# H5N5007P

Silicon N Channel MOS FET
High Speed Power Switching

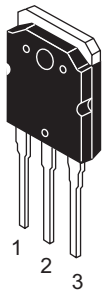
REJ03G1116-0400
(Previous: ADE-208-1404B)
Rev.4.00
Sep 07, 2005

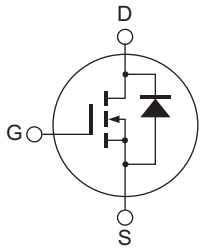
## Features

- Low on-resistance
- Low leakage current
- High speed switching
- Low gate charge

## 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 | Value | Unit |
|---|---|---|---|
| Drain to source voltage | $V_{DSS}$ | 500 | V |
| Gate to source voltage | $V_{GSS}$ | ±30 | V |
| Drain current | $I_D$ | 25 | A |
| Drain peak current | $I_{D\ (pulse)}$ Note 1 | 100 | A |
| Body-drain diode reverse drain current | $I_{DR}$ | 25 | A |
| Avalanche current | $I_{AP}$ Note 3 | 7 | A |
| Channel dissipation | Pch Note 2 | 150 | W |
| Channel to case thermal Impedance | θ ch-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. Tch ≤ 150°C

## Electrical Characteristics

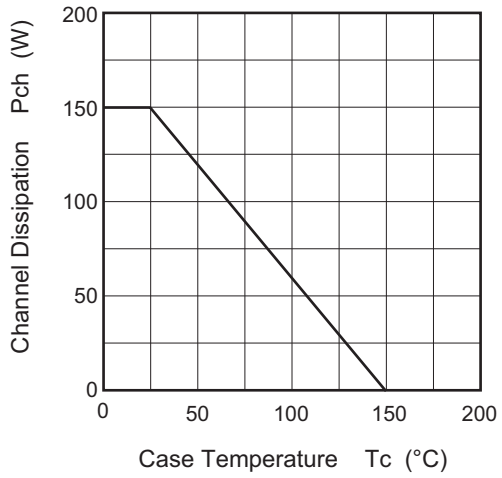
(Ta = 25°C)

| 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 |
| Gate to source leak current | $I_{GSS}$ | — | — | ±0.1 | µA | $V_{GS}$ = ±30 V, $V_{DS}$ = 0 |
| Zero gate voltage drain current | $I_{DSS}$ | — | — | 1 | µA | $V_{DS}$ = 500 V, $V_{GS}$ = 0 |
| Gate to source cutoff voltage | $V_{GS\ (off)}$ | 3.0 | — | 4.0 | V | $I_D$ = 1 mA, $V_{DS}$ = 10 V |
| Static drain to source on state resistance | $R_{DS\ (on)}$ | — | 0.18 | 0.225 | Ω | $I_D$ = 12.5 A, $V_{GS}$ = 10 V Note 4 |
| Forward transfer admittance | $\|y_{fs}\|$ | 14 | 24 | — | S | $I_D$ = 12.5 A, $V_{DS}$ = 10 V Note 4 |
| Input capacitance | Ciss | — | 3900 | — | pF | $V_{DS}$ = 25 V |
| Output capacitance | Coss | — | 375 | — | pF | $V_{GS}$ = 0 |
| Reverse transfer capacitance | Crss | — | 78 | — | pF | f = 1 MHz |
| Turn-on delay time | $t_{d\ (on)}$ | — | 55 | — | ns | $I_D$ = 12.5 A |
| Rise time | $t_r$ | — | 110 | — | ns | $V_{GS}$ = 10 V |
| Turn-off delay time | $t_{d\ (off)}$ | — | 225 | — | ns | $R_L$ = 20 Ω |
| Fall time | $t_f$ | — | 110 | — | ns | Rg = 10 Ω |
| Total gate charge | Qg | — | 135 | — | nC | $V_{DD}$ = 400 V |
| Gate to source charge | Qgs | — | 22 | — | nC | $V_{GS}$ = 10 V |
| Gate to drain charge | Qgd | — | 74 | — | nC | $I_D$ = 25 A |
| Body-drain diode forward voltage | $V_{DF}$ | — | 0.9 | 1.4 | V | $I_F$ = 25 A, $V_{GS}$ = 0 |
| Body-drain diode reverse recovery time | $t_{rr}$ | — | 390 | — | ns | $I_F$ = 25 A, $V_{GS}$ = 0 |
| Body-drain diode reverse recovery charge | $Q_{rr}$ | — | 5 | — | µC | $di_F/dt$ = 100 A/µs |

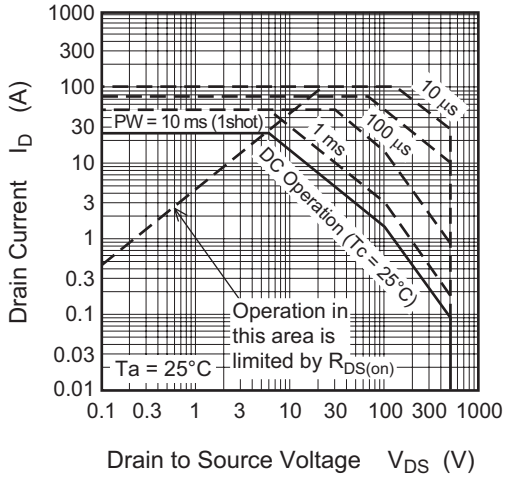
Note: 4. Pulse test

## Main Characteristics

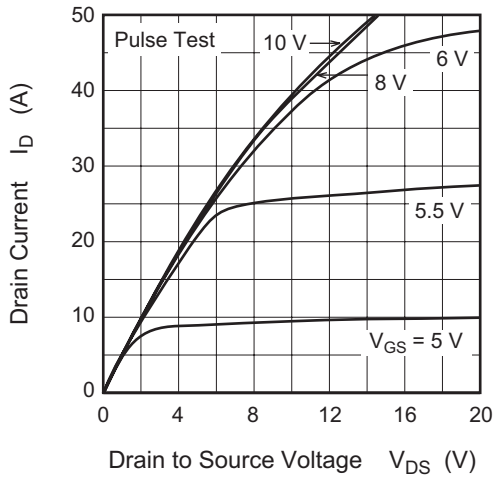
Power vs. Temperature Derating



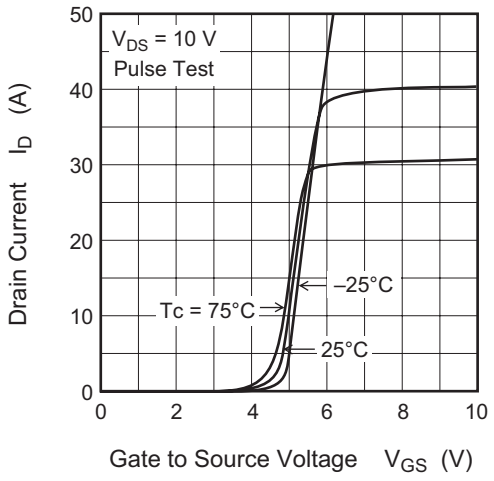

Maximum Safe Operation Area



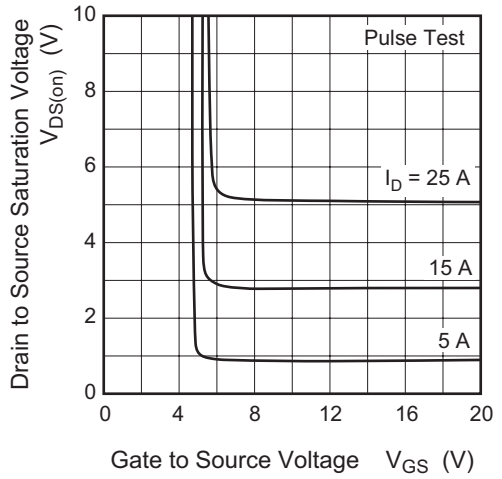

Typical Output Characteristics



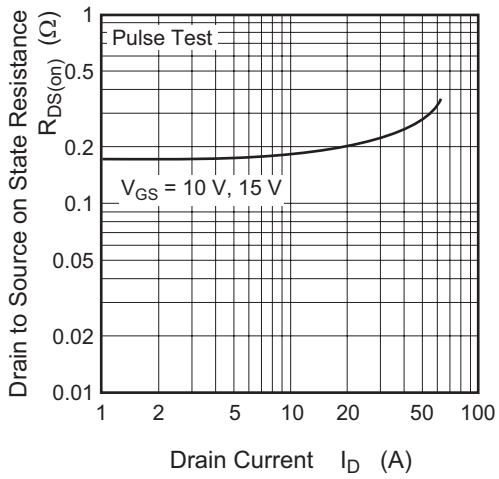

Typical Transfer Characteristics



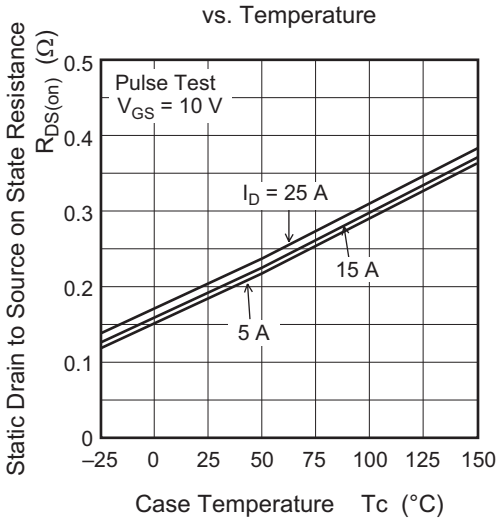

Drain to Source Saturation Voltage vs. Gate to Source Voltage



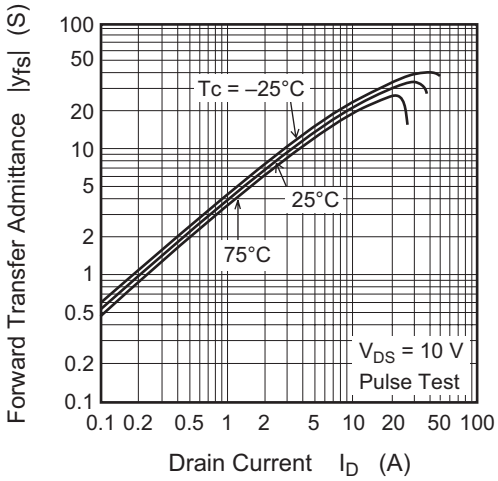

Static Drain to Source on State Resistance vs. Drain Current



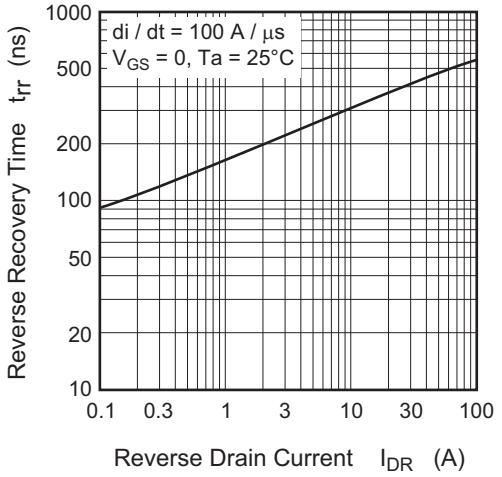
Static Drain to Source on State Resistance vs. Temperature



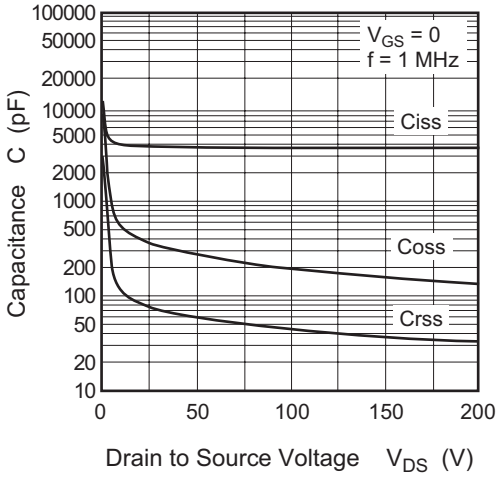

Forward Transfer Admittance vs. Drain Current



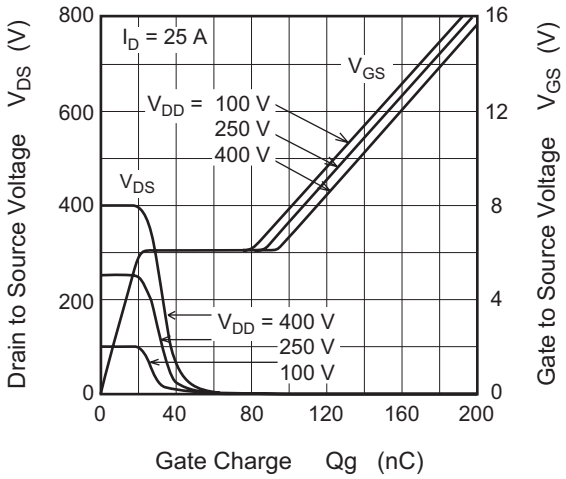

Body-Drain Diode Reverse Recovery Time



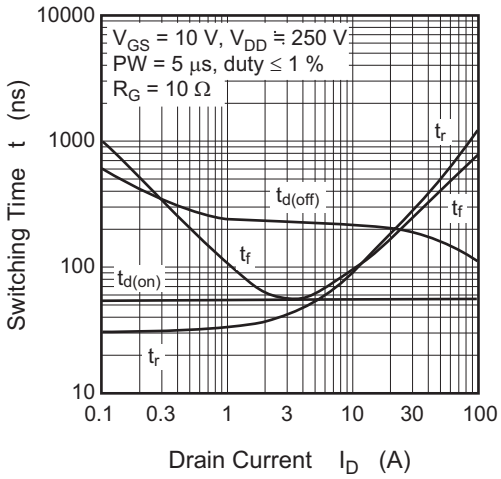

Typical Capacitance vs. Drain to Source Voltage



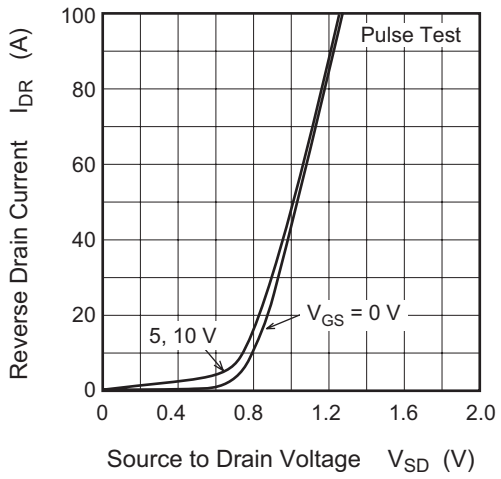

Dynamic Input Characteristics



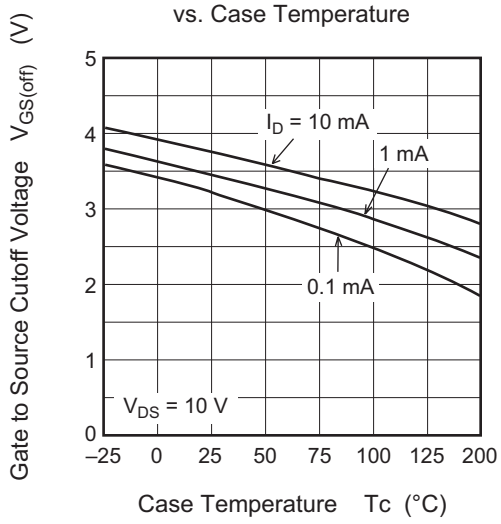

Switching Characteristics



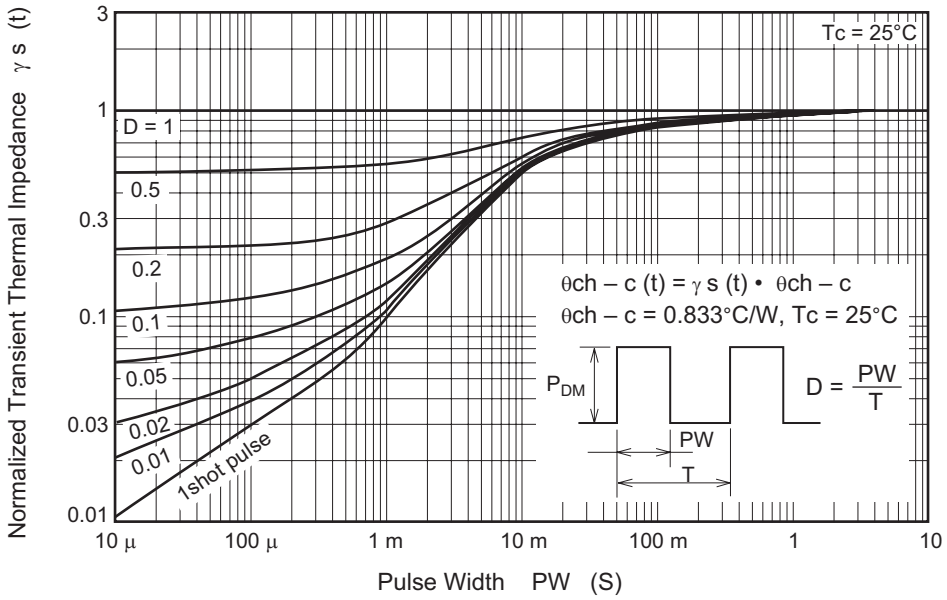
Reverse Drain Current vs.
Source to Drain Voltage



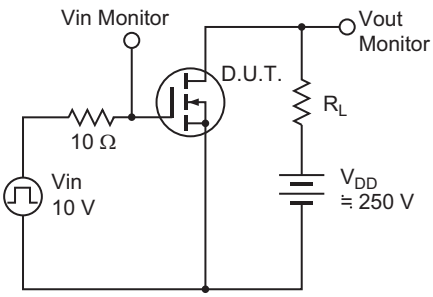

Gate to Source Cutoff Voltage
vs. Case Temperature



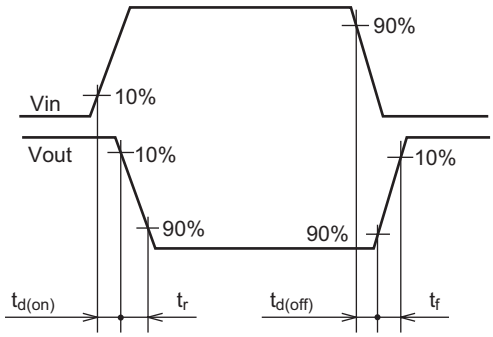

Normalized Transient Thermal Impedance vs. Pulse Width




Switching Time Test Circuit



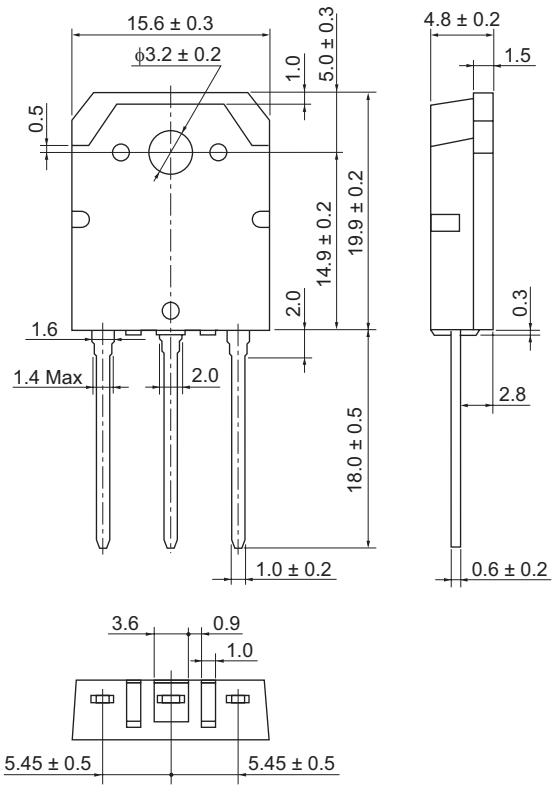

Waveform



## Package Dimensions

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

Unit: mm




## Ordering Information

| Part Name | Quantity | Shipping Container |
|---|---|---|
| H5N5007P-E | 360 pcs | Box (Tube) |

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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http://www.renesas.com

Refer to "**http://www.renesas.com/en/network**" for the latest and detailed information.

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