

# aLIGO TCS CO2 Laser Photodiode Preamp Mount Assembly

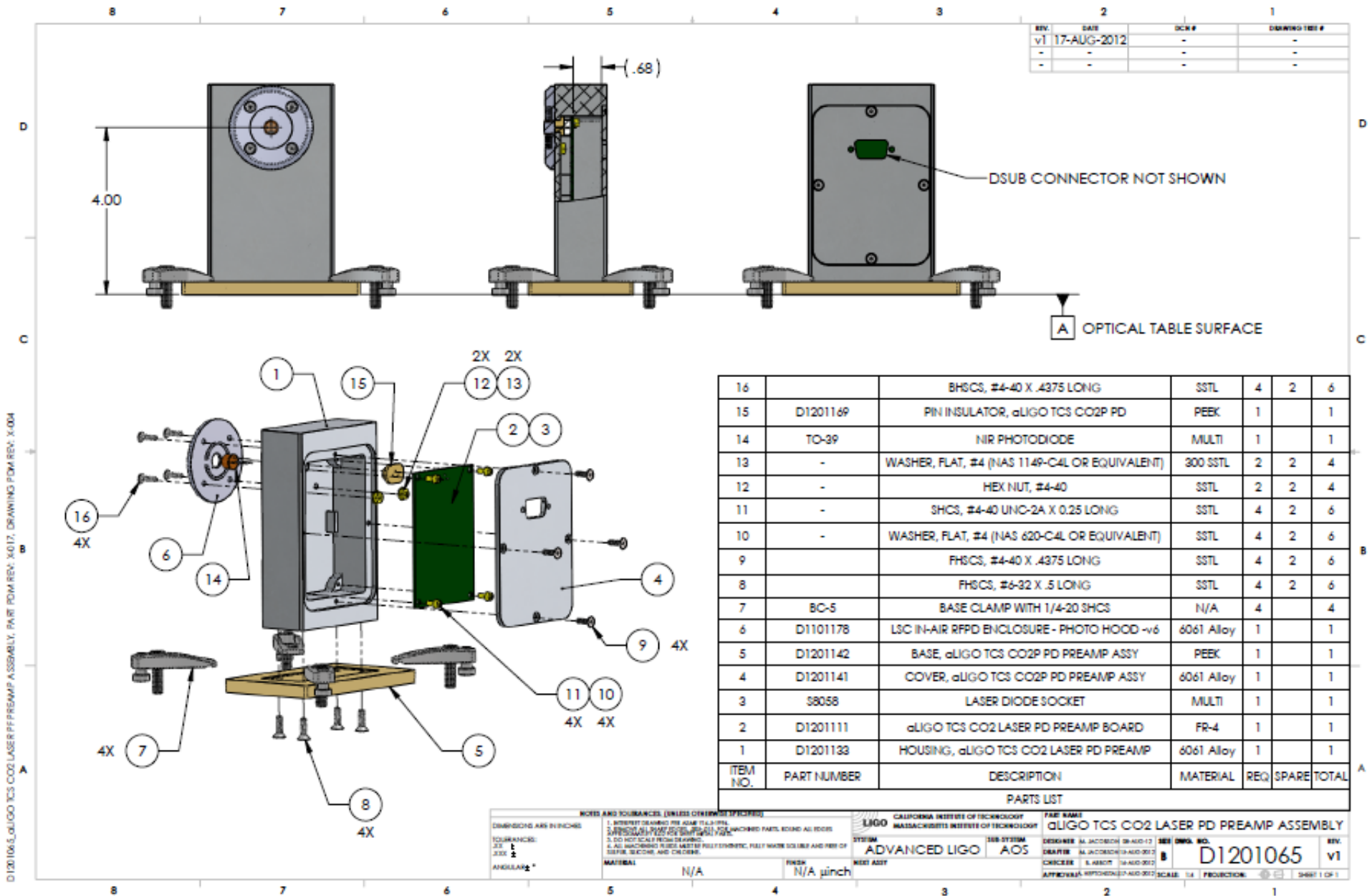
First Article, D1201065-v1

Analysis Package

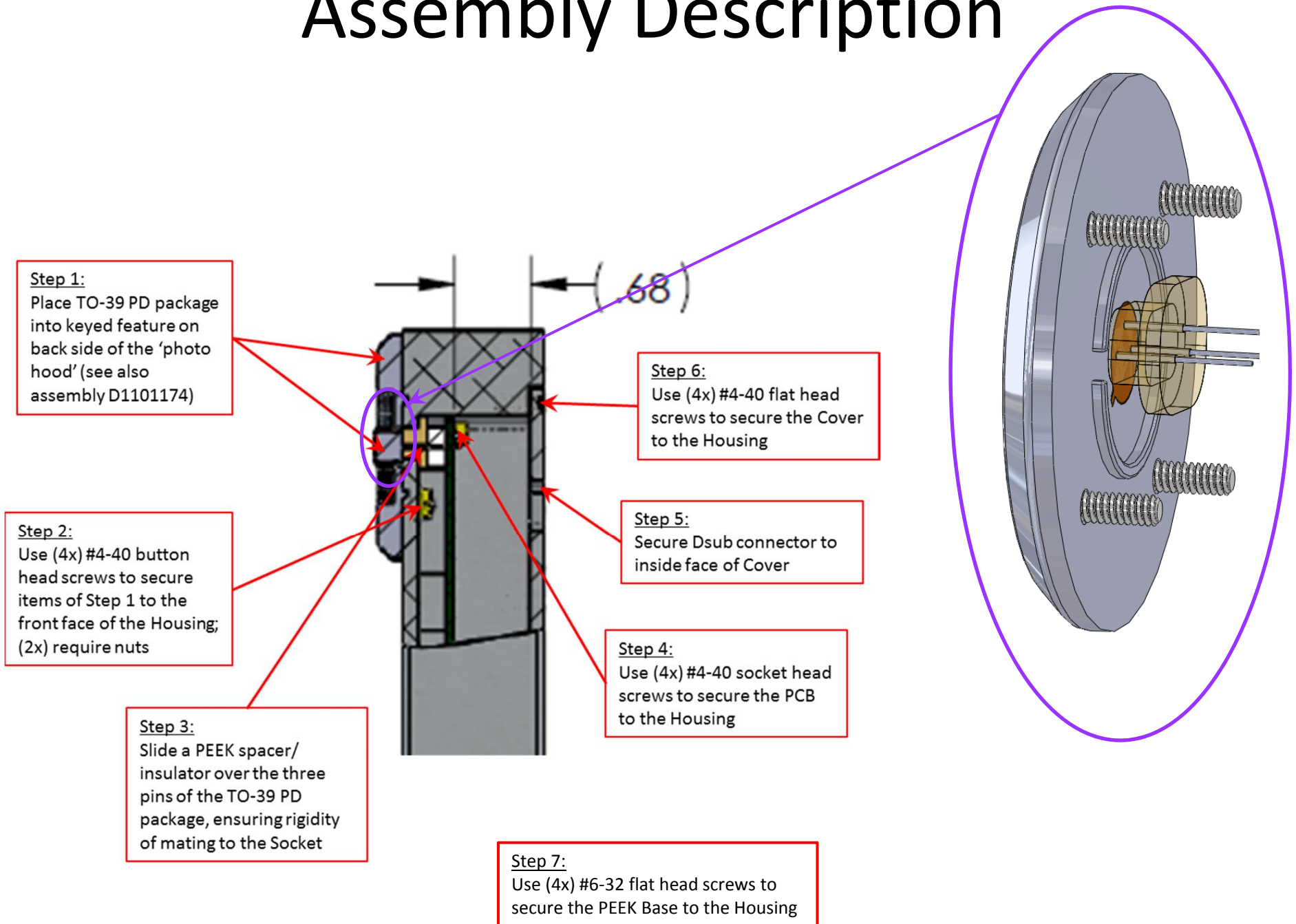
M. Jacobson

20-Aug-2012

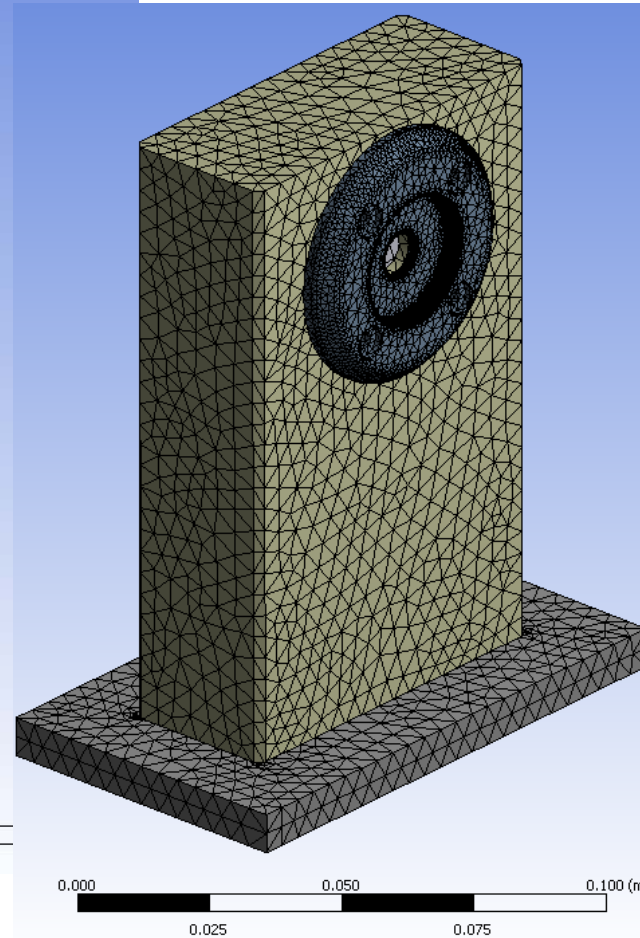
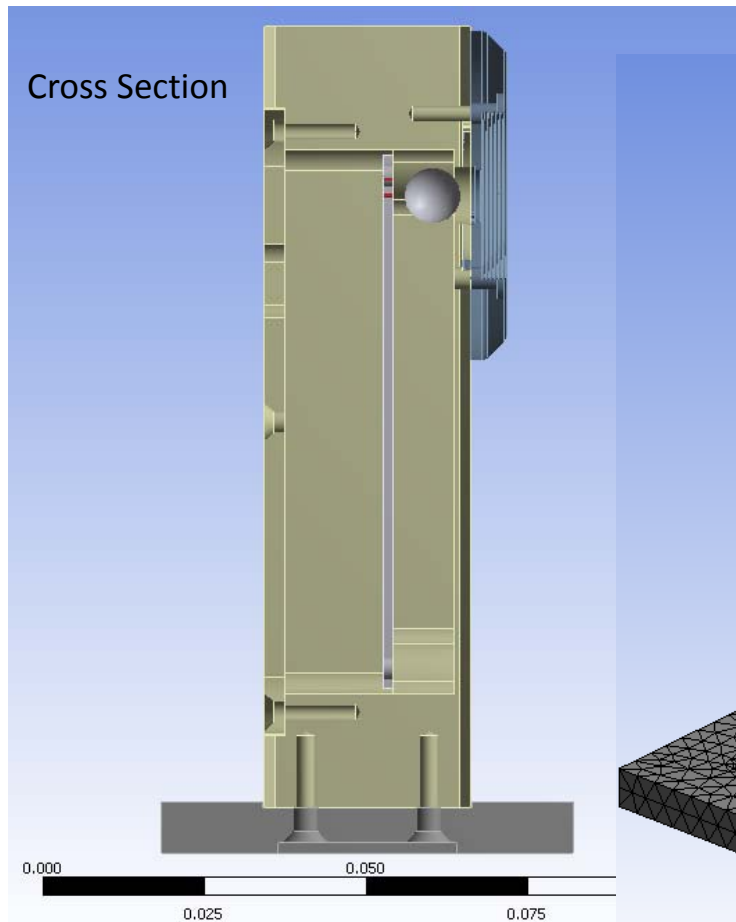
# Assembly Description



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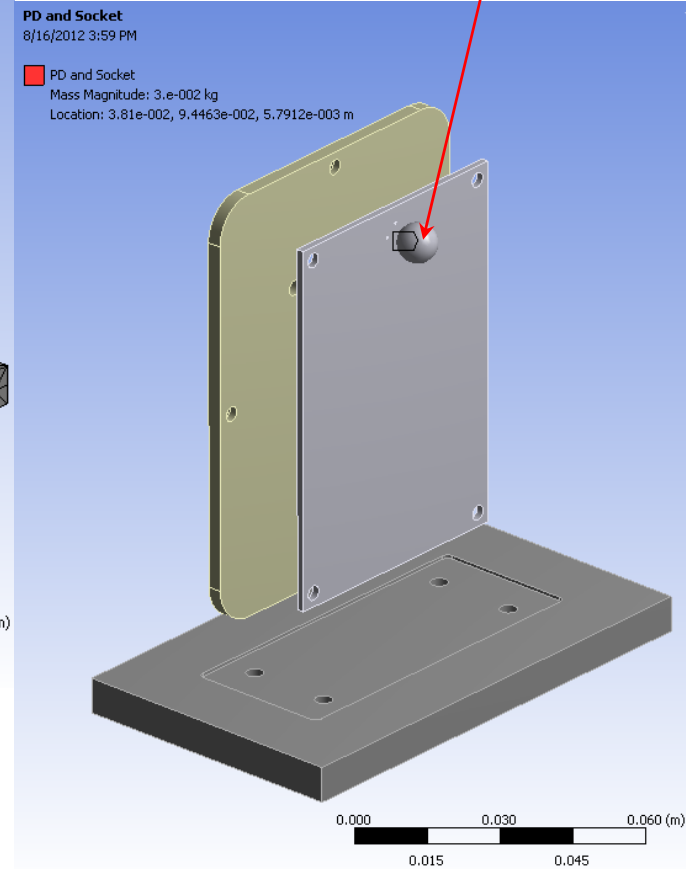


# Assembly FEA Description



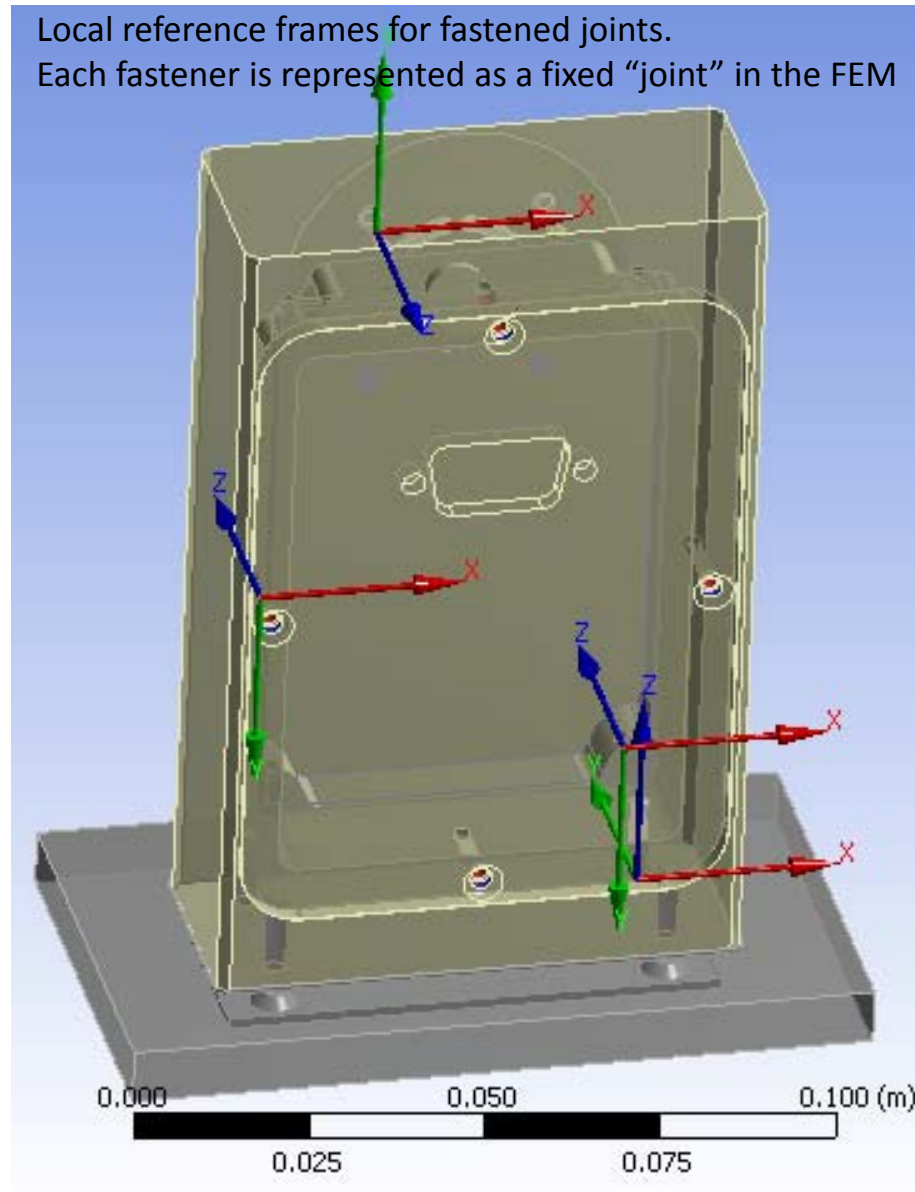
Total Mass = 944g

PD Socket represented as lumped  
12g mass, rigidly connected to the pin  
features in the FR-4 board



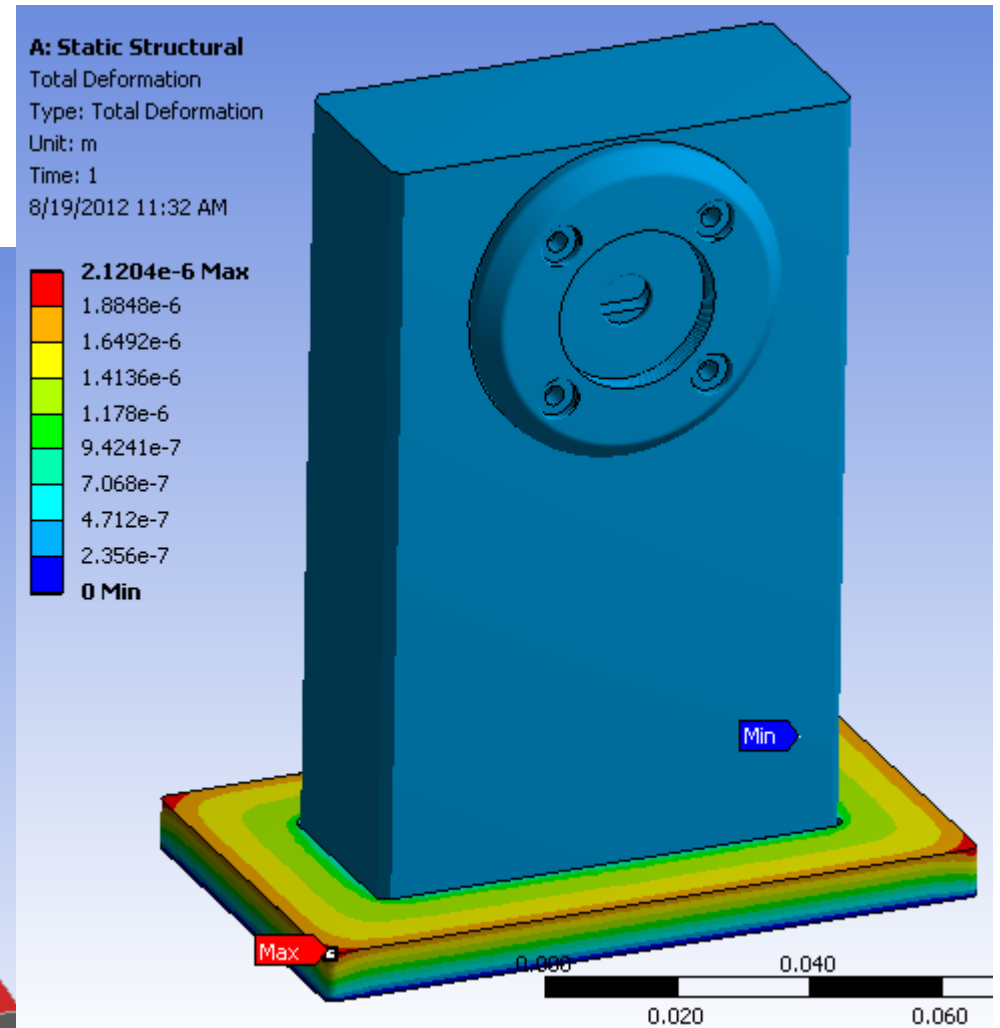
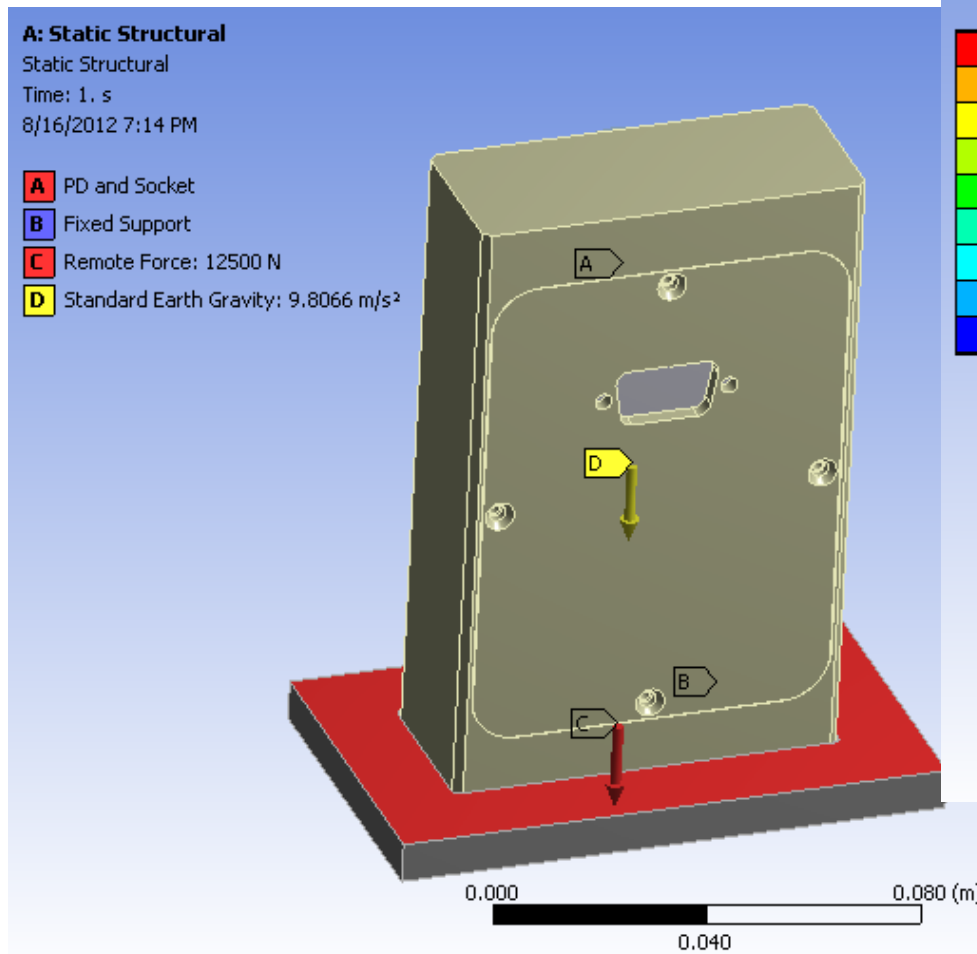
# Assembly FEA Description

Local reference frames for fastened joints.  
Each fastener is represented as a fixed "joint" in the FEM



# Assembly FEA Sequence

Static, 1-G field with simulated base-clamp force applied to top face of the Base plate.



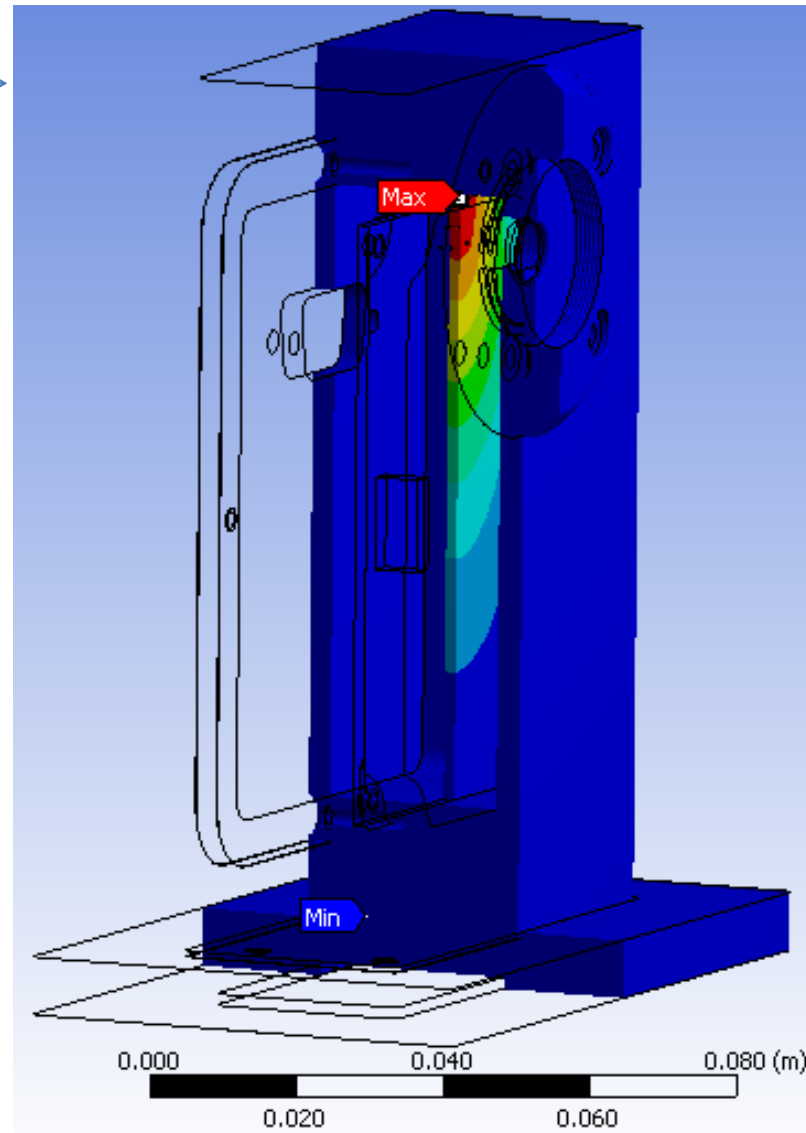
# Assembly FEA Sequence

Normal modes analysis initiated in the pre-stressed state, from the 1-G field.

Mode	<input checked="" type="checkbox"/> Frequency [Hz]
1.	680.36
2.	1030.9
3.	1275.5
4.	1666.1
5.	1707.2
6.	2030.4

Maximum deflection occurs in the vicinity of the socket, mounted directly to the PCB.

Amplitude of “drumhead” motion at 680Hz depends on magnitude of attenuated forcing function, coming through the Base plate.



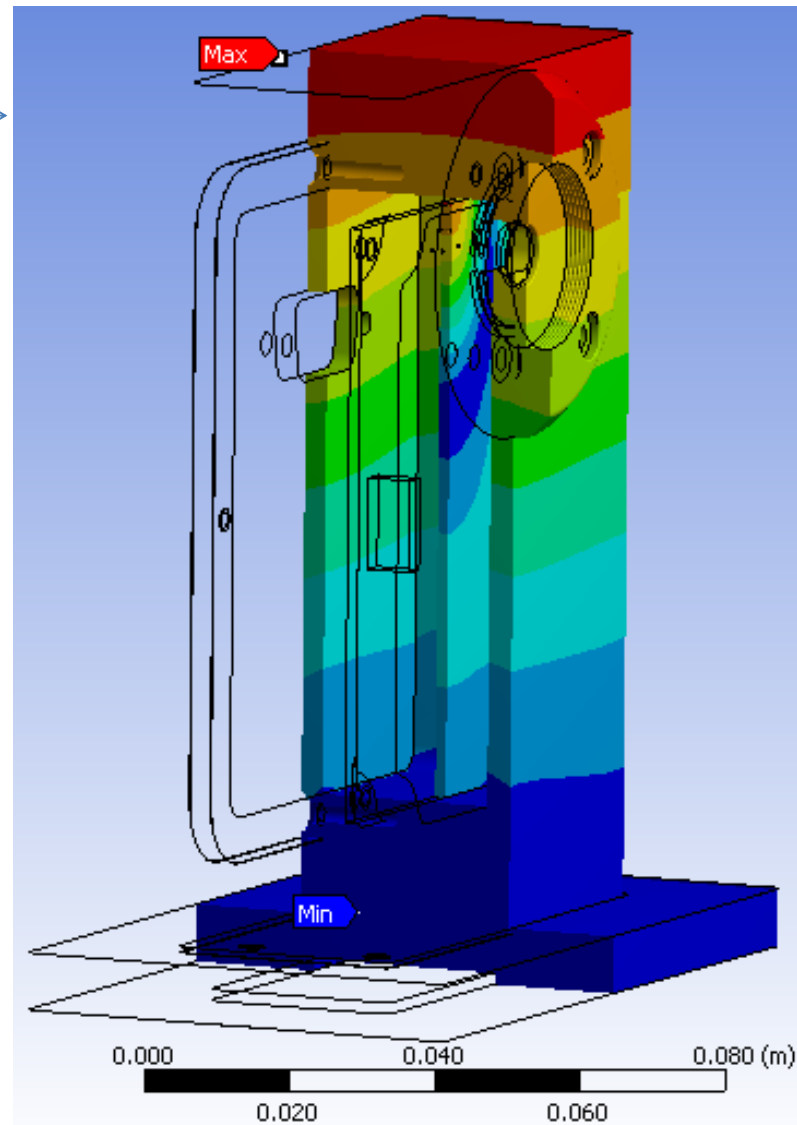
# Assembly FEA Sequence

Normal modes analysis initiated in the pre-stressed state, from the 1-G field.

Mode	<input checked="" type="checkbox"/> Frequency [Hz]
1.	680.36
2.	1030.9
3.	1275.5
4.	1666.1
5.	1707.2
6.	2030.4

Maximum deflection occurs at top of Housing.

Amplitude of “drumhead” motion at 1030Hz depends on magnitude of attenuated forcing function, coming through the Housing.





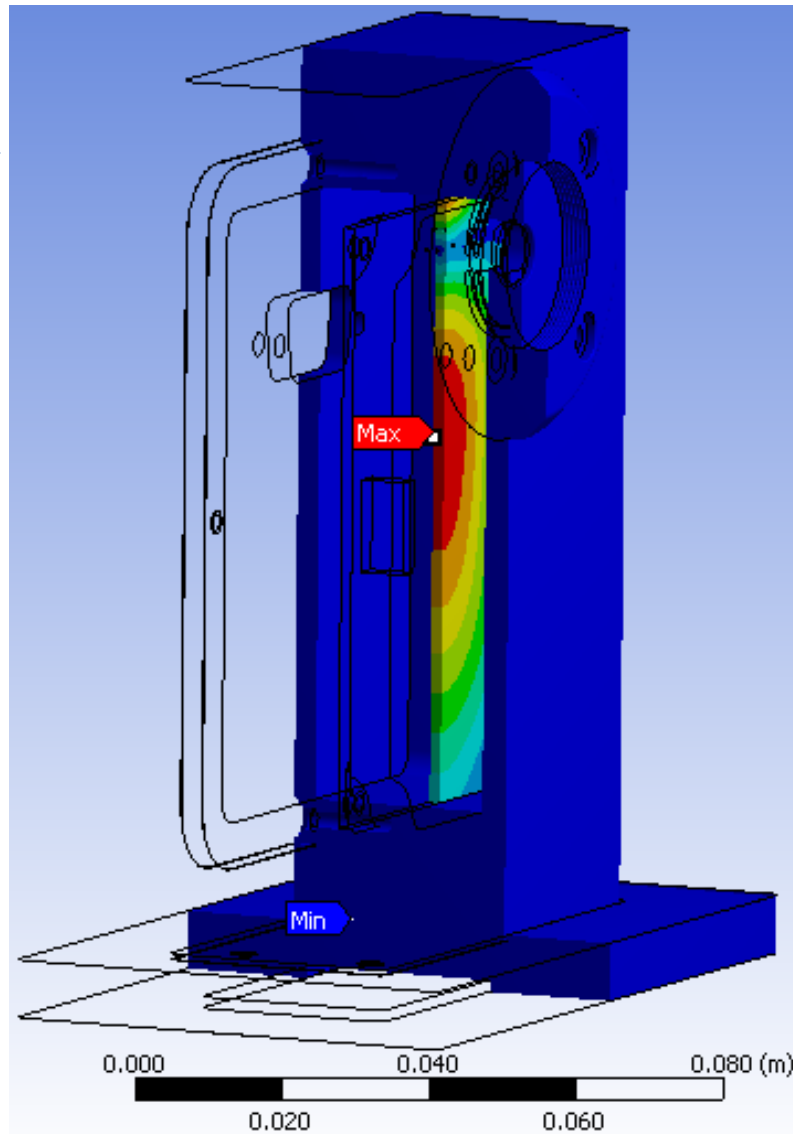
# Assembly FEA Sequence

Normal modes analysis initiated in the pre-stressed state, from the 1-G field.

Mode	<input checked="" type="checkbox"/> Frequency [Hz]
1.	680.36
2.	1030.9
3.	1275.5
4.	1666.1
5.	1707.2
6.	2030.4

Maximum deflection occurs in the free mid-span of the PCB.

Amplitude of “drumhead” motion at 1275Hz depends on magnitude of attenuated forcing function, coming through the Housing, which couples to motion of the PCB.



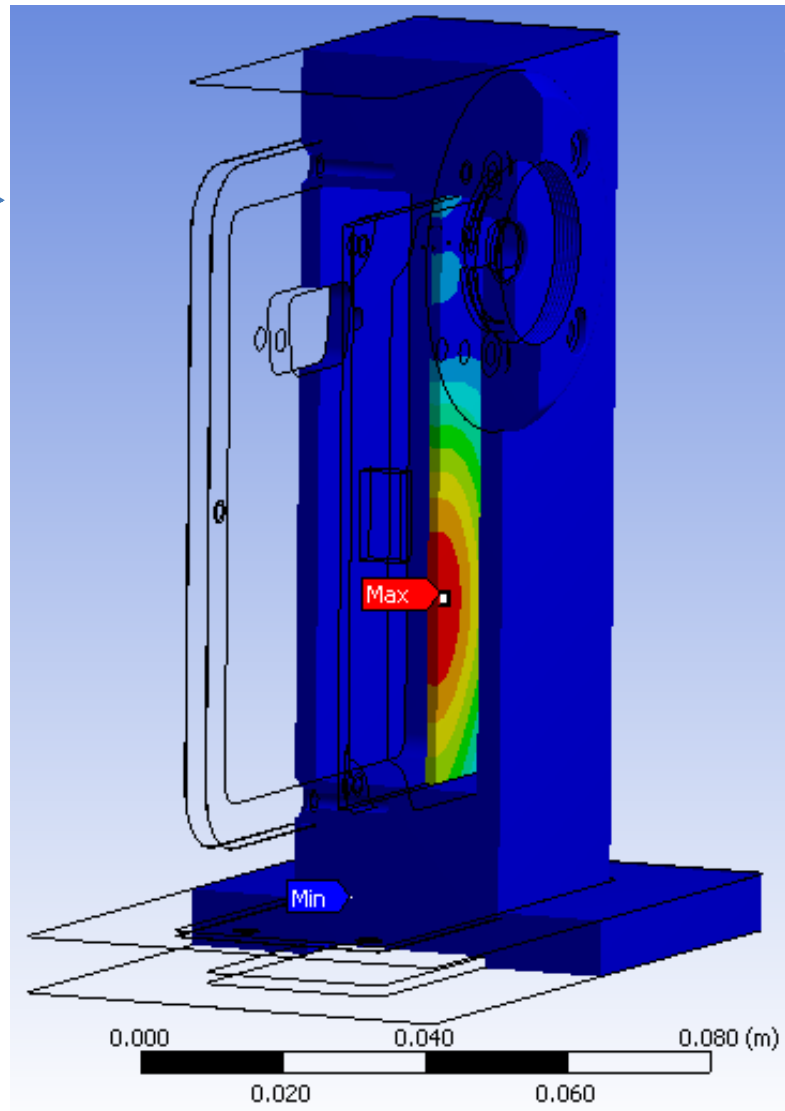
# Assembly FEA Sequence

Normal modes analysis initiated in the pre-stressed state, from the 1-G field.

Mode	<input checked="" type="checkbox"/> Frequency [Hz]
1.	680.36
2.	1030.9
3.	1275.5
4.	1666.1
5.	1707.2
6.	2030.4

Maximum deflection occurs in the free mid-span of the PCB.

Amplitude of “drumhead” motion at 1666Hz depends on magnitude of attenuated forcing function, coming through the Housing, which couples to motion of the PCB.



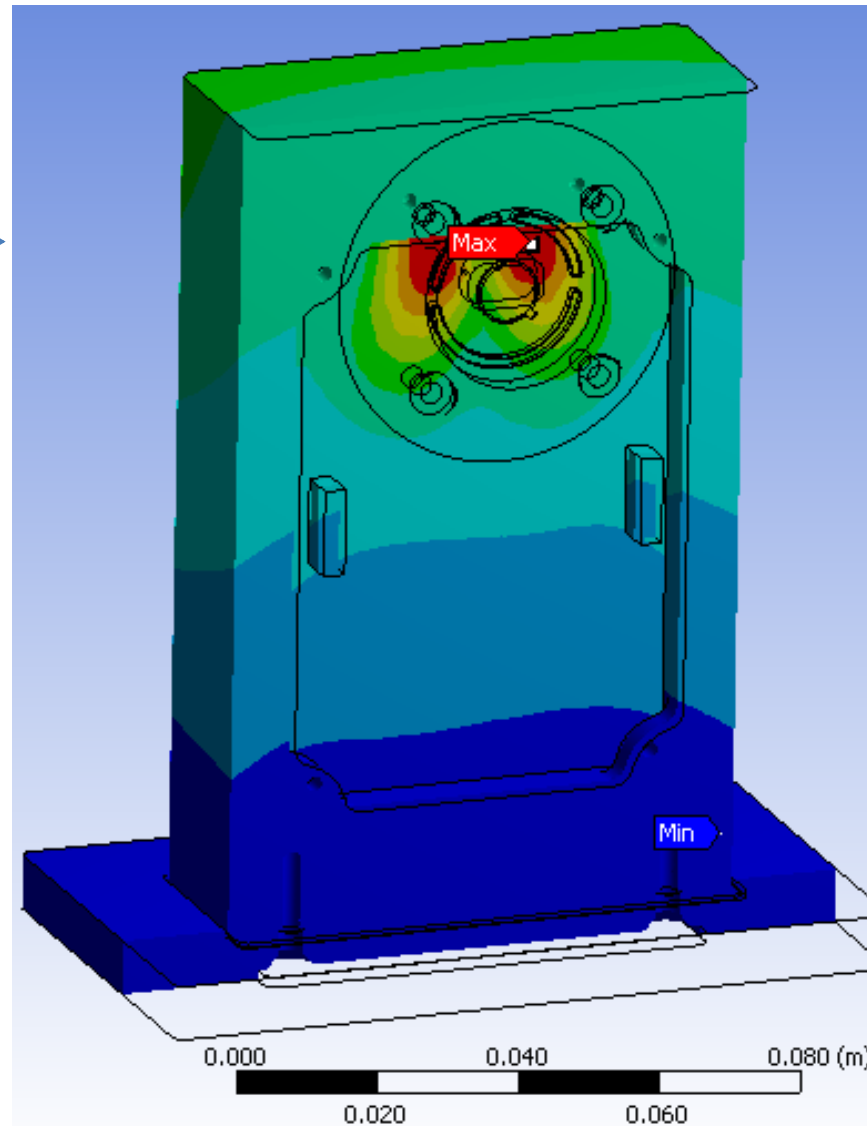
# Assembly FEA Sequence

Normal modes analysis initiated in the pre-stressed state, from the 1-G field.

Mode	<input checked="" type="checkbox"/> Frequency [Hz]
1.	680.36
2.	1030.9
3.	1275.5
4.	1666.1
5.	1707.2
6.	2030.4

Maximum deflection occurs within the PCB and is coupled to motion of the Housing.

Amplitude of motion at 1707Hz depends on magnitude of attenuated forcing function, coming through the Housing and Base plate.



# Assembly FEA Sequence

Normal modes analysis initiated in the pre-stressed state, from the 1-G field.

Mode	<input checked="" type="checkbox"/> Frequency [Hz]
1.	680.36
2.	1030.9
3.	1275.5
4.	1666.1
5.	1707.2
6.	2030.4

Maximum deflection occurs within the PCB and is coupled to motion of the Housing.

Amplitude of motion at 2030Hz depends on magnitude of attenuated forcing function, coming through the Housing and Base plate.

