

NEW PRODUCT

## Product Summary

$V_{(BR)DSS}$	$R_{DS(ON) \text{ max}}$	$I_D \text{ max}$ $T_A = 25^\circ\text{C}$
30V	20mΩ @ $V_{GS} = 10\text{V}$	10A

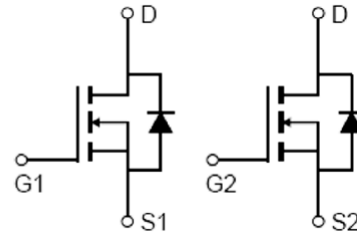
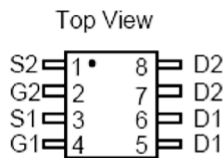
## Description and Applications

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.

- General Purpose Interfacing Switch
- Power Management Functions
- DC-DC Converters
- Analog Switch



Top View



## Features and Benefits

- N-Channel MOSFET
- Low On-Resistance
- Low Input Capacitance
- Low Input/Output leakage
- Low Gate Resistance
- Fast Switching Speed
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **Qualified to AEC-Q101 standards for High Reliability**

## Mechanical Data

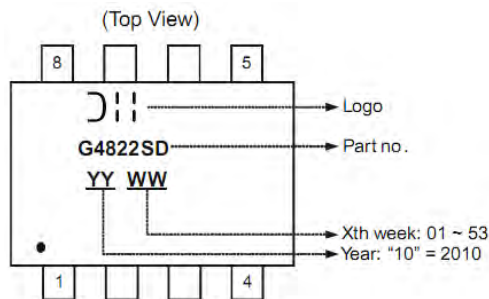
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See diagram
- Terminals: Finish — NiPdAu over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.072 grams (approximate)

## Ordering Information (Note 3)

Part Number	Case	Packaging
DMG4822SSD-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<sub>A</sub> = 25°C unless otherwise specified

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V <sub>DSS</sub>	30	V
Gate-Source Voltage			V <sub>GSS</sub>	±25	V
Continuous Drain Current (Note 4) V <sub>GS</sub> = 10V	Steady State	T <sub>A</sub> = 25°C	I <sub>D</sub>	10	A
		T <sub>A</sub> = 85°C		6.6	
Pulsed Drain Current (Note 5)			I <sub>DM</sub>	60	A
Avalanche Current (Note 6) (Note 7)			I <sub>AR</sub>	1.68	A
Repetitive Avalanche Energy L= 0.3mH (Note 6) (Note 7)			E <sub>AR</sub>	12.8	mJ

**Thermal Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 4)	P <sub>D</sub>	1.42	W
Thermal Resistance, Junction to Ambient (Note 4)	R <sub>θJA</sub>	88.4	°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 specified

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> = 250μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	-	-	1	μA	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> = ±25V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 8)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	1.0	-	3.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	-	13.4	20.0	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 8.5A
		-	19.5	31.0		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 6A
Forward Transfer Admittance	Y <sub>fs</sub>	-	20	-	mS	V <sub>DS</sub> = 5V, I <sub>D</sub> = 8.5A
Diode Forward Voltage (Note 8)	V <sub>SD</sub>	-	0.4	1.0	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 1A
<b>DYNAMIC CHARACTERISTICS (Note 9)</b>						
Input Capacitance	C <sub>iss</sub>	-	478.9	-	pF	V <sub>DS</sub> = 16V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	-	96.7	-	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	-	61.4	-	pF	
Gate resistance	R <sub>g</sub>		1.1		Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1.0MHz
Total Gate Charge (V <sub>GS</sub> = 4.5V)	Q <sub>g</sub>		5.0	-	nC	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 15V, I <sub>D</sub> = 8.5A
Total Gate Charge (V <sub>GS</sub> = 10V)	Q <sub>g</sub>	-	10.5	-	nC	
Gate-Source Charge	Q <sub>gs</sub>	-	1.8	-	nC	
Gate-Drain Charge	Q <sub>gd</sub>	-	1.6	-	nC	
Turn-On Delay Time	t <sub>D(on)</sub>	-	2.9	-	ns	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 10V, R <sub>L</sub> = 1.8Ω, R <sub>G</sub> = 3Ω,
Turn-On Rise Time	t <sub>r</sub>	-	7.9	-	ns	
Turn-Off Delay Time	t <sub>D(off)</sub>	-	14.6	-	ns	
Turn-Off Fall Time	t <sub>f</sub>	-	3.1	-	ns	

- Notes:
- Device mounted on FR-4 PCB, with minimum recommended pad layout.
  - Device mounted on minimum recommended pad layout test board, 10μs pulse duty cycle = 1%
  - Repetitive rating, pulse width limited by junction temperature.
  - I<sub>AR</sub> and E<sub>AR</sub> rating are based on low frequency and duty cycles to keep T<sub>J</sub>=25°C
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.

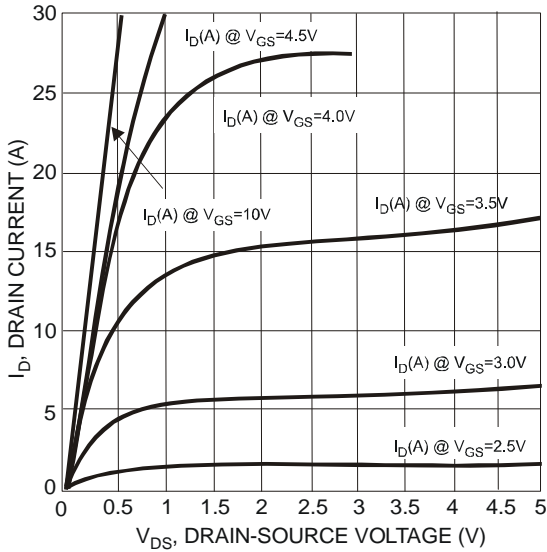


Fig.1 Typical Output Characteristic

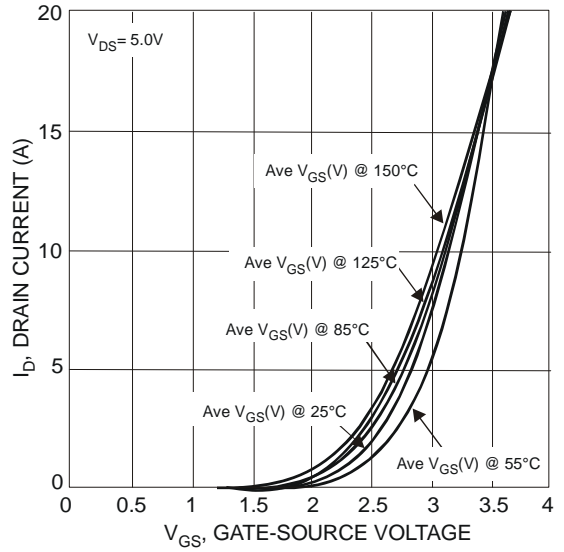


Fig.2 Typical Transfer Characteristics

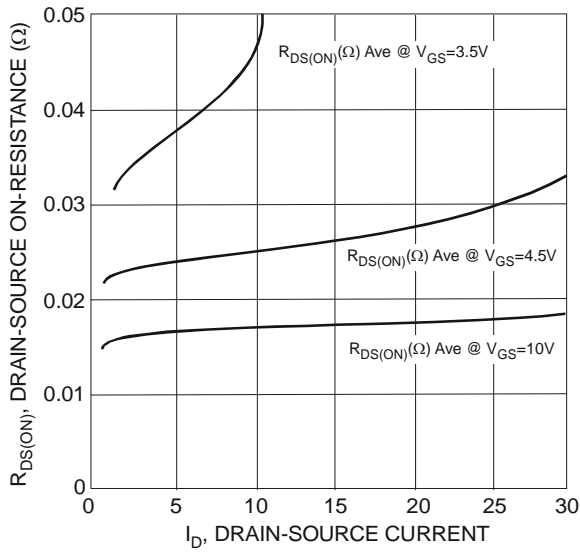


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

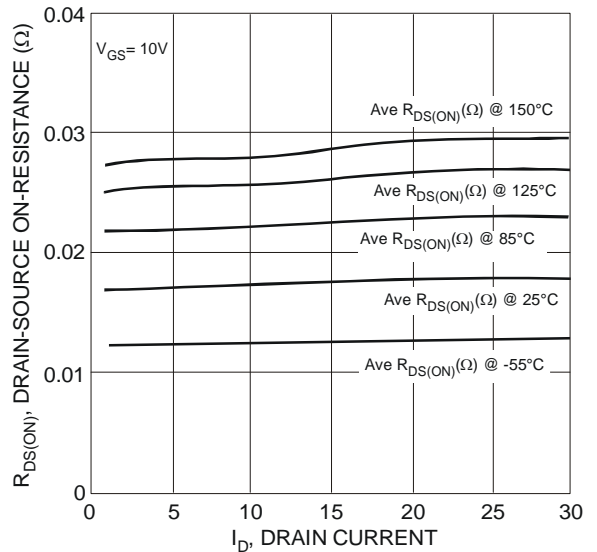


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

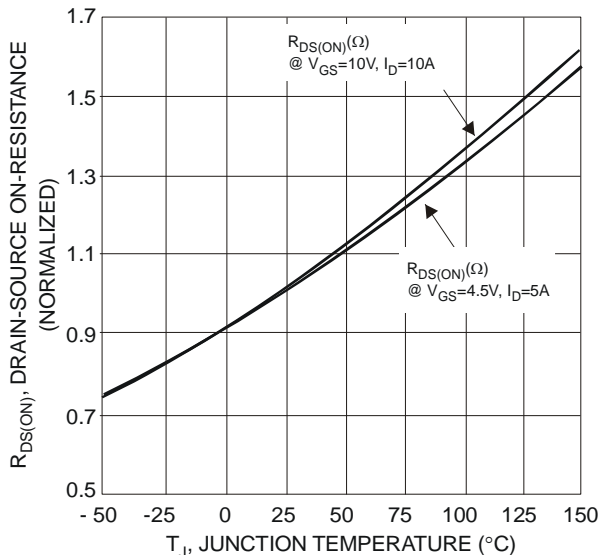


Fig. 5 On-Resistance Variation with Temperature

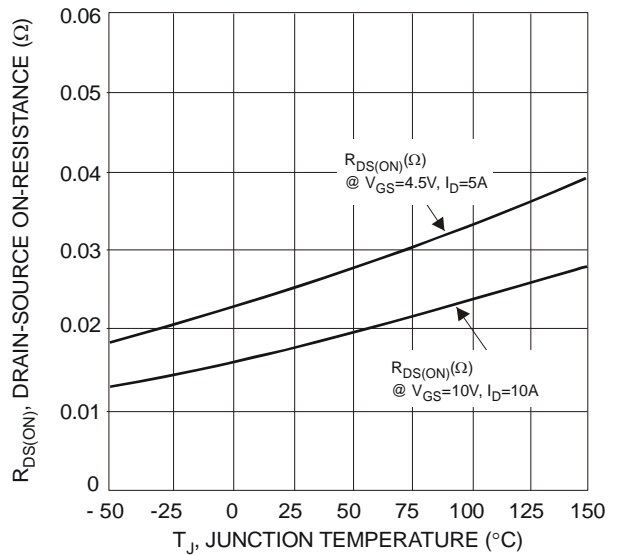


Fig. 6 On-Resistance Variation with Temperature

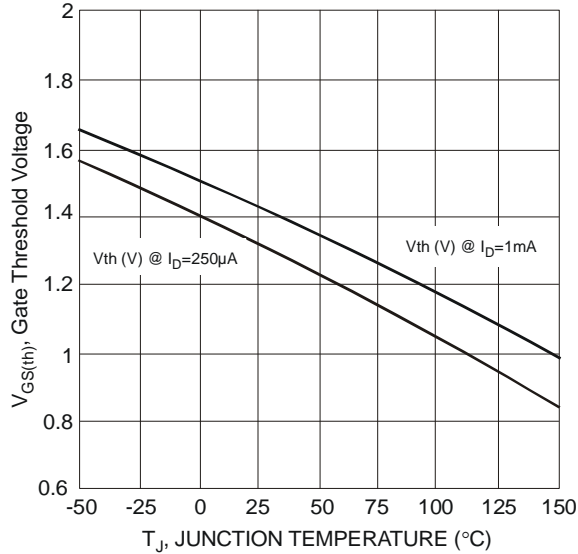


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

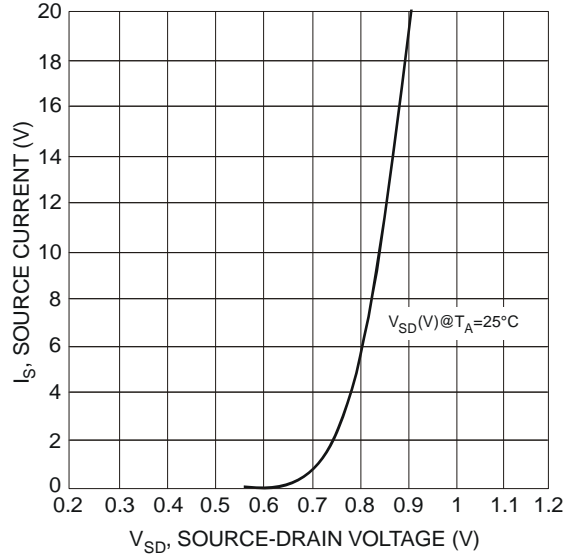


Fig. 8 Diode Forward Voltage vs. Current

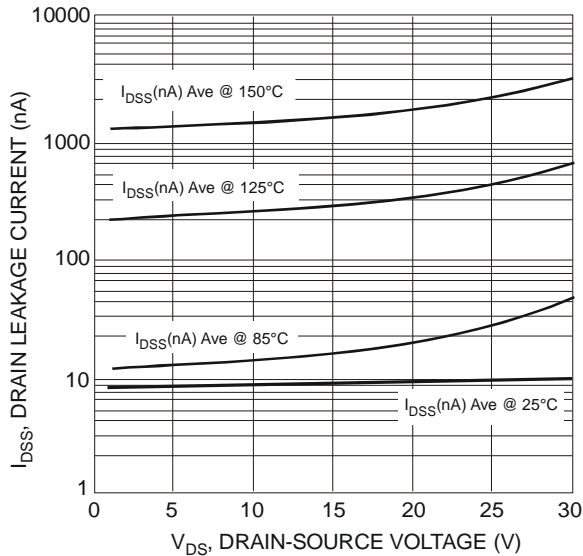


Fig. 9 Typical Drain-Source Leakage Current vs. Voltage

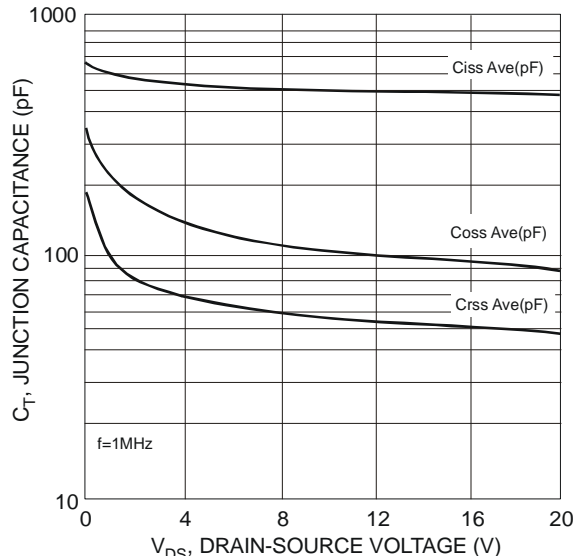


Fig. 10 Typical Junction Capacitance

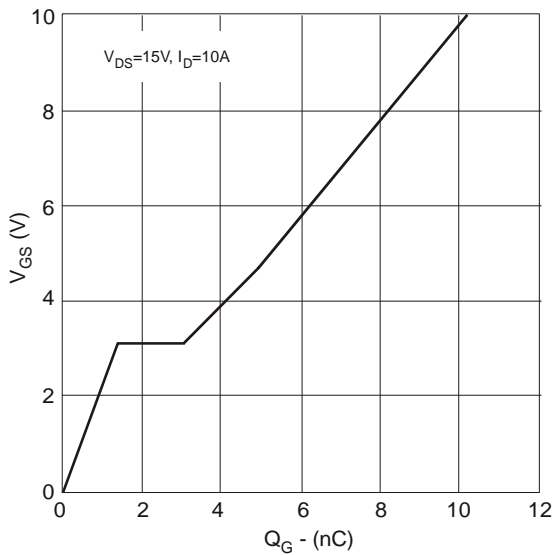
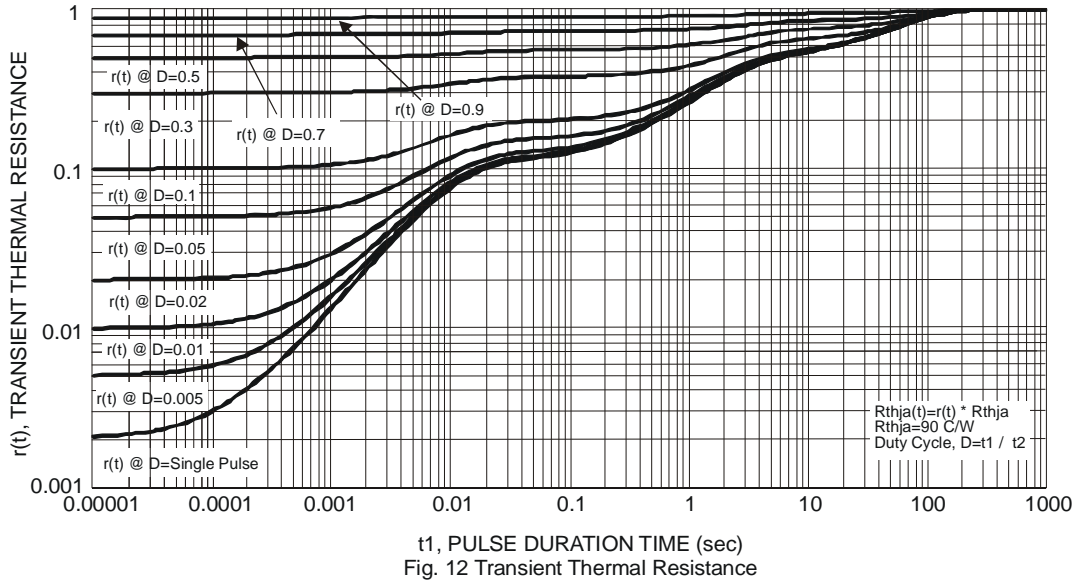
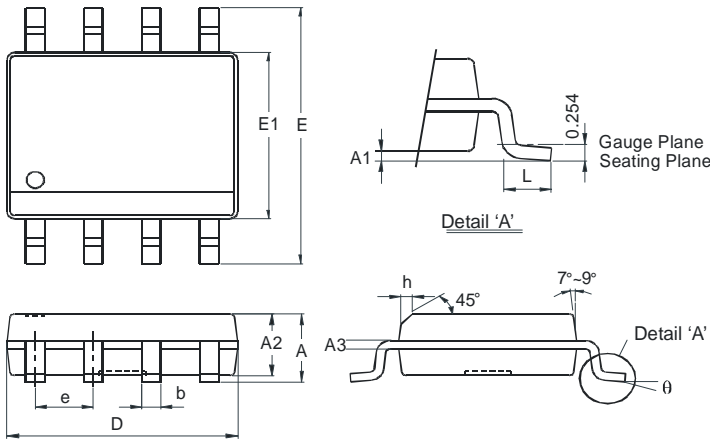


Fig. 11 Gate Charge



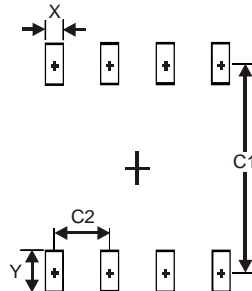
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**Package Outline Dimensions**



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
$\theta$	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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