

- ◇Structure           Silicon monolithic integrated circuit
- ◇Classification    8bit4chD/A converter
- ◇Product           BH2227FV
- ◇Features           •3-wire 12-bit serial interface
- POWER ON RESET circuit
- For independent 2 power sources (3V/5V)

◇Absolute maximum ratings (Ta=25°C)

| Parameter                 | Symbol | Limits   | Unit |
|---------------------------|--------|----------|------|
| Power source voltage      | VDD    | -0.3~7.0 | V    |
| Terminal voltage          | VIN    | -0.3~7.0 | V    |
| Storage temperature range | TSTG   | -55~125  | °C   |
| Permissible loss          | PD     | 400      | mW   |

\* This value decreases 4.0mW/°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. |      |
| VDD power source voltage     | VDD    | 2.7    | —    | 5.5  | V    |
| VFS voltage to be impressed  | VFS    | 2.7    | —    | 5.5  | V    |
| Terminal input voltage range | VIN    | 0      | —    | VDD  | 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. |      |                               |
| VDD system                         | IDD    | —       | 0.5  | 1.5  | mA   | VDD=5V, CLK=1MHz, 80H setting |
| VFS system                         | IFS    | —       | 0.3  | 0.9  | mA   | 80H setting                   |
| L input voltage                    | VIL    | VSS     | —    | 0.6  | V    | VDD=5V                        |
| H input voltage                    | VIH    | 2.4     | —    | VDD  | V    | VDD=5V                        |
| Output zero scale voltage          | ZS     | VSS     | —    | 0.1  | V    | 00h setting, at no load       |
| Output full scale voltage          | FS1    | VDD-0.1 | —    | VDD  | V    | FFh setting, at np load       |
|                                    | FS2    | VFS-0.1 | —    | VFS  | V    | FFh setting, at no load       |
| Differential nonlinearity 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 | trVDD  | 100     | —    | —    | μS   | VDD=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.

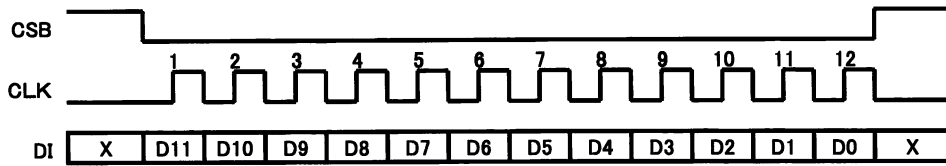
Note that ROHM cannot provide adequate confirmation of patents.

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).

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◇Command sending



•Data setting

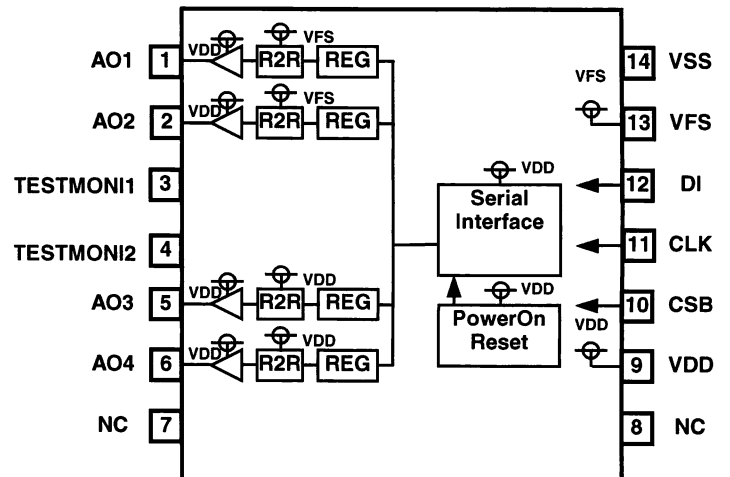
| D0 | D1 | D2 | D3 | D4 | D5 | D6 | D7 | Setting                    |
|----|----|----|----|----|----|----|----|----------------------------|
| 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | GND                        |
| 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | (VDD or VFS-GND)/256 × 1   |
| 0  | 1  | 0  |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

•Channel setting

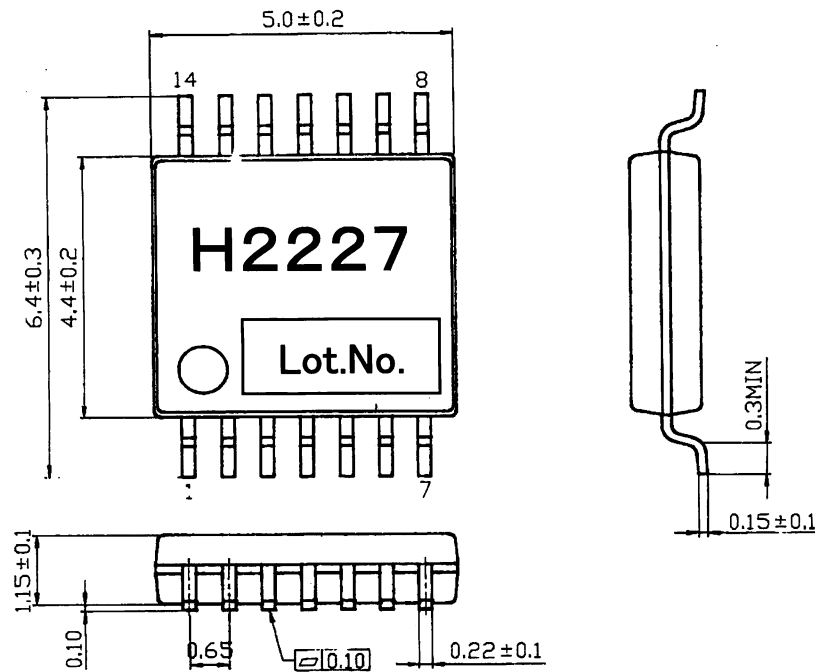
| D8               | D9 | D10 | D11 | Setting    |
|------------------|----|-----|-----|------------|
| 0                | 0  | 0   | 1   | AO1        |
| 0                | 0  | 1   | 0   | AO2        |
| 0                | 1  | 0   | 1   | AO3        |
| 0                | 1  | 1   | 0   | AO4        |
| except the above |    |     |     | Don't Care |

◇Pin description / Block diagram

| No. | Name       | Function                                                          |
|-----|------------|-------------------------------------------------------------------|
| 1   | AO1        | Analog output terminal                                            |
| 2   | AO2        |                                                                   |
| 3   | TEST MONI1 | Test terminal<br>(OPEN at normal use)                             |
| 4   | TEST MONI2 |                                                                   |
| 5   | AO3        | Analog output terminal                                            |
| 6   | AO4        |                                                                   |
| 7   | NC         | No connected                                                      |
| 8   | NC         |                                                                   |
| 9   | VDD        | Power source terminal<br>(AO3,4 full scale voltage use in common) |
| 10  | CSB        |                                                                   |
| 11  | CLK        | Serial clock input terminal                                       |
| 12  | DI         | Serial data input terminal                                        |
| 13  | VFS        | AO1,2 full scale Voltage setting terminal                         |
| 14  | VSS        | Ground terminal                                                   |



◇External dimensions (SSOPB14)



(UNIT : mm)

Drawing No.: B0841

◇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 characteristics.
- (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 dissipation in 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.

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(Contact address for overseas customers in Japan)

|          |                       |                        |
|----------|-----------------------|------------------------|
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