

## HAT2204C

### Silicon N Channel MOS FET Power Switching

REJ03G0448-0500

Rev.5.00

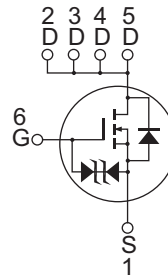
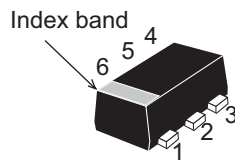
May 10, 2007

#### Features

- Low on-resistance  
 $R_{DS(on)} = 26m\Omega$  typ.(at  $V_{GS} = 4.5V$ )
- Low drive current
- High density mounting
- 1.8V gate drive device

#### Outline

RENESAS Package code: PWSF0006JA-A  
(Package name: CMFPAK - 6)



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

#### Absolute Maximum Ratings

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

| Item                                     | Symbol                          | Ratings     | Unit             |
|--|---------------------------------|-------------|------------------|
| Drain to Source voltage                  | $V_{DSS}$                       | 12          | V                |
| Gate to Source voltage                   | $V_{GSS}$                       | $\pm 8$     | V                |
| Drain current                            | $I_D$                           | 3.5         | A                |
| Drain peak current                       | $I_{D(pulse)}$ <sup>Note1</sup> | 14          | A                |
| Body - Drain diode reverse Drain current | $I_{DR}$                        | 3.5         | A                |
| Channel dissipation                      | $P_{ch}$ <sup>Note2</sup>       | 900         | mW               |
| Channel temperature                      | $T_{ch}$                        | 150         | $^\circ\text{C}$ |
| Storage temperature                      | $T_{stg}$                       | -55 to +150 | $^\circ\text{C}$ |

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

2. When using the glass epoxy board (FR4 40 x 40 x 1.6mm)

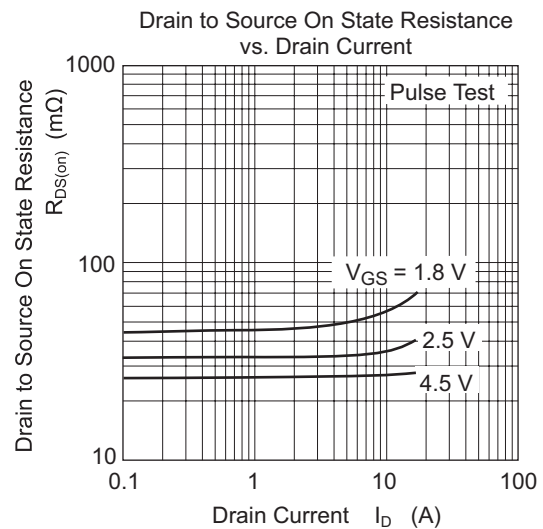
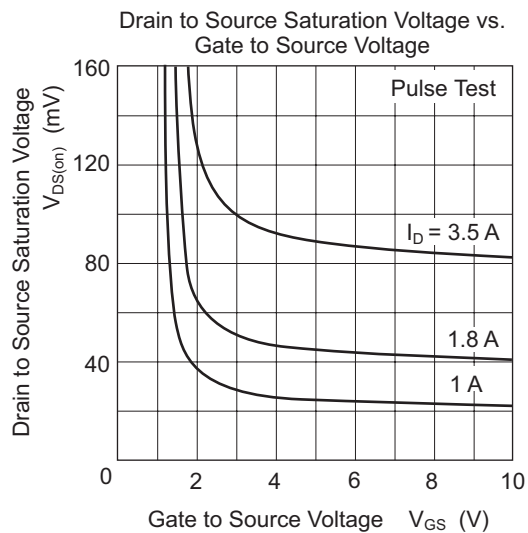
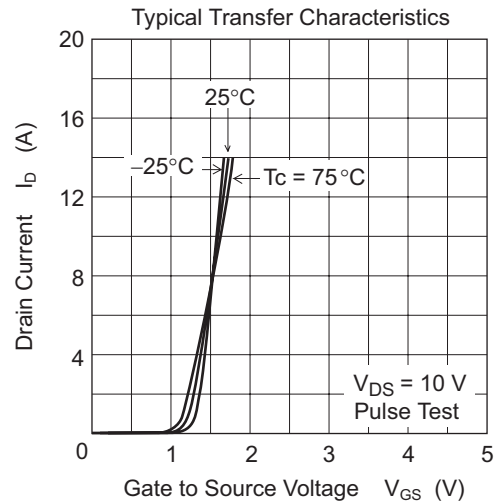
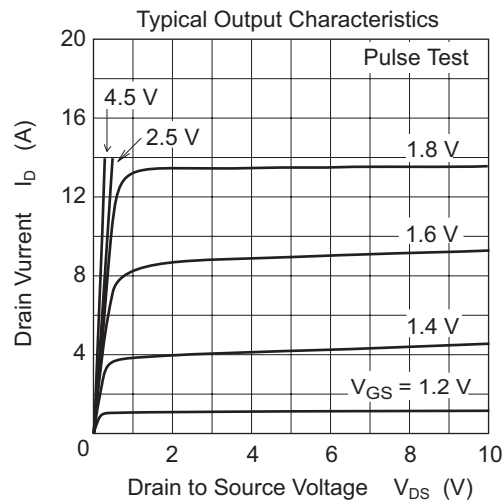
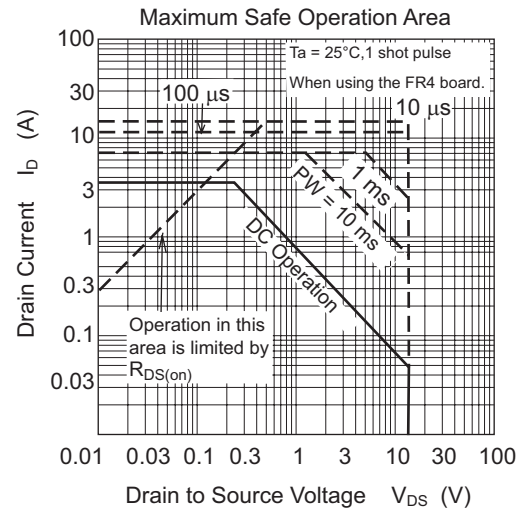
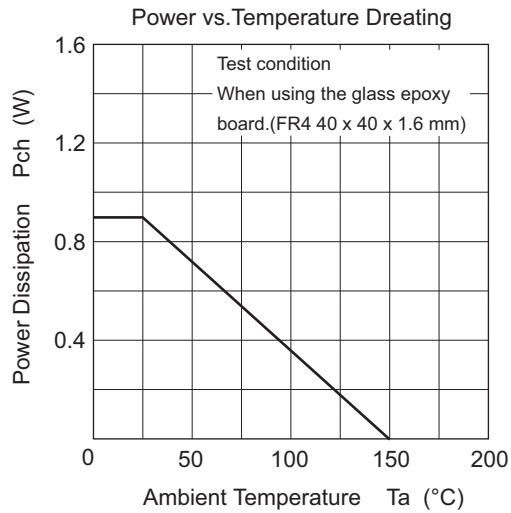
[Electrical Characteristics](#)

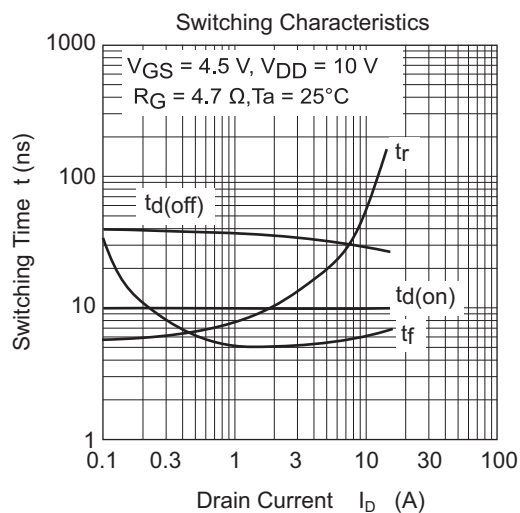
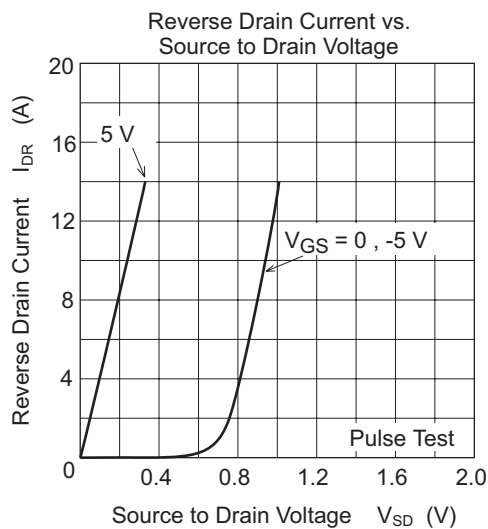
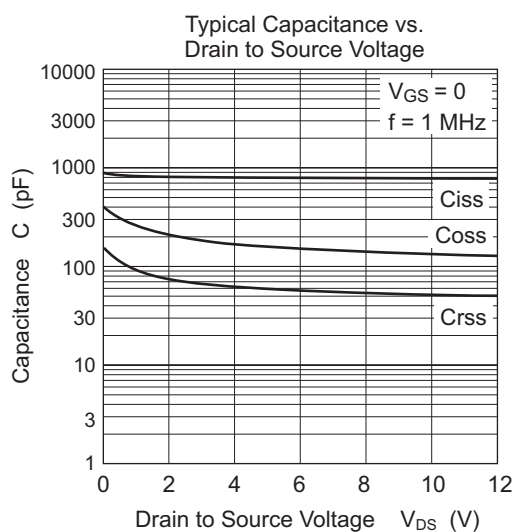
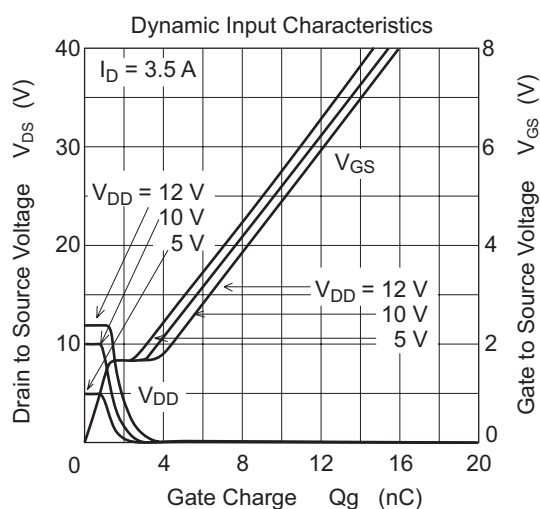
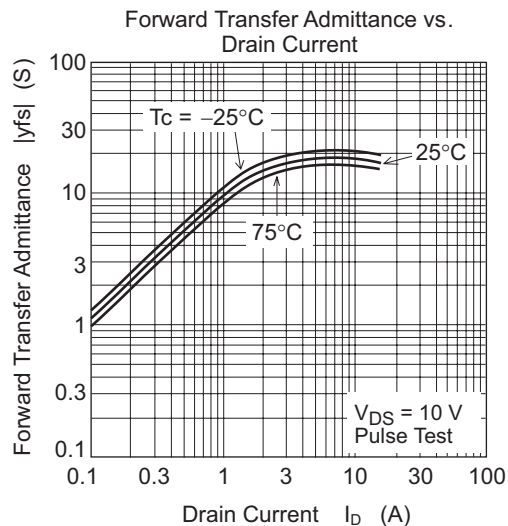
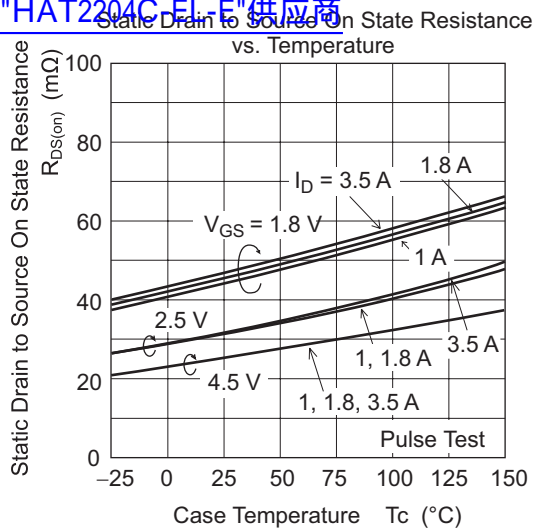
(Ta = 25°C)

| Item                                | Symbol        | Min     | Typ | Max      | Unit             | Test conditions  |
|-------------------------------------|---------------|---------|-----|----------|------------------|--|
| Drain to Source breakdown voltage   | $V_{(BR)DSS}$ | 12      | —   | —        | V                | $I_D = 10 \text{ mA}$ , $V_{GS} = 0$   |
| Gate to Source breakdown voltage    | $V_{(BR)GSS}$ | $\pm 8$ |     |          |                  | $I_G = \pm 10 \text{ }\mu\text{A}$ , $V_{DS} = 0$  |
| Gate to Source leakage current      | $I_{GSS}$     | —       | —   | $\pm 10$ | $\mu\text{A}$    | $V_{GS} = \pm 6.4 \text{ V}$ , $V_{DS} = 0$  |
| Drain to Source leakage current     | $I_{DSS}$     | —       | —   | 1        | $\mu\text{A}$    | $V_{DS} = 12 \text{ V}$ , $V_{GS} = 0$   |
| Gate to Source cutoff voltage       | $V_{GS(off)}$ | 0.3     | —   | 1.2      | V                | $V_{DS} = 10 \text{ V}$ , $I_D = 1 \text{ mA}$   |
| Drain to Source on state resistance | $R_{DS(on)}$  | —       | 26  | 34       | $\text{m}\Omega$ | $I_D = 1.8 \text{ A}$ , $V_{GS} = 4.5 \text{ V}$ <sup>Note3</sup>  |
|                                     | $R_{DS(on)}$  | —       | 34  | 44       | $\text{m}\Omega$ | $I_D = 1.8 \text{ A}$ , $V_{GS} = 2.5 \text{ V}$ <sup>Note3</sup>  |
|                                     | $R_{DS(on)}$  | —       | 45  | 69       | $\text{m}\Omega$ | $I_D = 1.8 \text{ A}$ , $V_{GS} = 1.8 \text{ V}$ <sup>Note3</sup>  |
| Forward transfer admittance         | $ y_{fs} $    | 8.5     | 13  | —        | S                | $I_D = 1.8 \text{ A}$ , $V_{DS} = 10 \text{ V}$ <sup>Note3</sup>   |
| Input capacitance                   | $C_{iss}$     | —       | 770 | —        | pF               | $V_{DS} = 10 \text{ V}$<br>$V_{GS} = 0$<br>$f = 1 \text{ MHz}$   |
| Output capacitance                  | $C_{oss}$     | —       | 115 | —        | pF               |  |
| Reverse transfer capacitance        | $C_{rss}$     | —       | 50  | —        | pF               |  |
| Turn - on delay time                | $t_{d(on)}$   | —       | 10  | —        | ns               | $I_D = 1.8 \text{ A}$ , $V_{GS} = 4.5 \text{ V}$<br>$V_{DS} = 10 \text{ V}$ , $R_L = 5.6 \text{ }\Omega$ ,<br>$R_g = 4.7 \text{ }\Omega$ |
| Rise time                           | $t_r$         | —       | 9.5 | —        | ns               |  |
| Turn - off delay time               | $t_{d(off)}$  | —       | 36  | —        | ns               |  |
| Fall time                           | $t_f$         | —       | 5   | —        | ns               |  |
| Total Gate charge                   | $Q_g$         | —       | 9   | —        | nC               | $V_{DD} = 10 \text{ V}$<br>$V_{GS} = 4.5 \text{ V}$<br>$I_D = 3.5 \text{ A}$   |
| Gate to Source charge               | $Q_{gs}$      | —       | 1.5 | —        | nC               |  |
| Gate to Drain charge                | $Q_{gd}$      | —       | 2   | —        | nC               |  |
| Body - Drain diode forward voltage  | $V_{DF}$      | —       | 0.8 | 1.1      | V                | $I_F = 3.5 \text{ A}$ , $V_{GS} = 0$ <sup>Note3</sup>  |

Notes: 3. Pulse test

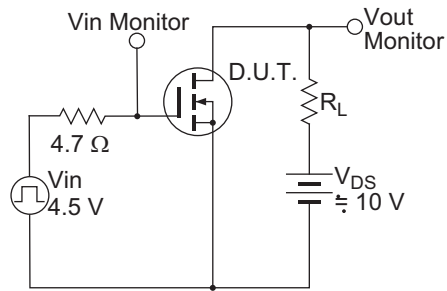
# Main Characteristics

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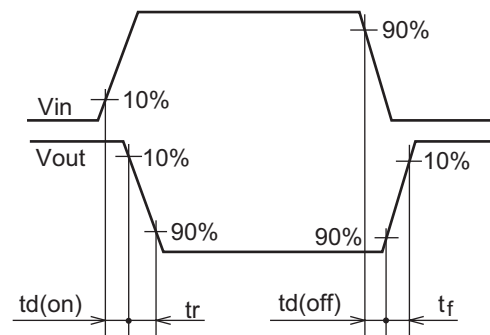
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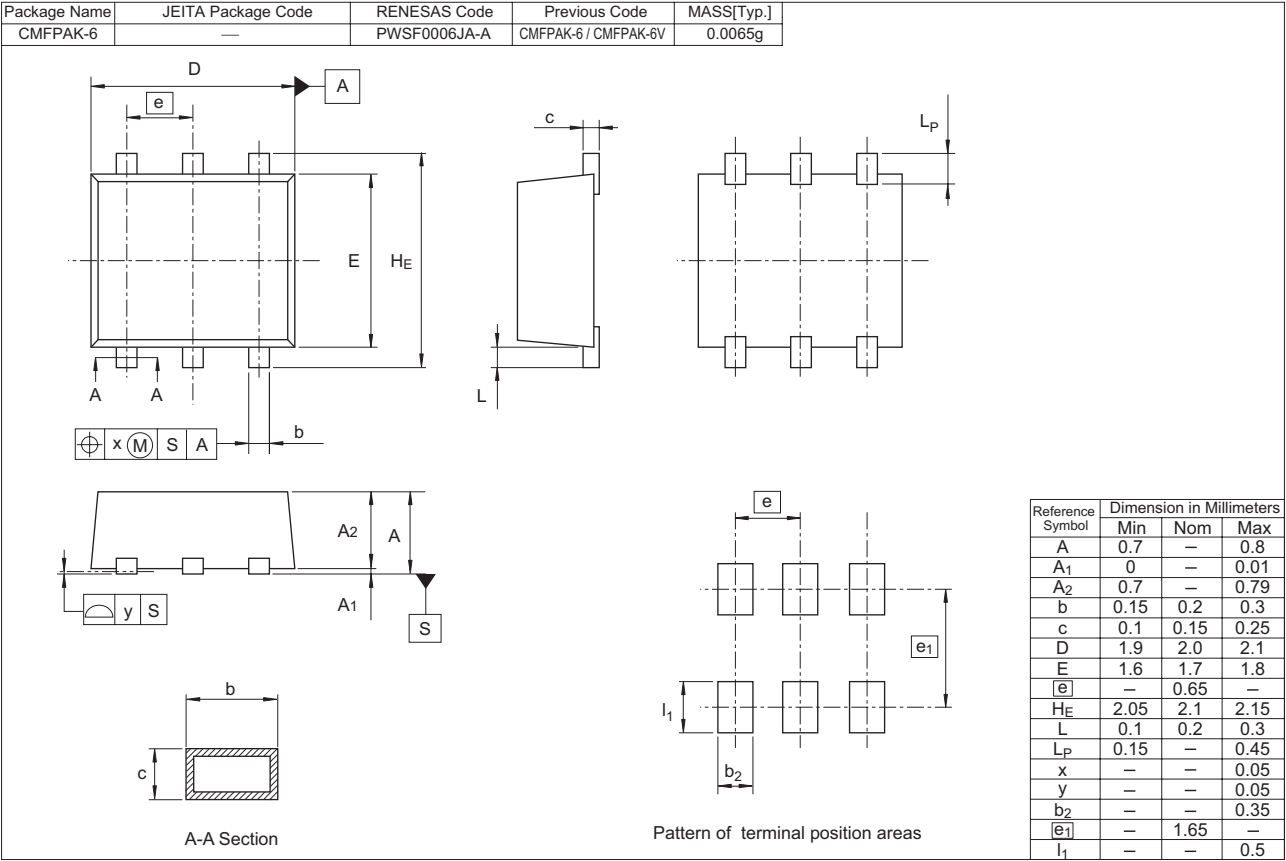
Switching Time Test Circuit



Switching Time Waveform



查看HAT2204C-EL-E\*供应商



Ordering Information

| Part Name     | Quantity | Shipping Container |
|---------------|----------|--------------------|
| HAT2204C-EL-E | 3000 pcs | Taping             |

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

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