



NY9A802B

2.5W Audio Power Amplifier

DATA SHEET



Revision History

<i>Version</i>	<i>Date</i>	<i>Description</i>	<i>Modified Page</i>
1.0	2023/02/20	New release.	-

矽源特科技
ChipSourceTek

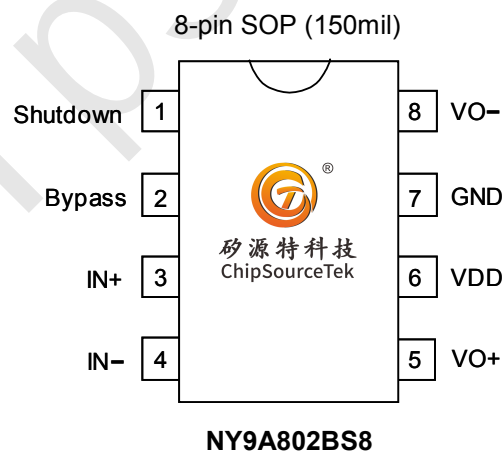


1. NY9A802B概述

NY9A802B 為 CMOS的單聲道音頻功率放大器IC，利用大型積體電路(LSI)製造技術，具有低電源及低成本的特性，在使用時只需要很少的週邊元件。NY9A802B是一款橋式 (Bridge-Tied Load)音頻功率放大器。在 5V電源電壓下，它能向 4Ω負載提供 2.5W的輸出功率，或向 3Ω負載提供 3.0W 的輸出功率，THD+N 小於10%。

2. NY9A802B功能

- (1). 寬廣的工作電壓：2.0V ~ 5.5V。
- (2). 橋式(BTL, Bridge-Tied Load)。
- (3). 高輸出功率：P_{OUT} 為 2.5W，條件為 V_{DD} = 5V, Load = 4Ω, f = 1kHz 和 THD+N = 10%。
- (4). 低關斷(待機)電流。(Typ.=0.1uA)
- (5). 支援PWM差動訊號輸入 (Differential signal input)。
- (6). 不需額外的輸出耦合電容、緩衝電容或啟動電容。
- (7). BTL 橋式輸出能夠直接推動電容式負載(蜂鳴片)。
- (8). 內建自動 Ramp-up/Ramp-down線路，能有效抑制開關時的雜音(Pop noise)，可以使用C_b Bypass電容來調整Ramp-up的時間。
- (9). 內建過溫保護功能 (TSD, Thermal Shutdown)。
- (10). 高達 5KV 的人體靜電模式 (HBM) 的 ESD 保護。
- (10). 提供 SOP-8封裝。



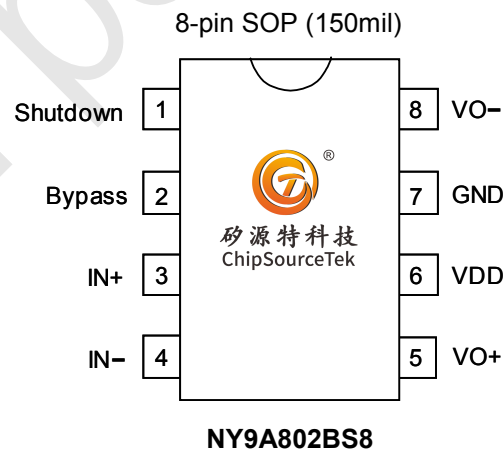


1. NY9A802B GENERAL DESCRIPTION

The NY9A802B is mono audio power amplifier CMOS IC. They are designed by LSI high technology with a low-power and low-cost process. Less peripheral components are required in application. NY9A802B is a Bridge-Tied Load (BTL) power amplifier. It is capable of delivering 2.5W of average power to a 4Ω load or 3.0W of average power to a 3Ω load with less than 10% distortion (THD+N) from a 5V power supply.

2. NY9A802B FEATURES

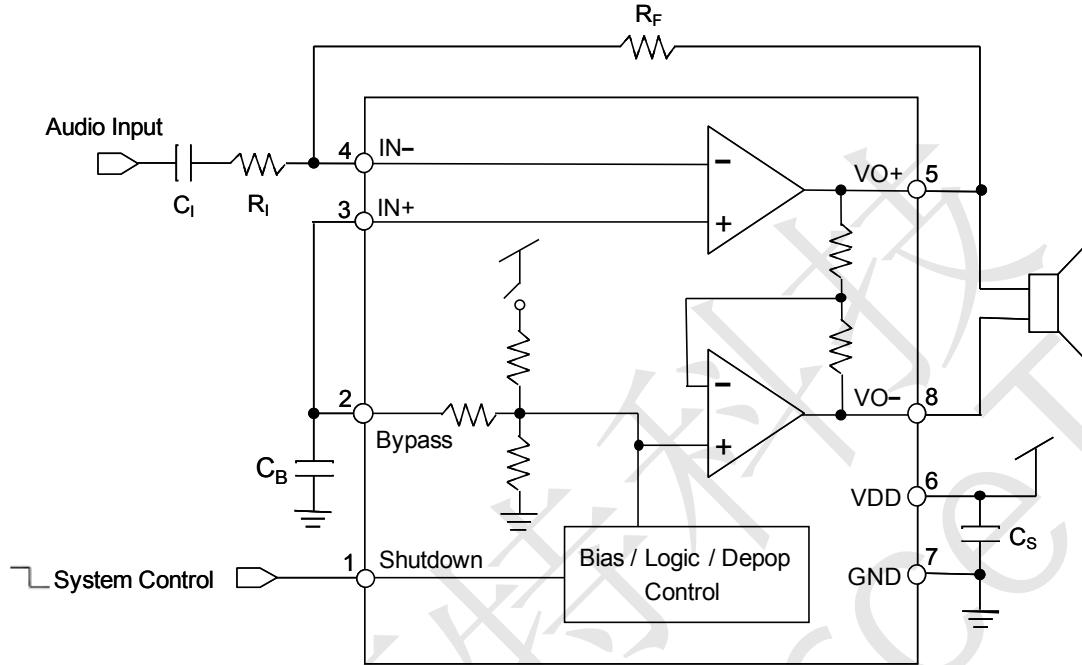
- (1). Wide operating voltage range: $V_{DD} = 2.0V \sim 5.5V$.
- (2). Bridge-Tied Load (BTL).
- (3). High output power: P_{OUT} is 2.5W for $V_{DD} = 5V$, Load =4Ω, $f = 1kHz$ and THD+N = 10%.
- (4). Low standby (shutdown) current. (Typ.=0.1uA)
- (5). Support PWM differential signal input.
- (6). No output coupling capacitors, snubber networks or bootstrap capacitors required.
- (7). BTL output can directly drive capacitive loads such like piezo-buzzer.
- (8). Built-in auto Ramp-up/ Ramp-down circuit to minimize the turn-on and turn-off pop noise. The time of Ramp-up can be adjusted by C_b bypass capacitor.
- (9). Built-in Thermal Shutdown (TSD).
- (10). High 5KV Human Body Mode (HBM) ESD protection.
- (11). SOP-8 package.





3. NY9A802B BLOCK DIAGRAM

3.1 NY9A802B





4. NY9A802B PIN DESCRIPTION

4.1 NY9A802B

Pin #	Pin Name	ATTR.	Description
1	Shutdown	I	Active high input to disable NY9A operation.
2	Bypass	I	Mid-supply bias at VDD/2 with an external 0.1uF ~ 1.0uF capacitor.
3	IN+	I	Non-inverting input.
4	IN-	I	Inverting input.
5	VO+	O	Positive BTL output.
6	VDD	Power	Power input.
7	GND	Power	Ground reference.
8	VO-	O	Negative BTL output.



5. NY9A802B ELECTRICAL CHARACTERISTICS

5.1 Absolute Maximum Rating

Symbol	Parameter	Rating	Unit	
$V_{DD} - V_{SS}$	Supply voltage	-0.5 ~ +7.0	V	
V_{IN}	Input voltage	$V_{SS}-0.3V \sim V_{DD}+0.3$	V	
θ_{JA}	Thermal resistance (Junction to Ambient)	SOP-8	150	°C/W
		ESOP-8	60	
P_D	Power dissipation	SOP-8	1.0	W
		ESOP-8	2.5	
T_A	Operating ambient temperature	-40 ~ +85	°C	
T_J	Operating junction temperature	+170	°C	
T_{ST}	Storage temperature	-55 ~ +170	°C	

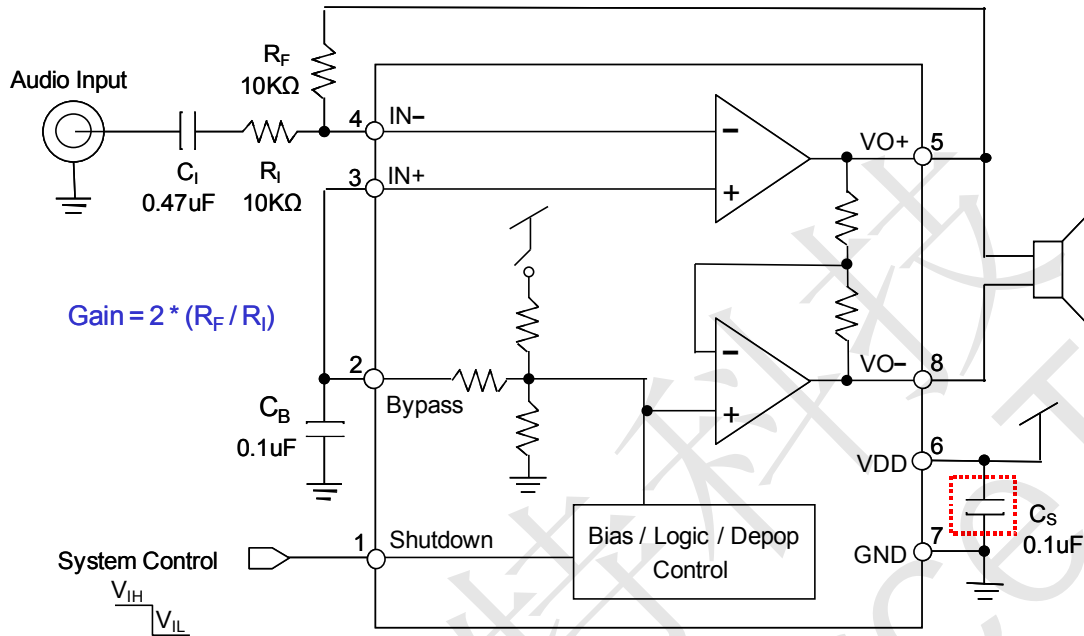
5.2 DC Characteristics ($V_{DD}=5.0V$, $T_A=25^\circ C$, unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Condition
V_{DD}	Operating voltage	2.0		5.5	V	
I_{SB}	Standby (Shutdown) current		0.1	1	uA	Shutdown is enabled.
I_{OP}	Operating current	$V_{DD} = 3.0V$	3.2		mA	No load
		$V_{DD} = 5.0V$	5.8		mA	
THD+N	Total harmonic distortion + noise		0.12		%	$R_L = 4\Omega$, $P_{OUT} = 1.0W$
			0.11		%	$R_L = 8\Omega$, $P_{OUT} = 1.0W$
SNR	Signal-to-Noise ratio		95		dB	$R_L = 4\Omega$, $P_{OUT} = 1.6W$
			96		dB	$R_L = 8\Omega$, $P_{OUT} = 1.0W$
P_{OUT}	Output power ($f = 1kHz$)	$R_L = 4\Omega$	2.0		W	THD+N = 1%
			2.5		W	THD+N = 10%
		$R_L = 8\Omega$	1.3		W	THD+N = 1%
			1.6		W	THD+N = 10%
V_{OS}	Output offset voltage		6	30	mV	$V_{IN} = 0V$
PSRR	Power supply rejection ratio		60		dB	$f = 1kHz$
T_{ON}	Wakeup time		14		ms	$C_B = 0.1\mu F$
			42		ms	$C_B = 0.47\mu F$
T_{OFF}	Shutdown time		1		ms	$C_B = 0.1\mu F$
			1		ms	$C_B = 0.47\mu F$

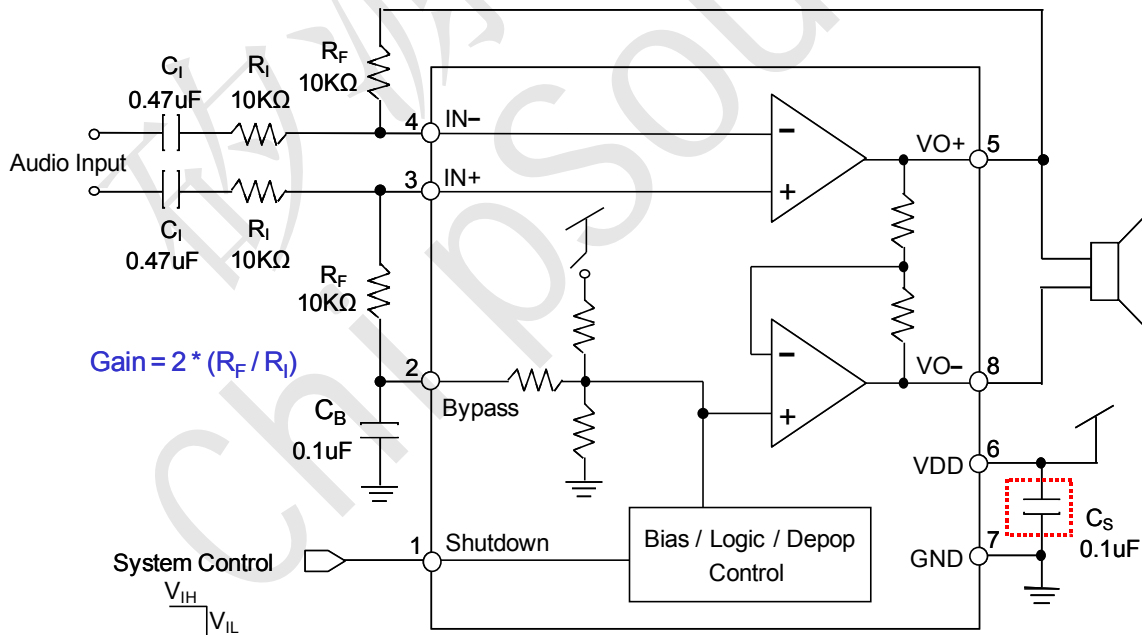


7. NY9A802B APPLICATION CIRCUIT

7.1 NY9A802B Typical Application



7.2 NY9A802B Differential Input Application

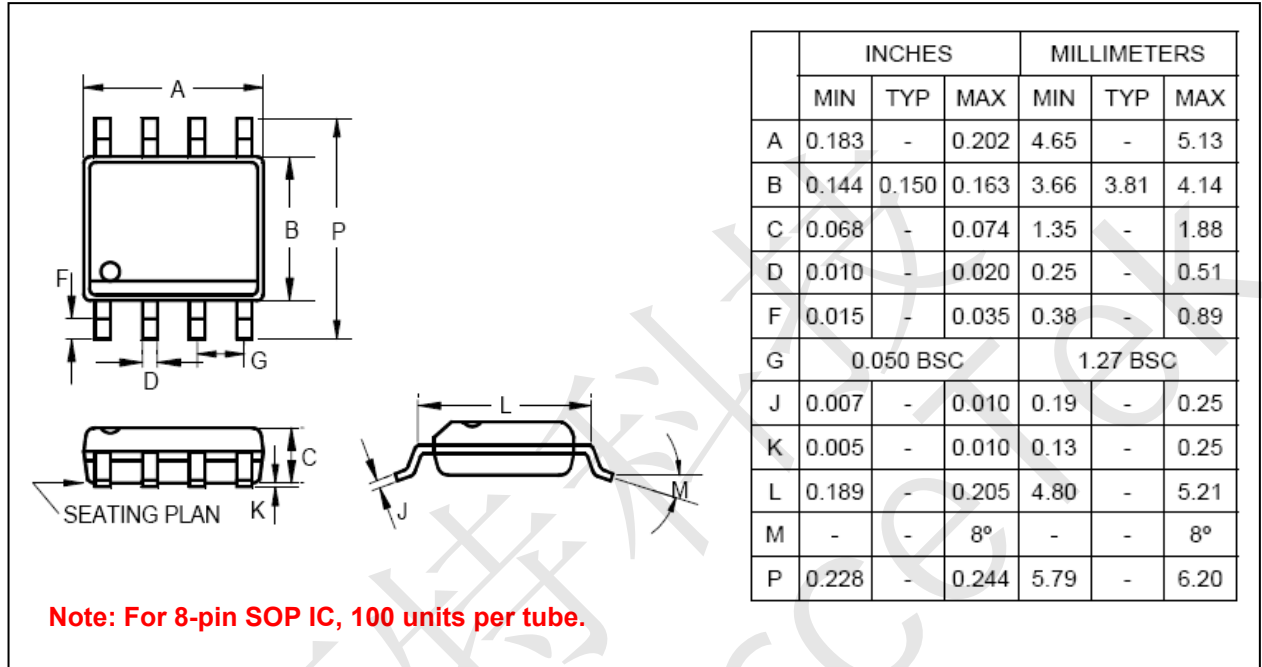


** In toy application, C_s (0.1uF) can be saved, but please reserve C_s space at PCB layout.*



8. NY9A802B PACKAGE DIMENSION

8.1 8-Pin Plastic SOP (150 mil)



9. NY9A802B ORDERING INFORMATION

P/N	Shipping Type	Remarks
NY9A802BS8	SOP-8	Width 150 mil.