

Product Summary

| BV _{DSS} | R _{DS(ON)} Max | I _D Max T _C = +25°C |
|-------------------|-------------------------------|--|
| 60V | 18mΩ @ V _{GS} = 10V | 43A |
| | 20mΩ @ V _{GS} = 4.5V | 41A |

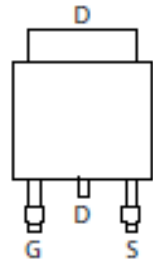
Description and Applications

This new generation 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.

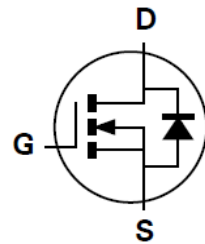
- Power Management Functions
- DC-DC Converters
- Industrial



Top View



Pin Out Top View



Equivalent Circuit

Features

- Low On-Resistance
- Low Input Capacitance
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

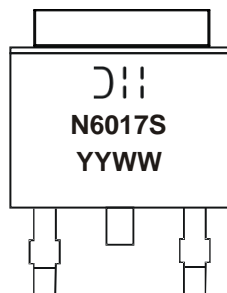
- Case: TO252 (DPAK)
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Weight: 0.33 grams (Approximate)

Ordering Information (Note 4)

| Part Number | Case | Packaging |
|---------------|--------------|-------------------|
| DMN6017SK3-13 | TO252 (DPAK) | 2,500/Tape & Reel |

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
 2. See http://www.diodes.com/quality/lead_free.html 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
 N6017S = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 17 = 2017)
 WW = Week Code (01 to 53)

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 5) | T _C = +25°C T _C = +70°C | I _D | 43 34 | A |
| | | T _A = +25°C T _A = +70°C | I _D | 11 8.8 |
| | Pulsed Drain Current (380µs Pulse, Duty Cycle = 1%) | | I _{DM} | 70 |
| | Maximum Continuous Body Diode Forward Current (Note 5) | I _S | 3.6 | A |
| Avalanche Current, L = 0.1mH | I _{AS} | 25 | A | |
| Avalanche Energy, L = 0.1mH | E _{AS} | 32 | mJ | |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit | |
|--|-----------------------------------|------------------------|------|---|
| Total Power Dissipation (Note 5) | P _D | T _A = +25°C | 3.3 | W |
| | | T _C = +25°C | 50 | |
| Thermal Resistance, Junction to Ambient (Note 5) | R _{θJA} | 38 | °C/W | |
| Thermal Resistance, Junction to Case (Note 5) | R _{θJC} | 2.5 | | |
| 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 6) | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | 60 | - | - | V | V _{GS} = 0V, I _D = 250µA |
| Zero Gate Voltage Drain Current | I _{DSS} | - | - | 1 | µA | V _{DS} = 48V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | - | - | ±100 | nA | V _{GS} = ±20V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 6) | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | 1 | - | 3 | V | V _{DS} = V _{GS} , I _D = 250µA |
| Static Drain-Source On-Resistance | R _{DS(ON)} | - | - | 18 | mΩ | V _{GS} = 10V, I _D = 6A |
| | | - | - | 20 | | V _{GS} = 4.5V, I _D = 4A |
| Diode Forward Voltage | V _{SD} | - | - | 1 | V | V _{GS} = 0V, I _S = 1A |
| DYNAMIC CHARACTERISTICS (Note 7) | | | | | | |
| Input Capacitance | C _{iSS} | - | 2711 | - | pF | V _{DS} = 15V, V _{GS} = 0V, f = 1MHz |
| Output Capacitance | C _{oss} | - | 152 | - | pF | |
| Reverse Transfer Capacitance | C _{rSS} | - | 126 | - | pF | |
| Gate Resistance | R _g | - | 1.4 | - | Ω | V _{DS} = 0V, V _{GS} = 0V, f = 1MHz |
| Total Gate Charge (V _{GS} = 4.5V) | Q _g | - | 26 | - | nC | V _{DS} = 48V, I _D = 6A |
| Total Gate Charge (V _{GS} = 10V) | Q _g | - | 55 | - | nC | |
| Gate-Source Charge | Q _{gs} | - | 6.2 | - | nC | |
| Gate-Drain Charge | Q _{gd} | - | 8.5 | - | nC | |
| Turn-On Delay Time | t _{D(ON)} | - | 4.9 | - | ns | V _{DD} = 30V, V _{GS} = 10V, R _g = 3.3Ω, I _D = 6A |
| Turn-On Rise Time | t _r | - | 5.4 | - | ns | |
| Turn-Off Delay Time | t _{D(OFF)} | - | 38.2 | - | ns | |
| Turn-Off Fall Time | t _f | - | 11 | - | ns | |
| Reverse Recovery Time | t _{RR} | - | 16.6 | - | ns | |
| Reverse Recovery Charge | Q _{RR} | - | 10.3 | - | nC | I _f = 6A, di/dt = 100A/µs |

- Notes:
- 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.

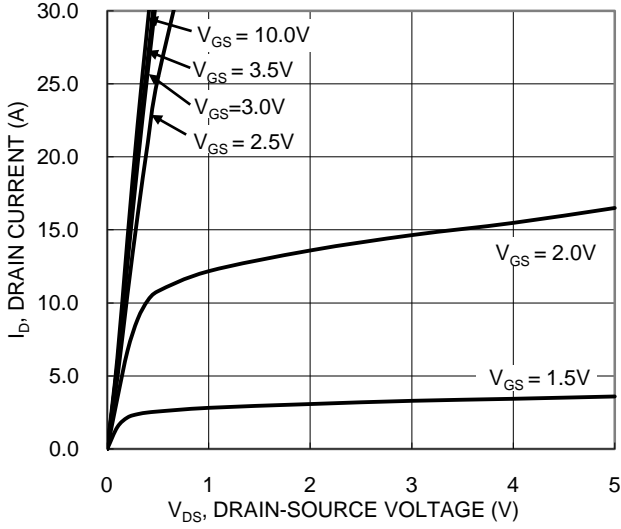


Figure 1. Typical Output Characteristic

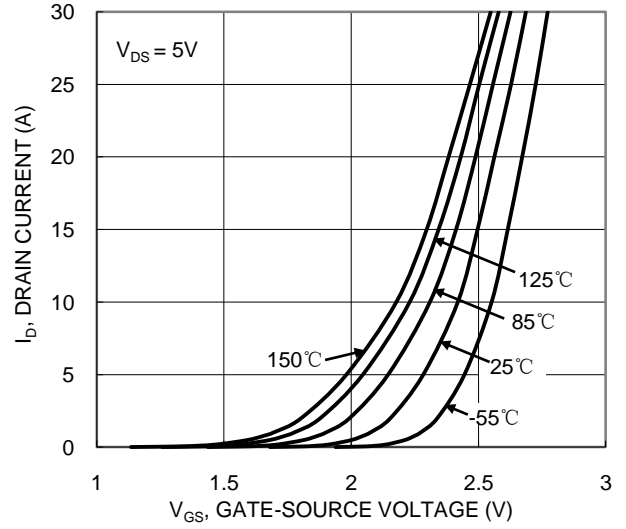


Figure 2. Typical Transfer Characteristic

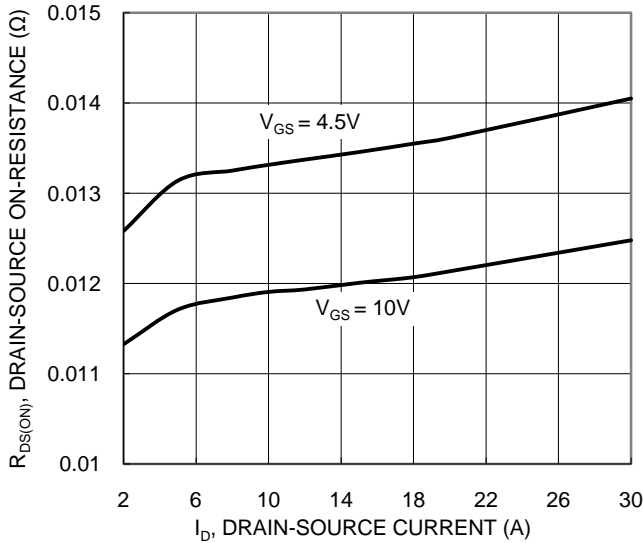


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

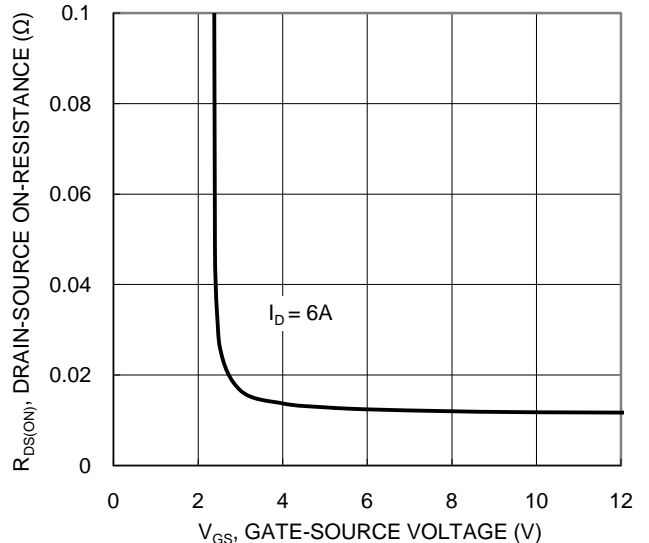


Figure 4. Typical Transfer Characteristic

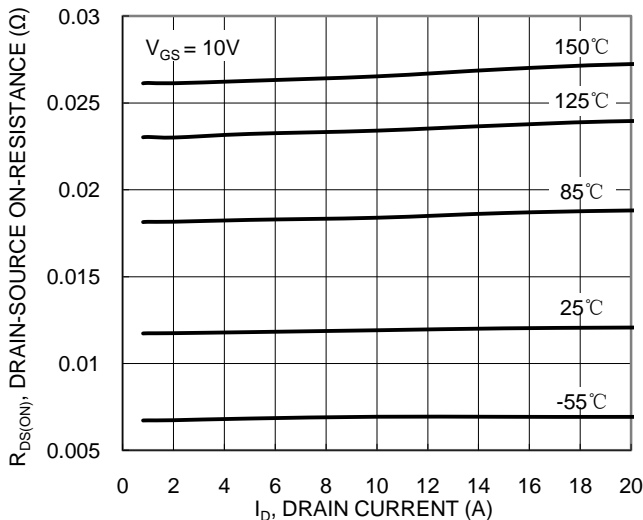


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

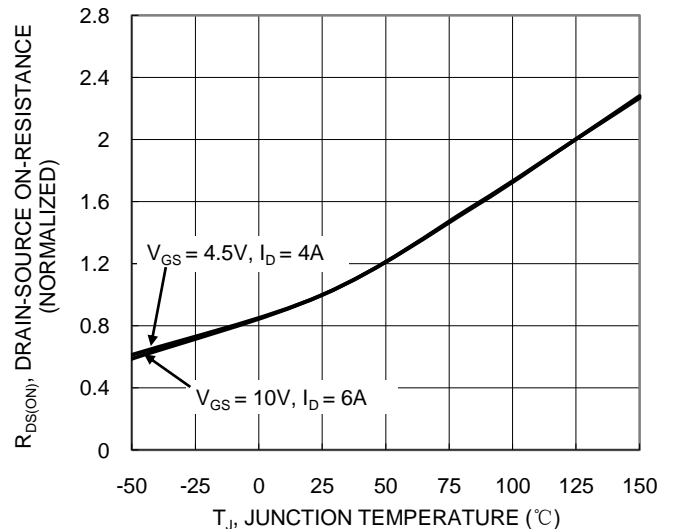


Figure 6. On-Resistance Variation with Temperature

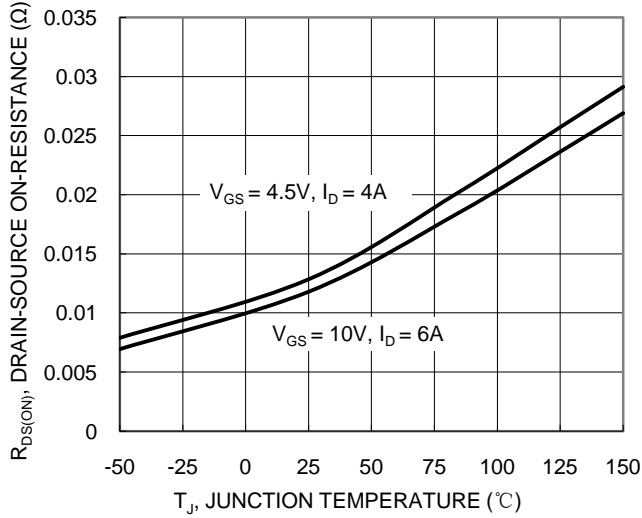


Figure 7. On-Resistance Variation with Temperature

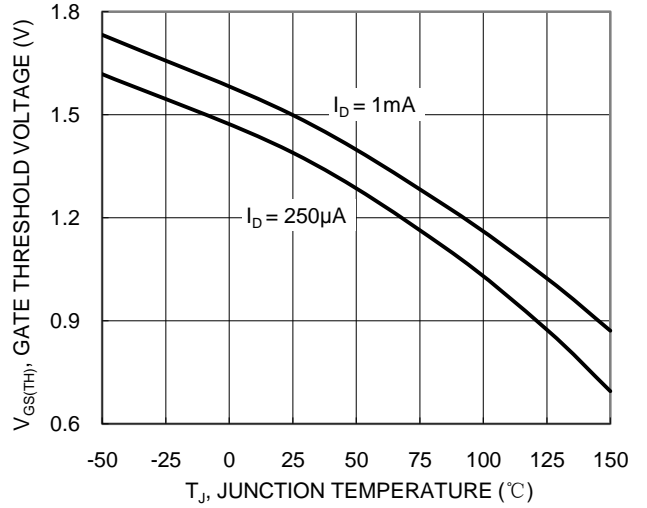


Figure 8. Gate Threshold Variation vs. Temperature

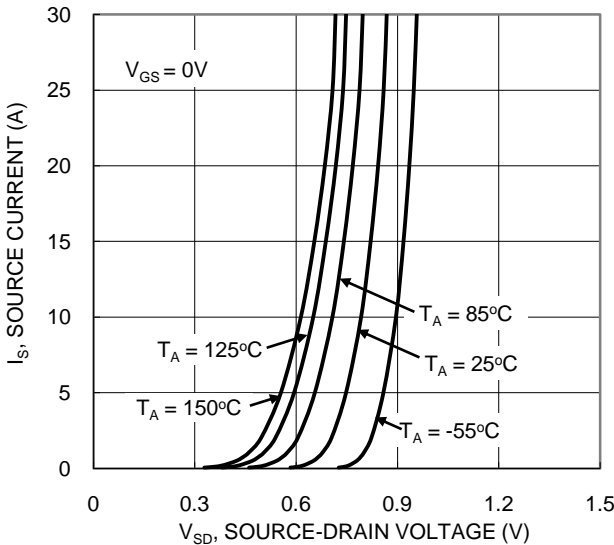


Figure 9. Diode Forward Voltage vs. Current

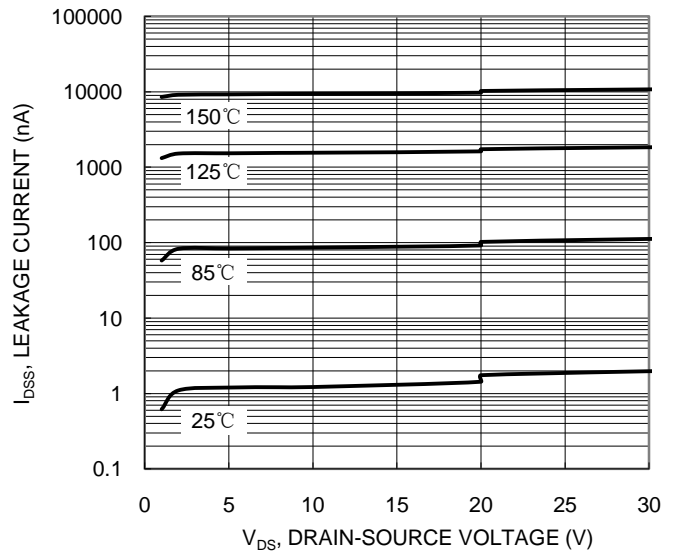


Figure 10. Typical Drain-Source Leakage Current vs. Voltage

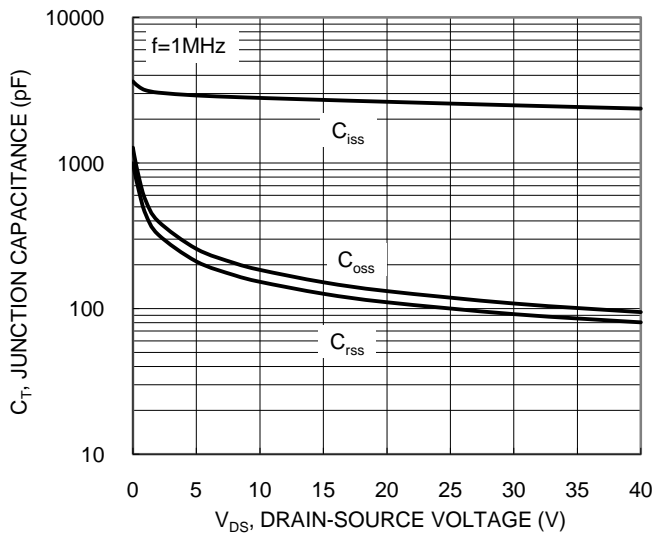


Figure 11. Typical Junction Capacitance

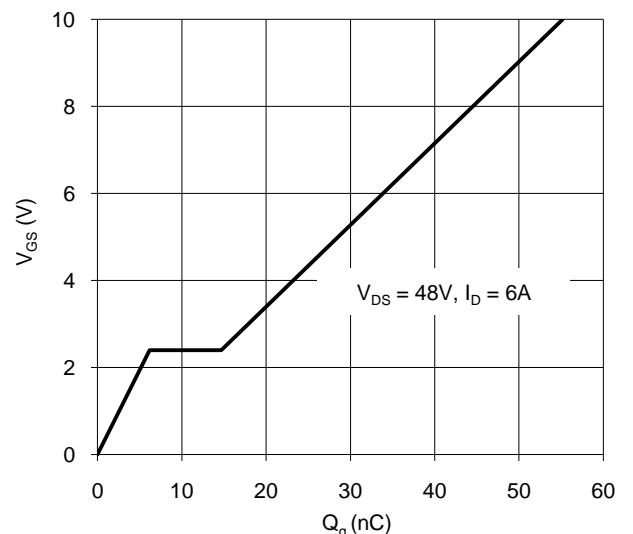
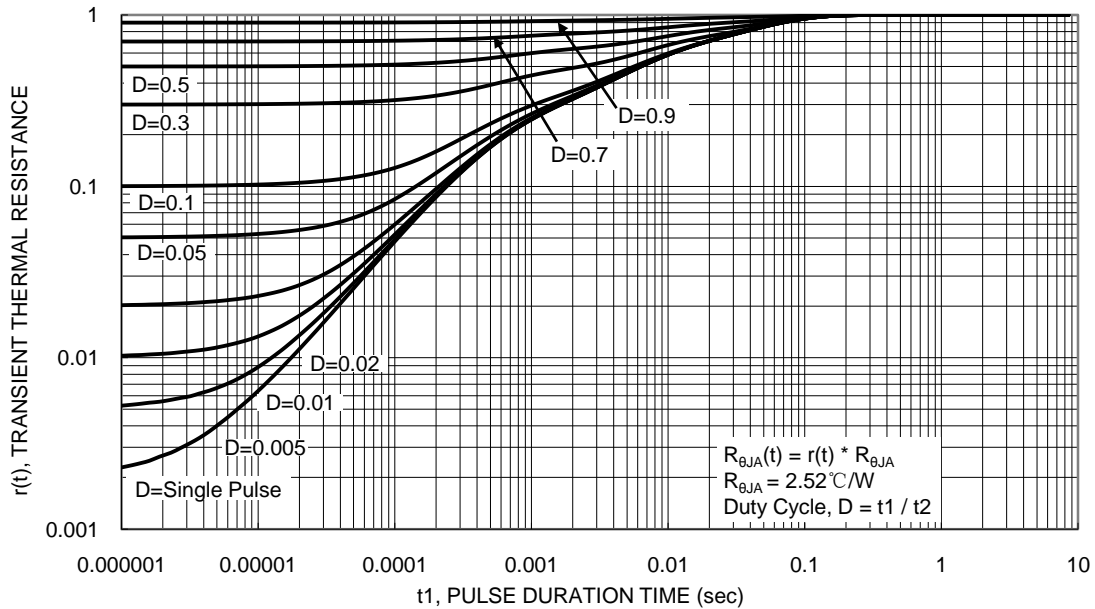
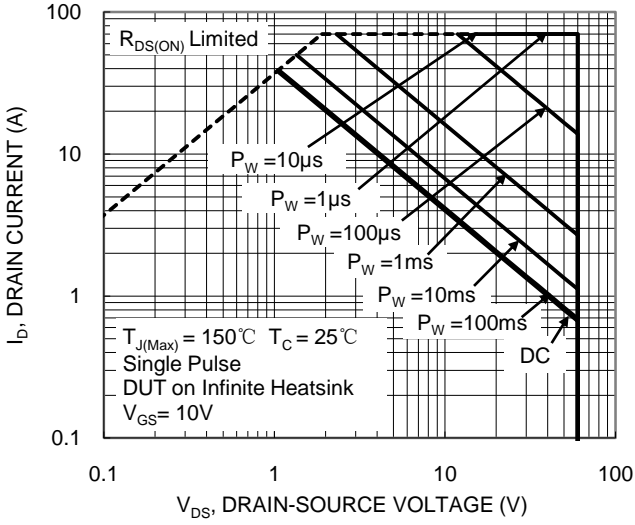


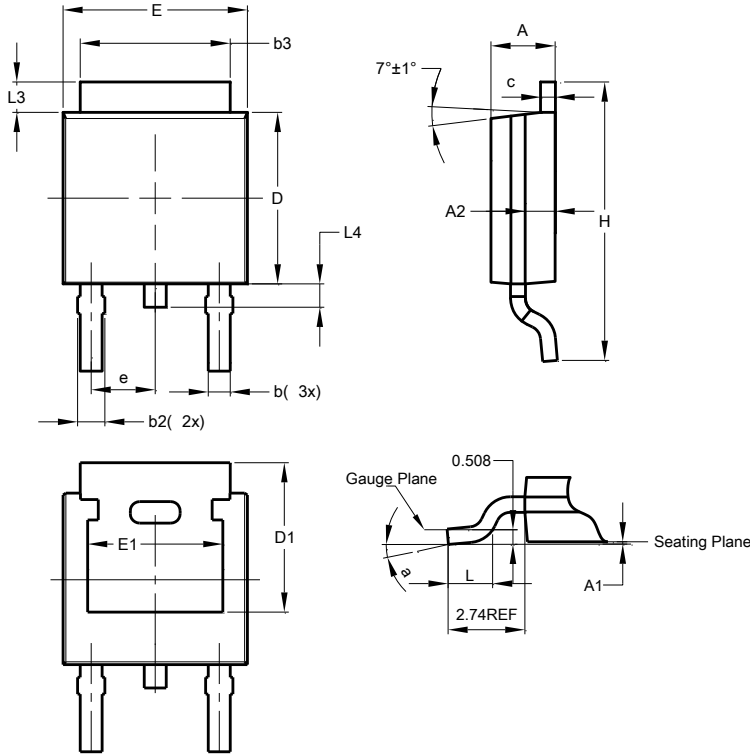
Figure 12. Gate Charge



Package Outline Dimensions

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

TO252 (DPAK)

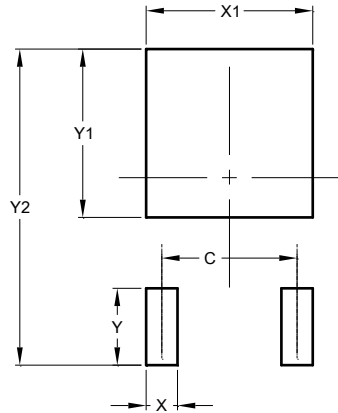


| TO252 (DPAK) | | | |
|----------------------|------|-------|-------|
| Dim | Min | Max | Typ |
| A | 2.19 | 2.39 | 2.29 |
| A1 | 0.00 | 0.13 | 0.08 |
| A2 | 0.97 | 1.17 | 1.07 |
| b | 0.64 | 0.88 | 0.783 |
| b2 | 0.76 | 1.14 | 0.95 |
| b3 | 5.21 | 5.46 | 5.33 |
| c | 0.45 | 0.58 | 0.531 |
| D | 6.00 | 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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