

31VPP OUTPUT PIEZO SOUNDER DRIVER WITH BOOST CONVERTER

General Description

This evaluation board user guide offers a simple and quick overview of the PAM8907.

The PAM8907 is a piezoelectric horn driver with built-in boost converter. The boost converter operates at a fixed frequency of 1.8MHz and provides a selectable 11V or 15.6V output with a minimum number of external components.

Key Features

- Input Supply Voltage Range: 1.8V to 5.5V
- Integrated Synchronous Boost Converter can be set (using VSET pin) to generate:
 - VOUT = 11.0V to drive piezo sounder with 22Vpp or
 - VOUT = 15.6V to drive piezo sounder with 31Vpp
- Very short turn-on/turn-off times
- Low current consumption
- Automatic wake-up and shutdown control

Evaluation Board Schematic

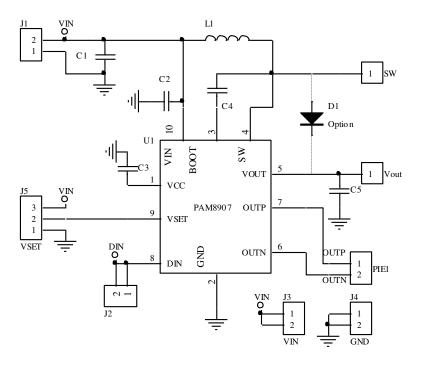


Figure 1. Evaluation Board Schematic





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Evaluation Board View

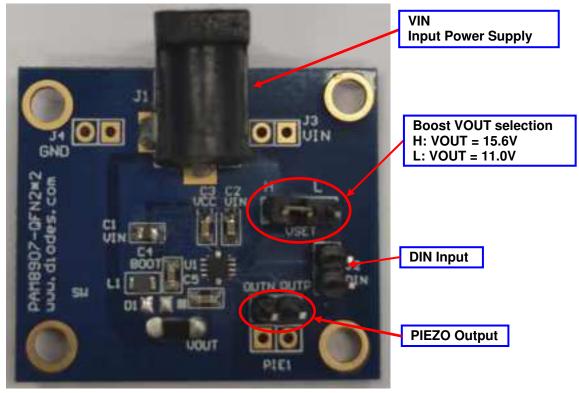


Figure 2. Evaluation Board View

EVB Operational Sequence

- 1. Preset the power supply to be between 1.8V and 5.5V.
- 2. Turn off the power supply.
- 3. Connect the power supply to the EVB's input supply connector.
- 4. Connect DIN input to the demo board input jack.
- 5. Connect the PIEZO to the output jack.
- 6. Turn on the power supply.
- 7. Turn on DIN.

External Components Selection

Power Supply Decoupling Caps (C1, C2)

- 1. Low ESR for good THD, PSRR.
- 2. C1 must be placed very close to the inductor.
- 3. C3 must be placed very close to the IC Pin 10.

Bootstrap Capacitor (C4)

- 1. For lower output ripple, low ESR is required.
- 2. For low leakage current, 0.1uF, a X5R/X7R ceramic capacitor is recommended.

VCC Capacitor (C3)

- 1. 1uF, X5R/X7R ceramic capacitor is recommended
- 2. Place very close to the device.



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PCB Layout Guidelines

Grounding

- 1. Use plane grounding or separate grounds.
- 2. Do not use the same trace to connect the power GND and analog GND.
- 3. Place multiple vias to connect the top plane GND to the bottom plane.
- 4. Connect the PAM8907's exposed pad to the backplane GND using vias.

Power Supply

- 1. Run separate traces for Boost Input Supply and VIN from the input power supply terminal.
- 2. It is recommended to route all power supply traces to be as short and thick as possible.
- 3. Any barricades placed in the power supply trace may result in poor amplifier performance.

Components Placement

- 1. Power supply capacitor, C1, should be placed very close to L1 pins.
- 2. Power supply capacitor, C5, should be placed very close to PAM8907 V_{OUT} pins.

PCB Layout Example

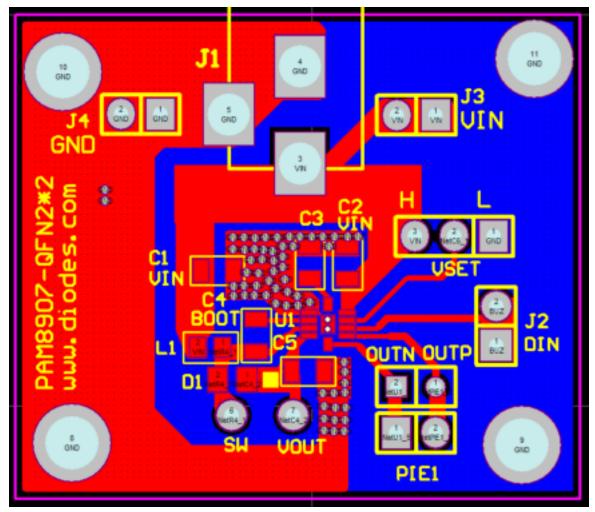


Figure 3. PCB Top Layer



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PCB Layout Example (continued)

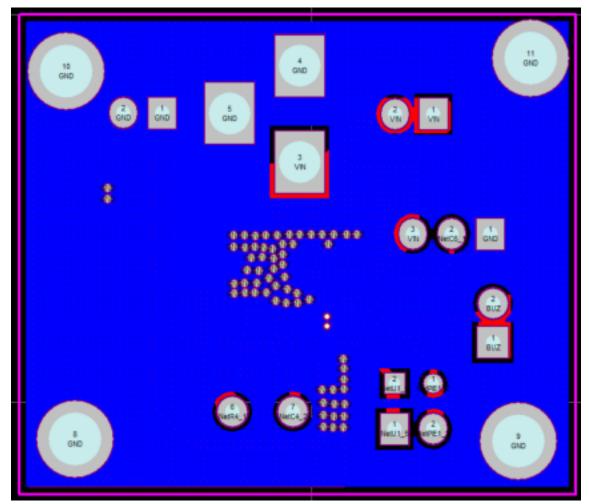


Figure 4. PCB Bottom Layer



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Bill of Materials

For normal applications with a battery current larger than CR2032, the BOM below is recommended.

Item	Value	Туре	Rating	Description
C1	10uF	X5R/X7R, Ceramic/0805	10V	VIN decoupling CAP
C2	1uF	X5R/X7R, Ceramic/0603	16V	VIN decoupling CAP
C3	1uF	X5R/X7R, Ceramic/0603	16V	VCC CAP
C4	0.1uF	X5R/X7R, Ceramic/0603	16V	Bootstrap CAP
C5	1uF	X5R/X7R, Ceramic/0603	25V	Vout CAP
L1	1uH	MDKK1616T1R0MM	1A	Boost inductance
D1	-	1A/20V Schottky diode	-	Optional
IC1	-	PAM8907	-	-

For tracker-related applications with piezo loading of around 20nF, especially when using a CR2032 battery, the BOM below is recommended.

Item	Value	Туре	Rating	Description
C1	47uF or 68uF	X5R/X7R, Ceramic/0805	6.5V	VIN decoupling CAP
C2	1uF	X5R/X7R, Ceramic/0603	16V	VIN decoupling CAP
C3	0.47uF	X5R/X7R, Ceramic/0603	16V	VCC CAP
C4	0.1uF	X5R/X7R, Ceramic/0603	16V	Bootstrap CAP
C5	0.33uF	X5R/X7R, Ceramic/0603	25V	Vout CAP
L1	1uH	MDKK1616T1R0MM	1A	Boost inductance
D1	-	1A/20V schottky diode	-	Optional
IC1	-	PAM8907	-	-



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