

## Features

- Dual N-Channel MOSFET
- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

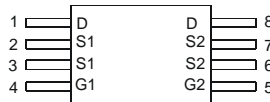
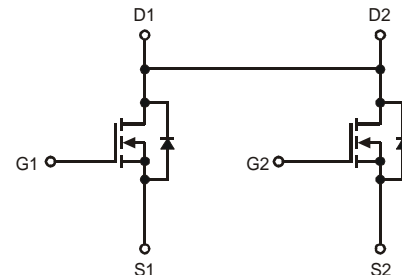
- Case: TSSOP-8L
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram Below
- Marking Information: See Page 4
- Ordering Information: See Page 4
- Weight: 0.039 grams (approximate)



TOP VIEW



BOTTOM VIEW


 Top View  
Pin Configuration


Internal Schematic

## Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			$V_{DSS}$	20	V
Gate-Source Voltage			$V_{GSS}$	$\pm 12$	V
Continuous Drain Current (Note 3)	Steady State	$T_A = 25^\circ\text{C}$	$I_D$	6.7	A
		$T_A = 70^\circ\text{C}$		4.9	
Pulsed Drain Current (Note 4)			$I_{DM}$	30	A

## Thermal Characteristics

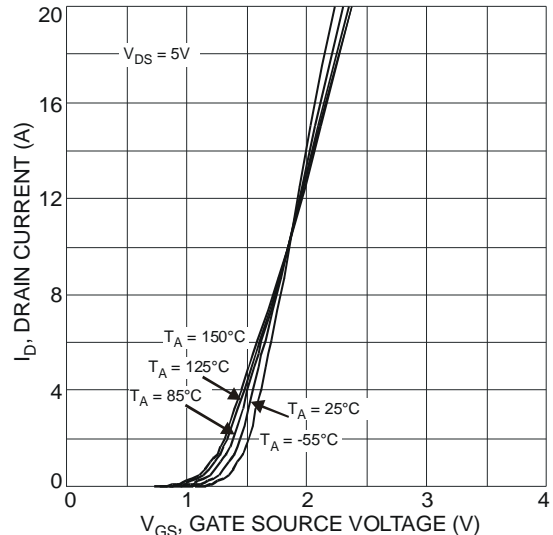
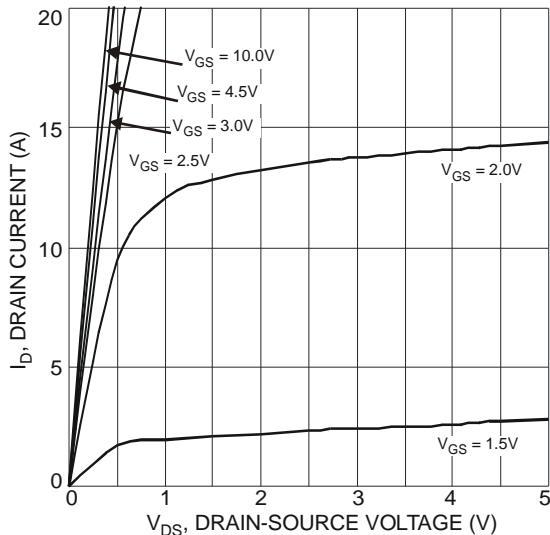
Characteristic			Symbol	Value	Unit
Power Dissipation (Note 3)			$P_D$	0.89	W
Thermal Resistance, Junction to Ambient @ $T_A = 25^\circ\text{C}$			$R_{\theta JA}$	140	$^\circ\text{C/W}$
Operating and Storage Temperature Range			$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

- Notes:
1. No purposefully added lead.
  2. Diodes Inc.'s "Green" policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php).
  3. Device mounted on FR-4 PCB with minimum recommended pad layout.
  4. Repetitive rating, pulse width limited by junction temperature.

**Electrical Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 5)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	20	-	-	V	$V_{GS} = 0V, I_D = 250\mu A$
Zero Gate Voltage Drain Current	$I_{DSS}$	-	-	1.0	$\mu A$	$V_{DS} = 20V, V_{GS} = 0V$
Gate-Source Leakage	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{GS} = \pm 12V, V_{DS} = 0V$
<b>ON CHARACTERISTICS (Note 5)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	0.5	-	1.2	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
Static Drain-Source On-Resistance	$R_{DS(on)}$	-	19	26	m $\Omega$	$V_{GS} = 4.5V, I_D = 6.0A$
			26	36		$V_{GS} = 2.5V, I_D = 5.2A$
Forward Transfer Admittance	$ Y_{fs} $	-	8	-	S	$V_{DS} = 10V, I_D = 6A$
Diodes Forward Voltage	$V_{SD}$	-	0.7	1.2	V	$I_S = 1.7A, V_{GS} = 0V$
<b>DYNAMIC CHARACTERISTICS (Note 6)</b>						
Input Capacitance	$C_{iss}$	-	570	-	pF	$V_{DS} = 10V, V_{GS} = 0V, f = 1.0MHz$
Output Capacitance	$C_{oss}$	-	85	-	pF	
Reverse Transfer Capacitance	$C_{rss}$	-	75	-	pF	
Gate Resistance	$R_g$	-	1.23	-	$\Omega$	$V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$
<b>SWITCHING CHARACTERISTICS (Note 6)</b>						
Total Gate Charge	$Q_g$	-	5.2	-	nC	$V_{GS} = 4.5V, V_{DS} = 10V, I_D = 7A$
Gate-Source Charge	$Q_{gs}$	-	0.86	-	nC	
Gate-Drain Charge	$Q_{gd}$	-	1.25	-	nC	
Turn-On Delay Time	$t_{D(on)}$	-	5.2	-	ns	$V_{DD} = 10V, V_{GS} = 4.5V, R_L = 1.5\Omega, R_G = 1\Omega$
Turn-On Rise Time	$t_r$	-	13.5	-	ns	
Turn-Off Delay Time	$t_{D(off)}$	-	19.8	-	ns	
Turn-Off Fall Time	$t_f$	-	6.1	-	ns	

Notes: 5. Short duration pulse test used to minimize self-heating effects.  
6. Guaranteed by design. Not subject to production testing.



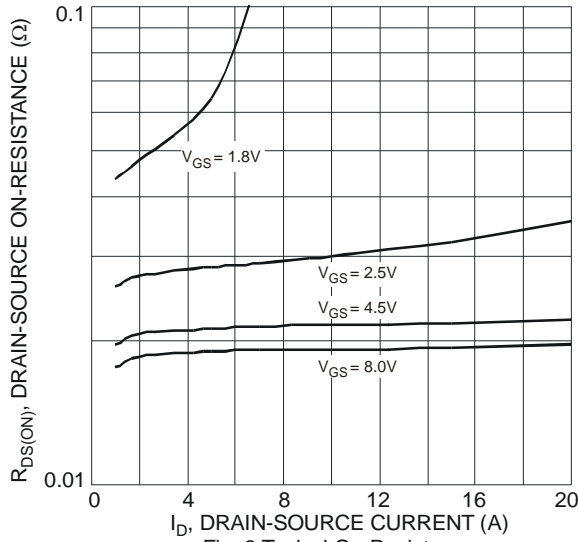


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

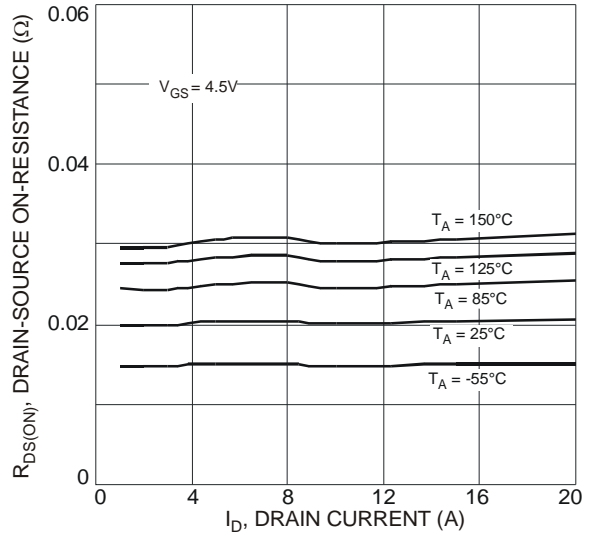


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

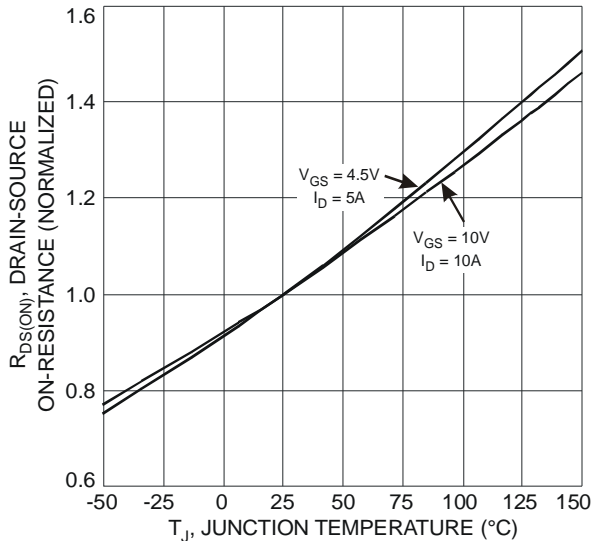


Fig. 5 On-Resistance Variation with Temperature

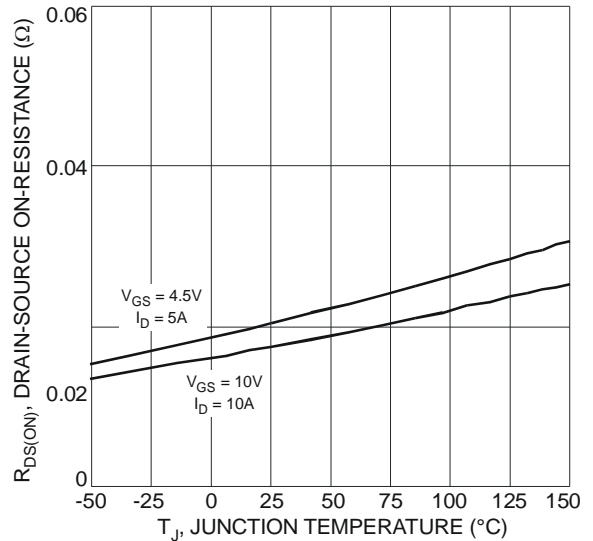


Fig. 6 On-Resistance Variation with Temperature

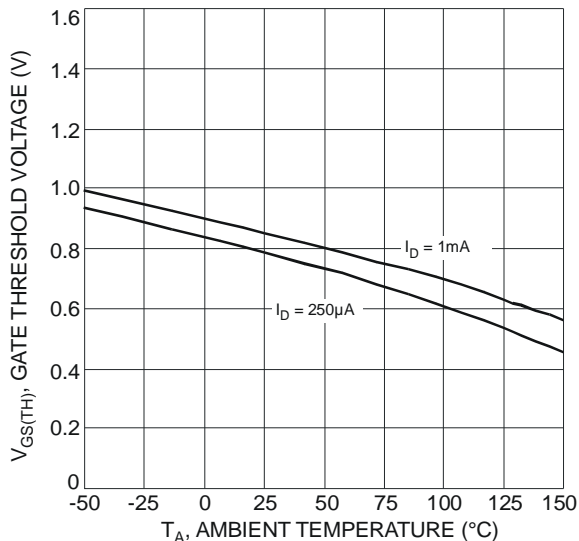


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

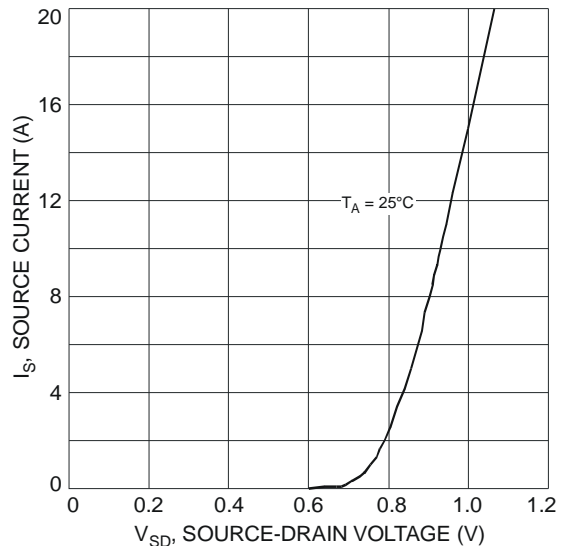
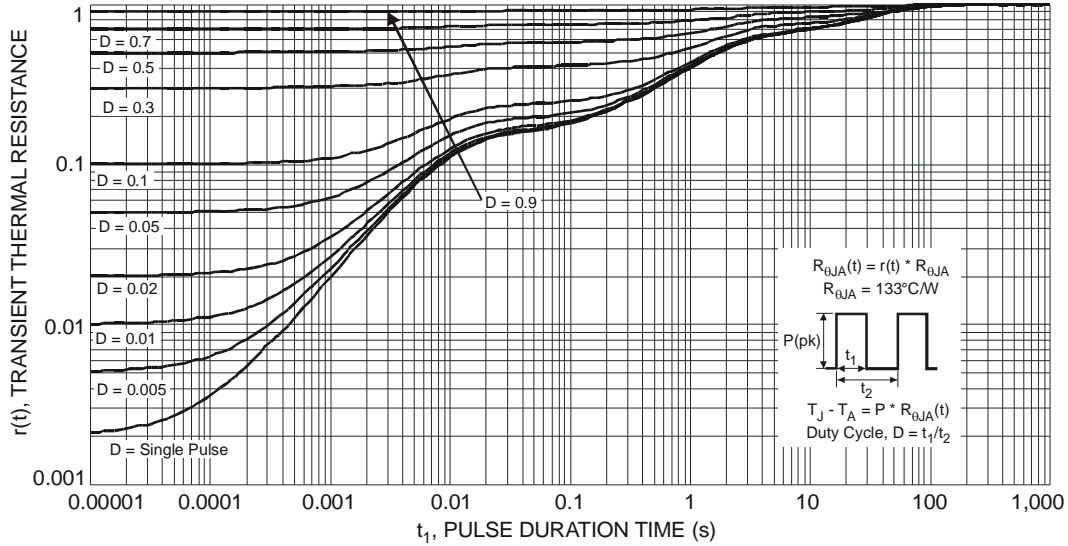
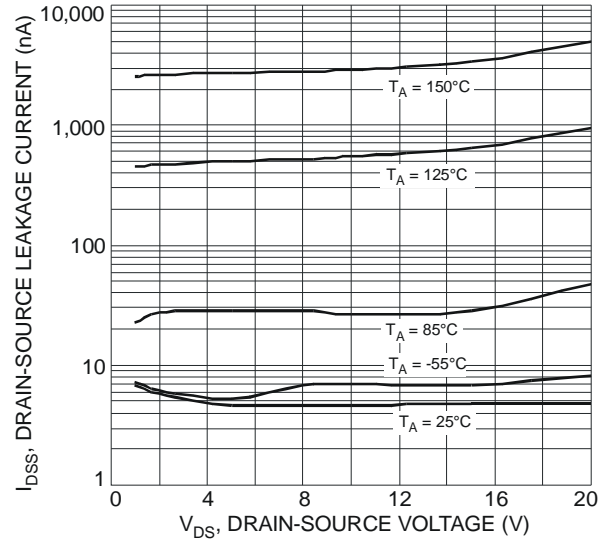
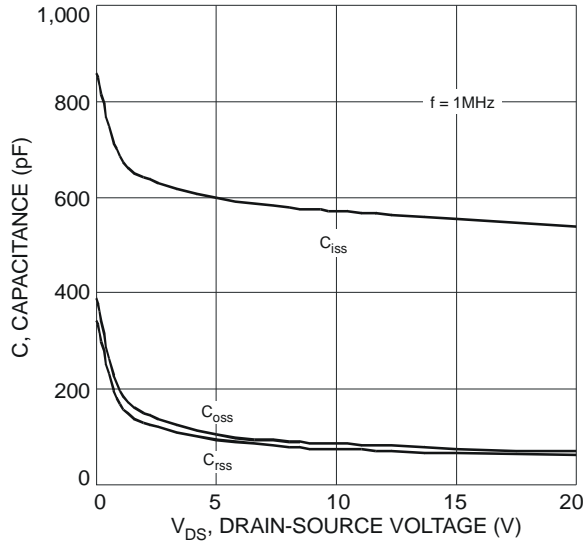


Fig. 8 Diode Forward Voltage vs. Current

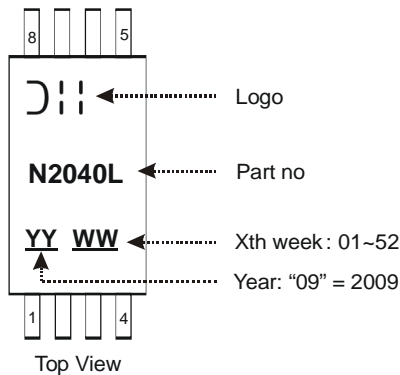


**Ordering Information** (Note 7)

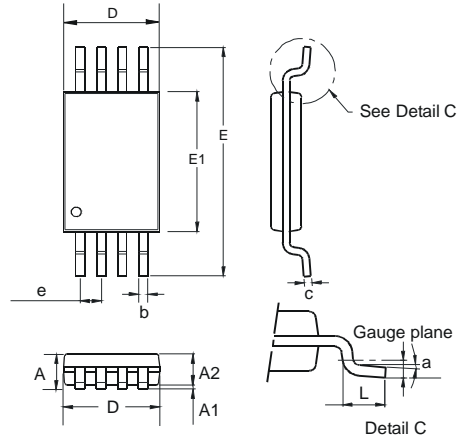
Part Number	Case	Packaging
DMN2040LTS-13	TSSOP-8L	2500 / Tape & Reel

Notes: 7. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

**Marking Information**

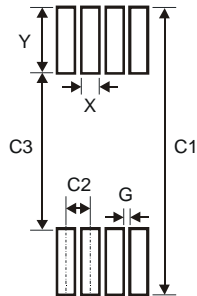


**Package Outline Dimensions**



TSSOP-8L			
Dim	Min	Max	Typ
a	0.09	–	–
A	–	1.20	–
A1	0.05	0.15	–
A2	0.825	1.025	0.925
b	0.19	0.30	–
c	0.09	0.20	–
D	2.90	3.10	3.025
e	–	–	0.65
E	–	–	6.40
E1	4.30	4.50	4.425
L	0.45	0.75	0.60
<b>All Dimensions in mm</b>			

**Suggested Pad Layout**



Dimensions	Value (in mm)
X	0.45
Y	1.78
C1	7.72
C2	0.65
C3	4.16
G	0.20

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