



# H7N0308CF

Silicon N Channel MOS FET  
High Speed Power Switching

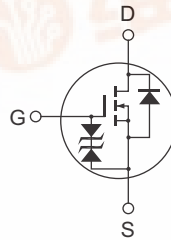
REJ03G1123-0300  
(Previous: ADE-208-1570A)  
Rev.3.00  
Sep 07, 2005

## Features

- Low on-resistance  
 $R_{DS(on)} = 3.8 \text{ m}\Omega$  typ.
- Low drive current
- 4.5 V gate drive device can be driven from 5 V source

## Outline

RENESAS Package code: PRSS0003AE-A  
(Package name: TO-220C•FM)



1. Gate
2. Drain
3. Source

## Absolute Maximum Ratings

(Ta = 25°C)

| Item                                   | Symbol                           | Value       | Unit |
|--|----------------------------------|-------------|------|
| Drain to source voltage                | $V_{DSS}$                        | 30          | V    |
| Gate to source voltage                 | $V_{GSS}$                        | ±20         | V    |
| Drain current                          | $I_D$                            | 60          | A    |
| Drain peak current                     | $I_{D(pulse)}$ <sup>Note 1</sup> | 240         | A    |
| Body-drain diode reverse drain current | $I_{DR}$                         | 60          | A    |
| Channel dissipation                    | $P_{ch}$ <sup>Note 2</sup>       | 30          | W    |
| Channel to case thermal impedance      | $\theta_{ch-c}$                  | 4.17        | °C/W |
| Channel to ambient thermal impedance   | $\theta_{ch-a}$                  | 62.5        | °C/W |
| Channel temperature                    | $T_{ch}$                         | 150         | °C   |
| Storage temperature                    | $T_{stg}$                        | -55 to +150 | °C   |

Notes: 1.  $PW \leq 10 \mu s$ , duty cycle  $\leq 1\%$ 2. Value at  $T_c = 25^\circ C$ 

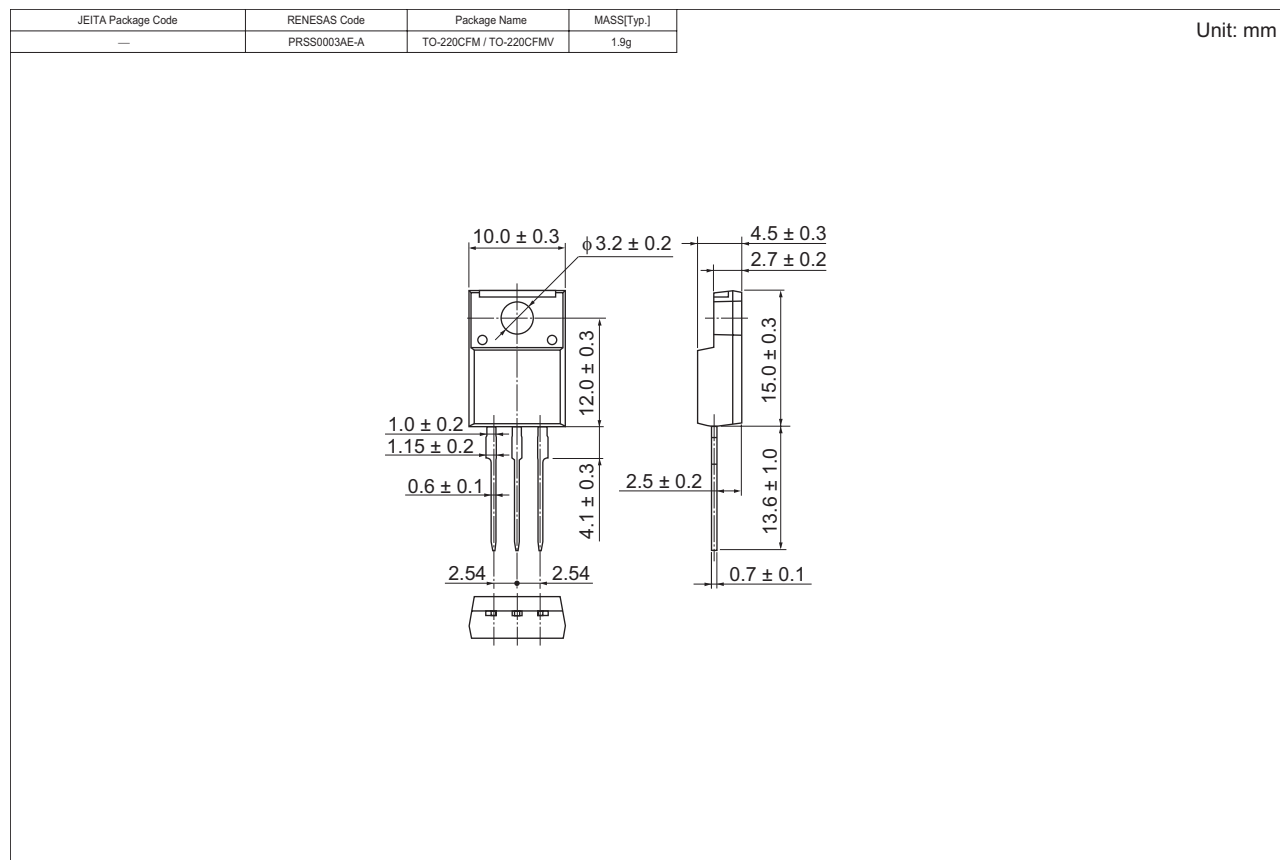
## Electrical Characteristics

(Ta = 25°C)

| Item                                       | Symbol        | Min | Typ  | Max | Unit       | Test Conditions   |
|--|---------------|-----|------|-----|------------|---|
| Drain to source breakdown voltage          | $V_{(BR)DSS}$ | 30  | —    | —   | V          | $I_D = 10 \text{ mA}$ , $V_{GS} = 0$                                  |
| Gate to source breakdown voltage           | $V_{(BR)GSS}$ | ±20 | —    | —   | V          | $I_G = \pm 100 \mu A$ , $V_{DS} = 0$                                  |
| Gate to source leak current                | $I_{GSS}$     | —   | —    | ±10 | $\mu A$    | $V_{GS} = \pm 16 \text{ V}$ , $V_{DS} = 0$                            |
| Zero gate voltage drain current            | $I_{DSS}$     | —   | —    | 10  | $\mu A$    | $V_{DS} = 30 \text{ V}$ , $V_{GS} = 0$                                |
| Gate to source cutoff voltage              | $V_{GS(off)}$ | 1.0 | —    | 2.5 | V          | $I_D = 1 \text{ mA}$ , $V_{DS} = 10 \text{ V}$ <sup>Note 3</sup>      |
| Static drain to source on state resistance | $R_{DS(on)}$  | —   | 3.8  | 4.8 | m $\Omega$ | $I_D = 30 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note 3</sup>      |
|  |               | —   | 6.0  | 8.5 | m $\Omega$ | $I_D = 30 \text{ A}$ , $V_{GS} = 4.5 \text{ V}$ <sup>Note 3</sup>     |
| Forward transfer admittance                | $ y_{fs} $    | 42  | 70   | —   | S          | $I_D = 30 \text{ A}$ , $V_{DS} = 10 \text{ V}$ <sup>Note 3</sup>      |
| Input capacitance                          | $C_{iss}$     | —   | 3350 | —   | pF         | $V_{DS} = 10 \text{ V}$   |
| Output capacitance                         | $C_{oss}$     | —   | 840  | —   | pF         | $V_{GS} = 0$  |
| Reverse transfer capacitance               | $C_{rss}$     | —   | 480  | —   | pF         | $f = 1 \text{ MHz}$   |
| Total gate charge                          | $Q_g$         | —   | 52   | —   | nC         | $V_{DD} = 10 \text{ V}$   |
| Gate to source charge                      | $Q_{gs}$      | —   | 11   | —   | nC         | $V_{GS} = 10 \text{ V}$   |
| Gate to drain charge                       | $Q_{gd}$      | —   | 10   | —   | nC         | $I_D = 60 \text{ A}$  |
| Turn-on delay time                         | $t_{d(on)}$   | —   | 30   | —   | ns         | $V_{GS} = 10 \text{ V}$ , $I_D = 30 \text{ A}$                        |
| Rise time                                  | $t_r$         | —   | 370  | —   | ns         | $R_L = 0.33 \Omega$   |
| Turn-off delay time                        | $t_{d(off)}$  | —   | 80   | —   | ns         | $R_g = 4.7 \Omega$  |
| Fall time                                  | $t_f$         | —   | 27   | —   | ns         |   |
| Body-drain diode forward voltage           | $V_{DF}$      | —   | 0.90 | —   | V          | $I_F = 60 \text{ A}$ , $V_{GS} = 0$                                   |
| Body-drain diode reverse recovery time     | $t_{rr}$      | —   | 55   | —   | ns         | $I_F = 60 \text{ A}$ , $V_{GS} = 0$<br>$di_F/dt = 50 \text{ A}/\mu s$ |

Note: 3. Pulse test

## Package Dimensions



## Ordering Information

| Part Name   | Quantity | Shipping Container |
|-------------|----------|--------------------|
| H7N0308CF-E | 50 pcs   | Plastic magazine   |

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

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