

FCC REPORT

Applicant: Nebra LTD.

Address of Applicant: Unit 4 Bells Yew Green Business Court, Bells Yew Green,
Tunbridge Wells TN3 9BJ

Equipment Under Test (EUT)

Product Name: Nebra Smart Outdoor LoRa Gateway / Nebra HNT Outdoor
Hotspot Miner

Model No.: HNTOUT-915-G-LT+, HNTOUT-915-G-LT, HNTOUT-915-LT+,
HNTOUT-915 -LT, HNTOUT-915-G-LT+, HNTOUT-915-G,
HNTOUT-915

Trade mark: Nebra

FCC ID: 2AZDM-HNTOUT

Applicable standards: FCC CFR Title 47 Part 15 Subpart B

Date of sample receipt: 01 Jun., 2021

Date of Test: 01 Jun., to 08 Jul., 2021

Date of report issued: 09 Jul., 2021

Test Result: Pass *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Bruce Zhang
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the JYT product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

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2 Version

| Version No. | Date | Description |
|-------------|---------------|-------------|
| 00 | 09 Jul., 2021 | Original |
| | | |
| | | |
| | | |
| | | |

Tested by:



Test Engineer

Date:

09 Jul., 2021

Reviewed by:



Project Engineer

Date:

09 Jul., 2021

3 Contents

| | Page |
|---|-----------|
| 1 COVER PAGE..... | 1 |
| 2 VERSION | 2 |
| 3 CONTENTS | 3 |
| 4 TEST SUMMARY | 4 |
| 5 GENERAL INFORMATION..... | 5 |
| 5.1 CLIENT INFORMATION | 5 |
| 5.2 GENERAL DESCRIPTION OF E.U.T. | 5 |
| 5.3 TEST MODE..... | 5 |
| 5.4 MEASUREMENT UNCERTAINTY | 6 |
| 5.5 DESCRIPTION OF SUPPORT UNITS | 6 |
| 5.6 RELATED SUBMITTAL(S) / GRANT (S)..... | 6 |
| 5.7 DESCRIPTION OF CABLE USED | 6 |
| 5.8 ADDITIONS TO, DEVIATIONS, OR EXCLUSIONS FROM THE METHOD | 6 |
| 5.9 LABORATORY FACILITY | 6 |
| 5.10 LABORATORY LOCATION..... | 6 |
| 5.11 TEST INSTRUMENTS LIST | 7 |
| 6 TEST RESULTS AND MEASUREMENT DATA | 8 |
| 6.1 CONDUCTED EMISSION..... | 8 |
| 6.2 RADIATED EMISSION | 13 |
| 7 TEST SETUP PHOTO | 21 |
| 8 EUT CONSTRUCTIONAL DETAILS | 24 |

4 Test Summary

| Test Item | Section in CFR 47 | Result |
|--|-------------------|--------|
| Conducted Emission | Part 15.107 | Pass |
| Radiated Emission | Part 15.109 | Pass |
| Remark: 1. Pass: The EUT complies with the essential requirements in the standard. 2. N/A: The EUT not applicable of the test item. | | |
| Test Method: | ANSI C63.4:2014 | |

5 General Information

5.1 Client Information

| | |
|---------------|---|
| Applicant: | Nebra LTD. |
| Address: | Unit 4 Bells Yew Green Business Court, Bells Yew Green, Tunbridge Wells TN3 9BJ |
| Manufacturer: | Nebra LTD. |
| Address: | Unit 4 Bells Yew Green Business Court, Bells Yew Green, Tunbridge Wells TN3 9BJ |
| Factory: | SUNSOAR TECH CO., LIMITED |
| Address: | 4/F, Block E, Fengze Building, Huafeng No.2 Industrial Park, Hangkong Road, XiXiang Town, BaoAn District, Shenzhen, China |

5.2 General Description of E.U.T.

| | |
|------------------------|---|
| Product Name: | Nebra Smart Outdoor LoRa Gateway / Nebra HNT Outdoor Hotspot Miner |
| Model No.: | HNTOUT-915-G-LT+, HNTOUT-915-G-LT, HNTOUT-915-LT+, HNTOUT-915 -LT, HNTOUT-915-G-LT+, HNTOUT-915-G, HNTOUT-915 |
| Test Power supply: | AC: AC 120V / 60Hz POE: DC48V |
| Test Sample Condition: | The test samples were provided in good working order with no visible defects. |
| Remark: | Model No.: HNTOUT-915-G-LT+, HNTOUT-915-G-LT, HNTOUT-915-LT+, HNTOUT-915 -LT, HNTOUT-915-G-LT+, HNTOUT-915-G, HNTOUT-915 The difference: we will offer the unit with or without a GPS module included. Models with the GPS Included are indicated with a -G on the end of the model number. For example a unit with model no HNTOUT-915 is 915 Mhz, no GPS. A unit with Model No HNTOUT-915-G, is 915Mhz with GPS. We offer the unit using the Raspberry Pi Compute Module 3+ 32GB by standard (no suffix) but have an -LT variant which uses the Raspberry Pi Compute Module 3 Lite with a 32 GB eMMC to SD adapter card and a -LT+ variant which uses the Raspberry Pi Compute Module 3+ Lite with a 32 GB eMMC to SD adapter card. These suffixes can be applied to the models both with and without GPS as described above. We also provide customers the ability to, optionally, add both cellular connectivity and an additional 8 channel LoRa gateway to any of these models by using an mPCIe module however these come as optional extras. |

5.3 Test Mode and test samples plans

| Operating mode | Detail description |
|---|--|
| ON-AC mode | Keep the EUT in ON link mode (AC power supply) |
| ON-POE mode | Keep the EUT in ON link mode (AC POE) |
| The sample was placed 0.8m above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. | |

5.4 Measurement Uncertainty

| Parameters | Expanded Uncertainty |
|-------------------------------------|----------------------|
| Conducted Emission (9kHz ~ 30MHz) | ±1.60 dB (k=2) |
| Radiated Emission (9kHz ~ 30MHz) | ±3.12 dB (k=2) |
| Radiated Emission (30MHz ~ 1000MHz) | ±4.32 dB (k=2) |
| Radiated Emission (1GHz ~ 18GHz) | ±5.16 dB (k=2) |
| Radiated Emission (18GHz ~ 40GHz) | ±3.20 dB (k=2) |

5.5 Description of Support Units

| Manufacturer | Description | Model | Serial Number | FCC ID/DoC |
|---|-------------|------------------------|---------------|------------|
| NEBRA | Adapter | TM-K018VP-01201500PE-Z | PS1082 | DoC |
| shenzhen gossell digital technology co.,ltd | POE | G0566-480-100 | 2053-000003 | N/A |
| MERCURY | Router | MW305R | 1192FPW000074 | N/A |
| Lenovo | PC | ThinkPad E450 | 0B95180 | DoC |

5.6 Related Submittal(s) / Grant (s)

This is an original grant, no related submittals and grants.

5.7 Description of Cable Used

N/A

5.8 Additions to, deviations, or exclusions from the method

No

5.9 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

● **FCC - Designation No.: CN1211**

JianYan Testing Group Shenzhen Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.

● **ISED – CAB identifier.: CN0021**

The 3m Semi-anechoic chamber of JianYan Testing Group Shenzhen Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

● **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <https://portal.a2la.org/scopepdf/4346-01.pdf>

5.10 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Address: No.101, Building 8, Innovation Wisdom Port, No.155 Hongtian Road, Huangpu Community, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, People's Republic of China.

Tel: +86-755-23118282, Fax: +86-755-23116366

Email: info-JYTee@lets.com, Website: <http://www.ccis-cb.com>

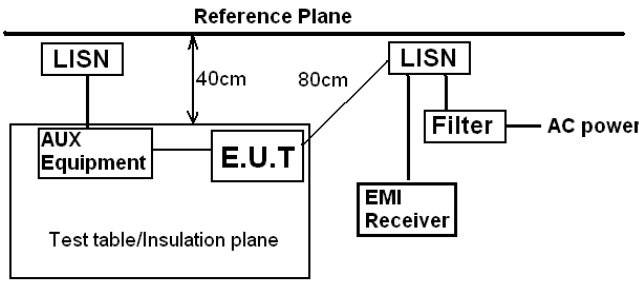
5.11 Test Instruments list

| Radiated Emission: | | | | | |
|--------------------|-----------------|---------------|--------------------|----------------------|--------------------------|
| Test Equipment | Manufacturer | Model No. | Serial No. | Cal. Date (mm-dd-yy) | Cal. Due date (mm-dd-yy) |
| 3m SAC | ETS | 9m*6m*6m | 966 | 01-19-2021 | 01-18-2024 |
| Loop Antenna | SCHWARZBECK | FMZB1519B | 00044 | 03-07-2021 | 03-06-2023 |
| BiConiLog Antenna | SCHWARZBECK | VULB9163 | 497 | 03-03-2021 | 03-02-2022 |
| Horn Antenna | SCHWARZBECK | BBHA9120D | 916 | 03-03-2021 | 03-02-2022 |
| Horn Antenna | SCHWARZBECK | BBHA9120D | 1805 | 06-18-2020 | 06-17-2021 |
| | | | | 06-17-2021 | 06-16-2022 |
| Horn Antenna | SCHWARZBECK | BBHA 9170 | BBHA9170582 | 11-18-2020 | 11-17-2021 |
| EMI Test Software | AUDIX | E3 | Version: 6.110919b | | |
| Pre-amplifier | HP | 8447D | 2944A09358 | 03-03-2021 | 03-02-2022 |
| Pre-amplifier | CD | PAP-1G18 | 11804 | 03-03-2021 | 03-02-2022 |
| Spectrum analyzer | Rohde & Schwarz | FSP30 | 101454 | 03-03-2021 | 03-02-2022 |
| Spectrum analyzer | Rohde & Schwarz | FSP40 | 100363 | 11-18-2020 | 11-17-2021 |
| EMI Test Receiver | Rohde & Schwarz | ESRP7 | 101070 | 03-03-2021 | 03-02-2022 |
| Cable | ZDECL | Z108-NJ-NJ-81 | 1608458 | 03-03-2021 | 03-02-2022 |
| Cable | MICRO-COAX | MFR64639 | K10742-5 | 03-03-2021 | 03-02-2022 |
| Cable | SUHNER | SUCOFLEX100 | 58193/4PE | 03-03-2021 | 03-02-2022 |

| Conducted Emission: | | | | | |
|---------------------|-----------------|------------|--------------------|----------------------|--------------------------|
| Test Equipment | Manufacturer | Model No. | Serial No. | Cal. Date (mm-dd-yy) | Cal. Due date (mm-dd-yy) |
| EMI Test Receiver | Rohde & Schwarz | ESCI | 101189 | 03-03-2021 | 03-02-2022 |
| Pulse Limiter | SCHWARZBECK | OSRAM 2306 | 9731 | 03-03-2021 | 03-02-2022 |
| LISN | CHASE | MN2050D | 1447 | 03-03-2021 | 03-02-2022 |
| LISN | Rohde & Schwarz | ESH3-Z5 | 8438621/010 | 06-18-2020 | 06-17-2022 |
| Cable | HP | 10503A | N/A | 03-03-2021 | 03-02-2022 |
| EMI Test Software | AUDIX | E3 | Version: 6.110919b | | |

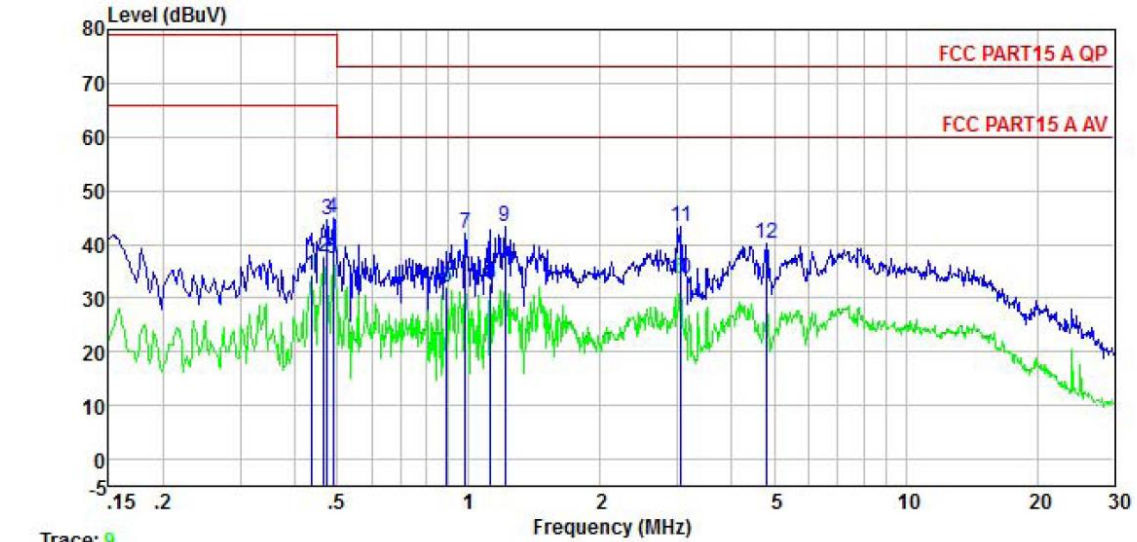
6 Test results and Measurement Data

6.1 Conducted Emission

| | | | |
|-----------------------|--|--------------|---------|
| Test Requirement: | FCC Part 15 B Section 15.107 | | |
| Test Frequency Range: | 150kHz to 30MHz | | |
| Class / Severity: | Class A | | |
| Receiver setup: | RBW=9kHz, VBW=30kHz | | |
| Limit: | Frequency range (MHz) | Limit (dBμV) | |
| | | Quasi-peak | Average |
| | 0.15-0.5 | 79 | 66 |
| | 0.5-30 | 73 | 60 |
| Test setup: |  <p>Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p> | | |
| Test procedure | <ol style="list-style-type: none"> 1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network(L.I.S.N.). The provide a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4(latest version) on conducted measurement. | | |
| Test Instruments: | Refer to section 5.11 for details | | |
| Test mode: | Refer to section 5.3 for details | | |
| Test results: | Pass | | |

Measurement data:

| | | | |
|-----------------|--|----------------|-----------------------|
| Product name: | Nebra Smart Outdoor LoRa Gateway / Nebra HNT Outdoor Hotspot Miner | Product model: | HNTOUT-915-G-LT+ |
| Test by: | Carey | Test mode: | ON-AC mode |
| Test frequency: | 150 kHz ~ 30 MHz | Phase: | Line |
| Test voltage: | AC 120 V/60 Hz | Environment: | Temp: 22.5℃ Humi: 55% |



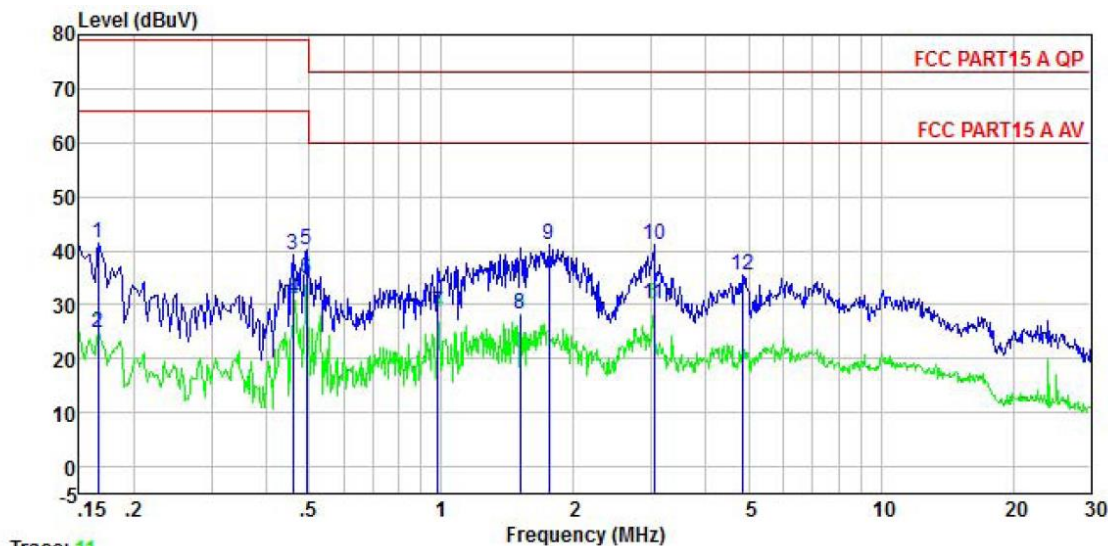
Trace: 9

| | Read | LISN | Aux | Cable | Limit | Over | | |
|------|-------|--------|--------|-------|-------|-------|-------|----------------|
| Freq | Level | Factor | Factor | Loss | Level | Line | Limit | Remark |
| MHz | dBuV | dB | dB | dB | dBuV | dBuV | dB | |
| 1 | 0.435 | 23.85 | 10.30 | 0.13 | 0.03 | 34.31 | 66.00 | -31.69 Average |
| 2 | 0.466 | 27.44 | 10.32 | -0.12 | 0.03 | 37.67 | 66.00 | -28.33 Average |
| 3 | 0.474 | 34.52 | 10.33 | -0.18 | 0.03 | 44.70 | 79.00 | -34.30 QP |
| 4 | 0.489 | 34.68 | 10.33 | -0.26 | 0.03 | 44.78 | 79.00 | -34.22 QP |
| 5 | 0.489 | 27.32 | 10.33 | -0.26 | 0.03 | 37.42 | 66.00 | -28.58 Average |
| 6 | 0.890 | 21.19 | 10.46 | 0.17 | 0.04 | 31.86 | 60.00 | -28.14 Average |
| 7 | 0.984 | 31.15 | 10.48 | 0.42 | 0.05 | 42.10 | 73.00 | -30.90 QP |
| 8 | 1.123 | 21.68 | 10.49 | 0.33 | 0.08 | 32.58 | 60.00 | -27.42 Average |
| 9 | 1.210 | 32.38 | 10.50 | 0.25 | 0.09 | 43.22 | 73.00 | -29.78 QP |
| 10 | 3.041 | 23.28 | 10.58 | -0.20 | 0.07 | 33.73 | 60.00 | -26.27 Average |
| 11 | 3.058 | 32.94 | 10.58 | -0.20 | 0.07 | 43.39 | 73.00 | -29.61 QP |
| 12 | 4.797 | 29.31 | 10.65 | 0.06 | 0.09 | 40.11 | 73.00 | -32.89 QP |

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

| | | | |
|-----------------|---|----------------|-----------------------|
| Product name: | Nebra Smart Outdoor LoRa Gateway / Nebra HNT Outdoor Hotspot Miner | Product model: | HNTOUT-915-G-LT+ |
| Test by: | Carey | Test mode: | ON-AC mode |
| Test frequency: | 150 kHz ~ 30 MHz | Phase: | Neutral |
| Test voltage: | AC 120 V/60 Hz | Environment: | Temp: 22.5℃ Humi: 55% |

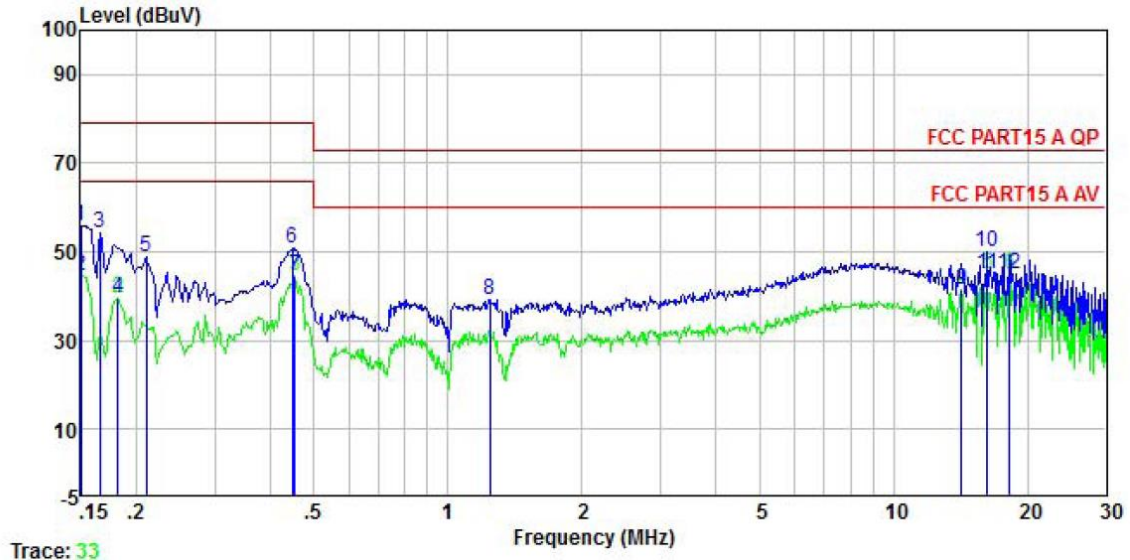


| | Freq | Read Level | LISN Factor | Aux Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|----|-------|------------|-------------|------------|------------|-------|------------|------------|---------|
| | MHz | dBuV | dB | dB | dB | dBuV | dBuV | dB | |
| 1 | 0.166 | 31.42 | 9.90 | 0.01 | 0.01 | 41.34 | 79.00 | -37.66 | QP |
| 2 | 0.166 | 14.97 | 9.90 | 0.01 | 0.01 | 24.89 | 66.00 | -41.11 | Average |
| 3 | 0.459 | 28.90 | 10.17 | 0.00 | 0.03 | 39.10 | 79.00 | -39.90 | QP |
| 4 | 0.461 | 20.82 | 10.17 | 0.00 | 0.03 | 31.02 | 66.00 | -34.98 | Average |
| 5 | 0.494 | 29.81 | 10.20 | 0.03 | 0.03 | 40.07 | 79.00 | -38.93 | QP |
| 6 | 0.494 | 24.48 | 10.20 | 0.03 | 0.03 | 34.74 | 66.00 | -31.26 | Average |
| 7 | 0.984 | 17.80 | 10.55 | 0.08 | 0.05 | 28.48 | 60.00 | -31.52 | Average |
| 8 | 1.511 | 17.37 | 10.70 | 0.13 | 0.15 | 28.35 | 60.00 | -31.65 | Average |
| 9 | 1.753 | 29.96 | 10.75 | 0.15 | 0.18 | 41.04 | 73.00 | -31.96 | QP |
| 10 | 3.041 | 29.97 | 10.90 | 0.32 | 0.07 | 41.26 | 73.00 | -31.74 | QP |
| 11 | 3.041 | 18.87 | 10.90 | 0.32 | 0.07 | 30.16 | 60.00 | -29.84 | Average |
| 12 | 4.822 | 23.59 | 11.00 | 0.65 | 0.09 | 35.33 | 73.00 | -37.67 | QP |

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

| | | | |
|------------------------|---|-----------------------|-----------------------|
| Product name: | Nebra Smart Outdoor LoRa Gateway / Nebra HNT Outdoor Hotspot Miner | Product model: | HNTOUT-915-G-LT+ |
| Test by: | Carey | Test mode: | ON-POE mode |
| Test frequency: | 150 kHz ~ 30 MHz | Phase: | Line |
| Test voltage: | DC 48V | Environment: | Temp: 22.5℃ Humi: 55% |

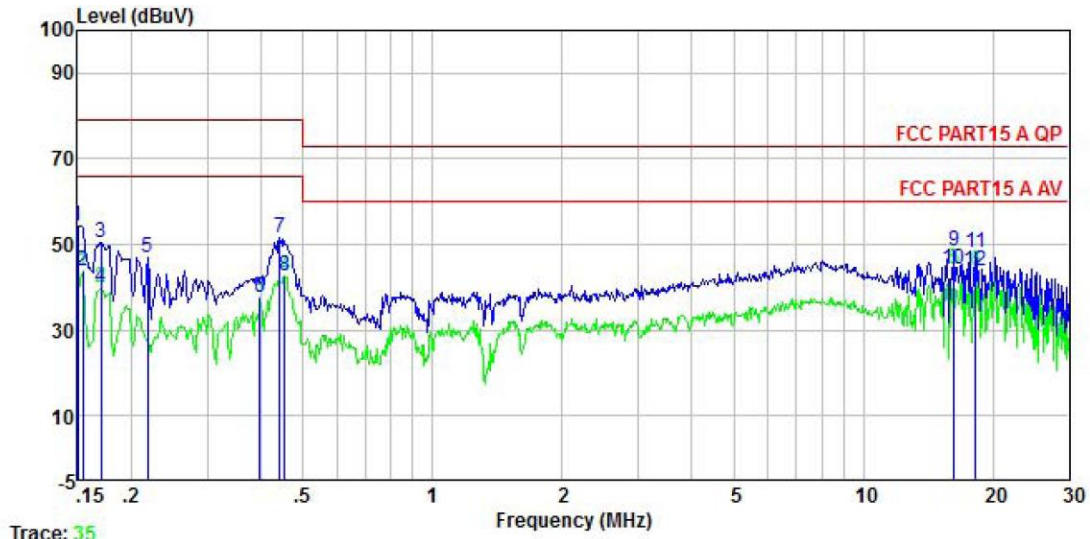


| | Freq | Read | LISN | Aux | Cable | Level | Limit | Over | |
|----|--------|-------|--------|--------|-------|-------|-------|--------|---------|
| | MHz | Level | Factor | Factor | Loss | dBuV | Line | Limit | Remark |
| | MHz | dBuV | dB | dB | dB | dBuV | dBuV | dB | |
| 1 | 0.150 | 45.67 | 10.12 | -0.05 | 0.01 | 55.75 | 79.00 | -23.25 | QP |
| 2 | 0.150 | 34.44 | 10.12 | -0.05 | 0.01 | 44.52 | 66.00 | -21.48 | Average |
| 3 | 0.166 | 44.11 | 10.13 | -0.09 | 0.01 | 54.16 | 79.00 | -24.84 | QP |
| 4 | 0.182 | 29.40 | 10.13 | -0.12 | 0.01 | 39.42 | 66.00 | -26.58 | Average |
| 5 | 0.211 | 38.96 | 10.15 | -0.17 | 0.03 | 48.97 | 79.00 | -30.03 | QP |
| 6 | 0.447 | 40.43 | 10.31 | 0.05 | 0.03 | 50.82 | 79.00 | -28.18 | QP |
| 7 | 0.454 | 34.40 | 10.32 | -0.01 | 0.03 | 44.74 | 66.00 | -21.26 | Average |
| 8 | 1.242 | 28.50 | 10.50 | 0.22 | 0.10 | 39.32 | 73.00 | -33.68 | QP |
| 9 | 14.213 | 26.81 | 11.01 | 3.38 | 0.12 | 41.32 | 60.00 | -18.68 | Average |
| 10 | 16.226 | 35.79 | 11.08 | 2.91 | 0.16 | 49.94 | 73.00 | -23.06 | QP |
| 11 | 16.226 | 30.90 | 11.08 | 2.91 | 0.16 | 45.05 | 60.00 | -14.95 | Average |
| 12 | 18.232 | 32.03 | 11.14 | 1.74 | 0.15 | 45.06 | 60.00 | -14.94 | Average |

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

| | | | |
|-----------------|---|----------------|-----------------------|
| Product name: | Nebra Smart Outdoor LoRa Gateway / Nebra HNT Outdoor Hotspot Miner | Product model: | HNTOUT-915-G-LT+ |
| Test by: | Carey | Test mode: | ON-POE mode |
| Test frequency: | 150 kHz ~ 30 MHz | Phase: | Neutral |
| Test voltage: | DC 48V | Environment: | Temp: 22.5℃ Humi: 55% |

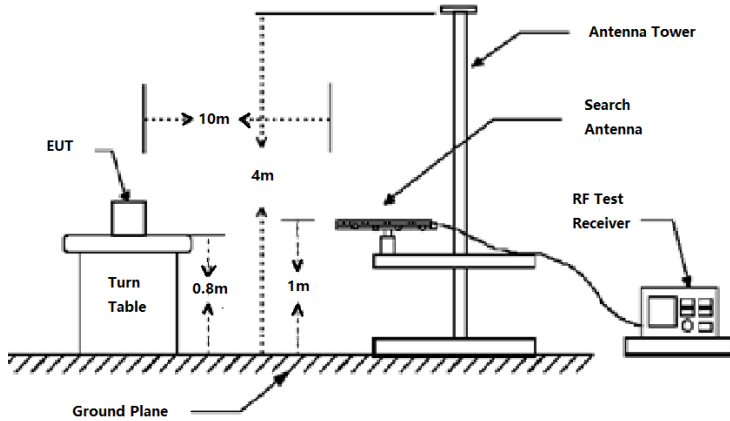
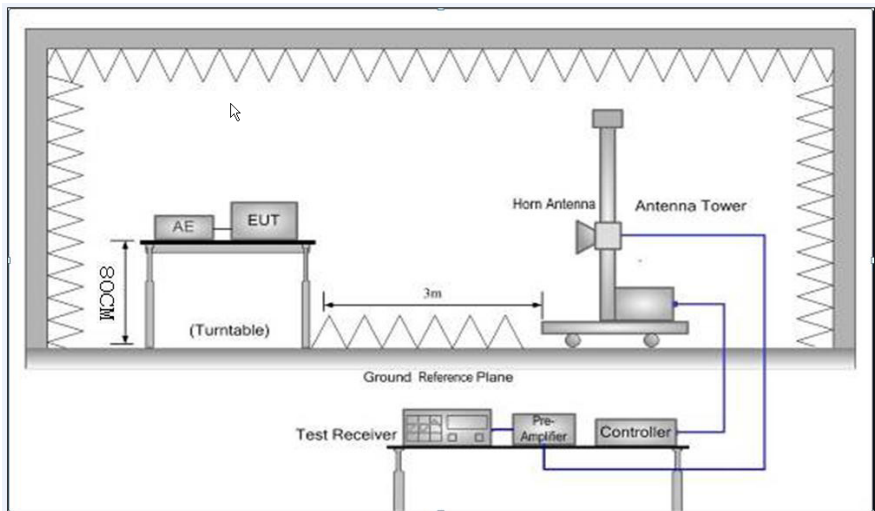


| | Freq | Read Level | LISN Factor | Aux Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|----|--------|------------|-------------|------------|------------|-------|------------|------------|---------|
| | MHz | dBuV | dB | dB | dB | dBuV | dBuV | dB | |
| 1 | 0.150 | 44.23 | 9.89 | 0.01 | 0.01 | 54.14 | 79.00 | -24.86 | QP |
| 2 | 0.154 | 33.81 | 9.89 | 0.01 | 0.01 | 43.72 | 66.00 | -22.28 | Average |
| 3 | 0.170 | 40.45 | 9.90 | 0.01 | 0.01 | 50.37 | 79.00 | -28.63 | QP |
| 4 | 0.170 | 29.95 | 9.90 | 0.01 | 0.01 | 39.87 | 66.00 | -26.13 | Average |
| 5 | 0.219 | 36.93 | 9.94 | 0.00 | 0.03 | 46.90 | 79.00 | -32.10 | QP |
| 6 | 0.398 | 27.37 | 10.12 | -0.06 | 0.04 | 37.47 | 66.00 | -28.53 | Average |
| 7 | 0.442 | 41.49 | 10.15 | -0.02 | 0.03 | 51.65 | 79.00 | -27.35 | QP |
| 8 | 0.454 | 32.45 | 10.16 | -0.01 | 0.03 | 42.63 | 66.00 | -23.37 | Average |
| 9 | 16.226 | 34.38 | 11.45 | 2.38 | 0.16 | 48.37 | 73.00 | -24.63 | QP |
| 10 | 16.226 | 30.28 | 11.45 | 2.38 | 0.16 | 44.27 | 60.00 | -15.73 | Average |
| 11 | 18.232 | 35.24 | 11.55 | 1.14 | 0.15 | 48.08 | 73.00 | -24.92 | QP |
| 12 | 18.232 | 31.03 | 11.55 | 1.14 | 0.15 | 43.87 | 60.00 | -16.13 | Average |

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

6.2 Radiated Emission

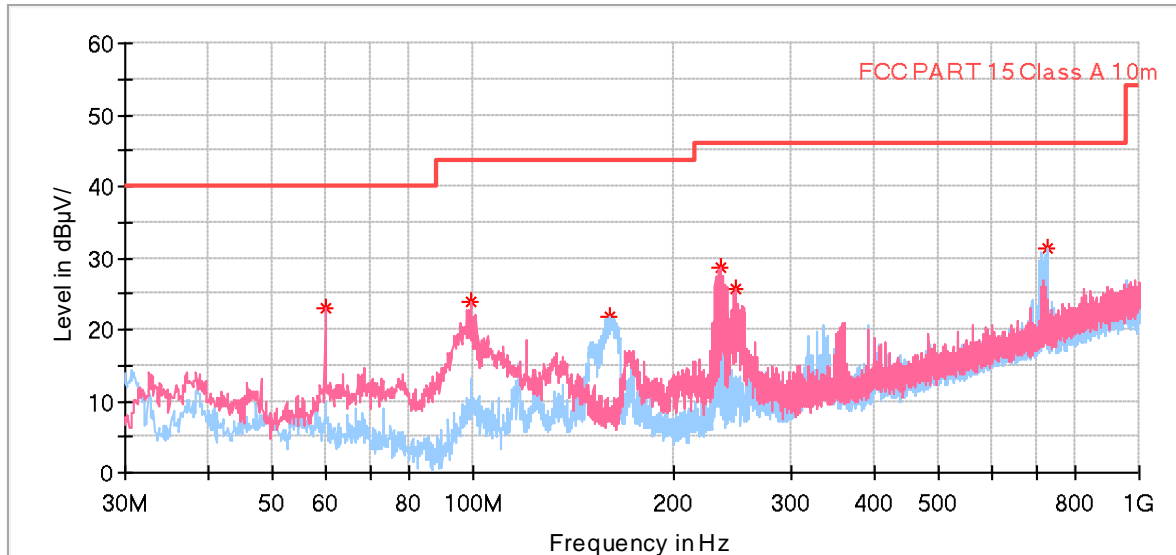
| | | | | | |
|-----------------------|---|------------|---------------------|---------------|------------------|
| Test Requirement: | FCC Part 15 B Section 15.109 | | | | |
| Test Frequency Range: | 30MHz to 6000MHz | | | | |
| Class / Severity: | Class A | | | | |
| Test site: | Measurement Distance: 3m & 10m (Semi-Anechoic Chamber) | | | | |
| Receiver setup: | Frequency | Detector | RBW | VBW | Remark |
| | 30MHz-1GHz | Quasi-peak | 120kHz | 300kHz | Quasi-peak Value |
| | Above 1GHz | Peak | 1MHz | 3MHz | Peak Value |
| RMS | | 1MHz | 3MHz | Average Value | |
| Limit: | Frequency | | Limit (dBuV/m @10m) | | Remark |
| | 30MHz-88MHz | | 40.0 | | Quasi-peak Value |
| | 88MHz-216MHz | | 43.5 | | Quasi-peak Value |
| | 216MHz-960MHz | | 46.4 | | Quasi-peak Value |
| | 960MHz-1GHz | | 49.5 | | Quasi-peak Value |
| | Frequency | | Limit (dBuV/m @3m) | | Remark |
| | Above 1GHz | | 59.5 | | Average Value |
| | | | 79.5 | | Peak Value |
| | | | | | |
| Test setup: | Below 1GHz | | | | |
| |  | | | | |
| | Above 1GHz | | | | |
| |  | | | | |
| Test Procedure: | <div>1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.</div> <div>2. The EUT was set 3 meters away from the interference-receiving antenna,</div> | | | | |

| | |
|-------------------|--|
| | <p>which was mounted on the top of a variable-height antenna tower.</p> <p>3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</p> <p>4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</p> <p>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</p> |
| Test Instruments: | Refer to section 5.11 for details |
| Test mode: | Refer to section 5.3 for details |
| Test results: | Passed |
| Remark: | All of the observed value above 6GHz were the noise floor , which were no recorded |

Measurement Data:
Below 1GHz:

| | | | |
|------------------------|--|-----------------------|-----------------------|
| Product Name: | Nebra Smart Outdoor LoRa Gateway / Nebra HNT Outdoor Hotspot Miner | Product Model: | HNTOUT-915-G-LT+ |
| Test By: | Carey | Test mode: | ON-AC mode |
| Test Frequency: | 30 MHz ~ 1 GHz | Polarization: | Vertical & Horizontal |
| Test Voltage: | AC 120/60Hz | Environment: | Temp: 24℃ Humi: 57% |

Full Spectrum



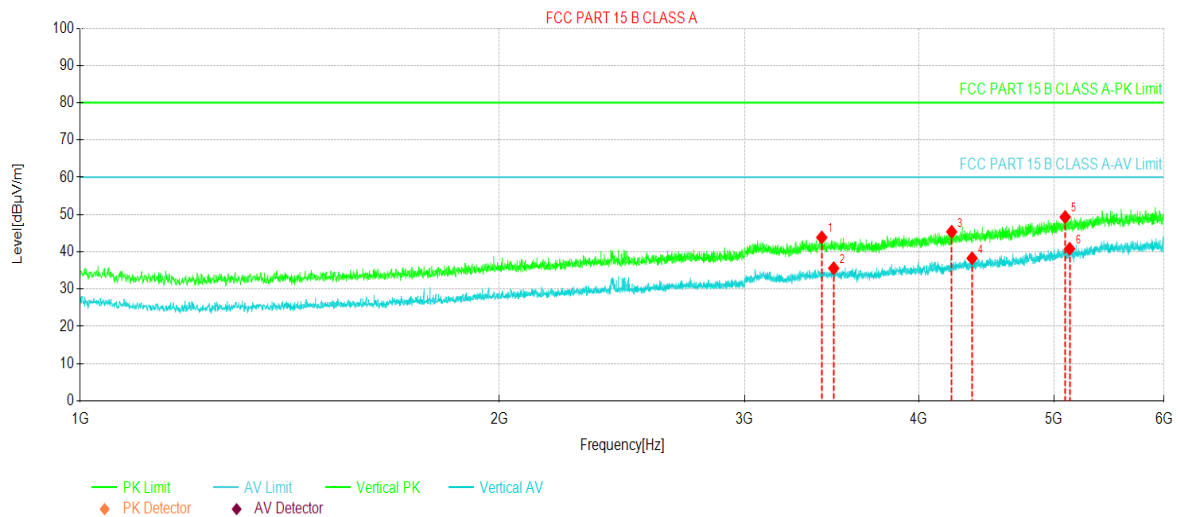
| Frequency ⁺ (MHz) [⊖] | Quasi-peak ⁺ (dB μ V/m) [⊖] | Limit ⁺ (dB μ V/m) [⊖] | Margin ⁺ (dB) [⊖] | Height ⁺ (cm) [⊖] | Pol ⁺ | Azimuth ⁺ (deg) [⊖] | Corr. ⁺ (dB/m) [⊖] |
|--|--|---|--|--|------------------|--|---|
| 59.973000 [⊖] | 22.90 [⊖] | 40.00 [⊖] | 17.10 [⊖] | 100.0 [⊖] | V [⊖] | 112.0 [⊖] | -16.3 [⊖] |
| 99.452000 [⊖] | 23.89 [⊖] | 43.50 [⊖] | 19.61 [⊖] | 100.0 [⊖] | V [⊖] | 300.0 [⊖] | -18.9 [⊖] |
| 160.368000 [⊖] | 21.90 [⊖] | 43.50 [⊖] | 21.60 [⊖] | 100.0 [⊖] | H [⊖] | 249.0 [⊖] | -14.6 [⊖] |
| 235.543000 [⊖] | 28.61 [⊖] | 46.00 [⊖] | 17.39 [⊖] | 100.0 [⊖] | V [⊖] | 36.0 [⊖] | -16.0 [⊖] |
| 248.056000 [⊖] | 25.57 [⊖] | 46.00 [⊖] | 20.43 [⊖] | 100.0 [⊖] | V [⊖] | 36.0 [⊖] | -15.7 [⊖] |
| 726.363000 [⊖] | 31.26 [⊖] | 46.00 [⊖] | 14.74 [⊖] | 100.0 [⊖] | H [⊖] | 104.0 [⊖] | -4.6 [⊖] |

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.
3. The Aux Factor is a notch filter switch box loss, this item is not used.

Above 1GHz:

| | | | |
|-----------------|--|----------------|---------------------|
| Product Name: | Nebra Smart Outdoor LoRa Gateway / Nebra HNT Outdoor Hotspot Miner | Product Model: | HNTOUT-915-G-LT+ |
| Test By: | Carey | Test mode: | ON-AC mode |
| Test Frequency: | 1 GHz ~ 6 GHz | Polarization: | Vertical |
| Test Voltage: | AC 120/60Hz | Environment: | Temp: 24℃ Humi: 57% |



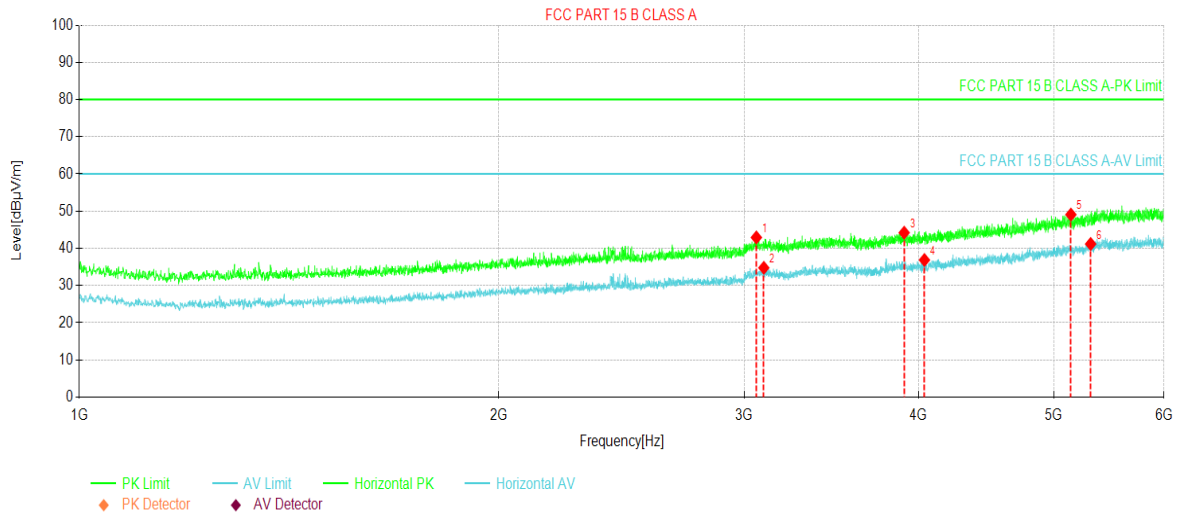
Suspected Data List

| NO. | Freq. [MHz] | Reading [dBμV/m] | Level [dBμV/m] | Factor [dB] | Limit [dBμV/m] | Margin [dB] | Trace | Polarity |
|-----|-------------|------------------|----------------|-------------|----------------|-------------|-------|----------|
| 1 | 3407.50 | 59.12 | 43.85 | -15.27 | 80.00 | 36.15 | PK | Vertical |
| 2 | 3475.62 | 50.53 | 35.58 | -14.95 | 60.00 | 24.42 | AV | Vertical |
| 3 | 4223.75 | 57.23 | 45.38 | -11.85 | 80.00 | 34.62 | PK | Vertical |
| 4 | 4368.75 | 49.59 | 38.27 | -11.32 | 60.00 | 21.73 | AV | Vertical |
| 5 | 5095.62 | 57.24 | 49.33 | -7.91 | 80.00 | 30.67 | PK | Vertical |
| 6 | 5133.12 | 48.54 | 40.81 | -7.73 | 60.00 | 19.19 | AV | Vertical |

Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
- The emission levels of other frequencies are very lower than the limit and not show in test report.

| | | | |
|------------------------|---|-----------------------|---------------------|
| Product Name: | Nebra Smart Outdoor LoRa Gateway / Nebra HNT Outdoor Hotspot Miner | Product Model: | HNTOUT-915-G-LT+ |
| Test By: | Carey | Test mode: | ON-AC mode |
| Test Frequency: | 1 GHz ~ 6 GHz | Polarization: | Horizontal |
| Test Voltage: | AC 120/60Hz | Environment: | Temp: 24℃ Humi: 57% |



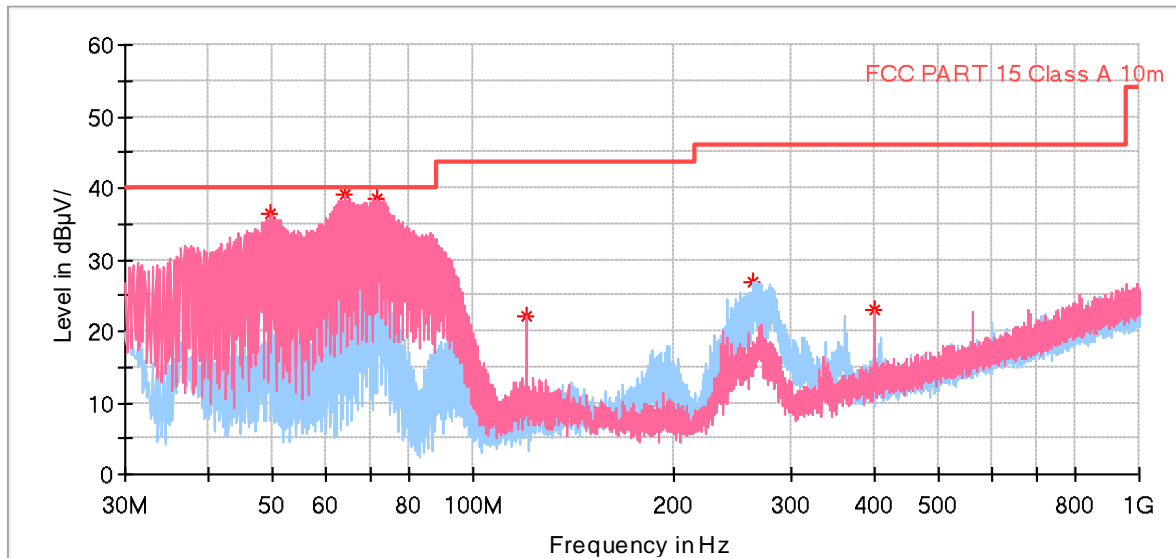
| Suspected Data List | | | | | | | | |
|---------------------|----------------|---------------------|-------------------|----------------|-------------------|----------------|-------|------------|
| NO. | Freq. [MHz] | Reading [dBμV/m] | Level [dBμV/m] | Factor [dB] | Limit [dBμV/m] | Margin [dB] | Trace | Polarity |
| 1 | 3060.00 | 59.24 | 42.92 | -16.32 | 80.00 | 37.08 | PK | Horizontal |
| 2 | 3098.12 | 50.74 | 34.77 | -15.97 | 60.00 | 25.23 | AV | Horizontal |
| 3 | 3906.25 | 57.70 | 44.21 | -13.49 | 80.00 | 35.79 | PK | Horizontal |
| 4 | 4039.37 | 49.76 | 36.87 | -12.89 | 60.00 | 23.13 | AV | Horizontal |
| 5 | 5145.00 | 56.73 | 49.06 | -7.67 | 80.00 | 30.94 | PK | Horizontal |
| 6 | 5315.62 | 47.71 | 41.17 | -6.54 | 60.00 | 18.83 | AV | Horizontal |

Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
- The emission levels of other frequencies are very lower than the limit and not show in test report.

| | | | |
|-----------------|--|----------------|-----------------------|
| Product Name: | Nebra Smart Outdoor LoRa Gateway / Nebra HNT Outdoor Hotspot Miner | Product Model: | HNTOUT-915-G-LT+ |
| Test By: | Carey | Test mode: | ON-POE mode |
| Test Frequency: | 30 MHz ~ 1 GHz | Polarization: | Vertical & Horizontal |
| Test Voltage: | DC 48V | Environment: | Temp: 24℃ Humi: 57% |

Full Spectrum



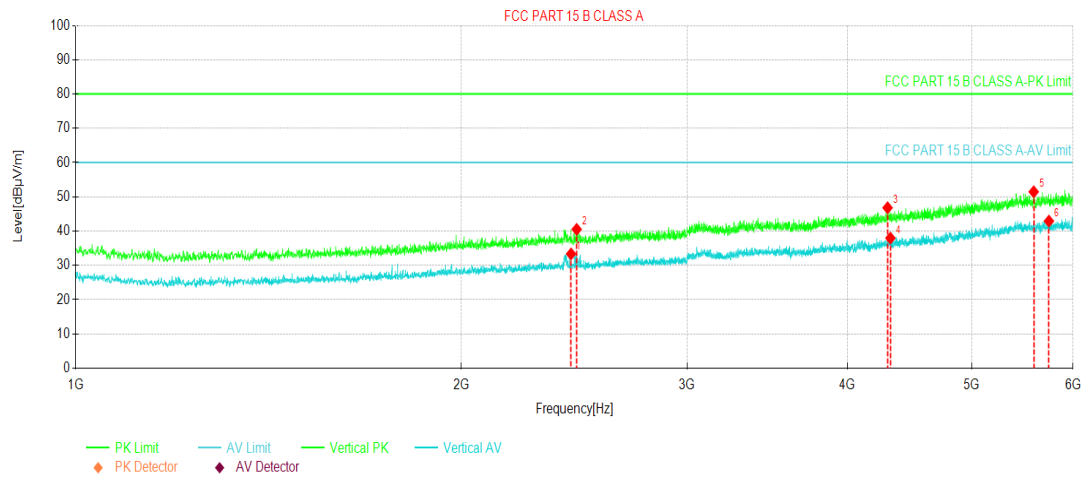
| Frequency ± (MHz) | Quasi-peak (dB μV/m) | Limit ± (dB μV/m) | Margin ± (dB) | Height ± (cm) | Pol. | Azimuth ± (deg) | Corr. ± (dB/m) |
|-------------------|----------------------|-------------------|---------------|---------------|------|-----------------|----------------|
| 49.497000 | 36.40 | 40.00 | 3.60 | 100.0 | V | 207.0 | -15.8 |
| 64.338000 | 39.07 | 40.00 | 0.93 | 100.0 | V | 283.0 | -17.2 |
| 71.516000 | 38.61 | 40.00 | 1.39 | 100.0 | V | 296.0 | -18.6 |
| 120.016000 | 22.05 | 43.50 | 21.45 | 100.0 | V | 151.0 | -17.1 |
| 263.770000 | 26.95 | 46.00 | 19.05 | 100.0 | H | 130.0 | -15.4 |
| 398.988000 | 22.93 | 46.00 | 23.07 | 100.0 | V | 122.0 | -11.0 |

Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- The Aux Factor is a notch filter switch box loss, this item is not used.

Above 1GHz:

| | | | |
|------------------------|--|-----------------------|---------------------|
| Product Name: | Nebra Smart Outdoor LoRa Gateway / Nebra HNT Outdoor Hotspot Miner | Product Model: | HNTOUT-915-G-LT+ |
| Test By: | Carey | Test mode: | ON-POE mode |
| Test Frequency: | 1 GHz ~ 6 GHz | Polarization: | Vertical |
| Test Voltage: | DC 48V | Environment: | Temp: 24℃ Humi: 57% |

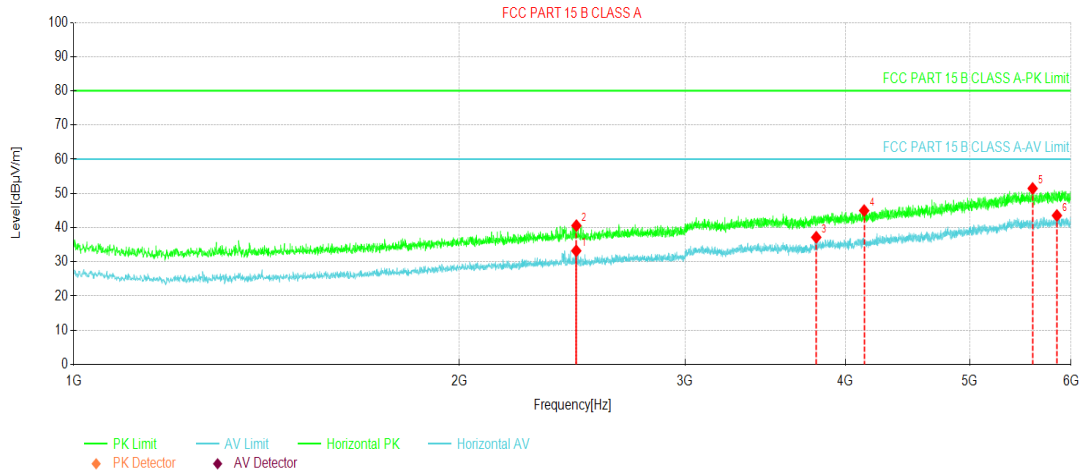


| Suspected Data List | | | | | | | | |
|---------------------|-------------|------------------|----------------|-------------|----------------|-------------|-------|----------|
| NO. | Freq. [MHz] | Reading [dBμV/m] | Level [dBμV/m] | Factor [dB] | Limit [dBμV/m] | Margin [dB] | Trace | Polarity |
| 1 | 2435.00 | 52.07 | 33.34 | -18.73 | 60.00 | 26.66 | AV | Vertical |
| 2 | 2460.00 | 59.19 | 40.51 | -18.68 | 80.00 | 39.49 | PK | Vertical |
| 3 | 4300.00 | 58.45 | 46.81 | -11.64 | 80.00 | 33.19 | PK | Vertical |
| 4 | 4321.87 | 49.51 | 37.97 | -11.54 | 60.00 | 22.03 | AV | Vertical |
| 5 | 5590.62 | 57.54 | 51.47 | -6.07 | 80.00 | 28.53 | PK | Vertical |
| 6 | 5745.62 | 48.14 | 42.92 | -5.22 | 60.00 | 17.08 | AV | Vertical |

Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
- The emission levels of other frequencies are very lower than the limit and not show in test report.

| | | | |
|------------------------|--|-----------------------|---------------------|
| Product Name: | Nebra Smart Outdoor LoRa Gateway / Nebra HNT Outdoor Hotspot Miner | Product Model: | HNTOUT-915-G-LT+ |
| Test By: | Carey | Test mode: | ON-POE mode |
| Test Frequency: | 1 GHz ~ 6 GHz | Polarization: | Horizontal |
| Test Voltage: | DC 48V | Environment: | Temp: 24℃ Humi: 57% |



Suspected Data List

| NO. | Freq. [MHz] | Reading [dBμV/m] | Level [dBμV/m] | Factor [dB] | Limit [dBμV/m] | Margin [dB] | Trace | Polarity |
|-----|-------------|------------------|----------------|-------------|----------------|-------------|-------|------------|
| 1 | 2466.87 | 51.89 | 33.22 | -18.67 | 60.00 | 26.78 | AV | Horizontal |
| 2 | 2467.50 | 59.26 | 40.59 | -18.67 | 80.00 | 39.41 | PK | Horizontal |
| 3 | 3796.25 | 51.07 | 37.17 | -13.90 | 60.00 | 22.83 | AV | Horizontal |
| 4 | 4137.50 | 57.27 | 44.97 | -12.30 | 80.00 | 35.03 | PK | Horizontal |
| 5 | 5600.00 | 57.51 | 51.44 | -6.07 | 80.00 | 28.56 | PK | Horizontal |
| 6 | 5849.37 | 48.55 | 43.55 | -5.00 | 60.00 | 16.45 | AV | Horizontal |

Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
- The emission levels of other frequencies are very lower than the limit and not show in test report.

8 EUT Constructional Details

Reference to the test report No.: JYTSZB-R12-2100992

-----End of report-----