

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$	I_D $T_A = +25^\circ\text{C}$
-70V	160m Ω @ $V_{GS} = -10\text{V}$	-2.6A
	250m Ω @ $V_{GS} = -4.5\text{V}$	-1.6A

Description

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

Applications

- Motor Control
- Transformer Driving Switch
- DC-DC Converters
- Power Management Functions
- Uninterrupted Power Supply

Features and Benefits

- 100% Unclamped Inductive Switch (UIS) Test in Production
- 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**
- **PPAP Available (Note 4)**

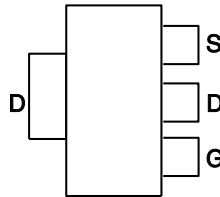
Mechanical Data

- Case: SOT223
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram Below
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208 ^(e3)
- Weight: 0.112 grams (Approximate)

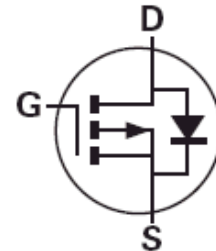
SOT223



Top View



Pin Out - Top



Equivalent Circuit

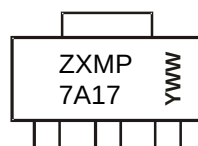
Ordering Information (Notes 4 & 5)

Part Number	Qualification	Case	Packaging
ZXMP7A17GQTA	Automotive	SOT223	1,000/Tape & Reel
ZXMP7A17GQTC	Automotive	SOT223	4,000/Tape & Reel

- Notes:
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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_grade_definitions/.
 5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information

SOT223



ZXMP7A17 = Product Type Marking Code
YWW = Date Code Marking
Y or Y = Last Digit of Year (ex: 5= 2015)
WW or WW = Week Code (01-53)

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V _{DSS}	-70	V
Gate-Source Voltage			V _{GS}	±20	V
Continuous Drain Current	V _{GS} = -10V	(Note 7)	I _D	-3.7	A
		T _A = +70°C (Note 7)		-2.9	
		(Note 6)		-2.6	
Pulsed Drain Current	V _{GS} = -10V	(Note 8)	I _{DM}	-9.6	A
Continuous Source Current (Body Diode)			I _S	-4.8	A
Pulsed Source Current (Body Diode)			I _{SM}	-9.6	A

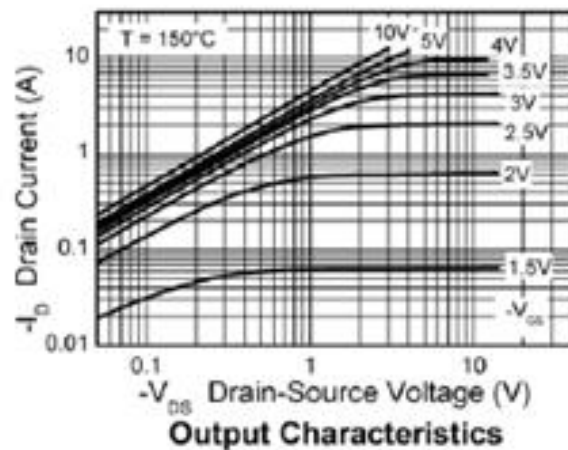
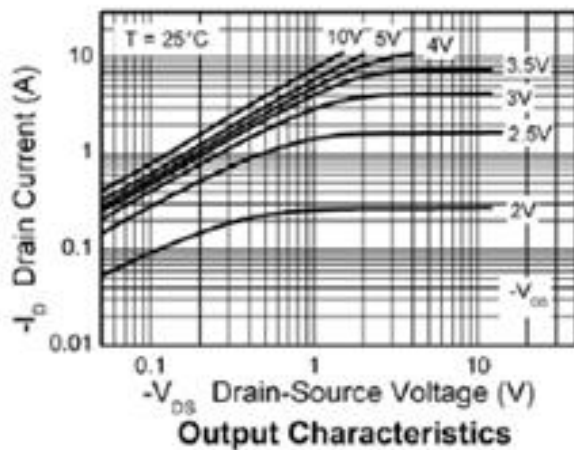
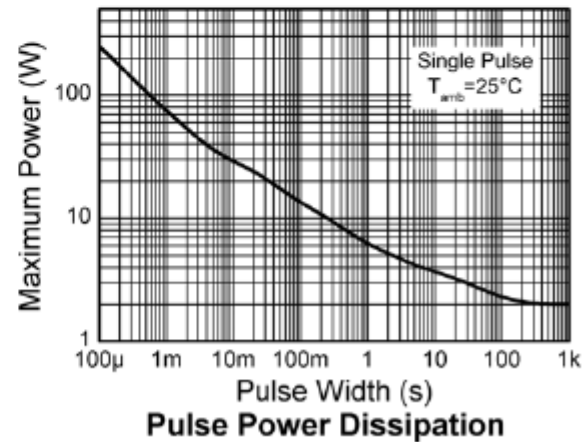
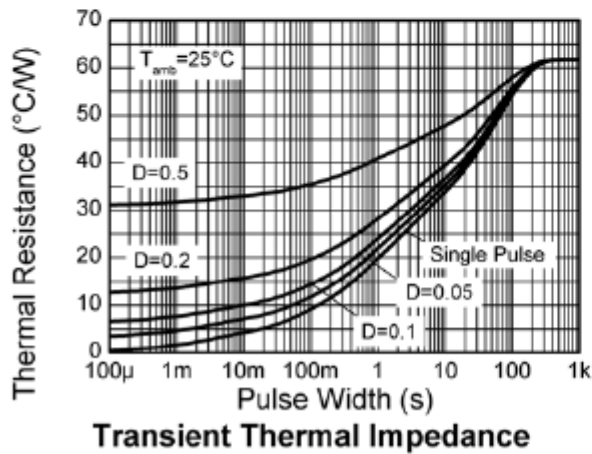
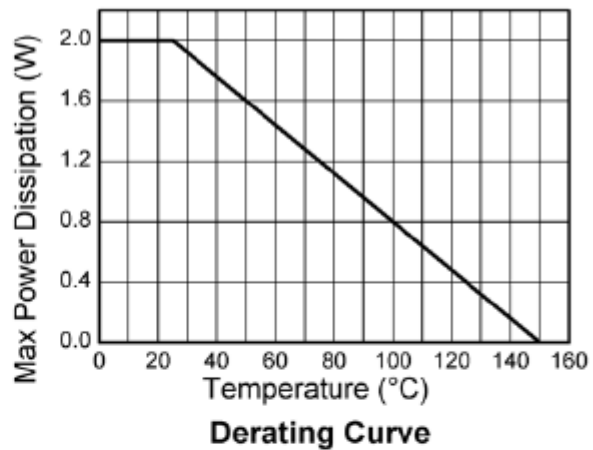
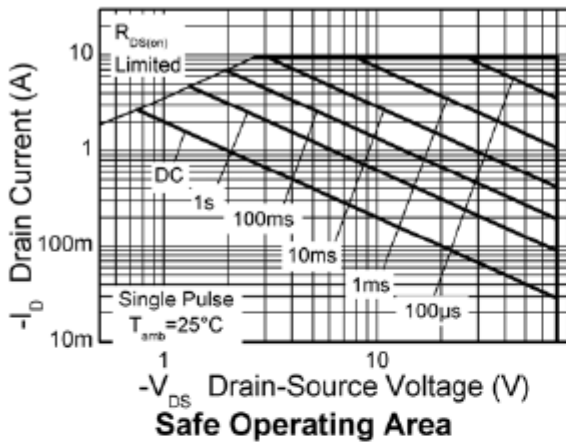
Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

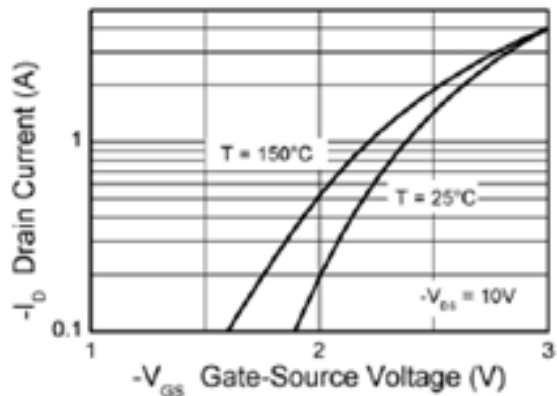
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 6)	P _D	2	W
	(Note 7)		16	
Linear Derating Factor	(Note 6)	R _{θJA}	3.9	mW/°C
	(Note 7)		31	
Thermal Resistance, Junction to Ambient	(Note 6)	R _{θJA}	62.5	°C/W
	(Note 7)		34	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

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

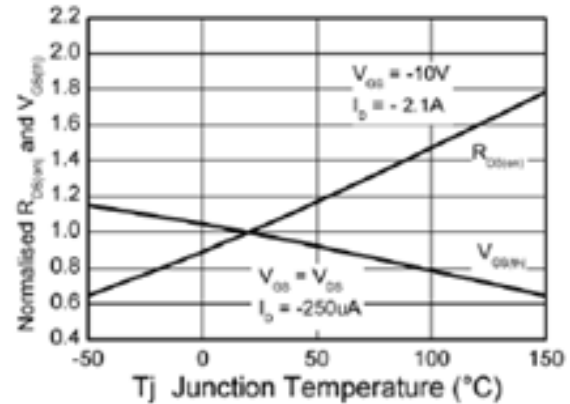
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition	
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage	BV _{DSS}	-70	—	—	V	I _D = -250μA, V _{GS} = 0V	
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1	μA	V _{DS} = -70V, V _{GS} = 0V	
Gate-Source Leakage	I _{GSS}	—	—	100	nA	V _{GS} = ±20V, V _{DS} = 0V	
ON CHARACTERISTICS							
Gate Threshold Voltage	V _{GS(th)}	-1	—	—	V	I _D = -250μA, V _{DS} = V _{GS}	
Static Drain-Source On-Resistance (Note 9)	R _{DS(ON)}	—	—	0.16	Ω	V _{GS} = -10V, I _D = -2.1A	
				0.25		V _{GS} = -4.5V, I _D = -1.7A	
Forward Transconductance (Notes 9 & 10)	g _{fs}	—	4.4	—	S	V _{DS} = -15V, I _D = -2.1A	
Diode Forward Voltage (Note 9)	V _{SD}	—	-0.85	-0.95	V	I _S = -2A, V _{GS} = 0V	
Reverse Recovery Time (Note 10)	t _{rr}	—	29.8	—	ns	I _S = -2.1A, di/dt= 100A/μs	
Reverse Recovery Charge (Note 10)	Q _{rr}	—	38.5	—	nC		
DYNAMIC CHARACTERISTICS (Note 10)							
Input Capacitance	C _{iss}	—	635	—	pF	V _{DS} = -40V, V _{GS} = 0V f= 1MHz	
Output Capacitance	C _{oss}	—	52	—	pF		
Reverse Transfer Capacitance	C _{rss}	—	42.5	—	pF		
Total Gate Charge (Note 11)	Q _g	—	9.6	—	nC	V _{GS} = -5V	V _{DS} = -35V I _D = -2.1A
Total Gate Charge (Note 11)	Q _g	—	18	—	nC	V _{GS} = -10V	
Gate-Source Charge (Note 11)	Q _{gs}	—	1.77	—	nC		
Gate-Drain Charge (Note 11)	Q _{gd}	—	3.66	—	nC		
Turn-On Delay Time (Note 11)	t _{D(on)}	—	2.5	—	ns	V _{DD} = -35V, V _{GS} = -10V I _D = -1A, R _G ≐ 6Ω	
Turn-On Rise Time (Note 11)	t _r	—	3.4	—	ns		
Turn-Off Delay Time (Note 11)	t _{D(off)}	—	27.9	—	ns		
Turn-Off Fall Time (Note 11)	t _f	—	8	—	ns		

- Notes:
- For a device surface mounted on 25mm x 25mm 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.
 - Same as Note 6, except the device is measured at t ≤ 5 seconds.
 - Same as Note 6, except the device is pulsed with D = 0.05 and pulse width 10μs. The pulse current is limited by the maximum junction temperature.
 - 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.

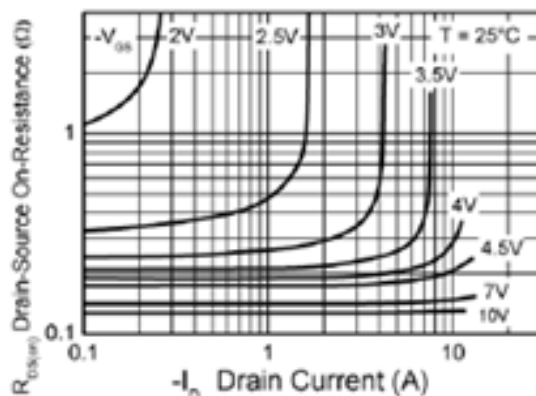




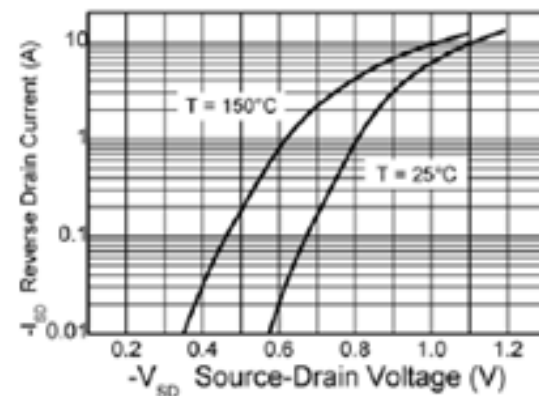
Typical Transfer Characteristics



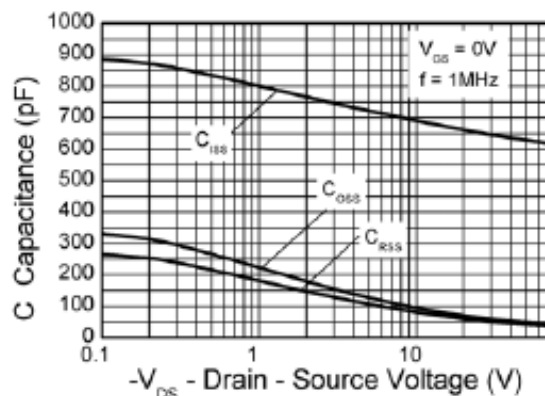
Normalised Curves v Temperature



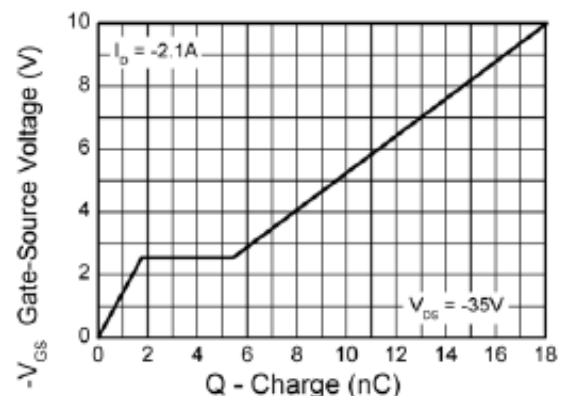
On-Resistance v Drain Current



Source-Drain Diode Forward Voltage



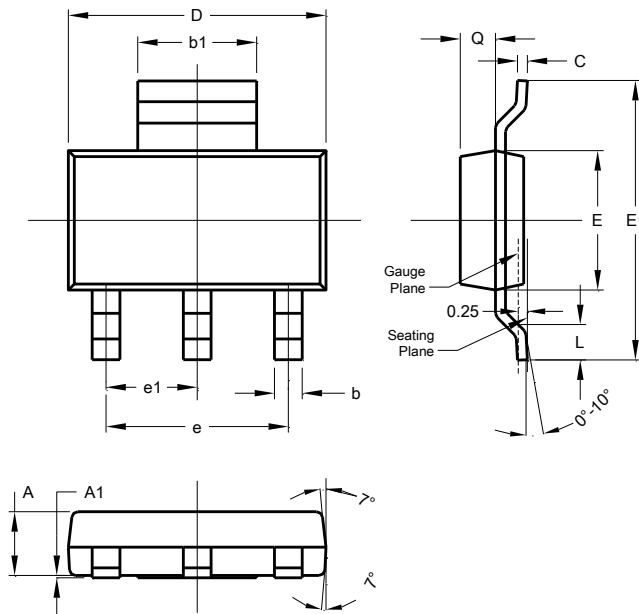
Capacitance v Drain-Source Voltage



Gate-Source Voltage v Gate Charge

Package Outline Dimensions

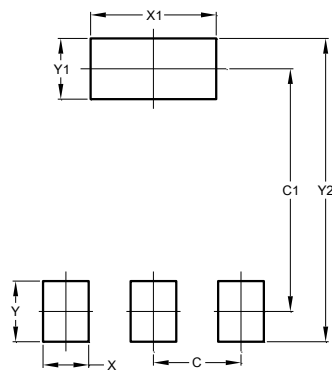
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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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