

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)} \text{ max}$	$I_D \text{ max}$ $T_A = 25^\circ\text{C}$
-30V	$7.5\text{m}\Omega @ V_{GS} = -10\text{V}$	-12A
	$10.2\text{m}\Omega @ V_{GS} = -4.5\text{V}$	-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
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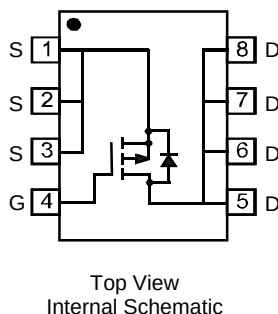


Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device, Halogen 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)

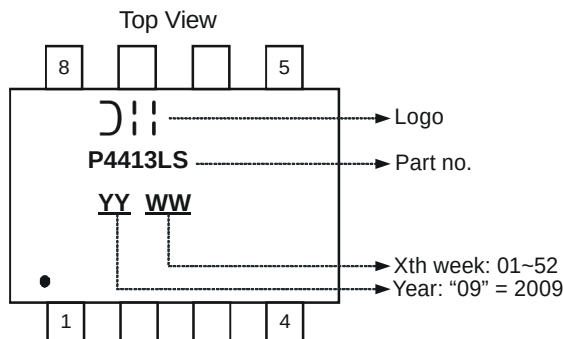


Ordering Information (Note 3)

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) V _{GS} = -10V	Steady State	T _A = 25°C T _A = 70°C	I _D	-12 -10	A
	t < 10s	T _A = 25°C T _A = 70°C	I _D	-22 -17	A
Continuous Drain Current (Note 5) V _{GS} = -4.5V	Steady State	T _A = 25°C T _A = 70°C	I _D	-10 -8	A
	t < 10s	T _A = 25°C T _A = 70°C	I _D	-18 -14	A
Pulsed Drain Current (10μs pulse, duty cycle = 1%)			I _{DM}	-100	A
Maximum Body Diode continuous Current			I _S	-4	A

Thermal Characteristics

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 4)	T _A = 25°C	P _D	1.7	W
	T _A = 70°C		1.1	
Thermal Resistance, Junction to Ambient (Note 4)	Steady State	R _{θJA}	74	°C/W
	t < 10s		22	
Total Power Dissipation (Note 5)	T _A = 25°C	P _D	2.2	W
	T _A = 70°C		1.4	
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	R _{θJA}	56	°C/W
	t < 10s		17	
Thermal Resistance, Junction to Case (Note 5)	Steady State	R _{θJC}	2.5	
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 6)						
Drain-Source Breakdown Voltage	BV _{DSS}	-30	—	—	V	V _{GS} = 0V, I _D = -250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1	μA	V _{DS} = -30V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±1	μA	V _{GS} = ±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 = -250μA
Static Drain-Source On-Resistance	R _{DS(on)}	—	6.3	7.5	mΩ	V _{GS} = -10V, I _D = -13A V _{GS} = -4.5V, I _D = -10A
		—	7.9	10.2		
Forward Transconductance	g _{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 (Note 7)						
Input Capacitance	C _{iss}	—	4965	—	pF	V _{DS} = -15V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{oss}	—	1487	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	711	—	pF	
Gate Resistance	R _G	—	7.3	—	Ω	V _{DS} = 0V, V _{GS} = 0V f = 1.0MHz
SWITCHING CHARACTERISTICS (Note 7)						
Total Gate Charge	Q _G	—	46	—	nC	V _{DS} = -15V, V _{GS} = -5V I _D = -13A
Gate-Source Charge	Q _{GS}	—	17	—		
Gate-Drain Charge	Q _{GD}	—	16	—		
Turn-On Delay Time	t _{d(on)}	—	15	—	ns	V _{DS} = -15V, V _{GS} = -10V, I _D = -1A, R _G = 6.0Ω
Rise Time	t _r	—	9	—		
Turn-Off Delay Time	t _{d(off)}	—	160	—		
Fall Time	t _f	—	66	—		

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

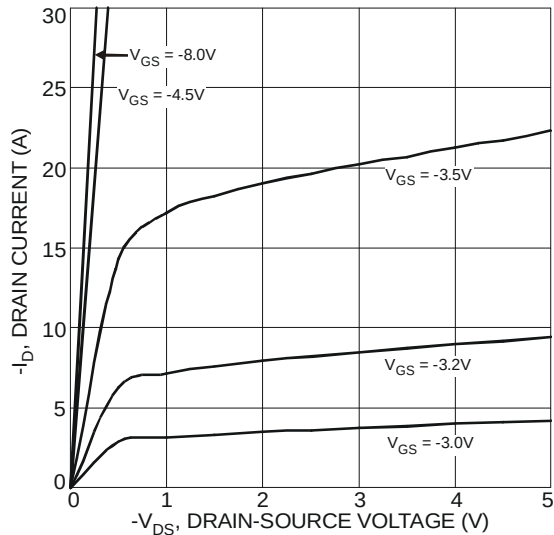


Fig. 1 Typical Output Characteristic

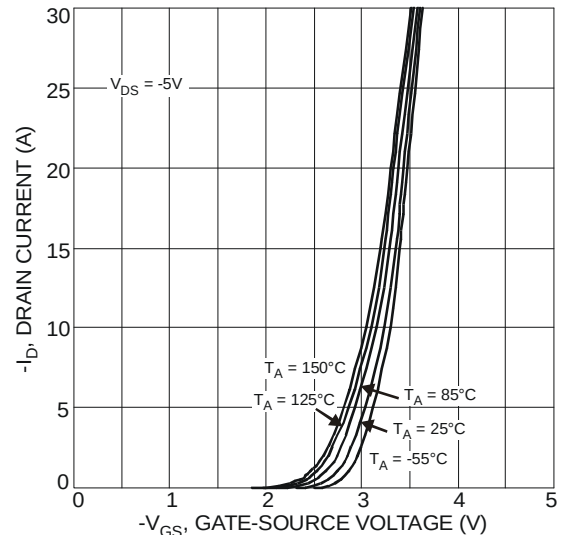


Fig. 2 Typical Transfer Characteristic

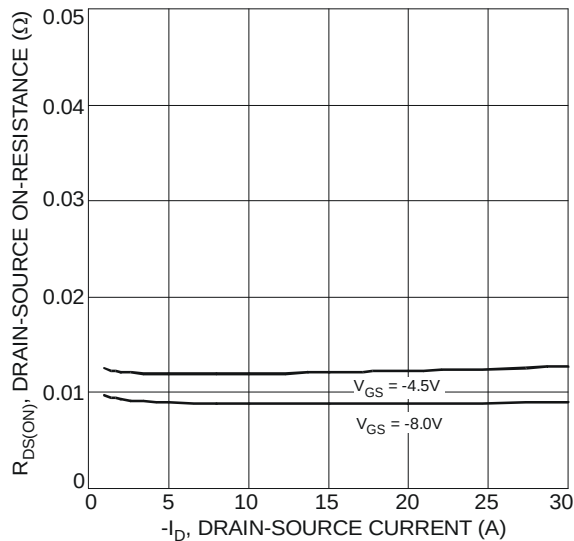


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

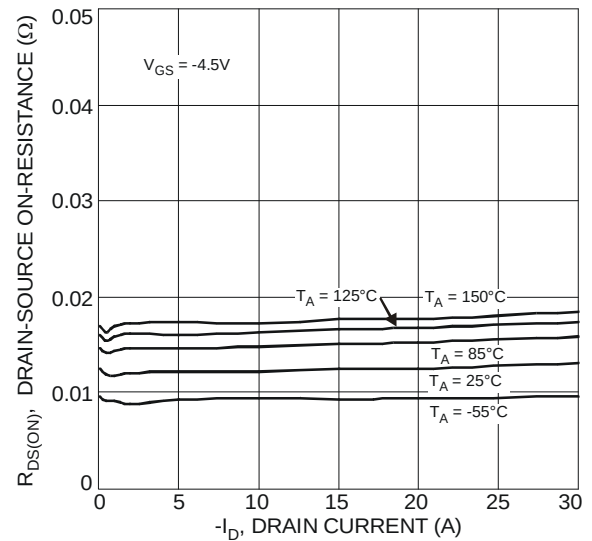


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

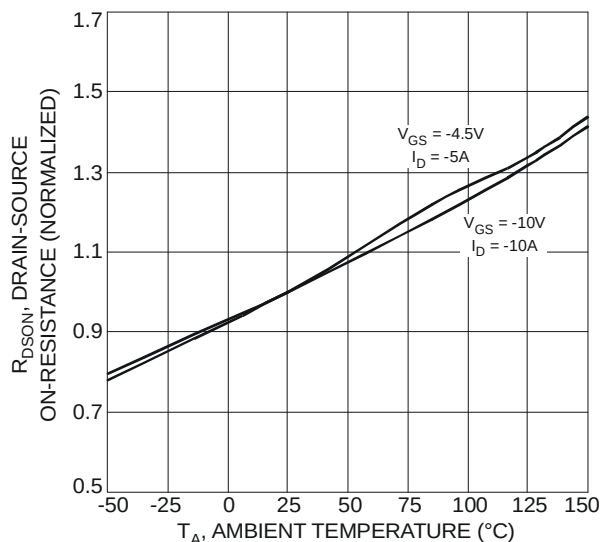


Fig. 5 On-Resistance Variation with Temperature

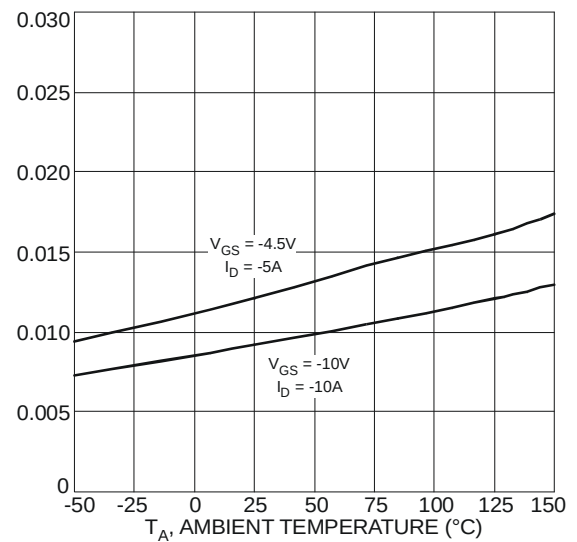


Fig. 6 On-Resistance Variation with Temperature

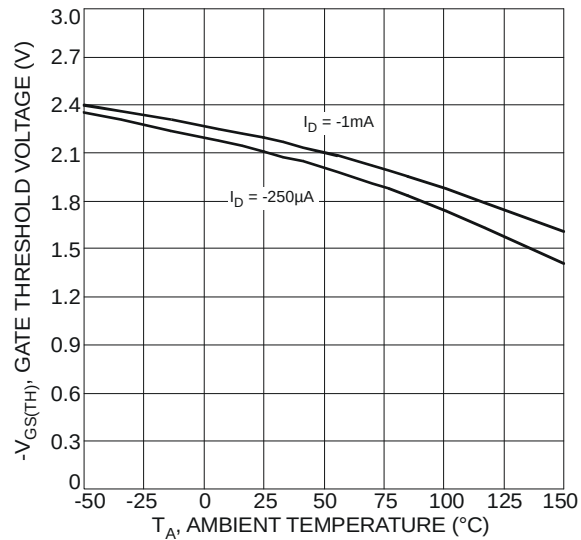


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

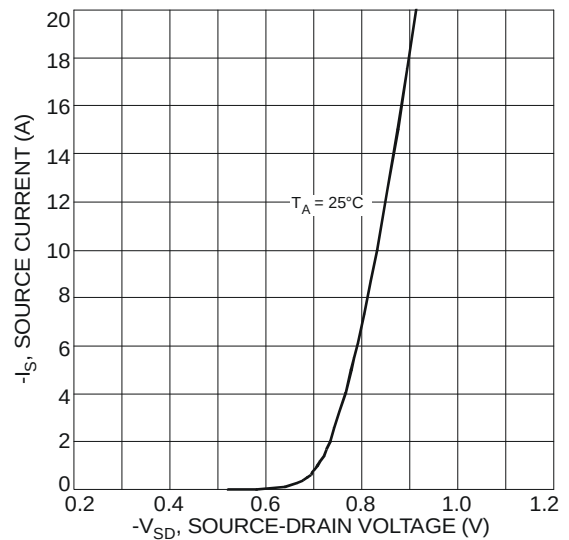


Fig. 8 Diode Forward Voltage vs. Current

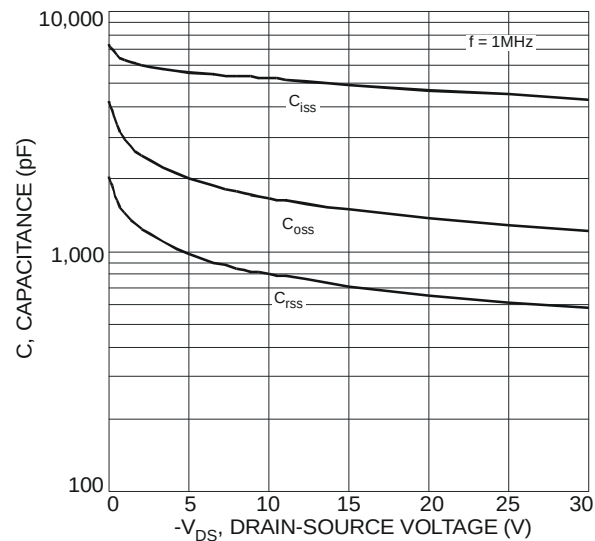
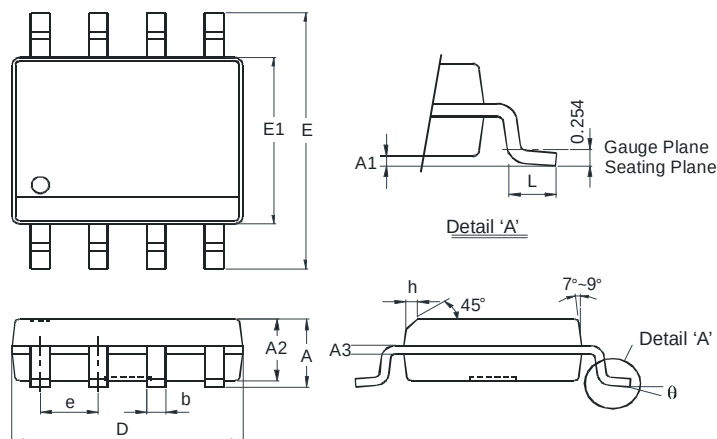


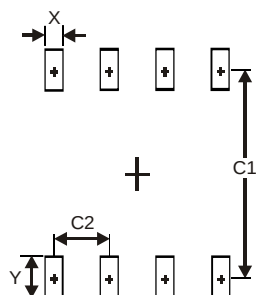
Fig. 9 Typical Total Capacitance

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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