



60V N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

V _{(BR)DSS}	R _{DS(on) max}	I _D T _C = +25°C	
60V	40mΩ @ V _{GS} = 10V	20A	
	50mΩ @ V _{GS} = 4.5V	16A	

Description

This new generation MOSFET has been designed to minimize the onstate resistance (RDS(ON)) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

- DC-DC Converters
- **Power Management Functions**
- Backlighting

Features

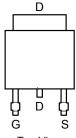
- Low Input Capacitance
- Low On-Resistance
- Fast Switching Speed
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

Mechanical Data

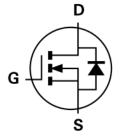
- Case: TO252 (DPAK)
- Case Material: Molded Plastic, "Green" Molding Compound UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish Matte Tin Finish annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 @3)
- Weight: 0.33 grams (approximate)







Top View



Internal Schematic

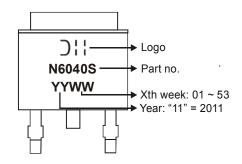
Ordering Information (Note 4)

Part Number	Case	Packaging
DMN6040SK3-13	TO252	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 for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green"
- 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





Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Units
Drain-Source Voltage	V_{DSS}	60	V
Gate-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current (Note 5) V _{GS} = -10V	I _D	20 13	А
Maximum Body Diode Forward Current (Note 5)	Is	4	Α
Pulsed Drain Current (10µs pulse, duty cycle = 1%)	I _{DM}	30	A
Avalanche Current (Note 6)	I _{AR}	14.2	Α
Avalanche Energy (Note 6)	E _{AR}	10	mJ

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

Characteristic	Symbol	Value	Units	
Total Power Dissipation (Note 5)	$T_{C} = +25^{\circ}C$	D	42	W
Total Power Dissipation (Note 5)	T _C = +100°C	P _D	17	
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	44	°C/W	
Thermal Resistance, Junction to Case (Note 5)	$R_{ heta JC}$	3	C/VV	
Operating and Storage Temperature Range	T _{J,} T _{STG}	-55 to +150	°C	

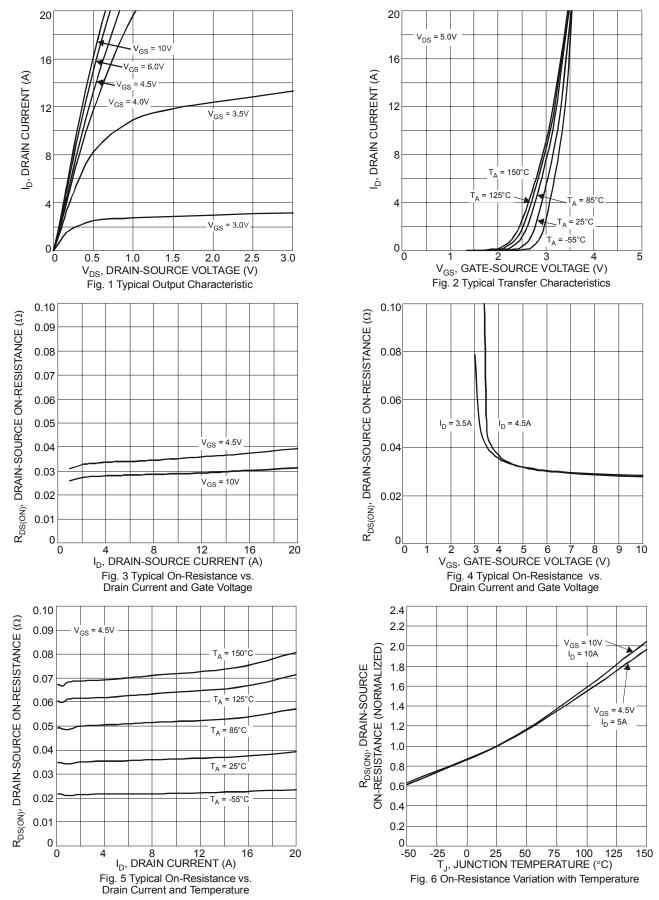
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 7)							
Drain-Source Breakdown Voltage	BV_{DSS}	60	_	_	V	$V_{GS} = 0V, I_D = 250\mu A$	
Zero Gate Voltage Drain Current	I _{DSS}		_	1	μA	V_{DS} = 60V, V_{GS} = 0V	
Gate-Source Leakage	I _{GSS}	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 7)	•						
Gate Threshold Voltage	V _{GS(th)}	1	_	3	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	
Static Drain-Source On-Resistance			30	40	mΩ	V _{GS} = 10V, I _D = 20A	
Static Drain-Source On-Resistance	R _{DS(ON)}		35	50	1115.2	$V_{GS} = 4.5V$, $I_D = 12A$	
Diode Forward Voltage	V_{SD}		0.7	1.2	V	$V_{GS} = 0V, I_{S} = 1A$	
DYNAMIC CHARACTERISTICS (Note 8)					-		
Input Capacitance	C _{iss}		1287	_		V _{DS} = 25V, V _{GS} = 0V f = 1.0MHz	
Output Capacitance	Coss		57	_	pF		
Reverse Transfer Capacitance	C _{rss}		44	_			
Gate Resistance	R_{G}	_	1.2	_	Ω	$V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz$	
Total Gate Charge (V _{GS} = 10V)	Qg		22.4	_			
Total Gate Charge (V _{GS} = 4.5V)	Qg		10.4	_	nC	V _{DS} = 30V, I _D = 4.3A	
Gate-Source Charge	Qgs		4.9	_	110		
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 Ω , 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	Qrr	_	11.9	_	nC	I _S = 4.3A, dI/dt = 100A/µs	

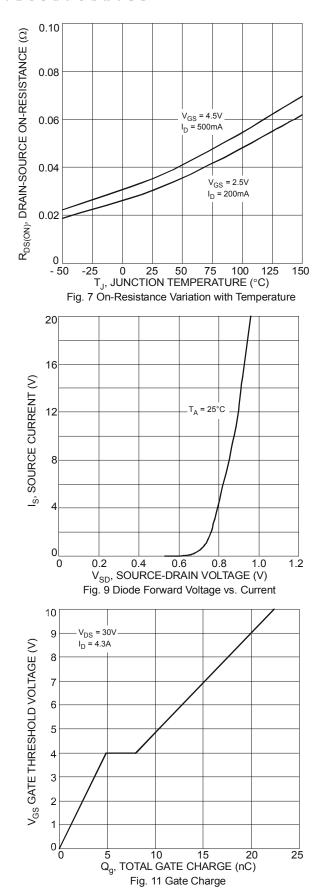
Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout.

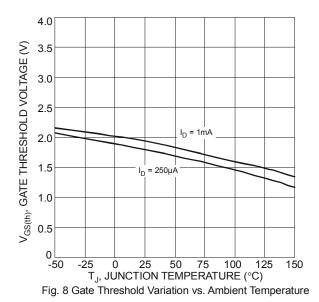
- 6. UIS in production with L = 0.1mH, T_J = +25°C. 7. Short duration pulse test used to minimize self-heating effect.
- 8. Guaranteed by design. Not subject to product testing.

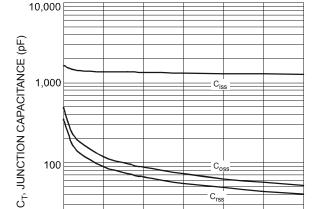












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V_{DS}, DRAIN-SOURCE VOLTAGE (V)

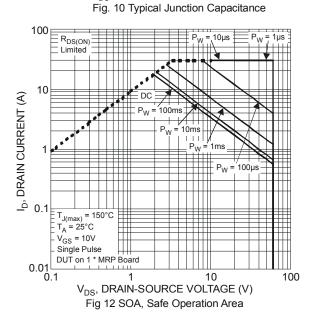
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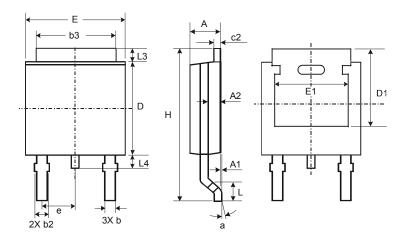
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Package Outline Dimensions

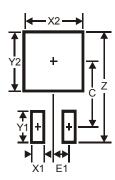
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



TO252					
Dim	Min	Max	Тур		
Α	2.19	2.39	2.29		
A1	0.00	0.13	0.08		
A2	0.97	1.17	1.07		
b	0.64	0.88	0.783		
b2	0.76	1.14	0.95		
b3	5.21	5.46	5.33		
c2	0.45	0.58	0.531		
D	6.00	6.20	6.10		
D1	5.21	_	_		
е	_	_	2.286		
Е	6.45	6.70	6.58		
E1	4.32	_	-		
Н	9.40	10.41	9.91		
L	1.40	1.78	1.59		
L3	0.88	1.27	1.08		
L4	0.64	1.02	0.83		
а	0°	10°	_		
All Dimensions in mm					

Suggested Pad Layout

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



Dimensions	Value (in mm)
Z	11.6
X1	1.5
X2	7.0
Y1	2.5
Y2	7.0
С	6.9
E1	2.3



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