DUAL N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

Features

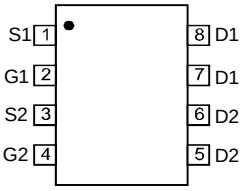
- Dual N-Channel MOSFET
- Low On-Resistance
  - 22mΩ @ V_{GS} = 10V
  - 33mΩ @ V_{GS} = 4.5V
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Lead Free By Design/RoHS Compliant (Note 2)**
- **"Green" Device (Note 4)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

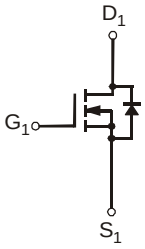
- Case: SOP-8L
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals Connections: See Diagram
- Terminals: Finish - Matte Tin annealed over Copper lead frame. Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 4
- Ordering Information: See Page 4
- Weight: 0.072grams (approximate)

SOP-8L

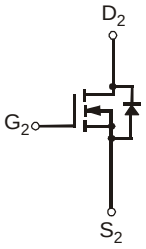
TOP VIEW



TOP VIEW
Internal Schematic



N-Channel MOSFET



N-Channel MOSFET

Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	30	V
Gate-Source Voltage			V_{GSS}	±20	V
Drain Current (Note 1)	Steady State	T_A = 25°C T_A = 70°C	I_D	6.9 5.8	A
Pulsed Drain Current (Note 3)			I_{DM}	30	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	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes:
1. Device mounted on 2 oz. Copper pads on FR-4 PCB with $R_{\theta JA}$ = 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.

Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 5)						
Drain-Source Breakdown Voltage	BV_{DSS}	30	—	—	V	V_{GS} = 0V, I_D = 250μA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	V_{DS} = 30V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 5)						
Gate Threshold Voltage	$V_{GS(th)}$	1	—	2.1	V	V_{DS} = V_{GS}, I_D = 250μA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	—	— —	22 33	mΩ	V_{GS} = 10V, I_D = 6.9A V_{GS} = 4.5V, I_D = 5.0A
Forward Transconductance	g_{fs}	—	7	—	S	V_{DS} =5V, I_D = 6.9A
Diode Forward Voltage (Note 5)	V_{SD}	0.5	—	1.2	V	V_{GS} = 0V, I_S = 1A
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{iss}	—	725	—	pF	V_{DS} = 15V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	114	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	92	—	pF	
Gate Resistance	R_G	—	0.89	—	Ω	V_{GS} = 0V, V_{DS} = 0V, f = 1.0MHz
SWITCHING CHARACTERISTICS						
Total Gate Charge	Q_g	—	6.4 13.0	—	nC	V_{GS} = 4.5V, V_{DS} = 15V, I_D =5A V_{GS} = 10V, V_{DS} = 15V, I_D = 6.9A
Gate-Source Charge	Q_{gs}	—	1.9	—	nC	V_{GS} = 4.5V, V_{DS} = 15V, I_D = 6.9A
Gate-Drain Charge	Q_{gd}	—	3.2	—	nC	V_{GS} = 4.5V, V_{DS} = 15V, I_D = 6.9A
Turn-On Delay Time	$t_{d(on)}$	—	11	—	ns	V_{DD} = 15V, V_{GS} = 10V, R_D = 1.8Ω, R_G = 6Ω
Turn-On Rise Time	t_r	—	7	—	ns	
Turn-Off Delay Time	$t_{d(off)}$	—	63	—	ns	
Turn-Off Fall Time	t_f	—	30	—	ns	

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

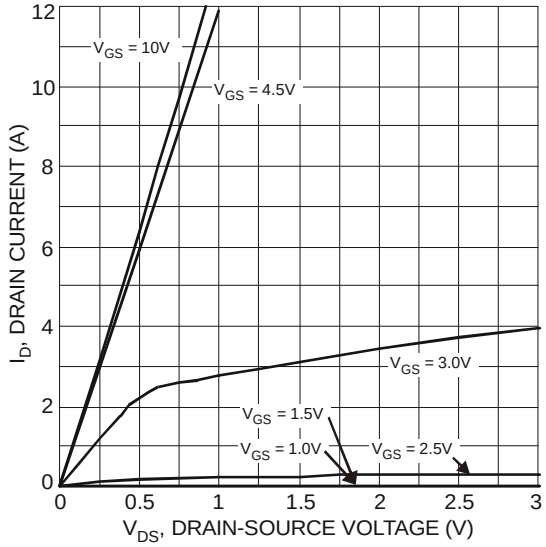


Fig. 1 Typical Output Characteristics

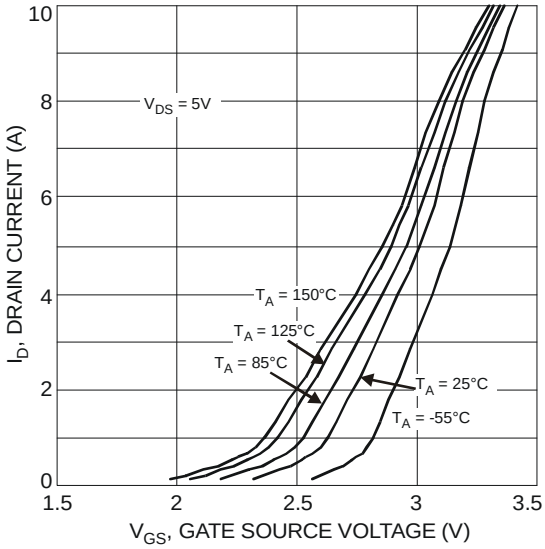


Fig. 2 Typical Transfer Characteristics

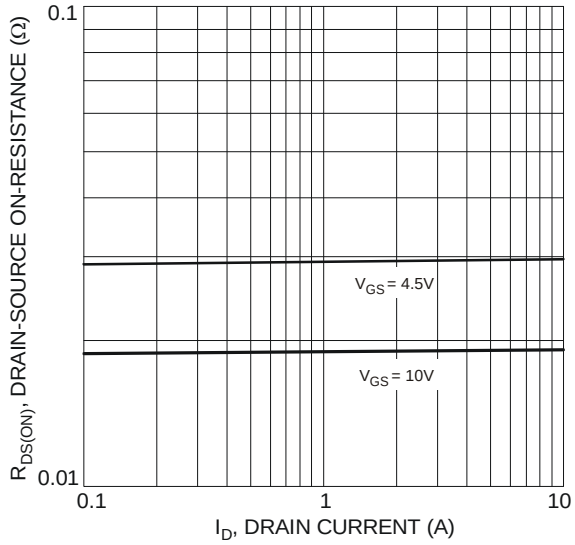


Fig. 3 Typical On-Resistance
vs. Drain Current and Gate Voltage

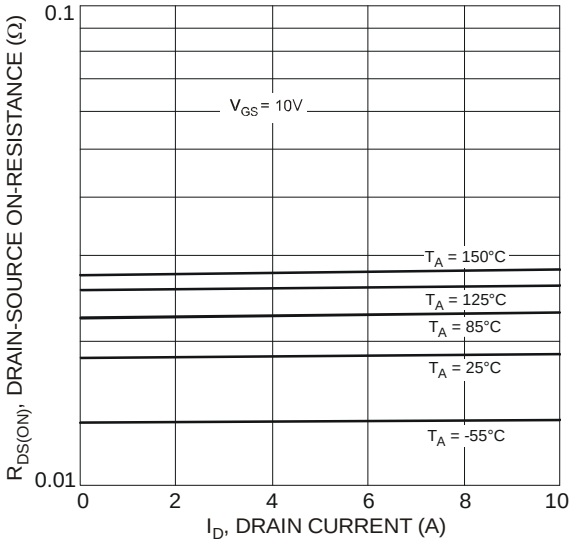


Fig. 4 Typical Drain-Source On-Resistance
vs. Drain Current and Temperature

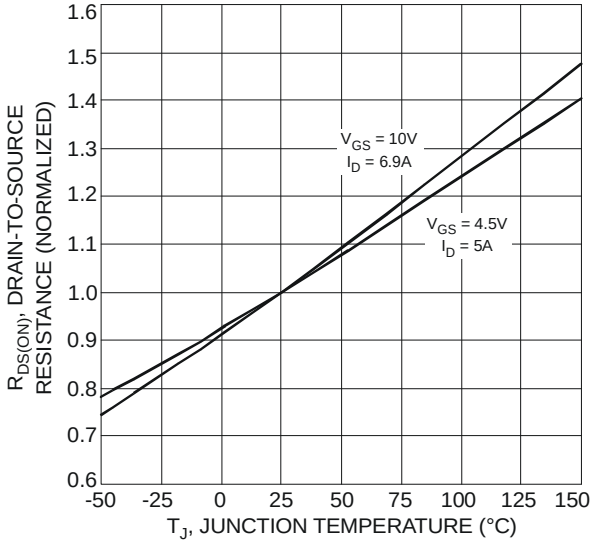


Fig. 5 On-Resistance Variation with Temperature

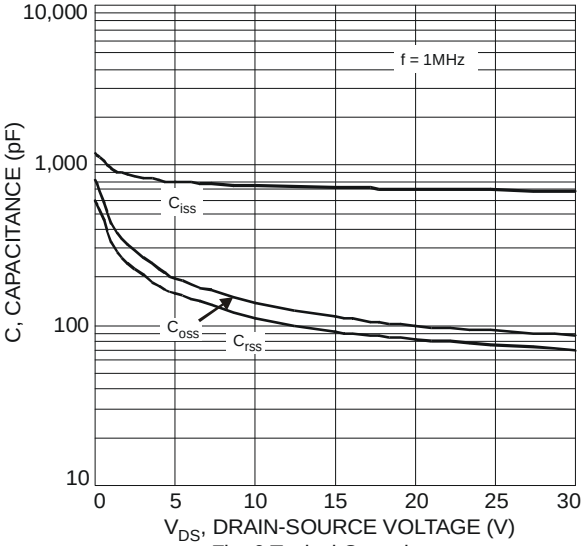


Fig. 6 Typical Capacitance

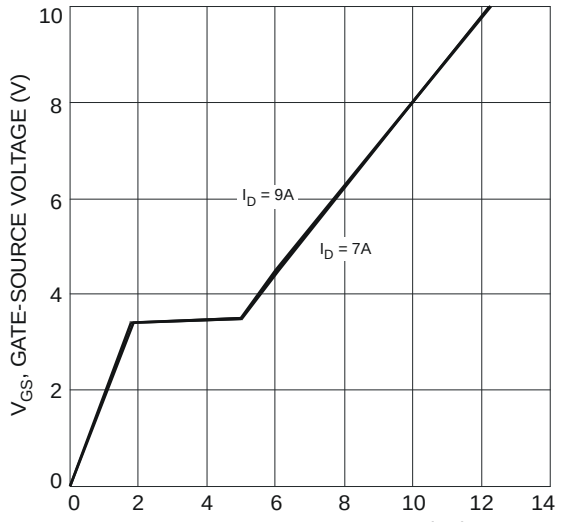


Fig. 7 Gate Charge

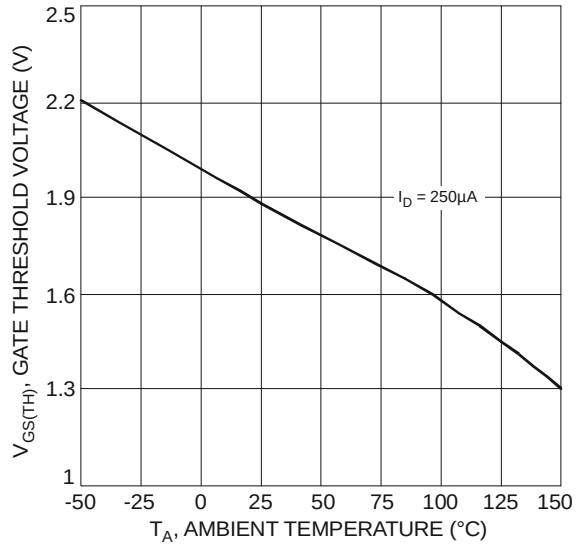


Fig. 8 Gate Threshold Variation vs. Ambient Temperature

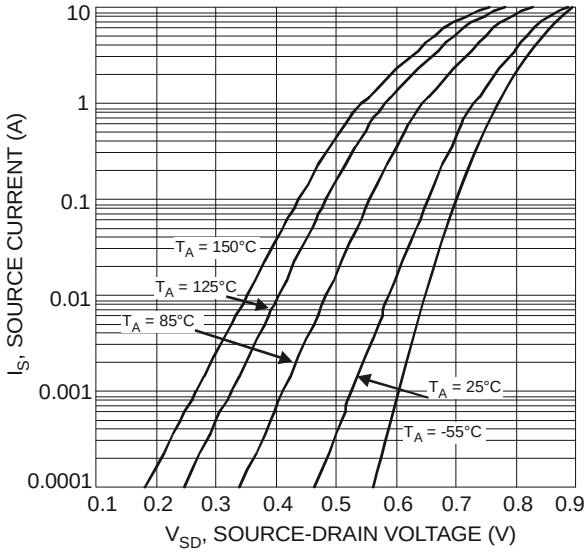


Fig. 9 Diode Forward Voltage vs. Current

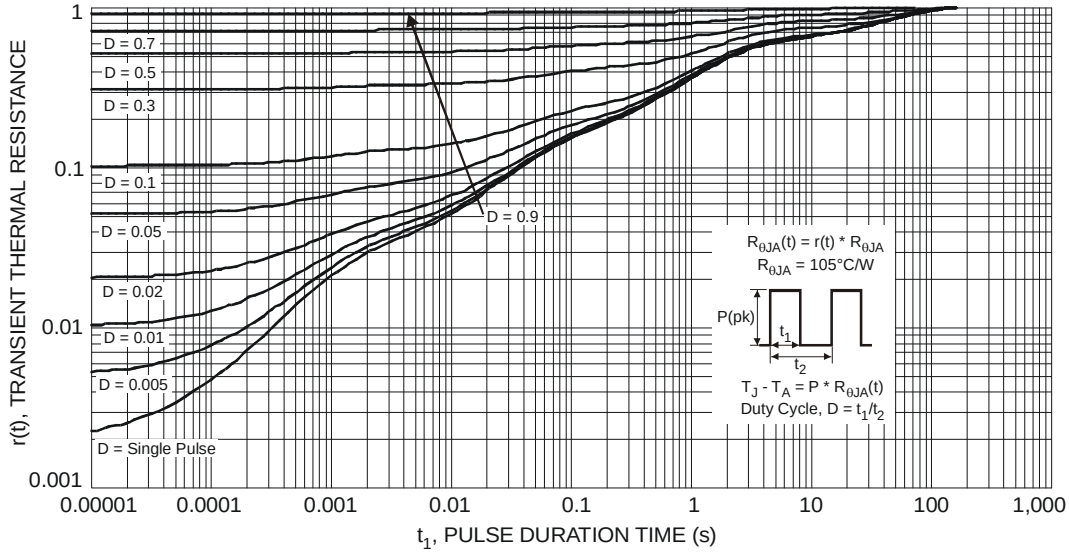


Fig. 10 Transient Thermal Response

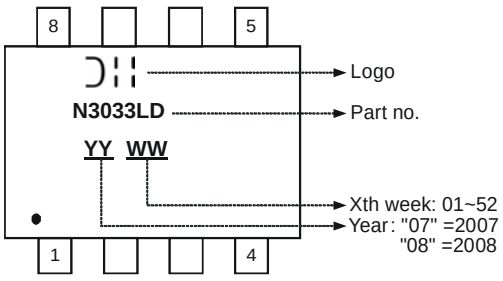
Ordering Information (Note 6)

Part Number	Case	Packaging
DMN3033LSD-13	SOP-8L	2500/Tape & Reel

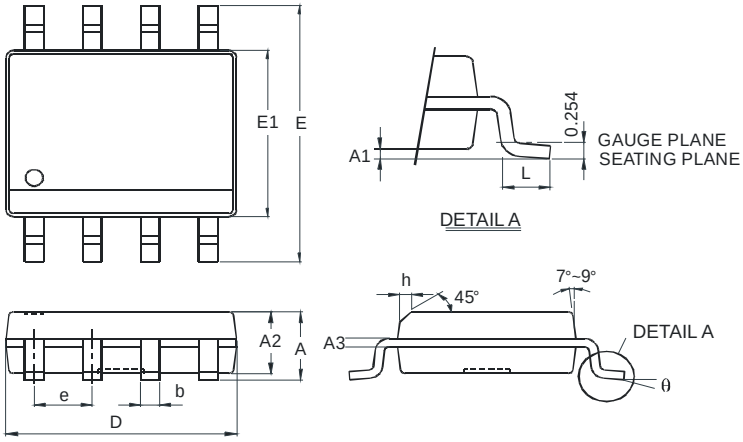
Notes: 6. For packaging details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

Marking Information

(Top View)

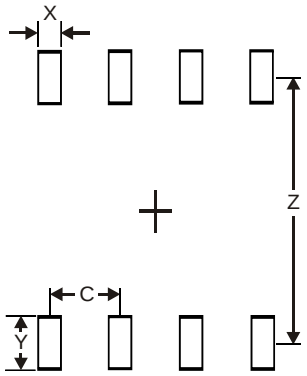


Package Outline Dimensions



SOP-8L		
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



Dimensions	Value (in mm)
Z	5.1
C	1.27
X	0.41
Y	1.0

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