

# V2 10N STATIC LOAD

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## Study Report

Analyzed File	V2 v5
Version	Autodesk Fusion 360 (2.0.3803)
Creation Date	2018-03-18, 21:09:55
Author	

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### ▣ Simulation Model 1:1

#### ▣ Study 2 - (10N) Static Stress

##### ▣ Study Properties

Study Type	Static Stress
Last Modification Date	2018-03-18, 03:21:08

##### ▣ Settings

###### ▣ General

Contact Tolerance	0.1 mm
Remove Rigid Body Modes	No

###### ▣ Mesh

Average Element Size (% of model size)	
Solids	10
Scale Mesh Size Per Part	No
Average Element Size (absolute value)	-
Element Order	Parabolic
Create Curved Mesh Elements	No
Max. Turn Angle on Curves (Deg.)	60
Max. Adjacent Mesh Size Ratio	1.5
Max. Aspect Ratio	10
Minimum Element Size (% of average size)	20

## ▣ Adaptive Mesh Refinement

Number of Refinement Steps	0
Results Convergence Tolerance (%)	20
Portion of Elements to Refine (%)	10
Results for Baseline Accuracy	Von Mises Stress

## ▣ Materials

Component	Material	Safety Factor
Headset V2 v3:1	PLA (3D Printed)	Yield Strength
Odroid XU4 v1:2	SolidWorks Materials Silicon 67	Yield Strength

### ▣ PLA (3D Printed)

Density	3.75E-07 kg / mm <sup>3</sup>
Young's Modulus	3400 MPa
Poisson's Ratio	0.38
Yield Strength	13 MPa
Ultimate Tensile Strength	15 MPa
Thermal Conductivity	1.6E-04 W / (mm C)
Thermal Expansion Coefficient	8.57E-05 / C
Specific Heat	1500 J / (kg C)

### ▣ SolidWorks Materials | Silicon | 67

Density	2.33E-06 kg / mm <sup>3</sup>
Young's Modulus	112400 MPa
Poisson's Ratio	0.28
Yield Strength	120 MPa
Ultimate Tensile Strength	0 MPa
Thermal Conductivity	0.124 W / (mm C)
Thermal Expansion Coefficient	0 / C
Specific Heat	0 J / (kg C)

## ▣ Contacts

### ▣ Bonded

Name
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[S] Bonded1 [Headset V2 v3:1  Odroid XU4 v1:2]
[S] Bonded2 [Headset V2 v3:1  Odroid XU4 v1:2]
[S] Bonded3 [Headset V2 v3:1  Odroid XU4 v1:2]

☐
**Mesh**

Type	Nodes	Elements
Solids	25643	12876

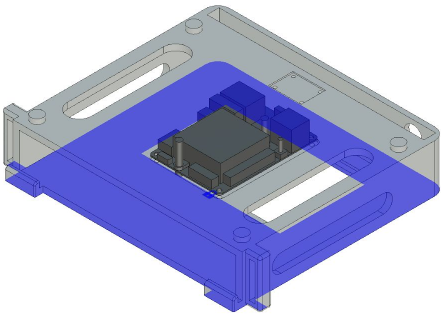
☐
**Load Case1**

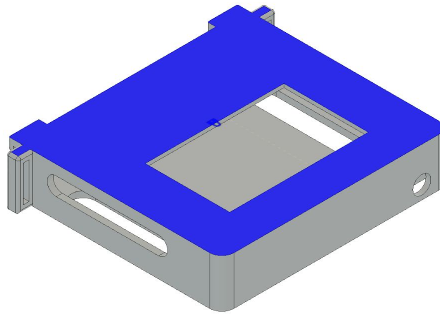
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**Constraints**

☐
**Fixed1**

Type	Fixed
Ux	Yes
Uy	Yes
Uz	Yes

☐
**Selected Entities**



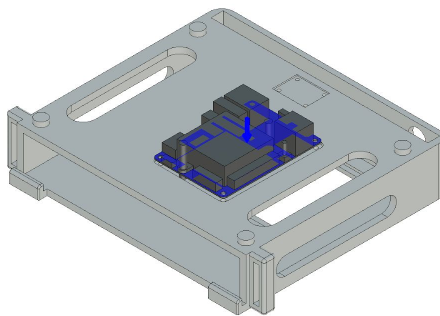


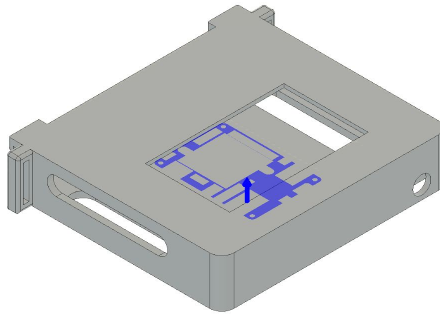
## ▣ Loads

### ▣ Force1

Type	Force
Magnitude	10 N
X Value	0 N
Y Value	-10 N
Z Value	0 N
Force Per Entity	No

### ▣ Selected Entities





## Results

### Result Summary

Name	Minimum	Maximum
Safety Factor		
Per Body	9.164	15
Stress		
Von Mises	4.18E-09 MPa	11.91 MPa
1st Principal	-3.402 MPa	7.691 MPa
3rd Principal	-16.17 MPa	2.236 MPa
Normal XX	-7.538 MPa	3.974 MPa
Normal YY	-7.782 MPa	4.758 MPa
Normal ZZ	-11.17 MPa	7.016 MPa
Shear XY	-1.238 MPa	3.613 MPa
Shear YZ	-6.403 MPa	2.543 MPa
Shear ZX	-1.671 MPa	1.349 MPa
Displacement		
Total	0 mm	0.1082 mm
X	-0.004519 mm	0.006206 mm
Y	-0.1082 mm	0.001083 mm
Z	-0.01003 mm	0.007075 mm
Reaction Force		
Total	0 N	1.52 N
X	-0.56 N	0.4115 N

Y	-0.8803 N	1.383 N
Z	-0.3044 N	0.5042 N
Strain		
Equivalent	2.253E-12	5.007E-04
1st Principal	-8.282E-07	4.78E-04
3rd Principal	-5.429E-04	6.853E-08
Normal XX	-2.653E-04	1.719E-04
Normal YY	-2.499E-04	2.955E-04
Normal ZZ	-3.192E-04	2.578E-04
Shear XY	-1.777E-04	1.756E-04
Shear YZ	-3.311E-04	3.82E-04
Shear ZX	-2.609E-04	2.146E-04
Contact Pressure		
Total	0 MPa	10.08 MPa
X	-1.444 MPa	1.082 MPa
Y	-4.162 MPa	7.782 MPa
Z	-1.805 MPa	6.403 MPa

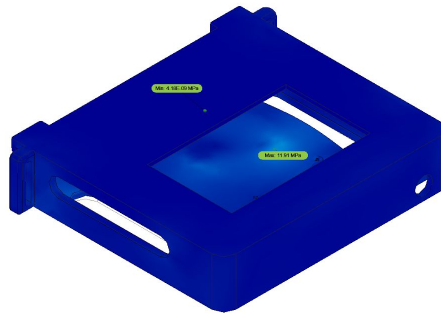
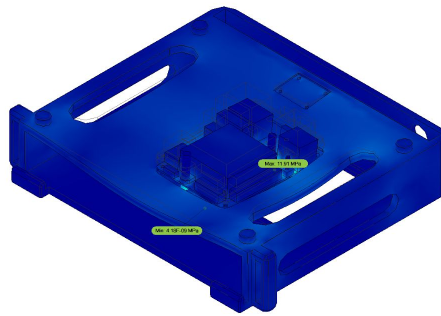
#### ☐ Reaction Forces

Constraint Name	Reaction Force		Reaction Moment	
	Magnitude	Component (X,Y,Z)	Magnitude	Component (X,Y,Z)
Fixed1	10.05 N	3.889E-05 N	180 N mm	13.51 N mm
		10.05 N		-0.002078 N mm
		-1.13E-05 N		179.5 N mm

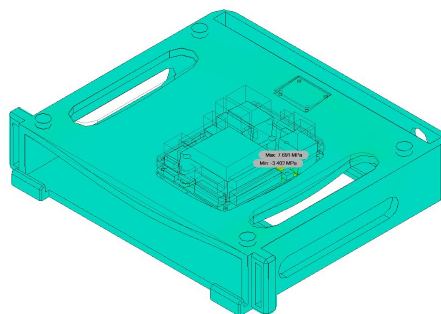
#### ☐ Stress

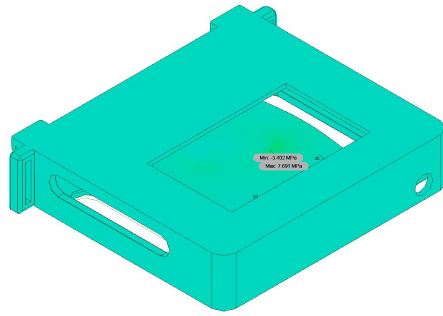
##### ☐ Von Mises

[MPa] 0  11.91



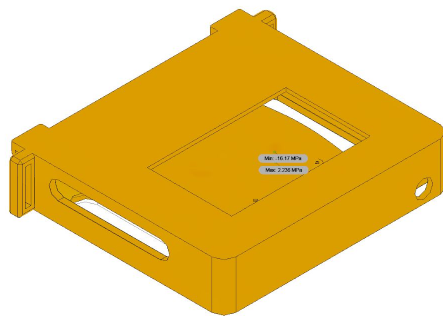
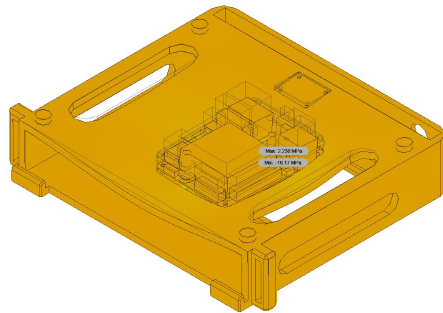
1st Principal  
[MPa] -3.402 7.691





☐ **3rd Principal**

[MPa] -16.17  2.24

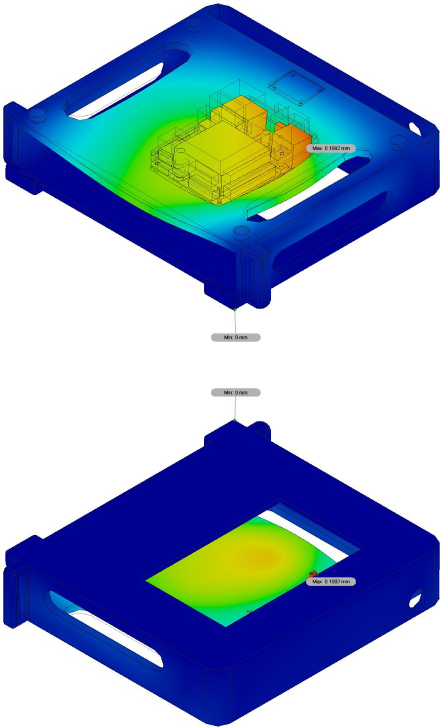


☐ **Displacement**

☐ **Total**



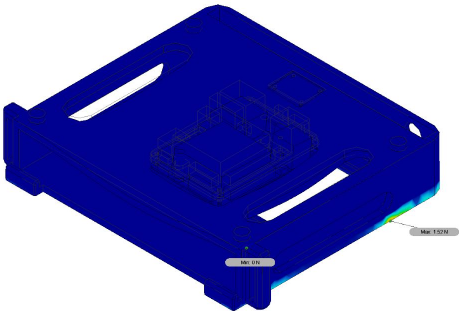
[mm] 0  0.1082

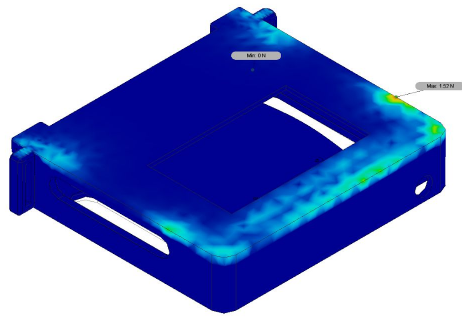


☐ **Reaction Force**

☐ **Total**

[N] 0  1.52

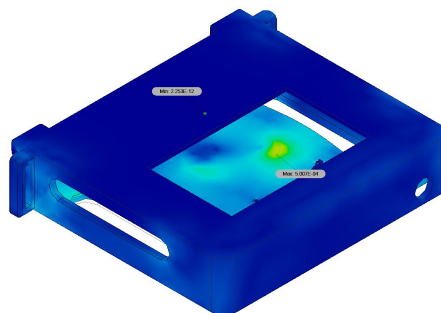
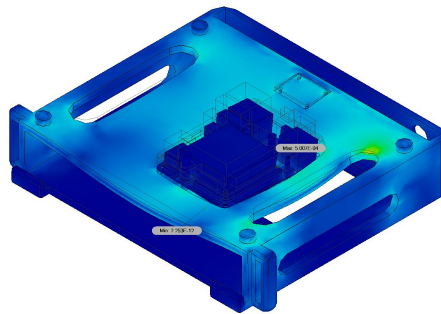




☐ **Strain**

☐ **Equivalent**

0  5.007E-04



☐ **Contact Pressure**

☐ **Total**

[MPa] 0  10.08

