

# HAT1094C

## Silicon P Channel MOS FET Power Switching

REJ03G1231-0400

Rev.4.00

Feb 28, 2006

### Features

- Low on-resistance  
 $R_{DS(on)} = 67 \text{ m}\Omega$  typ. (at  $V_{GS} = -4.5 \text{ V}$ )
- Low drive current.
- 1.8 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	$V_{DSS}$	-12	V
Gate to Source voltage	$V_{GSS}$	$\pm 8$	V
Drain current	$I_D$	-2.5	A
Drain peak current	$I_D$ (pulse) <sup>Note 1</sup>	-10	A
Body - Drain diode reverse drain current	$I_{DR}$	-2.5	A
Channel dissipation	$P_{ch}$ <sup>Note 2</sup>	850	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  $40 \times 40 \times 1.6\text{mm}$ ),  $T_a = 25^\circ\text{C}$

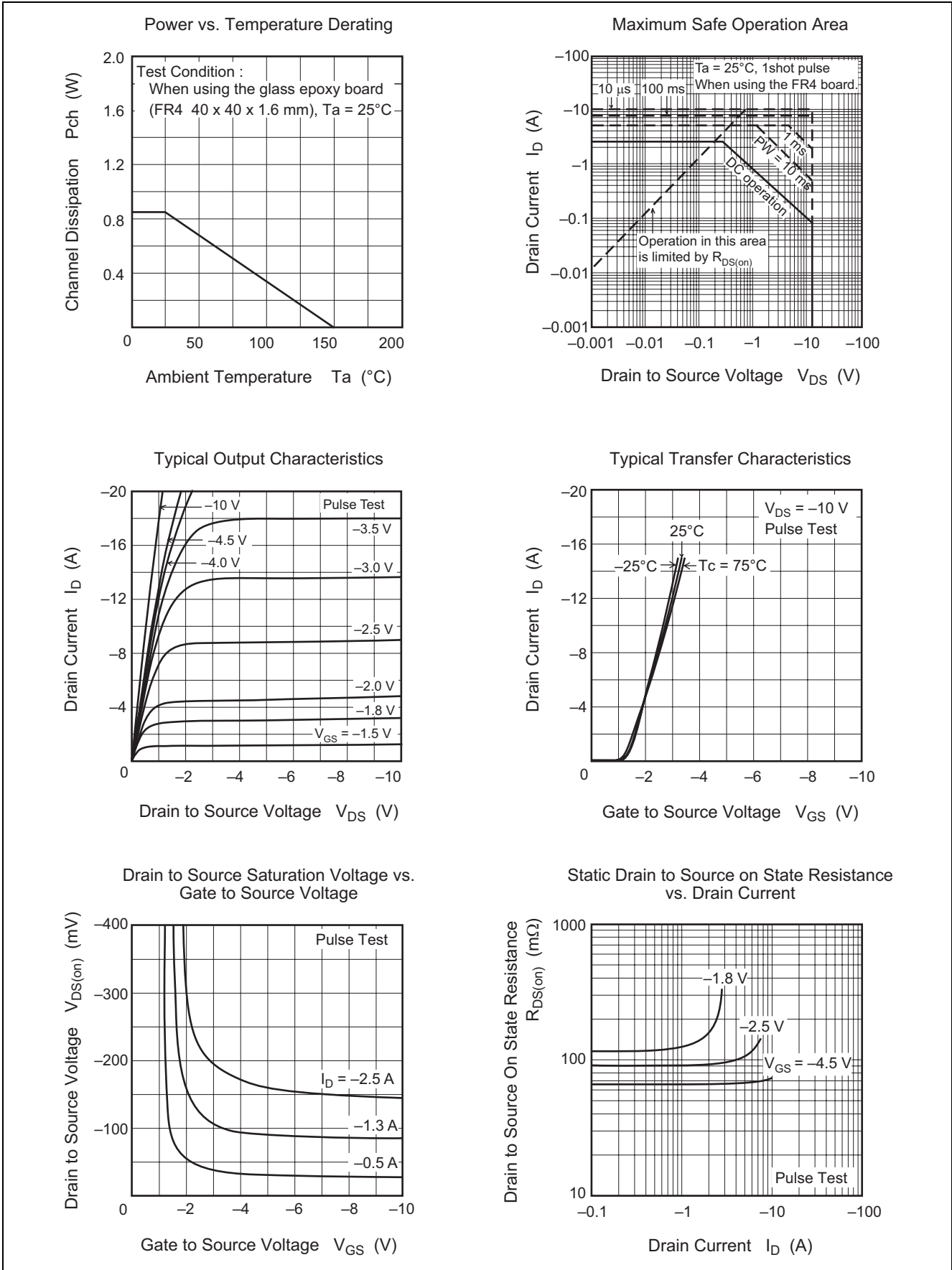
## Electrical Characteristics

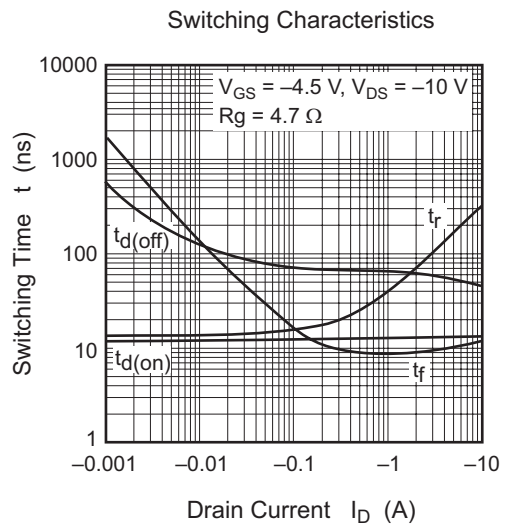
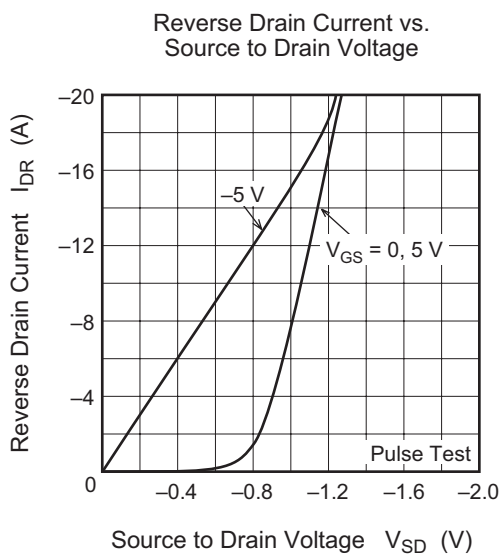
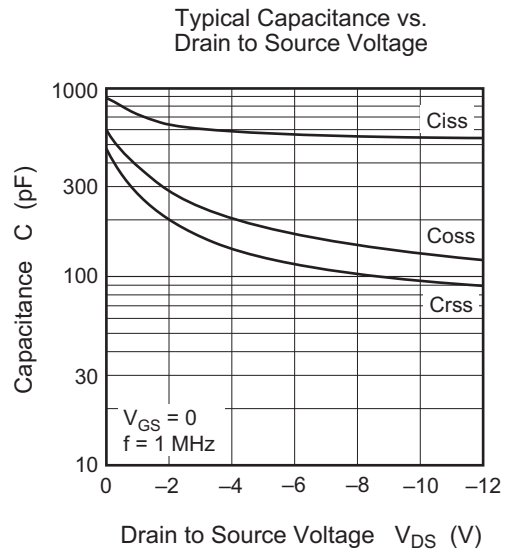
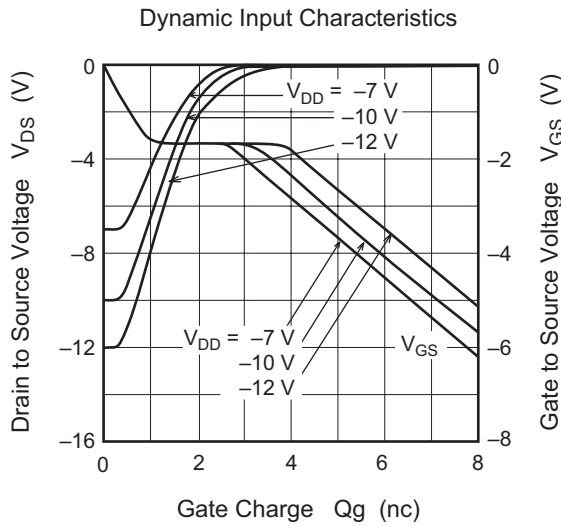
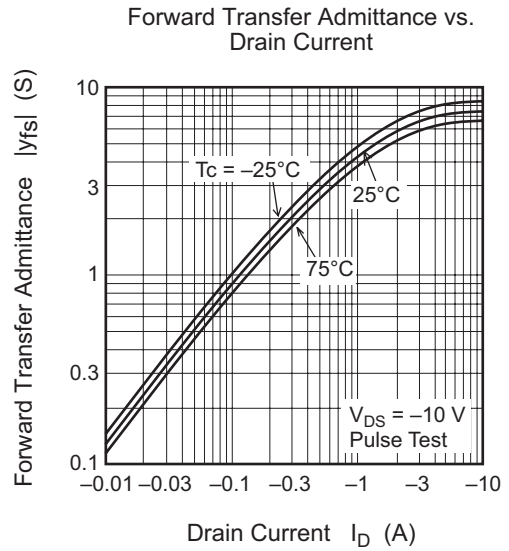
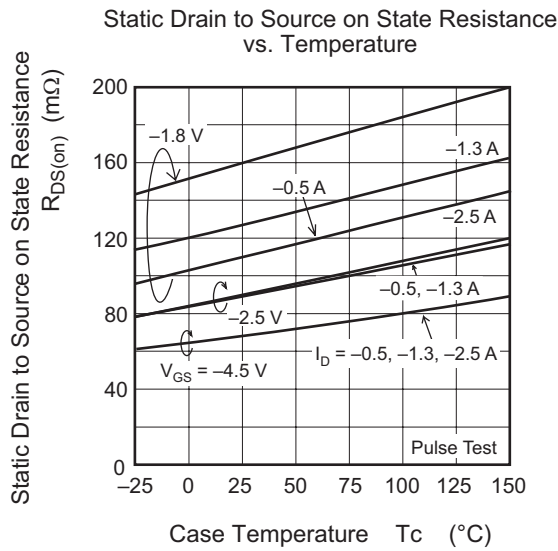
(Ta = 25°C)

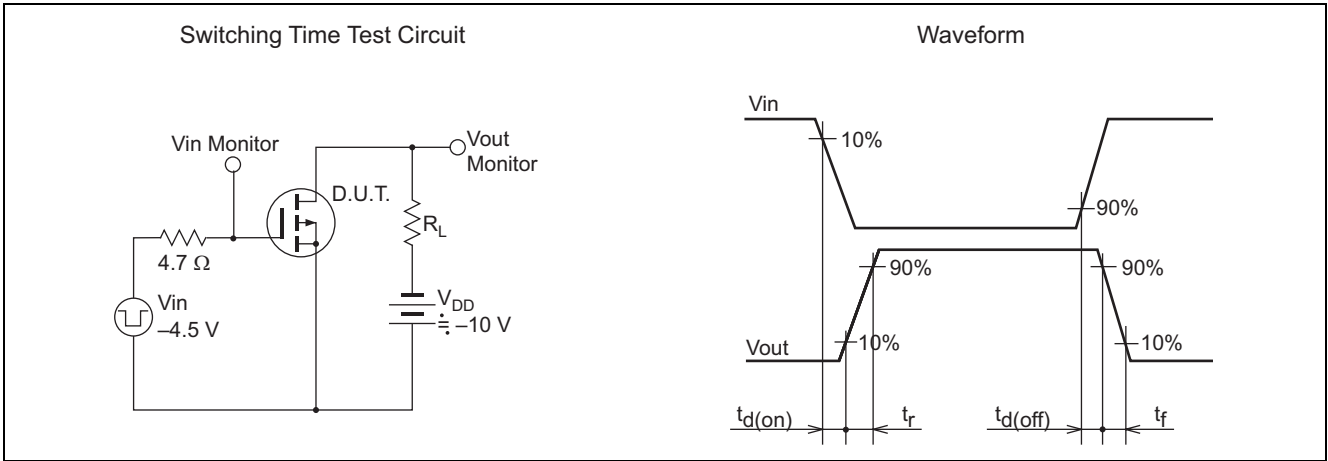
Item	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain to Source breakdown voltage	$V_{(BR)DSS}$	-12	—	—	V	$I_D = -10 \text{ mA}$ , $V_{GS} = 0$
Gate to Source breakdown voltage	$V_{(BR)GSS}$	$\pm 8$	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}$ , $V_{DS} = 0$
Gate to Source leakage current	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 6.4 \text{ V}$ , $V_{DS} = 0$
Drain to Source leakage current	$I_{DSS}$	—	—	-1	$\mu\text{A}$	$V_{DS} = -12 \text{ V}$ , $V_{GS} = 0$
Gate to Source cutoff voltage	$V_{GS(th)}$	-0.3	—	-1.2	V	$I_D = -1 \text{ A}$ , $V_{DS} = -10 \text{ V}$ <sup>Note3</sup>
Drain to Source on state resistance	$R_{DS(on)}$	—	67	88	m $\Omega$	$I_D = -1.3 \text{ A}$ , $V_{GS} = -4.5 \text{ V}$ <sup>Note3</sup>
		—	90	126	m $\Omega$	$I_D = -1.3 \text{ A}$ , $V_{GS} = -2.5 \text{ V}$ <sup>Note3</sup>
		—	128	192	m $\Omega$	$I_D = -1.3 \text{ A}$ , $V_{GS} = -1.8 \text{ V}$ <sup>Note3</sup>
Forward transfer admittance	$ y_{fs} $	3.5	5	—	S	$I_D = -1.3 \text{ A}$ , $V_{DS} = -10 \text{ V}$ <sup>Note3</sup>
Input capacitance	$C_{iss}$	—	530	—	pF	$V_{DS} = -10 \text{ V}$ , $V_{GS} = 0$ , $f = 1 \text{ MHz}$
Output capacitance	$C_{oss}$	—	130	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	95	—	pF	
Total gate charge	$Q_g$	—	6.5	—	nC	$V_{DS} = -10 \text{ V}$ , $V_{GS} = -4.5 \text{ V}$ , $I_D = -2.5 \text{ A}$
Gate to Source charge	$Q_{gs}$	—	1	—	nC	
Gate to Drain charge	$Q_{gd}$	—	1.8	—	nC	
Turn - on delay time	$t_{d(on)}$	—	12	—	ns	$V_{DS} = -10 \text{ V}$ , $V_{GS} = -4.5 \text{ V}$ , $I_D = -1.3 \text{ A}$ , $R_L = 7.7 \text{ }\Omega$ , $R_g = 4.7 \text{ }\Omega$
Rise time	$t_r$	—	52	—	ns	
Turn - off delay time	$t_{d(off)}$	—	62	—	ns	
Fall time	$t_f$	—	9	—	ns	
Body - Drain diode forward voltage	$V_{DF}$	—	-0.85	-1.1	V	$I_F = -2.5 \text{ A}$ , $V_{GS} = 0$

Notes: 3. Pulse test

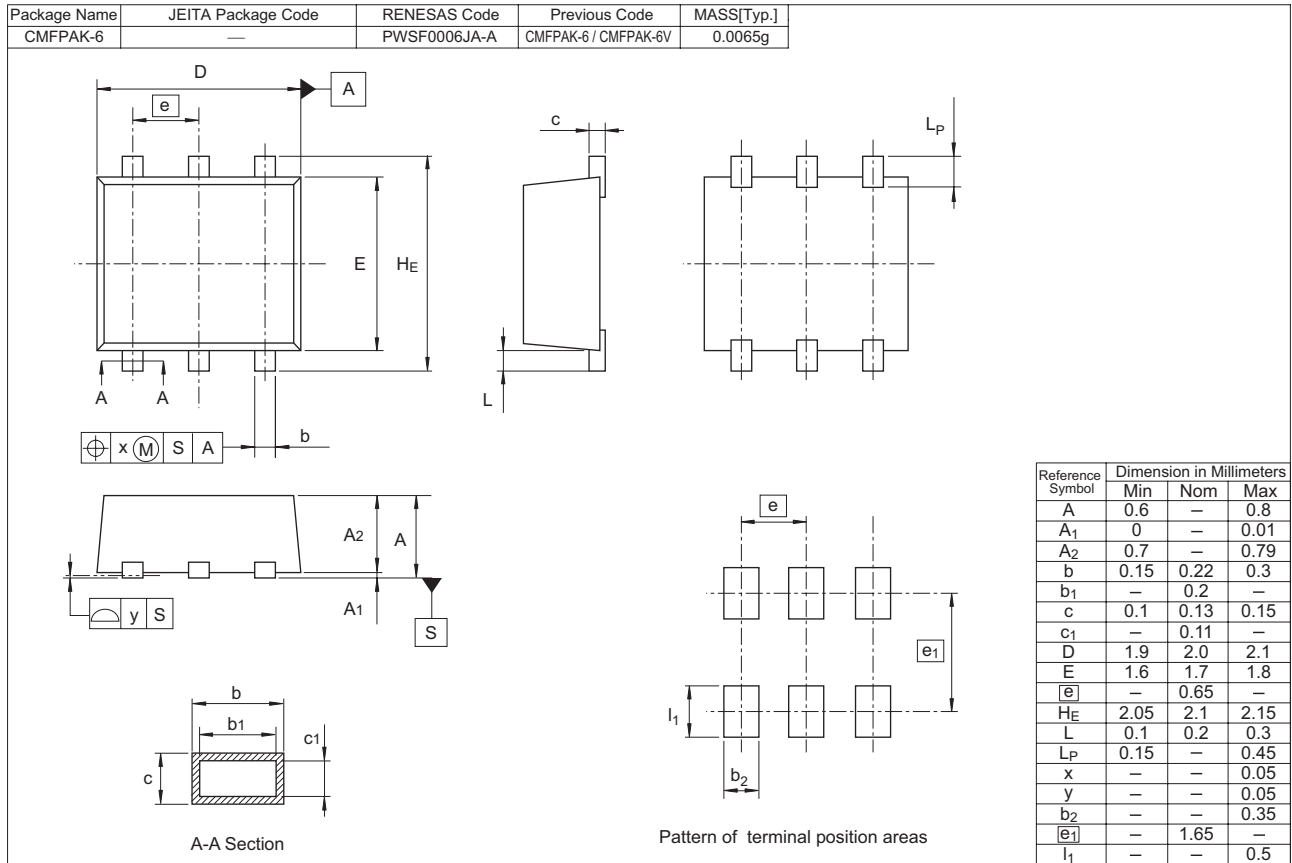
Main Characteristics







### Package Dimensions



### Ordering Information

Part Name	Quantity	Shipping Container
HAT1094C-EL-E	3000 pcs	Taping

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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.  
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**Renesas Technology (Shanghai) Co., Ltd.**

Unit 204, 205, AZIACenter, No.1233 Lujiazui Ring Rd, Pudong District, Shanghai, China 200120  
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**Renesas Technology Hong Kong Ltd.**

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10th Floor, No.99, Fushing North Road, Taipei, Taiwan  
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Tel: <65> 6213-0200, Fax: <65> 6278-8001

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Tel: <82> (2) 796-3115, Fax: <82> (2) 796-2145

**Renesas Technology Malaysia Sdn. Bhd**

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