



**THE DATASHEET OF
DMG8601UFG-7**



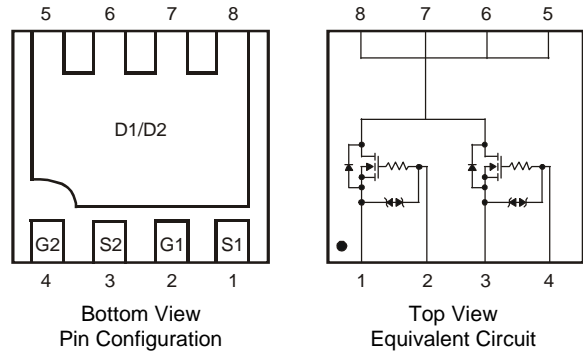
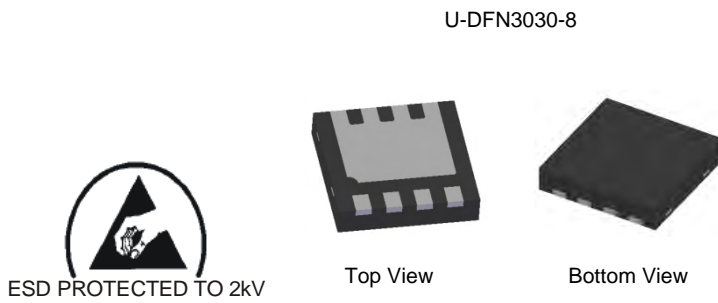
DUAL N-CANNEL ENHANCEMENT MODE MOSFET

Features

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **ESD Protected Up To 2KV**
- **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: U-DFN3030-8
- 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 lead frame. Solderable per MIL-STD-202, Method 208 ^{e4}
- Polarity: See Diagram
- Weight: 0.0172 grams (approximate)

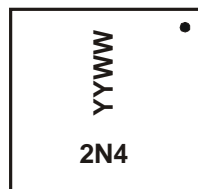


Ordering Information (Note 4)

| Part Number | Case | Packaging |
|--------------|-------------|------------------|
| DMG8601UFG-7 | U-DFN3030-8 | 3000/Tape & Reel |

- 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> 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>.

Marking Information



2N4 = Product marking code
 YYWW = Date code marking
 YY = Last digit of year (ex: 09 for 2009)
 WW = Week code (01 to 53)

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

| Characteristic | | | Symbol | Value | Unit |
|-----------------------------------|--------------|------------|------------------|-------|------|
| Drain-Source Voltage | | | V _{DSS} | 20 | V |
| Gate-Source Voltage | | | V _{GSS} | ±12 | V |
| Continuous Drain Current (Note 5) | Steady State | TA = +25°C | I _D | 6.1 | A |
| | | TA = +70°C | | 5.2 | |
| Pulsed Drain Current | | | I _{DM} | 27 | A |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|-----------------------------------|-------------|------|
| Power Dissipation (Note 5) | P _D | 0.92 | W |
| Thermal Resistance, Junction to Ambient @TA = +25°C | R _{θJA} | 136 | °C/W |
| 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 6) | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | 20 | - | - | V | V _{GS} = 0V, I _D = 250μA |
| Zero Gate Voltage Drain Current T _J = 25°C | I _{DSS} | - | - | 1.0 | μA | V _{DS} = 20V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | - | - | ±10 | μA | V _{GS} = ±10V, V _{DS} = 0V |
| Gate-Source Breakdown Voltage | BV _{GSS} | ±12 | - | - | V | V _{DS} = 0V, I _G = ±250μA |
| ON CHARACTERISTICS (Note 6) | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | 0.35 | - | 1.05 | V | V _{DS} = V _{GS} , I _D = 250μA |
| Static Drain-Source On-Resistance | R _{DS(on)} | - | 17 | 23 | mΩ | V _{GS} = 4.5V, I _D = 6.5A |
| | | - | 20 | 27 | | V _{GS} = 2.5V, I _D = 5.5A |
| | | - | 25 | 34 | | V _{GS} = 1.8V, I _D = 3.5A |
| Forward Transfer Admittance | Y _{fs} | - | 10 | - | S | V _{DS} = 10V, I _D = 5A |
| Diode Forward Voltage | V _{SD} | - | 0.7 | 1.0 | V | V _{GS} = 0V, I _S = 1A |
| DYNAMIC CHARACTERISTICS | | | | | | |
| Input Capacitance | C _{iss} | - | 143 | - | pF | V _{DS} = 10V, V _{GS} = 0V, f = 1.0MHz |
| Output Capacitance | C _{oss} | - | 74 | - | pF | |
| Reverse Transfer Capacitance | C _{rss} | - | 29 | - | pF | |
| Gate Resistance | R _g | - | 202 | - | Ω | V _{DS} = 0V, V _{GS} = 0V, f = 1MHz |
| Total Gate Charge | Q _g | - | 8.8 | - | nC | V _{GS} = 4.5V, V _{DS} = 10V, I _D = 6.5A |
| Gate-Source Charge | Q _{gs} | - | 1.4 | - | nC | |
| Gate-Drain Charge | Q _{gd} | - | 3.0 | - | nC | |
| Turn-On Delay Time | t _{D(on)} | - | 53 | - | ns | V _{DD} = 10V, V _{GS} = 4.5V, R _L = 10Ω, R _G = 6Ω |
| Turn-On Rise Time | t _r | - | 78 | - | ns | |
| Turn-Off Delay Time | t _{D(off)} | - | 562 | - | ns | |
| Turn-Off Fall Time | t _f | - | 234 | - | ns | |

Notes: 5. Device mounted on FR-4 PCB with minimum recommended pad layout.
6. Short duration pulse test used to minimize self-heating effect.

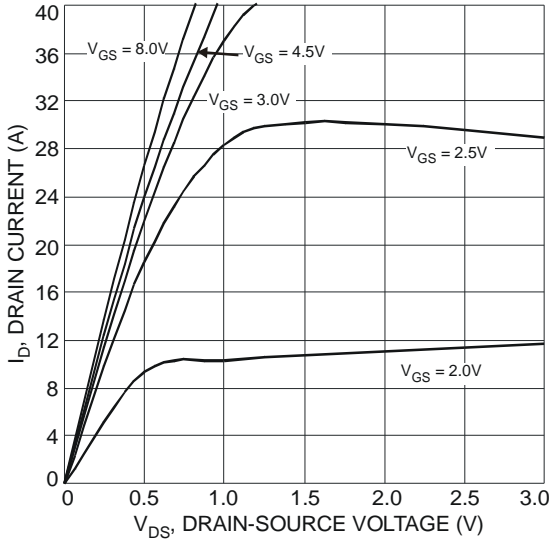


Fig. 1 Typical Output Characteristic

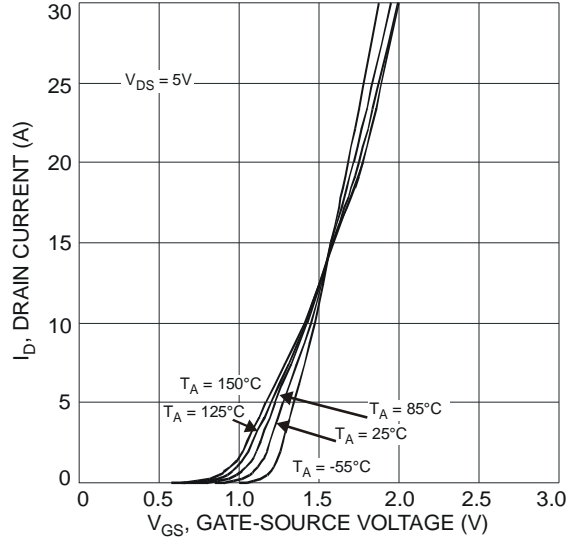


Fig. 2 Typical Transfer Characteristic

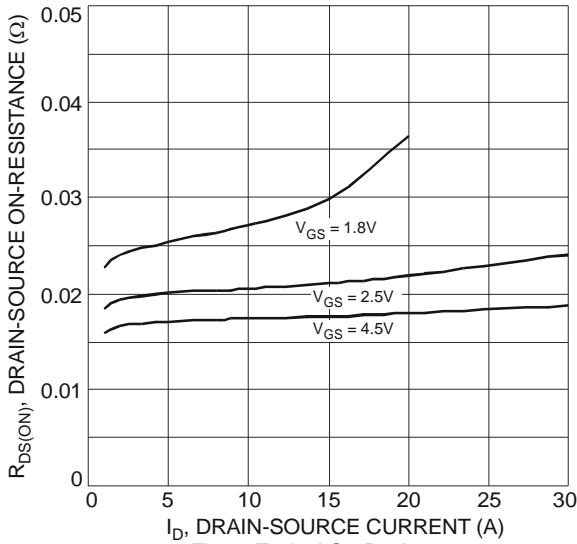


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

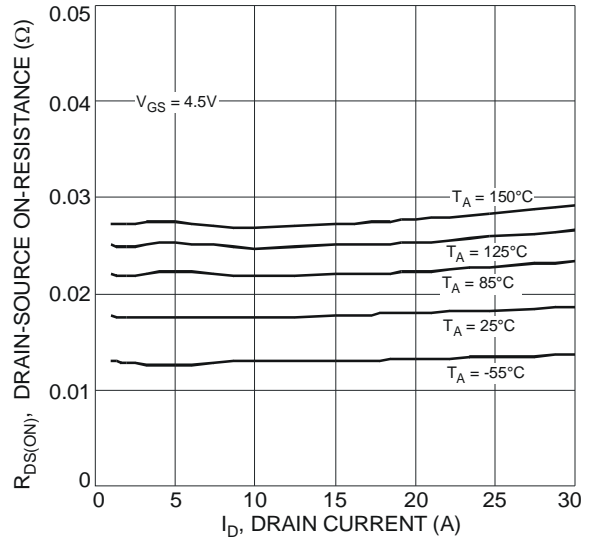


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

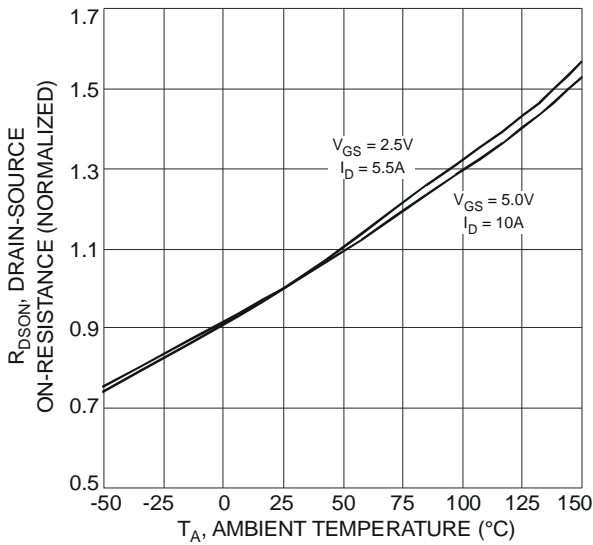


Fig. 5 On-Resistance Variation with Temperature

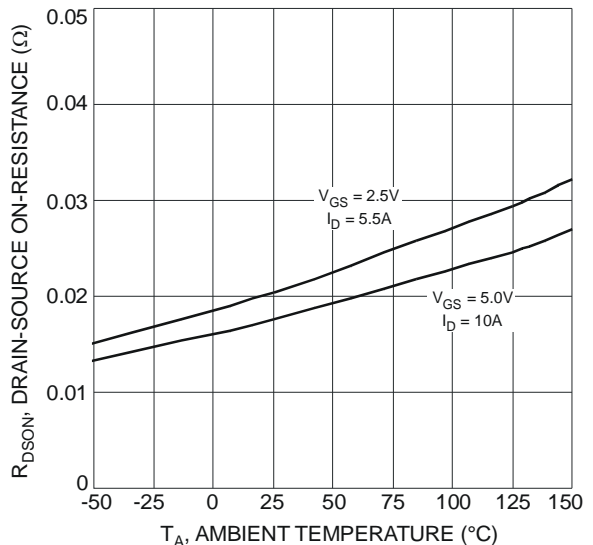


Fig. 6 On-Resistance Variation with Temperature

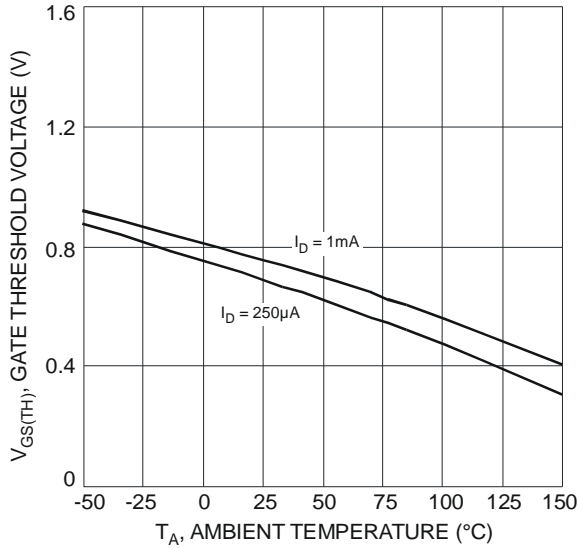


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

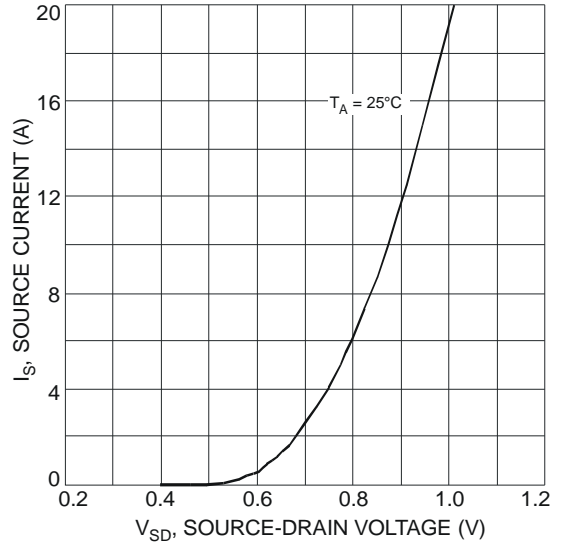


Fig. 8 Diode Forward Voltage vs. Current

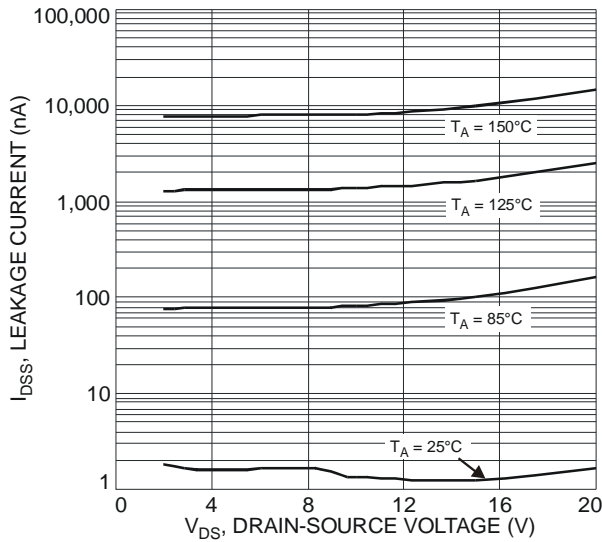


Fig. 9 Typical Leakage Current vs. Drain-Source Voltage

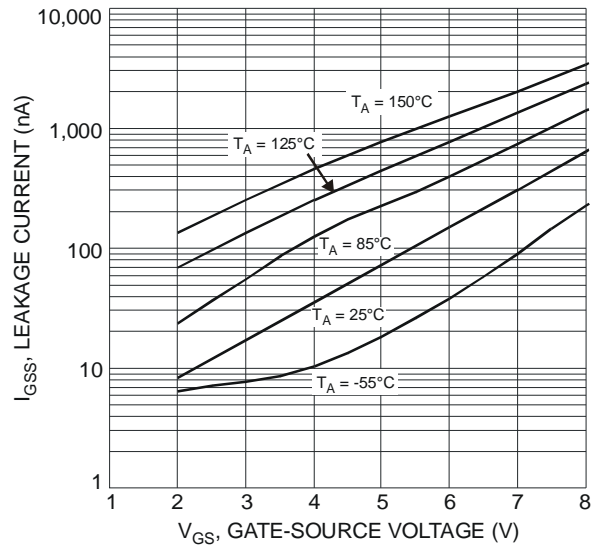


Fig. 10 Gate-Source Leakage Current vs. Voltage

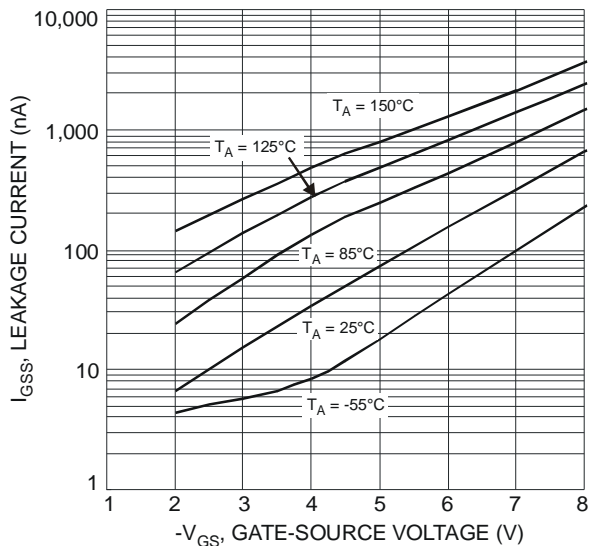


Fig. 11 Gate-Source Leakage Current vs. Voltage

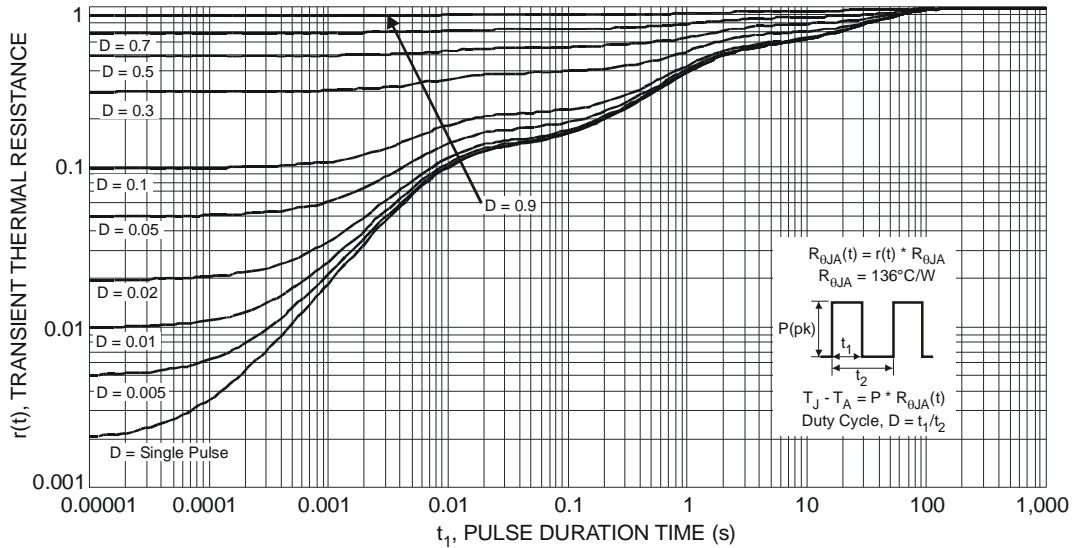
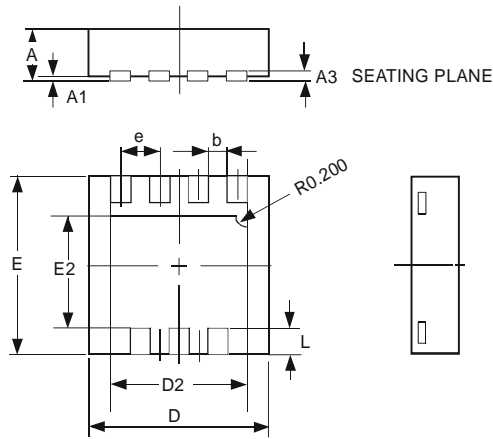


Fig. 12 Transient Thermal Response

Package Outline Dimensions

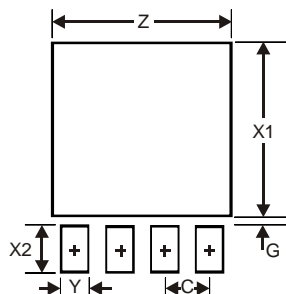
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| U-DFN3030-8 | | | |
|----------------------|------|------|------|
| Dim | Min | Max | Typ |
| A | 0.57 | 0.63 | 0.60 |
| A1 | 0 | 0.05 | 0.02 |
| A3 | — | — | 0.15 |
| b | 0.29 | 0.39 | 0.34 |
| D | 2.90 | 3.10 | 3.00 |
| D2 | 2.19 | 2.39 | 2.29 |
| e | — | — | 0.65 |
| E | 2.90 | 3.10 | 3.00 |
| E2 | 1.64 | 1.84 | 1.74 |
| L | 0.30 | 0.60 | 0.45 |
| 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 | 2.59 |
| G | 0.11 |
| X1 | 2.49 |
| X2 | 0.65 |
| Y | 0.39 |
| C | 0.65 |

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