BRO S-band Antenna Assembly Checkout

IFS No: 1060521

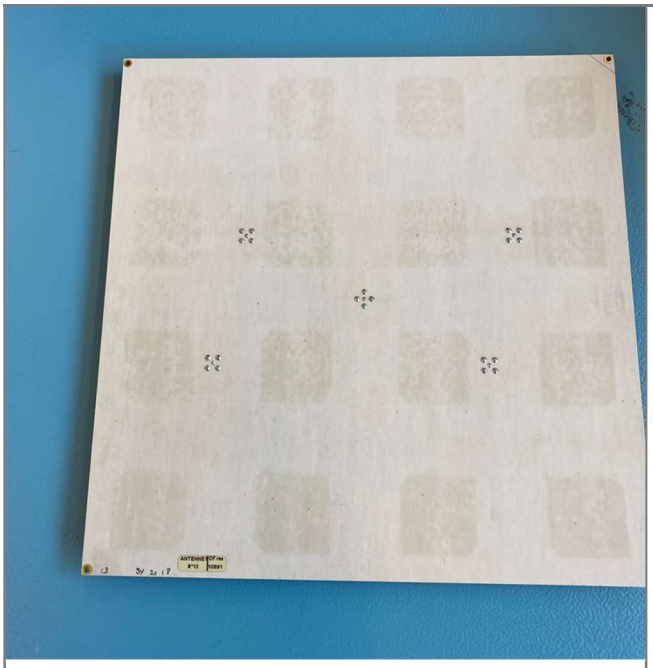
Rev	Date	Description
1.0	04-05-2020	Initial
2.0	25-10-2023	Retested with new antenna.

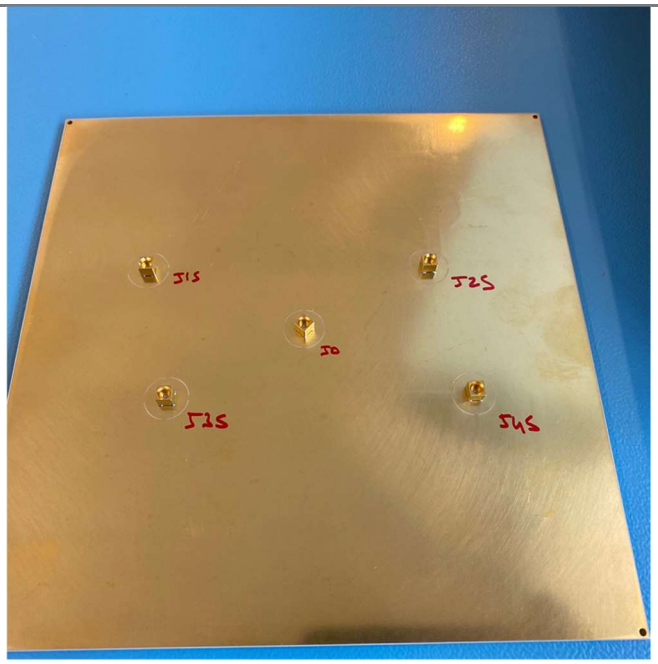
1 Contents

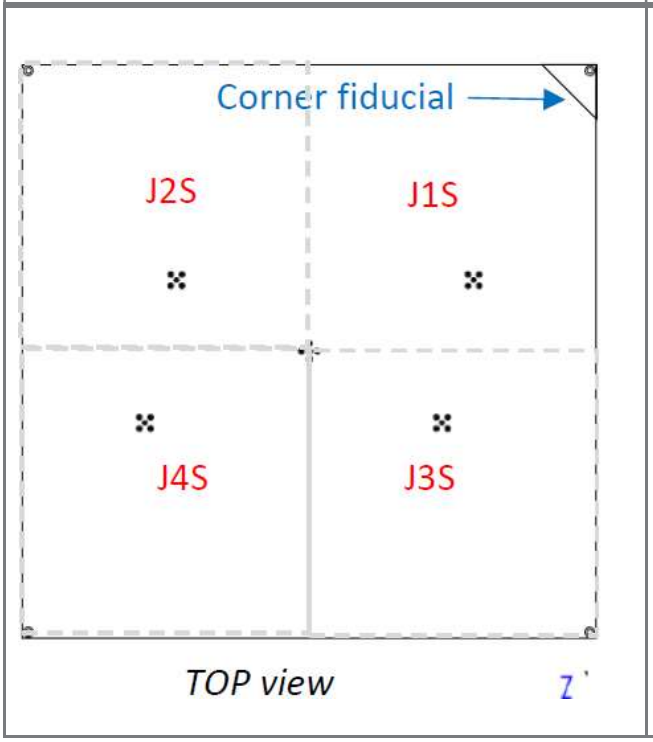
2 INTRODUCTION 3
2.1 LNA PIN CONNECTIONS 4
3 REQUIREMENTS 4
4 CHECK OUT TEST 4
4.1 INSPECTION 4
4.2 POWER CONSUMPTION 4
4.3 RF CHECKOUT 5
4.3.1 RF setup 5
4.3.2 Equipment 5
4.3.3 Results 5
4.3.4 RF performance before backplate mounted 6
4.3.5 RF performance with backplate mounted 6
4.3.6 Reference antenna 7
4.3.7 Comparison 8
4.3.8 RF performance reference cable 8
4.4 LNA POSITION 9
5 STATEMENT OF CONFORMITY 11
6 CONFIDENTIALITY NOTICE 11

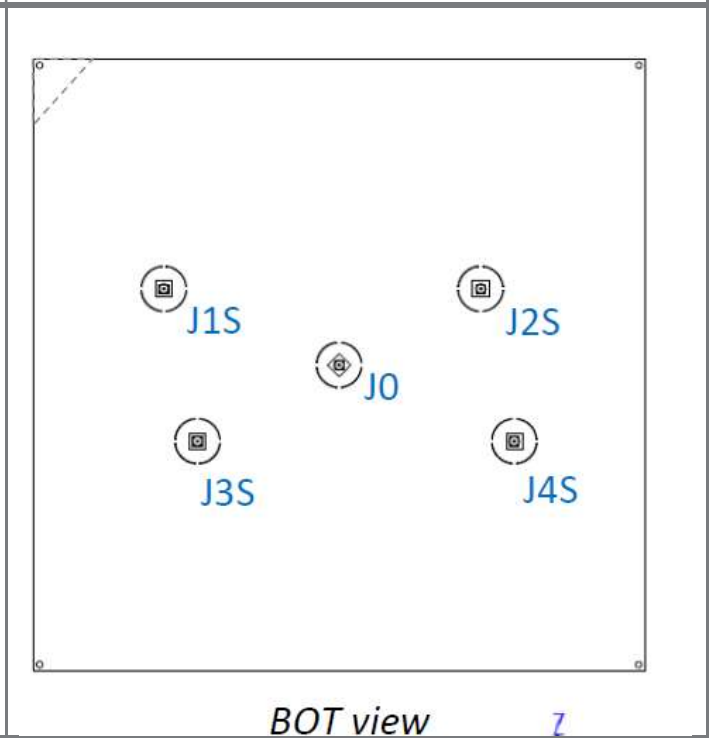
2 Introduction

The sband antenna assembly consist of four separate LNA's which are mounted on the backside of the antenna. The antenna is shown below and as shown on the front is there a fiducial located in the upper right corner and backside view the labeling of the connectors are shown.









The return loss antenna is measured without the LNA's to ensure no errors in processing of mounting the back plate. The location of LNA's are checked using the addresses on thermal sensors as ID.

2.1 LNA Pin connections

P100 connector	
Pin	**Description**
1	5V
2	GND

P110 connector	
Pin	**Description**
1	Vt
2	SCL
3	SDA
4	GND

3 Requirements

	Frequency	Limits	Comments
Return loss (port 1,2,3,4) **Return loss (port 5)**	3000-3100MHz 2968-2978	-14dB -3dB	
Temperature addresses LNA #1: **1001001** LNA #2: **1001010** LNA #3: **1001011** LNA #4: **1001100**			

4 Check out test

The aim of the check-out is to check the functionally and the performance of the unit before sent to the customer. This will include a visual inspection and an electrical test.

4.1 Inspection

No.	Test/Inspection	Check	PASS/FAIL
4.1	Visual inspection of antenna assembly.		Pass
4.1.1	Gomspace Identification*	111215-5	pass

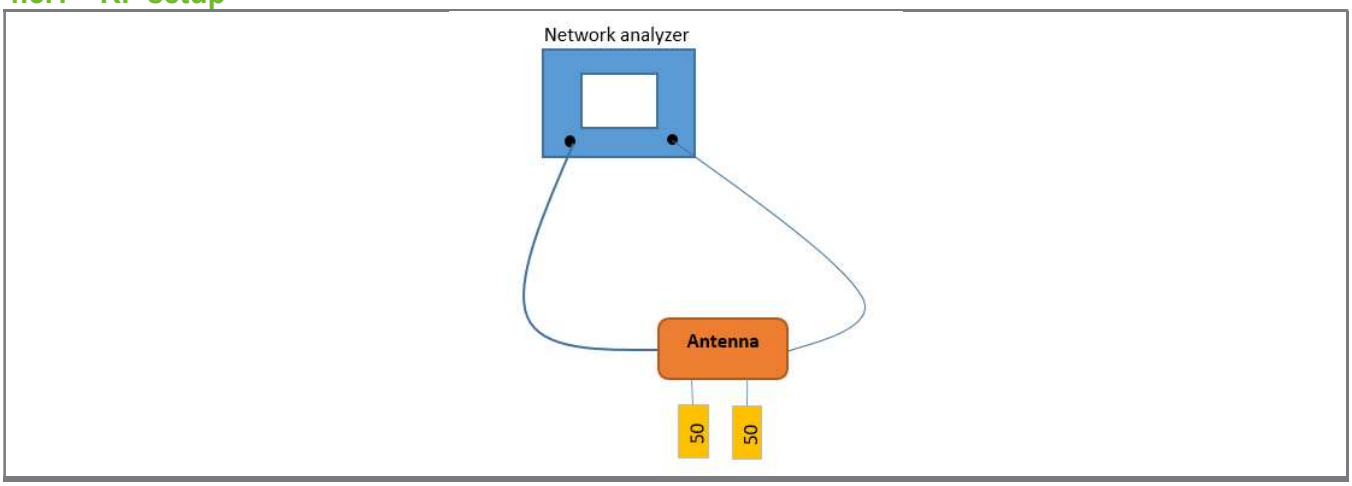
*) check production paper for part number and serial number.

4.2 Power consumption

No.	Test/Inspection	Min.	Max.	Unit	Measured	PASS/FAIL
4.2	Total Current consumption With all four LNA's	180	220	mA	210	Pass

4.3 RF checkout

4.3.1 RF setup



The network analyzer settings are 1601 point and 2-4GHz, using a resolution bandwidth of 1kHz. The network is calibrated as two port device. All unused ports are terminated in 50ohm
The following configuration shall be measured.

Port 1	Port 2	filename
J1	J2	Ser_no_5_SJ1x_Sj2x.csv
J1	J3	Ser_no_5_SJ1x_Sj3x.csv
J1	J4	Ser_no_5_SJ1x_Sj4x.csv
J2	J3	Ser_no_5_SJ2x_Sj3x.csv
J2	J4	Ser_no_5_SJ2x_Sj4x.csv
J3	J4	Ser_no_5_SJ3x_Sj4x.csv
J0	J1	Ser_no_5_SJ1x_Sj0x.csv

4.3.2 Equipment

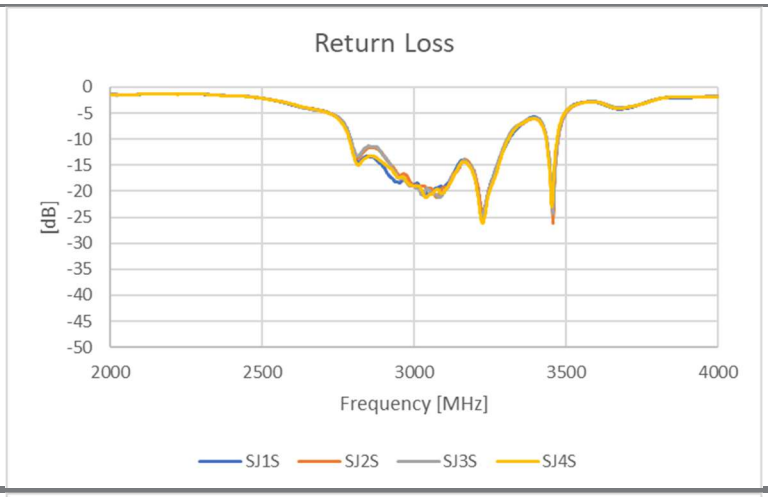
Instrument Used	Manufacture ID	Gomspace ID	Calibration date
Power supply	R&S HMC8043. 3A	GS-0726	
Network analyzer	R&S ZN20. 20GHz	GS-0050	13-12-2023

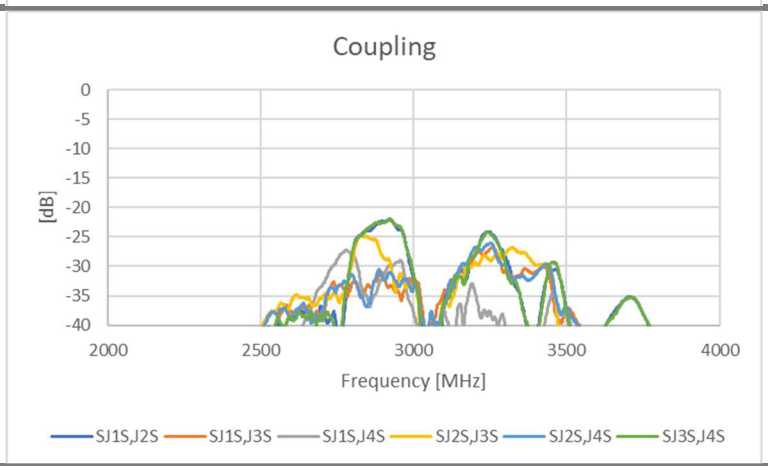
4.3.3 Results

No.	Test/Inspection	Frequency range.	Max.	Measured	PASS/FAIL
4.3.4	Return loss on antenna. With-out backplate and LNA's S11 (J1S) S22 (J2S) S33 (J3S) S44 (J4S)	3000-3100MHz	 -14dB -14dB -14dB -14dB	 -18.5dB -18.9dB -19.0dB -19.0dB	 Pass Pass Pass Pass
4.3.5	Return loss on antenna. With backplate and without LNA's S11 (J1S)	3000-3100MHz	-14dB	-20.5dB	Pass

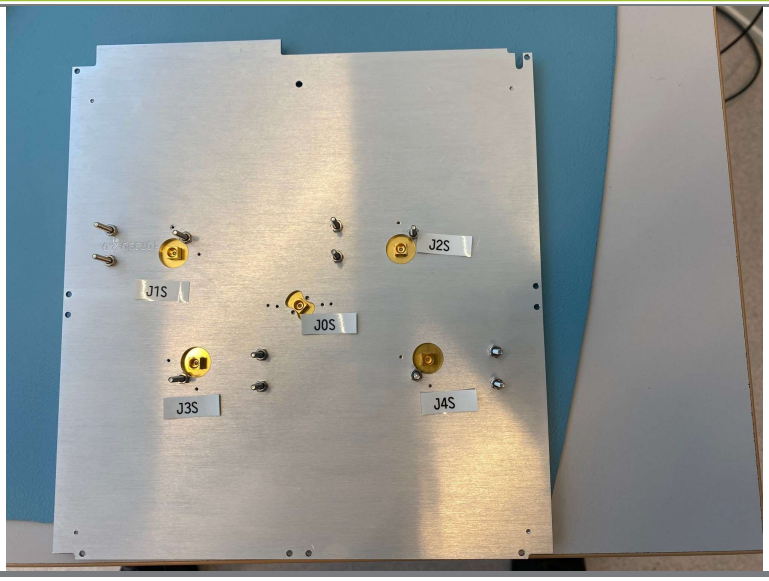
	S22 (J2S) S33 (J3S) S44 (J4S)		-14dB -14dB -14dB	-18.4dB -18.9dB -18.6dB	Pass Pass Pass
4.3.6	Minimum Return loss reference (SJ0S). Without backplate With backplate.	2967MHz +/- 5MHz	 -3dB -3dB	 -4.5dB -3.2dB	 Pass Pass
4.3.8	Return loss ref. Cable +antenna S11	2967MHz +/- 5MHz	-6dB	-6.2dB	Pass
4.3.8	Check correct connectors on cable Return loss of cable S11	3000-3100MHz	 -20dB	Check -22dB	Pass

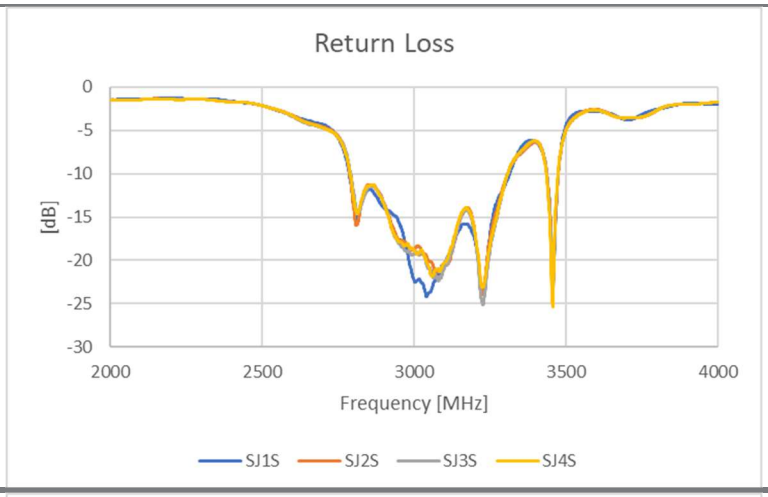
4.3.4 RF performance before backplate mounted

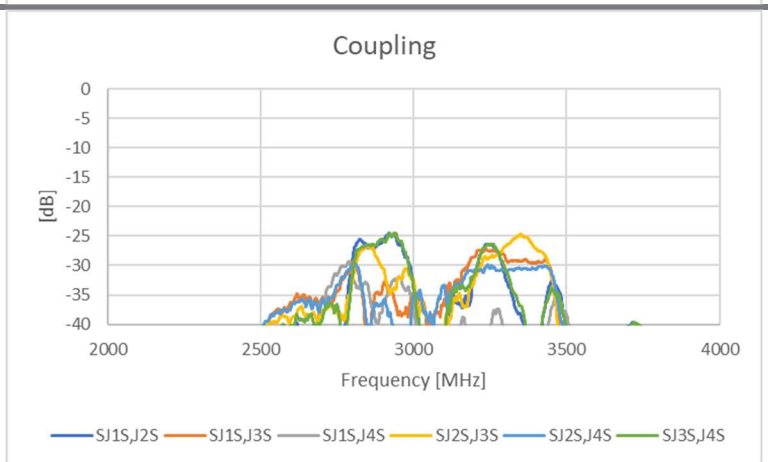




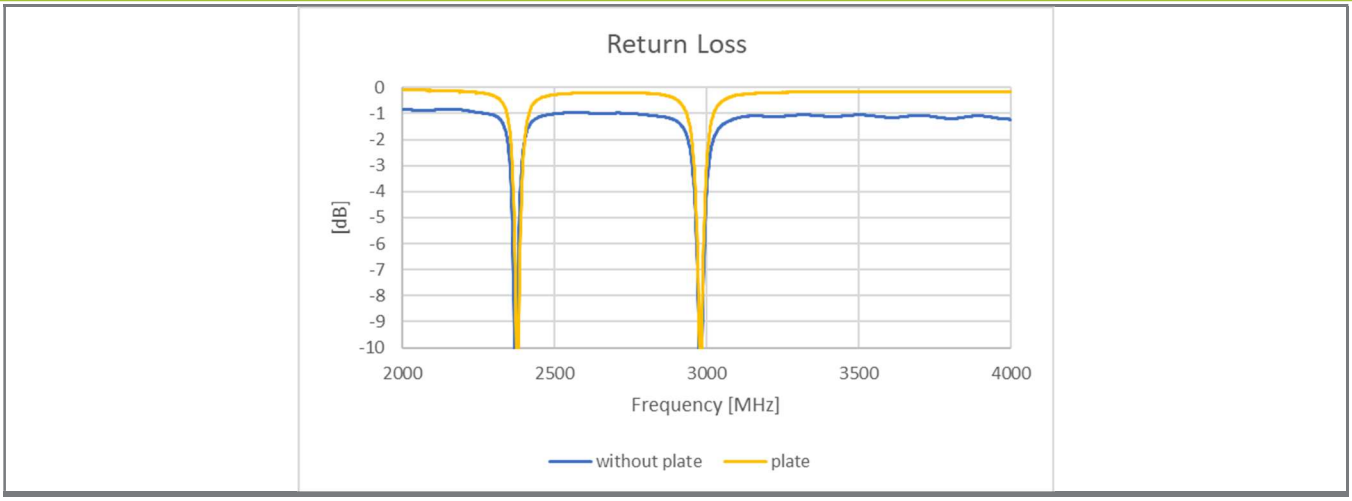
4.3.5 RF performance with backplate mounted



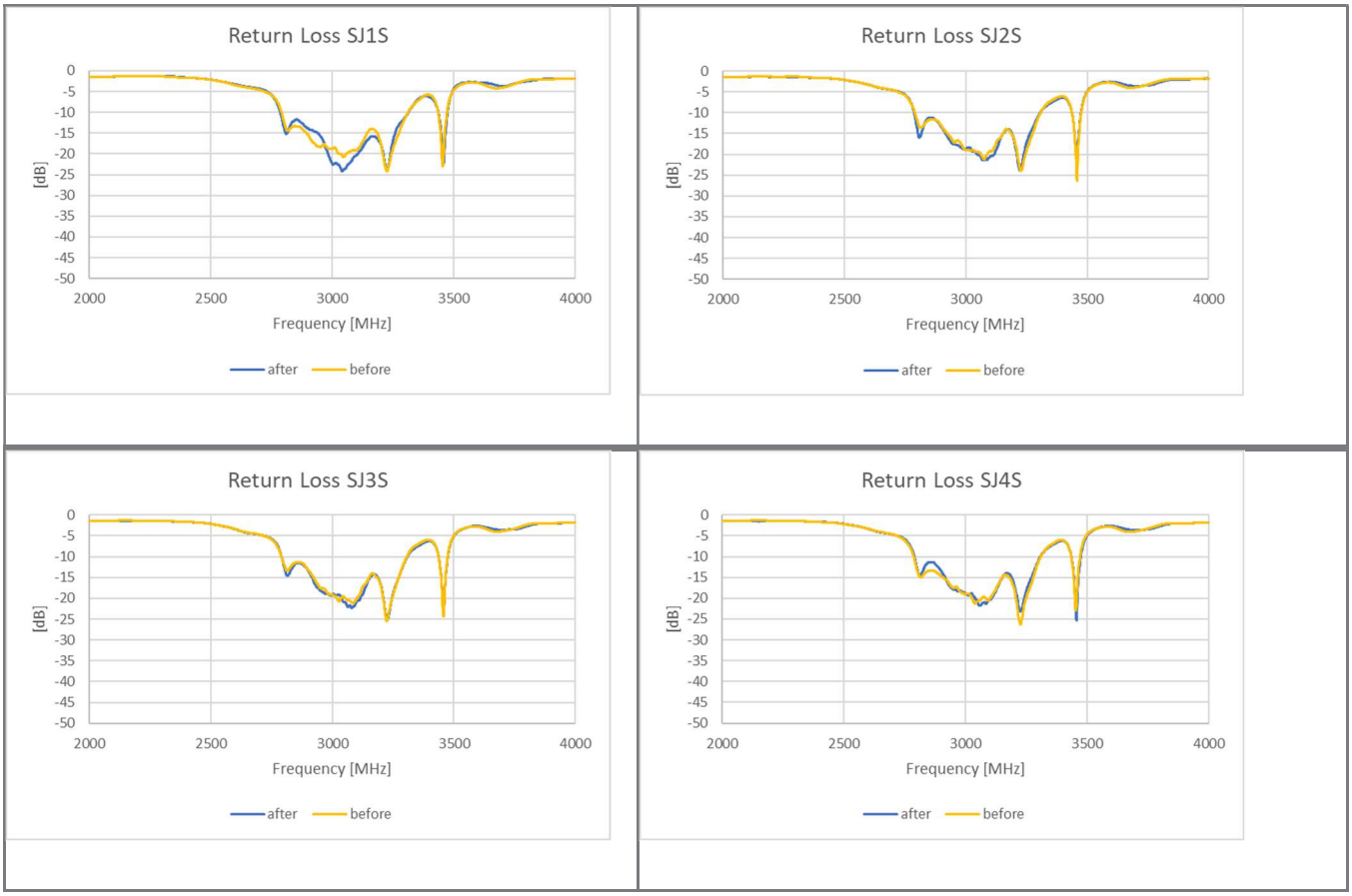




4.3.6 Reference antenna

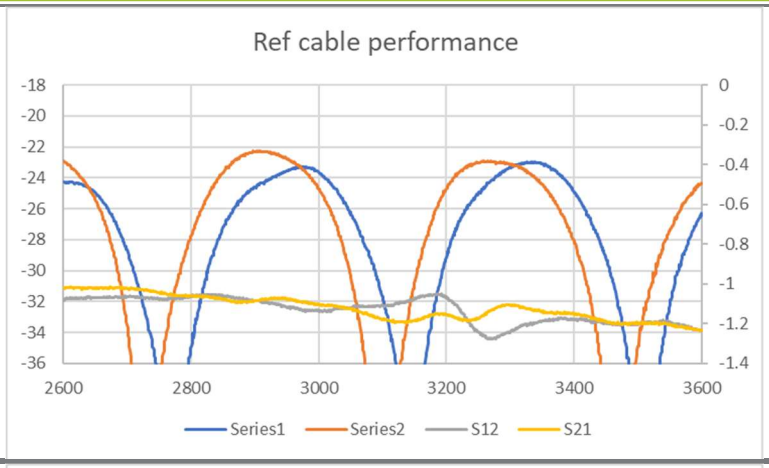


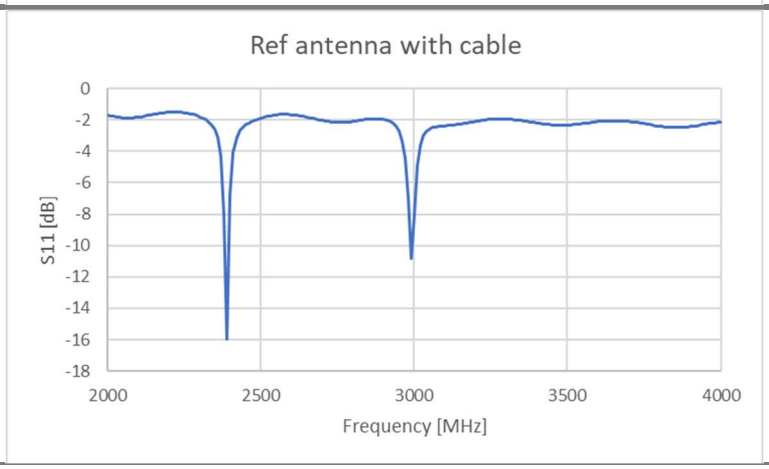
4.3.7 Comparison



4.3.8 RF performance reference cable

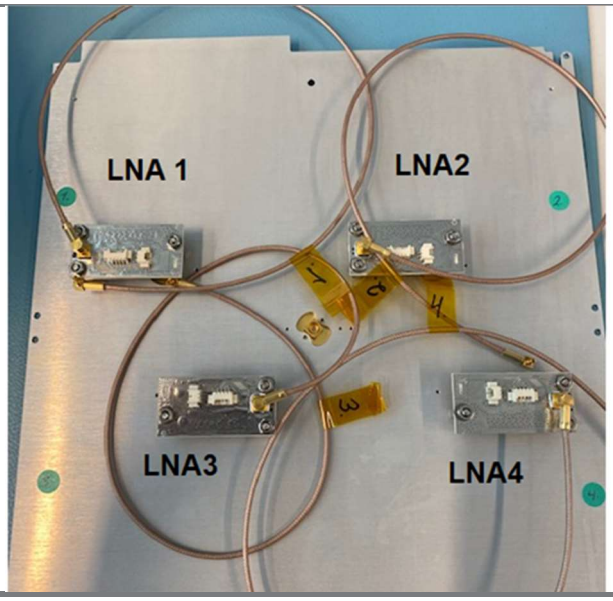
The reference cable shall have the connectors SSMCX and SMP, part no 108035.





4.4 LNA position

The position of the LNA are shown below. The check is done using the temperature addresses of the LNA's.



No.	Test/Inspection	Check	PASS/FAIL
	visual	Check orientation of P100 connectors on LNA to picture above.	Pass
4.4	Check LNA location on antenna **LNA #1:** 1001001 **LNA #2:** 1001010 **LNA #3:** 1001011 **LNA #4:** 1001100	Check, temperatures <30deg Check, temperatures <30deg Check, temperatures <30deg Check, temperatures <30deg	23.1C 23.0C 23.1C 23.1C

5 Statement of conformity

It is hereby certified that apart from the deviations or waivers noted in the Remarks box below, the whole of the items detailed, conform l all respects to the specification(s), drawings(s) and conditions(s) or requirement(s) respect to the specification(s), drawings(s) and conditions(s) of the contract.

Remarks:

LNA#1: 107022-89, LNA#2:107022-90, LNA#3: 107022-91 LNA4: 107022-92

Description	part no	Serial no	Test doc. no.	Test date	Pass/fail
Incoming antenna test	**13708***	**5***	**-**	**21-06-2024**	**Pass**
Antenna with back plate	**111215**	**5**	**-**	**02-07-2024**	**Pass**
Ref cable	**108035**	**6**	**-**	**28-06-2024**	**Pass**
LNA assembly	**108340**	**17**	**1060321**	**28-06-2024**	**Pass**
BRO14-16 S-Band Antenna Assembly	**111233**	**5**	**-**	**04-07-2027**	**Pass**

***) customer serial no**

Shop order 12129

Tested by: max

Approved by: max knudsen Date: 04-07-2024

6 Confidentiality Notice

This document is submitted for a specific purpose as agreed in writing and contains information, which is confidential and proprietary. The recipient agrees by accepting this document, that this material will not be use, transferred, reported, modified, copied or disclosed in whole or in part, in any manner or to any third part, expect own staff to the purpose for which it was submitted without prior written consent.