

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 _{DS} | 200 | V |
| | V _{DSX} *5 | 170 | V |
| Continuous drain current | I _D | ±18 | A |
| Pulsed drain current | I _{D(puls)} | ±72 | A |
| Gate-source voltage | V _{GS} | ±30 | V |
| Non-repetitive Avalanche current | I _{AS} *2 | 18 | A |
| Maximum Avalanche Energy | E _{AS} *1 | 125.5 | mJ |
| Maximum Drain-Source dV/dt | dV _{DS} /dt *4 | 20 | kV/μs |
| Peak Diode Recovery dV/dt | dV/dt *3 | 5 | kV/μs |
| Max. power dissipation | P _D | T _a =25°C | 2.16 |
| | | T _c =25°C | 37 |
| Operating and storage temperature range | T _{ch} | +150 | °C |
| | T _{stg} | -55 to +150 | °C |
| Isolation voltage | V _{ISO} *6 | 2 | kVrms |

*1 L=620μH, V_{CC}=48V, T_{ch}=25°C, See to Avalanche Energy Graph *2 T_{ch} ≤ 150°C

*3 I_F ≤ -I_D, -di/dt=50A/μs, V_{CC} ≤ BV_{DSS}, T_{ch} ≤ 150°C *4 V_{DS} ≤ 200V *5 V_{GS}=-30V *6 t=60sec f=60Hz

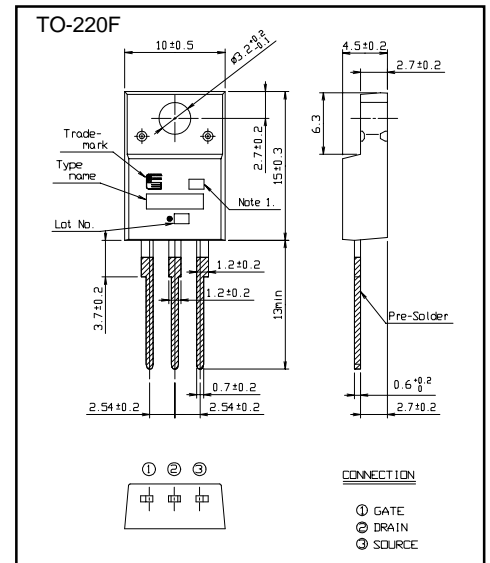
Electrical characteristics (T_c =25°C unless otherwise specified)

| Item | Symbol | Test Conditions | Min. | Typ. | Max. | Units |
|----------------------------------|----------------------|---|------|------|------|-------|
| Drain-source breakdown voltage | V _{(BR)DSS} | I _D =250μA V _{GS} =0V | 200 | | | 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} =200V V _{GS} =0V | | | 25 | μA |
| | | V _{DS} =160V V _{GS} =0V | | | 250 | μA |
| Gate-source leakage current | I _{GSS} | V _{GS} =±30V V _{DS} =0V | | 10 | 100 | nA |
| Drain-source on-state resistance | R _{DS(on)} | I _D =6.5A V _{GS} =10V | | 131 | 170 | mΩ |
| Forward transconductance | g _{fs} | I _D =6.5A V _{DS} =25V | 5.5 | 11 | | S |
| Input capacitance | C _{iss} | V _{DS} =75V | | 770 | 1155 | pF |
| Output capacitance | C _{oss} | V _{GS} =0V | | 110 | 165 | pF |
| Reverse transfer capacitance | C _{rss} | f=1MHz | | 5 | 7.5 | pF |
| Turn-on time t _{on} | td(on) | V _{CC} =48V I _D =6.5A | | 12 | 18 | ns |
| | t _r | V _{GS} =10V | | 2.6 | 3.9 | |
| Turn-off time t _{off} | td(off) | R _{GS} =10 Ω | | 22 | 33 | ns |
| | t _f | | | 6.1 | 9.2 | |
| Total Gate Charge | Q _G | V _{CC} =100V | | 21 | 31.5 | nC |
| Gate-Source Charge | Q _{GS} | I _D =13A | | 8 | 12 | |
| Gate-Drain Charge | Q _{GD} | V _{GS} =10V | | 5 | 7.5 | |
| Avalanche capability | I _{AV} | L=620μH T _{ch} =25°C | 18 | | | A |
| Diode forward on-voltage | V _{SD} | I _F =13A V _{GS} =0V T _{ch} =25°C | | 1.10 | 1.65 | V |
| Reverse recovery time | t _{rr} | I _F =13A V _{GS} =0V | | 0.15 | | μs |
| Reverse recovery charge | Q _{rr} | -di/dt=100A/μs T _{ch} =25°C | | 0.88 | | μC |

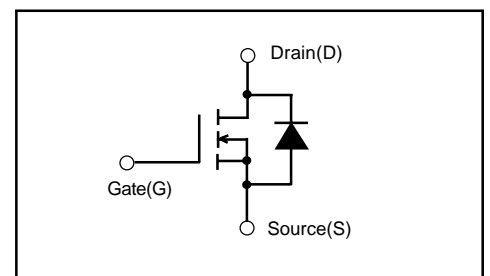
Thermal characteristics

| Item | Symbol | Test Conditions | Min. | Typ. | Max. | Units |
|--------------------|-----------------------|--------------------|------|------|-------|-------|
| Thermal resistance | R _{th(ch-c)} | channel to case | | | 3.378 | °C/W |
| | R _{th(ch-a)} | channel to ambient | | | 58.0 | °C/W |

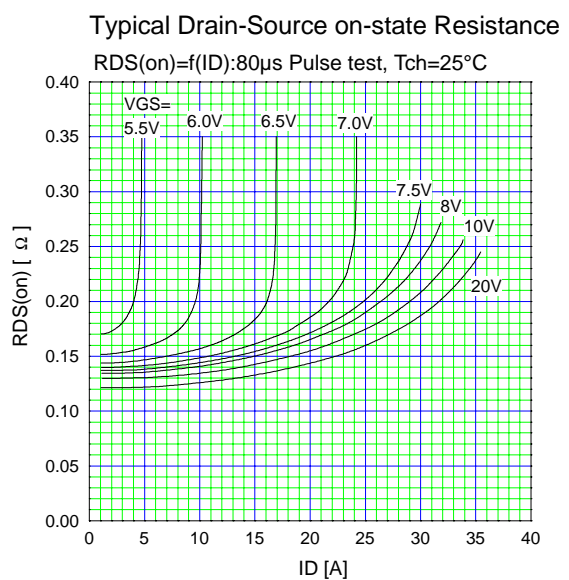
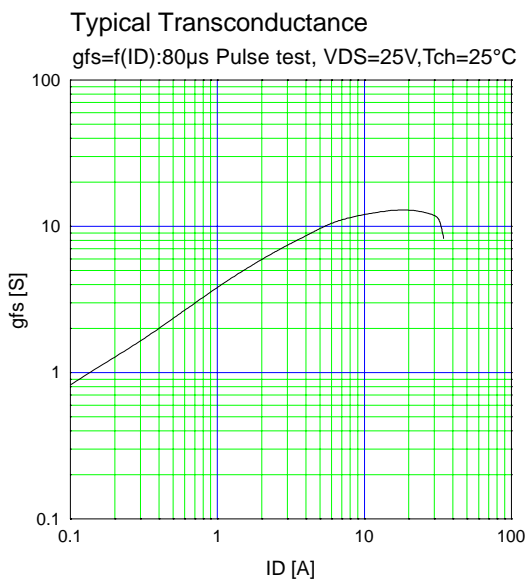
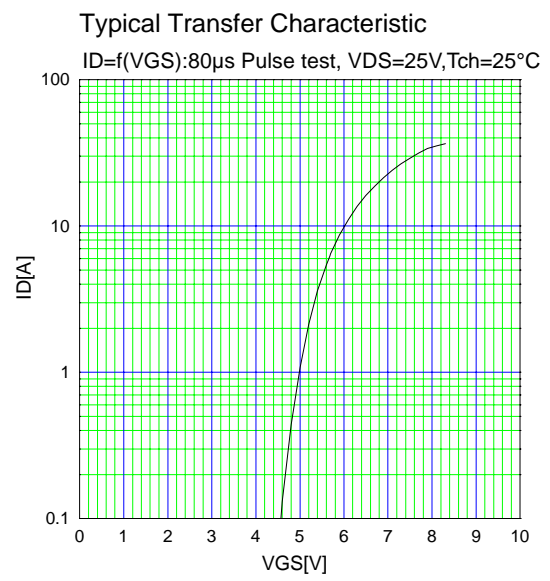
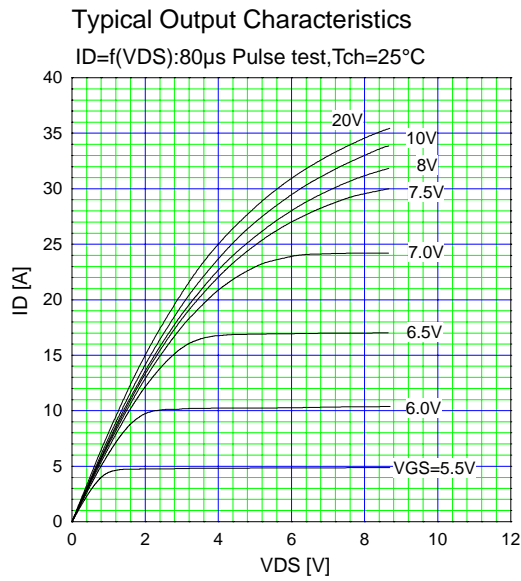
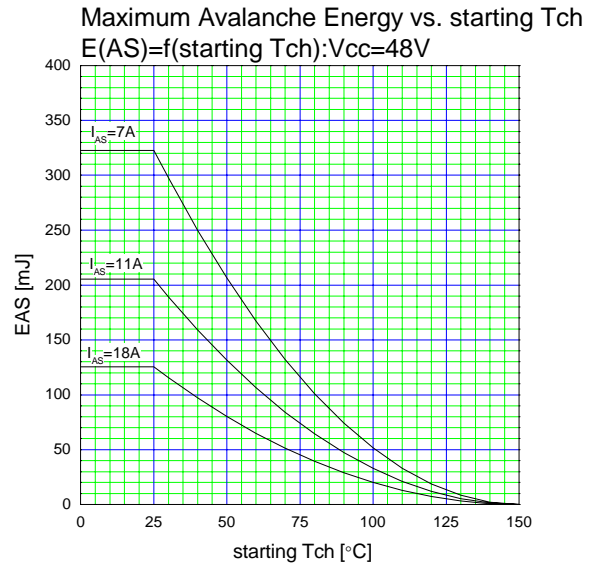
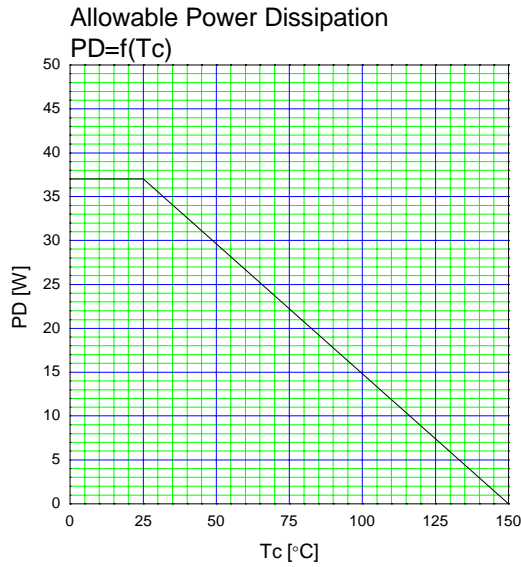
Outline Drawings (mm)



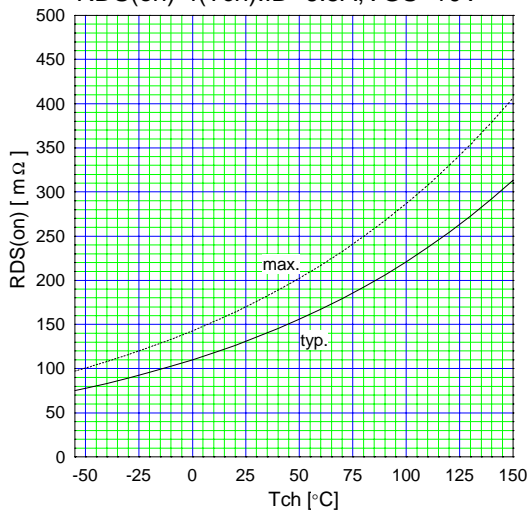
Equivalent circuit schematic



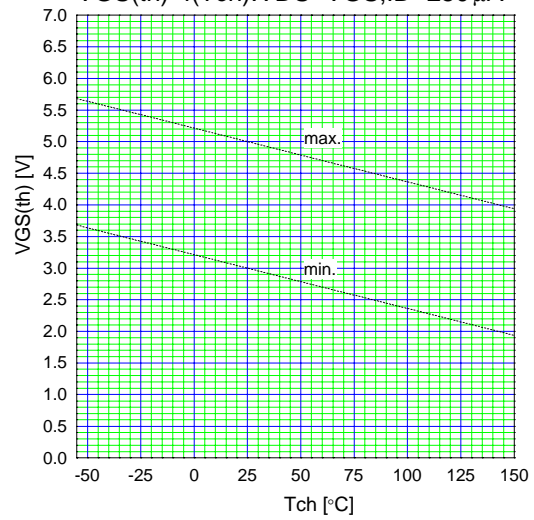
Characteristics



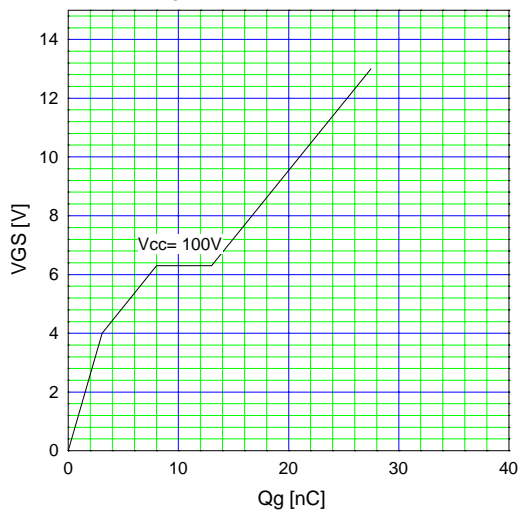
Drain-Source On-state Resistance
 $R_{DS(on)}=f(T_{ch}):I_D=6.5A, V_{GS}=10V$



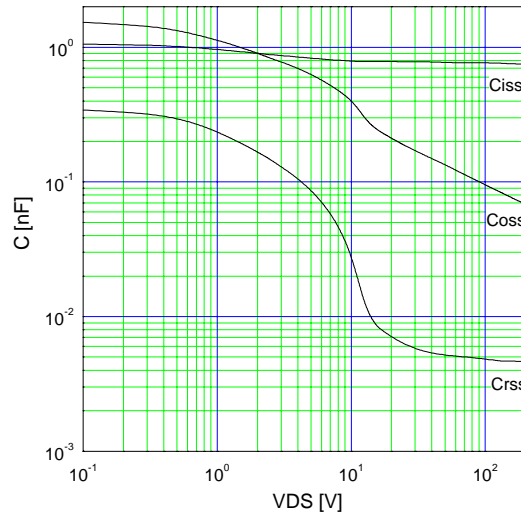
Gate Threshold Voltage vs. Tch
 $V_{GS(th)}=f(T_{ch}):V_{DS}=V_{GS}, I_D=250\mu A$



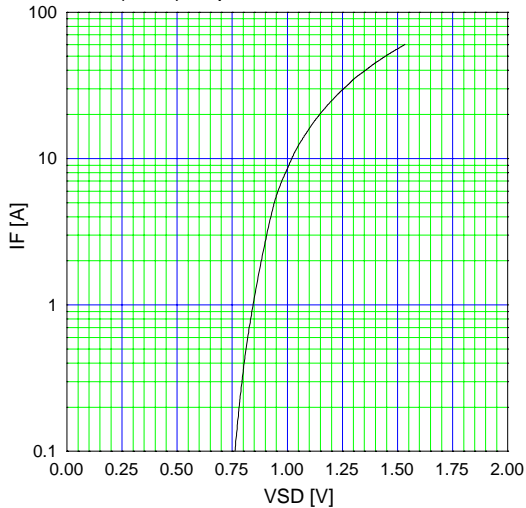
Typical Gate Charge Characteristics
 $V_{GS}=f(Q_g):I_D=13A, T_{ch}=25^\circ C$



Typical Capacitance
 $C=f(V_{DS}):V_{GS}=0V, f=1MHz$



Typical Forward Characteristics of Reverse Diode
 $I_F=f(V_{SD}):80\mu s$ Pulse test, $T_{ch}=25^\circ C$



Typical Switching Characteristics vs. ID
 $t=f(I_D):V_{CC}=48V, V_{GS}=10V, R_G=10\Omega$

