

H5N5004PL

Silicon N Channel MOS FET
High Speed Power Switching

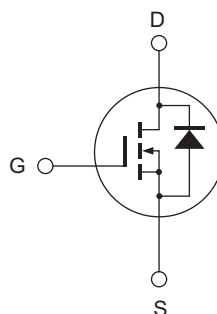
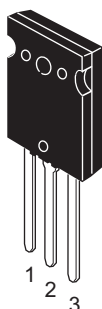
REJ03G1113-0200
(Previous: ADE-208-1381)
Rev.2.00
Sep 07, 2005

Features

- Low on-resistance: $R_{DS(on)} = 0.09 \Omega$ typ.
- Low leakage current: $I_{DSS} = 10 \mu A$ max (at $V_{DS} = 500 V$)
- High speed switching: $t_f = 280 ns$ typ (at $V_{GS} = 10 V$, $V_{DD} = 250 V$, $I_D = 25 A$)
- Low gate charge: $Q_g = 220 nC$ typ (at $V_{DD} = 400 V$, $V_{GS} = 10 V$, $I_D = 50 A$)
- Avalanche ratings
- Built-in fast recovery diode: $trr = 190 ns$ typ

Outline

RENESAS Package code: PRSS0004ZF-A
(Package name: TO-3PL)



1. Gate
2. Drain (Flange)
3. Source

Absolute Maximum Ratings

(Ta = 25°C)

| Item | Symbol | Value | Unit |
|---|---|-------------|------|
| Drain to source voltage | V _{DSS} | 500 | V |
| Gate to source voltage | V _{GSS} | ±30 | V |
| Drain current | I _D | 50 | A |
| Drain peak current | I _{D (pulse)} ^{Note 1} | 200 | A |
| Body-drain diode reverse drain current | I _{DR} | 50 | A |
| Body-drain diode reverse drain peak current | I _{DR (pulse)} ^{Note 1} | 200 | A |
| Avalanche current | I _{AP} ^{Note 3} | 15 | A |
| Channel dissipation | P _{ch} ^{Note 2} | 250 | W |
| Channel to case thermal Impedance | θ _{ch-c} | 0.5 | °C/W |
| Channel temperature | T _{ch} | 150 | °C |
| Storage temperature | T _{stg} | -55 to +150 | °C |

- Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1%
 2. Value at T_c = 25°C
 3. T_{ch} ≤ 150°C

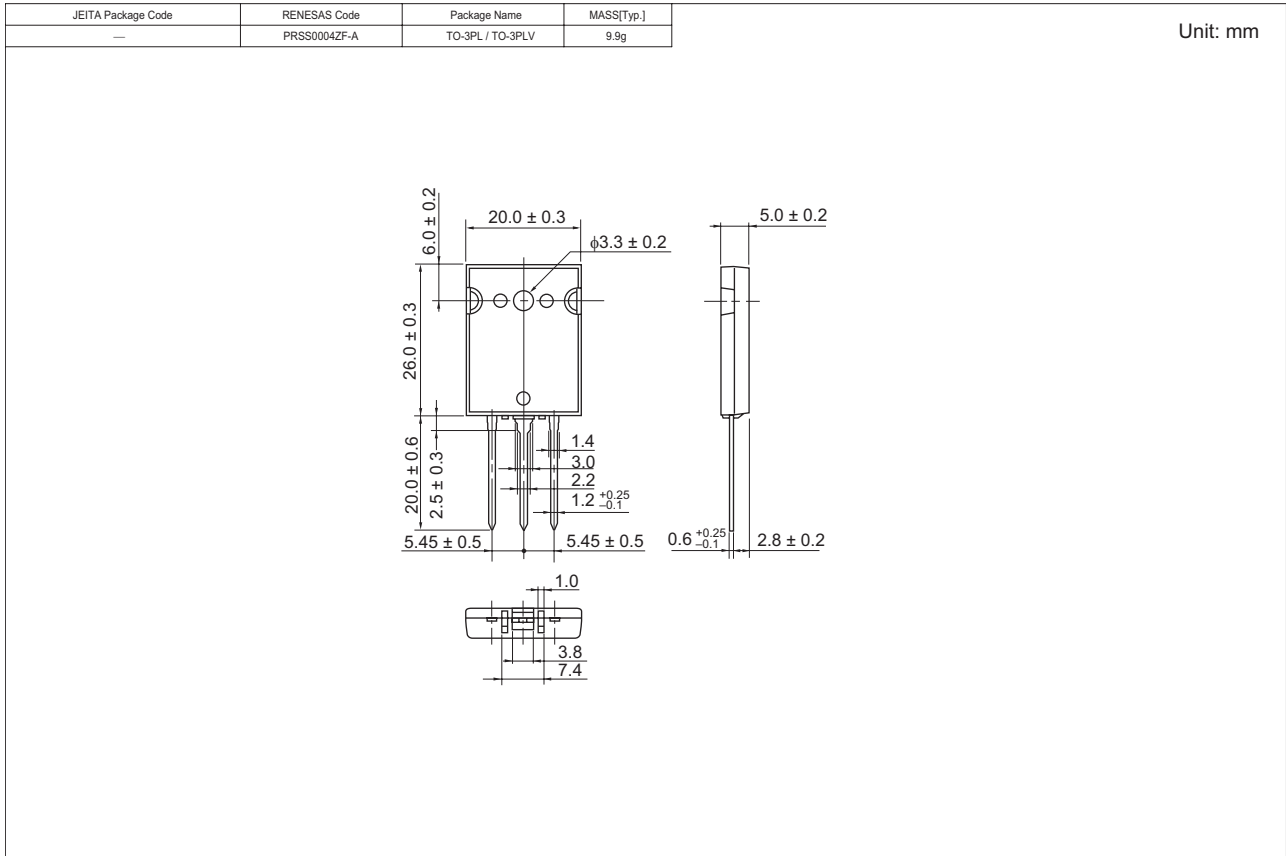
Electrical Characteristics

(Ta = 25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|--|-----------------------|-----|------|------|------|---|
| Drain to source breakdown voltage | V _{(BR) DSS} | 500 | — | — | V | I _D = 10 mA, V _{GS} = 0 |
| Gate to source leak current | I _{GSS} | — | — | ±0.1 | μA | V _{GS} = ±30 V, V _{DS} = 0 |
| Zero gate voltage drain current | I _{DSS} | — | — | 10 | μA | V _{DS} = 500 V, V _{GS} = 0 |
| Gate to source cutoff voltage | V _{GS (off)} | 2.0 | — | 4.0 | V | V _{DS} = 10 V, I _D = 1 mA |
| Static drain to source on state resistance | R _{DS (on)} | — | 0.09 | 0.11 | Ω | I _D = 25 A, V _{GS} = 10 V ^{Note 4} |
| Forward transfer admittance | y _{fs} | 27 | 45 | — | S | I _D = 25 A, V _{DS} = 10 V ^{Note 4} |
| Input capacitance | C _{iss} | — | 7630 | — | pF | V _{DS} = 25 V |
| Output capacitance | C _{oss} | — | 770 | — | pF | V _{GS} = 0 |
| Reverse transfer capacitance | C _{rss} | — | 160 | — | pF | f = 1 MHz |
| Turn-on delay time | t _{d (on)} | — | 90 | — | ns | I _D = 25 A |
| Rise time | t _r | — | 340 | — | ns | V _{GS} = 10 V |
| Turn-off delay time | t _{d (off)} | — | 370 | — | ns | R _L = 10 Ω |
| Fall time | t _f | — | 280 | — | ns | R _g = 10 Ω |
| Total gate charge | Q _g | — | 220 | — | nC | V _{DD} = 400 V |
| Gate to source charge | Q _{gs} | — | 30 | — | nC | V _{GS} = 10 V |
| Gate to drain charge | Q _{gd} | — | 110 | — | nC | I _D = 50 A |
| Body-drain diode forward voltage | V _{DF} | — | 0.98 | 1.5 | V | I _F = 50 A, V _{GS} = 0 |
| Body-drain diode reverse recovery time | t _{rr} | — | 190 | — | ns | I _F = 50 A, V _{GS} = 0 |
| Body-drain diode reverse recovery charge | Q _{rr} | — | 1.3 | — | μC | di _F /dt = 100 A/μs |

Note: 4. Pulse test

Package Dimensions



Ordering Information

| Part Name | Quantity | Shipping Container |
|-------------|----------|--------------------|
| H5N5004PL-E | 500 pcs | Box (Case) |

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