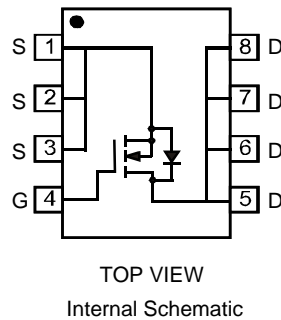
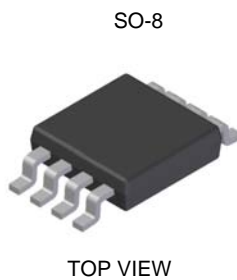


## Features

- Low On-Resistance
  - 8mΩ @ V<sub>GS</sub> = 10V
  - 9mΩ @ V<sub>GS</sub> = 4.5V
  - 12mΩ @ V<sub>GS</sub> = 2.5V
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Lead Free By Design/RoHS Compliant (Note 2)**
- **"Green" Device (Note 4)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## 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 lead frame. Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 4
- Ordering Information: See Page 4
- Weight: 0.072 grams (approximate)



## Maximum Ratings @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V <sub>DSS</sub>	20	V
Gate-Source Voltage			V <sub>GSS</sub>	±12	V
Drain Current (Note 1)	Steady State	T <sub>A</sub> = 25°C	I <sub>D</sub>	12	A
		T <sub>A</sub> = 70°C		9.6	
Pulsed Drain Current (Note 3)			I <sub>DM</sub>	42	A

## Thermal Characteristics

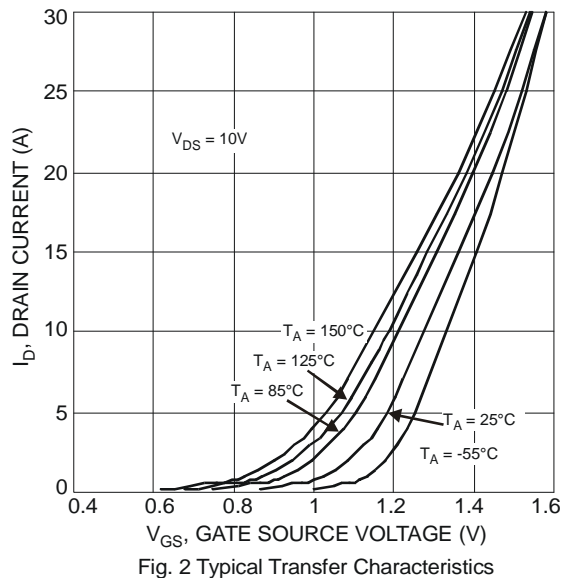
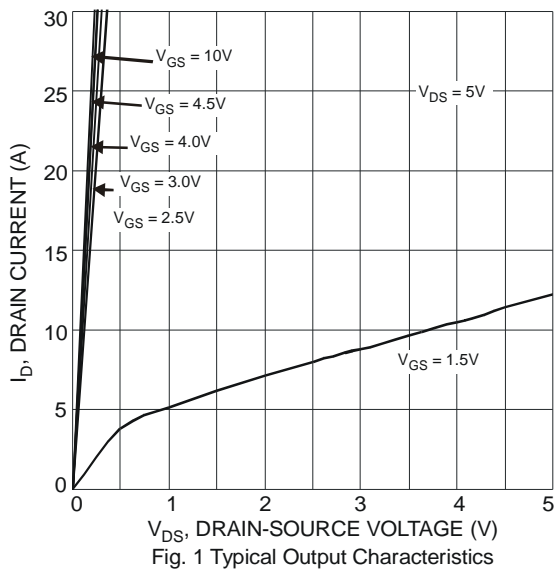
Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 1)	P <sub>D</sub>	2	W
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	62.5	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

- Notes:
1. Device mounted on 2 oz, FR-4 PCB, with R<sub>θJA</sub> = 62.5°C/W
  2. No purposefully added lead.
  3. Pulse width ≤10μS, Duty Cycle ≤1%.
  4. Diodes Inc.'s "Green" policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php).

**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 5)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	20	—	—	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> = 20V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±12V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 5)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	0.5	—	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>	—	—	8 9 12	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 12A V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 10A V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 8A
Forward Transconductance	g <sub>fs</sub>	—	27	—	S	V <sub>DS</sub> = 5V, I <sub>D</sub> = 6.5A
Diode Forward Voltage (Note 5)	V <sub>SD</sub>	0.5	0.7	1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 3A
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	C <sub>iss</sub>	—	2555	—	pF	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	523	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	496	—	pF	
Gate Resistance	R <sub>G</sub>	—	1.1	—	Ω	V <sub>GS</sub> = 0V V <sub>DS</sub> = 0V, f = 1MHz
<b>SWITCHING CHARACTERISTICS</b>						
Total Gate Charge	Q <sub>g</sub>	—	28.9 58.3	—	nC	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 12A V <sub>DS</sub> = 10V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 12A
Gate-Source Charge	Q <sub>gs</sub>	—	3.7	—		V <sub>DS</sub> = 10V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 12A
Gate-Drain Charge	Q <sub>gd</sub>	—	11.4	—		V <sub>DS</sub> = 10V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 12A
						V <sub>DS</sub> = 10V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 12A

Notes: 5. Short duration pulse test used to minimize self-heating effect.



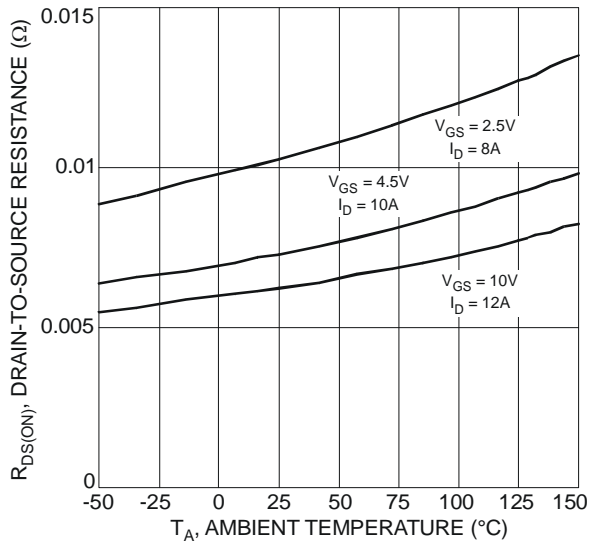


Fig. 3 On-Resistance Variation with Temperature

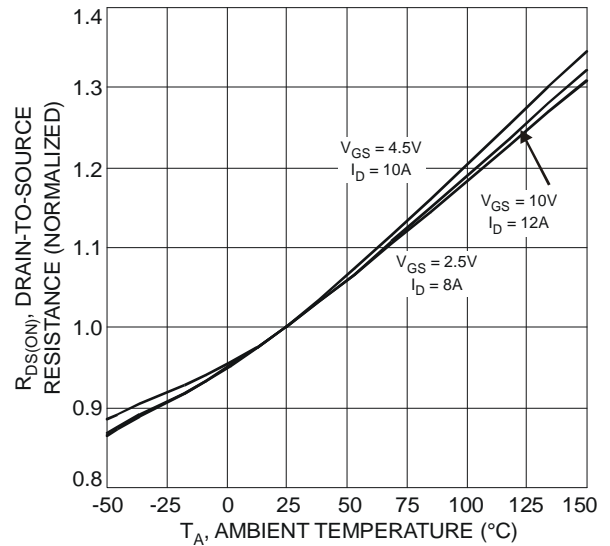


Fig. 4 On-Resistance Variation with Temperature

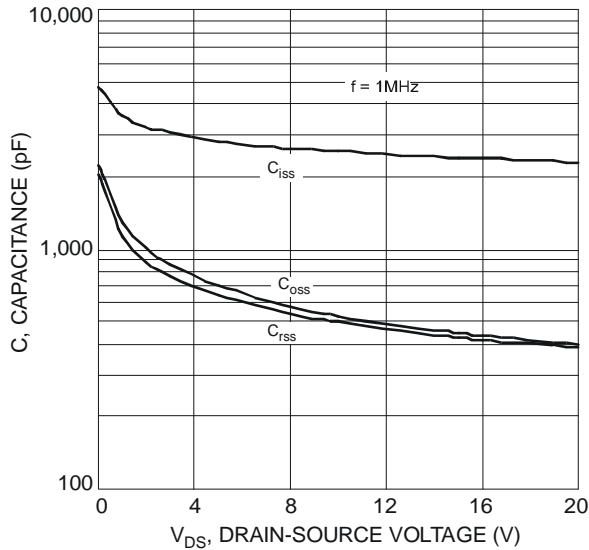


Fig. 5 Typical Capacitance

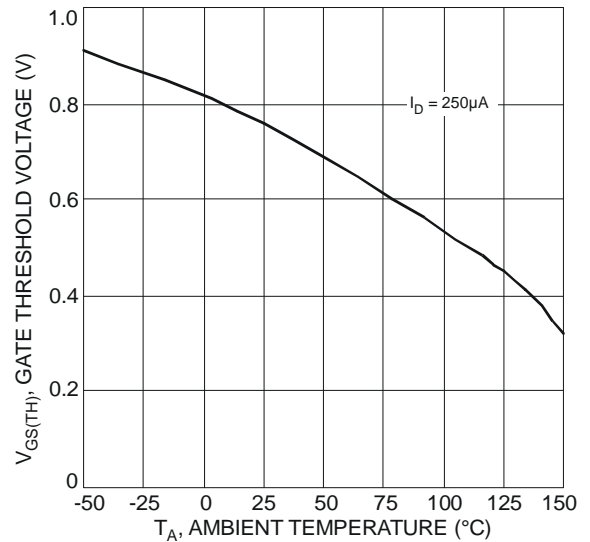


Fig. 6 Gate Threshold Variation vs. Ambient Temperature

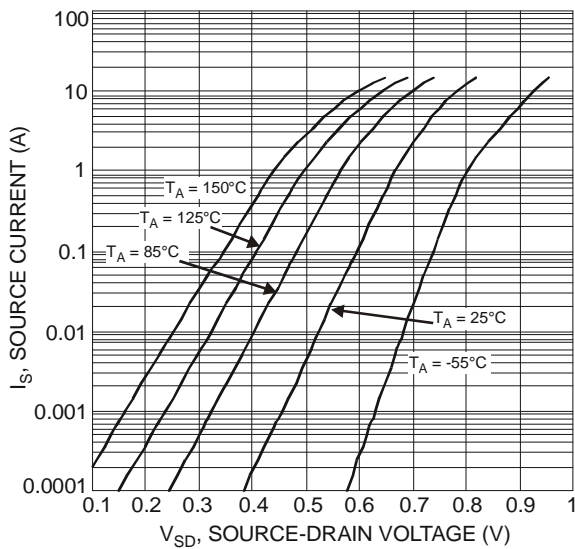


Fig. 7 Diode Forward Voltage vs. Current

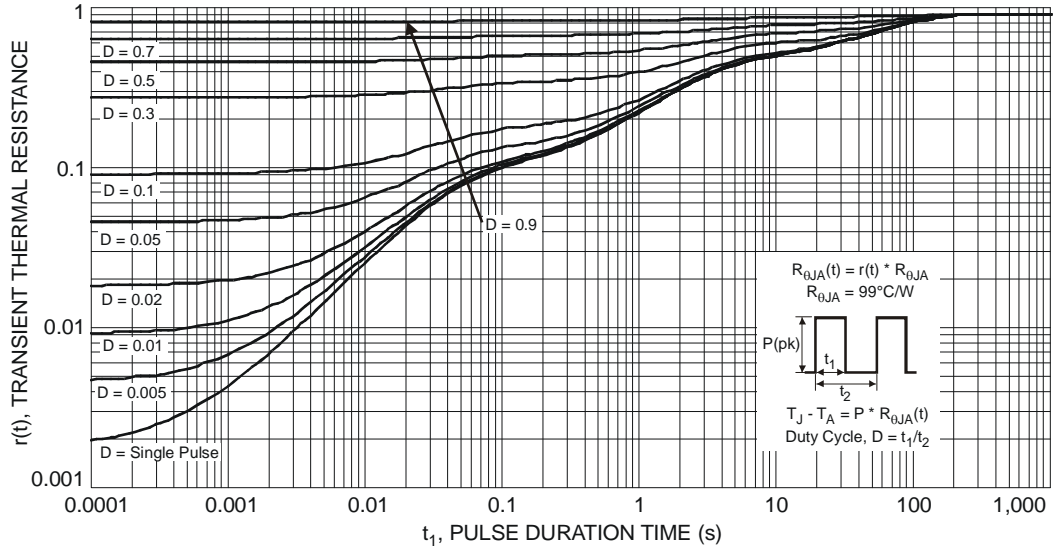


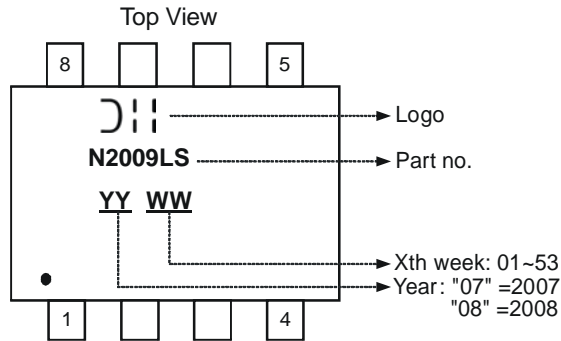
Fig. 8 Transient Thermal Response

**Ordering Information** (Note 6)

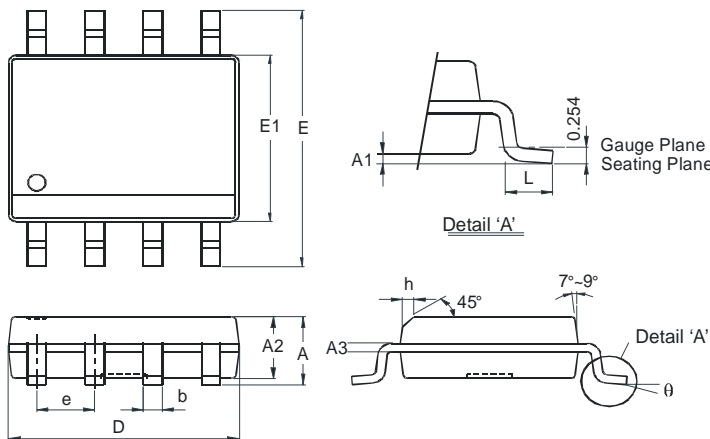
Part Number	Case	Packaging
DMN2009LSS-13	SO-8	2500/Tape & Reel

Notes: 6. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

**Marking Information**



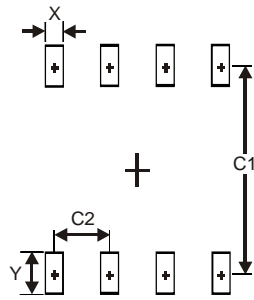
**Package Outline Dimensions**



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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