

2SK3753-01R

N-CHANNEL SILICON POWER MOSFET

Outline Drawings (mm) 200406

FUJI POWER MOSFET Super FAP-G Series

Features

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

Applications

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

Maximum ratings and characteristic

Absolute maximum ratings (Tc=25°C unless otherwise specified)

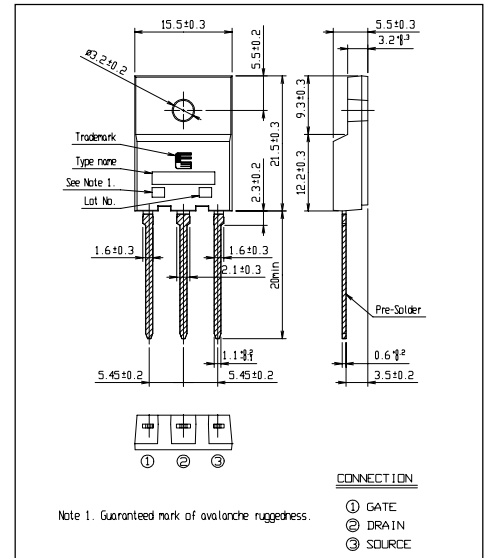
| Item | Symbol | Ratings | Unit | Remarks |
|-----------------------------------------|----------------------|-------------|-------|------------------------|
| Drain-source voltage | V _{DS} | 600 | V | |
| Continuous Drain Current | I _D | ±13 | A | |
| Pulsed Drain Current | I _{D(puls)} | ±52 | A | |
| Gate-Source Voltage | V _{GS} | ±30 | V | |
| Maximum Avalanche current | I _{AR} | 13 | A | Note *1 |
| Non-Repetitive Maximum Avalanche Energy | E _{AS} | 216.7 | mJ | Note *2 |
| Maximum Drain-Source dV/dt | dV _{DS} /dt | 20 | kV/μs | V _{DS} ≤ 600V |
| Peak Diode Recovery dV/dt | dV/dt | 5 | kV/μs | Note *4 |
| Max. Power Dissipation | P _D | 95 | W | T _c =25°C |
| | | 3.13 | | T _a =25°C |
| Operating and Storage Temperature range | T _{ch} | +150 | °C | |
| | T _{stg} | -55 to +150 | °C | |
| Isolation Voltage | V _{ISO} | 2 | kVrms | t=60sec. f=60Hz |

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

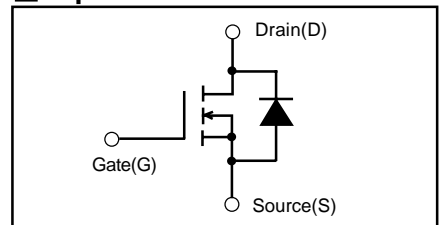
| Item | Symbol | Test Conditions | Min. | Typ. | Max. | Units |
|----------------------------------|---------------------|----------------------------------------------------------------------------------------|------------------------|------|------|-------|
| Drain-Source Breakdown Voltage | BV _{DSS} | I _D = 250μA V _{GS} =0V | 600 | | | 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} =600V V _{GS} =0V V _{DS} =480V V _{GS} =0V | T _{ch} =25°C | | 25 | μA |
| | | | T _{ch} =125°C | | 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 =6A V _{GS} =10V | | 0.50 | 0.65 | Ω |
| Forward Transconductance | g _{fs} | I _D =6A V _{DS} =25V | 5.5 | 11 | | S |
| Input Capacitance | C _{iss} | V _{DS} =25V | | 1600 | 2400 | pF |
| Output Capacitance | C _{oss} | V _{GS} =0V | | 160 | 240 | pF |
| Reverse Transfer Capacitance | C _{rss} | f=1MHz | | 7 | 10.5 | pF |
| Turn-On Time t _{on} | td(on) | V _{CC} =300V | | 18 | 27 | ns |
| | t _r | I _D =6A | | 16 | 24 | |
| Turn-Off Time t _{off} | td(off) | V _{GS} =10V | | 35 | 50 | ns |
| | t _r | R _{GS} =10 Ω | | 8 | 15 | |
| Total Gate Charge | Q _G | V _{CC} =300V | | 34 | 51 | nC |
| Gate-Source Charge | Q _{GS} | I _D =12A | | 12.5 | 19 | |
| Gate-Drain Charge | Q _{GD} | V _{GS} =10V | | 11.5 | 17.5 | |
| Avalanche Capability | I _{AV} | L=2.36mH T _{ch} =25°C | 13 | | | 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 | | 0.75 | | μs |
| Reverse recovery charge | Q _{rr} | -di/dt=100A/μs T _{ch} =25°C | | 6.5 | | 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 | | | 40.0 | °C/W |



Equivalent circuit schematic



Note *1: T_{ch} ≤ 150°C, Repetitive and Non-repetitive

Note *2: Starting T_{ch}=25°C, I_L=2.36mH, V_{CC}=60V

E_{AS} limited by maximum channel temperature and Avalanche current.

See to the 'Avalanche Energy' graph

Note *3: Repetitive rating: Pulse width limited by maximum channel temperature.

See to the 'Transient Thermal impedance' graph.

Note *4: I_F ≤ -I_D, -di/dt = 50A/μs, V_{CC} ≤ BV_{DSS}, T_{ch} ≤ 150°C

Characteristics

