

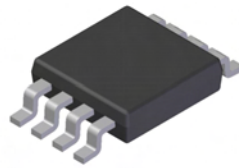
SINGLE N-CHANNEL ENHANCEMENT MODE MOSFET

Features

- Low On-Resistance
 - 18.5mΩ @ $V_{GS} = 10V$
 - 31mΩ @ $V_{GS} = 4.5V$
- 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**

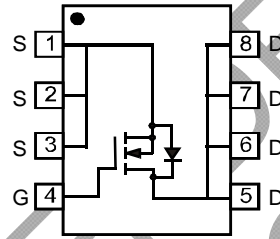
Mechanical Data

- Case: SO-8
- 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: 0.072g (approximate)



TOP VIEW

SOP-8L



TOP VIEW
Internal Schematic

Maximum Ratings @ $T_A = 25^\circ C$ 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	$T_A = 25^\circ C$	I_D	9	A
		$T_A = 70^\circ C$		6.75	A
Pulsed Drain Current (Note 3)			I_{DM}	40	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 1)	P_D	2.5	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	50	$^\circ C/W$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ C$

- Notes:
1. Device mounted on 2 oz copper pad layout with $R_{\theta JA} = 50^\circ C/W$.
 2. No purposefully added lead.
 3. Pulse width $\leq 10\mu S$, 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}	30	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	$V_{DS} = 30V, V_{GS} = 0V$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 5)						
Gate Threshold Voltage	$V_{GS(th)}$	1	—	2.1	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	15 26	18.5 31	m Ω	$V_{GS} = 10V, I_D = 9A$ $V_{GS} = 4.5V, I_D = 7A$
Forward Transconductance	g_{fs}	—	5.8	—	S	$V_{DS} = 10V, I_D = 9A$
Diode Forward Voltage (Note 5)	V_{SD}	0.5	0.7	1.2	V	$V_{GS} = 0V, I_S = 2.1A$
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{iss}	—	741	—	pF	$V_{DS} = 15V, V_{GS} = 0V$ $f = 1.0MHz$
Output Capacitance	C_{oss}	—	124	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	95	—	pF	
Gate Resistance	R_G	0.30	0.88	1.5	Ω	$V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz$
SWITCHING CHARACTERISTICS						
Total Gate Charge	Q_g	—	7.6 16.7	12 25	nC	$V_{DS} = 15V, V_{GS} = 4.5V, I_D = 9A$
Gate-Source Charge	Q_{gs}	—	1.9	—		$V_{DS} = 15V, V_{GS} = 10V, I_D = 9A$
Gate-Drain Charge	Q_{gd}	—	5.2	—	ns	$V_{GS} = 10V, V_{DS} = 15V,$ $R_L = 15\Omega, R_G = 6\Omega$
Turn-On Delay Time	$t_{d(on)}$	—	4.0	—		
Rise Time	t_r	—	4.4	—		
Turn-Off Delay Time	$t_{d(off)}$	—	23.0	—		
Fall Time	t_f	—	9.4	—		

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

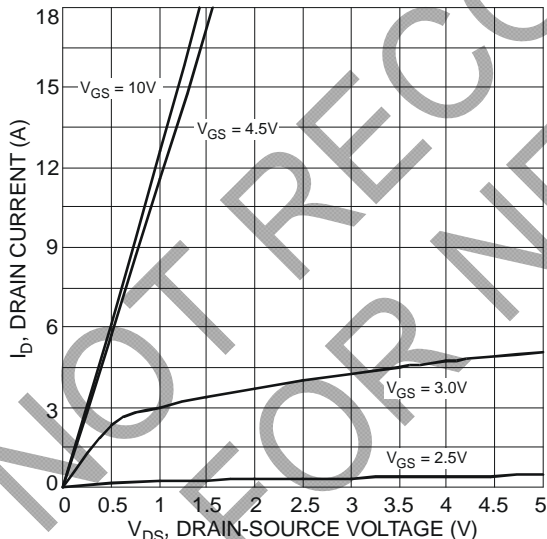


Fig. 1 Typical Output Characteristic

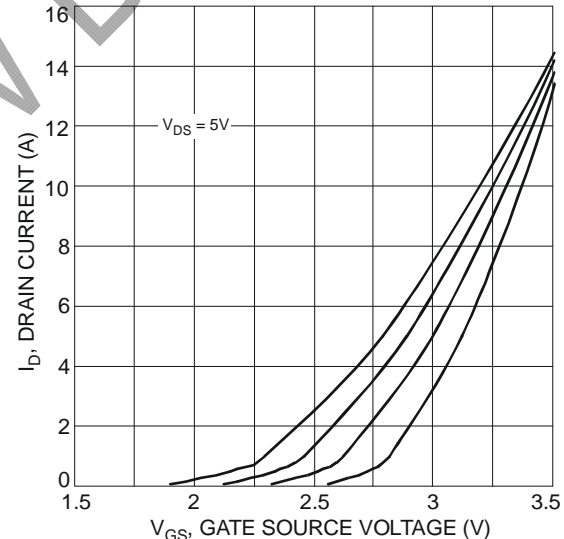


Fig. 2 Typical Transfer Characteristics

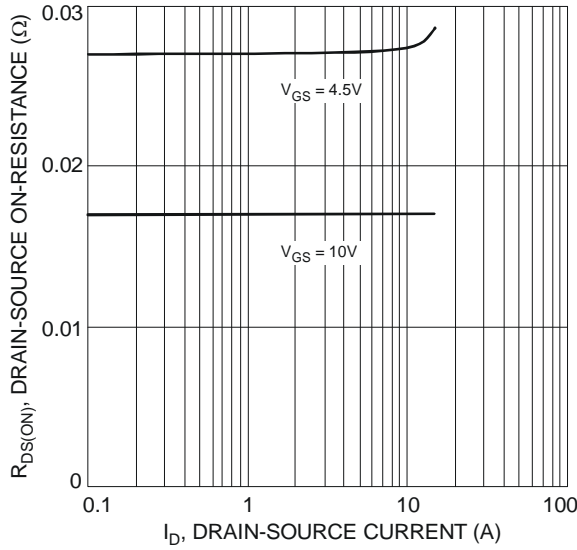


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

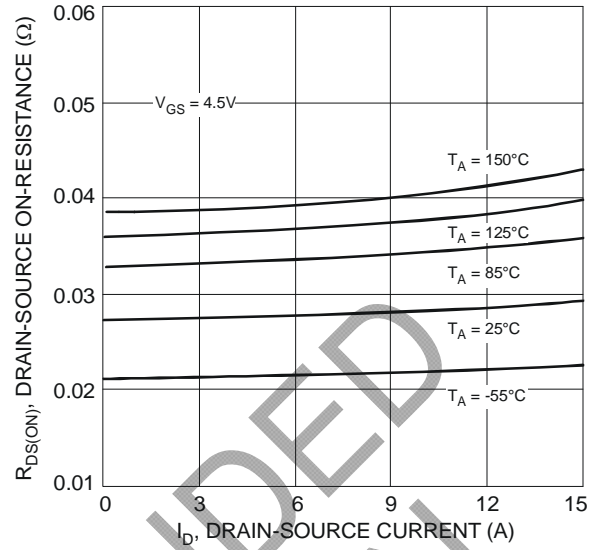


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

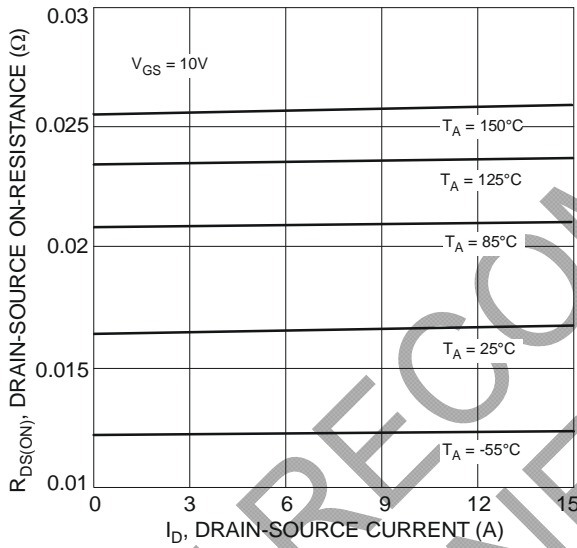


Fig. 5 Typical On-Resistance vs. Drain Current and Temperature

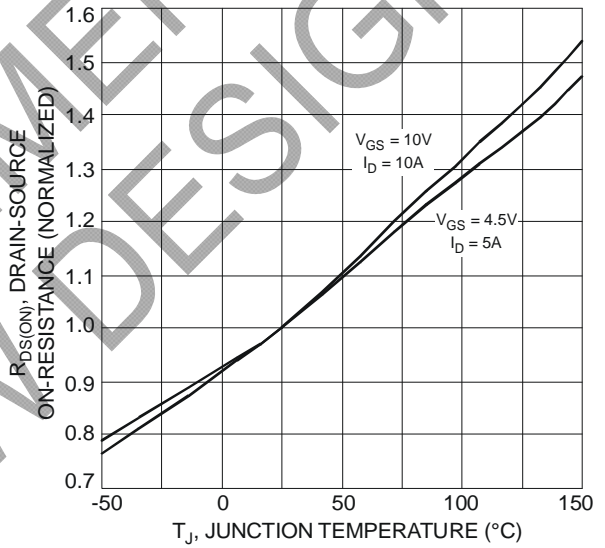


Fig. 6 On-Resistance Variation with Temperature

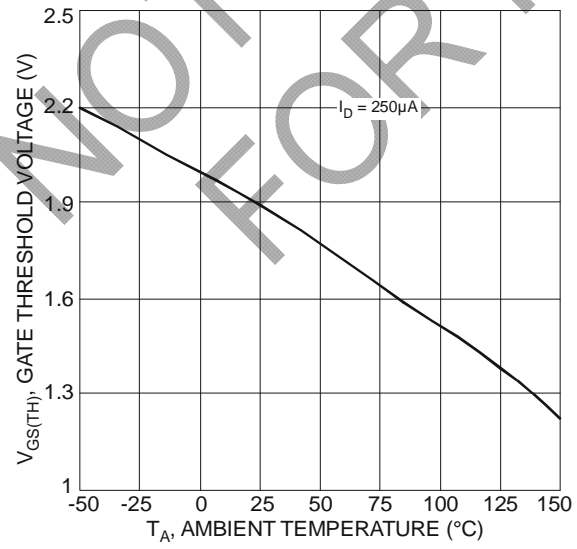


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

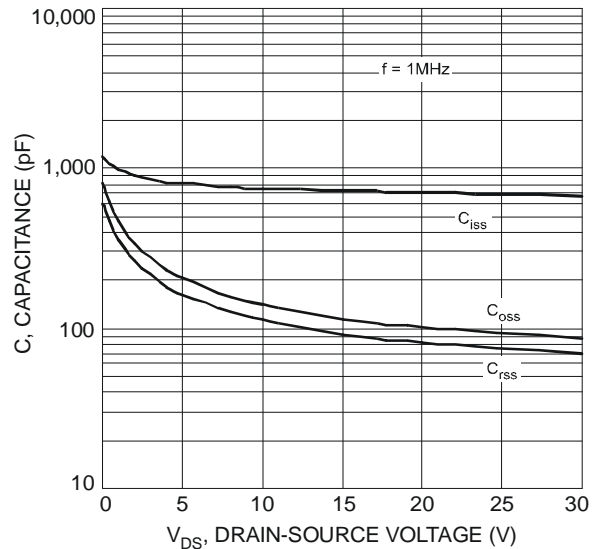


Fig. 8 Total Capacitance

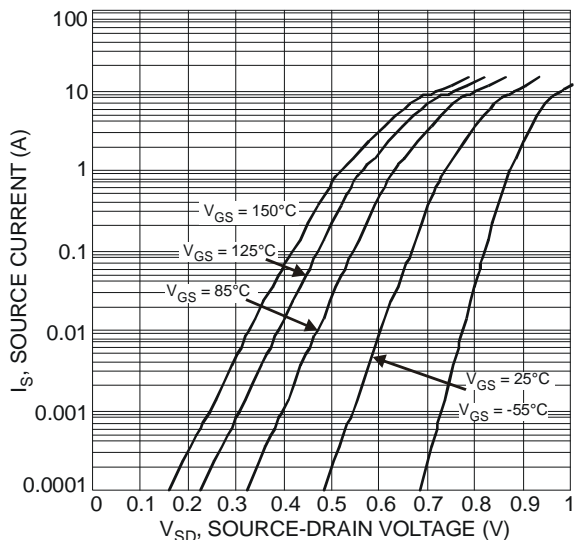


Fig. 9 Diode Forward Voltage vs. Current

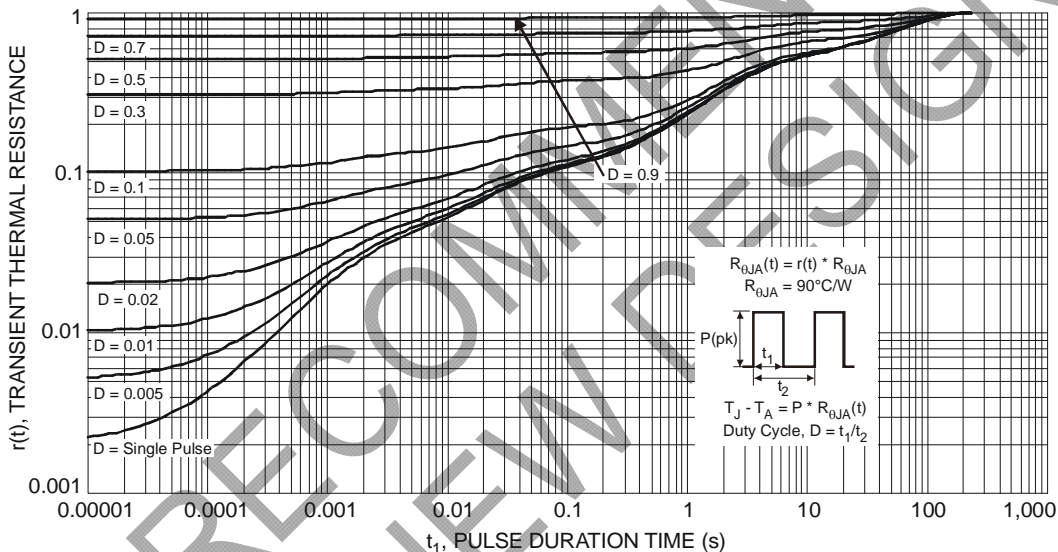


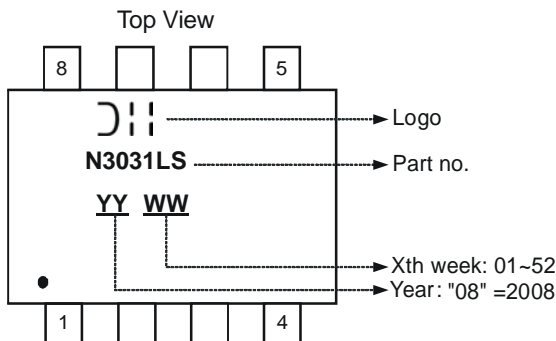
Fig. 10 Transient Thermal Response

Ordering Information (Note 6)

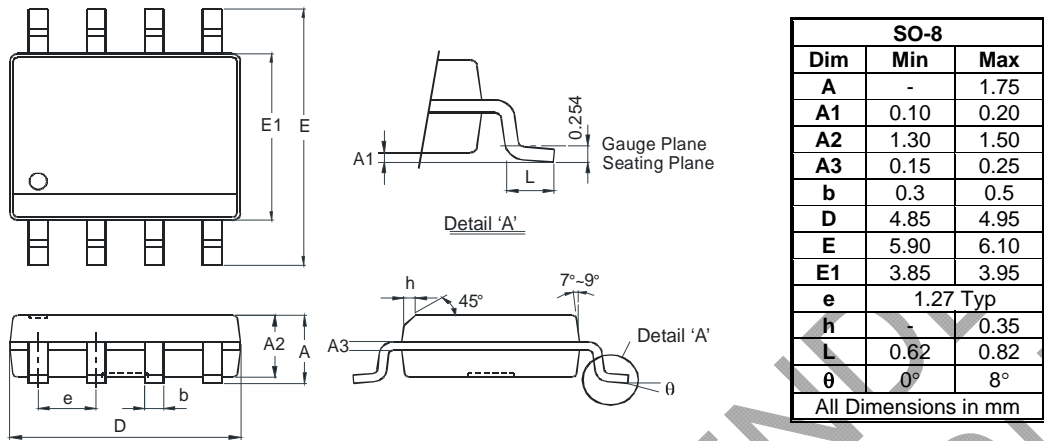
Part Number	Case	Packaging
DMN3031LSS-13	SO-8	2500/Tape & Reel

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

Marking Information



Package Outline Dimensions



Suggested Pad Layout



NOT RECOMMENDED FOR NEW DESIGN

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