

# 100V P-CHANNEL ENHANCEMENT MODE MOSFET

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$	$I_D$ $T_A = 25^\circ C$
-100V	350m $\Omega$ @ $V_{GS} = -10V$	-2.4
	450m $\Omega$ @ $V_{GS} = -6.0V$	-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**

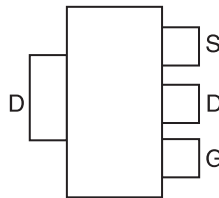
## Mechanical Data

- 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)

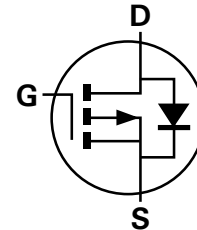
SOT223



Top View



Pin Out - Top View



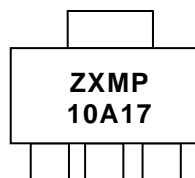
Equivalent Circuit

## Ordering Information

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

## Marking Information

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

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

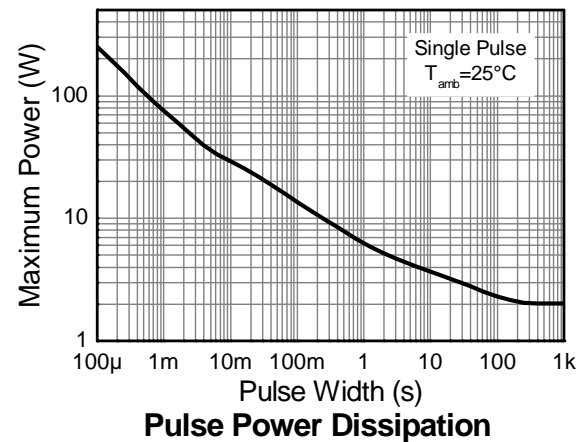
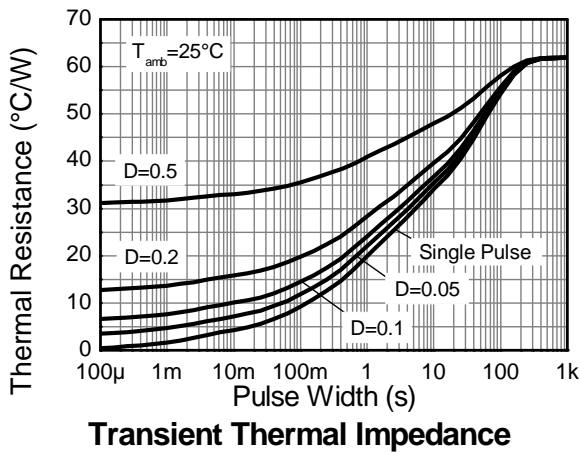
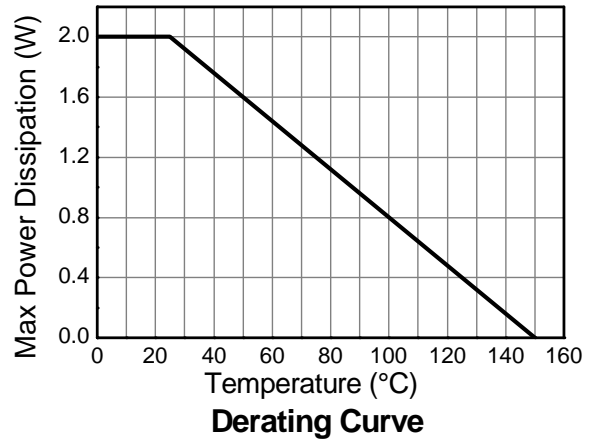
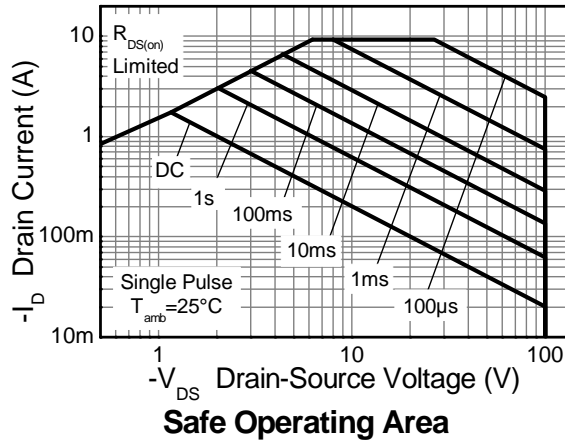
Characteristic			Symbol	Value	Unit
Drain-Source voltage			V <sub>DSS</sub>	-100	V
Gate-Source voltage			V <sub>GS</sub>	±20	V
Continuous Drain current	V <sub>GS</sub> = 10V	(Note 2)	I <sub>D</sub>	-2.4	A
		T <sub>A</sub> = 70°C (Note 2)		-1.9	
		(Note 1)		-1.7	
Pulsed Drain current	V <sub>GS</sub> =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

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

Characteristic		Symbol	Value	Unit
Power dissipation	(Note 1)	P <sub>D</sub>	2.0	W
			16	
Linear derating factor	(Note 2)		3.9	
			31	
Thermal Resistance, Junction to Ambient	(Note 1)	R <sub>θJA</sub>	62.5	°C/W
	(Note 2)		32.0	
Thermal Resistance, Junction to Lead	(Note 4)	R <sub>θJL</sub>	9.8	
Operating and storage temperature range		T <sub>J</sub> , T <sub>STG</sub>	-55 to 150	°C

- 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 ≤ 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

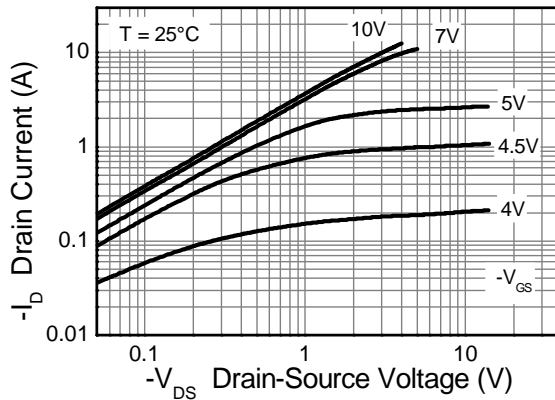


**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

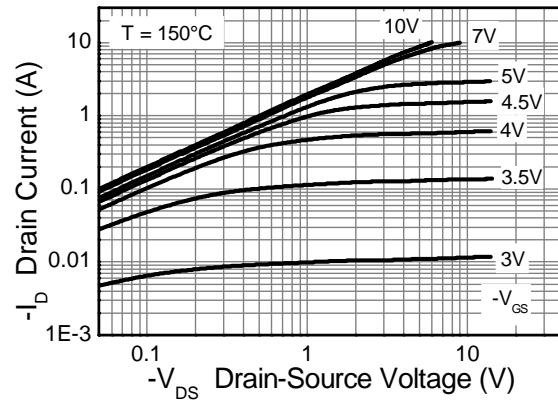
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition	
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-100	—	—	V	I <sub>D</sub> = -250μA, V <sub>GS</sub> = 0V	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	-0.5	μA	V <sub>DS</sub> = -100V, V <sub>GS</sub> = 0V	
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V	
ON CHARACTERISTICS							
Gate Threshold Voltage	V <sub>GS(th)</sub>	-2.0	—	-4.0	V	I <sub>D</sub> = -250μA, V <sub>DS</sub> = V <sub>GS</sub>	
Static Drain-Source On-Resistance (Note 5)	R <sub>DS (ON)</sub>	—	—	0.350	Ω	V <sub>GS</sub> = -10V, I <sub>D</sub> = -1.4A	
				0.450		V <sub>GS</sub> = -6V, I <sub>D</sub> = -1.2A	
Forward Transconductance (Notes 5 & 6)	g <sub>fs</sub>	—	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 <sub>S</sub> = -1.7A, V <sub>GS</sub> = 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	V <sub>DS</sub> = -50V, V <sub>GS</sub> = 0V f = 1MHz	
Output Capacitance	C <sub>oss</sub>	—	36.6	—	pF		
Reverse Transfer Capacitance	C <sub>rss</sub>	—	29.8	—	pF		
Total Gate Charge (Note 7)	Q <sub>g</sub>	—	7.1	—	nC	V <sub>GS</sub> = -6.0V	V <sub>DS</sub> = -50V I <sub>D</sub> = -1.4A
Total Gate Charge (Note 7)	Q <sub>g</sub>	—	10.7	—	nC	V <sub>GS</sub> = -10V	
Gate-Source Charge (Note 7)	Q <sub>gs</sub>	—	1.7	—	nC		
Gate-Drain Charge (Note 7)	Q <sub>gd</sub>	—	3.8	—	nC		
Turn-On Delay Time (Note 7)	t <sub>D(on)</sub>	—	3.0	—	ns		
Turn-On Rise Time (Note 7)	t <sub>r</sub>	—	3.5	—	ns		
Turn-Off Delay Time (Note 7)	t <sub>D(off)</sub>	—	13.4	—	ns		
Turn-Off Fall Time (Note 7)	t <sub>f</sub>	—	7.2	—	ns		

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

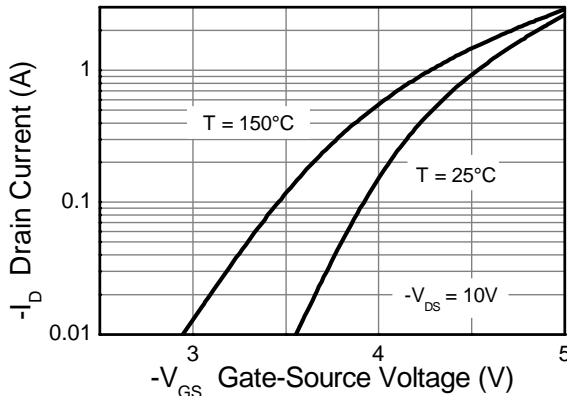
## Typical Characteristics



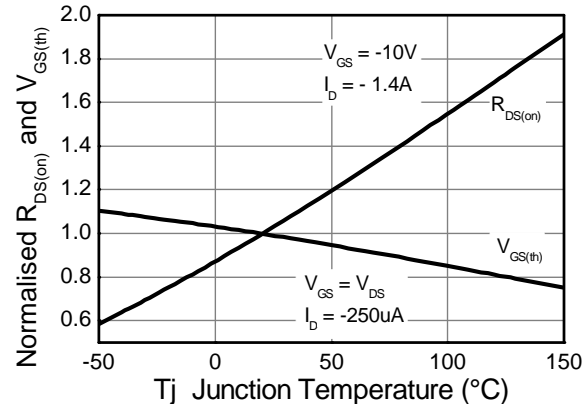
Output Characteristics



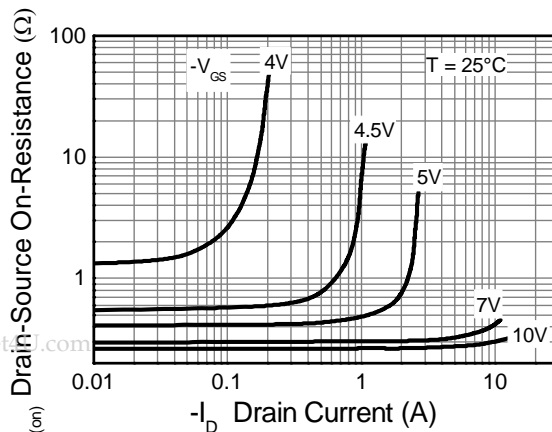
Output Characteristics



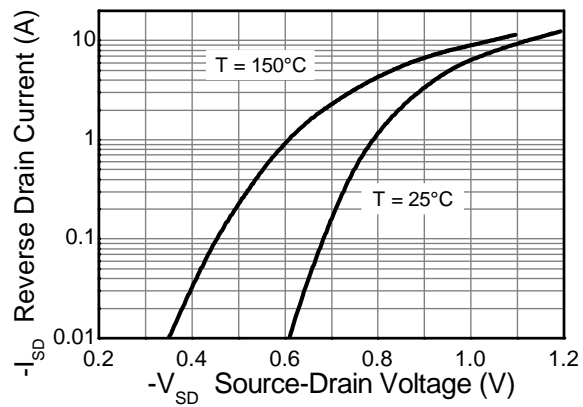
Typical Transfer Characteristics



Normalised Curves v Temperature

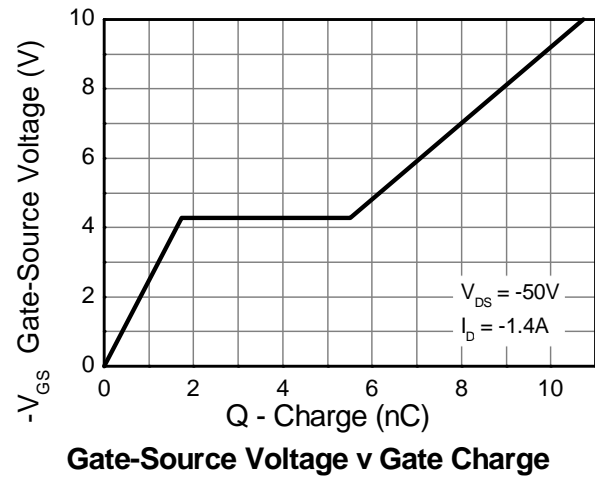
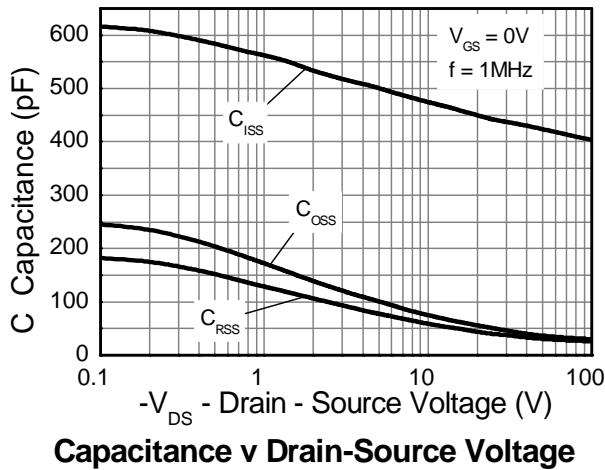


On-Resistance v Drain Current

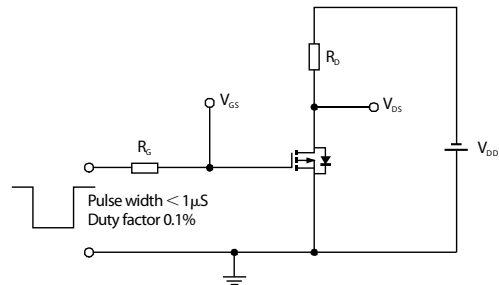
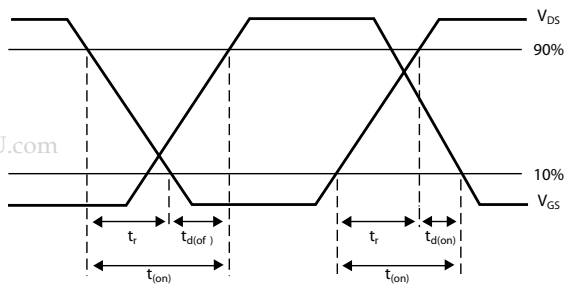
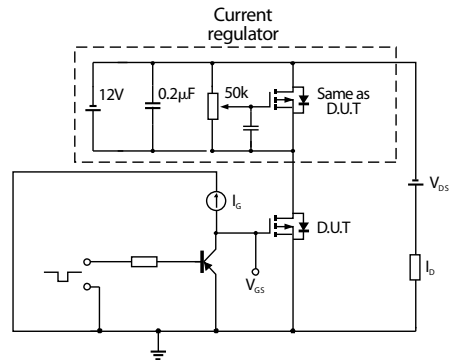
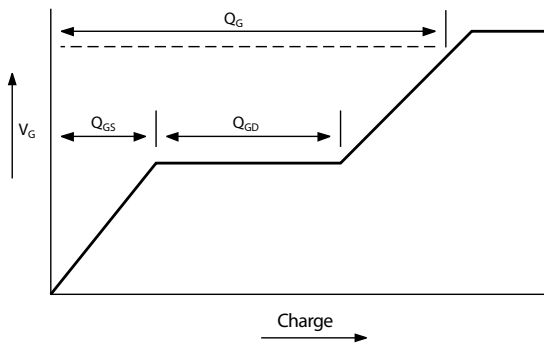


Source-Drain Diode Forward Voltage

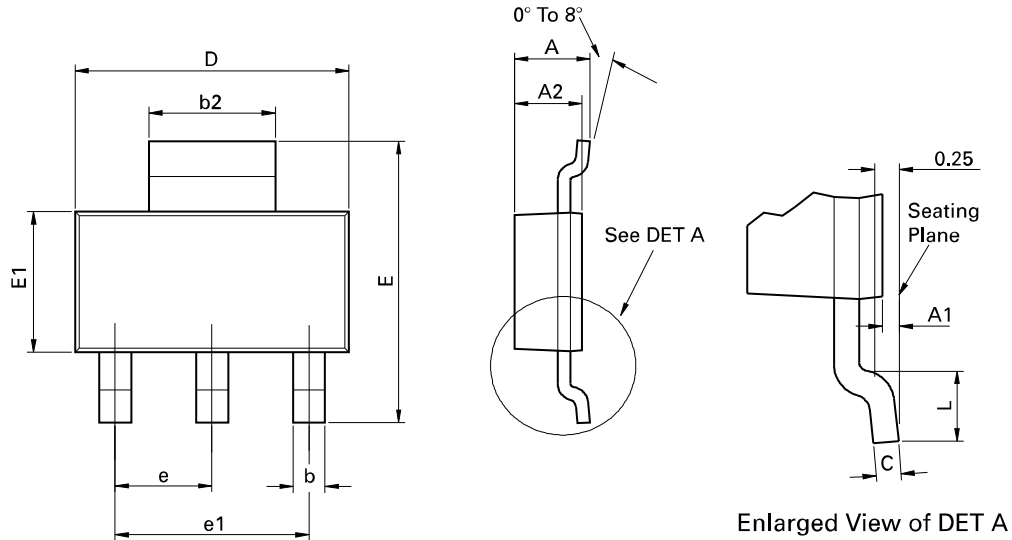
## Typical Characteristics - continued



## Test Circuits



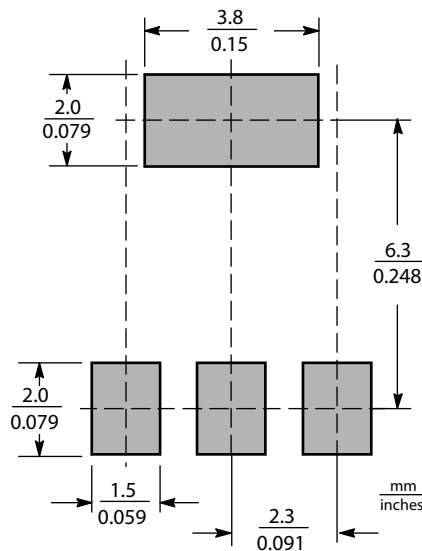
## Package Outline Dimensions



Conforms to JEDEC TO-261 AA Issue B

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	-	1.80	-	0.071	D	6.30	6.70	0.248	0.264
A1	0.02	0.10	0.0008	0.004	e	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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