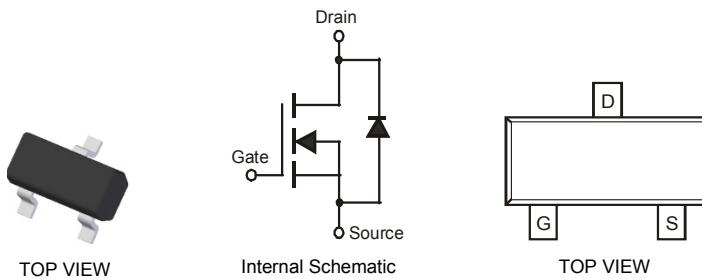


**Features**

- 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)**
- Qualified to AEC-Q101 Standards for High Reliability

**Mechanical Data**

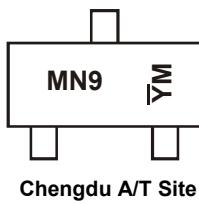
- Case: SOT-23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Terminals Connections: See Diagram Below
- Weight: 0.008 grams (approximate)

**Ordering Information** (Note 4)

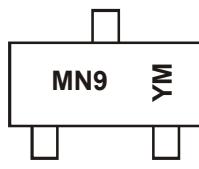
Part Number	Case	Packaging
DMN2041L-7	SOT-23	3000/Tape & Reel

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](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**

Chengdu A/T Site



Shanghai A/T Site

MN9 = Product Type Marking Code  
 YM = Date Code Marking for SAT (Shanghai Assembly/ Test site)

YM = Date Code Marking for CAT (Chengdu Assembly/ Test site)

Y or YM = Year (ex: A = 2013)

M = Month (ex: 9 = September)

**Date Code Key**

Year	2009	2010	2011	2012	2013	2014	2015					
Code	W	X	Y	Z	A	B	C					
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

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

Characteristic			Symbol	Value	Units
Drain-Source Voltage			$V_{DSS}$	20	V
Gate-Source Voltage			$V_{GSS}$	$\pm 12$	V
Continuous Drain Current (Note 5)	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	6.4 4.5	A
Pulsed Drain Current (Note 6)			$I_{DM}$	30	A

**Thermal Characteristics**

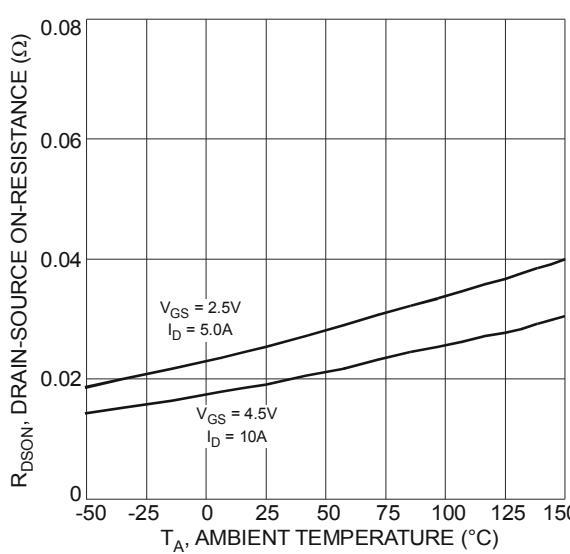
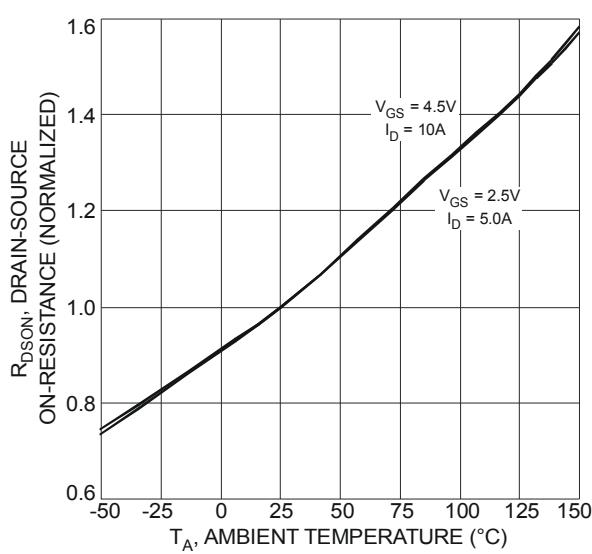
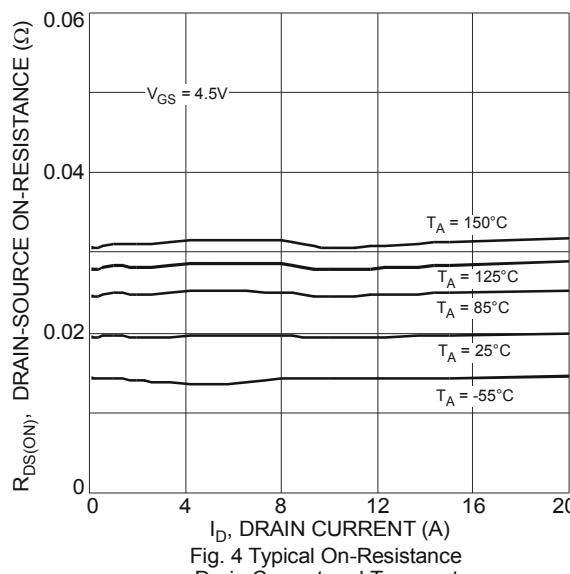
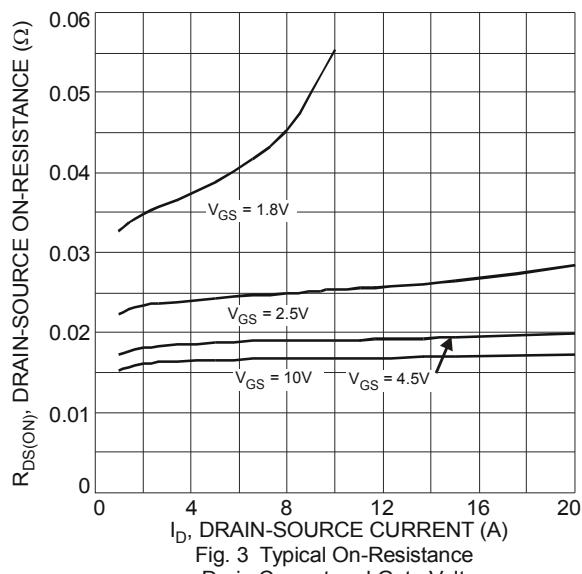
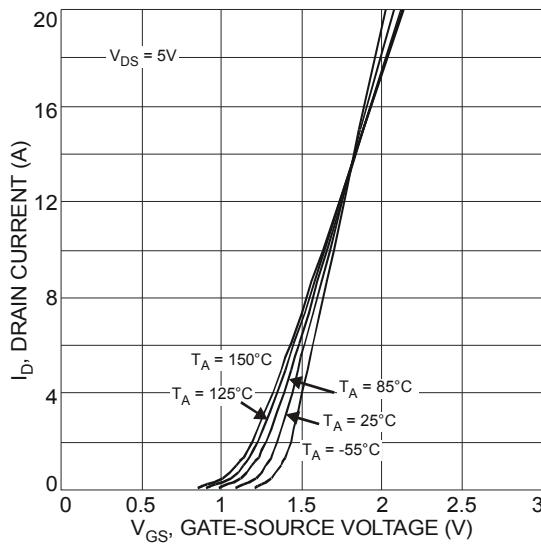
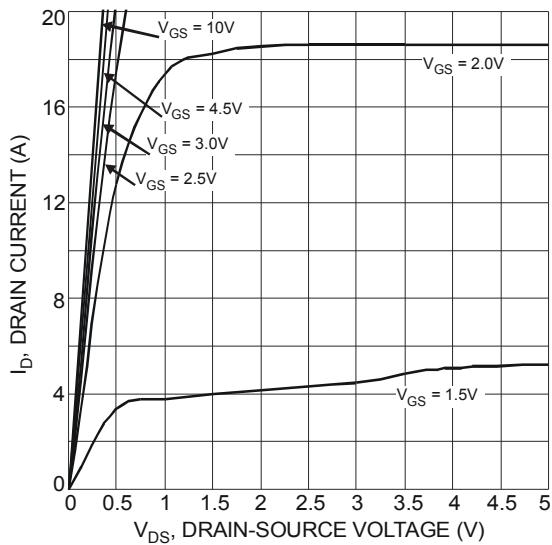
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	$P_D$	0.78	W
Thermal Resistance, Junction to Ambient @ $T_A = +25^\circ\text{C}$	$R_{\theta JA}$	161	°C/W
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	°C

Notes: 5. Device mounted on FR-4 PCB with minimum recommended pad layout.  
 6. 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 7)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	20	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current $T_J = 25^\circ\text{C}$	$I_{DSS}$	—	—	1.0	$\mu\text{A}$	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 100$	nA	$V_{GS} = \pm 12\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	0.5	—	1.2	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(\text{ON})}$	—	20 26	28 41	$\text{m}\Omega$	$V_{GS} = 4.5\text{V}, I_D = 6.0\text{A}$ $V_{GS} = 2.5\text{V}, I_D = 5.2\text{A}$
Forward Transfer Admittance	$ Y_{fs} $	—	6	—	S	$V_{DS} = 10\text{V}, I_D = 6\text{A}$
Diode Forward Voltage	$V_{SD}$	—	0.7	1.2	V	$V_{GS} = 0\text{V}, I_S = 1.7\text{A}$
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	$C_{iss}$	—	550	—	$\text{pF}$	$V_{DS} = 10\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	88	—		
Reverse Transfer Capacitance	$C_{rss}$	—	81	—	$\Omega$	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Gate Resistance	$R_g$	—	1.34	—		
Total Gate Charge (10V)	$Q_g$	—	15.6	—	$\text{nC}$	$V_{GS} = 10\text{V}, V_{DS} = 10\text{V}, I_D = 6\text{A}$
Total Gate Charge (4.5V)	$Q_g$	—	7.2	—		
Gate-Source Charge	$Q_{gs}$	—	1.0	—	$\text{nC}$	$V_{GS} = 4.5\text{V}, V_{DS} = 10\text{V}, I_D = 6\text{A}$
Gate-Drain Charge	$Q_{gd}$	—	1.9	—		
Turn-On Delay Time	$t_{D(on)}$	—	4.69	—	$\text{ns}$	$V_{DD} = 10\text{V}, V_{GEN} = 4.5\text{V}, R_{GEN} = 1\Omega, I_D = 6.7\text{A}$
Turn-On Rise Time	$t_r$	—	13.19	—		
Turn-Off Delay Time	$t_{D(off)}$	—	22.10	—		
Turn-Off Fall Time	$t_f$	—	6.43	—		

Notes: 7. Short duration pulse test used to minimize self-heating effect.  
 8. Guaranteed by design. Not subject to production testing.



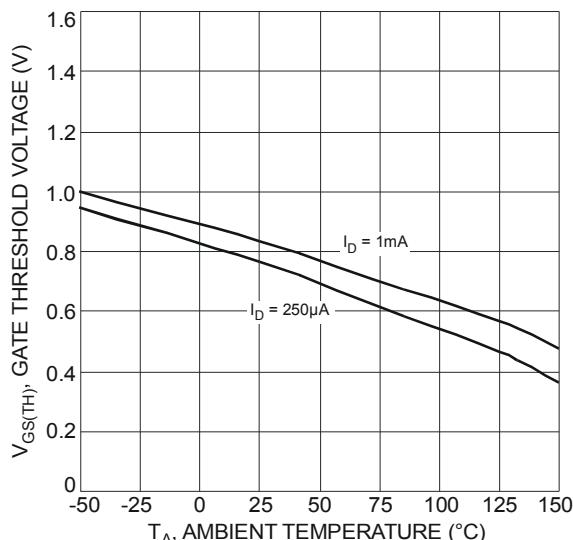


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

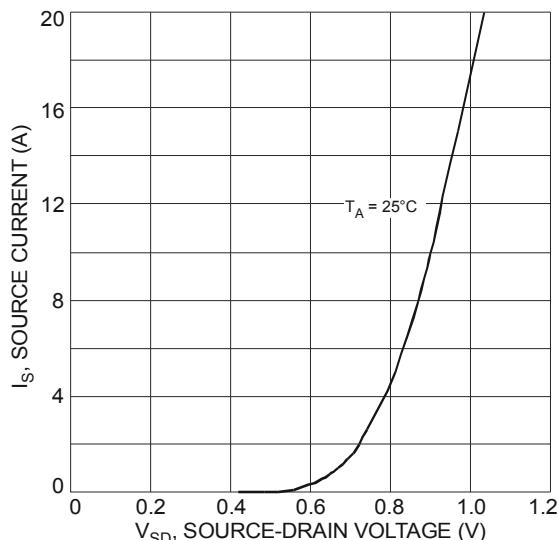


Fig. 8 Diode Forward Voltage vs. Current

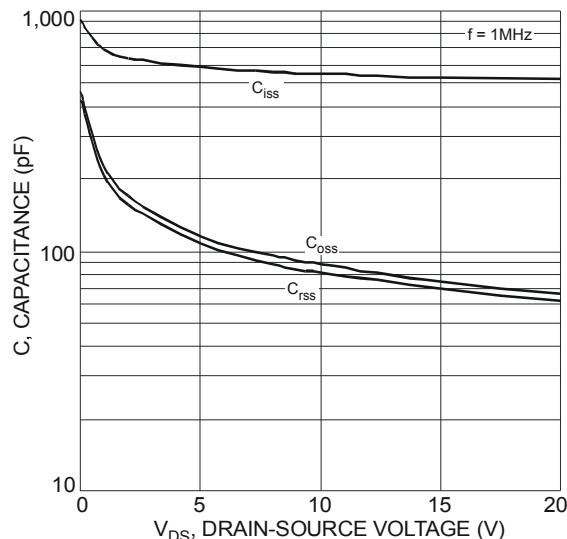


Fig. 9 Typical Total Capacitance

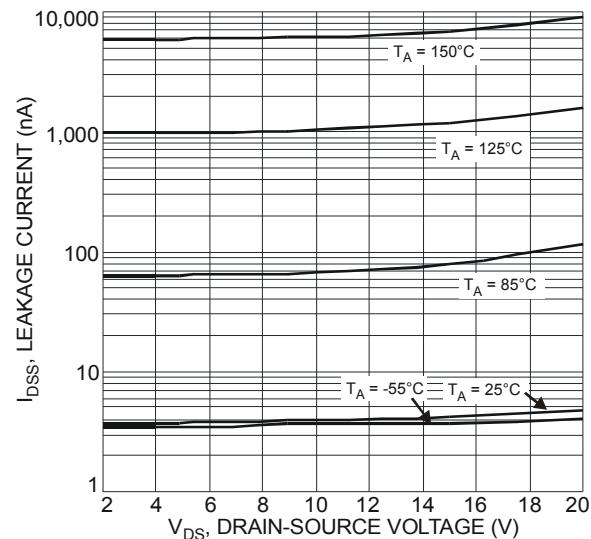


Fig. 10 Typical Leakage Current vs. Drain-Source Voltage

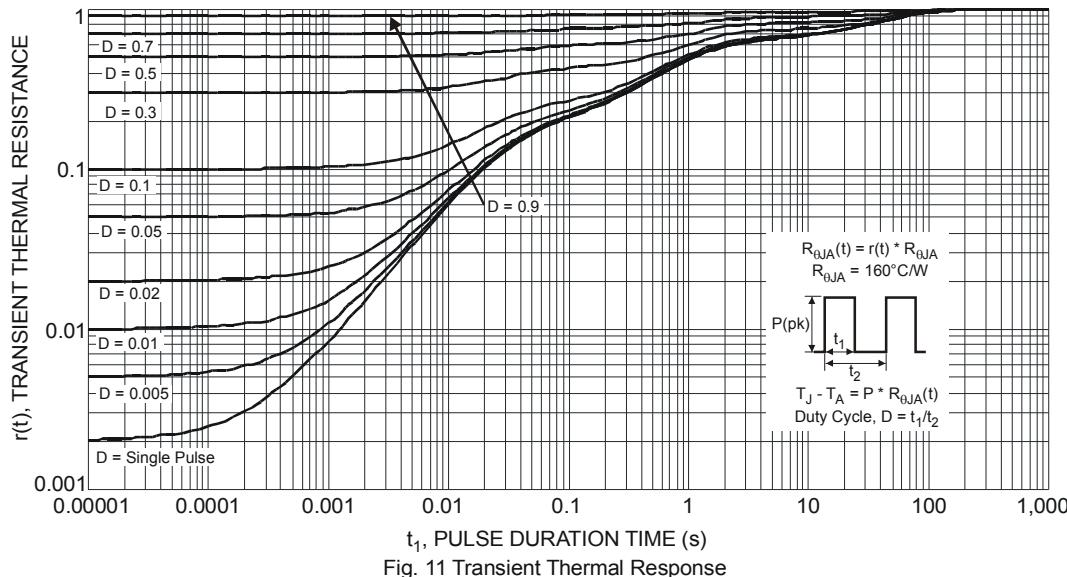
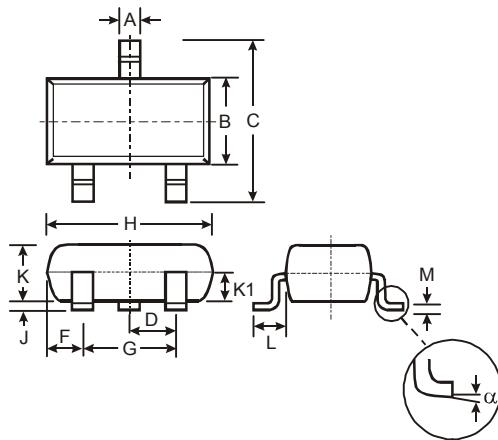


Fig. 11 Transient Thermal Response

## Package Outline Dimensions

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

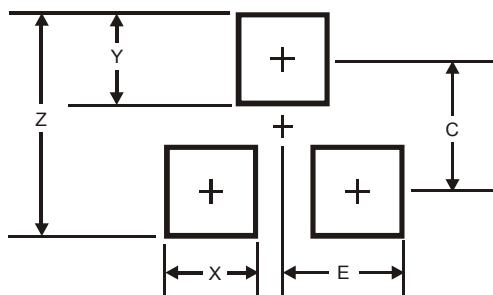


SOT-23			
Dim	Min	Max	Typ
<b>A</b>	0.37	0.51	0.40
<b>B</b>	1.20	1.40	1.30
<b>C</b>	2.30	2.50	2.40
<b>D</b>	0.89	1.03	0.915
<b>F</b>	0.45	0.60	0.535
<b>G</b>	1.78	2.05	1.83
<b>H</b>	2.80	3.00	2.90
<b>J</b>	0.013	0.10	0.05
<b>K</b>	0.903	1.10	1.00
<b>K1</b>	-	-	0.400
<b>L</b>	0.45	0.61	0.55
<b>M</b>	0.085	0.18	0.11
<b>α</b>	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)
<b>Z</b>	2.9
<b>X</b>	0.8
<b>Y</b>	0.9
<b>C</b>	2.0
<b>E</b>	1.35

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