

To our customers,

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April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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# RJK1008DPP

N-Channel Power MOSFET  
High-Speed Switching Use

REJ03G1708-0100

Rev.1.00

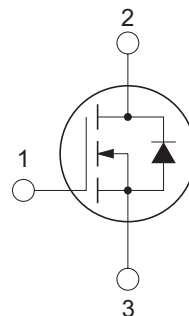
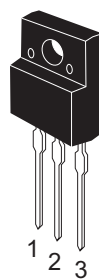
Jul 03, 2008

## Features

- $V_{DSS}$  : 100 V
- $R_{DS(on)}$  : 11 m $\Omega$  (Max)
- $I_D$  : 80 A

## Outline

RENESAS Package code: PRSS0003AB-A  
(Package name : TO-220FN)



1. Gate
2. Drain
3. Source

## Application

- Motor control, Lighting control, Solenoid control, DC-DC converter, etc.

## Absolute Maximum Ratings

( $T_a = 25^\circ\text{C}$ )

| Item                                        | Symbol                    | Ratings     | Unit               |
|---------------------------------------------|---------------------------|-------------|--------------------|
| Drain to source voltage                     | $V_{DSS}$                 | 100         | V                  |
| Gate to source voltage                      | $V_{GSS}$                 | $\pm 20$    | V                  |
| Drain current                               | $I_D$                     | 80          | A                  |
| Drain peak current                          | $I_{D(pulse)}$            | 160         | A                  |
| Body-drain diode reverse drain current      | $I_{DR}$                  | 80          | A                  |
| Body-drain diode reverse drain peak current | $I_{DR(pulse)}$           | 160         | A                  |
| Avalanche current                           | $I_{AP}$ <sup>Note2</sup> | 40          | A                  |
| Channel dissipation                         | $P_{ch}$ <sup>Note1</sup> | 45          | W                  |
| Channel to case thermal impedance           | $\theta_{ch-c}$           | 2.78        | $^\circ\text{C/W}$ |
| Channel temperature                         | $T_{ch}$                  | 150         | $^\circ\text{C}$   |
| Storage temperature                         | $T_{stg}$                 | -55 to +150 | $^\circ\text{C}$   |

Notes: 1. Value at  $T_c = 25^\circ\text{C}$

2.  $ST_{ch} = 25^\circ\text{C}$ ,  $T_{ch} \leq 150^\circ\text{C}$ ,  $L = 100 \mu\text{H}$

## Electrical Characteristics

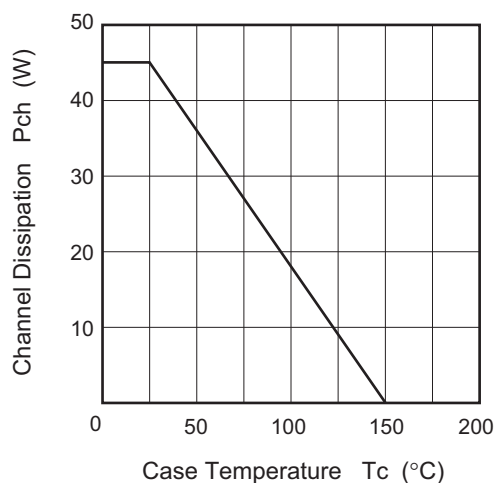
(Ta = 25°C)

| Item                                       | Symbol        | Min | Typ  | Max       | Unit             | Test conditions                                                                                 |
|--------------------------------------------|---------------|-----|------|-----------|------------------|-------------------------------------------------------------------------------------------------|
| Drain to source breakdown voltage          | $V_{(BR)DSS}$ | 100 | —    | —         | V                | $I_D = 1 \text{ mA}$ , $V_{GS} = 0$                                                             |
| Zero gate voltage drain current            | $I_{DSS}$     | —   | —    | 100       | $\mu\text{A}$    | $V_{DS} = 100 \text{ V}$ , $V_{GS} = 0$                                                         |
| Gate to source leak current                | $I_{GSS}$     | —   | —    | $\pm 0.1$ | $\mu\text{A}$    | $V_{GS} = \pm 20 \text{ V}$ , $V_{DS} = 0$                                                      |
| Gate to source cutoff voltage              | $V_{GS(off)}$ | 2.0 | 3.0  | 4.0       | V                | $I_D = 1 \text{ mA}$ , $V_{DS} = 10 \text{ V}$ <sup>Note3</sup>                                 |
| Static drain to source on state voltage    | $V_{DS(on)}$  | —   | 0.34 | 0.44      | V                | $I_D = 40 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note3</sup>                                 |
| Static drain to source on state resistance | $R_{DS(on)}$  | —   | 8.5  | 11        | $\text{m}\Omega$ | $I_D = 40 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note3</sup>                                 |
| Input capacitance                          | $C_{iss}$     | —   | 5200 | —         | pF               | $V_{DS} = 10 \text{ V}$<br>$V_{GS} = 0$<br>$f = 1 \text{ MHz}$                                  |
| Output capacitance                         | $C_{oss}$     | —   | 820  | —         | pF               |                                                                                                 |
| Reverse transfer capacitance               | $C_{rss}$     | —   | 220  | —         | pF               |                                                                                                 |
| Turn-on delay time                         | $t_{d(on)}$   | —   | 52   | —         | ns               | $V_{DD} = 50 \text{ V}$<br>$I_D = 40 \text{ A}$<br>$V_{GS} = 10 \text{ V}$<br>$R_G = 25 \Omega$ |
| Rise time                                  | $t_r$         | —   | 100  | —         | ns               |                                                                                                 |
| Turn-off delay time                        | $t_{d(off)}$  | —   | 230  | —         | ns               |                                                                                                 |
| Fall time                                  | $t_f$         | —   | 125  | —         | ns               |                                                                                                 |
| Body-drain diode forward voltage           | $V_{DF}$      | —   | 0.9  | 1.5       | V                | $I_F = 40 \text{ A}$ , $V_{GS} = 0$                                                             |
| Body-drain diode reverse recovery time     | $t_{rr}$      | —   | 70   | —         | ns               | $I_F = 80 \text{ A}$ , $V_{GS} = 0$<br>$di_F/dt = 100 \text{ A}/\mu\text{s}$                    |

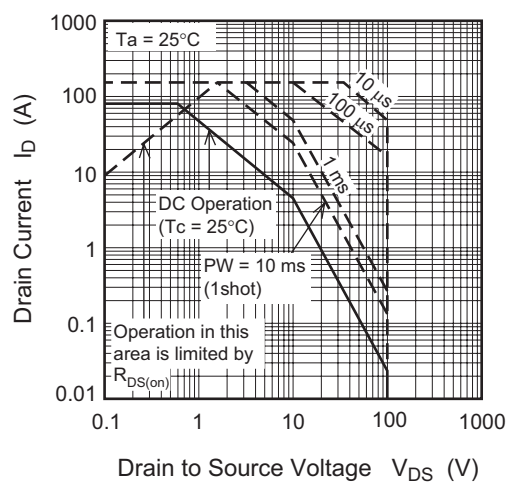
Notes: 3. Pulse test

## Main Characteristics

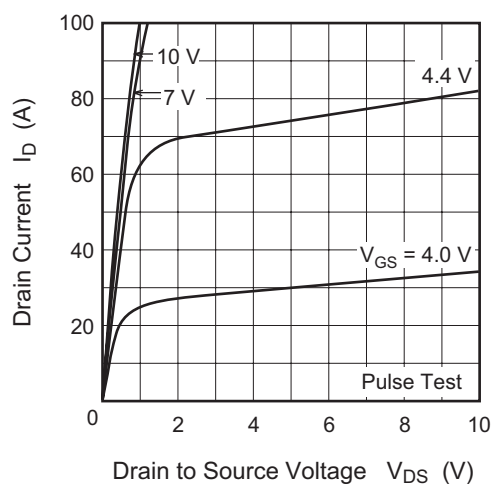
Power vs. Temperature Derating



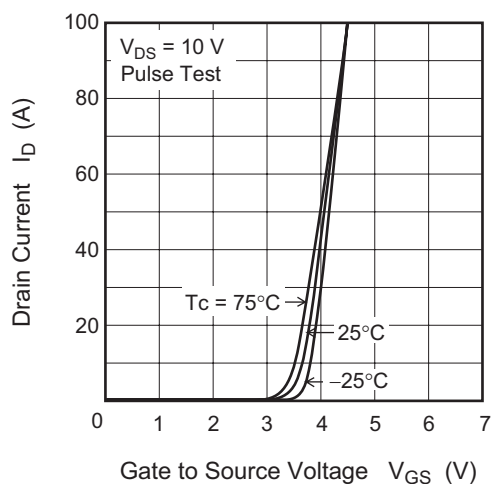
Maximum Safe Operation Area



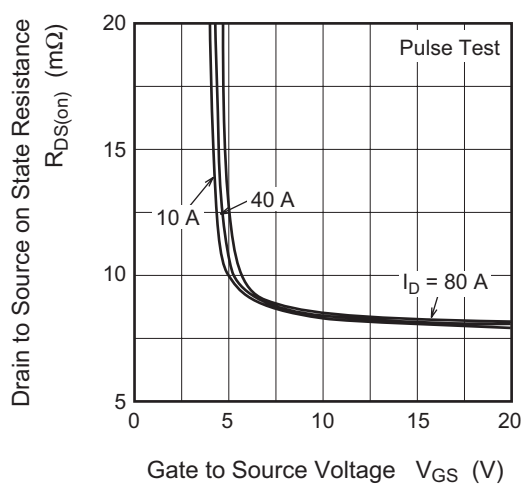
Typical Output Characteristics



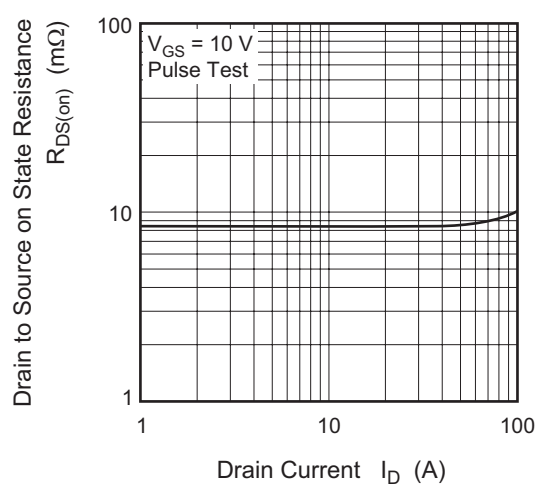
Typical Transfer Characteristics

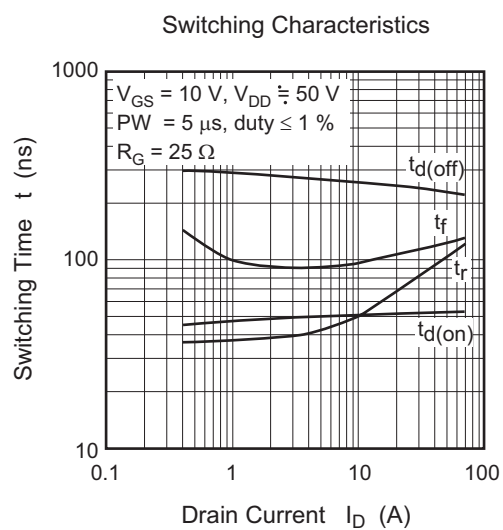
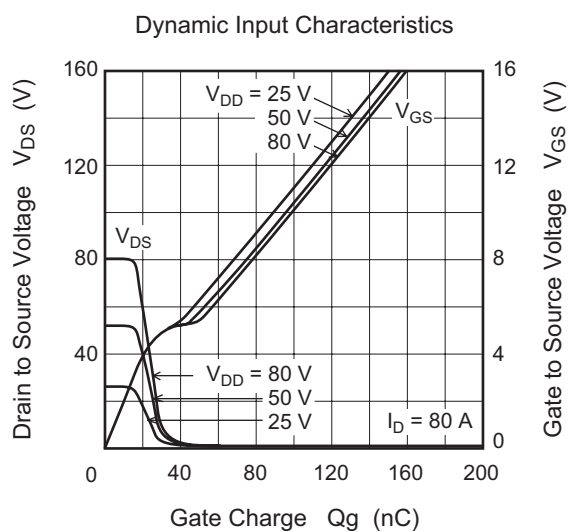
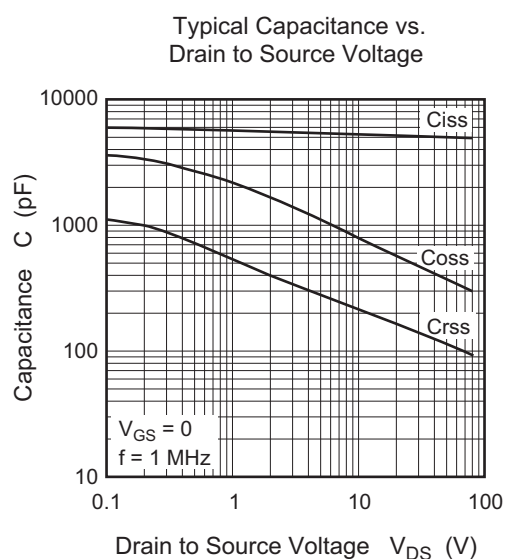
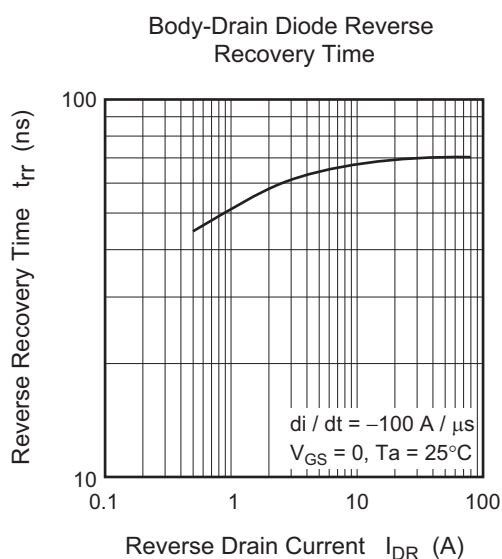
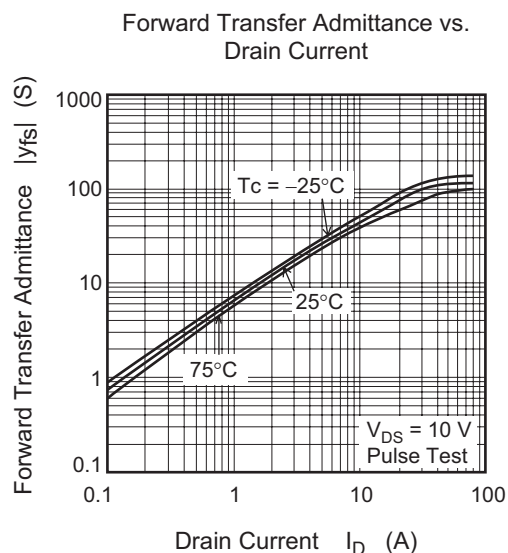
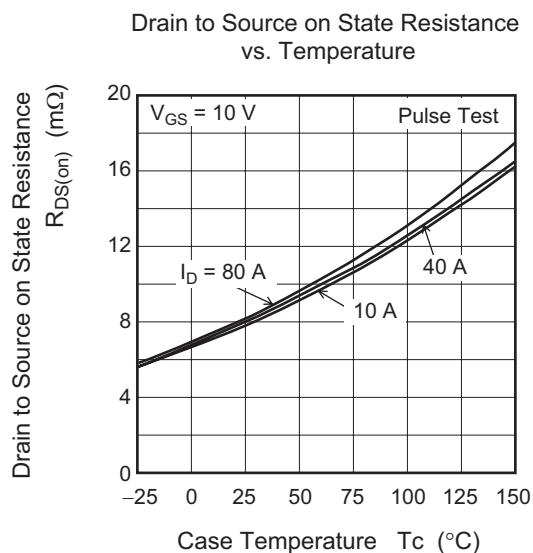


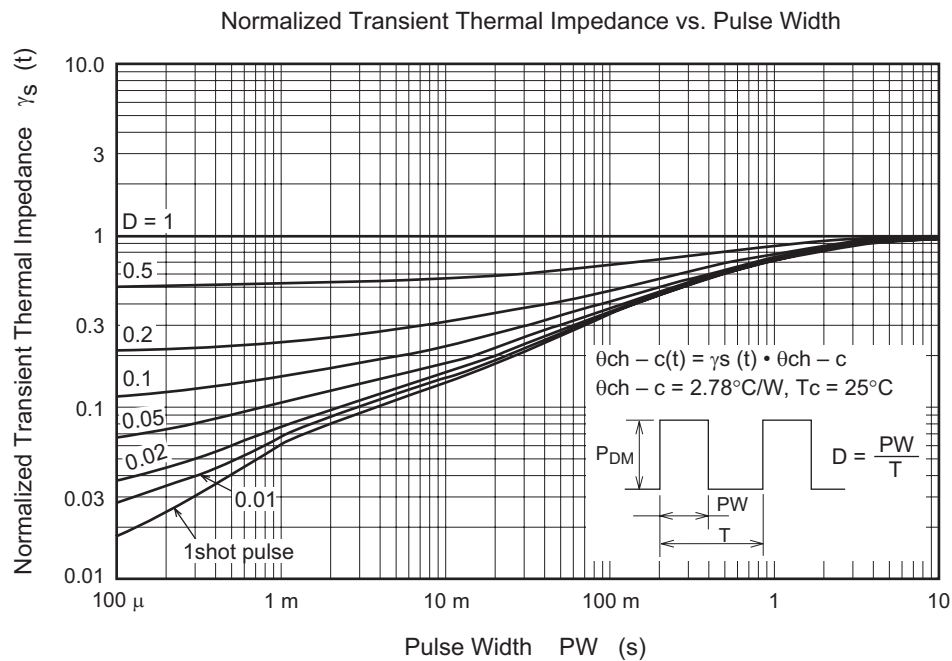
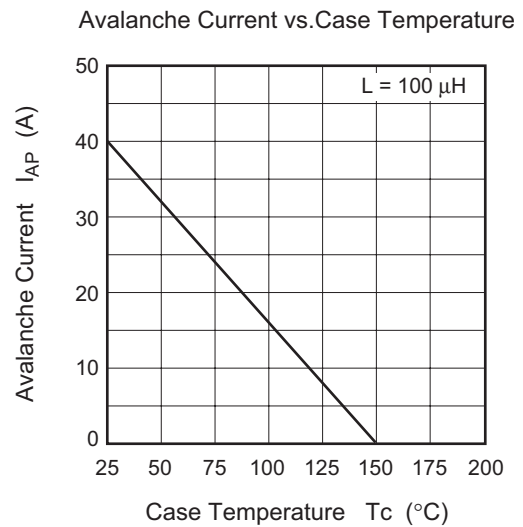
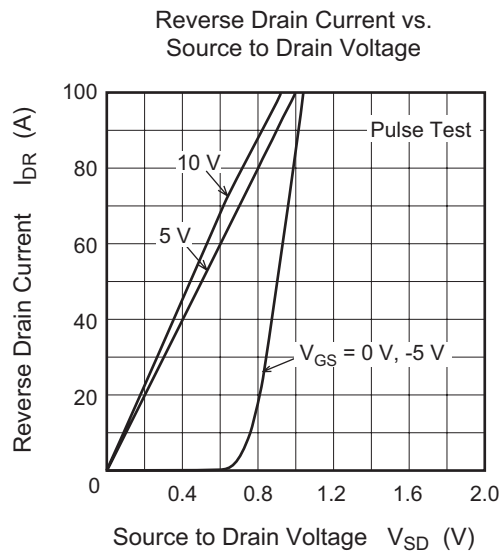
Drain to Source on State Resistance vs. Gate to Source Voltage



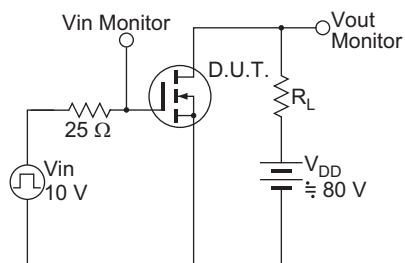
Drain to Source on State Resistance vs. Drain Current



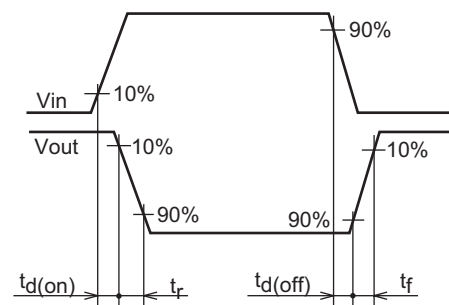




Switching Time Test Circuit



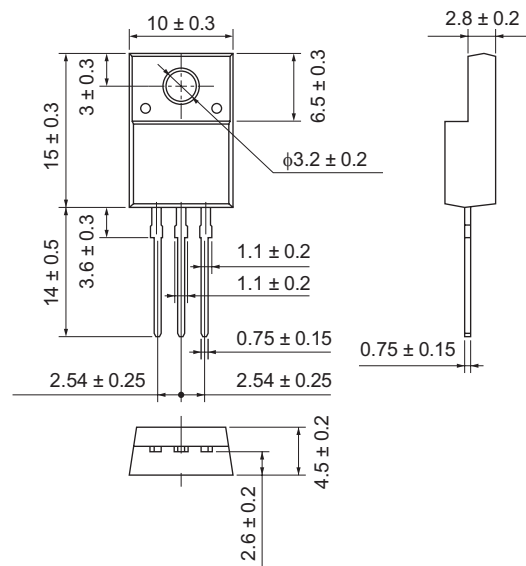
Waveform



## Package Dimensions

| Package Name | JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] |
|--------------|--------------------|--------------|---------------|------------|
| TO-220FN     | —                  | PRSS0003AB-A | —             | 2.0g       |

Unit: mm



## Ordering Information

| Part No.         | Quantity | Shipping Container |
|------------------|----------|--------------------|
| RJK1008DPP-00-T2 | 50 pcs   | Magazine (Tube)    |

Notes:

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