

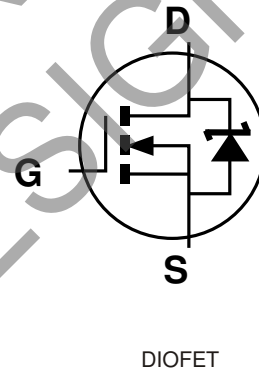
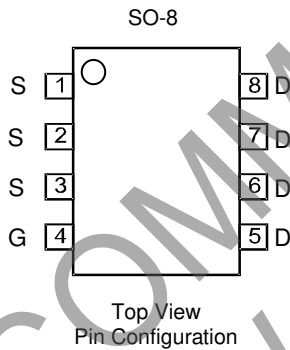
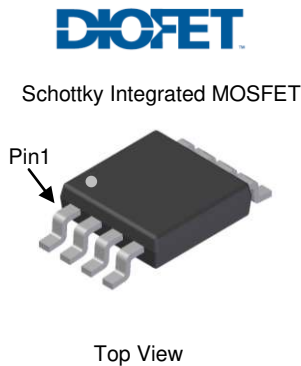
N-CHANNEL ENHANCEMENT MODE MOSFET WITH SCHOTTKY DIODE

**Features**

- High Density UMOS with Schottky Barrier Diode
- Low Leakage Current at High Temperature
- High Conversion Efficiency
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Utilizes Diodes Incorporated's Monolithic DIOFET Technology to Increase Conversion Efficiency
- UIS Tested, R<sub>G</sub> Tested
- **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**

**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 Below
- Terminals: Finish – Tin Finish Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 <sup>(e3)</sup>
- Weight: 0.074 grams (Approximate)

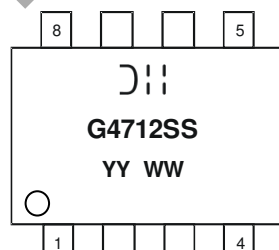


**Ordering Information** (Note 4)

Part Number	Case	Packaging
DMG4712SSS-13	SO-8	2,500 / Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  2. See <https://www.diodes.com/quality/lead-free/> 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. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

**Marking Information**



⌋⌋⌋ = Manufacturer's Marking  
 G4712SS = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY or YY = Year (ex: 18 = 2018)  
 WW = Week (01 to 53)

### Maximum Ratings (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V <sub>DSS</sub>	30	V
Gate-Source Voltage			V <sub>GSS</sub>	±12	V
Continuous Drain Current (Note 5)	Steady State	T <sub>A</sub> = +25°C T <sub>A</sub> = +85°C	I <sub>D</sub>	11.2 6.6	A
Pulsed Drain Current (Note 6)			I <sub>DM</sub>	63	A
Avalanche Current (Notes 6 & 7)			I <sub>AR</sub>	30	A
Repetitive Avalanche Energy (Notes 6 & 7) L = 0.1mH			E <sub>AR</sub>	45	mJ

### Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	1.55	W
Thermal Resistance, Junction to Ambient @T <sub>A</sub> = +25°C (Note 5)	R <sub>θJA</sub>	81.3	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

### Electrical Characteristics (@ T<sub>A</sub> = +25°C, unless otherwise stated.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 8)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	30	-	-	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 1mA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	-	-	100	µA	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> = ±12V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 8)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	1.0	-	2.2	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250µA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	-	10	14.0	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 11.2A
			11	15.4		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 10A
Forward Transfer Admittance	Y <sub>fs</sub>	-	23	-	S	V <sub>DS</sub> = 5V, I <sub>D</sub> = 11.2A
Diode Forward Voltage	V <sub>SD</sub>	-	0.37	0.55	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 1A
Maximum Body-Diode + Schottky Continuous Current	I <sub>S</sub>	-	-	5	A	-
<b>DYNAMIC CHARACTERISTICS (Note 9)</b>						
Input Capacitance	C <sub>iss</sub>	-	2,296	-	pF	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	-	164	-	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	-	120	-	pF	
Gate Resistance	R <sub>g</sub>	-	1.3	-	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge (V <sub>GS</sub> = 10V)	Q <sub>g</sub>	-	45.7	-	nC	V <sub>DS</sub> = 15V, I <sub>D</sub> = 11.2A
Total Gate Charge (V <sub>GS</sub> = 4.5V)	Q <sub>g</sub>	-	19.3	-	nC	
Gate-Source Charge	Q <sub>gs</sub>	-	5.0	-	nC	
Gate-Drain Charge	Q <sub>gd</sub>	-	2.9	-	nC	
Turn-On Delay Time	t <sub>D(ON)</sub>	-	5.5	-	ns	
Turn-On Rise Time	t <sub>R</sub>	-	24.4	-	ns	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 15V, R <sub>G</sub> = 3Ω, R <sub>L</sub> = 1.2Ω
Turn-Off Delay Time	t <sub>D(OFF)</sub>	-	33.1	-	ns	
Turn-Off Fall Time	t <sub>F</sub>	-	6.6	-	ns	

- Notes:
5. Device mounted on FR-4 PCB with minimum recommended pad layout. The value in any given application depends on the user's specific board design.
  6. Repetitive rating, pulse width limited by junction temperature.
  7. I<sub>AR</sub> and E<sub>AR</sub> ratings are based on low frequency and duty cycles to keep T<sub>J</sub> = +25°C. L = 0.1mH, V<sub>DD</sub> = 0V, R<sub>G</sub> = 0Ω, rated V<sub>DS</sub> = 30V, and V<sub>GS</sub> = 10V.
  8. Short duration pulse test used to minimize self-heating effect.
  9. Guaranteed by design. Not subject to product testing.

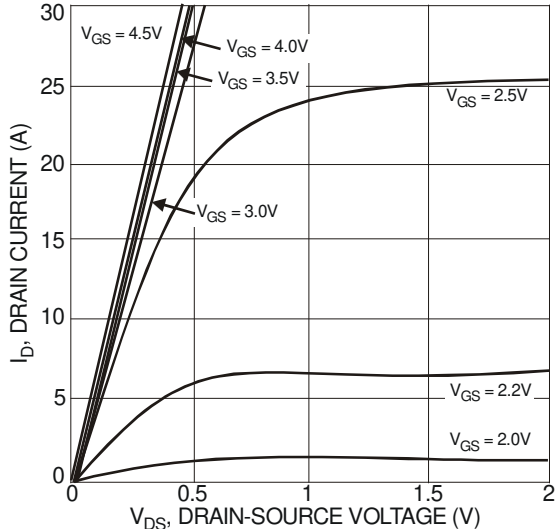


Fig. 1 Typical Output Characteristic

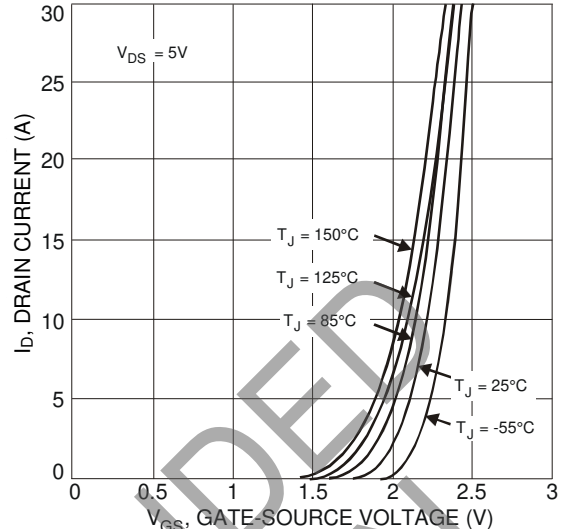


Fig. 2 Typical Transfer Characteristic

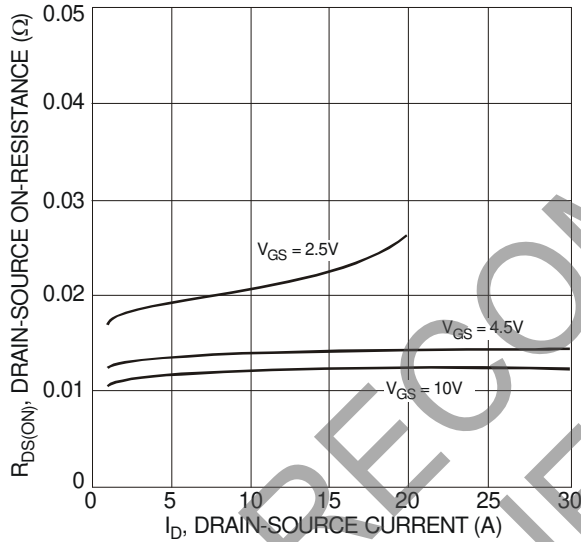


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

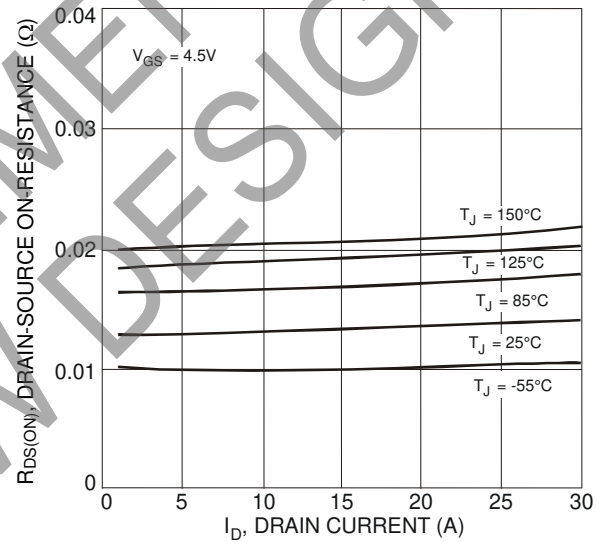


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

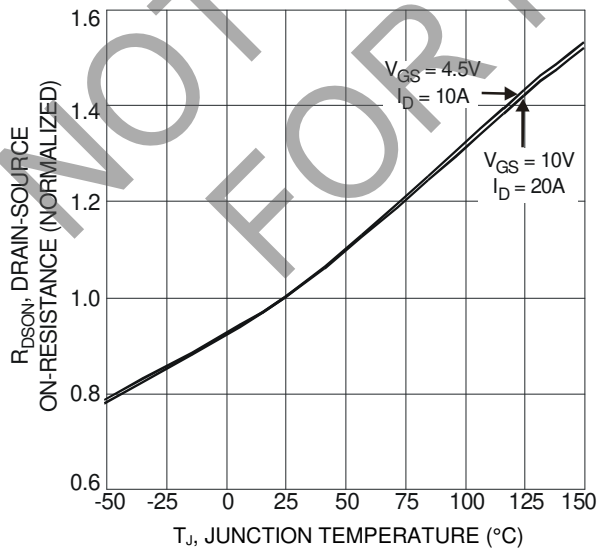


Fig. 5 On-Resistance Variation with Temperature

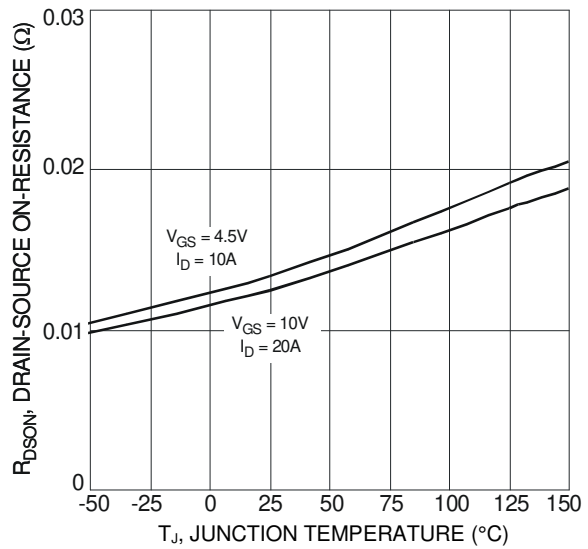


Fig. 6 On-Resistance Variation with Temperature

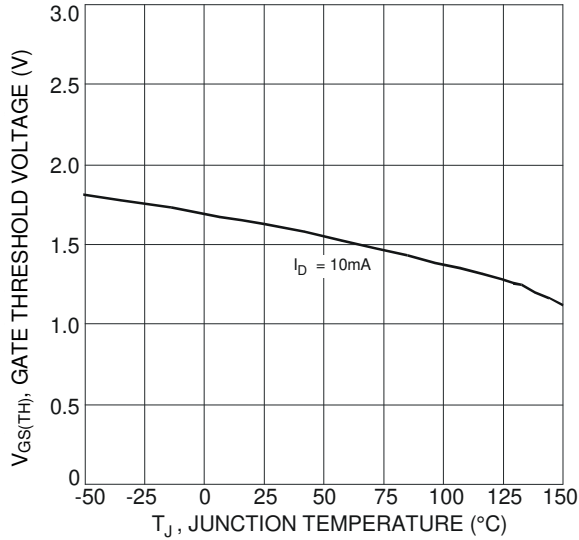


Fig. 7 Gate Threshold Variation vs. Junction Temperature

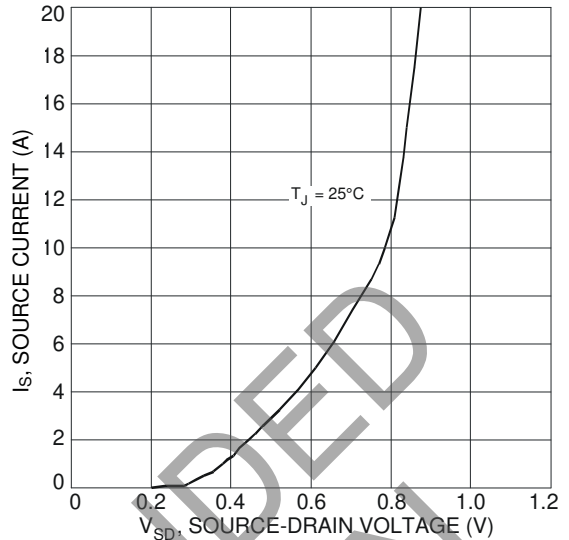


Fig. 8 Diode Forward Voltage vs. Current

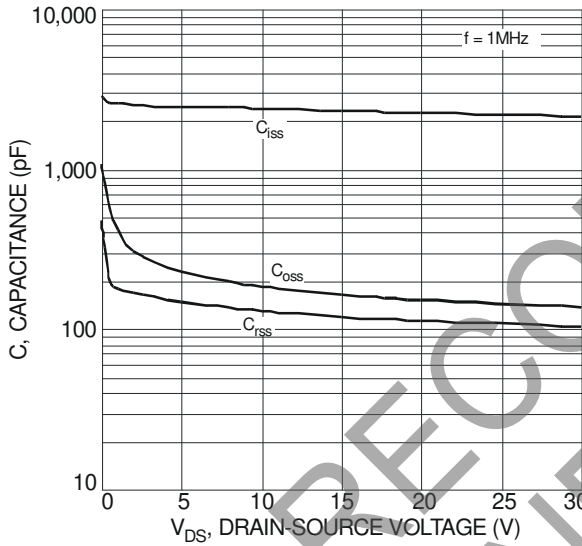


Fig. 9 Typical Total Capacitance

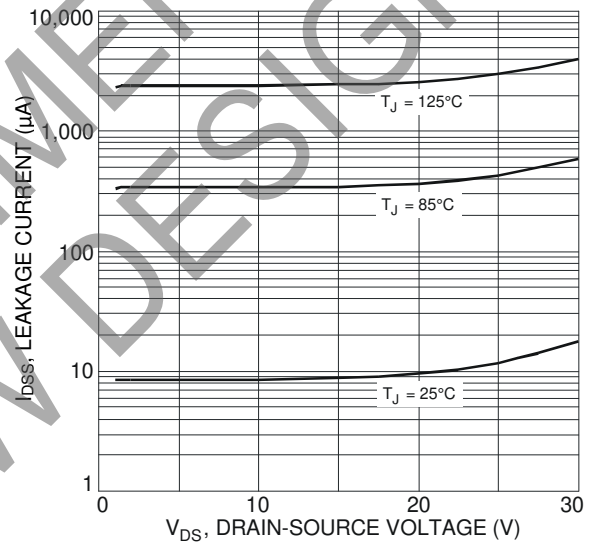


Fig. 10 Typical Leakage Current vs. Drain-Source Voltage

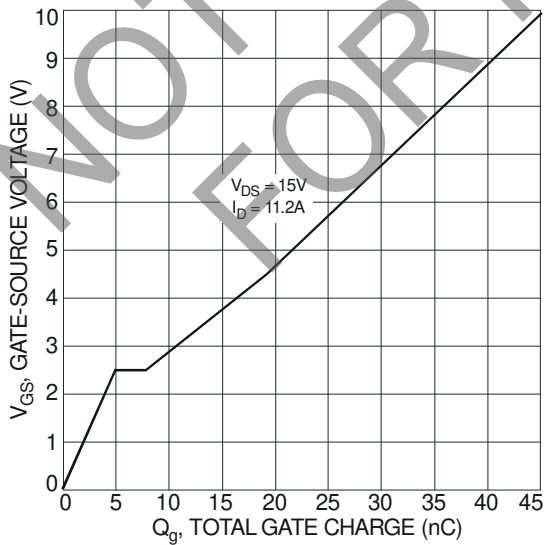


Fig. 11 Gate-Source Voltage vs. Total Gate Charge

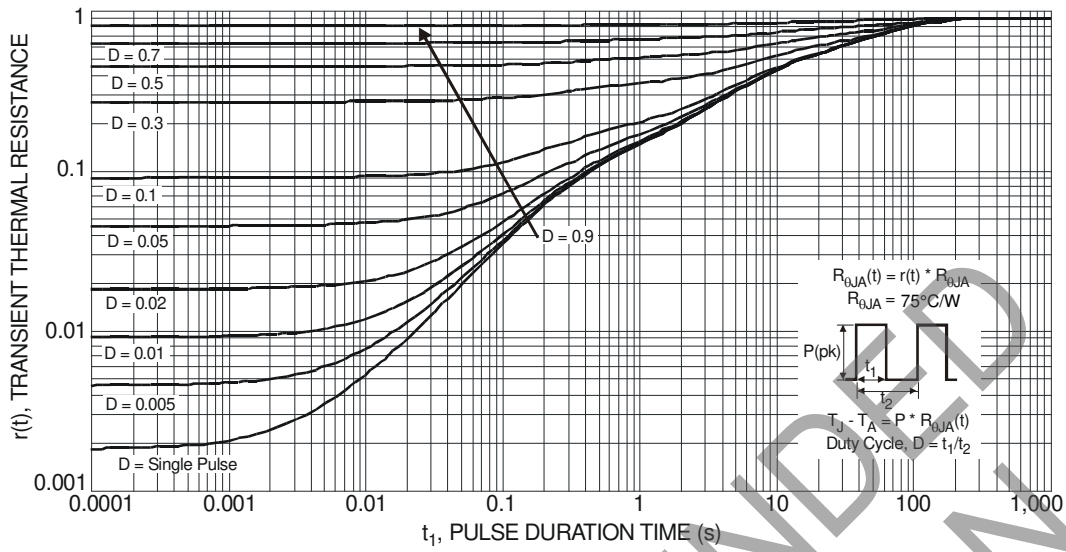
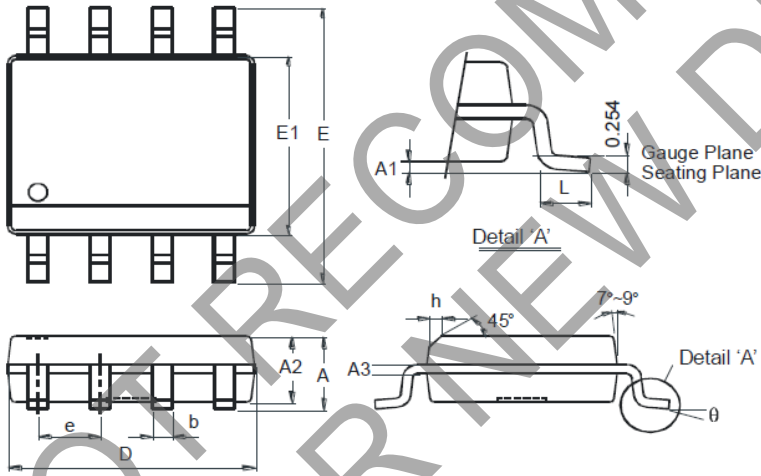


Fig. 12 Transient Thermal Response

**Package Outline Dimensions**

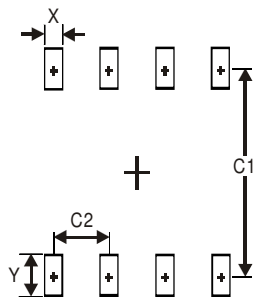
Please see <http://www.diodes.com/package-outlines.html> for the latest version.



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**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.



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

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