

## 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 Battery pack.

## FEATURES

□  $V_{DS} = -30V$ ,  $I_D = -14A$ .

□ Drain-Source ON Resistance.

$R_{DS(ON)} = 12m\Omega$  (Max.) @  $V_{GS} = -10V$

$R_{DS(ON)} = 18m\Omega$  (Max.) @  $V_{GS} = -4.5V$

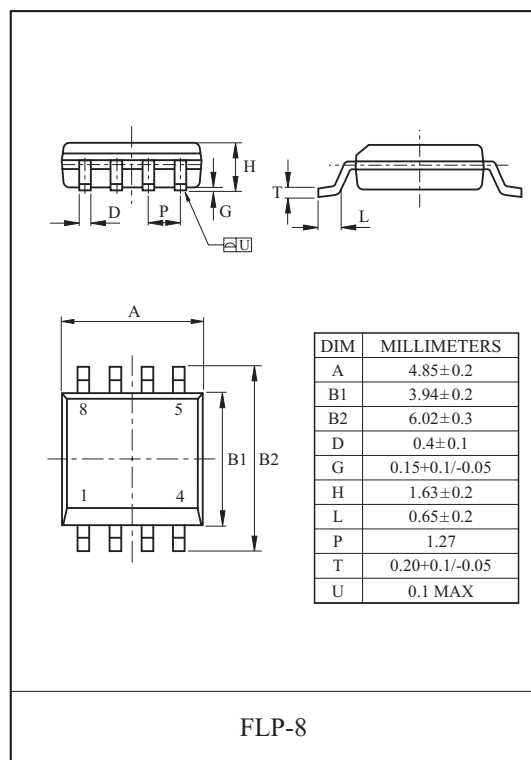
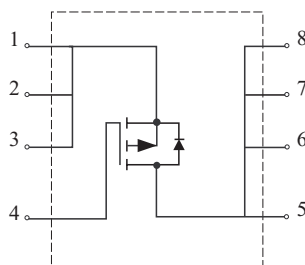
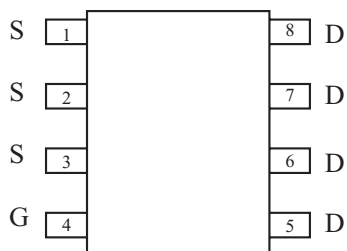
□ Super High Dense Cell Design

MOSFET Maximum Ratings ( $T_a = 25^\circ C$  Unless otherwise noted)

| CHARACTERISTIC                          | SYMBOL       | RATING   | UNIT         |
|-----------------------------------------|--------------|----------|--------------|
| Drain Source Voltage                    | $V_{DS}$     | -30      | V            |
| Gate Source Voltage                     | $V_{GS}$     | $\pm 20$ | V            |
| Drain Current                           | $I_D^*$      | 14       | A            |
|                                         | $I_{DP}$     | 10       | A            |
| Drain Source Diode Forward Current      | $I_S$        | -1.7     | A            |
| Drain Power Dissipation                 | $P_D$        | 2.5      | W            |
| Maximum Junction Temperature            | $T_j$        | 150      | $^\circ C$   |
| Storage Temperature Range               | $T_{stg}$    | -55~150  | $^\circ C$   |
| Thermal Resistance, Junction to Ambient | $R_{thJA}^*$ | 50       | $^\circ C/W$ |

Note : \*Surface Mounted on FR4 Board

## PIN CONNECTION (TOP VIEW)



Marking

Type Name

Lot No.

# KMB014P30QA

## ELECTRICAL CHARACTERISTICS (Ta=25°C) UNLESS OTHERWISE NOTED

| CHARACTERISTIC                                       | SYMBOL               | TEST CONDITION                                                                         | MIN. | TYP.  | MAX.  | UNIT |
|------------------------------------------------------|----------------------|----------------------------------------------------------------------------------------|------|-------|-------|------|
| Static                                               |                      |                                                                                        |      |       |       |      |
| Drain-Source Breakdown Voltage                       | BV <sub>DSS</sub>    | I <sub>DS</sub> =-250μA, V <sub>GS</sub> =0V                                           | -30  | -     | -     | V    |
| Drain Cut-off Current                                | I <sub>DSS</sub>     | V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V                                             | -    | -     | -1    | μA   |
| Gate Leakage Current                                 | I <sub>GSS</sub>     | V <sub>GS</sub> =± 25V, V <sub>DS</sub> =0V                                            | -    | -     | ± 100 | nA   |
| Gate Threshold Voltage                               | V <sub>th</sub>      | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA                              | -1.4 | -1.9  | -2.6  | V    |
| Drain-Source ON Resistance                           | R <sub>DS(ON)*</sub> | V <sub>GS</sub> =-10V, I <sub>D</sub> =-12A                                            | -    | 8.5   | 12.0  | mΩ   |
|                                                      |                      | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-10A                                           | -    | 12    | 18    |      |
| On-State Drain Current                               | I <sub>D(ON)*</sub>  | V <sub>DS</sub> =-5V, V <sub>GS</sub> =-10V                                            | -50  | -     | -     | A    |
| Forward Transconductance                             | G <sub>fs</sub> *    | V <sub>DS</sub> =-5V, I <sub>D</sub> =-10A                                             | -    | 14    | -     | S    |
| Dynamic                                              |                      |                                                                                        |      |       |       |      |
| Input Capacitance                                    | C <sub>iss</sub>     | V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz                                      | -    | 3625  | -     | pF   |
| Ouput Capacitance                                    | C <sub>oss</sub>     |                                                                                        | -    | 980   | -     |      |
| Reverse Transfer Capacitance                         | C <sub>rss</sub>     |                                                                                        | -    | 705   | -     |      |
| Total Gate Charge                                    | Q <sub>g</sub> *     | V <sub>DS</sub> =-5V, V <sub>GS</sub> =-10V, I <sub>D</sub> =-12A                      | -    | 65.5  | -     | nC   |
|                                                      |                      | V <sub>DS</sub> =-15V, V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-12A                    | -    | 32.6  | -     |      |
| Gate-Source Charge                                   | Q <sub>gs</sub> *    | V <sub>DS</sub> =-15V, V <sub>GS</sub> =-10V, I <sub>D</sub> =-12A                     | -    | 10.9  | -     |      |
| Gate-Drain Charge                                    | Q <sub>gd</sub> *    |                                                                                        | -    | 17.5  | -     |      |
| Turn-On Delay Time                                   | t <sub>d(on)*</sub>  | V <sub>DD</sub> =15V, V <sub>GS</sub> =-10V<br>R <sub>L</sub> =12A, R <sub>G</sub> =3Ω | -    | 48.5  | -     | ns   |
| Turn-On Rise Time                                    | t <sub>r</sub> *     |                                                                                        | -    | 20.3  | -     |      |
| Turn-Off Delay Time                                  | t <sub>d(off)*</sub> |                                                                                        | -    | 11.8  | -     |      |
| Turn-Off Fall Time                                   | t <sub>f</sub> *     |                                                                                        | -    | 2.8   | -     |      |
| Source-Drain Diode Ratings                           |                      |                                                                                        |      |       |       |      |
| Source-Drain Forward Voltage                         | V <sub>SDF</sub> *   | V <sub>GS</sub> =0V, I <sub>DR</sub> =-1.7A,                                           | -    | -0.73 | -1.2  | V    |
| Note                                                 |                      |                                                                                        |      |       |       |      |
| 1. Pulse Test : Pulse width ≤ 10μs , Duty cycle ≤ 1% |                      |                                                                                        |      |       |       |      |

Fig 1.  $I_D - V_{DS}$

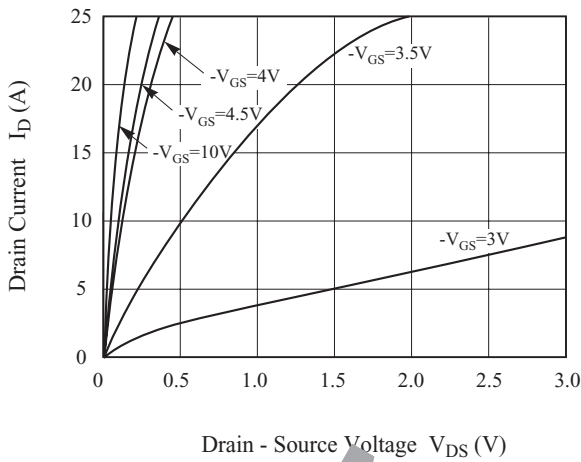


Fig 2.  $I_D - V_{GS}$

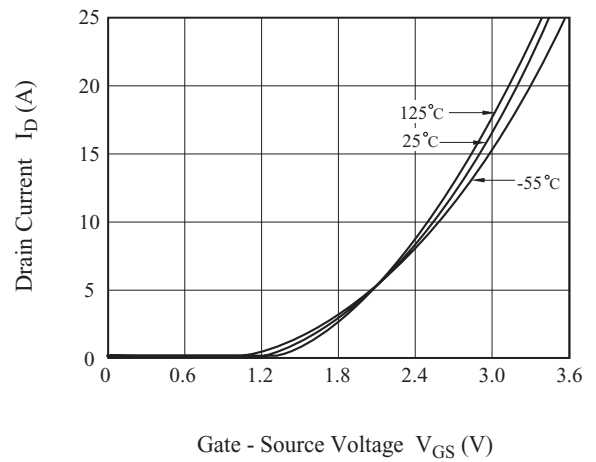


Fig 3. C -

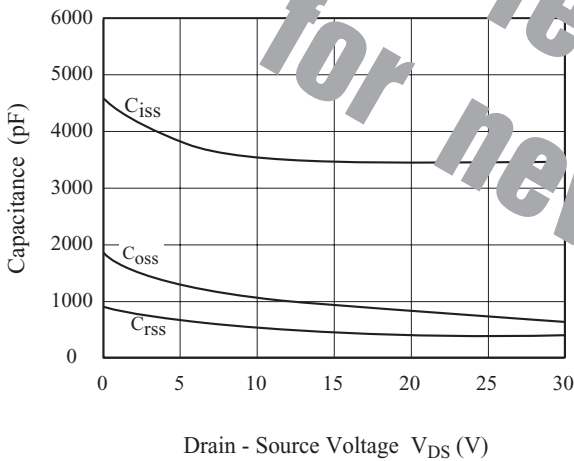


Fig 4.  $R_{DS(ON)} - T_j$

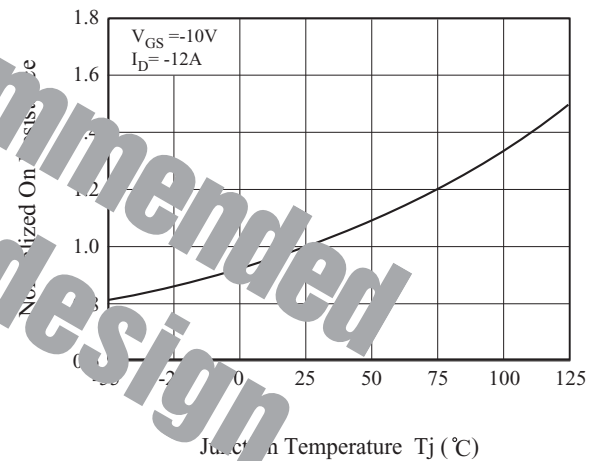


Fig 5.  $V_{th} - T_j$

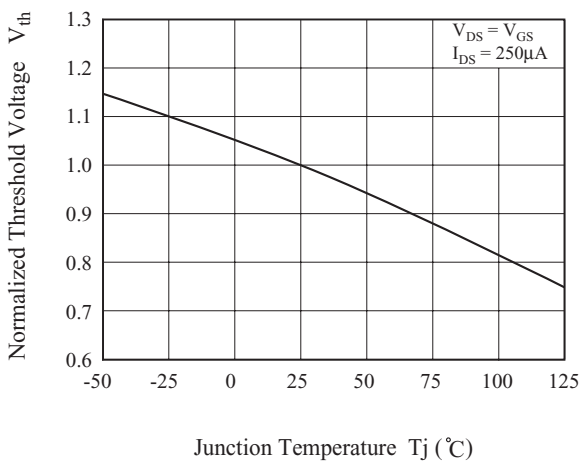


Fig 6.  $I_{DR} - V_{SD}$

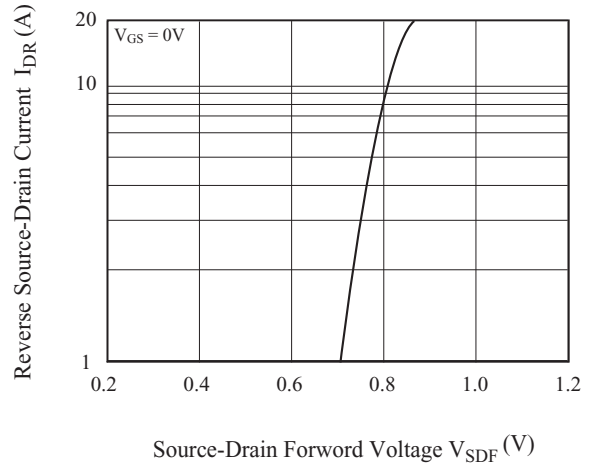


Fig 7.  $Q_g - V_{GS}$

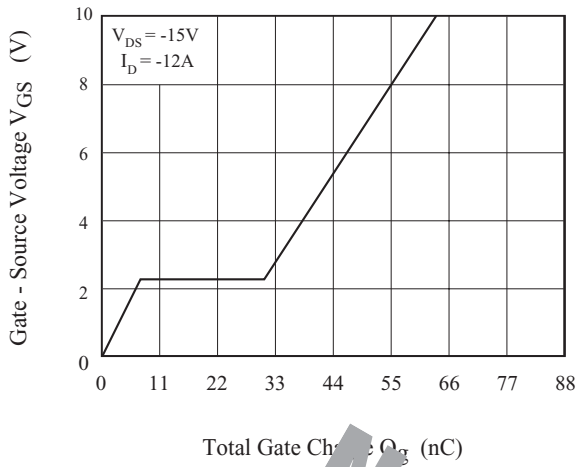


Fig8. Safe Operation Area

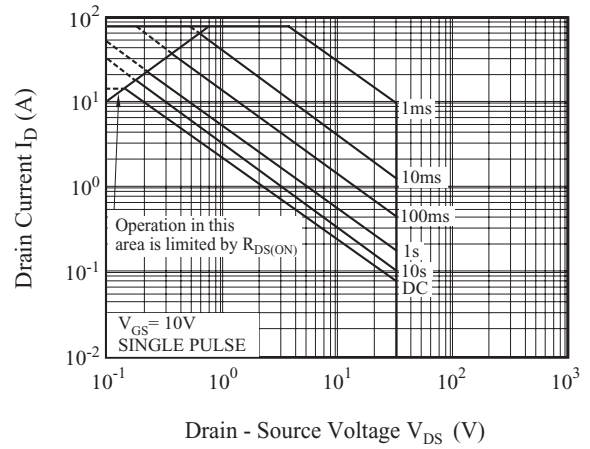


Fig. Thermal Response Curve

