



**THE DATASHEET OF
DMP2200UFCL-7**



DUAL P-CHANNEL ENHANCEMENT MODE MOSFET
Summary

| BV _{DSS} | R _{DS(ON)} max | I _D max |
|-------------------|---------------------------------|--------------------|
| -20V | 200mΩ @ V _{GS} = -4.5V | -1.7A |
| | 290mΩ @ V _{GS} = -2.5V | -1.3A |
| | 390mΩ @ V _{GS} = -1.8V | -1.1A |
| | 650mΩ @ V _{GS} = -1.5V | -0.5A |

Description

This device provides a high performance, low R_{DS(ON)} P-Channel MOSFET in the thermally and spatially efficient U-DFN1616-6 (Type F) package. The low R_{DS(ON)} of this MOSFET ensures conduction losses are kept making it ideal for use in the following applications.

Applications

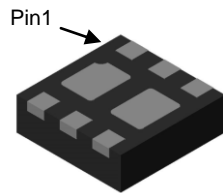
- Battery Disconnect Switch
- Load Switch for Power Management Functions

Features

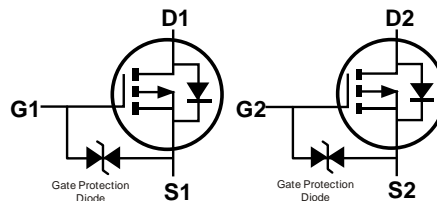
- Typical Off Board Profile of 0.5mm - Ideally Suited for Thin Applications
- Low R_{DS(ON)} – Minimizes Conduction Losses
- PCB Footprint of 2.56mm²
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. “Green” Device (Note 3)**
- Qualified to AEC-Q101 Standards for High Reliability**
- ESD Protected Gate**

Mechanical Data

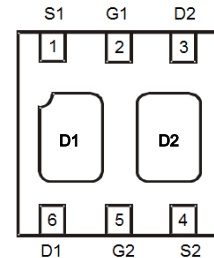
- Case: U-DFN1616-6 (Type F)
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – NiPdAu. Solderable per MIL-STD-202, Method 208⁽⁴⁾
- Weight: 0.04 grams (Approximate)



Bottom View



Device Symbol

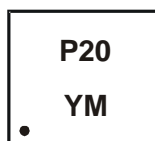


Pin Configuration Bottom View

Ordering Information (Note 4)

| Part Number | Reel Size (inches) | Tape Width (mm) | Quantity per Reel |
|---------------|--------------------|-----------------|-------------------|
| DMP2200UFCL-7 | 7 | 8 | 3,000 |

- 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information


P20 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: E = 2017)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|------|------|------|------|------|------|------|------|------|------|
| Code | E | F | G | H | I | J | K | L | M |

| 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 | Unit |
|--|------------------|----------------------------------|------|
| Drain-Source Voltage | V _{DSS} | -20 | V |
| Gate-Source Voltage | V _{GSS} | ±8 | V |
| Continuous Drain Current (Note 6) | I _D | @ T _A = +25°C -1.7 | A |
| | | @ T _A = +85°C -1.2 | |
| Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%) | I _{DM} | -8 | A |

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

| Characteristic | Symbol | Value | Unit |
|---|-----------------------------------|------------------|------|
| Total Power Dissipation | P _D | (Note 5) 0.66 | W |
| | | (Note 6) 1.58 | |
| Thermal Resistance, Junction to Ambient | R _{θJA} | (Note 5) 193 | °C/W |
| | | (Note 6) 80 | |
| 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} | -20 | — | — | V | V _{GS} = 0V, I _D = -250µA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | -1 | µA | V _{DS} = -20V, V _{GS} = 0V |
| Gate-Body Leakage | I _{GSS} | — | — | ±10 | µA | V _{GS} = ±8V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | -0.4 | — | -1.2 | V | V _{DS} = V _{GS} , I _D = -250µA |
| Static Drain-Source On-Resistance | R _{DS(ON)} | — | 153 | 200 | mΩ | V _{GS} = -4.5V, I _D = -2.0A V _{GS} = -2.5V, I _D = -1.2A V _{GS} = -1.8V, I _D = -0.24A V _{GS} = -1.5V, I _D = -0.18A |
| | | | 220 | 290 | | |
| | | | 260 | 390 | | |
| | | | 360 | 650 | | |
| Diode Forward Voltage (Note 7) | V _{SD} | — | — | -1.2 | V | V _{GS} = 0V, I _S = -0.6A |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C _{iss} | — | 184 | — | pF | V _{DS} = -10V, V _{GS} = 0V f = 1.0MHz |
| Output Capacitance | C _{oss} | — | 25.8 | — | pF | |
| Reverse Transfer Capacitance | C _{rss} | — | 18.6 | — | pF | |
| Total Gate Charge | Q _g | — | 2.2 | — | nC | V _{GS} = -4.5V, V _{DS} = -10V, I _D = -1.7A |
| Gate-Source Charge | Q _{gs} | — | 0.4 | — | nC | |
| Gate-Drain Charge | Q _{gd} | — | 0.5 | — | nC | |
| SWITCHING CHARACTERISTICS (Note 8) | | | | | | |
| Turn-On Delay Time | t _{D(ON)} | — | 9.8 | — | ns | V _{DD} = -10V, I _D = -1.5A, V _{GS} = -4.5V, R _{GEN} = 1Ω |
| Turn-Off Delay Time | t _{D(OFF)} | — | 23 | — | ns | |
| Turn-On Rise Time | t _R | — | 87 | — | ns | |
| Turn-Off Fall Time | t _F | — | 41 | — | ns | |
| Body Diode Reverse Recovery Time | t _{RR} | — | 21.5 | — | ns | I _F = -2A, di/dt = 100A/µs |
| Body Diode Reverse Recovery Charge | Q _{RR} | — | 4.2 | — | 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 1inch square copper plate.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

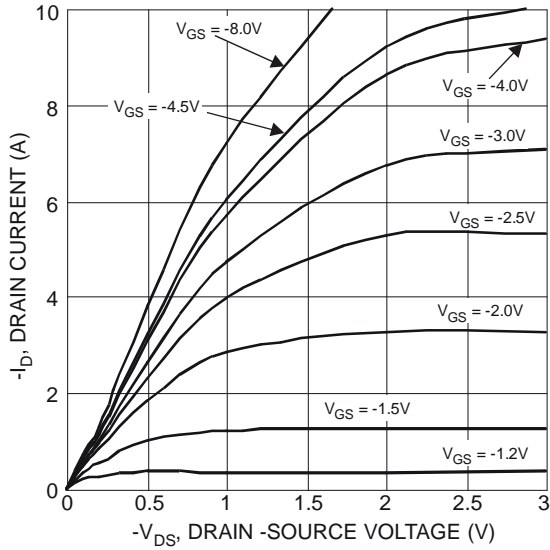


Figure 1 Typical Output Characteristics

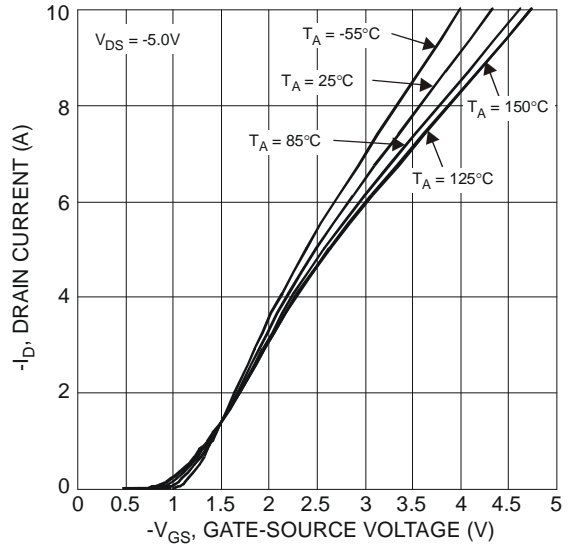


Figure 2 Typical Transfer Characteristics

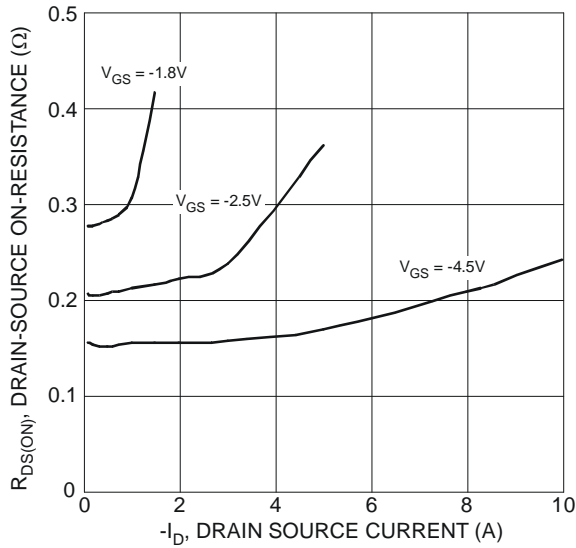


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

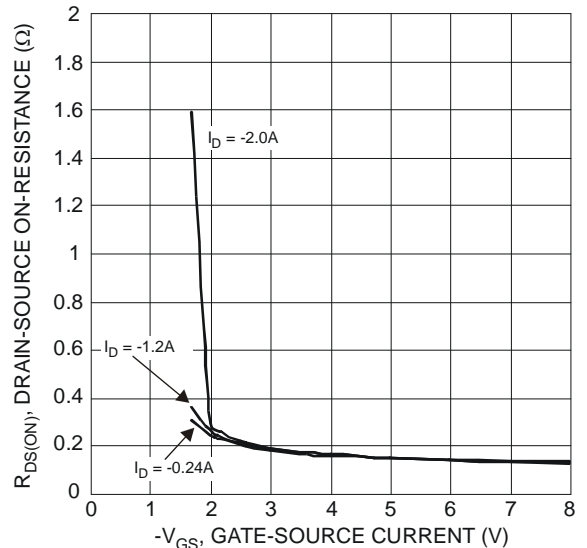


Figure 4 Typical Transfer Characteristics

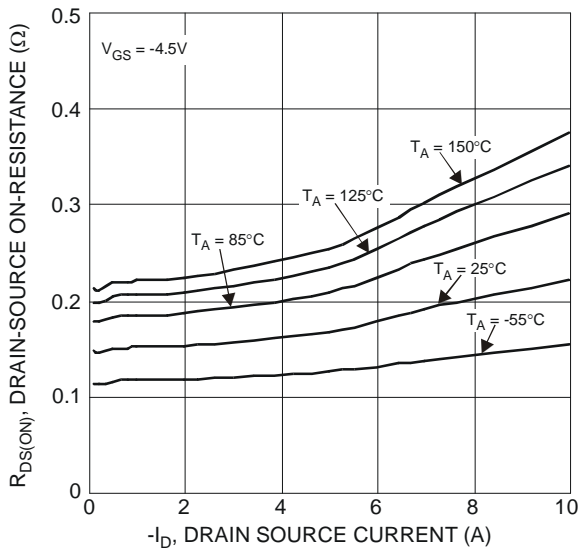


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

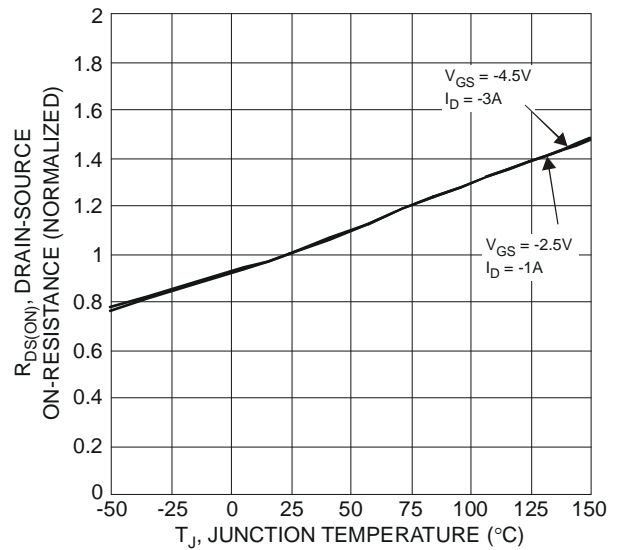


Figure 6 On-Resistance Variation with Temperature

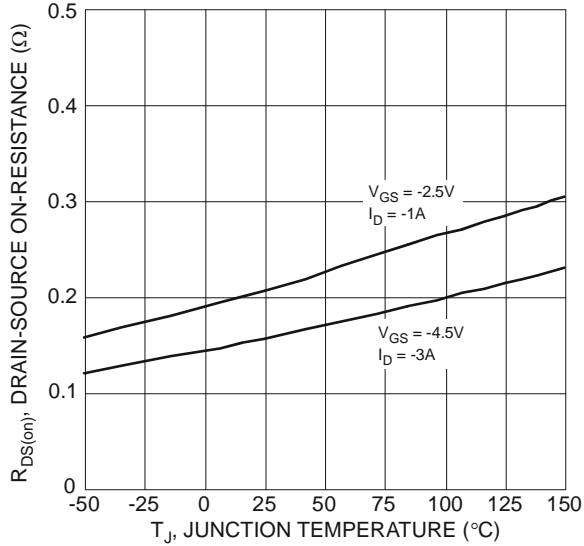


Figure 7 On-Resistance Variation with Temperature

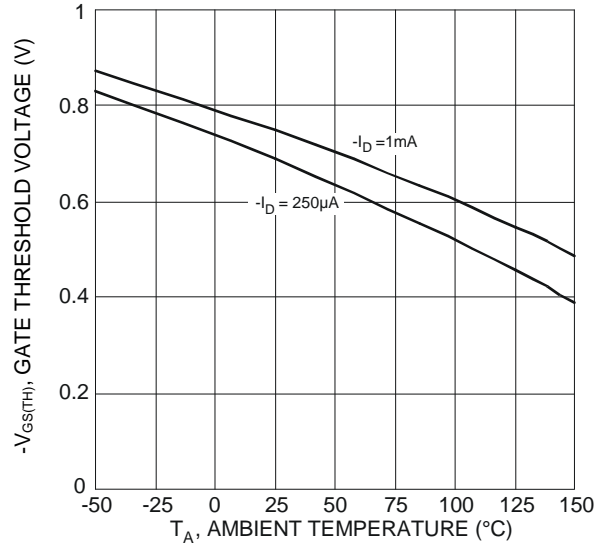


Figure 8 Gate Threshold Variation vs. Ambient Temperature

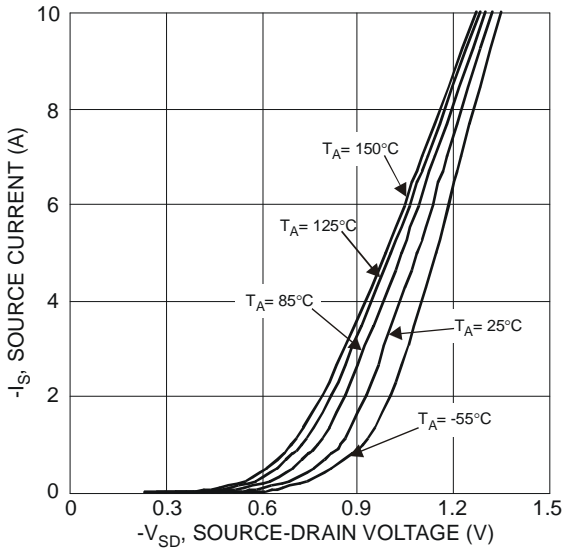


Figure 9 Diode Forward Voltage vs. Current

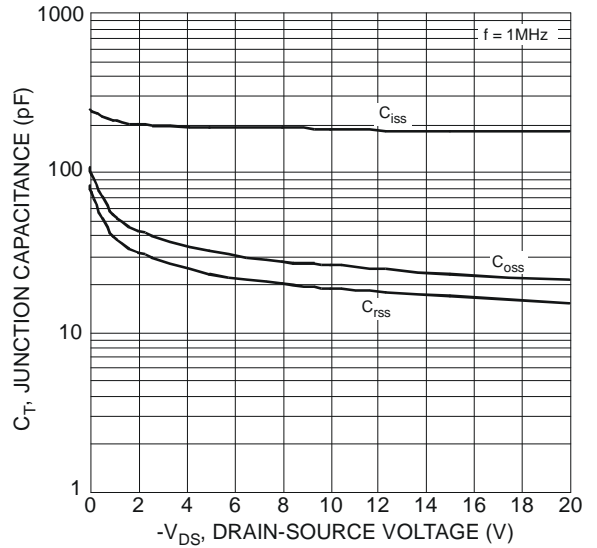


Figure 10 Typical Junction Capacitance

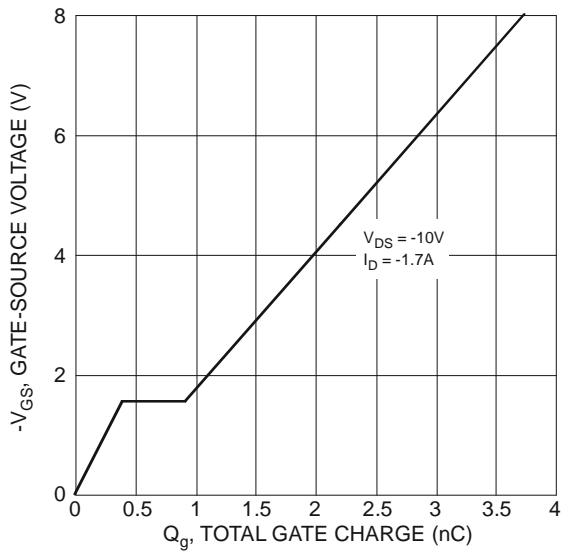


Figure 11 Gate-Charge Characteristics

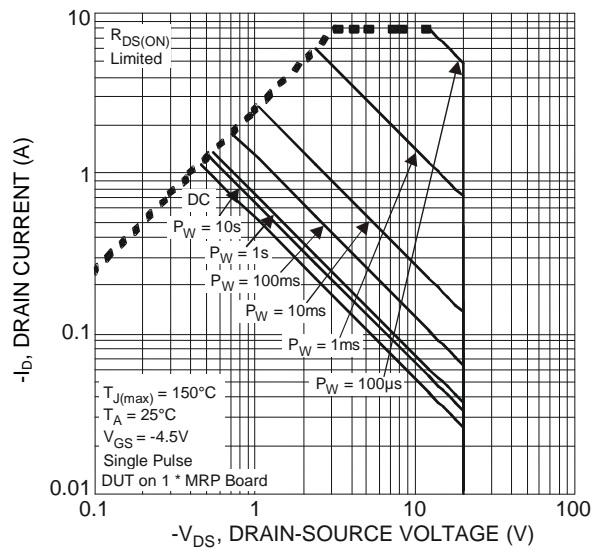


Figure 12 SOA, Safe Operation Area

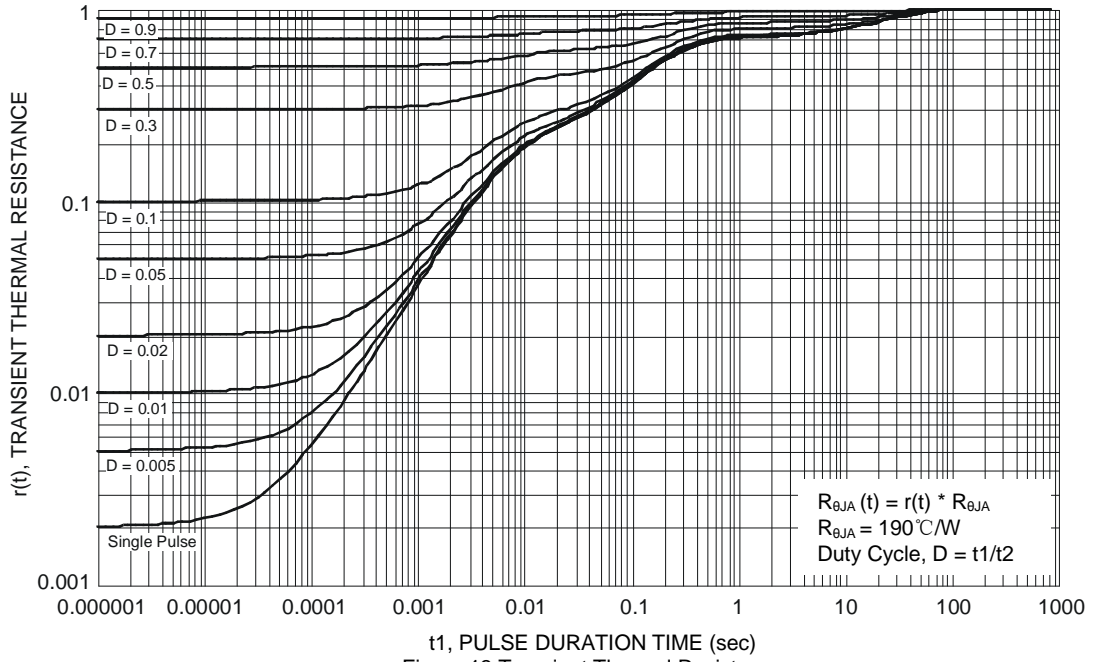
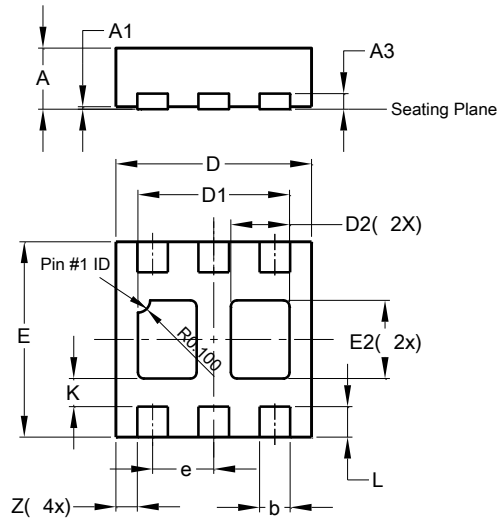


Figure 13 Transient Thermal Resistance

Package Outline Dimensions

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

U-DFN1616-6 (Type F)

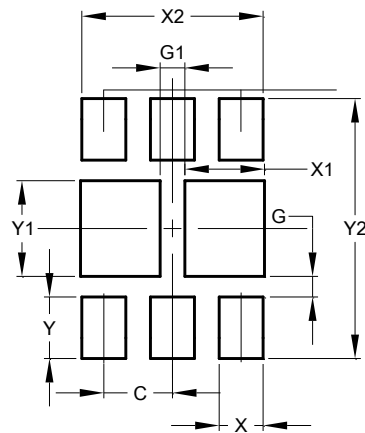


| U-DFN1616-6 Type F | | | |
|-----------------------------|------|------|-------|
| Dim | Min | Max | Typ |
| A | 0.45 | 0.55 | 0.50 |
| A1 | 0 | 0.05 | 0.02 |
| A3 | — | — | 0.127 |
| b | 0.20 | 0.30 | 0.25 |
| D | 1.55 | 1.65 | 1.60 |
| D1 | 1.14 | 1.34 | 1.24 |
| D2 | 0.38 | 0.58 | 0.48 |
| E | 1.55 | 1.65 | 1.60 |
| E2 | 0.54 | 0.74 | 0.64 |
| e | — | — | 0.50 |
| K | — | — | 0.23 |
| L | 0.15 | 0.35 | 0.25 |
| Z | — | — | 0.175 |
| All Dimensions in mm | | | |

Suggested Pad Layout

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

U-DFN1616-6 (Type F)



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 0.500 |
| G | 0.150 |
| G1 | 0.180 |
| X | 0.320 |
| X1 | 0.580 |
| X2 | 1.320 |
| Y | 0.450 |
| Y1 | 0.700 |
| Y2 | 1.900 |

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