

EV_MOD_ICU-30201-01

Evaluation Module User Guide

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1 SCOPE AND PURPOSE

This document details the specification, programming, operation, and basic performance of an EV_MOD_ICU-30201-01 ultrasonic sensor evaluation module. This module board incorporates the ICU-30201 Ultrasonic Sensor device with a 55° Field-of-View (FoV) acoustic housing assembly, PIF, two capacitors and an connector.



Figure 1. EV_MOD_ICU-30201-01 Evaluation Board

2 EV_MOD_ICU-30201-01 EVALUATION MODULE BOARD

2.1 PIN ASSIGNMENTS

Table 1. Connector Pinout

PIN	NAME	DESCRIPTION
1	VDD	Digital Logic Supply. Connect to externally regulated 1.8V +/-5% supply. Suggest common connection to AVDD. If not connected locally to AVDD, bypass with a 0.1μF capacitor close to VDD & GND pad.
2	GND	Ground
3	MUTCLK	External Input/Output 16x Operating Frequency Reference Clock (optional)
4	RTC_CLK	External Input/Output Low Frequency Reference Clock - 32.768kHz typical (optional)
5	INT2	Interrupt Request Open Drain Input/Output 2
6	INT1	Interrupt Request Open Drain Input/Output 1
7	CS_B	SPI Chip Select (active-low, from external SPI host)
8	MISO	MCU In Sensor Out serial data (to external SPI host)
9	MOSI	MCU Out Sensor In serial data (from external SPI host)
10	SCLK	SPI Interface Clock (from external SPI host) CPOL=1, CPHA=1
11	GND	Ground
12	VDDIO	I/O Power Supply. Connect to externally regulated 1.8V +/-5% or 3.3V +/-10% supply. Bypass with a 1μF capacitor close to VDDIO & GND pad.
13	GND (pad)	Ground
14	GND (pad)	Ground

2.2 ELECTRICAL SPECIFICATIONS

Please refer to DS-000524 ICU-30201 Datasheet for information on the device's electrical characteristics. Please note that the ICU-30201 electrical specifications in the datasheet still apply with different suffixes.

2.3 SCHEMATIC

Electrical connection to the EV_MOD_ICU-30201-01 module is via a 12-pin 0.5 mm pitch flat flex cable (FFC) connector. The electrical schematic of the board, including the connector pinout and the connections to the ICU-30201 sensor, is shown in Figure 2. Part numbers for the FFC connector and the recommended FFC cable correspond to the bill of materials listed in Section 2.4. Refer to the ICU-30201 datasheet and application notes for additional information on electrical connections and operation.

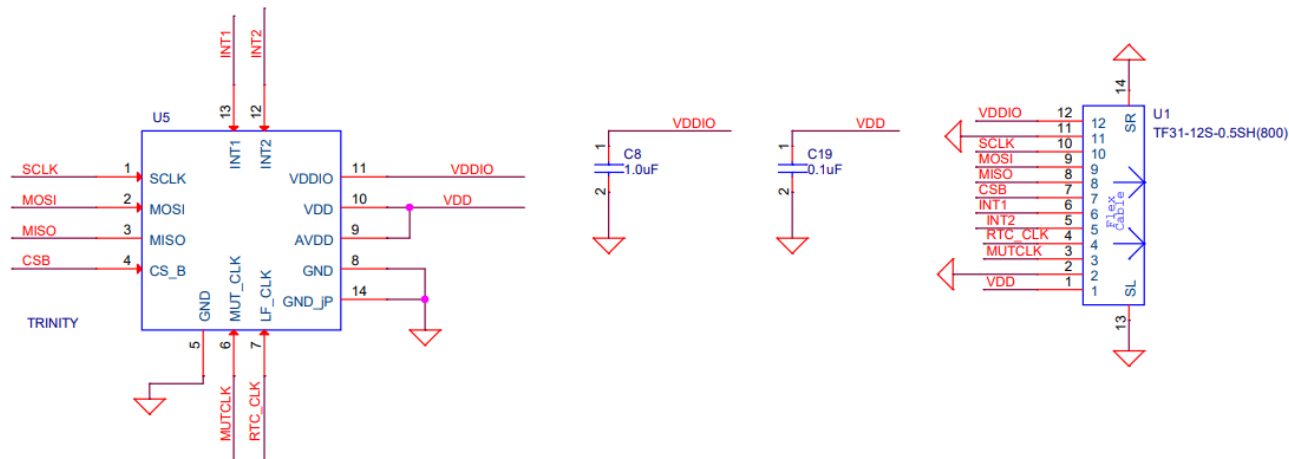


Figure 2. Schematic

2.4 BILL OF MATERIALS

Table 2. Bill of Material

QTY	REFERENCE	PART	PCB FOOTPRINT	MANUFACTURER	MANUFACTURER PART NUMBER
1	PCB	PCB, ICU-X201	N/A	TDK	100-06385
1	U5	ICU-30201	14-pin	TDK	ICU-30201
1	U1	CONN FFC 12POS 0.50MM SMD	12-pin, 0.50mm pitch	Hirose Electric Co Ltd	TF31-12S-0.5SH(800)
1	C8	CAP CER 1UF 16V 10% X6S 0402	0402	TDK	C1005X6S1C105K050BC
1	C19	CAP CER 0.1UF 25V 10% X7R 0402	0402	TDK	C1005X7R1H104K050BB
1		PIF, MESH		Saati	Acoustex B042HY (Custom)
1		ACOUSTIC HOUSING 55° FoV		TDK	AH-31057-055055-A1

Table 3. Recommended Flat Flex Cable and Connector

FLAT CABLE CONNECTOR TYPE	Hirose: TF31-12S-0.5SH(800) Datasheet
RECOMMENDED FLAT CABLE	MultiComp Pro: MP-FFCA05123052A Datasheet

2.5 BREAKOUT CONNECTIONS

A breakout board, 100-06407, can be used along with an FFC cable to access each pin connection. This can be used for debugging or to match electrical connections to another device.

3 MECHANICAL SPECIFICATIONS

3.1 MODULE DIMENSIONS

The outer dimensions of the EV_MOD_ICU-30201-01 assembly are shown in Figure 3. The acoustic housing mouth has a diameter of 8mm. During transducer operation the port must not be blocked. The sensor's port may only be covered by a particle ingress filter (PIF). Refer to AN-000458 EV_ICU-30201-00 Evaluation Board User Guide for additional specs of the PCBA.

Table 4. Geometric Dimensions for EV_MOD_ICU-30201-01

EV_MOD_ICU-30201-01	DIMENSION	UNIT
Acoustic housing mouth diameter	8.00	mm
Acoustic housing throat diameter	1.60	mm
Maximum PCB length and width	12.65 x 12.65	mm
PCB Thickness	0.60	mm

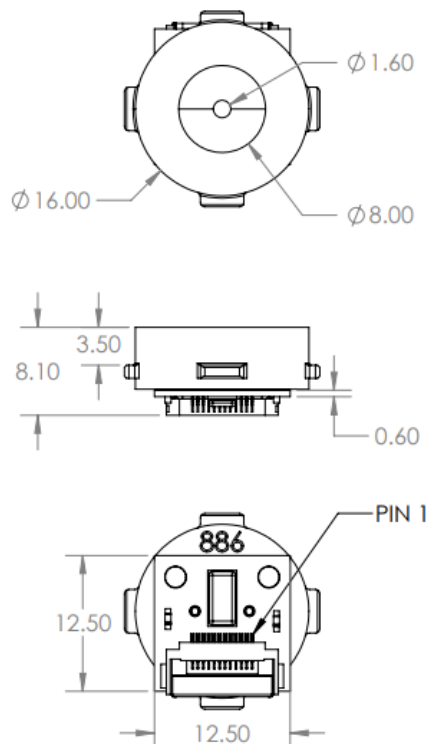


Figure 3. Dimensions of the EV_MOD_ICU-30201-01 Assembly

3.2 ACOUSTIC HOUSING

Refer to documentation for AH-31057-055055-A1 for additional specifications of the acoustic housing used on this module.

4 CONFIGURATION, PROGRAMMING, AND OPERATION

Please refer to DS-000540 ICU-30201 Datasheet for information on the device's electrical characteristics.

4.1 CONFIGURATION AND PROGRAMMING

Please refer to the following documents for configuration and programming information:

- AN-000175 SonicLib Programmers Guide
- AN-000329 ICU-x0201 Hello Chirp Example User Guide

4.2 OPERATION

Please refer to the following documents for operation information:

- AN-000398 ICU-x0201 EVK Platform User Guide

5 REVISION HISTORY

REVISION DATE	REVISION	DESCRIPTION
02/22/2024	1.0	Initial Release

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