



Using the demonstration board for the TS472 low noise microphone preamplifier with 2 V bias

Introduction

This application note describes the STEVAL-CCA023V1 demonstration board, specifically designed to evaluate the TS472 microphone preamplifier.

The document provides information on:

- the layout of the demonstration board,
- the board's components.

About the TS472

The TS472 is an advanced microphone preamplifier solution, especially intended for mobile multimedia applications, with the following key features.

- Low noise: 10 nV/ $\sqrt{\text{Hz}}$ typ. equivalent input noise at $F = 1 \text{ kHz}$
- Fully-differential input/output
- 2.2 to 5.5 V single supply operation
- Low power consumption at 20 dB: 1.8 mA
- Fast start-up time at 0 dB: 5 ms typ.
- Low distortion: 0.1% typ.
- 40 kHz bandwidth at -3 dB and adjustable gain
- Active low standby mode function (1 μA max)
- Low noise 2.0 V microphone bias output
- Available in flip-chip lead-free package and QFN24 4 x 4 mm
- ESD protection (2 kV)

Refer to the TS472 datasheet for complete device information.

1 Description of the demonstration board

The STEVAL-CCA023V1 is a demonstration board designed for the TS472 low noise microphone preamplifier with 2.0 V bias and active-low standby mode.

This demonstration board helps you to customize the conditions in which you conduct evaluation testing. Specifically, you can:

- set the adjustable gain of the TS472 device,
- use the TS472 built-in 2.0 V bias voltage to bias an electret microphone,
- or, externally bias the electret microphone.

1.1 Setting the adjustable gain

The gain of the TS472 is set by using the P5 connectors.

The connector has 7 jumper positions. By modifying the jumper positions, you can select any of the following gain values:

- -1.5 dB (minimum possible gain)
- 0 dB
- 10 dB
- 20 dB
- 30 dB
- 40 dB
- 41 dB (maximum possible gain)

Refer to [Table 1: Demonstration board connector description](#) to see how to place the jumper to obtain the desired gain value.

1.2 Output bias options

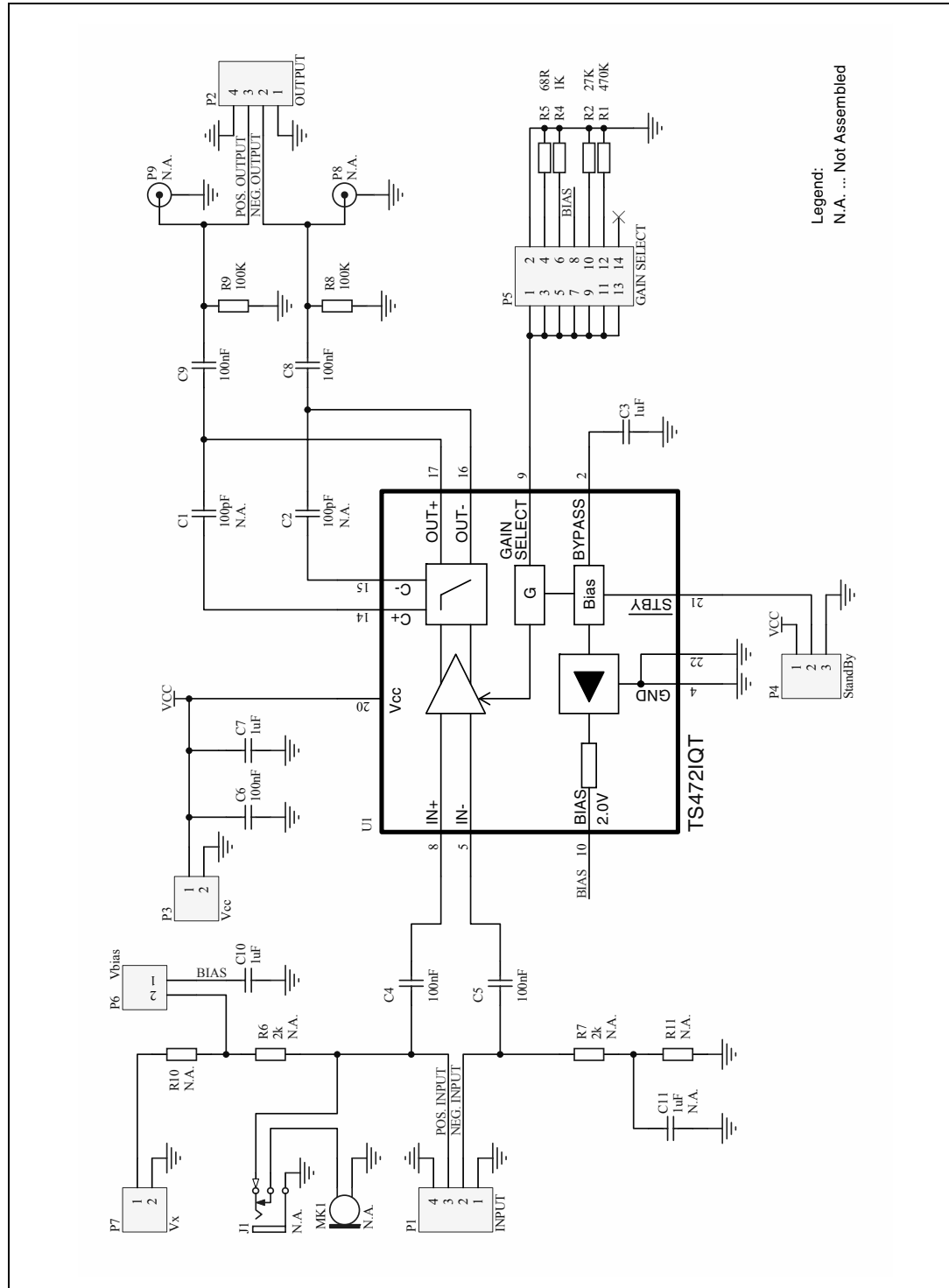
On the board, the R6, R7, R11 component locations are left empty to allow you to evaluate the TS472 in a typical application with an electret microphone biased by the TS472's built-in 2.0 V low noise bias output. To use the TS472's built-in biasing, the P6 connector must be closed and P7 must be left floating (refer to [Table 1: Demonstration board connector description](#)).

Alternatively, you can use the R10 empty component locations to externally bias the electret microphone. To do this:

1. connect the external bias voltage using the P7 connector.
2. leave the P6 connector open.
3. assemble the missing components.

3 Schematic diagram

Figure 1. Demonstration board schematic diagram



Legend:
N.A. ... Not Assembled

Table 2. Component list for the TS472 demonstration board

| Board marking | Quantity | Description |
|--------------------|----------|--|
| C1, C2 | 0 | Not assembled, 0805 |
| C3, C7, C10 | 3 | Capacitor 1 μ F/10 V, 0805 |
| C4, C5, C6, C8, C9 | 5 | Capacitor 100 nF/50 V, 0805 |
| C11 | 0 | Not assembled, 0805 |
| R1 | 1 | Resistor 470 k/100 mW, 1%, 0805 |
| R2 | 1 | Resistor 27 k/100 mW, 1%, 0805 |
| R4 | 1 | Resistor 1 k/100 mW, 1%, 0805 |
| R5 | 1 | Resistor 68 R/100 mW, 1%, 0805 |
| R6, R7, R10, R11 | 0 | Not assembled, 0805 |
| R8, R9 | 2 | Resistor 100 k/100 mW, 1%, 0805 |
| P1, P2 | 2 | Vertical pin header 1x4, 2.54 mm pitch |
| P3, P6, P7 | 3 | Vertical pin header 1x2, 2.54 mm pitch |
| P4 | 1 | Vertical pin header 1x3, 2.54 mm pitch |
| P5 | 1 | Vertical pin header 2x7, 2.54 mm pitch |
| U1 | 1 | TS472IQT |

4 Demonstration board layout

The following schematics show the different layers and top view of the demonstration board.

Figure 2. PCB top layer

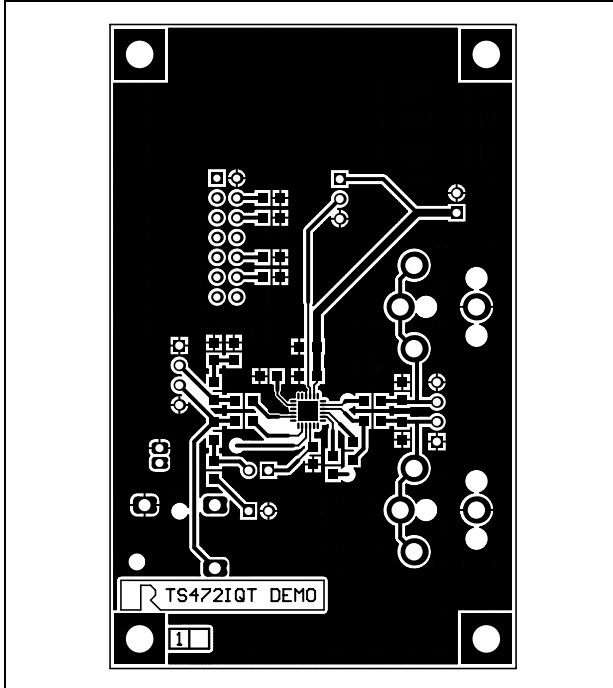


Figure 3. PCB bottom layer

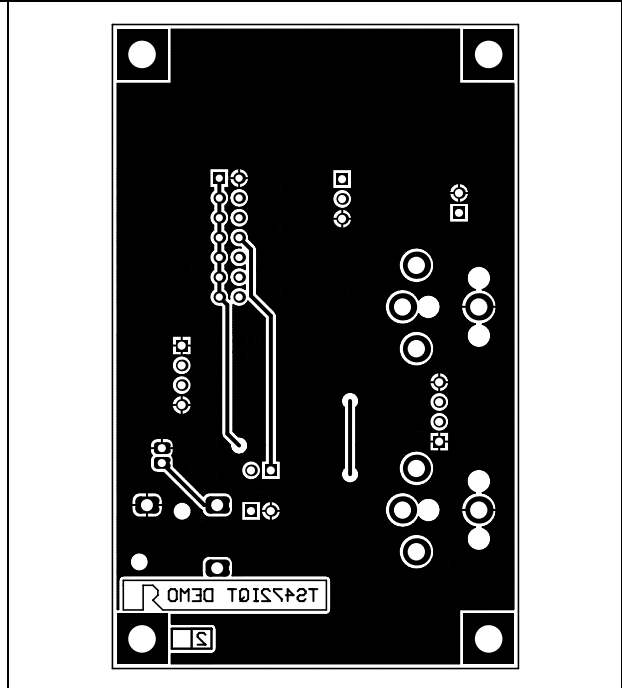
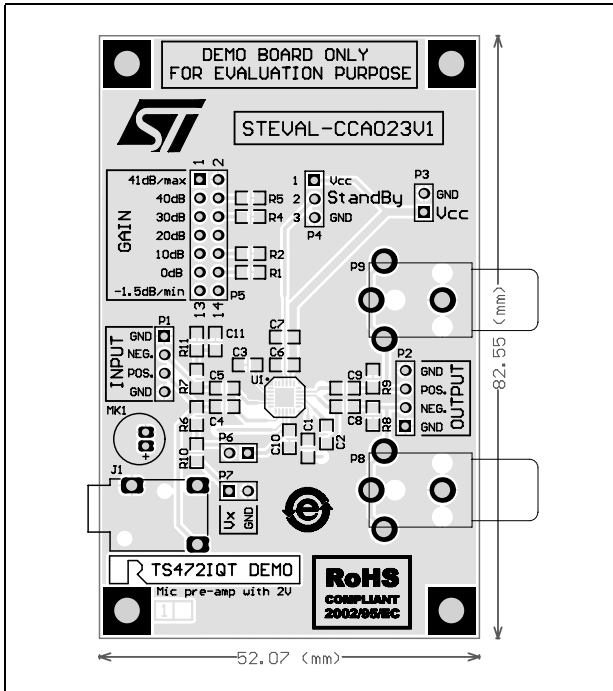


Figure 4. Top view of components layout



5 Conclusion

To order the board online, go to http://www.st.com/stonline/domains/buy/buy_dev.htm, and use the order code STEVAL-CCA023V1.

6 Revision history

Table 3. Document revision history

| Date | Revision | Changes |
|-------------|----------|--|
| 13-Jul-2006 | 1 | Initial release. |
| 4-Aug-2006 | 2 | Editorial updates. No technical changes. |
| 6-Mar-2007 | 3 | Added QFN package information. |
| 26-Aug-2009 | 4 | Changed PCB layouts in Chapter 4 . |

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