

# AN8735NSB

## 2-channel linear driver IC for CD/CD-ROM player

### Overview

The AN8735NSB is a 2-channel BTL driver IC for CD/CD-ROM. It is a small package version of the AN8735SB.

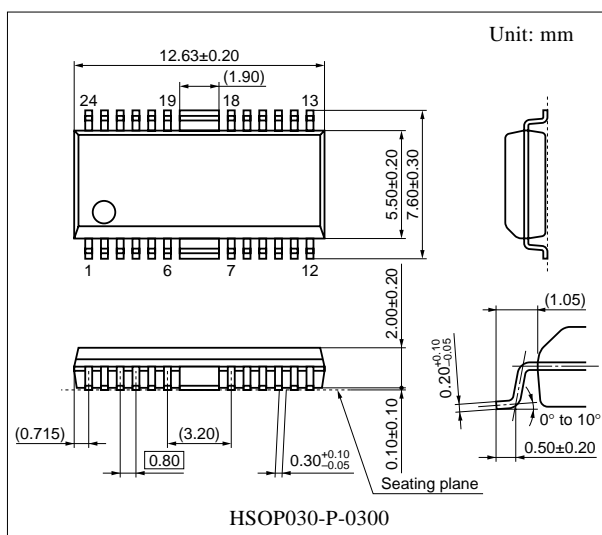
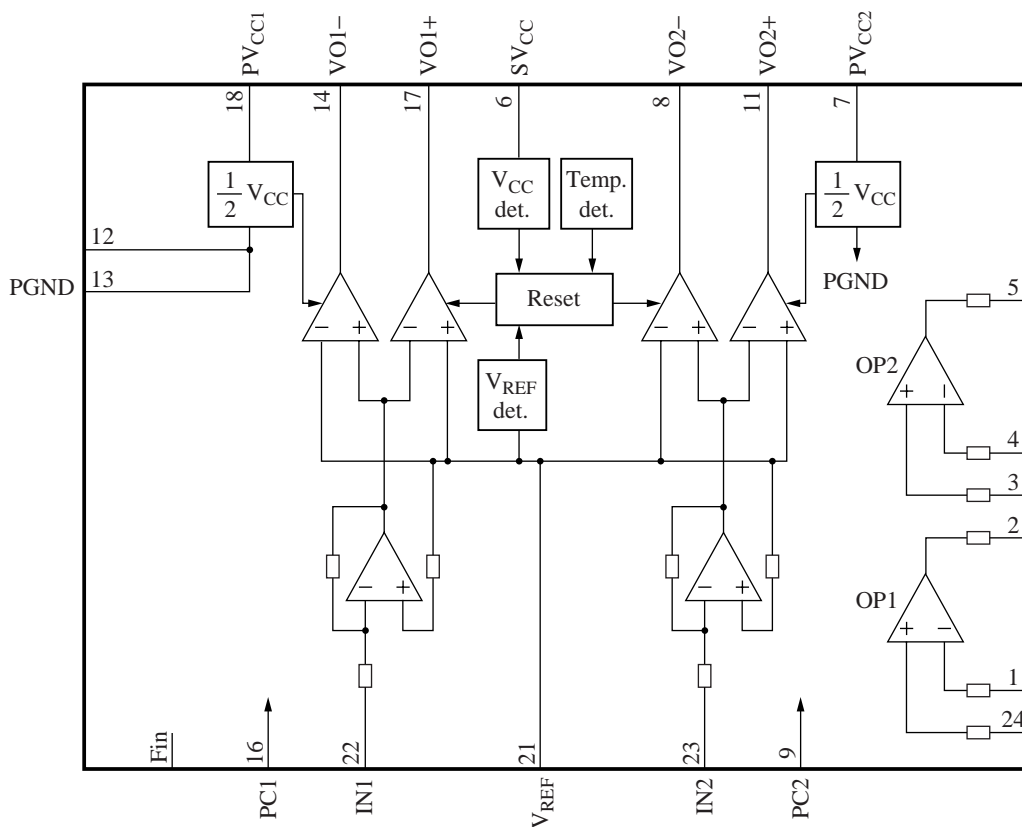
### Features

- 2-channel of D range widening type BTL driver built in
- Optimum to drive a motor actuator
- 2 pieces of exclusive op-amp. built in
- PC (power cut) function
- Thermal shut-down circuit built-in (with hysteresis)

### Applications

- Car CD player
- CD/CD-ROM player

### Block Diagram



## ■ Pin Descriptions

Pin No.	Description	Pin No.	Description
1	Op-amp. 1: inverted input pin	14	Driver-1 reverse rotation output pin
2	Op-amp. 1: output pin	15	N.C.
3	Op-amp. 2: non-inverted input pin	16	Power cut input pin 1
4	Op-amp. 2: inverted input pin	17	Driver-1 forward rotation output pin
5	Op-amp. 2: output pin	18	Driver power supply pin 1
6	Power supply pin	19	N.C.
7	Driver power supply pin 2	20	N.C.
8	Driver-2 reverse rotation output pin	21	V <sub>REF</sub> input pin
9	Power cut input pin 2	22	Driver-1 input pin
10	N.C.	23	Driver-2 input pin
11	Driver-2 forward rotation output pin	24	Op-amp. 1: non-inverted input pin
12	Driver GND pin 1	Fin	GND pin
13	Driver GND pin 2		

## ■ Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Supply voltage	V <sub>CC</sub>	14.4	V
Supply current	I <sub>SVCC</sub>	250	mA
	I <sub>PVCC1</sub> , I <sub>PVCC2</sub>	800	
Power dissipation *2	P <sub>D</sub>	390	mW
Operating ambient temperature *1	T <sub>opr</sub>	−30 to +85	°C
Storage temperature *1	T <sub>stg</sub>	−55 to +150	°C

Note) \*1: Except for the operating ambient temperature and storage temperature, all ratings are for T<sub>a</sub> = 25°C.

\*2: Referring to "■ Usage Notes", use within the range of P<sub>D</sub> = 390 mW or less at T<sub>a</sub> = 85°C, following the allowable power dissipation characteristic curve of "■ Application Notes".

## ■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	SV <sub>CC</sub>	4.5 to 14	V
	PV <sub>CC1</sub> , PV <sub>CC2</sub>	3.5 to 14	

■ Electrical Characteristics at  $SV_{CC} = 12\text{ V}$ ,  $PV_{CC1} = PV_{CC2} = 5\text{ V}$ ,  $V_{REF} = 1.65\text{ V}$ ,  $R_L = 8\ \Omega$ ,  $V_{PC1} = 5\text{ V}$ ,  $V_{PC2} = 5\text{ V}$ ,  $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Current consumption 1 with no signal	$I_{SVCC}$	$I_{IN1} = I_{IN2} = 0\ \mu\text{A}$ , $PC1 = PC2 = 0\text{ V}$	—	2.5	5	mA
Current consumption 2 with no signal	$I_{PVCC1}$	$I_{IN1} = I_{IN2} = 0\ \mu\text{A}$ , $PC1 = 0\text{ V}$	—	0.3	1	mA
Current consumption 3 with no signal	$I_{PVCC2}$	$I_{IN1} = I_{IN2} = 0\ \mu\text{A}$ , $PC2 = 0\text{ V}$	—	0.3	1	mA
<b>Driver 1, 2</b> $R_{L1} = R_{L2} = 8\ \Omega$						
Output offset voltage	$V_{DROF}$	$I_{IN1} = I_{IN2} = 0\ \mu\text{A}$	-65	0	65	mV
Gain (+)	$G_{1+}$	$R_{IN1} = R_{IN2} = 10\text{ k}\Omega$ , $V_{IN} = V_{REF} \pm 50\text{ mV}$	21.5	22.9	24.3	dB
Relative gain (+/-)	$G_1$		-0.7	—	+0.7	dB
Maximum output amplitude (+)	$V_{L1+}$	$V_{IN} = 3.3\text{ V}$	3.8	4.25	—	V
Maximum output amplitude (-)	$V_{L1-}$	$V_{IN} = 0\text{ V}$	—	-4.25	-3.8	V
<b>Op-amp. 1, 2</b>						
Input offset voltage	$V_{OPOF}$	$SV_{CC} = 12\text{ V}$	-10	0	10	mV
Input bias current	$I_{BOP}$	$SV_{CC} = 12\text{ V}$	-2	-0.5	0	$\mu\text{A}$
High-level output voltage	$V_{OH}$	$SV_{CC} = 12\text{ V}$ , $I_{OP} = +2\text{ mA}$	10	—	—	V
Low-level output voltage	$V_{OL}$	$SV_{CC} = 12\text{ V}$ , $I_{OP} = -2\text{ mA}$	—	—	0.9	V
Output driving current sink	$I_{SIN}$	$SV_{CC} = 12\text{ V}$	2.0	—	—	mA
Output driving current source	$I_{SOU}$	$SV_{CC} = 12\text{ V}$	2.0	—	—	mA
<b>Power cut operation</b>						
PC1 threshold high-level voltage	$V_{PC1H}$	$SV_{CC} = 12\text{ V}$	2.9	—	—	V
PC1 threshold low-level voltage	$V_{PC1L}$	$SV_{CC} = 12\text{ V}$	—	—	1.0	V
PC2 threshold high-level voltage	$V_{PC2H}$	$SV_{CC} = 12\text{ V}$	2.9	—	—	V
PC2 threshold low-level voltage	$V_{PC2L}$	$SV_{CC} = 12\text{ V}$	—	—	1.0	V
PC1 input current	$I_{PC1}$	$SV_{CC} = 12\text{ V}$ , $PC1 = 5\text{ V}$	—	70	140	$\mu\text{A}$
PC2 input current	$I_{PC2}$	$SV_{CC} = 12\text{ V}$ , $PC2 = 5\text{ V}$	—	70	140	$\mu\text{A}$
<b>Reset circuit</b>						
Reset operation release supply voltage	$V_{RST}$		—	—	4.5	V
$V_{REF}$ detection voltage	$V_R$		1.35	—	—	V

■ Electrical Characteristics at  $SV_{CC} = 12\text{ V}$ ,  $PV_{CC1} = PV_{CC2} = 5\text{ V}$ ,  $V_{REF} = 1.65\text{ V}$ ,  $R_L = 8\ \Omega$ ,  $V_{PC1} = 5\text{ V}$ ,  $V_{PC2} = 5\text{ V}$ ,  $T_a = 25^\circ\text{C}$  (continued)

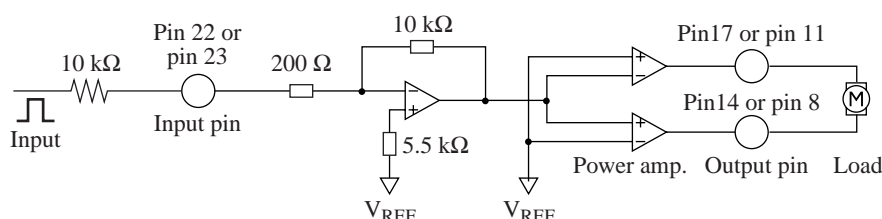
• Design reference data

Note) The characteristics listed below are theoretical values based on the IC design and are not guaranteed.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Thermal protection circuit						
Operating temperature equilibrium value	$T_{THD}$		—	160	—	$^\circ\text{C}$
Operating temperature hysteresis width	$\Delta T_{THD}$		—	45	—	$^\circ\text{C}$
Supply voltage detection hysteresis width	$\Delta V_{HD}$		—	0.2	—	V

■ Usage Notes

- Be sure to use  $SV_{CC}$  in the maximum potential.  
Otherwise, it is likely to cause an operating error.
- On driver gain setting,  
Power amp. voltage gain: 23 dB



- On operating mode of mute,

1) Driver

	PC1		PC2	
	High	Low (open)	High	Low (open)
Channel 1	Active	Mute	—	—
Channel 2	—	—	Active	Mute

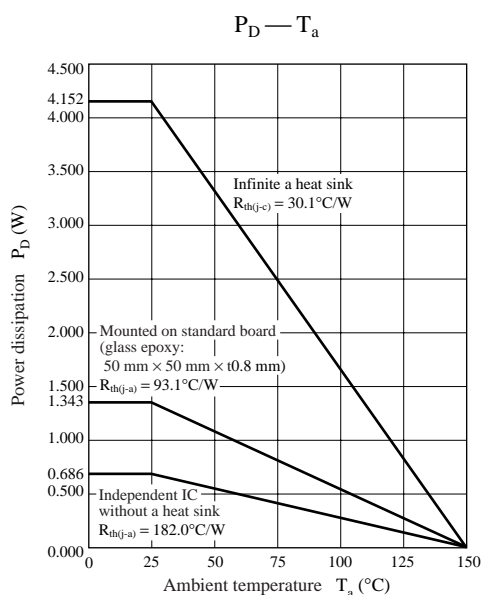
2) General-use op-amp.

		PC1	
		High	Low (open)
PC2	High	Active	Active
	Low (open)	Active	Mute

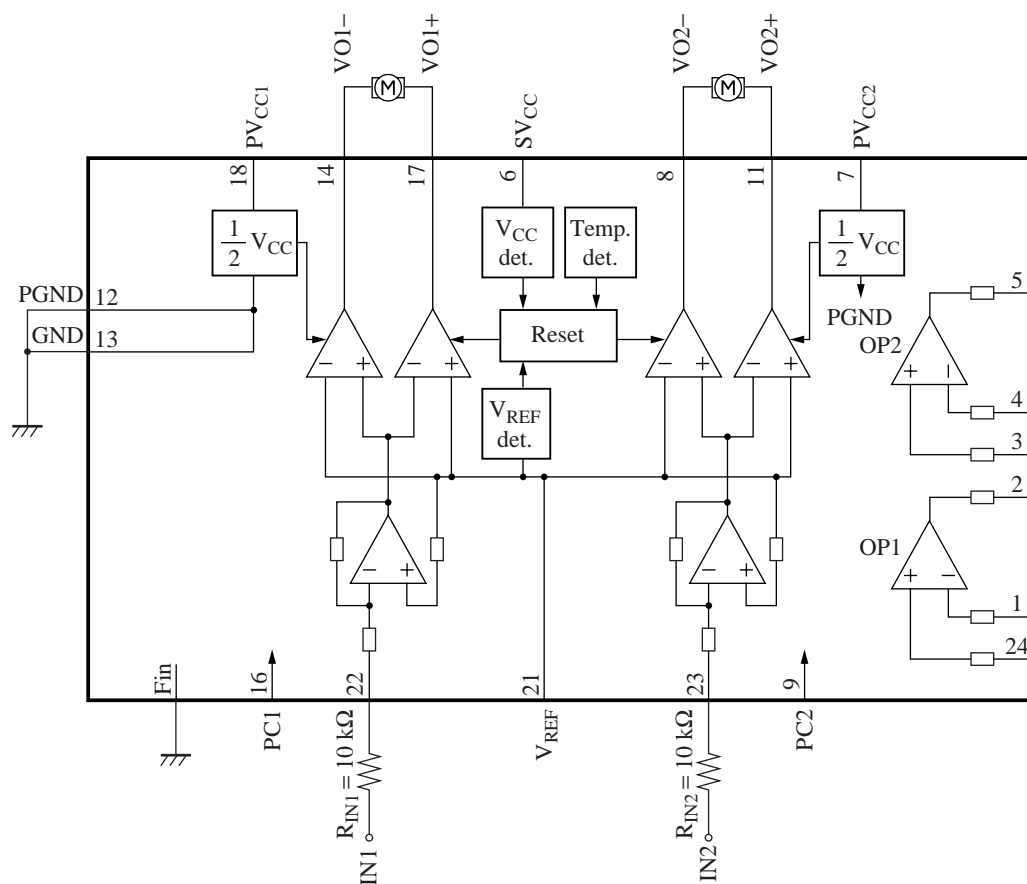
- Appropriate care should be taken on the characteristics.  
When changing an external circuit constant on actual use, secure an appropriate margin in consideration of characteristic fluctuation of external parts and our ICs including transient characteristics as well as static ones.
- Avoid the short-circuits between output pin and  $V_{CC}$ , output pin and GND (line-to-supply and line-to-ground), and between output pins (load short-circuit). Otherwise, the IC is likely to emit smoke and break down.
- An appropriate prior study should be done for use of dip soldering.

## Application Notes

- $P_D - T_a$  curves of HSOP030-P-0300



## Application Circuit Example



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