

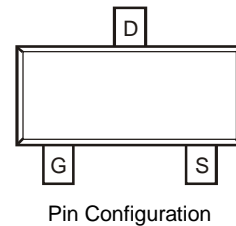
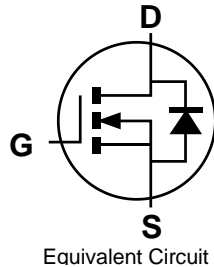
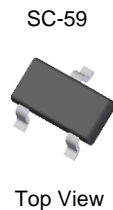
## Product Summary

BV <sub>DSS</sub>	R <sub>DS(on)</sub> max	I <sub>D</sub> T <sub>A</sub> = +25°C
30V	30mΩ @ V <sub>GS</sub> = 10V	6A
	40mΩ @ V <sub>GS</sub> = 4.5V	4A

## 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



## Features

- Low Gate Charge
- Low R<sub>DS(ON)</sub>
- 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)**

## Mechanical Data

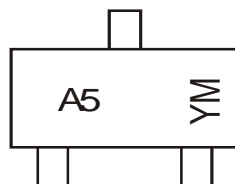
- Case: SC-59
- Case Material - Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Finish - Matte Tin Annealed over Copper Leadframe;
- Solderable per MIL-STD-202, Method 208 Ⓔ
- Weight: 0.014 grams (Approximate)

## 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/](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

**Maximum Ratings** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

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

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

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

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

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

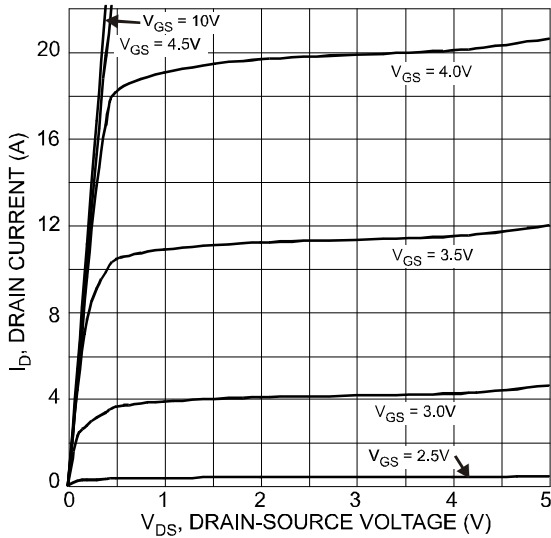


Fig. 1 Typical Output Characteristics

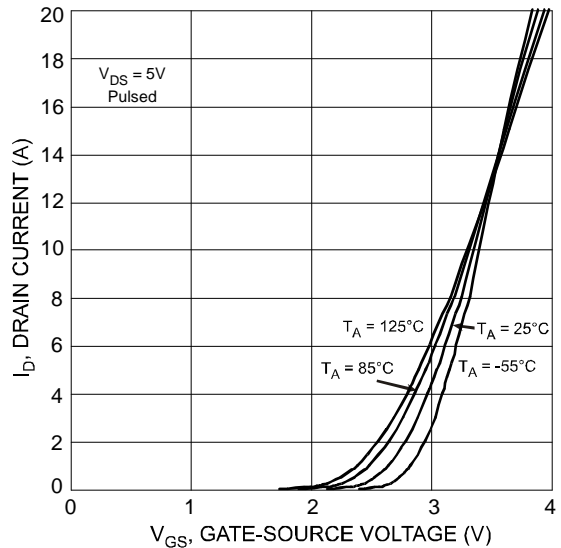


Fig. 2 Typical Transfer Characteristics

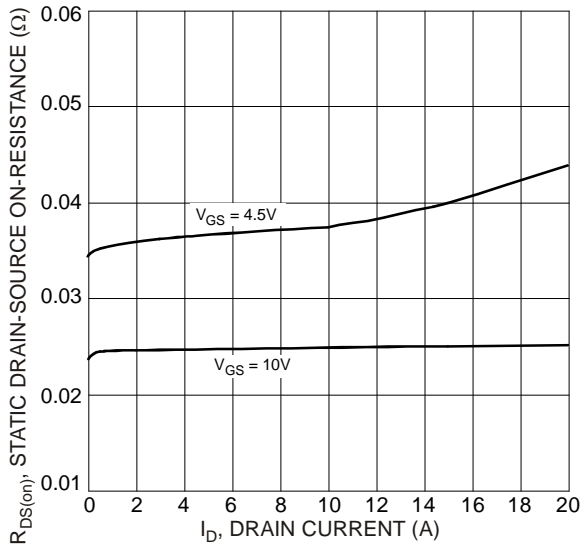


Fig. 3 On-Resistance vs. Drain Current and Gate Voltage

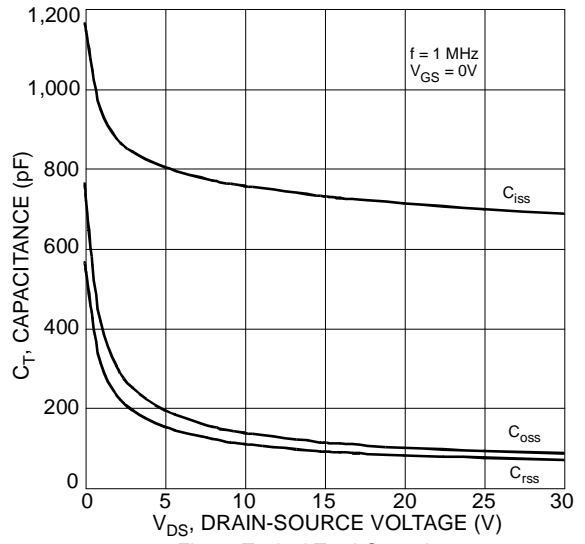


Fig. 4 Typical Total Capacitance

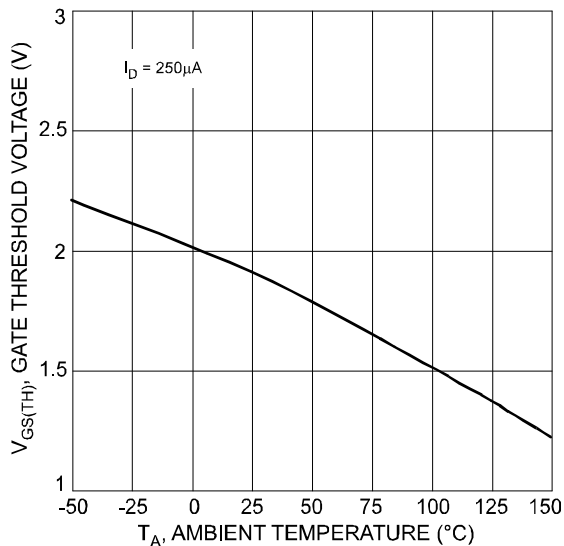


Fig. 5 Gate Threshold Voltage vs. Ambient Temperature

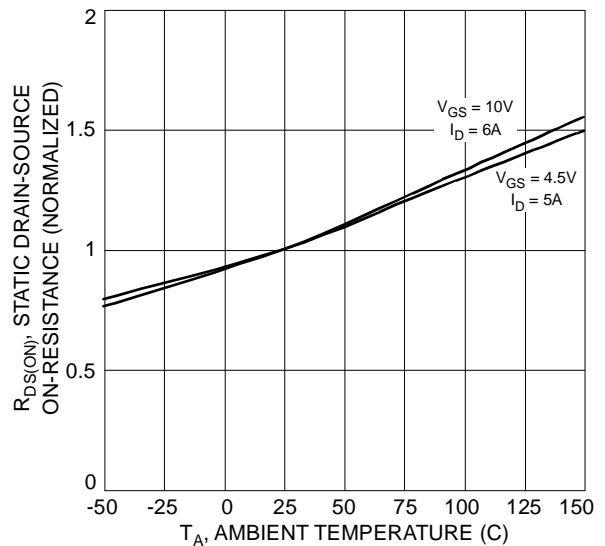


Fig. 6 Normalized Static Drain-Source On-Resistance vs. Ambient Temperature

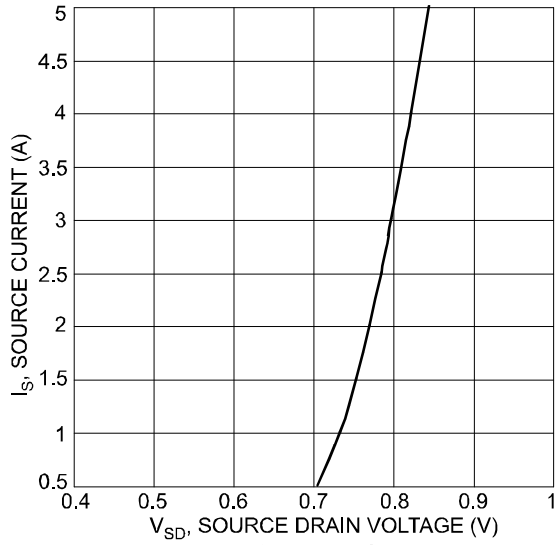
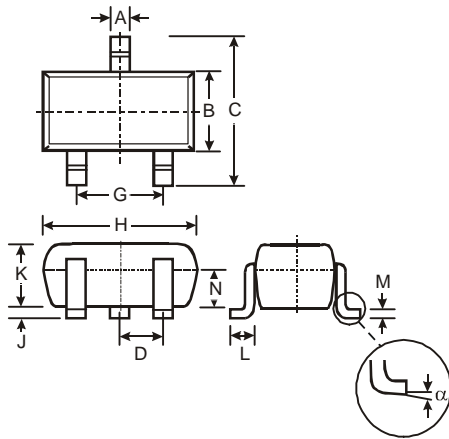


Fig. 7 Reverse Drain Current vs. Source-Drain Voltage

**Package Outline Dimensions**

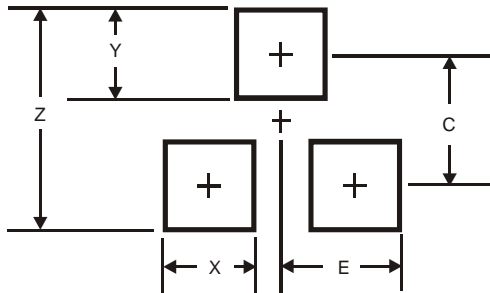
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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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