Optical disc ICs

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_{CC}	18	V
Power dissipation	Pd	1.8[*1] 2.9[*2]	W
Rated current	IoMax.	1.4[*3]	A
Operating temperature range	Topr	$-35\sim+85$	℃
Storage temperature range	Tstg	$-55\sim+150$	℃

*1 When mounted on a 70 mm $\times$ 70 mm $\times$ 1.6 mm glass epoxy board with less than 3% copper foil
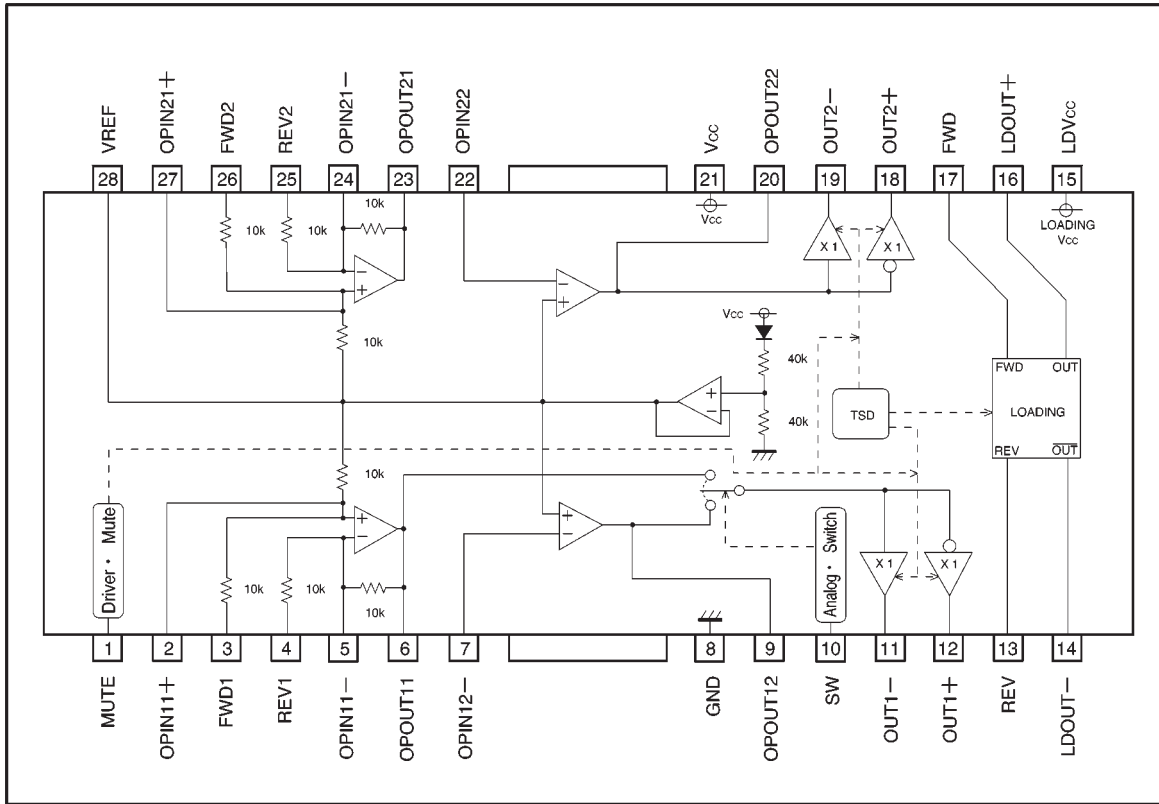*2 When mounted on a 70 mm $\times$ 70 mm $\times$ 1.6 mm glass epoxy board with less than 60% copper foil
*3 Within the range of power dissipation and safe operational area (ASO)

●Recommended operating conditions (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Power supply voltage	V_{CC}	$4.5\sim13.5$	V
Loading supply voltage	LDV_{CC}	$1.5\sim V_{CC}$	V

●Block diagram

ROHM

●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$_{CC}$	Vcc (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$_{CC}$	Vcc (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_{CC} = 12V, LDV_{CC} = 5V, R_L = 8Ω)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Quiescent current dissipation 1	I_{Q1}	—	10.5	15.5	mA	No load, loading open mode
Quiescent current dissipation 2	I_{Q2}	—	15.0	30.0	mA	No load, loading forward / reverse mode
Quiescent current dissipation 3	I_{Q3}	—	18.0	28.0	mA	No load, loading brake mode
Loading supply current	I_L	—	—	10	μA	Vcc open
〈Internal reference〉						
Output voltage	V_{ref}	5.40	5.70	6.00	V	
Maximum output (source)	I_{OSO}	10	15	—	mA	
Maximum output (sink)	I_{OSI}	10	40	—	mA	
〈Actuator driver〉						
Output voltage, offset	V_{OO}	—50	0	50	mV	
Maximum output amplitude	V_{OM}	7.5	8.5	—	V	
Closed loop voltage gain	G_{VC}	4.5	6.0	7.5	dB	
Ripple rejection	RR	—	60	—	dB	vosc=0.1V$_{rms}$,　100Hz
〈Analog switch input〉						
Input high level voltage	V_{IH}	2.0	—	Vcc	V	
Input low level voltage	V_{IL}	—0.3	—	0.5	V	
Input high level current	I_{IH}	—	90	135	μA	V_{IN}=5V
Input low level current	I_{IL}	—10	0	10	μA	V_{IN}=0V
〈Loading driver〉						
Output saturation voltage 1	Vsat1	—	0.4	0.7	V	Total for upper and low, I_L = 200 mA
Output saturation voltage 1 (forward / reverse differential)	△Vsat1	—	—	0.1	V	Differential between forward and reverse output saturation voltage 1
Output saturation voltage 2	Vsat2	—	0.9	1.6	V	Output saturation voltage (I_L) = 500 mA
Output saturation voltage 3 (reference)	Vsat3	—	1.0	1.3	V	R_L=7.5Ω
〈Loading logic〉						
Input high level voltage	V_{IHLD}	2.0	—	Vcc	V	
Input low level voltage	V_{ILLD}	—0.3	—	0.5	V	
Input high level current	I_{IHLD}	—	180	270	μA	
Input low level current	I_{ILLD}	—10	0	10	μA	

ROHM

●Measurement circuit

Fig. 1

●Application circuit
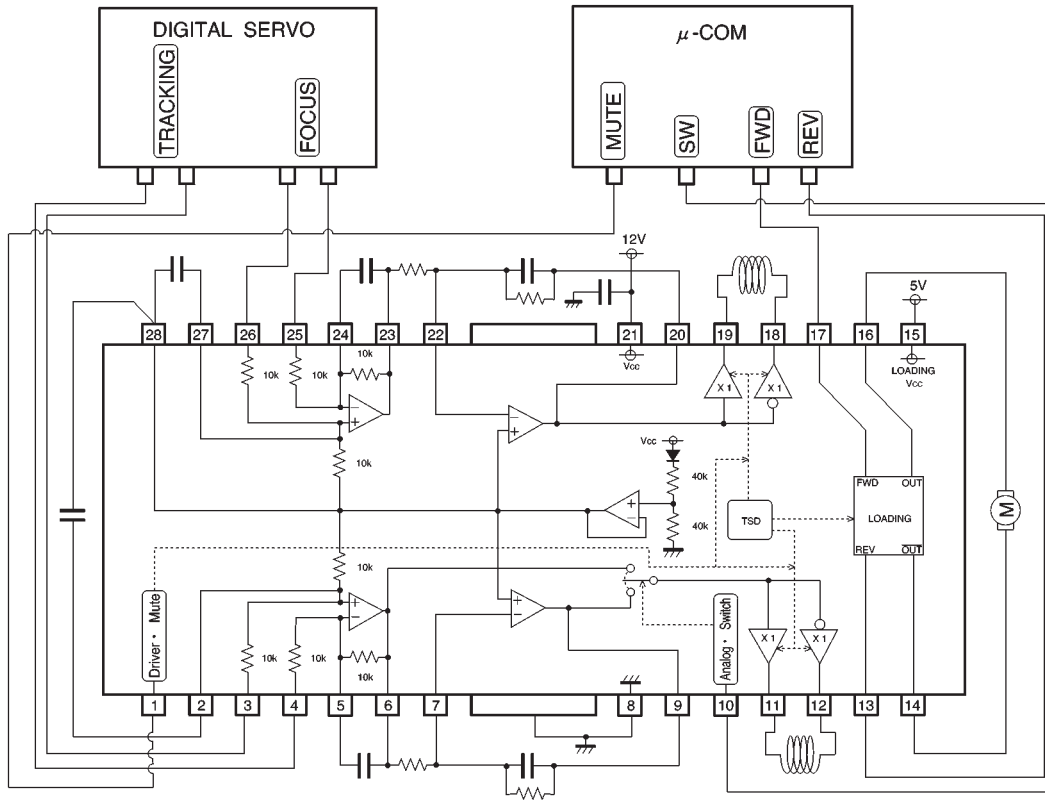
Fig. 2

●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.

224

●Electrical characteristic curves
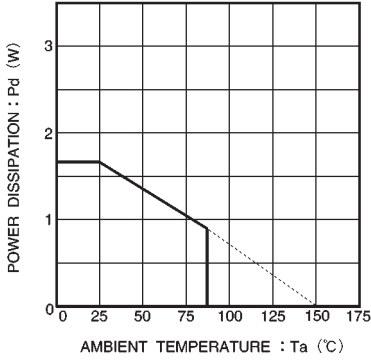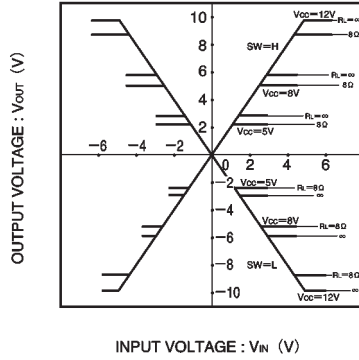

Fig. 3 Thermal derating curve

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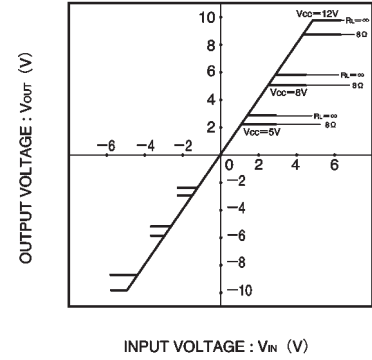(when load changes)

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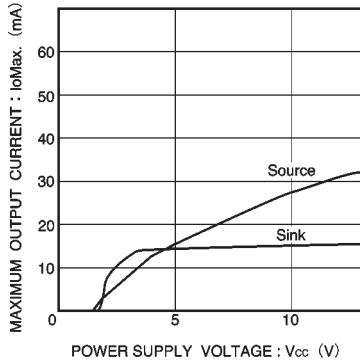(when supply voltage
changes)

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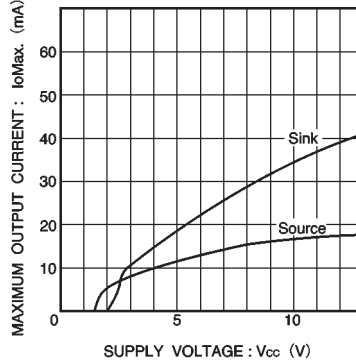Vref amplifier
maximum output current

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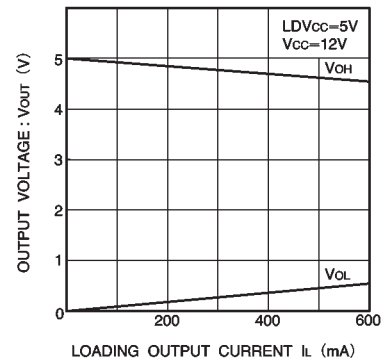maximum output current

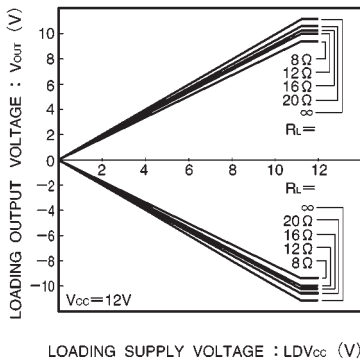Fig. 8 Loading output
current vs.
output voltage

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

●External dimensions (Units: mm)

HSOP28