

DUAL N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

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

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

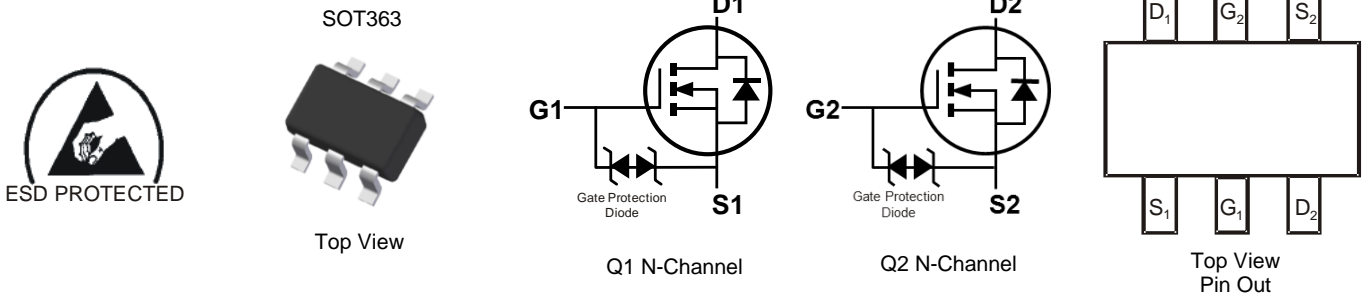
- DC-DC Converters
- Power Management Functions
- Battery Operated Systems and Solid-State Relays
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.

Features

- 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)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q101, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact@diodes.com) or your local Diodes representative.**
- <https://www.diodes.com/quality/product-definitions/>

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 (E3)
- Terminal Connections: See Diagram
- Weight: 0.006 grams (Approximate)

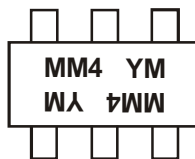


Ordering Information (Note 4)

| Part Number | Case | Packaging |
|---------------|--------|-------------------|
| DMN63D8LDW-7 | SOT363 | 3000/Tape & Reel |
| DMN63D8LDW-13 | SOT363 | 10000/Tape & Reel |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



MM4 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: G = 2019)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2011 | ~ | 2019 | 2020 | 2021 | 2022 | 2023 |
|------|------|---|------|------|------|------|------|
| Code | Y | ~ | G | H | I | J | K |

| 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} | 30 | V |
| Gate-Source Voltage | | | | V _{GSS} | ±20 | V |
| Continuous Drain Current (Note 5) | V _{GS} = 10V | Steady State | T _A = +25°C | I _D | 220 | mA |
| | | | T _A = +70°C | | 170 | |
| Continuous Drain Current (Note 6) | V _{GS} = 10V | Steady State | T _A = +25°C | I _D | 260 | mA |
| | | | T _A = +70°C | | 210 | |
| Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%) | | | | I _{DM} | 800 | mA |

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

| Characteristic | | Symbol | Value | Unit |
|---|----------|-----------------------------------|-------------|------|
| Total Power Dissipation | (Note 5) | P _D | 300 | mW |
| | (Note 6) | | 400 | |
| Thermal Resistance, Junction to Ambient | (Note 5) | R _{θJA} | 435 | °C/W |
| | (Note 6) | | 330 | |
| Thermal Resistance, Junction to Case | (Note 6) | R _{θJC} | 139 | |
| 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} | 30 | — | — | V | V _{GS} = 0V, I _D = 250μA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | 1.0 | μA | V _{DS} = 30V, V _{GS} = 0V |
| Gate-Body Leakage | I _{GSS} | — | — | ±10.0 | μA | V _{GS} = ±20V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | 0.8 | — | 1.5 | V | V _{DS} = V _{GS} , I _D = 250μA |
| Static Drain-Source On-Resistance | R _{DS(ON)} | — | — | 2.8 | Ω | V _{GS} = 10.0V, I _D = 250mA |
| | | — | — | 3.8 | | V _{GS} = 5V, I _D = 250mA |
| | | — | — | 4.2 | | 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 8) | | | | | | |
| Input Capacitance | C _{iSS} | — | 22.0 | — | pF | V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz |
| Output Capacitance | C _{oSS} | — | 3.2 | — | | |
| Reverse Transfer Capacitance | C _{rSS} | — | 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 | — | nC | V _{DS} = 30V, I _D = 150mA |
| Total Gate Charge (V _{GS} = 4.5V) | Q _g | — | 0.43 | — | | |
| Gate-Source Charge | Q _{gs} | — | 0.11 | — | | |
| Gate-Drain Charge | Q _{gd} | — | 0.11 | — | | |
| Turn-On Delay Time | t _{D(ON)} | — | 3.3 | — | ns | V _{DD} = 30V, I _D = 0.115A, V _{GEN} = 10V, R _{GEN} = 25Ω |
| Turn-On Rise Time | t _R | — | 3.2 | — | | |
| Turn-Off Delay Time | t _{D(OFF)} | — | 12.0 | — | | |
| Turn-Off Fall Time | t _F | — | 6.3 | — | | |

- 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.

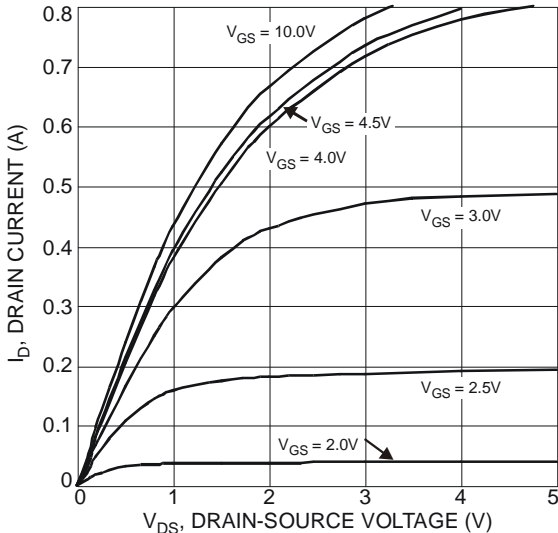


Figure 1 Typical Output Characteristic

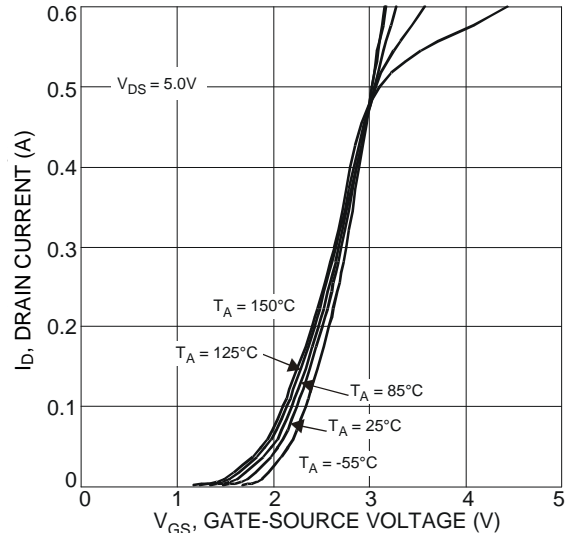


Figure 2 Typical Transfer Characteristics

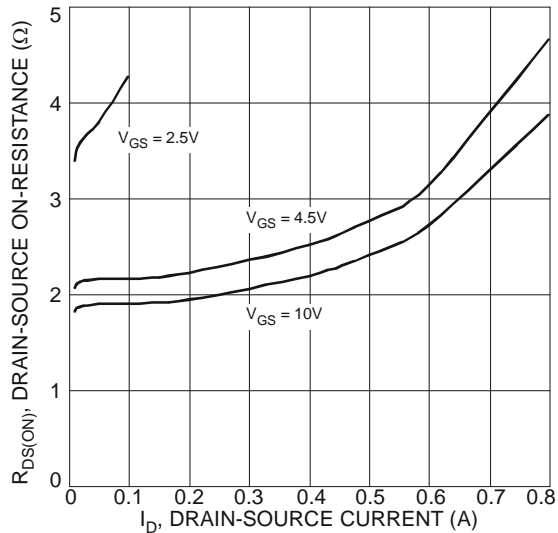


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

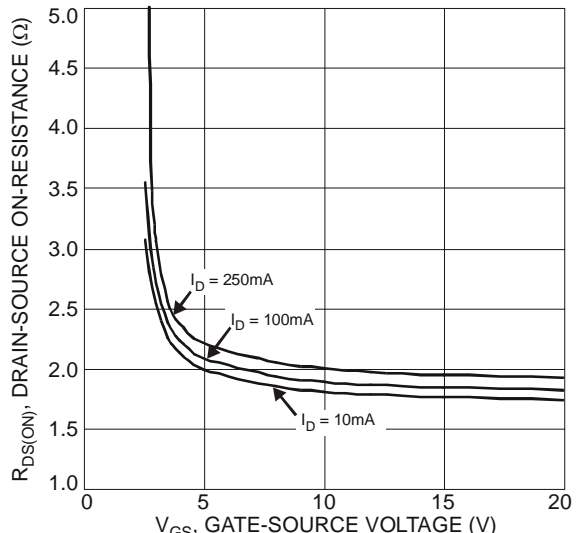


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

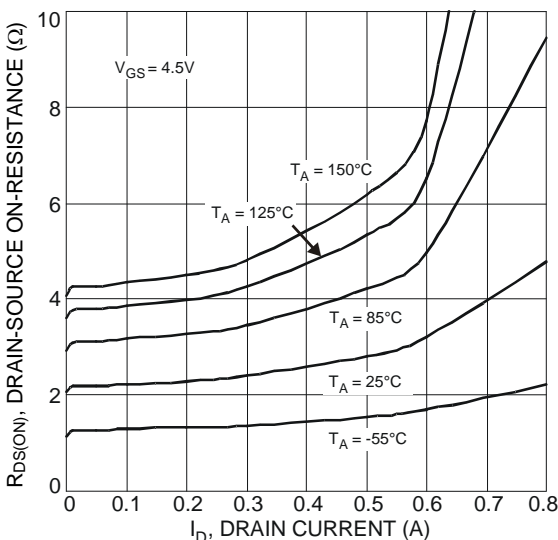


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

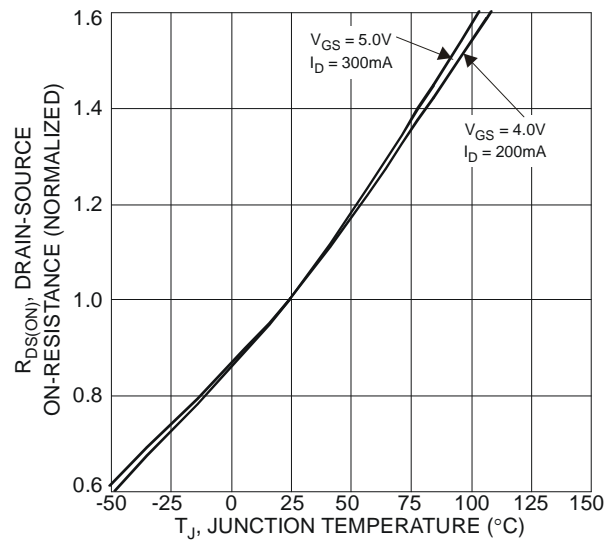


Figure 6 On-Resistance Variation with Temperature

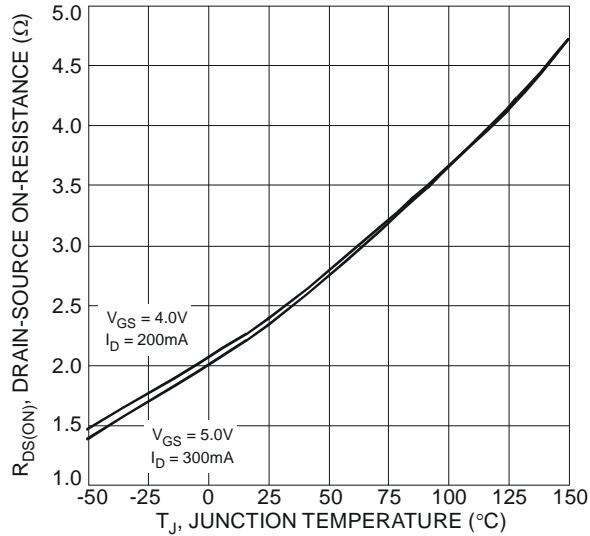


Figure 7 On-Resistance Variation with Temperature

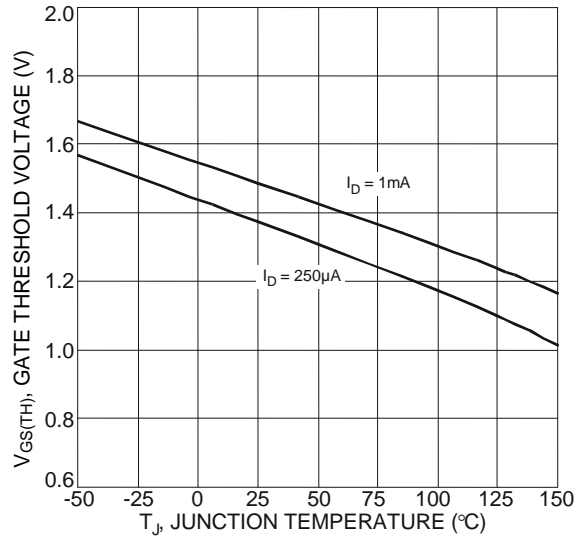


Figure 8 Gate Threshold Variation vs. Junction Temperature

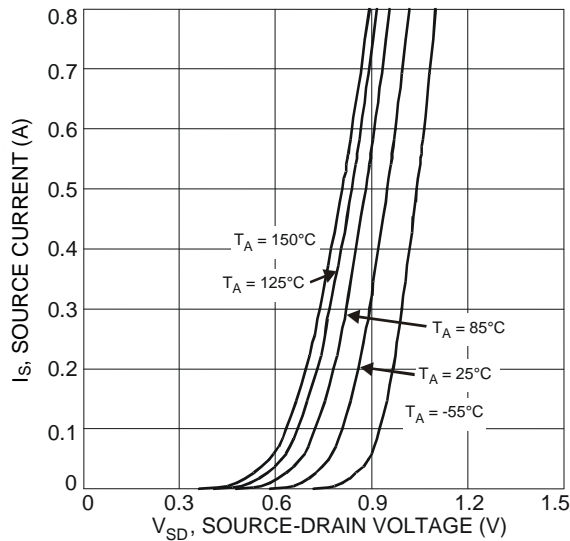
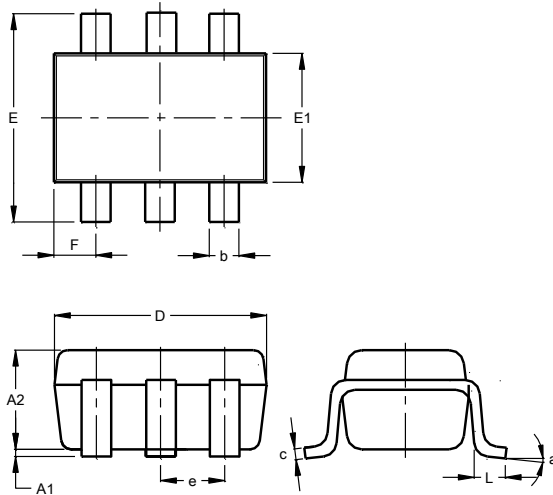


Figure 9 Diode Forward Voltage vs. Current

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT363

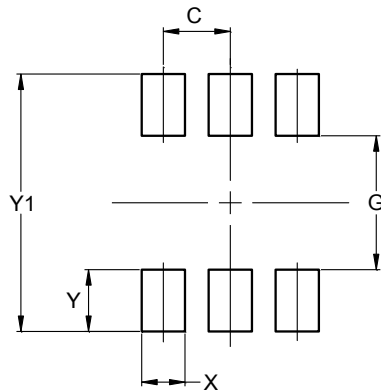


| SOT363 | | | |
|-----------------------------|-----------|------|-------|
| Dim | Min | Max | Typ |
| A1 | 0.00 | 0.10 | 0.05 |
| A2 | 0.90 | 1.00 | 0.95 |
| b | 0.10 | 0.30 | 0.25 |
| c | 0.10 | 0.22 | 0.11 |
| D | 1.80 | 2.20 | 2.15 |
| E | 2.00 | 2.20 | 2.10 |
| E1 | 1.15 | 1.35 | 1.30 |
| e | 0.650 BSC | | |
| F | 0.40 | 0.45 | 0.425 |
| L | 0.25 | 0.40 | 0.30 |
| a | 0° | 8° | -- |
| All Dimensions in mm | | | |

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT363



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 0.650 |
| G | 1.300 |
| X | 0.420 |
| Y | 0.600 |
| Y1 | 2.500 |

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