***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. |

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# 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.

## LNA Pin connections

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | P100 connector | | | Pin | **Description** | | 1 | 5V | | 2 | GND | | |  |  | | --- | --- | | P110 connector | | | Pin | **Description** | | 1 | Vt | | 2 | SCL | | 3 | SDA | | 4 | GND | |  |  | |

# 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 |  |  |  |

# 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.

## 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.

## 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 |

## RF checkout

### RF setup

|  |
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|  |

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 |

### 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 |

### 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)  S22 (J2S)  S33 (J3S)  S44 (J4S) | 3000-3100MHz | -14dB  -14dB  -14dB  -14dB | -20.5dB  -18.4dB  -18.9dB  -18.6dB | Pass  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 |

### RF performance before backplate mounted

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| --- |
|  |
|  |

### RF performance with backplate mounted

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| --- |
|  |

|  |
| --- |
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|  |

### Reference antenna

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|  |

### Comparison

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| --- | --- |
|  |  |
|  |  |

### RF performance reference cable

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

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| --- |
|  |
|  |

## 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 |

# 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 I 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 |

# Confidentiality Notice

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