



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

#### **Product Summary**

V <sub>(BR)DSS</sub>	R <sub>DS(on) max</sub>	I <sub>D</sub> T <sub>A</sub> = +25°C
4001/	220mΩ @ V <sub>GS</sub> = 10V	2.24A
100V	250mΩ @ $V_{GS} = 4.5V$	2.10A

#### **Description**

This new generation MOSFET is designed to minimize the on-state resistance (R<sub>DS(on)</sub>) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

#### **Applications**

- DC-DC Converters
- Power Management Functions
- Backlighting

#### **Features and Benefits**

- Low Input Capacitance
- Low On-Resistance
- Fast Switching Speed
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)

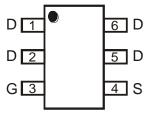
#### **Mechanical Data**

- Case: TSOT26
- 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 Tin Finish Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208<sup>®</sup>
- Weight: 0.013 grams (Approximate)

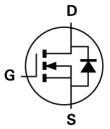




Top View



Top View Pin Configuration



Equivalent Circuit

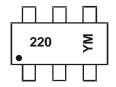
#### **Ordering Information** (Note 4)

Part Number	Case	Packaging
DMN10H220LVT-7	TSOT26	3,000/Tape & Reel
DMN10H220LVT-13	TSOT26	10,000/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**



220 = Product Type Marking Code YM = Date Code Marking Y or \overline{Y} = Year (ex: C = 2015) M = Month (ex: 9 = September)

Date Code Key

Year	2015		2016	2017		2018	2019		2020	2021		2022
Code	С		D	Е		F	G		Н			J
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	g Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	0	N	D

April 2015



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

Characteristic		Symbol	Value	Units	
Drain-Source Voltage	V <sub>DSS</sub>	100	V		
Gate-Source Voltage		V <sub>GSS</sub>	±16	V	
Continuous Drain Comment (Note 5) V	(Note 6)	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I <sub>D</sub>	2.24 1.79	А
Continuous Drain Current (Note 5) V <sub>GS</sub> = 10V	(Note 5)	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I <sub>D</sub>	1.87 1.50	А
Maximum Continuous Body Diode Forward Currer	Is	1.50	Α		
Pulsed Drain Current (10µs pulse, duty cycle = 1%	I <sub>DM</sub>	6.60	А		

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

Characteristic	Symbol	Value	Units		
Total Power Dissipation (Note 6)	$T_A = +25^{\circ}C$	C	1.67	W	
Total Power Dissipation (Note 6)	T <sub>A</sub> = +70°C	$P_{D}$	1.07		
Thermal Resistance, Junction to Ambient	(Note 6)	C	75	°C/W	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	108		
Operating and Storage Temperature Range		$T_{J_{I}}T_{STG}$	-55 to +150	°C	

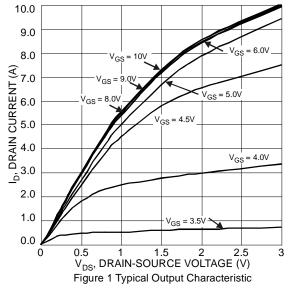
### Electrical Characteristics (@T<sub>A</sub> = +25°C unless otherwise specified.)

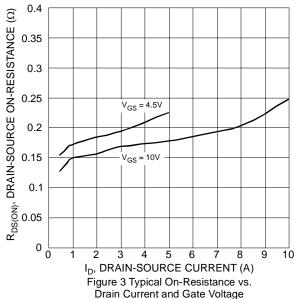
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 7)							
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	100	_	_	V	$V_{GS} = 0V, I_D = 250\mu A$	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	_	_	1	μΑ	V <sub>DS</sub> = 100V, V <sub>GS</sub> = 0V	
Gate-Source Leakage	I <sub>GSS</sub>		_	±100	nA	$V_{GS} = \pm 16V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 7)							
Gate Threshold Voltage	V <sub>GS(th)</sub>	1	1.8	2.5	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	
Static Drain-Source On-Resistance	0		172	220	mΩ	$V_{GS} = 10V, I_D = 1.6A$	
Static Drain-Source On-Resistance	R <sub>DS</sub> (ON)	_	211	250	11122	$V_{GS} = 4.5V, I_D = 1.3A$	
Diode Forward Voltage	V <sub>SD</sub>	_	0.77	1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 1.1A	
DYNAMIC CHARACTERISTICS (Note 8)							
Input Capacitance	C <sub>iss</sub>	_	401	_		V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V f = 1MHz	
Output Capacitance	Coss	_	22	_	pF		
Reverse Transfer Capacitance	C <sub>rss</sub>	_	17	_			
Gate Resistance	Rg	_	2.1	_	Ω	$V_{DS} = 0V$ , $V_{GS} = 0V$ , $f = 1MHz$	
Total Gate Charge (V <sub>GS</sub> = 4.5V)	Qg	_	4.1	_			
Total Gate Charge (V <sub>GS</sub> = 10V)	Qg	_	8.3	_	nC	$V_{DS} = 50V, I_{D} = 1.6A$	
Gate-Source Charge	Q <sub>gs</sub>	_	1.5	_	IIC		
Gate-Drain Charge	Q <sub>gd</sub>	_	2	_			
Turn-On Delay Time	t <sub>D(on)</sub>	_	6.8	_			
Turn-On Rise Time	t <sub>r</sub>	_	8.2	_		$V_{DS} = 50V, V_{GS} = 4.5V,$	
Turn-Off Delay Time	t <sub>D(off)</sub>	_	7.9	_	ns	$R_G = 6.8\Omega, I_D = 1A$	
Turn-Off Fall Time	t <sub>f</sub>	_	3.6	_	1		
Reverse Recovery Time	t <sub>rr</sub>	_	17	_	ns	1 4 4 4 4 11/11 4 4 9 9 4 / 1 -	
Reverse Recovery Charge	Q <sub>rr</sub>	_	9.8	_	nC I <sub>F</sub> = 1.1A, di/dt =100A/µs		

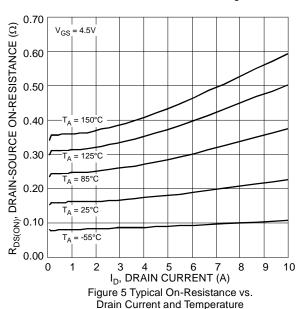
Notes:

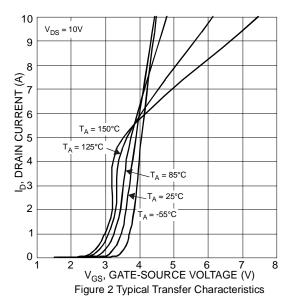
- 5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.6. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal vias to bottom layer 1-inch square copper plate.
- 7 .Short duration pulse test used to minimize self-heating effect.
- 8. Guaranteed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

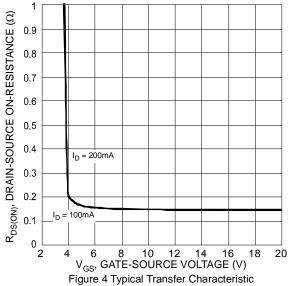












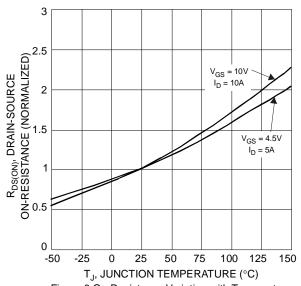
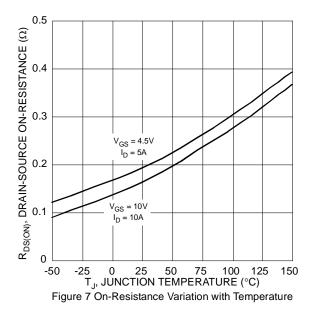


Figure 6 On-Resistance Variation with Temperature





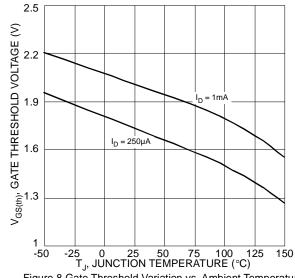
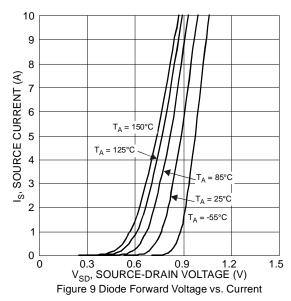
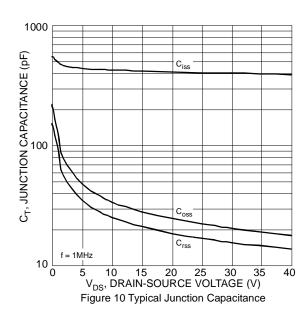
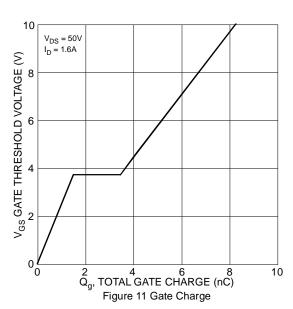
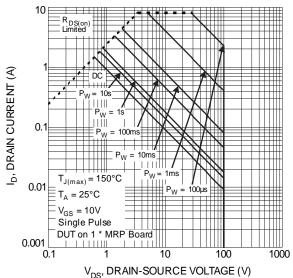


Figure 8 Gate Threshold Variation vs. Ambient Temperature



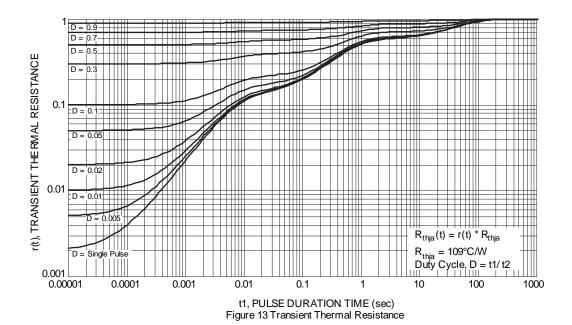






 ${
m V_{DS}}, {
m DRAIN\text{-}SOURCE\,VOLTAGE\,(V)}$  Figure 12 SOA, Safe Operation Area

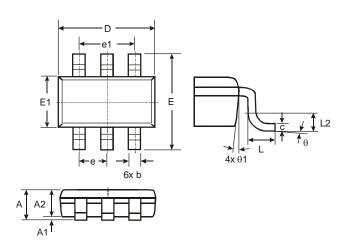






## **Package Outline Dimensions**

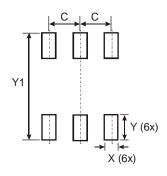
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



	TSOT26								
Dim	Min	Max	Тур						
Α		1.00							
A1	0.01								
A2	0.84	0.90							
D			2.90						
Е			2.80						
E1			1.60						
b	0.30	0.45	_						
С	0.12	0.20	_						
е			0.95						
e1			1.90						
L	0.30	0.50							
L2			0.25						
θ	0°	8°	4°						
θ1	4°	12°	_						
All D	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	0.950
X	0.700
Y	1.000
Y1	3.199



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многоканальный

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