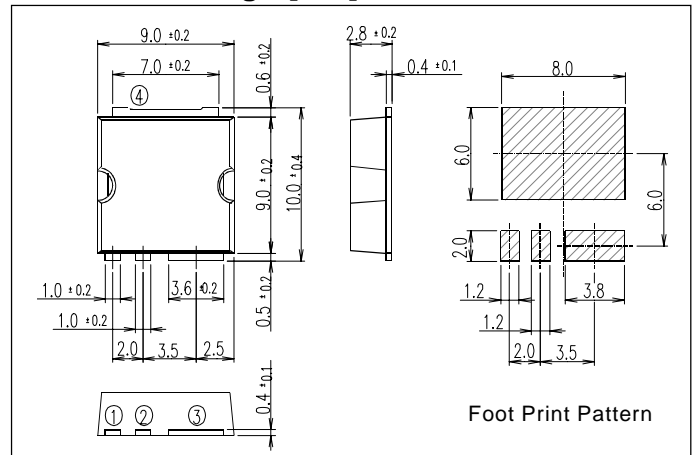


Super FAP-G Series

N-CHANNEL SILICON POWER MOSFET

■ Outline Drawings [mm]



■ Features

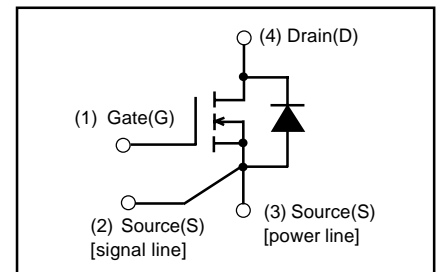
- High speed switching
- Low on-resistance
- No secondary breakdown
- Low driving power
- Avalanche-proof

■ Applications for Switching

■ Absolute Maximum Ratings at $T_c=25^\circ\text{C}$ (unless otherwise specified)

| Item | Symbol | Ratings | Unit | Remarks |
|---|--------------------|--------------|-------------------|---------------------------|
| Drain-source voltage | V_{DS} | 250 | V | |
| | V_{DSX} | 220 | V | $V_{GS}=30\text{V}$ |
| Continuous drain current | I_D | ± 37 | A | |
| | | ± 3.4 *4 | A | $T_a=25^\circ\text{C}$ |
| Pulsed drain current | $I_D(\text{puls})$ | ± 148 | A | |
| Gate-source voltage | V_{GS} | ± 30 | V | |
| Repetitive or non-repetitive | I_{AR} *2 | 37 | A | |
| Maximum Avalanche Energy | E_{AS} *1 | 251.9 | mJ | |
| Maximum Drain-Source dV/dt | dV_{DS}/dt | 20 | kV/ μs | $V_{DS} \leq 250\text{V}$ |
| Peak Diode Recovery dV/dt | dV/dt *3 | 5 | kV/ μs | |
| Max. power dissipation | P_D | 2.4 *4 | W | $T_a=25^\circ\text{C}$ |
| | | 270 | W | |
| Operating and storage temperature range | T_{ch} | +150 | $^\circ\text{C}$ | |
| | T_{stg} | -55 to +150 | $^\circ\text{C}$ | |

■ Equivalent circuit schematic



*1 $L=0.309\text{mH}$, $V_{CC}=48\text{V}$, See to Avalanche Energy Graph *2 $T_{ch} \leq 150^\circ\text{C}$ *3 $I_F \leq -I_D$, $-di/dt=50\text{A}/\mu\text{s}$, $V_{CC} \leq BV_{DS}$, $T_{ch} \leq 150^\circ\text{C}$

*4 Surface mounted on 1000mm^2 , $t=1.6\text{mm}$ FR-4 PCB(Drain pad area: 500mm^2)

● Electrical characteristics at $T_c=25^\circ\text{C}$ (unless otherwise specified)

| Item | Symbol | Test Conditions | Min. | Typ. | Max. | Units |
|----------------------------------|---------------|--|------|------|------|------------------|
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $I_D=250\mu\text{A}$ $V_{GS}=0\text{V}$ | 250 | | | V |
| Gate threshold voltage | $V_{GS(th)}$ | $I_D=250\mu\text{A}$ $V_{DS}=V_{GS}$ | 3.0 | | 5.0 | V |
| Zero gate voltage drain current | I_{DSS} | $V_{DS}=250\text{V}$ $V_{GS}=0\text{V}$ $T_{ch}=25^\circ\text{C}$ | | | 25 | μA |
| | | $V_{DS}=200\text{V}$ $V_{GS}=0\text{V}$ $T_{ch}=125^\circ\text{C}$ | | | 250 | |
| Gate-source leakage current | I_{GSS} | $V_{GS}=\pm 30\text{V}$ $V_{DS}=0\text{V}$ | | 10 | 100 | nA |
| Drain-source on-state resistance | $R_{DS(on)}$ | $I_D=12.5\text{A}$ $V_{GS}=10\text{V}$ | | 75 | 100 | $\text{m}\Omega$ |
| Forward transconductance | g_{fs} | $I_D=12.5\text{A}$ $V_{DS}=25\text{V}$ | 8 | 16 | | S |
| Input capacitance | C_{iss} | $V_{DS}=75\text{V}$ | | 2000 | 3000 | pF |
| Output capacitance | C_{oss} | $V_{GS}=0\text{V}$ | | 220 | 330 | |
| Reverse transfer capacitance | C_{rss} | $f=1\text{MHz}$ | | 15 | 30 | |
| Turn-on time t_{on} | $t_{d(on)}$ | $V_{CC}=72\text{V}$ $I_D=12.5\text{A}$ | | 20 | 30 | ns |
| | t_r | $V_{GS}=10\text{V}$ | | 30 | 45 | |
| Turn-off time t_{off} | $t_{d(off)}$ | $R_{GS}=10\Omega$ | | 60 | 90 | |
| | t_f | | | 20 | 30 | |
| Total Gate Charge | Q_G | $V_{CC}=72\text{V}$ | | 44 | 66 | nC |
| Gate-Source Charge | Q_{GS} | $I_D=25\text{A}$ | | 14 | 21 | |
| Gate-Drain Charge | Q_{GD} | $V_{GS}=10\text{V}$ | | 16 | 24 | |
| Avalanche capability | I_{AV} | $L=309\mu\text{H}$ $T_{ch}=25^\circ\text{C}$ | 37 | | | A |
| Diode forward on-voltage | V_{SD} | $I_F=25\text{A}$ $V_{GS}=0\text{V}$ $T_{ch}=25^\circ\text{C}$ | | 1.10 | 1.65 | V |
| Reverse recovery time | t_{rr} | $I_F=25\text{A}$ $V_{GS}=0\text{V}$ | | 0.45 | | μs |
| Reverse recovery charge | Q_{rr} | $-di/dt=100\text{A}/\mu\text{s}$ $T_{ch}=25^\circ\text{C}$ | | 1.5 | | μC |

● Thermal characteristics

| Item | Symbol | Test Conditions | Min. | Typ. | Max. | Units |
|--------------------|-------------------|--------------------|------|------|-------|---------------------------|
| Thermal resistance | $R_{th(ch-c)}$ | channel to case | | | 0.463 | $^\circ\text{C}/\text{W}$ |
| | $R_{th(ch-a)}$ | channel to ambient | | | 87.0 | $^\circ\text{C}/\text{W}$ |
| | $R_{th(ch-a)}$ *4 | channel to ambient | | | 52.0 | $^\circ\text{C}/\text{W}$ |

■ Characteristics

