

Super FAP-G Series

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

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

| Item | Symbol | Ratings | Unit | |
|---|-----------------|------------------------|-------------------|---|
| Drain-source voltage | V_{DS} | 500 | V | |
| | $V_{DSX} *5$ | 500 | V | |
| Continuous drain current | I_D | ± 25 | A | |
| Pulsed drain current | $I_{D(puls)}$ | ± 100 | A | |
| Gate-source voltage | V_{GS} | ± 30 | V | |
| Repetitive or non-repetitive | $I_{AR} *2$ | 25 | A | |
| Maximum Avalanche Energy | $E_{AS} *1$ | 336.5 | 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 | $T_a=25^\circ\text{C}$ | 2.50 | W |
| | | $T_c=25^\circ\text{C}$ | 335 | |
| Operating and storage temperature range | T_{ch} | +150 | $^\circ\text{C}$ | |
| | T_{stg} | -55 to +150 | $^\circ\text{C}$ | |

*1 $L=987\mu\text{H}$, $V_{CC}=50\text{V}$, See to Avalanche Energy Graph *2 $T_{ch} \leq 150^\circ\text{C}$

*3 $I_F \leq -I_D$, $-di/dt=50\text{A}/\mu\text{s}$, $V_{CC} \leq BV_{DSS}$, $T_{ch} \leq 150^\circ\text{C}$ *4 $V_{DS} \leq 500\text{V}$ *5 $V_{GS} = -30\text{V}$

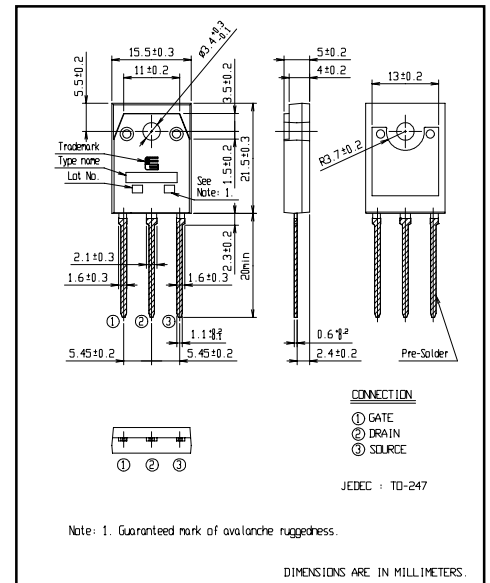
Electrical characteristics ($T_c = 25^\circ\text{C}$ unless otherwise specified)

| Item | Symbol | Test Conditions | Min. | Typ. | Max. | Units |
|----------------------------------|---------------|---|------|------|------|---------------|
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $I_D = 250\mu\text{A}$ $V_{GS} = 0\text{V}$ | 500 | | | 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} | $V_{DS} = 500\text{V}$ $V_{GS} = 0\text{V}$ | | | 25 | μA |
| | | $V_{DS} = 400\text{V}$ $V_{GS} = 0\text{V}$ | | | 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 | $R_{DS(on)}$ | $I_D = 10.5\text{A}$ $V_{GS} = 10\text{V}$ | | 0.20 | 0.26 | Ω |
| Forward transconductance | g_{fs} | $I_D = 10.5\text{A}$ $V_{DS} = 25\text{V}$ | 11 | 22 | | S |
| Input capacitance | C_{iss} | $V_{DS} = 25\text{V}$ | | 2280 | 3420 | pF |
| Output capacitance | C_{oss} | $V_{GS} = 0\text{V}$ | | 320 | 480 | |
| Reverse transfer capacitance | C_{rss} | $f = 1\text{MHz}$ | | 16 | 24 | |
| Turn-on time t_{on} | $t_{d(on)}$ | $V_{CC} = 300\text{V}$ $I_D = 10.5\text{A}$ | | 27 | 41 | ns |
| | t_r | $V_{GS} = 10\text{V}$ | | 37 | 56 | |
| Turn-off time t_{off} | $t_{d(off)}$ | $R_{GS} = 10\Omega$ | | 75 | 113 | ns |
| | t_f | | | 11 | 17 | |
| Total Gate Charge | Q_G | $V_{CC} = 300\text{V}$ | | 54 | 81 | nC |
| Gate-Source Charge | Q_{GS} | $I_D = 21\text{A}$ | | 16 | 24 | |
| Gate-Drain Charge | Q_{GD} | $V_{GS} = 10\text{V}$ | | 20 | 30 | |
| Avalanche capability | I_{AV} | $L = 987\mu\text{H}$ $T_{ch} = 25^\circ\text{C}$ | 25 | | | A |
| Diode forward on-voltage | V_{SD} | $I_F = 21\text{A}$ $V_{GS} = 0\text{V}$ $T_{ch} = 25^\circ\text{C}$ | | 0.98 | 1.50 | V |
| Reverse recovery time | t_{rr} | $I_F = 21\text{A}$ $V_{GS} = 0\text{V}$ | | 0.7 | | μs |
| Reverse recovery charge | Q_{rr} | $-di/dt = 100\text{A}/\mu\text{s}$ $T_{ch} = 25^\circ\text{C}$ | | 10.0 | | μC |

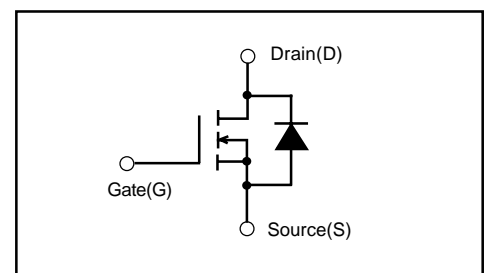
Thermal characteristics

| Item | Symbol | Test Conditions | Min. | Typ. | Max. | Units |
|--------------------|----------------|--------------------|------|------|-------|---------------------------|
| Thermal resistance | $R_{th(ch-c)}$ | channel to case | | | 0.373 | $^\circ\text{C}/\text{W}$ |
| | $R_{th(ch-a)}$ | channel to ambient | | | 50.0 | $^\circ\text{C}/\text{W}$ |

Outline Drawings [mm]



Equivalent circuit schematic



■ Characteristics

