Low Cost Mono 1W Audio Power Amplifier

■ Product Overview

The LN4898 is a differential input audio power amplifier circuit for cell phones and other portable audio devices with built-in speakers, providing 1W of stable output power to an 8Ω load. The LN4898 provides a stable output of 1W of power to an 8Ω load, and the bridge load structure of the LN4898 greatly reduces the number of external components while providing high-quality audio power amplification, eliminating the need for external output coupling capacitors and bootstrap capacitors.

The LN4898 has a built-in standby circuit that operates in standby mode when the SD pin is connected low, and the standby current does not exceed 2uA.The LN4898 has a built-in noise cancellation circuit that eliminates clicks or crackles during the startup and shutdown of the chip. The gain can also be adjusted by an external resistor.

■ Product Features

- Wide operating voltage range: 3.2 -12V
- No output coupling capacitors, buffer networks or bootstrap capacitors required
- Thermal Protection Function
- Fixed internal gain, adjustable external gain
- Ultra-compact package
- 1uA low power shutdown mode
- BTL outputs can drive capacitive loads
- No click or crackle on power up/down

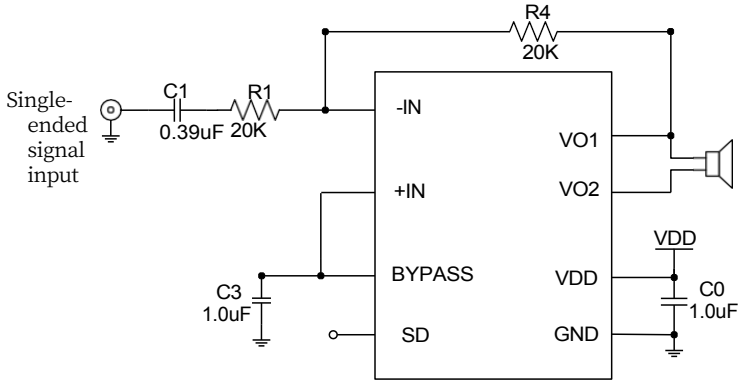
■ use

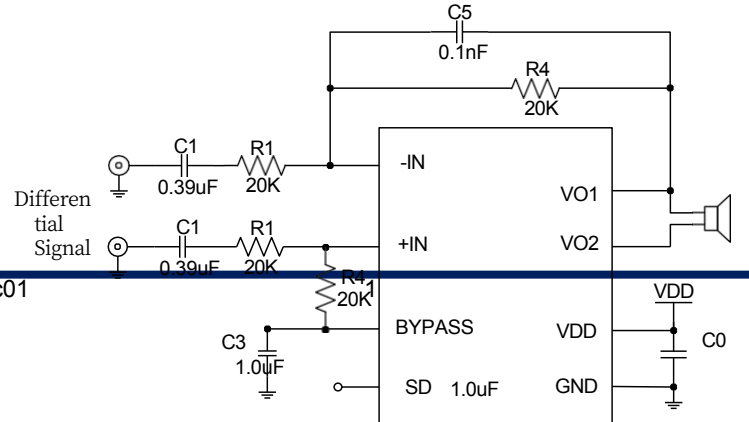
- mobile telephone
- PDA
- Portable electronic equipment

■ seal inside

- SOP8

■ Typical Application Circuit





Input

■ Ordering Information

LN4898①②③④⑤-⑥

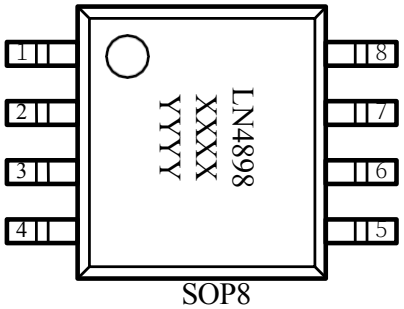
Digital projects	notation	descriptive
①②	A B	Class AB Audio Power Amplifiers
(iii)	1	Output Power 1W
④	S	SOP-8L package
⑤	R	Tape winding direction: Positive
	L	Tape winding direction: reverse
(vi)	G	green material

■ Pinout

pin number	pinout	Functional Description
1	SD	Chip Enable, Low Level Shutdown
2	BYPASS	Bypass Capacitor Input
3	+IN	Positive input (differential +)
4	-IN	Negative input (differential-)
5	VO1	Negative output (differential-)
6	VDD	Power Input
7	GND	grounding terminal
8	VO2	Positive output (differential +)

■ Printing Information

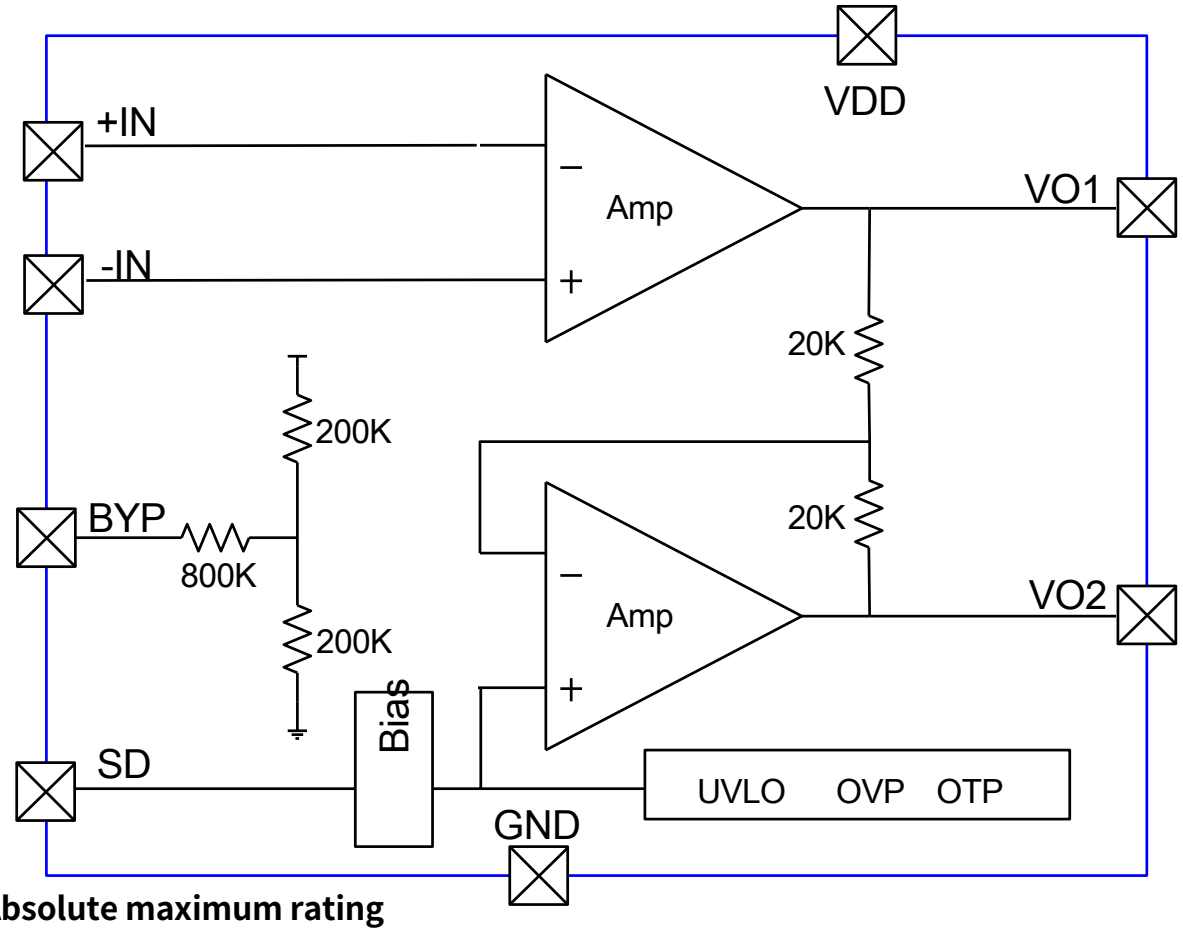
- Package form



SOP8
(TOP VIEW)

Print Symbol	Product Description
XXXX	Chip Wafer Information
YYYY	Chip Production Information

■ functional block diagram



■ Absolute maximum rating

sports event	notation	Absolute maximum rating	unit (of measure)
operating voltage	VDD	-0.3-15	V
Enable Voltage	SD	-0.3-15	
Input Voltage	VIN	-0.3-VDD+0.3	
ESD Parameters	-	2000	V
operating temperature	Topr	-40 to +125	℃
preservation temperature	Tstg	-60 to +150	

■ Electrical Characteristics

Test Conditions VDD=8.4V (Ta=25 °C unless otherwise specified)

sports event	notation	conditional		minimum value	typical value	maximum values	unit (of measure)
quiescent current	IDD	V_{IN} = 0V, Io = 0A, No Load		-	4	6	mA
		V_{IN} = 0V, Io = 0A, 8Ω Load		-	5	8	mA
Shutdown current	ISD	-		-	1	-	μA
Shutdown Voltage High Input High Level	VSDIH	-		1.2	-	-	V
Shutdown Voltage Low Input Low Level	VSDIL	-		-	-	0.4	V
Output Offset Voltage	VOS	-		-	±10	±30	mV
VDD undervoltage protection	VUV	-		-	3.2	-	V
VDD Undervoltage Recovery	VUVR	-		-	3.5	-	V
VDD overvoltage protection	VOV	-		-	10	-	V
VDD Overvoltage Recovery	VOVR	-		-	9.5	-	V
output power	PO	THD+N = 10% f = 1 kHz RL=8Ω	VDD=3.6V		0.5	-	W
			VDD=5.0V		1.0		
			VDD=7.5V		1.9		
		THD+N = 10% f = 1 kHz RL=16Ω	VDD=3.6V		0.35		W
			VDD=6.0V		1.0		
			VDD=8.4V		2.0		
Power Supply Rejection Ratio	PSRR	f = 217Hz, R_L = 8Ω, V_{IN} = 0V		55	62	-	dB
		f = 1kHz, R_L = 8Ω, V_{IN} = 0V		-	66	-	

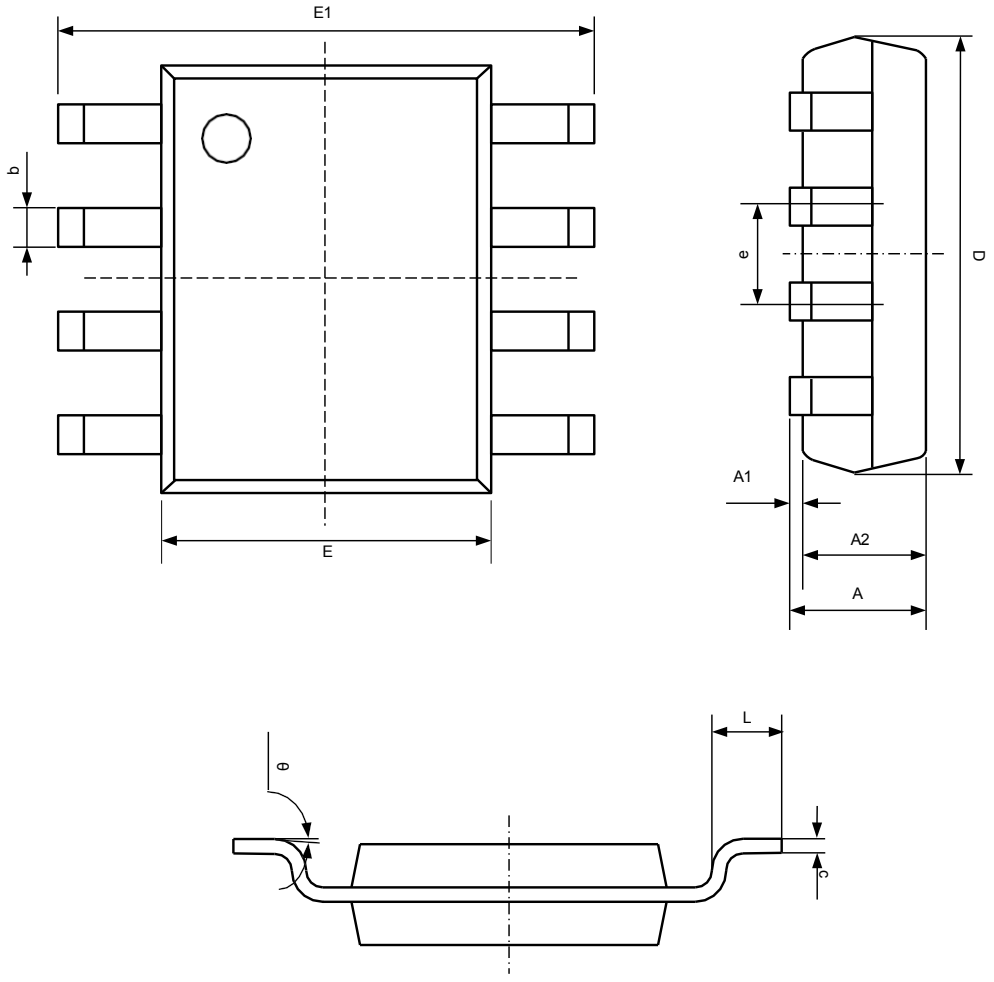
activation time	TWU	-	-	100	-	ms
OFF TIME	TSDT	8Ω Load	-	25.0	-	ms
Thermal shutdown temperature	TSD	-	-	160	-	℃
Thermal shutdown temperature hysteresis	TSDH	-	-	20	-	℃

■ Application Information

- LN4898 for 8Ω speaker to provide 1W output power; supply voltage greater than 7.5V, if the output power is too large may trigger the chip internal temperature protection.
- The VDD power supply capacitance is recommended to be not less than 1uF, and the BYPASS external capacitance is generally taken as 1uF;
- The LN4898 has a gain of 2*R4/R1, so selecting a lower gain will give you the best electrical output;
- For LN4898 differential signal input, it is recommended to add capacitor C5 in parallel with R4;
- The SD console is normally turned on by adding a 20KΩ resistor pull-up to VDD;
- R1 and C1 form the high pass filter structure of the audio input, set the corresponding high pass filter -3dB point according to the desired frequency range, C1 capacitance is not recommended to be larger than 0.47uF;
- Avoid shorting output VO1/VO2 to power supply VDD;
- All electronic components on the PCB board should be on the same surface as the IC, and resistors and capacitors should be as close as possible to the IC;
- In order to prevent antenna interference to the signal, the double-layer PCB board should be wired in a straight and symmetrical layout as far as possible;
- Keep the GND loop short in the PCB.

■ Package Information

- **SOP8**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max.	Min	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°