


ZXTD720MC
DUAL 40V PNP LOW SATURATION SWITCHING TRANSISTOR
Features and Benefits

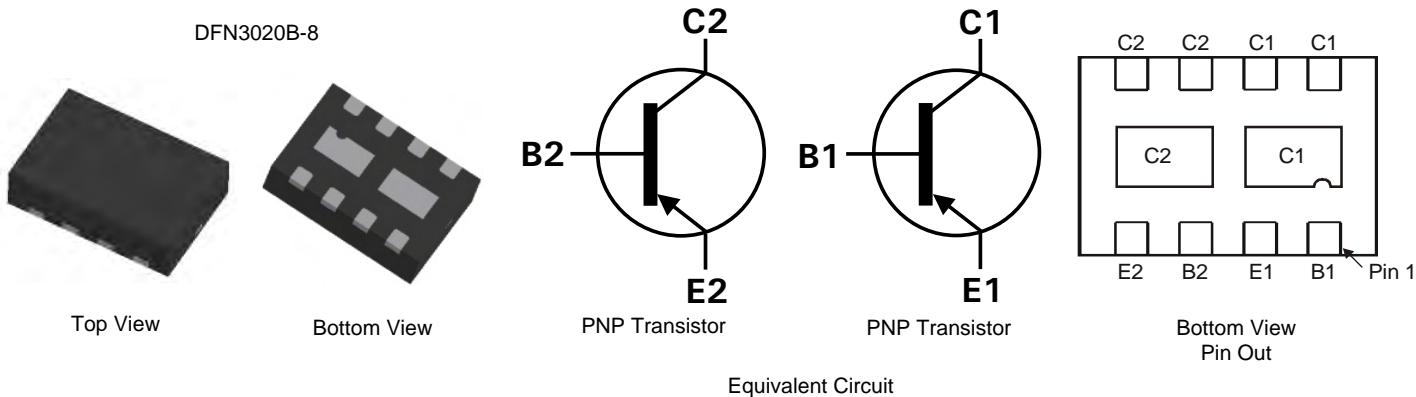
- $BV_{CEO} > -40V$
- $I_C = -3A$ Continuous Collector Current
- Low Saturation Voltage (-220mV @ -1A)
- $R_{SAT} = 104\text{ m}\Omega$ for Low Equivalent On Resistance
- hFE specified up to -3A for high gain holds up
- Dual NPN saving footprint and component count
- Low profile 0.8mm high package for thin applications
- R_{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-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	

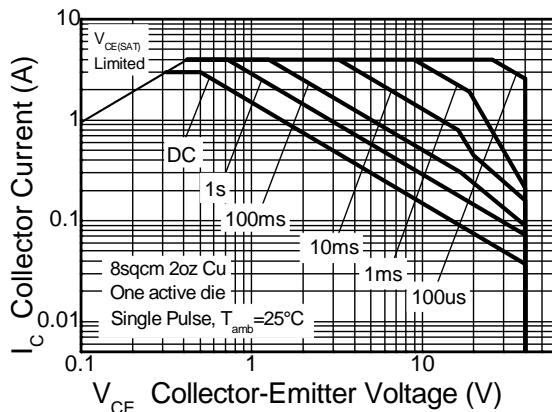
Thermal Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Notes 4 & 7)	P_D	1.5	W mW/°C
	(Notes 5 & 7)		12	
	(Notes 6 & 7)		2.45	
	(Notes 6 & 8)		19.6	
Thermal Resistance, Junction to Ambient	(Notes 4 & 7)	$R_{\theta JA}$	1.13	°C/W
	(Notes 5 & 7)		8	
	(Notes 6 & 7)		1.7	
	(Notes 6 & 8)		13.6	
Thermal Resistance, Junction to Lead	(Notes 7 & 9)	$R_{\theta JL}$	83.3	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	51.0	
			111	
			73.5	
			17.1	
			-55 to +150	°C

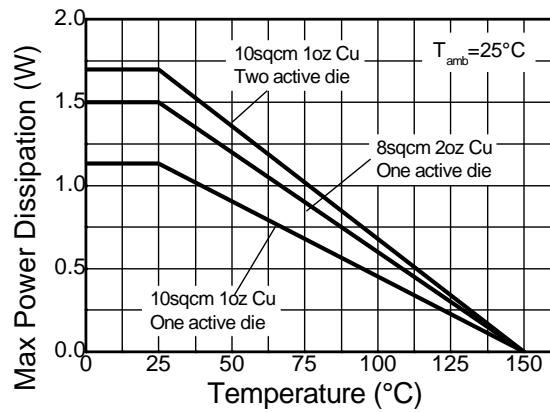
Notes:

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).

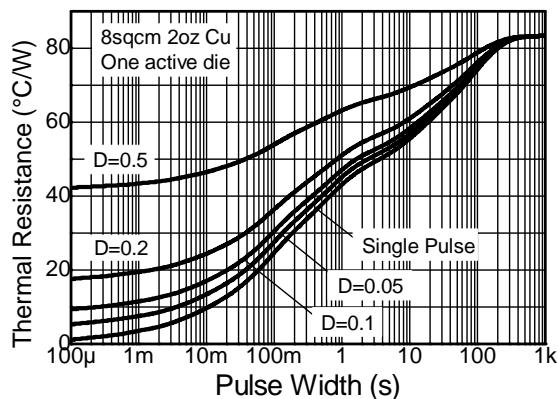
Thermal Characteristics



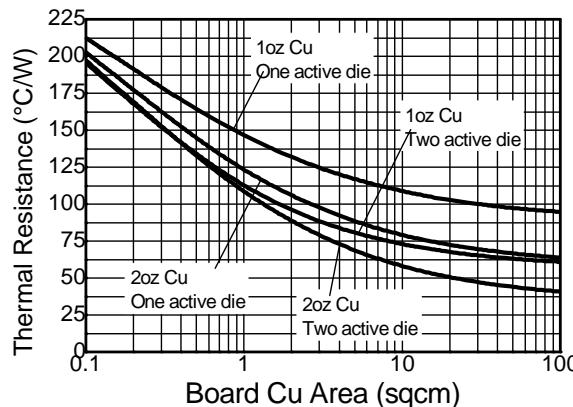
Safe Operating Area



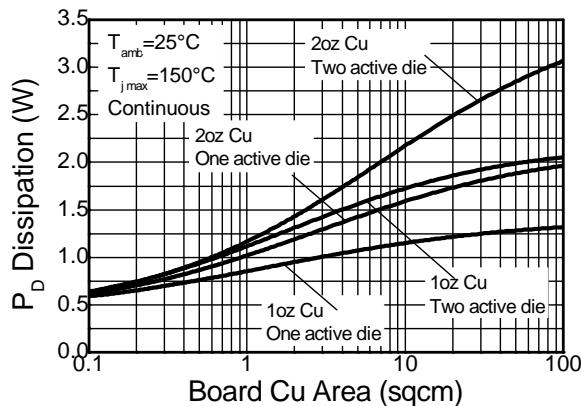
Derating Curve



Transient Thermal Impedance



Thermal Resistance v Board Area



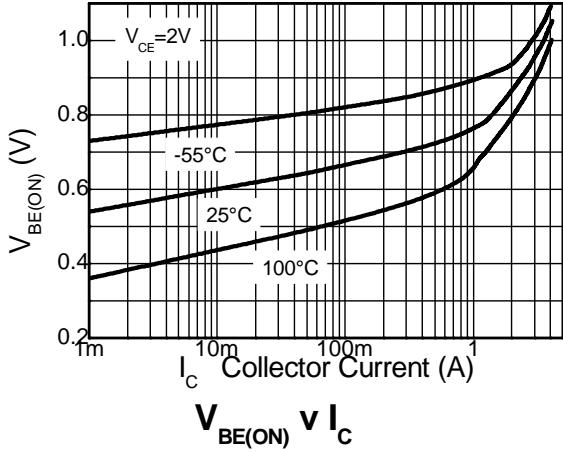
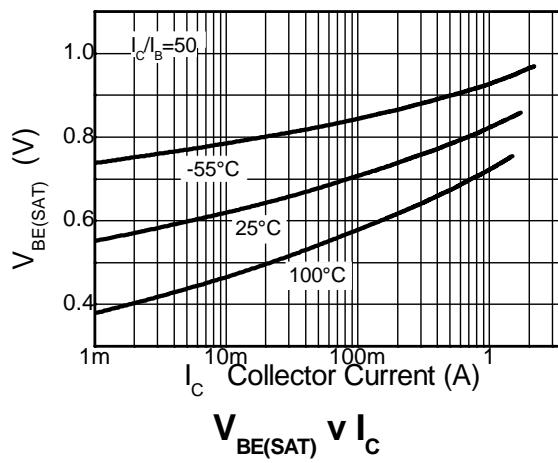
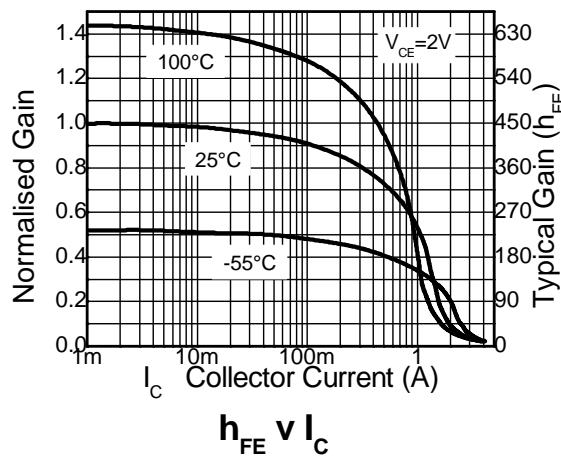
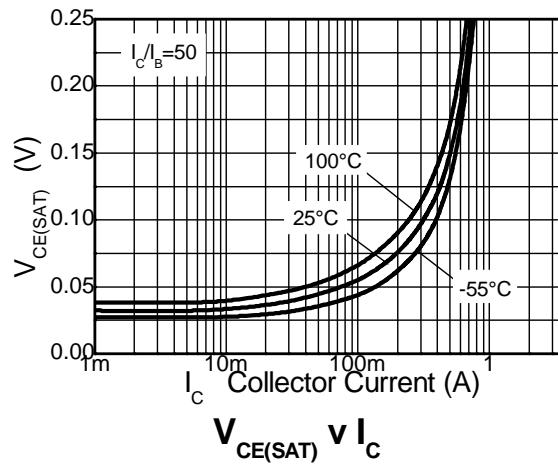
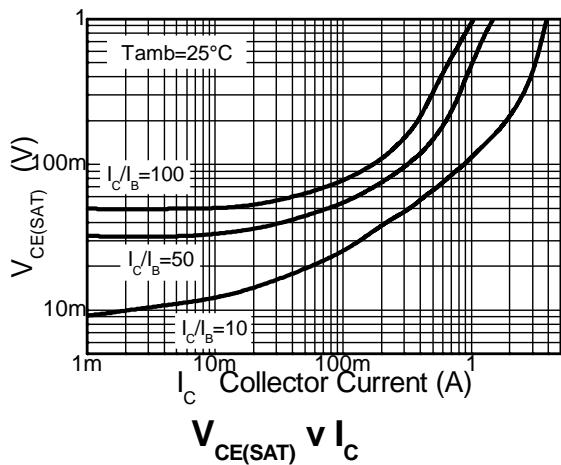
Power Dissipation v Board Area

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

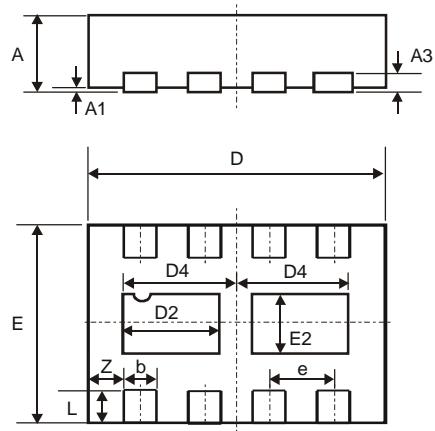
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-50	-80	-	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 10)	$V_{(BR)CEO}$	-40	-70	-	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-7	-8.5	-	V	$I_E = -100\mu\text{A}$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

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

Typical Electrical Characteristics



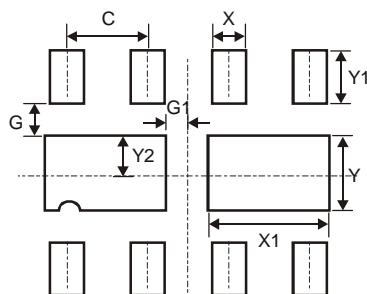
Package Outline Dimensions



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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