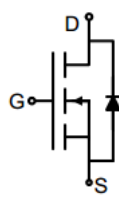
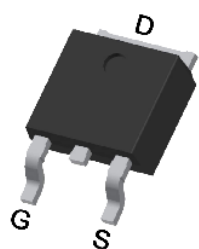


## N-Channel Enhancement Mode Power MOSFET

|                                                                                                                                                                                                                                                                                                                                                                                                                             |                |                                                                                                          |                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------------------------------------------------------------------|------------------|
| <b>Description</b><br><br>The GT095N10K uses advanced trench technology to provide excellent $R_{DS(ON)}$ , low gate charge. It can be used in a wide variety of applications.                                                                                                                                                                                                                                              |                | <br>Schematic Diagram |                  |
| <b>General Features</b> <ul style="list-style-type: none"> <li>• <math>V_{DS}</math> 100V</li> <li>• <math>I_D</math> (at <math>V_{GS} = 10V</math>) 60A</li> <li>• <math>R_{DS(ON)}</math> (at <math>V_{GS} = 10V</math>) &lt; 11m<math>\Omega</math></li> <li>• <math>R_{DS(ON)}</math> (at <math>V_{GS} = 4.5V</math>) &lt; 15m<math>\Omega</math></li> <li>• 100% Avalanche Tested</li> <li>• RoHS Compliant</li> </ul> |                | <br>TO-252            |                  |
| <b>Application</b> <ul style="list-style-type: none"> <li>• Synchronous Rectification in SMPS or LED Driver</li> <li>• UPS</li> <li>• Motor Control</li> <li>• BMS</li> <li>• High Frequency Circuit</li> </ul>                                                                                                                                                                                                             |                |                                                                                                          |                  |
| <b>Device</b>                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Package</b> | <b>Marking</b>                                                                                           | <b>Packaging</b> |
| GT095N10K                                                                                                                                                                                                                                                                                                                                                                                                                   | TO-252         | GT095N10                                                                                                 | 2500pcs/Reel     |

### Absolute Maximum Ratings $T_C = 25^\circ\text{C}$ , unless otherwise noted

| Parameter                                        | Symbol         | Value      | Unit             |
|--------------------------------------------------|----------------|------------|------------------|
| Drain-Source Voltage                             | $V_{DS}$       | 100        | V                |
| Continuous Drain Current                         | $I_D$          | 60         | A                |
| Pulsed Drain Current (note1)                     | $I_{DM}$       | 240        | A                |
| Gate-Source Voltage                              | $V_{GS}$       | $\pm 20$   | V                |
| Power Dissipation                                | $P_D$          | 76         | W                |
| Single pulse avalanche energy (note3)            | $E_{AS}$       | 7.5        | mJ               |
| Operating Junction and Storage Temperature Range | $T_J, T_{stg}$ | -55 To 150 | $^\circ\text{C}$ |

### Thermal Resistance

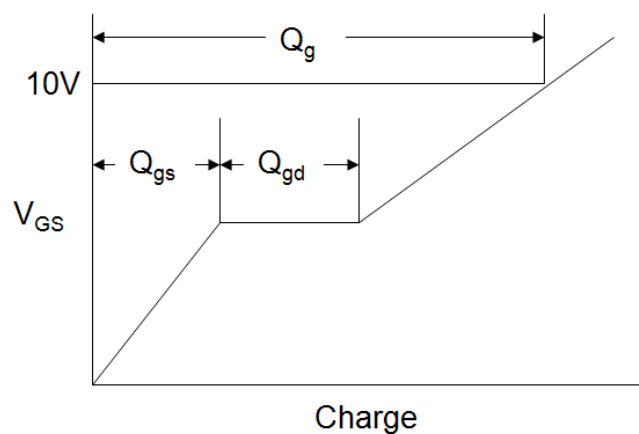
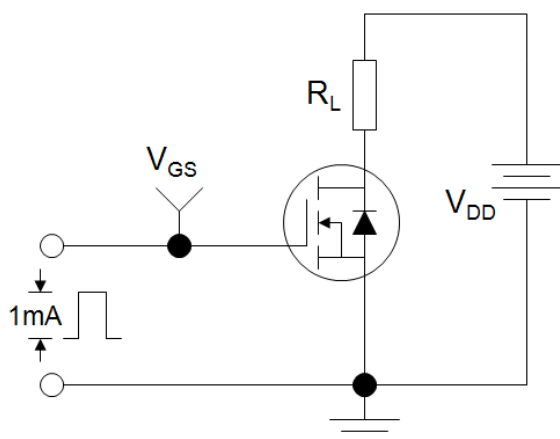
| Parameter                               | Symbol     | Value | Unit               |
|-----------------------------------------|------------|-------|--------------------|
| Thermal Resistance, Junction-to-Case    | $R_{thJC}$ | 1.65  | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Ambient | $R_{thJA}$ | 50    | $^\circ\text{C/W}$ |

| Specifications T <sub>J</sub> = 25°C, unless otherwise noted |                      |                                                                          |       |      |      |      |
|--------------------------------------------------------------|----------------------|--------------------------------------------------------------------------|-------|------|------|------|
| Parameter                                                    | Symbol               | Test Conditions                                                          | Value |      |      | Unit |
|                                                              |                      |                                                                          | Min.  | Typ. | Max. |      |
| Static Parameters                                            |                      |                                                                          |       |      |      |      |
| Drain-Source Breakdown Voltage                               | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA                             | 100   | --   | --   | V    |
| Zero Gate Voltage Drain Current                              | I <sub>DSS</sub>     | V <sub>DS</sub> = 100V, V <sub>GS</sub> = 0V                             | --    | --   | 1    | μA   |
| Gate-Source Leakage                                          | I <sub>GSS</sub>     | V <sub>GS</sub> = ±20V                                                   | --    | --   | ±100 | nA   |
| Gate-Source Threshold Voltage                                | V <sub>GS(th)</sub>  | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA               | 1.5   | 1.8  | 2.5  | V    |
| Drain-Source On-Resistance                                   | R <sub>DS(on)</sub>  | V <sub>GS</sub> = 10V, I <sub>D</sub> = 35A                              | --    | 9    | 11   | mΩ   |
|                                                              |                      | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 35A                             | --    | 13   | 15   |      |
| Forward Transconductance                                     | g <sub>FS</sub>      | V <sub>DS</sub> =5V,I <sub>D</sub> =20A                                  | --    | 60   | --   | S    |
| Dynamic Parameters                                           |                      |                                                                          |       |      |      |      |
| Input Capacitance                                            | C <sub>iss</sub>     | V <sub>GS</sub> = 0V,<br>V <sub>DS</sub> = 50V,<br>f = 1.0MHz            | --    | 2275 | --   | pF   |
| Output Capacitance                                           | C <sub>oss</sub>     |                                                                          | --    | 162  | --   |      |
| Reverse Transfer Capacitance                                 | C <sub>rss</sub>     |                                                                          | --    | 7.9  | --   |      |
| Total Gate Charge                                            | Q <sub>g</sub>       | V <sub>DS</sub> = 50V,<br>I <sub>D</sub> = 14A,<br>V <sub>GS</sub> = 10V | --    | 29   | --   | nC   |
| Gate-Source Charge                                           | Q <sub>gs</sub>      |                                                                          | --    | 5    | --   |      |
| Gate-Drain Charge                                            | Q <sub>gd</sub>      |                                                                          | --    | 5    | --   |      |
| Turn-on Delay Time                                           | t <sub>d(on)</sub>   | V <sub>DD</sub> = 50V,<br>I <sub>D</sub> = 14A,<br>R <sub>G</sub> = 10Ω  | --    | 8    | --   | ns   |
| Turn-on Rise Time                                            | t <sub>r</sub>       |                                                                          | --    | 3    | --   |      |
| Turn-off Delay Time                                          | t <sub>d(off)</sub>  |                                                                          | --    | 26   | --   |      |
| Turn-off Fall Time                                           | t <sub>f</sub>       |                                                                          | --    | 4    | --   |      |
| Drain-Source Body Diode Characteristics                      |                      |                                                                          |       |      |      |      |
| Continuous Body Diode Current                                | I <sub>S</sub>       | T <sub>C</sub> = 25°C                                                    | --    | --   | 60   | A    |
| Body Diode Voltage                                           | V <sub>SD</sub>      | T <sub>J</sub> = 25°C, I <sub>SD</sub> = 35A, V <sub>GS</sub> = 0V       | --    | --   | 1.2  | V    |
| Reverse Recovery Time                                        | T <sub>rr</sub>      | I <sub>S</sub> = 20A, V <sub>GS</sub> = 0V<br>di/dt=-100A/us             | --    | 50.4 | --   | ns   |
| Reverse Recovery Charge                                      | Q <sub>rr</sub>      |                                                                          | --    | 68   | --   | ns   |

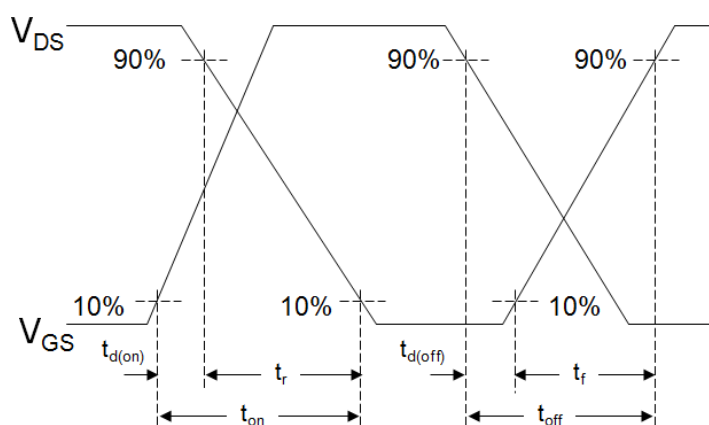
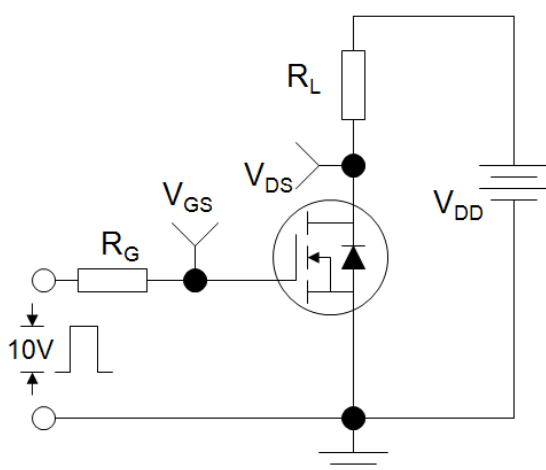
**Notes**

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Identical low side and high side switch with identical  $R_G$
3. EAS condition :  $T_J=25^\circ\text{C}$  ,  $V_{DD}=50V, V_{GS}=10V, L=0.5mH, R_g=25\Omega$

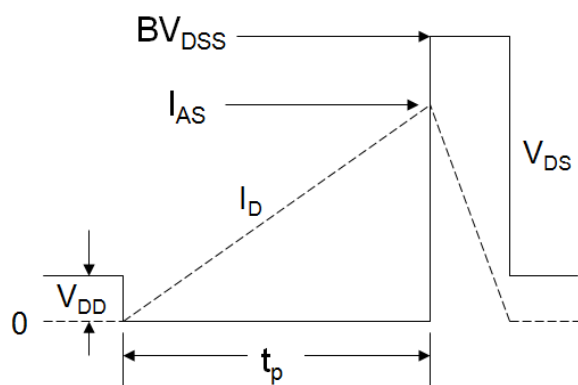
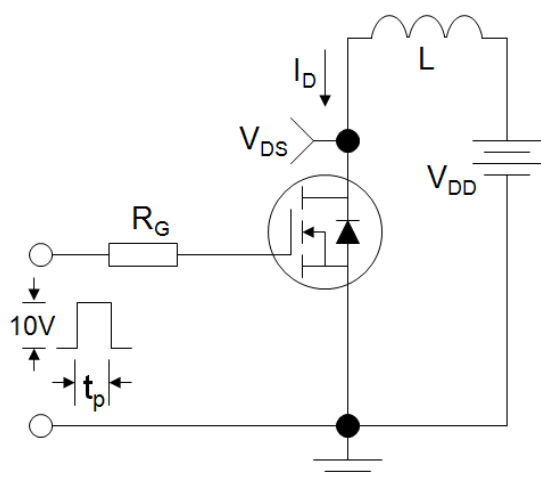
Gate Charge Test Circuit



EAS Test Circuit



Switch Time Test Circuit



Typical Characteristics  $T_J = 25^\circ\text{C}$ , unless otherwise noted

Figure 1. Output Characteristics

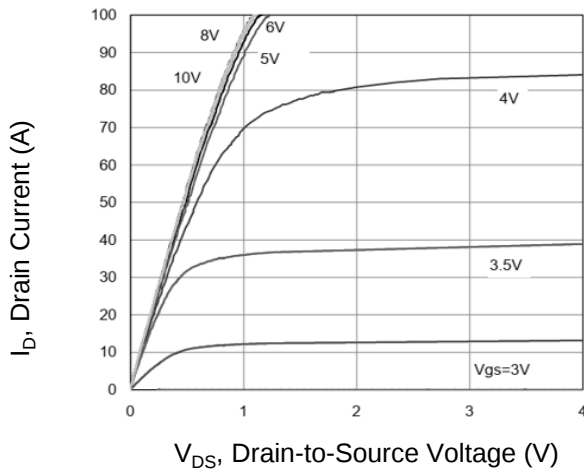


Figure 2. Transfer Characteristics

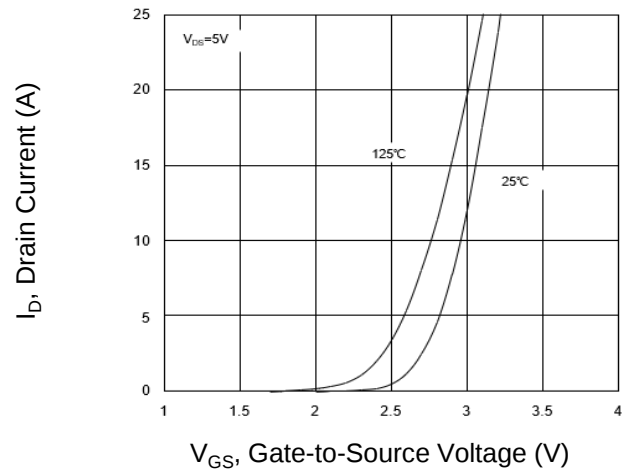


Figure 3. Gate Charge

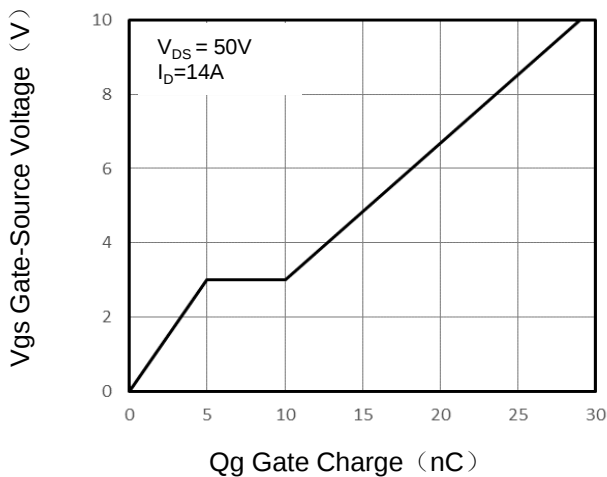


Figure 4. Drain Source On Resistance

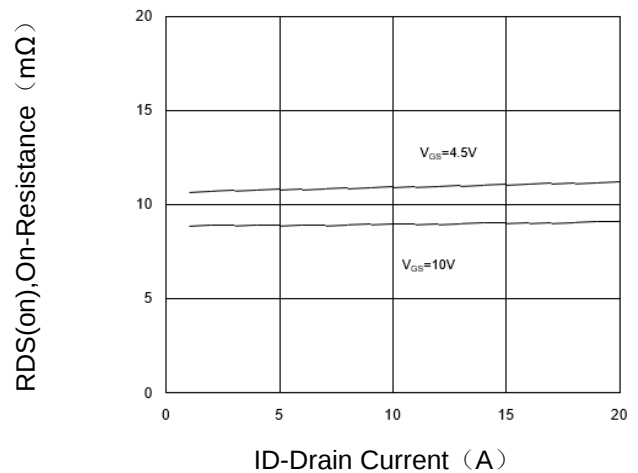


Figure 5. Capacitance vs Vds

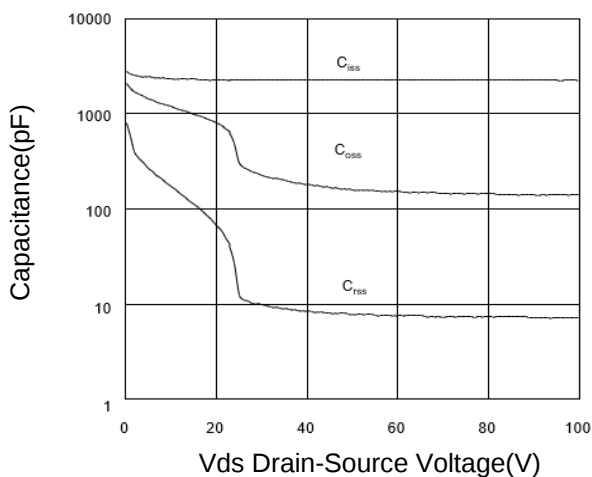
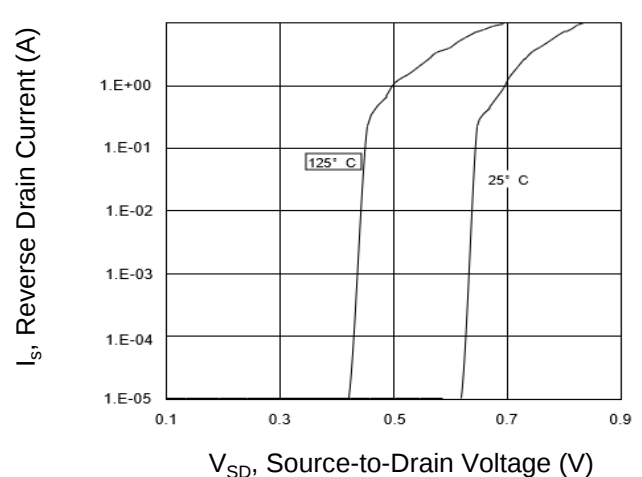


Figure 6. Source-Drain Diode Forward



# Typical Characteristics $T_J = 25^\circ\text{C}$ , unless otherwise noted

Figure 7. Drain-Source On-Resistance

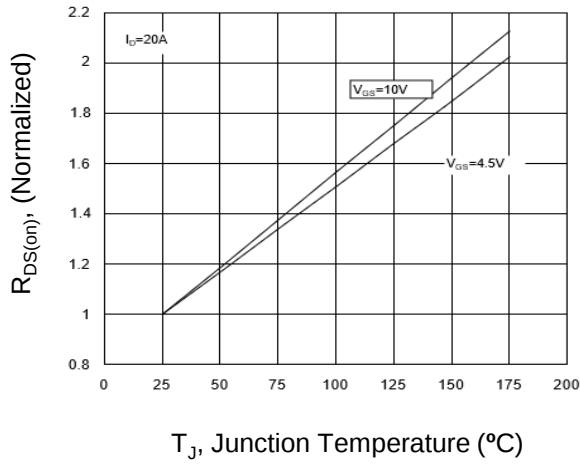


Figure 8. Safe Operation Area

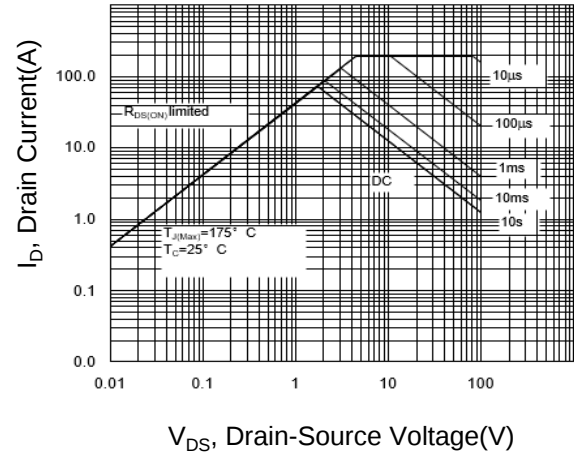
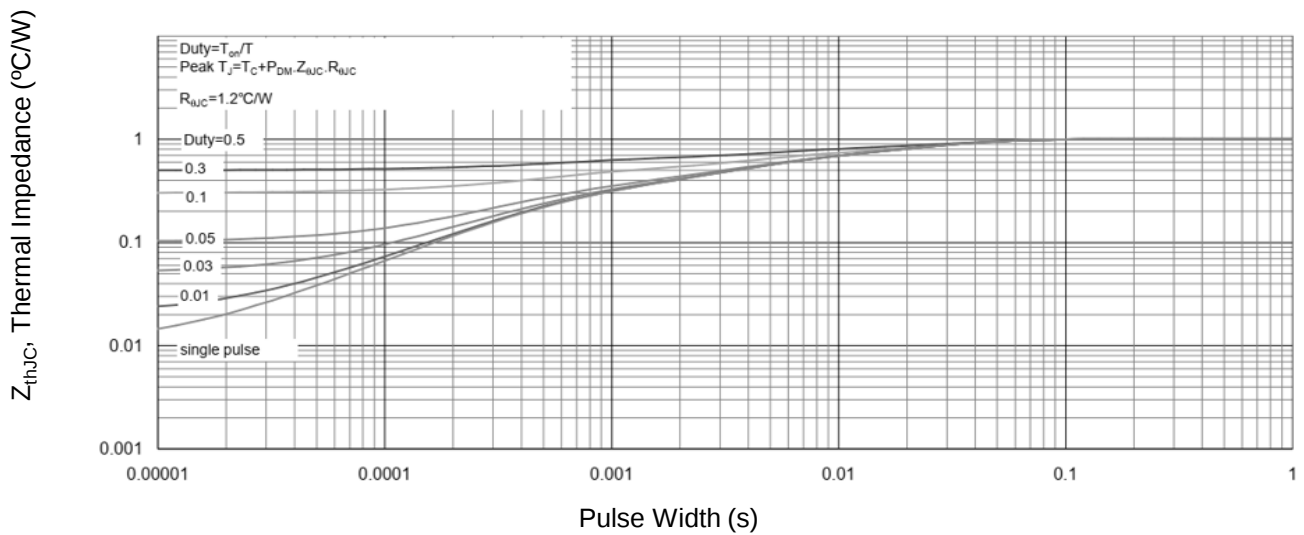
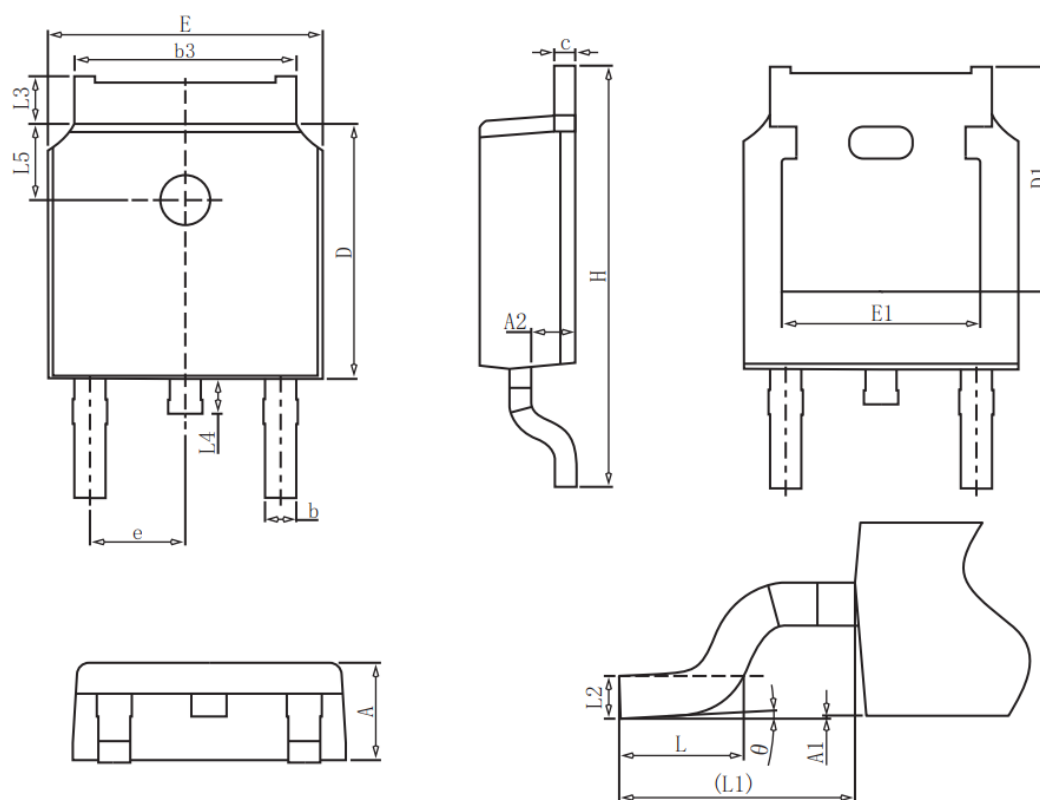


Figure 9. Normalized Maximum Transient Thermal Impedance



## TO-252 Package Information



| Symbol   | Dimensions in Millimeters |      |      |
|----------|---------------------------|------|------|
|          | MIN.                      | NOM. | MAX. |
| A        | 2.2                       | 2.3  | 2.4  |
| A1       | 0                         |      | 0.2  |
| A2       | 0.97                      | 1.07 | 1.17 |
| b        | 0.68                      | 0.78 | 0.9  |
| b3       | 5.2                       | 5.33 | 5.5  |
| c        | 0.43                      | 0.53 | 0.63 |
| D        | 5.98                      | 6.1  | 6.22 |
| D1       | 5.30REF                   |      |      |
| E        | 6.4                       | 6.6  | 6.8  |
| E1       | 4.63                      |      |      |
| e        | 2.286BSC                  |      |      |
| H        | 9.4                       | 10.1 | 10.5 |
| L        | 1.38                      | 1.5  | 1.75 |
| L1       | 2.90REF                   |      |      |
| L2       | 0.51BSC                   |      |      |
| L3       | 0.88                      |      | 1.28 |
| L4       | 0.5                       |      | 1    |
| L5       | 1.65                      | 1.8  | 1.95 |
| $\theta$ | 0°                        |      | 8°   |