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April 1st, 2010
Renesas Electronics Corporation

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HAT1021R

Silicon P Channel Power MOS FET
High Speed Power Switching

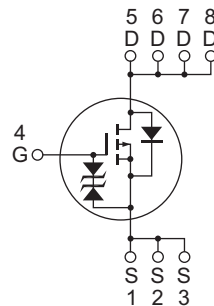
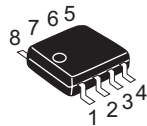
REJ03G1144-0600
(Previous: ADE-208-475D)
Rev.6.00
Sep 07, 2005

Features

- Low on-resistance
- Capable of 2.5 V gate drive
- Low drive current
- High density mounting

Outline

RENESAS Package code: PRSP0008DD-D
(Package name: SOP-8 <FP-8DAV>)



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

Absolute Maximum Ratings

(Ta = 25°C)

| Item | Symbol | Value | Unit |
|--|--|-------------|------|
| Drain to source voltage | V _{DSS} | -20 | V |
| Gate to source voltage | V _{GSS} | ±10 | V |
| Drain current | I _D | -5.5 | A |
| Drain peak current | I _{D (pulse)} ^{Note 1} | -44 | A |
| Body-drain diode reverse drain current | I _{DR} | -5.5 | A |
| Channel dissipation | P _{ch} ^{Note 2} | 2.5 | W |
| Channel temperature | T _{ch} | 150 | °C |
| Storage temperature | T _{stg} | -55 to +150 | °C |

Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1%

2. When using the glass epoxy board (FR4 40 × 40 × 1.6 mm), PW ≤ 10 s

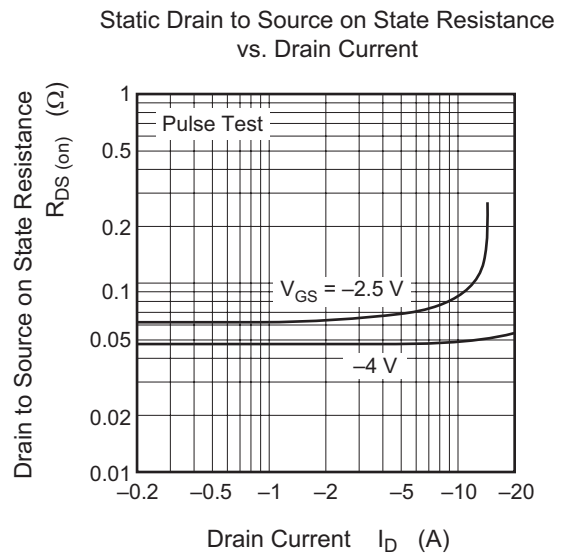
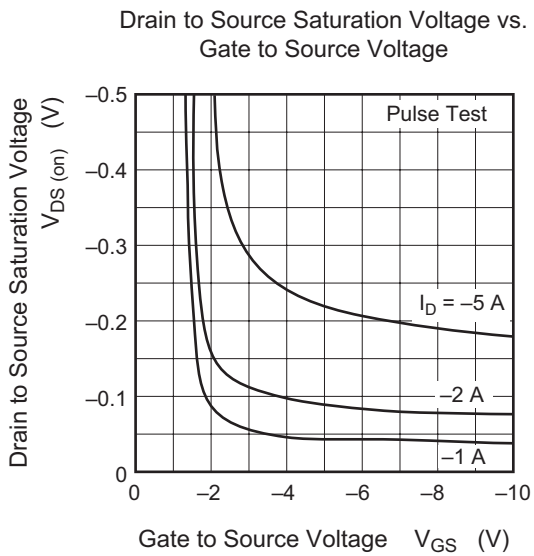
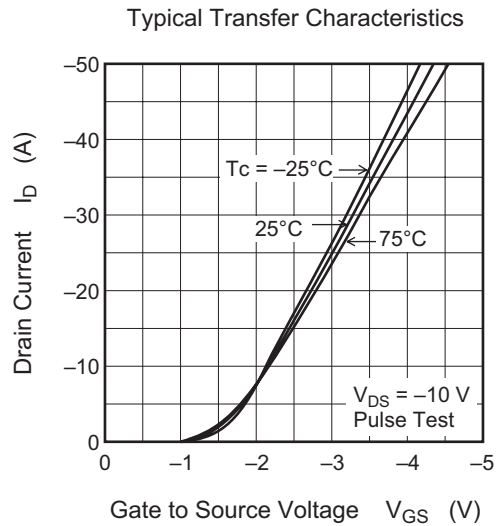
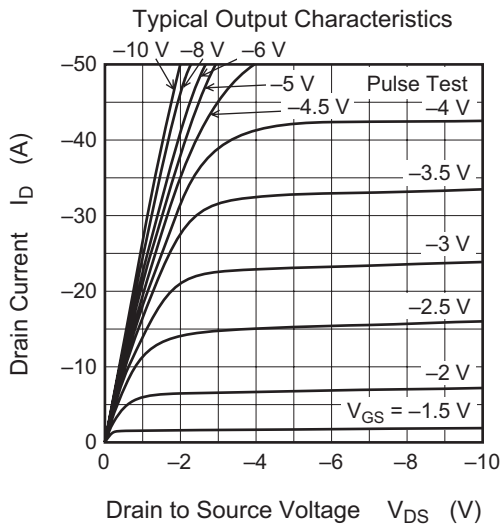
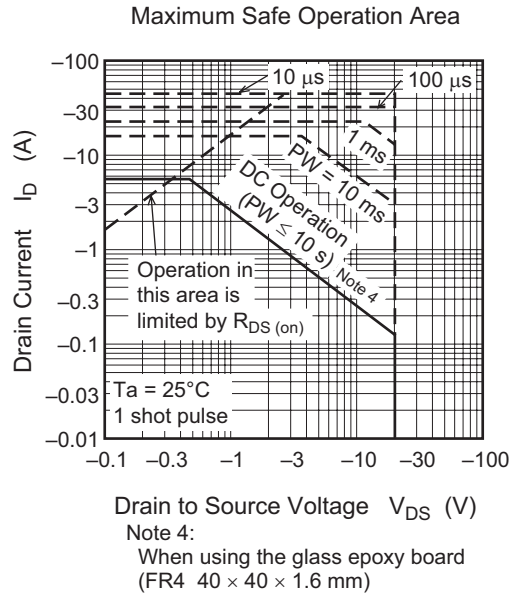
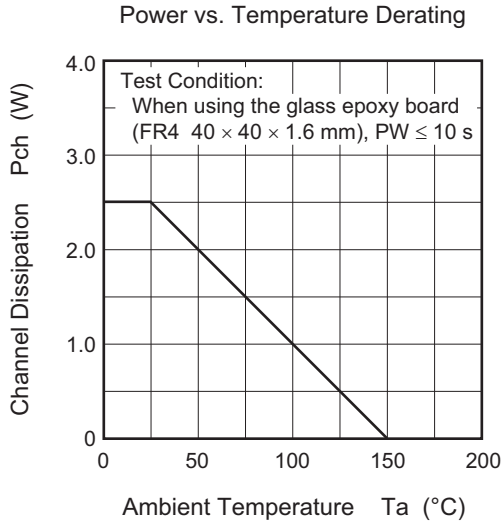
Electrical Characteristics

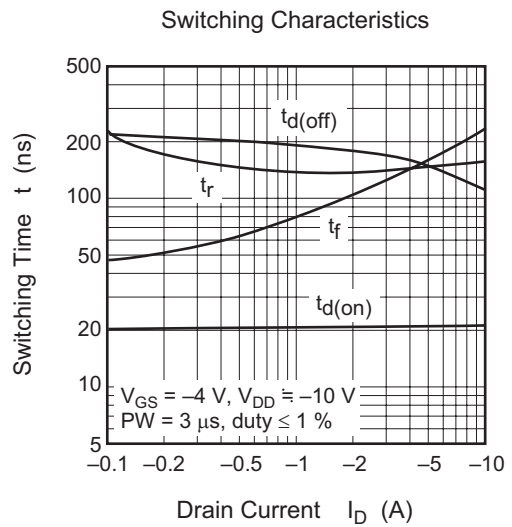
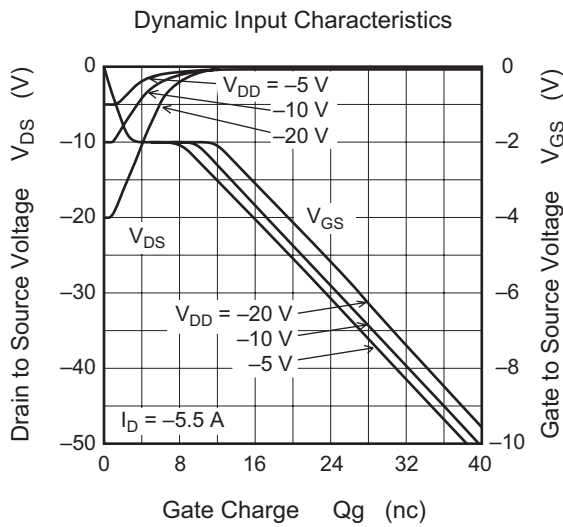
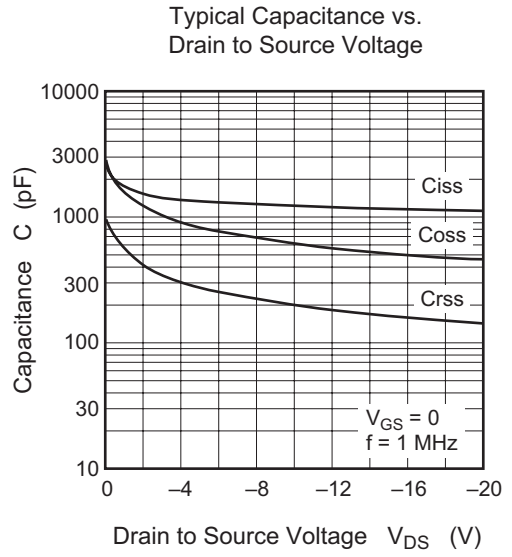
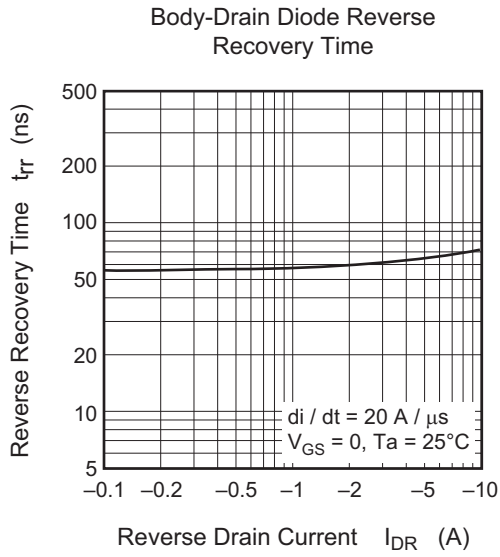
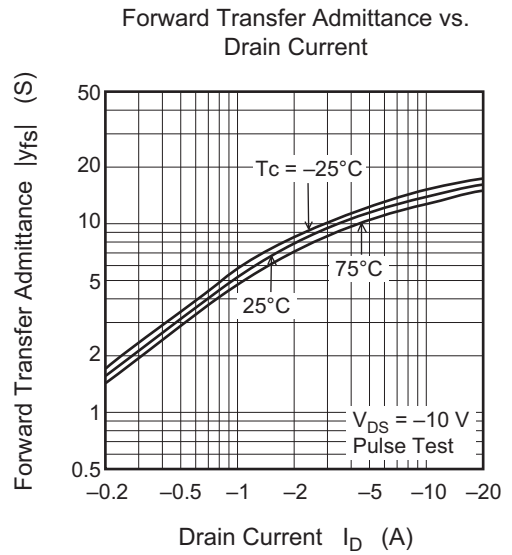
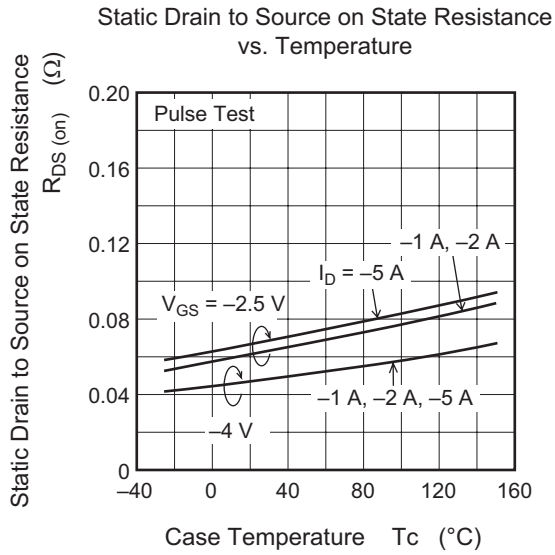
(Ta = 25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|--|-----------------------|------|-------|-------|------|---|
| Drain to source breakdown voltage | V _{(BR) DSS} | -20 | — | — | V | I _D = -10 mA, V _{GS} = 0 |
| Gate to source breakdown voltage | V _{(BR) GSS} | ±10 | — | — | V | I _G = ±100 μA, V _{DS} = 0 |
| Gate to source leak current | I _{GSS} | — | — | ±10 | μA | V _{GS} = ±8 V, V _{DS} = 0 |
| Zero gate voltage drain current | I _{DSS} | — | — | -10 | μA | V _{DS} = -20 V, V _{GS} = 0 |
| Gate to source cutoff voltage | V _{GS (off)} | -0.5 | — | -1.5 | V | V _{DS} = -10 V, I _D = -1 mA |
| Static drain to source on state resistance | R _{DS (on)} | — | 0.048 | 0.060 | Ω | I _D = -3 A, V _{GS} = -4 V ^{Note 3} |
| | R _{DS (on)} | — | 0.065 | 0.085 | Ω | I _D = -3 A, V _{GS} = -2.5 V ^{Note 3} |
| Forward transfer admittance | y _{fs} | 6 | 9.5 | — | S | I _D = -3 A, V _{DS} = -10 V ^{Note 3} |
| Input capacitance | C _{iss} | — | 1200 | — | pF | V _{DS} = -10 V |
| Output capacitance | C _{oss} | — | 630 | — | pF | V _{GS} = 0 |
| Reverse transfer capacitance | C _{rss} | — | 200 | — | pF | f = 1 MHz |
| Turn-on delay time | t _{d (on)} | — | 20 | — | ns | V _{GS} = -4 V, I _D = -3 A, |
| Rise time | t _r | — | 120 | — | ns | V _{DD} ≅ -10 V |
| Turn-off delay time | t _{d (off)} | — | 175 | — | ns | |
| Fall time | t _f | — | 140 | — | ns | |
| Body-drain diode forward voltage | V _{DF} | — | -0.9 | -1.4 | V | I _F = -5.5 A, V _{GS} = 0 ^{Note 3} |
| Body-drain diode reverse recovery time | t _{rr} | — | 65 | — | ns | I _F = -5.5 A, V _{GS} = 0 di _F /dt = 20 A/μs |

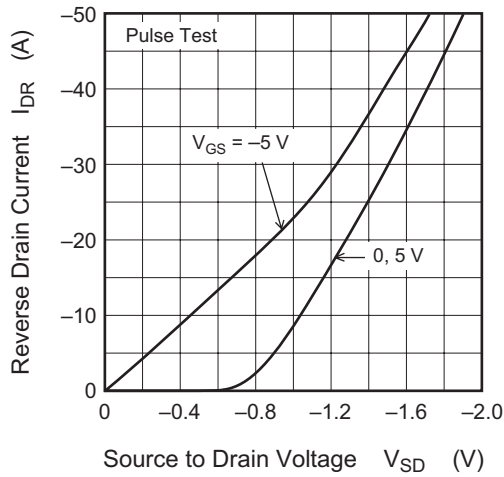
Note: 3. Pulse test

Main Characteristics

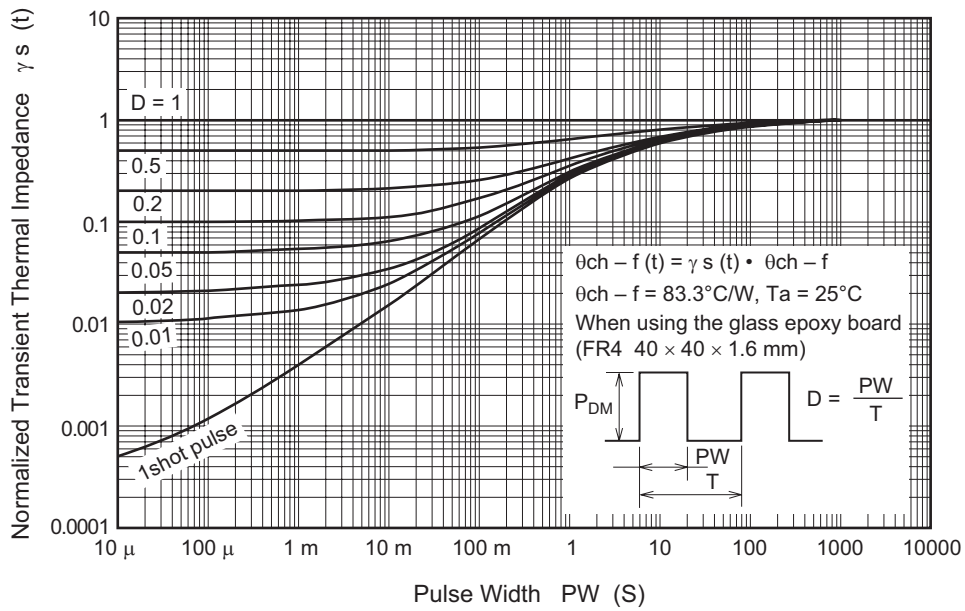




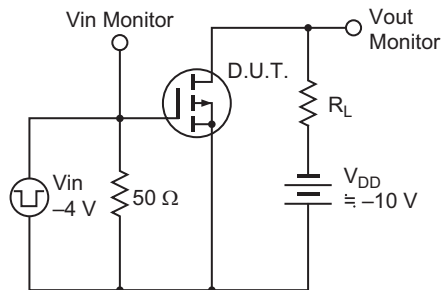
Reverse Drain Current vs. Source to Drain Voltage



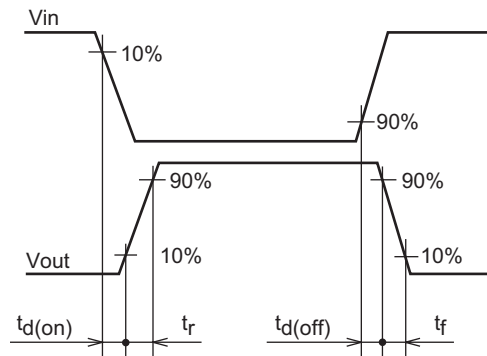
Normalized Transient Thermal Impedance vs. Pulse Width



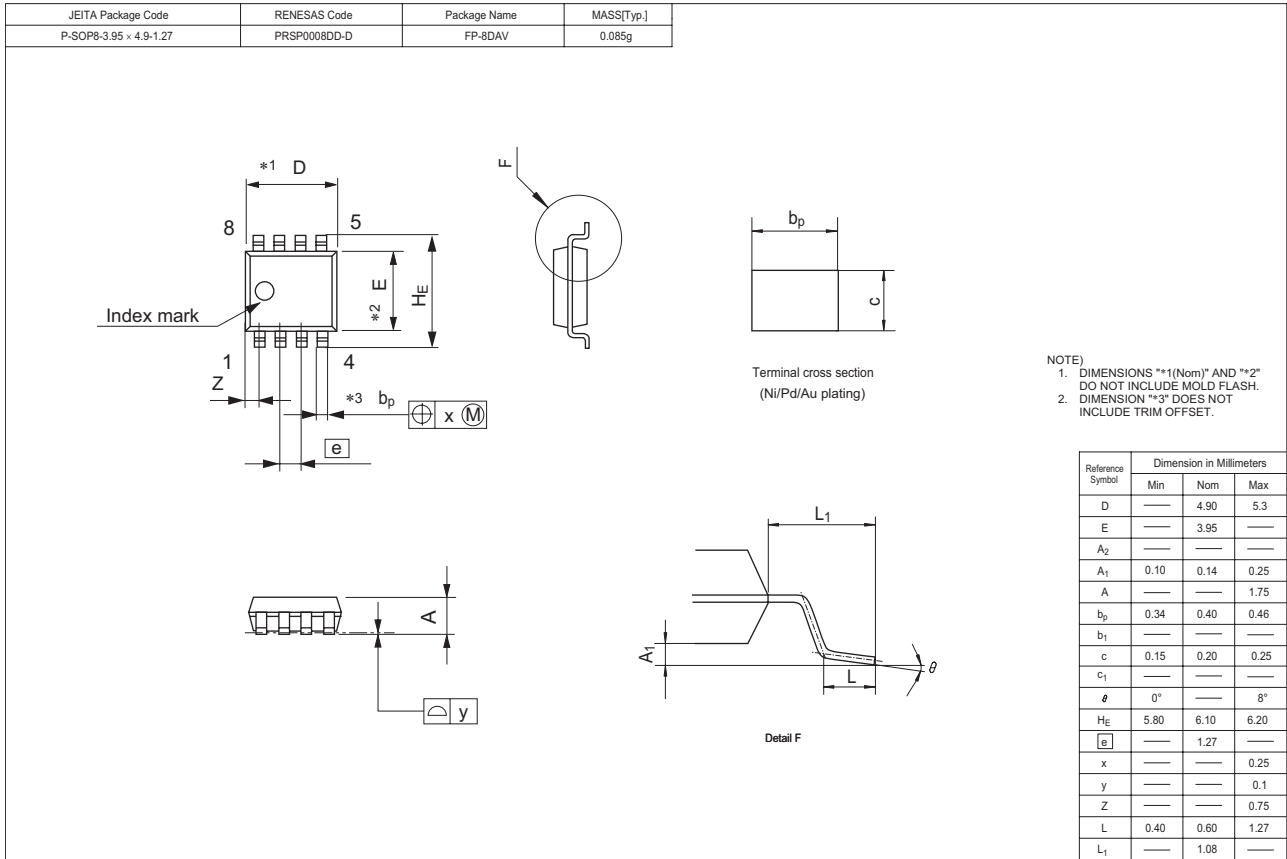
Switching Time Test Circuit



Switching Time Waveform



Package Dimensions



Ordering Information

| Part Name | Quantity | Shipping Container |
|---------------|----------|--------------------|
| HAT1021R-EL-E | 2500 pcs | Taping |

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