◇Structure Silicon monolithic integrated circuit
◇Classification Expansion port function built in 8bit8chD/A converter
◇Product BH2226FV
◇Features •3-wire 12-bit serial interface
•POWER ON RESET circuit

◇Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Power Supply voltage	VCC	-0.3~7.0	V
Terminal voltage	VIN	-0.3~7.0	V
Storage temperature range	TSTG	-55~125	°C
Permissible loss	PD	450	mW

* This value decreases 4.5mW/°C above 25°C.

* When installed on the standard board (Size : 70x70 mm, t =1.6 mm).

◇Operating conditions (Ta=25°C)

Parameter	Symbol	Limits			Unit
		MIN.	TYP.	MAX.	
VCC power source voltage	VCC	2.7	—	5.5	V
Terminal input voltage range	VIN	0	—	VCC	V
Analog output current	IO	−1.0	—	1.0	mA
Action temperature range	TOPR	-20	—	85	°C
Serial clock frequency	FCLK	—	1.0	10.0	MHz
Limit load capacity	CL	—	—	0.1	μF

* This product is no antiradiation design.

◇Electric characteristics (VCC=3.0V, RL=OPEN, CL=0pF, Ta=25°C; unless otherwise specified.)

Parameter	Symbol	Limits			Unit	Condition
		MIN.	TYP.	MAX.		
VCC system	ICC	—	1.1	2.5	mA	CLK=1MHz 80H setting
	ICCPD	—	5	20	μA	At power down setting
L input voltage	VIL	GND	—	0.6	V	VCC=5V
H input voltage	VIH	2.4	—	VCC	V	VCC=5V
L output voltage	VOL	—	—	0.4	V	IOH=2.5mA
H output voltage	VOH	VCC−0.4	—	—	V	IOL=0.4mA
Output zero scale voltage	ZS1	GND	—	0.1	V	00H setting, IOH=0.0mA
Output full scale voltage	FS1	VCC-0.1	—	VCC	V	FFH setting, IOL=0.0mA
Differential non linearity error	DNL	-1.0	—	1.0	LSB	Input code 02H~FDH
Integral non linearity error	INL	-1.5	—	1.5	LSB	Input code 02H~FDH
VCC power source voltage rise time	trVCC	100	—	—	μS	VCC=0→2.7V
Power on Reset release voltage	VPOR	—	1.9	—	V	
Output setting time	tOUT	—	—	100	μS	

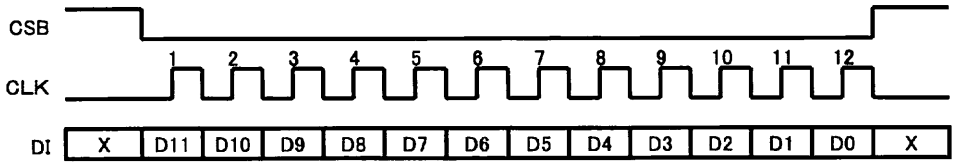
Status of this document
The Japanese version of this document is the formal specification.
A customer may use this translation version only for a reference to help reading the formal version.
If there are any differences in translation version of this document, formal version takes priority.

Application example
The application circuit is recommended for use. Make sure to confirm the adequacy of the characteristics.
When using the circuit with changes to the external circuit constants, make sure to leave an adequate margin for external components including static and transitional characteristics as well as dispersion of the IC.
Note that ROHM cannot provide adequate confirmation of patents.

The Product described in this specification is designed to be used with ordinary electronic equipment or devices (such as audio -visual equipment, office-automation equipment, communications devices, electrical appliances, and electronic toys).
Should you intend to use this product with equipment or devices which require an extremely high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear -reactor controllers, fuel controllers and other safety devices), please be sure to consult with our sales representative in advance.

ROHM assumes to responsibility for use of any circuits described herein, conveys no license under any patent or other right, and makes no representations that the circuits are free from patent infringement.

◇Command sending



・Data setting

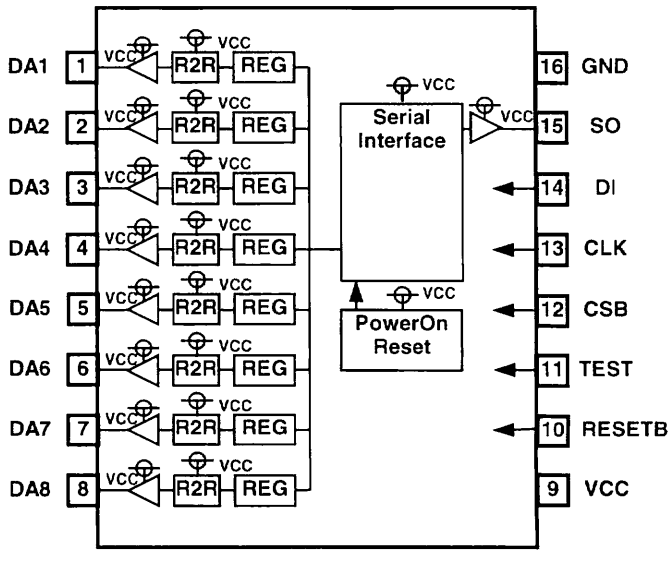
D0	D1	D2	D3	D4	D5	D6	D7	Setting
0	0	0	0	0	0	0	0	GND
1	0	0	0	0	0	0	0	(VCC-GND)/256×1
0	1	0	0	0	0	0	0	(VCC-GND)/256×2
~								~
0	1	1	1	1	1	1	1	(VCC-GND)/256×254
1	1	1	1	1	1	1	1	(VCC-GND)/256×255

・Channel setting

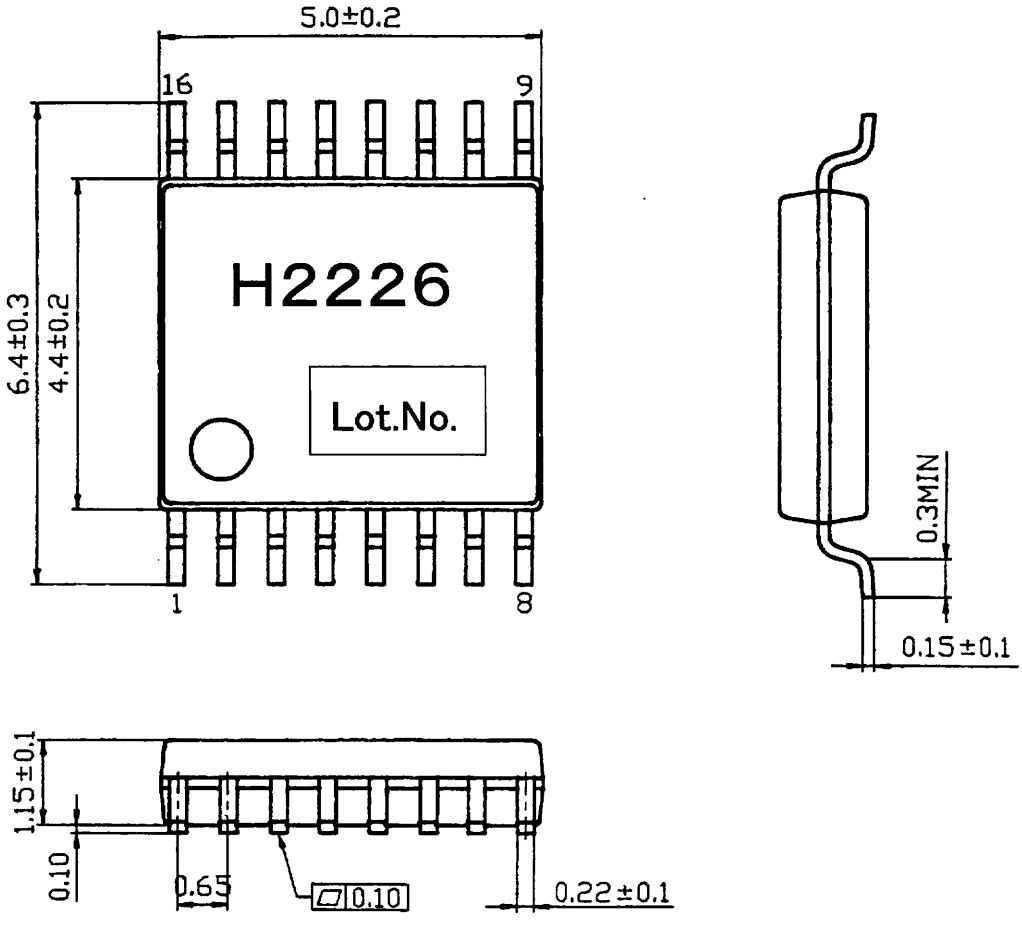
D8	D9	D10	D11	Setting
0	0	0	0	Power down setting (default)
0	0	0	1	DA1
0	0	1	0	DA2
0	0	1	1	DA3
0	1	0	0	DA4
0	1	0	1	DA5
0	1	1	0	DA6
0	1	1	1	DA7
1	0	0	0	DA8
1	0	0	1	Power down release
1	0	1	0	Don't Care
1	0	1	1	Don't Care
1	1	0	0	I/O DAC select
1	1	0	1	I/O serial⇒Parallel
1	1	1	0	I/O parallel⇒Serial
1	1	1	1	I/O status setting

◇Pin description／Block diagram

No.	Name	Function
1	DA1	Analog output terminal
2	DA2	I/O input/output terminal
3	DA3	
4	DA4	
5	DA5	
6	DA6	
7	DA7	
8	DA8	
9	VCC	Power source terminal
10	RESETB	Reset terminal
11	TEST	Test terminal (normal connected to GND)
12	CSB	Chip select signal input terminal
13	CLK	Serial Clock input terminal
14	DI	Serial data input terminal
15	SO	Serial data output terminal
16	GND	Ground terminal



◇External idimensions(SSOPB16)



(UNIT : mm)

Drawing No.; B0771

◇Cautions on use

(1) Numbers and data in entries are representative design values and are not guaranteed values of the items.

(2) Although we are confident in recommending the sample application circuits, carefully check their characteristics further when using them. When modifying externally attached component constants before use, determine them so that they have sufficient margins by taking into account variations in externally attached components and the Rohm LSI, not only for static characteristics but also including transient charcteristics.

(3) Absolute maximum ratings
If applied voltage, operating temperature range, or other absolute maximum ratings are exceeded, the LSI may be damaged. Do not apply voltages or temperatures that exceed the absolute maximum ratings. If you think of a case in which absolute maximum ratings are exceeded, enforce fuses or other physical safety measures and investigate how not to apply the conditions under which absolute maximum ratings are exceeded to the LSI.

(4) GND potential
Make the GND pin voltage such that it is the lowest voltage even when operating below it. Actually confirm that the voltage of each pin does not become a lower voltage than the GND pin, including transient phenomena.

(5) Thermal design
Perform thermal design in which there are adequate margins by taking into account the allowable power dissipationin actual states of use.

(6) Shorts between pins and misinstallation
When mounting the LSI on a board, pay adequate attention to orientation and placement discrepancies of the LSI. If it is misinstalled and the power is turned on, the LSI may be damaged. It also may be damaged if it is shorted by a foreign substance coming between pins of the LSI or between a pin and a power supply or a pin and a GND.

(7) Operation in strong magnetic fields
Adequately evaluate use in a strong magnetic field, since there is a possibility of malfunction.

Notes

- No technical content pages of this document may be reproduced in any form or transmitted by any means without prior permission of ROHM CO.,LTD.
- The contents described herein are subject to change without notice. The specifications for the product described in this document are for reference only. Upon actual use, therefore, please request that specifications to be separately delivered.
- Application circuit diagrams and circuit constants contained herein are shown as examples of standard use and operation. Please pay careful attention to the peripheral conditions when designing circuits and deciding upon circuit constants in the set.
- Any data, including, but not limited to application circuit diagrams information, described herein are intended only as illustrations of such devices and not as the specifications for such devices. ROHM CO.,LTD. disclaims any warranty that any use of such devices shall be free from infringement of any third party's intellectual property rights or other proprietary rights, and further, assumes no liability of whatsoever nature in the event of any such infringement, or arising from or connected with or related to the use of such devices.
- Upon the sale of any such devices, other than for buyer's right to use such devices itself, resell or otherwise dispose of the same, no express or implied right or license to practice or commercially exploit any intellectual property rights or other proprietary rights owned or controlled by
- ROHM CO., LTD. is granted to any such buyer.
- Products listed in this document are no antiradiation design.

The products listed in this document are designed to be used with ordinary electronic equipment or devices (such as audio visual equipment, office-automation equipment, communications devices, electrical appliances and electronic toys).
Should you intend to use these products with equipment or devices which require an extremely high level of reliability and the malfunction of with would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), please be sure to consult with our sales representative in advance.

About Export Control Order in Japan

Products described herein are the objects of controlled goods in Annex 1 (Item 16) of Export Trade Control Order in Japan.
In case of export from Japan, please confirm if it applies to "objective" criteria or an "informed" (by MITI clause) on the basis of "catch all controls for Non-Proliferation of Weapons of Mass Destruction.

Thank you for your accessing to ROHM product informations.

More detail product informations and catalogs are available,

please contact your nearest sales office.

Please contact our sales offices for details ;

U.S.A / San Diego	TEL : +1(858)625-3630	FAX : +1(858)625-3670
Atlanta	TEL : +1(770)754-5972	FAX : +1(770)754-0691
Dallas	TEL : +1(972)312-8818	FAX : +1(972)312-0330
Germany / Dusseldorf	TEL : +49(2154)9210	FAX : +49(2154)921400
United Kingdom / London	TEL : +44(1)908-282-666	FAX : +44(1)908-282-528
France / Paris	TEL : +33(0)1 56 97 30 60	FAX : +33(0) 1 56 97 30 80
China / Hong Kong	TEL : +852(2)740-6262	FAX : +852(2)375-8971
Shanghai	TEL : +86(21)6279-2727	FAX : +86(21)6247-2066
Dilian	TEL : +86(411)8230-8549	FAX : +86(411)8230-8537
Beijing	TEL : +86(10)8525-2483	FAX : +86(10)8525-2489
Taiwan / Taipei	TEL : +866(2)2500-6956	FAX : +866(2)2503-2869
Korea / Seoul	TEL : +82(2)8182-700	FAX : +82(2)8182-715
Singapore	TEL : +65-6332-2322	FAX : +65-6332-5662
Malaysia / Kuala Lumpur	TEL : +60(3)7958-8355	FAX : +60(3)7958-8377
Philippines / Manila	TEL : +63(2)807-6872	FAX : +63(2)809-1422
Thailand / Bangkok	TEL : +66(2)254-4890	FAX : +66(2)256-6334

Japan /
(Internal Sales)

Tokyo 2-1-1, Yaesu, Chuo-ku, Tokyo 104-0082
TEL : +81(3)5203-0321 FAX : +81(3)5203-0300

Yokohama 2-4-8, Shin Yokohama, Kohoku-ku, Yokohama, Kanagawa 222-8575
TEL : +81(45)476-2131 FAX : +81(45)476-2128

Nagoya Dainagayo Building 9F 3-28-12, Meieki, Nakamura-ku, Nagoya,Aichi 450-0002
TEL : +81(52)581-8521 FAX : +81(52)561-2173

Kyoto 579-32 Higashi Shiokouji-cho, Karasuma Nishi-iru, Shiokoujidori, Shimogyo-ku, Kyoto 600-8216
TEL : +81(75)311-2121 FAX : +81(75)314-6559

(Contact address for overseas customers in Japan)

Yokohama TEL : +81(45)476-9270 FAX : +81(045)476-9271

As of 18th. April 2005