

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

BV <sub>DSS</sub>	R <sub>DS(ON)</sub> Max	I <sub>D</sub> Max T <sub>A</sub> = +25°C
30V	20mΩ @ V <sub>GS</sub> = 10V	6.9A
	27mΩ @ V <sub>GS</sub> = 4.5V	5.8A

**Description and Applications**

This MOSFET is designed to meet the stringent requirements of automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

- Backlighting
- Power Management Functions
- DC-DC Converters

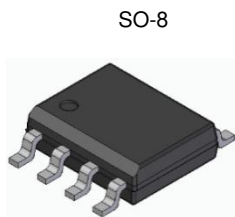
**Features**

- 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)**
- **The DMN3033LSDQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

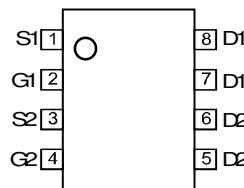
<https://www.diodes.com/quality/product-definitions/>

**Mechanical Data**

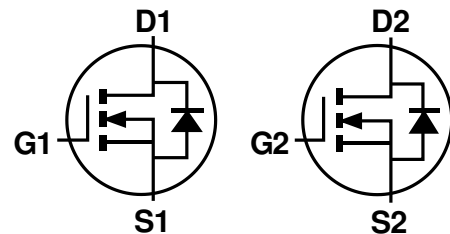
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208 @3
- Weight: 0.072grams (Approximate)



Top View



Top View



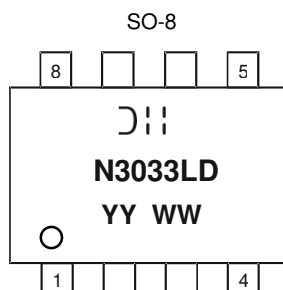
N-Channel MOSFET

N-Channel MOSFET

**Ordering Information (Note 4)**

Part Number	Case	Packaging
DMN3033LSDQ-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) & 2015/863/EU (RoHS 3) compliant.
  2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

**Marking Information**


⌋⌋ = Manufacturer's Marking  
 N3033LD = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY = Year (ex: 20 = 2020)  
 WW = Week (01 to 53)

**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>GSS</sub>	±20	V
Drain Current (Note 5)	Steady State	T <sub>A</sub> = +25°C	I <sub>D</sub>	6.9	A
		T <sub>A</sub> = +70°C		5.8	
Pulsed Drain Current (Note 6)			I <sub>DM</sub>	30	A

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P <sub>D</sub>	2	W
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	62.5	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	30	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	100	nA	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
		—	—	1	μA	V <sub>GS</sub> = ±25V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	1	—	2.1	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	13	20	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 6.9A
		—	22	27		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 5A
Forward Transconductance	g <sub>fs</sub>	—	7	—	S	V <sub>DS</sub> = 5V, I <sub>D</sub> = 6.9A
Diode Forward Voltage (Note 7)	V <sub>SD</sub>	0.5	—	1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 1A
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	C <sub>iss</sub>	—	725	—	pF	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V f = 1MHz
Output Capacitance	C <sub>oss</sub>	—	114	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	92	—	pF	
Gate Resistance	R <sub>G</sub>	—	0.89	—	Ω	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V, f = 1MHz
<b>SWITCHING CHARACTERISTICS (Note 8)</b>						
Total Gate Charge	Q <sub>g</sub>	—	6.4	—	nC	V <sub>GS</sub> = 4.5V, V <sub>DS</sub> = 15V, I <sub>D</sub> = 5A
		—	13	—		V <sub>GS</sub> = 10V, V <sub>DS</sub> = 15V, I <sub>D</sub> = 6.9A
Gate-Source Charge	Q <sub>gs</sub>	—	1.9	—	nC	V <sub>GS</sub> = 4.5V, V <sub>DS</sub> = 15V, I <sub>D</sub> = 6.9A
Gate-Drain Charge	Q <sub>gd</sub>	—	3.2	—	nC	V <sub>GS</sub> = 4.5V, V <sub>DS</sub> = 15V, I <sub>D</sub> = 6.9A
Turn-On Delay Time	t <sub>D(ON)</sub>	—	11	—	ns	V <sub>DD</sub> = 15V, V <sub>GS</sub> = 10V, R <sub>D</sub> = 1.8Ω, R <sub>G</sub> = 6Ω
Turn-On Rise Time	t <sub>r</sub>	—	7	—	ns	
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	63	—	ns	
Turn-Off Fall Time	t <sub>f</sub>	—	30	—	ns	

- Notes:
- Device mounted on 2 oz. Copper pads on FR-4 PCB with R<sub>θJA</sub> = 62.5°C/W.
  - Pulse width ≤ 10μs, Duty Cycle ≤ 1%.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.

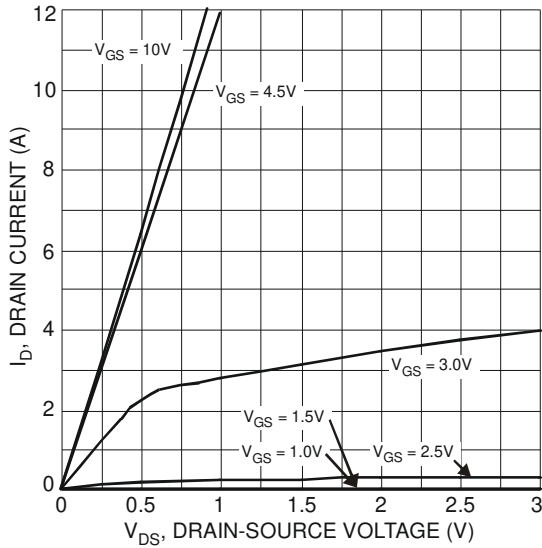


Fig. 1 Typical Output Characteristics

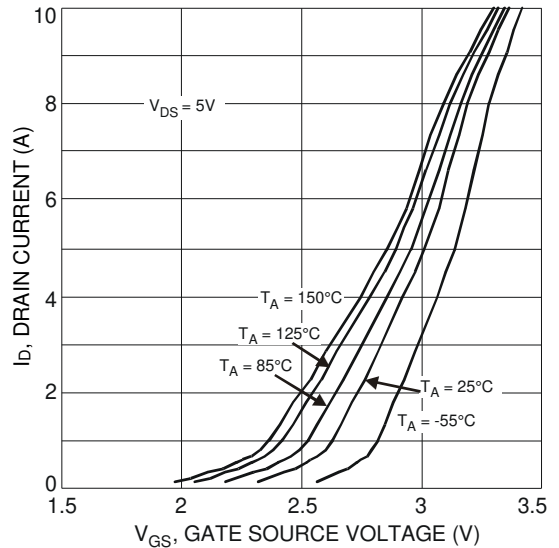


Fig. 2 Typical Transfer Characteristics

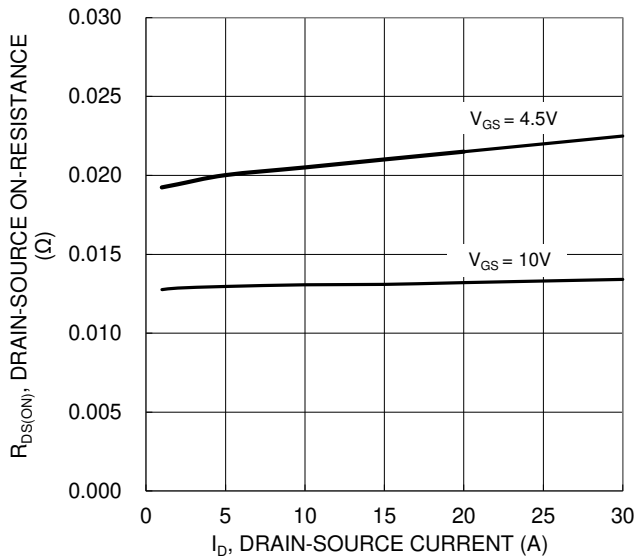


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

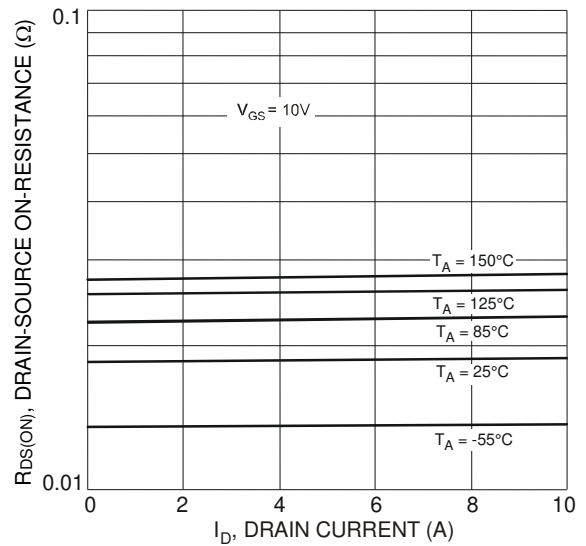


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

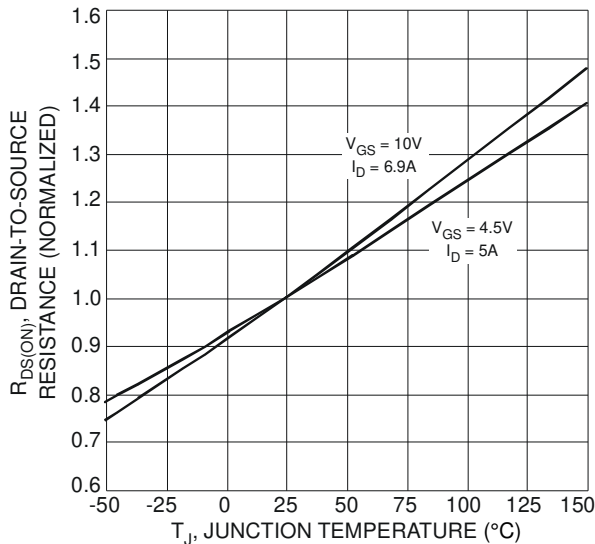


Fig. 5 On-Resistance Variation with Temperature

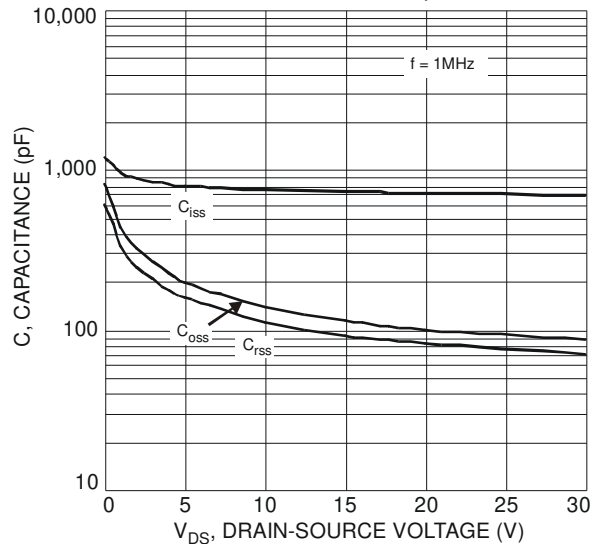


Fig. 6 Typical Capacitance

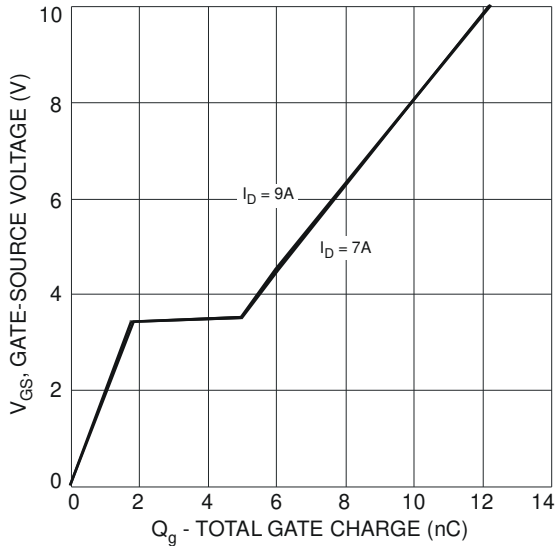


Fig. 7 Gate Charge

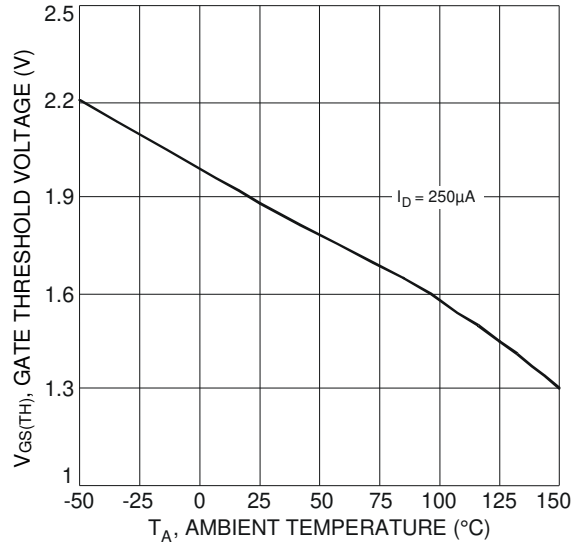


Fig. 8 Gate Threshold Variation vs. Ambient Temperature

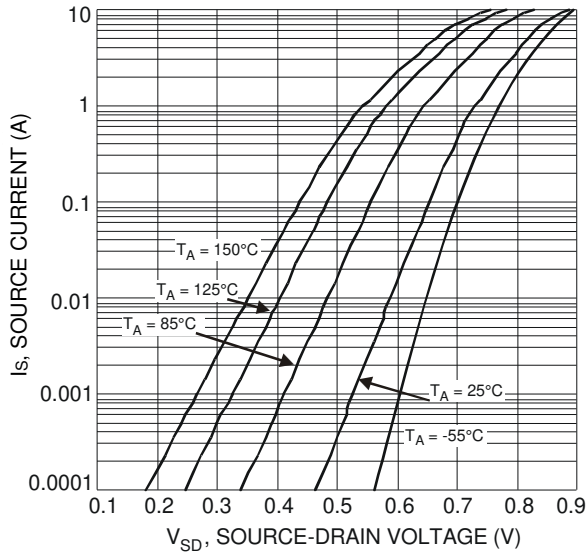


Fig. 9 Diode Forward Voltage vs. Current

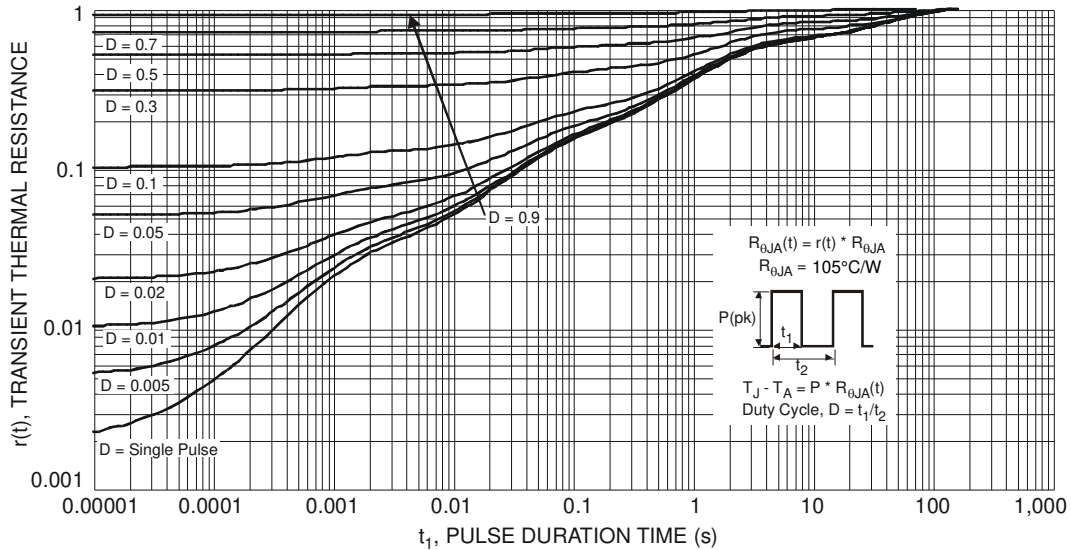
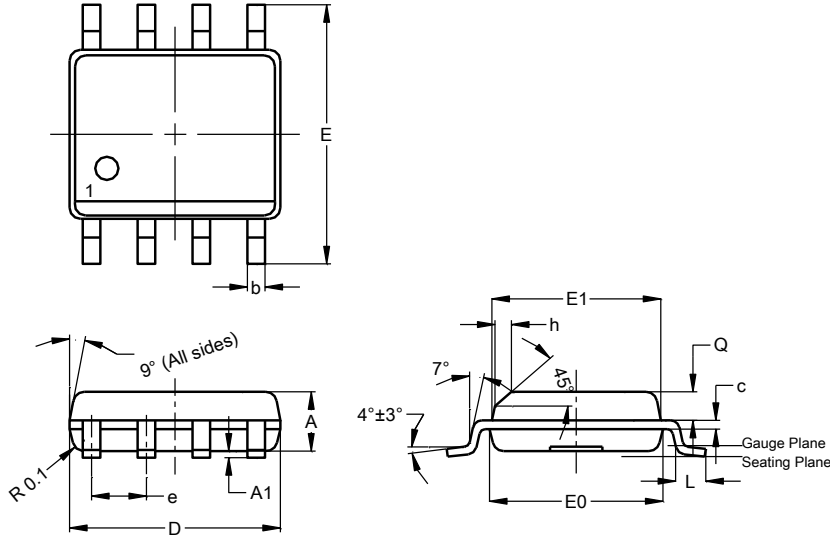


Fig. 10 Transient Thermal Response

**Package Outline Dimensions**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SO-8**

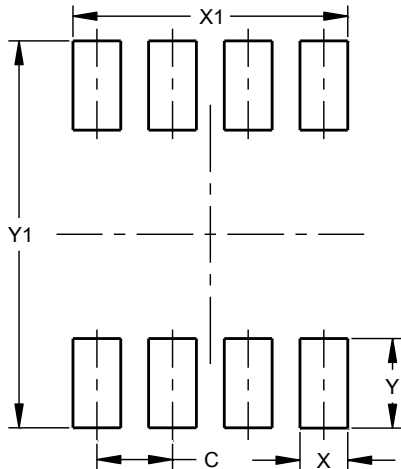


SO-8			
Dim	Min	Max	Typ
A	1.40	1.50	1.45
A1	0.10	0.20	0.15
b	0.30	0.50	0.40
c	0.15	0.25	0.20
D	4.85	4.95	4.90
E	5.90	6.10	6.00
E1	3.80	3.90	3.85
E0	3.85	3.95	3.90
e	--	--	1.27
h	--	--	0.35
L	0.62	0.82	0.72
Q	0.60	0.70	0.65
<b>All Dimensions in mm</b>			

**Suggested Pad Layout**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SO-8**



Dimensions	Value (in mm)
C	1.27
X	0.802
X1	4.612
Y	1.505
Y1	6.50

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