



P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

V _{(BR)DSS}	R _{DS(ON)} Max	I _D T _A = +25°C
-40V	11mΩ @ V _{GS} = -10V	-10.1A
	15mΩ @ V _{GS} = -4.5V	-8.8A

Features and Benefits

- 100% Unclamped Inductive Switch (UIS) test in production
- Low Input Capacitance
- 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
- PPAP Capable (Note 4)

Description

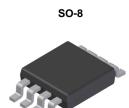
This new generation MOSFET is designed to minimize the on-state resistance (R_{DS(ON)}), yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

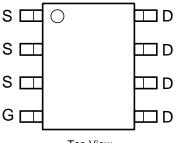
- DC-DC Converters
- Power Management Functions
- Analog Switch

Mechanical Data

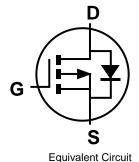
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound.
 UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish Matte Tin Annealed over Copper Leadframe.
 Solderable per MIL-STD-202, Method 208 63
- Weight: 0.074 grams (Approximate)







Top View Internal Schematic



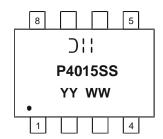
Ordering Information (Note 5)

Part Number	Qualification	Case	Packaging
DMP4015SSSQ-13	Automotive	SO-8	2,500/Tape & Reel

Notes:

- 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- See http://www.diodes.com/quality/lead_free.html 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to http://www.diodes.com/quality/product_compliance_definitions/.
- 5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



⊃¦¦ = Manufacturer's Marking P4015SS = Product Type Marking Code YYWW = Date Code Marking YY = Year (ex: 13 = 2013) WW = Week (01 - 53)



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

Characteristic	Symbol	Value	Units		
Drain-Source Voltage	V_{DSS}	-40	V		
Gate-Source Voltage	V_{GSS}	±25	V		
Continuous Drain Current (Note 6) V _{GS} = -10V	Steady State	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I _D	-9.1 -7.2	А
Continuous Drain Current (Note 6) V _{GS} = -4.5V	Steady State	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I _D	-7.8 -6.2	А
Continuous Drain Current (Note 7) V _{GS} = -10V	Steady State	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I _D	-10.1 -8	А
Continuous Drain Current (Note 7) V _{GS} = -4.5V	Steady State	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I _D	-8.8 -7	А
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	-100	А		
Avalanche Current (Note 8)			I _{AS}	-22	Α
Avalanche Energy (Note 8)			E _{AS}	242	mJ

Thermal Characteristics

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 6)	P _D	1.45	W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	88	°C/W
Total Power Dissipation (Note 7)	P _D	1.82	W
Thermal Resistance, Junction to Ambient (Note 7)	R _{0JA}	70	°C/W
Thermal Resistance, Junction to Case (Note 7)	R _{θJc}	7.6	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

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

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 9)							
Drain-Source Breakdown Voltage	BV _{DSS}	-40	_	_	V	$V_{GS} = 0V, I_{D} = -250\mu A$	
Zero Gate Voltage Drain Current	I _{DSS}	_	_	-1	μΑ	V _{DS} = -40V, V _{GS} = 0V	
Gate-Source Leakage	I _{GSS}		_	±100	nA	$V_{GS} = \pm 25V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 9)							
Gate Threshold Voltage	V _{GS(th)}	-1.5	-2	-2.5	V	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$	
Static Drain-Source On-Resistance			7	11	mΩ	$V_{GS} = -10V, I_D = -9.8A$	
Static Drain-Source On-Resistance	R _{DS(ON)}	_	9	15	11177	$V_{GS} = -4.5V, I_D = -9.8A$	
Forward Transfer Admittance	Y _{fs}		26	_	S	$V_{DS} = -20V, I_{D} = -9.8A$	
Diode Forward Voltage (Note 6)	V_{SD}	_	-0.7	-1	V	$V_{GS} = 0V, I_{S} = -1A$	
DYNAMIC CHARACTERISTICS (Note 10)							
Input Capacitance	Ciss	_	4,234	_			
Output Capacitance	Coss	_	1,036	_	pF	$V_{DS} = -20V, V_{GS} = 0V$ f = 1MHz	
Reverse Transfer Capacitance	C _{rss}	_	526			I = IIVIAZ	
Gate Resistance	Rg	_	7.77	_	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge	Q_{g}		47.5	_			
Gate-Source Charge	Q_{gs}	_	14.2	_	nC	$V_{DS} = -20V, V_{GS} = -5V$	
Gate-Drain Charge	Q_{gd}		13.5	_		_D = -9.8A	
Turn-On Delay Time	t _{D(on)}		13.2	_		$V_{GS} = -10V, V_{DD} = -20V, R_G = 6\Omega,$	
Turn-On Rise Time	t _r		10	_	nS		
Turn-Off Delay Time	t _{D(off)}		302.7	_	113	$I_D = -1A$, $R_L = 20\Omega$	
Turn-Off Fall Time	t _f	_	137.9	_			

Notes:

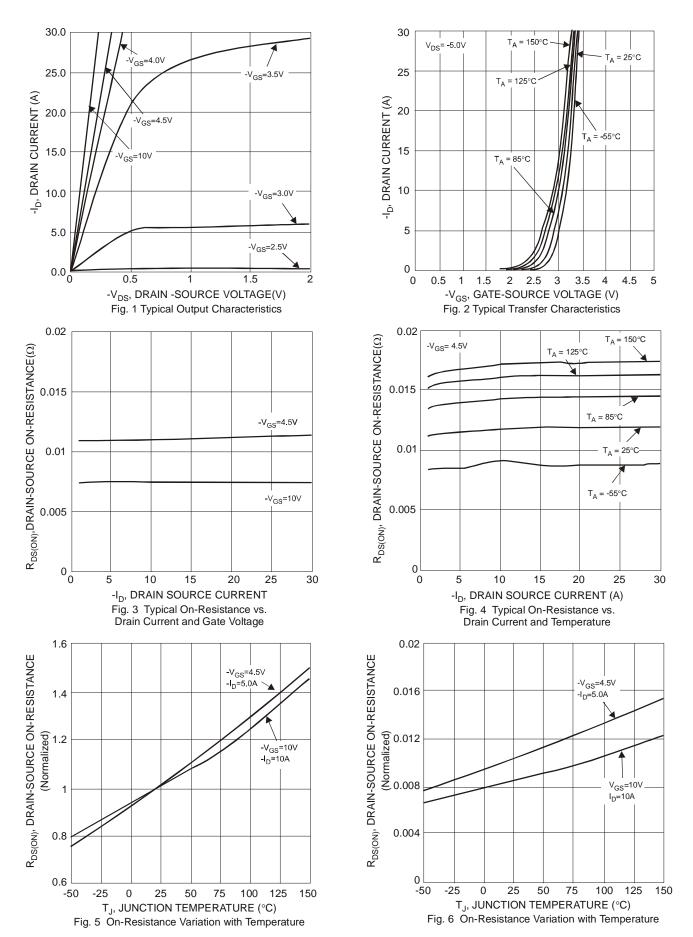
^{6.} Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
7. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal vias to bottom layer 1inch square copper plate

^{8 .}UIS in production with L = 1mH, $T_J = +25$ °C

^{9.} Short duration pulse test used to minimize self-heating effect.

^{10.} Guaranteed by design. Not subject to production testing.







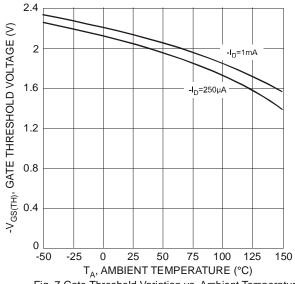
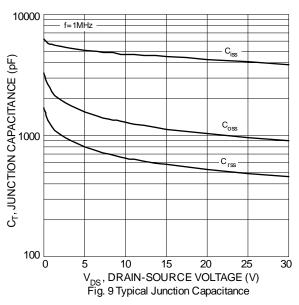
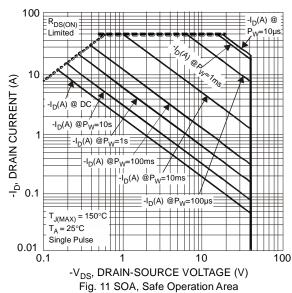
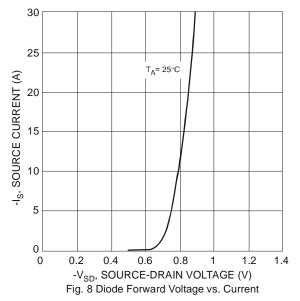
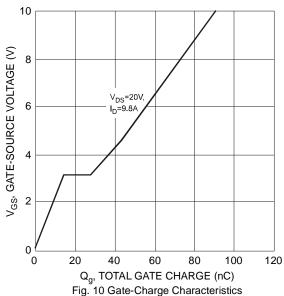


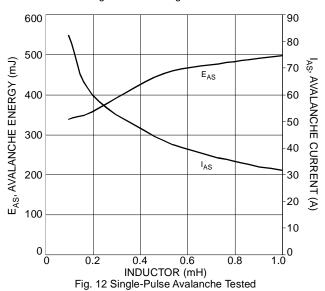
Fig. 7 Gate Threshold Variation vs. Ambient Temperature



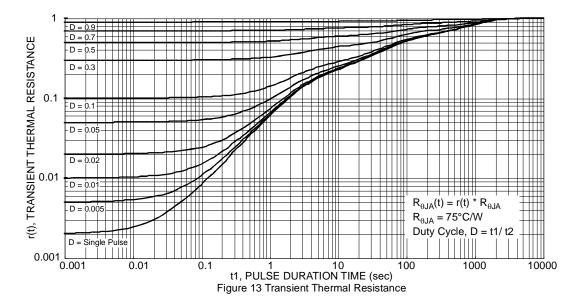










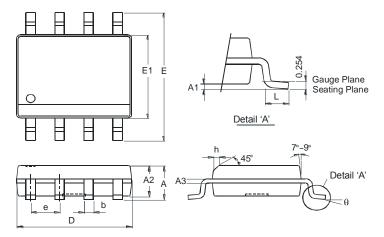




Package Outline Dimensions

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

SO-8

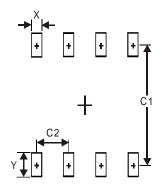


	SO-8		
Dim	Min	Max	
Α	-	1.75	
A1	0.10	0.20	
A2	1.30	1.50	
A3	0.15	0.25	
b	0.3	0.5	
D	4.85	4.95	
Е	5.90	6.10	
E1	3.85	3.95	
е	1.27 Typ		
h	-	0.35	
L	0.62	0.82	
θ	0°	8°	
All Dimensions in mm			

Suggested Pad Layout

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

SO-8



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



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