

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(ON)}$ | I_D $T_A = +25^\circ\text{C}$ |
|---------------|-------------------------------|------------------------------------|
| 60V | 2Ω @ $V_{GS} = 4\text{V}$ | 310mA |
| | 2.5Ω @ $V_{GS} = 2.5\text{V}$ | 295mA |

Description

This new generation 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

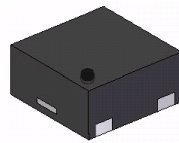
- DC-DC Converters
- Power management functions
- Battery Operated Systems and Solid-State Relays
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.

Features and Benefits

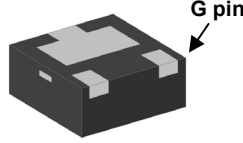
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **ESD Protected**
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

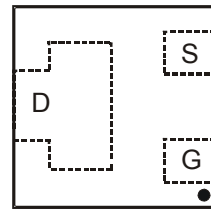
- Case: X1-DFN1212-3
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: NiPdAu over Copper leadframe. Solderable per MIL-STD-202, Method 208 (e4)
- Terminal Connections: See Diagram
- Weight: 0.005 grams (approximate)



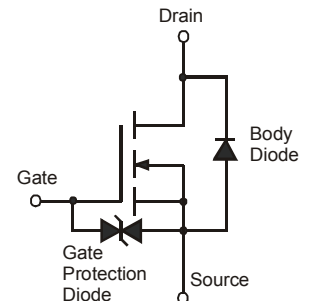
Top View



Bottom View



Pin-Out Top View



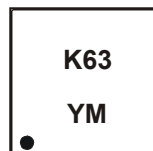
Equivalent Circuit

Ordering Information (Note 4)

| Part Number | Compliance | Case | Packaging |
|---------------|------------|--------------|--------------------|
| DMN62D0LFD-7 | Standard | X1-DFN1212-3 | 3,000/Tape & Reel |
| DMN62D0LFD-13 | Standard | X1-DFN1212-3 | 10,000/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/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



K63 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: Y = 2013)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | |
|-------|------|------|------|------|------|------|------|------|------|------|------|-----|
| Code | U | V | W | X | Y | Z | A | B | C | D | E | |
| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | O | N | D |

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

| Characteristic | Symbol | Value | Unit |
|---|------------------|-------------------------------|------|
| Drain-Source Voltage | V _{DSS} | 60 | V |
| Gate-Source Voltage | V _{GSS} | ±20 | V |
| Continuous Drain Current (Note 5) V _{GS} = 4.0V | I _D | T _A = +25°C 310 | mA |
| | | T _A = +70°C 260 | |
| Pulsed Drain Current (Note 6) (10µs pulse, duty cycle = 1%) | I _{DM} | 1.0 | A |

Thermal Characteristics

| Characteristic | Symbol | Max | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation (Note 5) | P _D | 0.48 | W |
| Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 5) | R _{θJA} | 265 | °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 7) | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | 60 | — | — | V | V _{GS} = 0V, I _D = 250µA |
| Zero Gate Voltage Drain Current T _J = +25°C | I _{DSS} | — | — | 1.0 | µA | V _{DS} = 60V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | — | — | ±100 | nA | V _{GS} = ±5V, V _{DS} = 0V |
| | | — | — | ±500 | nA | V _{GS} = ±10V, V _{DS} = 0V |
| | | — | — | ±2.0 | µA | V _{GS} = ±15V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | 0.6 | — | 1.0 | V | V _{DS} = V _{GS} , I _D = 250µA |
| Static Drain-Source On-Resistance | R _{DS(on)} | — | 1.3 | 2 | Ω | V _{GS} = 4V, I _D = 100mA |
| | | — | 1.4 | 2.5 | | V _{GS} = 2.5V, I _D = 50mA |
| | | — | 1.8 | 3 | | V _{GS} = 1.8V, I _D = 50mA |
| | | — | 2.4 | — | | V _{GS} = 1.5V, I _D = 10mA |
| Forward Transfer Admittance | Y _{fs} | — | 1.8 | — | S | V _{DS} = 10V, I _D = 200mA |
| Diode Forward Voltage | V _{SD} | — | 0.8 | 1.3 | V | V _{GS} = 0V, I _S = 115mA |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C _{iss} | — | 31 | — | pF | V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz |
| Output Capacitance | C _{oss} | — | 4.3 | — | | |
| Reverse Transfer Capacitance | C _{rss} | — | 3.0 | — | | |
| Gate Resistance | R _g | — | 99 | — | Ω | V _{DS} = 0V, V _{GS} = 0V, f = 1MHz |
| Total Gate Charge | Q _g | — | 0.5 | — | nC | V _{GS} = 4.5V, V _{DS} = 10V, I _D = 250mA |
| Gate-Source Charge | Q _{gs} | — | 0.09 | — | | |
| Gate-Drain Charge | Q _{gd} | — | 0.07 | — | | |
| Turn-On Delay Time | t _{D(on)} | — | 2.6 | — | ns | V _{GS} = 10V, V _{DS} = 30V, R _L = 150Ω, R _G = 25Ω, I _D = 200mA |
| Turn-On Rise Time | t _r | — | 2.1 | — | ns | |
| Turn-Off Delay Time | t _{D(off)} | — | 18 | — | ns | |
| Turn-Off Fall Time | t _f | — | 8.7 | — | ns | |

- Notes:
- Device mounted on FR-4 PCB with minimum recommended pad layout, single sided.
 - Repetitive rating, pulse width limited by junction temperature.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to production testing.

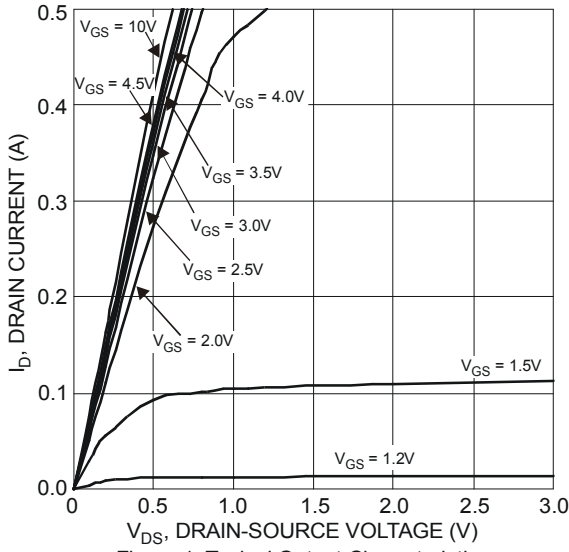


Figure 1 Typical Output Characteristics

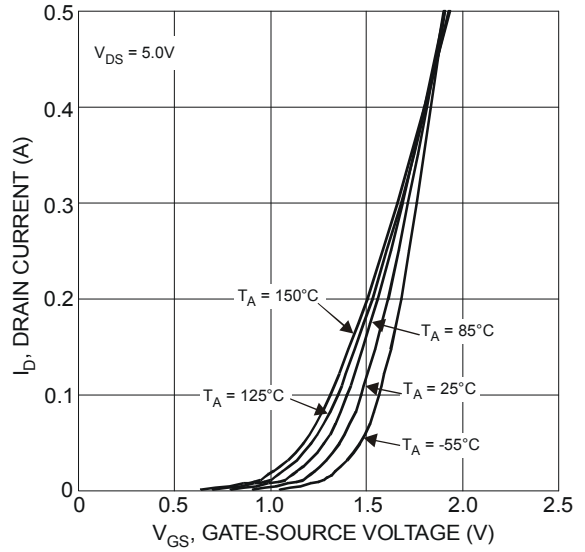


Figure 2 Typical Transfer Characteristics

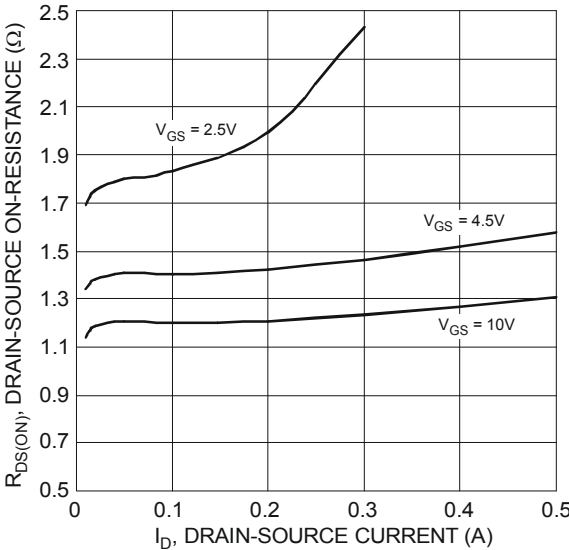


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

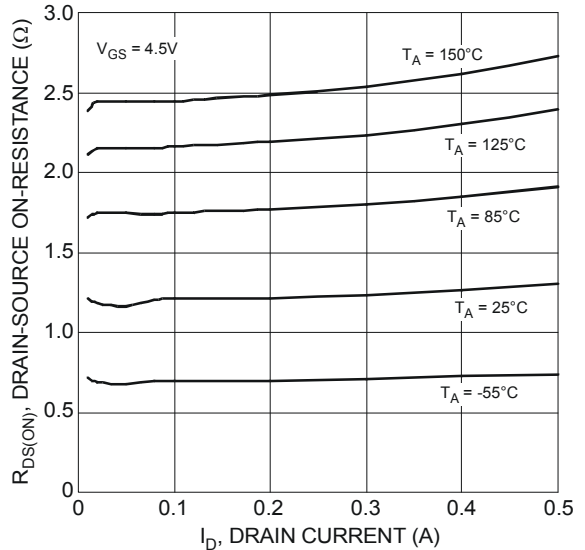


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

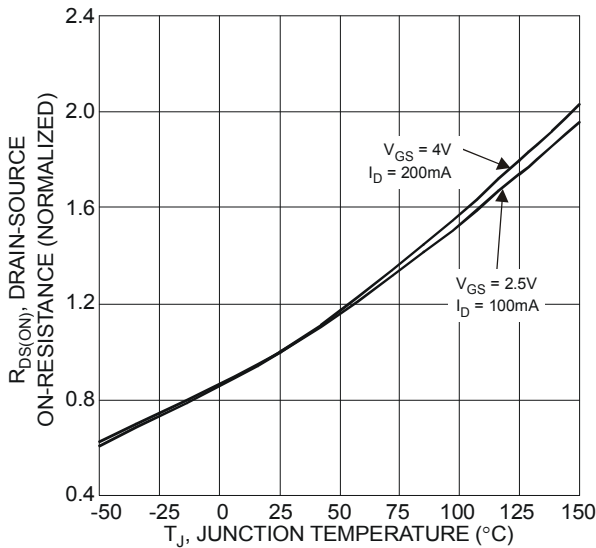


Figure 5 On-Resistance Variation with Temperature

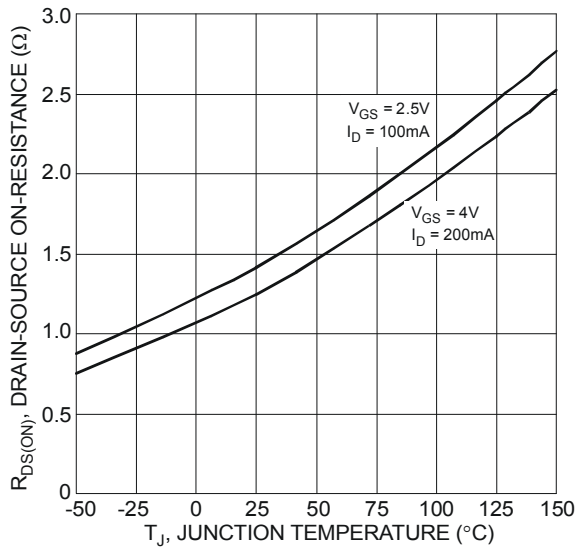


Figure 6 On-Resistance Variation with Temperature

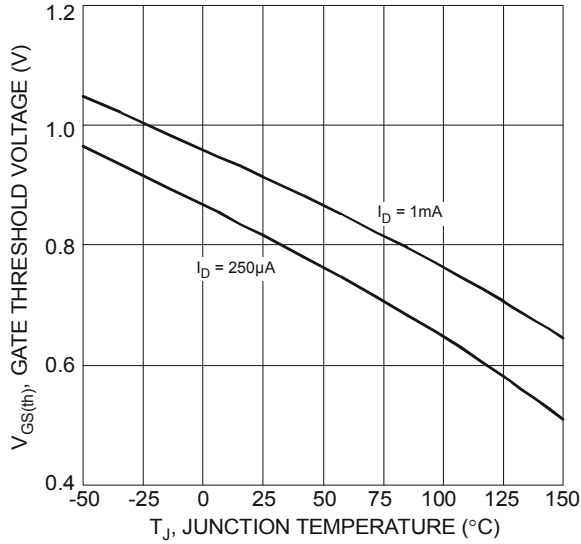


Figure 7 Gate Threshold Variation vs. Ambient Temperature

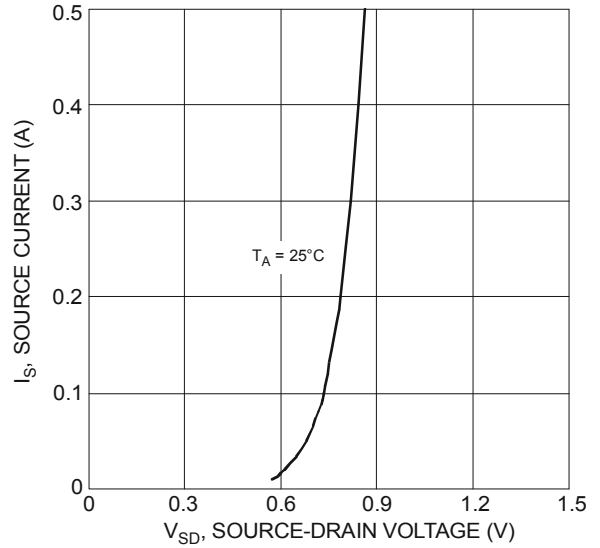


Figure 8 Diode Forward Voltage vs. Current

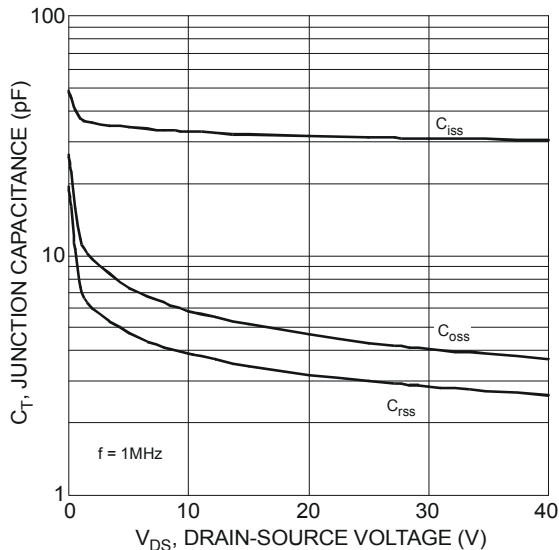


Figure 9 Typical Junction Capacitance

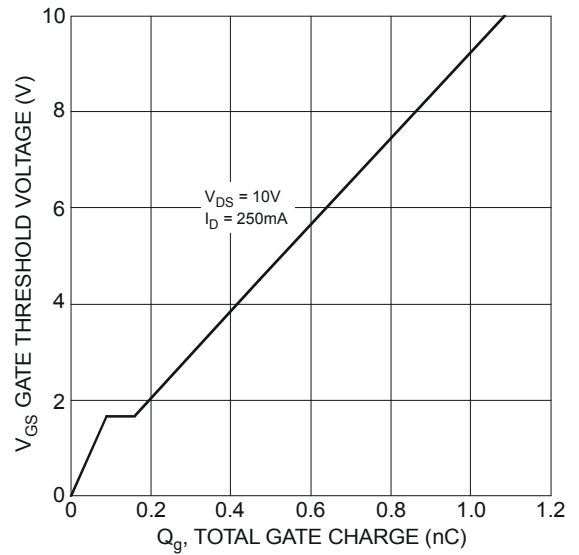


Figure 10 Gate Charge

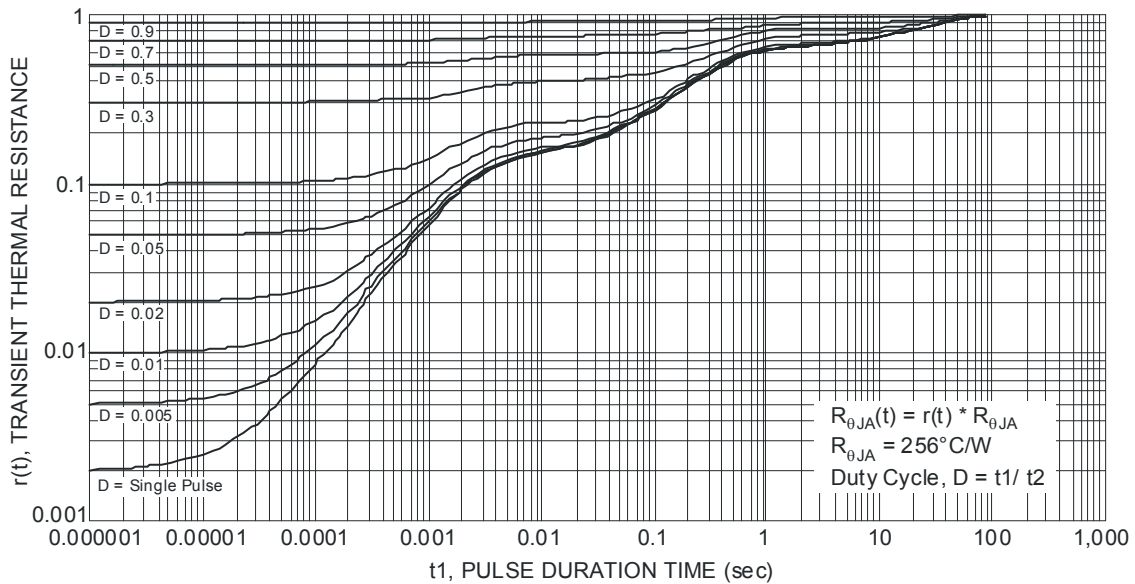
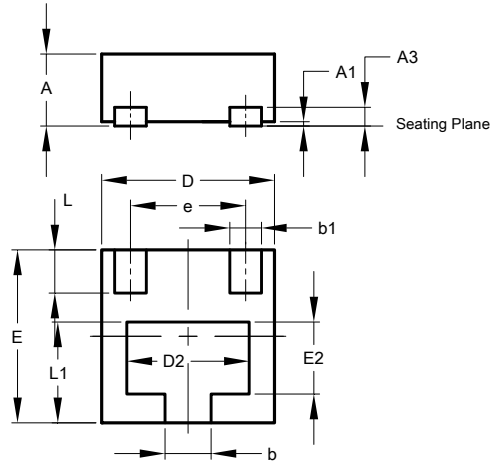


Figure 11 Transient Thermal Resistance

Package Outline Dimensions

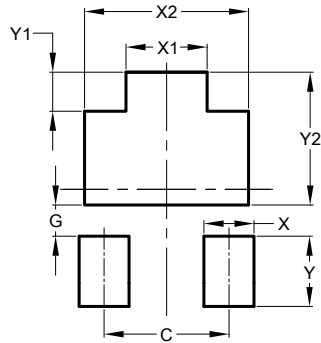
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| U-DFN1212-3 Type C | | | |
|-----------------------|------|------|------|
| Dim | Min | Max | Typ |
| A | 0.47 | 0.53 | 0.50 |
| A1 | 0 | 0.05 | 0.02 |
| A3 | - | - | 0.13 |
| b | 0.27 | 0.37 | 0.32 |
| b1 | 0.17 | 0.27 | 0.22 |
| D | 1.15 | 1.25 | 1.20 |
| D2 | 0.75 | 0.95 | 0.85 |
| e | - | - | 0.80 |
| E | 1.15 | 1.25 | 1.20 |
| E2 | 0.40 | 0.60 | 0.50 |
| L | 0.25 | 0.35 | 0.30 |
| L1 | 0.65 | 0.75 | 0.70 |
| All Dimensions in mm | | | |

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for latest version.



| U-DFN1212-3 Type C | |
|-----------------------|-------|
| Dimensions | Value |
| C | 0.800 |
| G | 0.200 |
| X | 0.320 |
| X1 | 0.520 |
| X2 | 1.050 |
| Y | 0.450 |
| Y1 | 0.250 |
| Y2 | 0.850 |
| All Dimensions in mm | |

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