



#### 30V P-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
-30V	2.4Ω @ V <sub>GS</sub> = -10V	-400mA
	4Ω @ V <sub>GS</sub> = -4.5V	-300mA
	16Ω @ V <sub>GS</sub> = -2.5V	-50mA

## **Description**

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.

# **Applications**

- Load Switch
- Portable Applications
- Power Management Functions

### **Features**

- Low On-Resistance
- Ultra-Small Surfaced Mount Package
- ESD Protected Gate
- 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**

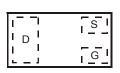
- Case: X1-DFN1006-3
- Case Material: Molded Plastic, "Green" Molding Compound.
   UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish NiPdAu over Copper leadframe. Solderable per MIL-STD-202, Method 208 @
- Weight: 0.001 grams (approximate)



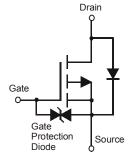




Bottom View



Top View



**Equivalent Circuit** 

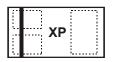
## Ordering Information (Note 4)

Product	Marking	Reel size (inches)	Quantity per reel
DMP32D4SFB-7B	XP	7	10,000

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**



Top View Bar Denotes Gate and Source Side

XP = Product Type Marking Code



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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V <sub>DSS</sub>	-30	V
Gate-Source Voltage			V <sub>GSS</sub>	±20	V
Continuous Drain Current (Note 5)	V <sub>GS</sub> = -10V	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	-400 -300	mA
Continuous Drain Current (Note 6)	V <sub>GS</sub> = -10V	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	-500 -400	mA
Pulsed Drain Current (Note 5)			I <sub>DM</sub>	-1	Α
Maximum Body Diode continuous Current			Is	-800	mA

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

Characteristic		Symbol	Value	Units	
Total Dawar Dissination	(Note 5)		0.5	W	
Total Power Dissipation	(Note 6)	$P_{D}$	1.2		
Thermal Resistance, Junction to Ambient	(Note 5)	6	273	°C/W	
Thermal Resistance, Junction to Ambient	(Note 6)	$R_{\theta JA}$	105		
Operating and Storage Temperature Range		$T_{J_i} T_{STG}$	-55 to 150	°C	

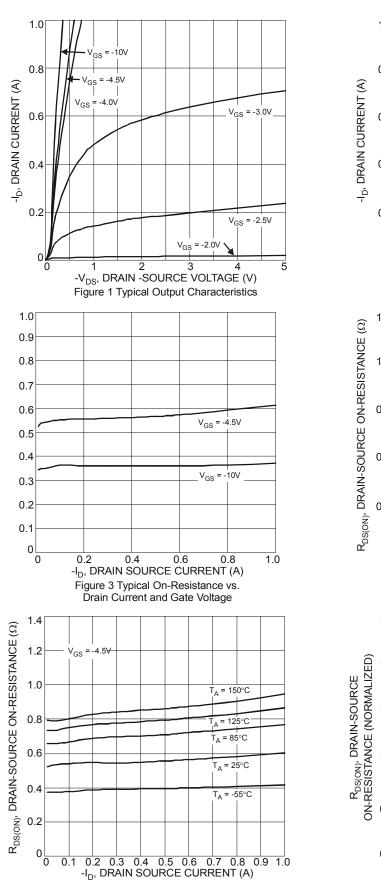
# **Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

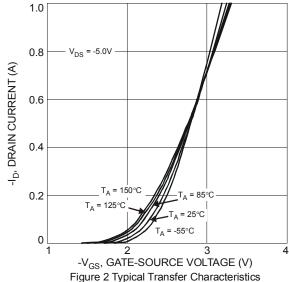
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 7)							
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-30	-	-	V	$V_{GS} = 0V$ , $I_D = -1mA$	
Zero Gate Voltage Drain Current T <sub>J</sub> = +25°C	I <sub>DSS</sub>	-	-	-1	μΑ	$V_{DS} = -30V, V_{GS} = 0V$	
Gate-Source Leakage	I <sub>GSS</sub>	-	-	±10	μA	$V_{GS} = \pm 16V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 7)							
Gate Threshold Voltage	V <sub>GS(th)</sub>	-1.3	-	-2.3	V	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$	
				2.4		$V_{GS} = -10V, I_D = -200mA$	
Static Drain-Source On-Resistance	R <sub>DS (ON)</sub>	-	-	4	Ω	$V_{GS} = -4.5V, I_D = -200mA$	
				16		$V_{GS} = -2.5V, I_D = -10mA$	
Forward Transfer Admittance	Y <sub>fs</sub>	-	6	-	S	$V_{DS} = -10V, I_D = -400mA$	
Diode Forward Voltage	V <sub>SD</sub>	-	8.0	1.2	V	$V_{GS} = 0V, I_{S} = -300mA$	
DYNAMIC CHARACTERISTICS (Note 8)							
Input Capacitance	C <sub>iss</sub>	-	51	-	pF	V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V, f = 1.0MHz	
Output Capacitance	Coss	-	11	-	pF		
Reverse Transfer Capacitance	C <sub>rss</sub>	-	9	-	pF	1 - 1.0WH12	
Total Gate Charge	Qg	-	0.6	-	nC	V <sub>GS</sub> = -4.5V	
Total Gate Charge	Qg	-	1.3	-	nC	V <sub>DS</sub> = -10V,	
Gate-Source Charge	Q <sub>gs</sub>	-	0.2	-	nC	V <sub>GS</sub> = -10V I <sub>D</sub> = -200mA	
Gate-Drain Charge	$Q_{gd}$	-	0.2	-	nC		
Turn-On Delay Time	t <sub>D(on)</sub>	-	3.6	-	ns	$V_{DS}$ = -15V, $I_{D}$ = -500mA $V_{GS}$ = -10V, $R_{G}$ = 1 $\Omega$	
Turn-On Rise Time	t <sub>r</sub>	-	8.5	-	ns		
Turn-Off Delay Time	$t_{D(off)}$	-	31.3	-	ns		
Turn-Off Fall Time	t <sub>f</sub>	-	20.2	-	ns		

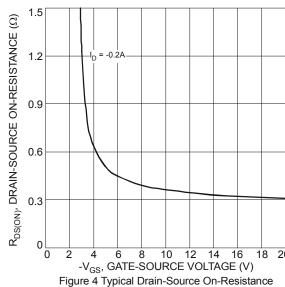
Notes:

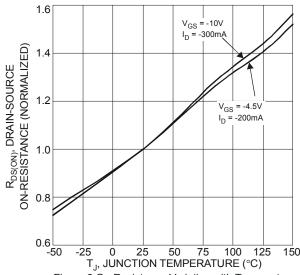
- 5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
  6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout
  7 .Short duration pulse test used to minimize self-heating effect.
- 8. Guaranteed by design. Not subject to production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









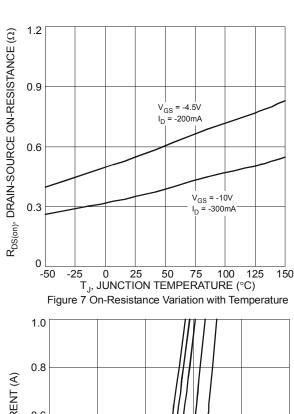


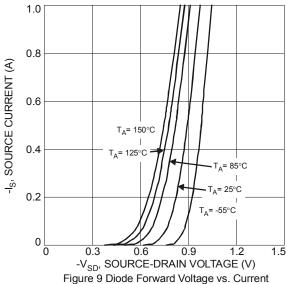
vs. Gate-Source Voltage

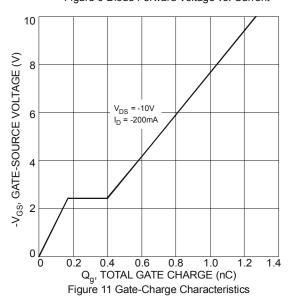
Figure 5 Typical On-Resistance vs.

Drain Current and Temperature









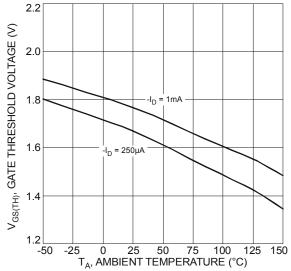
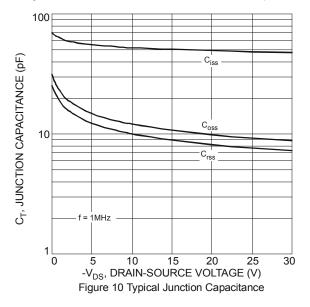


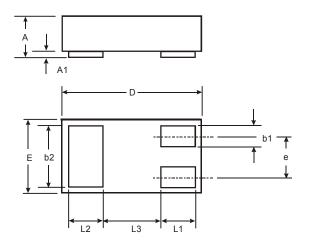
Figure 8 Gate Threshold Variation vs. Ambient Temperature





# **Package Outline Dimensions**

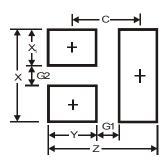
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



X1-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**

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



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



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