

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on) \max}$ | I_D $T_A = +25^\circ\text{C}$ |
|---------------|--|------------------------------------|
| 100V | 220m Ω @ $V_{GS} = 10\text{V}$ | 1.6A |
| | 250m Ω @ $V_{GS} = 4.5\text{V}$ | 1.3A |

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

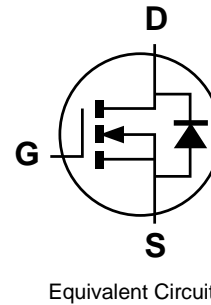
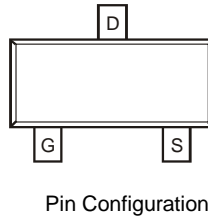
- Load Switch

Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- 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-020
- Terminal Connections: See Diagram
- Terminals: Finish – Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.0072 grams (approximate)



Ordering Information (Note 4)

| Part Number | Compliance | Case | Packaging |
|---------------|------------|-------|--------------------|
| DMN10H220L-7 | Standard | SOT23 | 3,000/Tape & Reel |
| DMN10H220L-13 | Standard | SOT23 | 10,000/Tape & Reel |

- Notes:
- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 - 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.
 - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 - For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



N1H = Marking Code
 YM = Date Code Marking for SAT (Shanghai Assembly/ Test site)
 YM = Date Code Marking for CAT (Chengdu Assembly/ Test site)
 Y or \bar{Y} = Year (ex: A = 2013)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|------|------|------|------|------|------|------|------|
| Code | A | B | C | D | E | 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 | O | N | D |

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Units |
|---|---|------------|-------|
| Drain-Source Voltage | V _{DSS} | 100 | V |
| Gate-Source Voltage | V _{GSS} | ±16 | V |
| Continuous Drain Current (Note 5) V _{GS} = 10V | (Note 6) T _A = +25°C T _A = +70°C | 1.6 1.3 | A |
| | (Note 5) T _A = +25°C T _A = +70°C | 1.4 1.1 | A |
| Maximum Continuous Body Diode Forward Current (Note 6) | I _S | 0.6 | A |
| Pulsed Drain Current (10μs pulse, duty cycle = 1%) | I _{DM} | 8 | A |

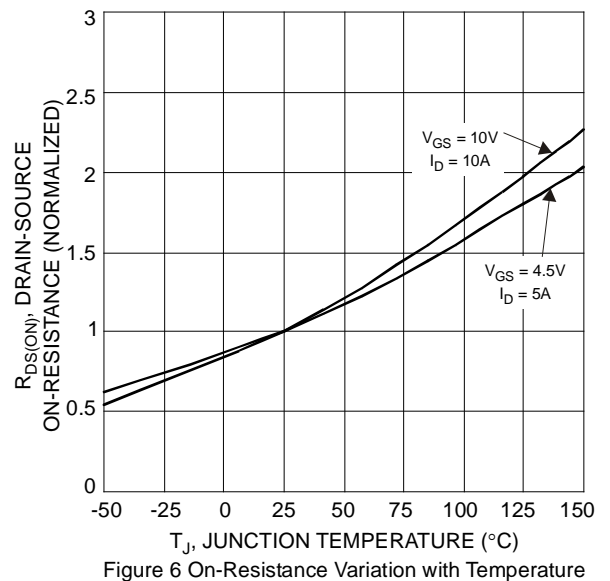
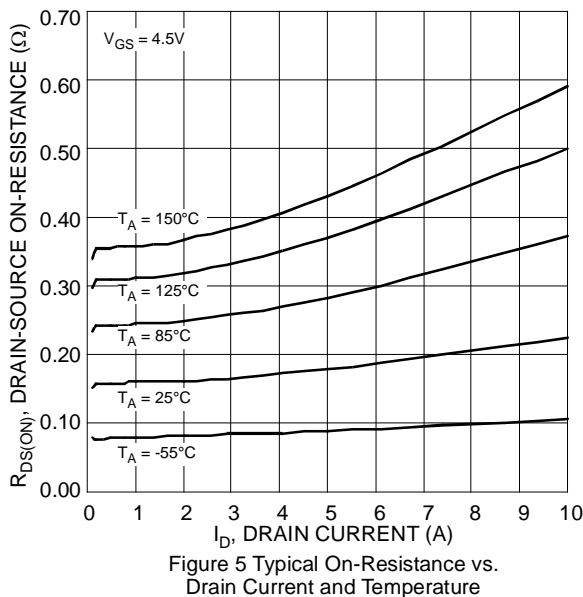
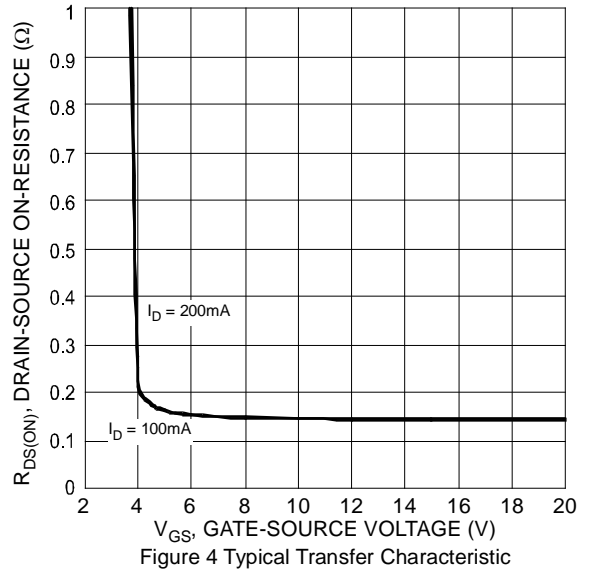
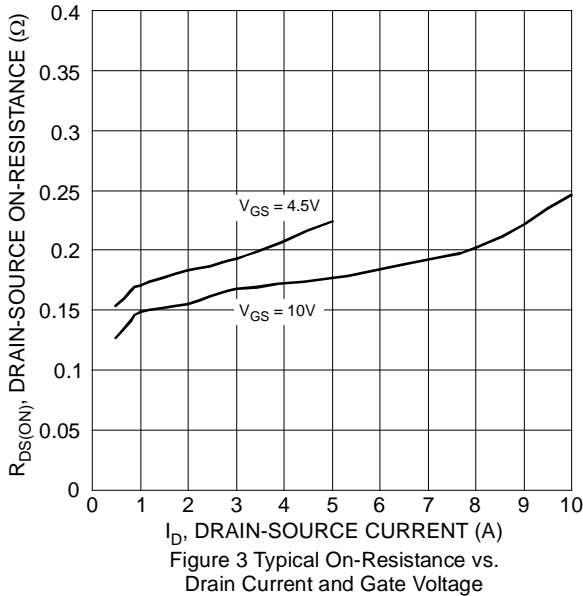
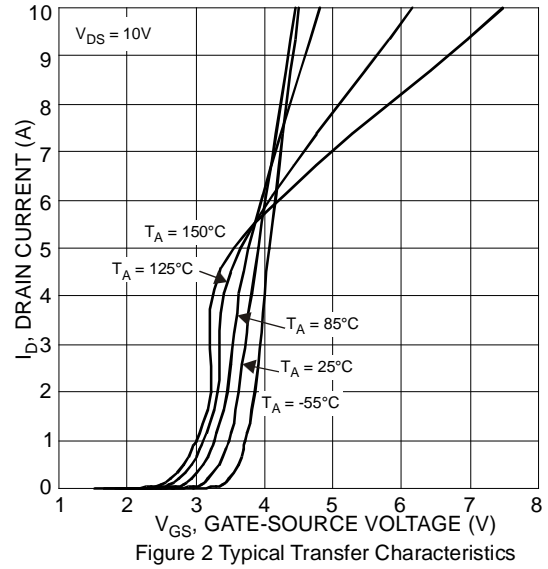
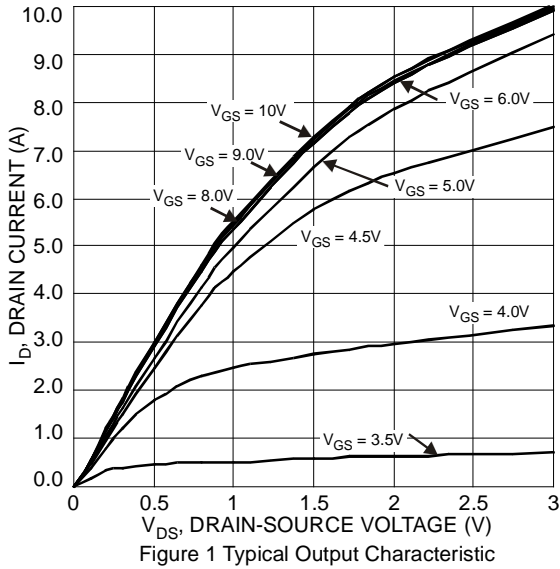
Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Units |
|---|-----------------------------------|------------------------|-------|
| Total Power Dissipation (Note 6) | P _D | T _A = +25°C | 1.3 |
| | | T _A = +70°C | 0.8 |
| Thermal Resistance, Junction to Ambient | R _{θJA} | (Note 6) | 94 |
| | | (Note 5) | 177 |
| 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} | 100 | — | — | V | V _{GS} = 0V, I _D = 250μA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | 1 | μA | V _{DS} = 100V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | — | — | ±100 | nA | V _{GS} = ±16V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | 1 | — | 2.5 | V | V _{DS} = V _{GS} , I _D = 250μA |
| Static Drain-Source On-Resistance | R _{DS(on)} | — | — | 220 | mΩ | V _{GS} = 10V, I _D = 1.6A |
| | | — | — | 250 | | V _{GS} = 4.5V, I _D = 1.3A |
| Diode Forward Voltage | V _{SD} | — | 0.7 | 1.2 | V | V _{GS} = 0V, I _S = 1.1A |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C _{iss} | — | 401 | — | pF | V _{DS} = 25V, V _{GS} = 0V f = 1MHz |
| Output Capacitance | C _{oss} | — | 22 | — | | |
| Reverse Transfer Capacitance | C _{rss} | — | 17 | — | | |
| Gate Resistance | R _g | — | 2.1 | — | Ω | V _{DS} = 0V, V _{GS} = 0V, f = 1MHz |
| Total Gate Charge (V _{GS} = 4.5V) | Q _g | — | 4.1 | — | nC | V _{DS} = 50V, I _D = 1.6A |
| Total Gate Charge (V _{GS} = 10V) | Q _g | — | 8.3 | — | | |
| Gate-Source Charge | Q _{gs} | — | 1.5 | — | | |
| Gate-Drain Charge | Q _{gd} | — | 2 | — | | |
| Turn-On Delay Time | t _{D(on)} | — | 6.8 | — | ns | V _{DS} = 50V, V _{GS} = 4.5V, R _G = 6.8Ω, I _D = 1A |
| Turn-On Rise Time | t _r | — | 8.2 | — | | |
| Turn-Off Delay Time | t _{D(off)} | — | 7.9 | — | | |
| Turn-Off Fall Time | t _f | — | 3.6 | — | | |
| Reverse Recovery Time | t _{rr} | — | 17 | — | ns | I _F = 1.1A, di/dt = 100A/μs |
| Reverse Recovery Charge | Q _{rr} | — | 9.8 | — | nC | |

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with thermal vias to bottom layer 1inch square copper plate.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to production testing.



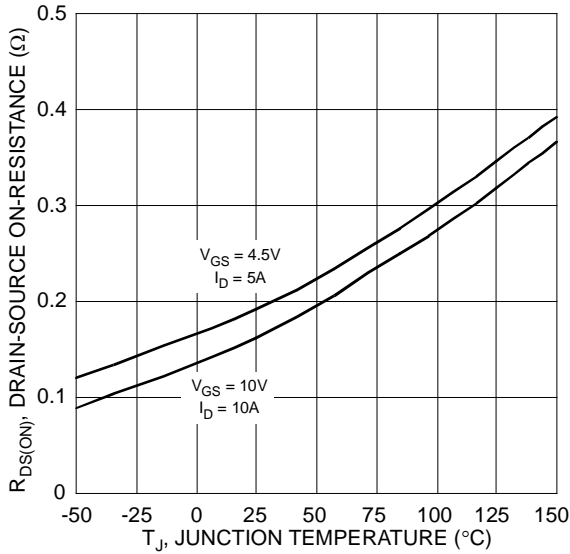


Figure 7 On-Resistance Variation with Temperature

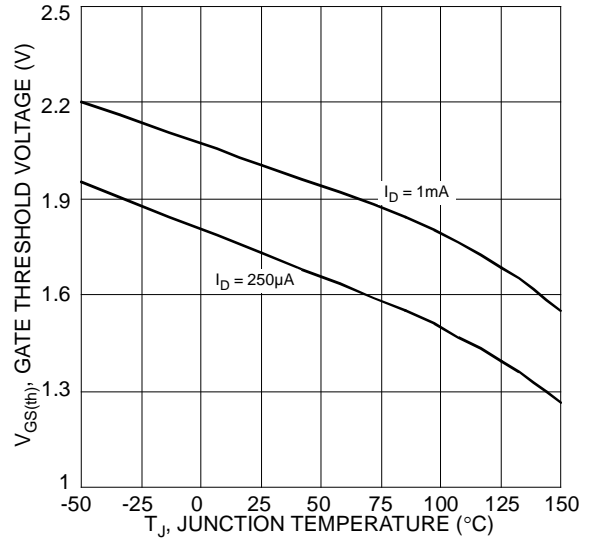


Figure 8 Gate Threshold Variation vs. Ambient Temperature

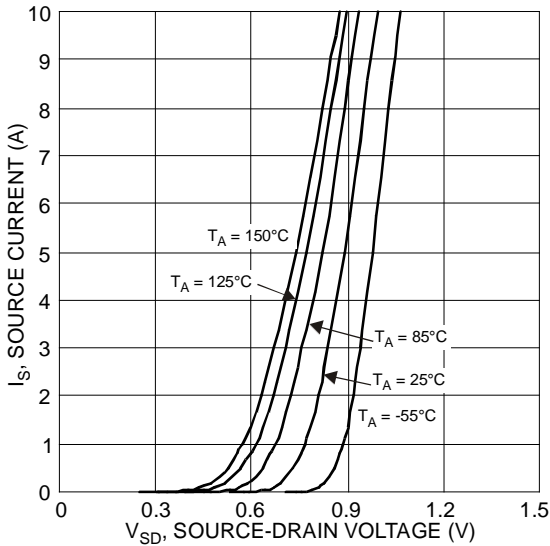


Figure 9 Diode Forward Voltage vs. Current

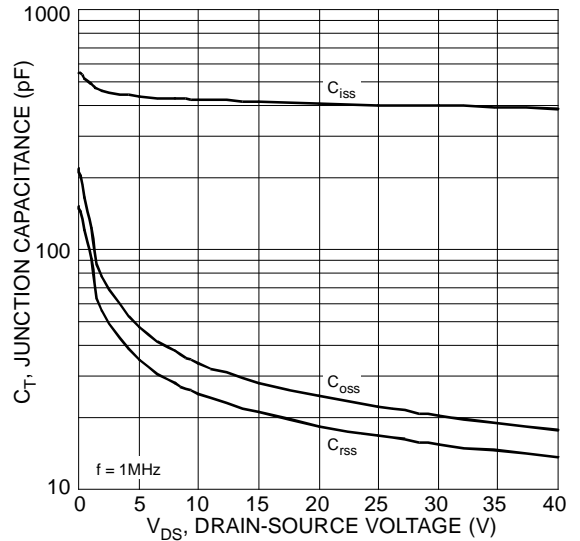


Figure 10 Typical Junction Capacitance

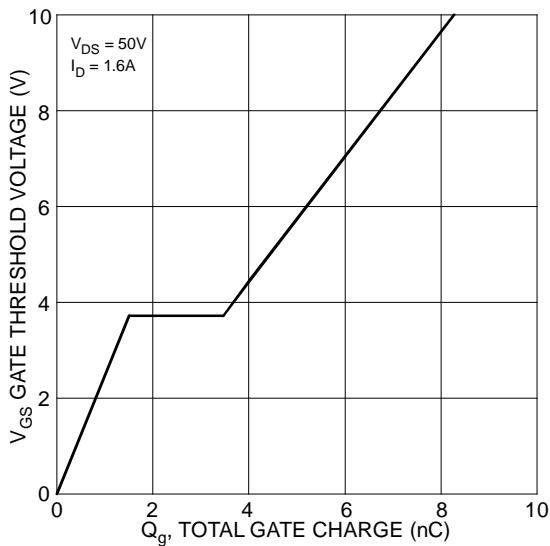


Figure 11 Gate Charge

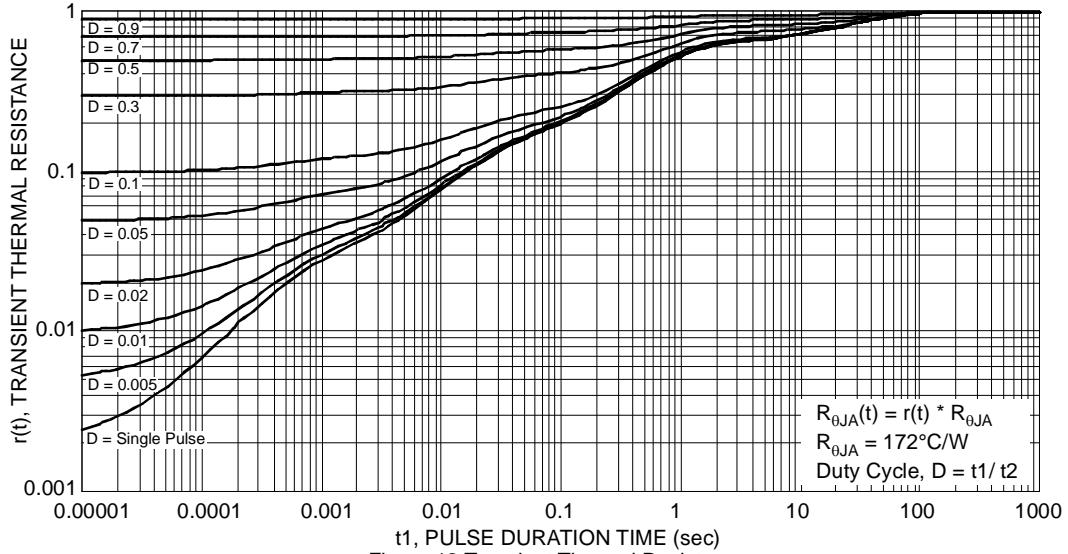
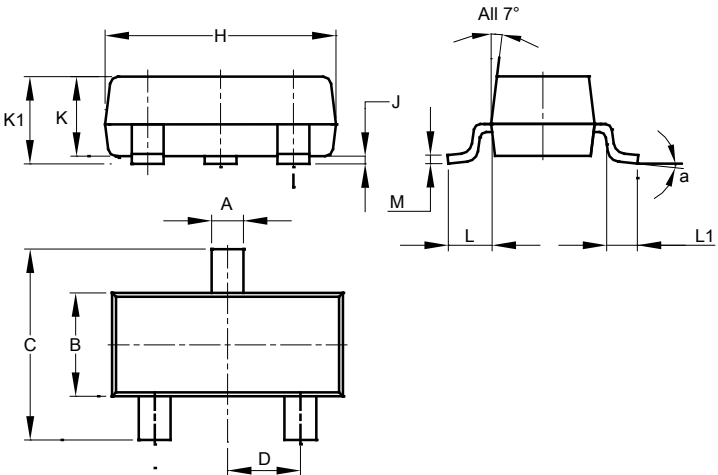


Figure 12 Transient Thermal Resistance

Package Outline Dimensions

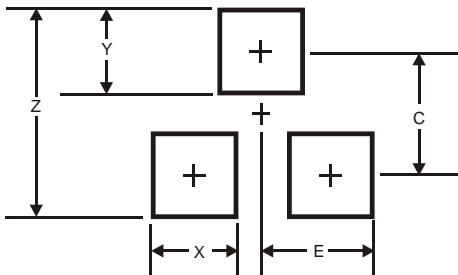
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| 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 | 0.890 | 1.00 | 0.975 |
| K1 | 0.903 | 1.10 | 1.025 |
| L | 0.45 | 0.61 | 0.55 |
| L1 | 0.25 | 0.55 | 0.40 |
| M | 0.085 | 0.150 | 0.110 |
| a | 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 | 2.9 |
| X | 0.8 |
| Y | 0.9 |
| C | 2.0 |
| E | 1.35 |

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