



<http://www.cubesatkit.com/>

# CubeSat Kit™ Midplane Standoff Kit

Hardware Revision: B

## Structural Component

### Applications

- 1U, 1.5U, 2U & 3U CubeSat Kits
- For Rev D and later CubeSat Kit structures

### Features

- Ties inter-module columns to CubeSat Kit structure
- Structurally strengthens CubeSat Kit
- Sized for M3 fasteners
- Minimal footprint
- Light weight



### ORDERING INFORMATION

Pumpkin P/N 711-00331

Option Code	Configuration
/00 (standard)	standard

Contact factory for availability of optional configurations.

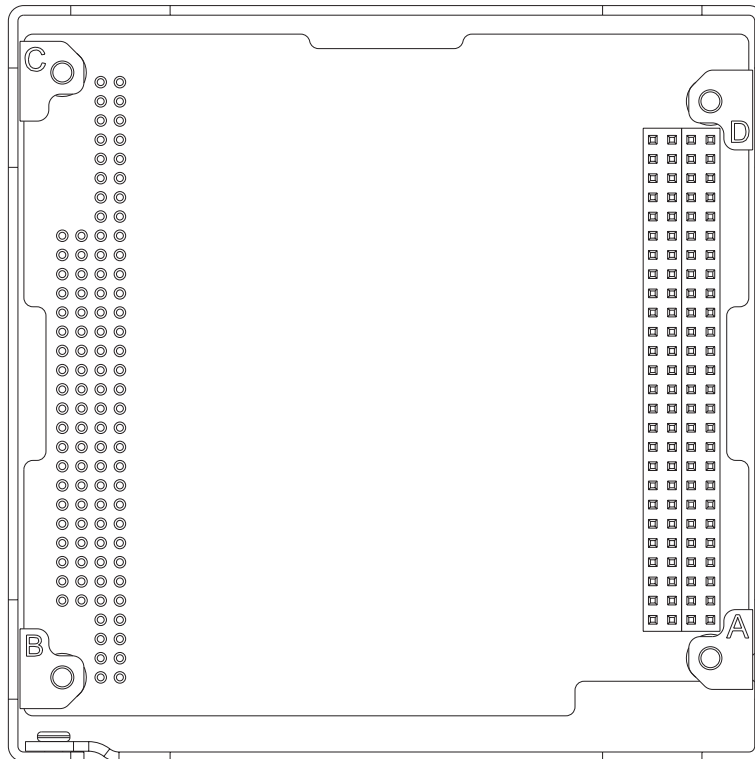
**MATERIAL**

Parameter	Value
Material	Aluminum 7075-T6
Finish	hard anodized, MIL-A-8625F

**PHYSICAL CHARACTERISTICS**

Parameter	Conditions / Notes	Symbol	Min	Typ	Max	Units
Mass	Complete set of 4, with 4 M3x5mm screws			4		g
Height	Rod or screw passes through this dimension			5.0		mm
Mounting hole	For flat-head machine screw, threaded			M3		
Through hole	For threaded rod or cap / button-head machine screw, not threaded			3		mm

**SIMPLIFIED MECHANICAL LAYOUT <sup>1</sup>**



Each Midplane Standoff kit includes four unique Midplane Standoffs labeled 'A', 'B', 'C' and 'D', and four M3x5mm stainless-steel flat-head machine screws. The arrangement of the Midplane Standoffs relative to the Chassis Walls and internal modules is shown above.

Rev D and later CubeSat Kit structures have dedicated mounting points for Midplane Standoffs on two opposing sides of the Chassis Walls.<sup>2</sup> These sets of four countersunk holes are located at roughly

<sup>1</sup> Shown from above a CubeSat Kit, with the Cover Plate Assembly removed. The CubeSat Kit Bus connectors H1 and H2 are shown on the right side.

<sup>2</sup> In contrast to Rev C CubeSat Kit structures, Rev D structures use a symmetric placement for the MPS mounting points in the Chassis Walls. Because of this, and because the four mounting holes of CubeSat Kit and PC/104 modules are arranged asymmetrically, the corresponding Rev D Midplane Standoffs are unique for each corner.

100mm intervals above the Base Plate Assembly. The number of mounting points is a function of the overall length of the Chassis Walls. For each Chassis Walls, the location of the Midplane Standoffs is designed to mate with a typical module stack at a distance of 1mm above the PCB nearest to the Midplane Standoffs. Due to production tolerances<sup>3</sup>, users must gauge the distance between the Midplane Standoffs and the nearest PCB and use a spacer of the appropriate thickness in order to obtain a proper clamping force between the Midplane Standoffs and the PCBs. M3 washers or machined M3 spacers with an outer diameter of maximum 6mm are permitted. This is illustrated in Figure 1, below.<sup>4</sup>

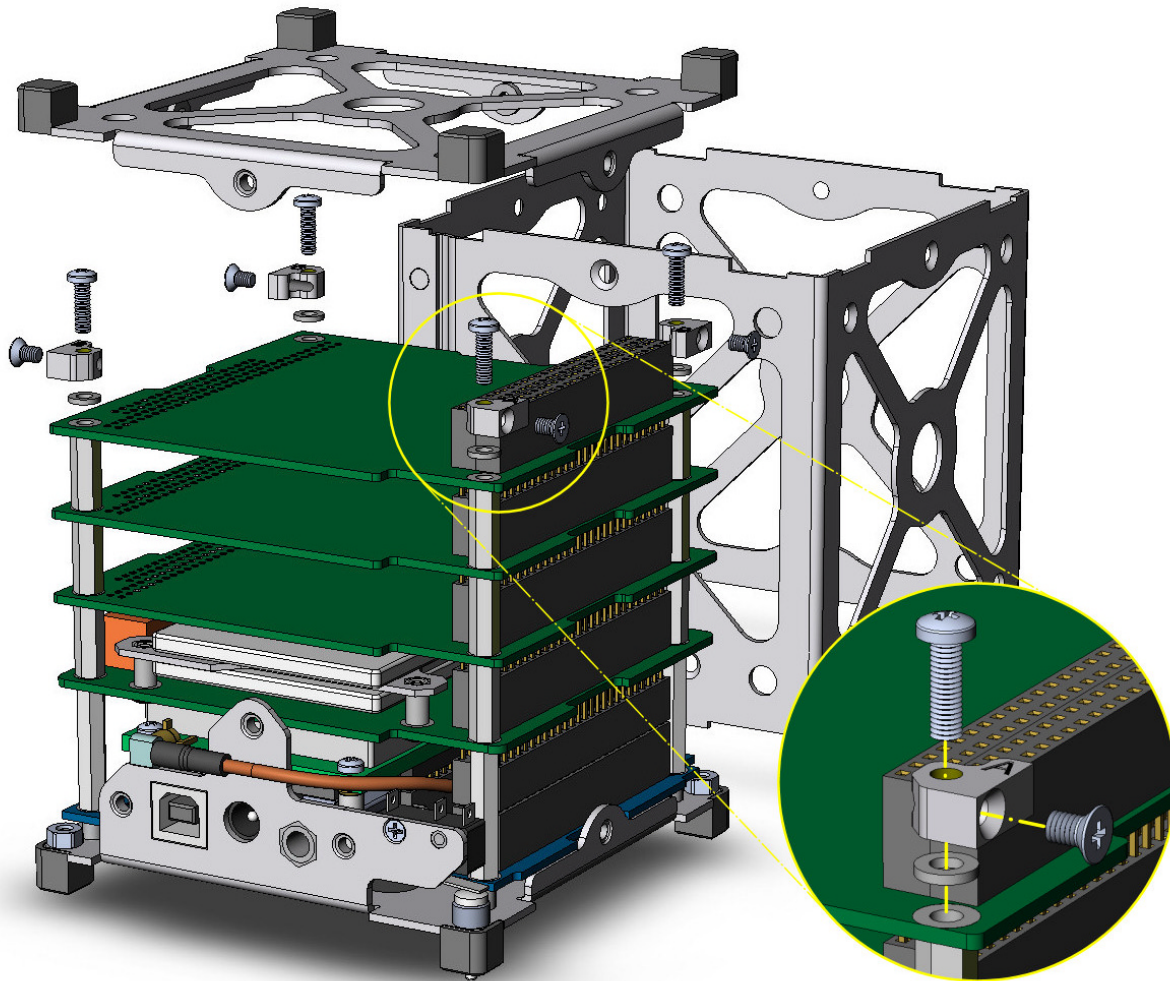


Figure 1: Exploded & detail views of Midplane Standoffs used to secure top of module mounting columns in a Rev D skeletonized 1U CubeSat Kit structure

Midplane Standoffs can be utilized in several different ways:

- As the topmost mounting points for the four standoff/spacer columns through the mounting holes of the internal modules,
- As an attachment point in the middle of a larger (i.e. > 1U) CubeSat Kit structure for a module stack, and
- As the basis for a "shelf" to mount structures inside CubeSat Kits of any size.

<sup>3</sup> E.g. the aggregate thickness of user PCBs, which can vary considerably.

<sup>4</sup> The illustration shows a module stacking scheme using male/female threaded hex standoffs. In such a scheme, an M3 machine screw is usually the topmost fastening element. The preferred method (due to less mass) is to use M3 threaded rods and simple spacers inside a CubeSat Kit. When using rods, a lock washer and hex nut secure the top of the rod to the Midplane Standoffs.

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