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 Low of Japan so that a verification work is required before exporting it.
Not designed for radiation resistance.

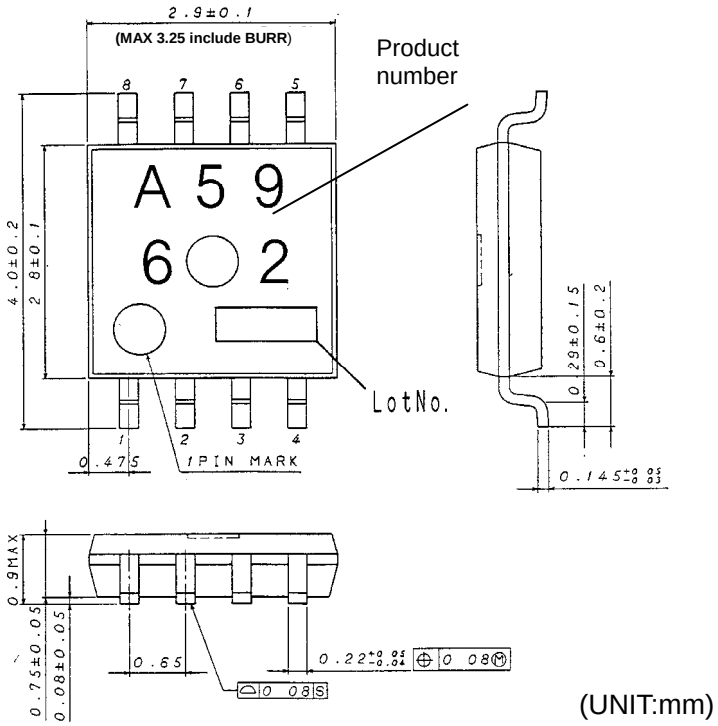
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○ ELECTRIC CHARACTERISTICS (Ta=25°C, Vcc=5V, VBIAS=1.65V, RL=50Ω, unless otherwise noted.)

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 (Input IN1)	GVC1	10	12	14	dB	Vin=1.35V, 1.95V
Closed Circuit Voltage Gain 2 (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.

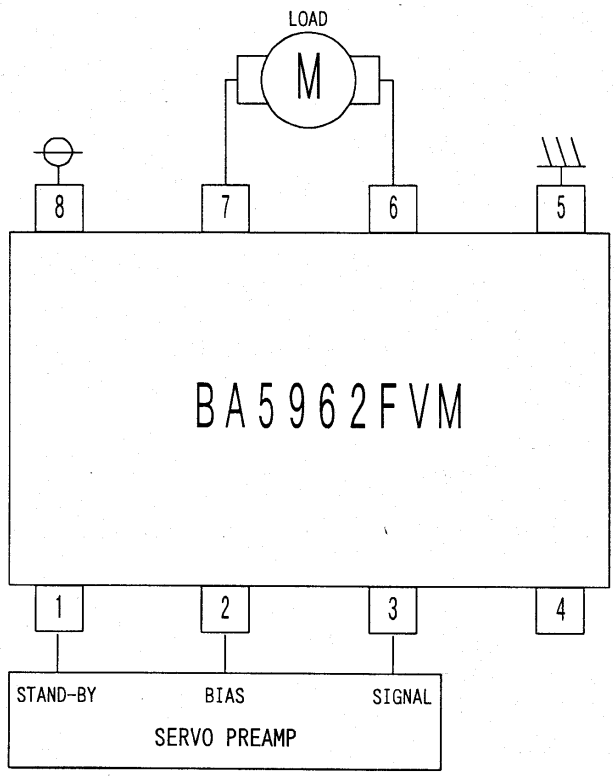
○ OUTLINE DIMENSIONS, SYMBOLS



(UNIT:mm)

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○ APPLICATION CIRCUIT DIAGRAM



○ 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

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○ 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.

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(15) This IC is a monolithic IC which has a P^+ 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.

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