

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on) \max}$ | I_D $T_A = 25^\circ\text{C}$ |
|---------------|---------------------------------------|-----------------------------------|
| 20V | 48m Ω @ $V_{GS} = 4.5\text{V}$ | 2.8A |
| | 59m Ω @ $V_{GS} = 2.5\text{V}$ | 2.6A |

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

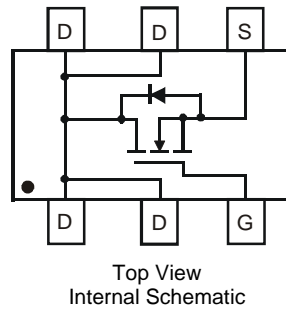


Benefit and Features

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

- Case: SOT363
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — Matte Tin annealed over Alloy42 leadframe. Solderable per MIL-STD-202, Method 208
- Terminals Connections: See Diagram Below
- Weight: 0.006 grams (approximate)

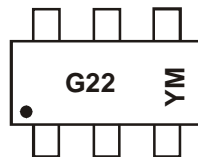


Ordering Information (Note 3)

| Part Number | Case | Packaging |
|--------------|--------|------------------|
| DMN2075UDW-7 | SOT363 | 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



G22 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: Y = 2011)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|------|------|------|------|------|------|------|------|
| Code | 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 | Units |
|--|--------------|--|------------------|------------|-------|
| Drain-Source Voltage | | | V _{DSS} | 20 | V |
| Gate-Source Voltage | | | V _{GSS} | ±8V | V |
| Continuous Drain Current (Note 5) V _{GS} = 4.5V | Steady State | T _A = 25°C T _A = 70°C | I _D | 2.8 2.2 | A |
| | t < 5s | T _A = 25°C T _A = 70°C | I _D | 3.1 2.5 | A |
| Continuous Drain Current (Note 5) V _{GS} = 2.5V | Steady State | T _A = 25°C T _A = 70°C | I _D | 2.6 2.1 | A |
| | t < 5s | T _A = 25°C T _A = 70°C | I _D | 2.8 2.2 | A |
| Pulsed Drain Current (10μs pulse, Duty cycle = 1%) | | | I _{DM} | 20 | A |
| Maximum Continuous Body Diode Current | | | I _S | 1.0 | A |

Thermal Characteristics

| Characteristic | | Symbol | Value | Units |
|--|--------------|-----------------------------------|-------------|-------|
| Total Power Dissipation (Note 4) | | P _D | 0.5 | W |
| Thermal Resistance, Junction to Ambient (Note 4) | Steady state | R _{θJA} | 257 | °C/W |
| | t < 5s | | 213 | °C/W |
| Total Power Dissipation (Note 5) | | P _D | 0.58 | W |
| Thermal Resistance, Junction to Ambient (Note 5) | Steady state | R _{θJA} | 221 | °C/W |
| | t < 5s | | 183 | °C/W |
| Thermal Resistance, Junction to Case (Note 5) | | R _{θJC} | 65 | °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 5) | | | | | | |
| 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} | - | - | ±100 | nA | V _{GS} = ±8V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 5) | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | 0.4 | - | 1.0 | V | V _{DS} = V _{GS} , I _D = 250μA |
| Static Drain-Source On-Resistance | R _{DS(on)} | - | 40 | 48 | mΩ | V _{GS} = 4.5V, I _D = 3A |
| | | - | 45 | 59 | | V _{GS} = 2.5V, I _D = 2A |
| | | - | 51 | 70 | | V _{GS} = 1.8V, I _D = 1A |
| | | - | 68 | 100 | | V _{GS} = 1.5V, I _D = 1A |
| Forward Transfer Admittance | Y _{fs} | - | 13 | - | S | V _{DS} = 5V, I _D = 3A |
| Diode Forward Voltage | V _{SD} | - | 0.75 | 1.0 | V | V _{GS} = 0V, I _S = 1A |
| DYNAMIC CHARACTERISTICS (Note 6) | | | | | | |
| Input Capacitance | C _{iss} | - | 594.3 | - | pF | V _{DS} = 10V, V _{GS} = 0V, f = 1.0MHz |
| Output Capacitance | C _{oss} | - | 64.5 | - | pF | |
| Reverse Transfer Capacitance | C _{riss} | - | 57.7 | - | pF | |
| Gate Resistance | R _g | - | 1.5 | - | Ω | V _{DS} = 0V, V _{GS} = 0V, f = 1MHz |
| Total Gate Charge | Q _g | - | 7.0 | - | nC | V _{GS} = 4.5V, V _{DS} = 10V, I _D = 3.6A |
| Gate-Source Charge | Q _{gs} | - | 0.9 | - | nC | |
| Gate-Drain Charge | Q _{gd} | - | 1.4 | - | nC | |
| Turn-On Delay Time | t _{D(on)} | - | 7.4 | - | ns | V _{DD} = 10V, V _{GS} = 4.5V, R _L = 2.78Ω, R _G = 1.0Ω |
| Turn-On Rise Time | t _r | - | 9.8 | - | ns | |
| Turn-Off Delay Time | t _{D(off)} | - | 28.1 | - | ns | |
| Turn-Off Fall Time | t _f | - | 6.7 | - | 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.

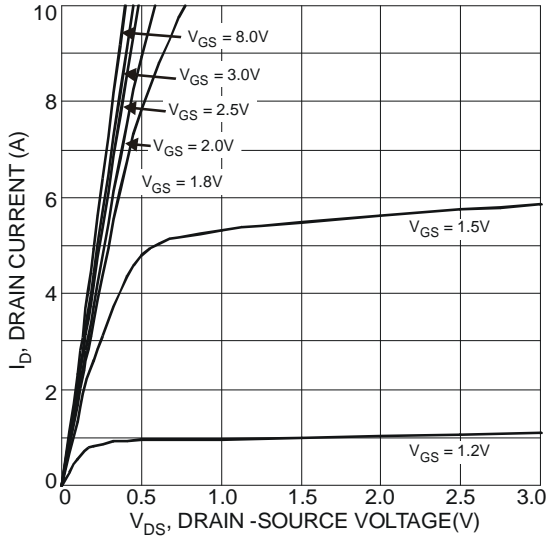


Fig. 1 Typical Output Characteristics

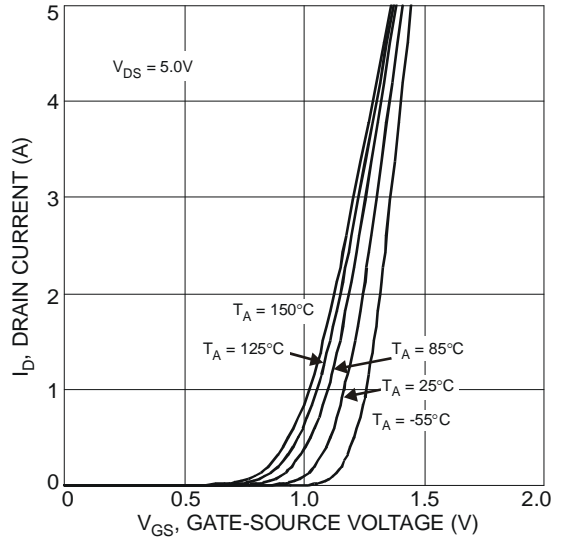


Fig. 2 Typical Transfer Characteristics

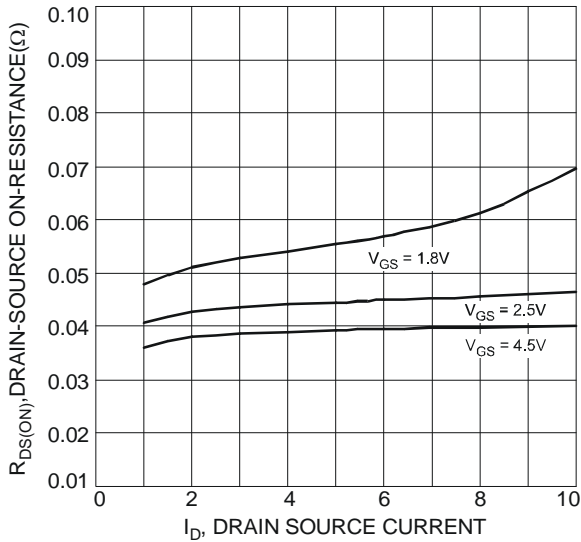


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

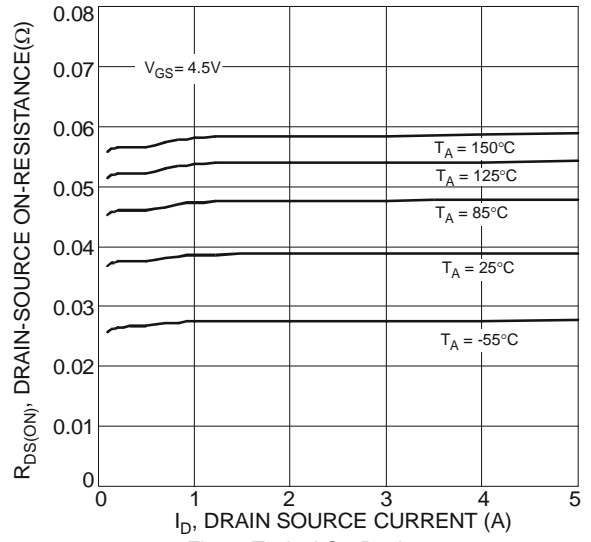


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

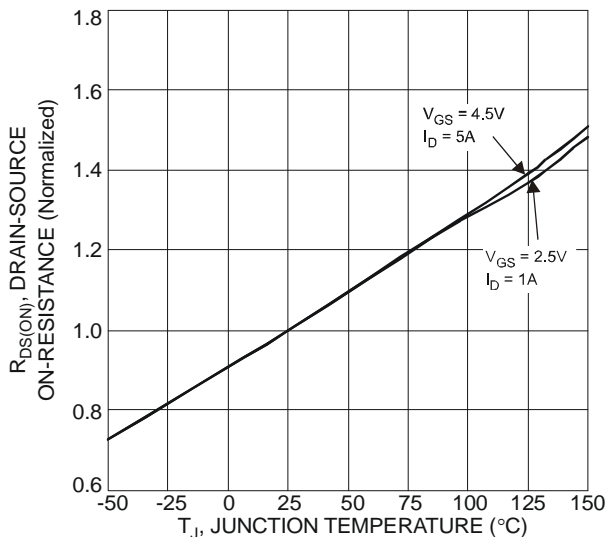


Fig. 5 On-Resistance Variation with Temperature

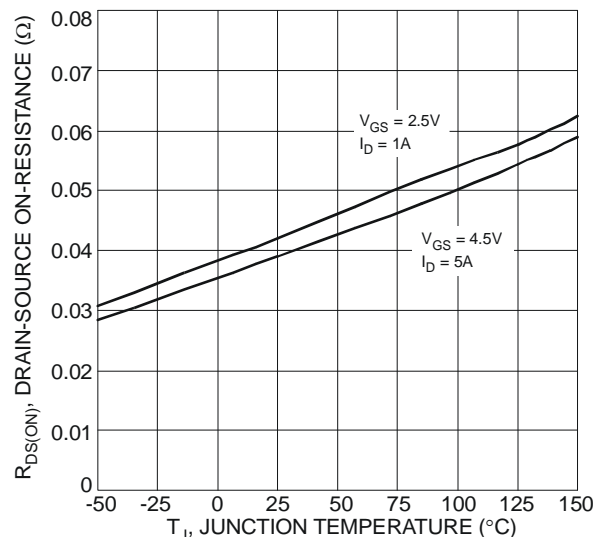


Fig. 6 On-Resistance Variation with Temperature

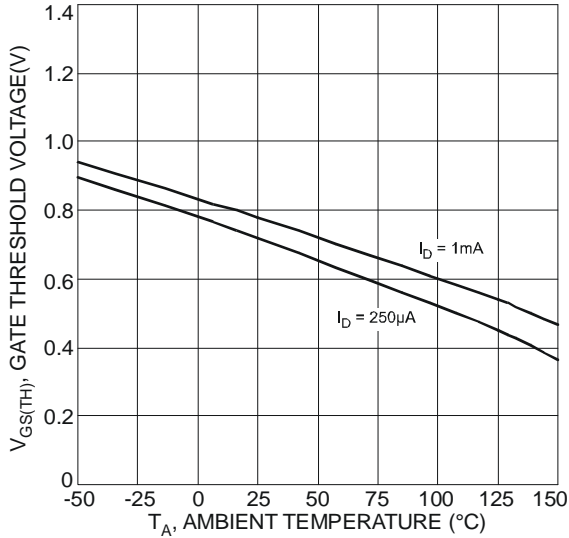


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

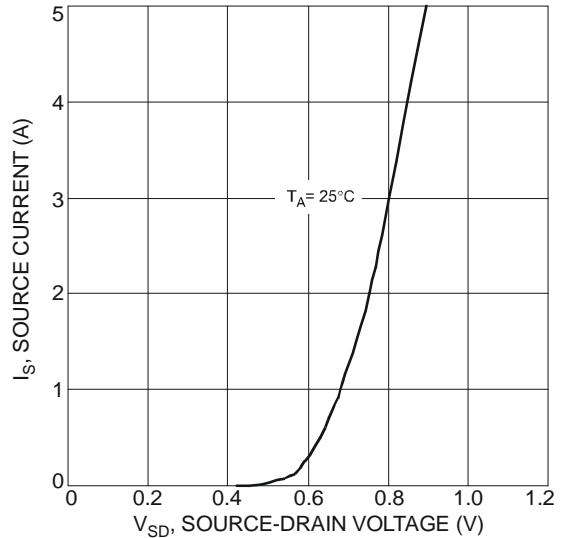


Fig. 8 Diode Forward Voltage vs. Current

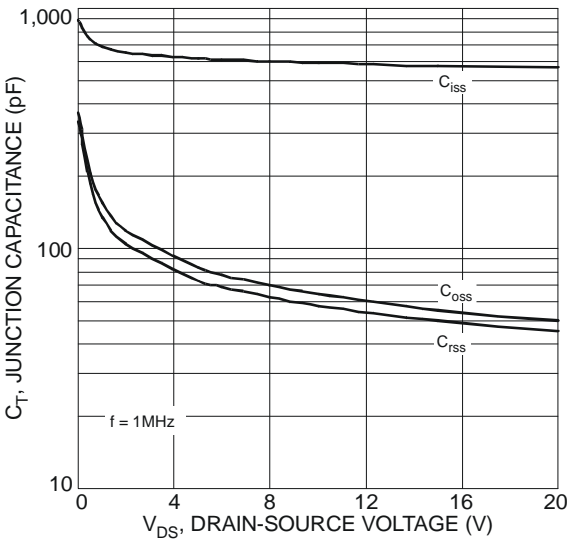


Fig. 9 Typical Junction Capacitance

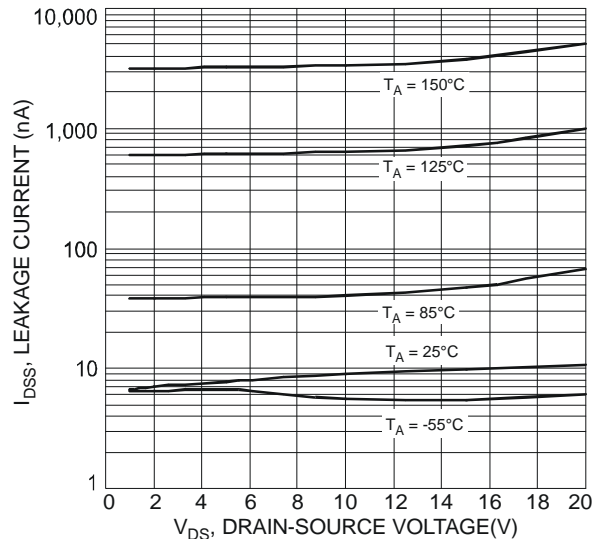


Fig. 10 Typical Drain-Source Leakage Current vs. Voltage

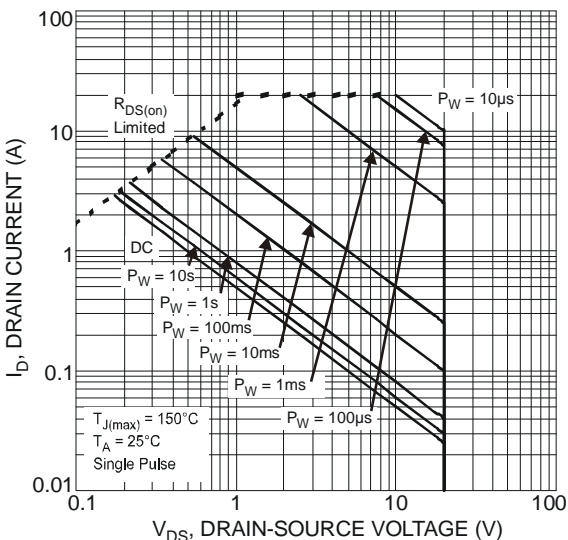
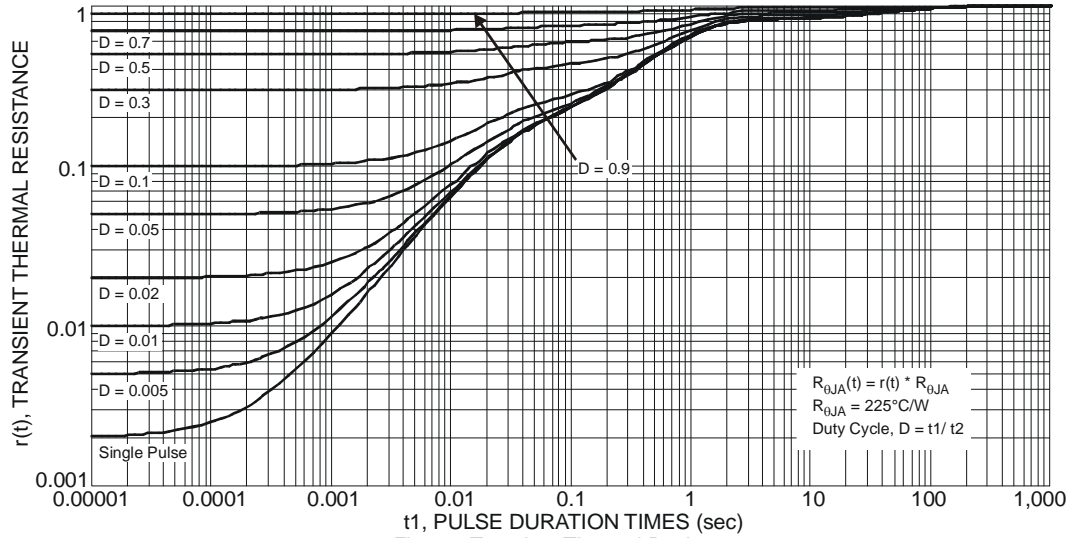
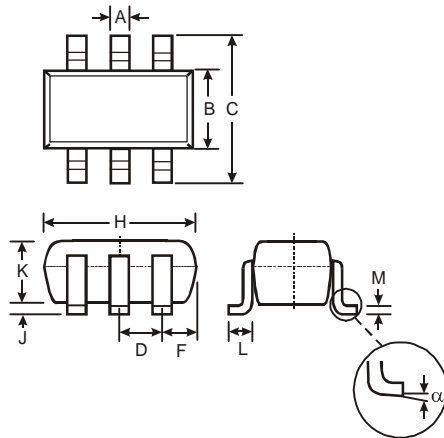


Fig. 11 SOA, Safe Operation Area

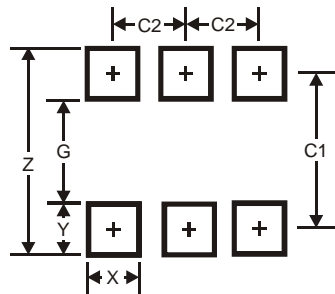


Package Outline Dimensions



| SOT363 | | |
|----------------------|----------|------|
| Dim | Min | Max |
| A | 0.10 | 0.30 |
| B | 1.15 | 1.35 |
| C | 2.00 | 2.20 |
| D | 0.65 Typ | |
| F | 0.40 | 0.45 |
| H | 1.80 | 2.20 |
| J | 0 | 0.10 |
| K | 0.90 | 1.00 |
| L | 0.25 | 0.40 |
| M | 0.10 | 0.22 |
| α | 0° | 8° |
| All Dimensions in mm | | |

Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| Z | 2.5 |
| G | 1.3 |
| X | 0.42 |
| Y | 0.6 |
| C1 | 1.9 |
| C2 | 0.65 |

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