

Product Summary

BV _{DSS}	R _{DS(on)}	I _D T _A = +25°C
-60V	125mΩ @ V _{GS} = -10V	-4.3A
	190mΩ @ V _{GS} = -4.5V	-3.5A

Features and Benefits

- Fast Switching Speed
- Low Gate Drive
- Low Input Capacitance
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The ZXMP6A17GQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

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

Description and Applications

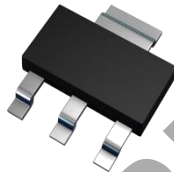
This MOSFET is designed to meet the stringent requirements of automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

- Motor control
- DC-DC converters
- Power-management functions
- Uninterrupted power supplies

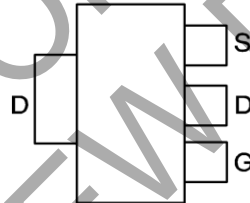
Mechanical Data

- Package: SOT223
- Package Material: Molded Plastic, 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)

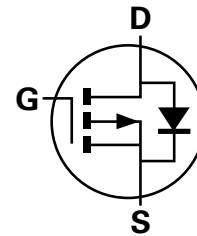
SOT223 (Type DN)



Top View



Pinout - Top View



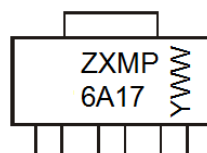
Equivalent Circuit

Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
ZXMP6A17GQTA	SOT223 (Type DN)	1000	Tape & Reel
ZXMP6A17GQTC	SOT223 (Type DN)	4000	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



ZXMP6A17 = Product Type Marking Code
YWW = Date Code Marking
Y or Y= Year (ex: 6 = 2026)
WW or WW = Week (01 to 53)

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

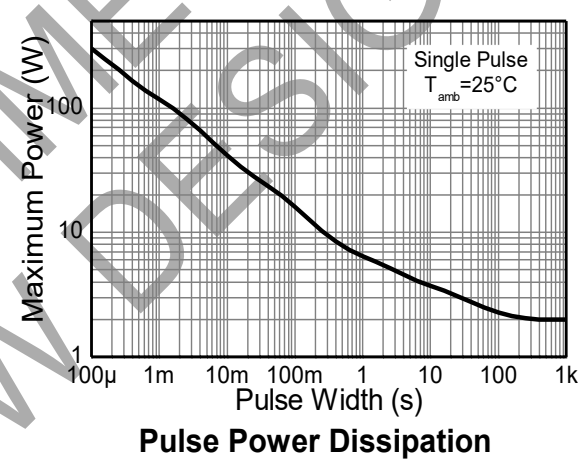
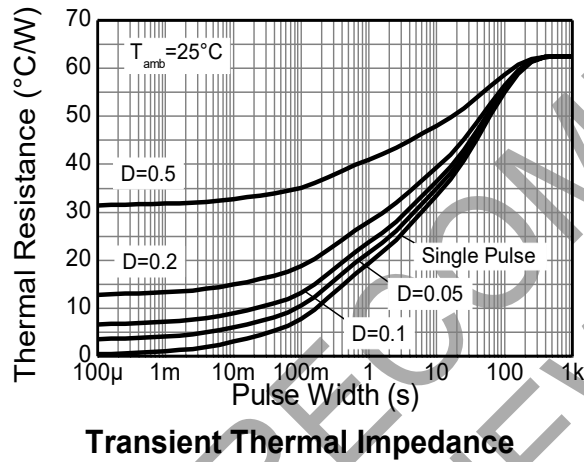
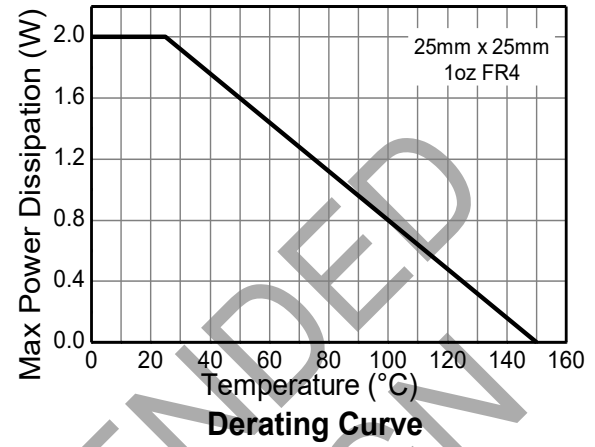
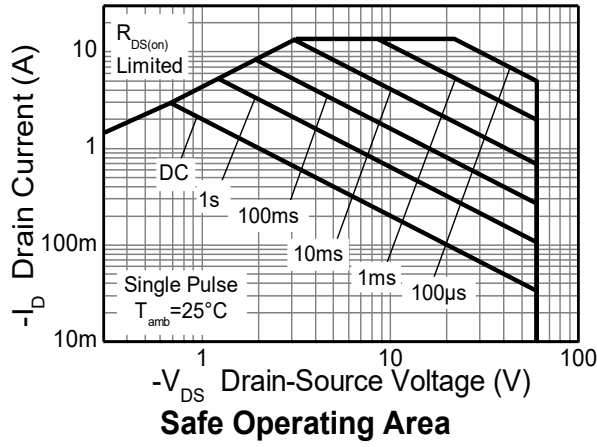
Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V _{DSS}	-60	V
Gate-Source Voltage			V _{GS}	±20	V
Continuous Drain Current	V _{GS} = 10V	(Note 6)	I _D	-4.3	A
		T _A = +70°C (Note 6)		-3.5	
		(Note 5)		-3	
Pulsed Drain Current	V _{GS} = 10V	(Note 7)	I _{DM}	-13.7	A
Continuous Source Current (Body Diode)			I _S	-4.3	A
Pulsed Source Current (Body Diode)			I _{SM}	-13.7	A

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

Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 5)	P _D	2	W
			16	
	(Note 6)		3.9	
Thermal Resistance, Junction to Ambient	(Note 5)	R _{θJA}	31	°C/W
	(Note 6)		62.5	
	(Note 6)		32	
Thermal Resistance, Junction to Lead	(Note 8)	R _{θJL}	9.8	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

- Notes:
5. For a device surface-mounted on 25mm × 25mm × 1.6mm FR4 PCB with high coverage of single-sided 2oz 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 ≤ 10s.
 7. Same as Note 5 except the device is pulsed with D = 0.02 and pulse width of 300μs. The pulse current is limited by the maximum junction temperature.
 8. Thermal resistance from junction to solder point (at the end of the drain lead).

Thermal Characteristics

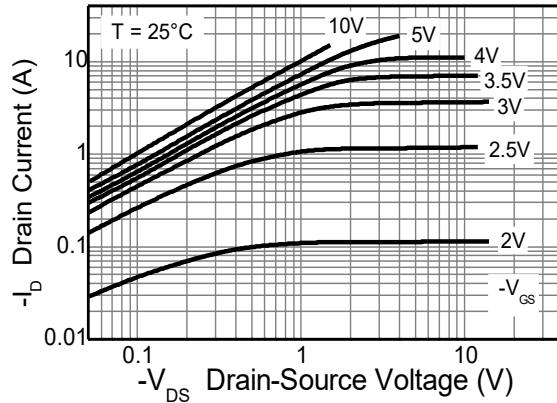


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

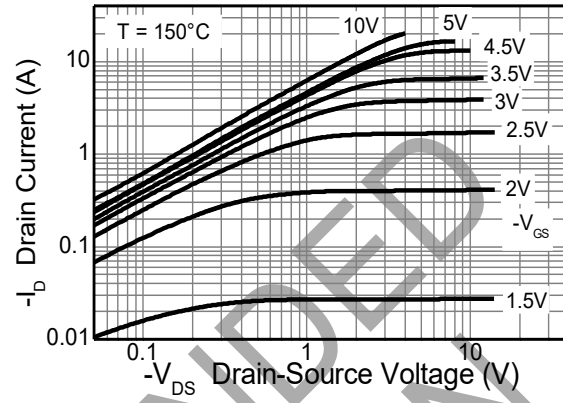
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 9)						
Drain-Source Breakdown Voltage	BV _{DSS}	-60	—	—	V	I _D = -250μA, V _{GS} = 0
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-0.5	μA	V _{DS} = -60V, V _{GS} = 0
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0
ON CHARACTERISTICS (Note 9)						
Gate Threshold Voltage	V _{GS(th)}	-1	—	—	V	I _D = -250μA, V _{DS} = V _{GS}
Static Drain-Source On-Resistance	R _{DS(on)}	—	96	125	mΩ	V _{GS} = -10V, I _D = -2.2A
		—	120	190		V _{GS} = -4.5V, I _D = -1.8A
Forward Transconductance	g _{fs}	—	4.7	—	S	V _{DS} = -15V, I _D = -2.2A
Diode Forward Voltage	V _{SD}	—	-0.85	-0.95	V	I _S = -2A, V _{GS} = 0, T _J = +25°C
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C _{iss}	—	637	—	pF	V _{DS} = -30V, V _{GS} = 0 f = 1MHz
Output Capacitance	C _{oss}	—	70	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	53	—	pF	
Total Gate Charge (V _{GS} = -4.5V)	Q _g	—	9	—	nC	V _{DS} = -30V I _D = -2.2A
Total Gate Charge (V _{GS} = -10V)	Q _g	—	17.7	—	nC	
Gate-Source Charge	Q _{gs}	—	1.6	—	nC	
Gate-Drain Charge	Q _{gd}	—	4.4	—	nC	
Turn-On Delay Time	t _{D(on)}	—	2.6	—	ns	V _{DD} = -30V, V _{GS} = -10V I _D = -1A, R _G = 6Ω
Turn-On Rise Time	t _r	—	3.4	—	ns	
Turn-Off Delay Time	t _{D(off)}	—	26.2	—	ns	
Turn-Off Fall Time	t _f	—	11.3	—	ns	
Reverse-Recovery Time	t _{rr}	—	25.1	—	ns	I _S = -1.7A, di/dt = 100A/μs
Reverse-Recovery Charge	Q _{rr}	—	27.2	—	nC	

Notes: 9. Short duration pulse test used to minimize self-heating effect.
10. Guaranteed by design. Not subject to production testing.

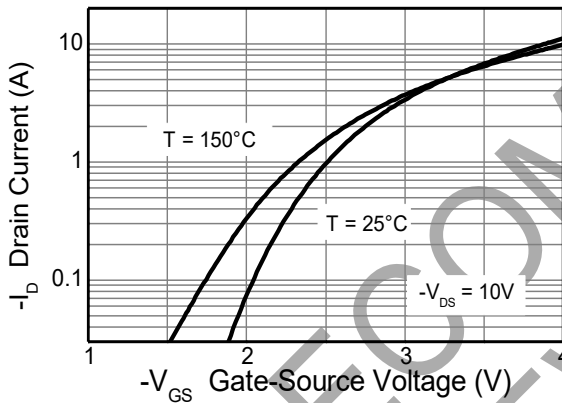
Typical Characteristics



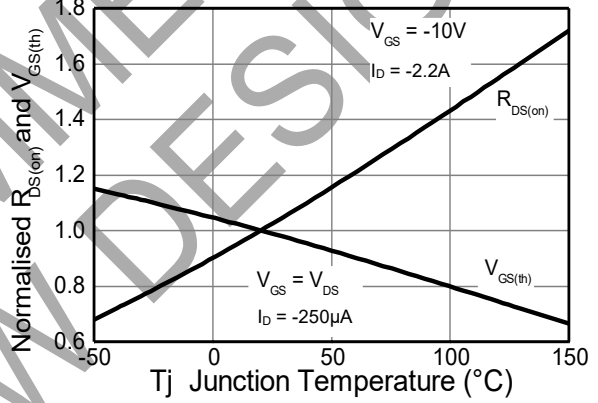
Output Characteristics



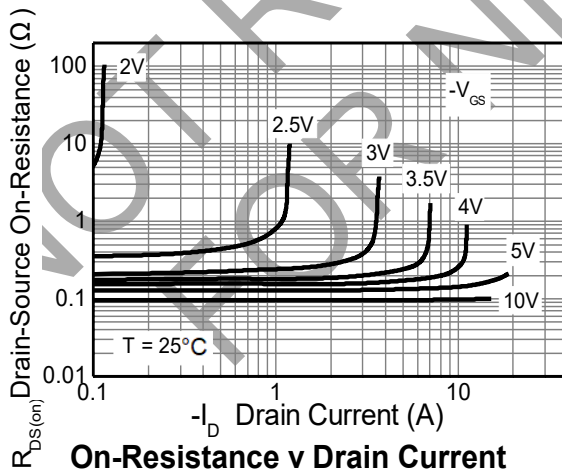
Output Characteristics



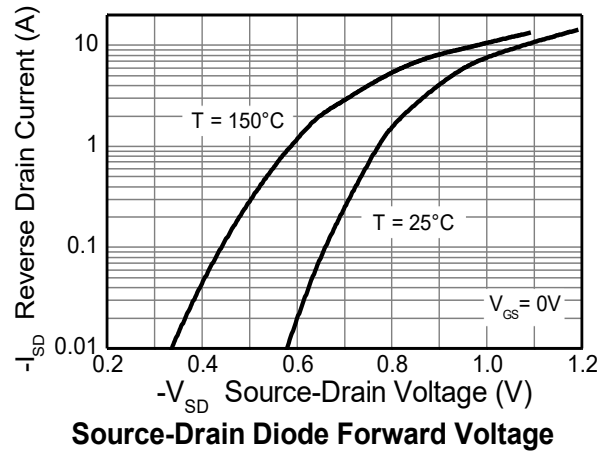
Typical Transfer Characteristics



Normalised Curves v Temperature

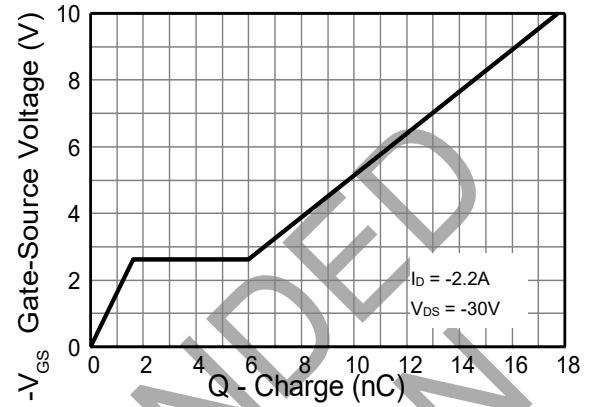
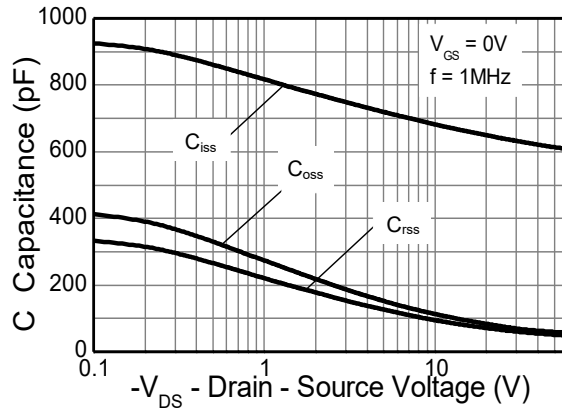


On-Resistance v Drain Current

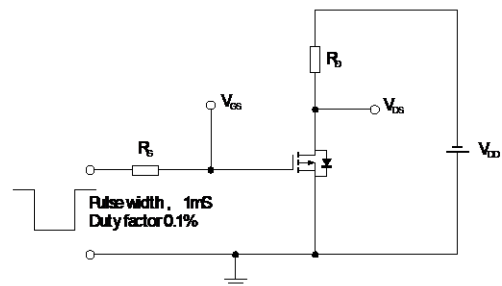
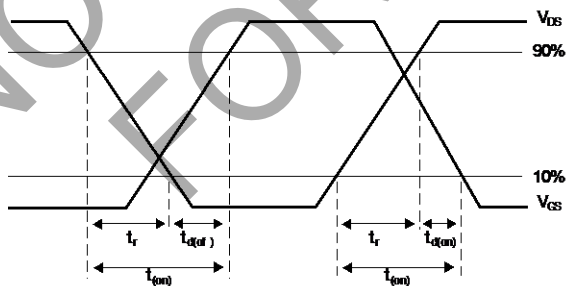
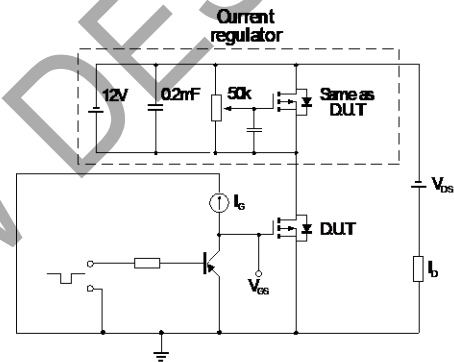
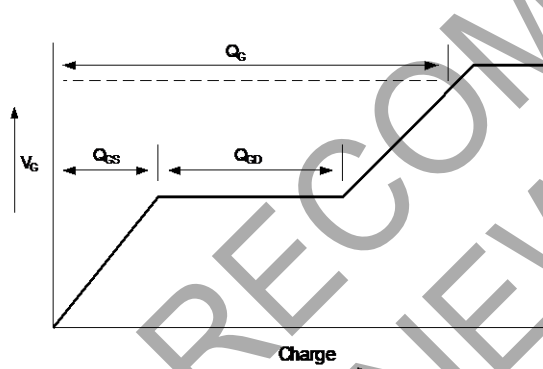


Source-Drain Diode Forward Voltage

Typical Characteristics (continued)



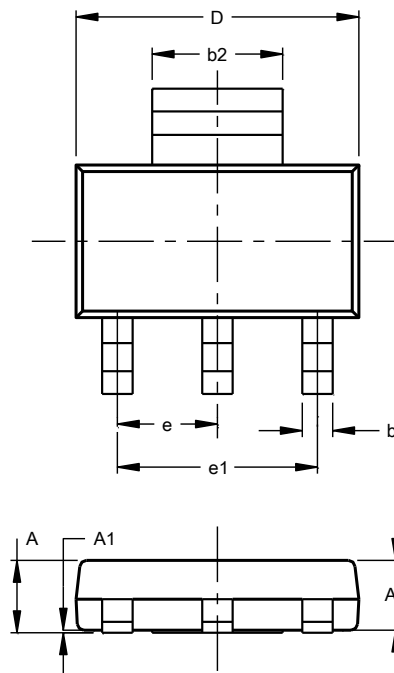
Test Circuits



Package Outline Dimensions

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

SOT223 (Type DN)

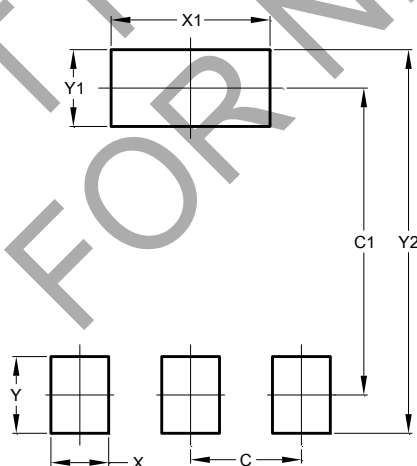


SOT223 (Type DN)			
Dim	Min	Max	Typ
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

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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