


**ZXTD619MC**
**DUAL 50V NPN LOW SATURATION SWITCHING TRANSISTOR**
**Features and Benefits**

- $BV_{CEO} > 50V$
- $I_C = 4A$  Continuous Collector Current
- Low Saturation Voltage (100mV max @ 1A)
- $R_{SAT} = 68m\Omega$  for Low Equivalent On Resistance
- $h_{FE}$  specified 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<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)

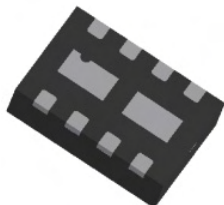
**Applications**

- DC – DC Converters
- MOSFET gate drivers
- Charging circuits
- Motor Control
- Power switches
- Portable applications

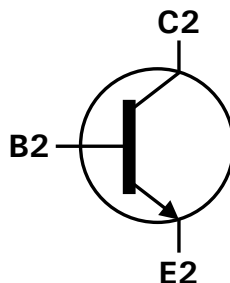
DFN3020B-8



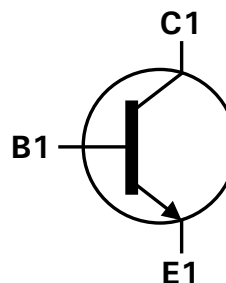
Top View



Bottom View

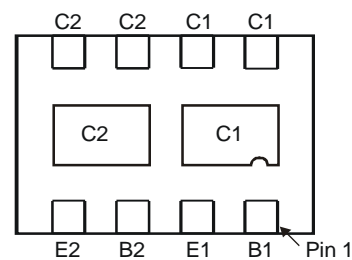


NPN Transistor



NPN Transistor

Equivalent Circuit


Bottom View  
Pin Out

**Ordering Information** (Note 3)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTD619MCTA	DCC	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**

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

**Maximum Ratings** @T<sub>A</sub> = 25°C unless otherwise specified

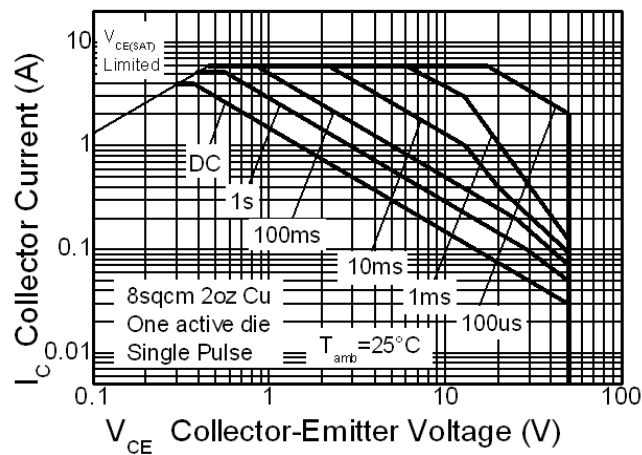
Parameter	Symbol	Limit	Unit
Collector-Base Voltage	V <sub>CBO</sub>	100	V
Collector-Emitter Voltage	V <sub>CEO</sub>	50	V
Emitter-Base Voltage	V <sub>EBO</sub>	7	V
Peak Pulse Current	I <sub>CM</sub>	6	A
Continuous Collector Current (Note 4 and 7)	I <sub>C</sub>	4	A
Base Current	I <sub>B</sub>	1	A

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

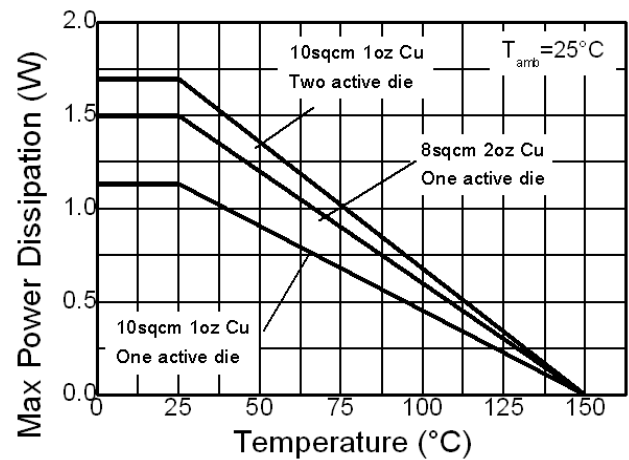
Characteristic	Symbol	Value	Unit
Power Dissipation Linear Derating Factor	P <sub>D</sub>	1.5	W mW/°C
		12	
		2.45	
		19.6	
		1.13	
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	8	°C/W
		1.7	
		13.6	
		83.3	
		51.0	
Thermal Resistance, Junction to Lead	R <sub>θJL</sub>	111	°C/W
		73.5	
		17.1	
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

- Notes:
4. 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.
  5. Same as note (4), except the device is measured at t < 5 sec.
  6. 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.
  7. For a dual device with one active die.
  8. For dual device with 2 active die running at equal power.
  9. Thermal resistance from junction to solder-point (at the end of the collector lead).

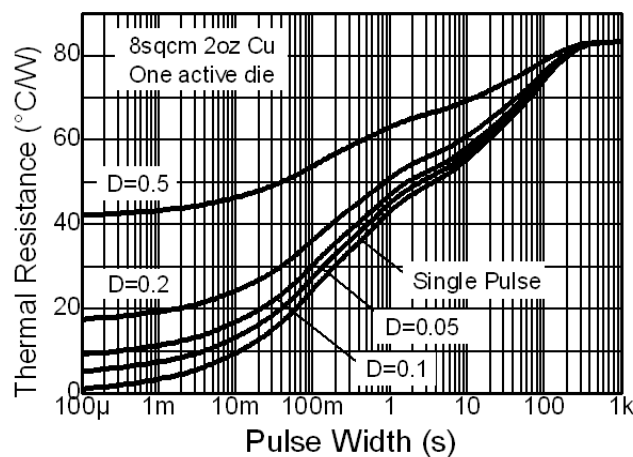
## Thermal Characteristics



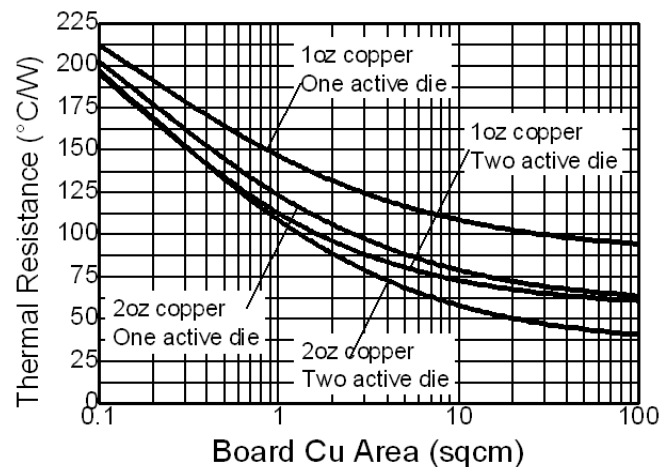
**Safe Operating Area**



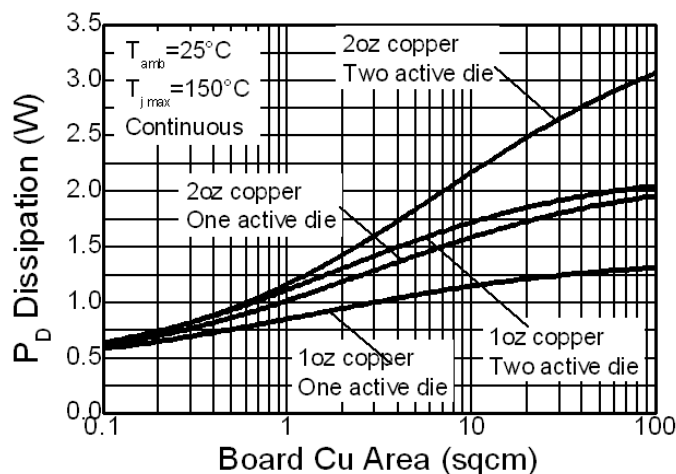
**Derating Curve**



**Transient Thermal Impedance**



**Thermal Resistance v Board Area**



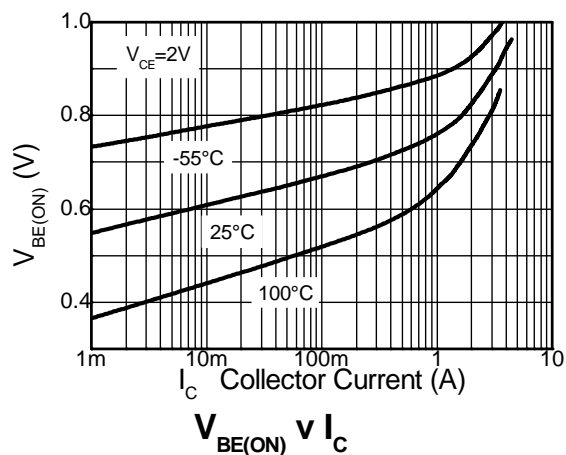
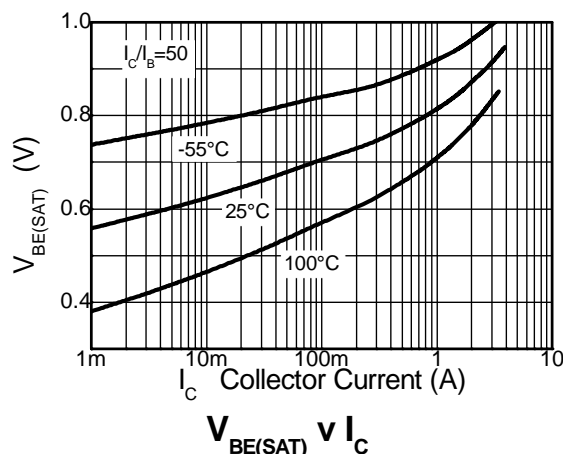
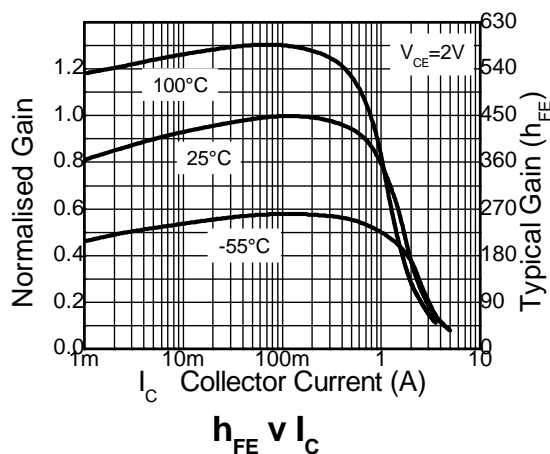
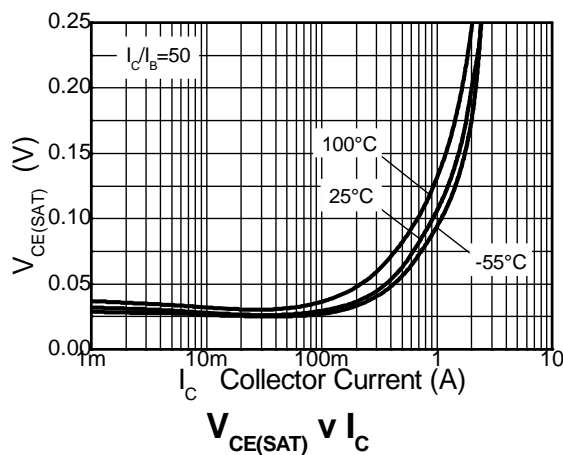
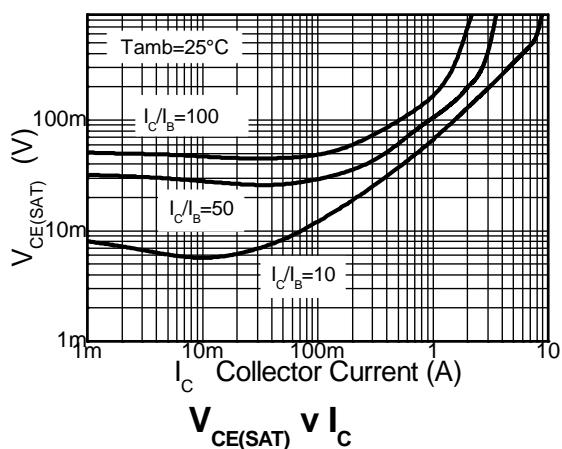
**Power Dissipation v Board Area**

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

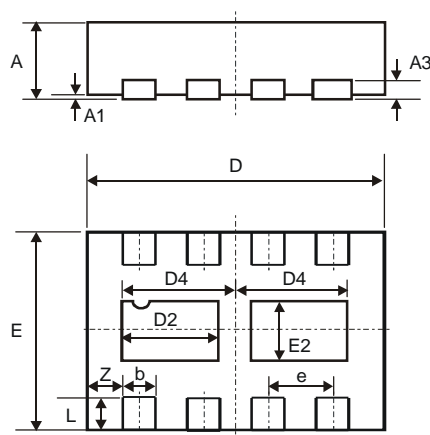
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	100	190	-	V	I <sub>C</sub> = 100μA
Collector-Emitter Breakdown Voltage (Note 10)	V <sub>(BR)CEO</sub>	50	65	-	V	I <sub>C</sub> = 10mA
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	7	8.2	-	V	I <sub>E</sub> = 100μA
Collector Cutoff Current	I <sub>CBO</sub>	-	-	100	nA	V <sub>CB</sub> = 80V
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> = 40V
Static Forward Current Transfer Ratio (Note 10)	h <sub>FE</sub>	200	400	-	-	I <sub>C</sub> = 10mA, V <sub>CE</sub> = 2V
		300	450	-	-	I <sub>C</sub> = 200mA, V <sub>CE</sub> = 2V
		200	400	-	-	I <sub>C</sub> = 1A, V <sub>CE</sub> = 2V
		100	225	-	-	I <sub>C</sub> = 2A, V <sub>CE</sub> = 2V
		-	40	-	-	I <sub>C</sub> = 6A, V <sub>CE</sub> = 2V
Collector-Emitter Saturation Voltage (Note 10)	V <sub>CE(sat)</sub>	-	10	20	mV	I <sub>C</sub> = 0.1A, I <sub>B</sub> = 10mA
		-	70	100	mV	I <sub>C</sub> = 1A, I <sub>B</sub> = 50mA
		-	145	200	mV	I <sub>C</sub> = 1A, I <sub>B</sub> = 10mA
		-	115	220	mV	I <sub>C</sub> = 2A, I <sub>B</sub> = 50mA
		-	225	300	mV	I <sub>C</sub> = 3A, I <sub>B</sub> = 100mA
		-	270	320	mV	I <sub>C</sub> = 4A, I <sub>B</sub> = 200mA
Base-Emitter Turn-On Voltage (Note 10)	V <sub>BE(on)</sub>	-	0.94	1.00	V	I <sub>C</sub> = 4A, V <sub>CE</sub> = 2V
Base-Emitter Saturation Voltage (Note 10)	V <sub>BE(sat)</sub>	-	1.00	1.07	V	I <sub>C</sub> = 4A, I <sub>B</sub> = 200mA
Output Capacitance	C <sub>obo</sub>	-	12	20	pF	V <sub>CB</sub> = 10V, f = 1MHz
Transition Frequency	f <sub>T</sub>	100	165	-	MHz	V <sub>CE</sub> = 10V, I <sub>C</sub> = 50mA, f = 100MHz
Turn-on Time	t <sub>on</sub>	-	170	-	ns	V <sub>CC</sub> = 10V, I <sub>C</sub> = 1A
Turn-off Time	t <sub>off</sub>	-	750	-	ns	I <sub>B1</sub> = I <sub>B2</sub> = 10mA

Notes: 10. Measured under pulsed conditions. Pulse width ≤ 300 μs. Duty cycle ≤ 2%

## Typical Electrical Characteristics

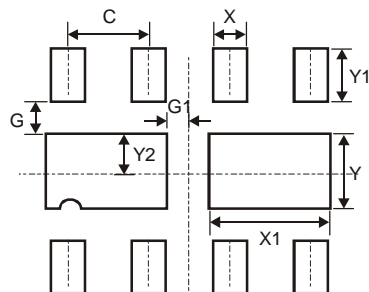


## Package Outline Dimensions



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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