

PDM Digital Output MEMS Microphone Flex Evaluation Board User Guide

GENERAL DESCRIPTION

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

- EV_ICS-41350-FX
- EV_ICS-41351-FX
- EV_ICS-51360-FX
- EV_INMP421-FX
- EV_INMP521-FX
- EV_INMP522-FX
- EV_INMP621-FX
- EV_T3902-FX
- EV_T5818-FX

This is a simple evaluation board that allows quick evaluation of the performance of PDM 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 0.1μF supply bypass capacitor.

Table 1 describes the functions of the five 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
Blue	DATA	PDM digital output signal
Red	VDD	Power supply, 1.62 V to 3.63 V DC
White	CLK	Clock input
Black	GND	Ground
Yellow	L/R SELECT	Left /right channel select
		DATA1 (right): L/R SELECT tied to GND
		DATA2 (left): L/R SELECT pulled to V _{DD}

TABLE 2. MICROPHONE FUNCTIONAL DIFFERENCES

Mics are bottom port unless specified otherwise

Microphone	Maximum Supply Current	Sensitivity	Clock Frequency
ICS-41350	0.65 mA	-26 dB FS	400 kHz to 3.3 MHz
		-32 dB FS	4.1 to 4.8 MHz
ICS-41351 (Top port)	0.6mA	-26 dB FS	690 kHz to 2.65 MHz
		-35.5 dB FS	2.97 to 3.6 MHz
ICS-51360	0.59mA	-26 dB FS -36 dB FS	690 to 800 kHz 1.0 to 4.8 MHz
INMP421	0.65 mA	-26 dB FS	1.0 to 3.3 MHz
INMP521	1.2 mA	-26 dB FS	1.25 to 3.072 MHz
INMP522	1.2 mA	-26 dB FS	0.9 to 3.6 MHz
INMP621	1.3 mA	-46 dB FS	0.9 to 3.6 MHz
T3902	0.65 mA	-26 dB FS	400 kHz to 3.3 MHz
		-32 dB FS	4.1 to 4.8 MHz
T5818	0.59 mA	-26 dB FS	400 to 800 kHz
		-41 dB FS	2.0 to 3.3 MHz

EVALUATION BOARD CIRCUIT

Figure 1 shows the schematic of the evaluation boards; Figure 2 (EV_ICS-41350-FX), Figure 3 (all other bottom port) and Figure 4 (EV_ICS-41351-FX) show the flex board layouts. See the respective microphone data sheets for complete descriptions and specifications of the microphones.

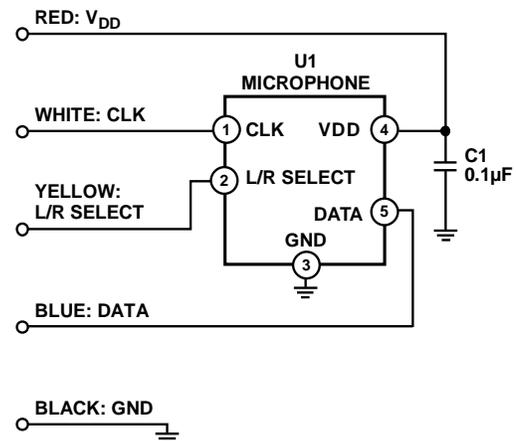


Figure 1. Evaluation Board Schematic

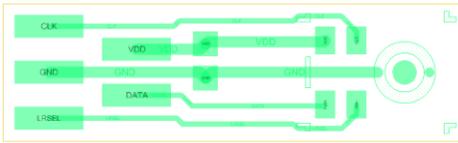


Figure 2. EV_ICS-41350-FX Board Layout (Top View)

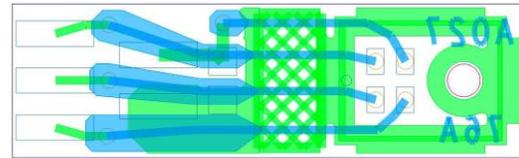


Figure 3. Bottom Port Mic Evaluation Board Layout (Top View)

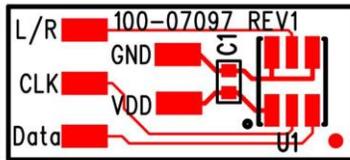


Figure 4. EV_ICS-41351-FX Board Layout (Top View)

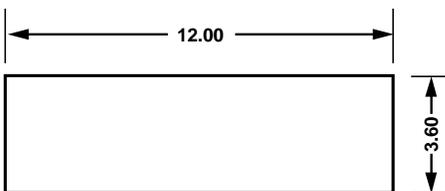


Figure 5. Bottom Port Evaluation Board Dimensions in Millimeters (Wires Not Included)

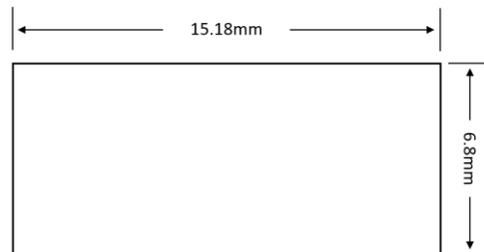


Figure 6. Top Port Evaluation Board

EVALUATION BOARD PHOTOGRAPHS

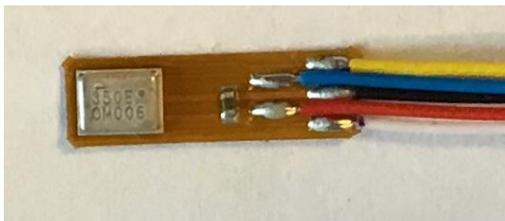


Figure 7. EV_ICS-41350-FX Top View

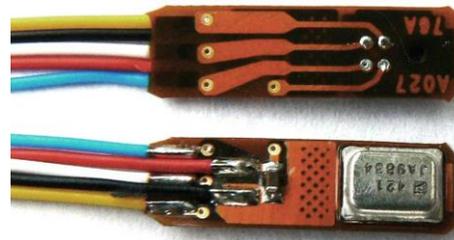


Figure 8. Bottom Port Mic Top and Bottom View (All Others)

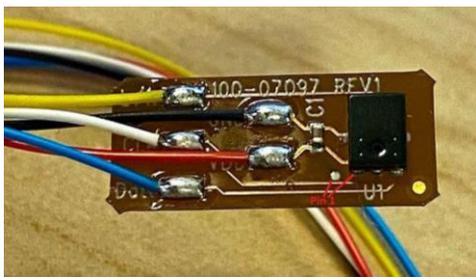


Figure 9. EV_41351-FX Top View

REVISION HISTORY

REVISION DATE	REVISION	DESCRIPTION
3/11/2015	1.0	Initial Release
1/25/2016	1.1	Added EV_ICS-41350-FX
6/1/2020	1.2	Added EV_ICS-41351-FX, EV_ICS-51360-FX, EV_T3902-FX, EV_T5818-FX

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