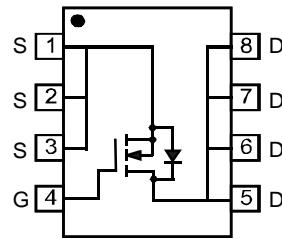
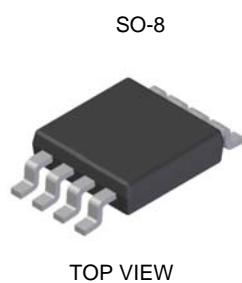


Features

- Low On-Resistance
 - 8mΩ @ $V_{GS} = 10V$
 - 9mΩ @ $V_{GS} = 4.5V$
 - 12mΩ @ $V_{GS} = 2.5V$
- 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)



TOP VIEW
Internal Schematic

Maximum Ratings

$\text{@} T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic		Symbol	Value	Units
Drain-Source Voltage		V_{DSS}	20	V
Gate-Source Voltage		V_{GSS}	± 12	V
Drain Current (Note 1)	Steady State	I_D	12	A
	$T_A = 25^\circ\text{C}$		9.6	
Pulsed Drain Current (Note 3)		I_{DM}	42	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 1)	P_D	2	W
Thermal Resistance, Junction to Ambient	R_{JJA}	62.5	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

Notes:

1. Device mounted on 2 oz, FR-4 PCB, with $R_{\text{JJA}} = 62.5^\circ\text{C/W}$
2. No purposefully added lead.
3. Pulse width $\leq 10\mu\text{s}$, Duty Cycle $\leq 1\%$.
4. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 5)						
Drain-Source Breakdown Voltage	BV_{DSS}	20	—	—	V	$\text{V}_{\text{GS}} = 0\text{V}$, $\text{I}_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	$\text{V}_{\text{DS}} = 20\text{V}$, $\text{V}_{\text{GS}} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$\text{V}_{\text{GS}} = \pm 12\text{V}$, $\text{V}_{\text{DS}} = 0\text{V}$
ON CHARACTERISTICS (Note 5)						
Gate Threshold Voltage	$\text{V}_{\text{GS}(\text{th})}$	0.5	—	1.2	V	$\text{V}_{\text{DS}} = \text{V}_{\text{GS}}$, $\text{I}_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$\text{R}_{\text{DS}(\text{ON})}$	—	—	8	$\text{m}\Omega$	$\text{V}_{\text{GS}} = 10\text{V}$, $\text{I}_D = 12\text{A}$
		—	—	9		$\text{V}_{\text{GS}} = 4.5\text{V}$, $\text{I}_D = 10\text{A}$
		—	—	12		$\text{V}_{\text{GS}} = 2.5\text{V}$, $\text{I}_D = 8\text{A}$
Forward Transconductance	g_{fs}	—	27	—	S	$\text{V}_{\text{DS}} = 5\text{V}$, $\text{I}_D = 6.5\text{A}$
Diode Forward Voltage (Note 5)	V_{SD}	0.5	0.7	1.2	V	$\text{V}_{\text{GS}} = 0\text{V}$, $\text{I}_S = 3\text{A}$
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{iss}	—	2555	—	pF	$\text{V}_{\text{DS}} = 10\text{V}$, $\text{V}_{\text{GS}} = 0\text{V}$, $f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	523	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	496	—	pF	
Gate Resistance	R_{G}	—	1.1	—	Ω	
SWITCHING CHARACTERISTICS						
Total Gate Charge	Q_{g}	—	28.9 58.3	—	nC	$\text{V}_{\text{DS}} = 10\text{V}$, $\text{V}_{\text{GS}} = 4.5\text{V}$, $\text{I}_D = 12\text{A}$
Gate-Source Charge	Q_{gs}	—	3.7	—		$\text{V}_{\text{DS}} = 10\text{V}$, $\text{V}_{\text{GS}} = 10\text{V}$, $\text{I}_D = 12\text{A}$
Gate-Drain Charge	Q_{gd}	—	11.4	—		$\text{V}_{\text{DS}} = 10\text{V}$, $\text{V}_{\text{GS}} = 10\text{V}$, $\text{I}_D = 12\text{A}$

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

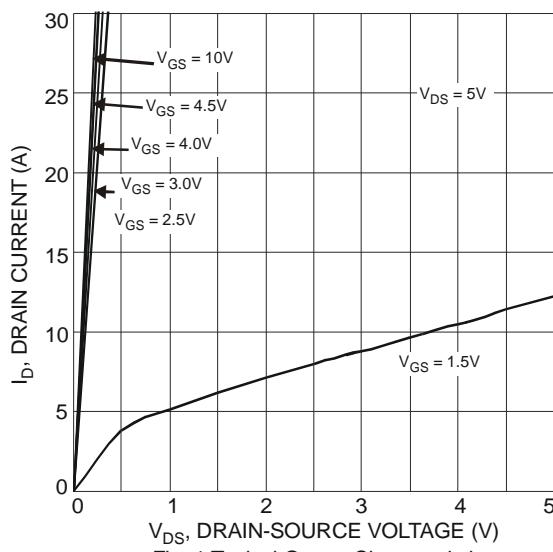


Fig. 1 Typical Output Characteristics

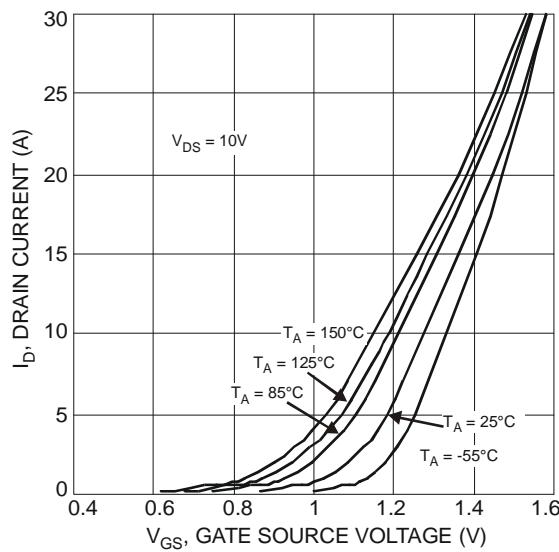


Fig. 2 Typical Transfer Characteristics

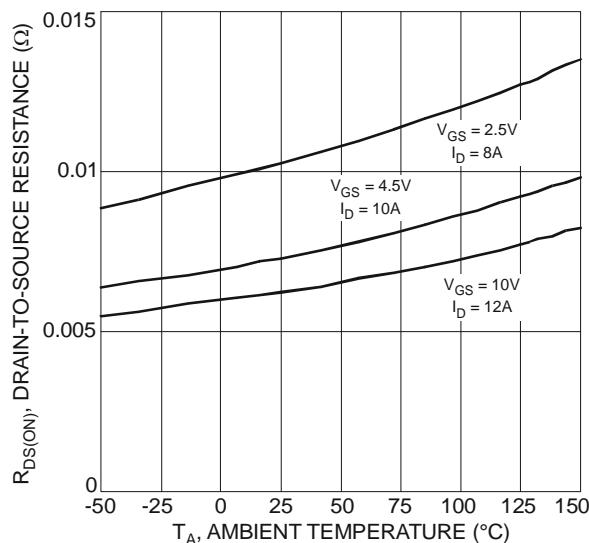


Fig. 3 On-Resistance Variation with Temperature

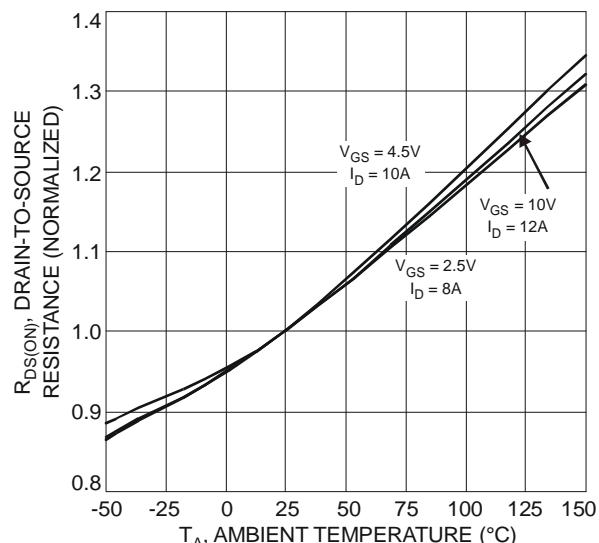


Fig. 4 On-Resistance Variation with Temperature

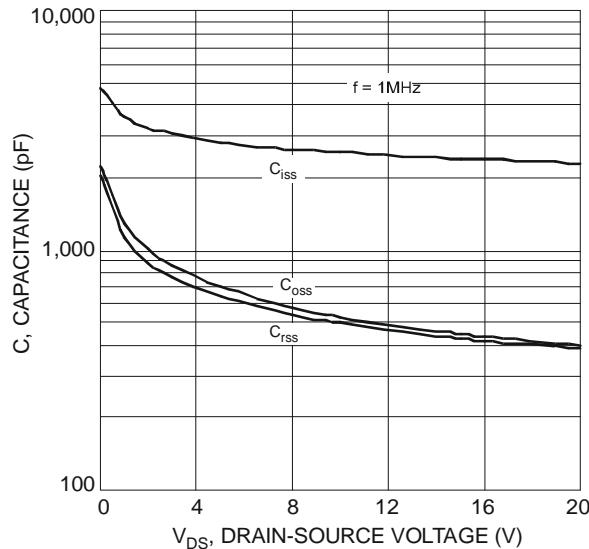


Fig. 5 Typical Capacitance

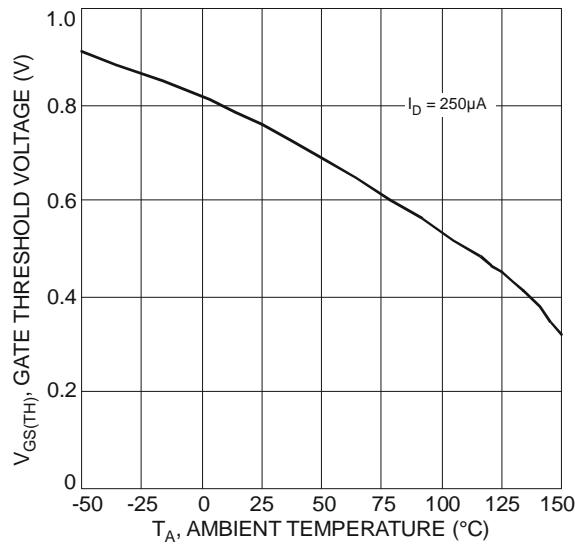


Fig. 6 Gate Threshold Variation vs. Ambient Temperature

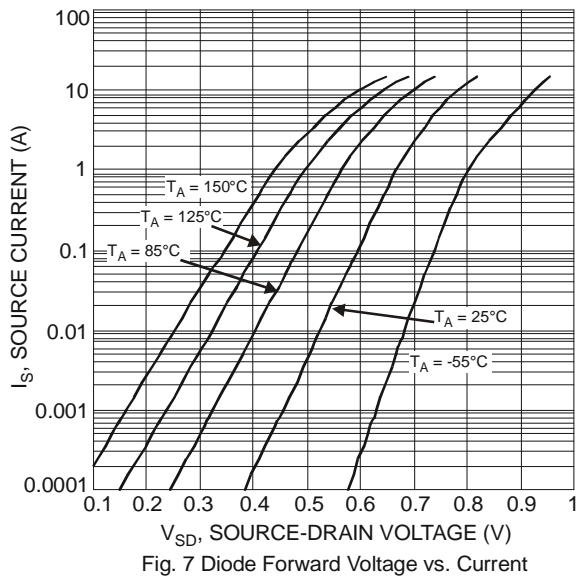


Fig. 7 Diode Forward Voltage vs. Current

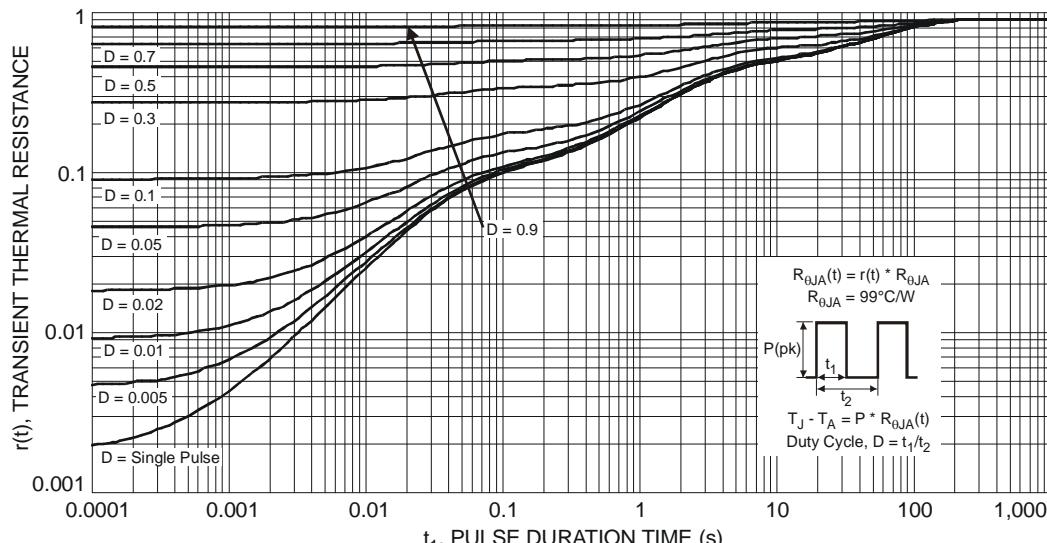


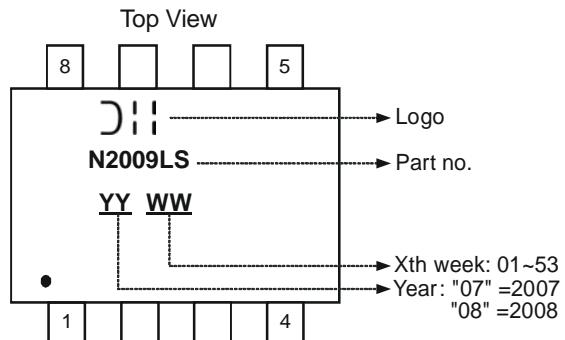
Fig. 8 Transient Thermal Response

Ordering Information (Note 6)

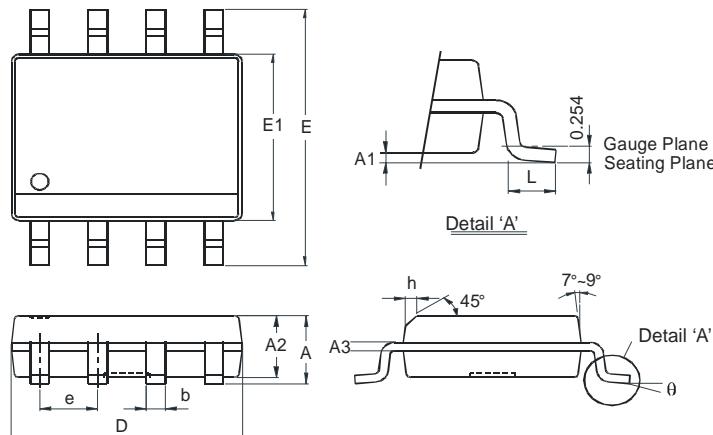
Part Number	Case	Packaging
DMN2009LSS-13	SO-8	2500/Tape & Reel

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

Marking Information



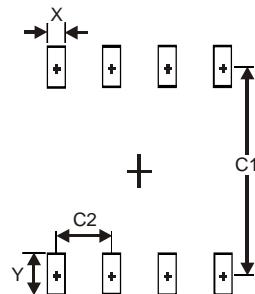
Package Outline Dimensions



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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