

RJK6025DPH-E0

600V - 1A - MOS FET
High Speed Power Switching

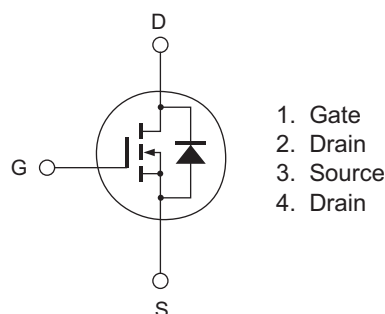
R07DS1012EJ0100
Rev.1.00
Feb 12, 2013

Features

- Low on-resistance
 $R_{DS(on)} = 13 \Omega$ typ. (at $I_D = 0.5 \text{ A}$, $V_{GS} = 10 \text{ V}$, $T_a = 25^\circ\text{C}$)
- Low drive current
- High density mounting

Outline

RENESAS Package code: PRSS0004ZJ-B
(Package name: TO-251)



Absolute Maximum Ratings

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

| Item | Symbol | Ratings | Unit |
|---|----------------------------------|-------------|--------------------|
| Drain to source voltage | V_{DSS} | 600 | V |
| Gate to source voltage | V_{GSS} | ± 30 | V |
| Drain current | I_D | 1 | A |
| Drain peak current | $I_{D(pulse)}$ ^{Note1} | 2 | A |
| Body-drain diode reverse drain current | I_{DR} | 1 | A |
| Body-drain diode reverse drain peak current | $I_{DR(pulse)}$ ^{Note1} | 2 | A |
| Channel dissipation | P_{ch} ^{Note2} | 29.7 | W |
| Channel to case thermal impedance | θ_{ch-c} | 4.2 | $^\circ\text{C/W}$ |
| 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 $T_c = 25^\circ\text{C}$

Electrical Characteristics

(Ta = 25°C)

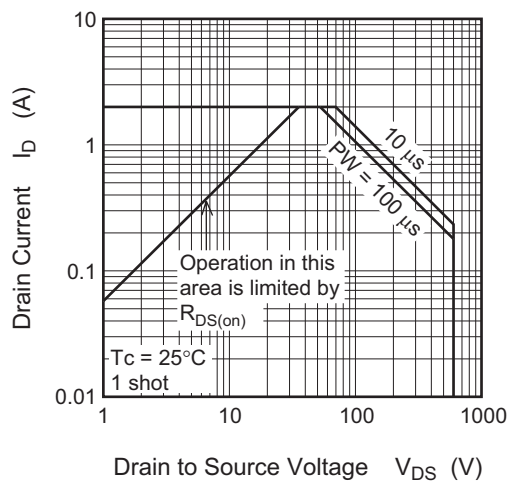
| Item | Symbol | Min | Typ | Max | Unit | Test conditions |
|--|---------------|-----|------|-----------|---------------|--|
| Drain to source breakdown voltage | $V_{(BR)DSS}$ | 600 | — | — | V | $I_D = 10 \text{ mA}$, $V_{GS} = 0$ |
| Zero gate voltage drain current | I_{DSS} | — | — | 1 | μA | $V_{DS} = 600 \text{ V}$, $V_{GS} = 0$ |
| Gate to source leak current | I_{GSS} | — | — | ± 0.1 | μA | $V_{GS} = \pm 30 \text{ V}$, $V_{DS} = 0$ |
| Gate to source cutoff voltage | $V_{GS(off)}$ | 3 | — | 5 | V | $V_{DS} = 10 \text{ V}$, $I_D = 1 \text{ mA}$ |
| Static drain to source on state resistance | $R_{DS(on)}$ | — | 13.5 | 17.5 | Ω | $I_D = 0.5 \text{ A}$, $V_{GS} = 10 \text{ V}$ ^{Note3} |
| Input capacitance | C_{iss} | — | 37.5 | — | pF | $V_{DS} = 25 \text{ V}$ $V_{GS} = 0$ $f = 1 \text{ MHz}$ |
| Output capacitance | C_{oss} | — | 7.5 | — | pF | |
| Reverse transfer capacitance | C_{rss} | — | 0.9 | — | pF | |
| Turn-on delay time | $t_{d(on)}$ | — | 30 | — | ns | $I_D = 0.2 \text{ A}$ $V_{GS} = 10 \text{ V}$ $R_L = 1500 \Omega$ $R_g = 10 \Omega$ |
| Rise time | t_r | — | 14.5 | — | ns | |
| Turn-off delay time | $t_{d(off)}$ | — | 48 | — | ns | |
| Fall time | t_f | — | 77 | — | ns | |
| Total gate charge | Q_g | — | 5.0 | — | nC | $V_{DD} = 480 \text{ V}$ $V_{GS} = 10 \text{ V}$ $I_D = 1.0 \text{ A}$ |
| Gate to source charge | Q_{gs} | — | 0.7 | — | nC | |
| Gate to drain charge | Q_{gd} | — | 3.3 | — | nC | |
| Body-drain diode forward voltage | V_{DF} | — | 0.85 | 1.45 | V | $I_F = 1.0 \text{ A}$, $V_{GS} = 0$ ^{Note3} |
| Body-drain diode reverse recovery time | t_{rr} | — | 230 | — | ns | $I_F = 0.4 \text{ A}$, $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$ |

Notes: 3. Pulse test

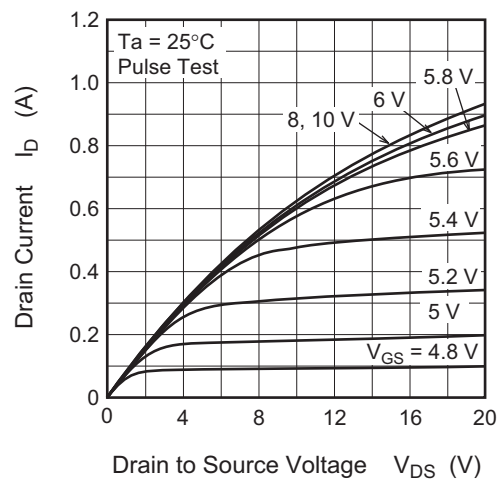
4. Since this device is equipped with high voltage FET chip ($V_{DSS} \geq 600 \text{ V}$), high voltage may be supplied. Therefore, please be sure to confirm about Electric discharge between Drain terminal and other terminal.
5. This device is sensitive to electrostatic discharge.
It is recommended to adopt appropriate cautions when handling this product.

Main Characteristics

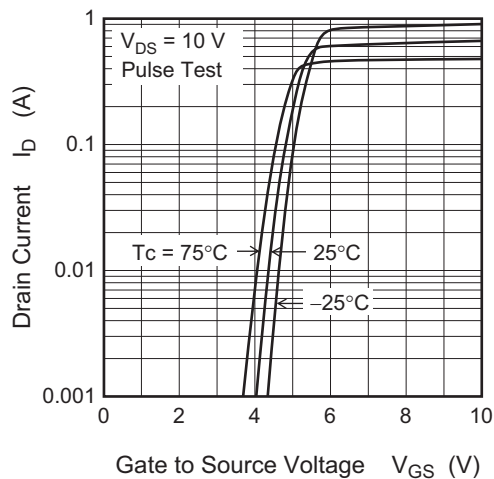
Maximum Safe Operation Area



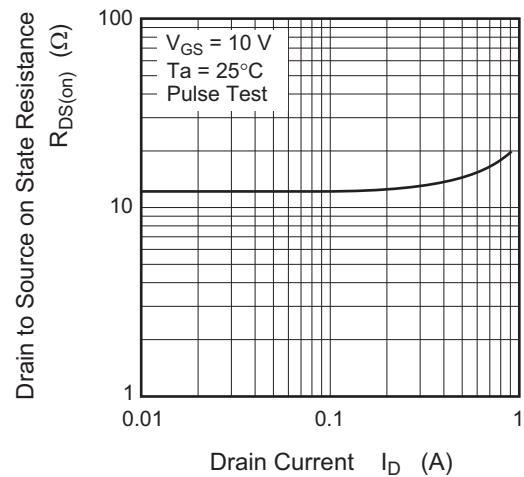
Typical Output Characteristics



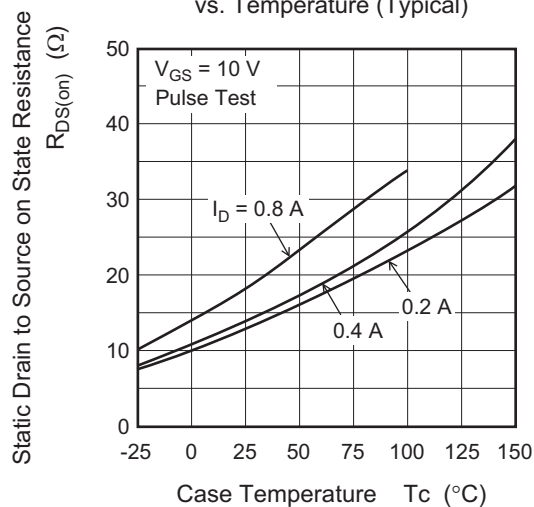
Typical Transfer Characteristics



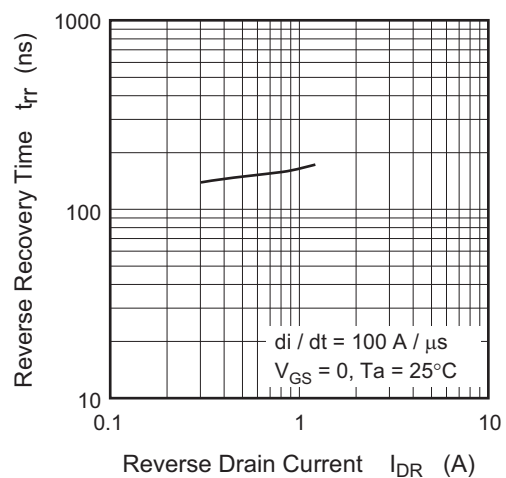
Static Drain to Source on State Resistance vs. Drain Current (Typical)



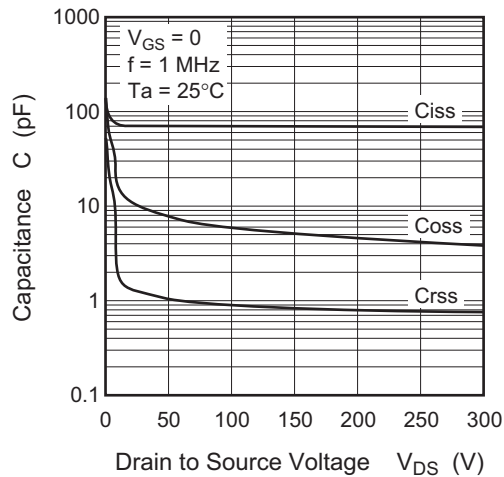
Static Drain to Source on State Resistance vs. Temperature (Typical)



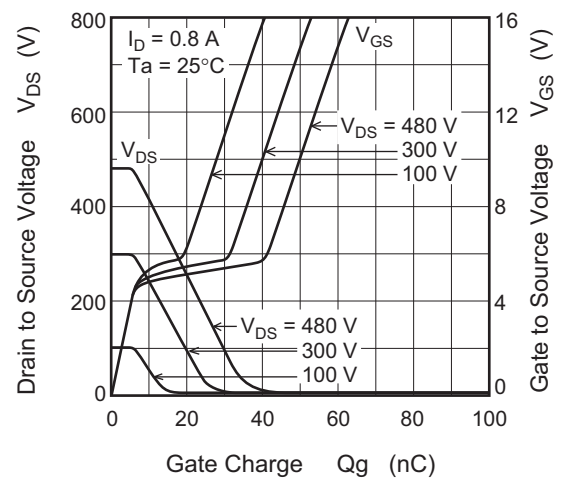
Body-Drain Diode Reverse Recovery Time (Typical)



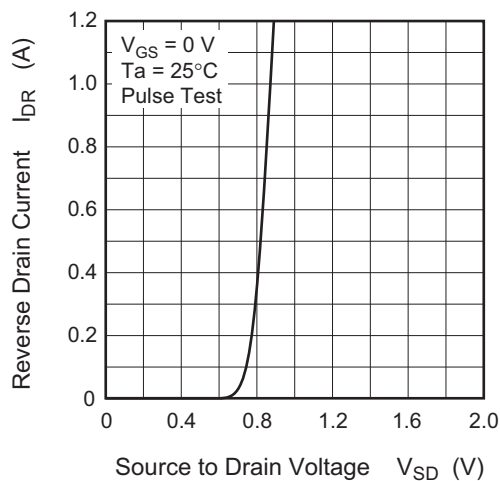
Typical Capacitance vs.
Drain to Source Voltage



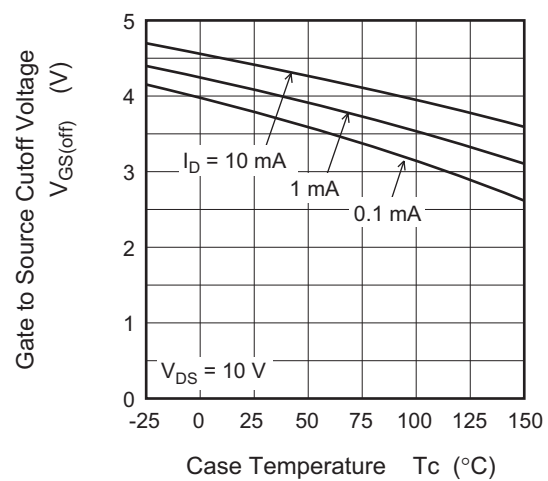
Dynamic Input Characteristics (Typical)

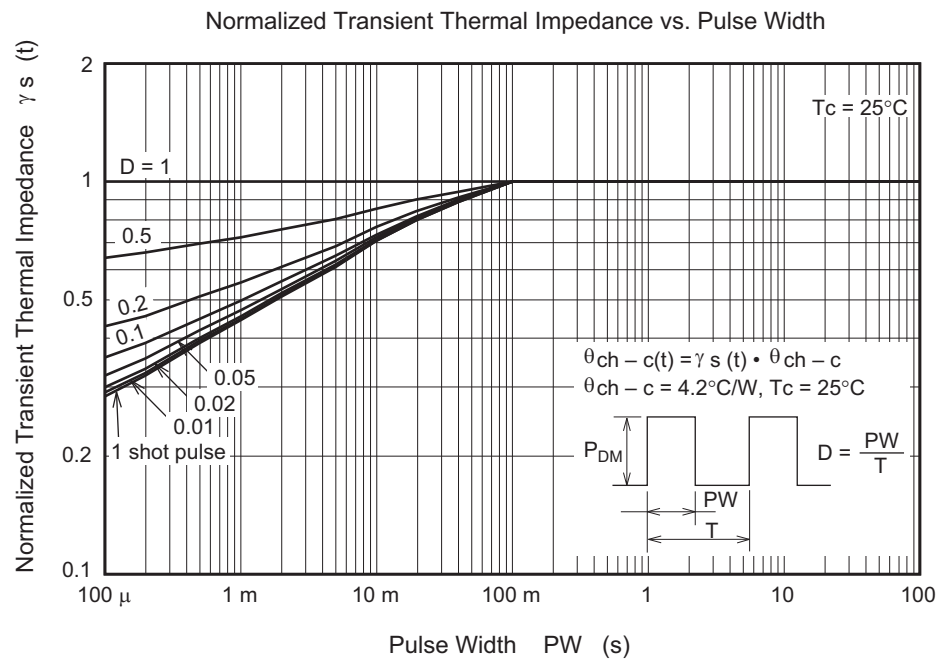


Reverse Drain Current vs.
Source to Drain Voltage (Typical)

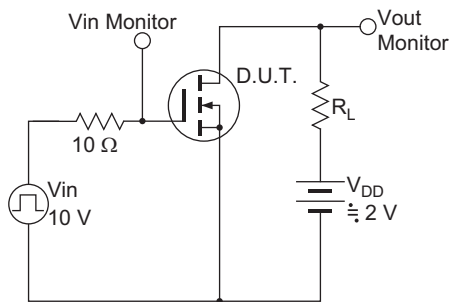


Gate to Source Cutoff Voltage
vs. Case Temperature (Typical)

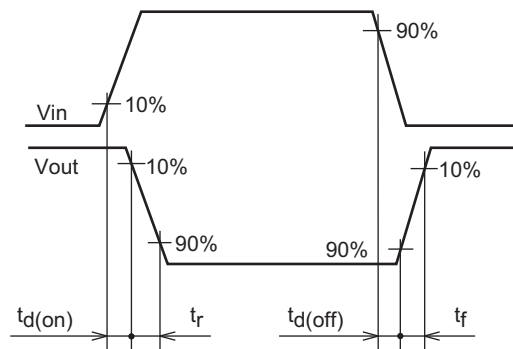




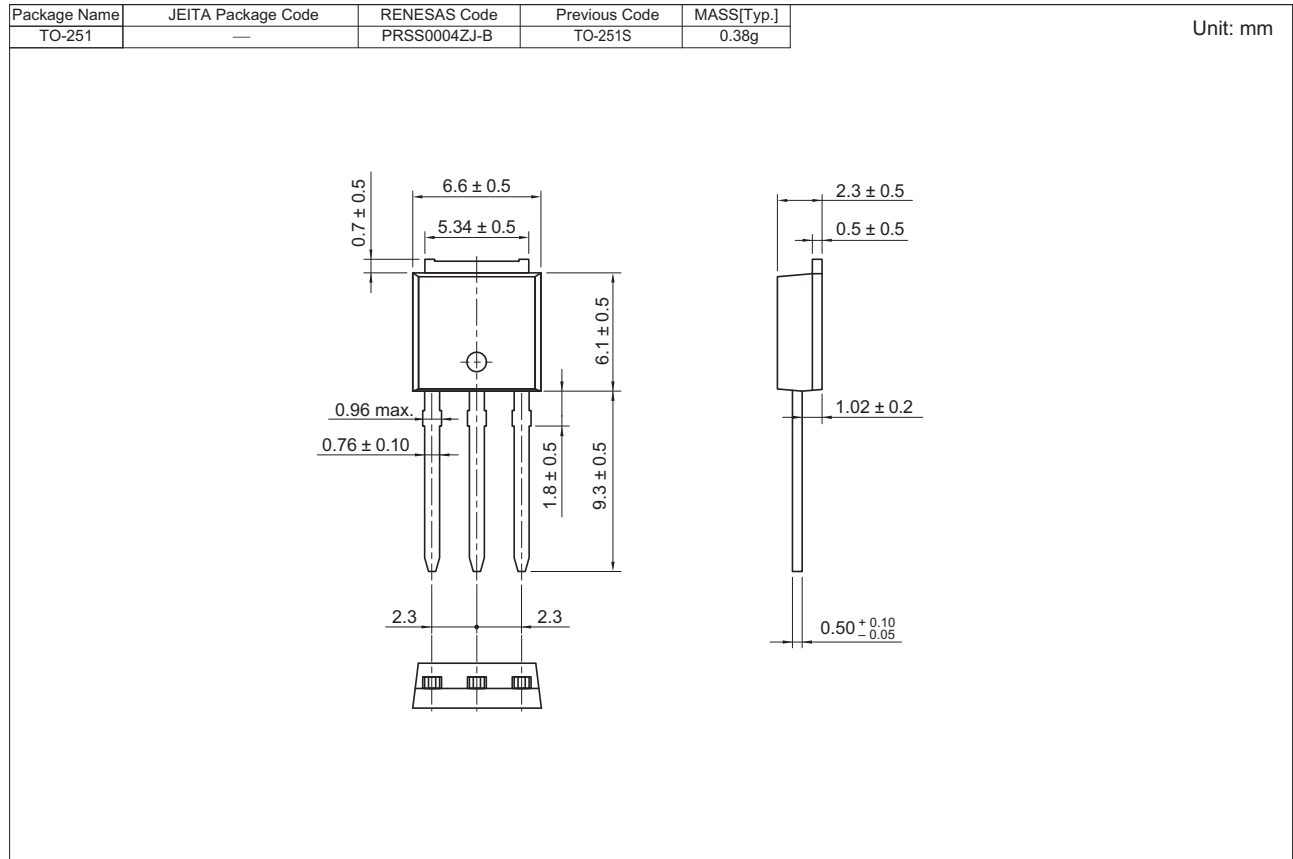
Switching Time Test Circuit



Waveform



Package Dimensions



Ordering Information

| Orderable Part No. | Quantity | Shipping Container |
|--------------------|----------|--------------------|
| RJK6025DPH-E0#T2 | 70 pcs | Tube |

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