DISCONTINUED

Lead-free Green

A Product Line of
Diodes Incorporated

ZXMP3F37DN8

30V DUAL P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$ Max	I_D T_A = 25°C (Notes 4 & 6)
-30V	25mΩ @ V_{GS}= -10V	-8.3A
	41mΩ @ V_{GS}= -4.5V	-6.5A

Features and Benefits

- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- **"Lead-Free", RoHS compliant (Note 1)**
- **Halogen and Antimony Free. "Green" Device (Note 1)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Description and Applications

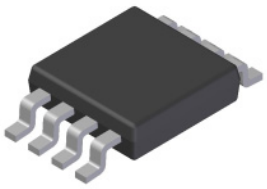
This MOSFET has been designed to minimize the on-state resistance and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- DC-DC Converters
- Power Management functions
- Disconnect Switches
- Motor control

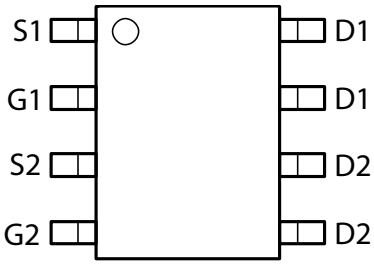
Mechanical Data

- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0 (Note 1)
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish; Solderable per MIL-STD-202, Method 208
- Weight: 0.074 grams (approximate)

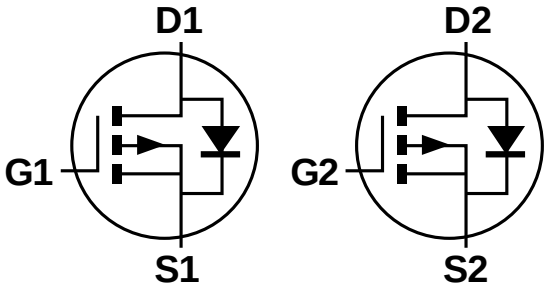
SO-8



Top View



Top View



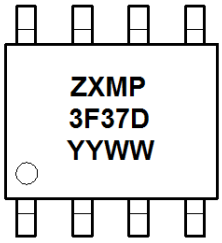
Equivalent Circuit

Ordering Information (Note 1)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXMP3F37DN8TA	ZXMP3F37D	7	12	500

Notes: 1. Diodes, Inc. defines "Green" products as those which are RoHS compliant and contain no halogens or antimony compounds; further information about Diodes Inc.'s "Green" Policy can be found on our website. For packaging details, go to our website.

Marking Information



ZXMP3F37D = Product Type Marking Code
YYWW = Date Code Marking
YY = Year (ex: 11 = 2011)
WW = Week (01 - 53)

Maximum Ratings @T_A = 25°C unless otherwise specified

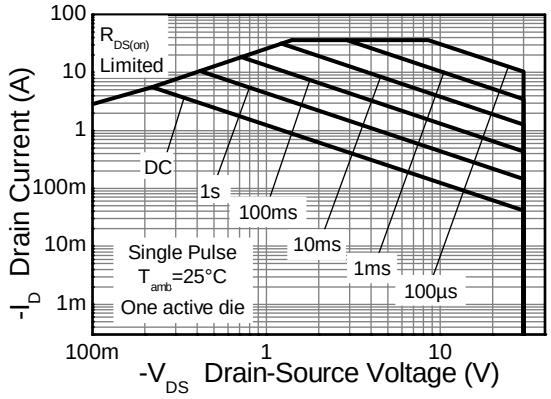
Characteristic			Symbol	Value	Unit
Drain-Source voltage			V_{DSS}	-30	V
Gate-Source voltage			V_{GS}	±20	V
Continuous Drain current	V_{GS} = -10V	(Notes 3 & 5)	I_D	-7.3	A
		T_A = 70°C (Notes 3 & 5)		-5.9	
		(Notes 2 & 5)		-5.7	
		(Note 7)		-8.3	
Pulsed Drain current		(Notes 4)	I_{DM}	-36	A
Continuous Source current (Body diode)		(Notes 3)	I_S	-3.5	A
Pulsed Source current (Body diode)		(Notes 4)	I_{SM}	-36	A

Thermal Characteristics @T_A = 25°C unless otherwise specified

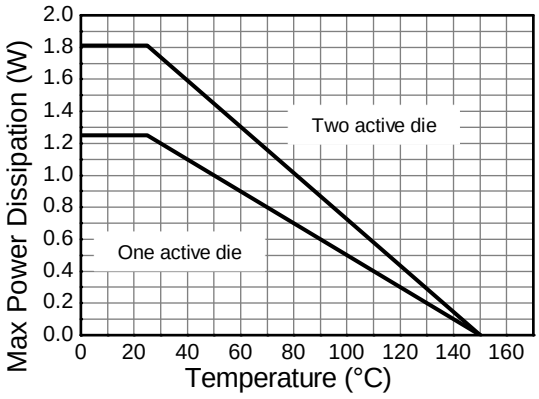
Characteristic		Symbol	Value	Unit
Power dissipation Linear derating factor	(Notes 2 & 5)	P_D	1.25 10.0	W mW/°C
	(Notes 2 & 6)		1.81 14	
	(Notes 3 & 5)		2.1 17	
	(Notes 2 & 7)		2.7 22	
Thermal Resistance, Junction to Ambient	(Notes 2 & 5)	$R_{\theta JA}$	100	°C/W
	(Notes 2 & 6)		70	
	(Notes 3 & 5)		60	
Thermal Resistance, Junction to Lead	(Notes 2 & 7)	$R_{\theta JL}$	46	
Operating and storage temperature range		T_J, T_{STG}	-55 to +150	°C

Notes:
2. 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; the device is measured when operating in a steady-state condition.
3. For a dual device surface mounted on FR4 PCB measured at t ≤ 10 sec.
4. Repetitive rating on 25mm X 25mm FR4 PCB, pulsed with D = 0.02 and pulse width 300µs – pulse width limited by maximum junction temperature.
5. For a dual device with one active die.
6. For a device with two active die running at equal power.
7. Thermal resistance from junction to solder-point (at the end of the drain lead).

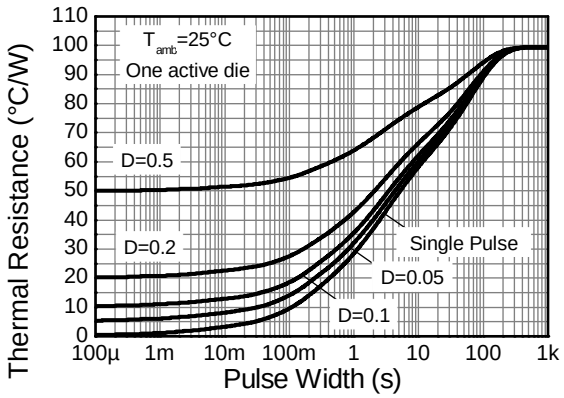
Thermal Characteristics



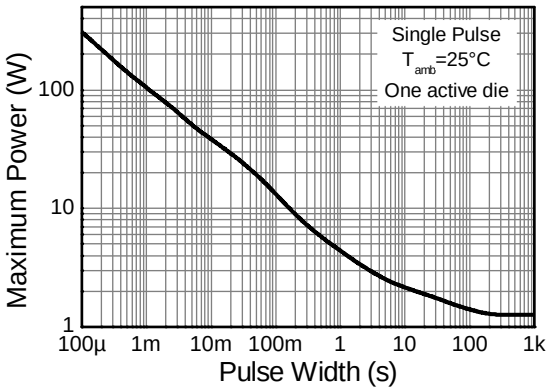
Safe Operating Area



Derating Curve



Transient Thermal Impedance



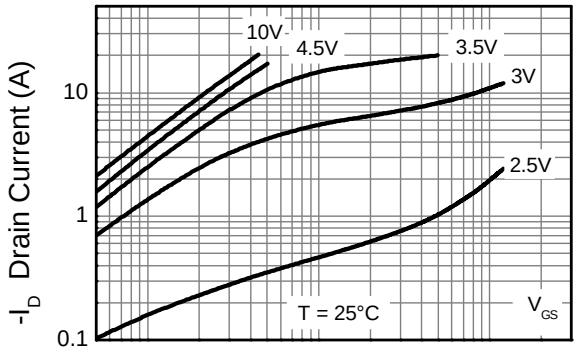
Pulse Power Dissipation

Electrical Characteristics @T_A = 25°C unless otherwise specified

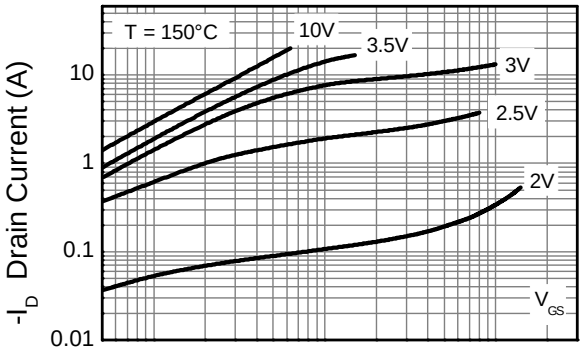
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	-30	—	—	V	I_D = -250μA, V_{GS}= 0V
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-0.5	μA	V_{DS} = -30V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(th)}$	-1.0	—	-3.0	V	I_D = -250μA, V_{DS} = V_{GS}
Static Drain-Source On-Resistance (Note 8)	$R_{DS\ (ON)}$	—	—	25	mΩ	V_{GS} = -10V, I_D = -7.1A
			—	41		V_{GS} = -4.5V, I_D = -5.5A
Forward Transconductance (Notes 8 & 9)	g_{fs}	—	18.6	—	S	V_{DS} = -15V, I_D = -7.1A
Diode Forward Voltage (Note 8)	V_{SD}	—	-0.8	-1.2	V	I_S = -1.7A, V_{GS} = 0V
Reverse recovery time (Note 9)	t_{rr}		16.2	—	ns	I_S = -2.2A, di/dt = 100A/μs
Reverse recovery charge (Note 9)	Q_{rr}	—	10	—	nC	
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	1678	—	pF	V_{DS} = -15V, V_{GS} = 0V f = 1MHz
Output Capacitance	C_{oss}	—	303	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	178	—	pF	
Total Gate Charge (Note 10)	Q_g	—	31.6	—	nC	V_{GS} = -10V, V_{DS} = -15V, I_D = -7.1A
Gate-Source Charge (Note 10)	Q_{gs}	—	4.3	—	nC	
Gate-Drain Charge (Note 10)	Q_{gd}	—	6.2	—	nC	
Turn-On Delay Time (Note 10)	$t_{D(on)}$	—	3.5	—	ns	V_{DD} = -15V, V_{GS} = -10V I_D = -1A, $R_G \cong$ 6.0Ω
Turn-On Rise Time (Note 10)	t_r	—	4.9	—	ns	
Turn-Off Delay Time (Note 10)	$t_{D(off)}$	—	44	—	ns	
Turn-Off Fall Time (Note 10)	t_f	—	28	—	ns	

Notes:
8. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%
9. For design aid only, not subject to production testing.
10. Switching characteristics are independent of operating junction temperatures.

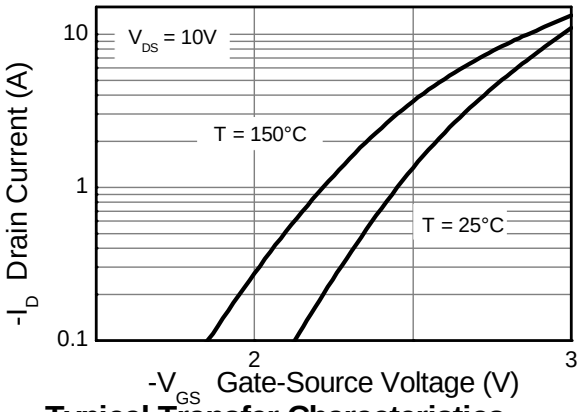
Typical Characteristics



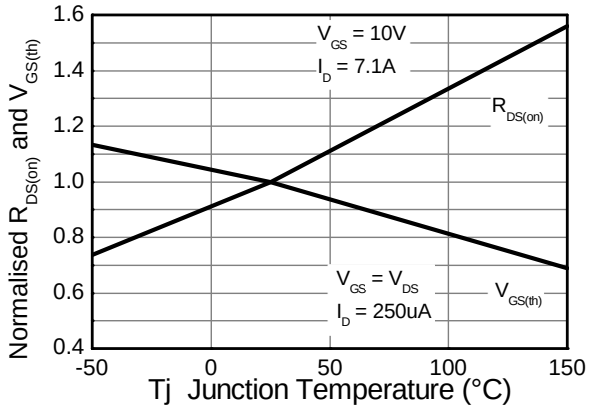
Output Characteristics



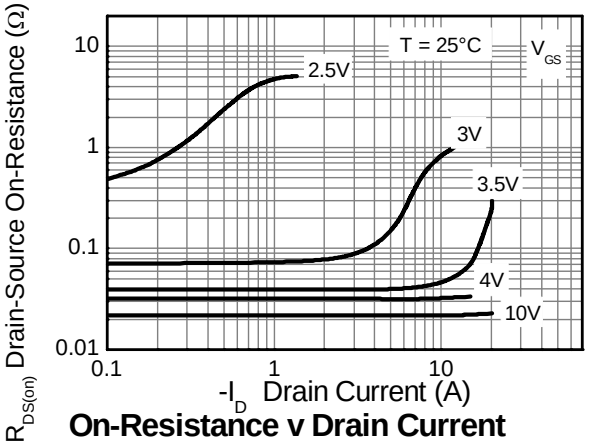
Output Characteristics



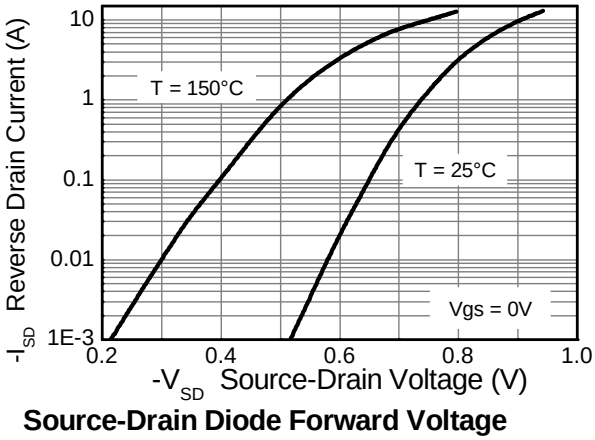
Typical Transfer Characteristics



Normalised Curves v Temperature

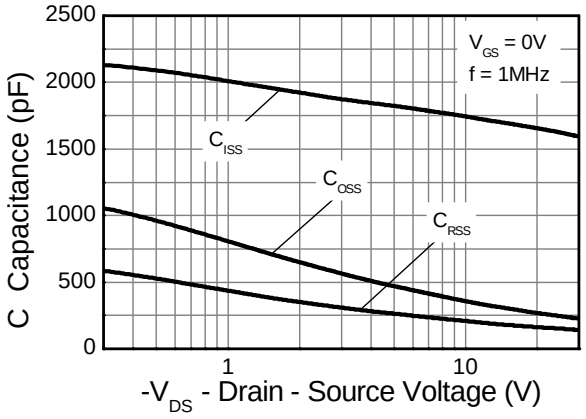


On-Resistance v Drain Current

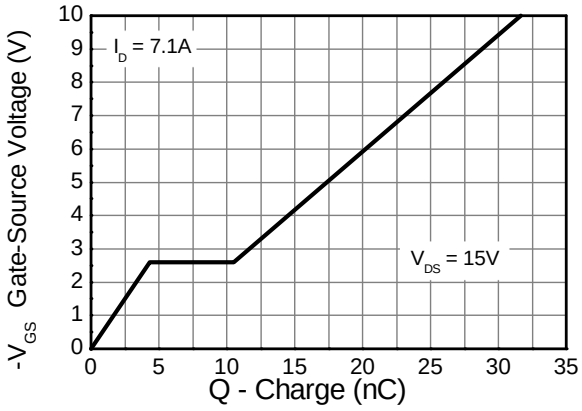


Source-Drain Diode Forward Voltage

Typical Characteristics - continued

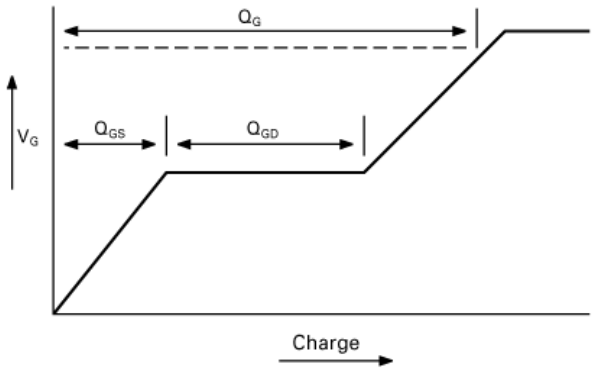


Capacitance v Drain-Source Voltage

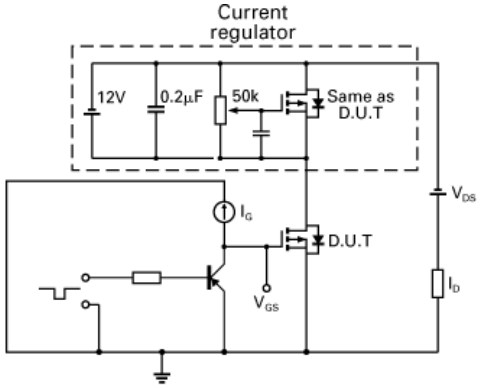


Gate-Source Voltage v Gate Charge

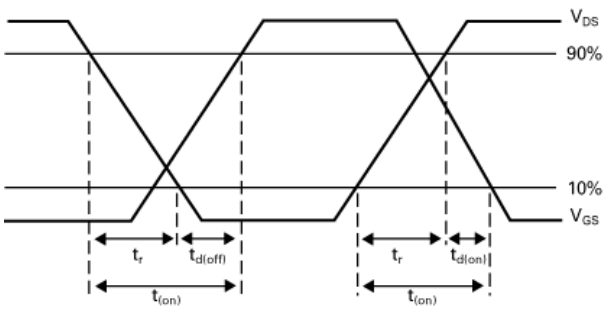
Test Circuits



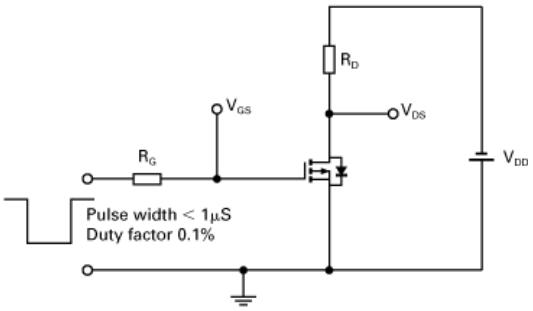
Basic gate charge waveform



Gate charge test circuit

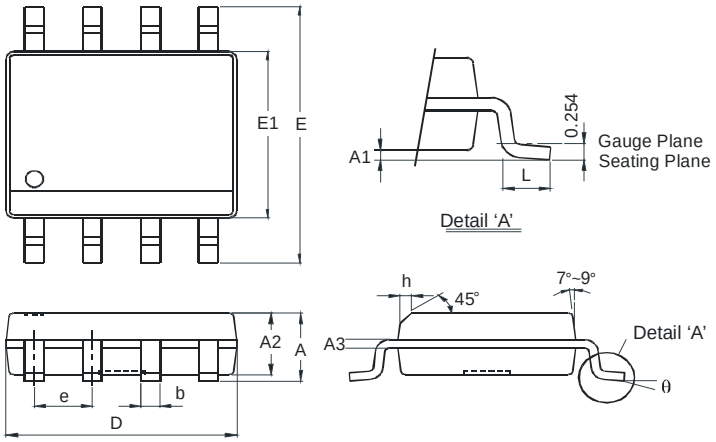


Switching time waveforms



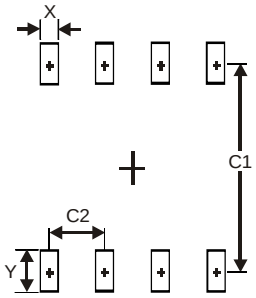
Switching time test circuit

Package Outline Dimensions



SO-8		
Dim	**Min**	**Max**
A	-	1.75
A1	0.10	0.20
A2	1.30	1.50
A3	0.15	0.25
b	0.3	0.5
D	4.85	4.95
E	5.90	6.10
E1	3.85	3.95
e	1.27 Typ	
h	-	0.35
L	0.62	0.82
θ	0°	8°
All Dimensions in mm		

Suggested Pad Layout



Dimensions	Value (in mm)
X	0.60
Y	1.55
C1	5.4
C2	1.27

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