

HAT1069C

Silicon P Channel Power MOS FET
Power Switching

REJ03G0164-0300

Rev.3.00

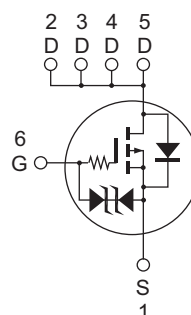
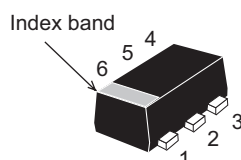
Oct 19, 2007

Features

- Low on-resistance
 $R_{DS(on)} = 38 \text{ m}\Omega$ typ (at $V_{GS} = -4.5 \text{ V}$)
- 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

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

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	-12	V
Gate to source voltage	V_{GSS}	± 8	V
Drain current	I_D	-4	A
Drain peak current	$I_{D(pulse)}$ ^{Note1}	-16	A
Body-drain diode reverse drain current	I_{DR}	-4	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. $PW \leq 10 \mu\text{s}$, duty cycle $\leq 1\%$

2. When using the glass epoxy board. (FR4 $40 \times 40 \times 1.6 \text{ mm}$)

Electrical Characteristics

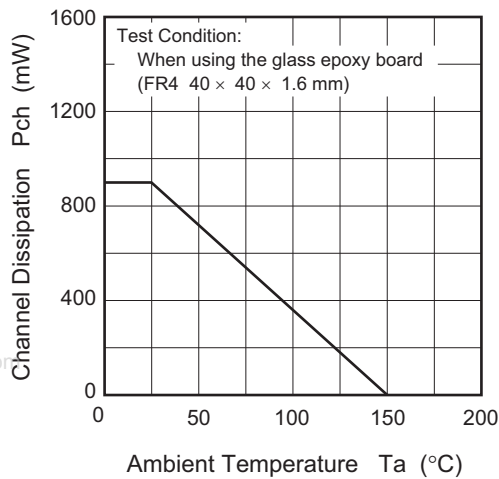
(Ta = 25°C)

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

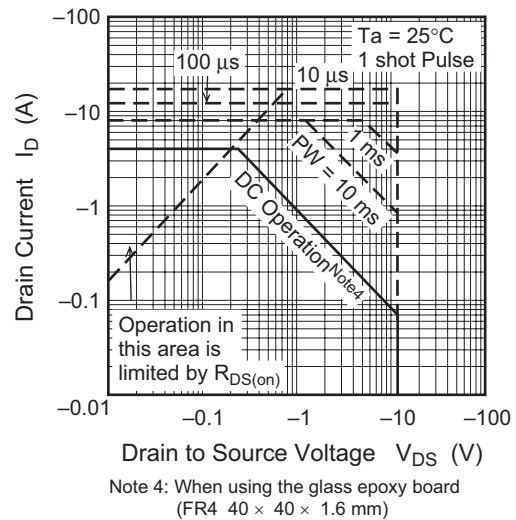
Notes: 3. Pulse test

Main Characteristics

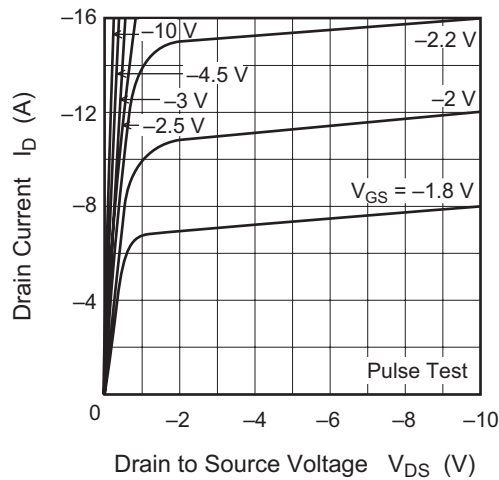
Power vs. Temperature Derating



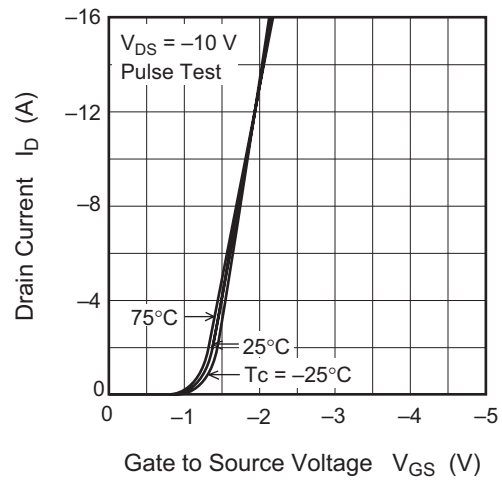
Maximum Safe Operation Area



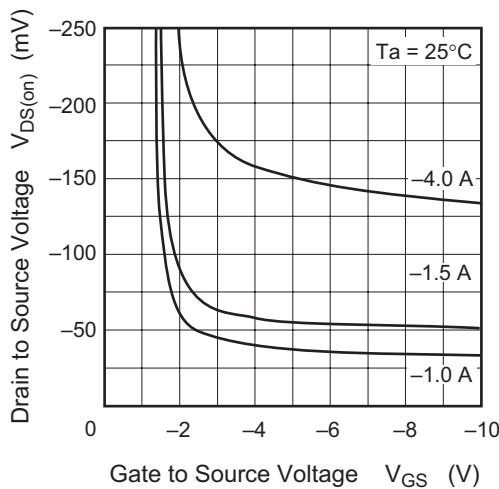
Typical Output Characteristics



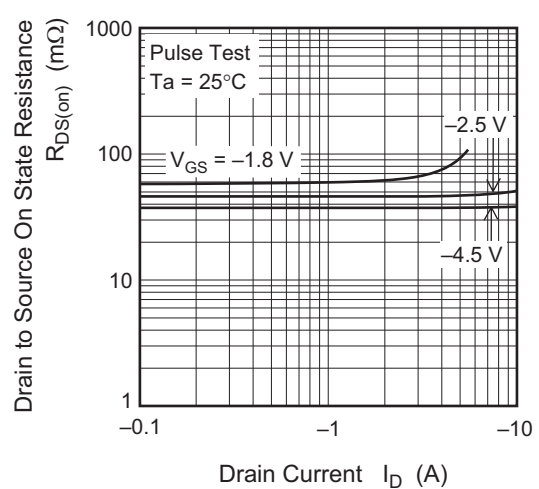
Typical Transfer Characteristics



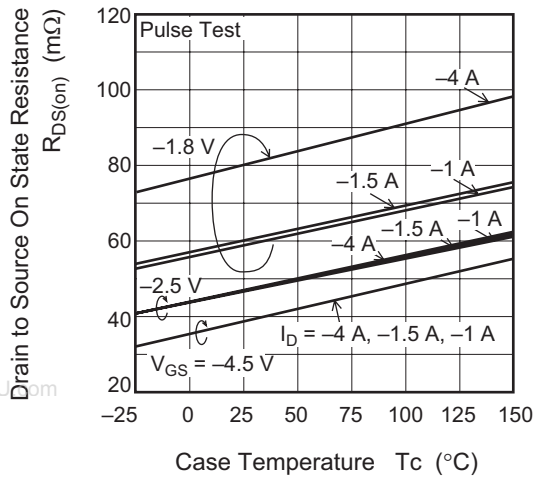
Drain to Source Saturation Voltage vs. Gate to Source Voltage



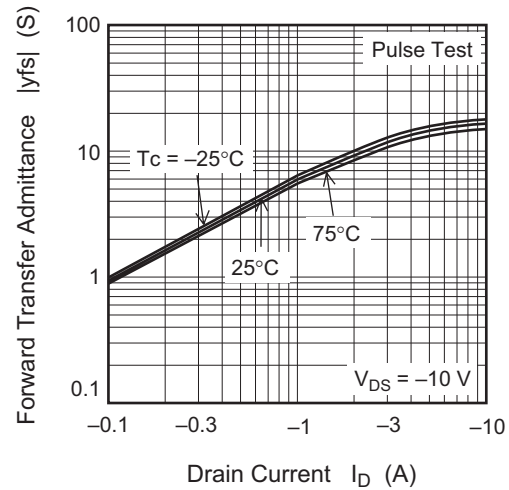
Static Drain to Source on State Resistance vs. Drain Current



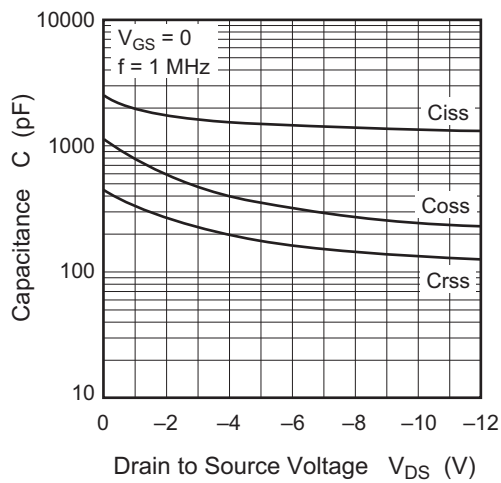
Static Drain to Source on State Resistance vs. Temperature



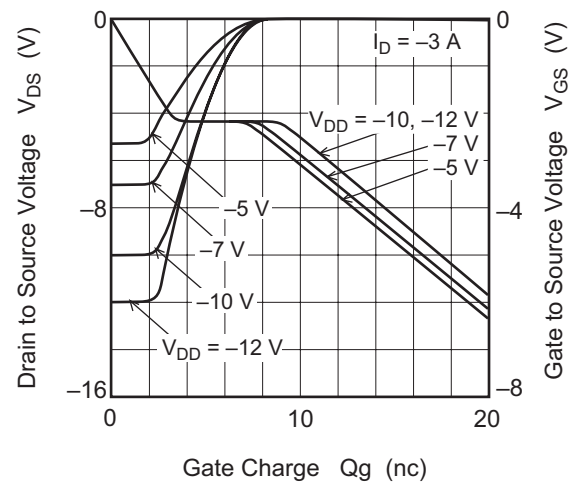
Forward Transfer Admittance vs. Drain Current



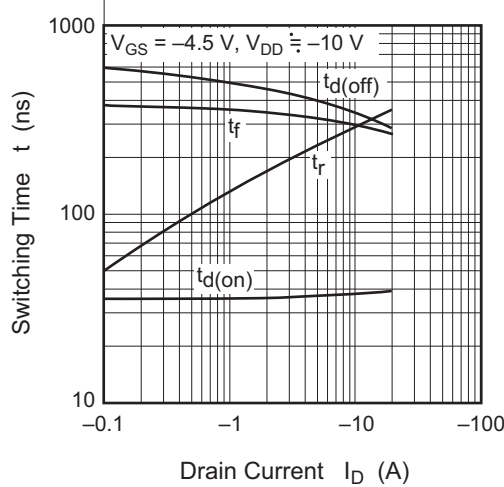
Typical Capacitance vs. Drain to Source Voltage



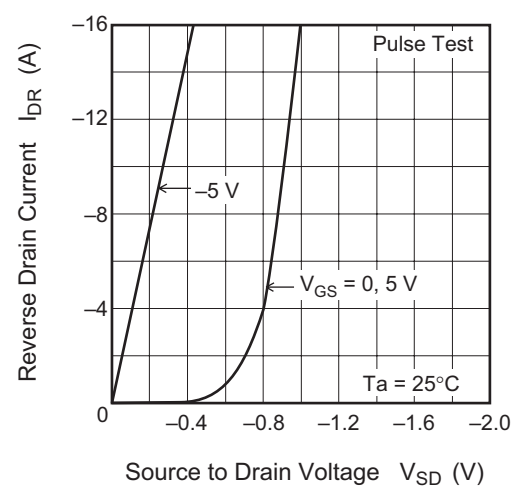
Dynamic Input Characteristics



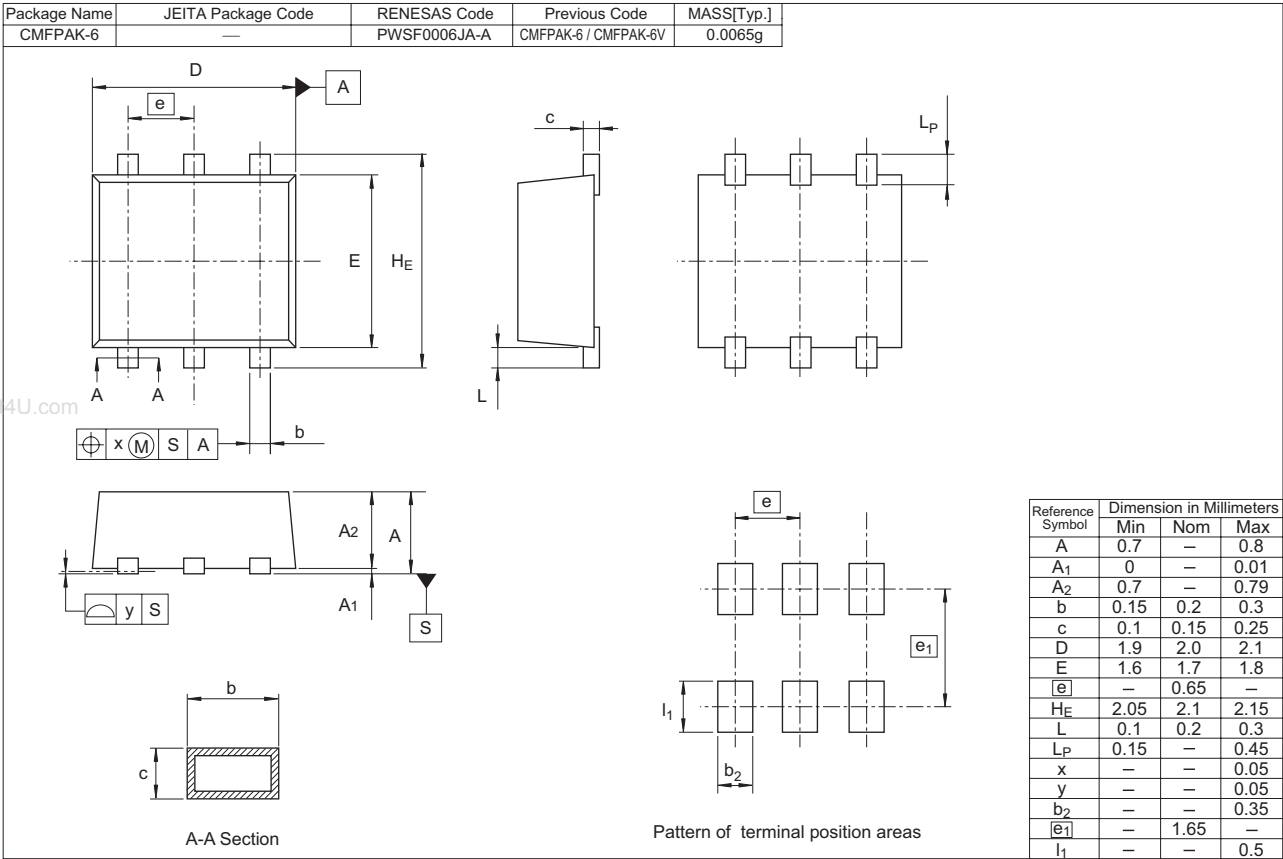
Switching Characteristics



Reverse Drain Current vs. Source to Drain Voltage



Package Dimensions



Ordering Information

Part Name	Quantity	Shipping Container
HAT1069C-EL-E	3000 pcs	Taping

Notes:

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