

## PIEZO AUDIO AMPLIFIERS



### INTRODUCTION

The **P**iezo **A**udio **A**mplifiers-series are a total solution to drive piezoceramic sound components. A range of different PCB sizes, amplifier topologies and maximum voltage peak to peak outputs, cover a wide solution to piezo audio amplification.

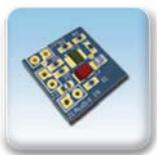
Piezo audio amplifiers are designed to handle capacitive loads and have the possibility to deliver large voltages peak to peak over the complete audio frequency range.

The heart of a piezo audio component is a ceramic piezo stone that interacts when it feels a certain voltage difference. An increase of a voltage peak to peak will have a larger piezo deformation and results in a larger sound output.

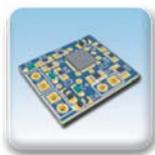
The PAA-series give a quality amplifier solution where a quality sound is needed.

### GENERAL OVERVIEW PAA SERIES

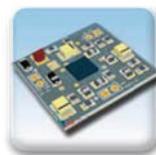
Model	PAA-LT3469-01	PAA-MAX9788-01	PAA-LM4960-02	PAA-StepUpBTL-01
Measurements PCB(mm)	15x15mm	14x16.5mm	25x25mm	40x35mm
Voltage input (V)	5V	5V	5V	5V-25V
MAX Capacitance Piezo Speaker	200nF	1µF	600nF	1µF
Max Voltage Output Vpp	33Vpp	20Vpp	24Vpp	60Vpp
Voltage Topology	Integrated step Up converter	Integrated step up converter	Integrated step up converter	Step up converter
Amplifier classification	Class A	Class G	Class AB	Class AB
Used amplifier configuration	Single ended	Fully Differential	Bridge Tied Load	Bridge Tied Load
Average current consumption of speaker and amplifier (mA)	45mA	15mA	85mA	40mA-400mA (2 Watt)



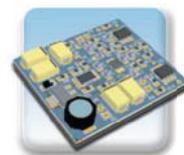
PAA-LT3469-01



PAA-MAX9788-01



PAA-LM4960SQ-02



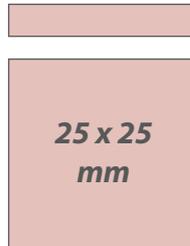
PAA-StepUpBTL-01

## PAA-LM4960SQ-02

A perfect balance of a bridge tied load and step up converter on a small PCB, the "LM4960" IC of National Semiconductor reaches 24 Vpp for a load of 600nF. Small design and great sound output makes it very understandable.

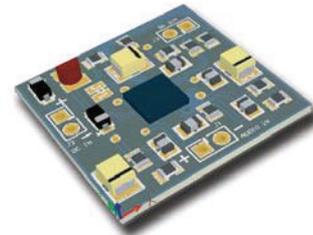
- Integrated Step Up Converter
- Bridge tied load
- Very small inductor
- Up to 24Vpp
- 22 components

total thickness:  
4.25 mm



25 x 25  
mm

actual size



Fixed amplification ratio: +/- 74  
Voltage input: 5 V

## PAA-StepUpBTL-01

To go loud is to amplify the input signal to a large Voltage peak to peak swing of maximum 60Vpp. Tuned on the SPS piezo speakers the "StepUpBTL" piezo audio amplifier is designed for a very loud audio sound in a room.

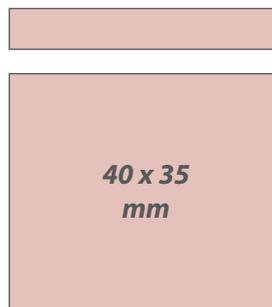
The creation of a 60Vpp swing derives from a stable DC power source of 30 V DC.

The boostconverter circuit is designed to a minimum surface with a maximum variety at the input source. A variation of the input voltage between 5V and 25V gives at the end a stable 30VDC to power the opamps with efficient power consumption.

The amplifier circuit is a perfect balance between power consumption and space design. The Bridge Tied Load amplifier topology makes it possible to swing the signal to 60Vpp.

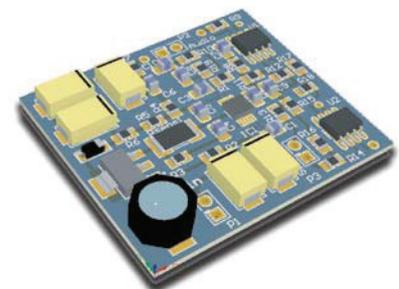
- Input voltage 5V-25V
- Max. output 60Vpp
- Two electronic circuits
- **Ideal: +input: 9Vdc**  
**+output: 40Vpp**

total thickness:  
6 mm



40 x 35  
mm

actual size



Fixed amplification ratio: +/- 90  
Voltage input: 5-25 V

### Boost converter + Amplifier

- DC-DC- converter: Max 669  
=> output: 30 Vdc
- Amplifier circuit: OPA 551  
=>"Bridge tied load configuration"