

## Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D$ $T_A = 25^\circ C$
30V	4.2Ω @ $V_{GS} = 5V$	200mA
	2.8Ω @ $V_{GS} = 10V$	260mA

## Description

This new generation MOSFET has been designed to minimize the on-state resistance ( $R_{DS(on)}$ ) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

## Applications

- DC-DC Converters
- Power management functions
- Battery Operated Systems and Solid-State Relays
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc

## Features

- Dual N-Channel MOSFET
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Small Surface Mount Package
- ESD Protected Gate
- **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**

## Mechanical Data

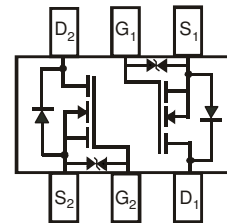
- Case: SOT563
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish annealed over Alloy 42 leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Weight: 0.006 grams (approximate)



SOT563



Top View

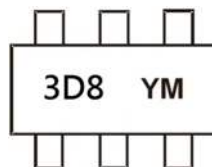

 Top View  
Internal Schematic

## Ordering Information (Note 4)

Part Number	Case	Packaging
DMN63D8LV-7	SOT563	3,000/Tape & Reel
DMN63D8LV-13	SOT563	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. For packaging details, go to our website at <http://www.diodes.com>.

## Marking Information



3D8 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: Z = 2012)  
 M = Month (ex: 9 = September)

### Date Code Key

Year Code	2011	2012	2013	2014	2015	2016	2017
	Y	Z	A	B	C	D	E

Month Code	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	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	Units
Drain-Source Voltage				$V_{DSS}$	30	V
Gate-Source Voltage				$V_{GSS}$	$\pm 20$	V
Continuous Drain Current (Note 5)	$V_{GS} = 10\text{V}$	Steady State	$T_A = 25^\circ\text{C}$ $T_A = 70^\circ\text{C}$	$I_D$	260 200	mA
Continuous Drain Current (Note 5)	$V_{GS} = 5\text{V}$	Steady State	$T_A = 25^\circ\text{C}$ $T_A = 70^\circ\text{C}$	$I_D$	220 160	mA
Pulsed Drain Current (10 $\mu\text{s}$ pulse, duty cycle = 1%)				$I_{DM}$	800	mA

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

Characteristic		Symbol	Value	Units
Total Power Dissipation	(Note 5)	$P_D$	450	mW
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	281	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range		$T_J, T_{STG}$	-55 to 150	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 6)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	30	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	1.0	$\mu\text{A}$	$V_{DS} = 30\text{V}, V_{GS} = 0\text{V}$
Gate-Body Leakage	$I_{GSS}$	—	—	$\pm 10.0$	$\mu\text{A}$	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 6)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	0.8	—	1.5	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	—	2.8	$\Omega$	$V_{GS} = 10.0\text{V}, I_D = 250\text{mA}$
		—	—	3.8		$V_{GS} = 5.0\text{V}, I_D = 250\text{mA}$
		—	—	4.2		$V_{GS} = 4.5\text{V}, I_D = 250\text{mA}$
		—	—	4.5		$V_{GS} = 4.0\text{V}, I_D = 250\text{mA}$
		—	—	13		$V_{GS} = 2.5\text{V}, I_D = 10\text{mA}$
Forward Transconductance	$g_{FS}$	80	—	—	mS	$V_{DS} = 10\text{V}, I_D = 0.115\text{A}$
Diode Forward Voltage	$V_{SD}$	-	0.8	1.2	V	$V_{GS} = 0\text{V}, I_S = 115\text{mA}$
<b>DYNAMIC CHARACTERISTICS (Note 7)</b>						
Input Capacitance	$C_{iss}$	—	22.0	—	pF	$V_{DS} = 25\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	3.2	—		
Reverse Transfer Capacitance	$C_{rss}$	—	2.0	—		
Gate Resistance	$R_G$	—	79.9	—	$\Omega$	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Total Gate Charge $V_{GS} = 10\text{V}$	$Q_g$	—	0.87	—	nC	$V_{GS} = 10\text{V}, V_{DS} = 30\text{V}, I_D = 150\text{mA}$
Total Gate Charge $V_{GS} = 4.5\text{V}$	$Q_g$	—	0.43	—		
Gate-Source Charge	$Q_{gs}$	—	0.11	—		
Gate-Drain Charge	$Q_{gd}$	—	0.11	—		
Turn-On Delay Time	$t_{D(on)}$	—	3.3	—	nS	$V_{DD} = 30\text{V}, I_D = 0.115\text{A}, V_{GEN} = 10\text{V}, R_{GEN} = 25\Omega$
Turn-On Rise Time	$t_r$	—	3.2	—		
Turn-Off Delay Time	$t_{D(off)}$	—	12.0	—		
Turn-Off Fall Time	$t_f$	—	6.3	—		

- Notes:
- Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to production testing.

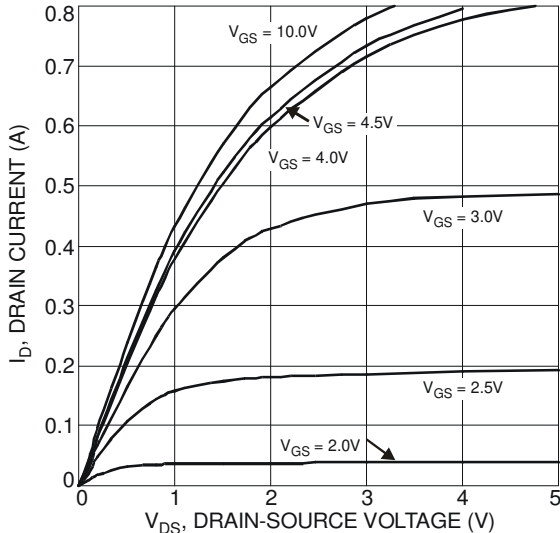


Figure 1 Typical Output Characteristic

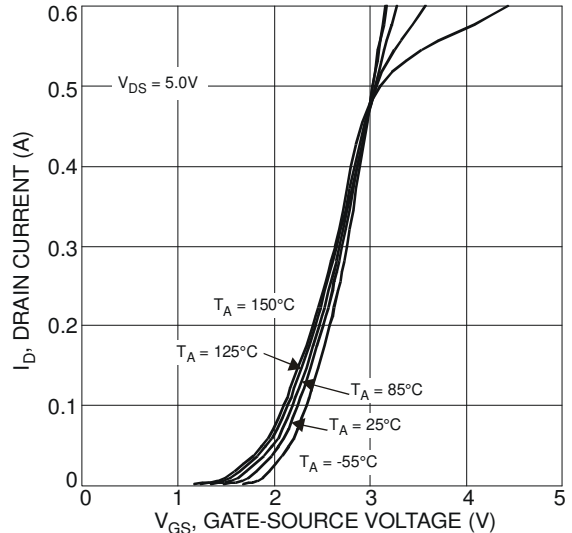


Figure 2 Typical Transfer Characteristics

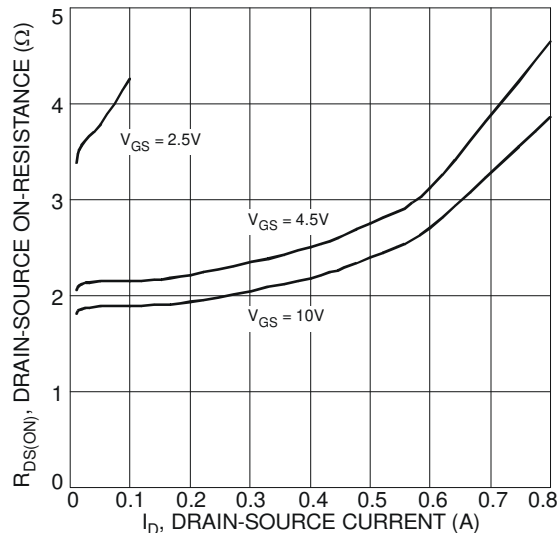


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

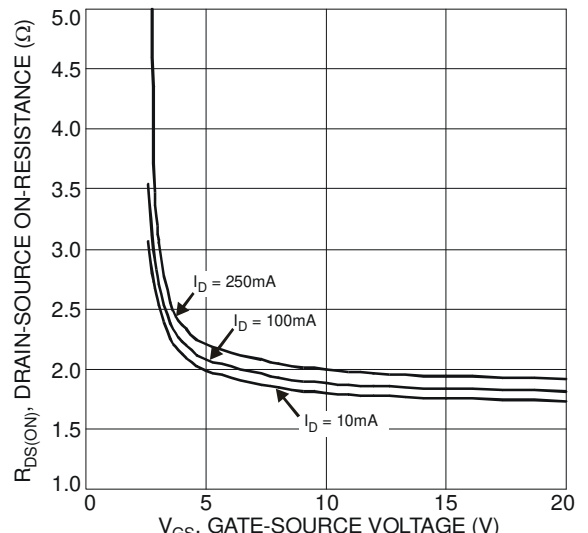


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

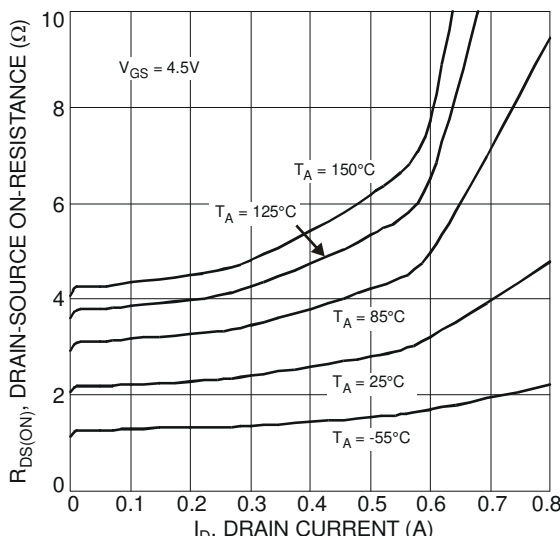


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

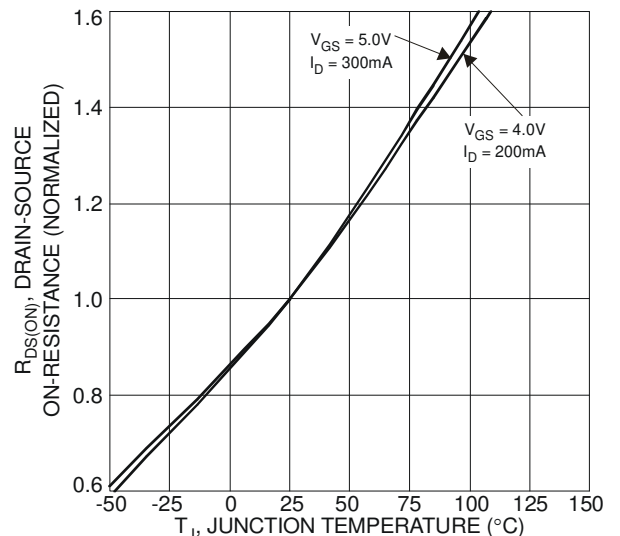


Figure 6 On-Resistance Variation with Temperature

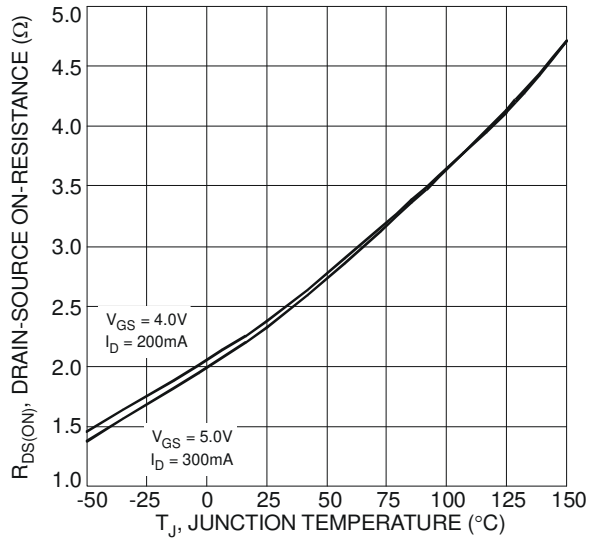


Figure 7 On-Resistance Variation with Temperature

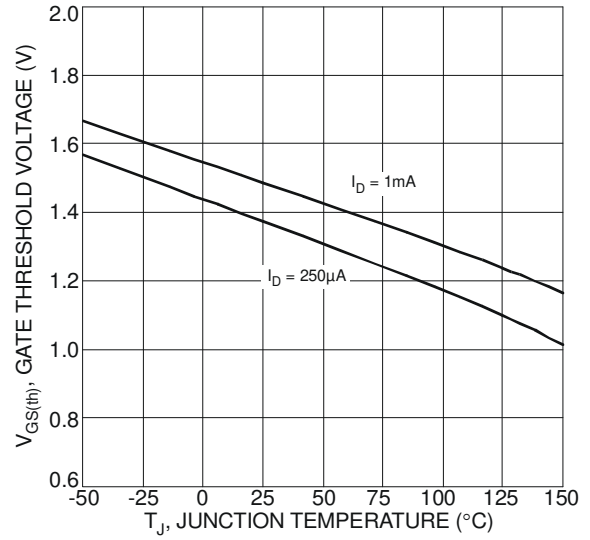


Figure 8 Gate Threshold Variation vs. Ambient Temperature

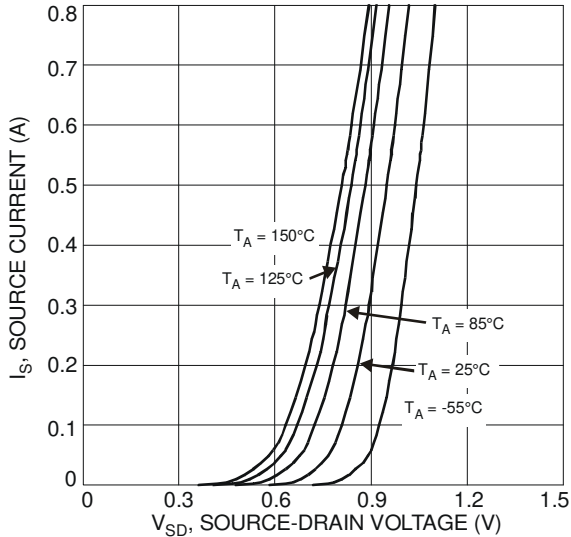
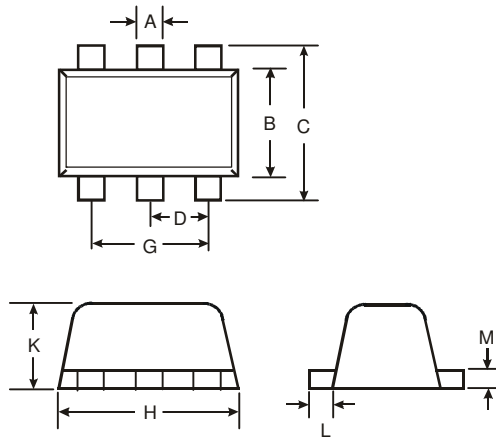


Figure 9 Diode Forward Voltage vs. Current

**Package Outline Dimensions**

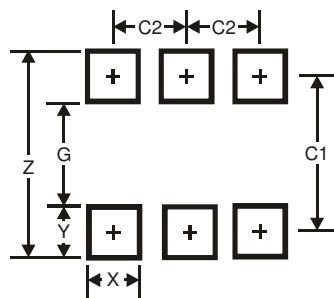
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



SOT563			
Dim	Min	Max	Typ
A	0.15	0.30	0.20
B	1.10	1.25	1.20
C	1.55	1.70	1.60
D	-	-	0.50
G	0.90	1.10	1.00
H	1.50	1.70	1.60
K	0.55	0.60	0.60
L	0.10	0.30	0.20
M	0.10	0.18	0.11
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	2.2
G	1.2
X	0.375
Y	0.5
C1	1.7
C2	0.5

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