

## 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

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

| Item                                    | Symbol                  | Ratings              | Unit  |
|---|-------------------------|----------------------|-------|
| Drain-source voltage                    | V <sub>DS</sub>         | 900                  | V     |
|   | V <sub>DSX</sub> *5     | 900                  | V     |
| Continuous drain current                | I <sub>D</sub>          | ±9                   | A     |
| Pulsed drain current                    | I <sub>D(puls)</sub>    | ±36                  | A     |
| Gate-source voltage                     | V <sub>GS</sub>         | ±30                  | V     |
| Repetitive or non-repetitive            | I <sub>AR</sub> *2      | 9                    | A     |
| Maximum Avalanche Energy                | E <sub>AS</sub> *1      | 287.7                | mJ    |
| Maximum Drain-Source dV/dt              | dV <sub>DS</sub> /dt *4 | 40                   | 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 | 2.02  |
|   |                         | T <sub>c</sub> =25°C | 270   |
| Operating and storage temperature range | T <sub>ch</sub>         | +150                 | °C    |
|   | T <sub>stg</sub>        | -55 to +150          | °C    |

\*1 L=6.51mH, V<sub>CC</sub>=90V, T<sub>ch</sub>=25°C See to Avalanche Energy Graph \*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> ≤ 900V \*5 V<sub>GS</sub> = -30V

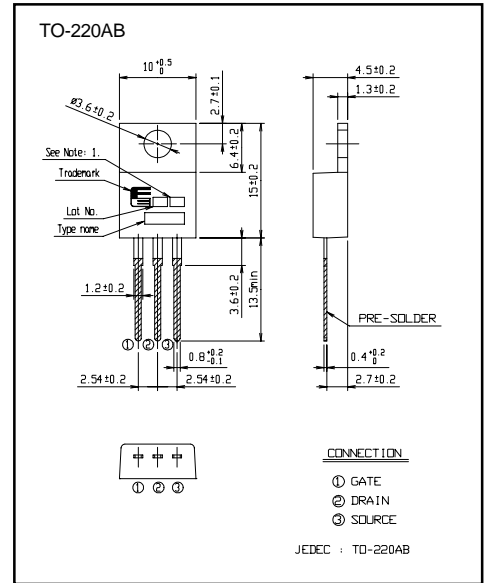
### Electrical characteristics (T<sub>c</sub> =25°C unless otherwise specified)

| 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                    | 900  |      |      | 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> =900V V <sub>GS</sub> =0V                    |      |      | 25   | μA    |
|                                  |                      | V <sub>DS</sub> =720V V <sub>GS</sub> =0V                    |      |      | 250  |       |
| Gate-source leakage current      | I <sub>GSS</sub>     | V <sub>GS</sub> =±30V V <sub>DS</sub> =0V                    |      |      | 100  | nA    |
| Drain-source on-state resistance | R <sub>DS(on)</sub>  | I <sub>D</sub> =4.5A V <sub>GS</sub> =10V                    |      | 1.22 | 1.58 | Ω     |
| Forward transconductance         | g <sub>fs</sub>      | I <sub>D</sub> =4.5A V <sub>DS</sub> =25V                    | 5    | 10   |      | S     |
| Input capacitance                | C <sub>iss</sub>     | V <sub>DS</sub> =25V   |      | 1100 | 1650 | pF    |
| Output capacitance               | C <sub>oss</sub>     | V <sub>GS</sub> =0V  |      | 140  | 210  |       |
| Reverse transfer capacitance     | C <sub>rss</sub>     | f=1MHz   |      | 8    | 12   |       |
| Turn-on time t <sub>on</sub>     | td(on)               | V <sub>CC</sub> =600V I <sub>D</sub> =4.5A                   |      | 25   | 38   | ns    |
|                                  | t <sub>r</sub>       | V <sub>GS</sub> =10V   |      | 12   | 18   |       |
| Turn-off time t <sub>off</sub>   | td(off)              | R <sub>GS</sub> =10 Ω  |      | 50   | 75   |       |
|                                  | t <sub>f</sub>       |  |      | 12   | 18   |       |
| Total Gate Charge                | Q <sub>G</sub>       | V <sub>CC</sub> =450V  |      | 31   | 46.5 | nC    |
| Gate-Source Charge               | Q <sub>GS</sub>      | I <sub>D</sub> =9A   |      | 4.5  | 8    |       |
| Gate-Drain Charge                | Q <sub>GD</sub>      | V <sub>GS</sub> =10V   |      | 11   | 16.5 |       |
| Avalanche capability             | I <sub>AV</sub>      | L=6.51mH T <sub>ch</sub> =25°C                               | 9    |      |      | A     |
| Diode forward on-voltage         | V <sub>SD</sub>      | I <sub>F</sub> =9A V <sub>GS</sub> =0V T <sub>ch</sub> =25°C |      | 0.90 | 1.50 | V     |
| Reverse recovery time            | t <sub>rr</sub>      | I <sub>F</sub> =9A V <sub>GS</sub> =0V                       |      | 3.2  |      | μs    |
| Reverse recovery charge          | Q <sub>rr</sub>      | -di/dt=100A/μs T <sub>ch</sub> =25°C                         |      | 15.5 |      | μC    |

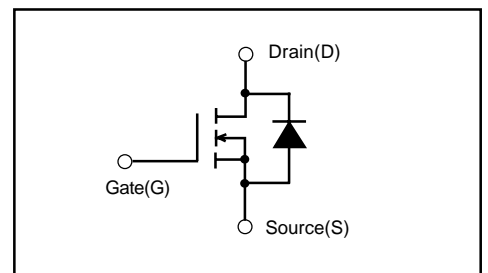
### Thermal characteristics

| Item               | Symbol                | Test Conditions    | Min. | Typ. | Max.  | Units |
|--------------------|-----------------------|--------------------|------|------|-------|-------|
| Thermal resistance | R <sub>th(ch-c)</sub> | channel to case    |      |      | 0.463 | °C/W  |
|                    | R <sub>th(ch-a)</sub> | channel to ambient |      |      | 62.0  | °C/W  |

### Outline Drawings [mm]



### Equivalent circuit schematic



Characteristics

