# RJK0655DPB

60V, 35A, 6.7mΩ max.
Silicon N Channel Power MOS FET
Power Switching

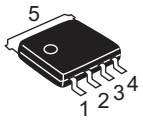
R07DS1053EJ0200
(Previous: REJ03G1881-0100)
Rev.2.00
Apr 09, 2013

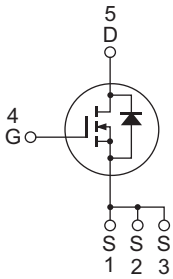
## Features

- High speed switching
- Low drive current
- Low on-resistance
  $R_{DS(on)}$ = 5.3 mΩ typ. (at $V_{GS}$ = 10 V)
- Pb-free
- Halogen-free
- High density mounting

## Outline

RENESAS Package code: PTZZ0005DA-A
(Package name: LFPAK)




| | |
|---|---|
| 1, 2, 3 | Source |
| 4 | Gate |
| 5 | Drain |

## Absolute Maximum Ratings

(Ta = 25°C)

| Item | Symbol | Ratings | Unit |
|---|---|---|---|
| Drain to source voltage | $V_{DSS}$ | 60 | V |
| Gate to source voltage | $V_{GSS}$ | ±20 | V |
| Drain current | $I_D$ | 35 | A |
| Drain peak current | $I_{D(pulse)}$ Note1 | 140 | A |
| Body-drain diode reverse drain current | $I_{DR}$ | 35 | A |
| Avalanche current | $I_{AP}$ Note 2 | 35 | A |
| Avalanche energy | $E_{AS}$ Note 2 | 9.2 | mJ |
| Channel dissipation | Pch Note3 | 60 | W |
| Channel to Case Thermal Resistance | θch-C | 2.08 | °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 L=10uH, Tch = 25°C, Rg ≥ 50 Ω
3. Tc = 25°C

## Electrical Characteristics

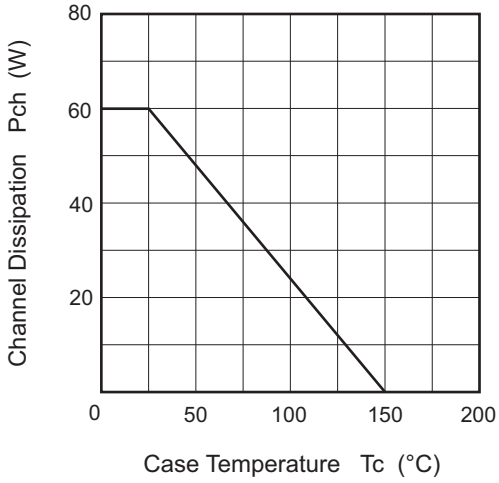
(Ta = 25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| Drain to source breakdown voltage | $V_{(BR)DSS}$ | 60 | — | — | V | $I_D$ = 10 mA, $V_{GS}$ = 0 V |
| Gate to source leak current | $I_{GSS}$ | — | — | ±0.1 | μA | $V_{GS}$ = ±20 V, $V_{DS}$ = 0 V |
| Zero gate voltage drain current | $I_{DSS}$ | — | — | 1 | μA | $V_{DS}$ = 60 V, $V_{GS}$ = 0 V |
| Gate to source cutoff voltage | $V_{GS(off)}$ | 2.0 | — | 4.0 | V | $V_{DS}$ = 10 V, $I_D$ = 1 mA |
| Static drain to source on state resistance | $R_{DS(on)}$ | — | 5.3 | 6.7 | mΩ | $I_D$ = 17.5 A, $V_{GS}$ = 10 V Note4 |
| Forward transfer admittance | $\|y_{fs}\|$ | — | 51 | — | S | $I_D$ = 17.5 A, $V_{DS}$ = 10 V Note4 |
| Input capacitance | Ciss | — | 2550 | — | pF | $V_{DS}$ = 10 V, $V_{GS}$ = 0 V, f = 1 MHz |
| Output capacitance | Coss | — | 580 | — | pF | |
| Reverse transfer capacitance | Crss | — | 155 | — | pF | |
| Gate Resistance | Rg | — | 0.5 | — | Ω | |
| Total gate charge | Qg | — | 35 | — | nC | $V_{DD}$ = 25 V, $V_{GS}$ = 10 V, $I_D$ = 35 A |
| Gate to source charge | Qgs | — | 11 | — | nC | |
| Gate to drain charge | Qgd | — | 6.5 | — | nC | |
| Turn-on delay time | $t_{d(on)}$ | — | 14 | — | ns | $V_{GS}$ = 10 V, $I_D$ = 17.5 A, $V_{DD}$ ≅ 30 V, $R_L$ = 1.7 Ω, Rg = 4.7 Ω |
| Rise time | $t_r$ | — | 7.8 | — | ns | |
| Turn-off delay time | $t_{d(off)}$ | — | 34 | — | ns | |
| Fall time | $t_f$ | — | 11 | — | ns | |
| Body–drain diode forward voltage | $V_{DF}$ | — | 0.8 | 1.1 | V | $I_F$ = 35 A, $V_{GS}$ = 0 V Note4 |
| Body–drain diode reverse recovery time | $t_{rr}$ | — | 42 | — | ns | $I_F$ = 35 A, $V_{GS}$ = 0 V $di_F/dt$ = 100 A/μs |

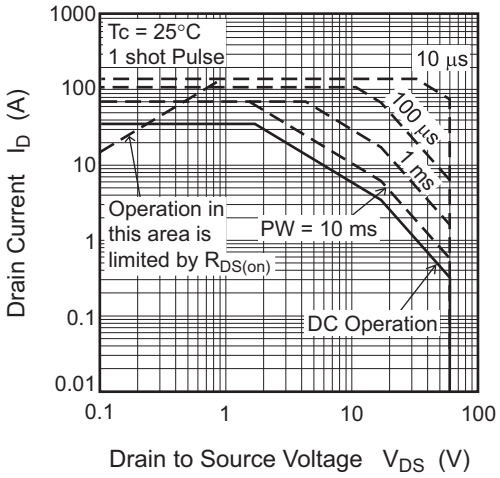
Notes: 4. Pulse test

## Main Characteristics

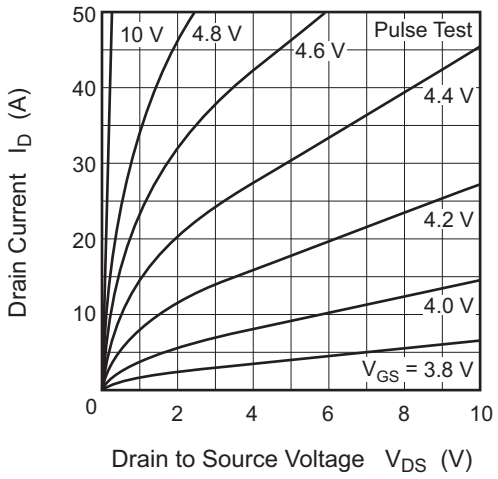
Power vs. Temperature Derating



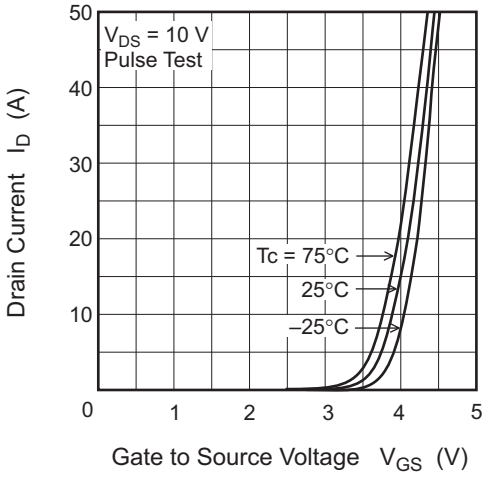

Maximum Safe Operation Area



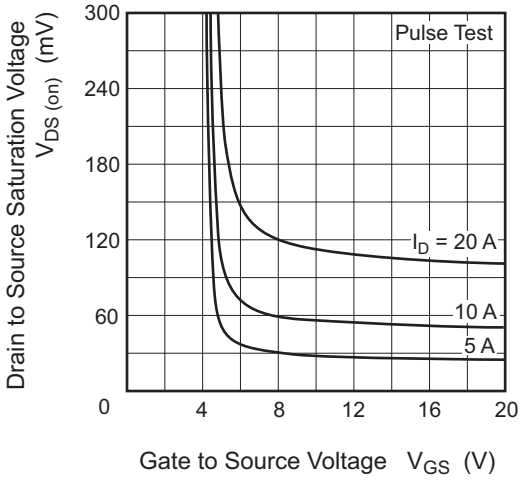

Typical Output Characteristics



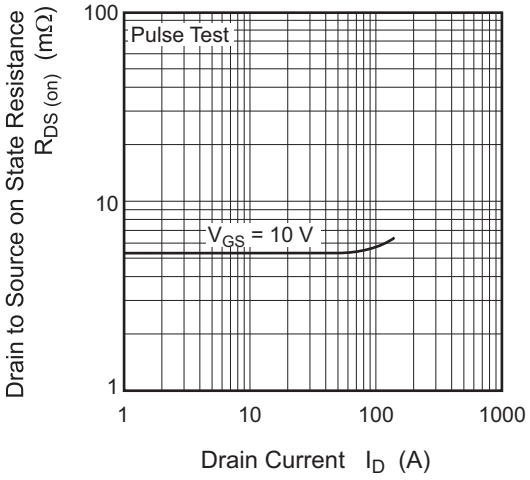

Typical Transfer Characteristics



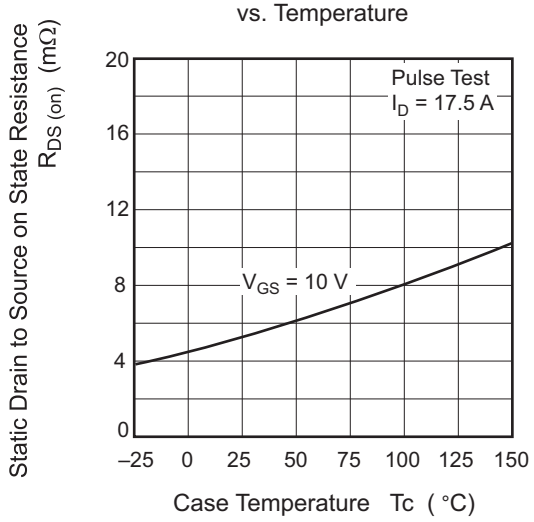

Drain to Source Saturation Voltage vs. Gate to Source Voltage



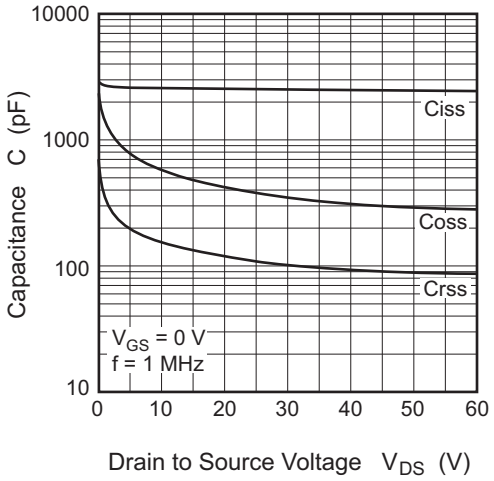

Static Drain to Source on State Resistance vs. Drain Current



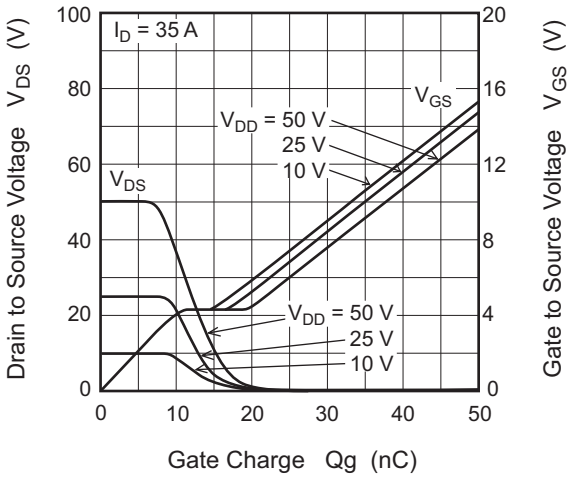
Static Drain to Source on State Resistance vs. Temperature



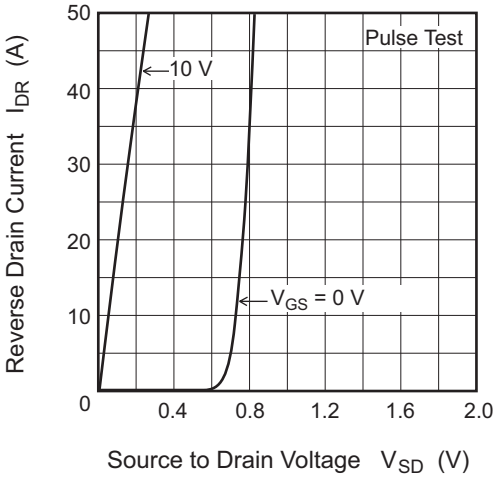

Typical Capacitance vs. Drain to Source Voltage



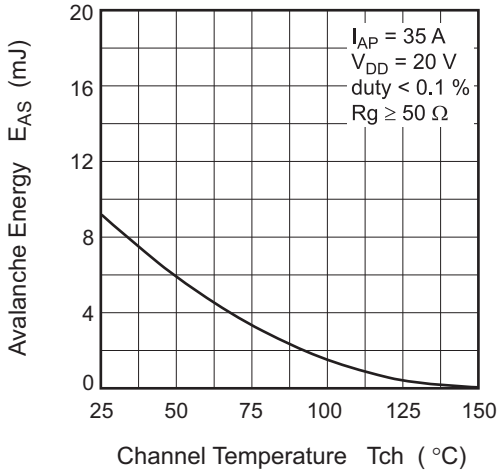

Dynamic Input Characteristics



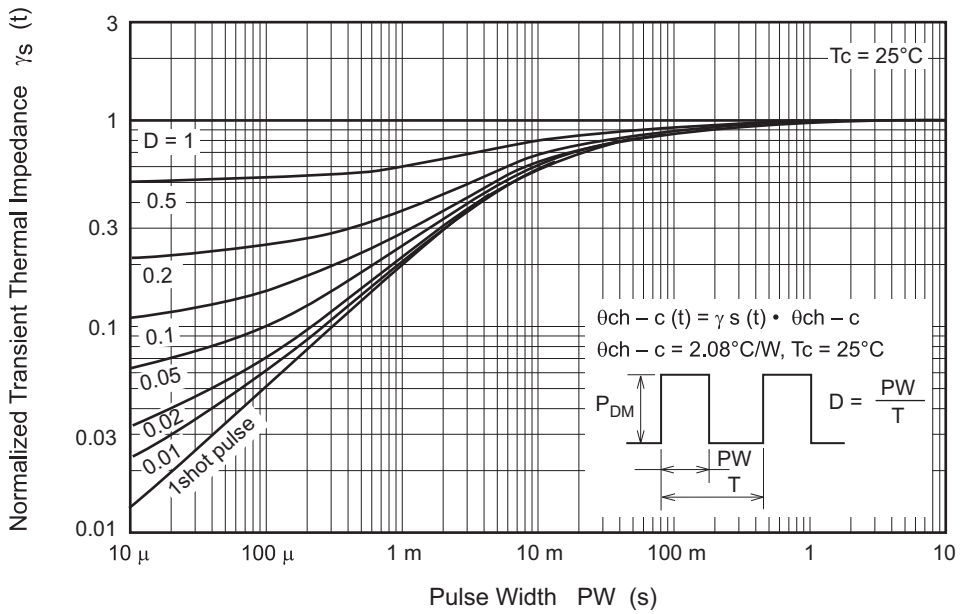

Reverse Drain Current vs. Source to Drain Voltage



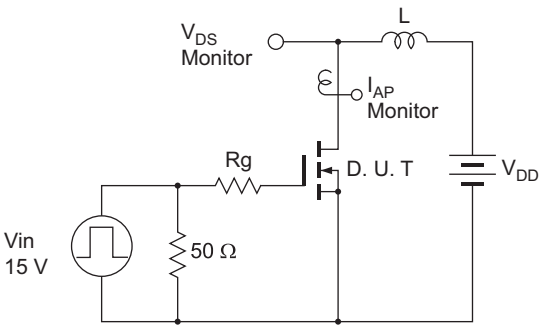

Maximum Avalanche Energy vs. Channel Temperature Derating



Normalized Transient Thermal Impedance vs. Pulse Width

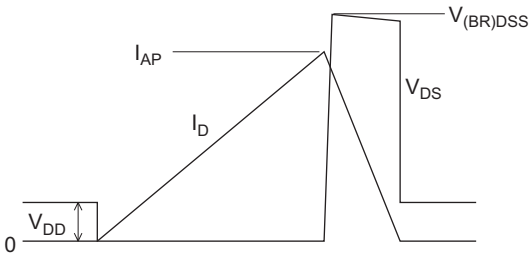



Avalanche Test Circuit

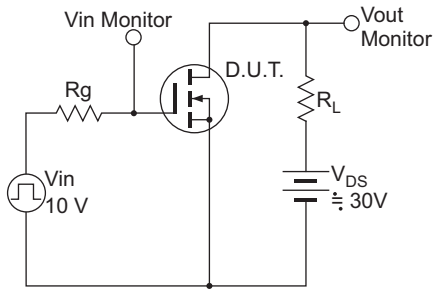



Avalanche Waveform

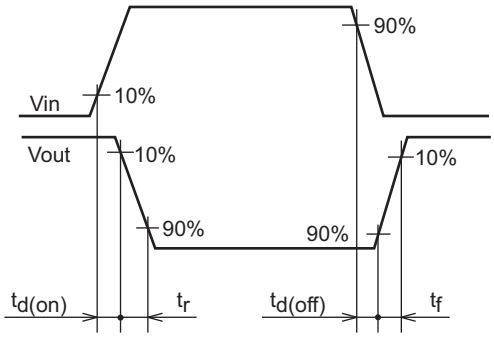
$$E_{AS} = \frac{1}{2} L \bullet I_{AP}^2 \bullet \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$




Switching Time Test Circuit



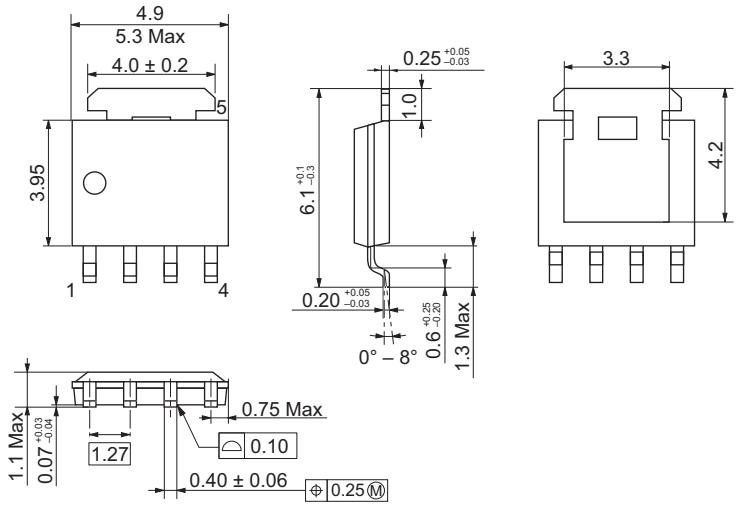

Switching Time Waveform



## Package Dimensions

| Package Name | JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] |
|---|---|---|---|---|
| LFPAK | SC-100 | PTZZ0005DA-A | LFPAKV | 0.080g |

Unit: mm




(Ni/Pd/Au plating)

## Ordering Information

| Part No. | Quantity | Shipping Container |
|---|---|---|
| RJK0655DPB-00-J5 | 2500 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
Tel: +86-21-5877-1818, Fax: +86-21-6887-7858 / -7898

**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

**Renesas Electronics Singapore Pte. Ltd.**
80 Bendemeer Road, Unit #06-02 Hyflux Innovation Centre Singapore 339949
Tel: +65-6213-0200, Fax: +65-6213-0300

**Renesas Electronics Malaysia Sdn.Bhd.**
Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No. 18, Jln Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: +60-3-7955-9390, Fax: +60-3-7955-9510

**Renesas Electronics Korea Co., Ltd.**
11F., Samik Lavied' or Bldg., 720-2 Yeoksam-Dong, Kangnam-Ku, Seoul 135-080, Korea
Tel: +82-2-558-3737, Fax: +82-2-558-5141



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