# RJK1576DPA

## 150V - 25A - MOS FET
## High Speed Power Switching

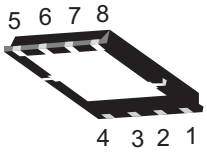
R07DS0855EJ0200
Rev.2.00
Jan 10, 2013

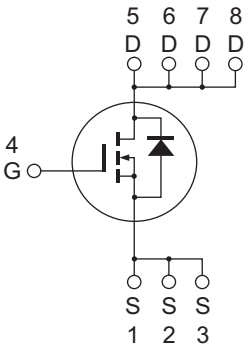
### Features

- Low on-resistance
  $R_{DS(on)}$ = 0.046 Ω typ. (at $I_D$ = 12.5 A, $V_{GS}$ = 10 V, Ta = 25 °C)
- Low leakage current
- High speed switching

### Outline

RENESAS Package code: PWSN0008DE-A
(Package name: WPAK(3F))




| | |
|---|---|
| 1, 2, 3 | Source |
| 4 | Gate |
| 5, 6, 7, 8 | Drain |

### Absolute Maximum Ratings

(Ta = 25°C)

| Item | Symbol | Ratings | Unit |
|---|---|---|---|
| Drain to source voltage | $V_{DSS}$ | 150 | V |
| Gate to source voltage | $V_{GSS}$ | ±30 | V |
| Drain current | $I_D$ Note1 | 25 | A |
| Drain peak current | $I_{D\ (pulse)}$ Note2 | 50 | A |
| Body-drain diode reverse drain current | $I_{DR}$ | 25 | A |
| Body-drain diode reverse drain peak current | $I_{DR\ (pulse)}$ Note2 | 50 | A |
| Avalanche current | $I_{AP}$ Note3 | 22 | A |
| Avalanche energy | $E_{AR}$ Note3 | 36.3 | mJ |
| Channel dissipation | Pch Note4 | 65 | W |
| Channel to case thermal impedance | θch-c | 1.93 | °C/W |
| Channel temperature | Tch | 150 | °C |
| Storage temperature | Tstg | –55 to +150 | °C |

Notes: 1. Limited by maximum safe operation area.
2. PW ≤ 10 μs, duty cycle ≤ 1%
3. STch = 25°C, Tch ≤ 150°C
4. Value at Tc = 25°C

## Electrical Characteristics

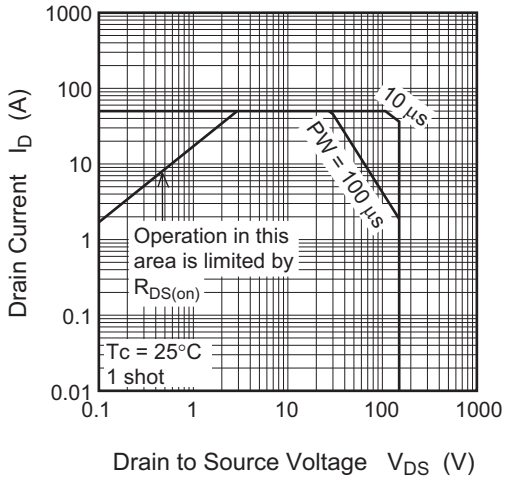
(Ta = 25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test conditions |
|---|---|---|---|---|---|---|
| Drain to source breakdown voltage | $V_{(BR)DSS}$ | 150 | — | — | V | $I_D$ = 10 mA, $V_{GS}$ = 0 |
| Zero gate voltage drain current | $I_{DSS}$ | — | — | 1 | μA | $V_{DS}$ = 150 V, $V_{GS}$ = 0 |
| Gate to source leak current | $I_{GSS}$ | — | — | ±1 | μA | $V_{GS}$ = ±30 V, $V_{DS}$ = 0 |
| Gate to source cutoff voltage | $V_{GS(off)}$ | 2.5 | — | 4.5 | V | $V_{DS}$ = 10 V, $I_D$ = 1 mA |
| Static drain to source on state resistance | $R_{DS(on)}$ | — | 0.046 | 0.058 | Ω | $I_D$ = 12.5 A, $V_{GS}$ = 10 V Note5 |
| Input capacitance | Ciss | — | 1200 | — | pF | $V_{DS}$ = 25 V<br>$V_{GS}$ = 0<br>f = 1 MHz |
| Output capacitance | Coss | — | 240 | — | pF | |
| Reverse transfer capacitance | Crss | — | 34 | — | pF | |
| Turn-on delay time | $t_{d(on)}$ | — | 17 | — | ns | $I_D$ = 12.5 A<br>$V_{GS}$ = 10 V<br>$R_L$ = 6 Ω<br>Rg = 10 Ω |
| Rise time | $t_r$ | — | 31 | — | ns | |
| Turn-off delay time | $t_{d(off)}$ | — | 28 | — | ns | |
| Fall time | $t_f$ | — | 10 | — | ns | |
| Total gate charge | Qg | — | 19 | — | nC | $V_{DD}$ = 120 V<br>$V_{GS}$ = 10 V<br>$I_D$ = 25 A |
| Gate to source charge | Qgs | — | 7 | — | nC | |
| Gate to drain charge | Qgd | — | 6 | — | nC | |
| Body-drain diode forward voltage | $V_{DF}$ | — | 0.83 | 1.40 | V | $I_F$ = 25 A, $V_{GS}$ = 0 Note5 |
| Body-drain diode reverse recovery time | $t_{rr}$ | — | 105 | — | ns | $I_F$ = 25 A, $V_{GS}$ = 0<br>$di_F/dt$ = 100 A/μs |

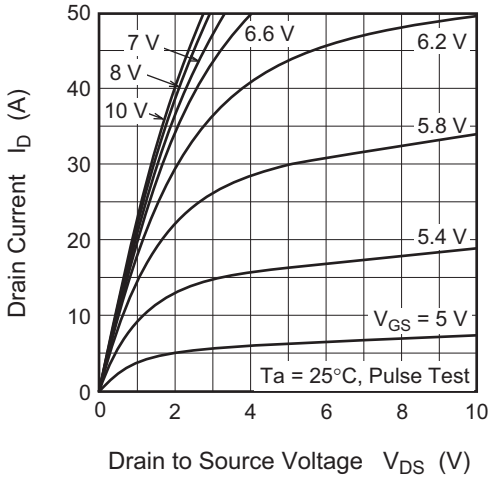
Notes: 5. Pulse test

## Main Characteristics

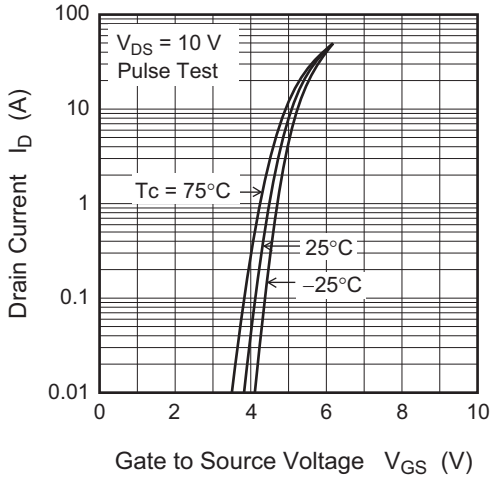
Maximum Safe Operation Area



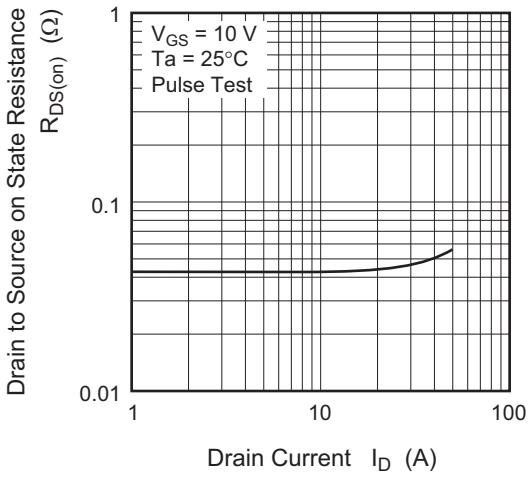

Typical Output Characteristics



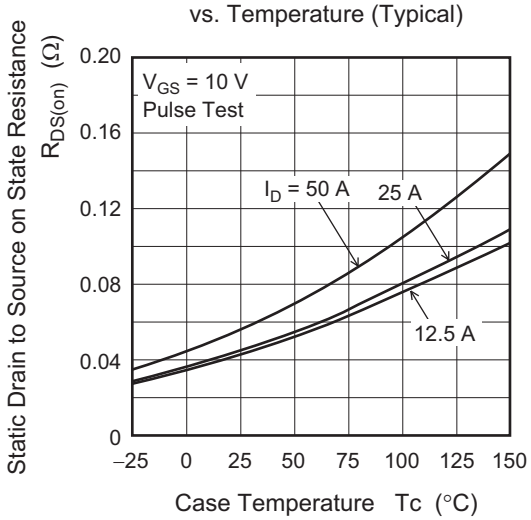

Typical Transfer Characteristics



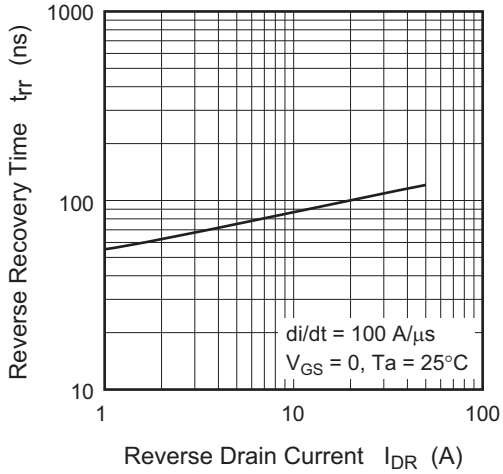

Static Drain to Source on State Resistance vs. Drain Current (Typical)



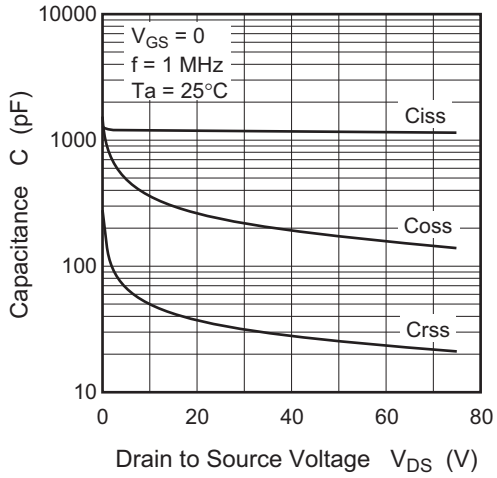

Static Drain to Source on State Resistance vs. Temperature (Typical)



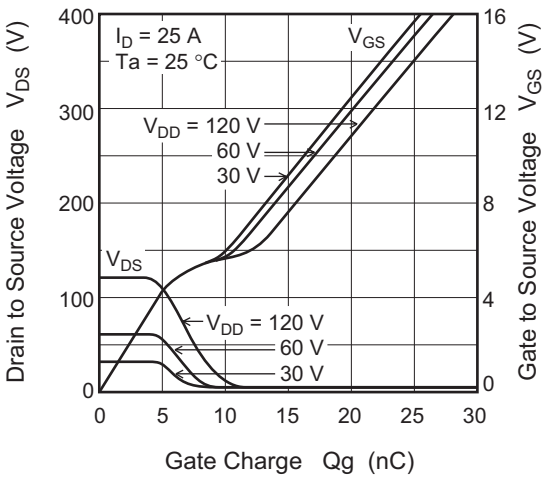

Body-Drain Diode Reverse Recovery Time (Typical)



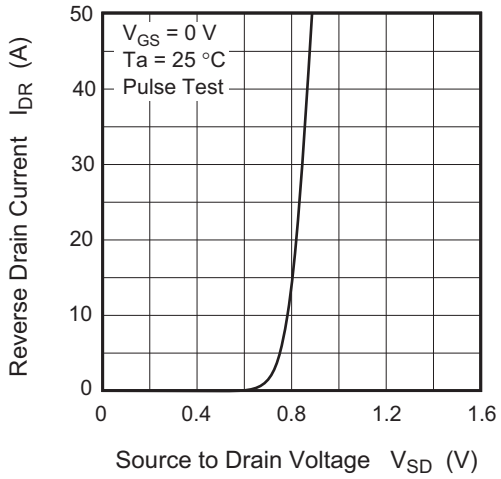
Typical Capacitance vs.
Drain to Source Voltage (Typical)



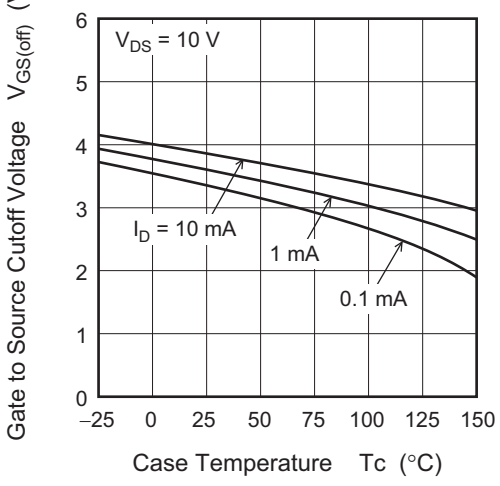

Dynamic Input Characteristics (Typical)



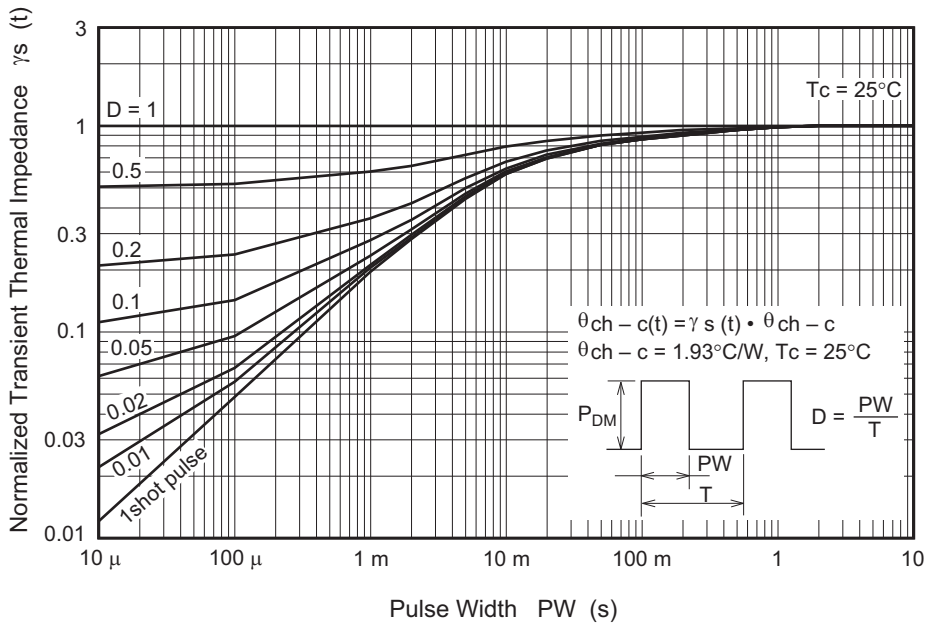

Reverse Drain Current vs.
Source to Drain Voltage (Typical)



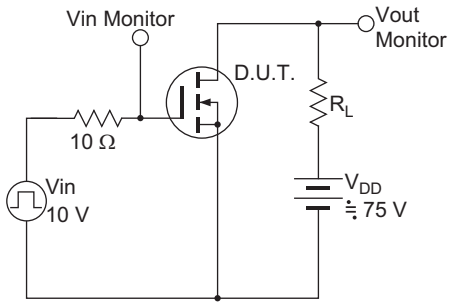

Gate to Source Cutoff Voltage
vs. Case Temperature (Typical)



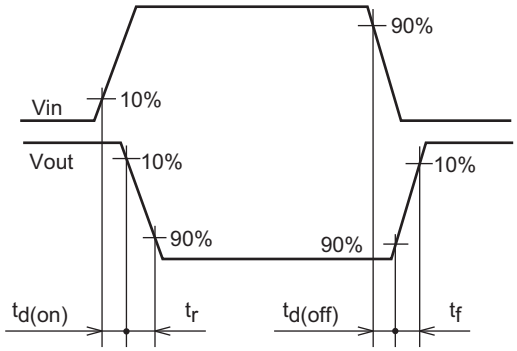
Normalized Transient Thermal Impedance vs. Pulse Width




Switching Time Test Circuit



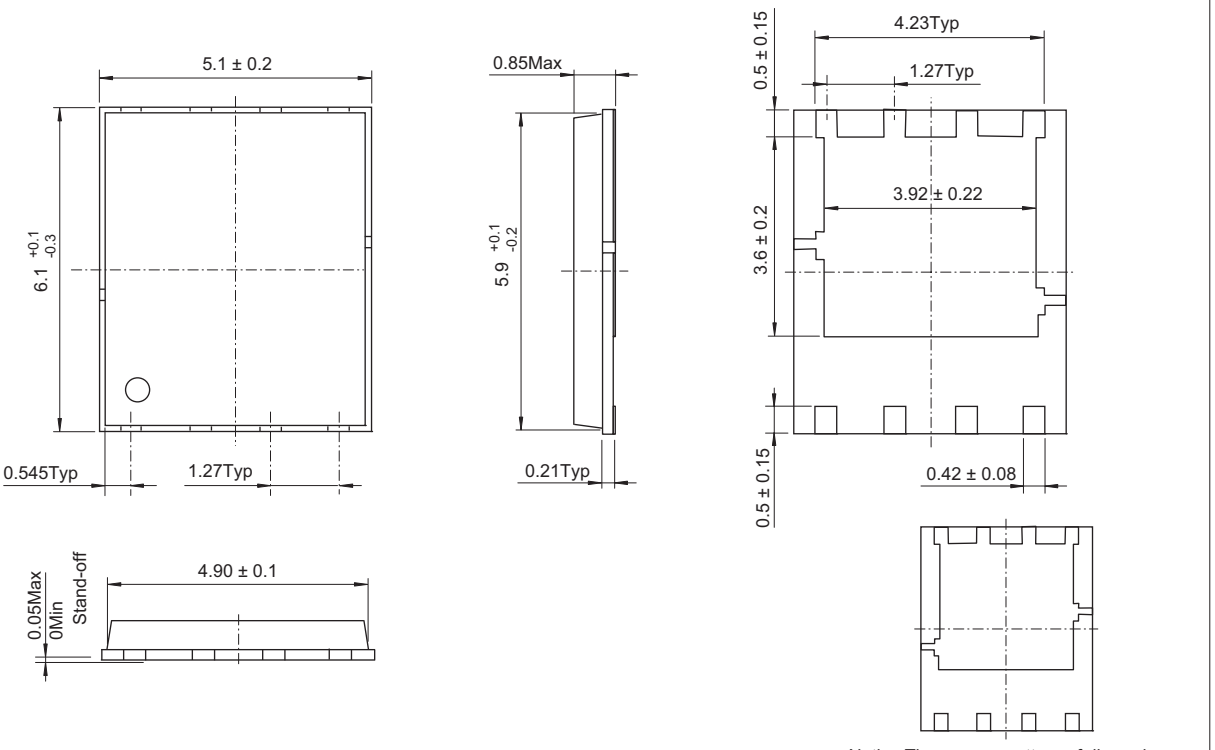

Waveform



## Package Dimensions

| Package Name | JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] |
|---|---|---|---|---|
| WPAK(3F) | — | PWSN0008DE-A | WPAK(3F)V | 0.075g |

Unit: mm




Notice:The reverse pattern of die-pad support lead described above exists.

## Ordering Information

| Orderable Part Number | Quantity | Shipping Container |
|---|---|---|
| RJK1576DPA-00#J5A | 3000 pcs | Taping |

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**Renesas Electronics America Inc.**
2880 Scott Boulevard Santa Clara, CA 95050-2554, U.S.A.
Tel: +1-408-588-6000, Fax: +1-408-588-6130

**Renesas Electronics Canada Limited**
1101 Nicholson Road, Newmarket, Ontario L3Y 9C3, Canada
Tel: +1-905-898-5441, Fax: +1-905-898-3220

**Renesas Electronics Europe Limited**
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K
Tel: +44-1628-651-700, Fax: +44-1628-651-804

**Renesas Electronics Europe GmbH**
Arcadiastrasse 10, 40472 Düsseldorf, Germany
Tel: +49-211-65030, Fax: +49-211-6503-1327

**Renesas Electronics (China) Co., Ltd.**
7th Floor, Quantum Plaza, No.27 ZhiChunLu Haidian District, Beijing 100083, P.R.China
Tel: +86-10-8235-1155, Fax: +86-10-8235-7679

**Renesas Electronics (Shanghai) Co., Ltd.**
Unit 204, 205, AZIA Center, No.1233 Lujiazui Ring Rd., Pudong District, Shanghai 200120, China
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**Renesas Electronics Hong Kong Limited**
Unit 1601-1613, 16/F., Tower 2, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hong Kong
Tel: +852-2886-9318, Fax: +852 2886-9022/9044

**Renesas Electronics Taiwan Co., Ltd.**
13F, No. 363, Fu Shing North Road, Taipei, Taiwan
Tel: +886-2-8175-9600, Fax: +886 2-8175-9670

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