

## 2SK1254 (L), 2SK1254 (S)

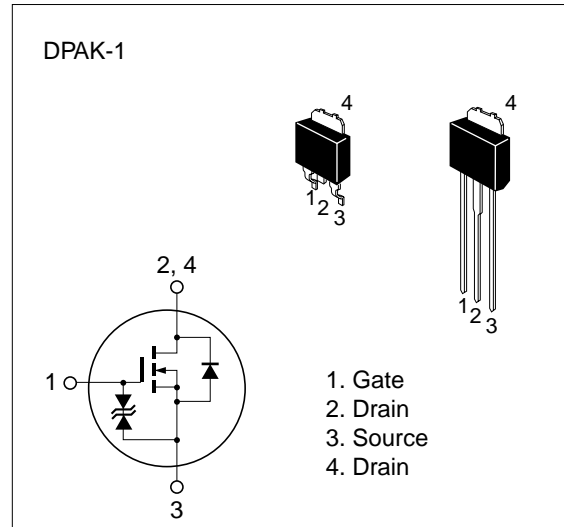
### Silicon N-Channel MOS FET

#### Application

High speed power switching

#### Features

- Low on-resistance
- High speed switching
- 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** ( $T_a = 25^\circ\text{C}$ )

| Item                                      | Symbol                  | Ratings     | Unit             |
|---|-------------------------|-------------|------------------|
| Drain to source voltage                   | $V_{DSS}$               | 120         | V                |
| Gate to source voltage                    | $V_{GSS}$               | $\pm 20$    | V                |
| Drain current                             | $I_D$                   | 3           | A                |
| Drain peak current                        | $I_{D(\text{pulse})}^*$ | 12          | A                |
| Body to drain diode reverse drain current | $I_{DR}$                | 3           | A                |
| Channel dissipation                       | $P_{ch}^{**}$           | 20          | W                |
| Channel temperature                       | $T_{ch}$                | 150         | $^\circ\text{C}$ |
| Storage temperature                       | $T_{stg}$               | -55 to +150 | $^\circ\text{C}$ |

\*  $PW \leq 10 \mu\text{s}$ , duty cycle  $\leq 1\%$

\*\* Value at  $T_C = 25^\circ\text{C}$

**Table 2 Electrical Characteristics** (Ta = 25°C)

| Item                                       | Symbol        | Min      | Typ  | Max      | Unit          | Test Conditions  |
|--|---------------|----------|------|----------|---------------|--|
| Drain to source breakdown voltage          | $V_{(BR)DSS}$ | 120      | —    | —        | 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            | $I_{DSS}$     | —        | —    | 100      | $\mu\text{A}$ | $V_{DS} = 100 \text{ V}, V_{GS} = 0$                                     |
| 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 | $R_{DS(on)}$  | —        | 0.30 | 0.40     | $\Omega$      | $I_D = 2 \text{ A}, V_{GS} = 10 \text{ V}^*$                             |
|  |               | —        | 0.35 | 0.55     |               | $I_D = 2 \text{ A}, V_{GS} = 4 \text{ V}^*$                              |
| Forward transfer admittance                | $ y_{fs} $    | 2.4      | 4.0  | —        | S             | $I_D = 2 \text{ A}, V_{DS} = 10 \text{ V}^*$                             |
| Input capacitance                          | $C_{iss}$     | —        | 420  | —        | pF            | $V_{DS} = 10 \text{ V}, V_{GS} = 0,$                                     |
| Output capacitance                         | $C_{oss}$     | —        | 190  | —        | pF            | $f = 1 \text{ MHz}$  |
| Reverse transfer capacitance               | $C_{rss}$     | —        | 25   | —        | pF            |  |
| Turn-on delay time                         | $t_{d(on)}$   | —        | 5    | —        | ns            | $I_D = 2 \text{ A}, V_{GS} = 10 \text{ V},$                              |
| Rise time                                  | $t_r$         | —        | 20   | —        | ns            | $R_L = 15 \text{ }\Omega$  |
| Turn-off delay time                        | $t_{d(off)}$  | —        | 150  | —        | ns            |  |
| Fall time                                  | $t_f$         | —        | 45   | —        | ns            |  |
| Body to drain diode forward voltage        | $V_{DF}$      | —        | 0.95 | —        | V             | $I_F = 3 \text{ A}, V_{GS} = 0$  |
| Body to drain diode reverse recovery time  | $t_{rr}$      | —        | 160  | —        | ns            | $I_F = 3 \text{ A}, V_{GS} = 0,$<br>$di_F/dt = 50 \text{ A}/\mu\text{s}$ |

\* Pulse Test

