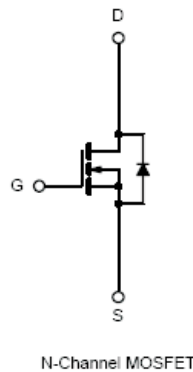
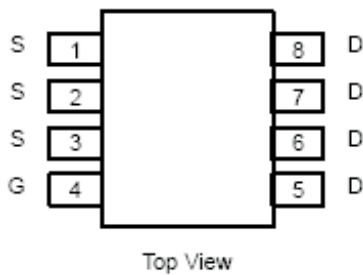
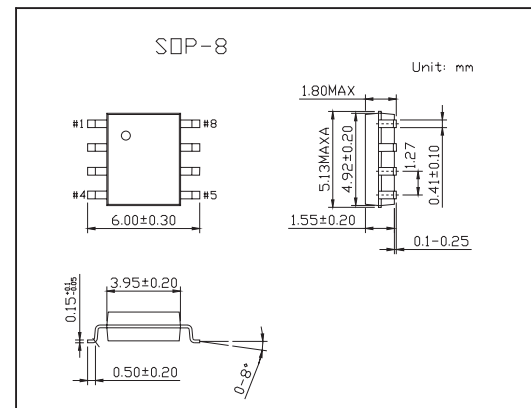


## N-Channel Qg, Fast Switching WFET™ KI4390DY

### ■ Features

- Extremely Low Qgd WFET Technology for Switching Losses
- TrenchFET™ Power MOSFET



### ■ Absolute Maximum Ratings Ta = 25°C

| Parameter   | Symbol                            | 10 secs    | Steady State | Unit |
|---|-----------------------------------|------------|--------------|------|
| Drain-Source Voltage  | V <sub>DS</sub>                   | 30         |              | V    |
| Gate-Source Voltage   | V <sub>GS</sub>                   | ±20        |              |      |
| Continuous Drain Current (T <sub>J</sub> = 150 °C) TA = 25°C<br>TA = 70°C | I <sub>D</sub>                    | 12.5       | 8.5          | A    |
|   |                                   | 10         | 6.8          |      |
| Pulsed Drain Current  | I <sub>DM</sub>                   | 20         |              |      |
| Continuous Source Current ( Diode Conduction)*                            | I <sub>S</sub>                    | 2.7        | 1.3          | W    |
| Maximum Power Dissipation *   | P <sub>D</sub>                    | 3          | 1.4          |      |
|   |                                   | 1.9        | 0.9          |      |
| Operating Junction and Storage Temperature Range                          | T <sub>J</sub> , T <sub>stg</sub> | -55 to 150 |              | °C   |

\*Surface Mounted on 1" X 1" FR4 Board.

## KI4390DY

## ■ Thermal Resistance Ratings

| Parameter                        |              | Symbol            | Typical | Maximum | Unit |
|----------------------------------|--------------|-------------------|---------|---------|------|
| Maximum Junction-to-Ambient *    | t ≤ 10 sec   | R <sub>thJA</sub> | 32      | 42      | °C/W |
|                                  | Steady-State |                   | 68      | 90      |      |
| Maximum Junction-to-Foot (Drain) | Steady-State | R <sub>thJF</sub> | 15      | 20      |      |

\* Surface Mounted on 1" X 1" FR4 Board.

## ■ Electrical Characteristics Ta = 25°C

| Parameter                          | Symbol              | Testconditions   | Min | Typ    | Max    | Unit |
|------------------------------------|---------------------|--|-----|--------|--------|------|
| Gate Threshold Voltage             | V <sub>GS(th)</sub> | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA  | 0.8 |        | 2.8    | V    |
| Gate-Body Leakage                  | I <sub>GSS</sub>    | V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20 V   |     |        | ±100   | nA   |
| Zero Gate Voltage Drain Current    | I <sub>DSS</sub>    | V <sub>DS</sub> = 24 V, V <sub>GS</sub> = 0 V  |     |        | 1      | μA   |
|                                    |                     | V <sub>DS</sub> = 24 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55°C                                     |     |        | 5      |      |
| On-State Drain Current*            | I <sub>D(on)</sub>  | V <sub>DS</sub> ≥ 5 V, V <sub>GS</sub> = 10 V  | 30  |        |        | A    |
| Drain Source On State Resistance*  | r <sub>DS(on)</sub> | V <sub>GS</sub> = 10 V, I <sub>D</sub> = 12.5 A  |     | 0.0075 | 0.0095 | Ω    |
|                                    |                     | V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 10.5 A   |     | 0.0105 | 0.0135 |      |
| Forward Transconductance           | g <sub>fs</sub>     | V <sub>DS</sub> = 15 V, I <sub>D</sub> = 12.5 A  |     | 38     |        | S    |
| Schottky Diode Forward Voltage*    | V <sub>SD</sub>     | I <sub>S</sub> = 2.7 A, V <sub>GS</sub> = 0 V  |     | 0.7    |        | V    |
| Total Gate Charge                  | Q <sub>g</sub>      | V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 12.5 A                                 |     | 10     | 15     | nC   |
| Gate-Source Charge                 | Q <sub>gs</sub>     |  |     | 3.5    |        |      |
| Gate-Drain Charge                  | Q <sub>gd</sub>     |  |     | 2.1    |        |      |
| Gate Resistance                    | R <sub>g</sub>      |  |     | 0.8    |        | Ω    |
| Turn-On Delay Time                 | t <sub>d(on)</sub>  | V <sub>DD</sub> =15V, R <sub>L</sub> =15Ω, I <sub>D</sub> =1A, V <sub>GEN</sub> =10V, R <sub>G</sub> =6Ω |     | 16     | 30     | ns   |
| Rise Time                          | t <sub>r</sub>      |  |     | 6      | 12     |      |
| Turn-Off Delay Time                | t <sub>d(off)</sub> |  |     | 43     | 70     |      |
| Fall Time                          | t <sub>f</sub>      |  |     | 14     | 25     |      |
| Source-Drain Reverse Recovery Time | t <sub>rr</sub>     | I <sub>F</sub> = 2.7 A, di/dt = 100 A/μs   |     | 35     | 60     | ns   |

\* Pulse test :Pulse width ≤300 μs, duty cycle ≤2%