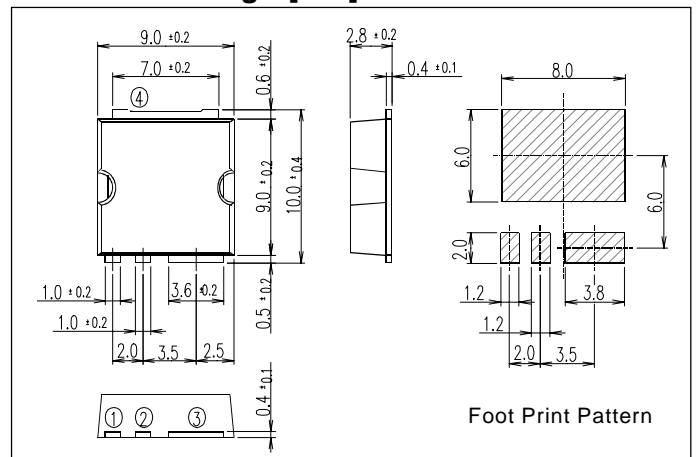


Super FAP-G Series

N-CHANNEL SILICON POWER MOSFET

■ Outline Drawings [mm]



■ Features

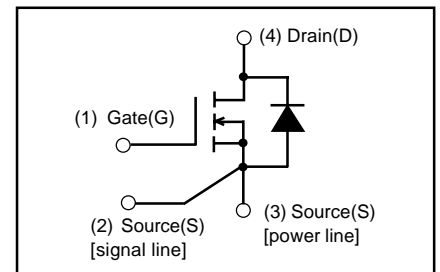
- High speed switching
- Low on-resistance
- No secondary breakdown
- Low driving power
- Avalanche-proof

■ Applications for Switching

■ Absolute Maximum Ratings at Tc=25°C (unless otherwise specified)

| Item | Symbol | Ratings | Unit | Remarks |
|---|----------------------|-------------|-------|-----------------------|
| Drain-source voltage | V _{DS} | 150 | V | |
| | V _{DSX} | 120 | V | V _{GS} =30V |
| Continuous drain current | I _D | ±33 | A | |
| | | ±4.1 *4 | A | T _a =25°C |
| Pulsed drain current | I _{D(puls)} | ±132 | A | |
| Gate-source voltage | V _{GS} | ±30 | V | |
| Repetitive or non-repetitive | I _{AR} *2 | 33 | A | |
| Maximum Avalanche Energy | E _{AS} *1 | 169 | mJ | |
| Maximum Drain-Source dV/dt | dV _{DS} /dt | 20 | kV/μs | V _{DS} ≤150V |
| Peak Diode Recovery dV/dt | dV/dt *3 | 5 | kV/μs | |
| Max. power dissipation | P _D | 2.4 *4 | W | T _a =25°C |
| | | 150 | W | |
| Operating and storage temperature range | T _{ch} | +150 | °C | |
| | T _{stg} | -55 to +150 | °C | |

■ Equivalent circuit schematic



*1 L=0.228mH, V_{CC}=48V, 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 Surface mounted on 1000mm², t=1.6mm FR-4 PCB(Drain pad area:500mm²)

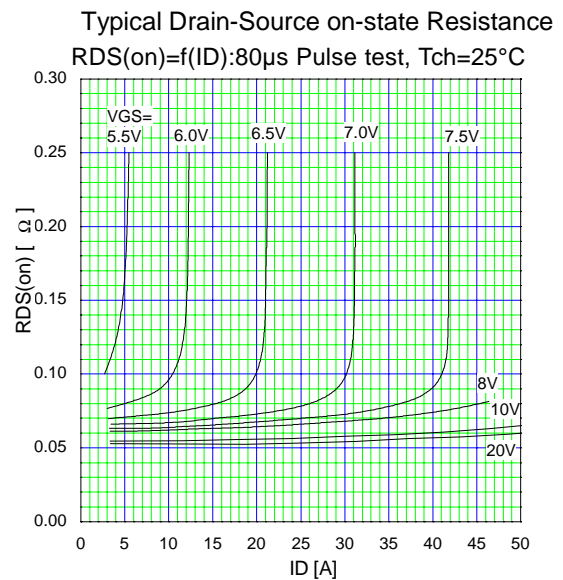
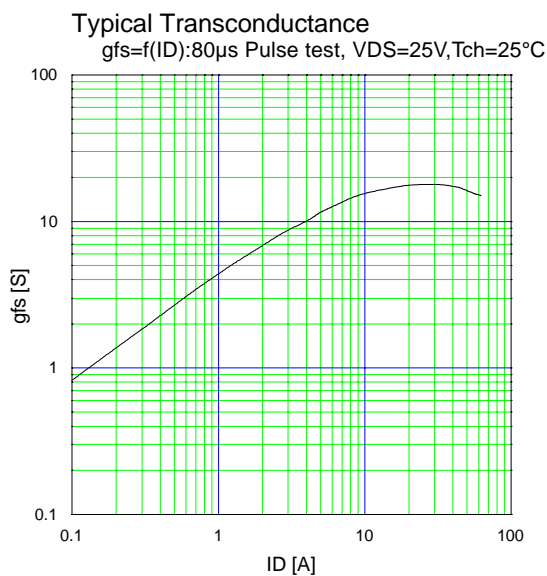
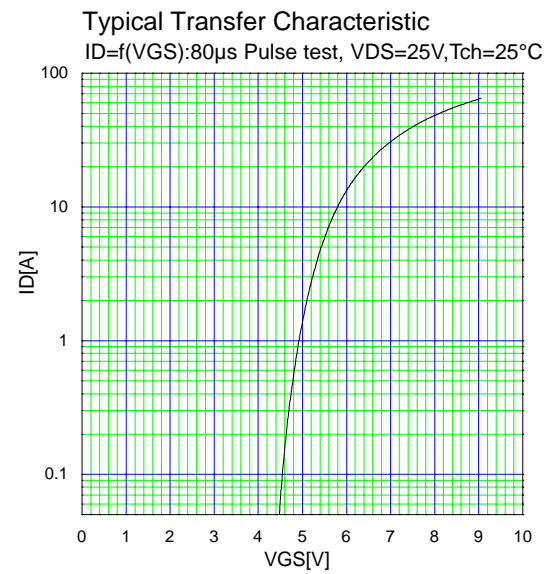
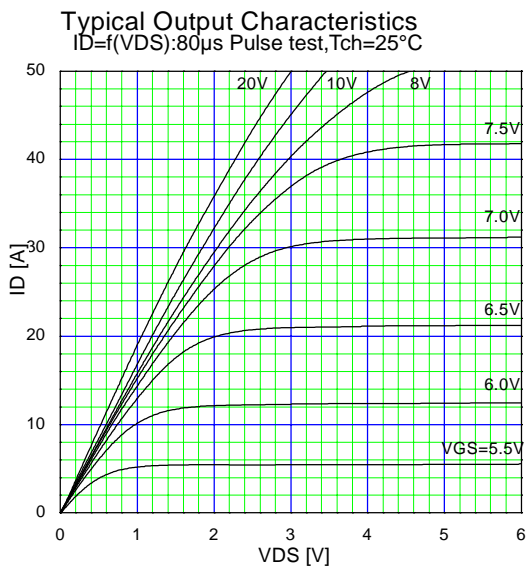
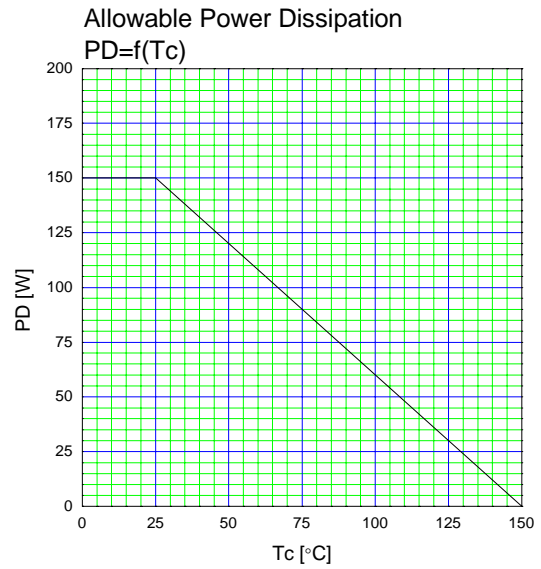
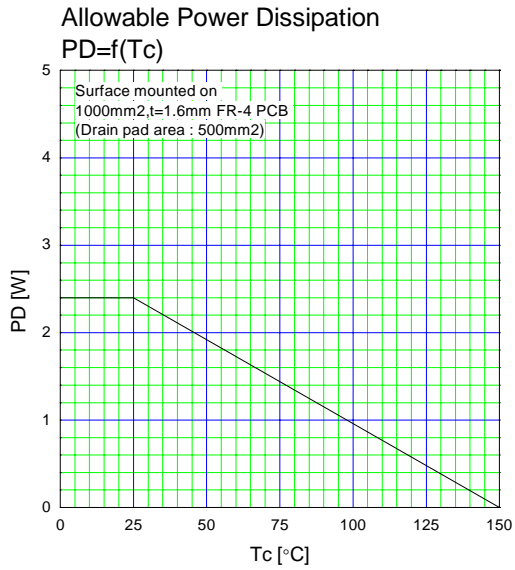
● Electrical characteristics at Tc =25°C (unless otherwise specified)

| Item | Symbol | Test Conditions | Min. | Typ. | Max. | Units |
|----------------------------------|----------------------|---|------|------|------|-------|
| Drain-source breakdown voltage | V _{(BR)DSS} | I _D =250μA V _{GS} =0V | 150 | | | 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} =150V V _{GS} =0V | | | 25 | μA |
| | | V _{DS} =120V 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 =11.5A V _{GS} =10V | | 54 | 70 | mΩ |
| Forward transconductance | g _{fs} | I _D =11.5A V _{DS} =25V | 8 | 16 | | S |
| Input capacitance | C _{iss} | V _{DS} =75V | | 1500 | 1730 | pF |
| Output capacitance | C _{oss} | V _{GS} =0V | | 200 | 300 | |
| Reverse transfer capacitance | C _{rss} | f=1MHz | | 17 | 26 | |
| Turn-on time t _{on} | t _{d(on)} | V _{CC} =48V I _D =11.5A | | 13 | 20 | ns |
| | t _r | V _{GS} =10V | | 15 | 23 | |
| Turn-off time t _{off} | t _{d(off)} | R _{GS} =10Ω | | 34 | 51 | |
| | t _f | | | 15 | 23 | |
| Total Gate Charge | Q _G | V _{CC} =48V | | 34 | 51 | nC |
| Gate-Source Charge | Q _{GS} | I _D =23A | | 9 | 13.5 | |
| Gate-Drain Charge | Q _{GD} | V _{GS} =10V | | 12.5 | 19 | |
| Avalanche capability | I _{AV} | L=228μH T _{ch} =25°C | 33 | | | A |
| Diode forward on-voltage | V _{SD} | I _F =23A V _{GS} =0V T _{ch} =25°C | | 1.10 | 1.60 | V |
| Reverse recovery time | t _{rr} | I _F =23A V _{GS} =0V | | 0.13 | | μs |
| Reverse recovery charge | Q _{rr} | -di/dt=100A/μs T _{ch} =25°C | | 0.6 | | μC |

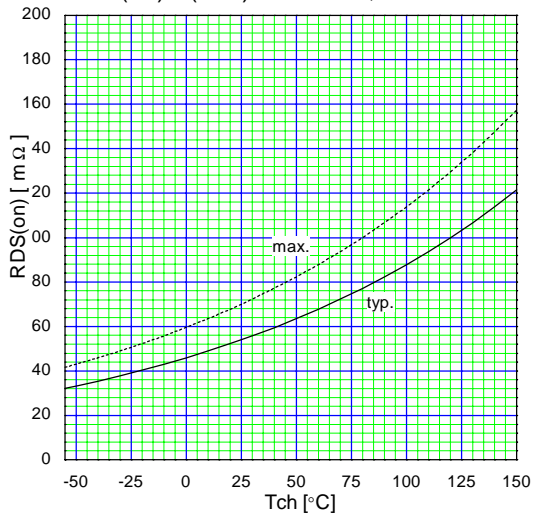
● Thermal characteristics

| Item | Symbol | Test Conditions | Min. | Typ. | Max. | Units |
|--------------------|--------------------------|--------------------|------|------|-------|-------|
| Thermal resistance | R _{th(ch-c)} | channel to case | | | 0.833 | °C/W |
| | R _{th(ch-a)} | channel to ambient | | | 87.0 | °C/W |
| | R _{th(ch-a)} *4 | channel to ambient | | | 52.0 | °C/W |

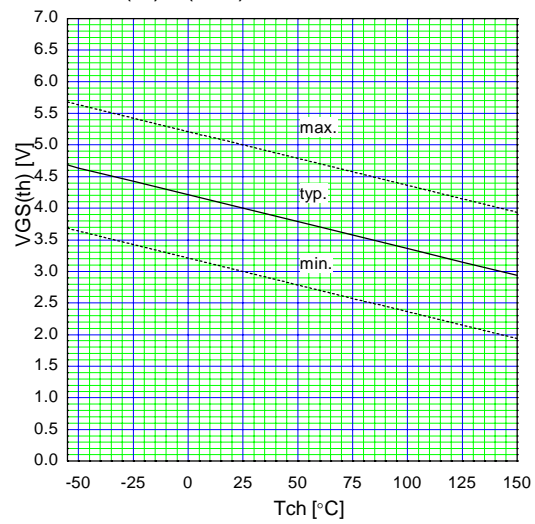
Characteristics



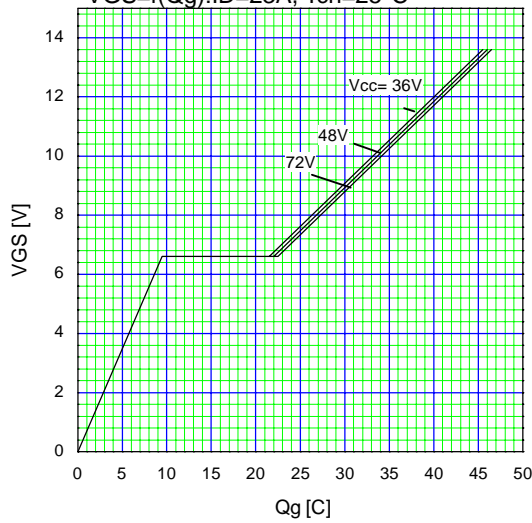
Drain-Source On-state Resistance
 $R_{DS(on)}=f(T_{ch}):I_D=11.5A, V_{GS}=10V$



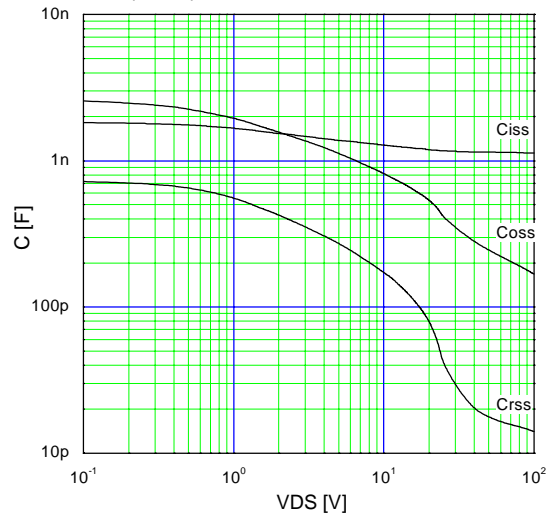
Gate Threshold Voltage vs. Tch
 $V_{GS(th)}=f(T_{ch}):V_{DS}=V_{GS}, I_D=1mA$



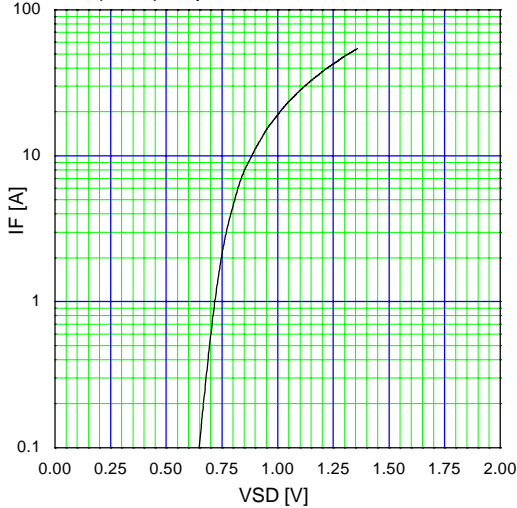
Typical Gate Charge Characteristics
 $V_{GS}=f(Q_g):I_D=23A, T_{ch}=25°C$



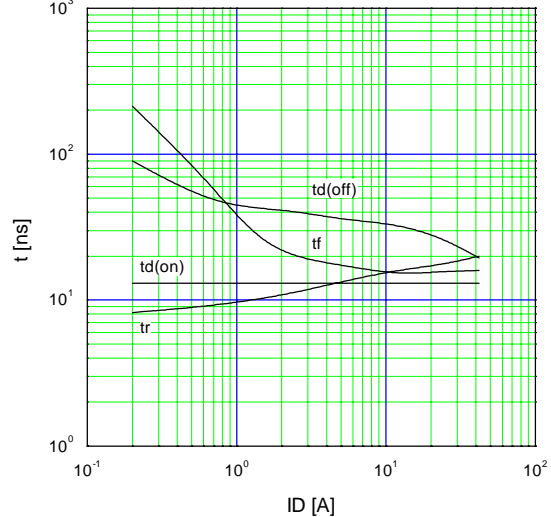
Typical Capacitance
 $C=f(V_{DS}):V_{GS}=0V, f=1MHz$



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

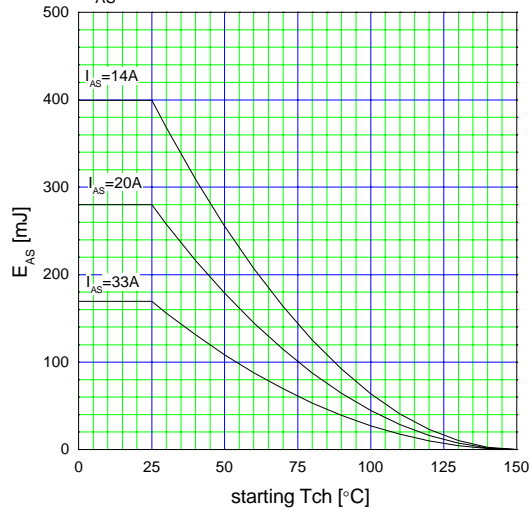


Typical Switching Characteristics vs. ID
 $t=f(I_D):V_{cc}=48V, V_{GS}=10V, R_G=10\Omega$



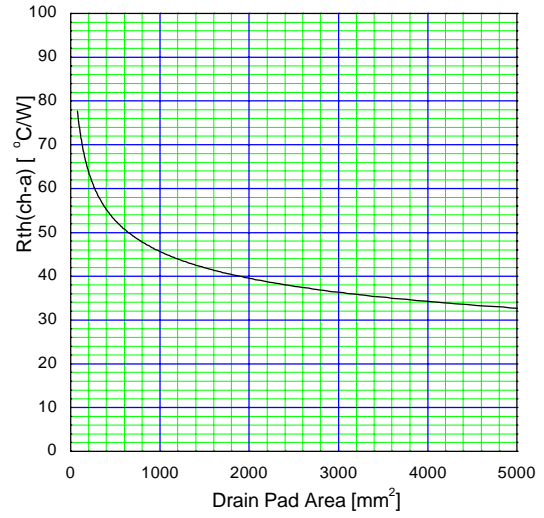
Maximum Avalanche Energy vs. starting Tch

$E_{AS}=f(\text{starting Tch}):V_{CC}=48V$



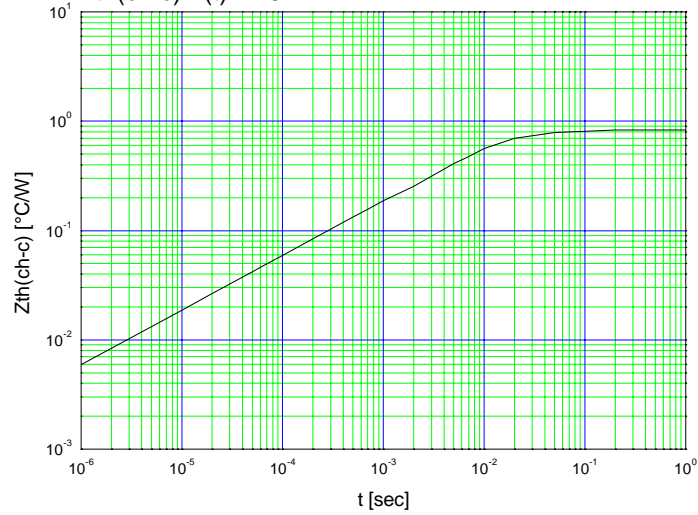
Thermal Resistance vs. Drain Pad area

$R_{th}(ch-a)=f(\text{Drain Pad area})$



Maximum Transient Thermal Impedance

$Z_{th}(ch-c)=f(t):D=0$



Maximum Avalanche Current Pulsewidth

$I_{AV}=f(t_{AV}): \text{starting Tch}=25^{\circ}C, V_{CC}=48V$

