



This document explains the function of the -Z Panel, its schematic level design, its board level design, and its functional testing

-Z Panel

High Gain Communication
Antenna

Revision: 1.0.0

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1 Introduction

This document explains how the -Z Panel will fulfill the following Functions and conform to the following Requirements. This document refers to the -Z Panel version 1.0.

1.1 Functions

The -Z Panel is responsible for the following:

- Provide the high gain communication antenna
- Provide a Sun sensor for the [ADCS](#)

1.2 Requirements

The system requirements and -Z panel requirements can be found [here](#).

2 Detailed Description

This section references the -Z panel [schematic](#).

2.1 Functional Block Diagram

The block diagram can be found on the first page of the schematic.

2.1.1 High Gain 230mm Antenna

The high gain antenna is responsible for transmitting large data files and is controlled by the Comms system.

2.1.2 Connector: To Comms

Connects the high gain antenna to Comms for control of data transmission.

2.1.3 Antenna Deploy Release

The antenna deploy release is responsible for deployment of the high gain antenna and is controlled by the EPS system.

2.1.4 Connector: To EPS

Connects the antenna deploy release to the EPS system.

2.1.5 Photodiodes

The photodiodes are used as sun sensors for the ADCS system to determine the location of the sun. There is one photodiode on the -Z Panel.

2.1.6 Analog-to-Digital Converter

The analog to digital converter (ADC) is meant to convert the photodiode analog signal to a digital signal for the ADCS system.

2.1.7 Connector: To ADCS

Connects the ADC to the ADCS system to transmit photodiode data.

2.2 Schematic

2.2.1 Isolated Grounds

~Unsure what goes here.

2.2.2 Photodiode

The photodiode can be found on page 2 of the schematic connected to the ADC. This photodiode is connected through the ADC to the ADCS system. This photodiode has a spectral sensitivity of $6.3nA/lx$ and the expected illuminance is on the order of $< 1Mlx$. This makes the expected voltage drop across the load resistor about 0.9V.

2.2.3 Analog-to-Digital Converter

The ADC is located on page 2 of the schematic. The ADC connects the photo diode to the ADCS system so the ADCS system can determine the location of the sun. The ADCS is connected to through a 1x4 picolock.

2.2.4 Antenna Deploy Release

The deploy release system is located on page 2 of the schematic. It is connected to the EPS through a 1x4 picolock and has 4 5mm spring contacts.

2.2.5 High Gain 230mm Antenna

The antenna contact is located on page 2 of the schematic and is connected to Comms with a single 1x1 connection.

2.3 Board

The board shall be double layers with 1oz copper and ENIG finish.

2.3.1 Layout Constraints

Unless specified in the following subsections, all signals shall use the default parameters specified below. Signals in the following subsections do not include their sense signals unless specified. Trace width can be broken if a trace needs to bottleneck down to a pin, the bottleneck shall be minimized.

Trace width:	0.2mm
Vias:	Ø0.3mm, unlimited count
Separation:	0.2mm
Length:	unlimited

2.3.1.1 $\overline{P}C-I2C_{[SDA, SCL]}$

Length:	Each node shall be length matched $\pm 1.0mm$
Stubs:	< 10.0mm