20V PNP LOW SATURATION TRANSISTOR IN DFN2020

Features and Benefits

- BV_{CEO} > -20V
- I_C = -3.5A Continuous Collector Current
- Low Saturation Voltage (-220mV max @ -1A)
- R_{sat} = 64 mΩ for a low equivalent on-resistance
- h_{FE} specified up to -6A for high current gain hold up
- Low-profile 0.6mm package for thin applications
- $R_{\theta JA}$ efficient, 60% lower than SOT23
- $4mm^2$ footprint, 50% smaller than SOT23
- **Totally Lead-Free & Fully RoHS compliant (Notes 2 & 3)**
- **Halogen and Antimony Free. "Green" Device (Note 2)**
- **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

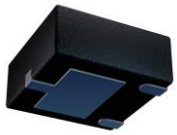
- Package: U-DFN2020-3 (Type B)
- Package Material: Molded Plastic. "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – NiPdAu, Solderable per MIL-STD-202, Method 208 e4
- Weight: 0.01 grams (Approximate)

Applications

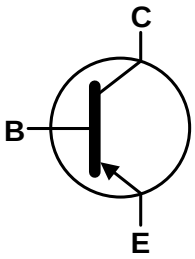
- MOSFET gate driving
- DC-DC converters
- Charging circuits
- Power switches
- Motor control

U-DFN2020-3 (Type B)

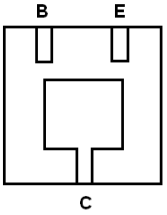
Top View



Bottom View



Device Symbol



Bottom View
Pin-Out

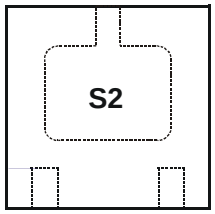
Ordering Information (Note 4)

Product	Marking	Reel Size (Inches)	Tape Width (mm)	Quantity per Reel
ZXTP718MATA	S2	7	8	3000
ZXTP718MATC	S2	13	8	10000

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

U-DFN2020-3 (Type B)



Top View

S2 = Product Type Marking code

Absolute Maximum Ratings @T_A = 25°C unless otherwise specified

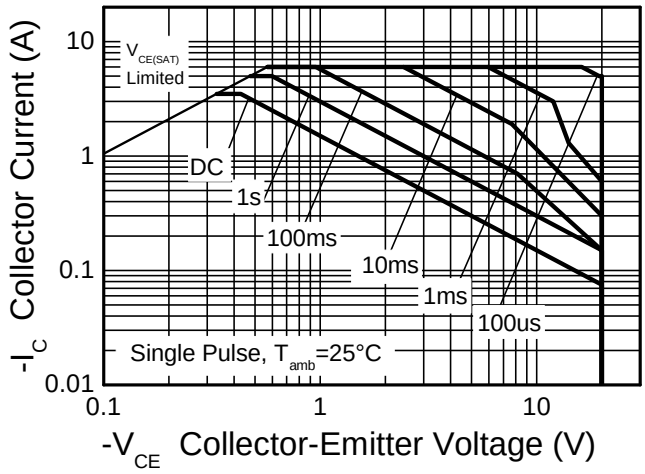
Characteristic		Symbol	Value	Unit
Collector-Base Voltage		V_{CBO}	-25	V
Collector-Emitter Voltage		V_{CEO}	-20	
Emitter-Base Voltage		V_{EBO}	-7	
Peak Pulse Current		I_{CM}	-6	A
Continuous Collector Current	(Note 5)	I_C	-3.5	
	(Note 6)		-4.0	
Base Current		I_B	-1	

Thermal Characteristics @T_A = 25°C unless otherwise specified

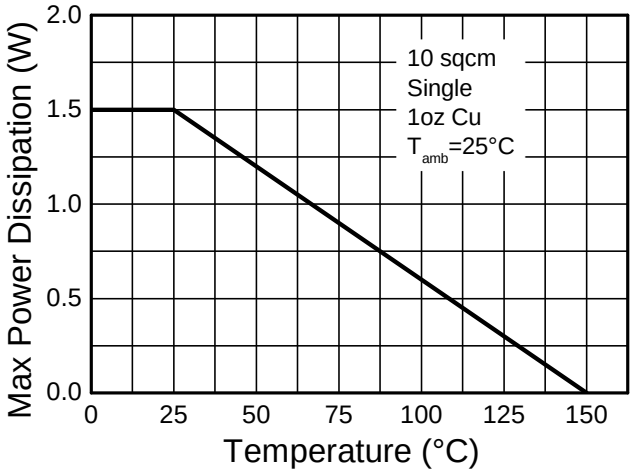
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	1.5	W
Linear Derating Factor			12	mW/°C
	(Note 6)		2.45	W
			19.6	mW/°C
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	83	°C/W
	(Note 6)		51	
Thermal Resistance, Junction to Lead	(Note 7)	$R_{\theta JL}$	16.8	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Notes:
5. For a device surface mounted on 31mm x 31mm (10cm^2) 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. The entire exposed collector pad is attached to the heatsink.
6. Same as note (3), except the device is measured at t ≤ 5 sec.
7. For a single device, thermal resistance is from junction to solder-point (at the end of the drain lead).

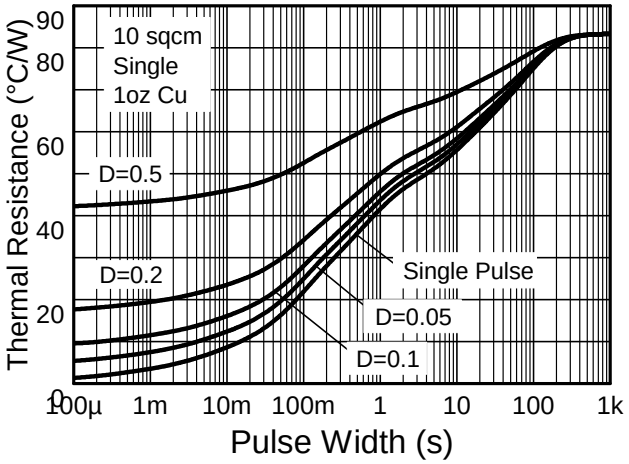
Thermal Characteristics



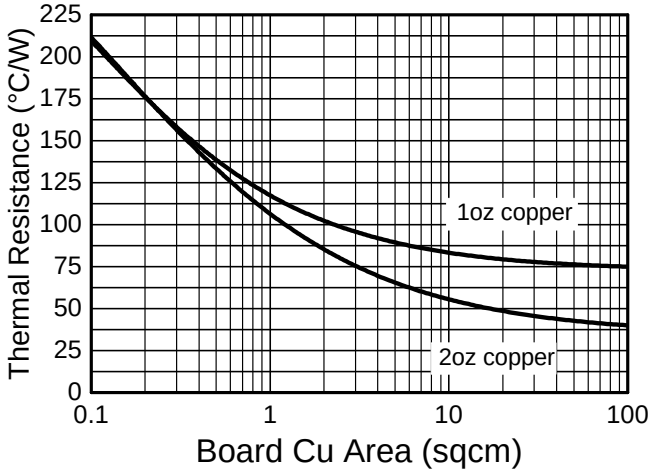
Safe Operating Area



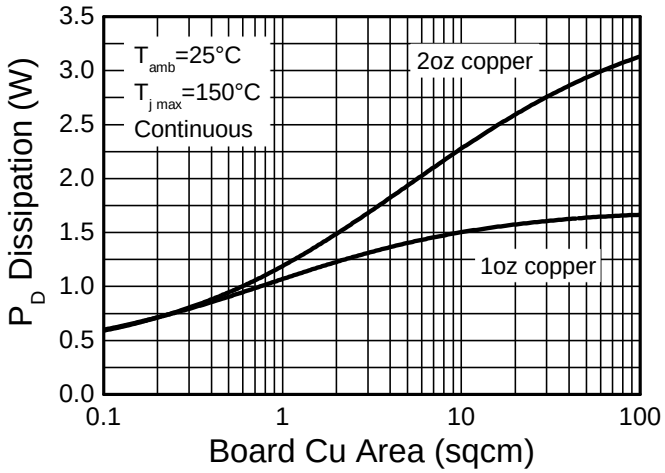
Derating Curve



Transient Thermal Impedance



Thermal Resistance v Board Area



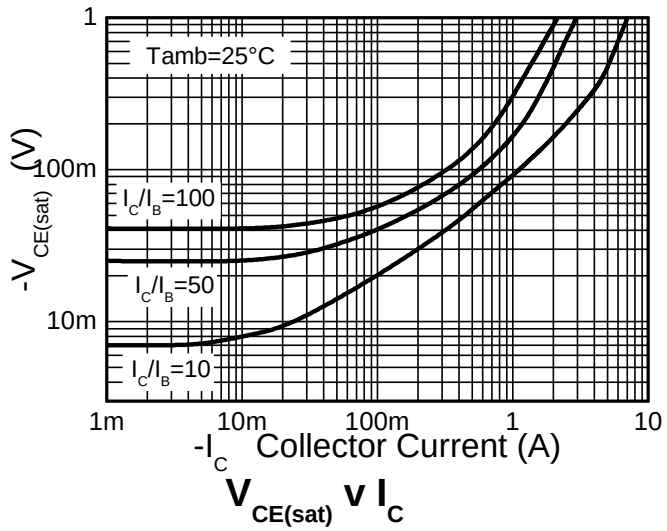
Power Dissipation v Board Area

Electrical Characteristics @T_A = 25°C unless otherwise specified

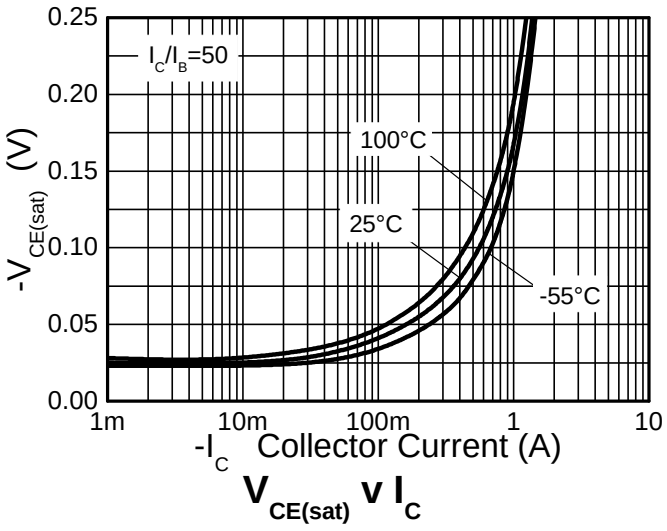
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-25	-35	-	V	I_C = -100 µA
Collector-Emitter Breakdown Voltage (Note 8)	BV_{CEO}	-20	-25	-	V	I_C = -10 mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.5	-	V	I_E = -100 µA
Collector Cutoff Current	I_{CBO}	-	-	-100	nA	V_{CB} = -20V
Emitter Cutoff Current	I_{EBO}	-	-	-100	□nA	V_{EB} = -6V
Collector Emitter Cutoff Current	I_{CES}	-	-	-100	nA	V_{CES} = -16V
Static Forward Current Transfer Ratio (Note 8)	h_{FE}	300 300 150 15	475 450 230 30	- - - -	-	I_C = -10mA, V_{CE} = -2V I_C = -100mA, V_{CE} = -2V I_C = -2A, V_{CE} = -2V I_C = -6A, V_{CE} = -2V
Collector-Emitter Saturation Voltage (Note 8)	$V_{CE(sat)}$	- - - - -	-19 -170 -190 -240 -225	-30 -220 -250 -350 -300	mV	I_C =- 0.1A, I_B = -10mA I_C = -1A, I_B = -20mA I_C = -1.5A, I_B = -50mA I_C = -2.5A, I_B = -150mA I_C = -3.5A, I_B = -350mA
Base-Emitter Turn-On Voltage (Note 8)	$V_{BE(on)}$	-	-0.87	-0.95	V	I_C = -3.5A, V_{CE} = -2V
Base-Emitter Saturation Voltage (Note 8)	$V_{BE(sat)}$	-	-1.01	-1.120	V	I_C = -3.5A, I_B = -350mA
Output Capacitance	C_{obo}	-	21	30	pF	V_{CB} =-10V. f = 1MHz
Transition Frequency	f_T	150	180	-	MHz	V_{CE} = -10V, I_C = -50mA, f = 100MHz
Turn-On Time	t_{on}	-	40	-	ns	V_{CC} = -10V, I_C = -1A
Turn-Off Time	t_{off}	-	670	-	ns	I_{B1} = -I_{B2} = -10mA

Notes: 8. Measured under pulsed conditions. Pulse width ≤ 300 µs. Duty cycle ≤ 2%.

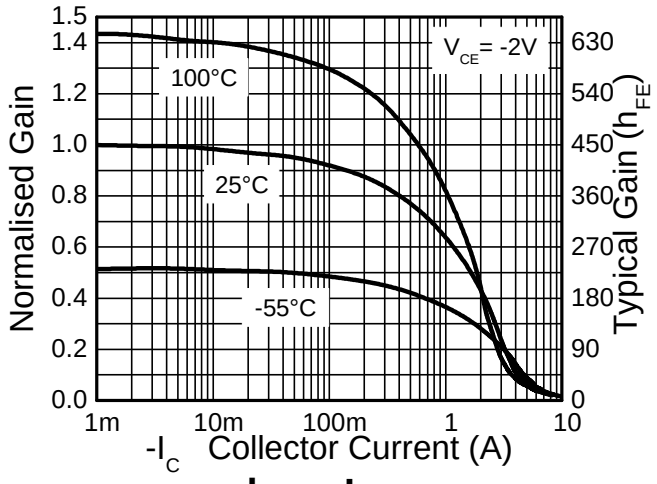
Typical Electrical Characteristics



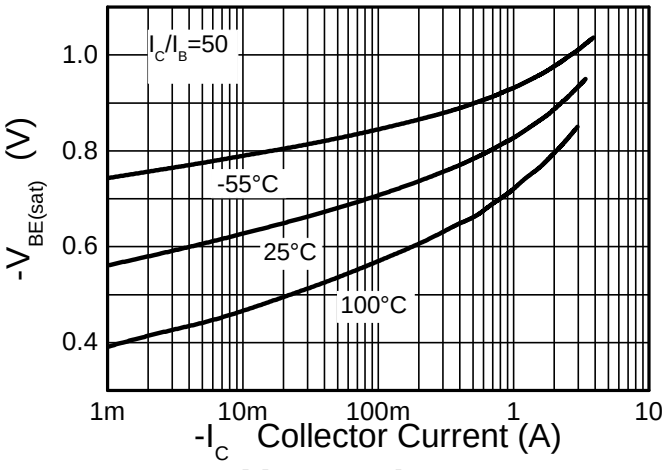
$V_{CE(sat)}$ v I_C



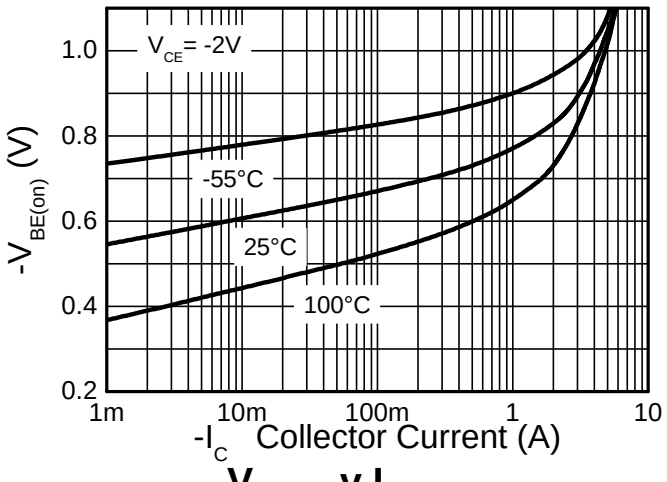
$V_{CE(sat)}$ v I_C



h_{FE} v I_C



$V_{BE(sat)}$ v I_C

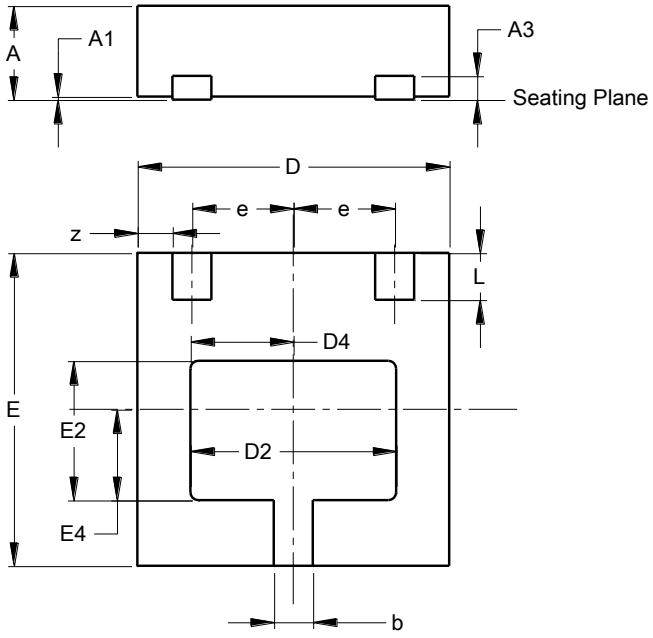


$V_{BE(on)}$ v I_C

Package Outline Dimensions

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

U-DFN2020-3 (Type B)

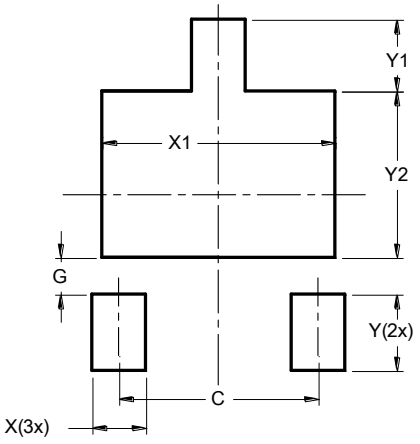


U-DFN2020-3 (Type B)			
Dim	**Min**	**Max**	**Typ**
A	0.57	0.63	0.60
A1	0.00	0.05	0.02
A3	—	—	0.152
b	0.20	0.30	0.25
D	1.950	2.075	2.00
D2	1.22	1.42	1.32
D4	0.56	0.76	0.66
E	1.950	2.075	2.00
E2	0.79	0.99	0.89
E4	0.48	0.68	0.58
e	—	—	0.65
L	0.25	0.35	0.30
z	—	—	0.225
All Dimensions in mm			

Suggested Pad Layout

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

U-DFN2020-3 (Type B)



Dimensions	Value (in mm)
C	1.300
G	0.240
X	0.350
X1	1.520
Y	0.500
Y1	0.470
Y2	1.090

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