

# 2SK1773

## Silicon N Channel MOS FET

### Application

High speed power switching

### Features

- Low on-resistance
- High speed switching
- Low drive current
- No secondary breakdown
- Suitable for switching regulator, DC-DC converter

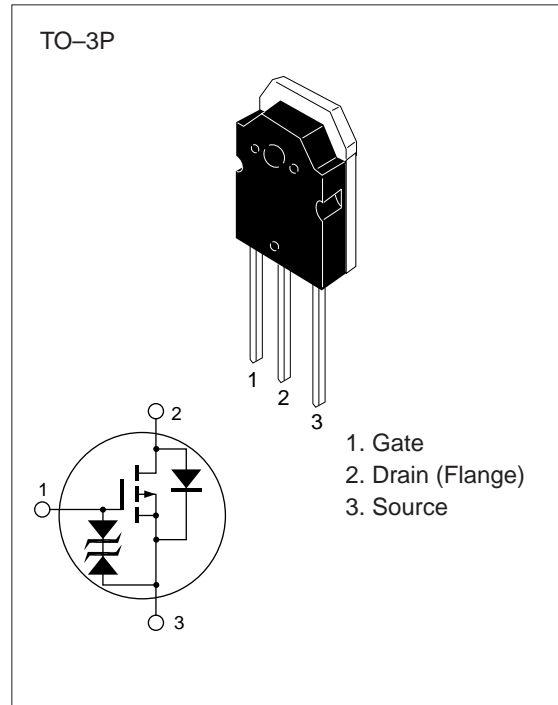


Table 1 Absolute Maximum Ratings (Ta = 25°C)

| Item                                   | Symbol                  | Ratings     | Unit |
|--|-------------------------|-------------|------|
| Drain to source voltage                | V <sub>DSS</sub>        | 1000        | V    |
| Gate to source voltage                 | V <sub>GSS</sub>        | ±30         | V    |
| Drain current                          | I <sub>D</sub>          | 5           | A    |
| Drain peak current                     | I <sub>D(pulse)</sub> * | 15          | A    |
| Body-drain diode reverse drain current | I <sub>DR</sub>         | 5           | A    |
| Channel dissipation                    | P <sub>ch</sub> **      | 100         | 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 %

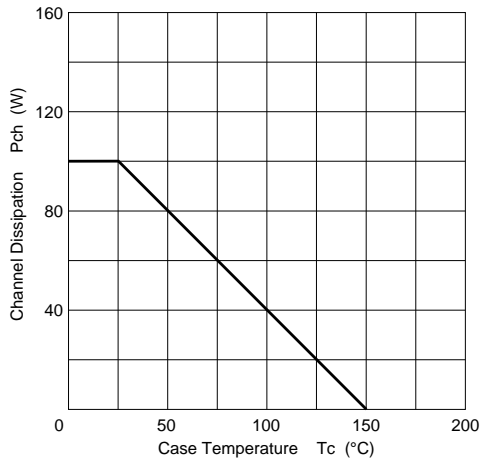
\*\* Value at T<sub>c</sub> = 25 °C

**Table 2 Electrical Characteristics** ( $T_a = 25^\circ\text{C}$ )

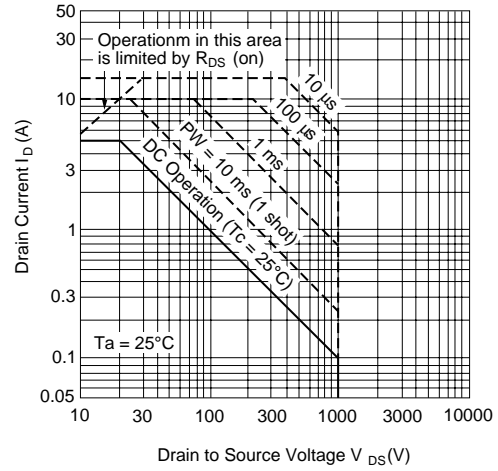
| Item                                       | Symbol        | Min      | Typ  | Max      | Unit          | Test Conditions   |
|--|---------------|----------|------|----------|---------------|---|
| Drain to source breakdown voltage          | $V_{(BR)DSS}$ | 1000     | —    | —        | V             | $I_D = 10 \text{ mA}$ , $V_{GS} = 0$  |
| Gate to source breakdown voltage           | $V_{(BR)GSS}$ | $\pm 30$ | —    | —        | V             | $I_G = \pm 100 \mu\text{A}$ , $V_{DS} = 0$  |
| Gate to source leak current                | $I_{GSS}$     | —        | —    | $\pm 10$ | $\mu\text{A}$ | $V_{GS} = \pm 25 \text{ V}$ , $V_{DS} = 0$  |
| Zero gate voltage drain current            | $I_{DSS}$     | —        | —    | 250      | $\mu\text{A}$ | $V_{DS} = 800 \text{ V}$ , $V_{GS} = 0$   |
| Gate to source cutoff voltage              | $V_{GS(off)}$ | 2.0      | —    | 3.0      | V             | $I_D = 1 \text{ mA}$ , $V_{DS} = 10 \text{ V}$                                    |
| Static drain to source on state resistance | $R_{DS(on)}$  | —        | 1.5  | 2.0      | $\Omega$      | $I_D = 3 \text{ A}$<br>$V_{GS} = 10 \text{ V}^*$                                  |
| Forward transfer admittance                | $ y_{fs} $    | 3.2      | 5.0  | —        | S             | $I_D = 3 \text{ A}$<br>$V_{DS} = 20 \text{ V}^*$                                  |
| Input capacitance                          | $C_{iss}$     | —        | 1700 | —        | pF            | $V_{DS} = 10 \text{ V}$   |
| Output capacitance                         | $C_{oss}$     | —        | 700  | —        | pF            | $V_{GS} = 0$  |
| Reverse transfer capacitance               | $C_{rss}$     | —        | 315  | —        | pF            | $f = 1 \text{ MHz}$   |
| Turn-on delay time                         | $t_{d(on)}$   | —        | 25   | —        | ns            | $I_D = 3 \text{ A}$   |
| Rise time                                  | $t_r$         | —        | 110  | —        | ns            | $V_{GS} = 10 \text{ V}$   |
| Turn-off delay time                        | $t_{d(off)}$  | —        | 210  | —        | ns            | $R_L = 10 \Omega$   |
| Fall time                                  | $t_f$         | —        | 135  | —        | ns            |   |
| Body-drain diode forward voltage           | $V_{DF}$      | —        | 0.85 | —        | V             | $I_F = 5 \text{ A}$ , $V_{GS} = 0$  |
| Body-drain diode reverse recovery time     | $t_{rr}$      | —        | 1050 | —        | ns            | $I_F = 5 \text{ A}$ , $V_{GS} = 0$ ,<br>$di_F / dt = 100 \text{ A} / \mu\text{s}$ |

\* Pulse Test

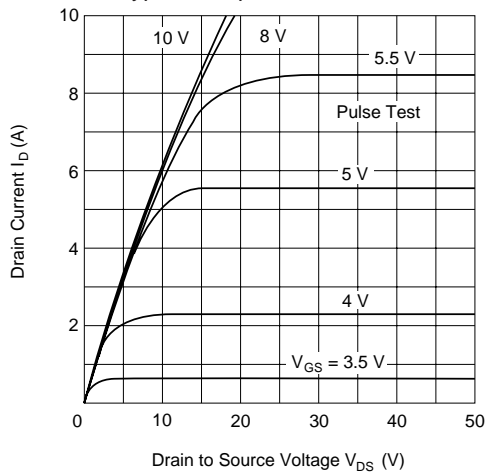
Power vs. Temperature Derating



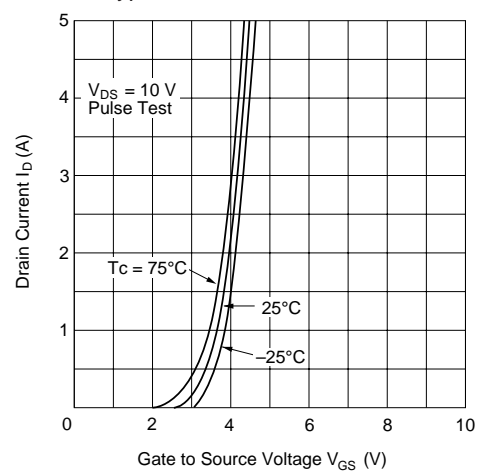
Maximum Safe Operation Area



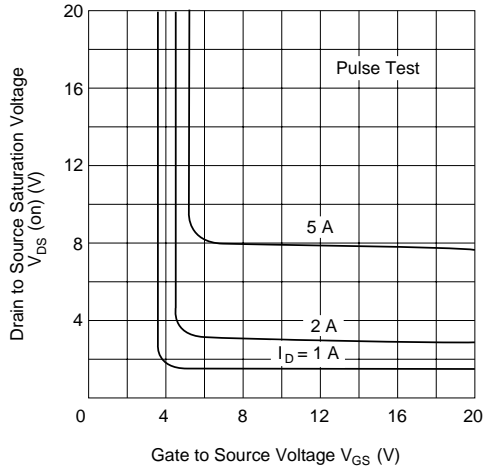
Typical Output Characteristics



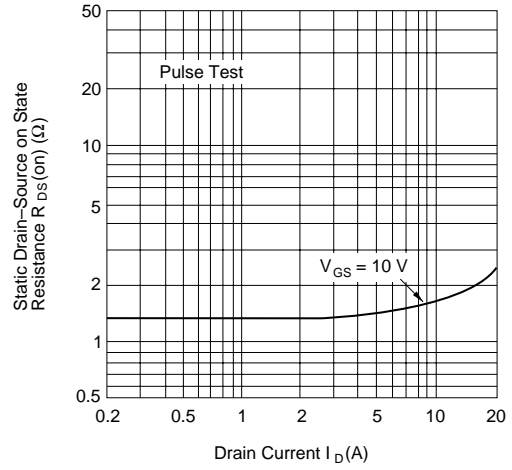
Typical Transfer Characteristics



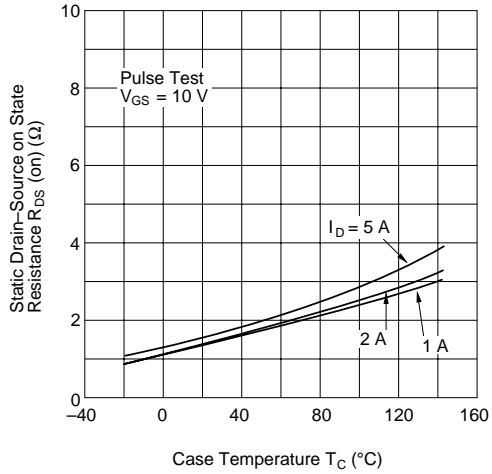
Drain-Source Saturation Voltage vs. Gate-Source Voltage



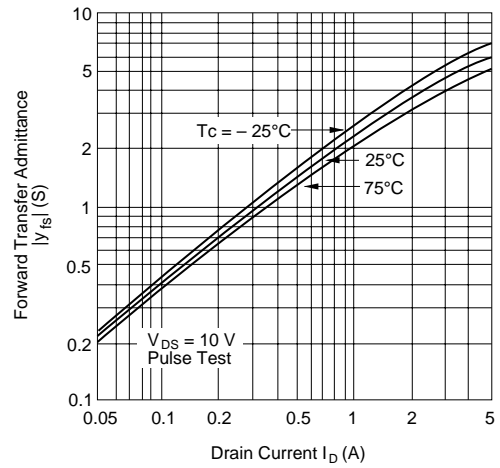
Static Drain-Source on State Resistance vs. Current



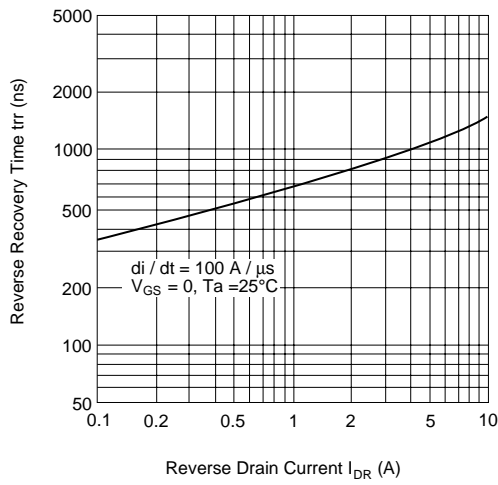
Static Drain-Source on State Resistance vs. Temperature



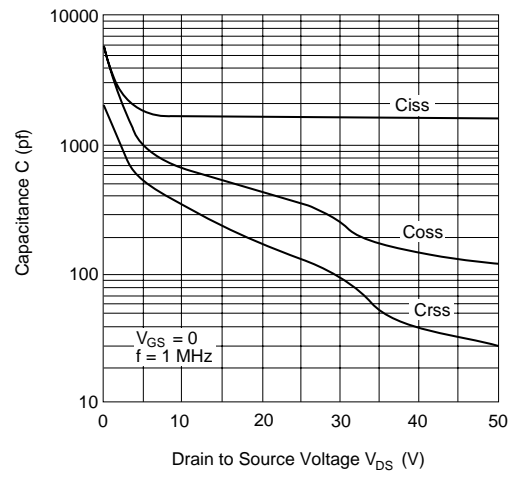
Forward Transfer Admittance vs. Drain Current



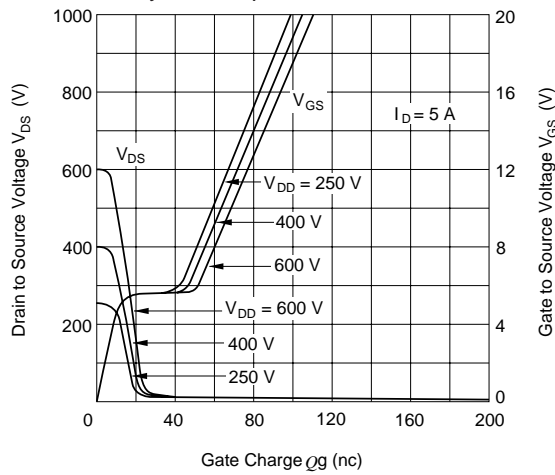
Body-Drain Diode Reverse Recovery Time



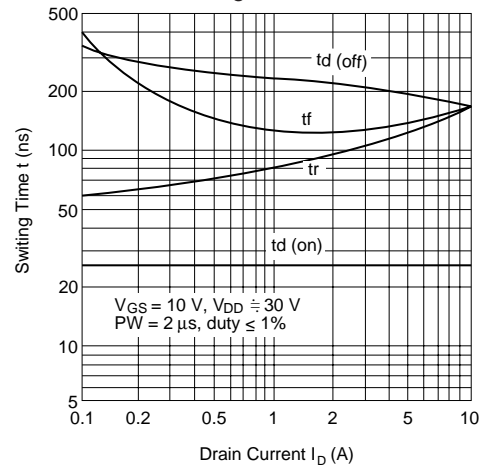
Typical Capacitance vs. Drain-Source Voltage



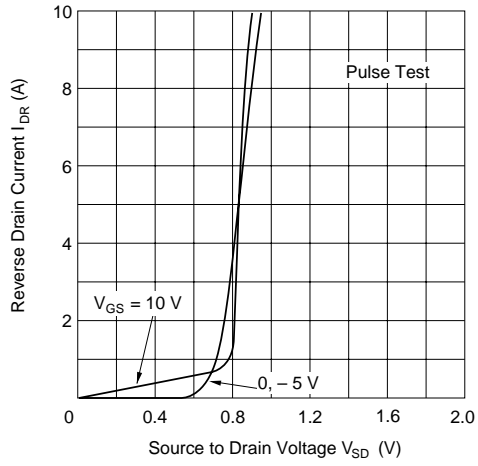
Dynamic Input Characteristics



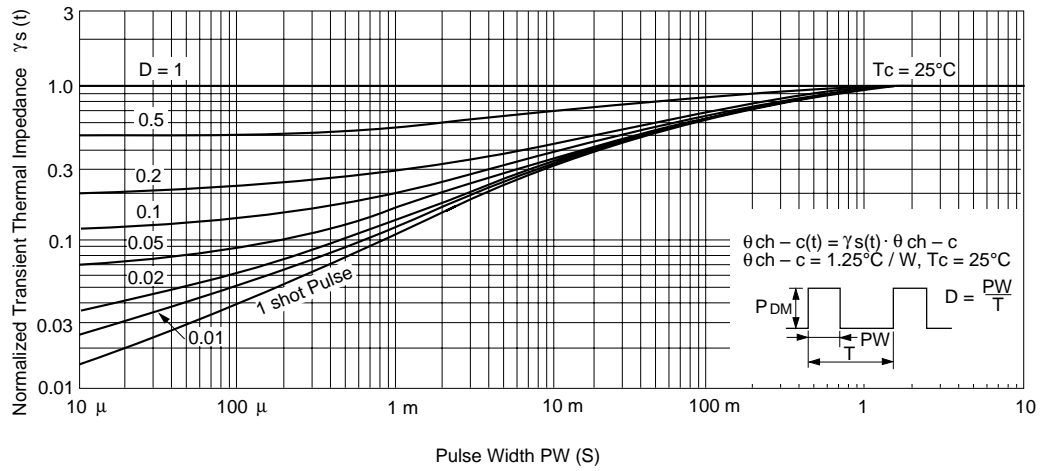
Switching Characteristics



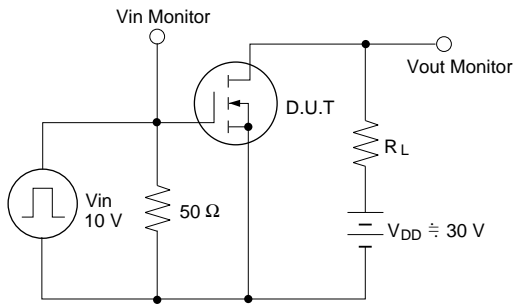
Reverse Drain Current vs. Source to Drain Voltage



Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



Waveforms

