

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**

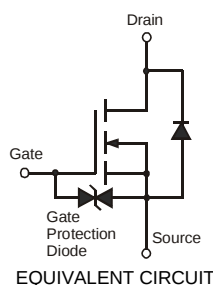
Mechanical Data

- 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)

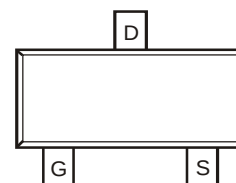
SC-59



TOP VIEW



EQUIVALENT CIRCUIT



TOP VIEW

Pin Out Configuration

Maximum Ratings @T_A = 25°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°C	I _D	6.9	A
		T _A = 85°C		4.5	
Pulsed Drain Current (Note 4)			I _{DM}	30	A

Thermal Characteristics

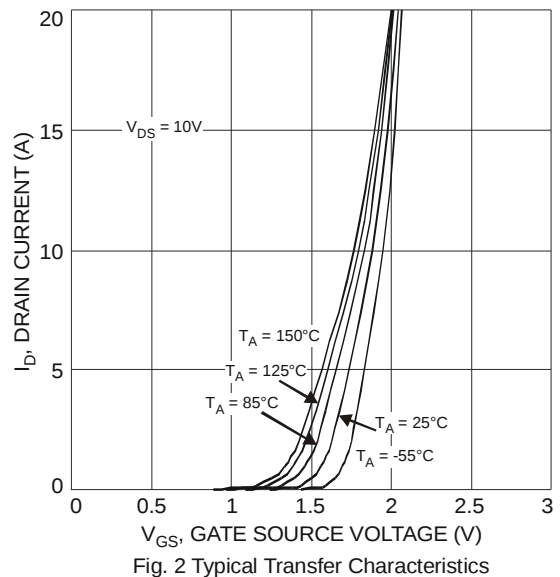
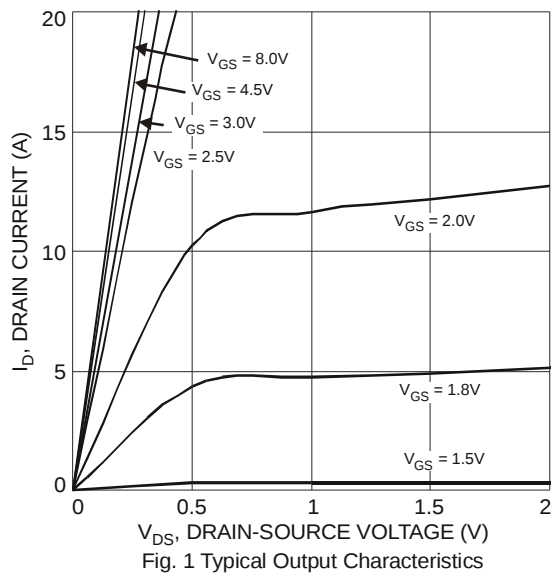
Characteristic	Symbol	Value	Units
Power Dissipation (Note 3)	P _D	0.61	W
Thermal Resistance, Junction to Ambient @T _A = 25°C (Note 3)	R _{θJA}	204	°C /W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

- 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 T _J = 25°C	I _{DSS}	-	-	1.0	μA	V _{DS} = 20V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	-	-	±10	μA	V _{GS} = ±12V, V _{DS} = 0V
ON CHARACTERISTICS (Note 5)						
Gate Threshold Voltage	V _{GS(th)}	0.5	1.0	1.5	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(on)}	-	13 18	20 28	mΩ	V _{GS} = 4.5V, I _D = 9.4A V _{GS} = 2.5V, I _D = 8.3A
Forward Transfer Admittance	Y _{fs}	-	16	-	S	V _{DS} = 5V, I _D = 9.4A
Diode Forward Voltage	V _{SD}	-	0.7	1.2	V	V _{GS} = 0V, I _S = 1.3A
DYNAMIC CHARACTERISTICS (Note 6)						
Input Capacitance	C _{iss}	-	1149	-	pF	V _{DS} = 10V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	-	157	-	pF	
Reverse Transfer Capacitance	C _{rss}	-	142	-	pF	
Gate Resistance	R _g	-	1.51	-	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge	Q _g	-	11.6	-	nC	V _{GS} = 4.5V, V _{DS} = 10V, I _D = 9.4A
Gate-Source Charge	Q _{gs}	-	2.7	-	nC	
Gate-Drain Charge	Q _{gd}	-	3.4	-	nC	
Turn-On Delay Time	t _{D(on)}	-	11.67	-	ns	V _{DD} = 10V, V _{GS} = 4.5V, R _{GEN} = 6Ω, I _D = 1A
Turn-On Rise Time	t _r	-	12.49	-	ns	
Turn-Off Delay Time	t _{D(off)}	-	35.89	-	ns	
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.



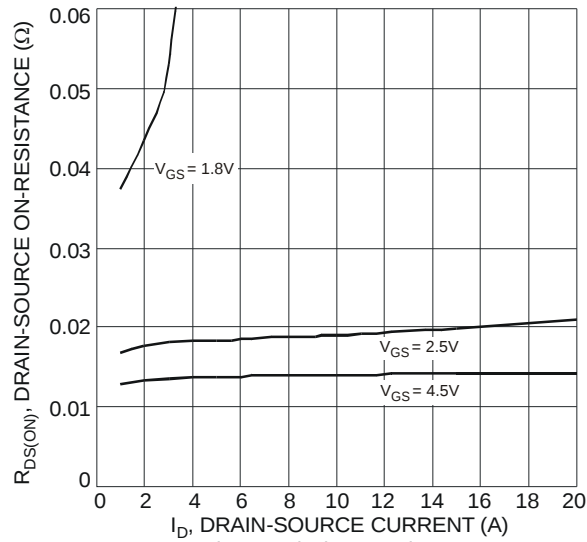


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

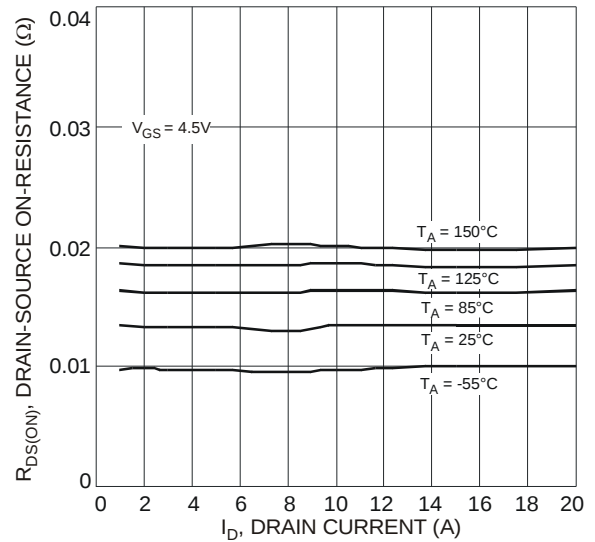


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

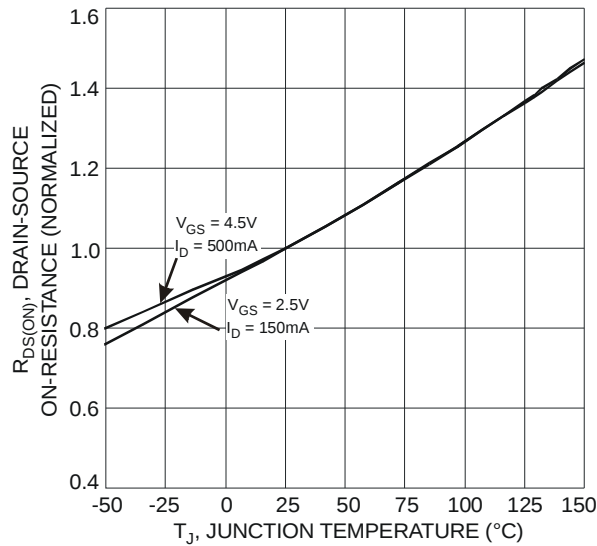


Fig. 5 On-Resistance Variation with Temperature

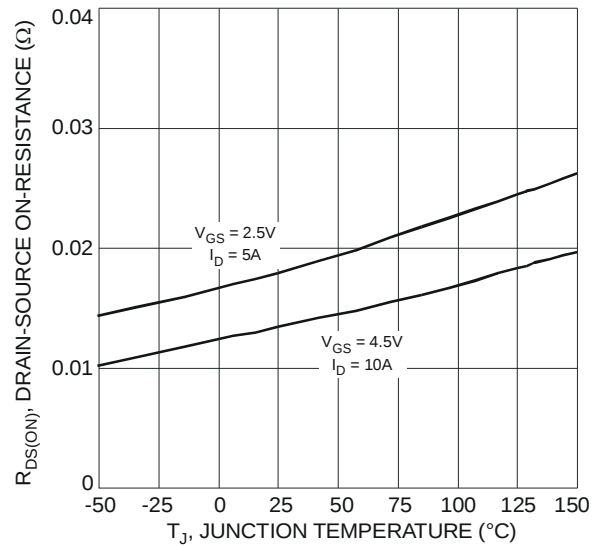


Fig. 6 On-Resistance Variation with Temperature

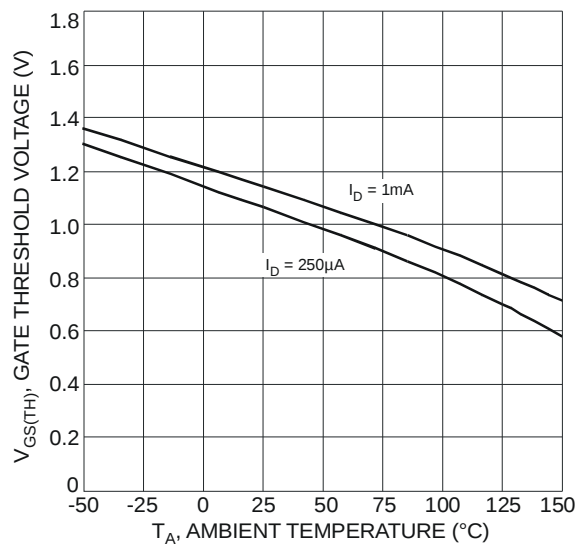


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

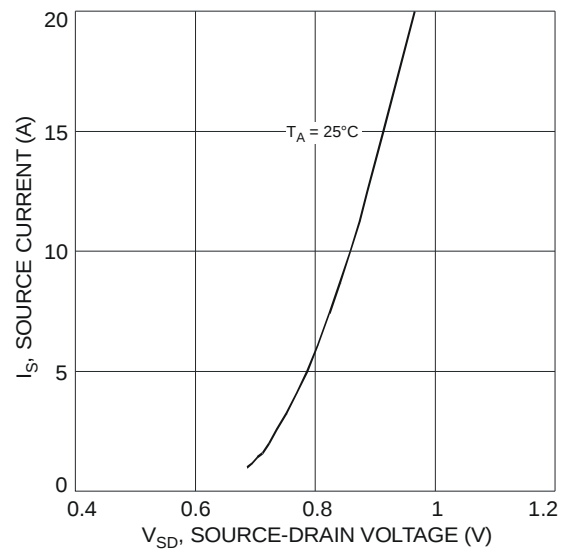
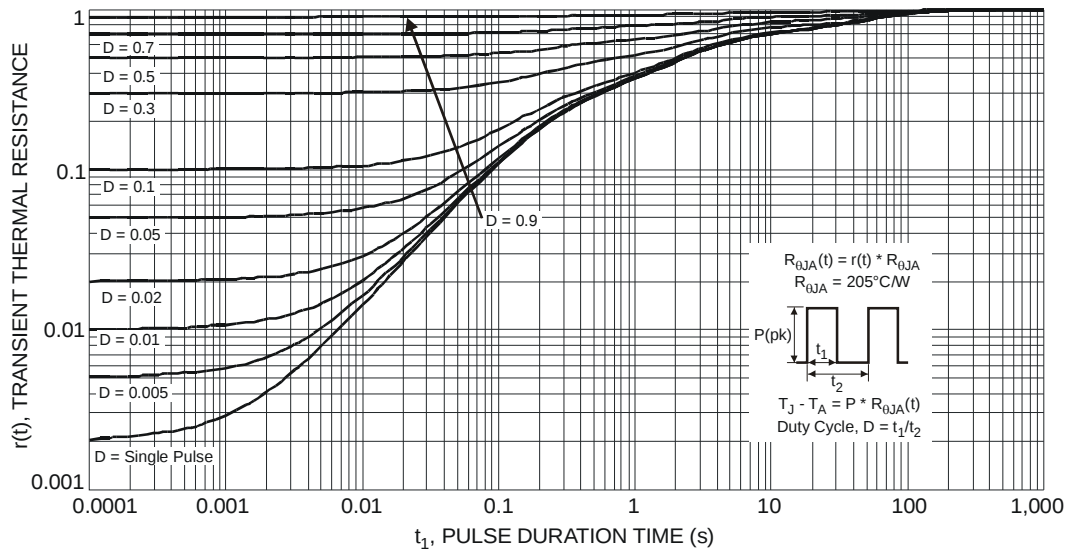
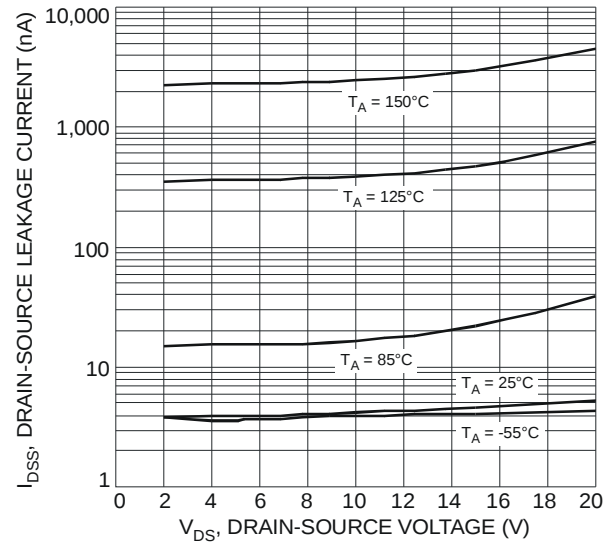
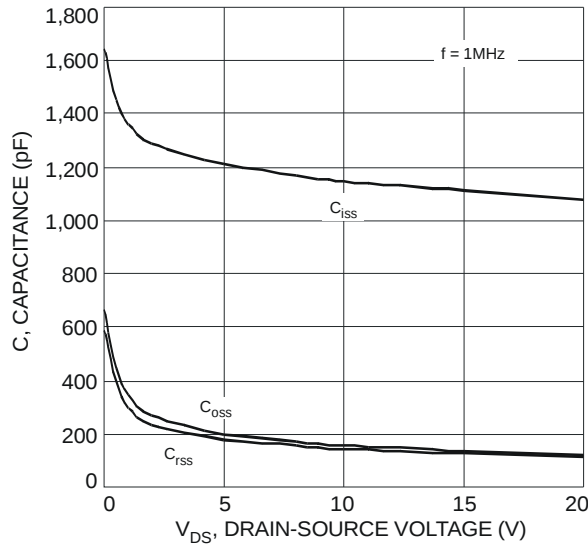


Fig. 8 Diode Forward Voltage vs. Current

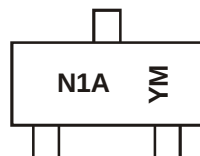


Ordering Information (Note 7)

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



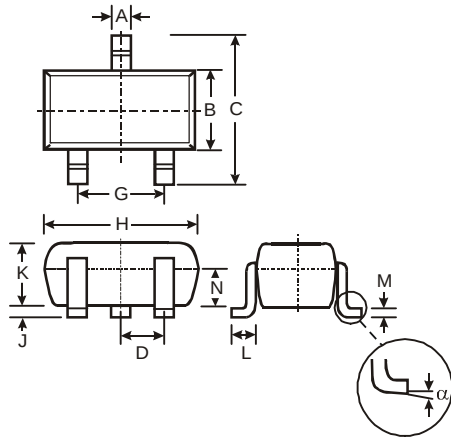
N1A = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: W = 2009)
M = Month (ex: 9 = September)

Date Code Key

Year	2009	2010	2011	2012	2013	2014	2015
Code	W	X	Y	Z	A	B	C

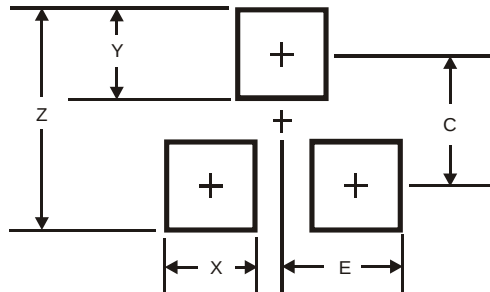
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

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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