



#### **DUAL N-CHANNEL ENHANCEMENT MODE MOSFET**

### **Product Summary**

V <sub>(BR)DSS</sub>	R <sub>DS(on)</sub>	<b>Ι</b> <sub>D</sub> Τ <sub>A</sub> = 25°C
20V	3.0 Ω @ V <sub>GS</sub> = 4.5V	240mA
	6.0 Ω @ V <sub>GS</sub> = 1.8V	180mA

#### **Description**

This new generation MOSFET has been designed to minimize the onstate 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

#### **Features**

- Dual N-Channel MOSFET
- Low On-Resistance:
  - 3.0 Ω @ 4.5V
  - 4.0 Ω @ 2.5V
  - 6.0 Ω @ 1.8V
  - 10 Ω @ 1.5V
- Very Low Gate Threshold Voltage, 1.05V max
- Low Input Capacitance
- Fast Switching Speed
- Ultra-Small Surface Mount Package
- ESD Protected Gate (HBM 300V)
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)

#### **Mechanical Data**

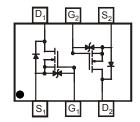
- Case: SOT963
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 (3)
- Weight: 0.0027 grams (approximate)





SOT963

Top View



Top View Schematic and Transistor Diagram

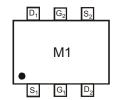
#### **Ordering Information** (Note 4)

Part Number	Case	Packaging
DMN26D0UDJ-7	SOT963	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 (Note 5)



M1 = Product Type Marking Code

Notes: 5. Package is non-polarized. Parts may be on reel in orientation illustrated, 180° rotated, or mixed (both ways).



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

Characteristic			Symbol	Value	Unit
Drain Source Voltage			$V_{DSS}$	20	V
Gate-Source Voltage			$V_{GSS}$	±10	V
Continuous Drain Current (Note 6) V <sub>GS</sub> = 4.5V	Steady State	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	240 190	mA
Continuous Drain Current (Note 6) V <sub>GS</sub> = 1.8V	Steady State	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	180 140	mA
Pulsed Drain Current - T <sub>P</sub> = 10μs			I <sub>DM</sub>	805	mA

## **Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 6)	$P_D$	300	mW
Thermal Resistance, Junction to Ambient (Note 6)	$R_{ hetaJA}$	409	°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 7)							
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	20	_	_	V	$V_{GS} = 0V, I_D = 100 \mu A$	
Zero Gate Voltage Drain Current @ T <sub>C</sub> = +25°C	I <sub>DSS</sub>	_		500	nA	$V_{DS} = 20V, V_{GS} = 0V$	
Gate-Body Leakage	I <sub>GSS</sub>	_	_	±1	μΑ	$V_{GS} = \pm 10V, V_{DS} = 0V$	
Gale-Body Leakage				±100	nA	$V_{GS} = \pm 5V$ , $V_{DS} = 0V$	
ON CHARACTERISTICS (Note 7)							
Gate Threshold Voltage	V <sub>GS(th)</sub>	0.45	8.0	1.05	V	$V_{DS} = V_{GS}$ , $I_{D} = 250 \mu A$	
		_	1.8	3.0		$V_{GS} = 4.5V, I_D = 100mA$	
	R <sub>DS</sub> (ON)		2.5	4.0	Ω	$V_{GS} = 2.5V, I_D = 50mA$	
Static Drain-Source On-Resistance			3.4	6.0		$V_{GS} = 1.8V, I_D = 20mA$	
			4.7	10.0		$V_{GS} = 1.5V, I_D = 10mA$	
		_	9.5	_		V <sub>GS</sub> = 1.2V, I <sub>D</sub> = 1mA	
Forward Transconductance	Y <sub>fs</sub>	180	240	_	mS	$V_{DS} = 10V, I_{D} = 0.1A$	
Source-Drain Diode Forward Voltage	$V_{SD}$	0.5	8.0	1.0	V	$V_{GS} = 0V, I_{S} = 10mA$	
DYNAMIC CHARACTERISTICS (Note 8)							
Input Capacitance	C <sub>iss</sub>		14.1		pF	1/ 45)/ 1/ 0)/	
Output Capacitance	Coss	_	2.9		pF	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V f = 1.0MHz	
Reverse Transfer Capacitance	C <sub>rss</sub>		1.6		pF		
SWITCHING CHARACTERISTICS, V <sub>GS</sub> = 4.5V (Note 8)							
Turn-On Delay Time	t <sub>d(on)</sub>	_	3.8				
Rise Time	t <sub>r</sub>		7.9	_	ns	$V_{GS} = 4.5V, V_{DD} = 10V$	
Turn-Off Delay Time	t <sub>d(off)</sub>	_	13.4	_	115	$I_D$ = 200mA, $R_G$ = 2.0 $\Omega$	
Fall Time	t <sub>f</sub>		15.2				

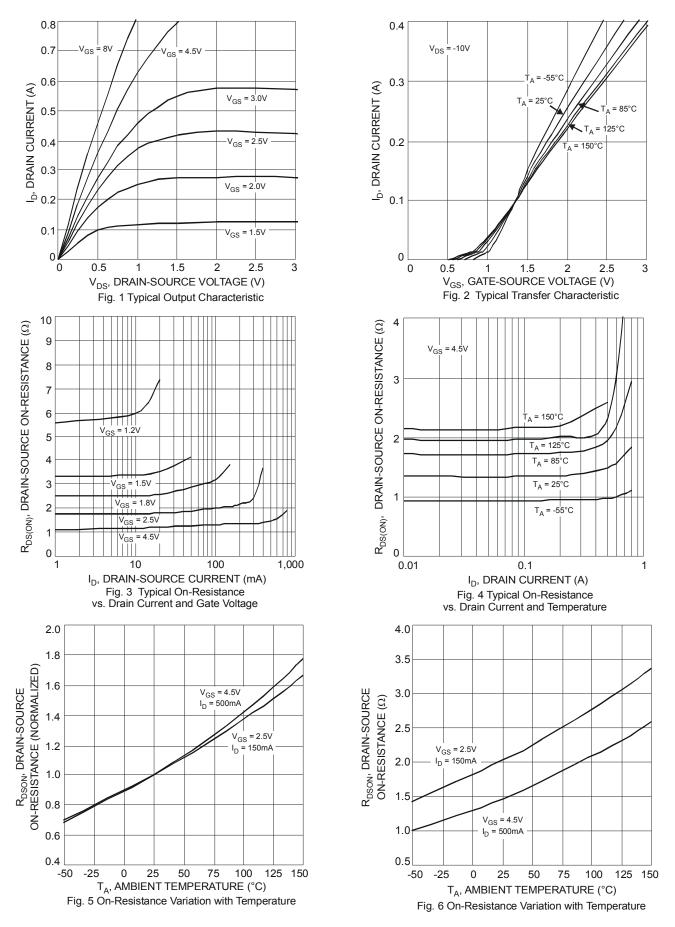
Notes:

<sup>6.</sup> Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch with minimum recommended pad layout; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at http://www.diodes.com.

7. Short duration pulse test used to minimize self-heating effect.

8. Switching characteristics are independent of operating junction temperature. Guaranteed by design, not subject to production testing.







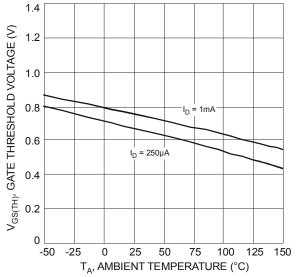
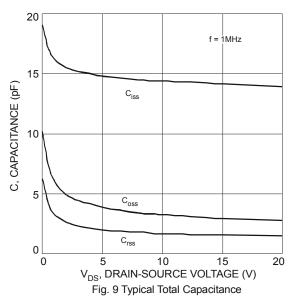
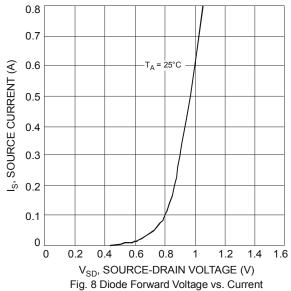


Fig. 7 Gate Threshold Variation vs. Ambient Temperature





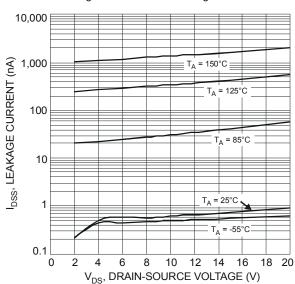
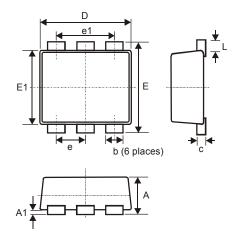


Fig. 10 Typical Leakage Current vs. Drain-Source Voltage

# **Package Outline Dimensions**

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

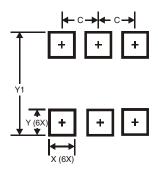


SOT963					
Dim	Min	Max	Тур		
Α	0.40	0.50	0.45		
A1	0	0.05	-		
С	0.120	0.180	0.150		
D	0.95	1.05	1.00		
E	0.95	1.05	1.00		
E1	0.75 0.85 0.8				
L	0.05	0.15	0.10		
b	0.10	0.20	0.15		
е	0.35 Typ				
e1	0.70 Typ				
All Dimensions in mm					



## **Suggested Pad Layout**

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



Dimensions	Value (in mm)
С	0.350
Х	0.200
Y	0.200
Y1	1.100

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