



#### N-CHANNEL ENHANCEMENT MODE MOSFET

### **Product Summary**

V <sub>(BR)DSS</sub>	R <sub>DS(ON)</sub> max	I <sub>D</sub> max T <sub>A</sub> = +25°C
	73mΩ @ V <sub>GS</sub> = 10V	3.3A
30V	110mΩ @ V <sub>GS</sub> = 4.5V	2.7A

### **Features and Benefits**

- Low On-Resistance
- 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

### **Description and Applications**

This 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.

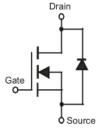
- General Purpose Interfacing Switch
- · Power Management Functions
- Boost Application
- Analog Switch

#### **Mechanical Data**

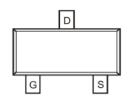
- Case: SOT-23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See diagram
- Terminals: Finish NiPdAu over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.027 grams (approximate)







Internal Schematic



TOP VIEW

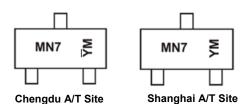
## **Ordering Information** (Note 4)

Part Number	Case	Packaging		
DMN3110S-7	SOT-23	3000/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 http://www.diodes.com/products/packages.html

## **Marking Information**



MN7 = Product Type Marking Code

YM = Date Code Marking for SAT (Shanghai Assembly/ Test site)
YM = Date Code Marking for CAT (Chengdu Assembly/ Test site)

Y or  $\overline{Y}$  = Year (ex: A = 2013)

M = Month (ex: 9 = September)

#### Date Code Key

Year	2007	2008	2009	2010	201	1 20	)12	2013	2014	2015	2016	2017
Code	J	V	W	X	Y		Z	Α	В	С	D	E
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** ( $@T_A = +25^{\circ}C$ , unless otherwise specified.)

Characteristic		Symbol	Value	Units	
Drain-Source Voltage		$V_{DSS}$	30	V	
Gate-Source Voltage		$V_{GSS}$	±20	V	
Continuous Drain Current (Note 5) V <sub>GS</sub> = 10V	Steady State	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	ID	2.5 2.0	А
Continuous Drain Current (Note 6) V <sub>GS</sub> = 10V	Steady State	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I <sub>D</sub>	3.3 2.7	Α
Continuous Drain Current (Note 6) V <sub>GS</sub> = 10V	t≦10sec	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I <sub>D</sub>	3.8 3.1	Α
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>	2.7 2.1	А
Pulsed Drain Current (Note 7)			I <sub>DM</sub>	25	Α

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

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	P <sub>D</sub>	0.74	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{ heta JA}$	173.4	°C/W
Total Power Dissipation (Note 6)	$P_{D}$	1.3	W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{ hetaJA}$	99.1	°C/W
Total Power Dissipation (Note 6) t≦10sec	$P_{D}$	1.8	W
Thermal Resistance, Junction to Ambient (Note 6) t≦10sec	$R_{ heta JA}$	72	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

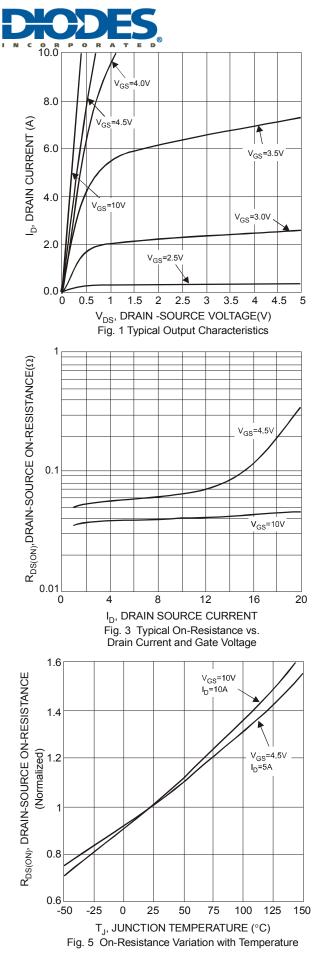
## Electrical Characteristics (@TA = +25°C, unless otherwise specified.)

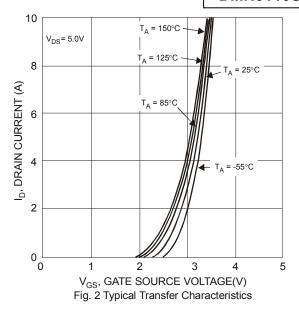
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)		•				•
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	30	-	-	V	$V_{GS} = 0V, I_D = 250\mu A$
Zero Gate Voltage Drain Current @T <sub>C</sub> = +25°	C I <sub>DSS</sub>	-	-	1.0	μΑ	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	-	-	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V <sub>GS(th)</sub>	1.0	-	3.0	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$
Static Drain-Source On-Resistance		-	54	73	mΩ	$V_{GS} = 10V, I_D = 3.1A$
Static Drain-Source On-Resistance	R <sub>DS (ON)</sub>	-	88	110	11177	$V_{GS} = 4.5V, I_D = 2A$
Forward Transfer Admittance	Y <sub>fs</sub>	-	4.8	-	mS	$V_{DS} = 10V, I_D = 3.1A$
Diode Forward Voltage (Note 6)	$V_{SD}$	-	0.75	1.0	V	$V_{GS} = 0V, I_{S} = 1A$
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C <sub>iss</sub>	-	305.8	-	рF	\\ 45\\\\\ 0\\
Output Capacitance	Coss	_	39.9	-	pF	$V_{DS} = 15V, V_{GS} = 0V,$ - f = 1.0MHz
Reverse Transfer Capacitance	C <sub>rss</sub>	-	39.5	-	pF	1 - 1.0MHZ
Gate Resistance	Rg	-	1.4	-	Ω	$V_{DS} = 0V$ , $V_{GS} = 0V$ , $f = 1.0MHz$
Total Gate Charge (V <sub>GS</sub> = 4.5V)	Qg	-	4.1	-	nC	
Total Gate Charge (V <sub>GS</sub> = 10V)	Qg	-	8.6	-	nC	$V_{GS} = 10V, V_{DS} = 10V,$
Gate-Source Charge	Q <sub>gs</sub>	-	1.2	-	nC	$I_D = 3A$
Gate-Drain Charge	Q <sub>gd</sub>	-	1.5	-	nC	
Turn-On Delay Time	t <sub>D(on)</sub>	-	2.6	-	ns	
Turn-On Rise Time	tr	-	4.6	-	ns	V <sub>DD</sub> = 15V, V <sub>GS</sub> = 10V,
Turn-Off Delay Time	t <sub>D(off)</sub>	-	13.1	-	ns	$R_L = 47\Omega$ , $R_G = 3\Omega$ ,
Turn-Off Fall Time	t <sub>f</sub>	-	2.5	-	ns	7

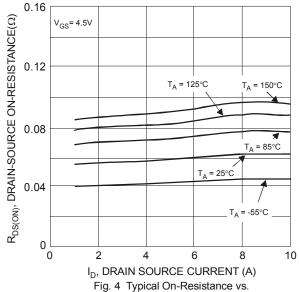
Notes:

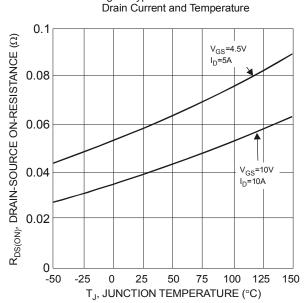
- 5. Device mounted on FR-4 PCB, with minimum recommended pad layout.
- Device mounted on FR-4 Fush, with minimum recommended pad rayout.
   Device mounted on FR-4 substrate PC board, 2oz copper, on 1 inch square copper plate
   Device mounted on minimum recommended pad layout test board, 10µs pulse duty cycle = 1%
   Short duration pulse test used to minimize self-heating effect.
   Guaranteed by design. Not subject to product testing.

### **DMN3110S**











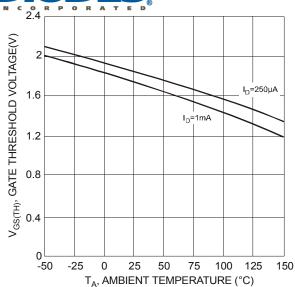
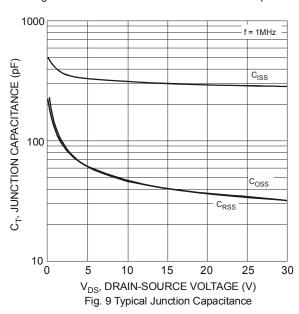
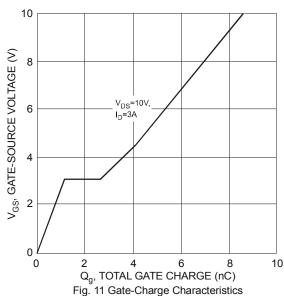
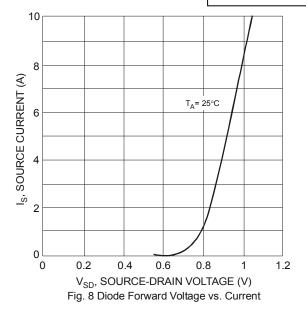
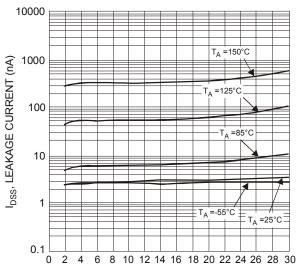


Fig. 7 Gate Threshold Variation vs. Ambient Temperature



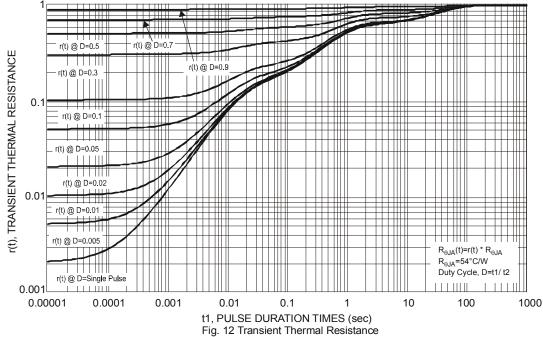






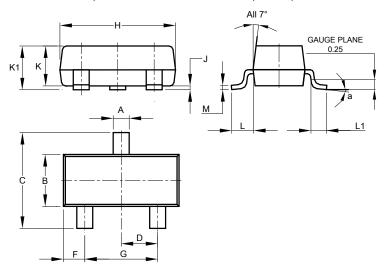
V<sub>DS</sub>, DRAIN-SOURCE VOLTAGE(V)
Fig. 10 Typical Drain-Source Leakage Current vs. Voltage





## **Package Outline Dimensions**

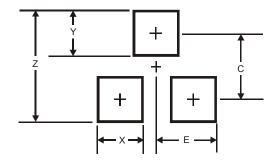
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



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					
α	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	2.9
X	0.8
Y	0.9
С	2.0
E	1.35



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