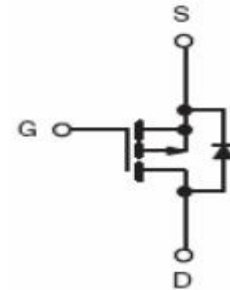




P-Channel Enhancement Mode Power MOSFET

Description

The MXN3347 uses advanced trench technology to provide excellent RDS(ON), low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a load switch or in PWM and a wide variety of applications.

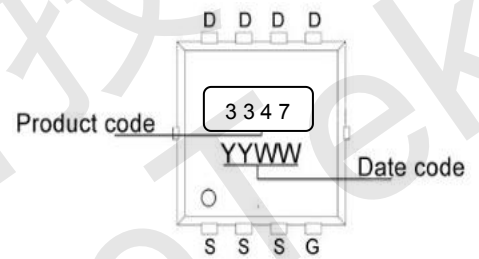


Schematic diagram

General Features

- ◆ $V_{DS} = -30V$, $I_D = -35A$
- ◆ $R_{DS(ON)}$ (Typ.) = $9\ m\ \Omega$ @ $V_{GS} = -10V$
- ◆ $R_{DS(ON)}$ (Typ.) = $13.5\ m\ \Omega$ @ $V_{GS} = -4.5V$

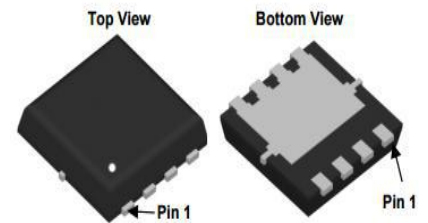
High Power and current handing capability
Lead free product is acquired
Surface mount package



Marking and pin Assignment

Application

PWM applications
Load switch
Power management



PDFN3.3x3.3-8L

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

| Parameter | Symbol | Limit | Unit |
|--------------------------------------------------|----------------|------------|------------|
| Drain-Source Voltage | V_{DS} | -30 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Drain Current-Continuous, $T_C = 25^\circ C$ | I_D | -35 | A |
| Drain Current-Pulsed (Note 1) | I_{DM} | -90 | A |
| Drain Current-Continuous, $T_A = 25^\circ C$ | I_{DSM} | -13 | A |
| Maximum Power Dissipation, $T_A = 25^\circ C$ | P_{DSM} | 3.1 | W |
| Maximum Power Dissipation, $T_C = 25^\circ C$ | P_D | 29 | W |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | -55 To 150 | $^\circ C$ |



Electrical Characteristics (TA=25°C unless otherwise noted)

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|-------------------------------------------|---------------------|---------------------------------------------------------------------------------------------|------|------|------|------|
| Drain-Source Breakdown Voltage | BV _{DSS} | V _{GS} =0V, I _D =-250μA | -30 | - | - | V |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} =-30V, V _{GS} =0V | - | - | -1 | μA |
| Gate-Body Leakage Current | I _{GSS} | V _{GS} =±20V, V _{DS} =0V | - | - | ±100 | nA |
| On Characteristics (Note 3) | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} =V _{GS} , I _D =-250μA | -1 | -1.4 | -2.5 | V |
| Drain-Source On-State Resistance | R _{DS(on)} | V _{GS} =-10V, I _D =-8A | - | 9 | 12 | mΩ |
| | | V _{GS} =-4.5V, I _D =-7A | - | 13.5 | 16 | mΩ |
| Forward Transconductance | g _{FS} | V _{DS} =-10V, I _D =-10A | 20 | - | - | S |
| Dynamic Characteristics (Note4) | | | | | | |
| Input Capacitance | C _{iss} | V _{DS} =-15V, V _{GS} =0V, F=1.0MHz | - | 1200 | - | PF |
| Output Capacitance | C _{oss} | | - | 200 | - | PF |
| Reverse Transfer Capacitance | C _{rss} | | - | 150 | - | PF |
| Switching Characteristics (Note 4) | | | | | | |
| Turn-on Delay Time | t _{d(on)} | V _{DD} =-15V, I _D =-10A, V _{GS} =-10V, R _{GEN} =1Ω | - | 11 | - | nS |
| Turn-on Rise Time | t _r | | - | 6 | - | nS |
| Turn-Off Delay Time | t _{d(off)} | | - | 28 | - | nS |
| Turn-Off Fall Time | t _f | | - | 10 | - | nS |
| Total Gate Charge | Q _g | V _{DS} =-15V, I _D =-10A, V _{GS} =-10V | - | 25 | - | nC |
| Gate-Source Charge | Q _{gs} | | - | 3.9 | - | nC |
| Gate-Drain Charge | Q _{gd} | | - | 4.8 | - | nC |
| Drain-Source Diode Characteristics | | | | | | |
| Diode Forward Voltage (Note 3) | V _{SD} | V _{GS} =0V, I _S =-2A | -0.4 | - | -1.0 | V |

Thermal Characteristic

| | | | |
|----------------------------------------------------|------------------|-----|------|
| Thermal Resistance, Junction-to-Ambient (Note 2) | R _{θJA} | 40 | °C/W |
| Thermal Resistance, Junction-to-Case, Steady State | R _{θJC} | 4.2 | °C/W |

Notes:

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



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

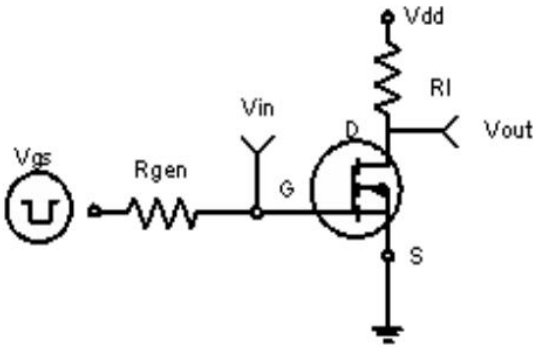


Figure 1: Switching Test Circuit

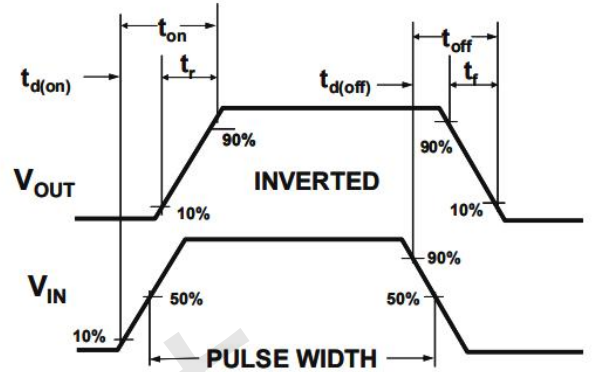


Figure 2: Switching Waveforms

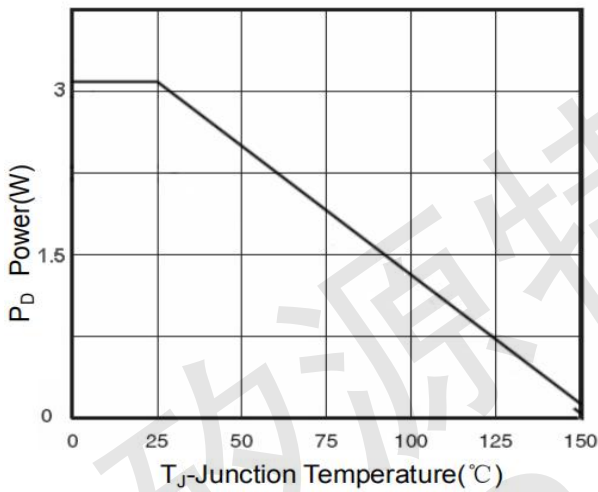


Figure 3 Power Dissipation

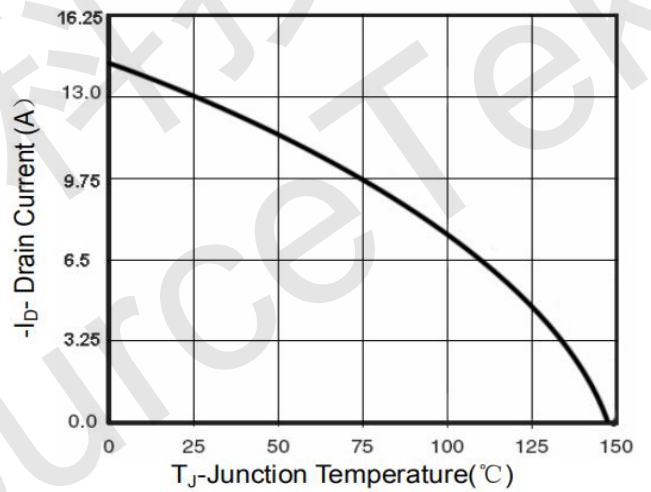


Figure 4 Drain Current

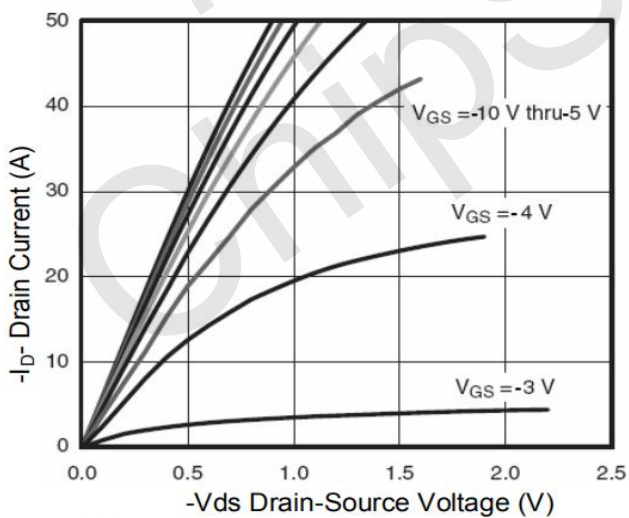


Figure 5 Output Characteristics

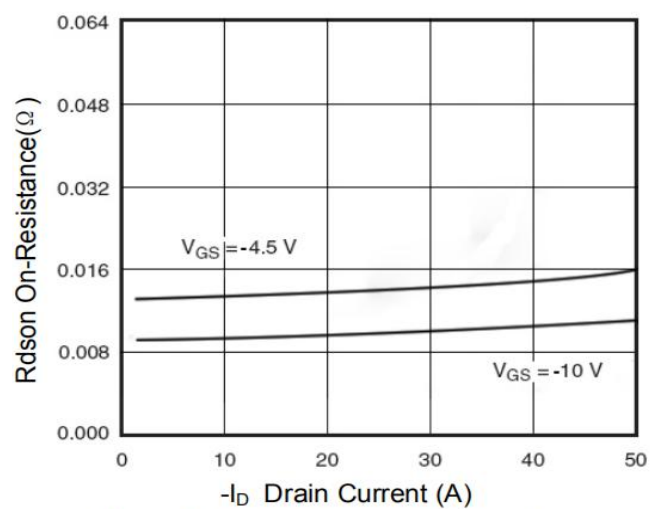


Figure 6 Drain-Source On-Resistance

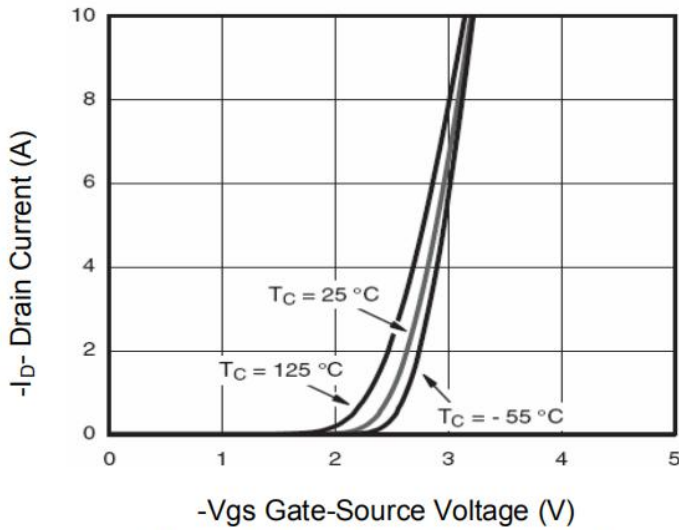


Figure 7 Transfer Characteristics

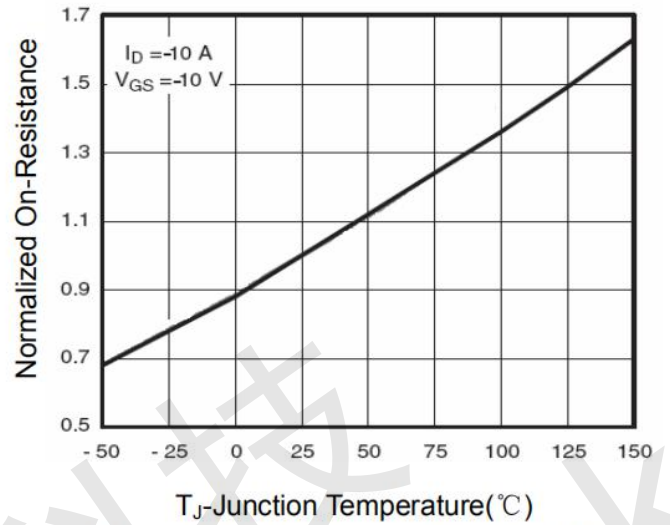


Figure 8 Drain-Source On-Resistance

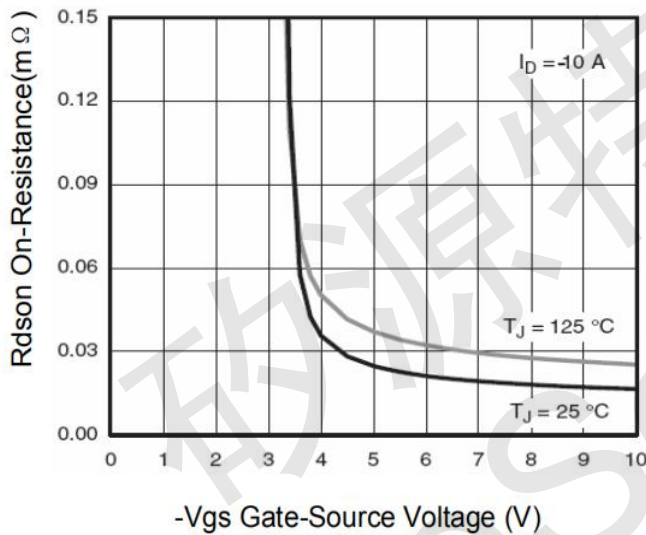


Figure 9 Rdson vs Vgs

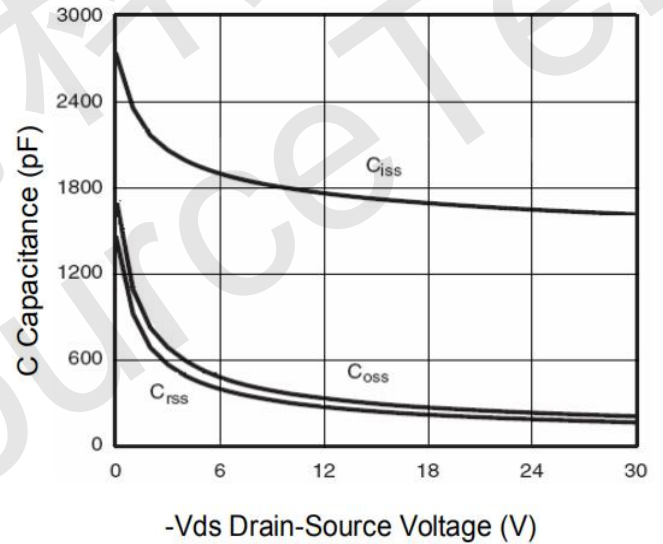


Figure 10 Capacitance vs Vds

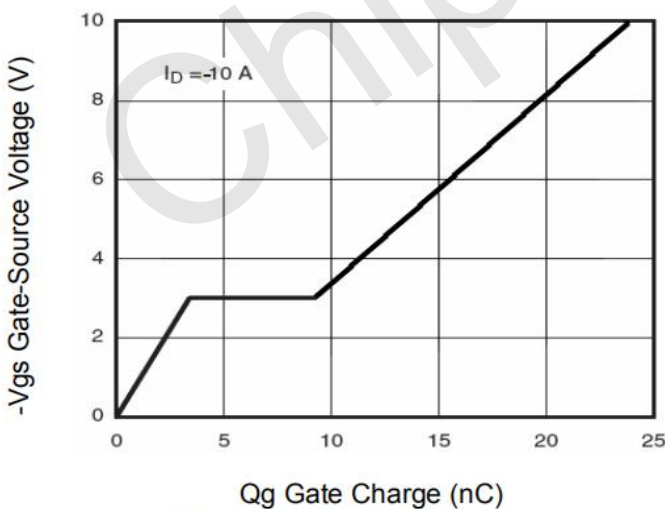


Figure 11 Gate Charge

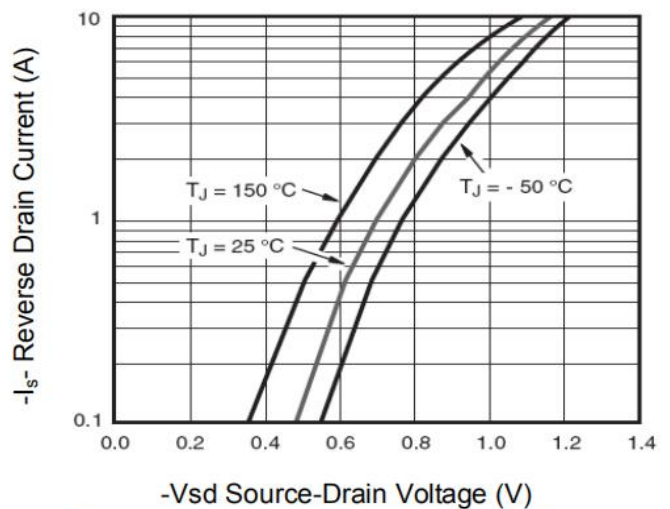


Figure 12 Source- Drain Diode Forward

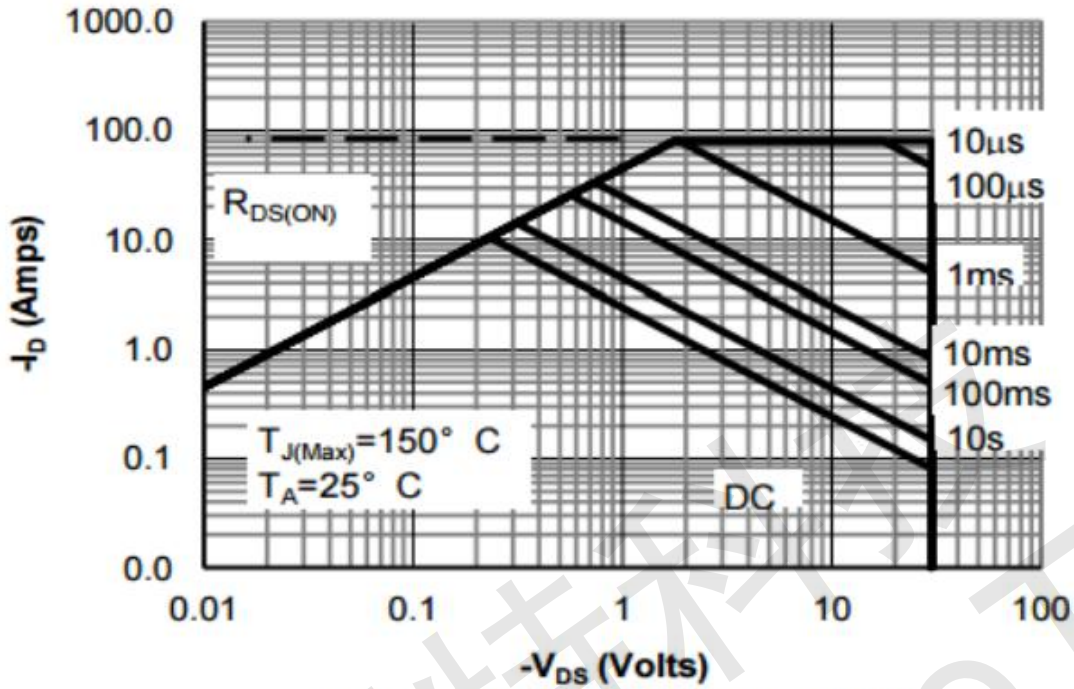


Figure 13 Safe Operation Area

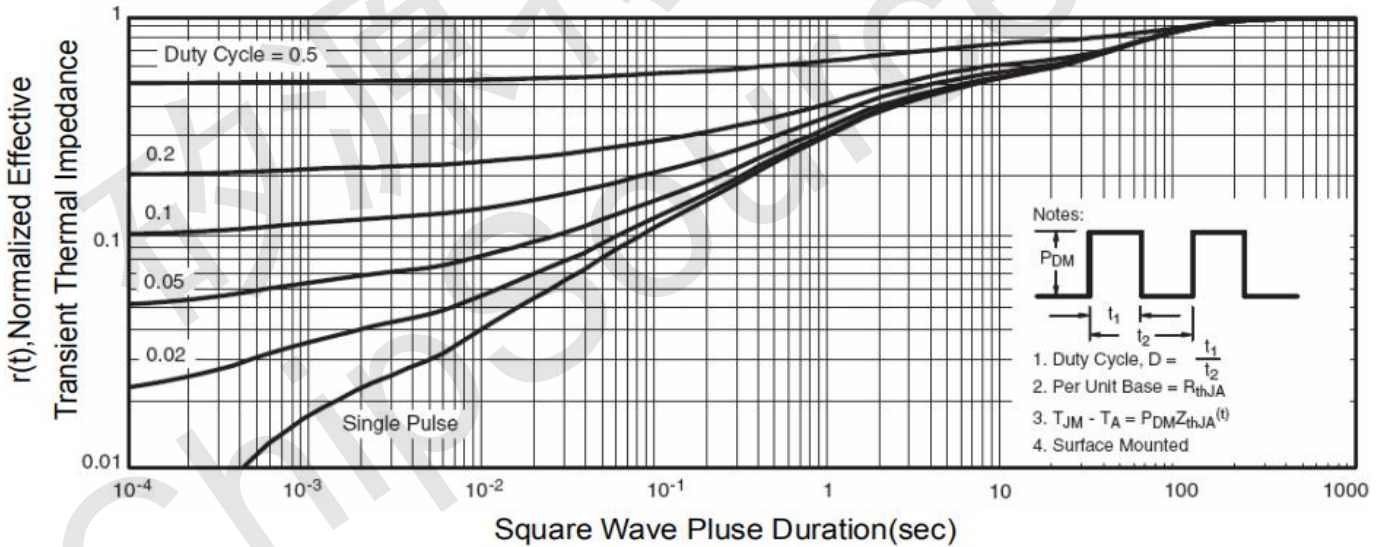
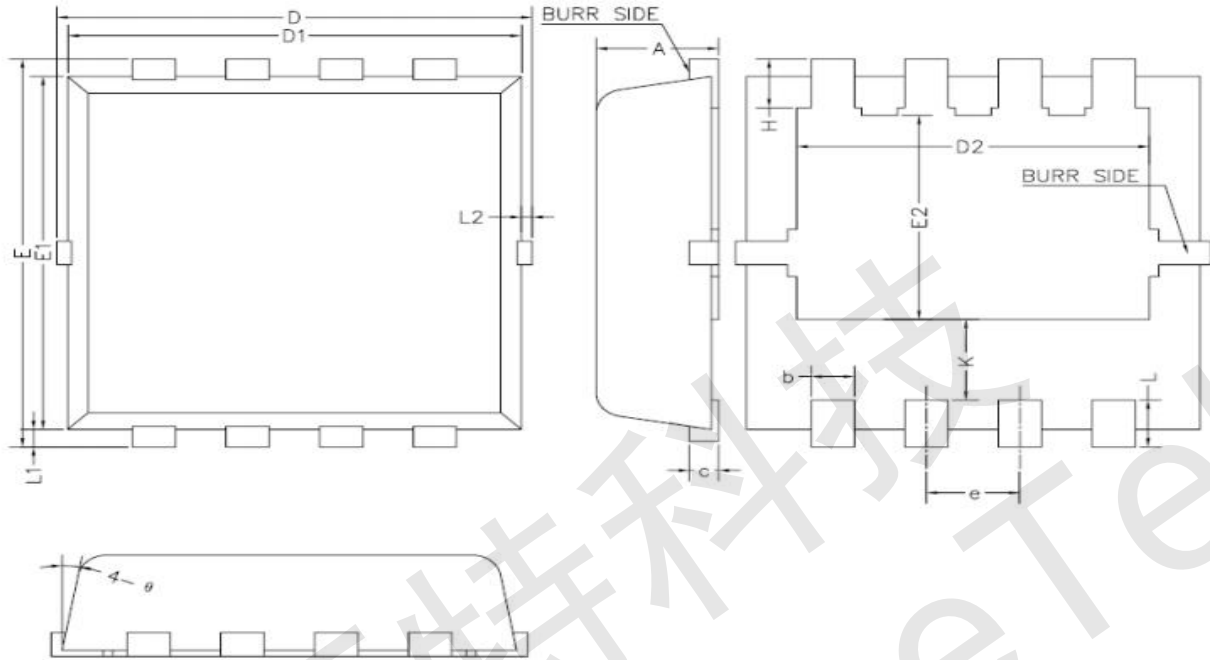


Figure 14 Normalized Maximum Transient Thermal Impedance



PDFN3.3x3.3-8L PACKAGE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

| SYMBOL | MIN | NOM | MAX |
|--------|------|------|------|
| A | 0.70 | 0.80 | 0.90 |
| b | 0.25 | 0.30 | 0.35 |
| c | 0.14 | 0.15 | 0.20 |
| D | 3.10 | 3.30 | 3.50 |
| D1 | 3.05 | 3.15 | 3.25 |
| D2 | 2.35 | 2.45 | 2.55 |
| e | 0.55 | 0.65 | 0.75 |
| E | 3.10 | 3.30 | 3.50 |
| E1 | 2.90 | 3.00 | 3.10 |
| E2 | 1.64 | 1.74 | 1.84 |
| H | 0.32 | 0.42 | 0.52 |
| K | 0.59 | 0.69 | 0.79 |
| L | 0.25 | 0.40 | 0.55 |
| L1 | 0.10 | 0.15 | 0.20 |
| L2 | — | — | 0.15 |
| θ | 8° | 10° | 12° |