HAT1069C

Silicon P Channel Power MOS FET
Power Switching

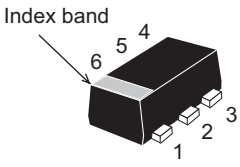
REJ03G0164-0300
Rev.3.00
Oct 19, 2007

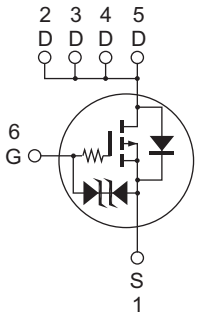
Features

- Low on-resistance
  $R_{DS(on)}$ = 38 mΩ typ (at V_{GS} = –4.5 V)
- High speed switching
- Capable of 1.8 V gate drive
- 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}	–12	V
Gate to source voltage	V_{GSS}	±8	V
Drain current	I_D	–4	A
Drain peak current	$I_{D(pulse)}$ Note1	–16	A
Body-drain diode reverse drain current	I_{DR}	–4	A
Channel dissipation	Pch Note2	900	mW
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

Notes: 1. PW ≤ 10 µs, duty cycle ≤ 1%
2. When using the grass epoxy board. (FR4 40 × 40 × 1.6 mm)

Electrical Characteristics

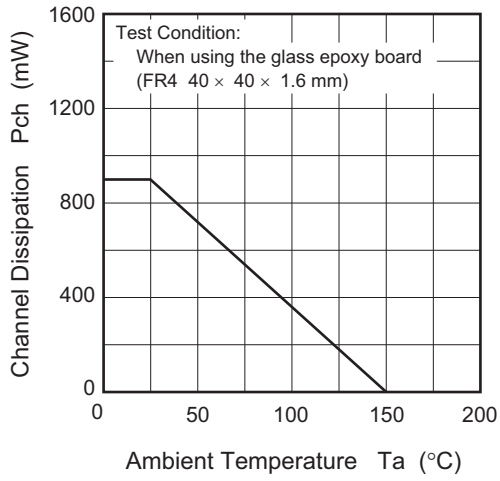
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	–12	—	—	V	I_D = –10 mA, V_{GS} = 0
Gate to source breakdown voltage	$V_{(BR)GSS}$	±8	—	—	V	I_G = ±100 µA, V_{DS} = 0
Gate to source leak current	I_{GSS}	—	—	±10	µA	V_{GS} = ±6.4 V, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	–1	µA	V_{DS} = –12 V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	–0.3	—	–1.2	V	V_{DS} = –10 V, I_D = –1 mA
Static drain to source on state resistance	$R_{DS(on)}$	—	38	52	mΩ	I_D = –1.5 A, V_{GS} = –4.5 V
	$R_{DS(on)}$	—	48	70	mΩ	I_D = –1.5 A, V_{GS} = –2.5 V
	$R_{DS(on)}$	—	60	93	mΩ	I_D = –1.5 A, V_{GS} = –1.8 V
Forward transfer admittance	$\|y_{fs}\|$	5	8	—	S	I_D = –1.5 A, V_{DS} = –10 V
Input capacitance	Ciss	—	1380	—	pF	V_{DS} = –10 V
Output capacitance	Coss	—	235	—	pF	V_{GS} = 0
Reverse transfer capacitance	Crss	—	115	—	pF	f = 1 MHz
Total gate charge	Qg	—	16	—	nC	V_{DS} = –10 V
Gate to source charge	Qgs	—	3	—	nC	V_{GS} = –4.5 V
Gate to drain charge	Qgd	—	6.2	—	nC	I_D = –3 A
Turn-on delay time	$t_{d(on)}$	—	35	—	ns	V_{GS} = –4 V, I_D = –1.5 A
Rise time	t_r	—	150	—	ns	V_{DD} ≅ –10 V
Turn-off delay time	$t_{d(off)}$	—	490	—	ns	R_L = 6.6 Ω
Fall time	t_f	—	350	—	ns	R_g = 4.7 Ω
Body–drain diode forward voltage	V_{DF}	—	–0.8	–1.1	V	I_F = –4 A, V_{GS} = 0 Note3

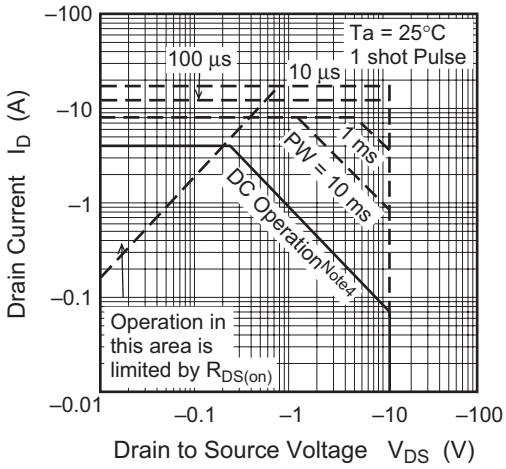
Notes: 3. Pulse test

Main Characteristics

Power vs. Temperature Derating

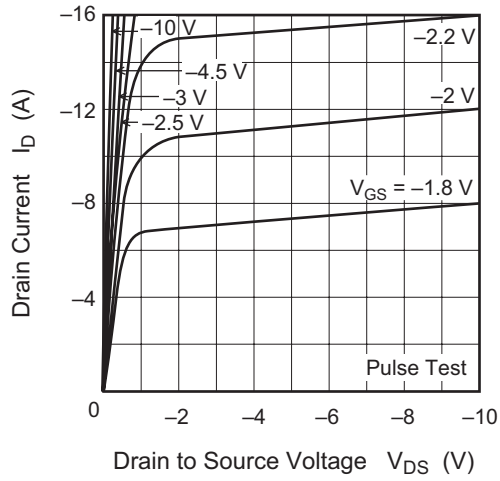


Maximum Safe Operation Area

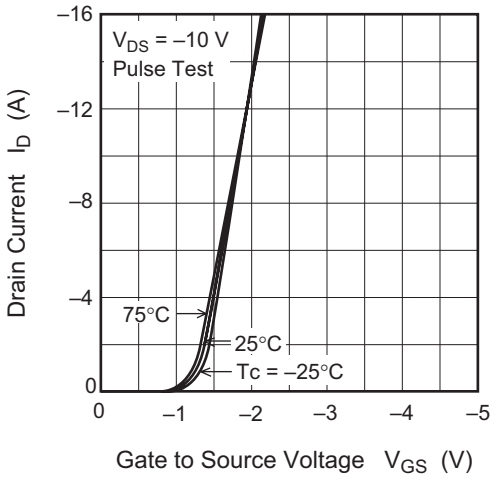


Note 4: When using the glass epoxy board
(FR4 40 × 40 × 1.6 mm)

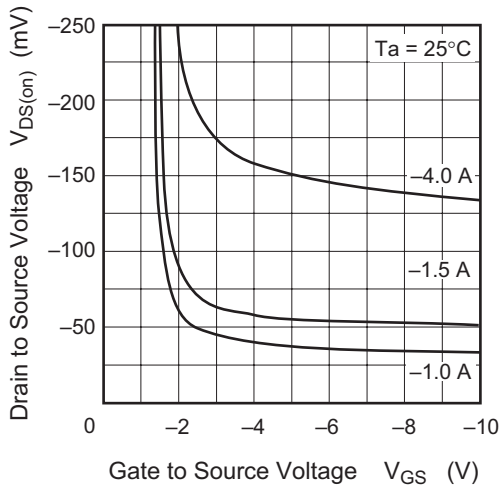
Typical Output Characteristics



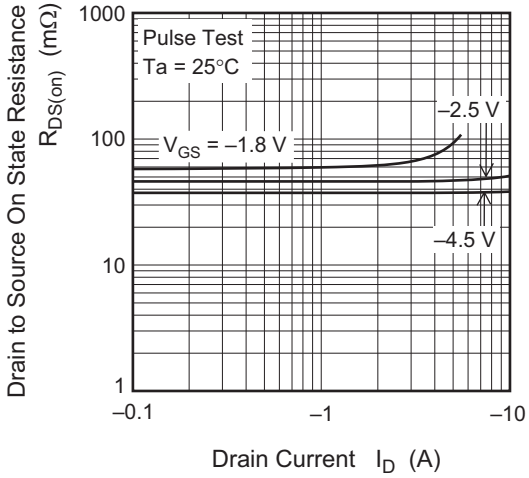
Typical Transfer Characteristics



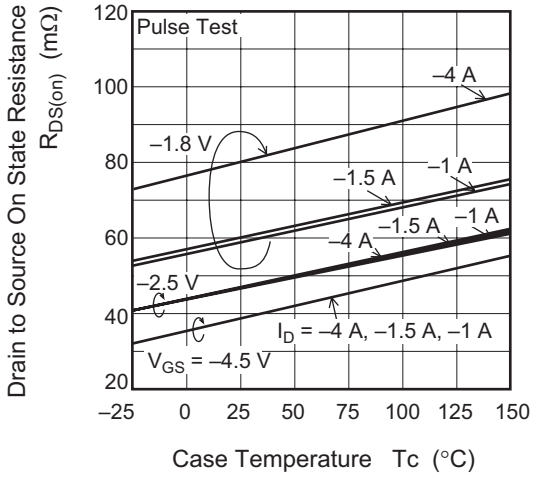
Drain to Source Saturation Voltage vs.
Gate to Source Voltage



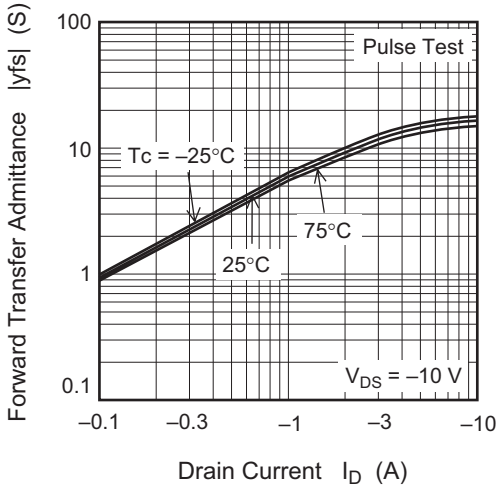
Static Drain to Source on State Resistance
vs. Drain Current



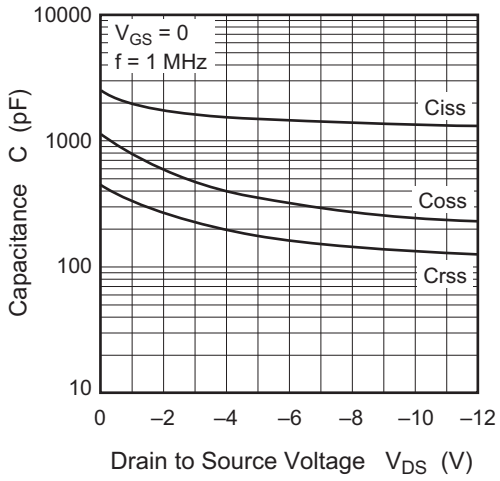
Static Drain to Source on State Resistance vs. Temperature



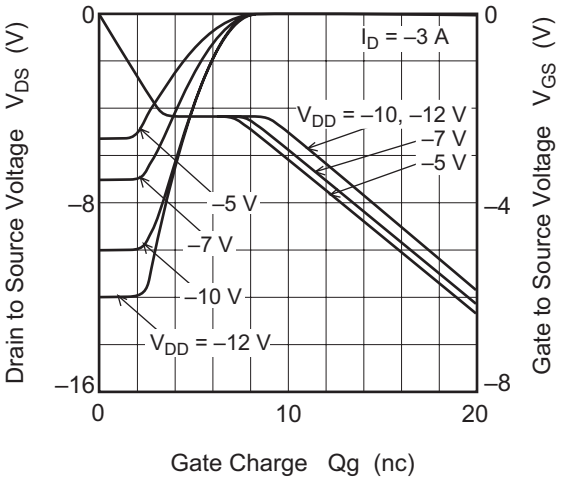
Forward Transfer Admittance vs. Drain Current



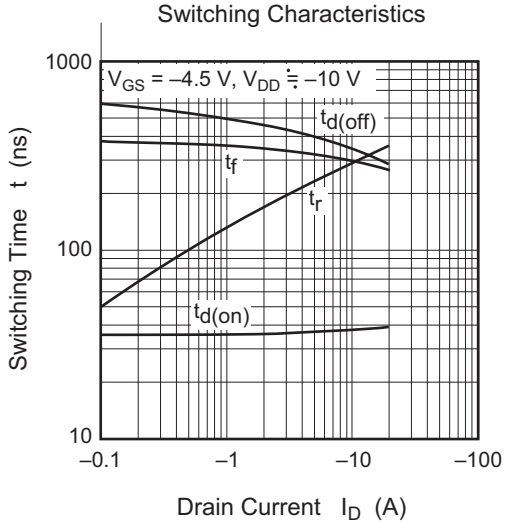
Typical Capacitance vs. Drain to Source Voltage



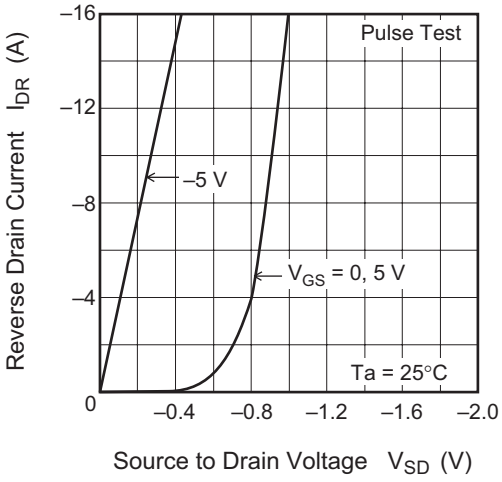
Dynamic Input Characteristics



Switching Characteristics

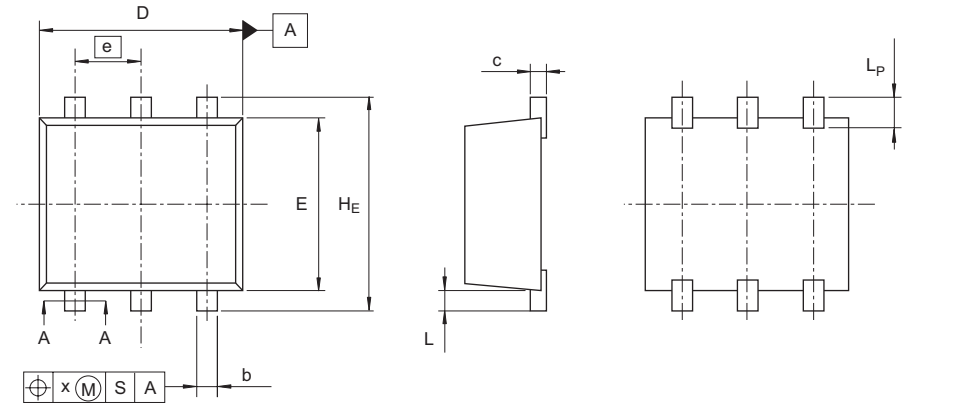


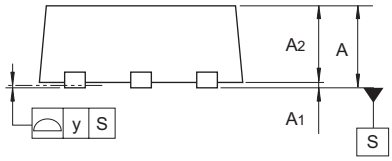
Reverse Drain Current vs. Source to Drain Voltage

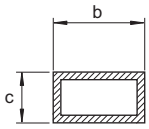


Package Dimensions

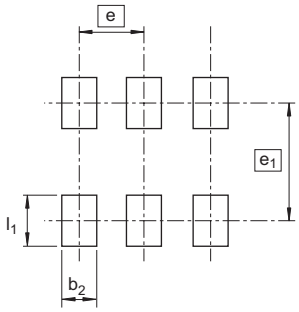
Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
CMFPAK-6	—	PWSF0006JA-A	CMFPAK-6 / CMFPAK-6V	0.0065g







A-A Section



Pattern of terminal position areas

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
A	0.7	–	0.8
A_1	0	–	0.01
A_2	0.7	–	0.79
b	0.15	0.2	0.3
c	0.1	0.15	0.25
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
HAT1069C-EL-E	3000 pcs	Taping

Renesas Technology Corp. Sales Strategic Planning Div. Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan

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Renesas Technology America, Inc.
450 Holger Way, San Jose, CA 95134-1368, U.S.A
Tel: <1> (408) 382-7500, Fax: <1> (408) 382-7501

Renesas Technology Europe Limited
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K.
Tel: <44> (1628) 585-100, Fax: <44> (1628) 585-900

Renesas Technology (Shanghai) Co., Ltd.
Unit 204, 205, AZIACenter, No.1233 Lujiazui Ring Rd, Pudong District, Shanghai, China 200120
Tel: <86> (21) 5877-1818, Fax: <86> (21) 6887-7898

Renesas Technology Hong Kong Ltd.
7th Floor, North Tower, World Finance Centre, Harbour City, 1 Canton Road, Tsimshatsui, Kowloon, Hong Kong
Tel: <852> 2265-6688, Fax: <852> 2730-6071

Renesas Technology Taiwan Co., Ltd.
10th Floor, No.99, Fushing North Road, Taipei, Taiwan
Tel: <886> (2) 2715-2888, Fax: <886> (2) 2713-2999

Renesas Technology Singapore Pte. Ltd.
1 Harbour Front Avenue, #06-10, Keppel Bay Tower, Singapore 098632
Tel: <65> 6213-0200, Fax: <65> 6278-8001

Renesas Technology Korea Co., Ltd.
Kukje Center Bldg. 18th Fl., 191, 2-ka, Hangang-ro, Yongsan-ku, Seoul 140-702, Korea
Tel: <82> (2) 796-3115, Fax: <82> (2) 796-2145

Renesas Technology Malaysia Sdn. Bhd
Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No.18, Jalan Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: <603> 7955-9390, Fax: <603> 7955-9510

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