

Structure : Silicon Monolithic Integrated Circuit  
 Product Name : Power Driver For CD Players

Device Name : **BA5962FVM**

Features : 

- BTL driver for CD players
- Use of the MSOP8 power package allows downsizing of the set.
- Incorporating a level shift circuit reduces the number of external components.
- A built-in thermal shutdown circuit installed.

○ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

| Parameter                   | Symbol | Limits     | Unit |
|-----------------------------|--------|------------|------|
| Power Supply Voltage        | Vcc    | 18         | V    |
| Power Dissipation           | Pd     | 0.55 #     | W    |
| Operating Temperature Range | Topr   | -35 to 85  | °C   |
| Storage Temperature Range   | Tstg   | -55 to 150 | °C   |

# When mounted on PCB (the glass/epoxy board with the size: 70 mm×70 mm, the thickness: 1.6 mm.)

Over Ta=25°C, derating at the rate of 4.4mW/°C.

○ RECOMMENDED OPERATING CONDITIONS (To determine a power supply voltage, the power dissipation must be taken into consideration.)

| Parameter            | Symbol | MIN | TYP | MAX | Unit |
|----------------------|--------|-----|-----|-----|------|
| Power Supply Voltage | Vcc    | 3   | 5   | 10  | V    |

This product has not been checked for the strategic materials (or service) defined in the Foreign Exchange and Foreign Trade Control Law of Japan so that a verification work is required before exporting it.

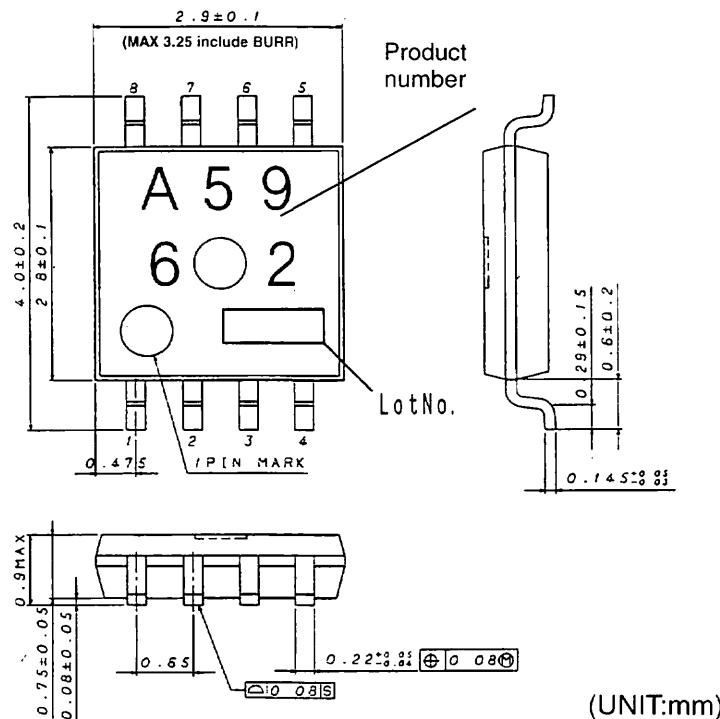
Not designed for radiation resistance.

## O ELECTRIC CHARACTERISTICS (Ta=25°C, Vcc=5V, VBIAS=1.65V, RL=50Ω, unless otherwise noted.)

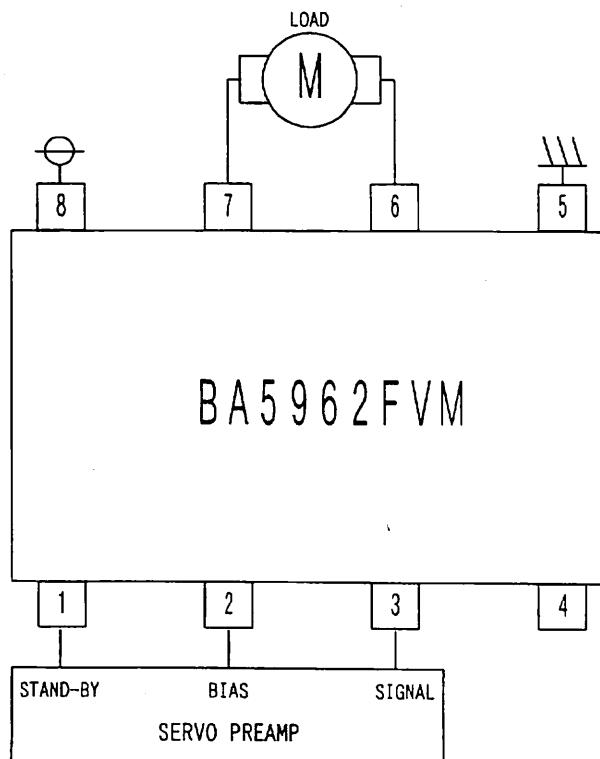
| Parameter                                    | Symbol | MIN. | TYP. | MAX. | Unit | Condition        |
|--|--------|------|------|------|------|------------------|
| Quiescent Circuit Current                    | IQ     | -    | 3    | 6    | mA   |                  |
| Driver part                                  |        |      |      |      |      |                  |
| Input Voltage Range                          | VINR   | 0    | -    | VCC  | V    |                  |
| Output Offset Voltage                        | VOOF   | -40  | -    | 40   | mV   | Vin=BIAS=1.65V   |
| Maximum Output Amplitude                     | VOM    | 3.7  | 4.1  | -    | V    |                  |
| Closed Circuit Voltage Gain 1<br>(Input IN1) | GVC1   | 10   | 12   | 14   | dB   | Vin=1.35V, 1.95V |
| Closed Circuit Voltage Gain 2<br>(Input IN2) | GVC2   | 16   | 18   | 20   | dB   | Vin=1.35V, 1.95V |
| Standby ON Voltage                           | VSTON  | -    | -    | 0.5  | V    |                  |
| Standby OFF Voltage                          | VSTOFF | 2.0  | -    | -    | V    |                  |
| Bias Drop Mute ON Voltage                    | VBMON  | -    | -    | 0.4  | V    |                  |
| Bias Drop Mute OFF Voltage                   | VBMOFF | 1.0  | -    | -    | V    |                  |

\*Not designed for radiation resistance.

## O OUTLINE DIMENSIONS, SYMBOLS



## O APPLICATION CIRCUIT DIAGRAM



## O PIN NUMBERS, PIN NAMES

| No. | Symbol | Description                         | No. | Symbol | Description                     |
|-----|--------|-------------------------------------|-----|--------|---------------------------------|
| 1   | STBY   | Standby terminal                    | 5   | GND    | GND terminal                    |
| 2   | BIAS   | Bias terminal                       | 6   | OUT-   | Driver negative output terminal |
| 3   | IN1    | Driver input terminal 1 (Low gain)  | 7   | OUT+   | Driver positive output terminal |
| 4   | IN2    | Driver input terminal 2 (High gain) | 8   | VCC    | Power supply input terminal     |

## O CAUTIONS ON USE

- (1) Setting the Standby terminal (pin 1) to 0.5V or less allows the circuit to enter the standby mode. Under conditions of normal use, the pin 1 should be pulled-up to 2.0V or above.
- (2) When Vcc (pin 8) has dropped to 2.5V (typ.) or less, the output current will be muted and, when recovering to 2.7V (typ.), the driver part circuit will be initiated.
- (3) When the voltage applied on the Bias terminal (pin 2) has dropped to 0.7V (typ.) or less, the mute function will be activated. Under conditions of normal use, it should be set to 1.0V or above.
- (4) Thermal shutdown power supply voltage drop, or bias terminal voltage drop will activate the mute function for all drivers, where only the driver part can be muted.
- (5) Connecting a capacitive load to the OP-AMP output results in a phase margin reduction of the amp and may cause an oscillation or a peak. When connecting a capacitive load, a resistance must be inserted in series between the output and the capacitive load. And after careful consideration of the frequency characteristics, the device should be used within the range where no problem is found in actual use.
- (6) Short-circuits between output pin-VCC, output pin-GND, or output terminals (load short) must be avoided. Make sure that the ICs are installed on the board in proper directions. Mounting the ICs in improper directions may damage them or produce smoke.
- (7) About absolute maximum ratings  
Exceeding the absolute maximum ratings, such as the applied voltage or the operating temperature range, may cause permanent device damage. As these cases cannot be limited to the broken short mode or the open mode, if a special mode where the absolute maximum ratings may be exceeded is assumed, it is recommended to take mechanical safety measures such as attaching fuses.
- (8) About power supply lines  
As a measure against the back current regenerated by a counter electromotive force of the motor, a capacitor to be used as a regenerated-current path can be installed between the power supply and GND and its capacitance value should be determined after careful check that any problems, for example, a leak capacitance of the electrolytic capacitor at low temperature, are not found in various characteristics.
- (9) About GND potential  
The electric potential of the GND terminal must be kept lowest in the circuitry at any operation states.
- (10) About thermal design  
With consideration of the power dissipation (Pd) under conditions of actual use, a thermal design provided with an enough margin should be done.
- (11) About operations in a strong electric field  
When used in a strong electric field, note that a malfunction may occur.
- (12) ASO  
When using this IC, the output Tr must be set not to exceed the values specified in the absolute maximum ratings and ASO.
- (13) Thermal shutdown circuit  
This IC incorporates a thermal shutdown circuit (TSD circuit). When the chip temperature reaches the value shown below, the coil output to the motor will be set to open.  
The thermal shutdown circuit is designed only to shut off the IC from a thermal runaway and not intended to protect or guarantee the entire IC functions.  
Therefore, users cannot assume that the TSD circuit once activated can be used continuously in the subsequent operations.

| TSD ON Temperature [°C] (typ.) | Hysteresis Temperature [°C] (typ.) |
|--------------------------------|------------------------------------|
| 160                            | 25                                 |

- (14) About earth wiring patterns  
When a small signal GND and a large current GND are provided, it is recommended that the large current GND pattern and the small signal GND pattern should be separated and grounded at a single point of the reference point of the set in order to prevent the voltage of the small signal GND from being affected by a voltage change caused by the resistance of the pattern wiring and the large current. Make sure that the GND wiring patterns of the external components will not change, too.
- (15) This IC is a monolithic IC which has a P<sup>+</sup> isolations and P substrate to isolate elements each other. This P layer and an N layer in each element form a PN junction to construct various parasitic elements.

Due to the IC structure, the parasitic elements are inevitably created by the potential relationship. Activation of the parasitic elements can cause interference between circuits and may result in a malfunction or, consequently, a fatal damage. Therefore, make sure that the IC must not be used under conditions that may activate the parasitic elements, for example, applying the lower voltage than the ground level (GND, P substrate) to the input terminals. In addition, do not apply the voltage to input terminals without applying the power supply voltage to the IC. Also while applying the power supply voltage, the voltage of each input terminal must not be over the power supply voltage, or within the guaranteed values in the electric characteristics.

## Appendix

---

### 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 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.

#### 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<br>TEL : +81(3)5203-0321   | FAX : +81(3)5203-0300 |
| Yokohama | 2-4-8, Shin Yokohama, Kohoku-ku, Yokohama, Kanagawa 222-8575<br>TEL : +81(45)476-2131                                    | FAX : +81(45)476-2128 |
| Nagoya   | Dainagayo Building 9F 3-28-12, Meieki, Nakamura-ku, Nagoya, Aichi 450-0002<br>TEL : +81(52)581-8521                      | FAX : +81(52)561-2173 |
| Kyoto    | 579-32 Higashi Shiokouji-cho, Karasuma Nishi-iru, Shiokoujidori, Shimogyo-ku,<br>Kyoto 600-8216<br>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 |
|----------|-----------------------|------------------------|