

To our customers,

Old Company Name in Catalogs and Other Documents

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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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HAT111C

Silicon P Channel MOS FET
Power Switching

REJ03G0446-0600

Rev.6.00

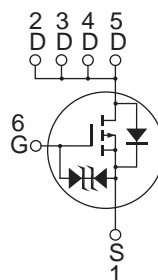
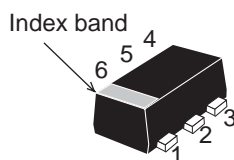
May 19.2005

Features

- Low on-resistance
 $R_{DS(on)} = 245 \text{ m}\Omega$ typ. (at $V_{GS} = -10 \text{ V}$)
- Low drive current.
- 4.5 V gate drive devices.
- High density mounting

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}	-60	V
Gate to Source voltage	V_{GSS}	-20 / +10	V
Drain current	I_D	-2	A
Drain peak current	I_D (pulse) ^{Note 1}	-8	A
Body - Drain diode reverse drain current	I_{DR}	-2	A
Channel dissipation	P_{ch} ^{Note 2}	1.25	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 $40 \times 40 \times 1.6\text{mm}$), $PW \leq 5 \text{ s}$, $T_a = 25^\circ\text{C}$

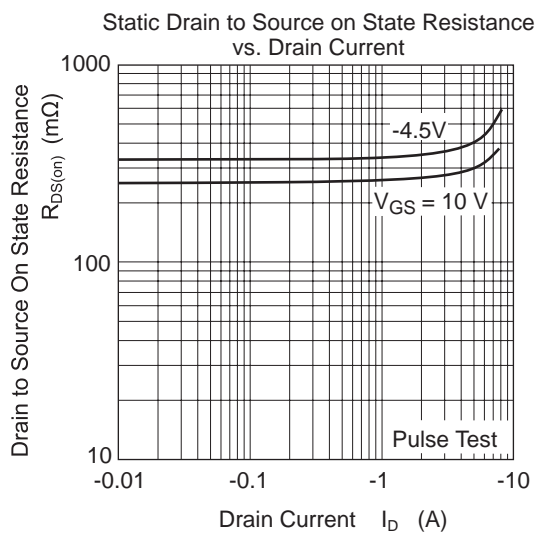
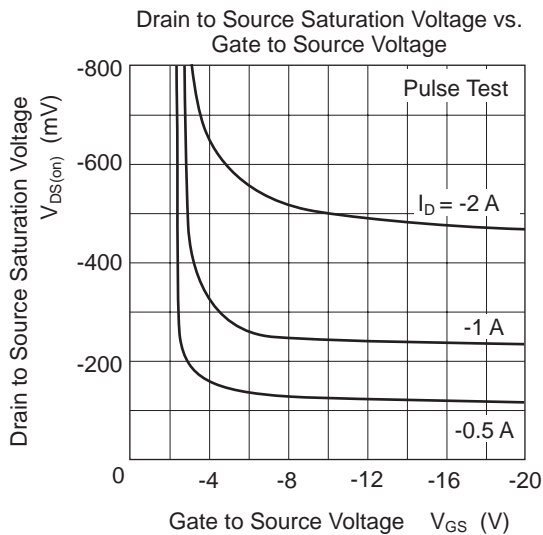
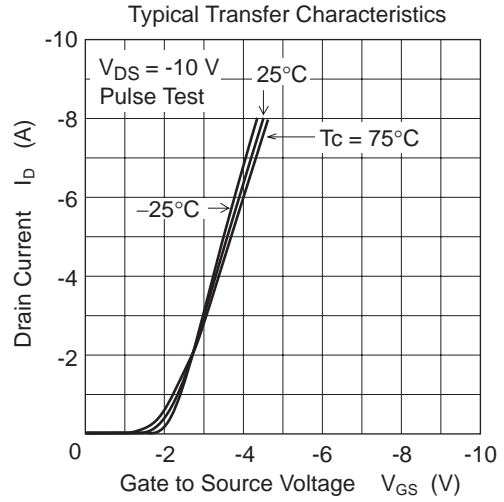
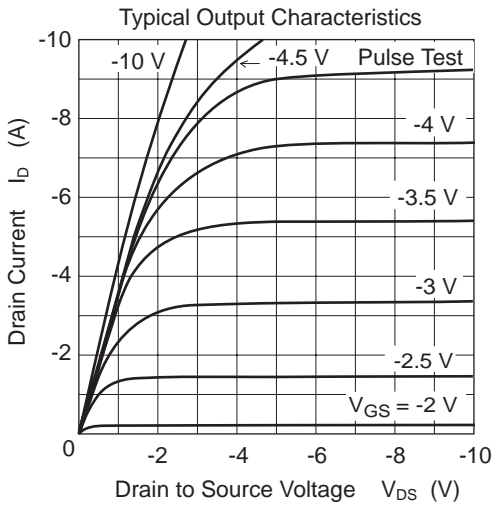
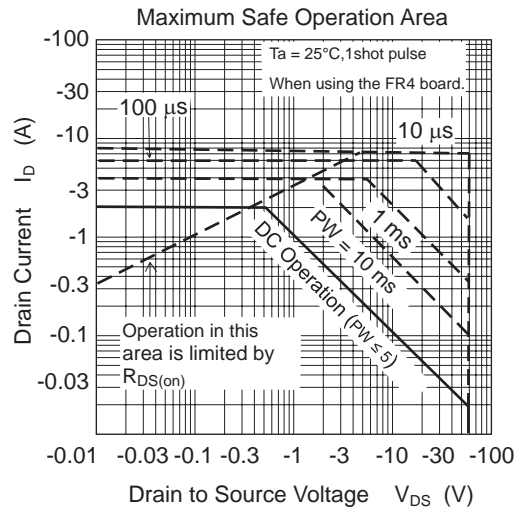
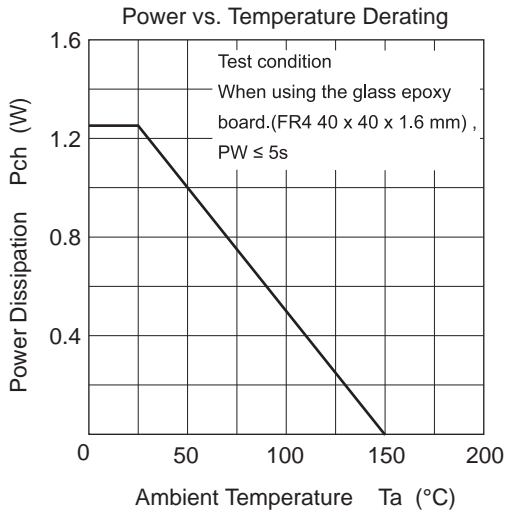
Electrical Characteristics

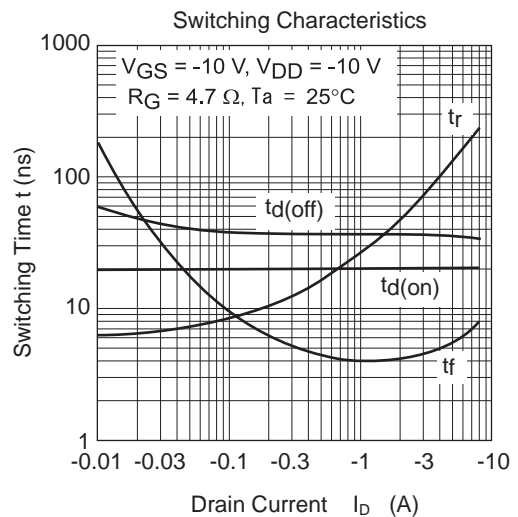
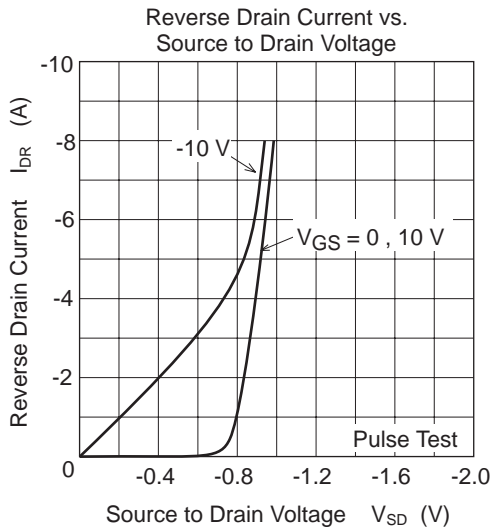
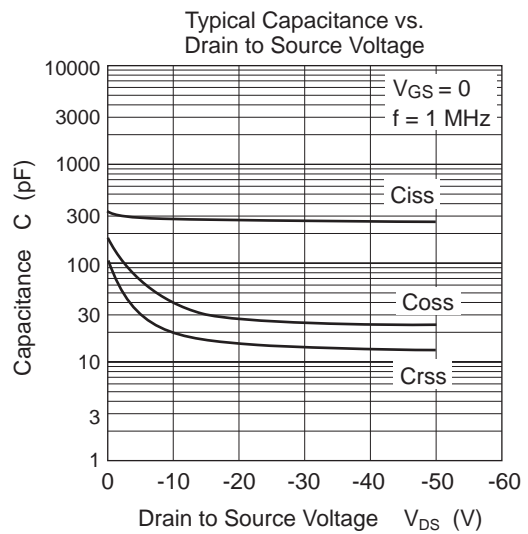
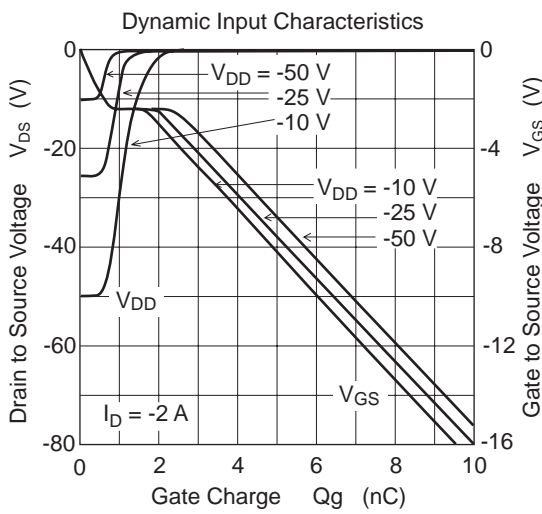
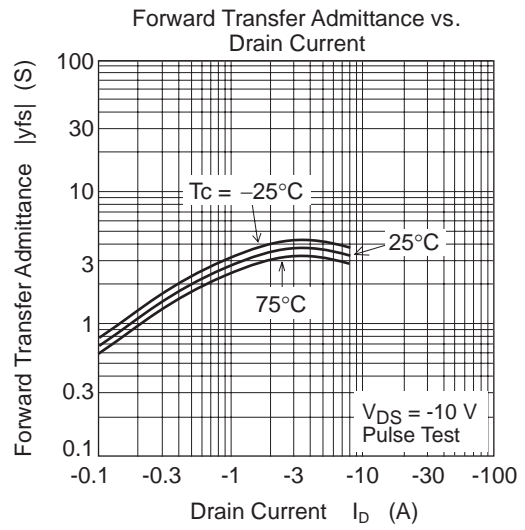
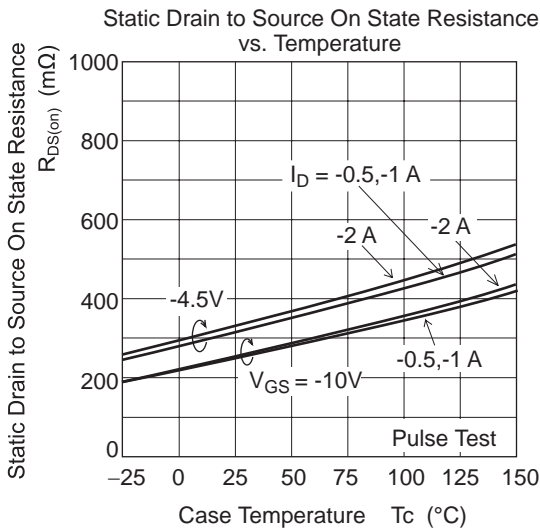
(Ta = 25°C)

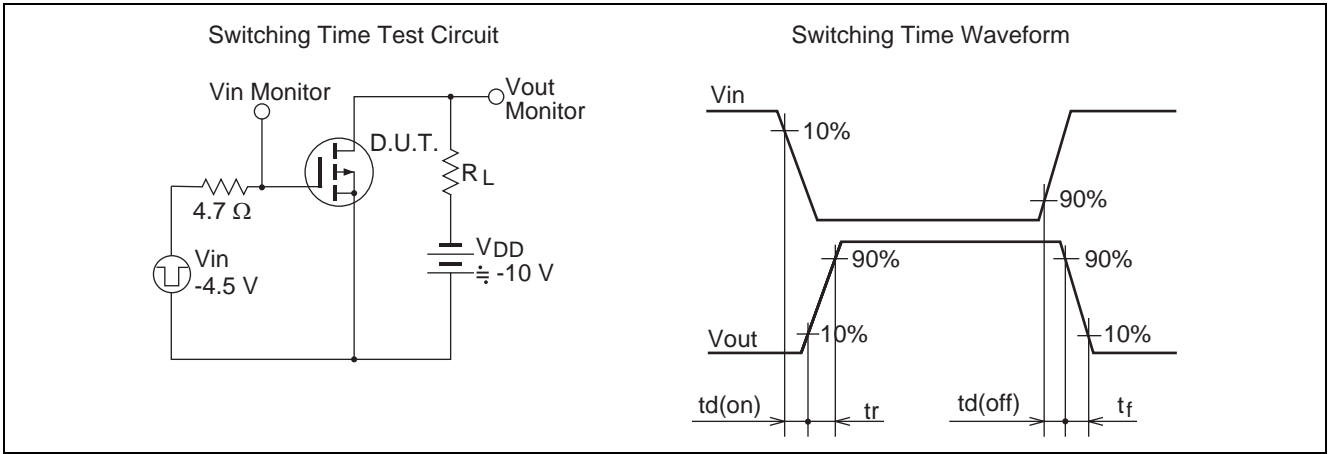
Item	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain to Source breakdown voltage	$V_{(BR)DSS}$	-60	—	—	V	$I_D = -10 \text{ mA}$, $V_{GS} = 0$
Gate to Source breakdown voltage	$V_{(BR)GSS}$	-20 +10	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}$, $V_{DS} = 0$
Gate to Source leakage current	I_{GSS}	—	—	± 10	μA	$V_{GS} = -16 / +8 \text{ V}$, $V_{DS} = 0$
Drain to Source leakage current	I_{DSS}	—	—	-1	μA	$V_{DS} = -60 \text{ V}$, $V_{GS} = 0$
Gate to Source cutoff voltage	$V_{GS(th)}$	-1	—	-2	V	$I_D = -1 \text{ mA}$, $V_{DS} = -10 \text{ V}$ ^{Note3}
Drain to Source on state resistance	$R_{DS(on)}$	—	245	307	$\text{m}\Omega$	$I_D = -1 \text{ A}$, $V_{GS} = -10 \text{ V}$ ^{Note3}
		—	310	450	$\text{m}\Omega$	$I_D = -1 \text{ A}$, $V_{GS} = -4.5 \text{ V}$ ^{Note3}
Forward transfer admittance	$ y_{fs} $	0.65	1	—	S	$I_D = -1 \text{ A}$, $V_{DS} = -10 \text{ V}$ ^{Note3}
Input capacitance	C_{iss}	—	290	—	pF	$V_{DS} = -10 \text{ V}$, $V_{GS} = 0$ $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	40	—	pF	
Reverse transfer capacitance	C_{rss}	—	20	—	pF	
Total gate charge	Q_g	—	6	—	nC	$V_{DS} = -10 \text{ V}$, $V_{GS} = -10 \text{ V}$ $I_D = -2 \text{ A}$
Gate to Source charge	Q_{gs}	—	0.7	—	nC	
Gate to Drain charge	Q_{gd}	—	1.2	—	nC	
Turn - on delay time	$t_{d(on)}$	—	20	—	ns	$V_{DS} = -10 \text{ V}$, $V_{GS} = -10 \text{ V}$ $I_D = -1 \text{ A}$, $R_L = 10 \text{ }\Omega$, $R_g = 4.7 \text{ }\Omega$
Rise time	t_r	—	25	—	ns	
Turn - off delay time	$t_{d(off)}$	—	37	—	ns	
Fall time	t_f	—	4	—	ns	
Body - Drain diode forward voltage	V_{DF}	—	-0.85	-1.2	V	$I_F = -2 \text{ A}$, $V_{GS} = 0$

Notes: 3. Pulse test

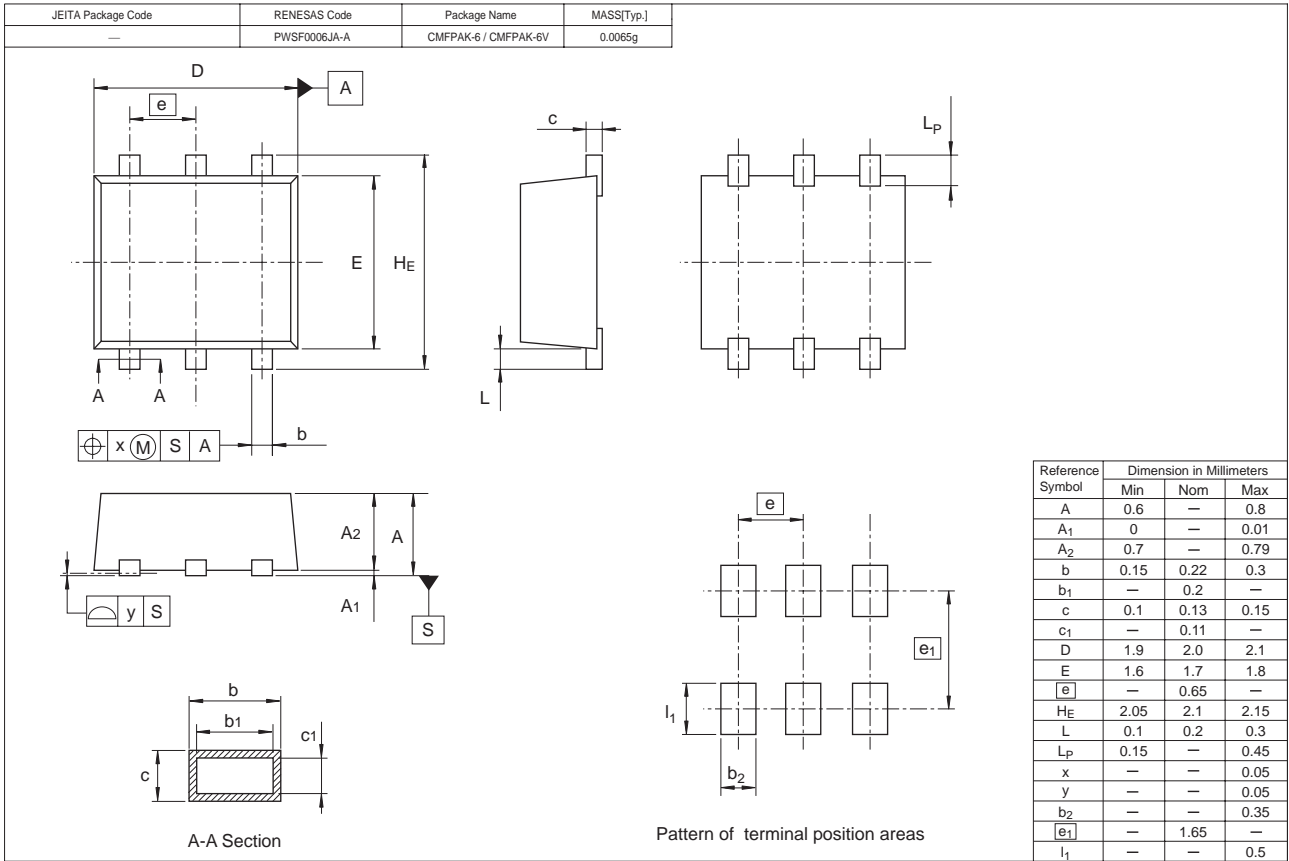
Main Characteristics







Package Dimensions



Ordering Information

Part Name	Quantity	Shipping Container
HAT1111C-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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