Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ max	I_D max T_A = 25°C
-30V	11mΩ @ V_{GS} = -20V	-9.9A
	17mΩ @ V_{GS} = -6V	-8.2A

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**

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.

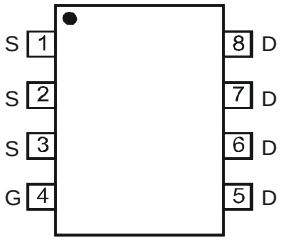
- Backlighting
- Power Management Functions
- DC-DC Converters

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: 0.075 grams (approximate)

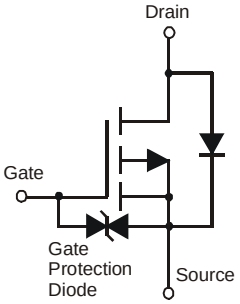
ESD PROTECTED

SO-8



Top View

Top View



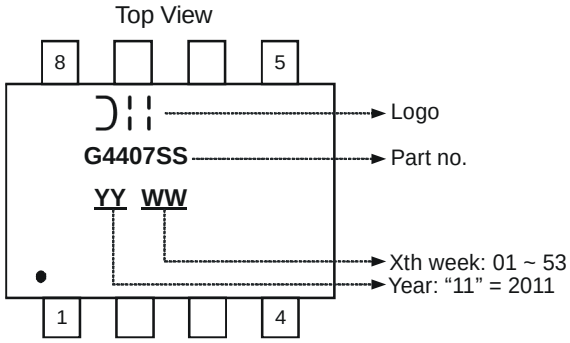
Equivalent Circuit

Ordering Information (Note 3)

Part Number	Case	Packaging
DMG4407SSS-13	SO-8	2500/Tape & Reel

Notes: 1. No purposefully added lead.
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}	±25	V
Continuous Drain Current (Note 5) V_{GS} = -20V	Steady State	T_A = 25°C T_A = 70°C	I_D	-9.9 -7.9	A
	t<10s	T_A = 25°C T_A = 70°C	I_D	-12.5 -10.0	A
Continuous Drain Current (Note 5) V_{GS} = -6V	Steady State	T_A = 25°C T_A = 70°C	I_D	-8.2 -6.5	A
	t<10s	T_A = 25°C T_A = 70°C	I_D	-11.0 -8.7	A
Maximum Continuous Body Diode Forward Current (Note 5)			I_S	3.0	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I_{DM}	-80	A

Thermal Characteristics @T_A = 25℃ unless otherwise specified

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 4)		P_D	1.45	W
Thermal Resistance, Junction to Ambient (Note 4)	Steady State	$R_{\theta JA}$	88	℃/W
	t<10s		50	℃/W
Total Power Dissipation (Note 5)		P_D	1.82	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	70	℃/W
	t<10s		41	℃/W
Thermal Resistance, Junction to Case (Note 5)		$R_{\theta JC}$	7.6	℃/W
Operating and Storage Temperature Range		T_J, T_{STG}	-50 to 155	℃

Electrical Characteristics T_A = 25℃ 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}	-	-	±10	µA	V_{GS} = ±25V, V_{DS} = 0V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	$V_{GS(th)}$	-1.7	-	-3.0	V	V_{DS} = V_{GS}, I_D = -250µA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	-	9	11	mΩ	V_{GS} = -20V, I_D = 12A
		-	10	13		V_{GS} = -10V, I_D = 10A
			12.7	17		V_{GS} = -6V, I_D = 10A
Forward Transfer Admittance	$\|Y_{fs}\|$	-	21	-	S	V_{DS} = -5V, I_D = -10A
Diode Forward Voltage	V_{SD}	-	-0.7	-1.0	V	V_{GS} = 0V, I_S = -1A
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C_{iss}	-	2246	-	pF	V_{DS} = -15V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	-	352	-	pF	
Reverse Transfer Capacitance	C_{rss}	-	294	-	pF	
Gate resistance	R_g	-	5.1	-	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz
Total Gate Charge (V_{GS} = 4.5V)	Q_g	-	20.5	-	nC	V_{GS} = -10V, V_{DS} = -15V, I_D = -12A
Total Gate Charge (V_{GS} = 10V)	Q_g	-	41	-	nC	
Gate-Source Charge	Q_{gs}	-	7.6	-	nC	
Gate-Drain Charge	Q_{gd}	-	8.0	-	nC	
Turn-On Delay Time	$t_{D(on)}$	-	11.3	-	ns	V_{DD} = -15V, V_{GS} = -10V, R_L = 1.25Ω, R_G = 3Ω,
Turn-On Rise Time	t_r	-	15.4	-	ns	
Turn-Off Delay Time	$t_{D(off)}$	-	38.0	-	ns	
Turn-Off Fall Time	t_f	-	22.0	-	ns	

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

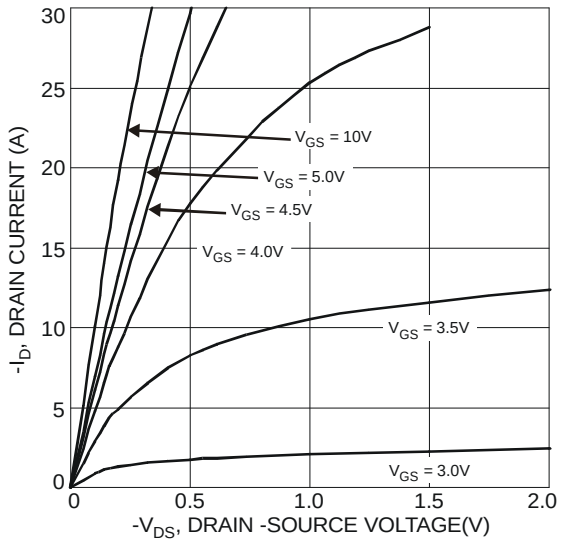


Fig. 1 Typical Output Characteristics

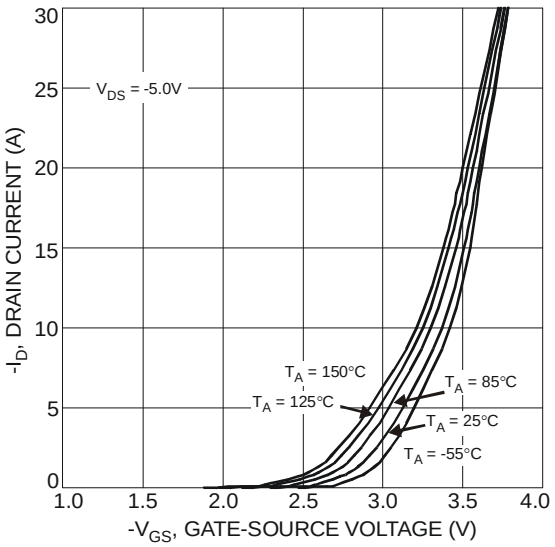


Fig. 2 Typical Transfer Characteristics

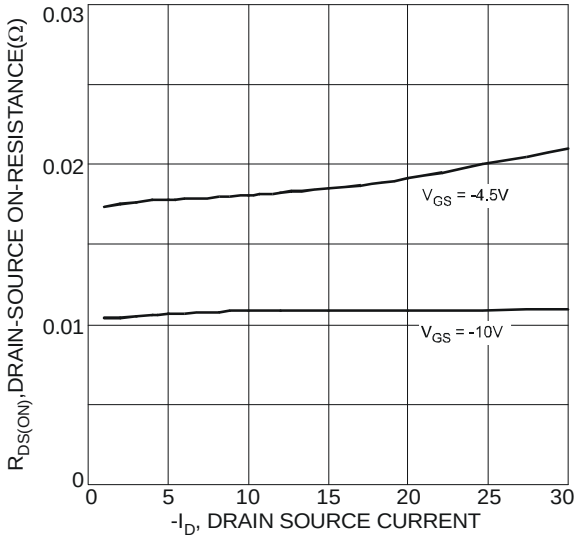


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

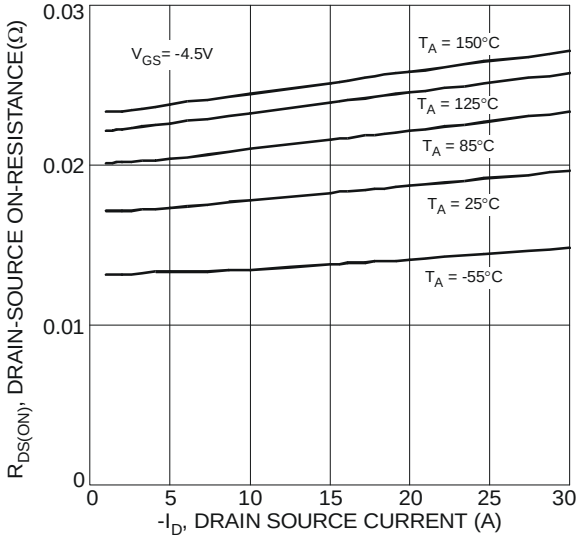


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

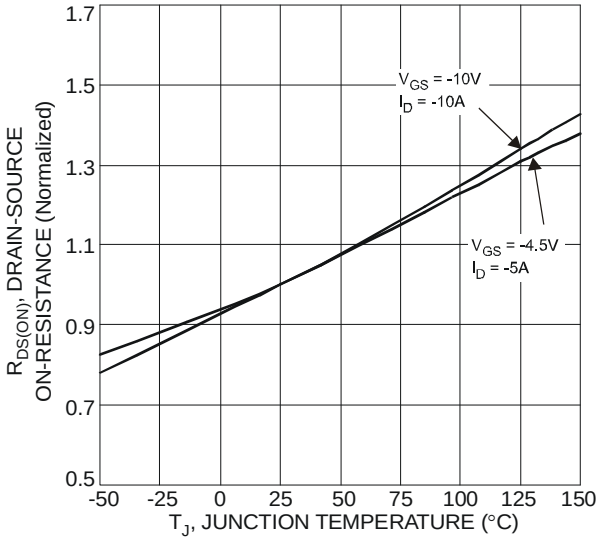


Fig. 5 On-Resistance Variation with Temperature

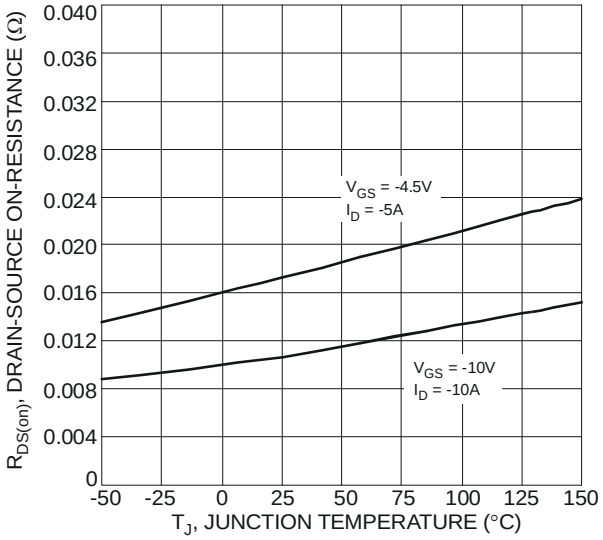


Fig. 6 On-Resistance Variation with Temperature

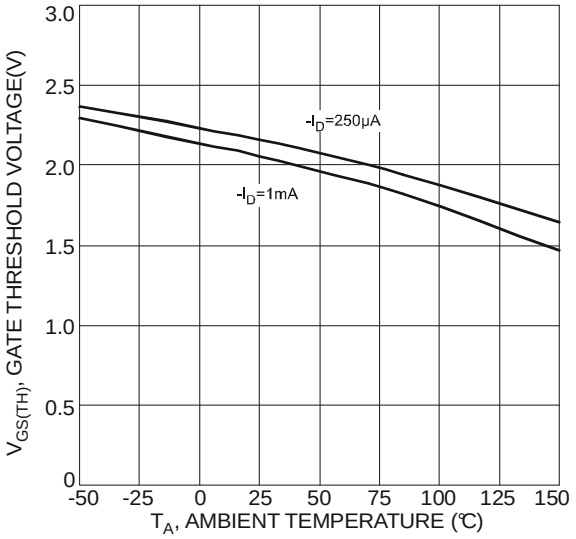


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

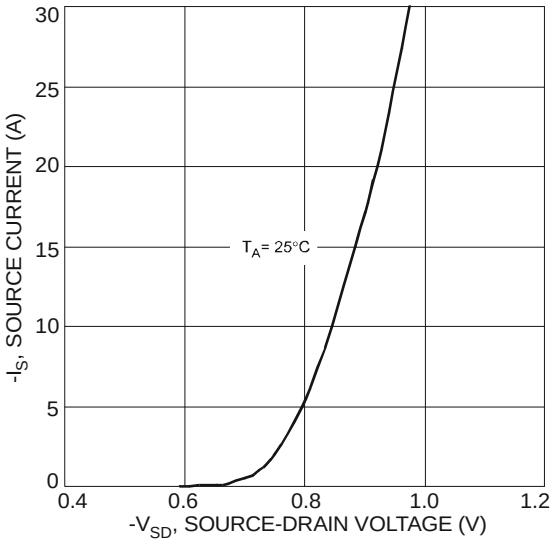


Fig. 8 Diode Forward Voltage vs. Current

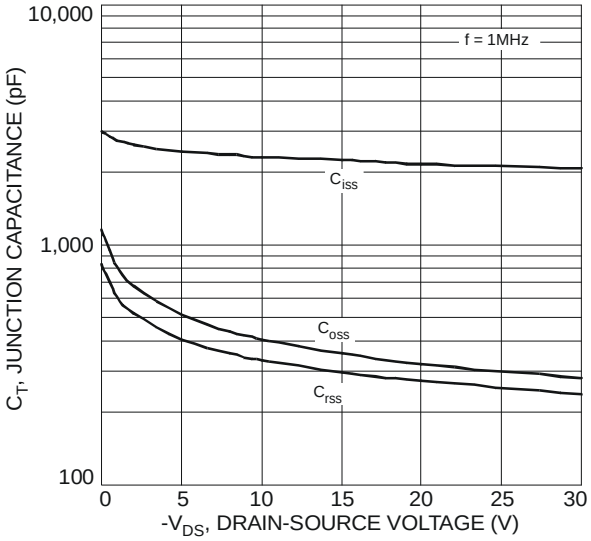


Fig. 9 Typical Junction Capacitance

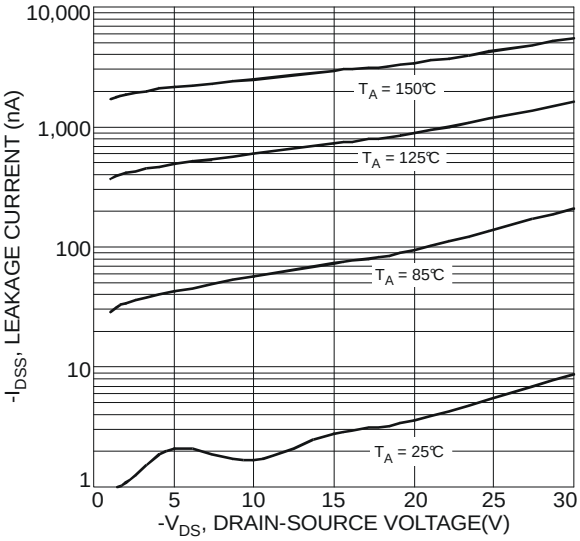


Fig. 10 Typical Drain-Source Leakage Current vs. Voltage

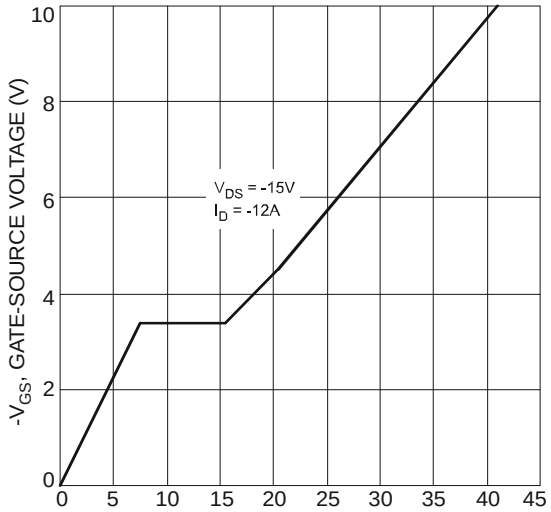


Fig. 11 Gate-Charge Characteristics

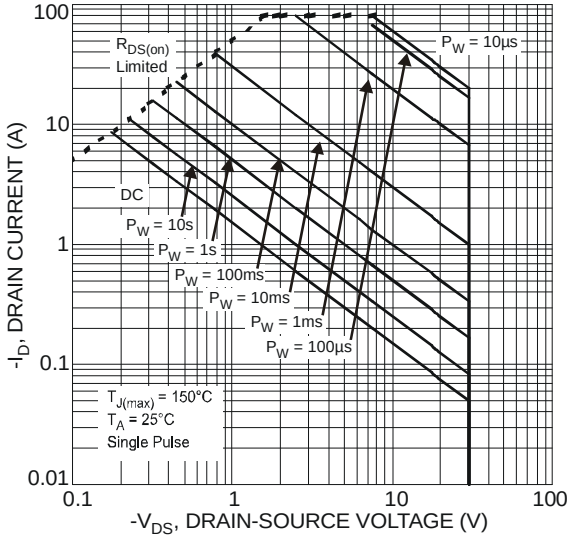


Fig. 12 SOA, Safe Operation Area

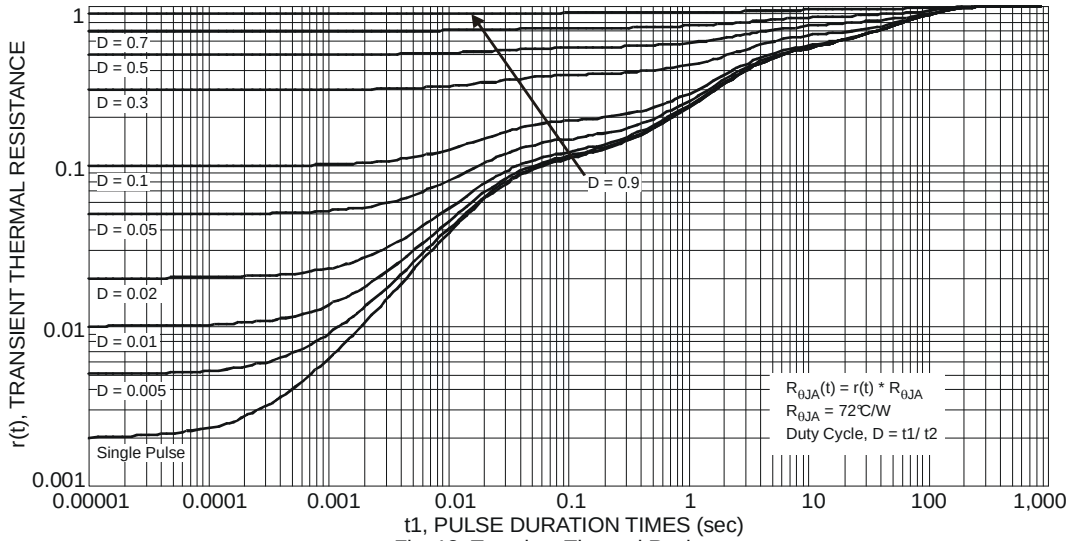
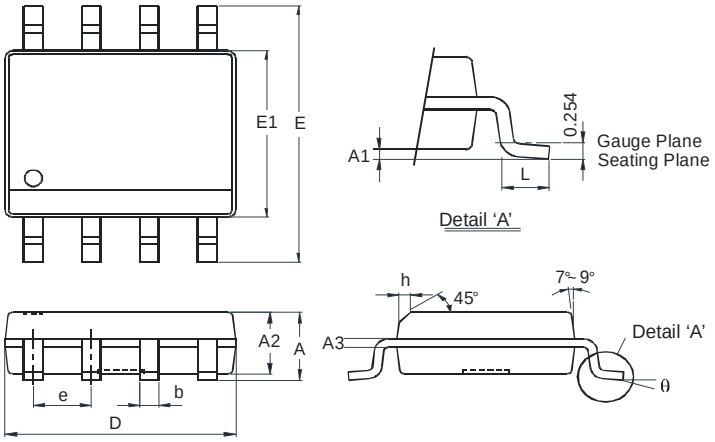


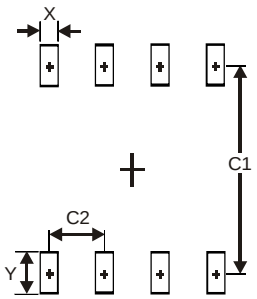
Fig. 13 Transient Thermal Resistance

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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2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

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