

Product Summary

| BV _{DSS} | R _{DS(ON)} MAX | I _D MAX T _A = +25°C |
|-------------------|--------------------------------|--|
| -30V | 25mΩ @ V _{GS} = -10V | -6.8A |
| | 38mΩ @ V _{GS} = -4.5V | -5.0A |

Description

This new generation 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.

Applications

- DC-DC converters
- Power-management functions
- Load switches

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)**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability.**
<https://www.diodes.com/quality/product-definitions/>
- **An automotive-compliant part is available under a separate datasheet ([DMP3028LFDEQ](#))**

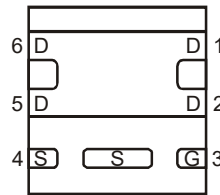
Mechanical Data

- Package: U-DFN2020-6
- Package 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 – NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208 ^(e4)
- Weight: 0.0065 grams (Approximate)

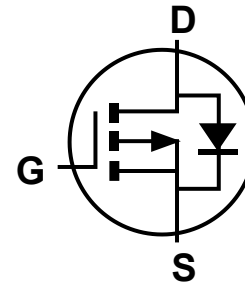
U-DFN2020-6 (Type E)



Bottom View



Pinout
Bottom View



Equivalent Circuit

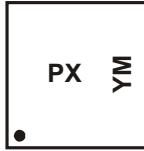
Ordering Information (Note 4)

| Orderable Part Number | Package | Packing | |
|-----------------------|----------------------|---------|-------------|
| | | Qty. | Carrier |
| DMP3028LFDE-7 | U-DFN2020-6 (Type E) | 3,000 | Tape & Reel |
| DMP3028LFDE-13 | U-DFN2020-6 (Type E) | 10,000 | 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

Site 1



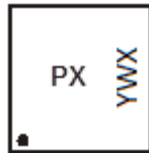
PX = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: M = 2025)
 M = Month (ex: 9 = September)

Date Code Key

| | | | | | | | | | | | | |
|-------------|-------------|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Year | 2012 | - | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 |
| Code | Z | - | M | N | P | R | S | T | U | V | W | X |

| | | | | | | | | | | | | |
|--------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 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 |

Site 2



PX = Product Type Marking Code
 YWX = Date Code Marking
 Y = Year (ex: 5 = 2025)
 W = Week (ex: a = Week 27; z Represents Week 52 and 53)
 X = Internal Code (ex: U = Monday)

Date Code Key

| | | | | | | | | | | | | |
|-------------|-------------|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Year | 2012 | - | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 |
| Code | 2 | - | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 |

| | | | | | | | | | | | | |
|-------------|-------------|--|--|--|--------------|--|--|--|-----------|--|--|--|
| Week | 1-26 | | | | 27-52 | | | | 53 | | | |
| Code | A-Z | | | | a-z | | | | z | | | |

| | | | | | | | |
|----------------------|------------|------------|------------|------------|------------|------------|------------|
| Internal Code | Sun | Mon | Tue | Wed | Thu | Fri | Sat |
| Code | T | U | V | W | X | Y | Z |

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

| Characteristic | Symbol | Value | Unit | |
|--|------------------|------------------------|------|---|
| Drain-Source Voltage | V _{DSS} | -30 | V | |
| Gate-Source Voltage | V _{GSS} | ±20 | V | |
| Continuous Drain Current (Note 5) V _{GS} = -10V | Steady State | T _A = +25°C | -6.8 | A |
| | | T _A = +70°C | -5.3 | A |
| | t < 10s | T _A = +25°C | -8.2 | A |
| | | T _A = +70°C | -6.6 | A |
| Maximum Body Diode Forward Current (Note 5) | I _S | -2.5 | A | |
| Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%) | I _{DM} | -40 | A | |

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

| Characteristic | Symbol | Value | Unit | |
|--|-----------------------------------|------------------------|------|------|
| Total Power Dissipation (Note 6) | P _D | T _A = +25°C | 0.66 | W |
| | | T _A = +70°C | 0.42 | |
| Thermal Resistance, Junction to Ambient (Note 6) | R _{θJA} | Steady State | 189 | °C/W |
| | | t < 10s | 125 | |
| Total Power Dissipation (Note 5) | P _D | T _A = +25°C | 2.03 | W |
| | | T _A = +70°C | 1.3 | |
| Thermal Resistance, Junction to Ambient (Note 5) | R _{θJA} | Steady State | 61 | °C/W |
| | | t < 10s | 41 | |
| Thermal Resistance, Junction to Case (Note 5) | R _{θJC} | 9.3 | | |
| 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 | — | — | V | V _{GS} = 0, I _D = -250µA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | -1 | µA | V _{DS} = -30V, V _{GS} = 0 |
| Gate-Source Leakage | I _{GSS} | — | — | ±100 | nA | V _{GS} = ±20V, V _{DS} = 0 |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | -1.2 | — | -2.4 | V | V _{DS} = V _{GS} , I _D = -250µA |
| Static Drain-Source On-Resistance | R _{DS(ON)} | — | 20 | 25 | mΩ | V _{GS} = -10V, I _D = -7A |
| | | — | 29 | 38 | | V _{GS} = -4.5V, I _D = -6.2A |
| Forward Transfer Admittance | Y _{fs} | — | 4.5 | — | s | V _{DS} = -5V, I _D = -7A |
| Diode Forward Voltage | V _{SD} | — | -0.7 | -1.2 | V | V _{GS} = 0, I _S = -2.1A |
| On-State Drain Current (Note 8) | I _{D(ON)} | -20 | — | — | A | V _{DS} ≤ -5V, V _{GS} = -4.5V |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C _{iss} | — | 1241 | 1860 | pF | V _{DS} = -15V, V _{GS} = 0 f = 1.0MHz |
| Output Capacitance | C _{oss} | — | 147 | 220 | | |
| Reverse Transfer Capacitance | C _{rss} | — | 110 | 165 | | |
| Gate Resistance | R _G | — | 15 | 30 | Ω | V _{DS} = 0, V _{GS} = 0, f = 1.0MHz |
| Total Gate Charge (V _{GS} = -10V) | Q _g | — | 22 | 33 | nC | V _{DS} = -15V, I _D = -7A |
| Total Gate Charge (V _{GS} = -4.5V) | Q _g | — | 10.9 | 17 | | |
| Gate-Source Charge | Q _{gs} | — | 3.5 | 6 | | |
| Gate-Drain Charge | Q _{gd} | — | 4.7 | 8 | | |
| Turn-On Delay Time | t _{D(on)} | — | 9.7 | 15 | ns | V _{GS} = -10V, V _{DD} = -15V R _{GEN} = 6Ω, I _D = -7A |
| Turn-On Rise Time | t _r | — | 17.1 | 26 | | |
| Turn-Off Delay Time | t _{D(off)} | — | 60.5 | 91 | | |
| Turn-Off Fall Time | t _f | — | 40.4 | 61 | | |

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

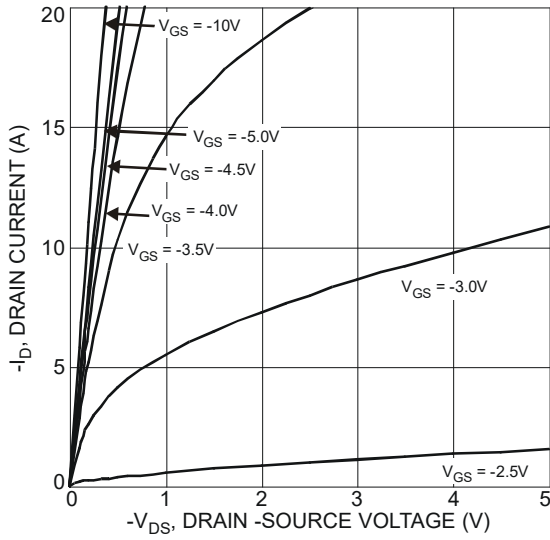


Figure 1 Typical Output Characteristics

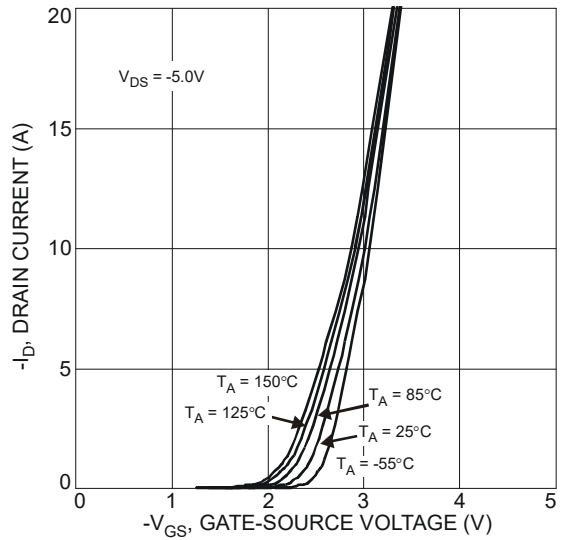


Figure 2 Typical Transfer Characteristics

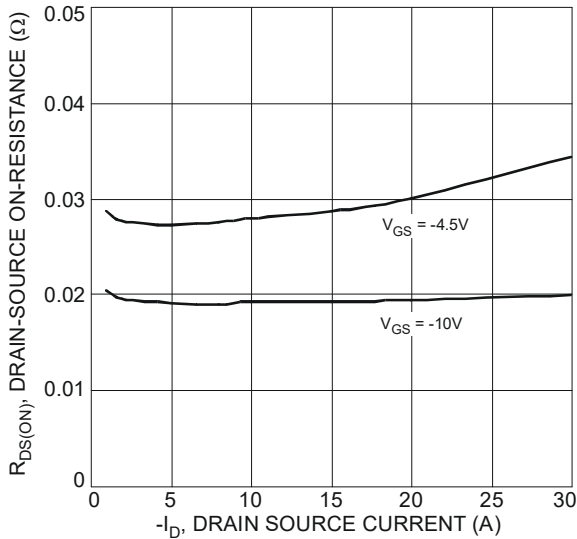


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

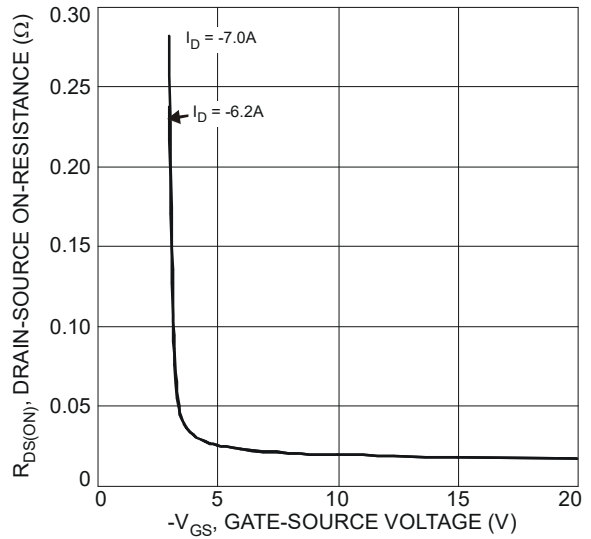


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

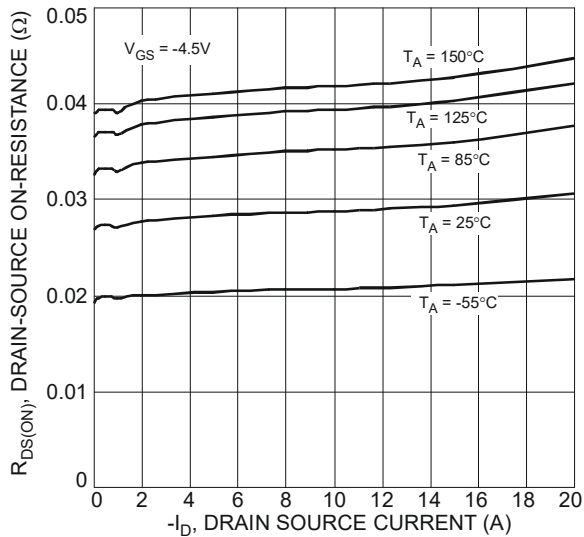


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

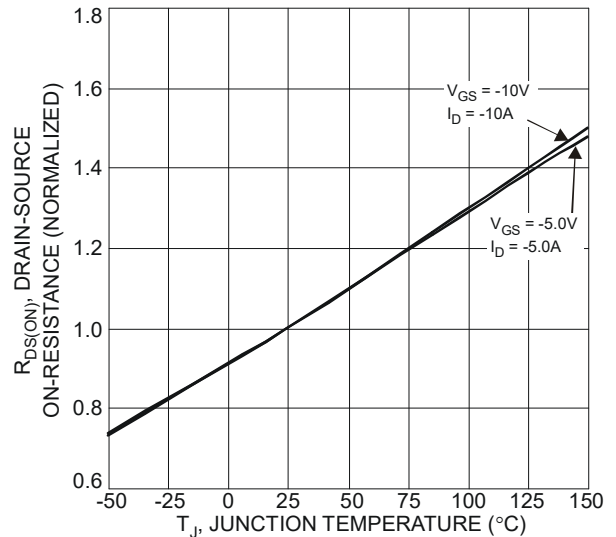


Figure 6 On-Resistance Variation with Temperature

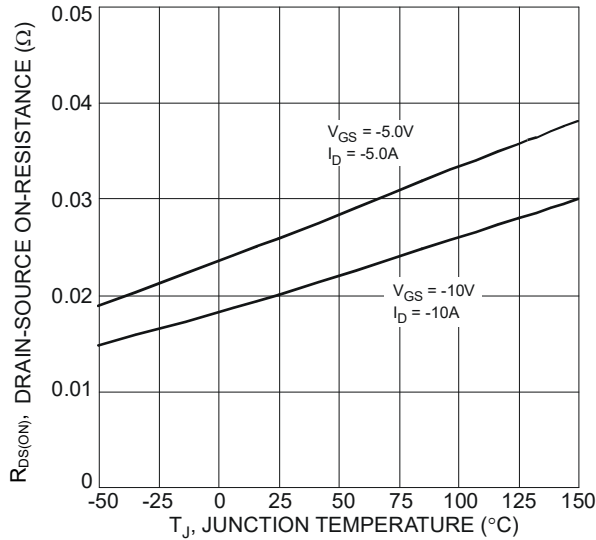


Figure 7 On-Resistance Variation with Temperature

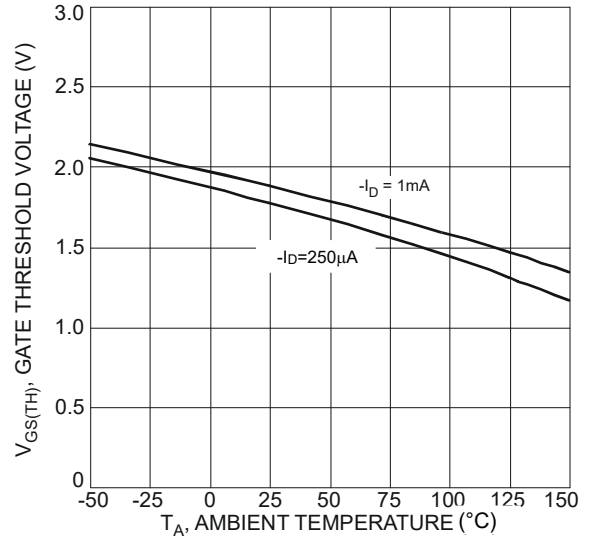


Figure 8 Gate Threshold Variation vs. Ambient Temperature

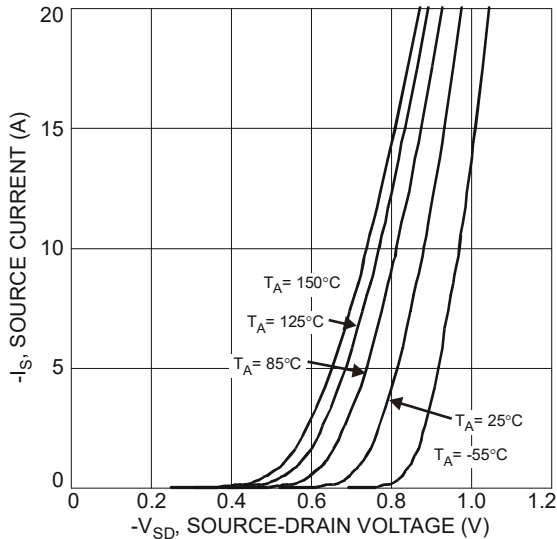


Figure 9 Diode Forward Voltage vs. Current

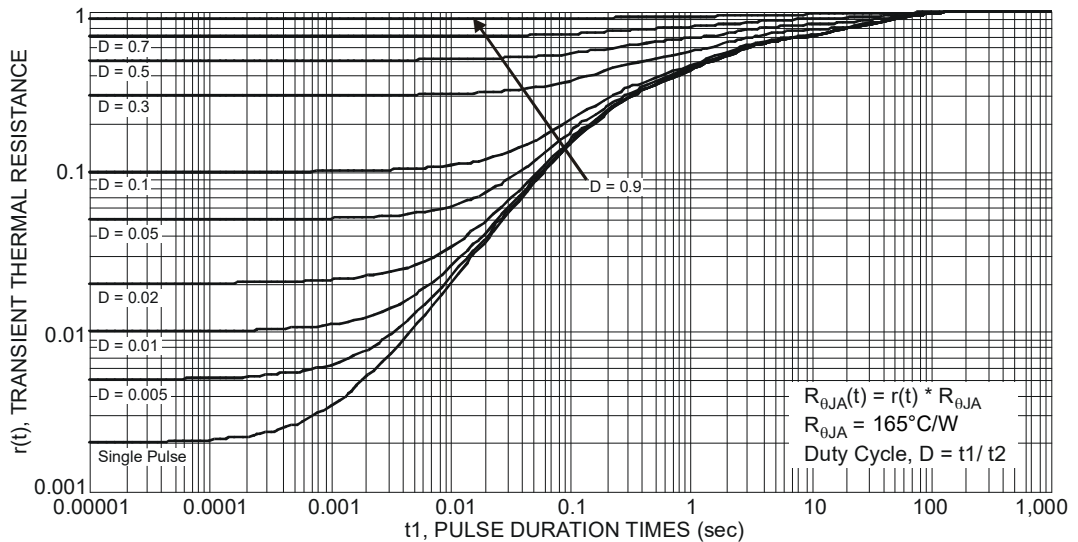
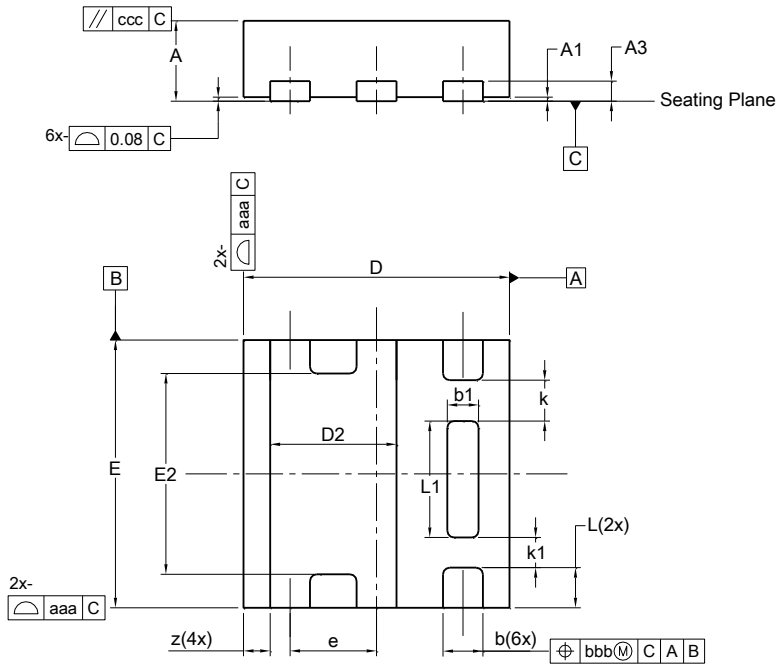


Figure 10 Transient Thermal Resistance

Package Outline Dimensions

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

U-DFN2020-6 (Type E)



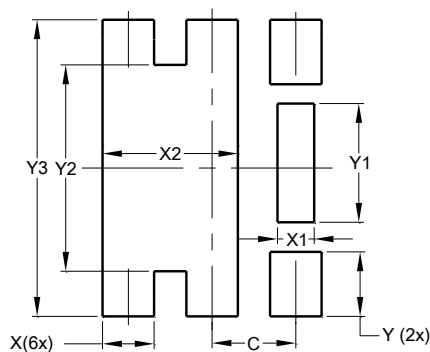
| U-DFN2020-6 (Type E) | | | |
|-------------------------|-------|-------|-------|
| Dim | Min | Max | Typ |
| A | 0.57 | 0.63 | 0.60 |
| A1 | 0.00 | 0.05 | 0.03 |
| A3 | - | - | 0.15 |
| b | 0.25 | 0.35 | 0.30 |
| b1 | 0.185 | 0.285 | 0.235 |
| D | 1.95 | 2.05 | 2.00 |
| D2 | 0.85 | 1.05 | 0.95 |
| 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 |
| k | - | - | 0.305 |
| k1 | - | - | 0.225 |
| Z | - | - | 0.20 |

All Dimensions in mm

Suggested Pad Layout

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

U-DFN2020-6 (Type E)



| 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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