

TEST REPORT

FCC ID	2AAS9-L0001S	
Test Report No	TCT220228E904	
Date of issue	Mar. 23, 2022	
Testing laboratory	SHENZHEN TONGCE TESTING LAB	
Testing location/ address:	TCT Testing Industrial Park Fuqiao 5th Industrial Zone, Fuhai Street, Bao'an District Shenzhen, Guangdong, 518103, People's Republic of China	
Applicant's name	BROWAN COMMUNICATIONS INCORPORATION	
Address	No.15-1, Zhonghua Rd., Hsinchu Industrial Park, Hukou, Hsinchu Hsien, Taiwan, 303	
Manufacturer's name ...	BROWAN COMMUNICATIONS INCORPORATION	
Address	No.15-1, Zhonghua Rd., Hsinchu Industrial Park, Hukou, Hsinchu Hsien, Taiwan, 303	
Standard(s)	FCC CFR Title 47 Part 15 Subpart C Section 15.249 ANSI C63.10:2013	
Product Name	MerryIoT Hotspot Miner V1	
Trade Mark	BROWAN, MerryIoT	
Model/Type reference	L0001, L0001-1, L0001-2, L0001-S, L0001-Max, L0001-PRO	
Rating(s)	DC 12V	
Date of receipt of test item	Feb. 28, 2022	
Date (s) of performance of test	Feb. 28, 2022 - Mar. 23, 2022	
Tested by (+signature) ...	Brews XU	
Check by (+signature)	Beryl ZHAO	
Approved by (+signature) :	Tomsin	

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1. General Product Information

1.1. EUT description

Product Name.....:	MerryloT Hotspot Miner V1
Model/Type reference.....:	L0001
Sample Number.....:	TCT211019E025-0101
Operation Frequency	125K: 922.0MHz~924.6MHz 250K: 921.8MHz~924.5MHz FSK: 921.8MHz~924.8MHz
Number of Channel	125K: 14 250K: 10 FSK: 16
Modulation Technology	LoRa(DIY frequencies) AS923
Antenna Type.....:	External Antenna
Antenna Gain.....:	0.61dBi
Rating(s)	DC 12V

Note: The antenna gain listed in this report is provided by applicant, and the test laboratory is not responsible for this parameter.

1.2. Model(s) list

No.	Model No.	Tested with
1	L0001	☒
Other models	L0001-1, L0001-2, L0001-S, L0001-Max, L0001-PRO	☐

Note: L0001 is tested model, other models are derivative models. The models are identical in circuit and PCB layout, only different on the model names and trade mark. So the test data of L0001 can represent the remaining models.

1.3. Operation Frequency

LoRa(DIY frequencies) AS923-125K

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	922.0MHz	5	922.8MHz	9	923.6MHz	13	924.4MHz
2	922.2MHz	6	923.0MHz	10	923.8MHz	14	924.6MHz
3	922.4MHz	7	923.2MHz	11	924.0MHz		
4	922.6MHz	8	923.4MHz	12	924.2MHz		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The Lowest channel	922.0MHz
The Middle channel	923.2MHz
The Highest channel	924.6MHz

LoRa(DIY frequencies) AS923- 250K

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	921.8MHz	4	922.7MHz	7	923.6MHz	10	924.5MHz
2	922.1MHz	5	923.0MHz	8	923.9MHz		
3	922.4MHz	6	923.3MHz	9	924.2MHz		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The Lowest channel	921.8MHz
The Middle channel	923.0MHz
The Highest channel	924.5MHz

LoRa(DIY frequencies) AS923- FSK

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	921.8MHz	5	922.6MHz	9	923.4MHz	13	924.2MHz
2	922.0MHz	6	922.8MHz	10	923.6MHz	14	924.4MHz
3	922.2MHz	7	923.0MHz	11	923.8MHz	15	924.6MHz
4	922.4MHz	8	923.2MHz	12	924.0MHz	16	924.8MHz

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The Lowest channel	921.8MHz
The Middle channel	923.2MHz
The Highest channel	924.8MHz

2. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna Requirement	§15.203	PASS
AC Power Line Conducted Emission	§15.207	PASS
Field Strength of Fundamental	§15.249 (a)	PASS
Spurious Emissions	§15.249 (a) (d)/ §15.209	PASS
Band Edge	§15.249 (d)/ §15.205	PASS
20dB Occupied Bandwidth	§15.215 (c)	PASS

Note:

1. Pass: Test item meets the requirement.
2. Fail: Test item does not meet the requirement.
3. N/A: Test case does not apply to the test object.
4. The test result judgment is decided by the limit of test standard.

3. General Information

3.1. Test Environment and Mode

Operating Environment:		
Condition	Conducted Emission	Radiated Emission
Temperature:	25 °C	24 °C
Humidity:	55 % RH	45 % RH
Atmospheric Pressure:	1010 mbar	1010 mbar
Test Mode:		
Engineering mode:	Keep the EUT in continuous transmitting by select channel and modulations.	
The sample was placed 0.8m & 1.5m for the measurement below & above 1GHz 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(Z axis) are shown in Test Results of the following pages.		

3.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
Adapter	JD-050200	2012010907576735	/	/

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4. Facilities and Accreditations

4.1. Facilities

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

- FCC - Registration No.: 645098

SHENZHEN TONGCE TESTING LAB

Designation Number: CN1205

The testing lab has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A-1

SHENZHEN TONGCE TESTING LAB

CAB identifier: CN0031

The testing lab has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

4.2. Location

SHENZHEN TONGCE TESTING LAB

Address: TCT Testing Industrial Park Fuqiao 5th Industrial Zone, Fuhai Street, Bao'an District Shenzhen, Guangdong, 518103, People's Republic of China

TEL: +86-755-27673339

4.3. Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	± 3.10 dB
2	RF power, conducted	± 0.12 dB
3	Spurious emissions, conducted	± 0.11 dB
4	All emissions, radiated(<1 GHz)	± 4.56 dB
5	All emissions, radiated(1 GHz - 18 GHz)	± 4.22 dB
6	All emissions, radiated(18 GHz- 40 GHz)	± 4.36 dB

5. Test Results and Measurement Data

5.1. Antenna Requirement

Standard requirement:

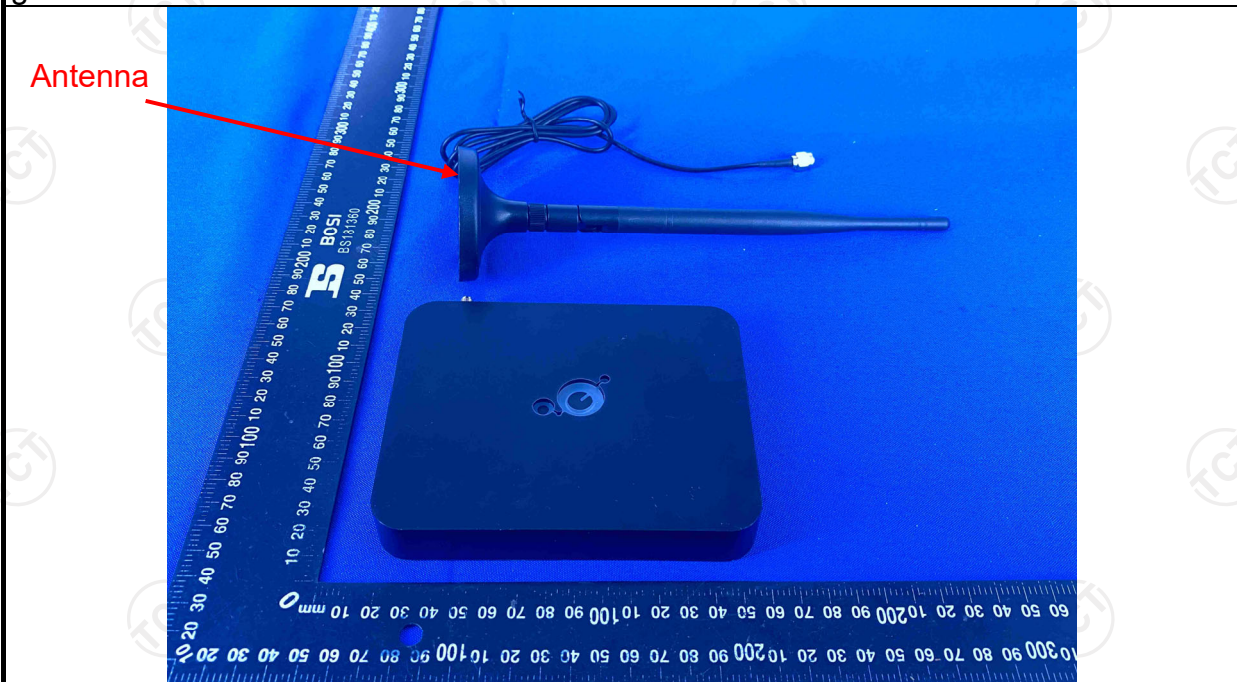
FCC Part15 C Section 15.203

15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

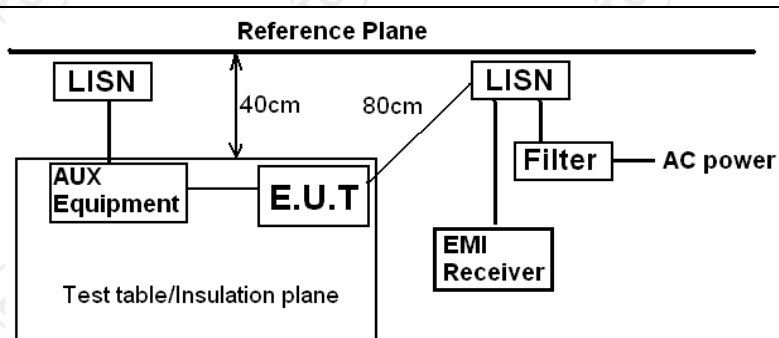
E.U.T Antenna:

The EUT antenna is external antenna which permanently attached, and the best case gain of the antenna is 0.61dBi.



5.2. Conducted Emission

5.2.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.207														
Test Method:	ANSI C63.10:2013														
Frequency Range:	150 kHz to 30 MHz														
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto														
Limits:	<table><tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBuV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr><tr><td>0.5-5</td><td>56</td><td>46</td></tr><tr><td>5-30</td><td>60</td><td>50</td></tr></table>	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
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													
Test Setup:	Reference Plane  Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m														
Test Mode:	Transmitting mode														
Test Procedure:	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides 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 refer 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 C63.10:2013 on conducted measurement.														
Test Result:	PASS														

5.2.2. Test Instruments

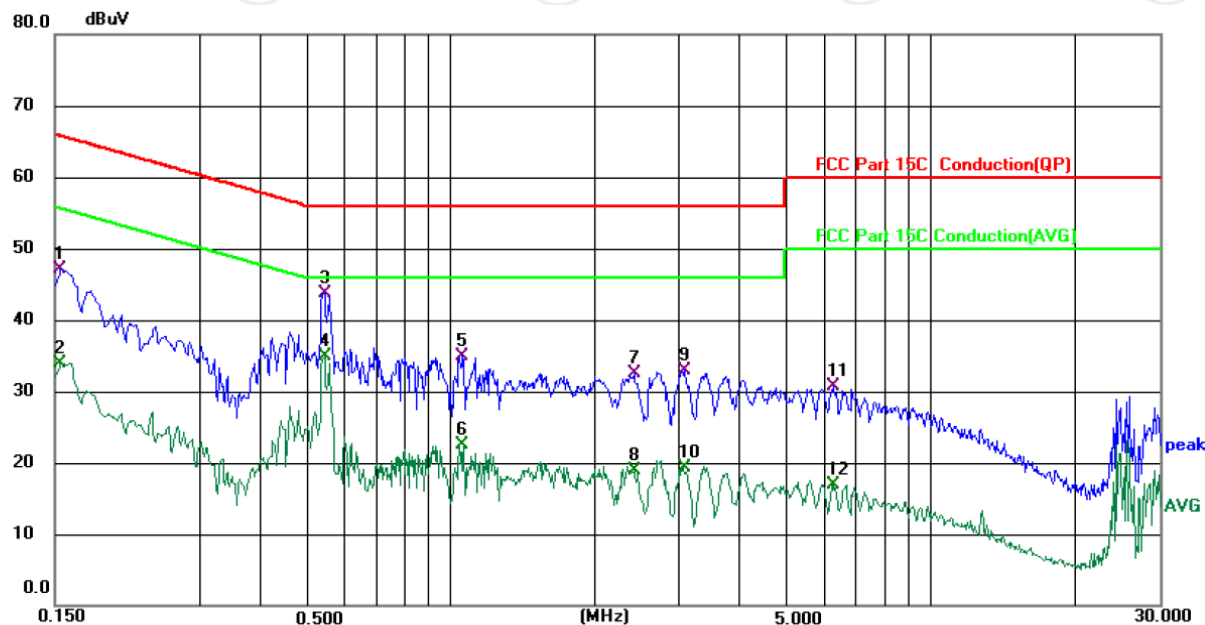
Conducted Emission Shielding Room Test Site (843)				
Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESCI3	100898	Jul. 07, 2022
Line Impedance Stabilisation Newtork(LISN)	Schwarzbeck	NSLK 8126	8126453	Mar. 11, 2022
Line-5	TCT	CE-05	N/A	Jul. 07, 2022
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

5.2.3. Test data

Please refer to following diagram for individual

LoRa(DIY frequencies) AS923- 125K

Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



Site 844 Shielding Room

Phase: L1

Temperature: 23.5 (°C)

Humidity: 53 %

Limit: FCC Part 15C Conduction(QP)

Power: AC 120 V/60 Hz

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1539	37.48	9.59	47.07	65.79	-18.72	QP	
2		0.1539	24.33	9.59	33.92	55.79	-21.87	AVG	
3		0.5460	34.02	9.71	43.73	56.00	-12.27	QP	
4	*	0.5460	25.19	9.71	34.90	46.00	-11.10	AVG	
5		1.0620	25.25	9.75	35.00	56.00	-21.00	QP	
6		1.0620	12.85	9.75	22.60	46.00	-23.40	AVG	
7		2.4100	22.61	9.87	32.48	56.00	-23.52	QP	
8		2.4100	9.02	9.87	18.89	46.00	-27.11	AVG	
9		3.0900	22.93	9.88	32.81	56.00	-23.19	QP	
10		3.0900	9.50	9.88	19.38	46.00	-26.62	AVG	
11		6.3060	20.80	9.81	30.61	60.00	-29.39	QP	
12		6.3060	7.12	9.81	16.93	50.00	-33.07	AVG	

Note:

Freq. = Emission frequency in MHz

Reading level (dBuV) = Receiver reading

Corr. Factor (dB) = LISN factor + Cable loss

Measurement (dBuV) = Reading level (dBuV) + Corr. Factor (dB)

Limit (dBuV) = Limit stated in standard

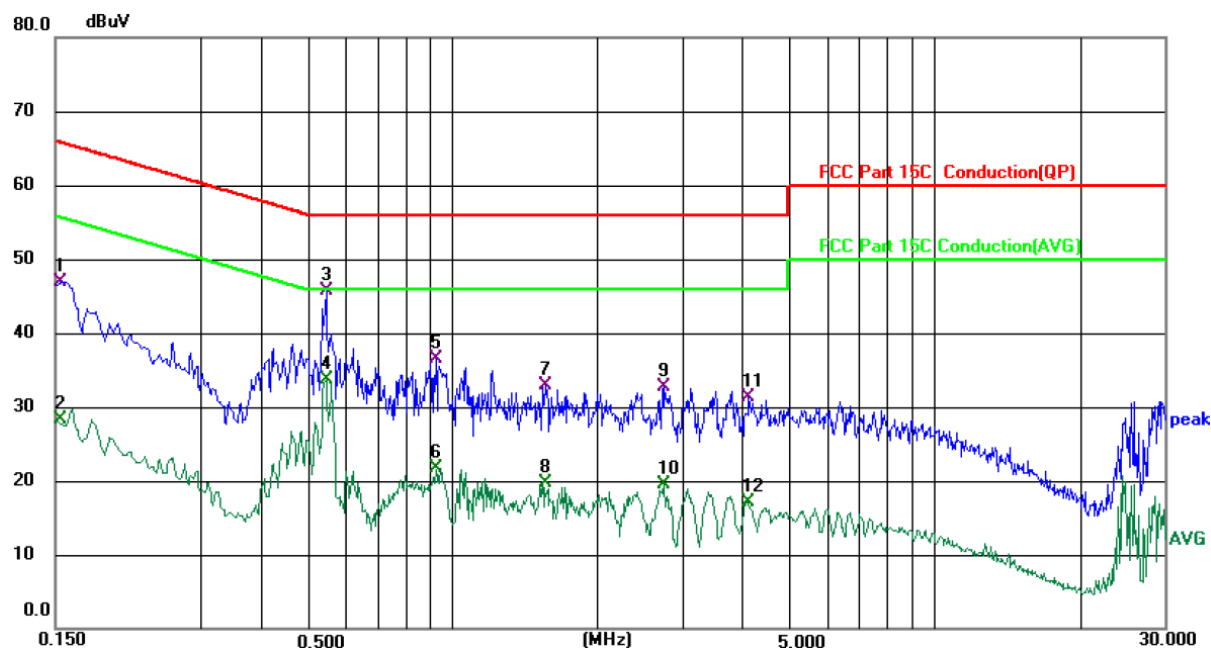
Margin (dB) = Measurement (dBuV) – Limits (dBuV)

Q.P. =Quasi-Peak

AVG =average

* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



Site 844 Shielding Room

Phase: N

Temperature: 23.5 (°C)

Humidity: 53 %

Limit: FCC Part 15C Conduction(QP)

Power: AC 120 V/60 Hz

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1539	37.23	9.68	46.91	65.79	-18.88	QP	
2		0.1539	18.59	9.68	28.27	55.79	-27.52	AVG	
3	*	0.5460	36.03	9.71	45.74	56.00	-10.26	QP	
4		0.5460	23.96	9.71	33.67	46.00	-12.33	AVG	
5		0.9260	26.86	9.74	36.60	56.00	-19.40	QP	
6		0.9260	11.92	9.74	21.66	46.00	-24.34	AVG	
7		1.5620	23.08	9.76	32.84	56.00	-23.16	QP	
8		1.5620	10.04	9.76	19.80	46.00	-26.20	AVG	
9		2.7419	22.85	9.78	32.63	56.00	-23.37	QP	
10		2.7419	9.75	9.78	19.53	46.00	-26.47	AVG	
11		4.1300	21.49	9.79	31.28	56.00	-24.72	QP	
12		4.1300	7.39	9.79	17.18	46.00	-28.82	AVG	

Note1:

Freq. = Emission frequency in MHz

Reading level (dBuV) = Receiver reading

Corr. Factor (dB) = LISN factor + Cable loss

Measurement (dBuV) = Reading level (dBuV) + Corr. Factor (dB)

Limit (dBuV) = Limit stated in standard

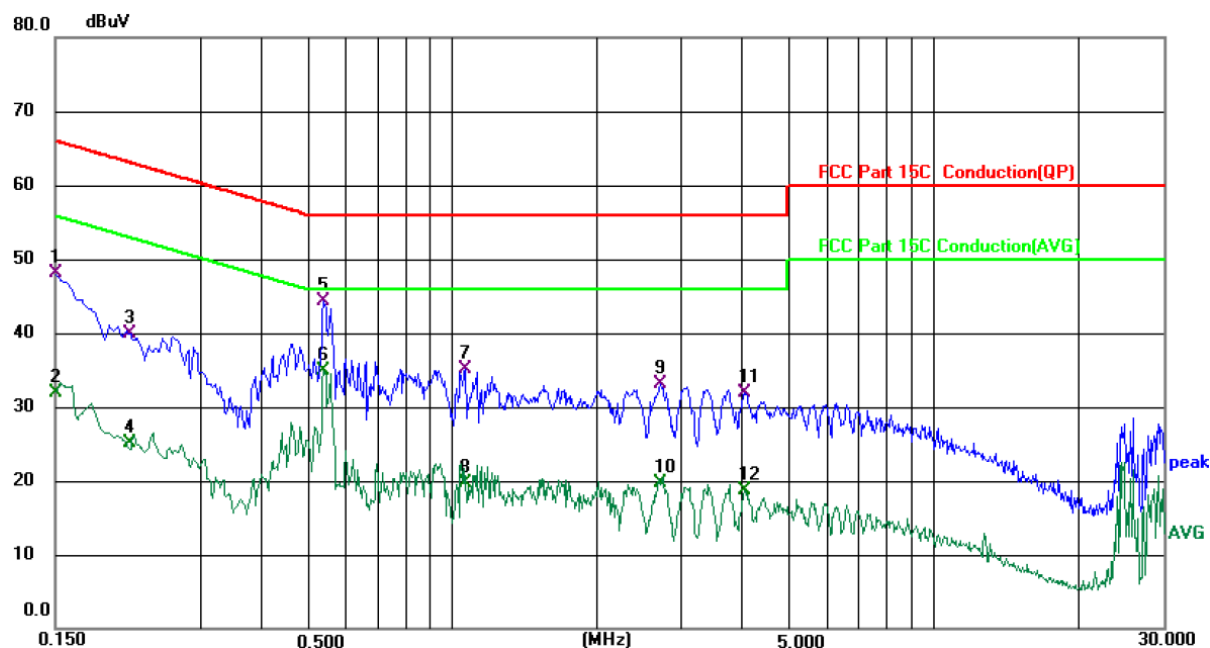
Margin (dB) = Measurement (dBuV) – Limits (dBuV)

Q.P. =Quasi-Peak AVG =average

* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

LoRa(DIY frequencies) AS923- 250K

Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



Site 844 Shielding Room

Phase: L1

Temperature: 23.5 (°C)

Humidity: 53 %

Limit: FCC Part 15C Conduction(QP)

Power: AC 120 V/60 Hz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBμV	dB	dBμV	dBμV	dB		
1		0.1500	38.57	9.58	48.15	66.00	-17.85	QP	
2		0.1500	22.24	9.58	31.82	56.00	-24.18	AVG	
3		0.2128	30.41	9.55	39.96	63.10	-23.14	QP	
4		0.2128	15.63	9.55	25.18	53.10	-27.92	AVG	
5		0.5420	34.58	9.71	44.29	56.00	-11.71	QP	
6	*	0.5420	25.24	9.71	34.95	46.00	-11.05	AVG	
7		1.0700	25.26	9.75	35.01	56.00	-20.99	QP	
8		1.0700	9.94	9.75	19.69	46.00	-26.31	AVG	
9		2.7139	23.18	9.88	33.06	56.00	-22.94	QP	
10		2.7139	9.90	9.88	19.78	46.00	-26.22	AVG	
11		4.0700	21.94	9.88	31.82	56.00	-24.18	QP	
12		4.0700	8.80	9.88	18.68	46.00	-27.32	AVG	

Note:

Freq. = Emission frequency in MHz

Reading level (dBμV) = Receiver reading

Corr. Factor (dB) = LISN factor + Cable loss

Measurement (dBμV) = Reading level (dBμV) + Corr. Factor (dB)

Limit (dBμV) = Limit stated in standard

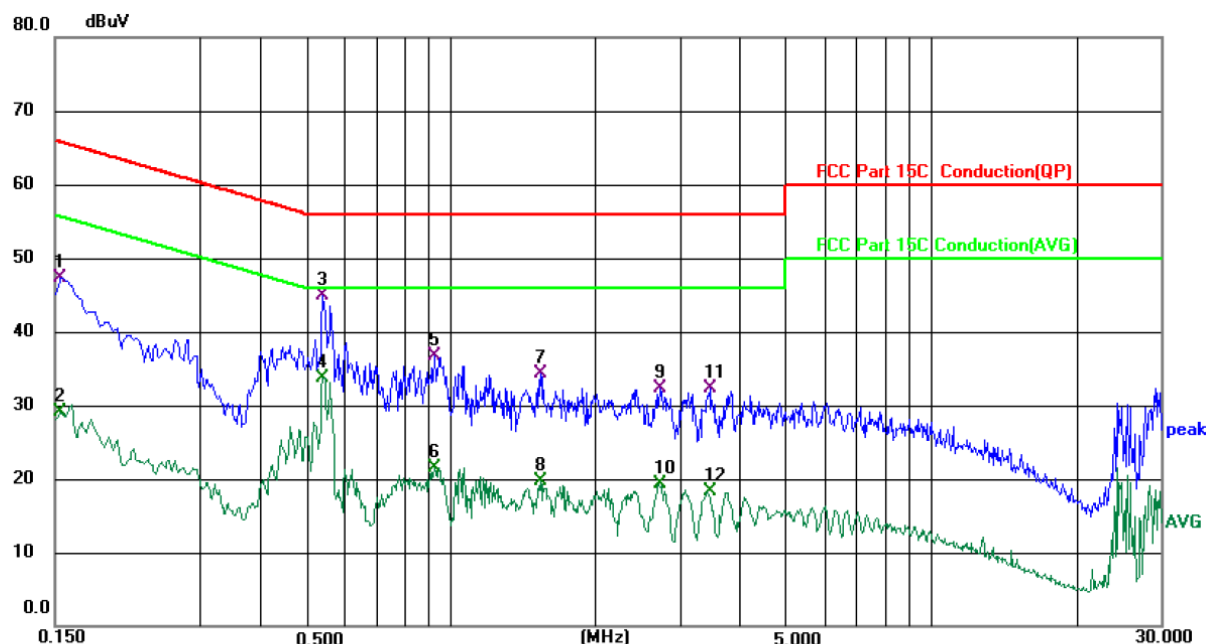
Margin (dB) = Measurement (dBμV) – Limits (dBμV)

Q.P. =Quasi-Peak

AVG =average

* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



Site 844 Shielding Room

Phase: N

Temperature: 23.5 (°C)

Humidity: 53 %

Limit: FCC Part 15C Conduction(QP)

Power: AC 120 V/60 Hz

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1539	37.67	9.68	47.35	65.79	-18.44	QP	
2		0.1539	19.37	9.68	29.05	55.79	-26.74	AVG	
3	*	0.5420	35.16	9.71	44.87	56.00	-11.13	QP	
4		0.5420	23.93	9.71	33.64	46.00	-12.36	AVG	
5		0.9260	26.99	9.74	36.73	56.00	-19.27	QP	
6		0.9260	11.72	9.74	21.46	46.00	-24.54	AVG	
7		1.5420	24.48	9.76	34.24	56.00	-21.76	QP	
8		1.5420	9.87	9.76	19.63	46.00	-26.37	AVG	
9		2.7219	22.61	9.78	32.39	56.00	-23.61	QP	
10		2.7219	9.52	9.78	19.30	46.00	-26.70	AVG	
11		3.4660	22.62	9.78	32.40	56.00	-23.60	QP	
12		3.4660	8.55	9.78	18.33	46.00	-27.67	AVG	

Note1:

Freq. = Emission frequency in MHz

Reading level (dBuV) = Receiver reading

Corr. Factor (dB) = LISN factor + Cable loss

Measurement (dBuV) = Reading level (dBuV) + Corr. Factor (dB)

Limit (dBuV) = Limit stated in standard

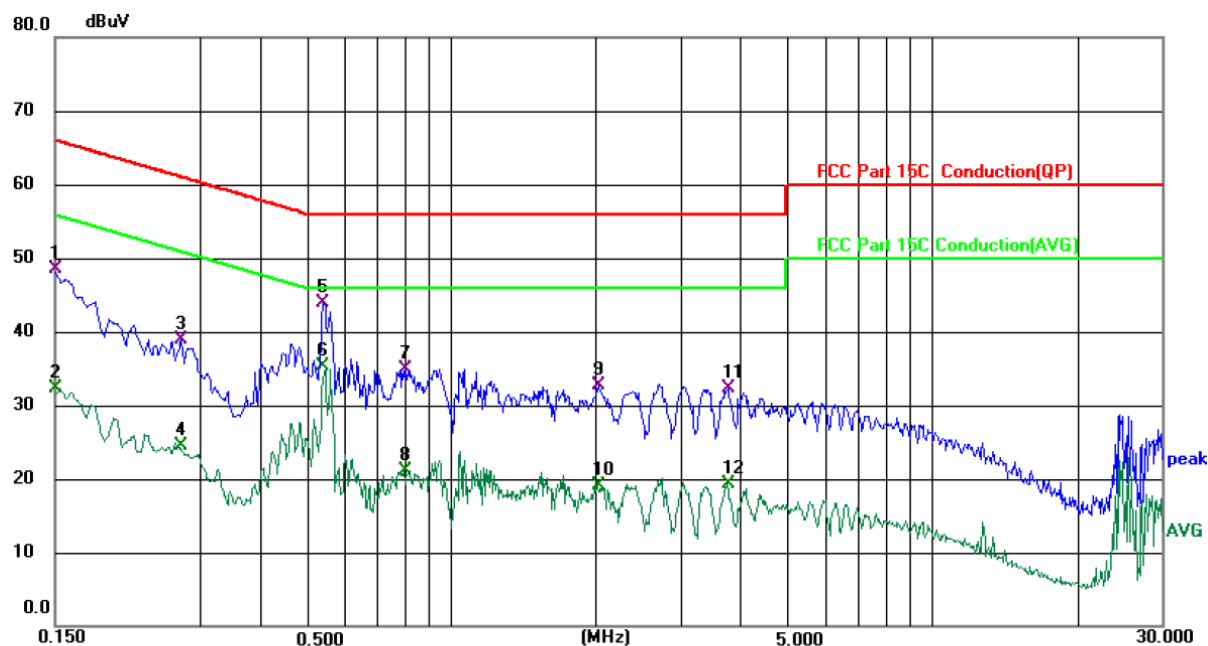
Margin (dB) = Measurement (dBuV) – Limits (dBuV)

Q.P. =Quasi-Peak AVG =average

* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

LoRa(DIY frequencies) AS923- FSK

Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



Site 844 Shielding Room

Phase: L1

Temperature: 23.5 (°C)

Humidity: 53 %

Limit: FCC Part 15C Conduction(QP)

Power: AC 120 V/60 Hz

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	38.89	9.58	48.47	66.00	-17.53	QP	
2		0.1500	22.71	9.58	32.29	56.00	-23.71	AVG	
3		0.2740	29.31	9.58	38.89	61.00	-22.11	QP	
4		0.2740	15.01	9.58	24.59	51.00	-26.41	AVG	
5		0.5420	34.18	9.71	43.89	56.00	-12.11	QP	
6	*	0.5420	25.69	9.71	35.40	46.00	-10.60	AVG	
7		0.8059	25.26	9.74	35.00	56.00	-21.00	QP	
8		0.8059	11.31	9.74	21.05	46.00	-24.95	AVG	
9		2.0259	22.84	9.87	32.71	56.00	-23.29	QP	
10		2.0259	9.27	9.87	19.14	46.00	-26.86	AVG	
11		3.7660	22.32	9.89	32.21	56.00	-23.79	QP	
12		3.7660	9.33	9.89	19.22	46.00	-26.78	AVG	

Note:

Freq. = Emission frequency in MHz

Reading level (dBuV) = Receiver reading

Corr. Factor (dB) = LISN factor + Cable loss

Measurement (dBuV) = Reading level (dBuV) + Corr. Factor (dB)

Limit (dBuV) = Limit stated in standard

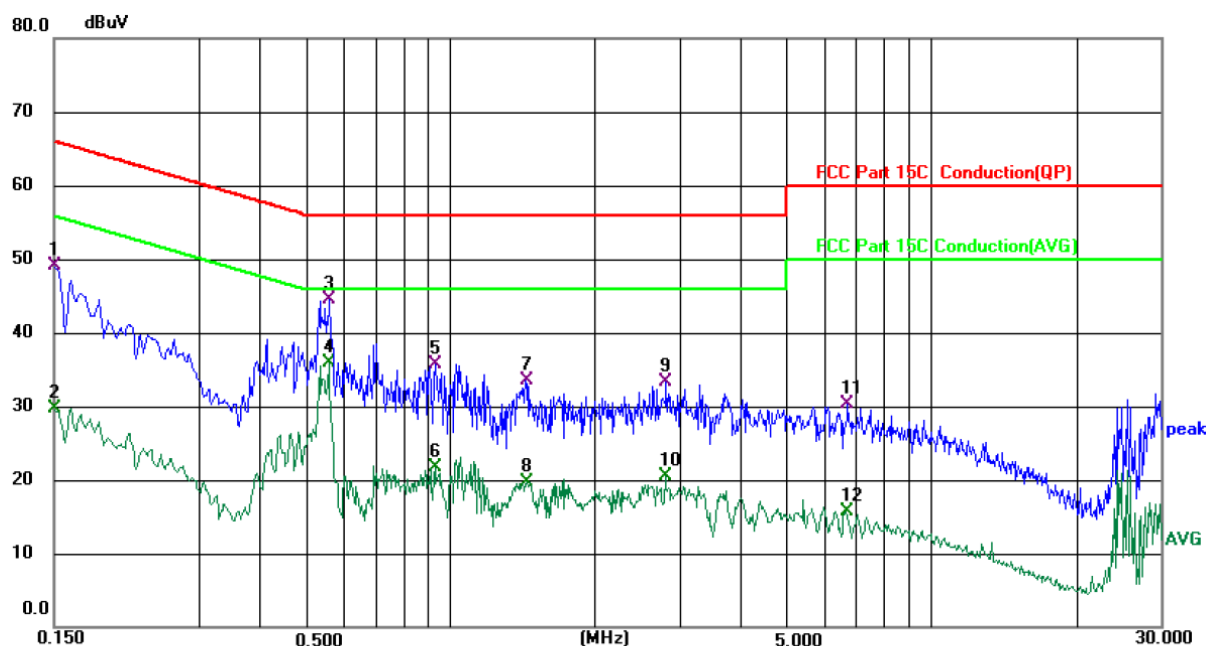
Margin (dB) = Measurement (dBuV) – Limits (dBuV)

Q.P. =Quasi-Peak

AVG =average

* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



Site 844 Shielding Room

Phase: N

Temperature: 23.5 (°C)

Humidity: 53 %

Limit: FCC Part 15C Conduction(QP)

Power: AC 120 V/60 Hz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1500	39.37	9.68	49.05	66.00	-16.95	QP	
2		0.1500	19.96	9.68	29.64	56.00	-26.36	AVG	
3		0.5620	34.85	9.72	44.57	56.00	-11.43	QP	
4	*	0.5620	26.09	9.72	35.81	46.00	-10.19	AVG	
5		0.9300	26.05	9.74	35.79	56.00	-20.21	QP	
6		0.9300	12.03	9.74	21.77	46.00	-24.23	AVG	
7		1.4339	23.78	9.75	33.53	56.00	-22.47	QP	
8		1.4339	10.02	9.75	19.77	46.00	-26.23	AVG	
9		2.8179	23.61	9.78	33.39	56.00	-22.61	QP	
10		2.8179	10.66	9.78	20.44	46.00	-25.56	AVG	
11		6.7300	20.49	9.72	30.21	60.00	-29.79	QP	
12		6.7300	6.02	9.72	15.74	50.00	-34.26	AVG	

Note1:

Freq. = Emission frequency in MHz

Reading level (dBuV) = Receiver reading

Corr. Factor (dB) = LISN factor + Cable loss

Measurement (dBuV) = Reading level (dBuV) + Corr. Factor (dB)

Limit (dBuV) = Limit stated in standard

Margin (dB) = Measurement (dBuV) - Limits (dBuV)

Q.P. =Quasi-Peak AVG =average

* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

5.3. Radiated Emission Measurement

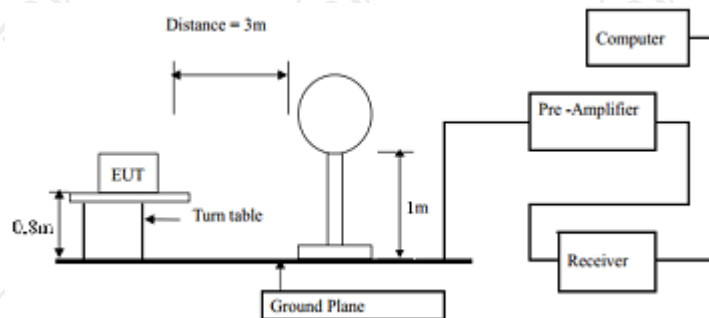
5.3.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.209				
Test Method:	ANSI C63.10:2013				
Frequency Range:	9 kHz to 25 GHz				
Measurement Distance:	3 m				
Antenna Polarization:	Horizontal & Vertical				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	9kHz- 150kHz	Quasi-peak	200Hz	1kHz	Quasi-peak Value
	150kHz- 30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
Limit(Field strength of the fundamental signal):					
	Frequency	Limit (dBuV/m @3m)		Remark	
	902MHz928MHz	94.00		Quasi-peak Value	
Limit(Spurious Emissions):	Frequency		Limit (dBuV/m @3m)		Remark
	0.009-0.490		2400/F(KHz)		Quasi-peak Value
	0.490-1.705		24000/F(KHz)		Quasi-peak Value
	1.705-30		30		Quasi-peak Value
	30MHz-88MHz		40.0		Quasi-peak Value
	88MHz-216MHz		43.5		Quasi-peak Value
	216MHz-960MHz		46.0		Quasi-peak Value
	960MHz-1GHz		54.0		Quasi-peak Value
	Above 1GHz		54.0		Average Value
			74.0		Peak Value
Limit (band edge) :	Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.				
Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber in below 1GHz, 1.5m above the ground in above 1GHz. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 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.				

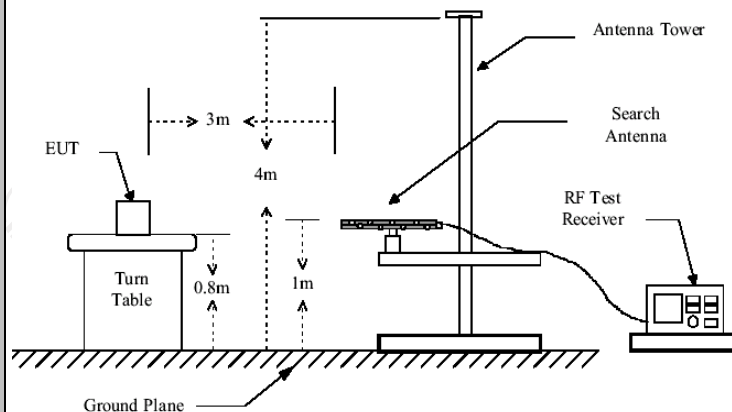
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
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.

Test setup:

For radiated emissions below 30MHz

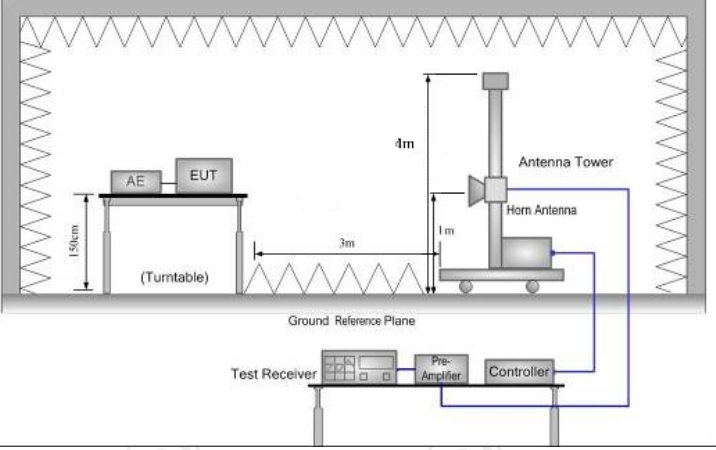


30MHz to 1GHz



Above 1GHz

(The diagram below shows the test setup that is utilized to make the measurements for emission from 1GHz to the tenth harmonic of the highest fundamental frequency or to 40GHz emissions, whichever is lower.)

	
Test results:	PASS

5.3.2. Test Instruments

Radiated Emission Test Site (966)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESIB7	100197	Jul. 07, 2022
Spectrum Analyzer	R&S	FSQ40	200061	Jul. 07, 2022
Pre-amplifier	SKET	LNPA_0118G-45	SK2021012102	Mar. 11, 2022
Pre-amplifier	SKET	LNPA_1840G-50	SK202109203500	Apr. 08, 2022
Pre-amplifier	HP	8447D	2727A05017	Jul. 07, 2022
Loop antenna	ZHINAN	ZN30900A	12024	Sep. 05, 2022
Broadband Antenna	Schwarzbeck	VULB9163	340	Sep. 04, 2022
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Sep. 04, 2022
Horn Antenna	Schwarzbeck	BBHA 9170	00956	Apr. 10, 2023
Antenna Mast	Keleto	RE-AM	N/A	N/A
Coaxial cable	SKET	RC_DC18G-N	N/A	Apr. 08, 2022
Coaxial cable	SKET	RC-DC18G-N	N/A	Apr. 08, 2022
Coaxial cable	SKET	RC-DC40G-N	N/A	Jul. 07, 2022
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

5.3.3. Test Data

Field Strength of Fundamental:

LoRa(DIY frequencies) AS923- 125K

Frequency (MHz)	Emission QP (dBuV/m)	Horizontal /Vertical	Limits QP (dBuV/m)	Margin (dB)
922.0	84.65	H	94	-9.35
922.0	89.63	V	94	-4.37
923.2	84.37	H	94	-9.63
923.2	89.49	V	94	-4.51
924.6	84.20	H	94	-9.8
924.6	89.23	V	94	-4.77

LoRa(DIY frequencies) AS923- 250K

Frequency (MHz)	Emission QP (dBuV/m)	Horizontal /Vertical	Limits QP (dBuV/m)	Margin (dB)
921.8	83.38	H	94	-10.62
921.8	89.37	V	94	-4.63
923.0	83.81	H	94	-10.19
923.0	89.57	V	94	-4.43
924.5	84.22	H	94	-9.78
924.5	89.79	V	94	-4.21

LoRa(DIY frequencies) AS923- FSK

Frequency (MHz)	Emission QP (dBuV/m)	Horizontal /Vertical	Limits QP (dBuV/m)	Margin (dB)
921.8	80.36	H	94	-13.64
921.8	87.04	V	94	-6.96
923.2	80.70	H	94	-13.3
923.2	87.11	V	94	-6.89
924.8	80.21	H	94	-13.79
924.8	87.27	V	94	-6.73

Note: 1. Emission Level=Reading+ Cable loss-Antenna factor-Amp factor.

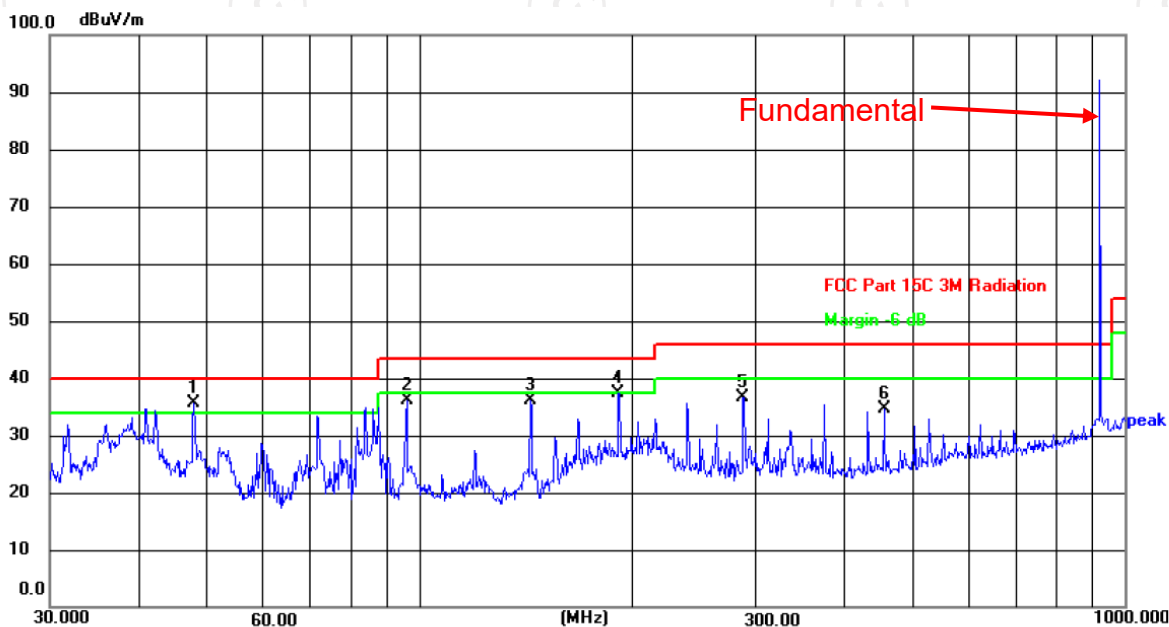
2. The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement.

3. For fundamental frequency, RBW >20dB BW , VBW>=RBW, PK detector is for PK value, RMS detector is for AV value.

LoRa(DIY frequencies) AS923- 125K

Frequency Range (30MHz-1GHz)

Horizontal:



Site

Polarization: **Horizontal**

Temperature: 24(°C)

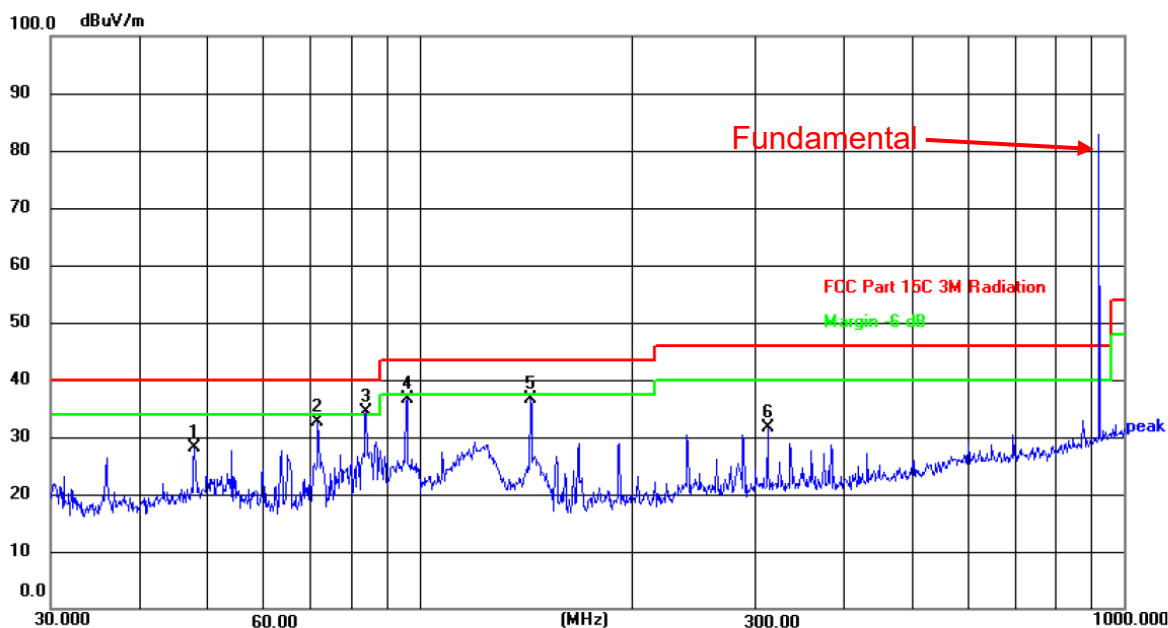
Limit: FCC Part 15C 3M Radiation

Power: AC 120 V/60 Hz

Humidity: 52 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 *	47.9940	47.98	-12.30	35.68	40.00	-4.32	peak	P	
2	96.0986	50.83	-14.72	36.11	43.50	-7.39	peak	P	
3	143.8295	52.25	-16.11	36.14	43.50	-7.36	peak	P	
4	191.7450	51.45	-13.96	37.49	43.50	-6.01	peak	P	
5	287.9904	48.14	-11.47	36.67	46.00	-9.33	peak	P	
6	455.9058	44.09	-9.58	34.51	46.00	-11.49	peak	P	

Vertical:



Site

Polarization: **Vertical**

Temperature: 24(°C)

Limit: FCC Part 15C 3M Radiation

Power: AC 120 V/60 Hz

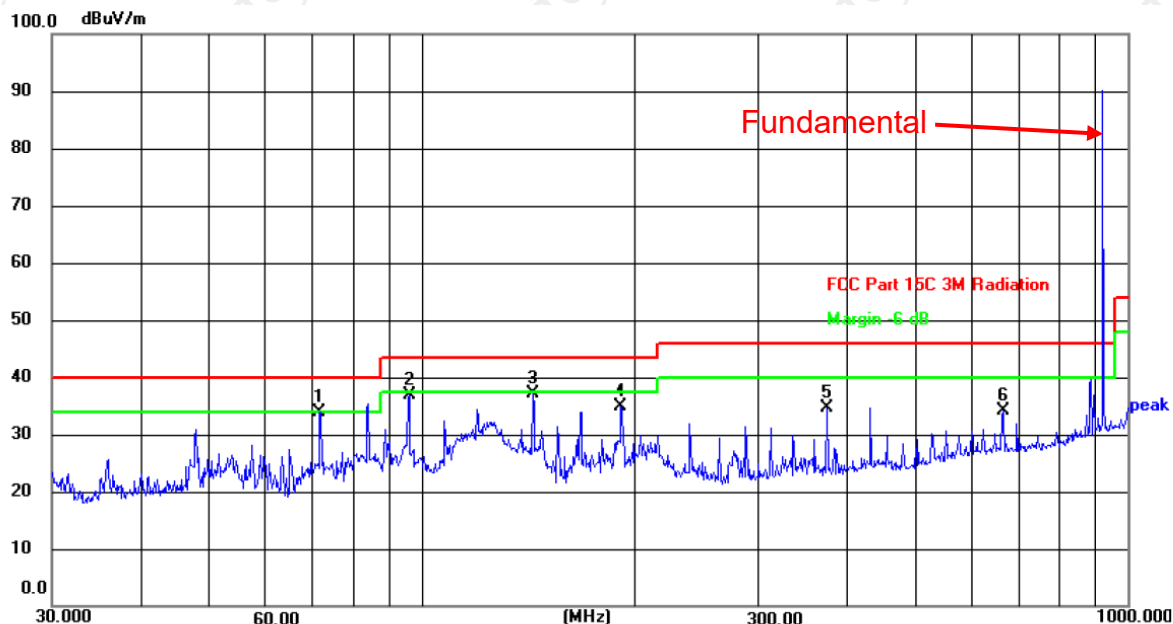
Humidity: 52 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	47.9940	40.51	-12.30	28.21	40.00	-11.79	peak	P	
2	71.8320	48.35	-15.83	32.52	40.00	-7.48	peak	P	
3 *	84.1100	50.45	-15.99	34.46	40.00	-5.54	peak	P	
4	96.0986	51.47	-14.72	36.75	43.50	-6.75	peak	P	
5	143.8295	52.76	-16.11	36.65	43.50	-6.85	peak	P	
6	312.1794	42.68	-11.07	31.61	46.00	-14.39	peak	P	

LoRa(DIY frequencies) AS923- 250K

Frequency Range (30MHz-1GHz)

Horizontal:



Site

Polarization: **Horizontal**

Temperature: 24(°C)

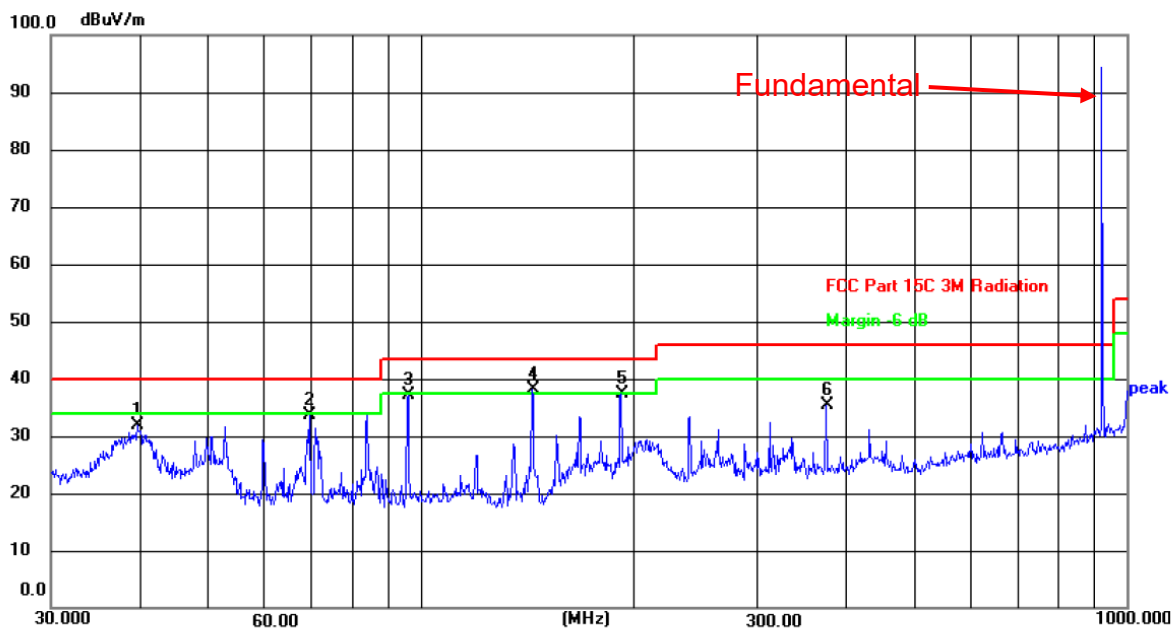
Limit: FCC Part 15C 3M Radiation

Power: AC 120 V/60 Hz

Humidity: 52 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 *	71.8320	49.79	-15.83	33.96	40.00	-6.04	peak	P	
2	96.0986	51.54	-14.72	36.82	43.50	-6.68	peak	P	
3	143.8295	53.36	-16.11	37.25	43.50	-6.25	peak	P	
4	191.7450	48.77	-13.96	34.81	43.50	-8.69	peak	P	
5	375.9385	45.28	-10.58	34.70	46.00	-11.30	peak	P	
6	665.8035	40.58	-6.39	34.19	46.00	-11.81	peak	P	

Vertical:



Site

Polarization: **Vertical**

Temperature: 24(°C)

Limit: FCC Part 15C 3M Radiation

Power: AC 120 V/60 Hz

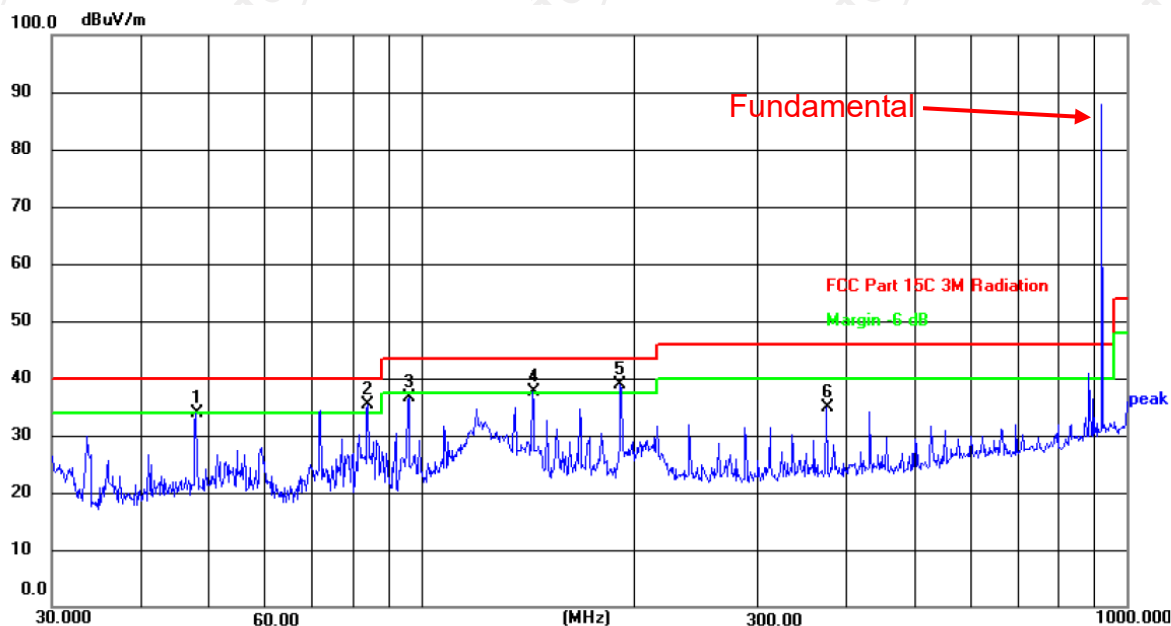
Humidity: 52 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	39.7146	45.60	-13.62	31.98	40.00	-8.02	peak	P	
2	69.6005	49.40	-15.74	33.66	40.00	-6.34	peak	P	
3	96.0986	51.93	-14.72	37.21	43.50	-6.29	peak	P	
4 *	143.8295	54.20	-16.11	38.09	43.50	-5.41	peak	P	
5	192.4186	51.38	-13.91	37.47	43.50	-6.03	peak	P	
6	375.9385	45.90	-10.58	35.32	46.00	-10.68	peak	P	

LoRa(DIY frequencies) AS923- FSK

Frequency Range (30MHz-1GHz)

Horizontal:



Site

Polarization: **Horizontal**

Temperature: 24(°C)

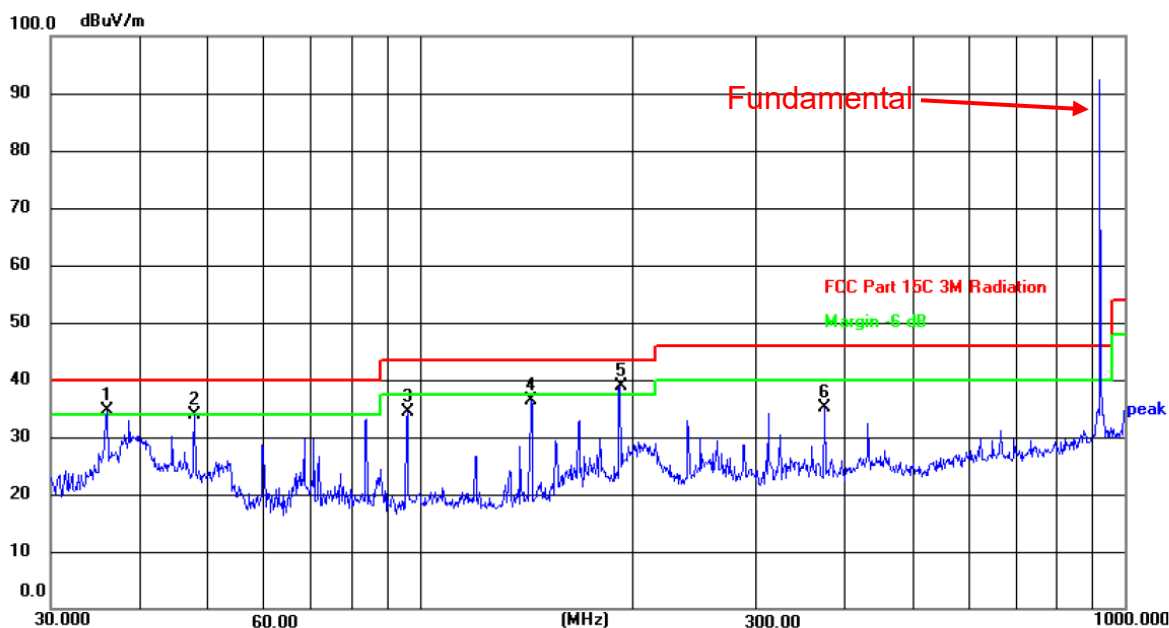
Limit: FCC Part 15C 3M Radiation

Power: AC 120 V/60 Hz

Humidity: 52 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	47.9940	46.08	-12.30	33.78	40.00	-6.22	peak	P	
2 *	84.1100	51.31	-15.99	35.32	40.00	-4.68	peak	P	
3	96.0986	51.43	-14.72	36.71	43.50	-6.79	peak	P	
4 !	143.8295	53.63	-16.11	37.52	43.50	-5.98	peak	P	
5 !	191.7450	52.77	-13.96	38.81	43.50	-4.69	peak	P	
6	375.9385	45.42	-10.58	34.84	46.00	-11.16	peak	P	

Vertical:



Site

Polarization: **Vertical**

Temperature: 24(°C)

Limit: FCC Part 15C 3M Radiation

Power: AC 120 V/60 Hz

Humidity: 52 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 !	36.0007	48.91	-14.26	34.65	40.00	-5.35	peak	P	
2	47.9940	46.14	-12.30	33.84	40.00	-6.16	peak	P	
3	96.0986	49.15	-14.72	34.43	43.50	-9.07	peak	P	
4	143.8295	52.39	-16.11	36.28	43.50	-7.22	peak	P	
5 *	192.4186	52.68	-13.91	38.77	43.50	-4.73	peak	P	
6	375.9385	45.80	-10.58	35.22	46.00	-10.78	peak	P	

LoRa(DIY frequencies) AS923- 125K

Above 1GHz

channel: 922.0MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
1844	H	51.48	---	-3.94	47.54	---	74	54	-6.46
2766	H	46.05	---	0.52	46.57	---	74	54	-7.43
---	---	---	---	---	---	---	---	---	---
1844	V	49.27	---	-3.94	45.33	---	74	54	-8.67
2766	V	42.53	---	0.52	43.05	---	74	54	-10.95
---	---	---	---	---	---	---	---	---	---

Middle channel: 923.2MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
1846.4	H	51.84	---	-3.98	47.86	---	74	54	-6.14
2769.6	H	45.10	---	0.57	45.67	---	74	54	-8.33
---	---	---	---	---	---	---	---	---	---
1846.4	V	51.72	---	-3.98	47.74	---	74	54	-6.26
2769.6	V	44.36	---	0.57	44.93	---	74	54	-9.07
---	---	---	---	---	---	---	---	---	---

High channel: 924.6MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
1849.2	H	52.91	---	-3.98	48.93	---	74	54	-5.07
2773.8	H	47.64	---	0.57	48.21	---	74	54	-5.79
---	---	---	---	---	---	---	---	---	---
1849.2	V	51.23	---	-3.98	47.25	---	74	54	-6.75
2773.8	V	45.40	---	0.57	45.97	---	74	54	-8.03
---	---	---	---	---	---	---	---	---	---

Note:

1. Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss – Pre-amplifier
2. Margin (dB) = Emission Level (Peak) (dBμV/m)-Average limit (dBμV/m)
3. The emission levels of other frequencies are very lower than the limit and not show in test report.
4. Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.
5. Data of measurement shown “---”in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.
6. All the restriction bands are compliance with the limit of 15.209.

LoRa(DIY frequencies) AS923- 250K

Above 1GHz

channel: 921.8MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
1843.6	H	50.82	---	-3.94	46.88	---	74	54	-7.12
2765.4	H	45.37	---	0.52	45.89	---	74	54	-8.11
---	---	---	---	---	---	---	---	---	---
1843.6	V	48.19	---	-3.94	44.25	---	74	54	-9.75
2765.4	V	41.75	---	0.52	42.27	---	74	54	-11.73
---	---	---	---	---	---	---	---	---	---

Middle channel: 923.0MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
1846	H	50.26	---	-3.98	46.28	---	74	54	-7.72
2769	H	44.58	---	0.57	45.15	---	74	54	-8.85
---	---	---	---	---	---	---	---	---	---
1846	V	52.02	---	-3.98	48.04	---	74	54	-5.96
2769	V	43.68	---	0.57	44.25	---	74	54	-9.75
---	---	---	---	---	---	---	---	---	---

High channel: 924.5MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
1849.0	H	51.91	---	-3.98	47.93	---	74	54	-6.07
2773.5	H	46.34	---	0.57	46.91	---	74	54	-7.09
---	---	---	---	---	---	---	---	---	---
1849.0	V	51.26	---	-3.98	47.28	---	74	54	-6.72
2773.5	V	45.70	---	0.57	46.27	---	74	54	-7.73
---	---	---	---	---	---	---	---	---	---

Note:

1. Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss – Pre-amplifier
2. Margin (dB) = Emission Level (Peak) (dBμV/m)-Average limit (dBμV/m)
3. The emission levels of other frequencies are very lower than the limit and not show in test report.
4. Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.
5. Data of measurement shown “---”in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.
6. All the restriction bands are compliance with the limit of 15.209.

LoRa(DIY frequencies) AS923- FSK

Above 1GHz

channel: 921.8MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
1843.6	H	52.37	---	-3.94	48.43	---	74	54	-5.57
2765.4	H	47.14	---	0.52	47.66	---	74	54	-6.34
---	---	---	---	---	---	---	---	---	---
1843.6	V	48.08	---	-3.94	44.14	---	74	54	-9.86
2765.4	V	43.61	---	0.52	44.13	---	74	54	-9.87
---	---	---	---	---	---	---	---	---	---

Middle channel: 923.2MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
1846.4	H	51.75	---	-3.98	47.77	---	74	54	-6.23
2769.6	H	46.28	---	0.57	46.85	---	74	54	-7.15
---	---	---	---	---	---	---	---	---	---
1846.4	V	52.93	---	-3.98	48.95	---	74	54	-5.05
2769.6	V	45.56	---	0.57	46.13	---	74	54	-7.87
---	---	---	---	---	---	---	---	---	---

High channel: 924.8MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
1849.6	H	53.60	---	-3.98	49.62	---	74	54	-4.38
2774.4	H	47.82	---	0.57	48.39	---	74	54	-5.61
---	---	---	---	---	---	---	---	---	---
1849.6	V	50.16	---	-3.98	46.18	---	74	54	-7.82
2774.4	V	42.73	---	0.57	43.30	---	74	54	-10.70
---	---	---	---	---	---	---	---	---	---

Note:

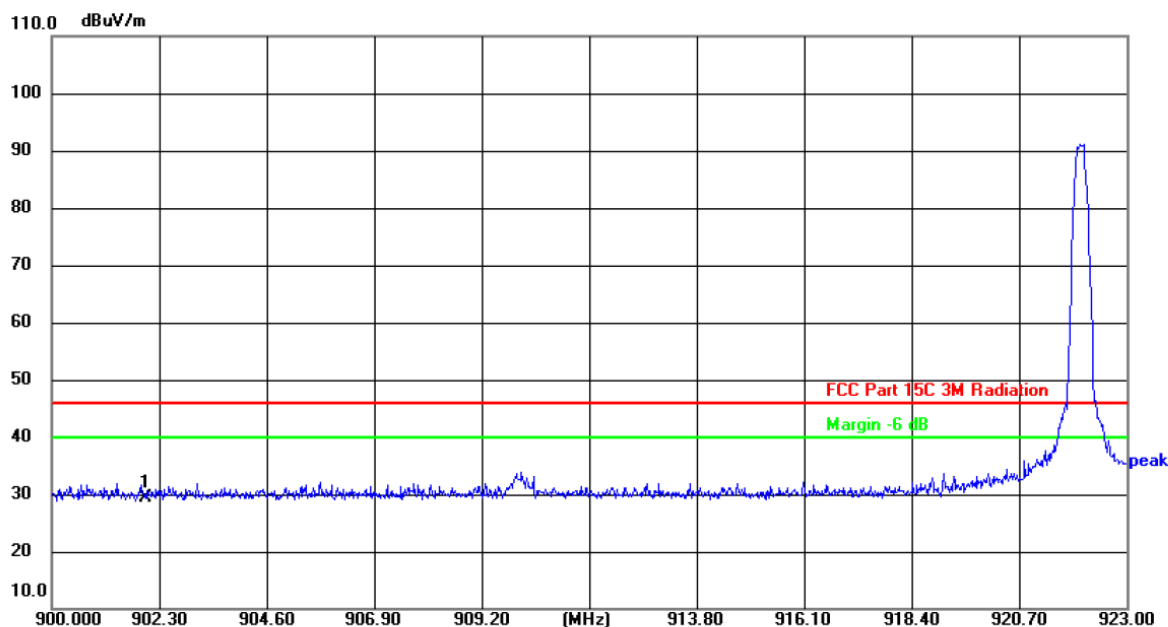
1. Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss – Pre-amplifier
2. Margin (dB) = Emission Level (Peak) (dBμV/m)-Average limit (dBμV/m)
3. The emission levels of other frequencies are very lower than the limit and not show in test report.
4. Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.
5. Data of measurement shown “---”in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.
6. All the restriction bands are compliance with the limit of 15.209.

Band Edge Requirement

LoRa(DIY frequencies) AS923- 125K

Lowest channel 922.0:

Horizontal:



Site

Polarization: **Horizontal**

Temperature: 24(°C)

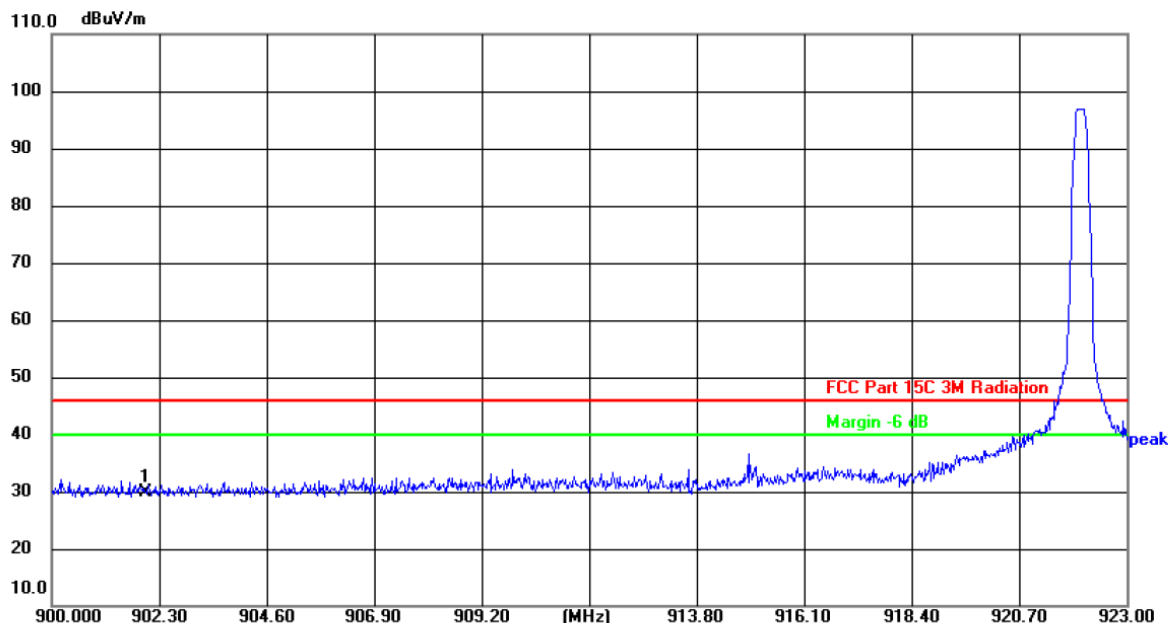
Limit: FCC Part 15C 3M Radiation

Power: AC 120 V/60 Hz

Humidity: 52 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 *	902.0000	32.46	-3.16	29.30	46.00	-16.70	peak	P	

Vertical:

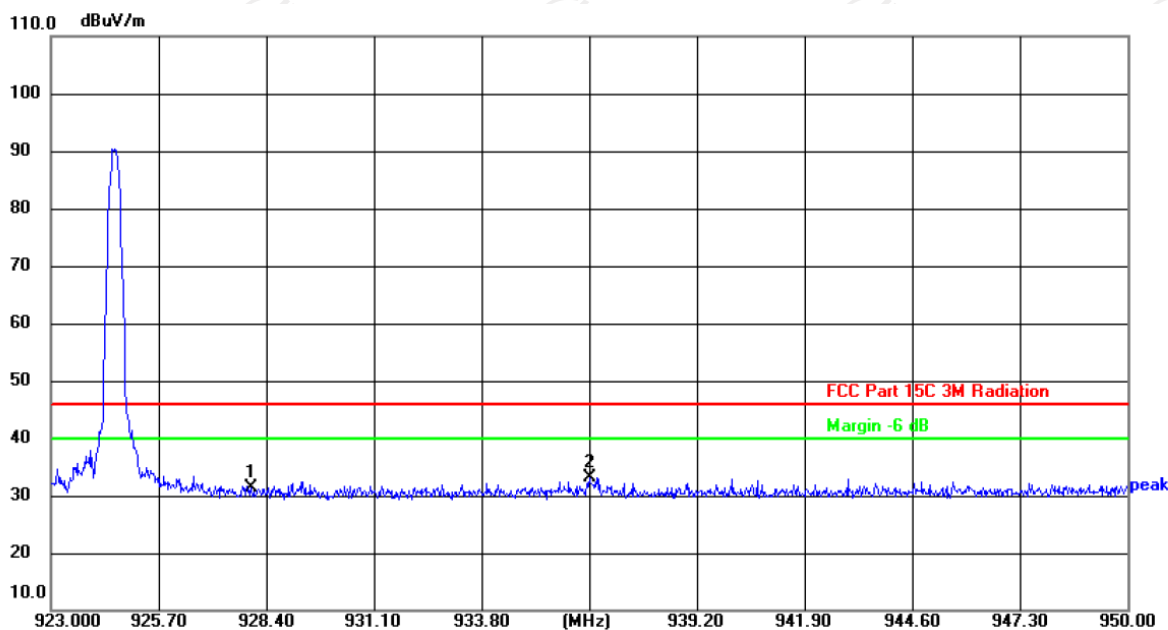


Site: Polarization: **Vertical** Temperature: 24(°C)
 Limit: FCC Part 15C 3M Radiation Power: AC 120 V/60 Hz Humidity: 52 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 *	902.0000	33.15	-3.16	29.99	46.00	-16.01	peak	P	

Highest channel 924.6:

Horizontal:



Site

Polarization: **Horizontal**

Temperature: 24(°C)

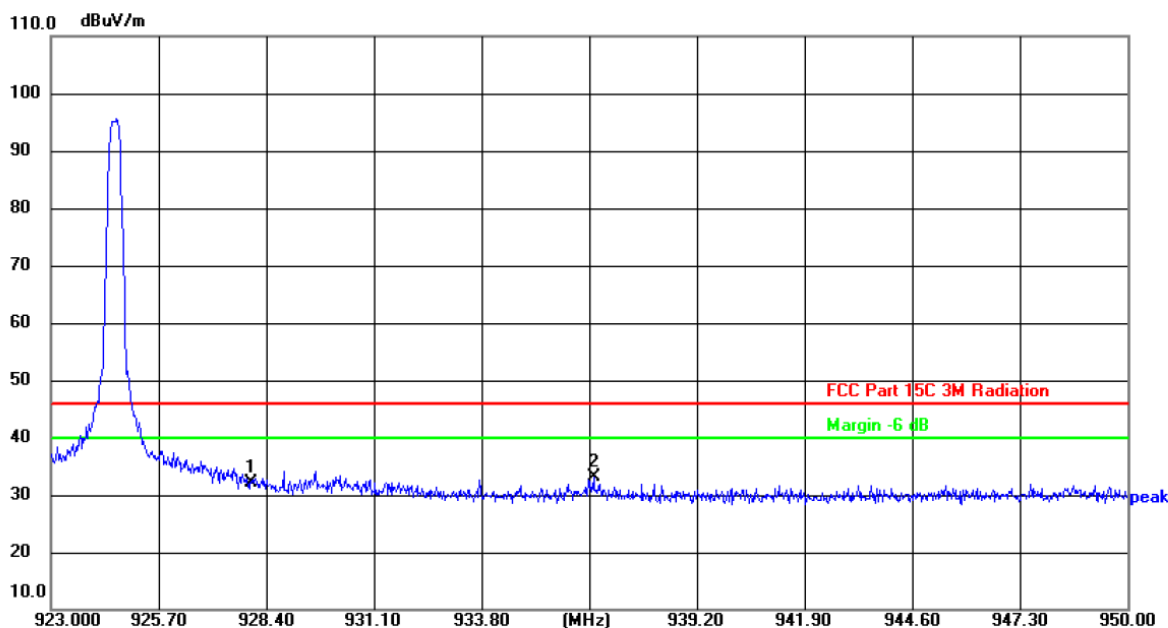
Limit: FCC Part 15C 3M Radiation

Power: AC 120 V/60 Hz

Humidity: 52 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	928.0000	34.12	-2.78	31.34	46.00	-14.66	peak	P	
2 *	936.5000	35.83	-2.60	33.23	46.00	-12.77	peak	P	

Vertical:



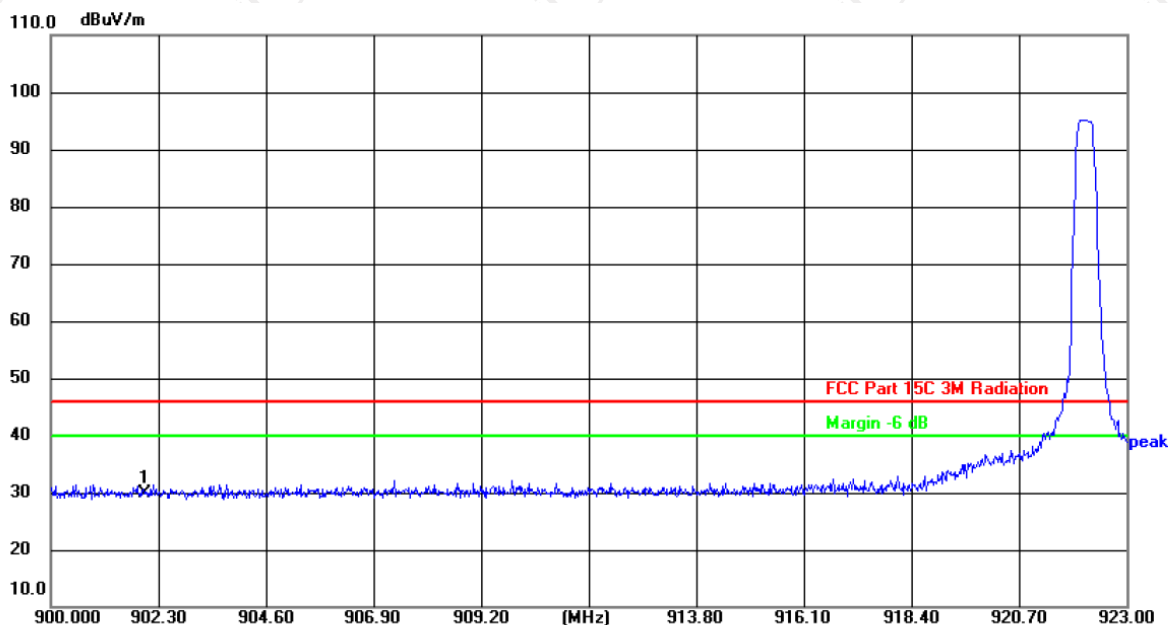
Site: Polarization: **Vertical** Temperature: 24(°C)
 Limit: FCC Part 15C 3M Radiation Power: AC 120 V/60 Hz Humidity: 52 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	928.0000	34.93	-2.78	32.15	46.00	-13.85	peak	P	
2 *	936.6079	35.79	-2.59	33.20	46.00	-12.80	peak	P	

LoRa(DIY frequencies) AS923- 250K

Lowest channel 921.8:

Horizontal:



Site

Polarization: **Horizontal**

Temperature: 24(°C)

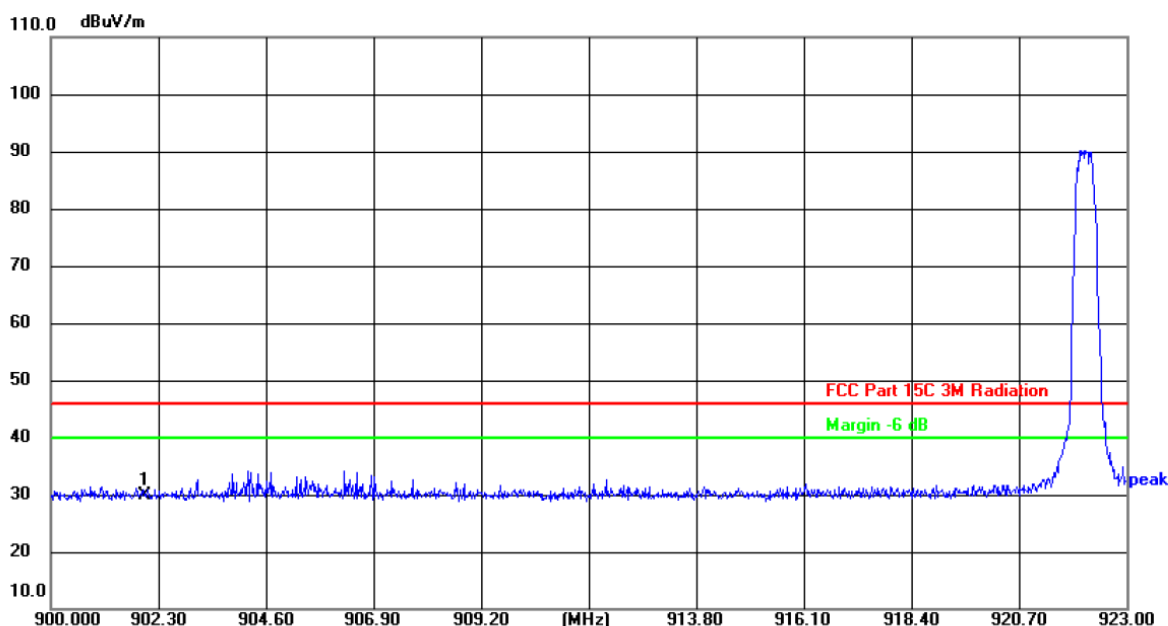
Limit: FCC Part 15C 3M Radiation

Power: AC 120 V/60 Hz

Humidity: 52 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 *	902.0000	33.02	-3.16	29.86	46.00	-16.14	peak	P	

Vertical:



Site

Polarization: **Vertical**

Temperature: 24(°C)

Limit: FCC Part 15C 3M Radiation

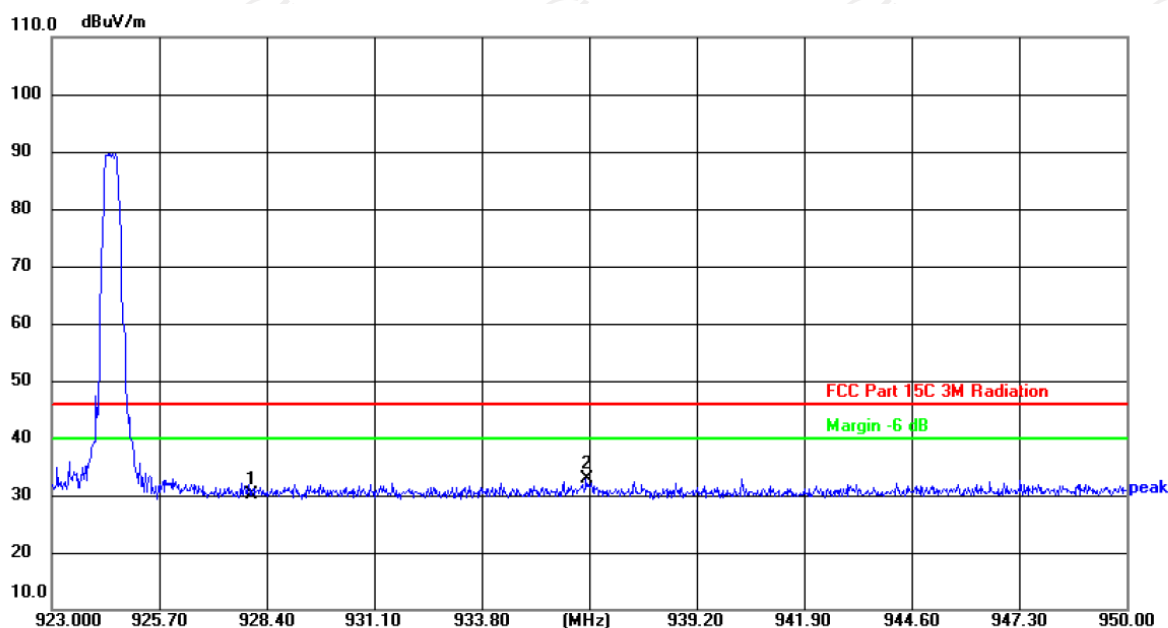
Power: AC 120 V/60 Hz

Humidity: 52 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 *	902.0000	33.04	-3.16	29.88	46.00	-16.12	peak	P	

Highest channel 924.5:

Horizontal:



Site

Polarization: **Horizontal**

Temperature: 24(°C)

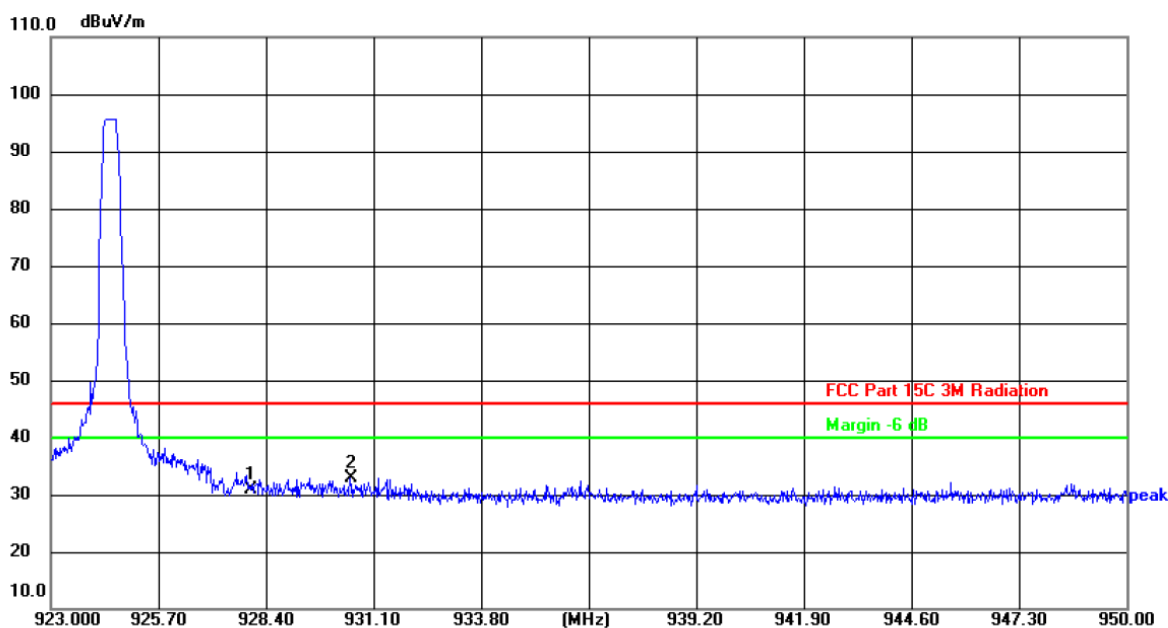
Limit: FCC Part 15C 3M Radiation

Power: AC 120 V/60 Hz

Humidity: 52 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	928.0000	32.93	-2.78	30.15	46.00	-15.85	peak	P	
2 *	936.4190	35.47	-2.60	32.87	46.00	-13.13	peak	P	

Vertical:



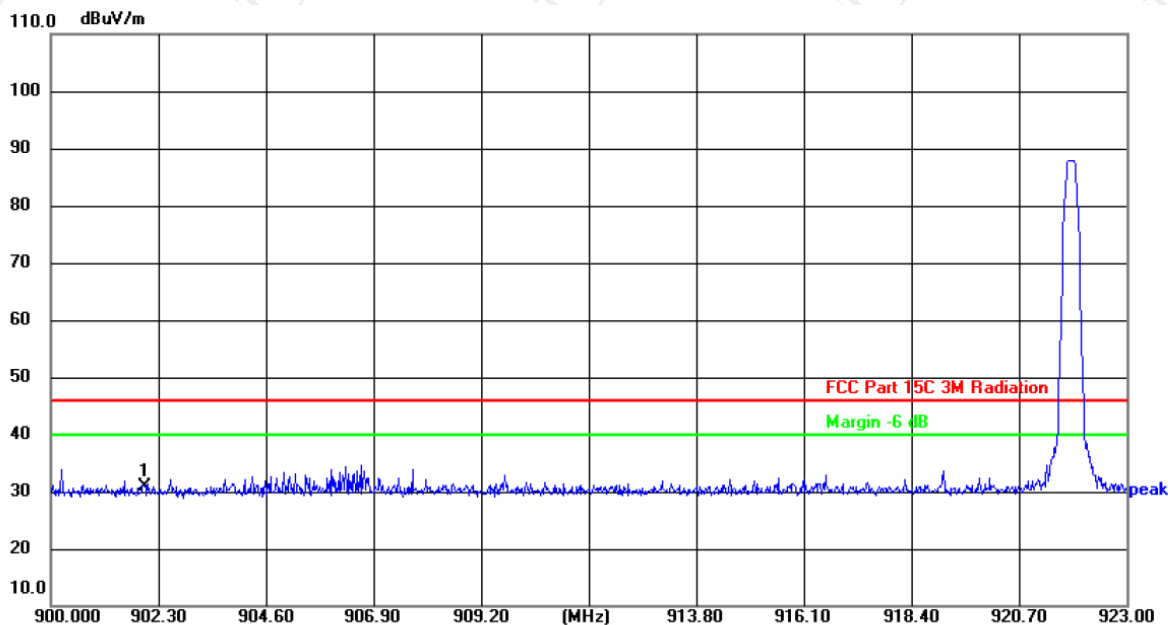
Site: Polarization: **Vertical** Temperature: 24(°C)
 Limit: FCC Part 15C 3M Radiation Power: AC 120 V/60 Hz Humidity: 52 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	928.0000	33.60	-2.78	30.82	46.00	-15.18	peak	P	
2 *	930.5060	35.64	-2.72	32.92	46.00	-13.08	peak	P	

LoRa(DIY frequencies) AS923- FSK

Lowest channel 921.8:

Horizontal:



Site

Polarization: **Horizontal**

Temperature: 24(°C)

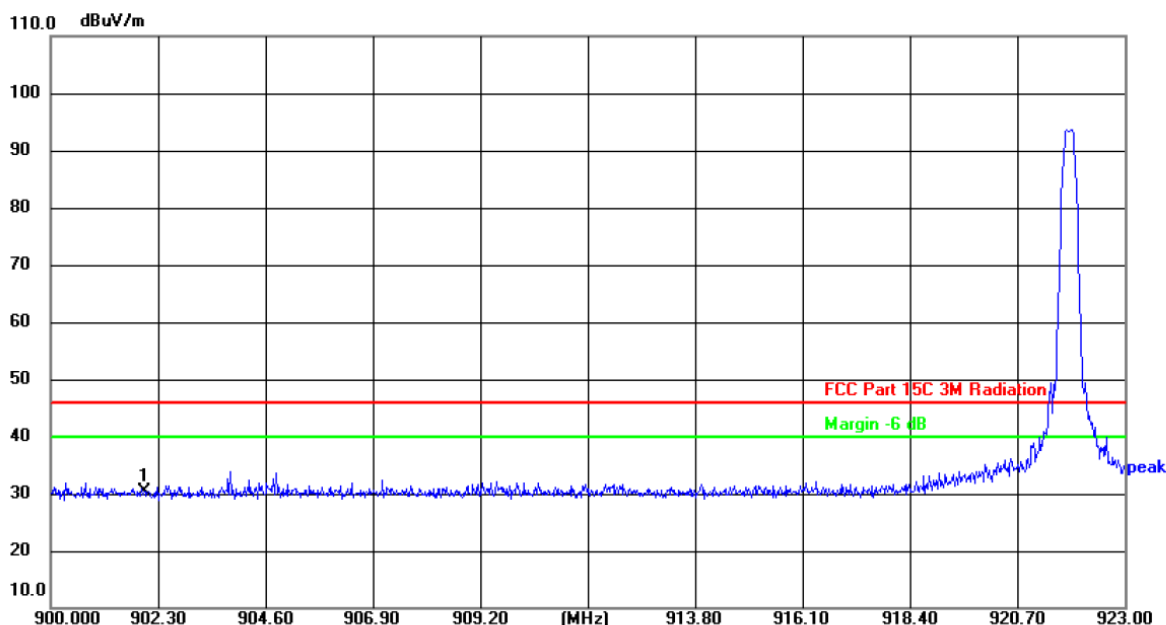
Limit: FCC Part 15C 3M Radiation

Power: AC 120 V/60 Hz

Humidity: 52 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 *	902.0000	33.97	-3.16	30.81	46.00	-15.19	peak	P	

Vertical:



Site

Polarization: **Vertical**

Temperature: 24(°C)

Limit: FCC Part 15C 3M Radiation

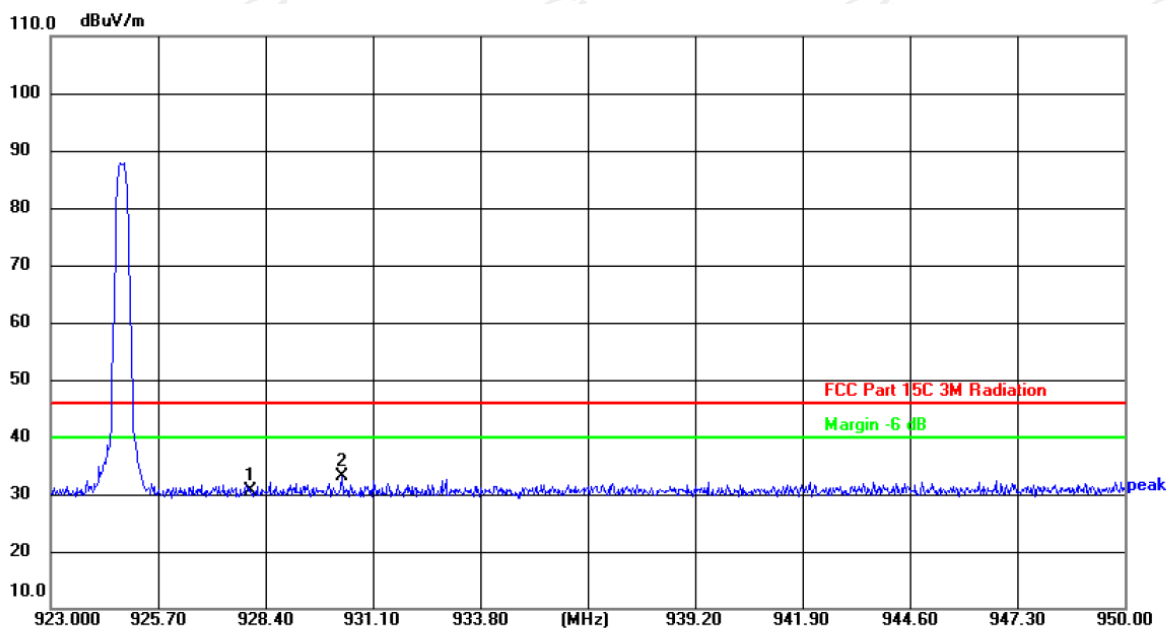
Power: AC 120 V/60 Hz

Humidity: 52 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 *	902.0000	33.47	-3.16	30.31	46.00	-15.69	peak	P	

Highest channel 924.8:

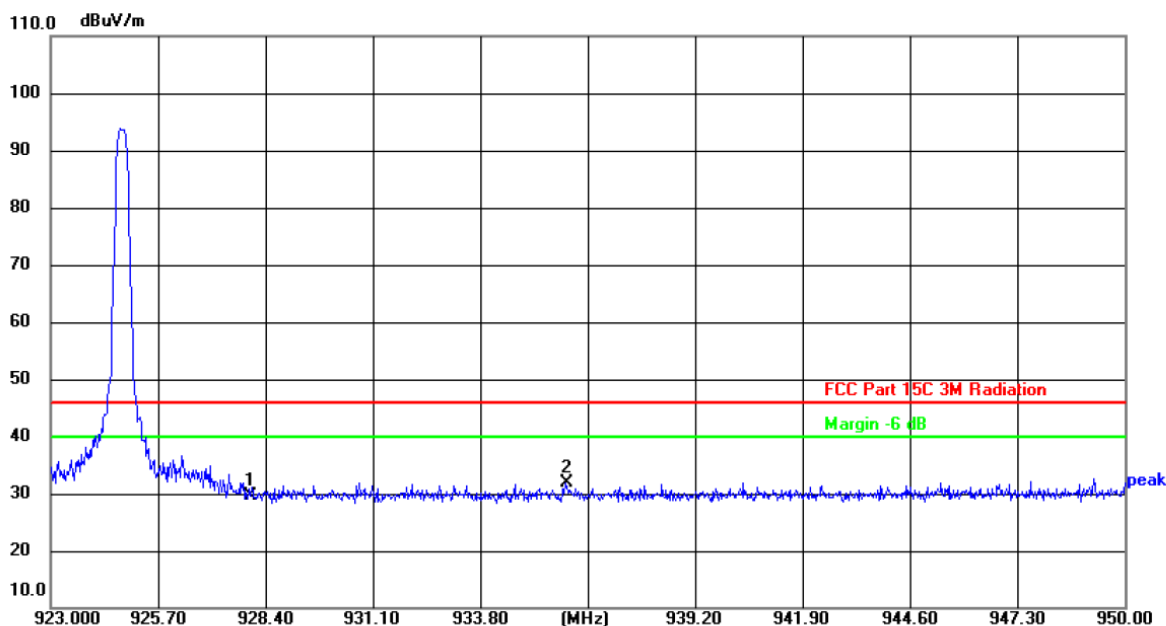
Horizontal:



Site: Polarization: **Horizontal** Temperature: 24(°C)
 Limit: FCC Part 15C 3M Radiation Power: AC 120 V/60 Hz Humidity: 52 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	928.0000	33.52	-2.78	30.74	46.00	-15.26	peak	P	
2 *	930.3170	35.94	-2.73	33.21	46.00	-12.79	peak	P	

Vertical:



Site: Polarization: **Vertical** Temperature: 24(°C)
 Limit: FCC Part 15C 3M Radiation Power: AC 120 V/60 Hz Humidity: 52 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	928.0000	32.30	-2.78	29.52	46.00	-16.48	peak	P	
2 *	935.9330	34.52	-2.61	31.91	46.00	-14.09	peak	P	

5.4. 20dB Occupied Bandwidth

5.4.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.215(c)
Test Method:	ANSI C63.10:2013
Limit:	N/A
	1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Use the following spectrum analyzer settings for 20dB Bandwidth measurement. Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel; RBW$\geq$1% of the 20 dB bandwidth; VBW$\geq$RBW; Sweep = auto; Detector function = peak; Trace = max hold. 4. Measure and record the results in the test report.
Test setup:	 The diagram illustrates the test setup. On the left is a green Spectrum Analyzer with a screen and two knobs. A cable connects it to a yellow rectangular box on the right labeled 'EUT'.
Test Mode:	Transmitting mode with modulation
Test results:	PASS

5.4.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSU	200054	Jul. 18, 2022

5.4.3. Test data

LoRa(DIY frequencies) AS923- 125K

Test Channel	20dB Occupy Bandwidth (kHz)	Limit	Conclusion
922.0MHz	136.5	---	PASS
923.2MHz	136.8	---	PASS
924.6MHz	133.3	---	PASS

LoRa(DIY frequencies) AS923- 250K

Test Channel	20dB Occupy Bandwidth (kHz)	Limit	Conclusion
921.8MHz	273.9	---	PASS
923.0MHz	269.7	---	PASS
924.5MHz	270.4	---	PASS

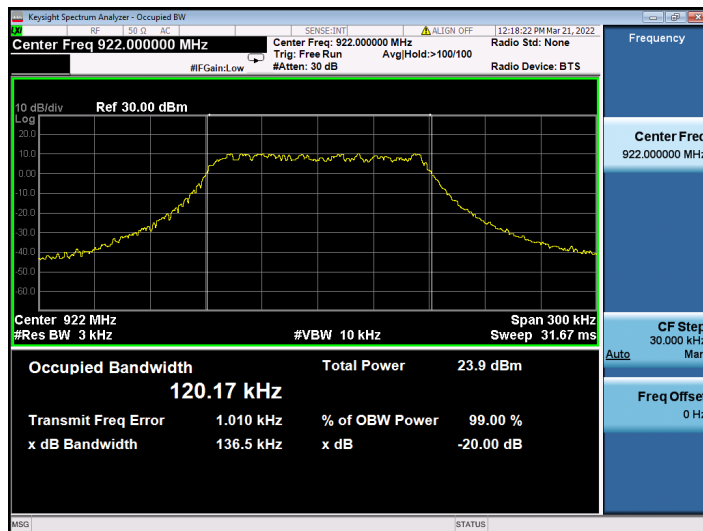
LoRa(DIY frequencies) AS923- FSK

Test Channel	20dB Occupy Bandwidth (kHz)	Limit	Conclusion
921.8MHz	154.1	---	PASS
923.2MHz	154.0	---	PASS
924.8MHz	153.8	---	PASS

Test plots as follows:

LoRa(DIY frequencies) AS923- 125K

Lowest channel



Middle channel

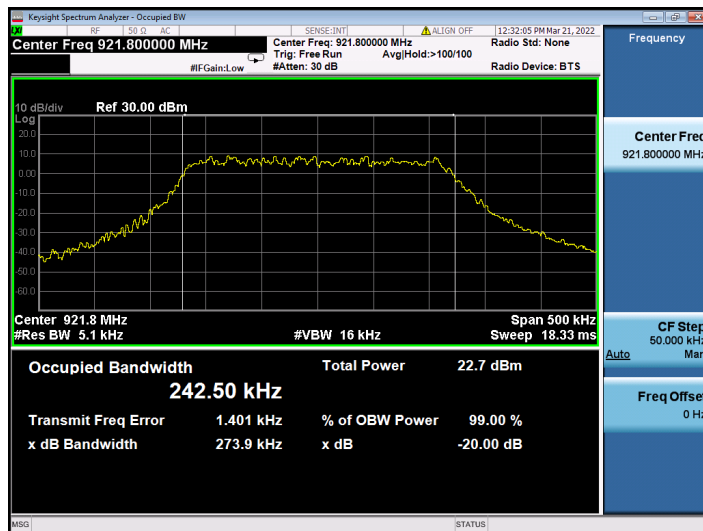


Highest channel

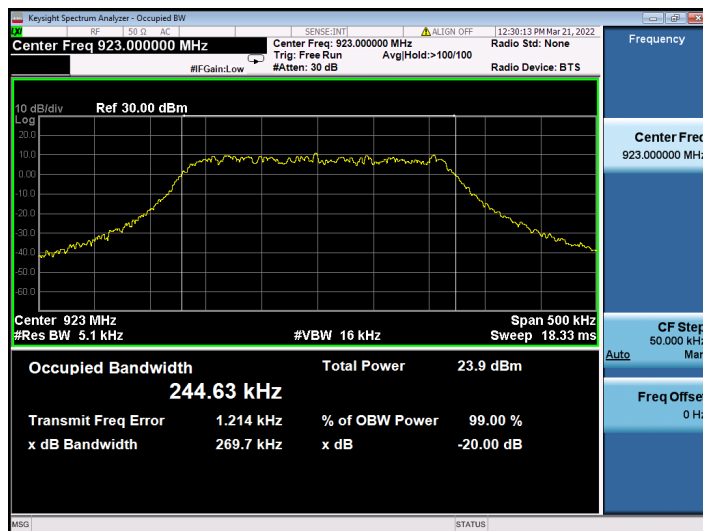


LoRa(DIY frequencies) AS923- 250K

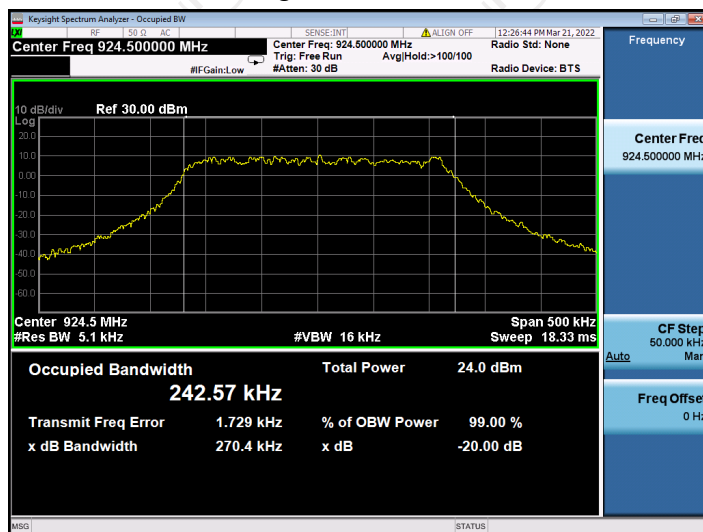
Lowest channel



Middle channel

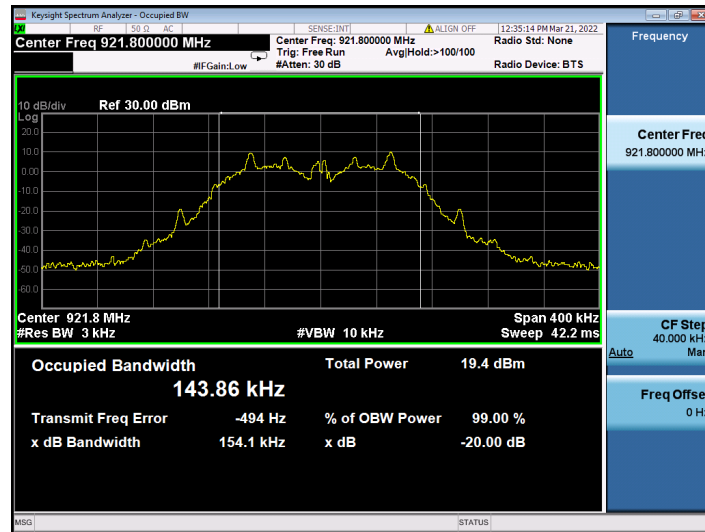


Highest channel

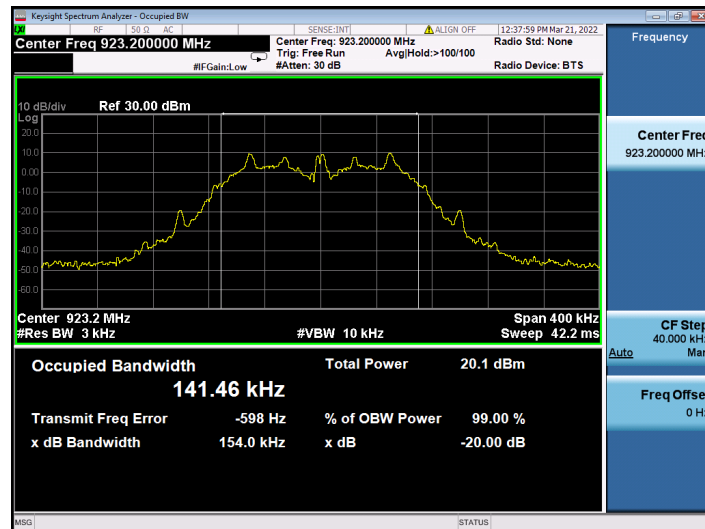


LoRa(DIY frequencies) AS923- FSK

Lowest channel



Middle channel



Highest channel



Appendix A: Photographs of Test Setup

Refer to the test report No. TCT220228E901

Appendix B: Photographs of EUT

Refer to the test report No. TCT220228E901

*******END OF REPORT*******