# RJK1021DPN

## N-Channel Power MOSFET
## High-Speed Switching Use

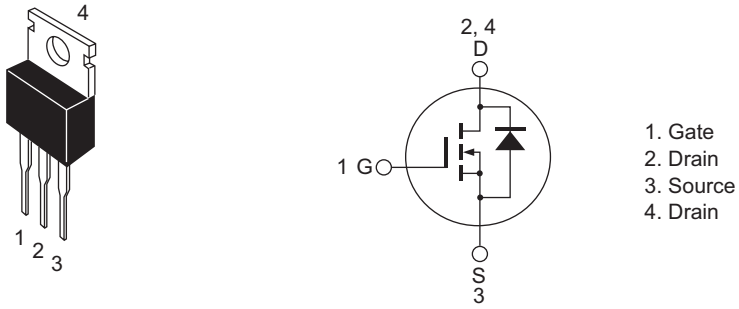
REJ03G1628-0100
Rev.1.00
Apr 02, 2008

### Features

- $V_{DSS}$ : 100 V
- $R_{DS(on)}$ : 20 mΩ (Max)
- $I_D$ : 70 A

### Outline

RENESAS Package code: PRSS0004AC-A
(Package name: TO-220AB)




### Application

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

### Absolute Maximum Ratings

(Ta = 25°C)

| Item | Symbol | Ratings | Unit |
|---|---|---|---|
| Drain to source voltage | $V_{DSS}$ | 100 | V |
| Gate to source voltage | $V_{GSS}$ | ±20 | V |
| Drain current | $I_D$ | 70 | A |
| Drain peak current | $I_{D\ (pulse)}$ | 140 | A |
| Body-drain diode reverse drain current | $I_{DR}$ | 70 | A |
| Body-drain diode reverse drain peak current | $I_{DR\ (pulse)}$ | 140 | A |
| Avalanche current | $I_{AP}$ Note2 | 35 | A |
| Channel dissipation | Pch Note1 | 100 | W |
| Channel to case thermal impedance | θch-c | 1.25 | °C/W |
| Channel temperature | Tch | 150 | °C |
| Storage temperature | Tstg | –55 to +150 | °C |

Notes: 1. Value at Tc = 25°C
2. STch = 25°C, Tch ≤ 150°C, L = 100 µH

## Electrical Characteristics

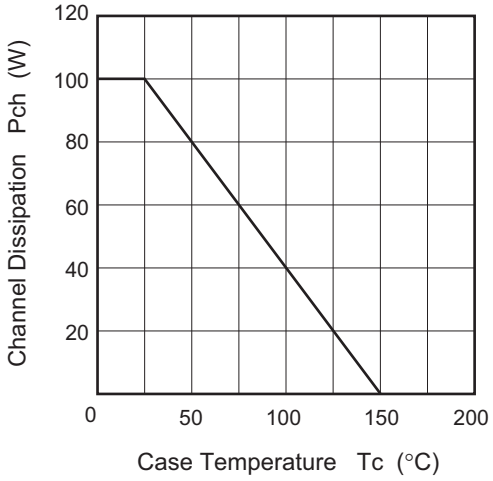
(Ta = 25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test conditions |
|---|---|---|---|---|---|---|
| Drain to source breakdown voltage | $V_{(BR)DSS}$ | 100 | — | — | V | $I_D$ = 1 mA, $V_{GS}$ = 0 |
| Zero gate voltage drain current | $I_{DSS}$ | — | — | 100 | µA | $V_{DS}$ = 100 V, $V_{GS}$ = 0 |
| Gate to source leak current | $I_{GSS}$ | — | — | ±0.1 | µA | $V_{GS}$ = ±20 V, $V_{DS}$ = 0 |
| Gate to source cutoff voltage | $V_{GS(off)}$ | 2.0 | 3.0 | 4.0 | V | $I_D$ = 1 mA, $V_{DS}$ = 10 V Note3 |
| Static drain to source on state voltage | $V_{DS(on)}$ | — | 0.56 | 0.70 | V | $I_D$ = 35 A, $V_{GS}$ = 10 V Note3 |
| Static drain to source on state resistance | $R_{DS(on)}$ | — | 16 | 20 | mΩ | $I_D$ = 35 A, $V_{GS}$ = 10 V Note3 |
| Input capacitance | Ciss | — | 2600 | — | pF | $V_{DS}$ = 10 V<br>$V_{GS}$ = 0<br>f = 1 MHz |
| Output capacitance | Coss | — | 430 | — | pF | |
| Reverse transfer capacitance | Crss | — | 160 | — | pF | |
| Turn-on delay time | $t_{d(on)}$ | — | 30 | — | ns | $V_{DD}$ = 50 V<br>$I_D$ = 35 A<br>$V_{GS}$ = 10 V<br>$R_G$ = 25 Ω |
| Rise time | $t_r$ | — | 70 | — | ns | |
| Turn-off delay time | $t_{d(off)}$ | — | 110 | — | ns | |
| Fall time | $t_f$ | — | 65 | — | ns | |
| Body-drain diode forward voltage | $V_{DF}$ | — | 0.9 | 1.5 | V | $I_F$ = 35 A, $V_{GS}$ = 0 |
| Body-drain diode reverse recovery time | $t_{rr}$ | — | 80 | — | ns | $I_F$ = 70 A, $V_{GS}$ = 0<br>$di_F/dt$ = 100 A/µs |

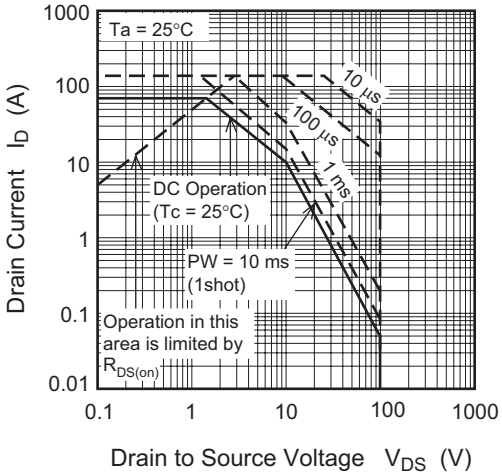
Notes: 3. Pulse test

## Main Characteristics

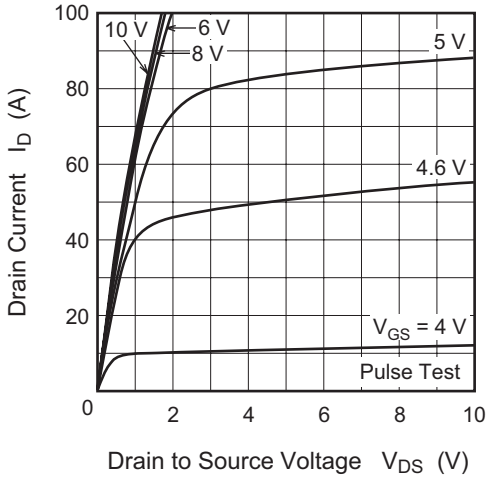
Power vs. Temperature Derating



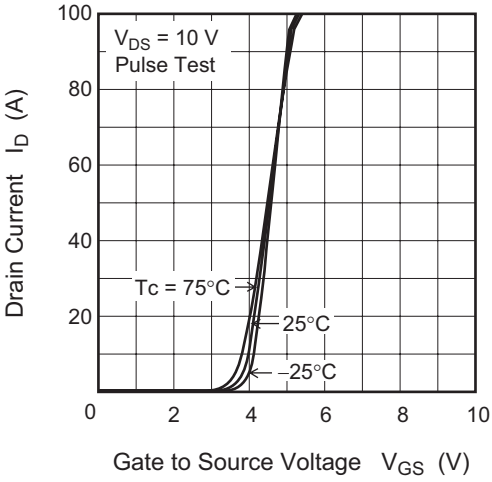

Maximum Safe Operation Area



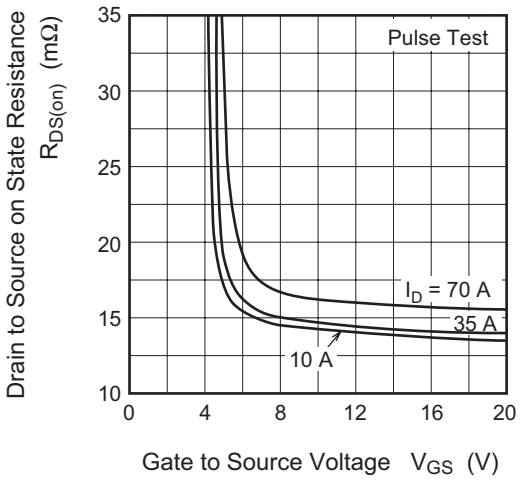

Typical Output Characteristics



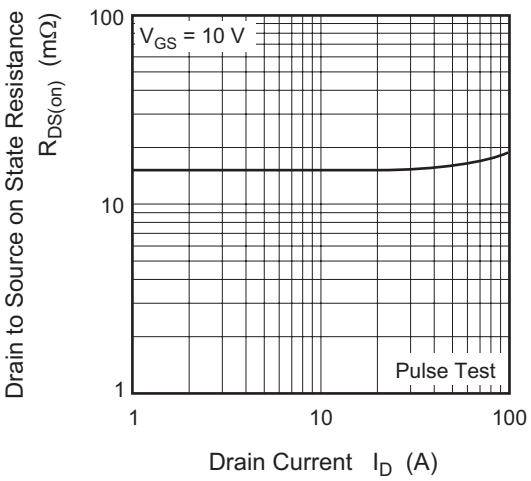

Typical Transfer Characteristics



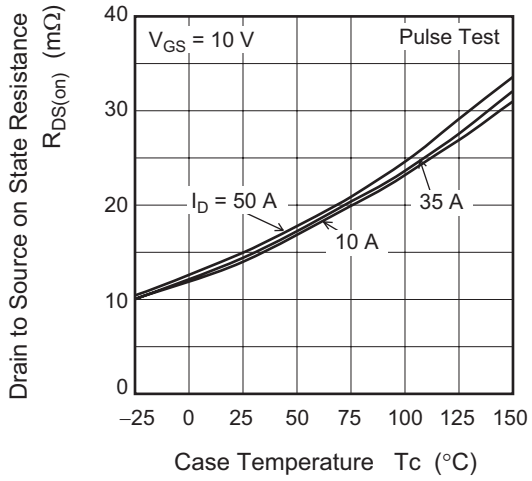

Drain to Source on State Resistance vs. Gate to Source Voltage



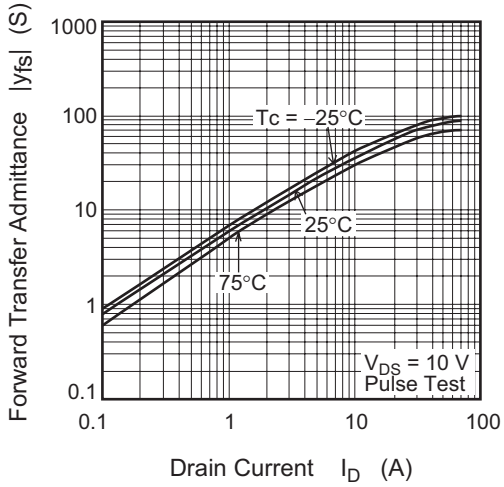

Drain to Source on State Resistance vs. Drain Current



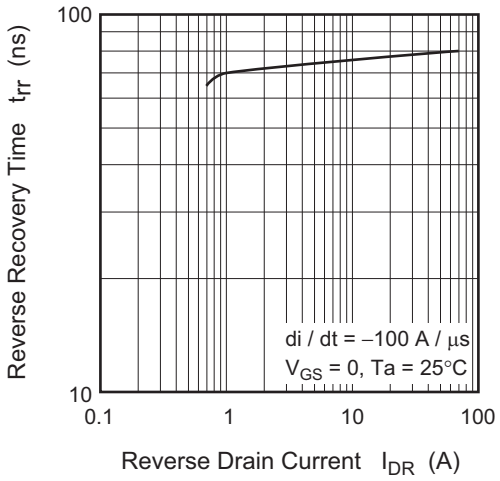
Drain to Source on State Resistance vs. Temperature



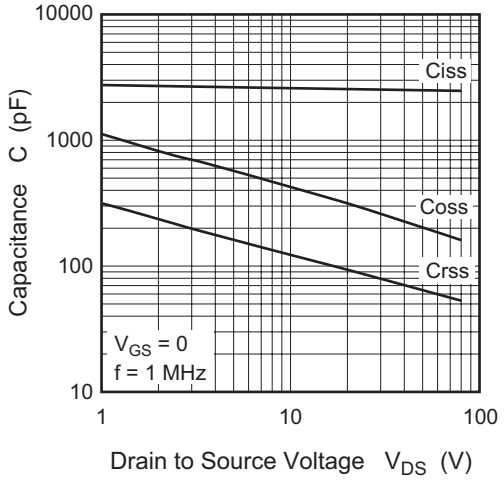

Forward Transfer Admittance vs. Drain Current



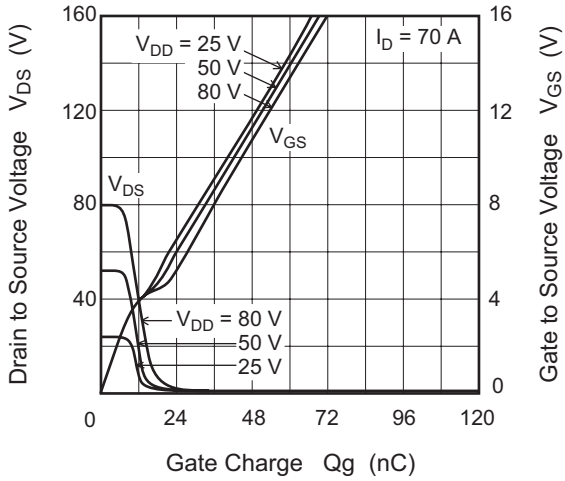

Body-Drain Diode Reverse Recovery Time



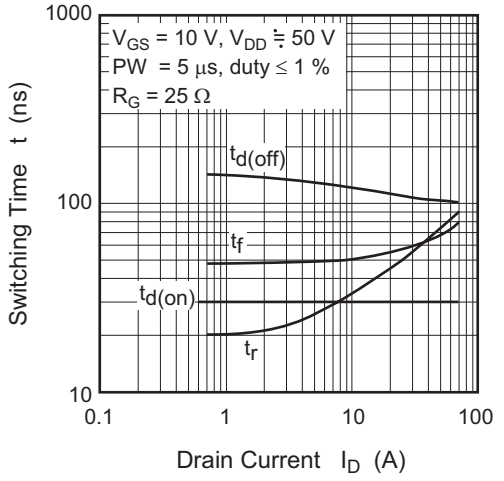

Typical Capacitance vs. Drain to Source Voltage



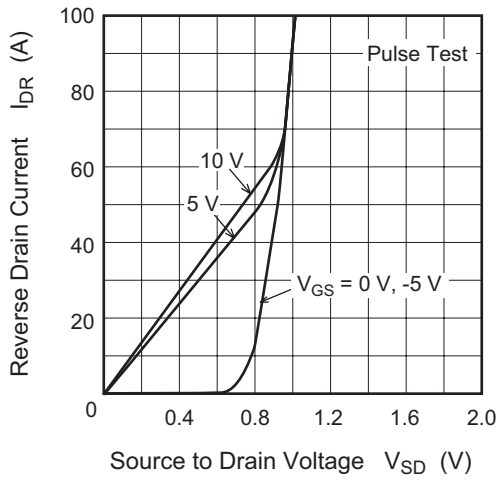

Dynamic Input Characteristics



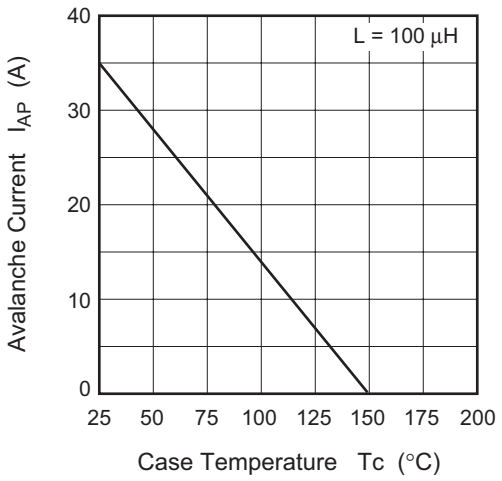

Switching Characteristics



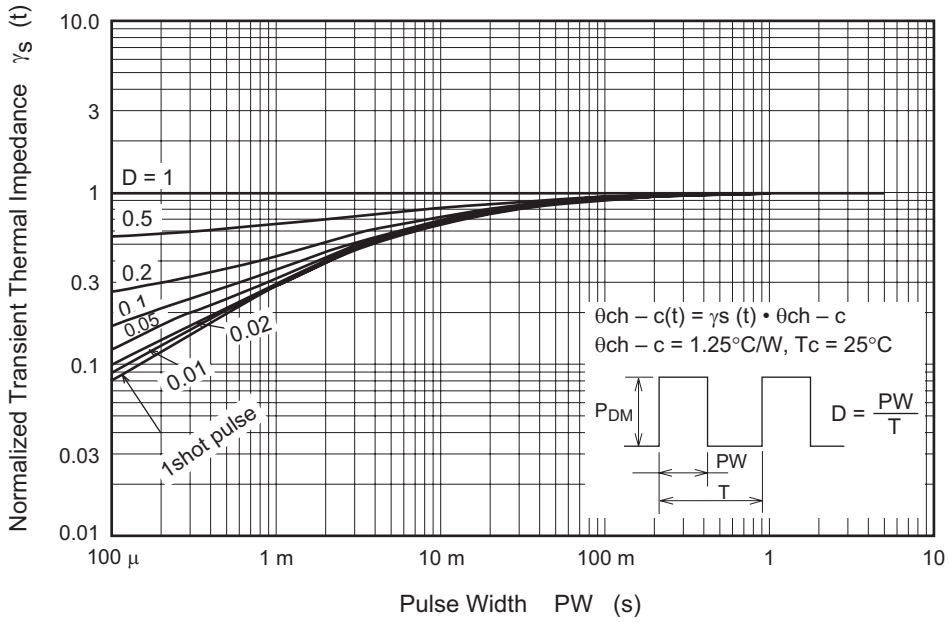
Reverse Drain Current vs.
Source to Drain Voltage



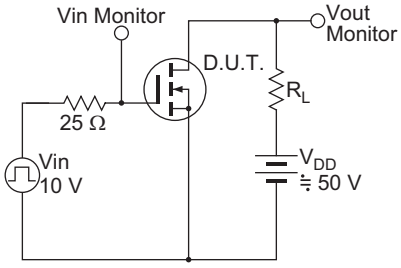

Avalanche Current vs.Case Temperature



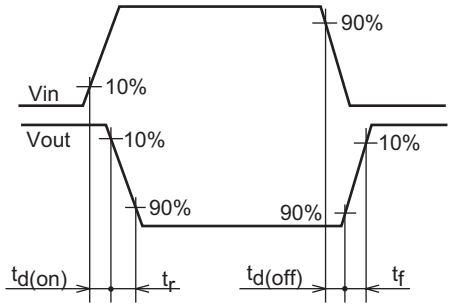

Normalized Transient Thermal Impedance vs. Pulse Width




Switching Time Test Circuit



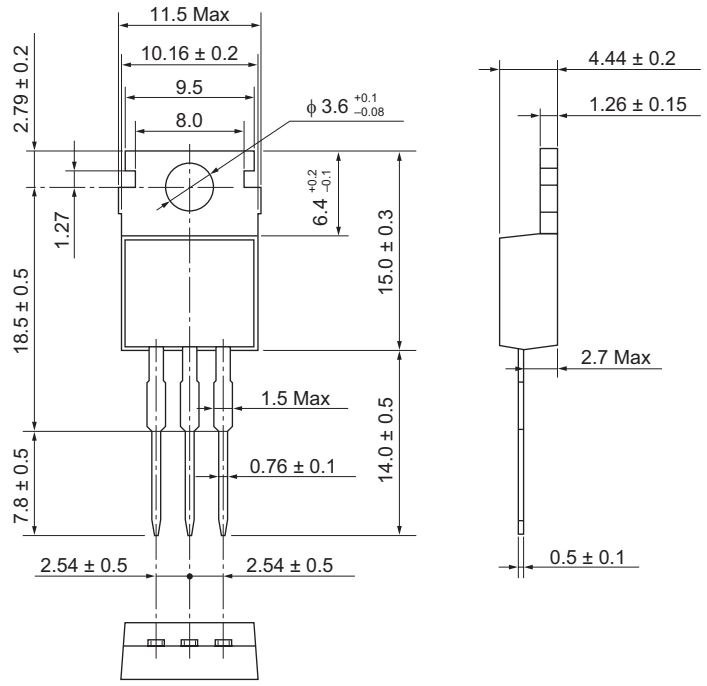

Waveform



## Package Dimensions

| Package Name | JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] |
|---|---|---|---|---|
| TO-220AB | SC-46 | PRSS0004AC-A | TO-220AB / TO-220ABV | 1.8g |

Unit: mm




## Ordering Information

| Part No. | Quantity | Shipping Container |
|---|---|---|
| RJK1021DPN-00-00 | 500 pcs | Box (Sack) |

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