DMN3024LSS

30V N-CHANNEL ENHANCEMENT MODE MOSFET

Please click here to visit our online spice models database.

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$	I_D T_A = 25°C
30V	24mΩ @ V_{GS}= 10V	8.5A
	36mΩ @ V_{GS}= 4.5V	6.9A

Features and Benefits

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

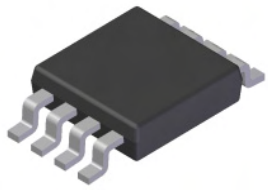
Description and Applications

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.

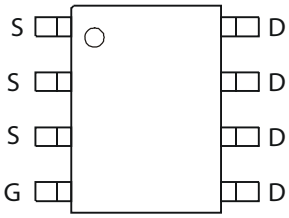
- Motor control
- Backlighting
- DC-DC Converters
- Power management functions

Mechanical Data

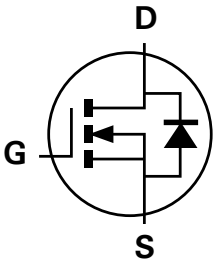
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0 (Note 1)
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals Connections: See Diagram
- Terminals: Finish - Matte Tin annealed over Copper lead frame. Solderable per MIL-STD-202,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



TOP VIEW



TOP VIEW



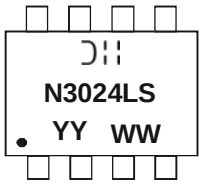
Equivalent Circuit

Ordering Information (Note 1)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DMN3024LSS-13	N3024LS	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



N3024LS = Product Type Marking Code
YY WW = Date Code Marking
YY = Year (ex: 09 = 2009)
WW = Week (01-52)

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Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic			Symbol	Value	Unit
Drain-Source voltage			V_{DSS}	30	V
Gate-Source voltage			V_{GS}	±20	V
Continuous Drain current	V_{GS} = 10V	(Note 3)	I_D	8.5	A
		T_A = 70°C (Note 3)		6.8	
		(Note 2)		6.4	
Pulsed Drain current	V_{GS}= 10V	(Note 4)	I_{DM}	36	A
Continuous Source current (Body diode)		(Note 3)	I_S	4.5	A
Pulsed Source current (Body diode)		(Note 4)	I_{SM}	36	A

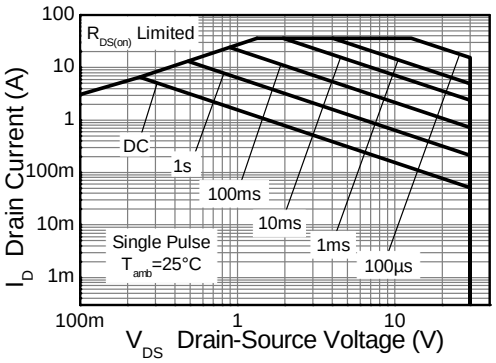
Thermal Characteristics @T_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Unit
Power dissipation	(Note 2)	P_D	1.6	W
Linear derating factor			12.5	mW/°C
	(Note 3)		2.8	W
			22.2	mW/°C
Thermal Resistance, Junction to Ambient	(Note 2)	$R_{\theta JA}$	80	°C/W
	(Note 3)		45	
Thermal Resistance, Junction to Lead	(Note 5)	$R_{\theta JL}$	35	°C/W
Operating and storage temperature range		T_J, T_{STG}	-55 to 150	°C

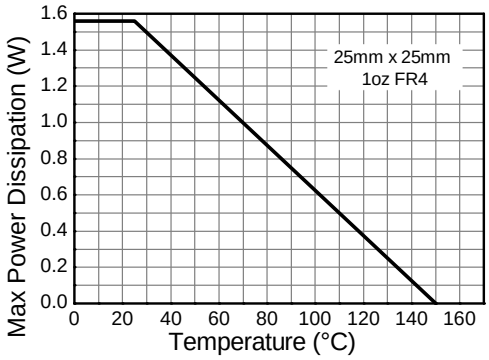
Notes:
2. For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
3. Same as note (2), except the device is measured at t ≤ 10 sec.
4. Same as note (2), except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

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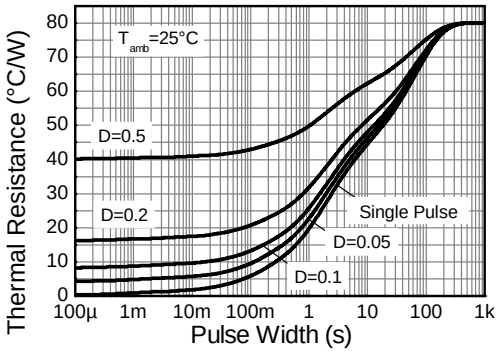
Thermal Characteristics



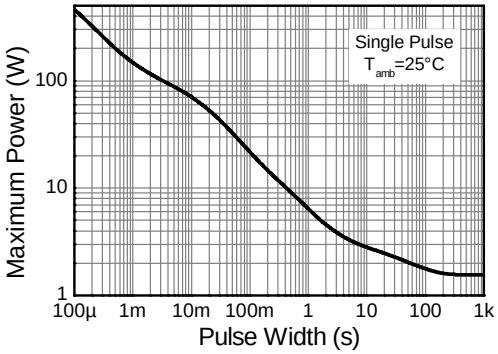
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

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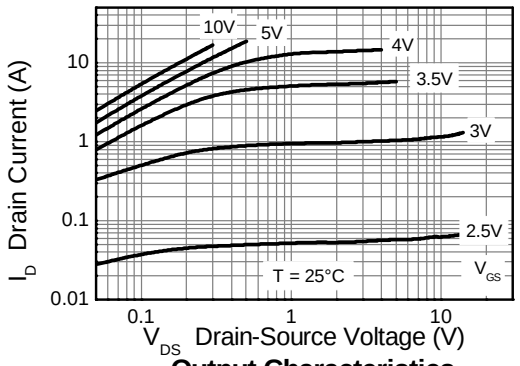
Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	30	—	—	V	I_D = 250μA, V_{GS}= 0V
Zero Gate Voltage Drain Current	I_{DSS}	—	—	0.5	μA	V_{DS}= 30V, V_{GS}= 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS}= ±20V, V_{DS}= 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(th)}$	1.0	—	3.0	V	I_D= 250μA, V_{DS}= V_{GS}
Static Drain-Source On-Resistance (Note 6)	$R_{DS\ (ON)}$	—	—	0.024	Ω	V_{GS}= 10V, I_D= 7.0A
				0.036		V_{GS}= 4.5V, I_D= 6.0A
Forward Transconductance (Notes 6 & 7)	g_{fs}	—	16.5	—	S	V_{DS}= 15V, I_D= 7.1A
Diode Forward Voltage (Note 6)	V_{SD}	—	0.82	1.2	V	I_S= 1.7A, V_{GS}= 0V
Reverse recovery time (Note 7)	t_{rr}		12	—	ns	I_S= 2.2A, di/dt= 100A/μs
Reverse recovery charge (Note 7)	Q_{rr}	—	4.8	—	nC	
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C_{iss}	—	608	—	pF	V_{DS}= 15V, V_{GS}= 0V f= 1MHz
Output Capacitance	C_{oss}	—	132	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	71	—	pF	
Total Gate Charge	Q_g	—	6.3	—	nC	V_{DS}= 15V, V_{GS}= 4.5V I_D= 7A
Total Gate Charge	Q_g	—	12.9	—	nC	V_{DS}= 15V, V_{GS}= 10V I_D= 7A
Gate-Source Charge	Q_{gs}	—	2.5	—	nC	
Gate-Drain Charge	Q_{gd}	—	2.5	—	nC	
Turn-On Delay Time (Note 8)	$t_{D(on)}$	—	2.9	—	ns	V_{DD}= 15V, V_{GS}= 10V I_D= 1A, $R_G \cong$ 6.0Ω
Turn-On Rise Time (Note 8)	t_r	—	3.3	—	ns	
Turn-Off Delay Time (Note 8)	$t_{D(off)}$	—	16	—	ns	
Turn-Off Fall Time (Note 8)	t_f	—	8	—	ns	

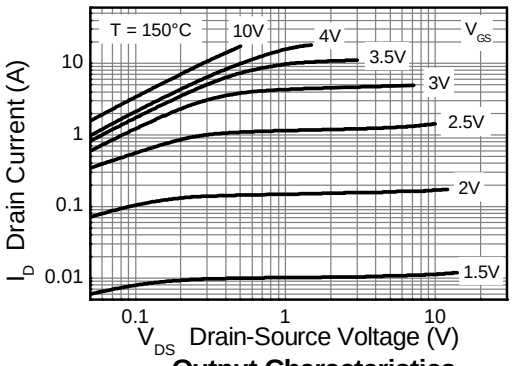
Notes:
6. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%
7. For design aid only, not subject to production testing.
8. Switching characteristics are independent of operating junction temperatures.

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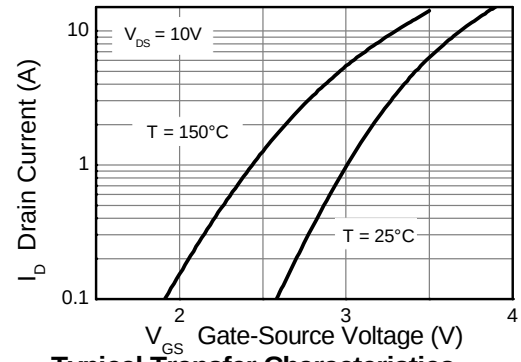
Typical Characteristics



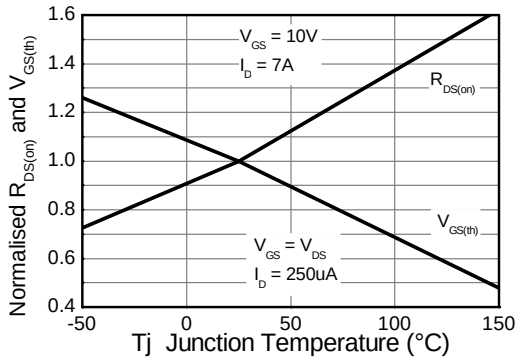
Output Characteristics



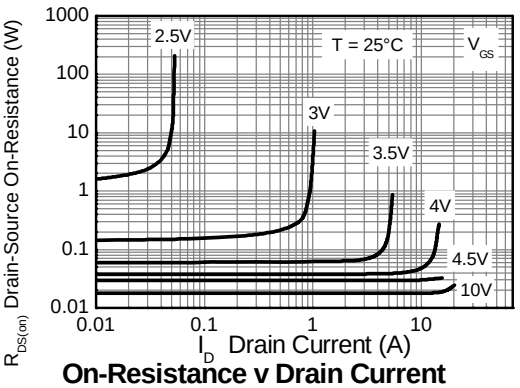
Output Characteristics



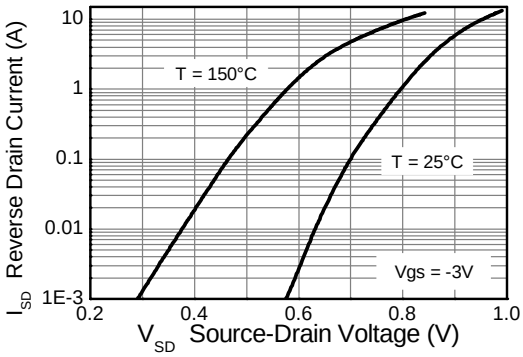
Typical Transfer Characteristics



Normalised Curves v Temperature



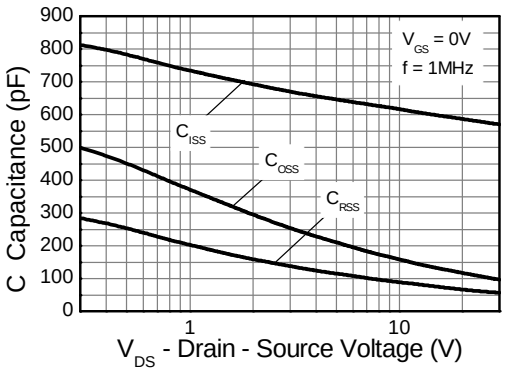
On-Resistance v Drain Current



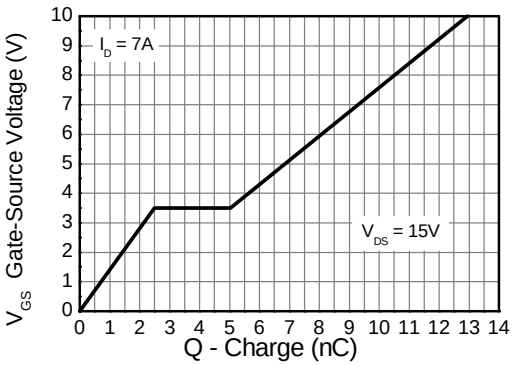
Source-Drain Diode Forward Voltage

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Typical Characteristics - continued

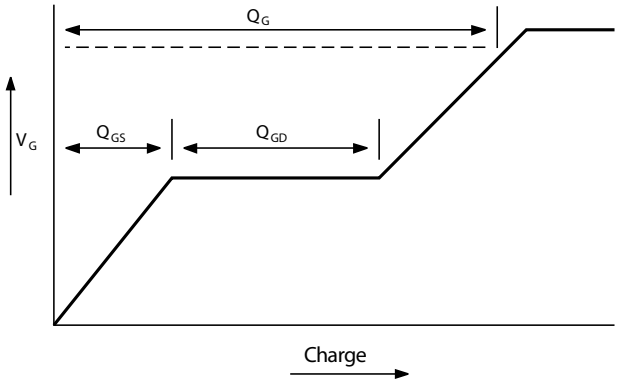


Capacitance v Drain-Source Voltage

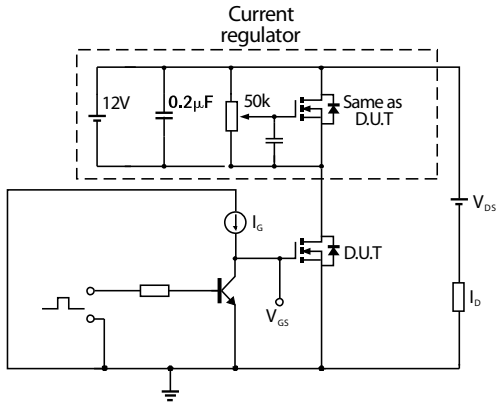


Gate-Source Voltage v Gate Charge

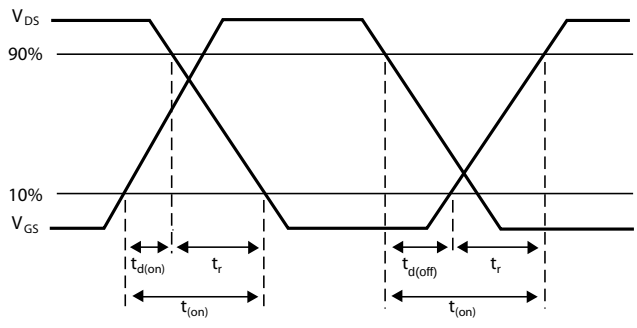
Test Circuits



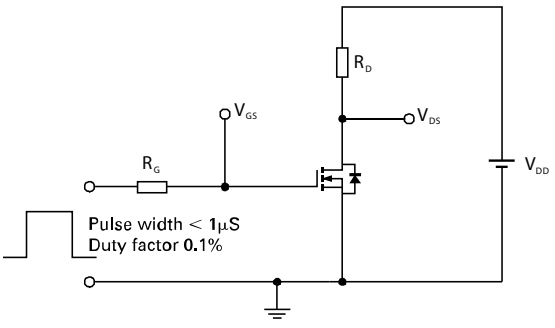
Basic gate charge waveform



Gate charge test circuit



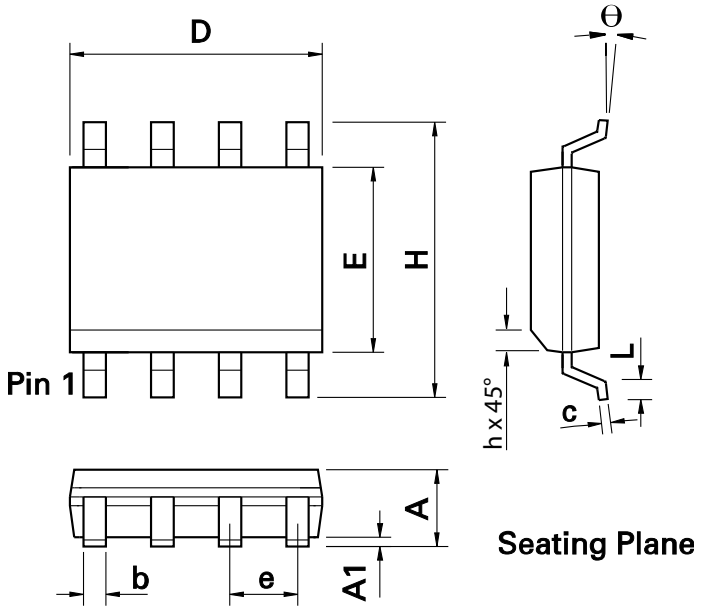
Switching time waveforms



Switching time test circuit

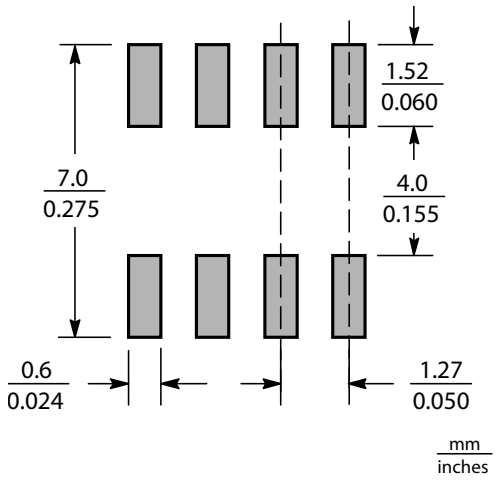
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Package Outline Dimensions



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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