LAN9360 Evaluation Board V2.3.0

(EVB-LAN9360)

User's Guide

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Preface

NOTICE TO CUSTOMERS

All documentation becomes dated, and this manual is no exception. Microchip tools and documentation are constantly evolving to meet customer needs, so some actual dialogs and/or tool descriptions may differ from those in this document. Please refer to our web site (www.microchip.com) to obtain the latest documentation available.

Documents are identified with a "DS" number. This number is located on the bottom of each page, in front of the page number. The numbering convention for the DS number is "DSXXXXXA", where "XXXXX" is the document number and "A" is the revision level of the document.

INTRODUCTION

This chapter contains general information that will be useful to know before using the EVB-LAN9360. Topics discussed in this chapter include:

- Intended Use
- Document Layout
- Term Definitions
- Recommended Reading
- Customer Support
- Document Revision History

INTENDED USE

This Microchip product is intended to be used for developing or testing AVB Audio End-point cases of application by persons with experience in developing multimedia devices.

Note: The operation of this Microchip product is only admitted with original Microchip devices.
Do not interfere with the product's original state. Otherwise user safety, faultless operation and electromagnetic compatibility are not ensured.
To avoid electric shocks and short circuits use this device only in an appropriate environment.
This open device may exceed the limits of electromagnetic interference. Electromagnetic compatibility can be only achieved if the equipment is built into an appropriate housing.

DOCUMENT LAYOUT

This user's guide describes how to use the EVB-LAN9360. The document is organized as follows:

- Chapter 1, Introduction – This chapter introduces the EVB-LAN9360, lists the board features and shows the functional block diagram.
- Chapter 2, PHY Daughter Board – This chapter gives an overview of LAN PHY daughter boards.
- Chapter 3, Board Details – This chapter lists the electrical characteristics of the board. Furthermore, it describes the board components including connectors, jumpers, LEDs and buttons.
- Chapter 4, Configuration Options – This chapter lists some configuration options applicable with the board.
- Chapter 5, Assembly Plan and Mechanical Dimensions – This chapter shows the top- and bottom view of the board and the mechanical dimensions.
- Appendix A – This chapter shows a block diagram of the board including the jumpers that are required for board configuration.
- List of Figures
- List of Tables

TERM DEFINITIONS

This user's guide uses the following term definitions:

Term	Description
AVB	Audio Video Bridging
AVTP	Audio Video Transport Protocol
gPTP	Generalized Precision Time Protocol
LED	Light Emitting Diode
MEMS	Micro-Electro-Mechanical Systems
NC	Not Connected
PDM	Pulse-Density Modulation
PPS	Pulse per second
RTP	Real Time Protocol
USB	Universal Serial Bus

RECOMMENDED READING

This user's guide describes how to use the EVB-LAN9360. Other useful documents[1] are listed below.

[1] LAN8770 Data Sheet, Microchip

[2] LAN9360 Data Sheet, Microchip

1. To access these documents, it is required to submit a technical support case. Go to http://www.microchip.com/support. This directs you to the Microchip Technical Support Portal. If you are not acquainted with submitting a technical support case, read the article "How to submit a technical support case?".

CUSTOMER SUPPORT

Users of Microchip products can receive assistance through several channels:

- Distributor or Representative
- Local Sales Office
- Field Application Engineer (FAE)
- Technical Support

Customers should contact their distributor, representative or field application engineer (FAE) for support. Local sales offices are also available to help customers. A listing of sales offices and locations is included in the back of this document.

Technical support is available through the web site at:

http://www.microchip.com/support.

DOCUMENT REVISION HISTORY

Revision A (May 2021)

- Initial release of this document.

NOTES:

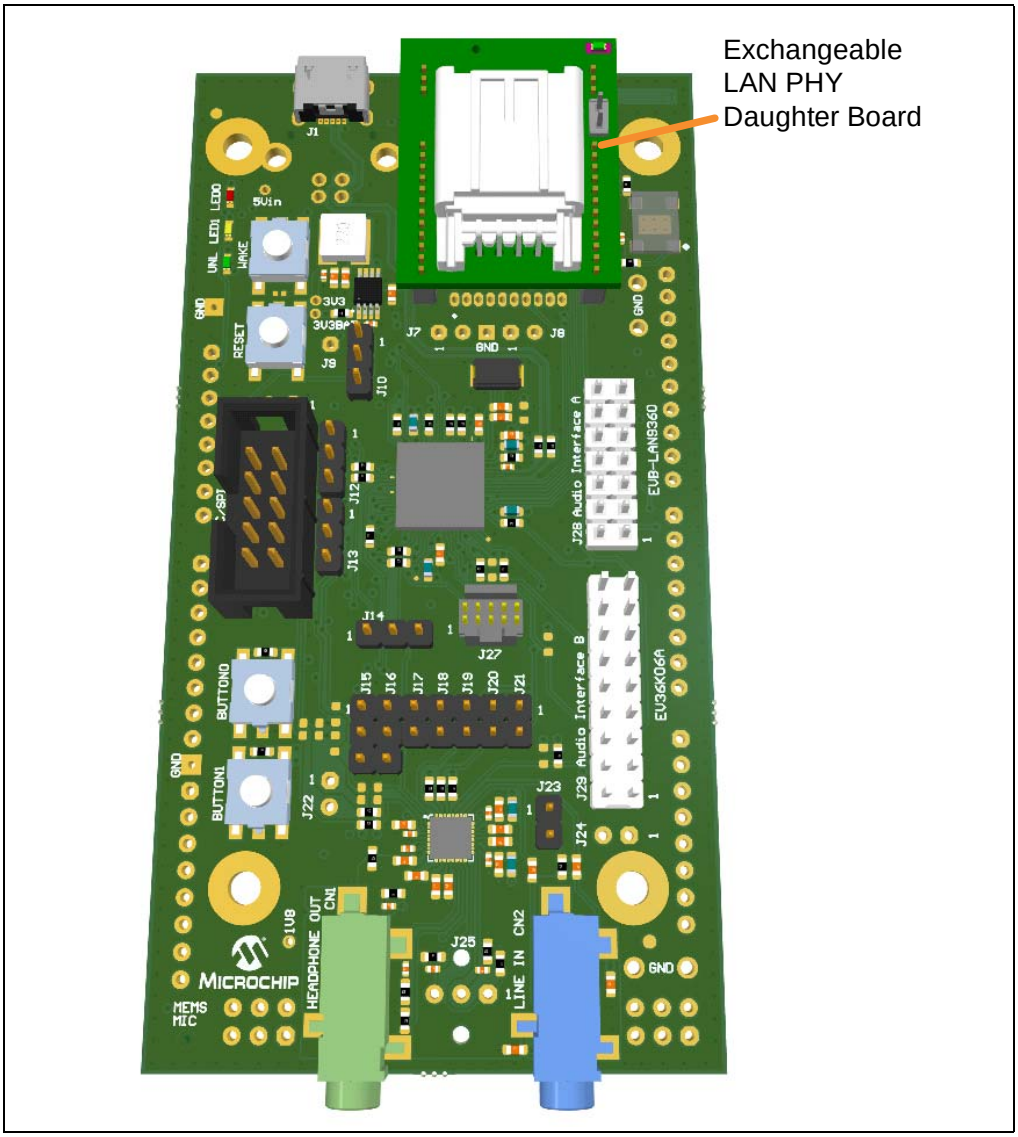
Chapter 1. Introduction

The EVB-LAN9360 is used to simulate an AVB Ethernet Endpoint that can be operated either as a Listener or a Talker. For that, the board provides a variety of functionalities that allow to prototype different types of Ethernet devices, such as a:

- remote amplifier,
- remote microphone or
- remote microphone array.

An image of the board (with an exchangeable LAN PHY daughter board) is shown in Figure 1-1.

FIGURE 1-1: EVB-LAN9360



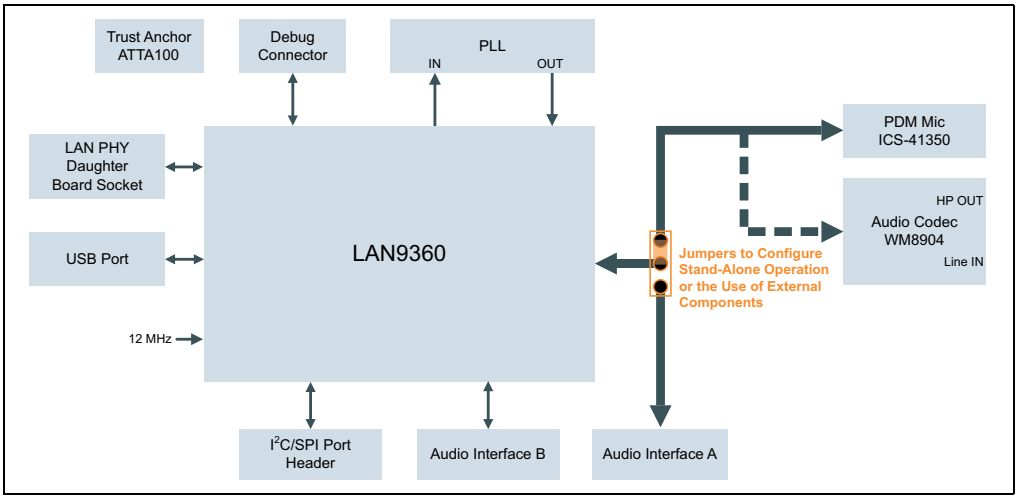
1.1 PRODUCT FEATURES

- Supports the following standards (and protocols):
  - IEEE Std 802.1AS™-2011 generalized Precision Time Protocol (gPTP) slave: time synchronization over the network
  - IEEE Std 1722™-2016 (AVTP), Talker and Listener
  - IEEE Std 1733™-2011 (AVB RTP Extension), Talker and Listener
- Microphone
  - One on-board PDM microphone (Micro-Electro-Mechanical Systems (MEMS) technology)
  - Support for external analog microphone
- Audio codec providing:
  - One analog stereo input
  - One analog stereo output

1.2 FUNCTIONAL DESCRIPTION

Figure 1-2 shows a simplified block diagram of the EVB-LAN9360.

FIGURE 1-2: BLOCK DIAGRAM



The EVB-LAN9360, assembled with a PDM microphone in MEMS technology and one stereo audio codec, can be used stand-alone to directly test or implement several configuration options (e.g., the board operates as a Talker and uses the Line In of the on-board codec).

Apart from the stand-alone use case, the board can be easily extended with customer components via on-board expansion connectors that allow external devices to be connected.

If the board should be run in stand-alone operation or if it uses external components can be configured by jumpers (simplified depicted in Figure 1-2; configuration details can be found in Figure A-1.

Chapter 2. PHY Daughter Board

As shown in Figure 1-1, the EVB-LAN9360 is designed in a way that allows to easily exchange the Ethernet transceiver (PHY) and connector. For this purpose Microchip Technology Inc. provides LAN PHY daughter boards:

- For 100BASE-TX applications the LAN PHY daughter board uses a KSZ8041[1]; for details refer to https://www.microchip.com/Developmenttools/ProductDetails/AC320004-5
- For 100BASE-T1 applications the LAN PHY daughter board uses a LAN8770 [1]; for details refer to https://www.microchip.com/Developmenttools/ProductDetails/EV48S68A
- For 10BASE-T1S applications please contact our Customer Support

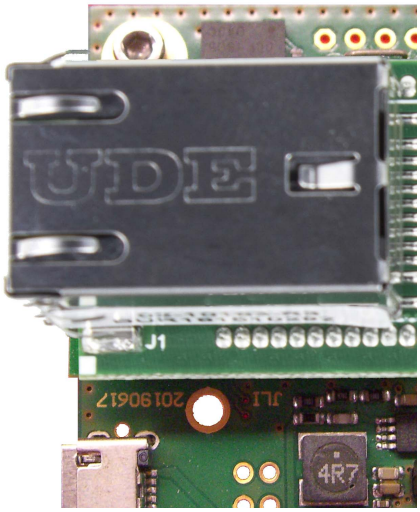
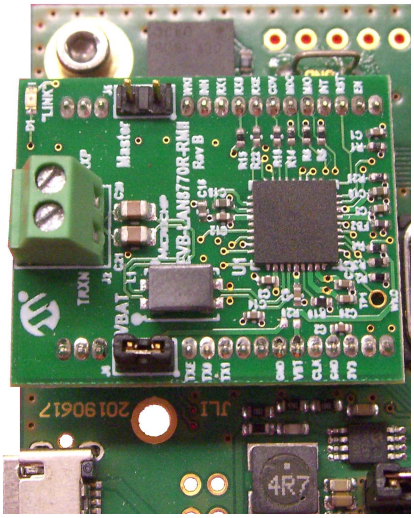
LAN PHY daughter boards must be connected to the EVB-LAN9360 by use of J2-J5, see Section 5.1.

Note: Connecting or changing LAN PHY daughter boards is only permitted when the device is detached from power. Hot plug is not supported and could damage the hardware.

Note: Repeated plugging and unplugging of LAN PHY daughter boards should be avoided due to the sensitivity of the connectors.

Figure 2-1 shows some examples of available LAN PHY daughter boards.

FIGURE 2-1: LAN PHY DAUGHTER BOARD EXAMPLES

KSZ8041 PHY Daughter Board	LAN8770R PHY Daughter Board
	

1. For custom designs, an automotive version "KSZ8051" is also available. For details refer to: https://www.microchip.com/wwwproducts/en/KSZ8051

NOTES:

Chapter 3. Board Details

3.1 ELECTRICAL CHARACTERISTICS

Parameter	Min.	Typ.	Max.	Unit
Board Current Consumption at	—	—	300	mA
Board Operating Voltage	4.5	5	5.5	V

3.2 CONNECTORS

3.2.1 CN1 and CN2 – Audio Sockets

These connectors are located on the top side of the board, see Section 5.1.

CN1 is used as Headphone Out connector.

CN2 is used as Line In connector.

Designator	Socket Type
CN1	SJ-3524-SMT-TR-GR, standard jack, stereo, 3.5 mm, green, from CUI Inc.
CN2	SJ-3524-SMT-TR-BE, standard jack, stereo, 3.5 mm, blue, from CUI Inc.
Suitable counter-piece: SP-3501, stereo plug, 3.5 mm male, from CUI Inc.	

3.2.2 J1 – USB Connector

This connector is located on the top side of the board, see Section 5.1.

Designator	Socket Type
J1	Standard type micro B
Suitable counter-piece: USB cable type A male/type micro B	

Table 3-1 shows the pin assignment of J1.

TABLE 3-1: USB CONNECTOR – PIN ASSIGNMENT

Pin	Description
1	VBUS
2	D-
3	D+
4	NC
5, 6, 7, 8, 9	GND

3.2.3 J2-J5 – LAN PHY Daughter Board Connector

These connectors are located on the top side of the board, see Section 5.1.

J2-J5 are used to attach a LAN PHY daughter board onto the EVB-LAN9360, see also Chapter 2.

3.2.4 J26 – I2C/SPI Connector

This connector is located on the top side of the board, see Section 5.1.

Designator	Socket Type
J26	612 010 235 121, 2x5 TH Header Shrouded 2.54 mm Pitch, from Würth Elektronik
Suitable counter-piece: WR-BHD	

Table 3-2 shows the pin assignment of J26.

TABLE 3-2: I2C/SPI CONNECTOR – PIN ASSIGNMENT

Pin	Description
1	B-SCL
2, 10	GND
3	B-SDA
4, 6	3.3 V
5	MISO
7	SPI-CLK
8	MOSI
9	/PCS

3.2.5 J28 – Audio Interface A Connector

This connector is located on the top side of the board, see Section 5.1.

J28 is used as serial synchronous controller interface. It serves as board extension for connecting external devices.

Designator	Socket Type
J28	TSW-107-07-G-D, 2.54 mm Pitch, from Samtec
Suitable counter-piece: SSW-107-01-G-D	

Table 3-3 shows the pin assignment of J28.

TABLE 3-3: AUDIO INTERFACE A CONNECTOR – PIN ASSIGNMENT

Pin	Description
1, 3, 5, 7, 9, 11, 13	GND
2	3.3 V
4	CLKEN
6	A-MCLK
8	SCKA
10	FSYA
12	SRA
14	SXA

3.2.6 J29 – Audio Interface B Connector

This connector is located on the top side of the board, see Section 5.1.

J29 is used as I^2S interface. It serves as board extension for connecting external devices.

Designator	Socket Type
J29	TSW-109-07-G-D, 2.54 mm Pitch, from Samtec
Suitable counter-piece: SSW-109-07-G-D	

Table 3-4 shows the pin assignment of J29.

TABLE 3-4: AUDIO INTERFACE B CONNECTOR – PIN ASSIGNMENT

Pin	Description
1, 3, 5, 7, 9, 11, 13, 15, 17	GND
2	3.3 V
4	CLKEN
6	A-MCLK
8	SCKB
10	FSYB
12	SRB
14	SXB
16	ext-SCL
18	ext-SDA

3.2.7 J30 – I2C/SPI Port Header

This port header can be accessed from the top and from the bottom side of the board. The location of the port header is visualized in Figure 5-2.

Designator	Socket Type
J30	TSW-110-23-F-S, 2.54 mm Pitch, from Samtec
Suitable counter-piece: SSW-110-23-F-S	

Table 3-5 shows the pin assignment of J30.

TABLE 3-5: I2C/SPI PORT HEADER – PIN ASSIGNMENT

Pin	Description
1	XP-SCL
2	XP-SDA
3	NC
4	GND
5	XP-SCK
6	XP-MISO
7	XP-MOSI
8	XP-SS
9	XP-FC
10	XP-Int0a

3.3 JUMPERS

All jumpers are located on the top side of the board, see Section 5.1.

3.3.1 J10 – Power Management Option

If closed (1-2), this jumper connects to LAN-INH, using the LAN PHY daughter board power management.

If closed (2-3), the board is always powered.

Designator	Socket Type
J10	TSW-103-23-F-S, 2.54 mm TH SQ Header, from Samtec
Suitable counter-piece: Jumper 2.54 mm	

3.3.2 J11 – Reserved

Reserved for future use. Do not close the jumper.

Designator	Socket Type
J11	TSW-102-23-F-S, 2.54 mm TH SQ Header, from Samtec
Suitable counter-piece: Jumper 2.54 mm	

3.3.3 J12 – SCL Connector

If closed (1-2), this jumper connects SCL1 to J26, pin1.

If closed (2-3), this jumper connects SCL0 to J26, pin1.

Designator	Socket Type
J12	TSW-103-23-F-S, 2.54 mm TH SQ Header, from Samtec
Suitable counter-piece: Jumper 2.54 mm	

3.3.4 J13 – SDA Connector

If closed (1-2), this jumper connects SDA1 to J26, pin3.

If closed (2-3), this jumper connects SDA0 to J26, pin3.

Designator	Socket Type
J13	TSW-103-23-F-S, 2.54 mm TH SQ Header, from Samtec
Suitable counter-piece: Jumper 2.54 mm	

3.3.5 J14 – Select SPI

If closed (1-2), this jumper setting is for test purposes only and must not be used.

If closed (2-3), this jumper connects the SPI SPCK signal to the SPI Port Header.

Designator	Socket Type
J14	TSW-103-23-F-S, 2.54 mm TH SQ Header, from Samtec
Suitable counter-piece: Jumper 2.54 mm	

3.3.6 J15 – Connect AVB Endpoint PLLIN/RK

If closed (1-2), this jumper connects the AVB Endpoint PLLIN/RK to the PLL divider output.

If closed (2-3), this jumper connects the AVB Endpoint PLLIN/RK to Audio Interface A, pin 8.

Designator	Socket Type
J15	TSW-103-23-F-S, 2.54 mm TH SQ Header, from Samtec
Suitable counter-piece: Jumper 2.54 mm	

3.3.7 J16 – Connect AVB Endpoint SRA Audio Interface A

If closed (1-2), this jumper connects the AVB Endpoint SRA Audio Interface A to the microphone.

If closed (2-3), this jumper connects the AVB Endpoint SRA Audio Interface A to the audio codec.

Designator	Socket Type
J16	TSW-103-23-F-S, 2.54 mm TH SQ Header, from Samtec
Suitable counter-piece: Jumper 2.54 mm	

3.3.8 J17 – Connect Microphone Clock to the AVB Endpoint

If closed (1-2), this jumper connects the microphone clock CLK to the AVB Endpoint.

Designator	Socket Type
J17	TSW-102-23-F-S, 2.54 mm TH SQ Header, from Samtec
Suitable counter-piece: Jumper 2.54 mm	

3.3.9 J18 – Connect Audio Codec Clock to the AVB Endpoint

If closed (1-2), this jumper connects the audio codec clock BCKL to the AVB Endpoint.

Designator	Socket Type
J18	TSW-102-23-F-S, 2.54 mm TH SQ Header, from Samtec
Suitable counter-piece: Jumper 2.54 mm	

3.3.10 J19 – Connect Audio Codec DAC to the AVB Endpoint

If closed (1-2), this jumper connects the audio codec DAC to the AVB Endpoint.

Designator	Socket Type
J19	TSW-102-23-F-S, 2.54 mm TH SQ Header, from Samtec
Suitable counter-piece: Jumper 2.54 mm	

3.3.11 J20 – Connect Audio Codec LRCLK to the AVB Endpoint

If closed (1-2), this jumper connects the audio codec LRCLK to the AVB Endpoint.

Designator	Socket Type
J20	TSW-102-23-F-S, 2.54 mm TH SQ Header, from Samtec
Suitable counter-piece: Jumper 2.54 mm	

3.3.12 J21 – Connect AVB Endpoint RF with AVB Endpoint EVIN

If closed (1-2), this jumper connects the AVB Endpoint RF signal with the AVB Endpoint EVIN signal.

Designator	Socket Type
J21	TSW-102-23-F-S, 2.54 mm TH SQ Header, from Samtec
Suitable counter-piece: Jumper 2.54 mm	

3.3.13 J22 – Erase Flash Memory of AVB Endpoint

If closed, this jumper is used to erase the flash memory of the AVB Endpoint.

Designator	Socket Type
J22	TSW-102-23-F-S, 2.54 mm TH SQ Header, from Samtec
Suitable counter-piece: Jumper 2.54 mm	

3.3.14 J23 – Enable External Power for Analog Microphone

If closed, this jumper is used to enable external power for an analog microphone.

Designator	Socket Type
J23	TSW-102-23-F-S, 2.54 mm TH SQ Header, from Samtec
Suitable counter-piece: Jumper 2.54 mm	

3.4 BUTTONS

All buttons are located on the top side of the board, see Section 5.1.

Designator	Description
Button0 (SW1)	Reserved for future use.
Button1 (SW2)	
Reset (SW3)	Reset components on the development board, especially the LAN9360
Wake (SW4)	Wake up PHY daughter board (WakeIN signal)

3.5 LEDS

LEDs 0-2 are mounted on the top side of the board (see Section 5.1); LED 120 is mounted on the bottom side (see Section 5.2).

The table below gives an overview of the LEDs and the states they signal.

Designator	State	Description
LED0 (LD1)	Off	Reserved for future use
	On (red)	
LED1 (LD2)	Off	
	On (yellow)	
UNL (LD3)	Off	Media Clock unlock indicator
	On (green)	Media Clock lock indicator
LED120 (LD120)	Off	PLL lock indicator
	On (red)	PLL unlock indicator, depends on firmware

NOTES:

Chapter 4. Configuration Options

This chapter lists several configuration options that can be setup with the EVB-LAN9360. Possible configuration options are as follows:

- Listener and/or Talker with On-Board Codec
- Listener and/or Talker with External Codec/DSP
- Talker with On-Board MEMS Mic (PDM) and Listener with On-Board Codec
- Talker with On-Board MEMS Mic (PDM) and Listener with External Sink
- Talker with External PCM Source and Listener with On-Board Codec
- 1PPS Method for Clock Accuracy Measurement

Common jumper settings

For all configuration options, the following jumper settings are common:

TABLE 4-1: COMMON JUMPER SETTINGS

Jumper	Setting
J10	2-3
J12	1-2
J13	
J14	2-3
J15	1-2
J21	Open

Deviating jumper settings are described in the respective configuration sections, see the following pages.

Codec

The on-board codec is configured by the LAN9360 via I^2C.

Note: The configuration of an external codec is not included in the LAN9360's functionality.

Media clock generation

For media clock generation the following conditions apply:

- If an on-board source or sink is used, the media clock (FSY, SCK) is generated by the LAN9360.
- If a MEMS microphone (PDM), either on-board or external is used, the media clock (FSY, SCK) is generated by the LAN9360.
- If an external source or sink (codec, DSP) is used, the media clock can either be provided externally or is generated by the LAN9360.

4.1 LISTENER AND/OR TALKER WITH ON-BOARD CODEC

In this configuration the LAN9360 acts as Talker or Listener or both. The on-board codec is used as PCM source and sink.

This configuration is the factory default configuration.

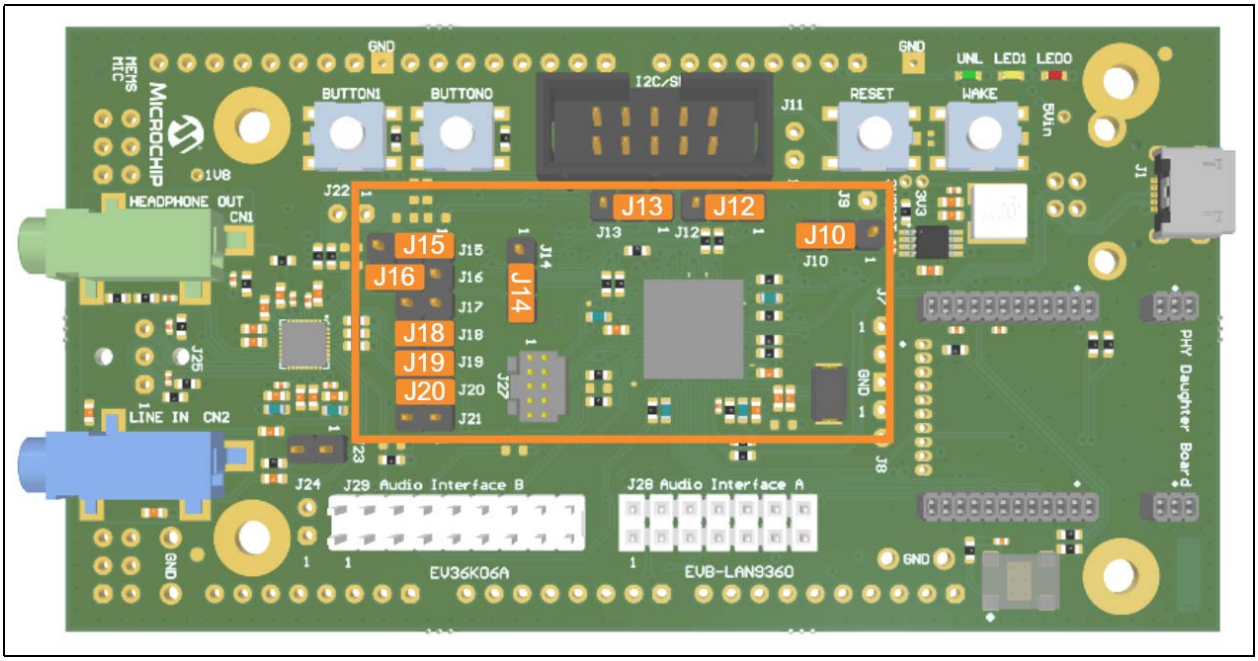
Table 4-2 gives an overview of the jumper settings for this configuration.

TABLE 4-2: LISTENER AND/OR TALKER WITH ON-BOARD CODEC – JUMPER SETTINGS

Jumper	Setting
J16	2-3
J17	Open
J18	1-2
J19	
J20	

Figure 4-1 depicts the jumper settings on the EVB-LAN9360.

FIGURE 4-1: LISTENER AND/OR TALKER WITH ON-BOARD CODEC – JUMPER SETTINGS



The audio source (stereo) for the AVB Talker is the blue jack connector (Line In).

Note: It is not possible to directly connect an analog microphone (no power feed).

The AVB Listener plays the received audio signal (stereo) through the green jack connector (Headphone Out).

4.2 LISTENER AND/OR TALKER WITH EXTERNAL CODEC/DSP

In this configuration the LAN9360 acts as Talker or Listener or both. An external codec or DSP is connected to the Audio Interface A Connector (J28, see Section 3.2.5) as PCM source and sink.

> **Note:** It is not possible to use the on-board codec simultaneously.

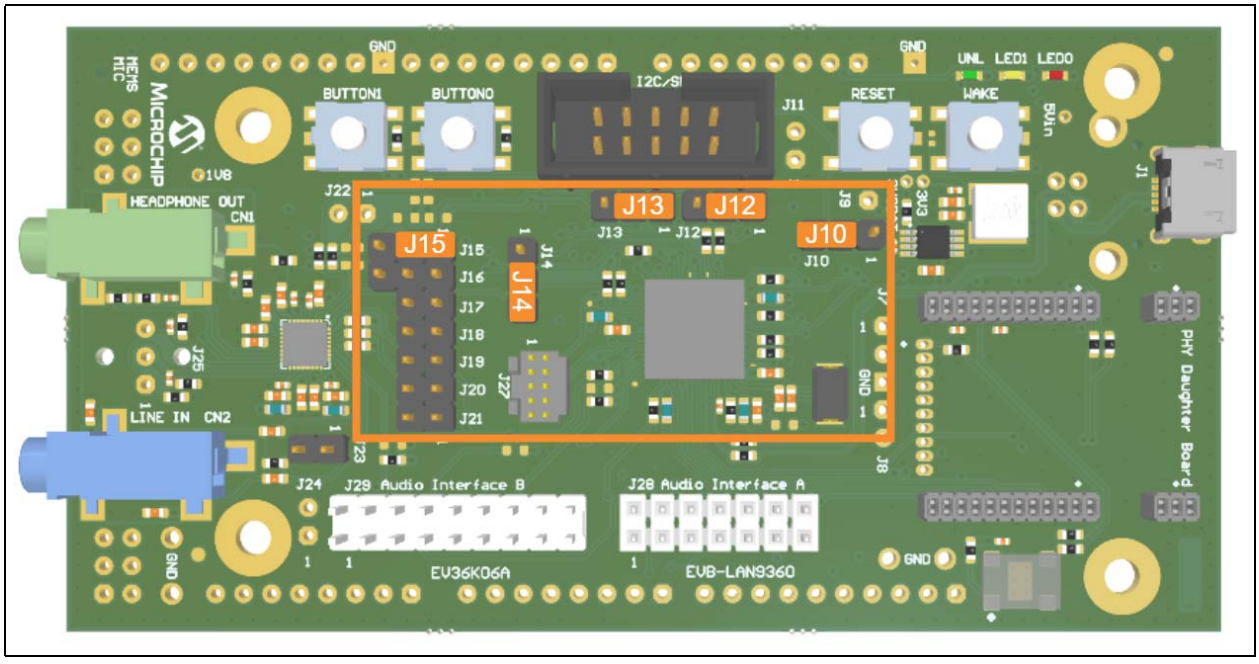
Table 4-3 gives an overview of the jumper settings for this configuration.

TABLE 4-3: LISTENER AND/OR TALKER WITH EXTERNAL CODEC/DSP – JUMPER SETTINGS

Jumper	Setting
J16	Open
J17	
J18	
J19	
J20	

Figure 4-2 depicts the jumper settings on the EVB-LAN9360.

FIGURE 4-2: LISTENER AND/OR TALKER WITH EXTERNAL CODEC/DSP – JUMPER SETTINGS



The audio source for the AVB Talker and the audio sink for the AVB Listener is provided at Audio Interface A.

4.3 TALKER WITH ON-BOARD MEMS MIC (PDM) AND LISTENER WITH ON-BOARD CODEC

In this configuration the LAN9360 acts as Talker. The on-board MEMS microphone is used as PDM source. In addition, the LAN9360 may act as Listener. The on-board codec is used as PCM sink.

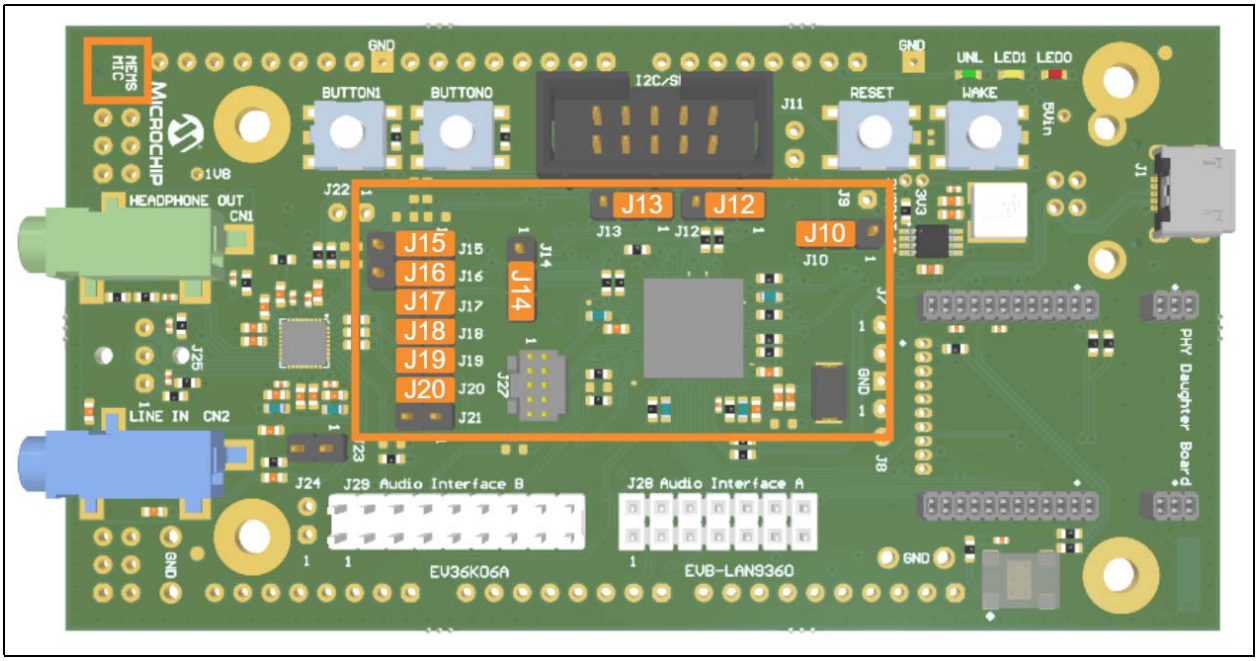
Table 4-4 gives an overview of the jumper settings for this configuration.

TABLE 4-4: TALKER WITH ON-BOARD MEMS MIC (PDM) AND LISTENER WITH ON-BOARD CODEC – JUMPER SETTINGS

Jumper	Setting
J16	1-2
J17	
J18	
J19	
J20	

Figure 4-3 depicts the jumper settings on the EVB-LAN9360.

FIGURE 4-3: TALKER WITH ON-BOARD MEMS MIC (PDM) AND LISTENER WITH ON-BOARD CODEC – JUMPER SETTINGS



The audio source (mono) for the AVB Talker is the on-board MEMS microphone ICS-41350 as shown in Figure 4-3 (upper left corner).

The AVB Listener plays the received audio signal (stereo) through the green jack connector (Headphone Out).

4.4 TALKER WITH ON-BOARD MEMS MIC (PDM) AND LISTENER WITH EXTERNAL SINK

In this configuration the LAN9360 acts as Talker and Listener. The on-board MEMS microphone is used as PDM source. An external codec/DSP is connected to the Audio Interface A Connector (J28, see Section 3.2.5) as PCM sink.

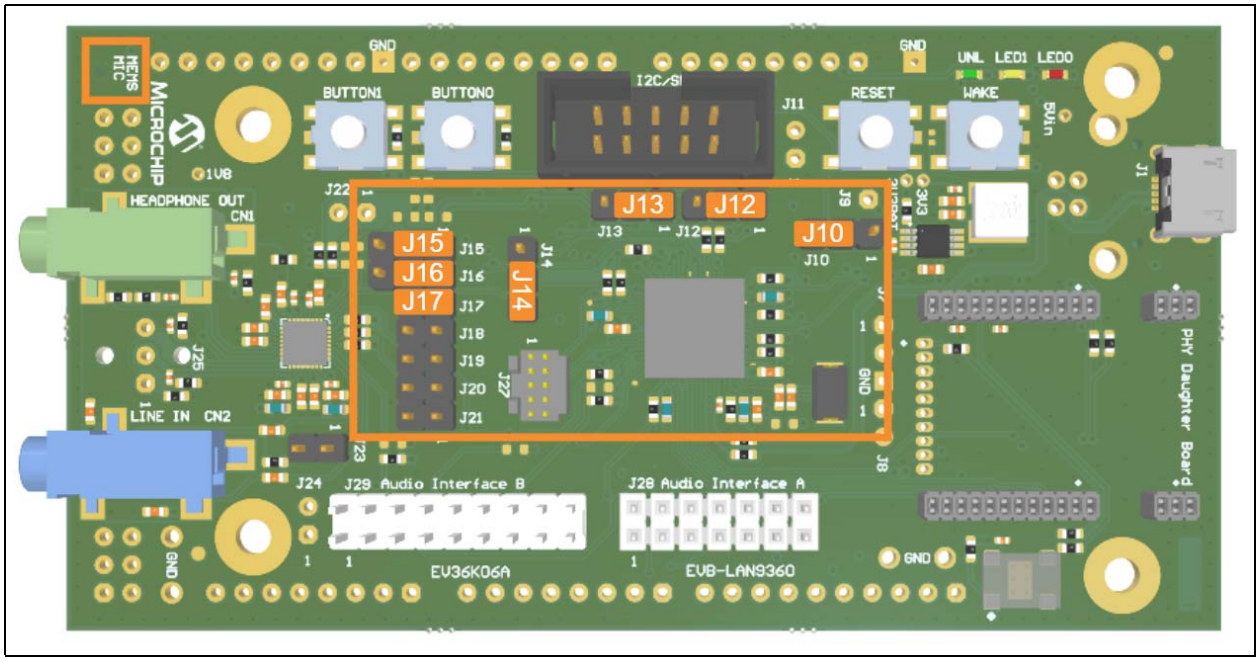
Table 4-5 gives an overview of the jumper settings for this configuration.

TABLE 4-5: TALKER WITH ON-BOARD MEMS MIC (PDM) AND LISTENER WITH EXTERNAL SINK – JUMPER SETTINGS

Jumper	Setting
J16	1-2
J17	
J18	Open
J19	
J20	

Figure 4-4 depicts the jumper settings on the EVB-LAN9360.

FIGURE 4-4: TALKER WITH ON-BOARD MEMS MIC (PDM) AND LISTENER WITH EXTERNAL SINK – JUMPER SETTINGS



The audio source (mono) for the AVB Talker is the on-board MEMS microphone ICS-41350 as shown in Figure 4-4 (upper left corner).

The audio sink for the AVB Listener is provided at Audio Interface A.

4.5 TALKER WITH EXTERNAL PCM SOURCE AND LISTENER WITH ON-BOARD CODEC

In this configuration the LAN9360 acts as Talker and Listener. An external codec/DSP is connected to Audio Interface A (J28, see Section 3.2.5) as PCM source. The on-board codec is used as PCM sink.

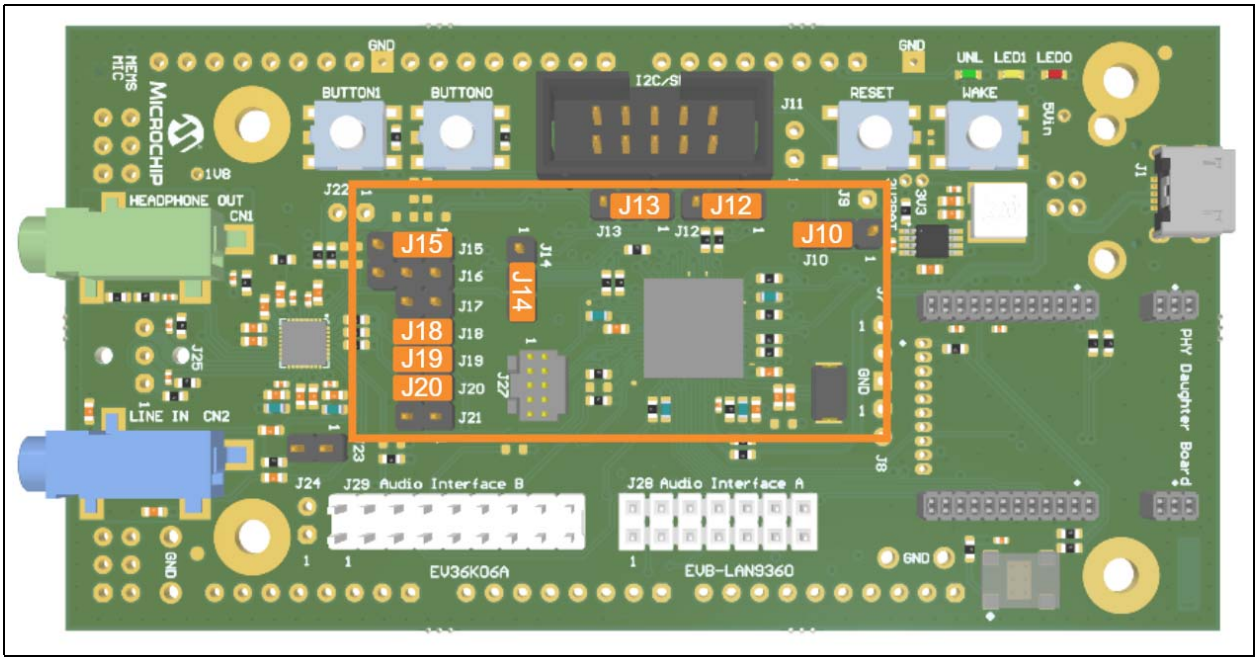
Table 4-6 gives an overview of the jumper settings for this configuration.

TABLE 4-6: TALKER WITH EXTERNAL PCM SOURCE AND LISTENER WITH ON-BOARD CODEC – JUMPER SETTINGS

Jumper	Setting
J16	Open
J17	
J18	1-2
J19	
J20	

Figure 4-5 depicts the jumper settings on the EVB-LAN9360.

FIGURE 4-5: TALKER WITH EXTERNAL PCM SOURCE AND LISTENER WITH ON-BOARD CODEC – JUMPER SETTINGS



The audio source for the AVB Talker is provided at Audio Interface A.

The AVB Listener plays the received audio signal (stereo) through the green jack connector (Headphone Out).

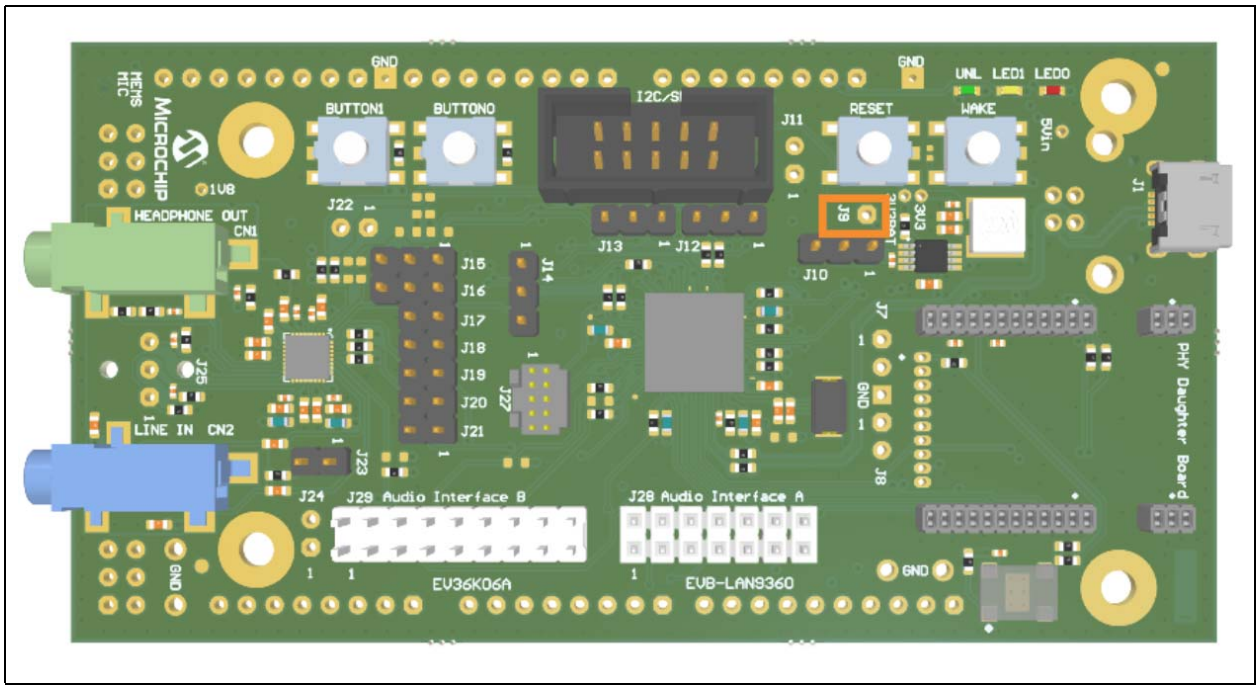
4.6 1PPS METHOD FOR CLOCK ACCURACY MEASUREMENT

In this configuration the LAN9360 does not process audio data, neither as a Talker nor as a Listener—hence, jumper settings are not required.

A one-pulse-per-second (1PPS) signal is provided at J9 to measure the accuracy of the synchronization to the gPTP clock. The device may operate as gPTP master or gPTP slave. Reception of a media clock is not required and has no influence on the 1PPS signal.

Figure 4-6 indicates the location of J9 on the LAN9360 Development Board.

FIGURE 4-6: 1PPS METHOD FOR CLOCK ACCURACY MEASUREMENT – J9



To evaluate the 1PPS signal, an oscilloscope can be connected to J9. However, the most accurate measurement can be obtained by connecting the oscilloscope between the mono flop and the resistor that goes to LAN9360 ball F8 (REFCLK0 signal), see Figure A-1.

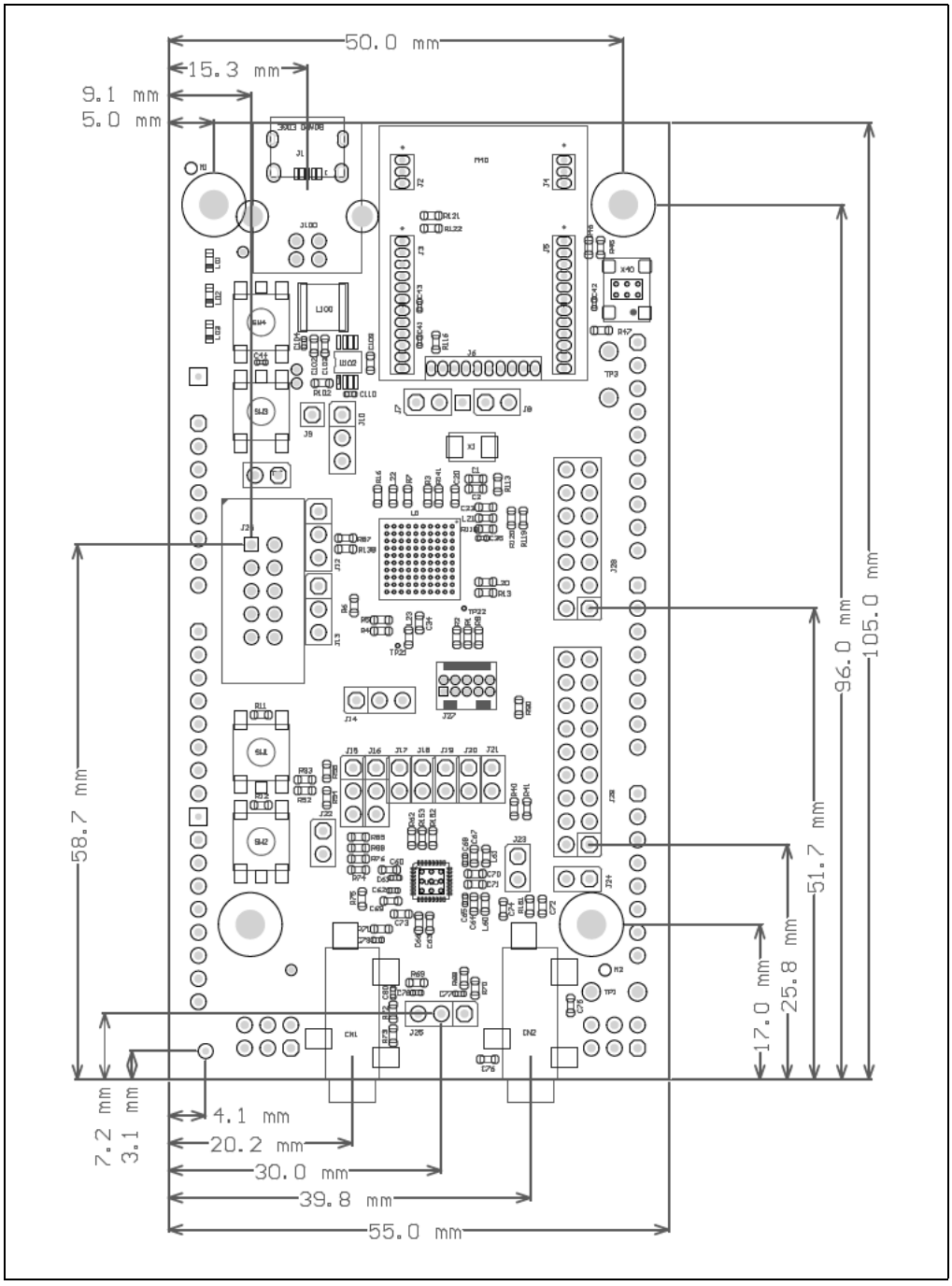
It is of advantage to compare the 1PPS signals with multiple devices (gPTP master with several gPTP slaves).

NOTES:

Chapter 5. Assembly Plan and Mechanical Dimensions

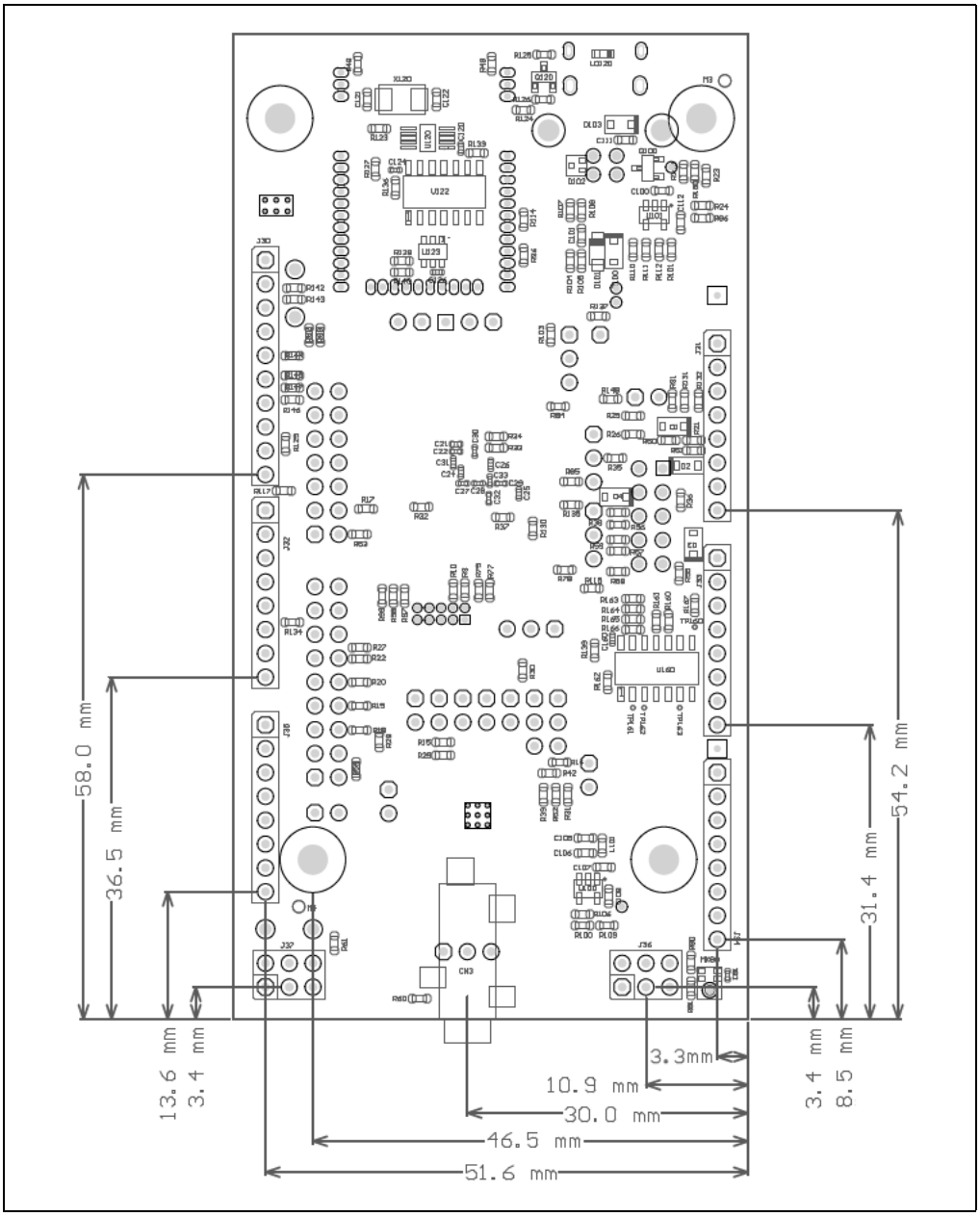
5.1 TOP VIEW AND MECHANICAL DIMENSIONS

FIGURE 5-1: ASSEMBLY PLAN – TOP VIEW AND MECHANICAL DIMENSIONS



5.2 BOTTOM VIEW AND MECHANICAL DIMENSIONS

FIGURE 5-2: ASSEMBLY PLAN – BOTTOM VIEW AND MECHANICAL DIMENSIONS



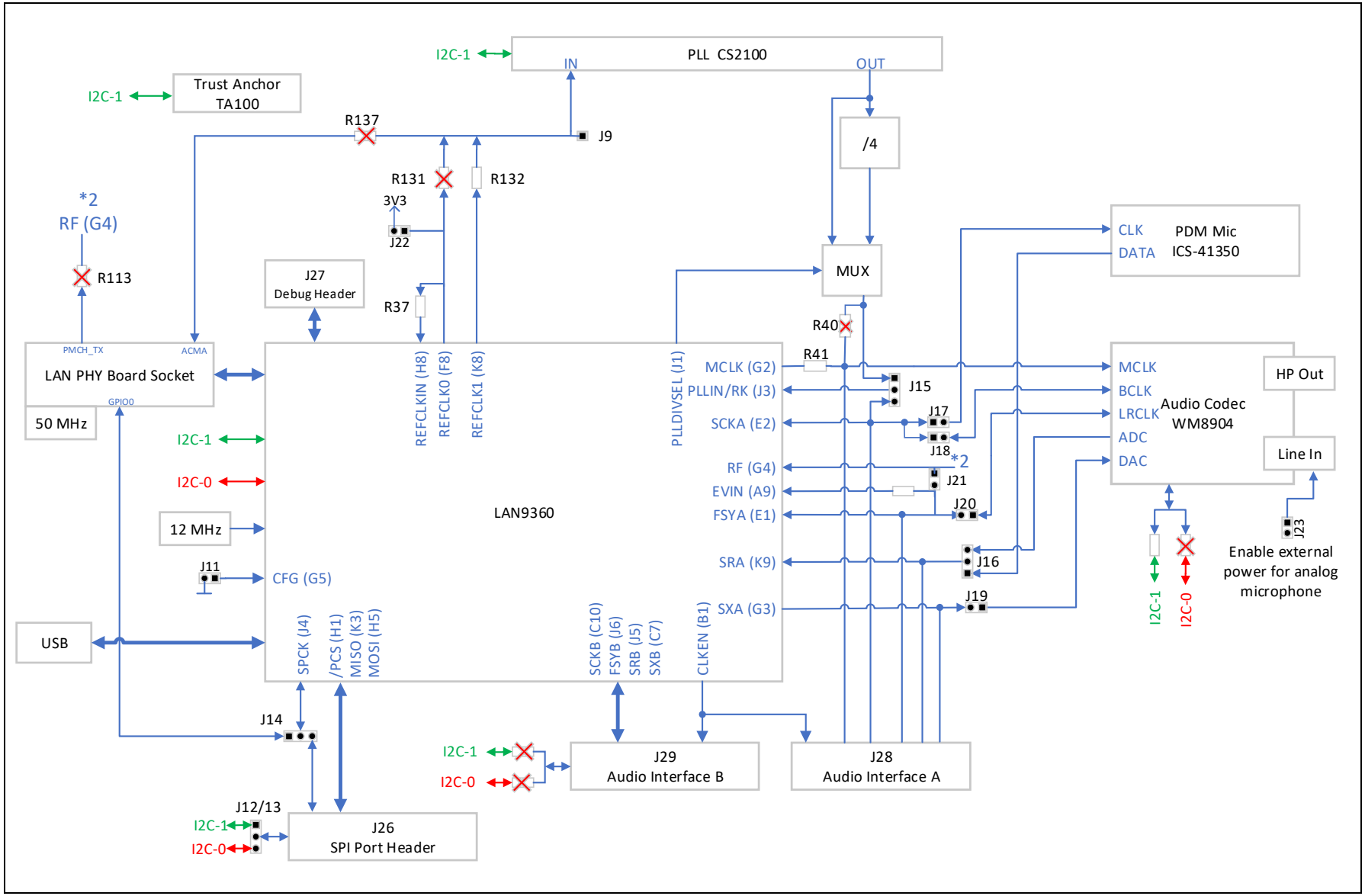
Appendix A. AVB Endpoint Connection Options

Figure A-1 shows a simple block diagram of the EVB-LAN9360 including the AVB Endpoint connection options configurable by jumpers.

Note: Pin 1 of each jumper is indicated by a square.

For a description of the jumpers refer to Section 3.3.

FIGURE A-1: AVB ENDPOINT CONNECTION OPTIONS



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