

SINGLE N-CHANNEL ENHANCEMENT MODE MOSFET

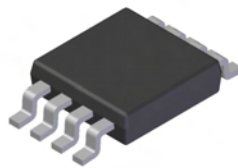
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Features

- 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**

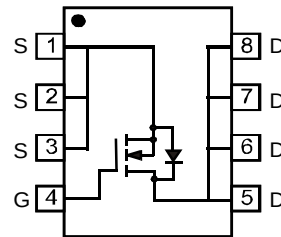
Mechanical Data

- 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	
Pulsed Drain Current (Note 3)			I_{DM}	40	A

Thermal Characteristics

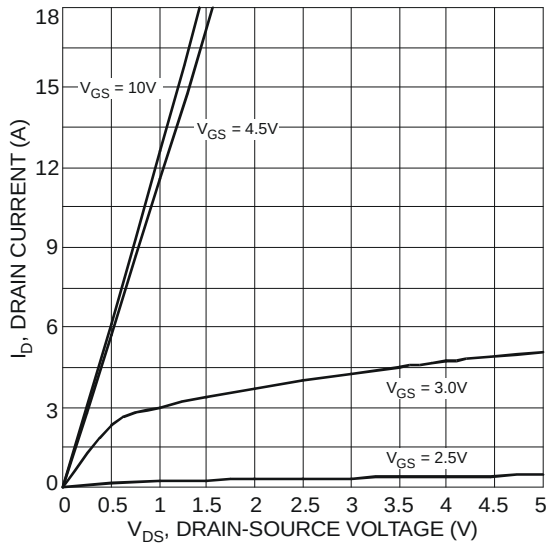
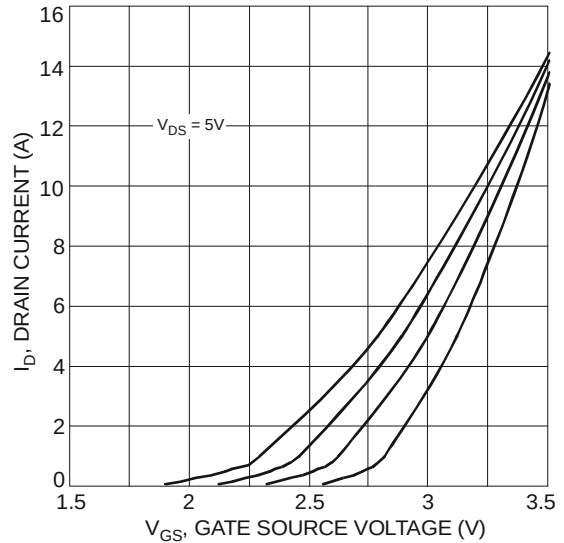
Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 1)	P_D	2.5	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	50	$^\circ C/W$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ C$

- 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°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)}	—	15 26	18.5 31	mΩ	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	—		
Turn-On Delay Time	t _{d(on)}	—	4.0	—	ns	V _{GS} = 10V, V _{DS} = 15V, R _L = 15Ω, R _G = 6Ω
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.



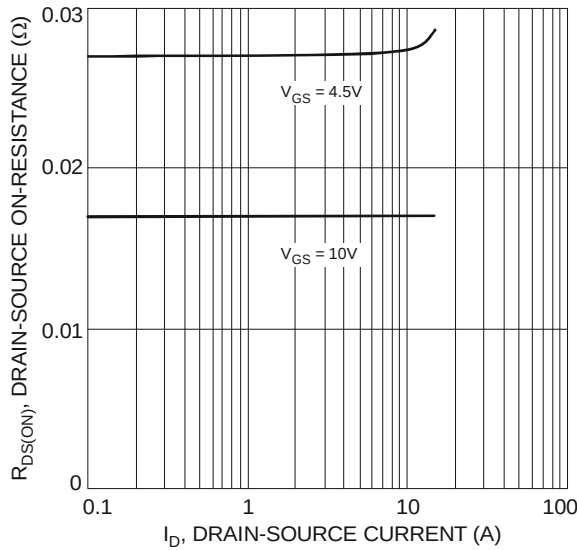


Fig. 3 Typical On-Resistance
vs. Drain Current and Gate Voltage

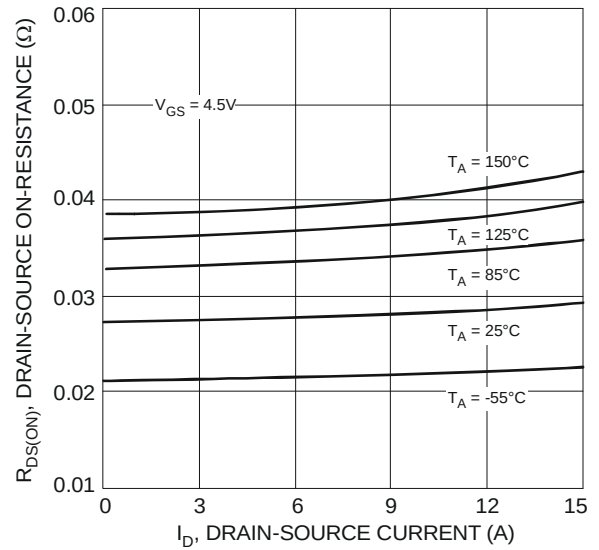


Fig. 4 Typical On-Resistance
vs. Drain Current and Temperature

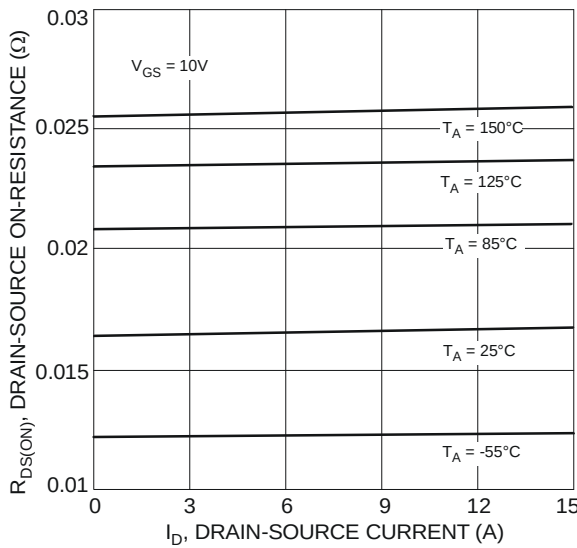


Fig. 5 Typical On-Resistance
vs. Drain Current and Temperature

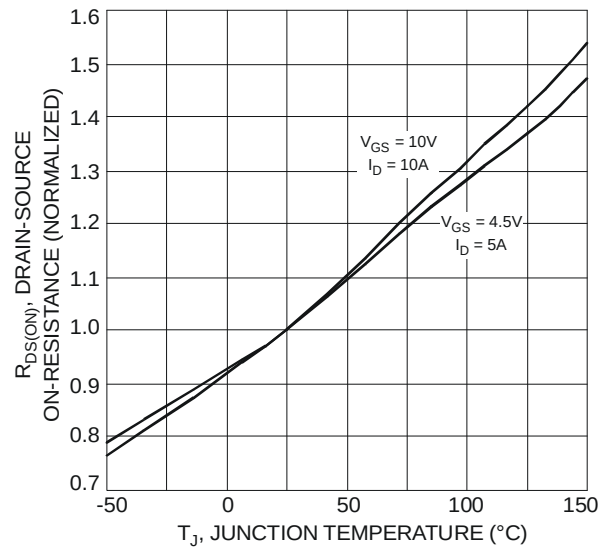


Fig. 6 On-Resistance Variation with Temperature

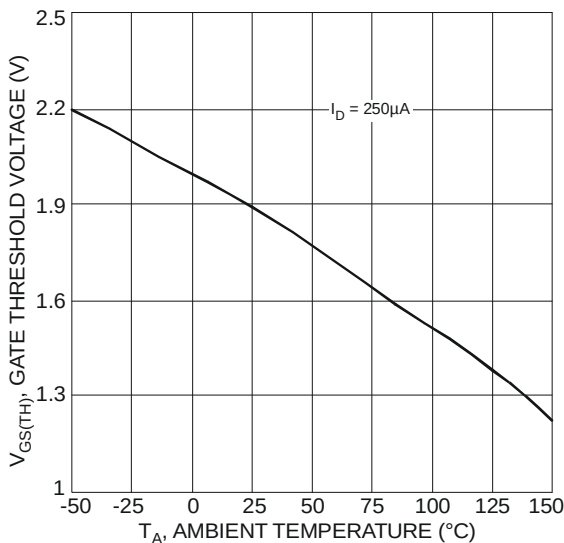


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

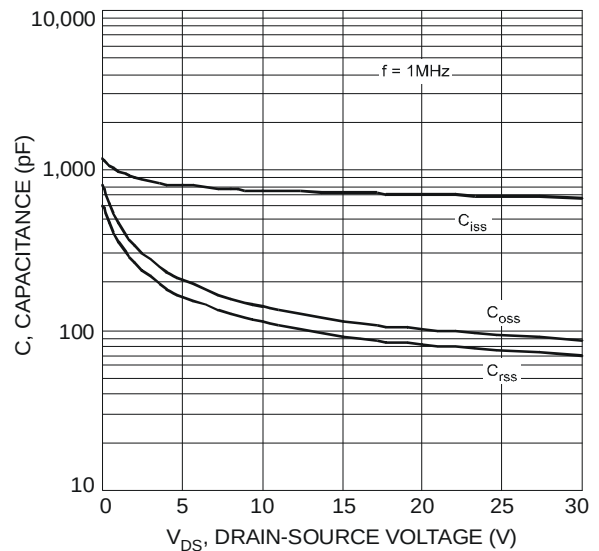


Fig. 8 Total Capacitance

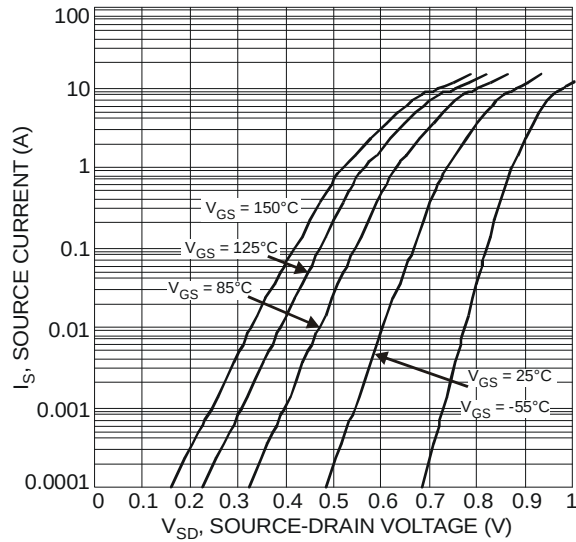


Fig. 9 Diode Forward Voltage vs. Current

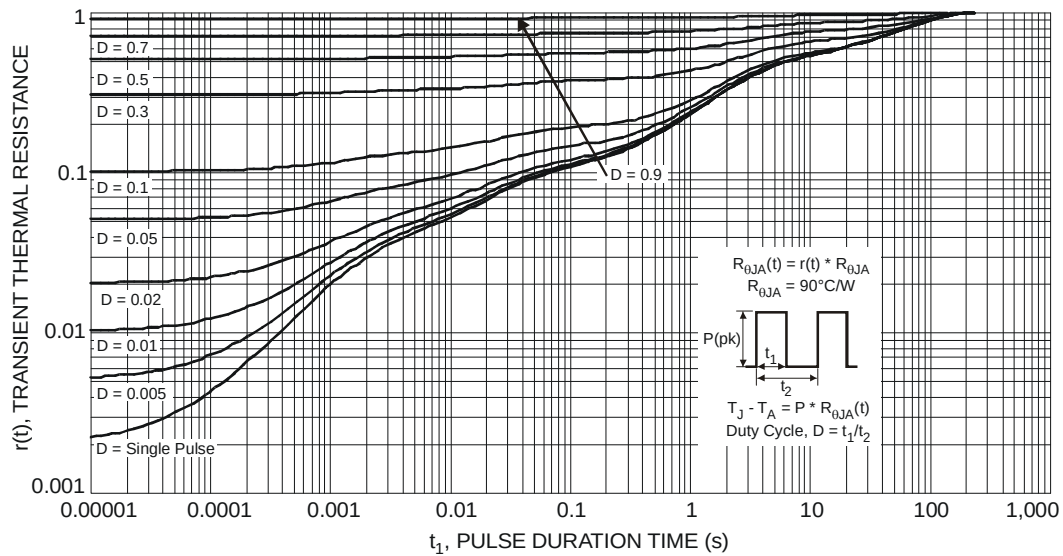


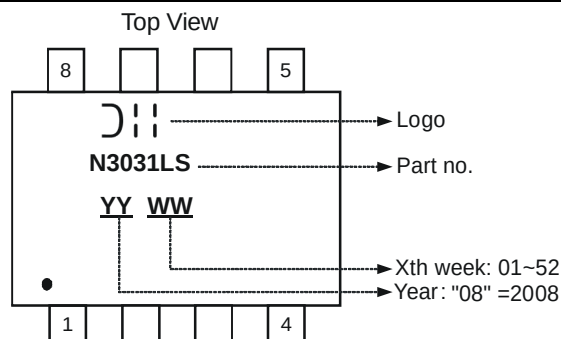
Fig. 10 Transient Thermal Response

Ordering Information (Note 6)

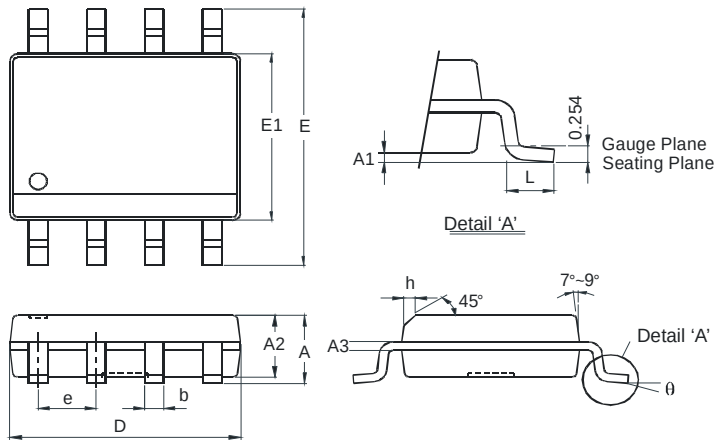
Part Number	Case	Packaging
DMN3031LSS-13	SO-8	2500/Tape & Reel

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

Marking Information

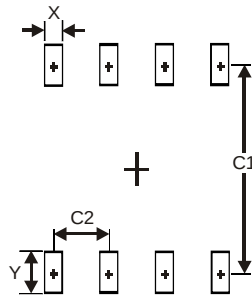


Package Outline Dimensions



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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