

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

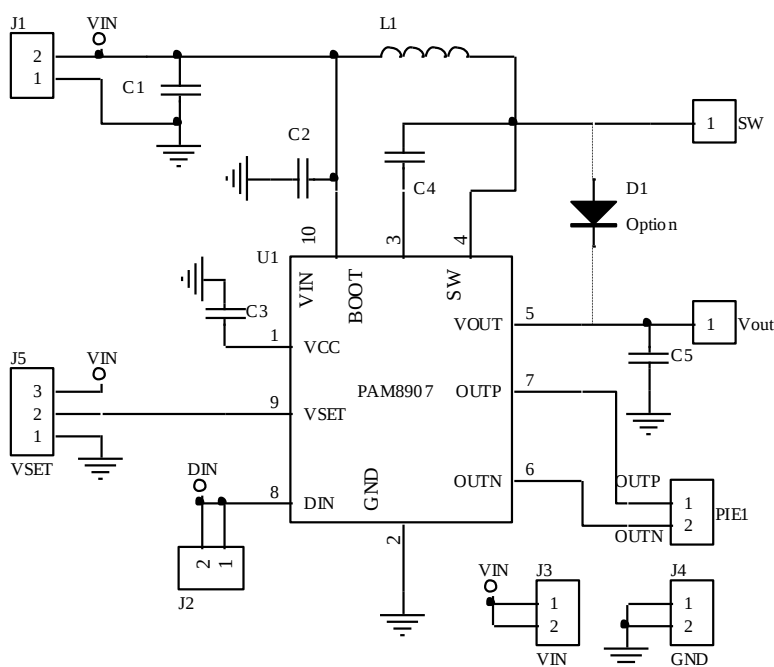


Figure 1. Evaluation Board Schematic

Evaluation Board View

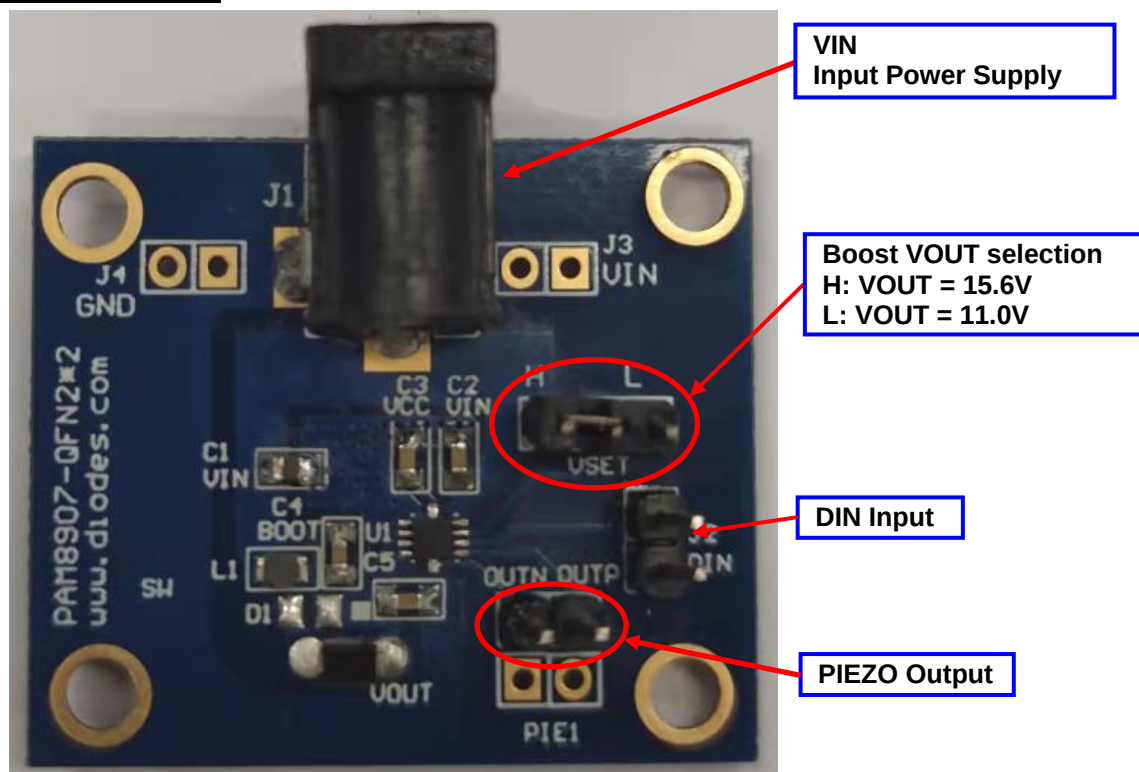


Figure 2. Evaluation Board View

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.

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

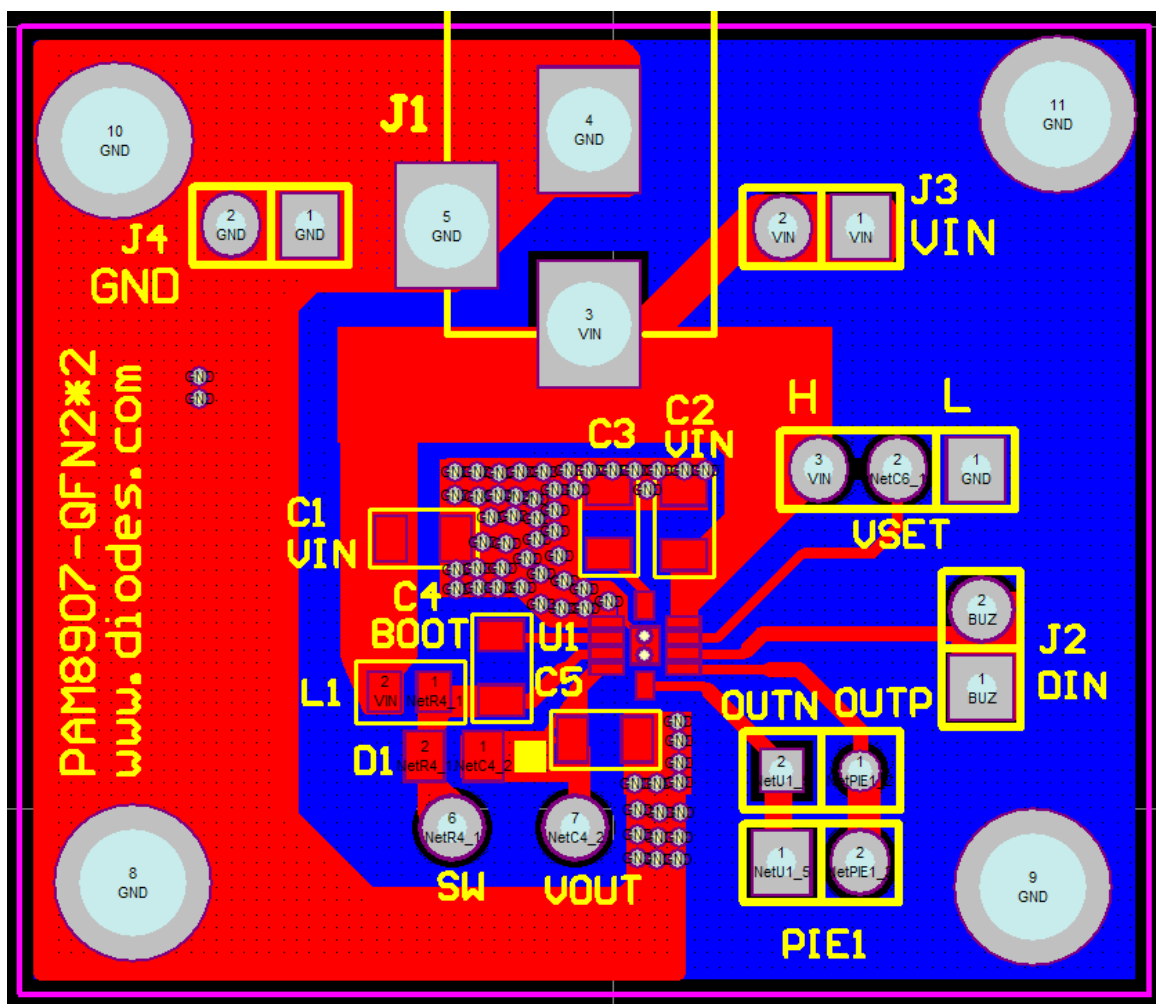


Figure 3. PCB Top Layer

PCB Layout Example (continued)

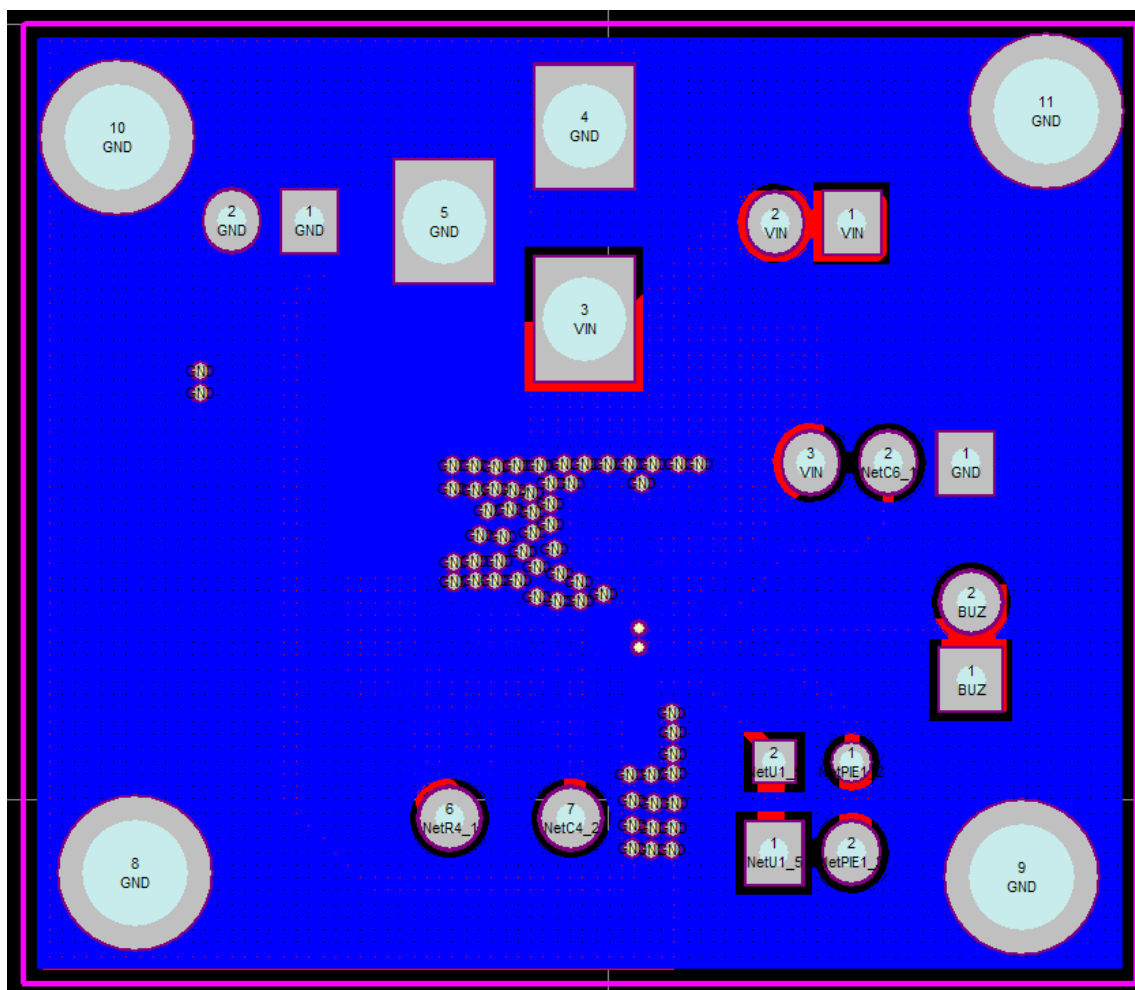


Figure 4. PCB Bottom Layer

Bill of Materials

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

Item	Value	Type	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	Type	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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