



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

Draft

Tested by:

Test Engineer

Date:

_____ 09 Jul., 2021

Reviewed by:

Project Engineer

Date:

_____ 09 Jul., 2021

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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	

Draft

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.
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5.7 Description of Cable Used

N/A

5.8 Additions to, deviations, or exclusions from the method

No

5.9 Laboratory Facility

<p>The test facility is recognized, certified, or accredited by the following organizations:</p> <ul style="list-style-type: none"> ● 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
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5.10 Laboratory Location

<p>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</p>

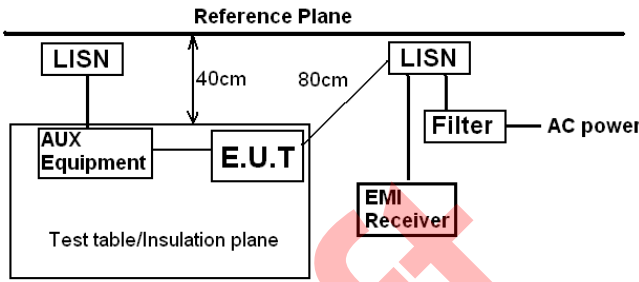
5.11 Test Instruments list

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		

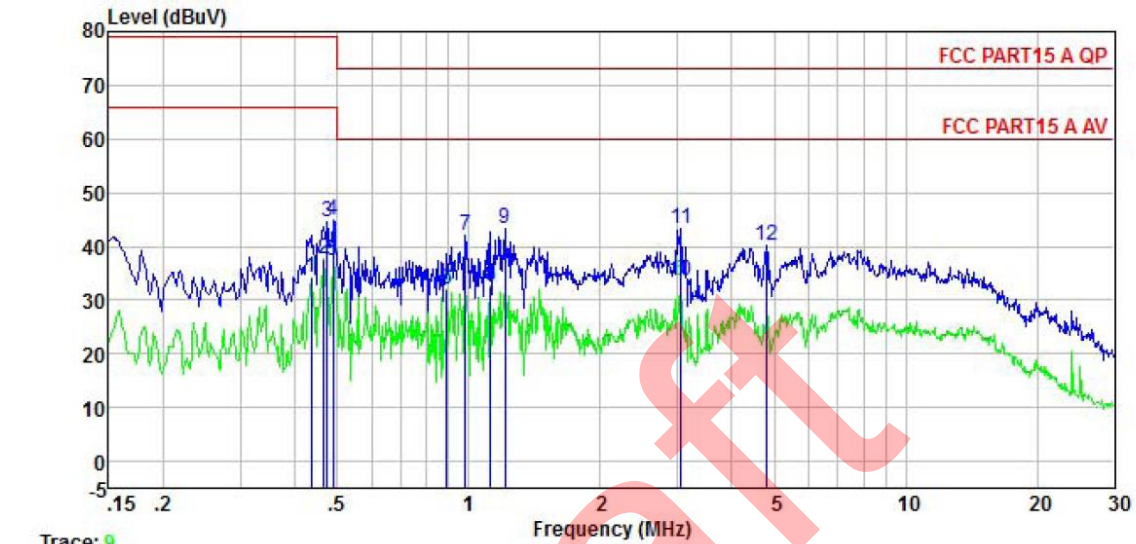
6 Test results and Measurement Data

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°C Humi: 55%



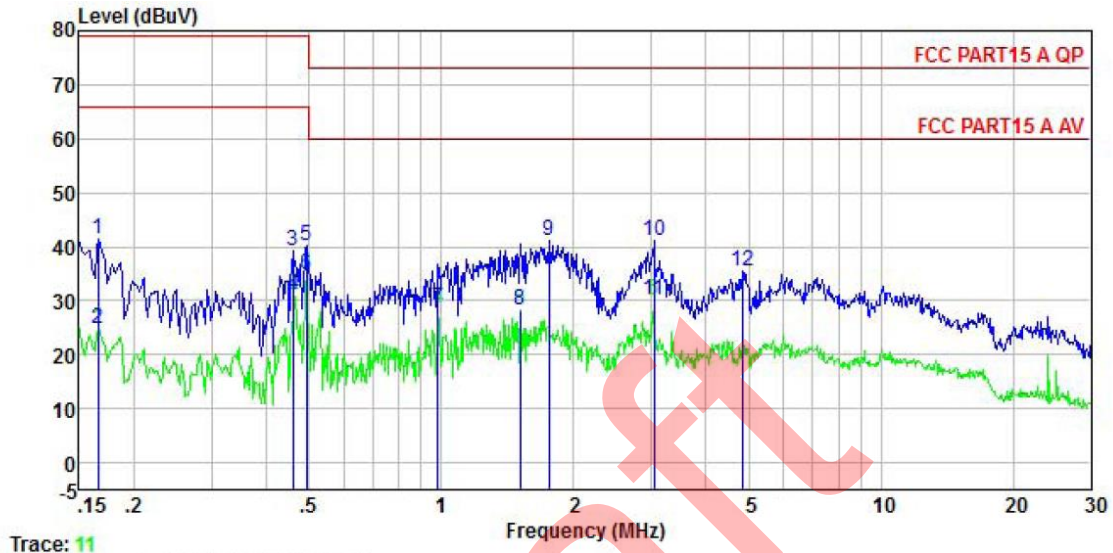
Trace: 9

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

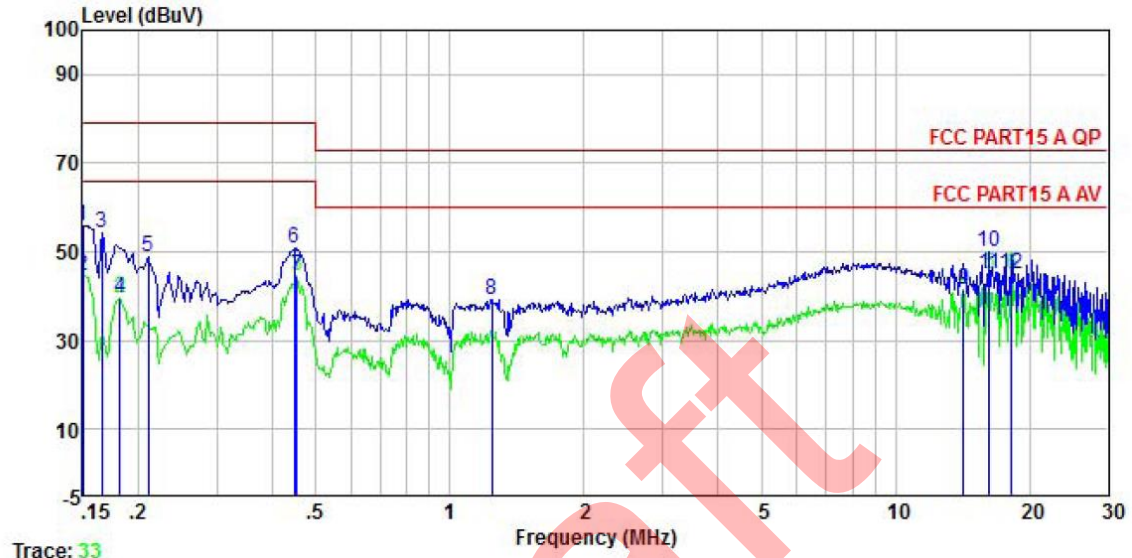


	Read Freq	LISN Level	Aux Factor	Cable Loss	Limit Level	Over Line	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB
1	0.166	31.42	9.90	0.01	41.34	79.00	-37.66 QP
2	0.166	14.97	9.90	0.01	24.89	66.00	-41.11 Average
3	0.459	28.90	10.17	0.00	39.10	79.00	-39.90 QP
4	0.461	20.82	10.17	0.00	31.02	66.00	-34.98 Average
5	0.494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



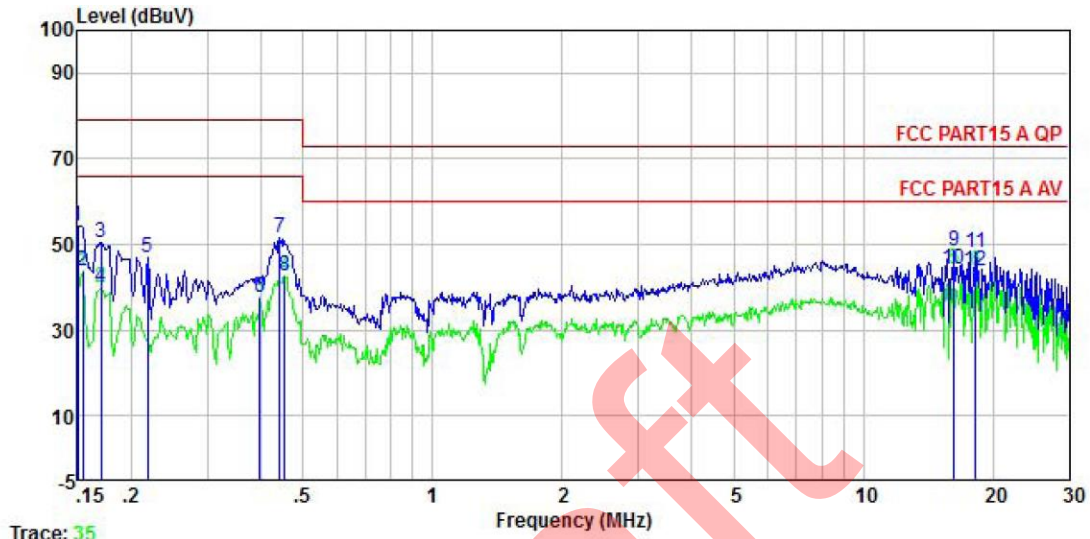
Trace: 33

	Freq	Read	LISN	Aux	Cable	Level	Limit	Over	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%

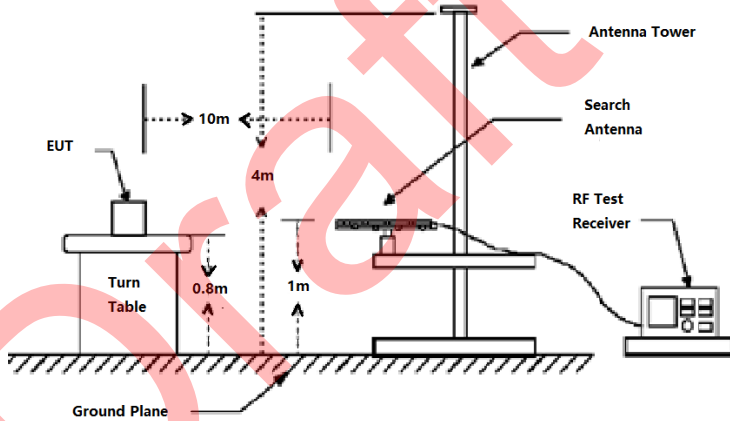
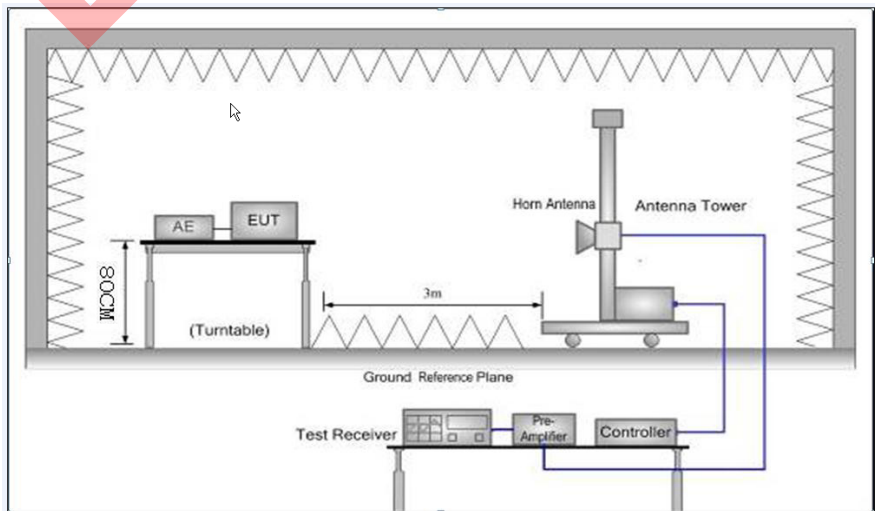


	Freq	Read Level	LISN Factor	Aux Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.150	44.23	9.89	0.01	0.01	54.14	79.00	-24.86	QP
2	0.154	33.81	9.89	0.01	0.01	43.72	66.00	-22.28	Average
3	0.170	40.45	9.90	0.01	0.01	50.37	79.00	-28.63	QP
4	0.170	29.95	9.90	0.01	0.01	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>				

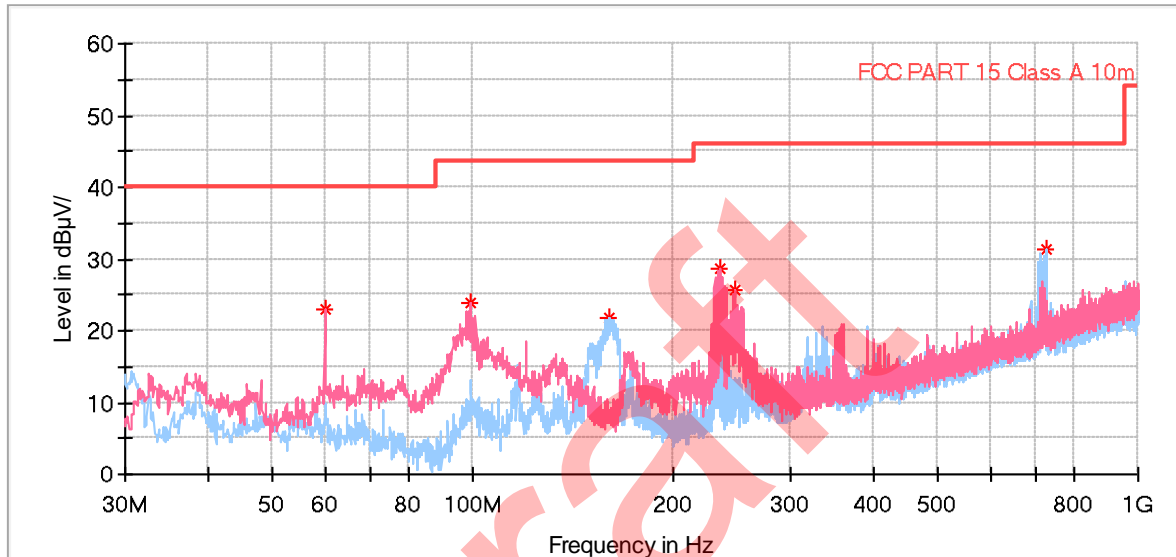
	<p>which was mounted on the top of a variable-height antenna tower.</p> <p>3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</p> <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

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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



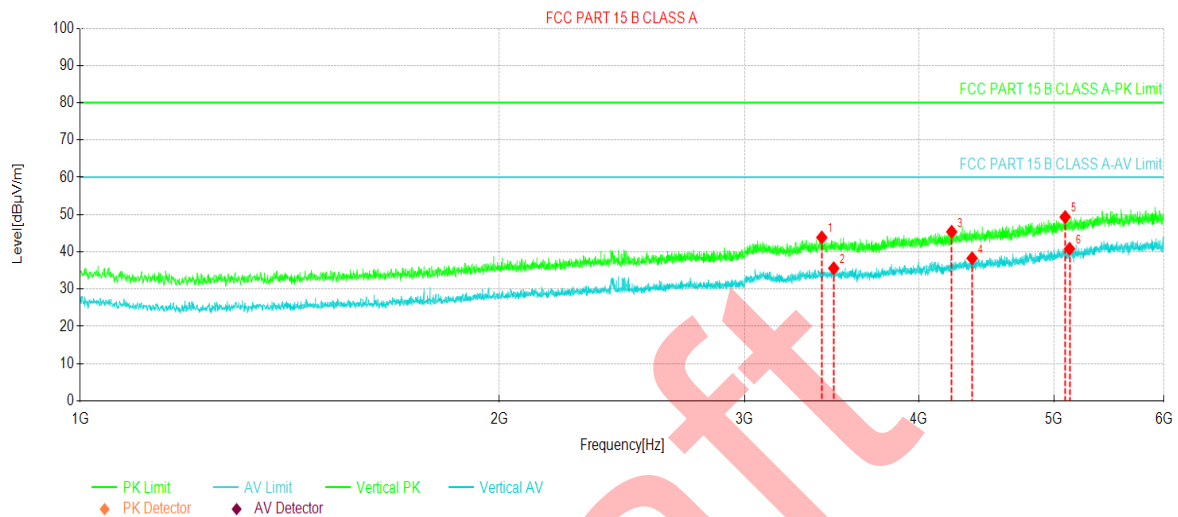
Frequency ⁺ (MHz) [⊖]	Quasi-peak ⁺ (dB μ V/m) [⊖]	Limit ⁺ (dB μ V/m) [⊖]	Margin ⁺ (dB) [⊖]	Height ⁺ (cm) [⊖]	Pol ⁺	Azimuth ⁺ (deg) [⊖]	Corr. ⁺ (dB/m) [⊖]
59.973000 [⊖]	22.90 [⊖]	40.00 [⊖]	17.10 [⊖]	100.0 [⊖]	V [⊖]	112.0 [⊖]	-16.3 [⊖]
99.452000 [⊖]	23.89 [⊖]	43.50 [⊖]	19.61 [⊖]	100.0 [⊖]	V [⊖]	300.0 [⊖]	-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%

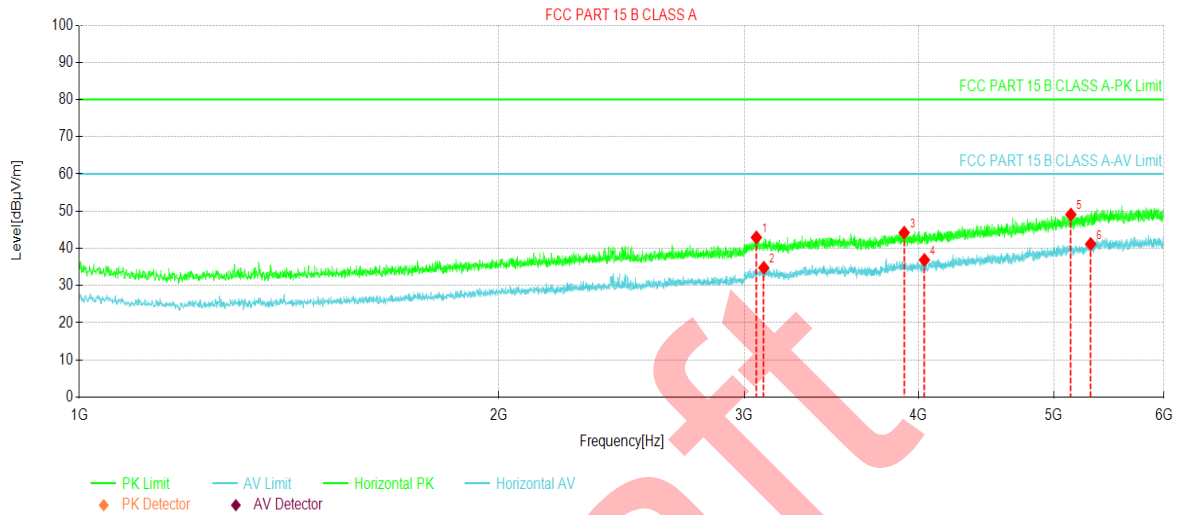


Suspected Data List								
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	3407.50	59.12	43.85	-15.27	80.00	36.15	PK	Vertical
2	3475.62	50.53	35.58	-14.95	60.00	24.42	AV	Vertical
3	4223.75	57.23	45.38	-11.85	80.00	34.62	PK	Vertical
4	4368.75	49.59	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%



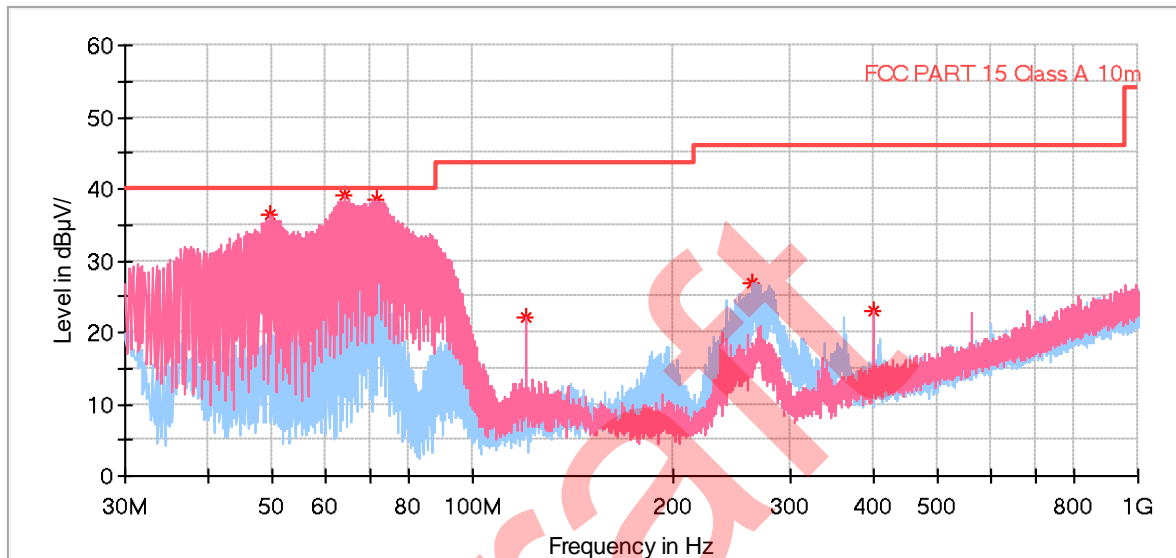
Suspected Data List								
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	3060.00	59.24	42.92	-16.32	80.00	37.08	PK	Horizontal
2	3098.12	50.74	34.77	-15.97	60.00	25.23	AV	Horizontal
3	3906.25	57.70	44.21	-13.49	80.00	35.79	PK	Horizontal
4	4039.37	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



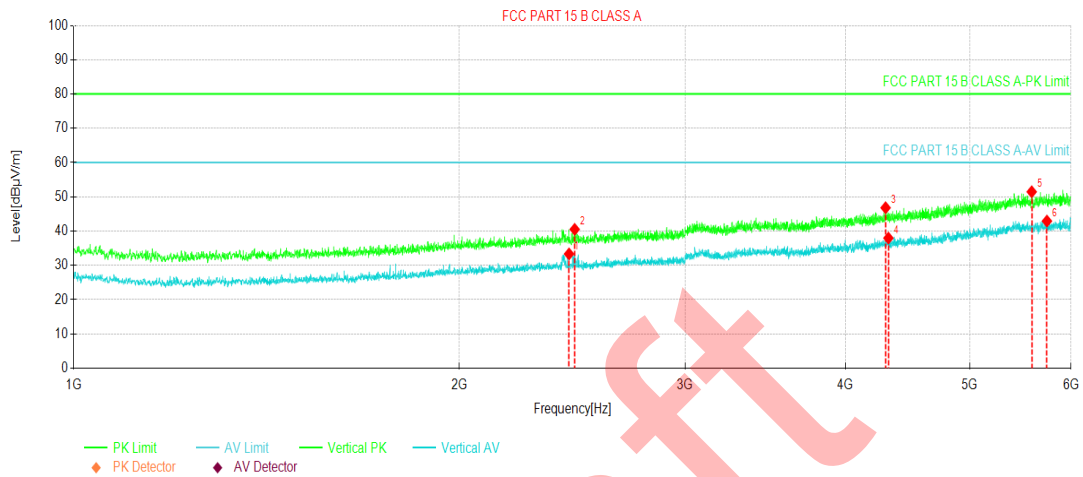
Frequency ± (MHz)	Quasi-peak (dB μV/m)	Limit ± (dB μV/m)	Margin ± (dB)	Height ± (cm)	Pol.	Azimuth ± (deg)	Corr. ± (dB/m)
49.497000	36.40	40.00	3.60	100.0	V	207.0	-15.8
64.338000	39.07	40.00	0.93	100.0	V	283.0	-17.2
71.516000	38.61	40.00	1.39	100.0	V	296.0	-18.6
120.016000	22.05	43.50	21.45	100.0	V	151.0	-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%

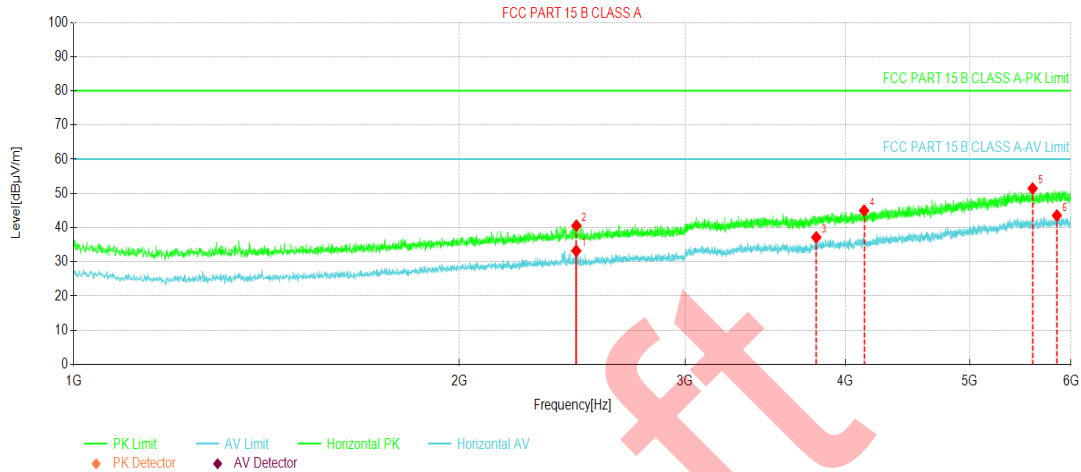


Suspected Data List								
NO.	Freq. [MHz]	Reading [dBuV/m]	Level [dBuV/m]	Factor [dB]	Limit [dBuV/m]	Margin [dB]	Trace	Polarity
1	2435.00	52.07	33.34	-18.73	60.00	26.66	AV	Vertical
2	2460.00	59.19	40.51	-18.68	80.00	39.49	PK	Vertical
3	4300.00	58.45	46.81	-11.64	80.00	33.19	PK	Vertical
4	4321.87	49.51	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%



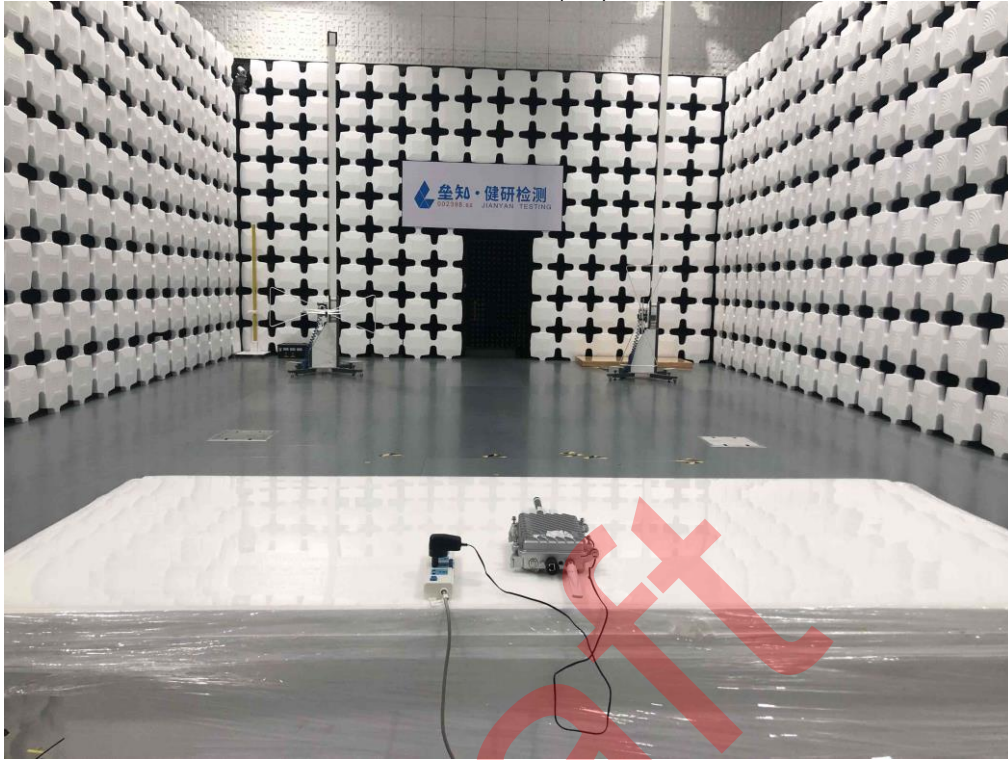
Suspected Data List								
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	2466.87	51.89	33.22	-18.67	60.00	26.78	AV	Horizontal
2	2467.50	59.26	40.59	-18.67	80.00	39.41	PK	Horizontal
3	3796.25	51.07	37.17	-13.90	60.00	22.83	AV	Horizontal
4	4137.50	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:

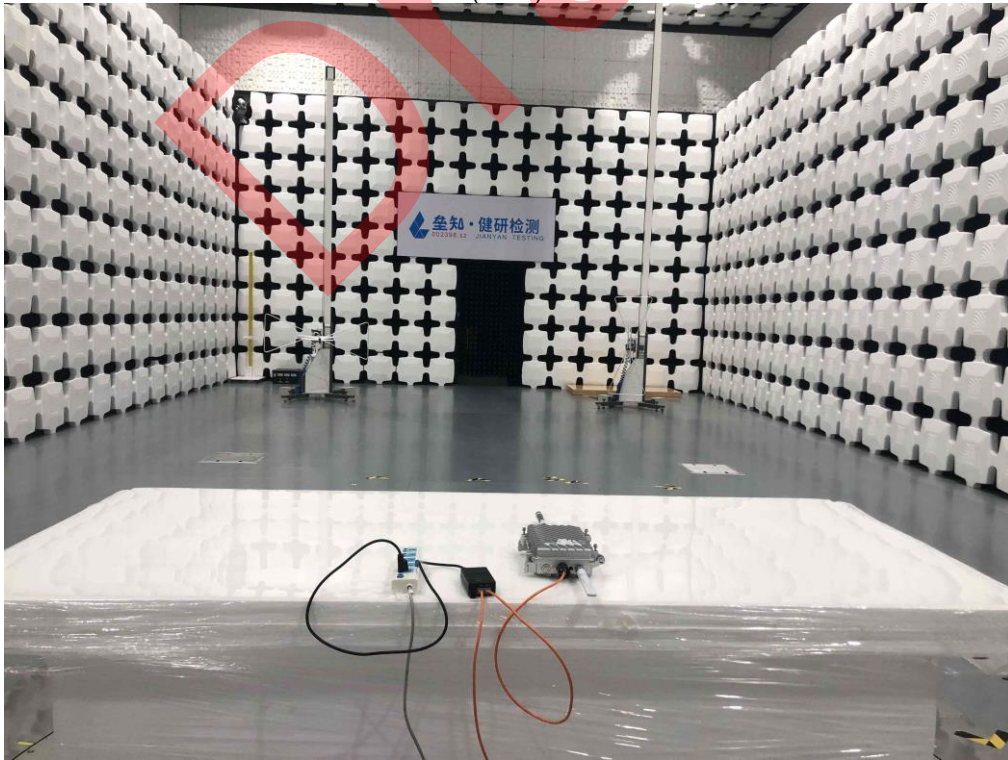
- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
- The emission levels of other frequencies are very lower than the limit and not show in test report.

7 Test Setup Photo

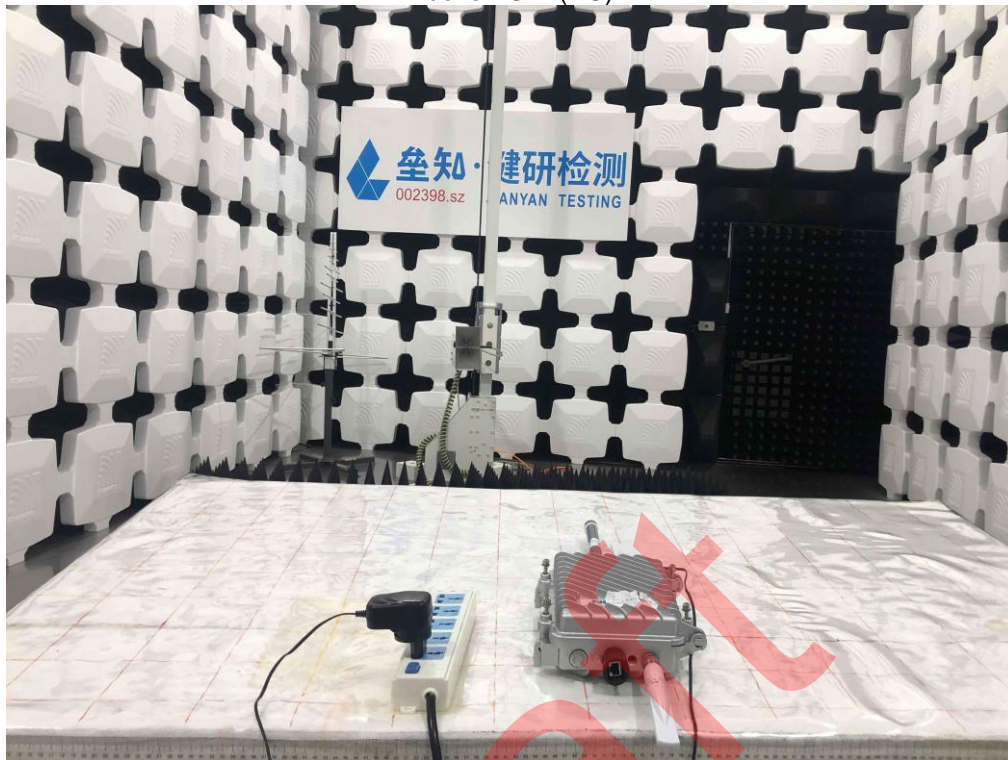
Radiated Emission
Below 1GHz(AC)



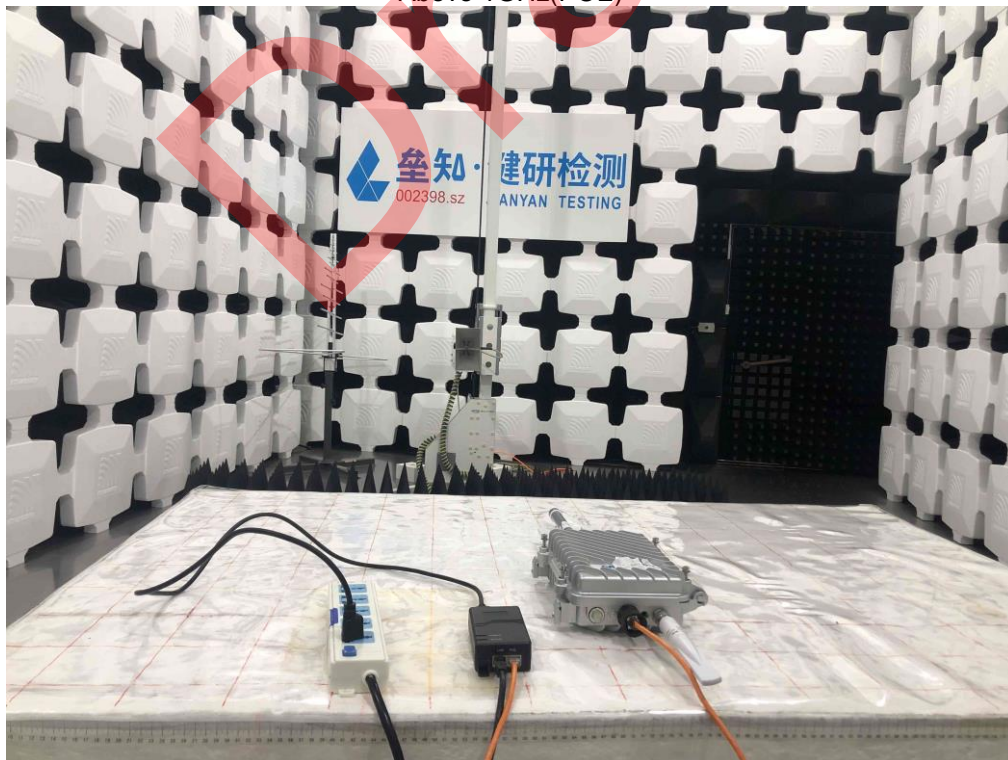
Below 1GHz(POE)Above 1GHz



Radiated Emission
Above 1GHz(AC)



Above 1GHz(POE)



Radiated Emission
Conducted Emission (AC)



Conducted Emission (POE)



8 EUT Constructional Details

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

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

Draft