



ZXTD720MC

DUAL 40V PNP LOW SATURATION SWITCHING TRANSISTOR

Features and Benefits

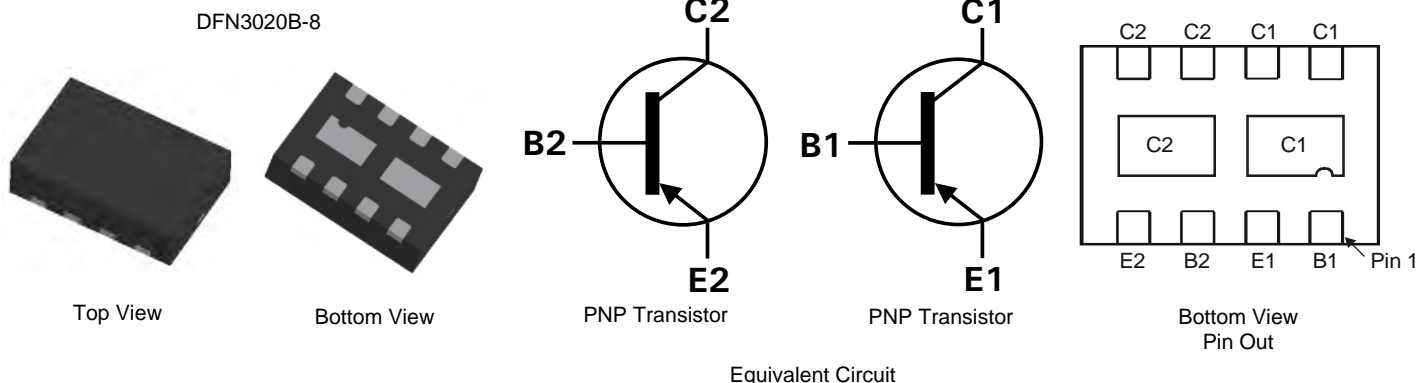
- $BV_{CEO} > -40V$
- $I_C = -3A$ Continuous Collector Current
- Low Saturation Voltage ($-220mV @ -1A$)
- $R_{SAT} = 104 m\Omega$ for Low Equivalent On Resistance
- hFE specified up to -3A for high gain holds up
- Dual NPN saving footprint and component count
- Low profile 0.8mm high package for thin applications
- $R_{\theta JA}$ efficient, 40% lower than SOT26
- $6mm^2$ 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. UL Flammability Rating 94V-0
- Terminals: Pre-Plated NiPdAu leadframe.
- Nominal package height: 0.8mm
- Moisture Sensitivity: Level 1 per J-STD-020
- Solderable per MIL-STD-202, Method 208
- Weight: 0.013 grams (approximate)

Applications

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



Ordering Information (Note 3)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTD720MCTA	D33	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



D33 = Product type Marking Code
Top View, Dot Denotes Pin 1

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

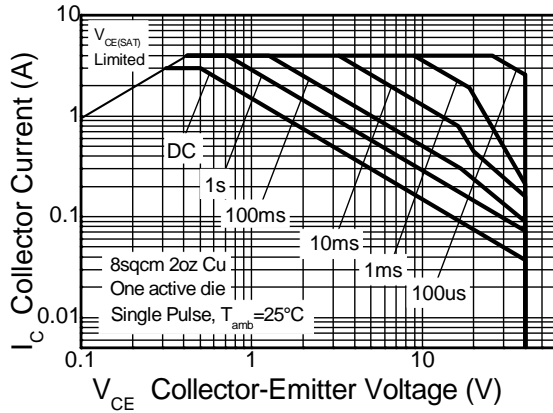
Parameter	Symbol	Limit	Unit
Collector-Base Voltage	V_{CBO}	-50	V
Collector-Emitter Voltage	V_{CEO}	-40	
Emitter-Base Voltage	V_{EBO}	-7	
Peak Pulse Current	I_{CM}	-4	A
Continuous Collector Current (Notes 4 and 7)	I_C	-3	
Base Current	I_B	-1	

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

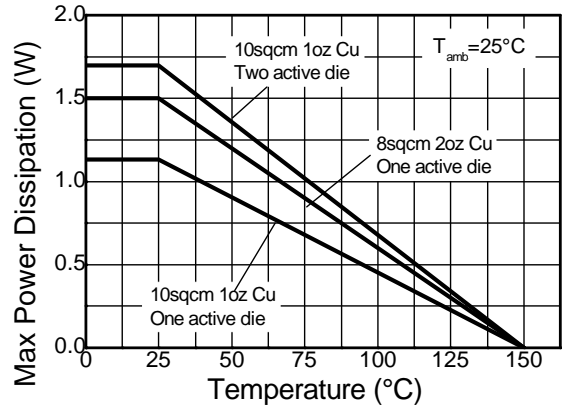
Characteristic	Symbol	Value	Unit
Power Dissipation Linear Derating Factor	P_D	1.5	W mW/°C
		12	
		2.45	
		19.6	
		1.13	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	8	°C/W
		1.7	
		13.6	
		83.3	
Thermal Resistance, Junction to Lead	$R_{\theta JL}$	51.0	°C/W
		111	
		73.5	
		17.1	
Operating 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).

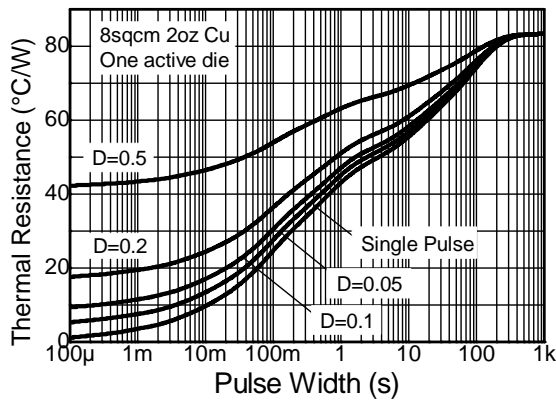
Thermal Characteristics



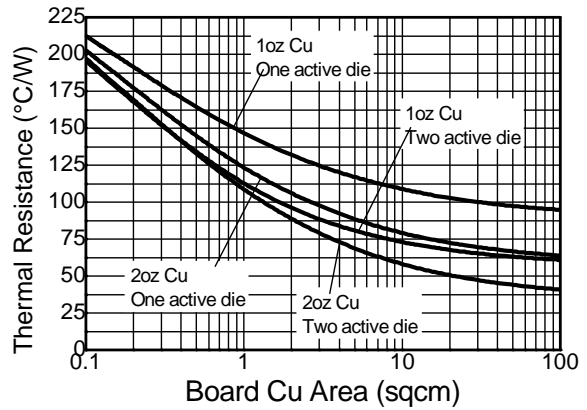
Safe Operating Area



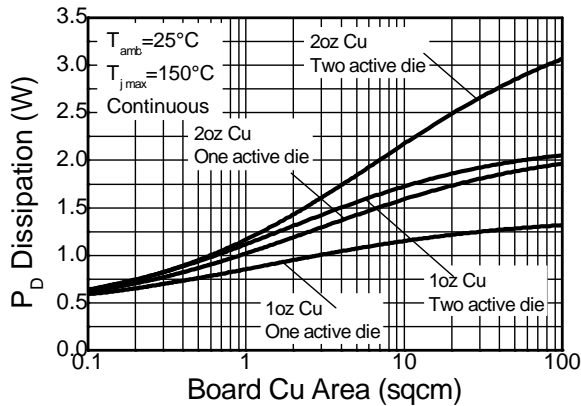
Derating Curve



Transient Thermal Impedance



Thermal Resistance v Board Area



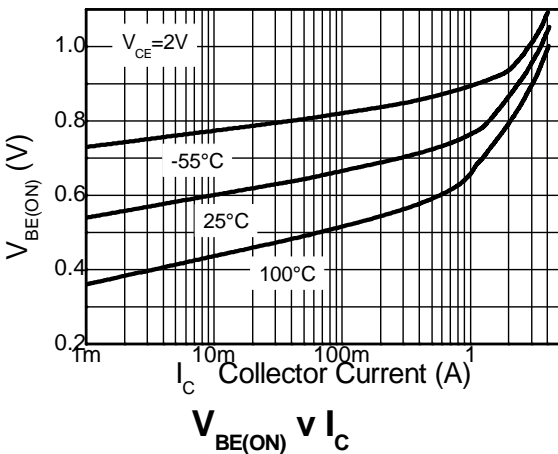
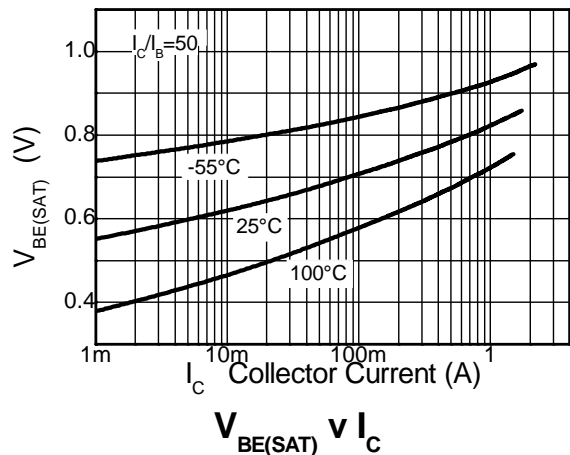
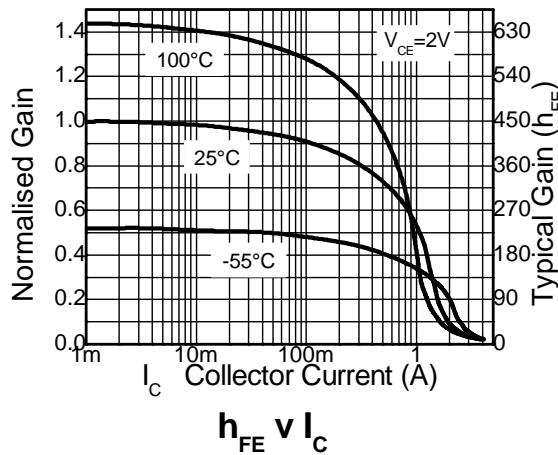
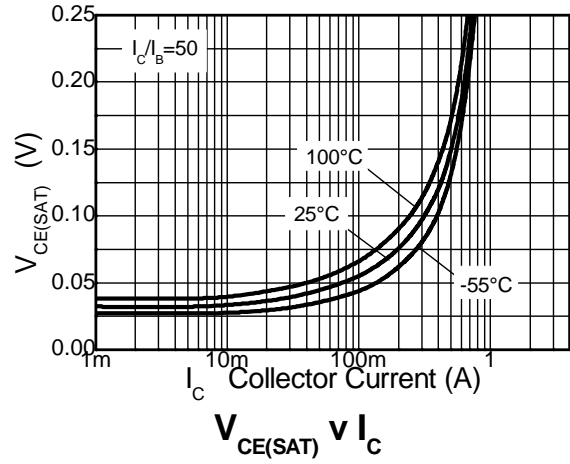
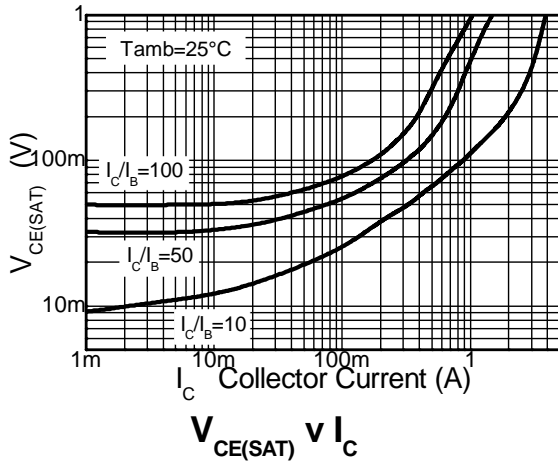
Power Dissipation v Board Area

Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	V _{(BR)CBO}	-50	-80	-	V	I _C = -100μA
Collector-Emitter Breakdown Voltage (Note 10)	V _{(BR)CEO}	-40	-70	-	V	I _C = -10mA
Emitter-Base Breakdown Voltage	V _{(BR)EBO}	-7	-8.5	-	V	I _E = -100μA
Collector Cutoff Current	I _{CBO}	-	-	-100	nA	V _{CB} = -40V
Emitter Cutoff Current	I _{EBO}	-	-	-100	nA	V _{EB} = -6V
Collector Emitter Cutoff Current	I _{CES}	-	-	-100	nA	V _{CES} = -32V
Static Forward Current Transfer Ratio (Note 10)	h _{FE}	300	480	-	-	I _C = -10mA, V _{CE} = -2V
		300	450	-	-	I _C = -100mA, V _{CE} = -2V
		180	290	-	-	I _C = -1A, V _{CE} = -2V
		60	130	-	-	I _C = -1.5A, V _{CE} = -2V
		12	22	-	-	I _C = -3A, V _{CE} = -2V
Collector-Emitter Saturation Voltage (Note 10)	V _{CE(sat)}	-	-25	-40	mV	I _C = -0.1A, I _B = -10mA
		-	-150	-220		I _C = -1A, I _B = -50mA
		-	-195	-300		I _C = -1.5A, I _B = -100mA
		-	-210	-300		I _C = -2A, I _B = -200mA
		-	-260	-370		I _C = -2.5A, I _B = -250mA
Base-Emitter Turn-On Voltage (Note 10)	V _{BE(on)}	-	-0.89	-0.95	V	I _C = -2.5A, V _{CE} = -2V
Base-Emitter Saturation Voltage (Note 10)	V _{BE(sat)}	-	-0.97	-1.05	V	I _C = -2.5A, I _B = -250mA
Output Capacitance	C _{obo}	-	19	25	pF	V _{CB} = -10V, f = 1MHz
Transition Frequency	f _T	150	190	-	MHz	V _{CE} = -10V, I _C = -50mA, f = 100MHz
Turn-on Time	t _{on}	-	40	-	ns	V _{CC} = -15V, I _C = -0.75A
Turn-off Time	t _{off}	-	435	-	ns	I _{B1} = I _{B2} = -15mA

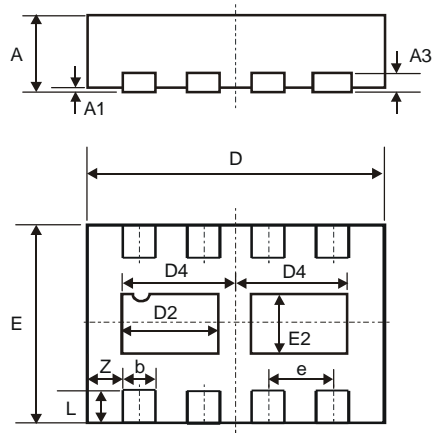
Notes: 10. Measured under pulsed conditions. Pulse width ≤ 300 μs. Duty cycle ≤ 2%

Typical Electrical Characteristics



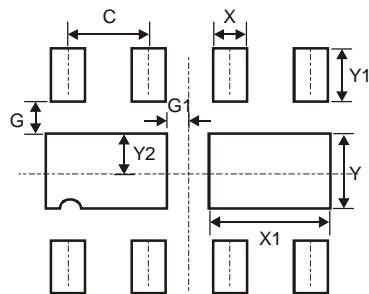
ZXTD720MC

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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