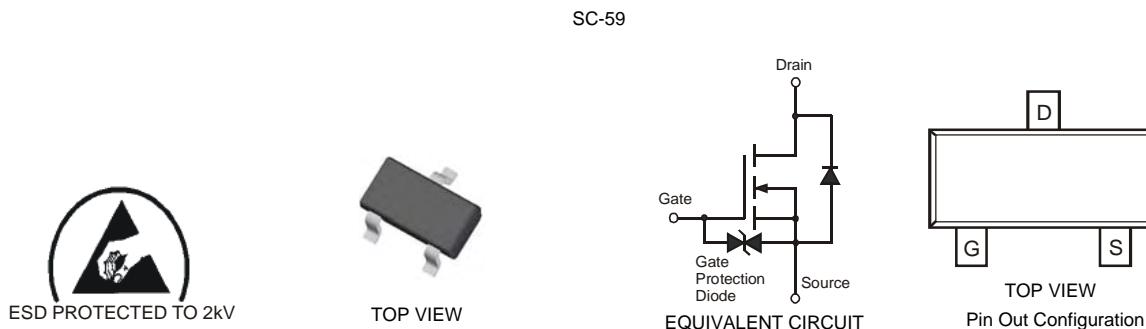


Features

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- ESD Protected Up To 2KV
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

- Case: SC-59
- 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
- Terminal Connections: See Diagram
- Marking Information: See Page 2
- Ordering Information: See Page 2
- Weight: 0.014 grams (approximate)



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}	± 12	V
Continuous Drain Current	Steady State	$T_A = 25^\circ\text{C}$	I_D	6.9	A
$T_A = 85^\circ\text{C}$				4.5	A
Pulsed Drain Current (Note 4)			I_{DM}	30	A

Thermal Characteristics

Characteristic	Symbol	Value	Units
Power Dissipation (Note 3)	P_D	0.61	W
Thermal Resistance, Junction to Ambient @ $T_A = 25^\circ\text{C}$ (Note 3)	$R_{\theta JA}$	204	$^\circ\text{C}/\text{W}$
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.
 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
OFF CHARACTERISTICS (Note 5)						
Drain-Source Breakdown Voltage	BV_{DSS}	20	-	-	V	$V_{\text{GS}} = 0\text{V}$, $I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current $T_J = 25^\circ\text{C}$	I_{DSS}	-	-	1.0	μA	$V_{\text{DS}} = 20\text{V}$, $V_{\text{GS}} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	-	-	± 10	μA	$V_{\text{GS}} = \pm 12\text{V}$, $V_{\text{DS}} = 0\text{V}$
ON CHARACTERISTICS (Note 5)						
Gate Threshold Voltage	$V_{\text{GS(th)}}$	0.5	1.0	1.5	V	$V_{\text{DS}} = V_{\text{GS}}$, $I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{\text{DS(on)}}$	-	13 18	20 28	$\text{m}\Omega$	$V_{\text{GS}} = 4.5\text{V}$, $I_D = 9.4\text{A}$ $V_{\text{GS}} = 2.5\text{V}$, $I_D = 8.3\text{A}$
Forward Transfer Admittance	$ Y_{\text{fs}} $	-	16	-	S	$V_{\text{DS}} = 5\text{V}$, $I_D = 9.4\text{A}$
Diode Forward Voltage	V_{SD}	-	0.7	1.2	V	$V_{\text{GS}} = 0\text{V}$, $I_S = 1.3\text{A}$
DYNAMIC CHARACTERISTICS (Note 6)						
Input Capacitance	C_{iss}	-	1149	-	pF	$V_{\text{DS}} = 10\text{V}$, $V_{\text{GS}} = 0\text{V}$, $f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	-	157	-	pF	
Reverse Transfer Capacitance	C_{rss}	-	142	-	pF	
Gate Resistance	R_g	-	1.51	-	Ω	$V_{\text{DS}} = 0\text{V}$, $V_{\text{GS}} = 0\text{V}$, $f = 1\text{MHz}$
Total Gate Charge	Q_g	-	11.6	-	nC	
Gate-Source Charge	Q_{qs}	-	2.7	-	nC	$V_{\text{GS}} = 4.5\text{V}$, $V_{\text{DS}} = 10\text{V}$, $I_D = 9.4\text{A}$
Gate-Drain Charge	Q_{qd}	-	3.4	-	nC	
Turn-On Delay Time	$t_{\text{D(on)}}$	-	11.67	-	ns	
Turn-On Rise Time	t_r	-	12.49	-	ns	
Turn-Off Delay Time	$t_{\text{D(off)}}$	-	35.89	-	ns	$V_{\text{DD}} = 10\text{V}$, $V_{\text{GS}} = 4.5\text{V}$, $R_{\text{GEN}} = 6\Omega$, $I_D = 1\text{A}$
Turn-Off Fall Time	t_f	-	12.33	-	ns	

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

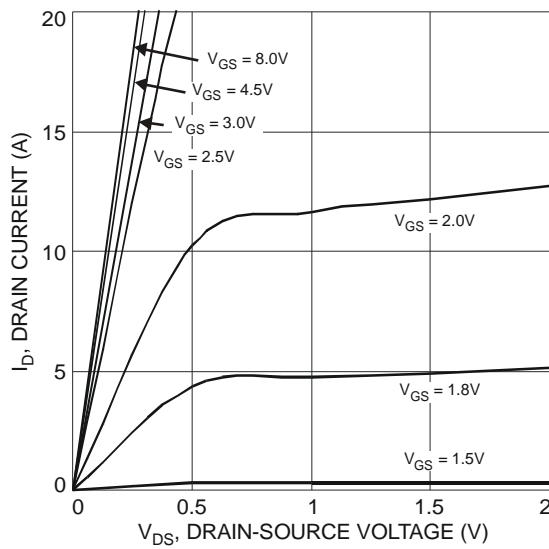


Fig. 1 Typical Output Characteristics

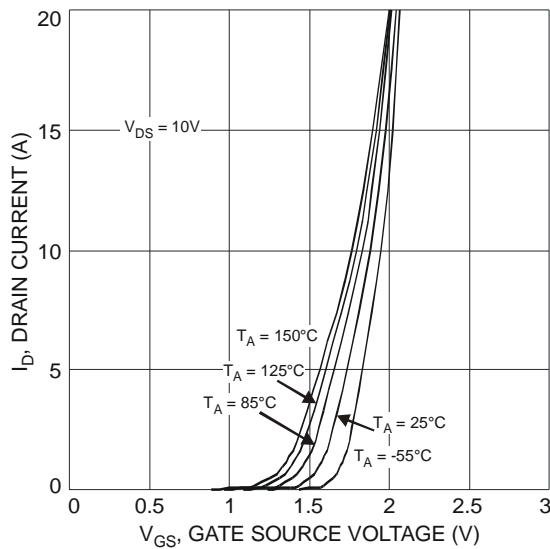


Fig. 2 Typical Transfer Characteristics

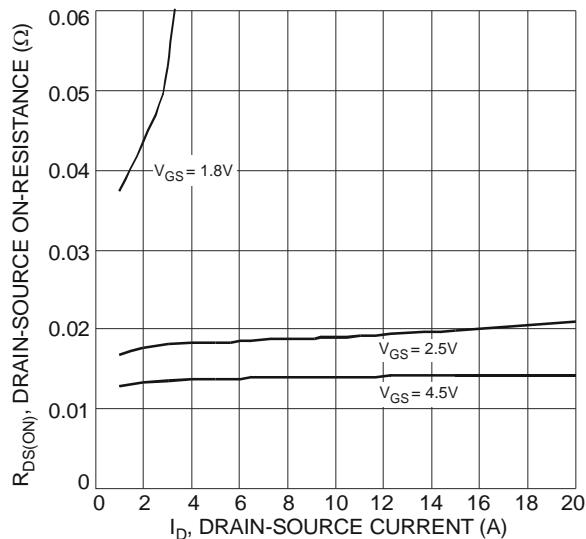


Fig. 3 Typical On-Resistance
vs. Drain Current and Gate Voltage

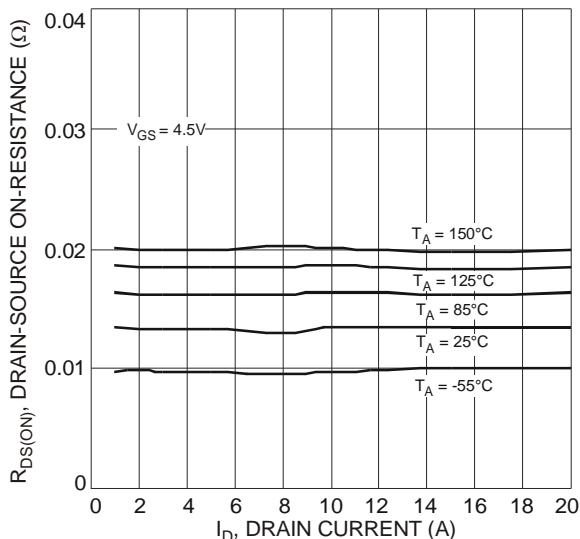


Fig. 4 Typical Drain-Source On-Resistance
vs. Drain Current and Temperature

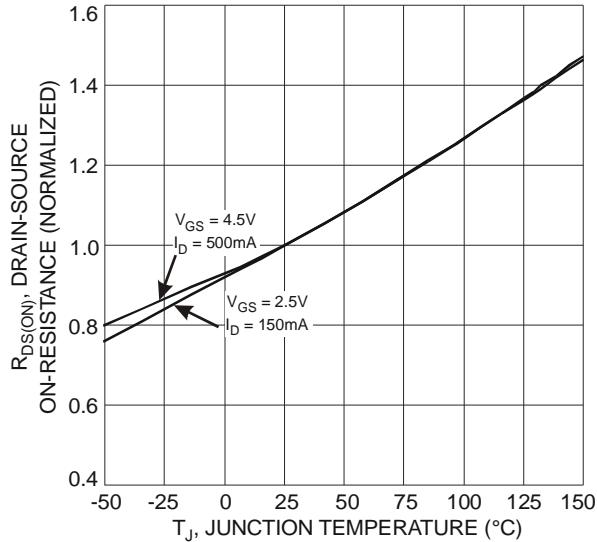


Fig. 5 On-Resistance Variation with Temperature

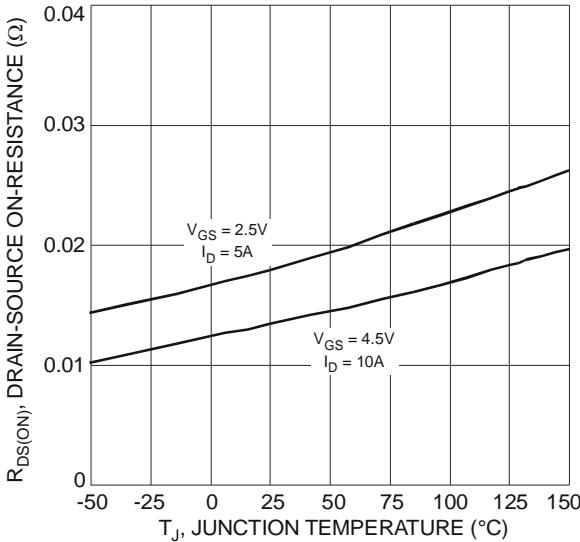


Fig. 6 On-Resistance Variation with Temperature

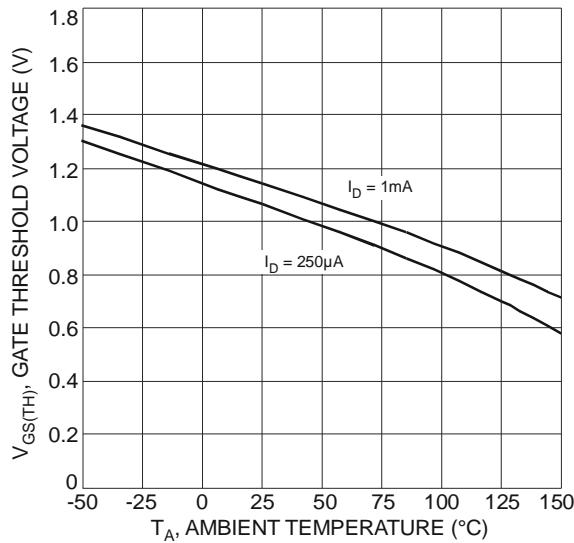


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

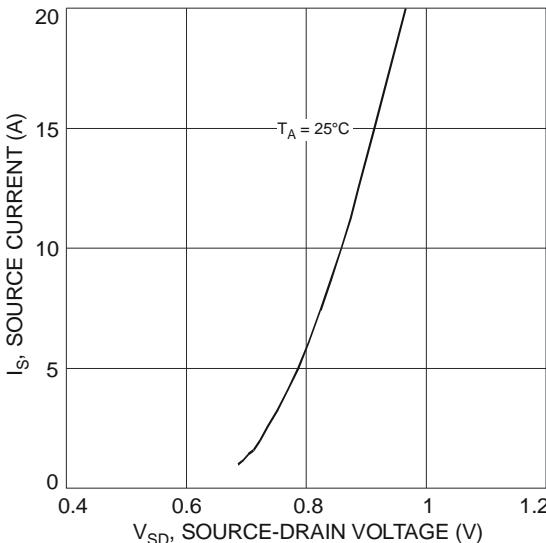


Fig. 8 Diode Forward Voltage vs. Current

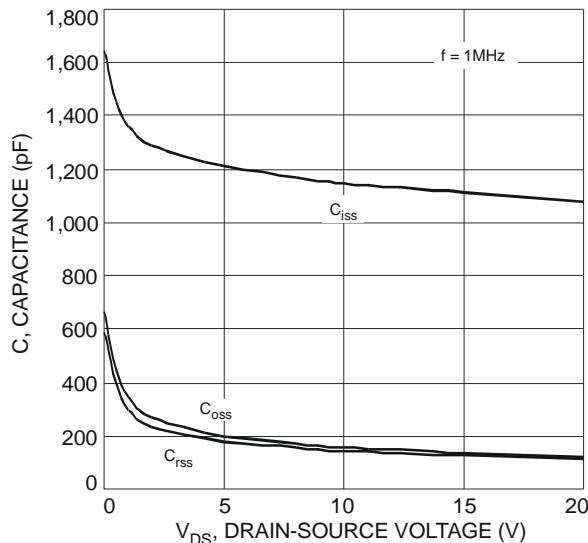


Fig. 9 Typical Capacitance

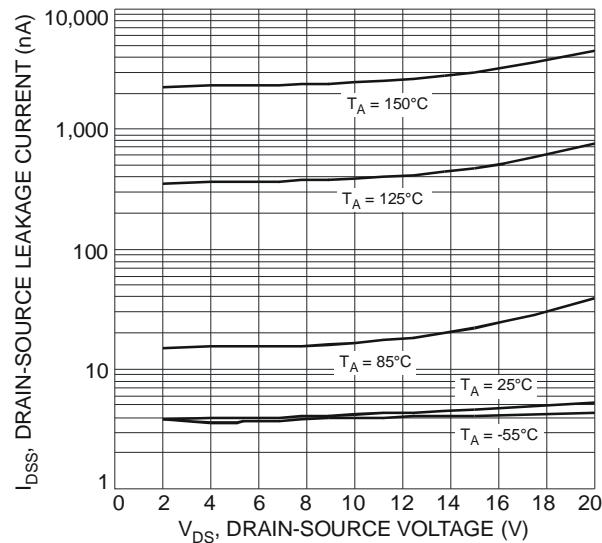


Fig. 10 Typical Drain-Source Leakage Current vs. Drain-Source Voltage

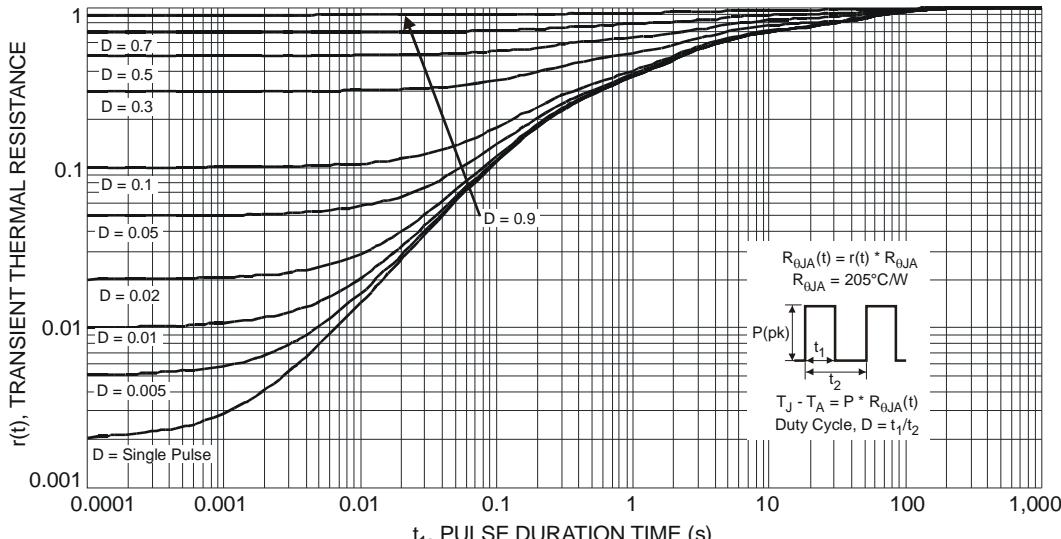


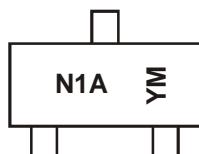
Fig. 11 Transient Thermal Response

Ordering Information (Note 7)

Part Number	Case	Packaging
DMN2020LSN-7	SC-59	3000/Tape & Reel

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

Marking Information

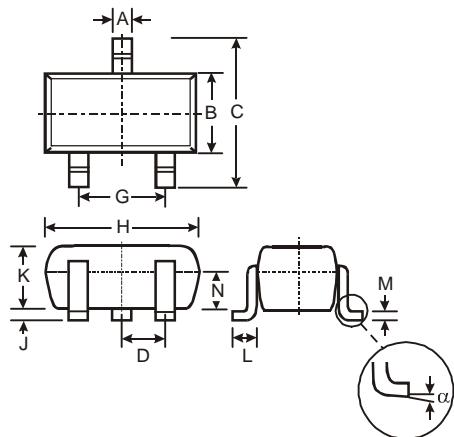


N1A = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: W = 2009)
 M = Month (ex: 9 = September)

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

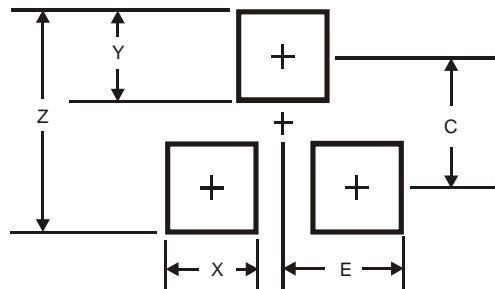
Package Outline Dimensions



SC-59			
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
G	-	-	1.90
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
N	0.70	0.80	0.75
α	0°	8°	-

All Dimensions in mm

Suggested Pad Layout



Dimensions	Value (in mm)
Z	3.4
X	0.8
Y	1.0
C	2.4
E	1.35

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