

**30V DUAL N-CHANNEL ENHANCEMENT MODE MOSFET**
**Product Summary**

$V_{(BR)DSS}$	$R_{DS(on)}$	$I_D$ $T_A = 25^\circ C$
30V	24m $\Omega$ @ $V_{GS} = 10V$	7.2A
	36m $\Omega$ @ $V_{GS} = 4.5V$	5.8A

**Description and Applications**

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.

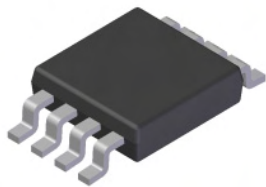
- Motor control
- Backlighting
- DC-DC Converters
- Power management functions

**Features and Benefits**

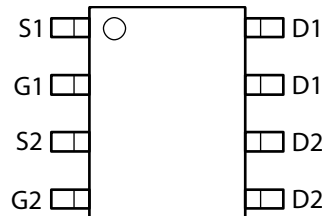
- Low on-resistance
- Fast switching speed
- "Green" component and RoHS compliant (Note 1)

**Mechanical Data**

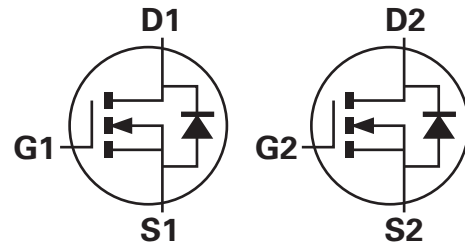
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0 (Note 1)
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals Connections: See Diagram
- Terminals: Finish - Matte Tin annealed over Copper lead frame. Solderable per MIL-STD-202, Method 208
- Weight: 0.074 grams (approximate)



TOP VIEW

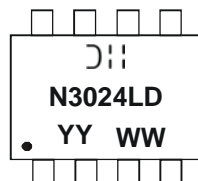


Top view


**Ordering Information** (Note 1)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DMN3024LSD-13	N3024LD	13	12	2,500

Note: 1. Diodes, Inc. defines "Green" products as those which are Eu RoHS compliant and contain no halogens or antimony compounds; further information about Diodes Inc.'s "Green" Policy can be found on our website. For packaging details, go to our website.

**Marking Information**


N3024LD = Product Type Marking Code  
 ⌋⌋ = Manufacturer's Marking  
 YYWW = Date Code Marking  
 YY = Year (ex: 09 = 2009)  
 WW = Week (01-52)

## Maximum Ratings @T<sub>A</sub> = 25°C unless otherwise specified

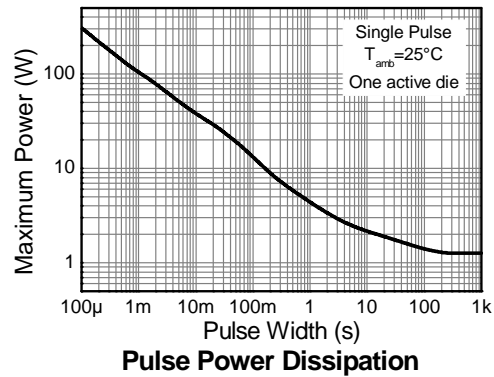
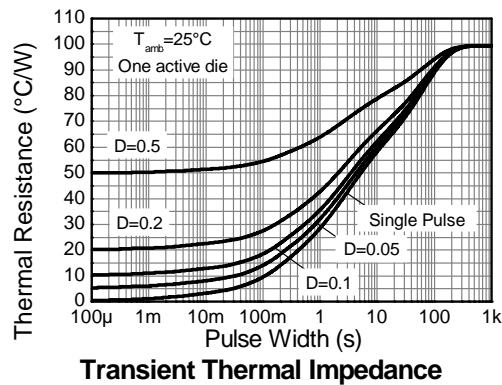
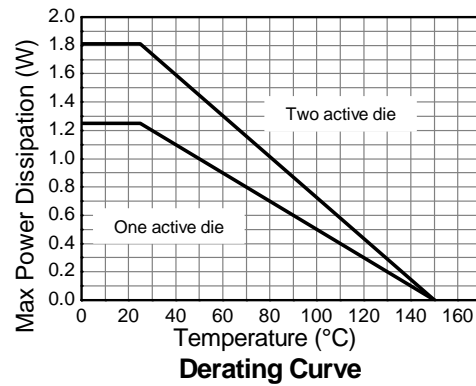
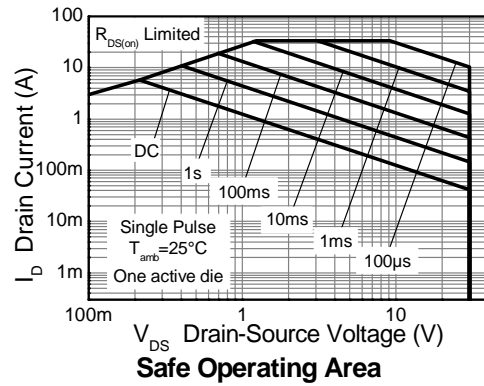
Characteristic			Symbol	Value	Unit
Drain-Source voltage			V <sub>DSS</sub>	30	V
Gate-Source voltage			V <sub>GS</sub>	±20	V
Continuous Drain current	V <sub>GS</sub> = 10V	(Notes 3 & 5)	I <sub>D</sub>	7.2	A
		T <sub>A</sub> = 70°C (Notes 3 & 5)		5.8	
		(Notes 2 & 5)		5.7	
		(Notes 2 & 6)		6.8	
Pulsed Drain current	V <sub>GS</sub> = 10V	(Notes 4 & 5)	I <sub>DM</sub>	34	A
Continuous Source current (Body diode)			I <sub>S</sub>	3.3	A
Pulsed Source current (Body diode)			I <sub>SM</sub>	34	A

## Thermal Characteristics @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic		Symbol	Value	Unit
Power dissipation Linear derating factor	(Notes 2 & 5)	P <sub>D</sub>	1.3	W mW/°C
	(Notes 2 & 6)		10.0	
	(Notes 2 & 6)		1.8	
	(Notes 3 & 5)		14.3	
Thermal Resistance, Junction to Ambient	(Notes 2 & 5)	R <sub>θJA</sub>	2.0	°C/W
	(Notes 2 & 6)		15.9	
	(Notes 3 & 5)		100	
	(Notes 2 & 6)		70	
Thermal Resistance, Junction to Lead	(Notes 3 & 5)	R <sub>θJL</sub>	63	°C/W
	(Notes 5 & 7)		53	
Operating and storage temperature range		T <sub>J</sub> , T <sub>STG</sub>	-55 to 150	°C

- Notes:
- For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
  - Same as note (2), except the device is measured at t ≤ 10 sec.
  - Same as note (2), except the device is pulsed with D= 0.02 and pulse width 300 μs. The pulse current is limited by the maximum junction temperature.
  - For a dual device with one active die.
  - For a device with two active die running at equal power.
  - Thermal resistance from junction to solder-point (at the end of the drain lead): the device is operating in a steady-state condition.

## Thermal Characteristics

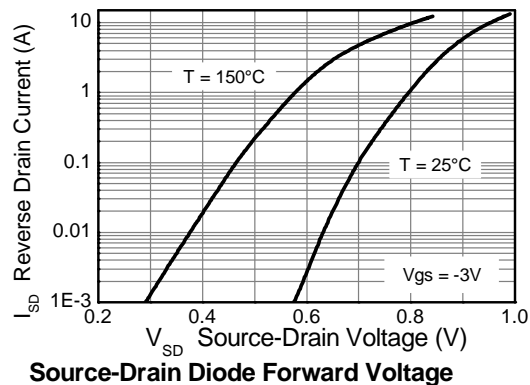
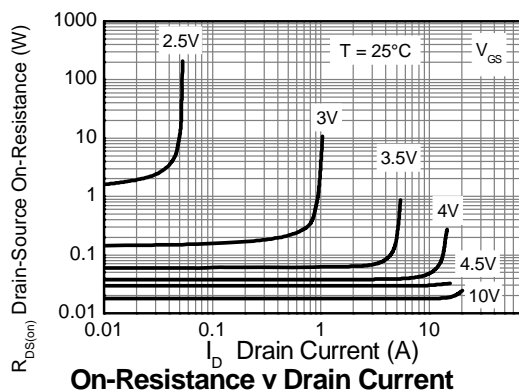
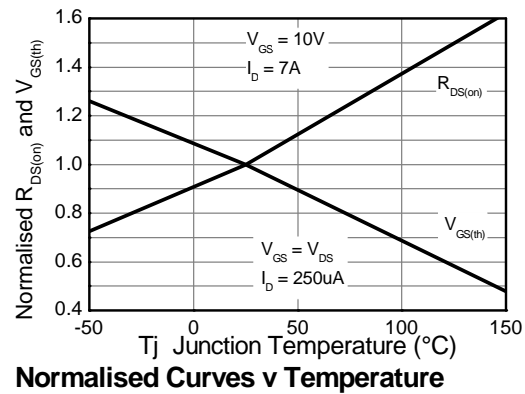
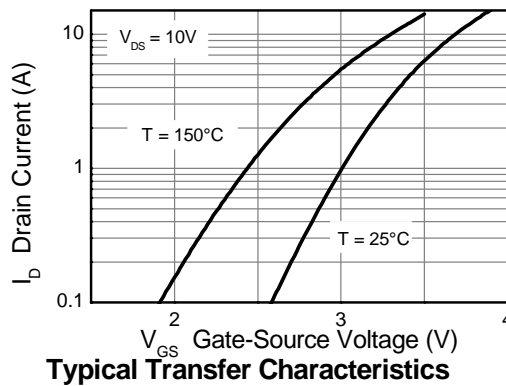
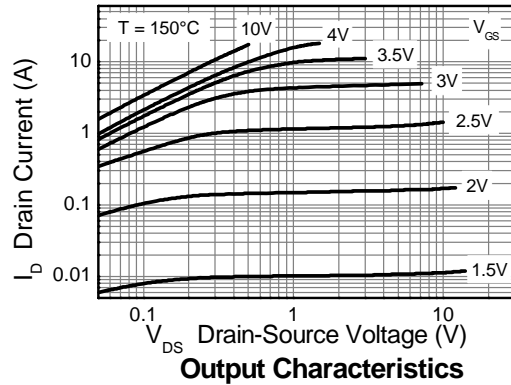
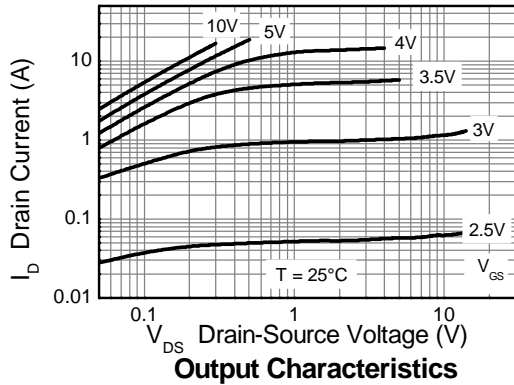


# Electrical Characteristics @T<sub>A</sub> = 25°C unless otherwise specified

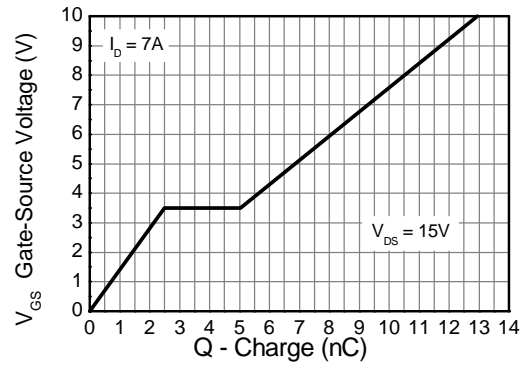
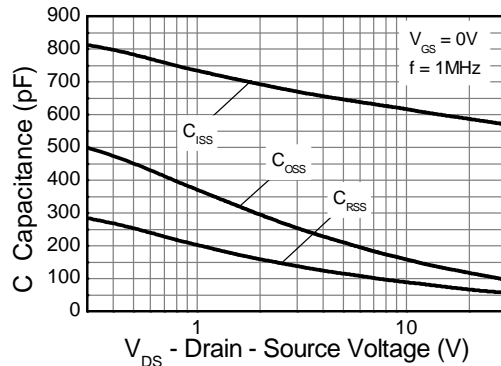
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	30	—	—	V	I <sub>D</sub> = 250μA, V <sub>GS</sub> = 0V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	0.5	μA	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	V <sub>GS(th)</sub>	1.0	—	3.0	V	I <sub>D</sub> = 250μA, V <sub>DS</sub> = V <sub>GS</sub>
Static Drain-Source On-Resistance (Note 8)	R <sub>DS (ON)</sub>	—	—	0.024	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 7.0A
				0.036		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 6.0A
Forward Transconductance (Notes 8 & 9)	g <sub>fs</sub>	—	16.5	—	S	V <sub>DS</sub> = 15V, I <sub>D</sub> = 7.1A
Diode Forward Voltage (Note 8)	V <sub>SD</sub>	—	0.82	1.2	V	I <sub>S</sub> = 1.7A, V <sub>GS</sub> = 0V
Reverse recovery time (Note 9)	t <sub>rr</sub>		12	—	ns	I <sub>S</sub> = 2.2A, di/dt= 100A/μs
Reverse recovery charge (Note 9)	Q <sub>rr</sub>	—	4.8	—	nC	
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C <sub>iss</sub>	—	608	—	pF	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V f= 1MHz
Output Capacitance	C <sub>oss</sub>	—	132	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	71	—	pF	
Total Gate Charge	Q <sub>g</sub>	—	6.3	—	nC	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 4.5V I <sub>D</sub> = 7A
Total Gate Charge	Q <sub>g</sub>	—	12.9	—	nC	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 10V I <sub>D</sub> = 7A
Gate-Source Charge	Q <sub>gs</sub>	—	2.5	—	nC	
Gate-Drain Charge	Q <sub>gd</sub>	—	2.5	—	nC	
Turn-On Delay Time (Note 10)	t <sub>D(on)</sub>	—	2.9	—	ns	V <sub>DD</sub> = 15V, V <sub>GS</sub> = 10V I <sub>D</sub> = 1A, R <sub>G</sub> ≐ 6.0Ω
Turn-On Rise Time (Note 10)	t <sub>r</sub>	—	3.3	—	ns	
Turn-Off Delay Time (Note 10)	t <sub>D(off)</sub>	—	16	—	ns	
Turn-Off Fall Time (Note 10)	t <sub>f</sub>	—	8	—	ns	

Notes: 8. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%  
9. For design aid only, not subject to production testing.  
10. Switching characteristics are independent of operating junction temperatures.

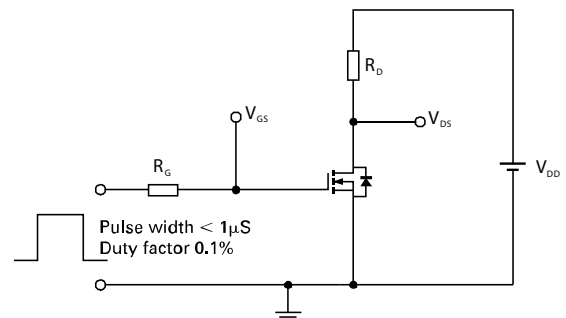
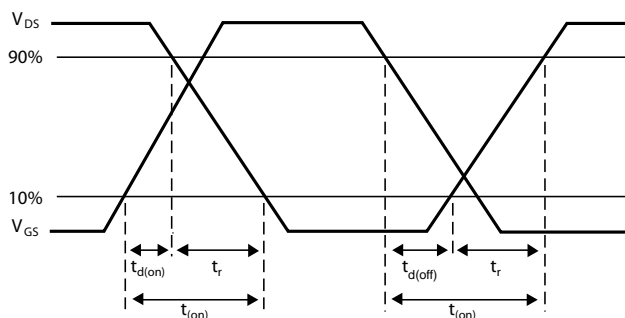
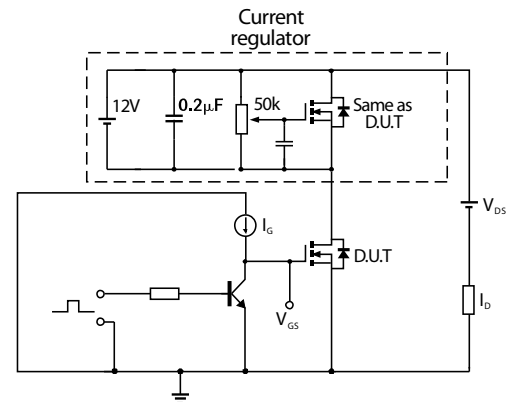
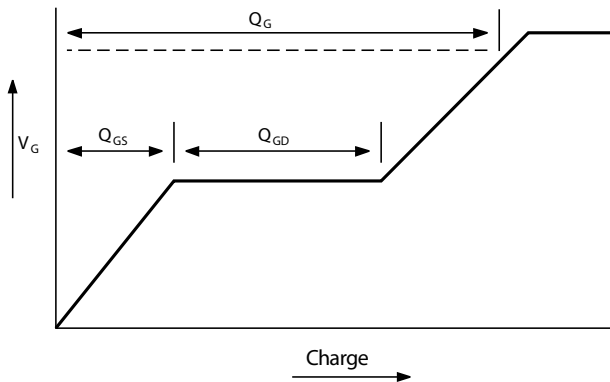
## Typical Characteristics



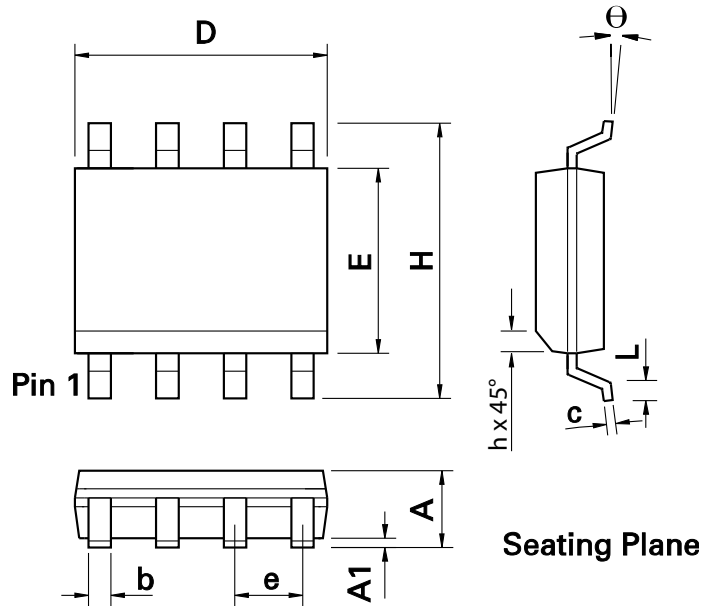
## Typical Characteristics - continued



## Test Circuits

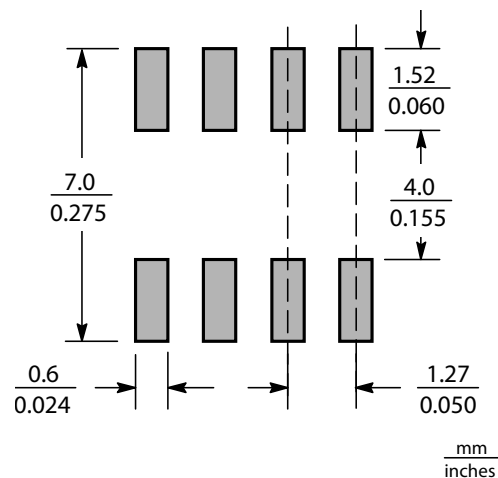


## Package Outline Dimensions



DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.053	0.069	1.35	1.75	e	0.050 BSC		1.27 BSC	
A1	0.004	0.010	0.10	0.25	b	0.013	0.020	0.33	0.51
D	0.189	0.197	4.80	5.00	c	0.008	0.010	0.19	0.25
H	0.228	0.244	5.80	6.20	θ	0°	8°	0°	8°
E	0.150	0.157	3.80	4.00	h	0.010	0.020	0.25	0.50
L	0.016	0.050	0.40	1.27	-	-	-	-	-

## Suggested Pad Layout



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