

## General Description

This Trench MOSFET has better characteristics, such as fast switching time, low on resistance, low gate charge and excellent avalanche characteristics. It is mainly suitable for DC/DC Converter.

## FEATURES

- $V_{DS}=30V$ ,  $I_D=79A$ .
- Low Drain to Source On-state Resistance.
  - :  $R_{DS(ON)}=4.8m\Omega$  (Max.) @  $V_{GS}=10V$
  - :  $R_{DS(ON)}=6.5m\Omega$  (Max.) @  $V_{GS}=4.5V$

## MAXIMUM RATING (Ta=25 Unless otherwise Noted)

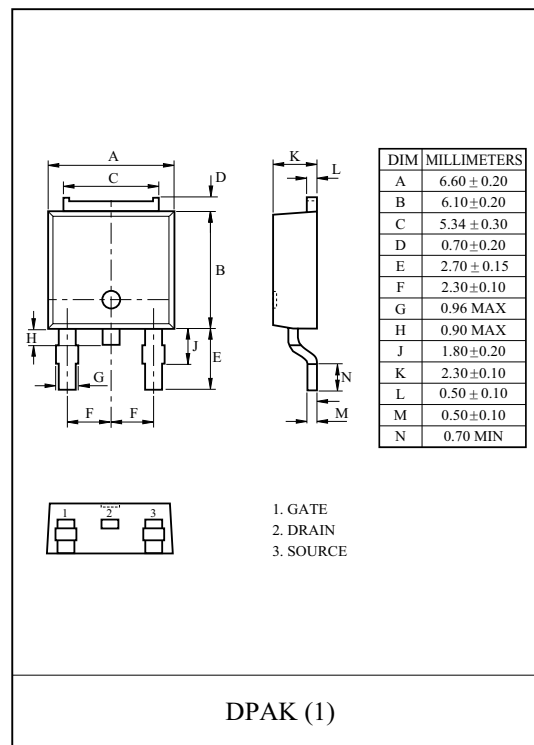
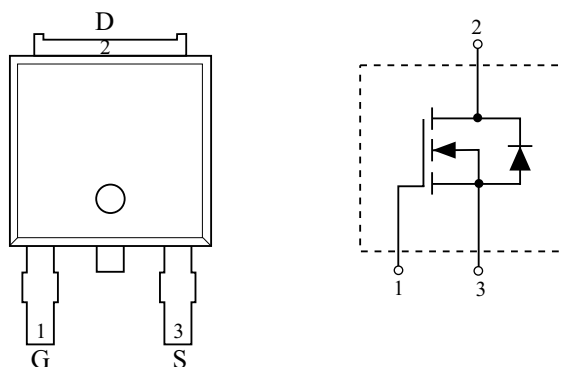
| CHARACTERISTIC                                  |                      | SYMBOL     | RATING   | UNIT |
|-------------------------------------------------|----------------------|------------|----------|------|
| Drain to Source Voltage                         |                      | $V_{DSS}$  | 30       | V    |
| Gate to Source Voltage                          |                      | $V_{GSS}$  | $\pm 20$ | V    |
| Drain Current                                   | DC@ $T_C=25$ (Note1) | $I_D$      | 84       | A    |
|                                                 | Pulsed (Note2)       | $I_{DP}$   | 336      |      |
| Single Pulsed Avalanche Energy (Note3)          |                      | $E_{AS}$   | 124      | mJ   |
| Drain Power Dissipation                         | @ $T_C=25$ (Note1)   | $P_D$      | 60       | W    |
|                                                 | @ $T_a=25$ (Note2)   |            | 3.8      |      |
| Maximum Junction Temperature                    |                      | $T_j$      | 150      |      |
| Storage Temperature Range                       |                      | $T_{stg}$  | -55 150  |      |
| Thermal Resistance, Junction to Case (Note1)    |                      | $R_{thJC}$ | 2.1      | /W   |
| Thermal Resistance, Junction to Ambient (Note2) |                      | $R_{thJA}$ | 40       | /W   |

Note 1)  $R_{thJC}$  means that the infinite heat sink is mounted.

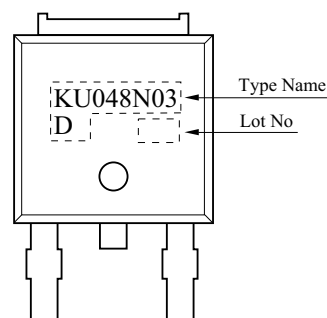
Note 2) Surface Mounted on 1 "× 1 "Pad of 2 oz copper.

Note 3)  $L=18\mu H$ ,  $I_{AS}=84A$ ,  $V_{DD}=15V$ ,  $V_{GS}=10V$ , Starting  $T_j=25$

## PIN CONNECTION (TOP VIEW)



## Marking



## ELECTRICAL CHARACTERISTICS (Ta=25 °C)

| CHARACTERISTIC                    |                       | SYMBOL              | TEST CONDITION                                                                                  | MIN. | TYP. | MAX.  | UNIT |
|-----------------------------------|-----------------------|---------------------|-------------------------------------------------------------------------------------------------|------|------|-------|------|
| Static                            |                       |                     |                                                                                                 |      |      |       |      |
| Drain to Source Breakdown Voltage |                       | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V, I <sub>D</sub> =250 μA                                                     | 30   | -    | -     | V    |
| Drain Cut-off Current             |                       | I <sub>DSS</sub>    | V <sub>GS</sub> =0V, V <sub>DS</sub> =30V                                                       | -    | -    | 1     | μA   |
| Gate to Source Leakage Current    |                       | I <sub>GSS</sub>    | V <sub>GS</sub> = ± 20V, V <sub>DS</sub> =0V                                                    | -    | -    | ± 100 | nA   |
| Gate to Source Threshold Voltage  |                       | V <sub>th</sub>     | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250 μA                                       | 1.0  | -    | 3.0   | V    |
| Drain to Source On Resistance     |                       | R <sub>DS(ON)</sub> | V <sub>GS</sub> =10V, I <sub>D</sub> =30A (Note4)                                               | -    | 3.0  | 4.8   | mΩ   |
|                                   |                       |                     | V <sub>GS</sub> =4.5V, I <sub>D</sub> =30A (Note4)                                              | -    | 4.0  | 6.5   |      |
| Forward Transconductance          |                       | g <sub>fs</sub>     | V <sub>DS</sub> =5V, I <sub>D</sub> =30A (Note4)                                                | -    | 75   | -     | S    |
| Dynamic                           |                       |                     |                                                                                                 |      |      |       |      |
| Input Capacitance                 |                       | C <sub>iss</sub>    | V <sub>DS</sub> =15V, f=1MHz, V <sub>GS</sub> =0V                                               | -    | 2772 | -     | pF   |
| Ouput Capacitance                 |                       | C <sub>oss</sub>    |                                                                                                 | -    | 550  | -     |      |
| Reverse Transfer Capacitance      |                       | C <sub>rss</sub>    |                                                                                                 | -    | 398  | -     |      |
| Gate Resistance                   |                       | R <sub>g</sub>      | f=1MHz                                                                                          | -    | 3.5  | -     | Ω    |
| Total Gate Charge                 | V <sub>GS</sub> =10V  | Q <sub>g</sub>      | V <sub>DS</sub> =15V, V <sub>GS</sub> =10V, I <sub>D</sub> =30A (Note4)                         | -    | 64.5 | -     | nC   |
|                                   | V <sub>GS</sub> =4.5V | Q <sub>g</sub>      |                                                                                                 | -    | 32.2 | -     |      |
| Gate to Source Charge             |                       | Q <sub>gs</sub>     |                                                                                                 | -    | 8.2  | -     |      |
| Gate to Drain Charge              |                       | Q <sub>gd</sub>     |                                                                                                 | -    | 14.7 | -     |      |
| Turn-On Delay Time                |                       | t <sub>d(on)</sub>  | V <sub>DD</sub> =15V, V <sub>GS</sub> =10V<br>I <sub>D</sub> =30A, R <sub>G</sub> =1.6Ω (Note4) | -    | 11.6 | -     | ns   |
| Turn-On Rise Time                 |                       | t <sub>r</sub>      |                                                                                                 | -    | 16.4 | -     |      |
| Turn-Off Delay Time               |                       | t <sub>d(off)</sub> |                                                                                                 | -    | 57.8 | -     |      |
| Turn-Off Fall Time                |                       | t <sub>f</sub>      |                                                                                                 | -    | 19.8 | -     |      |
| Source to Drain Diode Ratings     |                       |                     |                                                                                                 |      |      |       |      |
| Source to Drain Forward Voltage   |                       | V <sub>SD</sub>     | V <sub>GS</sub> =0V, I <sub>S</sub> =30A (Note4)                                                | -    | 0.8  | 1.2   | V    |
| Reverse Recovery time             |                       | t <sub>rr</sub>     | I <sub>S</sub> =30A, dI/dt=100A/μs                                                              | -    | 26.7 | -     | ns   |
| Reverse Recovered charge          |                       | Q <sub>rr</sub>     | I <sub>S</sub> =30A, dI/dt=100A/μs                                                              | -    | 17.6 | -     | nC   |

Note 4) Pulse Test : Pulse width <300 $\mu s$  , Duty cycle < 2%

Fig1.  $I_D - V_{DS}$

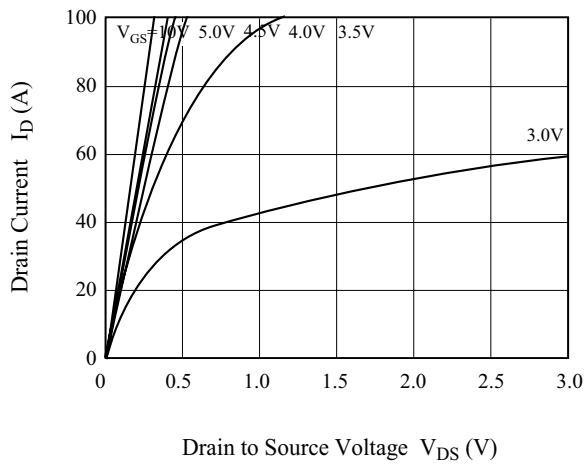


Fig2.  $R_{DS(on)} - I_D$

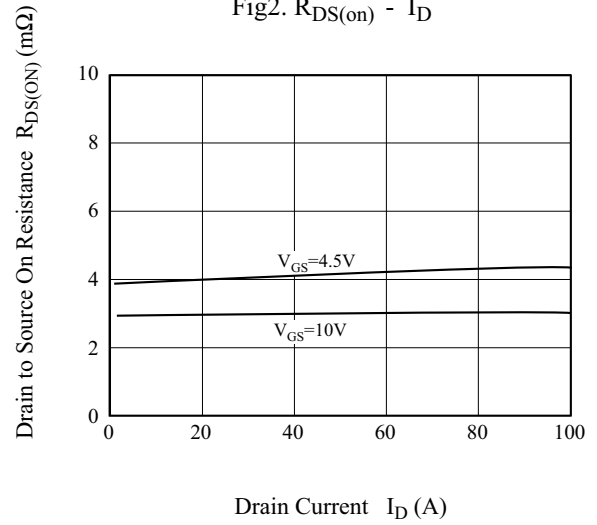


Fig3.  $I_D - V_{GS}$

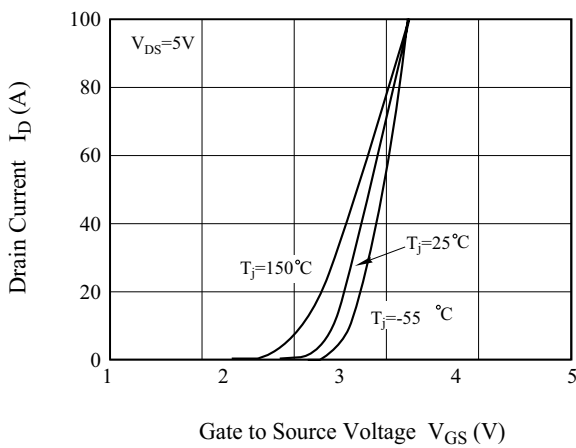


Fig4.  $R_{DS(on)} - T_J$

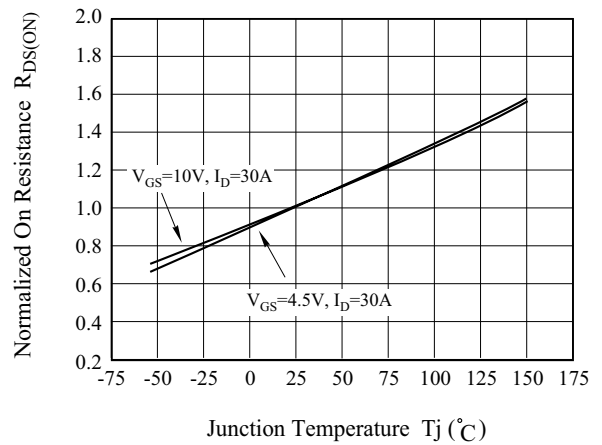


Fig5.  $V_{th} - T_J$

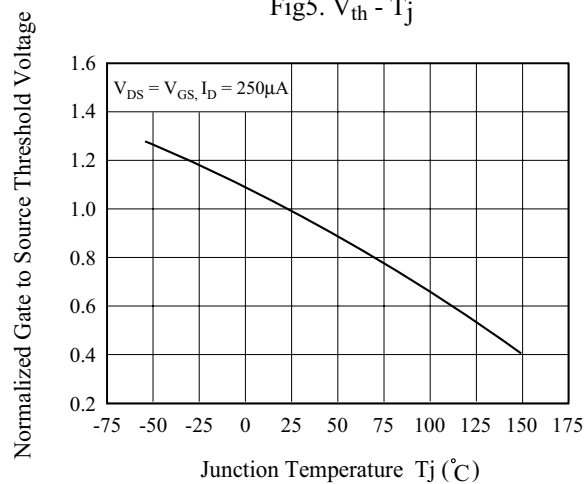


Fig6.  $I_S - V_{SD}$

