

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(ON)}$ | Package | I_D $T_A = +25^\circ C$ |
|---------------|-------------------------|---------|------------------------------|
| 30V | 0.15Ω @ $V_{GS} = 4.5V$ | SOT23 | 2A |
| | 0.2Ω @ $V_{GS} = 2.5V$ | | 1.6A |
| | 0.25Ω @ $V_{GS} = 1.8V$ | | 1.4A |
| | 0.3Ω @ $V_{GS} = 1.5V$ | | 1.2A |

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

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Small Surface Mount Package
- **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**

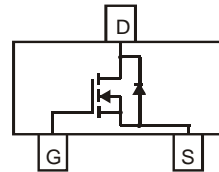
Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminal Connections: See Diagram
- Terminals: Finish — Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.008 grams (approximate)

SOT23



Top View



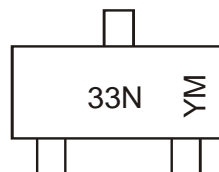
Internal Schematic

Ordering Information (Note 4)

| Part Number | Case | Packaging |
|-------------|-------|------------------|
| DMN3300U-7 | SOT23 | 3000/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> 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>.

Marking Information



33N = Marking Code
 YM = Date Code Marking
 Y = Year (ex: U = 2007)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | |
|-------|------|------|------|------|------|------|------|------|------|------|------|-----|
| Code | U | V | W | X | 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} | ±12 | V |
| Continuous Drain Current (Note 5) V _{GS} = 4.5V | Steady State | T _A = +25°C | I _D | 1.5 | A |
| | | T _A = +70°C | | 1.2 | |
| Continuous Drain Current (Note 6) V _{GS} = 4.5V | Steady State | T _A = +25°C | I _D | 2.0 | A |
| | | T _A = +70°C | | 1.6 | |
| Pulsed Drain Current (10µs pulse, duty cycle = 1%) | | | I _{DM} | 8 | A |
| Maximum Body Diode Continuous Current (Note 6) | | | I _S | 1.6 | A |

Thermal Characteristics

| Characteristic | | Symbol | Value | Units |
|---|----------|-----------------------------------|-------------|-------|
| Total Power Dissipation | (Note 5) | P _D | 0.7 | W |
| | (Note 6) | | 1.3 | |
| Thermal Resistance, Junction to Ambient | (Note 5) | R _{θJA} | 176 | °C/W |
| | (Note 6) | | 102 | |
| Thermal Resistance, Junction to Case | (Note 6) | R _{θJC} | 45 | |
| 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 | 37 | — | V | V _{GS} = 0V, I _D = 100µA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | 1 | µA | V _{DS} = 30V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | — | — | ±10 | µA | V _{GS} = ±12V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | 0.5 | — | 1 | V | V _{DS} = V _{GS} , I _D = 250µA |
| Static Drain-Source On-Resistance | R _{DS(ON)} | — | 100 | 150 | mΩ | V _{GS} = 4.5V, I _D = 4.5A |
| | | | 140 | 200 | | V _{GS} = 2.5V, I _D = 3.5A |
| | | | 185 | 250 | | V _{GS} = 1.8V, I _D = 1.5A |
| | | | 240 | 300 | | V _{GS} = 1.5V, I _D = 0.5A |
| Forward Transfer Admittance | Y _{fs} | — | 5 | — | S | V _{DS} = 5V, I _D = 2.4A |
| Diode Forward Voltage | V _{SD} | — | 0.8 | 1.1 | V | V _{GS} = 0V, I = 0.5A |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C _{iss} | — | 193 | — | pF | V _{DS} = 10V, V _{GS} = 0V f = 1.0MHz |
| Output Capacitance | C _{oss} | — | 35 | — | pF | |
| Reverse Transfer Capacitance | C _{rss} | — | 23 | — | pF | |
| Turn-On Delay Time | t _{d(on)} | — | 7 | — | ns | V _{DD} = 10V, R _L = 10Ω I _D = 1A, V _{GEN} = 4.5V, R _G = 6Ω |
| Rise Time | t _r | — | 24 | — | | |
| Turn-Off Delay Time | t _{d(off)} | — | 24 | — | | |
| Fall Time | t _f | — | 12 | — | | |

- 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

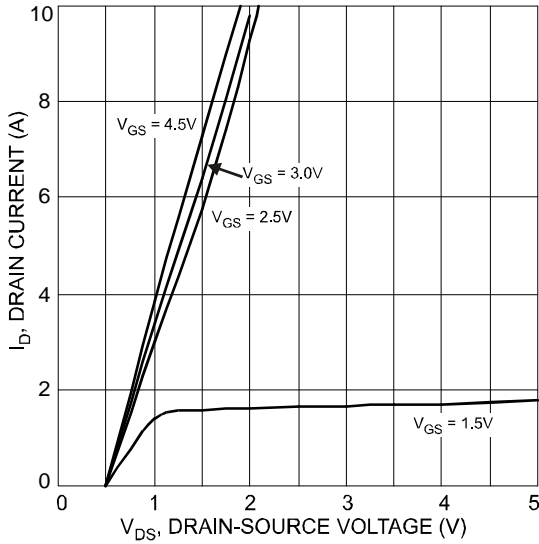


Fig. 1 Typical Output Characteristic

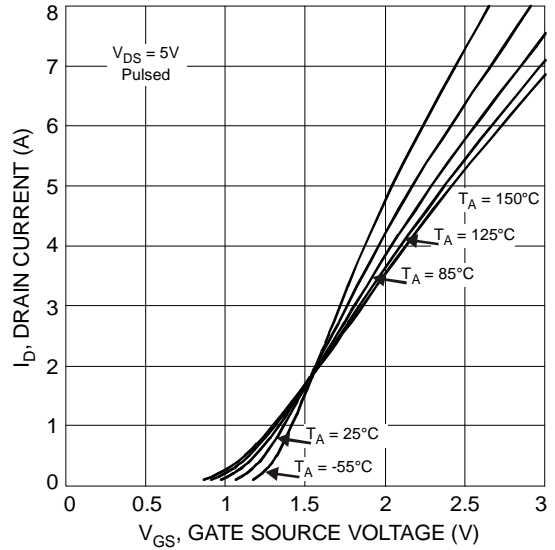


Fig. 2 Typical Transfer Characteristics

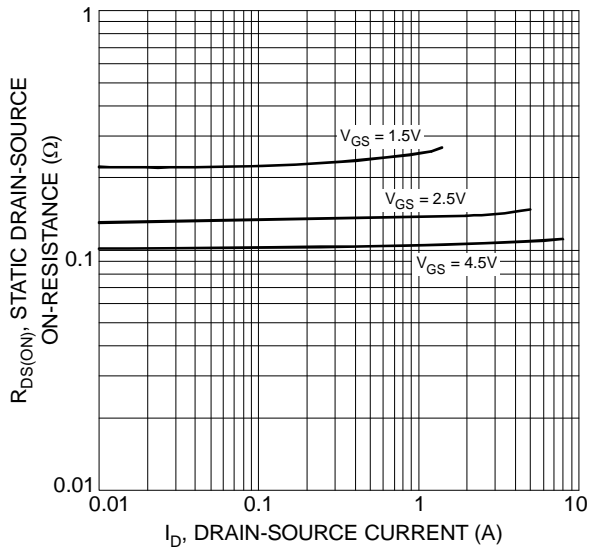


Fig. 3 On-Resistance vs. Drain Current & Gate Voltage

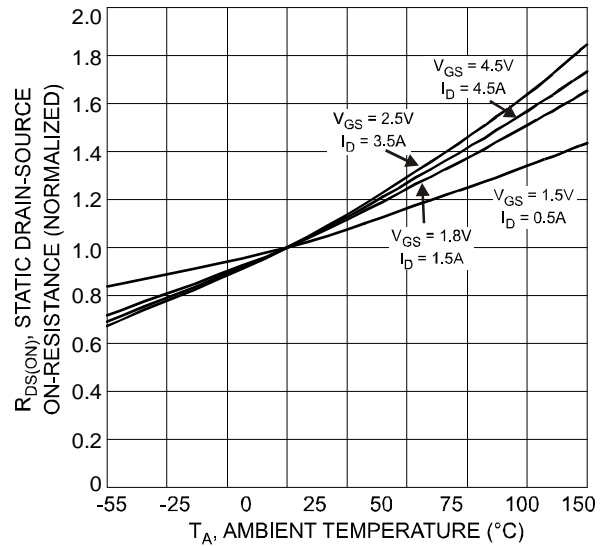


Fig. 4 Normalized Static Drain-Source On-Resistance vs. Ambient Temperature

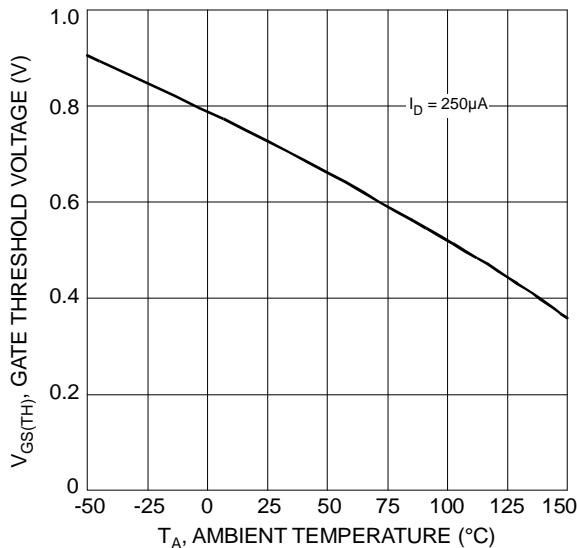


Fig. 5 Gate Threshold Variation vs. Ambient Temperature

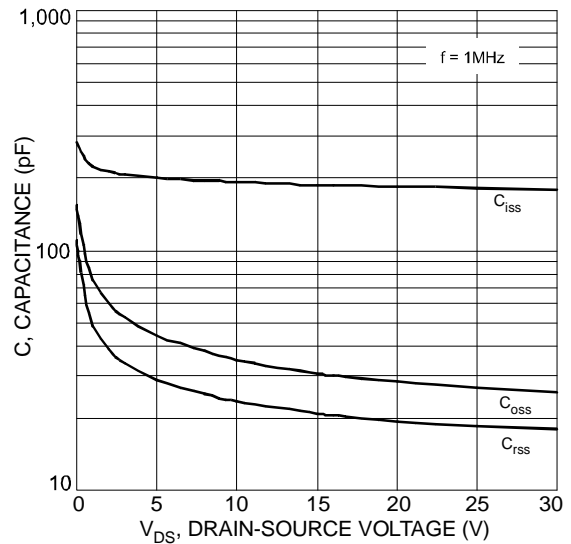


Fig. 6 Typical Total Capacitance

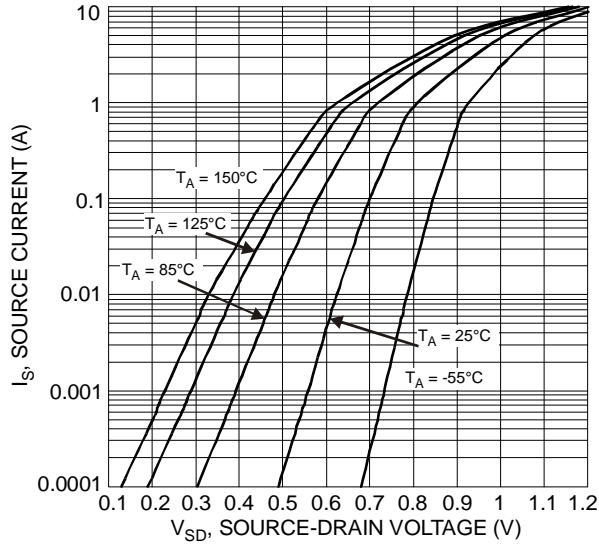


Fig. 7 Reverse Drain Current vs. Source-Drain Voltage

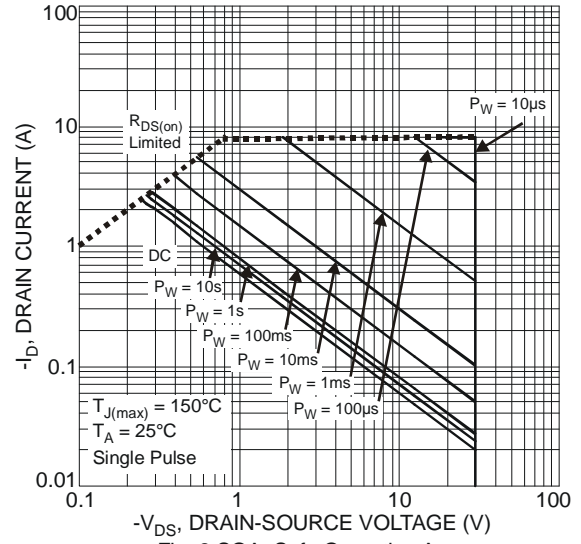


Fig. 8 SOA, Safe Operation Area

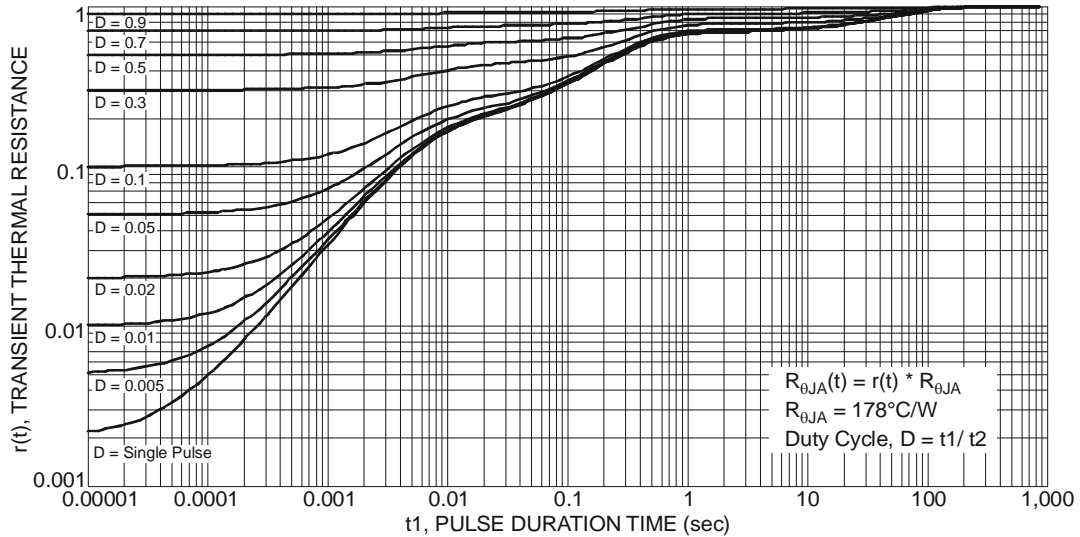
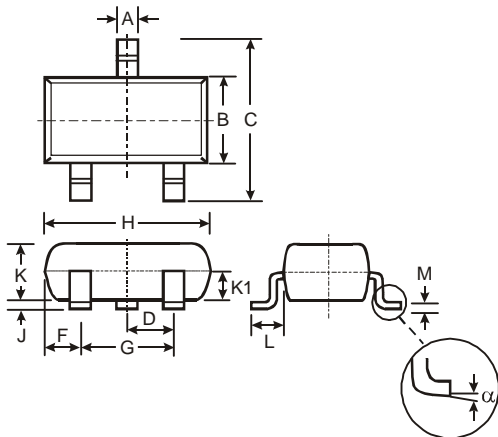


Fig. 9 Transient Thermal Resistance

Package Outline Dimensions

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

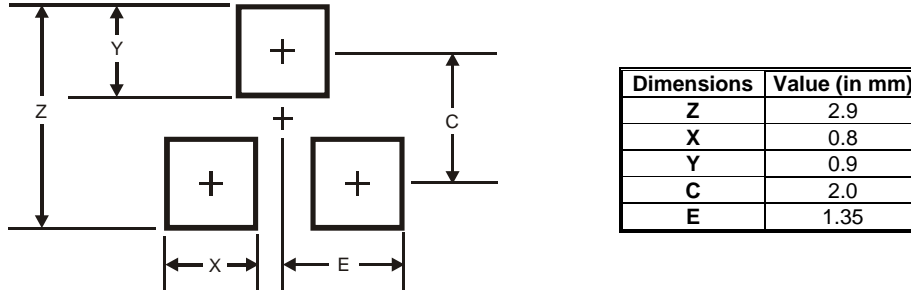


| SOT23 | | | |
|-------|-------|------|-------|
| Dim | Min | Max | Typ |
| A | 0.37 | 0.51 | 0.40 |
| B | 1.20 | 1.40 | 1.30 |
| C | 2.30 | 2.50 | 2.40 |
| D | 0.89 | 1.03 | 0.915 |
| F | 0.45 | 0.60 | 0.535 |
| G | 1.78 | 2.05 | 1.83 |
| H | 2.80 | 3.00 | 2.90 |
| J | 0.013 | 0.10 | 0.05 |
| K | 0.903 | 1.10 | 1.00 |
| K1 | - | - | 0.400 |
| L | 0.45 | 0.61 | 0.55 |
| M | 0.085 | 0.18 | 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.



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