

**DUAL 20V PNP LOW SATURATION SWITCHING TRANSISTOR**

**Features and Benefits**

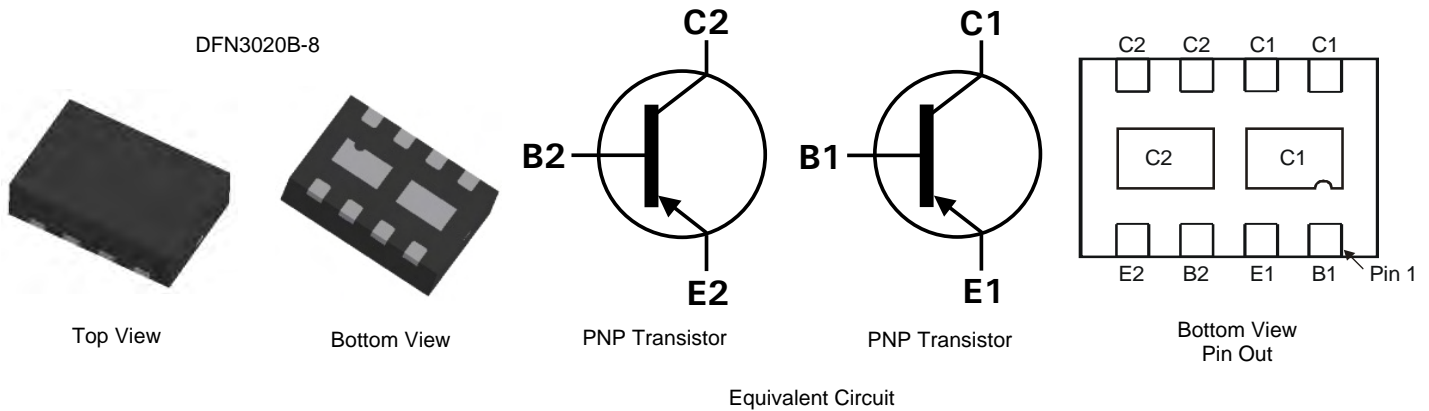
- $BV_{CEO} > -20V$ ;
- $I_C = -3.5A$  Continuous Collector Current
- $R_{SAT} = 64\ m\Omega$  for Low Equivalent On Resistance
- Low Saturation Voltage ( $-220mV$  @  $-1A$ )
- $hFE$  characterized up to  $-6A$  for high current gain holds up
- Dual NPN saving footprint and component count
- Low profile 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

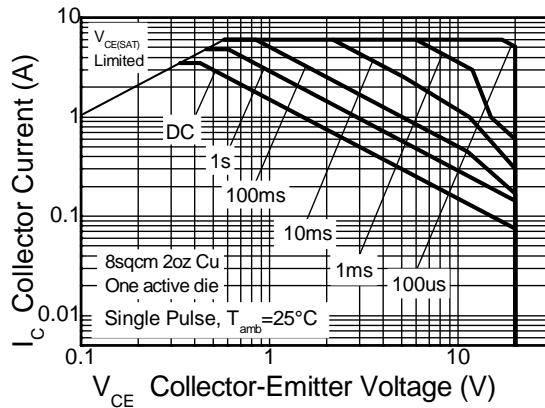
Parameter	Symbol	Limit	Unit
Collector-Base Voltage	$V_{CBO}$	-25	V
Collector-Emitter Voltage	$V_{CEO}$	-20	
Emitter-Base Voltage	$V_{EBO}$	-7	
Peak Pulse Current	$I_{CM}$	-6	A
Continuous Collector Current (Notes 4 and 7)	$I_C$	-3.5	
Base Current	$I_B$	-1	

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

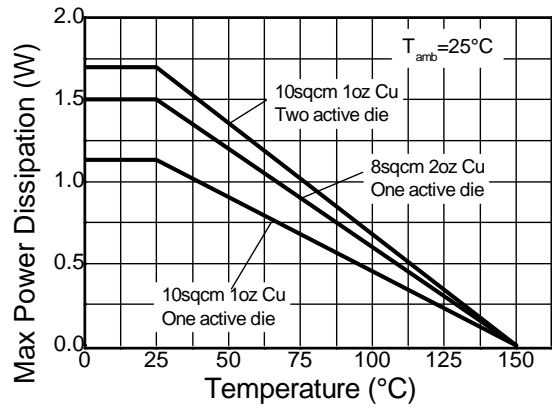
Characteristic	Symbol	Value	Unit
Power Dissipation Linear Derating Factor	$P_D$	1.5	W mW/°C
		12	
		2.45	
		19.6	
		1.13	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	8	°C/W
		1.7	
		13.6	
		83.3	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	51.0	°C/W
		111	
		73.5	
		17.1	
Thermal 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 (8cm<sup>2</sup>) 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 (10cm<sup>2</sup>) 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).

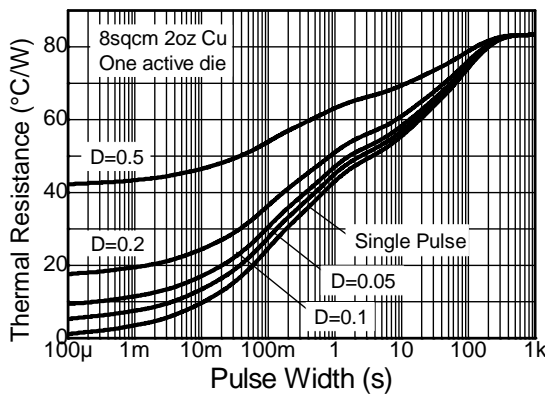
**Thermal Characteristics**



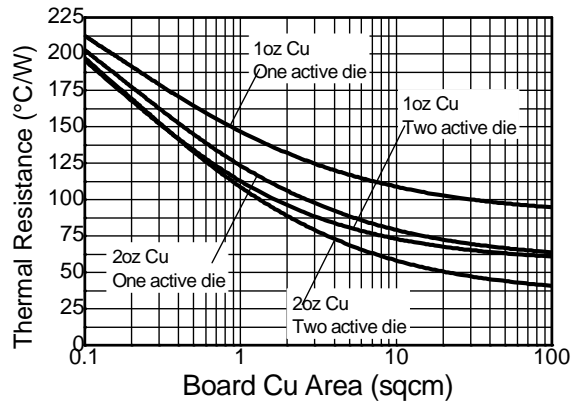
**Safe Operating Area**



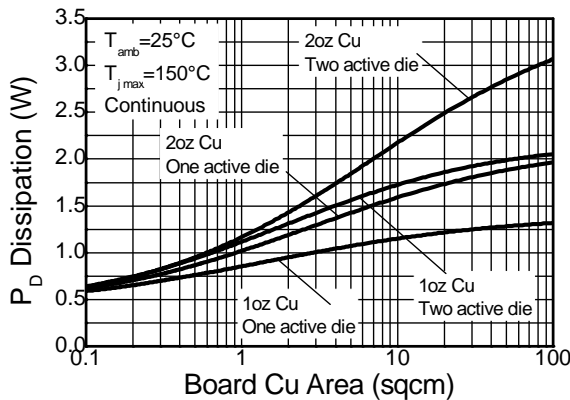
**Derating Curve**



**Transient Thermal Impedance**



**Thermal Resistance v Board Area**



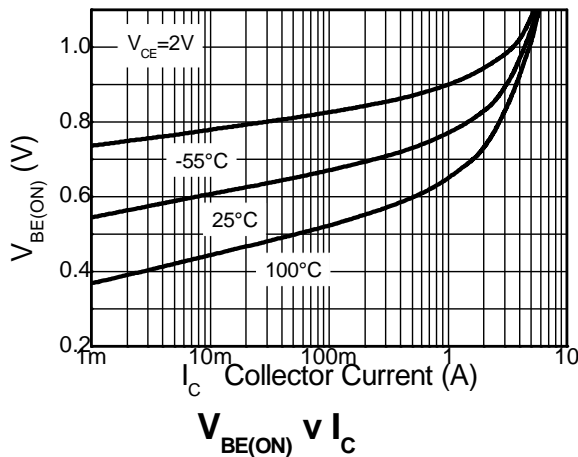
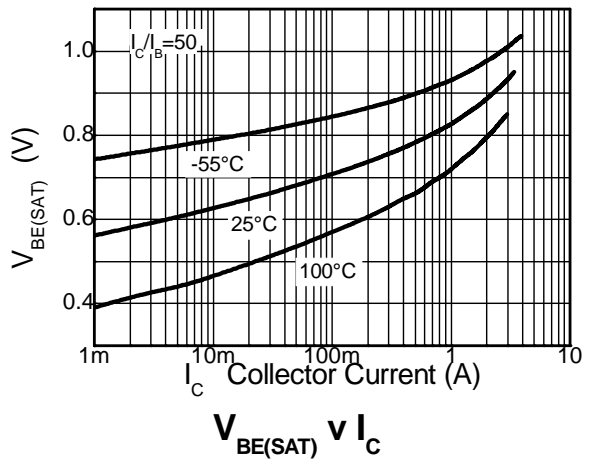
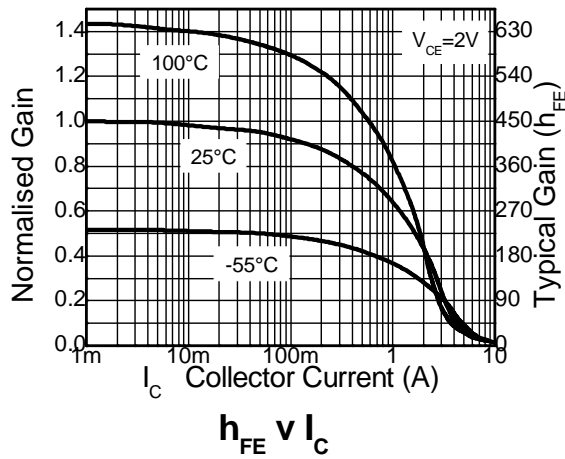
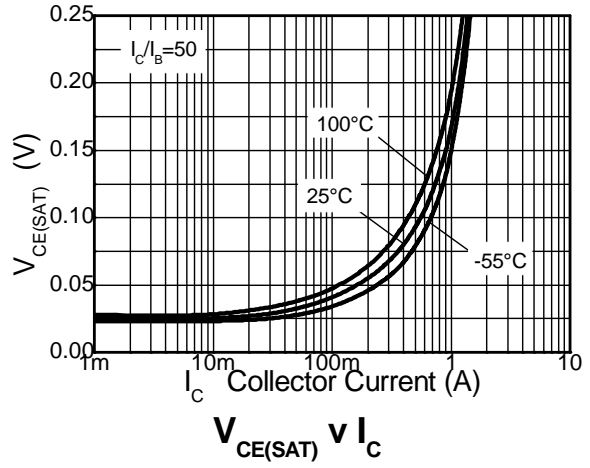
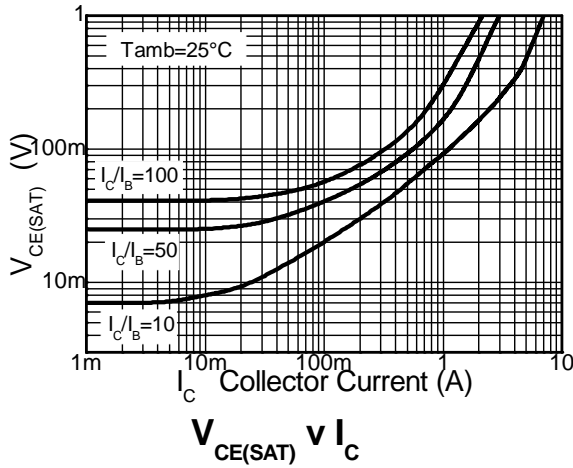
**Power Dissipation v Board Area**

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

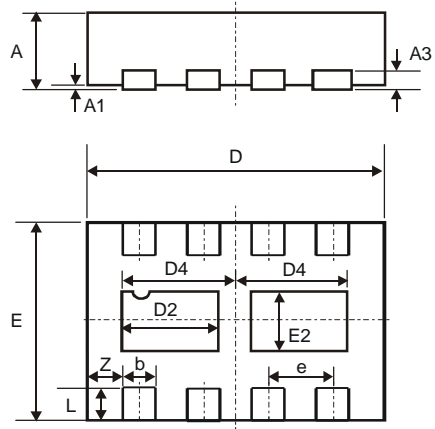
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$BV_{CBO}$	-25	-35	-	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 10)	$BV_{CEO}$	-20	-25	-	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	-7	8.5	-	V	$I_E = -100\mu\text{A}$
Collector 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**

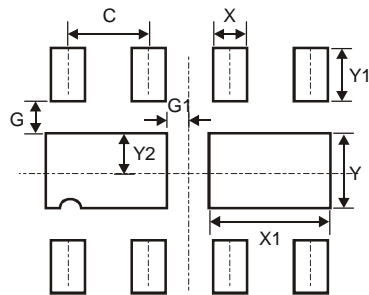


**Package Outline Dimensions**



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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