

20V PNP LOW SATURATION SWITCHING TRANSISTOR

Features and Benefits

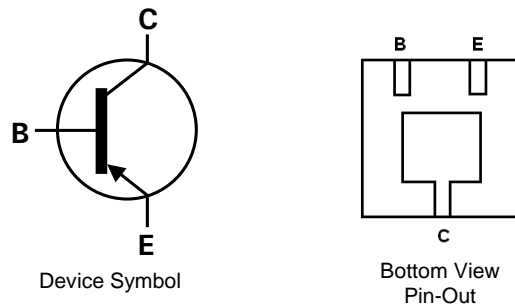
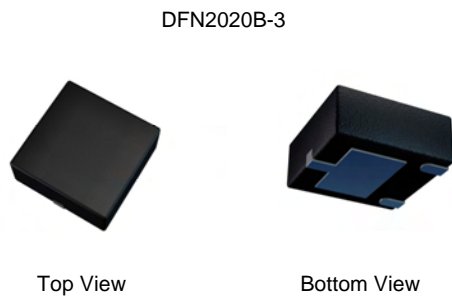
- $BV_{CEO} > -20V$
- $I_C = -3.5A$ Continuous Collector Current
- Low Saturation Voltage (-220mV max @ -1A)
- $R_{SAT} = 64\ m\Omega$ for a low equivalent On-Resistance
- h_{FE} specified up to -6A for high current gain hold up
- Low profile 0.6mm high package for thin applications
- $R_{\theta JA}$ efficient, 60% lower than SOT23
- 4mm² footprint, 50% smaller than SOT23
- **Lead-Free, RoHS Compliant (Note 1)**
- **Halogen and Antimony Free. "Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

- Case: DFN2020B-3
- Case Material: Molded Plastic. "Green" Molding Compound.
- Terminals: Pre-Plated NiPdAu leadframe.
- Nominal Package Height: 0.6mm
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Weight: 0.01 grams (approximate)

Applications

- MOSFET Gate Driving
- DC-DC Converters
- Charging Circuits
- Power switches
- Motor control

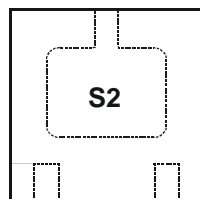


Ordering Information (Note 3)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTP718MATA	S2	7	8	3000
ZXTP718MATC	S2	13	8	10000

- Notes:
1. No purposefully added lead.
 2. Diodes Inc's "Green" policy can be found on our website at <http://www.diodes.com>
 3. For Packaging Details, go to our website at <http://www.diodes.com>.

Marking Information



Top View

S2 = Product Type Marking code

Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

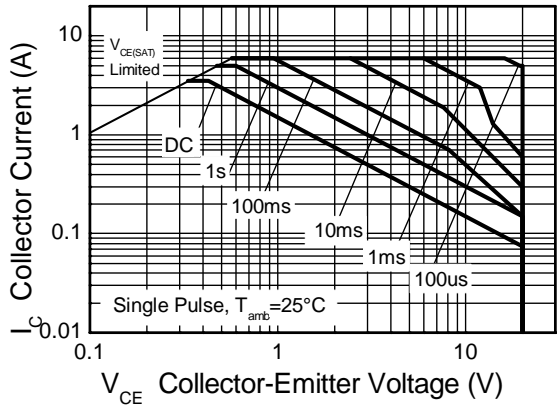
Characteristic		Symbol	Value	Unit
Collector-Base Voltage		V_{CBO}	-25	V
Collector-Emitter Voltage		V_{CEO}	-20	
Emitter-Base Voltage		V_{EBO}	-7	
Peak Pulse Current		I_{CM}	-6	A
Continuous Collector Current	(Note 4)	I_C	-3.5	
	(Note 5)		-4.0	
Base Current		I_B	-1	

Thermal Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

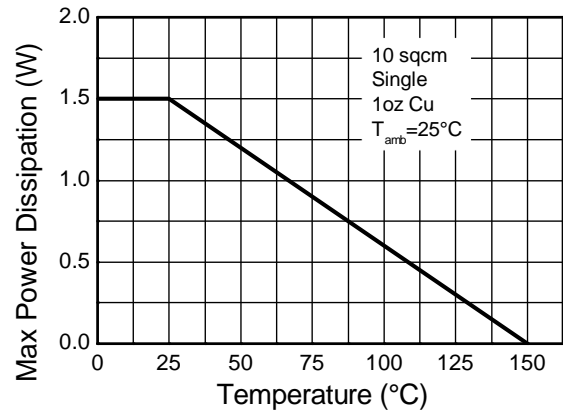
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 4)	P_D	1.5	W
	Linear Derating Factor		(Note 5)	
			19.6	
Thermal Resistance, Junction to Ambient	(Note 4)	$R_{\theta JA}$	83	$^\circ\text{C/W}$
	(Note 5)		51	
Thermal Resistance, Junction to Lead	(Note 6)	$R_{\theta JL}$	16.8	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

- Notes:
4. For a device surface mounted on 31mm x 31mm (10cm²) 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.
 5. Same as note (3), except the device is measured at $t \leq 5$ sec.
 6. For a single device, thermal resistance from junction to solder-point (at the end of the drain lead).

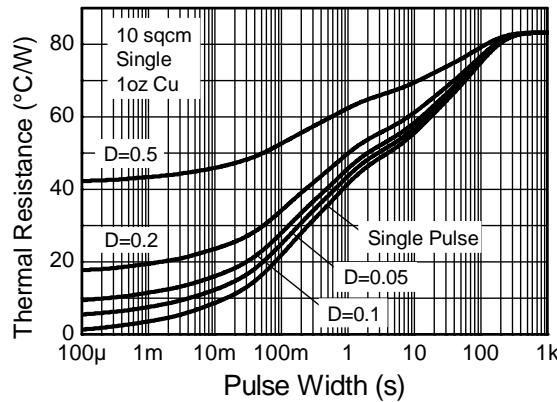
Thermal Characteristics



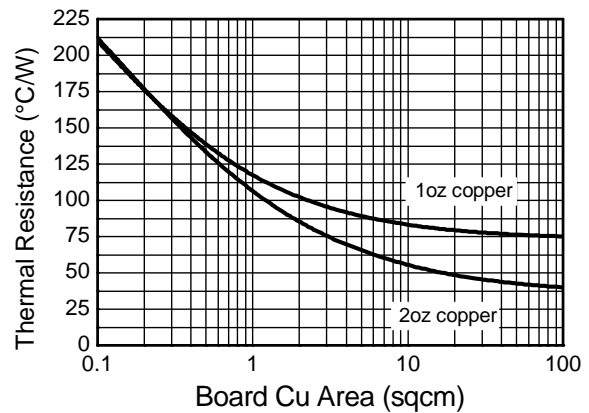
Safe Operating Area



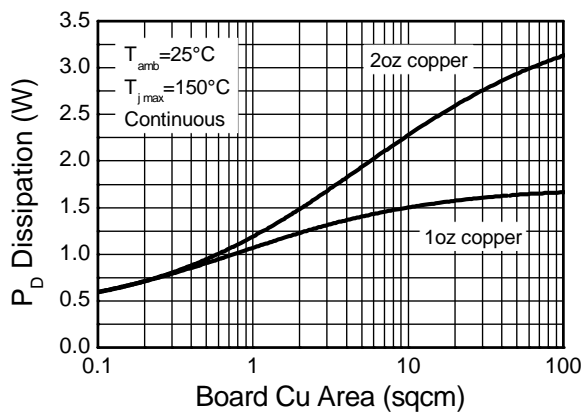
Derating Curve



Transient Thermal Impedance



Thermal Resistance v Board Area



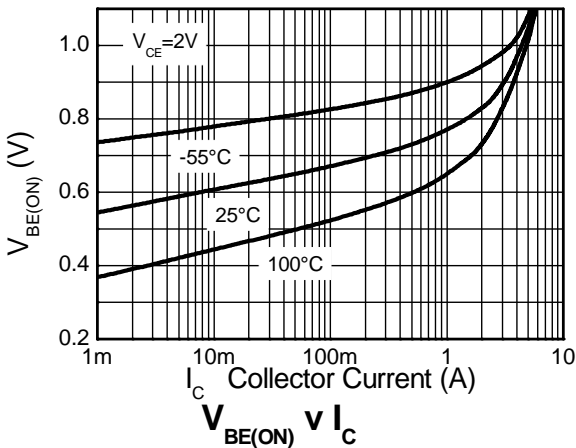
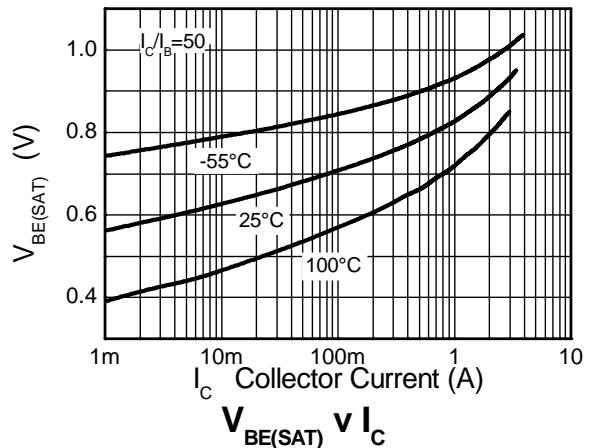
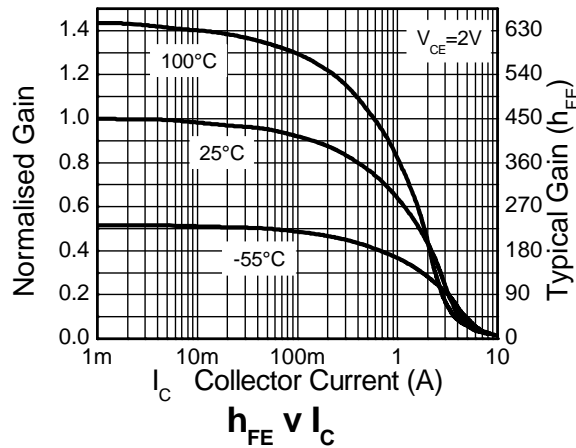
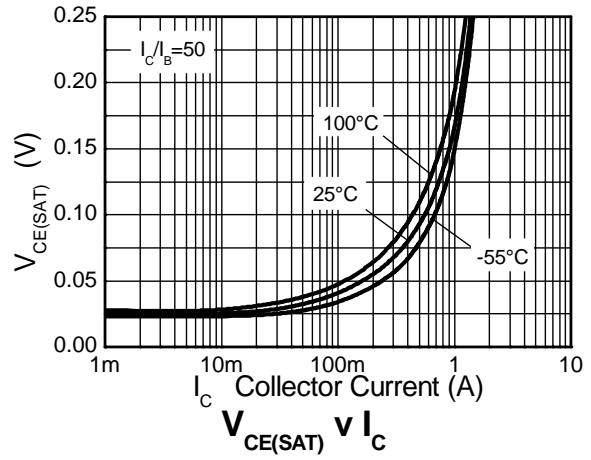
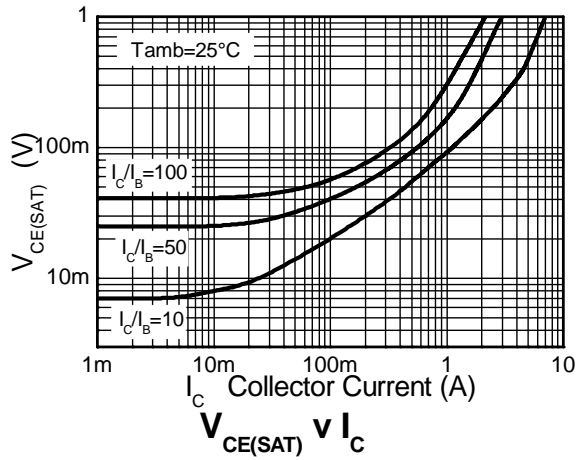
Power Dissipation v Board Area

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

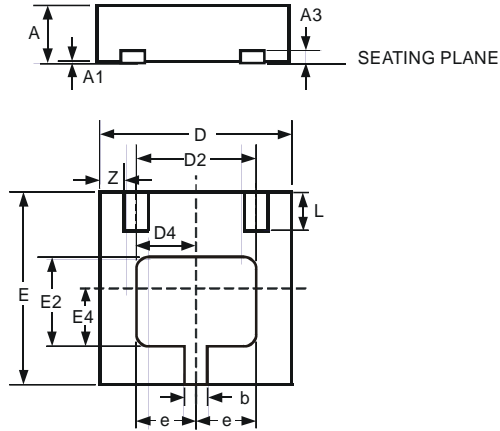
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-25	-35	-	V	$I_C = -100 \mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 7)	BV_{CEO}	-20	-25	-	V	$I_C = -10 \text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.5	-	V	$I_E = -100 \mu\text{A}$
Collector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

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

Typical Electrical Characteristics

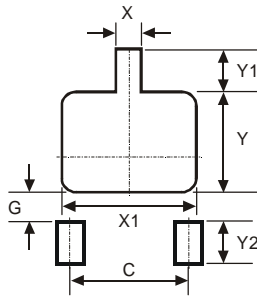


Package Outline Dimensions



DFN2020B-3			
Dim	Min	Max	Typ
A	0.57	0.63	0.60
A1	0	0.05	0.02
A3	—	—	0.152
b	0.20	0.30	0.25
D	1.95	2.075	2.00
D2	1.22	1.42	1.32
D4	0.56	0.76	0.66
e	—	—	0.65
E	1.95	2.075	2.00
E2	0.79	0.99	0.89
E4	0.48	0.68	0.58
L	0.25	0.35	0.30
Z	—	—	0.225
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
C	1.30
G	0.24
X	0.35
X1	1.52
Y	1.09
Y1	0.47
Y2	0.50

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