


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
- 6mm² 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)

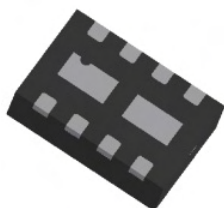
Applications

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

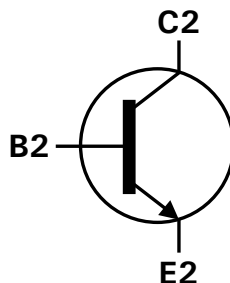
DFN3020B-8



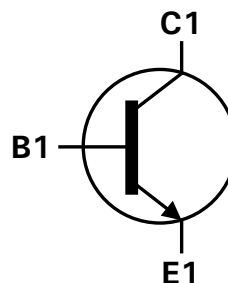
Top View



Bottom View

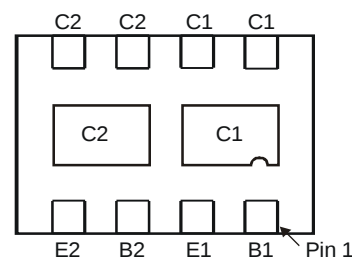


NPN Transistor



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_A = 25°C unless otherwise specified

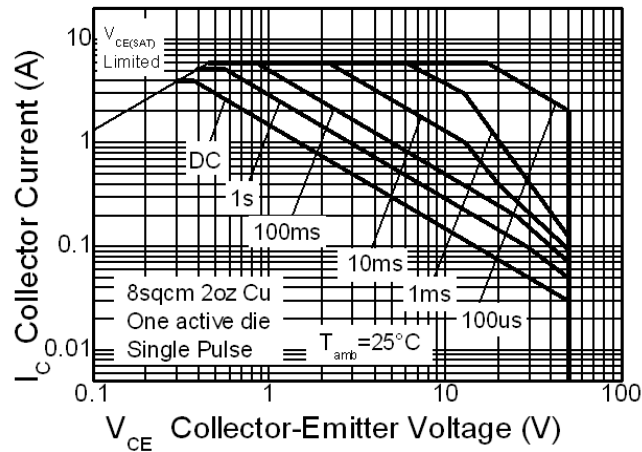
Parameter	Symbol	Limit	Unit
Collector-Base Voltage	V _{CBO}	100	V
Collector-Emitter Voltage	V _{CEO}	50	V
Emitter-Base Voltage	V _{EBO}	7	V
Peak Pulse Current	I _{CM}	6	A
Continuous Collector Current (Note 4 and 7)	I _C	4	A
Base Current	I _B	1	A

Thermal Characteristics @T_A = 25°C unless otherwise specified

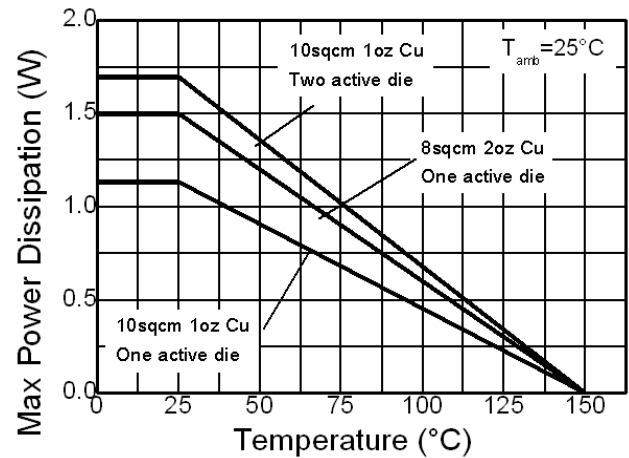
Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Notes 4 & 7)	P _D	1.5	W mW/°C
	(Notes 5 & 7)		12	
	(Notes 6 & 7)		2.45	
	(Notes 6 & 8)		19.6	
	(Notes 6 & 8)		1.13	
Thermal Resistance, Junction to Ambient	(Notes 4 & 7)	R _{θJA}	8	°C/W
	(Notes 5 & 7)		1.7	
	(Notes 6 & 7)		13.6	
	(Notes 6 & 8)		83.3	
Thermal Resistance, Junction to Lead	(Notes 7 & 9)	R _{θJL}	51.0	°C
Operating and Storage Temperature Range		T _J , T _{STG}	111	
			73.5	
			17.1	
			-55 to +150	

- Notes:
4. 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.
 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 (10cm²) 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).

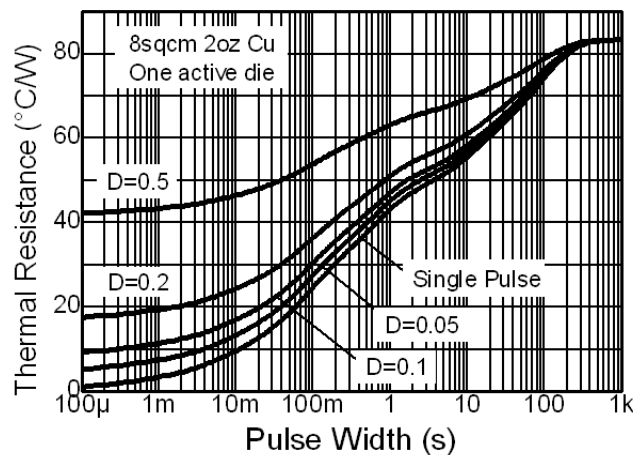
Thermal Characteristics



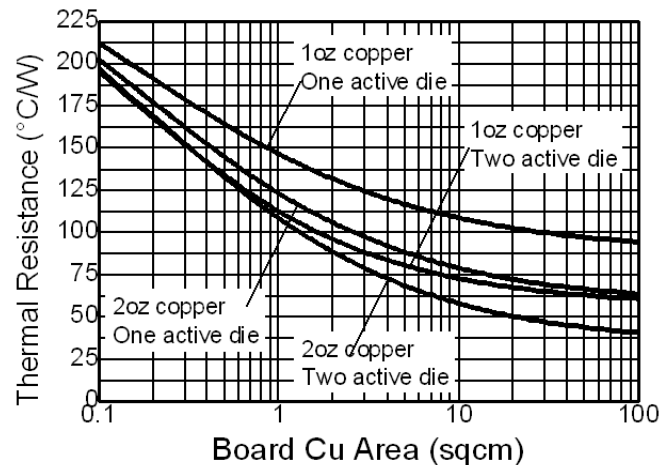
Safe Operating Area



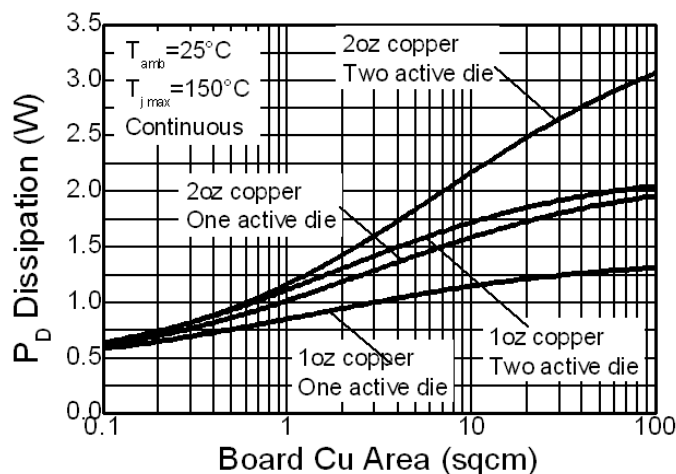
Derating Curve



Transient Thermal Impedance



Thermal Resistance v Board Area



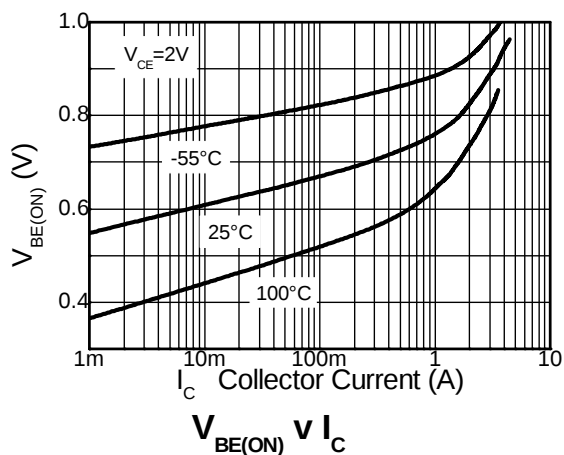
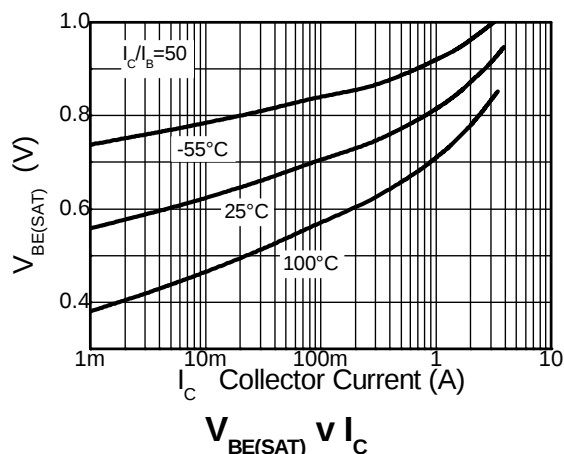
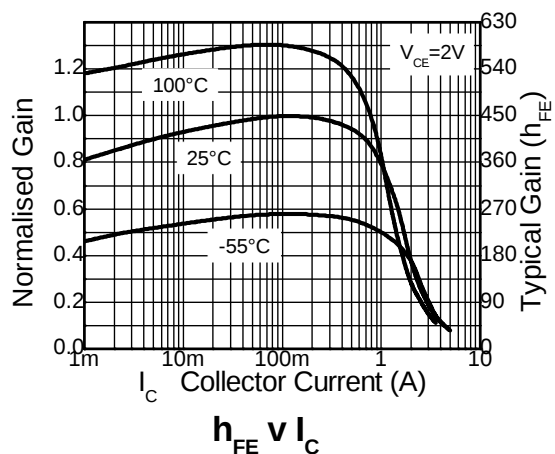
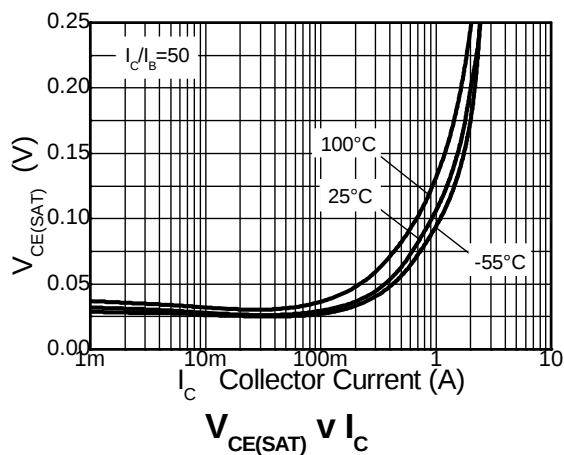
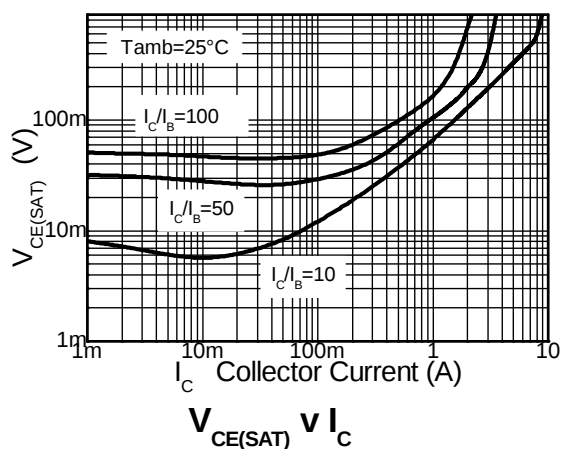
Power Dissipation v Board Area

Electrical Characteristics @T_A = 25°C unless otherwise specified

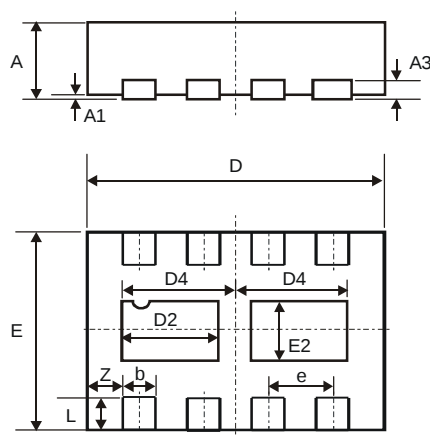
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	V _{(BR)CBO}	100	190	-	V	I _C = 100μA
Collector-Emitter Breakdown Voltage (Note 10)	V _{(BR)CEO}	50	65	-	V	I _C = 10mA
Emitter-Base Breakdown Voltage	V _{(BR)EBO}	7	8.2	-	V	I _E = 100μA
Collector Cutoff Current	I _{CBO}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

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

Typical Electrical Characteristics

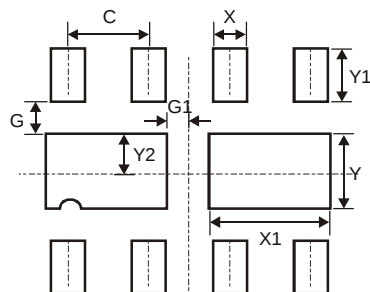


Package Outline Dimensions



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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