Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ max	I_D max T_A = 25°C
30V	11mΩ @ V_{GS} = 10V	10.3A
	15mΩ @ V_{GS} = 4.5V	9.3A

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

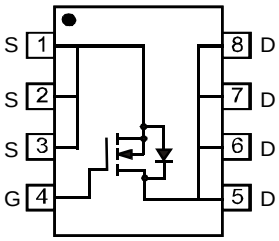
Features and Benefits

- 100% Unclamped Inductive Switch (UIS) test in production
- 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)

SO-8



Top View

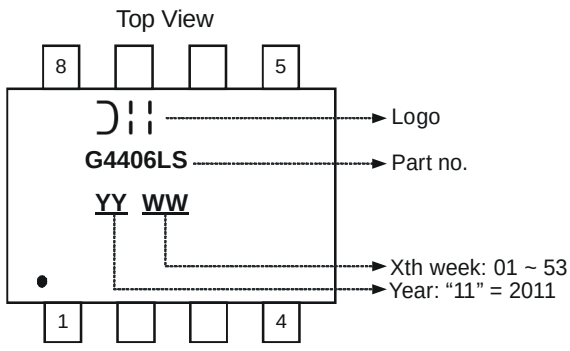
Top View
Internal Schematic

Ordering Information (Note 3)

Part Number	Case	Packaging
DMG4406LSS-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℃ 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	10.3 8.3	A
	t<10s	T_A = 25°C T_A = 70°C	I_D	13.4 10.6	A
Continuous Drain Current (Note 5) V_{GS} = 4.5V	Steady State	T_A = 25°C T_A = 70°C	I_D	9.3 7.3	A
	t<10s	T_A = 25°C T_A = 70°C	I_D	12.0 9.5	A
Maximum Continuous Body Diode Forward Current (Note 5)			I_S	2.5	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I_{DM}	90	A
Avalanche Current (Note 6) L = 0.1mH			I_{AR}	22	A
Repetitive Avalanche Energy (Note 6) L = 0.1mH			E_{AR}	24	mJ

Thermal Characteristics @T_A = 25℃ unless otherwise specified

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 4)		P_D	1.5	W
Thermal Resistance, Junction to Ambient (Note 4)	Steady State	$R_{\theta JA}$	80	℃/W
	t<10s		48	℃/W
Total Power Dissipation (Note 5)		P_D	2.0	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	61	℃/W
	t<10s		37	℃/W
Thermal Resistance, Junction to Case		$R_{\theta JC}$	6.4	℃/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to 150	℃

Electrical Characteristics T_A = 25℃ unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
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}	-	-	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	1.4	-	2.0	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	-	8	11	mΩ	V_{GS} = 10V, I_D = 12A
		-	12	15		V_{GS} = 4.5V, I_D = 10A
Forward Transfer Admittance	$\|Y_{fs}\|$	-	32	-	S	V_{DS} = 5V, I_D = 12A
Diode Forward Voltage	V_{SD}	-	0.70	1.0	V	V_{GS} = 0V, I_S = 1A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	-	1281	-	pF	V_{DS} = 15V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	-	145	-		
Reverse Transfer Capacitance	C_{rss}	-	125	-		
Gate resistance	R_g	-	1.2	-	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz
Total Gate Charge (V_{GS} = 4.5V)	Q_g	-	12.5	-	nC	V_{DS} = 15V, I_D = 12A
Total Gate Charge (V_{GS} = 10V)	Q_g	-	26.7	-		
Gate-Source Charge	Q_{gs}	-	3.6	-		
Gate-Drain Charge	Q_{gd}	-	4.4	-		
Turn-On Delay Time	$t_{D(on)}$	-	5.2	-	ns	V_{DD} = 15V, V_{GS} = 10V, R_L = 1.25Ω, R_G = 3Ω,
Turn-On Rise Time	t_r	-	21.2	-		
Turn-Off Delay Time	$t_{D(off)}$	-	22.3	-		
Turn-Off Fall Time	t_f	-	5.1	-		
Reverse Recovery Time	t_{rr}	-	8.5	-	ns	IF=12A, di/dt=500A/us
Reverse Recovery Charge	Q_{rr}	-	7.0	-	nC	

Notes:
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. I_{AR} and E_{AR} rating are based on low frequency and duty cycles to keep T_J = 25℃
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.

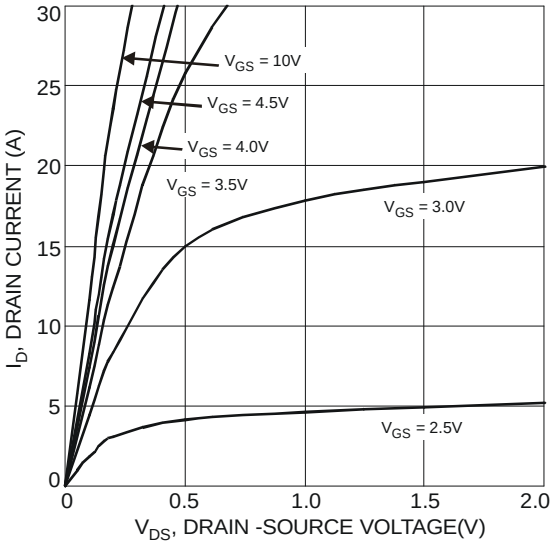


Fig. 1 Typical Output Characteristics

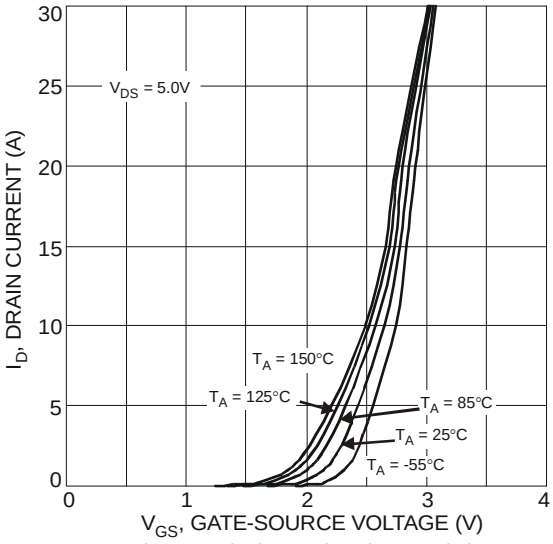


Fig. 2 Typical Transfer Characteristics

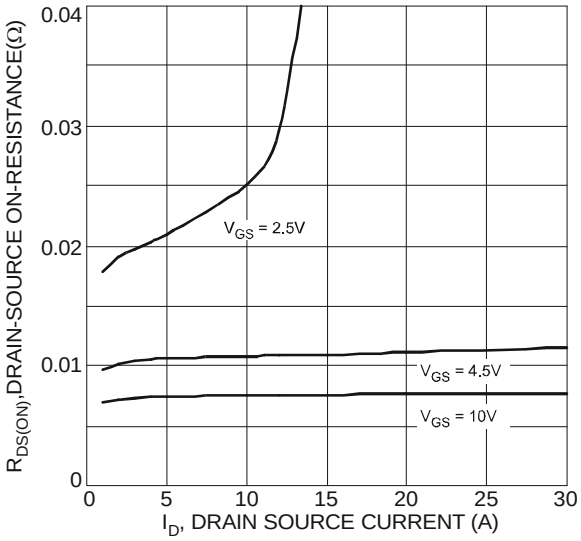


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

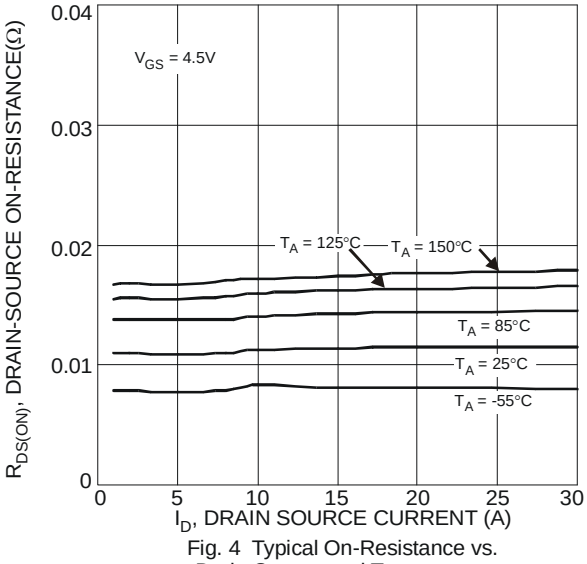


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

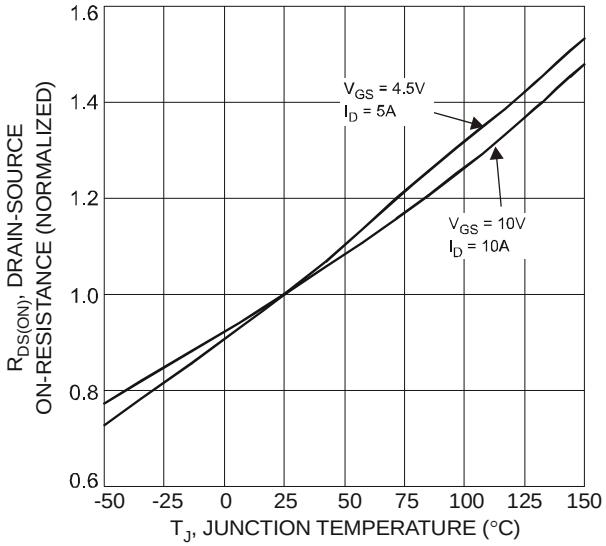


Fig. 5 On-Resistance Variation with Temperature

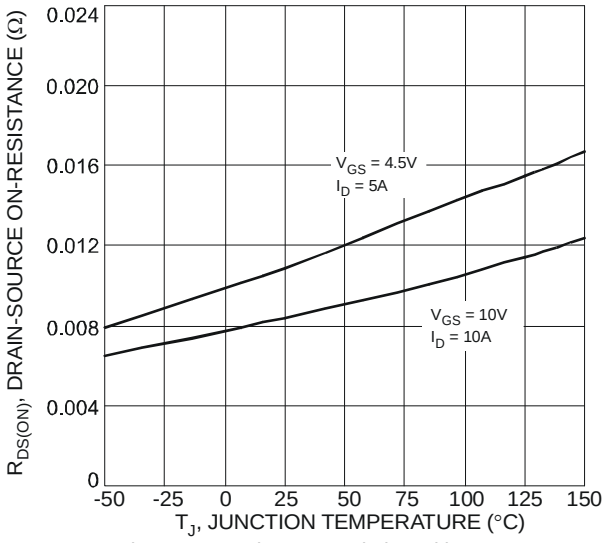


Fig. 6 On-Resistance Variation with Temperature

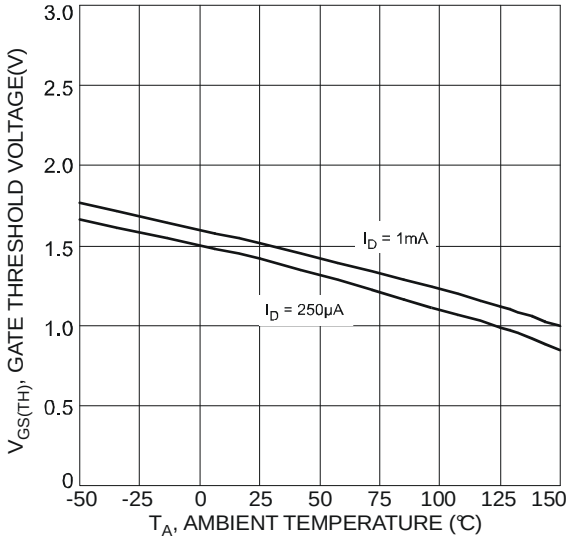


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

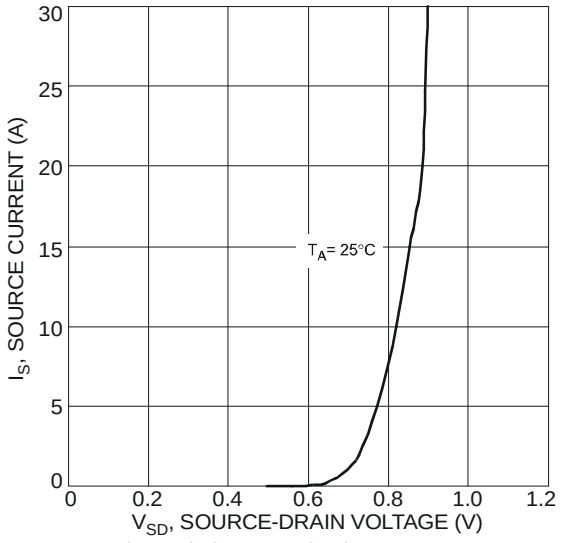


Fig. 8 Diode Forward Voltage vs. Current

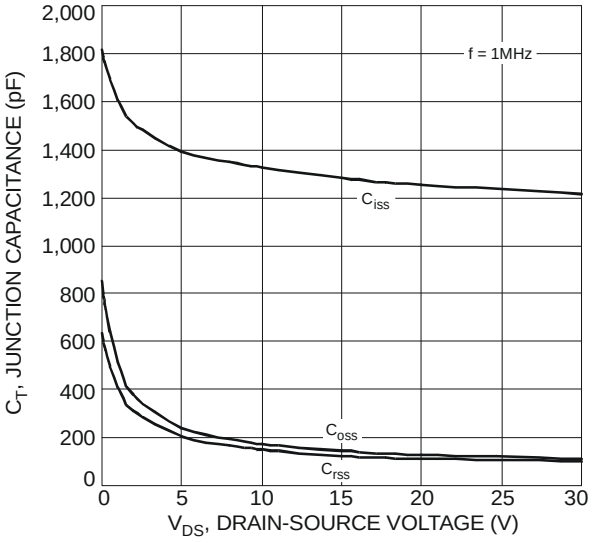


Fig. 9 Typical Junction Capacitance

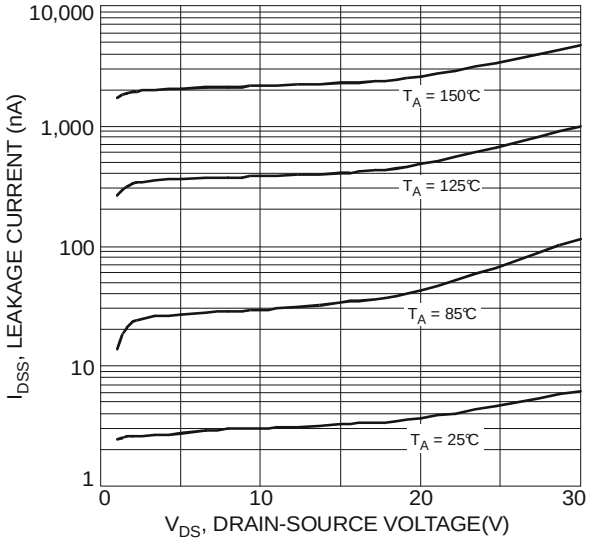


Fig. 10 Typical Drain-Source Leakage Current vs. Voltage

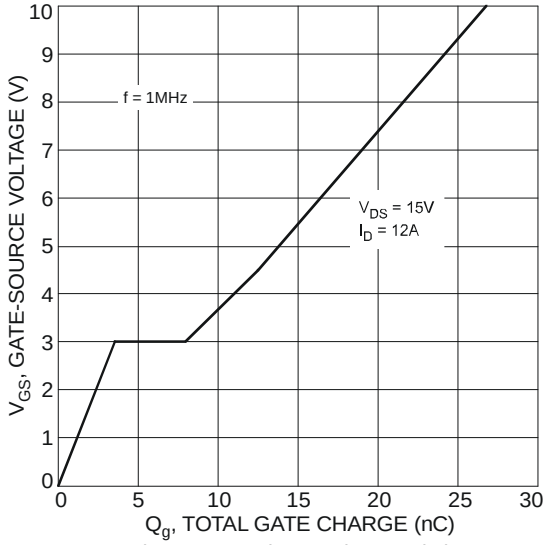


Fig. 11 Gate-Charge Characteristics

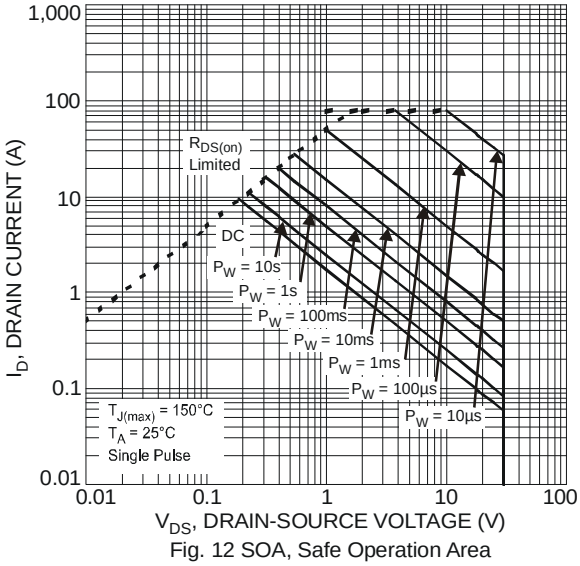


Fig. 12 SOA, Safe Operation Area

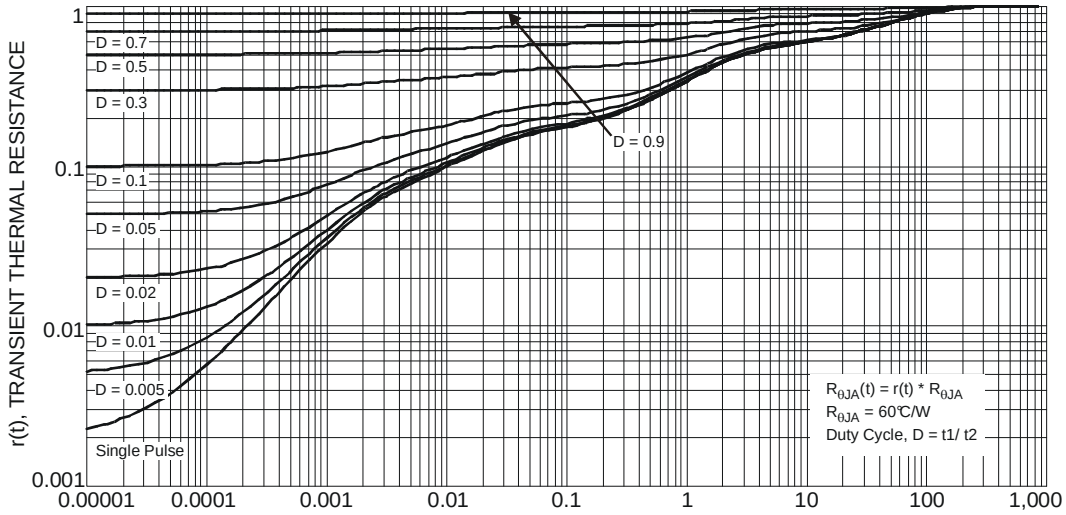
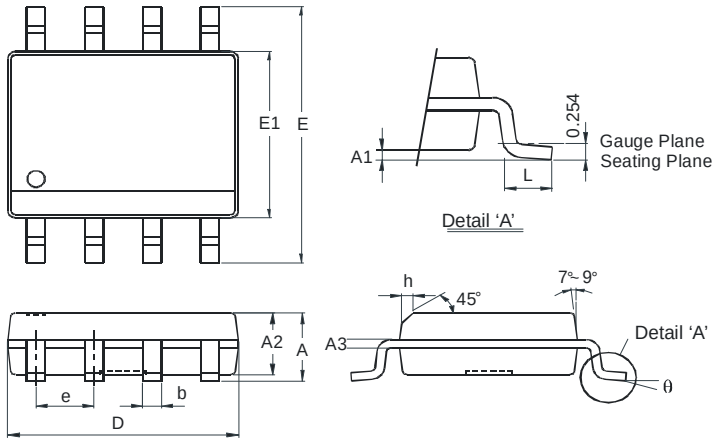


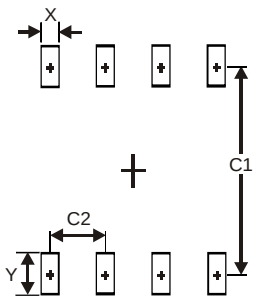
Fig. 13 Transient Thermal Resistance

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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