

Product Summary

| BV _{DSS} | R _{DS(ON)} | I _D T _A = +25°C |
|-------------------|------------------------------|--|
| 40V | 30mΩ @V _{GS} = 10V | 9.6A |
| | 50mΩ @V _{GS} = 4.5V | 7.4A |

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.

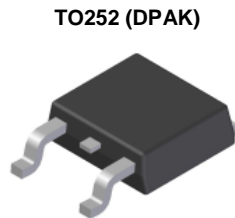
- Backlighting
- DC-DC Converters
- Power Management Functions

Features and Benefits

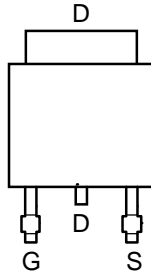
- Low On-Resistance
- Fast Switching Speed
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- For automotive applications requiring specific change control (i.e.: parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at <https://www.diodes.com/products/automotive/automotive-products/>.
- This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. <https://www.diodes.com/quality/product-definitions/>
- An Automotive-Compliant Part is Available Under Separate Datasheet ([DMN4030LK3Q](#))

Mechanical Data

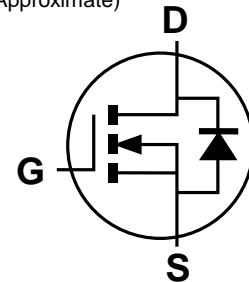
- Case: TO252
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 @3
- Weight: 0.33 grams (Approximate)



Top View



Top View
Pin-Out



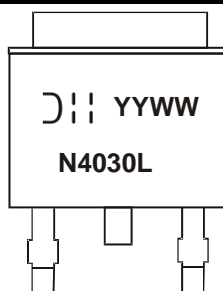
Equivalent Circuit

Ordering Information (Note 4)

| Part Number | Case | Packaging |
|---------------|--------------|-------------------|
| DMN4030LK3-13 | TO252 (DPAK) | 2,500/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



⌋⌋ = Manufacturer's Marking
 N4030L = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Year (ex: 21 = 2021)
 WW = Week (01 to 53)

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

| Characteristic | | | Symbol | Value | Unit |
|--|--------------|------------------------|------------------|-------|------|
| Drain-Source Voltage | | | V _{DSS} | 40 | V |
| Gate-Source Voltage | | | V _{GSS} | ±20 | V |
| Continuous Drain Current (Note 5) V _{GS} = 10V | Steady State | T _A = +25°C | I _D | 9.6 | A |
| | | T _A = +70°C | | 7.7 | |
| Maximum Body Diode Continuous Current (Note 5) | | | I _S | 9.6 | A |
| Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%) (Note 6) | | | I _{DM} | 37.7 | A |
| Pulsed Source Current (10µs Pulse, Duty Cycle = 1%) (Note 6) | | | I _{SM} | 37.7 | A |

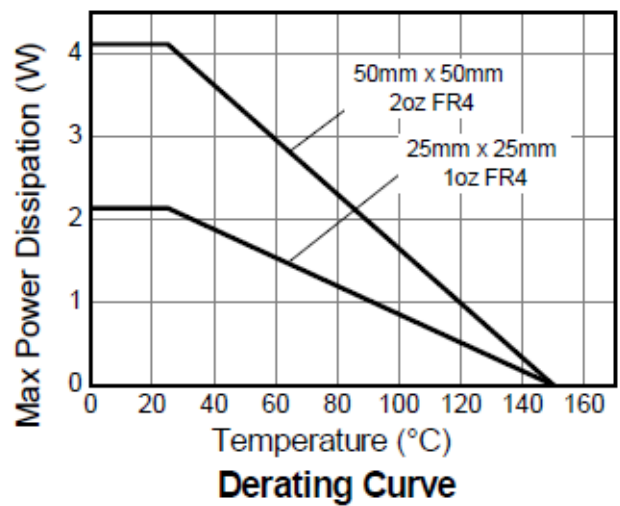
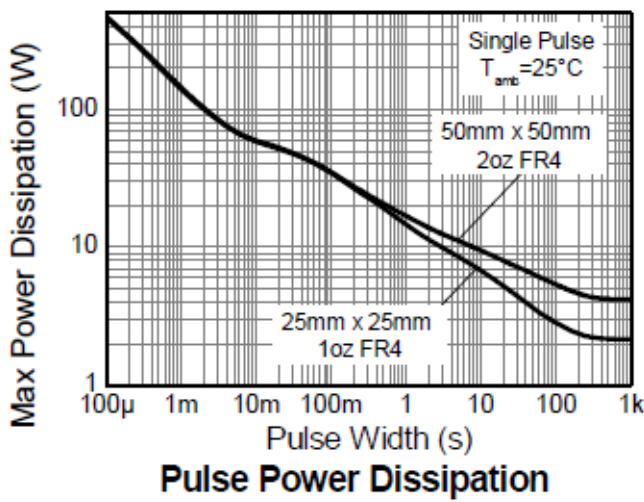
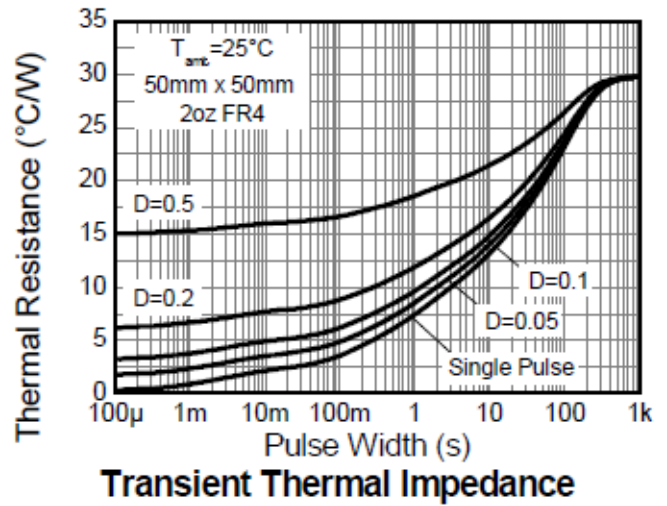
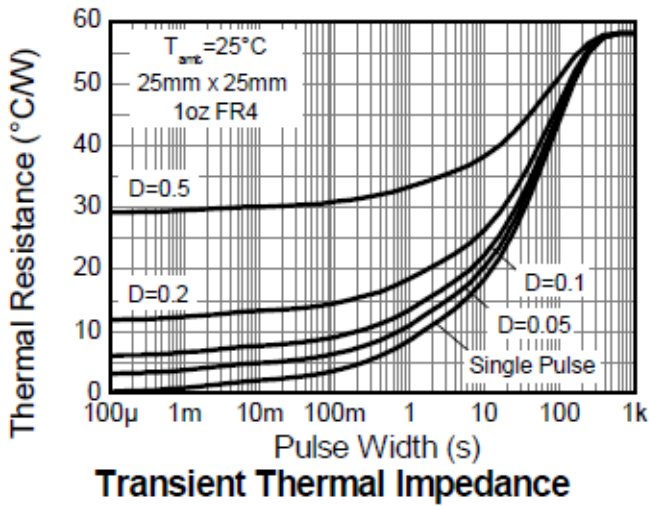
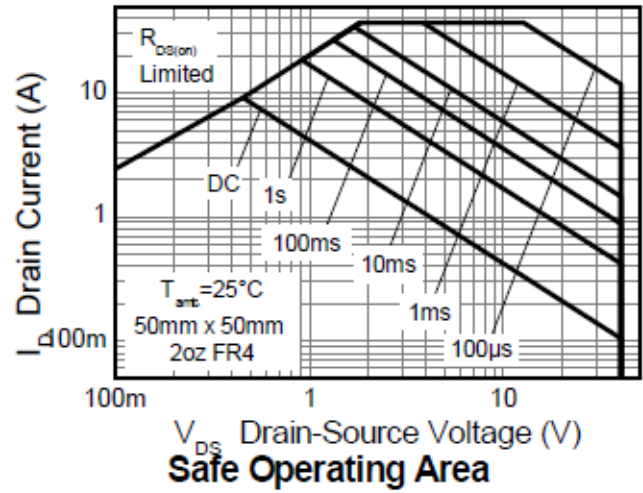
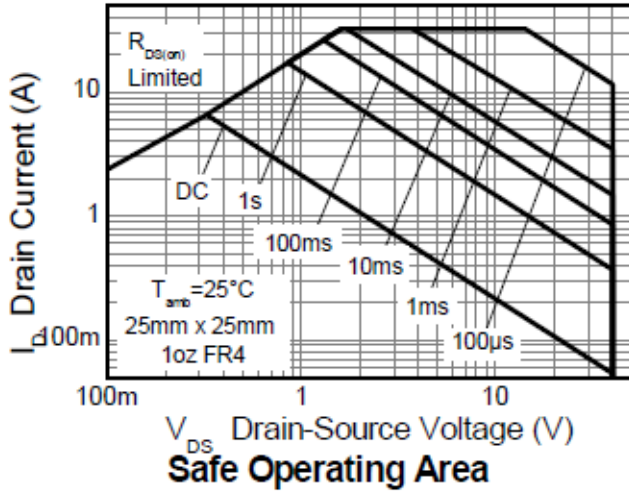
Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

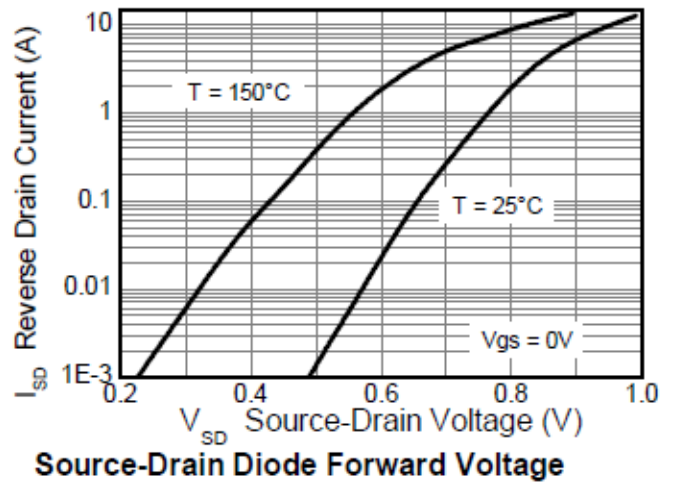
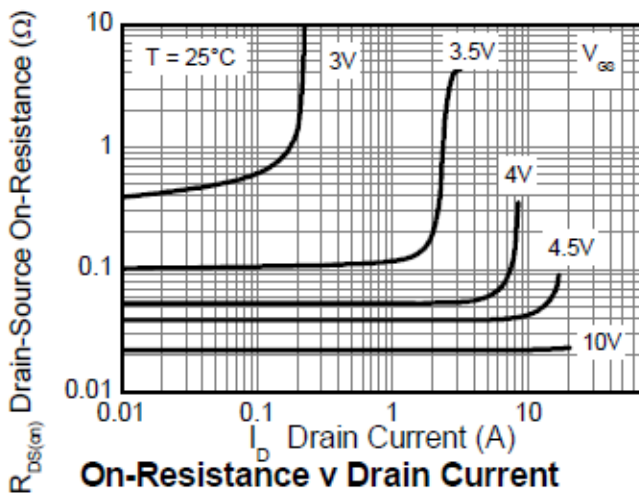
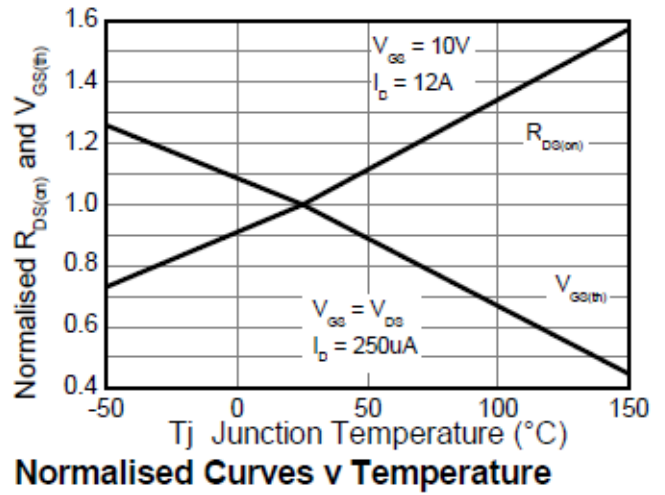
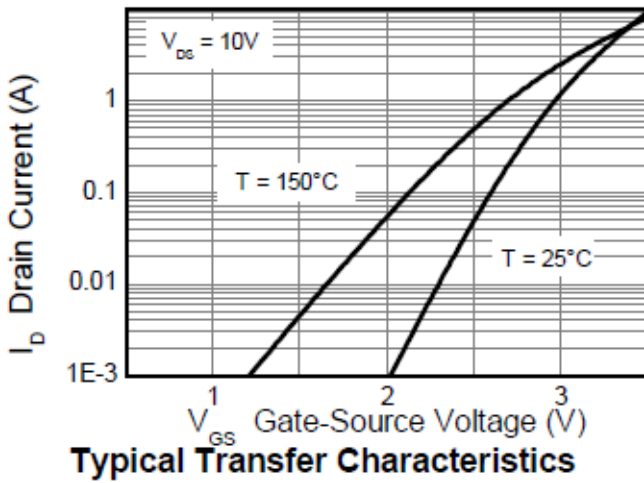
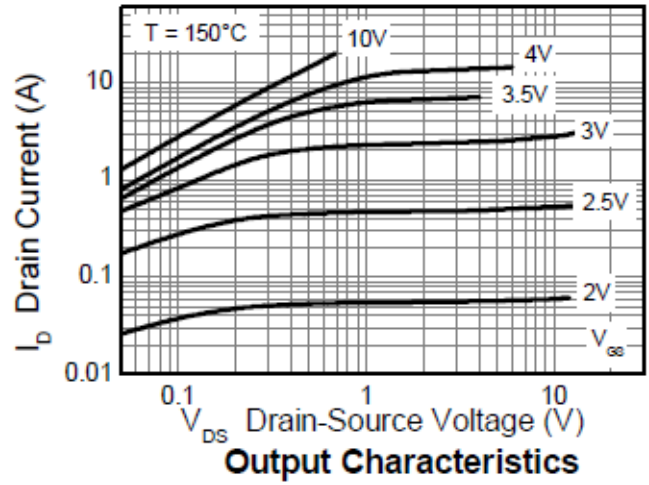
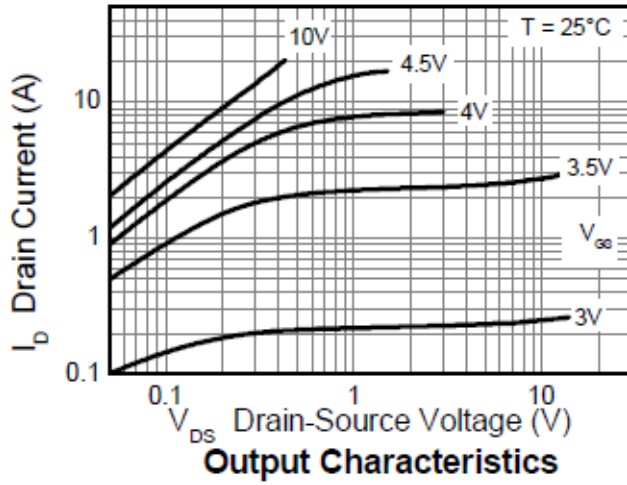
| Characteristic | | Symbol | Value | Unit |
|--|------------------------|-----------------------------------|-------------|------|
| Total Power Dissipation (Note 5) | T _A = +25°C | P _D | 4.18 | W |
| Thermal Resistance, Junction to Ambient (Note 5) | Steady State | R _{θJA} | 29.9 | °C/W |
| Total Power Dissipation (Note 7) | T _A = +25°C | P _D | 2.14 | W |
| Thermal Resistance, Junction to Ambient (Note 7) | Steady State | R _{θJA} | 58.4 | °C/W |
| Thermal Resistance, Junction to Case (Note 8) | | R _{θJC} | 2.46 | °C/W |
| Operating and Storage Temperature Range | | T _J , T _{STG} | -55 to +150 | °C |

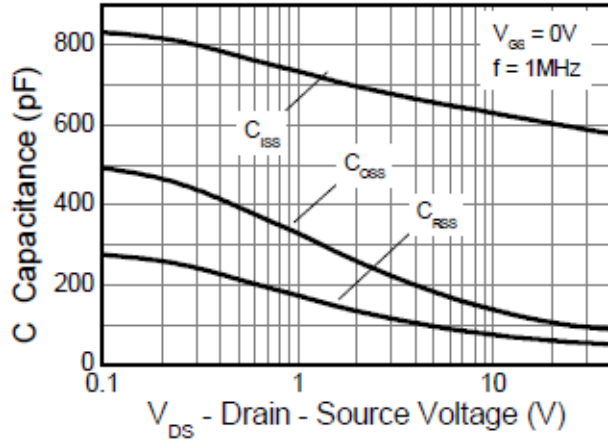
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|---------------------|-----|------|------|------|---|
| OFF CHARACTERISTICS (Note 9) | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | 40 | — | — | V | V _{GS} = 0V, I _D = 250µA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | 1 | µA | V _{DS} = 40V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | — | — | ±100 | nA | V _{GS} = ±20V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 9) | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | 1 | — | 3 | V | V _{DS} = V _{GS} , I _D = 250µA |
| Static Drain-Source On-Resistance | R _{DS(ON)} | — | 21 | 30 | mΩ | V _{GS} = 10V, I _D = 12A |
| | | — | 37 | 50 | | V _{GS} = 4.5V, I _D = 6A |
| Diode Forward Voltage | V _{SD} | — | 0.95 | 1.1 | V | V _{GS} = 0V, I _S = 12A |
| DYNAMIC CHARACTERISTICS (Note 10) | | | | | | |
| Input Capacitance | C _{iss} | — | 604 | — | pF | V _{DS} = 20V, V _{GS} = 0V, f = 1.0MHz |
| Output Capacitance | C _{oss} | — | 106 | — | | |
| Reverse Transfer Capacitance | C _{rss} | — | 59.6 | — | | |
| Total Gate Charge (V _{GS} = 4.5V) | Q _g | — | 6.5 | — | nC | V _{DS} = 20V, I _D = 12A |
| Total Gate Charge (V _{GS} = 10V) | Q _g | — | 12.9 | — | | |
| Gate-Source Charge | Q _{gs} | — | 2.3 | — | | |
| Gate-Drain Charge | Q _{gd} | — | 3.6 | — | | |
| Turn-On Delay Time | t _{D(ON)} | — | 4.2 | — | ns | V _{DD} = 20V, I _D = 12A, V _{GS} = 10V, R _G = 6Ω |
| Turn-On Rise Time | t _R | — | 12.4 | — | | |
| Turn-Off Delay Time | t _{D(OFF)} | — | 13.8 | — | | |
| Turn-Off Fall Time | t _F | — | 10.7 | — | | |
| Body Diode Reverse Recovery Time | t _{RR} | — | 135 | — | ns | I _F = 12A, di/dt = 100A/µs |
| Body Diode Reverse Recovery Charge | Q _{RR} | — | 799 | — | nC | I _F = 12A, di/dt = 100A/µs |

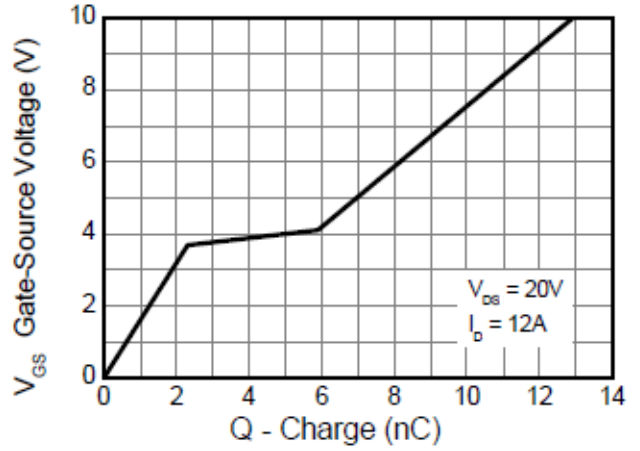
- Notes:
- For a device surface mounted on 50mm x 50mm x 1.6mm FR-4 PCB with high coverage of single sided 2oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
 - Same as note 5, except the device is pulsed with D = 0.02 and pulse width 300µs. The pulse current is limited by the maximum junction temperature.
 - For a device surface mounted on 25mm x 25mm x 1.6mm FR-4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
 - Thermal resistance from junction to solder-point (at the end of the drain lead).
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.







Capacitance v Drain-Source Voltage

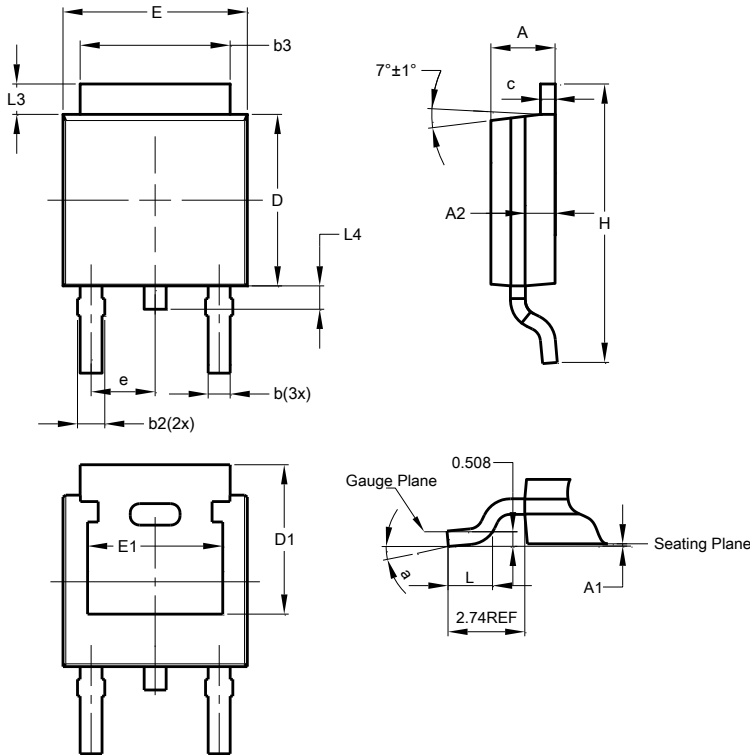


Gate-Source Voltage v Gate Charge

Package Outline Dimensions

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

TO252 (DPAK)

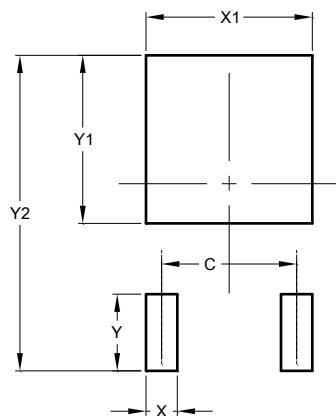


| TO252 (DPAK) | | | |
|-----------------------------|------|-------|-------|
| Dim | Min | Max | Typ |
| A | 2.19 | 2.39 | 2.29 |
| A1 | 0.00 | 0.13 | 0.08 |
| A2 | 0.97 | 1.17 | 1.07 |
| b | 0.64 | 0.88 | 0.783 |
| b2 | 0.76 | 1.14 | 0.95 |
| b3 | 5.21 | 5.46 | 5.33 |
| c | 0.45 | 0.58 | 0.531 |
| D | 6.00 | 6.20 | 6.10 |
| D1 | 5.21 | - | - |
| e | - | - | 2.286 |
| E | 6.45 | 6.70 | 6.58 |
| E1 | 4.32 | - | - |
| H | 9.40 | 10.41 | 9.91 |
| L | 1.40 | 1.78 | 1.59 |
| L3 | 0.88 | 1.27 | 1.08 |
| L4 | 0.64 | 1.02 | 0.83 |
| a | 0° | 10° | - |
| All Dimensions in mm | | | |

Suggested Pad Layout

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

TO252 (DPAK)



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 4.572 |
| X | 1.060 |
| X1 | 5.632 |
| Y | 2.600 |
| Y1 | 5.700 |
| Y2 | 10.700 |

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