

Product Summary

| BV_{DSS} | $R_{DS(ON)}$ Max | I_D $T_A = +25^\circ C$ |
|------------|---------------------------------|------------------------------|
| -12V | 50m Ω @ $V_{GS} = -4.5V$ | -4.8A |
| | 65m Ω @ $V_{GS} = -2.5V$ | -4.2A |

Description

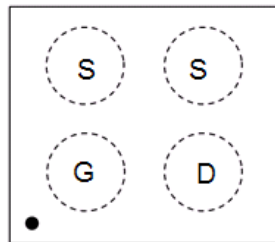
This new generation MOSFET has been designed to minimize the on-state resistance ($R_{DS(ON)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications. It is a high performance MOSFET in ultra-small 0.8mm x 0.8mm package.

Applications

- Portable Applications
- Load Switch
- Power Management Functions



X2-WLB0808-4 (Type C)



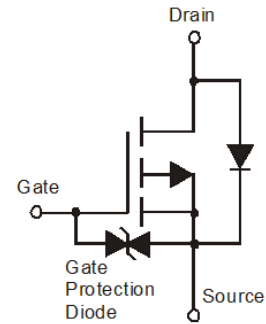
Top View

Features and Benefits

- Ultra Small 0.8mm x 0.8mm Package
- Built-in G-S Protection Diode Against ESD
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

- Case: X2-WLB0808-4
- Terminal Connections: See Diagram Below
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — SnAgCu. Solderable per MIL-STD-202 Method 208 (e1)
- Weight: 0.0011 grams (Approximate)



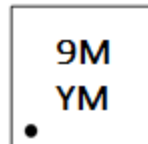
EQUIVALENT CIRCUIT

Ordering Information (Note 4)

| Part Number | Case | Packaging |
|---------------|-----------------------|------------------|
| DMP1045UCB4-7 | X2-WLB0808-4 (Type C) | 3000/Tape & Reel |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. 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.
 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



9M = Product Type Marking Code
 YM = Date Code Marking
 Y or \bar{Y} = Year (ex: G = 2019)
 M or \bar{M} = Month (ex: 9 = September)

Date Code Key

| Year | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|------|------|------|------|------|------|------|------|
| Code | 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} | -12 | V |
| Gate-Source Voltage | | | V _{GSS} | ±8 | V |
| Continuous Drain Current (Note 7) V _{GS} = -4.5V | Steady State | T _A = +25°C | I _D | -2.6 | A |
| | | T _A = +70°C | | -2.1 | |
| Continuous Drain Current (Note 5) V _{GS} = -4.5V | Steady State | T _A = +25°C | I _D | -4.8 | A |
| | | T _A = +70°C | | -3.8 | |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation (Note 7) | P _D | 0.53 | W |
| Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 7) | R _{θJA} | 238 | °C/W |
| Power Dissipation (Note 5) | P _D | 1.75 | W |
| Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 5) | R _{θJA} | 71 | °C/W |
| 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 8) | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | -12 | — | — | V | V _{GS} = 0V, I _D = -250μA |
| Zero Gate Voltage Drain Current T _J = +25°C | I _{DSS} | — | — | -1 | μA | V _{DS} = -9.6V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | — | — | ±10 | μA | V _{GS} = ±8V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 8) | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | -0.3 | -0.67 | -1.0 | V | V _{DS} = V _{GS} , I _D = -250μA |
| Static Drain-Source On-Resistance | R _{DS(ON)} | — | 42 | 50 | mΩ | V _{GS} = -4.5V, I _D = -2A |
| | | — | 51 | 65 | | V _{GS} = -2.5V, I _D = -2A |
| | | — | 67 | 100 | | V _{GS} = -1.8V, I _D = -1A |
| Diode Forward Voltage | V _{SD} | — | -0.7 | -1.2 | V | V _{GS} = 0V, I _S = -1.5A |
| DYNAMIC CHARACTERISTICS (Note 9) | | | | | | |
| Input Capacitance | C _{iss} | — | 535 | — | pF | V _{DS} = -6V, V _{GS} = 0V, f = 1.0MHz |
| Output Capacitance | C _{oss} | — | 136 | — | | |
| Reverse Transfer Capacitance | C _{rss} | — | 70 | — | | |
| Total Gate Charge | Q _g | — | 6.1 | — | nC | V _{GS} = -4.5V, V _{DD} = -6V, I _D = -2A |
| Gate-Source Charge | Q _{gs} | — | 0.4 | — | | |
| Gate-Drain Charge | Q _{gd} | — | 2.0 | — | | |
| Turn-On Delay Time | t _{D(ON)} | — | 28.8 | — | ns | V _{DD} = -6V, I _D = -2A V _{GEN} = -4.5V, R _g = 3Ω |
| Turn-On Rise Time | t _R | — | 11.3 | — | | |
| Turn-Off Delay Time | t _{D(OFF)} | — | 115.0 | — | | |
| Turn-Off Fall Time | t _F | — | 44.6 | — | | |

- Notes:
- Device mounted on FR-4 material with 1-inch² (6.45-cm²), 2-oz. (0.071-mm thick) Cu.
 - Repetitive rating, pulse width limited by junction temperature.
 - Device mounted on FR-4 PCB with minimum recommended pad layout, single sided.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to production testing.

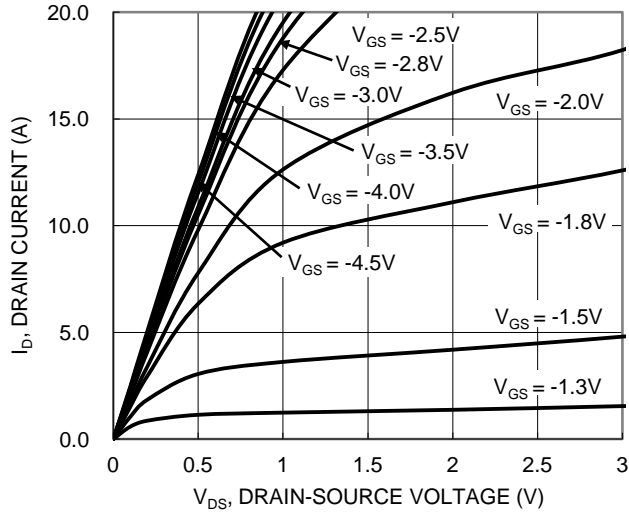


Figure 1. Typical Output Characteristic

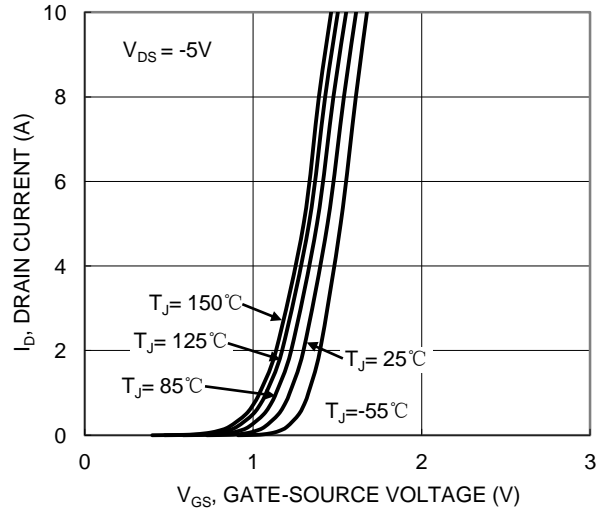


Figure 2. Typical Transfer Characteristic

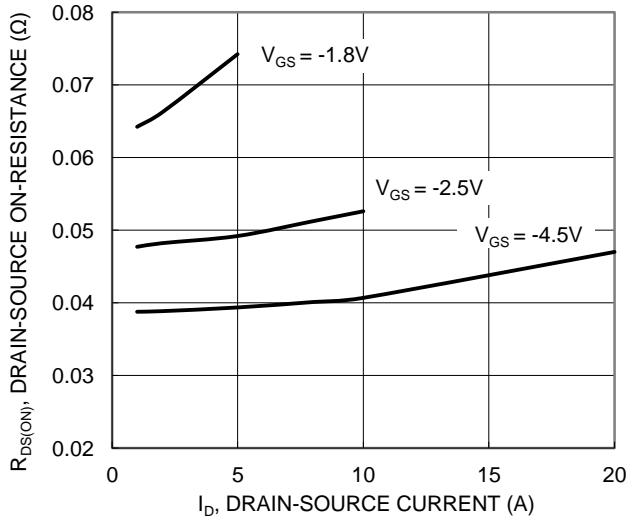


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

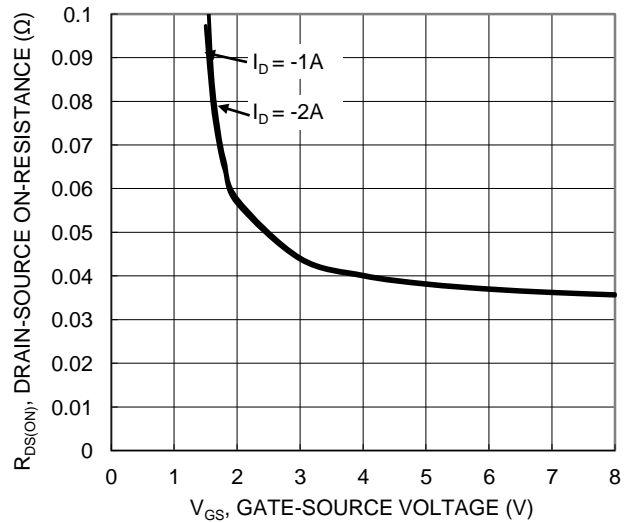


Figure 4. Typical Transfer Characteristic

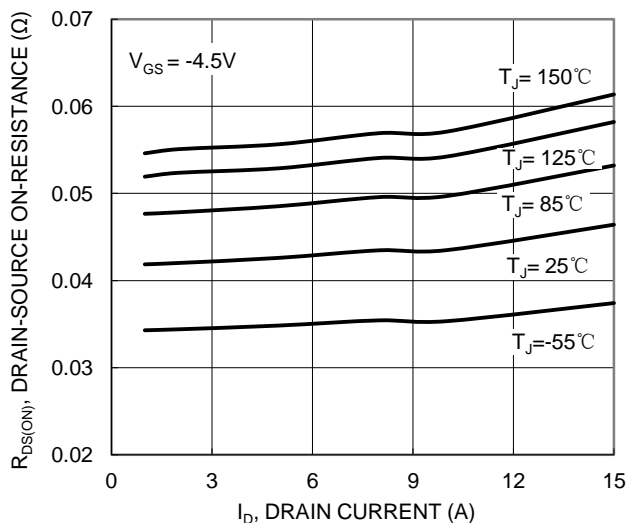


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

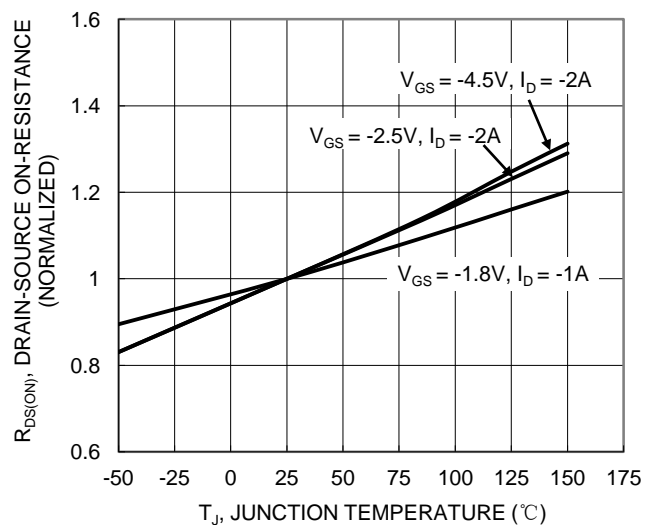


Figure 6. On-Resistance Variation with Temperature

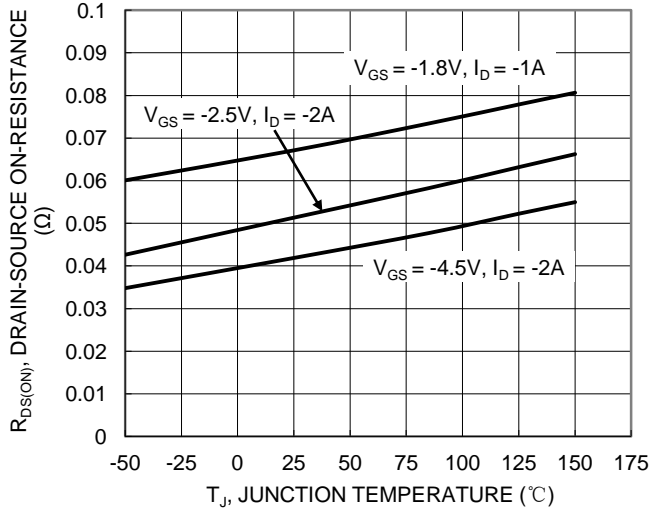


Figure 7. On-Resistance Variation with Temperature

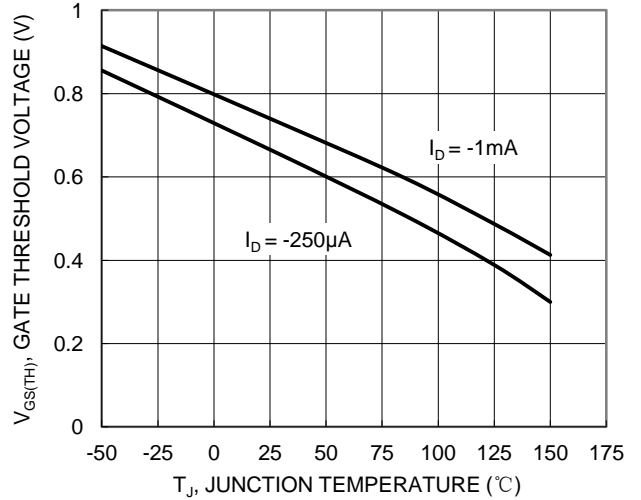


Figure 8. Gate Threshold Variation vs. Junction Temperature

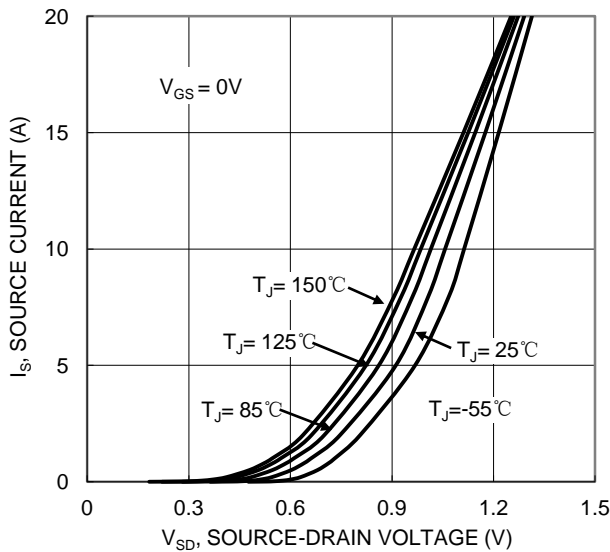


Figure 9. Diode Forward Voltage vs. Current

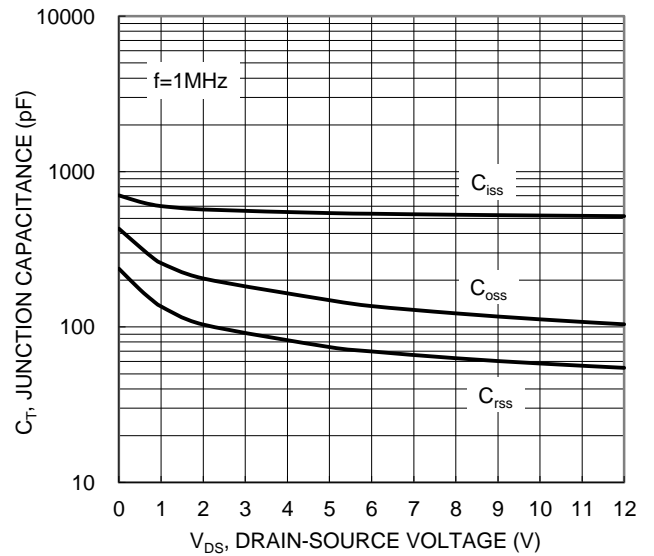


Figure 10. Typical Junction Capacitance

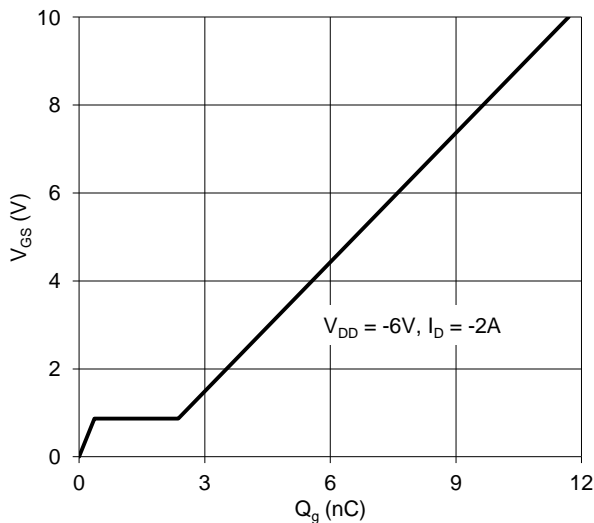


Figure 11. Gate Charge

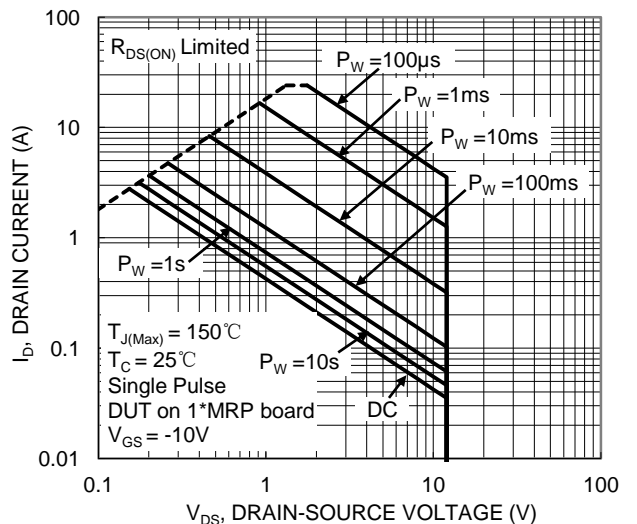


Figure 12. SOA, Safe Operation Area

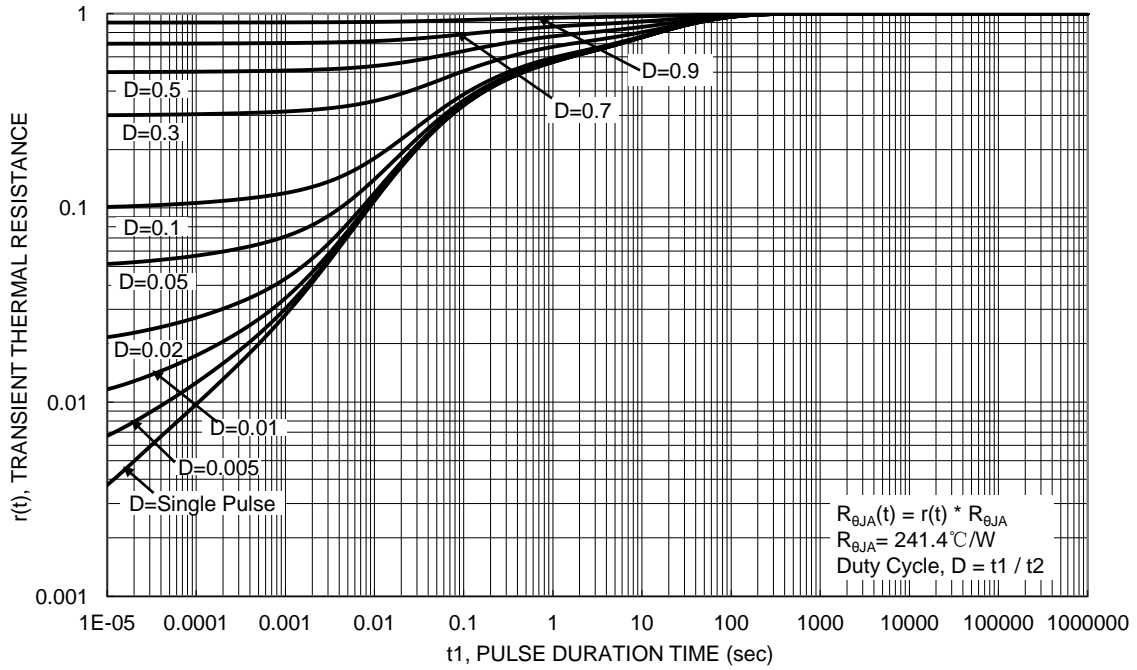
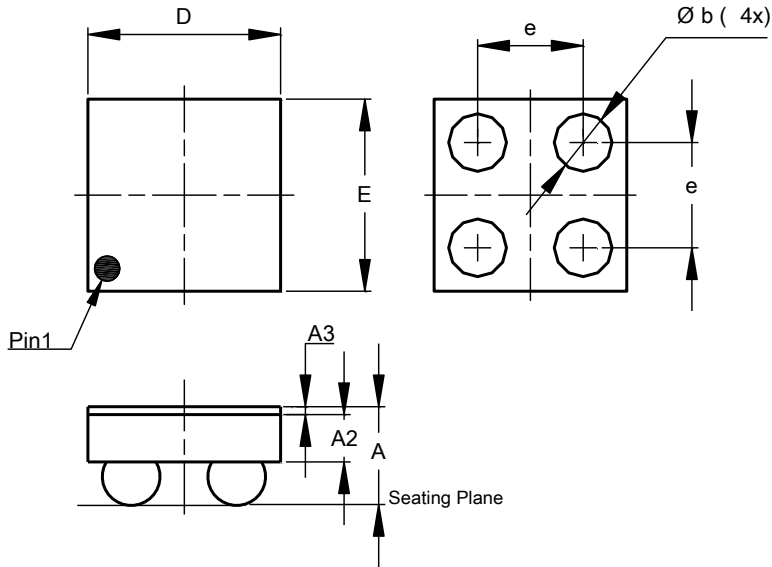


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

X2-WLB0808-4 (Type C)

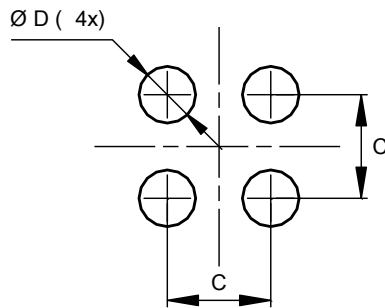


| X2-WLB0808-4 (Type C) | | | |
|--------------------------|--------|--------|--------|
| Dim | Min | Max | Typ |
| A | -- | 0.4000 | 0.3750 |
| A2 | -- | -- | 0.1800 |
| A3 | 0.0200 | 0.0300 | 0.0250 |
| b | 0.1971 | 0.2409 | 0.2190 |
| D | 0.7400 | 0.8000 | 0.7700 |
| E | 0.7400 | 0.8000 | 0.7700 |
| e | -- | -- | 0.4000 |
| All Dimensions in mm | | | |

Suggested Pad Layout

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

X2-WLB0808-4 (Type C)



| Dimensions | Value (in mm) |
|------------|------------------|
| C | 0.400 |
| D | 0.219 |

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