20V NPN LOW SATURATION TRANSISTOR IN SOT23

Features

- BV_{CEO} = 20V
- Low Saturation Voltage $V_{CE(sat)}$ < 12mV @ 100mA
- I_C = 2.5A Continuous Current
- R_{sat} = 40mΩ 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-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative. https://www.diodes.com/quality/product-definitions/**

Mechanical Data

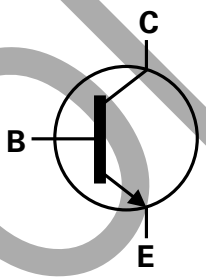
- Package: SOT23
- Package Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.008 grams (Approximate)

Application

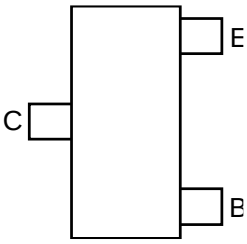
- DC-DC converters
- Power-management functions
- Power switches
- Motor controls

SOT23

Top View



Device Symbol



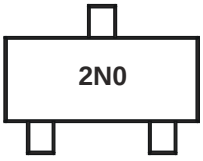
Top View
Pinout

Ordering Information (Note 4)

Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
ZXT11N20DFTA	SOT23	2N0	7	8	3000	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 https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information



2N0 = Product Type Marking Code

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

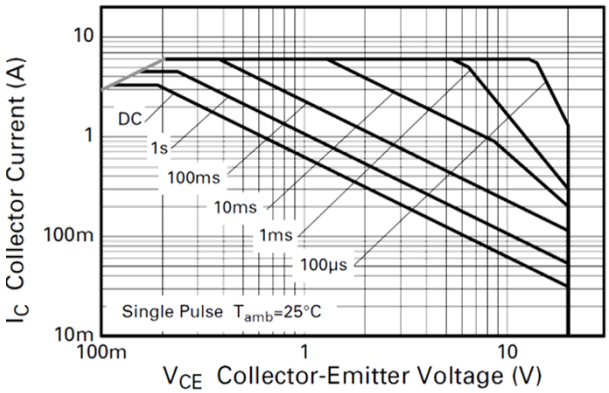
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	40	V
Collector-Emitter Voltage	V_{CEO}	20	V
Emitter-Base Voltage	V_{EBO}	7.5	V
Continuous Collector Current	I_C	2.5	A
Peak Pulse Collector Current (Single Pulse)	I_{CM}	5	A
Base Current	I_B	500	mA

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

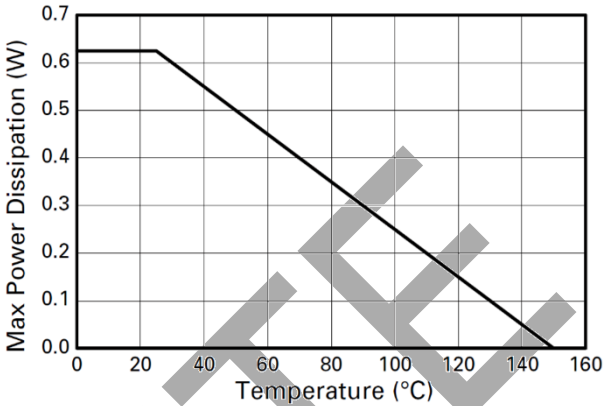
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5) Linear Derating Factor	P_D	625 5	W mW/°C
Power Dissipation (Note 6) Linear Derating Factor	P_D	806 6.4	W mW/°C
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	200	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta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

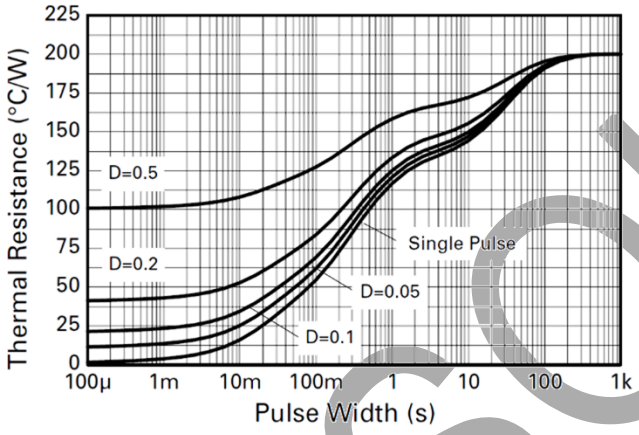
Thermal Characteristics and Derating Information



Safe Operating Area



Derating Curve



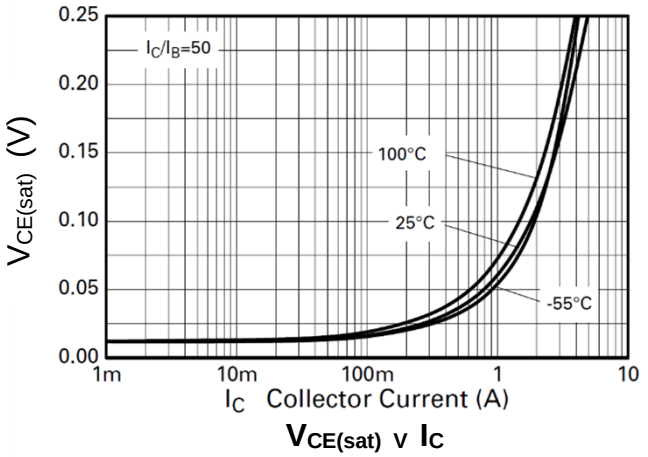
Transient Thermal Impedance

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

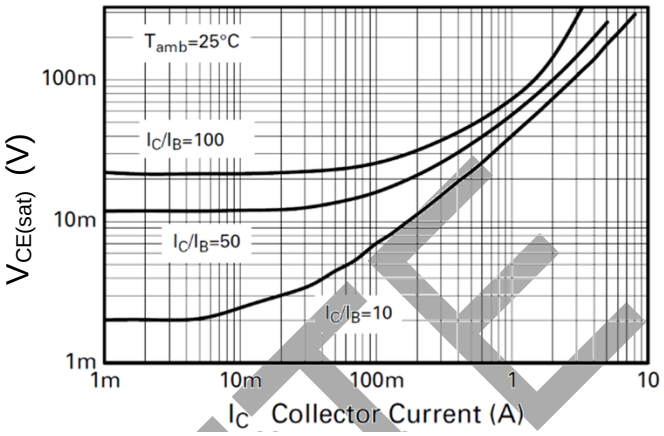
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	40	—	—	V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Note 7)	BV_{CEO}	20	—	—	V	I_C = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	7.5	—	—	V	I_E = 100µA
Collector Cutoff Current	I_{CBO}	—	—	100	nA	V_{CB}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

Note: 7. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

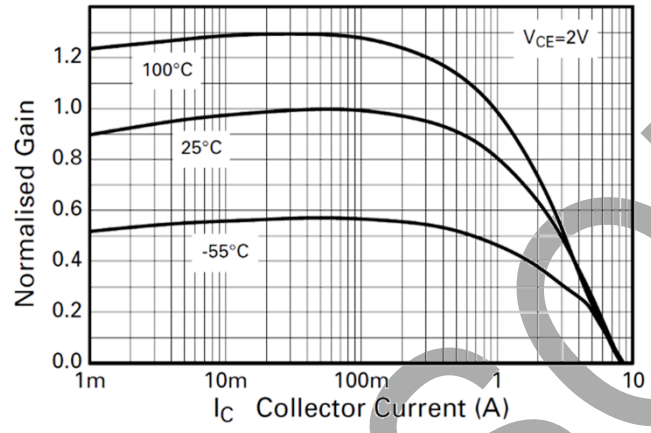
Typical Electrical Characteristics (@ T_A = +25°C, unless otherwise specified.)



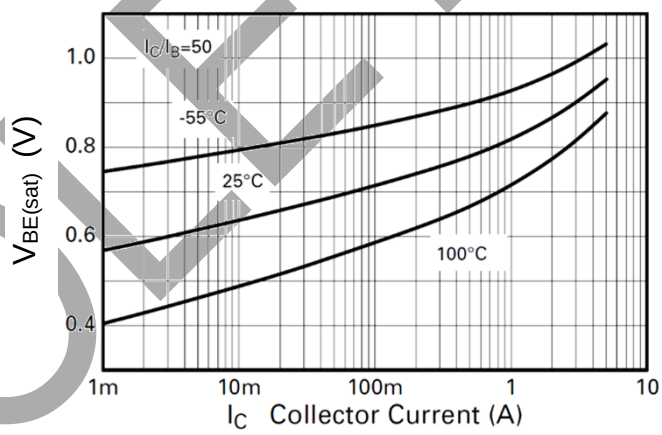
$V_{CE(sat)}$ v I_C



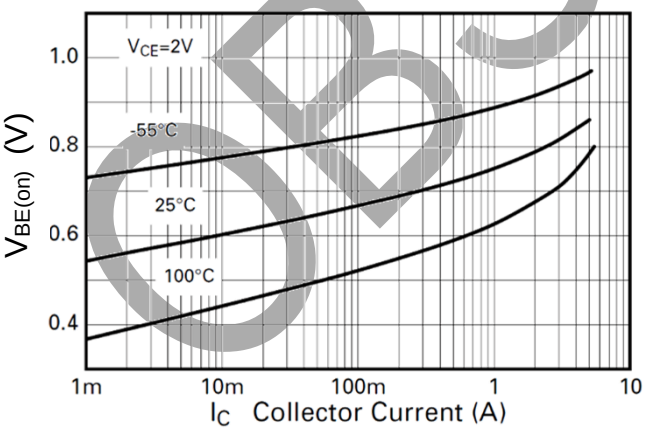
$V_{CE(sat)}$ v I_C



h_{FE} v I_C



$V_{BE(sat)}$ v I_C

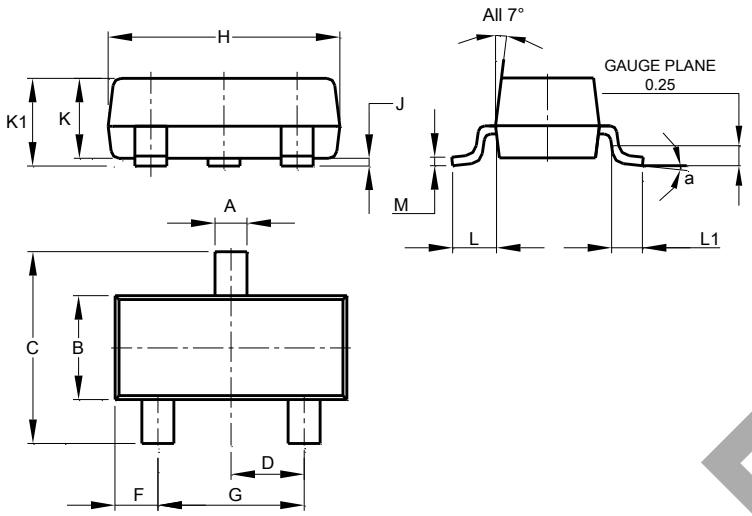


$V_{BE(on)}$ v I_C

Package Outline Dimensions

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

SOT23

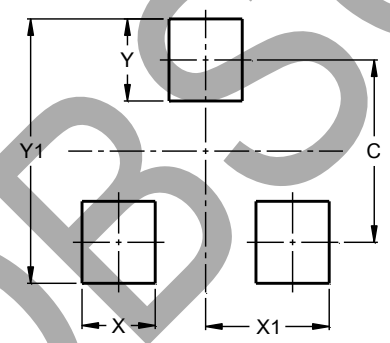


SOT23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

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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