



30V P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

V _{(BR)DSS}	R _{DS(ON)} max	I _D max T _A = 25°C
	$7.5 \text{m}\Omega$ @ $V_{GS} = -10V$	-12A
-30V	10.2mΩ @ V _{GS} = -4.5V	-10A

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
- •



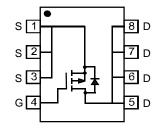
Top View

Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Lead Free By Design/RoHS Compliant (Note 1)
- "Green" Device, Halogan and Antimony Free (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 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 Internal Schematic

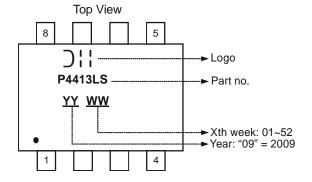
Ordering Information (Note 3)

Part Number	Case	Packaging
DMG4413LSS-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_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Units		
Drain-Source Voltage		V_{DSS}	-30	V	
Gate-Source Voltage		V_{GSS}	±20	V	
Continuous Drain Current (Note 5) // 40//	Steady State	$T_A = 25$ °C $T_A = 70$ °C	I _D	-12 -10	А
Continuous Drain Current (Note 5) V _{GS} = -10V	t<10s	$T_A = 25^{\circ}C$ $T_A = 70^{\circ}C$	I _D	-22 -17	А
State $T_{\Lambda} = 70^{\circ}$ C		$T_A = 25$ °C $T_A = 70$ °C	I _D	-10 -8	А
Continuous Drain Current (Note 5) V _{GS} = -4.5V	t<10s	$T_A = 25^{\circ}C$ $T_A = 70^{\circ}C$	I _D	-18 -14	Α
Pulsed Drain Current (10μs pulse, duty cycle = 1	I _{DM}	-100	Α		
Maximum Body Diode continuous Current	I _S	-4	А		

Thermal Characteristics

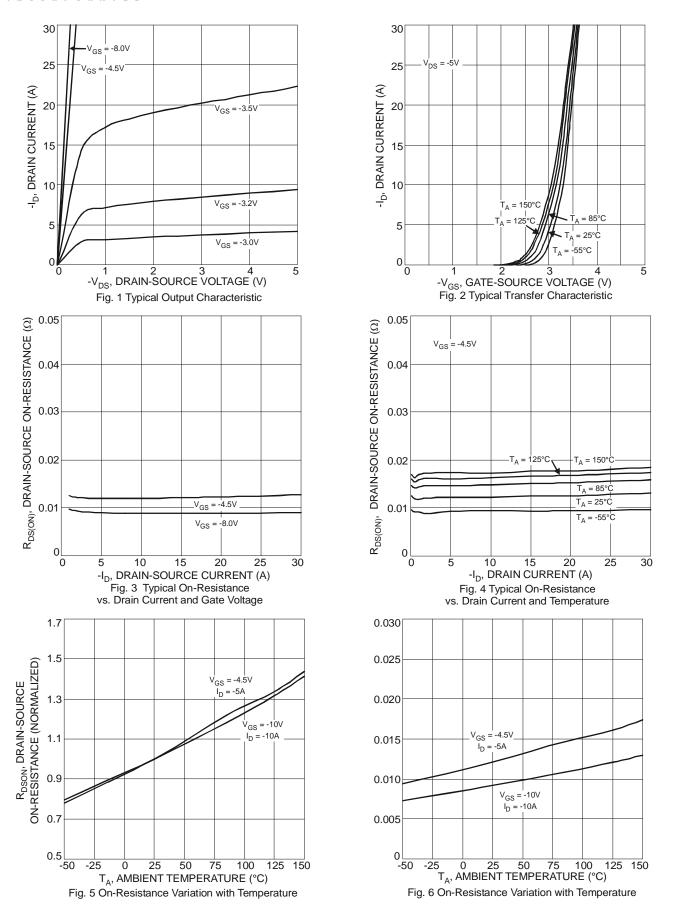
Characteristic	Symbol	Value	Units		
Total Bower Dissination (Note 4)	T _A = 25°C	р	1.7	W	
Total Power Dissipation (Note 4)	$T_A = 70$ °C	P_{D}	1.1	VV	
Thermal Resistance, Junction to Ambient (Note 4)	Steady State	D	74	°C/W	
Thermal Resistance, Junction to Ambient (Note 4)	t<10s	$R_{\theta JA}$	22	C/VV	
Total Power Dissipation (Note 5)	$T_A = 25$ °C	ь	2.2	W	
Total Power Dissipation (Note 5)	$T_A = 70$ °C	P_{D}	1.4	VV	
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	D	56	°C/W	
Thermal Resistance, Junction to Ambient (Note 3)	t<10s	$R_{\theta JA}$	17		
Thermal Resistance, Junction to Case (Note 5)	Steady State	$R_{\theta JC}$	2.5		
Operating and Storage Temperature Range	$T_{J_i} T_{STG}$	-55 to 150	°C		

Electrical Characteristics @T_A = 25°C unless otherwise specified

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}	_	_	-1	μΑ	$V_{DS} = -30V, V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}	_	_	±1	μΑ	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 6)							
Gate Threshold Voltage	V _{GS(th)}	-1.1	1.6	-2.1	V	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$	
Static Drain-Source On-Resistance	R _{DS (ON)}	_	6.3 7.9	7.5 10.2	mΩ	$V_{GS} = -10V, I_D = -13A$ $V_{GS} = -4.5V, I_D = -10A$	
Forward Transconductance	9 _{fs}	_	26	_	S	$V_{DS} = -15V, I_D = -13A$	
Diode Forward Voltage	V_{SD}	_	-0.7	-1.0	V	$V_{GS} = 0V, I_S = -2.7A$	
DYNAMIC CHARACTERISTICS(Note7)				-			
Input Capacitance	C _{iss}	_	4965	_	pF	V 45V V 0V	
Output Capacitance	Coss	_	1487	_	pF	$V_{DS} = -15V, V_{GS} = 0V$ -f = 1.0MHz	
Reverse Transfer Capacitance	C _{rss}	_	711	_	pF	T = 1.0WHZ	
Gate Resistance	R_{G}	_	7.3	_	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$ f = 1.0MHz	
SWITCHING CHARACTERISTICS (Note7)						•	
Total Gate Charge	Q _G	_	46	_			
Gate-Source Charge	Q _{GS}	_	17	_	nC	$V_{DS} = -15V, V_{GS} = -5V$ $I_{D} = -13A$	
Gate-Drain Charge	Q_{GD}	_	16	_		ID = -13A	
Turn-On Delay Time	t _{d(on)}	_	15				
Rise Time	t _r	_	9	_	$V_{DS} = -15V, V_{GS} = -10V,$		
Turn-Off Delay Time	t _{d(off)}	_	160	_	ns	$I_D = -1A, R_G = 6.0\Omega$	
Fall Time	t _f	_	66	_			

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. Notes:







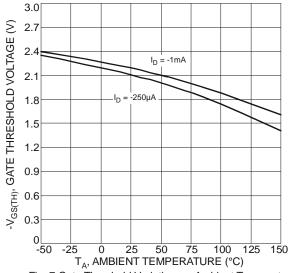
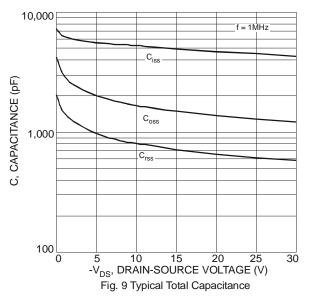
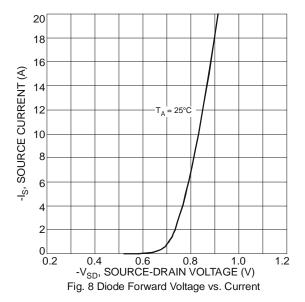
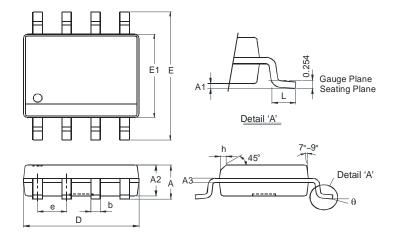


Fig. 7 Gate Threshold Variation vs. Ambient Temperature





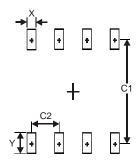
Package Outline Dimensions



SO-8						
Dim	Min	Max				
Α	1	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	e 1.27 Typ					
h	1	0.35				
L	0.62	0.82				
θ	0°	8°				
All Dimensions in mm						



Suggested Pad Layout



Dimensions	Value (in mm)			
Х	0.60			
Υ	1.55			
C1	5.4			
C2	1.27			

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