

Product Summary

BV _{DSS}	R _{DS(ON)}	I _D T _A = +25°C
-70V	160mΩ @ V _{GS} = -10V	-2.6A
	250mΩ @ V _{GS} = -4.5V	-1.6A

Description

This MOSFET is designed to minimize the on-state resistance (R_{DS(ON)}) yet maintain superior switching performance, making it ideal for high-efficiency power-management applications.

Applications


- Motor controls
- 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)**
- **The ZXMP7A17GQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF16949 certified facilities.**

<https://www.diodes.com/quality/product-definitions/>

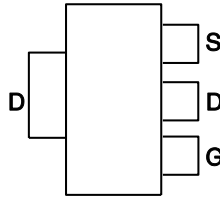
Mechanical Data

- 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 
- Weight: 0.112 grams (Approximate)

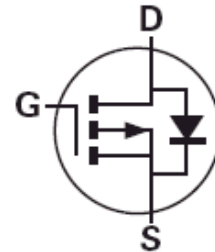
SOT223 (Type DN)



Top View



Pinout - Top



Equivalent Circuit

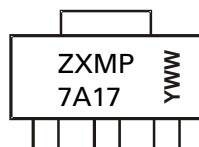
Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
ZXMP7A17GQTA	SOT223 (Type DN)	1,000	Tape & Reel
ZXMP7A17GQTC	SOT223 (Type DN)	4,000	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_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 6)	I _D	-3.7	A
		T _A = +70°C (Note 6)		-2.9	
		(Note 5)		-2.6	
Pulsed Drain Current	V _{GS} = -10V	(Note 7)	I _{DM}	-9.6	A
Continuous Source Current (Body Diode)			I _S	-3.7	A
Pulsed Source Current (Body Diode)			I _{SM}	-9.6	A

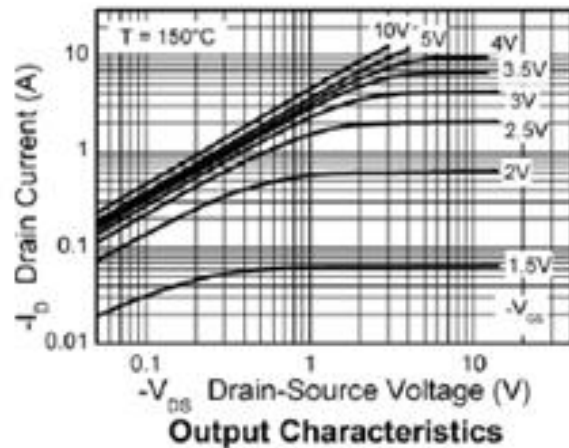
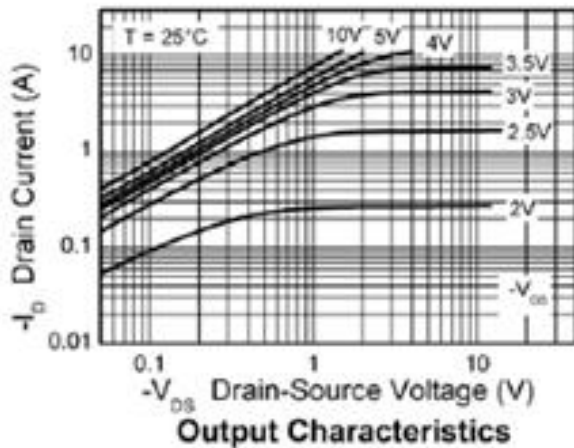
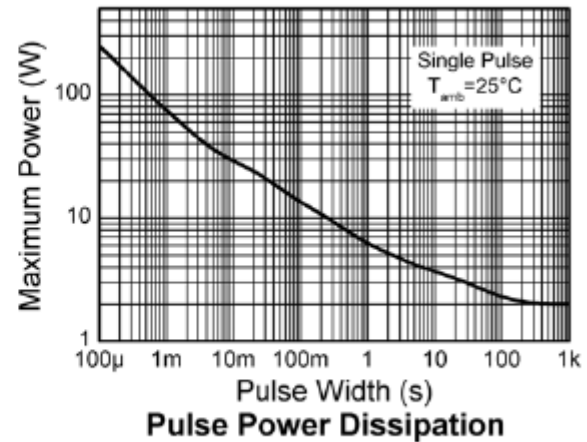
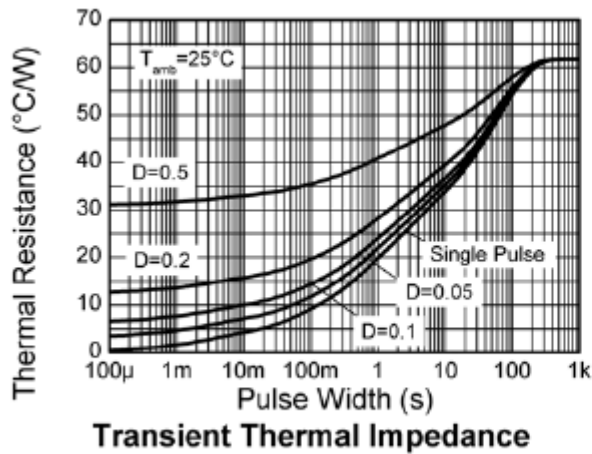
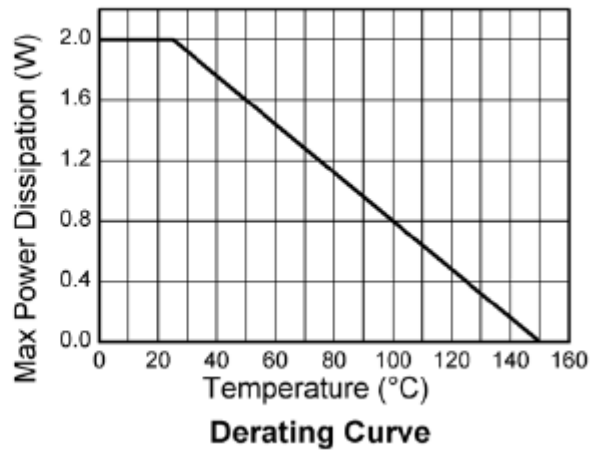
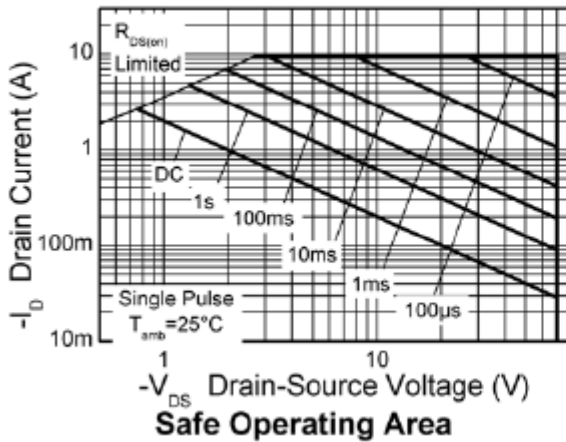
Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

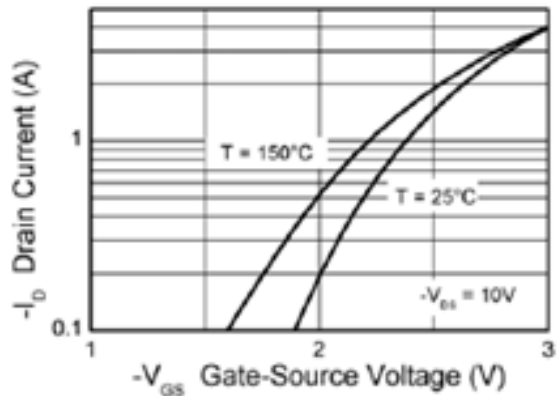
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P _D	2	W
	(Note 6)		16	
Linear Derating Factor	(Note 5)	R _{θJA}	3.9	mW/°C
	(Note 6)		31	
Thermal Resistance, Junction to Ambient	(Note 5)	R _{θJA}	62.5	°C/W
	(Note 6)		34	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

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

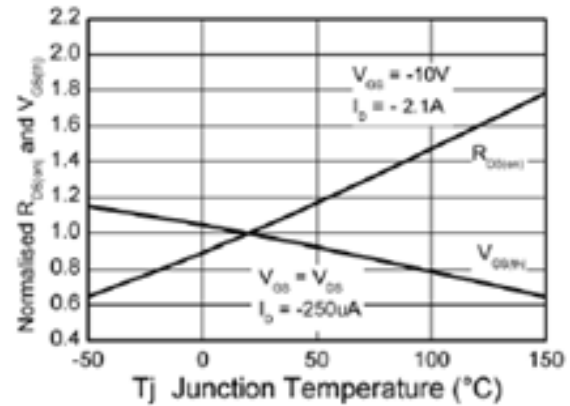
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition	
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage	BV _{DSS}	-70	—	—	V	I _D = -250μA, V _{GS} = 0V	
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1	μA	V _{DS} = -70V, V _{GS} = 0V	
Gate-Source Leakage	I _{GSS}	—	—	100	nA	V _{GS} = ±20V, V _{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 8)	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 8 & 9)	g _{fs}	—	4.4	—	S	V _{DS} = -15V, I _D = -2.1A	
Diode Forward Voltage (Note 8)	V _{SD}	—	-0.85	-0.95	V	I _S = -2A, V _{GS} = 0V	
Reverse-Recovery Time (Note 9)	t _{rr}	—	29.8	—	ns	I _S = -2.1A, di/dt = 100A/μs	
Reverse-Recovery Charge (Note 9)	Q _{rr}	—	38.5	—	nC		
DYNAMIC CHARACTERISTICS (Note 9)							
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 10)	Q _g	—	9.6	—	nC	V _{GS} = -5V	V _{DS} = -35V I _D = -2.1A
Total Gate Charge (Note 10)	Q _g	—	18	—	nC	V _{GS} = -10V	
Gate-Source Charge (Note 10)	Q _{gs}	—	1.77	—	nC		
Gate-Drain Charge (Note 10)	Q _{gd}	—	3.66	—	nC		
Turn-On Delay Time (Note 10)	t _{D(on)}	—	2.5	—	ns	V _{DD} = -35V, V _{GS} = -10V I _D = -1A, R _G ≅ 6Ω	
Turn-On Rise Time (Note 10)	t _r	—	3.4	—	ns		
Turn-Off Delay Time (Note 10)	t _{D(off)}	—	27.9	—	ns		
Turn-Off Fall Time (Note 10)	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 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.

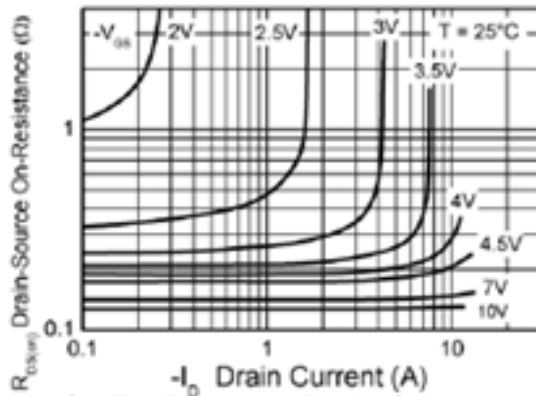




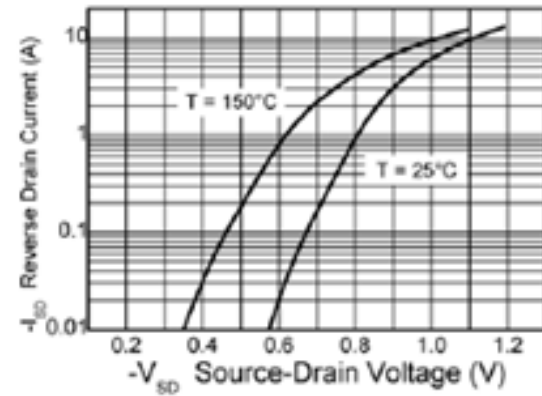
Typical Transfer Characteristics



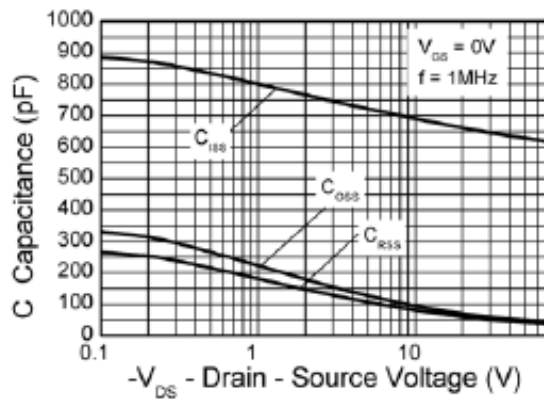
Normalised Curves v Temperature



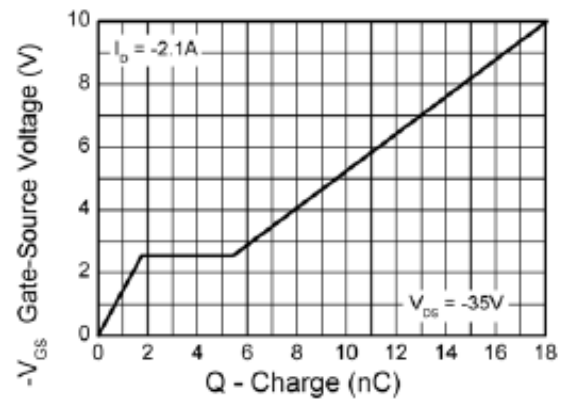
On-Resistance v Drain Current



Source-Drain Diode Forward Voltage



Capacitance v Drain-Source Voltage

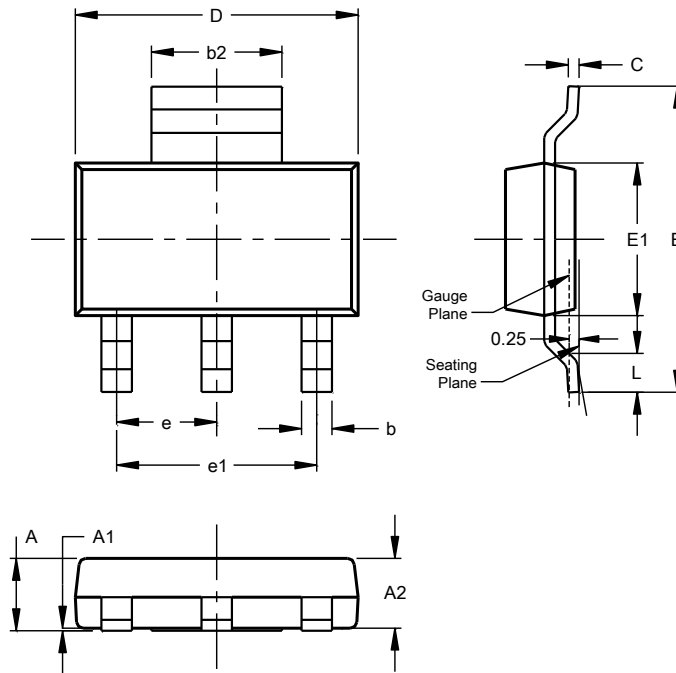


Gate-Source Voltage v Gate Charge

Package Outline Dimensions

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

SOT223 (Type DN)

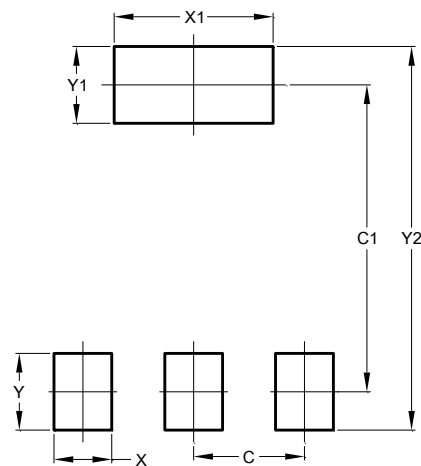


SOT223 (Type DN)			
Dim	Min	Max	Typ
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

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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