

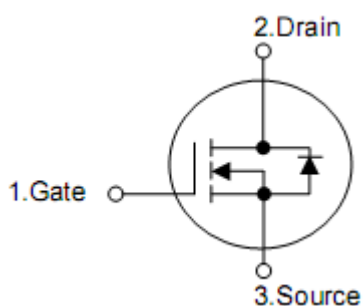
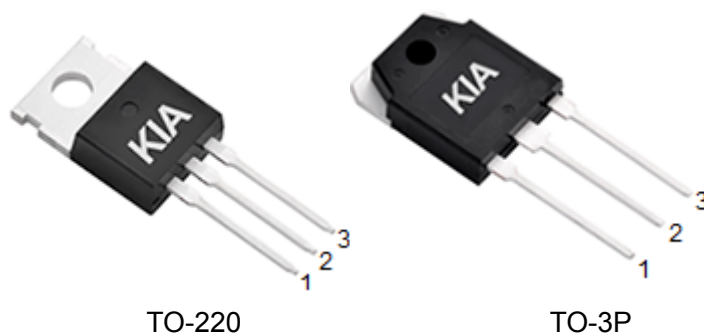
## 1. Features

- $R_{DS(ON)}=4.8m\Omega(\text{typ.}) @ V_{GS}=10V$
- Lead free and Green Device Available
- Low Rds-on to Minimize Conductive Loss
- High avalanche Current

## 2. Applications

- Power switching application
- Hard switched and High frequency circuits
- Uninterruptible power supply

## 3. Symbol



| Pin | Function |
|-----|----------|
| 1   | Gate     |
| 2   | Drain    |
| 3   | Source   |

## 4. Ordering Information

| Part Number | Package | Brand |
|-------------|---------|-------|
| KNP2908D    | TO-220  | KIA   |
| KNH2908D    | TO-3P   | KIA   |

## 5. Absolute maximum ratings

(T<sub>A</sub>=25°C, unless otherwise noted)

| Parameter                                                  |                       | Symbol                            | Rating     | Units |
|------------------------------------------------------------|-----------------------|-----------------------------------|------------|-------|
| Drain-source voltage                                       |                       | V <sub>DS</sub>                   | 80         | V     |
| Gate-source voltage                                        |                       | V <sub>GS</sub>                   | ±25        | V     |
| Continuous drain current <sup>3)</sup>                     | T <sub>C</sub> =25°C  | I <sub>D</sub>                    | 130        | A     |
|                                                            | T <sub>C</sub> =100°C | I <sub>D</sub>                    | 95         | A     |
| Pulsed drain current (@T <sub>C</sub> =25°C) <sup>4)</sup> |                       | I <sub>DM</sub>                   | 500        | A     |
| Avalanche Current <sup>5)</sup>                            |                       | I <sub>AS</sub>                   | 30         | A     |
| Single pulse avalanche energy                              |                       | E <sub>AS</sub>                   | 900        | mJ    |
| Total power dissipation                                    | T <sub>C</sub> =25°C  | P <sub>D</sub>                    | 246        | W     |
|                                                            | T <sub>C</sub> =100°C | P <sub>D</sub>                    | 150        | W/°C  |
| Operation junction and temperature range                   |                       | T <sub>J</sub> , T <sub>STG</sub> | -55 to 175 | °C    |

## 6. Thermal characteristics

| Parameter                               | Symbol           | Max  | Unit |
|-----------------------------------------|------------------|------|------|
| Thermal Resistance, Junction-to-Case    | R <sub>θJC</sub> | 0.78 | °C/W |
| Thermal resistance, Junction to ambient | R <sub>θJA</sub> | 62.5 | °C/W |

## 7. Electrical characteristics

(T<sub>A</sub>=25°C, unless otherwise noted)

| Parameter                                | Symbol              | Test Conditions                                                                                      | Min | Typ  | Max  | Units |
|------------------------------------------|---------------------|------------------------------------------------------------------------------------------------------|-----|------|------|-------|
| Drain-source breakdown voltage           | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA                                                           | 80  | -    | -    | V     |
| Drain-Source Leakage Current             | I <sub>DSS</sub>    | V <sub>DS</sub> =64V, V <sub>GS</sub> =0V                                                            | -   | -    | 1    | μA    |
|                                          |                     | V <sub>DS</sub> =64V, T <sub>J</sub> =125°C                                                          | -   | -    | 10   | uA    |
| Gate to source leakage current           | I <sub>GSS</sub>    | V <sub>GS</sub> =±25V, 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   | 3    | 4    | V     |
| Drain-source on-Resistance <sup>1)</sup> | R <sub>DS(on)</sub> | V <sub>GS</sub> =10V, I <sub>D</sub> =50A,                                                           | -   | 4.8  | 6    | mΩ    |
| Gate resistance                          | R <sub>G</sub>      | V <sub>DS</sub> =0V, V <sub>GS</sub> =0V,<br>f=1MHz                                                  | -   | 1.7  | -    | Ω     |
| Total gate charge                        | Q <sub>g</sub>      | V <sub>DS</sub> =64V,<br>V <sub>GS</sub> =10V, I <sub>D</sub> =60A <sup>2)</sup>                     | -   | 110  | -    | nC    |
| Gate-source charge                       | Q <sub>gs</sub>     |                                                                                                      | -   | 16   | -    |       |
| Gate-drain charge                        | Q <sub>gd</sub>     |                                                                                                      | -   | 45   | -    |       |
| Turn-on delay time                       | t <sub>d(on)</sub>  | V <sub>DD</sub> =60V, I <sub>D</sub> =40A,<br>R <sub>G</sub> =6Ω, V <sub>GS</sub> =10V <sup>2)</sup> | -   | 25   | -    | ns    |
| Rise time                                | t <sub>r</sub>      |                                                                                                      | -   | 16   | -    |       |
| Turn-off delay time                      | t <sub>d(off)</sub> |                                                                                                      | -   | 40   | -    |       |
| Fall time                                | t <sub>f</sub>      |                                                                                                      | -   | 52   | -    |       |
| Input capacitance                        | C <sub>iss</sub>    | V <sub>DS</sub> =25V, V <sub>GS</sub> =0V,<br>f=1MHz <sup>2)</sup>                                   | -   | 4500 | -    | pF    |
| Output capacitance                       | C <sub>oss</sub>    |                                                                                                      | -   | 640  | -    |       |
| Reverse transfer capacitance             | C <sub>rss</sub>    |                                                                                                      | -   | 230  | -    |       |
| Continuous source current <sup>3)</sup>  | I <sub>S</sub>      | —                                                                                                    | -   | -    | 130  | A     |
| Diode Forward voltage <sup>1)</sup>      | V <sub>SD</sub>     | V <sub>GS</sub> =0V, I <sub>S</sub> =130A                                                            | -   | -    | 1.3  | V     |
| Reverse recovery time                    | t <sub>rr</sub>     | I <sub>F</sub> =30A, V <sub>GS</sub> =0V,<br>dI <sub>F</sub> /dt=100A/us                             | -   | 30   | -    | ns    |
| Reverse recovery charge                  | Q <sub>rr</sub>     |                                                                                                      | -   | 52   | -    | nC    |

Note

1) Pulse test; pulse width≤300us, duty cycle≤2%.

2) Guaranteed by design, not subject to production testing.

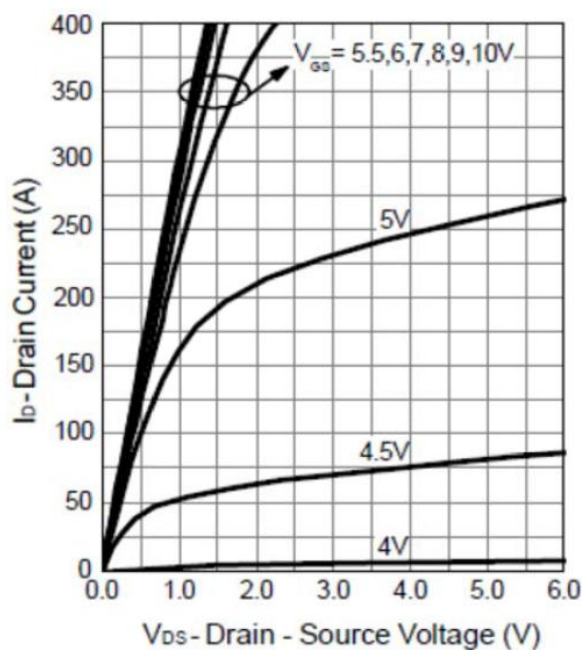
3) Package limitation current is 55A. Calculated continuous current based on maximum allowable junction temperature.

4) Repetitive rating, pulse width limited by max junction temperature.

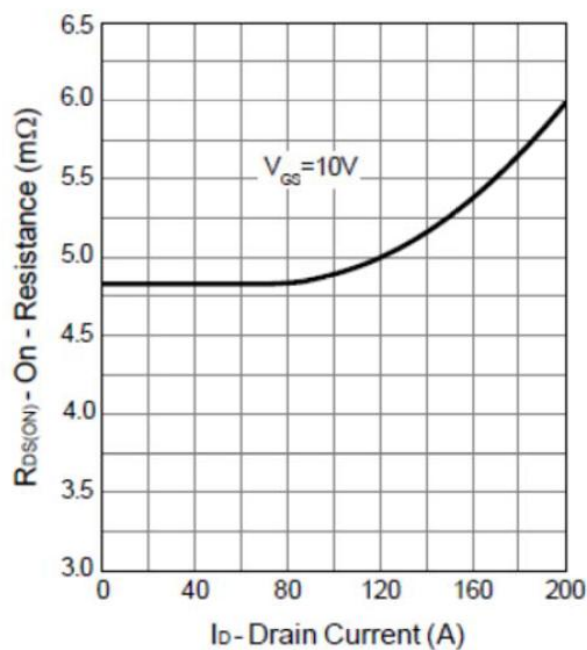
5) Starting T<sub>J</sub>=25°C, L=0.5mH, V<sub>DD</sub>=64V, I<sub>AS</sub>=64A.

## 8. Typical operating characteristics

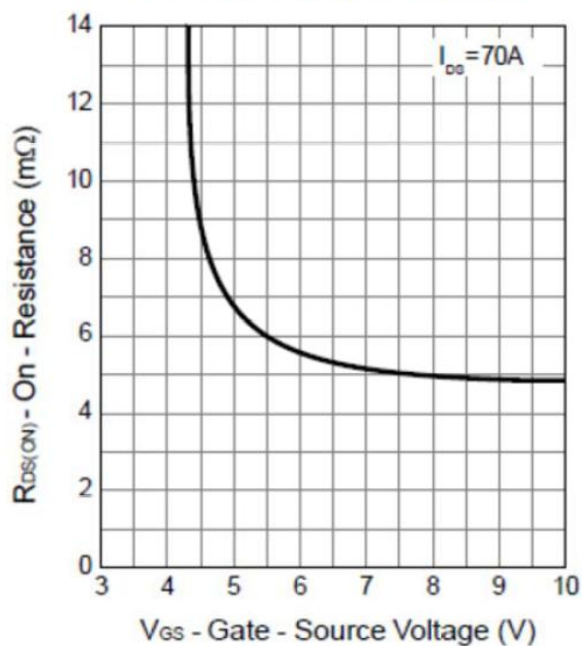
**Output Characteristics**



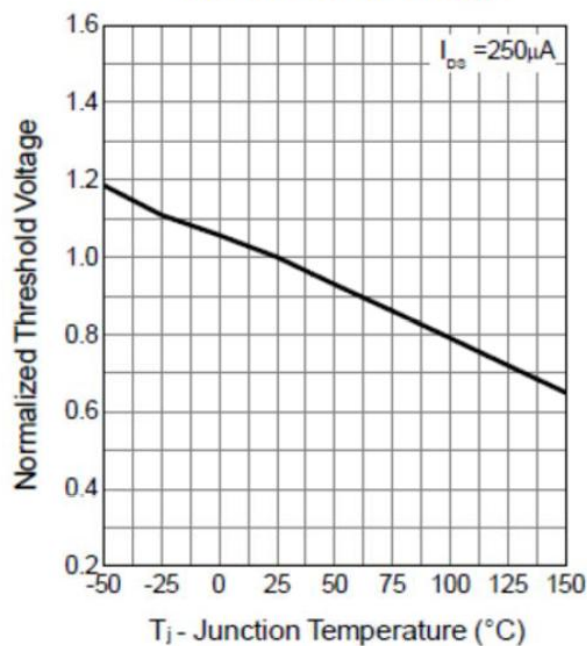
**Drain-Source On Resistance**



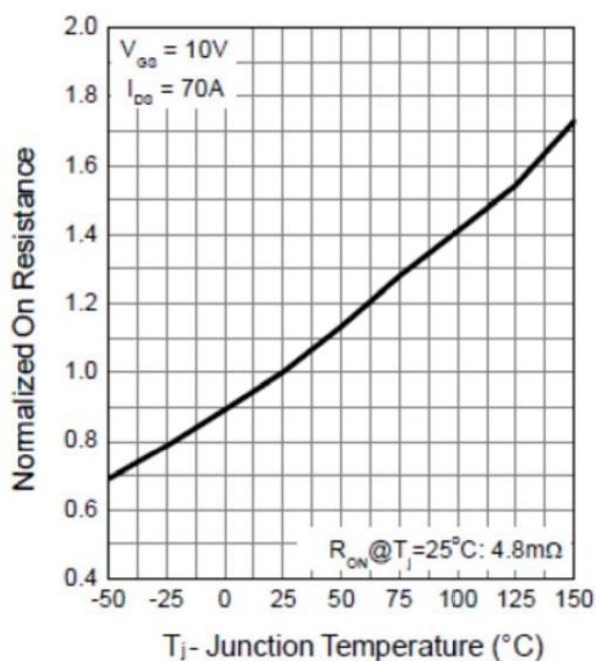
**Gate-Source On Resistance**



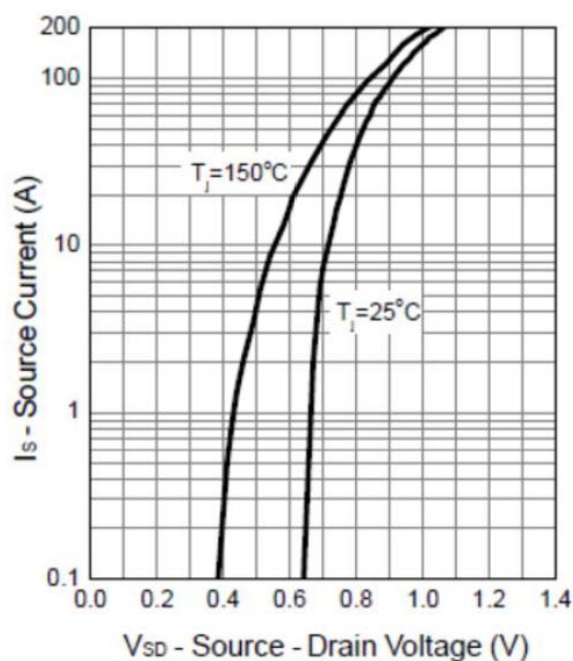
**Gate Threshold Voltage**



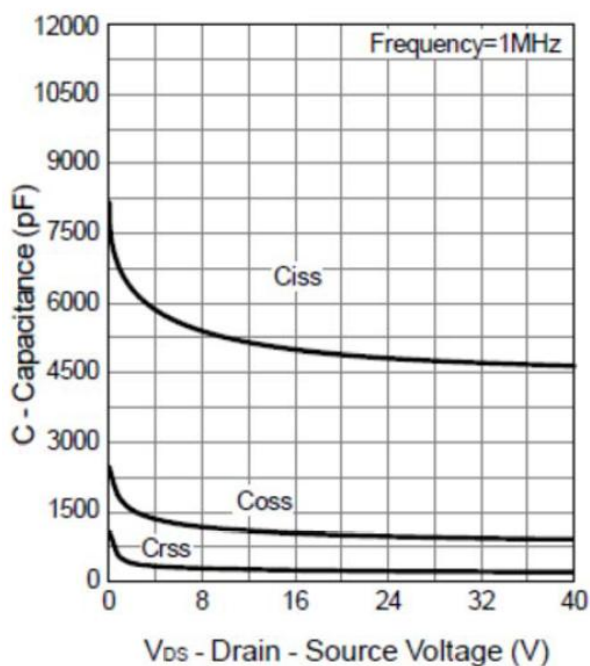
**Drain-Source On Resistance**



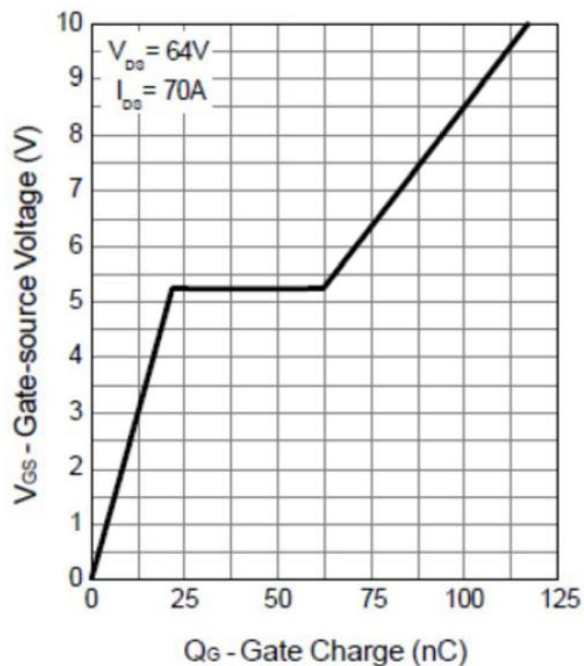
**Source-Drain Diode Forward**



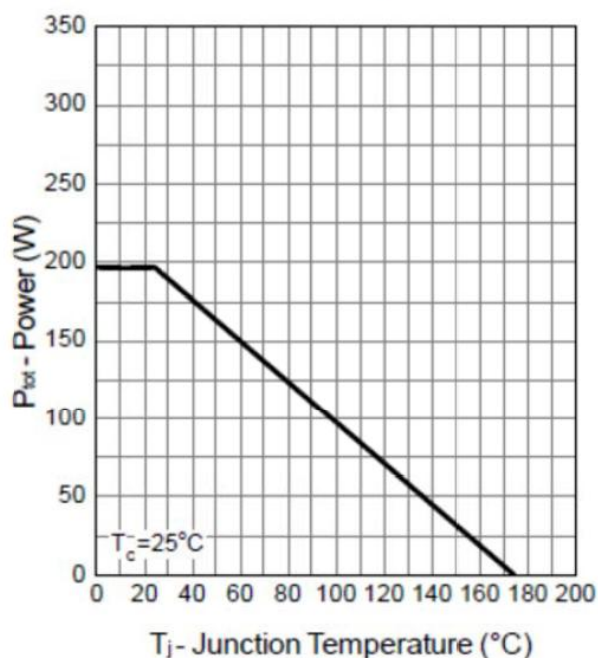
**Capacitance**



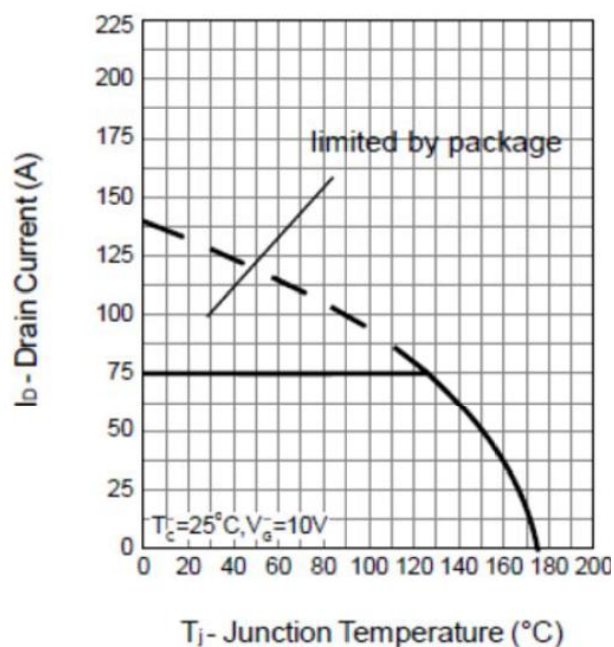
**Gate Charge**



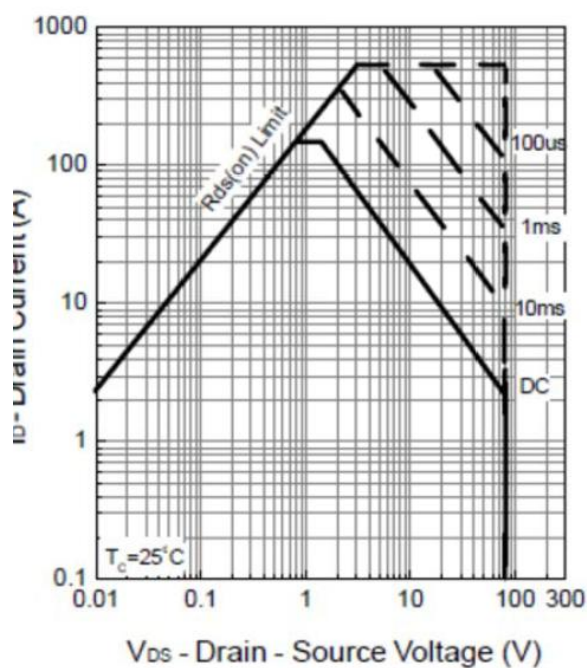
**Power Dissipation**



**Drain Current**



**Safe Operation Area**



**Thermal Transient Impedance**

