# 2SJ218

Silicon P-Channel MOS FET

HITACHI

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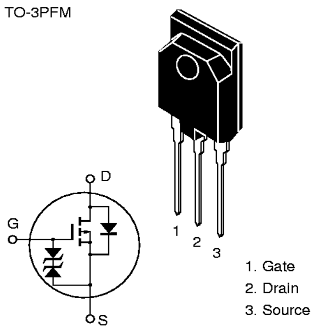
## Application

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

## Outline



## Absolute Maximum Ratings (Ta = 25°C)

| Item | Symbol | Ratings | Unit |
|---|---|---|---|
| Drain to source voltage | $V_{DSS}$ | –60 | V |
| Gate to source voltage | $V_{GSS}$ | ±20 | V |
| Drain current | $I_D$ | –45 | A |
| Drain peak current | $I_{D(pulse)}{}^{*1}$ | –180 | A |
| Body to drain diode reverse drain current | $I_{DR}$ | –45 | A |
| Channel dissipation | $Pch^{*2}$ | 60 | W |
| Channel temperature | Tch | 150 | °C |
| Storage temperature | Tstg | –55 to +150 | °C |

Notes 1. PW ≤ 10 µs, duty cycle ≤ 1%

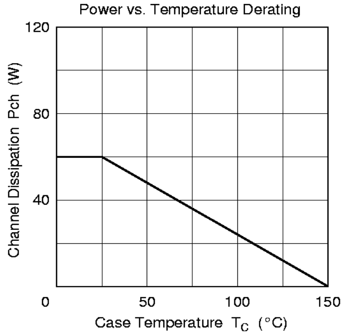
2. Value at $T_c$ = 25°C

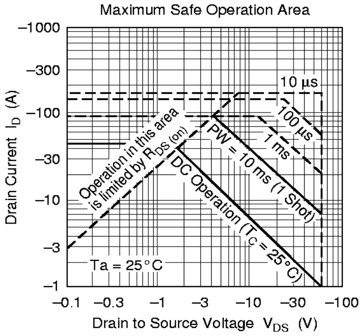
## Electrical Characteristics (Ta = 25°C)

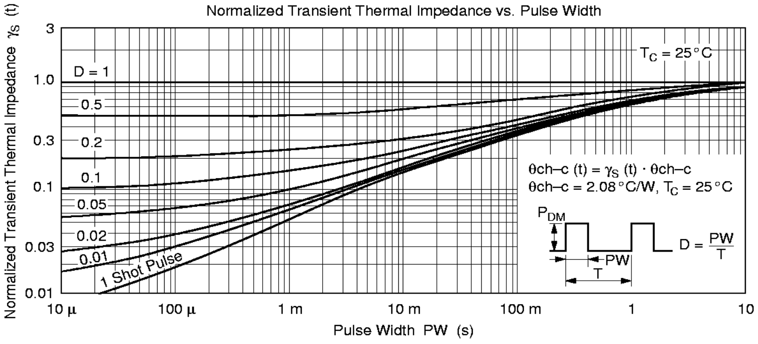
| Item | Symbol | Min | Typ | Max | Unit | Test conditions |
|---|---|---|---|---|---|---|
| Drain to source breakdown voltage | $V_{(BR)DSS}$ | –60 | — | — | V | $I_D$ = –10 mA, $V_{GS}$ = 0 |
| Gate to source breakdown voltage | $V_{(BR)GSS}$ | ±20 | — | — | V | $I_G$ = ±100 µA, $V_{DS}$ = 0 |
| Gate to source leak current | $I_{GSS}$ | — | — | ±10 | µA | $V_{GS}$ = ±16 V, $V_{DS}$ = 0 |
| Zero gate voltage drain current | $I_{DSS}$ | — | — | –250 | µA | $V_{DS}$ = –50 V, $V_{GS}$ = 0 |
| Gate to source cutoff voltage | $V_{GS(off)}$ | –1.0 | — | –2.0 | V | $I_D$ = –1 mA, $V_{DS}$ = –10 V |
| Static drain to source on state resistance | $R_{DS(on)}$ | — | 0.033 | 0.042 | Ω | $I_D$ = –20 A, $V_{GS}$ = –10 V*[1] |
| | | — | 0.045 | 0.06 | | $I_D$ = –20 A, $V_{GS}$ = –4 V*[1] |
| Forward transfer admittance | $\|y_{fs}\|$ | 16 | 25 | — | S | $I_D$ = –20 A, $V_{DS}$ = –10 V*[1] |
| Input capacitance | Ciss | — | 3800 | — | pF | $V_{DS}$ = –10 V, $V_{GS}$ = 0,<br>f = 1 MHz |
| Output capacitance | Coss | — | 2000 | — | pF | |
| Reverse transfer capacitance | Crss | — | 490 | — | pF | |
| Turn-on delay time | $t_{d(on)}$ | — | 30 | — | ns | $I_D$ = –20 A, $V_{GS}$ = –10 V,<br>$R_L$ = 1.5 Ω |
| Rise time | $t_r$ | — | 235 | — | ns | |
| Turn-off delay time | $t_{d(off)}$ | — | 670 | — | ns | |
| Fall time | $t_f$ | — | 450 | — | ns | |
| Body to drain diode forward voltage | $V_{DF}$ | — | –1.35 | — | V | $I_F$ = –45 A, $V_{GS}$ = 0 |
| Body to drain diode reverse recovery time | $t_{rr}$ | — | 300 | — | ns | $I_F$ = –45 A, $V_{GS}$ = 0,<br>$di_F/dt$ = 50 A/µs |

Note 1. Pulse test

See characteristic curves of 2SJ217


Power vs. Temperature Derating


Maximum Safe Operation Area


Normalized Transient Thermal Impedance vs. Pulse Width