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**DMG9926USD**

**DUAL N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR**

## Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)} \text{ max}$	$I_D \text{ max}$ $T_A = +25^\circ\text{C}$
20V	24m $\Omega$ @ $V_{GS} = 4.5\text{V}$	8A
	29m $\Omega$ @ $V_{GS} = 2.5\text{V}$	5.5A
	37m $\Omega$ @ $V_{GS} = 1.8\text{V}$	4.8A

## Description

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.

## Applications

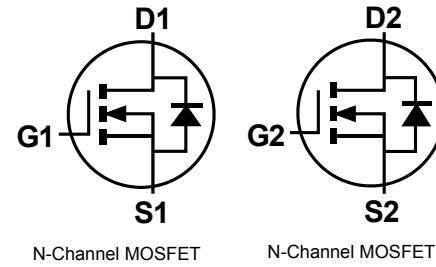
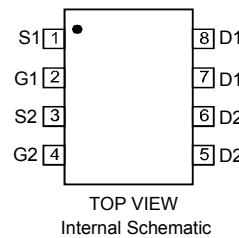
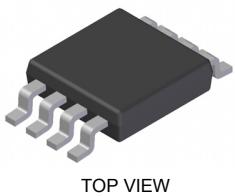
- Power Management Functions
- DC-DC Converters
- 

## Features

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- 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-020D
- Terminals Connections: See Diagram
- Terminals: Finish - Matte Tin annealed over Copper lead frame. Solderable per MIL-STD-202, Method 208
- Weight: 0.072g (approximate)



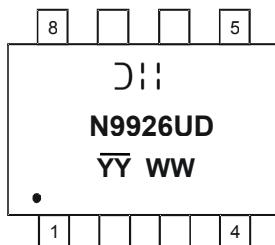
## Ordering Information (Note 4)

Part Number	Case	Packaging
DMG9926USD-13	SO-8	2,500/Tape & Reel

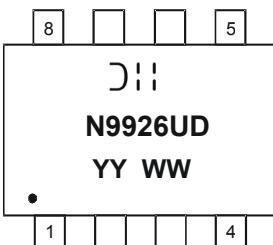
Notes:

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) 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 <http://www.diodes.com/products/packages.html>.

## Marking Information



Chengdu A/T Site



Shanghai A/T Site

DII = Manufacturer's Marking

N9926UD = Product Type Marking Code

YYWW = Date Code Marking

YY or YY = Year (ex: 13 = 2013)

WW = Week (01 - 53)

YY = Date Code Marking for SAT (Shanghai Assembly/ Test site)

YY = Date Code Marking for CAT (Chengdu Assembly/ Test site)



DMG9926USD

### Maximum Ratings (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Value	Units
Drain-Source Voltage	$V_{DSS}$	20	V
Gate-Source Voltage	$V_{GSS}$	$\pm 8$	V
Drain Current (Note 5)	$I_D$	8	A
Steady State $T_A = +25^\circ\text{C}$		6.7	
Pulsed Drain Current (Note 6)	$I_{DM}$	30	A
$T_A = +70^\circ\text{C}$			

### Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	$P_D$	1.3	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	96	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

### Electrical Characteristics (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

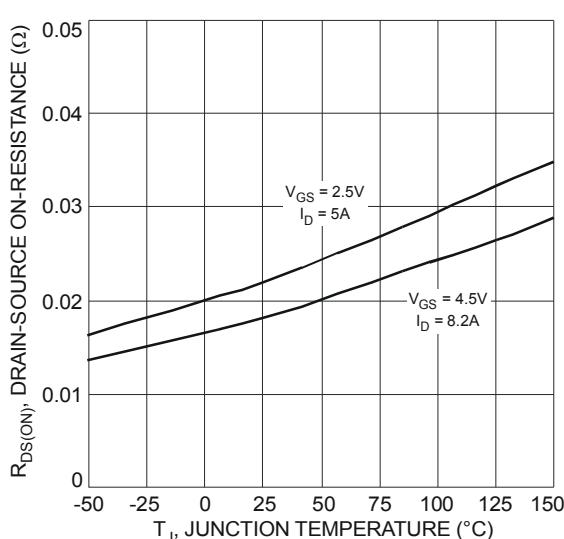
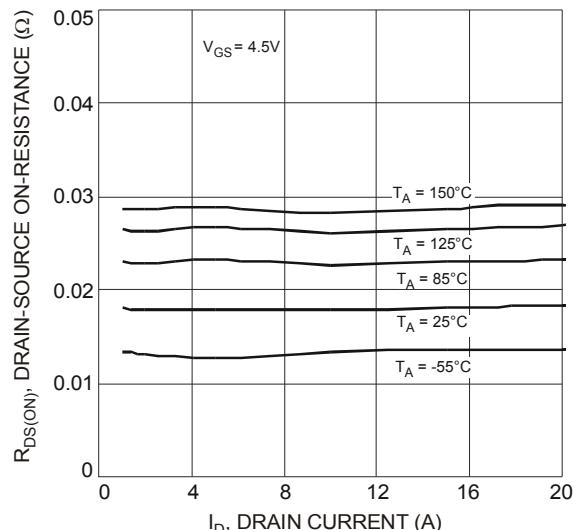
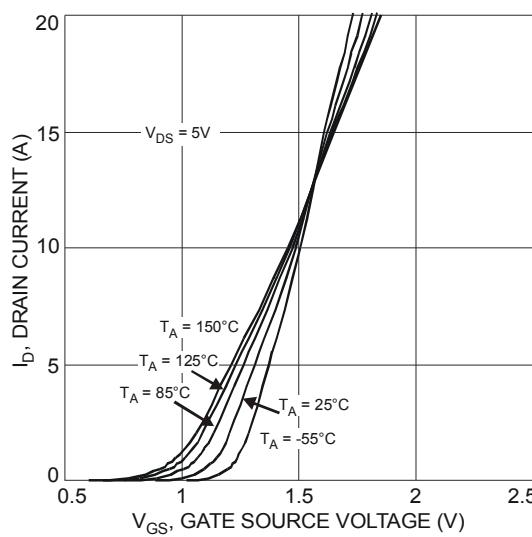
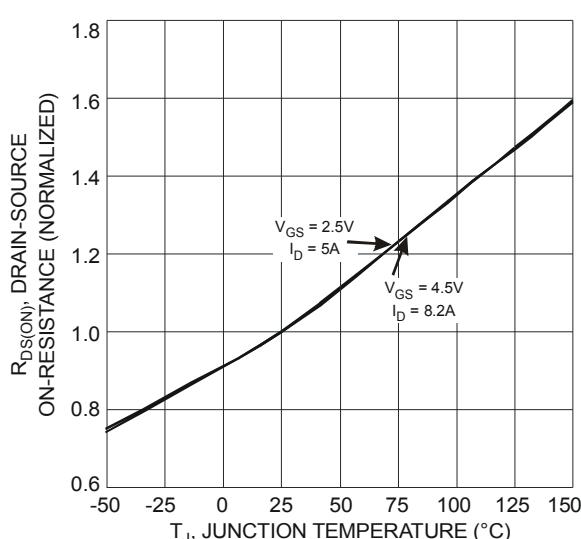
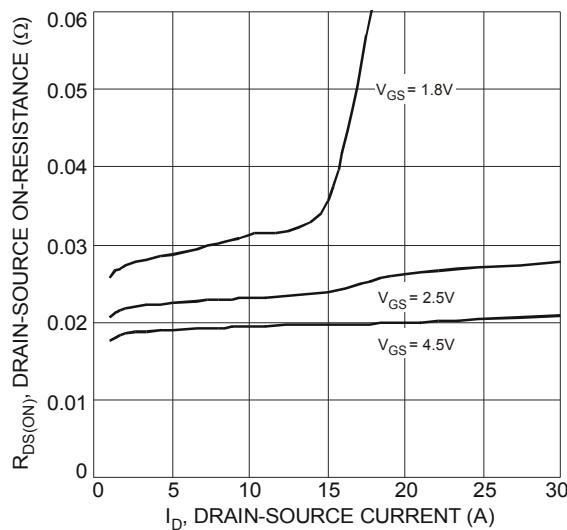
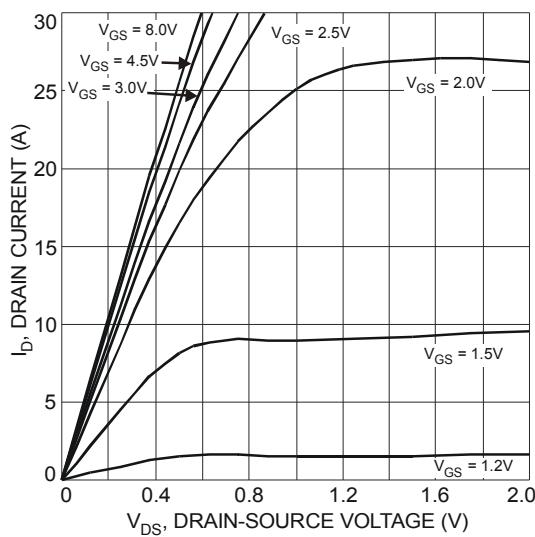
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	20	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 100$	nA	$V_{GS} = \pm 8\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$V_{GS(\text{th})}$	0.5	—	0.9	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(\text{ON})}$	—	19 23 29	24 29 37	$\text{m}\Omega$	$V_{GS} = 4.5\text{V}, I_D = 8.2\text{A}$ $V_{GS} = 2.5\text{V}, I_D = 3.3\text{A}$ $V_{GS} = 1.8\text{V}, I_D = 2\text{A}$
Forward Transfer Admittance	$ Y_{fs} $	—	7	—	S	$V_{DS} = 10\text{V}, I_D = 4\text{A}$
Diode Forward Voltage	$V_{SD}$	0.5	—	0.9	V	$V_{GS} = 0\text{V}, I_S = 1\text{A}$
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	$C_{iss}$	—	867	—	$\text{pF}$	$V_{DS} = 15\text{V}, V_{GS} = 0\text{V}$ $f = 1\text{MHz}$
Output Capacitance	$C_{oss}$	—	85	—	$\text{pF}$	
Reverse Transfer Capacitance	$C_{rss}$	—	81	—	$\text{pF}$	
Gate Resistance	$R_G$	—	1.29	—	$\Omega$	$V_{GS} = 0\text{V}, V_{DS} = 0\text{V}, f = 1\text{MHz}$
<b>SWITCHING CHARACTERISTICS (Note 8)</b>						
Total Gate Charge	$Q_g$	—	8.8	—	nC	$V_{GS} = 4.5\text{V}, V_{DS} = 10\text{V}, I_D = 8.2\text{A}$
Gate-Source Charge	$Q_{gs}$	—	1.2	—	nC	
Gate-Drain Charge	$Q_{gd}$	—	3	—	nC	
Turn-On Delay Time	$t_{d(\text{on})}$	—	13.2	—	ns	$V_{DD} = 10\text{V}, V_{GS} = 4.5\text{V},$ $R_L = 10\Omega, R_G = 6\Omega$
Turn-On Rise Time	$t_r$	—	12.6	—	ns	
Turn-Off Delay Time	$t_{d(\text{off})}$	—	64.8	—	ns	
Turn-Off Fall Time	$t_f$	—	21.7	—	ns	

Notes:

- Device mounted on FR-4 PCB with minimum recommended pad layout.
- Repetitive rating, pulse width limited by function temperature.
- Short duration pulse test used to minimize self-heating effect.
- Guaranteed by design. Not subject to production testing.



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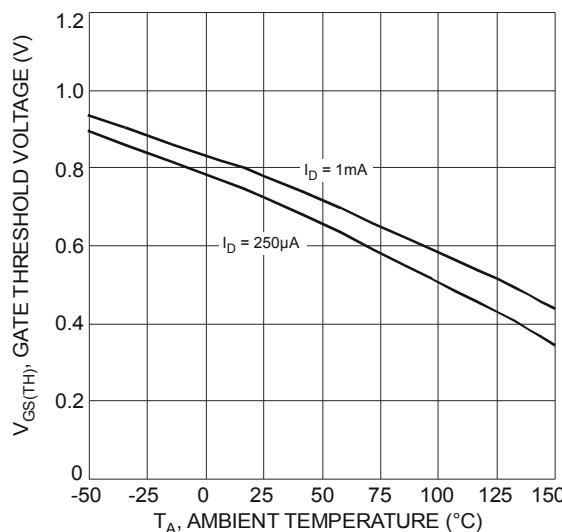


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

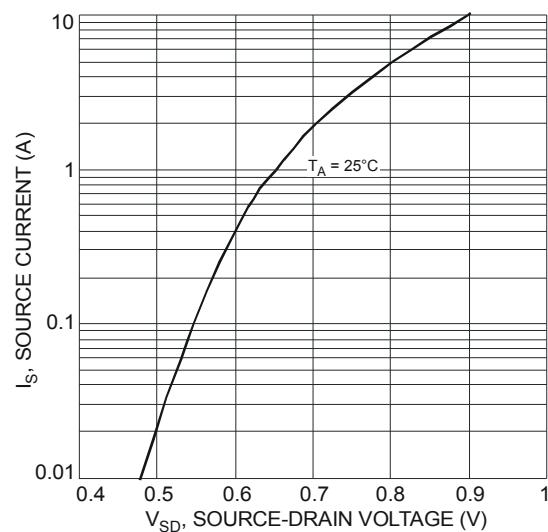


Fig. 8 Diode Forward Voltage vs. Current

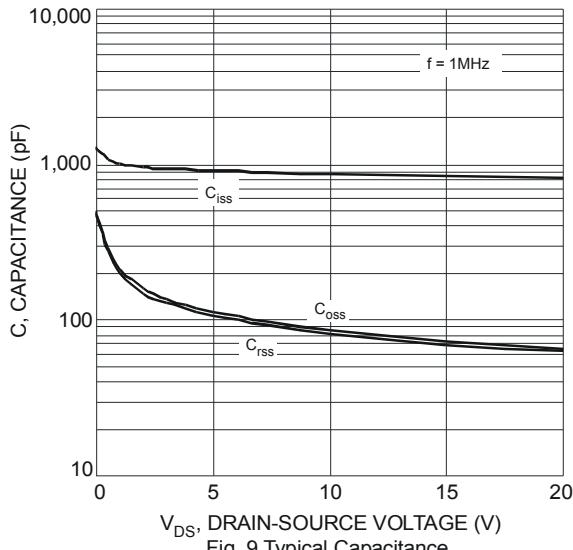


Fig. 9 Typical Capacitance

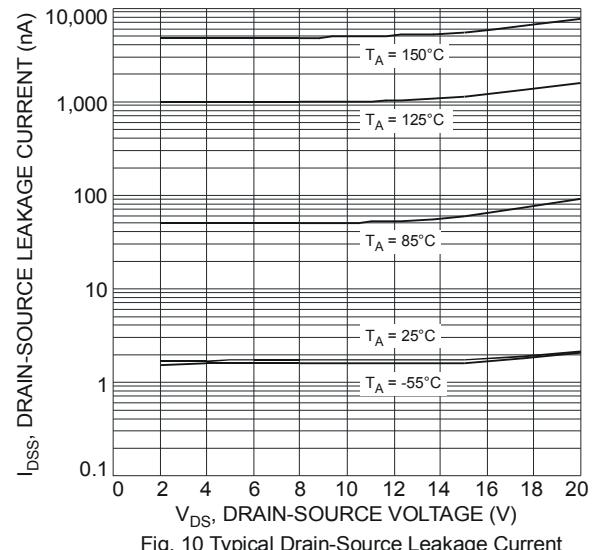


Fig. 10 Typical Drain-Source Leakage Current vs. Drain-Source Voltage

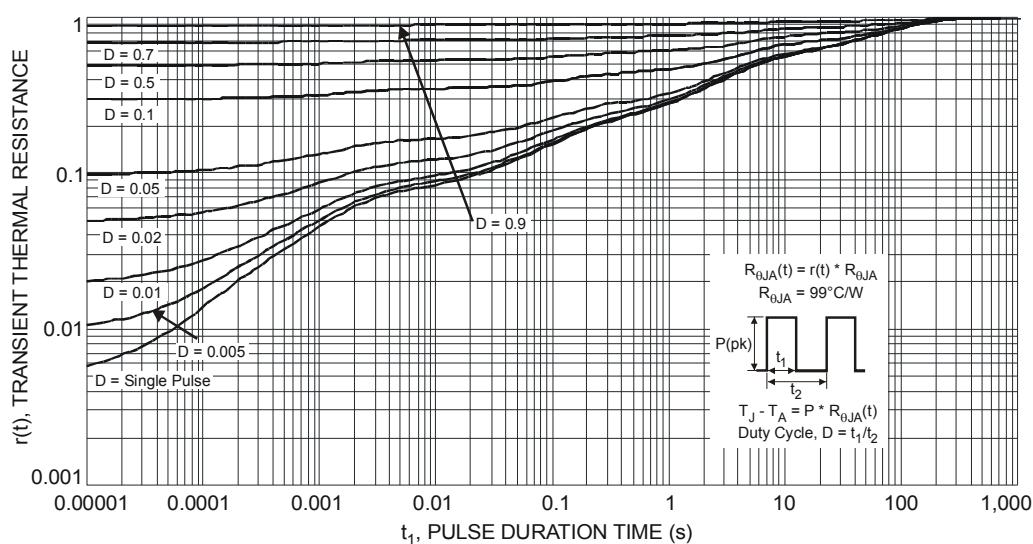
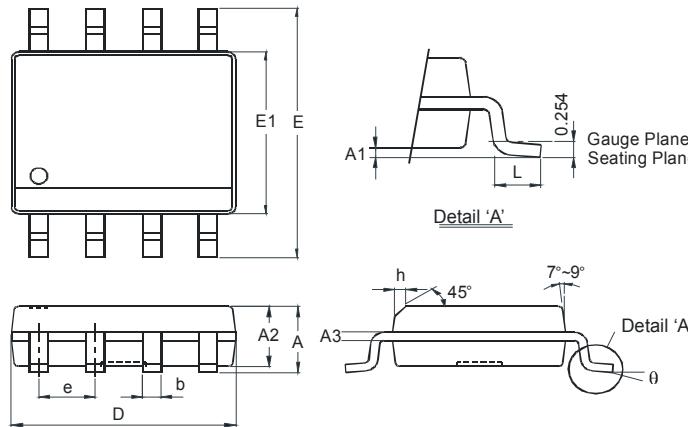


Fig. 11 Transient Thermal Response

## Package Outline Dimensions

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.

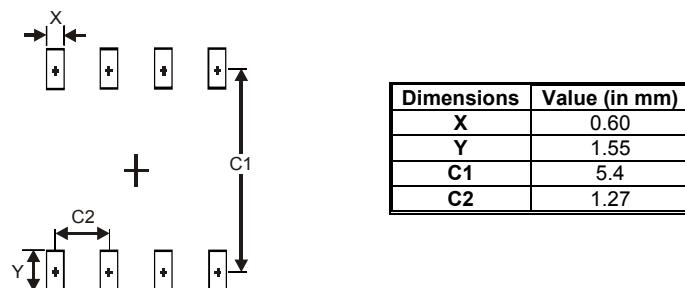


SOP-8L		
Dim	Min	Max
<b>A</b>	-	1.75
<b>A1</b>	0.10	0.20
<b>A2</b>	1.30	1.50
<b>A3</b>	0.15	0.25
<b>b</b>	0.3	0.5
<b>D</b>	4.85	4.95
<b>E</b>	5.90	6.10
<b>E1</b>	3.85	3.95
<b>e</b>	1.27 Typ	
<b>h</b>	-	0.35
<b>L</b>	0.62	0.82
<b>θ</b>	0°	8°

All Dimensions in mm

## Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



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