



## PE3119 P-Channel Enhancement Mode Power MOSFET

### PE3119 Description

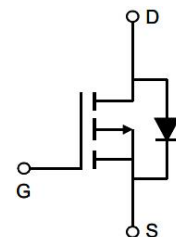
The PE3119 uses advanced trench technology to provide excellent  $R_{DS(ON)}$  and low gate charge. It can be used in a wide variety of applications.

### PE3119 General Features

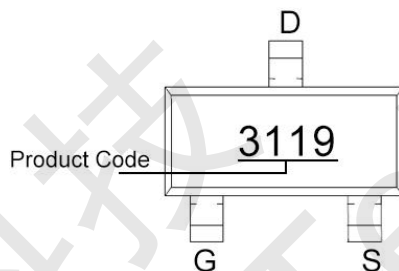
- $V_{DS} = -30V$ ,  $I_D = -7.2A$
- $R_{DS(ON)} < 18m\Omega$  @  $V_{GS} = -10V$
- $R_{DS(ON)} < 26m\Omega$  @  $V_{GS} = -4.5V$
- $R_{DS(ON)} < 25m\Omega$  @  $V_{GS} = -5V$
- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

### PE3119 Application

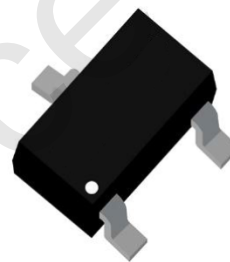
- PWM applications
- Load switch
- Power management



Schematic diagram



Marking and pin assignment



SOT-23-3L

### PE3119 Absolute Maximum Ratings (TA=25°C unless otherwise noted)

| Parameter                                        | Symbol         | Rating     | Unit |
|--------------------------------------------------|----------------|------------|------|
| Drain-Source Voltage                             | $V_{DS}$       | -30        | V    |
| Gate-Source Voltage                              | $V_{GS}$       | $\pm 20$   | V    |
| Drain Current-Continuous                         | $I_D$          | -7.2       | A    |
| Drain Current-Continuous(TA=70°C)                | $I_D$          | -5.8       | A    |
| Pulsed Drain Current (Note 1)                    | $I_{DM}$       | -28        | A    |
| Maximum Power Dissipation                        | $P_D$          | 1.5        | W    |
| Operating Junction and Storage Temperature Range | $T_J, T_{STG}$ | -55 To 150 | °C   |

### PE3119 Thermal Characteristic

|                                                  |                 |    |      |
|--------------------------------------------------|-----------------|----|------|
| Thermal Resistance, Junction-to-Ambient (Note 2) | $R_{\theta JA}$ | 83 | °C/W |
|--------------------------------------------------|-----------------|----|------|



### PE3119 Electrical Characteristics (TA=25°C unless otherwise noted)

| Parameter                             | Symbol       | Condition                                                 | Min | Typ  | Max       | Unit       |
|---------------------------------------|--------------|-----------------------------------------------------------|-----|------|-----------|------------|
| Off Characteristics                   |              |                                                           |     |      |           |            |
| Drain-Source Breakdown Voltage        | $BV_{DSS}$   | $V_{GS}=0V, I_D=-250\mu A$                                | -   | -30  | -         | V          |
| Zero Gate Voltage Drain Current       | $I_{DSS}$    | $V_{DS}=-27V, V_{GS}=0V$                                  | -   | -    | 1         | $\mu A$    |
| Gate-Body Leakage Current             | $I_{GSS}$    | $V_{GS}=\pm 20V, V_{DS}=0V$                               | -   | -    | $\pm 100$ | nA         |
| On Characteristics (Note 3)           |              |                                                           |     |      |           |            |
| Gate Threshold Voltage                | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=-250\mu A$                            | -1  | -1.7 | -2.5      | V          |
| Drain-Source On-State Resistance      | $R_{DS(ON)}$ | $V_{GS}=-10V, I_D=-4A$                                    | -   | 15   | 18        | m $\Omega$ |
|                                       |              | $V_{GS}=-4.5V, I_D=-3A$                                   | -   | 22   | 26        | m $\Omega$ |
|                                       |              | $V_{GS}=-5V, I_D=-1A$                                     | -   | 20   | 25        | m $\Omega$ |
| Forward Transconductance              | $g_{FS}$     | $V_{DS}=-10V, I_D=-5A$                                    | -   | 18   | -         | S          |
| Dynamic Characteristics (Note 4)      |              |                                                           |     |      |           |            |
| Input Capacitance                     | $C_{iss}$    | $V_{DS}=-15V, V_{GS}=0V,$<br>$F=1.0MHz$                   | -   | 1220 | -         | pF         |
| Output Capacitance                    | $C_{oss}$    |                                                           | -   | 210  | -         | pF         |
| Reverse Transfer Capacitance (Note 4) | $C_{rss}$    |                                                           | -   | 180  | -         | pF         |
| Gate Resistance                       | $R_g$        | $V_{DS}=0V, V_{GS}=0V, F=1.0MHz$                          | -   | 10   | -         | $\Omega$   |
| Switching Characteristics             |              |                                                           |     |      |           |            |
| Turn-on Delay Time                    | $t_{d(on)}$  | $V_{DS}=-15V, R_L=1\Omega,$<br>$V_{GS}=-10V, R_G=3\Omega$ | -   | 9    | -         | nS         |
| Turn-on Rise Time                     | $t_r$        |                                                           | -   | 3.2  | -         | nS         |
| Turn-Off Delay Time                   | $t_{d(off)}$ |                                                           | -   | 38   | -         | nS         |
| Turn-Off Fall Time                    | $t_f$        |                                                           | -   | 11   | -         | nS         |
| Total Gate Charge                     | $Q_g$        | $V_{DS}=-15V, I_D=-4A,$<br>$V_{GS}=-10V$                  | -   | 18   | -         | nC         |
| Gate-Source Charge                    | $Q_{gs}$     |                                                           | -   | 3.6  | -         | nC         |
| Gate-Drain Charge                     | $Q_{gd}$     |                                                           | -   | 5    | -         | nC         |
| Drain-Source Diode Characteristics    |              |                                                           |     |      |           |            |
| Diode Forward Voltage (Note 3)        | $V_{SD}$     | $V_{GS}=0V, I_S=-1A$                                      | -   | -    | -1.2      | V          |
| Diode Forward Current (Note 2)        | $I_S$        |                                                           | -   | -    | -4        | 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 product.



## PE3119 Typical Electrical and Thermal Characteristics

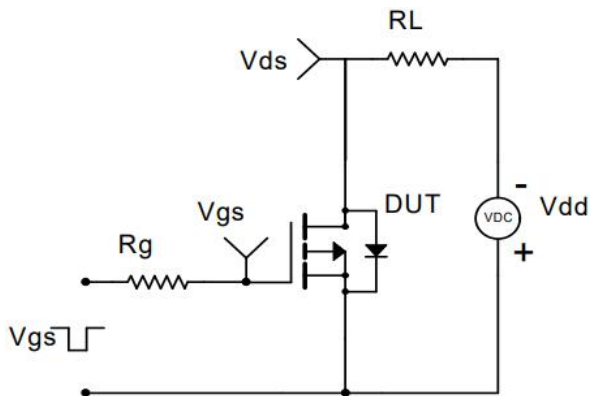


Figure 1 Switching Test Circuit

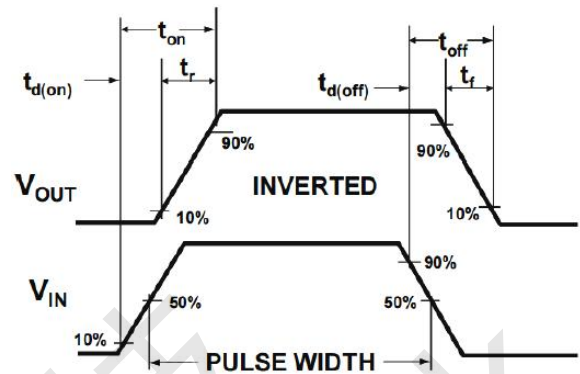


Figure 2 Switching Waveform

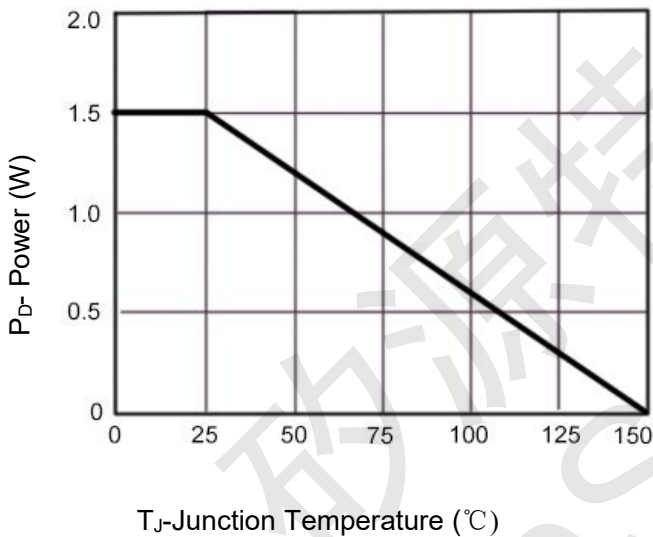


Figure 3 Power De-rating

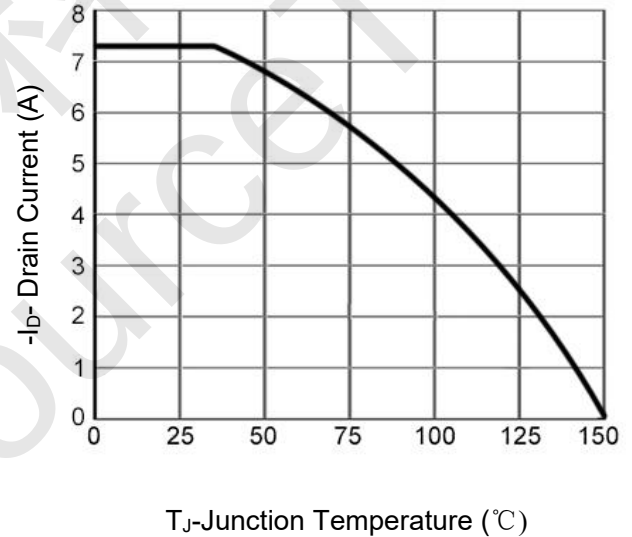


Figure 4 Drain Current

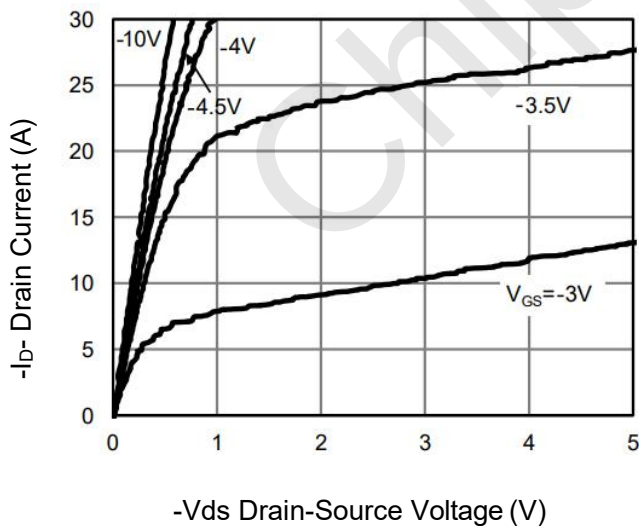


Figure 5 Output Characteristics

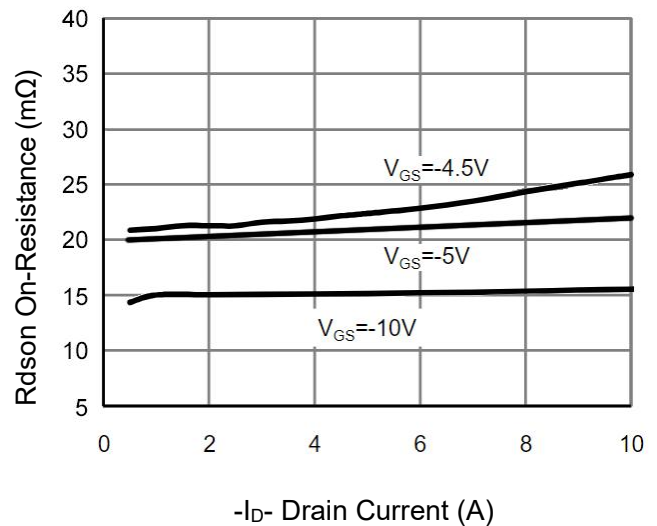


Figure 6 Rdson vs Drain Current

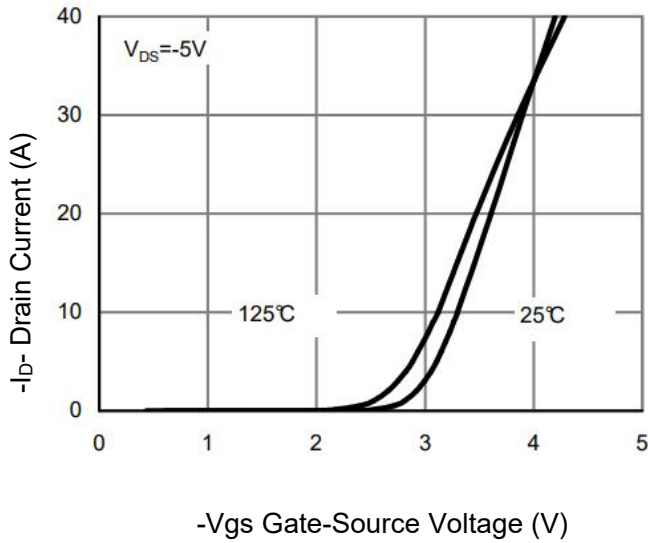


Figure 7 Transfer Characteristics

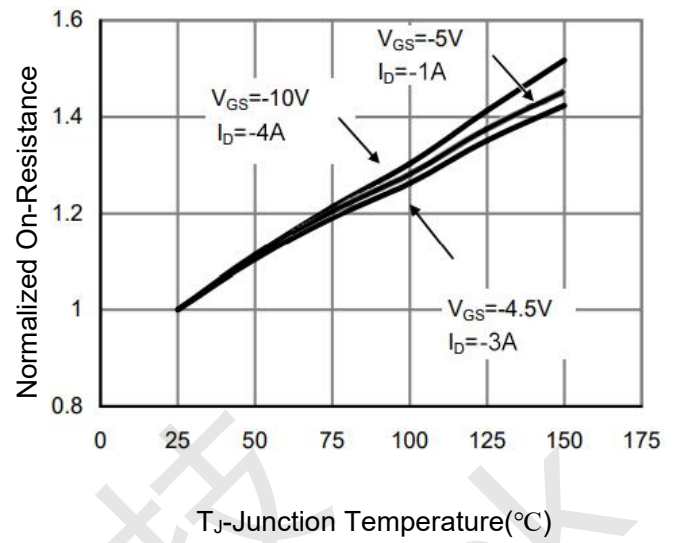


Figure 8 Rdson vs Junction Temperature

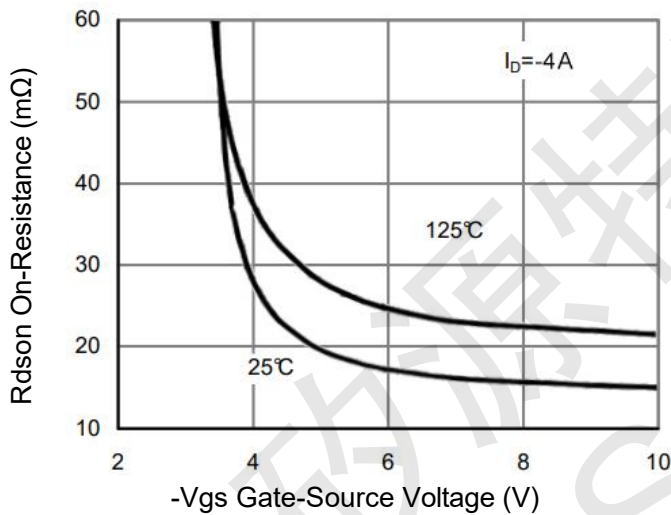


Figure 9 Rdson vs Vgs

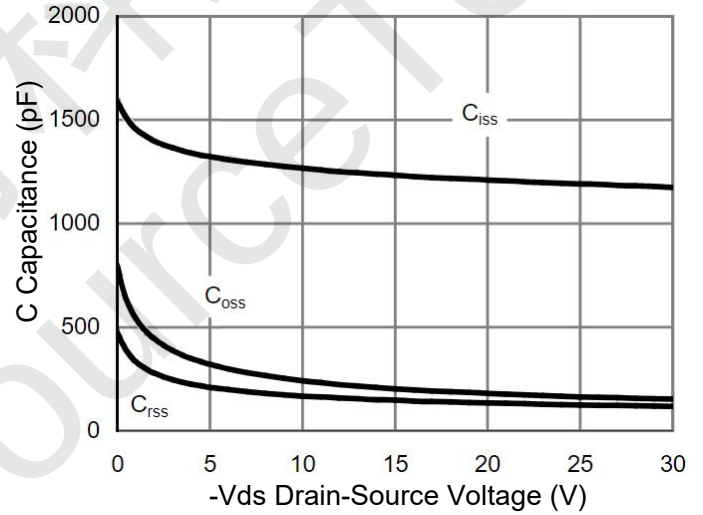


Figure 10 Capacitance vs Vds

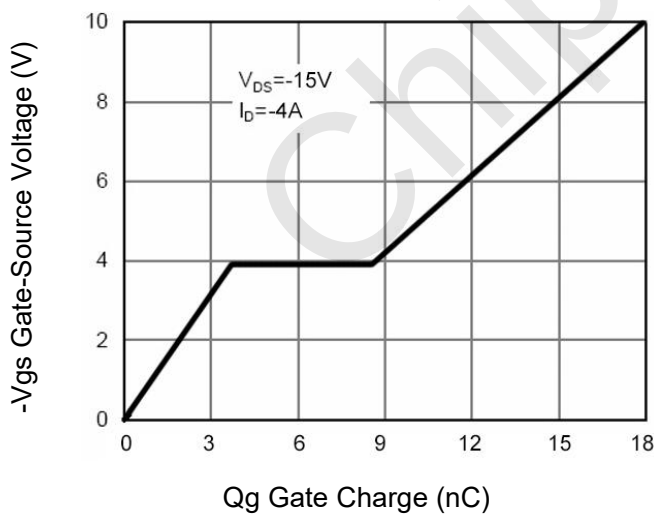


Figure 11 Gate Charge

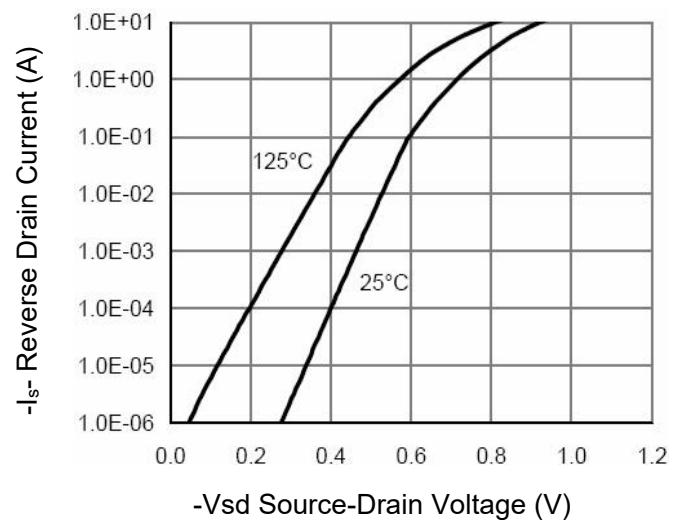


Figure 12 Source- Drain Diode Forward

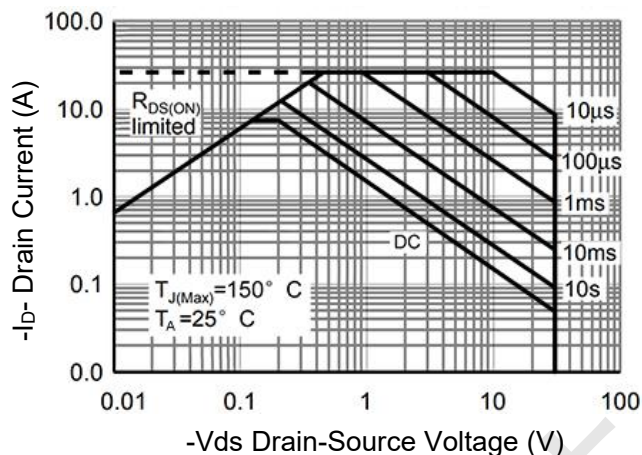


Figure 13 Safe Operation Area

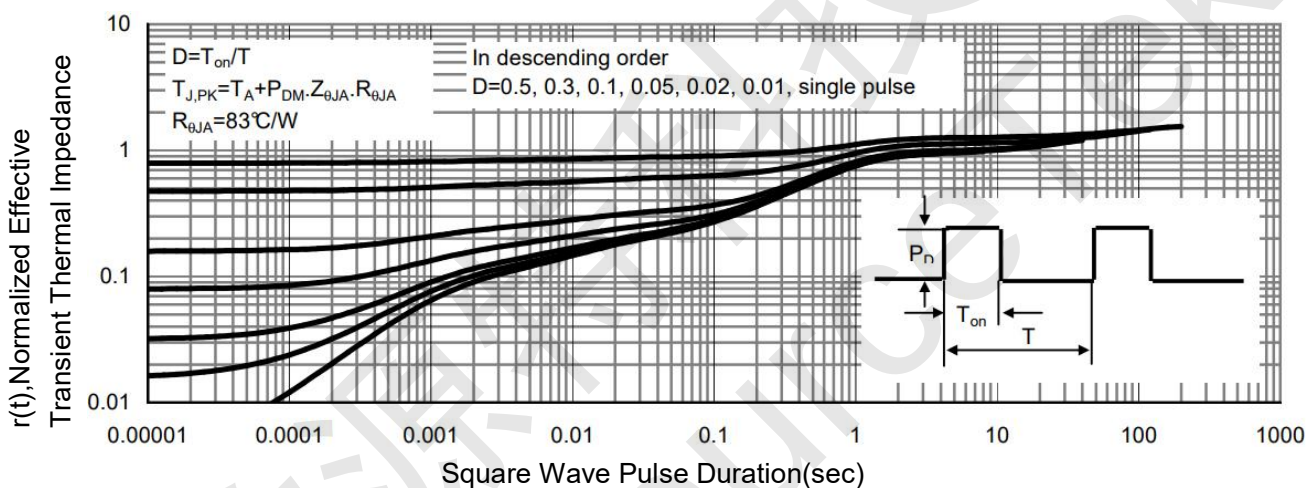
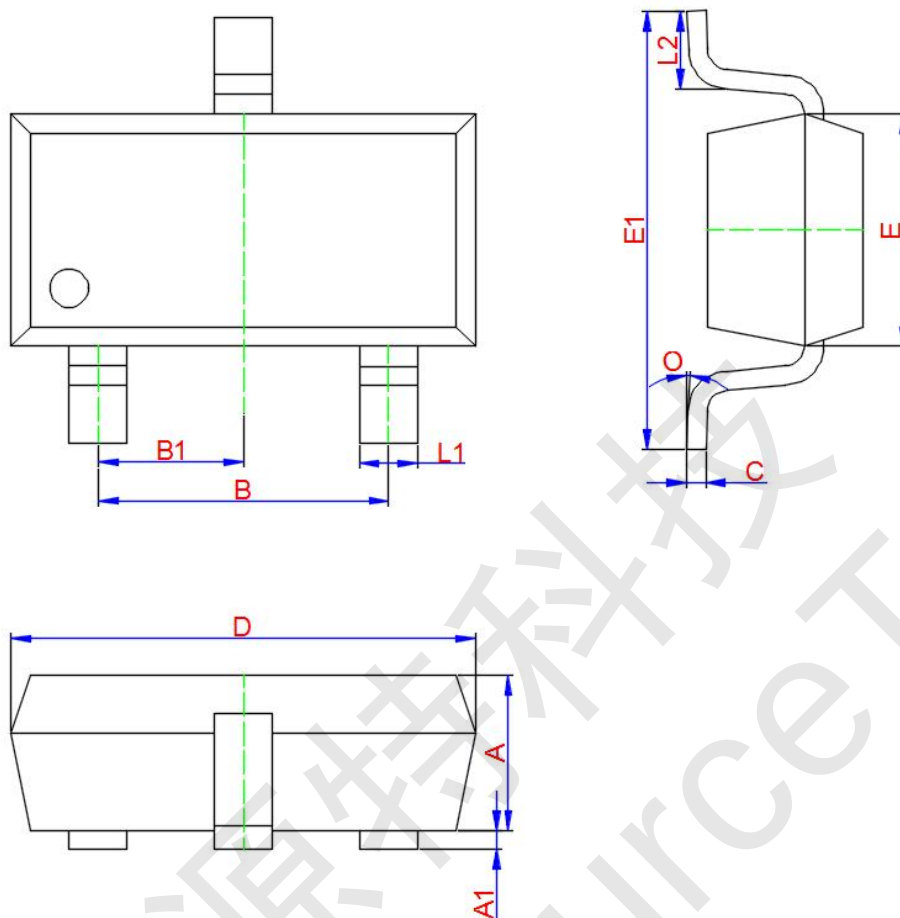


Figure 14 Normalized Maximum Transient Thermal Impedance



## PE3119 SOT-23-3L Package Information



| Symbol | Dimensions In Millimeters |       |       |
|--------|---------------------------|-------|-------|
|        | Min.                      | Typ.  | Max.  |
| A      | 1.050                     | 1.100 | 1.150 |
| A1     | 0.000                     | 0.050 | 0.100 |
| L1     | 0.300                     | 0.400 | 0.500 |
| C      | 0.100                     | 0.150 | 0.200 |
| D      | 2.820                     | 2.920 | 3.020 |
| E      | 1.500                     | 1.600 | 1.700 |
| E1     | 2.650                     | 2.800 | 2.950 |
| B      | 1.800                     | 1.900 | 2.000 |
| B1     | 0.950 TYP.                |       |       |
| L2     | 0.300                     | 0.450 | 0.600 |
| O      | 0°                        | 4°    | 8°    |