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Dual P-CHANNEL ENHANCEMENT MODE MOSFET
Summary

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

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

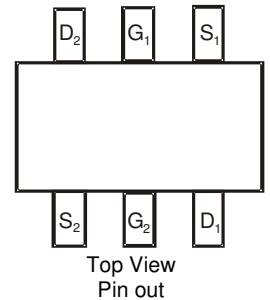
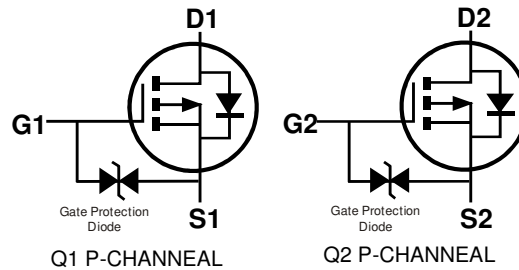
- Case: SOT363
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram
- Terminals: Finish - Matte Tin Annealed over Alloy 42 Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.006 grams (Approximate)



SOT363



Top View

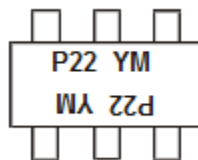

Ordering Information (Note 4)

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

| Characteristic | Symbol | Value | Units |
|-----------------------------------|-----------|---------------------------|-------|
| Drain-Source Voltage | V_{DSS} | -20 | V |
| Gate-Source Voltage | V_{GSS} | ± 8 | V |
| Continuous Drain Current (Note 6) | I_D | $T_A = +25^\circ\text{C}$ | -0.9 |
| | | $T_A = +85^\circ\text{C}$ | -0.7 |

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

| Characteristic | Symbol | Value | Units |
|--|-----------------|-------------|--------------------|
| Total Power Dissipation (Note 5) | P_D | 0.45 | W |
| Total Power Dissipation (Note 6) | | 0.6 | W |
| Thermal Resistance, Junction to Ambient (Note 5) | $R_{\theta JA}$ | 275 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Ambient (Note 6) | | 208 | |
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 72 | |
| 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 |
|---|--------------|------|------|----------|---------------|--|
| OFF CHARACTERISTICS (Note 7) | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | -20 | — | — | V | $V_{GS} = 0V, I_D = 250\mu\text{A}$ |
| Zero Gate Voltage Drain Current | I_{DSS} | — | — | -1 | μA | $V_{DS} = -16V, V_{GS} = 0V$ |
| Gate-Body Leakage | I_{GSS} | — | — | ± 10 | μA | $V_{GS} = \pm 8V, V_{DS} = 0V$ |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | -0.4 | — | -1.2 | V | $V_{DS} = V_{GS}, I_D = -250\mu\text{A}$ |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | — | 180 | 260 | m Ω | $V_{GS} = -4.5V, I_D = -0.88A$ |
| | | — | 240 | 500 | | $V_{GS} = -2.5V, I_D = -0.71A$ |
| | | — | 320 | 1,000 | | $V_{GS} = -1.8V, I_D = -0.20A$ |
| Diode Forward Voltage | V_{SD} | — | -0.8 | -1.2 | V | $V_{GS} = 0V, I_S = -0.48A$ |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C_{iss} | — | 184 | — | pF | $V_{DS} = -10V, V_{GS} = 0V$ $f = 1.0\text{MHz}$ |
| Output Capacitance | C_{oss} | — | 26.4 | — | pF | |
| Reverse Transfer Capacitance | C_{rss} | — | 18.5 | — | pF | |
| Gate Resistance | R_g | — | 221 | — | Ω | $V_{DS} = V_{GS} = 0V, f = 1.0\text{MHz}$ |
| Total Gate Charge | Q_g | — | 2.1 | — | 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 | |
| Turn-On Delay Time | $t_{D(ON)}$ | — | 9.8 | — | ns | $V_{DD} = -10V, I_D = -1.5A,$ $V_{GS} = -4.5V, R_{GEN} = 1\Omega$ |
| Turn-Off Delay Time | $t_{D(OFF)}$ | — | 24.4 | — | ns | |
| Turn-On Rise Time | t_r | — | 88 | — | ns | |
| Turn-Off Fall Time | t_f | — | 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.

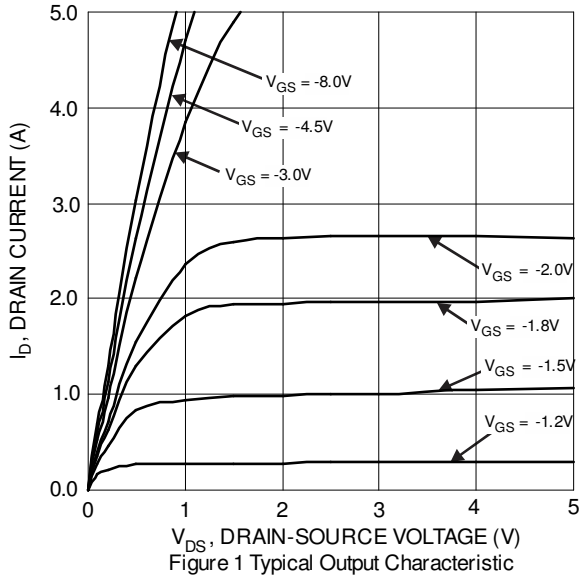


Figure 1 Typical Output Characteristic

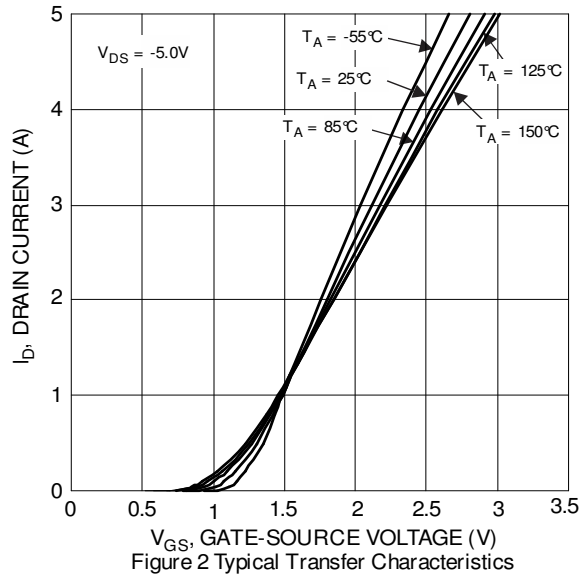


Figure 2 Typical Transfer Characteristics

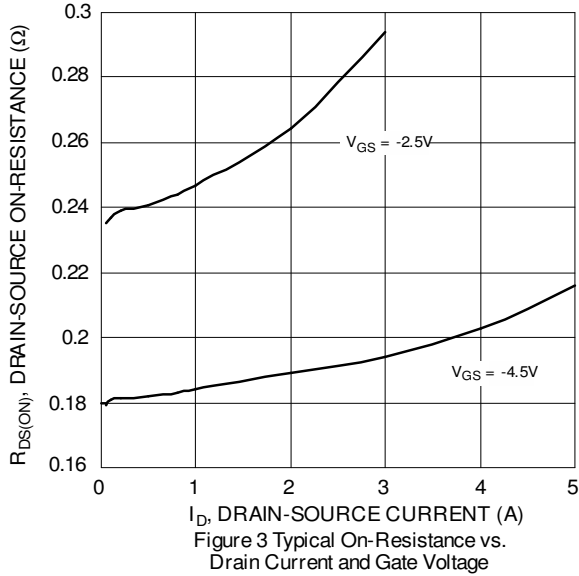


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

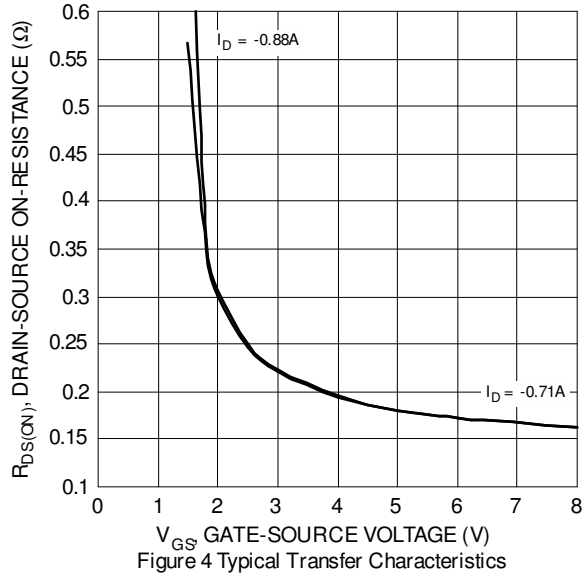


Figure 4 Typical Transfer Characteristics

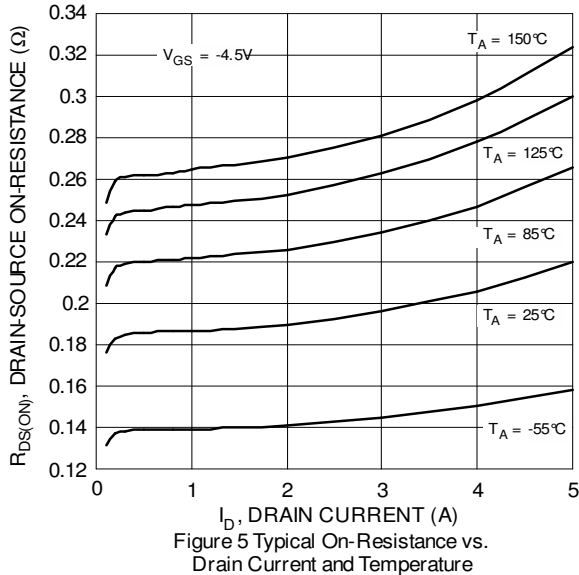


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

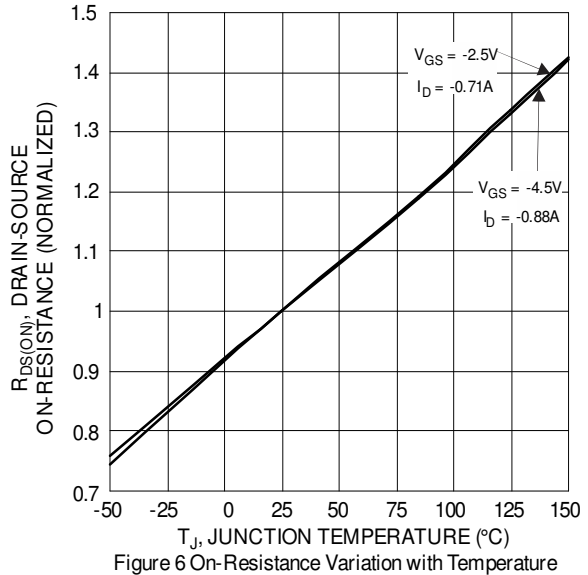


Figure 6 On-Resistance Variation with Temperature

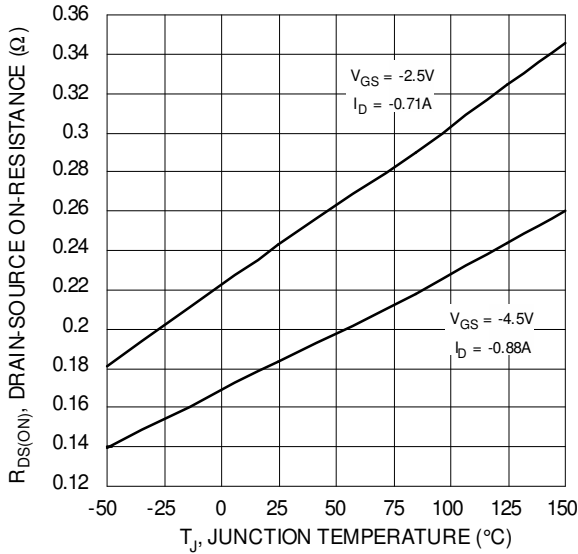


Figure 7 On-Resistance Variation with Temperature

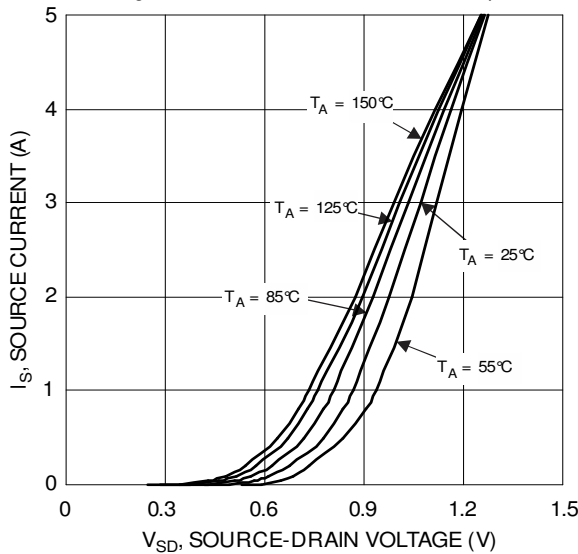


Figure 9 Diode Forward Voltage vs. Current

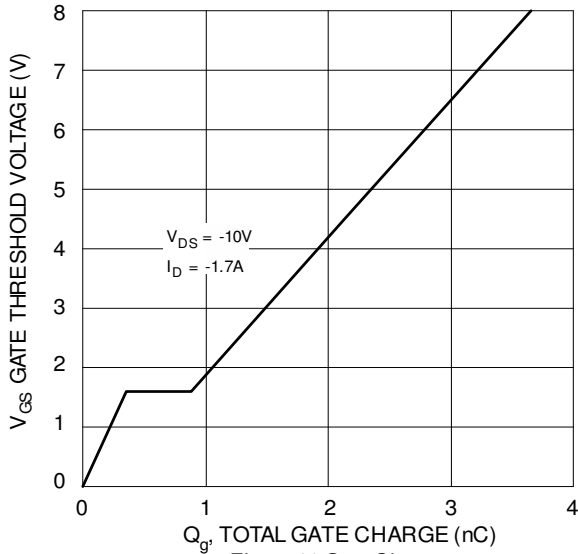


Figure 11 Gate Charge

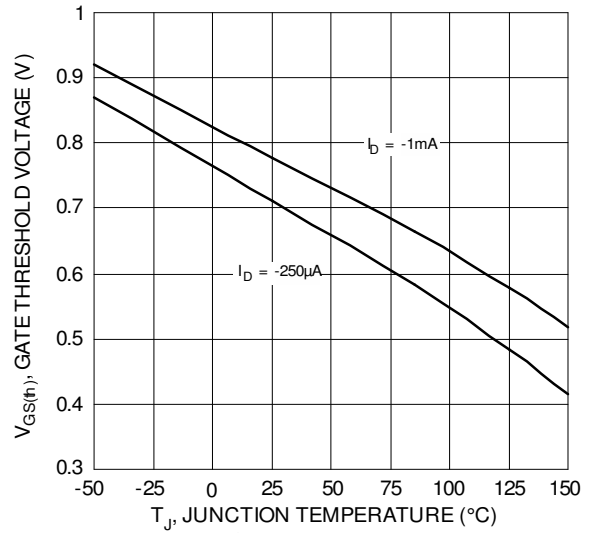


Figure 8 Gate Threshold Variation vs. Junction Temperature

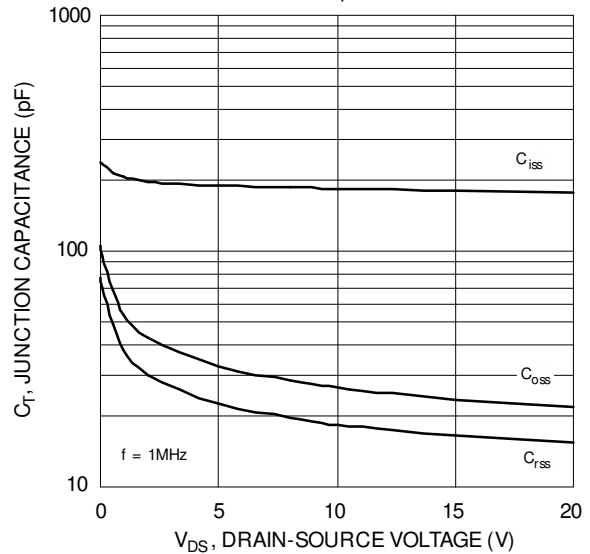


Figure 10 Typical Junction Capacitance

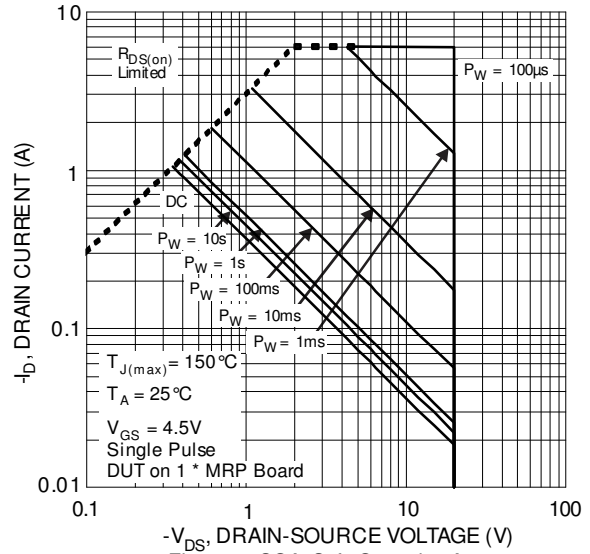
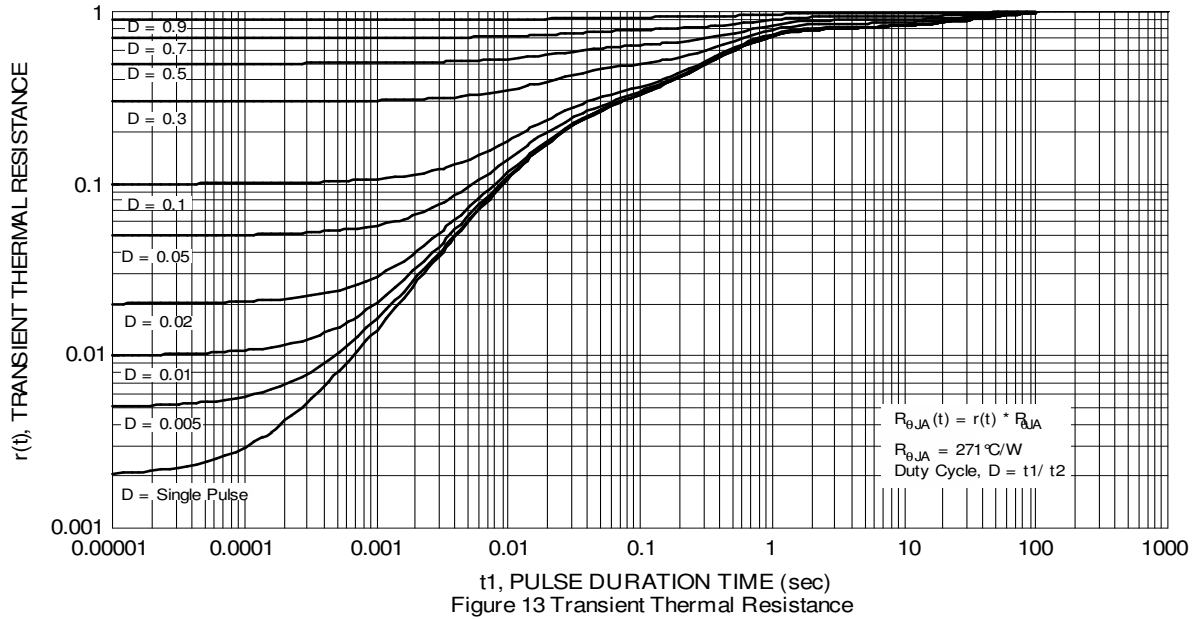
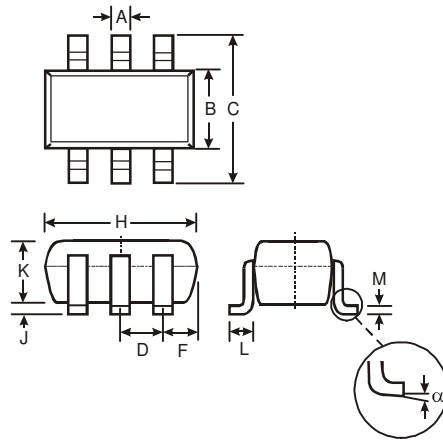


Figure 12 SOA, Safe Operation Area



Package Outline Dimensions

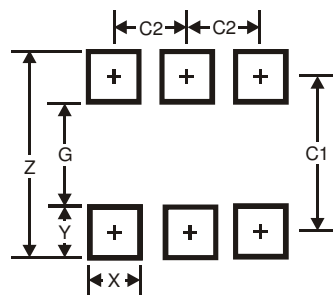
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| 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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