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 mΩ 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^2 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)

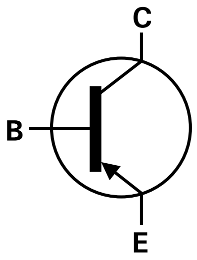
Applications

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

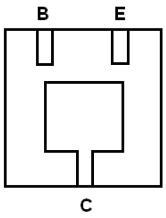
DFN2020B-3

Top View

Bottom View



Device Symbol



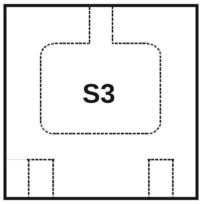
Bottom View
Pin-Out

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_A = 25℃ unless otherwise specified

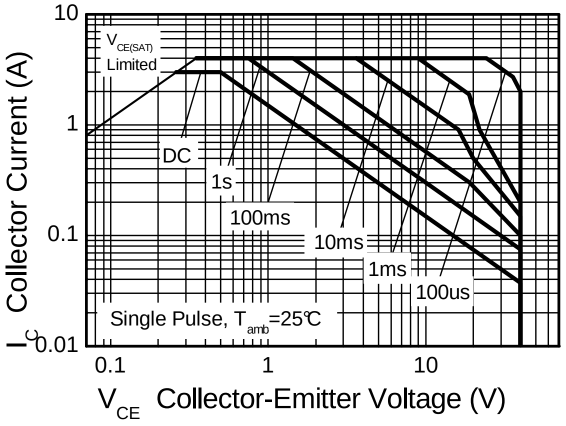
Parameter		Symbol	Limit	Unit
Collector-Base Voltage		V_{CBO}	-50	V
Collector-Emitter Voltage		V_{CEO}	-40	
Emitter-Base Voltage		V_{EBO}	-7	
Peak Pulse Current		I_{CM}	-4	A
Continuous Collector Current	(Note 4)	I_C	-3	
	(Note 5)		-3.3	
Base Current		I_B	-1	

Thermal Characteristics @T_A = 25℃ unless otherwise specified

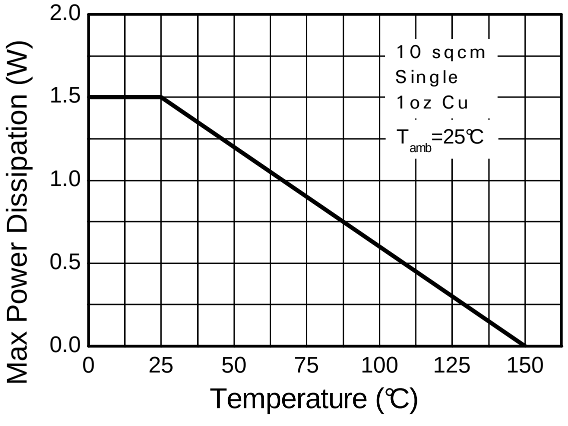
Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 4)	P_D	1.5 12	W mW/°C
	(Note 5)		2.45 19.6	
Thermal Resistance, Junction to Ambient	(Note 4)	$R_{\theta JA}$	83	°C/W
	(Note 5)		51	
Thermal Resistance, Junction to Lead	(Note 6)	$R_{\theta JL}$	16.8	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Notes:
4. For a device surface mounted on 31mm x 31mm (10cm^2) 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).

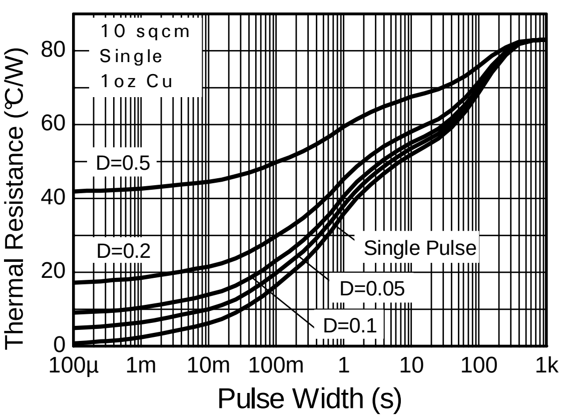
Thermal Characteristics



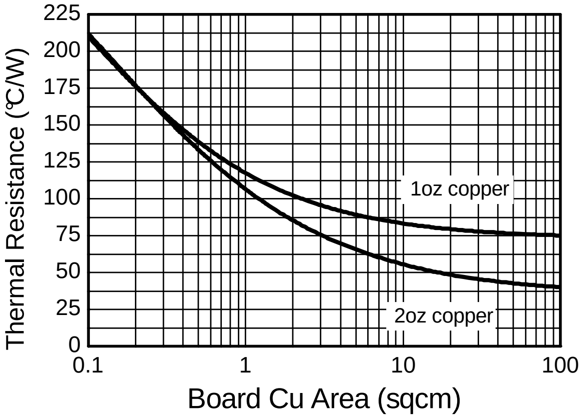
Safe Operating Area



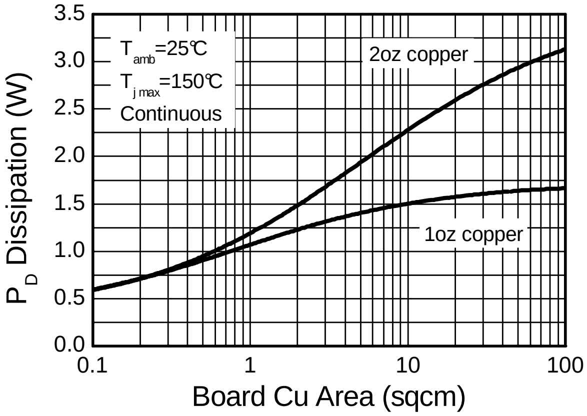
Derating Curve



Transient Thermal Impedance



Thermal Resistance v Board Area



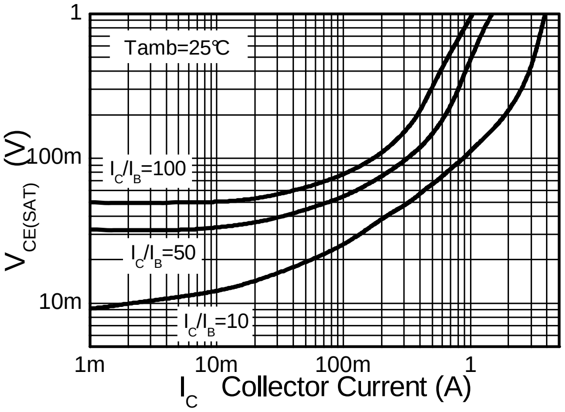
Power Dissipation v Board Area

Electrical Characteristics @T_A = 25℃ unless otherwise specified

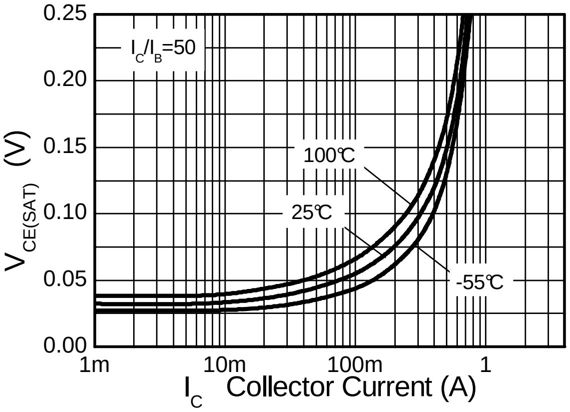
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-50	-80	-	V	I_C = -100µA
Collector-Emitter Breakdown Voltage (Note 7)	BV_{CEO}	-40	-70	-	V	I_C = -10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.5	-	V	I_E = -100µA
Collector Cutoff Current	I_{CBO}	-	-	-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 7)	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 7)	$V_{CE(sat)}$	-	-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 7)	$V_{BE(on)}$	-	-0.89	-0.95	V	I_C = -2.5A, V_{CE} = -2V
Base-Emitter Saturation Voltage (Note 7)	$V_{BE(sat)}$	-	-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 I_{B1} = I_{B2} = -15mA
Turn-Off Time	t_{off}	-	435	-	ns	

Notes: 7. Measured under pulsed conditions. Pulse width ≤ 300 µs. Duty cycle ≤ 2%.

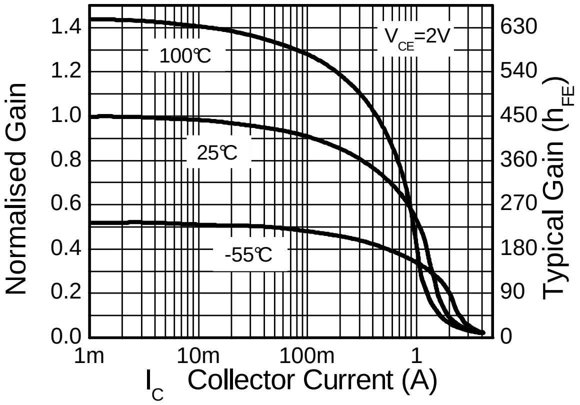
Typical Electrical Characteristics



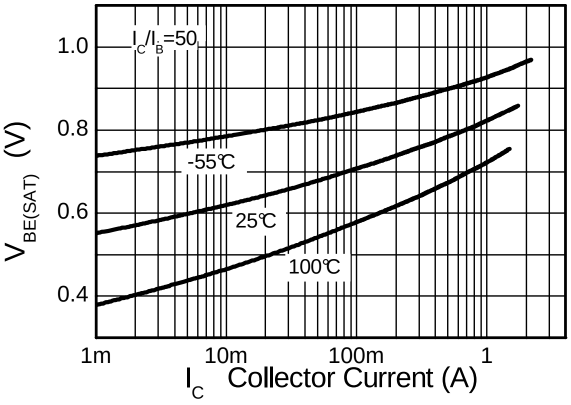
$V_{CE(SAT)}$ v I_C



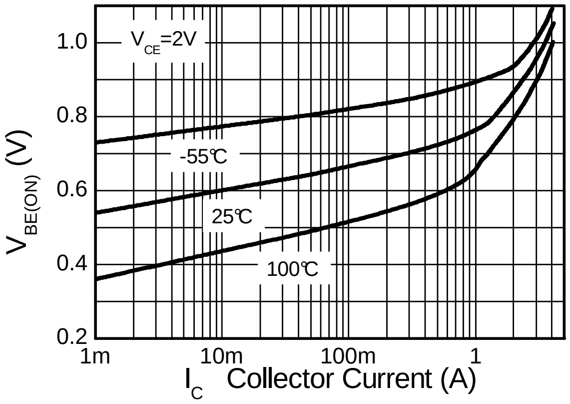
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C

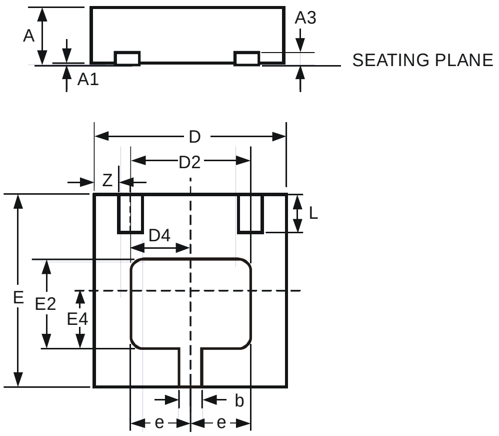


$V_{BE(SAT)}$ v I_C



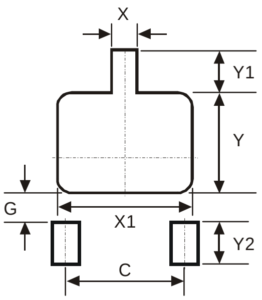
$V_{BE(ON)}$ v I_C

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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