

**Dual P-CHANNEL ENHANCEMENT MODE MOSFET**
**Summary**

| $V_{(BR)DSS}$ | $R_{DS(on)}$ max                  | $I_D$ max |
|---------------|-----------------------------------|-----------|
| -20V          | 260m $\Omega$ @ $V_{GS} = -4.5V$  | -0.9 A    |
|               | 500m $\Omega$ @ $V_{GS} = -2.5V$  |           |
|               | 1000m $\Omega$ @ $V_{GS} = -1.8V$ |           |

**Description**

This MOSFET is 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**

- Battery Disconnect Switch
- Load Switch for Power Management Functions

**Features**

- Low  $R_{DS(on)}$  – Minimizes Conduction Losses
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- ESD Protected Gate**
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**

**Mechanical Data**

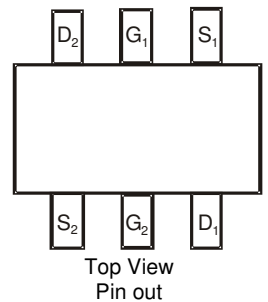
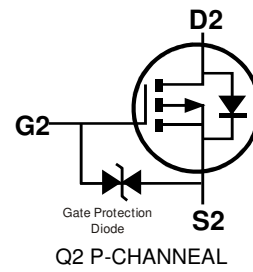
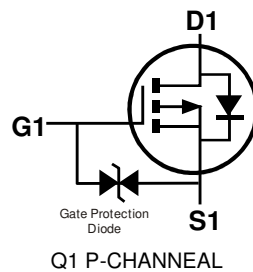
- Case: SOT363
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram
- Terminals: Finish - Matte Tin Annealed over Alloy 42 Leadframe. Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.006 grams (Approximate)



SOT363



Top View

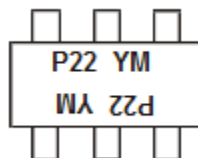

**Ordering Information** (Note 4)

| Part Number   | Case   | Packaging          |
|---------------|--------|--------------------|
| DMP2200UDW-7  | SOT363 | 3,000/Tape & Reel  |
| DMP2200UDW-13 | SOT363 | 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**

SOT363



P22 = Marking Code  
 YM = Date Code Marking  
 Y or Y = Year (ex: B = 2014)  
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|------|------|------|------|------|------|------|------|
| Code | B    | C    | D    | E    | F    | G    | H    |

| 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<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                    | Symbol           | Value                                            | Units |
|-----------------------------------|------------------|--------------------------------------------------|-------|
| Drain-Source Voltage              | V <sub>DSS</sub> | -20                                              | V     |
| Gate-Source Voltage               | V <sub>GSS</sub> | ±8                                               | V     |
| Continuous Drain Current (Note 6) | I <sub>D</sub>   | -0.9<br>-0.7                                     | A     |
|                                   |                  | T <sub>A</sub> = +25°C<br>T <sub>A</sub> = +85°C |       |

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                   | Symbol                            | Value       | Units |
|--------------------------------------------------|-----------------------------------|-------------|-------|
| Total Power Dissipation (Note 5)                 | P <sub>D</sub>                    | 0.45        | W     |
| Total Power Dissipation (Note 6)                 |                                   | 0.6         | W     |
| Thermal Resistance, Junction to Ambient (Note 5) | R <sub>θJA</sub>                  | 275         | °C/W  |
| Thermal Resistance, Junction to Ambient (Note 6) |                                   | 208         |       |
| Thermal Resistance, Junction to Case             | R <sub>θJC</sub>                  | 72          |       |
| Operating and Storage Temperature Range          | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C    |

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                          | Symbol              | Min  | Typ               | Max                 | Unit | Test Condition                                                                                                                                           |
|-----------------------------------------|---------------------|------|-------------------|---------------------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>OFF CHARACTERISTICS (Note 7)</b>     |                     |      |                   |                     |      |                                                                                                                                                          |
| Drain-Source Breakdown Voltage          | BV <sub>DSS</sub>   | -20  | —                 | —                   | V    | V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA                                                                                                             |
| Zero Gate Voltage Drain Current         | I <sub>DSS</sub>    | —    | —                 | -1                  | μA   | V <sub>DS</sub> = -16V, V <sub>GS</sub> = 0V                                                                                                             |
| Gate-Body Leakage                       | I <sub>GSS</sub>    | —    | —                 | ±10                 | μA   | V <sub>GS</sub> = ±8V, V <sub>DS</sub> = 0V                                                                                                              |
| <b>ON CHARACTERISTICS (Note 7)</b>      |                     |      |                   |                     |      |                                                                                                                                                          |
| Gate Threshold Voltage                  | V <sub>GS(th)</sub> | -0.4 | —                 | -1.2                | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA                                                                                              |
| Static Drain-Source On-Resistance       | R <sub>DS(on)</sub> | —    | 180<br>240<br>320 | 260<br>500<br>1,000 | mΩ   | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -0.88A<br>V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -0.71A<br>V <sub>GS</sub> = -1.8V, I <sub>D</sub> = -0.20A |
| Diode Forward Voltage                   | V <sub>SD</sub>     | —    | -0.8              | -1.2                | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = -0.48A                                                                                                            |
| <b>DYNAMIC CHARACTERISTICS (Note 8)</b> |                     |      |                   |                     |      |                                                                                                                                                          |
| Input Capacitance                       | C <sub>iss</sub>    | —    | 184               | —                   | pF   | V <sub>DS</sub> = -10V, V <sub>GS</sub> = 0V<br>f = 1.0MHz                                                                                               |
| Output Capacitance                      | C <sub>oss</sub>    | —    | 26.4              | —                   | pF   |                                                                                                                                                          |
| Reverse Transfer Capacitance            | C <sub>rss</sub>    | —    | 18.5              | —                   | pF   |                                                                                                                                                          |
| Gate Resistance                         | R <sub>g</sub>      | —    | 221               | —                   | Ω    | V <sub>DS</sub> = V <sub>GS</sub> = 0V, f = 1.0MHz                                                                                                       |
| Total Gate Charge                       | Q <sub>g</sub>      | —    | 2.1               | —                   | nC   | V <sub>GS</sub> = -4.5V, V <sub>DS</sub> = -10V,<br>I <sub>D</sub> = -1.7A                                                                               |
| Gate-Source Charge                      | Q <sub>gs</sub>     | —    | 0.4               | —                   | nC   |                                                                                                                                                          |
| Gate-Drain Charge                       | Q <sub>gd</sub>     | —    | 0.5               | —                   | nC   |                                                                                                                                                          |
| Turn-On Delay Time                      | t <sub>D(ON)</sub>  | —    | 9.8               | —                   | ns   | V <sub>DD</sub> = -10V, I <sub>D</sub> = -1.5A,<br>V <sub>GS</sub> = -4.5V, R <sub>GEN</sub> = 1Ω                                                        |
| Turn-Off Delay Time                     | t <sub>D(OFF)</sub> | —    | 24.4              | —                   | ns   |                                                                                                                                                          |
| Turn-On Rise Time                       | t <sub>r</sub>      | —    | 88                | —                   | ns   |                                                                                                                                                          |
| Turn-Off Fall Time                      | t <sub>f</sub>      | —    | 45                | —                   | ns   |                                                                                                                                                          |

- 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.

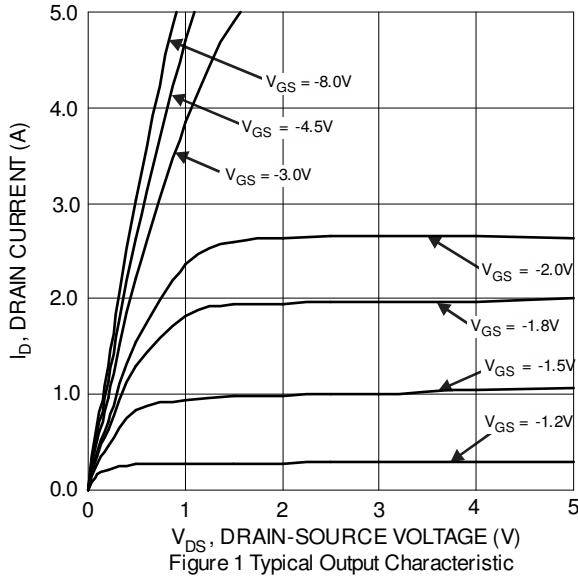


Figure 1 Typical Output Characteristic

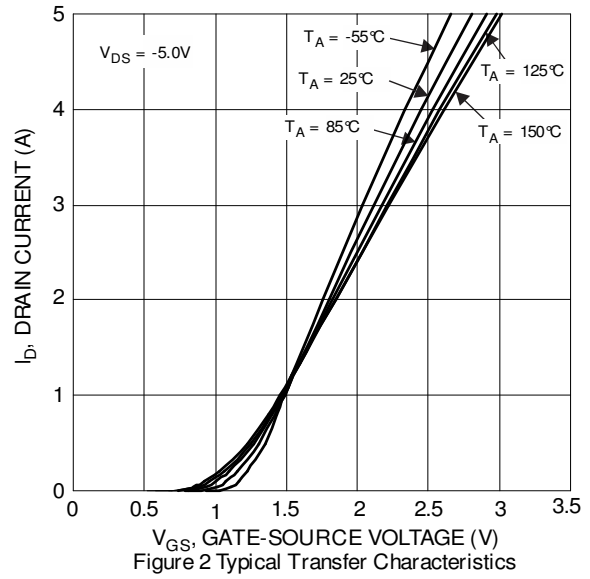


Figure 2 Typical Transfer Characteristics

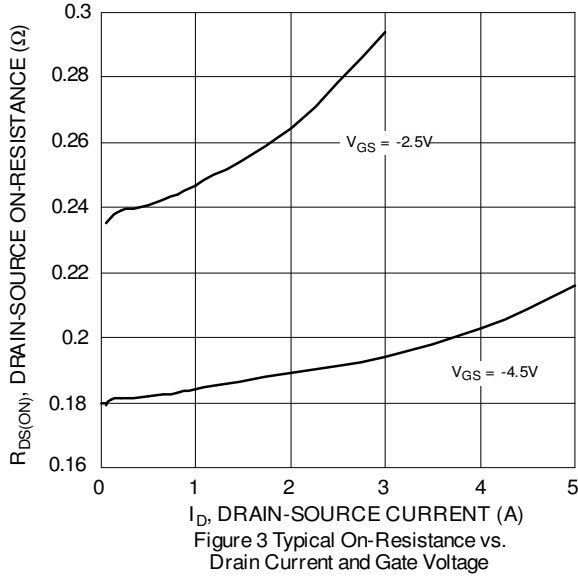


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

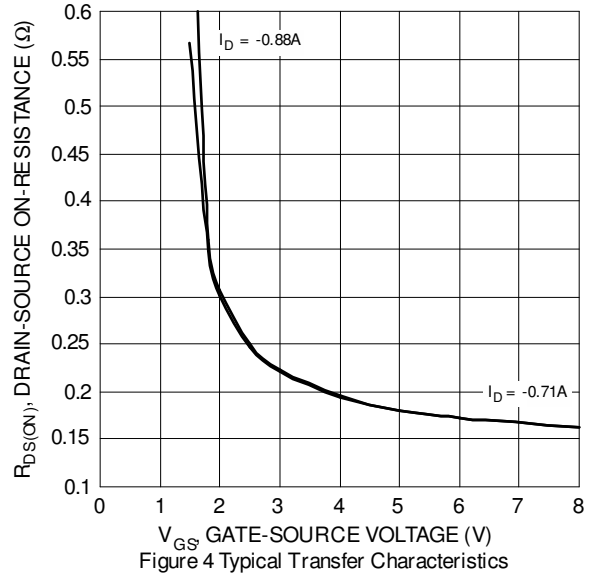


Figure 4 Typical Transfer Characteristics

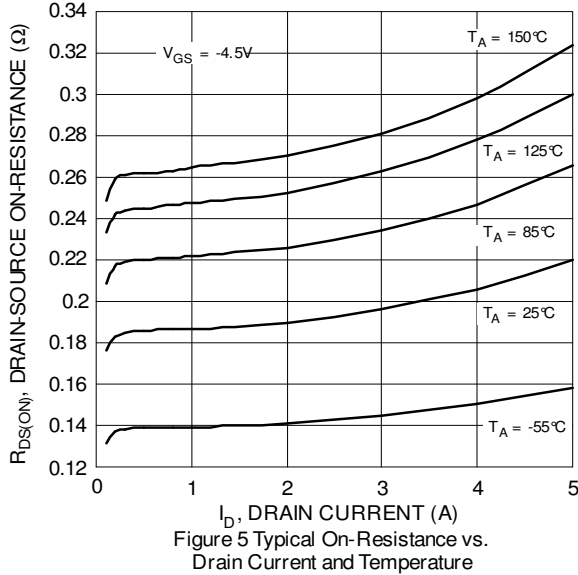


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

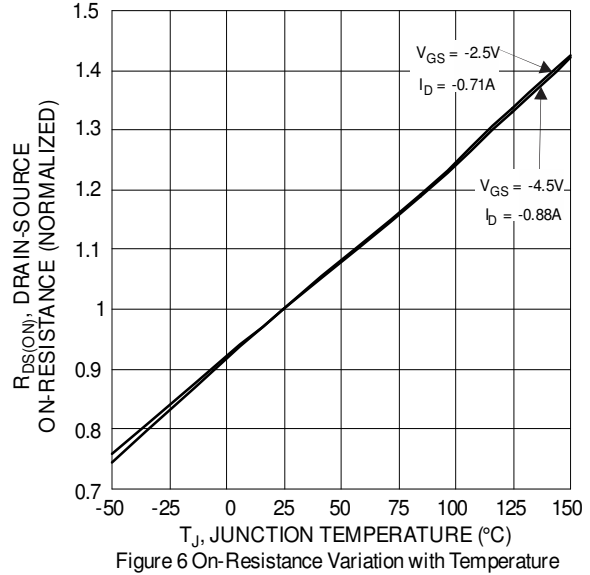
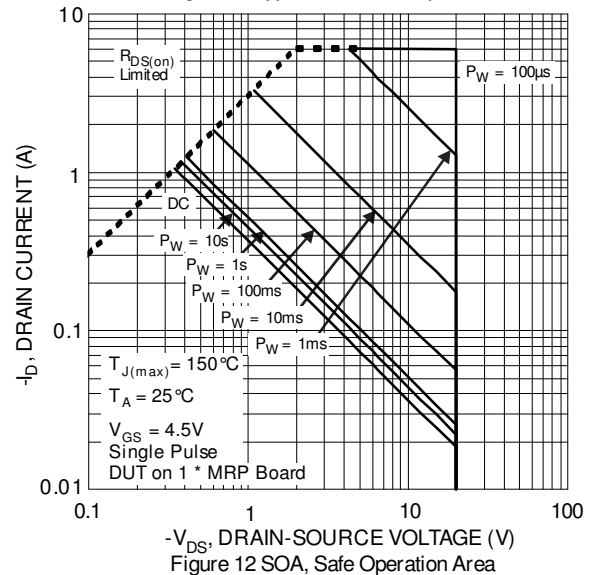
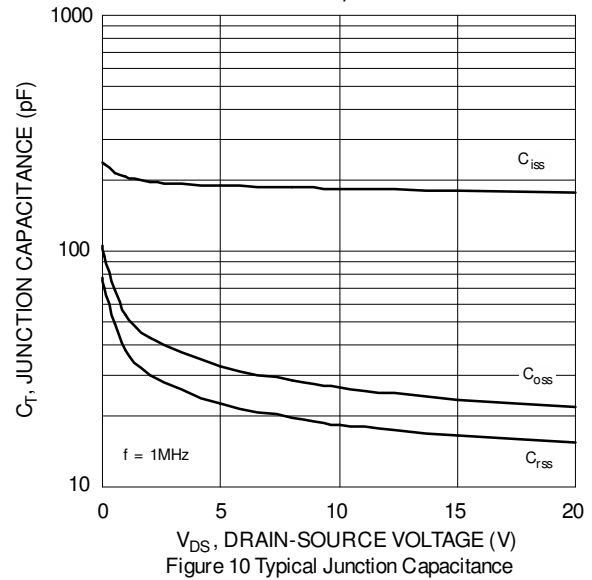
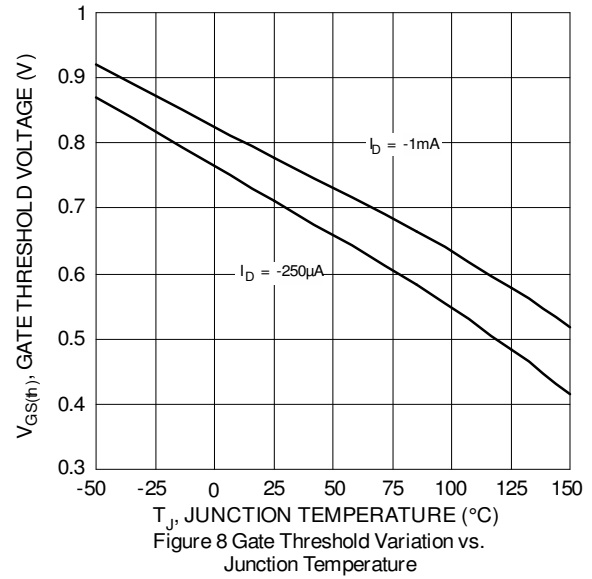
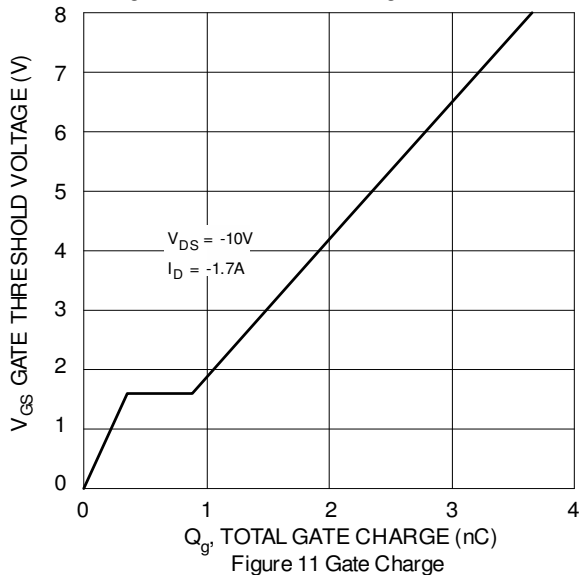
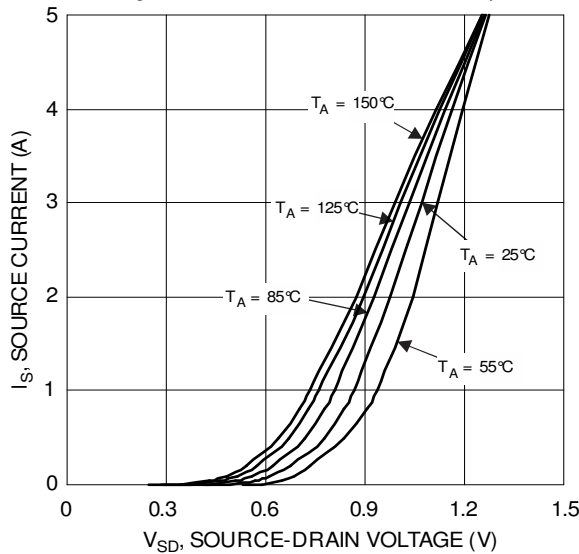
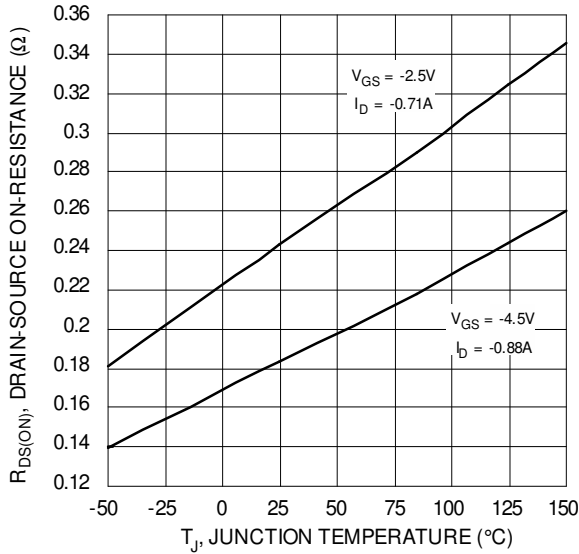
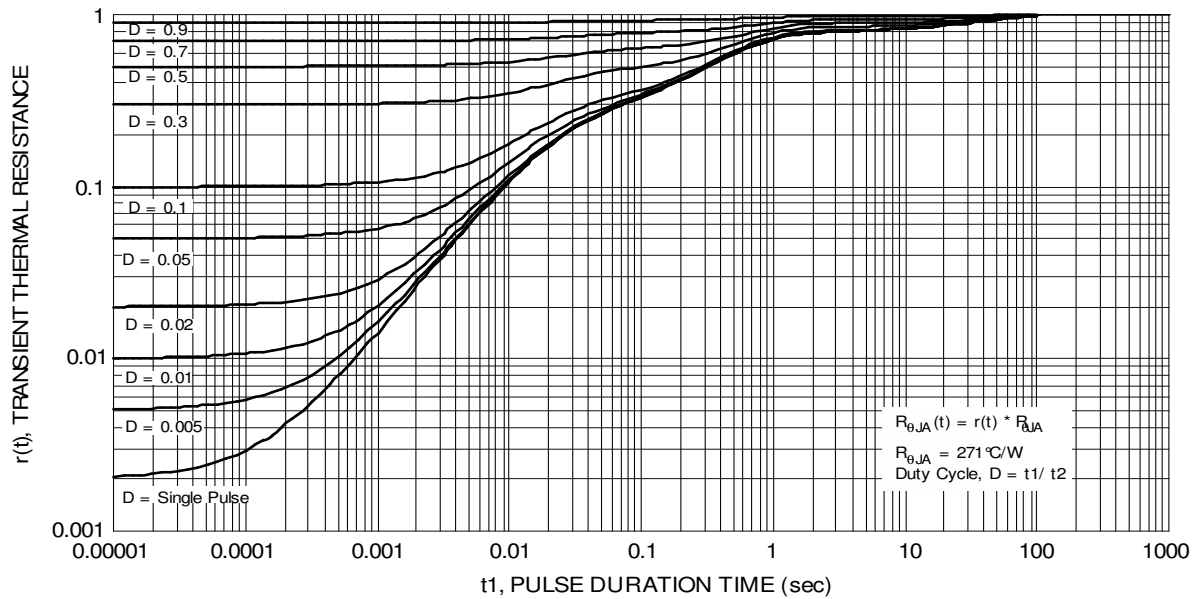


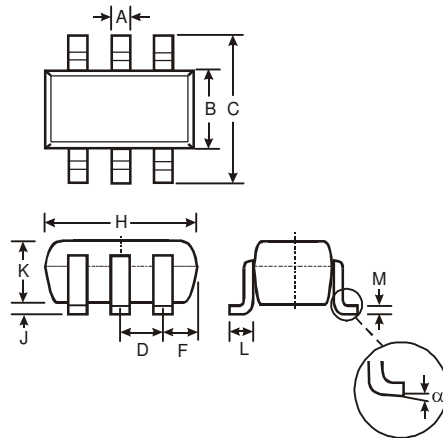
Figure 6 On-Resistance Variation with Temperature





## Package Outline Dimensions

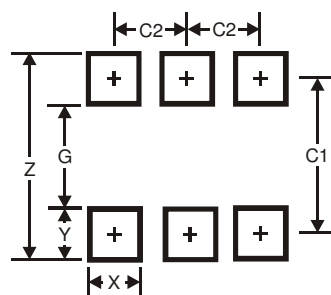
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| SOT363               |          |      |       |
|----------------------|----------|------|-------|
| Dim                  | Min      | Max  | Typ   |
| A                    | 0.10     | 0.30 | 0.25  |
| B                    | 1.15     | 1.35 | 1.30  |
| C                    | 2.00     | 2.20 | 2.10  |
| D                    | 0.65 Typ |      |       |
| F                    | 0.40     | 0.45 | 0.425 |
| H                    | 1.80     | 2.20 | 2.15  |
| J                    | 0        | 0.10 | 0.05  |
| K                    | 0.90     | 1.00 | 1.00  |
| L                    | 0.25     | 0.40 | 0.30  |
| M                    | 0.10     | 0.22 | 0.11  |
| α                    | 0°       | 8°   | -     |
| 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) |
|------------|---------------|
| Z          | 2.5           |
| G          | 1.3           |
| X          | 0.42          |
| Y          | 0.6           |
| C1         | 1.9           |
| C2         | 0.65          |

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