

Product Summary

| BV_{DSS} | $R_{DS(ON)}$ Max | I_D $T_C = +25^\circ C$ |
|------------|---------------------------------|------------------------------|
| 60V | 5.7m Ω @ $V_{GS} = 10V$ | 64.6A |
| | 8.1m Ω @ $V_{GS} = 4.5V$ | 54.2A |

Description and Applications

This MOSFET is designed to meet the stringent requirements of Automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

- Synchronous Rectifier
- Power Management Functions
- DC-DC Converters

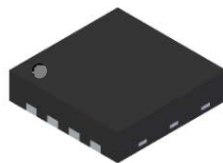
Features and Benefits

- 100% Unclamped Inductive Switching (UIS) Test in Production – Ensures More Reliable And Robust End Application
- High Conversion Efficiency
- Low $R_{DS(ON)}$ – Minimizes On State Losses
- Low Input Capacitance
- Fast Switching Speed
- ESD Protected Gate
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DMT67M8LCGQ is suitable for automotive applications requiring specific change control and is AEC-Q101 qualified, is PPAP capable, and is manufactured in IATF16949:2016 certified facilities.**

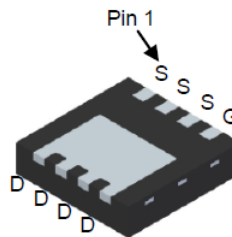
Mechanical Data

- Case: V-DFN3333-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Below Diagram
- Terminals: Finish—NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208 E4
- Weight: 0.027 grams (Approximate)

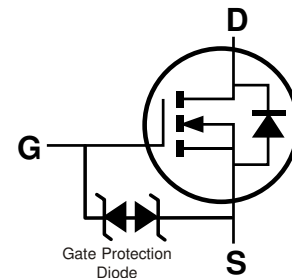
V-DFN3333-8 (Type B)



Top View



Bottom View



Equivalent Circuit

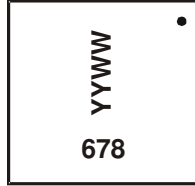
Ordering Information (Note 4)

| Part Number | Case | Packaging |
|----------------|----------------------|-------------------|
| DMT67M8LCGQ-7 | V-DFN3333-8 (Type B) | 2,000/Tape & Reel |
| DMT67M8LCGQ-13 | V-DFN3333-8 (Type B) | 3,000/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/>.

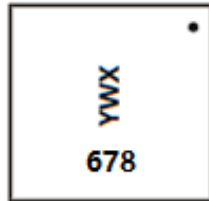
Marking Information

Site1:



678 = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Year (ex: 19 = 2019)
 WW = Week (01 to 53)

Site2:



678 = Product Type Marking Code
 YWX = Date Code Marking
 Y = Year (ex: 9 = 2019)
 W = Week (ex: a = Week 27; z Represents Week 52 and 53)
 X = Internal Code (ex: U = Monday)

Date Code Key

| Year | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|------|------|------|------|------|------|------|------|------|------|
| Code | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 |

| 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°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit | |
|---|------------------|--|--------------|---|
| Drain-Source Voltage | V _{DSS} | 60 | V | |
| Gate-Source Voltage | V _{GSS} | ±20 | V | |
| Continuous Drain Current, V _{GS} = 10V (Note 6) | I _D | T _A = +25°C T _A = +70°C | 16 12.8 | A |
| Continuous Drain Current, V _{GS} = 10V (Note 7) | | T _C = +25°C T _C = +70°C | 64.6 51.7 | A |
| Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%) | I _{DM} | 256 | A | |
| Maximum Continuous Body Diode Forward Current (Note 6) | I _S | 64 | A | |
| Pulsed Body Diode Forward Current (10µs Pulse, Duty Cycle = 1%) | I _{SM} | 256 | A | |
| Avalanche Current, L=0.3mH | I _{AS} | 23.7 | A | |
| Avalanche Energy, L=0.3mH | E _{AS} | 84.5 | mJ | |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit | |
|--|-----------------------------------|------------------------|------|------|
| Total Power Dissipation (Note 5) | P _D | T _A = +25°C | 0.9 | W |
| Thermal Resistance, Junction to Ambient (Note 5) | | R _{θJA} | 138 | °C/W |
| Total Power Dissipation (Note 6) | P _D | T _A = +25°C | 2.2 | W |
| Thermal Resistance, Junction to Ambient (Note 6) | | R _{θJA} | 57 | °C/W |
| Thermal Resistance, Junction to Case (Note 7) | R _{θJC} | 3.5 | °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} | 60 | — | — | V | V _{GS} = 0V, I _D = 1mA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | 1 | µA | V _{DS} = 48V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | — | — | ±10 | µA | V _{GS} = ±20V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 8) | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | 1.2 | — | 2.5 | V | V _{DS} = V _{GS} , I _D = 250µA |
| Static Drain-Source On-Resistance | R _{DS(ON)} | — | 4.3 | 5.7 | mΩ | V _{GS} = 10V, I _D = 20A |
| | | — | 6.1 | 8.1 | | V _{GS} = 4.5V, I _D = 18A |
| Diode Forward Voltage | V _{SD} | — | 0.8 | 1.2 | V | V _{GS} = 0V, I _S = 13.5A |
| DYNAMIC CHARACTERISTICS (Note 9) | | | | | | |
| Input Capacitance | C _{iSS} | — | 2130 | — | pF | V _{DS} = 30V, V _{GS} = 0V, f = 1MHz |
| Output Capacitance | C _{oSS} | — | 786 | — | | |
| Reverse Transfer Capacitance | C _{rSS} | — | 70 | — | | |
| Gate Resistance | R _g | — | 0.6 | — | Ω | V _{DS} = 0V, V _{GS} = 0V, f = 1MHz |
| Total Gate Charge (V _{GS} = 4.5V) | Q _g | — | 20 | — | nC | V _{DS} = 30V, I _D = 20A |
| Total Gate Charge (V _{GS} = 10V) | Q _g | — | 37.5 | — | | |
| Gate-Source Charge | Q _{gs} | — | 5.4 | — | | |
| Gate-Drain Charge | Q _{gd} | — | 9.5 | — | | |
| Turn-On Delay Time | t _{D(ON)} | — | 5.5 | — | ns | V _{DD} = 30V, V _{GS} = 10V, I _D = 20A, R _G = 3Ω |
| Turn-On Rise Time | t _r | — | 6.8 | — | | |
| Turn-Off Delay Time | t _{D(OFF)} | — | 22.1 | — | | |
| Turn-Off Fall Time | t _f | — | 10.8 | — | | |
| Reverse Recovery Time | t _{RR} | — | 26.9 | — | ns | I _F = 20A, di/dt = 300A/µs |
| Reverse Recovery Charge | Q _{RR} | — | 56.8 | — | nC | |

- 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. Thermal resistance from junction to soldering point (on the exposed drain pad).
 8. Short duration pulse test used to minimize self-heating effect.
 9. Guaranteed by design. Not subject to product testing.

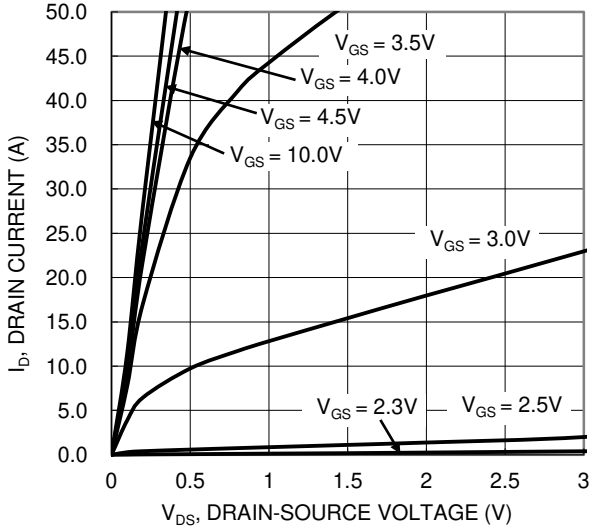


Figure 1. Typical Output Characteristic

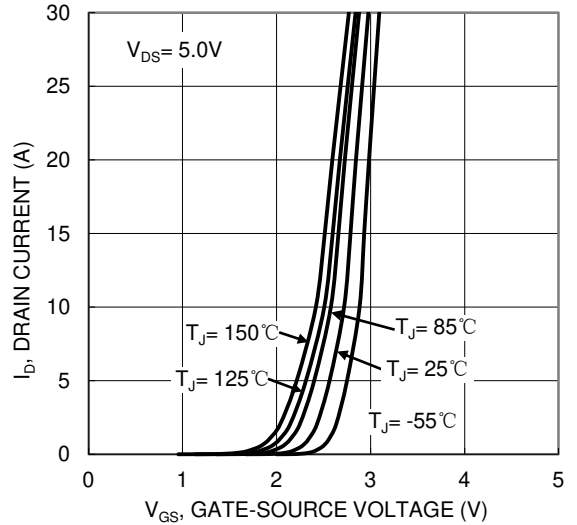


Figure 2. Typical Transfer Characteristic

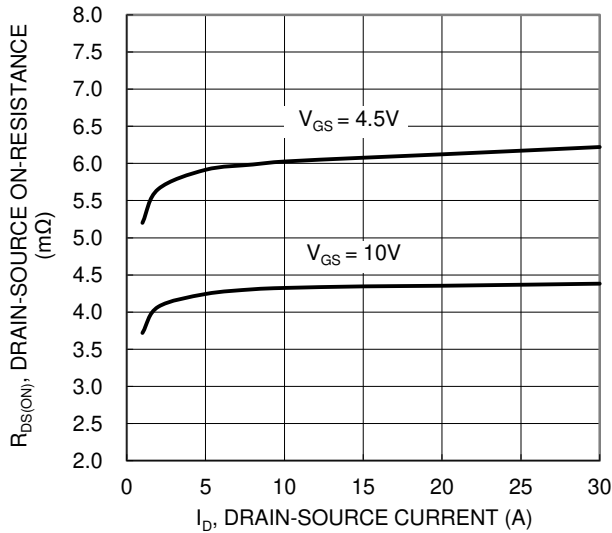


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

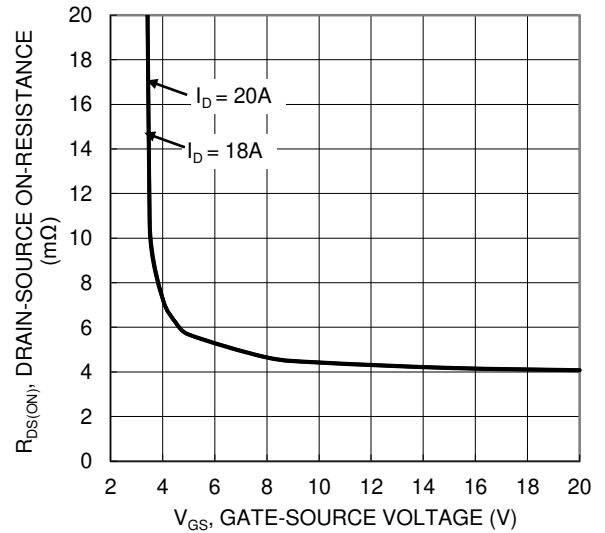


Figure 4. Typical Transfer Characteristic

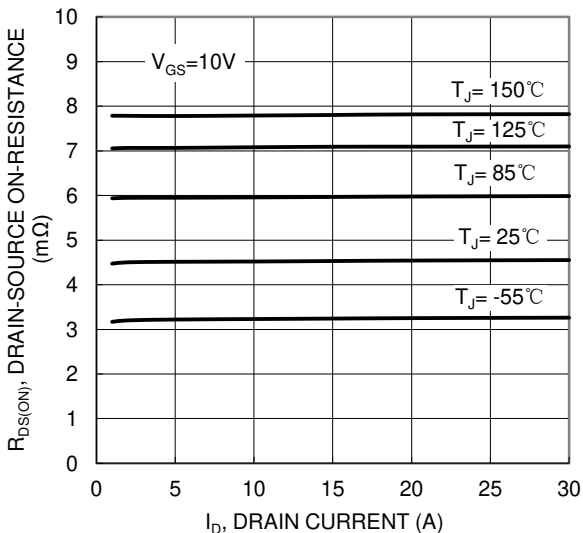


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

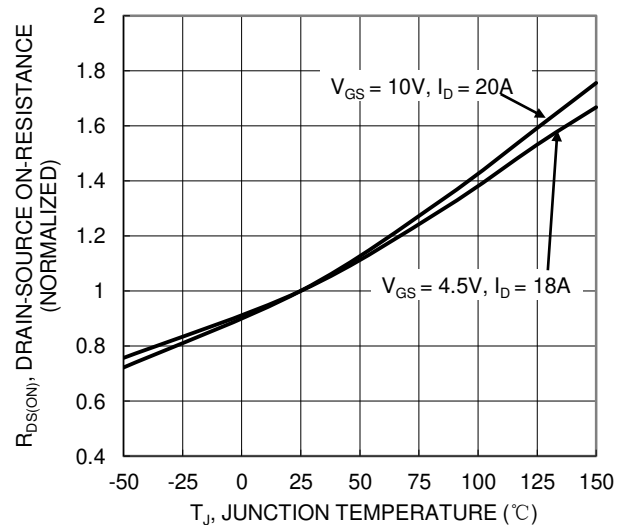


Figure 6. On-Resistance Variation with Temperature

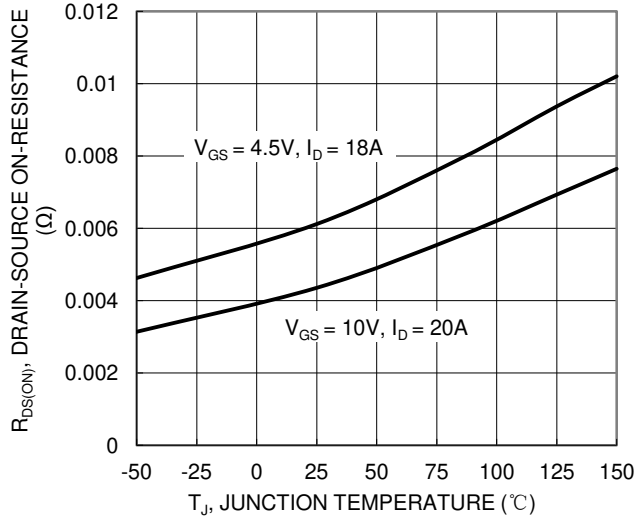


Figure 7. On-Resistance Variation with Temperature

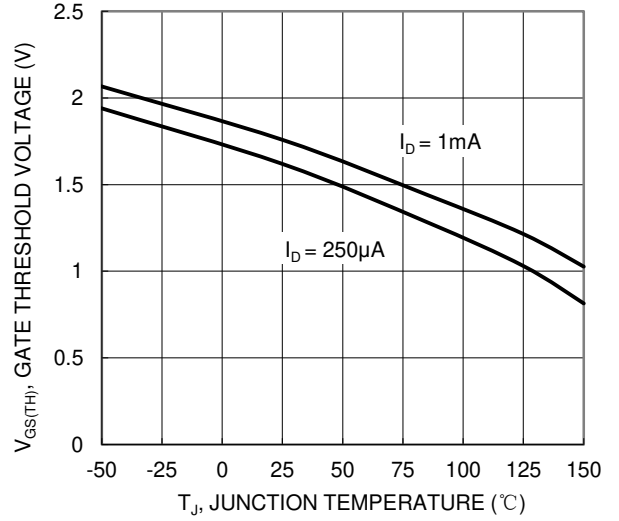


Figure 8. Gate Threshold Variation vs. Temperature

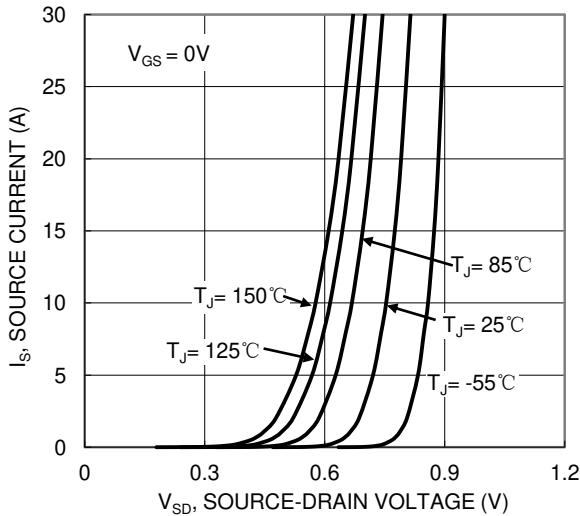


Figure 9. Diode Forward Voltage vs. Current

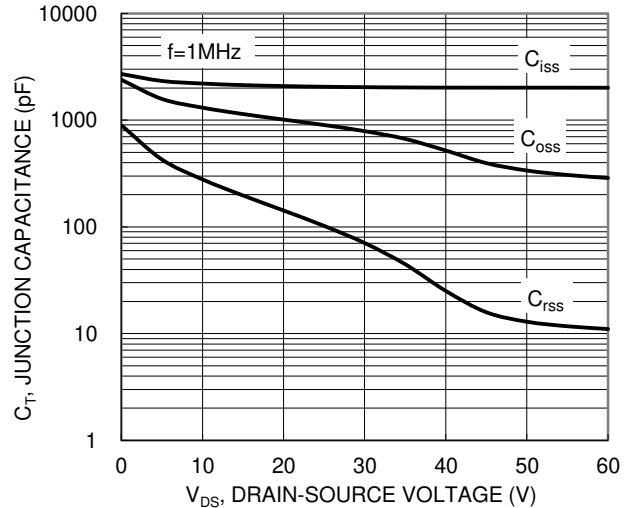


Figure 10. Typical Junction Capacitance

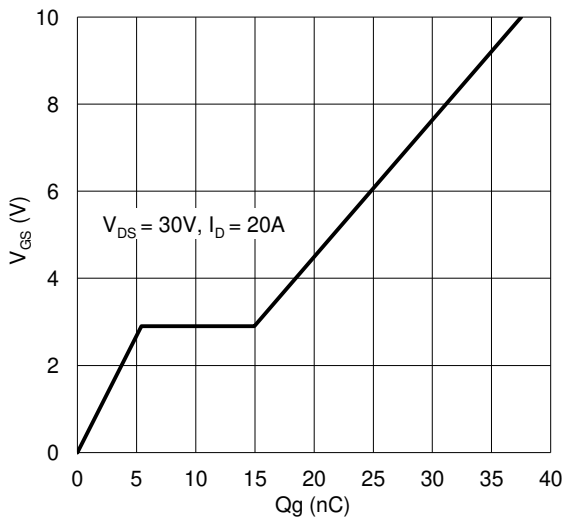


Figure 11. Gate Charge

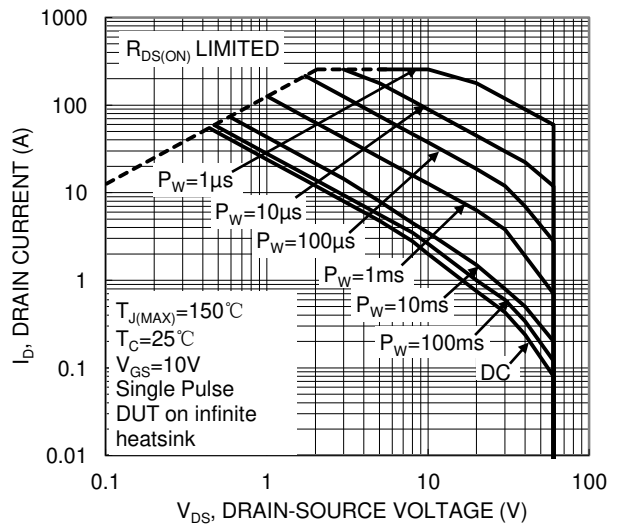


Figure 12. SOA, Safe Operation Area

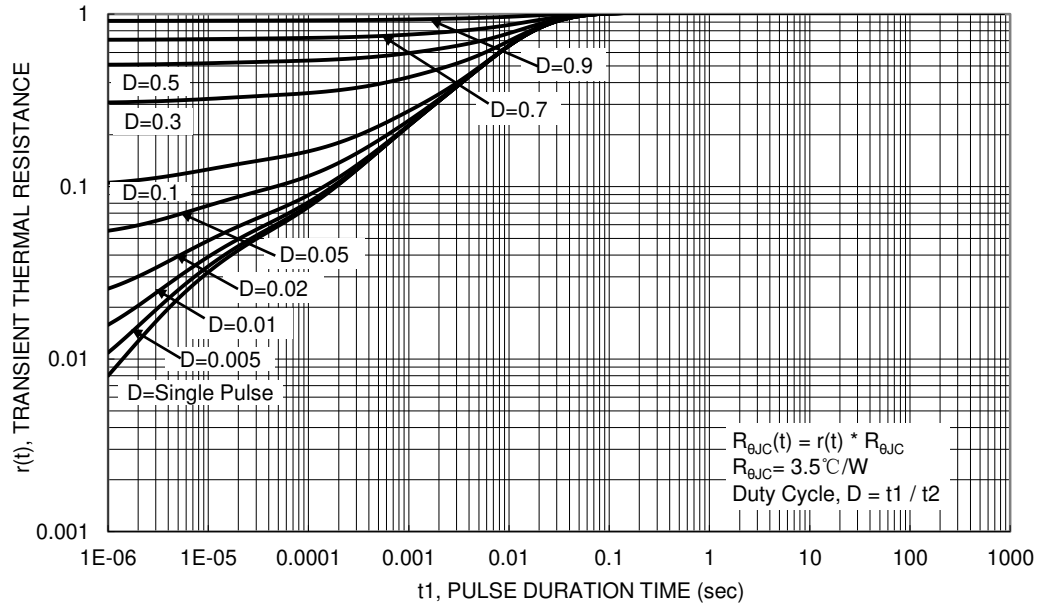
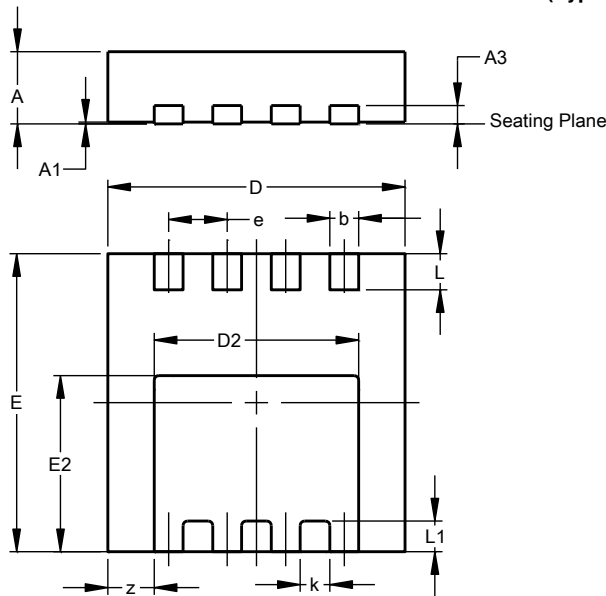


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

V-DFN3333-8 (Type B)

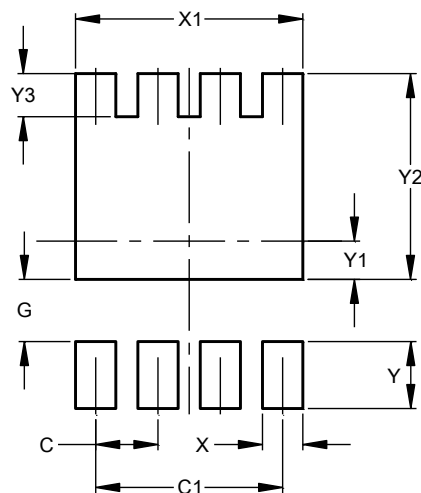


| V-DFN3333-8 (Type B) | | | |
|-------------------------|------|------|-------|
| Dim | Min | Max | Typ |
| A | 0.75 | 0.85 | 0.80 |
| A1 | 0.00 | 0.05 | 0.02 |
| A3 | -- | -- | 0.203 |
| b | 0.27 | 0.37 | 0.32 |
| D | 3.25 | 3.35 | 3.30 |
| D2 | 2.17 | 2.37 | 2.27 |
| E | 3.25 | 3.35 | 3.30 |
| E2 | 1.85 | 2.05 | 1.95 |
| e | -- | -- | 0.65 |
| k | -- | -- | 0.33 |
| L | 0.35 | 0.45 | 0.40 |
| L1 | -- | -- | 0.34 |
| z | -- | -- | 0.515 |
| All Dimensions in mm | | | |

Suggested Pad Layout

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

V-DFN3333-8 (Type B)



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 0.650 |
| C1 | 1.950 |
| G | 0.650 |
| X | 0.420 |
| X1 | 2.370 |
| Y | 0.700 |
| Y1 | 0.400 |
| Y2 | 2.150 |
| Y3 | 0.450 |

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