

RJK1590DP3-A0

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

R07DS1255EJ0100
Rev.1.00
Mar 30, 2015

Features

- Capable of 2.5 V gate drive
- Low drive current
- Low on-resistance
 $R_{DS(on)} = 1.5 \Omega$ typ. (at $V_{GS} = 4 V$)

Outline

RENESAS Package code: PRSP0004ZB-A
(Package name: SOT-223)

1. Gate
2. Drain
3. Source
4. Drain

Absolute Maximum Ratings

($T_a = 25^\circ C$)

| Item | Symbol | Value | Unit |
|--|--------------------------------------|-------------|--------------|
| Drain to source voltage | V_{BSS} | 150 | V |
| Gate to source voltage | V_{GSS} | ± 10 | V |
| Drain current | I_D | 1 | A |
| Drain peak current | $I_{D(pulse)}$ <small>Note 1</small> | 4 | A |
| Body-drain diode reverse drain current | I_{DR} | 1 | A |
| Channel dissipation | P_{ch} | 1.04 | W |
| Channel to ambient thermal impedance | θ_{ch-a} | 120 | $^\circ C/W$ |
| Channel temperature | T_{ch} | 150 | $^\circ C$ |
| Storage temperature | T_{stg} | -55 to +150 | $^\circ C$ |

Notes: 1. $PW \leq 10 \mu s$, duty cycle $\leq 1\%$

Electrical Characteristics

(Ta = 25°C)

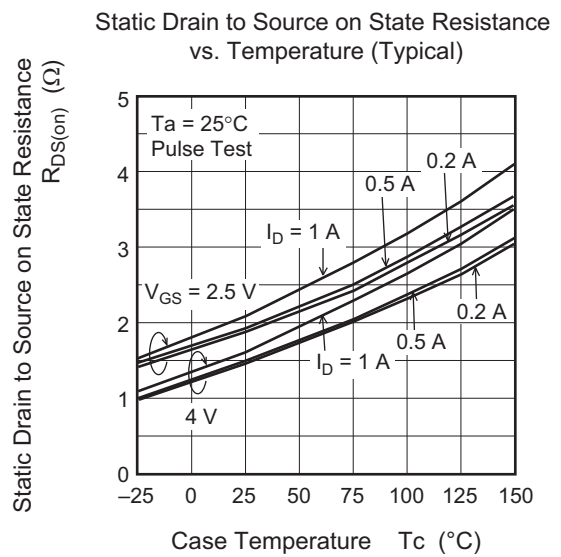
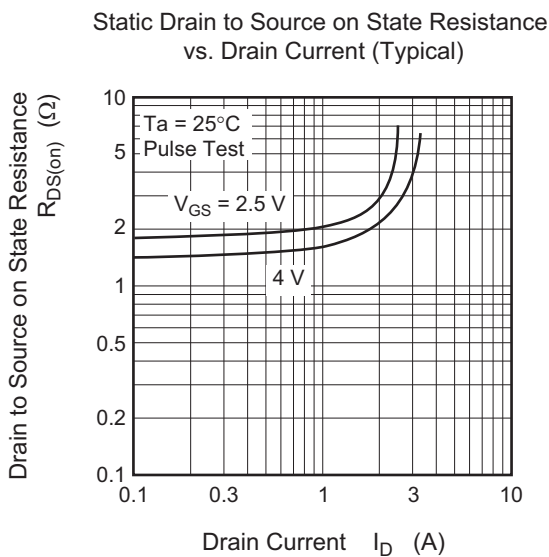
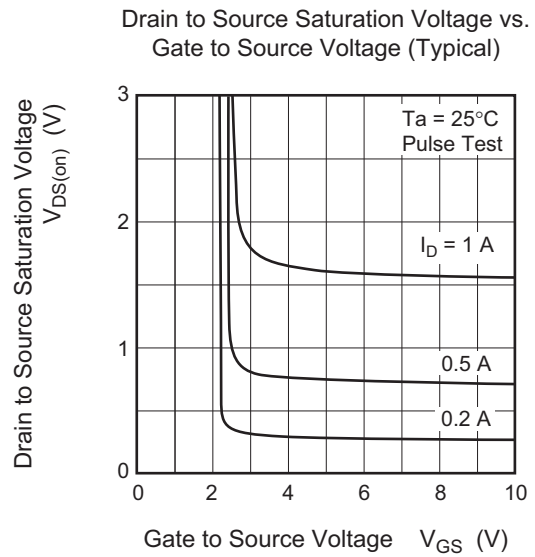
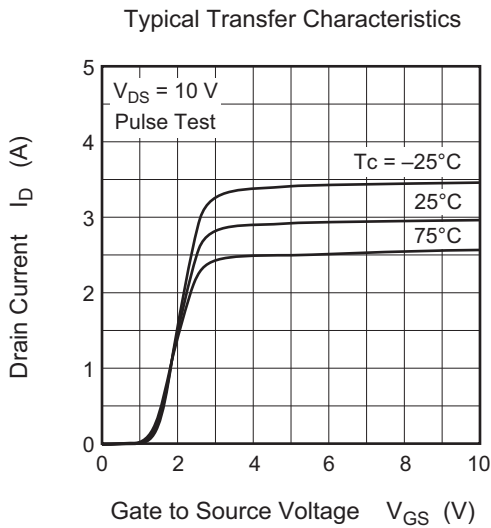
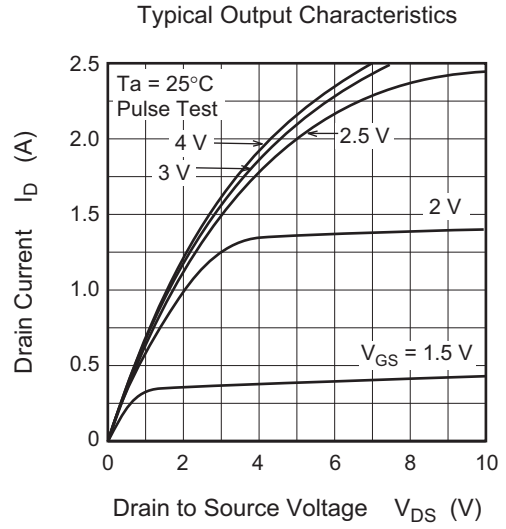
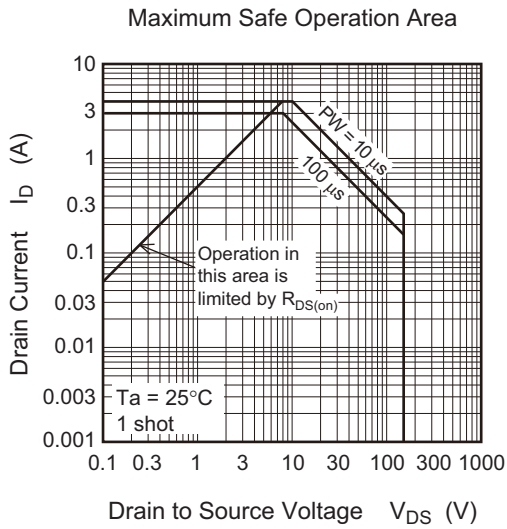
| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|--|---------------|----------|-----|----------|---------------|--|
| Drain to source breakdown voltage | $V_{(BR)DSS}$ | 150 | — | — | V | $I_D = 10 \text{ mA}$, $V_{GS} = 0$ |
| Gate to source breakdown voltage | $V_{(BR)GSS}$ | ± 10 | — | — | V | $I_G = \pm 100 \text{ }\mu\text{A}$, $V_{DS} = 0$ |
| Gate to source leak current | I_{GSS} | — | — | ± 10 | μA | $V_{GS} = \pm 8 \text{ V}$, $V_{DS} = 0$ |
| Zero gate voltage drain current | I_{DSS} | — | — | 1 | μA | $V_{DS} = 150 \text{ V}$, $V_{GS} = 0$ |
| Gate to source cutoff voltage | $V_{GS(off)}$ | 0.5 | — | 1.5 | V | $V_{DS} = 10 \text{ V}$, $I_D = 1 \text{ mA}$ |
| Static drain to source on state resistance | $R_{DS(on)}$ | — | 1.5 | 1.95 | Ω | $I_D = 0.5 \text{ A}$, $V_{GS} = 4 \text{ V}$ ^{Note 2} |
| | $R_{DS(on)}$ | — | 1.9 | 2.5 | Ω | $I_D = 0.5 \text{ A}$, $V_{GS} = 2.5 \text{ V}$ ^{Note 2} |
| Input capacitance | C_{iss} | — | 98 | — | pF | $V_{DS} = 10 \text{ V}$ $V_{GS} = 0$ $f = 1 \text{ MHz}$ |
| Output capacitance | C_{oss} | — | 31 | — | pF | |
| Reverse transfer capacitance | C_{rss} | — | 14 | — | pF | |
| Total gate charge | Q_g | — | 3.5 | — | nC | $V_{DD} = 100 \text{ V}$ |
| Gate to source charge | Q_{gs} | — | 0.5 | — | nC | $V_{GS} = 4 \text{ V}$ |
| Gate to drain charge | Q_{gd} | — | 1.8 | — | nC | $I_D = 1 \text{ A}$ |
| Turn-on delay time | $t_{d(on)}$ | — | 8 | — | ns | $V_{GS} = 4 \text{ V}$ $I_D = 0.5 \text{ A}$ $R_L = 60 \text{ }\Omega$ |
| Rise time | t_r | — | 12 | — | ns | |
| Turn-off delay time | $t_{d(off)}$ | — | 34 | — | ns | |
| Fall time | t_f | — | 19 | — | ns | |
| Body-drain diode forward voltage | V_{DF} | — | 1.0 | 1.5 | V | $I_F = 1 \text{ A}$, $V_{GS} = 0$ ^{Note 2} |
| Body-drain diode reverse recovery time | t_{rr} | — | 60 | — | ns | $I_F = 1 \text{ A}$, $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$ |

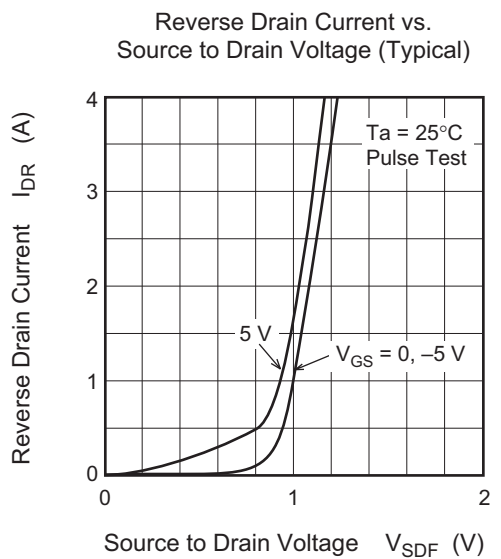
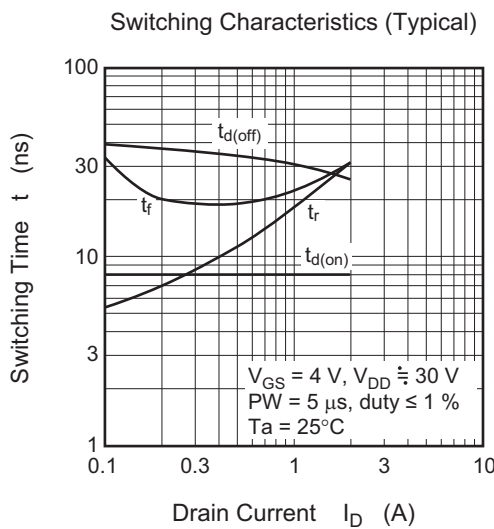
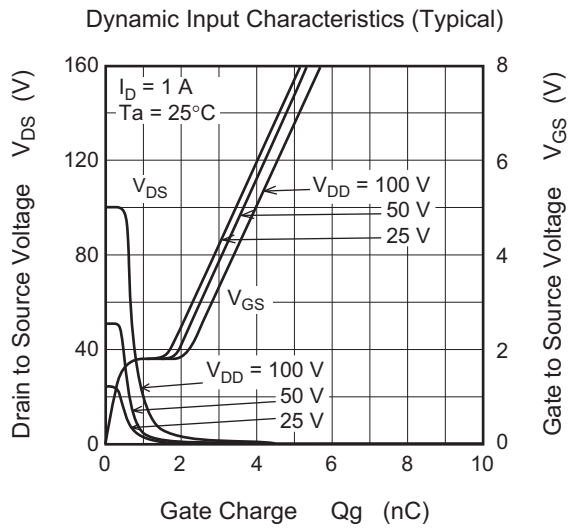
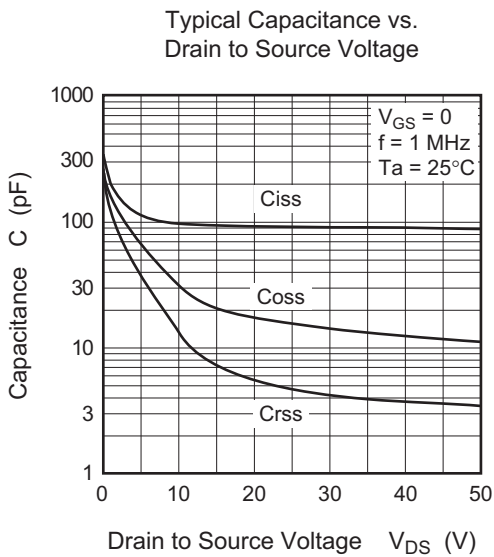
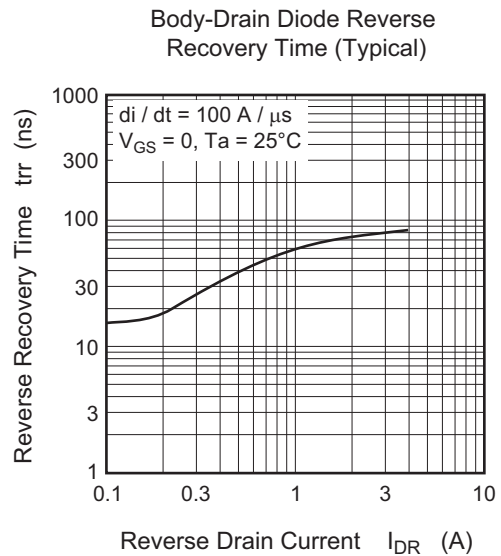
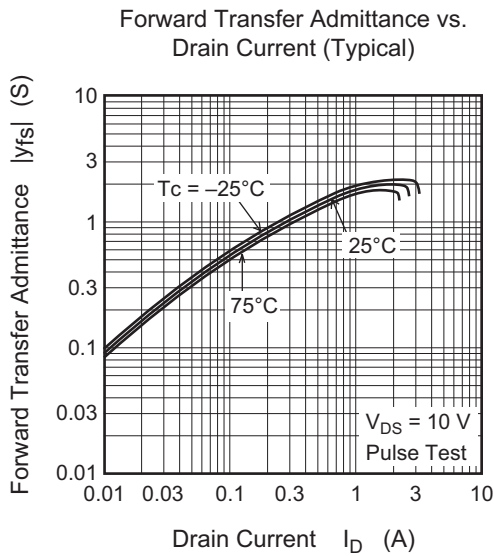
Notes: 2. Pulse test

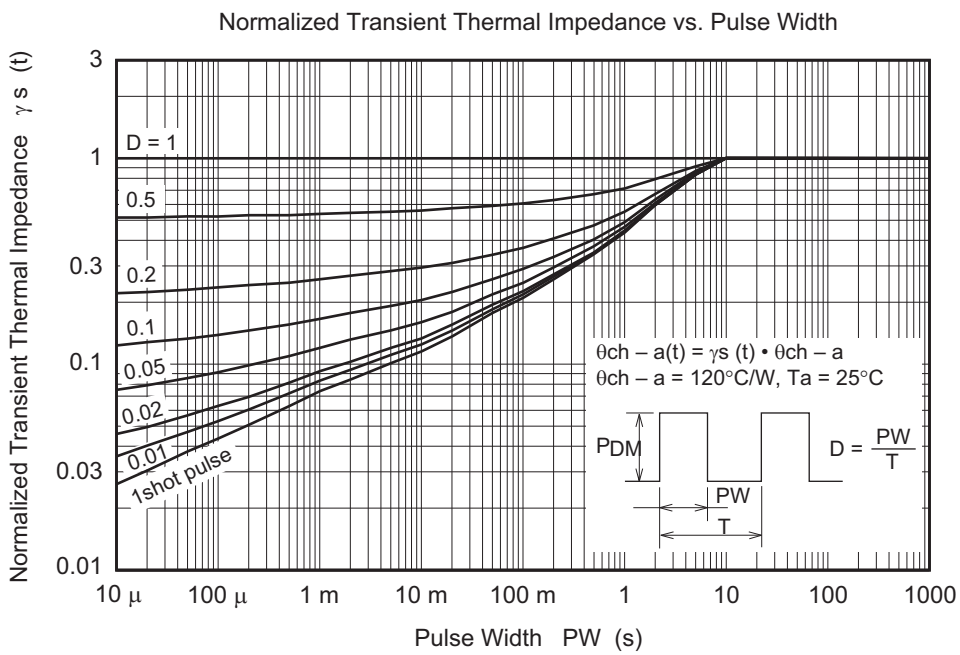
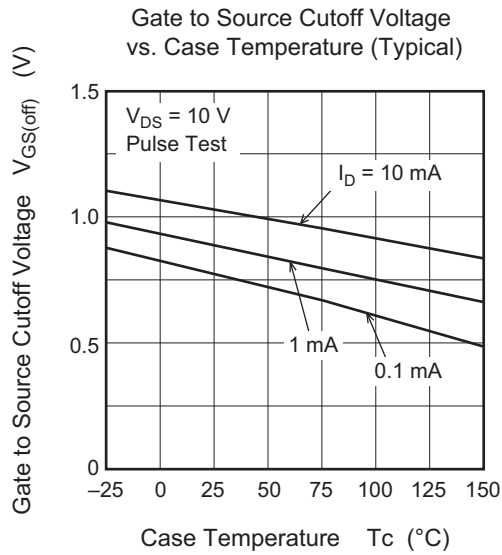
3. This device is sensitive to electrostatic discharge.

It is recommended to adopt appropriate cautions when handling this product.

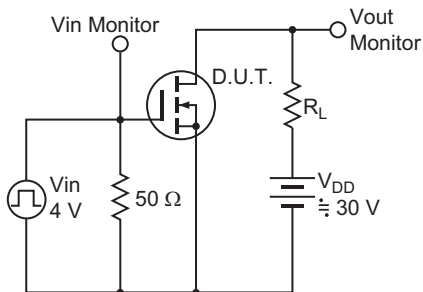
Main Characteristics



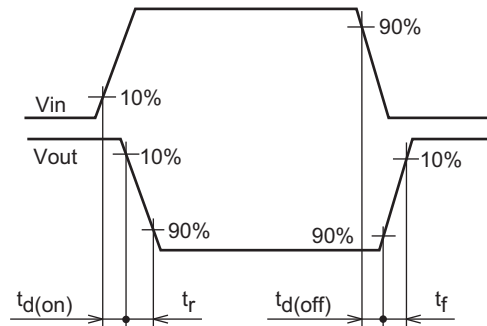




Switching Time Test Circuit



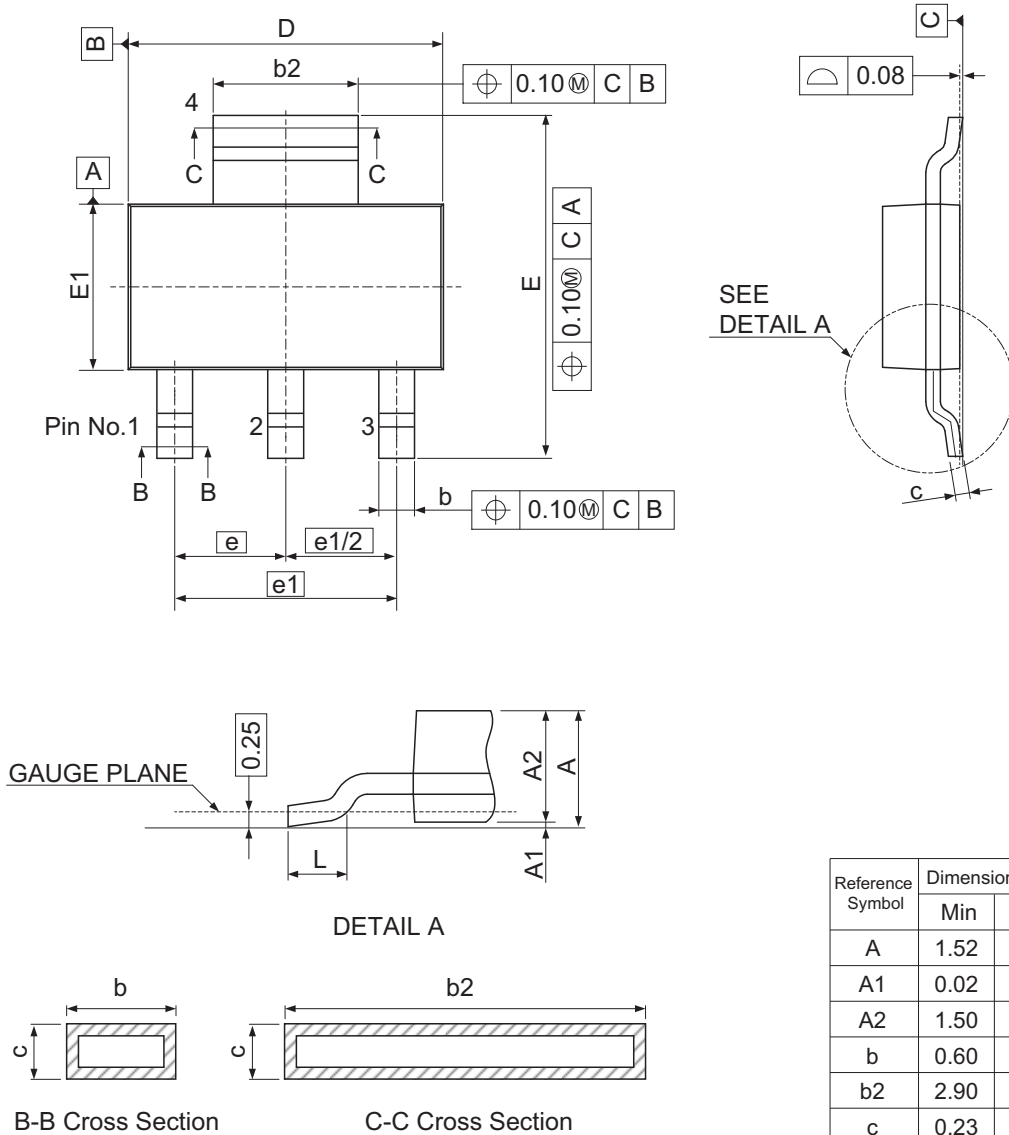
Waveform



Package Dimensions

| Package Name | JEITA Package Code | RENESAS Code | Previous Code | MASS (Typ) [g] |
|--------------|--------------------|--------------|---------------|----------------|
| SOT-223 | — | PRSP0004ZB-A | SOT-223A | 0.12 |

Unit: mm



| Reference Symbol | Dimensions in millimeters | | |
|------------------|---------------------------|------|------|
| | Min | Nom | Max |
| A | 1.52 | 1.66 | 1.80 |
| A1 | 0.02 | — | 0.10 |
| A2 | 1.50 | — | 1.70 |
| b | 0.60 | — | 0.80 |
| b2 | 2.90 | — | 3.10 |
| c | 0.23 | — | 0.33 |
| D | 6.30 | — | 6.70 |
| E | 6.70 | — | 7.30 |
| E1 | 3.30 | — | 3.70 |
| e | 2.30 BASIC | | |
| e1 | 4.60 BASIC | | |
| L | 0.90 | — | 1.10 |

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Ordering Information

| Orderable Part No. | Quantity | Shipping Container |
|--------------------|----------|--------------------|
| RJK1590DP3-A0#J2 | 3000 pcs | Taping |

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