



#### N-CHANNEL ENHANCEMENT MODE MOSFET

### **Product Summary**

V <sub>(BR)DSS</sub>	R <sub>DS(ON)</sub>	I <sub>D</sub> T <sub>A</sub> = +25°C			
300V	$14\Omega$ @ $V_{GS}$ = $10V$	0.21A			
3007	20Ω @ V <sub>GS</sub> = 4.5V	0.17A			

### **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**

- · Power management functions
- · Battery Operated Systems and Solid-State Relays
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc

#### **Features**

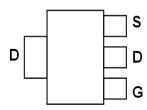
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

#### **Mechanical Data**

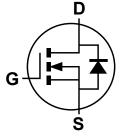
- Case: SOT89
- Case Material: Molded Plastic, "Green" Molding Compound UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish Matte Tin Finish annealed over Copper lead frame. Solderable per MIL-STD-202, Method 208@3
- Weight: 0.052 grams (approximate)







Pin-out Top



#### Equivalent Circuit

### Ordering Information (Note 4)

Part Number	Compliance	Case	Quantity per reel
DMN30H14DLY-13	Standard	SOT89	2,500

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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product\_grade\_definitions/.

### **Marking Information**



Oll = Manufacturer's Marking H4Y = Marking Code YWW = Date Code Marking Y= Year (ex: 4 = 2014) WW = Week (01 - 53)



## **Maximum Ratings** ( $@T_A = +25^{\circ}C$ , unless otherwise specified.)

Characteristic			Symbol	Value	Units
Drain-Source Voltage			$V_{DSS}$	300	V
Gate-Source Voltage			V <sub>GSS</sub>	±20	V
Continuous Drain Current (Note 6) $V_{GS}$ = 10V Steady $T_A$ = +25°C $T_A$ = +70°C		I <sub>D</sub>	0.21 0.16	А	
Pulsed Drain Current (10µs pulse, duty cycle ≦1%)			I <sub>DM</sub>	1	Α
Maximum Body Diode Continuous Current (Note 6)			Is	2	A

#### **Thermal Characteristics**

Characteristic	Symbol	Value	Units	
Total Power Dissipation	(Note 5)	D-	0.9	W
Total Power Dissipation	(Note 6)	$P_D$	2.2	
Thermal Resistance, Junction to Ambient	(Note 5)	Б	132	°C/W
Thermal Resistance, Junction to Ambient	(Note 6)	$R_{ hetaJA}$	55	
Thermal Resistance, Junction to Case (Note 6)		$R_{ heta JC}$	9.6	
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.)

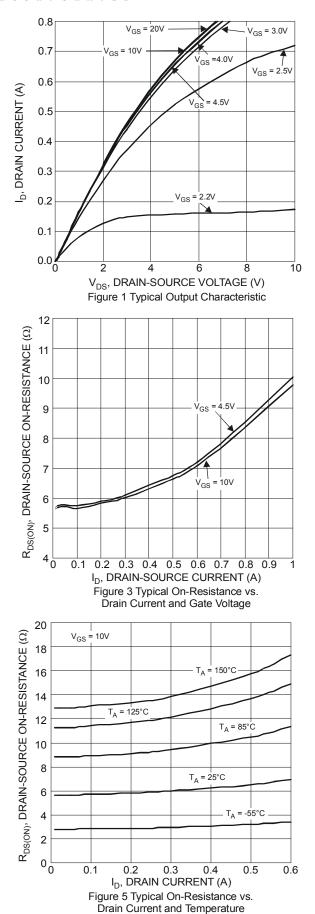
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 7)							
Drain-Source Breakdown Voltage	$BV_{DSS}$	300	_	_	٧	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	_	_	1	μΑ	V <sub>DS</sub> = 240V, V <sub>GS</sub> = 0V	
Gate-Body 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>	1		3	>	$V_{DS} = V_{GS}, I_D = 250 \mu A$	
Static Drain-Source On-Resistance	D		6	14	0	$V_{GS} = 10V, I_D = 0.3A$	
Static Diani-Source On-Resistance	R <sub>DS(ON)</sub>	_	6	20	Ω	$V_{GS} = 4.5V, I_D = 0.2A$	
Diode Forward Voltage	$V_{SD}$	_	0.7	1.2	V	$V_{GS} = 0V, I_{S} = 0.3A$	
DYNAMIC CHARACTERISTICS (Note 8)							
Input Capacitance	C <sub>iss</sub>		96	_		V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V, f = 1MHz	
Output Capacitance	Coss	_	5.8	_	pF		
Reverse Transfer Capacitance	C <sub>rss</sub>	_	3.2	_		1 – 11011 12	
Gate Resistance	R <sub>G</sub>	_	12	_	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1.0MHz	
Total Gate Charge	Qg	_	4	_			
Gate-Source Charge	Q <sub>gs</sub>	_	0.3	_	nC	$V_{DS} = 192V, V_{GS} = 10V,$ $I_{D} = 0.5A$	
Gate-Drain Charge	Q <sub>gd</sub>	_	1.9	_			
Turn-On Delay Time	t <sub>D(on)</sub>	_	3.3	_			
Turn-On Rise Time	t <sub>r</sub>	_	8.6	_	nS	$V_{DS} = 60V, R_L = 200\Omega$ $V_{GS} = 10V, R_G = 25\Omega$	
Turn-Off Delay Time	t <sub>D(off)</sub>	_	22	_	no		
Turn-Off Fall Time	t <sub>f</sub>	_	12	_			
Reverse Recovery Time	t <sub>rr</sub>	_	43	_	nS	\( - 400\\ \ \ - 4 00 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
Reverse Recovery Charge	Q <sub>rr</sub>	_	47	_	nC	$V_R = 100V$ , $I_F = 1.0A$ , $di/dt = 100A/\mu s$	

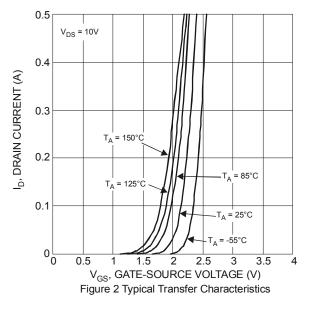
5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.

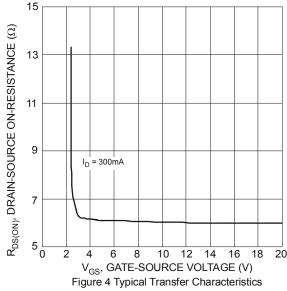
<sup>6.</sup> Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate 7. Short duration pulse test used to minimize self-heating effect

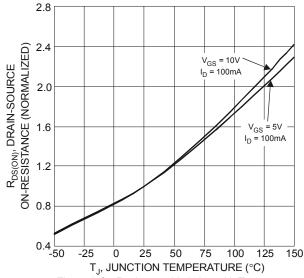
<sup>8.</sup> Guaranteed by design. Not subject to production testing



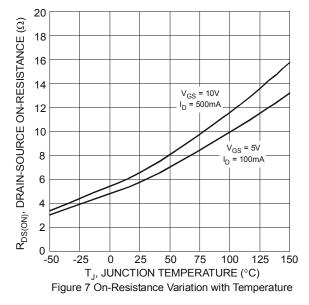


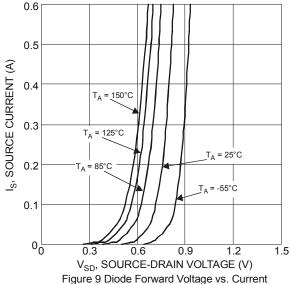


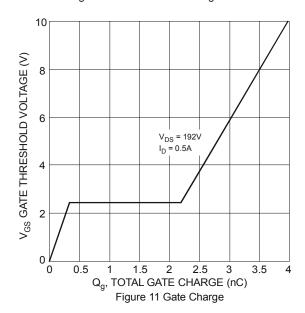












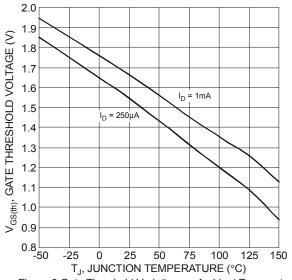
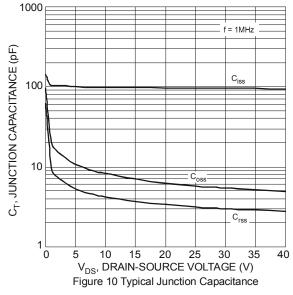
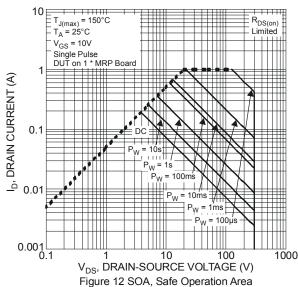
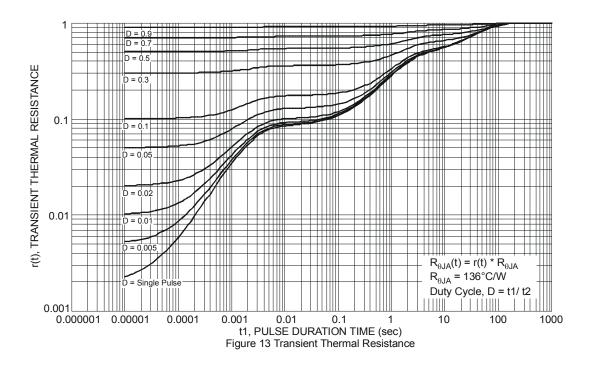


Figure 8 Gate Threshold Variation vs. Ambient Temperature



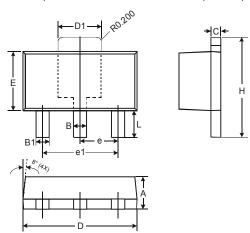






## **Package Outline Dimensions**

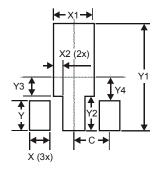
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



SOT89					
Dim	Min	Max			
Α	1.40	1.60			
В	0.44	0.62			
B1	0.35	0.54			
С	0.35	0.43			
D	4.40	4.60			
D1	1.52	1.83			
Е	2.29	2.60			
e	1.50 Typ				
e1	3.00 Typ				
H	3.94	4.25			
L	0.89	1.20			
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)			
Х	0.900			
X1	1.733			
X2	0.416			
Υ	1.300			
Y1	4.600			
Y2	1.475			
Y3	0.950			
Y4	1.125			
С	1.500			



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