



# FS30AS-2

## High-Speed Switching Use Nch Power MOS FET

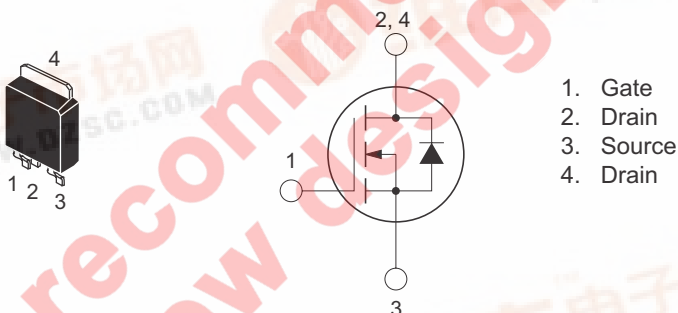
REJ03G1411-0200  
(Previous: MEJ02G0100-0101)  
Rev.2.00  
Aug 07, 2006

### Features

- Drive voltage : 10 V
- $V_{DS}$  : 100 V
- $r_{DS(ON)} (max)$  : 100 m $\Omega$
- $I_D$  : 30 A
- Integrated Fast Recovery Diode (TYP.) : 95 ns

### Outline

RENESAS Package code: PRSS0004ZA-A  
(Package name: MP-3A)



### Applications

Motor control, Lamp control, Solenoid control, DC-DC converters, etc.

### Maximum Ratings

(T<sub>c</sub> = 25°C)

| Parameter                        | Symbol    | Ratings      | Unit | Conditions        |
|----------------------------------|-----------|--------------|------|-------------------|
| Drain-source voltage             | $V_{DS}$  | 100          | V    | $V_{GS} = 0$ V    |
| Gate-source voltage              | $V_{GS}$  | $\pm 20$     | V    | $V_{DS} = 0$ V    |
| Drain current                    | $I_D$     | 30           | A    |                   |
| Drain current (Pulsed)           | $I_{DM}$  | 120          | A    |                   |
| Avalanche drain current (Pulsed) | $I_{DA}$  | 30           | A    | $L = 100$ $\mu$ H |
| Source current                   | $I_S$     | 30           | A    |                   |
| Source current (Pulsed)          | $I_{SM}$  | 120          | A    |                   |
| Maximum power dissipation        | $P_D$     | 35           | W    |                   |
| Channel temperature              | $T_{ch}$  | - 55 to +150 | °C   |                   |
| Storage temperature              | $T_{stg}$ | - 55 to +150 | °C   |                   |
| Mass                             | —         | 0.32         | g    | Typical value     |



## Electrical Characteristics

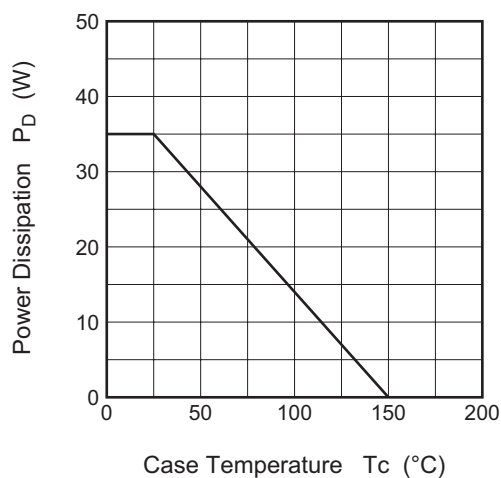
(T<sub>ch</sub> = 25°C)

| Parameter                        | Symbol         | Min | Typ  | Max       | Unit                 | Test Conditions   |
|----------------------------------|----------------|-----|------|-----------|----------------------|---|
| Drain-source breakdown voltage   | $V_{(BR)DSS}$  | 100 | —    | —         | V                    | $I_D = 1 \text{ mA}$ , $V_{GS} = 0 \text{ V}$   |
| Gate-source leakage current      | $I_{GSS}$      | —   | —    | $\pm 0.1$ | $\mu\text{A}$        | $V_{GS} = \pm 20 \text{ V}$ , $V_{DS} = 0 \text{ V}$  |
| Drain-source leakage current     | $I_{DSS}$      | —   | —    | 0.1       | mA                   | $V_{DS} = 100 \text{ V}$ , $V_{GS} = 0 \text{ V}$   |
| Gate-source threshold voltage    | $V_{GS(th)}$   | 2.0 | 3.0  | 4.0       | V                    | $I_D = 1 \text{ mA}$ , $V_{DS} = 10 \text{ V}$  |
| Drain-source on-state resistance | $r_{DS(ON)}$   | —   | 69   | 100       | m $\Omega$           | $I_D = 15 \text{ A}$ , $V_{GS} = 10 \text{ V}$  |
| Drain-source on-state voltage    | $V_{DS(ON)}$   | —   | 1.04 | 1.50      | V                    | $I_D = 15 \text{ A}$ , $V_{GS} = 10 \text{ V}$  |
| Forward transfer admittance      | $ y_{fs} $     | —   | 18   | —         | S                    | $I_D = 15 \text{ A}$ , $V_{DS} = 10 \text{ V}$  |
| Input capacitance                | $C_{iss}$      | —   | 1250 | —         | pF                   | $V_{DS} = 10 \text{ V}$ , $V_{GS} = 0 \text{ V}$ ,<br>$f = 1 \text{ MHz}$                                       |
| Output capacitance               | $C_{oss}$      | —   | 230  | —         | pF                   |   |
| Reverse transfer capacitance     | $C_{rss}$      | —   | 105  | —         | pF                   |   |
| Turn-on delay time               | $t_{d(on)}$    | —   | 25   | —         | ns                   | $V_{DD} = 50 \text{ V}$ , $I_D = 15 \text{ A}$ ,<br>$V_{GS} = 10 \text{ V}$ ,<br>$R_{GEN} = R_{GS} = 50 \Omega$ |
| Rise time                        | $t_r$          | —   | 60   | —         | ns                   |   |
| Turn-off delay time              | $t_{d(off)}$   | —   | 60   | —         | ns                   |   |
| Fall time                        | $t_f$          | —   | 50   | —         | ns                   |   |
| Source-drain voltage             | $V_{SD}$       | —   | 1.0  | 1.5       | V                    | $I_S = 15 \text{ A}$ , $V_{GS} = 0 \text{ V}$   |
| Thermal resistance               | $R_{th(ch-c)}$ | —   | —    | 3.57      | $^{\circ}\text{C/W}$ | Channel to case   |
| Reverse recovery time            | $t_{rr}$       | —   | 95   | —         | ns                   | $I_S = 30 \text{ A}$ , $d_i/d_t = -100 \text{ A}/\mu\text{s}$   |

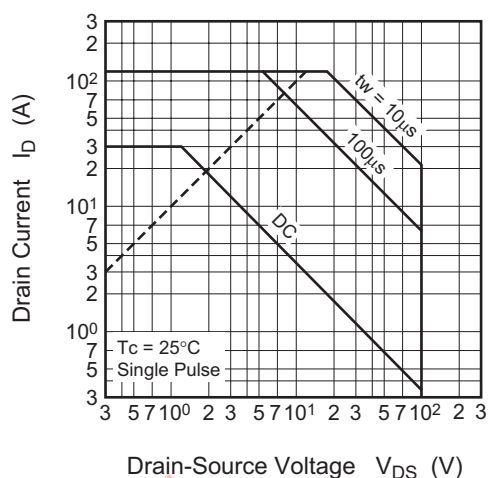
Not recommended  
for new design

## Performance Curves

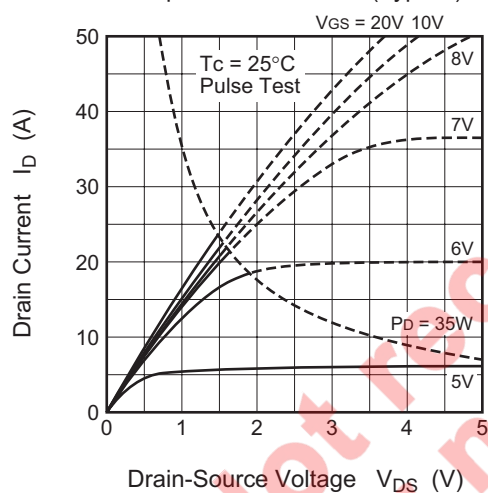
Power Dissipation Derating Curve



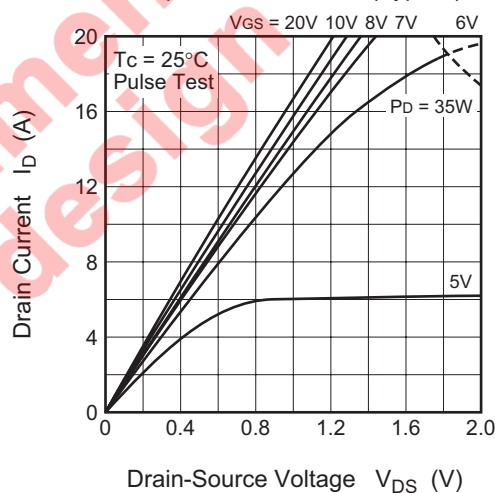
Maximum Safe Operating Area



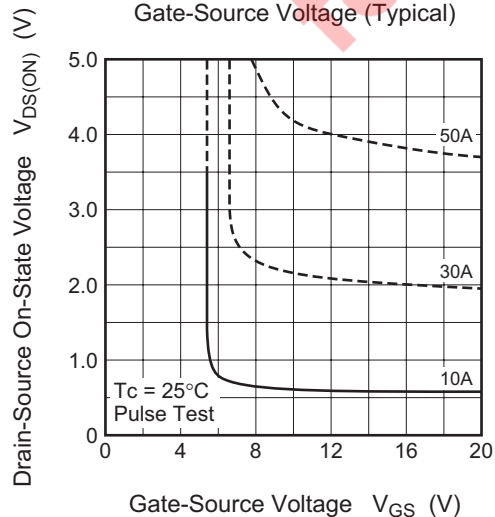
Output Characteristics (Typical)



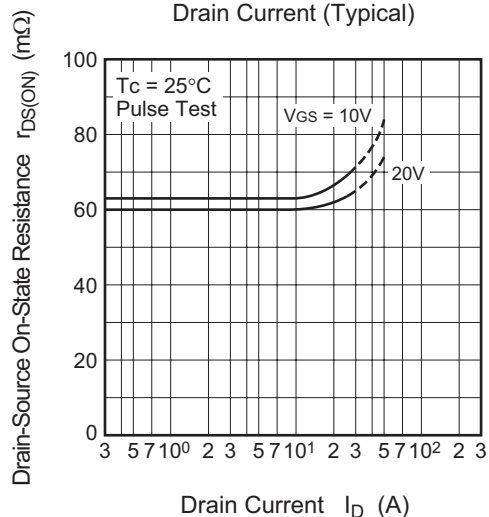
Output Characteristics (Typical)



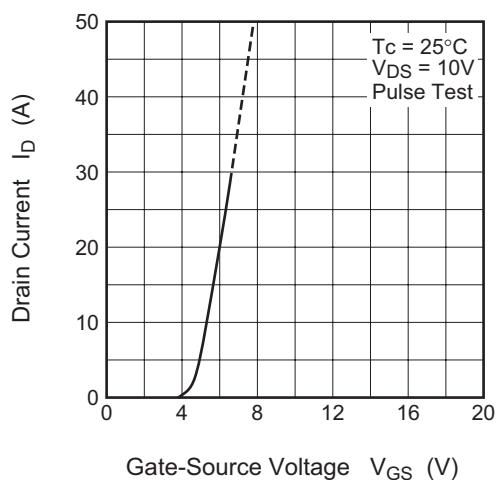
On-State Voltage vs. Gate-Source Voltage (Typical)



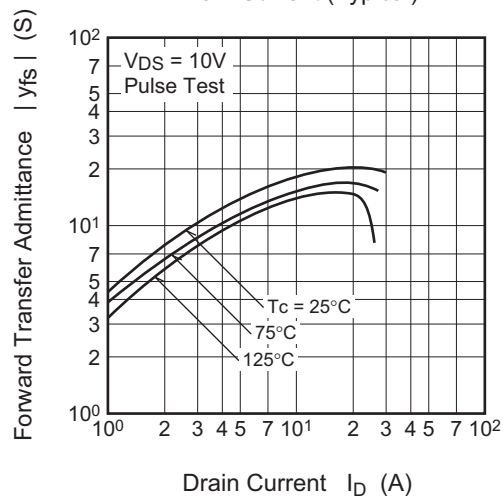
On-State Resistance vs. Drain Current (Typical)



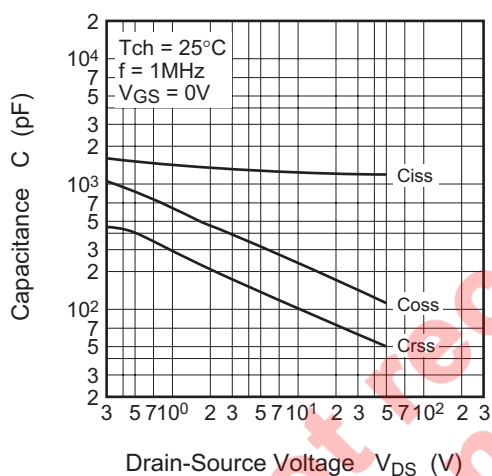
Transfer Characteristics (Typical)



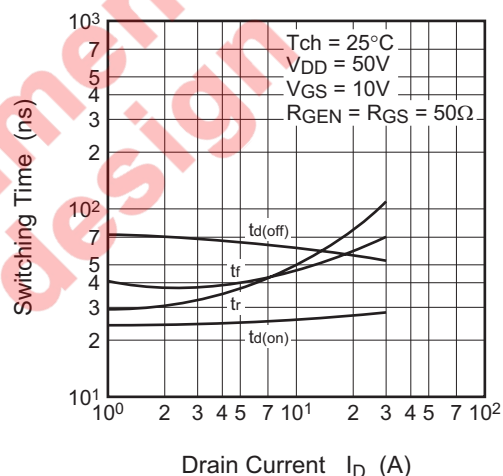
Forward Transfer Admittance vs. Drain Current (Typical)



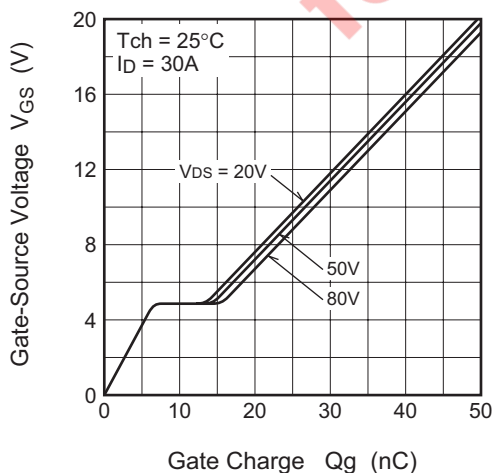
Capacitance vs. Drain-Source Voltage (Typical)



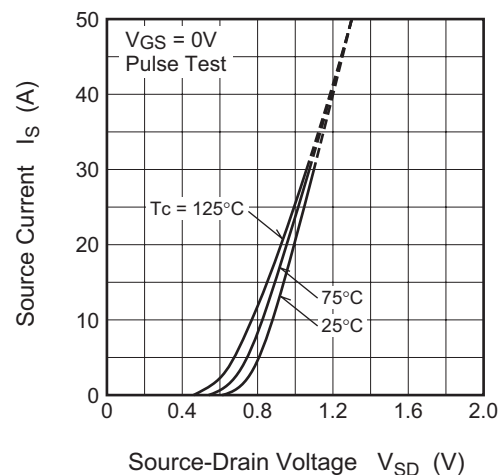
Switching Characteristics (Typical)

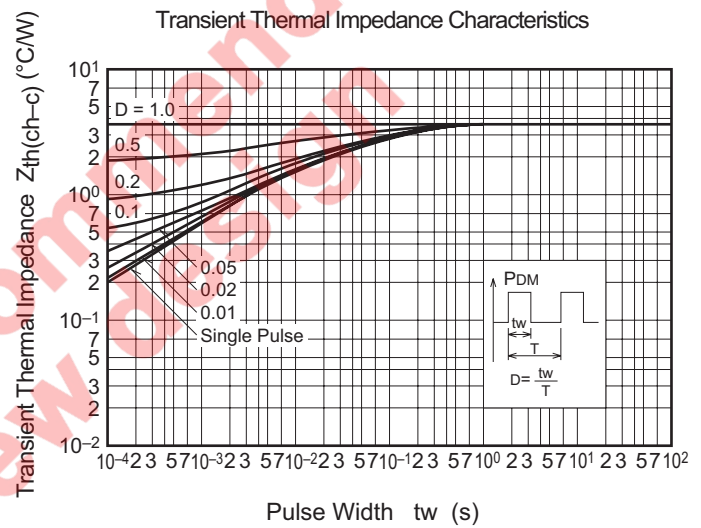
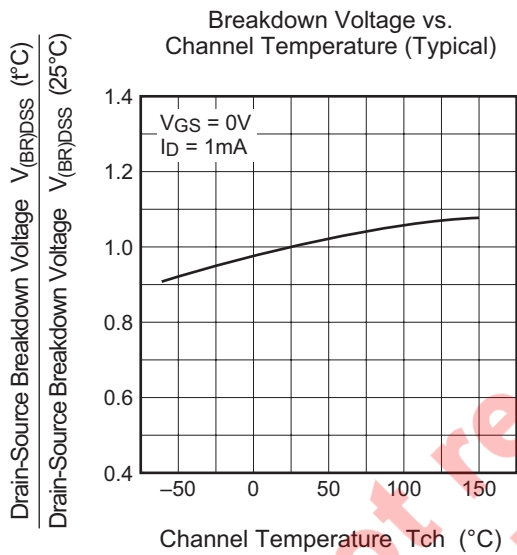
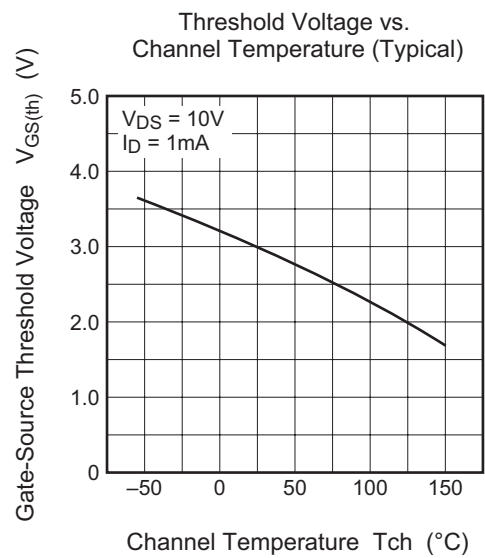
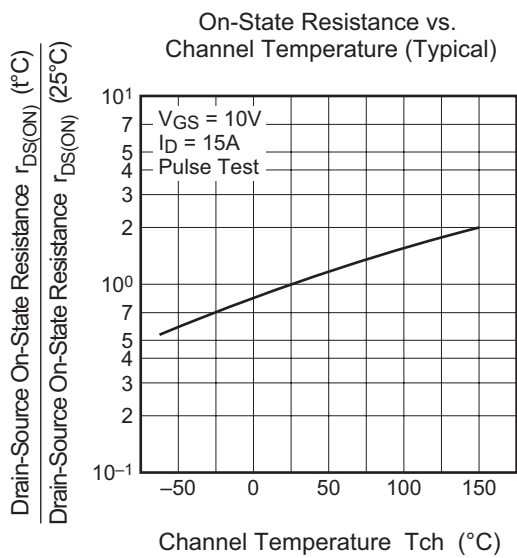


Gate-Source Voltage vs. Gate Charge (Typical)

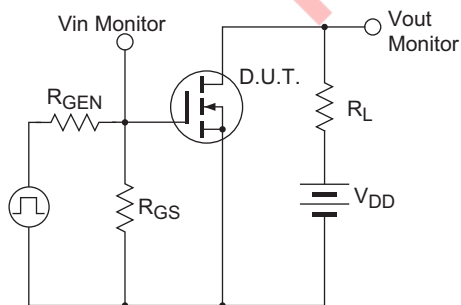


Source-Drain Diode Forward Characteristics (Typical)

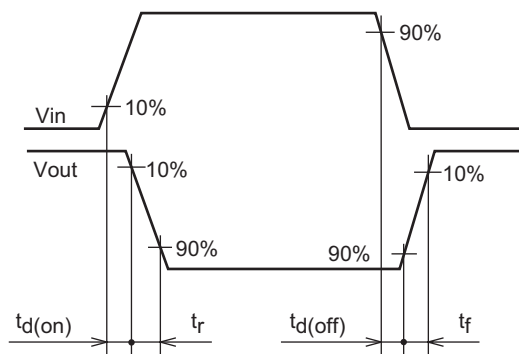




Switching Time Measurement Circuit



Switching Waveform



## Package Dimensions

| Package Name | JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] | Unit: mm |
|--------------|--------------------|--------------|---------------|------------|----------|
| MP-3A        | SC-63              | PRSS0004ZA-A | —             | 0.32g      |          |

The drawing shows three views of the FS30AS-2 package:

- Top View:** Overall width is 6.6 mm. The central body width is  $5.3 \pm 0.2$  mm. The distance from the body edge to the lead edge is  $1 \pm 0.2$  mm. The total height is  $10.4 \text{ Max}$  mm. The lead height is  $2.5 \text{ Min}$  mm. The lead thickness is  $0.76 \pm 0.2$  mm. The lead width is  $2.3 \pm 0.2$  mm. The lead pitch is  $1 \text{ Max}$  mm.
- Side View:** The package height is  $2.3$  mm. The lead height is  $0.5 \pm 0.2$  mm. The lead thickness is  $0.1 \pm 0.1$  mm. The lead width is  $1.4 \pm 0.2$  mm. The lead pitch is  $0.5 \pm 0.2$  mm.
- Bottom View:** The package width is  $2.3$  mm. The lead width is  $1$  mm.

## Order Code

| Lead form            | Standard packing        | Quantity | Standard order code                  | Standard order code example |
|----------------------|-------------------------|----------|--------------------------------------|-----------------------------|
| Surface-mounted type | Taping                  | 3000     | Type name – T +Direction (1 or 2) +3 | FS30AS-2-T13                |
| Surface-mounted type | Plastic Magazine (Tube) | 75       | Type name                            | FS30AS-2                    |

Note : Please confirm the specification about the shipping in detail.

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