

# 2SK3024 (Tentative)

## Silicon N-Channel Power F-MOS FET

### ■ Features

- Avalanche energy capacity guaranteed
- High-speed switching
- Low ON-resistance
- No secondary breakdown
- Low-voltage drive
- High electrostatic breakdown voltage

### ■ Applications

- Contactless relay
- Diving circuit for a solenoid
- Driving circuit for a motor
- Control equipment
- Switching power supply

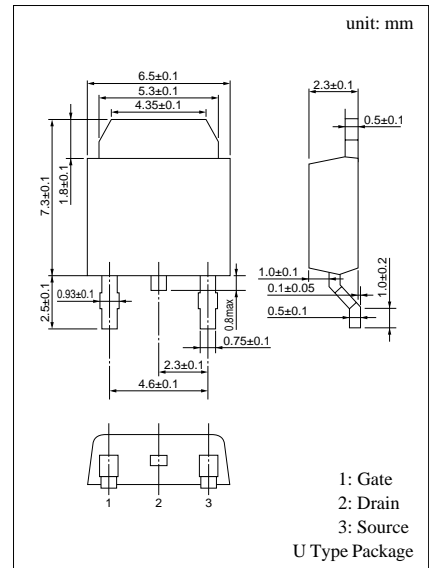
### ■ Absolute Maximum Ratings ( $T_C = 25^\circ\text{C}$ )

| Parameter                         | Symbol                   | Rated       | Unit             |
|-----------------------------------|--------------------------|-------------|------------------|
| Drain to Source breakdown voltage | $V_{DSS}$                | 60          | V                |
| Gate to Source voltage            | $V_{GSS}$                | $\pm 20$    | V                |
| Drain current                     | DC                       | $I_D$       | $\pm 20$ A       |
|                                   | Pulse                    | $I_{DP}$    | $\pm 40$ A       |
| Avalanche energy capacity         | EAS*                     | 20          | mJ               |
| Allowable power dissipation       | $T_C = 25^\circ\text{C}$ | $P_D$       | 20 W             |
|                                   | $T_a = 25^\circ\text{C}$ |             | 1                |
| Channel temperature               | $T_{ch}$                 | 150         | $^\circ\text{C}$ |
| Storage temperature               | $T_{stg}$                | -55 to +150 | $^\circ\text{C}$ |

\*  $L = 0.1\text{mH}$ ,  $I_L = 20\text{A}$ , 1 pulse

### ■ Electrical Characteristics ( $T_C = 25^\circ\text{C}$ )

| Parameter   | Symbol         | Conditions   | min                                     | typ  | max      | Unit               |    |
|---|----------------|--|---|------|----------|--------------------|----|
| Drain to Source cut-off current                   | $I_{DSS}$      | $V_{DS} = 50\text{V}$ , $V_{GS} = 0$                     |   |      | 10       | $\mu\text{A}$      |    |
| Gate to Source leakage current                    | $I_{GSS}$      | $V_{GS} = \pm 20\text{V}$ , $V_{DS} = 0$                 |   |      | $\pm 10$ | $\mu\text{A}$      |    |
| Drain to Source breakdown voltage                 | $V_{DSS}$      | $I_D = 1\text{mA}$ , $V_{GS} = 0$                        | 60                                      |      |          | V                  |    |
| Gate threshold voltage                            | $V_{th}$       | $V_{DS} = 10\text{V}$ , $I_D = 1\text{mA}$               | 1                                       |      | 2.5      | V                  |    |
| Drain to Source ON-resistance                     | $R_{DS(on)1}$  | $V_{GS} = 10\text{V}$ , $I_D = 10\text{A}$               |   | 33   | 50       | $\text{m}\Omega$   |    |
|   | $R_{DS(on)2}$  | $V_{GS} = 4\text{V}$ , $I_D = 10\text{A}$                |   | 44   | 70       | $\text{m}\Omega$   |    |
| Forward transfer admittance                       | $ Y_{fs} $     | $V_{DS} = 10\text{V}$ , $I_D = 10\text{A}$               | 8                                       | 12   |          | S                  |    |
| Diode forward voltage                             | $V_{DSF}$      | $I_{DR} = 20\text{A}$ , $V_{GS} = 0$                     |   |      | -1.5     | V                  |    |
| Input capacitance (Common Source)                 | $C_{iss}$      | $V_{DS} = 10\text{V}$ , $V_{GS} = 0$ , $f = 1\text{MHz}$ |   | 330  |          | pF                 |    |
| Output capacitance (Common Source)                | $C_{oss}$      |  |   |      | 290      | pF                 |    |
| Reverse transfer capacitance (Common Source)      | $C_{rss}$      |  |   |      | 70       | pF                 |    |
| Turn-on time (delay time)                         | $t_{d(on)}$    | $V_{DD} = 30\text{V}$ , $I_D = 10\text{A}$               |   | 20   |          | ns                 |    |
| Rise time   | $t_r$          |  | $V_{GS} = 10\text{V}$ , $R_L = 3\Omega$ |      | 125      |                    | ns |
| Fall time   | $t_f$          |  |   |      | 520      |                    | ns |
| Turn-off time (delay time)                        | $t_{d(off)}$   |  |   | 1480 |          | ns                 |    |
| Thermal resistance between channel and case       | $R_{th(ch-c)}$ |  |   |      | 6.25     | $^\circ\text{C/W}$ |    |
| Thermal resistance between channel and atmosphere | $R_{th(ch-a)}$ |  |   |      | 125      | $^\circ\text{C/W}$ |    |



### Internal Connection

