

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ max	I_D max $T_A = +25^\circ\text{C}$
30V	7m Ω @ $V_{GS} = 10\text{V}$	16A
	10m Ω @ $V_{GS} = 4.5\text{V}$	13.5A

Description and Applications

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.

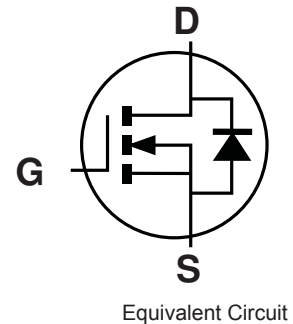
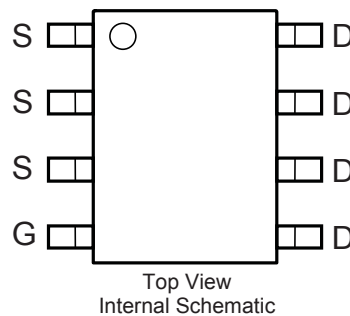
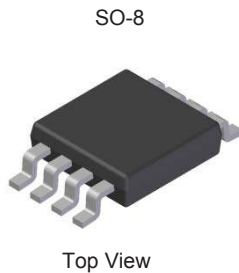
- Backlighting
- Power Management Functions
- DC-DC Converters

Features and Benefits

- 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**
- **PPAP Available (Note 4)**

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
- Terminal Connections Indicator: See diagram
- Terminals: Finish — Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.074 grams (approximate) e3

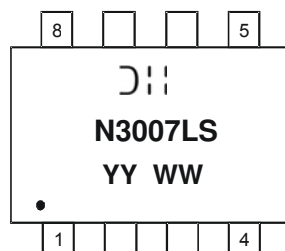


Ordering Information (Note 4 & 5)

Part Number	Compliance	Case	Packaging
DMN3007LSSQ-13	Automotive	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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_grade_definitions/.
 5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



D = Manufacturer's Marking
N3007LS = Product Type Marking Code
YYWW = Date Code Marking
YY = Year (ex: 13 = 2013)
WW = Week (01 - 53)

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 6)	Steady State	$T_A = +25^\circ\text{C}$	I_D	16	A
		$T_A = +70^\circ\text{C}$		13	
Pulsed Drain Current (Note 7)			I_{DM}	64	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 6)	P_D	2.5	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	50	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV_{DSS}	30	—	—	V	$V_{GS} = 0V, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	$V_{DS} = 30V, V_{GS} = 0V$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(th)}$	1.3	—	2.1	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	5	7	m Ω	$V_{GS} = 10V, I_D = 15A$
		—	7.9	10		$V_{GS} = 4.5V, I_D = 13A$
Forward Transconductance	g_{fs}	—	16.4	—	S	$V_{DS} = 10V, I_D = 15A$
Diode Forward Voltage	V_{SD}	—	0.67	1.2	V	$V_{GS} = 0V, I_S = 2.3A$
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	2714	—	pF	$V_{DS} = 15V, V_{GS} = 0V$ $f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	436	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	380	—	pF	
Gate Resistance	R_G	—	0.7	—	Ω	$V_{DS} = 0V, V_{GS} = 0V, f = 1.0\text{MHz}$
SWITCHING CHARACTERISTICS (Note 9)						
Total Gate Charge	Q_g	—	31.2 64.2	—	nC	$V_{DS} = 15V, V_{GS} = 4.5V, I_D = 16A$
Gate-Source Charge	Q_{gs}	—	7.1	—		$V_{DS} = 15V, V_{GS} = 10V, I_D = 16A$
Gate-Drain Charge	Q_{gd}	—	17.1	—		$V_{DS} = 15V, V_{GS} = 10V, I_D = 16A$
Turn-On Delay Time	$t_{d(on)}$	—	10.3	—	ns	$V_{DS} = 15V, V_{GS} = 10V,$ $I_D = 1A, R_G = 6.0\Omega$
Rise Time	t_r	—	14.8	—		
Turn-Off Delay Time	$t_{d(off)}$	—	85.1	—		
Fall Time	t_f	—	43.6	—		

- Notes:
6. Device mounted on 2 oz. Copper pads on FR-4 PCB, with $R_{\theta JA} = +50^\circ\text{C}$
 7. Pulse width $\leq 10\mu\text{s}$, Duty Cycle $\leq 1\%$.
 8. Short duration pulse test used to minimize self-heating effect.
 9. Guaranteed by design. Not subject to product testing.

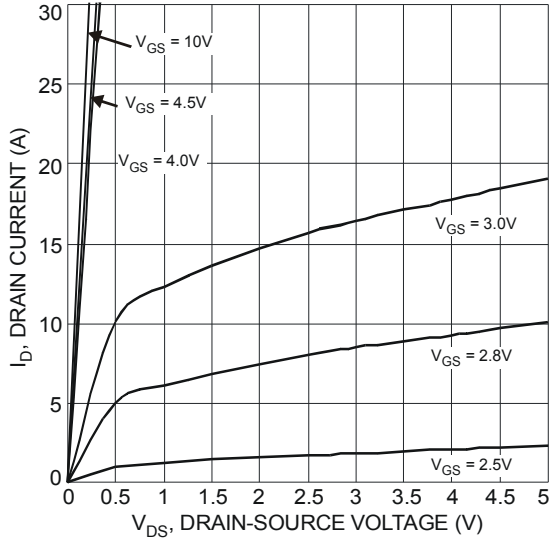


Fig. 1 Typical Output Characteristic

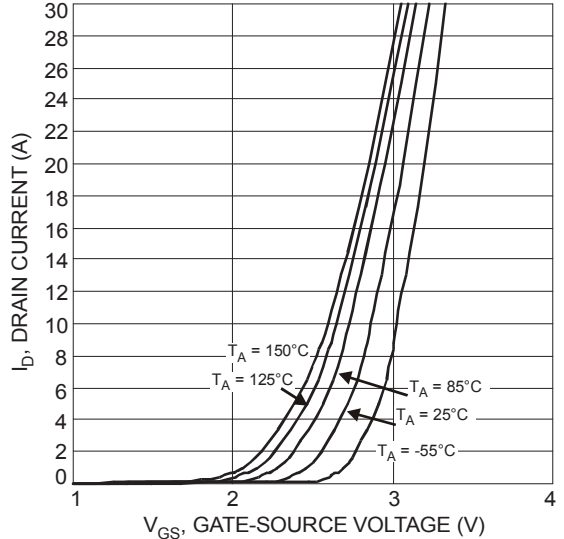


Fig. 2 Typical Transfer Characteristic

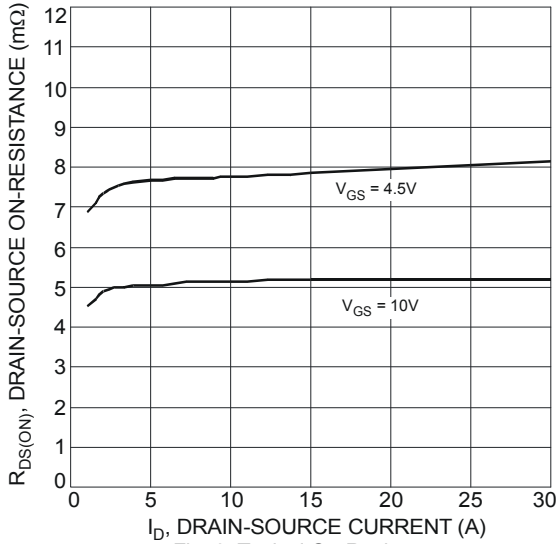


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

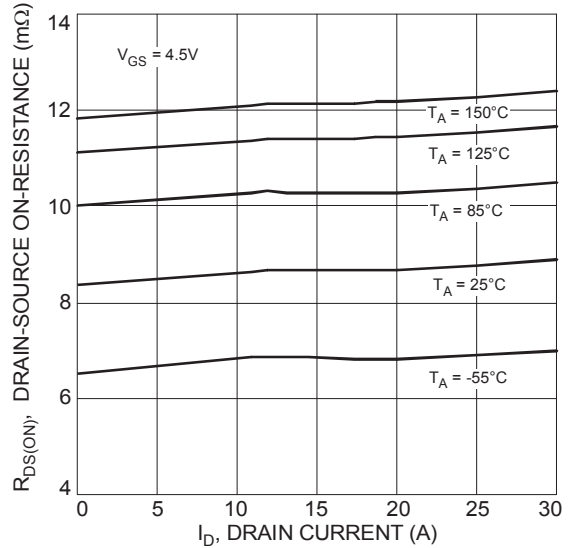


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

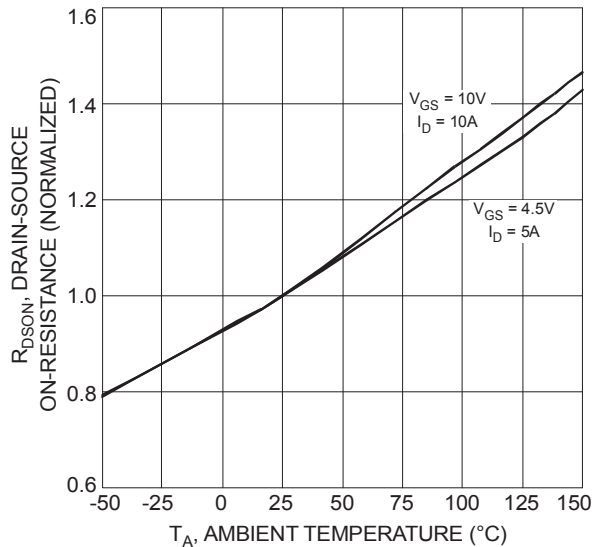


Fig. 5 On-Resistance Variation with Temperature

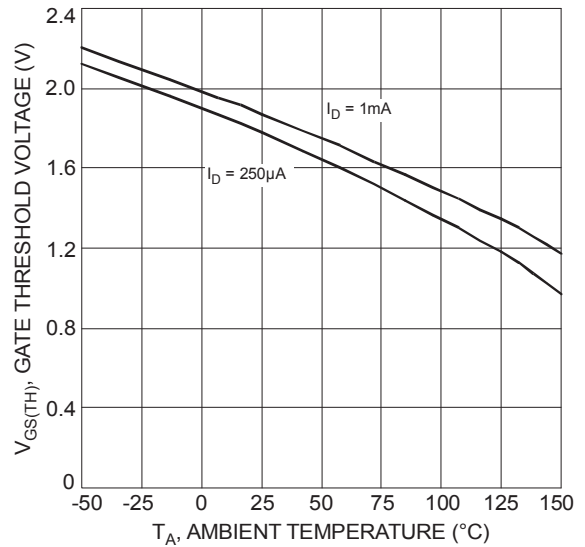


Fig. 6 Gate Threshold Variation vs. Ambient Temperature

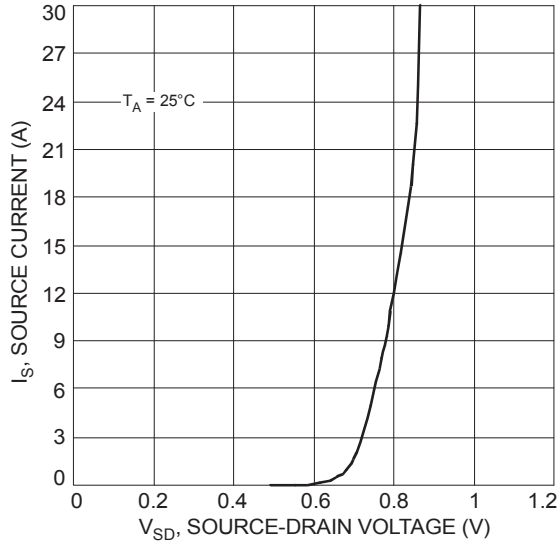


Fig. 7 Diode Forward Voltage vs. Current

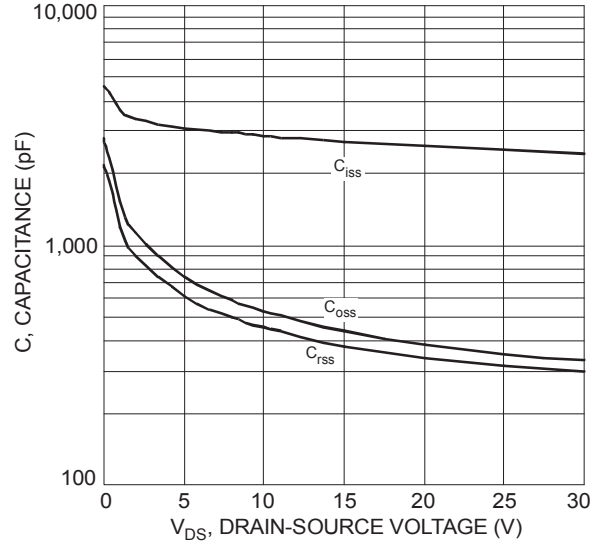


Fig. 8 Typical Total Capacitance

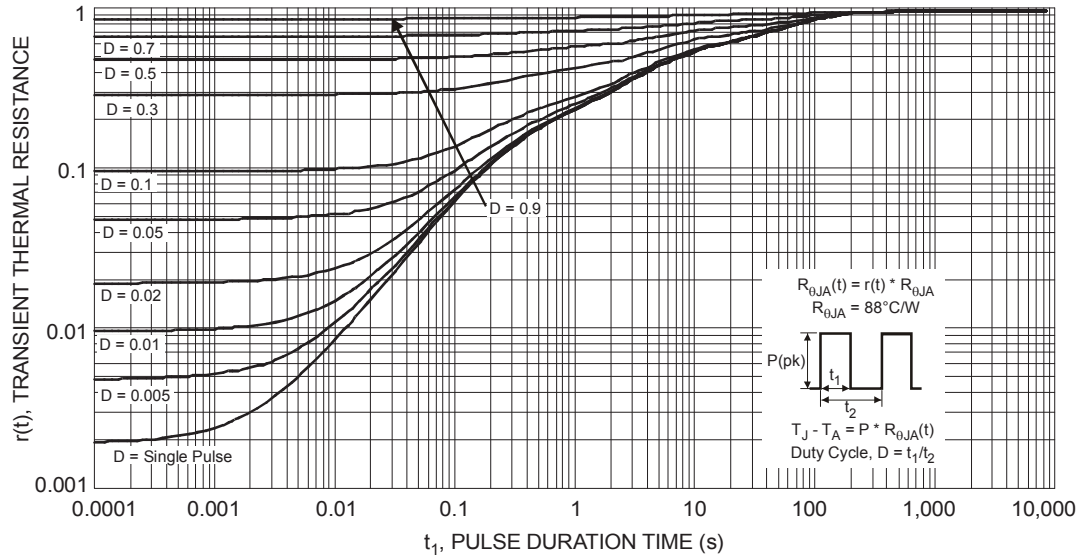
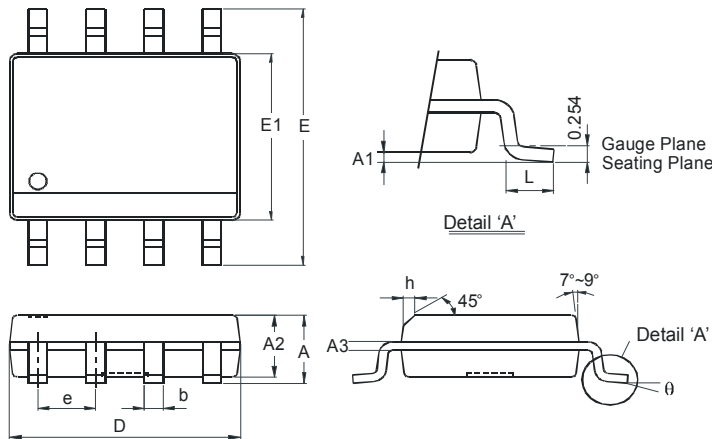


Fig. 9 Transient Thermal Response

Package Outline Dimensions

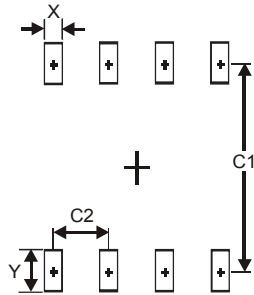
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version



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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