Product Summary

BV_{DSS}	$R_{DS(on)\ max}$	I_D T_A = +25°C
30V	30mΩ @ V_{GS} = 10V	6A
	40mΩ @ V_{GS} = 4.5V	4A

Features

- Low Gate Charge
- Low $R_{DS(ON)}$
- Low Input/Output Leakage
- **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**
- **PPAP (Note 4)**

Description and Applications

This new generation small-signal enhancement mode MOSFET features low on-resistance and fast switching, making it ideal for high-efficiency power management applications.

- Motor Control
- Backlighting
- DC-DC Converters
- Power Management Functions

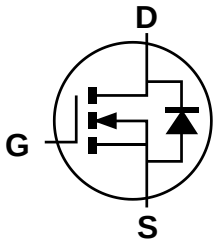
Mechanical Data

- Case: SC-59
- Case Material - Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Finish - Matte Tin Annealed over Copper Leadframe;
- Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.014 grams (Approximate)

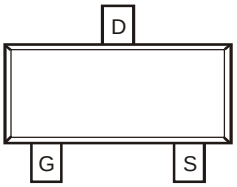
SC-59



Top View



Equivalent Circuit



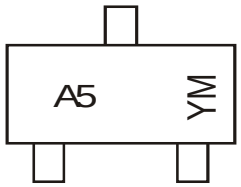
Pin Configuration

Ordering Information (Note 5)

Part Number	Case	Packaging
DMN3033LSNQ-7	SC-59	3,000/Tape & Reel
DMN3033LSNQ-13	SC-59	10,000/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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_grade_definitions/.
5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



A5 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: U = 2007)
M = Month (ex: 9 = September)

Date Code Key

Year	2007	…	2015	2016	2017	2018	2019	2020	2021	2022
Code	U	…	C	D	E	F	G	H	I	J

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

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Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current (Note 6) Continuous	T_A = +25°C T_A = +70°C	I_D	6 5	A
Pulsed Drain Current (Note 7)		I_{DM}	24	A
Body-Diode Continuous Current (Note 6)		I_S	2.25	A

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 6)	P_D	1.4	W
Thermal Resistance, Junction to Ambient (Note 6) t ≤10s	$R_{\theta JA}$	90	°C /W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes: 6. Device mounted on 1"x1", FR-4 PC board with 2 oz. Copper and test pulse width t ≤10s.
7. 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
STATIC PARAMETERS							
Drain-Source Breakdown Voltage		BV_{DSS}	30	—	—	V	I_D = 250µA, V_{GS} = 0V
Zero Gate Voltage Drain Current	T_J = 25°C (Note 9) T_J = 55°C	I_{DSS}	—	—	1 5	µA	V_{DS} = 30V, V_{GS} = 0V
Gate-Body Leakage Current		I_{GSS}	—	—	±100	nA	V_{DS} = 0V, V_{GS} = ±20V
Gate Threshold Voltage		$V_{GS(th)}$	1.0	—	2.1	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance (Note 8)		$R_{DS\ (ON)}$	—	25 36	30 40	mΩ	V_{GS} = 10V, I_D = 6A V_{GS} = 4.5V, I_D = 5A
Forward Transconductance (Note 8)		g_{FS}	—	5	—	S	V_{DS} = 10V, I_D = 8A
Diode Forward Voltage (Note 8)		V_{SD}	—	0.7	1.1	V	I_S = 2.25A, V_{GS} = 0V
DYNAMIC PARAMETERS (Note 9)							
Total Gate Charge		Q_g	—	10.5	—	nC	V_{GS} = 5V, V_{DS} = 15V, I_D = 6A
Gate-Source Charge		Q_{gs}	—	3.8	—	nC	V_{GS} = 10V, V_{DS} = 15V, I_D = 6A
Gate-Drain Charge		Q_{gd}	—	2.9	—	nC	V_{GS} = 10V, V_{DS} = 15V, I_D = 6A
Turn-On Delay Time		$t_{D(on)}$	—	11	—	ns	V_{DD} = 15V, V_{GS} = 10V, R_D = 1.8Ω, R_G = 6Ω
Turn-On Rise Time		t_r	—	7	—	ns	
Turn-Off Delay Time		$t_{D(off)}$	—	63	—	ns	
Turn-Off Fall Time		t_f	—	30	—	ns	
Input Capacitance		C_{iss}	—	755	—	pF	V_{DS} = 10V, V_{GS} = 0V f = 1.0MHz
Output Capacitance		C_{oss}	—	136	—	pF	
Reverse Transfer Capacitance		C_{rss}	—	108	—	pF	

Notes: 8. Test pulse width t = 300ms.
9. Guaranteed by design. Not subject to production testing.

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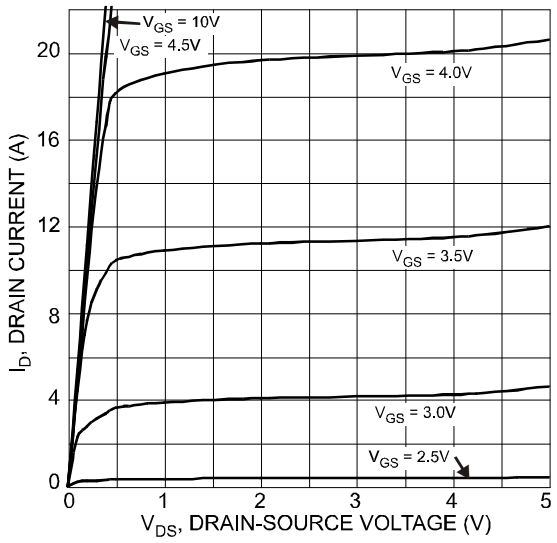

Fig. 1 Typical Output Characteristics

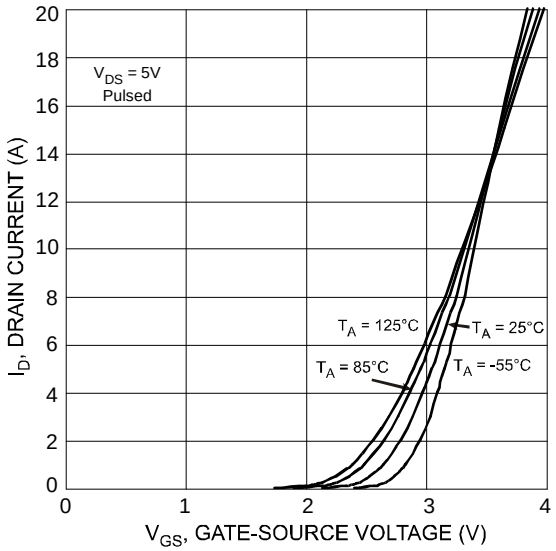

Fig. 2 Typical Transfer Characteristics

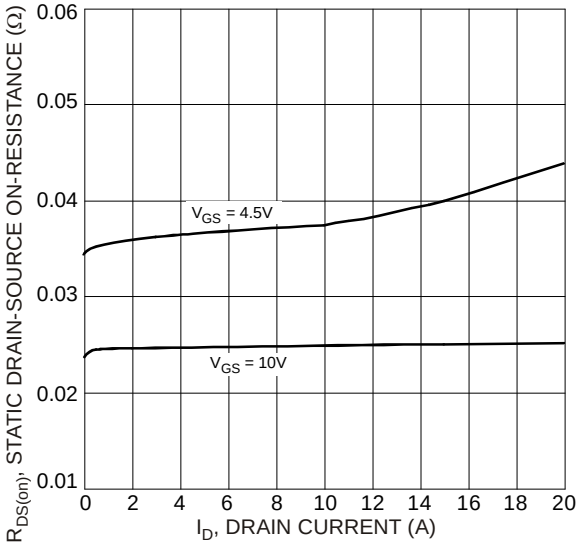

Fig. 3 On-Resistance vs. Drain Current and Gate Voltage

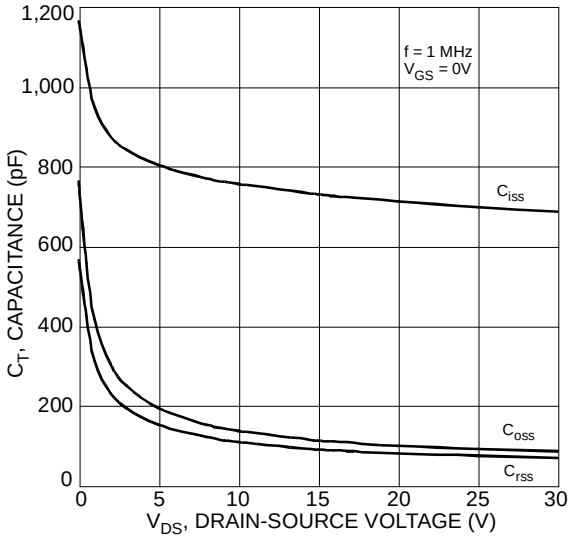

Fig. 4 Typical Total Capacitance

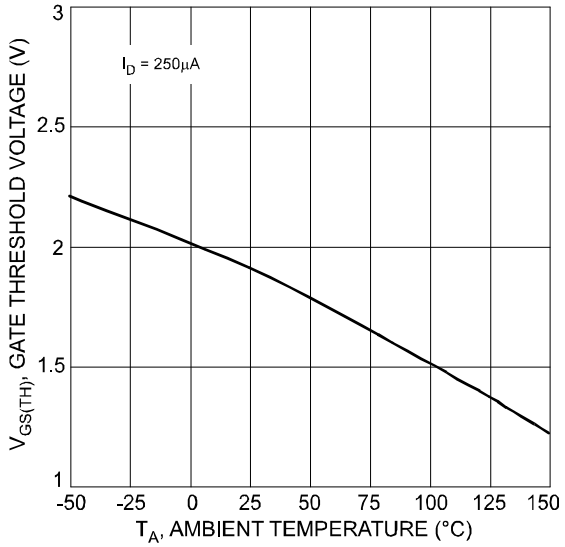

Fig. 5 Gate Threshold Voltage vs. Ambient Temperature

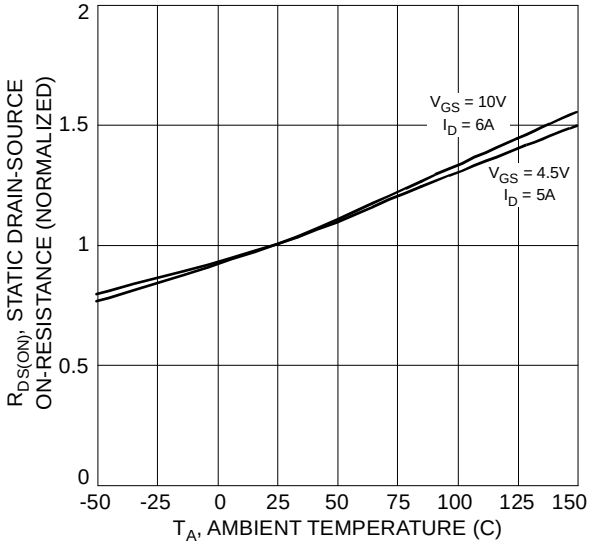

Fig. 6 Normalized Static Drain-Source On-Resistance vs. Ambient Temperature

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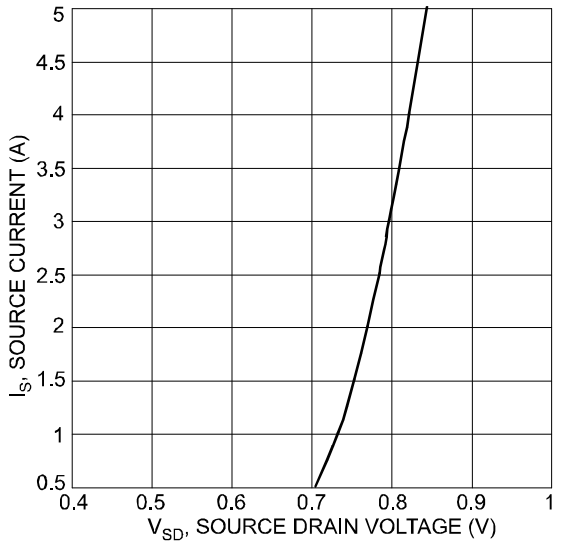

Fig. 7 Reverse Drain Current vs. Source-Drain Voltage

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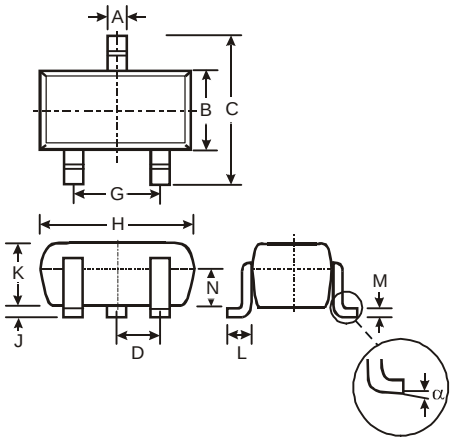
Package Outline Dimensions

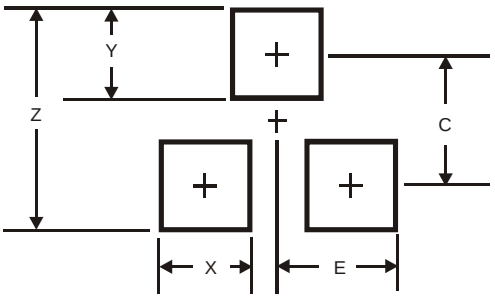
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



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

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



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

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