



**ZXTD617MC**

**DUAL 15V NPN LOW SATURATION TRANSISTORS**

**Features and Benefits**

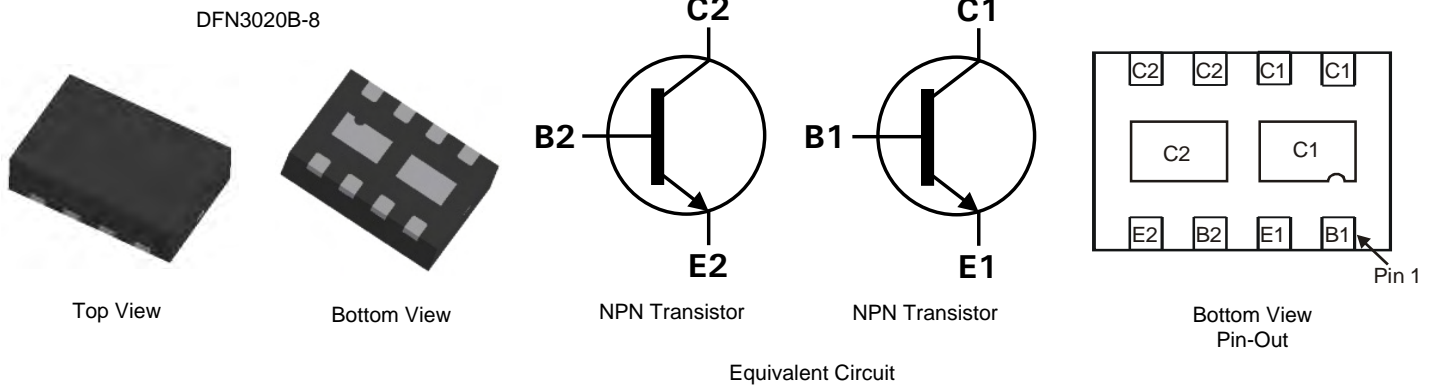
- $BV_{CEO} > 15V$
- $I_C = 4.5A$  Continuous Collector Current
- Low Saturation Voltage (100mV max @ 1A)
- $R_{SAT} = 45 m\Omega$  for a Low Equivalent On-Resistance
- $h_{FE}$  specified up to 12A for high current gain hold up
- Dual NPN saving footprint and component count
- Low profile 0.8mm high package for thin applications
- $R_{\theta JA}$  efficient, 40% lower than SOT26
- 6mm<sup>2</sup> 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.
- Terminals: Pre-Plated NiPdAu leadframe
- UL Flammability Rating 94V-0
- Nominal Package Height: 0.8mm
- Moisture Sensitivity: Level 1 per J-STD-020
- Weight: 0.013 grams (approximate)

**Applications**

- DC-DC Converters
- Charging circuits
- Motor control
- Power switches
- Portable applications



**Ordering Information**

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTD617MCTA	DAA	7	8	3000

- Notes:
1. No purposefully added lead.
  2. Diodes Inc's "Green" Policy can be found on our website at <http://www.diodes.com>

**Marking Information**



DAA = Product type marking code  
Top view, dot denotes pin 1

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

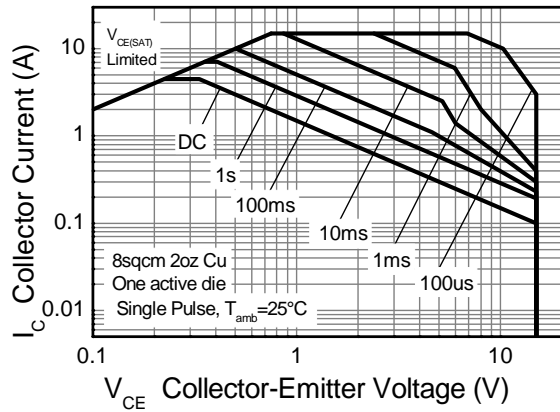
Characteristic		Symbol	Value	Unit
Collector-Base Voltage		$V_{CBO}$	40	V
Collector-Emitter Voltage		$V_{CEO}$	15	
Emitter-Base Voltage		$V_{EBO}$	7	
Peak Pulse Current		$I_{CM}$	15	A
Continuous Collector Current	(Notes 3 & 6)	$I_C$	4.5	
	(Notes 4 & 6)		5	
Base Current		$I_B$	1	

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

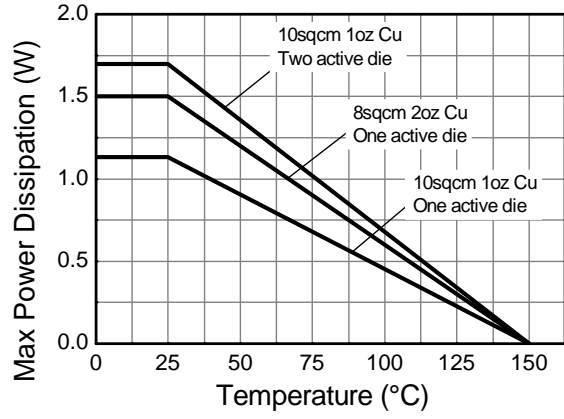
Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Notes 3 & 6)	$P_D$	1.5	W mW/°C
	(Notes 4 & 6)		12	
	(Notes 5 & 6)		2.45	
			19.6	
	(Notes 5 & 7)		1.13	
Thermal Resistance, Junction to Ambient	(Notes 3 & 6)	$R_{\theta JA}$	8	°C/W
	(Notes 4 & 6)		1.7	
	(Notes 5 & 6)		13.6	
	(Notes 5 & 7)		83.3	
	(Notes 6 & 8)		51.0	
Thermal Resistance, Junction to Lead	(Notes 6 & 8)	$R_{\theta JL}$	111	°C
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	73.5	

- Notes:
3. 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.
  4. Same as note (3), except the device is measured at  $t < 5$  sec.
  5. Same as note (3), except the device is surface mounted on 31mm x 31mm (10cm<sup>2</sup>) FR4 PCB with high coverage of single sided 1oz copper.
  6. For a dual device with one active die.
  7. For dual device with 2 active die running at equal power.
  8. Thermal resistance from junction to solder-point (at the end of the collector lead).

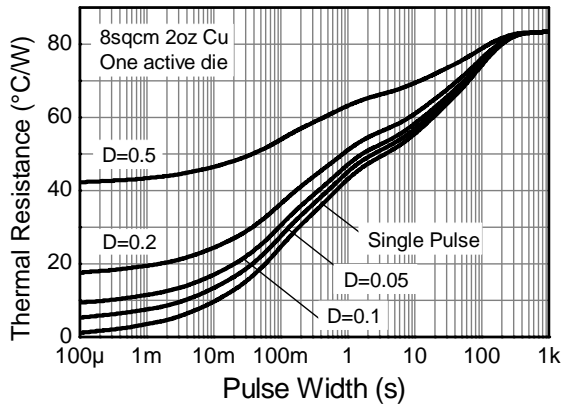
**Thermal Characteristics**



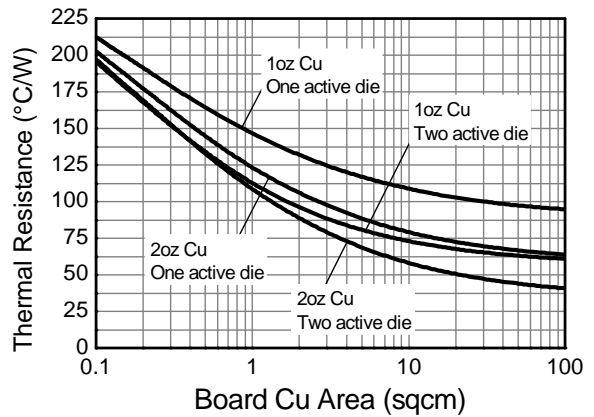
**Safe Operating Area**



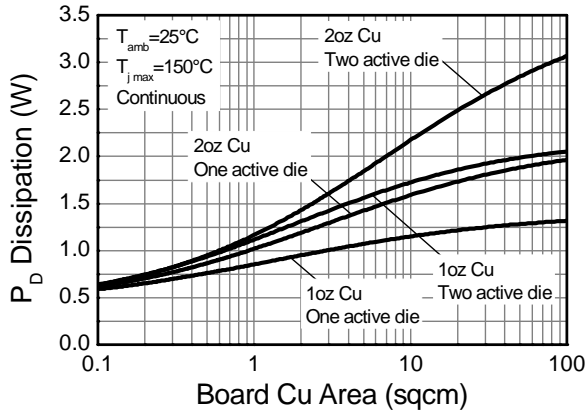
**Derating Curve**



**Transient Thermal Impedance**



**Thermal Resistance v Board Area**



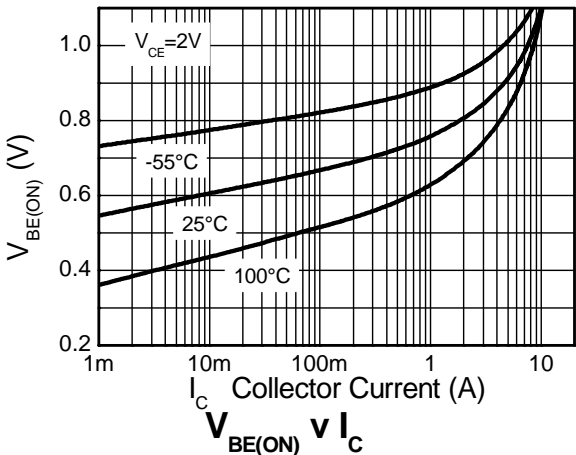
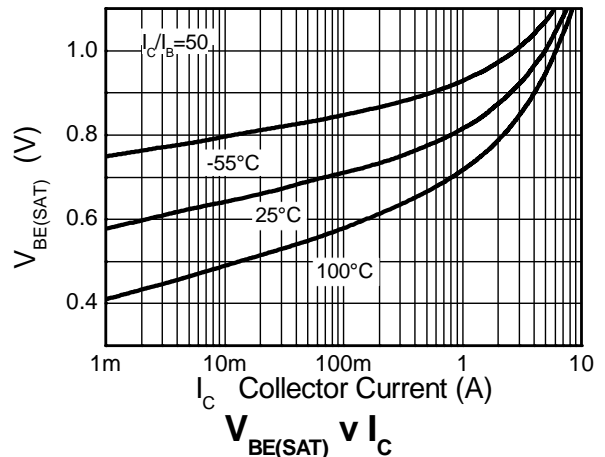
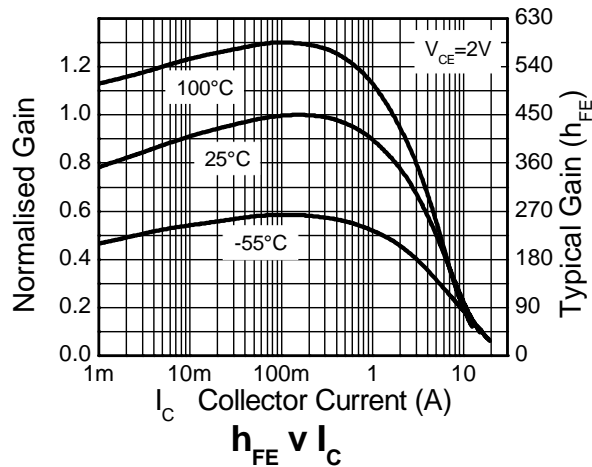
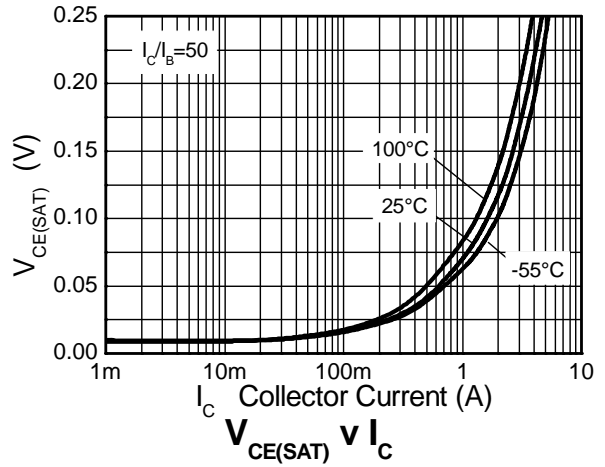
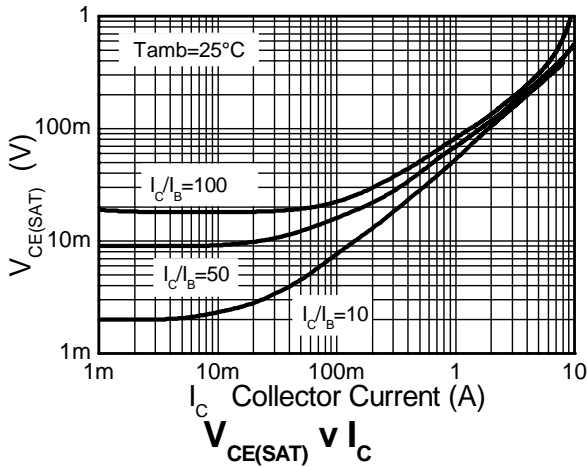
**Power Dissipation v Board Area**

**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CB0</sub>	40	70	-	V	I <sub>C</sub> = 100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV <sub>CEO</sub>	15	18	-	V	I <sub>C</sub> = 10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	7	8.2	-	V	I <sub>E</sub> = 100μA
Collector Cutoff Current	I <sub>CB0</sub>	-	-	100	nA	V <sub>CB</sub> = 30V
Emitter Cutoff Current	I <sub>EBO</sub>	-	-	100	nA	V <sub>EB</sub> = 6V
Collector Emitter Cutoff Current	I <sub>CES</sub>	-	-	100	nA	V <sub>CES</sub> = 12V
Static Forward Current Transfer Ratio (Note 9)	h <sub>FE</sub>	200	415	-	-	I <sub>C</sub> = 10mA, V <sub>CE</sub> = 2V
		300	450	-	-	I <sub>C</sub> = 200mA, V <sub>CE</sub> = 2V
		200	320	-	-	I <sub>C</sub> = 3A, V <sub>CE</sub> = 2V
		150	240	-	-	I <sub>C</sub> = 5A, V <sub>CE</sub> = 2V
		-	80	-	-	I <sub>C</sub> = 12A, V <sub>CE</sub> = 2V
Collector-Emitter Saturation Voltage (Note 9)	V <sub>CE(sat)</sub>	-	8	14	mV	I <sub>C</sub> = 0.1A, I <sub>B</sub> = 10mA
		-	70	100	mV	I <sub>C</sub> = 1A, I <sub>B</sub> = 10mA
		-	165	200	mV	I <sub>C</sub> = 3A, I <sub>B</sub> = 50mA
		-	240	310	mV	I <sub>C</sub> = 4.5A, I <sub>B</sub> = 50mA
		-	200	-	mV	I <sub>C</sub> = 4.5A, I <sub>B</sub> = 100mA
Base-Emitter Turn-On Voltage (Note 9)	V <sub>BE(on)</sub>	-	0.88	0.96	V	I <sub>C</sub> = 4.5A, V <sub>CE</sub> = 2V
Base-Emitter Saturation Voltage (Note 9)	V <sub>BE(sat)</sub>	-	0.94	1.05	V	I <sub>C</sub> = 4.5A, I <sub>B</sub> = 50mA
Output Capacitance	C <sub>obo</sub>	-	30	40	pF	V <sub>CB</sub> = 10V, f = 1MHz
Transition Frequency	f <sub>T</sub>	80	120	-	MHz	V <sub>CE</sub> = 10V, I <sub>C</sub> = 50mA, f = 100MHz
Turn-on Time	t <sub>on</sub>	-	120	-	ns	V <sub>CC</sub> = 10V, I <sub>C</sub> = 1A
Turn-off Time	t <sub>off</sub>	-	160	-	ns	I <sub>B1</sub> = I <sub>B2</sub> = 10mA

Notes: 9. Measured under pulsed conditions. Pulse width ≤ 300 μs. Duty cycle ≤ 2%

**Typical Electrical Characteristics**

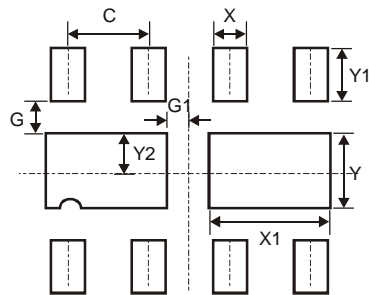


**Package Outline Dimensions**



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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