EMC 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 Indoor LoRa Gateway / Nebra HNT Indoor Hotspot Miner
Model No.:	HNTIN-470-G, HNTIN-868-G, HNTIN-915-G,HNTIN-433-G, HNTIN-470,HNTIN-868, HNTIN-915,HNTIN-433
Applicable standards:	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.1.1 (2019-03) ETSI EN 301 489-17 V3.2.4 (2020-09) ETSI EN 301 489-19 V2.1.1 (2019-04)
Date of sample receipt:	12 Mar., 2021
Date of Test:	13 Mar., to 19 Apr., 2021
Date of report issue:	23 Apr., 2021
Test Result:	PASS*

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

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EC Declaration of Conformity and compliance with all relevant EC Directives. The protection requirements with respect to electromagnetic compatibility contained in Directive 2014/53/EU are considered.

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.

2 Version

Version No.	Date	Description
00	*23 Apr., 2021*	*Original*

Tested by: _____ ***Date:*** *23 Apr., 2021*

Test Engineer

Reviewed by: _____ ***Date:*** *23 Apr., 2021*

Project Engineer

3 Contents

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4 Test Summary

Test Item	Test Requirement	Test Method	Application	Result
EMI Test Items				
Radiated Emission	ETSI EN301 489-1	EN 55032	Enclosure	PASS
Conducted Emission	ETSI EN301 489-1	EN 55032	AC port	PASS
Harmonic Current Emissions	ETSI EN301 489-1	EN 61000-3-2	AC port	Not Required
Voltage Fluctuations and Flicker	ETSI EN301 489-1	EN 61000-3-3	AC port	Not Required
EMS Test Items				
ESD (Electrostatic Discharge)	ETSI EN301 489-1	EN 61000-4-2	Enclosure	PASS
Radiated Immunity	ETSI EN301 489-1	EN 61000-4-3	Enclosure	PASS
EFT (Electrical Fast Transients)	ETSI EN301 489-1	EN 61000-4-4	AC port	PASS
Surge Immunity	ETSI EN301 489-1	EN 61000-4-5	AC port	PASS
Injected Currents	ETSI EN301 489-1	EN 61000-4-6	AC port	PASS
Voltage Dips andInterruptions	ETSI EN301 489-1	EN 61000-4-11	AC port	PASS

Remark:
1. Pass: Meet the requirement.
2. N/A: Not Applicable.

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 Indoor LoRa Gateway / Nebra HNT Indoor Hotspot Miner			
Model No.:	HNTIN-470-G, HNTIN-868-G, HNTIN-915-G,HNTIN-433-G, HNTIN-470,HNTIN-868, HNTIN-915,HNTIN-433			
Tx Frequency:	Wi-Fi:	2412MHz~2472MHz	LoRa:	868.1MHz~868.5MHz
	Bluetooth/ BLE: 2402MHz~2480MHz			
Rx Frequency:	Wi-Fi:	2412MHz~2472MHz	LoRa:	868.1MHz~868.5MHz
	Bluetooth/ BLE: 2402MHz~2480MHz		GPS:	1575.42MHz
Hardware version:	V12-15-2020-1614			
Software version:	a98bfc8			
Modulation technology:	Wi-Fi:	☒802.11b(DSSS)	☒802.11g/n20/n40 (OFDM)	
	Bluetooth:	☒BDR(GFSK)	☒EDR(π/4-DQPSK, 8DPSK)	☒LE(GFSK)
	LoRa	☒OOK		
Antenna Type:	Wi-Fi/ Bluetooth/ BLE/ GPS: Internal Antenna LoRa: Cylindrical Antenna			
Antenna Gain:	Wi-Fi: 2.0dBi		Bluetooth/ BLE: 2.0dBi	
	LoRa: 3.0dBi		GPS: 24dBi	
Power supply:	DC 12V			
AC adapter:	Model: TM-K018VP-01201500PE-Z Input: 100-240V~50/60Hz 0.45A Output: 12.0V , 1.5A			
Remark:	Model No.: HNTIN-470-G, HNTIN-868-G, HNTIN-915-G,HNTIN-433-G, HNTIN-470,HNTIN-868, HNTIN-915,HNTIN-433 has the same internal circuit design, layout, components and internal wiring. The difference is that the ones with the -G suffix have GPS function, while those without the suffix do not. Each model has two appearances, except for the appearance, the interior is exactly the same. In addition, the corresponding frequency of each model of LoRa module is different, as follows: The Nebra HNT Indoor Hotspot is available in 4 variants to support multiple regions. It is available in the following frequency variants: • 433 MHz (HNTIN-433) • 470 Mhz (HNTIN-470) • 868 Mhz (HNTIN-868) • 915 Mhz (HNTIN-915)			

5.3 Test mode and test samples plans

Radiated emission	
TM 1: Wi-Fi link(2.4G Wi-Fi +Bluetooth link + GPS link + LoRa link + Adapter	
Remark:	The report only reflects the test data of worst mode.

5.4 Description of Support Units

Manufacturer	Description	Model	S/N	FCC ID/DoC
MERCURY	Wireless router	MW150R	12922104015	FCC ID
NAKAMICHI	Bluetooth earphone	T8	N/A	FCC ID
DELL	PC	OPTIPLEX7070	2J8XSZ2	DoC
DELL	MONITOR	SE2018HR	3M7QPY2	DoC
DELL	KEYBOARD	KB216d	N/A	DoC
DELL	MOUSE	MS116t1	N/A	DoC
HP	Printer	HP LaserJet P1007	VNFP409729	DoC
Anritsu	Simulated Station	MT8820C	6201026545	N/A
Simulated Station	Rohde& Schwarz	CMU200	122477	N/A

5.5 Measurement Uncertainty

Parameter	Expanded Uncertainty (Confidence of 95%)
Conducted Emission (9kHz ~ 30MHz)	±1.60 dB
Radiated Emission (9kHz ~ 30MHz)	±3.12 dB
Radiated Emission (30MHz ~ 1000MHz)	±4.32 dB
Radiated Emission (1GHz ~ 18GHz)	±5.16 dB
Radiated Emission (18GHz ~ 26.5GHz)	±3.20 dB

5.6 Description of Cable Used

N/A

5.7 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 17025:2005General 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

5.8 Laboratory Location

JianYan Testing Group Shenzhen 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@ccis-cb.com, Website: http://www.ccis-cb.com

5.9 Monitoring of EUT for the Immunity Test

Visual:	Monitored the display of EUT
Sound:	Monitored the sound of EUT
Other:	Monitored the data link of EUT

5.10 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
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-03-2021	03-02-2022
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-03-2021	03-02-2022
EMI Test Software	AUDIX	E3	Version: 6.110919b		
Pre-amplifier	HP	8447D	2944A09358	03-03-2021	03-02-2022
Pre-amplifier	CD	TRLA-010180G50B	20120401	03-03-2021	03-02-2022
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-03-2021	03-02-2022
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-03-2021	03-02-2022
Simulated Station	Anritsu	MT8820C	6201026545	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 3	101189	03-03-2021	03-02-2022
RF Switch	TOP PRECISION	RSU0301	N/A	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	06-17-2021
ISN	Schwarzbeck	CAT3 8158	#96	03-03-2021	03-02-2022
ISN	Schwarzbeck	CAT5 8158	#166	03-03-2021	03-02-2022
ISN	Schwarzbeck	NTFM 8158	#126	03-03-2021	03-02-2022
Cable	HP	10503A	N/A	03-03-2021	03-02-2022
EMI Test Software	AUDIX	E3	Version: 6.110919b		

ESD:					
Test Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
ESD Simulator	Haefely	ONYX30	183900	03-03-2021	03-02-2022

Conducted Immunity:					
Test Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date (mm-dd-yy)**	**Cal. Due date (mm-dd-yy)**
Conducted Disturbance Test system	SCHLODER	CDG6000	126B1445/2016	03-03-2021	03-02-2022
Coupling/Decoupling Network	SCHLODER	CDN-M2+3	A2210417/2016	03-03-2021	03-02-2022
EM Clamp	SCHLODER	EMCL-20	132A1281/2016	03-03-2021	03-02-2022
Coupling/Decoupling Network	SCHLODER	CDN M5-32A	10204-1	02-02-2021	02-01-2022
Nexus Condutuining Amplifier	B&K	2690-0S2	3003552	N/A	N/A
MUTH Simulator	B&K	4227	N/A	N/A	N/A
Sound Level Calibrator	B&K	4231	N/A	N/A	N/A
Audio Analyzer	Rohde & Schwarz	UPL 16	100150	03-03-2021	03-02-2022

Surge \ EFT \ V-dips \ RW :					
Test Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
Four-in-one Immunity test system	EMC PARTNER	IMU-MGE	109937-1520	01-30-2021	01-29-2022
Lightning test system module	EMC PARTNER	EXT-IMU3000S6 (Surge1.2/50us)	1652	01-30-2021	01-29-2022
Lightning surge high speed communication line coupling network 8 lines (Surge, RW)	EMC PARTNER	CDN-UTP8 ED3	1594	01-30-2021	01-29-2022
Lightning test module of telecommunication terminal	EMC PARTNER	EXT-IMU3000 T6 (Surge 10/700 μ s)	1568	01-30-2021	01-29-2022
Coupling decoupling network of power line (Surge, EFT, RW)	EMC PARTNER	CDN-A-6-32	109037-3063	01-30-2021	01-29-2022
EFT test system module	EMC PARTNER	EXT-IMU3000F5	1626	01-30-2021	01-29-2022
Capacitive coupling clamp EFT	EMC PARTNER	CN-EFT1000/VERI-CP-EFT	1863/1635	01-30-2021	01-29-2022
Voltage dips and Interruption test module	EMC PARTNER	EXT-IMU D	1723	01-30-2021	01-29-2022
Ring wave test module	EMC PARTNER	EXT-IMU3000 R6	1567	01-30-2021	01-29-2022

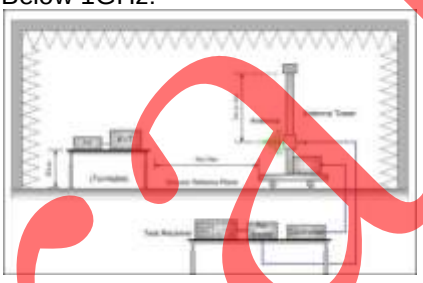
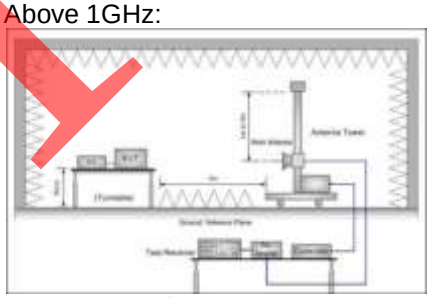
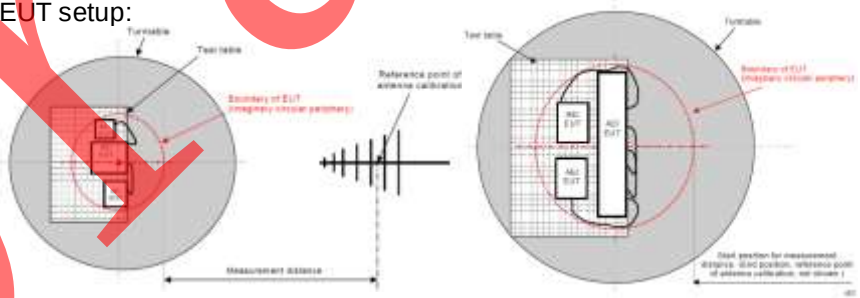
Radiated Immunity:					
Test Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date (mm-dd-yy)**	**Cal. Due date (mm-dd-yy)**
Signal Generator	Rohde & Schwarz	SMR20	1104.002.20	03-03-2021	03-02-2022
RF Amplifier 80M-1GHz	Amplifier Research	AR 150W1000	115243	03-03-2021	03-02-2022
RF Amplifier 1GHz-4.2GHz	Amplifier Research	AR 25S1G4AM1	145863	03-03-2021	03-02-2022
RF Amplifier 4GHz-6GHz	Amplifier Research	35S4G8A	247443	03-03-2021	03-02-2022
Power Meter	Rohde & Schwarz	NRVS	1020.1809.02	03-03-2021	03-02-2022
Software EMC32	Rohde & Schwarz	EMC32-S	N/A	N/A	N/A
Log-periodic Antenna	Amplifier Research	AT1080	3654	03-03-2021	03-02-2022
Antenna Tripod	Amplifier Research	TP1000A	7412	N/A	N/A
High Gain Horn Antenna	Amplifier Research	AT4002A	6987	03-03-2021	03-02-2022
Nexus Condutuining Amplifier	B&K	2690	3003552	N/A	N/A
MUTH Simulator	B&K	4227	N/A	N/A	N/A
Sound Level Calibrator	B&K	4231	N/A	N/A	N/A
Audio Analyzer	Rohde & Schwarz	UPL 16	100150	03-03-2021	03-02-2022

Harmonic Current/ Voltage Fluctuation and Flicker:					
Test Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date (mm-dd-yy)**	**Cal. Due date (mm-dd-yy)**
Three phase harmonic scintillation analyzer	AMETEK	PACS-3	2046A02916	02-03-2021	02-02-2022
Three phase harmonic power supply	AMETEK	MX45	2046A00586	02-03-2021	02-02-2022

6 EMC Requirements Specification in ETSI EN 301489

6.1 EMI (Emission)

6.1.1 Radiated Emission

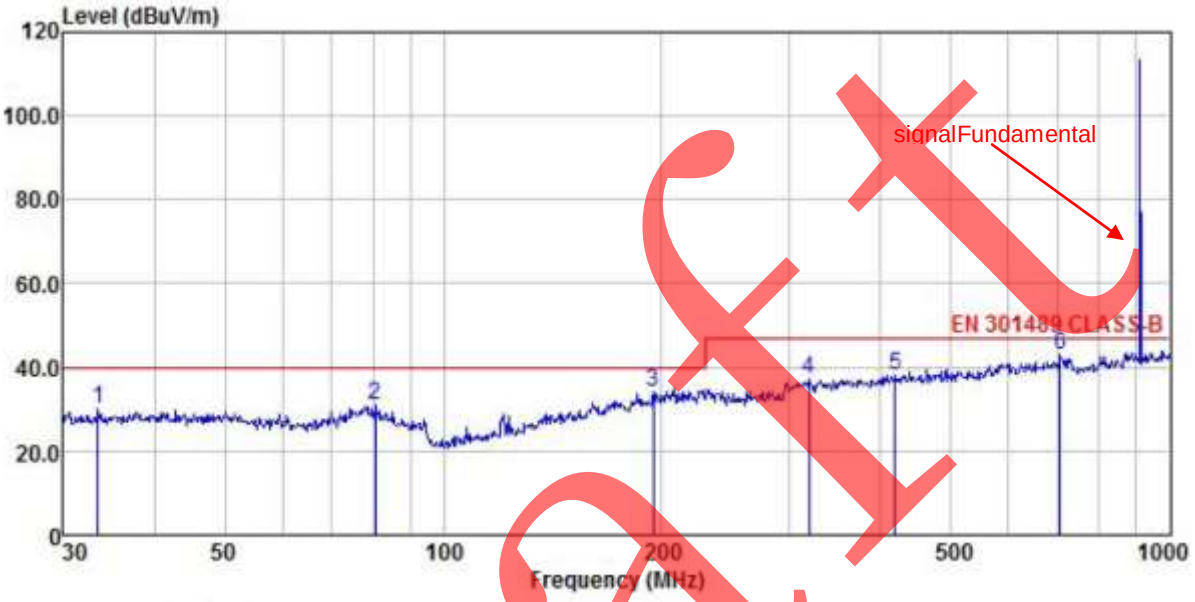
Test Requirement:	ETSI EN301 489-1				
Test Method:	EN55032				
TestFrequencyRange:	30MHz to 6GHz				
TestDistance:	3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	QP Value
	Above 1GHz	Peak	1MHz	3MHz	PK Value
		Average	1MHz	3MHz	AV Value
Limit:	Frequency	Limit (dBuV/m @3m)		Remark	
	30MHz-230MHz	40.0		QP Value	
	230MHz-1GHz	47.0		QP Value	
	1GHz-3GHz	50.0		AV Value	
		70.0		PK Value	
	3GHz-6GHz	54.0		AV Value	
		74.0		PK Value	
Test setup:	Below 1GHz:  Above 1GHz:  EUT setup: 				
Test Procedure:	**30MHz to 1GHz:** 1. The radiated emissions test was conducted in a semi-anechoic chamber. 2. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation. 3. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT. 4. The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance.				

	Measurements were performed for both horizontal and vertical antenna polarization. **Above 1GHz:** 1. The radiated emissions test wasconducted in a fully-anechoic chamber. 2. The tabletop EUT was placed upon anon-metallic table0.8m above the ground reference plane.And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation. 3. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emission spectrum plots of the EUT. 4. The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.
Test Instruments:	Refer to section 5.10 for details
Testmode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

Below 1GHz:

Product Name:	Nebra Smart Indoor LoRa Gateway / Nebra HNT Indoor Hotspot Miner	**Product Model:**	HNTIN-868-G
Test By:	Yaro	**Test mode:**	TM 1
Test Frequency:	30 MHz ~ 1 GHz	**Polarization:**	Vertical
Test Voltage:	AC 230/50Hz	**Environment:**	Temp: 24℃ Huni: 57%

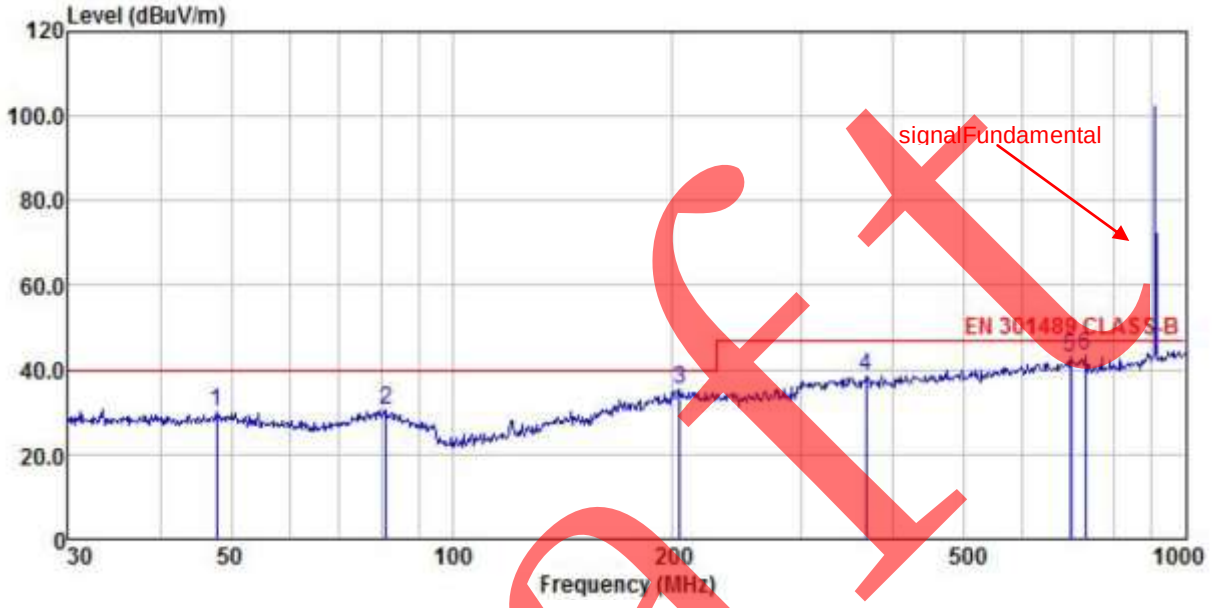


	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	33.445	17.51	12.36	0.38	0.00	30.25	40.00	-9.75	QP
2	80.644	17.50	12.66	0.69	0.00	30.85	40.00	-9.15	QP
3	194.453	14.90	17.75	1.39	0.00	34.04	40.00	-5.96	QP
4	318.817	16.66	18.74	1.81	0.00	37.21	47.00	-9.79	QP
5	419.108	16.87	19.14	2.09	0.00	38.10	47.00	-8.90	QP
6	706.700	19.46	20.51	2.85	0.00	42.82	47.00	-4.18	QP

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.*

Product Name:	Nebra Smart Indoor LoRa Gateway / Nebra HNT Indoor Hotspot Miner	Product Model:	HNTIN-868-G
Test By:	Yaro	Test mode:	TM 1
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Horizontal
Test Voltage:	AC 230/50Hz	Environment:	Temp: 24℃ Huni: 57%



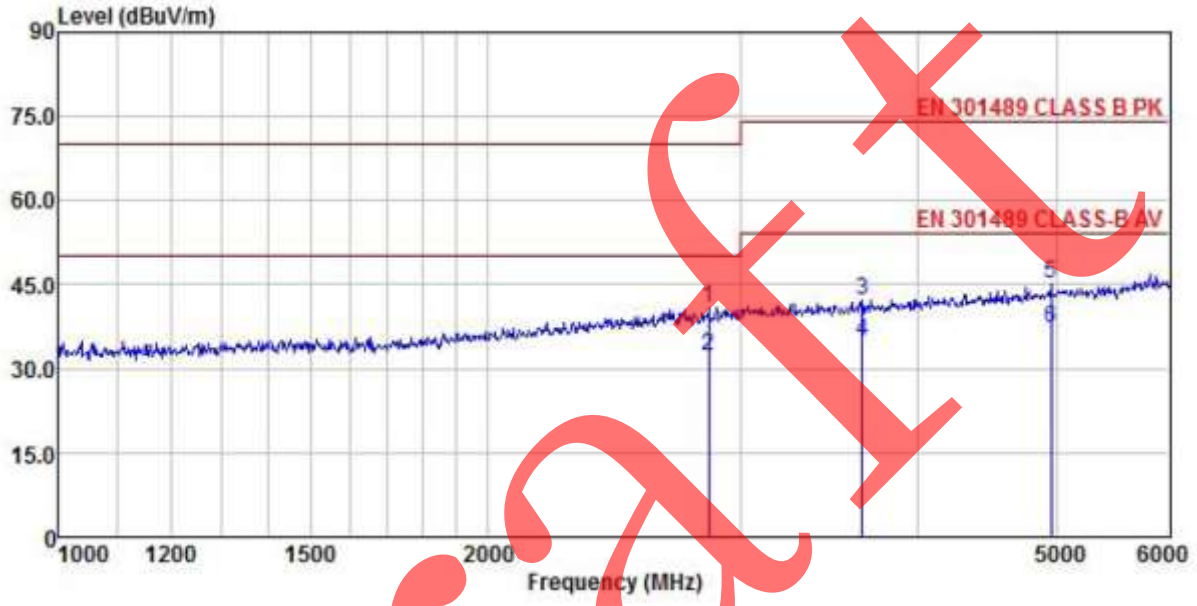
	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	47.826	16.47	13.07	0.48	0.00	30.02	40.00	-9.98	QP
2	81.212	17.27	12.52	0.69	0.00	30.48	40.00	-9.52	QP
3	204.238	15.45	18.32	1.44	0.00	35.21	40.00	-4.79	QP
4	366.823	17.78	18.90	1.94	0.00	38.62	47.00	-8.38	QP
5	696.857	19.72	20.48	2.82	0.00	43.02	47.00	-3.98	QP
6	729.358	20.02	20.56	2.93	0.00	43.51	47.00	-3.49	QP

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 Indoor LoRa Gateway / Nebra HNT Indoor Hotspot Miner	Product Model:	HNTIN-868-G
Test By:	Yaro	Test mode:	TM 1
Test Frequency:	1 GHz ~ 6 GHz	Polarization:	Vertical
Test Voltage:	AC 230/50Hz	Environment:	Temp: 24℃ Huni: 57%

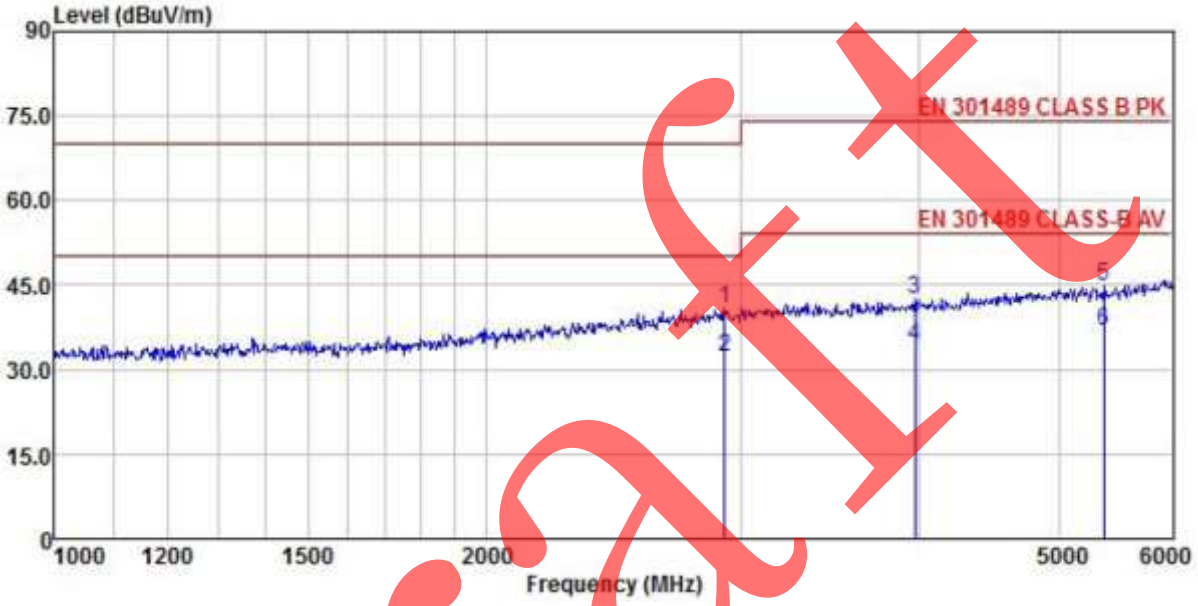


	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2852.453	58.99	28.10	8.37	54.57	40.89	70.00	-29.11	Peak
2	2852.453	50.16	28.10	8.37	54.57	32.06	50.00	-17.94	Average
3	3652.610	58.40	28.89	9.39	54.47	42.21	74.00	-31.79	Peak
4	3652.610	50.98	28.89	9.39	54.47	34.79	54.00	-19.21	Average
5	4953.236	57.54	31.11	10.91	54.29	45.27	74.00	-28.73	Peak
6	4953.236	49.51	31.11	10.91	54.29	37.24	54.00	-16.76	Average

Remark:

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

Product Name:	Nebra Smart Indoor LoRa Gateway / Nebra HNT Indoor Hotspot Miner	Product Model:	HNTIN-868-G
Test By:	Yaro	Test mode:	TM 1
Test Frequency:	1 GHz ~ 6 GHz	Polarization:	Horizontal
Test Voltage:	AC 230/50Hz	Environment:	Temp: 24℃ Huni: 57%

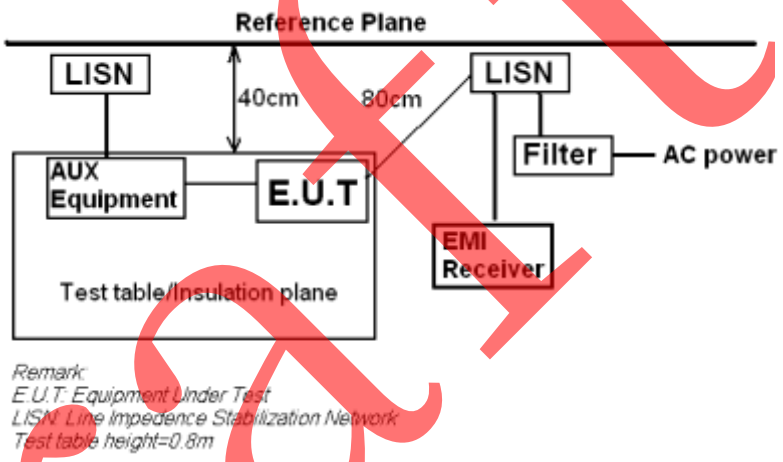


	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2924.911	58.55	28.24	8.46	54.56	40.69	70.00	-29.31	Peak
2	2924.911	50.13	28.24	8.46	54.56	32.27	50.00	-17.73	Average
3	3966.417	57.97	29.26	9.73	54.42	42.54	74.00	-31.46	Peak
4	3966.417	49.70	29.26	9.73	54.42	34.27	54.00	-19.73	Average
5	5378.783	56.36	32.03	10.70	54.32	44.77	74.00	-29.23	Peak
6	5378.783	48.53	32.03	10.70	54.32	36.94	54.00	-17.06	Average

Remark:

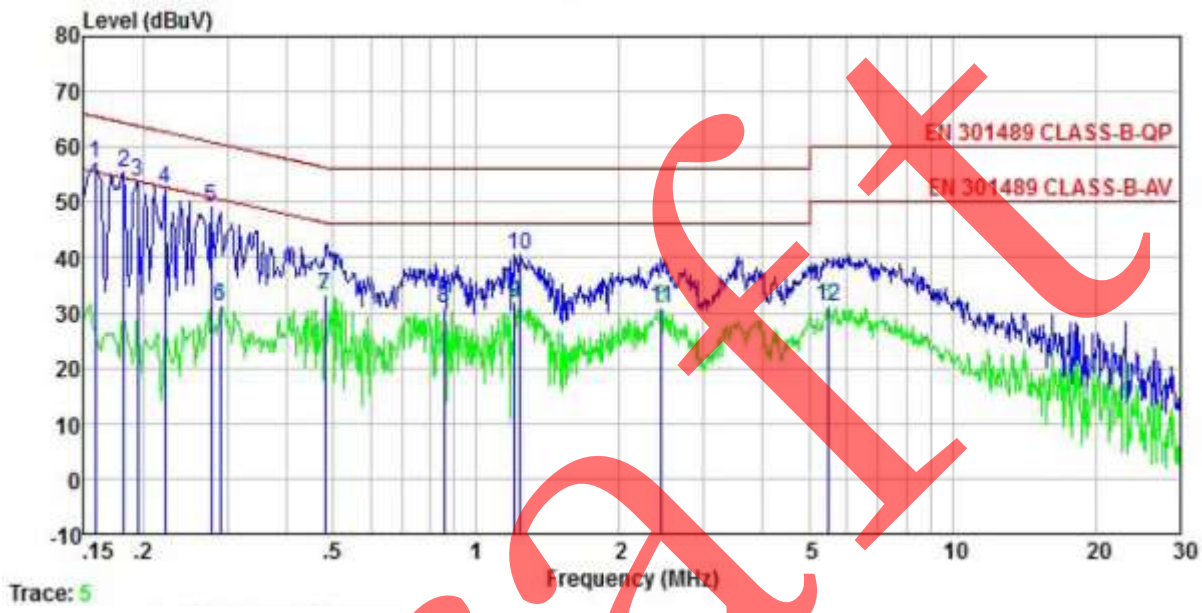
2. *Final Level =Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.*
3. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

6.1.2 Conducted Emissions

Test Requirement:	ETSI EN301 489-1		
Test Method:	EN 55032		
TestFrequencyRange:	150kHz to 30MHz		
Class / Severity:	Class B		
Receiver setup:	RBW=9kHz, VBW=30kHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
	* Decreases with the logarithm of the frequency.		
Test setup:	 Remark: E.U.T: Equipment Under Test LISN: Line Impedence Stabilization Network Test table height=0.8m		
Test procedure	The E.U.T and simulators are connected to the main power through a line impedance stabilization network(L.I.S.N.). Which provide a 50ohm/50uH coupling impedance for the measuring equipment. 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). 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 EN55032 Class B on conducted measurement.		
Test Instruments:	Refer to section 5.10 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Passed		

Measurement Data:

Product name:	Nebra Smart Indoor LoRa Gateway / Nebra HNT Indoor Hotspot Miner	Product model:	HNTIN-868-G
Test by:	Yaro	Test mode:	TM 1
Test frequency:	150 kHz ~ 30 MHz	Phase:	Line
Test voltage:	AC 230 V/50 Hz	Environment:	Temp: 22.5℃ Huni: 55%

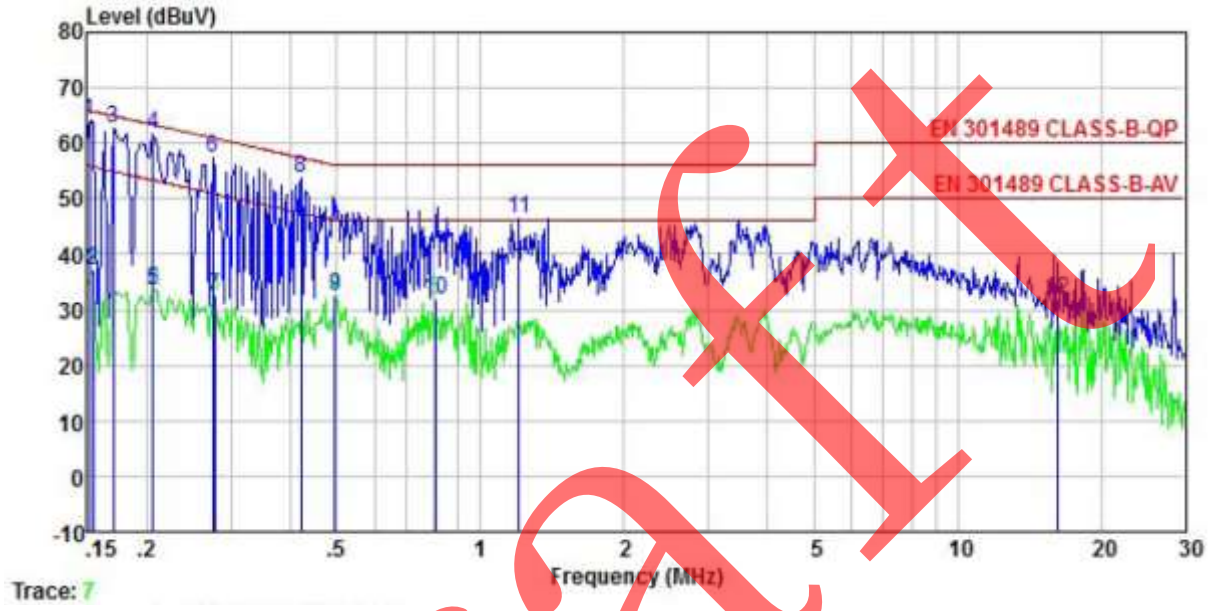


	Freq	Read Level	LISN Factor	Aux Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.158	46.80	10.20	0.01	0.01	57.02	65.56	-8.54	QP
2	0.182	45.14	10.20	0.00	0.01	55.35	64.42	-9.07	QP
3	0.194	43.44	10.20	0.00	0.03	53.67	63.84	-10.17	QP
4	0.222	42.35	10.20	0.00	0.03	52.58	62.74	-10.16	QP
5	0.277	38.74	10.20	0.01	0.02	48.97	60.90	-11.93	QP
6	0.289	21.00	10.20	0.01	0.03	31.24	50.54	-19.30	Average
7	0.481	22.89	10.20	0.02	0.03	33.14	46.32	-13.18	Average
8	0.857	20.63	10.20	0.06	0.04	30.93	46.00	-15.07	Average
9	1.203	21.38	10.20	0.10	0.09	31.77	46.00	-14.23	Average
10	1.229	30.03	10.21	0.11	0.10	40.45	56.00	-15.55	QP
11	2.448	20.08	10.29	0.24	0.14	30.75	46.00	-15.25	Average
12	5.476	20.15	10.30	0.71	0.09	31.25	50.00	-18.75	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 + Aux Factor.*

Product name:	Nebra Smart Indoor LoRa Gateway / Nebra HNT Indoor Hotspot Miner	Product model:	HNTIN-868-G
Test by:	Yaro	Test mode:	TM 1
Test frequency:	150 kHz ~ 30 MHz	Phase:	Neutral
Test voltage:	AC 230 V/50 Hz	Environment:	Temp: 22.5℃ Huni: 55%

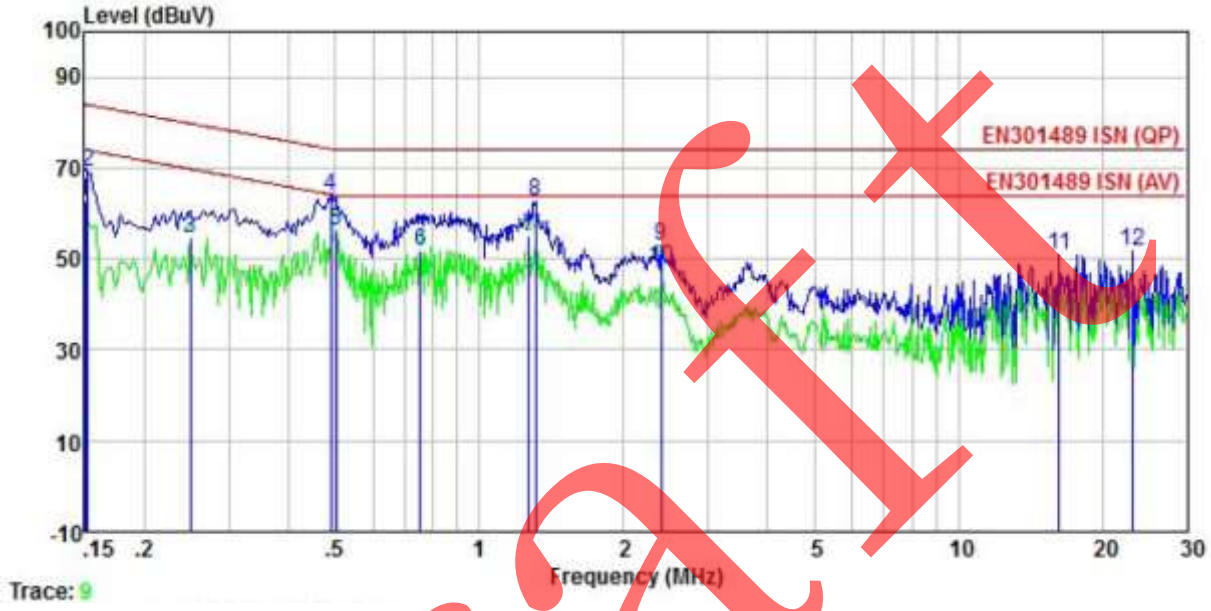


	Freq	Read Level	LISN Factor	Aux Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.152	53.79	10.20	0.01	0.01	64.01	65.91	-1.90	QP
2	0.154	26.80	10.20	0.01	0.01	37.02	55.78	-18.76	Average
3	0.170	52.64	10.20	0.01	0.01	62.86	64.94	-2.08	QP
4	0.206	51.59	10.20	0.00	0.04	61.83	63.36	-1.53	QP
5	0.206	23.39	10.20	0.00	0.04	33.63	53.36	-19.73	Average
6	0.274	47.11	10.20	0.01	0.02	57.34	60.98	-3.64	QP
7	0.277	22.17	10.20	0.01	0.02	32.40	50.90	-18.50	Average
8	0.421	43.63	10.20	-0.04	0.04	53.83	57.42	-3.59	QP
9	0.497	22.38	10.20	0.03	0.03	32.64	46.05	-13.41	Average
10	0.804	21.51	10.20	0.06	0.03	31.80	46.00	-14.20	Average
11	1.203	36.23	10.20	0.10	0.09	46.62	56.00	-9.38	QP
12	16.226	18.49	10.68	2.38	0.16	31.71	50.00	-18.29	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 + Aux Factor.*

Product name:	Nebra Smart Indoor LoRa Gateway / Nebra HNT Indoor Hotspot Miner	Product model:	HNTIN-868-G
Test by:	Yaro	Test mode:	Working mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Line
Test voltage:	AC 230 V/50 Hz	Environment:	Temp: 22.5℃ Huni: 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	52.58	9.95	0.00	0.01	62.54	74.00	-11.46	Average
2	0.152	59.17	9.95	0.00	0.01	69.13	83.87	-14.74	QP
3	0.249	44.61	9.83	0.00	0.01	54.45	69.78	-15.33	Average
4	0.489	54.04	9.69	0.00	0.03	63.76	74.19	-10.43	QP
5	0.502	46.46	9.69	0.00	0.03	56.18	64.00	-7.82	Average
6	0.751	42.24	9.53	0.00	0.03	51.80	64.00	-12.20	Average
7	1.269	45.19	9.58	0.00	0.10	54.87	64.00	-9.13	Average
8	1.310	52.83	9.59	0.00	0.11	62.53	74.00	-11.47	QP
9	2.396	43.25	9.65	0.00	0.15	53.05	74.00	-20.95	QP
10	2.396	38.07	9.65	0.00	0.15	47.87	64.00	-16.13	Average
11	16.226	40.90	9.81	0.00	0.16	50.87	74.00	-23.13	QP
12	23.140	41.60	9.76	0.00	0.17	51.53	74.00	-22.47	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 + Aux Factor.*

6.1.3 Harmonics Test Results

Test Requirement:	ETSI EN 301 489-1/3/17/19: EN61000-3-2
Test Method:	N/A: See Remark Below
Remark:	There is no need for Harmonics test to be performed on this product (rated power is less than 75W) in accordance with EN 61000-3-2. For further details, please refer to Clause 7, Note 1 of EN 61000-3-2 which states: "For the following categories of equipment limits are not specified in this edition of the standard. Note 1: Equipment with a rated power of 75W or less, other than lighting equipment."

6.1.4 Flicker Test Results

Test Requirement:	ETSI EN 301 489-1/3/17/19: EN61000-3-3
Test Method:	N/A: See Remark Below
Remark:	1. The appropriate requirements of EN 61000-3-3 [9] for voltage fluctuations and flicker apply for equipment covered bythe scope of the present document with an input current up to and including 16A per phase. For equipment with an inputcurrent of greater than 16A per phase EN 61000-3-11 [12] applies. 2. As the section 6.1 of EN 61000-3-3, "Devices and Equipment that do(with the utmost probability) not generate relevant voltage fluctuations or flicker need not to be tested".

6.2 EMS (Immunity)

Performance Criteria of ETSI EN 301 489-1/3/17/19, sub clause 6

Criteria	Performance Criteria of EN 301 489-1 clause 6
CT/CR	During the test, the equipment shall: • continue to operate as intended; • not unintentionally transmit; • not unintentionally change its operating state; • not unintentionally change critical stored data.
TT/TR	For all ports and transient phenomena with the exception described below, the following applies: • The application of the transient phenomena shall not result in a change of the mode of operation (e.g. unintended transmission) or the loss of critical stored data. • After application of the transient phenomena, the equipment shall operate as intended. For surges applied to symmetrically operated wired network ports intended to be connected directly to outdoor lines the following criteria applies: • For products with only one symmetrical port intended for connection to outdoor lines, loss of function is allowed, provided the function is self-recoverable, or can be otherwise restored. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost. • For products with more than one symmetrical port intended for connection to outdoor lines, loss of function on the port under test is allowed, provided the function is self-recoverable. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

Performance Criteria of EN 301 489-3 clause 6

In the table below:
• performance criterion A applies for immunity tests with phenomena of a continuous nature;
• performance criterion B applies for immunity tests with phenomena of a transient nature.
NOTE: Whether a phenomenon is considered transient, continuous or otherwise is indicated in the test proceduresfor the phenomenon in ETSI EN 301 489-1 [1], clause 9.

Table 2: Performance Requirements

Criterion	During test	After test
A	Operate as intended No loss of function No unintentional responses	Operate as intended No loss of function No degradation of performance No loss of stored data or user programmable functions
B	May show loss of function No unintentional responses	Operate as intended Lost function(s) shall be self-recoverable No degradation of performance No loss of stored data or user programmable functions

Criteria	Performance Criteria of EN 301 489-17 clause 6
CT	The performance criteria A shall apply. Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an ACKnowledgement (ACK) or Not ACKnowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.
TT	The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 msduration, for which performance criteria C shall apply. Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does notoccur. In systems using acknowledgement signals, it is recognized that an acknowledgement (ACK) ornot-acknowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmissionresulting from the application of the test is correctly interpreted.
CR	The performance criteria A shall apply. Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. Insystems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and stepsshould be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.
TR	The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 ms durationfor which performance criteria C shall apply. Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. Insystems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and stepsshould be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

Table 1: Performance criteria

Criteria	During test	After test (i.e. as a result of the application of the test)
A	Shall operate as intended. (see note). Shall be no loss of function. Shall be no unintentional transmissions.	Shall operate as intended. Shall be no degradation of performance. Shall be no loss of function. Shall be no loss of critical stored data.
B	May be loss of function.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no loss of critical stored data.
C	May be loss of function.	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no loss of critical stored data.
NOTE: Operate as intended during the test allows a level of degradation in accordance with clause 6.2.2.		

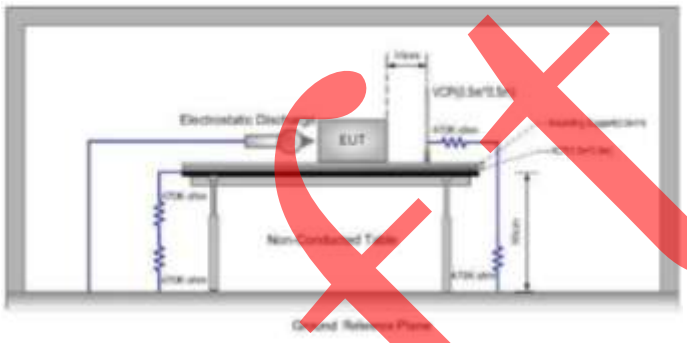
6.2.2 Minimum performance level

For equipment that supports a PER or FER, the minimum performance level shall be a PER or FER less than or equal to 10 %.

For equipment that does not support a PER or a FER, the minimum performance level shall be no loss of the wireless transmission function needed for the intended use of the equipment.

Criteria	Performance Criteria of EN 301 489-19 clause 6
CR	For the EUT, excluding spot frequency tests as part of the immunity test with radiated RF electromagnetic fields (seeETSI EN 301 489-1 [1], clause 9.2): • the general performance criteria set out in clause 6.1; • during the test no false calls shall occur; • at the conclusion of the test comprising the series of individual exposures the EUT shall operate as intendedwith no loss of functions or stored data (messages), as declared by the manufacturer. For the spot frequency test as part of the immunity test with radiated RF electromagnetic fields (see ETSIEN 301 489-1 [1], clause 9.2) the EUT shall be assessed by monitoring the accuracy of the call received alert signal.
TR	For the EUT: • the general performance criteria set out in clause 6.1; • during the test no false calls shall occur; • at the conclusion of the test comprising the series of individual exposures, the EUT shall operate as intendedwith no loss of function and/or stored data (messages), as declared by the manufacturer.

6.2.1 Electrostatic Discharge

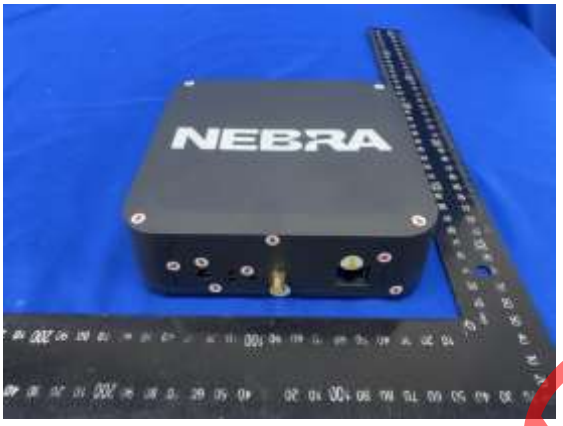
Test Requirement:	ETSI EN301489-1
Test Method:	EN61000-4-2
Discharge Voltage:	Contact Discharge, HCP and VCP: ±2kV, ±4kV, Air Discharge: ±2kV, ±4kV, ±8kV
Polarity:	Positive & Negative
Number of Discharge:	Contact Discharge: Minimum 25 times at each test point, Air Discharge: Minimum 10 times at each test point.
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum
Testsetup:	
Test Procedure:	**1) Air discharge:** The test was applied on non-conductive surfaces of EUT. The round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT. After each discharge, the discharge electrode was removed from the EUT. The generator was re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure was repeated until all the air discharge completed **2) Contact discharge:** The test was applied on conductive surfaces of EUT. the generator was re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. the tip of the discharge electrode was touch the EUT before the discharge switch was operated. **3) Indirect discharge for horizontal coupling plane** At least 10 single discharges shall be applied at the front edge of each HCP opposite the centre point of each unit of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.Consideration should be given to exposing all sides of the EUT. **4) Indirect discharge for vertical coupling plane** At least 10 single discharges were applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, was placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges were applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

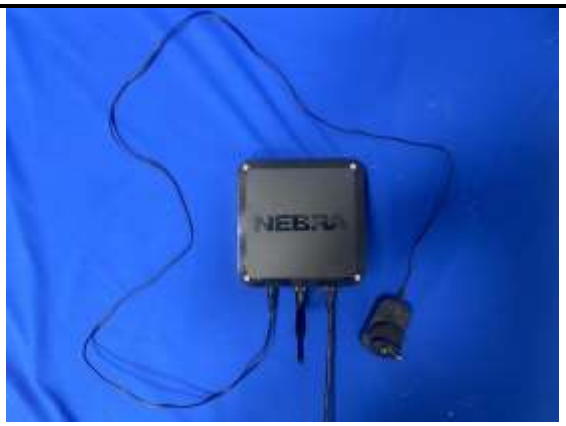
Testenvironment:	Temp.:	26°C	Humid.:	54%	Press.:	101kPa
Test Instruments:	Refer to section 5.10 for details					
Test mode:	Refer to section 5.3 for details					
Test results:	Passed					

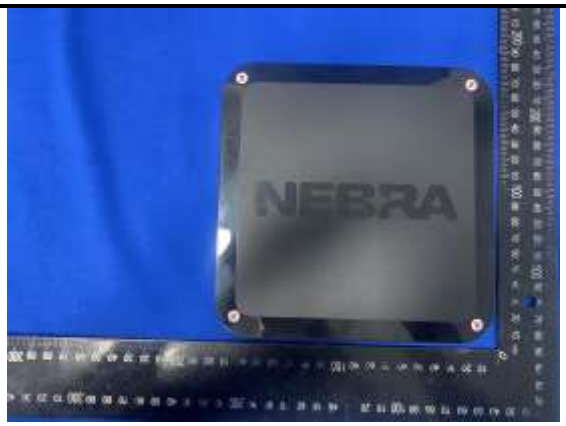
Measurement Record:

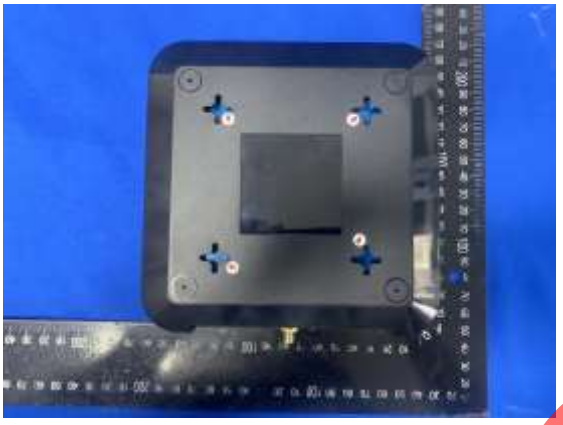
Test mode:	TM 1			
Test points:	I: Please refer to red arrows as below plots			
	II: Please refer to yellow arrows as below plots			
Direct discharge				
Discharge Voltage (KV)	**Type of discharge**	**Test points**	**Observations (Performance Criterion)**	**Result**
± 2,± 4	Contact	II	TT/TR	Pass
± 2,± 4,± 8	Air	I	TT/TR	Pass
Indirect discharge				
Discharge Voltage (KV)	**Type of discharge**	**Test points**	**Observation Performance**	**Result**
± 2,± 4	HCP-Bottom/Top/ Front/Back/Left/Right	Edge of the HCP	TT/TR	Pass
± 2,± 4	VCP-Front/Back /Left/Right	Center of the VCP	TT/TR	Pass
Remark: *Red arrow: air discharge test points.* *Yellow arrow: contact discharge test points.*				

ESD Test points as below:

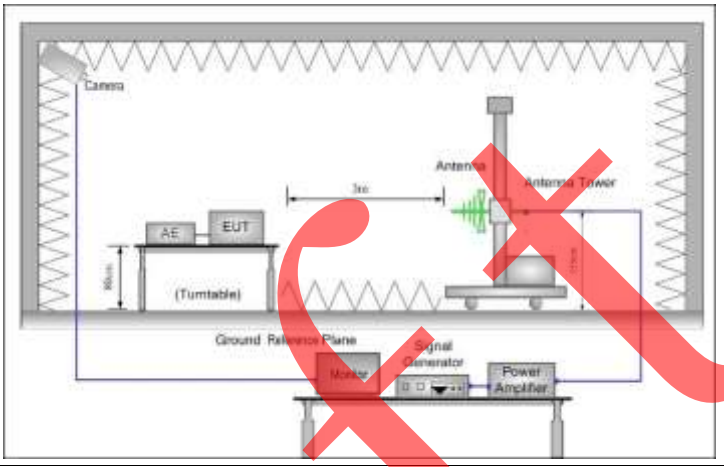








6.2.2 RadiatedImmunity

Test Requirement:	ETSI EN 301 489-1					
Test Method:	EN61000-4-3					
Frequency range:	80MHz to 6GHz					
Test Level:	3V/m					
Modulation:	80%, 1kHz Amplitude Modulation					
Testsetup:						
Test Procedure:	1. For table-top equipment, the EUT was placed in the chamber on a non-conductive table 0.8m high. For arrangement of floor-standing equipment, the EUT was mounted on a non-conductive support 0.1m above the supporting plane. For human body-mounted equipment, the EUT may be tested in the same manner astable top items. 2. If possible, a minimum of 1 m of cable is exposed to the electromagnetic field.Excess length of cables interconnecting units of the EUT shall be bundled low-inductively inthe approximate center of the cable to form a bundle 30 cm to 40 cm in length. 3. The EUT was initially placed with one face coincident with the calibration plane. The EUT facebeing illuminated was contained within the UFA (Uniform Field Area). 4. The frequency ranges to be considered were swept with the signal modulated and pausing to adjust the RF signal level or to switch oscillators and antennas as necessary.Where the frequency range was swept incrementally, the step size was not exceed 1 % of thepreceding frequency value. 5. The dwell time of the amplitude modulated carrier at each frequency was not be less than thetime necessary for the EUT to be exercised and to respond, and was not less than0,5 s. 6. The test normally was performed with the generating antenna facing each side of theEUT. 7. The polarizationof the field generated by each antenna necessitates testing each selectedside twice, once with the antenna positioned vertically and again with the antenna positionedhorizontally. 8. The EUT was performed in a configuration to actual installation conditions, a video camera and/ora audio monitor were used to monitor the performance of the EUT.					
Testenvironment:	Temp.:	26°C	Humid.:	54%	Press.:	101kPa
Test Instruments:	Refer to section 5.10 for details					
Test mode:	Refer to section 5.3 for details					
Test results:	Passed					

Measurement Record:

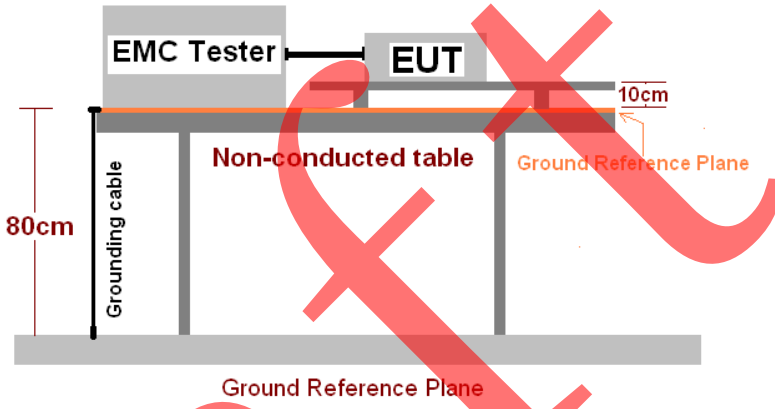
Test mode: TM 1

Frequency	Level	Modulation	Antenna Polarization	EUT Face	Observations (Performance Criterion)	Result
80MHz-6GHz	3V/m	1kHz, 80% Amp. Mod, 1% increment, dwell time=3seconds	V	Front	CT/CR	Pass
			H			
			V	Rear		
			H			
			V	Left		
			H			
			V	Right		
			H			
			V	Top		
			H			
			V	Bottom		
			H			

Special conditions of ETSI EN 301 489-19 V2.1.1 (2019-04)

Frequency	Level	Modulation	Antenna Polarization	EUT Face	Observations (Performance Criterion)	Result
80 MHz; 104 MHz; 136 MHz; 165 MHz; 200 MHz; 260 MHz; 330 MHz; 430 MHz; 560 MHz; 715 MHz ± 1 MHz; 920 MHz ± 1 MHz.	3V/m	(measured unmodulated) 100 % modulated by 200 Hz pulses of equal mark to space ratio	V	Front	CT/CR	Pass
			H			
			V	Rear		
			H			
			V	Left		
			H			
			V	Right		
			H			
			V	Top		
			H			
			V	Bottom		
			H			

6.2.3 Electrical Fast Transients

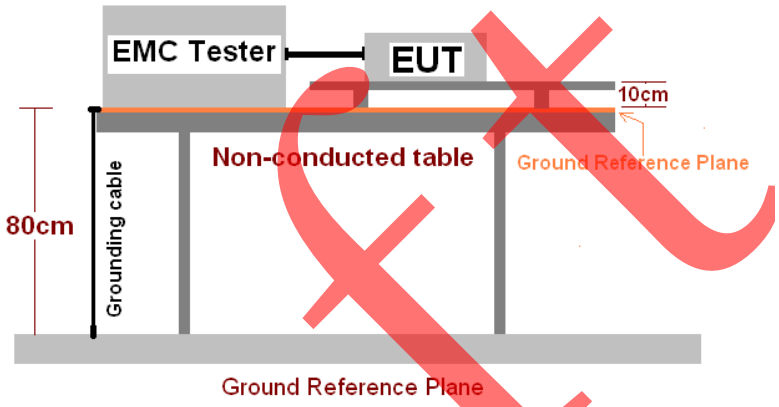
Test Requirement:	ETSI EN 301 489-1					
Test Method:	EN 61000-4-4					
Test Level:	±1.0kV on AC port					
Polarity:	Positive & Negative					
Repetition Frequency:	5kHz					
Burst Duration:	15ms					
Burst Period:	300ms					
Test Duration:	2 minute per level & polarity					
Testsetup:						
Test Procedure:	The EUT and its simulators were placed on the ground reference plane and wereinsulated from it by a wood support 0.1m + 0.01m thick. The ground reference planewas 1m*1m metallic sheet with 0.65mm minimum thickness. This reference groundplane was project beyond the EUT by at least 0.1m on all sides and the minimumdistance between EUT and all other conductive structure, except the ground plane wasmore than 0.5m. All cables to the EUT was placed on the wood support, cables notsubject to EFT/B was routed as far as possible from the cable under test to minimizethe coupling between the cables. Test on SignalPorts, TelecommunicationPorts and ControlPorts: The EFT interference signal is through a coupling clamp device couples to the signal and control lines of the EUT with burst noise for 2 minutes. Test on power supply ports: The EUT is connected to the power mains through a coupling device that directly couples the EFT/B interference signal.Each of the Line and Neutral conductors is impressed with burst noise for 2 minutes.The length of the signal and power lines between the coupling device and the EUT is 0.5m					
Testenvironment:	Temp.:	26°C	Humid.:	54%	Press.:	101kPa
Test Instruments:	Refer to section 5.10 for details					
Test mode:	Refer to section 5.3 for details					
Test results:	Passed					

Measurement Record:

Test mode: TM 1

Lead under Test	Level(kV)	Coupling Direct/Clamp	Observations (Performance Criterion)	Result
L	±1.0	Direct	TT/TR	Pass
N	± 1.0	Direct	TT/TR	Pass
L-N	± 1.0	Direct	TT/TR	Pass
LAN	± 0.5	Direct	A	Pass

6.2.4 Surge

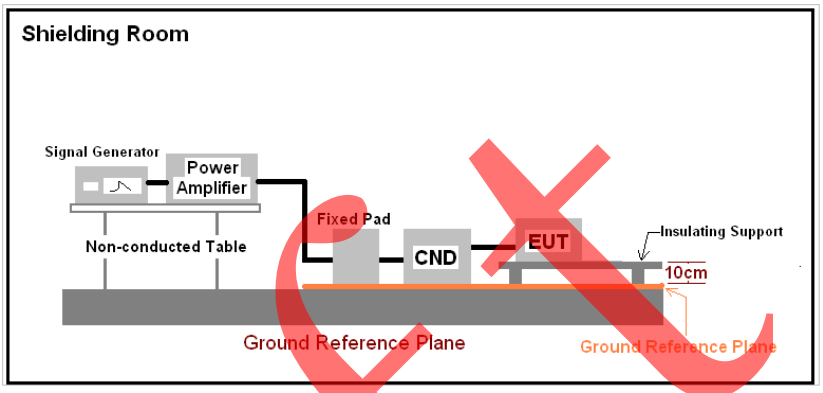
Test Requirement:	ETSI EN 301 489-1
Test Method:	EN61000-4-5
Test Level:	±1kV Live to Neutral: Differential mode ±2kV Live to Earth or Neutral to Earth: Common mode
Polarity:	Positive & Negative
Test Interval:	60s between each surge
No. of surges:	5 positive, 5 negative at 0°, 90°, 180°, 270°.
Performance Criterion:	B
Testsetup:	
Test Procedure:	1. For line-to-line coupling mode, provide a 1kV 1.2/50us voltage surge (atopen-circuit condition) and 8/20us current surge to EUT selected points, and foractive line / neutral lines to ground are same except test level is 2kV. 2. At least 5 positive and 5 negative (polarity) tests with a maximum 1/minrepetition rate are applied during test. 3. Different phase angles are done individually. 4. Record the EUT operating situation during compliance test and decide the EUTimmunity criterion for above each test.
Testenvironment:	Temp.: 26°C Humid.: 53% Press.: 101kPa
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Record:

Test mode: TM 1

Location	Level(kV)	Pulse No	Surge Interval	Phase(deg)	Observations (Performance Criterion)	Result
L-N	± 1	5	60s	0°	TT/TR	Pass
				90°		
				180°		
				270°		
LAN	± 1	5	60s	/	A	Pass

6.2.5 Injected Currents susceptibility Test

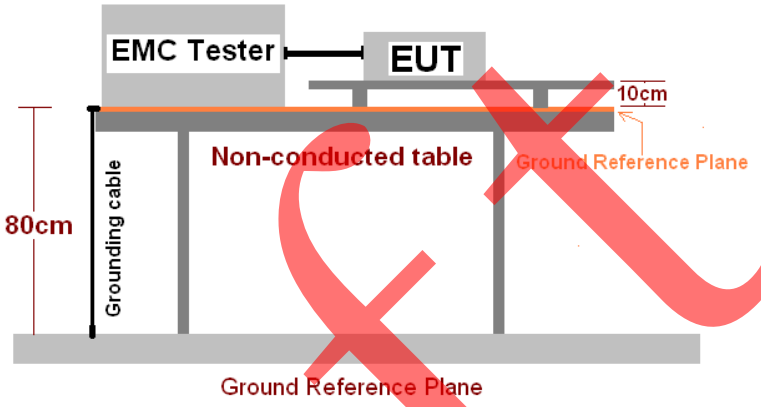
Test Requirement:	ETSI EN301489-1					
Test Method:	EN61000-4-6					
Frequency range:	0.15MHz to 80MHz					
Test Level:	3V rms on AC Ports (unmodulated emf into 150 Ω)					
Modulation:	80%, 1kHz Amplitude Modulation					
Testsetup:						
Test Procedure:	1. Let the EUT work in test mode and test it. 2. The EUT are placed on an insulating support 0.1m high above a groundreference plane. CDN (coupling and decoupling device) is placed on theground plane about 0.3m from EUT. Cables between CDN and EUT are asshort as possible, and their height above the ground reference plane shall bebetween 30 and 50 mm (where possible). 3. The disturbance signal described below is injected to EUT through CDN. 4. The EUT operates within its operational mode(s) under intended climaticconditions after power on. 5. The frequency range is swept from 0.150MHz to 80MHz using 3V signal level,and with the disturbance signal 80% amplitude modulated with a 1kHz sinewave. 6. The rate of sweep shall not exceed 1.5*10-3decades/s. Where the frequency isswept incrementally; the step size shall not exceed 1% of the start andthereafter 1% of the preceding frequency value. 7. Recording the EUT operating situation during compliance testing and decidethe EUT immunity criterion.					
Testenvironment:	Temp.:	26°C	Humid.:	53%	Press.:	101kPa
Test Instruments:	Refer to section 5.10 for details					
Test mode:	Refer to section 5.3 for details					
Test results:	Passed					

Measurement Record:

Test mode: TM 1

Frequency	Injected Position	Test Level	Modulation	Step Size	Dwell Time	Observations (Performance Criterion)	Result
150kHz to 80MHz	AC Mains	3Vrms	80%, 1kHz Amp. Mod.	1%	2s	CT/CR	Pass
150kHz to 80MHz	LAN	3Vrms	80%, 1kHz Amp. Mod.	1%	2s	CT/CR	Pass

6.2.6 Voltage Dip and Voltage Interruptions

Test Requirement:	ETSI EN301489-1
Test Method:	EN61000-4-11
Test Level:	0% of VT(Supply Voltage) for 0.5 period 0% of VT(Supply Voltage) for 1.0 period 70% of VT(Supply Voltage) for 25 period 0% of VT(Supply Voltage) for 250 period
No. of Dips / Interruptions:	3 per Level
Testsetup:	
Test Procedure:	1. The EUT and test generator were setup as shown on above setup photo. 2. The interruptions are introduced at selected phase angles with specified duration. 3. Record any degradation of performance.
Testenvironment:	Temp.: 26°C Humid.: 53% Press.: 101kPa
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Record:

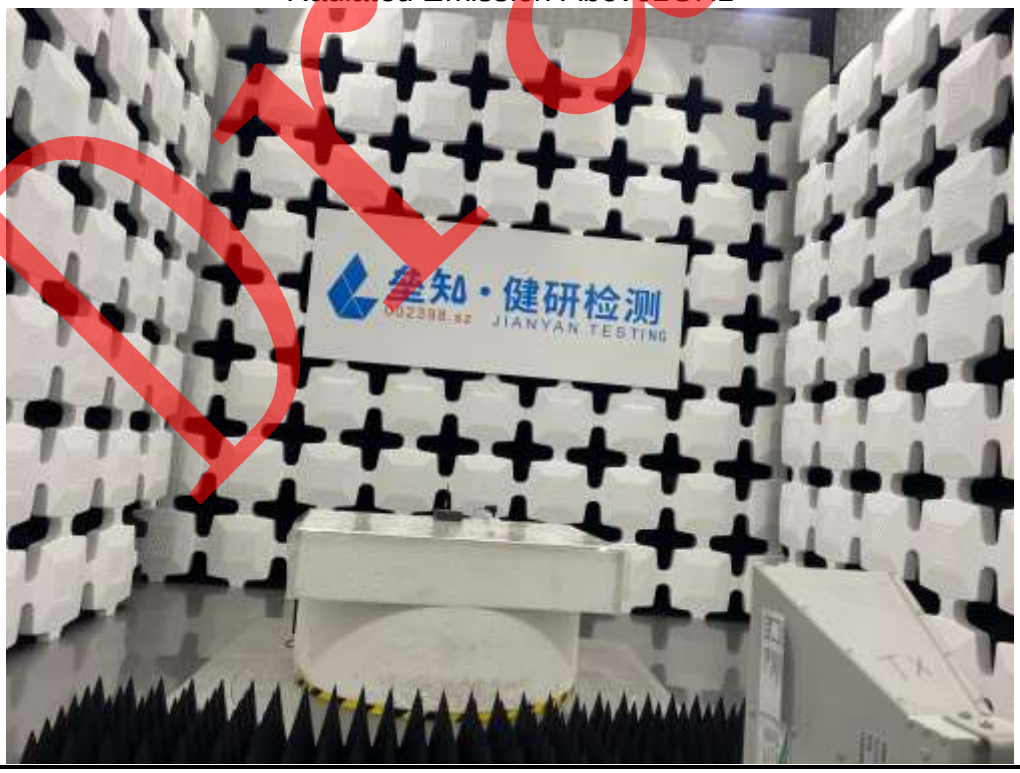
Test mode: TM 1

Test Level % U_T	Duration (Periods)	Phase angle	No of dropout	Time between dropout	Observations (Performance Criterion)	Result
0	0.5	0°, 90°, 180°, 270°	3	10s	TT/TR	Pass
0	1	0°, 90°, 180°, 270°	3	10s		
70	25	0°, 90°, 180°, 270°	3	10s		
0	250	0°, 90°, 180°, 270°	3	10s		

7 Test Setup Photo

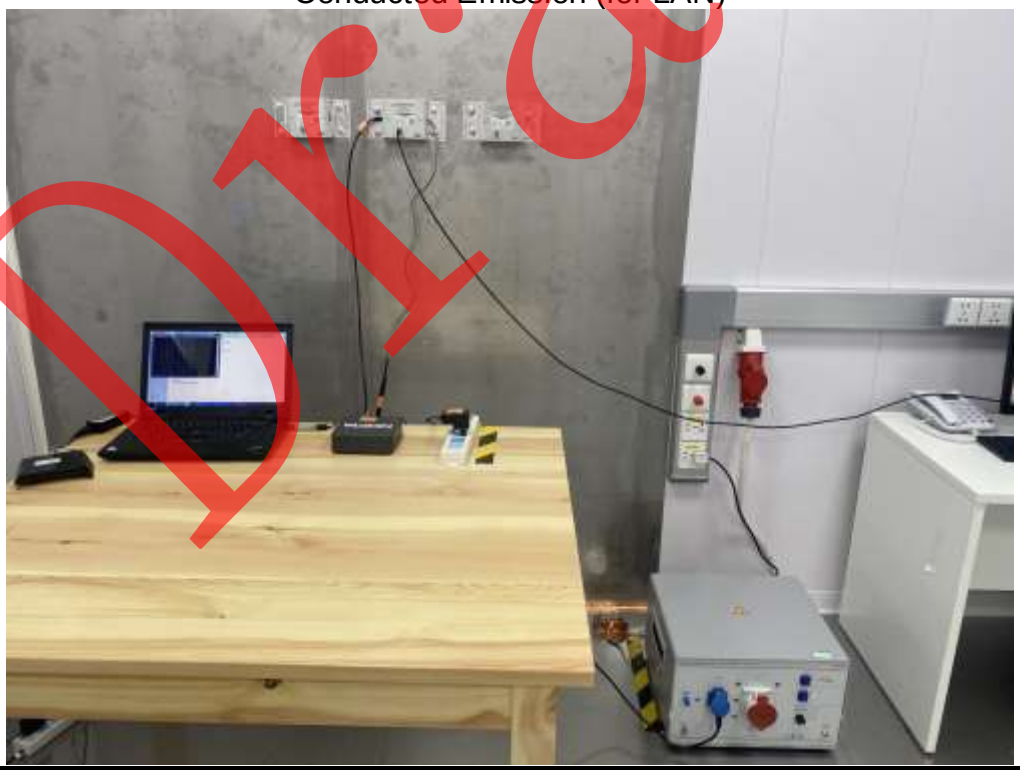
Radiated Emission Below1GHz

Radiated Emission Above1GHz

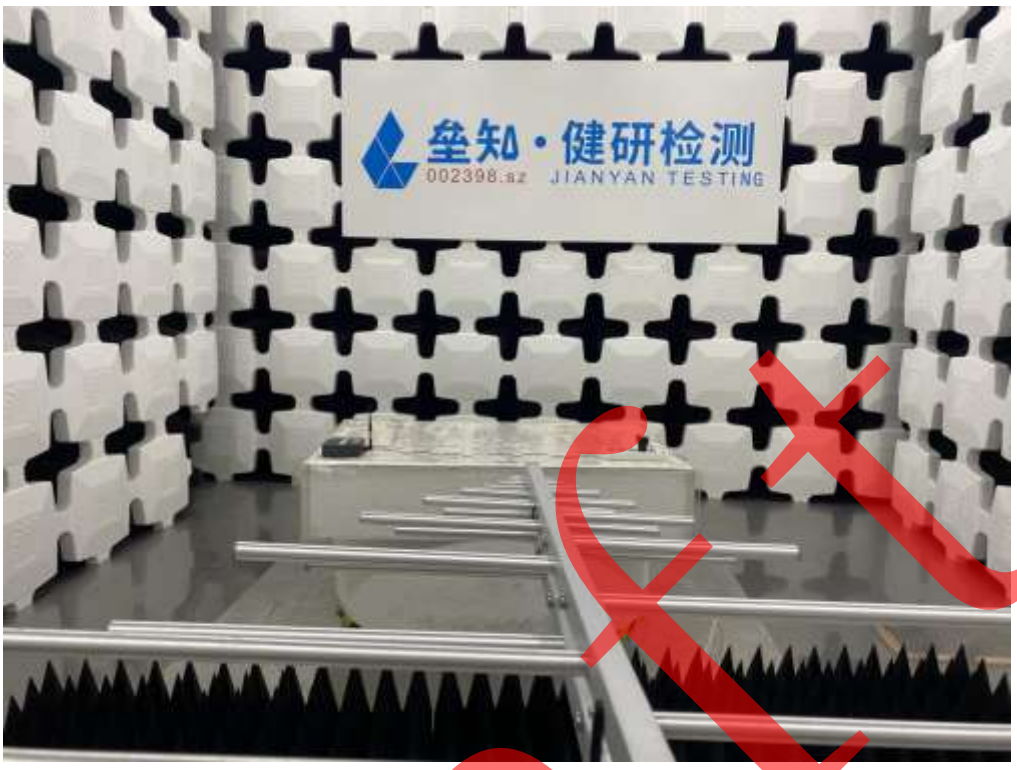


Conducted Emission (for AC)

Conducted Emission (for LAN)



R/S

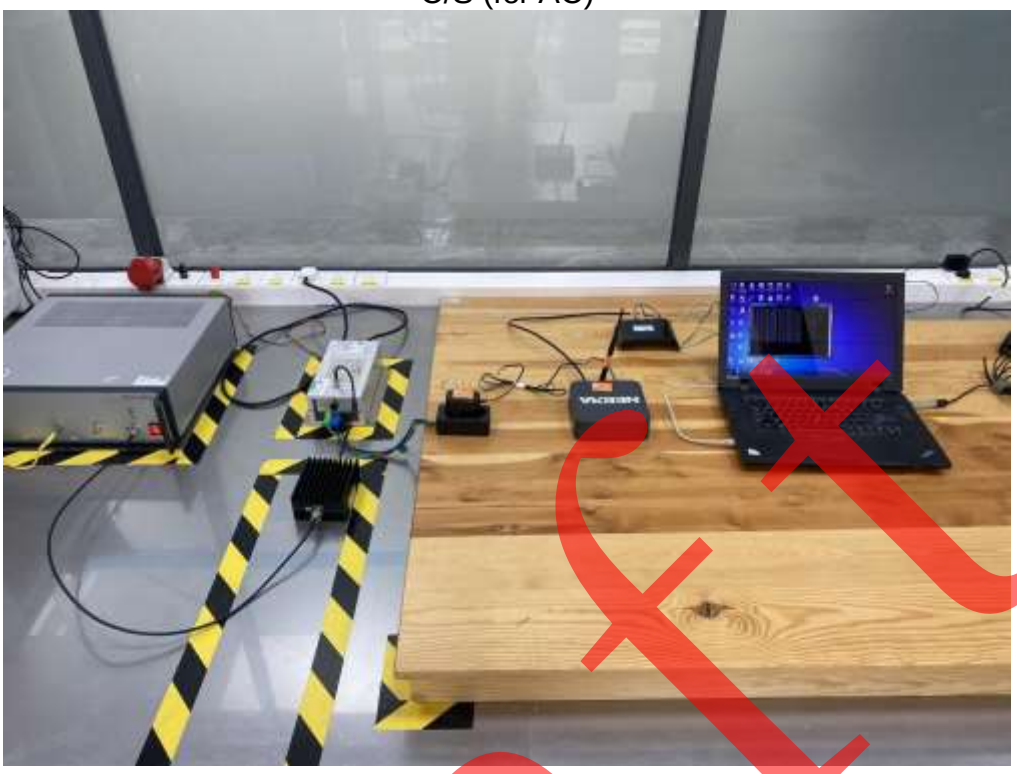


EFT/B / Surge / V-dips (fo AC)

Surge (for LAN)

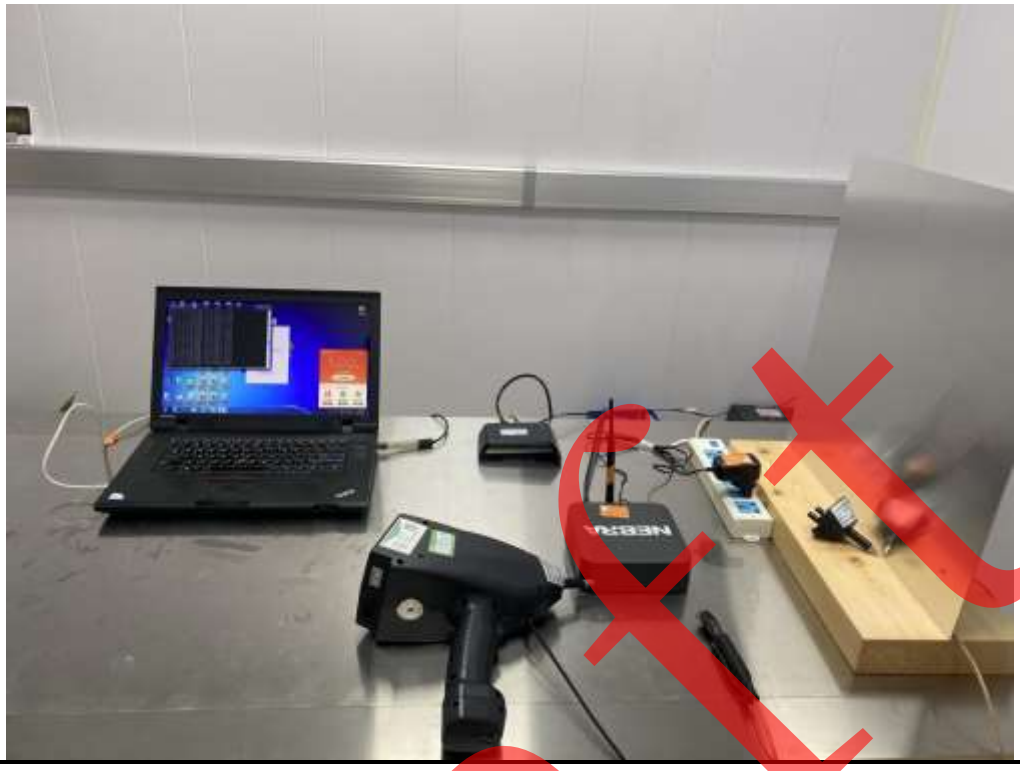
EFT/B (for LAN)

C/S (for AC)

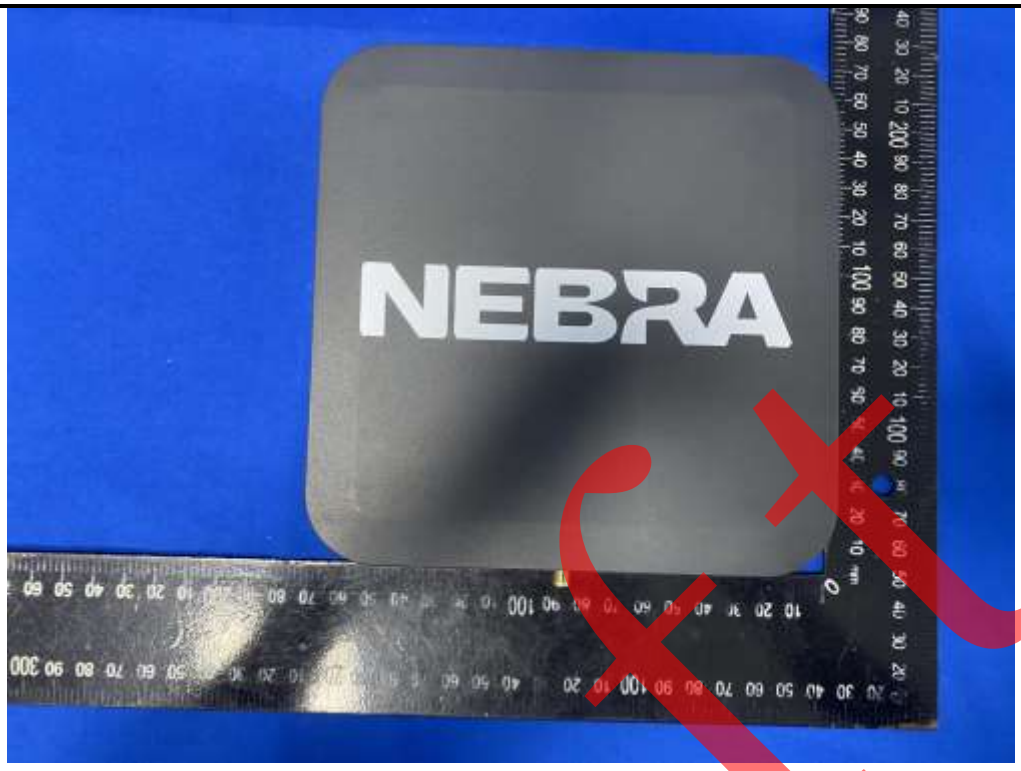


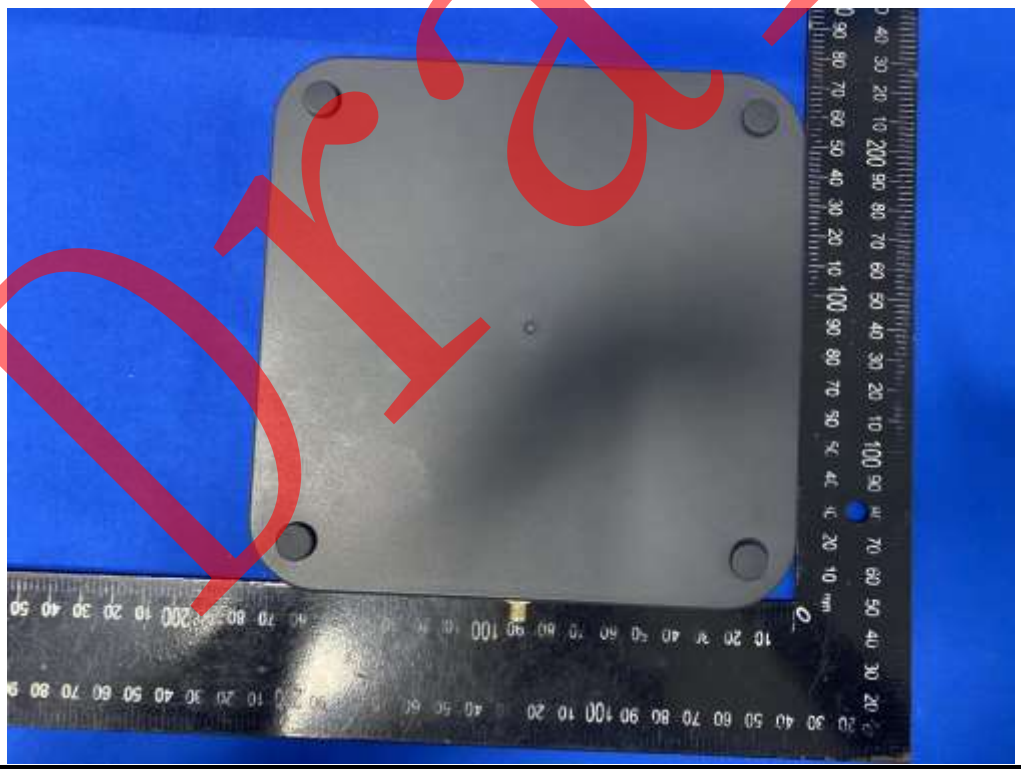
C/S (for LAN)

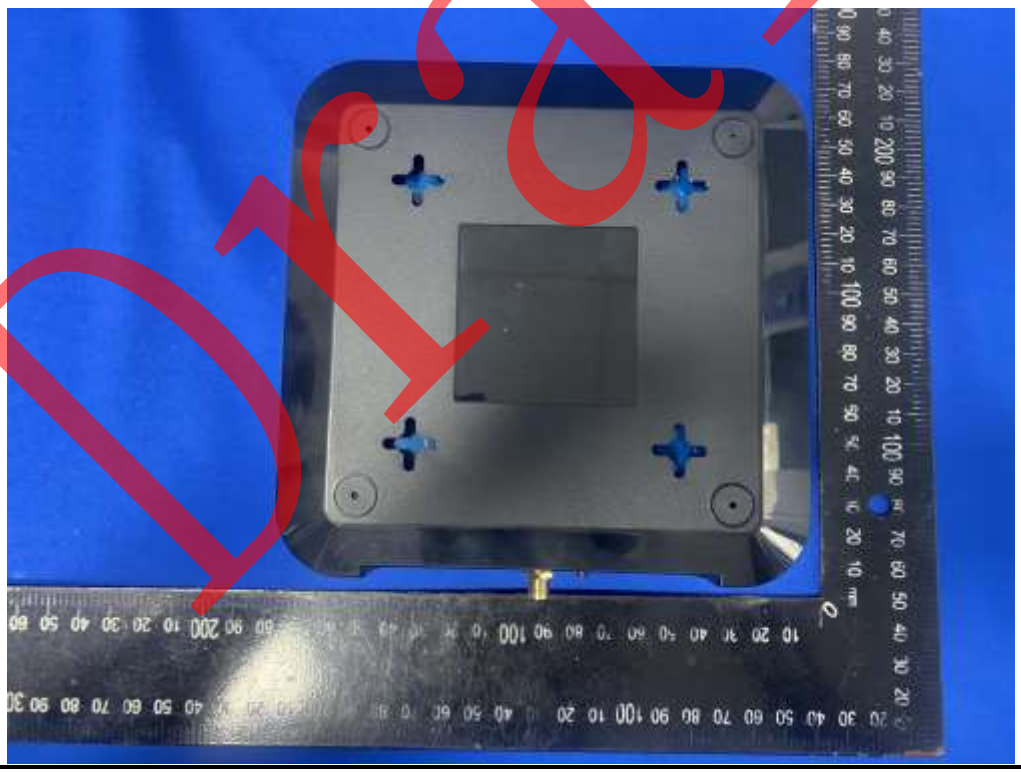
ESD

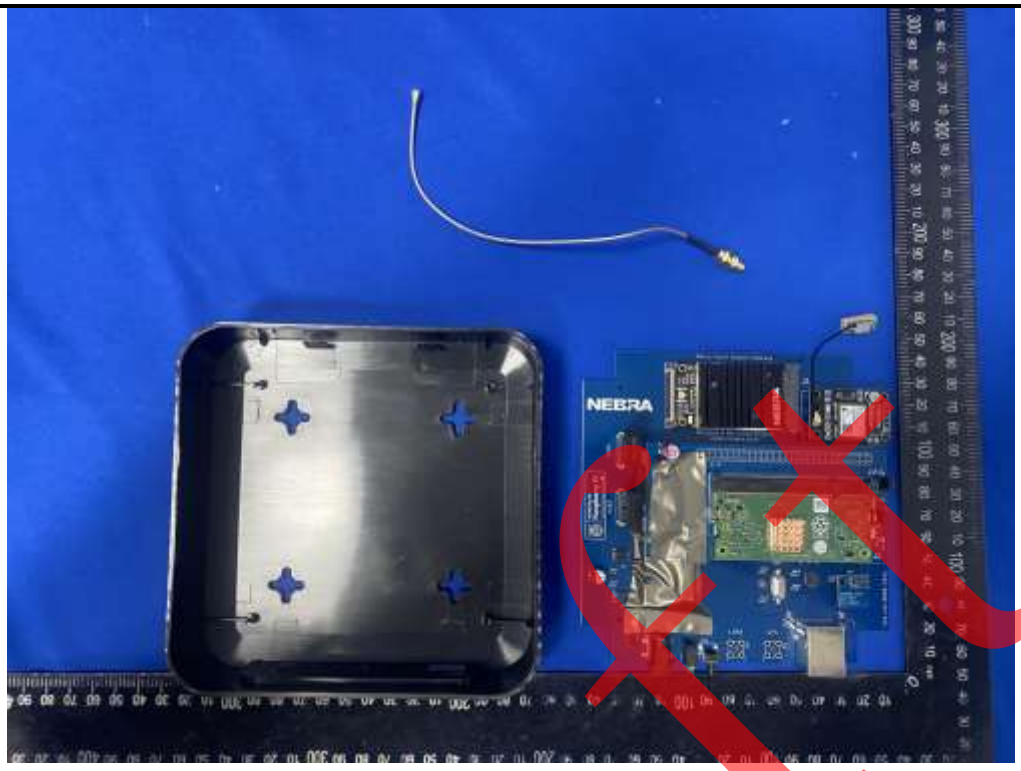


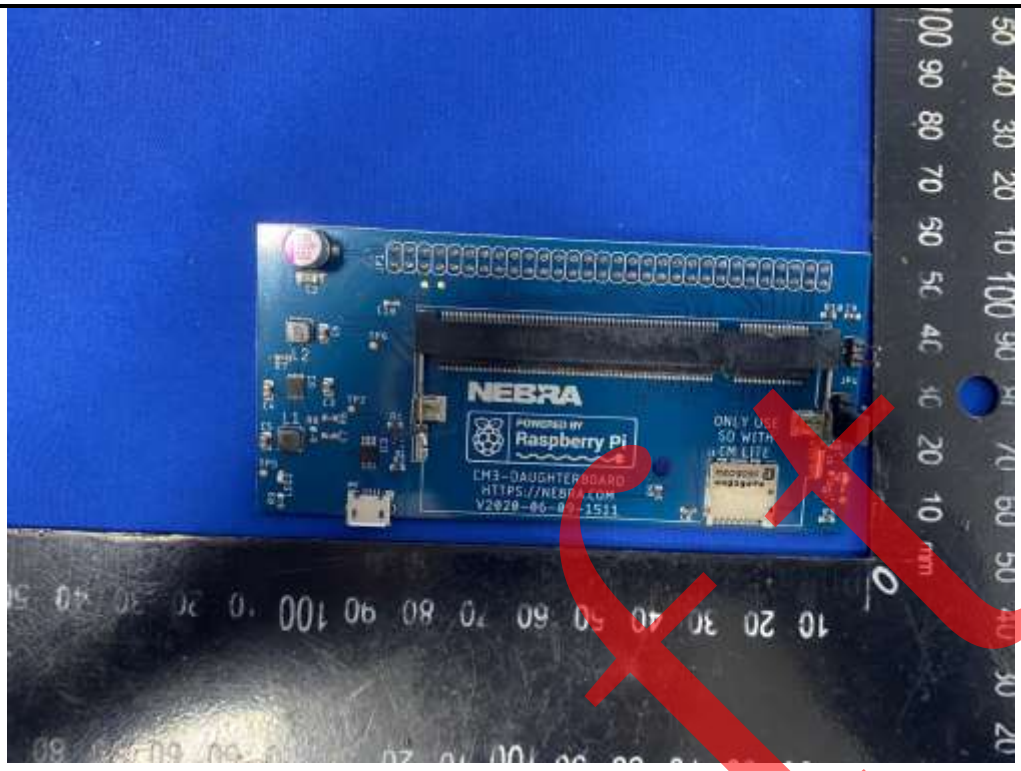
8 EUT Constructional Details







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LM3-DAUGHTERBOARD
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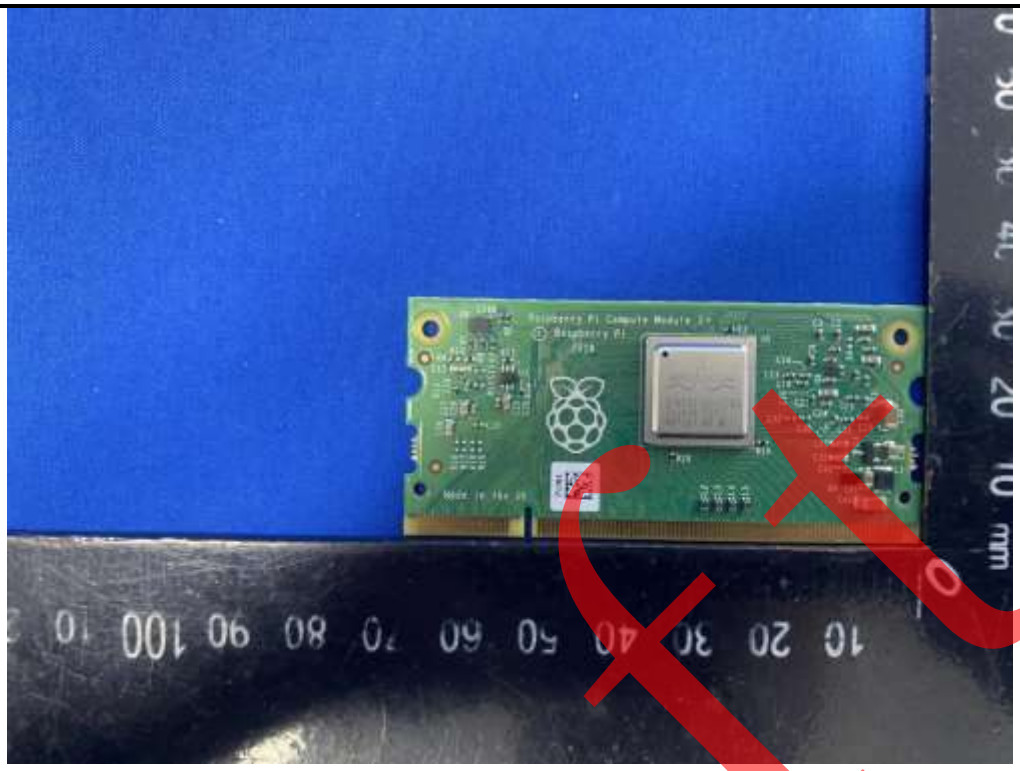

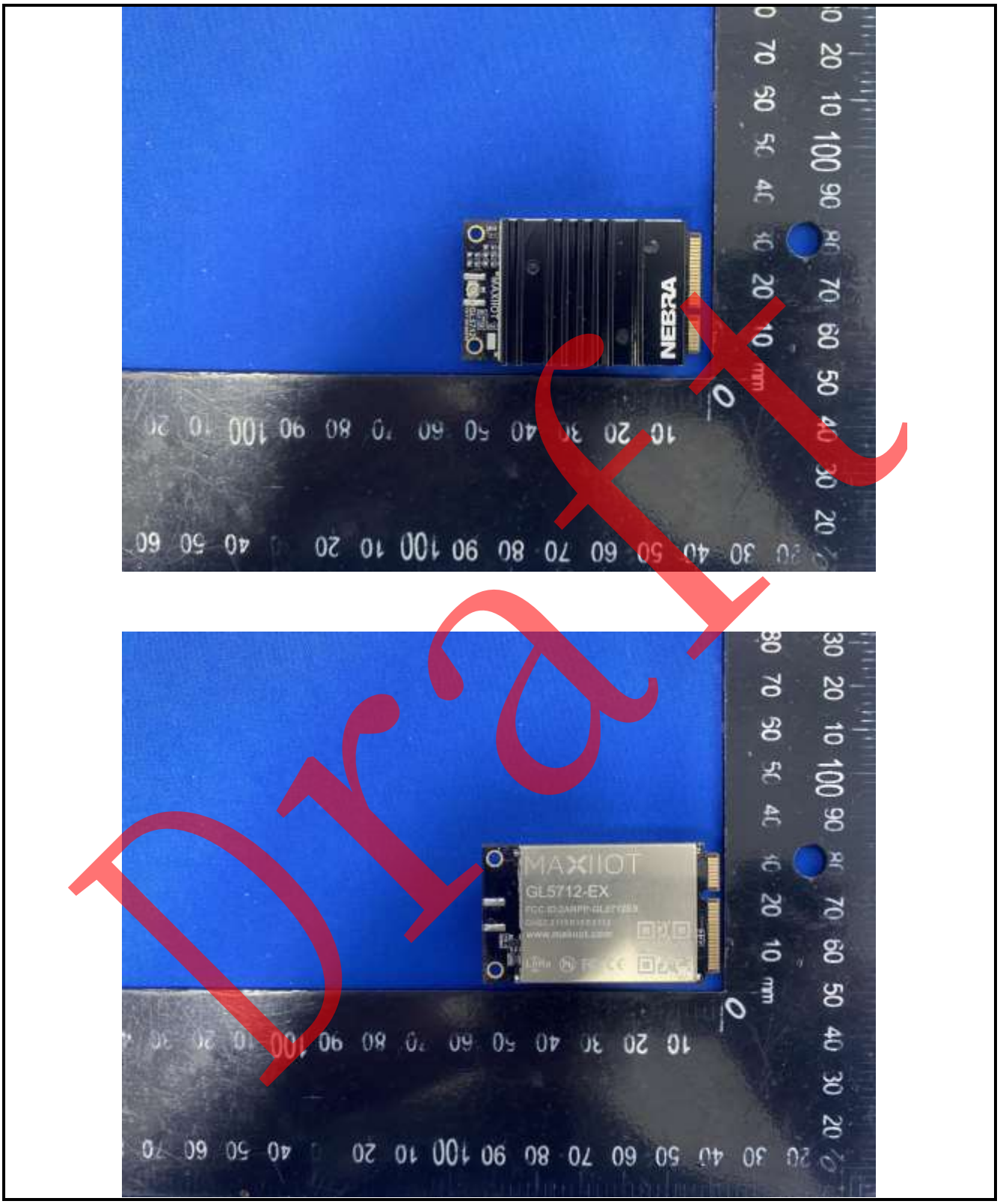

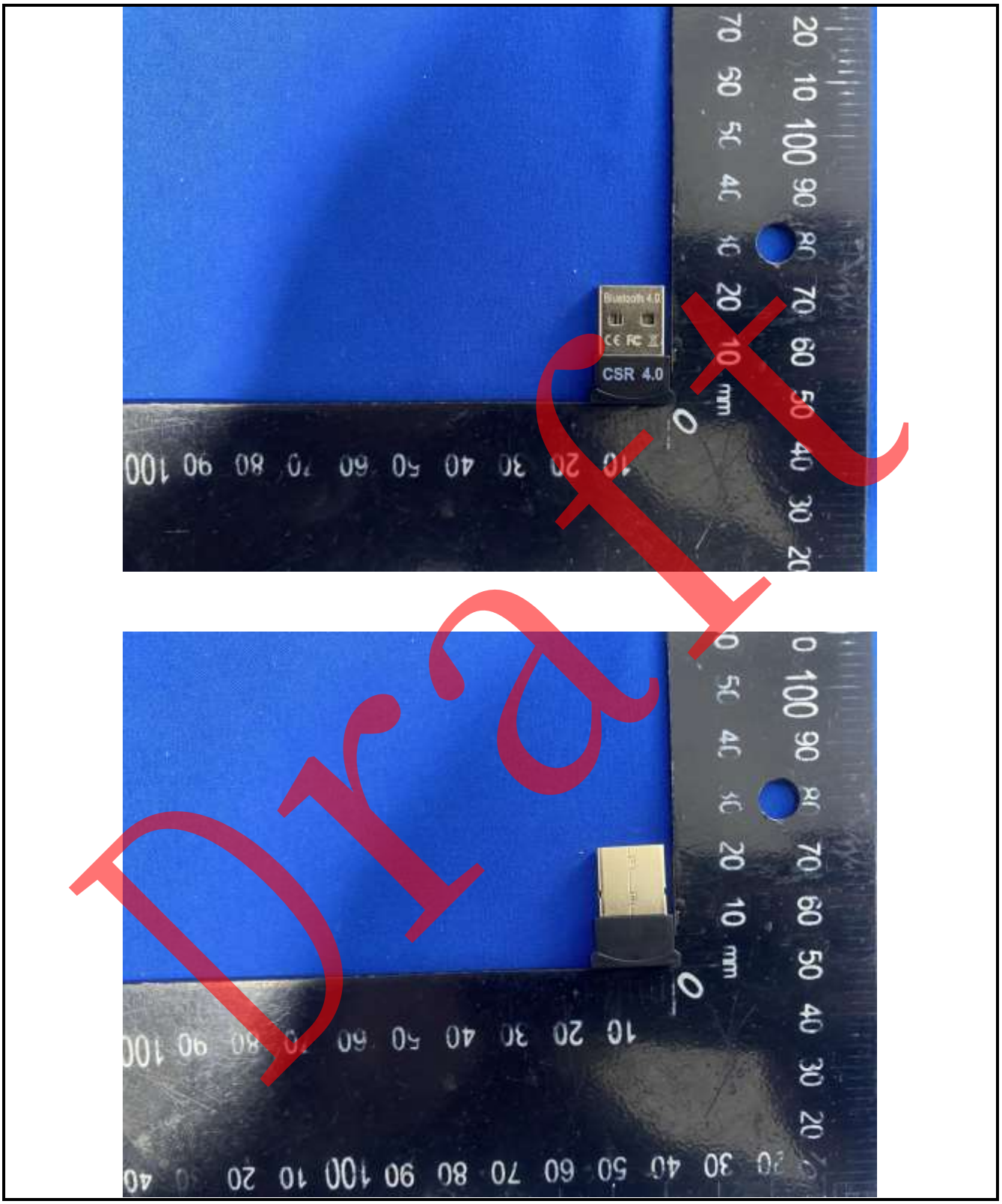

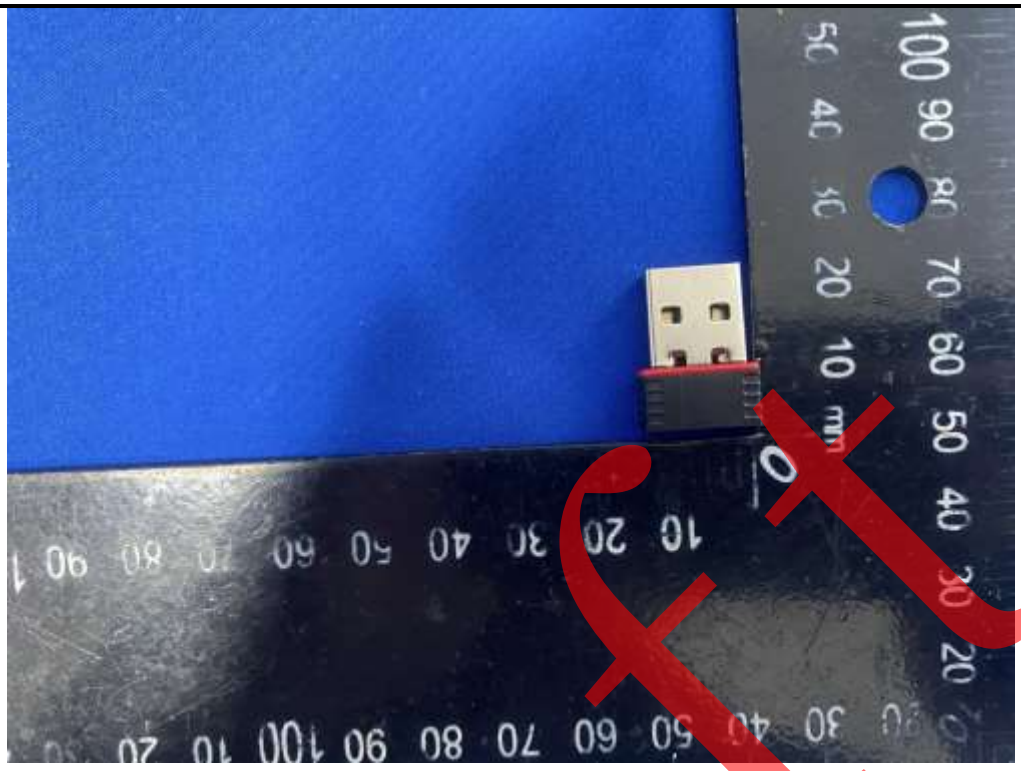

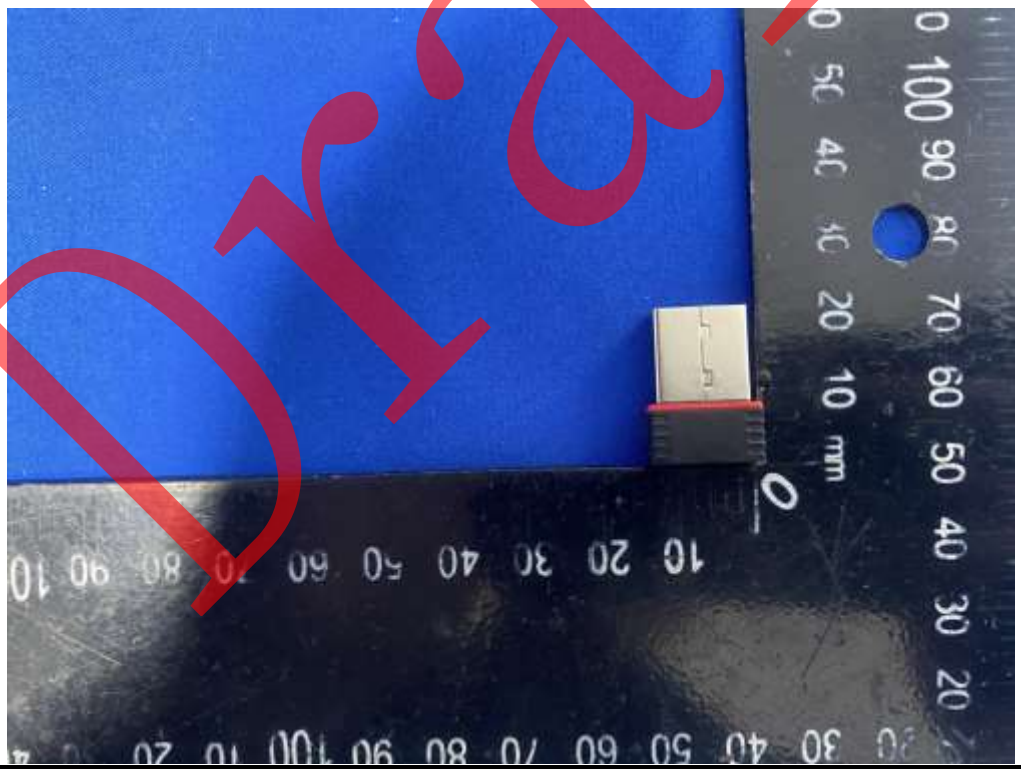

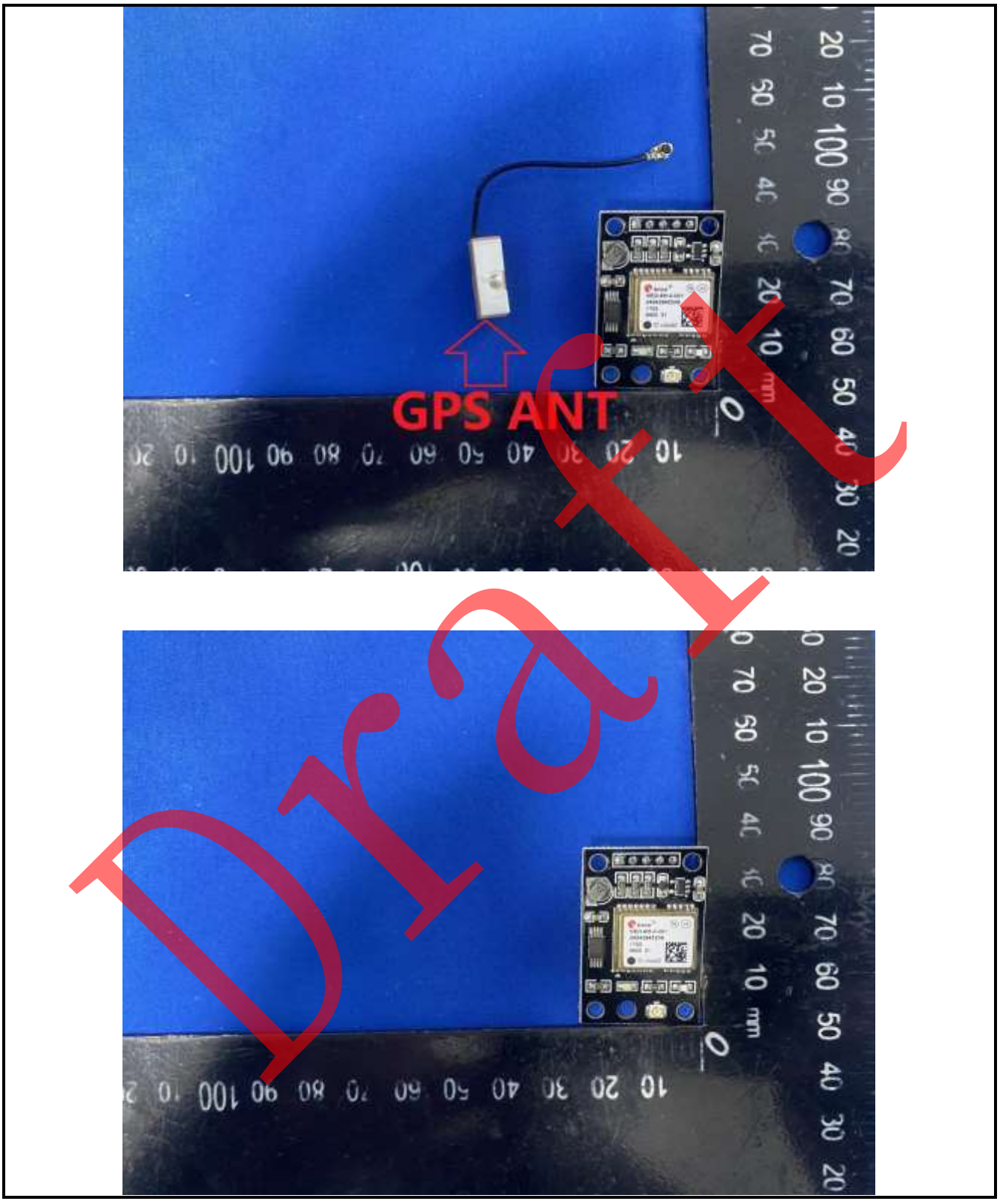

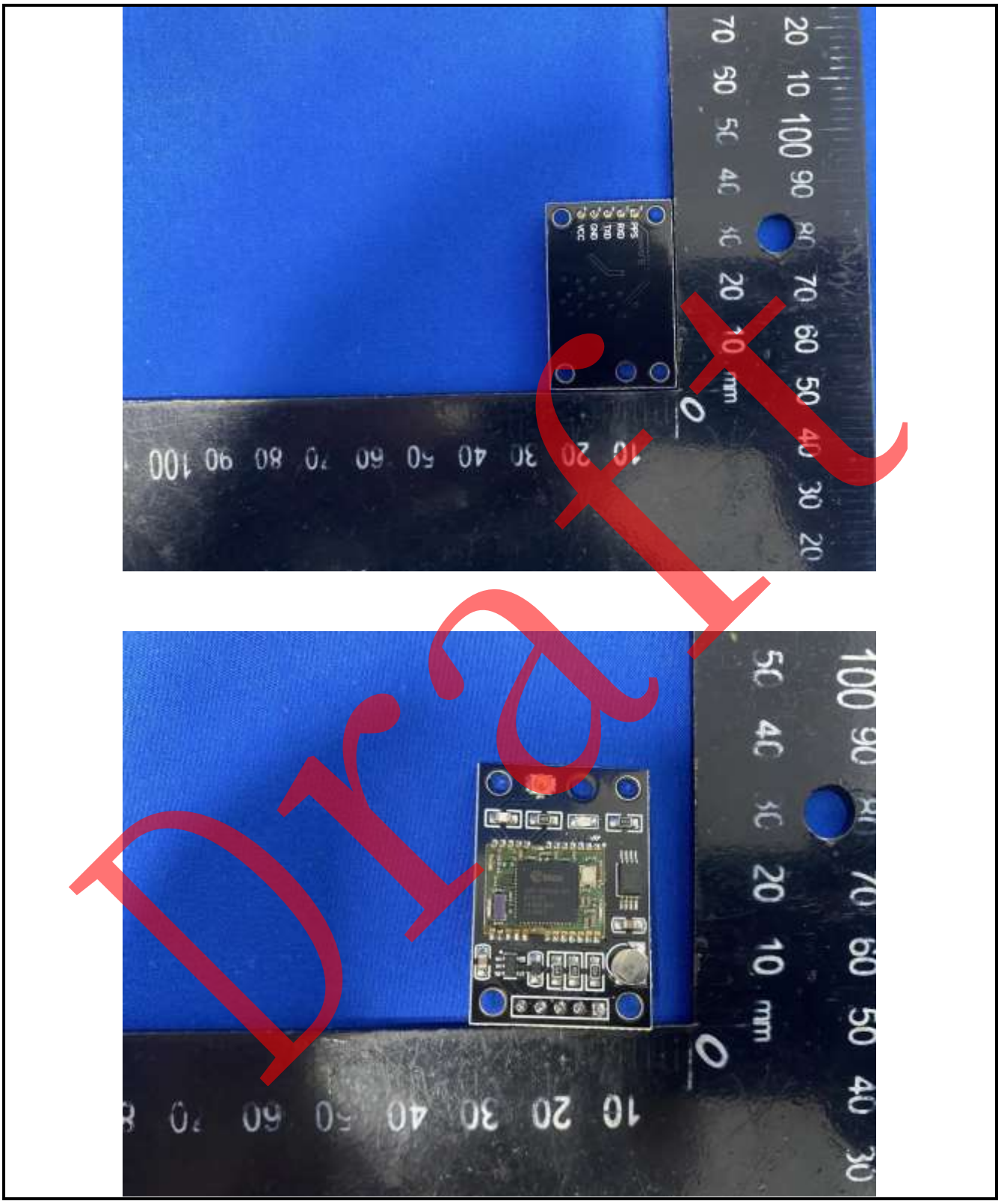

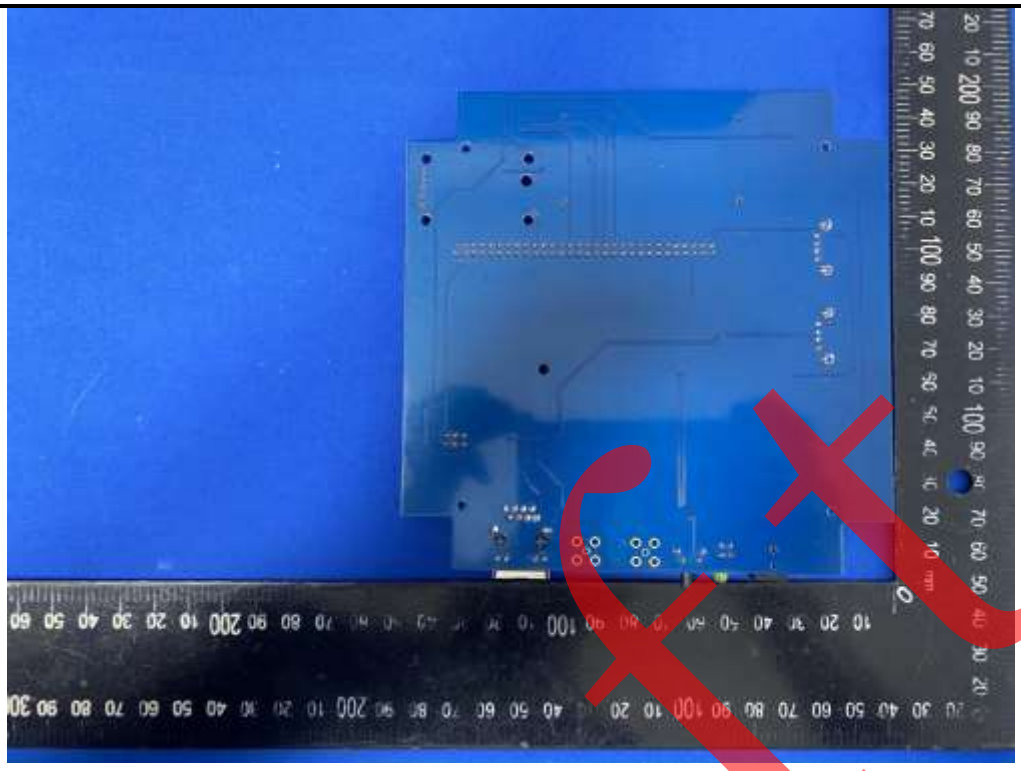

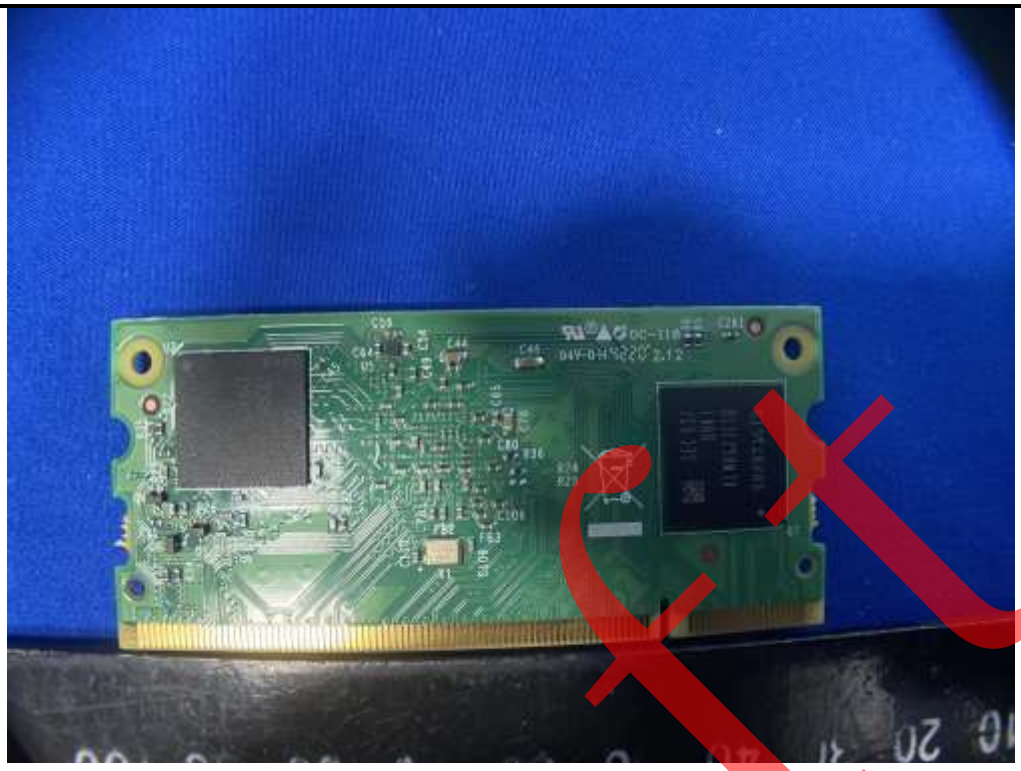

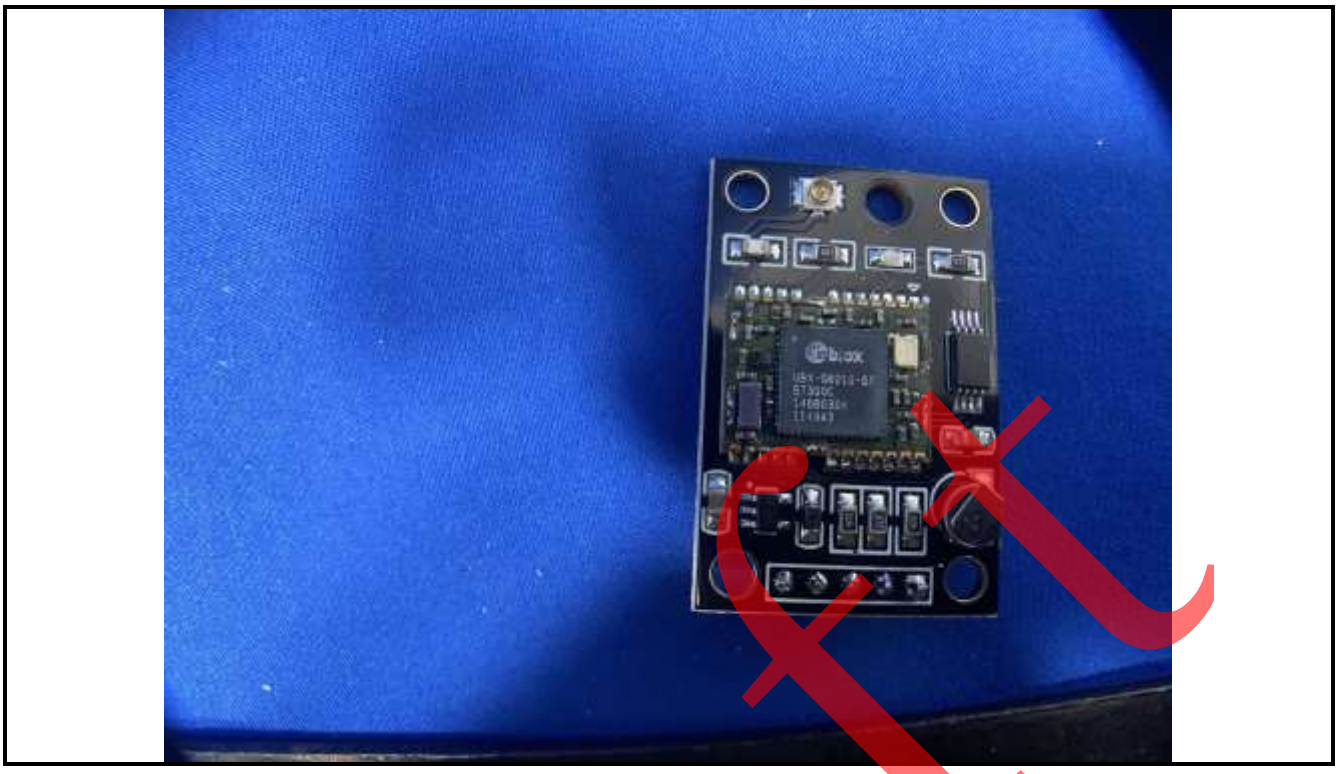

------End of report------