

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ max	I_D max $T_A = +25^\circ C$
30V	22m Ω @ $V_{GS} = 10V$	6.7A
	30m Ω @ $V_{GS} = 4.5V$	5.2A

Description

This MOSFET has been designed to minimize the on-state resistance ($R_{DS(ON)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

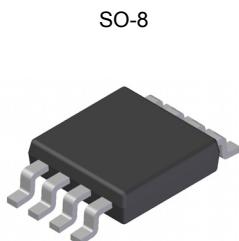
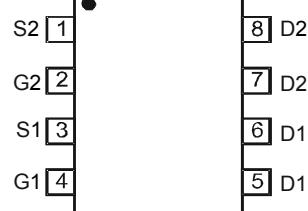
- Backlighting
- Power Management Functions
- DC-DC Converters

Features

- Low On-Resistance
- 100% UIS (Avalanche) Rated
- **ESD Protected Gate**
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- Qualified to AEC-Q101 Standards for High Reliability

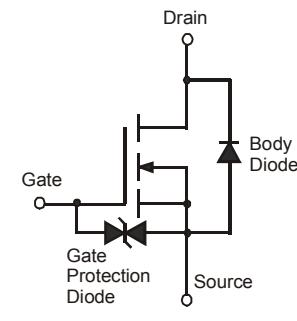
Mechanical Data

- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See diagram
- Terminals: Finish — Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.008 grams (approximate)


SO-8


Top View

Pin Configuration



Equivalent Circuit per Element

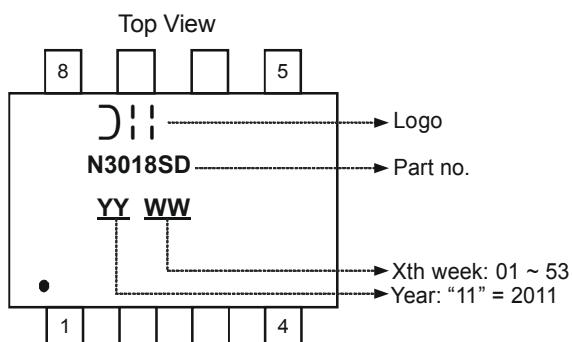
Ordering Information (Note 4)

Part Number	Case	Packaging
DMN3018SSD-13	SO-8	2500/Tape & Reel

Notes:

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See <http://www.diodes.com> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at <http://www.diodes.com>.

Marking Information



Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	30	V
Gate-Source Voltage			V_{GSS}	± 20	V
Continuous Drain Current (Note 5) $V_{GS} = 10\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	I_D	6.7 5.3	A
	$t < 10\text{s}$	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	I_D	8.7 6.9	A
Pulsed Drain Current (10 μs pulse, duty cycle = 1%)			I_{DM}	60	A
Maximum Body Diode continuous Current			I_S	2.0	A
Avalanche Current (Note 6) $L = 0.1\text{mH}$			I_{AR}	19	A
Repetitive Avalanche Energy (Note 6) $L = 0.1\text{mH}$			E_{AR}	18	mJ

 Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

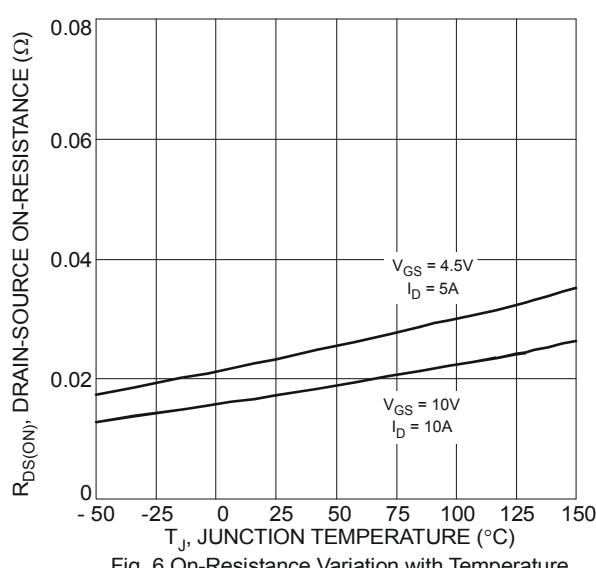
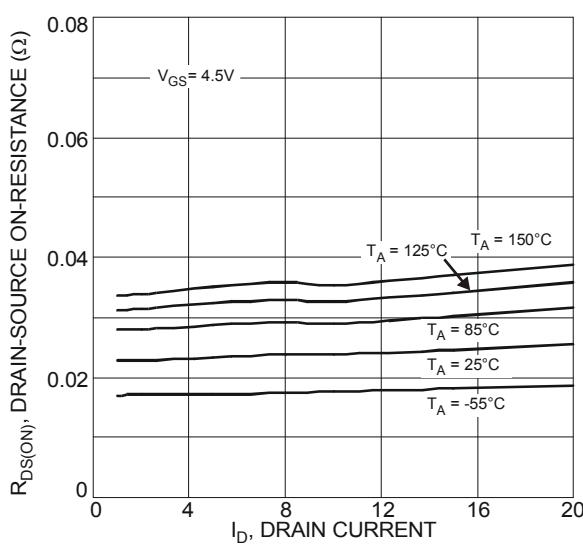
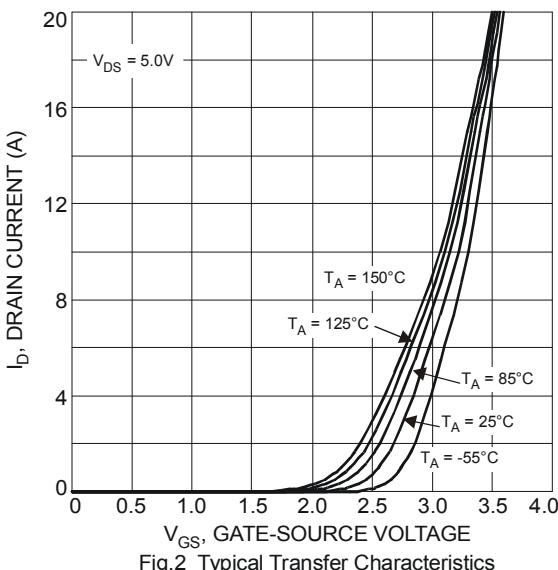
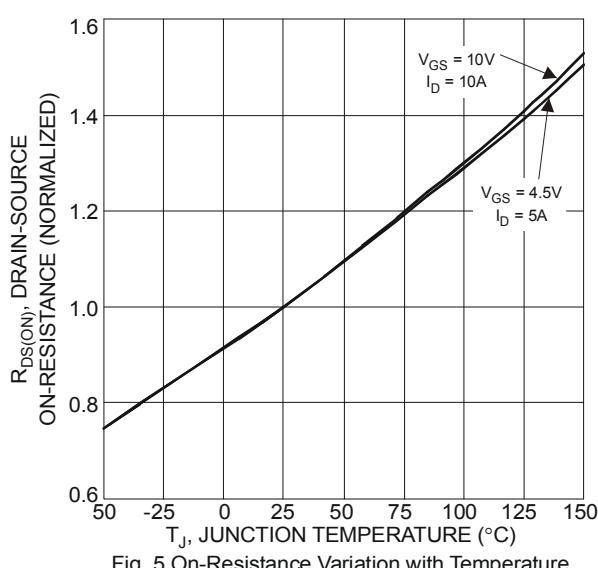
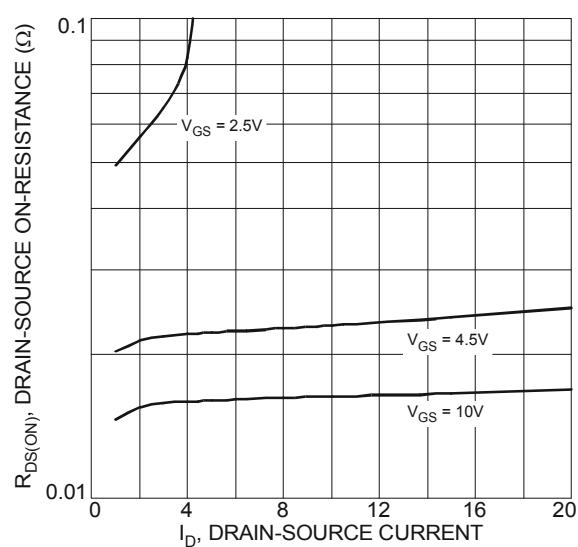
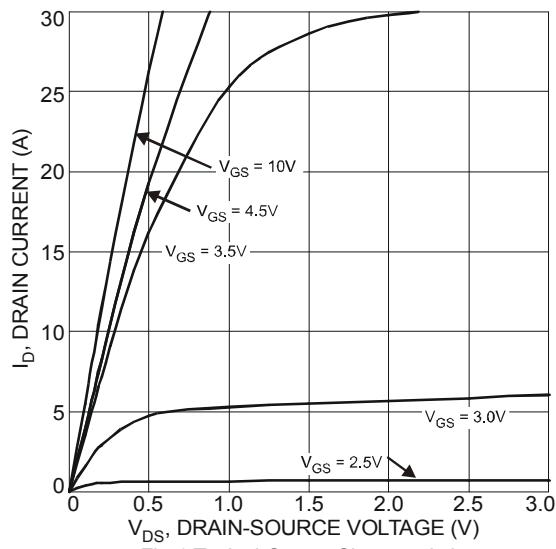
Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	P_D	1.5	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	83	$^\circ\text{C}/\text{W}$
	$t < 10\text{s}$	50	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case (Note 5)	$R_{\theta JC}$	14.5	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

 Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	30	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	$V_{DS} = 24\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(\text{th})}$	1	1.7	2.1	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(\text{ON})}$	—	16	22	$\text{m}\Omega$	$V_{GS} = 10\text{V}, I_D = 10\text{A}$
		—	23	30		$V_{GS} = 4.5\text{V}, I_D = 6\text{A}$
Forward Transfer Admittance	$ Y_{fs} $	—	8.3	—	S	$V_{DS} = 5\text{V}, I_D = 6.9\text{A}$
Diode Forward Voltage	V_{SD}	0.5	—	1.2	V	$V_{GS} = 0\text{V}, I_S = 1\text{A}$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	697	—	pF	$V_{DS} = 15\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	97	—		
Reverse Transfer Capacitance	C_{rss}	—	67	—		
Gate resistance	R_g	—	1.47	—	nC	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Total Gate Charge ($V_{GS} = 4.5\text{V}$)	Q_g	—	6.0	—		
Total Gate Charge ($V_{GS} = 10\text{V}$)	Q_g	—	13.2	—		
Gate-Source Charge	Q_{gs}	—	2.2	—		
Gate-Drain Charge	Q_{gd}	—	1.8	—		
Turn-On Delay Time	$t_{D(\text{on})}$	—	4.3	—		
Turn-On Rise Time	t_r	—	4.4	—	ns	$V_{DD} = 15\text{V}, V_{GS} = 10\text{V}, R_L = 15\Omega, I_D = 1\text{A}, R_G = 6\Omega$
Turn-Off Delay Time	$t_{D(\text{off})}$	—	20.1	—		
Turn-Off Fall Time	t_f	—	4.1	—		
Reverse Recovery Time	t_{rr}	—	7.3	—	nC	$I_F = 9\text{A}, di/dt = 500\text{A}/\mu\text{s}$
Reverse Recovery Charge	Q_{rr}	—	7.9	—		

Notes:

5. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
6. I_{AR} and E_{AR} rating are based on low frequency and duty cycles to keep $T_J = +25^\circ\text{C}$
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.



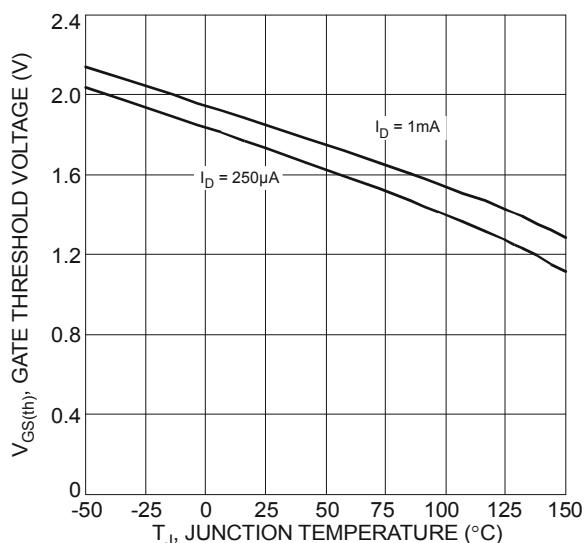


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

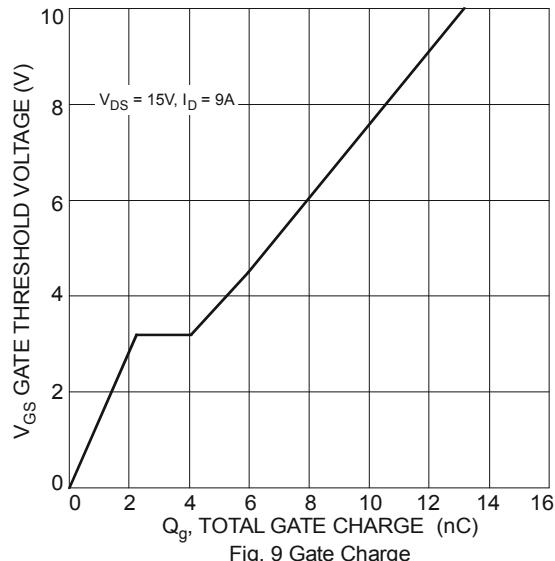


Fig. 9 Gate Charge

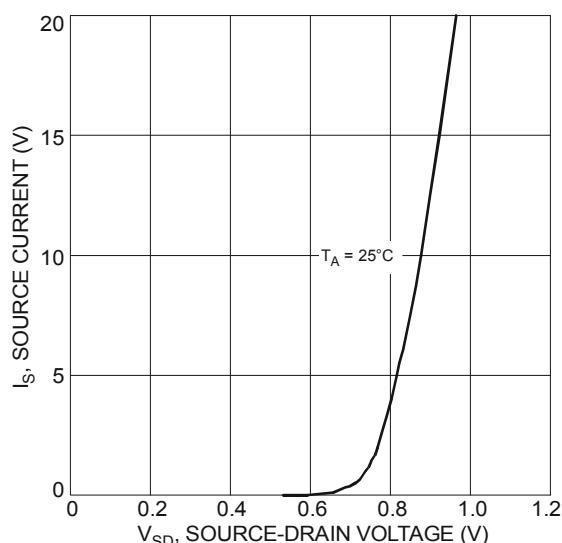


Fig. 8 Diode Forward Voltage vs. Current

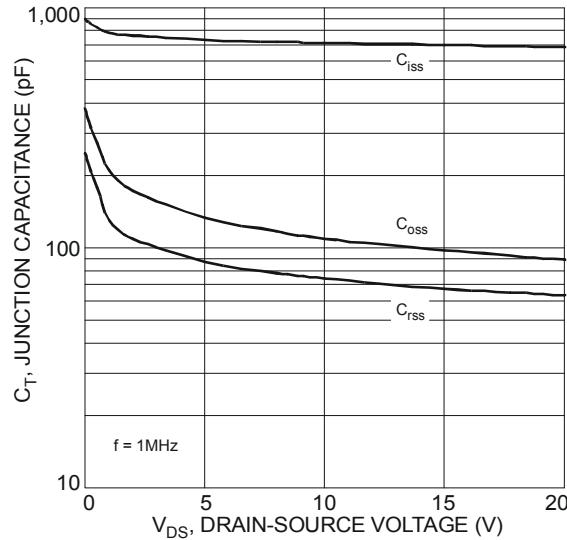


Fig. 10 Typical Junction Capacitance

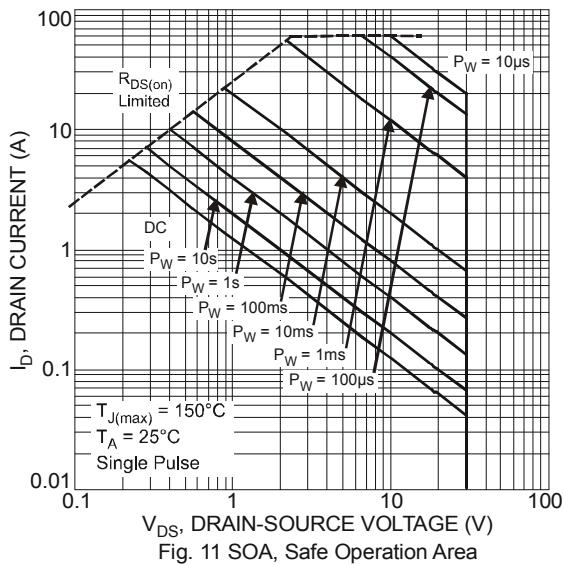


Fig. 11 SOA, Safe Operation Area

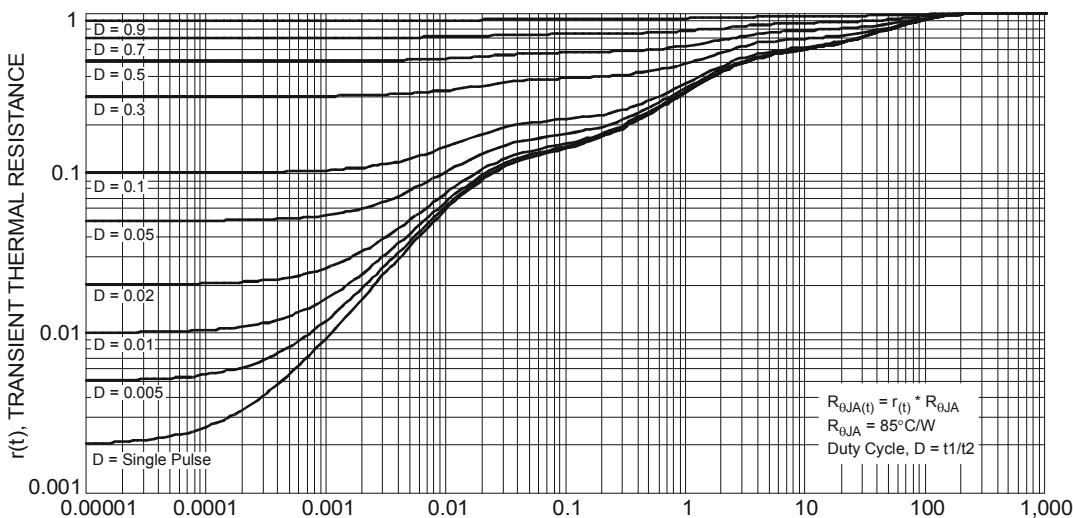
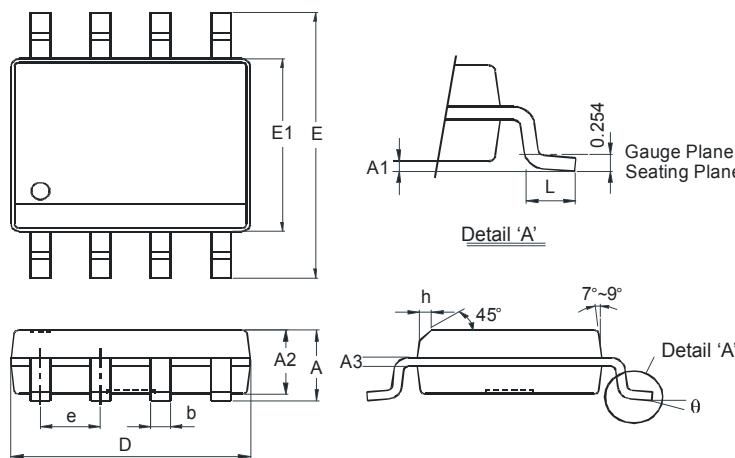


Fig. 12 Transient Thermal Resistance

Package Outline Dimensions

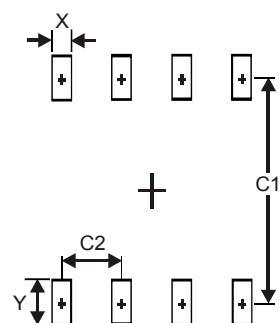
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



Dimensions	Value (in mm)
X	0.60
Y	1.55
C1	5.4
C2	1.27

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