

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)} \text{ max}$	$I_D \text{ max}$ $T_A = +25^\circ\text{C}$
30V	20mΩ @ $V_{GS} = 10\text{V}$	6.9A
	27mΩ @ $V_{GS} = 4.5\text{V}$	5.8A

Description

This 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

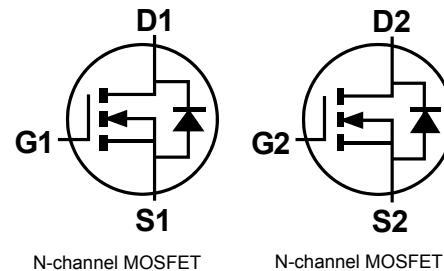
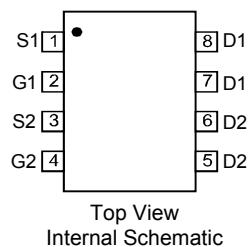
- Backlighting
- Power Management Functions
- DC-DC Converters

Features

- Dual N-Channel MOSFET
- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **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: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram
- Terminals: Finish - Matte Tin annealed over Copper lead frame. Solderable per MIL-STD-202, Method 208
- Weight: 0.072grams (approximate)



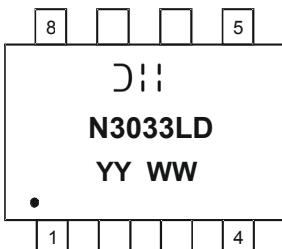
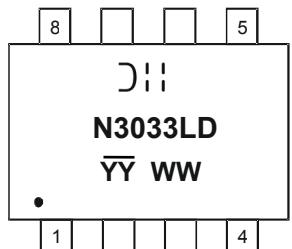
Ordering Information (Note 4)

Part Number	Case	Packaging
DMN3033LSD-13	SO-8	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" 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



DII = Manufacturer's Marking
 N3033LD = Product Type Marking Code
 YYWW = Date Code Marking
 YY or YY = Year (ex: 13 = 2013)
 WW = Week (01 - 53)
 YY = Date Code Marking for SAT (Shanghai Assembly/ Test site)
 YY = Date Code Marking for CAT (Chengdu Assembly/ Test site)

Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic		Symbol	Value	Units
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current (Note 5)	Steady State	I_D	6.9 5.8	A
Pulsed Drain Current (Note 6)		I_{DM}	30	A

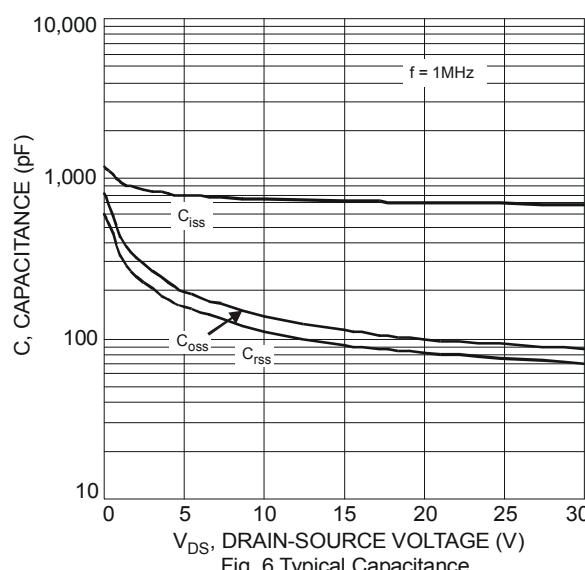
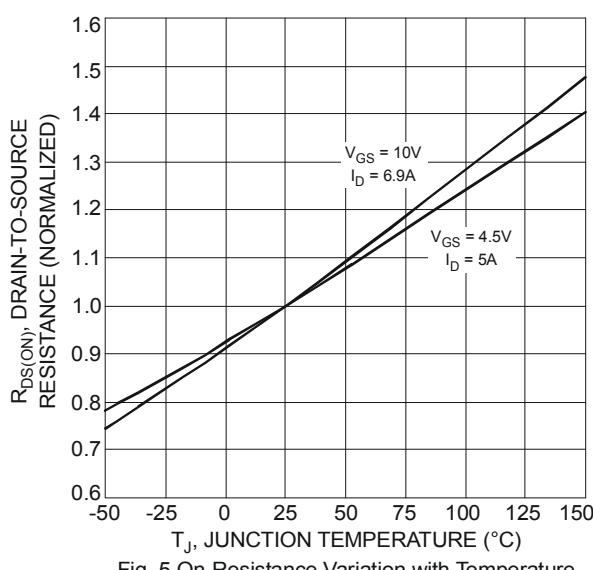
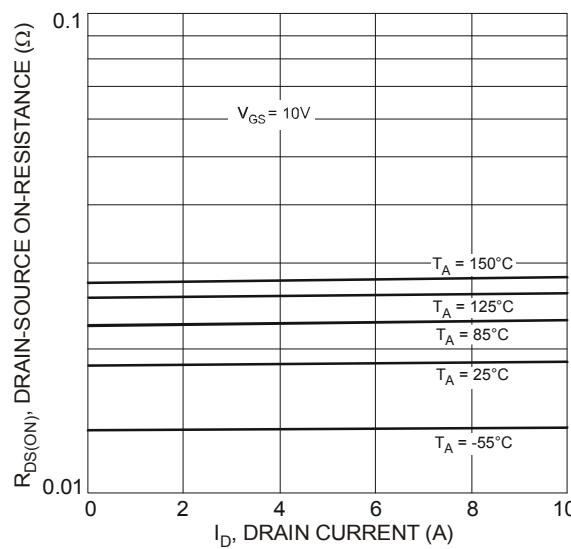
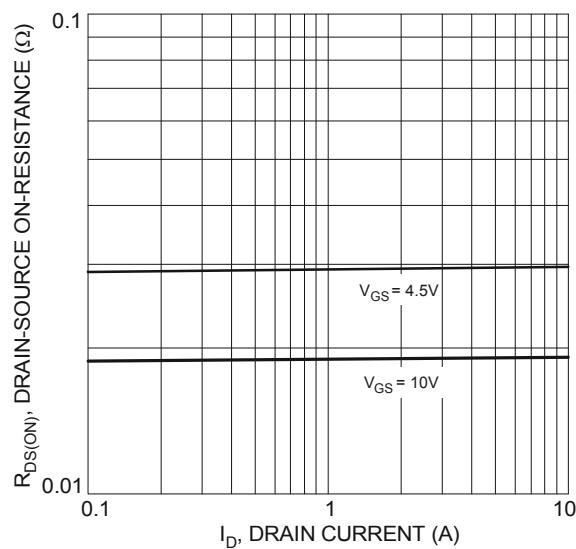
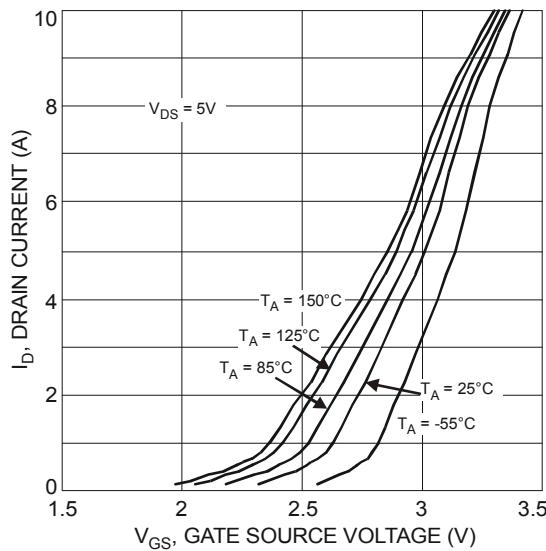
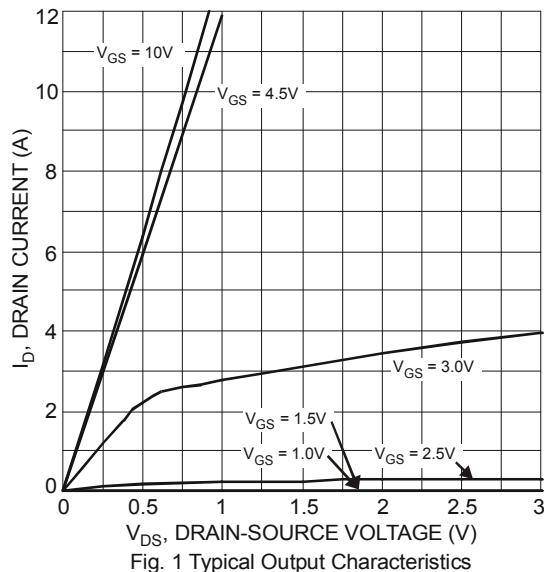
Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P_D	2	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	30	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	100	nA	$V_{DS} = 30\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
—	—	—	—	1	μA	$V_{GS} = \pm 25\text{V}, V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(\text{th})}$	1	—	2.1	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(\text{ON})}$	—	13 22	20 27	$\text{m}\Omega$	$V_{GS} = 10\text{V}, I_D = 6.9\text{A}$ $V_{GS} = 4.5\text{V}, I_D = 5\text{A}$
Forward Transconductance	g_{fs}	—	7	—	S	$V_{DS} = 5\text{V}, I_D = 6.9\text{A}$
Diode Forward Voltage (Note 7)	V_{SD}	0.5	—	1.2	V	$V_{GS} = 0\text{V}, I_S = 1\text{A}$
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{iss}	—	725	—	pF	$V_{DS} = 15\text{V}, V_{GS} = 0\text{V}$ $f = 1\text{MHz}$
Output Capacitance	C_{oss}	—	114	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	92	—	pF	
Gate Resistance	R_G	—	0.89	—	Ω	$V_{GS} = 0\text{V}, V_{DS} = 0\text{V}, f = 1\text{MHz}$
SWITCHING CHARACTERISTICS						
Total Gate Charge	Q_g	—	6.4 13	—	nC	$V_{GS} = 4.5\text{V}, V_{DS} = 15\text{V}, I_D = 5\text{A}$ $V_{GS} = 10\text{V}, V_{DS} = 15\text{V}, I_D = 6.9\text{A}$
Gate-Source Charge	Q_{gs}	—	1.9	—	nC	$V_{GS} = 4.5\text{V}, V_{DS} = 15\text{V}, I_D = 6.9\text{A}$
Gate-Drain Charge	Q_{gd}	—	3.2	—	nC	$V_{GS} = 4.5\text{V}, V_{DS} = 15\text{V}, I_D = 6.9\text{A}$
Turn-On Delay Time	$t_{d(on)}$	—	11	—	ns	$V_{DD} = 15\text{V}, V_{GS} = 10\text{V},$ $R_D = 1.8\Omega, R_G = 6\Omega$
Turn-On Rise Time	t_r	—	7	—	ns	
Turn-Off Delay Time	$t_{d(off)}$	—	63	—	ns	
Turn-Off Fall Time	t_f	—	30	—	ns	

Notes: 5. Device mounted on 2 oz. Copper pads on FR-4 PCB with $R_{\theta JA} = 62.5^\circ\text{C/W}$
 6. Pulse width $\leq 10\mu\text{S}$, Duty Cycle $\leq 1\%$.
 7. Short duration pulse test used to minimize self-heating effect.



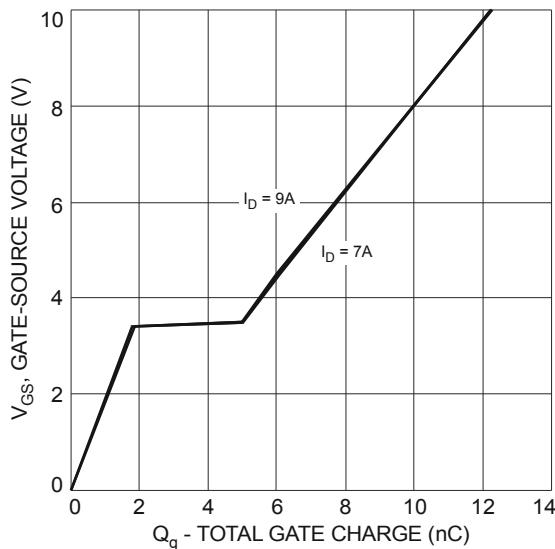


Fig. 7 Gate Charge

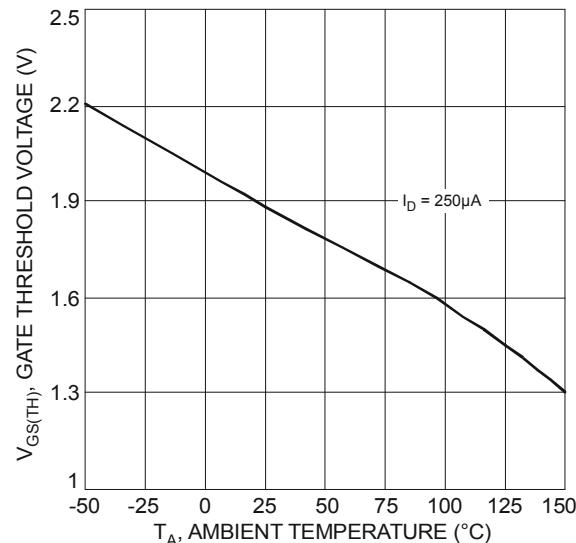


Fig. 8 Gate Threshold Variation vs. Ambient Temperature

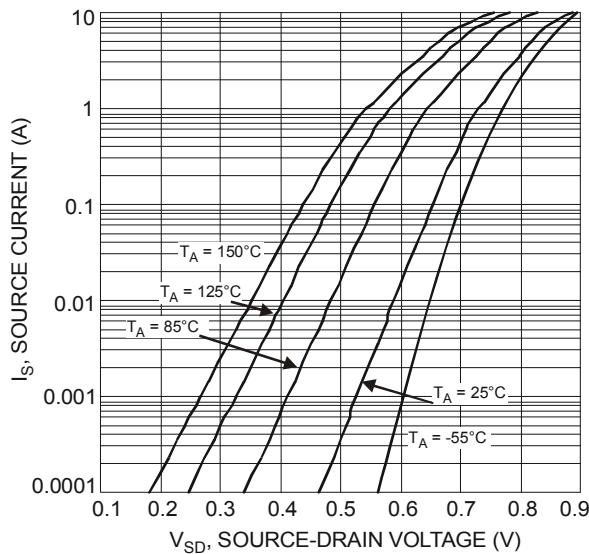


Fig. 9 Diode Forward Voltage vs. Current

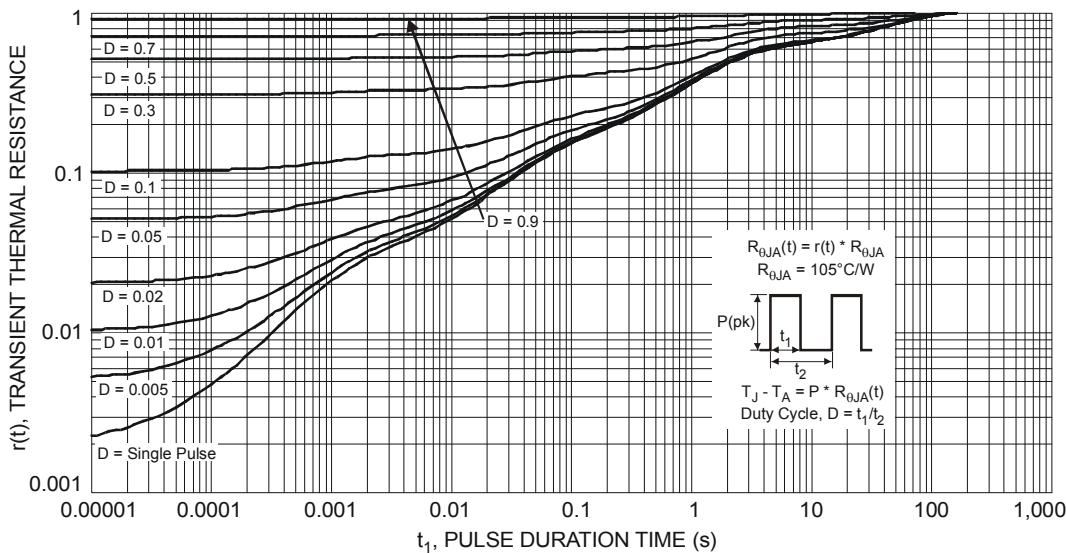
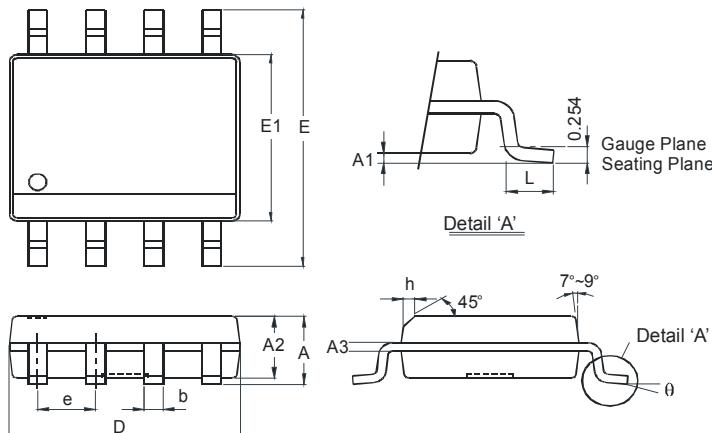


Fig. 10 Transient Thermal Response

Package Outline Dimensions

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

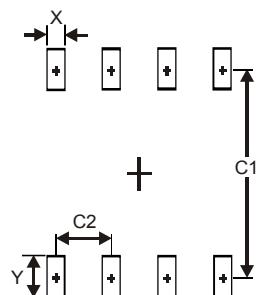


SO-8		
Dim	Min	Max
A	-	1.75
A1	0.10	0.20
A2	1.30	1.50
A3	0.15	0.25
b	0.3	0.5
D	4.85	4.95
E	5.90	6.10
E1	3.85	3.95
e	1.27 Typ	
h	-	0.35
L	0.62	0.82
θ	0°	8°

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)
X	0.60
Y	1.55
C1	5.4
C2	1.27

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