

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)}$ | I_D $T_A = 25^\circ C$ |
|---------------|--------------------------|-----------------------------|
| 60V | $2\Omega @ V_{GS} = 10V$ | 540mA |
| | $3\Omega @ V_{GS} = 5V$ | 430mA |

Description and Applications

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.

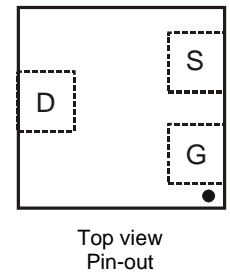
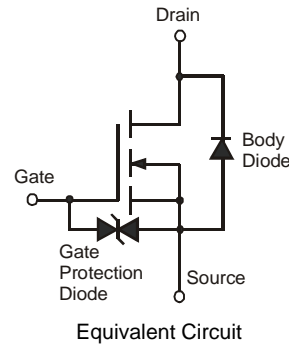
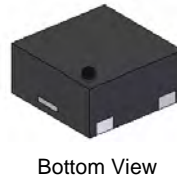
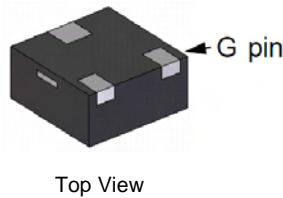
- DC-DC Converters
- Power management functions
- Battery Operated Systems and Solid-State Relays
- Load switch

Features and Benefits

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- ESD Protected Gate to 2kV
- **Lead Free/RoHS Compliant (Note 1)**
- **Green Device (Note 2)**
- **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: Solderable per MIL-STD-202, Method 208
- Terminals: Finish – NiPdAu over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Weight: 0.005 grams (approximate)

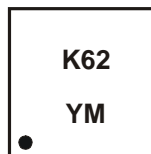


Ordering Information (Note 3)

| Part Number | Case | Packaging |
|--------------|--------------|------------------|
| DMN62D0SFD-7 | X1-DFN1212-3 | 3000/Tape & Reel |

- 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



K62 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: Y = 2011)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------|------|------|------|------|------|------|
| Code | U | V | W | X | Y | Z |

| 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 | Units |
|---|--------------|--|------------------|------------|-------|
| Drain-Source Voltage | | | V _{DSS} | 60 | V |
| Gate-Source Voltage | | | V _{GSS} | ±20 | V |
| Continuous Drain Current (Note 5) V _{GS} = 10V | Steady State | T _A = 25°C T _A = 70°C | I _D | 540 430 | mA |
| | t < 10s | T _A = 25°C T _A = 70°C | I _D | 630 500 | mA |
| Continuous Drain Current (Note 5) V _{GS} = 5V | Steady State | T _A = 25°C T _A = 70°C | I _D | 430 340 | mA |
| | t < 10s | T _A = 25°C T _A = 70°C | I _D | 510 410 | mA |
| Pulsed Drain Current (10µs pulse, duty cycle = 1%) | | | I _{DM} | 1.0 | A |
| Maximum Body Diode Forward Current (Note 5) | | | I _S | 1.0 | A |

Thermal Characteristics @T_A = 25°C unless otherwise specified

| Characteristic | | Symbol | Value | Units |
|--|--------------|-----------------------------------|-------------|-------|
| Total Power Dissipation (Note 4) | | P _D | 0.43 | W |
| Thermal Resistance, Junction to Ambient (Note 4) | Steady state | R _{θJA} | 260 | °C/W |
| | t < 10s | | 182 | °C/W |
| Total Power Dissipation (Note 5) | | P _D | 0.89 | W |
| Thermal Resistance, Junction to Ambient (Note 5) | Steady state | R _{θJA} | 140 | °C/W |
| | t < 10s | | 98 | °C/W |
| Thermal Resistance, Junction to Case (Note 5) | | R _{θJC} | 112 | °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} | 60 | - | - | V | V _{GS} = 0V, I _D = 10µA |
| Zero Gate Voltage Drain Current T _J = 25°C | I _{DSS} | - | - | 100 | nA | V _{DS} = 60V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | - | - | 10 | µA | V _{GS} = ±20V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 6) | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | 1.0 | 1.6 | 2.5 | V | V _{DS} = 10V, I _D = 1mA |
| Static Drain-Source On-Resistance | R _{DS(on)} | - | - | 2 | Ω | V _{GS} = 10V, I _D = 500mA |
| | | - | - | 3 | | V _{GS} = 5V, I _D = 50mA |
| Forward Transfer Admittance | Y _{fs} | - | 130 | - | mS | V _{DS} = 3V, I _D = 30mA |
| Diode Forward Voltage | V _{SD} | - | 0.8 | 1.2 | V | V _{GS} = 0V, I _S = 300mA |
| DYNAMIC CHARACTERISTICS (Note 7) | | | | | | |
| Input Capacitance | C _{iss} | - | 30.2 | - | pF | V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz |
| Output Capacitance | C _{oss} | - | 4.4 | - | pF | |
| Reverse Transfer Capacitance | C _{rss} | - | 2.8 | - | pF | |
| Gate Resistance | R _g | - | 131 | - | Ω | V _{DS} = 0V, V _{GS} = 0V, f = 1MHz |
| Total Gate Charge (V _{GS} = 4.5V) | Q _g | - | 0.39 | - | nC | V _{DS} = 10V, I _D = 1A |
| Total Gate Charge (V _{GS} = 10.0V) | Q _g | - | 0.87 | - | nC | |
| Gate-Source Charge | Q _{gs} | - | 0.14 | - | nC | |
| Gate-Drain Charge | Q _{gd} | - | 0.09 | - | nC | |
| Turn-On Delay Time | t _{D(on)} | - | 3.95 | - | ns | V _{DS} = 30V, I _D = 200mA V _{GS} = 10V, R _G = 25Ω |
| Turn-On Rise Time | t _r | - | 3.81 | - | ns | |
| Turn-Off Delay Time | t _{D(off)} | - | 16.0 | - | ns | |
| Turn-Off Fall Time | t _f | - | 9.04 | - | 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 thermal vias to bottom layer 1inch square copper plate
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to production testing.

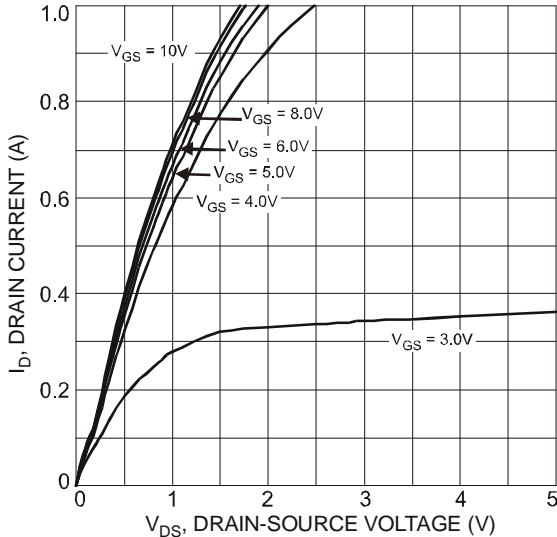


Fig. 1 Typical Output Characteristic

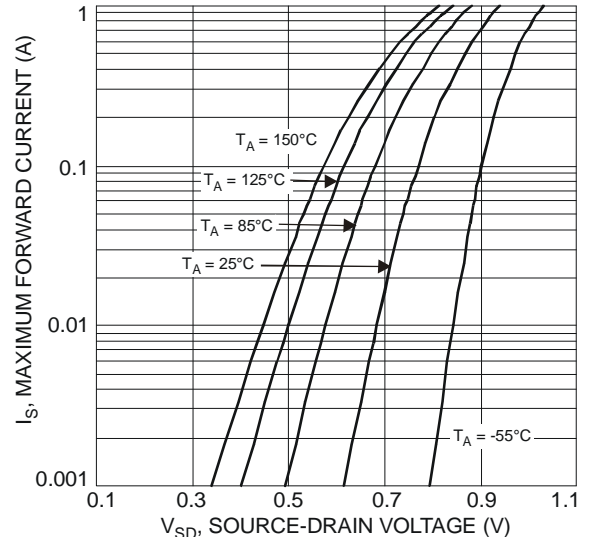


Fig. 2 Maximum Forward Current vs. Source-Drain Voltage

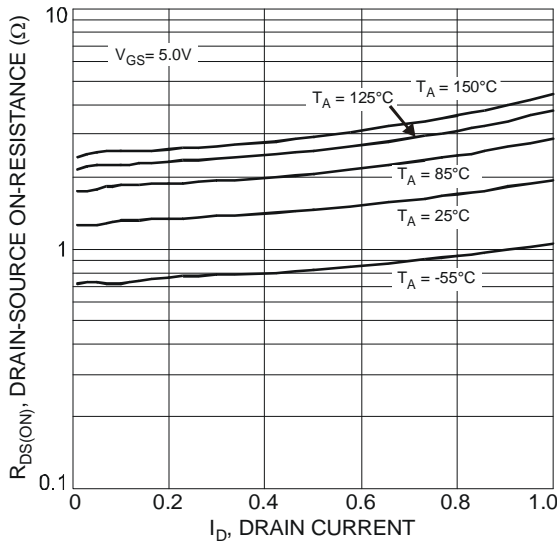


Fig. 3 Typical On-Resistance vs. Drain Current and Temperature

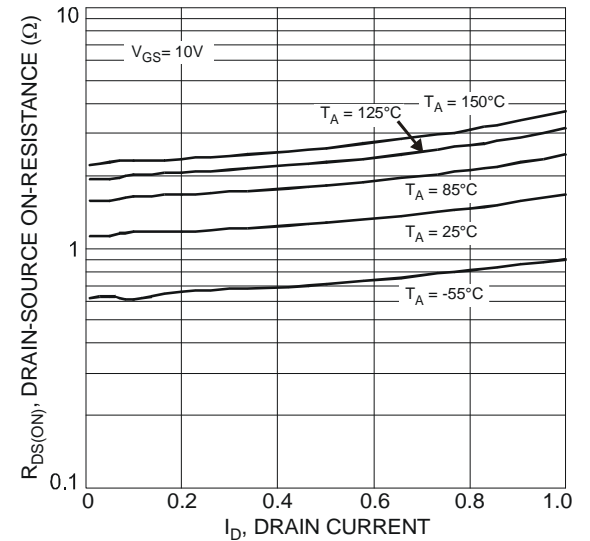


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

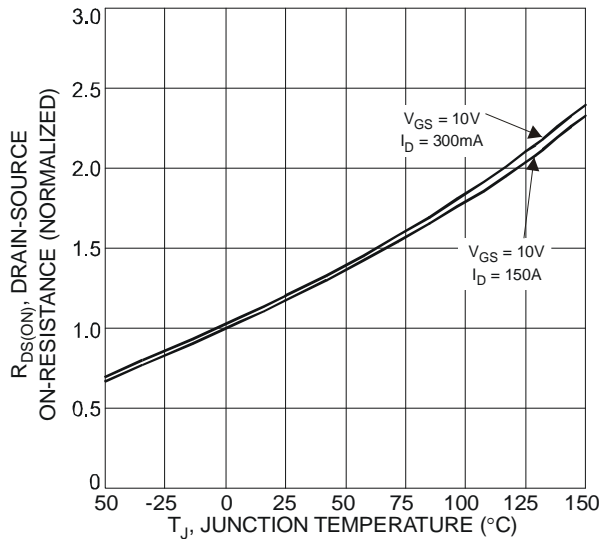


Fig. 5 On-Resistance Variation with Temperature

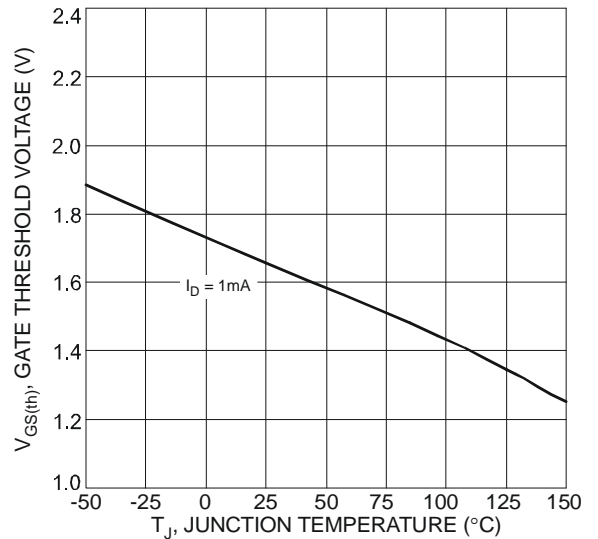


Fig. 6 Gate Threshold Variation vs. Ambient Temperature

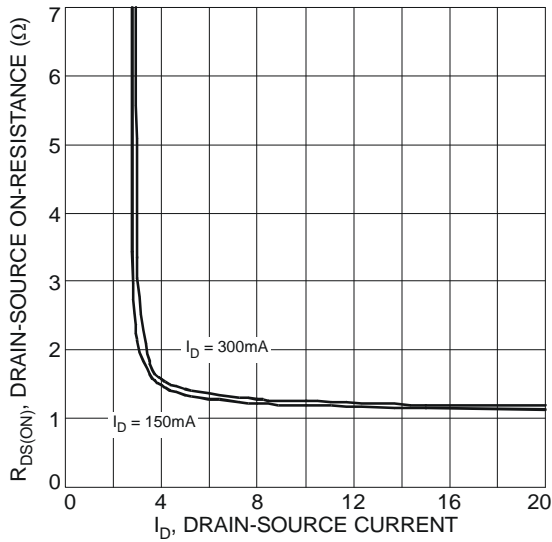


Fig. 7 Typical On-Resistance vs. Drain Current

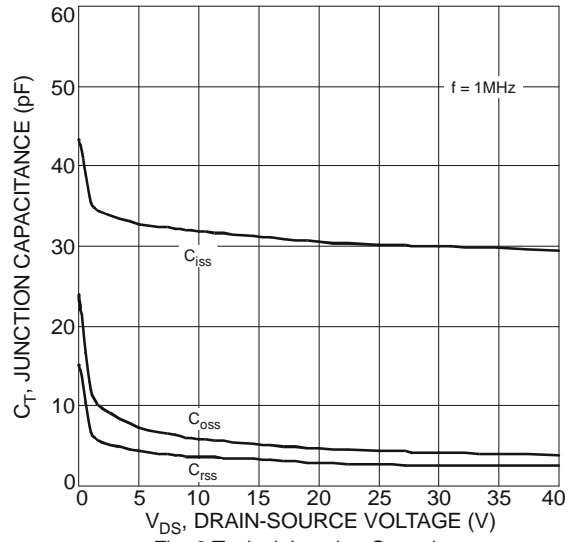


Fig. 8 Typical Junction Capacitance

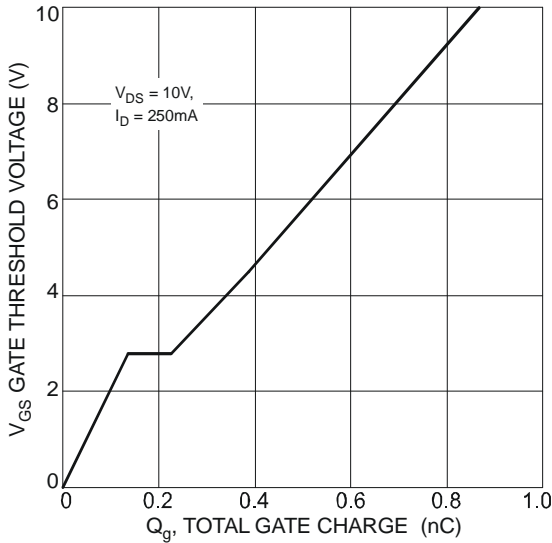


Fig. 9 Gate Charge

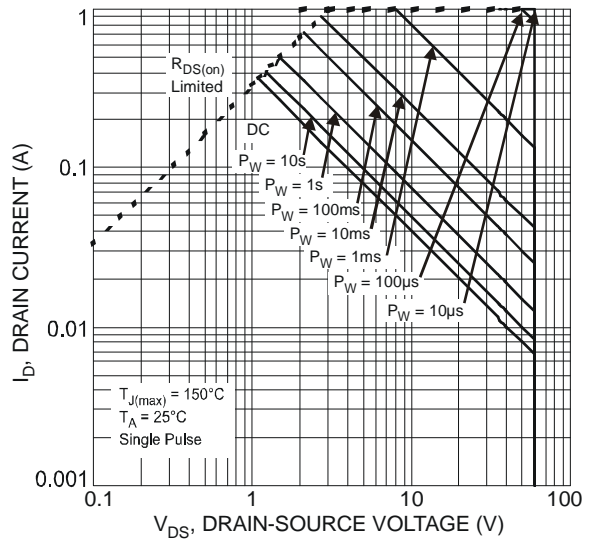


Fig. 10 SOA, Safe Operation Area

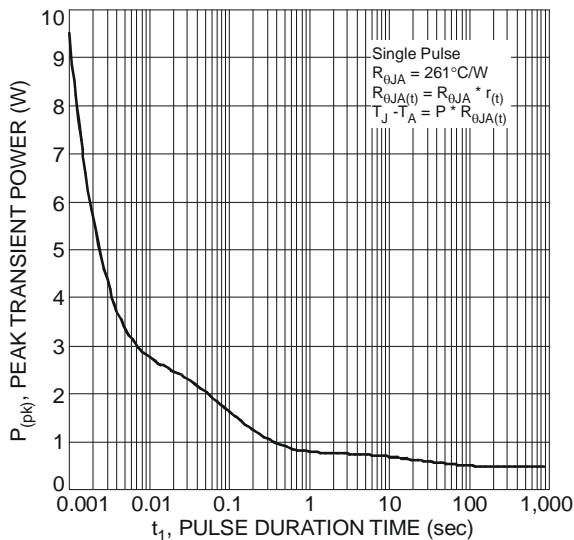
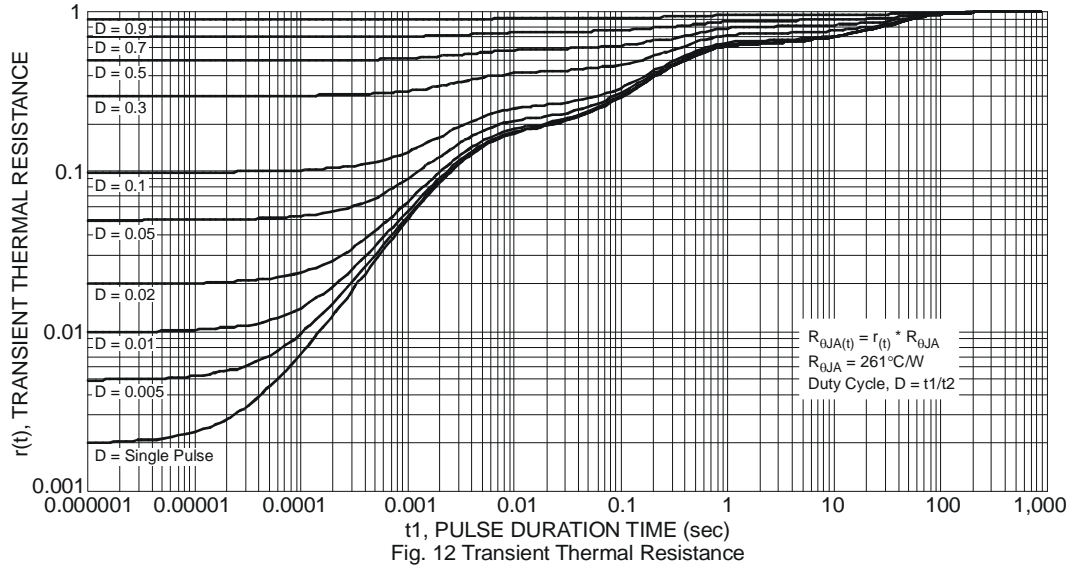
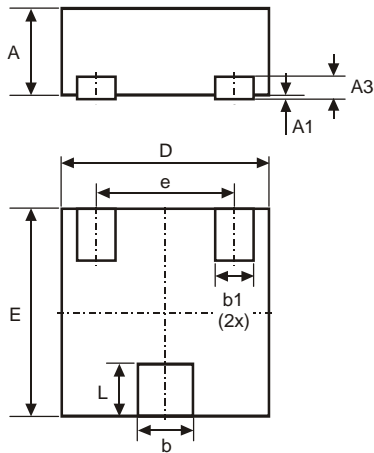


Fig. 11 Single Pulse Maximum Power Dissipation

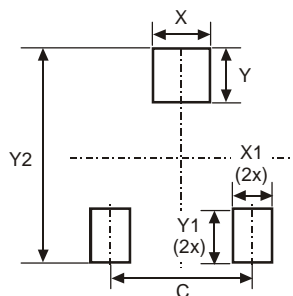


Package Outline Dimensions



| X1-DFN1212-3 | | | |
|----------------------|------|------|------|
| 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 |
| E | 1.15 | 1.25 | 1.20 |
| e | - | - | 0.80 |
| L | 0.25 | 0.35 | 0.30 |
| All Dimensions in mm | | | |

Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 0.80 |
| X | 0.42 |
| X1 | 0.32 |
| Y | 0.50 |
| Y1 | 0.50 |
| Y2 | 1.50 |

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