

DUAL N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

| BV _{DSS} | R _{DS(ON)} Max | I _D Max T _C = +25°C |
|-------------------|-----------------------------|--|
| 20V | $24m\Omega @ V_{GS} = 4.5V$ | 6.2A |
| | $28m\Omega @ V_{GS} = 2.5V$ | 5.7A |

Features and Benefits

- Low Gate Threshold Voltage
- Low On-Resistance
- ESD Protected Gate
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)

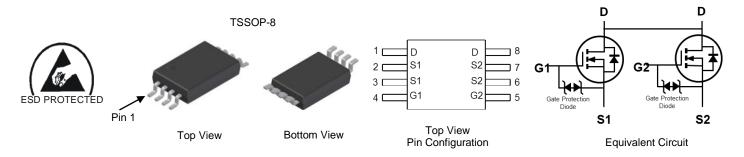
Description and Applications

This MOSFET is designed to minimize the on-state resistance (R_{DS(ON)}) yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

- Battery Management Application
- Power Management Functions
- DC-DC Converters

Mechanical Data

- Case: TSSOP-8
- Case Material: Molded Plastic, "Green" Molding Compound.
 UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminals: Finish—Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 3
- Weight: 0.039 grams (Approximate)



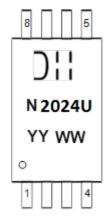
Ordering Information (Note 4)

| Part Number | Case | Packaging |
|---------------|---------|------------------|
| DMN2024UTS-13 | TSSOP-8 | 2500/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



D'|| = Manufacturer's Marking
 N2024U = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Year (ex: 18 = 2018)
 WW = Week (01 to 53)



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

| Characteristic | Symbol | Value | Unit | | |
|--|------------------|----------------------------------|----------------|--------------|---|
| Drain-Source Voltage | V_{DSS} | 20 | V | | |
| Gate-Source Voltage | V _{GSS} | ±10 | V | | |
| Continuous Dusin Compant (Note C) V | Steady State | $T_A = +25$ °C $T_A = +70$ °C | I _D | 6.2 4.9 | А |
| Continuous Drain Current (Note 6) V _{GS} = 4.5V | Steady State | $T_C = +25$ °C $T_C = +70$ °C | I _D | 15.2 12.1 | А |
| Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%) | I _{DM} | 45 | Α | | |
| Maximum Continuous Body Diode Forward Current (| Is | 1.6 | Α | | |
| Pulsed Source-Drain Diode Current (10µs Pulse, Dut | I _{SM} | 45 | Α | | |
| Avalanche Current (Note 7) L = 0.1mH | I _{AS} | 12 | Α | | |
| Avalanche Energy (Note 7) L = 0.1mH | E _{AS} | 8 | mJ | | |

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

| Characteristic | | Symbol | Value | Unit |
|--|------------------------|----------------------------------|-------------|-------|
| Total Power Dissipation (Note 5) | T _A = +25°C | P _D | 0.89 | W |
| Thermal Resistance, Junction to Ambient (Note 5) | Steady State | $R_{	heta JA}$ | 140 | °C/W |
| Total Power Dissipation (Note 6) | T _A = +25°C | P _D | 1.39 | W |
| Thermal Resistance, Junction to Ambient (Note 6) Steady State | | $R_{	heta JA}$ | 90 | °C/W |
| Thermal Resistance, Junction to Case (Note 6) | | $R_{\theta JC}$ | 15 | *C/VV |
| 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 | Тур | Max | Unit | Test Condition | |
|--|---------------------|------|------|------|------|---|--|
| OFF CHARACTERISTICS (Note 8) | | | | | | | |
| Drain-Source Breakdown Voltage | | 20 | I | _ | V | $V_{GS} = 0V, I_D = 250\mu A$ | |
| Zero Gate Voltage Drain Current T _J = +25°C | I _{DSS} | _ | | 1 | μΑ | $V_{DS} = 20V$, $V_{GS} = 0V$ | |
| Gate-Source Leakage | I _{GSS} | _ | _ | ±10 | μΑ | $V_{GS} = \pm 8V$, $V_{DS} = 0V$ | |
| ON CHARACTERISTICS (Note 8) | | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | 0.35 | _ | 0.95 | V | $V_{DS} = V_{GS}, I_{D} = 250 \mu A$ | |
| Static Drain-Source On-Resistance | | | 16 | 24 | mΩ | $V_{GS} = 4.5V, I_D = 6.5A$ | |
| Static Dialii-Source Off-Resistance | R _{DS(ON)} | _ | 18 | 28 | | $V_{GS} = 2.5V, I_D = 5.5A$ | |
| Diode Forward Voltage | V_{SD} | _ | 0.7 | 1.0 | V | $V_{GS} = 0V$, $I_S = 1A$ | |
| DYNAMIC CHARACTERISTICS (Note 9) | | | | | | | |
| Input Capacitance | C _{iss} | _ | 647 | _ | pF | V _{DS} = 10V, V _{GS} = 0V, f = 1.0MHz | |
| Output Capacitance | Coss | | 78 | _ | рF | | |
| Reverse Transfer Capacitance | Crss | _ | 38 | _ | pF | | |
| Gate Resistance | R_G | _ | 628 | _ | Ω | $V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$ | |
| Total Gate Charge (V _{GS} = 4.5V) | Q_{G} | _ | 7.1 | _ | nC | | |
| Total Gate Charge (V _{GS} = 10V) | Q_G | _ | 0.9 | _ | nC | \/ 10\/ L 0.5A | |
| Gate-Source Charge | Q _{GS} | _ | 0.7 | _ | nC | $V_{DS} = 10V, I_{D} = 6.5A$ | |
| Gate-Drain Charge | Q_{GD} | _ | 98 | _ | nC | 1 | |
| Turn-On Delay Time | t _{D(ON)} | _ | 140 | _ | ns | $V_{DS} = 10V, V_{GS} = 4.5V,$ $R_G = 6\Omega, R_L = 10\Omega, I_D = 1A$ | |
| Turn-On Rise Time | t _R | _ | 1024 | _ | ns | | |
| Turn-Off Delay Time | t _{D(OFF)} | _ | 434 | _ | ns | | |
| Turn-Off Fall Time | t _F | _ | 245 | _ | ns | | |
| Reverse Recovery Time | t _{RR} | _ | 149 | _ | ns | I _F = 1A, di/dt = 100A/μs | |
| Reverse Recovery Charge | Q_{RR} | _ | 647 | _ | nC | | |

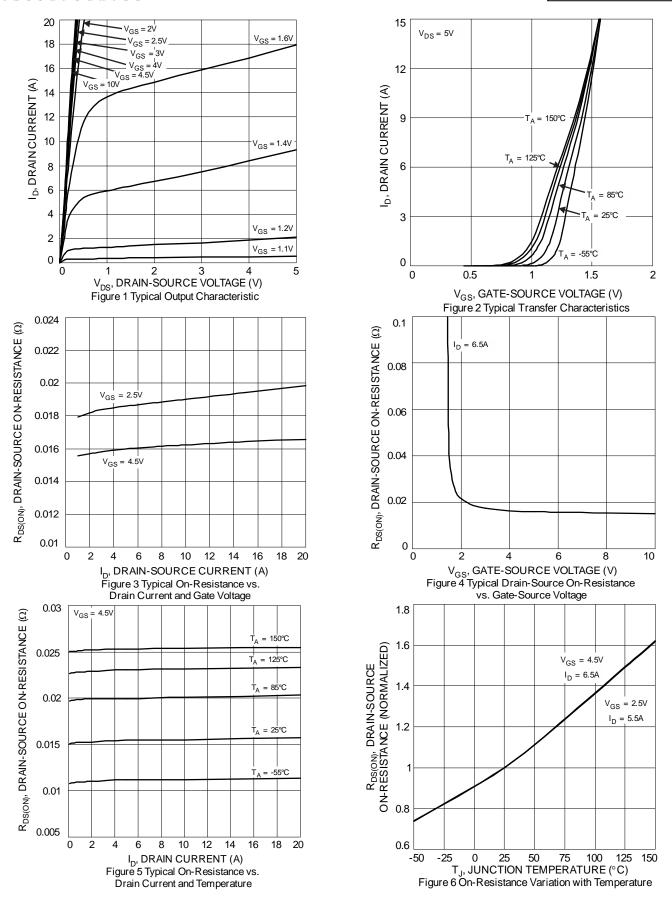
5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate. Notes:

9. Guaranteed by design. Not subject to product testing.

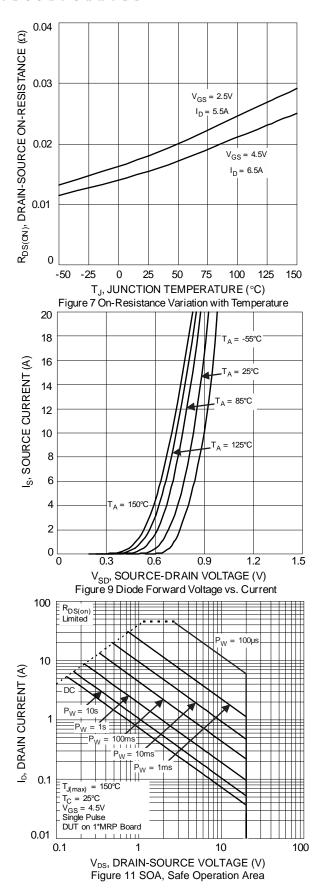
^{7.} I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = +25°C.

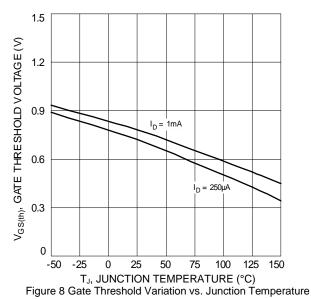
^{8.} Short duration pulse test used to minimize self-heating effect.

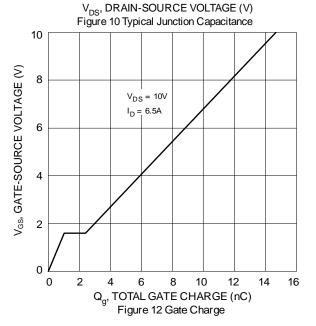








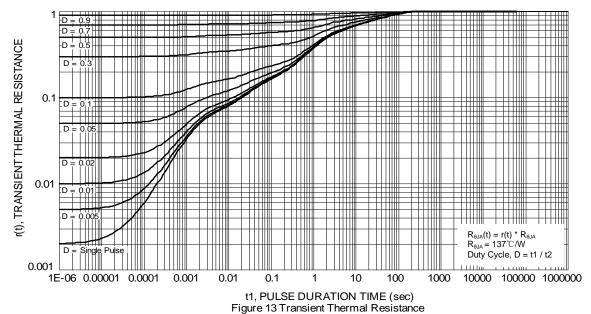




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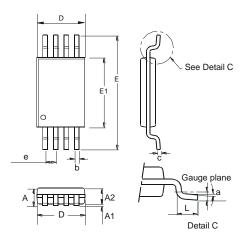
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Package Outline Dimensions

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

TSSOP-8

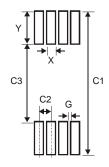


| TSSOP-8 | | | | | |
|----------------------|-------|-------|-------|--|--|
| Dim | Min | Max | Тур | | |
| а | 0.09 | - | - | | |
| Α | - | 1.20 | - | | |
| A1 | 0.05 | 0.15 | _ | | |
| A2 | 0.825 | 1.025 | 0.925 | | |
| b | 0.19 | 0.30 | - | | |
| С | 0.09 | 0.20 | - | | |
| D | 2.90 | 3.10 | 3.025 | | |
| е | - | - | 0.65 | | |
| Е | _ | _ | 6.40 | | |
| E1 | 4.30 | 4.50 | 4.425 | | |
| L | 0.45 | 0.75 | 0.60 | | |
| All Dimensions in mm | | | | | |

Suggested Pad Layout

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

TSSOP-8



| Dimensions | value (in mm) | | |
|------------|---------------|--|--|
| X | 0.45 | | |
| Υ | 1.78 | | |
| C1 | 7.72 | | |
| C2 | 0.65 | | |
| C3 | 4.16 | | |
| G | 0.20 | | |



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многоканальный

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