



**ZXTP720MA**

**40V PNP LOW SATURATION SWITCHING TRANSISTOR**

**Features and Benefits**

- $BV_{CEO} > -40V$
- $I_C = -3A$  Continuous Collector Current
- Low Saturation Voltage (-220mV max @ -1A)
- $R_{SAT} = 104\ m\Omega$  for a low equivalent On-Resistance
- $h_{FE}$  specified up to -3A for high current gain hold up
- Low profile 0.6mm high package for thin applications
- $R_{\theta JA}$  efficient, 60% lower than SOT23
- 4mm<sup>2</sup> footprint, 50% smaller than SOT23
- **Lead-Free, RoHS Compliant (Note 1)**
- **Halogen and Antimony Free. "Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

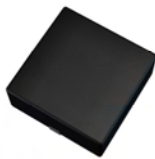
**Mechanical Data**

- Case: DFN2020B-3
- Case material: Molded Plastic. "Green" Molding Compound.
- Terminals: Pre-Plated NiPdAu leadframe.
- Nominal package height: 0.6mm
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Weight: 0.01 grams (approximate)

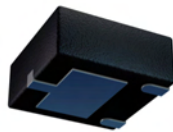
**Applications**

- MOSFET Gate Driving
- DC-DC Converters
- Charging Circuits
- Power switches
- Motor control

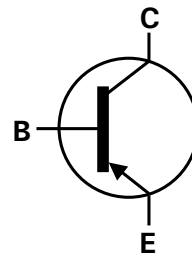
DFN2020B-3



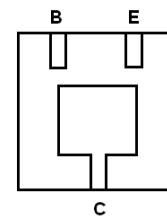
Top View



Bottom View



Device Symbol



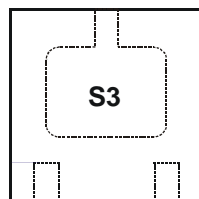
Bottom View Pin-Out

**Ordering Information** (Note 3)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTP720MATA	S3	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>
  3. For Packaging Details, go to our website at <http://www.diodes.com>.

**Marking Information**



Top View

S3 = Product Type Marking code

**Maximum Ratings** @T<sub>A</sub> = 25°C unless otherwise specified

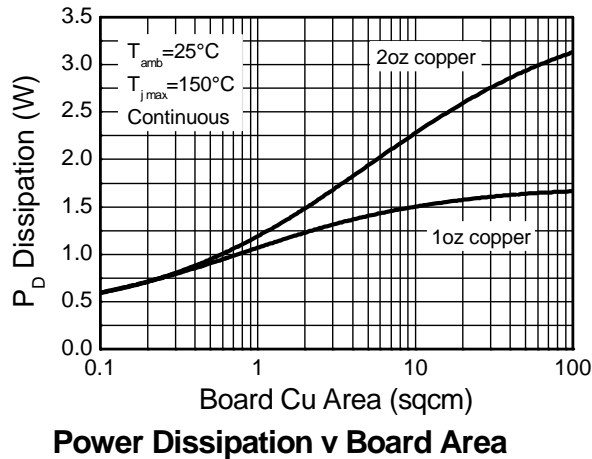
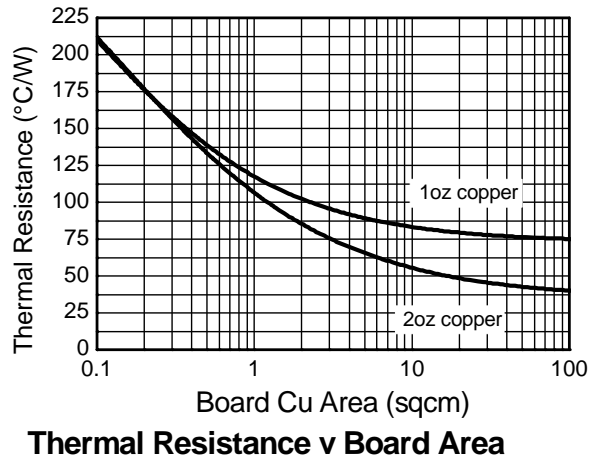
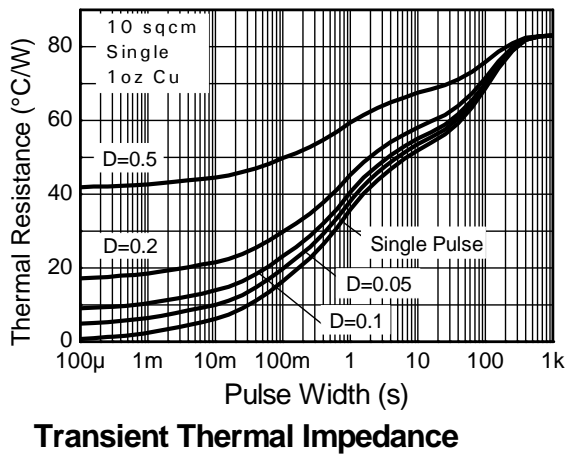
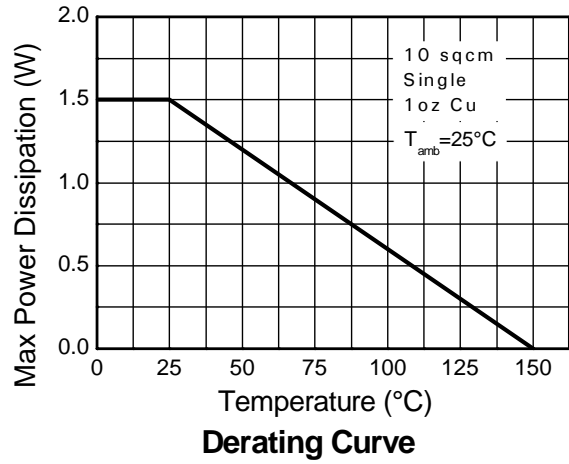
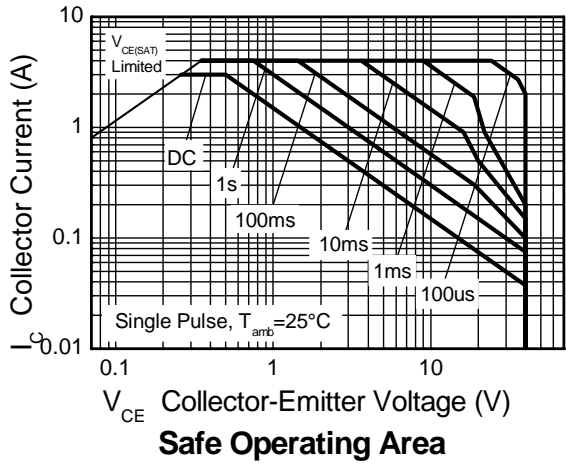
Parameter		Symbol	Limit	Unit
Collector-Base Voltage		V <sub>CB0</sub>	-50	V
Collector-Emitter Voltage		V <sub>CEO</sub>	-40	
Emitter-Base Voltage		V <sub>EBO</sub>	-7	
Peak Pulse Current		I <sub>CM</sub>	-4	A
Continuous Collector Current	(Note 4)	I <sub>C</sub>	-3	
	(Note 5)		-3.3	
Base Current		I <sub>B</sub>	-1	

**Thermal Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 4)	P <sub>D</sub>	1.5	W mW/°C
	(Note 5)		12	
Thermal Resistance, Junction to Ambient	(Note 4)	R <sub>θJA</sub>	2.45	°C/W
	(Note 5)		19.6	
Thermal Resistance, Junction to Lead	(Note 4)	R <sub>θJL</sub>	83	
	(Note 5)		51	
Operating and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

- Notes:
4. For a device surface mounted on 31mm x 31mm (10cm<sup>2</sup>) FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition. The entire exposed collector pad is attached to the heatsink.
  5. Same as note (4), except the device is measured at t ≤ 5 sec.
  6. For a single device, thermal resistance from junction to solder-point (at the end of the drain lead).

**Thermal Characteristics**

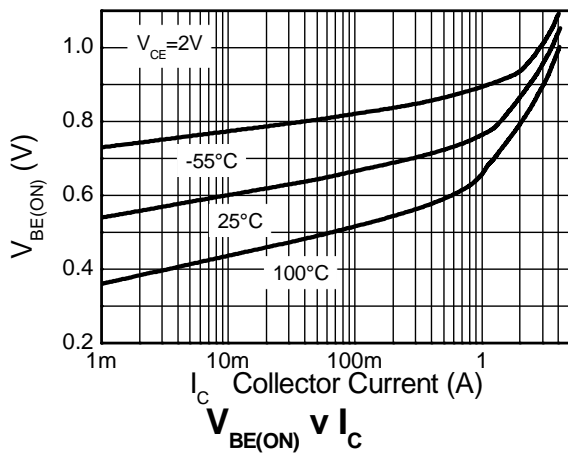
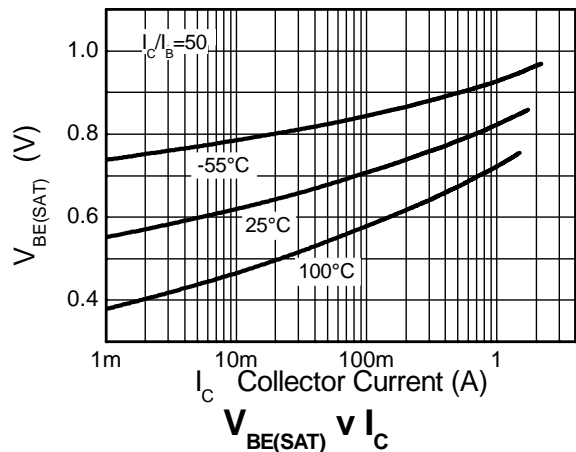
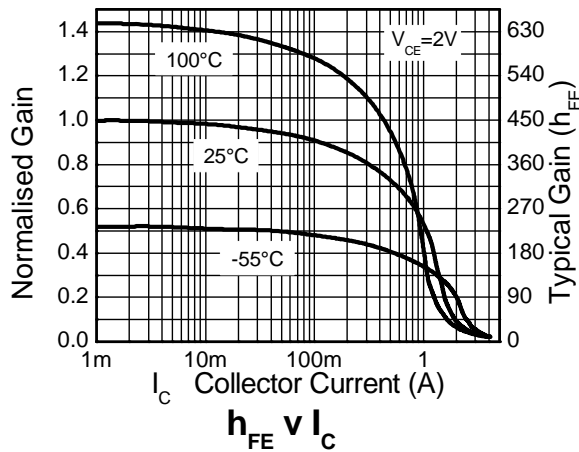
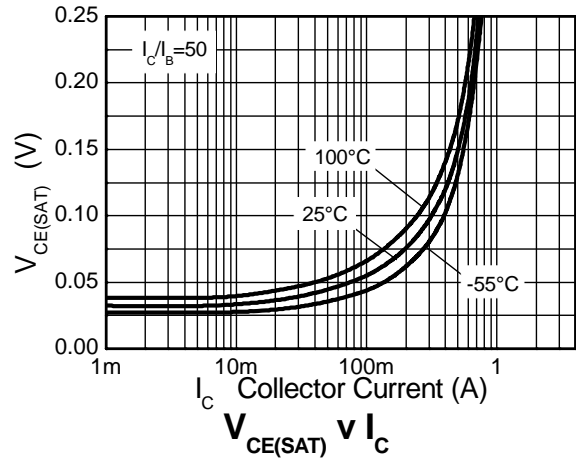
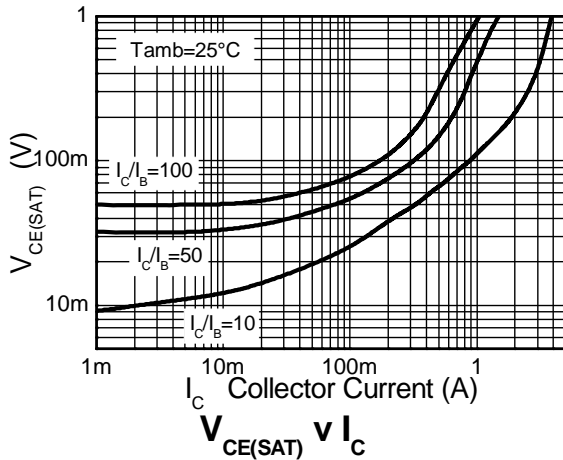


**Electrical Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

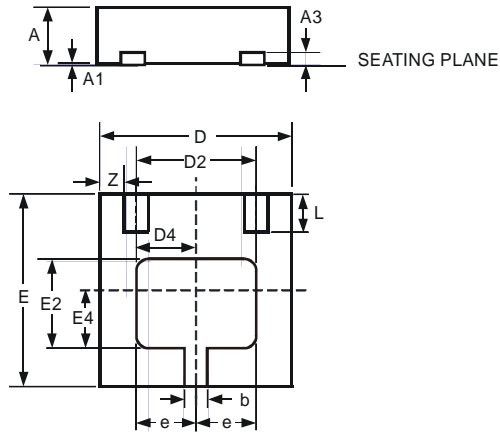
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$BV_{CBO}$	-50	-80	-	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 7)	$BV_{CEO}$	-40	-70	-	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	-7	-8.5	-	V	$I_E = -100\mu\text{A}$
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 7)	$h_{FE}$	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 7)	$V_{CE(sat)}$	-	-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 7)	$V_{BE(on)}$	-	-0.89	-0.95	V	$I_C = -2.5\text{A}, V_{CE} = -2\text{V}$
Base-Emitter Saturation Voltage (Note 7)	$V_{BE(sat)}$	-	-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: 7. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

**Typical Electrical Characteristics**

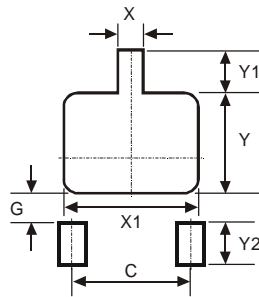


**Package Outline Dimensions**



DFN2020B-3			
Dim	Min	Max	Typ
A	0.57	0.63	0.60
A1	0	0.05	0.02
A3	—	—	0.152
b	0.20	0.30	0.25
D	1.95	2.075	2.00
D2	1.22	1.42	1.32
D4	0.56	0.76	0.66
e	—	—	0.65
E	1.95	2.075	2.00
E2	0.79	0.99	0.89
E4	0.48	0.68	0.58
L	0.25	0.35	0.30
Z	—	—	0.225
All Dimensions in mm			

**Suggested Pad Layout**



Dimensions	Value (in mm)
C	1.30
G	0.24
X	0.35
X1	1.52
Y	1.09
Y1	0.47
Y2	0.50

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