

HAT2204C

Silicon N Channel MOS FET Power Switching

REJ03G0448-0500

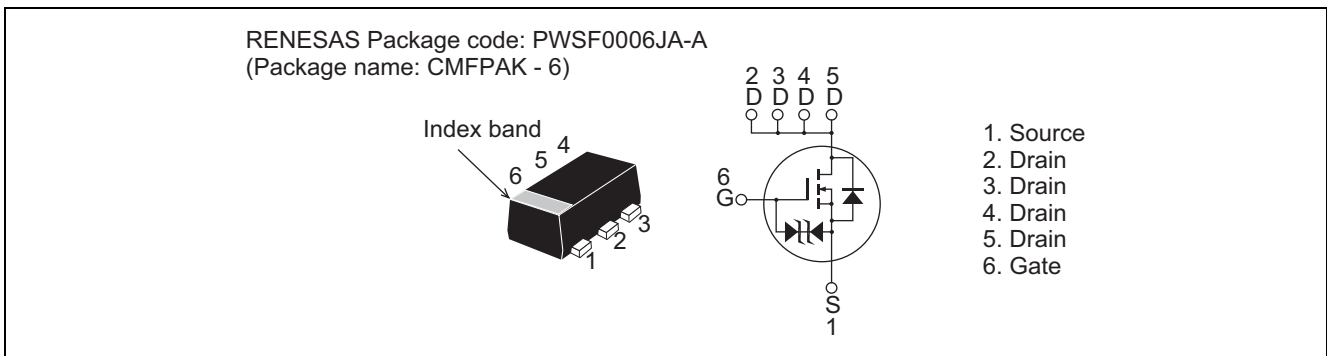
Rev.5.00

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



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}	± 8	V
Drain current	I_D	3.5	A
Drain peak current	$I_{D(pulse)}$ ^{Note1}	14	A
Body - Drain diode reverse Drain current	I_{DR}	3.5	A
Channel dissipation	P_{ch} ^{Note2}	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)

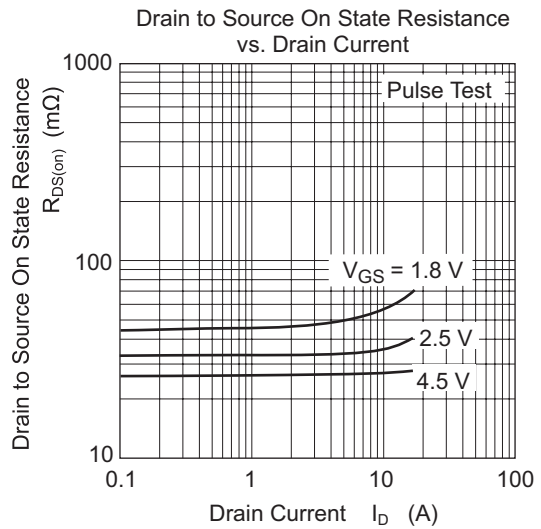
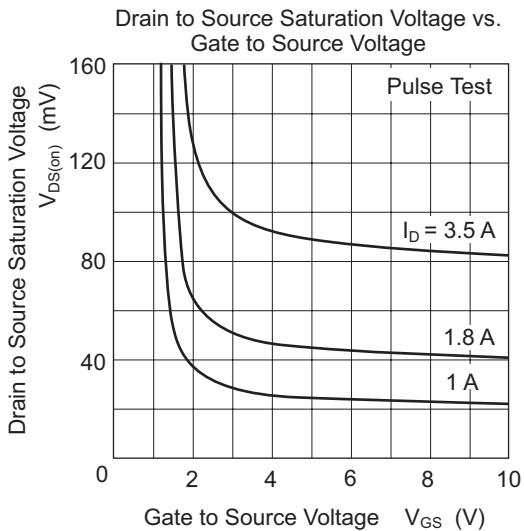
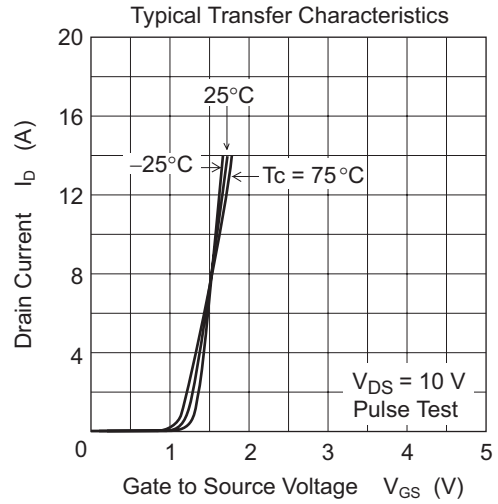
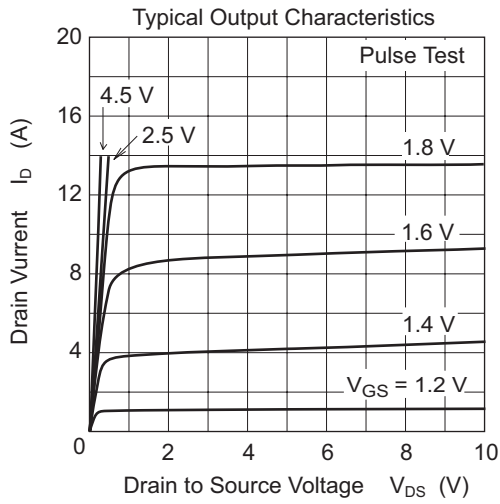
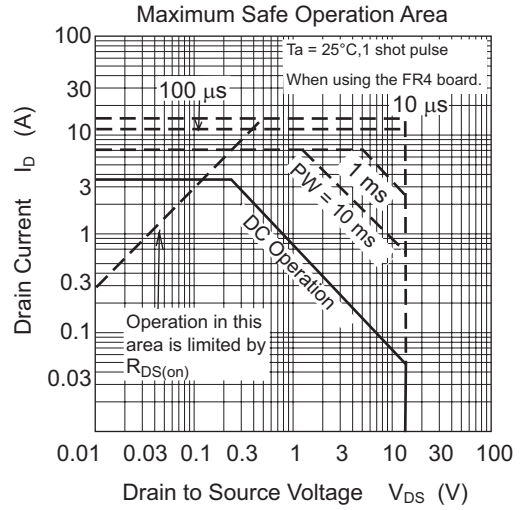
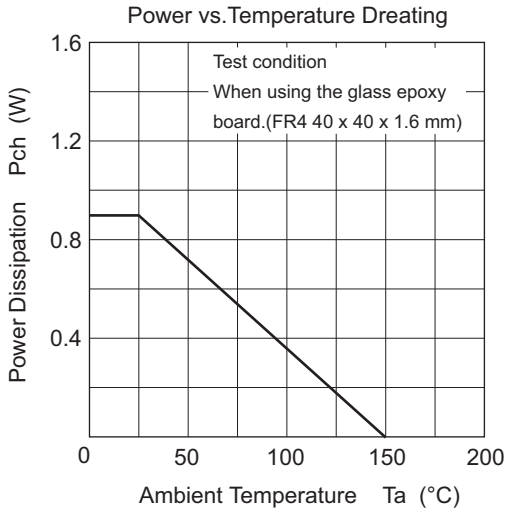
Electrical Characteristics

(Ta = 25°C)

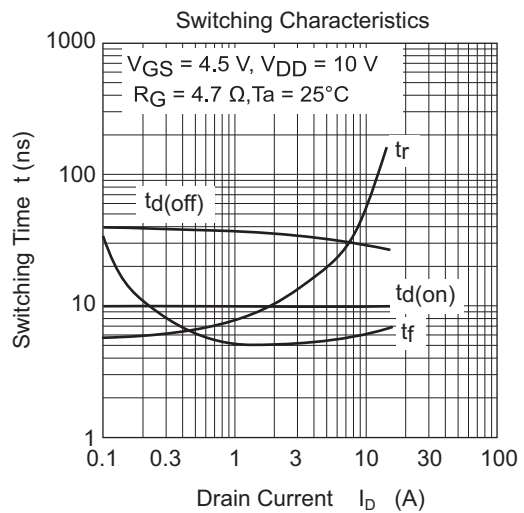
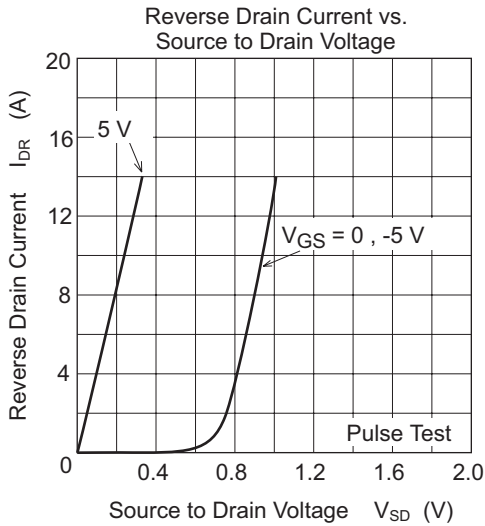
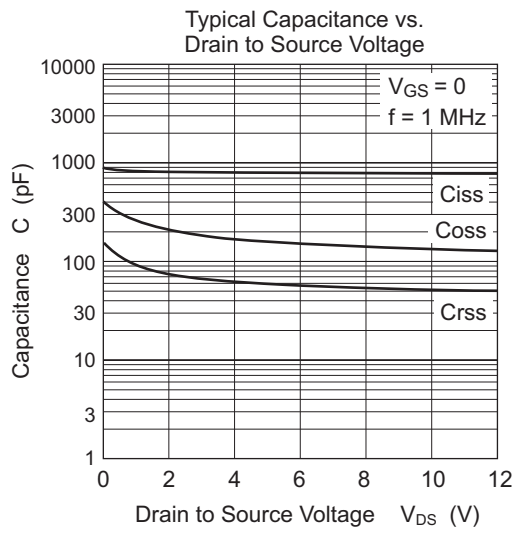
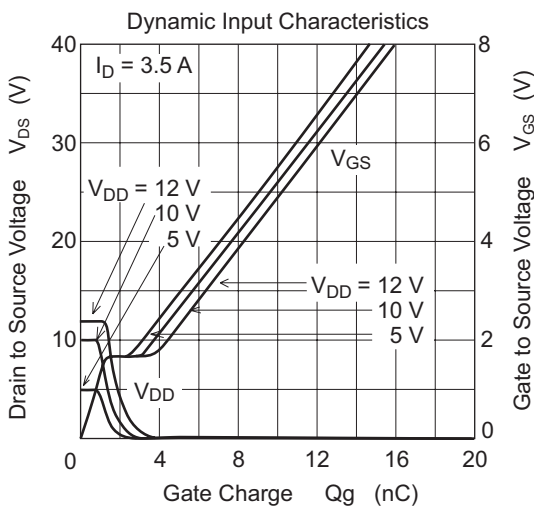
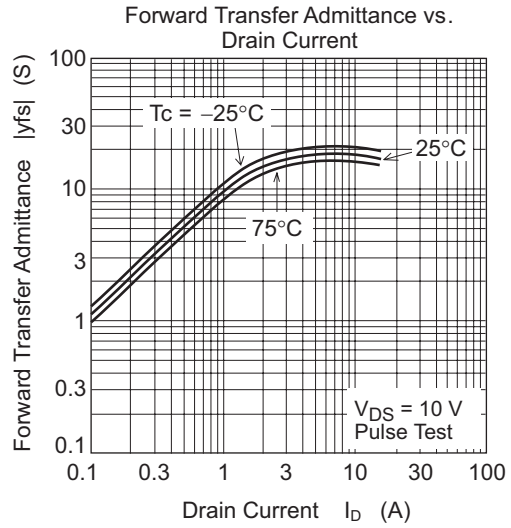
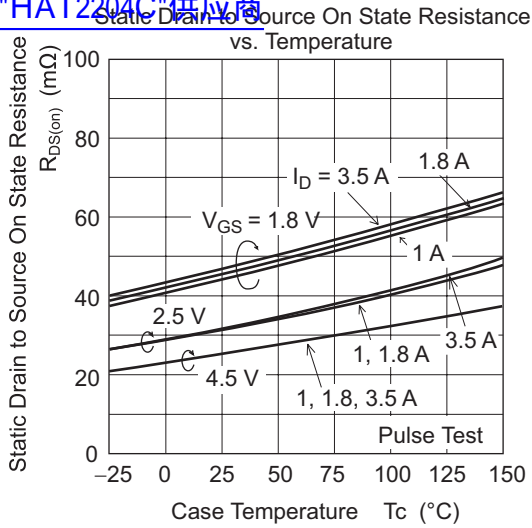
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to Source breakdown voltage	$V_{(BR)DSS}$	12	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Gate to Source breakdown voltage	$V_{(BR)GSS}$	± 8	—	—	—	$I_G = \pm 10 \text{ }\mu\text{A}$, $V_{DS} = 0$
Gate to Source leakage current	I_{GSS}	—	—	± 10	μA	$V_{GS}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

Notes: 3. Pulse test

Main Characteristics
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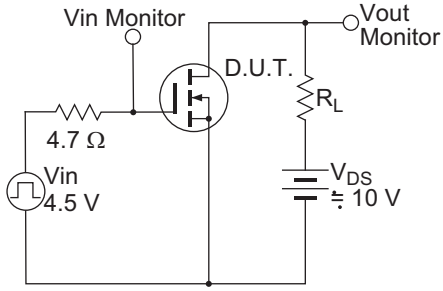


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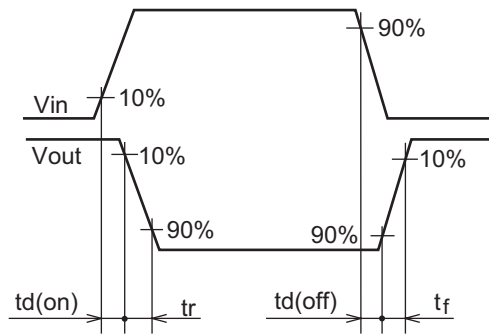


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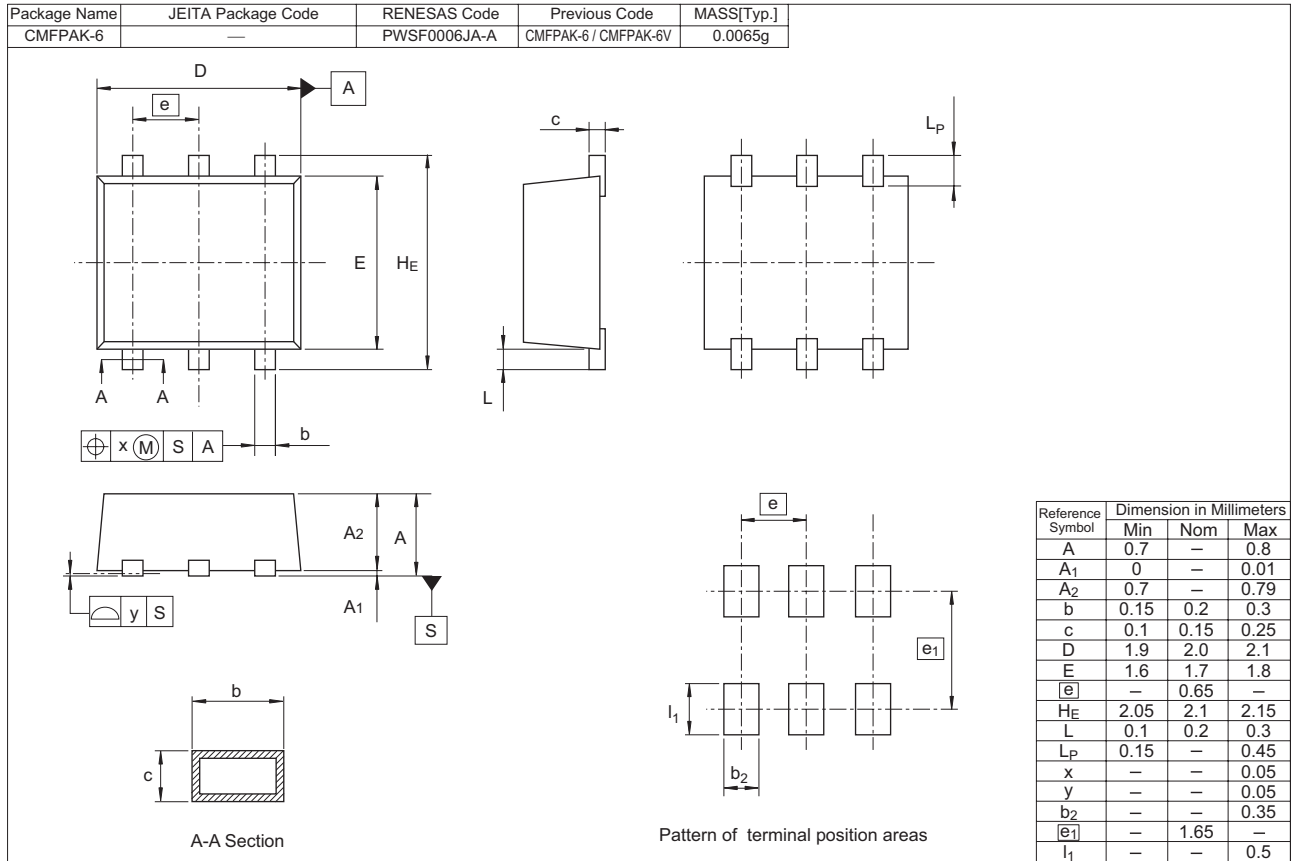
Switching Time Test Circuit



Switching Time Waveform



Package Dimensions



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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