

## Product Summary

BV <sub>DSS</sub>	R <sub>Ds(ON)</sub>	I <sub>D</sub> T <sub>A</sub> = +25°C
30V	4.2Ω @ V <sub>GS</sub> = 5V	200mA
	2.8Ω @ V <sub>GS</sub> = 10V	260mA

## Description

This new generation MOSFET has been designed to minimize the on-state resistance (R<sub>Ds(ON)</sub>) 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)
- For automotive applications requiring specific change control (i.e.: parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at <https://www.diodes.com/products/automotive/automotive-products/>.
- This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. <https://www.diodes.com/quality/product-definitions/>

## Mechanical Data

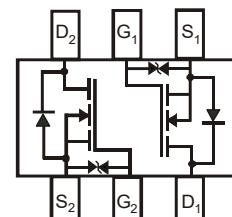
- Package: SOT563
- Package Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Alloy 42 Leadframe (Lead-Free Plating). Solderable per MIL-STD-202, Method 208 (E3)
- Terminal Connections: See Diagram
- Weight: 0.006 grams (Approximate)



ESD PROTECTED



Top View

Top View  
Internal Schematic

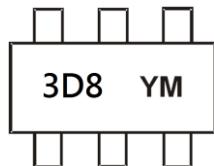
## Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
DMN63D8LV-7	SOT563	3,000	Tape & Reel
DMN63D8LV-7B	SOT563	8,000	Tape & Reel (Note 5)
DMN63D8LV-13	SOT563	10,000	Tape & Reel

Notes:

- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
- See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
- Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
- For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.
- Change the pitch from 4mm to 2mm in tape & reel.

## Marking Information



3D8 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: M = 2025)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2012	-	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Code	Z	-	M	N	P	R	S	T	U	V	W	X
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		
Continuous Drain Current (Note 6), $V_{GS} = 10\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	260 200	mA
Continuous Drain Current (Note 6), $V_{GS} = 5\text{V}$	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	Unit
Total Power Dissipation	$P_D$	450	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	281	°C/W
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	°C

Note: 6. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	$\text{BV}_{\text{DSS}}$	30	—	—	V	$\text{V}_{\text{GS}} = 0, \text{I}_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	$\text{I}_{\text{DSS}}$	—	—	1.0	$\mu\text{A}$	$\text{V}_{\text{DS}} = 30\text{V}, \text{V}_{\text{GS}} = 0$
Gate-Body Leakage	$\text{I}_{\text{GSS}}$	—	—	$\pm 10.0$	$\mu\text{A}$	$\text{V}_{\text{GS}} = \pm 20\text{V}, \text{V}_{\text{DS}} = 0$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$\text{V}_{\text{GS}(\text{th})}$	0.8	—	1.5	V	$\text{V}_{\text{DS}} = \text{V}_{\text{GS}}, \text{I}_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$\text{R}_{\text{DS}(\text{ON})}$	—	—	2.8	$\Omega$	$\text{V}_{\text{GS}} = 10.0\text{V}, \text{I}_D = 250\text{mA}$
		—	—	3.8		$\text{V}_{\text{GS}} = 5.0\text{V}, \text{I}_D = 250\text{mA}$
		—	—	4.2		$\text{V}_{\text{GS}} = 4.5\text{V}, \text{I}_D = 250\text{mA}$
		—	—	4.5		$\text{V}_{\text{GS}} = 4.0\text{V}, \text{I}_D = 250\text{mA}$
		—	—	13		$\text{V}_{\text{GS}} = 2.5\text{V}, \text{I}_D = 10\text{mA}$
Forward Transconductance	$\text{g}_{\text{FS}}$	80	—	—	$\text{mS}$	$\text{V}_{\text{DS}} = 10\text{V}, \text{I}_D = 0.115\text{A}$
Diode Forward Voltage	$\text{V}_{\text{SD}}$	—	0.8	1.2	V	$\text{V}_{\text{GS}} = 0, \text{I}_S = 115\text{mA}$
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	$\text{C}_{\text{iss}}$	—	22.0	—	$\text{pF}$	$\text{V}_{\text{DS}} = 25\text{V}, \text{V}_{\text{GS}} = 0, \text{f} = 1.0\text{MHz}$
Output Capacitance	$\text{C}_{\text{oss}}$	—	3.2	—		
Reverse Transfer Capacitance	$\text{C}_{\text{rss}}$	—	2.0	—		
Gate Resistance	$\text{R}_{\text{G}}$	—	79.9	—	$\Omega$	$\text{V}_{\text{DS}} = 0, \text{V}_{\text{GS}} = 0, \text{f} = 1.0\text{MHz}$
Total Gate Charge $\text{V}_{\text{GS}} = 10\text{V}$	$\text{Q}_{\text{g}}$	—	0.87	—	$\text{nC}$	$\text{V}_{\text{DS}} = 30\text{V}, \text{I}_D = 150\text{mA}$
Total Gate Charge $\text{V}_{\text{GS}} = 4.5\text{V}$	$\text{Q}_{\text{g}}$	—	0.43	—		
Gate-Source Charge	$\text{Q}_{\text{gs}}$	—	0.11	—		
Gate-Drain Charge	$\text{Q}_{\text{gd}}$	—	0.11	—		
Turn-On Delay Time	$\text{t}_{\text{D}(\text{on})}$	—	3.3	—	$\text{ns}$	$\text{V}_{\text{DD}} = 30\text{V}, \text{I}_D = 0.115\text{A}, \text{V}_{\text{GEN}} = 10\text{V}, \text{R}_{\text{GEN}} = 25\Omega$
Turn-On Rise Time	$\text{t}_{\text{r}}$	—	3.2	—		
Turn-Off Delay Time	$\text{t}_{\text{D}(\text{off})}$	—	12.0	—		
Turn-Off Fall Time	$\text{t}_{\text{f}}$	—	6.3	—		

Notes: 7. Short duration pulse test used to minimize self-heating effect.  
8. Guaranteed by design. Not subject to production testing.

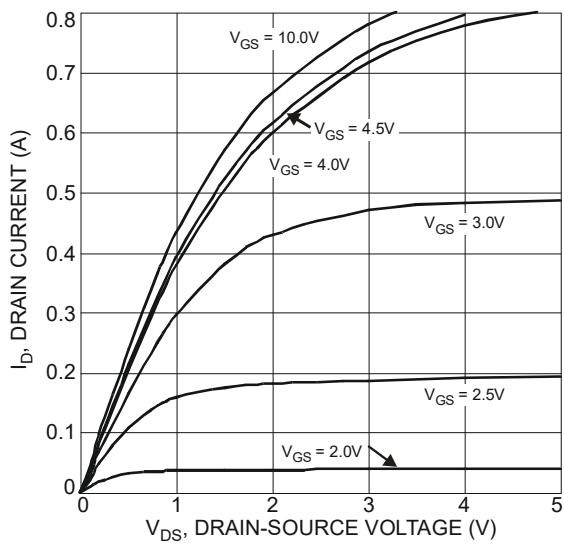


Figure 1 Typical Output Characteristic

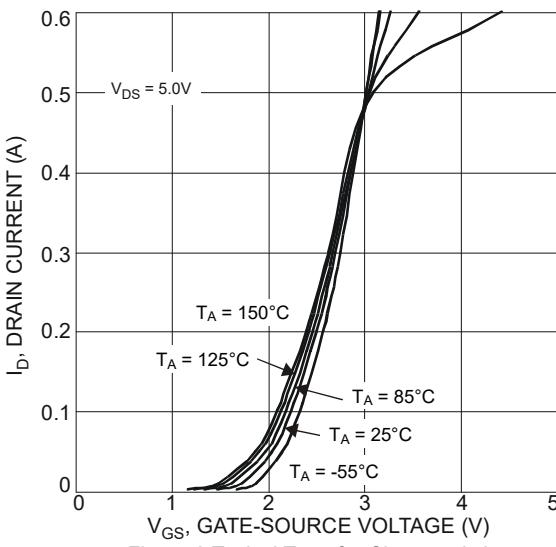


Figure 2 Typical Transfer Characteristics

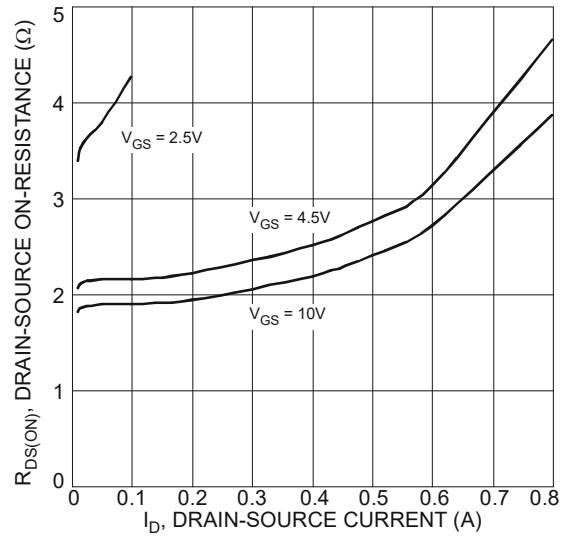


Figure 3 Typical On-Resistance vs.  
Drain Current and Gate Voltage

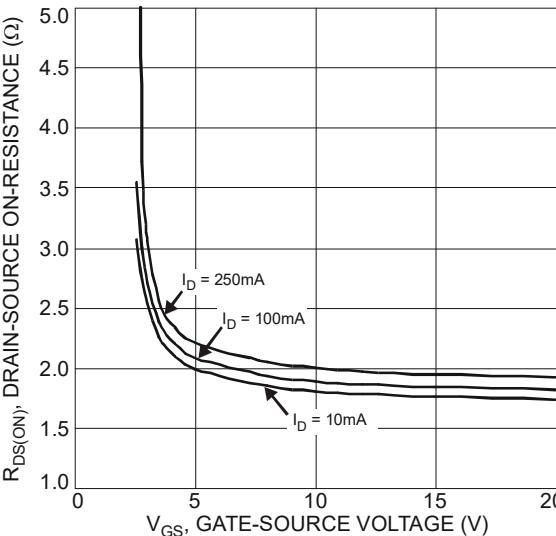


Figure 4 Typical Drain-Source On-Resistance  
vs. Gate-Source Voltage

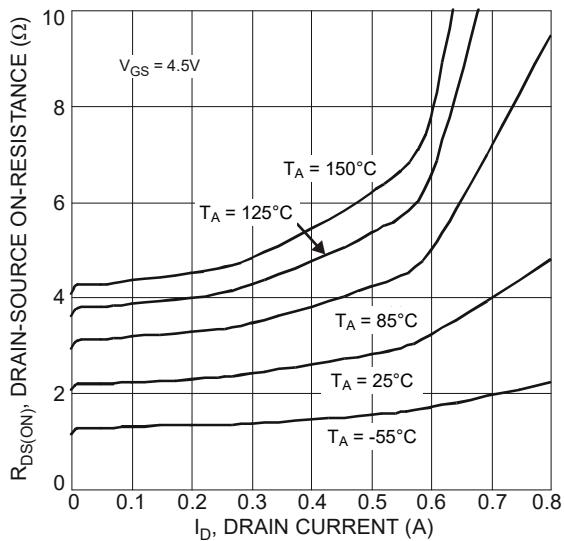


Figure 5 Typical On-Resistance vs.  
Drain Current and Temperature

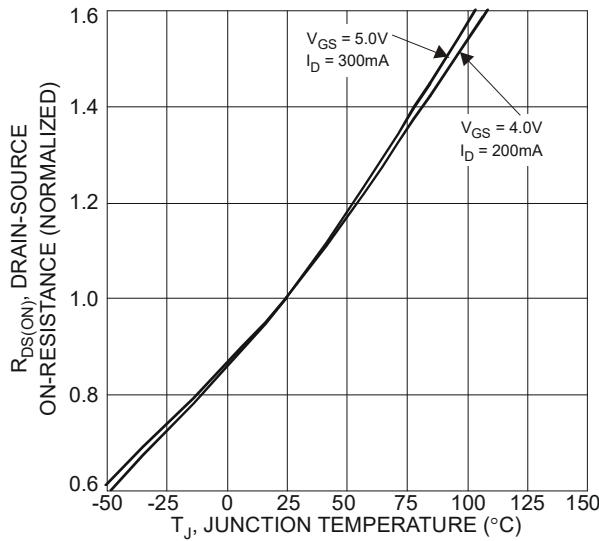


Figure 6 On-Resistance Variation with Temperature

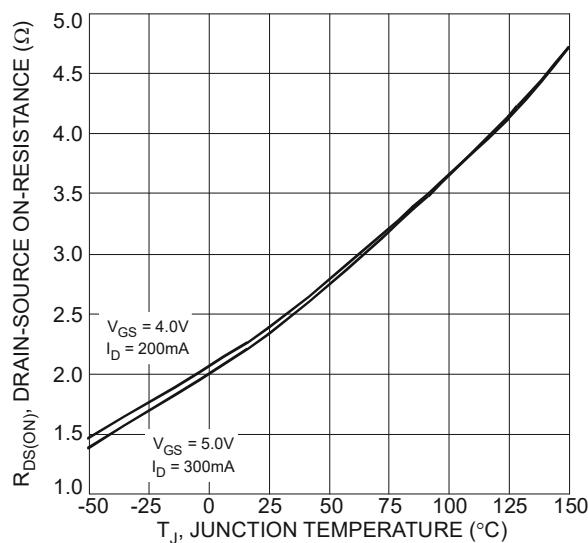


Figure 7 On-Resistance Variation with Temperature

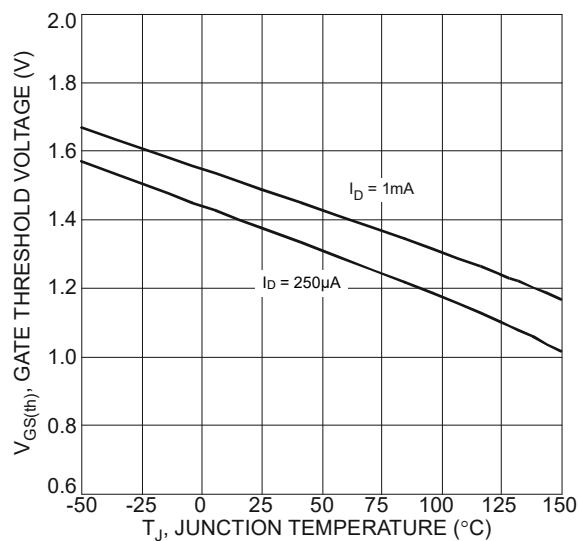


Figure 8 Gate Threshold Variation vs. Junction Temperature

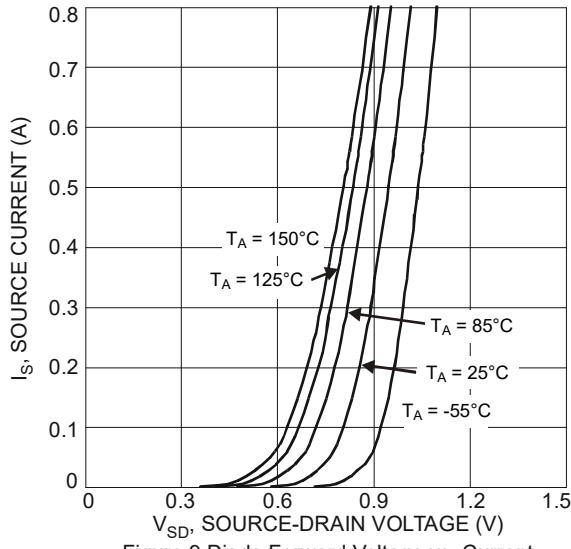
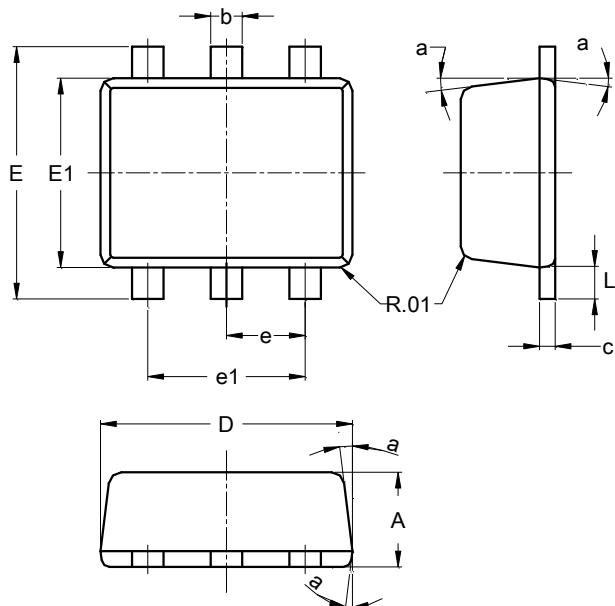


Figure 9 Diode Forward Voltage vs. Current

## Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT563**



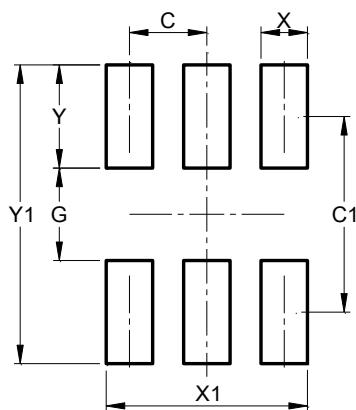
SOT563			
Dim	Min	Max	Typ
<b>A</b>	0.55	0.60	--
<b>b</b>	0.15	0.30	0.20
<b>c</b>	0.10	0.18	0.11
<b>D</b>	1.50	1.70	1.60
<b>E</b>	1.55	1.70	1.60
<b>E1</b>	1.10	1.25	1.20
<b>e</b>	--	--	0.50
<b>e1</b>	0.90	1.10	1.00
<b>L</b>	0.10	0.30	0.20
<b>a</b>	8°	9°	7°

All Dimensions in mm

## Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT563**



Dimensions	Value (in mm)
<b>C</b>	0.500
<b>C1</b>	1.270
<b>G</b>	0.600
<b>X</b>	0.300
<b>X1</b>	1.300
<b>Y</b>	0.670
<b>Y1</b>	1.940

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