





N-CHANNEL ENHANCEMENT MODE MOSFET

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

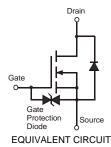
- Case: SC-59
- Case Material Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Marking Information: See Page 2
- Ordering Information: See Page 2
- Weight: 0.014 grams (approximate)

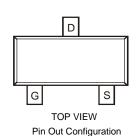
SC-59





TOP VIEW





 $\begin{tabular}{ll} \textbf{Maximum Ratings} & @T_A = 25^{\circ}C \ unless \ otherwise \ specified \end{tabular}$

Charae	cteristic		Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	20	V
Gate-Source Voltage Continuous			V_{GSS}	±12	V
Continuous Drain Current Steady $T_A = 25^{\circ}C$ State $T_A = 85^{\circ}C$			I _D	6.9 4.5	Α
Pulsed Drain Current (Note 4)			I _{DM}	30	А

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)	$R_{ hetaJA}$	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.

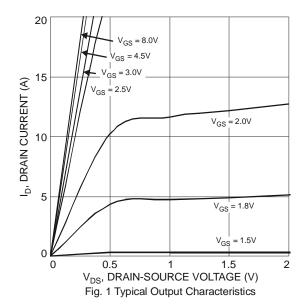


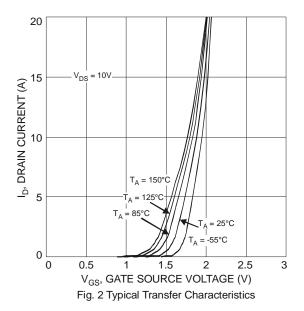
Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 5)							
Drain-Source Breakdown Voltage	BV _{DSS}	20	-	-	V	$V_{GS} = 0V, I_D = 250\mu A$	
Zero Gate Voltage Drain Current T _J = 25°C	I _{DSS}	1	-	1.0	μΑ	$V_{DS} = 20V, V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}	-	-	±10	μΑ	$V_{GS} = \pm 12V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 5)							
Gate Threshold Voltage	$V_{GS(th)}$	0.5	1.0	1.5	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	
Static Drain-Source On-Resistance	R _{DS (ON)}	_	13	20	mΩ	$V_{GS} = 4.5V, I_D = 9.4A$	
			18	28		$V_{GS} = 2.5V, I_D = 8.3A$	
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	$V_{DS} = 10V, V_{GS} = 0V,$	
Output Capacitance	C_{oss}	-	157	-	pF	-f = 1.0MHz	
Reverse Transfer Capacitance	C_{rss}	-	142	-	pF	1 - 1.01/11/2	
Gate Resistance	R_g	•	1.51	-	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge	Q_{g}	1	11.6	-	nC	$V_{GS} = 4.5 \text{V}, V_{DS} = 10 \text{V},$	
Gate-Source Charge	Q_qs	-	2.7	-	nC	$V_{GS} = 4.5V, V_{DS} = 10V,$ $V_{ID} = 9.4A$	
Gate-Drain Charge	Q_gd	1	3.4	1	nC	ID = 3.4A	
Turn-On Delay Time	$t_{D(on)}$	-	11.67	-	ns		
Turn-On Rise Time	t _r	-	12.49	-	ns	$V_{DD} = 10V, V_{GS} = 4.5V,$	
Turn-Off Delay Time	t _{D(off)}	-	35.89	-	ns	$R_{GEN} = 6\Omega$, $I_D = 1A$	
Turn-Off Fall Time	t _f	-	12.33	-	ns		

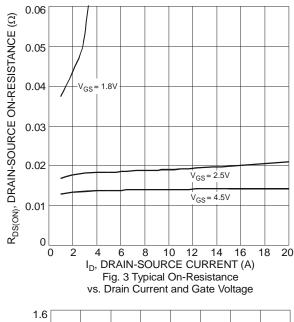
Notes:

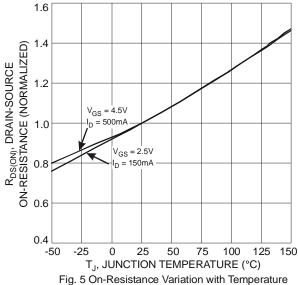
- 5. Short duration pulse test used to minimize self-heating effect.
- 6. Guaranteed by design. Not subject to production testing.











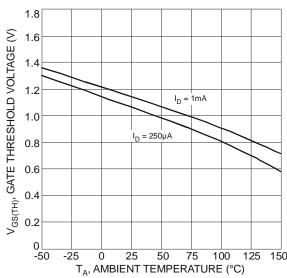


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

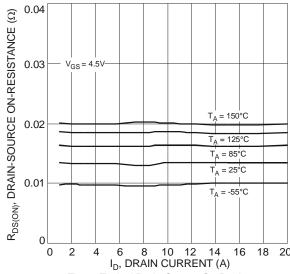


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

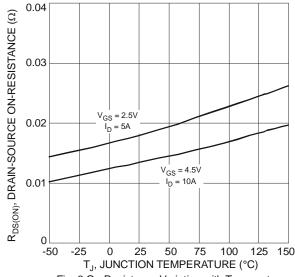
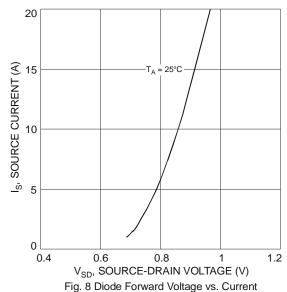
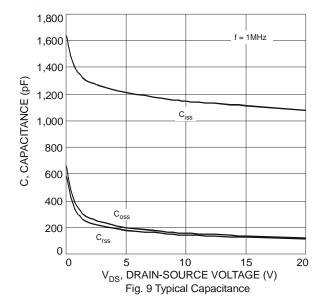


Fig. 6 On-Resistance Variation with Temperature







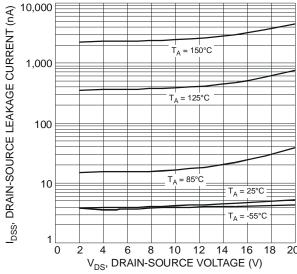


Fig. 10 Typical Drain-Source Leakage Current vs. Drain-Source Voltage

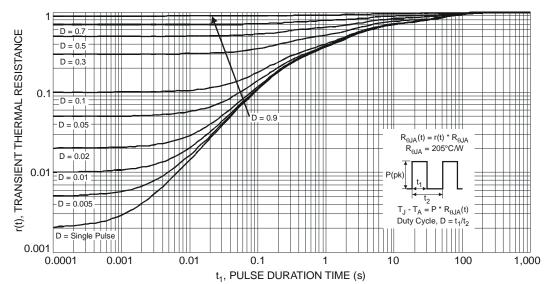


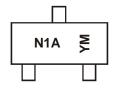
Fig. 11 Transient Thermal Response

Ordering Information (Note 7)

ĺ	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



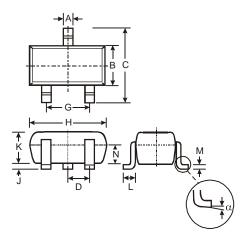
N1A = Product Type Marking Code YM = Date Code Marking Y = Year (ex: W = 2009) M = Month (ex: 9 = September)

Date Code Key

Year	200	9	2010		2011	20	12	2013		2014	2	2015
Code	W		Х		Υ	2	7	Α		В		С
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	0	N	D

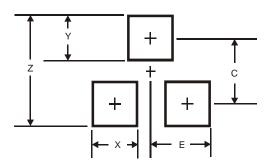


Package Outline Dimensions



	SC-59						
Dim	Min	Max	Тур				
Α	0.35	0.50	0.38				
В	1.50	1.70	1.60				
С	2.70	3.00	2.80				
D	-	-	0.95				
G	-	-	1.90				
Н	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	All Dimensions in mm						

Suggested Pad Layout



Dimensions	Value (in mm)
Z	3.4
Х	0.8
Y	1.0
С	2.4
E	1.35



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