

2SK970

Silicon N-Channel MOS FET

Application

High speed power switching

Features

- Low on-resistance
- High speed switching
- Low drive current
- 4 V gate drive device
  - Can be driven from 5 V source
- Suitable for motor drive, DC-DC converter, power switch and solenoid drive

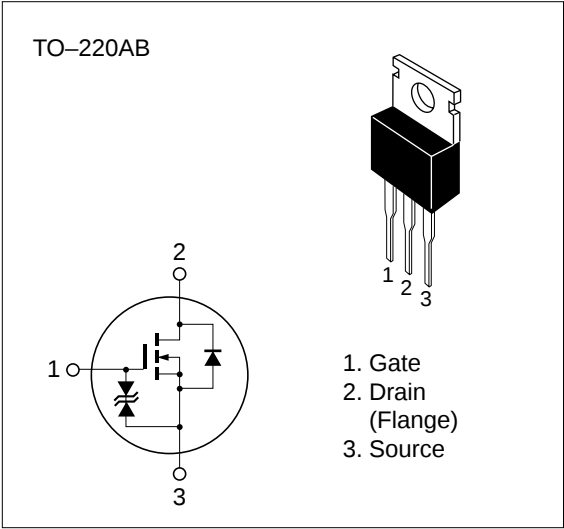


Table 1 Absolute Maximum Ratings (Ta = 25°C)

| Item                                      | Symbol                             | Ratings     | Unit |
|-------------------------------------------|------------------------------------|-------------|------|
| Drain to source voltage                   | V <sub>DSS</sub>                   | 60          | V    |
| Gate to source voltage                    | V <sub>GSS</sub>                   | ±20         | V    |
| Drain current                             | I <sub>D</sub>                     | 10          | A    |
| Drain peak current                        | I <sub>D(pulse)</sub> <sup>*</sup> | 40          | A    |
| Body to drain diode reverse drain current | I <sub>DR</sub>                    | 10          | A    |
| Channel dissipation                       | P <sub>ch</sub> <sup>**</sup>      | 30          | W    |
| Channel temperature                       | T <sub>ch</sub>                    | 150         | °C   |
| Storage temperature                       | T <sub>stg</sub>                   | –55 to +150 | °C   |

\* PW ≤ 10 μs, duty cycle ≤ 1 %

\*\* Value at T<sub>C</sub> = 25 °C

Table 2 Electrical Characteristics (Ta = 25°C)

| Item                                       | Symbol        | Min      | Typ  | Max      | Unit          | Test conditions                                                               |
|--------------------------------------------|---------------|----------|------|----------|---------------|-------------------------------------------------------------------------------|
| Drain to source breakdown voltage          | $V_{(BR)DSS}$ | 60       | —    | —        | V             | $I_D = 10 \text{ mA}$ , $V_{GS} = 0$                                          |
| Gate to source breakdown voltage           | $V_{(BR)GSS}$ | $\pm 20$ | —    | —        | V             | $I_G = \pm 100 \text{ }\mu\text{A}$ , $V_{DS} = 0$                            |
| Gate to source leak current                | $I_{GSS}$     | —        | —    | $\pm 10$ | $\mu\text{A}$ | $V_{GS} = \pm 16 \text{ V}$ , $V_{DS} = 0$                                    |
| Zero gate voltage drain current            | $I_{DSS}$     | —        | —    | 250      | $\mu\text{A}$ | $V_{DS} = 50 \text{ V}$ , $V_{GS} = 0$                                        |
| Gate to source cutoff voltage              | $V_{GS(off)}$ | 1.0      | —    | 2.0      | V             | $I_D = 1 \text{ mA}$ , $V_{DS} = 10 \text{ V}$                                |
| Static drain to source on state resistance | $R_{DS(on)}$  | —        | 0.12 | 0.15     | $\Omega$      | $I_D = 5 \text{ A}$ , $V_{GS} = 10 \text{ V}^*$                               |
|                                            |               |          | 0.17 | 0.22     |               | $I_D = 5 \text{ A}$ , $V_{GS} = 4 \text{ V}^*$                                |
| Forward transfer admittance                | $ y_{fs} $    | 3.5      | 6.0  | —        | S             | $I_D = 5 \text{ A}$ , $V_{DS} = 10 \text{ V}^*$                               |
| Input capacitance                          | $C_{iss}$     | —        | 400  | —        | pF            | $V_{DS} = 10 \text{ V}$ , $V_{GS} = 0$ ,<br>$f = 1 \text{ MHz}$               |
| Output capacitance                         | $C_{oss}$     | —        | 220  | —        | pF            |                                                                               |
| Reverse transfer capacitance               | $C_{rss}$     | —        | 60   | —        | pF            |                                                                               |
| Turn-on delay time                         | $t_{d(on)}$   | —        | 5    | —        | ns            | $I_D = 5 \text{ A}$ , $V_{GS} = 10 \text{ V}$ ,<br>$R_L = 6 \Omega$           |
| Rise time                                  | $t_r$         | —        | 55   | —        | ns            |                                                                               |
| Turn-off delay time                        | $t_{d(off)}$  | —        | 140  | —        | ns            |                                                                               |
| Fall time                                  | $t_f$         | —        | 90   | —        | ns            |                                                                               |
| Body to drain diode forward voltage        | $V_{DF}$      | —        | 1.2  | —        | V             | $I_F = 10 \text{ A}$ , $V_{GS} = 0$                                           |
| Body to drain diode reverse recovery time  | $t_{rr}$      | —        | 125  | —        | ns            | $I_F = 10 \text{ A}$ , $V_{GS} = 0$ ,<br>$di_F/dt = 50 \text{ A}/\mu\text{s}$ |

\* Pulse Test

