



**THE DATASHEET OF
DMN33D8LDW-7**



DUAL N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(ON)}$ max | I_D max $T_A = +25^\circ\text{C}$ |
|---------------|-----------------------------|--|
| 30V | 3Ω @ $V_{GS} = 4.5\text{V}$ | 250 mA |
| | 5Ω @ $V_{GS} = 4.0\text{V}$ | 200 mA |
| | 7Ω @ $V_{GS} = 2.5\text{V}$ | 100 mA |

Description

This 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

- Motor Control
- Power Management Functions
- DC-DC Converters
- Backlighting

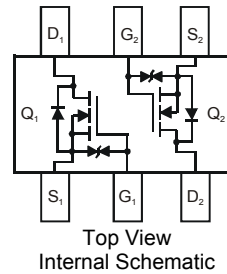
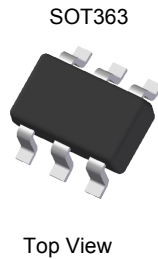
Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- ESD Protected Gate to 2kV
- **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**

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
- Terminal Connections Indicator: See diagram
- Terminals: Finish — Matte Tin annealed over Alloy42 leadframe. Solderable per MIL-STD-202, Method 208 
- Weight: 0.006 grams (approximate)

NEW PRODUCT

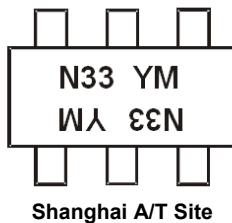
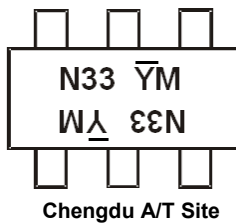


Ordering Information (Note 4)

| Part Number | Case | Packaging |
|---------------|--------|-----------------|
| DMN33D8LDW-7 | SOT363 | 3K/Tape & Reel |
| DMN33D8LDW-13 | SOT363 | 10K/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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>

Marking Information



N33 = Product Type Marking Code
 YM = Date Code Marking for SAT (Shanghai Assembly/ Test site)
 YM = Date Code Marking for CAT (Chengdu Assembly/ Test site)
 Y or Y = Year (ex: A = 2013)
 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} | 30 | V |
| Gate-Source Voltage | V _{GSS} | ±20 | V |
| Continuous Drain Current (Note 5) V _{GS} = 4.5V | Steady State | T _A = +25°C | 250 |
| | | T _A = +70°C | 200 |
| Maximum Continuous Body Diode Forward Current (Note 5) | I _S | 0.5 | A |
| Pulsed Drain Current (10µs pulse, duty cycle=1%) | I _{DM} | 0.8 | A |

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

| Characteristic | Symbol | Value | Units |
|--|-----------------------------------|------------------------|-------|
| Total Power Dissipation (Note 5) | P _D | T _A = +25°C | 0.35 |
| | | T _A = +70°C | 0.22 |
| Thermal Resistance, Junction to Ambient (Note 5) | R _{θJA} | 360 | °C/W |
| Thermal Resistance, Junction to Case | R _{θJC} | 126 | |
| 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} | 30 | — | — | V | V _{GS} = 0V, I _D = 1mA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | 1 | µA | @T _C = +25°C V _{DS} = 30V, 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)} | 0.8 | — | 1.5 | V | V _{DS} = 3V, I _D = 100µA |
| Static Drain-Source On-Resistance | R _{DS(on)} | — | — | 2.4 | Ω | V _{GS} = 10V, I _D = 250mA |
| | | — | — | 3.0 | | V _{GS} = 4.5V, I _D = 250mA |
| | | — | — | 5.0 | | V _{GS} = 4.0V, I _D = 10mA |
| | | — | — | 7.0 | | V _{GS} = 2.5V, I _D = 5mA |
| | | — | — | 20 | | V _{GS} = 1.8V, I _D = 5mA |
| Forward Transfer Admittance | Y _{fs} | 10 | — | - | mS | V _{DS} = 3V, I _D = 10mA |
| Diode Forward Voltage | V _{SD} | — | — | 1.2 | V | V _{GS} = 0V, I _S = 115mA |
| DYNAMIC CHARACTERISTICS (Note 7) | | | | | | |
| Input Capacitance | C _{iss} | — | 48 | — | pF | V _{DS} = 5V, V _{GS} = 0V, f = 1.0MHz |
| Output Capacitance | C _{oss} | — | 11 | — | pF | |
| Reverse Transfer Capacitance | C _{rss} | — | 8 | — | pF | |
| Gate Resistance | R _g | — | 57 | — | Ω | f=1MHz, Vgs=0V, Vds=0V |
| Total Gate Charge (V _{GS} = 4.5V) | Q _g | — | 0.55 | — | nC | V _{GS} = 10V, V _{DS} = 10V, I _D = 250mA |
| Total Gate Charge (V _{GS} = 10V) | Q _g | — | 1.23 | — | nC | |
| Gate-Source Charge | Q _{gs} | — | 0.14 | — | nC | |
| Gate-Drain Charge | Q _{gd} | — | 0.14 | — | nC | |
| Turn-On Delay Time | t _{D(on)} | — | 2.9 | — | ns | V _{DD} = 30V, V _{GS} = 10V, R _G = 25Ω, I _D = 200mA |
| Turn-On Rise Time | t _r | — | 2.6 | — | ns | |
| Turn-Off Delay Time | t _{D(off)} | — | 18.2 | — | ns | |
| Turn-Off Fall Time | t _f | — | 13.6 | — | ns | |

- Notes: 5. Device mounted on 1" x 1" FR-4 PCB with high coverage 2oz. Copper, single sided.
6. Short duration pulse test used to minimize self-heating effect.
7. Guaranteed by design. Not subject to product testing.

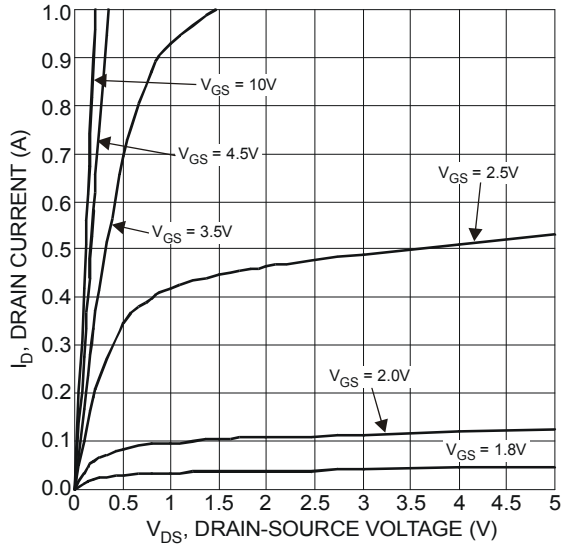


Figure 1 Typical Output Characteristics

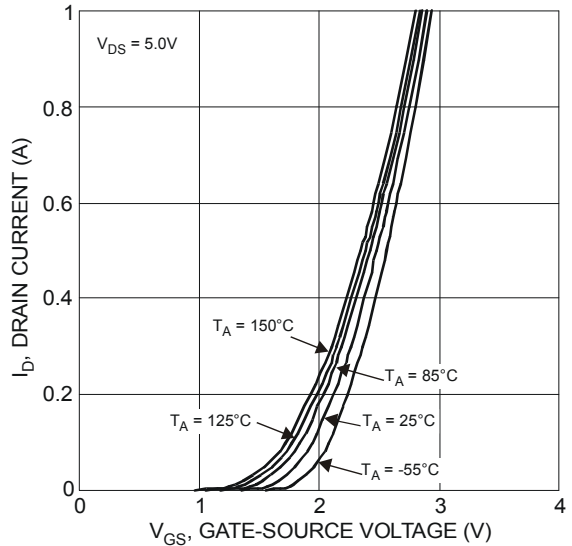


Figure 2 Typical Transfer Characteristics

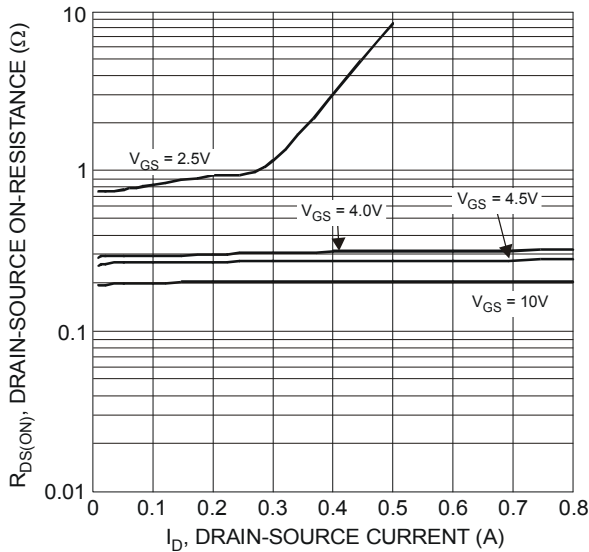


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

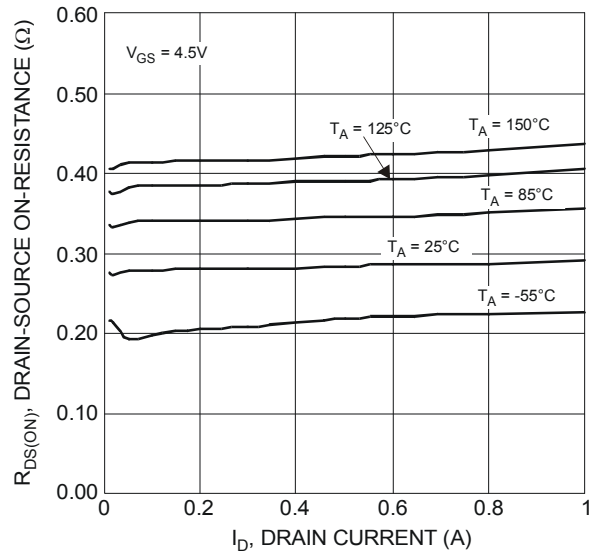


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

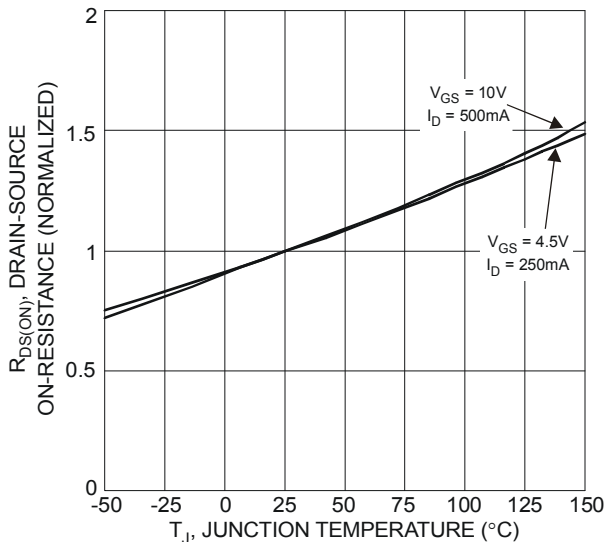


Figure 5 On-Resistance Variation with Temperature

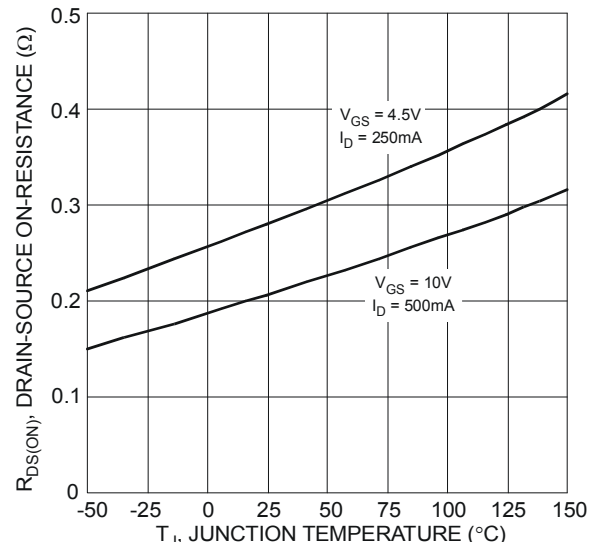


Figure 6 On-Resistance Variation with Temperature

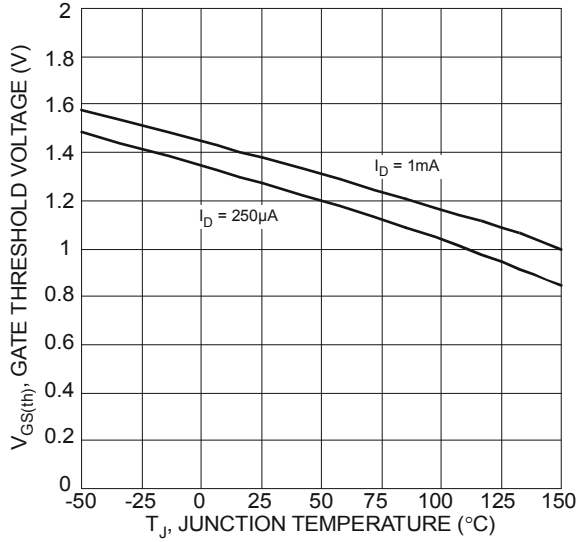


Figure 7 Gate Threshold Variation vs. Ambient Temperature

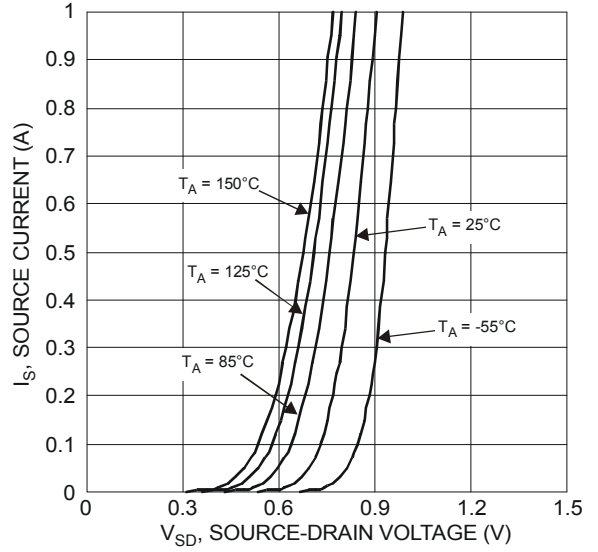


Figure 8 Diode Forward Voltage vs. Current

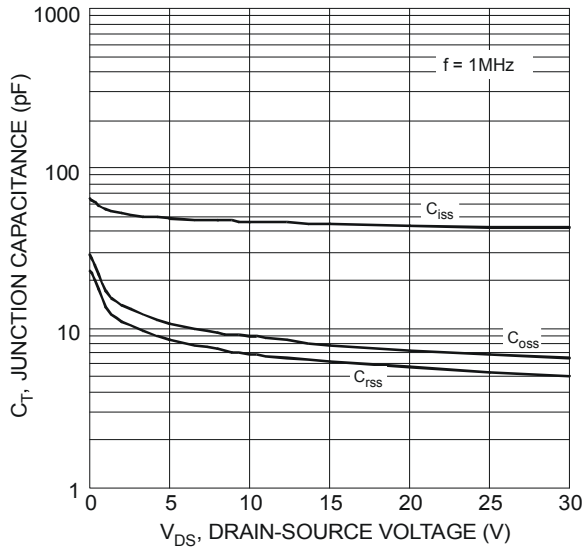


Figure 9 Typical Junction Capacitance

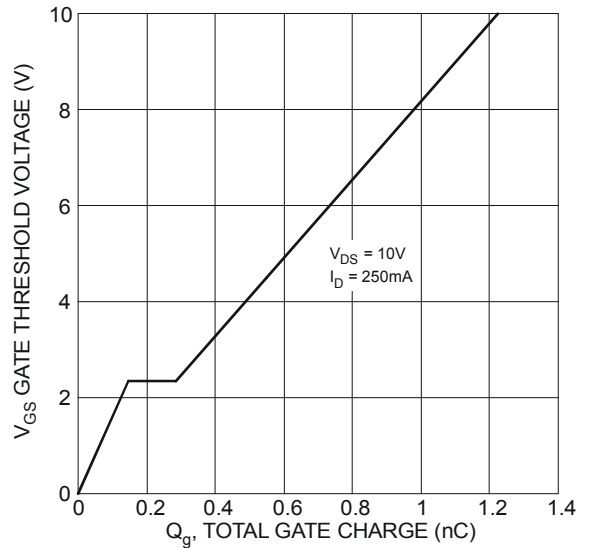


Figure 10 Gate Charge

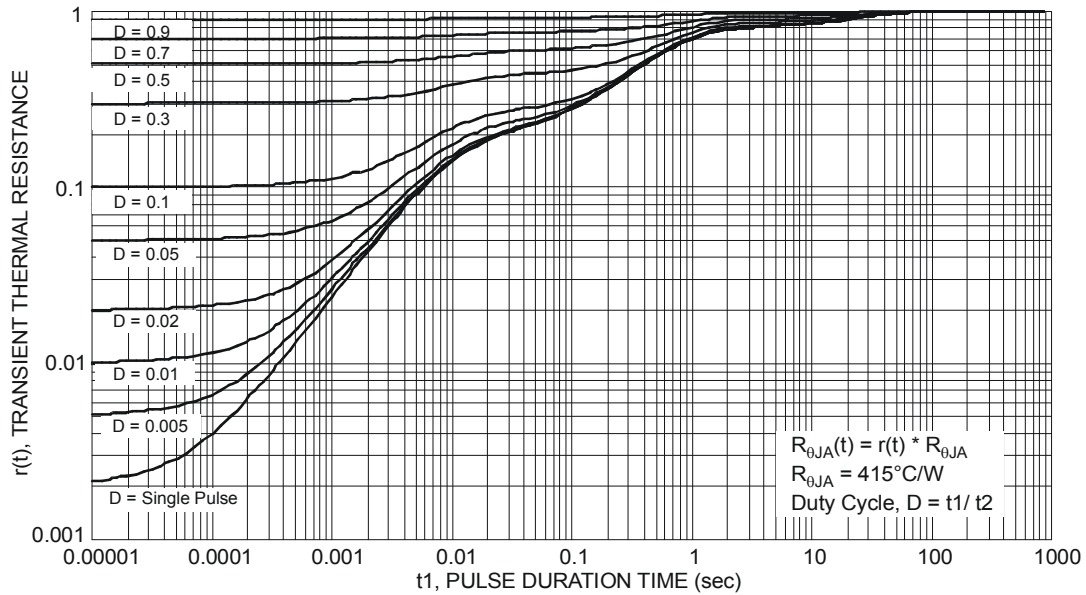
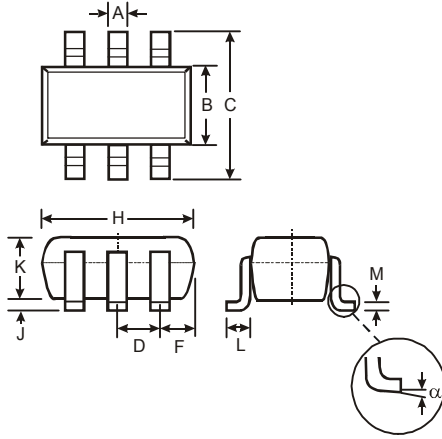


Figure 11 Transient Thermal Resistance

Package Outline Dimensions

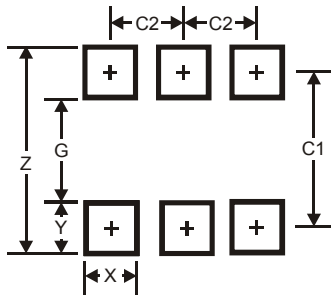
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| SOT363 | | | |
|-----------------------------|----------|------|-------|
| Dim | Min | Max | Typ |
| A | 0.10 | 0.30 | 0.25 |
| B | 1.15 | 1.35 | 1.30 |
| C | 2.00 | 2.20 | 2.10 |
| D | 0.65 Typ | | |
| F | 0.40 | 0.45 | 0.425 |
| H | 1.80 | 2.20 | 2.15 |
| J | 0 | 0.10 | 0.05 |
| K | 0.90 | 1.00 | 1.00 |
| L | 0.25 | 0.40 | 0.30 |
| M | 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 |
| X | 0.42 |
| Y | 0.6 |
| C1 | 1.9 |
| C2 | 0.65 |

NEW PRODUCT

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