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 µF 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 µA	0.18 V rms	200 Ω	0.8 V
INMP405	250 µA	0.18 V rms	200 Ω	0.8 V
INMP504	225 µA	0.18 V rms	200 Ω	0.8 V
INMP510	250 µA	0.40 V rms	350 Ω	0.7 V
ICS-40180	260 µA	0.40 V rms	350 Ω	0.7 V
ICS-40181	250 µA	0.40 V rms	350 Ω	0.7 V
ICS-40310	25 µA	0.12 V rms	4.5 kΩ	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.

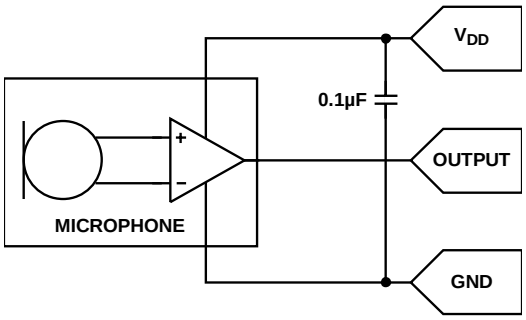

Figure 1. Evaluation Board Schematic

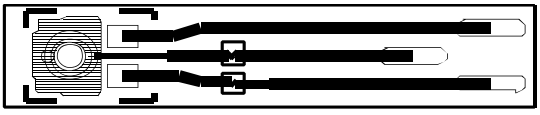

Figure 2. Evaluation Board Layout (Top View)

InvenSense reserves the right to change the detail specifications as may be required to permit improvements in the design of its products.

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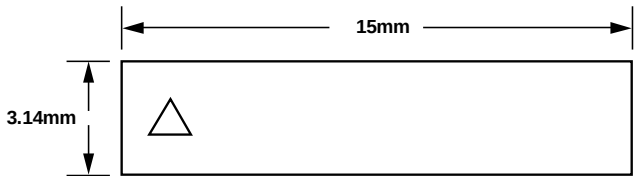

Figure 3. Evaluation Board Dimensions in Millimeters (Wires Not Included)

BOTTOM PORT EVALUATION BOARD PHOTOGRAPH

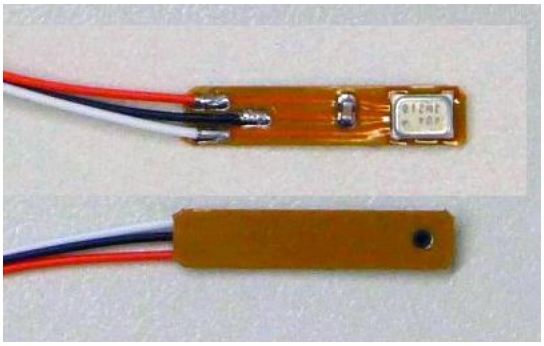

Figure 4. Top and Bottom View

TOP PORT EVALUATION BOARD PHOTOGRAPH

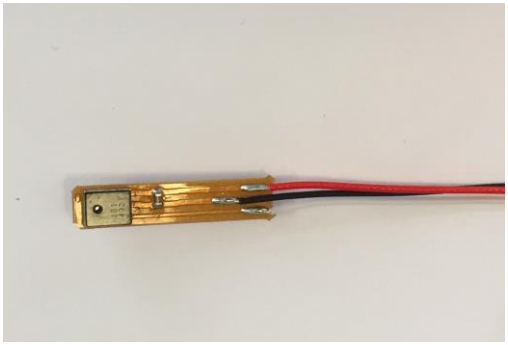

Figure 5. Top View

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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