

# 3-channel BTL driver for CDs, CD-ROMs, DVDs and DVD-ROMs

## BA5932FP

The BA5932FP is a 3-channel BTL driver designed for CD and DVD player actuators and loading drives. The actuator drive can be set to the desired gain and f characteristic with attached components, making this IC adaptable for a wide array of applications.

### ●Applications

CD and DVD players, CD-ROM drives, DVD-ROM drives, and other optical disc devices

### ●Features

- 1) 28-pin HSOP package for application miniaturization.
- 2) Gain is adjustable with an attached resistor.
- 3) Positive and negative input pins, for a wide range of input types, including reverse phase input.

### ●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Power supply voltage	V <sub>CC</sub>	18	V
Power dissipation	P <sub>d</sub>	1.8* <sup>1</sup> 2.9* <sup>2</sup>	W
Rated current	I <sub>oMax.</sub>	1.4* <sup>3</sup>	A
Operating temperature range	T <sub>opr</sub>	-35~+85	°C
Storage temperature range	T <sub>stg</sub>	-55~+150	°C

\*1 When mounted on a 70 mm × 70 mm × 1.6 mm glass epoxy board with less than 3% copper foil

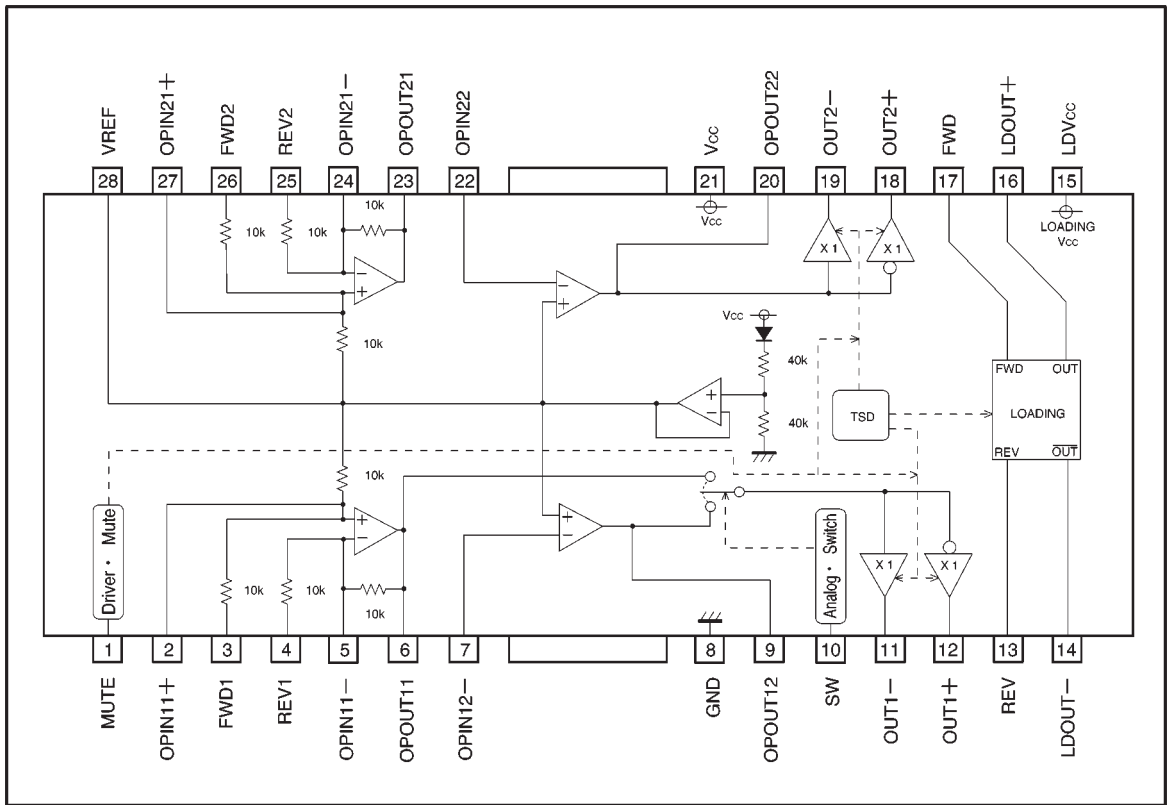
\*2 When mounted on a 70 mm × 70 mm × 1.6 mm glass epoxy board with less than 60% copper foil

\*3 Within the range of power dissipation and safe operational area (ASO)

### ●Recommended operating conditions (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Power supply voltage	V <sub>CC</sub>	4.5~13.5	V
Loading supply voltage	LDV <sub>CC</sub>	1.5~V <sub>CC</sub>	V

● Block diagram



## ● Pin descriptions

Pin No.	Pin name	Function
1	MUTE	Mute pin
2	OPIN11+	Operational amplifier non-inverted input
3	FWD1	Forward input
4	REV1	Reverse input
5	OPIN11-	Operational amplifier inverted input
6	OPOUT11	Operational amplifier output
7	OPIN12-	Operational amplifier inverted input
8	GND	Substrate ground
9	OPOUT12	Operational amplifier output
10	SW	Analog switch input
11	OUT1-	Driver output
12	OUT1+	Driver output
13	REV	Loading reverse input
14	LDOUT-	Loading negative output
15	LDV <sub>cc</sub>	V <sub>cc</sub> (loading / output H bridge)
16	LDOUT+	Loading positive output
17	FWD	Loading forward input
18	OUT2+	Driver output
19	OUT2-	Driver output
20	OPOUT22	Operational amplifier output
21	V <sub>cc</sub>	V <sub>cc</sub> (biaxial driver, loading predrive)
22	OPIN22	Operational amplifier inverted input
23	OPOUT21	Operational amplifier output
24	OPIN21-	Operational amplifier inverted input
25	REV2	Reverse input
26	FWD2	Forward input
27	OPIN21+	Operational amplifier non-inverted input
28	VREF	Reference voltage output

●Electrical characteristics (unless otherwise noted, Ta = 25°C, V<sub>CC</sub> = 12V, LDV<sub>CC</sub> = 5V, R<sub>L</sub> = 8Ω)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Quiescent current dissipation 1	I <sub>Q1</sub>	—	10.5	15.5	mA	No load, loading open mode
Quiescent current dissipation 2	I <sub>Q2</sub>	—	15.0	30.0	mA	No load, loading forward / reverse mode
Quiescent current dissipation 3	I <sub>Q3</sub>	—	18.0	28.0	mA	No load, loading brake mode
Loading supply current	I <sub>L</sub>	—	—	10	μA	V <sub>CC</sub> open
〈Internal reference〉						
Output voltage	V <sub>ref</sub>	5.40	5.70	6.00	V	
Maximum output (source)	I <sub>OSO</sub>	10	15	—	mA	
Maximum output (sink)	I <sub>OSI</sub>	10	40	—	mA	
〈Actuator driver〉						
Output voltage, offset	V <sub>OO</sub>	−50	0	50	mV	
Maximum output amplitude	V <sub>OM</sub>	7.5	8.5	—	V	
Closed loop voltage gain	G <sub>VC</sub>	4.5	6.0	7.5	dB	
Ripple rejection	RR	—	60	—	dB	v <sub>osc</sub> =0.1V <sub>rms</sub> , 100Hz
〈Analog switch input〉						
Input high level voltage	V <sub>IH</sub>	2.0	—	V <sub>CC</sub>	V	
Input low level voltage	V <sub>IL</sub>	−0.3	—	0.5	V	
Input high level current	I <sub>IH</sub>	—	90	135	μA	V <sub>IN</sub> =5V
Input low level current	I <sub>IL</sub>	−10	0	10	μA	V <sub>IN</sub> =0V
〈Loading driver〉						
Output saturation voltage 1	V <sub>sat1</sub>	—	0.4	0.7	V	Total for upper and low, I <sub>L</sub> = 200 mA
Output saturation voltage 1 (forward / reverse differential)	ΔV <sub>sat1</sub>	—	—	0.1	V	Differential between forward and reverse output saturation voltage 1
Output saturation voltage 2	V <sub>sat2</sub>	—	0.9	1.6	V	Output saturation voltage (I <sub>L</sub> ) = 500 mA
Output saturation voltage 3 (reference)	V <sub>sat3</sub>	—	1.0	1.3	V	R <sub>L</sub> =7.5Ω
〈Loading logic〉						
Input high level voltage	V <sub>IHLD</sub>	2.0	—	V <sub>CC</sub>	V	
Input low level voltage	V <sub>ILLD</sub>	−0.3	—	0.5	V	
Input high level current	I <sub>IHLD</sub>	—	180	270	μA	
Input low level current	I <sub>ILLD</sub>	−10	0	10	μA	

● Measurement circuit

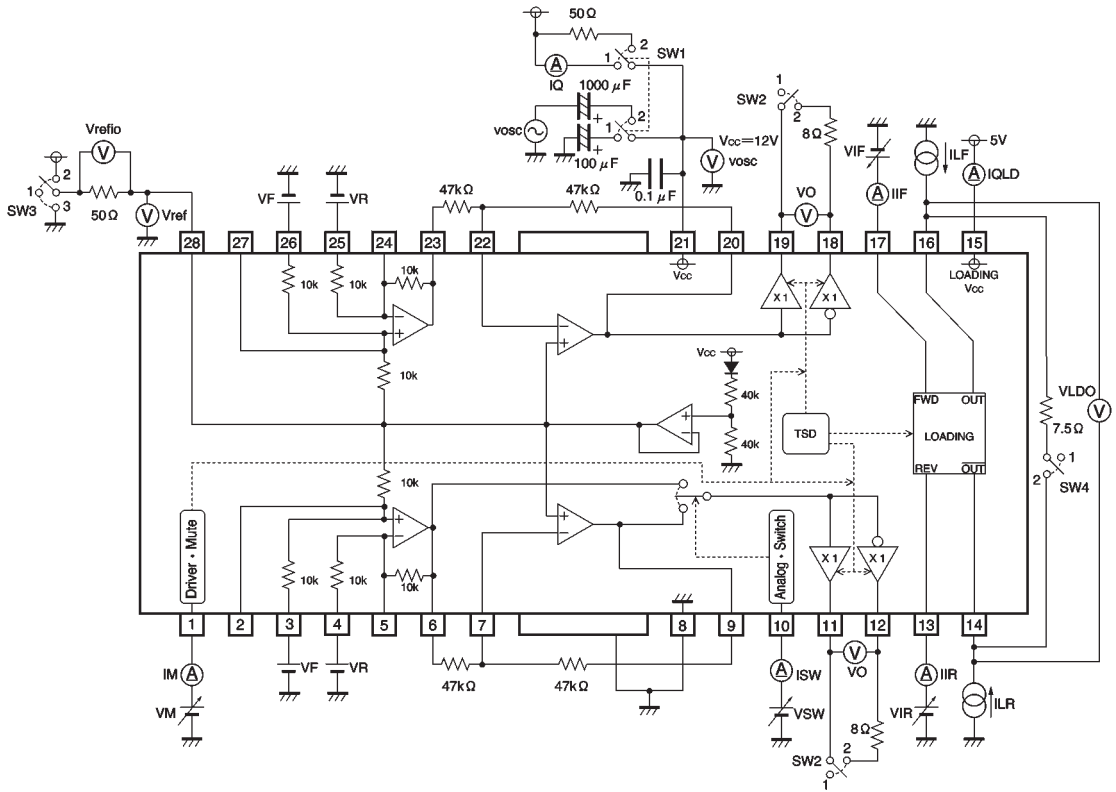


Fig. 1

## ●Application circuit

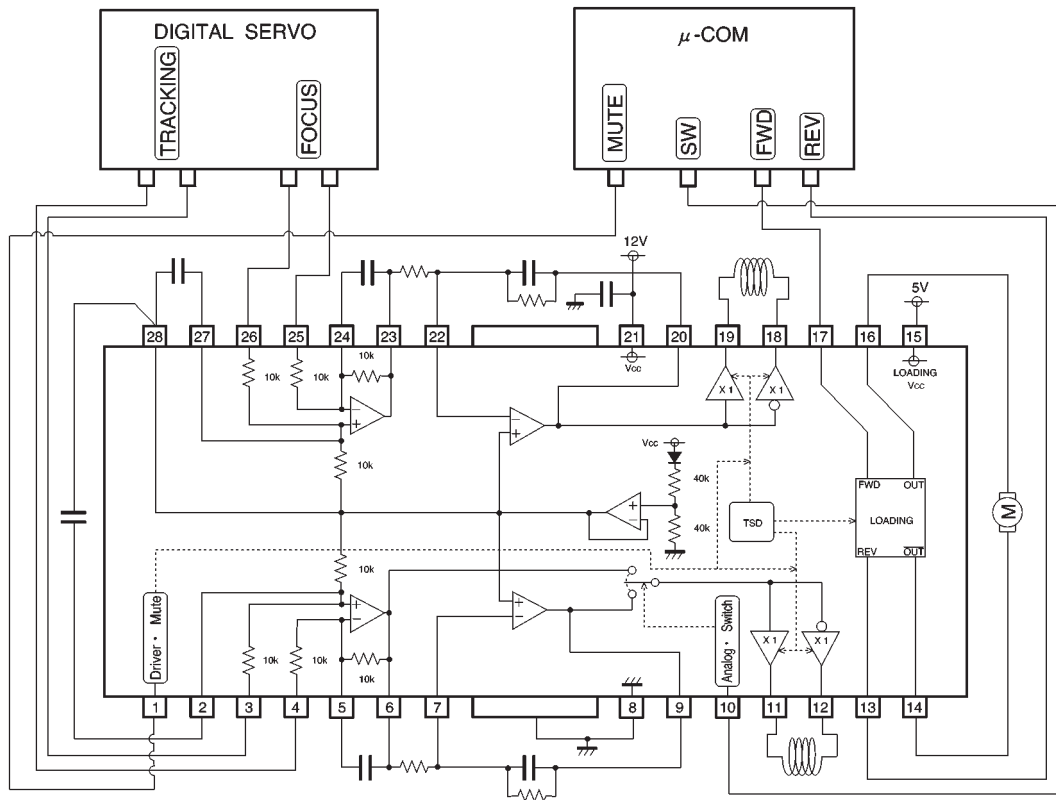


Fig. 2

## ●Operation notes

## (1) Mute input (pin 1) truth table

Input	Function
L	Actuator driver mute ON
H	Actuator driver mute OFF

## (2) Analog switch input (pin 10) truth table

Input	Function
L	Driver buffer input: to pin 6
H	Driver buffer input: to pin 9

## (3) Loading driver logic input (pins 13, 17) truth table

FWD	REV	Function
L	L	Open mode
L	H	Reverse mode
H	L	Forward mode
H	H	Brake mode

(4) The BA5932FP has an internal thermal shutdown circuit. Output current is muted when the chip temperature exceeds 175°C (typically) and restored when the chip temperature falls to 150°C (typically).

(5) Connect the IC to a 0.1μF bypass capacitor to the power supply, at the base of the IC.

(6) Be sure to connect the radiating fin to an external ground.

●Electrical characteristic curves

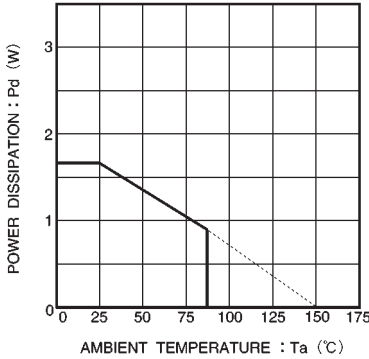


Fig. 3 Thermal derating curve

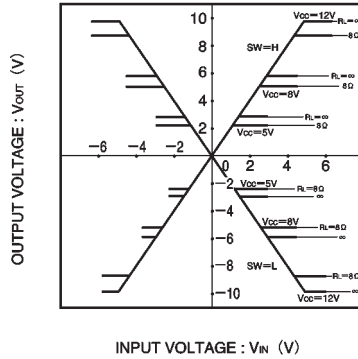


Fig. 4 Driver I/O characteristics (when load changes)

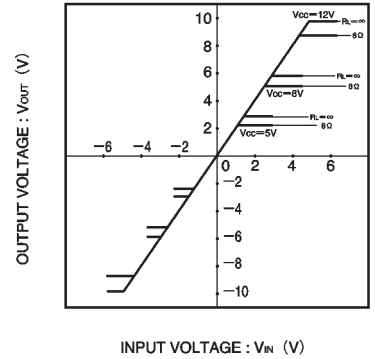


Fig. 5 Driver I/O characteristics (when supply voltage changes)

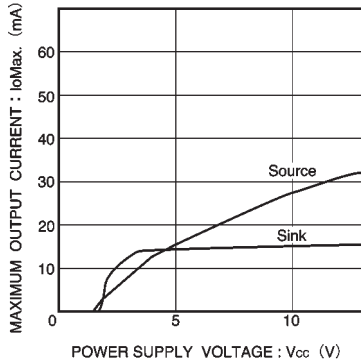


Fig. 6 Power supply voltage vs. Vref amplifier maximum output current

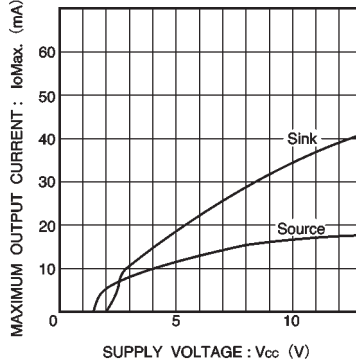


Fig. 7 Supply voltage vs. operational amplifier maximum output current

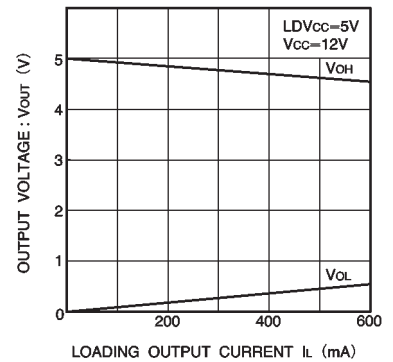


Fig. 8 Loading output current vs. output voltage

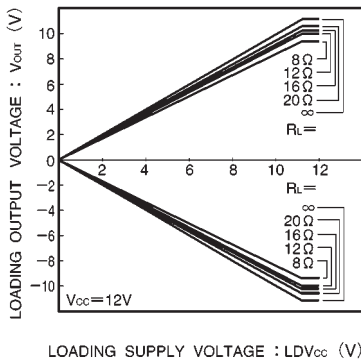


Fig. 9 Loading supply voltage vs. output voltage (variable load)

●External dimensions (Units: mm)

