





#### 30V 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
30V	460mΩ @ V <sub>GS</sub> = 4.5V	0.9A
300	560mΩ @ V <sub>GS</sub> = 2.5V	0.7A

#### **Features and Benefits**

- 0.5mm ultra low profile package for thin application
- 0.6mm<sup>2</sup> package footprint, 10 times smaller than SOT23
- Low V<sub>GS(th)</sub>, can be driven directly from a battery
- Low R<sub>DS(on)</sub>
- "Lead Free", RoHS Compliant (Note 1)
- Halogen and Antimony Free. "Green" Device (Note 2)
- ESD Protected Gate 2kV
- Qualified to AEC-Q101 Standards for High Reliability

### **Description and Applications**

This MOSFET has been 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.

- Load switch
- Portable applications
- Power Management Functions

#### **Mechanical Data**

- Case: DFN1006-3
- 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 NiPdAu over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.001 grams (approximate)

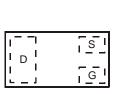


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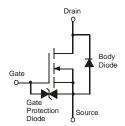
DFN1006-3



Bottom View



Top View Internal Schematic



Equivalent Circuit

### Ordering Information (Note 3)

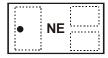
Part Number	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DMN3730UFB-7	NE	7	8	3,000
DMN3730UFB-7B	NE	7	8	10,000

Notes:

- 1. No purposefully added lead
- 2. Diodes Inc's "Green" policy can be found on our website at http://www.diodes.com.
- 3. For packaging details, go to our website at http://www.diodes.com.

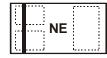
# Marking Information

DMN3730UFB-7



Top View Dot Denotes Drain Side

DMN3730UFB-7B



Top View Bar Denotes Gate and Source Side

NE = Product Type Marking Code





### Maximum Ratings @TA = 25°C unless otherwise specified

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			$V_{DSS}$	30	V
Gate-Source Voltage			$V_{GSS}$	±8	V
		(Note 5)		0.91	
Continuous Drain Current	$V_{GS} = 4.5V$	$T_A = 70^{\circ}C \text{ (Note 5)}$	ID	0.73	А
		(Note 4)		0.75	
Pulsed Drain Current (Note 6)		I <sub>DM</sub>	3	A	

# **Thermal Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit		
Power Dissipation	(Note 5)	В	0.69	W	
Power Dissipation	(Note 4)	$P_{D}$	0.47		
Thermal Desigtance, Junction to Ambient	(Note 5)	Б	180	°C/W	
Thermal Resistance, Junction to Ambient	(Note 4)	$R_{\theta JA}$	258	C/VV	
Operating and Storage Temperature Range		$T_J$ , $T_{STG}$	-55 to +150	°C	

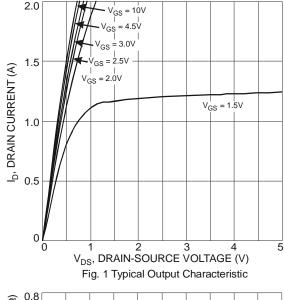
# Electrical Characteristics @TA = 25°C unless otherwise specified

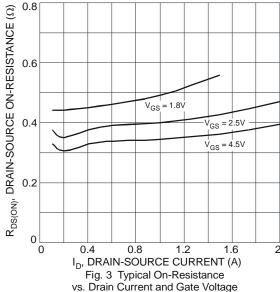
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	30	-	-	<b>V</b>	$V_{GS} = 0V, I_{D} = 10\mu A$	
Zero Gate Voltage Drain Current T <sub>J</sub> = 25°C	I <sub>DSS</sub>	1	-	1	μΑ	$V_{DS} = 30V, V_{GS} = 0V$	
Gate-Source Leakage	I <sub>GSS</sub>	-	-	3	μΑ	$V_{GS} = \pm 8V$ , $V_{DS} = 0V$	
ON CHARACTERISTICS						_	
Gate Threshold Voltage	V <sub>GS(th)</sub>	0.45	-	0.95	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	
				460		$V_{GS} = 4.5V, I_D = 200mA$	
Static Drain-Source On-Resistance (Note 7)	R <sub>DS</sub> (ON)	-	-	560	$\mathbf{m}\Omega$	$V_{GS} = 2.5V, I_D = 100mA$	
				730		$V_{GS} = 1.8V, I_D = 75mA$	
Forward Transfer Admittance	Y <sub>fs</sub>	40	-	-	mS	$V_{DS} = 3V, I_{D} = 10mA$	
Diode Forward Voltage (Note 7)	V <sub>SD</sub>	-	0.7	1.2	V	$V_{GS} = 0V, I_S = 300mA$	
DYNAMIC CHARACTERISTICS (Note 8)			-	-			
Input Capacitance	C <sub>iss</sub>	-	64.3	-	pF	\/ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
Output Capacitance	Coss	-	6.1	-	pF	$V_{DS} = 25V, V_{GS} = 0V,$ - f = 1.0MHz	
Reverse Transfer Capacitance	$C_{rss}$	•	4.5	-	рF	1.0 V   2	
Gate Resistance	$R_{g}$	-	70	-	Ω	$V_{DS} = 0V$ , $V_{GS} = 0V$ , $f = 1MHz$	
Total Gate Charge	Qg	-	1.6	-	nC	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
Gate-Source Charge	Q <sub>gs</sub>	-	0.2	-	nC	$V_{GS} = 4.5V, V_{DS} = 15V,$	
Gate-Drain Charge	Q <sub>gd</sub>	-	0.2	-	nC	I <sub>D</sub> = 1A	
Turn-On Delay Time	t <sub>D(on)</sub>	-	3.5	-	ns		
Turn-On Rise Time	t <sub>r</sub>	-	2.8	-	ns	$V_{DS} = 10V, I_{D} = 1A$	
Turn-Off Delay Time	t <sub>D(off)</sub>	-	38	-	ns	$V_{GS} = 10V, R_G = 6\Omega$	
Turn-Off Fall Time	t <sub>f</sub>	-	13	-	ns		

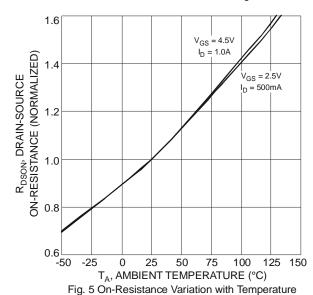
Notes:

- 4. For a device surface mounted on a minimum recommended pad layout of an FR4 PCB, in still air conditions; the device is measured when operating in steady-state condition.
- 5. Same as note 4, except the device measured at  $t \le 10$  sec.
- 6. Same as note 4, except the device is pulsed at duty cycle of 1% for a pulse width of 10μs.
  7. Measured under pulsed conditions to minimize self-heating effect. Pulse width ≤ 300μs; duty cycle ≤ 2%
- 8. For design aid only, not subject to production testing.

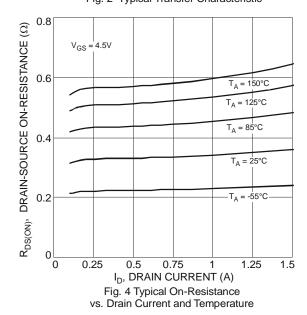


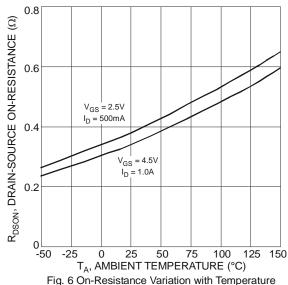






2.0  $V_{DS} = 5V$ 1.5  $T_{A} = 150^{\circ}C$   $T_{A} = 25^{\circ}C$ 0.5  $T_{A} = 150^{\circ}C$   $T_{A} = 25^{\circ}C$ 0.5  $T_{A} = 55^{\circ}C$ 0.5  $T_{A} = 55^{\circ}C$ 0.7  $T_{A} = 55^{\circ}C$ 







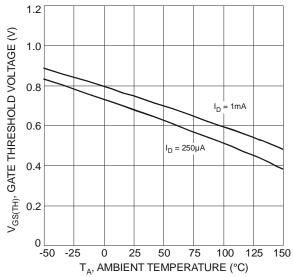
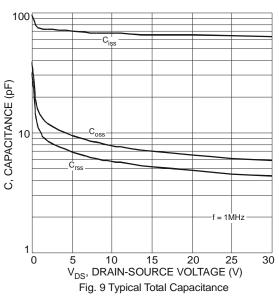
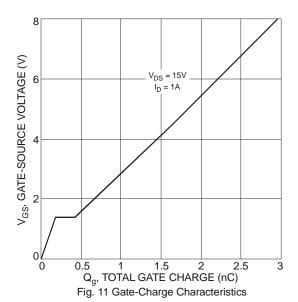
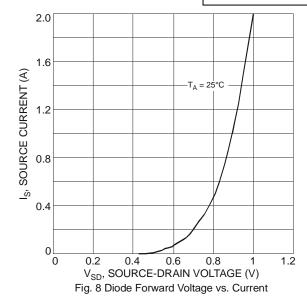
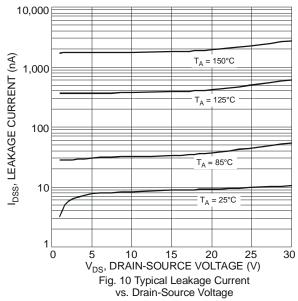


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

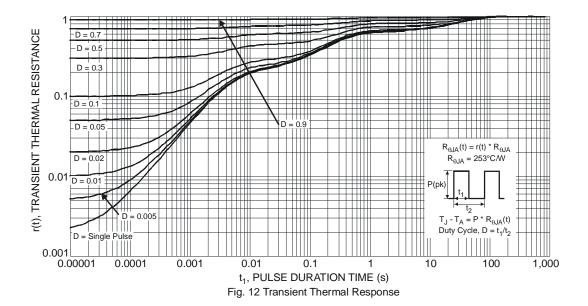




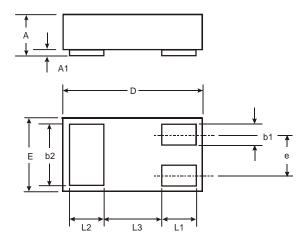






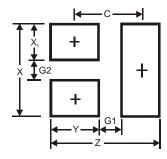


# **Package Outline Dimensions**



DFN1006-3					
Dim	Min	Max	Тур		
Α	0.47	0.53	0.50		
A1	0	0.05	0.03		
b1	0.10	0.20	0.15		
b2	0.45	0.55	0.50		
D	0.95	1.075	1.00		
Е	0.55	0.675	0.60		
е			0.35		
L1	0.20	0.30	0.25		
L2	0.20	0.30	0.25		
L3	_		0.40		
All Dimensions in mm					

# Suggested Pad Layout



Dimensions	Value (in mm)			
Z	1.1			
G1	0.3			
G2	0.2			
Х	0.7			
X1	0.25			
Υ	0.4			
С	0.7			





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