



#### N-CHANNEL ENHANCEMENT MODE MOSFET

### **Product Summary**

BV <sub>DSS</sub>	R <sub>DS(ON)</sub> max	I <sub>D</sub> max T <sub>A</sub> = +25°C			
30V	$14m\Omega @ V_{GS} = 10V$	8.6A			
307	20mΩ @ V <sub>GS</sub> = 4.5V	7.1A			

### **Description**

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

### **Applications**

- Backlighting
- Power Management Functions
- DC-DC Converters

### **Features**

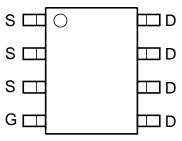
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability
- PPAP Capable (Note 4)

### **Mechanical Data**

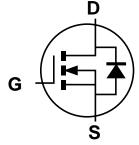
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound.
   UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram
- Terminals: Finish Matte Tin Annealed over Copper Leadframe.
   Solderable per MIL-STD-202, Method 208 (3)
- Weight: 0.072g (Approximate)



Top View



Top View Internal Schematic



**Equivalent Circuit** 

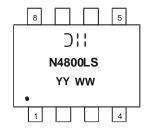
### **Ordering Information (Note 5)**

Part Number	Case	Packaging
DMN4800LSSQ-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 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. Refer to http://www.diodes.com/product\_compliance\_definitions.html.
- 5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

## **Marking Information**



O!! = Manufacturer's Marking
N4800LS = Product Type Marking Code
YYWW = Date Code Marking
YY = Year (ex: 13 = 2013)
WW = Week (01 - 53)



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

Characteristic	Symbol	Value	Units		
Drain-Source Voltage	V <sub>DSS</sub>	30	V		
Gate-Source Voltage	$V_{GSS}$	±25	V		
Continuous Prais Current (Note 7) / 40/	Steady State	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I <sub>D</sub>	8.6 6.3	А
Continuous Drain Current (Note 7) V <sub>GS</sub> = 10V	t<10s	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I <sub>D</sub>	11.8 9.0	А
Maximum Body Diode Forward Current (Note 7)			I <sub>S</sub>	2.4	Α
Pulsed Drain Current (Note 8)	I <sub>DM</sub>	50	Α		

### **Thermal Characteristics**

Characteristic	Symbol	Value	Units		
Total Power Dissipation (Note 6)	$T_A = +25^{\circ}C$	0	1.46	W	
Total Power Dissipation (Note 6)	$T_A = +70^{\circ}C$	P <sub>D</sub>	0.9		
Thermal Resistance, Junction to Ambient (Note 6)	Steady state	5	86	- °C/W	
Thermal Resistance, Junction to Ambient (Note 6)	t<10s	$-$ R <sub><math>\theta</math>JA</sub>	46		
Total Power Dissipation (Note 7)	$T_A = +25$ °C	D-	1.7	W	
Total Fower Dissipation (Note 1)	$T_A = +70^{\circ}C$	P <sub>D</sub>	1.0	VV	
Thermal Resistance, Junction to Ambient (Note 7)	Steady state	5	75		
Thermal Resistance, Junction to Ambient (Note 7)	t<10s	$-$ R <sub><math>\theta</math>JA</sub>	40	°C/W	
Thermal Resistance, Junction to Case (Note 7)		$R_{ heta JC}$	15		
Operating and Storage Temperature Range	$T_{J_i} T_{STG}$	-55 to +150	°C		

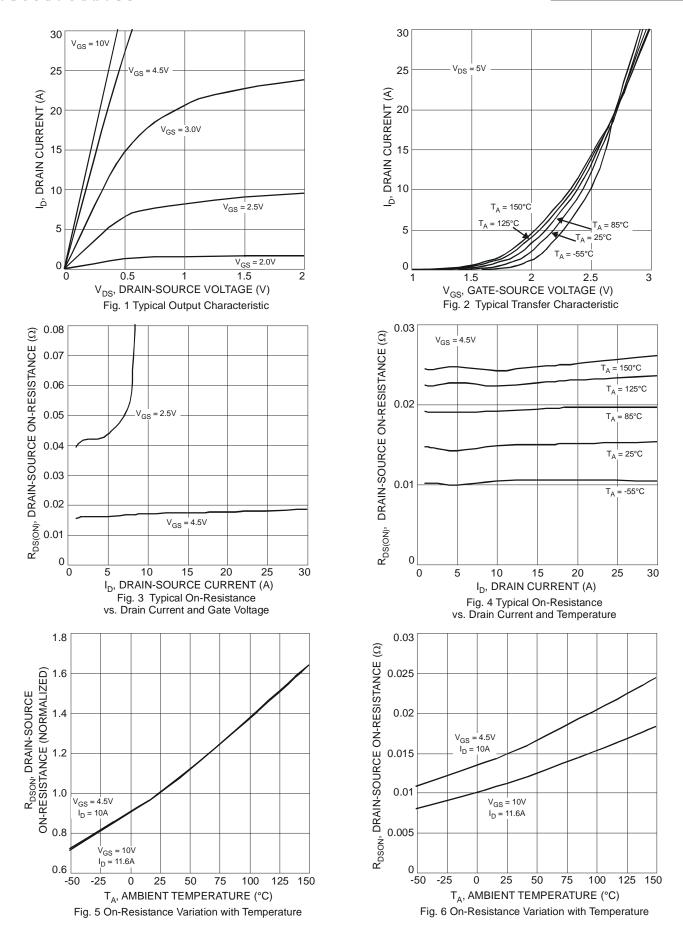
## **Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 9)						
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	μΑ	$V_{DS} = 30V, V_{GS} = 0V$
Gate-Source Leakage	I <sub>GSS</sub>	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 9)						
Gate Threshold Voltage	V <sub>GS(th)</sub>	0.8	1.2	1.6	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$
Static Drain-Source On-Resistance	D		11	14	mΩ	$V_{GS} = 10V, I_D = 9A$
Static Diani-Source On-Resistance	R <sub>DS (ON)</sub>		14	20		$V_{GS} = 4.5V, I_D = 7A$
Forward Transconductance	9 <sub>fs</sub>	_	8		S	$V_{DS} = 10V, I_D = 9A$
Diode Forward Voltage	$V_{SD}$	_	0.72	0.94	V	$V_{GS} = 0V, I_{S} = 1A$
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C <sub>iss</sub>	_	798		pF	V 40V V 0V
Output Capacitance	Coss	_	128	_	pF	$V_{DS} = 10V, V_{GS} = 0V$ - f = 1.0MHz
Reverse Transfer Capacitance	C <sub>rss</sub>	_	122	_	pF	
Gate Resistance	$R_{G}$	_	1.37	_	Ω	$V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz$
Total Gate Charge	Qg	_	8.7	_		
Gate-Source Charge	$Q_{gs}$	_	1.7	_	nC	$V_{GS} = 5V, V_{DS} = 15V, I_D = 9A$
Gate-Drain Charge	$Q_{gd}$	_	2.4	_		
Turn-On Delay Time	t <sub>d(on)</sub>	_	5.03	_		
Rise Time	t <sub>r</sub>		4.50	_	no	$V_{DD} = 15V, V_{GEN} = 10V,$
Turn-Off Delay Time	t <sub>d(off)</sub>		26.33	_	ns $R_L = 15\Omega$ , $R_G = 6.0\Omega$ , $I_D =$	
Fall Time	t <sub>f</sub>	_	8.55	_		

Notes:

- 6. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
- 7. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout.
- 8. Repetitive rating, pulse width limited by junction temperature.
- 9. Short duration pulse test used to minimize self-heating effect.
- 10. Guaranteed by design. Not subject to product testing.







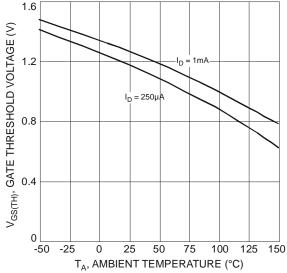
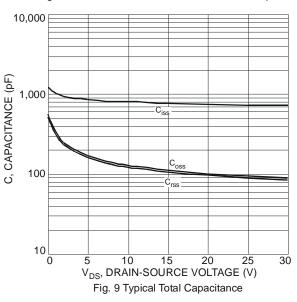


Fig. 7 Gate Threshold Variation vs. Ambient Temperature



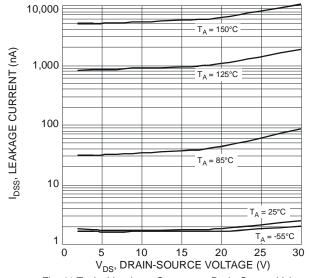
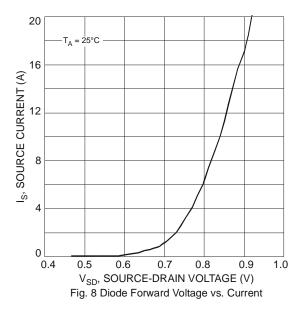
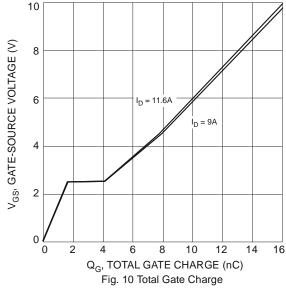
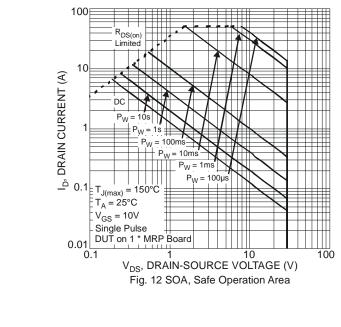


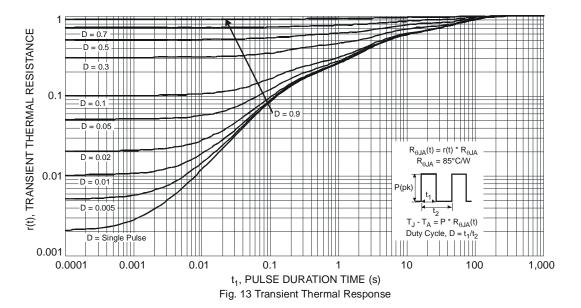
Fig. 11 Typical Leakage Current vs. Drain-Source Voltage





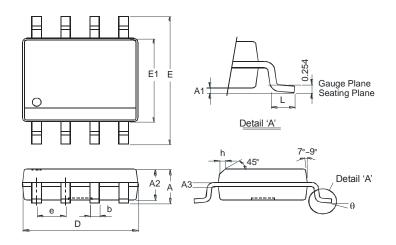






## **Package Outline Dimensions**

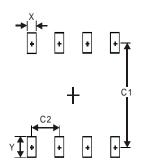
Please see http://www.diodes.com/package-outlines.html for the latest version.



SO-8					
Dim	Min	Max			
Α	-	1.75			
A1	0.10	0.20			
A2	1.30	1.50			
А3	0.15	0.25			
b	0.3	0.5			
D	4.85	4.95			
Е	5.90	6.10			
E1	3.85 3.95				
е	1.27 Typ				
h	-	0.35			
L	0.62	0.82			
θ	0°	8°			
All Dimensions in mm					

# **Suggested Pad Layout**

Please see http://www.diodes.com/package-outlines.html for the latest version.



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



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