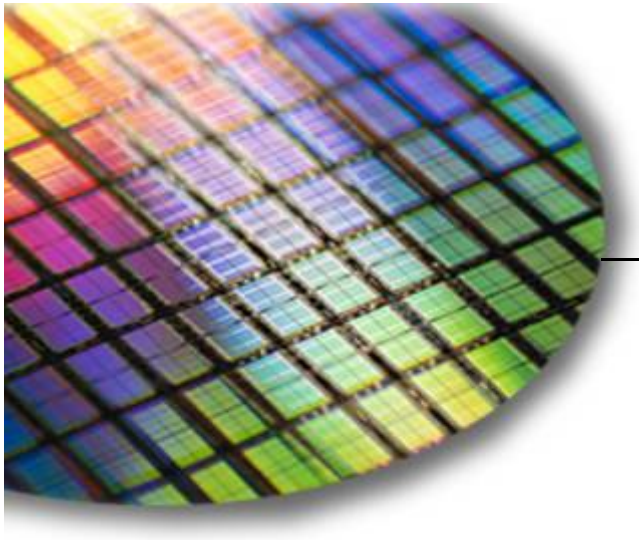


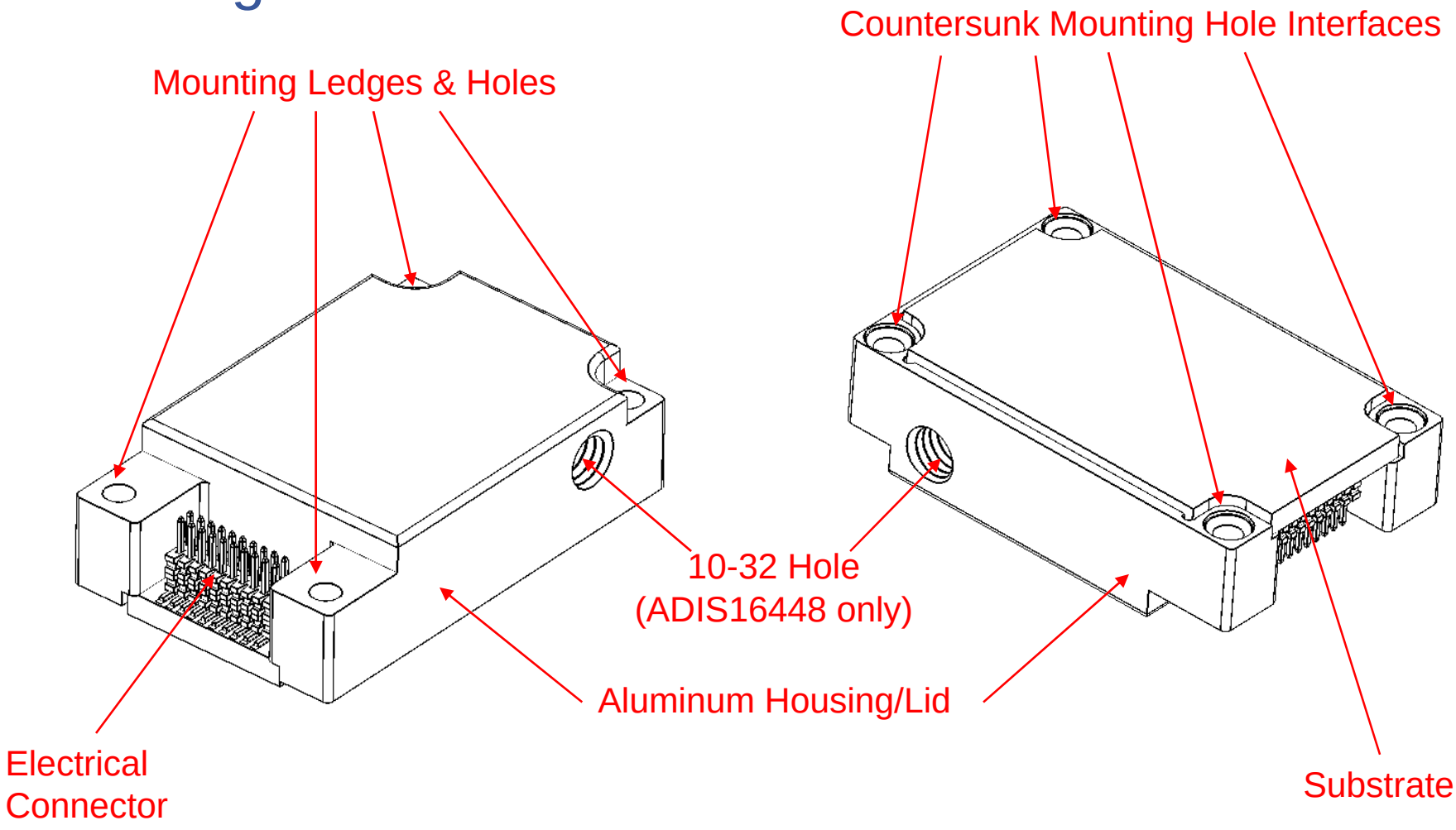
The World Leader in High Performance Signal Processing Solutions

ADIS16445/ADIS16448 Mechanical Design Tips

March 2013

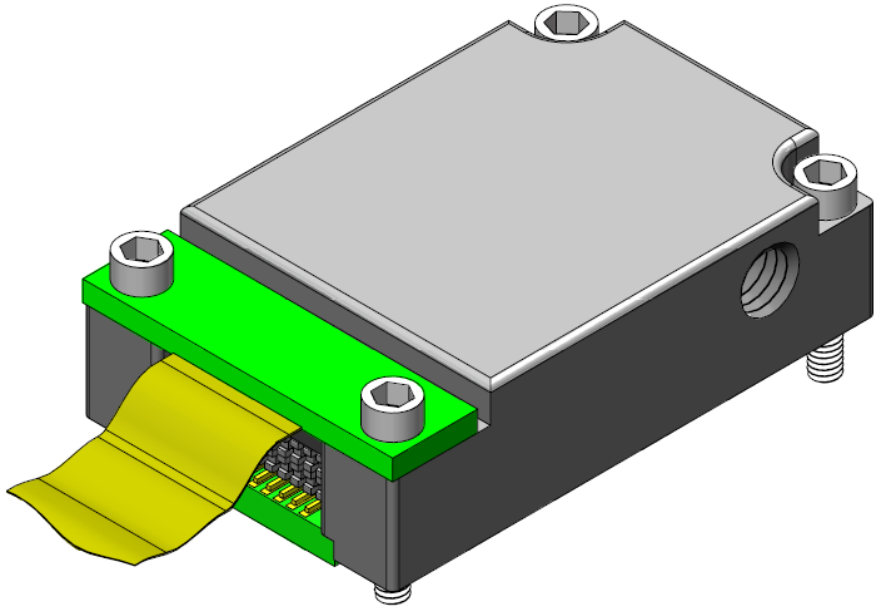
ANALOG DEVICES

Package Features



Option #1, Connector-up

- **Connector-up identifies any mounting approach that orients the electrical connector away from the mounting surface.**
- **Advantages:**
  - **Lowest profile**
  - **Simplest mechanical design**
- **Trade-offs:**
  - **Custom-cable interface.**
  - **Opportunity to influence key performance behaviors.**
    - Initial bias error, gyroscope
    - Bias tempco, gyroscope
- **NOTE: direct application of mounting force to the substrate (not shown in this view) can impact initial bias and bias temperature coefficient metrics.**



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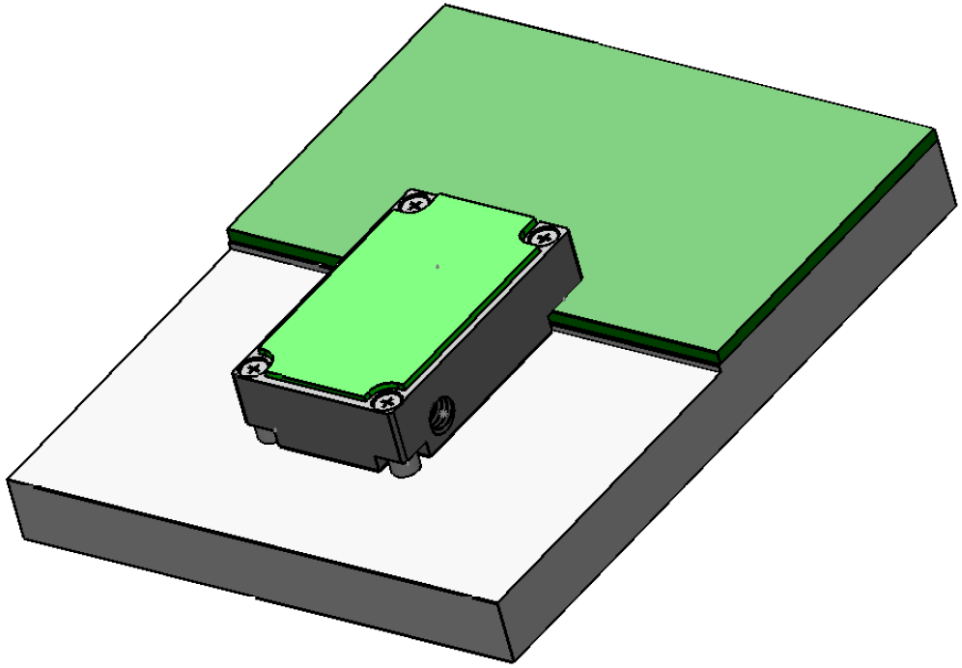
Option #2, Connector-down

- **Connector-down identifies any mounting approach that orients the electrical connector towards the mounting surface.**
- **Advantages:**
  - **Preserve key performance**
- **Trade-offs:**
  - **Elevated complexity in the mechanical design**
  - **Modest increase of "installed height"**
- **"Raised PCB" surface and spacers lift package off of the mounting surface.**
- **Key objective was to protect the substrate from direct application of mounting force and other forces that could introduce "bending" in this substrate.**



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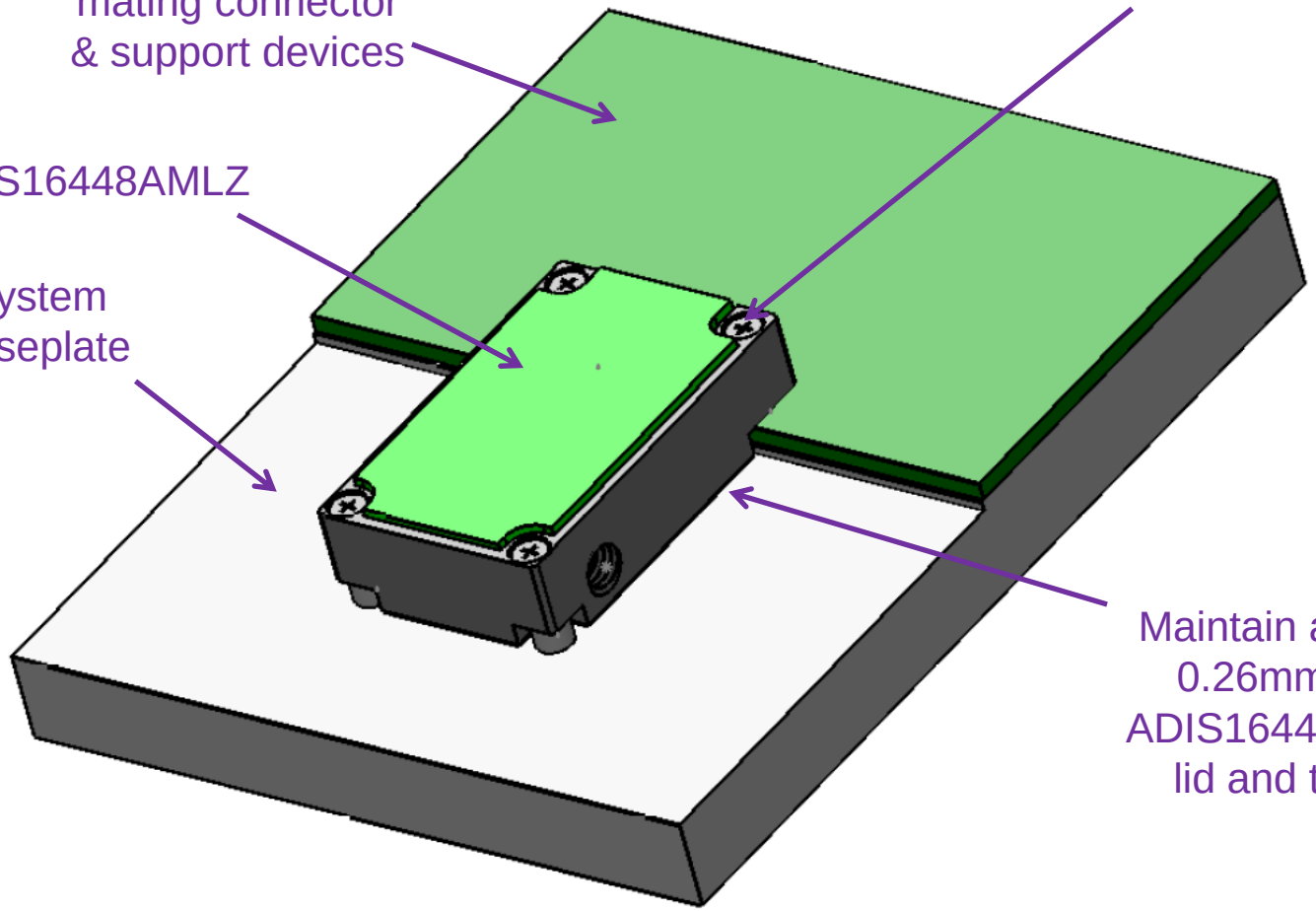
Connector-down Example
The Basics

M2x0.4mm or 2-56 machine screws with countersunk heads (4x). They are the only point of mechanical contact on this side of the package
SUGGESTED TORQUE = 28 inch-ounces

System PCB for mating connector & support devices

ADIS16448AMLZ

System Baseplate



Maintain a gap of at least 0.26mm between the ADIS1644xAMLZ package lid and the baseplate.

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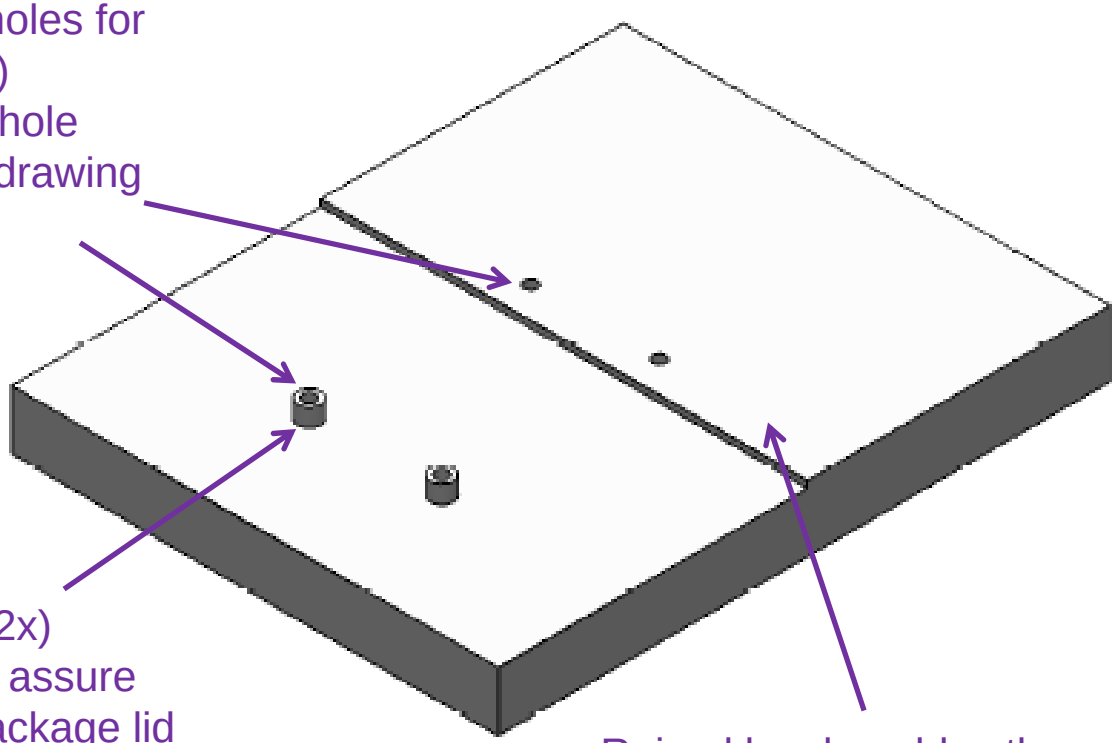
Connector-down Example
The Baseplate & Spacers

M2x0.4mm or 2-56 tapped holes for mounting screws (4x)
NOTE: Use the nominal hole locations from the package drawing to place these holes



Mechanical spacers (2x)
NOTE: height designed to assure 0.26mm gap between the package lid and the baseplate surface
NOTE: Two of the M2x0.4mm or 2-56 tapped holes are under these spacers

Raised level enables the use of a standard PCB thickness (such as 1.6mm), while matching the basic height of the mechanical spacers

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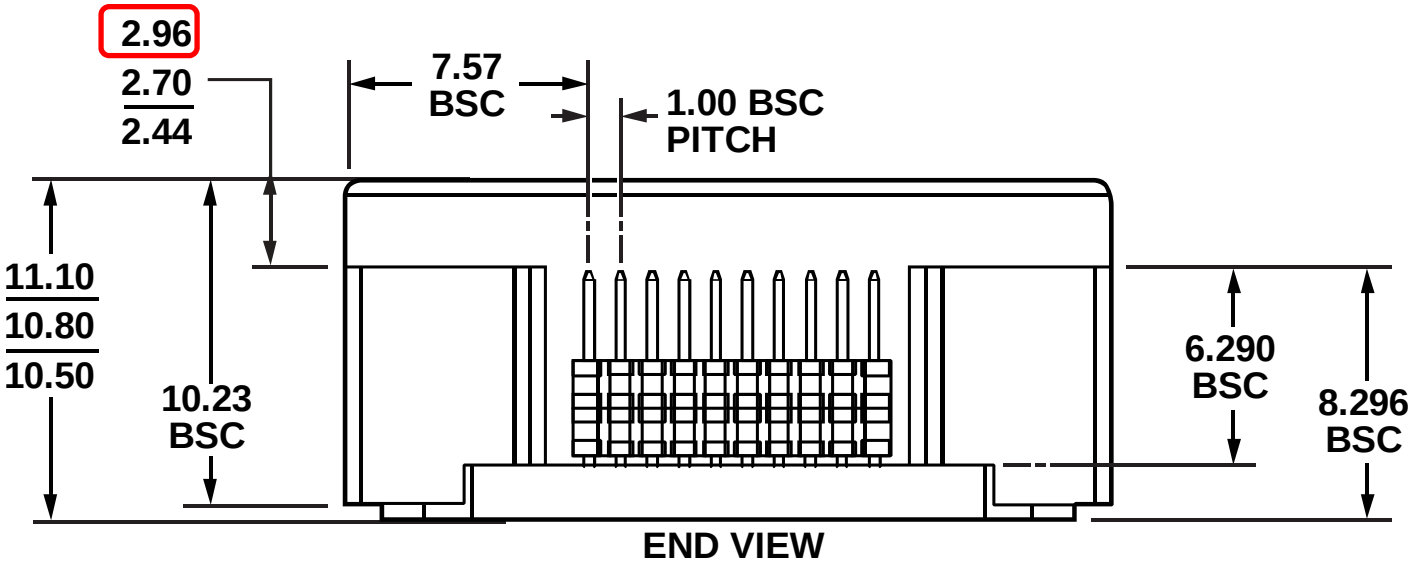
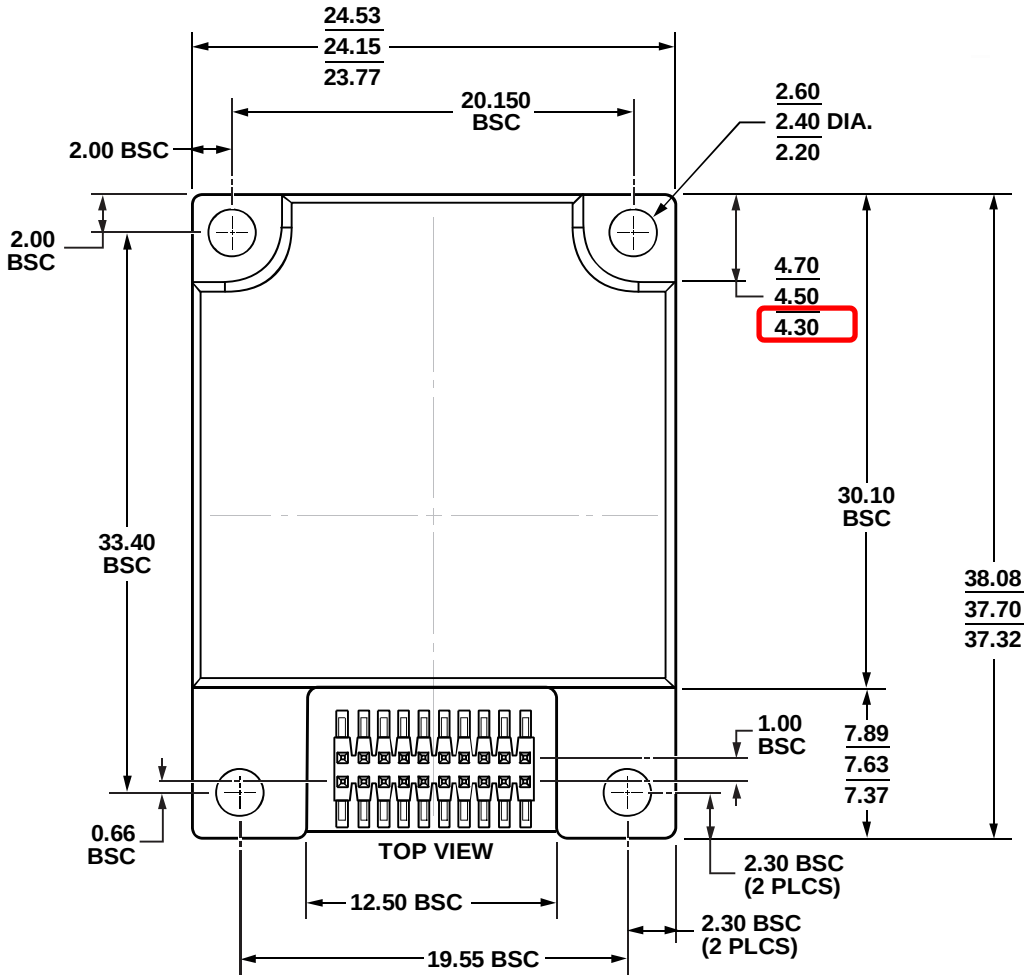
Connector-down Example
Spacer height

- Minimum gap from package lid to mounting surface = 0.26mm
- Maximum distance between the mounting ledge and package top = 2.96mm
- Minimum spacer height = 2.96mm + 0.26mm = **3.22mm**
- If we assume a tolerance of +/-0.26mm on the mechanical spacer, then the nominal spacer height would need to be = 3.22mm + 0.26mm = **3.48mm**



Connector-down Example Spacer Diameter



- The spacer diameter must be smaller than the minimum ledge size (4.3mm) and must be able to accommodate the maximum diameter on the M2x0.4mm or 2-56 machines screws.

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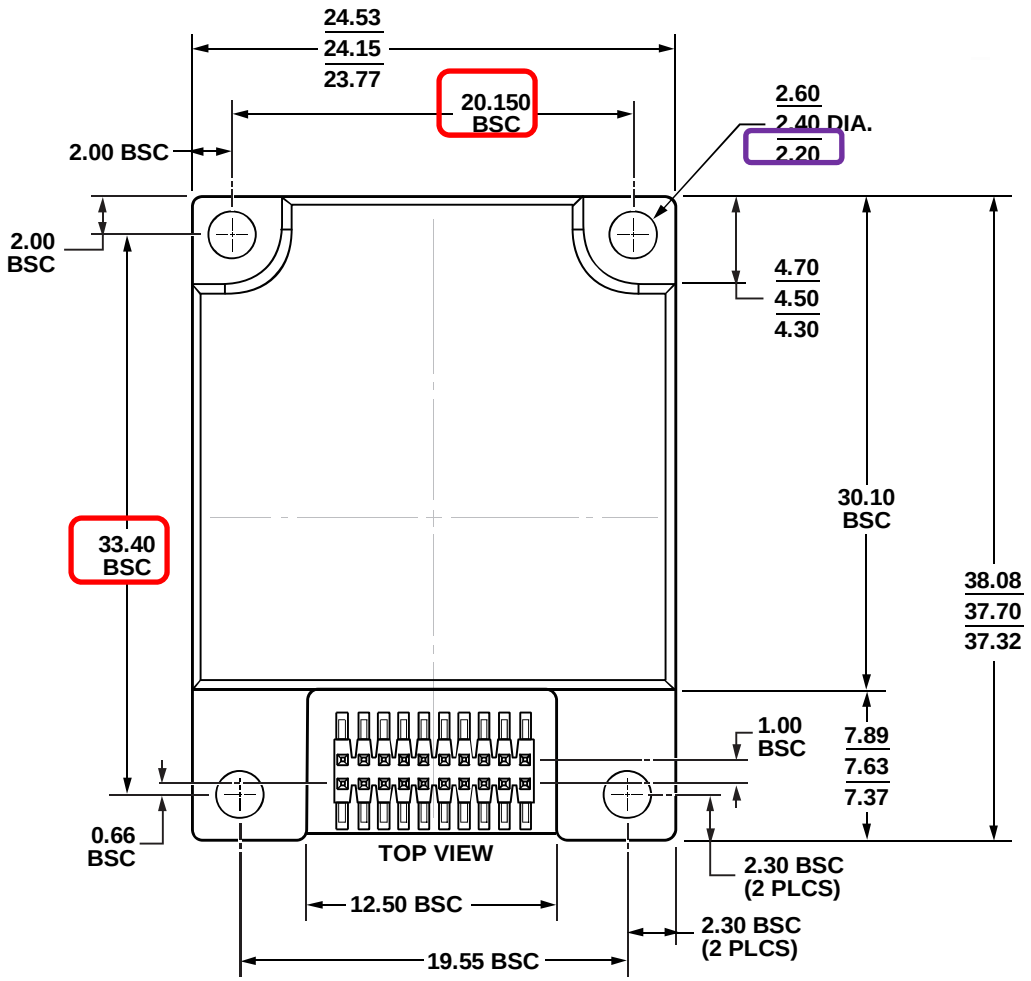
Connector-down Example Baseplate Hole Locations



- Use the “BSC” dimensions (20.15mm & 33.40 mm) between holes to establish the nominal hole locations in the system baseplate.
- NOTE: Take note of the minimum hole size (2.20mm) and the maximum screw diameter when establishing the precision requirements for drill/tap location.

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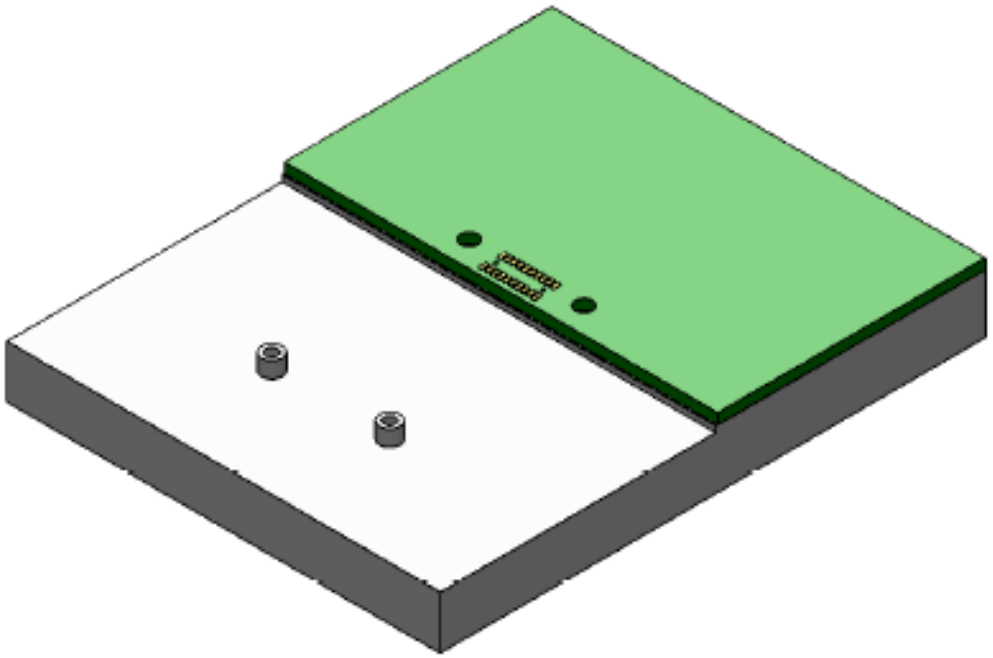
Connector-down Example Baseplate height



- Design the height of the raised surface to accommodate the minimum height of 3.22mm, when using a standard-thickness printed circuit board.
- For example, if the PCB thickness is ± 1.6mm with a tolerance of ± 0.16mm, the minimum height on the raised surface is:
  3.22 – 1.6 + 0.16 = 1.78mm
- If the tolerance on this height is +/-0.26mm, then the height would be = 2.04mm, ±0.26mm

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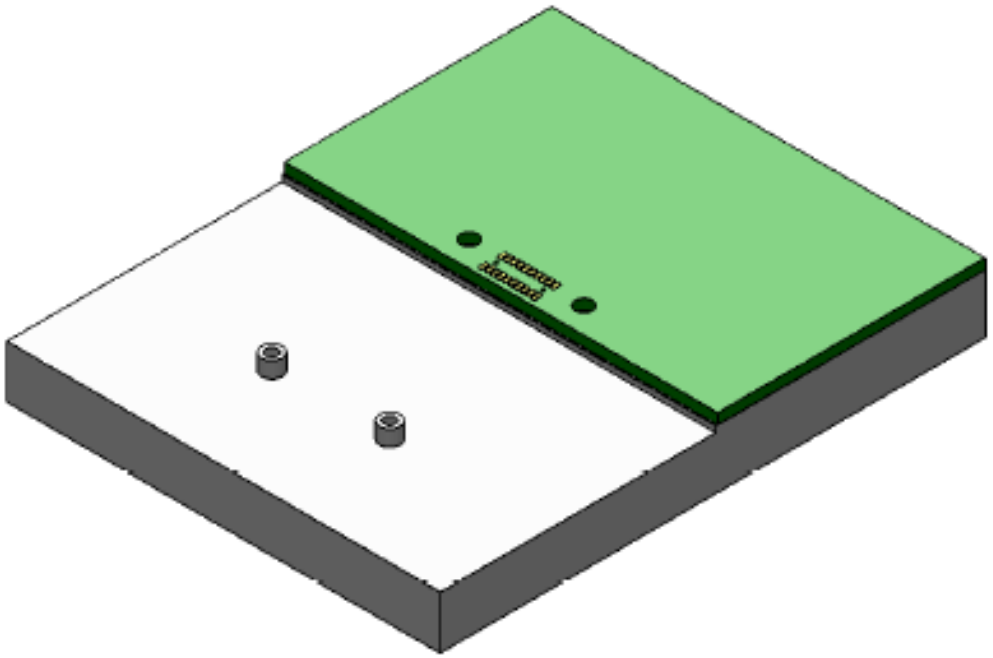
Connector-down Example Printed Circuit Board Holes



- The holes in the PCB will allow the machine screws to pass through to mate with the tapped holes in the system baseplate.
- The diameter of these holes must accommodate the connector-hole variation in the ADIS1644xAMLZ package, along with the same variation in the system PCB.
- For the ADIS1644xAMLZ, this variation is ±0.3mm.
- Assuming that the system PCB has the same variation, a RSS combination would produce a tolerance of ~±0.43mm.

Connector-down Example Mating Connector

- We suggest the CLM-110-02 series from Samtec for the mating connector.
- This connector's nominal base height is 2.248mm
- The nominal distance between the top of the mounting ledge and the base of the ADIS1648xAMLZ's connector is 2.84mm.
  - Not specified on the package drawing
- This leaves ~0.59mm for tolerance build-up

NOTE: These dimensions are being updated to reflect 2.84mm BSC pin length.