



N-CHANNEL ENHANCEMENT MODE MOSFET WITH SCHOTTKY DIODE

Features

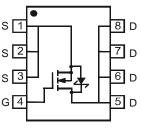
- DIOFET utilizes a unique patented process to monolithically integrate a MOSFET and a Schottky in a single die to deliver:
 - Low R_{DS(ON)} minimizes conduction losses
 - Low V_{SD} reducing the losses due to body diode conduction
 - Low Q_{rr} lower Q_{rr} of the integrated Schottky reduces body diode switching losses
 - Low gate capacitance (Q_g/Q_{gs}) ratio reduces risk of shootthrough 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)







Top View Internal Schematic

Maximum Ratings @TA = 25°C unless otherwise specified

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V _{DSS}	30	V
Gate-Source Voltage			V _{GSS}	±12	V
Continuous Drain Current (Note 3) V _{GS} = 4.5V	Steady State	TA = 25°C TA = 85°C	I _D	9.8 6.3	А
Pulsed Drain Current (Note 4)			I _{DM}	90	Α
Avalanche Current (Note 4) (Note 5)			I _{AR}	13	Α
Repetitive Avalanche Energy (Note 4) (Note 5) L = 0.3mH			E _{AR}	25.4	mJ

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 3)	P _D	1.54	W
Thermal Resistance, Junction to Ambient @T _A = 25°C (Note 3)	$R_{ heta JA}$	81	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°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.
- 3. Device mounted on minimum recommended layout. 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 $T_J = 25^{\circ}$ C

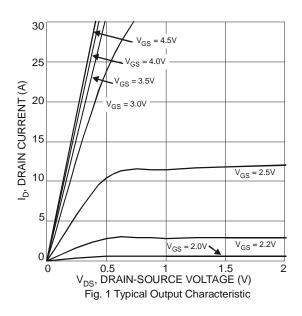


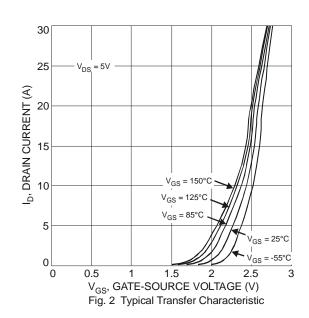
Electrical Characteristics @ T_A = 25°C unless otherwise stated

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 6)							
Drain-Source Breakdown Voltage	BV _{DSS}	30	-	-	V	$V_{GS} = 0V, I_D = 250\mu A$	
Zero Gate Voltage Drain Current	I _{DSS}	-	-	0.1	mA	V _{DS} = 30V, V _{GS} = 0V	
Gate-Source Leakage	I _{GSS}	-	-	±100	nA	$V_{GS} = \pm 12V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 6)							
Gate Threshold Voltage	$V_{GS(th)}$	1.0	-	2.3	V	$V_{DS} = V_{GS}, I_D = 250 \mu A$	
Static Drain-Source On-Resistance	Dec (a)	-	9	13	mΩ	$V_{GS} = 10V, I_D = 9.8A$	
Static Dialit-Source Off-Resistance	R _{DS} (ON)	-	11	16	111 2 2	$V_{GS} = 4.5V, I_D = 9.8A$	
Forward Transfer Admittance	Y _{fs}	-	5	-	S	$V_{DS} = 5V, I_D = 9.8A$	
Diode Forward Voltage	V _{SD}	-	0.4	1	V	V _{GS} = 0V, I _S = 1A	
Maximum Body-Diode + Schottky Continuous Current	Is	-	-	5	Α	-	
DYNAMIC CHARACTERISTICS (Note 7)							
Input Capacitance	C _{iss}	-	1849	-	pF	45 0 \	
Output Capacitance	Coss	-	158	-	pF	V _{DS} =15V, V _{GS} = 0V, -f = 1.0MHz	
Reverse Transfer Capacitance	Crss	-	123	-	pF	1 = 1.0IVII 12	
Gate Resistance	R_g	0.53	2.68	4.82	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge V _{GS} = 4.5V	Qg	-	18.5	-	nC	$V_{DS} = 15V, V_{GS} = 10V,$ $I_{D} = 9.8A$	
Total Gate Charge V _{GS} = 10V	Qg	-	43	-	nC		
Gate-Source Charge	Q _{gs}	-	4.7	-	nC		
Gate-Drain Charge	Q_{gd}	-	4.0	-	nC		
Turn-On Delay Time	t _{D(on)}	-	6.62	-	ns		
Turn-On Rise Time	t _r	-	8.73	_	ns	$V_{GS} = 10V, V_{DS} = 10V,$	
Turn-Off Delay Time	t _{D(off)}	-	36.41	_	ns	$R_G = 3\Omega$, $R_L = 1.2\Omega$	
Turn-Off Fall Time	t _f	-	4.69	-	ns	1	

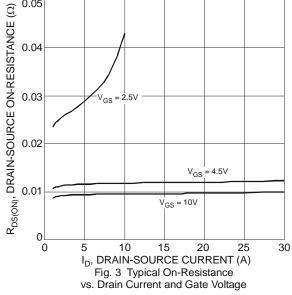
Notes:

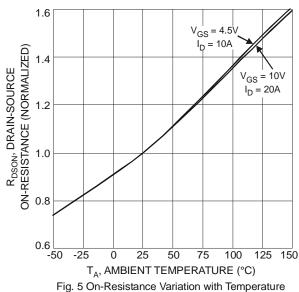
- 6. Short duration pulse test used to minimize self-heating effect.
- 7. Guaranteed by design. Not subject to production testing.











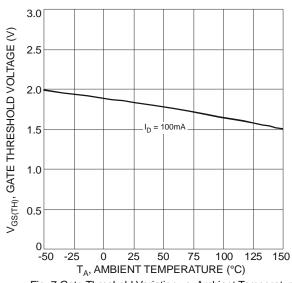
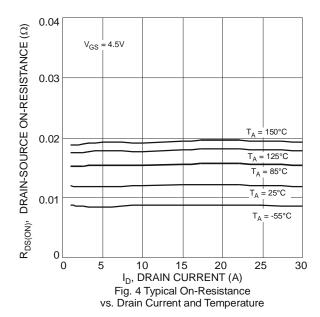
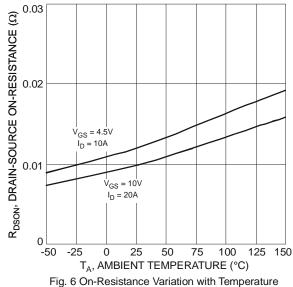
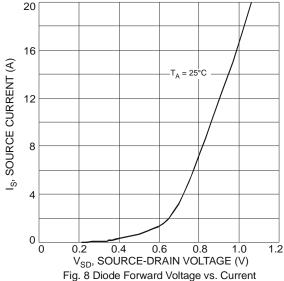


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

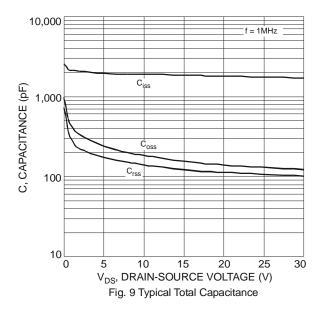


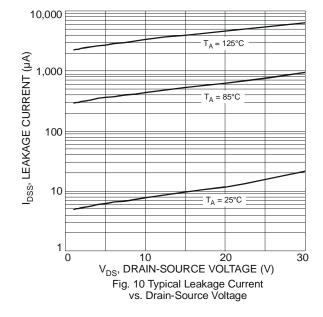


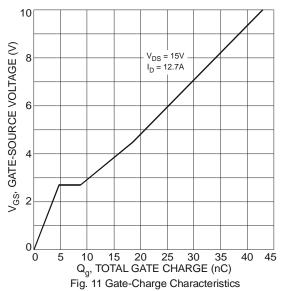
Tig. 0 Off Nesistance variation with remperature











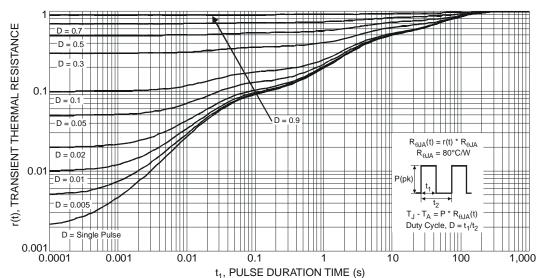


Fig. 12 Transient Thermal Response

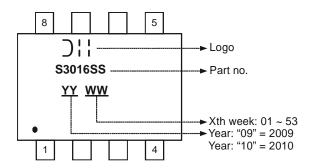


Ordering Information (Note 8)

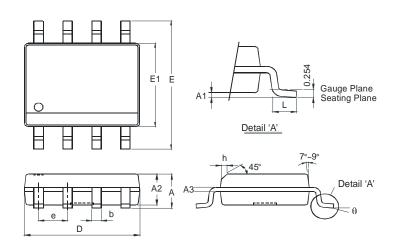
Part Number	Case	Packaging
DMS3016SSS-13	SO-8	2500 / Tape & Reel

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

Marking Information

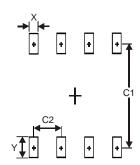


Package Outline Dimensions



SO-8					
Dim	Min	Max			
Α	-	1.75			
A 1	0.10	0.20			
A2	1.30	1.50			
A3	0.15	0.25			
b	0.3	0.5			
D	4.85	4.95			
Е	5.90	6.10			
E1	3.85	3.95			
е	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)
Х	0.60
Y	1.55
C1	5.4
C2	1.27



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