Lead-free Green

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 mΩ 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^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.
- 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)

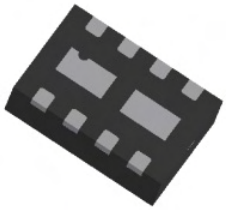
Applications

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

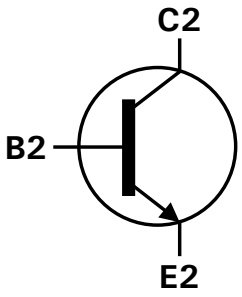
DFN3020B-8



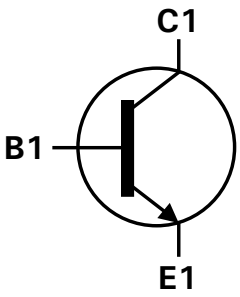
Top View



Bottom View

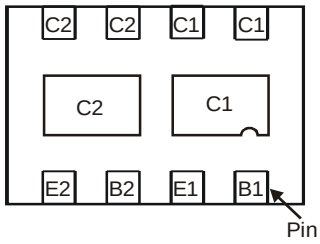


NPN Transistor



NPN Transistor

Equivalent Circuit



Bottom View
Pin-Out

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

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Maximum Ratings @T_A = 25°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	

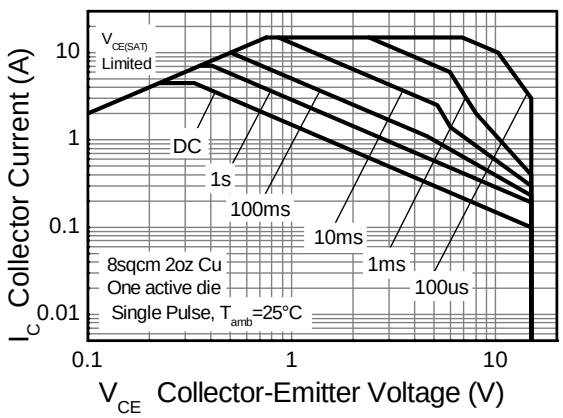
Thermal Characteristics @ T_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Notes 3 & 6)	P_D	1.5 12	W mW/°C
	(Notes 4 & 6)		2.45 19.6	
	(Notes 5 & 6)		1.13 8	
	(Notes 5 & 7)		1.7 13.6	
Thermal Resistance, Junction to Ambient	(Notes 3 & 6)	$R_{\theta JA}$	83.3	°C/W
	(Notes 4 & 6)		51.0	
	(Notes 5 & 6)		111	
	(Notes 5 & 7)		73.5	
Thermal Resistance, Junction to Lead	(Notes 6 & 8)	$R_{\theta JL}$	17.1	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

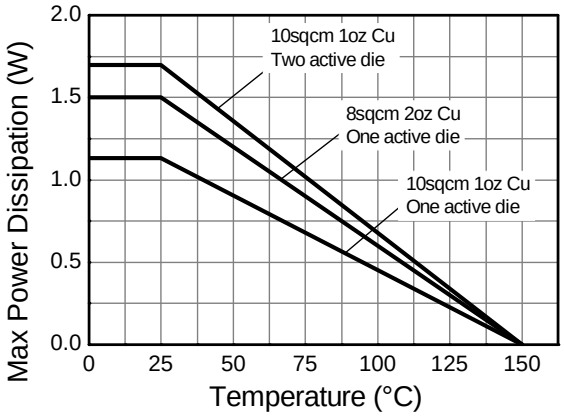
Notes:
3. For a dual device surface mounted on 28mm x 28mm (8cm^2) FR4 PCB with high coverage of single sided 2 oz copper, in still air conditions; the device is measured when operating in a steady-state condition. The heatsink is split in half with the exposed collector pads connected to each half.
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^2) 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).

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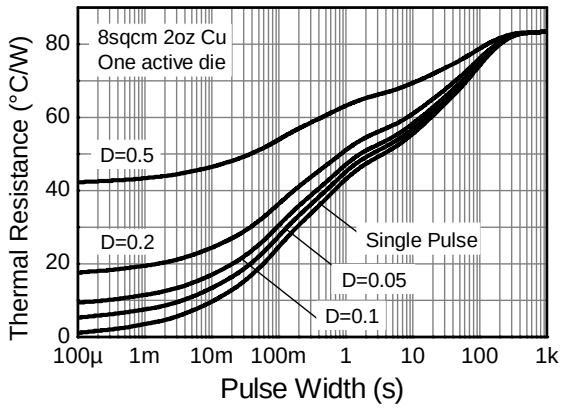
Thermal Characteristics



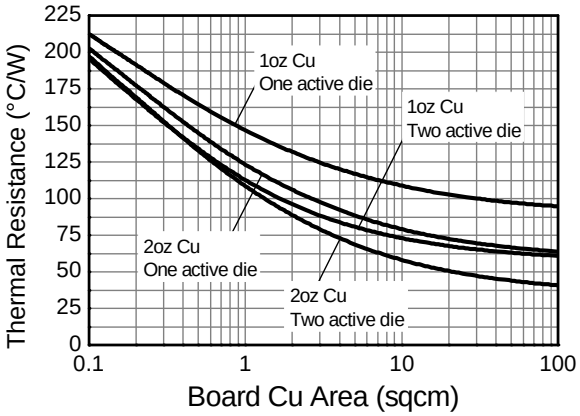
Safe Operating Area



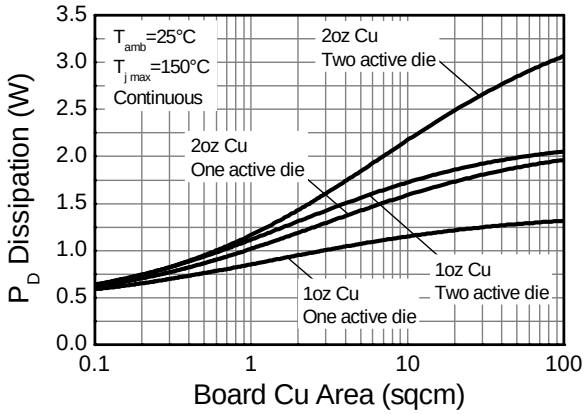
Derating Curve



Transient Thermal Impedance



Thermal Resistance v Board Area



Power Dissipation v Board Area

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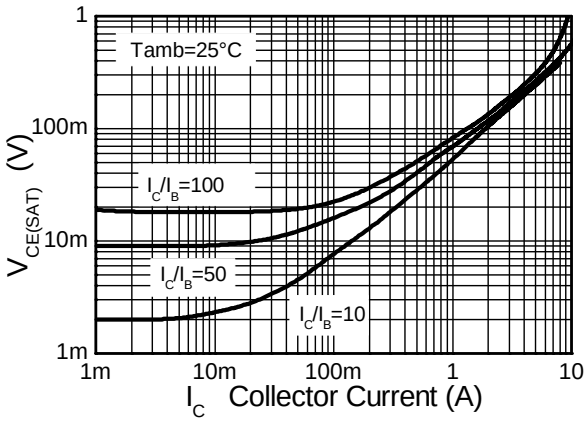
Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	40	70	-	V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	15	18	-	V	I_C = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8.2	-	V	I_E = 100µA
Collector Cutoff Current	I_{CBO}	-	-	100	nA	V_{CB} = 30V
Emitter Cutoff Current	I_{EBO}	-	-	100	nA	V_{EB} = 6V
Collector Emitter Cutoff Current	I_{CES}	-	-	100	nA	V_{CES} = 12V
Static Forward Current Transfer Ratio (Note 9)	h_{FE}	200 300 200 150 -	415 450 320 240 80	- - - - -	- - - - -	I_C = 10mA, V_{CE} = 2V I_C = 200mA, V_{CE} = 2V I_C = 3A, V_{CE} = 2V I_C = 5A, V_{CE} = 2V I_C = 12A, V_{CE} = 2V
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	- - - - -	8 70 165 240 200	14 100 200 310 -	mV mV mV mV mV	I_C =0.1A, I_B = 10mA I_C = 1A, I_B = 10mA I_C = 3A, I_B = 50mA I_C =4.5A, I_B = 50mA I_C =4.5A, I_B = 100mA
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(on)}$	-	0.88	0.96	V	I_C = 4.5A, V_{CE} = 2V
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(sat)}$	-	0.94	1.05	V	I_C = 4.5A, I_B = 50mA
Output Capacitance	C_{obo}	-	30	40	pF	V_{CB} = 10V. f = 1MHz
Transition Frequency	f_T	80	120	-	MHz	V_{CE} = 10V, I_C = 50mA, f = 100MHz
Turn-on Time	t_{on}	-	120	-	ns	V_{CC} = 10V, I_C = 1A
Turn-off Time	t_{off}	-	160	-	ns	I_{B1} = I_{B2} = 10mA

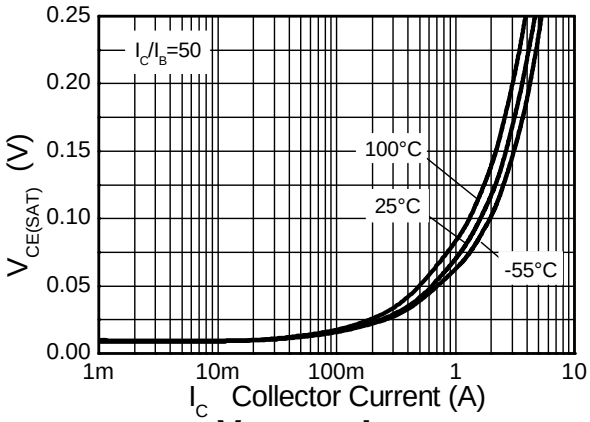
Notes: 9. Measured under pulsed conditions. Pulse width ≤ 300 µs. Duty cycle ≤ 2%

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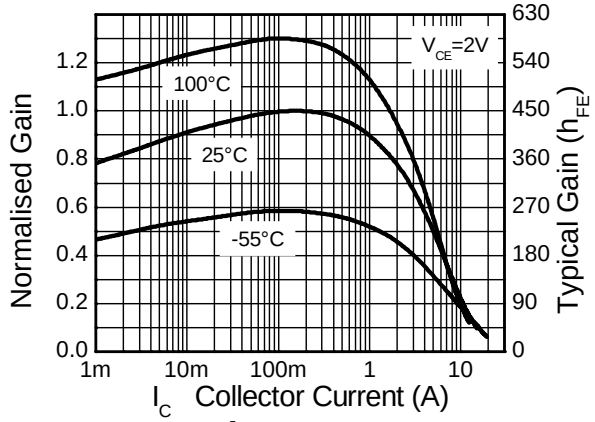
Typical Electrical Characteristics



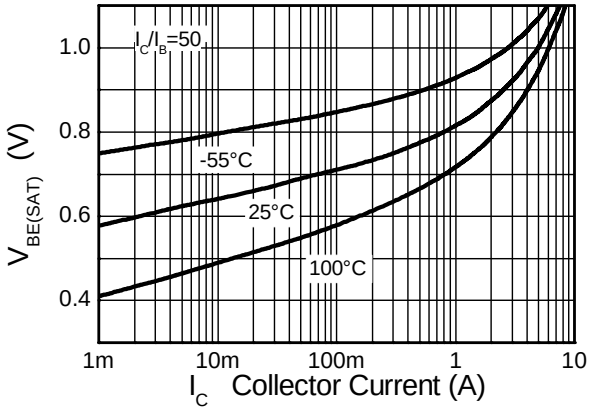
$V_{CE(SAT)}$ v I_C



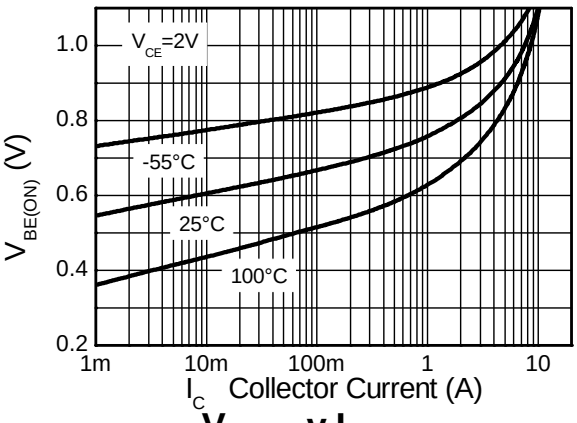
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



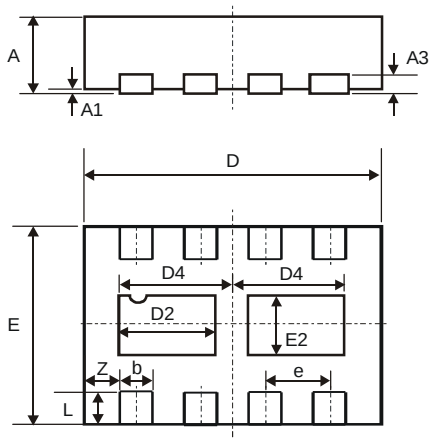
$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

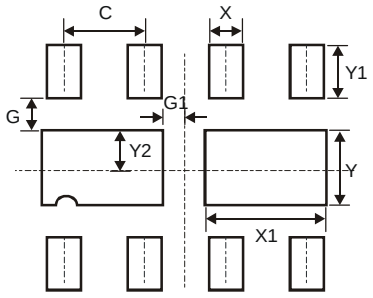
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Package Outline Dimensions



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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