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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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HAT2221C

Silicon N Channel MOS FET Power Switching

REJ03G1240-0400

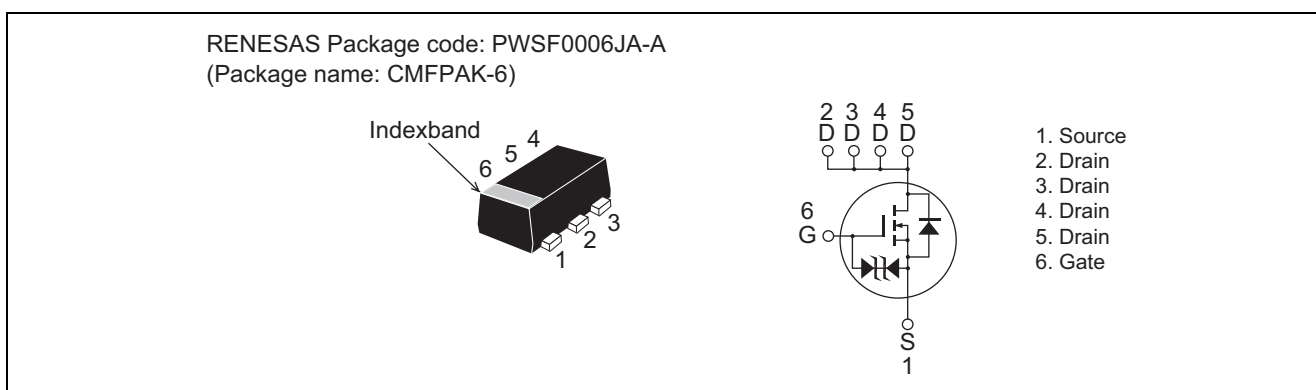
Rev.4.00

Feb 28, 2006

Features

- Low on-resistance
 $R_{DS(on)} = 120 \text{ m}\Omega$ typ. (at $V_{GS} = 10 \text{ V}$)
- Low drive current.
- High density mounting
- 4.5 V gate drive devices.

Outline



Absolute Maximum Ratings

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

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	30	V
Gate to source voltage	V_{GSS}	+20 / -10	V
Drain current	I_D	1.5	A
Drain peak current	I_D (pulse) ^{Note 1}	6	A
Body - Drain diode reverse drain current	I_{DR}	1.5	A
Channel dissipation	P_{ch} ^{Note 2}	790	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. When using the glass epoxy board. (FR4 $40 \times 40 \times 1.6 \text{ mm}$)

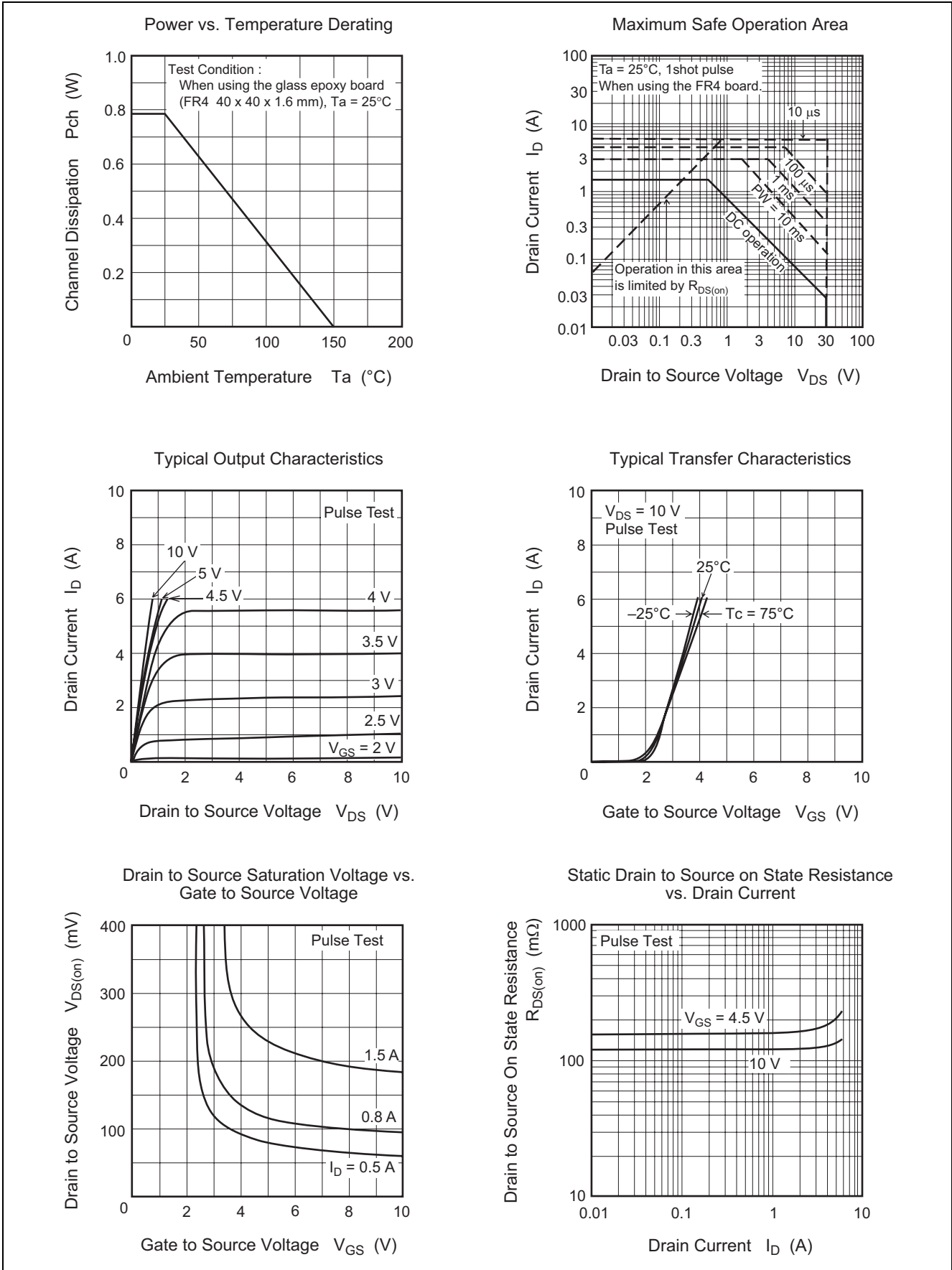
Electrical Characteristics

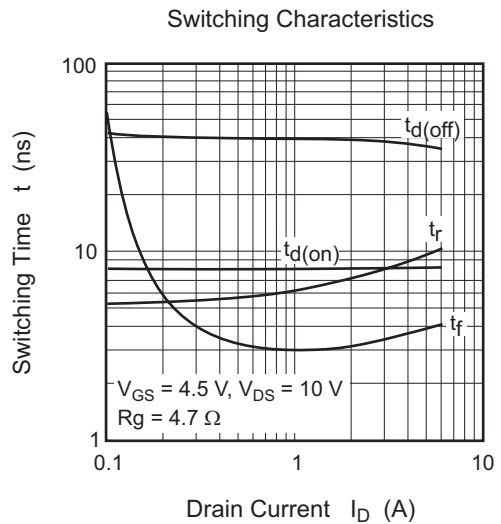
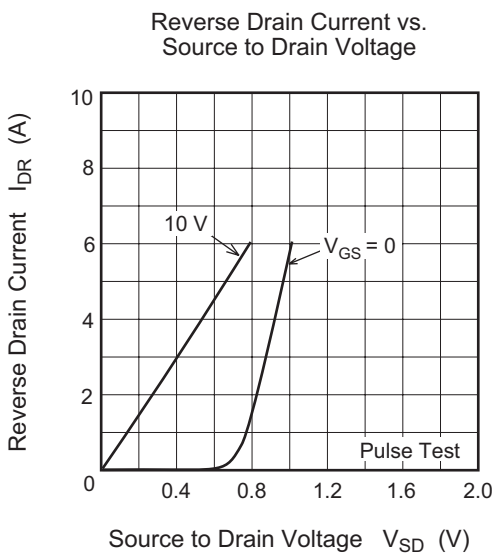
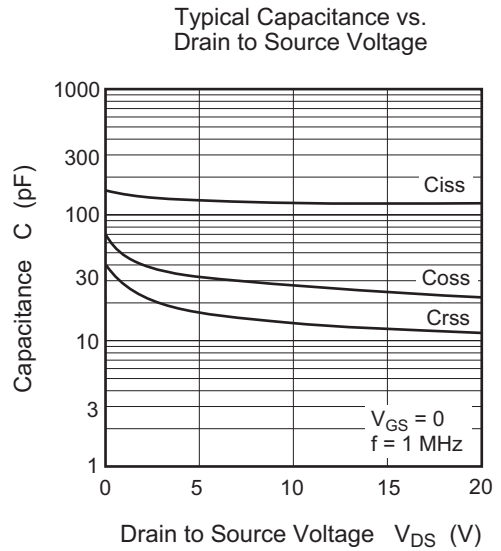
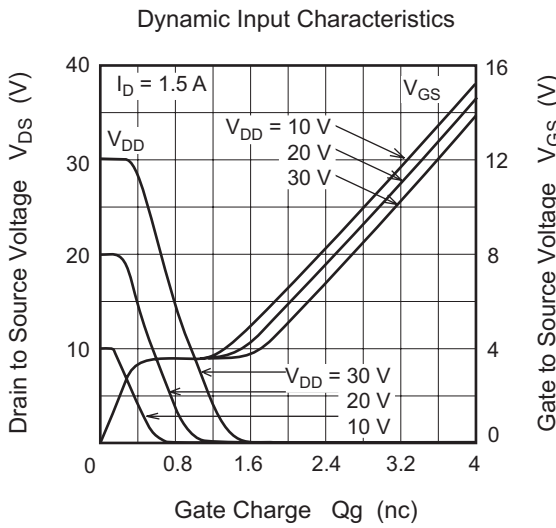
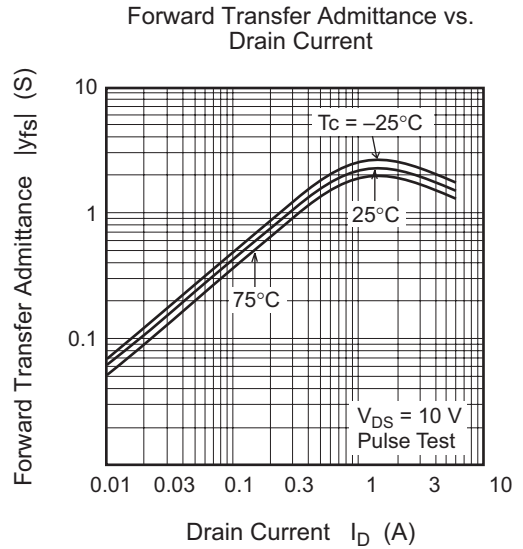
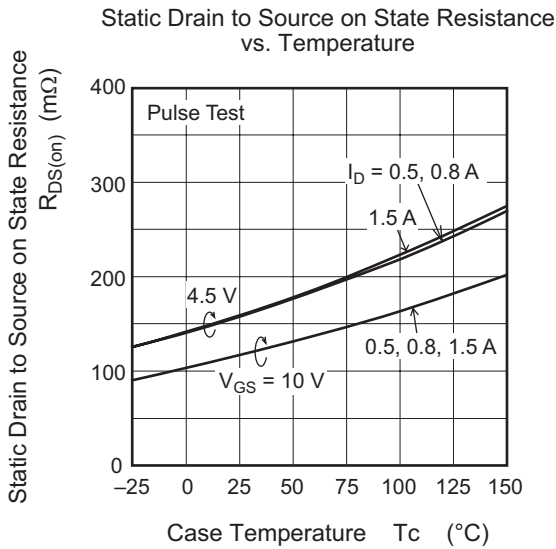
(Ta = 25°C)

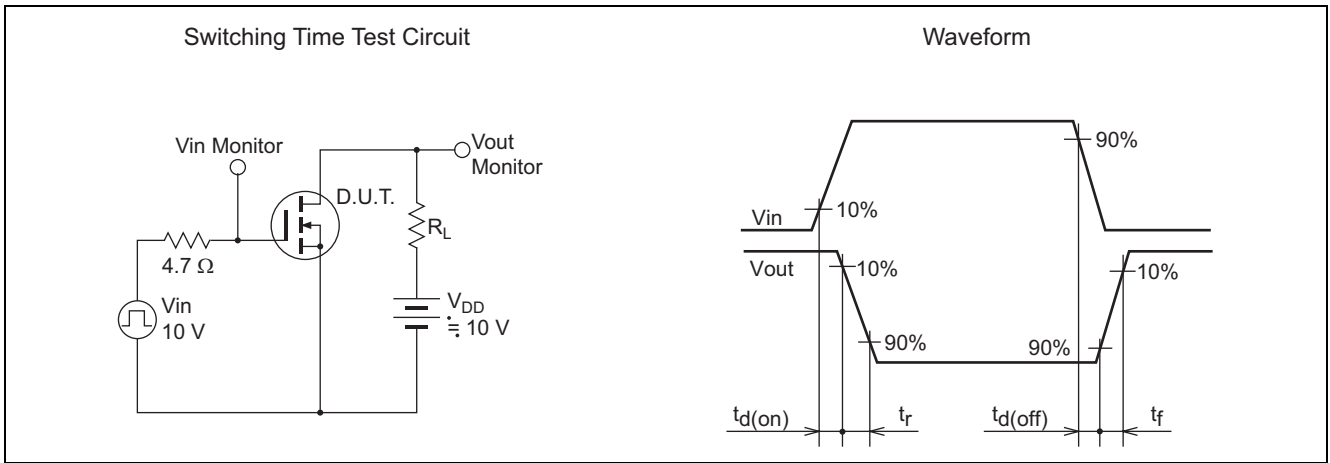
Item	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain to Source breakdown voltage	$V_{(BR)DSS}$	30	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Gate to Source breakdown voltage	$V_{(BR)GSS}$	+20 -10	—	—	V	$I_G = \pm 10 \text{ }\mu\text{A}$, $V_{DS} = 0$
Gate to Source leakage current	I_{GSS}	—	—	± 10	μA	$V_{GS} = +16 / -8 \text{ V}$, $V_{DS} = 0$
Drain to Source leakage current	I_{DSS}	—	—	1	μA	$V_{DS} = 30 \text{ V}$, $V_{GS} = 0$
Gate to Source cutoff voltage	$V_{GS(off)}$	0.4	—	1.4	V	$V_{DS} = 10 \text{ V}$, $I_D = 1 \text{ mA}$
Drain to Source on state resistance	$R_{DS(on)}$	—	120	150	$\text{m}\Omega$	$I_D = 0.8 \text{ A}$, $V_{GS} = 10 \text{ V}$ ^{Note3}
		—	160	235	$\text{m}\Omega$	$I_D = 0.8 \text{ A}$, $V_{GS} = 4.5 \text{ V}$ ^{Note3}
Forward transfer admittance	$ y_{fs} $	1.3	2	—	S	$I_D = 0.8 \text{ A}$, $V_{DS} = 10 \text{ V}$ ^{Note3}
Input capacitance	C_{iss}	—	110	—	pF	$V_{DS} = 10 \text{ V}$, $V_{GS} = 0$, $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	27	—	pF	
Reverse transfer capacitance	C_{rss}	—	13	—	PF	
Total gate charge	Q_g	—	2.8	—	nC	$V_{DD} = 10 \text{ V}$, $V_{GS} = 10 \text{ V}$, $I_D = 1.5 \text{ A}$
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	$I_D = 0.8 \text{ A}$, $V_{GS} = 10 \text{ V}$, $V_{DD} = 10 \text{ V}$, $R_L = 12.5 \text{ }\Omega$, $R_g = 4.7 \text{ }\Omega$
Rise time	t_r	—	6	—	ns	
Turn - off delay time	$t_{d(off)}$	—	40	—	ns	
Fall time	t_f	—	3	—	ns	
Body - Drain diode forward voltage	V_{DF}	—	0.8	1.1	V	$I_F = 1.5 \text{ A}$, $V_{GS} = 0$ ^{Note3}

Notes: 3. Pulse test

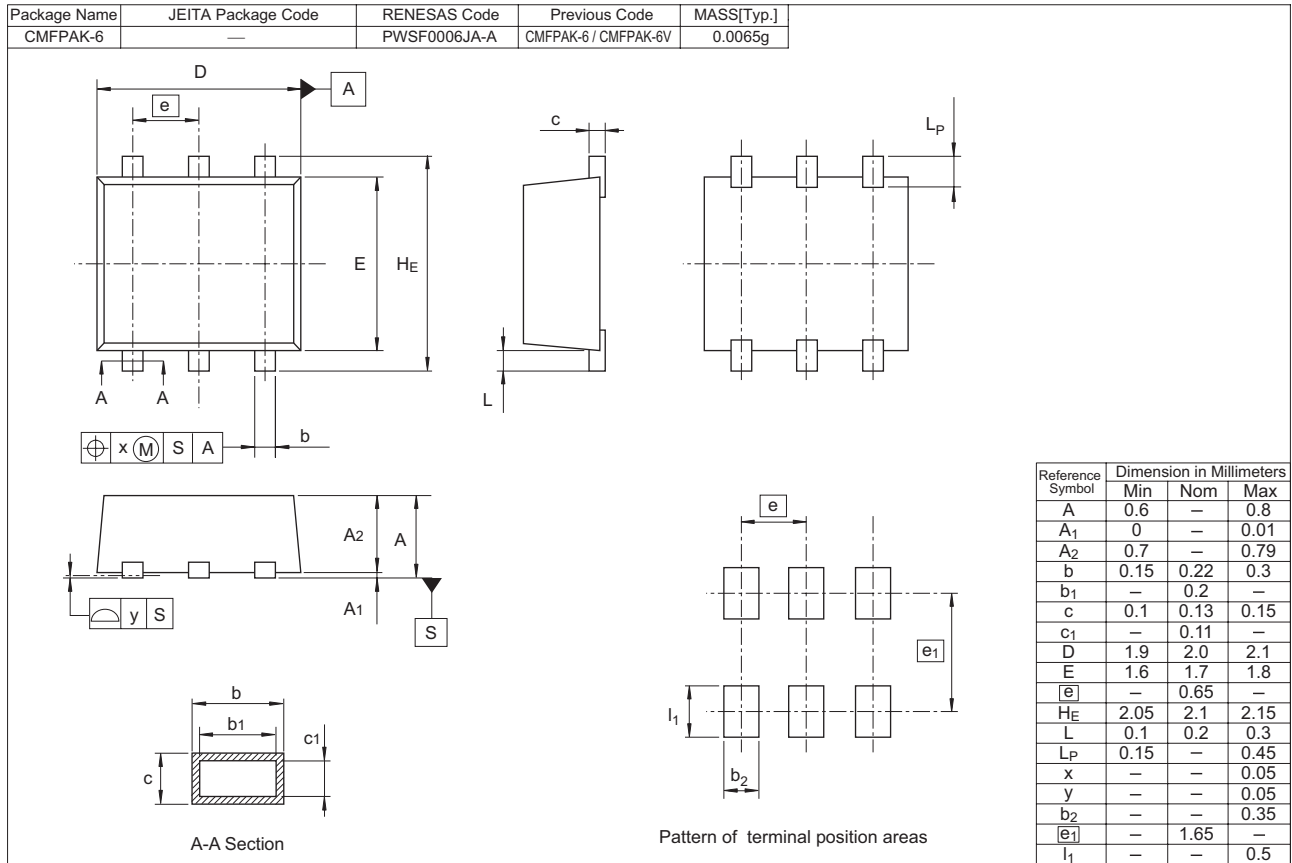
Main Characteristics







Package Dimensions



Ordering Information

Part Name	Quantity	Shipping Container
HAT2221C-EL-E	3000 pcs	Taping

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