





60V DUAL N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

V _{(BR)DSS}	R _{DS(ON)} Max	I _D T _A = +25°C	
60V	$40m\Omega$ @ $V_{GS} = 10V$	5.0A	
	55mΩ @ V _{GS} = 4.5V	4.4A	

Description and Applications

This new generation MOSFET is designed to minimize the on-state resistance (R_{DS(ON)}), yet maintain superior switching performance, making it ideal for high efficiency power management applications.

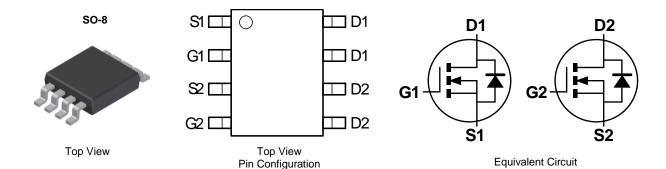
- DC-DC Converters
- Power Management Functions
- Backlighting

Features and Benefits

- Low Input Capacitance
- Low On-Resistance
- 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: See Diagram
- Terminals: Finish Tin Finish Annealed over Copper Leadframe.
 Solderable per MIL-STD-202, Method 208 (§3)
- Weight: 0.074 grams (Approximate)



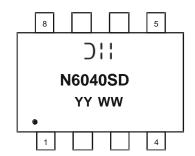
Ordering Information (Note 5)

Part Number	Case	Packaging
DMN6040SSDQ-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 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. Please refer to http://www.diodes.com/quality/product_compliance_definitions/.
- 5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



⊃¦¦ = Manufacturer's Marking
 N6040SD = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Year (ex: 16 = 2016)
 WW = Week (01 - 53)



Maximum Ratings (@TA = +25°C unless otherwise specified)

Characteristic	Symbol	Value	Units		
Drain-Source Voltage			V_{DSS}	60	V
Gate-Source Voltage			V _{GSS}	±20	V
Steady State		$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	ID	5.0 4.1	А
Continuous Drain Current (Note 7) V _{GS} = 10V	t<10s	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	ID	6.6 5.3	А
Maximum Body Diode Forward Current (Note 7)	Is	2.5	Α		
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I _{DM}	30	Α
Avalanche Current (Note 8) L = 0.1mH			I _{AS}	14.2	Α
Avalanche Energy (Note 8) L = 0.1mH			E _{AS}	10	mJ

Thermal Characteristics (@TA = +25°C unless otherwise specified)

Characteristic	Symbol	Value	Units	
Total Power Dissipation (Note 6)	T _A = +25°C	D	1.3	W
Total Power Dissipation (Note 6)	$T_A = +70^{\circ}C$	P_{D}	0.8	
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	D	102	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	t<10s	R _{0JA}	61	
Total Power Dissipation (Note 7)	$T_A = +25$ °C	D-	1.7	W
Total Fower Dissipation (Note 1)	$T_A = +70^{\circ}C$	P _D	1.1	
Thermal Resistance, Junction to Ambient (Note 7)	Steady State	D	75	
Internal Resistance, Junction to Ambient (Note 7)	t<10s	R _{0JA}	50	°C/W
Thermal Resistance, Junction to Case (Note 7)	$R_{\theta JC}$	14.5		
Operating and Storage Temperature Range		$T_{J,}T_{STG}$	-55 to +150	°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}	60	_	_	V	$V_{GS} = 0V, I_D = 250\mu A$	
Zero Gate Voltage Drain Current	I _{DSS}	_	_	100	nA	$V_{DS} = 60V, V_{GS} = 0V$	
Gate-Source Leakage	Igss	_	_	±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		30	40	mΩ	$V_{GS} = 10V, I_D = 4.5A$	
Static Dialii-Source Off-Resistance	R _{DS(ON)}		35	55	11122	$V_{GS} = 4.5V, I_D = 3.5A$	
Forward Transfer Admittance	Y _{FS}	_	4.5	_	S	$V_{DS} = 10V, I_D = 4.3A$	
Diode Forward Voltage	V _{SD}	_	0.7	1.2	V	$V_{GS} = 0V, I_{S} = 1A$	
DYNAMIC CHARACTERISTICS (Note 10)							
Input Capacitance	C _{ISS}		1,287	_		V _{DS} = 25V, V _{GS} = 0V f = 1.0MHz	
Output Capacitance	Coss	_	57	_	pF		
Reverse Transfer Capacitance	C _{RSS}	_	44	_			
Gate Resistance	Rg	_	1.2	_	Ω	$V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz$	
Total Gate Charge (V _{GS} = 10V)	Q_{G}	_	22.4	_			
Total Gate Charge (V _{GS} = 4.5V)	Q_{G}	_	10.4	_	nC	V 20V L 42A	
Gate-Source Charge	Q _{GS}	_	4.9	_	nc	$V_{DS} = 30V, I_D = 4.3A$	
Gate-Drain Charge	Q_{GD}	_	3.0	_			
Turn-On Delay Time	t _{D(ON)}	_	6.6	_		$V_{GS} = 10V$, $V_{DD} = 30V$, $R_G = 6\Omega$, $I_D = 4.3A$	
Turn-On Rise Time	t _R	_	8.1	_			
Turn-Off Delay Time	t _{D(OFF)}	_	20.1	_	ns		
Turn-Off Fall Time	t _F		4.0	_			
Body Diode Reverse Recovery Time	t _{RR}	_	18	_	ns	I _S = 4.3A, dI/dt = 100A/μs	
Body Diode Reverse Recovery Charge	Q_{RR}		11.9		nC	I _S = 4.3A, dl/dt = 100A/μs	

Notes: 6. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.

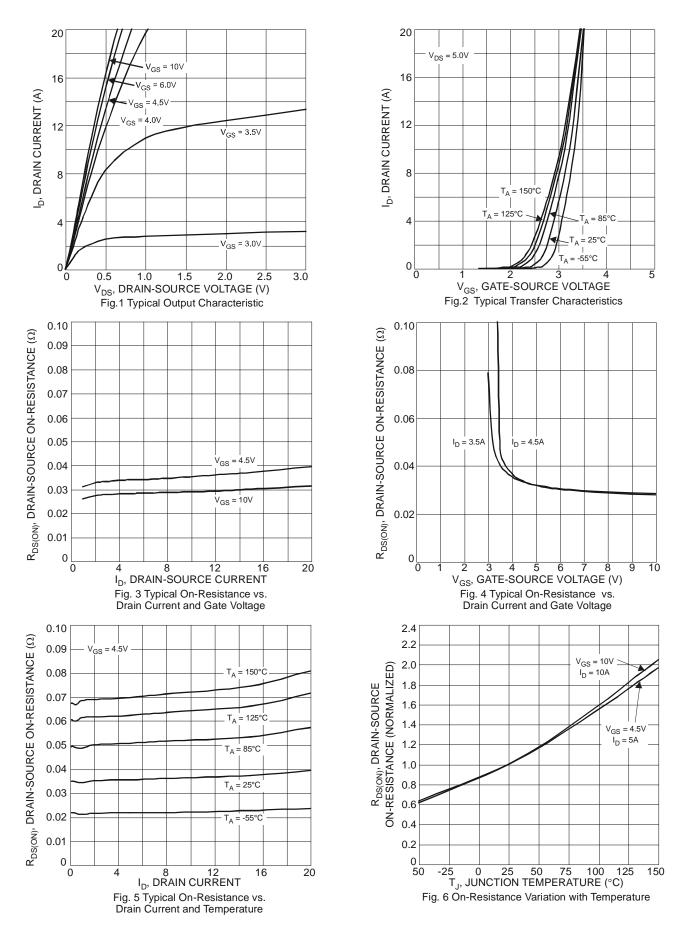
^{7.} Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.

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

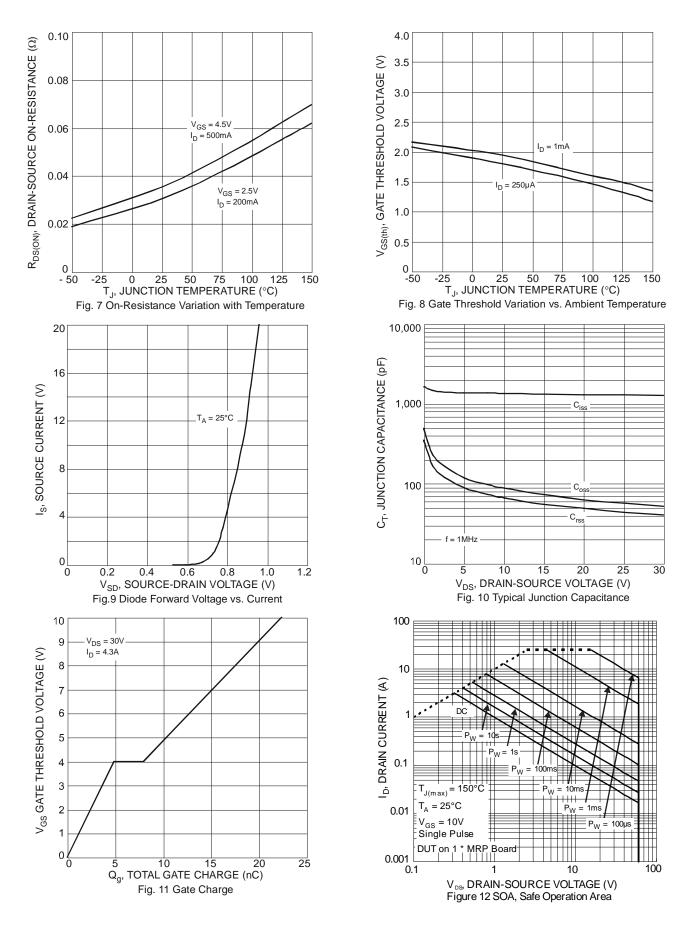
^{9.} Short duration pulse test used to minimize self-heating effect.

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

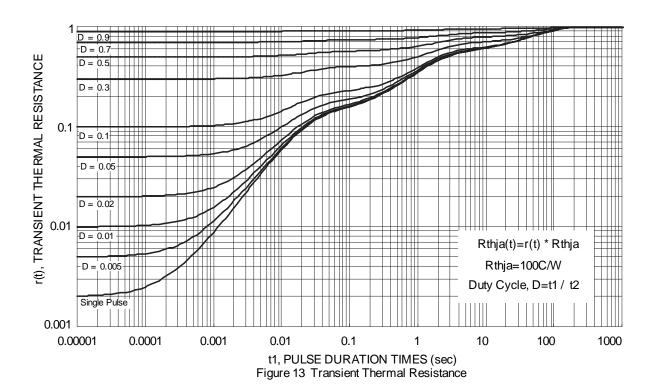










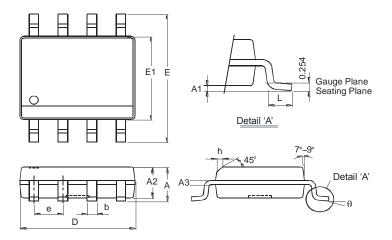




Package Outline Dimensions

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

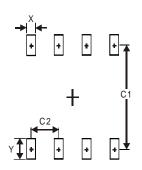
SO-8



SO-8					
Dim	Min	Max			
Α	-	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			
Е	5.90	6.10			
E1	3.85	3.95			
е	1.27 Typ				
h	-	0.35			
L	0.62	0.82			
θ	0°	8°			
All Dimensions in mm					

Suggested Pad Layout

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



SO-8

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



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