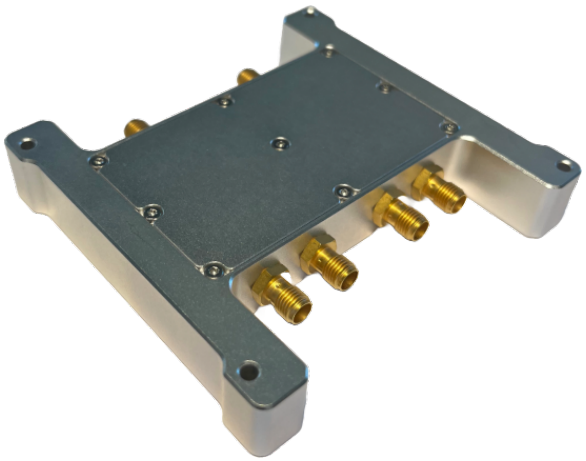
S-band Splitter/Combiner Module

Introduction

The Satlab SRU-2 is a passive S-band splitter and combiner module, designed for use at the ITU space operations S-band frequencies. The module functionality is implemented using two independant Wilkinson divider/combiner paths.

Features

- Low insertion loss (typ. 0.2 dB)
- Power handling up to 5 W
- SMA connectors on all ports
- CubeSat Kit form factor compatible aluminum enclosure



Key Parameters

Parameter	Specification
Frequency range on both paths	2000 to 2500 MHz
Insertion loss	typ. 0.2 dB
Power handling	5 W
Operating temperature	-40℃ to +85℃
Dimensions	87.2 x 93.0 x 15.7 mm
Mass	181 g

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1 Description

The SRU-2 is a splitter and combiner module based on two independent Wilkinson divider circuits, built into a aluminimum enclosure, and designed to be used in conjunction with the Satlab SRS-3 / SRS-4 S-band transceiver modules.

An mechanical drawing of the unit can be seen in figure 1, where the sum port is indicated by subscript S and the two other ports indicated by subscript 1 and 2. The two paths are identical, and when mated with an SRS-3 or SRS-4, the path designated T will become the transmit path, and thus the splitter, and likewise R will be the receive path, and thus the combiner.

The unit has DC pass-through independently on the two paths, e.g. for LNA supply or similar.

2 Electrical Specifications

All electrical parameters in all tables are specified under the following conditions, unless stated otherwise:

- Typical values are based on T_{AMB} = 20℃, by production test and/or design characterization.
- Minimum and maximum values represent the worst conditions across input power, process variation, and operating temperature.
- All values refer to levels specified on the connectors, i.e. not including cable loss.

2.1 Absolute Maximum Ratings

The table below lists the minimum and maximum allowable levels on the connector pins. Exceeding these may damage the product permanently.

Table 1: Absolute Maximum Ratings

Parameter	Min	Max	Unit
Storage temperature	-40	85	℃
DC current	–	200	mA/port
RF input power	–	+40	dBm

2.2 Operating Conditions

Table 2: General Operating Condition

Parameter	Min	Typ	Max	Unit
Operational Temperature	-40	–	85	℃
Insertion loss above 3 dB	–	0.2	0.5	dB
Isolation port 1-2	20	–	–	dB
Isolation Rx - Tx path	70	–	–	dB
Phase unbalance	–	2	4	deg
Input power	–	–	+37	dBm

3 Mechanical Specifications

Table 3: Mechanical Specifications

Parameter	Min	Typ	Max	Unit
Mass	176	181	186	g
X-dimension	87.10	87.20	87.30	mm
Y-dimension	92.90	93.00	93.10	mm
Z-dimension	15.60	15.70	15.80	mm

3.1 Board Outline

Figure 1 shows the SRU-2 from the top side (Z+) and from the connector sides (X+ and X-). Note that the four mounting holes use the ”CubeSat Kit” (PC/104) layout and are not symmetrical. CAD models are available on the Satlab website.

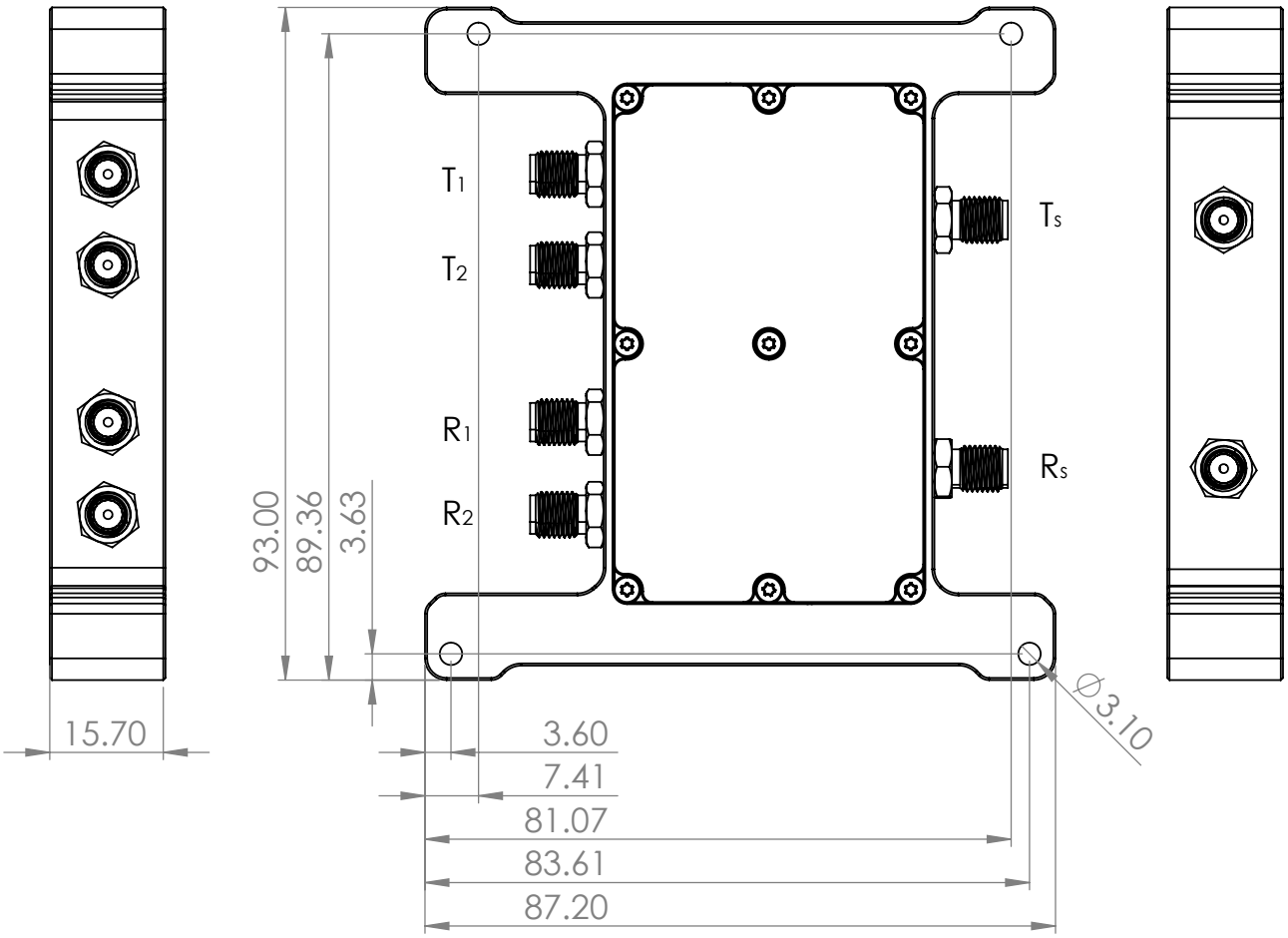

Figure 1: Board outline and side views showing the X+, X-, and Z+ faces. All dimensions in mm and ±0.1 mm tolerance.

4 Revision History

The document ID of this datasheet is **SLDS-SRU2-1.0** and the revision number is **1.0**.

Revision	Date	Description
1.0	2023-11-17	First released version.

