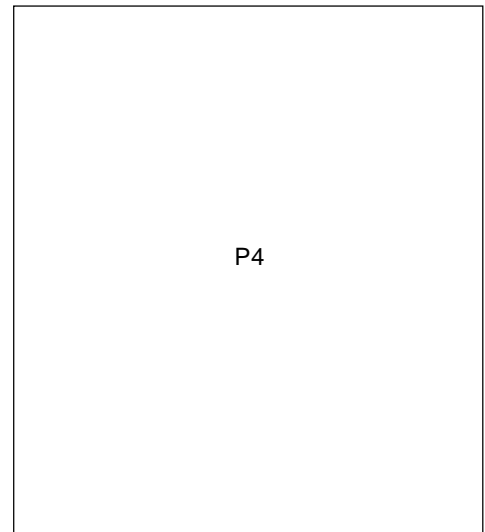


FUJI POWER MOSFET Super FAP-G Series

N-CHANNEL SILICON POWER MOSFET

■ Outline Drawings



■ Features

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

■ Applications

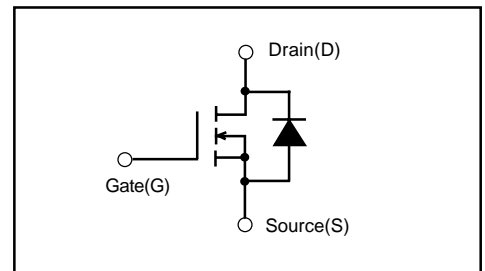
- Switching regulators
- UPS (Uninterruptible Power Supply)
- DC-DC converters

■ Maximum ratings and characteristic Absolute maximum ratings

● (T_c=25°C unless otherwise specified)

| Item | Symbol | Ratings | Unit | |
|---|-------------------------|----------------------|-------|---|
| Drain-source voltage | V _{DS} | 500 | V | |
| Continuous drain current | I _D | ±12 | A | |
| Pulsed drain current | I _{D(puls)} | ±48 | A | |
| Gate-source voltage | V _{GS} | ±30 | V | |
| Repetitive or non-repetitive | IAR *2 | 12 | A | |
| Maximum Avalanche Energy | EAS *1 | 217 | 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 | 1.67 | W |
| | | T _c =25°C | 95 | |
| Operating and storage temperature range | T _{ch} | +150 | °C | |
| | T _{stg} | -55 to +150 | °C | |

■ Equivalent circuit schematic



*1 L=2.77mH, V_{CC}=50V *2 T_{ch}≤150°C *3 I_F≤-I_D, -di/dt=50A/μs, V_{CC}≤BV_{DSS}, T_{ch}≤150°C

*4V_{DS}≤500V

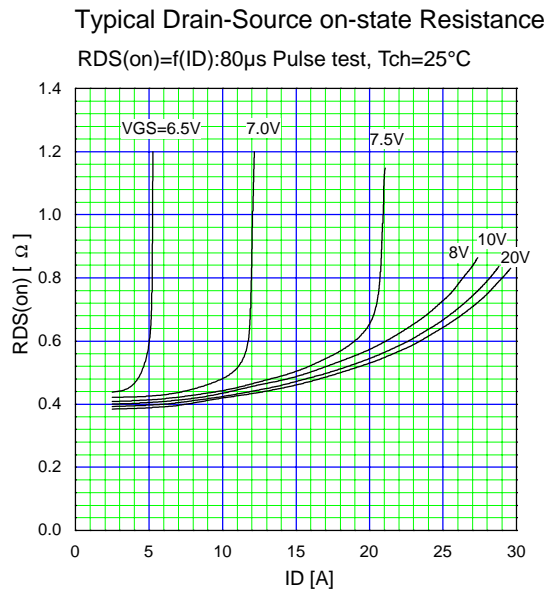
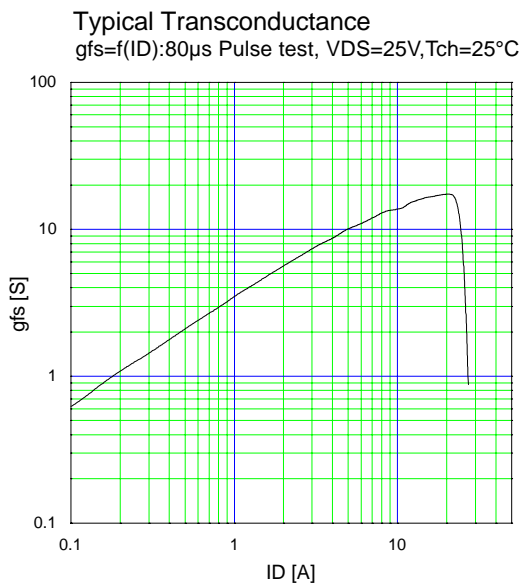
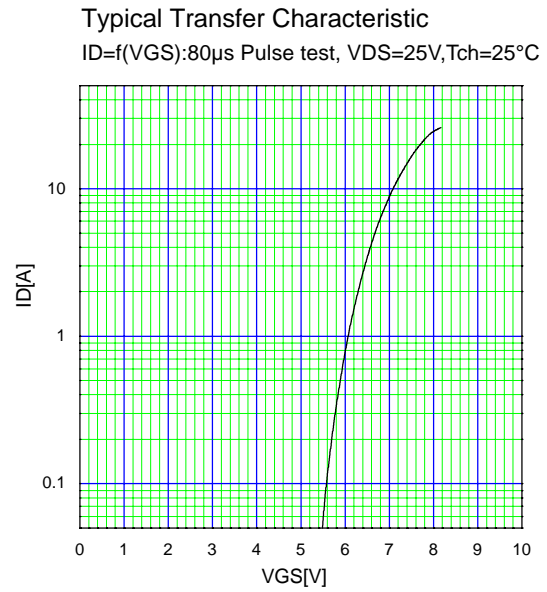
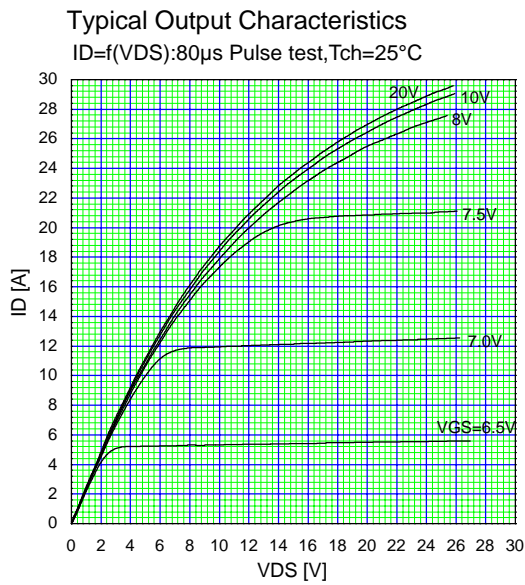
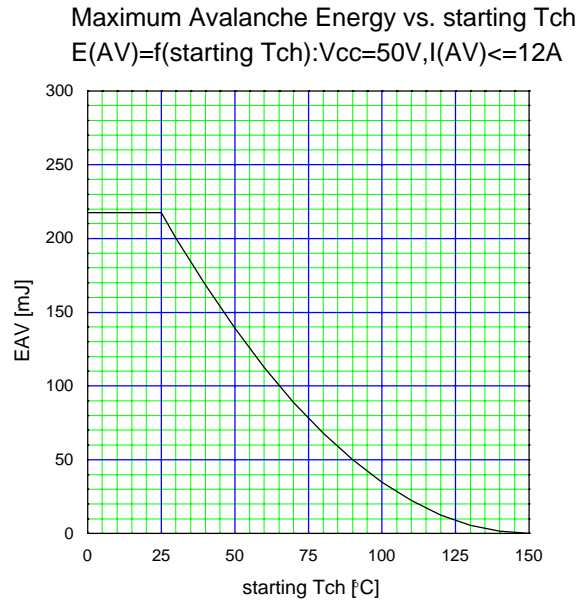
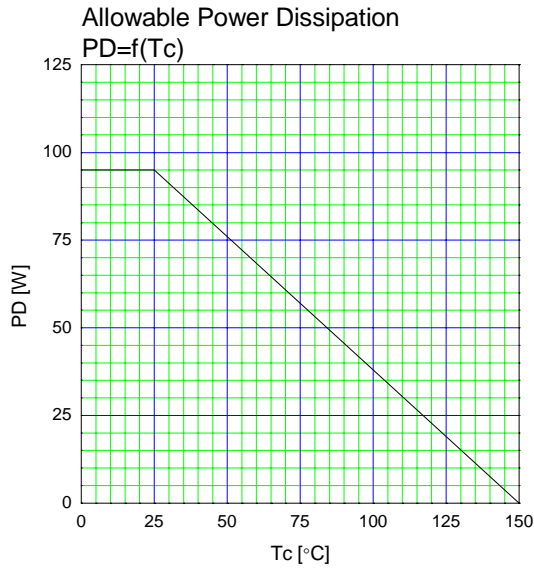
● Electrical characteristics (T_c =25°C unless otherwise specified)

| Item | Symbol | Test Conditions | Min. | Typ. | Max. | Units |
|----------------------------------|----------------------|---|------|------|------|-------|
| Drain-source breakdown voltage | V _{(BR)DSS} | I _D =250μA V _{GS} =0V | 500 | | | 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} =500V V _{GS} =0V | | | 25 | μA |
| | | V _{DS} =400V V _{GS} =0V | | | 250 | |
| 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 =6A V _{GS} =10V | | 0.40 | 0.52 | Ω |
| Forward transconductance | g _{fs} | I _D =6A V _{DS} =25V | 5.5 | 11 | | S |
| Input capacitance | C _{iss} | V _{DS} =25V | | 1200 | 1800 | pF |
| Output capacitance | C _{oss} | V _{GS} =0V | | 140 | 210 | |
| Reverse transfer capacitance | C _{rss} | f=1MHz | | 6.0 | 9.0 | |
| Turn-on time t _{on} | td(on) | V _{CC} =300V I _D =6A | | 17 | 26 | ns |
| | t _r | V _{GS} =10V | | 15 | 23 | |
| Turn-off time t _{off} | td(off) | R _{GS} =10 Ω | | 34 | 51 | |
| | t _f | | | 7 | 11 | |
| Total Gate Charge | Q _G | V _{CC} =250V | | 30 | 45 | nC |
| Gate-Source Charge | Q _{GS} | I _D =12A | | 11 | 16.5 | |
| Gate-Drain Charge | Q _{GD} | V _{GS} =10V | | 10 | 15 | |
| Avalanche capability | I _{AV} | L=2.77mH T _{ch} =25°C | 12 | | | A |
| Diode forward on-voltage | V _{SD} | I _F =12A V _{GS} =0V T _{ch} =25°C | | 1.00 | 1.50 | V |
| Reverse recovery time | t _{rr} | I _F =12A V _{GS} =0V | | 0.7 | | μs |
| Reverse recovery charge | Q _{rr} | -di/dt=100A/μs T _{ch} =25°C | | 4.5 | | μC |

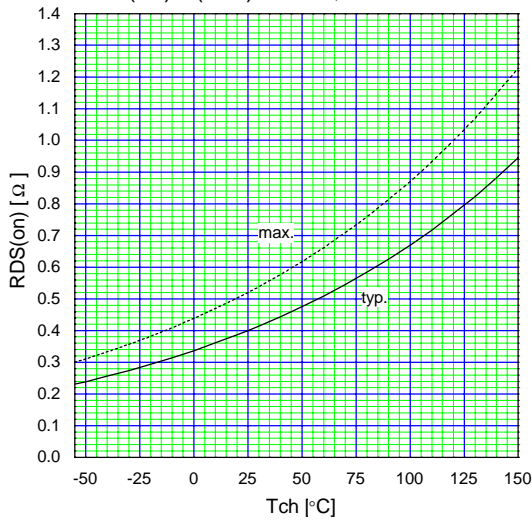
● Thermal characteristics

| Item | Symbol | Test Conditions | Min. | Typ. | Max. | Units |
|--------------------|-----------------------|--------------------|------|------|------|-------|
| Thermal resistance | R _{th(ch-c)} | channel to case | | | 1.32 | °C/W |
| | R _{th(ch-a)} | channel to ambient | | | 75.0 | °C/W |

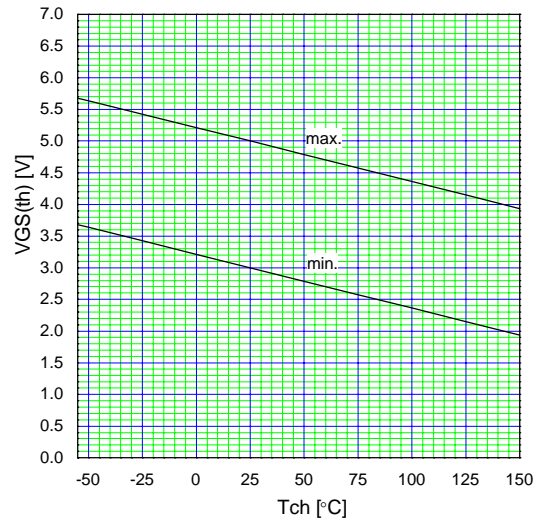
■ Characteristics



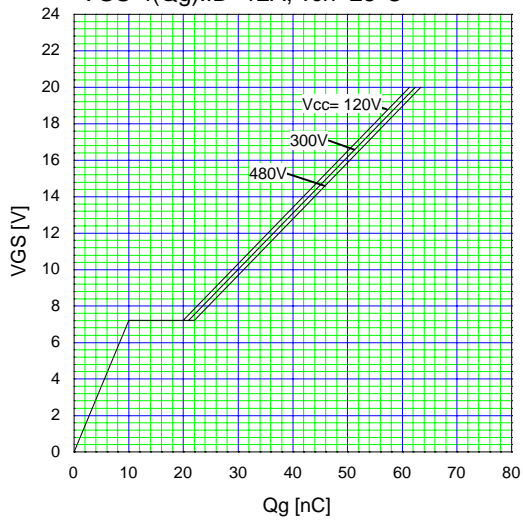
Drain-Source On-state Resistance
 $R_{DS(on)}=f(T_{ch}):I_D=6A, V_{GS}=10V$



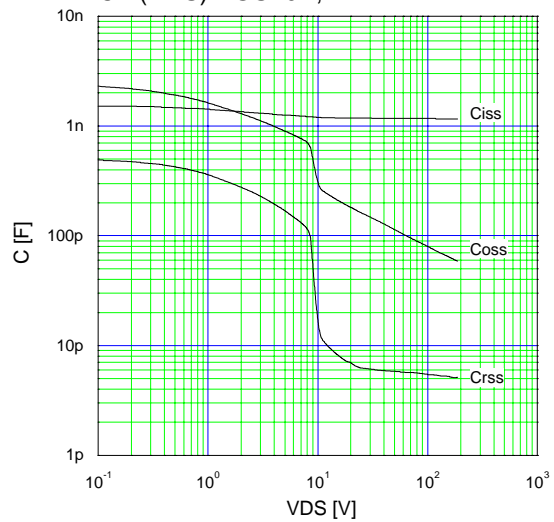
Gate Threshold Voltage vs. Tch
 $V_{GS(th)}=f(T_{ch}):V_{DS}=V_{GS}, I_D=250\mu A$



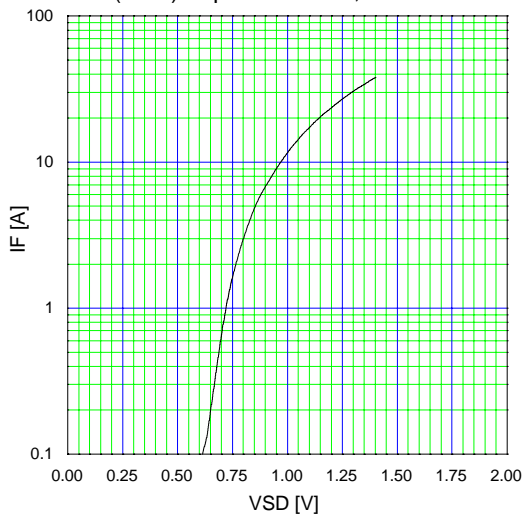
Typical Gate Charge Characteristics
 $V_{GS}=f(Q_g):I_D=12A, T_{ch}=25^\circ C$



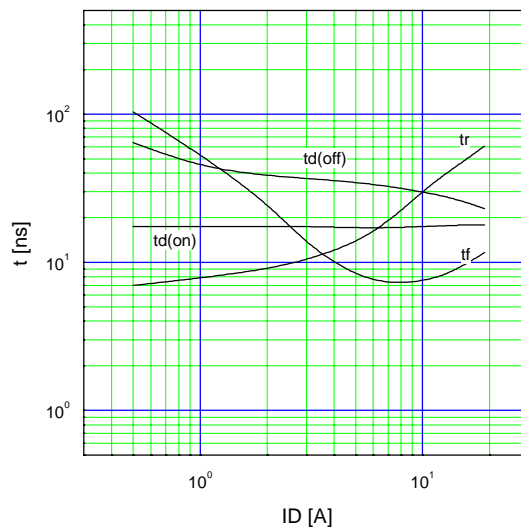
Typical Capacitance
 $C=f(V_{DS}):V_{GS}=0V, f=1MHz$

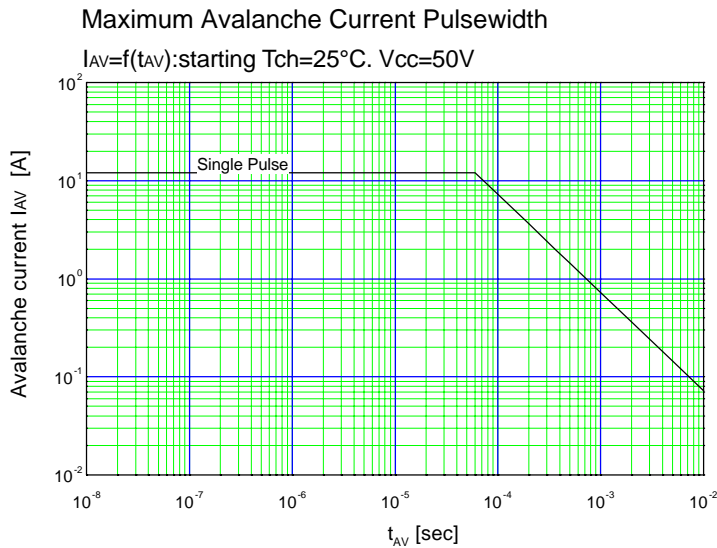
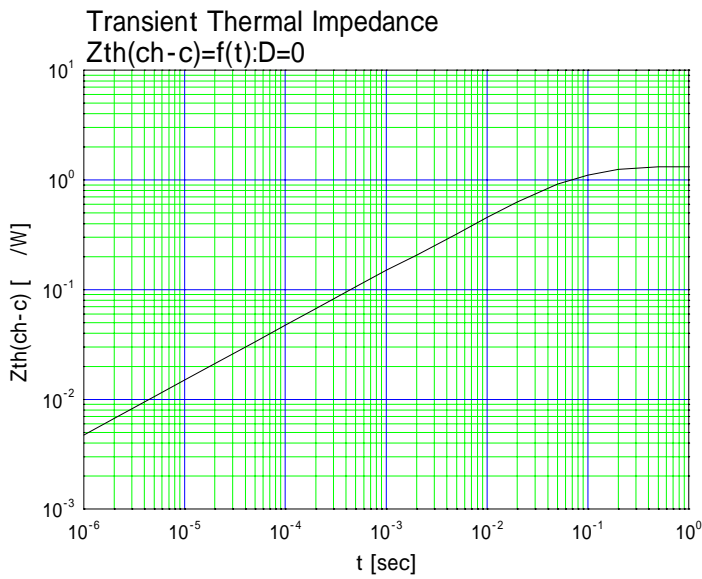


Typical Forward Characteristics of Reverse Diode
 $I_F=f(V_{SD}):80\mu s \text{ Pulse test}, T_{ch}=25^\circ C$

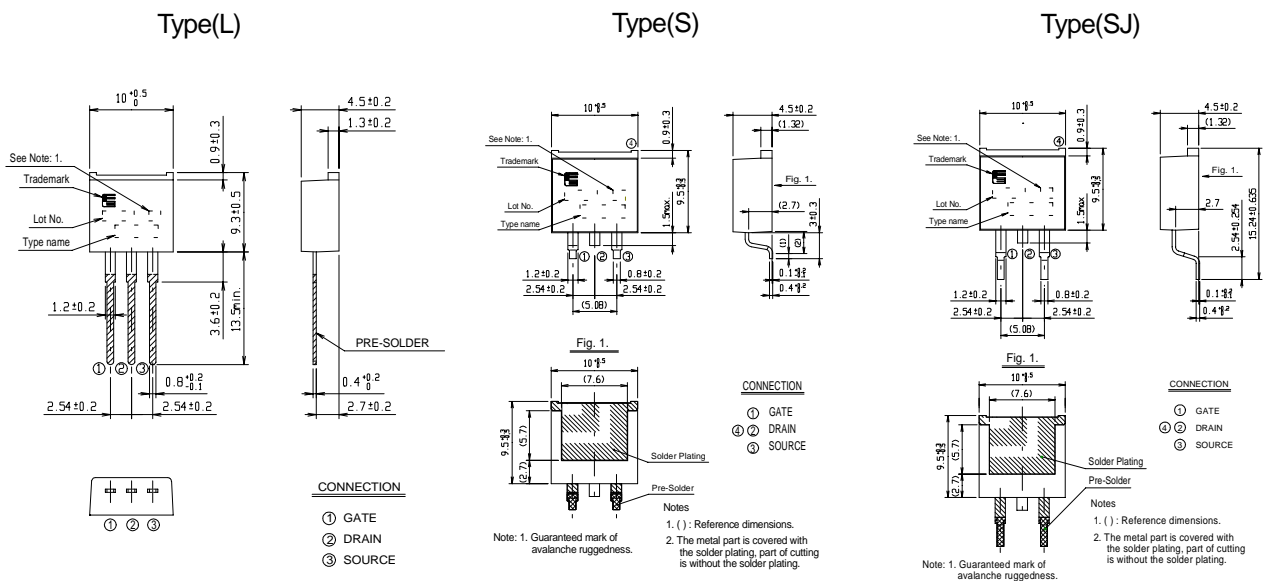


Typical Switching Characteristics vs. ID
 $t=f(I_D):V_{cc}=300V, V_{GS}=10V, R_G=10\Omega$





■ Outline Drawings (mm)



Note: 1. Guaranteed mark of avalanche ruggedness.

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