

Product Summary

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

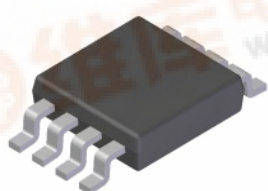
- Motor control
- Backlighting
- DC-DC Converters
- Power management functions

Features and Benefits

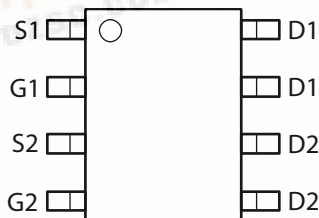
- Low on-resistance
- Fast switching speed
- "Green" component and RoHS compliant (Note 1)

Mechanical Data

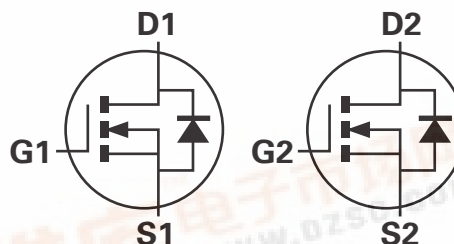
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0 (Note 1)
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals Connections: See Diagram
- Terminals: Finish - Matte Tin annealed over Copper lead frame. Solderable per MIL-STD-202,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



TOP VIEW



Top view

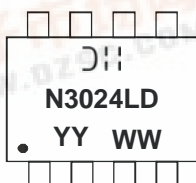


Ordering Information (Note 1)

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
 3024 = Manufacturer's Marking
 YYWW = Date Code Marking
 YY = Year (ex: 09 = 2009)
 WW = Week (01-52)

Maximum Ratings @T_A = 25°C unless otherwise specified

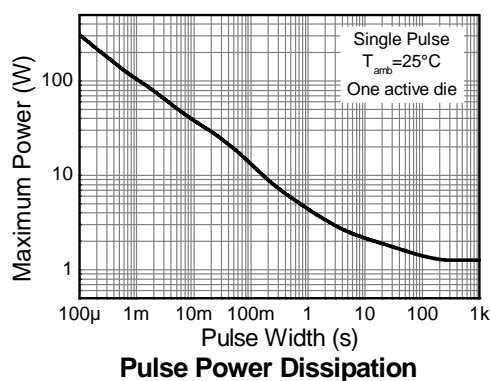
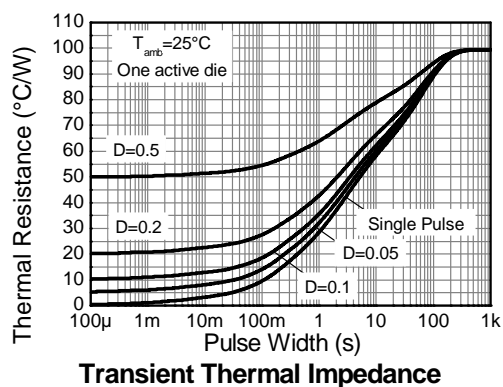
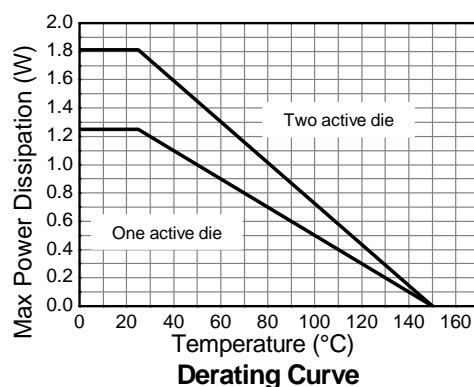
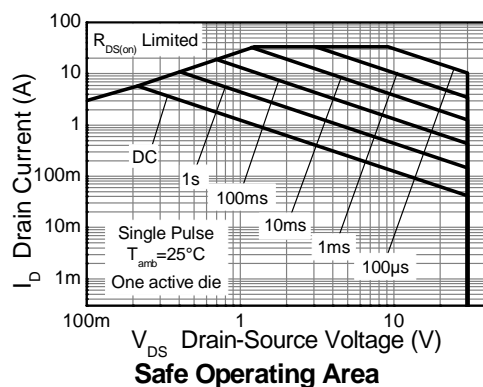
Characteristic			Symbol	Value	Unit
Drain-Source voltage			V _{DSS}	30	V
Gate-Source voltage			V _{GS}	±20	V
Continuous Drain current	V _{GS} = 10V	(Notes 3 & 5)	I _D	7.2	A
		T _A = 70°C (Notes 3 & 5)		5.8	
		(Notes 2 & 5)		5.7	
		(Notes 2 & 6)		6.8	
Pulsed Drain current	V _{GS} = 10V	(Notes 4 & 5)	I _{DM}	34	A
Continuous Source current (Body diode)			I _S	3.3	A
Pulsed Source current (Body diode)			I _{SM}	34	A

Thermal Characteristics @T_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Unit
Power dissipation Linear derating factor	(Notes 2 & 5)	P _D	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 _{θJA}	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 _{θJL}	63	°C/W
	(Notes 5 & 7)		53	
Operating and storage temperature range		T _J , T _{STG}	-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

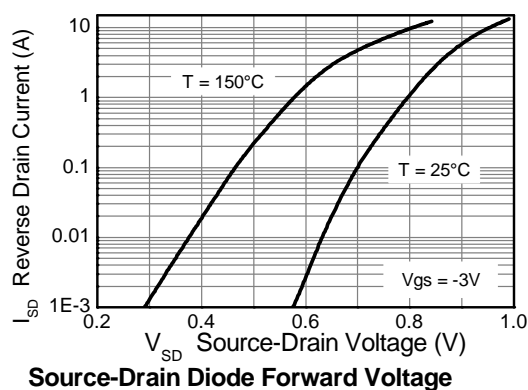
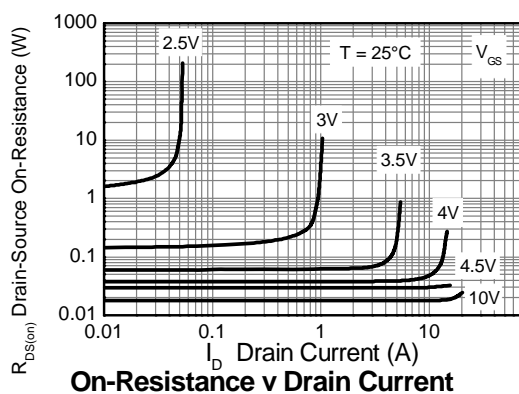
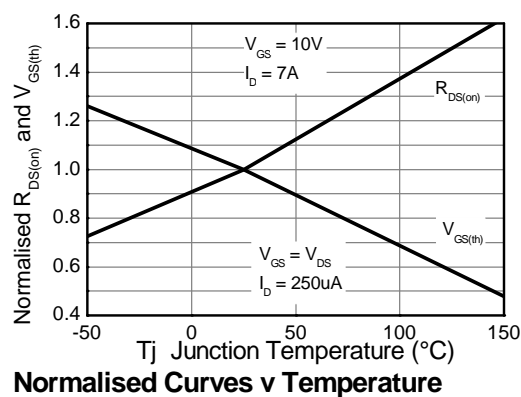
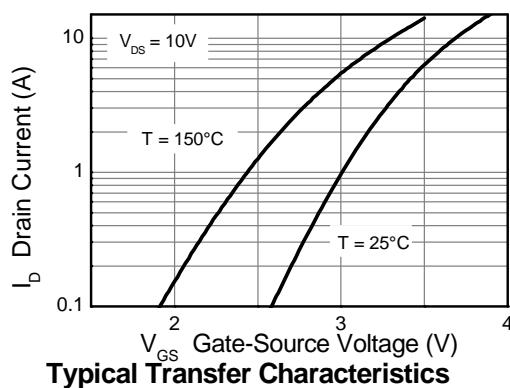
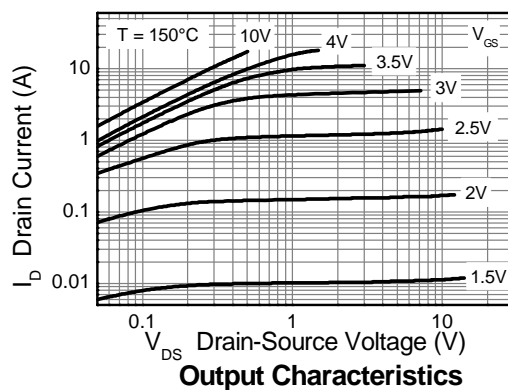
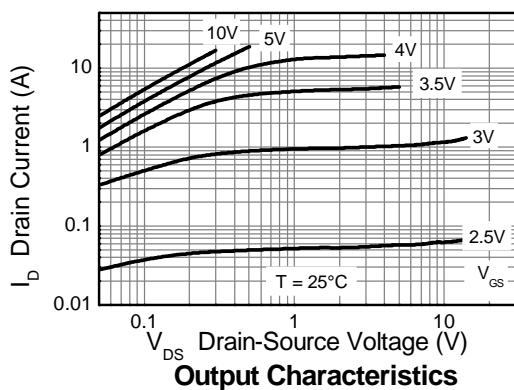


Electrical Characteristics @T_A = 25°C unless otherwise specified

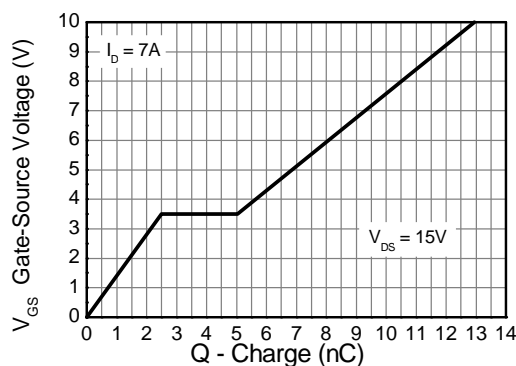
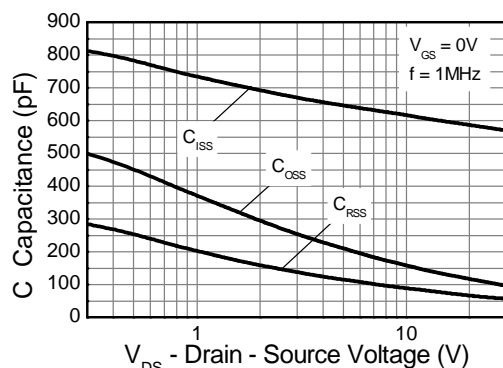
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	30	—	—	V	I _D = 250μA, V _{GS} = 0V
Zero Gate Voltage Drain Current	I _{DSS}	—	—	0.5	μA	V _{DS} = 30V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 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 8)	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 8 & 9)	g _{fs}	—	16.5	—	S	V _{DS} = 15V, I _D = 7.1A
Diode Forward Voltage (Note 8)	V _{SD}	—	0.82	1.2	V	I _S = 1.7A, V _{GS} = 0V
Reverse recovery time (Note 9)	t _{rr}		12	—	ns	I _S = 2.2A, di/dt= 100A/μs
Reverse recovery charge (Note 9)	Q _{rr}	—	4.8	—	nC	
DYNAMIC CHARACTERISTICS (Note 9)						
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 10)	t _{D(on)}	—	2.9	—	ns	V _{DD} = 15V, V _{GS} = 10V I _D = 1A, R _G ≐ 6.0Ω
Turn-On Rise Time (Note 10)	t _r	—	3.3	—	ns	
Turn-Off Delay Time (Note 10)	t _{D(off)}	—	16	—	ns	
Turn-Off Fall Time (Note 10)	t _f	—	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.

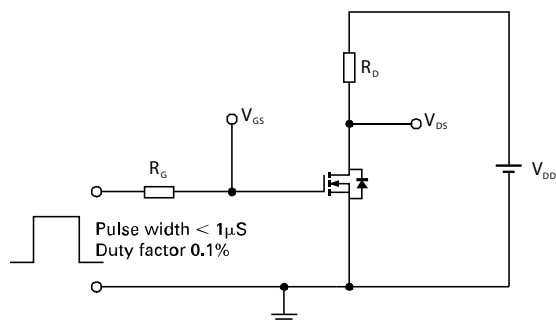
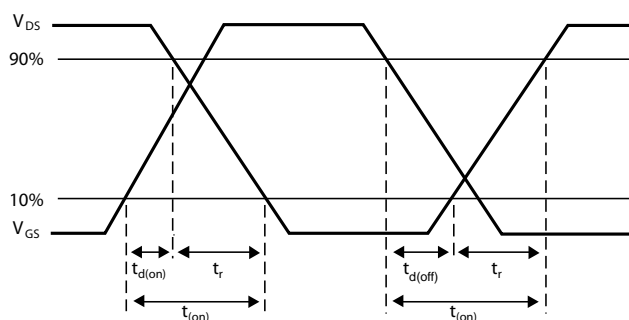
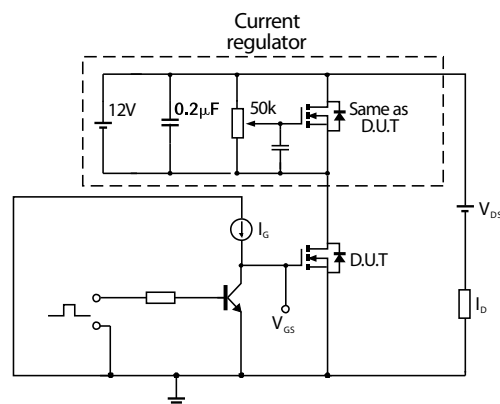
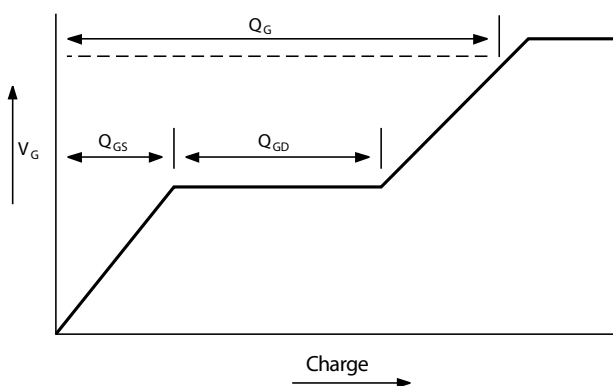
Typical Characteristics



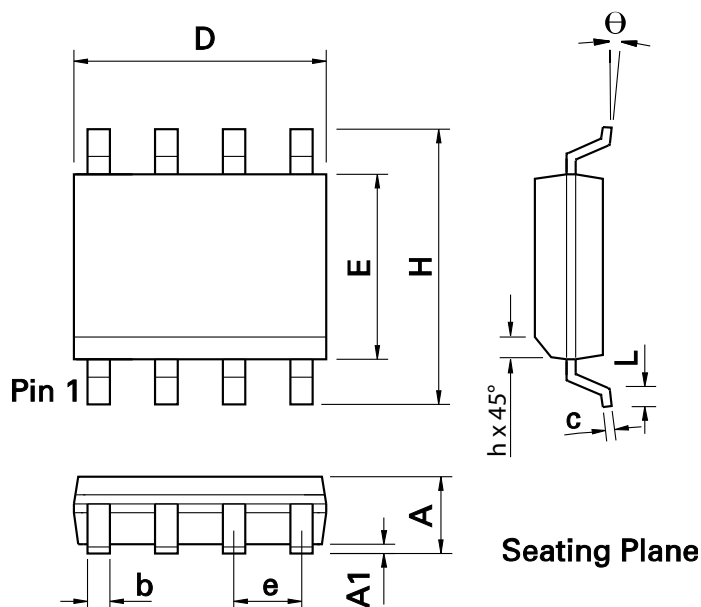
Typical Characteristics - continued



Test Circuits

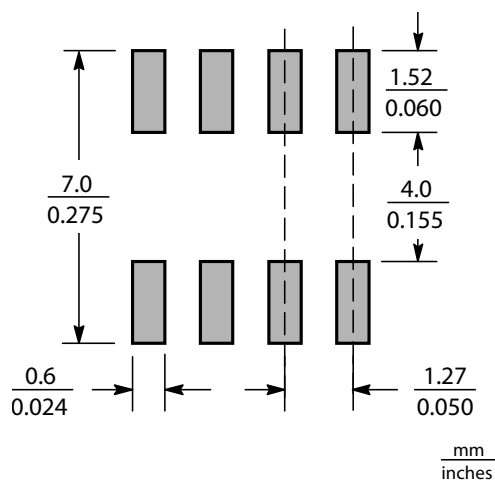


Package Outline Dimensions



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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