Product Summary

BV_{DSS}	$R_{DS(ON)}$ max	I_D T_A = +25°C
-100V	350mΩ @ V_{GS} = -10V	-2.4A
	450mΩ @ V_{GS} = -6V	-2.1A

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 controls
- DC-DC converters
- Power management functions
- Relay and solenoid driving

Features and Benefits

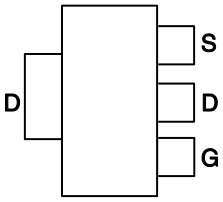
- Fast Switching Speed
- Low Input Capacitance
- Low Gate Drive
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The ZXMP10A17GQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF16949 certified facilities.**
  https://www.diodes.com/quality/product-definitions/

Mechanical Data

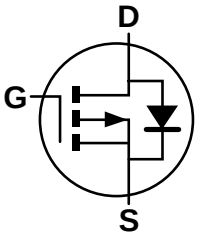
- Package: SOT223
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.112 grams (Approximate)

SOT223 (Type DN)

Top View



Pin Out - Top View



Equivalent Circuit

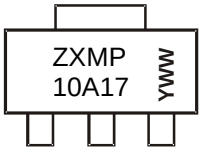
Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
ZXMP10A17GQTA	SOT223 (Type DN)	1,000	Tape & Reel
ZXMP10A17GQTC	SOT223 (Type DN)	4,000	Tape & Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
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)



ZXMP10A17 = Product Type Marking Code
YWW = Date Code Marking
Y = Year (ex: 2 = 2022)
WW = Week (01 to 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_{GS}	±20	V
Continuous Drain Current	V_{GS} = -10V	(Note 6)	I_D	-2.4	A
		T_A = +70°C (Note 6)		-1.9	
		(Note 5)		-1.7	
Pulsed Drain Current	V_{GS} = -10V	(Note 7)	I_{DM}	-9.4	A
Continuous Source Current (Body Diode)		(Note 6)	I_S	-2.4	A
Pulsed Source Current (Body Diode)		(Note 7)	I_{SM}	-9.4	A

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

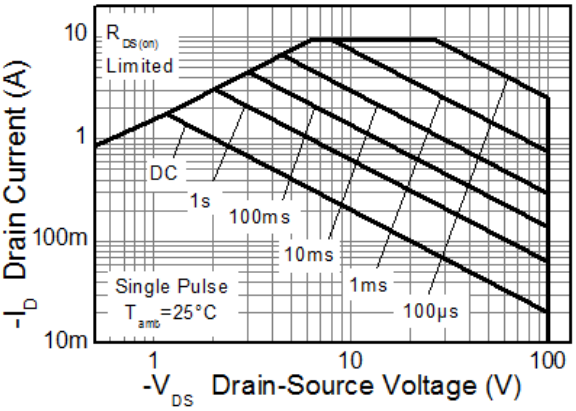
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	2.0	W
Linear Derating Factor			16	mW/°C
	(Note 6)		3.9	W
			31	mW/°C
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	62.5	°C/W
	(Note 6)		32.0	
Thermal Resistance, Junction to Case	(Note 5)	$R_{\theta JC}$	7.7	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

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

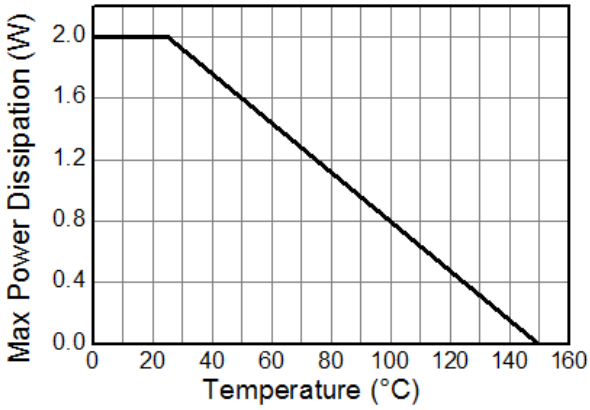
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	-100	—	—	V	I_D = -250µA, V_{GS} = 0V
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-0.5	µA	V_{DS} = -100V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 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 8)	$R_{DS(on)}$	—	—	0.350	Ω	V_{GS} = -10V, I_D = -1.4A
				0.450		V_{GS} = -6V, I_D = -1.2A
Forward Transconductance (Notes 8, 9)	g_{fs}	—	2.8	—	S	V_{DS} = -15V, I_D = -1.4A
Diode Forward Voltage (Note 8)	V_{SD}	—	-0.85	-0.95	V	I_S = -1.7A, V_{GS} = 0V
Reverse Recovery Time (Note 9)	t_{RR}		33	—	ns	I_F = -1.5A, di/dt = 100A/µs
Reverse Recovery Charge (Note 9)	Q_{RR}	—	48	—	nC	
DYNAMIC CHARACTERISTICS (Note 9)						
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 10)	Q_g	—	7.1	—	nC	V_{GS} = -6.0V, V_{DS} = -50V, I_D = -1.4A
Total Gate Charge (Note 10)	Q_g	—	10.7	—	nC	V_{GS} = -10V, V_{DS} = -50V, I_D = -1.4A
Gate-Source Charge (Note 10)	Q_{gs}	—	1.7	—	nC	
Gate-Drain Charge (Note 10)	Q_{gd}	—	3.8	—	nC	
Turn-On Delay Time (Note 10)	$t_{D(on)}$	—	3.0	—	ns	V_{DD} = -15V, V_{GS} = -10V, I_D = -1A, $R_G \cong$ 6.0Ω
Turn-On Rise Time (Note 10)	t_R	—	3.5	—	ns	
Turn-Off Delay Time (Note 10)	$t_{D(off)}$	—	13.4	—	ns	
Turn-Off Fall Time (Note 10)	t_F	—	7.2	—	ns	

Notes:
5. For a device surface mounted on 25mm x 25mm x 1.6mm FR-4 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. Measured under pulsed conditions. Pulse width ≤ 300µs; duty cycle ≤ 2%.
9. For design aid only, not subject to production testing.
10. Switching characteristics are independent of operating junction temperatures.

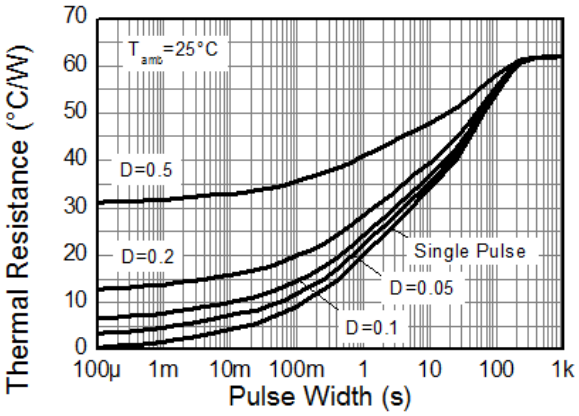
Thermal Characteristics



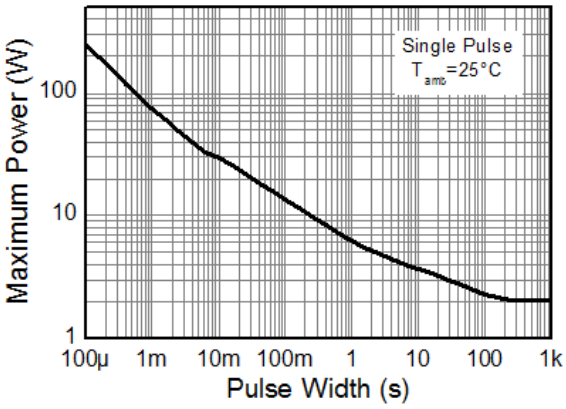
Safe Operating Area



Derating Curve

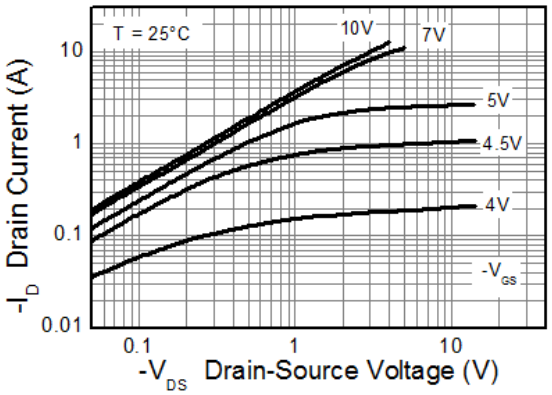


Transient Thermal Impedance

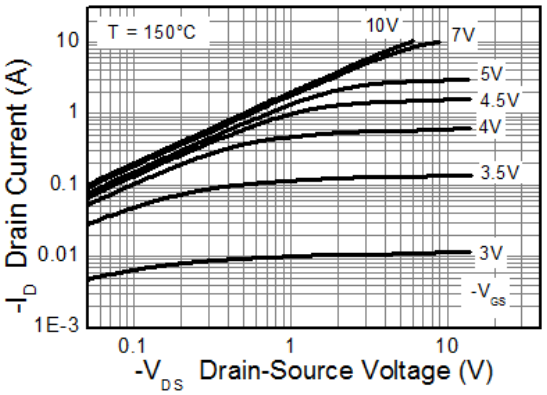


Pulse Power Dissipation

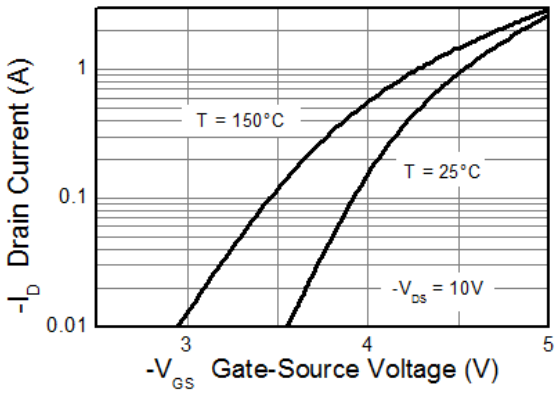
Typical Characteristics (continued)



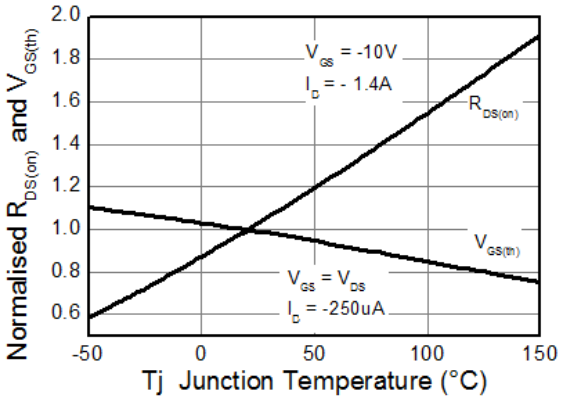
Output Characteristics



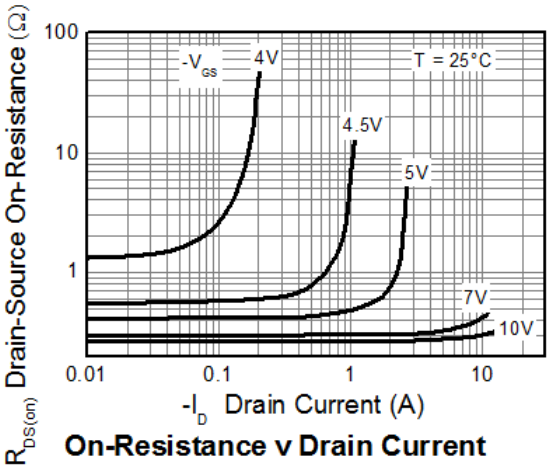
Output Characteristics



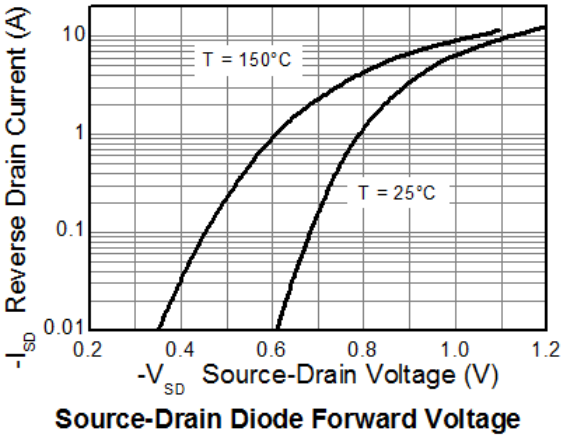
Typical Transfer Characteristics



Normalised Curves v Temperature



On-Resistance v Drain Current

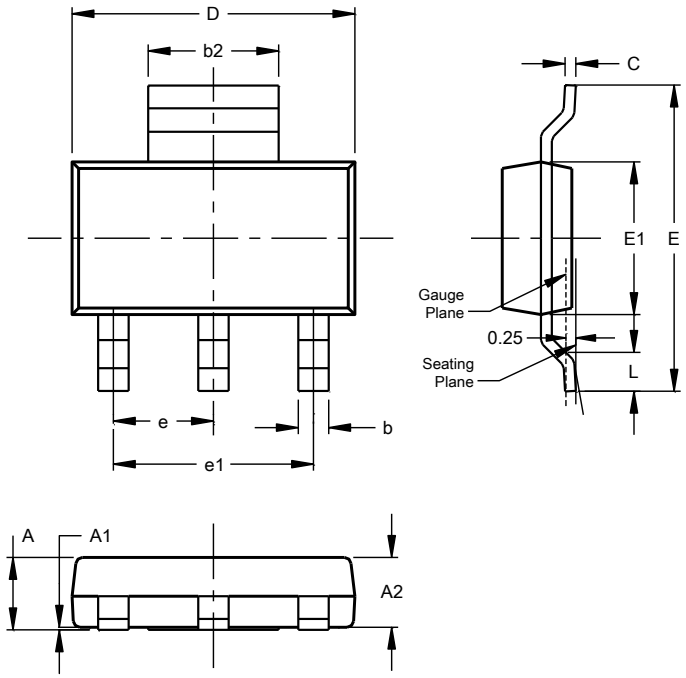


Source-Drain Diode Forward Voltage

Package Outline Dimensions

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

SOT223 (Type DN)

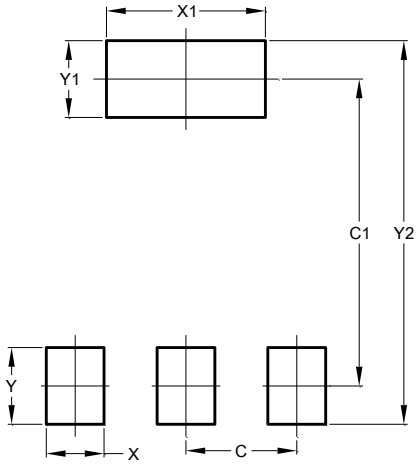


SOT223 (Type DN)			
Dim	**Min**	**Max**	**Typ**
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

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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