

Super FAP-G Series

N-CHANNEL SILICON POWER MOSFET

Features

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

Applications

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

Maximum ratings and characteristic Absolute maximum ratings

(Tc=25°C unless otherwise specified)

| Item | Symbol | Ratings | Unit | Remarks |
|---|----------------------|---------|-------|------------------------|
| Drain-source voltage | V _{DS} | 450 | V | |
| | V _{DSX} | 450 | V | V _{GS} =-30V |
| Continuous drain current | I _D | 4.3 | A | |
| Pulsed drain current | I _{D(puls)} | ±17.2 | A | |
| Gate-source voltage | V _{GS} | ±30 | V | |
| Repetitive or non-repetitive | I _{AR} | 4.3 | A | Note *1 |
| Non-repetitive Maximum avalanche energy | E _{AS} | 211 | mJ | Note *2 |
| Repetitive Maximum avalanche energy | | 2.1 | mJ | Note *3 |
| Maximum drain-source dV/dt | dV _{DS} /dt | 20 | kV/μs | V _{DS} ≤ 450V |
| Peak diode recovery dV/dt | dV/dt | 5 | kV/μs | Note *4 |
| Max. power dissipation | P _D | 2.16 | W | T _a =25°C |
| | | 21 | W | T _c =25°C |
| Operating and storage temperature range | T _{ch} | +150 | °C | |
| Isolation voltage | V _{ISO} *6 | 2 | kVrms | t=60sec, f=60Hz |

Note *1 T_{ch} ≤ 150°C

Note *2 Starting T_{ch}=25°C, I_{AS}=1.8A, L=119mH, V_{CC}=45V, R_G=50Ω
E_{AS} limited by maximum channel temperature and avalanche current.
See to 'Avalanche Energy' graph.

Note *3 Repetitive rating : Pulse width limited by maximum channel temperature.
See to 'Transient Thermal impedance' graph.

Note *4 I_{RS} ≤ -I_D, -di/dt=50A/μs, V_{CC} ≤ BV_{DSS}, T_{ch} ≤ 150°C

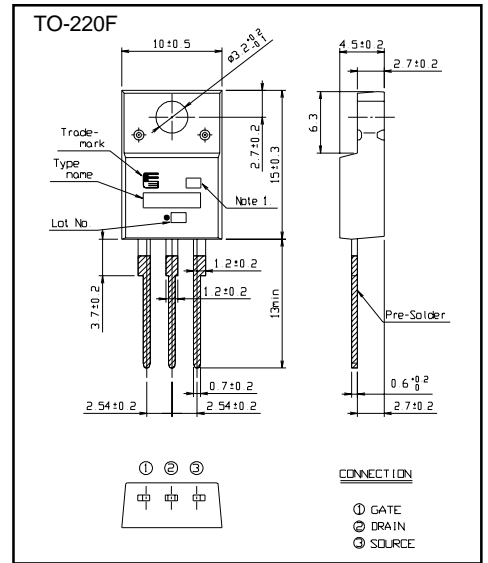
Electrical characteristics (Tc =25°C unless otherwise specified)

| Item | Symbol | Test Conditions | | | |
|----------------------------------|----------------------|--|------|------|----|
| Drain-source breakdown voltage | V _{(BR)DSS} | I _D = 250μA V _{GS} =0V | 450 | | V |
| Gate threshold voltage | V _{GS(th)} | I _D = 250μA V _{DS} =V _{GS} | 3.0 | 5.0 | V |
| Zero gate voltage drain current | I _{DSS} | V _{DS} =450V V _{GS} =0V | | 25 | μA |
| | | V _{DS} =360V V _{GS} =0V | | 2.0 | mA |
| Gate-source leakage current | I _{GSS} | V _{GS} =±30V V _{DS} =0V | | 100 | nA |
| Drain-source on-state resistance | R _{DS(on)} | I _D =2.1A V _{GS} =10V | 1.30 | 1.60 | Ω |
| Forward transconductance | g _{fs} | I _D =2.1A V _{DS} =25V | 1.8 | 3.5 | S |
| Input capacitance | C _{iss} | V _{DS} =25V | 330 | 500 | pF |
| Output capacitance | C _{oss} | V _{GS} =0V | 50 | 75 | |
| Reverse transfer capacitance | C _{rss} | f=1MHz | 2 | 4 | |
| Turn-on time t _{on} | td(on) | V _{CC} =300V I _D =2.1A | 11 | 17.5 | ns |
| | t _r | V _{GS} =10V | 5.5 | 8.5 | |
| Turn-off time t _{off} | td(off) | R _{GS} =10 Ω | 23 | 34.5 | |
| | t _f | | 5.0 | 8.0 | |
| Total Gate Charge | Q _G | V _{CC} =225V | 13.0 | 20 | nC |
| Gate-Source Charge | Q _{GS} | I _D =4.3A | 6.0 | 9.0 | |
| Gate-Drain Charge | Q _{GD} | V _{GS} =10V | 2.5 | 3.8 | |
| Diode forward on-voltage | V _{SD} | I _F =4.3A V _{GS} =0V T _{ch} =25°C | 1.00 | 1.50 | V |
| Reverse recovery time | t _{rr} | I _F =4.3A V _{GS} =0V | 280 | | ns |
| Reverse recovery charge | Q _{rr} | -di/dt=100A/μs T _{ch} =25°C | 1.6 | | μC |

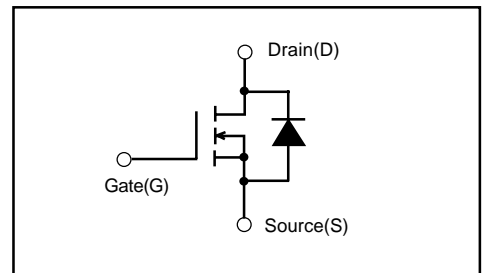
Thermal characteristics

| Item | Symbol | Test Conditions | Min. | Typ. | Max. | Units |
|--------------------|-----------------------|--------------------|------|------|-------|-------|
| Thermal resistance | R _{th(ch-c)} | channel to case | | | 5.952 | °C/W |
| | R _{th(ch-a)} | channel to ambient | | | 58.0 | °C/W |

Outline Drawings [mm]



Equivalent circuit schematic



Characteristics

