# RJL5015DPK

## Silicon N Channel MOS FET
## High Speed Power Switching

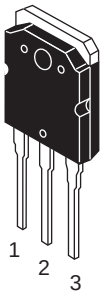
REJ03G1912-0100
Rev.1.00
May 27, 2010

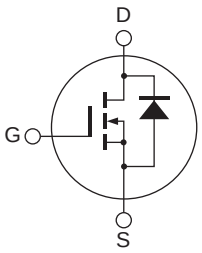
### Features

- Built-in fast recovery diode
- Low on-resistance
  $R_{DS(on)}$ = 0.23 Ω typ. (at $I_D$ = 11 A, $V_{GS}$ = 10 V, Ta = 25°C)
- Low leakage current
- High speed switching

### Outline

RENESAS Package code: PRSS0004ZE-A
(Package name:TO-3P)




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

### Absolute Maximum Ratings

(Ta = 25°C)

| Item | Symbol | Ratings | Unit |
|---|---|---|---|
| Drain to source voltage | $V_{DSS}$ | 500 | V |
| Gate to source voltage | $V_{GSS}$ | ±30 | V |
| Drain current | $I_D$ | 22 | A |
| Drain peak current | $I_{D\ (pulse)}^{Note1}$ | 66 | A |
| Body-drain diode reverse drain current | $I_{DR}$ | 22 | A |
| Body-drain diode reverse drain peak current | $I_{DR\ (pulse)}^{Note1}$ | 66 | A |
| Avalanche current | $I_{AP}^{Note3}$ | 7 | A |
| Avalanche energy | $E_{AR}^{Note3}$ | 2.7 | mJ |
| Channel dissipation | $Pch^{Note2}$ | 150 | W |
| Channel to case thermal impedance | θch-c | 0.833 | °C/W |
| Channel temperature | Tch | 150 | °C |
| Storage temperature | Tstg | –55 to +150 | °C |

Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1%
2. Value at Tc = 25°C
3. STch = 25°C, Tch ≤ 150°C

## Electrical Characteristics

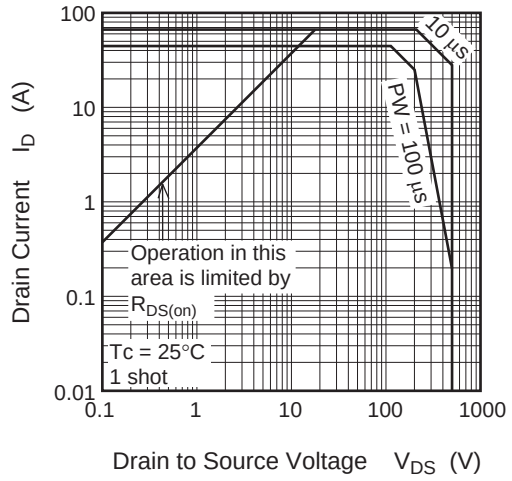
(Ta = 25°C)

| 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 |
| Zero gate voltage drain current | $I_{DSS}$ | — | — | 10 | μA | $V_{DS}$ = 500 V, $V_{GS}$ = 0 |
| Gate to source leak current | $I_{GSS}$ | — | — | ±0.1 | μA | $V_{GS}$ = ±30 V, $V_{DS}$ = 0 |
| Gate to source cutoff voltage | $V_{GS(off)}$ | 1.5 | — | 4.0 | V | $V_{DS}$ = 10 V, $I_D$ = 1 mA |
| Static drain to source on state resistance | $R_{DS(on)}$ | — | 0.23 | 0.27 | Ω | $I_D$ = 11 A, $V_{GS}$ = 10 V Note4 |
| Input capacitance | Ciss | — | 2400 | — | pF | $V_{DS}$ = 25 V<br>$V_{GS}$ = 0<br>f = 1 MHz |
| Output capacitance | Coss | — | 264 | — | pF | |
| Reverse transfer capacitance | Crss | — | 32 | — | pF | |
| Turn-on delay time | $t_{d(on)}$ | — | 36 | — | ns | $I_D$ = 11 A<br>$V_{GS}$ = 10 V<br>$R_L$ = 22.7 Ω<br>Rg = 10 Ω |
| Rise time | $t_r$ | — | 28 | — | ns | |
| Turn-off delay time | $t_{d(off)}$ | — | 108 | — | ns | |
| Fall time | $t_f$ | — | 50 | — | ns | |
| Total gate charge | Qg | — | 66 | — | nC | $V_{DD}$ = 400 V<br>$V_{GS}$ = 10 V<br>$I_D$ = 22 A |
| Gate to source charge | Qgs | — | 12 | — | nC | |
| Gate to drain charge | Qgd | — | 29 | — | nC | |
| Body-drain diode forward voltage | $V_{DF}$ | — | 0.91 | 1.55 | V | $I_F$ = 22 A, $V_{GS}$ = 0 Note4 |
| Body-drain diode reverse recovery time | $t_{rr}$ | — | 140 | — | ns | $I_F$ = 22 A, $V_{GS}$ = 0<br>$di_F/dt$ = 100 A/μs |

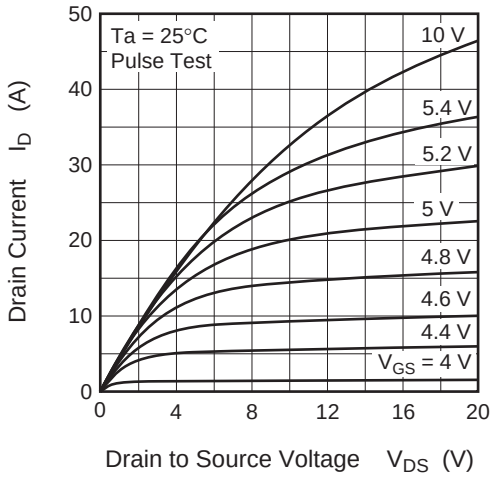
Notes: 4. Pulse test

## Main Characteristics

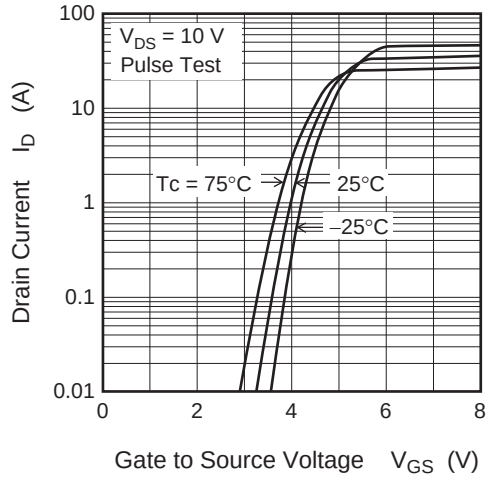
Maximum Safe Operation Area



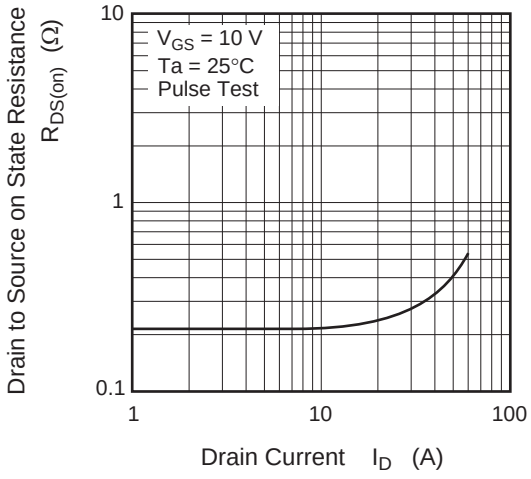

Typical Output Characteristics



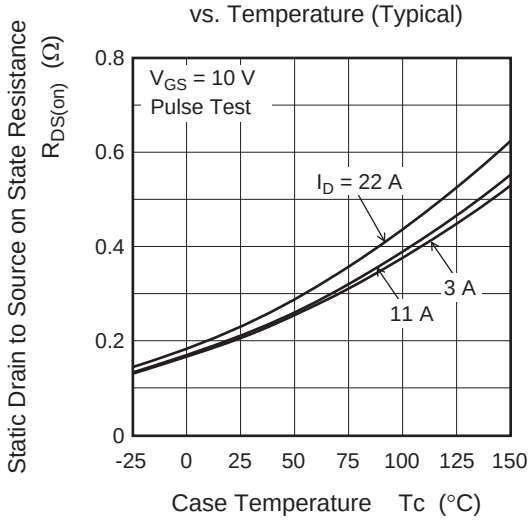

Typical Transfer Characteristics



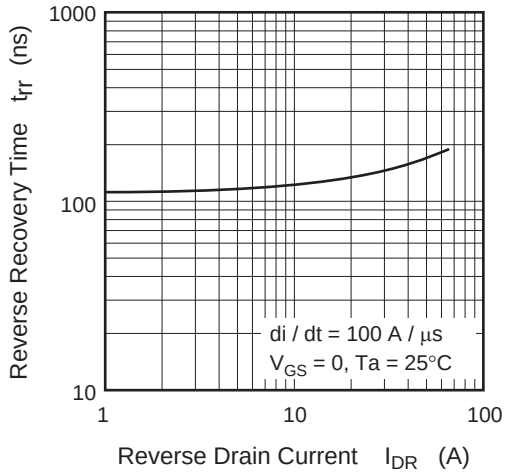

Static Drain to Source on State Resistance vs. Drain Current (Typical)



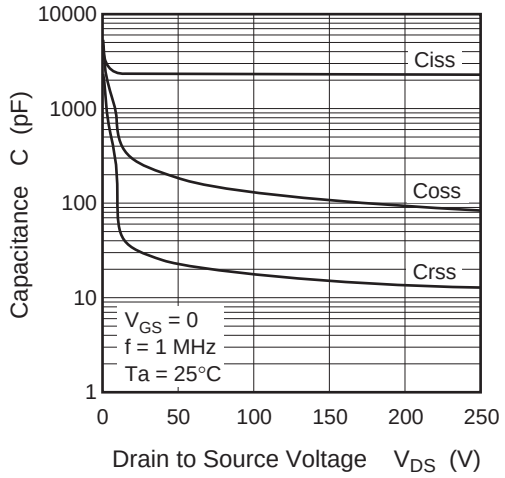

Static Drain to Source on State Resistance vs. Temperature (Typical)



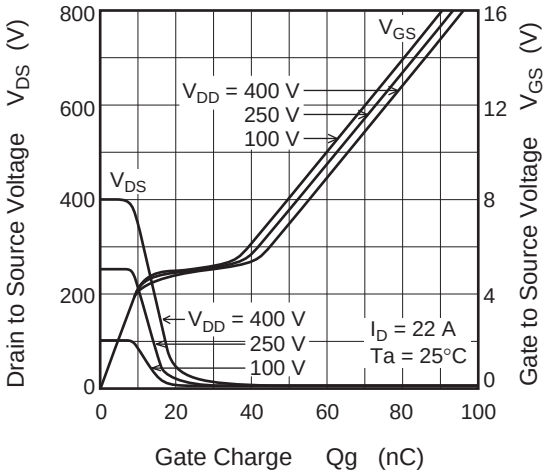

Body-Drain Diode Reverse Recovery Time (Typical)



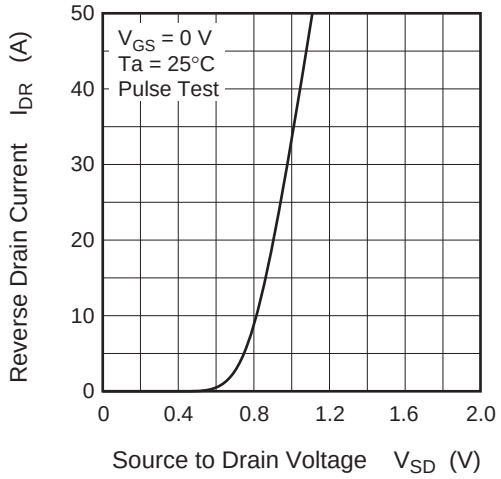
Typical Capacitance vs.
Drain to Source Voltage



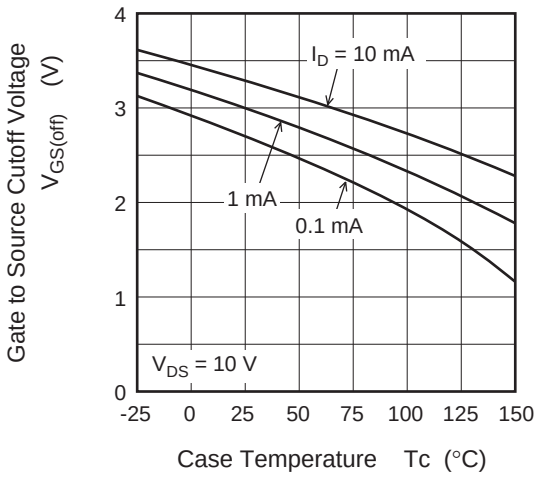

Dynamic Input Characteristics (Typical)



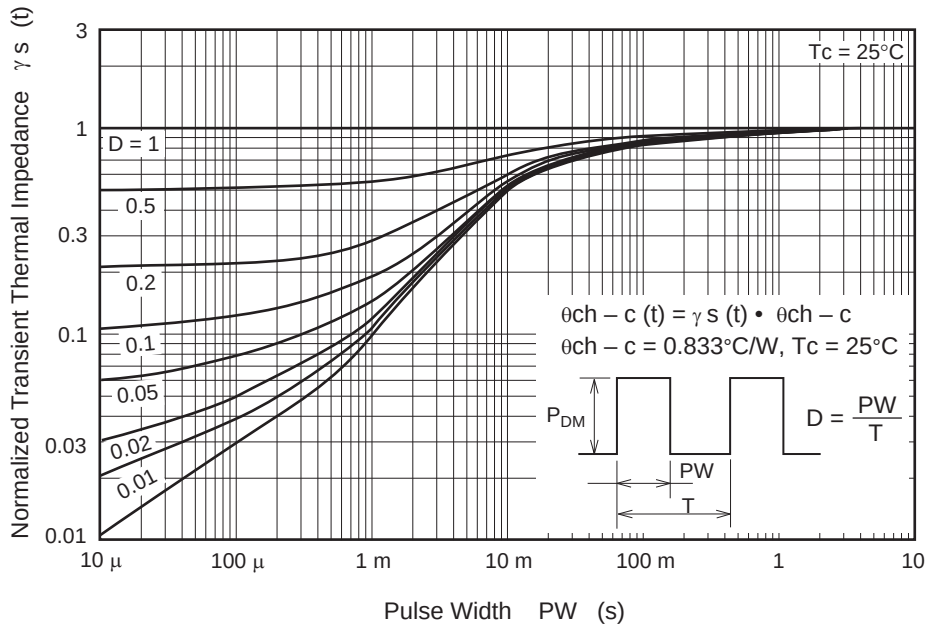

Reverse Drain Current vs.
Source to Drain Voltage (Typical)



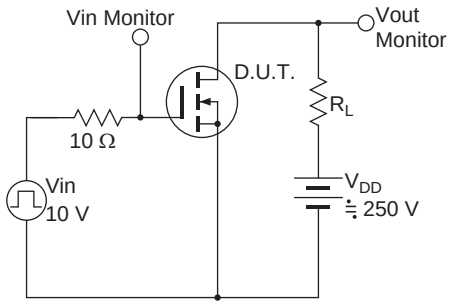

Gate to Source Cutoff Voltage
vs. Case Temperature (Typical)



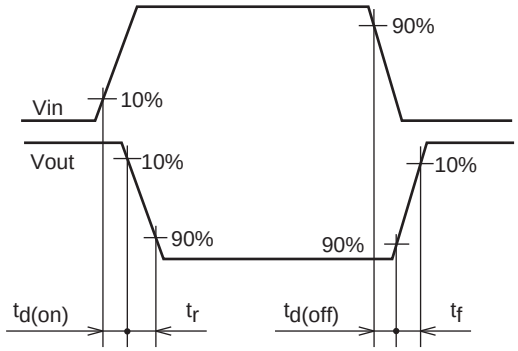
Normalized Transient Thermal Impedance vs. Pulse Width




Switching Time Test Circuit



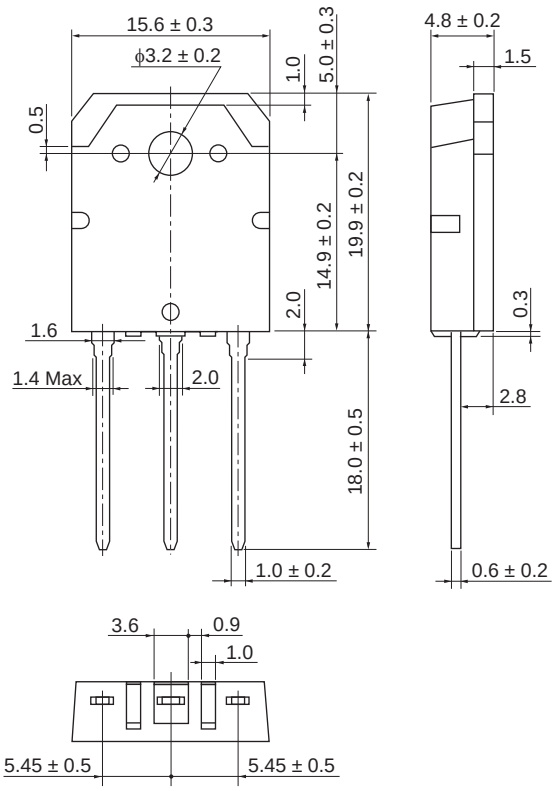

Waveform



## Package Dimensions

| Package Name | JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] |
|---|---|---|---|---|
| TO-3P | SC-65 | PRSS0004ZE-A | TO-3P / TO-3PV | 5.0g |

Unit: mm




## Ordering Information

| Part No. | Quantity | Shipping Container |
|---|---|---|
| RJL5015DPK-00-T0 | 360 pcs | Box (Tube) |

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