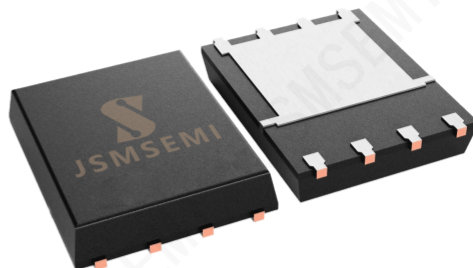


## Product Summary

- $V_{DS}$  100V
- $I_D$  100A
- $R_{DS(ON)}$  (at  $V_{GS}=10V$ )  $<6.4m\Omega$
- 100% EAS Tested
- 100%  $\nabla V_{DS}$  Tested

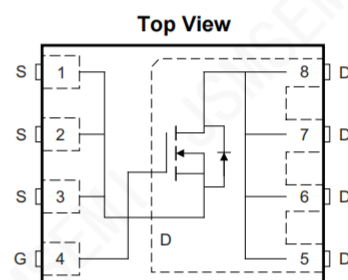


## General Description

- Trench Power MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low  $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

## Applications

- Power switching application
- Uninterruptible power supply
- DC-DC convertor
- Motor drivers



### ■ 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                    |                         | $V_{GS}$       | $\pm 20$        | V                |
| Drain Current                          | $T_C=25^\circ\text{C}$  | $I_D$          | 100             | A                |
|                                        | $T_C=100^\circ\text{C}$ |                | 80              |                  |
| Pulsed Drain Current <sup>A</sup>      |                         | $I_{DM}$       | 400             | A                |
| Avalanche energy <sup>B</sup>          |                         | EAS            | 580             | mJ               |
| Total Power Dissipation <sup>C</sup>   | $T_C=25^\circ\text{C}$  | $P_D$          | 154             | W                |
|                                        | $T_C=100^\circ\text{C}$ |                | 100             |                  |
| Junction and Storage Temperature Range |                         | $T_J, T_{STG}$ | $-55 \sim +150$ | $^\circ\text{C}$ |

### ■ Thermal resistance

| Parameter                                           |              | Symbol          | Typ | Max | Units              |
|-----------------------------------------------------|--------------|-----------------|-----|-----|--------------------|
| Thermal Resistance Junction-to-Ambient <sup>D</sup> | Steady-State | $R_{\theta JA}$ | 45  |     | $^\circ\text{C/W}$ |
| Thermal Resistance Junction-to-Case                 | Steady-State | $R_{\theta JC}$ | 1.0 |     |                    |

## Ordering Information

| Order number    | Package    | Marking  | Operation Temperature Range  | MSL Grade | Ship, Quantity | Green |
|-----------------|------------|----------|------------------------------|-----------|----------------|-------|
| CSD19531Q5A-JSM | DFN5060-8L | CSD19531 | $-55$ to $150^\circ\text{C}$ | 1         | T&R, 5000      | RoHS  |

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

| Parameter                             | Symbol              | Conditions                                                                               | Min | Typ  | Max  | Units |
|---------------------------------------|---------------------|------------------------------------------------------------------------------------------|-----|------|------|-------|
| Static Parameter                      |                     |                                                                                          |     |      |      |       |
| Drain-Source Breakdown Voltage        | BV <sub>DSS</sub>   | V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA                                              | 100 | -    | -    | V     |
|                                       |                     | V <sub>GS</sub> = 0V, I <sub>D</sub> =1mA                                                | 100 | -    | -    | V     |
| Zero Gate Voltage Drain Current       | I <sub>DSS</sub>    | V <sub>DS</sub> =100V, V <sub>GS</sub> =0V                                               | -   | -    | 1    | μA    |
|                                       |                     | V <sub>DS</sub> =100V, V <sub>GS</sub> =0V, T <sub>j</sub> =150°C                        | -   | -    | 100  |       |
| Gate-Body Leakage Current             | I <sub>GSS</sub>    | V <sub>GS</sub> = ±20V, V <sub>DS</sub> =0V                                              | -   | -    | ±100 | nA    |
| Gate Threshold Voltage                | V <sub>GS(th)</sub> | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA                                | 2.0 | -    | 4.0  | V     |
| Static Drain-Source On-Resistance     | R <sub>DS(ON)</sub> | V <sub>GS</sub> = 10V, I <sub>D</sub> =20A                                               | -   | 5.3  | 6.4  | mΩ    |
| Diode Forward Voltage                 | V <sub>SD</sub>     | I <sub>S</sub> =50A, V <sub>GS</sub> =0V                                                 | -   | -    | 1.2  | V     |
| Gate resistance                       | R <sub>G</sub>      | f=1MHz                                                                                   | -   | 1.7  | -    | Ω     |
| Maximum Body-Diode Continuous Current | I <sub>S</sub>      |                                                                                          | -   | -    | 100  | A     |
| Dynamic Parameters                    |                     |                                                                                          |     |      |      |       |
| Input Capacitance                     | C <sub>iss</sub>    | V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1MHz                                        | -   | 3920 | -    | pF    |
| Output Capacitance                    | C <sub>oss</sub>    |                                                                                          | -   | 590  | -    |       |
| Reverse Transfer Capacitance          | C <sub>rss</sub>    |                                                                                          | -   | 20   | -    |       |
| Switching Parameters                  |                     |                                                                                          |     |      |      |       |
| Total Gate Charge                     | Q <sub>g</sub>      | V <sub>GS</sub> =10V, V <sub>DS</sub> =80V, I <sub>D</sub> =20A                          | -   | 59   | -    | nC    |
| Gate-Source Charge                    | Q <sub>gs</sub>     |                                                                                          | -   | 18   | -    |       |
| Gate-Drain Charge                     | Q <sub>gd</sub>     |                                                                                          | -   | 15   | -    |       |
| Reverse Recovery Charge               | Q <sub>rr</sub>     | I <sub>F</sub> =1A, di/dt=100A/us                                                        | -   | 53   | -    | nC    |
| Reverse Recovery Time                 | t <sub>rr</sub>     |                                                                                          | -   | 55   | -    | ns    |
| Turn-on Delay Time                    | t <sub>D(on)</sub>  | V <sub>GS</sub> =10V, V <sub>DD</sub> =50V, I <sub>D</sub> =50A<br>R <sub>GEN</sub> =10Ω | -   | 24   | -    | ns    |
| Turn-on Rise Time                     | t <sub>r</sub>      |                                                                                          | -   | 105  | -    |       |
| Turn-off Delay Time                   | t <sub>D(off)</sub> |                                                                                          | -   | 57   | -    |       |
| Turn-off fall Time                    | t <sub>f</sub>      |                                                                                          | -   | 74   | -    |       |

A. Repetitive rating; pulse width limited by max. junction temperature.

 B.  $T_J=25^{\circ}\text{C}$ ,  $V_G=10\text{V}$ ,  $R_G=25\Omega$ ,  $L=0.5\text{mH}$ 

 C.  $P_d$  is based on max. junction temperature, using junction-case and junction-ambient thermal resistance.

■ Typical Electrical and Thermal Characteristics Diagrams

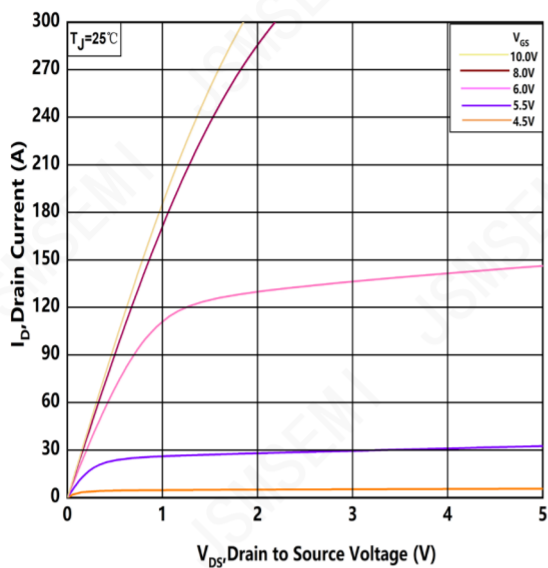


Figure.1 Output Characteristics  $T_J = 25^\circ\text{C}$

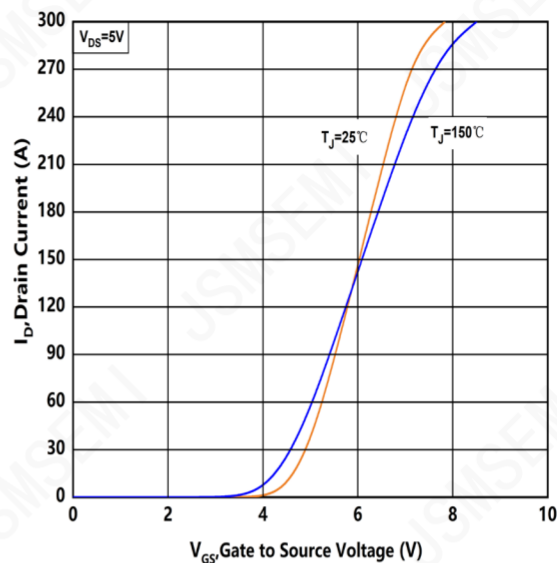


Figure.2 Transfer Characteristic for Various Junction Temperatures

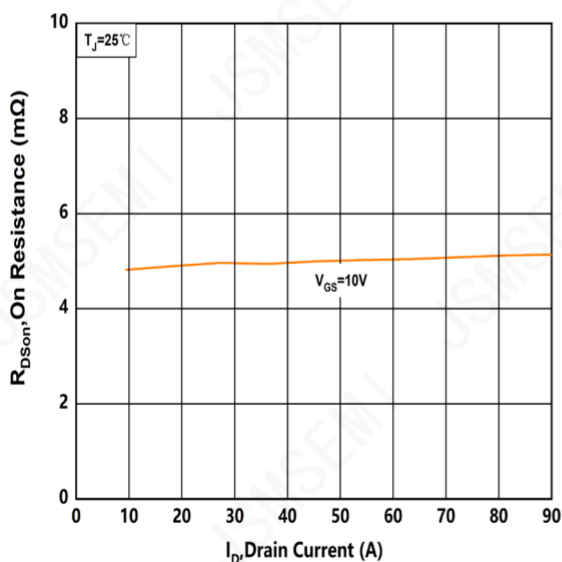


Figure.3 On-Resistance vs Drain Current For Various Gate Voltage

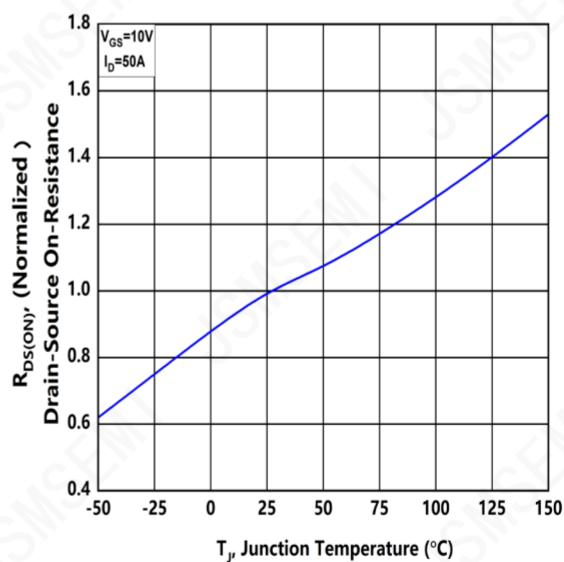


Figure.4 Typical On-Resistance vs Junction Temperature

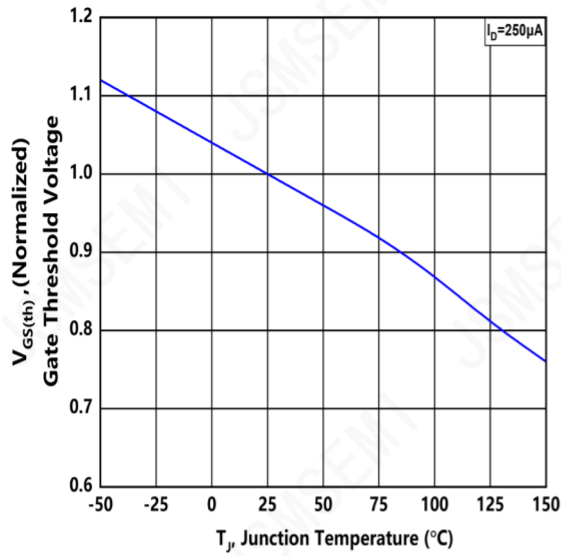


Figure.5 Typical Threshold Voltage vs Junction Temperature

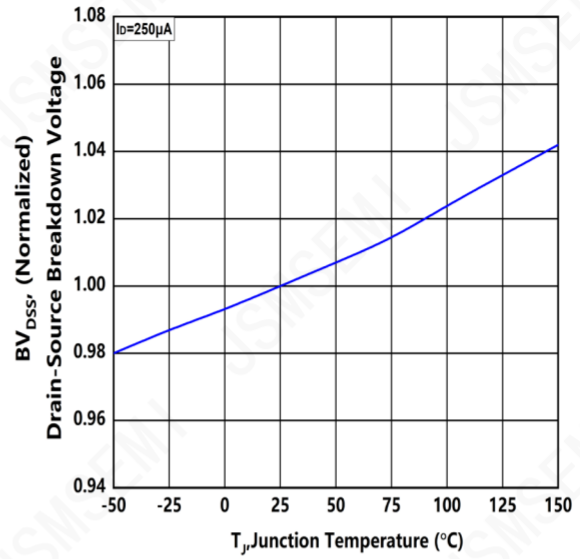


Figure.6 Typical Breakdown Voltage vs Junction Temperature

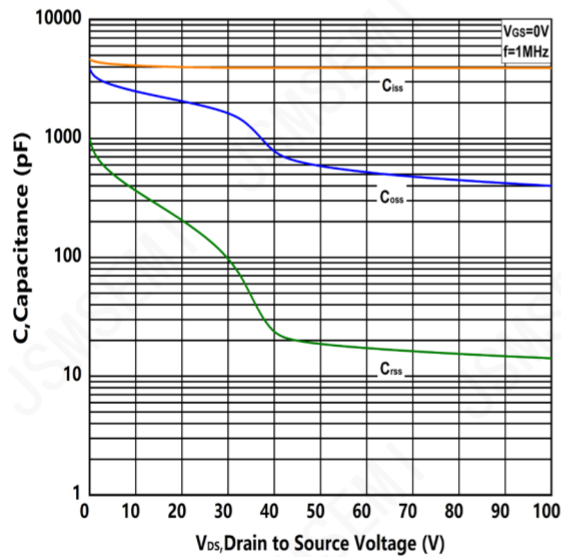


Figure.7 Typical Capacitance vs Drain to Source Voltage

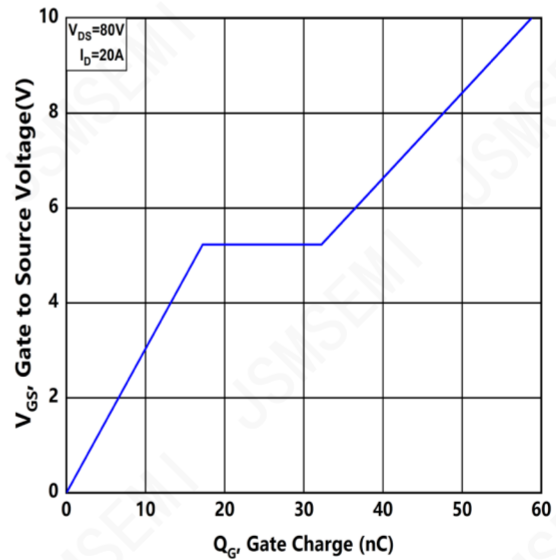


Figure.8 Typical Gate Charge vs Gate to Source Voltage

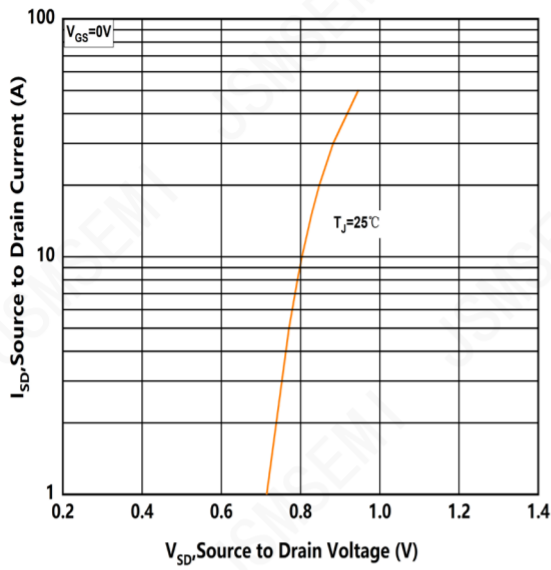


Figure.9 Typical Body Diode Characteristics

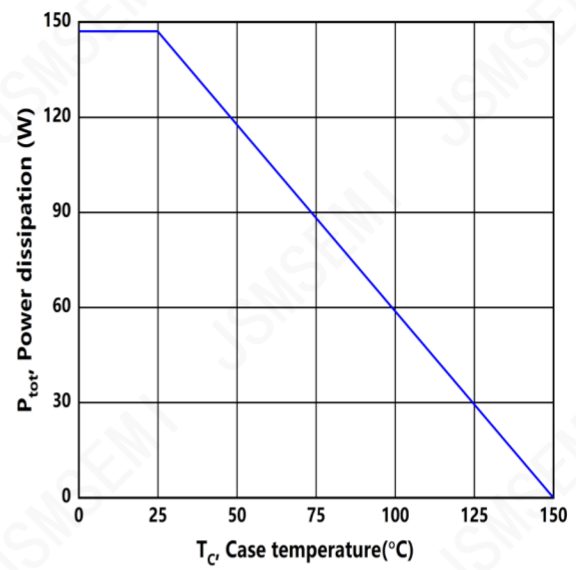


Figure.10 Maximum power Dissipation Derating vs Case Temperature

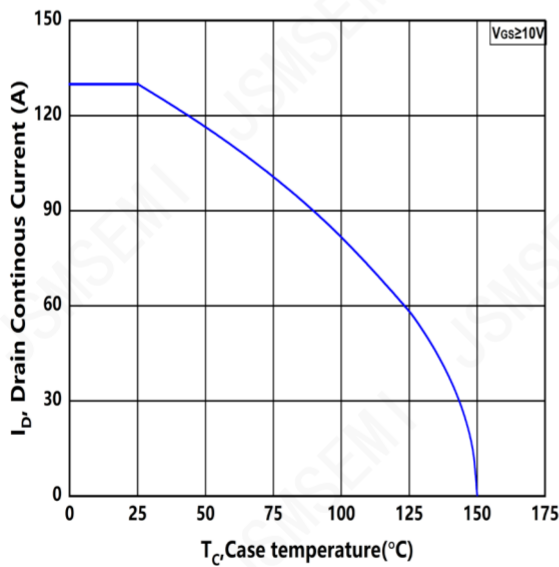


Figure.11 Continuous Drain Current Derating vs Case Temperature

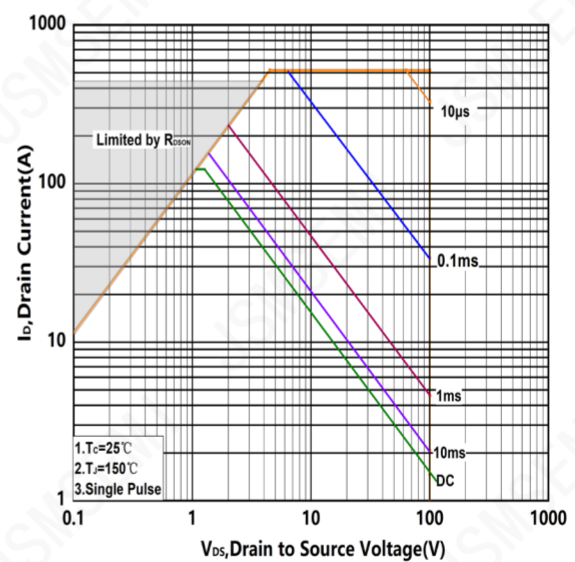


Figure.12 Safe Operating Area

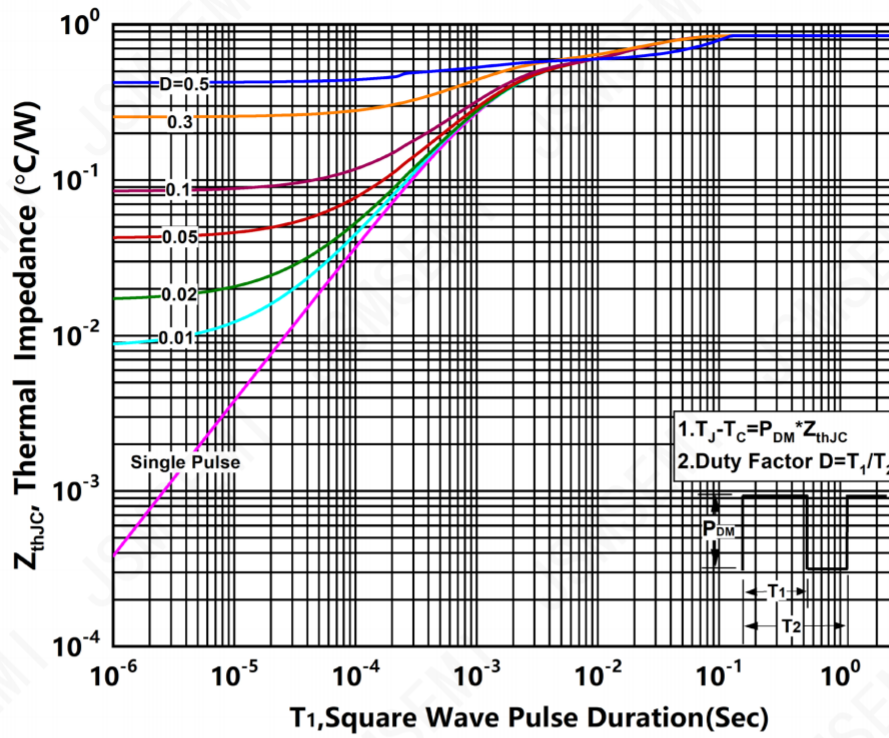
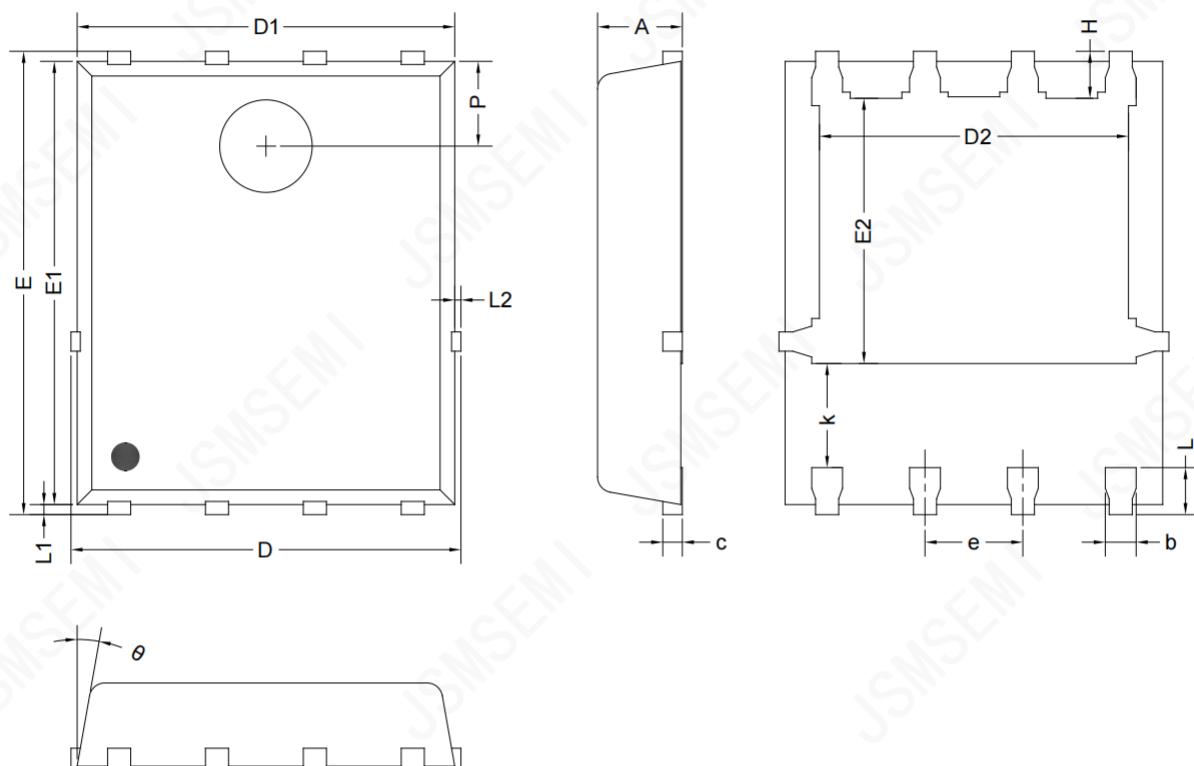


Figure.13 Transient Thermal Impedance (Junction - Case)



## Package Information

### DFN5060-8L



| Symbol | Dimensions In Millimeters |       |       |
|--------|---------------------------|-------|-------|
|        | MIN                       | NOM   | MAX   |
| A      | 1.000                     | 1.100 | 1.200 |
| b      | 0.350                     | 0.400 | 0.450 |
| c      | 0.210                     | 0.250 | 0.340 |
| D      | 4.800                     | -     | 5.100 |
| D1     | 4.800                     | 4.900 | 5.000 |
| D2     | 3.910                     | 4.010 | 4.110 |
| E      | 5.900                     | 6.000 | 6.100 |
| E1     | 5.700                     | 5.750 | 5.800 |
| E2     | 3.340                     | 3.440 | 3.540 |
| e      | 1.270 BSC                 |       |       |
| H      | 0.510                     | 0.610 | 0.710 |
| k      | 1.100                     | -     | -     |
| L      | 0.510                     | 0.610 | 0.710 |
| L1     | 0.060                     | 0.130 | 0.200 |
| L2     | -                         | -     | 0.100 |
| P      | 1.000                     | 1.100 | 1.200 |
| θ      | 8°                        | 10°   | 12°   |

NOTE: This drawing is subject to change without notice.

## Revision History

| Rev. | Change          | Date      |
|------|-----------------|-----------|
| V1.0 | Initial version | 6/27/2021 |
|      |                 |           |

## Important Notice

JSMSEMI Semiconductor (JSMSEMI) PRODUCTS ARE NEITHER DESIGNED NOR INTENDED FOR USE IN MILITARY AND/OR AEROSPACE, AUTOMOTIVE OR MEDICAL DEVICES OR SYSTEMS UNLESS THE SPECIFIC JSMSEMI PRODUCTS ARE SPECIFICALLY DESIGNATED BY JSMSEMI FOR SUCH USE. BUYERS ACKNOWLEDGE AND AGREE THAT ANY SUCH USE OF JSMSEMI PRODUCTS WHICH JSMSEMI HAS NOT DESIGNATED FOR USE IN MILITARY AND/OR AEROSPACE, AUTOMOTIVE OR MEDICAL DEVICES OR SYSTEMS IS SOLELY AT THE BUYER' S RISK.

JSMSEMI assumes no liability for application assistance or customer product design. Customers are responsible for their products and applications using JSMSEMI products.

Resale of JSMSEMI products or services with statements diferent from or beyond the parameters stated by JSMSEMI for that product or service voids all express and any implied warranties for the associated JSMSEMI product or s ervice. JSMSEMI is not responsible or liable for any such statements.

JSMSEMI All Rights Reserved. Information and data in this document are owned by JSMSEMI wholly and may not be edited, reproduced, or redistributed in any way without the express written consent from JSMSEMI.

Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the JSMSEMI product that you intend to use.

For additional information please contact Kevin@jsmsemi.com or visit www.jsmsemi.com