AN8818SB

3ch. Linear Driver IC for CD/CD-ROM

■ Overview

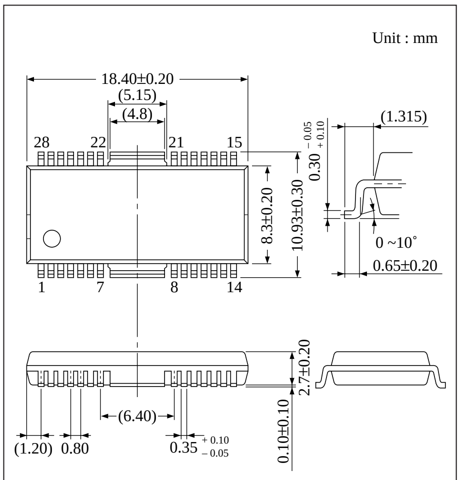
The AN8818SB is a 3ch. driver using the power operational amplifier method. It employs the surface mounting type package superior in radiation characteristics.

■ Features

- Wide output D-range is available regardless of the reference voltage on the system
- Input/Output gain setting for the driver enabled by an external resistance
- 3ch. independently controllable PC (Power Cut) feature built-in
- Thermal shut down circuit (with hysteresis) built-in
- Proper heat of IC controllable by separating the output supply for 2ch. and one ch. and independently setting for them
- Accessary operational amplifier built-in
- Relatively easy pattern design by separating and concentrating the input line and output line

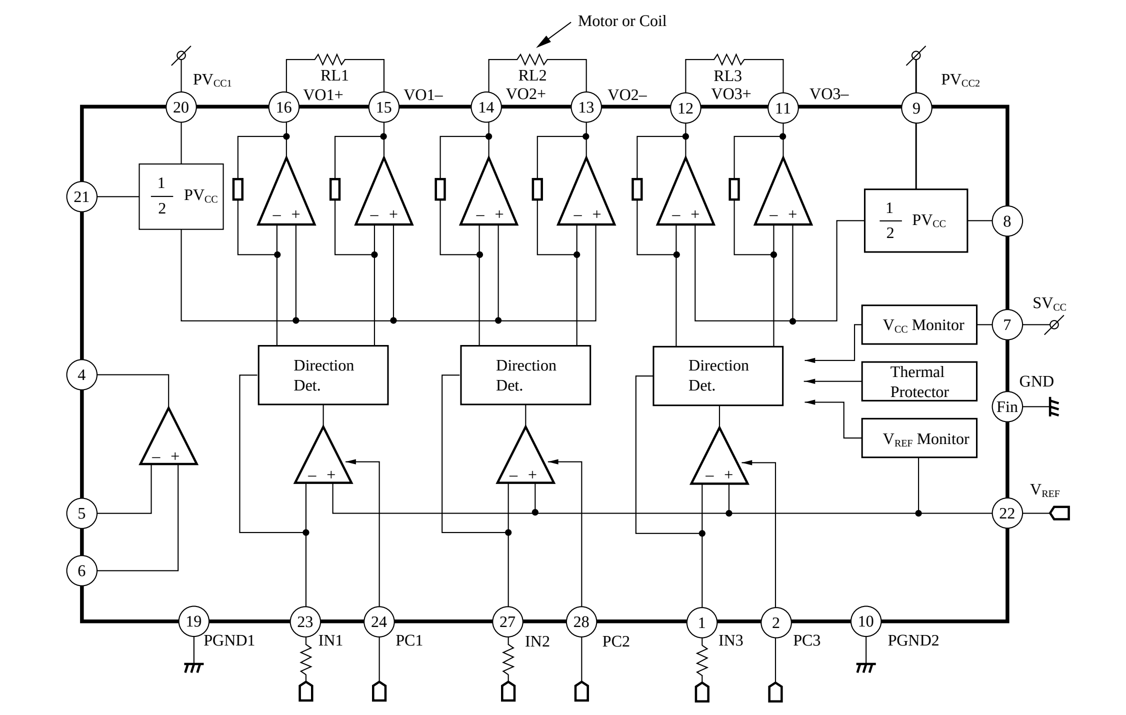
■ Application

Actuator for CD/CD-ROM, motor driver



Fin-attached 28-lead SOP package (HSOP042-P-0400)

■ Block Diagram



■ Pin Description

Pin No.	Pin Name	Pin No.	Pin Name
1	Input Pin of Motor Driver 3	16	Normal Rotation Output Pin of Motor Driver 1
2	PC (Power Cut) Input Pin 3	17	NC
3	NC	18	NC
4	Output Pin of Op-Amp.	19	GND 1 for Driver
5	Reverse Rotation Input Pin of Op-Amp.	20	V_{CC} 1 for Driver
6	Normal Rotation Input Pin of Op-Amp.	21	1/2 PV_{CC} Output Pin 1
7	V_{CC}	22	V_{REF} Input Pin
8	1/2 PV_{CC} Output Pin 2	23	Input Pin of Motor Driver 1
9	V_{CC} 2 for Driver	24	PC (Power Cut) Input Pin 1
10	GND 2 for Driver	25	NC
11	Reverse Rotation Output Pin of Motor Driver 3	26	NC
12	Normal Rotation Output Pin of Motor Driver 3	27	Input Pin of Motor Driver 2
13	Reverse Rotation Output Pin of Motor Driver 2	28	PC (Power Cut) Input Pin 2
14	Normal Rotation Output Pin of Motor Driver 2	Fin	GND
15	Normal Rotation Output Pin of Motor Driver 1	—	———

■ Absolute Maximum Ratings (Ta=25˚C)

Parameter	Symbol	Rating	Rating
Supply Voltage	V_{CC}	18	V
Supply Current	I_{CC}	—	mA
Power Dissipation Note)	P_D	3140	mW
Operating Ambient Temperature	T_{opr}	–30 ~ + 85	˚C
Storage Temperature	T_{stg}	–55 ~ + 150	˚C

Note) For surface mounting on 100 × 80 × 1.6 mm double face glass epoxy board.

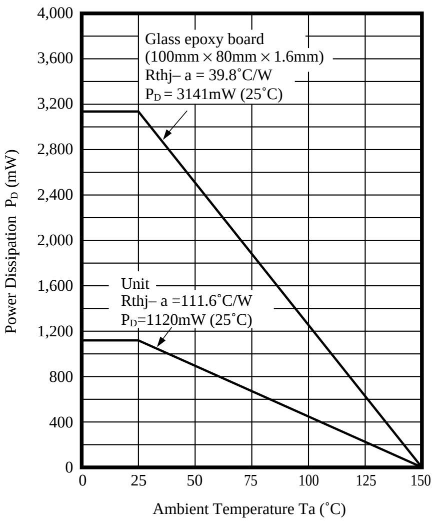
■ Recommended Operating Range (Ta=25˚C)

Parameter	Symbol	Range
Operating Supply Voltage Range	SV_{CC} Note)	4.5V ~ 14V
	PV_{CC1}, PV_{CC2}	

Note) Set SV_{CC} to the maximum electric potential.

■ Characteristic Curve

P_D –Ta

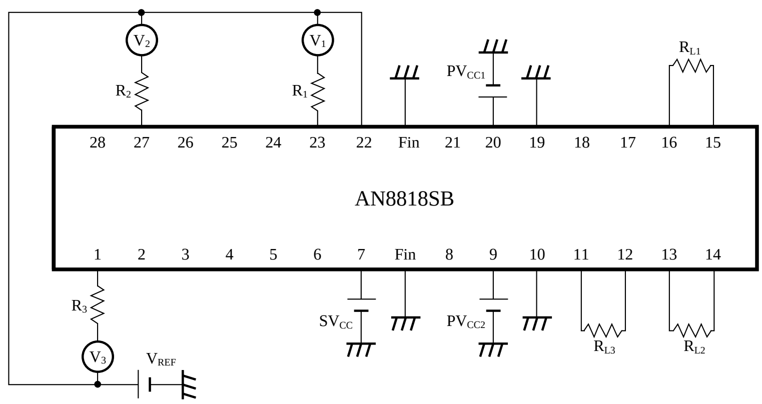


■ Electrical Characteristics (Ta=25˚C)

Parameter	Symbol	Condition	min.	typ.	max.	Uni
Total Circuit Current	I_{tot}	$PV_{CC1} = PV_{CC2} = SV_{CC} = 8V$	5	10	15	mA
Drivers 1 and 4						
Input Offset Voltage	V_{IOF}	$PV_{CC1} = PV_{CC2} = SV_{CC} = 8V$ $R_L = 8\Omega$, $R_{IN} = 10k\Omega$	–10	—	10	mV
Output Offset Voltage	V_{OOF}	$PV_{CC1} = PV_{CC2} = SV_{CC} = 8V$ $R_L = 8\Omega$, $R_{IN} = 10k\Omega$	–50	—	50	mV
Gain	G	$PV_{CC1} = PV_{CC2} = SV_{CC} = 8V$ $R_L = 8\Omega$, $R_{IN} = 10k\Omega$	18	20	22	dB
Maximum Output Amplitude (+)	V_{L+}	$PV_{CC1} = PV_{CC2} = SV_{CC} = 8V$ $R_L = 8\Omega$, $R_{IN} = 10k\Omega$	4.4	5.0	—	V
Maximum Output Amplitude (–)	V_{L-}	$PV_{CC1} = PV_{CC2} = SV_{CC} = 8V$ $R_L = 8\Omega$, $R_{IN} = 10k\Omega$	—	–5.0	–4.4	V
Threshold H	V_{PCH}	$PV_{CC1} = PV_{CC2} = SV_{CC} = 8V$ $R_L = 8\Omega$, $R_{IN} = 10k\Omega$	2.0	—	—	V
Threshold L	V_{PCL}	$PV_{CC1} = PV_{CC2} = SV_{CC} = 8V$ $R_L = 8\Omega$, $R_{IN} = 10k\Omega$	—	—	0.3	V
Reset Circuit						
Reset Operation Release Supply Voltage	V_{RST}	$I_{IN} = 10\mu A$, $R_{IN} = 10k\Omega$	3.0	3.2	3.3	V
V_{REF} Detection	V_{REF}		2.0	—	—	V
OP Amp.						
Input Offset Voltage	V_{OF}	$PV_{CC1} = PV_{CC2} = SV_{CC} = 8V$	–5	—	5	mV
Input Bias Current	I_{BOP}	$PV_{CC1} = PV_{CC2} = SV_{CC} = 8V$	—	150	500	nA
High-Level Output Voltage	V_{OH}	$PV_{CC1} = PV_{CC2} = SV_{CC} = 8V$	6.0	—	—	V
Low-Level Output Voltage	V_{OL}	$PV_{CC1} = PV_{CC2} = SV_{CC} = 8V$	—	—	1.7	V
Output Drive Current Sink	I_{SIN}	$PV_{CC1} = PV_{CC2} = SV_{CC} = 8V$	2.0	—	—	mA
Output Drive Current Source	I_{SOU}	$PV_{CC1} = PV_{CC2} = SV_{CC} = 8V$	2.0	—	—	mA
Heat Protection Circuit						
Operation Temperature Equilibrium Value Note 1)	T_{THD}		(—)	(180)	(—)	˚C
Operation Temperature Hysteresis Width Note 1)	DT_{THD}		(—)	(45)	(—)	˚C

Note 1) Characteristic value in parentheses is a reference value for design but not a guaranteed value.

■ Cautions for use



When the AN8818SB is used, take into account the following cautions and follow the power dissipation characteristic curve.

(1) Load current, I_{P1} flowing in loads R_{L1} and R_{L2} is supplied through Pin20.

$$I_{P1} = \frac{|V_{16}-V_{15}|}{R_{L1}} + \frac{|V_{14}-V_{13}|}{R_{L2}}$$

(2) Load current, I_{P2} flowing in load R_{L3} is supplied through Pin9.

$$I_{P2} = \frac{|V_{12}-V_{11}|}{R_{L3}}$$

(3) Dissipation increase (ΔP_d) inside the IC (power output stage) caused by loads R_{L1}, R_{L2}, and R_{L3} is as follows ;

$$\Delta P_d = (PV_{CC1} - |V_{16}-V_{15}|) \times \frac{|V_{16}-V_{15}|}{R_{L1}} + (PV_{CC1} - |V_{14}-V_{13}|) \times \frac{|V_{14}-V_{13}|}{R_{L2}} + (PV_{CC2} - |V_{12}-V_{11}|) \times \frac{|V_{12}-V_{11}|}{R_{L3}}$$

(4) Dissipation increase (ΔP_S) inside the IC (signal block supplied from Pin7 caused by loads R_{L1}, R_{L2} and R_{L3} is almost as follows:

$$\Delta P_S = 3\left\{\frac{V_1}{R_1}(2SV_{CC} + |V_{16}-V_{15}|) + \frac{V_2}{R_2}(2SV_{CC} + |V_{14}-V_{13}|) + \frac{V_3}{R_3}(2SV_{CC} + |V_{12}-V_{11}|)\right\}$$

(5) Dissipation increase during driver running is $\Delta P_d + \Delta P_S$.

(6) Inside loss under no load (P_{d1}) is almost as follows ;

$$P_{d1} = SV_{CC} \times I\,(SV_{CC}) + PV_{CC1} \times I\,(PV_{CC1}) + PV_{CC2} \times I\,(PV_{CC2})$$

(7) Entire IC inside loss (P_d) is almost as follows ;

$$P_d = P_{d1} + \Delta P_d + \Delta P_S$$