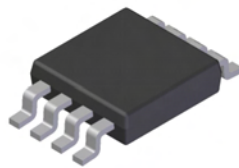


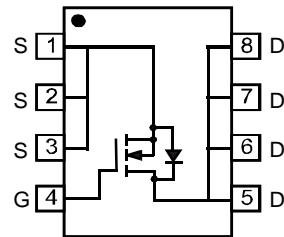
## Features

- 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**



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			$V_{GSS}$	$\pm 20$	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

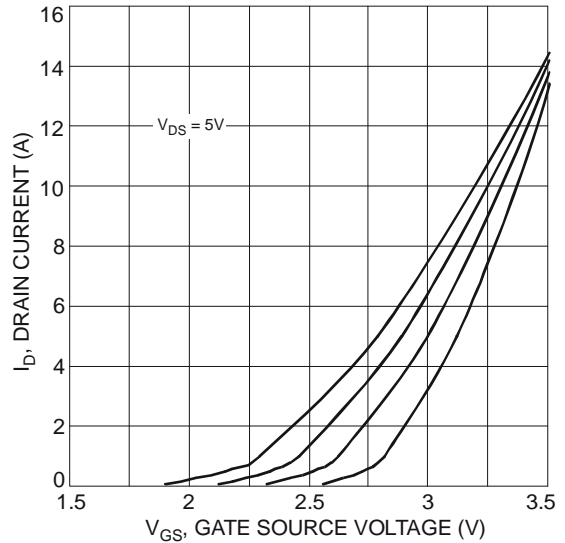
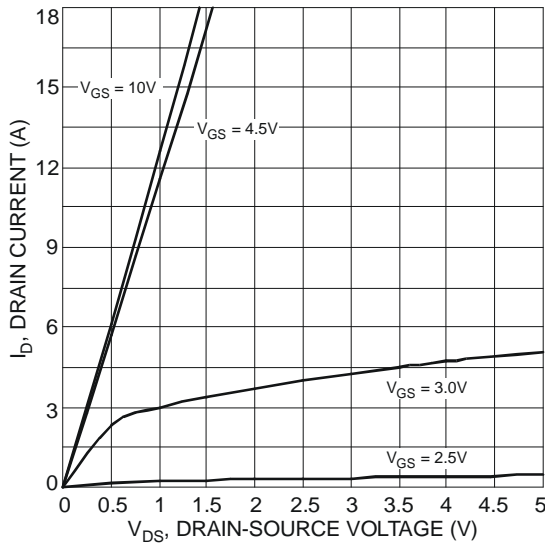
Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 1)	$P_D$	2.5	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	50	$^\circ C/W$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ C$

- Notes:
- Device mounted on 2 oz copper pad layout with  $R_{\theta JA} = 50^\circ C/W$ .
  - No purposefully added lead.
  - Pulse width  $\leq 10\mu s$ , Duty Cycle  $\leq 1\%$ .
  - Diodes Inc.'s "Green" policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php).

**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 5)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	30	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	1	μA	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 5)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	1	—	2.1	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	—	15 26	18.5 31	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 9A V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 7A
Forward Transconductance	g <sub>fs</sub>	—	5.8	—	S	V <sub>DS</sub> = 10V, I <sub>D</sub> = 9A
Diode Forward Voltage (Note 5)	V <sub>SD</sub>	0.5	0.7	1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 2.1A
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	C <sub>iss</sub>	—	741	—	pF	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	124	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	95	—	pF	
Gate Resistance	R <sub>G</sub>	0.30	0.88	1.5	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1.0MHz
<b>SWITCHING CHARACTERISTICS</b>						
Total Gate Charge	Q <sub>g</sub>	—	7.6 16.7	12 25	nC	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 9A
Gate-Source Charge	Q <sub>gs</sub>	—	1.9	—		V <sub>DS</sub> = 15V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 9A
Gate-Drain Charge	Q <sub>gd</sub>	—	5.2	—		
Turn-On Delay Time	t <sub>d(on)</sub>	—	4.0	—	ns	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 15V, R <sub>L</sub> = 15Ω, R <sub>G</sub> = 6Ω
Rise Time	t <sub>r</sub>	—	4.4	—		
Turn-Off Delay Time	t <sub>d(off)</sub>	—	23.0	—		
Fall Time	t <sub>f</sub>	—	9.4	—		

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



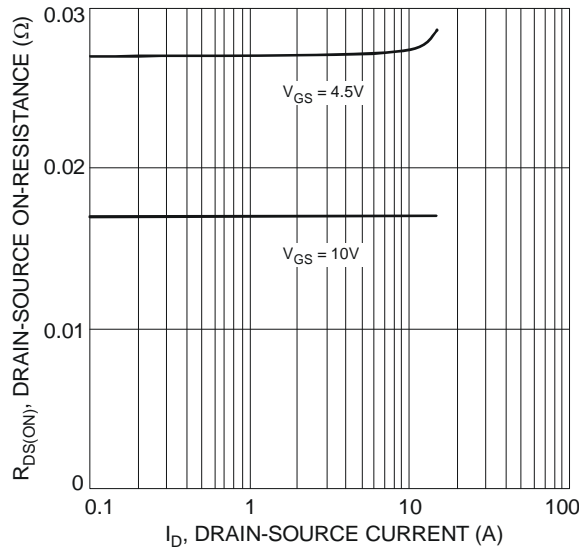


Fig. 3 Typical On-Resistance  
vs. Drain Current and Gate Voltage

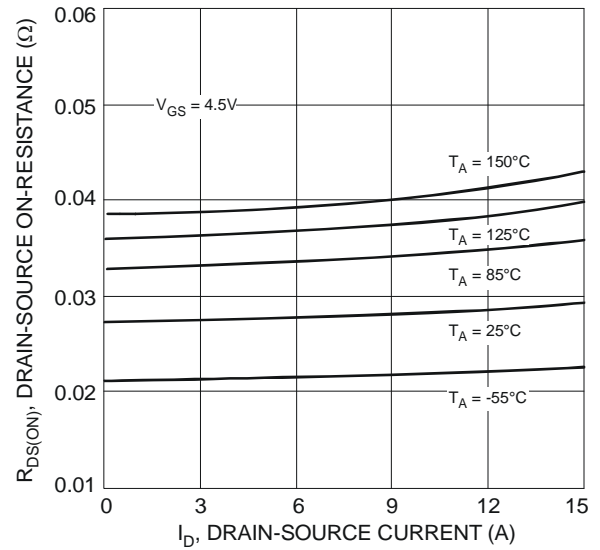


Fig. 4 Typical On-Resistance  
vs. Drain Current and Temperature

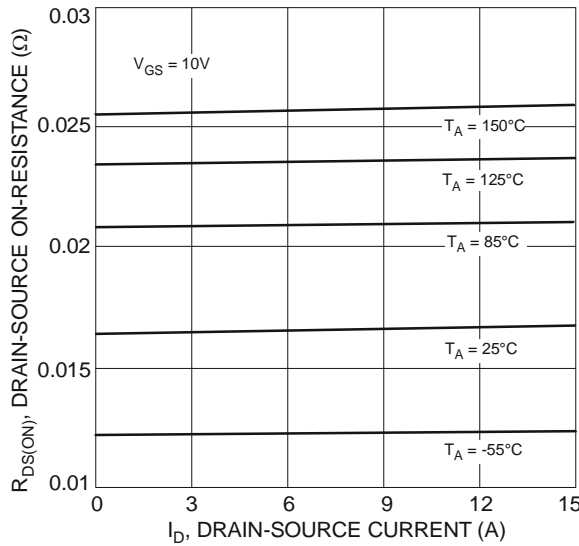


Fig. 5 Typical On-Resistance  
vs. Drain Current and Temperature

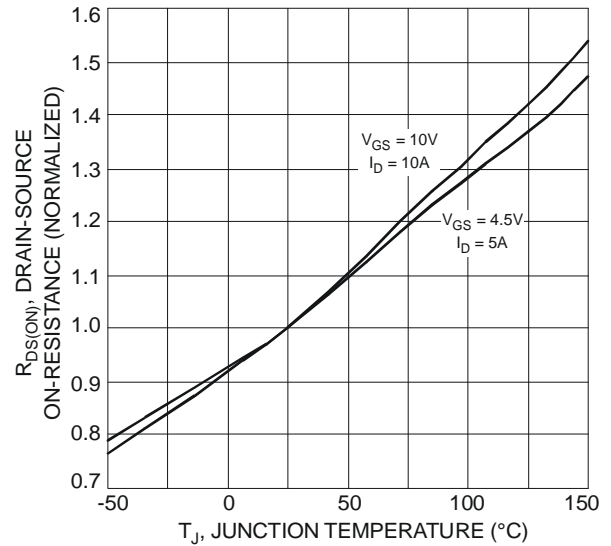


Fig. 6 On-Resistance Variation with Temperature

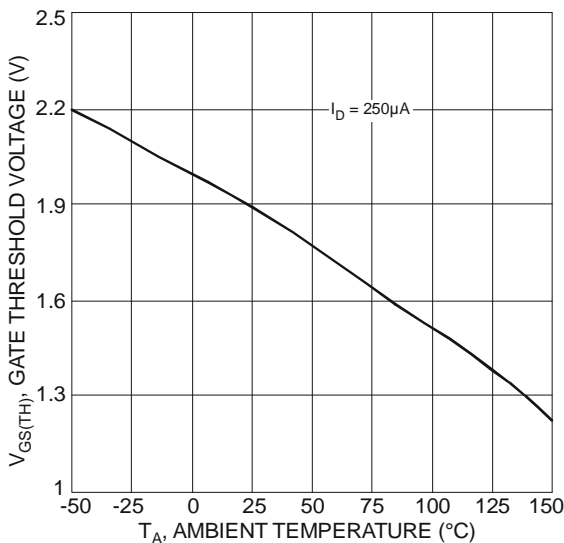


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

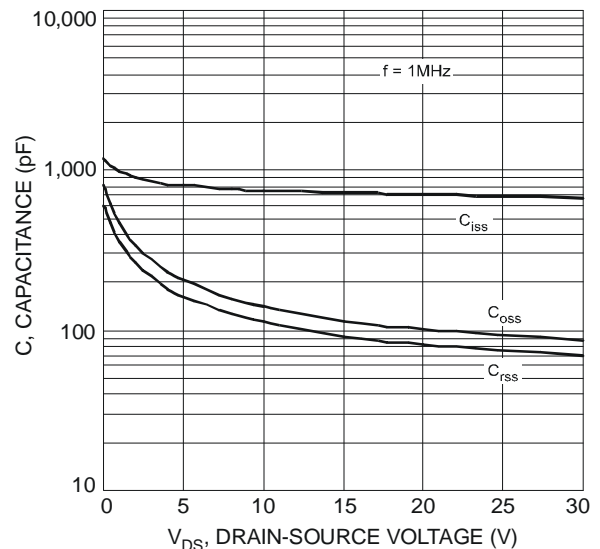


Fig. 8 Total Capacitance

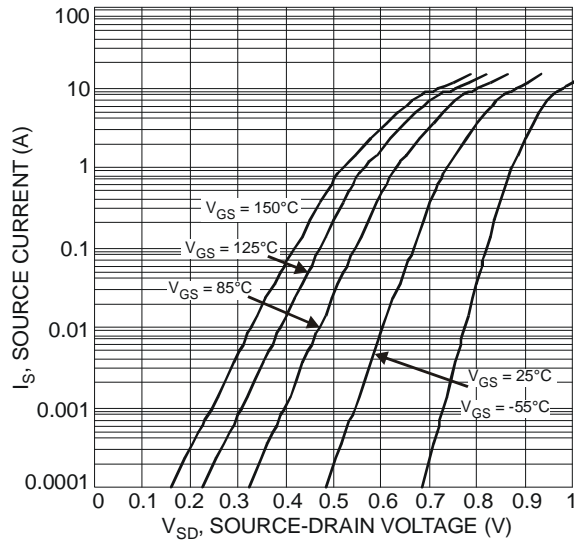


Fig. 9 Diode Forward Voltage vs. Current

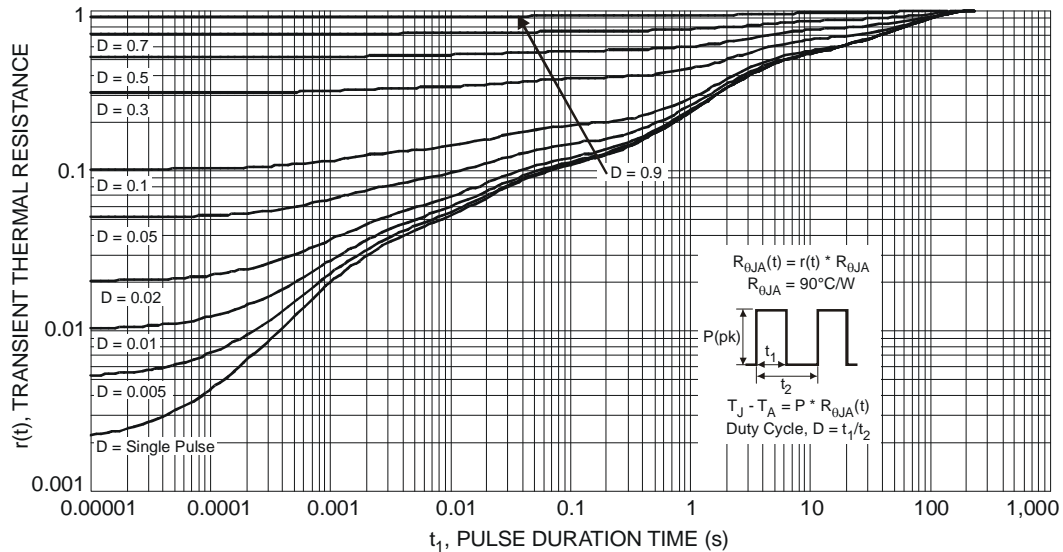


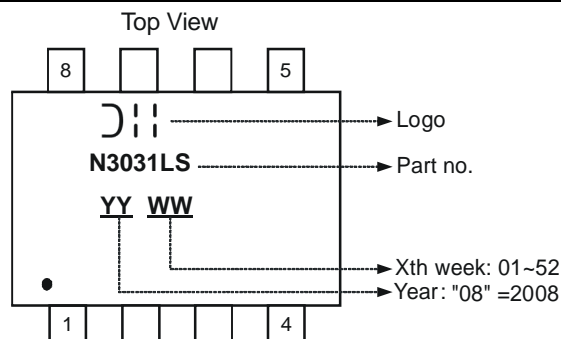
Fig. 10 Transient Thermal Response

## Ordering Information (Note 6)

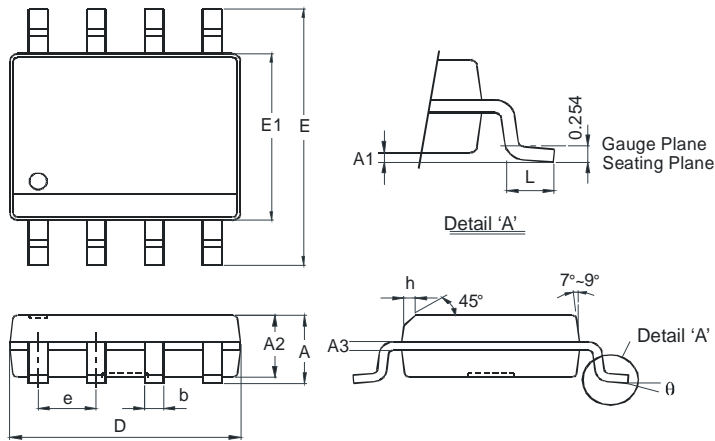
Part Number	Case	Packaging
DMN3031LSS-13	SO-8	2500/Tape & Reel

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

## Marking Information

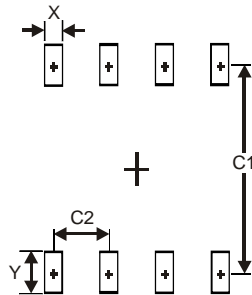


## Package Outline Dimensions



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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