

70V P-CHANNEL ENHANCEMENT MODE MOSFET
Product Summary

BV _{DSS}	R _{DS(on)} max	I _D T _A = +25°C
-70V	160mΩ @ V _{GS} = -10V	-5.7A
	250mΩ @ V _{GS} = -4.5V	-5.3A

Description

This new generation of trench MOSFETs utilizes a unique structure that combines the benefits of low on-resistance with fast switching speed. The ZXMP7A17KQ is ideal for high efficiency, low voltage power management applications.

Applications

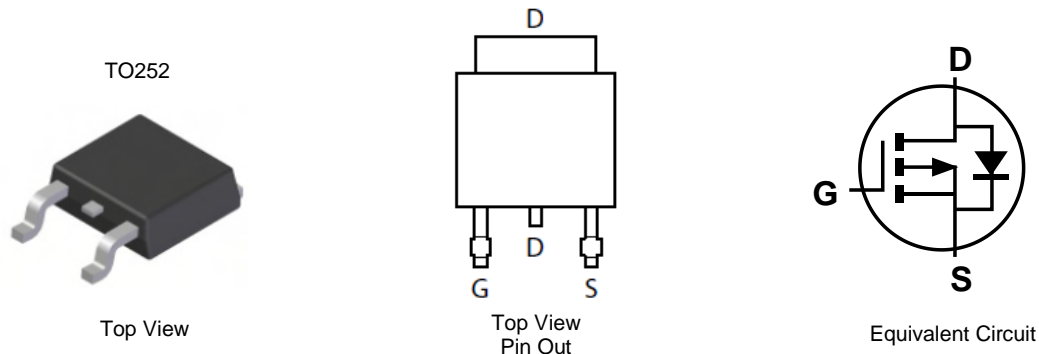
- DC-DC Converters
- Power Management Functions
- Disconnect Switches
- Motor Control
- Class D Audio Output Stages

Features and Benefits

- Low On-Resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Drive
- DPAK Package
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

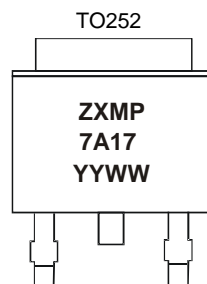
Mechanical Data

- Case: TO252 (DPAK)
- 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 Leadframe; Solderable per MIL-STD-202, Method 208③
- Weight: 0.315 grams (Approximate)


Ordering Information (Note 5)

Part Number	Case	Packaging
ZXMP7A17KQTC	TO252	2,500/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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_grade_definitions/.
 5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information


ZXMP7A17 = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Year (ex: 10 = 2010)
 WW = Week (01 - 53)

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 7)	I _D	-5.7	A	
		T _A = +70°C (Note 7)		-4.6		
		(Note 6)		-3.8		
Pulsed Drain Current	V _{GS} = 10V	(Note 8)	I _{DM}	-17.7	A	
Continuous Source Current (Body diode)			(Note 7)	I _S	-9.2	A
Pulsed Source Current (Body diode)			(Note 8)	I _{SM}	-17.7	A

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

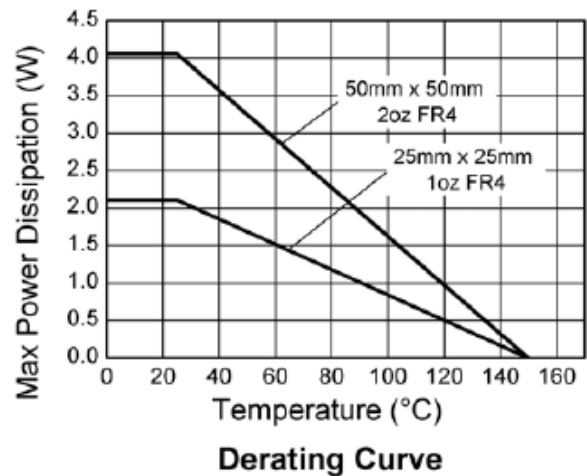
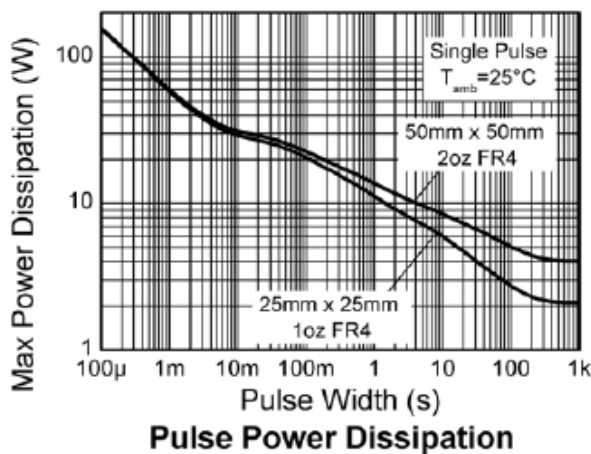
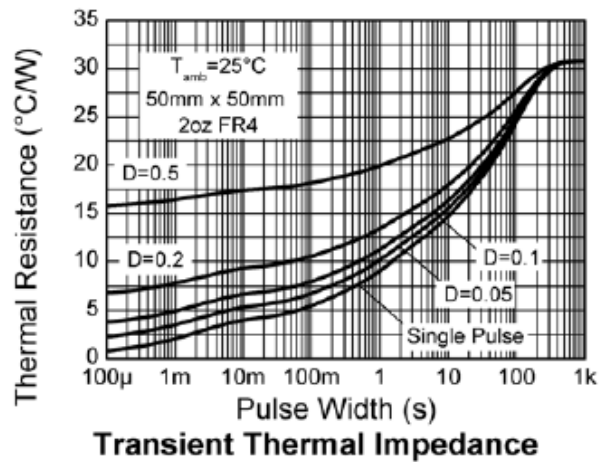
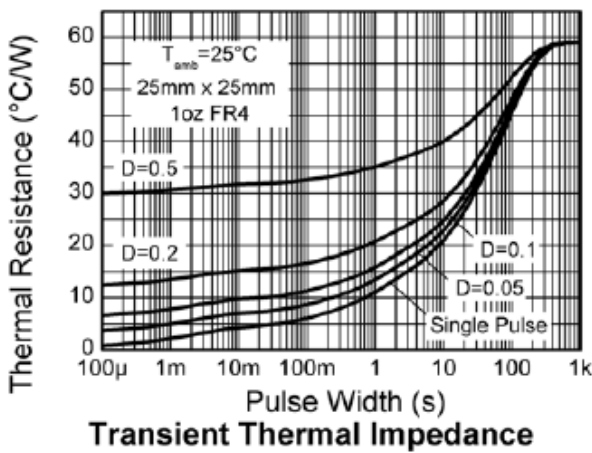
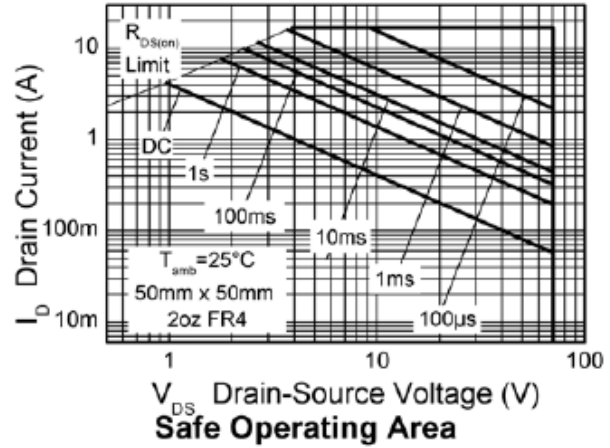
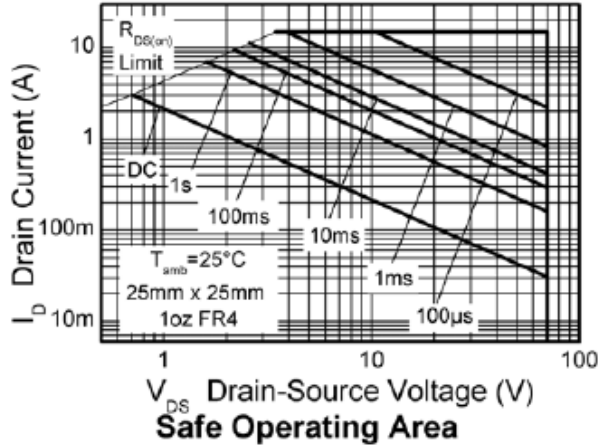
Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 6)	P _D	4.17	W mW/°C
			33.3	
	(Note 7)		9.25	
			74	
	(Note 9)		2.11	
			16.8	
Thermal Resistance, Junction to Ambient	(Note 6)	R _{θJA}	30	°C/W
	(Note 7)		13.5	
	(Note 8)		59.1	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

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

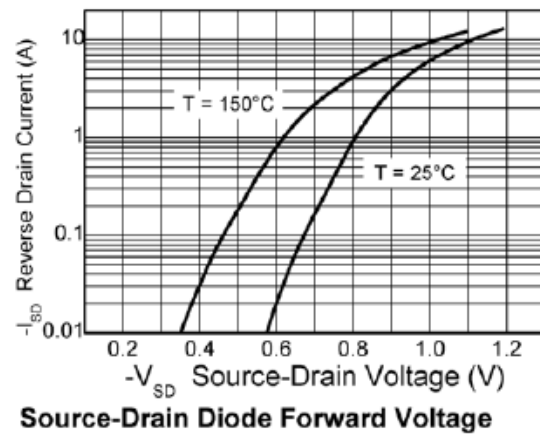
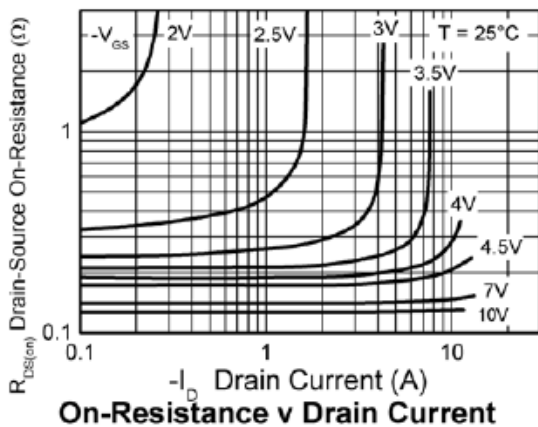
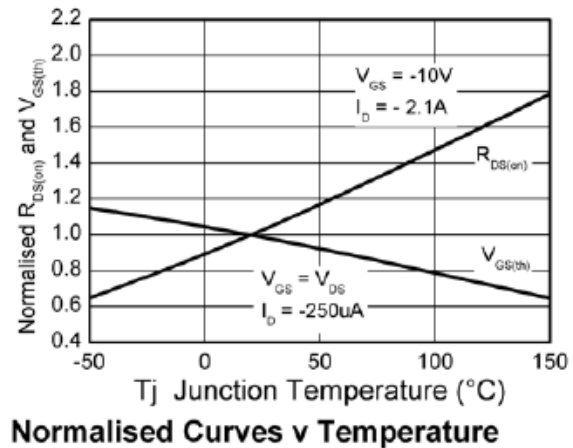
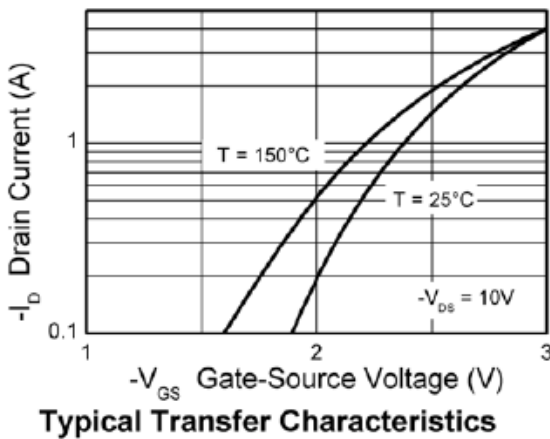
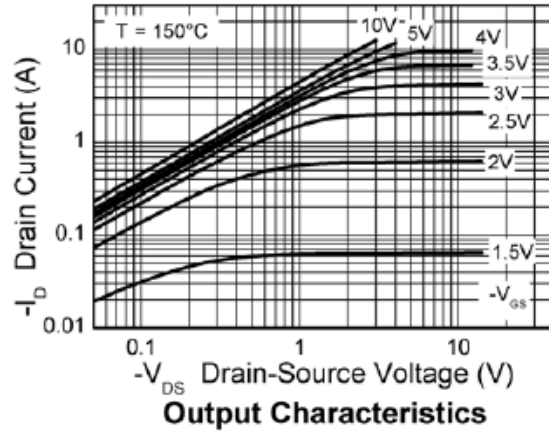
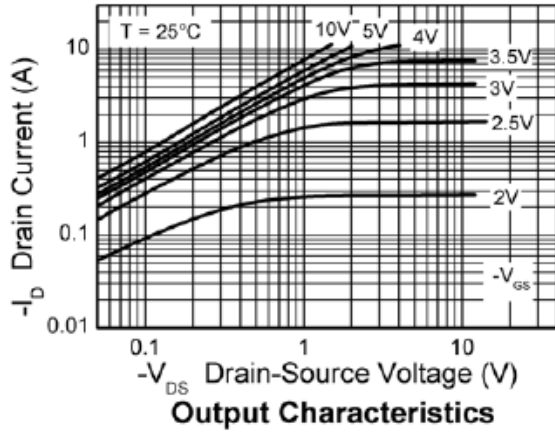
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	-70	—	—	V	I _D = -250μA, V _{GS} = 0V
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1	μA	V _{DS} = -70V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 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 10)	R _{DS(ON)}	—	—	0.16	Ω	V _{GS} = -10V, I _D = -2.1A
				0.25		V _{GS} = -4.5V, I _D = -1.7A
Forward Transconductance (Notes 10 & 11)	g _{fs}	—	4.4	—	S	V _{DS} = -15V, I _D = -2.1A
Diode Forward Voltage (Note 10)	V _{SD}	—	-0.85	-0.95	V	I _S = -2.0A, V _{GS} = 0V, T _J = +25°C
Reverse Recovery Time (Note 11)	t _{rr}	—	29.8	—	ns	I _S = -2.1A, di/dt = 100A/μs
Reverse Recovery Charge (Note 11)	Q _{rr}	—	38.5	—	nC	
DYNAMIC CHARACTERISTICS (Note 11)						
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 12)	Q _g	—	9.6	—	nC	V _{GS} = -5V
Total Gate Charge (Note 12)	Q _g	—	18	—	nC	V _{GS} = -10V V _{DS} = -35V I _D = -2.1A
Gate-Source Charge (Note 12)	Q _{gs}	—	1.77	—	nC	
Gate-Drain Charge (Note 12)	Q _{gd}	—	3.66	—	nC	
Turn-On Delay Time (Note 12)	t _{D(on)}	—	2.5	—	ns	V _{DD} = -35V, V _{GS} = -10V I _D = -1A, R _G ≅ 6.0Ω
Turn-On Rise Time (Note 12)	t _r	—	3.4	—	ns	
Turn-Off Delay Time (Note 12)	t _{D(off)}	—	27.9	—	ns	
Turn-Off Fall Time (Note 12)	t _f	—	8	—	ns	

- Notes:
6. For a device surface mounted on 50mm x 50mm x 1.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions.
 7. For a device surface mounted on FR4 PCB measured at t ≤ 10 sec.
 8. Repetitive rating 50mm x 50mm x 1.6mm FR4 PCB, D=0.02 pulse width=300μs - pulse width limited by maximum junction temperature.
 9. For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
 10. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%.
 11. Switching characteristics are independent of operating junction temperature.
 12. For design aid only, not subject to production testing.

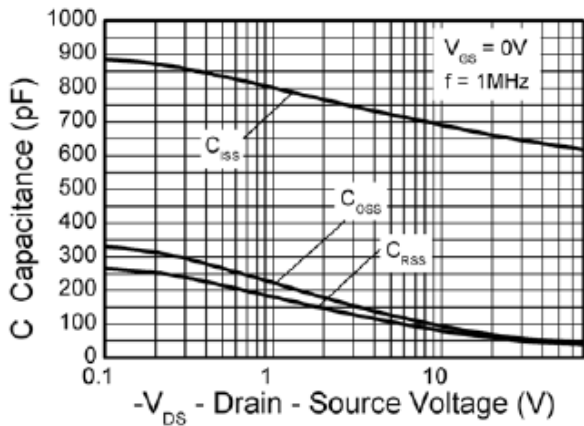
Thermal Characteristics



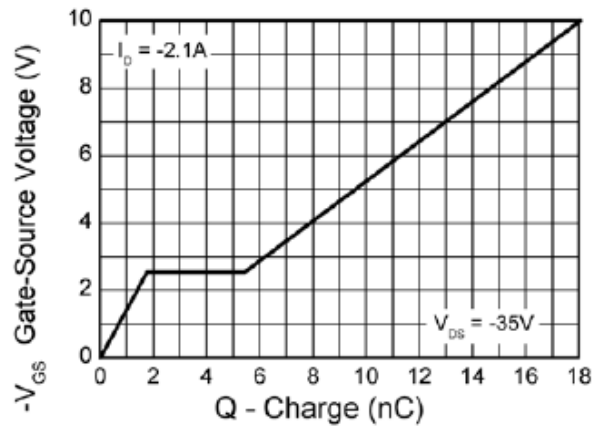
Typical Characteristics



Typical Characteristics (cont.)



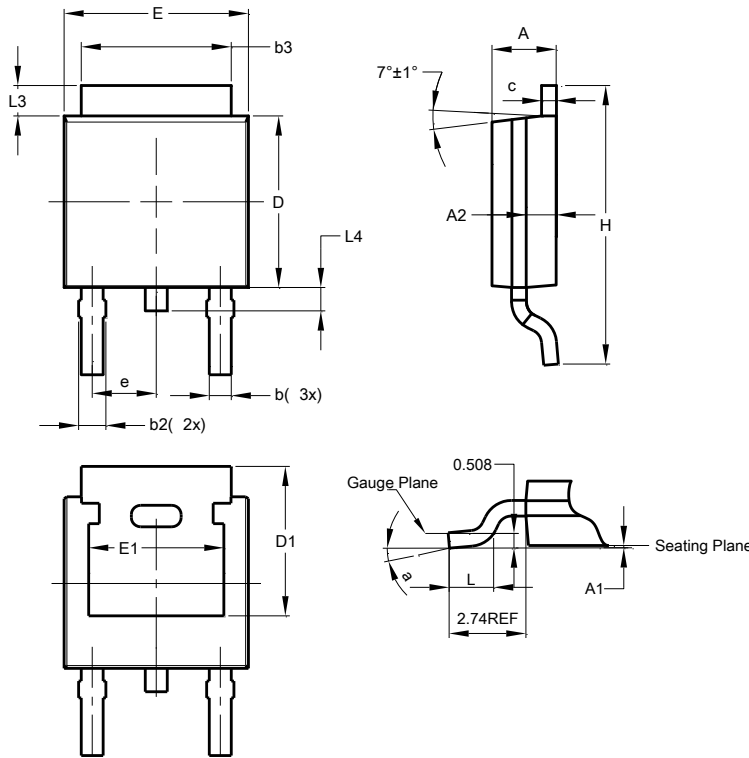
Capacitance v Drain-Source Voltage



Gate-Source Voltage v Gate Charge

Package Outline Dimensions

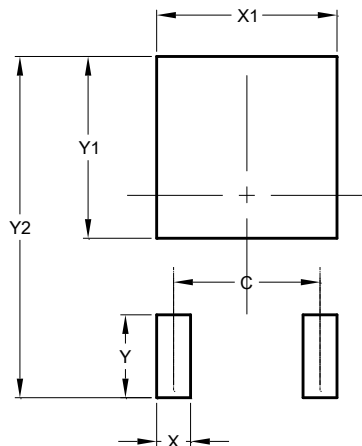
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



TO252 (DPAK)			
Dim	Min	Max	Typ
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	-	-
e	-	-	2.286
E	6.45	6.70	6.58
E1	4.32	-	-
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°	10°	-
All Dimensions in mm			

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



Dimensions	Value (in mm)
C	4.572
X	1.060
X1	5.632
Y	2.600
Y1	5.700
Y2	10.700

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