

70V P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$	I_D $T_A = +25^\circ C$
-70V	160mΩ @ $V_{GS} = -10V$	-2.6A
	250mΩ @ $V_{GS} = -4.5V$	-1.6A

Description

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.

Applications

- Motor Control
- Transformer Driving Switch
- DC-DC Converters
- Power Management Functions
- Uninterrupted Power Supply

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)**
- **Qualified to AEC-Q101 Standards for High Reliability**

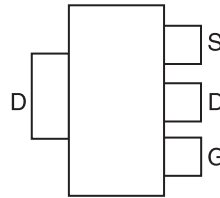
Mechanical Data

- Case: SOT223
- Case 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 lead frame. Solderable per MIL-STD-202, Method 208 (3)
- Weight: 0.112 grams (approximate)

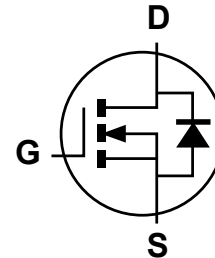
SOT223



Top View



Pin Out - Top View



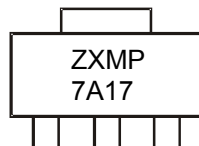
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Qualification	Case	Packaging
ZXMP7A17GTA	Commercial	SOT223	1,000/Tape & Reel
ZXMP7A17GQTA	Automotive	SOT223	1,000/Tape & Reel

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
 2. See http://www.diodes.com/quality/lead_free.html 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 <http://www.diodes.com/products/packages.html>

Marking Information



ZXMP7A17 = Product Type Marking Code

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)			(Note 6)	I _S	-4.8	A
Pulsed Source Current (Body diode)			(Note 7)	I _{SM}	-9.6	A

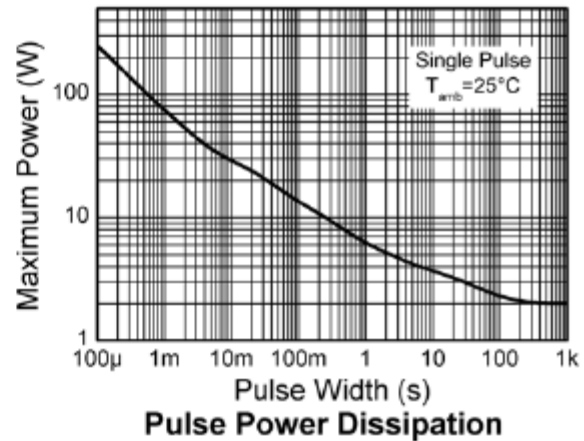
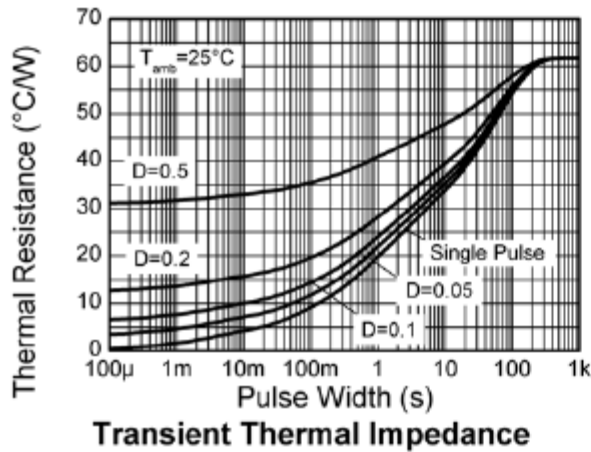
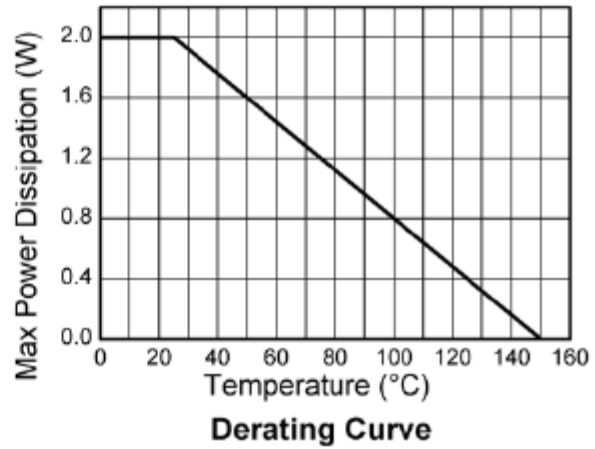
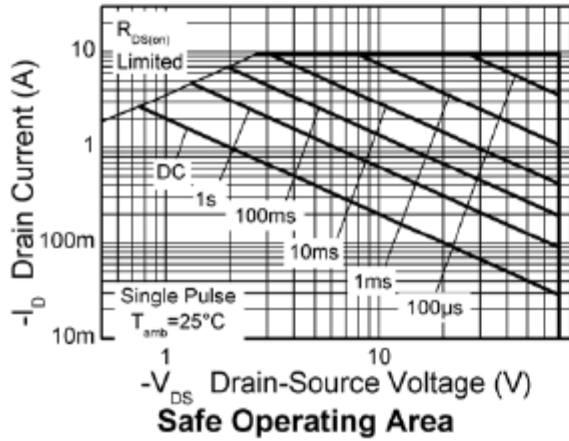
Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

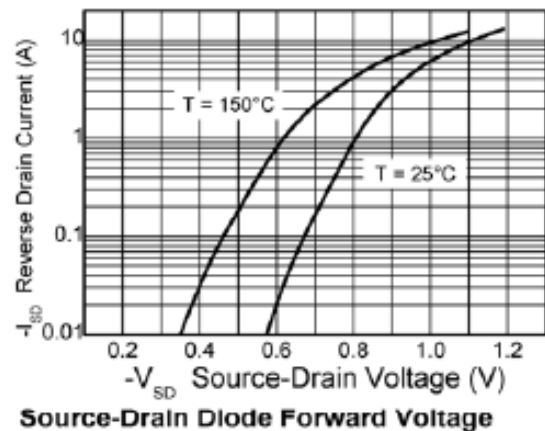
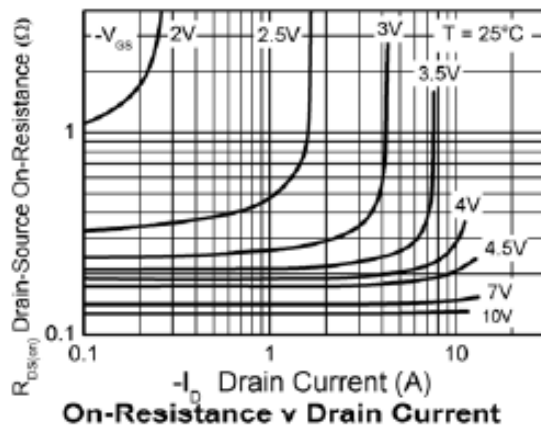
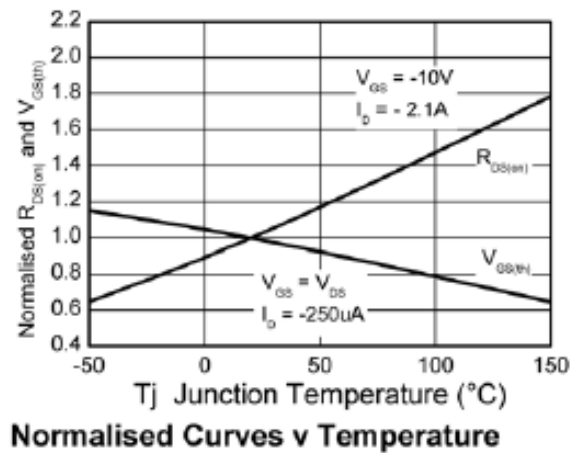
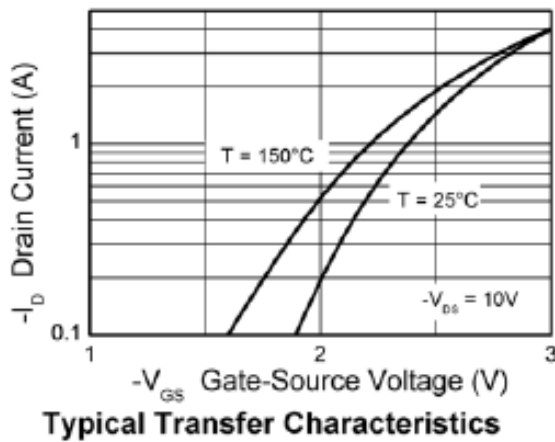
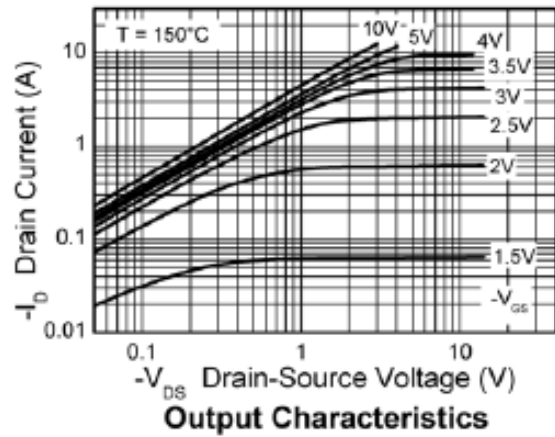
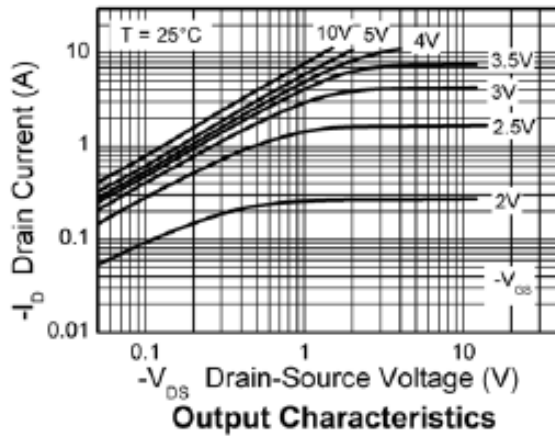
Characteristic		Symbol	Value	Unit
Power dissipation	(Note 5)	P _D	2.0	W
	Linear derating factor		16.0	
			3.9	mW/°C
			31	
Thermal Resistance, Junction to Ambient	(Note 5)	R _{θJA}	62.5	°C/W
	(Note 6)		34	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

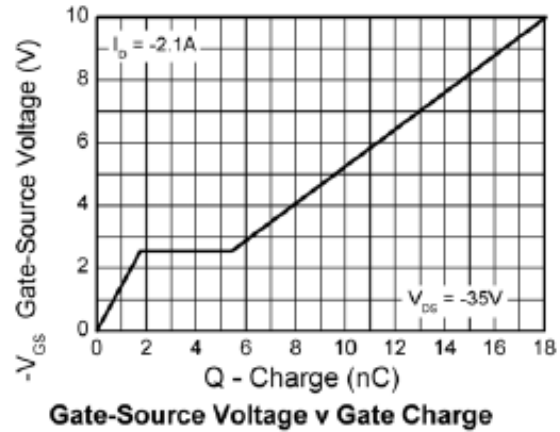
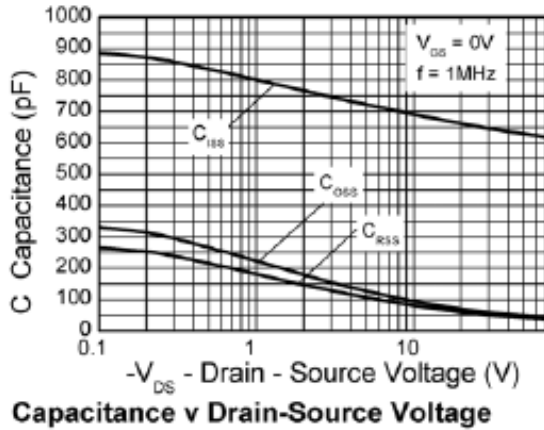
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

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)}	-1.0	—	—	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 V _{GS} = -4.5V, I _D = -1.7A
				0.25		
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 = -2.0A, 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
Total Gate Charge (Note 10)	Q _g	—	18	—	nC	
Gate-Source Charge (Note 10)	Q _{gs}	—	1.77	—	nC	V _{GS} = -10V
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 = 6.0Ω
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	

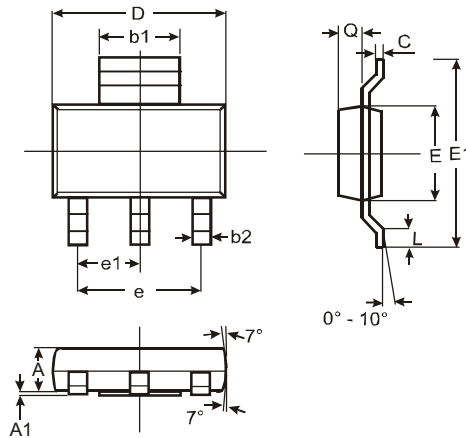
- Notes:
- For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
 - Same as note (6), except the device is measured at t ≤ 5 sec.
 - Same as note (6), except the device 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.





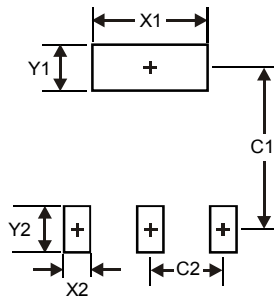


Package Outline Dimensions



SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b1	2.90	3.10	3.00
b2	0.60	0.80	0.70
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	—	—	4.60
e1	—	—	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
X1	3.3
X2	1.2
Y1	1.6
Y2	1.6
C1	6.4
C2	2.3

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