

This version (28 Jan 2021 14:39) was approved by Glenn Amparo. The Previously approved version (17 Dec 2020 16:32) is available.

# EVAL-ADISIMU1-RPIZ Hardware User Guide

## OVERVIEW

The EVAL-ADISIMU1-RPIZ allows multiple compatible IMU components (with the ADIS16IMU1/PCBZ and ADIS16IMU4/PCBZ breakout boards) to be connected to the Raspberry Pi. The following table outlines which IMU components can be directly mounted with the EVAL-ADISIMU1-RPIZ board

| IMU Part Number | ADISIMU1 Connector | Mounting Location | Breakout Board Connector |
|-----------------|--------------------|-------------------|--------------------------|
| ADIS16360       | P2                 | Mounting Slot B   | ADIS16IMU1/PCBZ          |
| ADIS16400       | P2                 | Mounting Slot B   | ADIS16IMU1/PCBZ          |
| ADIS16362       | P2                 | Mounting Slot B   | ADIS16IMU1/PCBZ          |
| ADIS16364       | P2                 | Mounting Slot B   | ADIS16IMU1/PCBZ          |
| ADIS16365       | P2                 | Mounting Slot B   | ADIS16IMU1/PCBZ          |
| ADIS16367       | P2                 | Mounting Slot B   | ADIS16IMU1/PCBZ          |
| ADIS16405       | P2                 | Mounting Slot B   | ADIS16IMU1/PCBZ          |
| ADIS16407       | P2                 | Mounting Slot B   | ADIS16IMU1/PCBZ          |
| ADIS16133       | P2                 | Mounting Slot C   | ADIS16IMU1/PCBZ          |
| ADIS16135       | P2                 | Mounting Slot C   | ADIS16IMU1/PCBZ          |
| ADIS16136       | P2                 | Mounting Slot C   | ADIS16IMU1/PCBZ          |
| ADIS16137       | P2                 | Mounting Slot C   | ADIS16IMU1/PCBZ          |
| ADIS16375       | P2                 | Mounting Slot F   | ADIS16IMU1/PCBZ          |
| ADIS16480       | P2                 | Mounting Slot F   | ADIS16IMU1/PCBZ          |
| ADIS16485       | P2                 | Mounting Slot F   | ADIS16IMU1/PCBZ          |
| ADIS16488A      | P2                 | Mounting Slot F   | ADIS16IMU1/PCBZ          |
| ADIS16489       | P2                 | Mounting Slot F   | ADIS16IMU1/PCBZ          |
| ADIS16490       | P2                 | Mounting Slot F   | ADIS16IMU1/PCBZ          |
| ADIS16495       | P2                 | Mounting Slot F   | ADIS16IMU1/PCBZ          |
| ADIS16497       | P2                 | Mounting Slot F   | ADIS16IMU1/PCBZ          |
| ADIS16467       | P7                 | Mounting Slot I   | ADIS16IMU4/PCBZ          |
| ADIS16460       | P7                 | Mounting Slot I   | ADIS16IMU4/PCBZ          |
| ADIS16465       | P7                 | Mounting Slot I   | ADIS16IMU4/PCBZ          |

Table of Contents

EVAL-ADISIMU1-RPIZ Hardware User Guide

OVERVIEW

Inertial Measurement Unit(IMU)/Gyroscope Mounting

P2 Connection

Mounting Slot B

Mounting Slot C

Mounting Slot F

P7 Connection

Raspberry Pi Connector

Headers and Jumpers

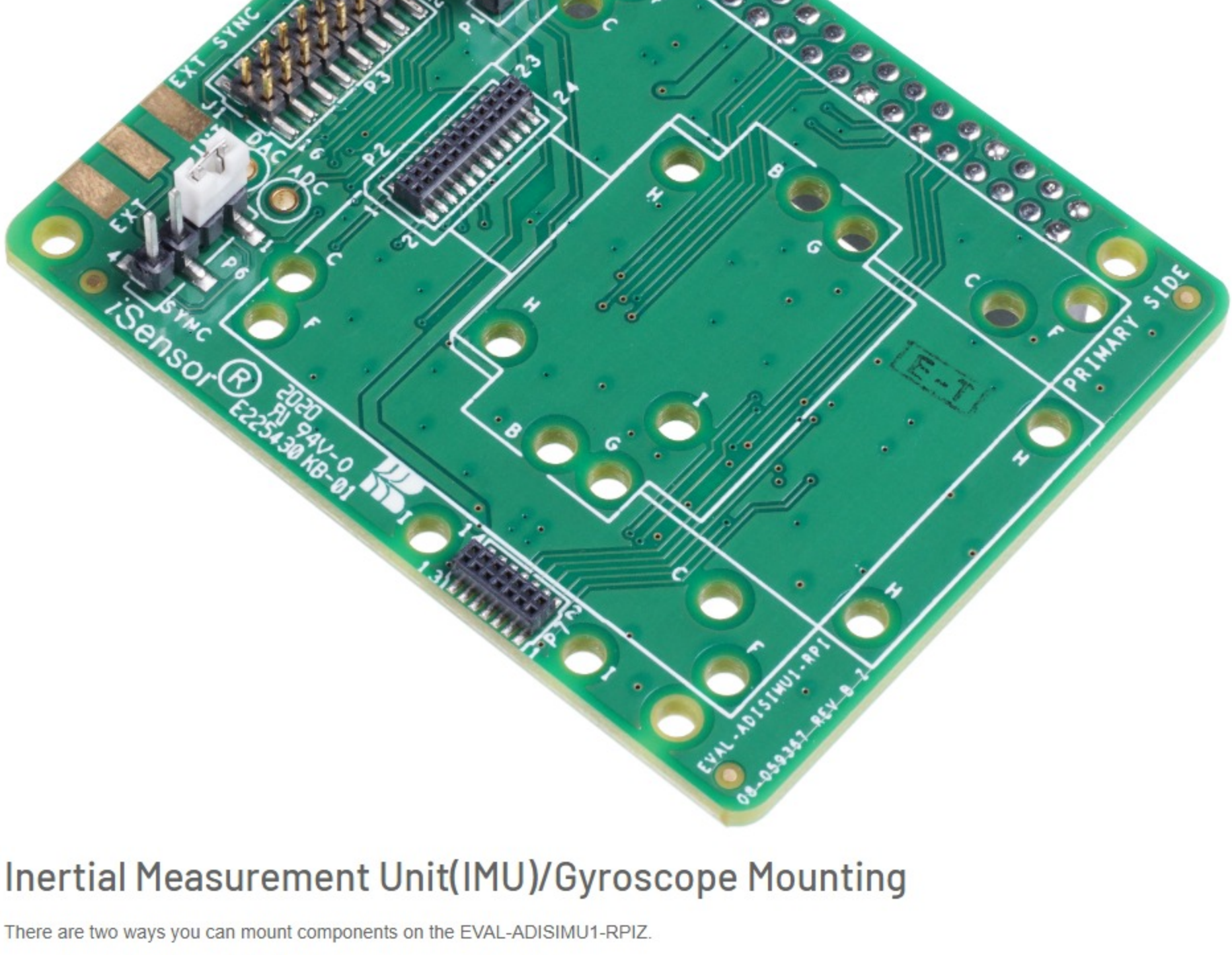
Real Time Clock

Power

Sync Selector

Test Points

Schematic, PCB Layout Files, Bill of Materials



## Inertial Measurement Unit(IMU)/Gyroscope Mounting

There are two ways you can mount components on the EVAL-ADISIMU1-RPIZ.

- Directly mount the IMU using the proper mounting location
- Indirect connection using the P3 connector along with the ribbon cable and the breakout board

Any IMU can use the indirect method of connecting to the P3 header using the ribbon cable and it's corresponding breakout board. So the following sections are going to describe how to directly mount the compatible IMUs to the EVAL-ADISIMU1-RPIZ. Please see the pictures for device mounting hole locations.

There are four(4) mounting holes without any labels. These mounting holes are assigned to mount the EVAL-ADISIMU1-RPIZ to the Raspberry Pi host board. There are four(4) nylon screws and spacers provided in the kit, and these should be used for this purpose. The nominal diameter of the four(4) holes is 3.175mm.

MACHINE SCREWS IMPACT LOCAL MAGNETIC FIELDS

The machine screws in the EVAL-ADISIMU1-RPIZ kit are made out of stainless steel, which can have some moderate impact on magnetic fields, local to the IMU. For those whose application demands the best magnetometer performance offered by these IMUs, consider using plastic screws that will not impact the magnetic fields around the devices.

## P2 Connection

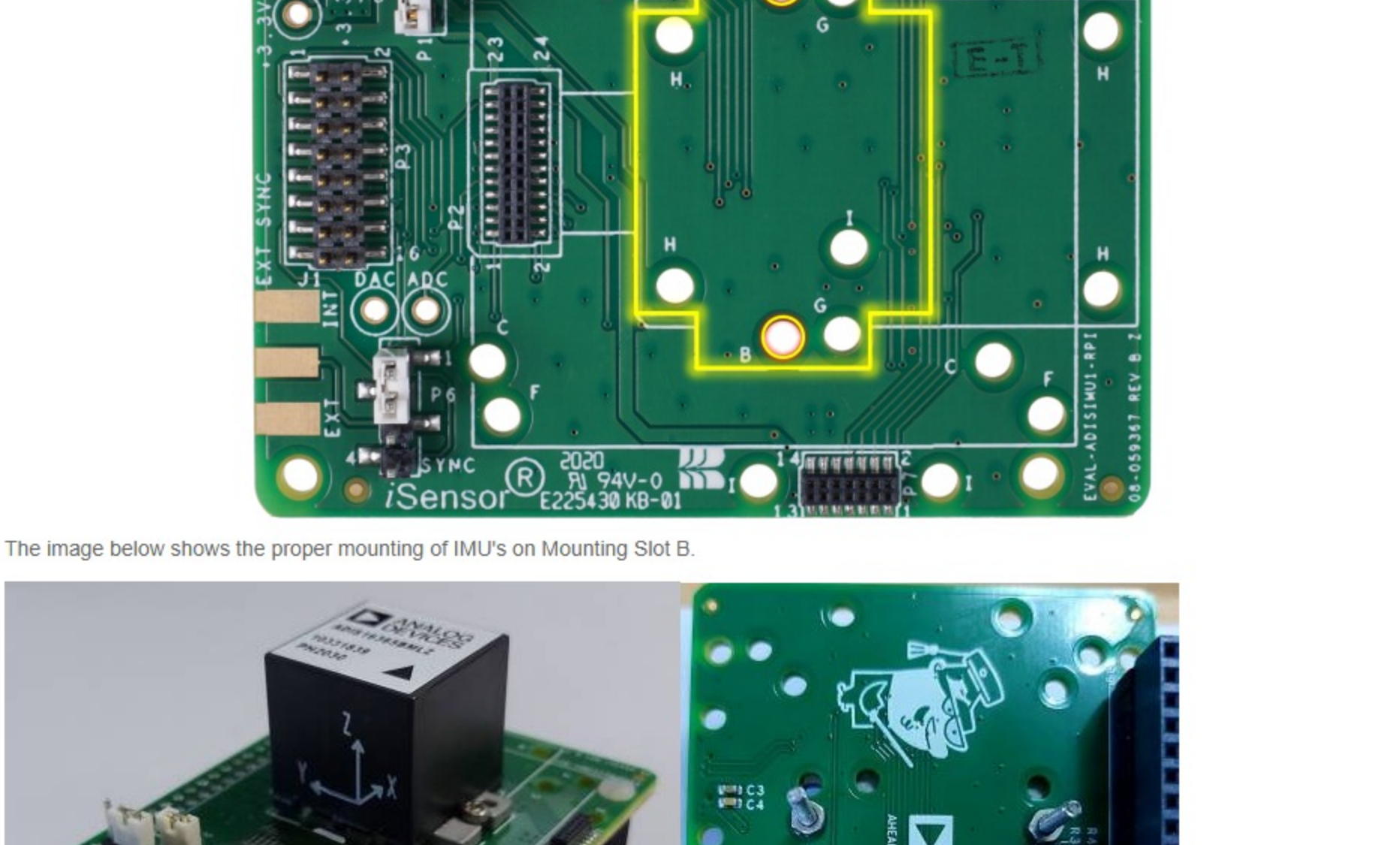
### Mounting Slot B

#### IMU Components

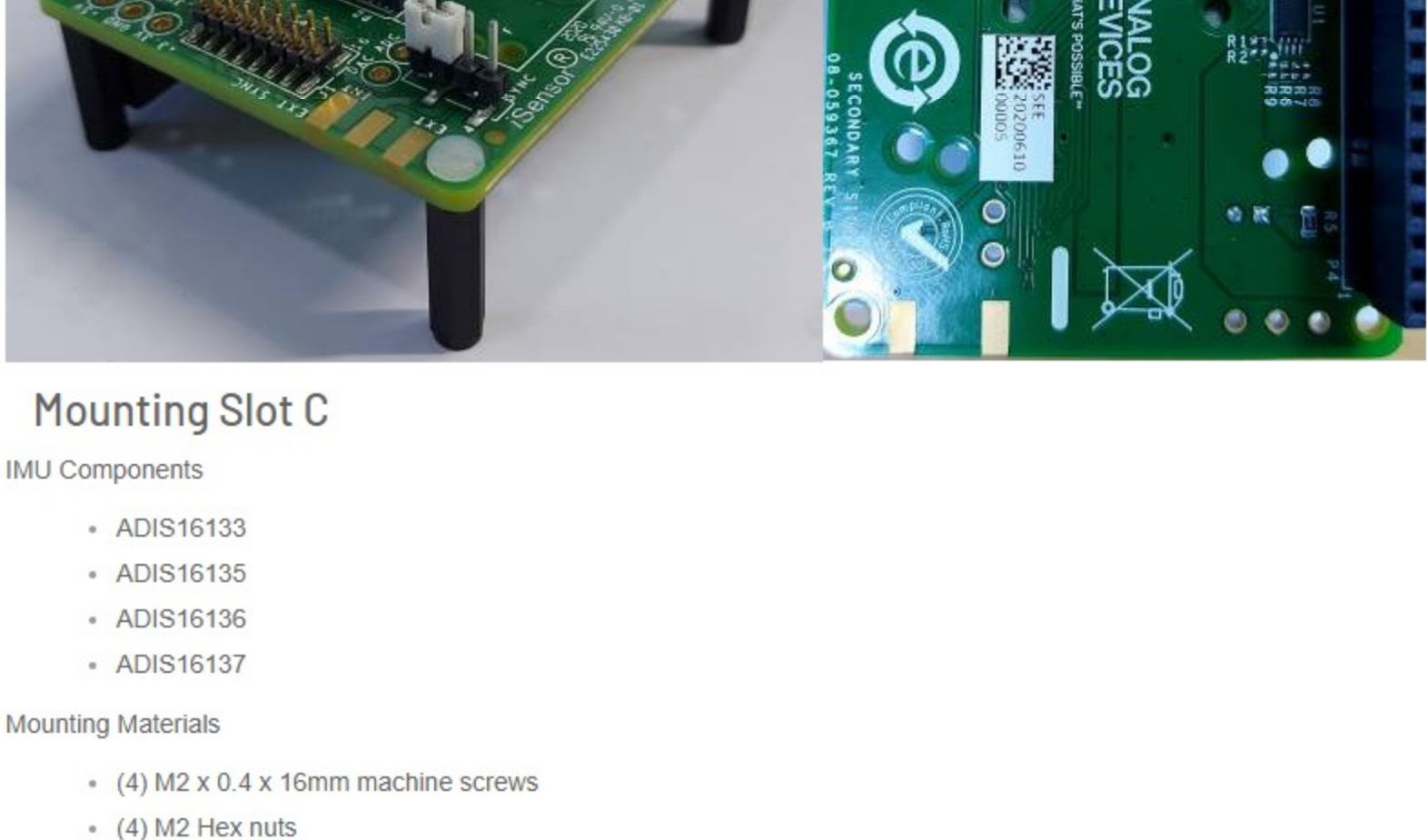
- ADIS16360
- ADIS16362
- ADIS16364
- ADIS16365
- ADIS16367
- ADIS16400
- ADIS16405
- ADIS16407

#### Mounting Materials

- (2) M2 x 0.4 x 4mm machine screws
  - For high-vibration environments, consider using more than 2 screws. Application Note AN-1045 offers some ideas on using more than two screws to attach this package style to a system frame.
- (2) M2 Hex nuts



The image below shows the proper mounting of IMU's on Mounting Slot B.



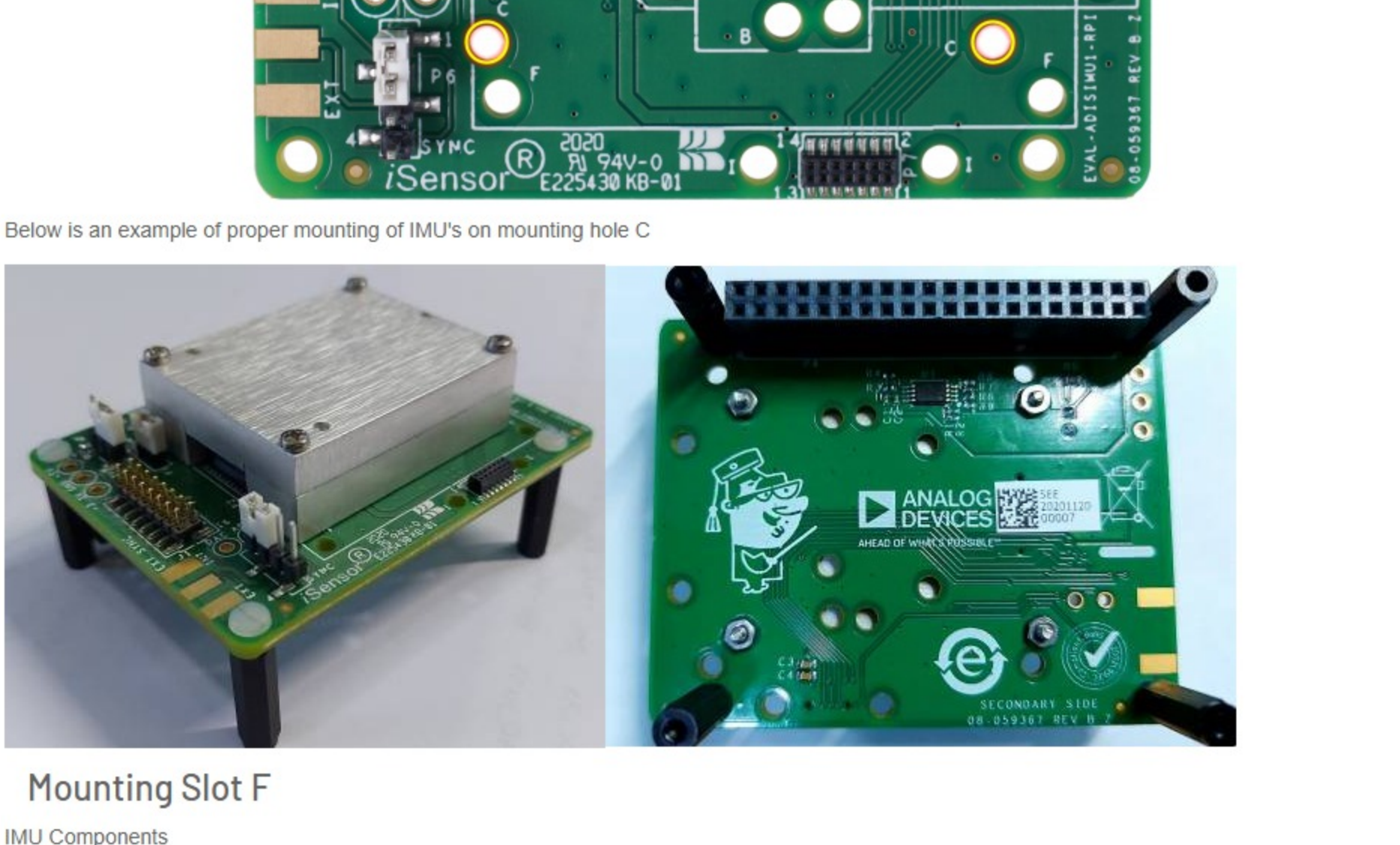
### Mounting Slot C

#### IMU Components

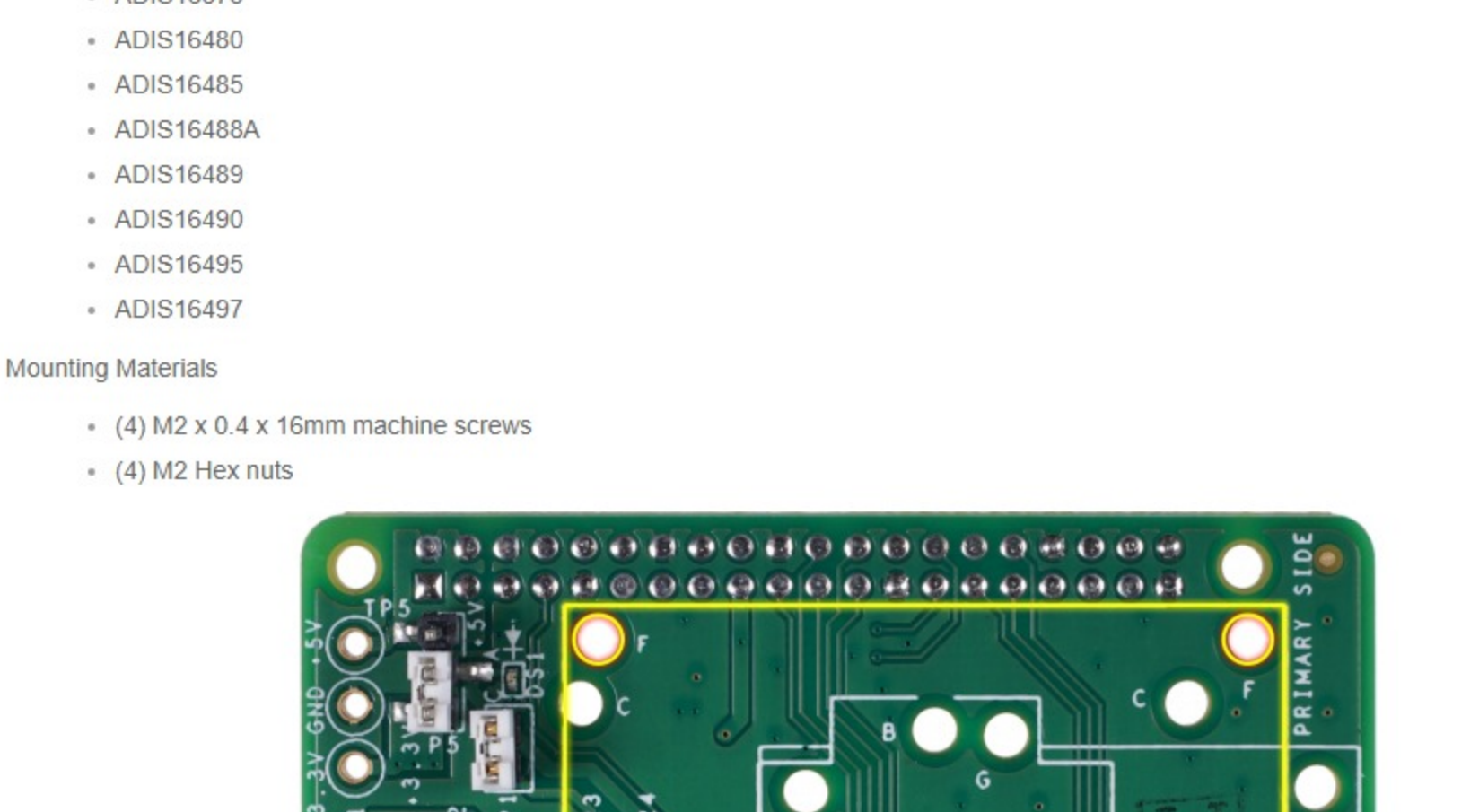
- ADIS16133
- ADIS16135
- ADIS16136
- ADIS16137

#### Mounting Materials

- (4) M2 x 0.4 x 16mm machine screws
- (4) M2 Hex nuts



Below is an example of proper mounting of IMU's on mounting hole C



### Mounting Slot F

#### IMU Components

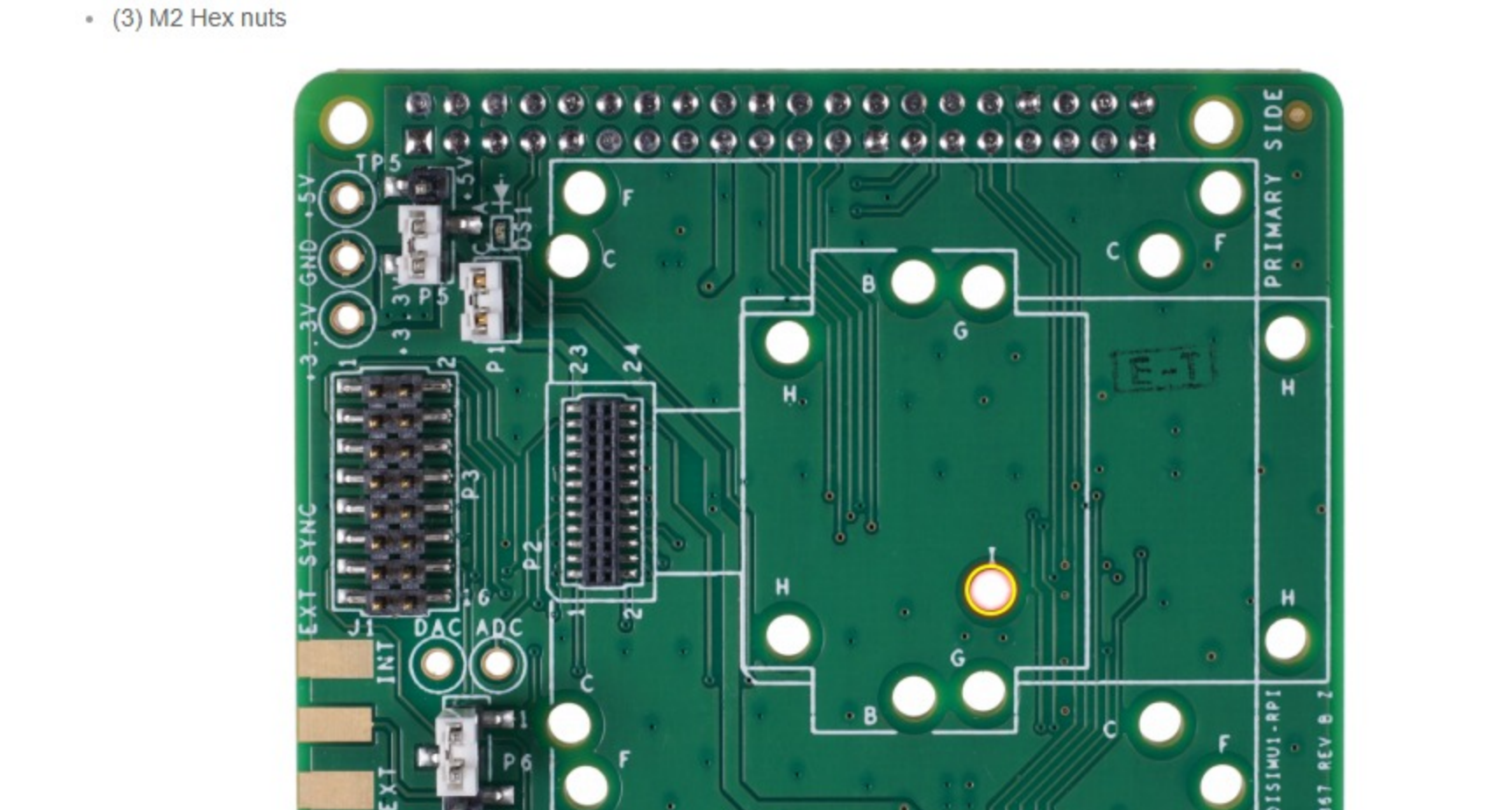
- ADIS16375
- ADIS16480
- ADIS16485
- ADIS16488A
- ADIS16489
- ADIS16490
- ADIS16495
- ADIS16497

#### Mounting Materials

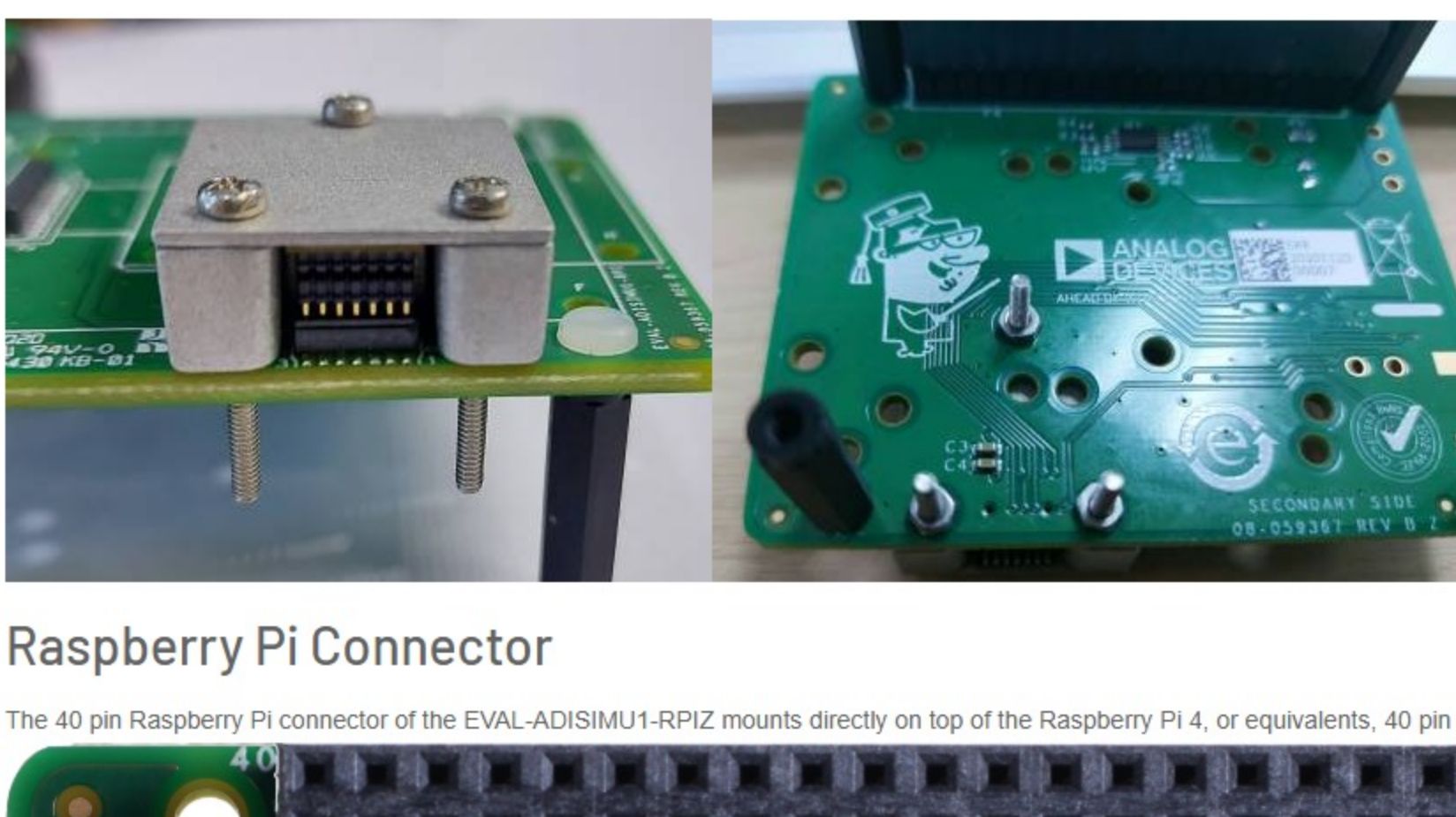
- (4) M2 x 0.4 x 16mm machine screws
- (4) M2 Hex nuts



Below is an image that show proper mounting of IMU's on mounting slot F

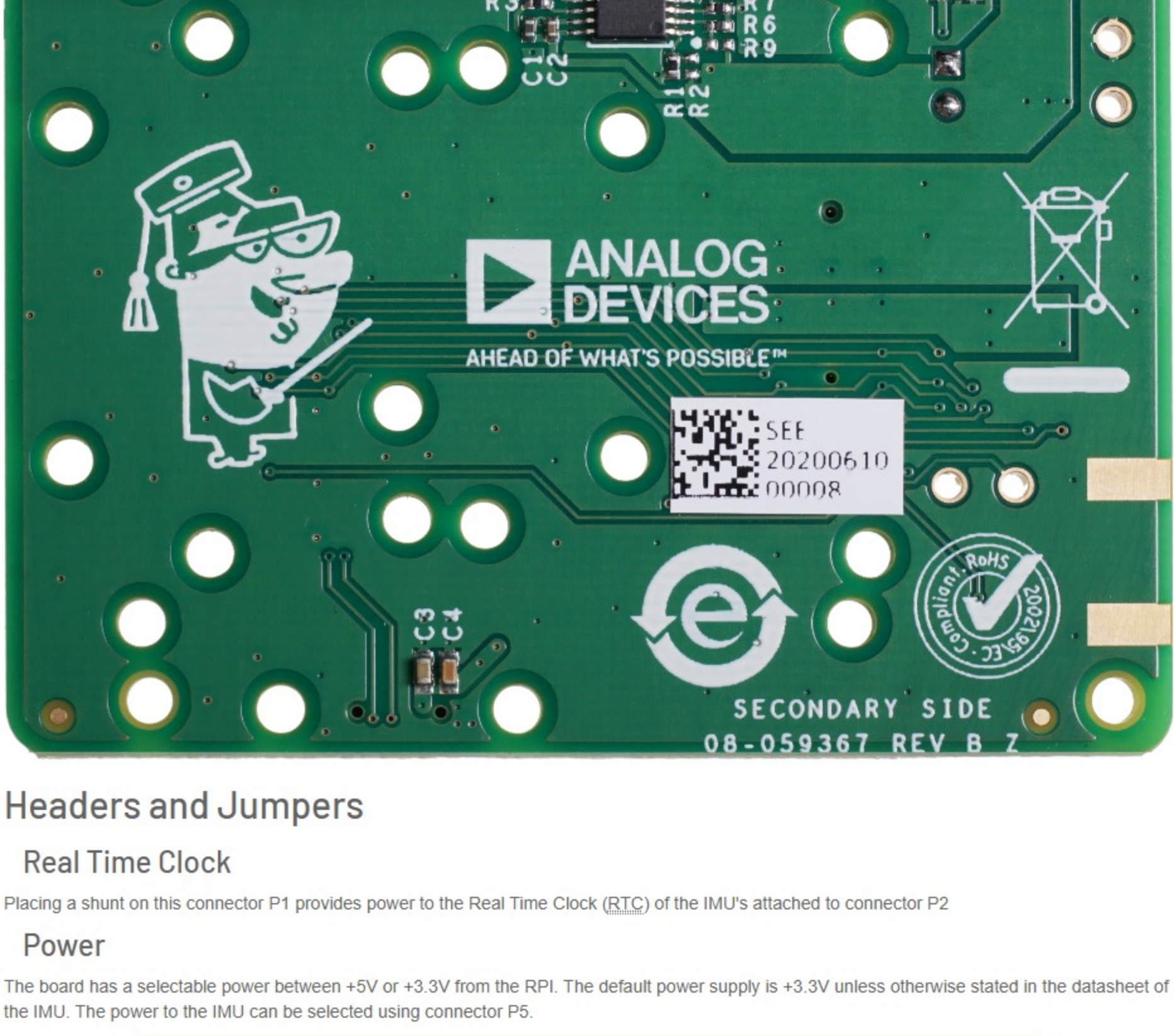


Below is an image that show proper mounting of IMU's on mounting slot I. Ensure that the machine screws are tightened on the bottom side of the board using the hex nuts as shown below:



## Raspberry Pi Connector

The 40 pin Raspberry Pi connector of the EVAL-ADISIMU1-RPIZ mounts directly on top of the Raspberry Pi 4, or equivalents, 40 pin male headers.



## Headers and Jumpers

### Real Time Clock

Placing a shunt on this connector P1 provides power to the Real Time Clock (RTC) of the IMU's attached to connector P2

#### Power

The board has a selectable power between +5V or +3.3V from the RPI. The default power supply is +3.3V unless otherwise stated in the datasheet of the IMU. The power to the IMU can be selected using connector P5.

It's critical to know the power supply required for the IMU you are using before changing this setting. If you power any IMU from 5V that was designed for 3.3V power, you will destroy the IMU and it will no longer function. This is a VERY EXPENSIVE mistake.

| Power | Shunt Position                     |
|-------|------------------------------------|
| +5.0V | Pin 1 and Pin 2                    |
| +3.3V | Pin 2 and Pin 3 (Default Position) |

### Sync Selector

#### Sync Header

Header P6 allows for selectable sync signal to be used by the IMU's. It can be done by moving the shunt to select the source, either via RPI or an external source.

| Sync | Shunt Position                     |
|------|------------------------------------|
| RPI  | Pin 1 and Pin 2 (Default Position) |
| Ext  | Pin 3 and Pin 4                    |

#### Ext Sync Pads

This allows for an external sync signal to be used by the IMU's by installing an SMA connector on pads of connector J1.

### Test Points

#### +5V

This test point provides connection to the +5V rail.

#### +3.3V

This test point provides connection to the +3.3V rail.

#### GN

This test point provides connection to the ground.

#### DAC

This test point provides connection to the output of the DAC.

#### ADC

This test point provides connection to the output of the ADC.

## Schematic, PCB Layout Files, Bill of Materials

EVAL-ADISIMU1-RPIZ Design & Integration Files

Schematics

Bill of Materials

Layout

End of Document