

## Product Summary

$V_{(BR)DSS}$	$R_{DS(ON) \max}$	$I_D$ $T_A = +25^\circ\text{C}$
20V	10Ω @ $V_{GS} = 4.5\text{V}$	0.5A
	14Ω @ $V_{GS} = 2.5\text{V}$	0.5A
	25Ω @ $V_{GS} = 1.5\text{V}$	0.1A

## Description

This new generation MOSFET is 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.

## Applications

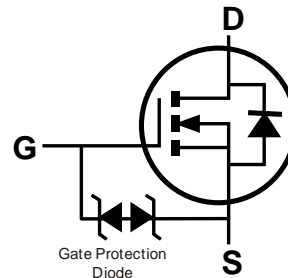
- Notebook Computer
- Portable Phone
- PCMCIA Cards and Battery Powered Circuits



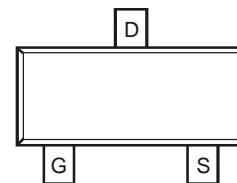
SC59



TOP VIEW



EQUIVALENT CIRCUIT


 TOP VIEW  
Pin Out Configuration

## Mechanical Data

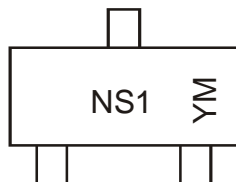
- Case: SC59
- Case Material - Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Finish Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Marking Information: See Page 3
- Ordering & Date Code Information: See Page 3
- Weight: 0.014 grams (approximate)

## Ordering Information (Note 4)

Part Number	Case	Packaging
DMN2112SN-7	SC59	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



### Date Code Key

Year	2007	2008	2009	...	2012	2013	2014	2015	2016	2017	2018
Code	U	V	W	...	Z	A	B	C	D	E	F

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	$V_{GSS}$	$\pm 8$	V
Drain Current	$I_D$	1.2 4.0	A

**Thermal Characteristics** (@ $T_A = +25^\circ\text{C}$  unless otherwise specified)

Characteristic	Symbol	Value	Units
Total Power Dissipation	$P_d$	500	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	250	$^\circ\text{C}/\text{W}$
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
<b>OFF CHARACTERISTICS (Note 5)</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	$I_{DSS}$	—	—	10	$\mu\text{A}$	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}$
Gate-Body Leakage	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 8\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 5)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	0.5	—	1.2	V	$V_{DS} = 10\text{V}, I_D = 1.0\text{mA}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	—	0.10 0.14 0.25	$\Omega$	$V_{GS} = 4.5\text{V}, I_D = 0.5\text{A}$ $V_{GS} = 2.5\text{V}, I_D = 0.5\text{A}$ $V_{GS} = 1.5\text{V}, I_D = 0.1\text{A}$
Forward Transfer Admittance	$ Y_{fs} $	—	4.2	—	S	$V_{DS} = 10\text{V}, I_D = 0.5\text{A}$
Diode Forward Voltage	$V_{SD}$	—	0.8	1.1	V	$V_{GS} = 0\text{V}, I_S = 1\text{A}$
<b>DYNAMIC CHARACTERISTICS (Note 6)</b>						
Input Capacitance	$C_{iss}$	—	220	—	pF	$V_{DS} = 10\text{V}, V_{GS} = 0\text{V}$ $f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	120	—	pF	
Reverse Transfer Capacitance	$C_{rss}$	—	45	—	pF	
<b>SWITCHING CHARACTERISTICS (Note 6)</b>						
Turn-On Delay Time	$t_{D(ON)}$	—	10	—	ns	$V_{DD} = 5\text{V}, I_D = 0.5\text{A},$ $V_{GS} = 10\text{V}, R_{GEN} = 50\Omega$
Turn-Off Delay Time	$t_{D(OFF)}$	—	75	—	ns	
Turn-On Rise Time	$t_r$	—	15	—	ns	
Turn-Off Fall Time	$t_f$	—	65	—	ns	

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

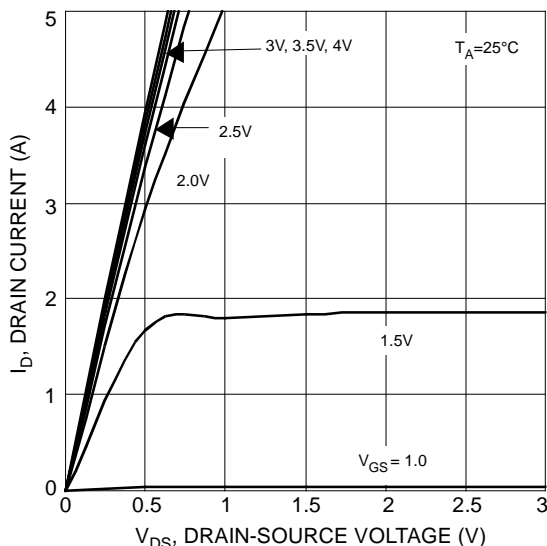


Fig. 1 Typical Output Characteristics

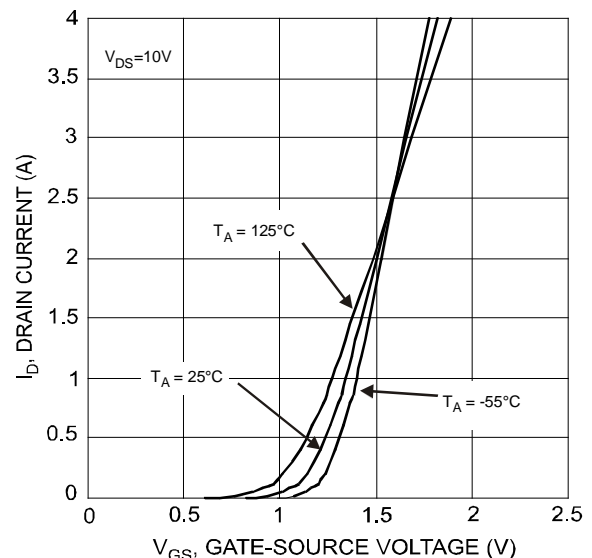


Fig. 2 Typical Transfer Characteristics

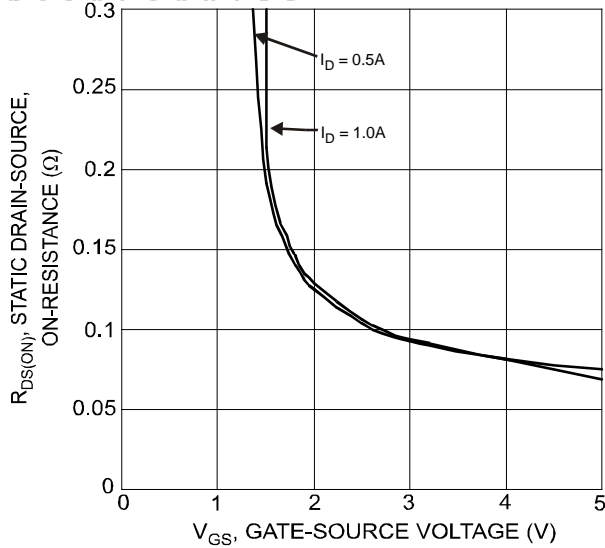


Fig. 3 On-Resistance vs. Gate Voltage

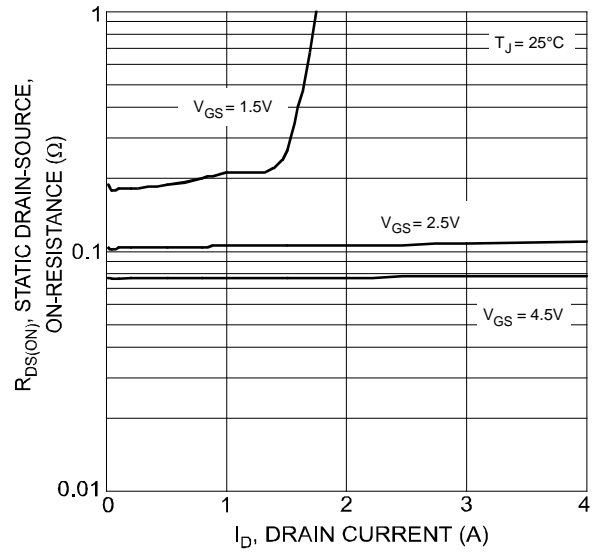


Fig. 4 On-Resistance vs. Drain Current

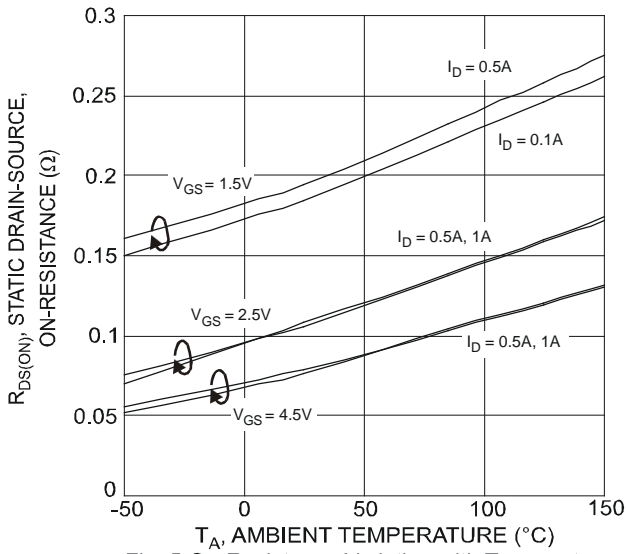


Fig. 5 On-Resistance Variation with Temperature

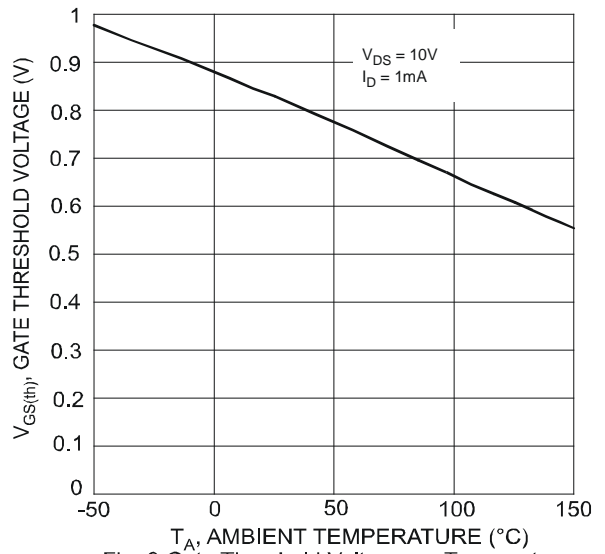


Fig. 6 Gate Threshold Voltage vs. Temperature

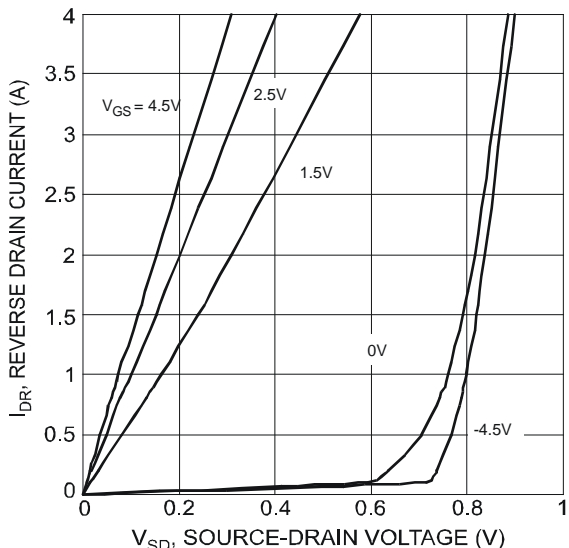


Fig. 7 Reverse Drain Current vs. Source-Drain Voltage

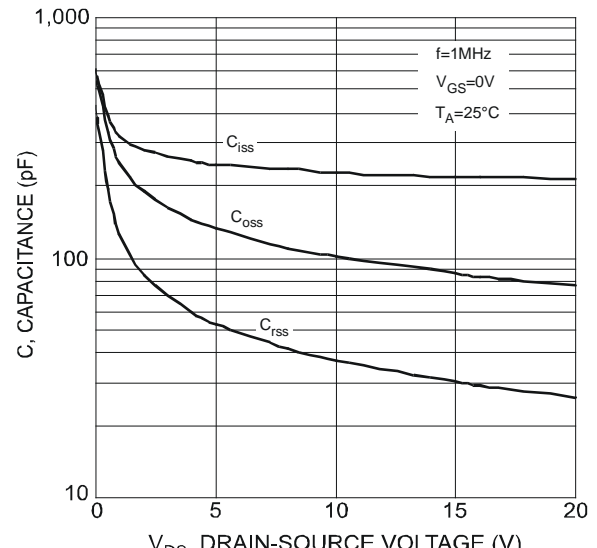
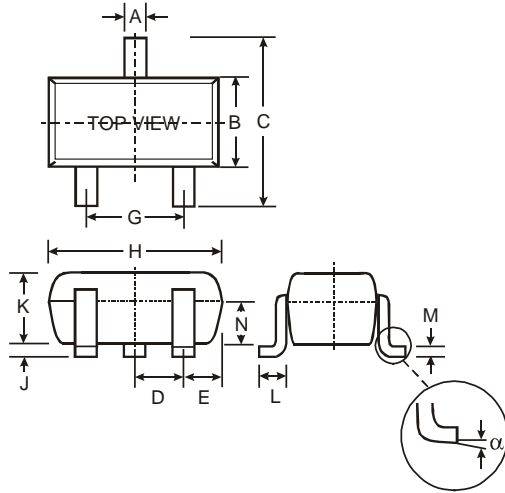


Fig. 8 Typical Junction Capacitance

**Package Outline Dimensions**

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



SC59		
Dim	Min	Max
A	0.35	0.50
B	1.50	1.70
C	2.70	3.00
D	0.95	
E	—	
G	1.90	
H	2.90	3.10
J	0.013	0.10
K	1.00	1.30
L	0.35	0.55
M	0.10	0.20
N	0.70	0.80
α	0°	8°
All Dimensions in mm		

**Suggested Pad Layout**

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for latest version.

Dimensions	Value (in mm)
Z	4.0
G	1.2
X	0.9
Y	1.4
C	2.6
E	0.95

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