RENESAS

# 2SJ451

## Silicon P Channel MOS FET

REJ03G0864-0400
Rev.4.00
Sep 07, 2007

## Description

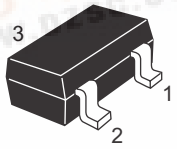
Low frequency power switching

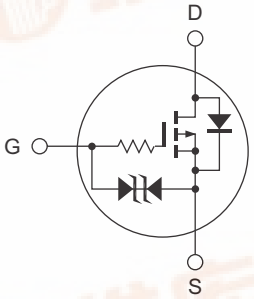
## Features

- Low on-resistance.
- Low drive power
- 2.5 V gate drive device.
- Small package (MPAK).

## Outline

RENESAS Package code: PLSP0003ZB-A
(Package name: MPAK)




Note: Marking is “ZK–”.

## Absolute Maximum Ratings

(Ta = 25°C)

| Item | Symbol | Value | Unit |
|---|---|---|---|
| Drain to source voltage | $V_{DSS}$ | –20 | V |
| Gate to source voltage | $V_{GSS}$ | ±20 | V |
| Drain current | $I_D$ | –0.2 | A |
| Drain peak current | $I_{D\ (pulse)}$ Note 1 | –0.4 | A |
| Channel dissipation | Pch | 150 | mW |
| Channel temperature | Tch | 150 | °C |
| Storage temperature | Tstg | –55 to +150 | °C |

Note: 1. PW ≤ 10 µs, duty cycle ≤ 1%

## Electrical Characteristics

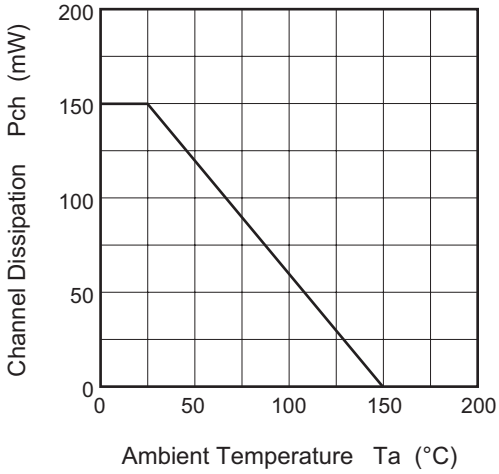
(Ta = 25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| Drain to source breakdown voltage | $V_{(BR)\ DSS}$ | –20 | — | — | V | $I_D$ = –100 µA, $V_{GS}$ = 0 |
| Gate to source breakdown voltage | $V_{(BR)\ GSS}$ | ±20 | — | — | V | $I_G$ = ±100 µA, $V_{DS}$ = 0 |
| Zero gate voltage drain current | $I_{DSS}$ | — | — | –1.0 | µA | $V_{DS}$ = –16 V, $V_{GS}$ = 0 |
| Gate to source leak current | $I_{GSS}$ | — | — | ±2.0 | µA | $V_{GS}$ = ±16 V, $V_{DS}$ = 0 |
| Gate to source cutoff voltage | $V_{GS\ (off)}$ | –0.5 | — | –1.5 | V | $I_D$ = –10 µA, $V_{DS}$ = –5 V |
| Static drain to source on state resistance | $R_{DS\ (on)\ 1}$ | — | 2.3 | 3.5 | Ω | $I_D$ = –100 mA, $V_{GS}$ = –4 V Note 2 |
| | $R_{DS\ (on)\ 2}$ | — | 5.0 | 9.0 | Ω | $I_D$ = –40 mA, $V_{GS}$ = –2.5 V Note 2 |
| Forward transfer admittance | $\|y_{fs}\|$ | 0.13 | 0.23 | — | S | $I_D$ = –100 mA, $V_{DS}$ = –10 V Note 2 |
| Input capacitance | Ciss | — | 2.4 | — | pF | $V_{DS}$ = –10 V |
| Output capacitance | Coss | — | 31 | — | pF | $V_{GS}$ = 0 |
| Reverse transfer capacitance | Crss | — | 0.6 | — | pF | f = 1 MHz |
| Turn-on delay time | $t_{d\ (on)}$ | — | 170 | — | ns | $I_D$ = –0.1 A |
| Rise time | $t_r$ | — | 680 | — | ns | $V_{GS}$ = –10 V |
| Turn-off delay time | $t_{d\ (off)}$ | — | 3.0 | — | µs | $R_L$ = 100 Ω |
| Fall time | $t_f$ | — | 2.8 | — | µs | |

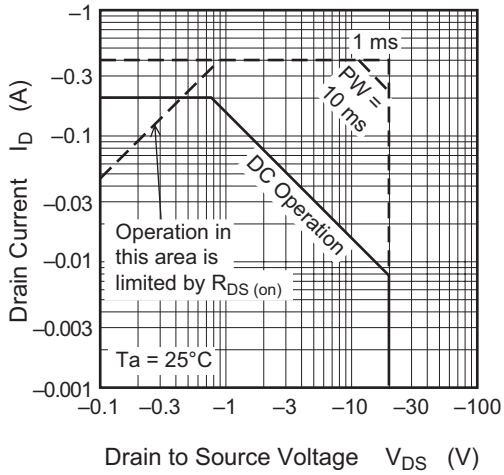
Note: 2. Pulse test

## Main Characteristics

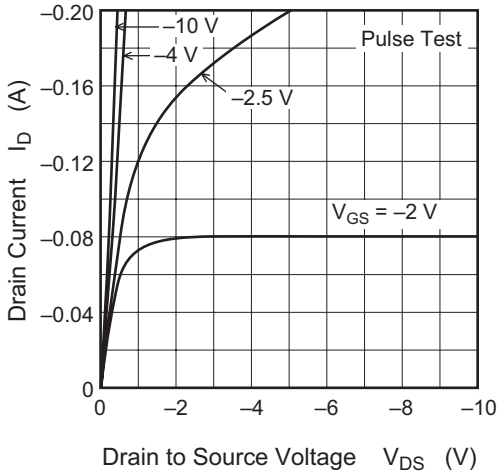
Maximum Channel Dissipation Curve



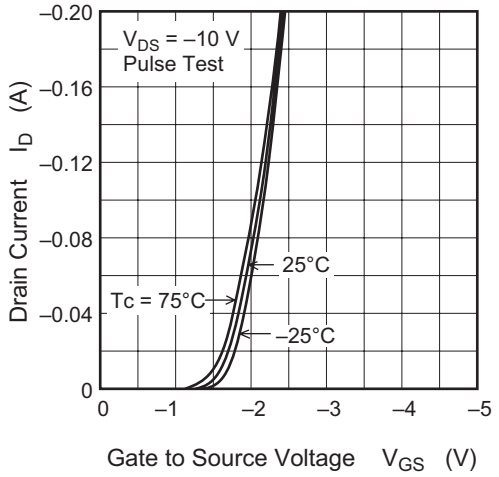

Maximum Safe Operation Area



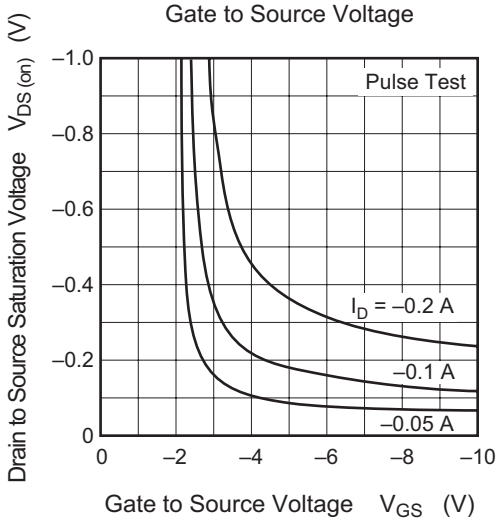

Typical Output Characteristics



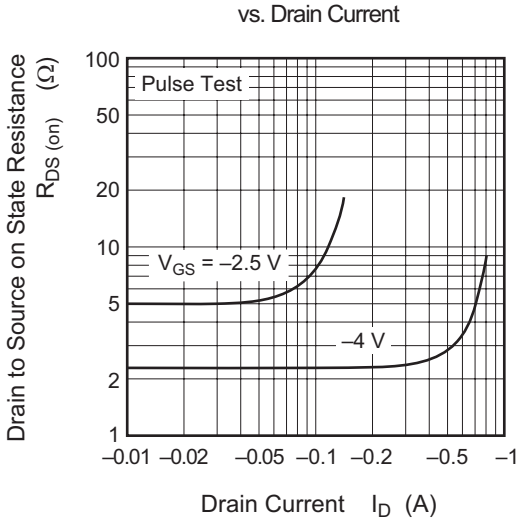

Typical Transfer Characteristics



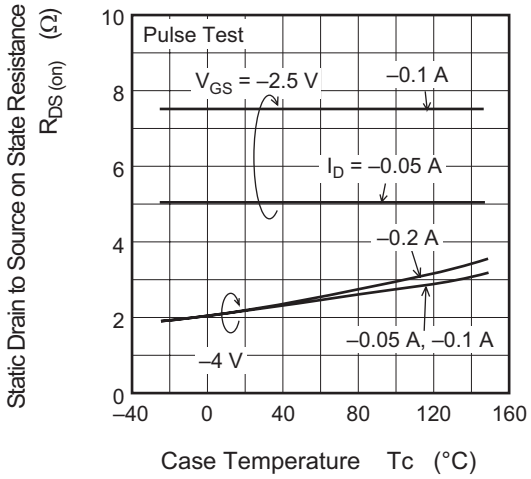

Drain to Source Saturation Voltage vs. Gate to Source Voltage



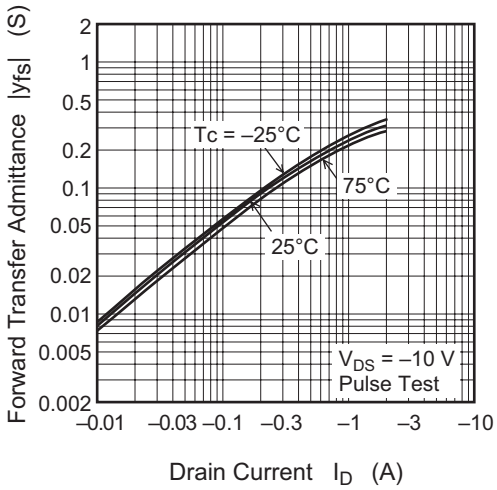

Static Drain to Source on State Resistance vs. Drain Current



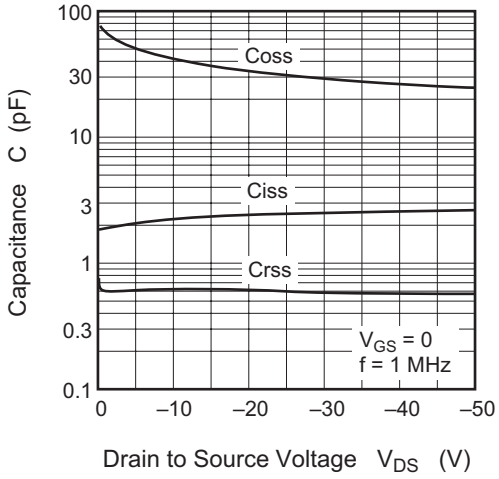
Static Drain to Source on State Resistance vs. Temperature



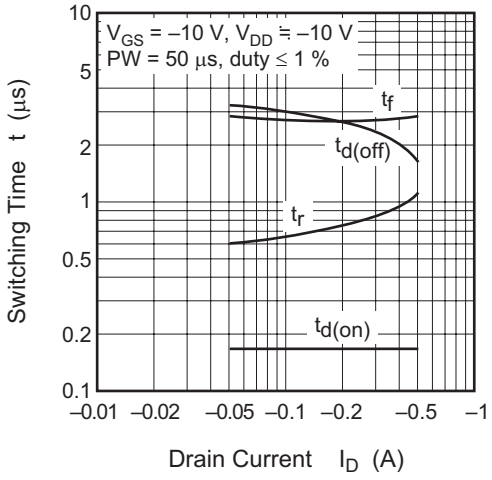

Forward Transfer Admittance vs. Drain Current



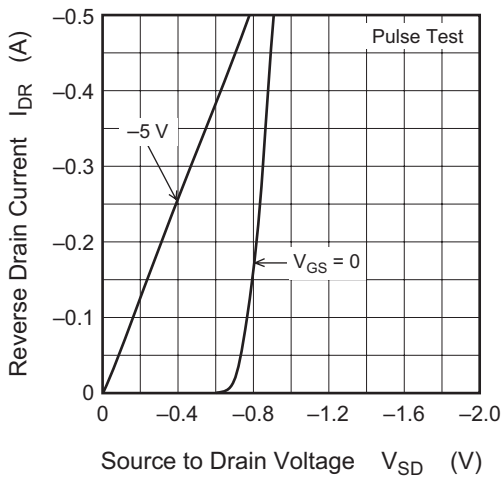

Typical Capacitance vs. Drain to Source Voltage



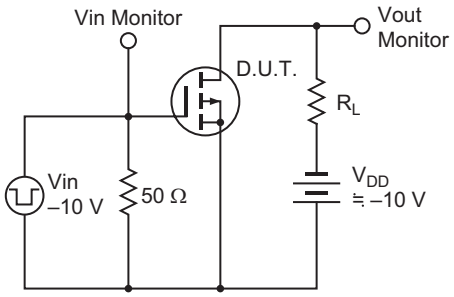

Switching Characteristics



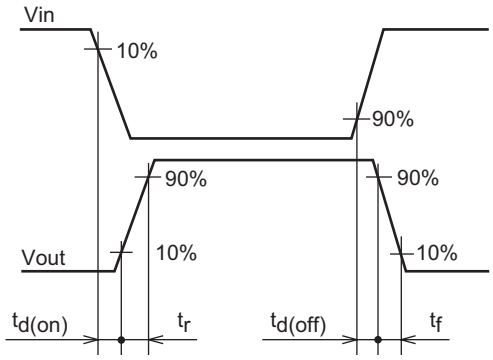

Reverse Drain Current vs. Source to Drain Voltage



Switching Time Test Circuit

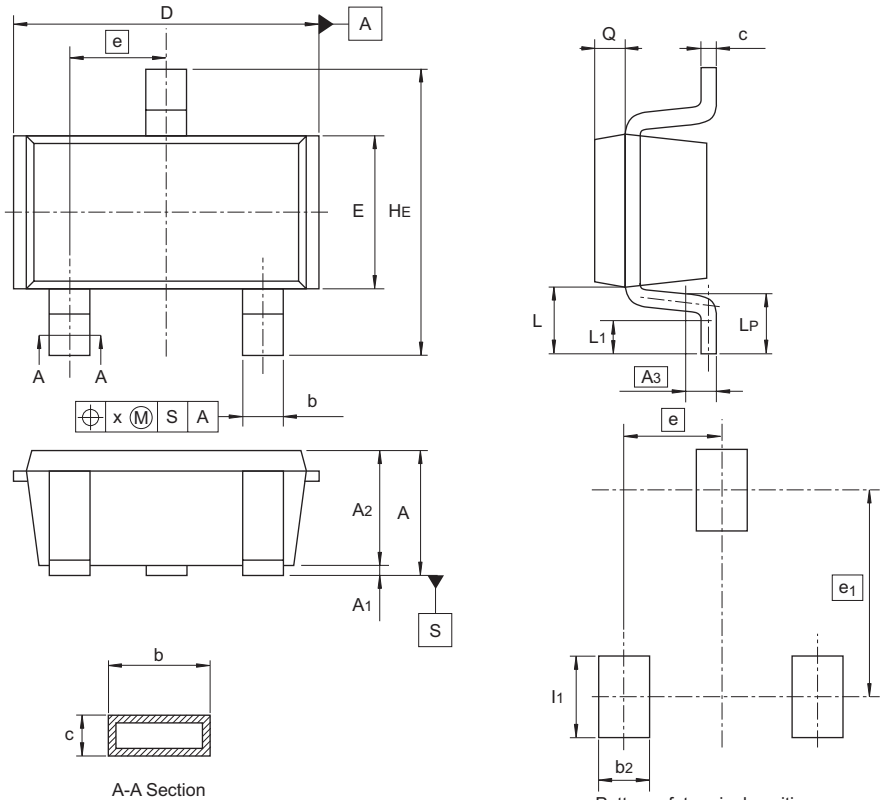



Waveform



## Package Dimensions

| Package Name | JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] |
|---|---|---|---|---|
| MPAK | SC-59A | PLSP0003ZB-A | MPAK(T) / MPAK(T)V | 0.011g |




| Reference Symbol | Dimension in Millimeters | | |
|---|---|---|---|
| | Min | Nom | Max |
| A | 1.0 | – | 1.3 |
| $A_1$ | 0 | – | 0.1 |
| $A_2$ | 1.0 | 1.1 | 1.2 |
| $\boxed{A_3}$ | – | 0.25 | – |
| b | 0.35 | 0.4 | 0.5 |
| c | 0.1 | 0.16 | 0.26 |
| D | 2.7 | – | 3.1 |
| E | 1.35 | 1.5 | 1.65 |
| $\boxed{e}$ | – | 0.95 | – |
| $H_E$ | 2.2 | 2.8 | 3.0 |
| L | 0.35 | – | 0.75 |
| $L_1$ | 0.15 | – | 0.55 |
| $L_P$ | 0.25 | – | 0.65 |
| x | – | – | 0.05 |
| $b_2$ | – | – | 0.55 |
| $\boxed{e_1}$ | – | 1.95 | – |
| $l_1$ | – | – | 1.05 |
| Q | – | 0.3 | – |

## Ordering Information

| Part Name | Quantity | Shipping Container |
|---|---|---|
| 2SJ451ZK-TL-E | 3000 pcs | Taping |
| 2SJ451ZK-TR-E | 3000 pcs | Taping |

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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