

PAM8012-EV Board User Guide

AE Department

1. Revision Information

Date	Revision	Description	Comment
2011/06/09	V1.0	Initial Release	

2. Key Features

- 1.0W/2.0W@<1% THD Output with a 8Ω/4ΩLoad at 5V Supply
- Supply Voltage from 2.5V to 5.5 V
- Maximum Output Power Can Be Set by One External Resistor
- Auto Recovering Short Circuit Protection
- Minimized ON/OFF Pop Noise
- Over Temperature Protection
- Superior Low Noise
- 9 Ball, 1.3mm x 1.3mm, 0.4mm Pitch WCSP
- High PSRR

3. EV Board Schematic

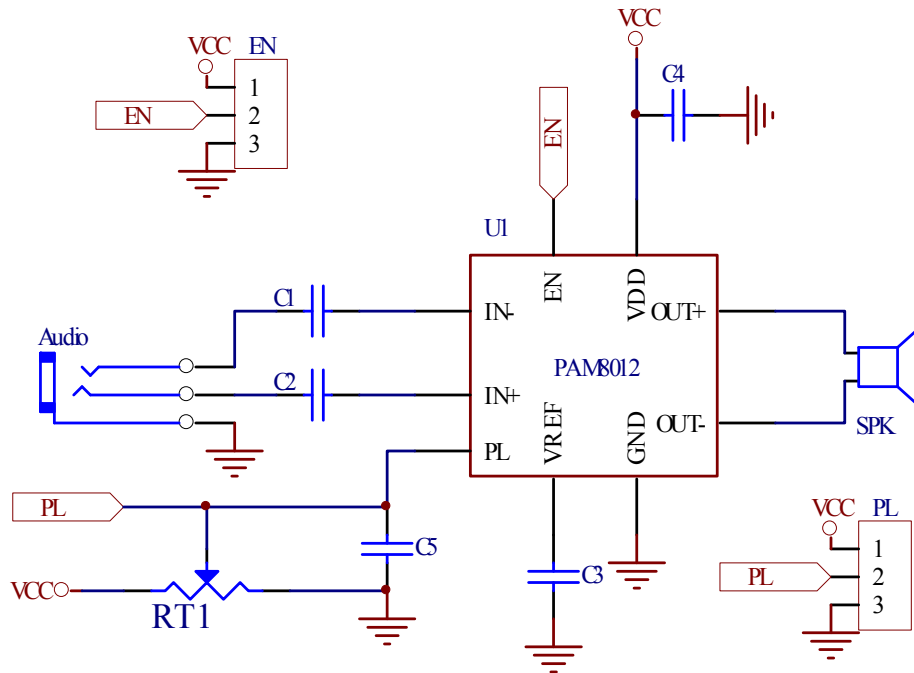


Figure 1

4. PAM8012 TB13AA Description

The PAM8012 is a 2.0W mono filter less class-D amplifier with high PSRR and differential input that reduce noise.

Features like 89% efficiency and small PCB area make the PAM8012 Class-D amplifier ideal for cellular handsets. The filter less architecture requires no external output filter, fewer external components, less PCB area and lower system costs, and simplifies application design.

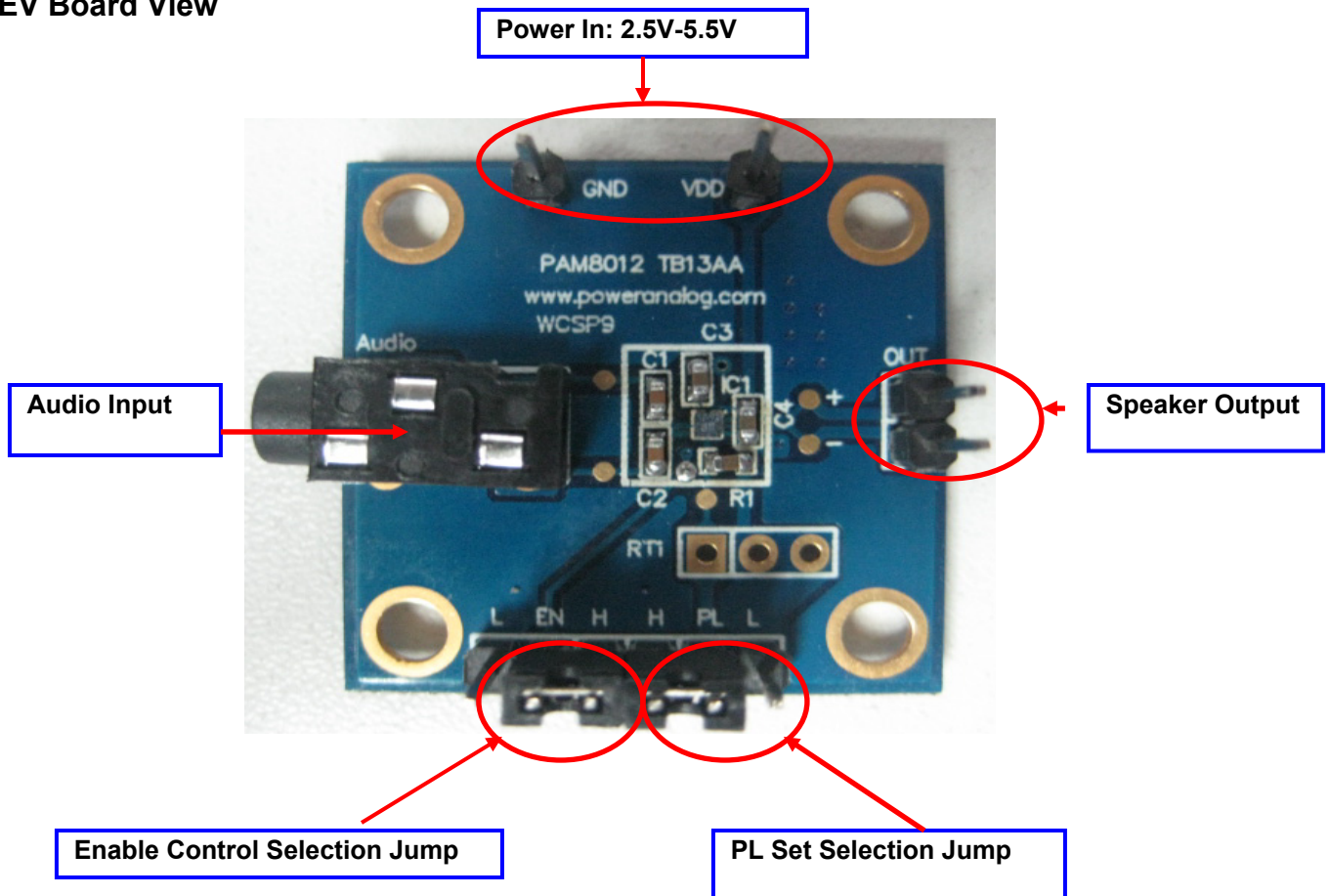
The PAM8012 features anti-saturation function which detect output signal clip due to the over input level and keep the output non-saturation automatically to get the excellent sound quality.

The maximum output power without clip can be set by one resistor at PL pin that to prevent the speaker to be damaged.

The PAM8012 features short circuit protection and over temperature protection.

The PAM8012 is available in tiny WCSP9 (1.3mm x 1.3mm) package.

5. EV Board View



EV board Operational sequence:

- Preset the power supply to between 2.5V and 5.5V.
- Turn off the power supply.
- Connect power supply to EV board power.
- Connect audio input from audio input jack.
- Connect the Speaker to the output jack
- Turn on the power supply

EV Board BOM List

Item	Value	Type	Rating	Description	Vender and port
C1,C2	0.1 μ F	X5R/X7R, Ceramic/0603	10V	Input coupling CAP	LMK063BJ104KP-F
C3	1 μ F	X5R/X7R, Ceramic/0603	10V	VREF decoupling CAP	TMK107B7105KA-T
C5	1 μ F	X5R/X7R, Ceramic/0603	10V	PL decoupling CAP	TMK107B7105KA-T
C4	1 μ F	X5R/X7R, Ceramic/0805	10V	VDD decoupling CAP	TMK107B7105KA-T

6. External Components Selection

Input Capacitors (C1, C2)

- (1) Form a high pass filter with R_i , and the cut off frequency is $f_c = 1/2\pi R_i C_i$
- (2) Have a tolerance of 10% or better for matching: any mismatch in capacitance causes an important mismatch at the corner frequency.
- (3) Low leakage current needed, 1 μ F, X5R/X7R ceramic

Power Supply decoupling Caps (C4)

- (1) Low ESR for good THD, PSRR
- (2) C4, Additional 1 μ F or greater for low frequency noise filtering and serves as a local storage capacitor for supplying current during large signal transients on the amplifier outputs
- (3) Need place very closed to the IC

VREF Capacitor (C3)

- (1). 1 μ F ceramic recommend
- (2). Need place very closely to the pin for good THD, PSRR

7. PCB Layout Guidelines

Grounding

- (1). Use plane grounding
- (2). Output noise grounds must tie to system ground at the power in exclusively.
- (3). Signal currents for the inputs need to be returned to quite ground.

This ground only ties to the signal components and the GND pin.

Power Supply

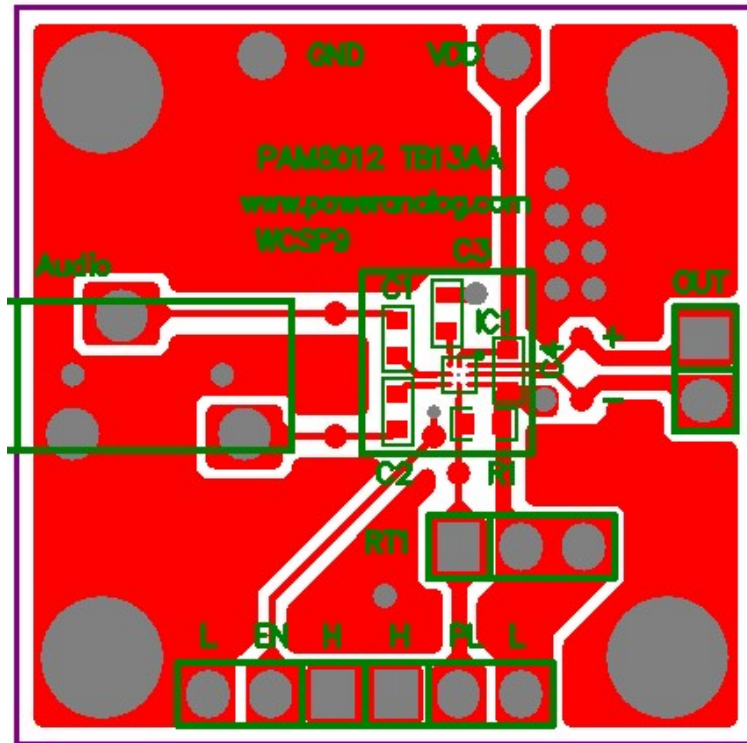
- (1) Recommend that the all the trace could be routed as short and thick as possible.
- (2) Any barricade placed in the trace could result in the bad performance of the amplifier.

Others

- (1) The power supply capacitors (C4) need to place very close to the PAM8012's pins.
- (2) Input capacitors (C1, C2) place closed to input pin as near as possible

8. PCB Layout Guidelines

Top Layer



Bottom Layer

