





Lead-free ZXMP10A17G 100V P-CHANNEL ENHANCEMENT MODE MOSFET

# **Product Summary**

V <sub>(BR)DSS</sub>	R <sub>DS(on)</sub>	I <sub>D</sub> T <sub>A</sub> = 25°C
-100V	350mΩ @ V <sub>GS</sub> = -10V	-2.4
	450mΩ @ V <sub>GS</sub> = -6.0V	-2.1

#### **Description and Applications**

This MOSFET has been designed to minimize the on-state resistance and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- Motor control
- DC-DC Converters
- Power management functions
- Uninterrupted power supply

#### **Features and Benefits**

- Fast switching speed
- Low gate drive
- Low input capacitance
- Qualified to AEC-Q101 Standards for High Reliability

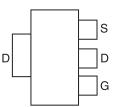
#### **Mechanical Data**

- Case: SOT223
- Case Material: Molded Plastic, UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish Matte Tin annealed over Copper lead frame. Solderable per MIL-STD-202, Method 208
- Weight: 0.112 grams (approximate)

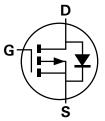
SOT223



Top View



Pin Out - Top View

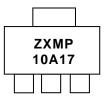


Equivalent Circuit

#### **Ordering Information**

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel	
ZXMP10A17GTA	See below	7	12	1,000	

#### **Marking Information**



ZXMP = Product Type Marking Code, Line 1 10A17 = Product Type Marking Code, Line 2



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

Characteristic			Symbol	Value	Unit	
Drain-Source voltage			V <sub>DSS</sub>	-100	V	
Gate-Source voltage			V <sub>GS</sub>	±20	V	
Continuous Drain current		(Note 2)	ID	-2.4		
	$V_{GS} = 10V$	T <sub>A</sub> = 70°C (Note 2)		-1.9	А	
		(Note 1)		-1.7		
Pulsed Drain current V <sub>GS</sub> = 10V (N		(Note 3)	I <sub>DM</sub>	-9.4	А	
Continuous Source current (Body diode) (Note 2)		(Note 2)	ls	-4.5	А	
Pulsed Source current (Body diode) (Note3)		I <sub>SM</sub>	-9.4	А		

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

Characteristic	Symbol	Value	Unit	
Power dissipation	(Note 1)		2.0 16	W
Linear derating factor	(Note 2)	– P <sub>D</sub>	3.9 31	mW/°C
Thermal Resistance, Junction to Ambient	(Note 1)		62.5	
mermar Resistance, Junction to Ambient	(Note 2)	$R_{ heta JA}$	32.0	°C/W
Thermal Resistance, Junction to Lead	(Note 4)	$R_{ ext{ heta}JL}$	9.8	
Operating and storage temperature range		TJ, TSTG	-55 to 150	۵°

Notes: 1. For a device surface mounted on 25mm x 25mm x 1.6mm 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.

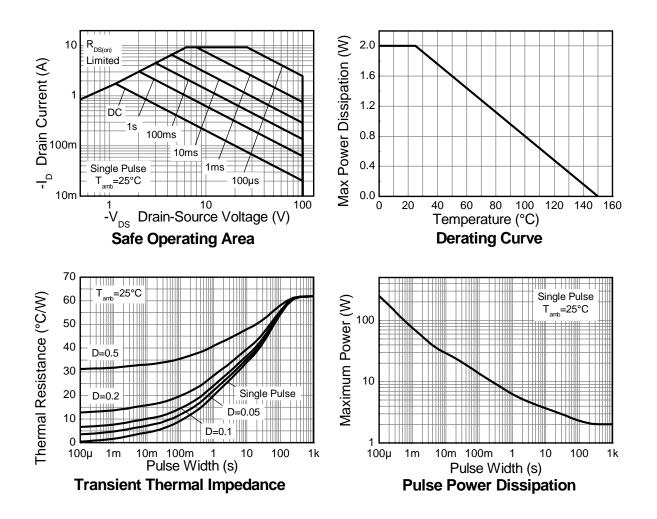
2. Same as note (1), except the device is measured at t  $\leq$  10 sec.

3. Same as note (1), except the device is pulsed with D= 0.02 and pulse width 300 µs. The pulse current is limited by the maximum junction temperature.

4. Thermal resistance from junction to solder-point (at the end of the drain lead).



## **Thermal Characteristics**





## Electrical Characteristics @T<sub>A</sub> = 25°C unless otherwise specified

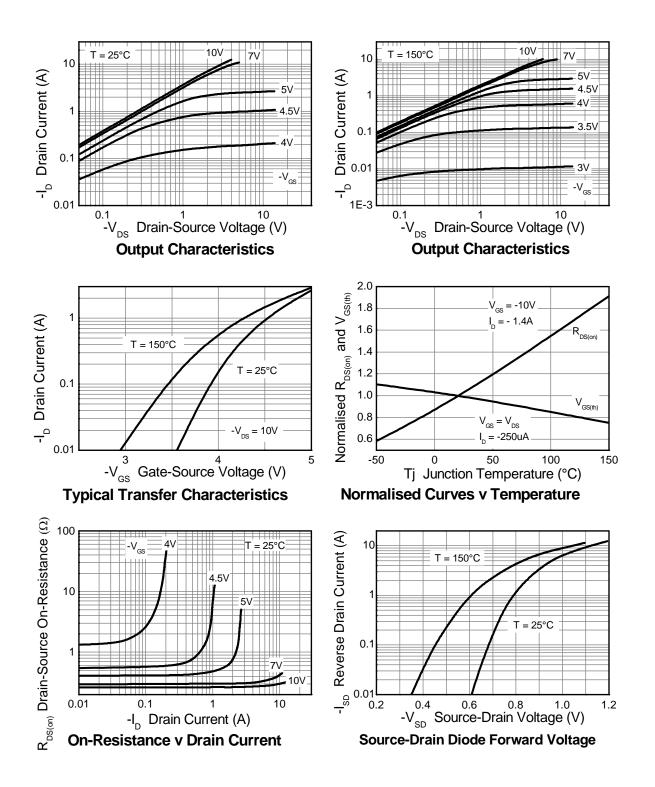
Characteristic	Symbol	Min	Тур	Max	Unit	Test	Condition	
OFF CHARACTERISTICS						•		
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-100		_	V	$I_D = -250 \mu A, V_{GS} = 0 V$		
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	_	_	-0.5	μΑ	V <sub>DS</sub> = -100V, V	′ <sub>GS</sub> = 0V	
Gate-Source Leakage	I <sub>GSS</sub>	_		±100	nA	$V_{GS} = \pm 20V, V$	<sub>DS</sub> = 0V	
ON CHARACTERISTICS	· ·							
Gate Threshold Voltage	V <sub>GS(th)</sub>	-2.0		-4.0	V	$I_D = -250 \mu A, V_I$	ds = Vgs	
Static Drain-Source On-Resistance (Note 5)	р			0.350	Ω	$V_{GS}$ = -10V, $I_D$	= -1.4A	
Static Drain-Source On-Resistance (Note 5)	R <sub>DS (ON)</sub>	_	_	0.450	12	$V_{GS}$ = -6V, $I_D$ =	-1.2A	
Forward Transconductance (Notes 5 & 6)	<b>g</b> fs	_	2.8	_	S	V <sub>DS</sub> = -15V, I <sub>D</sub> = -1.4A		
Diode Forward Voltage (Note 5)	V <sub>SD</sub>	_	-0.85	-0.95	V	$I_{S} = -1.7A, V_{GS} = 0V$		
Reverse recovery time (Note 6)	t <sub>rr</sub>		33		ns	I <sub>S</sub> = -1.5A, di/dt = 100A/μs		
Reverse recovery charge (Note 6)	Q <sub>rr</sub>	_	48		nC			
DYNAMIC CHARACTERISTICS (Note 6)								
Input Capacitance	C <sub>iss</sub>	_	424	—	pF			
Output Capacitance	C <sub>oss</sub>	_	36.6	_	pF	V <sub>DS</sub> = -50V, V <sub>GS</sub> = 0V f = 1MHz		
Reverse Transfer Capacitance	C <sub>rss</sub>	_	29.8	_	pF			
Total Gate Charge (Note 7)	Qg	_	7.1	_	nC	$V_{GS} = -6.0V$		
Total Gate Charge (Note 7)	Qg	_	10.7	_	nC		V <sub>DS</sub> = -50V	
Gate-Source Charge (Note 7)	Q <sub>gs</sub>	_	1.7	_	nC	V <sub>GS</sub> = -10V	$I_{D} = -1.4A$	
Gate-Drain Charge (Note 7)	Q <sub>gd</sub>	_	3.8		nC	7		
Turn-On Delay Time (Note 7)	t <sub>D(on)</sub>	_	3.0		ns			
Turn-On Rise Time (Note 7)	tr	_	3.5	_	ns	V <sub>DD</sub> = -50V, V <sub>GS</sub> = -10V		
Turn-Off Delay Time (Note 7)	t <sub>D(off)</sub>	_	13.4	_	ns	$I_D = -1A, R_G \cong 6.0\Omega$		
Turn-Off Fall Time (Note 7)	t <sub>f</sub>	_	7.2	_	ns	7		

Notes:

Measured under pulsed conditions. Pulse width ≤ 300µs; duty cycle ≤ 2%
For design aid only, not subject to production testing.
Switching characteristics are independent of operating junction temperatures.

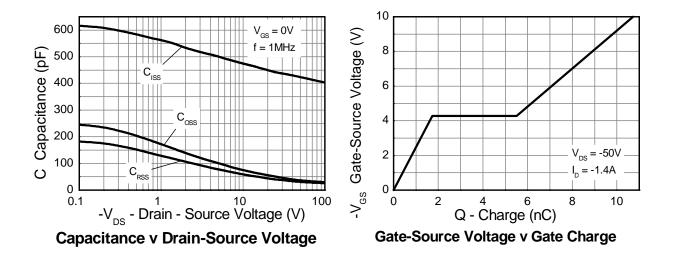


# **Typical Characteristics**

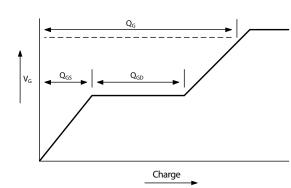




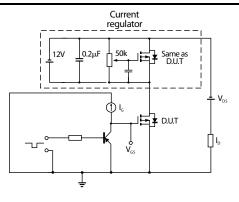
# **Typical Characteristics - continued**



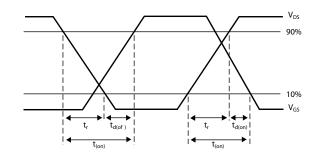
## **Test Circuits**



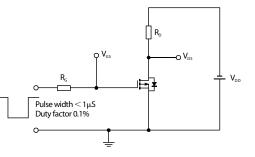
Basic gate charge waveform



Gate charge test circuit



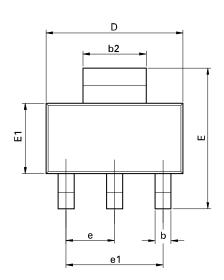
Switching time waveforms

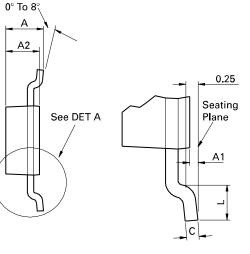


#### Switching time test circuit



# **Package Outline Dimensions**



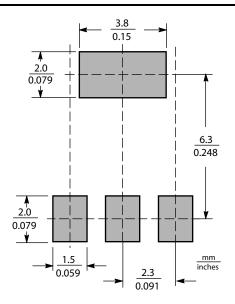


Enlarged View of DET A

Conforms to JEDEC TO-261 AA Issue B

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
Α	-	1.80	-	0.071	D	6.30	6.70	0.248	0.264
A1	0.02	0.10	0.0008	0.004	е	2.30 BSC		0.0905 BSC	
A2	1.55	1.65	0.0610	0.0649	e1	4.60 BSC		0.181 BSC	
b	0.66	0.84	0.026	0.033	E	6.70	7.30	0.264	0.287
b2	2.90	3.10	0.114	0.122	E1	3.30	3.70	0.130	0.146
c	0.23	0.33	0.009	0.013	L	0.90	-	0.355	-

# Suggested Pad Layout





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