

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

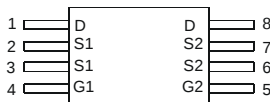
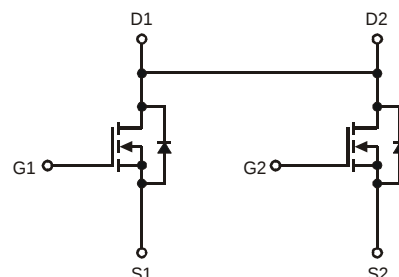
- Case: TSSOP-8L
- Case Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram Below
- Marking Information: See Page 4
- Ordering Information: See Page 4
- Weight: 0.039 grams (approximate)



TOP VIEW



BOTTOM VIEW


Top View
Pin Configuration


Internal Schematic

Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V _{DSS}	20	V
Gate-Source Voltage			V _{GSS}	±12	V
Continuous Drain Current (Note 3)	Steady State	T _A = 25°C	I _D	6.7	A
		T _A = 70°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°C			R _{θJA}	140	°C/W
Operating and Storage Temperature Range			T _J , T _{STG}	-55 to +150	°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.
 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°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 5)						
Drain-Source Breakdown Voltage	BV _{DSS}	20	-	-	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	-	-	1.0	μA	V _{DS} = 20V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	-	-	±100	nA	V _{GS} = ±12V, V _{DS} = 0V
ON CHARACTERISTICS (Note 5)						
Gate Threshold Voltage	V _{GS(th)}	0.5	-	1.2	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS (ON)}	-	19	26	mΩ	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
DYNAMIC CHARACTERISTICS (Note 6)						
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	-	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
SWITCHING CHARACTERISTICS (Note 6)						
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 = 1.5Ω, R _G = 1Ω
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.

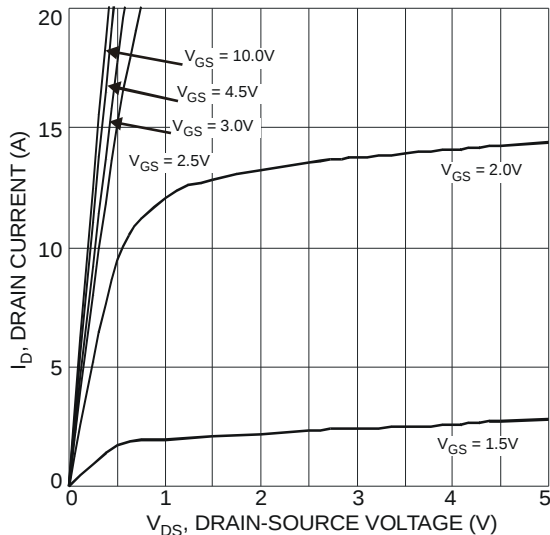


Fig. 1 Typical Output Characteristics

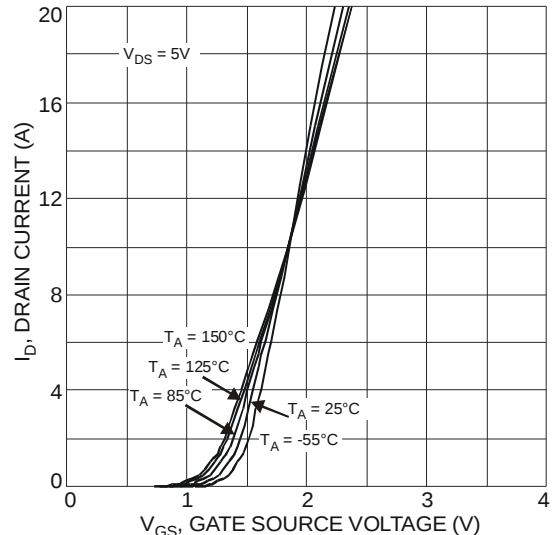


Fig. 2 Typical Transfer Characteristics

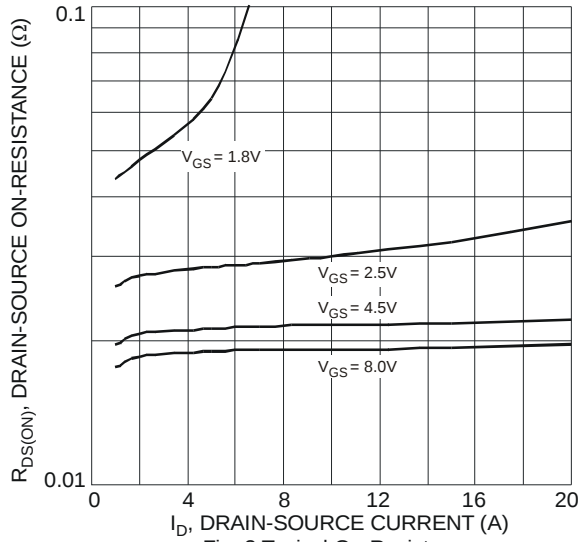


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

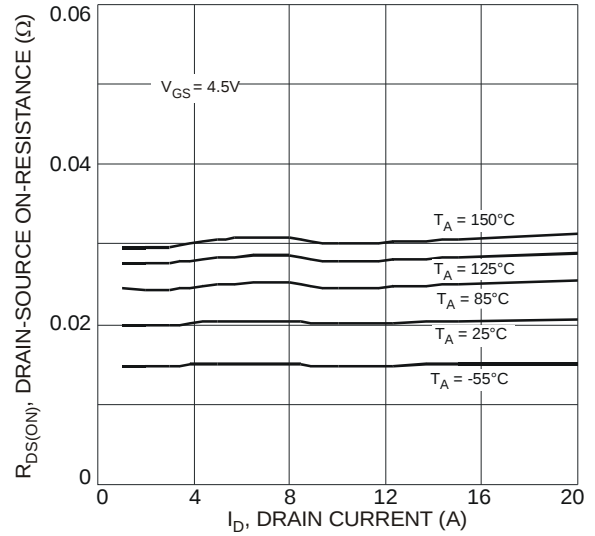


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

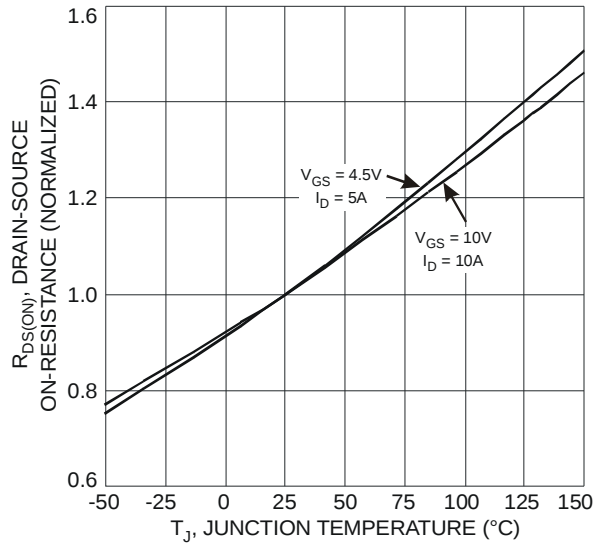


Fig. 5 On-Resistance Variation with Temperature

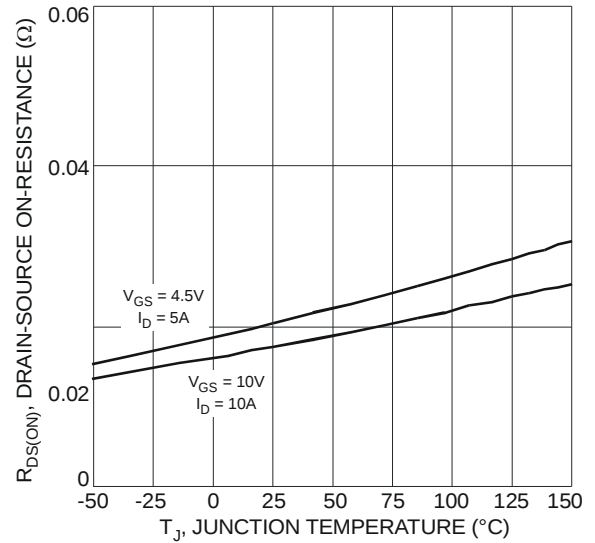


Fig. 6 On-Resistance Variation with Temperature

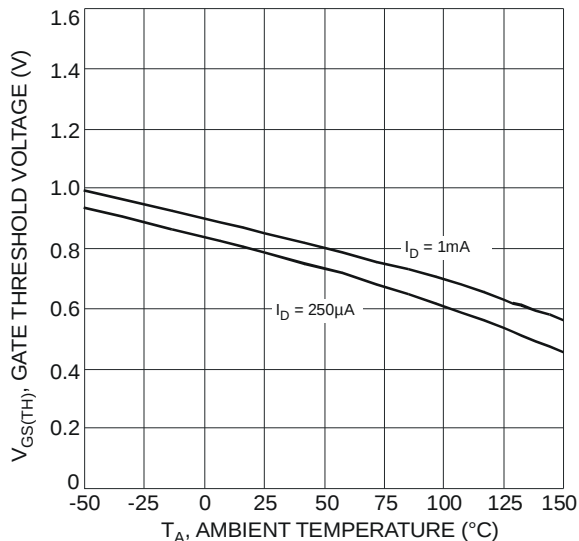


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

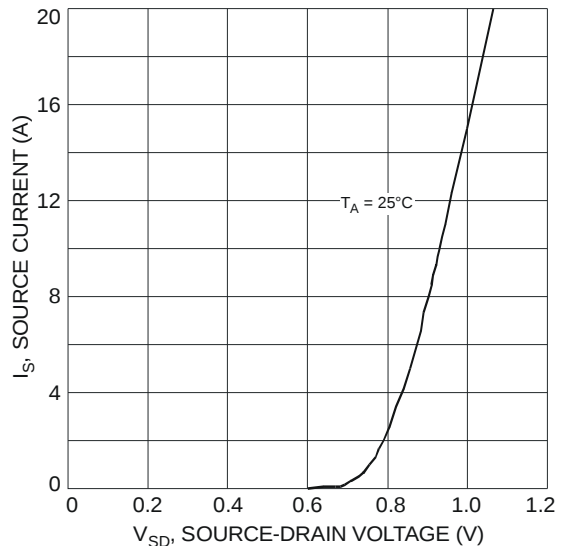


Fig. 8 Diode Forward Voltage vs. Current

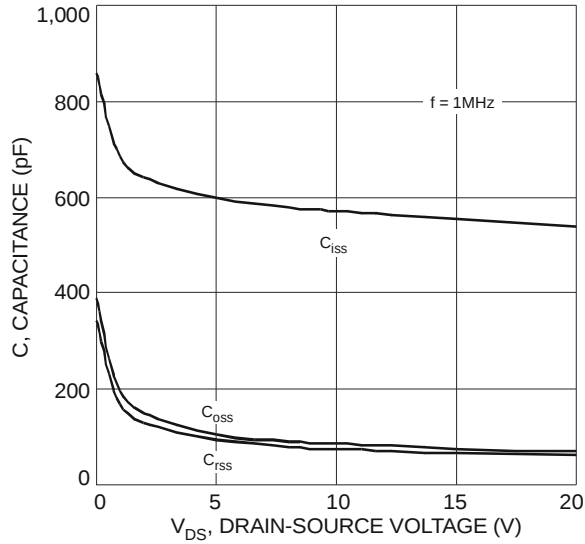


Fig. 9 Typical Capacitance

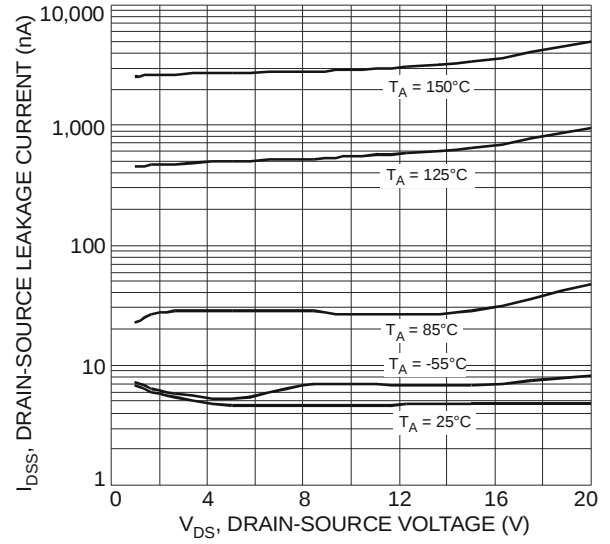


Fig. 10 Typical Drain-Source Leakage Current vs. Drain-Source Voltage

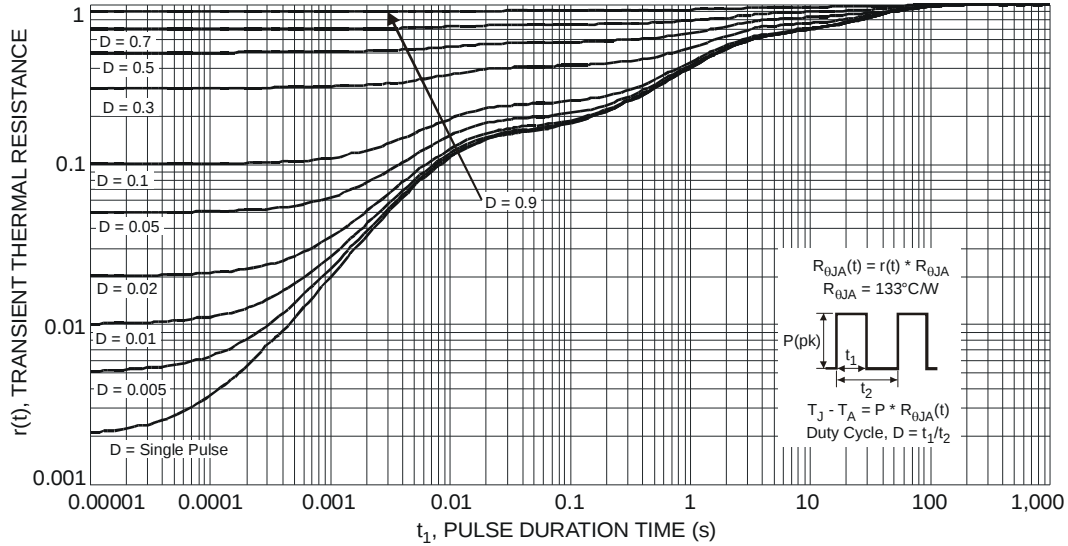


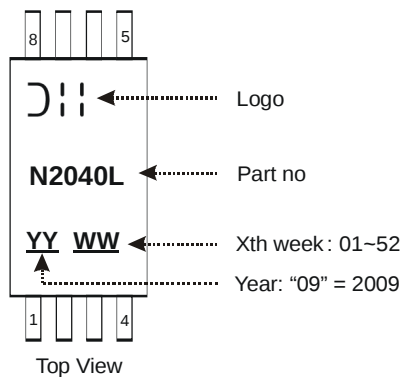
Fig. 11 Transient Thermal Response

Ordering Information (Note 7)

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

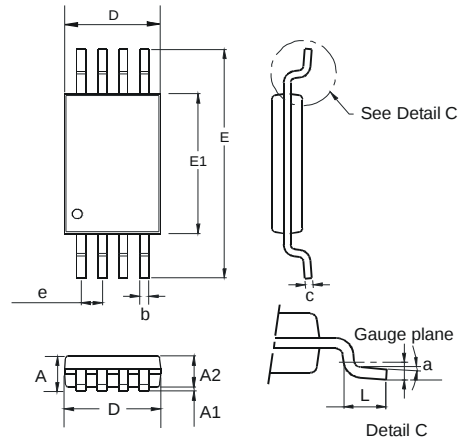
Notes: 7. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



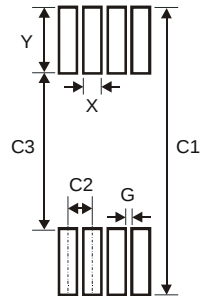
Top View

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
All Dimensions in mm			

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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