

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$	$I_D$ $T_A = +25^\circ C$
-30V	1.5 $\Omega$ @ $V_{GS} = -4.5V$	-0.3 A
	2.5 $\Omega$ @ $V_{GS} = -2.5V$	-0.2 A

## Description

This MOSFET is 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

- 0.4mm Ultra Low Profile Package for Thin Application
- 0.48mm<sup>2</sup> Package Footprint, 16 Times Smaller Than SOT23
- Low  $V_{GS(th)}$  can be Driven Directly from a Battery
- Low  $R_{DS(ON)}$
- ESD Protected**
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**

## Mechanical Data

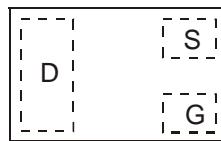
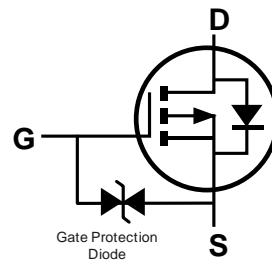
- Case: X2-DFN0806-3
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208 **④**
- Weight: 0.00043 grams (Approximate)



X2-DFN0806-3



Bottom View

Top View  
Package Pin Configuration

Equivalent Circuit

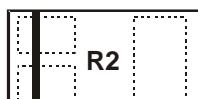
## Ordering Information (Note 4)

Part Number	Case	Packaging
DMP32D5LFA-7B	X2-DFN0806-3	10,000/Tape & Reel

## Notes:

- 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](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.
- Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
- For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



R2= Product Type Marking Code

Top View  
Bar Denotes Gate  
and Source Side

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

Characteristic			Symbol	Value	Units
Drain-Source Voltage			$V_{DSS}$	30	V
Gate-Source Voltage			$V_{GSS}$	$\pm 8$	V
Continuous Drain Current (Note 5) $V_{GS} = 4.5\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	-0.3 -0.2	A
Pulsed Drain Current (Note 6)			$I_{DM}$	-1.5	A

**Thermal Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)	Steady State	$P_D$	360	mW
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	353	°C/W
Operating and Storage Temperature Range		$T_J, T_{STG}$	-55 to +150	°C

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	-30	—	—	V	$V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	-100	nA	$V_{DS} = -24\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 8\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(th)}$	-0.4	—	-1.2	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
Static Drain-Source On-Resistance (Note 7)	$R_{DS(on)}$	—	0.9	1.5	$\Omega$	$V_{GS} = -4.5\text{V}, I_D = -200\text{mA}$
			1.2	2.5		$V_{GS} = -2.5\text{V}, I_D = -100\text{mA}$
			2.5	7.5		$V_{GS} = -1.8\text{V}, I_D = -50\text{mA}$
Diode Forward Voltage (Note 8)	$V_{SD}$	—	—	-1.0	V	$V_{GS} = 0\text{V}, I_S = -10\text{mA}$
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	$C_{iss}$	—	40.9	—	pF	$V_{DS} = -15\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	4.7	—	pF	
Reverse Transfer Capacitance	$C_{rss}$	—	3.6	—	pF	
Total Gate Charge	$Q_g$	—	0.7	—	nC	$V_{GS} = -4.5\text{V}, V_{DS} = -15\text{V}, I_D = -200\text{mA}$
Gate-Source Charge	$Q_{gs}$	—	0.1	—	nC	
Gate-Drain Charge	$Q_{gd}$	—	0.2	—	nC	
Turn-On Delay Time	$t_{D(on)}$	—	20	—	ns	$V_{DS} = -15\text{V}, I_D = -200\text{mA}$ $V_{GS} = -4.5\text{V}, R_G = 6\Omega$
Turn-On Rise Time	$t_r$	—	40	—	ns	
Turn-Off Delay Time	$t_{D(off)}$	—	144	—	ns	
Turn-Off Fall Time	$t_f$	—	58	—	ns	

Notes:

- 5. Device mounted on FR-4 PCB, with minimum recommended pad layout.
- 6. Device mounted on minimum recommended pad layout test board, 10 $\mu\text{s}$  pulse duty cycle = 1%.
- 7. Short duration pulse test used to minimize self-heating effect.
- 8. Guaranteed by design. Not subject to product testing.

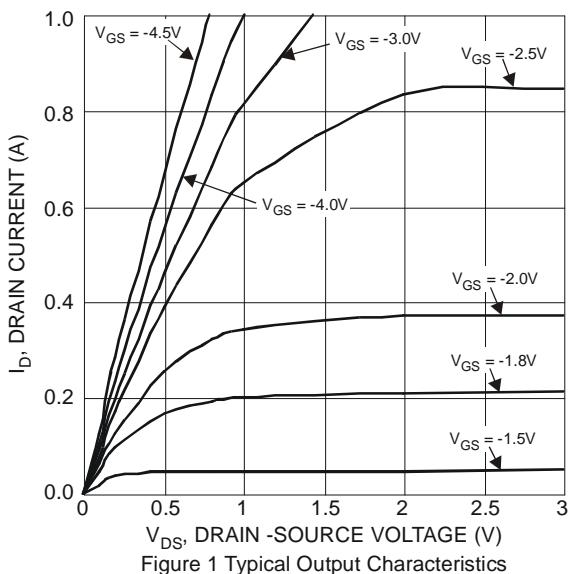


Figure 1 Typical Output Characteristics

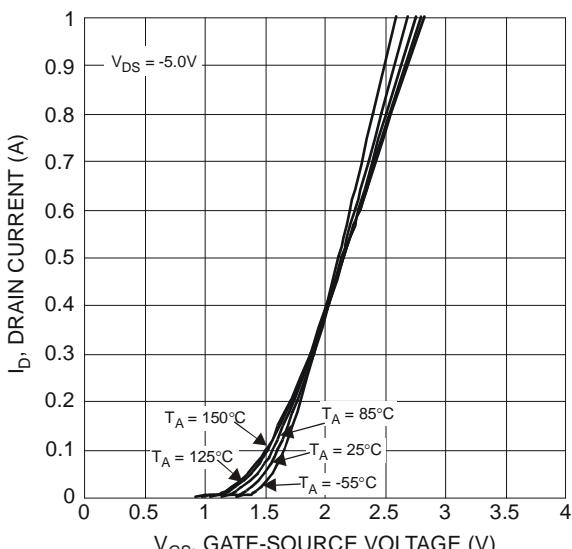


Figure 2 Typical Transfer Characteristics

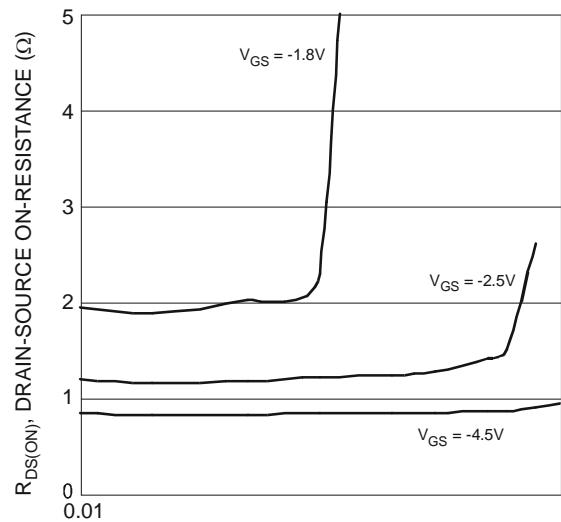


Figure 3 Typical On-Resistance vs.  
Drain Current and Gate Voltage

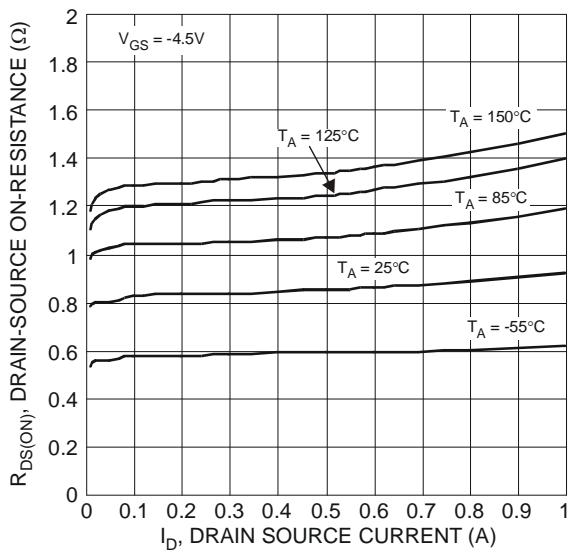


Figure 4 Typical On-Resistance vs.  
Drain Current and Temperature

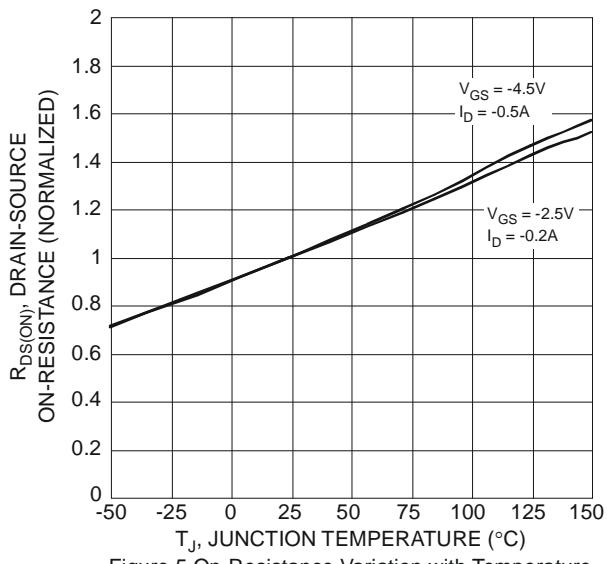


Figure 5 On-Resistance Variation with Temperature

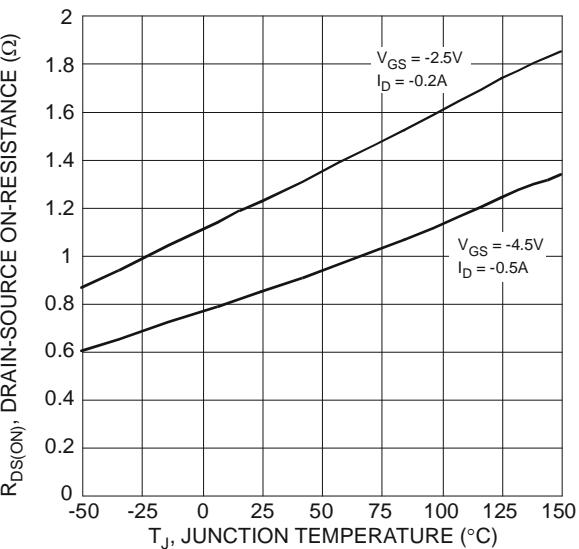


Figure 6 On-Resistance Variation with Temperature

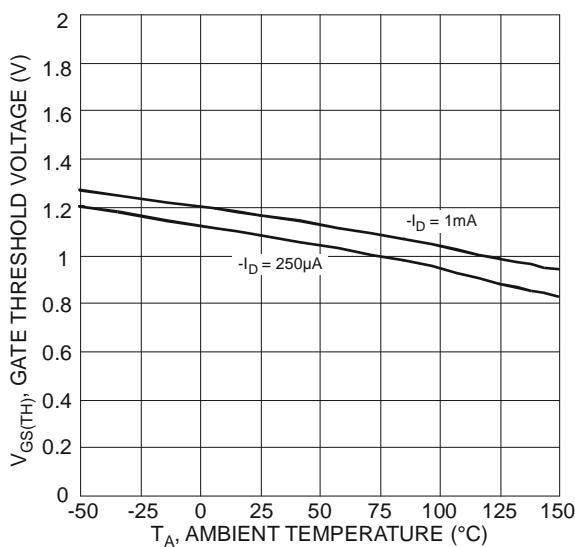


Figure 7 Gate Threshold Variation vs. Ambient Temperature

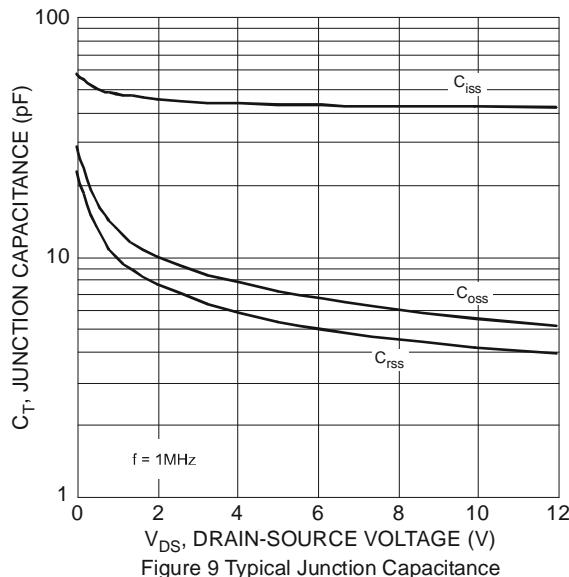


Figure 9 Typical Junction Capacitance

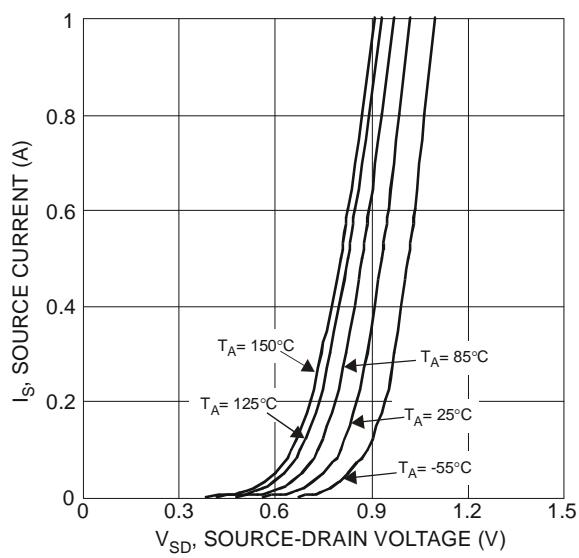


Figure 8 Diode Forward Voltage vs. Current

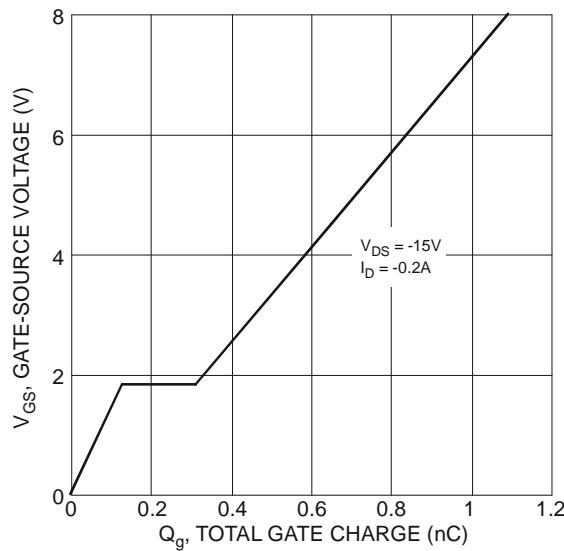


Figure 10 Gate-Charge Characteristics

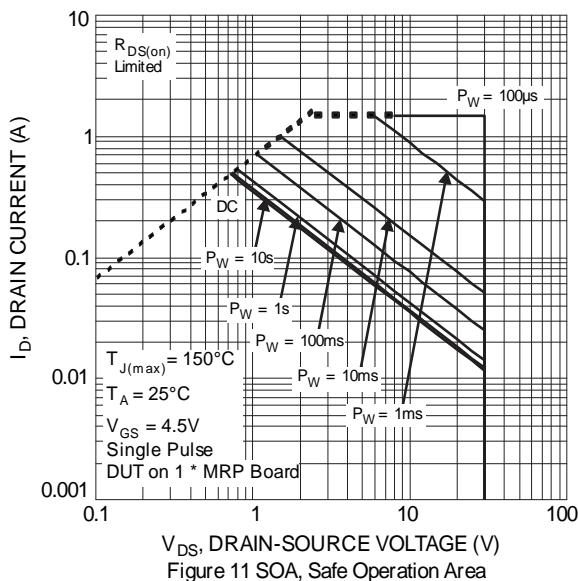
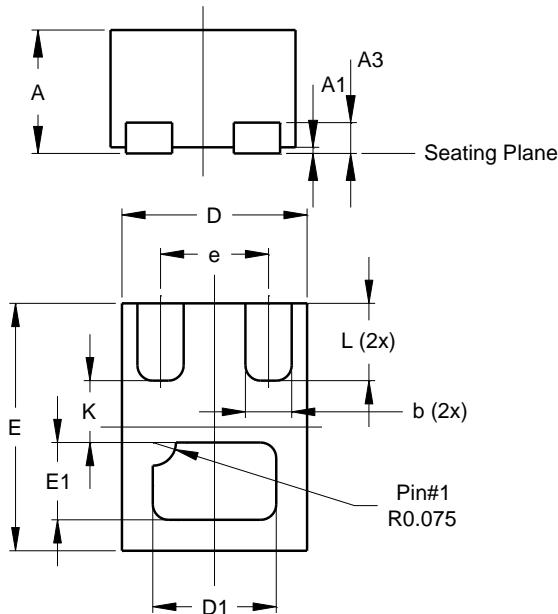


Figure 11 SOA, Safe Operation Area

## Package Outline Dimensions

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

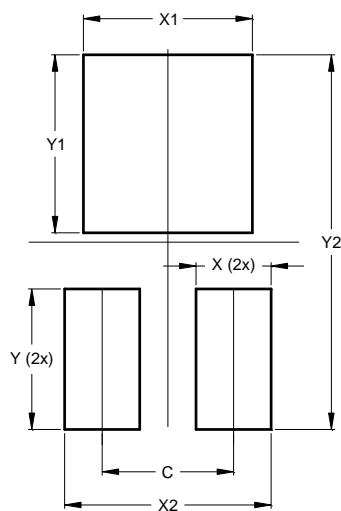


X2-DFN0806-3			
Dim	Min	Max	Typ
A	0.375	0.40	0.39
A1	0	0.05	0.02
A3	-	-	0.10
b	0.10	0.20	0.15
D	0.55	0.65	0.60
D1	0.35	0.45	0.40
E	0.75	0.85	0.80
E1	0.20	0.30	0.25
e	-	-	0.35
K	-	-	0.20
L	0.20	0.30	0.25

**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)
C	0.350
X	0.200
X1	0.450
X2	0.550
Y	0.375
Y1	0.475
Y2	1.000

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