

DUAL 20V PNP LOW SATURATION SWITCHING TRANSISTOR

Features and Benefits

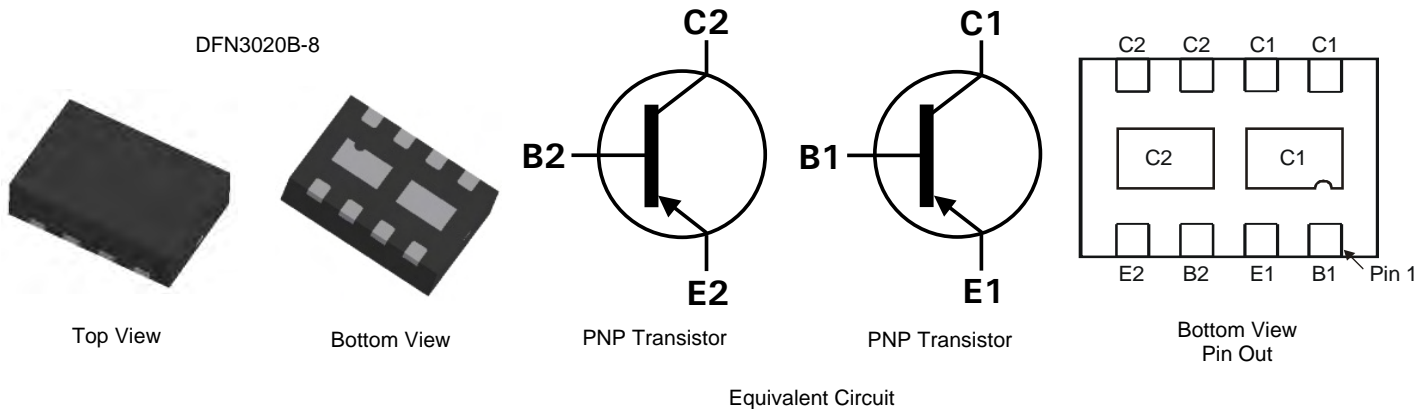
- $BV_{CEO} > -20V$;
- $I_C = -3.5A$ Continuous Collector Current
- $R_{SAT} = 64\ m\Omega$ for Low Equivalent On Resistance
- Low Saturation Voltage ($-220mV$ @ $-1A$)
- hFE characterized up to $-6A$ for high current gain holds up
- Dual NPN saving footprint and component count
- Low profile 0.8mm high package for thin applications
- $R_{\theta JA}$ efficient, 40% lower than SOT26
- $6mm^2$ footprint, 50% smaller than TSOP6 and SOT26
- **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: DFN3020B-8
- Case material: Molded Plastic. "Green" Molding Compound.
- UL Flammability Rating 94V-0
- Terminals: Pre-Plated NiPdAu leadframe.
- Nominal package height: 0.8mm
- Moisture Sensitivity: Level 1 per J-STD-020
- Solderable per MIL-STD-202, Method 208
- Weight: 0.013 grams (approximate)

Applications

- Battery charging circuits
- Load disconnect switches
- DC-DC converters
- Motor drive
- LED backlighting circuits
- Portable applications



Ordering Information (Note 3)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTD718MCTA	D22	7	8	3,000

- 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



D22 = Product type Marking Code
Top view, dot denotes Pin 1

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

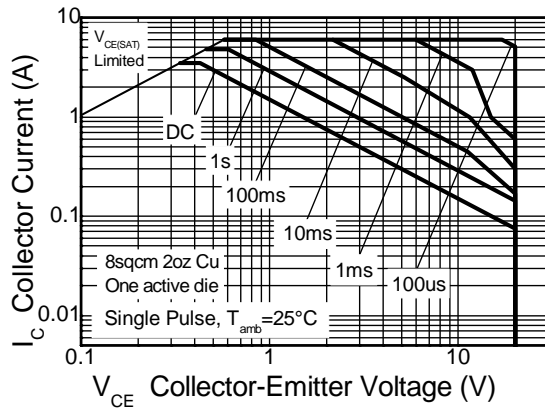
Parameter	Symbol	Limit	Unit
Collector-Base Voltage	V_{CBO}	-25	V
Collector-Emitter Voltage	V_{CEO}	-20	
Emitter-Base Voltage	V_{EBO}	-7	
Peak Pulse Current	I_{CM}	-6	A
Continuous Collector Current (Notes 4 and 7)	I_C	-3.5	
Base Current	I_B	-1	

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

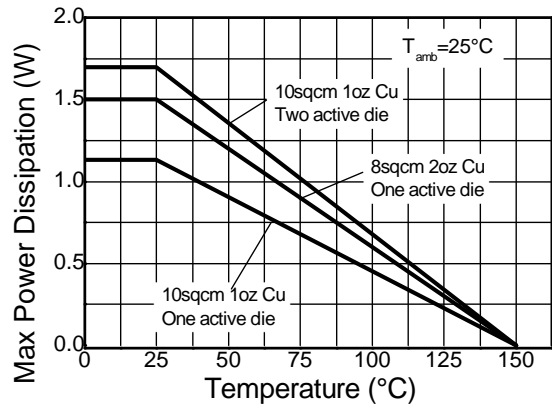
Characteristic	Symbol	Value	Unit
Power Dissipation Linear Derating Factor	P_D	1.5	W mW/°C
		12	
		2.45	
		19.6	
		1.13	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	8	°C/W
		1.7	
		13.6	
		83.3	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	51.0	°C/W
		111	
		73.5	
		17.1	
Thermal Resistance, Junction to Lead	$R_{\theta JL}$	17.1	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

- Notes:
- For a dual device surface mounted on 28mm x 28mm (8cm²) FR4 PCB with high coverage of single sided 2 oz copper, in still air conditions; the device is measured when operating in a steady-state condition. The heatsink is split in half with the exposed collector pads connected to each half.
 - Same as note (4), except the device is measured at $t < 5$ sec.
 - Same as note (4), except the device is surface mounted on 31mm x 31mm (10cm²) FR4 PCB with high coverage of single sided 1oz copper.
 - For a dual device with one active die.
 - For dual device with 2 active die running at equal power.
 - Thermal resistance from junction to solder-point (at the end of the collector lead).

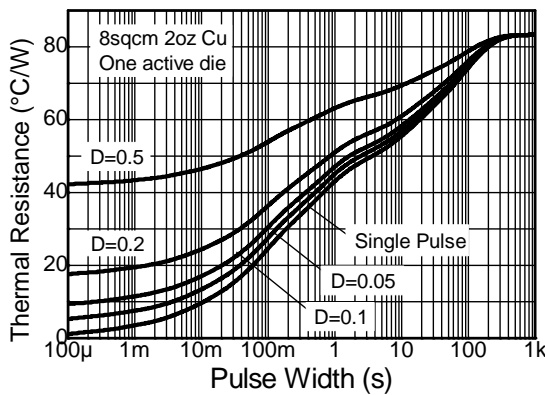
Thermal Characteristics



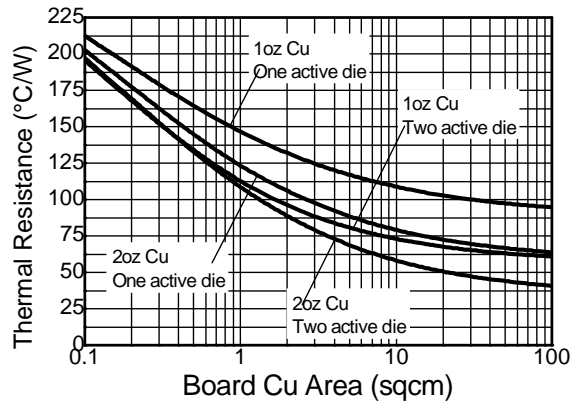
Safe Operating Area



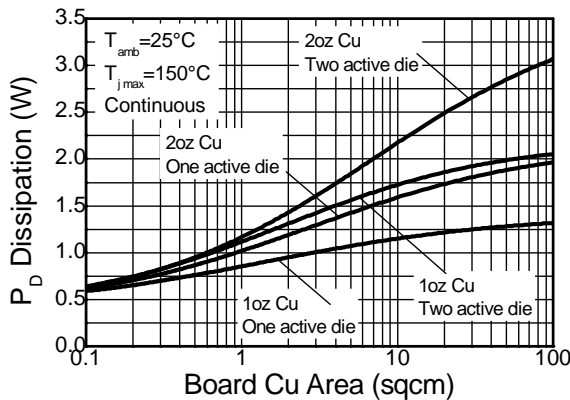
Derating Curve



Transient Thermal Impedance



Thermal Resistance v Board Area



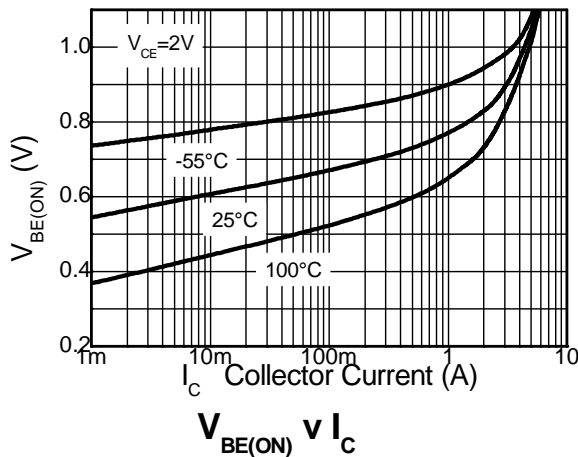
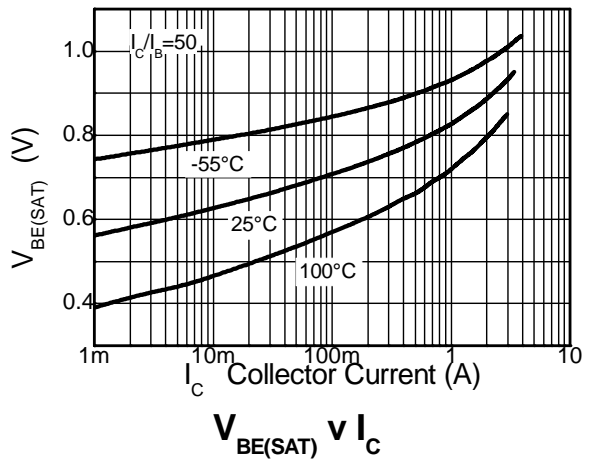
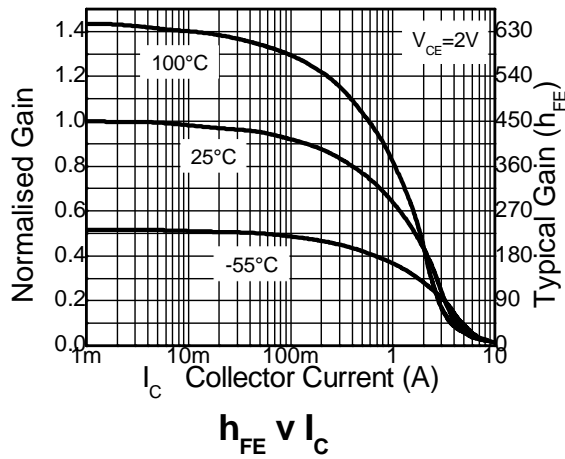
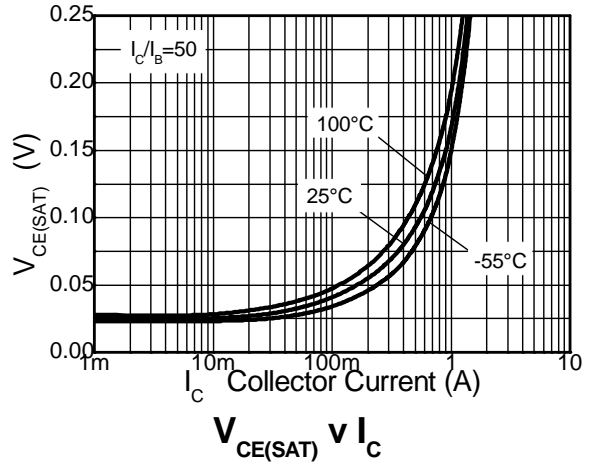
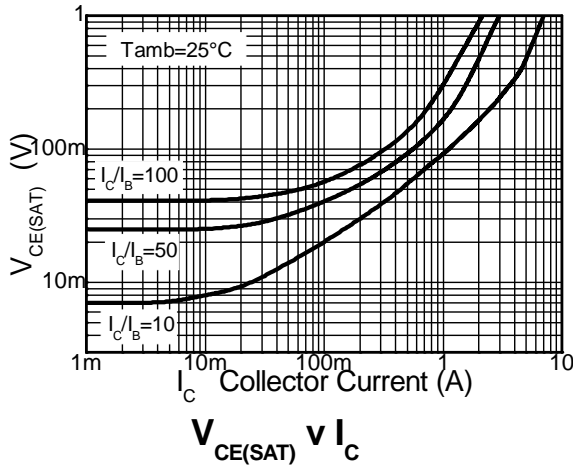
Power Dissipation v Board Area

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

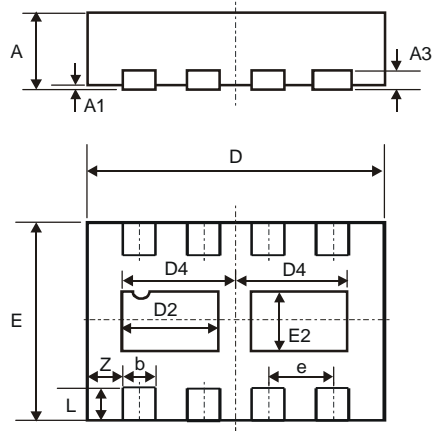
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-25	-35	-	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 10)	BV_{CEO}	-20	-25	-	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	8.5	-	V	$I_E = -100\mu\text{A}$
Collector 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 10)	h_{FE}	300	475	-	-	$I_C = -10\text{mA}, V_{CE} = -2\text{V}$
		300	450	-		$I_C = -100\text{mA}, V_{CE} = -2\text{V}$
		150	230	-		$I_C = -2\text{A}, V_{CE} = -2\text{V}$
		15	30	-		$I_C = -6\text{A}, V_{CE} = -2\text{V}$
Collector-Emitter Saturation Voltage (Note 10)	$V_{CE(sat)}$	-	-19	-30	mV	$I_C = -0.1\text{A}, I_B = -10\text{mA}$
		-	-170	-220		$I_C = -1\text{A}, I_B = -20\text{mA}$
		-	-190	-250		$I_C = -1.5\text{A}, I_B = -50\text{mA}$
		-	-240	-350		$I_C = -2.5\text{A}, I_B = -150\text{mA}$
		-	-225	-300		$I_C = -3.5\text{A}, I_B = -350\text{mA}$
Base-Emitter Turn-On Voltage (Note 10)	$V_{BE(on)}$	-	-0.87	-0.95	V	$I_C = -3.5\text{A}, V_{CE} = -2\text{V}$
Base-Emitter Saturation Voltage (Note 10)	$V_{BE(sat)}$	-	-1.01	-1.12	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	$I_{B1} = I_{B2} = 20\text{mA}$

Notes: 10. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$

Typical Electrical Characteristics

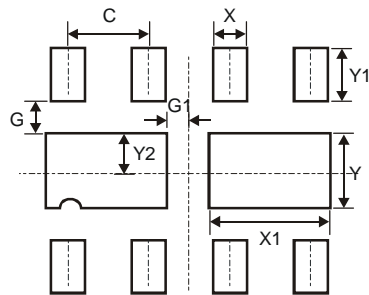


Package Outline Dimensions



DFN3020B-8			
Dim	Min	Max	Typ
A	0.77	0.83	0.80
A1	0	0.05	0.02
A3	-	-	0.15
b	0.25	0.35	0.30
D	2.95	3.075	3.00
D2	0.82	1.02	0.92
D4	1.01	1.21	1.11
e	-	-	0.65
E	1.95	2.075	2.00
E2	0.43	0.63	0.53
L	0.25	0.35	0.30
Z	-	-	0.375
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
C	0.650
G	0.285
G1	0.090
X	0.400
X1	1.120
Y	0.730
Y1	0.500
Y2	0.365

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Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.