

Description

The G06N10 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

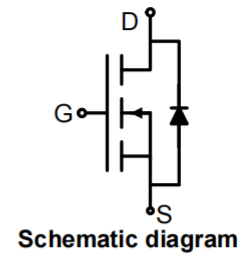
General Features

| V_{DS} | $R_{DS(ON)}(Typ)$ @ $V_{GS}=10V$ | I_D |
|----------|-------------------------------------|-------|
| 100V | 195m Ω | 6A |

- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation
- RoHS Compliant

Application

- Power switching application
- LED lighting



Ordering Information

| Part Number | Marking | Case | Packaging |
|-------------|---------|--------|--------------|
| G06N10 | G06N10 | TO-252 | 2500pcs/Reel |

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

| Parameter | Symbol | Limit | Unit |
|--------------------------------------------------|----------------|------------|------------------|
| Drain-Source Voltage | V_{DS} | 100 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Drain Current-Continuous | I_D | 6 | A |
| Drain Current-Pulsed ^(Note 1) | I_{DM} | 20 | A |
| Maximum Power Dissipation | P_D | 25 | W |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | -55 To 175 | $^\circ\text{C}$ |

Thermal Characteristic

| | | | |
|-------------------------------------------------------------|-----------------|---|--------------------|
| Thermal Resistance, Junction-to-Ambient ^(Note 2) | $R_{\theta JA}$ | 6 | $^\circ\text{C/W}$ |
|-------------------------------------------------------------|-----------------|---|--------------------|

Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|---------------------------------|------------|---------------------------------|-----|-----|-----|---------------|
| Off Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0V, I_D=250\mu\text{A}$ | 100 | 112 | - | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=100V, V_{GS}=0V$ | - | - | 1 | μA |

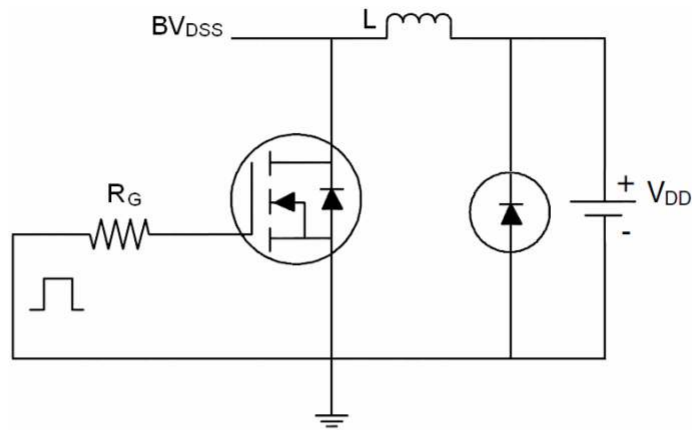
| | | | | | | |
|------------------------------------------------------|--------------|-------------------------------------------------------------------|-----|------|-----------|------------|
| Gate-Body Leakage Current | I_{GSS} | $V_{GS}=\pm 20V, V_{DS}=0V$ | - | - | ± 100 | nA |
| On Characteristics ^(Note 3) | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 1.2 | 2.0 | 3.0 | V |
| Drain-Source On-State Resistance | $R_{DS(ON)}$ | $V_{GS}=10V, I_D=6A$ | - | 195 | 240 | m Ω |
| Forward Transconductance | g_{FS} | $V_{DS}=5V, I_D=6A$ | 2 | - | - | S |
| Dynamic Characteristics ^(Note4) | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=50V, V_{GS}=0V,$ $F=1.0MHz$ | - | 190 | - | PF |
| Output Capacitance | C_{oss} | | - | 22 | - | PF |
| Reverse Transfer Capacitance | C_{rss} | | - | 13 | - | PF |
| Switching Characteristics ^(Note 4) | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}=50V, I_D=6.0A, R_L=39\Omega$ $V_{GS}=10V, R_G=1\Omega$ | - | 6 | - | nS |
| Turn-on Rise Time | t_r | | - | 10 | - | nS |
| Turn-Off Delay Time | $t_{d(off)}$ | | - | 10 | - | nS |
| Turn-Off Fall Time | t_f | | - | 6 | - | nS |
| Total Gate Charge | Q_g | $V_{DS}=50V, I_D=6.0A,$ $V_{GS}=10V$ | - | 5.2 | - | nC |
| Gate-Source Charge | Q_{gs} | | - | 0.75 | - | nC |
| Gate-Drain Charge | Q_{gd} | | - | 1.4 | - | nC |
| Drain-Source Diode Characteristics | | | | | | |
| Diode Forward Voltage ^(Note 3) | V_{SD} | $V_{GS}=0V, I_S=6.0A$ | - | - | 1.2 | V |
| Diode Forward Current ^(Note 2) | I_S | | - | - | 2 | A |

Notes:

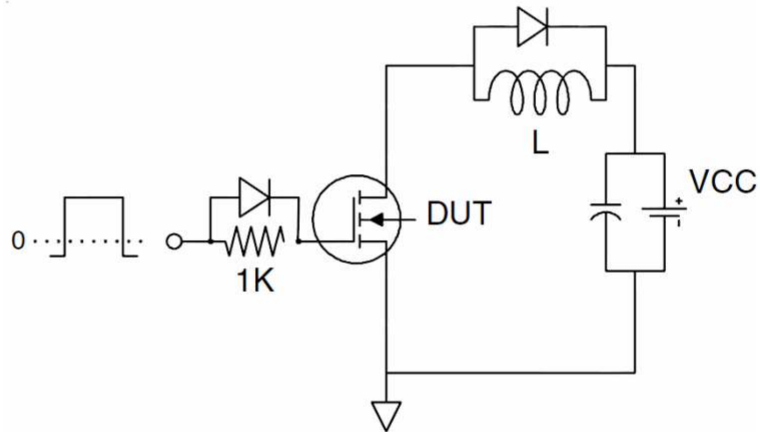
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production

Test Circuit

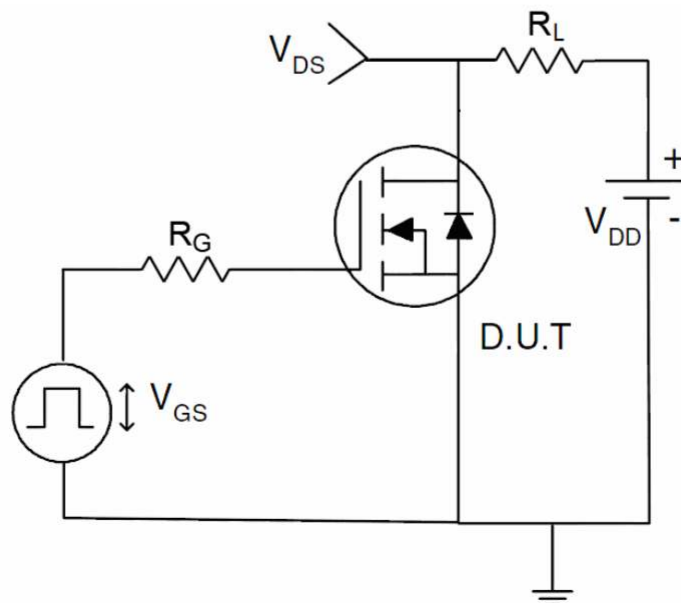
1) E_{AS} test circuit



2) Gate charge test circuit



3) Switch Time Test Circuit



Typical Electrical and Thermal Characteristics (Curves)

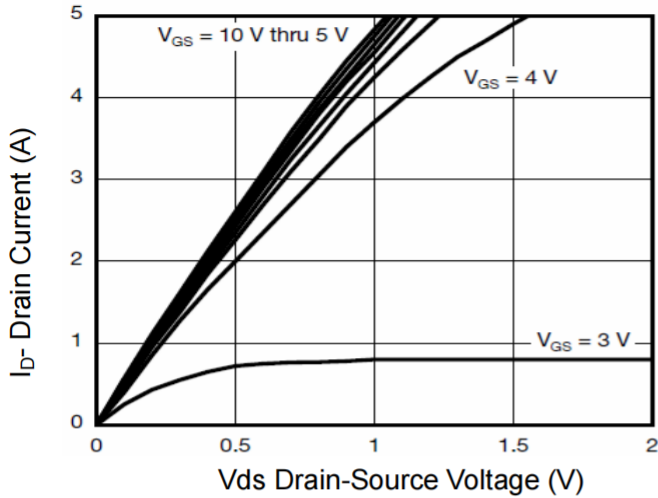


Figure 1 Output Characteristics

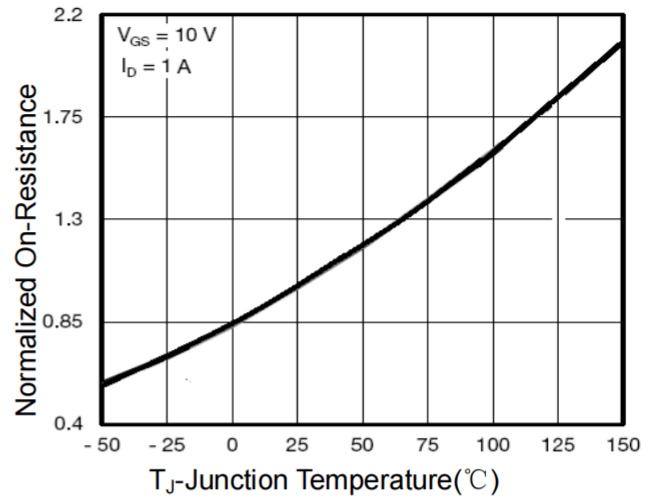


Figure 4 R_{dson} -Junction Temperature

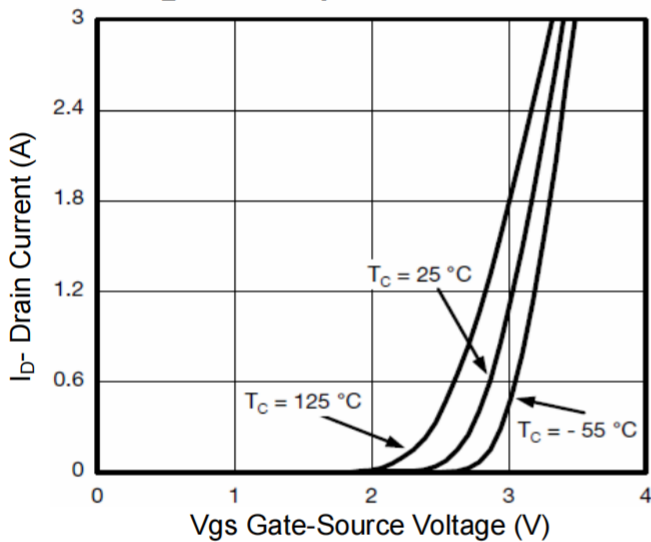


Figure 2 Transfer Characteristics

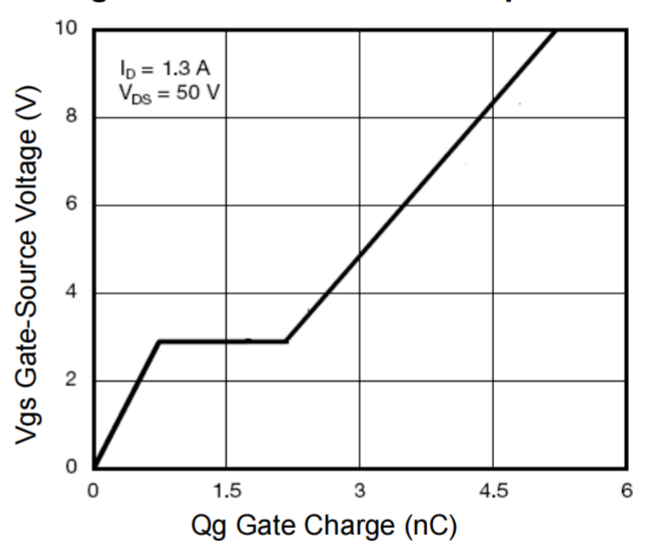


Figure 5 Gate Charge

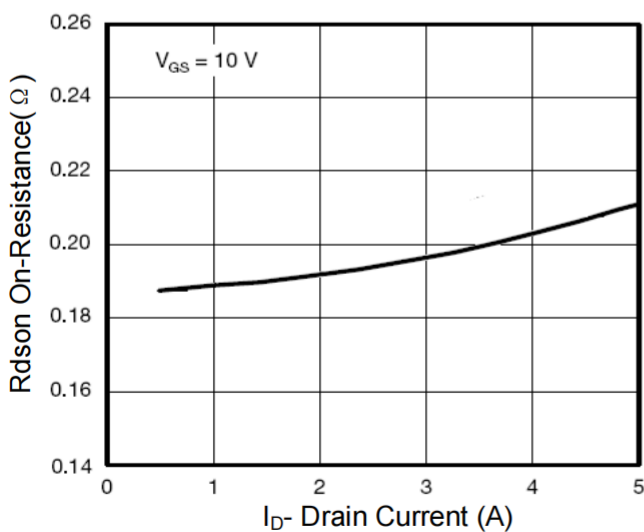


Figure 3 R_{dson} - Drain Current

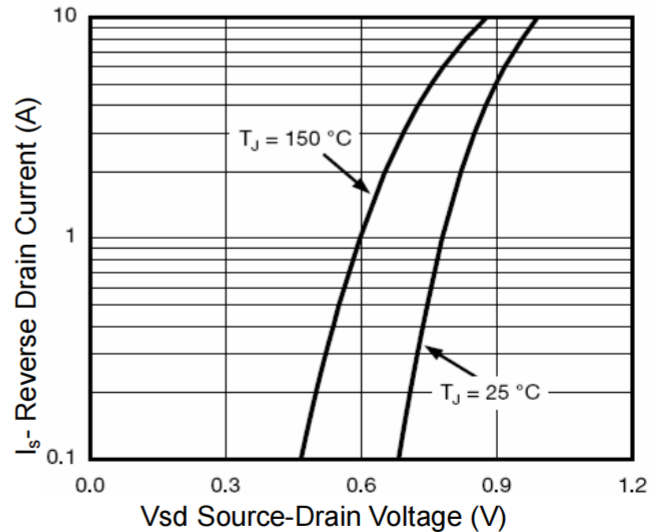


Figure 6 Source- Drain Diode Forward

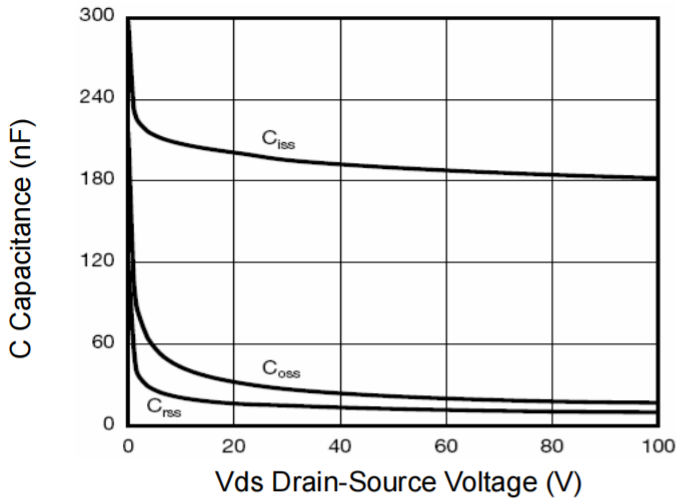


Figure 7 Capacitance vs Vds

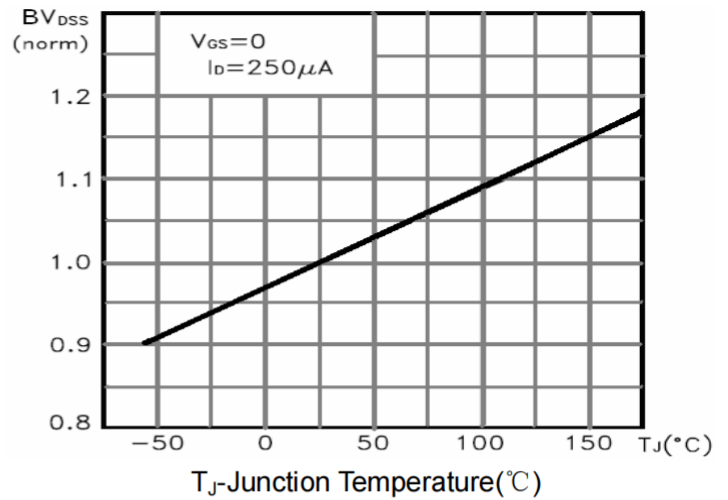


Figure 9 BV_{DSS} vs Junction Temperature

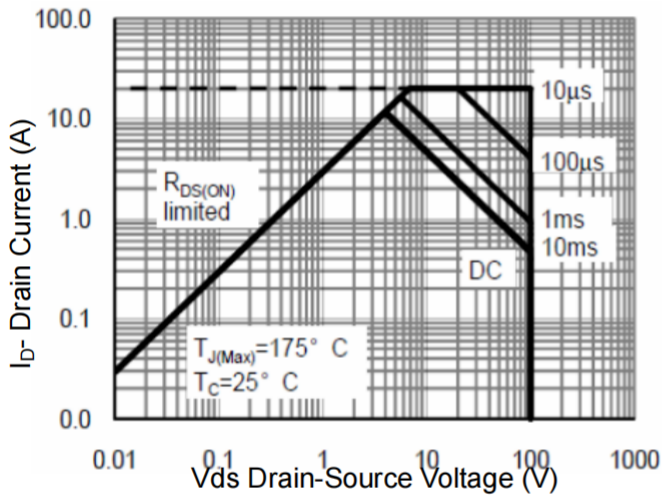


Figure 8 Safe Operation Area

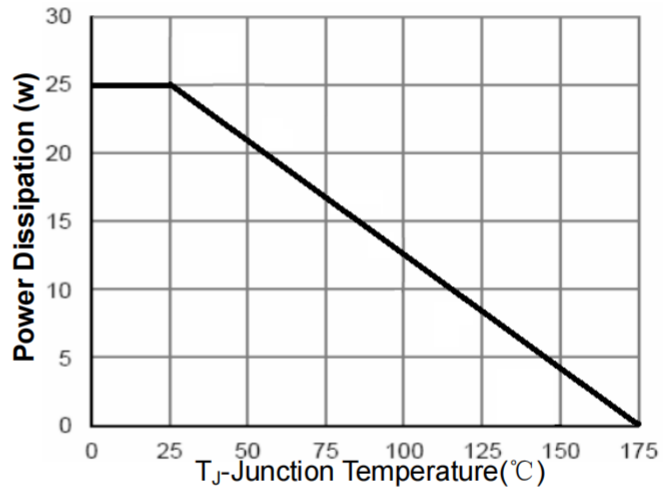


Figure 10 Power De-ratin

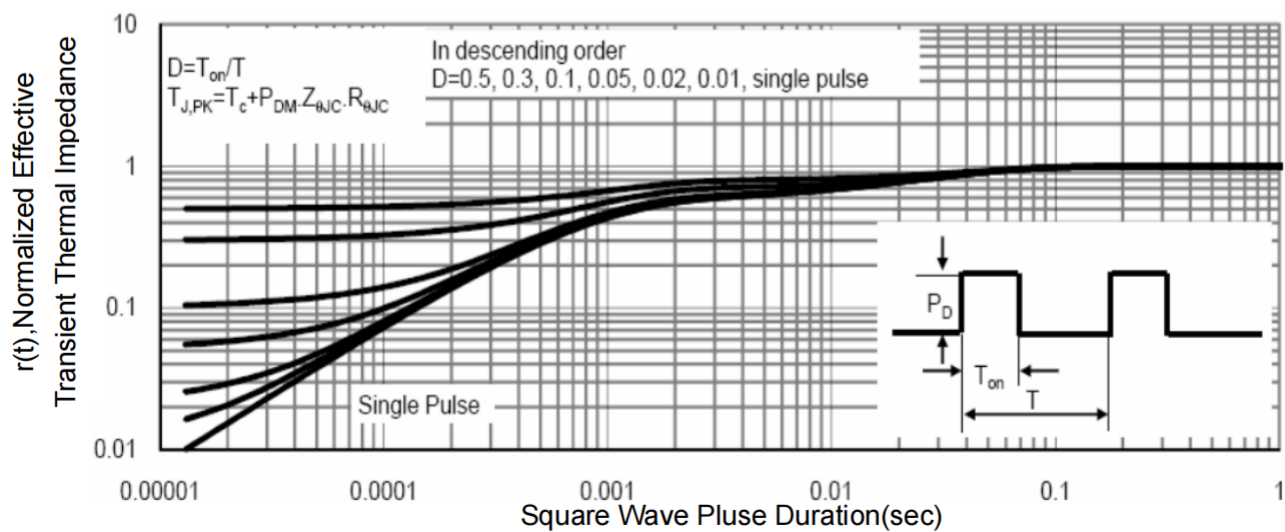
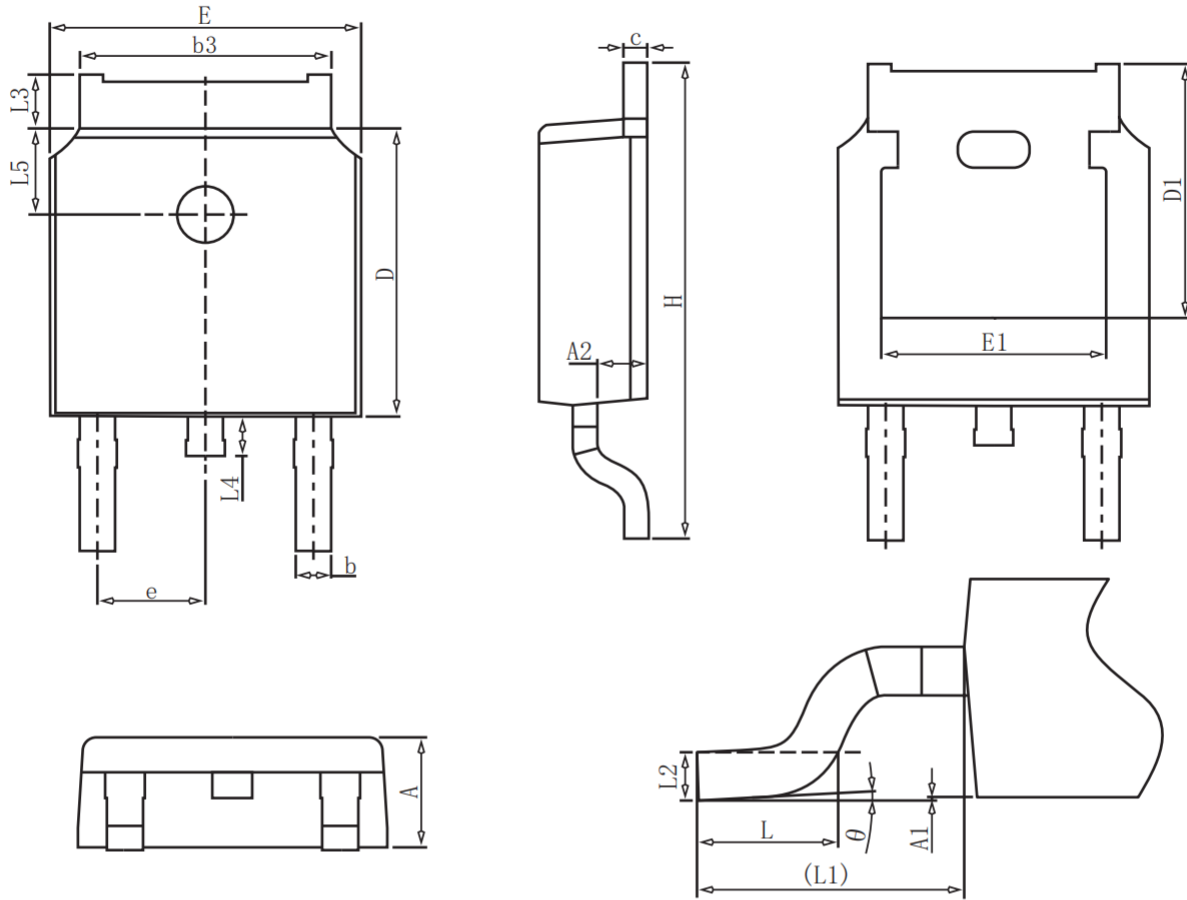


Figure 11 Normalized Maximum Transient Thermal Impedance

TO-252 Package information



COMMON DIMENSIONS

| SYMBOL | mm | | |
|--------|----------|-------|-------|
| | MIN | NOM | MAX |
| A | 2.20 | 2.30 | 2.40 |
| A1 | 0.00 | - | 0.20 |
| A2 | 0.97 | 1.07 | 1.17 |
| b | 0.68 | 0.78 | 0.90 |
| b3 | 5.20 | 5.33 | 5.50 |
| c | 0.43 | 0.53 | 0.63 |
| D | 5.98 | 6.10 | 6.22 |
| D1 | 5.30REF | | |
| E | 6.40 | 6.60 | 6.80 |
| E1 | 4.63 | - | - |
| e | 2.286BSC | | |
| H | 9.40 | 10.10 | 10.50 |
| L | 1.38 | 1.50 | 1.75 |
| L1 | 2.90REF | | |
| L2 | 0.51BSC | | |
| L3 | 0.88 | - | 1.28 |
| L4 | 0.50 | - | 1.00 |
| L5 | 1.65 | 1.80 | 1.95 |
| θ | 0° | - | 8° |