



DUAL N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

| V _{(BR)DSS} | R _{DS(ON)} | I _D T _A = 25°C |
|----------------------|-------------------------------|---|
| 30V | 4.2Ω @ $V_{GS} = 4.5V$ | 200mA |
| 307 | 2.8Ω @ V _{GS} = 10V | 260mA |

Description

This new generation MOSFET is 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

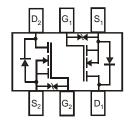
- Dual N-Channel MOSFET
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Small Surface Mount Package
- ESD Protected Gate
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability
- PPAP Capable (Note 4)

Mechanical Data

- Case: SOT363
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish annealed over Alloy 42 leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208@3
- Terminal Connections: See Diagram
- Weight: 0.006 grams (approximate)







Top View Internal Schematic

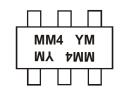
Ordering Information (Note 5)

| Part Number | Case | Packaging |
|----------------|--------|-------------------|
| DMN63D8LDWQ-7 | SOT363 | 3000/Tape & Reel |
| DMN63D8LDWQ-13 | SOT363 | 10000/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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_compliance_definitions/.
- 5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



MM4 = Product Type Marking Code YM = Date Code Marking Y = Year (ex: B = 2014) M = Month (ex: 9 = September)

Date Code Key

| Date Code Ney | | | | | | | | | | | | |
|---------------|-----|-----|------|-----|------|-----|-----|------|-----|------|-----|------|
| Year | 201 | 3 | 2014 | | 2015 | 20 | 16 | 2017 | | 2018 | - 2 | 2019 |
| Code | Α | | В | | С | |) | Е | | F | | G |
| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | N | D |



Maximum Ratings (@ $T_A = +25^{\circ}C$, unless otherwise specified.)

| Characteristic | | | Symbol | Value | Units |
|---|-----------------|--|------------------|------------|-------|
| Drain-Source Voltage | | | V _{DSS} | 30 | V |
| Gate-Source Voltage | | | V _{GSS} | ±20 | V |
| Continuous Drain Current (Note 6) V _{GS} = 10V | Steady State | $T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$ | I _D | 220 170 | mA |
| Continuous Drain Current (Note 7) V _{GS} = 10V | Steady State | T _A = +25°C T _A = +70°C | I _D | 260 210 | mA |
| Pulsed Drain Current (10µs pulse, duty cycle = 1%) | I _{DM} | 800 | mA | | |

Thermal Characteristics (@TA = +25°C, unless otherwise specified.)

| Characteristic | | Symbol | Value | Units |
|---|----------|------------------|------------|-------|
| Total Power Dissipation | (Note 5) | ٥ | 300 | mW |
| Total Power Dissipation | (Note 6) | P _D | 400 | IIIVV |
| Thermal Resistance, Junction to Ambient | (Note 5) | 0 | 435 | |
| Thermal Resistance, Junction to Ambient | (Note 6) | $R_{	hetaJA}$ | 330 | °C/W |
| Thermal Resistance, Junction to Case | (Note 6) | $R_{	heta JC}$ | 139 | |
| Operating and Storage Temperature Range | | $T_{J_i}T_{STG}$ | -55 to 150 | °C |

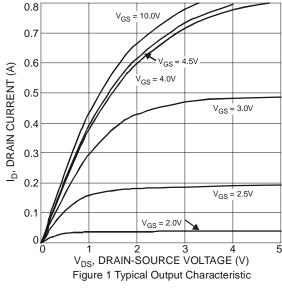
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

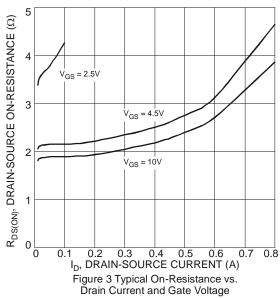
| Characteristic | Symbol | Min | Тур | Max | Unit | Test Condition |
|--|----------------------|-----|------|-------|------|---|
| OFF CHARACTERISTICS (Note 8) | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | 30 | | _ | V | $V_{GS} = 0V, I_D = 250\mu A$ |
| Zero Gate Voltage Drain Current | I _{DSS} | | | 1.0 | μΑ | $V_{DS} = 30V$, $V_{GS} = 0V$ |
| Gate-Body Leakage | I _{GSS} | | | ±10.0 | μΑ | $V_{GS} = \pm 20V, V_{DS} = 0V$ |
| ON CHARACTERISTICS (Note 8) | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | 8.0 | | 1.5 | V | $V_{DS} = V_{GS}$, $I_D = 250\mu A$ |
| | | | | 2.8 | | $V_{GS} = 10.0V, I_D = 250mA$ |
| | | | | 3.8 | | $V_{GS} = 5V, I_D = 250mA$ |
| Static Drain-Source On-Resistance | R _{DS (ON)} | | | 4.2 | Ω | $V_{GS} = 4.5V, I_D = 250mA$ |
| | | | | 4.5 | | $V_{GS} = 4.0V, I_D = 250mA$ |
| | | _ | _ | 13 | | $V_{GS} = 2.5V, I_D = 10mA$ |
| Forward Transconductance | g _{FS} | 80 | | _ | mS | $V_{DS} = 10V, I_D = 0.115A$ |
| Diode Forward Voltage | V_{SD} | - | 0.8 | 1.2 | V | $V_{GS} = 0V, I_{S} = 115mA$ |
| DYNAMIC CHARACTERISTICS (Note 9) | | | | | | |
| Input Capacitance | Ciss | | 22.0 | _ | | |
| Output Capacitance | Coss | | 3.2 | _ | pF | $V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz$ |
| Reverse Transfer Capacitance | Crss | | 2.0 | _ | | |
| Gate Resistance | R _G | | 79.9 | _ | Ω | $V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz$ |
| Total Gate Charge V _{GS} = 10V | Q_g | _ | 0.87 | _ | | |
| Total Gate Charge V _{GS} = 4.5V | Qg | _ | 0.43 | _ | nC | $V_{GS} = 10V, V_{DS} = 30V,$ |
| Gate-Source Charge | Q_{gs} | _ | 0.11 | _ | IIC | I _D = 150mA |
| Gate-Drain Charge | Q_{qd} | _ | 0.11 | _ | | |
| Turn-On Delay Time | t _{D(on)} | _ | 3.3 | _ | | |
| Turn-On Rise Time | t _r | | 3.2 | _ | nS | $V_{DD} = 30V, I_D = 0.115A, V_{GEN} = 10V$ |
| Turn-Off Delay Time | t _{D(off)} | | 12.0 | _ | no | $R_{GEN} = 25\Omega$ |
| Turn-Off Fall Time | t _f | _ | 6.3 | _ | | |

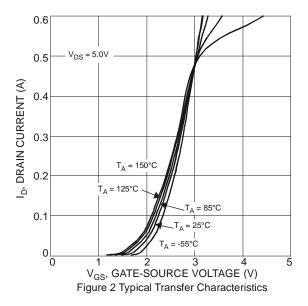
Notes:

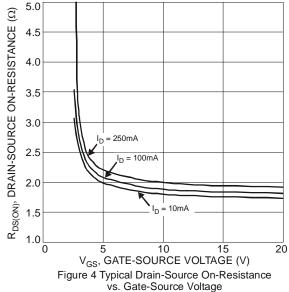
- 6. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.7. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout.8. Short duration pulse test used to minimize self-heating effect.
- 9. Guaranteed by design. Not subject to production testing.



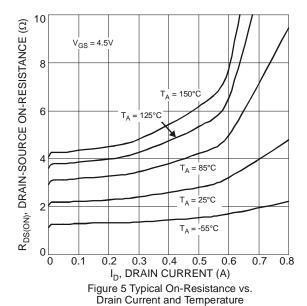


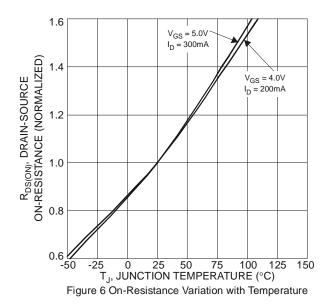


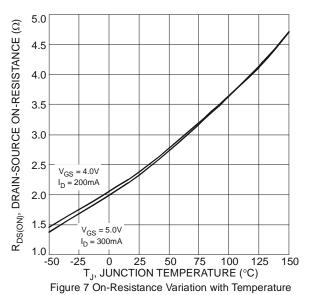


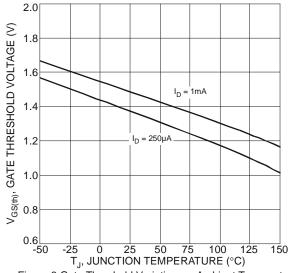












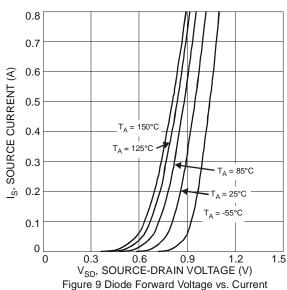
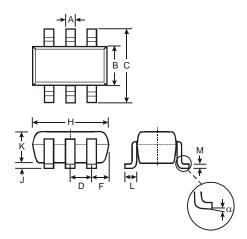


Figure 8 Gate Threshold Variation vs. Ambient Temperature



Package Outline Dimensions

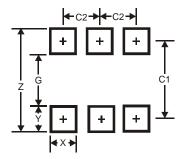
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



| | SOT363 | | | | | | | |
|----------------------|---------------|----------------|-------|--|--|--|--|--|
| Dim | Min Max Typ | | | | | | | |
| Α | 0.10 | 0.30 | 0.25 | | | | | |
| В | 1.15 | 1.35 | 1.30 | | | | | |
| O | 2.00 | 2.00 2.20 2.10 | | | | | | |
| D | 0.65 Typ | | | | | | | |
| F | 0.40 | 0.45 | 0.425 | | | | | |
| Н | 1.80 2.20 2.1 | | | | | | | |
| J | 0 0.10 0.0 | | | | | | | |
| K | 0.90 | 1.00 | 1.00 | | | | | |
| L | 0.25 | 0.40 | 0.30 | | | | | |
| М | 0.10 | 0.22 | 0.11 | | | | | |
| α | 0° | 8° | - | | | | | |
| 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 | 2.5 |
| G | 1.3 |
| Х | 0.42 |
| Υ | 0.6 |
| C1 | 1.9 |
| C2 | 0.65 |



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