

# 2SK758

## Silicon N-Channel Power F-MOS

### ■ Features

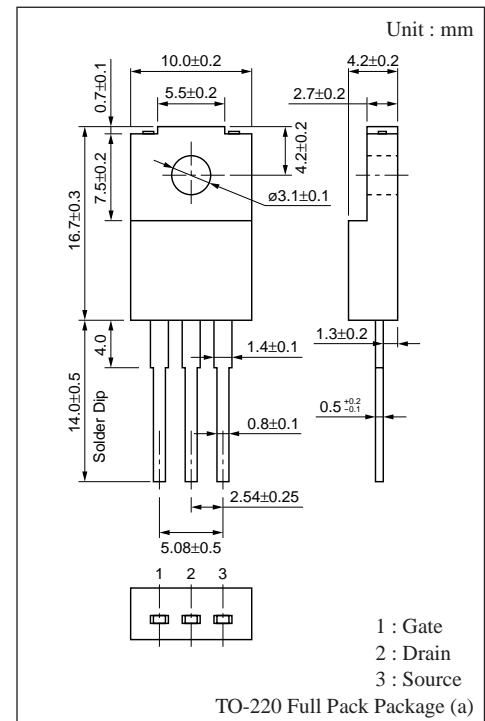
- Low ON-resistance  $R_{DS(on)}$  :  $R_{DS(on)} = 0.45\Omega(\text{typ})$
- High-speed switching :  $t_f = 45\text{ns}(\text{typ})$
- No secondary breakdown

### ■ Applications

- DC-DC converter
- Non-contact relay
- Solenoid drive
- Motor drive

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

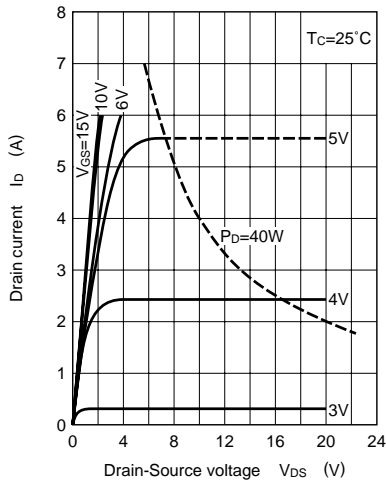
| Parameter                      | Symbol                   | Rating      | Unit             |   |
|--------------------------------|--------------------------|-------------|------------------|---|
| Drain-Source breakdown voltage | $V_{DSS}$                | 250         | V                |   |
| Gate-Source voltage            | $V_{GSS}$                | $\pm 20$    | V                |   |
| Drain current                  | DC                       | $I_D$       | $\pm 5$          | A |
|                                | Pulse                    | $I_{DP}$    | $\pm 10$         | A |
| Allowable power dissipation    | $T_c = 25^\circ\text{C}$ | $P_D$       | 40               | W |
|                                | $T_a = 25^\circ\text{C}$ |             | 2                |   |
| Channel temperature            | $T_{ch}$                 | 150         | $^\circ\text{C}$ |   |
| Storage temperature            | $T_{stg}$                | -55 to +150 | $^\circ\text{C}$ |   |



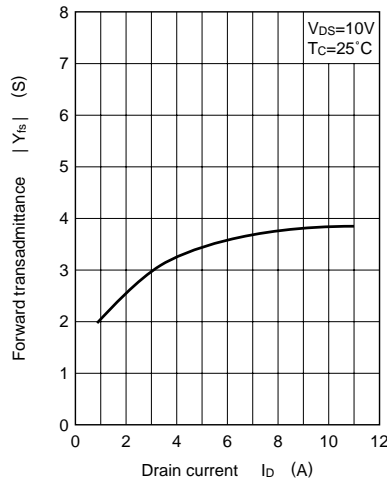
### ■ Electrical Characteristics ( $T_c = 25^\circ\text{C}$ )

| Parameter                      | Symbol            | Condition  | Min | Typ  | Max     | Unit          |
|--------------------------------|-------------------|--|-----|------|---------|---------------|
| Drain-Source cut-off current   | $I_{DSS}$         | $V_{DS} = 200\text{V}, V_{GS} = 0$   |     |      | 0.1     | mA            |
| Gate-Source leakage current    | $I_{GSS}$         | $V_{GS} = \pm 20\text{V}, V_{DS} = 0$  |     |      | $\pm 1$ | $\mu\text{A}$ |
| Drain-Source breakdown voltage | $V_{DSS}$         | $I_D = 1\text{mA}, V_{GS} = 0$   | 250 |      |         | V             |
| Gate threshold voltage         | $V_{th}$          | $V_{DS} = 10\text{V}, I_D = 1\text{mA}$  | 1   |      | 5       | V             |
| Drain-Source ON-resistance     | $R_{DS(on)}$      | $V_{GS} = 10\text{V}, I_D = 3\text{A}$   |     | 0.45 | 0.7     | $\Omega$      |
| Forward transadmittance        | $ Y_{fs} $        | $V_{DS} = 10\text{V}, I_D = 3\text{A}$   | 1.8 | 3    |         | S             |
| Input capacitance              | $C_{iss}$         | $V_{DS} = 10\text{V}, V_{GS} = 0, f = 1\text{MHz}$                               |     | 390  |         | pF            |
| Output capacitance             | $C_{oss}$         |  |     | 160  |         | pF            |
| Feedback capacitance           | $C_{rss}$         |  |     | 80   |         | pF            |
| Turn-on time                   | $t_{on}$          | $V_{GS} = 10\text{V}, I_D = 3\text{A}$<br>$V_{DD} = 100\text{V}, R_L = 33\Omega$ |     | 30   |         | ns            |
| Fall time                      | $t_f$             |  |     | 45   |         | ns            |
| Turn-off time (delay time)     | $t_d(\text{off})$ |  |     | 90   |         | ns            |

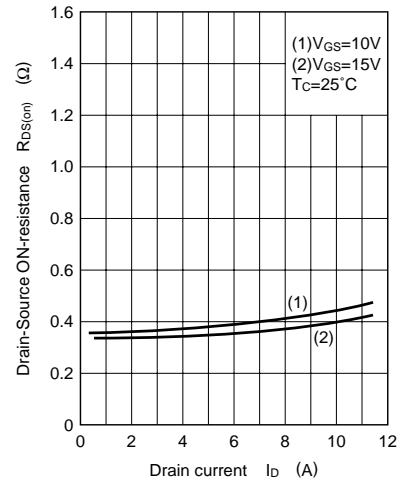
$I_D - V_{DS}$



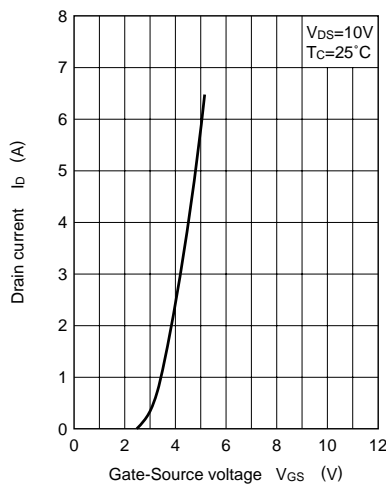
$|Y_{fs}| - I_D$



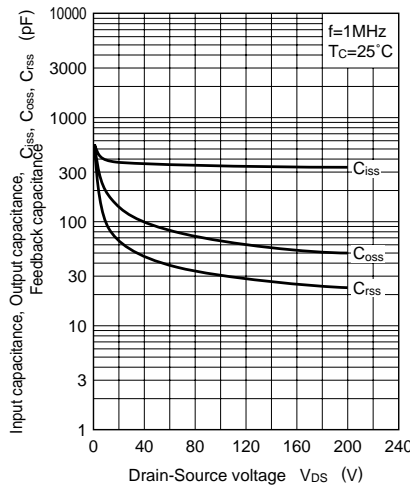
$R_{DS(on)} - I_D$



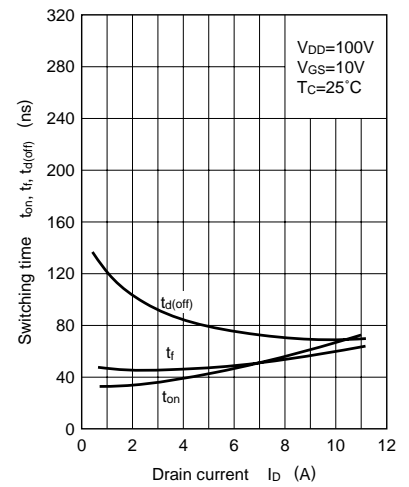
$I_D - V_{GS}$



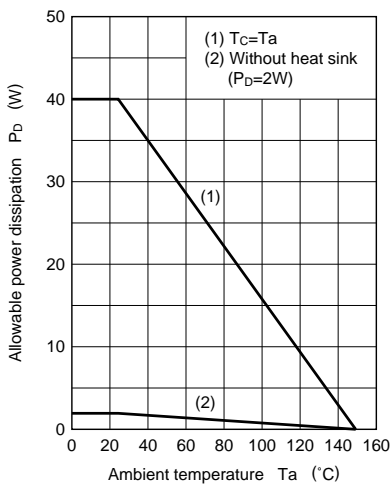
$C_{iss}, C_{oss}, C_{rss} - V_{DS}$



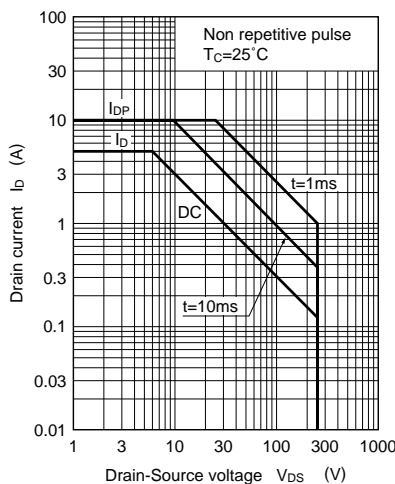
$t_{on}, t_f, t_d(off) - I_D$



$P_D - T_a$



Area of safe operation (ASO)



$R_{DS(on)} - I_D$

