



DMN53D0LDW

### **DUAL N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR**

### **Product Summary**

V <sub>(BR)DSS</sub>	R <sub>DS(ON)</sub>	I <sub>D</sub> T <sub>A</sub> = +25°C
50V	$1.6\Omega$ @ $V_{GS} = 10V$	360mA
	2.5Ω @ V <sub>GS</sub> = 4.5V	250mA

### **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 to 2KV
- 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: SOT363
- 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<sup>(3)</sup>
- Terminal Connections: See Diagram
- Weight: 0.006 grams (approximate)

#### SOT363





Top View Internal Schematic

Top View

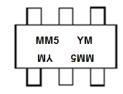
### Ordering Information (Note 4)

Part Number	Case	Packaging
DMN53D0LDW-7	SOT363	3000/Tape & Reel
DMN53D0LDW-13	SOT363	10000/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.diodes.com/products/packages.html.

### **Marking Information**



MM5 = Product Type Marking Code YM = Date Code Marking Y = Year (ex: B = 2014) M = Month (ex: 9 = September)

#### Date Code Key

Year	201	4	2015		2016	20	17	2018		2019	2	2020
Code	В		С		D		Ξ	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	$V_{DSS}$	50	V
Gate-Source Voltage	$V_{GSS}$	±20	V
Drain Current (Note 5)	I <sub>D</sub>	360	mA

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

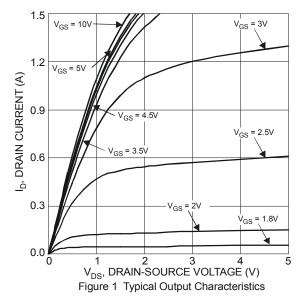
Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	$P_{D}$	310	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{ hetaJA}$	411	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

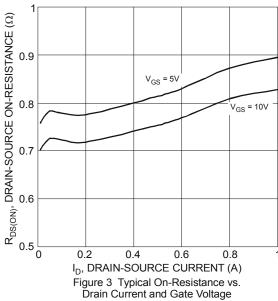
## Electrical Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 6)							
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	50	_	_	V	$V_{GS} = 0V, I_D = 250\mu A$	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	_	_	1.0	μΑ	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V	
Gate-Body Leakage	I <sub>GSS</sub>	_	_	10	μΑ	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 6)							
Gate Threshold Voltage	V <sub>GS(th)</sub>	0.8	_	1.5	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	
Static Drain-Source On-Resistance	R <sub>DS (ON)</sub>		_ _ _	1.6 2.5 4.5	Ω	$V_{GS} = 10V, I_D = 500mA$ $V_{GS} = 4.5V, I_D = 200mA$ $V_{GS} = 2.5V, I_D = 100mA$	
Source-Drain Diode Forward Voltage	V <sub>SD</sub>	_	_	1.4	V	$V_{GS} = 0V, I_S = 500mA$	
DYNAMIC CHARACTERISTICS (Note 7)							
Input Capacitance	C <sub>iss</sub>	_	46	_	pF		
Output Capacitance	Coss	_	5.3	_	pF	$V_{DS} = 25V, V_{GS} = 0V$ f = 1.0MHz	
Reverse Transfer Capacitance	C <sub>rss</sub>	_	4.0	_	pF	-1 - 1.0IVII IZ	
Total Gate Charge	$Q_g$	_	0.6	_	nC	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
Gate-Source Charge	$Q_{gs}$	_	0.2	_	nC	$V_{GS} = 4.5V, V_{DS} = 10V,$ $I_{D} = 250 \text{mA}$	
Gate-Drain Charge	$Q_{gd}$	_	0.1	_	nC	1D = 23011IA	
Turn-On Delay Time	t <sub>D(on)</sub>	_	2.7	_	ns		
Turn-On Rise Time	t <sub>r</sub>	_	2.5	_	ns	$V_{DD} = 30V, V_{GS} = 10V,$ $R_{G} = 25\Omega, I_{D} = 200\text{mA}$	
Turn-Off Delay Time	t <sub>D(off)</sub>	_	19	_	ns		
Turn-Off Fall Time	t <sub>f</sub>	_	11	_	ns		

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







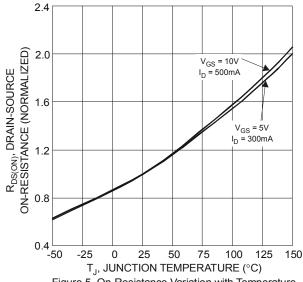
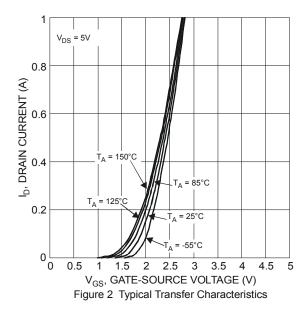
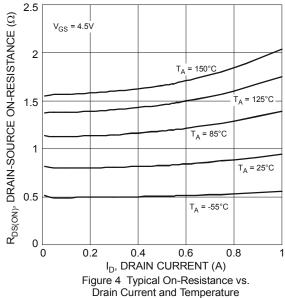


Figure 5 On-Resistance Variation with Temperature





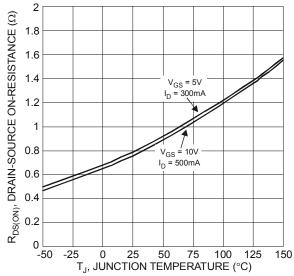


Figure 6 On-Resistance Variation with Temperature



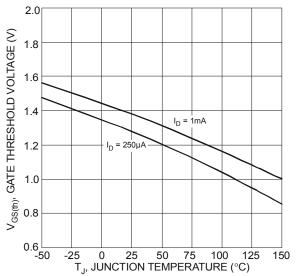
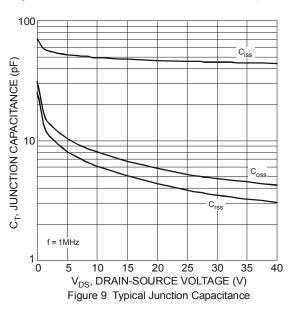
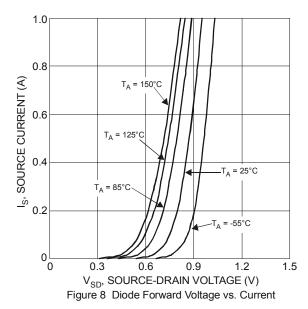
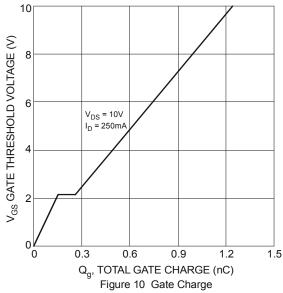


Figure 7 Gate Threshold Variation vs. Ambient Temperature

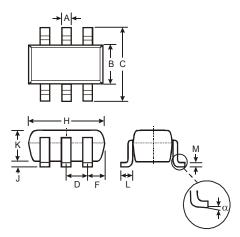






### **Package Outline Dimensions**

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

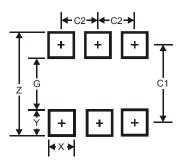


	SOT363							
Dim	Min	Тур						
Α	0.10	0.30	0.25					
В	1.15	1.35	1.30					
С	2.00	2.20	2.10					
D		0.65 Ty	p					
F	0.40 0.45 0.42							
Н	1.80	2.20	2.15					
J	0	0.10	0.05					
K	0.90	1.00	1.00					
L	0.25	0.40	0.30					
М	0.10	0.22	0.11					
α	0°	8°	-					
All	All Dimensions in mm							



### **Suggested Pad Layout**

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



Dimensions	Value (in mm)
Z	2.5
G	1.3
Х	0.42
Υ	0.6
C1	1.9
C2	0.65

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