

## Product Summary

BV <sub>DSS</sub>	R <sub>DS(ON)</sub>	I <sub>D</sub> T <sub>A</sub> = +25°C
-70V	160mΩ @ V <sub>GS</sub> = -10V	-2.6A
	250mΩ @ V <sub>GS</sub> = -4.5V	-1.6A

## Description

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

## Applications

- Motor control
- Transformer driving switches
- DC-DC converters
- Power-management functions
- Uninterrupted power supplies

## 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)**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability.**  
<https://www.diodes.com/quality/product-definitions/>
- **An automotive-compliant part is available under a separate datasheet ([ZXMP7A17GQ](#))**

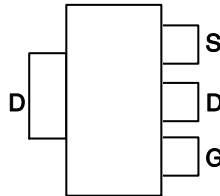
## Mechanical Data

- Package: SOT223
- Package 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<sup>(e3)</sup>
- Weight: 0.112 grams (Approximate)

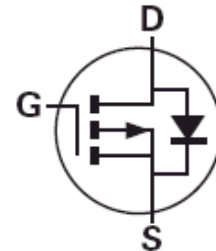
SOT223 (Type DN)



Top View



Pin Out – Top View



Equivalent Circuit

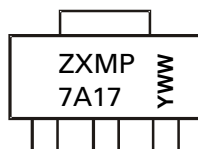
## Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
ZXMP7A17GTA	SOT223 (Type DN)	1,000	Tape & Reel

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
  2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information

SOT223 (Type DN)



ZXMP7A17 = Product Type Marking Code  
 YWW = Date Code Marking  
 Y or  $\bar{Y}$  = Last Digit of Year (ex: 5 = 2025)  
 WW or  $\bar{W}W$  = Week Code (01 to 53)

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V <sub>DSS</sub>	-70	V
Gate-Source Voltage			V <sub>GS</sub>	±20	V
Continuous Drain Current	V <sub>GS</sub> = -10V	(Note 6)	I <sub>D</sub>	-3.7	A
		T <sub>A</sub> = +70°C (Note 6)		-2.9	
		(Note 5)		-2.6	
Pulsed Drain Current	V <sub>GS</sub> = -10V	(Note 7)	I <sub>DM</sub>	-9.6	A
Continuous Source Current (Body Diode)			I <sub>S</sub>	-3.7	A
Pulsed Source Current (Body Diode)			I <sub>SM</sub>	-9.6	A

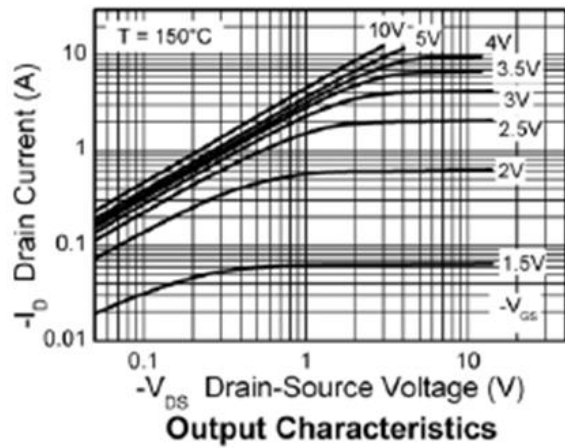
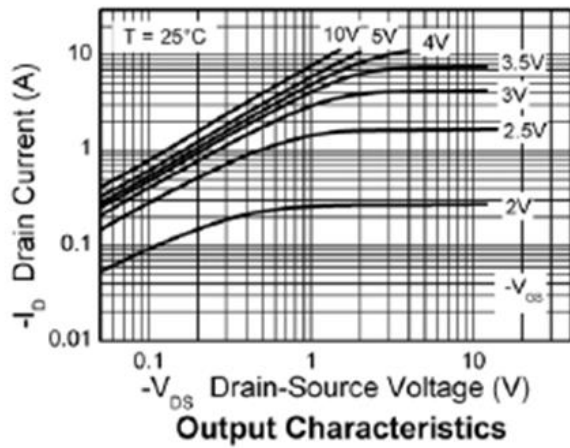
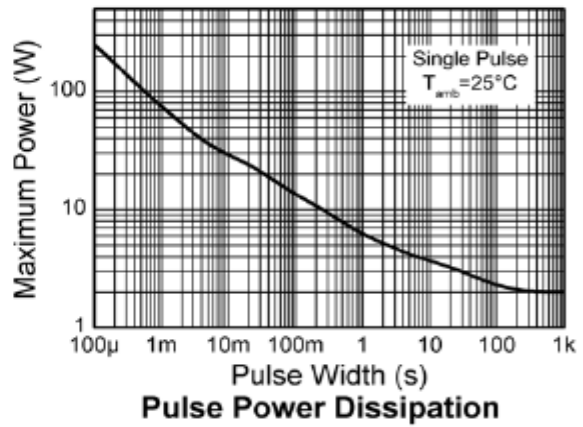
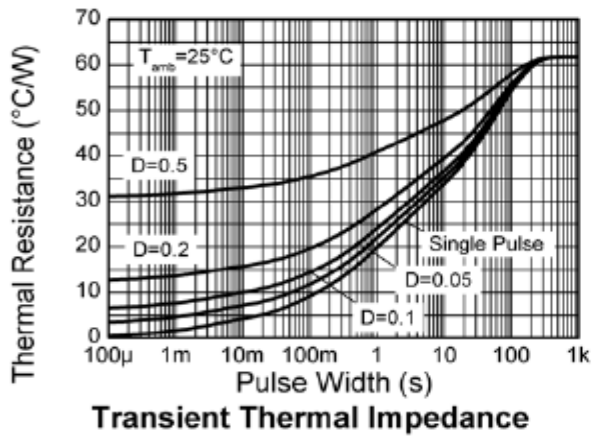
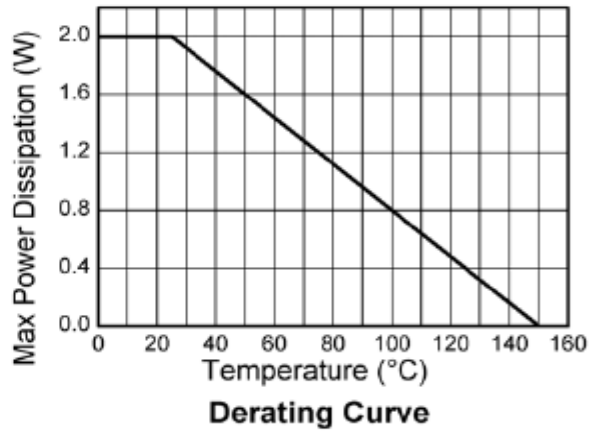
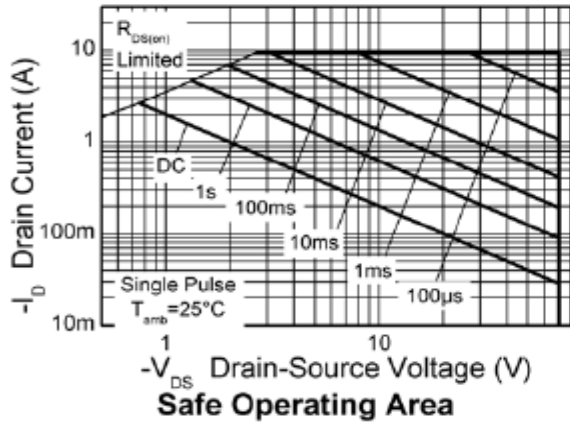
**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

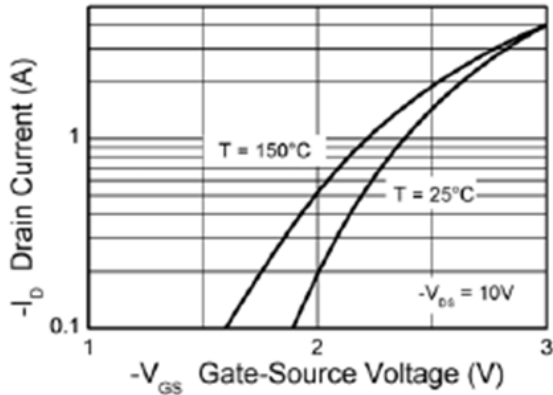
Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 5)	P <sub>D</sub>	2.0	W mW/°C
	(Note 6)		16.0	
	(Note 6)		3.9 31	
Thermal Resistance, Junction to Ambient	(Note 5)	R <sub>θJA</sub>	62.5	°C/W
	(Note 6)		34	
Operating and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

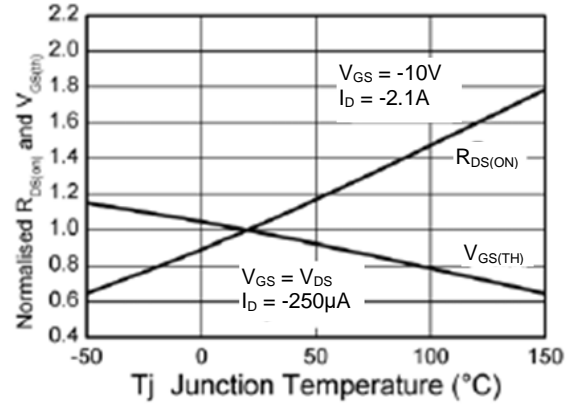
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-70	—	—	V	I <sub>D</sub> = -250μA, V <sub>GS</sub> = 0
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	-1	μA	V <sub>DS</sub> = -70V, V <sub>GS</sub> = 0
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	-1.0	—	—	V	I <sub>D</sub> = -250μA, V <sub>DS</sub> = V <sub>GS</sub>
Static Drain-Source On-Resistance (Note 8)	R <sub>DS(ON)</sub>	—	—	0.16	Ω	V <sub>GS</sub> = -10V, I <sub>D</sub> = -2.1A
				0.25		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -1.7A
Forward Transconductance (Notes 8 & 9)	g <sub>fs</sub>	—	4.4	—	S	V <sub>DS</sub> = -15V, I <sub>D</sub> = -2.1A
Diode Forward Voltage (Note 8)	V <sub>SD</sub>	—	-0.85	-0.95	V	I <sub>S</sub> = -2.0A, V <sub>GS</sub> = 0
Reverse-Recovery Time (Note 9)	t <sub>RR</sub>	—	29.8	—	ns	I <sub>S</sub> = -2.1A, di/dt = 100A/μs
Reverse-Recovery Charge (Note 9)	Q <sub>RR</sub>	—	38.5	—	nC	
<b>DYNAMIC CHARACTERISTICS (Note 9)</b>						
Input Capacitance	C <sub>iss</sub>	—	635	—	pF	V <sub>DS</sub> = -40V, V <sub>GS</sub> = 0 f = 1MHz
Output Capacitance	C <sub>oss</sub>	—	52	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	42.5	—	pF	
Total Gate Charge (Note 10)	Q <sub>g</sub>	—	9.6	—	nC	V <sub>GS</sub> = -5V
Total Gate Charge (Note 10)	Q <sub>g</sub>	—	18	—	nC	
Gate-Source Charge (Note 10)	Q <sub>gs</sub>	—	1.77	—	nC	V <sub>GS</sub> = -10V
Gate-Drain Charge (Note 10)	Q <sub>gd</sub>	—	3.66	—	nC	
Turn-On Delay Time (Note 10)	t <sub>D(ON)</sub>	—	2.5	—	ns	V <sub>DD</sub> = -35V, V <sub>GS</sub> = -10V I <sub>D</sub> = -1A, R <sub>G</sub> ≅ 6.0Ω
Turn-On Rise Time (Note 10)	t <sub>R</sub>	—	3.4	—	ns	
Turn-Off Delay Time (Note 10)	t <sub>D(OFF)</sub>	—	27.9	—	ns	
Turn-Off Fall Time (Note 10)	t <sub>F</sub>	—	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 5, except the device is measured at t ≤ 5 seconds.
  - Same as Note 5, 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.

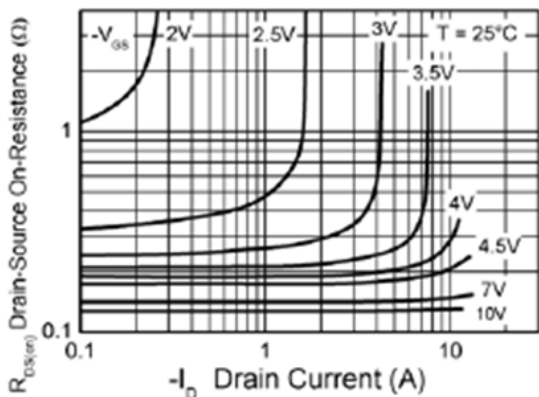




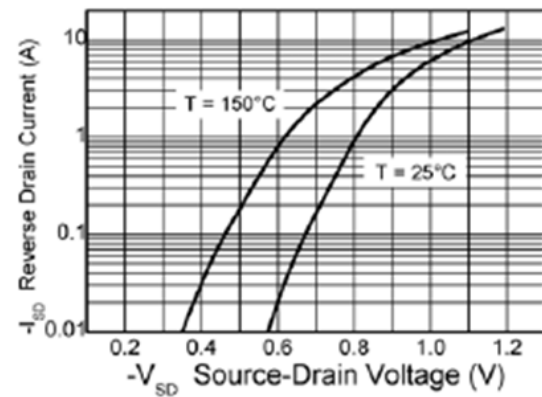
**Typical Transfer Characteristics**



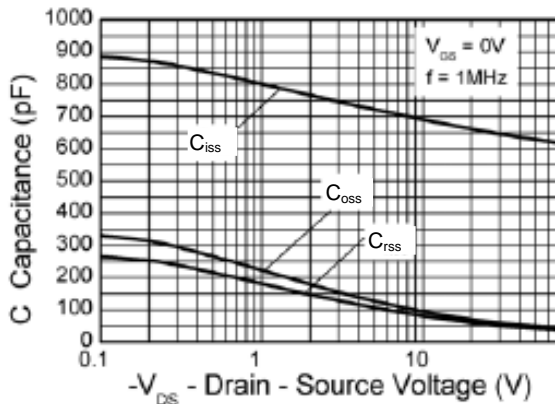
**Normalised Curves v Temperature**



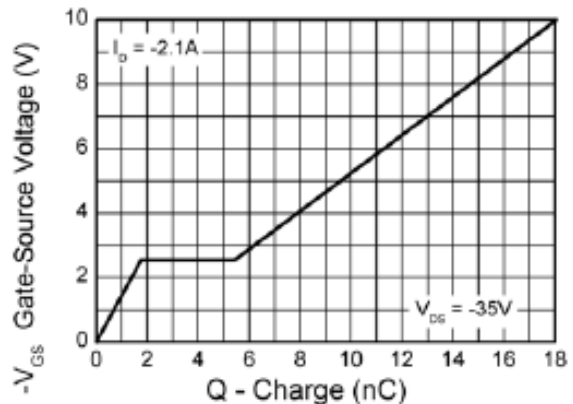
**On-Resistance v Drain Current**



**Source-Drain Diode Forward Voltage**



**Capacitance v Drain-Source Voltage**

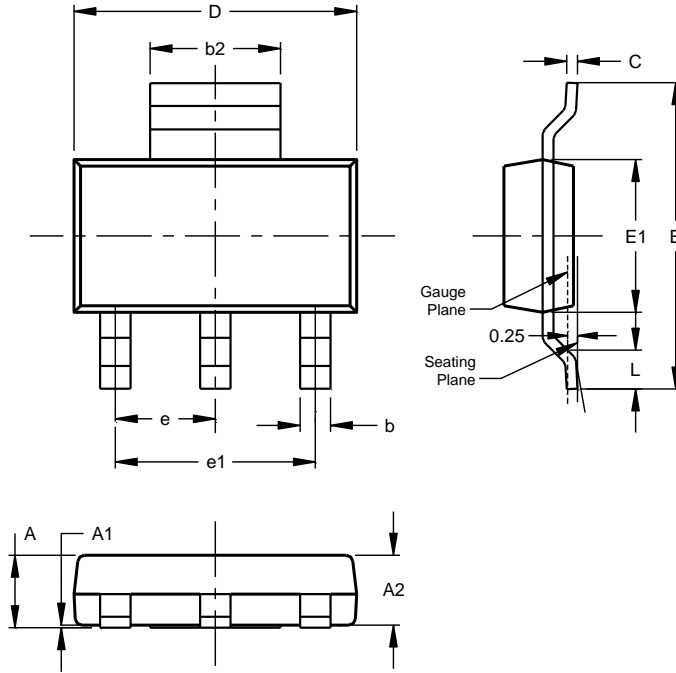


**Gate-Source Voltage v Gate Charge**

**Package Outline Dimensions**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT223 (Type DN)**

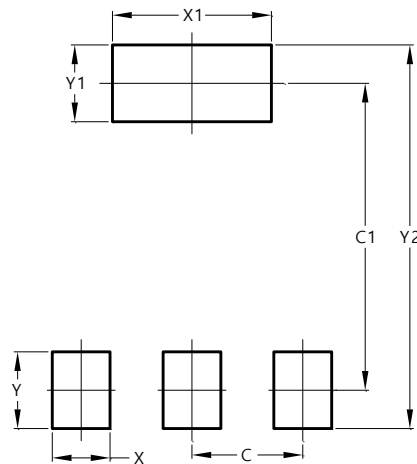


SOT223 (Type DN)			
Dim	Min	Max	Typ
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

**Suggested Pad Layout**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT223 (Type DN)**



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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