


ZXTD618MC
DUAL 20V NPN LOW SATURATION SWITCHING TRANSISTOR
Features and Benefits

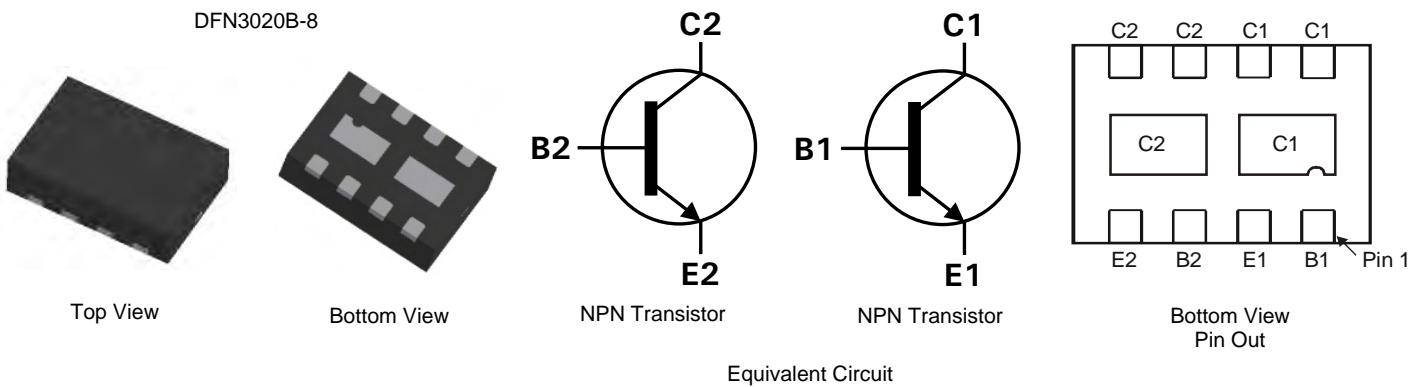
- $BV_{CEO} > 20V$
- $I_C = 4.5A$ Continuous Collector Current
- Low Saturation Voltage (150mV @ 1A)
- $R_{SAT} = 47m\Omega$ for a Low Equivalent On-Resistance
- h_{FE} specified up to 6A for high current gain hold up
- Dual NPN saving footprint and component count
- Low profile 0.8mm high package for thin applications
- R_{eJA} 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-3
- 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 (Note 3)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTD618MCTA	DBB	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


DBB = 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}	40	V
Collector-Emitter Voltage	V_{CEO}	20	
Emitter-Base Voltage	V_{EBO}	7	
Peak Pulse Current	I_{CM}	12	A
Continuous Collector Current (Notes 4 and 7)	I_C	4.5	
Continuous Collector Current (Notes 5 and 7)	I_C	5	
Base Current	I_B	1	

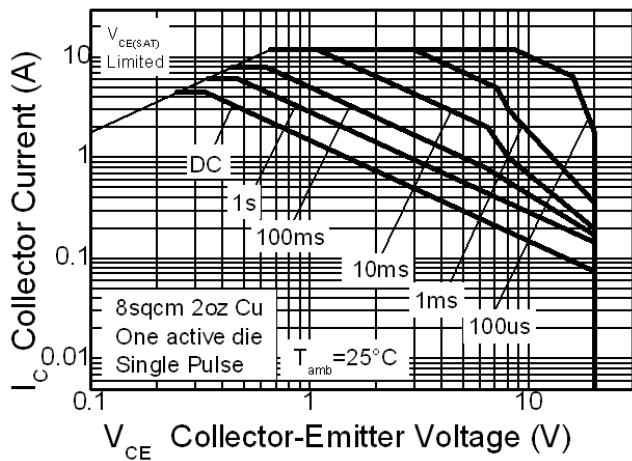
Thermal Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

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

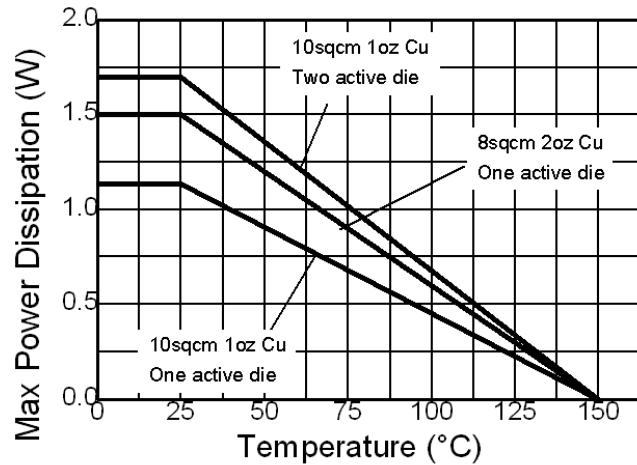
Notes:

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).

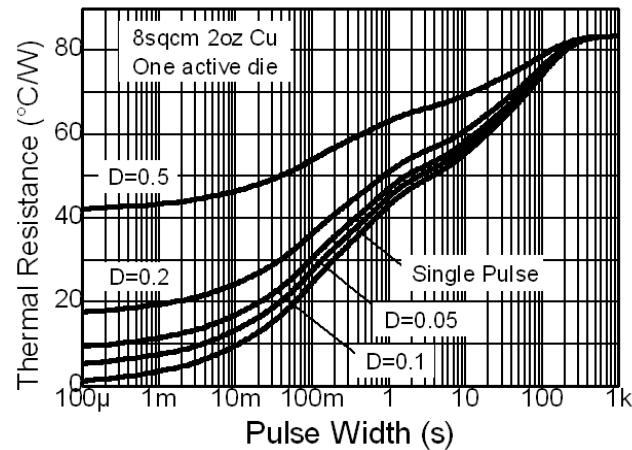
Thermal Characteristics



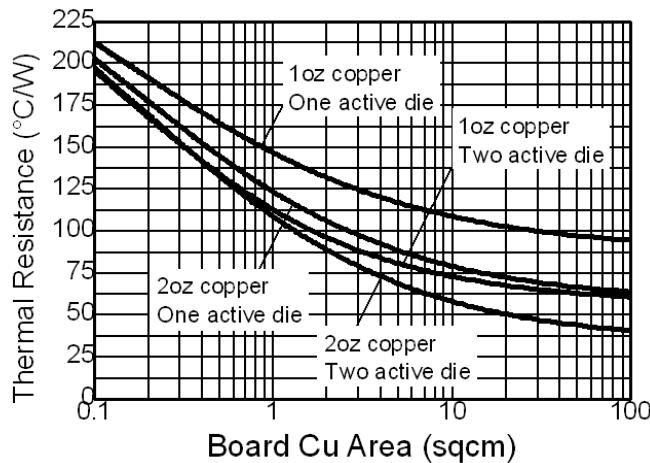
Safe Operating Area



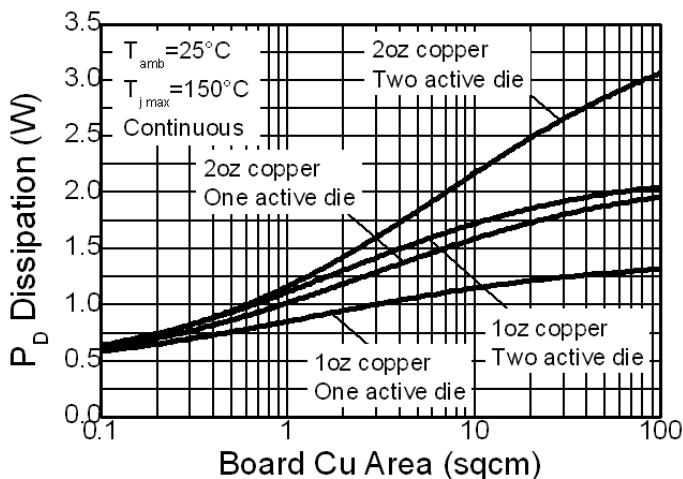
Derating Curve



Transient Thermal Impedance



Thermal Resistance v Board Area



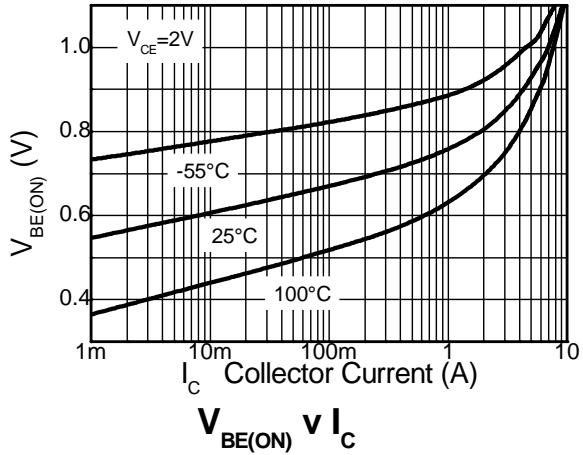
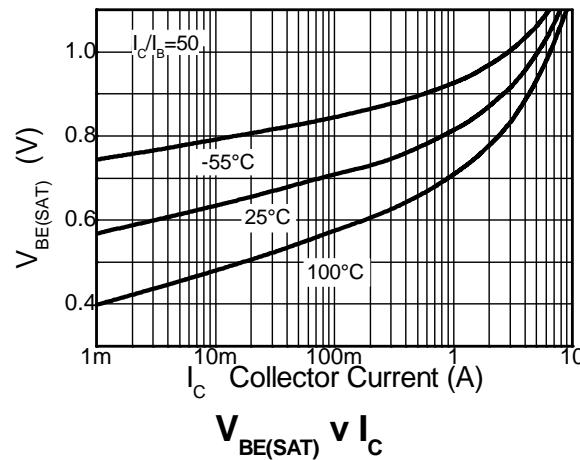
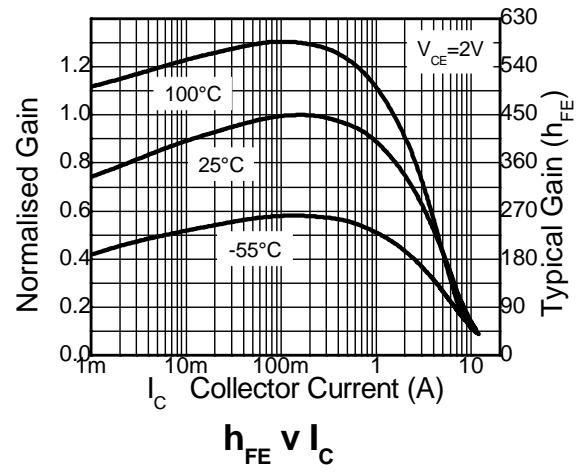
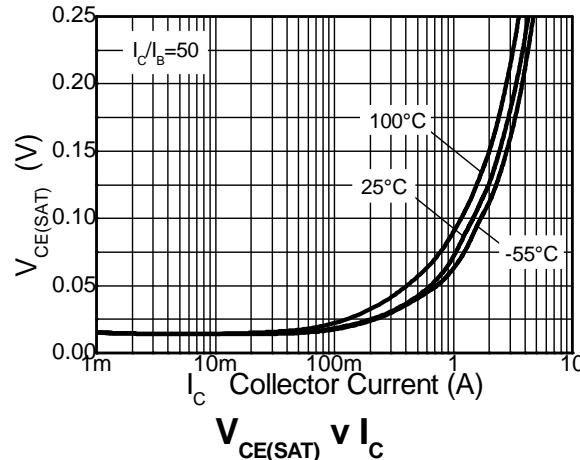
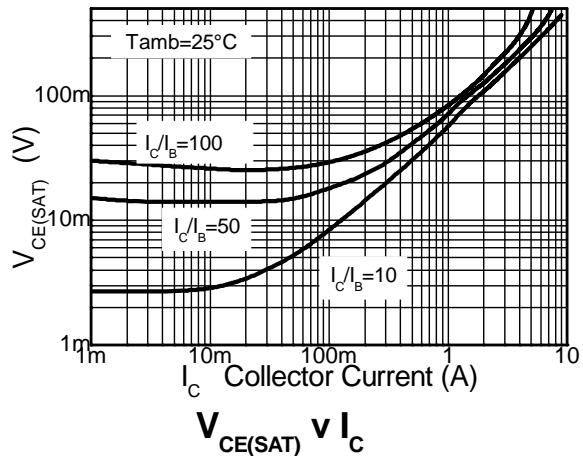
Power Dissipation v Board Area

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

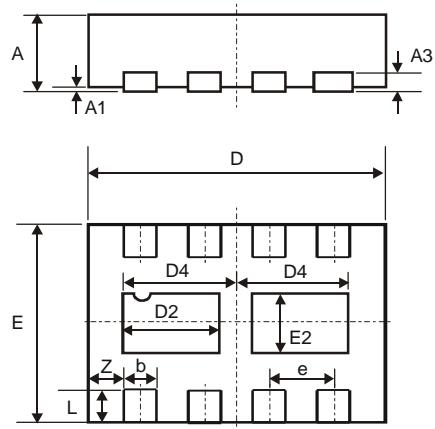
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	40	100	-	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 10)	BV_{CEO}	20	27	-	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	7.0	8.2	-	V	$I_E = 100\mu\text{A}$
Collector Cutoff Current	I_{CBO}	-	-	100	nA	$V_{\text{CB}} = 30\text{V}$
Emitter Cutoff Current	I_{EBO}	-	-	100	nA	$V_{\text{EB}} = 6\text{V}$
Collector Emitter Cutoff Current	I_{CES}	-	-	100	nA	$V_{\text{CES}} = 16\text{V}$
Static Forward Current Transfer Ratio (Note 10)	h_{FE}	200	400	-	-	$I_C = 10\text{mA}, V_{\text{CE}} = 2\text{V}$
		300	450	-	-	$I_C = 200\text{mA}, V_{\text{CE}} = 2\text{V}$
		200	360	-	-	$I_C = 2\text{A}, V_{\text{CE}} = 2\text{V}$
		100	180	-	-	$I_C = 6\text{A}, V_{\text{CE}} = 2\text{V}$
Collector-Emitter Saturation Voltage (Note 10)	$V_{\text{CE}(\text{sat})}$	-	8	15	mV	$I_C = 0.1\text{A}, I_B = 10\text{mA}$
		-	90	150		$I_C = 1\text{A}, I_B = 10\text{mA}$
		-	115	135		$I_C = 2\text{A}, I_B = 50\text{mA}$
		-	190	250		$I_C = 3\text{A}, I_B = 100\text{mA}$
		-	210	300		$I_C = 4.5\text{A}, I_B = 125\text{mA}$
Base-Emitter Turn-On Voltage (Note 10)	$V_{\text{BE}(\text{on})}$	-	0.88	0.97	V	$I_C = 4.5\text{A}, V_{\text{CE}} = 2\text{V}$
Base-Emitter Saturation Voltage (Note 10)	$V_{\text{BE}(\text{sat})}$	-	0.98	1.07	V	$I_C = 4.5\text{A}, I_B = 125\text{mA}$
Output Capacitance	C_{obo}	-	23	30	pF	$V_{\text{CB}} = 10\text{V}, f = 1\text{MHz}$
Transition Frequency	f_T	100	140	-	MHz	$V_{\text{CE}} = 10\text{V}, I_C = 50\text{mA}, f = 100\text{MHz}$
Turn-on Time	t_{on}	-	170	-	ns	$V_{\text{CC}} = 10\text{V}, I_C = 3\text{A}$
Turn-off Time	t_{off}	-	400	-	ns	$I_{B1} = I_{B2} = 10\text{mA}$

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

Typical Electrical Characteristics



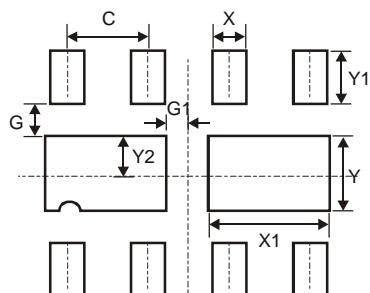
Package Outline Dimensions



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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