Lead-free

ZXMP10A17G

100V P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$	I_D T_A = 25°C
-100V	350mΩ @ V_{GS}= -10V	-2.4
	450mΩ @ V_{GS}= -6.0V	-2.1

Features and Benefits

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

Description and Applications

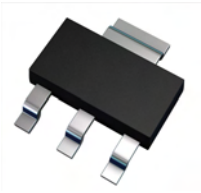
This MOSFET has been designed to minimize the on-state resistance and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

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

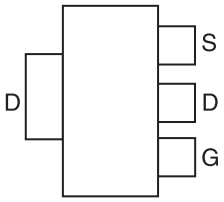
Mechanical Data

- 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)

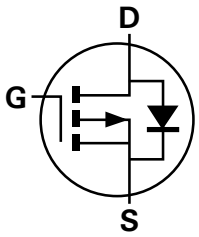
SOT223



Top View



Pin Out - Top View

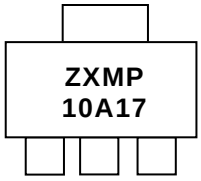


Equivalent Circuit

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°C unless otherwise specified

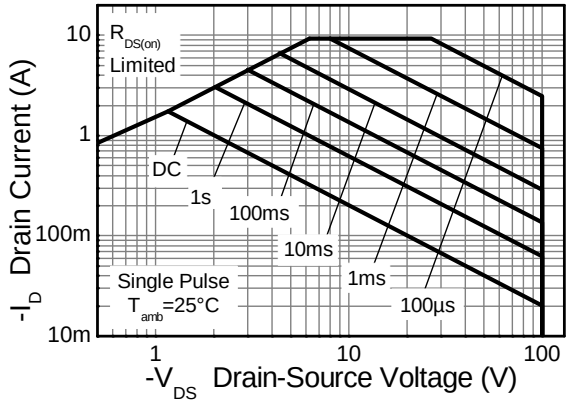
Characteristic			Symbol	Value	Unit
Drain-Source voltage			V_{DSS}	-100	V
Gate-Source voltage			V_{GS}	±20	V
Continuous Drain current	V_{GS} = 10V	(Note 2)	I_D	-2.4	A
		T_A = 70°C (Note 2)		-1.9	
		(Note 1)		-1.7	
Pulsed Drain current	V_{GS}= 10V	(Note 3)	I_{DM}	-9.4	A
Continuous Source current (Body diode)		(Note 2)	I_S	-4.5	A
Pulsed Source current (Body diode)		(Note3)	I_{SM}	-9.4	A

Thermal Characteristics @T_A = 25°C unless otherwise specified

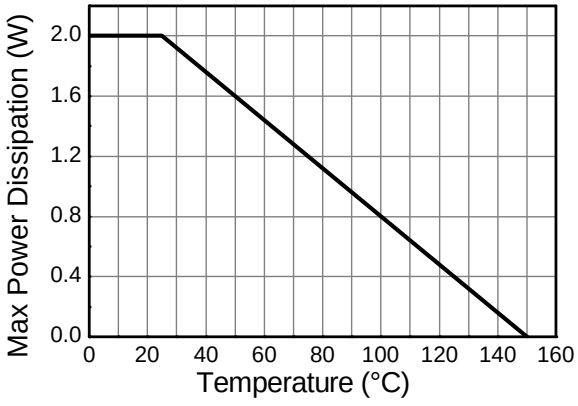
Characteristic		Symbol	Value	Unit
Power dissipation Linear derating factor	(Note 1)	P_D	2.0 16	W mW/°C
	(Note 2)		3.9 31	
Thermal Resistance, Junction to Ambient	(Note 1)	$R_{\theta JA}$	62.5	°C/W
	(Note 2)		32.0	
Thermal Resistance, Junction to Lead	(Note 4)	$R_{\theta JL}$	9.8	
Operating and storage temperature range		T_J, T_{STG}	-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).

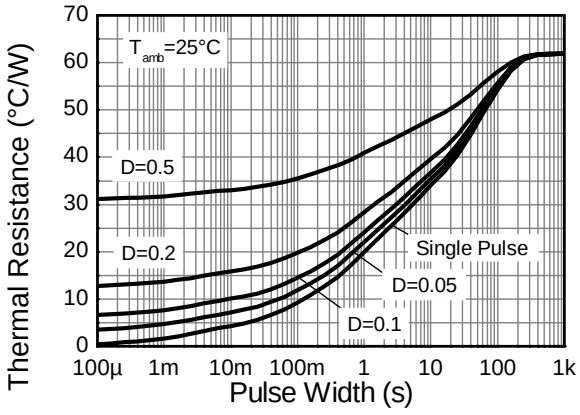
Thermal Characteristics



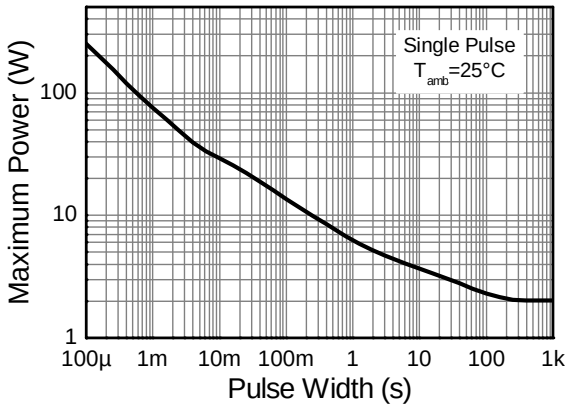
Safe Operating Area



Derating Curve



Transient Thermal Impedance



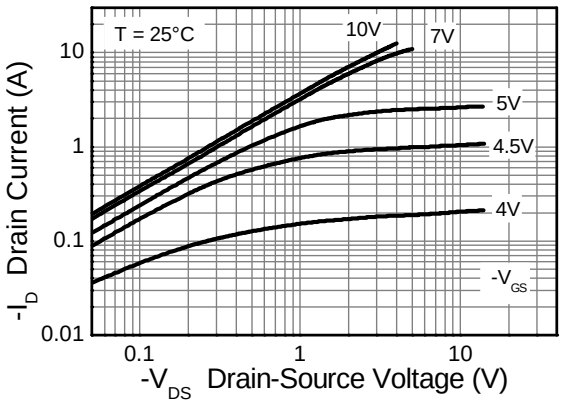
Pulse Power Dissipation

Electrical Characteristics @T_A = 25°C unless otherwise specified

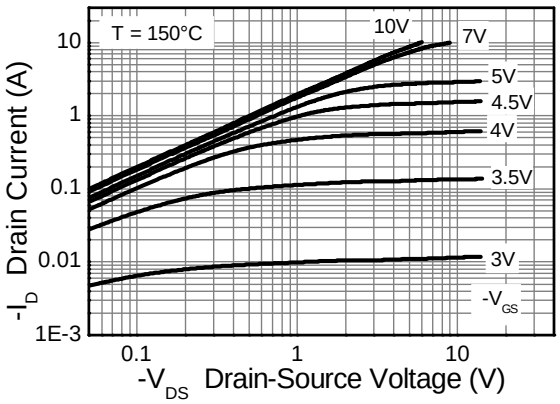
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	-100	—	—	V	I_D = -250μA, V_{GS} = 0V
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-0.5	μA	V_{DS} = -100V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(th)}$	-2.0	—	-4.0	V	I_D = -250μA, V_{DS} = V_{GS}
Static Drain-Source On-Resistance (Note 5)	$R_{DS\ (ON)}$	—	—	0.350	Ω	V_{GS} = -10V, I_D = -1.4A
				0.450		V_{GS} = -6V, I_D = -1.2A
Forward Transconductance (Notes 5 & 6)	g_{fs}	—	2.8	—	S	V_{DS} = -15V, I_D = -1.4A
Diode Forward Voltage (Note 5)	V_{SD}	—	-0.85	-0.95	V	I_S = -1.7A, V_{GS} = 0V
Reverse recovery time (Note 6)	t_{rr}		33	—	ns	I_S = -1.5A, di/dt = 100A/μs
Reverse recovery charge (Note 6)	Q_{rr}	—	48	—	nC	
DYNAMIC CHARACTERISTICS (Note 6)						
Input Capacitance	C_{iss}	—	424	—	pF	V_{DS} = -50V, V_{GS} = 0V f = 1MHz
Output Capacitance	C_{oss}	—	36.6	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	29.8	—	pF	
Total Gate Charge (Note 7)	Q_g	—	7.1	—	nC	V_{GS} = -6.0V; V_{DS} = -50V, I_D = -1.4A
Total Gate Charge (Note 7)	Q_g	—	10.7	—	nC	V_{GS} = -10V; V_{DS} = -50V, I_D = -1.4A
Gate-Source Charge (Note 7)	Q_{gs}	—	1.7	—	nC	V_{GS} = -10V; V_{DS} = -50V, I_D = -1.4A
Gate-Drain Charge (Note 7)	Q_{gd}	—	3.8	—	nC	V_{GS} = -10V; V_{DS} = -50V, I_D = -1.4A
Turn-On Delay Time (Note 7)	$t_{D(on)}$	—	3.0	—	ns	V_{DD} = -50V, V_{GS} = -10V I_D = -1A, $R_G \cong 6.0\Omega$
Turn-On Rise Time (Note 7)	t_r	—	3.5	—	ns	
Turn-Off Delay Time (Note 7)	$t_{D(off)}$	—	13.4	—	ns	
Turn-Off Fall Time (Note 7)	t_f	—	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.

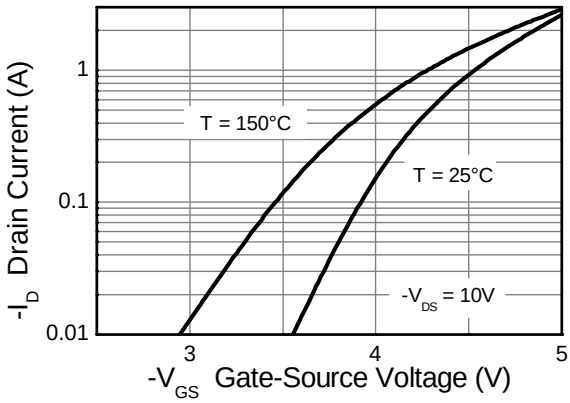
Typical Characteristics



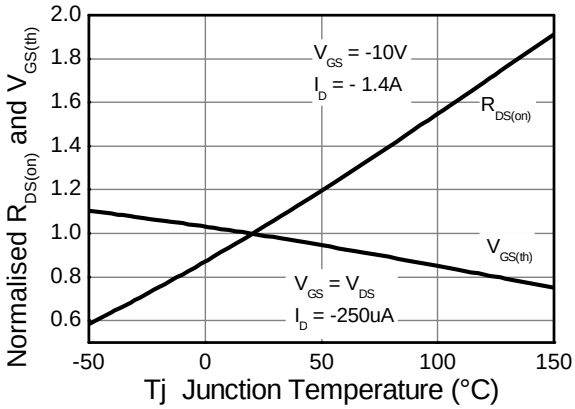
Output Characteristics



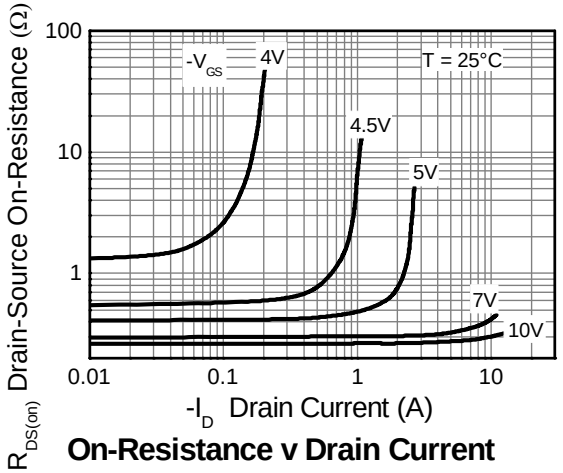
Output Characteristics



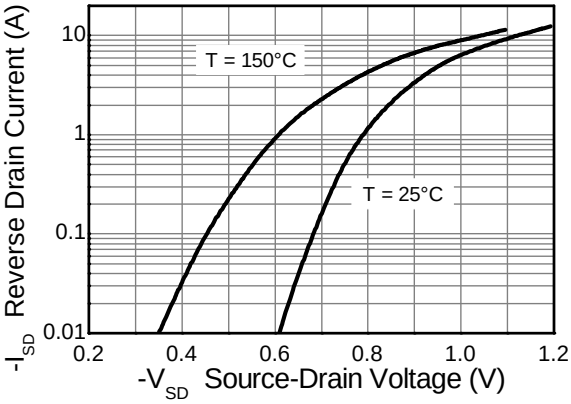
Typical Transfer Characteristics



Normalised Curves v Temperature

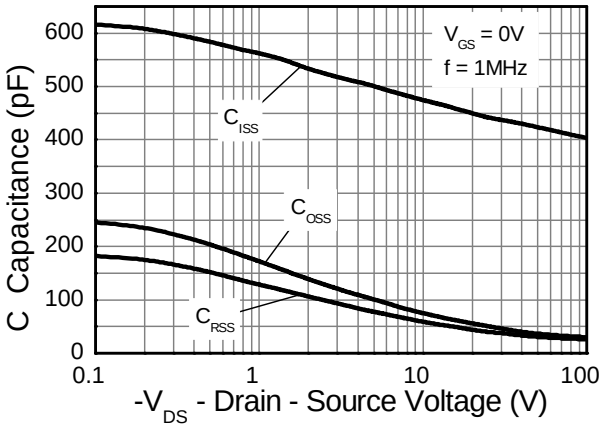


On-Resistance v Drain Current

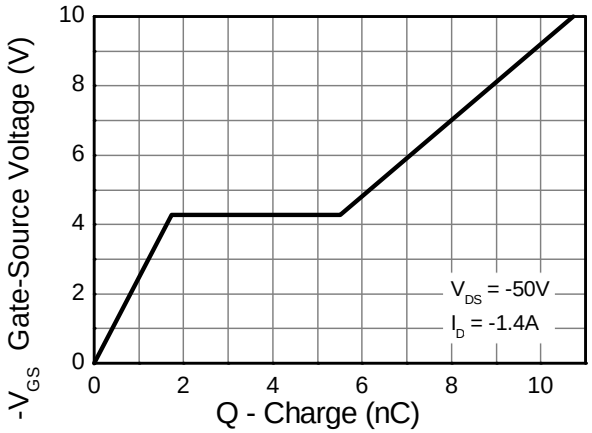


Source-Drain Diode Forward Voltage

Typical Characteristics - continued

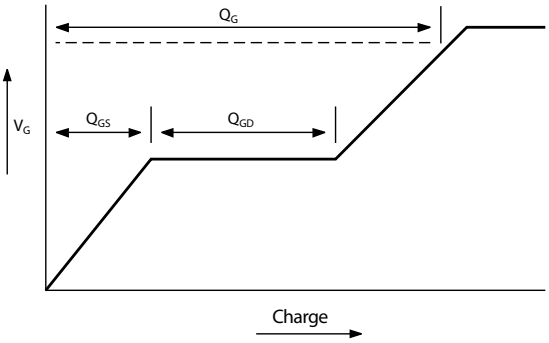


Capacitance v Drain-Source Voltage

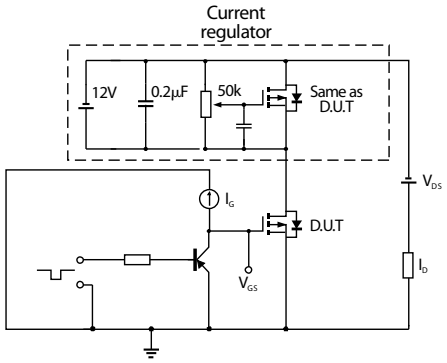


Gate-Source Voltage v Gate Charge

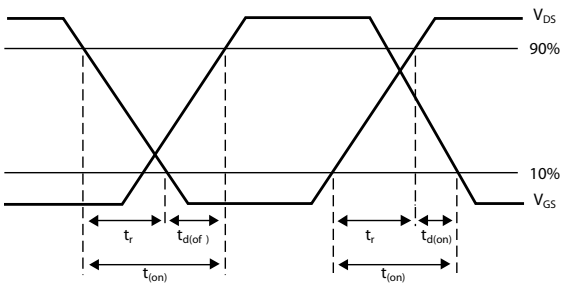
Test Circuits



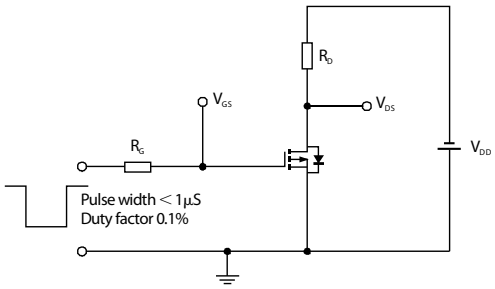
Basic gate charge waveform



Gate charge test circuit

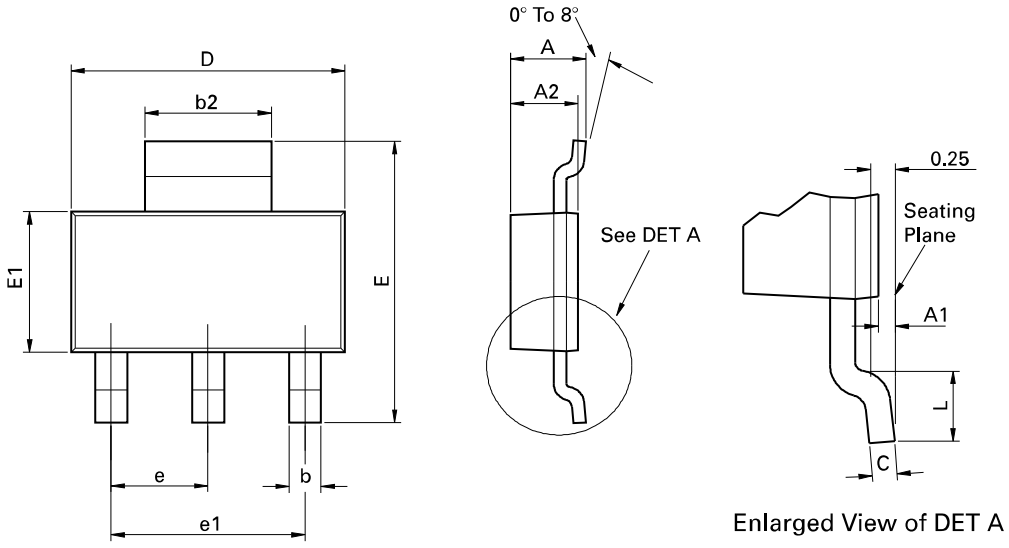


Switching time waveforms



Switching time test circuit

Package Outline Dimensions

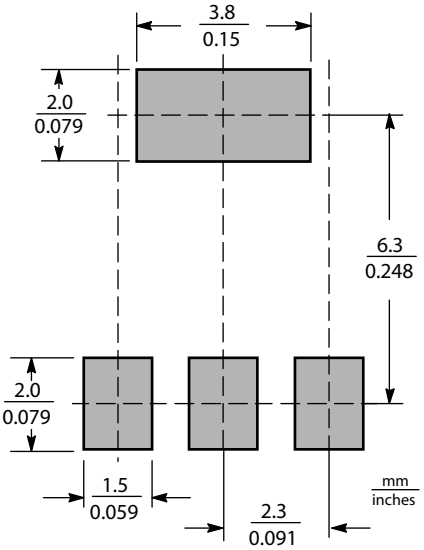


Enlarged View of DET A

Conforms to JEDEC TO-261 AA Issue B

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
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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