

# H5N2305PF

Silicon N Channel MOS FET  
High Speed Power Switching

REJ03G0026-0200Z

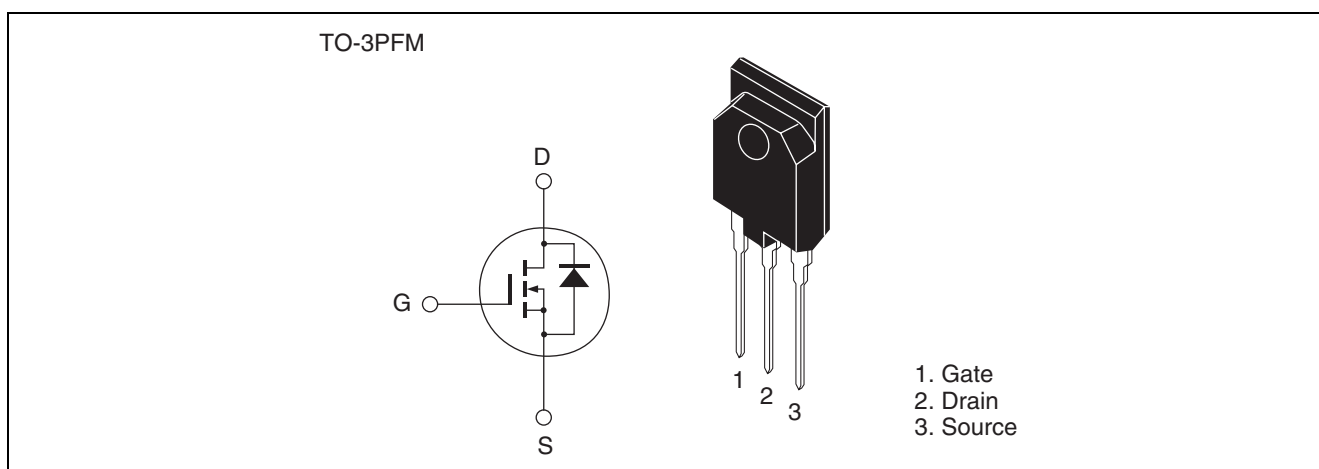
Rev.2.00

Jun.25.2004

## Features

- Low on-resistance
- Low leakage current
- High speed switching

## Outline



## Absolute Maximum Rating

(Ta = 25°C)

| Item                                        | Symbol                                   | Rating      | Unit  |
|---------------------------------------------|------------------------------------------|-------------|-------|
| Drain to source voltage                     | V <sub>DSS</sub>                         | 230         | V     |
| Gate to source voltage                      | V <sub>GSS</sub>                         | ±30         | V     |
| Drain current                               | I <sub>D</sub>                           | 35          | A     |
| Drain peak current                          | I <sub>D (pulse)</sub> <sup>Note1</sup>  | 140         | A     |
| Body-drain diode reverse drain current      | I <sub>DR</sub>                          | 35          | A     |
| Body-drain diode reverse drain peak current | I <sub>DR (pulse)</sub> <sup>Note1</sup> | 140         | A     |
| Avalanche current                           | I <sub>AP</sub> <sup>Note3</sup>         | 18          | A     |
| Channel dissipation                         | P <sub>ch</sub> <sup>Note2</sup>         | 60          | W     |
| Channel to case thermal impedance           | θ <sub>ch-c</sub>                        | 2.08        | °C /W |
| Channel temperature                         | T <sub>ch</sub>                          | 150         | °C    |
| Storage temperature                         | T <sub>stg</sub>                         | –55 to +150 | °C    |

Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1%

2. Value at T<sub>c</sub> = 25°C3. ST<sub>ch</sub> = 25°C, T<sub>ch</sub> ≤ 150°C

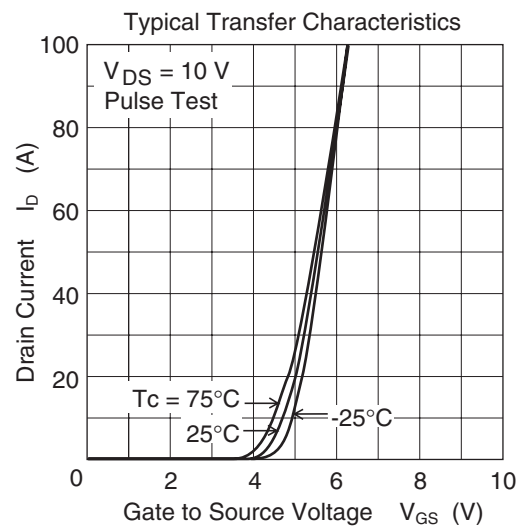
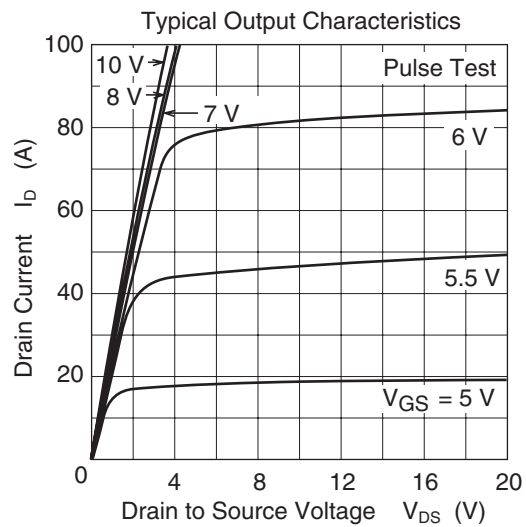
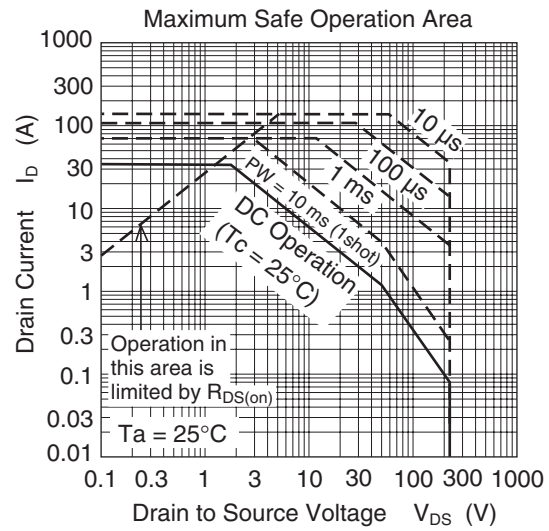
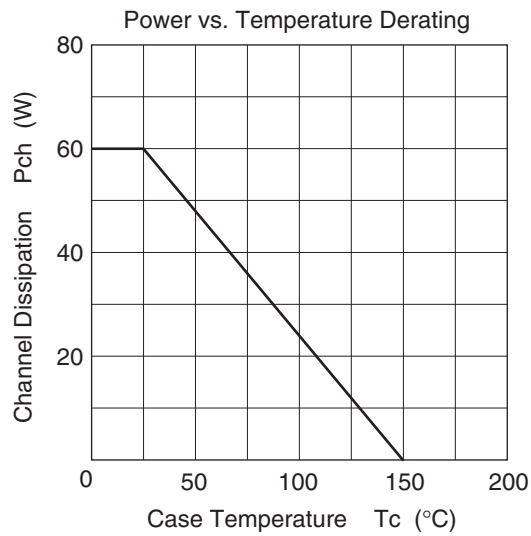
## Electrical Characteristics

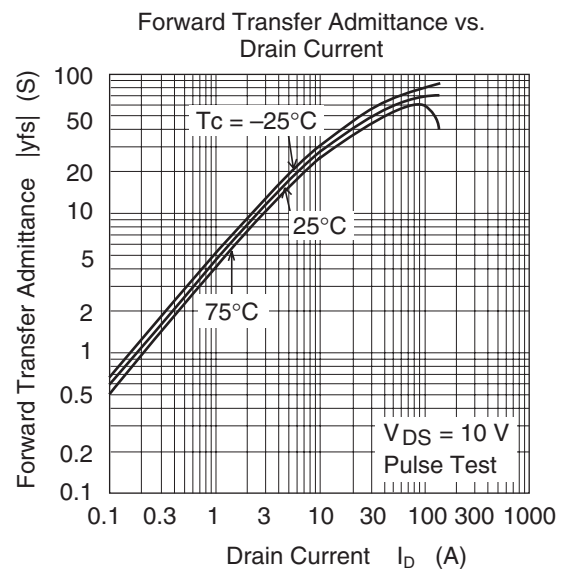
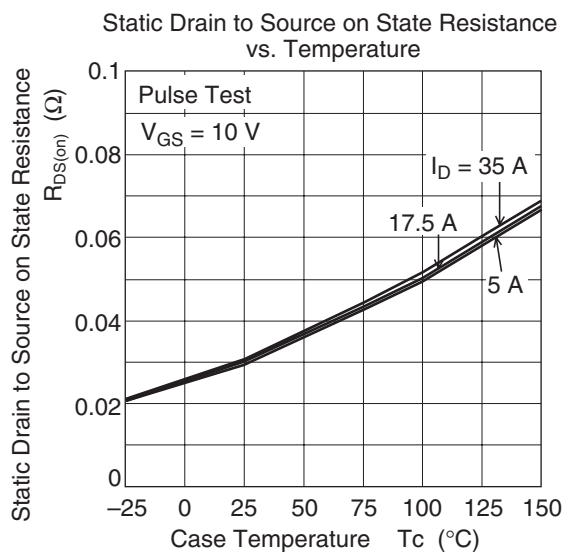
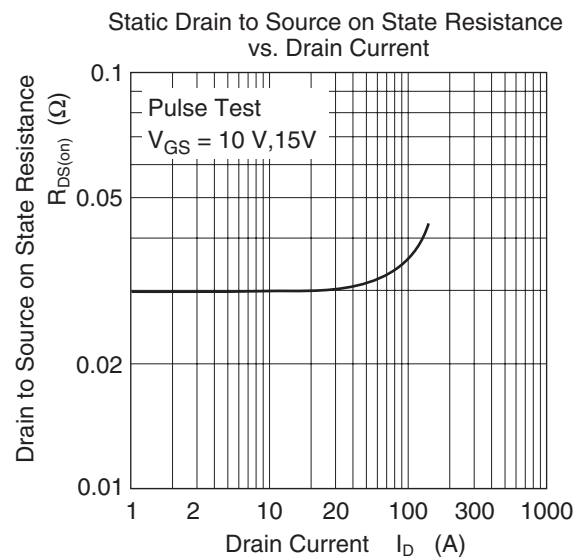
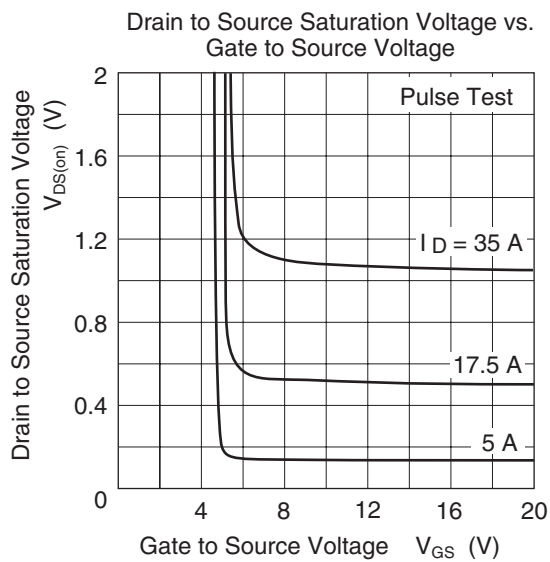
(Ta = 25°C)

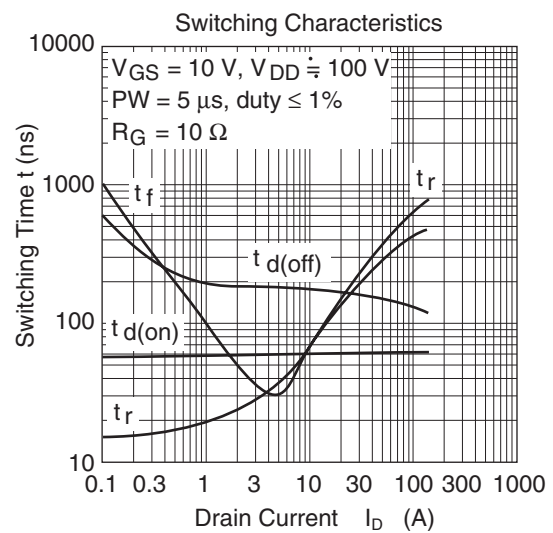
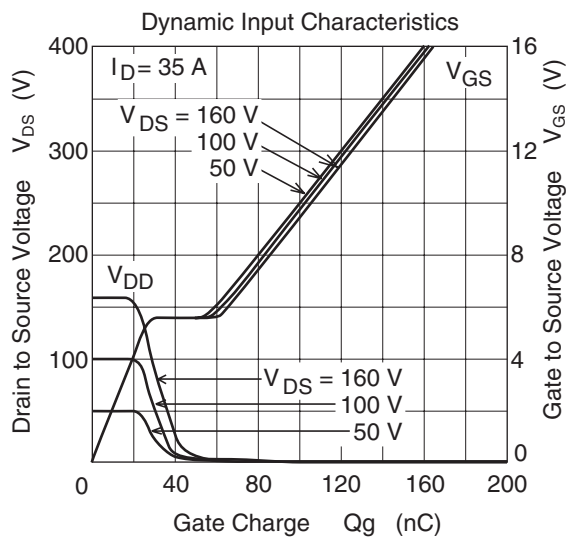
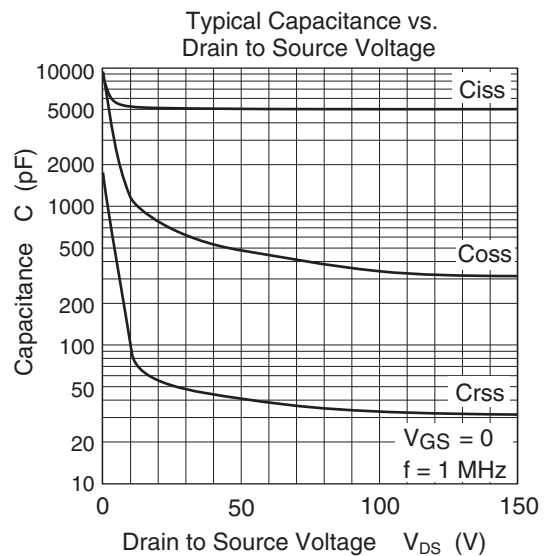
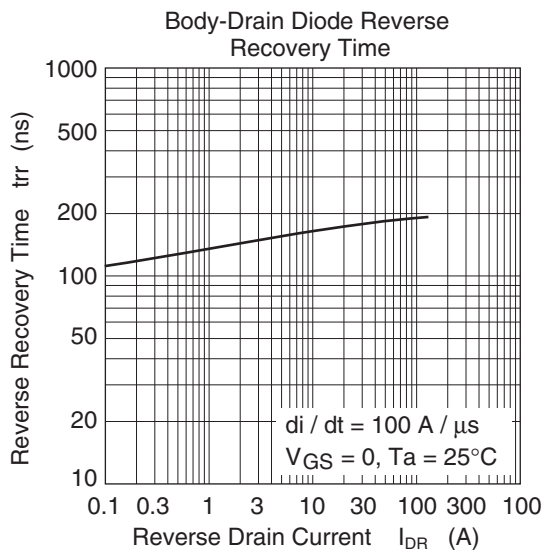
| Item                                       | Symbol        | Min | Typ   | Max       | Unit          | Test condition                                                              |
|--------------------------------------------|---------------|-----|-------|-----------|---------------|-----------------------------------------------------------------------------|
| Drain to Source breakdown voltage          | $V_{(BR)DSS}$ | 230 | —     | —         | V             | $I_D = 10 \text{ mA}$ , $V_{GS} = 0$                                        |
| Zero gate voltage drain current            | $I_{DSS}$     | —   | —     | 1         | $\mu\text{A}$ | $V_{DS} = 230 \text{ V}$ , $V_{GS} = 0$                                     |
| Gate to source leak current                | $I_{GSS}$     | —   | —     | $\pm 0.1$ | $\mu\text{A}$ | $V_{GS} = \pm 30 \text{ V}$ , $V_{DS} = 0$                                  |
| Gate to source cutoff voltage              | $V_{GS(off)}$ | 2.5 | —     | 4.0       | V             | $V_{DS} = 10 \text{ V}$ , $I_D = 1 \text{ mA}$                              |
| Forward transfer admittance                | $ y_{fs} $    | 22  | 38    | —         | S             | $I_D = 17.5 \text{ A}$ , $V_{DS} = 10 \text{ V}$ <sup>Note4</sup>           |
| Static drain to source on state resistance | $R_{DS(on)}$  | —   | 0.030 | 0.038     | $\Omega$      | $I_D = 17.5 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note4</sup>           |
| Input capacitance                          | $C_{iss}$     | —   | 5200  | —         | pF            | $V_{DS} = 25 \text{ V}$                                                     |
| Output capacitance                         | $C_{oss}$     | —   | 690   | —         | pF            | $V_{GS} = 0$                                                                |
| Reverse transfer capacitance               | $C_{rss}$     | —   | 50    | —         | pF            | $f = 1 \text{ MHz}$                                                         |
| Turn-on delay time                         | $t_{d(on)}$   | —   | 60    | —         | ns            | $I_D = 17.5 \text{ A}$                                                      |
| Rise time                                  | $t_r$         | —   | 130   | —         | ns            | $R_L = 5.7 \Omega$                                                          |
| Turn-off delay time                        | $t_{d(off)}$  | —   | 180   | —         | ns            | $V_{GS} = 10 \text{ V}$                                                     |
| Fall time                                  | $t_f$         | —   | 120   | —         | ns            | $R_g = 10 \Omega$                                                           |
| Total gate charge                          | $Q_g$         | —   | 105   | —         | nC            | $V_{DD} = 160 \text{ V}$                                                    |
| Gate to source charge                      | $Q_{gs}$      | —   | 25    | —         | nC            | $V_{GS} = 10 \text{ V}$                                                     |
| Gate to drain charge                       | $Q_{gd}$      | —   | 37    | —         | nC            | $I_D = 35 \text{ A}$                                                        |
| Body-drain diode forward voltage           | $V_{DF}$      | —   | 0.92  | 1.4       | V             | $I_F = 35 \text{ A}$ , $V_{GS} = 0$ <sup>Note4</sup>                        |
| Body-drain diode reverse recovery time     | $t_{rr}$      | —   | 180   | —         | ns            | $I_F = 35 \text{ A}$ , $V_{GS} = 0$<br>$diF/dt = 100 \text{ A}/\mu\text{s}$ |
| Body-drain diode reverse recovery charge   | $Q_{rr}$      | —   | 1.3   | —         | $\mu\text{C}$ |                                                                             |

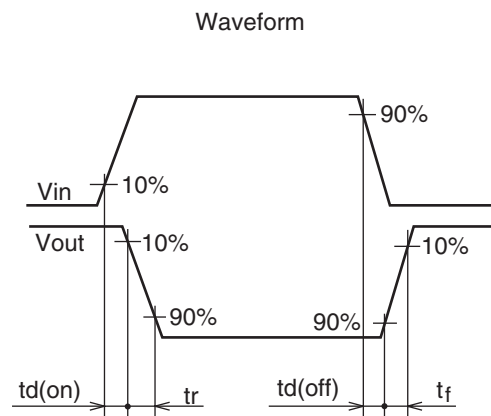
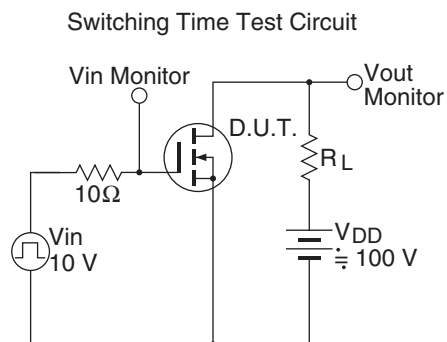
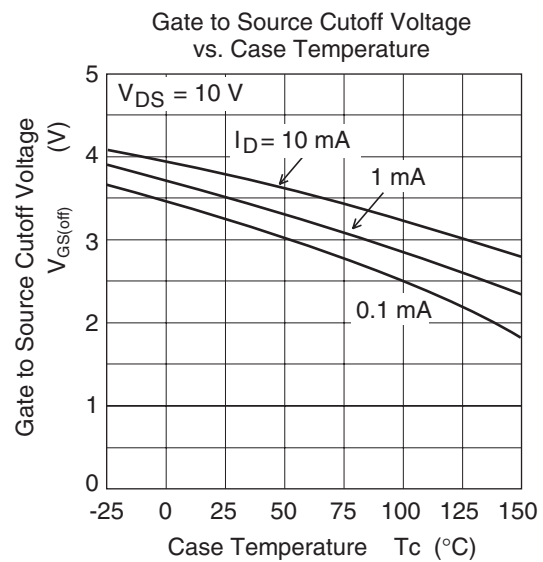
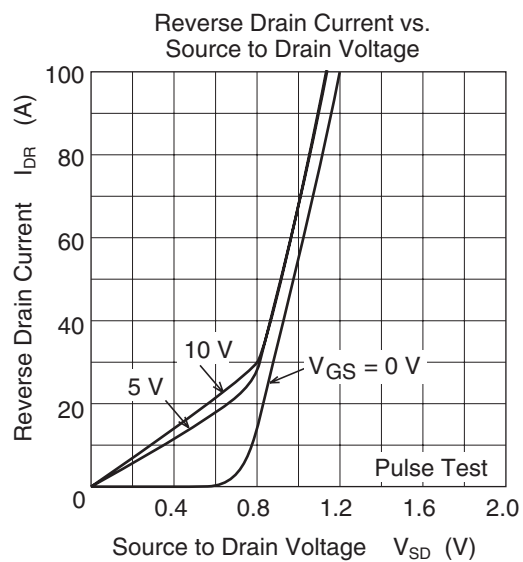
Notes: 4. Pulse test

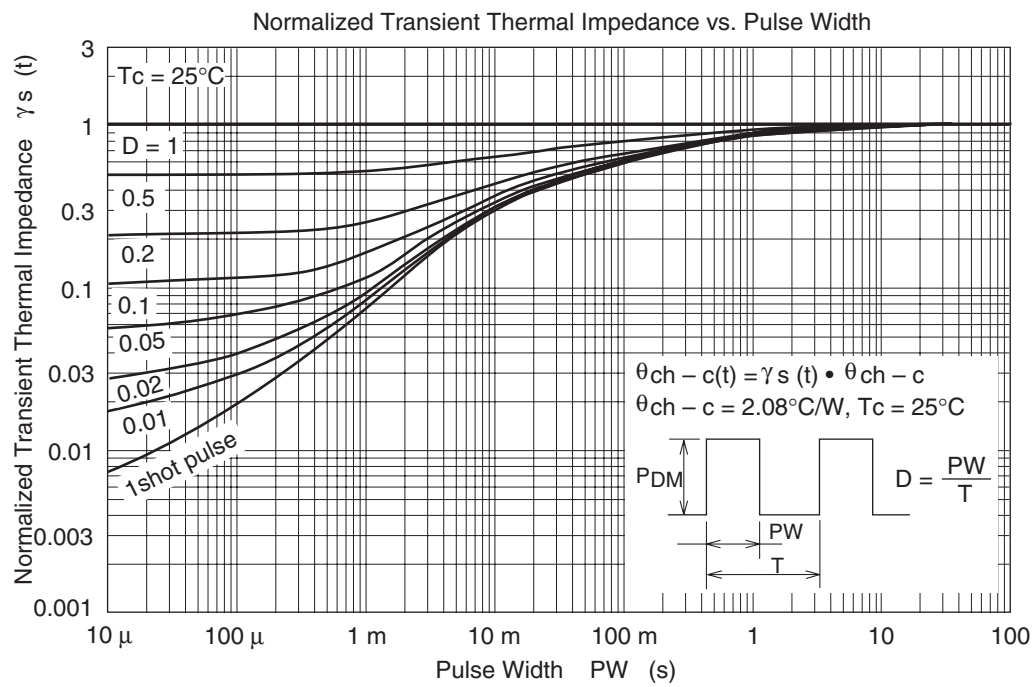
## Main Characteristics













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