

# 4-channel H-bridge type BTL driver for CD players

## BA6892FP

The BA6892FP is a 4-channel H-bridge BTL driver for CD players. Independent power supplies for each predriver and power driver assure efficient operation at low voltages. Each channel is independently mutable.

### ●Applications

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

### ●Features

- 1) 4-channel BTL driver in a HSOP 28-pin package, ideal for application miniaturization.
- 2) Wide dynamic range.
- 3) Driver gain is adjustable with an attached resistor.
- 4) Independent power supply for each preamplifier and power amplifier, for drives that operate efficiently on low voltages.
- 5) Power amplifier current drops to an extremely low level when the preamplifier power supply is lowered, allowing for a standby mode.

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

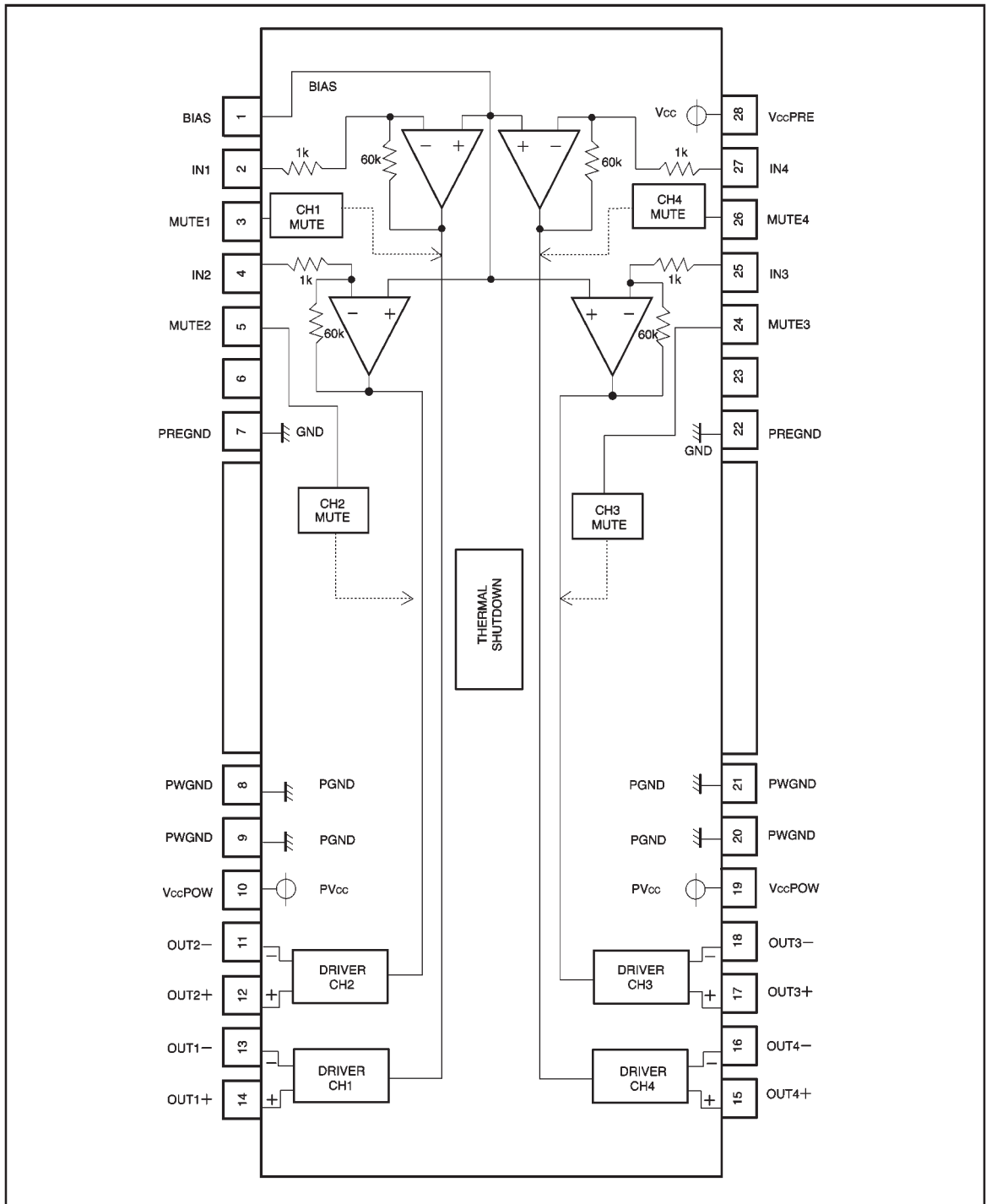
Parameter	Symbol	Limits	Unit
Power supply voltage	V <sub>CC</sub>	18	V
Power dissipation	P <sub>d</sub>	1800*	mW
Operating temperature	T <sub>opr</sub>	−30~+85	°C
Storage temperature	T <sub>stg</sub>	−55~+150	°C

\* Reduced by 14.4 mW for each increase in Ta of 1°C over 25°C.

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

Parameter	Symbol	Min.	Typ.	Max.	Unit
Predriver supply voltage	V <sub>CCPRE</sub>	3.0	—	14.0	V
Powerdriver supply voltage	V <sub>CCPOW</sub>	1.5	—	14.0	V

## ● Block diagram



## ● Pin descriptions

Pin No.	Pin name	Function
1	BIAS	Bias input
2	IN1	Channel 1 input
3	MUTE1	Channel 1 mute
4	IN2	Channel 2 input
5	MUTE2	Channel 2 mute
6	—	Test pin
7	PREGND	Pre-ground
8	PWGND	Power ground
9	PWGND	Power ground
10	VccPOW	Power Vcc
11	OUT2—	Channel 2 negative output
12	OUT2+	Channel 2 positive output
13	OUT1—	Channel 1 negative output
14	OUT1+	Channel 1 positive output
15	OUT4+	Channel 4 positive output
16	OUT4—	Channel 4 negative output
17	OUT3+	Channel 3 positive output
18	OUT3—	Channel 3 negative output
19	VccPOW	Power Vcc
20	PWGND	Power ground
21	PWGND	Power ground
22	PREGND	Pre-ground
23	—	N.C.
24	MUTE3	Channel 3 mute
25	IN3	Channel 3 input
26	MUTE4	Channel 4 mute
27	IN4	Channel 4 input
28	VccPRE	Pre Vcc

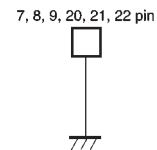
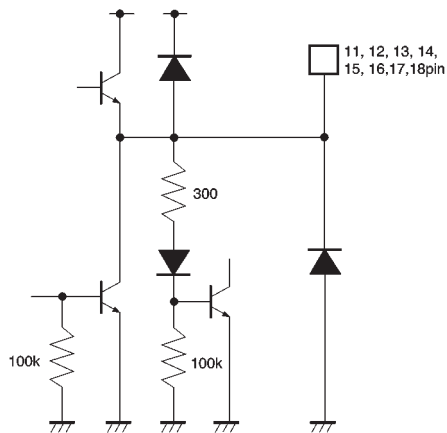
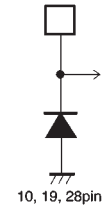
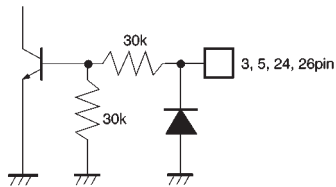
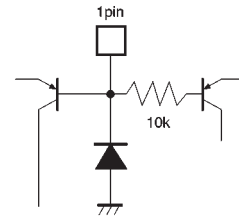
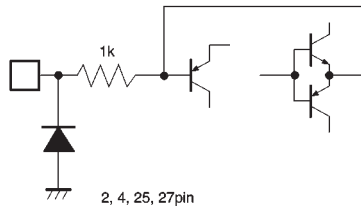
Notes: (1) Positive and negative output of the driver is relative to the polarity of the input pins.

(For example, pin 14 is HIGH when pin 2 input is HIGH.)

(2) The radiating fin is internally shorted by pin 8 (GND).

(3) Pin 6 is the test pin and should be left unconnected.

## ● Input / output circuits



- Electrical characteristics (unless otherwise noted,  $T_a = 25^\circ\text{C}$ ,  $V_{CCPRE} = V_{CCPOW} = 4\text{V}$ ,  $\text{BIAS} = 2\text{V}$ ,  $R_L = 8\Omega$ ,  $R_{IN} = 9.1\text{k}\Omega$ )

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions	Measurement Circuit
Supply current 1 ( $V_{CCPRE}$ )	$I_{Q1}$	—	3.6	6.0	mA	Open input	Fig. 1
Supply current 2 ( $V_{CCPOW}$ )	$I_{Q2}$	—	—	10	$\mu\text{A}$	Open input	Fig. 1
Standby current	$I_{ST}$	—	—	1	$\mu\text{A}$	$V_{CCPRE}=\text{OFF}$ , $V_{CCPOW}=4\text{V}$	Fig. 1
Input offset voltage	$V_{OI}$	−5.5	0.7	5.5	mV		Fig. 1
Output offset voltage	$V_{OO}$	−35	0	35	mV		Fig. 1
Dead zone width	$V_{DB}$	1	4	10	mV	Total for positive and negative	Fig. 1
Maximum output amplitude	$V_{OM}$	2.0	2.5	—	V	$V_{IN}=\pm 0.7\text{V}$	Fig. 1
Voltage gain	$G_{VC}$	11	14	17	dB	$V_{IN}=\pm 0.3\text{V}$	Fig. 1
Voltage gain differential (positive and negative)	$\Delta G_{VC}$	−1.9	0	1.0	dB		Fig. 1
MUTE-ON voltage	$V_{MON}$	2.0	—	—	V		Fig. 1
MUTE-OFF voltage	$V_{MOFF}$	—	—	0.5	V		Fig. 1

## ● Measurement circuit

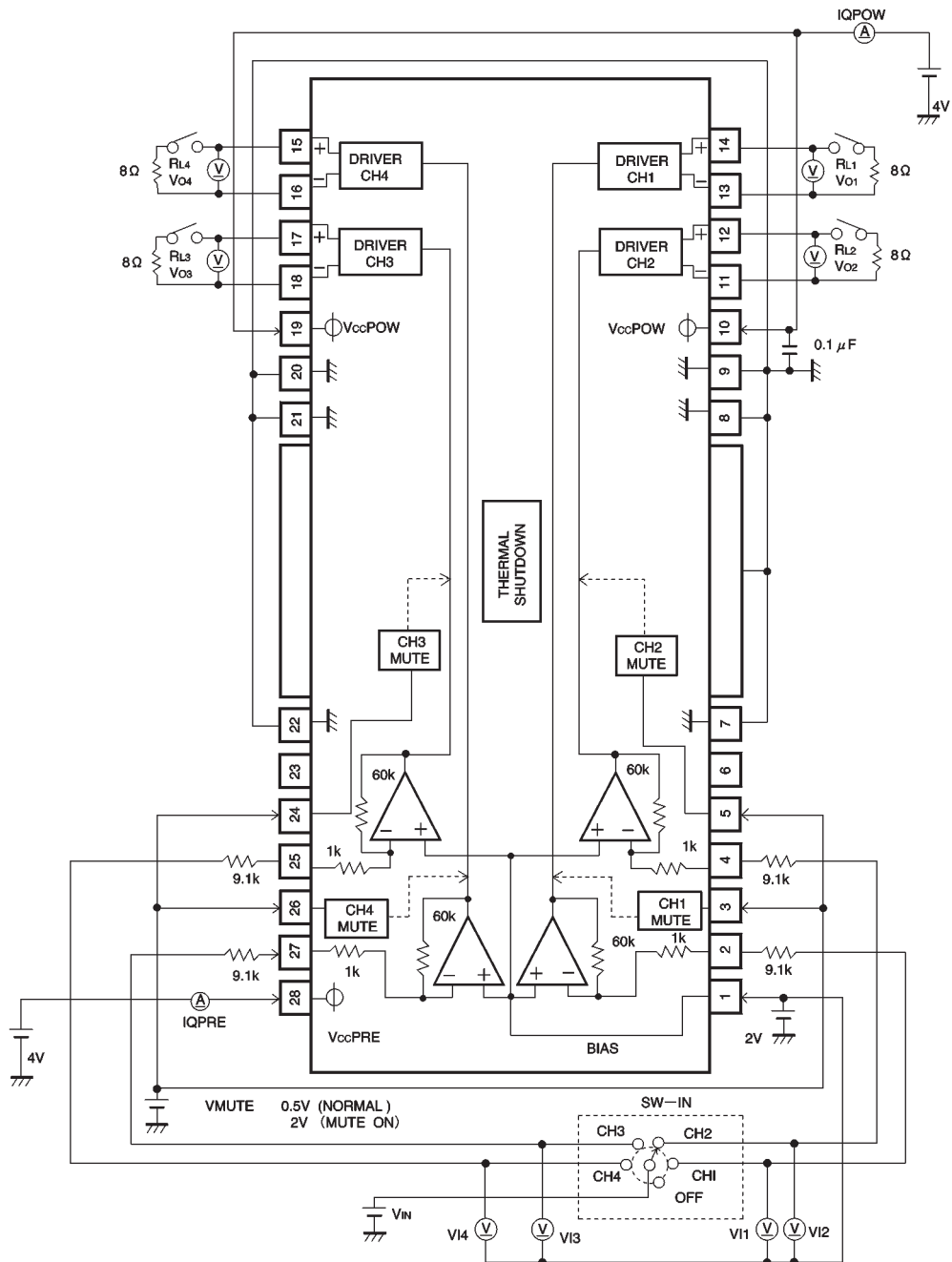
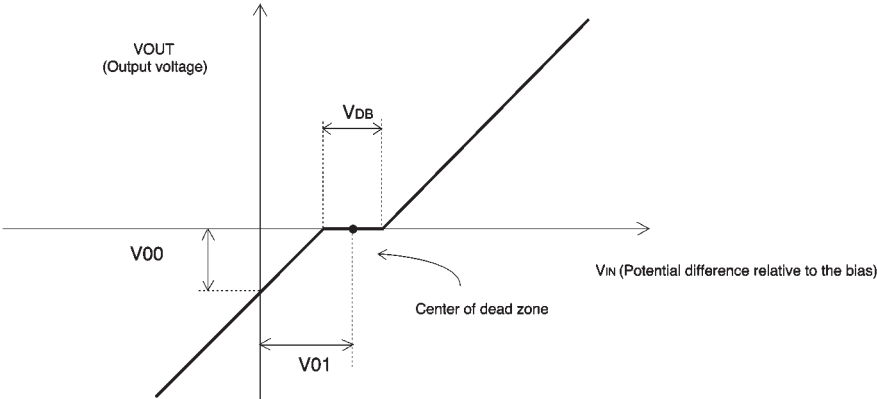


Fig.1

	VIN	IN	VPRE	RL	Measurement point
Iq1	OFF	OFF	ON	OFF	IQPRE
Iq2	OFF	OFF	ON	OFF	IQPOW
IsT	OFF	OFF	OFF	OFF	IQPOW
VoI	OFF	Channel1~4	ON	OFF	V <sub>I1~4</sub>
VoO	0V	Channel1~4	ON	ON	V <sub>O1~4</sub>
VdB	Sweep from -50 mV to 50 mV	Channel1~4	ON	ON	Verify range of V <sub>IN</sub> where V <sub>O1~4</sub> are 0 mV
VoM	±2.0V	Channel1~4	ON	ON	V <sub>O1~4</sub>
GvC	±0.3V	Channel1~4	ON	ON	20 log ( (V <sub>O1~4</sub> ) / V <sub>IN</sub> )
ΔGvC	±0.3V	Channel1~4	ON	ON	Differential between GvC+GvC

Note: Because the input offset is also the center of the dead zone, an output will be generated at the point where  $V_{IN} = V_{BIAS}$  when the input offset is outside the dead zone width (4 mV). This is the output offset voltage.



## ●Application example

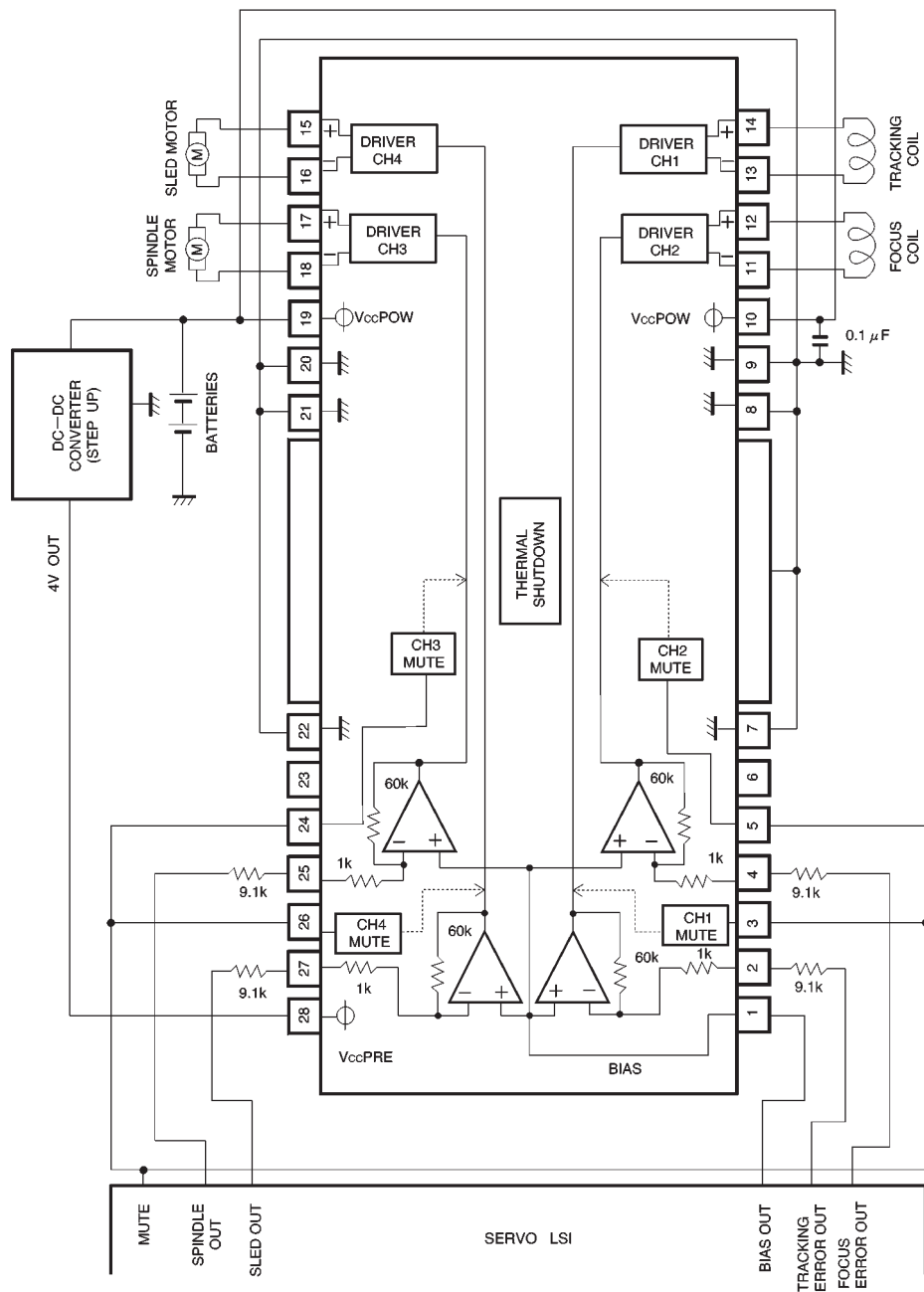


Fig. 2



### ● Operation notes

- (1) The BA6892FP 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).
- (2) The mute pin operates normally when open and at the LOW level (below 0.5V), but mutes the output when raised to the HIGH level (above 2V). A high impedance is output during muting. The mute pin functions independently for each channel.
- (3) Dead zone width is determined as follows:  
Dead zone width = input resistance (attached resistor +

internal input resistor 1kΩ) × 0.2μA

Dead zone width varies according to the gain setting as defined in the preceding equation.

Example: When attached input resistor = 9.1kΩ, VDB = (9.1k+1k) × 0.2μA ≐ 2mV

Output pins output high impedance in a dead zone equal to AmV (total for positive and negative).

(4) Be sure to connect the IC to a 0.1μF bypass capacitor to the power supply, at the base of the IC.

(5) Connect the radiating fin to an external ground.

### ● Electrical characteristic curves

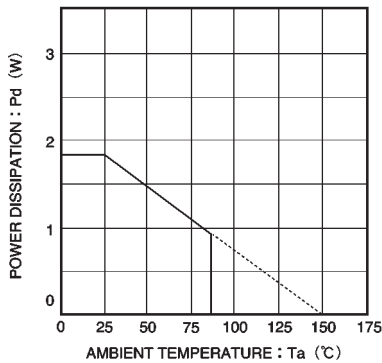


Fig. 3 Thermal derating curve

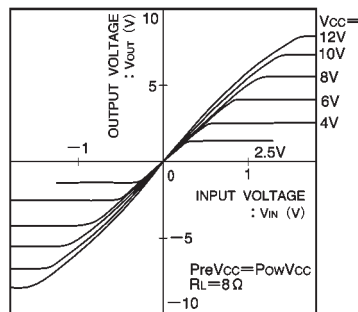


Fig. 4 I/O characteristics  
(Pre and power driver  
Vcc variation)

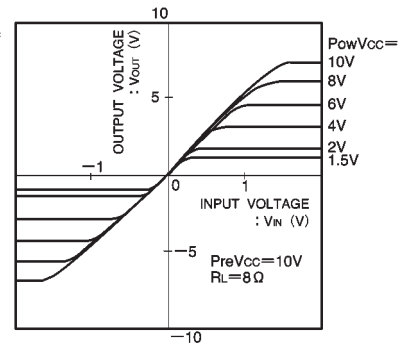


Fig. 5 I/O characteristics  
(powerdriver Vcc variation)

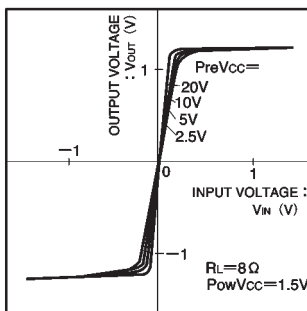


Fig. 6 I/O characteristics  
(predriver Vcc variation)

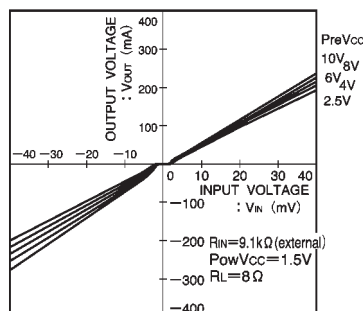


Fig. 7 Dead zone I/O characteristics  
(predriver Vcc variation)

●External dimensions (Units: mm)

