

## Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ Max	$I_D$ Max $T_A = +25^\circ\text{C}$
-30V	11m $\Omega$ @ $V_{GS} = -10\text{V}$	-13A
	17m $\Omega$ @ $V_{GS} = -4.5\text{V}$	-9.9A

## Description

This MOSFET is designed to minimize the on-state resistance ( $R_{DS(ON)}$ ), yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

## Applications

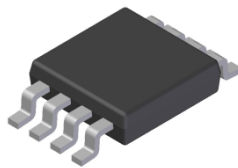
- Backlighting
- Power Management Functions
- DC-DC Converters

## Features and Benefits

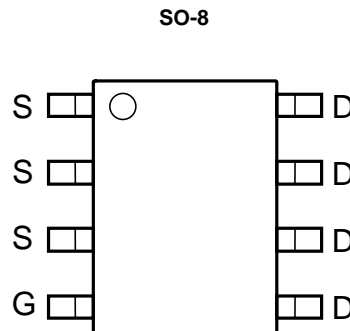
- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

## Mechanical Data

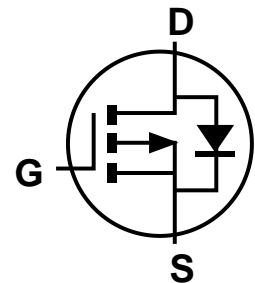
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.074g (Approximate)



Top View



Top View  
Internal Schematic



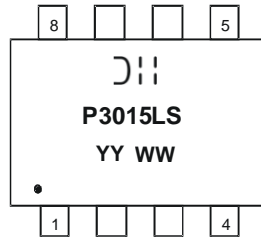
Equivalent Circuit

## 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.
  2. See [http://www.diodes.com/quality/lead\\_free.html](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/](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**



$\text{D}|||$  = Manufacturer's Marking  
 P3015LS = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY = Year (ex: 13 = 2013)  
 WW = Week (01 - 53)

**Maximum Ratings** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic			Symbol	Value	Units
Drain-Source Voltage			$V_{DSS}$	-30	V
Gate-Source Voltage			$V_{GSS}$	$\pm 20$	V
Drain Current (Note 6)	Steady State	$T_A = +25^\circ\text{C}$	$I_D$	-13	A
		$T_A = +70^\circ\text{C}$		-9.75	
Pulsed Drain Current (Note 7)			$I_{DM}$	-45	A

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 6)	$P_D$	2.5	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	50	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

Notes: 6. Device mounted on 2 oz. Copper pads on FR-4 PCB with  $R_{\theta JA} = +50^\circ\text{C/W}$ .  
 7. Pulse width  $\leq 10\mu\text{s}$ , Duty Cycle  $\leq 1\%$ .

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b> (Note 8)						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-30	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	-1	μA	V <sub>DS</sub> = -30V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS</b> (Note 8)						
Gate Threshold Voltage	V <sub>GS(th)</sub>	-1	—	-2	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	—	9 14	11 17	mΩ	V <sub>GS</sub> = -10V, I <sub>D</sub> = -13A V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -10A
Forward Transconductance	g <sub>fs</sub>	—	15	—	S	V <sub>DS</sub> = -15V, I <sub>D</sub> = -8A
Diode Forward Voltage (Note 8)	V <sub>SD</sub>	-0.5	—	-1.1	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = -2.1A
<b>DYNAMIC CHARACTERISTICS</b> (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	C <sub>oss</sub>	—	357	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	356	—	pF	
Gate Resistance	R <sub>G</sub>	—	2.0	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V f = 1.0MHz
<b>SWITCHING CHARACTERISTICS</b> (Note 9)						
Total Gate Charge	Q <sub>g</sub>	—	30.0 60.4	—	nC	V <sub>DS</sub> = -10V, V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -13A V <sub>DS</sub> = -10V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -13A
Gate-Source Charge	Q <sub>gs</sub>	—	7.2	—		V <sub>DS</sub> = -10V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -13A
Gate-Drain Charge	Q <sub>gd</sub>	—	16.4	—		V <sub>DS</sub> = -10V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -13A
Turn-On Delay Time	t <sub>d(on)</sub>	—	11.2	—	nS	V <sub>DS</sub> = -15V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -1A, R <sub>G</sub> = 6.0Ω
Rise Time	t <sub>r</sub>	—	12.4	—		
Turn-Off Delay Time	t <sub>d(off)</sub>	—	104.9	—		
Fall Time	t <sub>f</sub>	—	61.7	—		

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

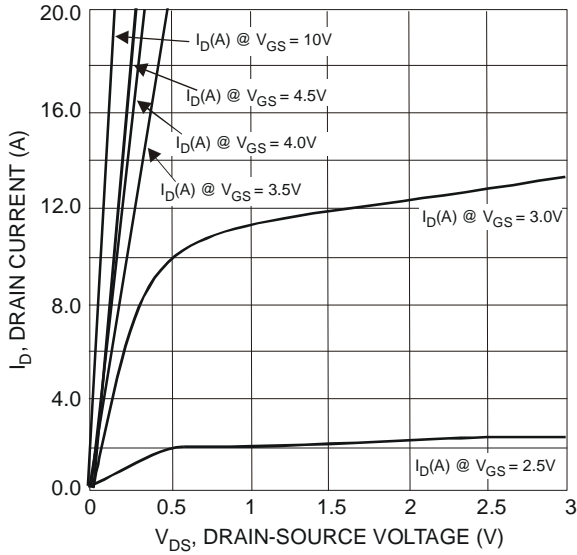


Fig. 1 Typical Output Characteristics

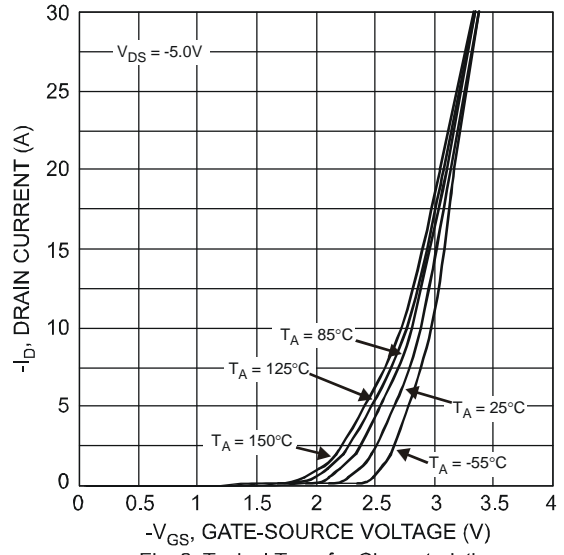


Fig. 2 Typical Transfer Characteristics

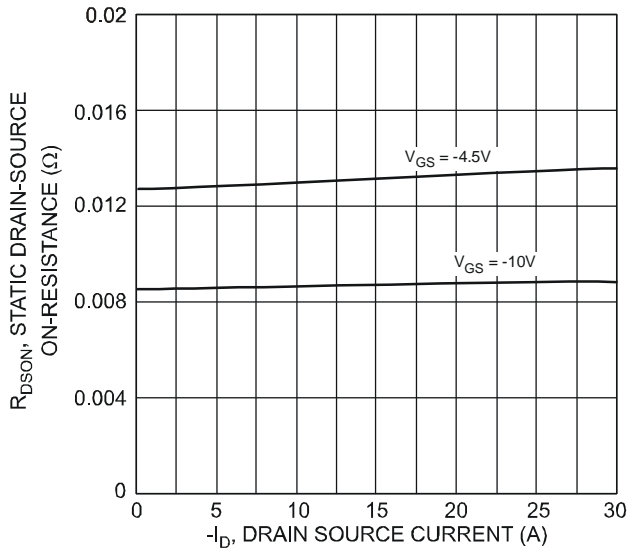


Fig. 3 On-Resistance vs. Drain Current & Gate Voltage

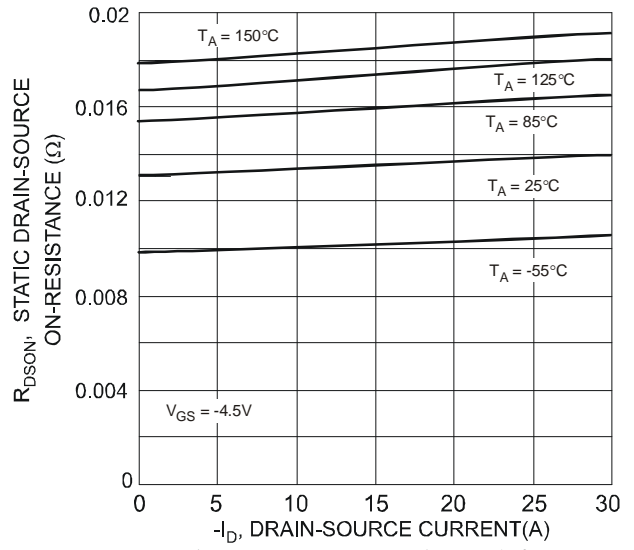


Fig. 4 On-Resistance vs. Drain Current & Gate Voltage

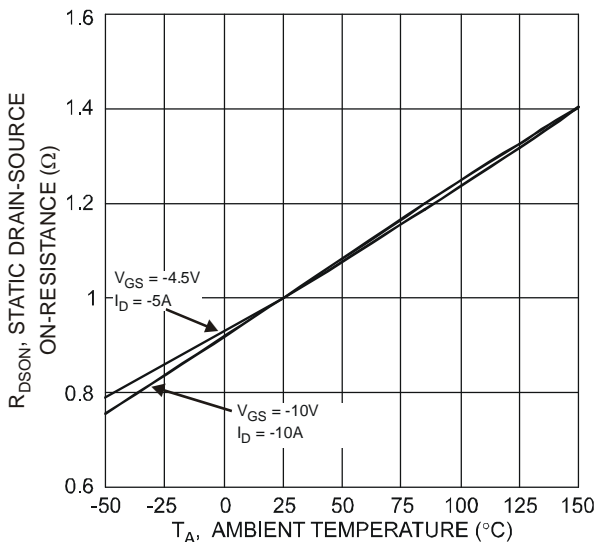


Fig. 5 Static Drain-Source On-Resistance vs. Ambient Temperature

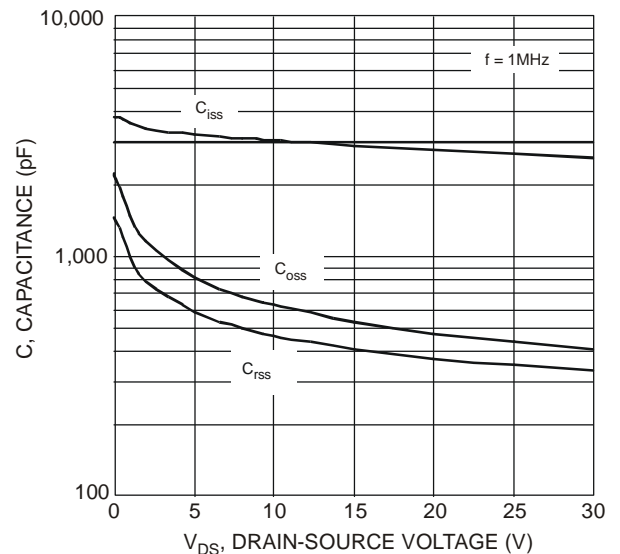


Fig. 6 Typical Total Capacitance

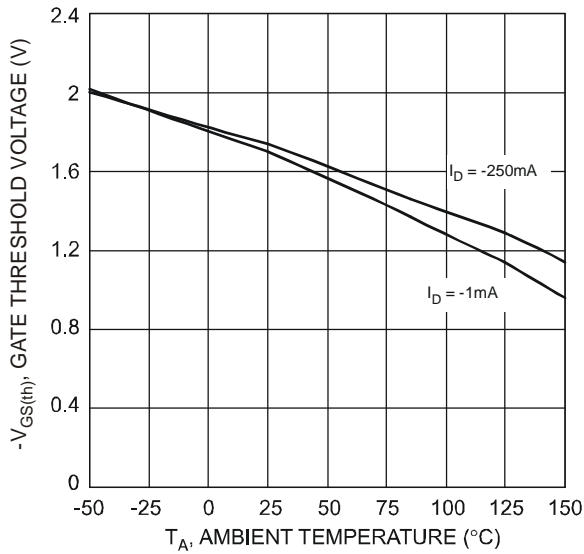


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

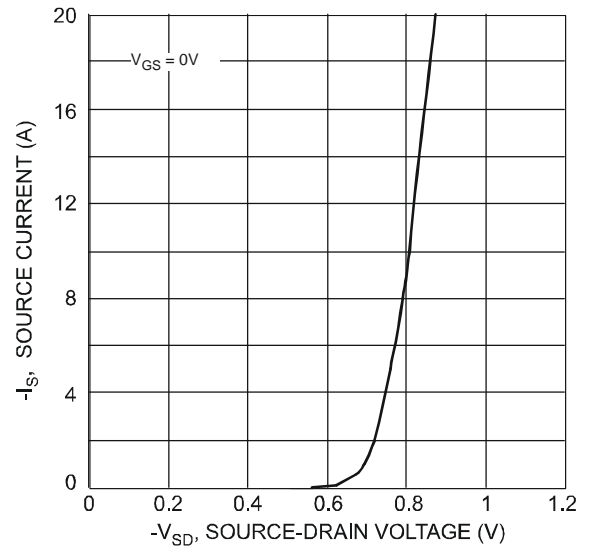


Fig. 8 Forward Drain Current vs. Source-Drain Voltage

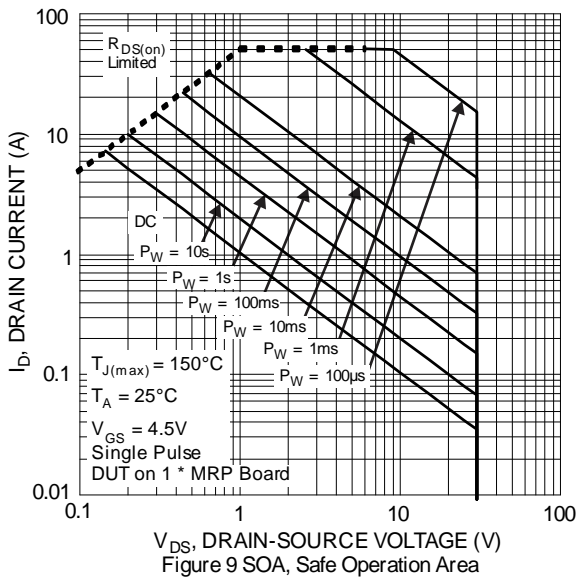


Figure 9 SOA, Safe Operation Area

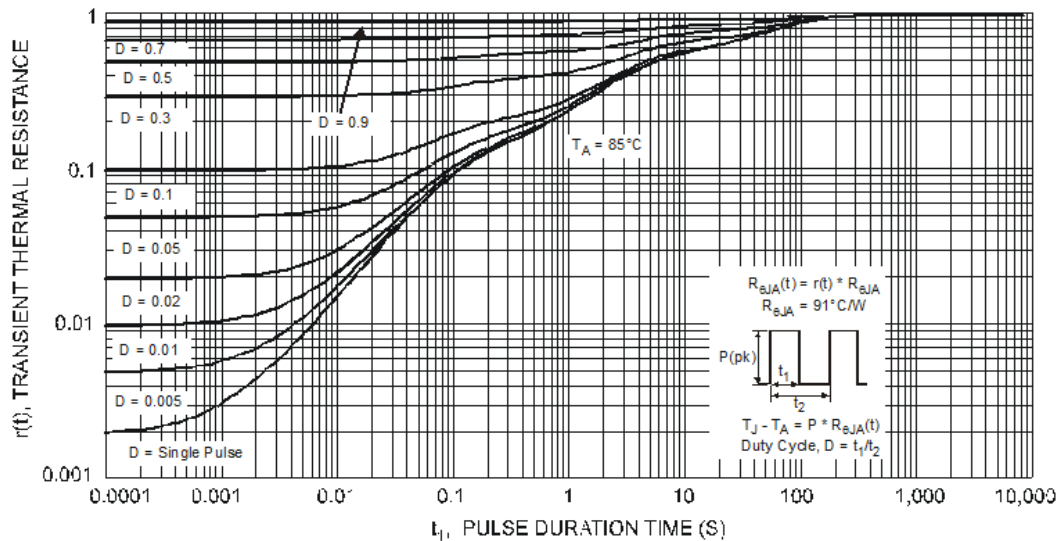
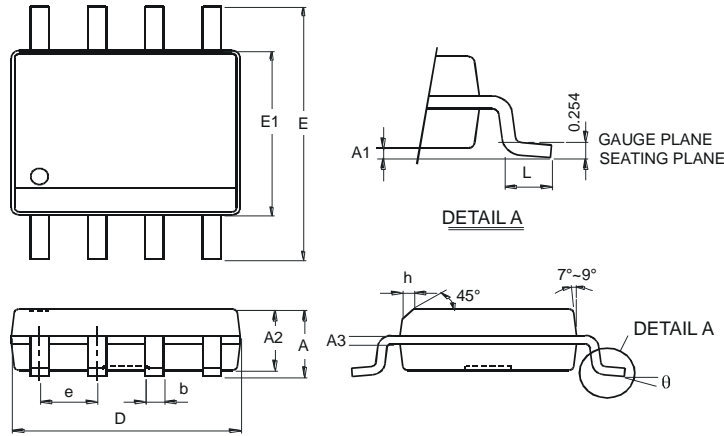


Fig. 10 Transient Thermal Resistance

**Package Outline Dimensions**

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

SO-8

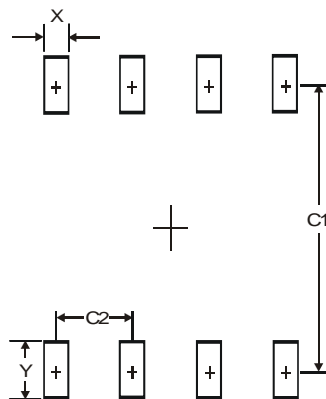


SO-8		
Dim	Min	Max
A	—	1.75
A1	0.08	0.25
A2	1.30	1.50
A3	0.20 Typ.	
b	0.3	0.5
D	4.80	5.30
E	5.79	6.20
E1	3.70	4.10
e	1.27 Typ.	
h	—	0.35
L	0.38	1.27
θ	0°	8°
All Dimensions in mm		

**Suggested Pad Layout**

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

SO-8



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

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