

Product Summary

BV_{DSS}	$R_{DS(ON)}$ max	I_D $T_A = +25^\circ\text{C}$
-100V	350m Ω @ $V_{GS} = -10\text{V}$	-2.4A
	450m Ω @ $V_{GS} = -6\text{V}$	-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/>

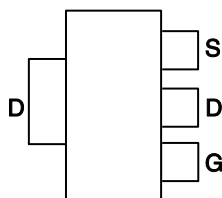
Mechanical Data

- 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 
- Weight: 0.112 grams (Approximate)

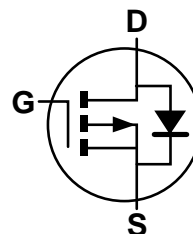
SOT223 (Type DN)



Top View



Pin Out - Top View



Equivalent Circuit

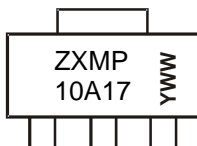
Ordering Information (Note 4)

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)			I _S	-2.4	A
Pulsed Source Current (Body Diode)			I _{SM}	-9.4	A

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

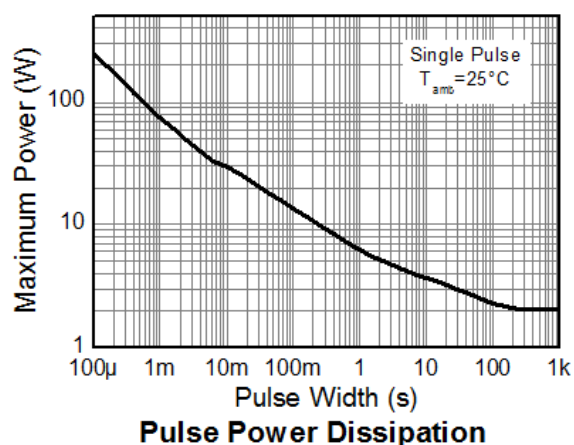
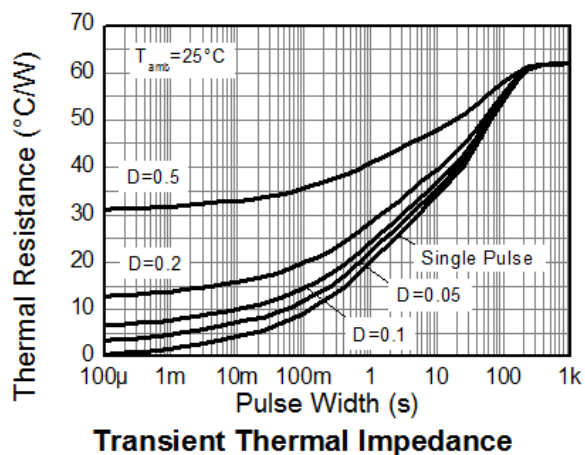
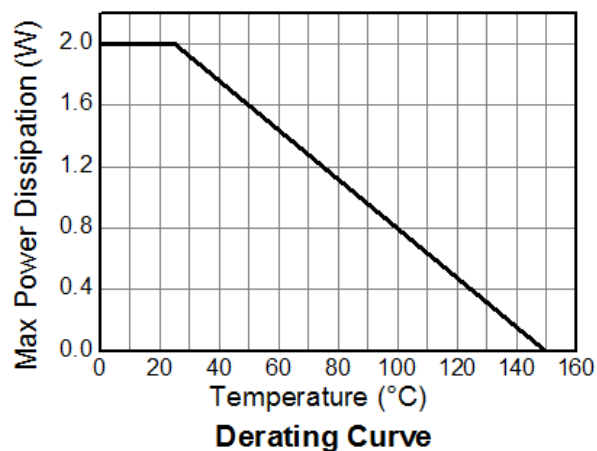
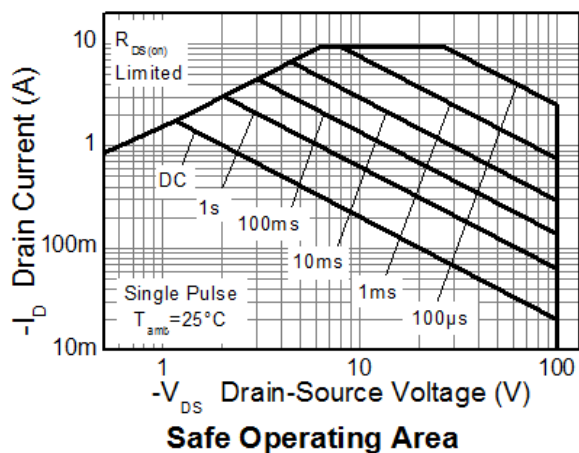
Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 5)	P _D	2.0	W mW/°C
			16	
	(Note 6)		3.9 31	
Thermal Resistance, Junction to Ambient	(Note 5)	R _{θJA}	62.5	°C/W
	(Note 6)		32.0	
Thermal Resistance, Junction to Case	(Note 5)	R _{θJC}	7.7	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

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

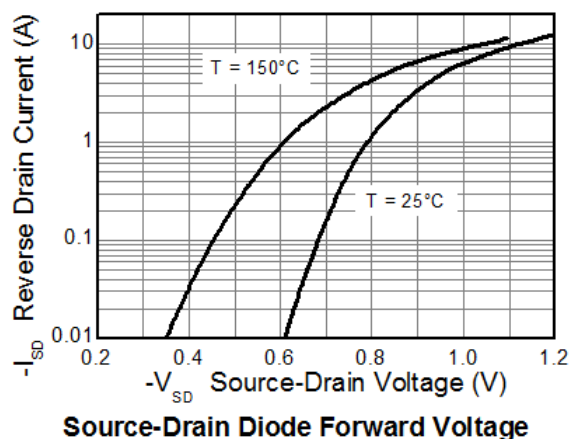
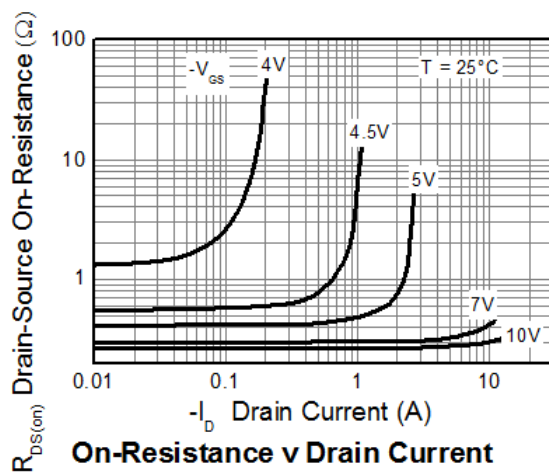
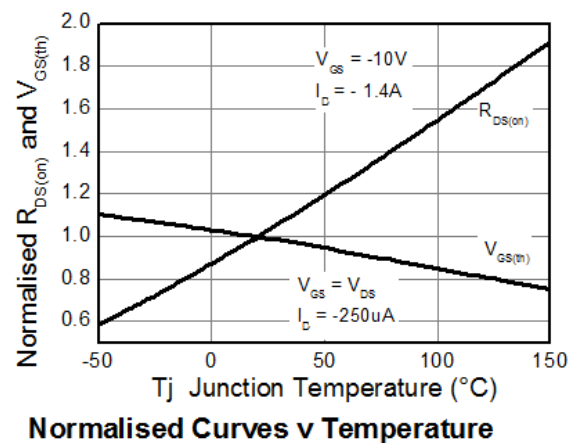
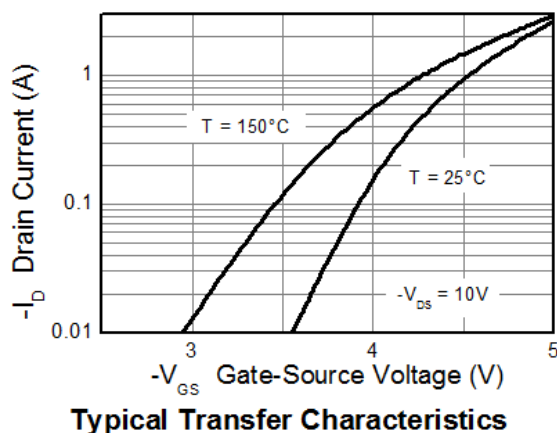
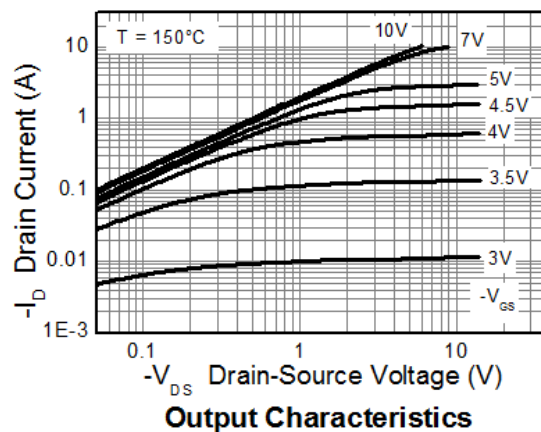
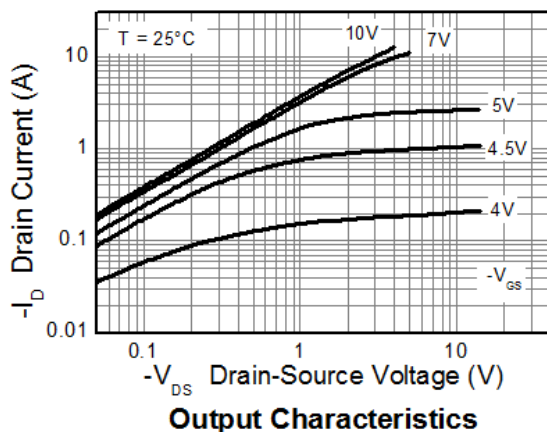
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition	
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage	BV _{DSS}	-100	—	—	V	I _D = -250μA, V _{GS} = 0V	
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-0.5	μA	V _{DS} = -100V, V _{GS} = 0V	
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, 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	
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 ≅ 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:
- 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.
 - Same as Note 5, except the device is measured at t ≤ 10 seconds.
 - 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.
 - 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.

Thermal Characteristics



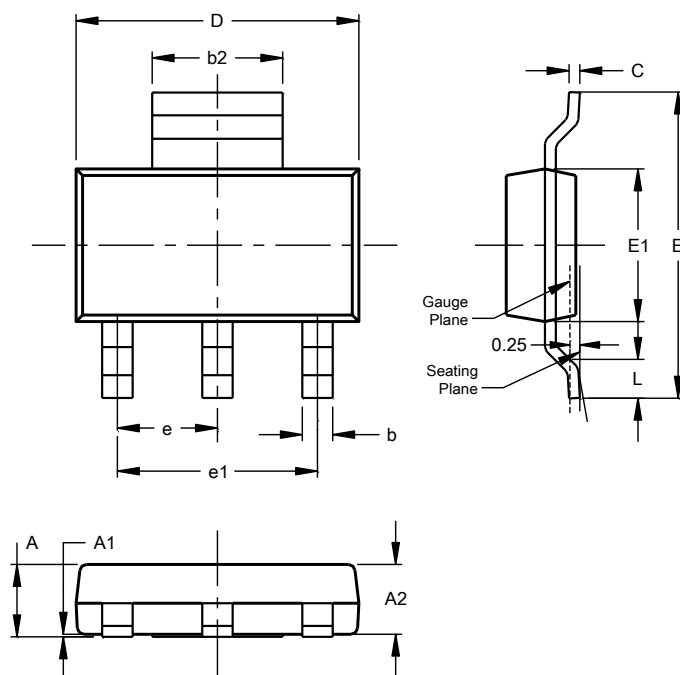
Typical Characteristics (continued)



Package Outline Dimensions

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

SOT223 (Type DN)

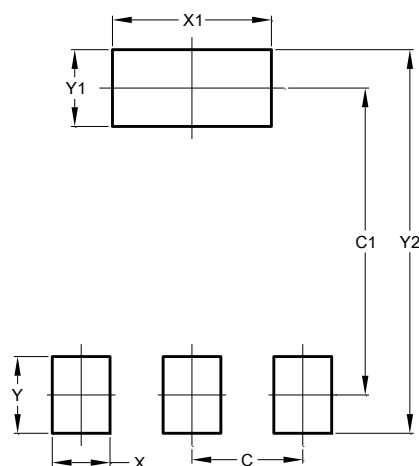


SOT223 (Type DN)			
Dim	Min	Max	Typ
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

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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