

ZXMP10A18G

100V P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV_{DSS}	$R_{DS(on) \max}$	$I_D \max$ $T_A = +25^\circ C$
-100V	150m Ω @ $V_{GS} = -10V$	-3.7A
	190m Ω @ $V_{GS} = -6V$	-3.3A

Features and Benefits

- Low On-Resistance
- Fast Switching Speed
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

Description and Applications

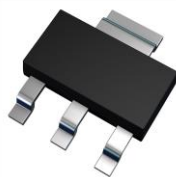
This MOSFET is designed to minimize the on-state resistance and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- Motor Control
- DC-DC Converters
- Power Management Functions
- Relay and Solenoid Driving

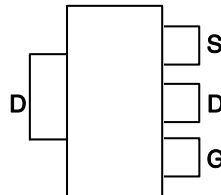
Mechanical Data

- Case: SOT223
- Case Material: Molded Plastic, UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.112 grams (Approximate)

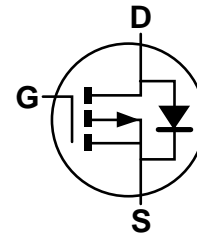
SOT223



Top View



Pin Out - Top View



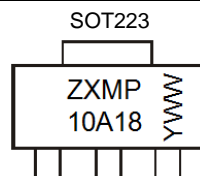
Equivalent Circuit

Ordering Information (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXMP10A18GTA	ZXMP10A18	7	12	1,000

- Note:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
 2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>

Marking Information



ZXMP10A18 =Product Type Marking Code
 YWW = Date Code Marking
 Y or \bar{Y} = Last Digit of Year (ex: 5 = 2015)
 WW or $\bar{W}W$ = Week Code (01 - 53)

Maximum Ratings (@T_A = +25°C unless otherwise specified.)

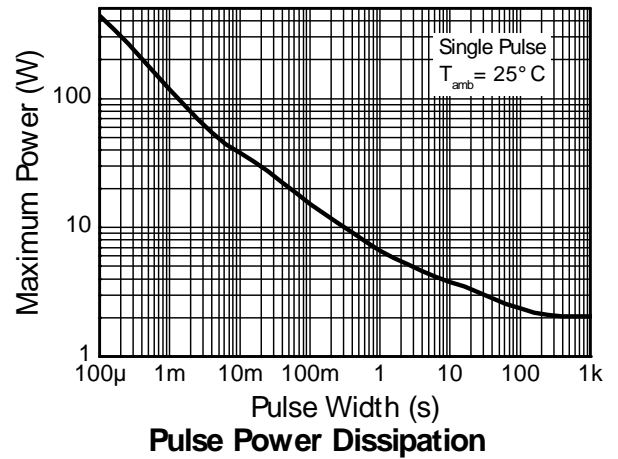
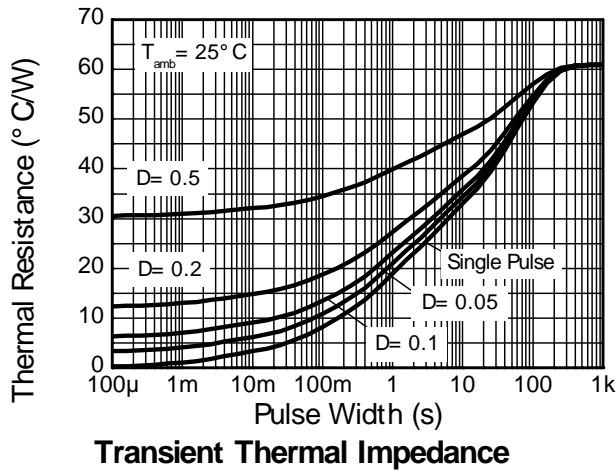
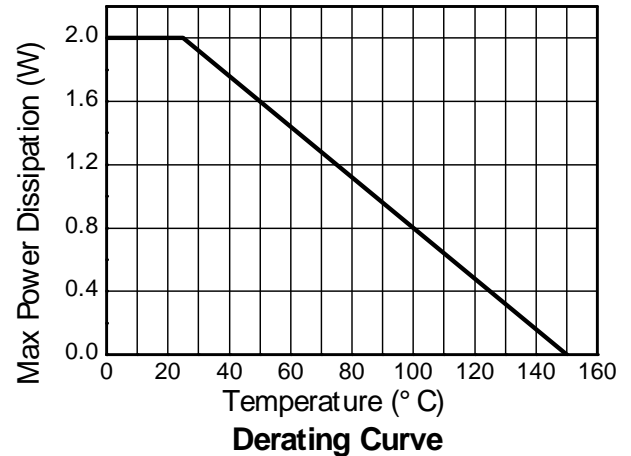
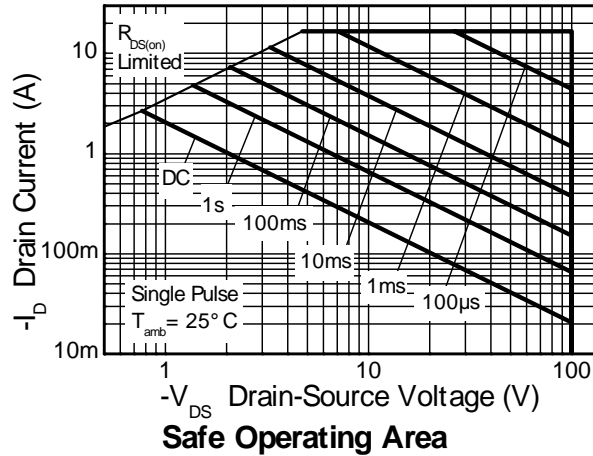
Characteristic			Symbol	Value	Unit	
Drain-Source Voltage			V _{DSS}	-100	V	
Gate-Source Voltage			V _{GSS}	±20	V	
Continuous Drain Current	V _{GS} = 10V	(Note 6)	I _D	-3.7	A	
		T _A = +70°C (Note 6)		-3.0		
		(Note 5)		-2.6		
Pulsed Drain Current	V _{GS} = 10V	(Note 7)	I _{DM}	-16.5	A	
Continuous Source Current (Body diode)			(Note 6)	I _S	-5.3	A
Pulsed Source Current (Body diode)			(Note 7)	I _{SM}	-16.5	A

Thermal Characteristics (@T_A = +25°C unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 5)	P _D	2.0	W mW/°C
	(Note 6)		16	
Thermal Resistance, Junction to Ambient	(Note 5)	R _{θJA}	3.9	°C/W
	(Note 6)		31	
Thermal Resistance, Junction to Lead	(Note 8)	R _{θJL}	62.5	°C/W
Operating and Storage Temperature Range		T _J , T _{STG}	32.2	
			7.65	°C
			-55 to 150	

- Notes:
5. 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.
 6. Same as Note 5, except the device is measured at t ≤ 10 seconds.
 7. Same as Note 5, except the device is pulsed with D = 0.02 and pulse width 300μs. The pulse current is limited by the maximum junction temperature.
 8. Thermal resistance from junction to solder-point (at the end of the drain lead).

Thermal Characteristics

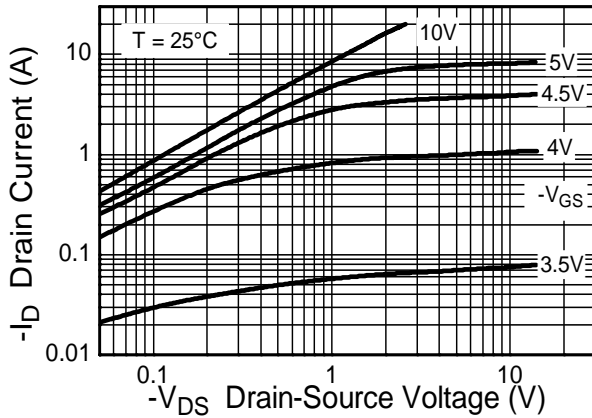


Electrical Characteristics (@T_A = +25°C unless otherwise specified.)

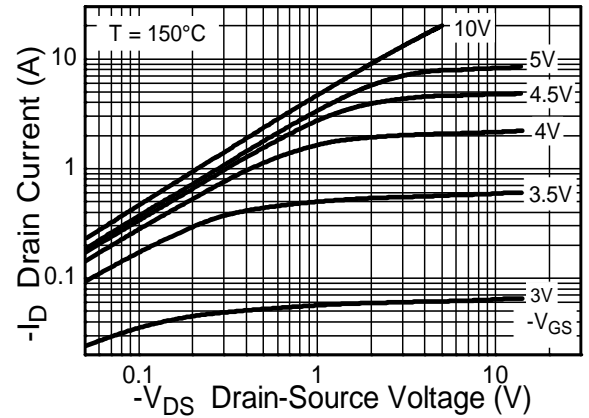
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	-100	—	—	V	I _D = -250μA, V _{GS} = 0V
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1	μA	V _{DS} = -100V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 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 9)	R _{DS(on)}	—	—	150	mΩ	V _{GS} = -10V, I _D = -2.8A
				190		V _{GS} = -6V, I _D = -2.4A
Forward Transconductance (Notes 9 & 10)	g _{fs}	—	6.0	—	S	V _{DS} = -15V, I _D = -2.8A
Diode Forward Voltage (Note 9)	V _{SD}	—	-0.85	-0.95	V	I _S = -3.5A, V _{GS} = 0V, T _J = +25°C
Reverse Recovery Time (Note 10)	t _{rr}	—	49	—	ns	I _S = -2.8A, di/dt = 100A/μs,
Reverse Recovery Charge (Note 10)	Q _{rr}	—	107	—	nC	T _J = +25°C
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C _{iSS}	—	1055	—	pF	V _{DD} = -50V, V _{GS} = 0V f = 1MHz
Output Capacitance	C _{oss}	—	90	—	pF	
Reverse Transfer Capacitance	C _{rSS}	—	76	—	pF	
Total Gate Charge (Note 11)	Q _g	—	26.9	—	nC	V _{GS} = -10V, V _{DS} = -50V I _D = -2.8A
Gate-Source Charge (Note 11)	Q _{gs}	—	3.9	—	nC	
Gate-Drain Charge (Note 11)	Q _{gd}	—	10.2	—	nC	
Turn-On Delay Time (Note 11)	t _{D(on)}	—	4.6	—	ns	V _{DD} = -50V, V _{GS} = -10V I _D = -1A, R _G ≅ 6.0Ω
Turn-On Rise Time (Note 11)	t _r	—	6.8	—	ns	
Turn-Off Delay Time (Note 11)	t _{D(off)}	—	33.9	—	ns	
Turn-Off Fall Time (Note 11)	t _f	—	17.9	—	ns	

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

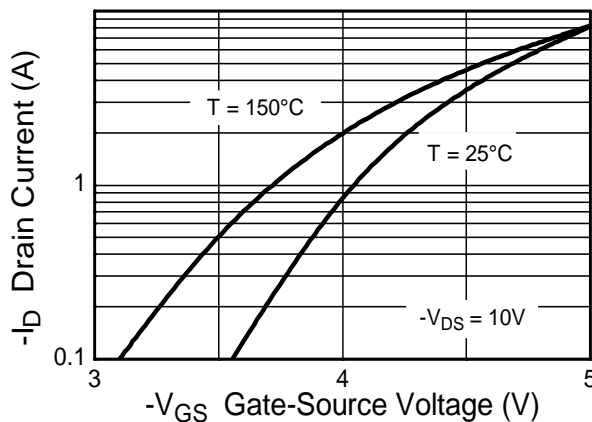
Typical Characteristics



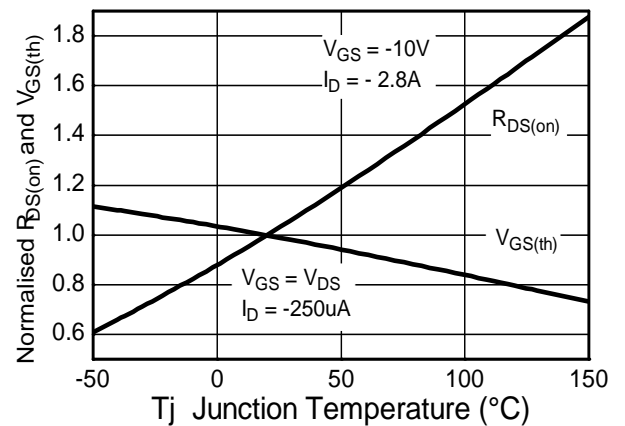
Output Characteristics



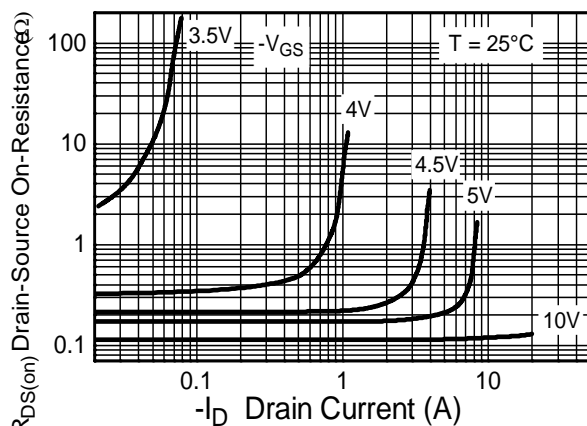
Output Characteristics



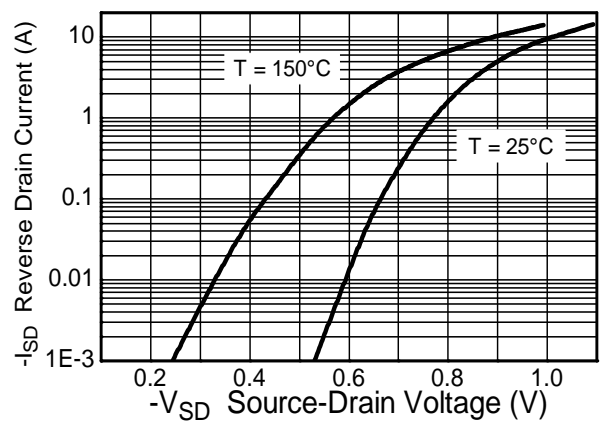
Typical Transfer Characteristics



Normalised Curves v Temperature

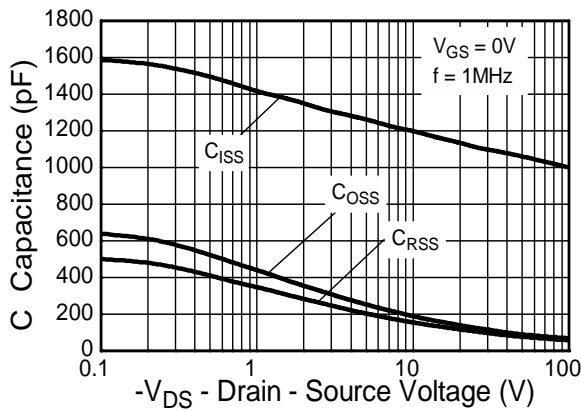


On-Resistance v Drain Current

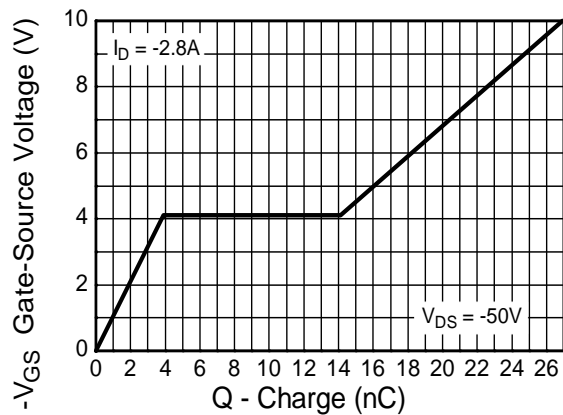


Source-Drain Diode Forward Voltage

Typical Characteristics (cont.)

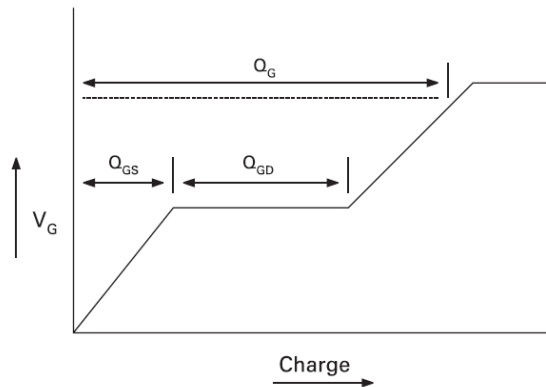


Capacitance v Drain-Source Voltage

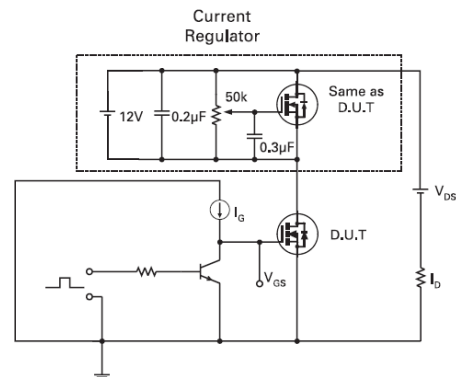


Gate-Source Voltage v Gate Charge

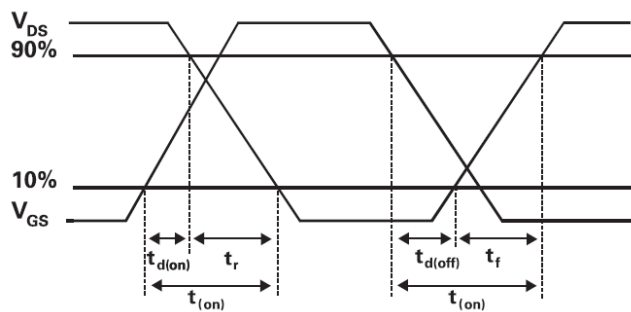
Test Circuits



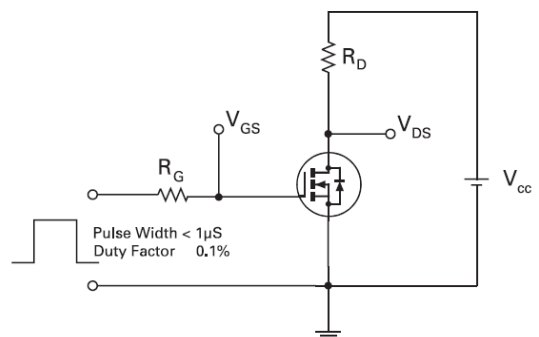
Basic Gate Charge Waveform



Gate Charge Test Circuit



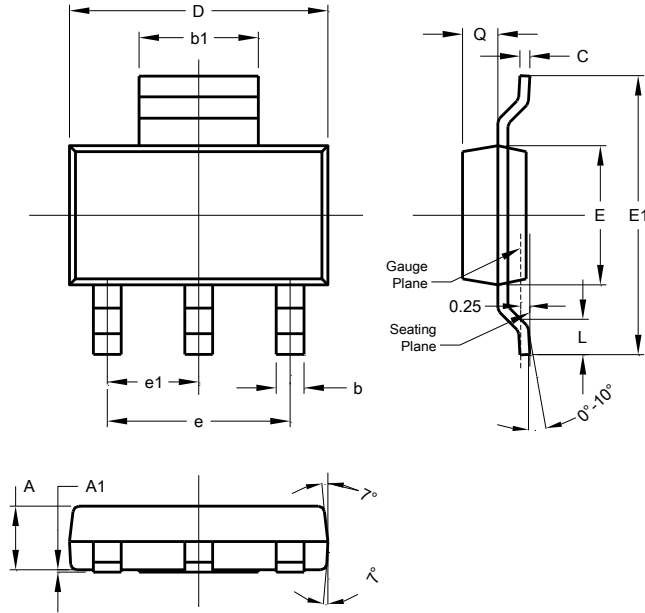
Switching Time Waveforms



Switching Time Test Circuit

Package Outline Dimensions

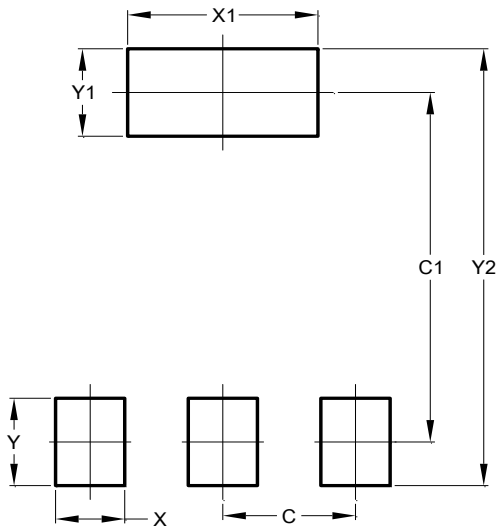
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	-	-	4.60
e1	-	-	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



Dimensions	Value (in mm)
C	2.30
C1	6.40
X	1.20
X1	3.30
Y	1.60
Y1	1.60
Y2	8.00

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