

2SK3685-01 (500V/0.38Ω/19A)

1) Package TO-247

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

| Items | Symbols | Ratings | Units |
|---|-------------------------------------|-------------------|----------|
| Drain-Source Voltage | V _{DS} | 500 | V |
| Continuous Drain Current | I _D | ±19 | A |
| Pulsed Drain Current | I _{D(pulse)} | ±76 | A |
| Gate-Source Voltage | V _{GS} | ±30 | V |
| Repetitive and Non-Repetitive Maximum Avalanche Current | I _{AR} | 19 | A |
| Non-Repetitive Maximum Avalanche Energy | E _{AS} | 245.3 | mJ *1 |
| Maximum Drain-Source dV/dt | dV _{DS} /dt | 20 | kV/us |
| Peak Diode recovery dV/dt | dV/dt | 5 | kV/us *2 |
| Maximum Power Dissipation | P _{D @Tc=25°C} | 235 | W |
| | P _{D @Ta=25°C} | 2.50 | W |
| Operating and Storage Temperature range | T _{ch} T _{stg} | 150 -55 ~ +150 | |

3) Electrical Characteristics (Tch=25°C unless otherwise specified)

| Items | Symbols | Test Conditions | min. | typ. | max. | Units |
|----------------------------------|---------------------|--|------|------|------|-------|
| Drain-Source Breakdown Voltage | BV _{DSS} | I _D =250uA V _{GS} =0V | 500 | --- | --- | V |
| Gate Threshold Voltage | V _{GS(th)} | I _D =250uA V _{DS} =V _{GS} | 3.0 | --- | 5.0 | V |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} =500V T _{ch} =25 | --- | --- | 25 | μA |
| | | V _{GS} =0V T _{ch} =125 | --- | --- | 250 | μA |
| Gate-Source Leakage Current | I _{GSS} | V _{GS} =±30V V _{DS} =0V | --- | --- | 100 | μA |
| Drain-Source On-State Resistance | R _{DS(on)} | I _D =9.5A V _{GS} =10V | --- | --- | 0.38 | Ω |
| Input Capacitance | C _{iss} | V _{DS} =25V | --- | 1580 | 2370 | pF |
| Output Capacitance | C _{oss} | V _{GS} =0V | --- | 240 | 360 | |
| Reverse Transfer Capacitance | C _{rss} | f=1MHz | --- | 12 | 18 | |
| Total Gate Charge | Q _g | V _{CC} =250V | --- | 32 | 48 | nC |
| Gate to Source Charge | Q _{gs} | I _D =19A | --- | 16 | 24 | |
| Gate to Drain (Miller) Charge | Q _{gd} | V _{GS} =10V | --- | 12 | 18 | |
| Avalanche Capability | I _{AV} | L=1.25mH Tch=25 | 19 | --- | --- | A |
| Diode Forward On-Voltage | V _{SD} | I _F =19A, V _{GS} =0V, Tch=25°C | --- | 1.0 | 1.5 | V |

4) Thermal Characteristics

| Items | Symbols | Test Conditions | min. | typ. | max. | Units |
|--------------------|-----------------------|-----------------|------|------|-------|-------|
| Channel to Case | R _{th(ch-c)} | | | | 0.532 | /W |
| Channel to Ambient | R _{th(ch-a)} | | | | 50.0 | /W |

*1 L=1.25mH, V_{CC}=50V*2 I_F ≤ -I_D, -di/dt=50A/μs, V_{CC} ≤ BV_{DSS}, Tch ≤ 150°C

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| DATE | NAME | APPROVED | Fuji Electric Co., Ltd. | |
|-----------------------|-----------|----------|-------------------------|---------------|
| DRAWN Sep. -02- '02 | Y. HARA | | DWG. NO. | MT5F12584 1/1 |
| CHECKED Sep. -02- '02 | T. Yamada | T. HOSEN | | |
| REVISIONS | | | | |