

Product Summary

| BV _{DSS} | R _{DS(ON)} Max | I _D Max T _A = +25°C |
|-------------------|--------------------------------|--|
| -30V | 19mΩ @ V _{GS} = -10V | -8.6A |
| | 45mΩ @ V _{GS} = -4.5V | -5.5A |

Description and Applications

This 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.

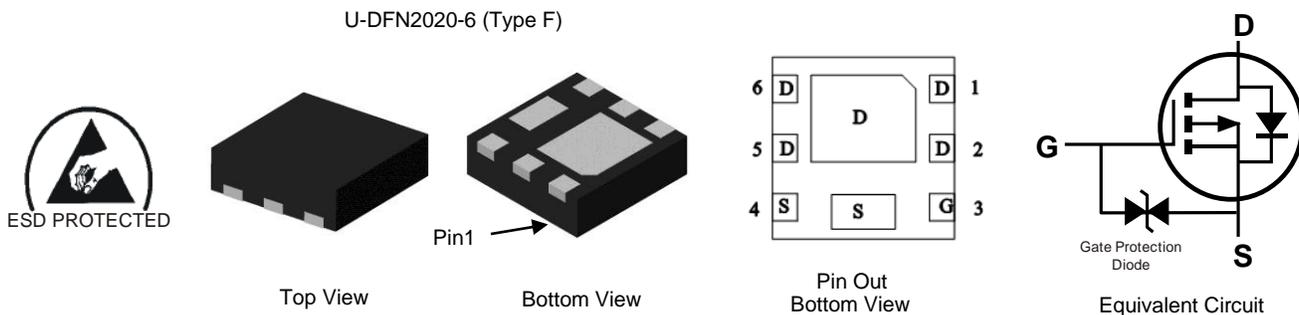
- Battery Management Application
- Power Management Functions
- DC-DC Converters

Features and Benefits

- 0.6mm Profile – Ideal for Low Profile Applications
- Low Gate Threshold Voltage
- Low On-Resistance
- ESD Protected Gate
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**
- For automotive applications requiring specific change control (i.e.: parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at <https://www.diodes.com/products/automotive/automotive-products/>.**
- This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. <https://www.diodes.com/quality/product-definitions/>**

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
- Terminals: Finish – NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208 ^(e4)
- Weight: 0.007 grams (Approximate)



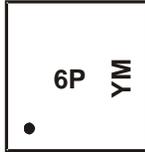
Ordering Information (Note 4)

| Part Number | Case | Packaging |
|----------------|----------------------|--------------------|
| DMP3026SFDF-7 | U-DFN2020-6 (Type F) | 3,000/Tape & Reel |
| DMP3026SFDF-13 | U-DFN2020-6 (Type F) | 10,000/Tape & Reel |

- Notes:
- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 - 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.
 - 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

Site 1



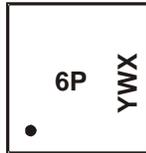
6P = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: H = 2020)
 M = Month (ex: 9 = September)

Date Code Key

| | | | | | | | | | | | | |
|-------------|-------------|-----|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Year | 2016 | ... | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 |
| Code | D | ... | H | I | J | K | L | M | N | O | P | R |

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



6P = Product Type Marking Code
 YWX = Date Code Marking
 Y = Year (ex: 0 = 2020)
 W = Week (ex: a = week 27; z Represents Week 52 and 53)
 X = Internal Code (ex: U = Monday)

Date Code Key

| | | | | | | | | | | | | |
|-------------|-------------|-----|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Year | 2016 | ... | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 |
| Code | 6 | ... | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

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

| Characteristic | | | Symbol | Value | Unit |
|--|------------------|--|-----------|---------------|------|
| Drain-Source Voltage | | | V_{DSS} | -30 | V |
| Gate-Source Voltage | | | V_{GSS} | ± 25 | 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 | -8.6 -6.9 | A |
| | $t < 10\text{s}$ | $T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$ | I_D | -10.3 -8.3 | A |
| Pulsed Drain Current (10 μs Pulse, Duty Cycle = 1%) | | | I_{DM} | -50 | A |
| Continuous Source-Drain Diode Current (Note 6) | | $T_A = +25^\circ\text{C}$ | I_S | -2.0 | A |
| Avalanche Current (Note 7) $L = 0.1\text{mH}$ | | | I_{AS} | -23 | A |
| Avalanche Energy (Note 7) $L = 0.1\text{mH}$ | | | E_{AS} | 27 | mJ |

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

| Characteristic | | Symbol | Value | Unit |
|--|---------------------------|-----------------|-------------|--------------------|
| Total Power Dissipation (Note 5) | $T_A = +25^\circ\text{C}$ | P_D | 0.71 | W |
| | $T_A = +70^\circ\text{C}$ | | 0.47 | |
| Thermal Resistance, Junction to Ambient (Note 5) | Steady State | $R_{\theta JA}$ | 178 | $^\circ\text{C/W}$ |
| | $t < 10\text{s}$ | | 125 | |
| Total Power Dissipation (Note 6) | $T_A = +25^\circ\text{C}$ | P_D | 2.0 | W |
| | $T_A = +70^\circ\text{C}$ | | 1.3 | |
| Thermal Resistance, Junction to Ambient (Note 6) | Steady State | $R_{\theta JA}$ | 62 | $^\circ\text{C/W}$ |
| | $t < 10\text{s}$ | | 43 | |
| Thermal Resistance, Junction to Case (Note 6) | Steady State | $R_{\theta JC}$ | 7.4 | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range | | T_J, T_{STG} | -55 to +150 | $^\circ\text{C}$ |

- 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 1-inch square copper plate.
 7. I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep $T_J = +25^\circ\text{C}$.

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

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|---------------------|-----|-------|------|------|--|
| OFF CHARACTERISTICS (Note 8) | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | -30 | — | — | V | V _{GS} = 0V, I _D = -250μA |
| Zero Gate Voltage Drain Current T _J = +25°C | I _{DSS} | — | — | -1 | μA | V _{DS} = -24V, V _{GS} = 0V |
| Zero Gate Voltage Drain Current T _J = +150°C (Note 9) | | — | — | -100 | | |
| Gate-Source Leakage | I _{GSS} | — | — | ±10 | μA | V _{GS} = ±25V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 8) | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | -1 | — | -3 | V | V _{DS} = V _{GS} , I _D = -250μA |
| Static Drain-Source On-Resistance | R _{DS(ON)} | — | 15 | 19 | mΩ | V _{GS} = -10V, I _D = -4.5A |
| | | | 28 | 45 | | V _{GS} = -4.5V, I _D = -3.5A |
| | | | 34 | 54 | | V _{GS} = -4.0V, I _D = -3.0A |
| Diode Forward Voltage | V _{SD} | — | -0.7 | -1.2 | V | V _{GS} = 0V, I _S = -1.0A |
| DYNAMIC CHARACTERISTICS (Note 9) | | | | | | |
| Input Capacitance | C _{ISS} | — | 1,204 | — | pF | V _{DS} = -15V, V _{GS} = 0V, f = 1.0MHz |
| Output Capacitance | C _{OSS} | — | 154 | — | | |
| Reverse Transfer Capacitance | C _{RSS} | — | 112 | — | | |
| Gate Resistance | R _G | — | 16 | — | Ω | V _{DS} = 0V, V _{GS} = 0V, f = 1MHz |
| Total Gate Charge (V _{GS} = -10V) | Q _G | — | 19.6 | — | nC | V _{DS} = -15V, I _D = -9.5A |
| Total Gate Charge (V _{GS} = -4.5V) | Q _G | — | 9.2 | — | | |
| Gate-Source Charge | Q _{GS} | — | 4.3 | — | | |
| Gate-Drain Charge | Q _{GD} | — | 3.9 | — | | |
| Turn-On Delay Time | t _{D(ON)} | — | 5.3 | — | ns | V _{DS} = -15V, V _{GS} = -10V, R _G = 6Ω, I _D = -9.5A |
| Turn-On Rise Time | t _R | — | 23 | — | | |
| Turn-Off Delay Time | t _{D(OFF)} | — | 34 | — | | |
| Turn-Off Fall Time | t _F | — | 26 | — | | |
| Reverse Recovery Time | t _{RR} | — | 10 | — | ns | I _F = -9.5A, di/dt = 100A/μs |
| Reverse Recovery Charge | Q _{RR} | — | 3.3 | — | nC | |

Notes: 8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to product testing.

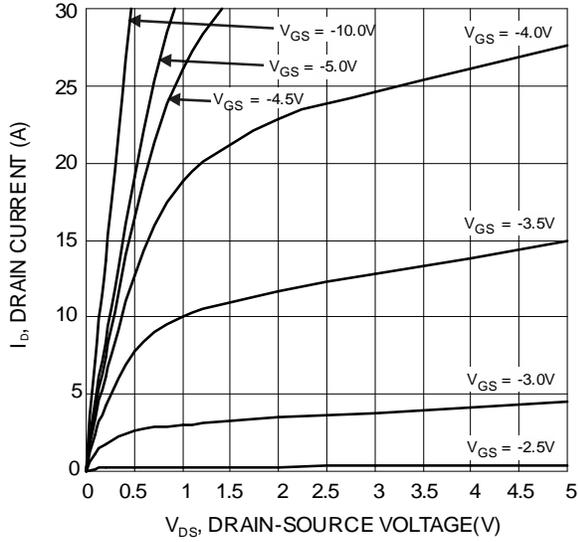


Figure1 Typical Output Characteristic

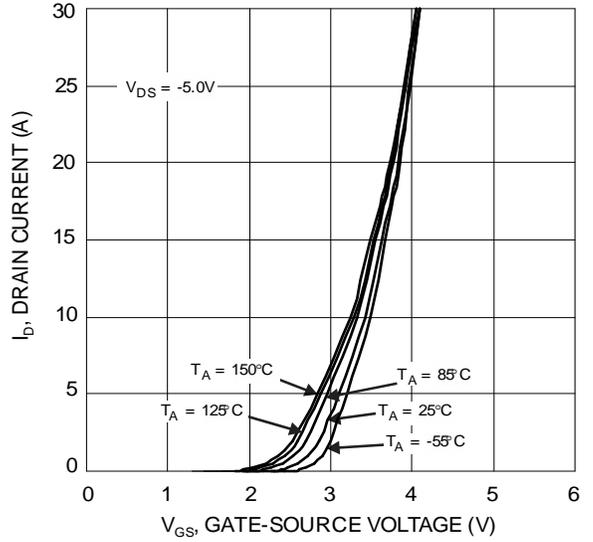


Figure 2 Typical Transfer Characteristic

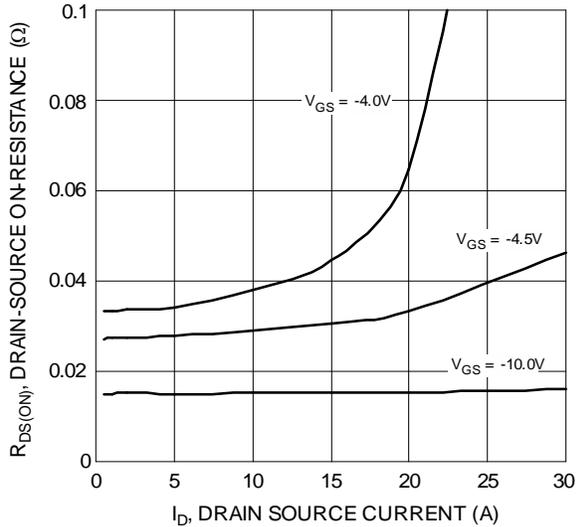


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

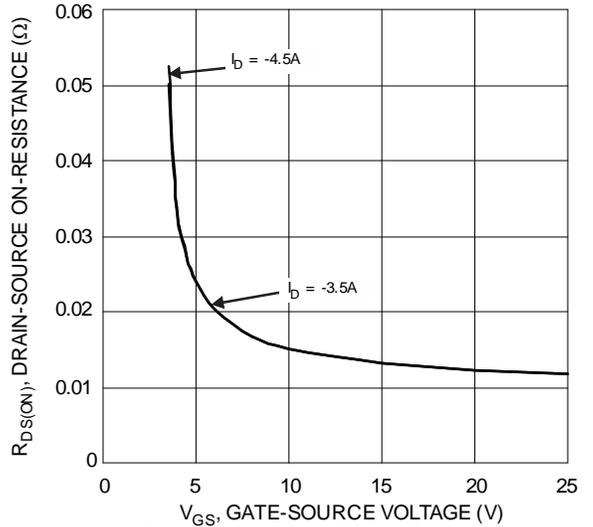


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

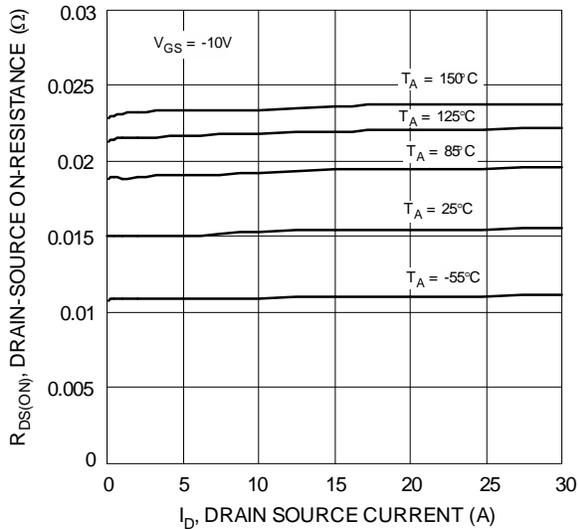


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

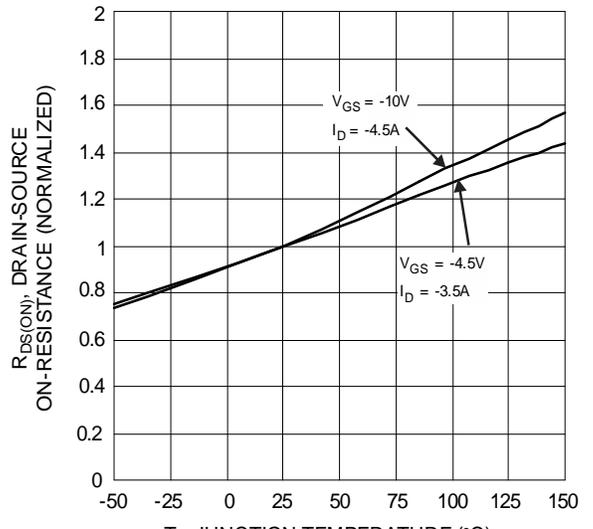


Figure 6 On-Resistance Variation with Temperature

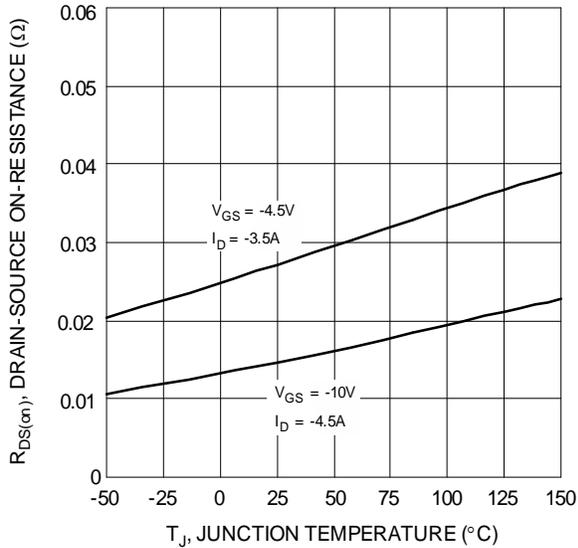


Figure 7 On-Resistance Variation with Temperature

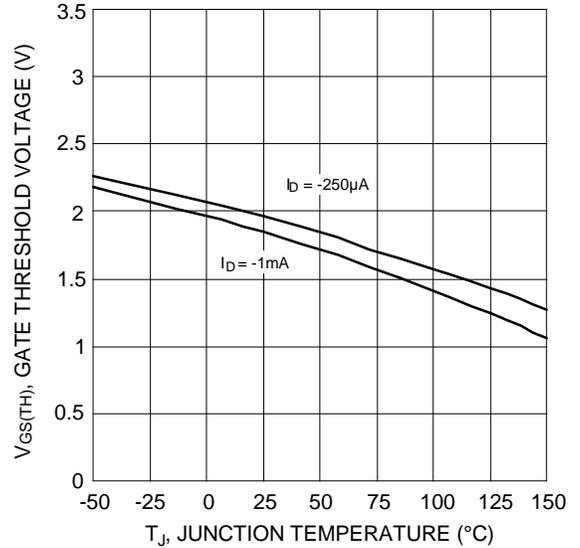


Figure 8 Gate Threshold Variation vs. Junction Temperature

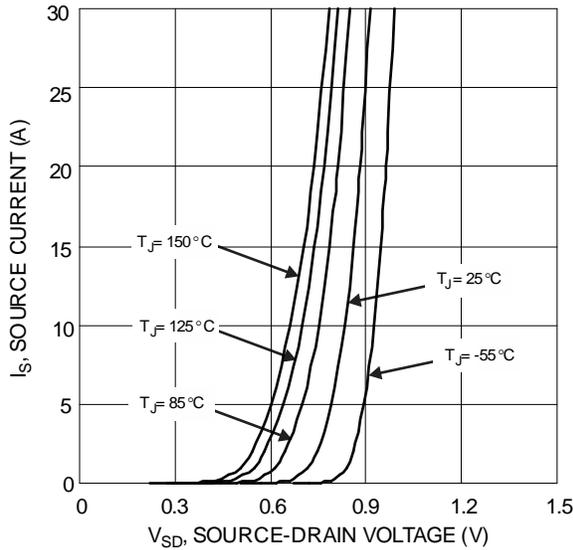


Figure 9 Diode Forward Voltage vs. Current

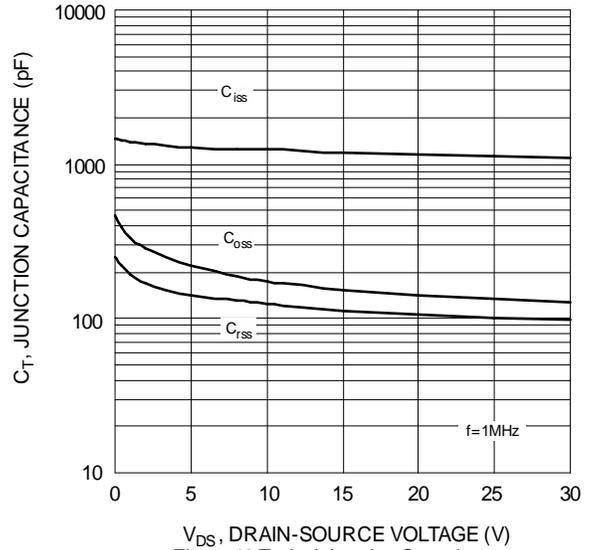


Figure 10 Typical Junction Capacitance

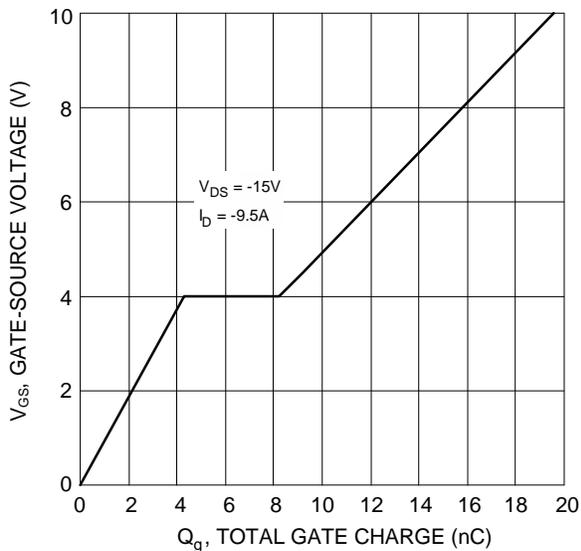


Figure 11 Gate Charge

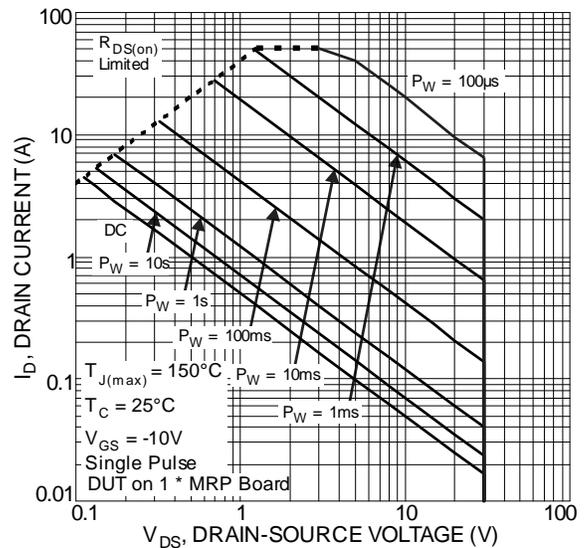
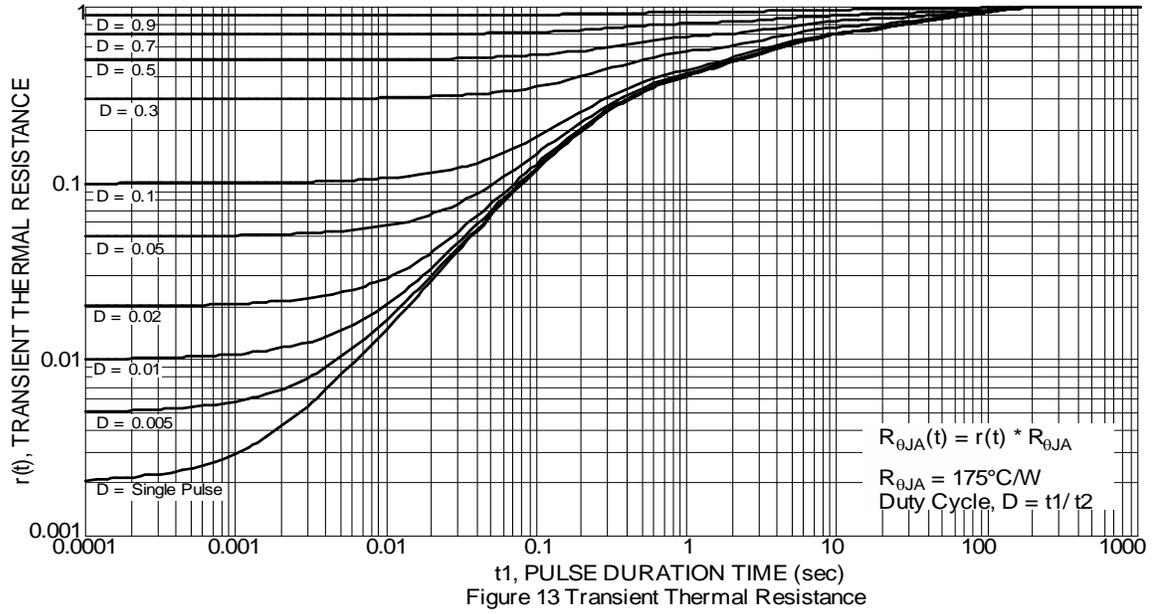


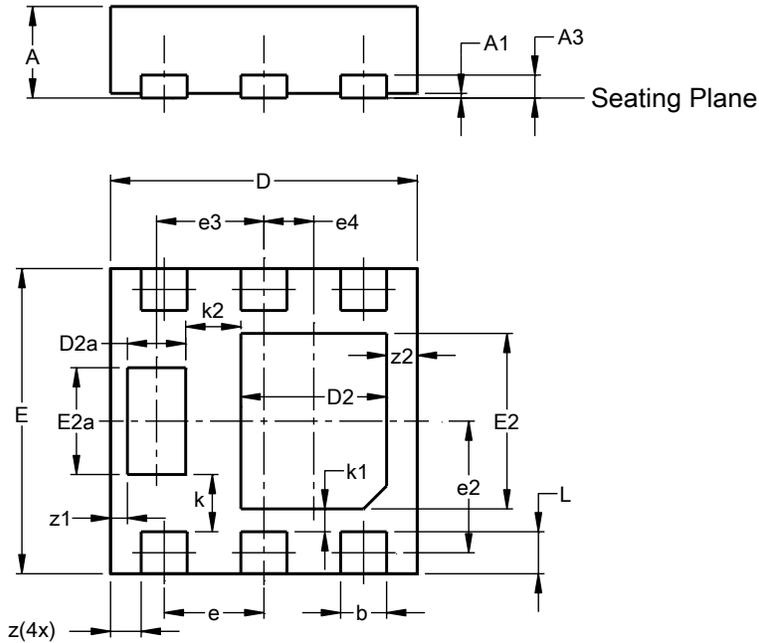
Figure 12 SOA, Safe Operation Area



Package Outline Dimensions

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

U-DFN2020-6 (Type F)

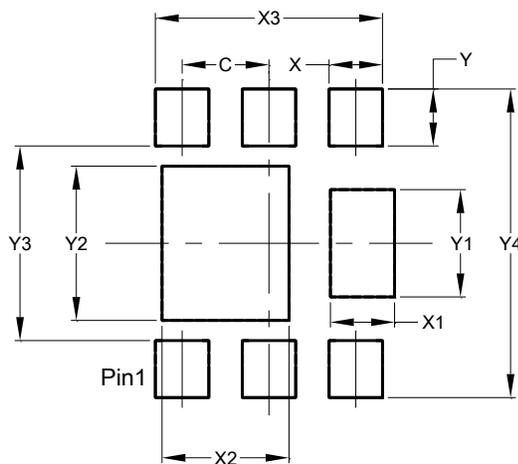


| U-DFN2020-6 (Type F) | | | |
|-----------------------------|-----------|-------|-------|
| Dim | Min | Max | Typ |
| A | 0.57 | 0.63 | 0.60 |
| A1 | 0.00 | 0.05 | 0.03 |
| A3 | - | - | 0.15 |
| b | 0.25 | 0.35 | 0.30 |
| D | 1.95 | 2.05 | 2.00 |
| D2 | 0.85 | 1.05 | 0.95 |
| D2a | 0.33 | 0.43 | 0.38 |
| E | 1.95 | 2.05 | 2.00 |
| E2 | 1.05 | 1.25 | 1.15 |
| E2a | 0.65 | 0.75 | 0.70 |
| e | 0.65 BSC | | |
| e2 | 0.863 BSC | | |
| e3 | 0.70 BSC | | |
| e4 | 0.325 BSC | | |
| k | 0.37 BSC | | |
| k1 | 0.15 BSC | | |
| k2 | 0.36 BSC | | |
| L | 0.225 | 0.325 | 0.275 |
| z | 0.20 BSC | | |
| z1 | 0.110 BSC | | |
| z2 | 0.20 BSC | | |
| All Dimensions in mm | | | |

Suggested Pad Layout

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

U-DFN2020-6 (Type F)



| Dimensions | Value (in mm) |
|------------|------------------|
| C | 0.650 |
| X | 0.400 |
| X1 | 0.480 |
| X2 | 0.950 |
| X3 | 1.700 |
| Y | 0.425 |
| Y1 | 0.800 |
| Y2 | 1.150 |
| Y3 | 1.450 |
| Y4 | 2.300 |

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