

## Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ max	$I_D$ max $T_A = 25^\circ\text{C}$
30V	$21\text{m}\Omega$ @ $V_{GS} = 10\text{V}$	7.3A
	$35\text{m}\Omega$ @ $V_{GS} = 4.5\text{V}$	5.5A

## Description and Applications

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.

- Backlighting
- Power Management Functions
- DC-DC Converters

## Features and Benefits

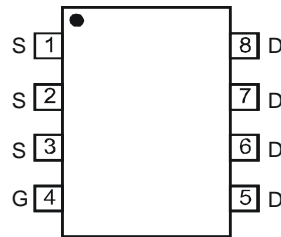
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- **ESD Protected Gate**
- **"Green" component and RoHS compliant (Notes 1 & 2)**
- **Qualified to AEC-Q101 standards for High Reliability**

## Mechanical Data

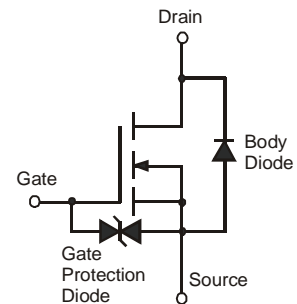
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound.  
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See diagram
- Terminals: Finish — Matte Tin annealed over Copper leadframe.  
Solderable per MIL-STD-202,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



Top View



Top View  
Pin Configuration



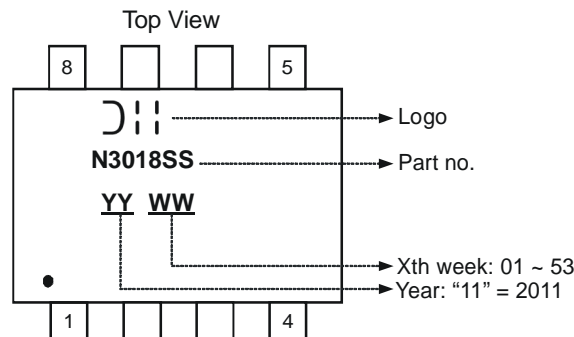
Equivalent Circuit Per Element

## Ordering Information (Note 3)

Part Number	Case	Packaging
DMN3018SSS-13	SO-8	2500/Tape & Reel

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. No purposely added lead. Halogen and Antimony free.
  2. Diodes Inc.'s "Green" policy can be found on our website at <http://www.diodes.com>.
  3. For packaging details, go to our website at <http://www.diodes.com>.

## Marking Information



**Maximum Ratings** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V <sub>DSS</sub>	30	V
Gate-Source Voltage			V <sub>GSS</sub>	±25	V
Continuous Drain Current (Note 5) V <sub>GS</sub> = 10V	Steady State	T <sub>A</sub> = 25°C T <sub>A</sub> = 70°C	I <sub>D</sub>	7.3 5.7	A
	t < 10s	T <sub>A</sub> = 25°C T <sub>A</sub> = 70°C	I <sub>D</sub>	9.7 7.8	A
Continuous Drain Current (Note 5) V <sub>GS</sub> = 4.5V	Steady State	T <sub>A</sub> = 25°C T <sub>A</sub> = 70°C	I <sub>D</sub>	5.5 4.3	A
	t < 10s	T <sub>A</sub> = 25°C T <sub>A</sub> = 70°C	I <sub>D</sub>	7.6 5.8	A
Pulsed Drain Current (10μs pulse, duty cycle = 1%)			I <sub>DM</sub>	60	A
Maximum Body Diode continuous Current			I <sub>S</sub>	2.5	A

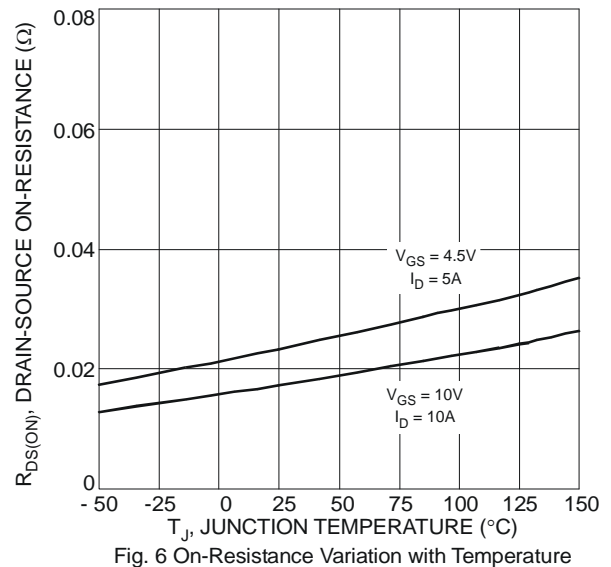
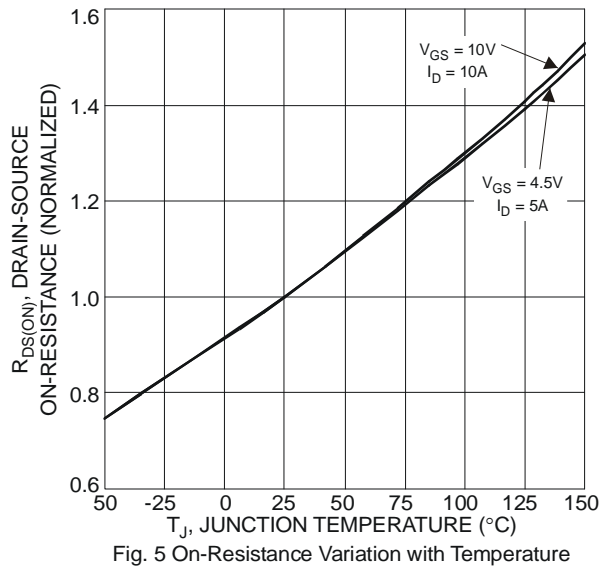
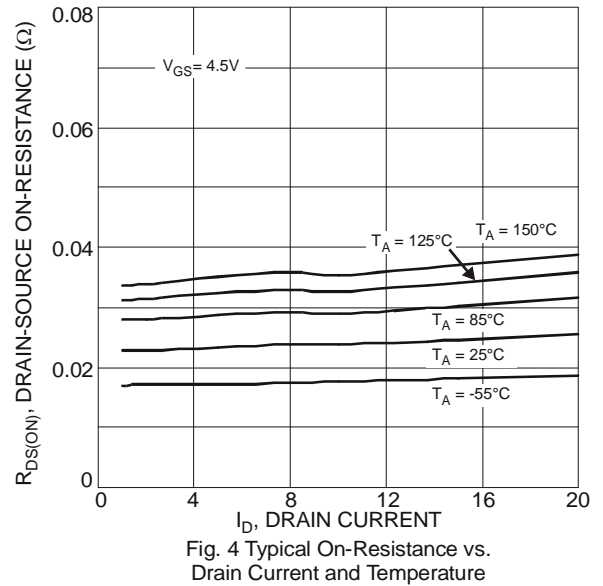
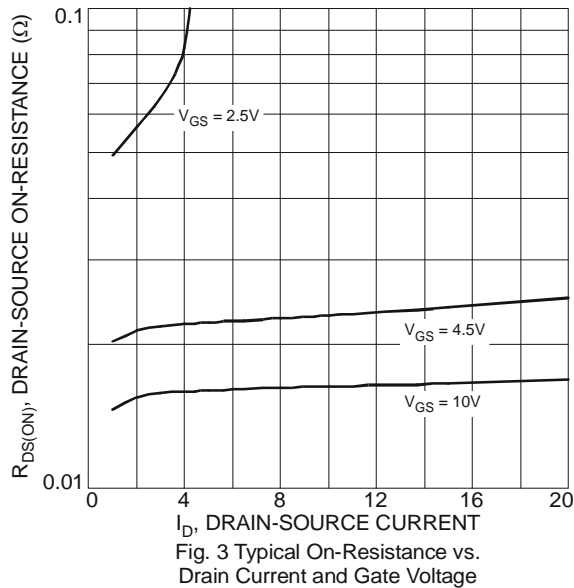
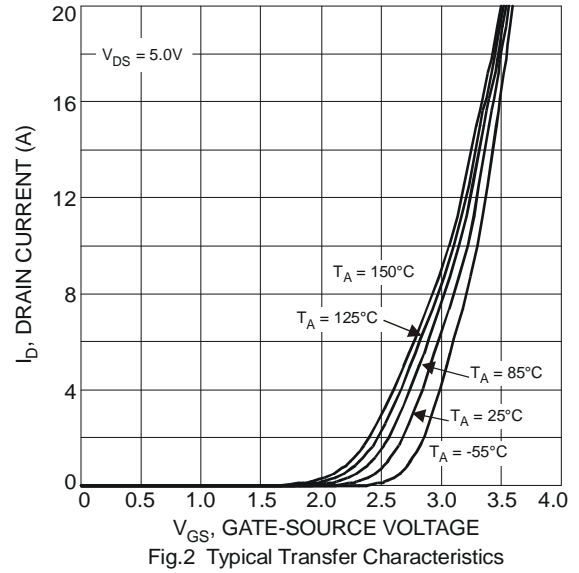
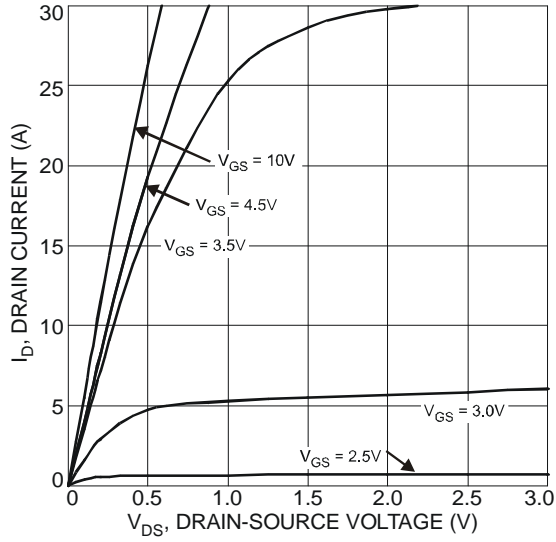
**Thermal Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 4)	T <sub>A</sub> = 25°C	P <sub>D</sub>	1.4	W
	T <sub>A</sub> = 70°C		0.9	
Thermal Resistance, Junction to Ambient (Note 4)	Steady state	R <sub>θJA</sub>	90	°C/W
	t < 10s		50	°C/W
Total Power Dissipation (Note 5)	T <sub>A</sub> = 25°C	P <sub>D</sub>	1.7	W
	T <sub>A</sub> = 70°C		1.1	
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	R <sub>θJA</sub>	75	°C/W
	t < 10s		42	°C/W
Thermal Resistance, Junction to Case (Note 5)		R <sub>θJC</sub>	7.6	°C/W
Operating and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 6)</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> = 24V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	-	-	±10	μA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 6)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	1	1.7	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	21	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 10A
		-	20	35		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 8.5A
Forward Transfer Admittance	Y <sub>fs</sub>	-	8.3	-	S	V <sub>DS</sub> = 5V, I <sub>D</sub> = 6.9A
Diode Forward Voltage	V <sub>SD</sub>	0.5	-	1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 1A
<b>DYNAMIC CHARACTERISTICS (Note 7)</b>						
Input Capacitance	C <sub>iss</sub>	-	697	-	pF	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	-	97	-	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	-	67	-	pF	
Gate resistance	R <sub>g</sub>	-	1.47	-	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1.0MHz
Total Gate Charge (V <sub>GS</sub> = 4.5V)	Q <sub>g</sub>	-	6.0	-	nC	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 15V, I <sub>D</sub> = 9A
Total Gate Charge (V <sub>GS</sub> = 10V)	Q <sub>g</sub>	-	13.2	-	nC	
Gate-Source Charge	Q <sub>gs</sub>	-	2.2	-	nC	
Gate-Drain Charge	Q <sub>gd</sub>	-	1.8	-	nC	
Turn-On Delay Time	t <sub>D(on)</sub>	-	4.3	-	ns	V <sub>DD</sub> = 15V, V <sub>GS</sub> = 10V, R <sub>L</sub> = 15Ω, I <sub>D</sub> = 1A, R <sub>G</sub> = 6Ω
Turn-On Rise Time	t <sub>r</sub>	-	4.4	-	ns	
Turn-Off Delay Time	t <sub>D(off)</sub>	-	20.1	-	ns	
Turn-Off Fall Time	t <sub>f</sub>	-	4.1	-	ns	
Reverse Recovery Time	T <sub>rr</sub>	-	7.3	-	ns	I <sub>F</sub> = 9A, di/dt = 500A/μs
Reverse Recovery Charge	Q <sub>rr</sub>	-	7.9	-	nC	

- Notes: 4. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.  
5. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.  
6. Short duration pulse test used to minimize self-heating effect.  
7. Guaranteed by design. Not subject to product testing.



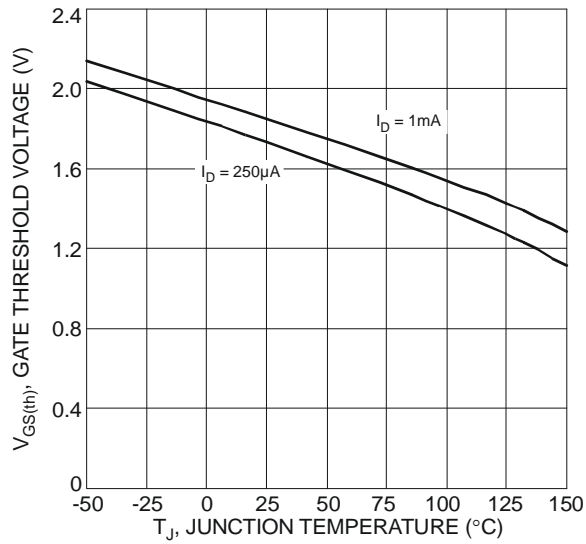


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

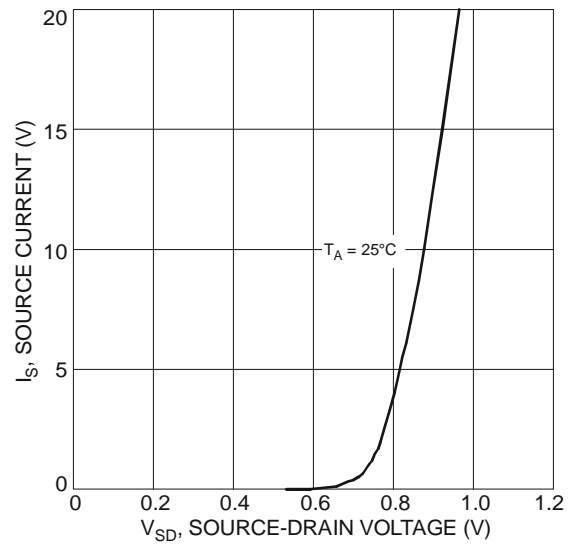


Fig. 8 Diode Forward Voltage vs. Current

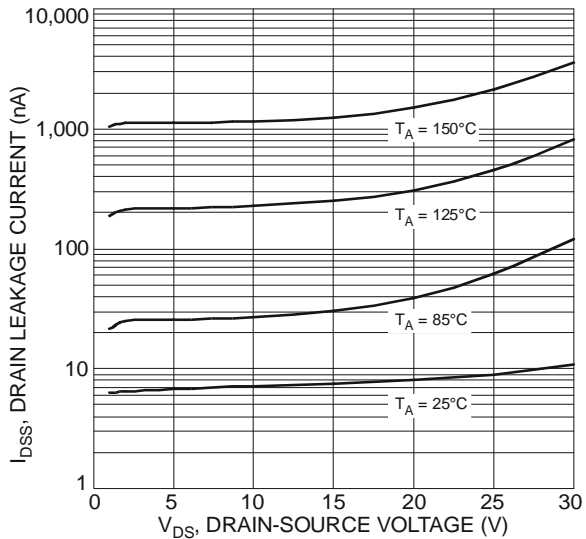


Fig. 9 Typical Drain-Source Leakage Current vs. Voltage

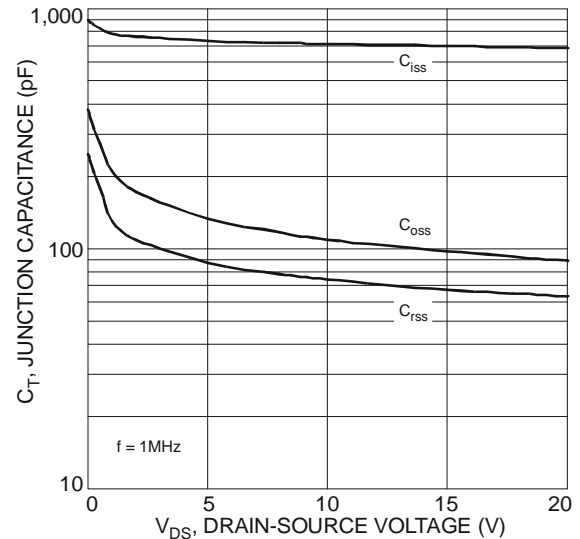


Fig. 10 Typical Junction Capacitance

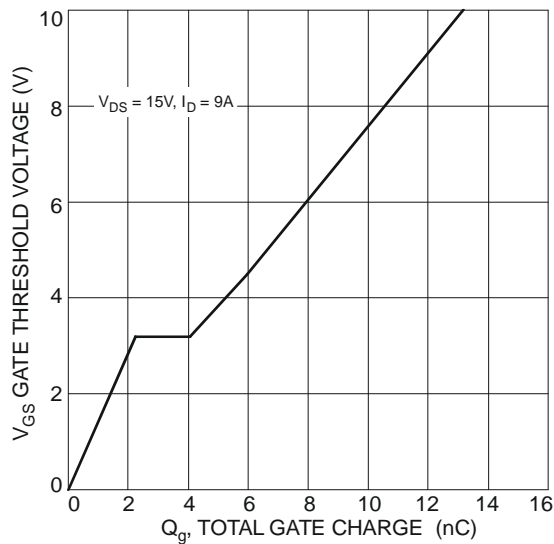
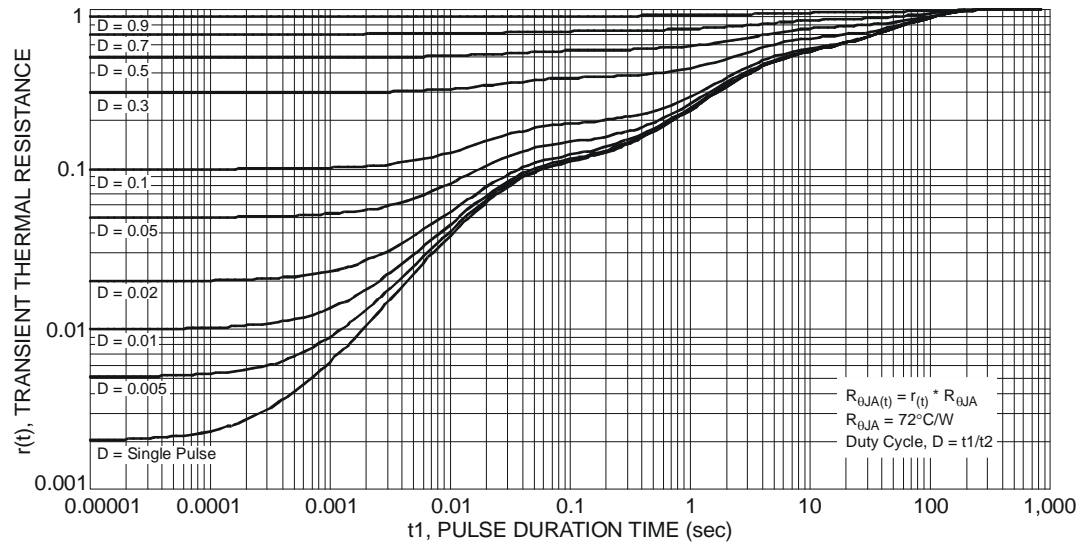
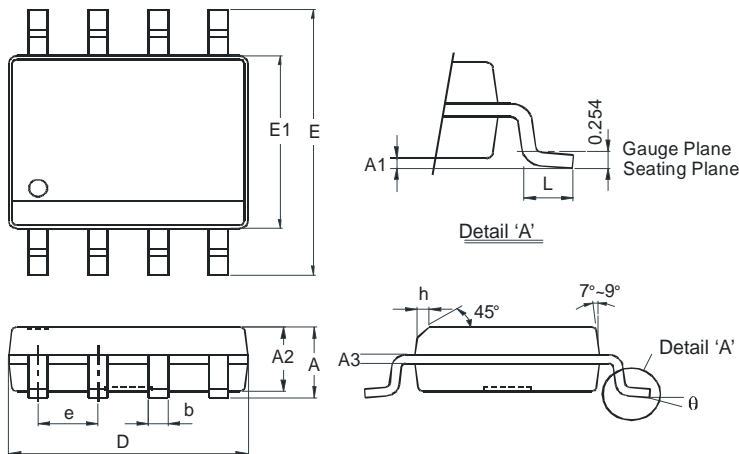


Fig. 11 Gate Charge

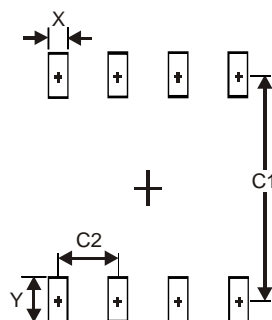


## Package Outline Dimensions



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
$\theta$	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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