



40V 175°C DUAL N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV _{DSS}	Rds(on) max	I _D T _A = +25°C	
40V	$24m\Omega @V_{GS} = 10V$	7.5A	
40 V	$32m\Omega @V_{GS} = 4.5V$	6.5A	

Description and Applications

This MOSFET is designed to meet the stringent requirements of Automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

- Motor Control
- Backlighting
- Power Management Functions
- DC-DC Converters

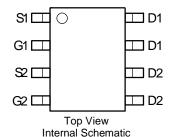
Features

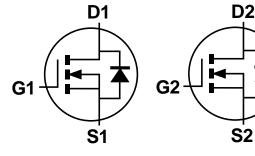
- Rated to +175°C Ideal for High Ambient Temperature Environments
- 100% Unclamped Inductive Switching Ensures More Reliable And Robust End Application
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability
- PPAP Capable (Note 4)

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 Below
- Terminals: Finish Matte Tin Annealed Over Copper Lead Frame. Solderable per MIL-STD-202, Method 208 (3)
- Weight: 0.074 grams (Approximate)







Equivalent Circuit

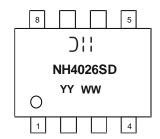
Ordering Information (Note 5)

Part Number	Case	Packaging
DMNH4026SSDQ-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.
- See 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to http://www.diodes.com/product_compliance_definitions.html.
- 5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



);; = Manufacturer's Marking
NH4026SD = Product Type Marking Code
YYWW = Date Code Marking
YY = Year (ex: 16 = 2016)
WW = Week (01 to 53)



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

Characteristic		Symbol	Value	Unit	
Drain-Source Voltage		V _{DSS}	40	V	
Gate-Source Voltage		V _{GSS}	±20	V	
Continuous Drain Current (Note 7) $V_{GS} = 10V$ Steady $T_A = +25^{\circ}C$ State $T_A = +100^{\circ}C$			I _D	7.5 5.3	А
Maximum Continuous Body Diode Forward Curre	ent (Note 7)	I _S	2.5	A	
Pulsed Drain Current (10µs Pulse, Duty Cycle =	I _{DM}	60	A		
Avalanche Current (Note 8) L = 0.1mH	I _{AS}	18	A		
Avalanche Energy (Note 8) L = 0.1mH		E _{AS}	18	mJ	

Thermal Characteristics

Characteristic		Symbol	Value	Unit	
Total Power Dissipation (Note 6)	T _A = +25°C	P _D	1.5	W	
Thermal Resistance, Junction to Ambient (Note 6)	Steady State		101	°C/W	
Thermal Resistance, Junction to Ambient (Note 6)	t<10s	$R_{ heta JA}$	59	C/VV	
Total Power Dissipation (Note 7)	$T_A = +25^{\circ}C$	P _D	2.0	W	
Thermal Resistance, Junction to Ambient (Note 7)	Steady State	0	74	°C/W	
Thermal Resistance, Junction to Ambient (Note 7)	t<10s	$R_{\theta JA}$	43		
Thermal Resistance, Junction to Case (Note 7)	R ₀ JC	10.5			
Operating and Storage Temperature Range	T _{J,} T _{STG}	-55 to +175	°C		

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 9)						
Drain-Source Breakdown Voltage	BV _{DSS}	40	_	_	V	$V_{GS} = 0V, I_D = 250\mu A$
Zero Gate Voltage Drain Current	I _{DSS}	_	_	1	μA	V _{DS} = 40V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 9)				•	•	
Gate Threshold Voltage	$V_{GS(TH)}$	1	_	3	V	$V_{DS} = V_{GS}$, $I_D = 250\mu A$
Static Drain-Source On-Resistance	D	_	15	24	0	$V_{GS} = 10V, I_D = 6A$
Static Diani-Source On-Resistance	R _{DS(ON)}	_	20	32	mΩ	$V_{GS} = 4.5V, I_D = 5A$
Diode Forward Voltage	V _{SD}	_	0.7	1.0	V	V _{GS} = 0V, I _S = 1.0A
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	Ciss		1060	_		$V_{DS} = 20V, V_{GS} = 0V,$ f = 1.0MHz
Output Capacitance	Coss	_	84	_	pF	
Reverse Transfer Capacitance	C _{rss}	_	58	_		
Gate Resistance	R_g	_	1.6	_	Ω	$V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz$
Total Gate Charge (V _{GS} = 4.5V)	Qg		8.8	_		
Total Gate Charge (V _{GS} = 10V)	Qg	_	19.1	_	nC	$V_{DS} = 20V, I_D = 8A$
Gate-Source Charge	Q_{gs}		3.0	_	IIC	
Gate-Drain Charge	Q_{gd}	_	2.5	_		
Turn-On Delay Time	t _{D(ON)}	_	5.3	_		$V_{DD} = 25V, R_L = 2.5\Omega$ $V_{GS} = 10V, R_g = 3\Omega$
Turn-On Rise Time	t _R		7.1	_	no	
Turn-Off Delay Time	t _{D(OFF)}	_	15.1	_	ns	
Turn-Off Fall Time	t _F	_	4.8	_		
Body Diode Reverse Recovery Time	t _{RR}		10.5	_	ns	I _F = 8A, di/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q_{RR}		4.15	_	nC	I _F = 8A, di/dt = 100A/μs

Notes:

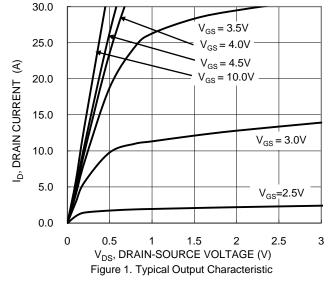
^{6.} Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
7. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.

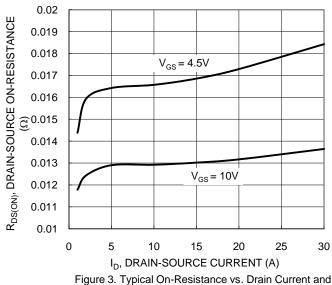
^{8.} I_{AS} and E_{AS} rating are based on low frequency and duty cycles to keep T_J = +25°C.

^{9.} Short duration pulse test used to minimize self-heating effect.

^{10.} Guaranteed by design. Not subject to product testing.







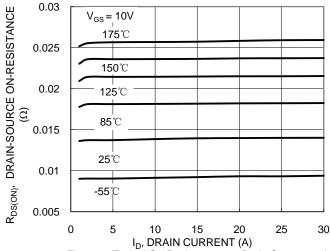
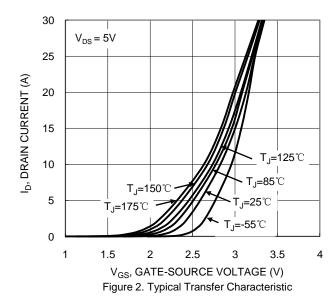
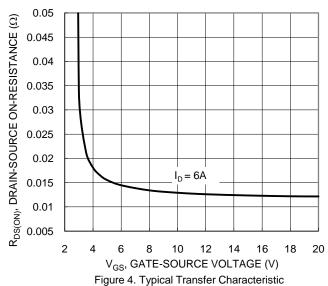


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

Gate Voltage





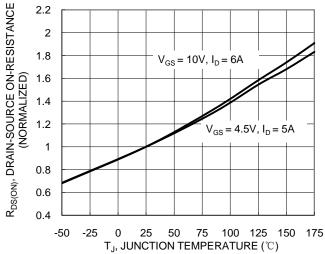


Figure 6.On-Resistance Variation with Temperature



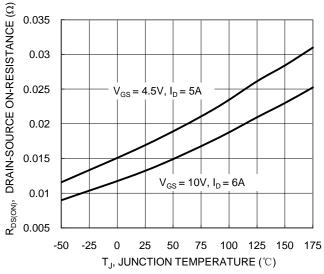
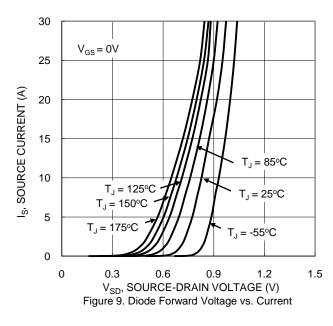
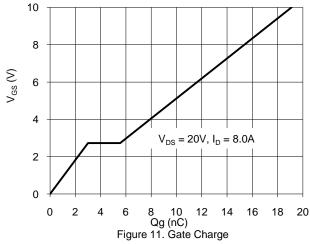
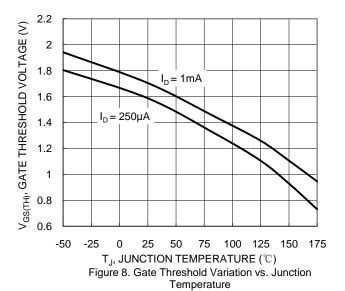
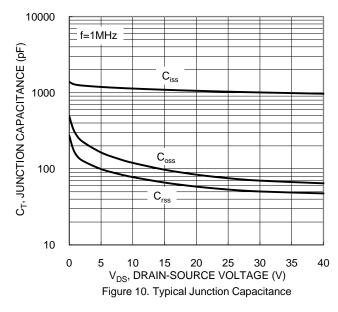


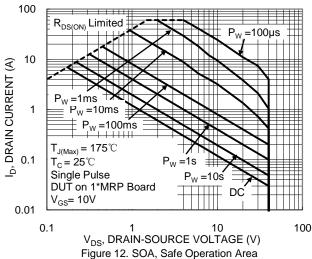
Figure 7. On-Resistance Variation with Temperature













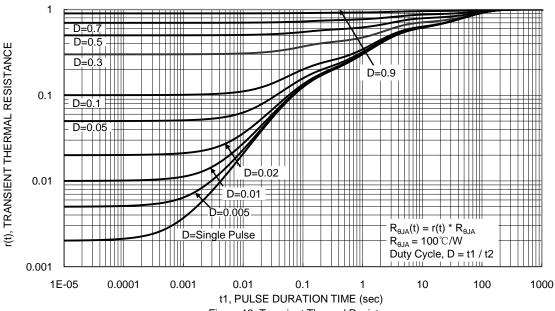


Figure 13. Transient Thermal Resistance

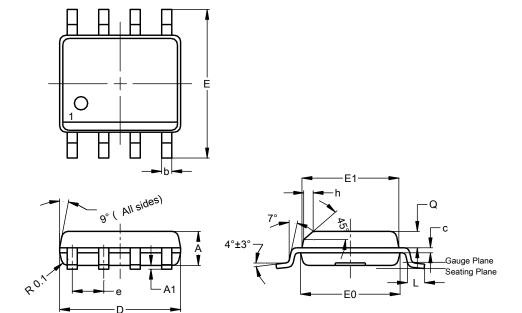
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Package Outline Dimensions

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

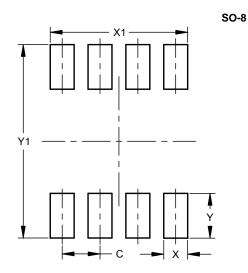
SO-8



SO-8						
Dim	Min	Max	Тур			
Α	1.40	1.50	1.45			
A1	0.10	0.20	0.15			
b	0.30	0.50	0.40			
С	0.15	0.25	0.20			
D	4.85	4.95	4.90			
Е	5.90	6.10	6.00			
E1	3.80	3.90	3.85			
E0	3.85	3.95	3.90			
е			1.27			
h	1		0.35			
L	0.62	0.82	0.72			
Q	0.60	0.70	0.65			
All Dimensions in mm						

Suggested Pad Layout

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



Dimensions	Value (in mm)				
С	1.27				
Х	0.802				
X1	4.612				
Y	1.505				
V1	6.50				



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