



N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

V _{(BR)DSS}	R _{DS(ON)}	I _D T _C = +25°C
30V	$9.5 \text{m}\Omega$ @ $V_{GS} = 10V$	43A
307	11.5m Ω @ V _{GS} = 4.5V	39A

Description

This new generation 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

- Backlighting
- DC-DC Converters
- Power Management Functions

Features

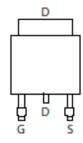
- Low R_{DS(ON)} ensures on state losses are minimized
- Small form factor thermally efficient package enables higher density end products
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

Mechanical Data

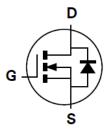
- Case: TO252-3L
- Case Material: Molded Plastic, "Green" Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Weight: 0.33 grams (approximate)







Pin Out Top View



Equivalent Circuit

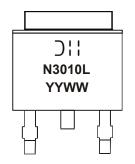
Ordering Information (Note 4)

Ī	Part Number	Case	Packaging
	DMN3010LK3-13	TO252	2500/Tape & Reel

Notes:

- 1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
- 2. 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. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



Old = Manufacturer's Marking
N3010L = Product Type Marking Code
YYWW = Date Code Marking
YY = Last Digit of Year (ex: 13 = 2013)
WW = Week Code (01 to 53)



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

Characteris	Symbol	Value	Unit		
Drain-Source Voltage	V _{DSS}	30	V		
Gate-Source Voltage	V_{GSS}	±20	V		
Continuous Drain Compant (Nata C) V - 40V	Steady State	T _C = +25°C T _C = +70°C	I _D	43 34	А
Continuous Drain Current (Note 6) V _{GS} = 10V	Steady State	T _A = +25°C T _A = +70°C	I _D	13.1 10.5	А
Pulsed Drain Current (10µs pulse, duty cycle = 1%	I _{DM}	90	Α		
Avalanche Current (Notes 7) L = 0.1mH	I _{AR}	28	Α		
Avalanche Energy (Notes 7) L = 0.1mH	E _{AR}	40	mJ		

Thermal Characteristics

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)		P _D	1.6	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	R _{θJA}	78	°C/W
Thermal Resistance, Junction to Ambient (Note 5)	t<10s		31	°C/W
Total Power Dissipation (Note 6)		P_{D}	2.4	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	D	51	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	t<10s	$R_{\theta JA}$	21	°C/W
Thermal Resistance, Junction to Case (Note 6)		$R_{ heta JC}$	4.7	°C/W
Operating and Storage Temperature Range		T _{J,} T _{STG}	-55 to +150	°C

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

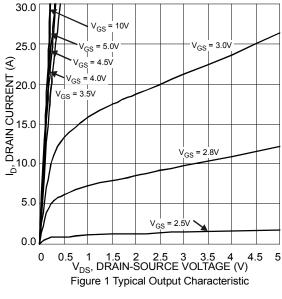
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 8)							
Drain-Source Breakdown Voltage	BV _{DSS}	30	_		V	$V_{GS} = 0V, I_D = 250\mu A$	
Zero Gate Voltage Drain Current	I _{DSS}	_		1	μΑ	V _{DS} = 30V, V _{GS} = 0V	
Gate-Source Leakage	I _{GSS}	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 8)							
Gate Threshold Voltage	$V_{GS(th)}$	1.0	_	2.5	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	
Static Drain-Source On-Resistance		_	8	9.5	mΩ	$V_{GS} = 10V, I_D = 18A$	
Static Drain-Source On-Resistance	R _{DS(ON)}	_	10	11.5	11122	$V_{GS} = 4.5V, I_D = 16A$	
Diode Forward Voltage	V_{SD}	_	0.75	1.0	V	$V_{GS} = 0V, I_{S} = 1A$	
DYNAMIC CHARACTERISTICS (Note 9)							
Input Capacitance	C _{iss}	_	2075			V _{DS} = 15V, V _{GS} = 0V, f = 1.0MHz	
Output Capacitance	Coss	_	190		pF		
Reverse Transfer Capacitance	C _{rss}	_	138	_		I = 1.0IVIH2	
Gate resistance	R_{g}	_	2.4	_	Ω	$V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz$	
Total Gate Charge (V _{GS} = 4.5V)	Qg	_	16.1	_			
Total Gate Charge (V _{GS} = 10V)	Q_g	_	37	_	nC	V - 45V L - 40A	
Gate-Source Charge	Q _{qs}	_	6.1	_	IIC	$V_{DS} = 15V, I_{D} = 18A$	
Gate-Drain Charge	Q_{gd}	_	5.9	_			
Turn-On Delay Time	t _{D(on)}	_	4.5	_			
Turn-On Rise Time	tr	_	19.6	_		$V_{DS} = 15V, V_{GS} = 10V,$ $R_{L} = 0.83\Omega, R_{GEN} = 3\Omega,$	
Turn-Off Delay Time	t _{D(off)}	_	31	_	ns		
Turn-Off Fall Time	t _f	_	10.7	_			
Reverse Recovery Time	t _{rr}	_	13.7		ns	1 -45A di/dt-500A/	
Reverse Recovery Charge	Q _{rr}	_	18.3	_	nC	I _F =15A, di/dt=500A/μs	

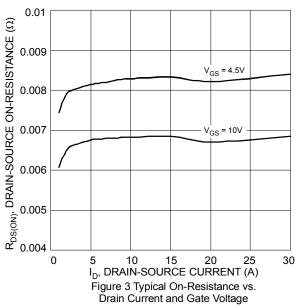
5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

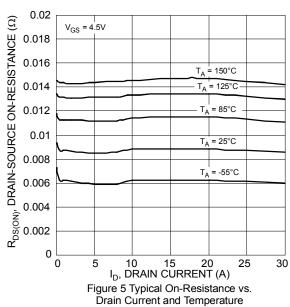
6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

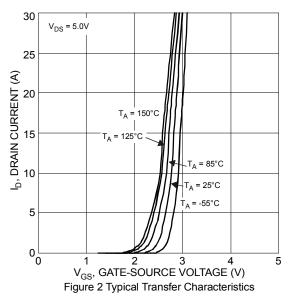
I_{AS} and E_{AS} rating are based on low frequency and duty cycles to keep T_J = +25°C
 Short duration pulse test used to minimize self-heating effect.
 Guaranteed by design. Not subject to product testing.

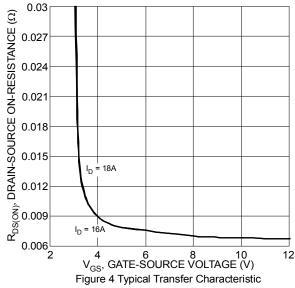












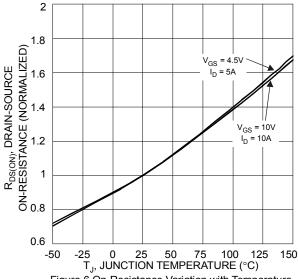
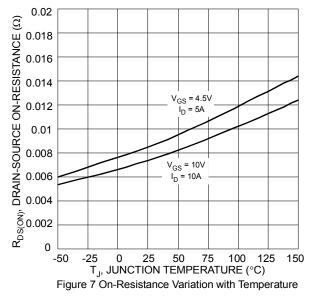
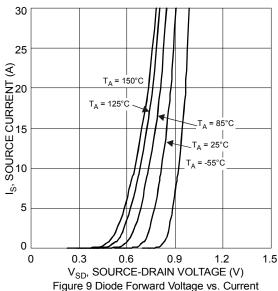
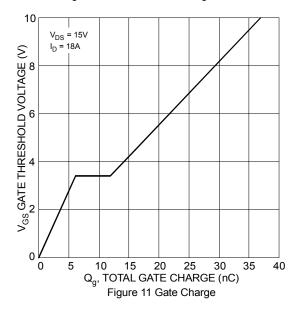


Figure 6 On-Resistance Variation with Temperature









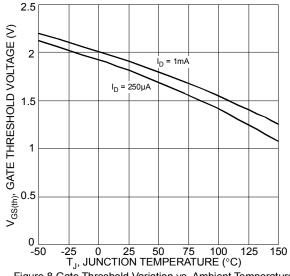
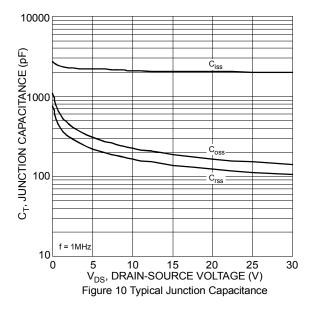
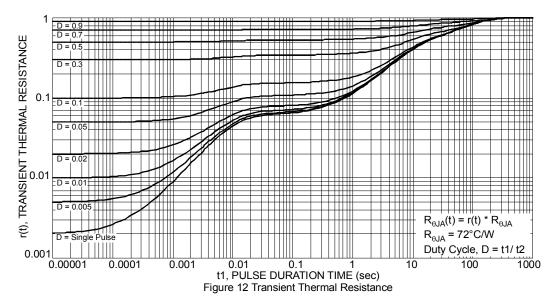


Figure 8 Gate Threshold Variation vs. Ambient Temperature

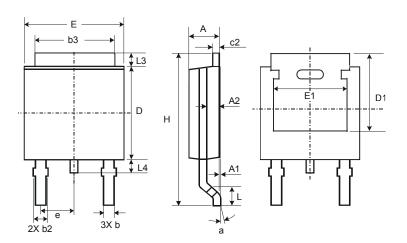






Package Outline Dimensions

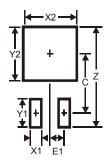
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



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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