

# RJK0854DPB

80V, 25A, 13 mΩ max.

Silicon N Channel Power MOS FET

Power Switching

R07DS1055EJ0200  
(Previous: REJ03G1883-0100)

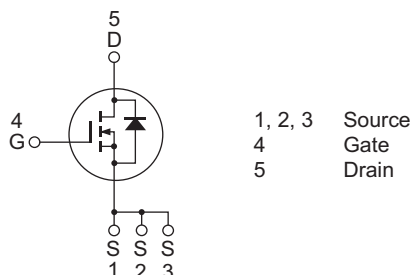
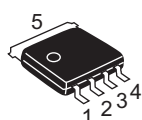
Rev.2.00  
Apr 11, 2013

## Features

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

## Outline

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



## Absolute Maximum Ratings

( $T_a = 25^\circ\text{C}$ )

| Item                                   | Symbol                          | Ratings     | Unit               |
|----------------------------------------|---------------------------------|-------------|--------------------|
| Drain to source voltage                | $V_{DSS}$                       | 80          | V                  |
| Gate to source voltage                 | $V_{GSS}$                       | $\pm 20$    | V                  |
| Drain current                          | $I_D$                           | 25          | A                  |
| Drain peak current                     | $I_{D(pulse)}$ <sup>Note1</sup> | 100         | A                  |
| Body-drain diode reverse drain current | $I_{DR}$                        | 25          | A                  |
| Avalanche current                      | $I_{AP}$ <sup>Note 2</sup>      | 25          | A                  |
| Avalanche energy                       | $E_{AS}$ <sup>Note 2</sup>      | 8.3         | mJ                 |
| Channel dissipation                    | $P_{ch}$ <sup>Note3</sup>       | 55          | W                  |
| Channel to Case Thermal Resistance     | $\theta_{ch-C}$                 | 2.27        | $^\circ\text{C/W}$ |
| Channel temperature                    | $T_{ch}$                        | 150         | $^\circ\text{C}$   |
| Storage temperature                    | $T_{stg}$                       | -55 to +150 | $^\circ\text{C}$   |

- Notes: 1.  $PW \leq 10 \mu\text{s}$ , duty cycle  $\leq 1\%$   
2. Value at  $L=10\mu\text{H}$ ,  $T_{ch} = 25^\circ\text{C}$ ,  $R_g \geq 50 \Omega$   
3.  $T_c = 25^\circ\text{C}$

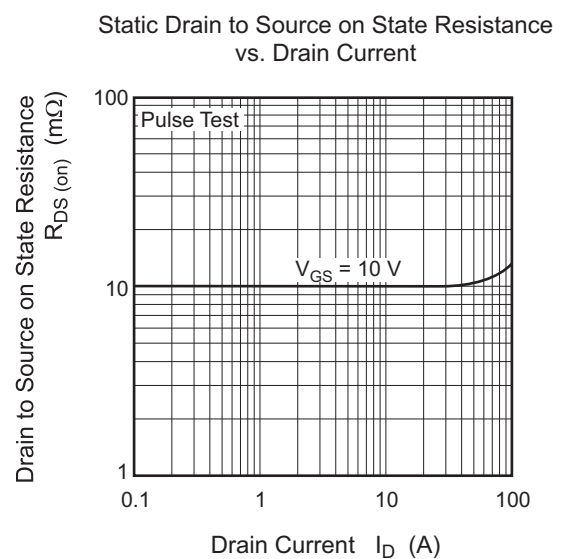
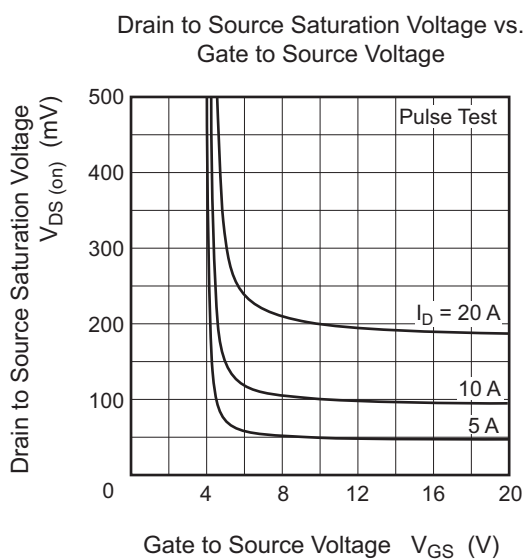
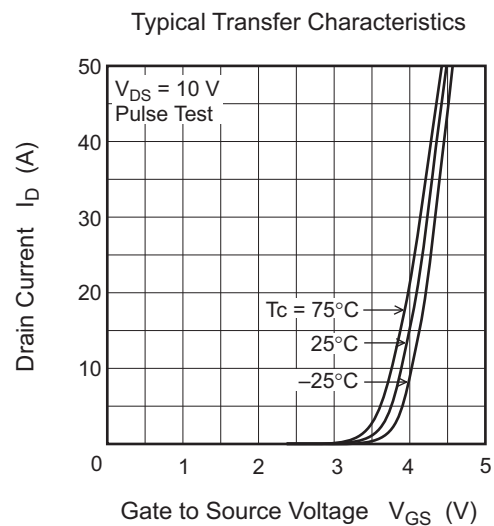
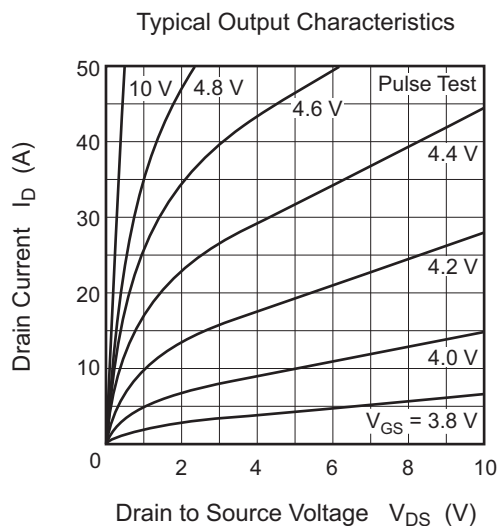
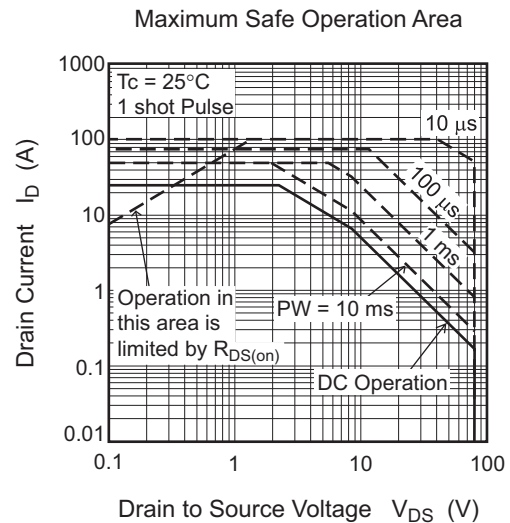
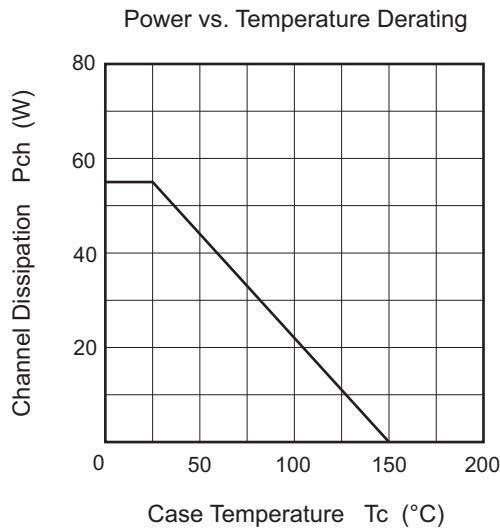
## Electrical Characteristics

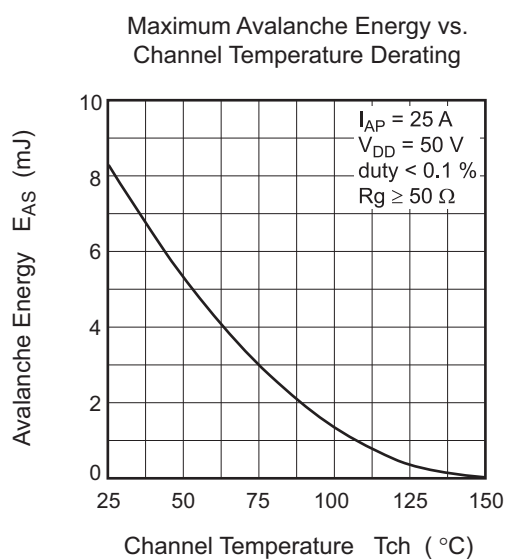
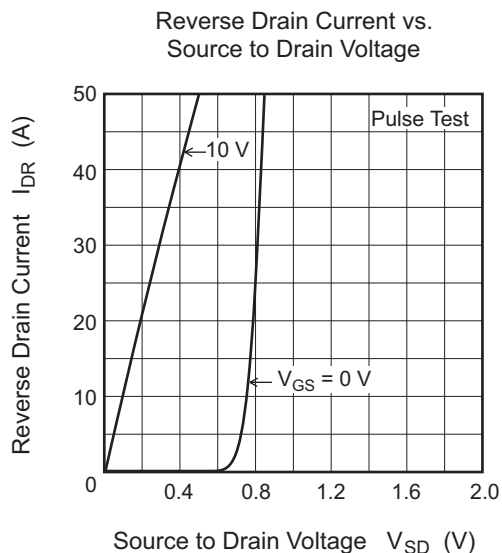
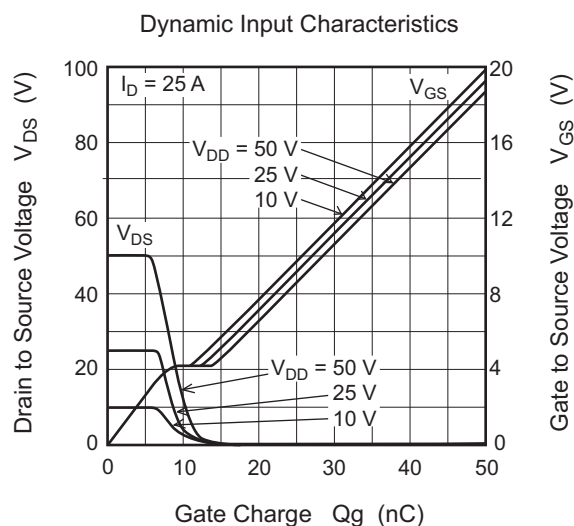
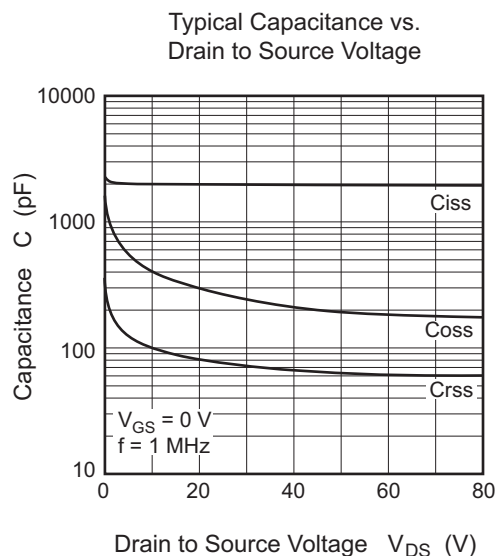
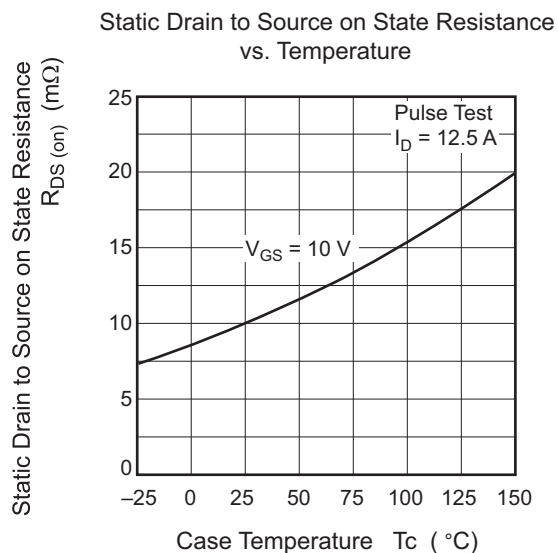
(Ta = 25°C)

| Item                                       | Symbol        | Min | Typ  | Max       | Unit             | Test Conditions                                                                                                                |
|--------------------------------------------|---------------|-----|------|-----------|------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Drain to source breakdown voltage          | $V_{(BR)DSS}$ | 80  | —    | —         | V                | $I_D = 10 \text{ mA}$ , $V_{GS} = 0 \text{ V}$                                                                                 |
| Gate to source leak current                | $I_{GSS}$     | —   | —    | $\pm 0.1$ | $\mu\text{A}$    | $V_{GS} = \pm 20 \text{ V}$ , $V_{DS} = 0 \text{ V}$                                                                           |
| Zero gate voltage drain current            | $I_{DSS}$     | —   | —    | 1         | $\mu\text{A}$    | $V_{DS} = 80 \text{ V}$ , $V_{GS} = 0 \text{ V}$                                                                               |
| Gate to source cutoff voltage              | $V_{GS(off)}$ | 2.0 | —    | 4.0       | V                | $V_{DS} = 10 \text{ V}$ , $I_D = 1 \text{ mA}$                                                                                 |
| Static drain to source on state resistance | $R_{DS(on)}$  | —   | 10   | 13        | $\text{m}\Omega$ | $I_D = 12.5 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note4</sup>                                                              |
| Forward transfer admittance                | $ y_{fs} $    | —   | 36   | —         | S                | $I_D = 12.5 \text{ A}$ , $V_{DS} = 10 \text{ V}$ <sup>Note4</sup>                                                              |
| Input capacitance                          | $C_{iss}$     | —   | 2000 | —         | pF               | $V_{DS} = 10 \text{ V}$ , $V_{GS} = 0 \text{ V}$ ,<br>$f = 1 \text{ MHz}$                                                      |
| Output capacitance                         | $C_{oss}$     | —   | 405  | —         | pF               |                                                                                                                                |
| Reverse transfer capacitance               | $C_{rss}$     | —   | 100  | —         | pF               |                                                                                                                                |
| Gate Resistance                            | $R_g$         | —   | 0.5  | —         | $\Omega$         |                                                                                                                                |
| Total gate charge                          | $Q_g$         | —   | 27   | —         | nC               | $V_{DD} = 25 \text{ V}$ , $V_{GS} = 10 \text{ V}$ ,<br>$I_D = 25 \text{ A}$                                                    |
| Gate to source charge                      | $Q_{gs}$      | —   | 9.0  | —         | nC               |                                                                                                                                |
| Gate to drain charge                       | $Q_{gd}$      | —   | 4.5  | —         | nC               |                                                                                                                                |
| Turn-on delay time                         | $t_{d(on)}$   | —   | 12   | —         | ns               | $V_{GS} = 10 \text{ V}$ , $I_D = 12.5 \text{ A}$ ,<br>$V_{DD} \cong 30 \text{ V}$ , $R_L = 2.4 \Omega$ ,<br>$R_g = 4.7 \Omega$ |
| Rise time                                  | $t_r$         | —   | 5.5  | —         | ns               |                                                                                                                                |
| Turn-off delay time                        | $t_{d(off)}$  | —   | 32   | —         | ns               |                                                                                                                                |
| Fall time                                  | $t_f$         | —   | 6.9  | —         | ns               |                                                                                                                                |
| Body-drain diode forward voltage           | $V_{DF}$      | —   | 0.8  | 1.1       | V                | $I_F = 25 \text{ A}$ , $V_{GS} = 0 \text{ V}$ <sup>Note4</sup>                                                                 |
| Body-drain diode reverse recovery time     | $t_{rr}$      | —   | 42   | —         | ns               | $I_F = 25 \text{ A}$ , $V_{GS} = 0 \text{ V}$<br>$di_F/dt = 100 \text{ A}/\mu\text{s}$                                         |

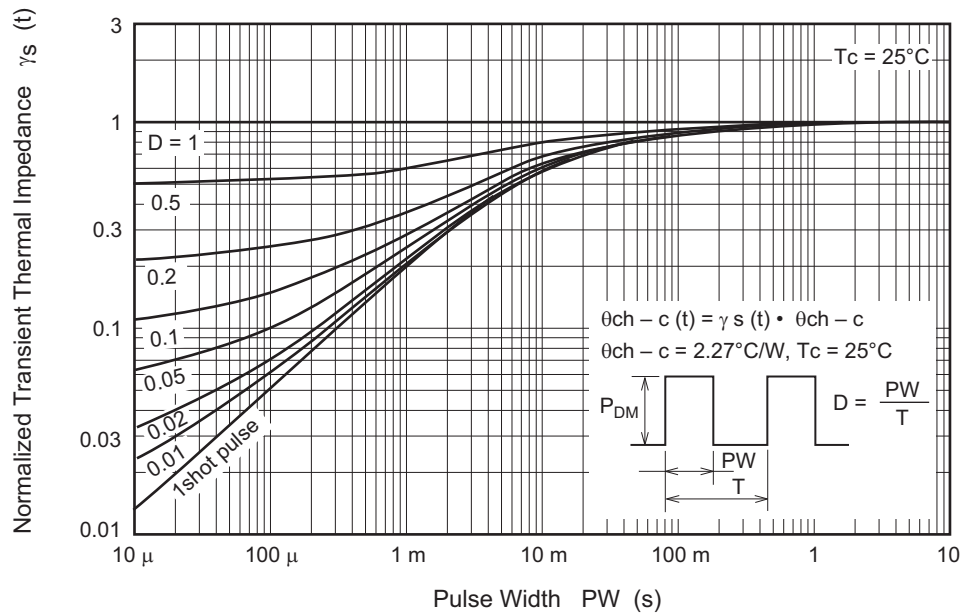
Notes: 4. Pulse test

## Main Characteristics

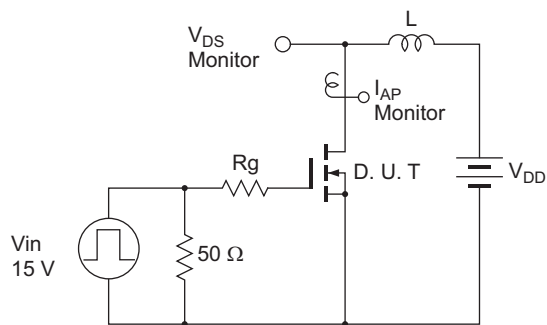




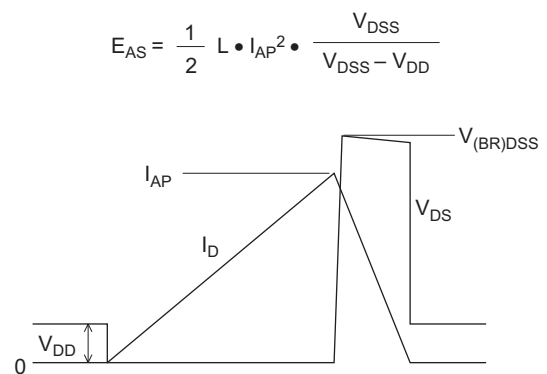
Normalized Transient Thermal Impedance vs. Pulse Width



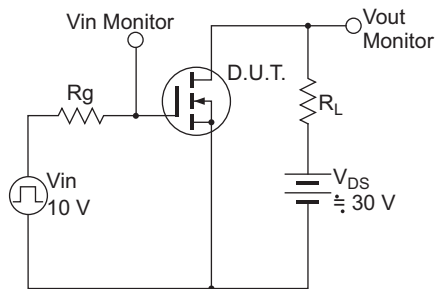
Avalanche Test Circuit



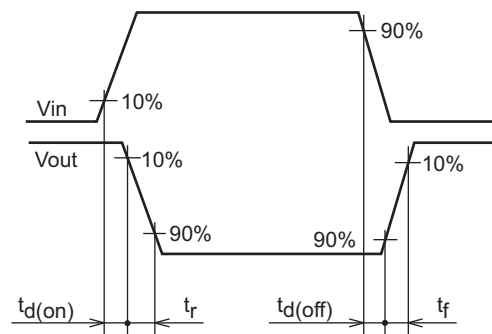
Avalanche Waveform



Switching Time Test Circuit



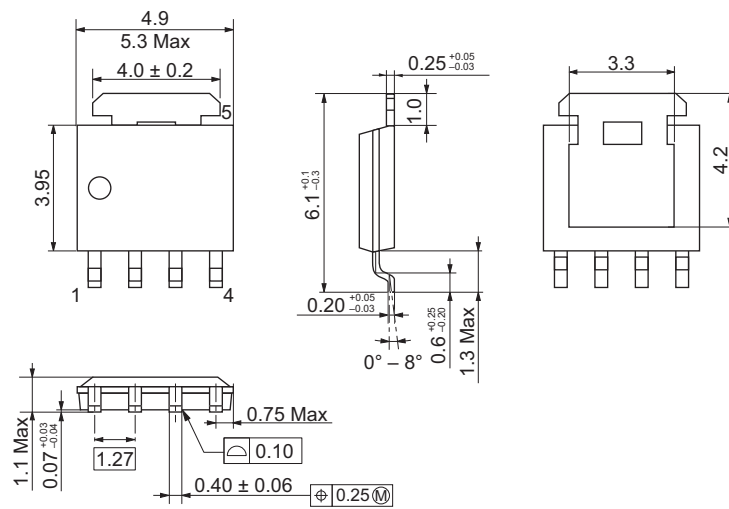
Switching Time Waveform



## Package Dimensions

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

Unit: mm



(Ni/Pd/Au plating)

## Ordering Information

| Part No.         | Quantity | Shipping Container |
|------------------|----------|--------------------|
| RJK0854DPB-00-J5 | 2500 pcs | Taping             |

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