

## FUJI POWER MOSFET Super FAP-G Series

### N-CHANNEL SILICON POWER MOSFET

#### Features

- High speed switching
- Low on-resistance
- No secondary breakdown
- Low driving power
- Avalanche-proof

#### Applications

- Switching regulators
- UPS (Uninterruptible Power Supply)
- DC-DC converters

#### Maximum ratings and characteristic Absolute maximum ratings

(Tc=25°C unless otherwise specified)

| Item                                    | Symbol                  | Ratings              | Unit  |
|---|-------------------------|----------------------|-------|
| Drain-source voltage                    | V <sub>DS</sub>         | 150                  | V     |
|   | V <sub>DSX</sub> *5     | 120                  | V     |
| Continuous drain current                | I <sub>D</sub>          | ±16                  | A     |
| Pulsed drain current                    | I <sub>D(puls)</sub>    | ±64                  | A     |
| Gate-source voltage                     | V <sub>GS</sub>         | ±30                  | V     |
| Non-repetitive Avalanche current        | I <sub>AS</sub> *2      | 16                   | A     |
| Maximum Avalanche Energy                | E <sub>AS</sub> *1      | 189                  | mJ    |
| Maximum Drain-Source dV/dt              | dV <sub>DS</sub> /dt *4 | 20                   | kV/μs |
| Peak Diode Recovery dV/dt               | dV/dt *3                | 5                    | kV/μs |
| Max. power dissipation                  | P <sub>D</sub>          | T <sub>a</sub> =25°C | 2.16  |
|   |                         | T <sub>c</sub> =25°C | 25    |
| Operating and storage temperature range | T <sub>ch</sub>         | +150                 | °C    |
|   | T <sub>stg</sub>        | -55 to +150          | °C    |
| Isolation voltage                       | V <sub>ISO</sub>        | 2                    | kVrms |

\*1 L=1.08mH, V<sub>CC</sub>=48V \*2 T<sub>ch</sub>≤150°C \*3 I<sub>F</sub>≤-I<sub>D</sub>, -di/dt=50A/μs, V<sub>CC</sub>≤BV<sub>DSS</sub>, T<sub>ch</sub>≤150°C

\*4 V<sub>DS</sub> ≤ 150V \*5 V<sub>GS</sub>=-30V t=60sec f=60Hz

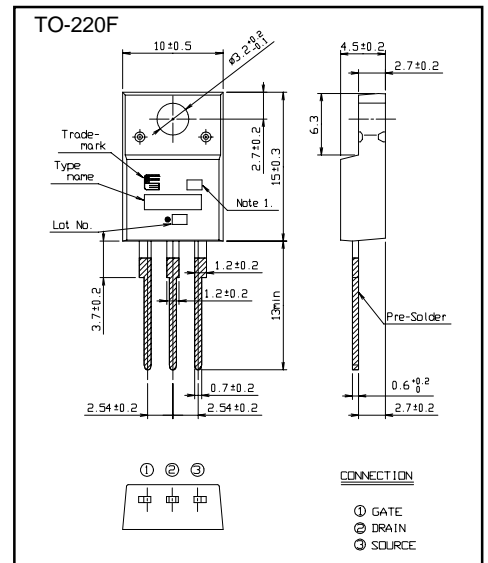
#### Electrical characteristics (T<sub>c</sub> =25°C unless otherwise specified)

| Item                             | Symbol               | Test Conditions   | Min. | Typ. | Max. | Units |
|----------------------------------|----------------------|---|------|------|------|-------|
| Drain-source breakdown voltage   | V <sub>(BR)DSS</sub> | I <sub>D</sub> = 250μA V <sub>GS</sub> =0V                    | 150  |      |      | V     |
| Gate threshold voltage           | V <sub>GS(th)</sub>  | I <sub>D</sub> = 250μA V <sub>DS</sub> =V <sub>GS</sub>       | 3.0  |      | 5.0  | V     |
| Zero gate voltage drain current  | I <sub>DSS</sub>     | V <sub>DS</sub> =150V V <sub>GS</sub> =0V                     |      |      | 25   | μA    |
|                                  |                      | V <sub>DS</sub> =120V V <sub>GS</sub> =0V                     |      |      | 250  |       |
| Gate-source leakage current      | I <sub>GSS</sub>     | V <sub>GS</sub> =±30V V <sub>DS</sub> =0V                     |      | 10   | 100  | nA    |
| Drain-source on-state resistance | R <sub>DS(on)</sub>  | I <sub>D</sub> =8A V <sub>GS</sub> =10V                       |      | 79   | 105  | mΩ    |
| Forward transconductance         | g <sub>fs</sub>      | I <sub>D</sub> =8A V <sub>DS</sub> =25V                       | 6    | 12   |      | S     |
| Input capacitance                | C <sub>iss</sub>     | V <sub>DS</sub> =75V  |      | 760  | 1140 | pF    |
| Output capacitance               | C <sub>oss</sub>     | V <sub>GS</sub> =0V   |      | 130  | 195  |       |
| Reverse transfer capacitance     | C <sub>rss</sub>     | f=1MHz  |      | 6    | 9    |       |
| Turn-on time t <sub>on</sub>     | td(on)               | V <sub>CC</sub> =48V I <sub>D</sub> =8A                       |      | 12   | 18   | ns    |
|                                  | t <sub>r</sub>       | V <sub>GS</sub> =10V  |      | 2.8  | 4.2  |       |
| Turn-off time t <sub>off</sub>   | td(off)              | R <sub>GS</sub> =10 Ω   |      | 22   | 33   |       |
|                                  | t <sub>f</sub>       |   |      | 6.2  | 9.3  |       |
| Total Gate Charge                | Q <sub>G</sub>       | V <sub>CC</sub> =75V  |      | 21   | 31.5 | nC    |
| Gate-Source Charge               | Q <sub>GS</sub>      | I <sub>D</sub> =16A   |      | 9    | 13.5 |       |
| Gate-Drain Charge                | Q <sub>GD</sub>      | V <sub>GS</sub> =10V  |      | 6    | 9    |       |
| Avalanche capability             | I <sub>AV</sub>      | L=100μH T <sub>ch</sub> =25°C                                 | 16   |      |      | A     |
| Diode forward on-voltage         | V <sub>SD</sub>      | I <sub>F</sub> =16A V <sub>GS</sub> =0V T <sub>ch</sub> =25°C |      | 1.10 | 1.65 | V     |
| Reverse recovery time            | t <sub>rr</sub>      | I <sub>F</sub> =16A V <sub>GS</sub> =0V                       |      | 0.13 |      | μs    |
| Reverse recovery charge          | Q <sub>rr</sub>      | -di/dt=100A/μs T <sub>ch</sub> =25°C                          |      | 0.59 |      | μC    |

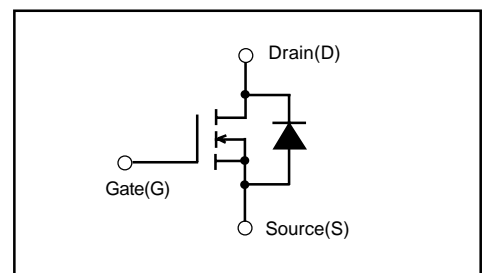
#### Thermal characteristics

| Item               | Symbol                | Test Conditions    | Min. | Typ. | Max. | Units |
|--------------------|-----------------------|--------------------|------|------|------|-------|
| Thermal resistance | R <sub>th(ch-c)</sub> | channel to case    |      |      | 5.0  | °C/W  |
|                    | R <sub>th(ch-a)</sub> | channel to ambient |      |      | 58.0 | °C/W  |

#### Outline Drawings (mm)



#### Equivalent circuit schematic



## Characteristics

