



#### N-CHANNEL ENHANCEMENT MODE MOSFET

### **Product Summary**

BV <sub>DSS</sub>	R <sub>DS(ON)</sub>	Package	I <sub>D</sub> T <sub>A</sub> = +25°C
60V	$3\Omega$ @ $V_{GS} = 10V$	SOT23	310mA
OUV	4Ω @ V <sub>GS</sub> = 5V	30123	270mA

### **Description**

This new generation MOSFET has been designed to minimize the onstate resistance ( $R_{\rm DS(ON)}$ ) 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.





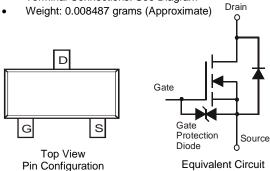
Top View

#### **Features**

- Low On-Resistance
- Low Gate Threshold Voltage
- 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: SOT23
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Solderable per MIL-STD-202, Method 208 (3)
- Lead Free Plating (Matte Tin Finish Annealed over Alloy 42 Leadframe).
- Terminal Connections: See Diagram



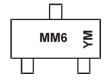
#### Ordering Information (Note 4)

Part Number	Case	Packaging
DMN65D8L-7	SOT23	3000/Tape & Reel

Notes:

- 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- See http://www.diodes.com/quality/lead\_free.html 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. www.diodes.com/products/packages.html.

### **Marking Information**



MM6 = Product Type Marking Code YM = Date Code Marking Y = Year (ex: D = 2016) M = Month (ex: 9 = September)

Date Code Key

- and dodd no												
Year	201	1	~		2016	20	17	2018		2019	2	2020
Code	Υ		~		D	[		F		G		Н
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



# **Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit		
Drain-Source Voltage	$V_{DSS}$	60	V		
Gate-Source Voltage			$V_{GSS}$	±20	V
Continuous Drain Current (Note 6) V <sub>GS</sub> = 10V	I <sub>D</sub>	310 240	mA		
Continuous Drain Current (Note 6) V <sub>GS</sub> = 5V	I <sub>D</sub>	270 210	mA		
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I <sub>DM</sub>	800	mA		
Maximum Body Diode Continuous Current (Note 5)	I <sub>S</sub>	500	mA		

# **Thermal Characteristics**

Characteristic		Symbol	Value	Unit	
Total Power Dissipation	(Note 6)	D	370	mW	
Total Power Dissipation	(Note 5)	P <sub>D</sub>	540		
The word Designation to Ambient	(Note 6)	-	348		
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	241	°C/W	
Thermal Resistance, Junction to Case	(Note 5)	$R_{ heta JC}$	91		
Operating and Storage Temperature Range		$T_{J_1}T_{STG}$	-55 to +150	°C	

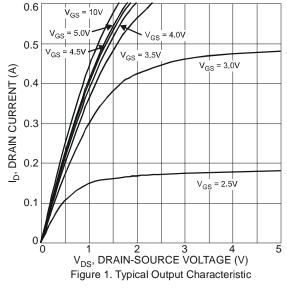
# **Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

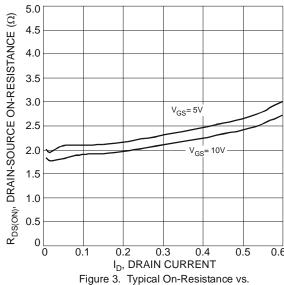
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)	• • • • • • • • • • • • • • • • • • • •		- 71-			
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	60	_	_	V	$V_{GS} = 0V, I_D = 250\mu A$
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	_	_	1.0	μΑ	$V_{DS} = 60V, V_{GS} = 0V$
Gate-Body Leakage	I <sub>GSS</sub>	_	_	±5	μΑ	$V_{GS} = \pm 20V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	1.2	_	2.0	V	$V_{DS} = V_{GS}$ , $I_D = 250\mu A$
Static Drain-Source On-Resistance			2	3	Ω	$V_{GS} = 10V, I_D = 0.115A$
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>		2.5	4	Ω	$V_{GS} = 5V, I_D = 0.115A$
Forward Transconductance	<b>g</b> FS	80	290		ms	$V_{DS} = 10V, I_D = 0.115A$
Diode Forward Voltage	$V_{SD}$	_	0.8	1.2	V	$V_{GS} = 0V, I_{S} = 115mA$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C <sub>iss</sub>		22.0			V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	Coss		3.2		pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	_	2.0			
Gate Resistance	Rg	_	79.9	_	Ω	$V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz$
Total Gate Charge V <sub>GS</sub> = 10V	Qg	_	0.87	_		
Total Gate Charge V <sub>GS</sub> = 4.5V	Qg	_	0.43	_	nC	$V_{GS} = 10V, V_{DS} = 30V,$
Gate-Source Charge	Qgs	_	0.11	_	nc nc	$I_D = 150 \text{mA}$
Gate-Drain Charge	Q <sub>qd</sub>	_	0.11	_		
Turn-On Delay Time	t <sub>D(ON)</sub>	_	2.7	_		
Turn-On Rise Time	t <sub>R</sub>	_	2.8	_	no	$V_{DD} = 30V, I_D = 0.115A, V_{GEN} = 10V,$
Turn-Off Delay Time	t <sub>D(OFF)</sub>	_	12.6	_	ns	$R_{GEN} = 25\Omega$
Turn-Off Fall Time	t <sub>F</sub>	_	7.3	_		

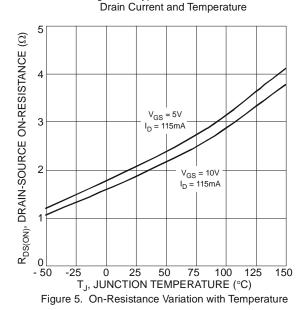
- 5. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout 6. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
- 7 .Short duration pulse test used to minimize self-heating effect.
  8. Guaranteed by design. Not subject to production testing

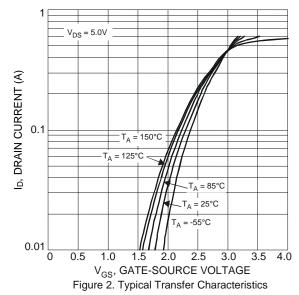
DMN65D8L Document number: DS35923 Rev. 3 - 2











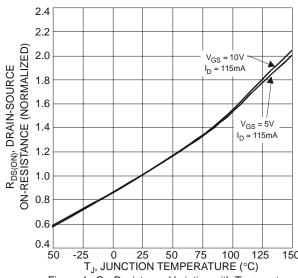


Figure 4. On-Resistance Variation with Temperature

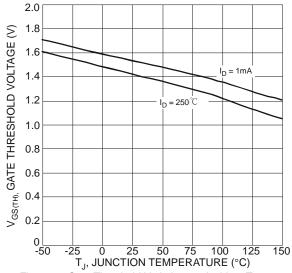
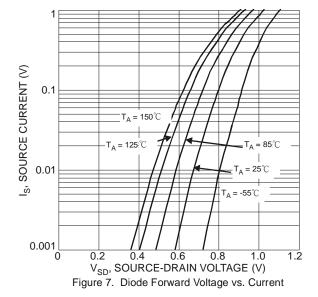


Figure 6. Gate Threshold Variation vs. Ambient Temperature





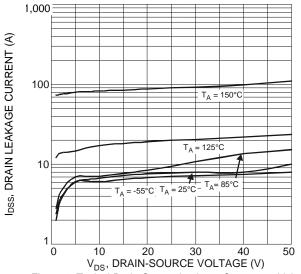
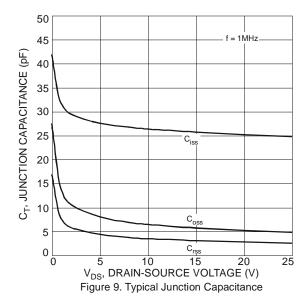


Figure 8. Typical Drain-Source Leakage Current vs. Voltage

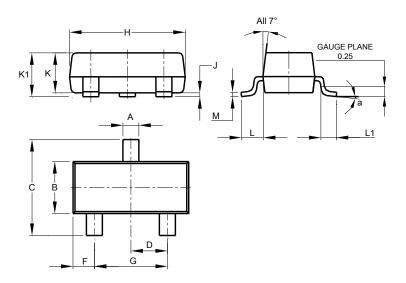




# **Package Outline Dimensions**

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

#### SOT23

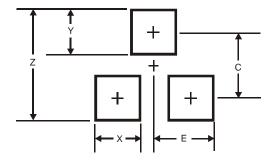


SOT23							
Dim	Min	Max	Тур				
Α	0.37	0.51	0.40				
В	1.20	1.40	1.30				
С	2.30	2.50	2.40				
D	0.89	1.03	0.915				
F	0.45	0.60	0.535				
G	1.78	2.05	1.83				
Н	2.80	3.00	2.90				
J	0.013	0.10	0.05				
K	0.890	1.00	0.975				
K1	0.903	1.10	1.025				
L	0.45	0.61	0.55				
L1	0.25	0.55	0.40				
М	0.085	0.150	0.110				
а	8°						
All Dimensions in mm							

# **Suggested Pad Layout**

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

#### SOT23



Dimensions	Value (in mm)
Z	2.9
Х	0.8
Y	0.9
С	2.0
E	1.35



#### IMPORTANT NOTICE

DIODES INCORPORATED MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. Diodes Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does Diodes Incorporated convey any license under its patent or trademark rights, nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on Diodes Incorporated website, harmless against all damages.

Diodes Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel. Should Customers purchase or use Diodes Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold Diodes Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

Products described herein may be covered by one or more United States, international or foreign patents pending. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks.

This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and determinative format released by Diodes Incorporated.

#### LIFE SUPPORT

Diodes Incorporated products are specifically not authorized for use as critical components in life support devices or systems without the express written approval of the Chief Executive Officer of Diodes Incorporated. As used herein:

- A. Life support devices or systems are devices or systems which:
  - 1. are intended to implant into the body, or
  - 2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.
- B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or systems.

Copyright © 2016, Diodes Incorporated

www.diodes.com

# **Mouser Electronics**

**Authorized Distributor** 

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Diodes Incorporated:

DMN65D8L-7