

Analog Output MEMS Microphone Flex Evaluation Board User Guide

GENERAL DESCRIPTION

This user guide applies to the following MEMS microphone evaluation boards:

- EV_INMP404-FX
- EV_INMP405-FX
- EV_INMP504-FX
- EV_INMP510-FX
- EV_ICS-40180-FX
- EV_ICS-40181-FX
- EV_ICS-40310-FX

This is a simple evaluation board that allows quick evaluation of the performance of single-ended analog MEMS microphones. The small size and low profile of the flexible PCB enables direct placement of the microphone into a prototype or an existing design for an in situ evaluation. The evaluation board consists of a bottom port microphone soldered to a flexible PCB with color-coded wires attached. The only other component on the board is a 0.1 μ F supply bypass capacitor.

Table 1 describes the functions of the three connection wires. Table 2 describes the functional differences between the different microphones that are used with this flex circuit.

TABLE 1. PIN FUNCTION DESCRIPTIONS

| Wire Color | Microphone Pin | Description |
|------------|----------------|--|
| Red | VDD | Power Supply. 1.5 V DC to 3.6 V DC; (0.9 V DC to 1.3 V DC for ICS-40310) |
| White | OUTPUT | Analog Output Signal |
| Black | GND | Ground |

TABLE 2. MICROPHONE FUNCTIONAL DIFFERENCES

| Microphone | Maximum Supply Current | Maximum Output Voltage | Output Impedance | DC Offset |
|------------|------------------------|------------------------|------------------|-----------|
| INMP404 | 250 μ A | 0.18 V rms | 200 Ω | 0.8 V |
| INMP405 | 250 μ A | 0.18 V rms | 200 Ω | 0.8 V |
| INMP504 | 225 μ A | 0.18 V rms | 200 Ω | 0.8 V |
| INMP510 | 250 μ A | 0.40 V rms | 350 Ω | 0.7 V |
| ICS-40180 | 260 μ A | 0.40 V rms | 350 Ω | 0.7 V |
| ICS-40181 | 250 μ A | 0.40 V rms | 350 Ω | 0.7 V |
| ICS-40310 | 25 μ A | 0.12 V rms | 4.5 k Ω | 0.57 V |

EVALUATION BOARD CIRCUIT

Figure 1 shows the schematic of the evaluation board, and Figure 2 shows the flex board layout. See the respective microphone data sheets for complete descriptions and specifications of the microphones. Note that the layout for the EV_ICS-40181-FX differs slightly from what is shown in Figure 2 because of this part’s different package footprint, but the routing of the three signals is consistent.



Figure 1. Evaluation Board Schematic



Figure 2. Evaluation Board Layout (Top View)

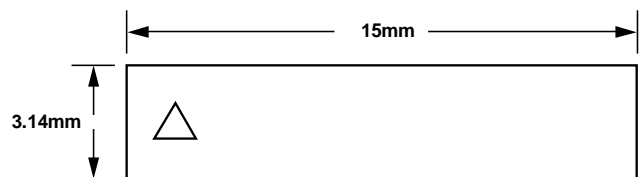


Figure 3. Evaluation Board Dimensions in Millimeters (Wires Not Included)

BOTTOM PORT EVALUATION BOARD PHOTOGRAPH



Figure 4. Top and Bottom View

TOP PORT EVALUATION BOARD PHOTOGRAPH

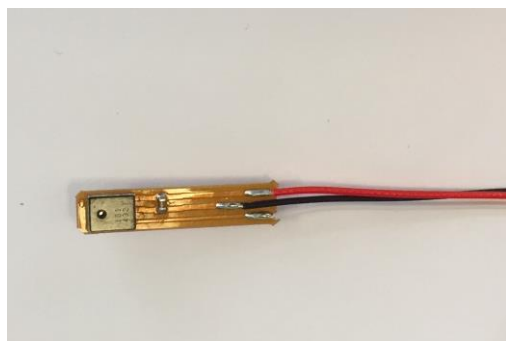


Figure 5. Top View

REVISION HISTORY

| REVISION DATE | REVISION | DESCRIPTION |
|---------------|----------|--|
| 10/14/2015 | 1.3 | This v1.3 is the initial release in Agile. Previous revisions were uncontrolled. |
| 03/26/2015 | 1.4 | Updated part names, added Figure 5 |

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