THE ZXMP6A17GQ IS NOT RECOMMENDED FOR NEW DESIGNS.
PLEASE USE THE DMP6185SEQ.

ZXMP6A17GQ

60V P-CHANNEL ENHANCEMENT MODE MOSFET

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

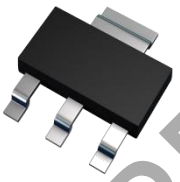
This MOSFET is designed to meet the stringent requirements of automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

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

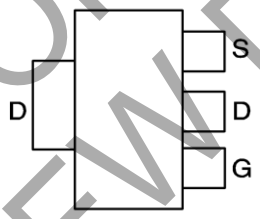
Mechanical Data

- 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)

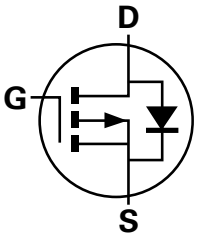
SOT223 (Type DN)



Top View



Pinout - Top View



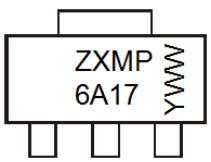
Equivalent Circuit

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)

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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)		(Note 6)	I_S	-4.3	A
Pulsed Source Current (Body Diode)		(Note 7)	I_{SM}	-13.7	A

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

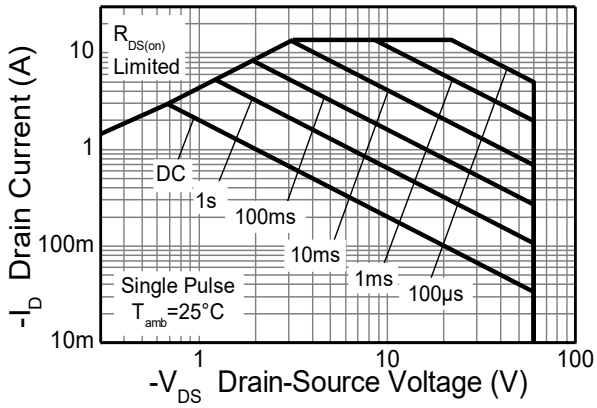
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	2	W
Linear Derating Factor			16	
	(Note 6)		3.9	
			31	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	62.5	°C/W
	(Note 6)		32	
Thermal Resistance, Junction to Lead	(Note 8)	$R_{\theta JL}$	9.8	
Operating and Storage Temperature 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).

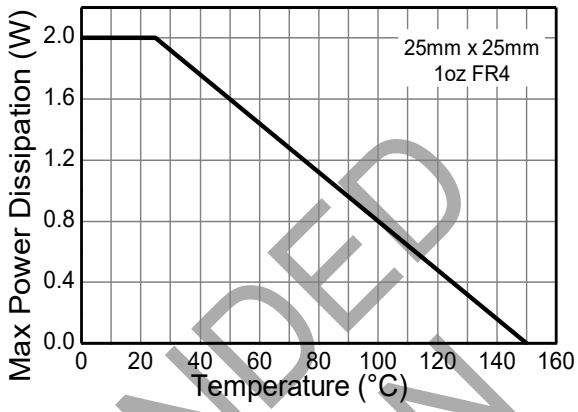
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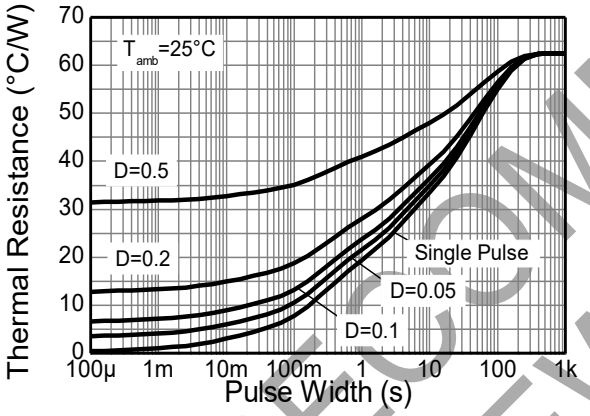
Thermal Characteristics



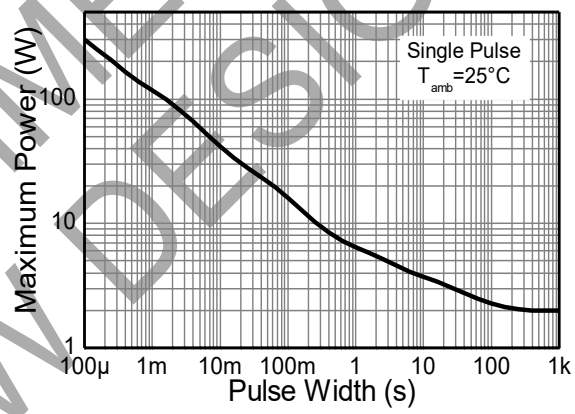
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

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

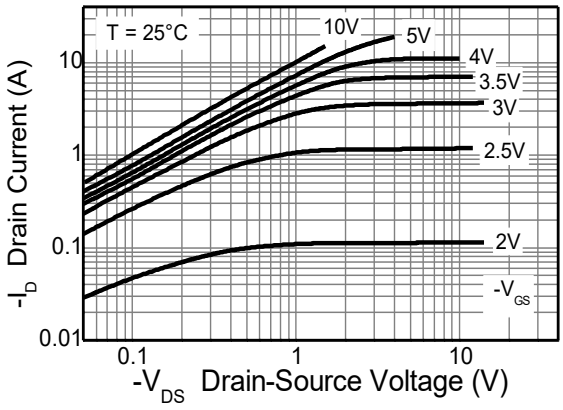
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 9)						
Drain-Source Breakdown Voltage	BV_{DSS}	-60	—	—	V	I_D = -250µA, V_{GS} = 0
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-0.5	µA	V_{DS} = -60V, V_{GS} = 0
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 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, $R_G \cong 6\Omega$
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.

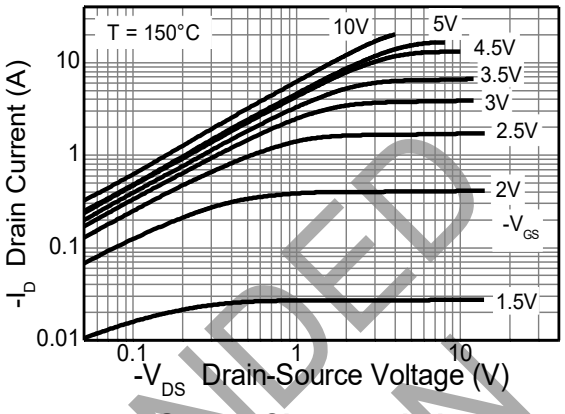
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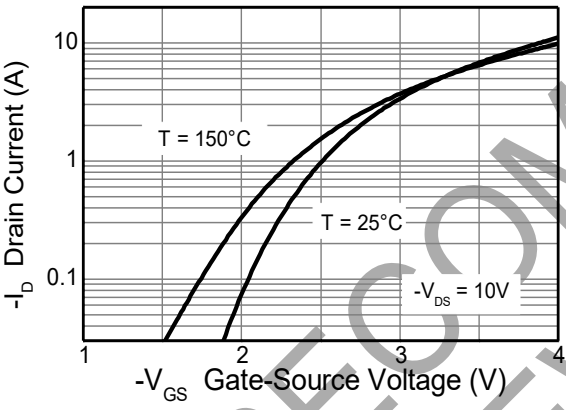
Typical Characteristics



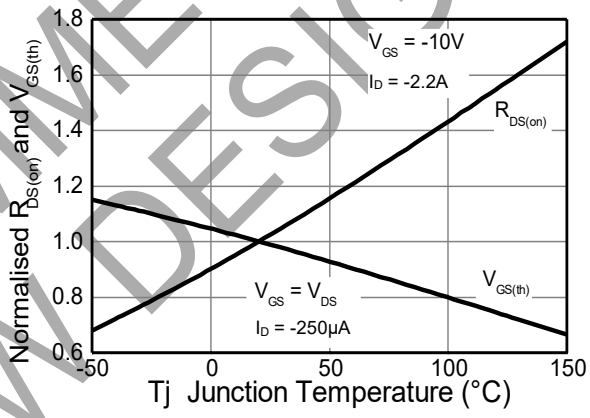
Output Characteristics



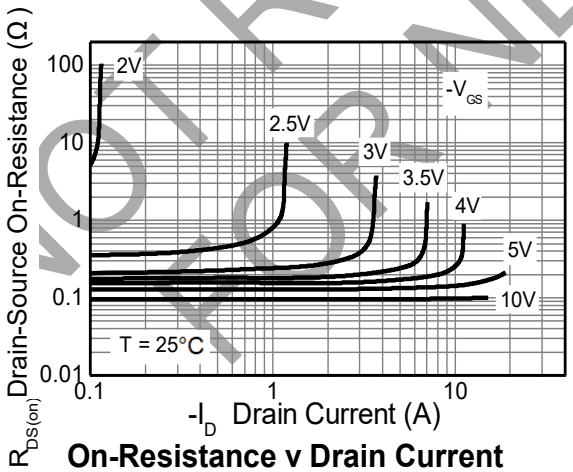
Output Characteristics



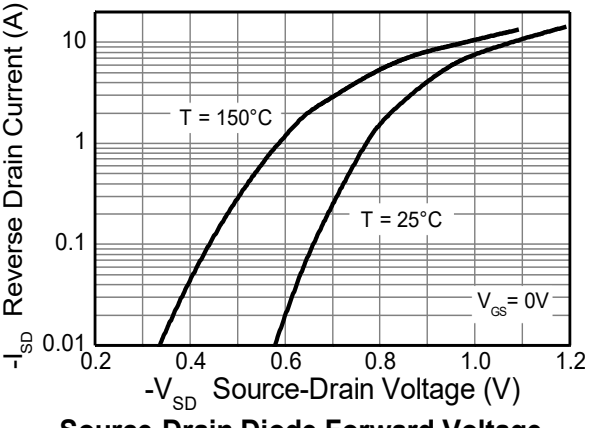
Typical Transfer Characteristics



Normalised Curves v Temperature



On-Resistance v Drain Current

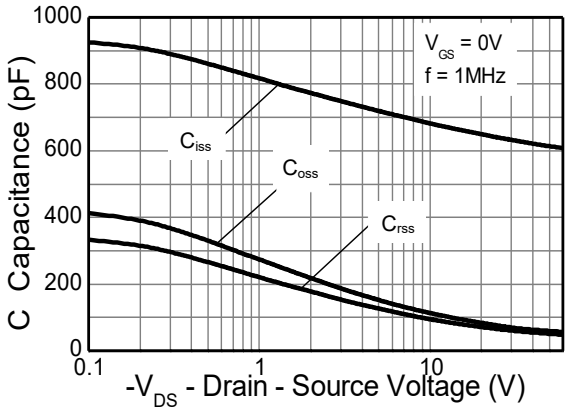


Source-Drain Diode Forward Voltage

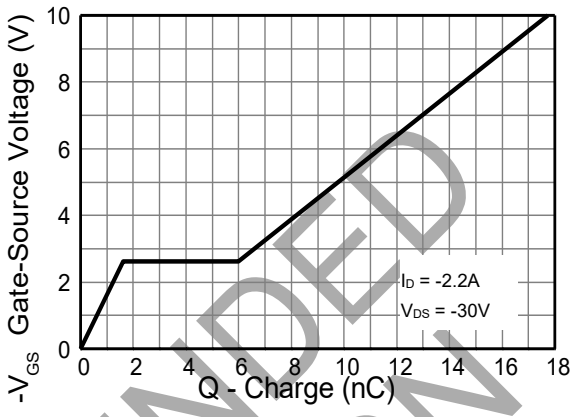
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Typical Characteristics (continued)

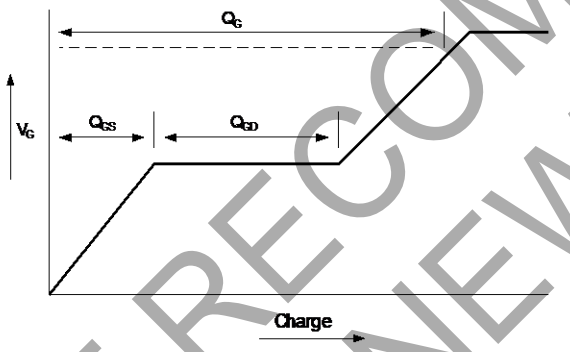


Capacitance v Drain-Source Voltage

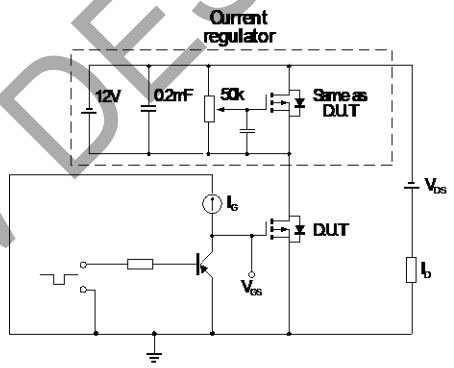


Gate-Source Voltage v Gate Charge

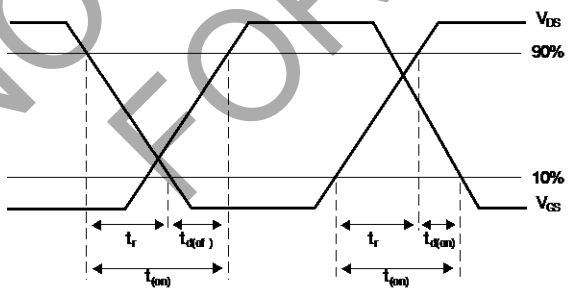
Test Circuits



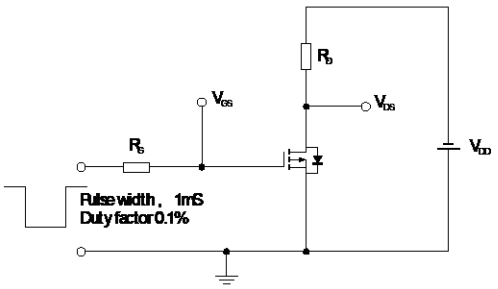
Basic Gate Charge Waveform



Gate Charge Test Circuit



Switching Time Waveform



Switching Time Test Circuit

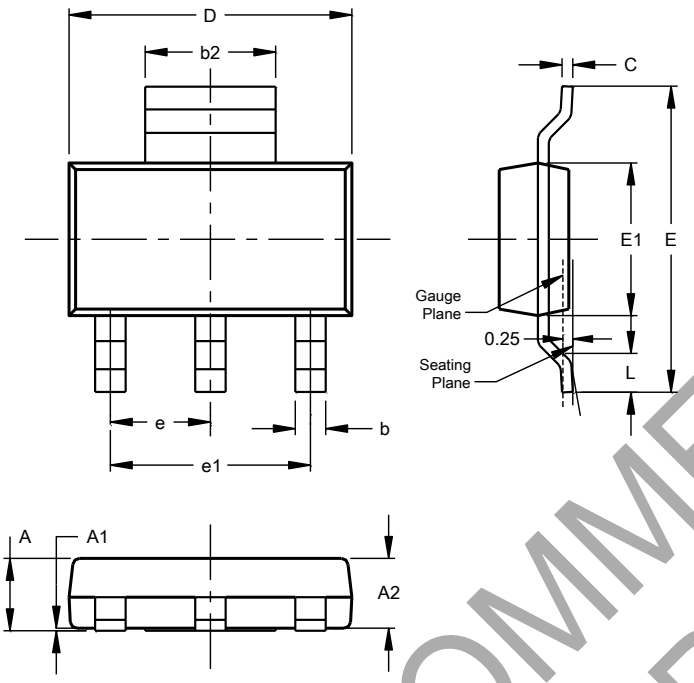
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Package Outline Dimensions

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

SOT223 (Type DN)



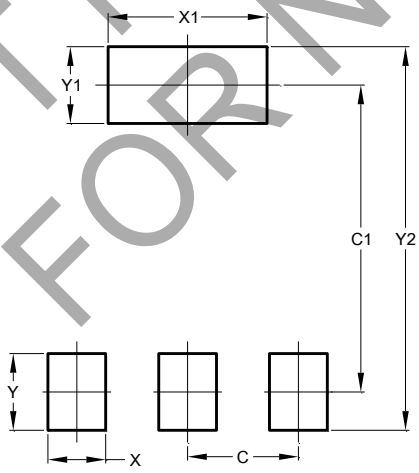
SOT223 (Type DN)			
Dim	Min	Max	Typ
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

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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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