

NanoUtil FPP Top-S

Datasheet

Small Flight Preparation Panel for nano-satellites

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2 Changelog

| Date | Revision | Author | Description |
|------------|----------|--------|--------------------------|
| 21-10-2016 | 1.1 | FJH | First edition |
| 22-11-2016 | 1.2 | KLK | Text and picture updates |
| 11-1-2017 | 1.3 | KLK | New photos and chapter 7 |

3 Overview

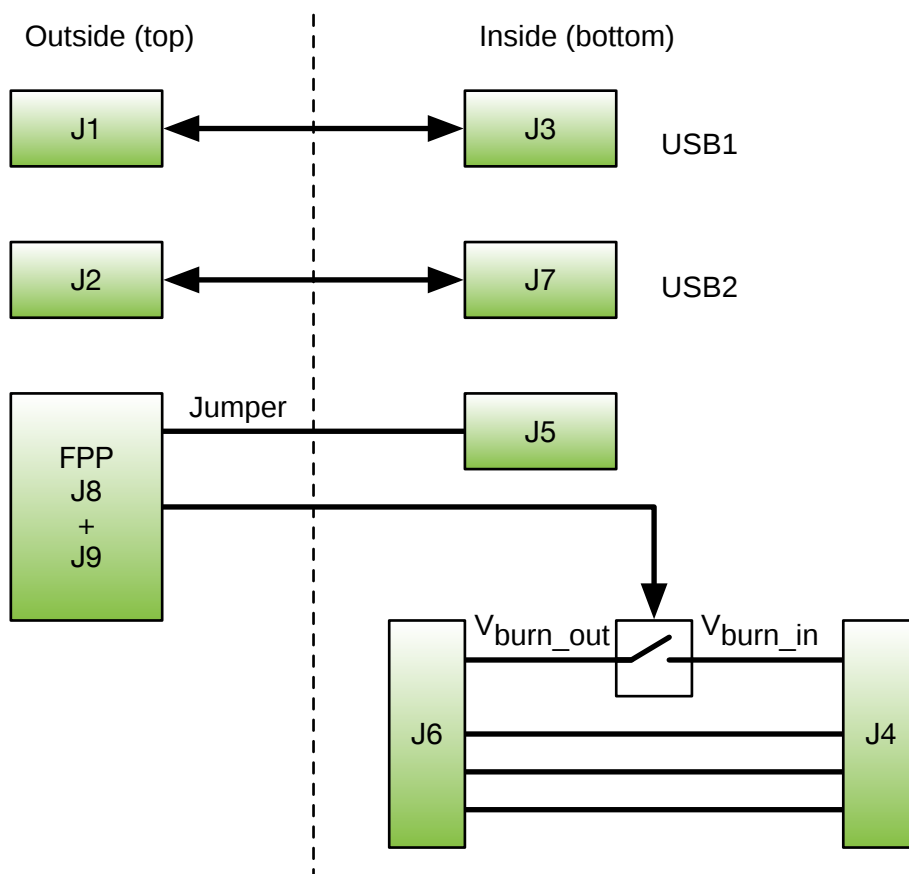
The NanoUtil FFP Top-S is a small Flight Preparation Panel for 1U, 2U or 3U nano-satellites. The connectors on the top of the PCB can be reached from the outside of the satellite, and those on the bottom are used to connect to other subsystems inside the satellite.

The FFP Top-S is designed to be mounted just below a solar panel and on top of an antenna board on the top or bottom of the satellite. See chapter 8.

3.1 Highlighted Features

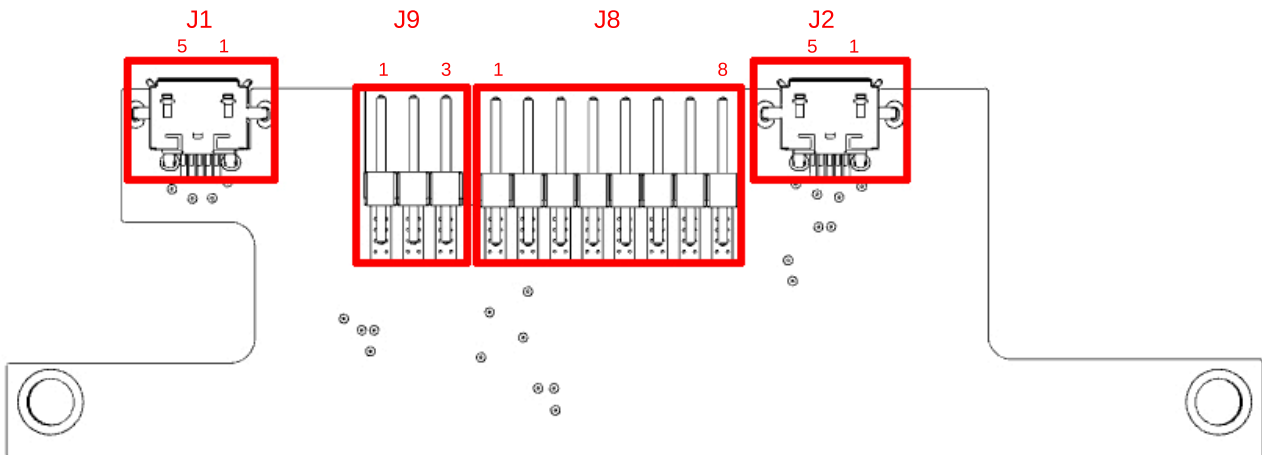
- Easy integration with other GomSpace products
- Flight Preparation Panel
 - 2 USB interfaces with ESD and noise protection
 - Remove Before Flight (RBF) pins
 - Satellite charging interface
 - Kill Switch on/off
- PCB material: glass/polyimide
- IPC-A-610 Class 2 assembly

3.2 Block Diagram



4 Hardware Layout

4.1 Connector Location Top



4.1.1 J1 – Standard Micro USB

Micro USB Type AB. AMP 1981584-1 USB Connector.

4.1.2 J2 – Standard Micro USB

Micro USB Type AB. AMP 1981584-1 USB Connector.

4.1.3 J8 – Flight Preparation Panel Pins

2.54 mm Header

| Pin | Description |
|-----|-------------------|
| 1 | GND |
| 2 | UHF_ARM |
| 3 | GND |
| 4 | RBF |
| 5 | GND |
| 6 | Kill Switch Reset |
| 7 | GND |
| 8 | Kill Switch 1 |

Use 2.54 mm female jumpers.

Antenna Release

With a pin in UHF_ARM the antenna cannot be released.

RBF - Remove Before Flight

The RBF is connected to the EPS RBF and by shorting it to ground ensures that the satellite cannot be switched on.

Kill Switch

There are two kill switch pins. By shorting Kill Switch 1 to ground the satellite will turn on. By shorting Kill Switch Reset it will turn off.

4.1.4 J9 - Flight Preparation Panel Pins

2.54 mm Header

| Pin | Description |
|-----|------------------|
| 1 | GND |
| 2 | EPS_CHARGE_STATE |
| 3 | EPS_CHARGE |

Use 2.54 mm female jumpers.

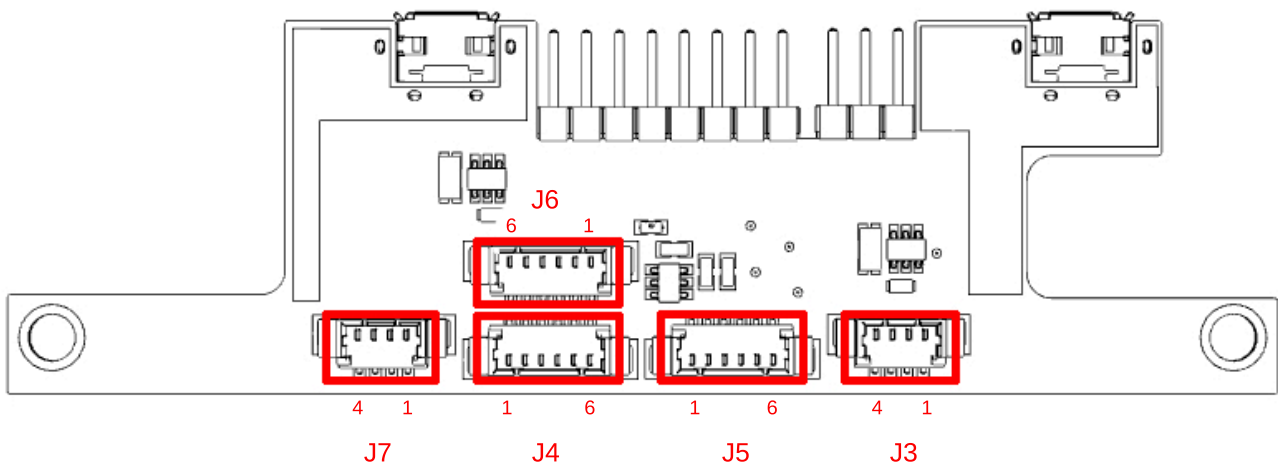
Charge

The satellite can be charged through the EPS_CHARGE.

Battery Voltage

The battery voltage can be measured through the EPS_CHARGE_STATE pin.

4.2 Connector Location Bottom



4.2.1 J3 – Connect to PC

PicoBlade 1.25 mm Pitch. Straight. Molex 53398-0471.

| Pin | Description |
|-----|-------------|
| 1 | GND |
| 2 | USB5Vin |
| 3 | Din_N |
| 4 | Din_P |

4.2.2 J4 – Connect to Interstages

PicoBlade 1.25 mm Pitch. Straight. Molex 53398-0671.

| Pin | Description |
|-----|-------------|
| 1 | GSSB_SDA |
| 2 | GSSB_SCL |
| 3 | GSSB_VCC |
| 4 | GND |
| 5 | GSSB_VCC2 |
| 6 | BURN_IN |

4.2.3 J5 – Connect to EPS

PicoBlade 1.25 mm Pitch. Straight. Molex 53398-0671.

| Pin | Description |
|-----|------------------|
| 1 | EPS_CHARGE |
| 2 | EPS_CHARGE_STATE |
| 3 | KS_RST |
| 4 | KS1 |
| 5 | RBF |
| 6 | GND |

4.2.4 J6 - Connect to Interstages

PicoBlade 1.25 mm Pitch. Straight. Molex 53398-0671.

| Pin | Description |
|-----|-------------|
| 1 | BURN_OUT |
| 2 | GSSB_VCC2 |
| 3 | GND |
| 4 | GSSB_VCC |
| 5 | GSSB_SCL |
| 6 | GSSB_SDA |

4.2.5 J7 – Connect to PC

PicoBlade 1.25 mm Pitch. Straight. Molex 53398-0471.

| Pin | Description |
|-----|-------------|
| 1 | GND |
| 2 | USB5Vin |
| 3 | Din_N |
| 4 | Din_P |

5 Absolute Maximum Ratings

Stresses above those listed under Absolute Maximum Rating may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may effect the reliability.

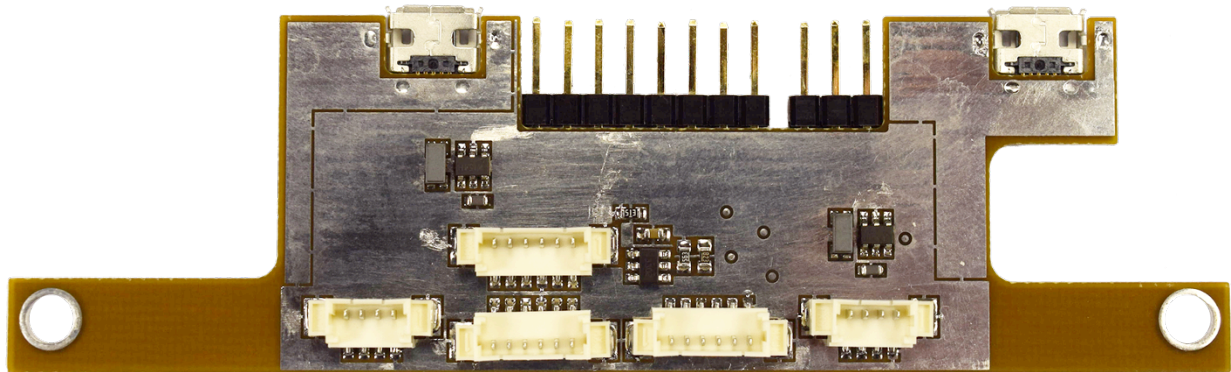
| Parameter | Description | Min | Typ. | Max | Unit |
|-----------------|-------------------------------|-----|------|-----|------|
| T _{op} | Operational temperature range | -40 | | 85 | °C |
| T _{st} | Storage temperature range | -40 | | 85 | °C |

6 Physical Characteristics

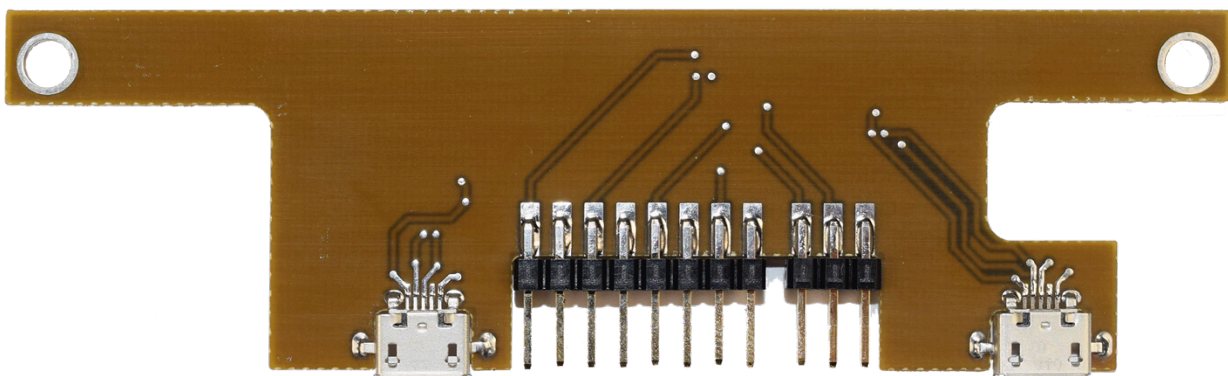
| Description | Value | Unit |
|-------------|-------------------|------|
| Mass | 6 | g |
| Size | 98.0 x 28.0 x 8.0 | mm |

7 Physical Layout

7.1 Top



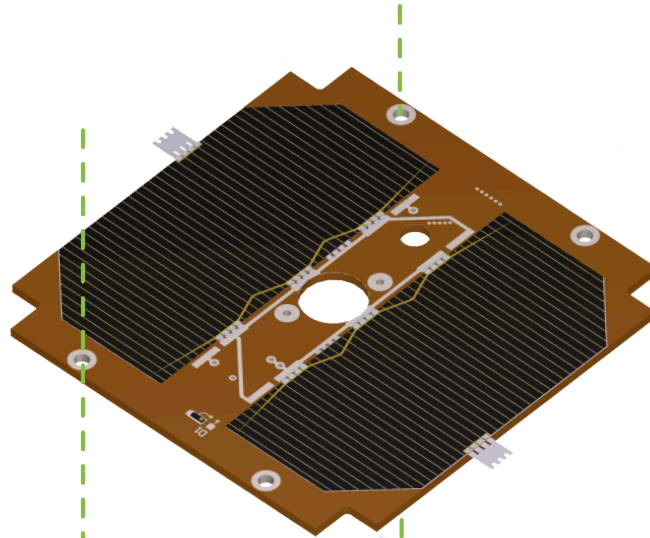
7.2 Bottom



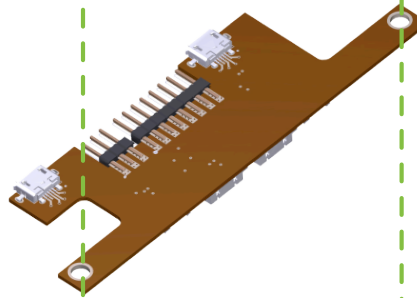
8 Using FPP Top-S with other GomSpace Products

The drawing below illustrates the placement of the FPP-S in between a NanoPower P110 and a NanoCom ANT430 PCB. The FPP Top-S can only be placed along one specific side of the ANT430.

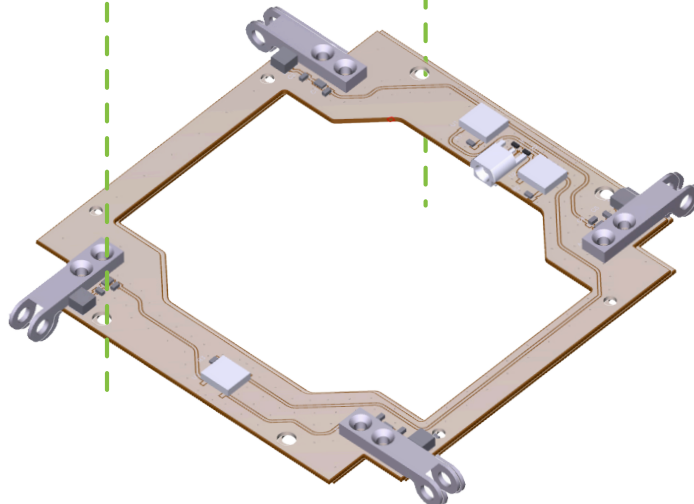
NanoPower P110



NanoPower FPP Top-S



NanoCom ANT430



Notice that the bottom connectors of the FPP Top-S have room within the ANT430 and that the outline of the FPP Top-S PCB is made to fit in between the antenna release hinges. The FPP Top-S and the ANT430 are soldered together. In between the FPP-Top-S and the solar panel can be placed a 2 mm washer (not shown in drawing). Screws inserted from the top, go through the three PCB and are fastened in the structure.