

## Product Summary

| BV <sub>DSS</sub> | R <sub>DS(ON)</sub> Max       | I <sub>D</sub><br>T <sub>C</sub> = +25°C |
|-------------------|-------------------------------|------------------------------------------|
| 100V              | 15mΩ @ V <sub>GS</sub> = 10V  | 52.7A                                    |
|                   | 18mΩ @ V <sub>GS</sub> = 6V   | 48A                                      |
|                   | 25mΩ @ V <sub>GS</sub> = 4.5V | 40A                                      |

## Description

This new generation MOSFET features low on-resistance and fast switching, making it ideal for high efficiency power management applications.

## Applications

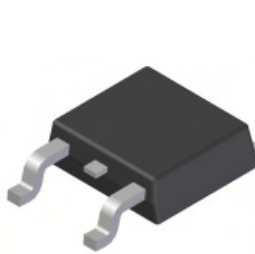
- Power Management Functions
- DC-DC Converters
- Backlighting

## Features

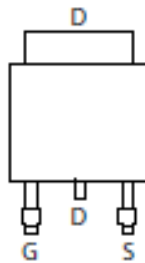
- 100% Unclamped Inductive Switching (UIS) Test in Production – Ensures More Reliable and Robust End Application
- Low R<sub>DS(ON)</sub> – Minimizes Power Losses
- Low Q<sub>G</sub> – Minimizes Switching Losses
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**
- Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

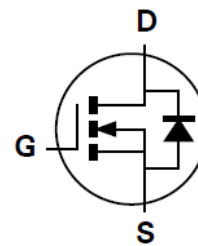
- Case: TO252 (DPAK)
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.33 grams (Approximate)



Top View



Pin Out Top View



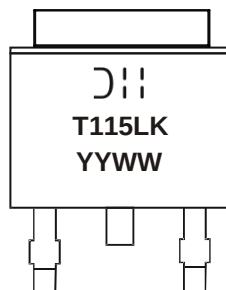
Equivalent Circuit

## Ordering Information (Note 4)

| Part Number     | Case         | Packaging         |
|-----------------|--------------|-------------------|
| DMT10H015LK3-13 | TO252 (DPAK) | 2,500/Tape & Reel |

- Notes:
- EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
  - 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.
  - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  - For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



D = Manufacturer's Marking  
 T115LK = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY = Last Two Digits of Year (ex: 18 = 2018)  
 WW = Week Code (01 to 53)

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                                                          | Symbol           | Value                                            | Unit |
|-----------------------------------------------------------------------------------------|------------------|--------------------------------------------------|------|
| Drain-Source Voltage                                                                    | V <sub>DSS</sub> | 100                                              | V    |
| Gate-Source Voltage                                                                     | V <sub>GSS</sub> | ±20                                              | V    |
| Continuous Drain Current, V <sub>GS</sub> = 10V                                         | I <sub>D</sub>   | 52.7<br>42.1                                     | A    |
|                                                                                         |                  | T <sub>C</sub> = +25°C<br>T <sub>C</sub> = +70°C |      |
| Pulsed Drain Current (10μs Pulse, T <sub>C</sub> = +25°C, Package Limited)              | I <sub>DM</sub>  | 210                                              | A    |
| Maximum Continuous Body Diode Forward Current (Note 6)                                  | I <sub>S</sub>   | 48                                               | A    |
| Pulsed Body Diode Forward Current (10μs Pulse, T <sub>C</sub> = +25°C, Package Limited) | I <sub>SM</sub>  | 210                                              | A    |
| Avalanche Current, L = 3mH                                                              | I <sub>AS</sub>  | 7.5                                              | A    |
| Avalanche Energy, L = 3mH                                                               | E <sub>AS</sub>  | 85                                               | mJ   |

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                   | Symbol                            | Value       | Unit |
|--------------------------------------------------|-----------------------------------|-------------|------|
| Total Power Dissipation (Note 5)                 | P <sub>D</sub>                    | 1.8         | W    |
| Thermal Resistance, Junction to Ambient (Note 5) | R <sub>θJA</sub>                  | 69          | °C/W |
| Total Power Dissipation (Note 6)                 | P <sub>D</sub>                    | 2.9         | W    |
| Thermal Resistance, Junction to Ambient (Note 6) | R <sub>θJA</sub>                  | 42          | °C/W |
| Thermal Resistance, Junction to Case             | R <sub>θJC</sub>                  | 2           | °C/W |
| Operating and Storage Temperature Range          | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C   |

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                          | Symbol              | Min | Typ  | Max  | Unit | Test Condition                                                                             |
|-----------------------------------------|---------------------|-----|------|------|------|--------------------------------------------------------------------------------------------|
| <b>OFF CHARACTERISTICS (Note 7)</b>     |                     |     |      |      |      |                                                                                            |
| Drain-Source Breakdown Voltage          | BV <sub>DSS</sub>   | 100 | —    | —    | V    | V <sub>GS</sub> = 0V, I <sub>D</sub> = 1mA                                                 |
| Zero Gate Voltage Drain Current         | I <sub>DSS</sub>    | —   | —    | 1    | μA   | V <sub>DS</sub> = 80V, V <sub>GS</sub> = 0V                                                |
| Gate-Source Leakage                     | I <sub>GSS</sub>    | —   | —    | ±100 | nA   | V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V                                               |
| <b>ON CHARACTERISTICS (Note 7)</b>      |                     |     |      |      |      |                                                                                            |
| Gate Threshold Voltage                  | V <sub>GS(TH)</sub> | 1.4 | —    | 3.5  | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA                                 |
| Static Drain-Source On-Resistance       | R <sub>DS(ON)</sub> | —   | 10.7 | 15   | mΩ   | V <sub>GS</sub> = 10V, I <sub>D</sub> = 20A                                                |
|                                         |                     | —   | 13.1 | 18   |      | V <sub>GS</sub> = 6V, I <sub>D</sub> = 20A                                                 |
|                                         |                     | —   | 18.2 | 25   |      | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 5A                                                |
|                                         |                     | —   | —    | —    |      | V <sub>GS</sub> = 0V, I <sub>S</sub> = 20A                                                 |
| Diode Forward Voltage                   | V <sub>SD</sub>     | —   | —    | 1.3  | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = 20A                                                 |
| <b>DYNAMIC CHARACTERISTICS (Note 8)</b> |                     |     |      |      |      |                                                                                            |
| Input Capacitance                       | C <sub>ISS</sub>    | —   | 1871 | —    | pF   | V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V<br>f = 1MHz                                    |
| Output Capacitance                      | C <sub>OSS</sub>    | —   | 261  | —    |      |                                                                                            |
| Reverse Transfer Capacitance            | C <sub>RSS</sub>    | —   | 6.9  | —    |      |                                                                                            |
| Gate Resistance                         | R <sub>G</sub>      | —   | 0.75 | —    | Ω    | V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz                                       |
| Total Gate Charge                       | Q <sub>G</sub>      | —   | 33.3 | —    | nC   | V <sub>DD</sub> = 50V, I <sub>D</sub> = 10A,<br>V <sub>GS</sub> = 10V                      |
| Gate-Source Charge                      | Q <sub>GS</sub>     | —   | 6.9  | —    |      |                                                                                            |
| Gate-Drain Charge                       | Q <sub>GD</sub>     | —   | 5.1  | —    |      |                                                                                            |
| Turn-On Delay Time                      | t <sub>D(ON)</sub>  | —   | 6.5  | —    | ns   | V <sub>DD</sub> = 50V, V <sub>GS</sub> = 10V,<br>I <sub>D</sub> = 10A, R <sub>G</sub> = 6Ω |
| Turn-On Rise Time                       | t <sub>R</sub>      | —   | 7.0  | —    |      |                                                                                            |
| Turn-Off Delay Time                     | t <sub>D(OFF)</sub> | —   | 19.7 | —    |      |                                                                                            |
| Turn-Off Fall Time                      | t <sub>F</sub>      | —   | 8.1  | —    |      |                                                                                            |
| Reverse Recovery Time                   | t <sub>RR</sub>     | —   | 37.9 | —    | ns   | I <sub>F</sub> = 10A, di/dt = 100A/μs                                                      |
| Reverse Recovery Charge                 | Q <sub>RR</sub>     | —   | 51.9 | —    | 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 1-inch square copper plate.  
7. Short duration pulse test used to minimize self-heating effect.  
8. Guaranteed by design. Not subject to product testing.

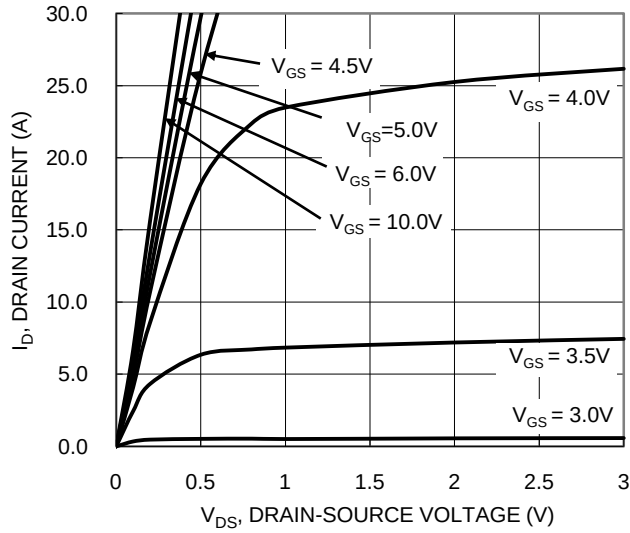


Figure 1. Typical Output Characteristic

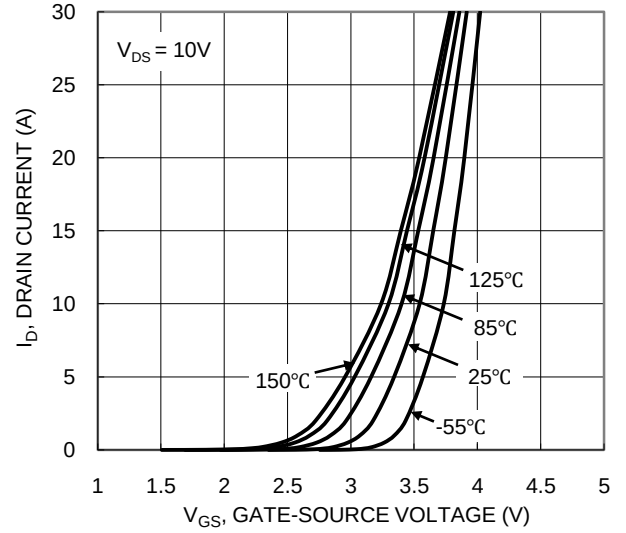


Figure 2. Typical Transfer Characteristic

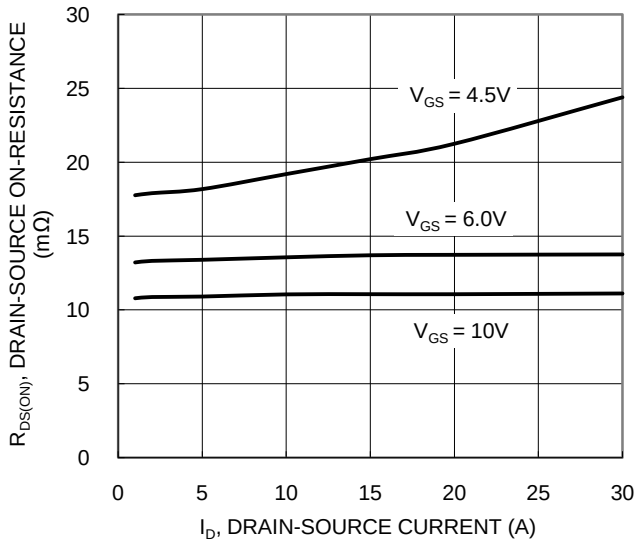


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

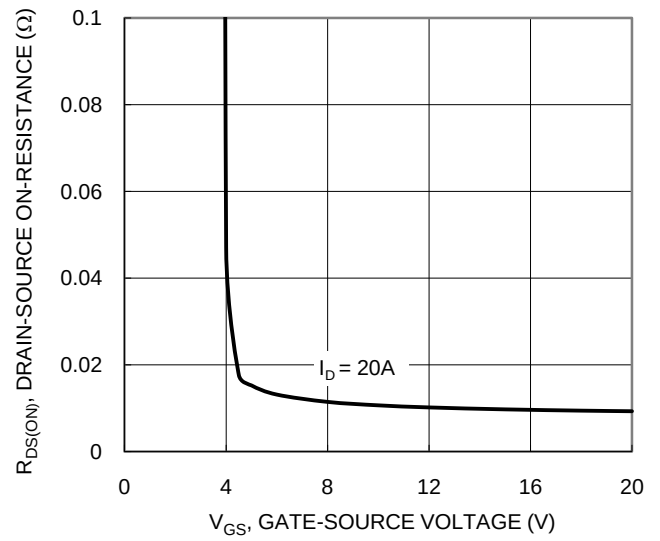


Figure 4. Typical Transfer Characteristic

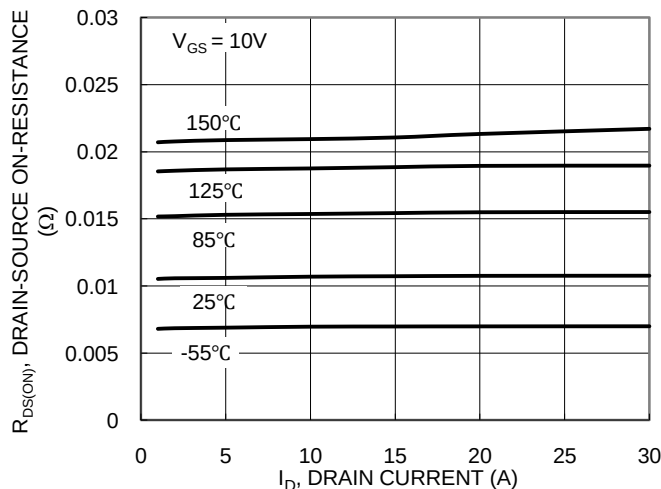


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

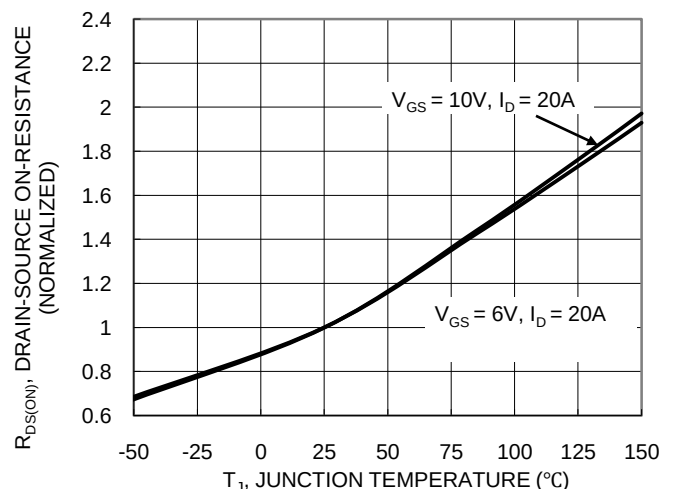
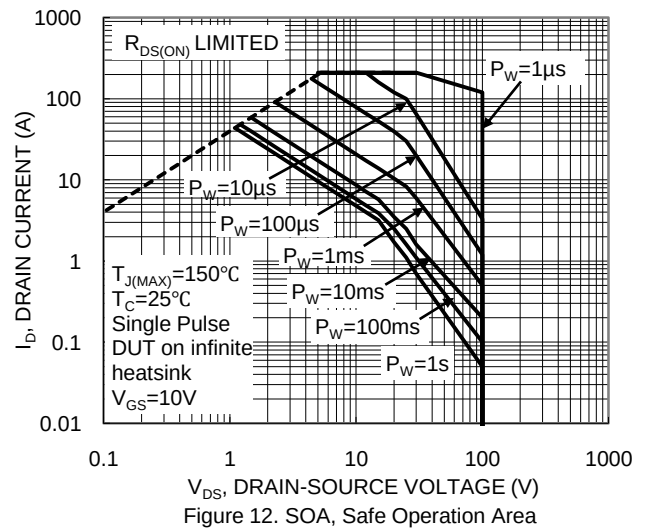
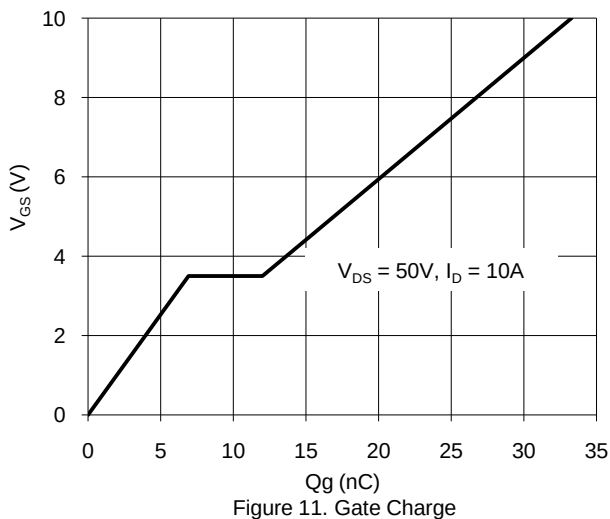
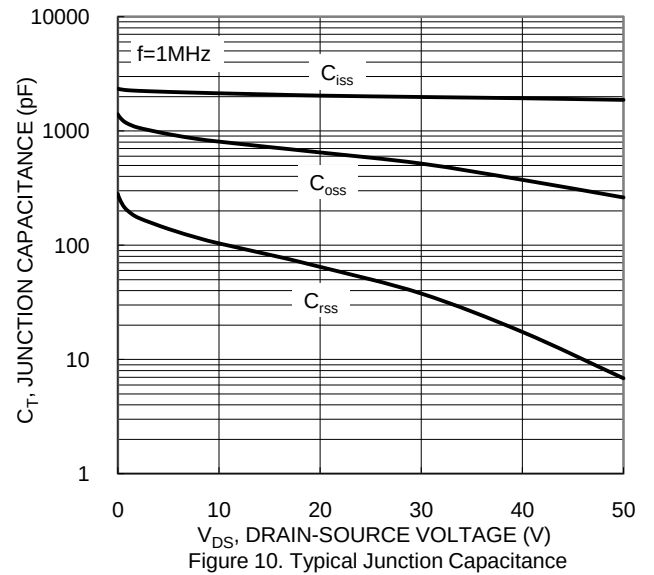
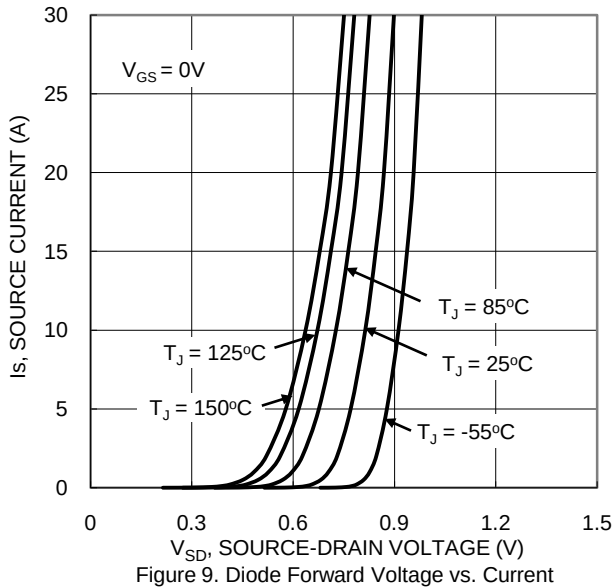
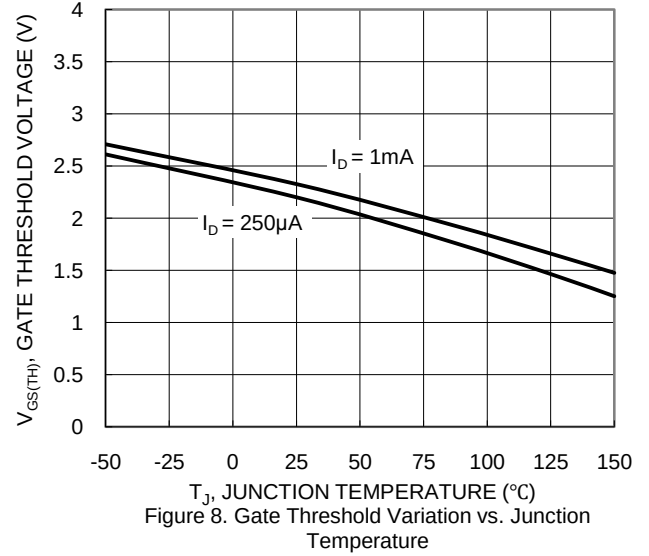
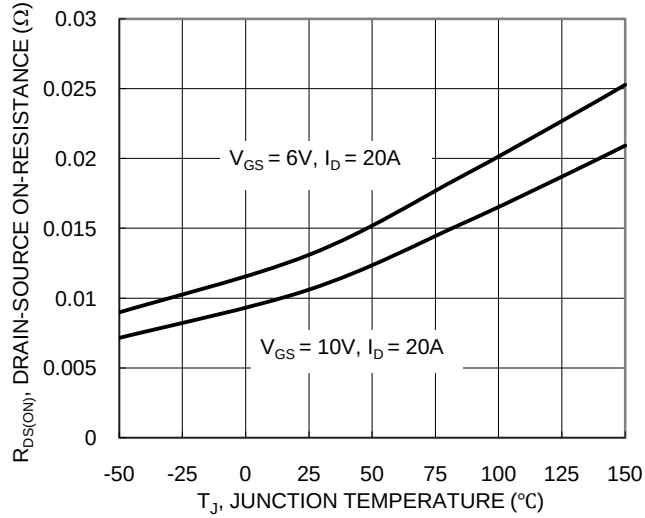


Figure 6. On-Resistance Variation with Junction Temperature



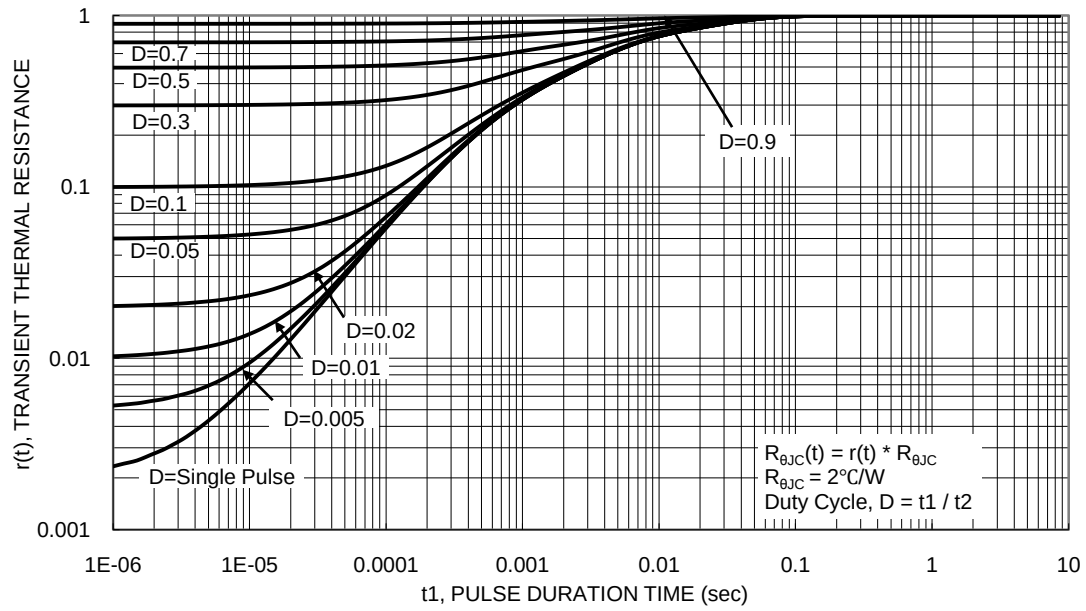
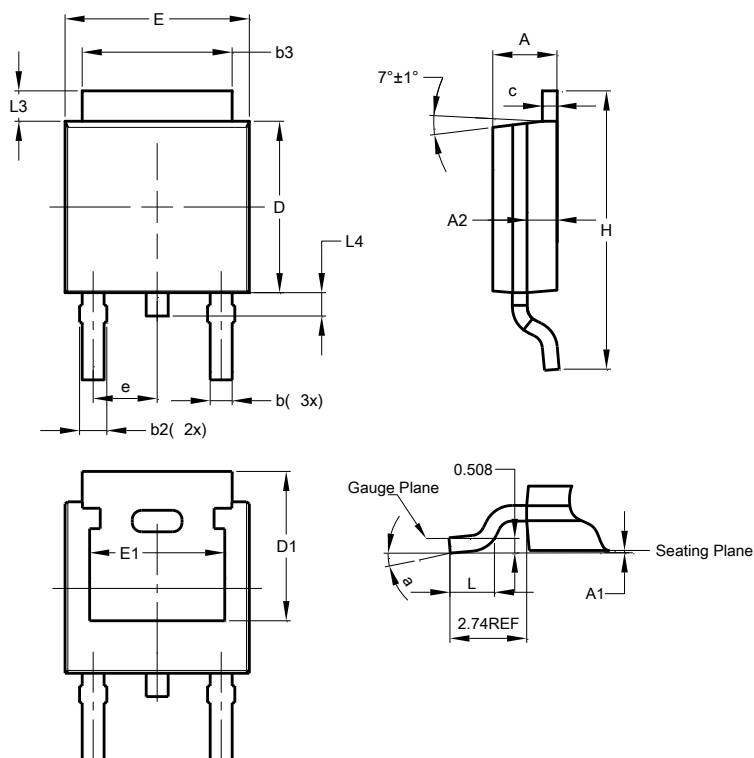


Figure 13. Transient Thermal Resistance

## Package Outline Dimensions

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

**TO252 (DPAK)**

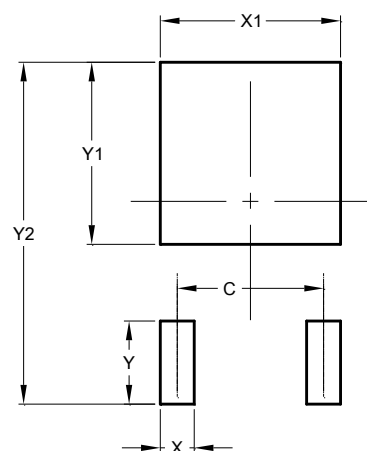


| TO252 (DPAK)         |      |       |       |
|----------------------|------|-------|-------|
| Dim                  | Min  | Max   | Typ   |
| A                    | 2.19 | 2.39  | 2.29  |
| A1                   | 0.00 | 0.13  | 0.08  |
| A2                   | 0.97 | 1.17  | 1.07  |
| b                    | 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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