HAT1111C

Silicon P Channel MOS FET
Power Switching

REJ03G0446-0600
Rev.6.00
May 19.2005

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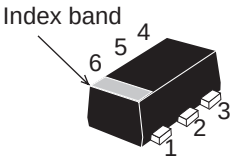
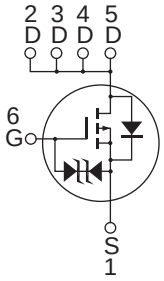
Features

- Low on-resistance
  $R_{DS(on)}$ = 245 mΩ typ. (at V_{GS} = –10 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

(Ta = 25°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)[Note1]	–8	A
Body - Drain diode reverse drain current	I_{DR}	–2	A
Channel dissipation	Pch[Note 2]	1.25	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

Notes: 1. PW ≤ 10 µs, duty cycle ≤ 1%
2. When using the glass epoxy board. (FR4 40 × 40 × 1.6mm), PW ≤ 5 s, Ta = 25°C

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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 mA, V_{GS} = 0
Gate to Source breakdown voltage	$V_{(BR)GSS}$	–20 +10	—	—	V	I_G = ±100 µA, V_{DS} = 0
Gate to Source leakage current	I_{GSS}	—	—	±10	µA	V_{GS} = –16 / +8 V, V_{DS} = 0
Drain to Source leakage current	I_{DSS}	—	—	-1	µA	V_{DS} = –60 V, V_{GS} = 0
Gate to Source cutoff voltage	$V_{GS(th)}$	–1	—	-2	V	I_D = –1 mA, V_{DS} = -10 V Note3
Drain to Source on state resistance	$R_{DS(on)}$	—	245	307	mΩ	I_D = –1 A, V_{GS} = -10 V Note3
		—	310	450	mΩ	I_D = –1 A, V_{GS} = -4.5 V Note3
Forward transfer admittance	$\|y_{fs}\|$	0.65	1	—	S	I_D = –1 A, V_{DS} = -10 V Note3
Input capacitance	Ciss	—	290	—	pF	V_{DS} = –10 V, V_{GS} = 0 f = 1 MHz
Output capacitance	Coss	—	40	—	pF	
Reverse transfer capacitance	Crss	—	20	—	pF	
Total gate charge	Qg	—	6	—	nC	V_{DS} = –10 V, V_{GS} = –10 V I_D = –2 A
Gate to Source charge	Qgs	—	0.7	—	nC	
Gate to Drain charge	Qgd	—	1.2	—	nC	
Turn - on delay time	$t_{d(on)}$	—	20	—	ns	V_{DS} = –10 V, V_{GS} = –10 V I_D = –1 A, R_L = 10 Ω, R_g = 4.7 Ω
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 A, V_{GS} = 0

Notes: 3. Pulse test

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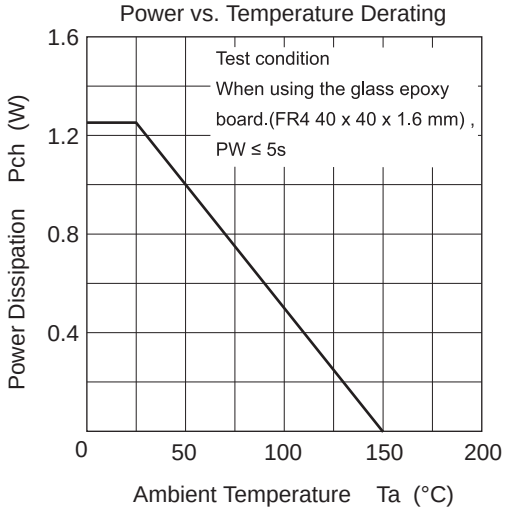
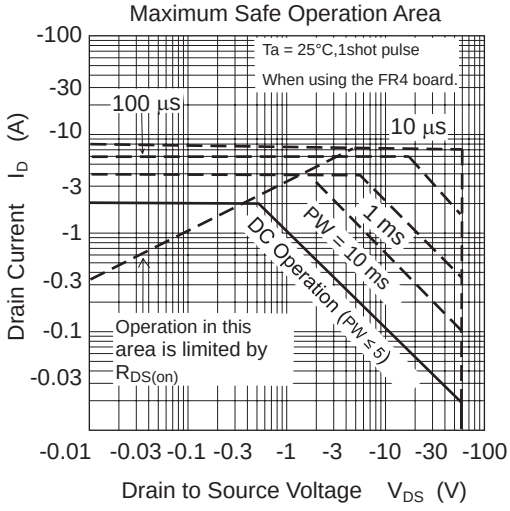
Main Characteristics

Power vs. Temperature Derating



Maximum Safe Operation Area



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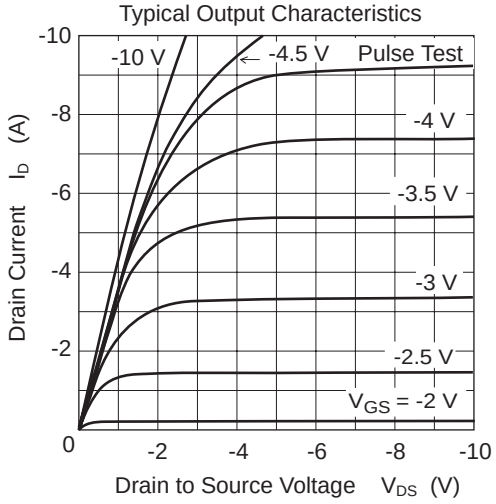
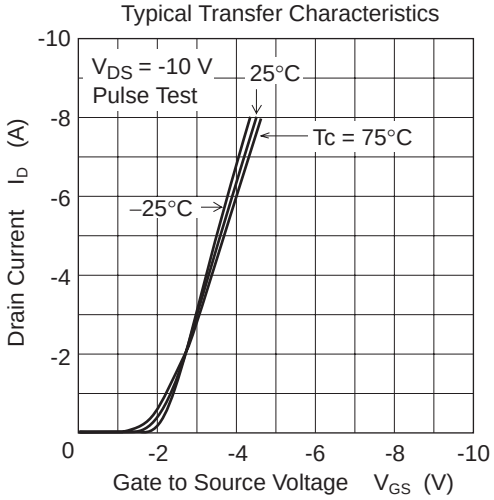
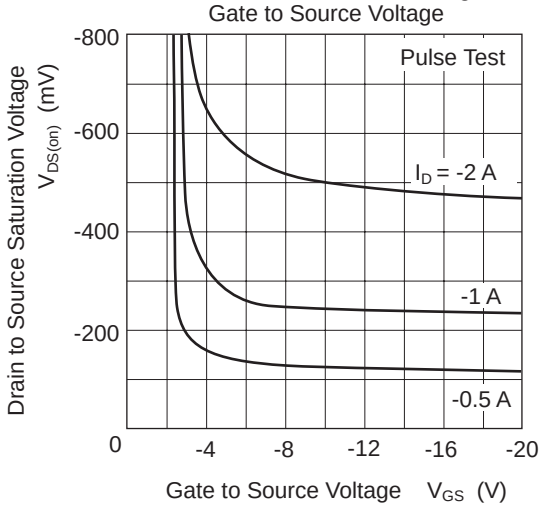
Typical Output Characteristics



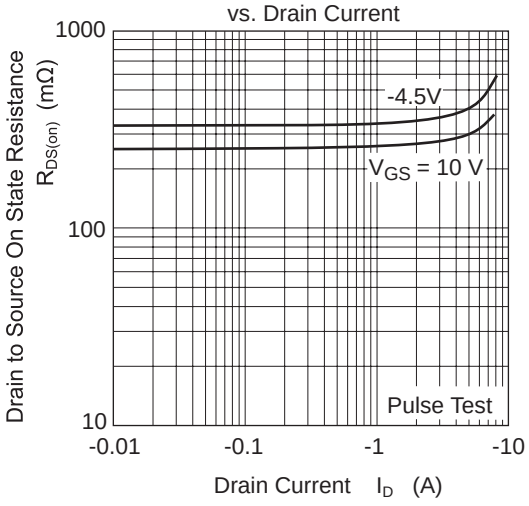
Typical Transfer Characteristics



Drain to Source Saturation Voltage vs. Gate to Source Voltage



Static Drain to Source on State Resistance vs. Drain Current



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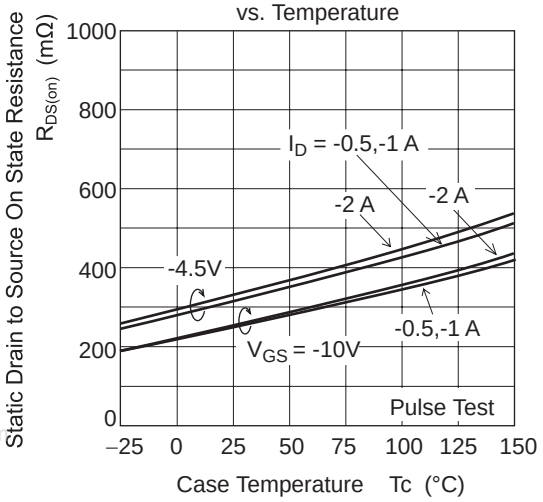
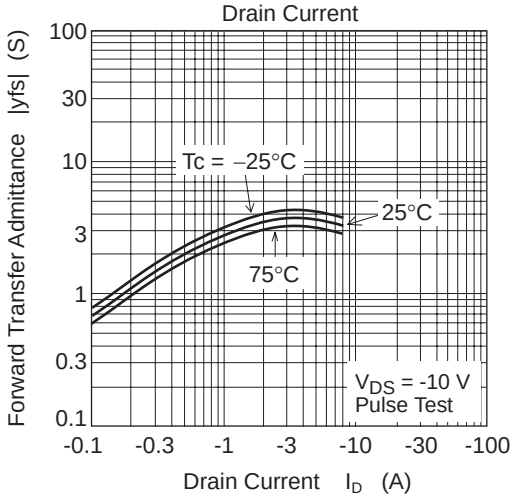
Static Drain to Source On State Resistance vs. Temperature



Forward Transfer Admittance vs. Drain Current



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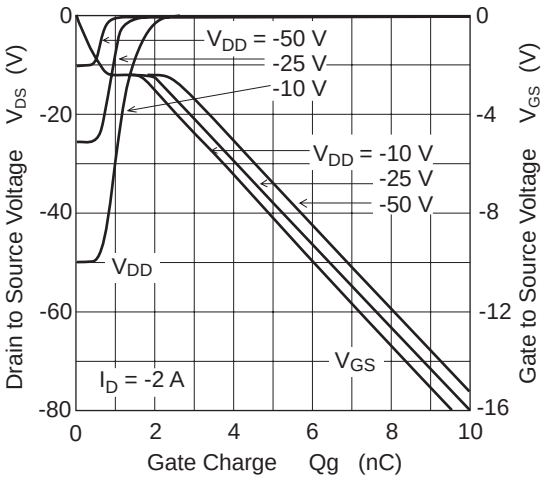
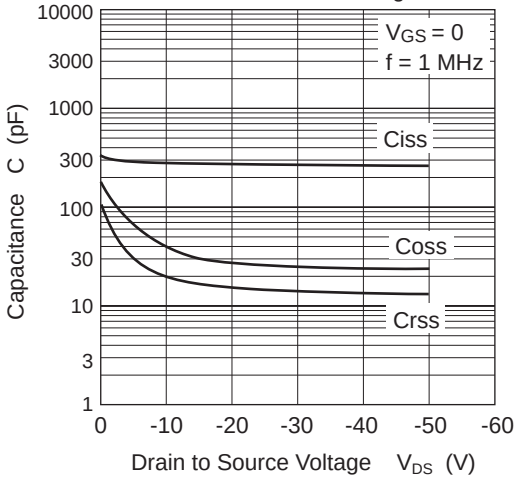
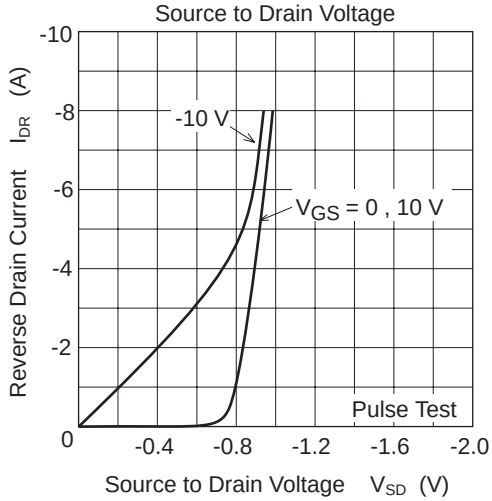
Dynamic Input Characteristics



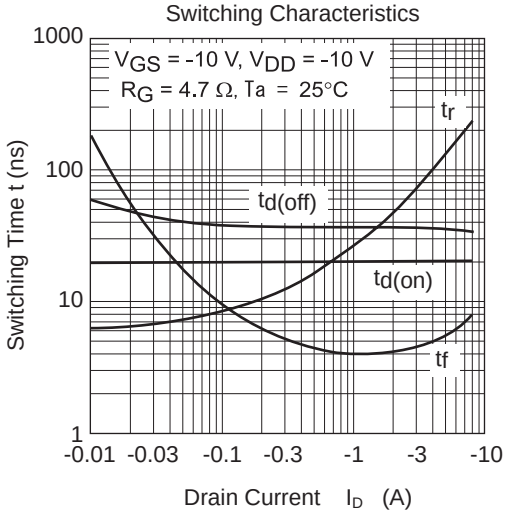
Typical Capacitance vs. Drain to Source Voltage



Reverse Drain Current vs. Source to Drain Voltage



Switching Characteristics



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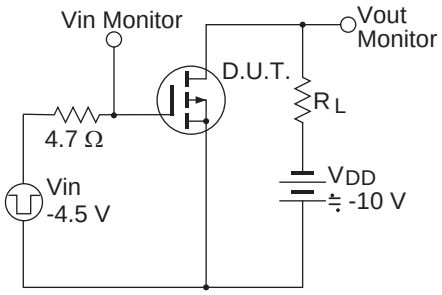
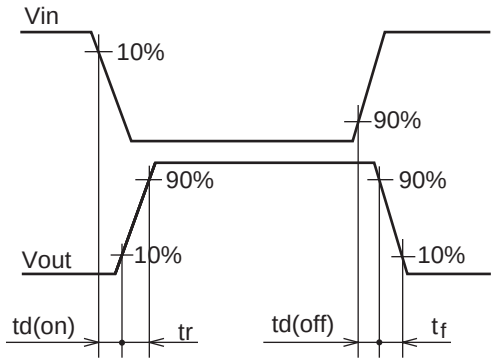
Switching Time Test Circuit



Switching Time Waveform



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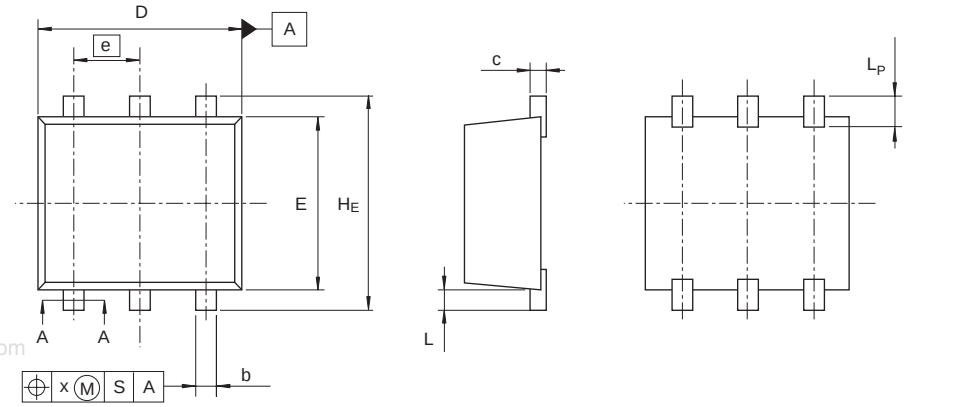
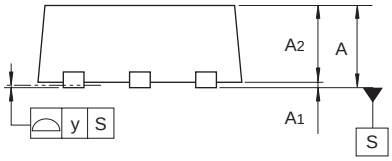
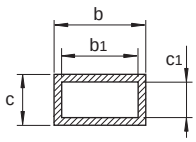
Package Dimensions

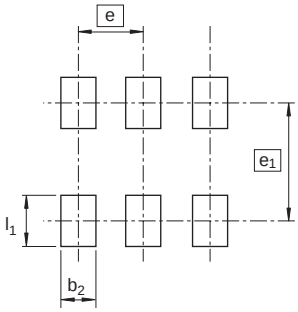
JEITA Package Code	RENESAS Code	Package Name	MASS[Typ.]
—	PWSF0006JA-A	CMFPAK-6 / CMFPAK-6V	0.0065g







A-A Section



Pattern of terminal position areas

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
A	0.6	—	0.8
A_1	0	—	0.01
A_2	0.7	—	0.79
b	0.15	0.22	0.3
b_1	—	0.2	—
c	0.1	0.13	0.15
c_1	—	0.11	—
D	1.9	2.0	2.1
E	1.6	1.7	1.8
e	—	0.65	—
H_E	2.05	2.1	2.15
L	0.1	0.2	0.3
L_P	0.15	—	0.45
x	—	—	0.05
y	—	—	0.05
b_2	—	—	0.35
e_1	—	1.65	—
l_1	—	—	0.5

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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