

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)}$ | I_D $T_A = 25^\circ C$ |
|---------------|---------------------------------|-----------------------------|
| 30V | 460m Ω @ $V_{GS} = 4.5V$ | 0.9A |
| | 560m Ω @ $V_{GS} = 2.5V$ | 0.7A |

Description and Applications

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.

- Load switch
- Portable applications
- Power Management Functions

Features and Benefits

- 0.4mm ultra low profile package for thin application
- 0.6mm² package footprint, 10 times smaller than SOT23
- Low $V_{GS(th)}$, can be driven directly from a battery
- Low $R_{DS(on)}$
- "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

Mechanical Data

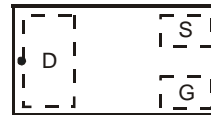
- Case: DFN1006H4-3
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – NiPdAu over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.001 grams (approximate)



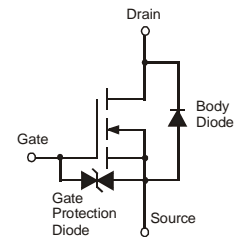
DFN1006H4-3



Bottom View



Top View



Equivalent Circuit

Ordering Information (Note 3)

| Part Number | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|----------------|---------|--------------------|-----------------|-------------------|
| DMN3730UFB4-7 | NF | 7 | 8 | 3000 |
| DMN3730UFB4-7B | NF | 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



NF = Product Type Marking Code
Dot Denotes Drain Side

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} | ±8 | |
| Continuous Drain Current | V _{GS} = 4.5V | (Note 5) | 0.91 | A |
| | | T _A = 70°C (Note 5) | 0.73 | |
| | | (Note 4) | 0.75 | |
| Pulsed Drain Current | | I _{DM} | 3 | |

Thermal Characteristics @T_A = 25°C unless otherwise specified

| Characteristic | | Symbol | Value | Unit |
|---|----------|-----------------------------------|-------------|------|
| Power Dissipation | (Note 5) | P _D | 0.69 | W |
| | (Note 4) | | 0.47 | |
| Thermal Resistance, Junction to Ambient | (Note 5) | R _{θJA} | 180 | °C/W |
| | (Note 4) | | 258 | |
| 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 | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | 30 | - | - | V | V _{GS} = 0V, I _D = 10μA |
| Zero Gate Voltage Drain Current | I _{DSS} | - | - | 1 | μA | V _{DS} = 30V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | - | - | 3 | μA | V _{GS} = ±8V, V _{DS} = 0V |
| ON CHARACTERISTICS | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | 0.45 | - | 0.95 | V | V _{DS} = V _{GS} , I _D = 250μA |
| Static Drain-Source On-Resistance (Note 7) | R _{DS(on)} | - | - | 460 | mΩ | V _{GS} = 4.5V, I _D = 200mA |
| | | | | 560 | | V _{GS} = 2.5V, I _D = 100mA |
| | | | | 730 | | V _{GS} = 1.8V, I _D = 75mA |
| Forward Transfer Admittance | Y _{fs} | 40 | - | - | mS | V _{DS} = 3V, I _D = 10mA |
| Diode Forward Voltage (Note 7) | V _{SD} | - | 0.7 | 1.2 | V | V _{GS} = 0V, I _S = 300mA |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C _{iss} | - | 64.3 | - | pF | V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz |
| Output Capacitance | C _{oss} | - | 6.1 | - | pF | |
| Reverse Transfer Capacitance | C _{rss} | - | 4.5 | - | pF | |
| Gate Resistance | R _g | - | 70 | - | Ω | V _{DS} = 0V, V _{GS} = 0V, f = 1MHz |
| Total Gate Charge | Q _g | - | 1.6 | - | nC | V _{GS} = 4.5V, V _{DS} = 15V, I _D = 1A |
| Gate-Source Charge | Q _{gs} | - | 0.2 | - | nC | |
| Gate-Drain Charge | Q _{gd} | - | 0.2 | - | nC | |
| Turn-On Delay Time | t _{D(on)} | - | 3.5 | - | ns | V _{DS} = 10V, I _D = 1A V _{GS} = 10V, R _G = 6Ω |
| Turn-On Rise Time | t _r | - | 2.8 | - | ns | |
| Turn-Off Delay Time | t _{D(off)} | - | 38 | - | ns | |
| Turn-Off Fall Time | t _f | - | 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 ≤ 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.

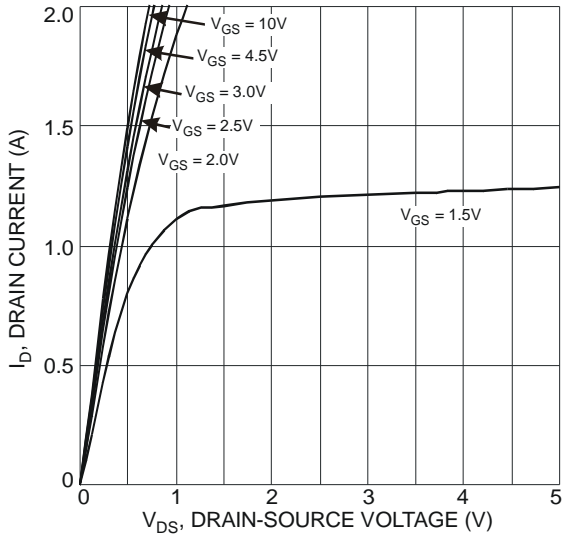


Fig. 1 Typical Output Characteristic

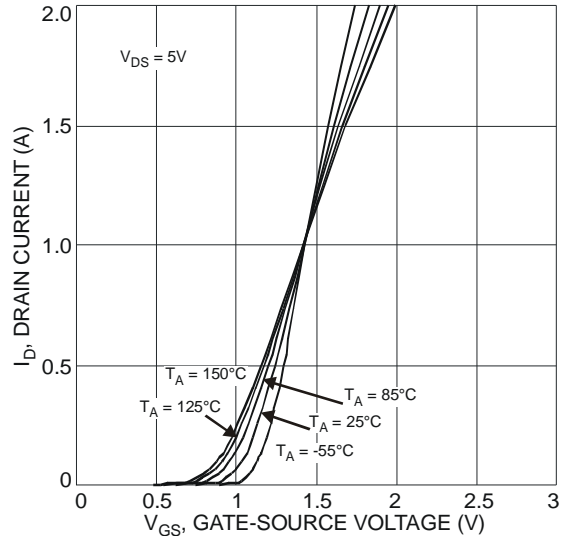


Fig. 2 Typical Transfer Characteristic

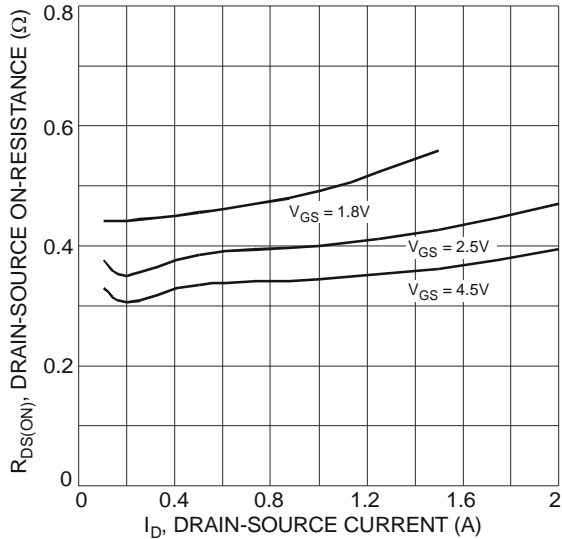


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

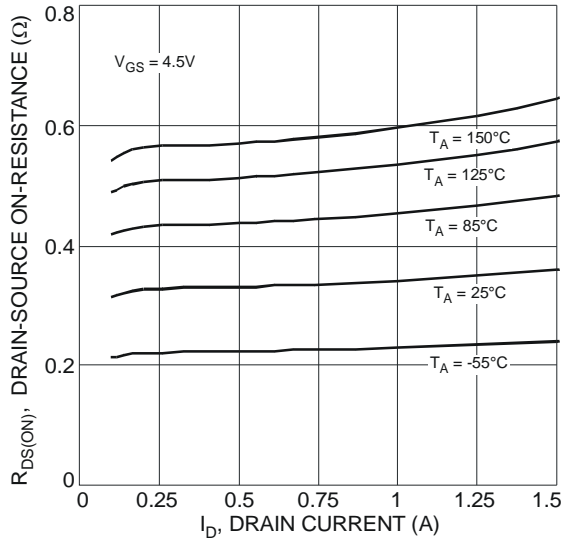


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

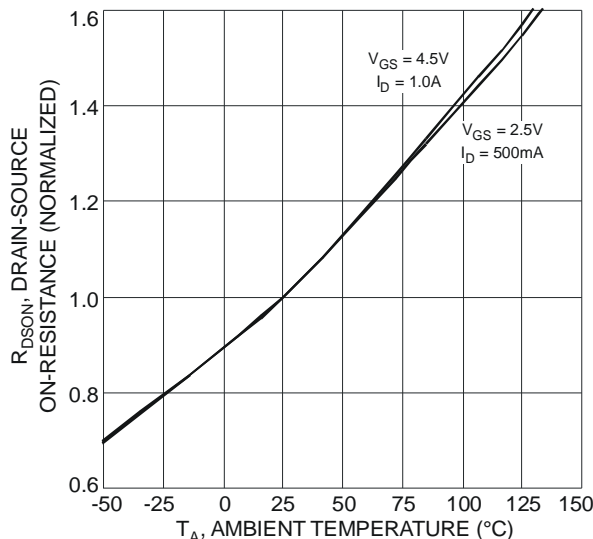


Fig. 5 On-Resistance Variation with Temperature

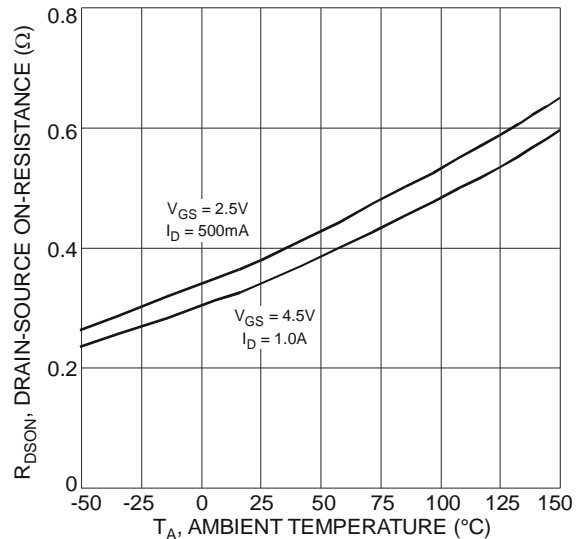


Fig. 6 On-Resistance Variation with Temperature

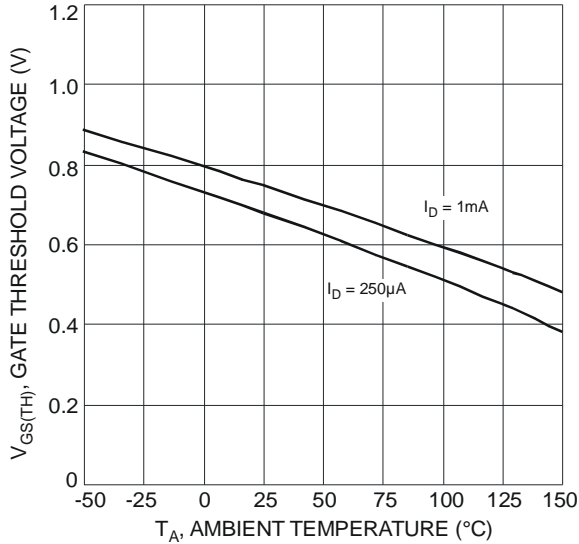


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

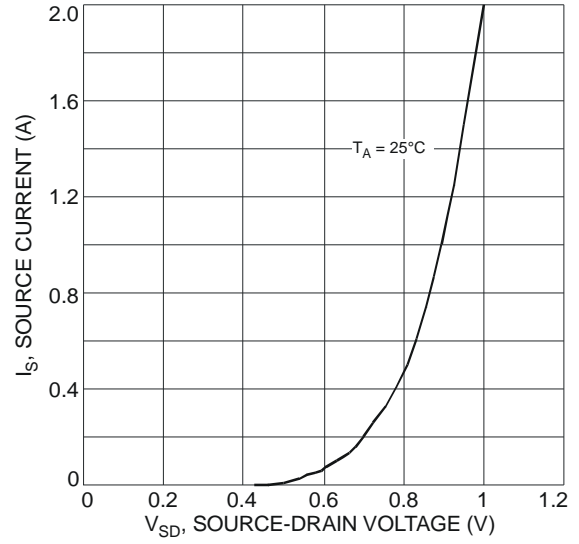


Fig. 8 Diode Forward Voltage vs. Current

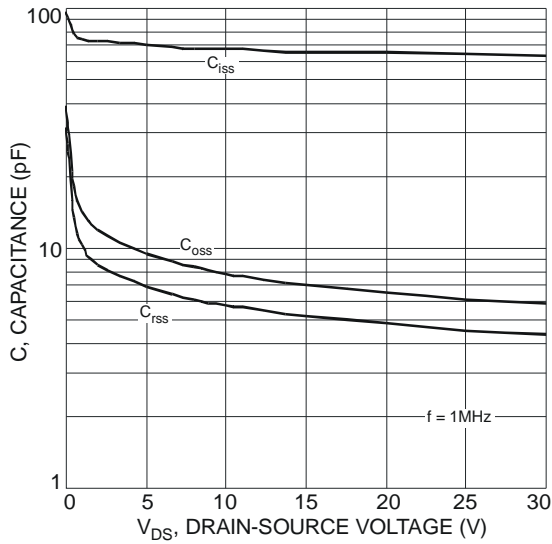


Fig. 9 Typical Total Capacitance

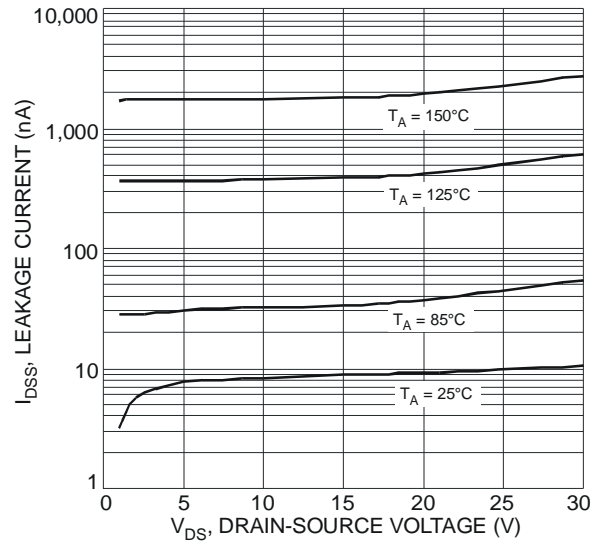


Fig. 10 Typical Leakage Current vs. Drain-Source Voltage

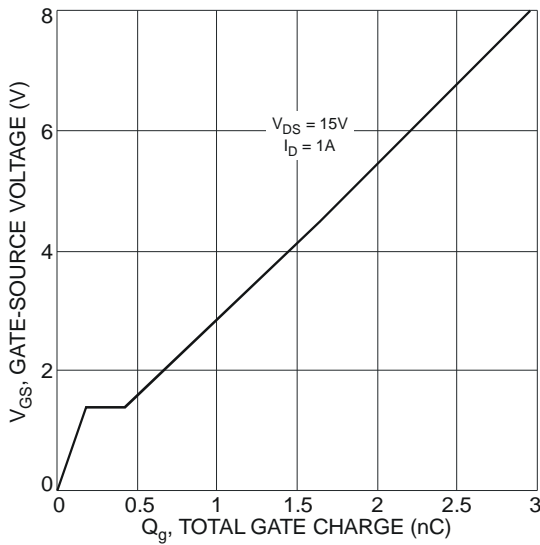


Fig. 11 Gate-Charge Characteristics

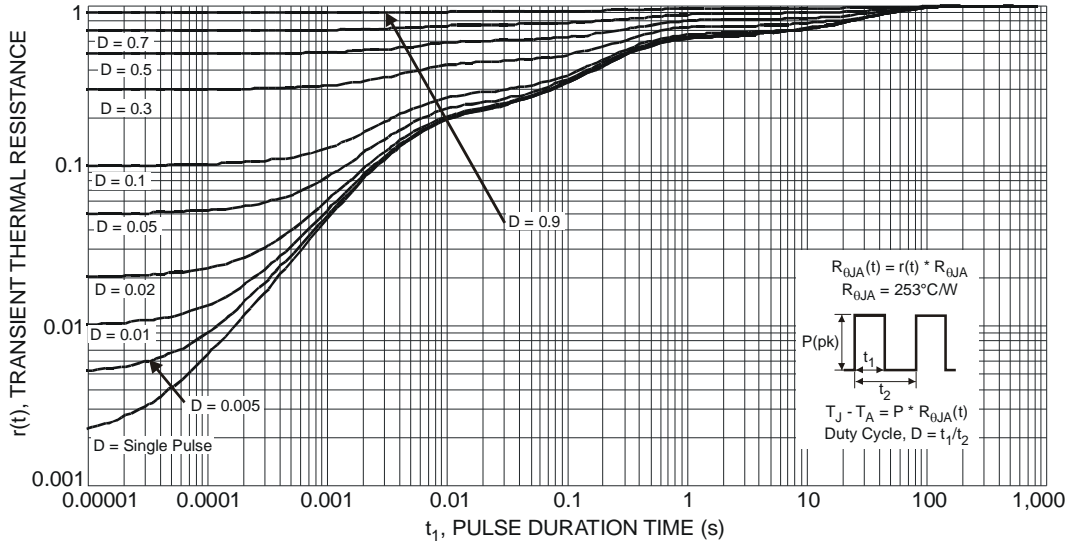
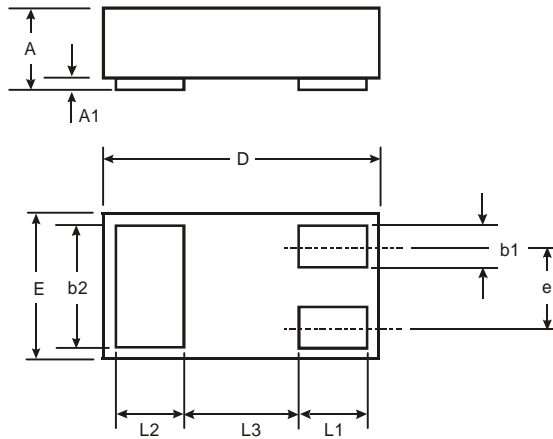


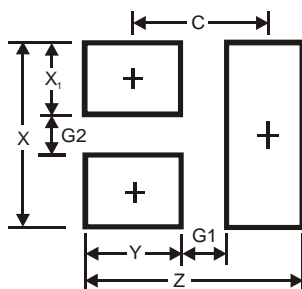
Fig. 12 Transient Thermal Response

Package Outline Dimensions



| DFN1006H4-3 | | | |
|----------------------|------|-------|------|
| Dim | Min | Max | Typ |
| A | — | 0.40 | — |
| A1 | 0 | 0.05 | 0.02 |
| 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



| 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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