SINGLE N-CHANNEL ENHANCEMENT MODE MOSFET

Features

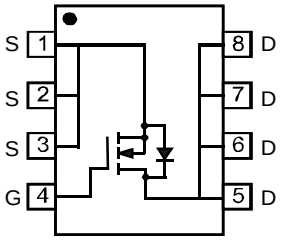
- Low On-Resistance
  - 8mΩ @ V_{GS} = 10V
  - 9mΩ @ V_{GS} = 4.5V
  - 12mΩ @ V_{GS} = 2.5V
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Lead Free By Design/RoHS Compliant (Note 2)**
- **"Green" Device (Note 4)**
- **Qualified to AEC-Q101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

SO-8

TOP VIEW



TOP VIEW

Internal Schematic

Maximum Ratings @T_A = 25℃ 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	T_A = 25℃ T_A = 70℃	I_D	12 9.6	A
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	$R_{\theta JA}$	62.5	℃/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	℃

Notes:
1. Device mounted on 2 oz, FR-4 PCB, with $R_{\theta JA}$ = 62.5℃/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.

Electrical Characteristics @T_A = 25℃ unless otherwise specified

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

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

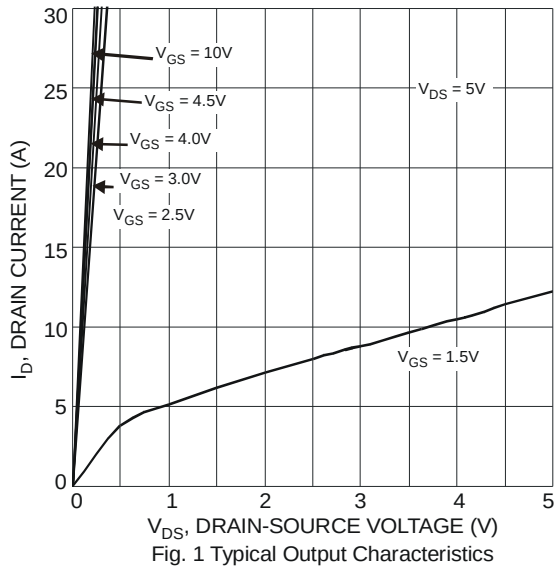


Fig. 1 Typical Output Characteristics

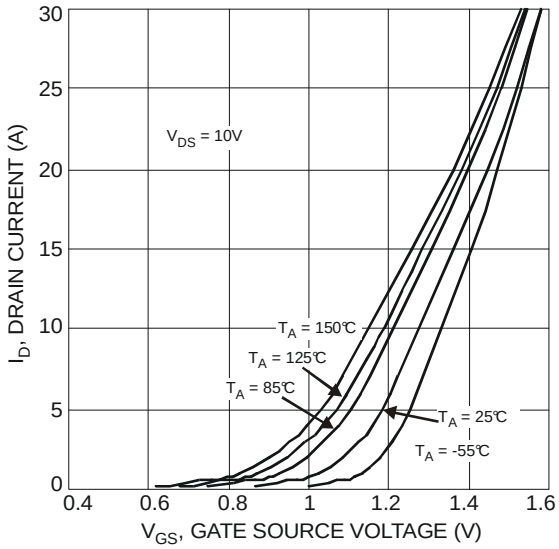


Fig. 2 Typical Transfer Characteristics

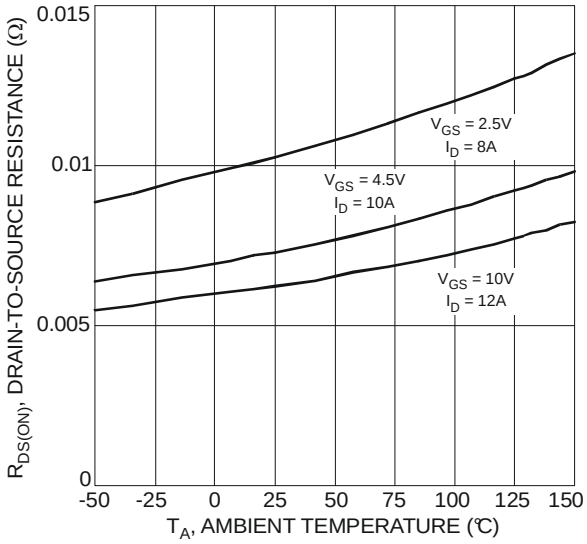


Fig. 3 On-Resistance Variation with Temperature

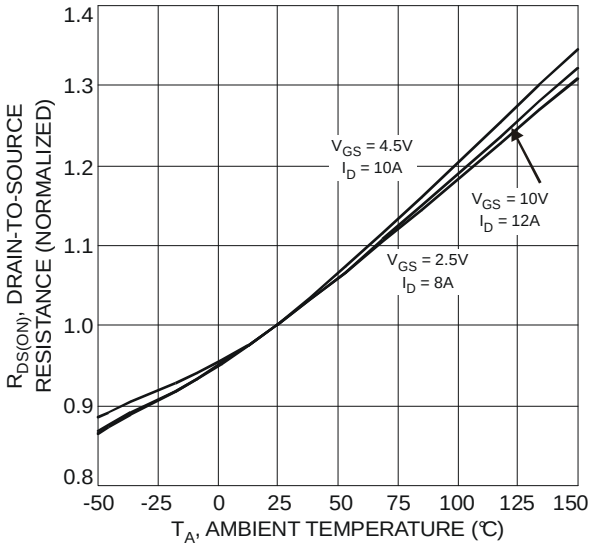


Fig. 4 On-Resistance Variation with Temperature

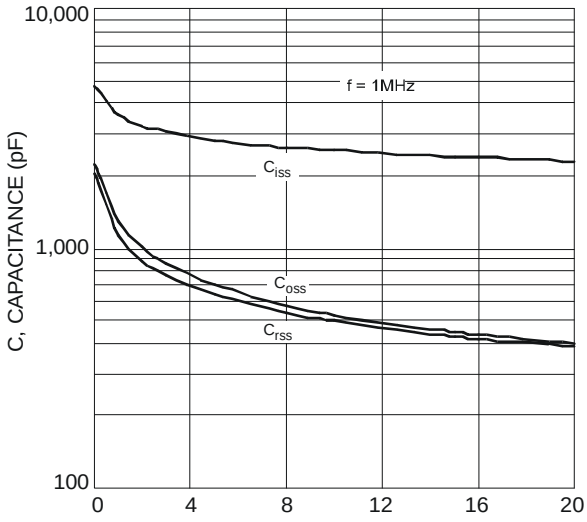


Fig. 5 Typical Capacitance

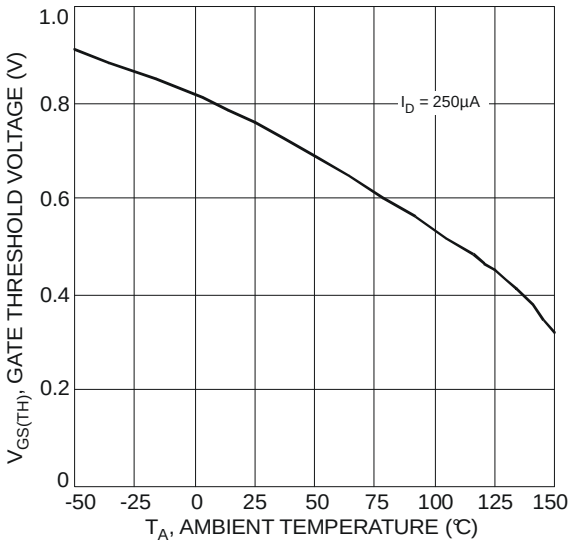


Fig. 6 Gate Threshold Variation vs. Ambient Temperature

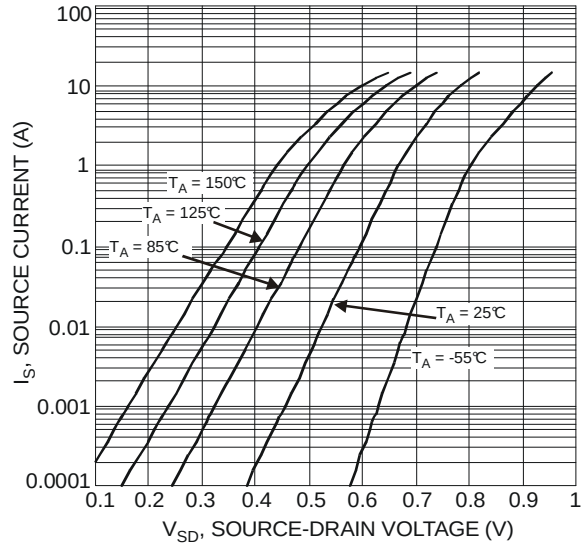


Fig. 7 Diode Forward Voltage vs. Current

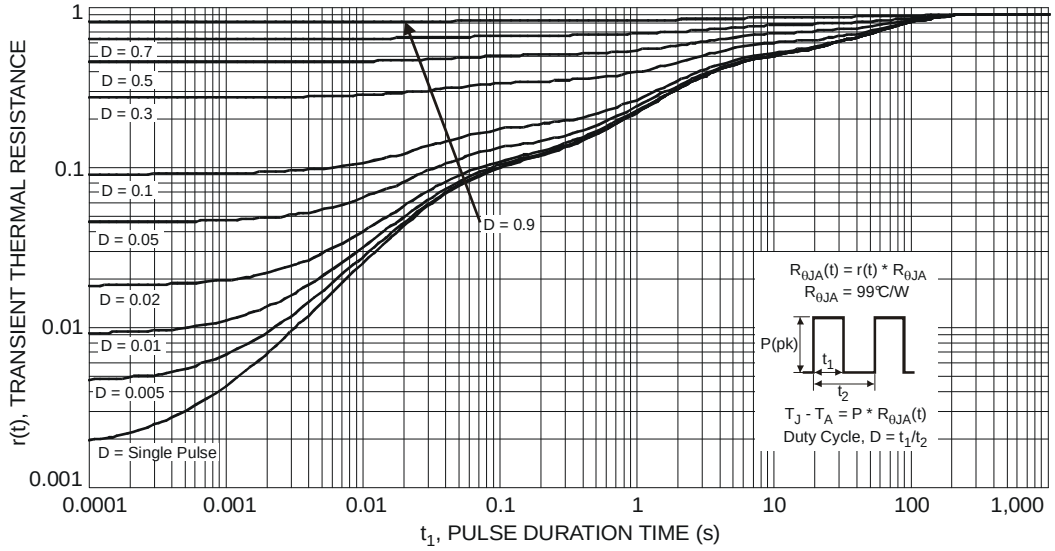


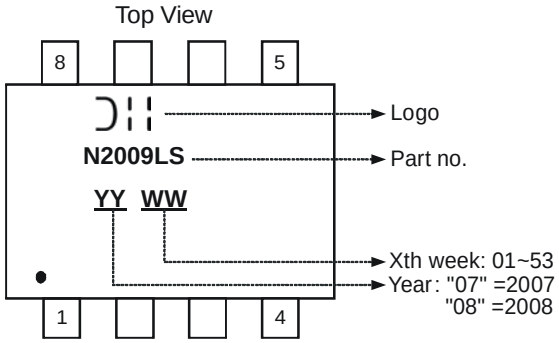
Fig. 8 Transient Thermal Response

Ordering Information (Note 6)

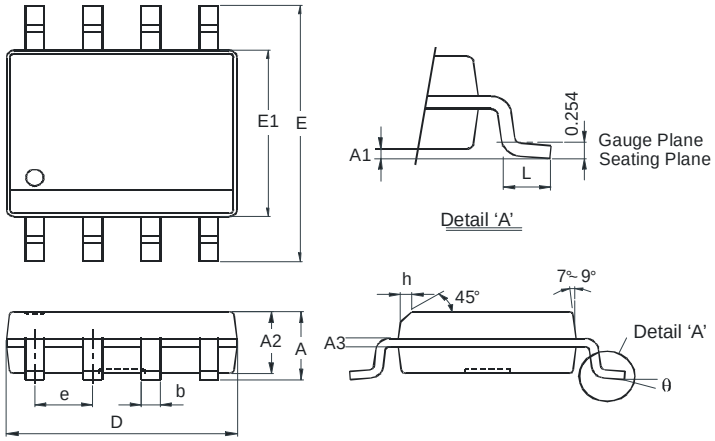
Part Number	Case	Packaging
DMN2009LSS-13	SO-8	2500/Tape & Reel

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

Marking Information

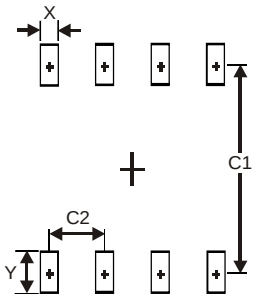


Package Outline Dimensions



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