



#### SINGLE P-CHANNEL ENHANCEMENT MODE MOSFET

# **Product Summary**

V <sub>(BR)DSS</sub>	R <sub>DS(ON)</sub> Max	I <sub>D</sub> Max T <sub>A</sub> = +25°C
	11mΩ @ V <sub>GS</sub> = -10V	-13A
-30V	17mΩ @ V <sub>GS</sub> = -4.5V	-9.9A

## **Description**

This MOSFET is designed to minimize the on-state resistance (R<sub>DS(ON)</sub>), yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

# **Applications**

- Backlighting
- Power Management Functions
- DC-DC Converters

# **Features and Benefits**

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- · Fast Switching Speed
- Low Input/Output Leakage
- Totally Lead-Free & Fully 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)

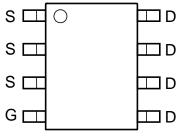
### **Mechanical Data**

- Case: SO-8
- 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
- Terminals: Finish Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (3)
- Weight: 0.074g (Approximate)

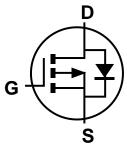
**SO-8** 



Top View



Top View Internal Schematic



**Equivalent Circuit** 

# Ordering Information (Note 5)

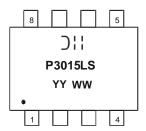
Part Number	Case	Packaging
DMP3015LSSQ-13	SO-8	2,500/Tape & Reel

Notes:

- 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- 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\_compliance\_definitions/.
- 5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.



# **Marking Information**



);;= Manufacturer's Marking
P3015LS = Product Type Marking Code
YYWW = Date Code Marking
YY = Year (ex: 13 = 2013)
WW = Week (01 - 53)

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

Charac	cteristic		Symbol	Value	Units
Drain-Source Voltage			V <sub>DSS</sub>	-30	V
Gate-Source Voltage			V <sub>GSS</sub>	±20	V
Drain Current (Note 6)	Steady State	$T_A = +25$ °C $T_A = +70$ °C	I <sub>D</sub>	-13 -9.75	Α
Pulsed Drain Current (Note 7)			I <sub>DM</sub>	-45	Α

## **Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 6)	$P_{D}$	2.5	W
Thermal Resistance, Junction to Ambient	$R_{ heta JA}$	50	°C/W
Operating and Storage Temperature Range	T <sub>J,</sub> T <sub>STG</sub>	-55 to +150	°C

lotes: 6. Device mounted on 2 oz. Copper pads on FR-4 PCB with  $R_{\theta JA} = +50^{\circ}$ C/W.

7. Pulse width ≤10µS, Duty Cycle ≤1%.

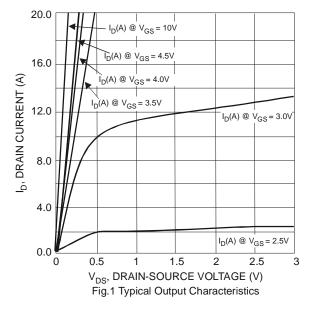


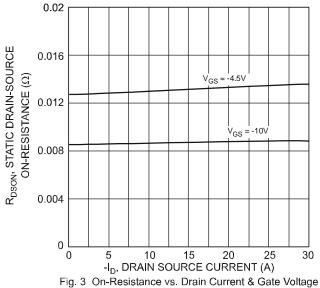
# **Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

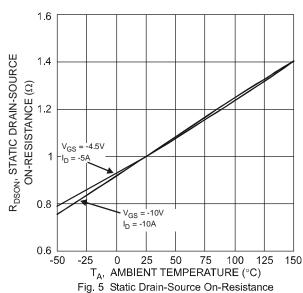
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 8)							
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-30	_		V	$V_{GS} = 0V, I_D = -250\mu A$	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	_	_	-1	μA	$V_{DS} = -30V, V_{GS} = 0V$	
Gate-Source Leakage	I <sub>GSS</sub>	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 8)							
Gate Threshold Voltage	V <sub>GS(th)</sub>	-1		-2	V	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$	
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>		9 14	11 17	mΩ	$V_{GS} = -10V, I_D = -13A$ $V_{GS} = -4.5V, I_D = -10A$	
Forward Transconductance	9fs	_	15	_	S	$V_{DS} = -15V, I_{D} = -8A$	
Diode Forward Voltage (Note 8)	V <sub>SD</sub>	-0.5	_	-1.1	V	$V_{GS} = 0V, I_{S} = -2.1A$	
DYNAMIC CHARACTERISTICS (Note 9)							
Input Capacitance	C <sub>iss</sub>	_	2,748	_	pF	V <sub>DS</sub> = -20V, V <sub>GS</sub> = 0V f = 1.0MHz	
Output Capacitance	Coss	_	357	_	pF		
Reverse Transfer Capacitance	C <sub>rss</sub>	_	356	_	pF	1 = 1.0IVID2	
Gate Resistance	R <sub>G</sub>	_	2.0		Ω	$V_{DS} = 0V$ , $V_{GS} = 0V$ f = 1.0MHz	
SWITCHING CHARACTERISTICS (Note 9)							
Total Gate Charge	Qg	_	30.0 60.4	_		$V_{DS} = -10V$ , $V_{GS} = -4.5V$ , $I_{D} = -13A$ $V_{DS} = -10V$ , $V_{GS} = -10V$ , $I_{D} = -13A$	
Gate-Source Charge	Q <sub>gs</sub>	_	7.2	_	nC	$V_{DS} = -10V, V_{GS} = -10V, I_{D} = -13A$	
Gate-Drain Charge	$Q_{qd}$	_	16.4	_		$V_{DS} = -10V, V_{GS} = -10V, I_{D} = -13A$	
Turn-On Delay Time	t <sub>d(on)</sub>	_	11.2	_			
Rise Time	t <sub>r</sub>	_	12.4	_	nS	$V_{DS} = -15V, V_{GS} = -10V,$	
Turn-Off Delay Time	t <sub>d(off)</sub>	_	104.9	_	115	$I_D = -1A, R_G = 6.0\Omega$	
Fall Time	t <sub>f</sub>		61.7				

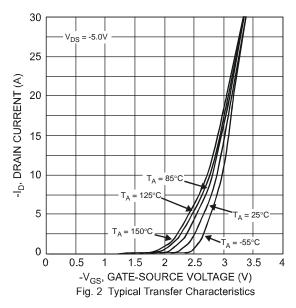
8. Short duration pulse test used to minimize self-heating effect.9. Guaranteed by design. Not subject to product testing. Notes:











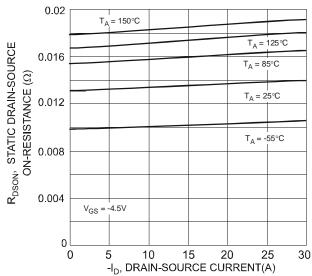
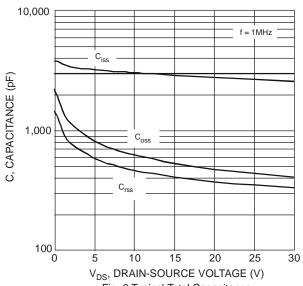


Fig. 4 On-Resistance vs.Drain Current & Gate Voltage





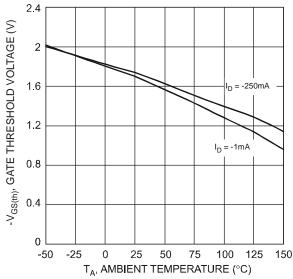


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

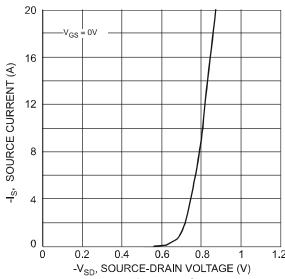
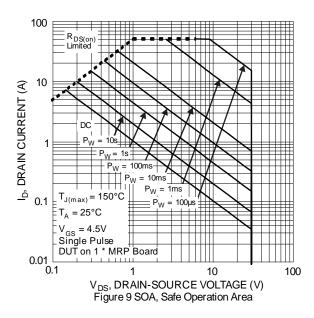
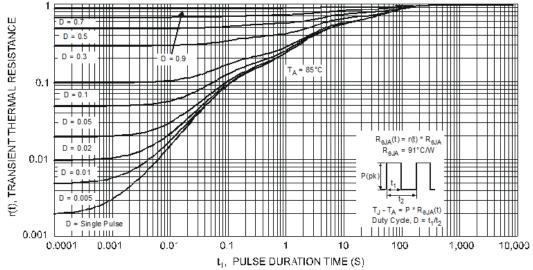


Fig. 8 Forward Drain Current vs. Source-Drain Voltage



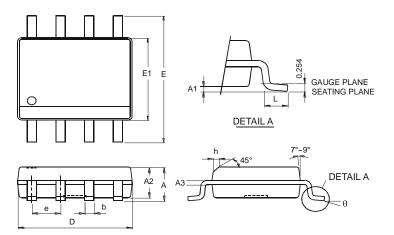




# **Package Outline Dimensions**

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

#### SO-8

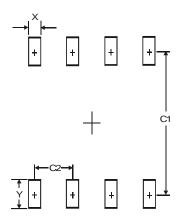


SO-8				
Dim	Min	Max		
Α	_	1.75		
A1	0.08	0.25		
A2	1.30	1.50		
А3	0.20	Тур.		
þ	0.3	0.5		
D	4.80	5.30		
Е	5.79	6.20		
E1	3.70	4.10		
е	1.27 Typ.			
h	_	0.35		
L	0.38	1.27		
θ	0°	8°		
All Dimensions in mm				

# **Suggested Pad Layout**

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

**SO-8** 



Dimensions	Value (in mm)
Х	0.60
Υ	1.55
C1	5.4
C2	1.27



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