

N-CHANNEL ENHANCEMENT MODE MOSFET WITH SCHOTTKY DIODE

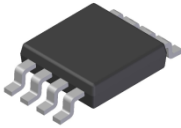
Features

- High Density UMOS with Schottky Barrier Diode
- Low Leakage Current at High Temp.
- High Conversion Efficiency
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Utilizes Diodes Incorporated's Monolithic SiMFET Technology to Increase Conversion Efficiency
- 100% UIS and R_g Tested
- **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**

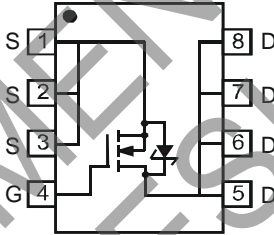
Mechanical Data

- 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: See Diagram Below
- Weight: 0.072 grams (Approximate)

SiMFET
Schottky Integrated MOSFET



Top View



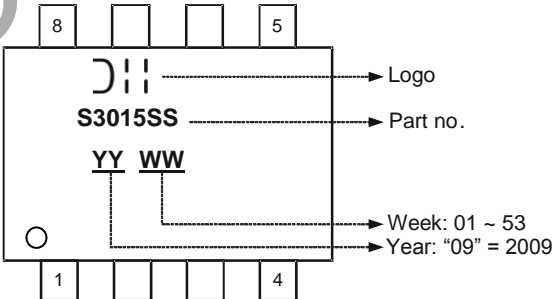
Top View
Internal Schematic

Ordering Information (Note 4)

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

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	
Drain-Source Voltage	V _{DSS}	30	V	
Gate-Source Voltage	V _{GSS}	±20	V	
Continuous Drain Current (Note 5) V _{GS} = 10V	I _D	T _A = +25°C	11	A
		T _A = +85°C	6.6	A
Pulsed Drain Current (Note 6)	I _{DM}	80	A	
Avalanche Current (Notes 6 & 7)	I _{AR}	17	A	
Repetitive Avalanche Energy (Notes 6 & 7) L = 0.3mH	E _{AR}	43	mJ	

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P _D	1.55	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 5)	R _{θJA}	81.3	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV _{DSS}	30	-	-	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	-	-	0.1	mA	V _{DS} = 30V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	-	-	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	1.0	1.5	2.5	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	-	8.5	11.9	mΩ	V _{GS} = 10V, I _D = 11A
		-	9.5	14.9		V _{GS} = 4.5V, I _D = 8.8A
Forward Transfer Admittance	Y _{fs}	-	18	-	S	V _{DS} = 5V, I _D = 10A
Diode Forward Voltage	V _{SD}	-	0.45	1	V	V _{GS} = 0V, I _S = 1A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iss}	-	1276	-	pF	V _{DS} = 15V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	-	160	-	pF	
Reverse Transfer Capacitance	C _{rss}	-	136	-	pF	
Gate Resistance	R _g	-	1.48	2.7	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 4.5V)	Q _g	-	14.3	-	nC	V _{DS} = 15V, V _{GS} = 4.5V, I _D = 8.8A
Total Gate Charge (V _{GS} = 10V)	Q _g	-	30.6	-	nC	
Gate-Source Charge	Q _{gs}	-	3.4	-	nC	V _{DS} = 15V, V _{GS} = 10V, I _D = 8.8A
Gate-Drain Charge	Q _{gd}	-	4.3	-	nC	
Turn-On Delay Time	t _{D(ON)}	-	15.8	-	ns	V _{GS} = 4.5V, V _{DS} = 15V, R _G = 1.8Ω, I _D = 8.8A
Turn-On Rise Time	t _R	-	27.8	-	ns	
Turn-Off Delay Time	t _{D(OFF)}	-	29.7	-	ns	
Turn-Off Fall Time	t _F	-	13.6	-	ns	

- Notes:
5. 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.
 6. Repetitive rating, pulse width limited by junction temperature.
 7. I_{AR} and E_{AR} ratings are based on low frequency and duty cycles to keep T_J = +25°C.
 8. Short duration pulse test used to minimize self-heating effect.
 9. Guaranteed by design. Not subject to production testing.

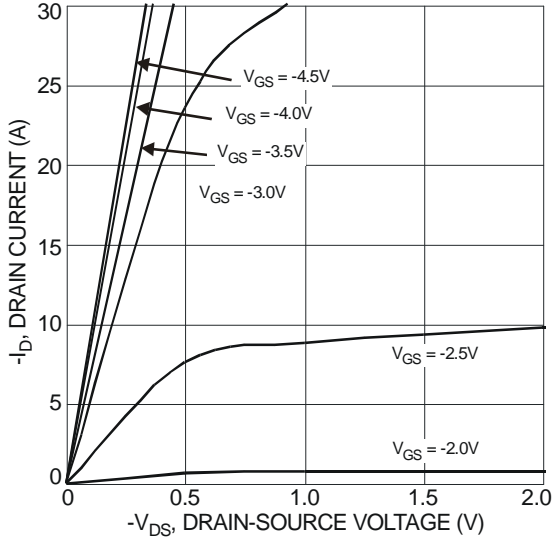


Fig. 1 Typical Output Characteristics

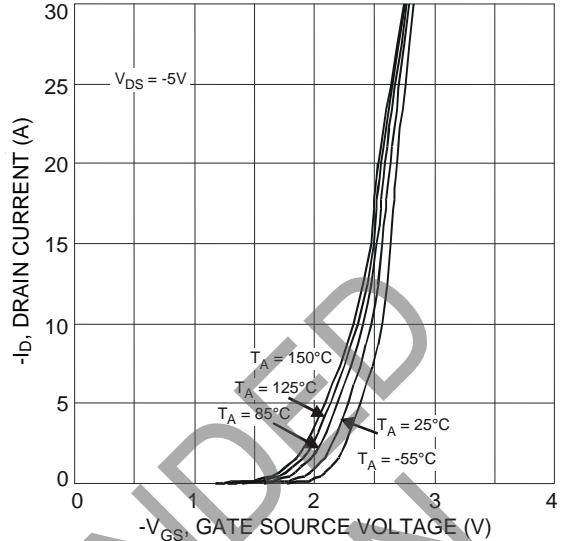


Fig. 2 Typical Transfer Characteristics

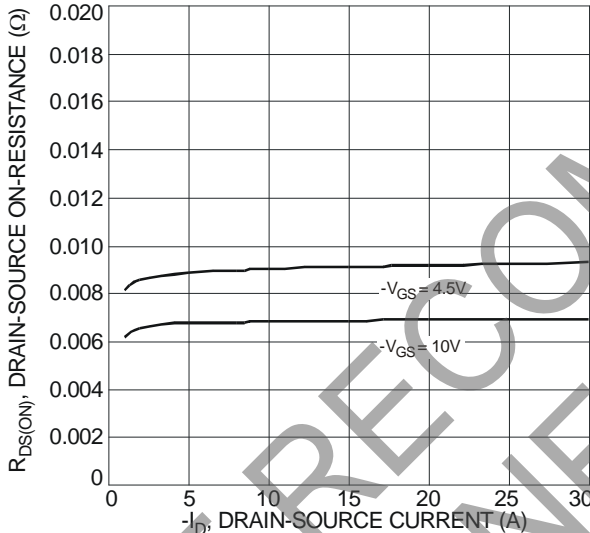


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

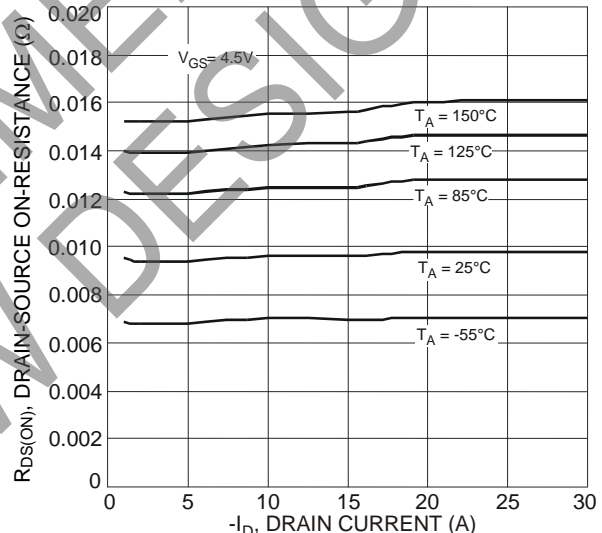


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

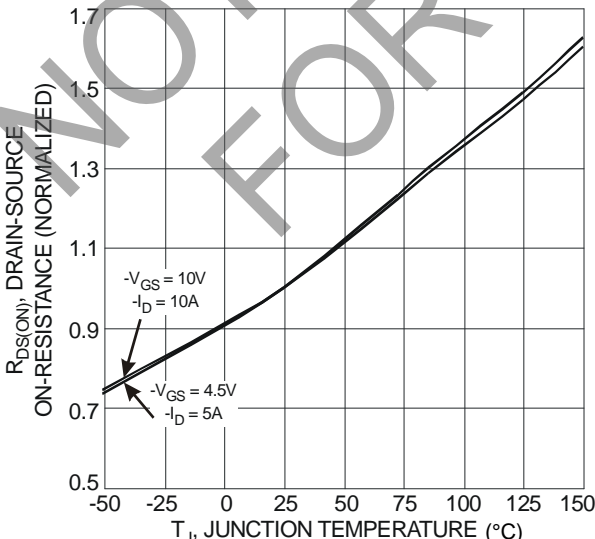


Fig. 5 On-Resistance Variation with Temperature

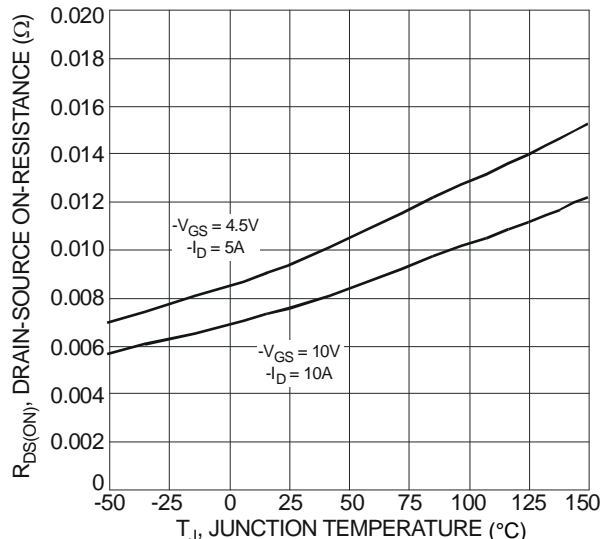


Fig. 6 On-Resistance Variation with Temperature

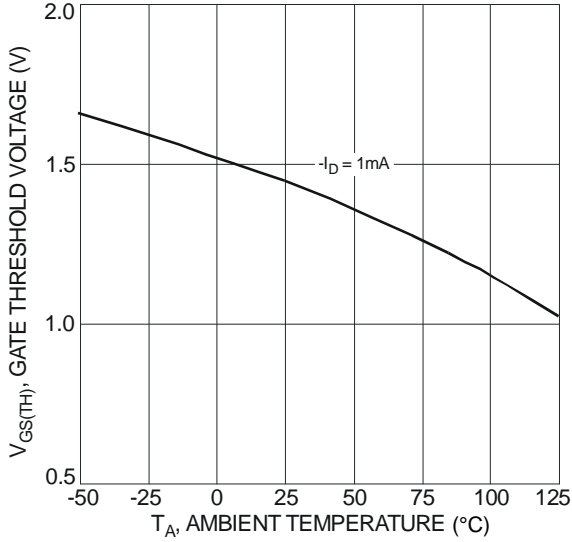


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

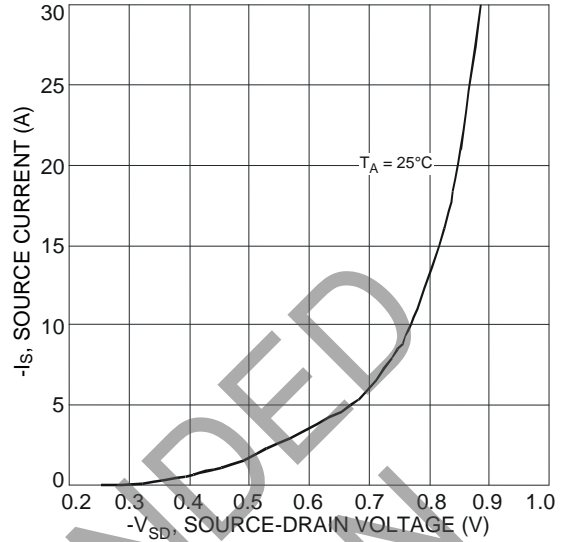


Fig. 8 Diode Forward Voltage vs. Current

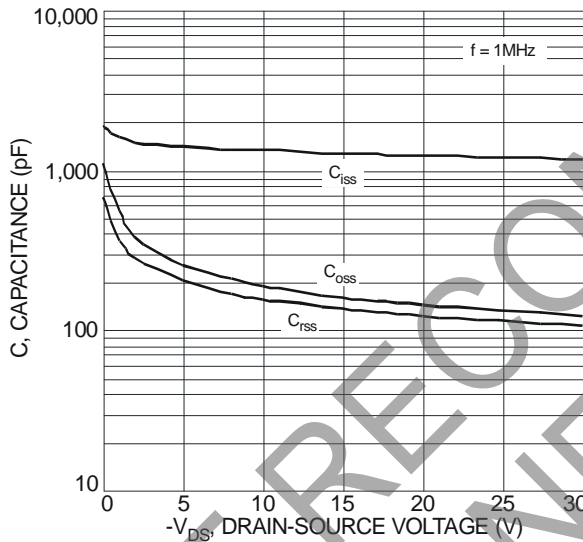


Fig. 9 Typical Capacitance

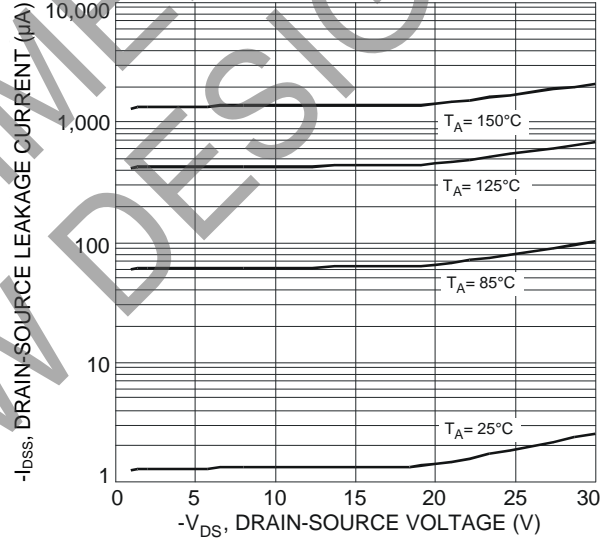


Fig. 10 Typical Drain-Source Leakage Current vs. Drain-Source Voltage

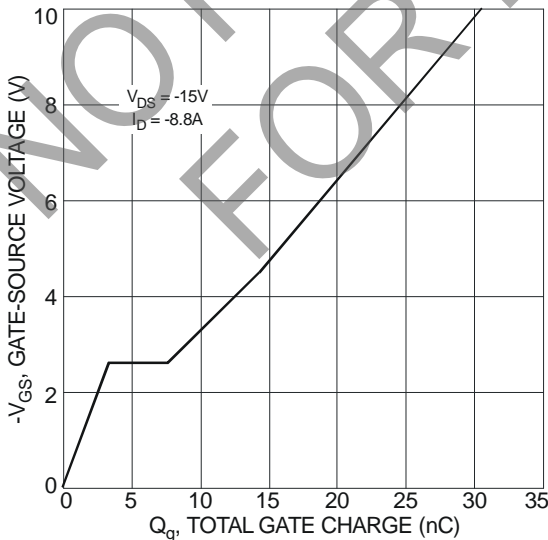


Fig. 11 Gate-Source Voltage vs. Total Gate Charge

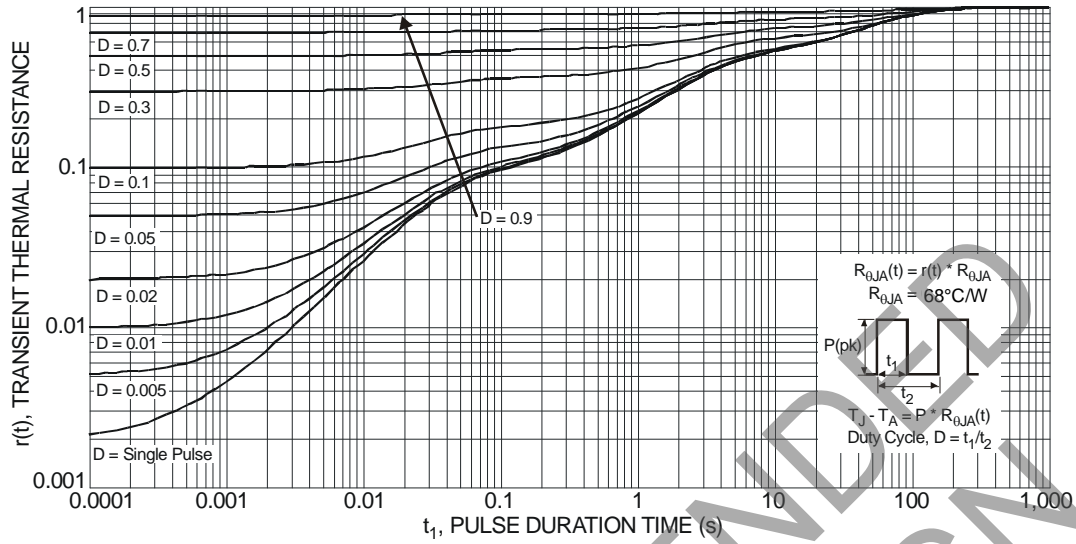


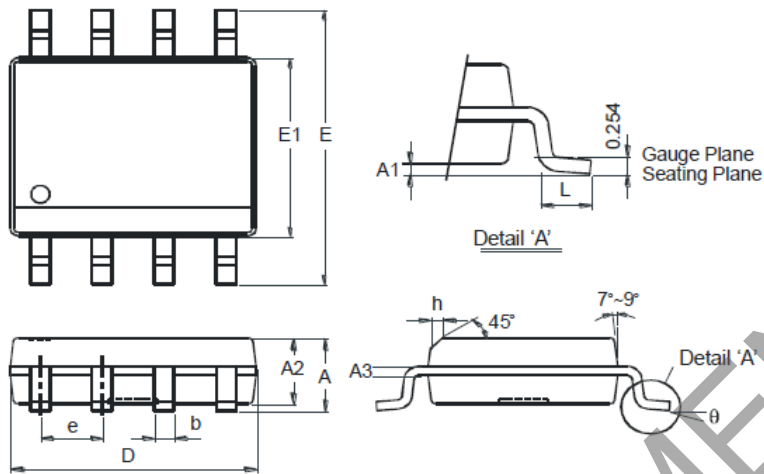
Fig. 12 Transient Thermal Response

NOT RECOMMENDED FOR NEW DESIGN

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

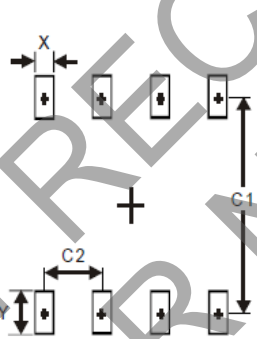
SO-8



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

Please see <http://www.diodes.com/package-outlines.html> for the latest version.



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

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