

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)}$ max | I_D $T_A = 25^\circ C$ |
|---------------|---------------------------------|-----------------------------|
| -30V | 25m Ω @ $V_{GS} = -10V$ | -6.8A |
| | 38m Ω @ $V_{GS} = -4.5V$ | -5.0A |

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
- Load Switch

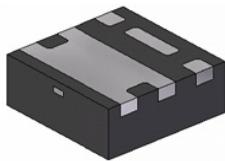
Features

- Low Input Capacitance
- Low On-Resistance
- Fast Switching Speed
- 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

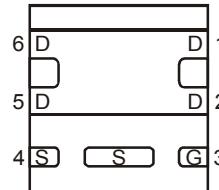
Mechanical Data

- Case: U-DFN2020-6
- 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: 0.0065 grams (approximate)

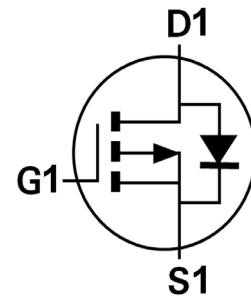
U-DFN2020-6



Bottom View



Pin Out



Equivalent Circuit

Ordering Information (Note 4)

| Part Number | Case | Packaging |
|----------------|-------------|--------------------|
| DMP3028LFDE-7 | U-DFN2020-6 | 3,000/Tape & Reel |
| DMP3028LFDE-13 | U-DFN2020-6 | 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> 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>.

Marking Information



PX = Product Type Marking Code

YM = Date Code Marking

Y = Year (ex: Y = 2011)

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 (@ $T_A = +25^\circ\text{C}$, 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 6) $V_{GS} = 10\text{V}$ | Steady State | $T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$ | I_D | -6.8 -5.3 | A |
| | $t < 10\text{s}$ | $T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$ | I_D | -8.2 -6.6 | A |
| Maximum Body Diode Forward Current (Note 6) | | | I_S | -2.5 | A |
| Pulsed Drain Current (10 μs pulse, duty cycle = 1%) | | | I_{DM} | -40 | A |

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | | | Symbol | Value | Units | |
|--|--|---------------------------|-----------------|-------------|-------|--|
| Total Power Dissipation (Note 5) | | $T_A = +25^\circ\text{C}$ | P_D | 0.66 | W | |
| | | $T_A = +70^\circ\text{C}$ | | 0.42 | | |
| Thermal Resistance, Junction to Ambient (Note 5) | | Steady state | $R_{\theta JA}$ | 189 | °C/W | |
| | | $t < 10\text{s}$ | | 125 | | |
| Total Power Dissipation (Note 6) | | $T_A = +25^\circ\text{C}$ | P_D | 2.03 | W | |
| | | $T_A = +70^\circ\text{C}$ | | 1.3 | | |
| Thermal Resistance, Junction to Ambient (Note 6) | | Steady state | $R_{\theta JA}$ | 61 | °C/W | |
| | | $t < 10\text{s}$ | | 41 | | |
| Thermal Resistance, Junction to Case (Note 6) | | | $R_{\theta JC}$ | 9.3 | | |
| Operating and Storage Temperature Range | | | T_J, T_{STG} | -55 to +150 | °C | |

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|---------------------|-----|------|-----------|------------------|---|
| OFF CHARACTERISTICS (Note 7) | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | -30 | — | — | V | $V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$ |
| Zero Gate Voltage Drain Current | I_{DSS} | — | — | -1 | μA | $V_{DS} = -30\text{V}, V_{GS} = 0\text{V}$ |
| Gate-Source Leakage | I_{GSS} | — | — | ± 100 | nA | $V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$ |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | -1 | — | -2.4 | V | $V_{DS} = V_{GS}, I_D = -250\mu\text{A}$ |
| Static Drain-Source On-Resistance | $R_{DS(\text{ON})}$ | — | 20 | 25 | $\text{m}\Omega$ | $V_{GS} = -10\text{V}, I_D = -7\text{A}$ |
| | | — | 29 | 38 | | $V_{GS} = -4.5\text{V}, I_D = -6.2\text{A}$ |
| Forward Transfer Admittance | $ Y_{fs} $ | — | 4.5 | — | S | $V_{DS} = -5\text{V}, I_D = -7\text{A}$ |
| Diode Forward Voltage | V_{SD} | — | 0.7 | 1.2 | V | $V_{GS} = 0\text{V}, I_S = -2.1\text{A}$ |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C_{iss} | — | 1241 | — | pF | $V_{DS} = -15\text{V}, V_{GS} = 0\text{V}$ $f = 1.0\text{MHz}$ |
| Output Capacitance | C_{oss} | — | 147 | — | | |
| Reverse Transfer Capacitance | C_{rss} | — | 110 | — | | |
| Gate Resistance | R_G | — | 15 | — | Ω | $V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$ |
| Total Gate Charge ($V_{GS} = 10\text{V}$) | Q_g | — | 22 | — | nC | $V_{DS} = -15\text{V}, I_D = -7\text{A}$ |
| Total Gate Charge ($V_{GS} = 4.5\text{V}$) | Q_g | — | 10.9 | — | | |
| Gate-Source Charge | Q_{gs} | — | 3.5 | — | | |
| Gate-Drain Charge | Q_{gd} | — | 4.7 | — | | |
| Turn-On Delay Time | $t_{D(on)}$ | — | 9.7 | — | nS | $V_{GS} = -10\text{V}, V_{DD} = -15\text{V}, R_{GEN} = 6\Omega, I_D = -7\text{A}$ |
| Turn-On Rise Time | t_r | — | 17.1 | — | | |
| Turn-Off Delay Time | $t_{D(off)}$ | — | 60.5 | — | | |
| Turn-Off Fall Time | t_f | — | 40.4 | — | | |

Notes: 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.

7. Short duration pulse test used to minimize self-heating effect.

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

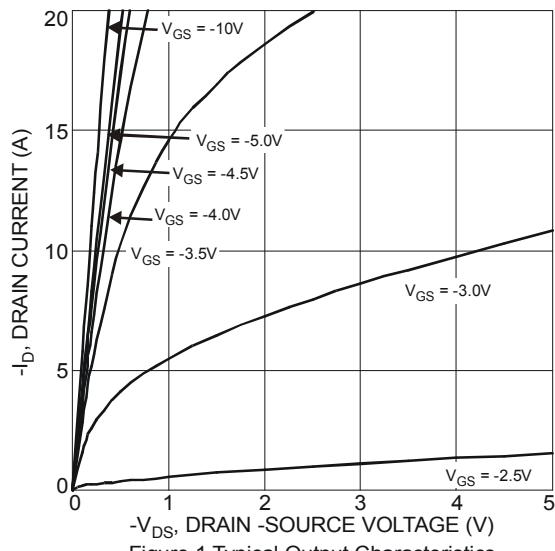


Figure 1 Typical Output Characteristics

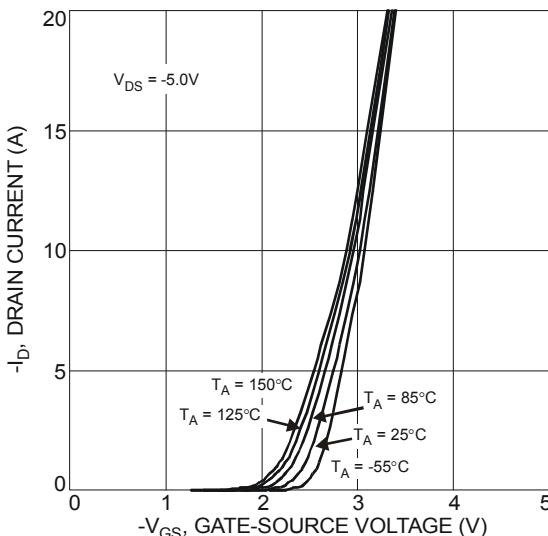


Figure 2 Typical Transfer Characteristics

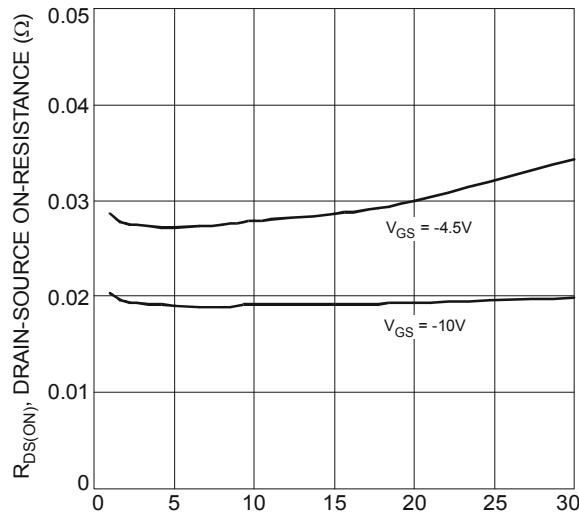


Figure 3 Typical On-Resistance vs.
Drain Current and Gate Voltage

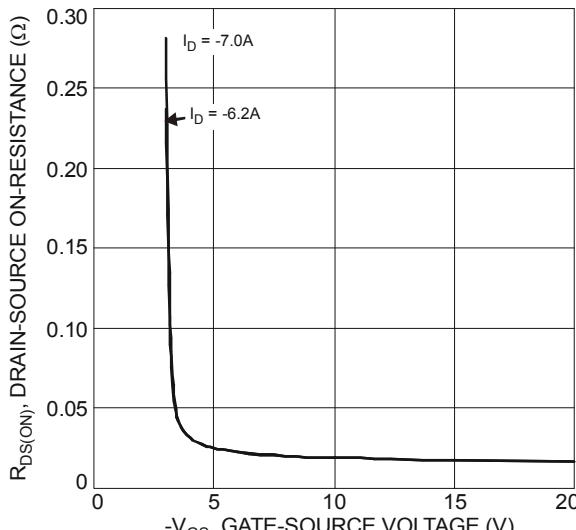


Figure 4 Typical Drain-Source On-Resistance
vs. Gate-Source Voltage

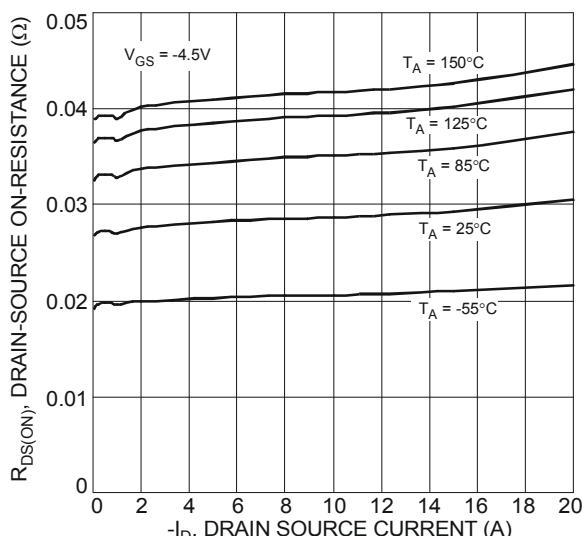


Figure 5 Typical On-Resistance vs.
Drain Current and Temperature

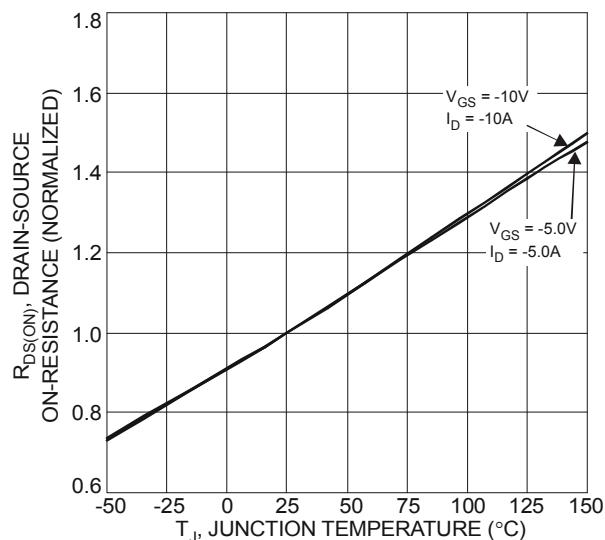
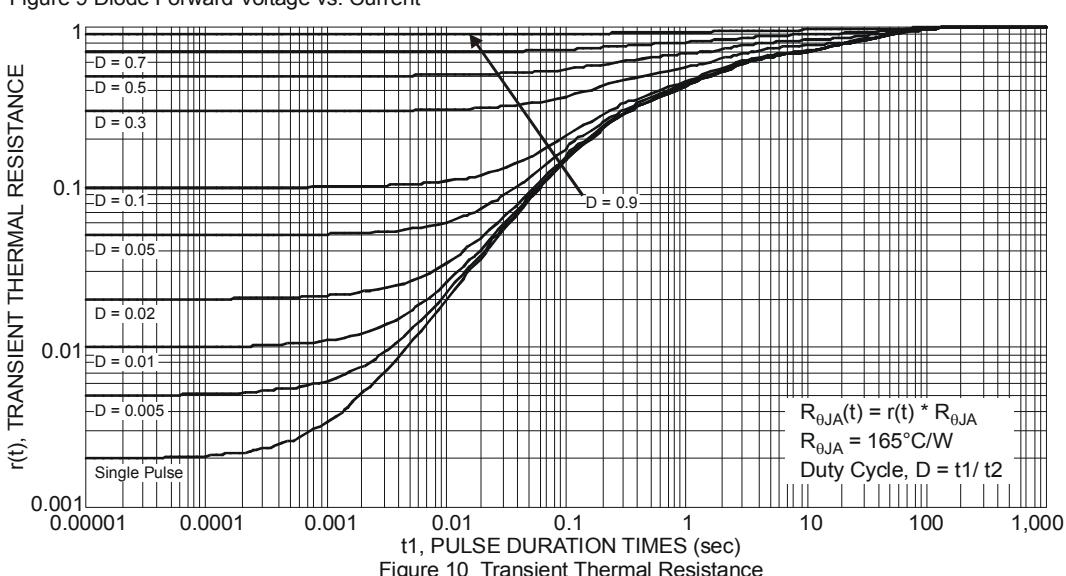
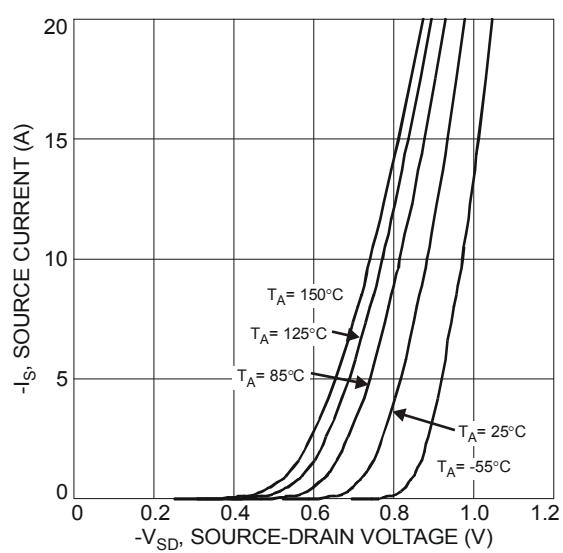
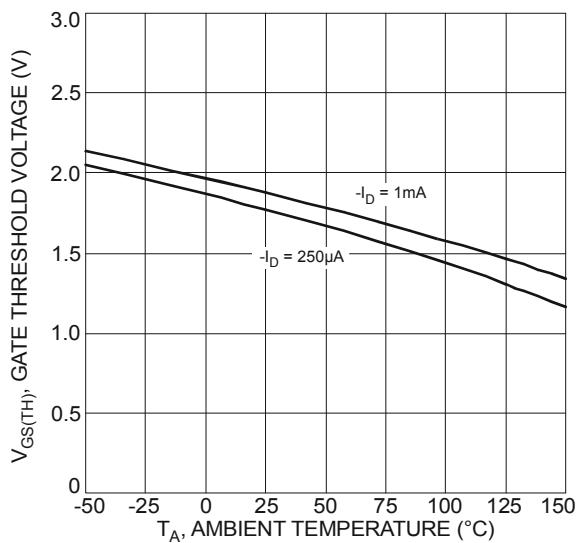
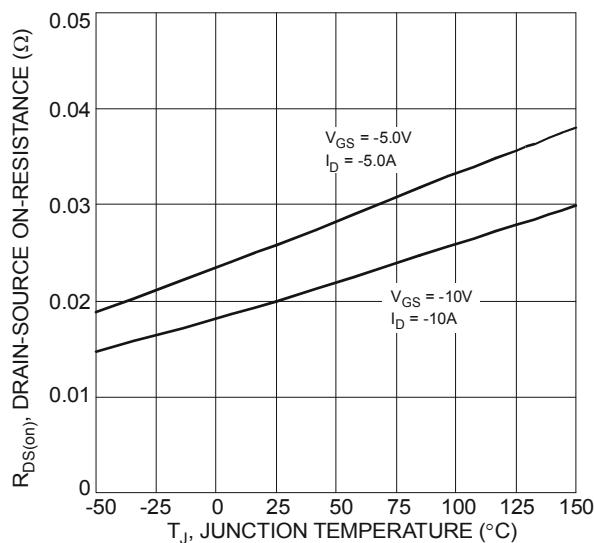
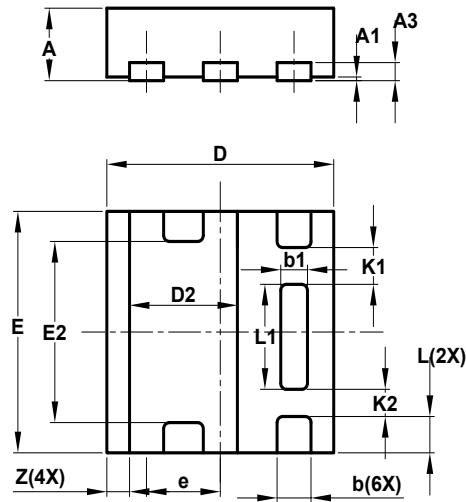


Figure 6 On-Resistance Variation with Temperature



Package Outline Dimensions

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

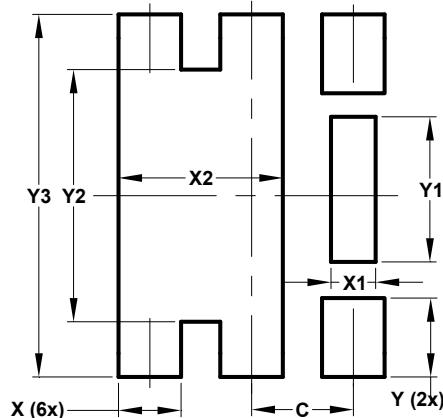


| U-DFN2020-6 Type E | | | |
|-----------------------|-------|-------|-------|
| Dim | Min | Max | Typ |
| A | 0.57 | 0.63 | 0.60 |
| A1 | 0 | 0.05 | 0.03 |
| A3 | — | — | 0.15 |
| b | 0.25 | 0.35 | 0.30 |
| b1 | 0.185 | 0.285 | 0.235 |
| D | 1.95 | 2.05 | 2.00 |
| D2 | 0.85 | 1.05 | 0.95 |
| E | 1.95 | 2.05 | 2.00 |
| E2 | 1.40 | 1.60 | 1.50 |
| e | — | — | 0.65 |
| L | 0.25 | 0.35 | 0.30 |
| L1 | 0.82 | 0.92 | 0.87 |
| K1 | — | — | 0.305 |
| K2 | — | — | 0.225 |
| Z | — | — | 0.20 |

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) |
|------------|------------------|
| C | 0.650 |
| X | 0.400 |
| X1 | 0.285 |
| X2 | 1.050 |
| Y | 0.500 |
| Y1 | 0.920 |
| Y2 | 1.600 |
| Y3 | 2.300 |

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