30V P-CHANNEL ENHANCEMENT MODE MOSFET

NEW PRODUCT

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$ Max	I_D Max @ T_A = +25°C
-30V	2.4Ω @ V_{GS} = -10V	-400mA
	4Ω @ V_{GS} = -4.5V	-300mA
	16Ω @ V_{GS} = -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

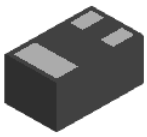
- Low On-Resistance
- Ultra-Small Surfaced Mount Package
- **ESD Protected Gate**
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

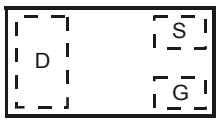
- Case: X1-DFN1006-3
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – NiPdAu over Copper leadframe. Solderable per MIL-STD-202, Method 208 e4
- Weight: 0.001 grams (approximate)

ESD PROTECTED

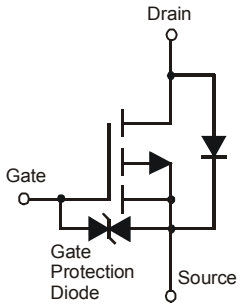
X1-DFN1006-3



Bottom View



Top View



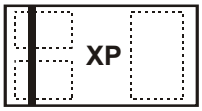
Equivalent Circuit

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.
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



Top View
Bar Denotes Gate and Source Side

XP = Product Type Marking Code

NEW PRODUCT

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	-30	V
Gate-Source Voltage			V_{GSS}	±20	V
Continuous Drain Current (Note 5)	V_{GS} = -10V	T_A = +25°C T_A = +70°C	I_D	-400 -300	mA
Continuous Drain Current (Note 6)	V_{GS} = -10V	T_A = +25°C T_A = +70°C	I_D	-500 -400	mA
Pulsed Drain Current (Note 5)			I_{DM}	-1	A
Maximum Body Diode continuous Current			I_S	-800	mA

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

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

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	-30	-	-	V	V_{GS} = 0V, I_D = -1mA
Zero Gate Voltage Drain Current T_J = +25°C	I_{DSS}	-	-	-1	µA	V_{DS} = -30V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	-	-	±10	µA	V_{GS} = ±16V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	-1.3	-	-2.3	V	V_{DS} = V_{GS}, I_D = -250µA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	-	-	2.4	Ω	V_{GS} = -10V, I_D = -200mA
				4		V_{GS} = -4.5V, I_D = -200mA
				16		V_{GS} = -2.5V, I_D = -10mA
Forward Transfer Admittance	$\|Y_{fs}\|$	-	6	-	S	V_{DS} = -10V, I_D = -400mA
Diode Forward Voltage	V_{SD}	-	0.8	1.2	V	V_{GS} = 0V, I_S = -300mA
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	-	51	-	pF	V_{DS} = -15V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	-	11	-	pF	
Reverse Transfer Capacitance	C_{rss}	-	9	-	pF	
Total Gate Charge	Q_g	-	0.6	-	nC	V_{GS} = -4.5V; V_{DS} = -10V, I_D = -200mA
Total Gate Charge	Q_g	-	1.3	-	nC	V_{GS} = -10V; V_{DS} = -10V, I_D = -200mA
Gate-Source Charge	Q_{gs}	-	0.2	-	nC	V_{GS} = -10V; V_{DS} = -10V, I_D = -200mA
Gate-Drain Charge	Q_{gd}	-	0.2	-	nC	V_{GS} = -10V; V_{DS} = -10V, I_D = -200mA
Turn-On Delay Time	$t_{D(on)}$	-	3.6	-	ns	V_{DS} = -15V, I_D = -500mA, V_{GS} = -10V, R_G = 1Ω
Turn-On Rise Time	t_r	-	8.5	-	ns	
Turn-Off Delay Time	$t_{D(off)}$	-	31.3	-	ns	
Turn-Off Fall Time	t_f	-	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.

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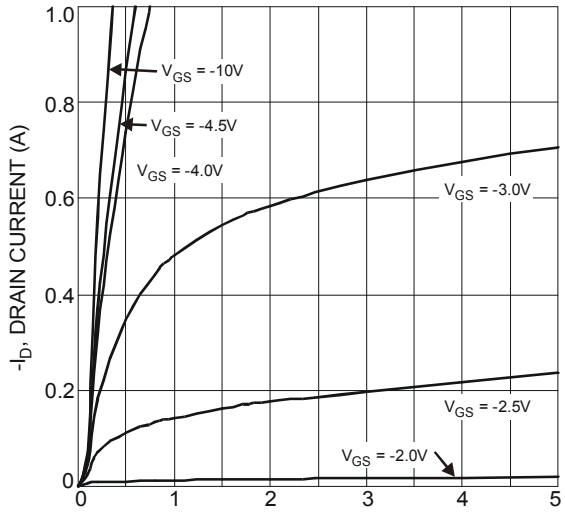

Figure 1 Typical Output Characteristics

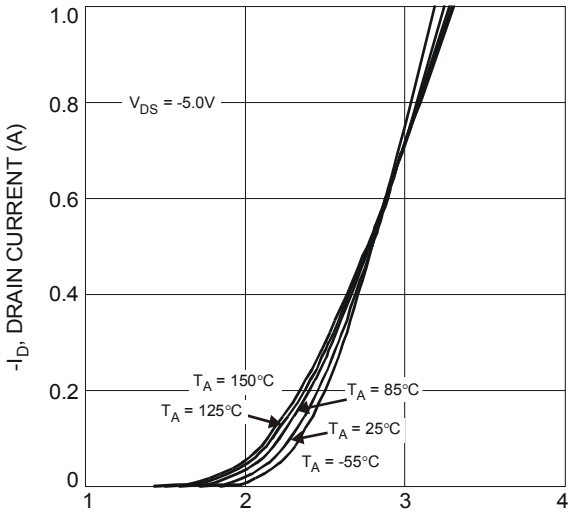

Figure 2 Typical Transfer Characteristics

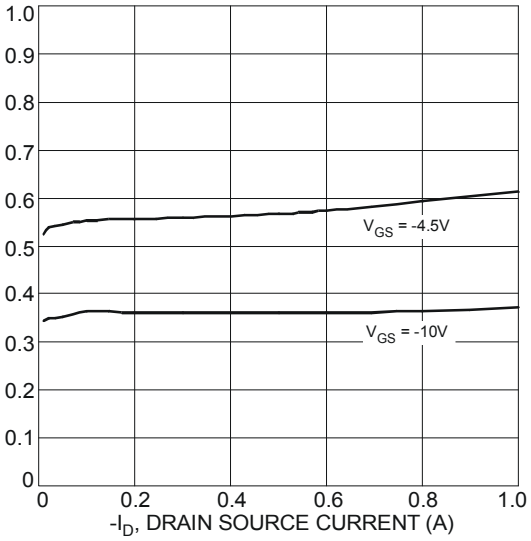

Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

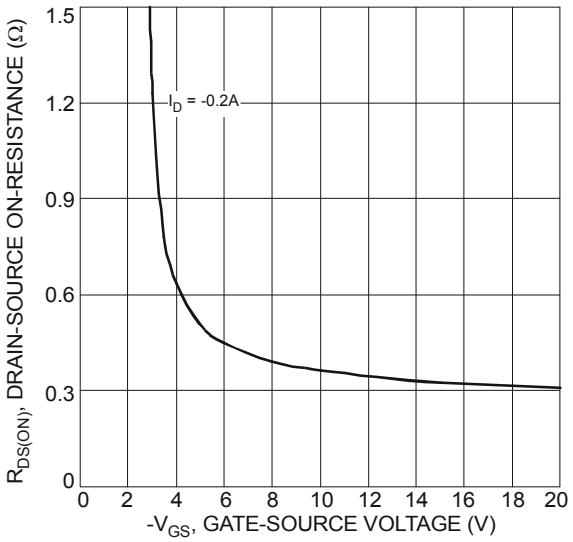

Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

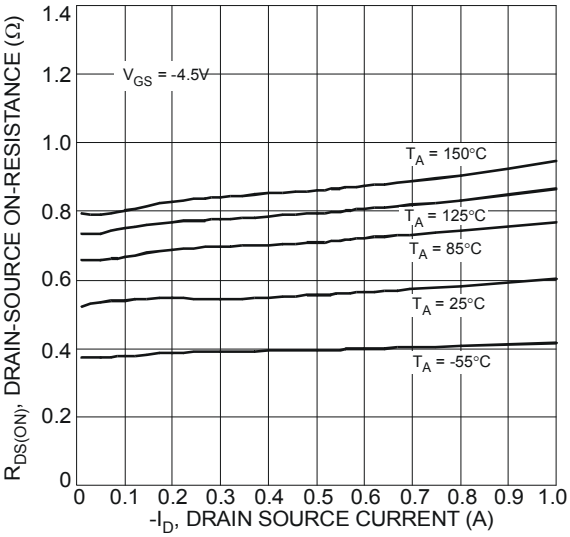

Figure 5 Typical On-Resistance vs. Drain Current and Temperature

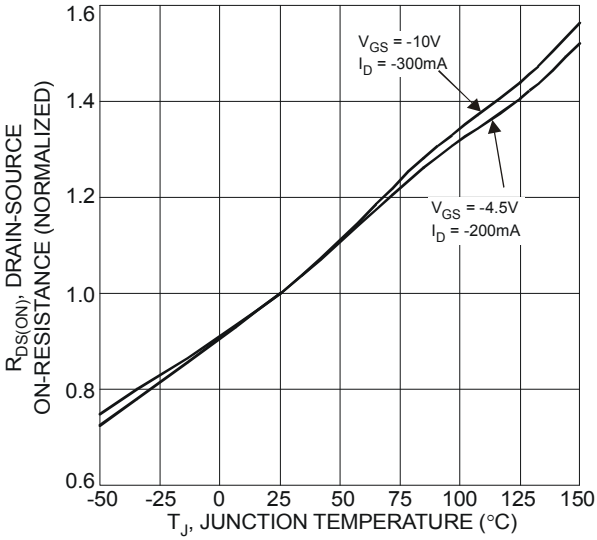

Figure 6 On-Resistance Variation with Temperature

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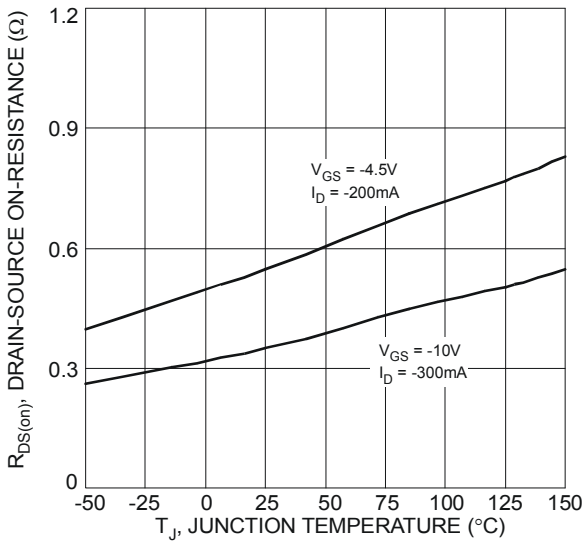

Figure 7 On-Resistance Variation with Temperature

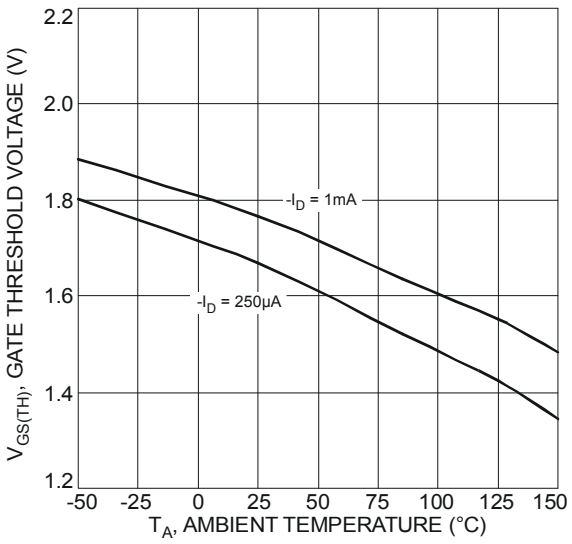

Figure 8 Gate Threshold Variation vs. Ambient Temperature

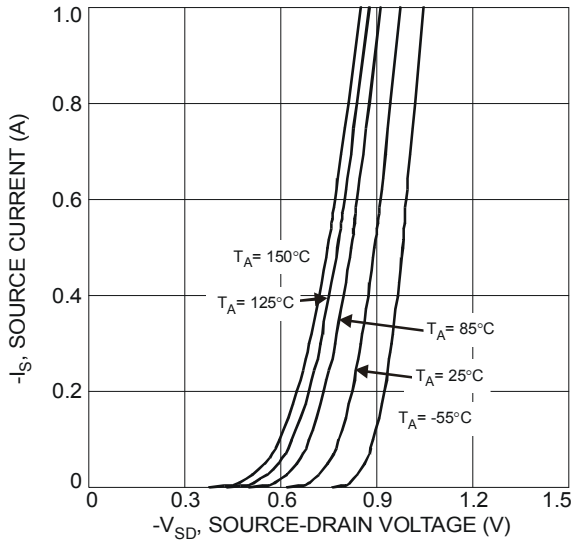

Figure 9 Diode Forward Voltage vs. Current

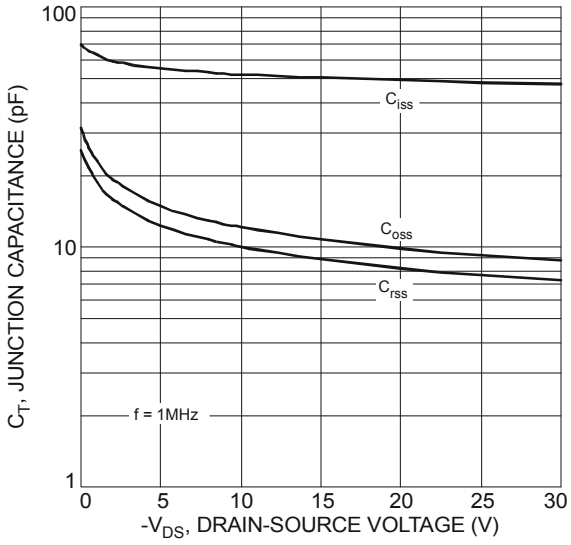

Figure 10 Typical Junction Capacitance

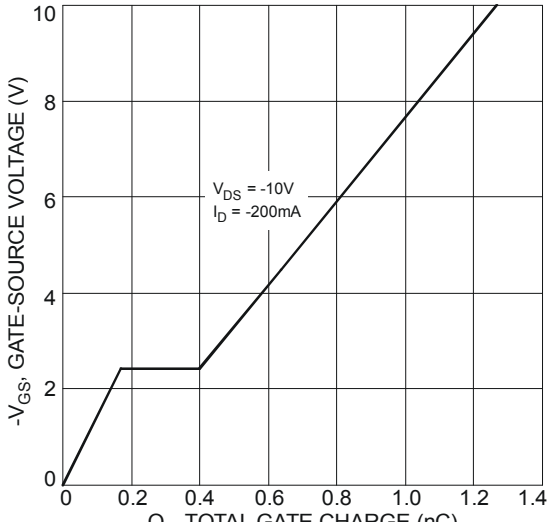

Figure 11 Gate-Charge Characteristics

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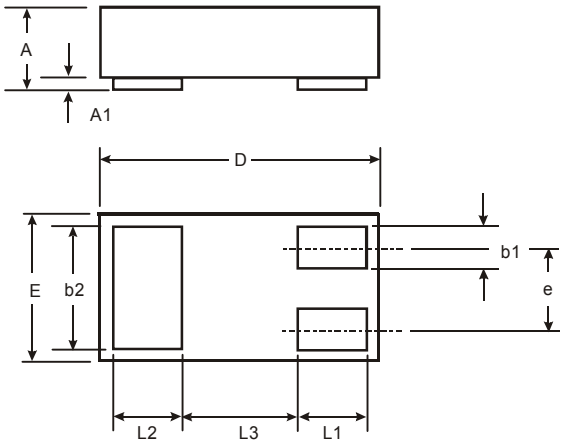
Package Outline Dimensions

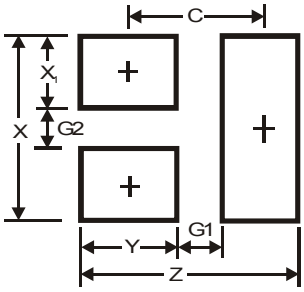
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



X1-DFN1006-3			
Dim	**Min**	**Max**	**Typ**
A	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
E	0.55	0.675	0.60
e	—	—	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
C	0.7

NEW PRODUCT

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