AN8735NSB

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

■ Overview

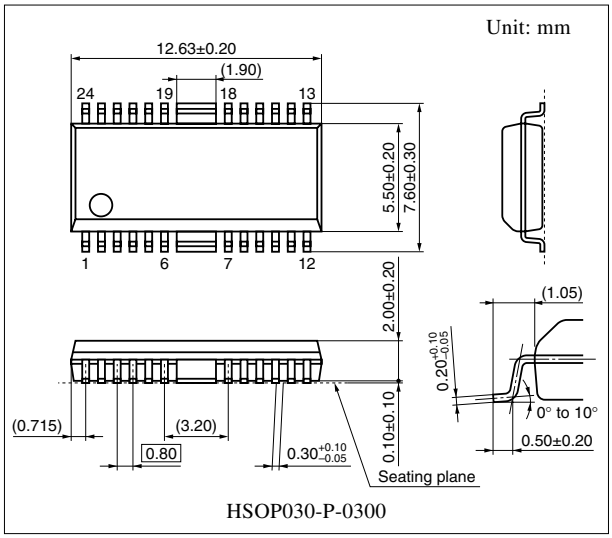
The AN8735NSB is a 2-channel BTL driver IC for CD/CD-ROM. It is a small package version of the AN8735SB.

■ 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

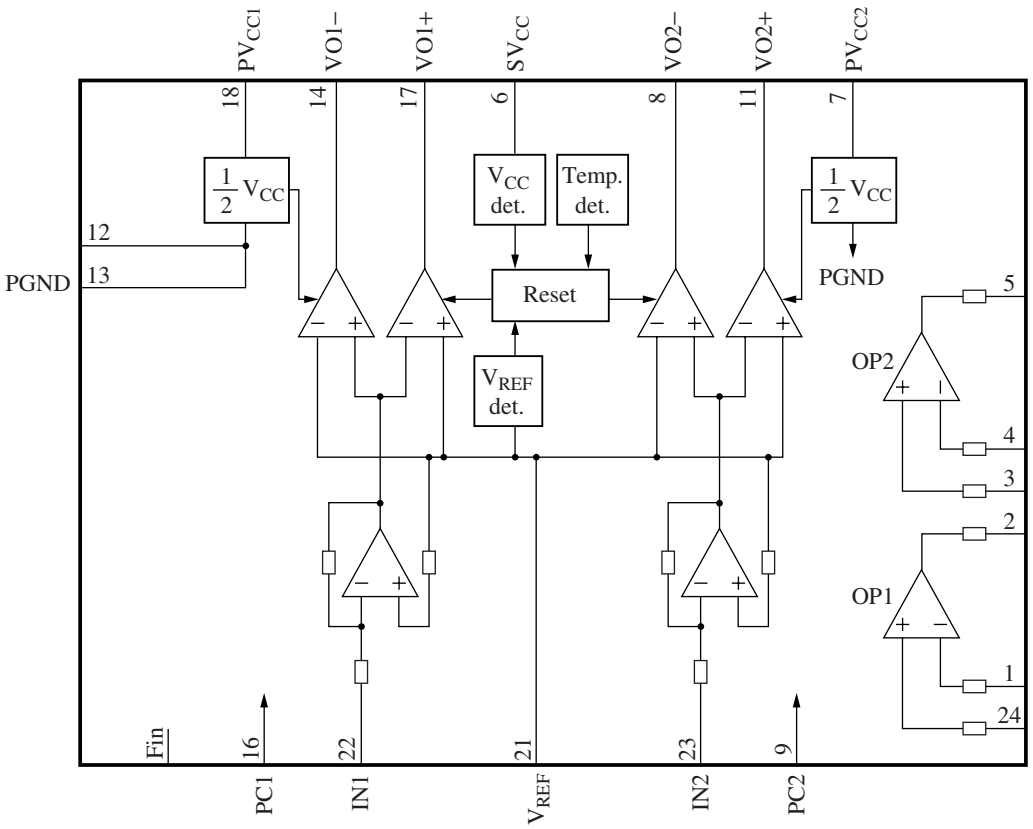
- Car CD player
- CD/CD-ROM player



HSOP030-P-0300

Note) The package of this product will be changed to lead-free type (HSOP030-P-0300A). See the new package dimensions section later of this datasheet.

■ Block Diagram



■ Pin Descriptions

Pin No.	Description	Pin No.	Description
1	Op-amp. 1: inverted inpuit 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 inpuit 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_{REF} 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_{CC}	14.4	V
Supply current	I_{SVCC}	250	mA
	I_{PVCC1} , I_{PVCC2}	800	
Power dissipation *2	P_D	390	mW
Operating ambient temperature *1	T_{opr}	−30 to +85	°C
Storage temperature *1	T_{stg}	−55 to +150	°C

Note) ∗1: Except for the operating ambient temperature and storage temperature, all ratings are for T_a = 25°C.

∗2: Referring to "■ Usage Notes", use within the range of P_D = 390 mW or less at T_a = 85°C, following the allowable power dissipation characteristic curve of "■ Application Notes".

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	SV_{CC}	4.5 to 14	V
	PV_{CC1} , PV_{CC2}	3.5 to 14	

■ Electrical Characteristics at SV_{CC} = 12 V, PV_{CC1} = PV_{CC2} = 5 V, V_{REF} = 1.65 V, R_L = 8 Ω, V_{PC1} = 5 V, V_{PC2} = 5 V, T_a = 25°C

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Current consumption 1 with no signal	I_{SVCC}	I_{IN1} = I_{IN2} = 0 µA, PC1 = PC2 = 0 V	—	2.5	5	mA
Current consumption 2 with no signal	I_{PVCC1}	I_{IN1} = I_{IN2} = 0 µA, PC1 = 0 V	—	0.3	1	mA
Current consumption 3 with no signal	I_{PVCC2}	I_{IN1} = I_{IN2} = 0 µA, PC2 = 0 V	—	0.3	1	mA
Driver 1, 2 R_{L1} = R_{L2} = 8 Ω						
Output offset voltage	V_{DROF}	I_{IN1} = I_{IN2} = 0 µA	–65	0	65	mV
Gain (+)	G_{1+}	R_{IN1} = R_{IN2} = 10 kΩ, V_{IN} = V_{REF} ±50 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 V	3.8	4.25	—	V
Maximum output amplitude (–)	$V_{L1–}$	V_{IN} = 0 V	—	–4.25	–3.8	V
Op-amp. 1, 2						
Input offset voltage	V_{OPOF}	SV_{CC} = 12 V	–10	0	10	mV
Input bias current	I_{BOP}	SV_{CC} = 12 V	–2	– 0.5	0	µA
High-level output voltage	V_{OH}	SV_{CC} = 12 V, I_{OP} = +2 mA	10	—	—	V
Low-level output voltage	V_{OL}	SV_{CC} = 12 V, I_{OP} = –2 mA	—	—	0.9	V
Output driving current sink	I_{SIN}	SV_{CC} = 12 V	2.0	—	—	mA
Output driving current source	I_{SOU}	SV_{CC} = 12 V	2.0	—	—	mA
Power cut operation						
PC1 threshold high-level voltage	V_{PC1H}	SV_{CC} = 12 V	2.9	—	—	V
PC1 threshold low-level voltage	V_{PC1L}	SV_{CC} = 12 V	—	—	1.0	V
PC2 threshold high-level voltage	V_{PC2H}	SV_{CC} = 12 V	2.9	—	—	V
PC2 threshold low-level voltage	V_{PC2L}	SV_{CC} = 12 V	—	—	1.0	V
PC1 input current	I_{PC1}	SV_{CC} = 12 V, PC1 = 5 V	—	70	140	µA
PC2 input current	I_{PC2}	SV_{CC} = 12 V, PC2 = 5 V	—	70	140	µA
Reset circuit						
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 V, PV_{CC1} = PV_{CC2} = 5 V, V_{REF} = 1.65 V, R_L = 8 Ω, V_{PC1} = 5 V, V_{PC2} = 5 V, T_a = 25°C (continued)

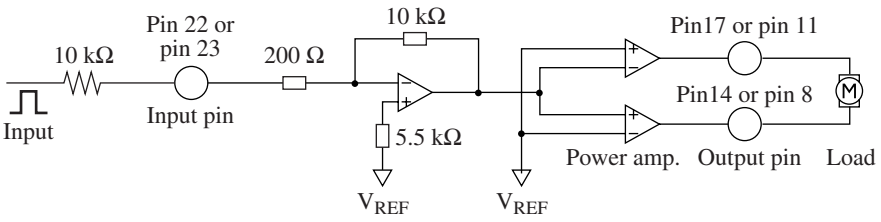
• Design reference data

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	—	°C
Operating temperature hysteresis width	ΔT_{THD}		—	45	—	°C
Supply voltage detection hysteresis width	ΔV_{HD}		—	0.2	—	V

■ Usage Notes

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



3. On operating mode of mute,

1) Driver

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

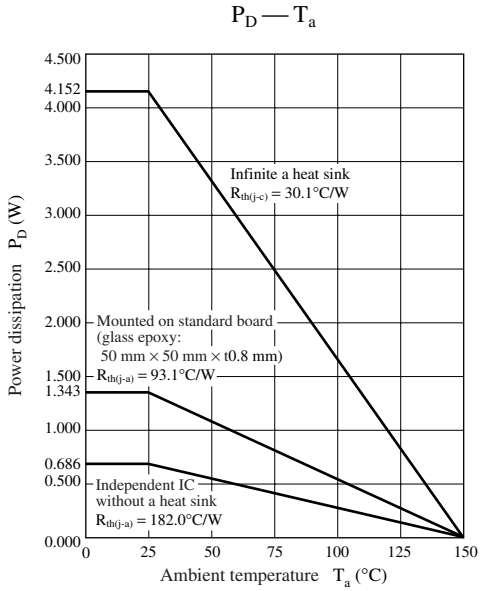
2) General-use op-amp.

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

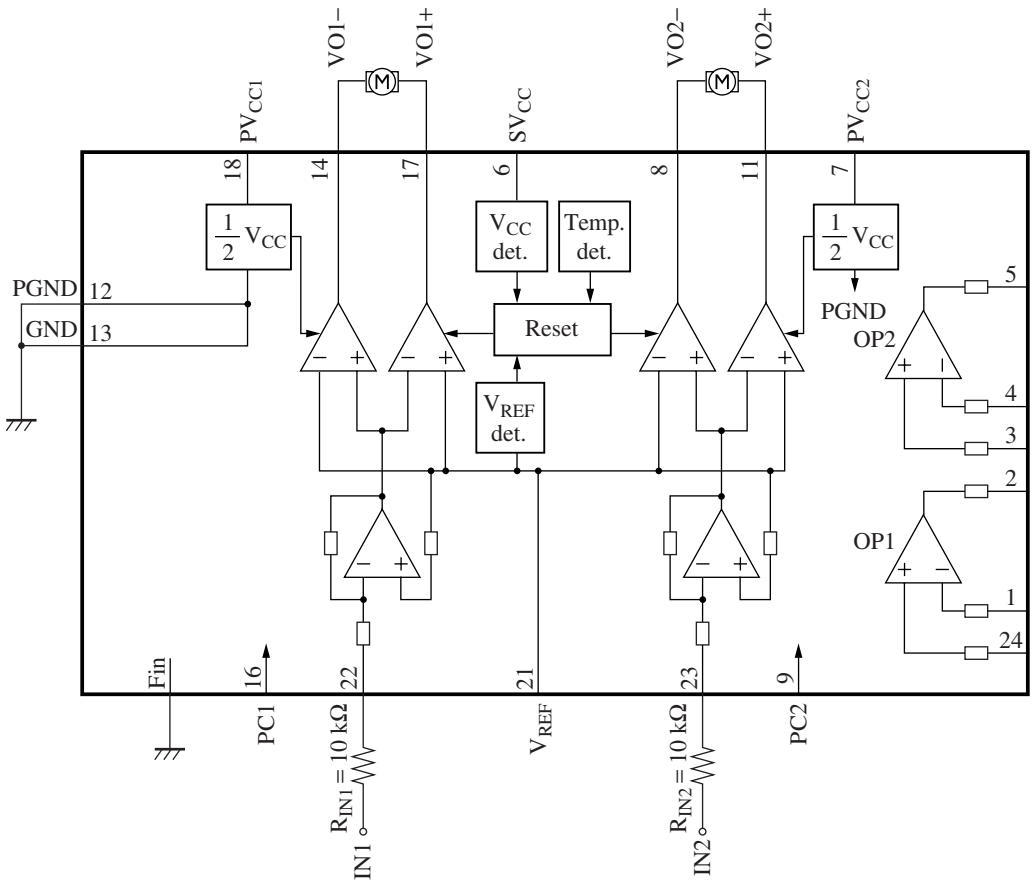
4. Appropriate care should be taken on the characteristics.
   When changing an external circuit constant on actual use, secure an appropriate margin in consideration of characteristic fluctuation of external parts and our ICs including transient characteristics as well as static ones.
5. Avoid the short-circuits 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.
6. An appropriate prior study should be done for use of dip soldering.

■ Application Notes

• P_D — T_a curves of HSOP030-P-0300

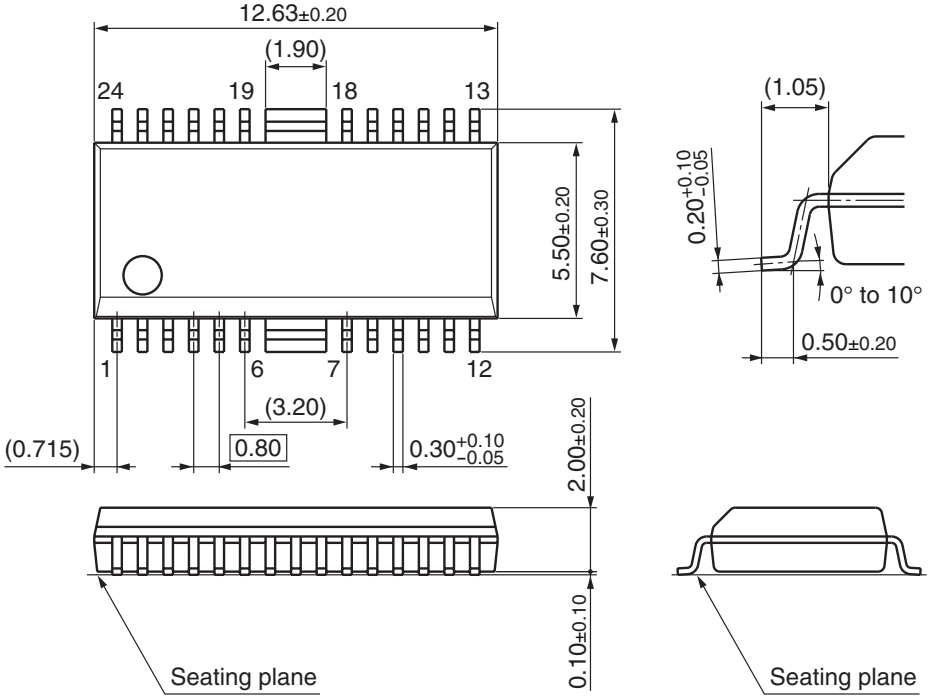


■ Application Circuit Example



■ New Package Dimensions (Unit: mm)

• HSOP030-P-0300A (Lead-free package)



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