

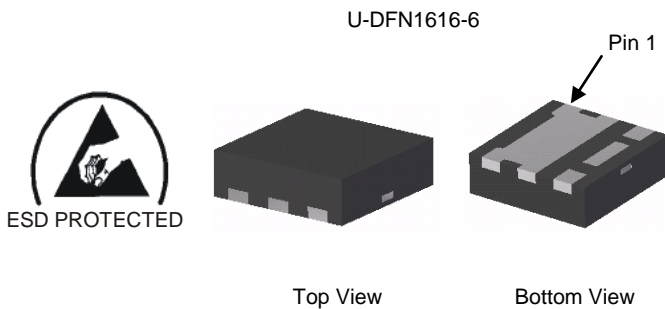
## Summary

| V <sub>DSS</sub> | R <sub>DS(ON)</sub> max       | I <sub>D</sub> max<br>T <sub>A</sub> = +25°C |
|------------------|-------------------------------|--|
| -20V             | 24mΩ @V <sub>GS</sub> = -4.5V | -6.6 A                                       |
|                  | 31mΩ @V <sub>GS</sub> = -2.5V | -5.8 A                                       |

## Applications

This new generation MOSFET is designed to minimize the on-state resistance (R<sub>DS(ON)</sub>) and yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

- Power Management Functions
- Analog Switches

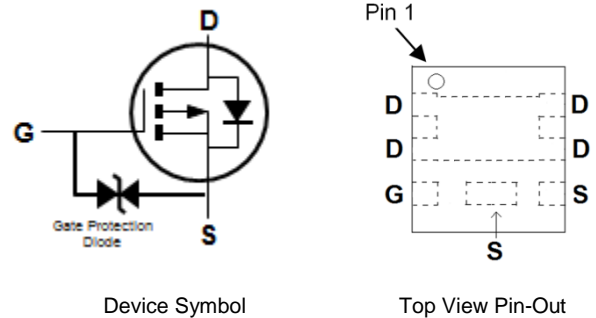


## Features and Benefits

- Typical Off Board Profile of 0.575mm - Ideally Suited for Thin Applications
- Low R<sub>DS(ON)</sub> - Minimizes Conduction Losses
- PCB Footprint of 2.56mm<sup>2</sup>
- ESD Protected Gate 2kV
- **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-DFN1616-6
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Lead Free Plating (NiPdAu Finish over Copper Leadframe).
- Terminals: Solderable per MIL-STD-202, Method 208 (e4)
- Weight: 0.04 grams (Approximate)

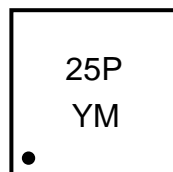


## Ordering Information (Note 4)

| Product       | Case        | Packaging         |
|---------------|-------------|-------------------|
| DMP2035UFCL-7 | U-DFN1616-6 | 3,000/Tape & Reel |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. See [http://www.diodes.com/quality/lead\\_free.html](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.
  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 <http://www.diodes.com>.

## Marking Information



25P = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: C = 2015)  
 M = Month (ex: 9 = September)

### Date Code Key

| Year | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|------|------|------|------|------|------|------|------|
| Code | C    | D    | E    | F    | G    | H    | I    |

| 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  |              |                           | $V_{DSS}$ | -20     | V     |
| Gate-Source Voltage   |              |                           | $V_{GSS}$ | $\pm 8$ | V     |
| Continuous Drain Current (Note 6)                                     | Steady State | $T_A = +25^\circ\text{C}$ | $I_D$     | -6.6    | A     |
|   |              | $T_A = +70^\circ\text{C}$ |           | -5.3    |       |
| Pulsed Drain Current (380 $\mu\text{s}$ Pulse, 1% Duty Cycle)(Note 7) |              |                           | $I_{DM}$  | -40     | A     |
| Maximum Continuous Body Diode Forward Current (Note 6)                |              |                           | $I_S$     | -1.7    | A     |

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

| Characteristic   | Symbol          | Value       | Unit               |
|--|-----------------|-------------|--------------------|
| Power Dissipation (Note 5)   | $P_D$           | 0.74        | W                  |
| Thermal Resistance, Junction to Ambient @ $T_A = +25^\circ\text{C}$ (Note 5) | $R_{\theta JA}$ | 169         | $^\circ\text{C/W}$ |
| Power Dissipation (Note 6)   | $P_D$           | 1.6         | W                  |
| Thermal Resistance, Junction to Ambient @ $T_A = +25^\circ\text{C}$ (Note 6) | $R_{\theta JA}$ | 79          | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range                                      | $T_J, T_{STG}$  | -55 to +150 | $^\circ\text{C}$   |

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

| Characteristic  | Symbol       | Min  | Typ   | Max      | Unit       | Test Condition  |
|---|--------------|------|-------|----------|------------|---|
| <b>OFF CHARACTERISTICS (Note 8)</b>                                 |              |      |       |          |            |   |
| Drain-Source Breakdown Voltage                                      | $BV_{DSS}$   | -20  | -     | -        | V          | $V_{GS} = 0V, I_D = -250\mu A$                                  |
| Zero Gate Voltage Drain Current $T_J = +25^\circ\text{C}$           | $I_{DSS}$    | -    | -     | -1.0     | $\mu A$    | $V_{DS} = -16V, V_{GS} = 0V$                                    |
| Zero Gate Voltage Drain Current $T_J = +150^\circ\text{C}$ (Note 8) | $I_{DSS}$    | -    | -     | -100     | $\mu A$    | $V_{DS} = -16V, V_{GS} = 0V$                                    |
| Gate-Source Leakage   | $I_{GSS}$    | -    | -     | $\pm 10$ | $\mu A$    | $V_{GS} = \pm 8V, V_{DS} = 0V$                                  |
| <b>ON CHARACTERISTICS (Note 8)</b>                                  |              |      |       |          |            |   |
| Gate Threshold Voltage  | $V_{GS(TH)}$ | -0.4 | -     | -1.0     | V          | $V_{DS} = V_{GS}, I_D = -250\mu A$                              |
| Static Drain-Source On-Resistance                                   | $R_{DS(ON)}$ | -    | 19    | 24       | m $\Omega$ | $V_{GS} = -4.5V, I_D = -8.0A$                                   |
|   |              |      | 24    | 31       |            | $V_{GS} = -2.5V, I_D = -7.0A$                                   |
|   |              |      | 31    | 45       |            | $V_{GS} = -1.8V, I_D = -6.0A$                                   |
| Diode Forward Voltage   | $V_{SD}$     | -0.5 | -0.7  | -1.2     | V          | $V_{GS} = 0V, I_S = -1A$  |
| <b>DYNAMIC CHARACTERISTICS (Note 9)</b>                             |              |      |       |          |            |   |
| Input Capacitance   | $C_{iss}$    | -    | 1,610 | 2,200    | pF         | $V_{DS} = -10V, V_{GS} = 0V$<br>$f = 1.0\text{MHz}$             |
| Output Capacitance  | $C_{oss}$    | -    | 157   | 240      | pF         |   |
| Reverse Transfer Capacitance  | $C_{rss}$    | -    | 145   | 220      | pF         |   |
| Gate Resistance   | $R_g$        | -    | 9.45  | 14.5     | $\Omega$   | $V_{DS} = 0V, V_{GS} = 0V, f = 1\text{MHz}$                     |
| Total Gate Charge ( $V_{GS} = -8V$ )                                | $Q_g$        | -    | 29    | 44       | nC         | $V_{DS} = -10V,$<br>$I_D = -4A$                                 |
| Total Gate Charge ( $V_{GS} = -4.5V$ )                              | $Q_g$        | -    | 15.4  | 21       | nC         |   |
| Gate-Source Charge  | $Q_{gs}$     | -    | 2.5   | 3.8      | nC         |   |
| Gate-Drain Charge   | $Q_{gd}$     | -    | 3.3   | 5        | nC         |   |
| Turn-On Delay Time  | $t_{D(ON)}$  | -    | 16.8  | 34       | ns         | $V_{DS} = -20V, V_{GS} = -10V,$<br>$R_G = 6.0\Omega, I_D = -6A$ |
| Turn-On Rise Time   | $t_R$        | -    | 12.4  | 25       | ns         |   |
| Turn-Off Delay Time   | $t_{D(OFF)}$ | -    | 94.1  | 188      | ns         |   |
| Turn-Off Fall Time  | $t_F$        | -    | 42.4  | 85       | ns         |   |

- 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. Repetitive rating, pulse width limited by junction temperature.
  8. Short duration pulse test used to minimize self-heating effect.
  9. Guaranteed by design. Not subject to product testing.

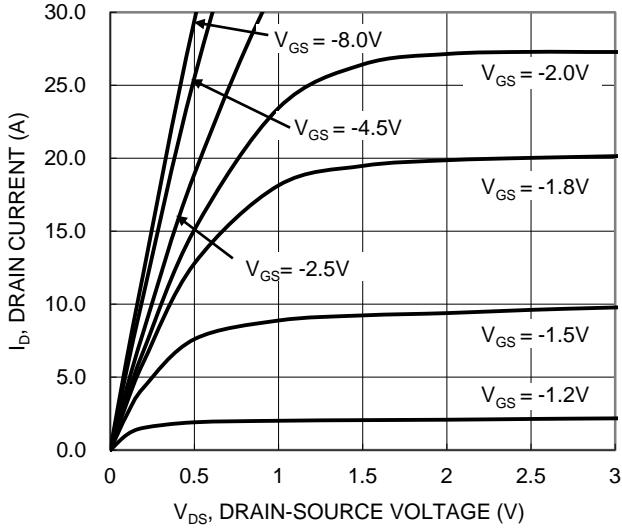


Figure 1. Typical Output Characteristic

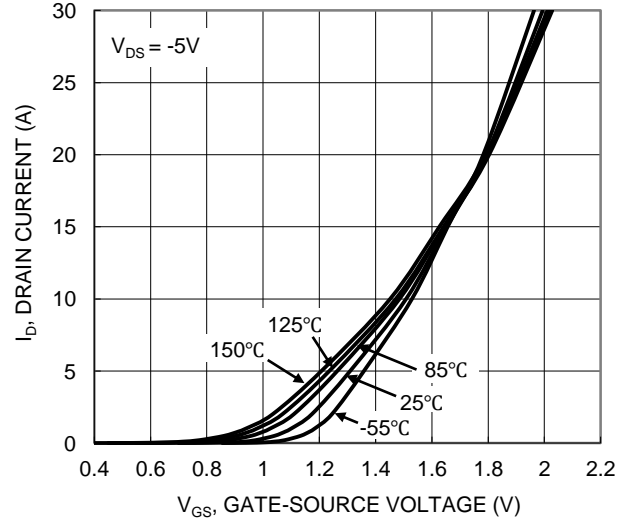


Figure 2. Typical Transfer Characteristic

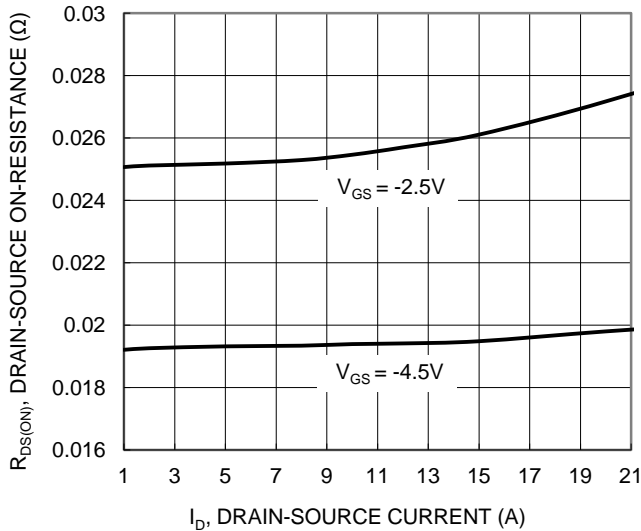


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

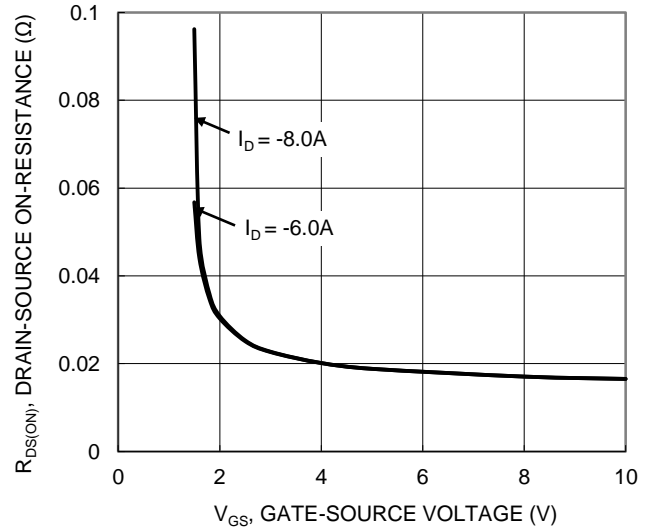


Figure 4. Typical Transfer Characteristic

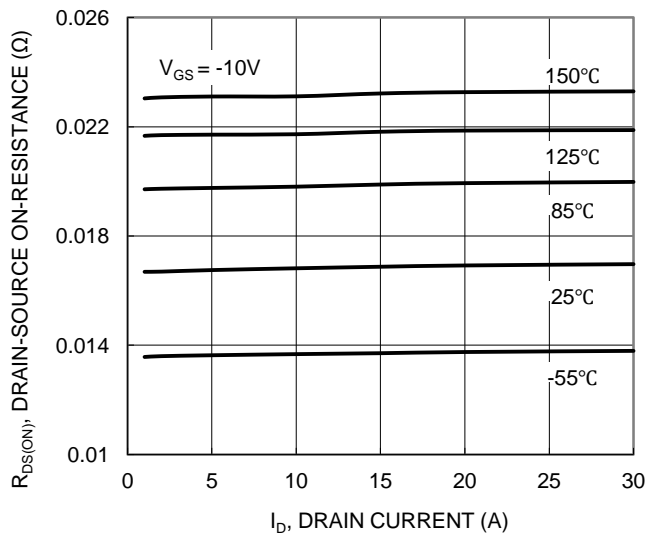


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

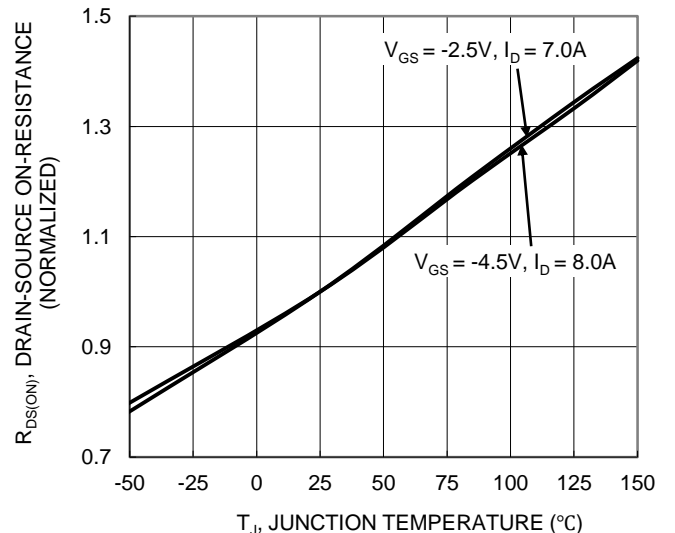


Figure 6. On-Resistance Variation with Junction Temperature

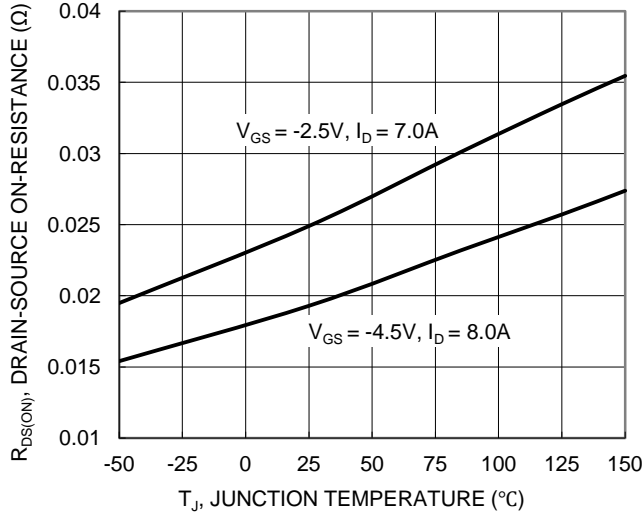


Figure 7. On-Resistance Variation with Junction Temperature

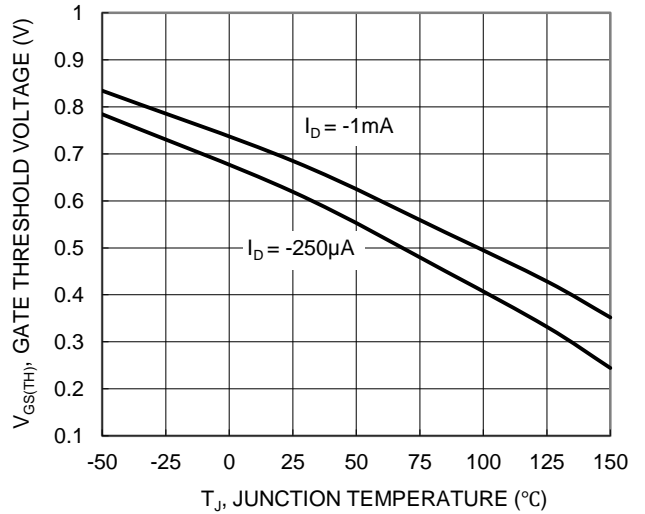


Figure 8. Gate Threshold Variation vs. Junction Temperature

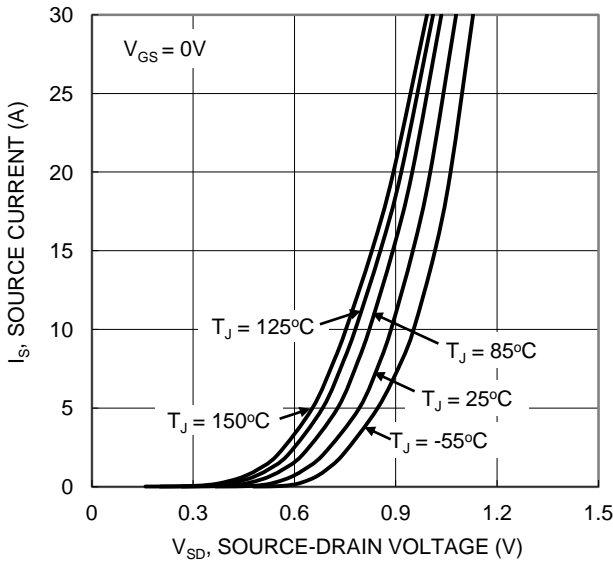


Figure 9. Diode Forward Voltage vs. Current

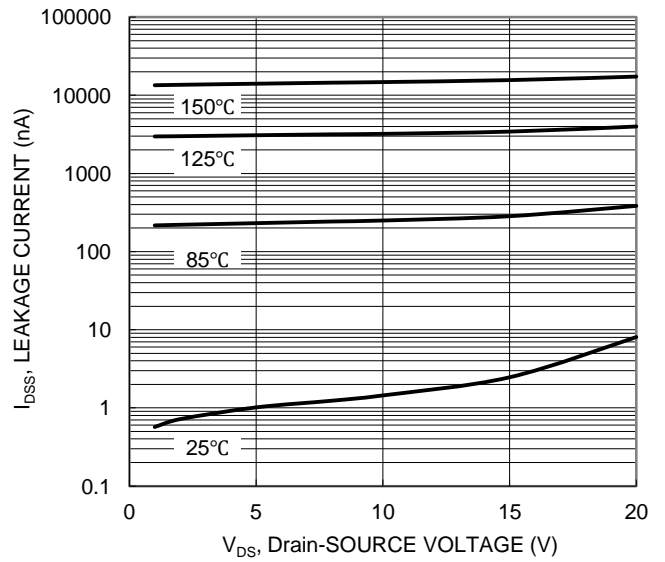


Figure 10. Typical Drain-Source Leakage Current vs. Voltage

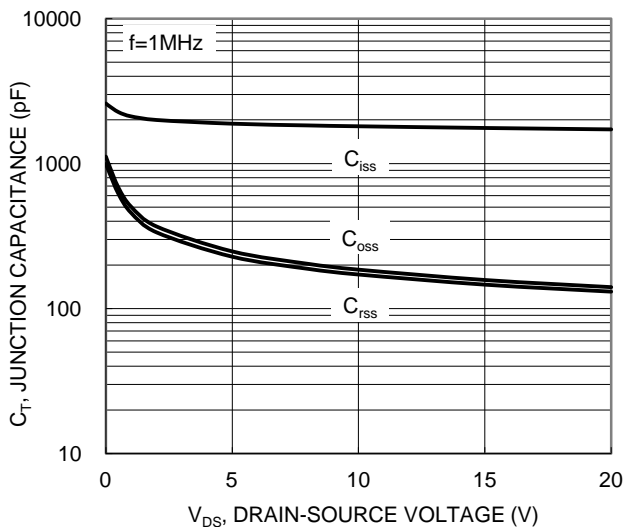


Figure 11. Typical Junction Capacitance

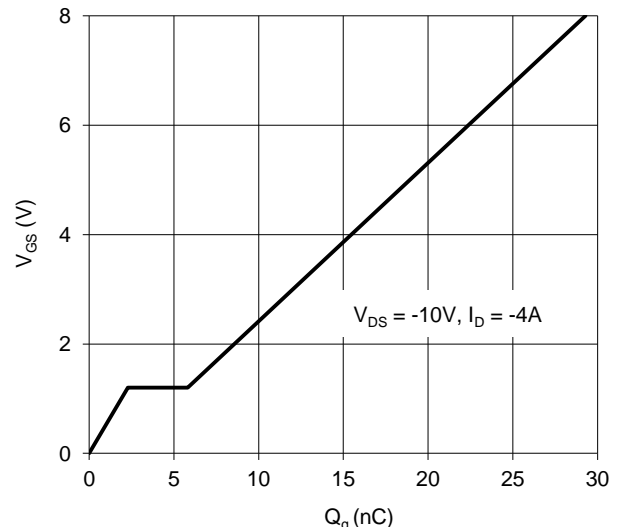
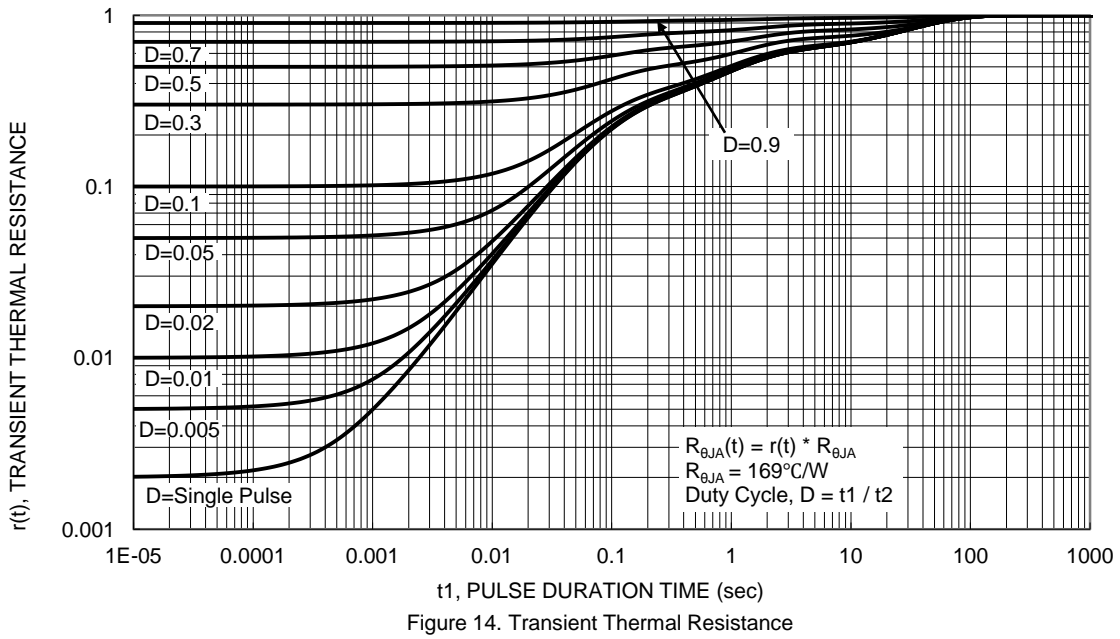
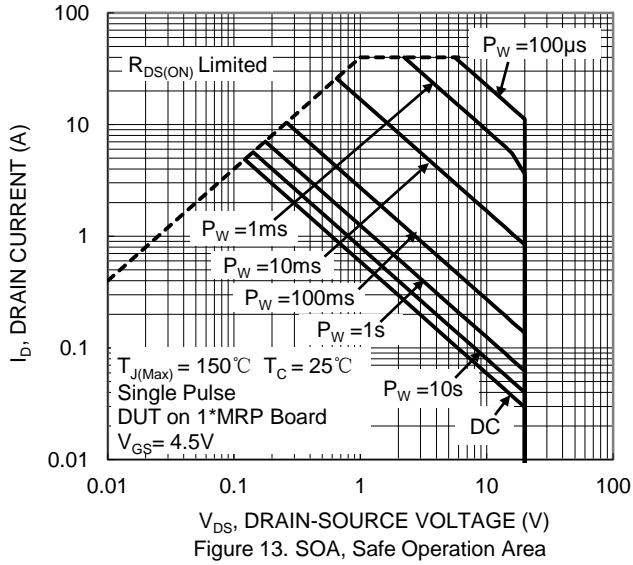
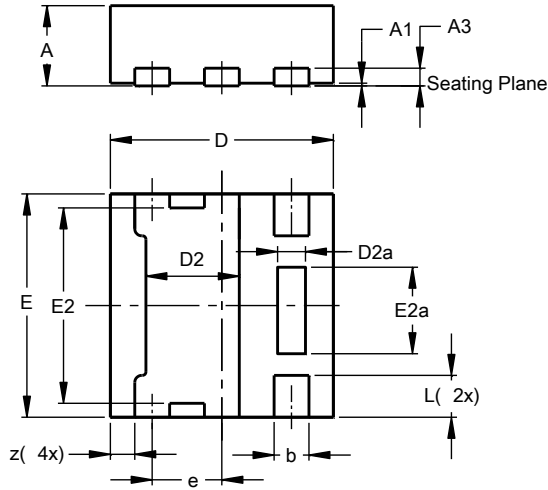


Figure 12. Gate Charge



**Package Outline Dimensions**

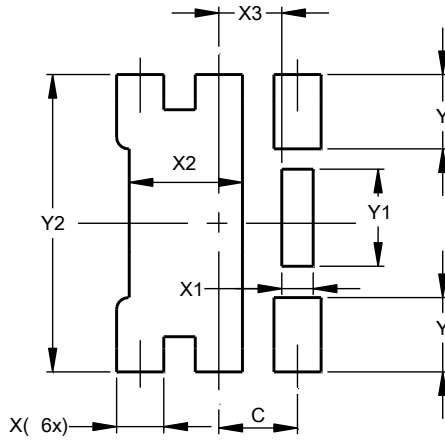
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| U-DFN1616-6<br>(Type K) |      |      |       |
|-------------------------|------|------|-------|
| Dim                     | Min  | Max  | Typ   |
| A                       | 0.55 | 0.60 | 0.575 |
| A1                      | 0.00 | 0.05 | 0.02  |
| A3                      | --   | --   | 0.13  |
| b                       | 0.20 | 0.30 | 0.25  |
| D                       | 1.55 | 1.65 | 1.60  |
| D2                      | 0.57 | 0.77 | 0.67  |
| D2a                     | 0.10 | 0.30 | 0.20  |
| e                       | --   | --   | 0.50  |
| E                       | 1.55 | 1.65 | 1.60  |
| E2                      | 1.30 | 1.50 | 1.40  |
| E2a                     | 0.52 | 0.72 | 0.62  |
| L                       | 0.25 | 0.35 | 0.30  |
| z                       | --   | --   | 0.175 |
| All Dimensions in mm    |      |      |       |

**Suggested Pad Layout**

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



| Dimensions | Value<br>(in mm) |
|------------|------------------|
| C          | 0.500            |
| X          | 0.300            |
| X1         | 0.200            |
| X2         | 0.720            |
| X3         | 0.400            |
| Y          | 0.475            |
| Y1         | 0.620            |
| Y2         | 1.900            |

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