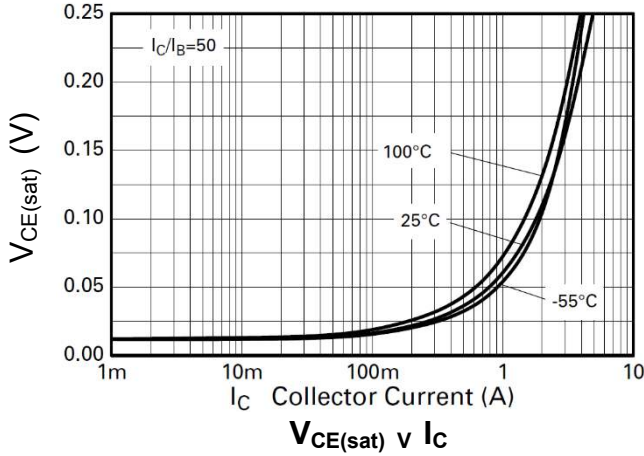
**Transient Thermal Impedance**

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$BV_{CBO}$	40	—	—	V	$I_C = 100\mu\text{A}$
Collector- Emitter Breakdown Voltage (Note 7)	$BV_{CEO}$	20	—	—	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	7.5	—	—	V	$I_E = 100\mu\text{A}$
Collector Cut-Off Current	$I_{CBO}$	—	—	100	nA	$V_{CB} = 32\text{V}$
Collector Emitter Cut-Off Current	$I_{CES}$	—	—	100	nA	$V_{CES} = 32\text{V}$
Emitter Cut-Off Current	$I_{EBO}$	—	—	100	nA	$V_{EB} = 6\text{V}$
Collector-Emitter Saturation Voltage (Note 7)	$V_{CE(sat)}$	—	7 65 40 90	12 100 60 130	mV	$I_C = 100\text{mA}, I_B = 10\text{mA}$ $I_C = 1\text{A}, I_B = 10\text{mA}$ $I_C = 1\text{A}, I_B = 100\text{mA}$ $I_C = 2.5\text{A}, I_B = 250\text{mA}$
Base-Emitter Saturation Voltage (Note 7)	$V_{BE(sat)}$	—	0.9	1.0	V	$I_C = 2.5\text{A}, I_B = 250\text{mA}$
Base-Emitter Turn-On Voltage (Note 7)	$V_{BE(on)}$	—	0.85	1.0	V	$I_C = 2.5\text{A}, V_{CE} = 2\text{V}$
DC Current Gain (Note 7)	$h_{FE}$	200 300 250 150 100	—	— 900 — — —	—	$I_C = 10\text{mA}, V_{CE} = 2\text{V}$ $I_C = 100\text{mA}, V_{CE} = 2\text{V}$ $I_C = 1\text{A}, V_{CE} = 2\text{V}$ $I_C = 3\text{A}, V_{CE} = 2\text{V}$ $I_C = 5\text{A}, V_{CE} = 2\text{V}$
Transitional frequency	$f_T$	—	160	—	MHz	$I_C = 50\text{mA}, V_{CE} = 10\text{V}$ $f = 50\text{MHz}$
Output Capacitance	$C_{obo}$	—	20	—	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$
Switching Time	$t_{on}$	—	122	—	ns	$I_C = 2\text{A}, V_{CC} = 10\text{V},$ $I_{B1} = -I_{B2} = 20\text{mA}$
	$t_{off}$	—	295	—		

Note: 7. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

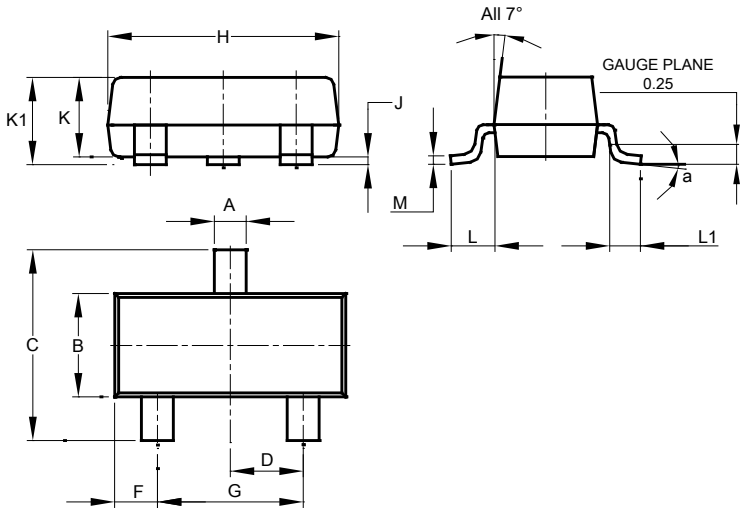
**Typical Electrical Characteristics** (@  $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



**Package Outline Dimensions**

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

**SOT23**

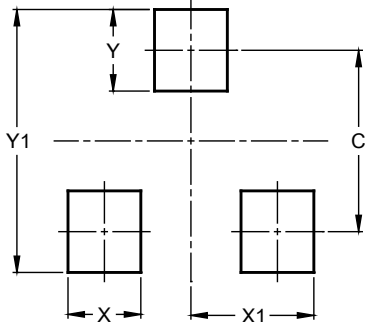


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

**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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