

# HAT2196C

Silicon N Channel MOS FET  
Power Switching

R07DS1178EJ0600  
(Previous: REJ03G1235-0500)  
Rev.6.00  
Mar 19, 2014

## Features

- Low on-resistance  
 $R_{DS(on)} = 45 \text{ m}\Omega$  typ. (at  $V_{GS} = 4.5 \text{ V}$ )
- Low drive current.
- High density mounting
- 2.5 V gate drive devices.

## 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	$V_{DSS}$	20	V
Gate to source voltage	$V_{GSS}$	$\pm 12$	V
Drain current	$I_D$	2.5	A
Drain peak current	$I_{D(pulse)}$ <sup>Note 1</sup>	10	A
Body-drain diode reverse drain current	$I_{DR}$	2.5	A
Channel dissipation	$P_{ch}$ <sup>Note 2</sup>	850	mW
Channel temperature	$T_{ch}$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

- Notes 1.  $PW \leq 10 \mu\text{s}$ , duty cycle  $\leq 1\%$   
2. When using the glass epoxy board. (FR4 40 × 40 × 1.6mm)

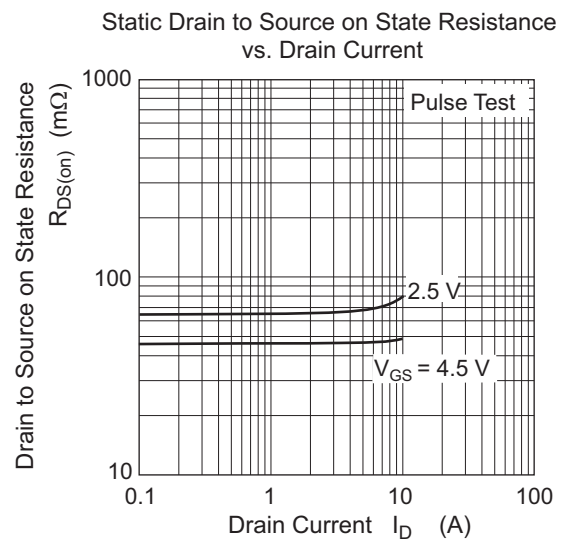
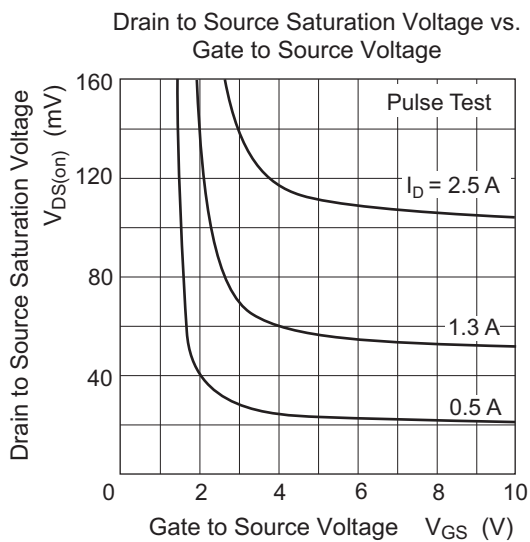
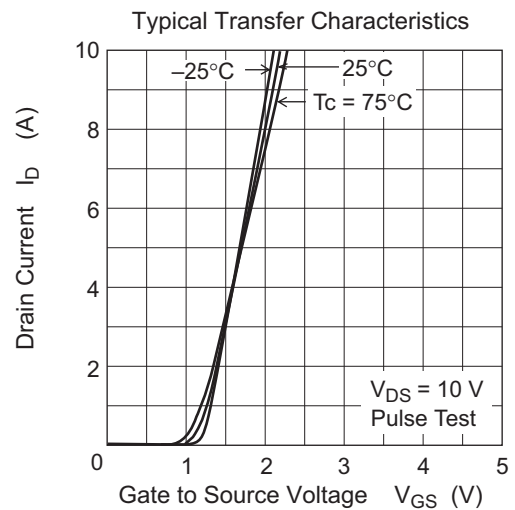
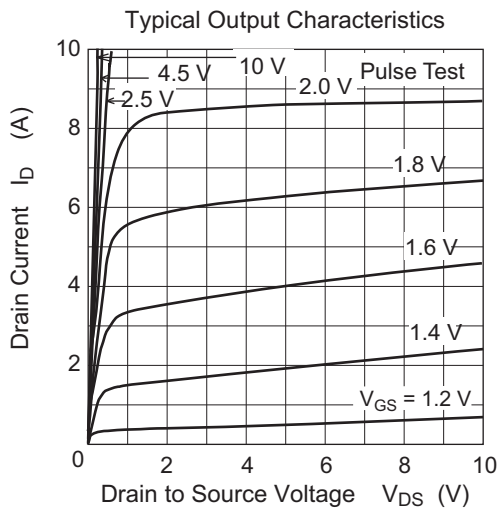
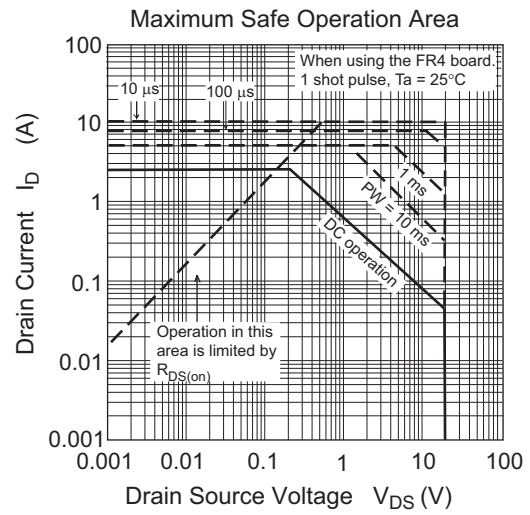
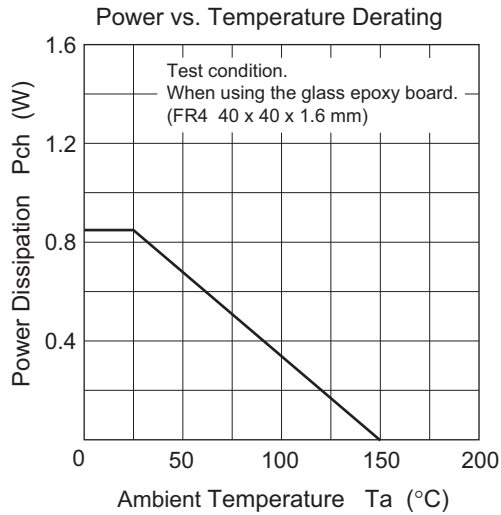
## Electrical Characteristics

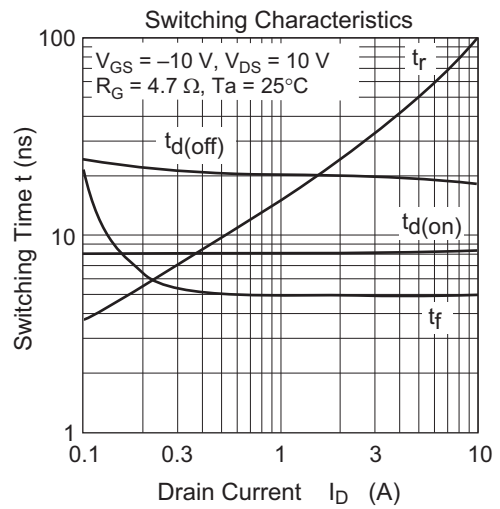
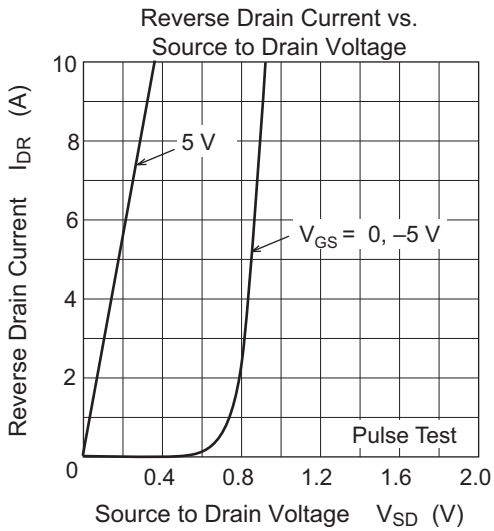
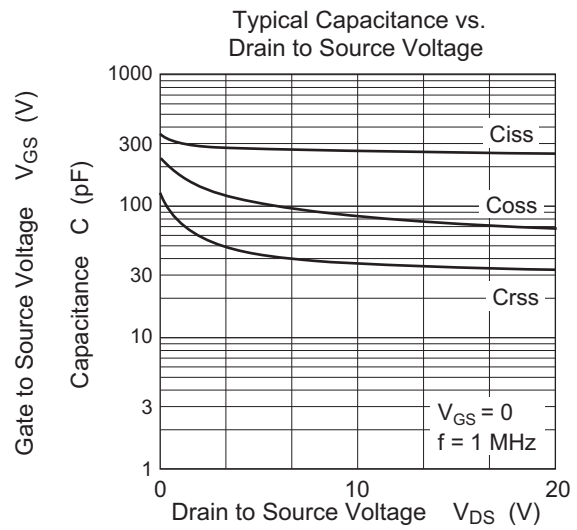
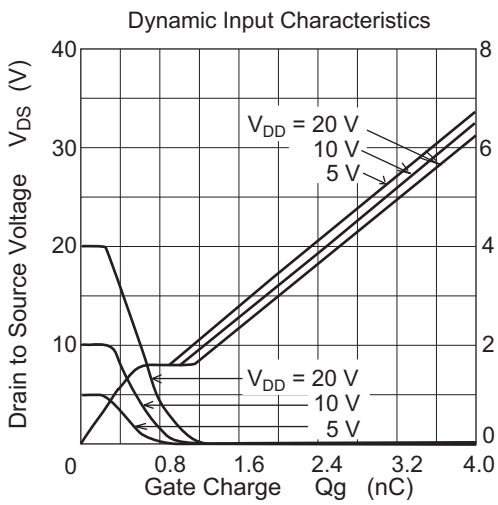
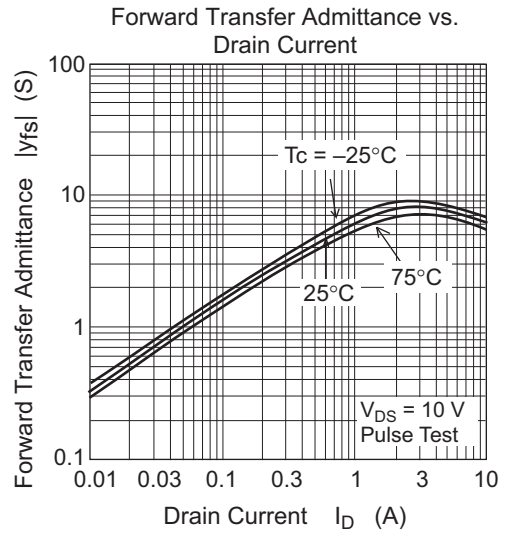
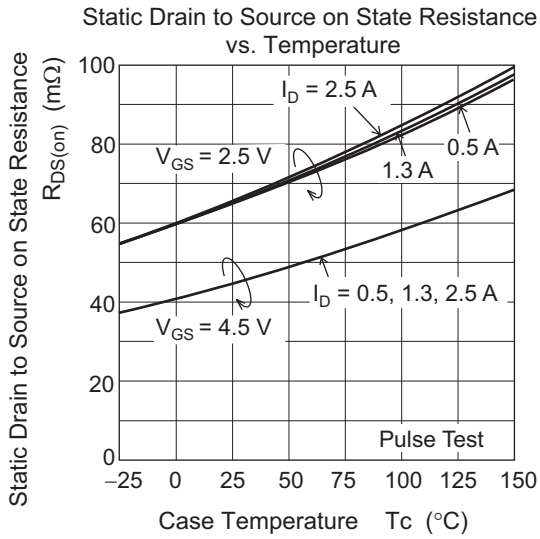
(Ta = 25°C)

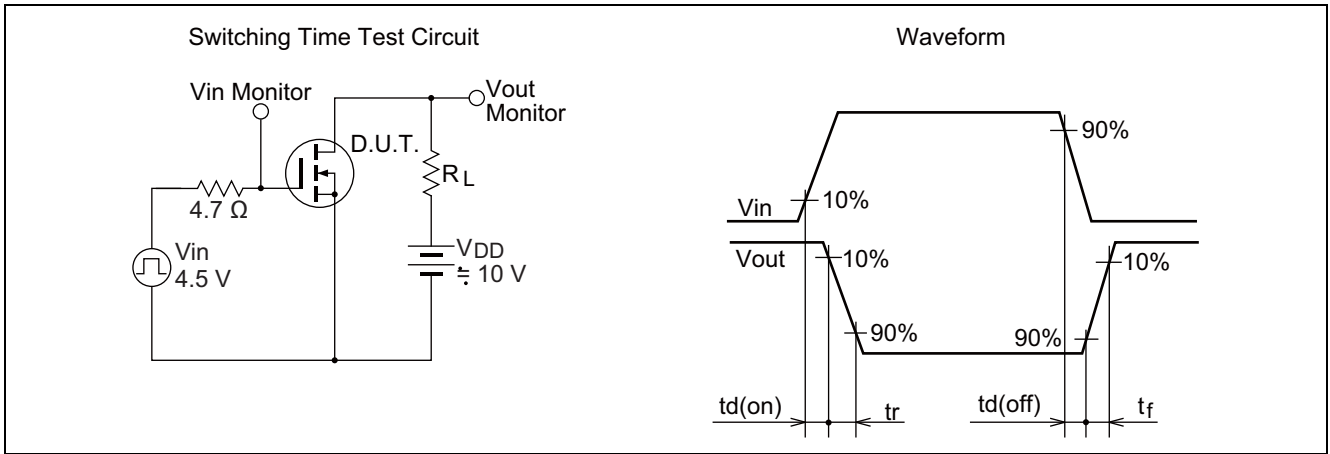
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to Source breakdown voltage	$V_{(BR)DSS}$	20	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Gate to Source breakdown voltage	$V_{(BR)GSS}$	$\pm 12$	—	—	V	$I_G = \pm 10 \text{ }\mu\text{A}$ , $V_{DS} = 0$
Gate to Source leakage current	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 10 \text{ V}$ , $V_{DS} = 0$
Drain to Source leakage current	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 20 \text{ V}$ , $V_{GS} = 0$
Gate to Source cutoff voltage	$V_{GS(off)}$	0.4	—	1.4	V	$I_D = 1 \text{ mA}$ , $V_{DS} = 10 \text{ V}$
Drain to Source on state resistance	$R_{DS(on)}$	—	45	58	m $\Omega$	$I_D = 1.3 \text{ A}$ , $V_{GS} = 4.5 \text{ V}$ <sup>Note3</sup>
	$R_{DS(on)}$	—	66	93	m $\Omega$	$I_D = 1.3 \text{ A}$ , $V_{GS} = 2.5 \text{ V}$ <sup>Note3</sup>
Forward transfer admittance	$ y_{fs} $	4.5	7	—	S	$I_D = 1.3 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note3</sup>
Input capacitance	$C_{iss}$	—	270	—	pF	$V_{GS} = 0$ , $f = 1 \text{ MHz}$ , $V_{DS} = 10 \text{ V}$
Output capacitance	$C_{oss}$	—	85	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	35	—	pF	
Total gate charge	$Q_g$	—	2.8	—	nC	$V_{GS} = 4.5 \text{ V}$ , $V_{DS} = 10 \text{ V}$ , $I_D = 2.5 \text{ A}$
Gate to Source charge	$Q_{gs}$	—	0.6	—	nC	
Gate to Drain charge	$Q_{gd}$	—	0.5	—	nC	
Turn - on delay time	$t_{d(on)}$	—	8	—	ns	$V_{GS} = 4.5 \text{ V}$ , $I_D = 1.3 \text{ A}$ , $V_{DD} = 10 \text{ V}$ , $R_L = 7.7 \text{ }\Omega$ , $R_g = 4.7 \text{ }\Omega$
Rise time	$t_r$	—	19	—	ns	
Turn - off delay time	$t_{d(off)}$	—	20	—	ns	
Fall time	$t_f$	—	5	—	ns	
Body - Drain diode forward voltage	$V_{DF}$	—	0.8	1.1	V	$I_F = 2.5 \text{ A}$ , $V_{GS} = 0$ <sup>Note3</sup>

Notes: 3. Pulse test

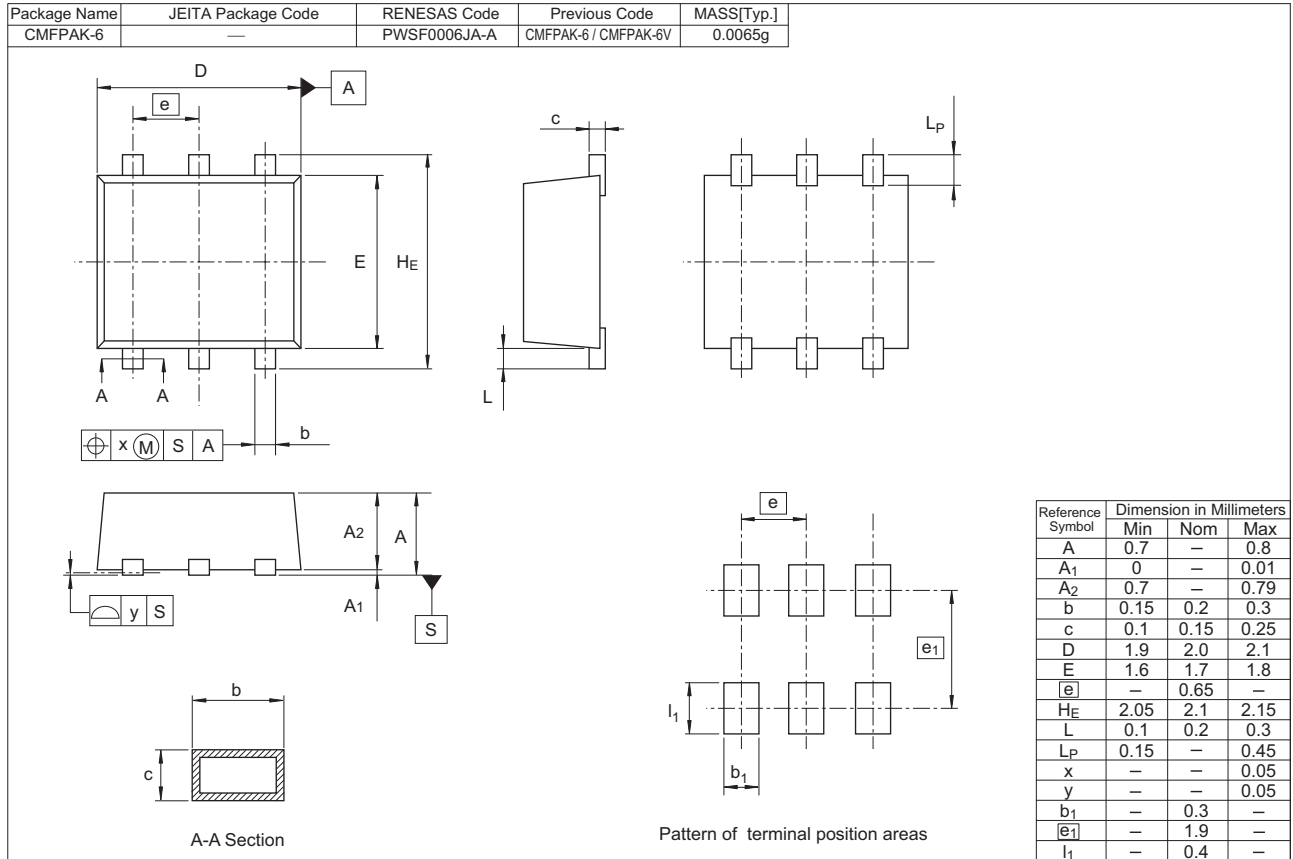
### Main Characteristics







### Package Dimensions



### Ordering Information

Orderable Part Number	Quantity	Shipping Container
HAT2196C-EL-E	3000 pcs	Taping

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Tel: +1-408-586-6000, Fax: +1-408-588-6130

**Renesas Electronics Canada Limited**  
1101 Nicholson Road, Newmarket, Ontario L3Y 9C3, Canada  
Tel: +1-905-898-5441, Fax: +1-905-898-3220

**Renesas Electronics Europe Limited**  
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K  
Tel: +44-1628-585-100, Fax: +44-1628-585-900

**Renesas Electronics Europe GmbH**  
Arcadiastrasse 10, 40472 Düsseldorf, Germany  
Tel: +49-211-6503-0, Fax: +49-211-6503-1327

**Renesas Electronics (China) Co., Ltd.**  
Room 1709, Quantum Plaza, No.27 ZhiChunLu Haidian District, Beijing 100191, P.R.China  
Tel: +86-10-8235-1155, Fax: +86-10-8235-7679

**Renesas Electronics (Shanghai) Co., Ltd.**  
Unit 301, Tower A, Central Towers, 555 Langao Road, Putuo District, Shanghai, P. R. China 200333  
Tel: +86-21-2226-0888, Fax: +86-21-2226-0999

**Renesas Electronics Hong Kong Limited**  
Unit 1601-1613, 16/F., Tower 2, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hong Kong  
Tel: +852-2265-6688, Fax: +852 2886-9022/9044

**Renesas Electronics Taiwan Co., Ltd.**  
13F, No. 363, Fu Shing North Road, Taipei 10543, Taiwan  
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Tel: +60-3-7955-9390, Fax: +60-3-7955-9510

**Renesas Electronics Korea Co., Ltd.**  
12F., 234 Teheran-ro, Gangnam-Ku, Seoul, 135-920, Korea  
Tel: +82-2-558-3737, Fax: +82-2-558-5141