



**THE DATASHEET OF
DMP32D4SFB-7B**



Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)}$ Max | I_D Max @ $T_A = +25^\circ\text{C}$ |
|---------------|-------------------------------|------------------------------------------|
| -30V | 2.4Ω @ $V_{GS} = -10\text{V}$ | -400mA |
| | 4Ω @ $V_{GS} = -4.5\text{V}$ | -300mA |
| | 16Ω @ $V_{GS} = -2.5\text{V}$ | -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**

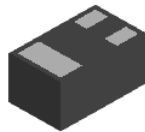
Mechanical Data

- 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 (4)
- Weight: 0.001 grams (approximate)

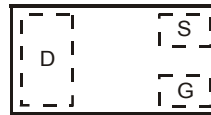


ESD PROTECTED

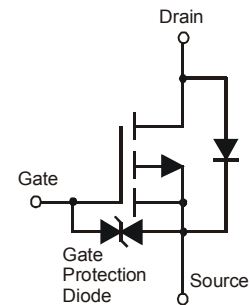
X1-DFN1006-3



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



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

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, 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 | $^\circ\text{C/W}$ |
| | (Note 6) | | 105 | |
| Operating and Storage Temperature Range | | T_J, T_{STG} | -55 to 150 | $^\circ\text{C}$ |

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

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|-----------------------------------------------------------|--------------|------|------|----------|---------------|---------------------------------------------------------------|
| OFF CHARACTERISTICS (Note 7) | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | -30 | - | - | V | $V_{GS} = 0\text{V}, I_D = -1\text{mA}$ |
| Zero Gate Voltage Drain Current $T_J = +25^\circ\text{C}$ | I_{DSS} | - | - | -1 | μA | $V_{DS} = -30\text{V}, V_{GS} = 0\text{V}$ |
| Gate-Source Leakage | I_{GSS} | - | - | ± 10 | μA | $V_{GS} = \pm 16\text{V}, V_{DS} = 0\text{V}$ |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | -1.3 | - | -2.3 | V | $V_{DS} = V_{GS}, I_D = -250\mu\text{A}$ |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | - | - | 2.4 | Ω | $V_{GS} = -10\text{V}, I_D = -200\text{mA}$ |
| | | | | 4 | | $V_{GS} = -4.5\text{V}, I_D = -200\text{mA}$ |
| | | | | 16 | | $V_{GS} = -2.5\text{V}, I_D = -10\text{mA}$ |
| Forward Transfer Admittance | $ Y_{fs} $ | - | 6 | - | S | $V_{DS} = -10\text{V}, I_D = -400\text{mA}$ |
| Diode Forward Voltage | V_{SD} | - | 0.8 | 1.2 | V | $V_{GS} = 0\text{V}, I_S = -300\text{mA}$ |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C_{iss} | - | 51 | - | pF | $V_{DS} = -15\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$ |
| Output Capacitance | C_{oss} | - | 11 | - | pF | |
| Reverse Transfer Capacitance | C_{rss} | - | 9 | - | pF | |
| Total Gate Charge | Q_g | - | 0.6 | - | nC | $V_{GS} = -4.5\text{V}$ |
| Total Gate Charge | Q_g | - | 1.3 | - | nC | |
| Gate-Source Charge | Q_{gs} | - | 0.2 | - | nC | $V_{GS} = -10\text{V}$ |
| Gate-Drain Charge | Q_{gd} | - | 0.2 | - | nC | |
| Turn-On Delay Time | $t_{D(on)}$ | - | 3.6 | - | ns | $V_{DS} = -10\text{V}, I_D = -200\text{mA}$ |
| 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:
- Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to production testing.

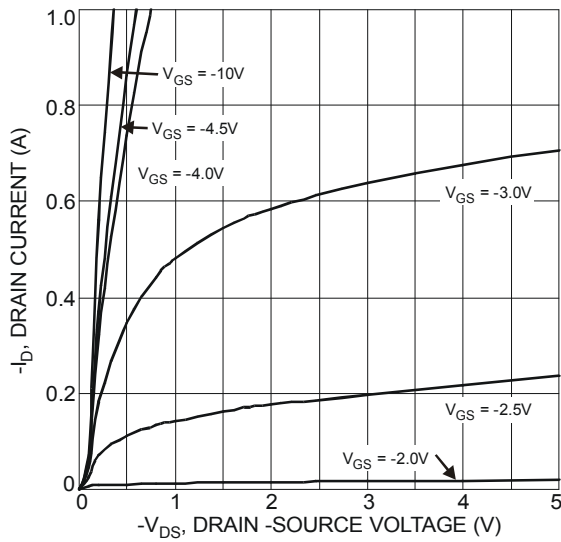


Figure 1 Typical Output Characteristics

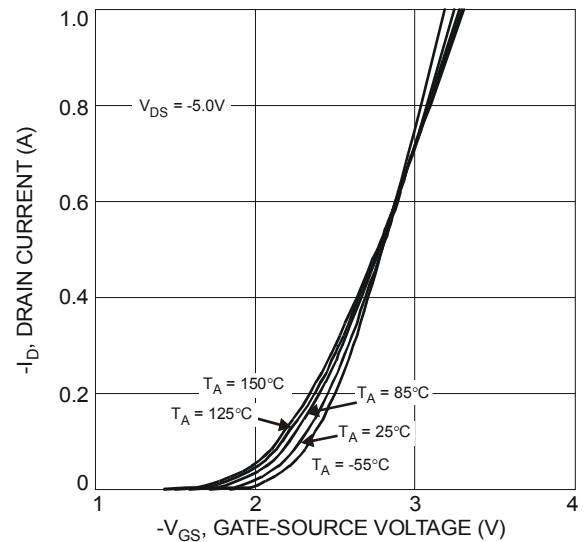


Figure 2 Typical Transfer Characteristics

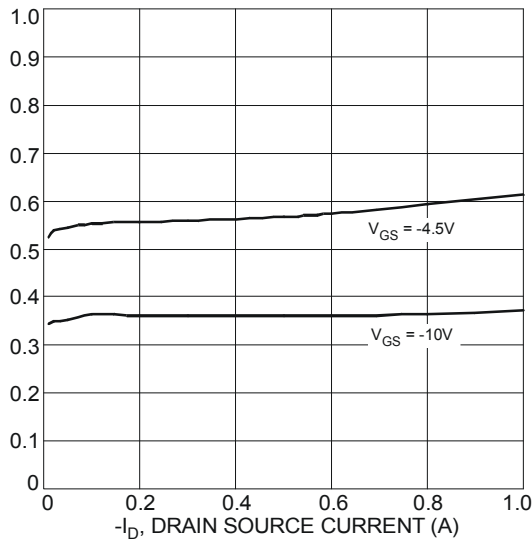


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

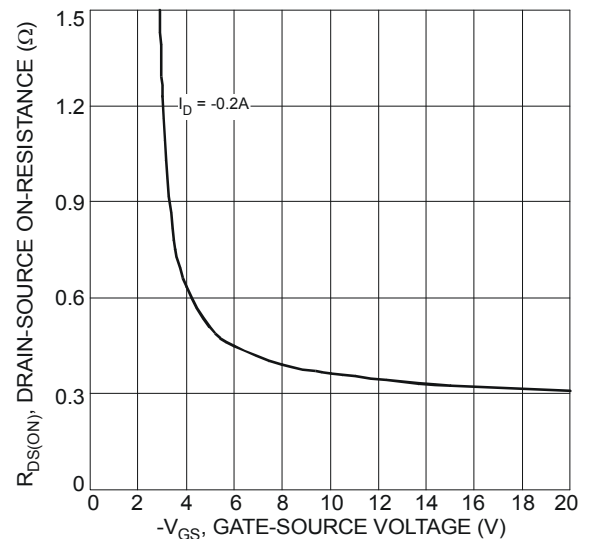


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

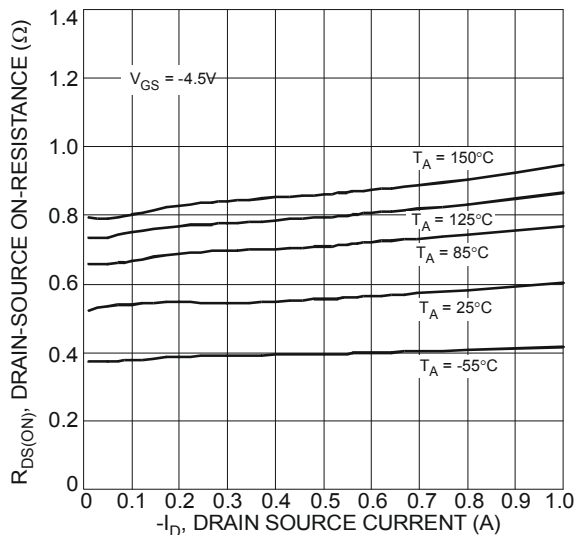


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

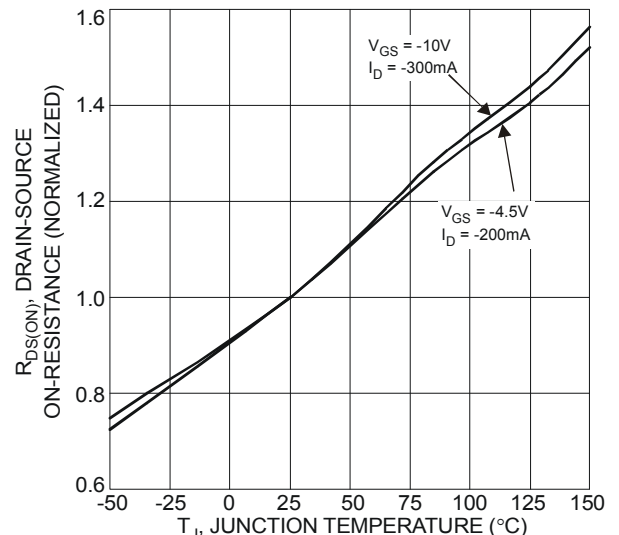


Figure 6 On-Resistance Variation with Temperature

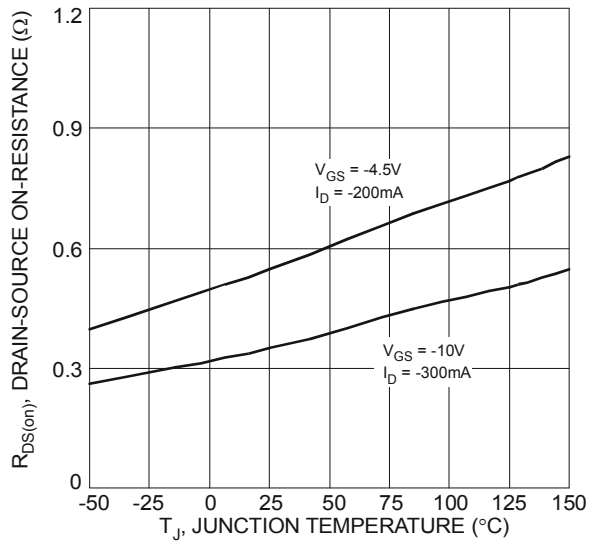


Figure 7 On-Resistance Variation with Temperature

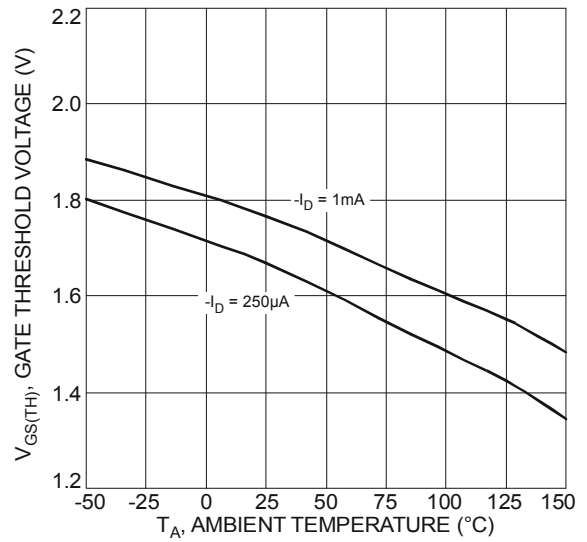


Figure 8 Gate Threshold Variation vs. Ambient Temperature

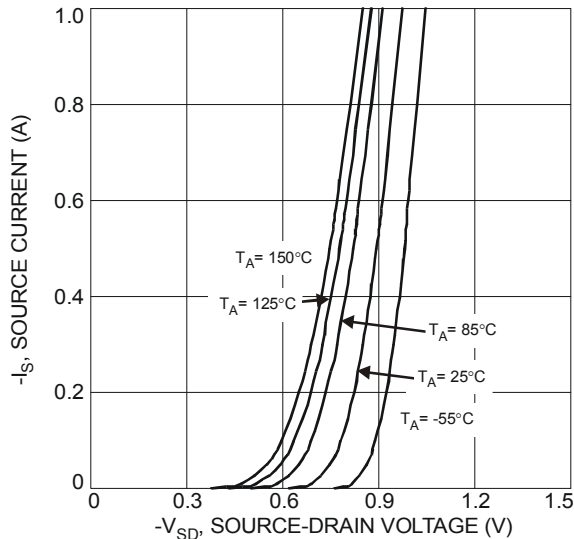


Figure 9 Diode Forward Voltage vs. Current

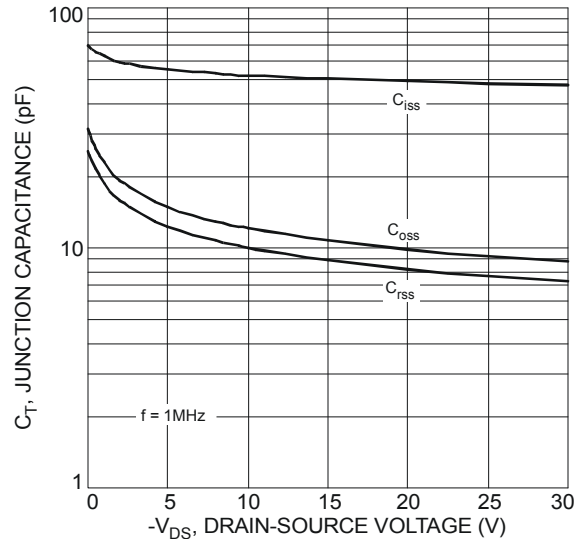


Figure 10 Typical Junction Capacitance

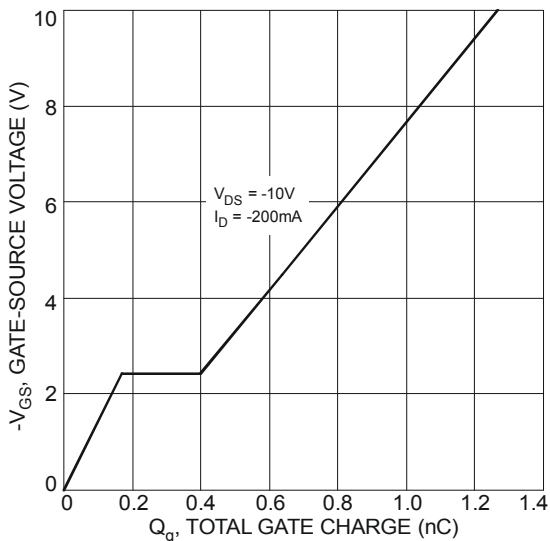
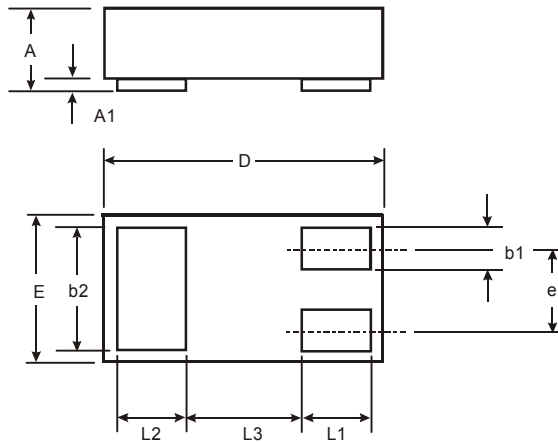


Figure 11 Gate-Charge Characteristics

Package Outline Dimensions

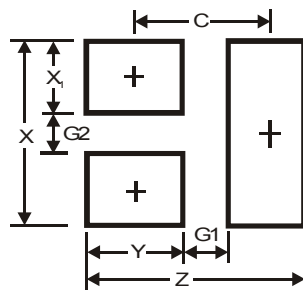
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| 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 |

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