

Product Summary

| BV_{DSS} | $R_{DS(ON)}$ Max | I_D Max $T_A = +25^\circ C$ |
|------------|--------------------------------|----------------------------------|
| 30V | 11m Ω @ $V_{GS} = 10V$ | 10.5A |
| | 15m Ω @ $V_{GS} = 4.5V$ | 9.2A |

Description and Applications

This MOSFET has been designed to minimize the on-state resistance ($R_{DS(ON)}$) yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- Backlighting
- Power Management Functions
- DC-DC Converters

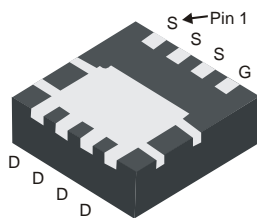
Features and Benefits

- Low $R_{DS(ON)}$ – Ensures On State Losses Are Minimized
- Small Form Factor Thermally Efficient Package Enables Higher Density End Products
- Occupies Just 33% of The Board Area Occupied by SO-8 Enabling Smaller End Product
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact@diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**
- **An Automotive-Compliant Part is Available Under Separate Datasheet ([DMG7430LFGQ](#))**

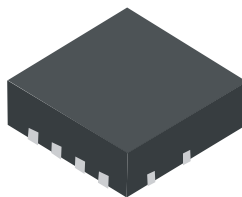
Mechanical Data

- Case: PowerDI[®]3333-8
- 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 Diagram
- Terminals: Finish — NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (e4)
- Weight: 0.072 grams (Approximate)

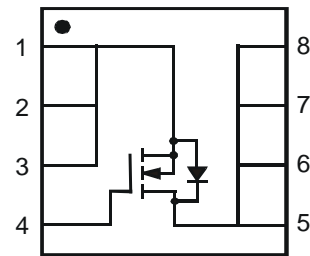
PowerDI3333-8



Bottom View



Top View



Top View
Internal Schematic

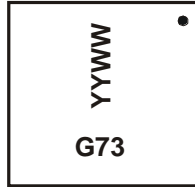
Ordering Information (Note 4)

| Part Number | Case | Packaging |
|---------------|---------------|------------------|
| DMG7430LFG-7 | PowerDI3333-8 | 2000/Tape & Reel |
| DMG7430LFG-13 | PowerDI3333-8 | 3000/Tape & Reel |

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
 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



G73 = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 21 = 2021)
 WW = Week Code (01 to 53)

Site 2



G73 = Product Type Marking Code
 YWX = Date Code Marking
 Y = Year (ex: 1 = 2021)
 W = Week (ex: A = Week 27; Z Represents Week 52 And 53)
 X = Internal Code (ex: U = Monday)

Date Code Key

| Year | 2011 | ... | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| Code | 1 | ... | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |

| 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} | 30 | V | |
| Gate-Source Voltage | V _{GSS} | ±20 | V | |
| Continuous Drain Current (Note 6) V _{GS} = 10V | Steady State | T _A = +25°C T _A = +70°C | 10.5 8.5 | A |
| | t < 10s | T _A = +25°C T _A = +70°C | 14 11 | A |
| Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%) | I _{DM} | 90 | A | |
| Maximum Continuous Body Diode Forward Current (Note 6) | I _S | 3.0 | A | |
| Avalanche Current (Note 7) L = 0.1mH | I _{AR} | 22 | A | |
| Repetitive Avalanche Energy (Note 7) L = 0.1mH | E _{AR} | 24 | mJ | |

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit | |
|--|-----------------------------------|--------------|------|------|
| Total Power Dissipation (Note 5) | P _D | Steady State | 0.9 | W |
| | | t < 10s | 1.5 | |
| Thermal Resistance, Junction to Ambient (Note 5) | R _{θJA} | Steady State | 142 | °C/W |
| | | t < 10s | 78 | |
| Total Power Dissipation (Note 6) | P _D | Steady State | 2.2 | W |
| | | t < 10s | 3.5 | |
| Thermal Resistance, Junction to Ambient (Note 6) | R _{θJA} | Steady State | 59 | °C/W |
| | | t < 10s | 33 | |
| Thermal Resistance, Junction to Case (Note 6) | R _{θJC} | 11 | | |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C | |

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. I_{AR} and E_{AR} ratings are based on low frequency and duty cycles to keep T_J = +25°C.

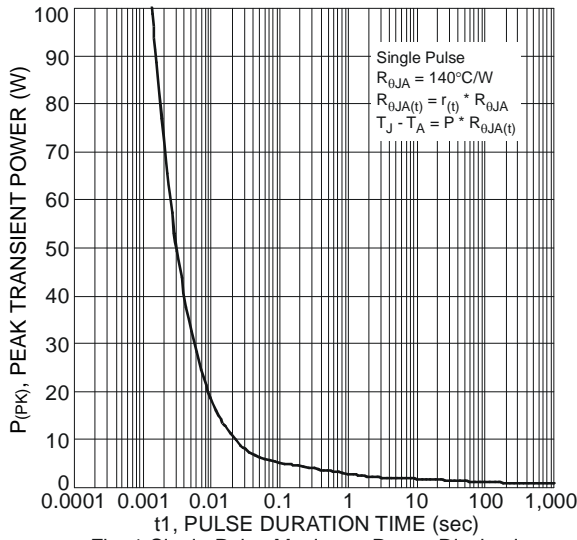


Fig. 1 Single Pulse Maximum Power Dissipation

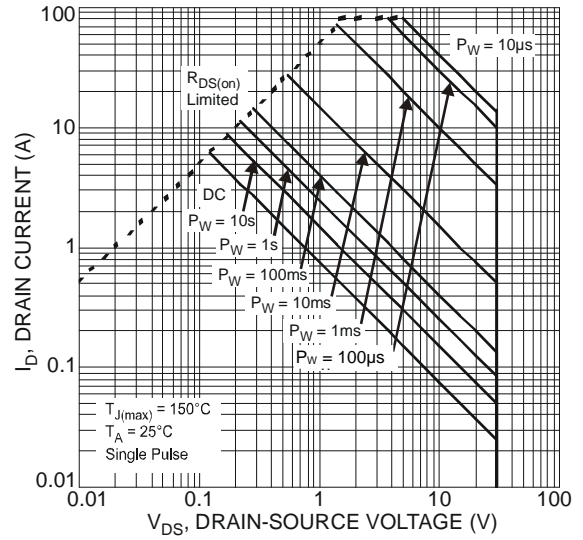


Fig. 2 SOA, Safe Operation Area

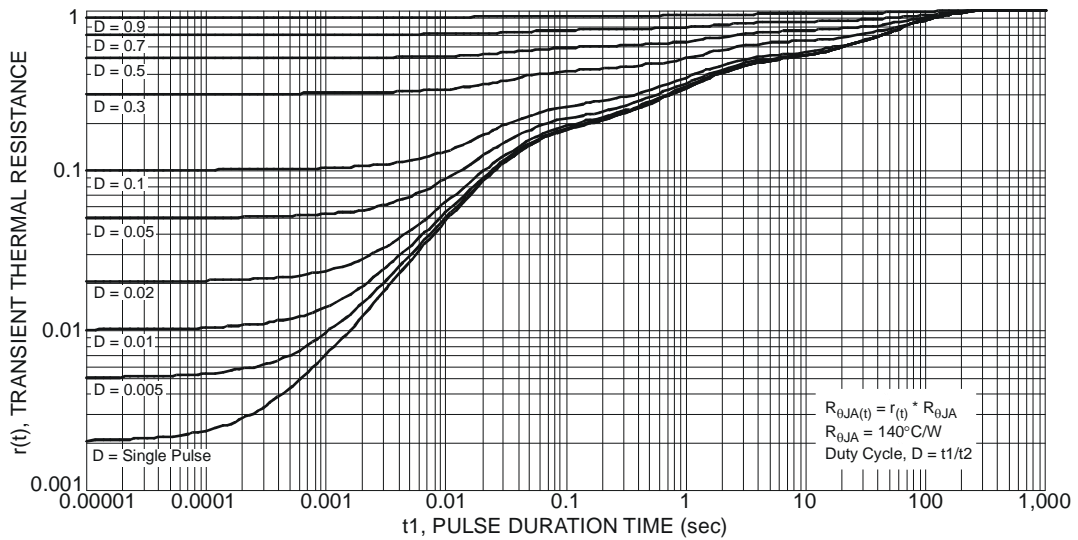


Fig. 3 Transient Thermal Resistance

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} | 30 | — | — | V | V _{GS} = 0V, I _D = 250μA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | 1 | μA | V _{DS} = 30V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | — | — | ±100 | nA | V _{GS} = ±20V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 8) | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | 1.4 | — | 2.5 | V | V _{DS} = V _{GS} , I _D = 250μA |
| Static Drain-Source On-Resistance | R _{DS(ON)} | — | 7 | 11 | mΩ | V _{GS} = 10V, I _D = 20A |
| | | — | 11 | 15 | | V _{GS} = 4.5V, I _D = 20A |
| Forward Transfer Admittance | Y _{fs} | — | 74 | — | S | V _{DS} = 5V, I _D = 20A |
| Diode Forward Voltage | V _{SD} | — | 0.75 | 1.0 | V | V _{GS} = 0V, I _S = 1A |
| DYNAMIC CHARACTERISTICS (Note 9) | | | | | | |
| Input Capacitance | C _{iss} | — | 1281 | — | pF | V _{DS} = 15V, V _{GS} = 0V, f = 1.0MHz |
| Output Capacitance | C _{oss} | — | 145 | — | pF | |
| Reverse Transfer Capacitance | C _{riss} | — | 125 | — | pF | |
| Gate Resistance | R _g | — | 1.2 | — | Ω | V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz |
| Total Gate Charge (V _{GS} = 4.5V) | Q _g | — | 12.5 | — | nC | V _{DS} = 15V, I _D = 12A |
| Total Gate Charge (V _{GS} = 10V) | Q _g | — | 26.7 | — | nC | |
| Gate-Source Charge | Q _{gs} | — | 3.6 | — | nC | |
| Gate-Drain Charge | Q _{gd} | — | 4.4 | — | nC | |
| Turn-On Delay Time | t _{D(ON)} | — | 5.2 | — | ns | V _{DD} = 15V, V _{GS} = 10V, R _L = 1.25Ω, R _G = 3Ω |
| Turn-On Rise Time | t _R | — | 21.2 | — | ns | |
| Turn-Off Delay Time | t _{D(OFF)} | — | 22.3 | — | ns | |
| Turn-Off Fall Time | t _F | — | 5.1 | — | ns | |
| Reverse Recovery Time | t _{RR} | — | 8.5 | — | ns | |
| Reverse Recovery Charge | Q _{RR} | — | 7.0 | — | nC | I _F = 12A, di/dt = 500A/μs |

Notes: 8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to product testing.

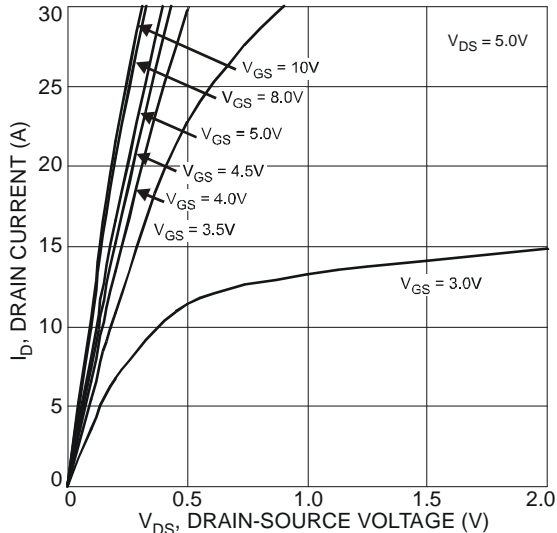


Fig. 4 Typical Output Characteristic

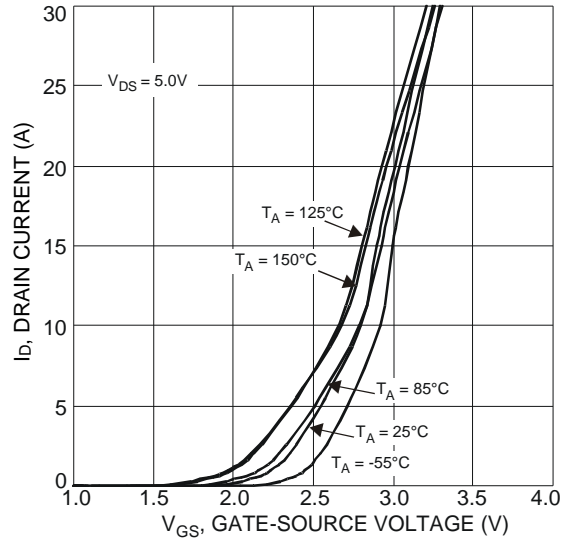


Fig. 5 Typical Transfer Characteristics

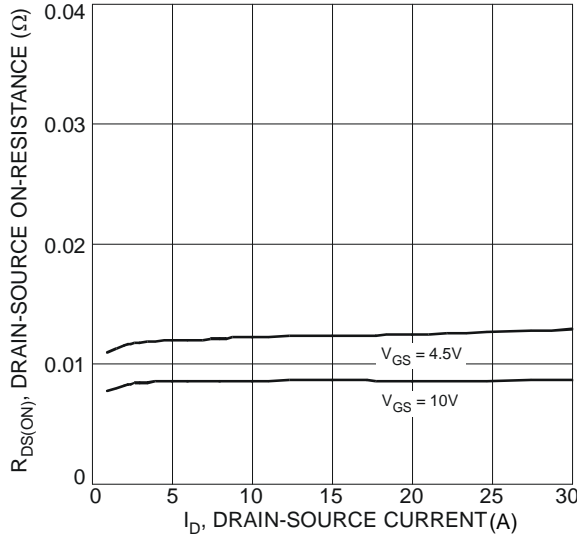


Fig. 6 Typical On-Resistance vs. Drain Current and Gate Voltage

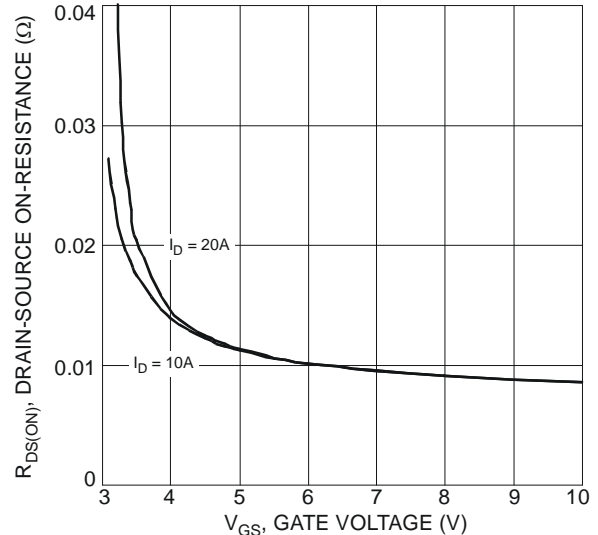


Fig. 7 Typical On-Resistance vs. Gate Voltage

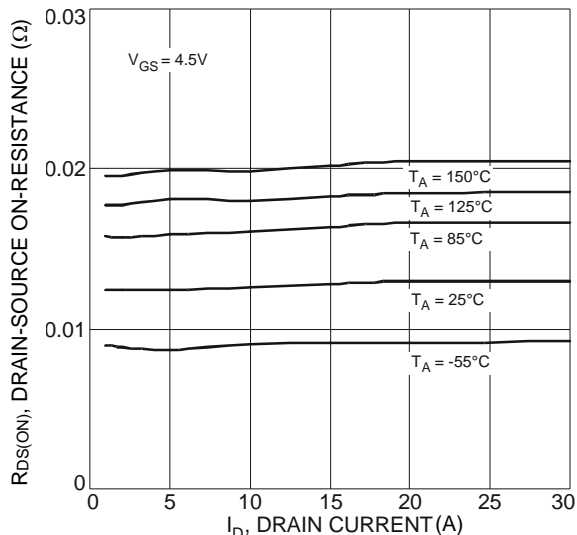


Fig. 8 Typical On-Resistance vs. Drain Current and Temperature

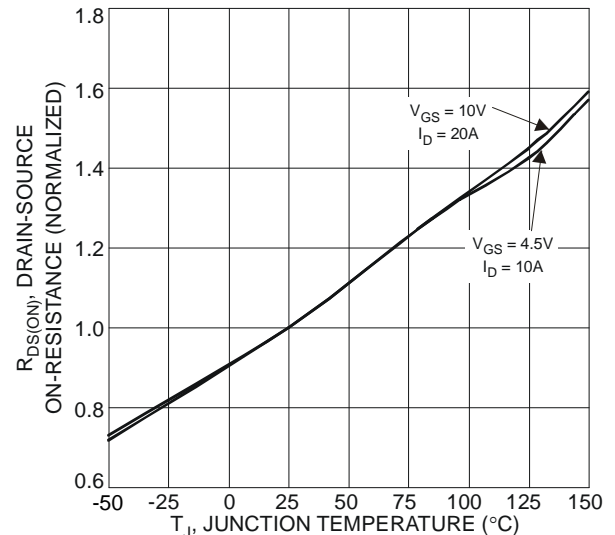


Fig. 9 On-Resistance Variation with Temperature

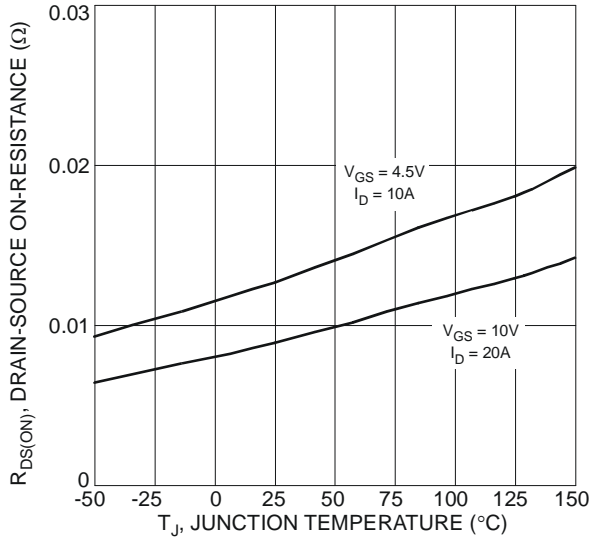


Fig. 10 On-Resistance Variation with Temperature

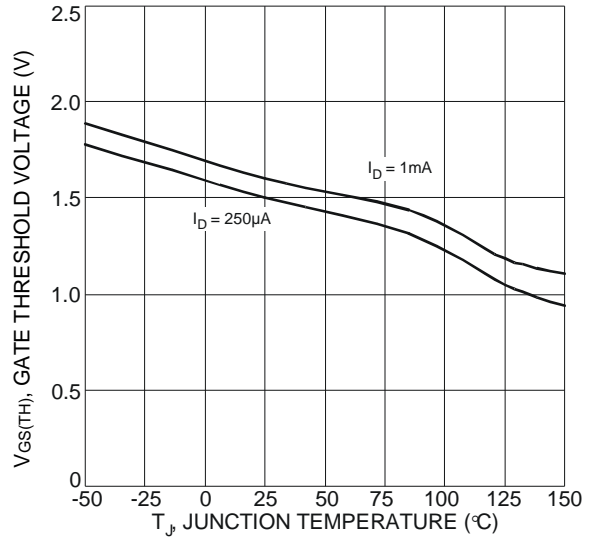


Fig. 11 Gate Threshold Variation vs. Junction Temperature

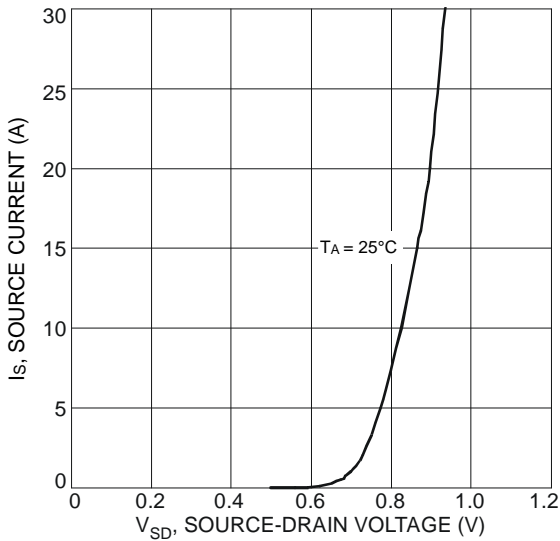


Fig. 12 Diode Forward Voltage vs. Current

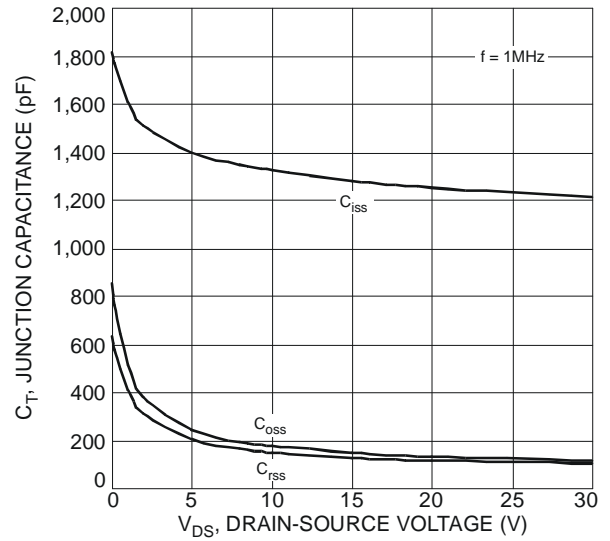


Fig. 13 Typical Junction Capacitance

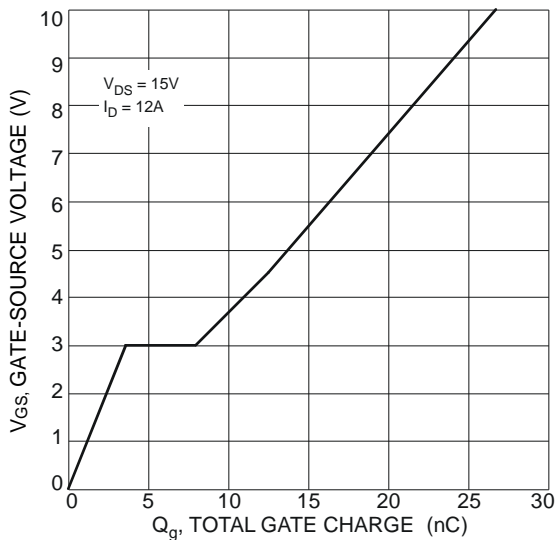
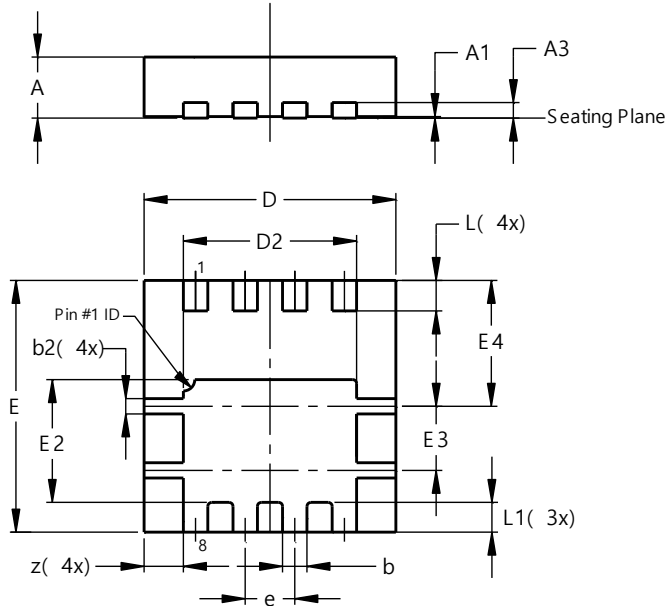


Fig. 14 Gate Charge

Package Outline Dimensions

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

PowerDI3333-8

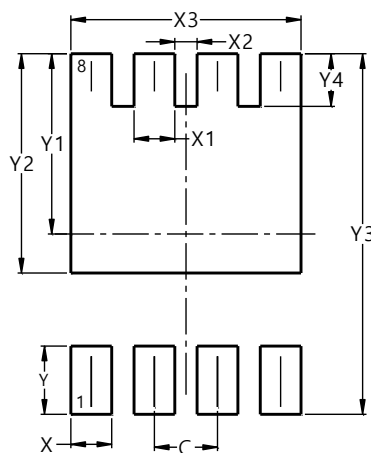


| PowerDI3333-8 | | | |
|----------------------|------|------|-------|
| Dim | Min | Max | Typ |
| A | 0.75 | 0.85 | 0.80 |
| A1 | 0.00 | 0.05 | 0.02 |
| A3 | - | - | 0.203 |
| b | 0.27 | 0.37 | 0.32 |
| b2 | 0.15 | 0.25 | 0.20 |
| D | 3.25 | 3.35 | 3.30 |
| D2 | 2.22 | 2.32 | 2.27 |
| E | 3.25 | 3.35 | 3.30 |
| E2 | 1.56 | 1.66 | 1.61 |
| E3 | 0.79 | 0.89 | 0.84 |
| E4 | 1.60 | 1.70 | 1.65 |
| e | - | - | 0.65 |
| L | 0.35 | 0.45 | 0.40 |
| L1 | - | - | 0.39 |
| z | - | - | 0.515 |
| All Dimensions in mm | | | |

Suggested Pad Layout

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

PowerDI3333-8



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 0.650 |
| X | 0.420 |
| X1 | 0.420 |
| X2 | 0.230 |
| X3 | 2.370 |
| Y | 0.700 |
| Y1 | 1.850 |
| Y2 | 2.250 |
| Y3 | 3.700 |
| Y4 | 0.540 |

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