



#### 100V N-CHANNEL ENHANCEMENT MODE MOSFET

## **Product Summary**

BV <sub>DSS</sub>	R <sub>DS(ON)</sub>	I <sub>D</sub> T <sub>A</sub> = +25°C
100V	700mΩ @ V <sub>GS</sub> = $10$ V	0.70A
100 V	$900m\Omega$ @ $V_{GS} = 6.0V$	0.62A

## **Description**

This new generation MOSFET is 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 and Benefits**

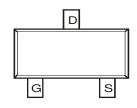
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Small Surface Mount Package
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

### **Mechanical Data**

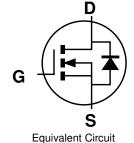
- Case: SOT23
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish Annealed over Alloy 42 Leadframe). (23)
- Terminal Connections: See Diagram
- Weight: 0.006 grams (Approximate)







Top View Pin Configuration



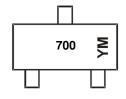
## Ordering Information (Note 4)

Part Number	Case	Packaging
DMN10H700S-7	SOT23	3,000/Tape & Reel
DMN10H700S-13	SOT23	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/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 https://www.diodes.com/design/support/packaging/diodes-packaging/.

# **Marking Information**



700 = Product Type Marking Code YM = Date Code Marking Y or  $\overline{Y}$  = Year (ex: E= 2017) M = Month (ex: 9 = September)

Date Code Key

Date Code No	"											
Year	2015	2016	2017	2018	2019	2020	202	21	2022	2023	2024	2025
Code	С	D	Е	F	G	Н	I		J	K	L	М
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Au	g Ser	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	0	N	D



# **Maximum Ratings** (@ $T_A = +25$ °C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	100	V
Gate-Source Voltage	$V_{GSS}$	±20	V
Continuous Drain Current (Note 6) V <sub>GS</sub> = 10V	I <sub>D</sub>	0.70 0.56	А
Pulsed Drain Current (10µs Pulse, Duty Cycle ≦1%)	I <sub>DM</sub>	2.5	Α
Maximum Body Diode Continuous Current (Note 6)	I <sub>S</sub>	0.6	Α

### Thermal Characteristics (@TA = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Total Power Dissipation	(Note 5)	0	0.4	W
Total Fower Dissipation	(Note 6)	$P_{D}$	0.5	VV
Thermal Resistance, Junction to Ambient (Note 5)		$R_{ heta JA}$	303	
Thermal Resistance, Junction to Ambient (Note 6)		$R_{ heta JA}$	239	°C/W
Thermal Resistance, Junction to Case	(Note 6)	$R_{ heta JC}$	88	
Operating and Storage Temperature Range		$T_{J}$ , $T_{STG}$	-55 to +150	°C

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

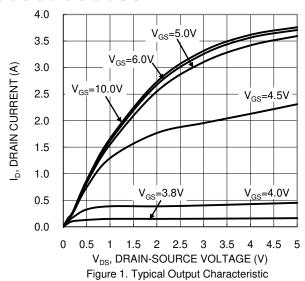
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)	, -,		71-	<u> </u>		
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	100	_	_	V	$V_{GS} = 0V, I_D = 250\mu A$
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	_	_	1	μΑ	$V_{DS} = 100V, V_{GS} = 0V$
Gate-Source Leakage	I <sub>GSS</sub>	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	2.0	2.7	4.0	V	$V_{DS} = V_{GS}$ , $I_D = 250 \mu A$
Static Drain-Source On-Resistance	D	_	540	700	mΩ	$V_{GS} = 10V, I_D = 1.5A$
Static Dialit-Source Off-nesistance	R <sub>DS(ON)</sub>	_	550	900	11122	$V_{GS} = 6.0V, I_D = 1.0A$
Diode Forward Voltage	$V_{SD}$	_	0.9	1.1	V	$V_{GS} = 0V, I_S = 1.5A$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	Ciss	_	235	_		$V_{DS} = 50V, V_{GS} = 0V,$ f = 1.0MHz
Output Capacitance	Coss	_	7	_	pF	
Reverse Transfer Capacitance	Crss	_	5	_		
Gate Resistance	R <sub>G</sub>	_	1.9	_	Ω	$V_{DS} = 0V$ , $V_{GS} = 0V$ , $f = 1.0MHz$
Total Gate Charge	Qg	_	4.6	_		V 50V V 10V
Gate-Source Charge	Q <sub>gs</sub>	_	1.1	_	nC	$V_{DS} = 50V, V_{GS} = 10V,$ $I_{D} = 1.0A$
Gate-Drain Charge	$Q_{gd}$	_	1.6	_		ID = 1.0A
Turn-On Delay Time	t <sub>D(ON)</sub>	_	2.5	_		
Turn-On Rise Time	t <sub>R</sub>	_	1.1	_	ns	$V_{DS} = 50V, I_{D} = 1.0A,$
Turn-Off Delay Time	t <sub>D(OFF)</sub>	_	5.4	_	115	$V_{GS} = 10V$ , $R_G = 6.0\Omega$
Turn-Off Fall Time	t <sub>F</sub>	_	1.0	_		
Reverse Recovery Time	t <sub>RR</sub>	_	22	_	ns	V <sub>B</sub> = 100V, I <sub>F</sub> =1.8A, di/dt=100A/μs
Reverse Recovery Charge	Q <sub>RR</sub>		15		nC	$V_R = 100V$ , $I_F = 1.0A$ , $U/U I = 100A/\mu S$

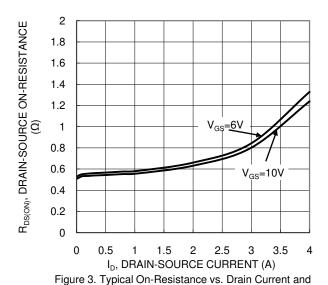
Notes:

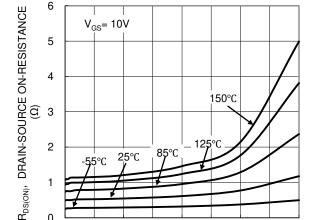
- 5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout.
- 7 .Short duration pulse test used to minimize self-heating effect.
- 8. Guaranteed by design. Not subject to production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

# **DMN10H700S**









1.5

Gate Voltage

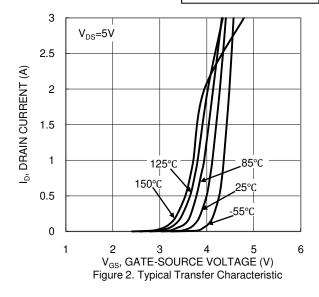
I<sub>D</sub>, DRAIN CURRENT (A) Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

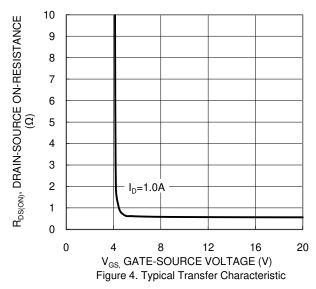
2

2.5

3

3.5





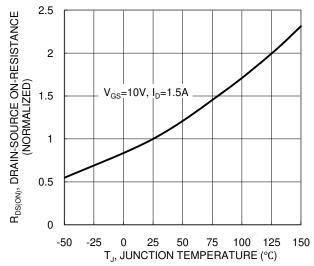


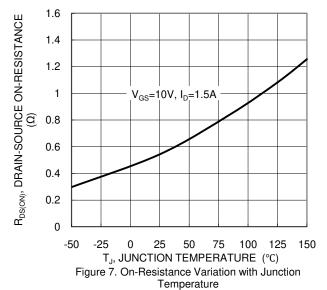
Figure 6. On-Resistance Variation with Junction Temperature

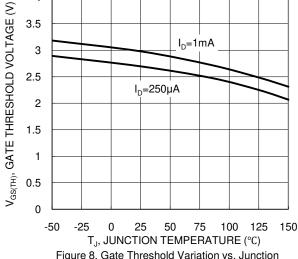
0

0.5



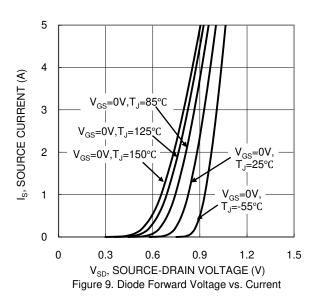


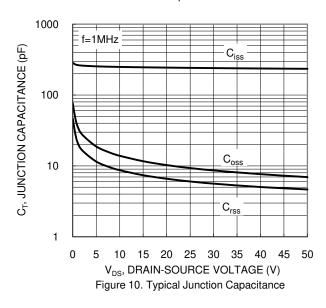


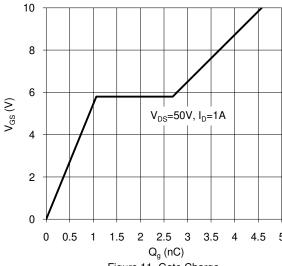


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Figure 8. Gate Threshold Variation vs. Junction Temperature







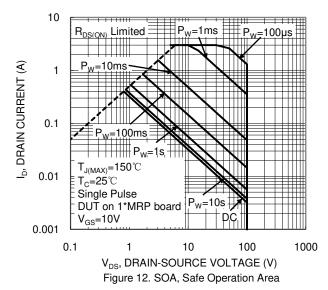


Figure 11. Gate Charge



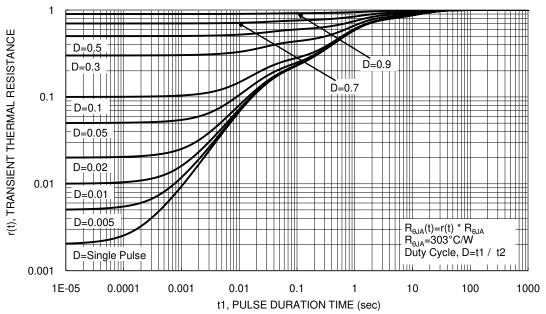


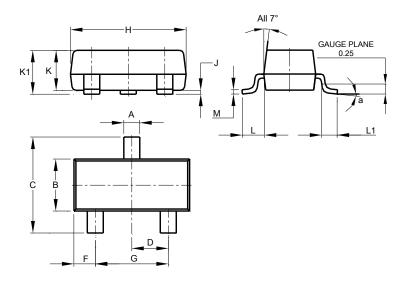
Figure 13. Transient Thermal Resistance



# **Package Outline Dimensions**

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

#### SOT23

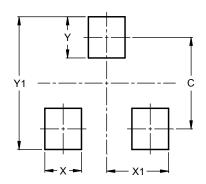


SOT23							
Dim	Min	Max	Тур				
Α	0.37	0.51	0.40				
В	1.20	1.40	1.30				
С	2.30	2.50	2.40				
D	0.89	1.03	0.915				
F	0.45	0.60	0.535				
G	1.78	2.05	1.83				
Н	2.80	3.00	2.90				
7	0.013	0.10	0.05				
K	0.890	1.00	0.975				
K1	0.903	1.10	1.025				
L	0.45	0.61	0.55				
L1	0.25	0.55	0.40				
М	0.085	0.150	0.110				
а	0°	8°					
All Dimensions in mm							

# **Suggested Pad Layout**

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

#### SOT23



Dimensions	Value (in mm)				
С	2.0				
Х	0.8				
X1	1.35				
Υ	0.9				
Y1	2.9				



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