



**THE DATASHEET OF  
DMN2100UDM-7**



## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$ max	$I_D$ max $T_A = 25^\circ\text{C}$
20V	55m $\Omega$ @ $V_{GS} = 4.5\text{V}$	4.0A
	70m $\Omega$ @ $V_{GS} = 2.5\text{V}$	3.5A
	90m $\Omega$ @ $V_{GS} = 1.8\text{V}$	3.1A
	130m $\Omega$ @ $V_{GS} = 1.5\text{V}$	2.5A

## Features and Benefits

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- ESD Protected Gate
- **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**

## Description and Applications

This new generation 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.

- General Purpose Interfacing Switch
- Power Management Functions

## Mechanical Data

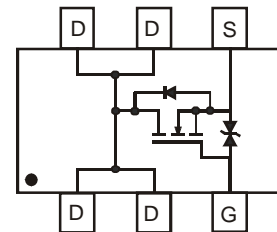
- Case: SOT26
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish — Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.015 grams (approximate)



SOT26



Top View

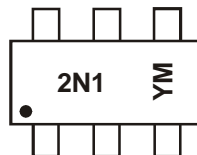

 Top View  
Internal Schematic

## Ordering Information (Note 4)

Part Number	Case	Packaging
DMN2100UDM-7	SOT26	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> 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>.

## Marking Information



2N1 = Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: U = 2007)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	
Code	U	V	W	X	Y	Z	A	B	C	D	E	
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<sub>A</sub> = 25°C unless otherwise specified

Characteristic		Symbol	Value	Units	
Drain-Source Voltage		V <sub>DSS</sub>	20	V	
Gate-Source Voltage		V <sub>GSS</sub>	±8	V	
Continuous Drain Current (Note 6) V <sub>GS</sub> = 4.5V	Steady State	I <sub>D</sub>	T <sub>A</sub> = 25°C T <sub>A</sub> = 70°C	4.0 3.1	A
	t < 10s		T <sub>A</sub> = 25°C T <sub>A</sub> = 70°C	4.5 3.5	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)		I <sub>DM</sub>	13	A	
Maximum Body Diode Continuous Current		I <sub>S</sub>	1.5	A	

**Thermal Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)	T <sub>A</sub> = 25°C	P <sub>D</sub>	1	W
	T <sub>A</sub> = 70°C		0.6	
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	R <sub>θJA</sub>	127	°C/W
	t < 10s		91	
Total Power Dissipation (Note 6)	T <sub>A</sub> = 25°C	P <sub>D</sub>	1.5	W
	T <sub>A</sub> = 70°C		0.9	
Thermal Resistance, Junction to Ambient (Note 6)	Steady state	R <sub>θJA</sub>	85	°C/W
	t < 10s		63	
Thermal Resistance, Junction to Case (Note 6)		R <sub>θJC</sub>	3.1	
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>	20	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250µA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	1	µA	V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±1	µA	V <sub>GS</sub> = ±8V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	0.6	—	1.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250µA
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	—	32	55	mΩ	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 6A
		—	43	70		V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 4.0A
		—	56	90		V <sub>GS</sub> = 1.8V, I <sub>D</sub> = 1.5A
		—	80	130		V <sub>GS</sub> = 1.5V, I <sub>D</sub> = 1.0A
Forward Transfer Admittance	Y <sub>fs</sub>	—	8	—	S	V <sub>DS</sub> = 10V, I <sub>D</sub> = 6A
Diode Forward Voltage	V <sub>SD</sub>	—	0.7	1.1	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 2A
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	C <sub>iss</sub>	—	555	—	pF	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	112	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	84	—	pF	
Total Gate Charge	Q <sub>g</sub>	—	8.8	—	nC	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 6.5A
Gate-Source Charge	Q <sub>gs</sub>	—	1.4	—	nC	
Gate-Drain Charge	Q <sub>gd</sub>	—	3	—	nC	
Turn-On Delay Time	t <sub>D(on)</sub>	—	53	—	ns	V <sub>DS</sub> = 10V, I <sub>D</sub> = 1.0A V <sub>GS</sub> = 4.5V, R <sub>G</sub> = 6Ω
Turn-On Rise Time	t <sub>r</sub>	—	78	—	ns	
Turn-Off Delay Time	t <sub>D(off)</sub>	—	561	—	ns	
Turn-Off Fall Time	t <sub>f</sub>	—	234	—	ns	

- Notes:
- Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
  - Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate
  - Short duration pulse test used to minimize self-heating effect
  - Guaranteed by design. Not subject to production testing

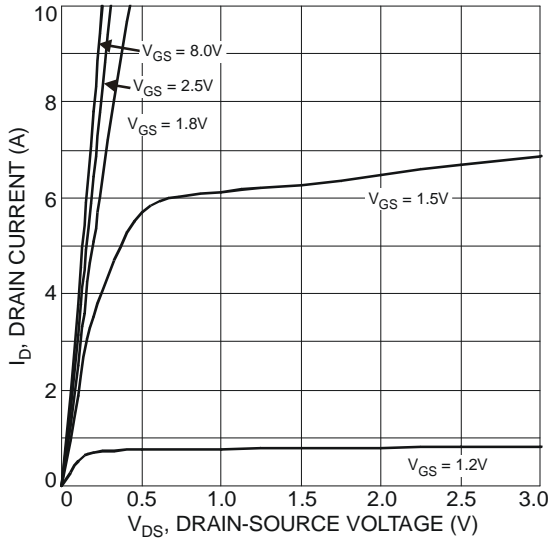


Fig. 1 Typical Output Characteristic

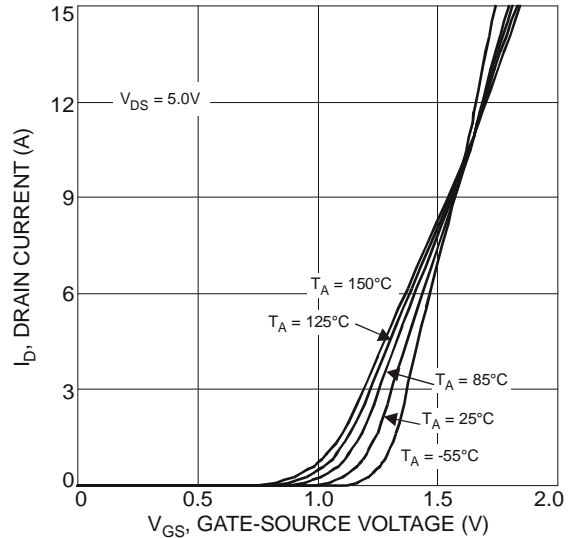


Fig. 2 Typical Transfer Characteristics

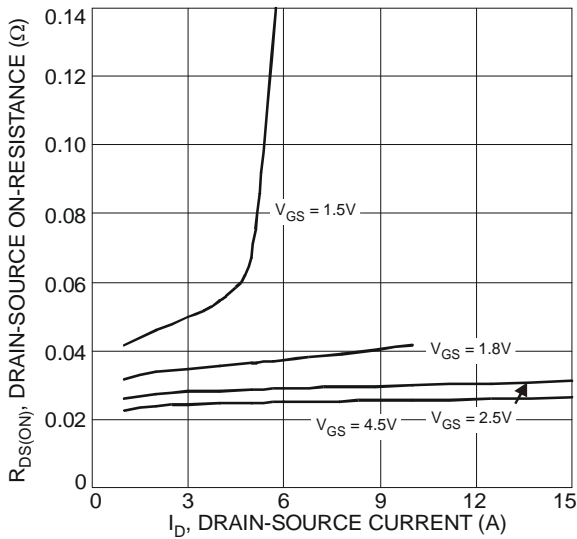


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

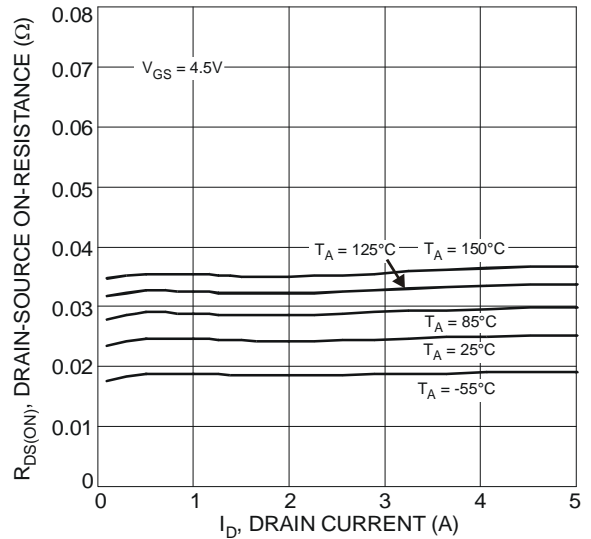


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

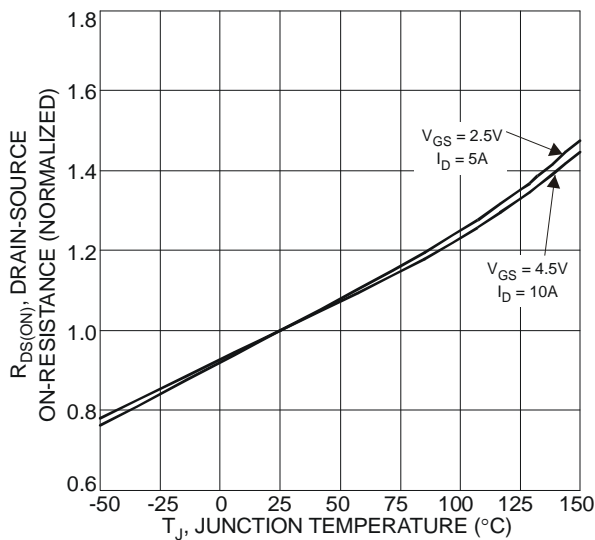


Fig. 5 On-Resistance Variation with Temperature

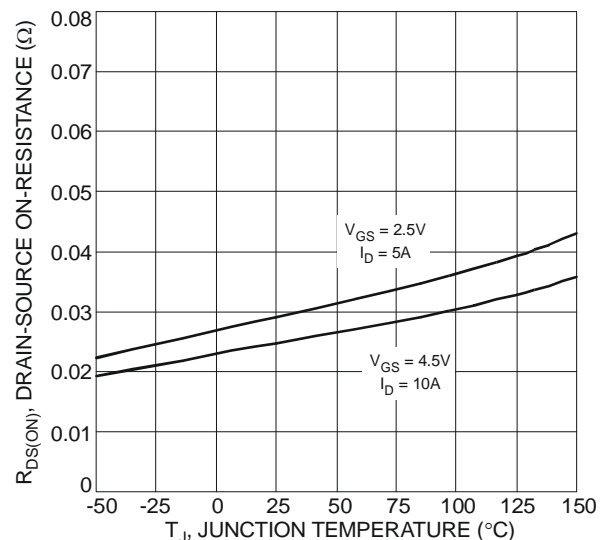


Fig. 6 On-Resistance Variation with Temperature

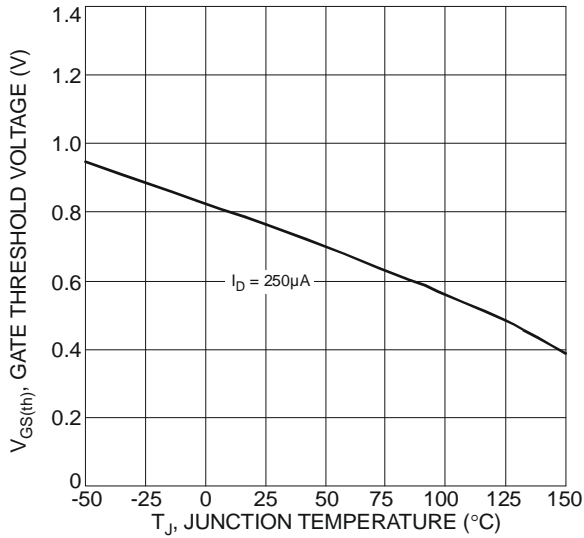


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

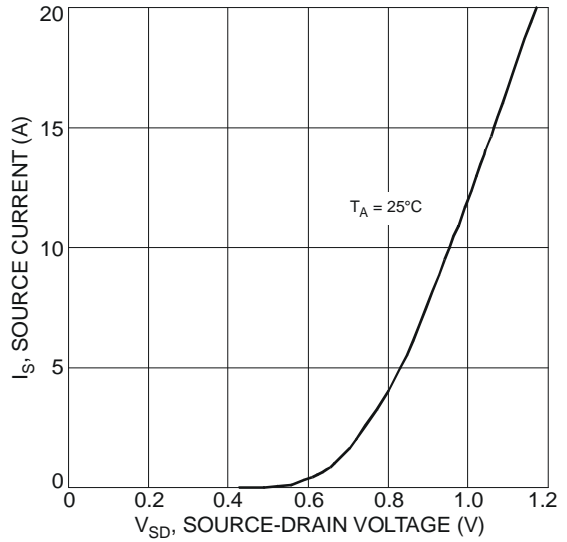


Fig. 8 Diode Forward Voltage vs. Current

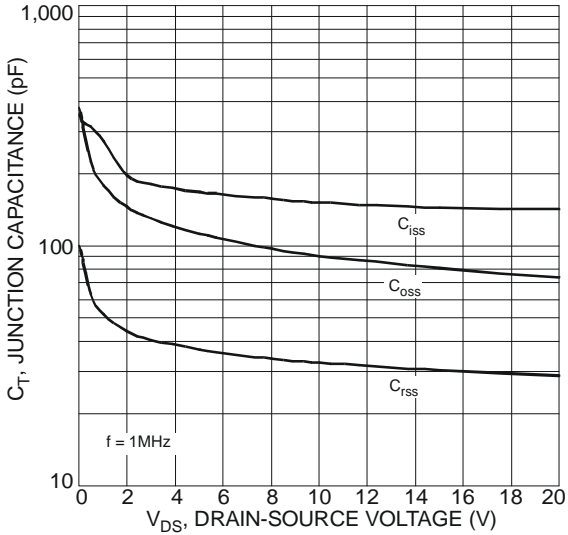


Fig. 9 Typical Junction Capacitance

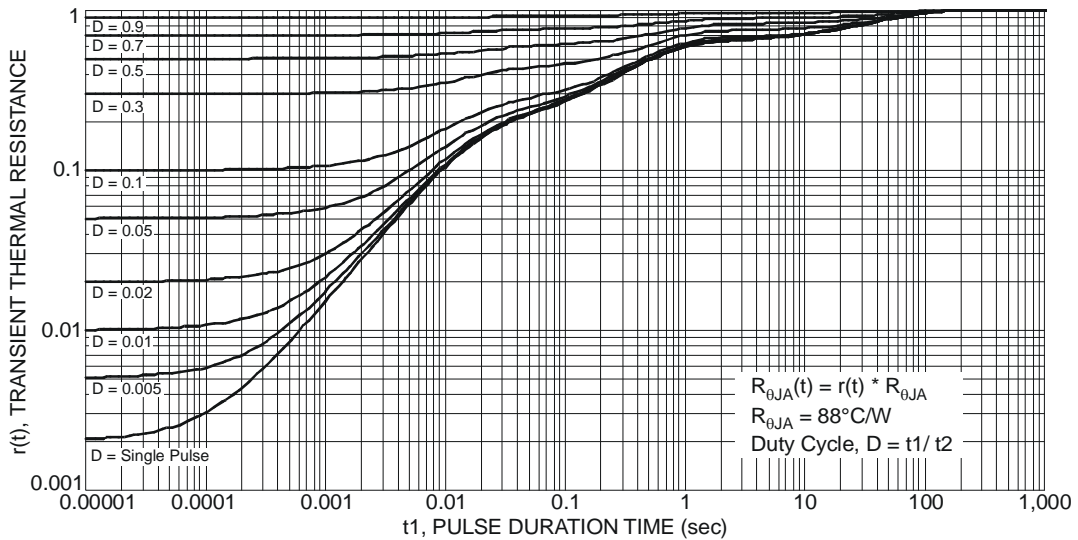
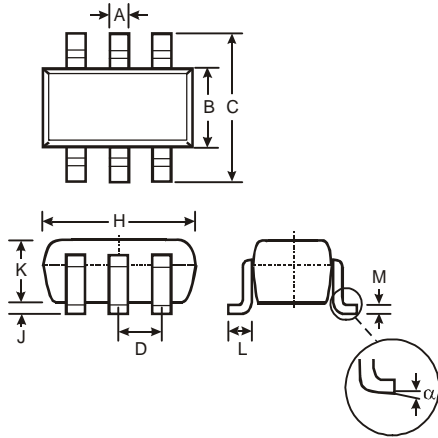


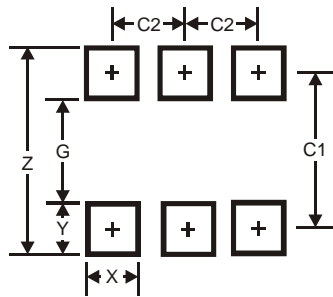
Fig. 10 Transient Thermal Resistance

**Package Outline Dimensions**



SOT26			
Dim	Min	Max	Typ
A	0.35	0.50	0.38
B	1.50	1.70	1.60
C	2.70	3.00	2.80
D	—	—	0.95
H	2.90	3.10	3.00
J	0.013	0.10	0.05
K	1.00	1.30	1.10
L	0.35	0.55	0.40
M	0.10	0.20	0.15
α	0°	8°	—
<b>All Dimensions in mm</b>			

**Suggested Pad Layout**



Dimensions	Value (in mm)
Z	3.20
G	1.60
X	0.55
Y	0.80
C1	2.40
C2	0.95

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