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**DMS3015SSS**

**N-CHANNEL ENHANCEMENT MODE MOSFET WITH SCHOTTKY DIODE**

NEW PRODUCT

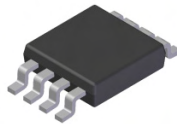
**Features**

- DIOFET utilizes a unique patented process to monolithically integrate a MOSFET and a Schottky in a single die to deliver:
  - Low  $R_{DS(ON)}$  - minimizes conduction losses
  - Low  $V_{SD}$  - reducing the losses due to body diode conduction
  - Low  $Q_{rr}$  - lower  $Q_{rr}$  of the integrated Schottky reduces body diode switching losses
  - Low gate capacitance ( $Q_g/Q_{GS}$ ) ratio – reduces risk of shoot-through or cross conduction currents at high frequencies
  - Avalanche rugged –  $I_{AR}$  and  $E_{AR}$  rated
- **Lead Free, RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

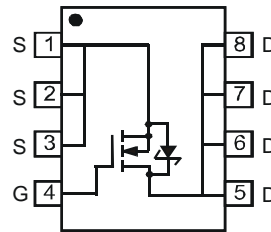
**Mechanical Data**

- 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: See Diagram Below
- Marking Information: See Page 5
- Ordering Information: See Page 5
- Weight: 0.072 grams (approximate)

**DIOFET**



Top View



Top View  
Internal Schematic

**Maximum Ratings** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			$V_{DSS}$	30	V
Gate-Source Voltage			$V_{GSS}$	$\pm 20$	V
Continuous Drain Current (Note 3) $V_{GS} = 10\text{V}$	Steady State	$T_A = 25^\circ\text{C}$	$I_D$	11	A
		$T_A = 85^\circ\text{C}$		6.6	
Pulsed Drain Current (Note 4)			$I_{DM}$	80	A
Avalanche Current (Notes 4 & 5)			$I_{AR}$	17	A
Repetitive Avalanche Energy (Notes 4 & 5) $L = 0.3\text{mH}$			$E_{AR}$	43	mJ

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 3)	$P_D$	1.55	W
Thermal Resistance, Junction to Ambient @ $T_A = 25^\circ\text{C}$ (Note 3)	$R_{\theta JA}$	81.3	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

- Notes:
1. No purposefully added lead.
  2. 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).
  3. Device mounted on 1in \* 1in FR-4 PCB with 2oz. Copper. The value in any given application depends on the user's specific board design.
  4. Repetitive rating, pulse width limited by junction temperature.
  5.  $I_{AR}$  and  $E_{AR}$  rating are based on low frequency and duty cycles to keep  $T_J = 25^\circ\text{C}$

**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>	-	-	0.1	mA	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 6)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	1.0	1.5	2.5	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	-	8.5	11.9	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 11A
		-	9.5	14.9		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 8.8A
Forward Transfer Admittance	Y <sub>fs</sub>	-	18	-	S	V <sub>DS</sub> = 5V, I <sub>D</sub> = 10A
Diode Forward Voltage	V <sub>SD</sub>	-	0.45	0.55	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 1A
<b>DYNAMIC CHARACTERISTICS (Note 7)</b>						
Input Capacitance	C <sub>iss</sub>	-	1276	-	pF	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	-	160	-	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	-	136	-	pF	
Gate Resistance	R <sub>g</sub>	0.3	1.48	2.7	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge (V <sub>GS</sub> = 4.5V)	Q <sub>g</sub>	-	14.3	-	nC	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 8.8A
Total Gate Charge (V <sub>GS</sub> = 10V)	Q <sub>g</sub>	-	30.6	-	nC	
Gate-Source Charge	Q <sub>gs</sub>	-	3.4	-	nC	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 8.8A
Gate-Drain Charge	Q <sub>gd</sub>	-	4.3	-	nC	
Turn-On Delay Time	t <sub>D(on)</sub>	-	15.8	-	ns	V <sub>GS</sub> = 4.5V, V <sub>DS</sub> = 15V, R <sub>G</sub> = 1.8Ω, I <sub>D</sub> = 8.8A
Turn-On Rise Time	t <sub>r</sub>	-	27.8	-	ns	
Turn-Off Delay Time	t <sub>D(off)</sub>	-	29.7	-	ns	
Turn-Off Fall Time	t <sub>f</sub>	-	13.6	-	ns	

Notes: 6. Short duration pulse test used to minimize self-heating effect.  
 7. Guaranteed by design. Not subject to production testing.

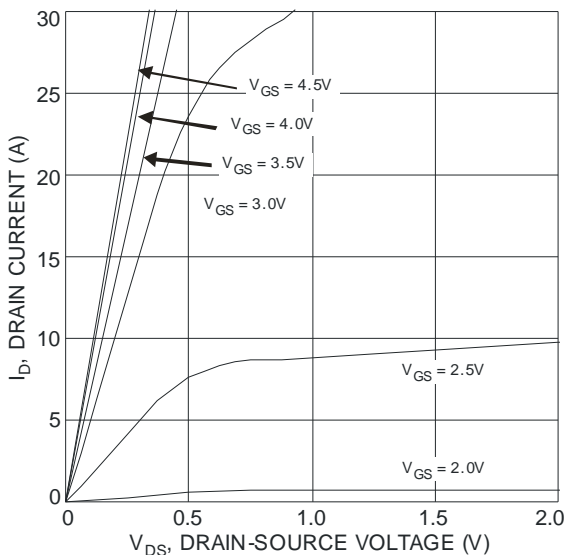


Fig. 1 Typical Output Characteristics

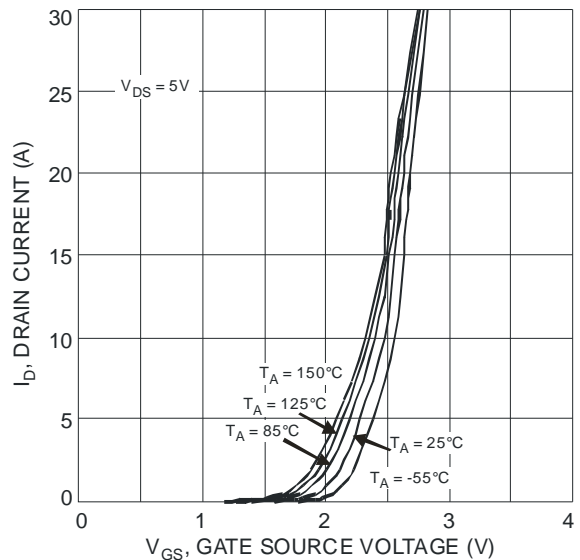


Fig. 2 Typical Transfer Characteristics



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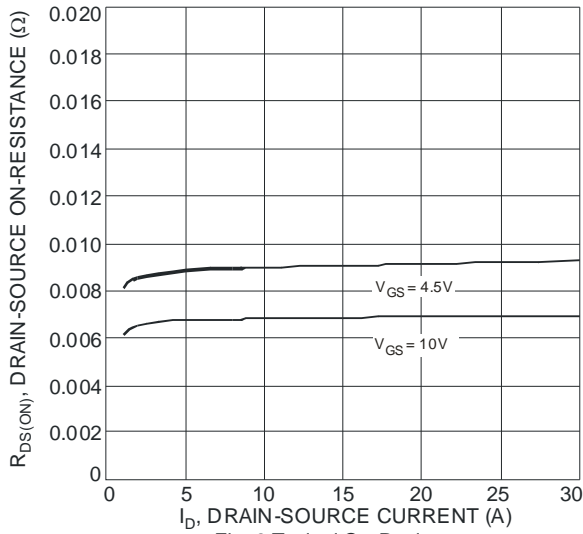


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

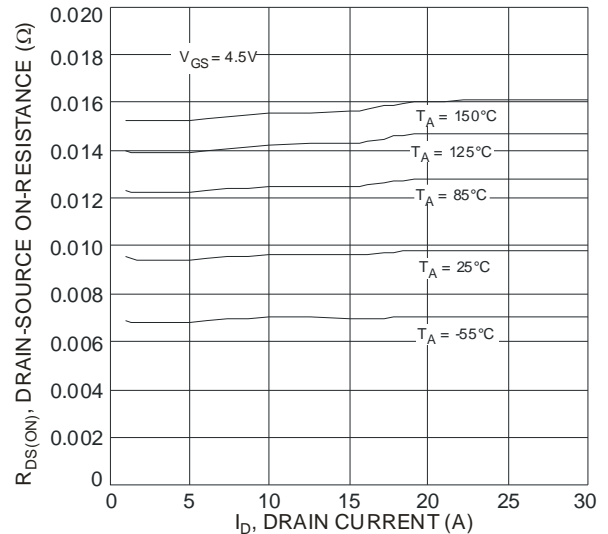


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

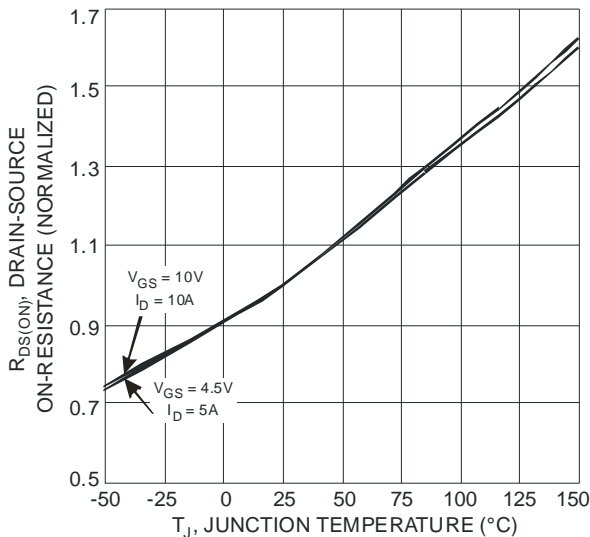


Fig. 5 On-Resistance Variation with Temperature

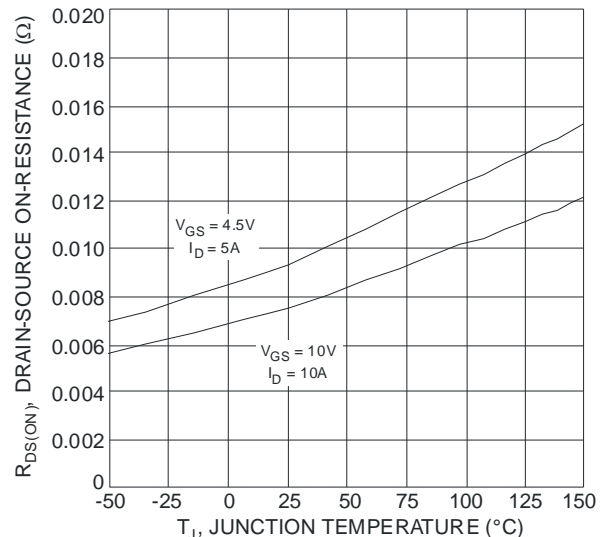


Fig. 6 On-Resistance Variation with Temperature

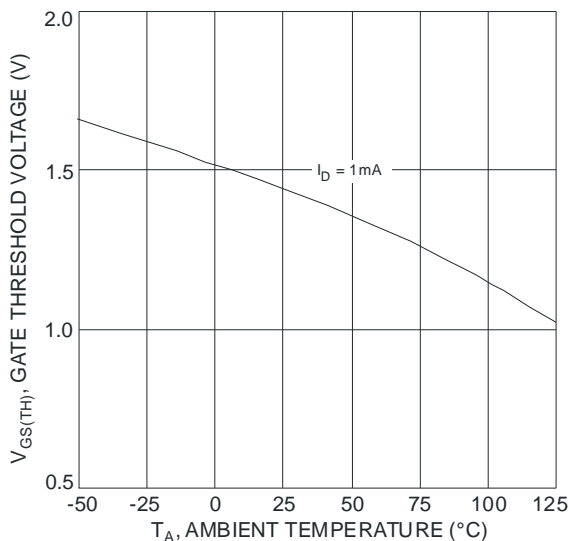


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

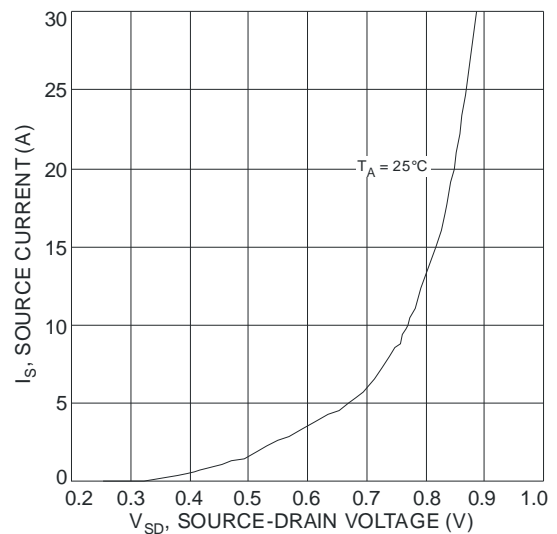


Fig. 8 Diode Forward Voltage vs. Current



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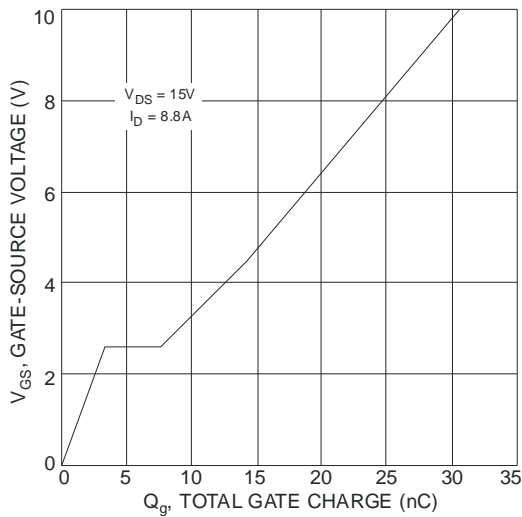
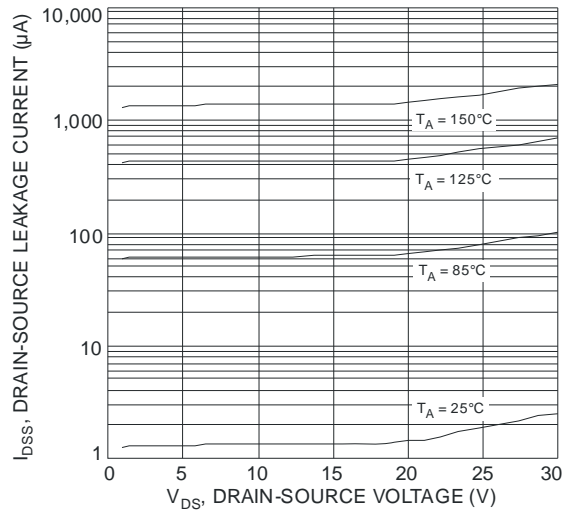
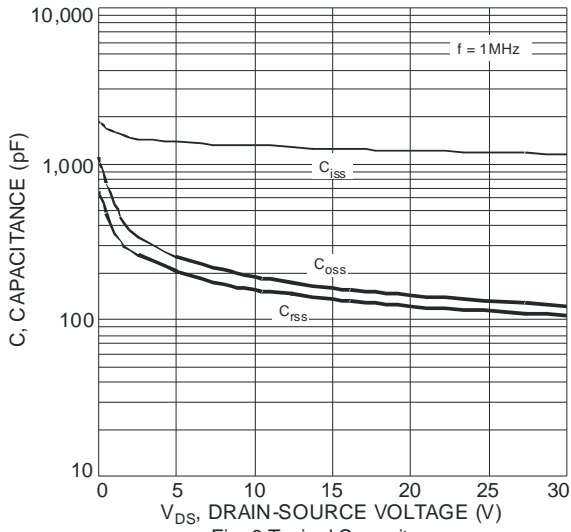


Fig. 11 Gate-Source Voltage vs. Total Gate Charge

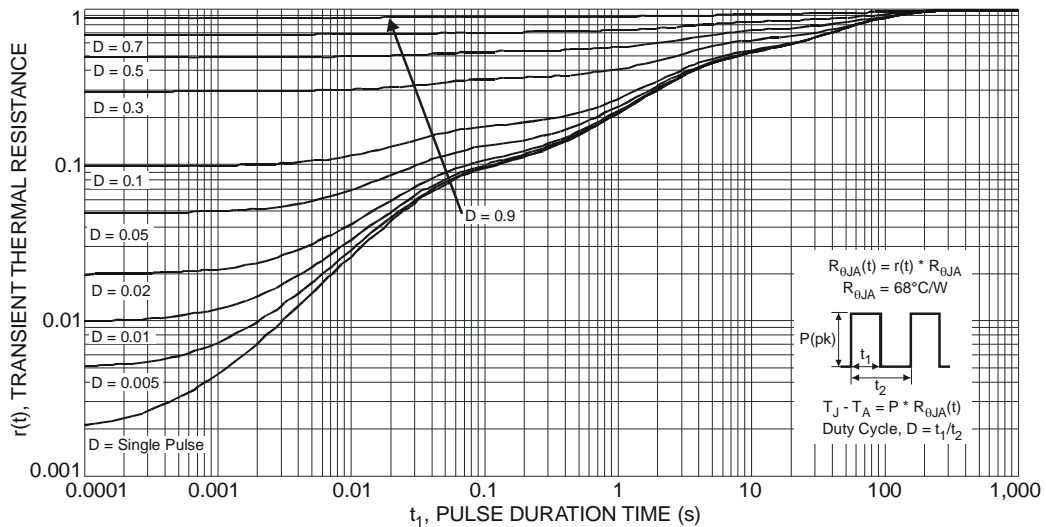


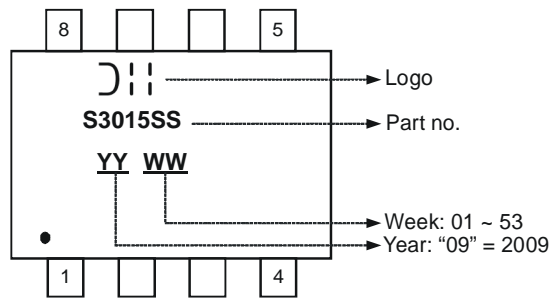
Fig. 12 Transient Thermal Response

**Ordering Information** (Note 8)

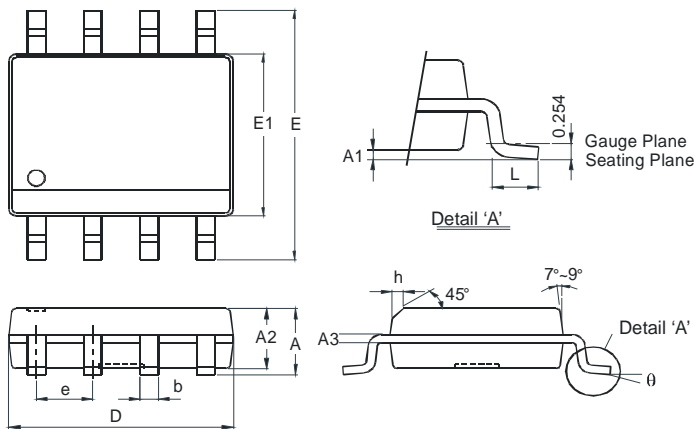
Part Number	Case	Packaging
DMS3015SSS-13	SO-8	2500 / Tape & Reel

Notes: 8. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

**Marking Information**

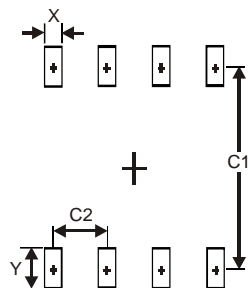


**Package Outline Dimensions**



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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