



FCC CERTIFICATION TEST REPORT

Applicant	:	Tenetics, LLC
Address of Applicant	:	8630 Guilford Road, Suite M #108, Columbia, MD 21046 USA
Manufacturer	:	Tenetics, LLC
Address of Manufacturer	:	8630 Guilford Road, Suite M #108, Columbia, MD 21046 USA
Equipment under Test	:	wireless internet gateway
Model No.	:	GW3
FCC ID	:	2AA6Q-GW3
Test Standard(s)	:	FCC Rules and Regulations Part 15 Subpart C, ANSI C63.10:2013
Report No.	:	DDT-RE24092616-2E04
Issue Date	:	2025/01/07
Issue By	:	Guangdong Dongdian Testing Service Co., Ltd. Unit 2, Building 1, No. 17, Zongbu 2nd Road, Songshan Lake Park, Dongguan, Guangdong, China, 523808

REPORT

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Test Report Declare

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Equipment under Test	:	wireless internet gateway
Model No.	:	GW3
Manufacturer	:	Tenetics, LLC
Address of Manufacturer	:	8630 Guilford Road, Suite M #108, Columbia, MD 21046 USA

Test Standard Used:
FCC Rules and Regulations Part 15 Subpart C,
ANSI C63.10:2013

We Declare:
The equipment described above is tested by Guangdong Dongdian Testing Service Co., Ltd. and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Guangdong Dongdian Testing Service Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

Report No.:	DDT-RE24092616-2E04		
Date of Receipt:	2024/12/04	Date of Test:	2024/12/04 - 2025/01/07

Prepared By:

Tiger Mo

Tiger Mo/Engineer

Approved By:

Damon Hu

Damon Hu/EMC Manager

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Guangdong Dongdian Testing Service Co., Ltd.

Revision History

Rev.	Revisions	Issue Date	Revised By
---	Initial issue	2025/01/07	

1. Summary of Test Results

No.	Test Parameter	Clause No.	Condition	Result
1	6 dB Bandwidth and 99% Bandwidth	FCC Part 15: 15.247(a)(2)	/	Pass
2	Peak Output Power	FCC Part 15: 15.247(b)(3)	/	Pass
3	Power Spectral Density	FCC Part 15:15.247(e)	/	Pass
4	RF Conducted Spurious Emissions	FCC Part 15: 15.247(d)	/	Pass
5	Radiated Emission	FCC Part 15: 15.205, FCC Part 15: 15.209, FCC Part 15: 15.247(d)	/	Pass
6	Band Edge Compliance	FCC Part 15: 15.205, FCC Part 15: 15.209, FCC Part 15: 15.247(d)	/	Pass
7	Antenna Requirement	FCC Part 15: 15.203	/	Pass
8	Power Line Conducted Emissions	FCC Part 15: 15.207(a)	/	Pass
Note: N/A is an abbreviation for Not Applicable, and means this item is not applicable for this device or no need to test according to standard.				

2. General Test Information

2.1. Description of EUT

EUT Name	: wireless internet gateway
Model Number	: GW3
EUT Function Description	: Please reference user manual of this device
Power Supply	: DC 12V power by external adapter or solar panel or a built in 6V sealed lead-acid battery.
Antenna Type	: Internal printed meandered inverted F antenna, : External Ziiisor 3dBi omni-directional antenna, : External Laird FG0293 5dBi omni-directional antenna
Max Antenna Gain(dBi)	: Internal printed meandered inverted F antenna, Max Gain 2.54dBi : External Ziiisor 3dBi omni-directional antenna, Max Gain 3dBi : External Laird FG0293 5dBi omni-directional antenna, Max Gain 5dBi

Operation Frequency	: 903MHz-914.2MHz
Modulation	: LoRa/CSS

Channel information	
Channel	Frequency (MHz)
0	903.0
1	904.6
2	906.2
3	907.8
4	909.4
5	911.0
6	912.6
7	914.2

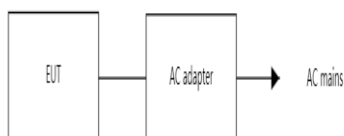
Note: The above EUT information is declared by manufacturer and for more detailed features description please refer to the manufacturer's specifications or User's Manual. The above Antenna information is declared by manufacturer and for more detailed features description please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

“☑” means to be chosen or applicable; “☐” means don't to be chosen or not applicable; This note applies to entire report.

2.2. Accessories of EUT

Accessories	Manufacturer	Model number	Description
Adapter	NetBlit	NBS40C1203 00VU	Input: 100-240V~ 50/60Hz 1.0A Output: 12.0=V3.0A
Solar panel	Zhiwang Energy	ZW-145145- 12V	/
Rechargeable Soeled Lead Acx, Batory	Powersonic	PS-640F1	Cycle use:DC 7.20-7.50V Standby use: DC 6.75-6.90V

2.3. Block diagram of EUT configuration for test



2.4. Decision of final test mode

According pre-test, the worst test modes were reported as below:

Test software: putty.exe

The test software was used to control EUT work in Continuous Tx mode, and select test channel, wireless mode as below table:

The pathloss of external cable: 0.5dB (According to the manufacturer's claims)

Tested mode, channel, information			
Mode	Setting Tx Power	Channel	Frequency (MHz)
LoRa/CSS	Default	CH0	903
	Default	CH3	907.8
	Default	CH7	914.2

2.5. Deviations of test standard

No deviation.

2.6. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature range:	+15°C to +35 °C
Humidity range:	20% to 75%
Pressure range:	86 kPa to106 kPa

Note: The specific temperature and humidity information of each test item refers to the temperature and humidity record in the corresponding test data.

2.7. Test laboratory

Guangdong Dongdian Testing Service Co., Ltd.

Add.: Unit 2, Building 1, No. 17, Zongbu 2nd Road, Songshan Lake Park, Dongguan, Guangdong, China, 523808.

Tel.: +86-0769-38826678, <http://www.dgddt.com>, Email: ddt@dgddt.com.

CNAS Accreditation No. L6451; A2LA Accreditation Number: 3870.01

FCC Designation Number: CN1182, Test Firm Registration Number: 540522

Innovation, Science and Economic Development Canada Site Registration Number: 10288A

Conformity Assessment Body identifier: CN0048

VCCI facility registration number: C-20087, T-20088, R-20123, R-20155, G-20118

2.8. Measurement uncertainty

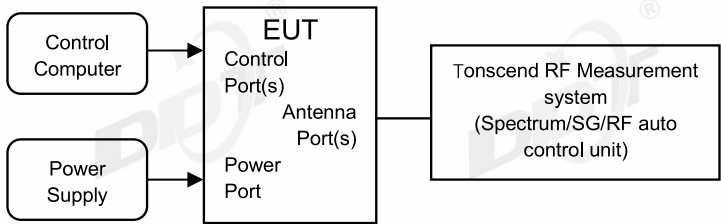
Test Item	Uncertainty
Bandwidth	1.1%
Peak Output Power (Conducted) (Spectrum analyzer)	0.86 dB ($10 \text{ MHz} \leq f < 3.6 \text{ GHz}$);
	1.38 dB ($3.6 \text{ GHz} \leq f < 8 \text{ GHz}$)
Peak Output Power (Conducted) (Power Sensor)	0.74 dB
Power Spectral Density	0.74 dB ($10 \text{ MHz} \leq f < 3.6 \text{ GHz}$);
	1.38 dB ($3.6 \text{ GHz} \leq f < 8 \text{ GHz}$)
Frequencies Stability	6.7×10^{-8} (Antenna couple method)
	5.5×10^{-8} (Conducted method)
Conducted spurious emissions	0.86 dB ($10 \text{ MHz} \leq f < 3.6 \text{ GHz}$);
	1.40 dB ($3.6 \text{ GHz} \leq f < 8 \text{ GHz}$)
	1.66 dB ($8 \text{ GHz} \leq f < 26.5 \text{ GHz}$)
Uncertainty for radio frequency (RBW < 20 kHz)	3×10^{-8}
Temperature	0.4 °C
Humidity	2 %
Uncertainty for Radiation Emission test (9 kHz – 30 MHz)	3.44 dB
Uncertainty for Radiation Emission test (30 MHz - 1 GHz)	4.70 dB (Antenna Polarize: V)
	4.84 dB (Antenna Polarize: H)
Uncertainty for Radiation Emission test (1 GHz - 40 GHz)	4.10 dB (1 - 6 GHz)
	4.40 dB (6 GHz - 18 GHz)
	3.54 dB (18 GHz - 26 GHz)
	4.30 dB (26 GHz - 40 GHz)
Uncertainty for Power line conduction emission test	3.34dB (150KHz-30MHz)
	3.72dB (9KHz-150KHz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

3. Equipment Used During Conductive Test

Equipment	Manufacturer	Model No.	Serial Number	Due Date
☑RF Connected Test (RF Measurement System 4#)				
Signal &Spectrum Analyzer	R&S	FSV3044	101173	2025/03/31
Wideband Radio Communication Tester	R&S	CMW500	168801	2025/03/31
MXG Vector Signal Generator	Agilent	N5182A	MY48180737	2025/03/31
PSG Vector Signal Generator	Agilent	E8267D	US49060192	2025/08/25
RF Control Unit	Tonsend	JS0806-2	2118060485	2025/03/31
TEMP&HUMI Programmable Chamber	ZHIXIANG	ZXGDJS-150L	ZX170110-A	2025/04/22
Test Software	Tonscend	JS1120-3	Ver.3.2.22	N/A

4. 6dB Bandwidth

4.1. Block diagram of test setup



4.2. Limits

For direct sequence systems, the minimum 6 dB bandwidth shall be at least 500 kHz

4.3. Test procedure

- (1) The test according to ANSI C63.10-2013 clause 11.8.
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable, the path loss was compensated to the results
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously
- (4) Use the following spectrum analyzer settings for 6 dB Bandwidth:
 - RBW: 100 kHz
 - VBW: $\geq [3 \times \text{RBW}]$
 - Detector Mode: peak
 - Sweep time: auto
 - Trace mode max hold

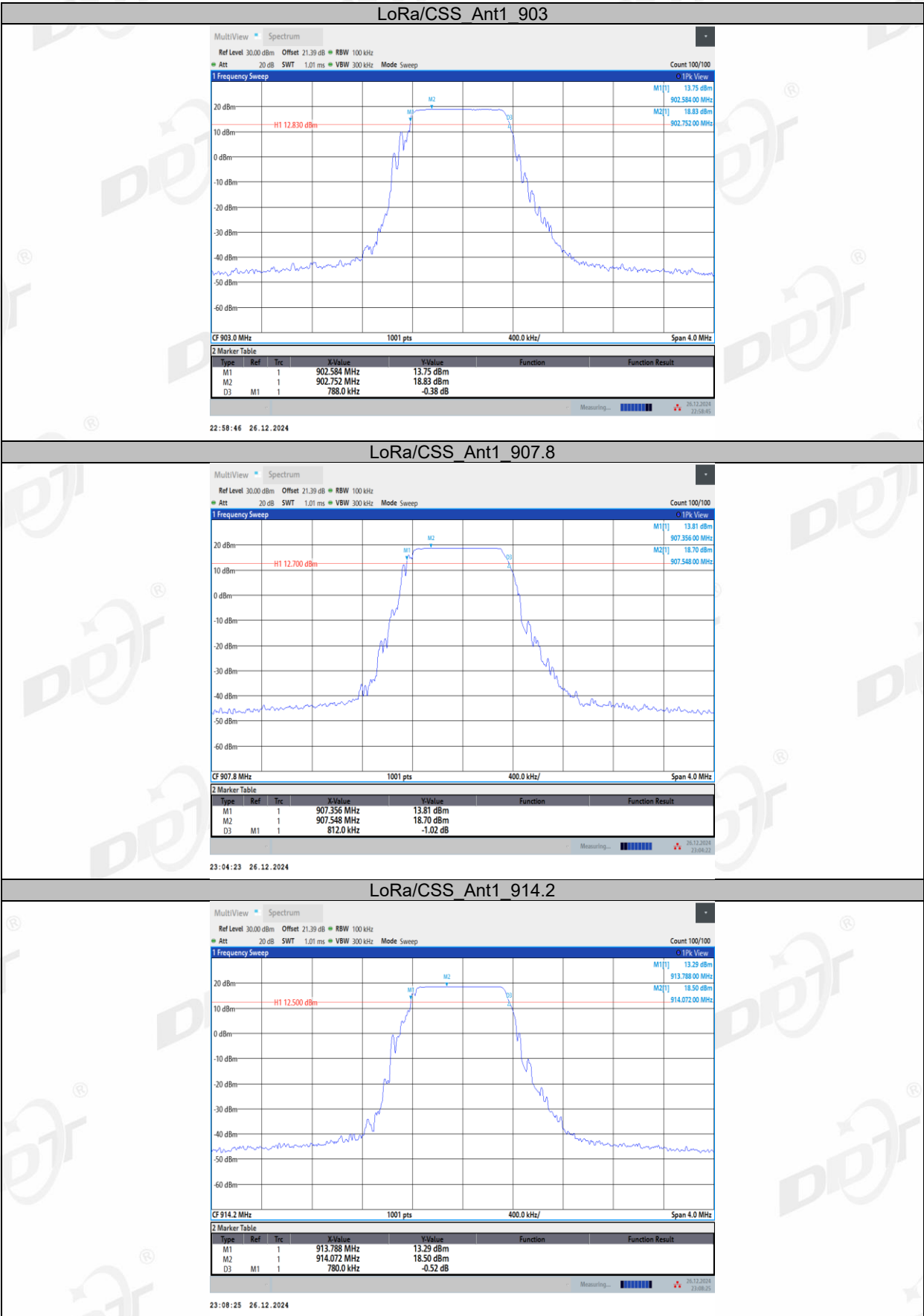
Allow the trace to stabilize, measure the 6 dB bandwidth of signal, and record the results in the report

4.4. Test result

Test Engineer:	Haofeng	Test Site:	RF Measurement System 4#
Ambient Condition:	23.6℃,42.3%RH	Test Date:	2024.12.26-2024.12.27
Test Power Supply:	DC 12V	Sample Number:	S24092616-001

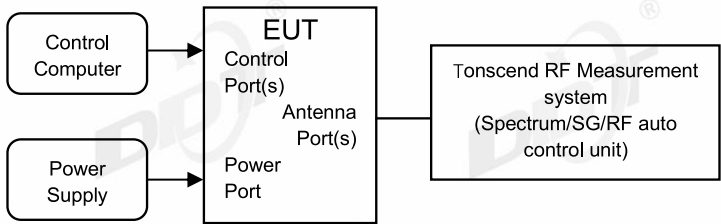
Test Mode	Antenna	Frequency [MHz]	DTS BW [MHz]	FL [MHz]	FH [MHz]	Limit [MHz]	Verdict
LoRa/CS S	Ant1	903	0.79	902.58	903.37	0.5	PASS
		907.8	0.81	907.36	908.17	0.5	PASS
		914.2	0.78	913.79	914.57	0.5	PASS

4.5. Test graphs



5. 99% Bandwidth

5.1. Block diagram of test setup



5.2. Limits

Just for Report.

5.3. Test procedure

- (1) The test according to ANSI C63.10-2013 clause 6.9.3.
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable, the path loss was compensated to the results
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously
- (4) Use the following spectrum analyzer settings for the 99% Bandwidth:
 - RBW: 1% to 5% of the OBW
 - VBW: approximately three times RBW
 - Span: between 1.5 times and 5.0 times the OBW
 - Detector Mode: peak
 - Sweep time: auto
 - Trace mode max hold

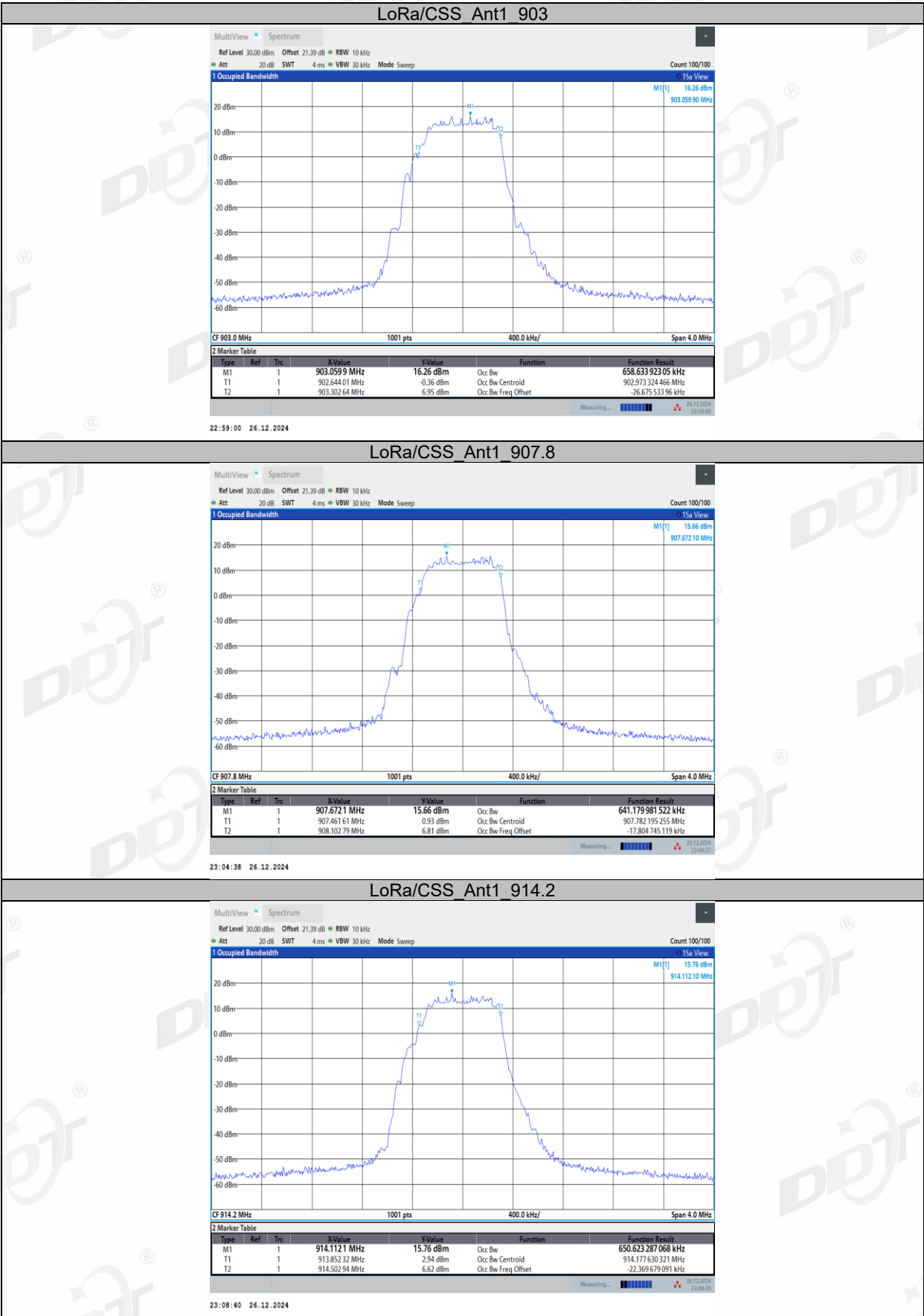
Allow the trace to stabilize, measure the 99% bandwidth of signal, and record the results in the report.

5.4. Test result

Test Engineer:	Haofeng	Test Site:	RF Measurement System 4#
Ambient Condition:	23.6℃,42.3%RH	Test Date:	2024.12.26-2024.12.27
Test Power Supply:	DC 12V	Sample Number:	S24092616-001

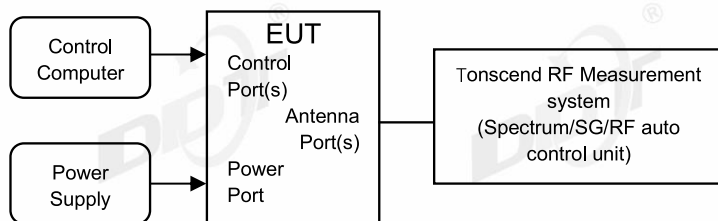
TestMode	Antenna	Channel Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
LoRa/CSS	Ant1	903	0.659	902.6440	903.3026	---	---
		907.8	0.641	907.4616	908.1028	---	---
		914.2	0.651	913.8523	914.5029	---	---

5.5. Test graphs



6. Conducted Output Power

6.1. Block diagram of test setup



6.2. Limits

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

6.3. Test procedure

- (1) The test according to ANSI C63.10-2013 clause 11.9.2.3.
- (2) Connect EUT's antenna output to RF power meter by RF cable, the path loss was compensated to the results.
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously, If the transmitter does not transmit continuously, measure the duty cycle, D, of the transmitter output signal.
- (4) Measure the average power of the transmitter. This measurement is an average over both the ON and OFF periods of the transmitter.
- (5) Adjust the measurement in dBm by adding $[10 \log (1 / D)]$, where D is the duty cycle.
- (6) Record the RF average power of each antenna port.

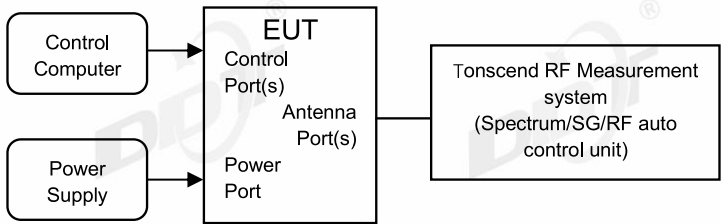
6.4. Test result average

Test Engineer:	Haofeng	Test Site:	RF Measurement System 4#
Ambient Condition:	23.6℃,42.3%RH	Test Date:	2024.12.26-2024.12.27
Test Power Supply:	DC 12V	Sample Number:	S24092616-001

Test Mode	Antenna	Frequency [MHz]	Average power [dBm]	Duty Cycle [%]	DC Factor [dB]	Result [dBm]	Limit [dBm]	Verdict
LoRa/CSS	Ant1	903	18.11	100.00	0.00	18.11	≤30.00	PASS
		907.8	18.08	100.00	0.00	18.08	≤30.00	PASS
		914.2	18.05	100.00	0.00	18.05	≤30.00	PASS

7. Power Spectral Density

7.1. Block diagram of test setup



7.2. Limits

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

7.3. Test procedure

- (1) The test according to ANSI C63.10-2013 clause 11.10.5.
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable, the path loss was compensated to the results.
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously.
- (4) Use the following spectrum analyzer settings for Power Spectral Density measurement:

Center frequency	DTS Channel center frequency
RBW:	$3\text{ kHz} \leq \text{RBW} \leq 100\text{ kHz}$
VBW:	$\geq 3\text{RBW}$
Span	1.5 times the DTS bandwidth
Detector Mode:	RMS
Sweep time:	auto
Trace mode	max hold
	Employ trace averaging (rms)
Trace	mode over a minimum of 100 traces.

- (5) Add $[10 \log (1 / D)]$, where D is the duty cycle measured in step a), to the measured PSD to compute the average PSD during the actual transmission time.
If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

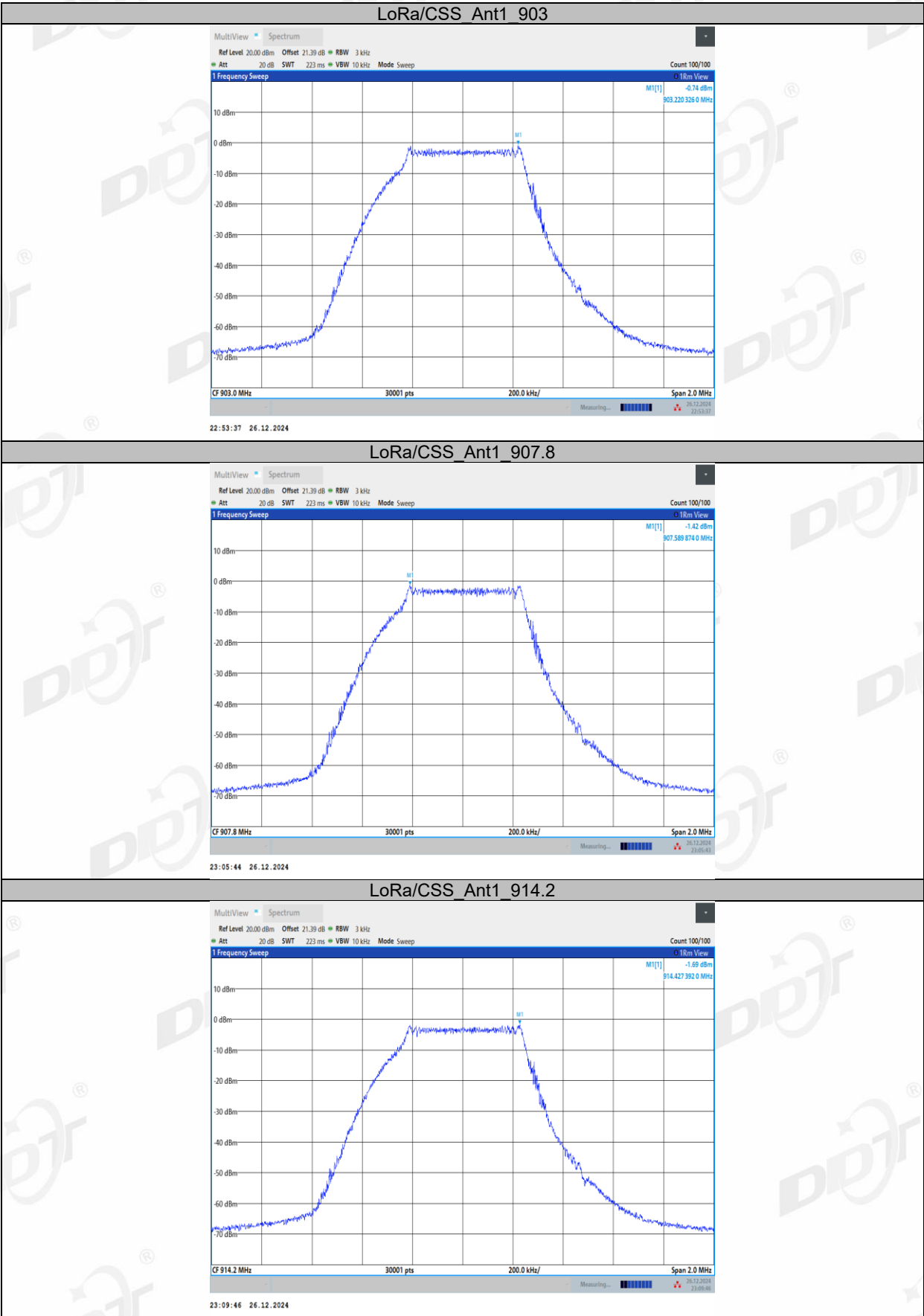
7.4. Test result

Test Engineer:	Haofeng	Test Site:	RF Measurement System 4#
Ambient Condition:	23.6℃,42.3%RH	Test Date:	2024.12.26-2024.12.27
Test Power Supply:	DC 12V	Sample Number:	S24092616-001

Test Mode	Antenna	Frequency [MHz]	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
LoRa/CSS	Ant1	903	-0.74	≤8.00	PASS
		907.8	-1.42	≤8.00	PASS
		914.2	-1.69	≤8.00	PASS

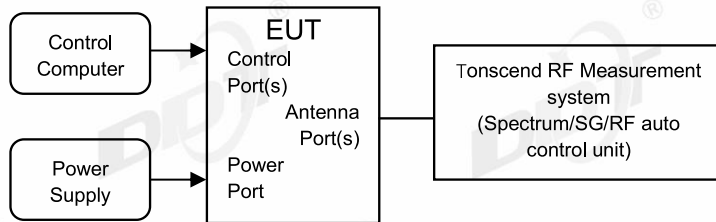
Note: The Duty Cycle Factor is compensated in the graph.

7.5. Test graphs



8. Band Edge Compliance (Conducted Method)

8.1. Block diagram of test setup



8.2. Limits

In any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

8.3. Test procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

(2) Establish a reference level by using the following procedure:

RBW:	100 kHz
VBW:	300 kHz
Span	Encompass frequency range to be measured
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

(3) Allow the trace to stabilize, use the peak marker function to determine the maximum peak power level to establish the reference level.

Then mark the maximum amplitude of all unwanted emissions outside of the authorized frequency band.

8.4. Test result

Test Engineer:	Haofeng	Test Site:	RF Measurement System 4#
Ambient Condition:	23.6℃,42.3%RH	Test Date:	2024.12.26-2024.12.27
Test Power Supply:	DC 12V	Sample Number:	S24092616-001

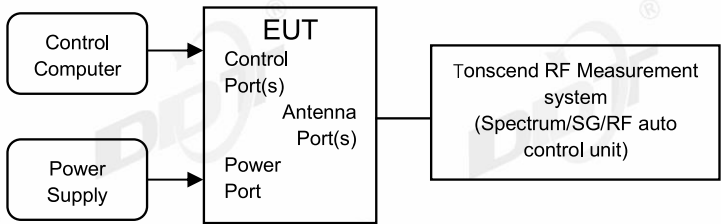
EUT Set Mode	CH or Frequency	Result(dBm)
LoRa/CSS	CH0	Pass
	CH7	Pass

8.5. Test graphs



9. RF Conducted Spurious Emissions

9.1. Block diagram of test setup



9.2. Limits

In any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

9.3. Test procedure

- Connect EUT's antenna output to spectrum analyzer by RF cable.
- Establish a reference level by using the following procedure:

Center frequency	Test frequency
RBW:	100 kHz
VBW:	300 kHz
Span	Wide enough to capture the peak level of the in-band emission
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold
- Allow the trace to stabilize, use the peak marker function to determine the maximum peak power level to establish the reference level.
- Set the spectrum analyzer as follows:

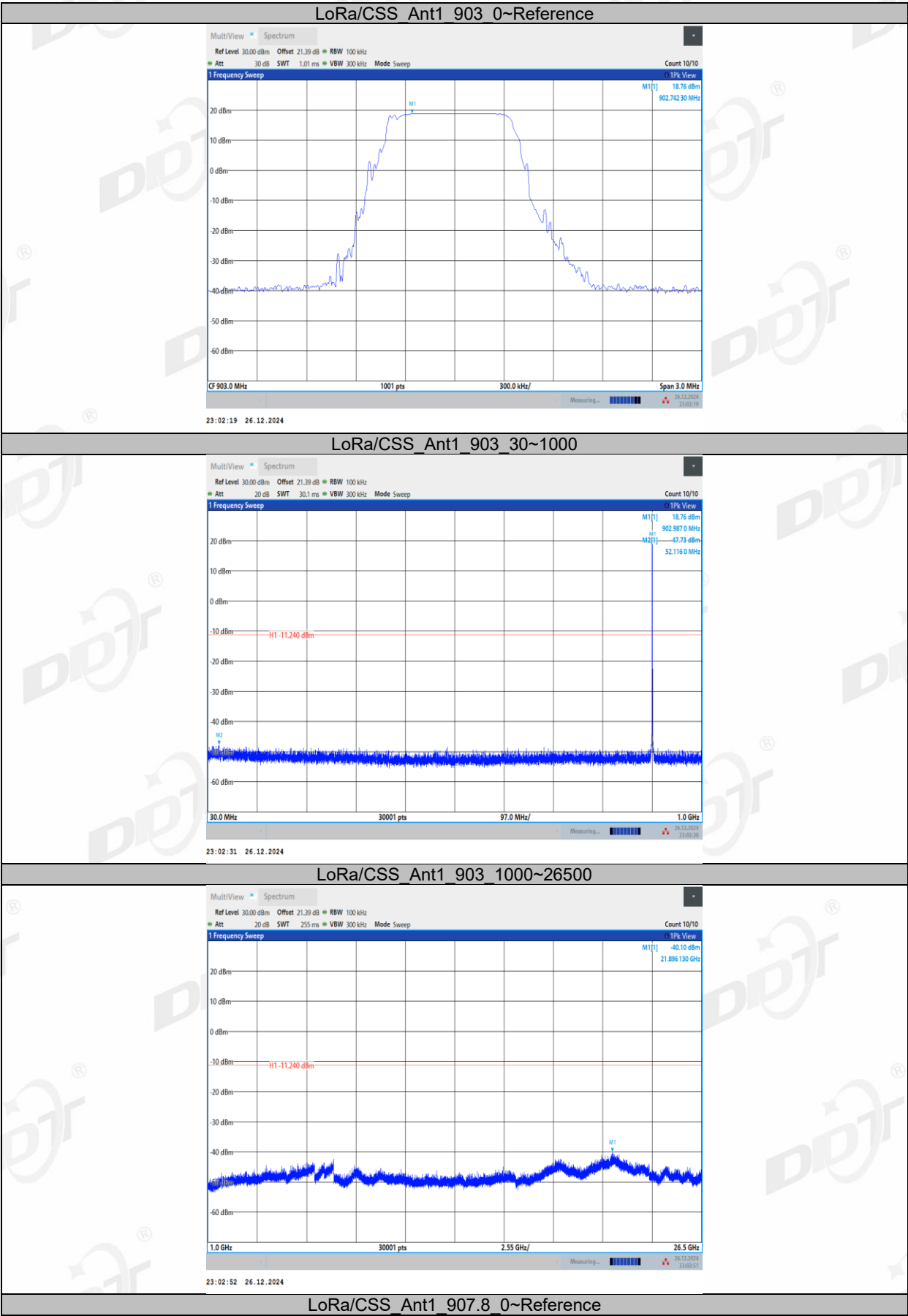
RBW:	100 kHz
VBW:	300 kHz
Span	Encompass frequency range to be measured
Number of measurement points	$\geq \text{Span/RBW}$
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

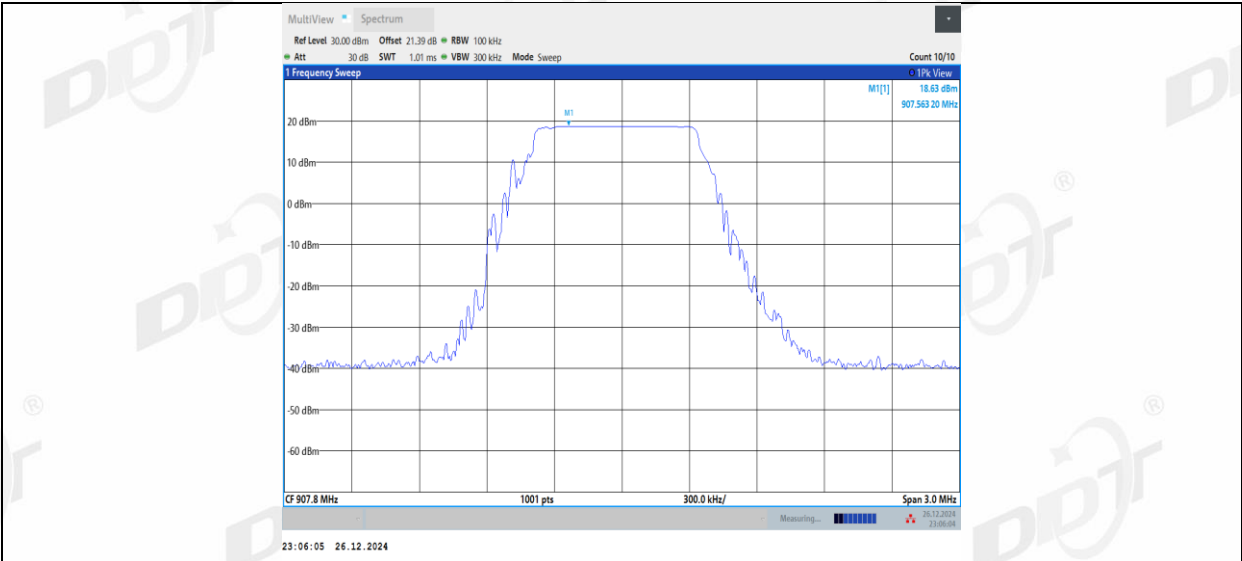
- (5) Allow the trace to stabilize, use the peak marker function to determine the maximum amplitude of all unwanted emissions outside of the authorized frequency band

9.4. Test result

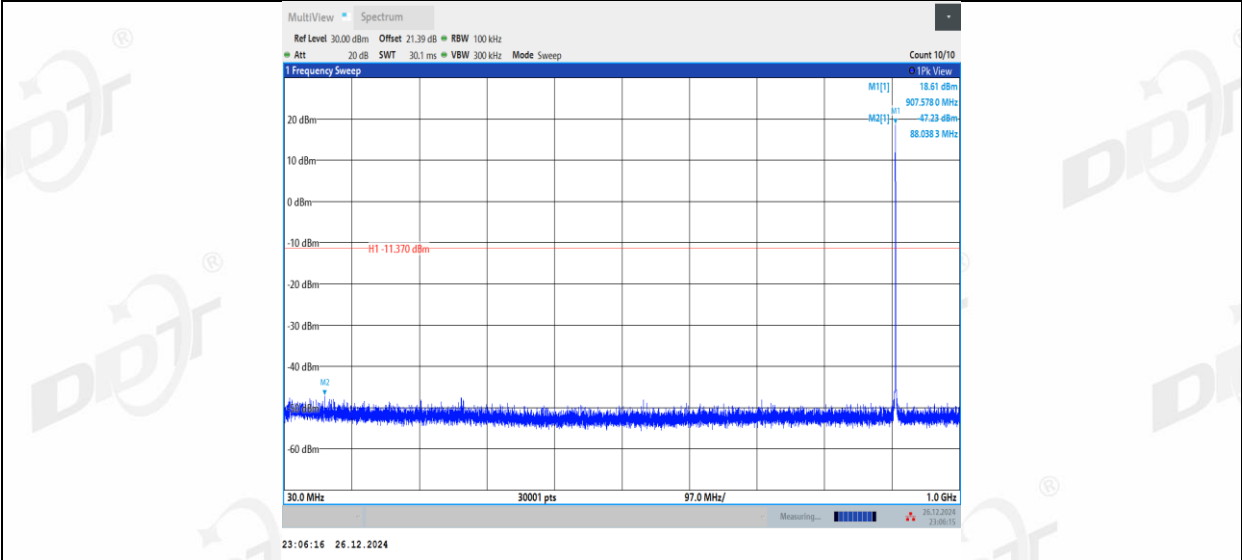
Test Engineer:	Haofeng	Test Site:	RF Measurement System 4#
Ambient Condition:	23.6℃,42.3%RH	Test Date:	2024.12.26-2024.12.27
Test Power Supply:	DC 12V	Sample Number:	S24092616-001
EUT Set Mode	CH or Frequency		Result(dBm)
LoRa/CSS	CH0		Pass
	CH7		Pass

9.5. Test graphs

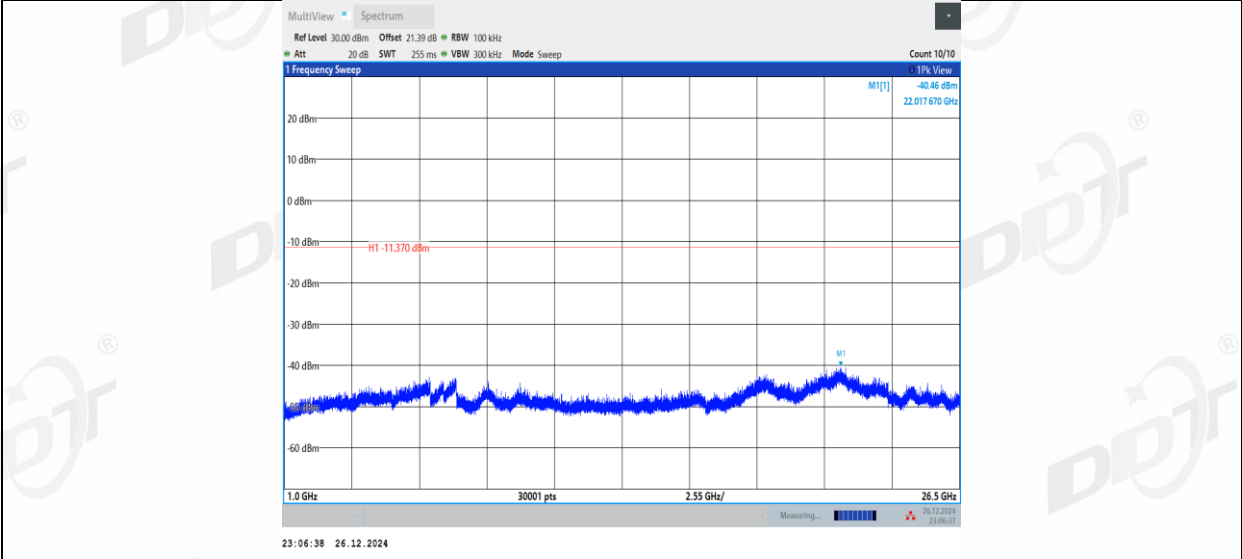




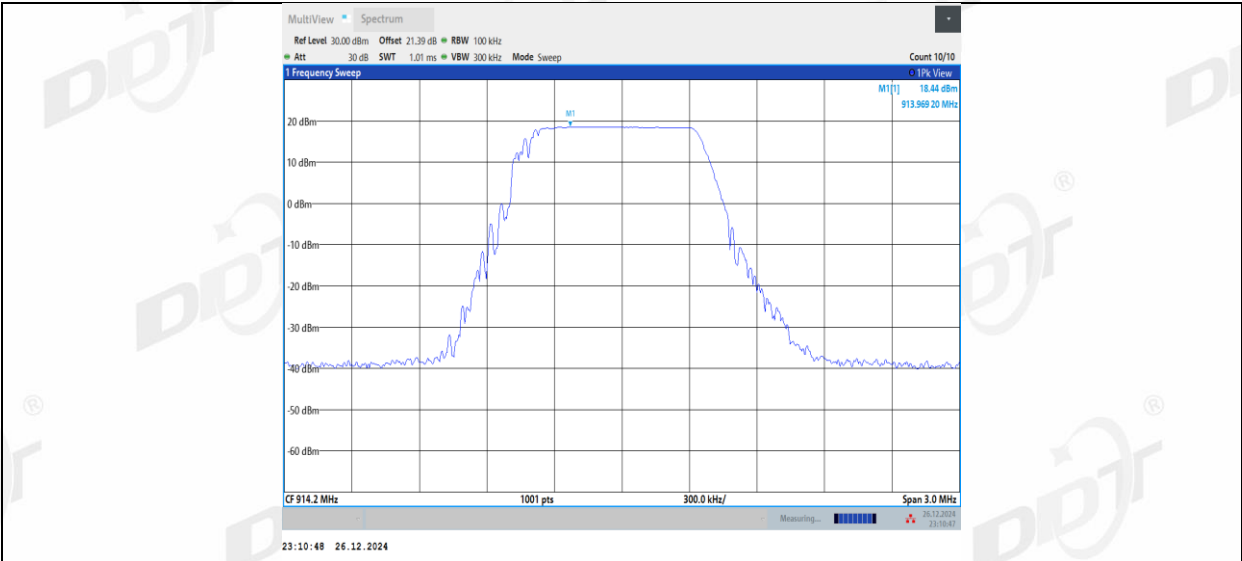
LoRa/CSS_Ant1_907.8_30~1000



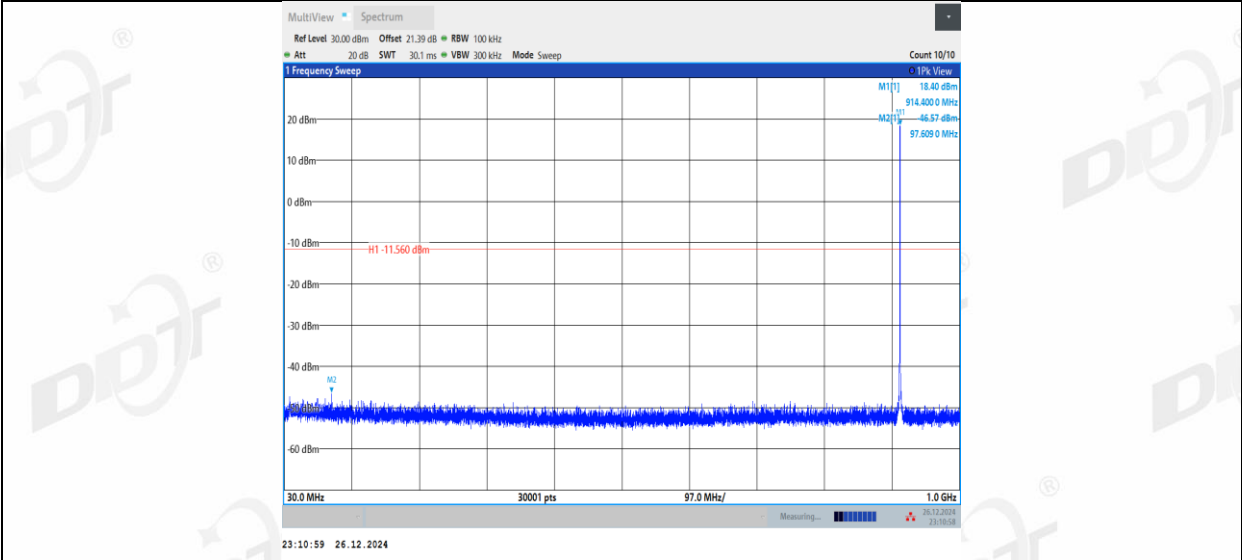
LoRa/CSS_Ant1_907.8_1000~26500



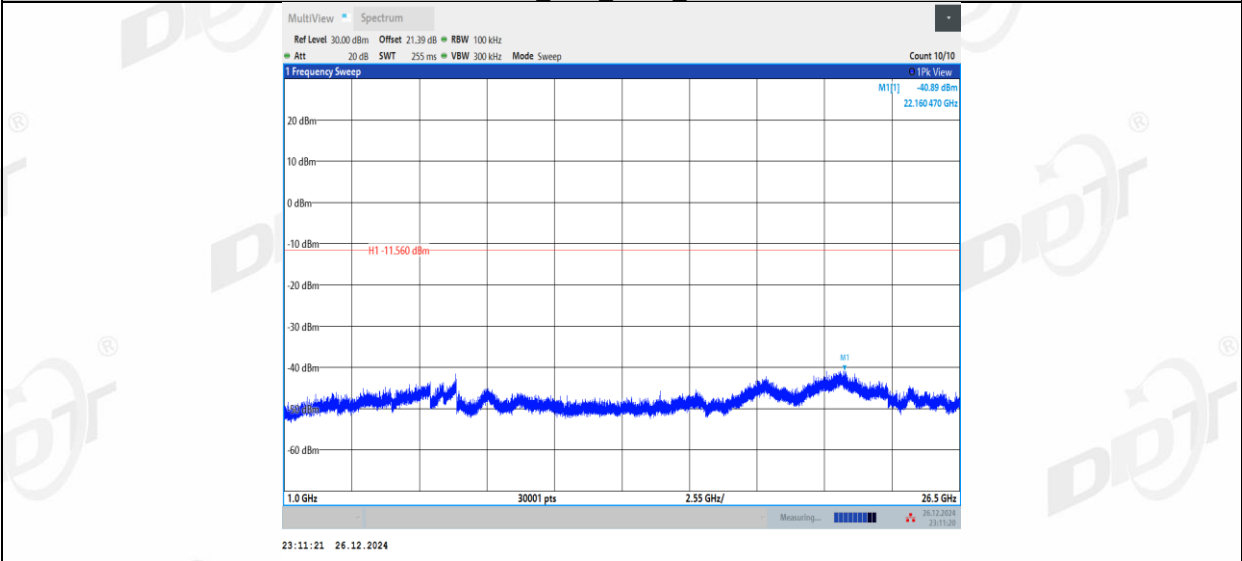
LoRa/CSS_Ant1_914.2_0~Reference



LoRa/CSS_Ant1_914.2_30~1000

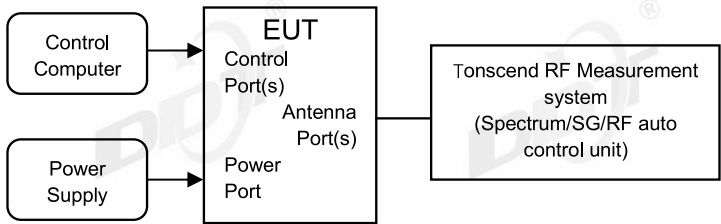


LoRa/CSS_Ant1_914.2_1000~26500



10. Duty Cycle

10.1. Block diagram of test setup



10.2. Limit

Just for Report.

10.3. Test procedure

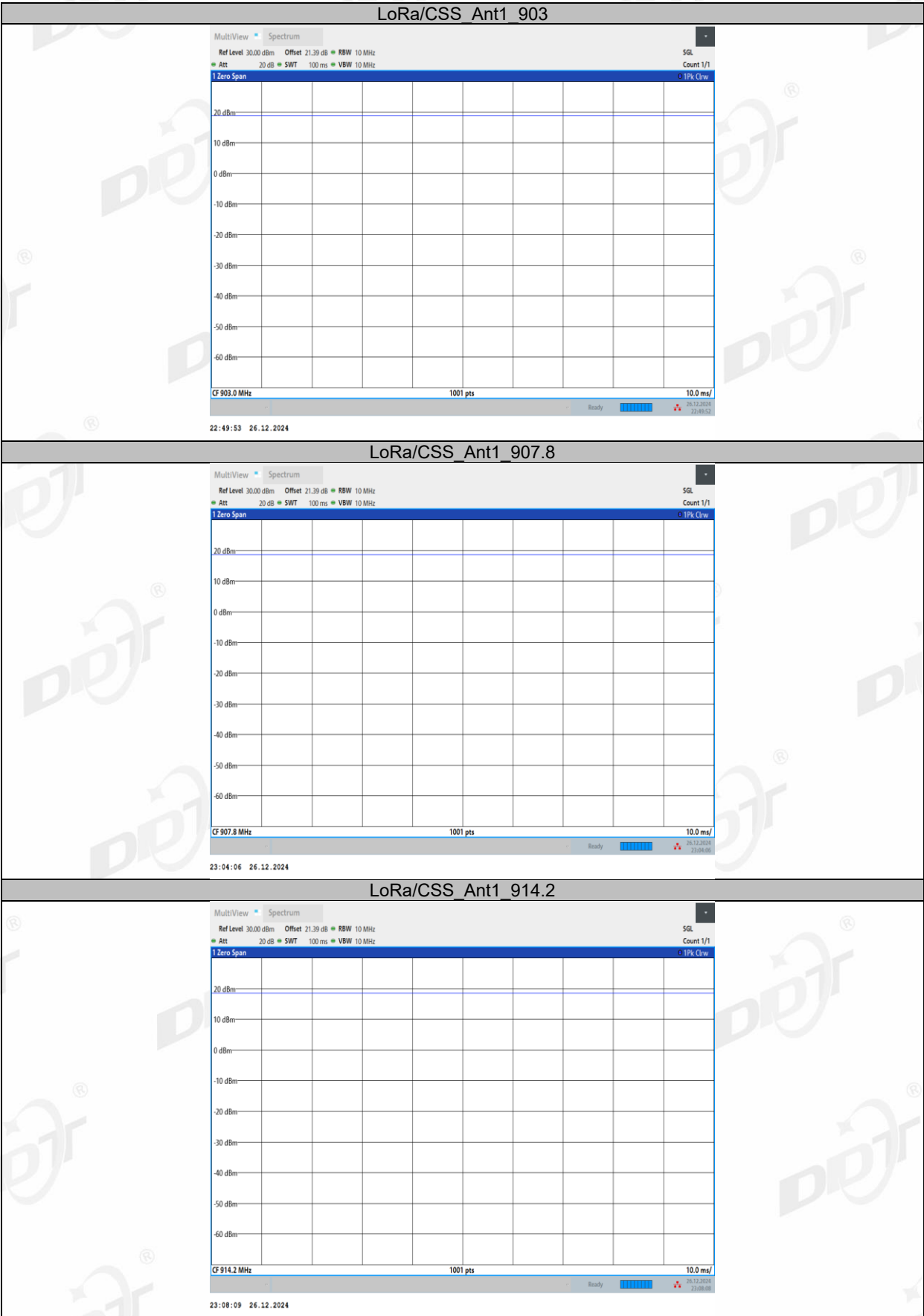
- (1) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, The cable loss and attenuator loss have been put into spectrum analyzer as amplitude offset.
set the Spectrum Analyzer as below:
Centre Frequency: The centre frequency of the middle hopping channel.
Resolution BW: 10 MHz.
Video BW: 10 MHz.
Span: Zero span.
Detector: Peak.
Trace Mode: Clear Write.
Sweep: Video Trigger
- (2) When the trace is complete, measure the sending time of 1 burst and the duty cycle of 1 burst cycle.
- (3) Calculate dwell time follow below formula:
Duty cycle= Pulse's on time / Burst cycle

10.4. Test result

Test Engineer:	Haofeng	Test Site:	RF Measurement System 4#
Ambient Condition:	23.6℃,42.3%RH	Test Date:	2024.12.26-2024.12.27
Test Power Supply:	DC 12V	Sample Number:	S24092616-001

Test Mode	Antenna	Frequency [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
LoRa/CSS	Ant1	903	0.00	0.00	100
		907.8	0.00	0.00	100
		914.2	0.00	0.00	100

10.5. Test graphs



11. Antenna Requirements

11.1. Limit

For intentional device, according to FCC 47 CFR Section 15.203, 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. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

11.2. Result

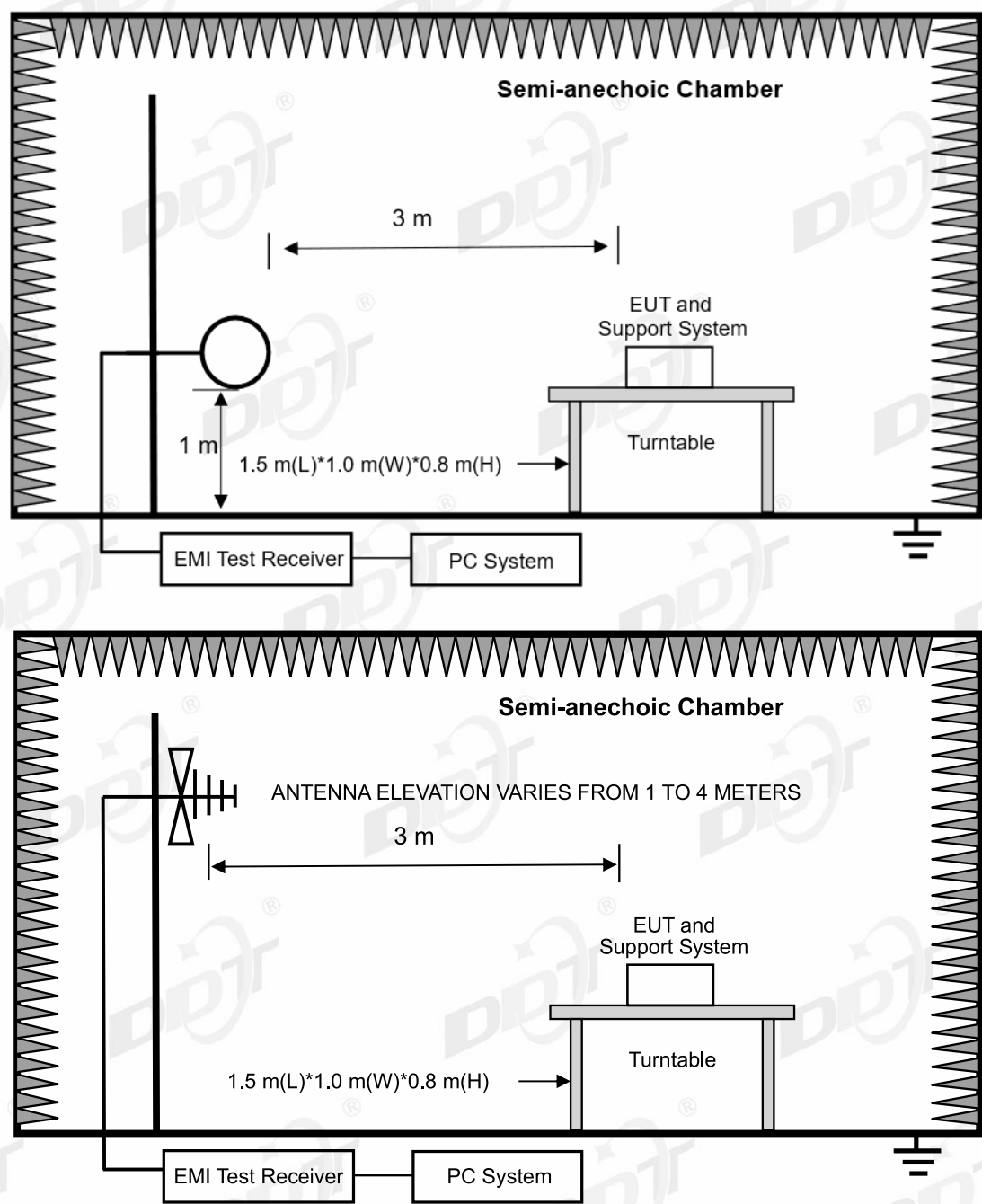
The antenna used for this product as Antenna information described in section 2.1 of the report, and there is no other antenna than that furnished by the responsible party shall be used with the device.

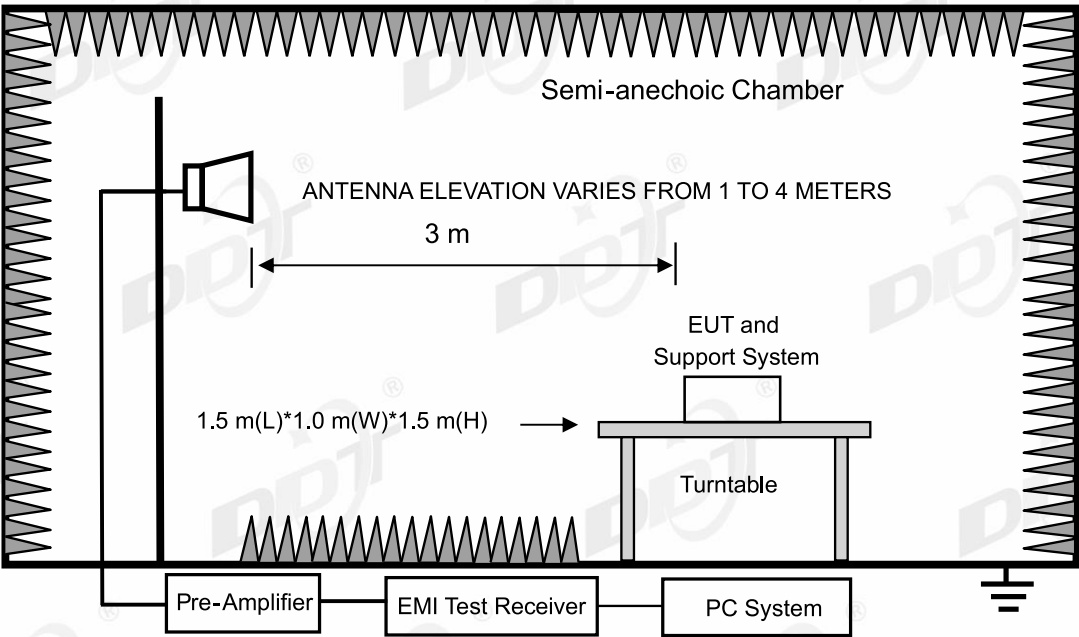
12.Radiated Emission

12.1. Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Cal Due To
RF Cable	N/A	W24.02 HL-562	DDT-ZC04022	2025/03/31
Active Loop Antenna	Schwarzbeck	FMZB1519	DDT-ZC00524	2025/09/11
Pre-amplifier	COM-POWER	PAM-840A	DDT-ZC01693	2025/03/31
Hochgewinn-Hornantenne	SCHWARZBEC K	BBHA 9120 D	DDT-ZC02129	2025/09/18
EMI TEST RECEIVER	R&S	ESU26	DDT-ZC01909	2025/03/31
RF Cable	N/A	W13.02 AP1-X2	DDT-ZC04023	2025/03/31
Micro-Tronics filters	REBES	BRM50702	DDT-ZC03242	/
High pass filter	Micro-Tronics	HPM50102	DDT-ZC00561	2025/04/22
RF cable	Yuhu Technology	JCTB810-NJ-NJ- 9M	DDT-ZC02538	2025/03/31
RF cable	Yuhu Technology	ZT26S-SMAJ- SMAJ-1M	DDT-ZC02037	2025/03/31
RF cable	Zhongke Junchuang	JCT26S-NJ-NJ- 1.5M	DDT-ZC02762	2025/03/31
Trilog Broadband Antenna	Schwarzbeck	VULB 9163	DDT-ZC02050	2025/07/11
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	DDT-ZC00506	2025/04/26
High pass filter	Micro-Tronics	HPM50108	DDT-ZC00560	2025/04/22
Pre-amplifier	COM-POWER	PAM-118A	DDT-ZC01293	2025/08/25
High Pass filter	Xi'an Xingbo	XBLBQ-GTA67	DDT-ZC02179	2025/04/22
Micro-Tronics filters	REBES	BRM50716	DDT-ZC03240	/
PSA Series Spectrum Analyzer	Agilent	E4447A	DDT-ZC00517	2025/03/31

12.2. Block diagram of test setup





12.3. Limits

(1) FCC 15.205 Restricted frequency band

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
¹ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.1772&4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.2072&4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	²
13.36-13.41			

¹Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

²Above 38.6

(2) FCC 15.209 Limit

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		uV/m	dBuV/m
0.009 ~ 0.490	300	2400/F(kHz)	67.6-20log(F)
0.490 ~ 1.705	30	24000/F(kHz)	87.6-20log(F)
1.705 ~ 30.0	30	30	29.54
30~88	3	100	40.0
88~216	3	150	43.5
216~960	3	200	46.0
960~1000	3	500	54.0
Above 1000	3	74.0 dBuV/m (Peak) 54.0 dBuV/m (Average)	

Note:

(1) The emission limits shown in the above table are based on measurements employing a CISPR QP detector except for the frequency bands 9 - 90 kHz, 110 - 490 kHz and above 1000 MHz, radiated emissions limits in these three bands are based on measurements employing an average detector.

(2) At frequencies below 30 MHz, measurement may be performed at a distance closer than that specified, and the limit at closer measurement distance can be extrapolated by below formula:

$$\text{Limit}_{3\text{m}}(\text{dBuV/m}) = \text{Limit}_{30\text{m}}(\text{dBuV/m}) + 40\text{Log}(30\text{m}/3\text{m})$$

(3) Limit for this EUT

The emiss all the other emissions shall be at least 20 dB below the fundamental emissions or comply with 15.209 limits.

12.4. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	Description	other
/	/	/	/	/

12.5. Test procedure

(1) EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber for below 1G and 150 cm above the ground plane inside a fully-anechoic chamber for above 1G.

(2) Test antenna was located 3 m from the EUT on an adjustable mast, and the antenna used as below table.

Test frequency range	Test antenna used	Test antenna distance
9 kHz - 30 MHz	Active Loop antenna	3 m
30 MHz - 1 GHz	Trilog Broadband Antenna	3 m
1 GHz - 18 GHz	Double Ridged Horn Antenna(1 GHz-18 GHz)	3 m

18 GHz - 40 GHz	Horn Antenna(18 GHz-40 GHz)	1 m
-----------------	-----------------------------	-----

According ANSI C63.10:2013 clause 6.4.6 and 6.5.3, for measurements below 30 MHz, Antenna was located 3 m from EUT, the loop antenna was positioned in three antenna orientations (parallel, perpendicular, and round-parallel), for each measurement antenna alignment, the EUT shall be rotated through 0° to 360° on a turntable, and the lowest height of the magnetic antenna shall be 1 m above the ground. For measurement above 30MHz, the trilog Broadband Antenna or Horn Antenna was located 3m from EUT, Measurements were made with the antenna positioned in both the horizontal and vertical planes of Polarization, and the measurement antenna was varied from 1 m to 4 m. in height above the reference ground plane to obtain the maximum signal strength.

(3) Below pre-scan procedure was first performed in order to find prominent frequency spectrum radiated emissions from 9 kHz to 25 GHz:

(a) Scanning the peak frequency spectrum with the antenna specified in step (3), and the EUT was rotated 360 degree, the antenna height was varied from 1 m to 4 m (Except loop antenna, it's fixed 1 m above ground.)

(b) Change work frequency or channel of device if practicable.

(c) Change modulation type of device if practicable.

(d) Change power supply range from 85% to 115% of the rated supply voltage

(e) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions.

Spectrum frequency from 9 kHz to 25 GHz (tenth harmonic of fundamental frequency) was investigated, and no any obvious emission were detected from 18 GHz to 25 GHz, so below final test was performed with frequency range from 9 kHz to 18 GHz.

(4) For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied between 1 m and 4 m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipment and all of the interface cables were changed according to ANSI C63.10:2013 on Radiated Emission test.

(5) The emissions from 9 kHz to 1 GHz were measured based on CISPR QP detector except for the frequency bands 9 - 90 kHz, 110 - 490 kHz, for emissions from 9 kHz - 90 kHz, 110 kHz - 490 kHz and above 1 GHz were measured based on average detector, for emissions above 1 GHz, peak emissions also be measured and need comply with Peak limit.

(6) The emissions from 9 kHz to 1 GHz, QP or average values were measured with EMI receiver with below RBW.

Frequency band	RBW
9 kHz - 150 kHz	200 Hz
150 kHz - 30 MHz	9 kHz
30 MHz - 1 GHz	120 kHz

(7) For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1 MHz, VBW is set at 3 MHz for Peak measure; According ANSI C63.10:2013 clause 4.1.4.2.2 procedure for average measure.

(8) For portable device, X axis, Y axis, Z axis are tested, and worse setup is reported.

(9) According exploratory test, the emission levels are 20 dB below the limit detected from 9 kHz to 30 MHz and 18 GHz to 25 GHz, so the final test was performed with frequency range from 30 MHz to 18 GHz and recorded in below.

(10) For 30 MHz ~ 25 GHz: (Scan with all mode, the worst case is reported)

(11) For emissions below 1 GHz, according exploratory explorer test, when change Tx mode and channel, have no distinct influence on emissions level, so for emissions below 1 GHz, the final test was only performed with EUT working in worst mode.

12.6. Test result

PASS. (See below detailed test result)

12.7. Test data

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-23

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

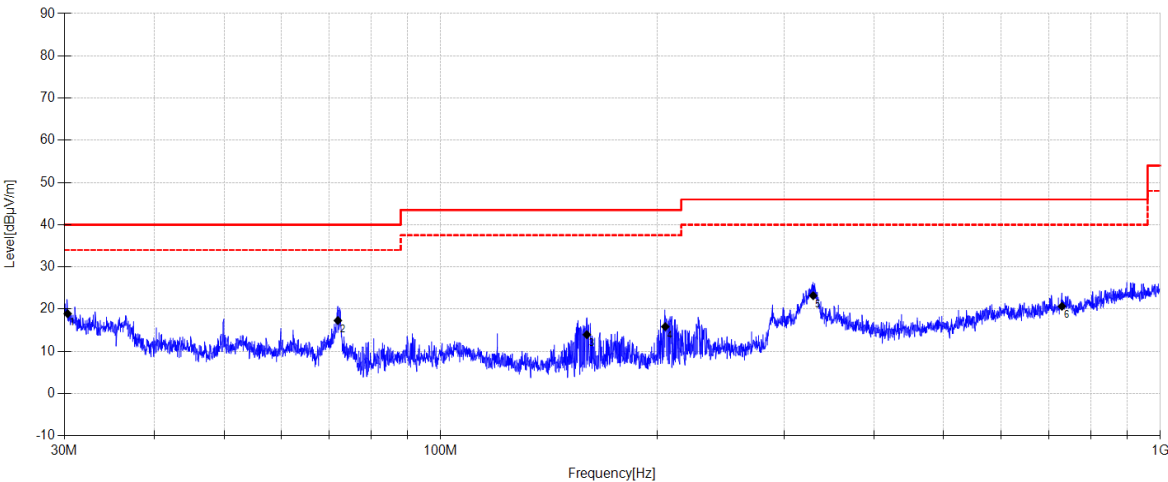
DDT 3# Chamber

File Path:

d:\ts\2024 report data\Q24092616-2E\FCC BELOW 1G\20241223-223713_H

Memo:

Sample Number:S24042326 (PCB Antenna)



Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable Loss [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	30.317	35.93	10.33	3.76	18.92	40.00	21.08	QP	Horizontal
2	71.971	34.77	9.60	4.03	17.30	40.00	22.70	QP	Horizontal
3	159.619	31.78	8.79	4.54	13.95	43.50	29.55	QP	Horizontal
4	205.164	31.68	10.60	4.78	15.85	43.50	27.65	QP	Horizontal
5	329.343	35.08	14.19	5.34	23.20	46.00	22.80	QP	Horizontal
6	729.916	25.36	19.89	6.77	20.66	46.00	25.34	QP	Horizontal

Note:

1. Result Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-23

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

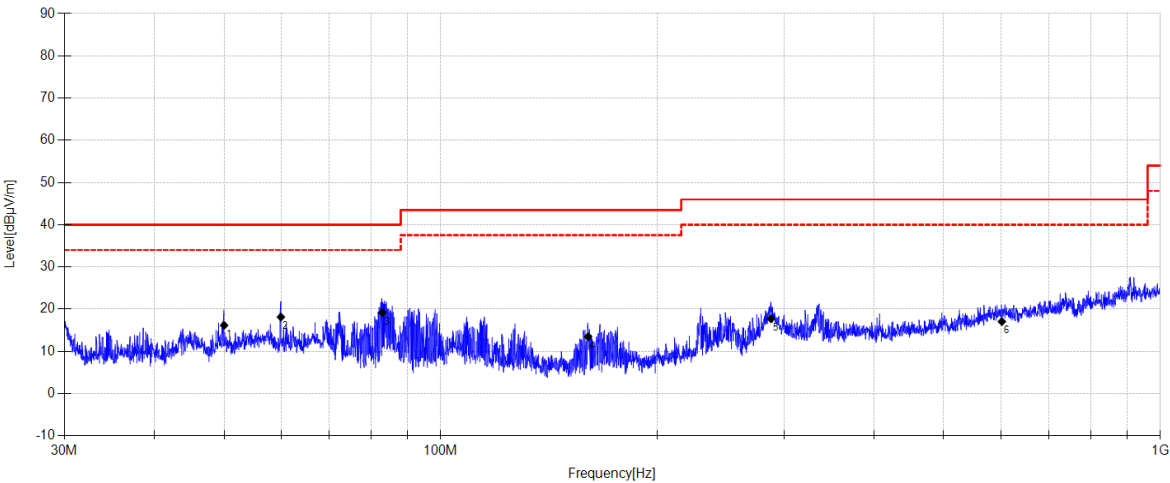
DDT 3# Chamber

File Path:

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Memo:

Sample Number:S24042326 (PCB Antenna)



Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable Loss [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	50.016	30.38	12.99	3.88	16.15	40.00	23.85	QP	Vertical
2	59.977	32.48	12.79	3.96	18.13	40.00	21.87	QP	Vertical
3	82.980	36.88	9.29	4.11	19.18	40.00	20.82	QP	Vertical
4	160.292	31.17	8.90	4.55	13.46	43.50	30.04	QP	Vertical
5	287.658	31.21	12.73	5.16	17.72	46.00	28.28	QP	Vertical
6	602.332	23.07	19.11	6.38	17.06	46.00	28.94	QP	Vertical

Note:

1. Result Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-23

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

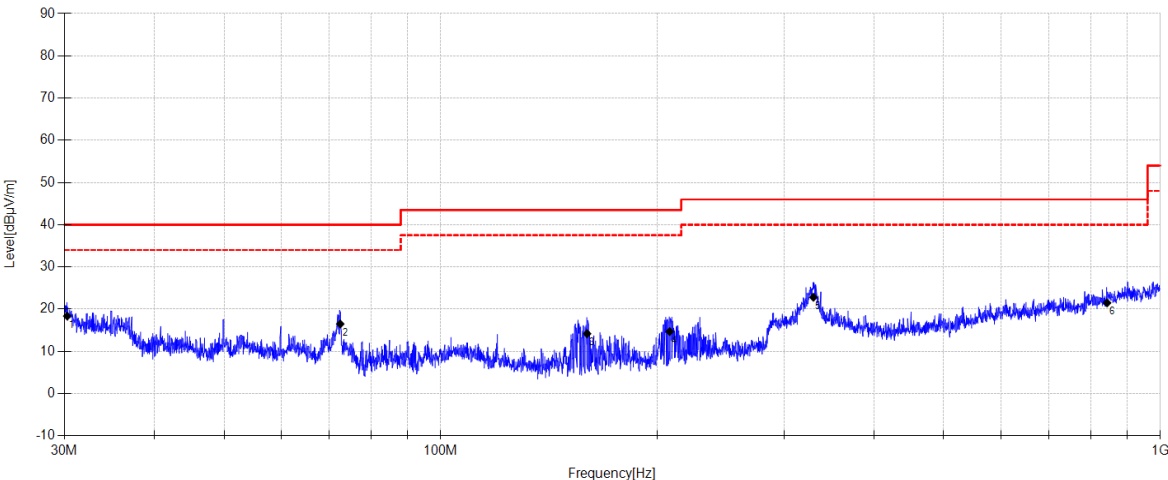
DDT 3# Chamber

File Path:

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Memo:

Sample Number:S24042326 (3dBi Antenna)



Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable Loss [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	30.275	35.38	10.33	3.76	18.37	40.00	21.63	QP	Horizontal
2	72.528	34.16	9.39	4.04	16.49	40.00	23.51	QP	Horizontal
3	159.731	31.98	8.82	4.54	14.18	43.50	29.32	QP	Horizontal
4	208.061	30.56	10.54	4.80	14.68	43.50	28.82	QP	Horizontal
5	329.574	34.66	14.23	5.34	22.82	46.00	23.18	QP	Horizontal
6	843.340	24.43	20.83	7.06	21.49	46.00	24.51	QP	Horizontal

Note:

- Result Level = Reading + Cable loss + Antenna Factor + AMP
- If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
- Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-23

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

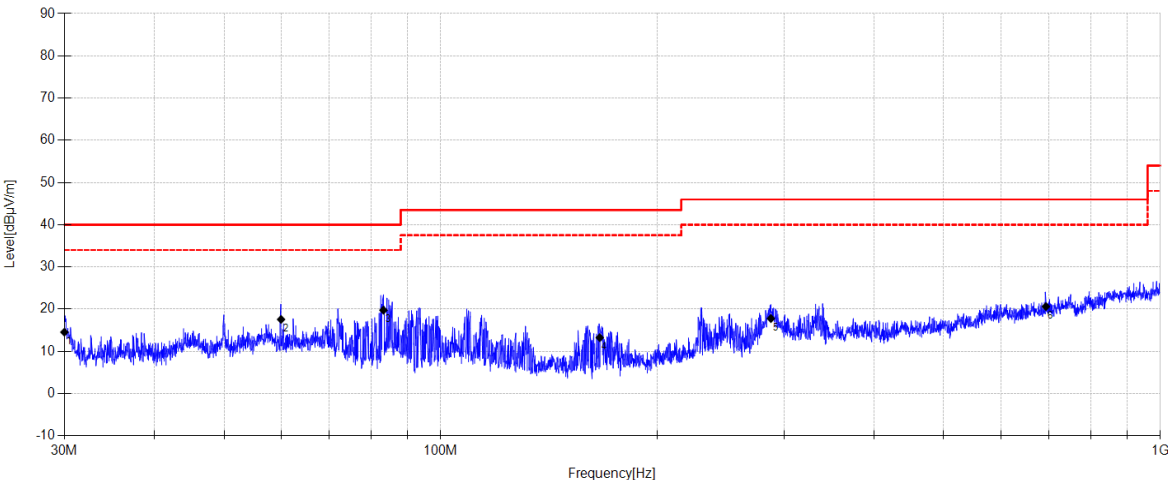
DDT 3# Chamber

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Memo:

Sample Number:S24042326 (3dBi Antenna)



Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable Loss [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	30.000	31.58	10.30	3.76	14.54	40.00	25.46	QP	Vertical
2	60.019	31.92	12.79	3.96	17.57	40.00	22.43	QP	Vertical
3	83.271	37.65	9.11	4.11	19.77	40.00	20.23	QP	Vertical
4	166.361	31.1	8.74	4.58	13.25	43.50	30.25	QP	Vertical
5	287.658	31.27	12.73	5.16	17.78	46.00	28.22	QP	Vertical
6	693.495	25.8	19.64	6.67	20.61	46.00	25.39	QP	Vertical

Note:

1. Result Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-23

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

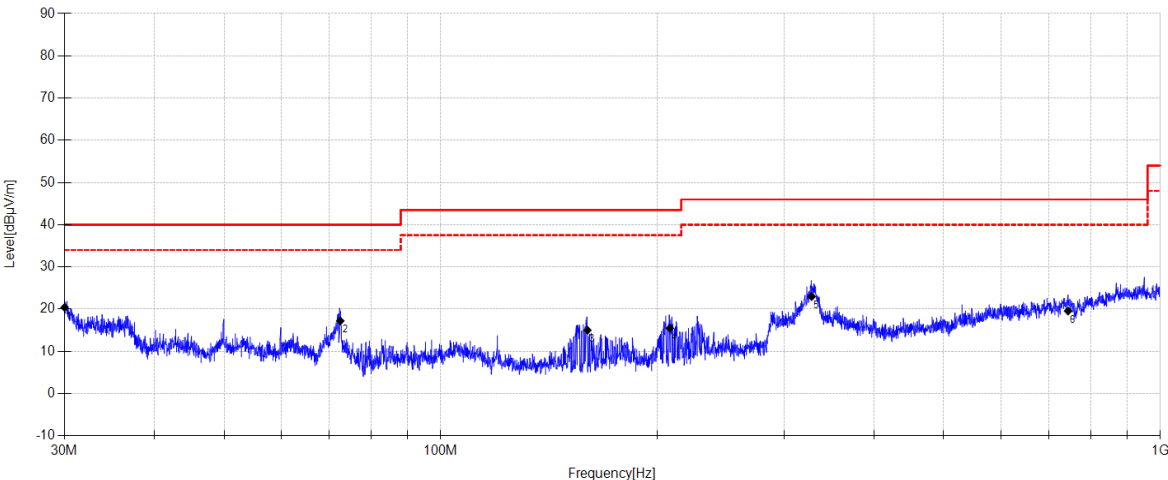
DDT 3# Chamber

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Memo:

Sample Number:S24042326 (5dBi Antenna)



Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable Loss [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	30.021	37.44	10.30	3.76	20.40	40.00	19.60	QP	Horizontal
2	72.528	34.88	9.39	4.04	17.21	40.00	22.79	QP	Horizontal
3	159.955	32.73	8.89	4.54	15.00	43.50	28.50	QP	Horizontal
4	208.207	31.35	10.54	4.80	15.47	43.50	28.03	QP	Horizontal
5	327.731	35.14	13.94	5.33	23.00	46.00	23.00	QP	Horizontal
6	744.388	24.07	19.98	6.81	19.57	46.00	26.43	QP	Horizontal

Note:

1. Result Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-23

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

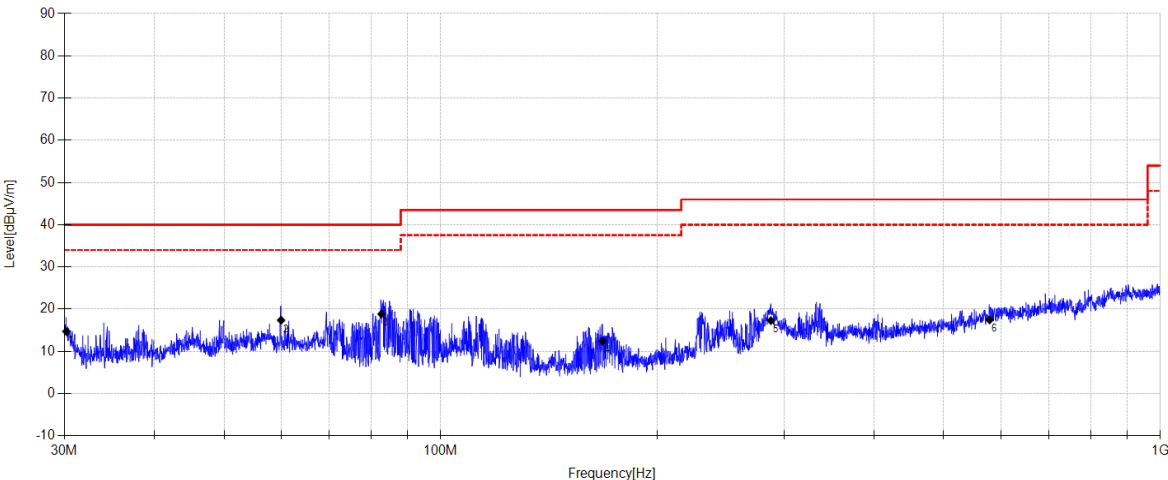
DDT 3# Chamber

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Memo:

Sample Number:S24042326 (5dBi Antenna)



Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable Loss [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	30.190	31.74	10.32	3.76	14.72	40.00	25.28	QP	Vertical
2	60.019	31.73	12.79	3.96	17.38	40.00	22.62	QP	Vertical
3	82.747	36.6	9.22	4.11	18.83	40.00	21.17	QP	Vertical
4	167.884	30.08	8.89	4.59	12.39	43.50	31.11	QP	Vertical
5	287.658	30.77	12.73	5.16	17.28	46.00	28.72	QP	Vertical
6	579.139	23.77	18.90	6.29	17.46	46.00	28.54	QP	Vertical

Note:

1. Result Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-11

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels 903MHz

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

DDT 3# Chamber

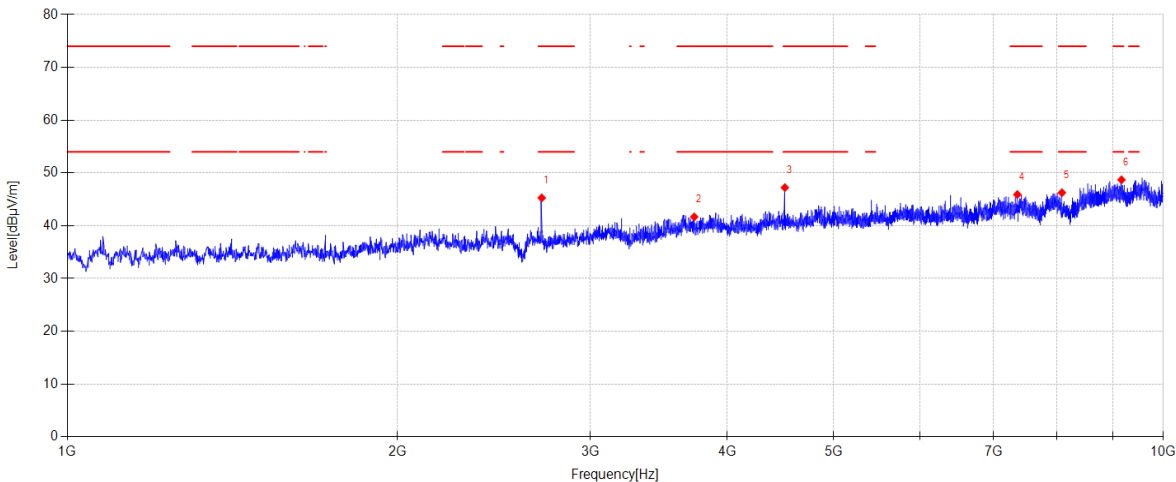
File Path:

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Memo:

Sample Number:S24042326 Power Setting:20 (PCB Antenna)

Test Graph



Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	2709.100	51.79	27.52	5.04	-39.07	45.28	74.00	28.72	PK	Horizontal
2	3732.400	45.74	30.46	5.10	-39.62	41.68	74.00	32.32	PK	Horizontal
3	4515.400	49.68	31.83	5.36	-39.64	47.23	74.00	26.77	PK	Horizontal
4	7358.500	43.18	36.78	6.63	-40.68	45.91	74.00	28.09	PK	Horizontal
5	8081.200	42.09	37.16	7.00	-39.99	46.26	74.00	27.74	PK	Horizontal
6	9158.500	41.76	38.52	7.35	-38.93	48.70	74.00	25.30	PK	Horizontal

Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-11

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels 903MHz

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

DDT 3# Chamber

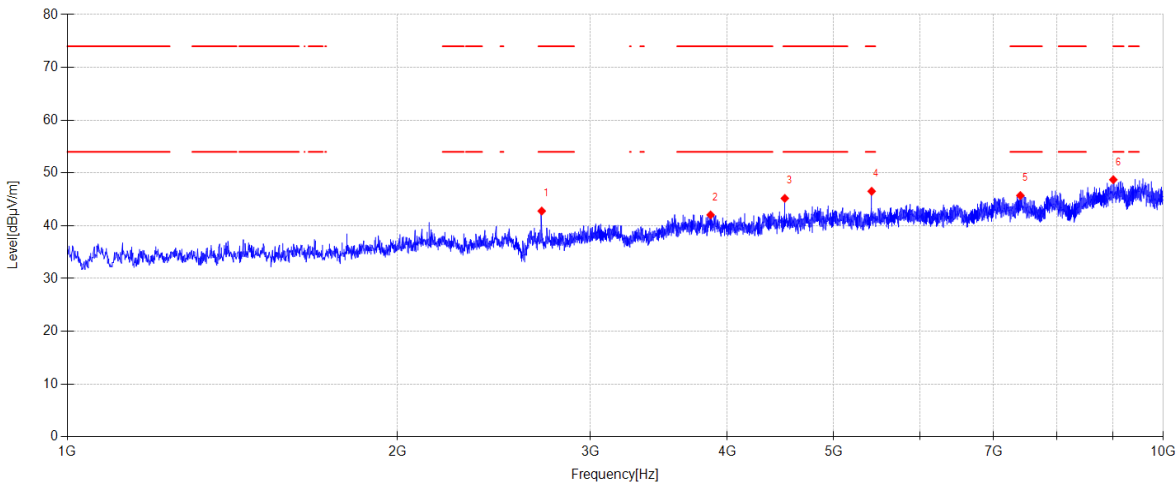
File Path:

d:\ts\2024 report data\Q24092616-2E\1211 FCC ABOVE 1G\20

Memo:

Sample Number:S24042326 Power Setting:20 (PCB Antenna)

Test Graph



Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	2709.100	49.29	27.52	5.04	-39.07	42.78	74.00	31.22	PK	Vertical
2	3862.900	45.65	30.98	5.07	-39.65	42.05	74.00	31.95	PK	Vertical
3	4514.500	47.63	31.83	5.36	-39.64	45.18	74.00	28.82	PK	Vertical
4	5418.100	47.20	33.06	5.87	-39.60	46.53	74.00	27.47	PK	Vertical
5	7405.300	43.02	36.69	6.65	-40.64	45.72	74.00	28.28	PK	Vertical
6	9002.800	41.91	38.31	7.30	-38.80	48.72	74.00	25.28	PK	Vertical

Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-11

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels 907.8MHz

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

DDT 3# Chamber

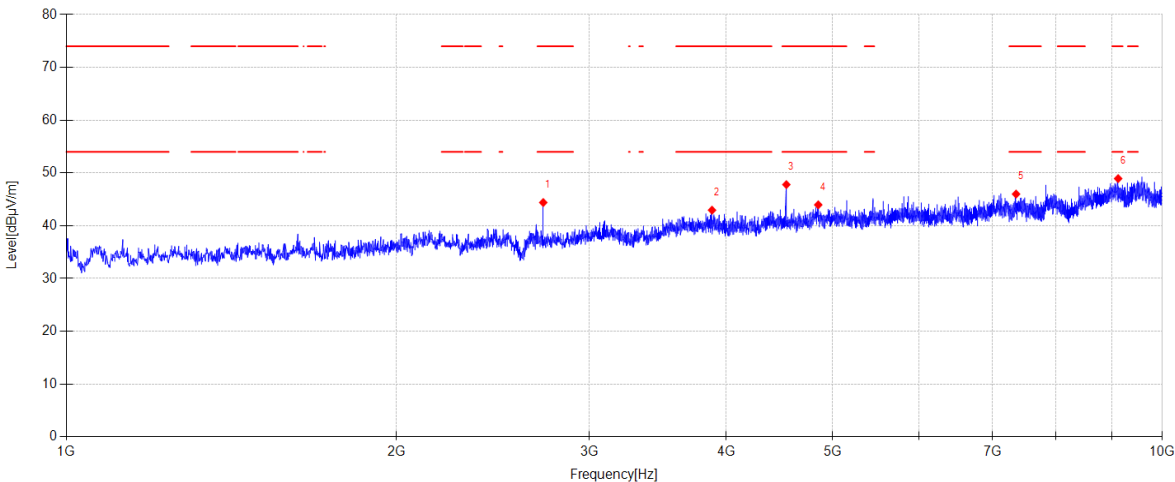
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Memo:

Sample Number:S24042326 Power Setting:20 (PCB Antenna)

Test Graph



Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	2723.500	50.89	27.55	5.05	-39.09	44.40	74.00	29.60	PK	Horizontal
2	3882.700	46.43	31.10	5.07	-39.65	42.95	74.00	31.05	PK	Horizontal
3	4538.800	50.19	31.88	5.37	-39.64	47.80	74.00	26.20	PK	Horizontal
4	4853.800	44.27	33.74	5.56	-39.61	43.96	74.00	30.04	PK	Horizontal
5	7354.000	43.26	36.79	6.63	-40.68	46.00	74.00	28.00	PK	Horizontal
6	9113.500	41.98	38.50	7.34	-38.89	48.93	74.00	25.07	PK	Horizontal

Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-11

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels 907.8MHz

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

DDT 3# Chamber

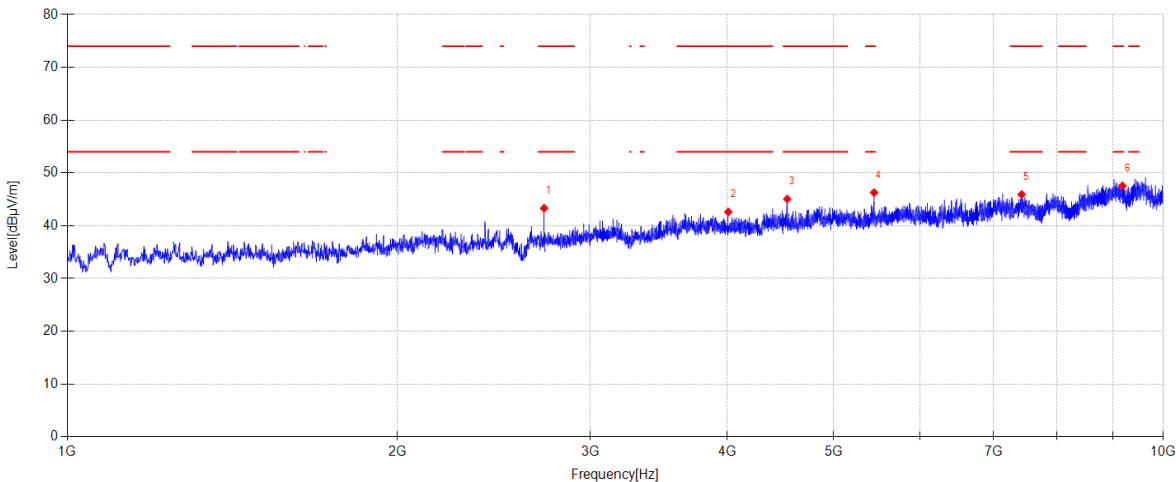
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Memo:

Sample Number:S24042326 Power Setting:20 (PCB Antenna)

Test Graph



Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	2722.600	49.80	27.55	5.05	-39.09	43.31	74.00	30.69	PK	Vertical
2	4009.600	46.31	30.92	5.06	-39.68	42.61	74.00	31.39	PK	Vertical
3	4537.900	47.45	31.88	5.37	-39.64	45.06	74.00	28.94	PK	Vertical
4	5446.000	46.97	33.01	5.89	-39.60	46.27	74.00	27.73	PK	Vertical
5	7425.100	43.21	36.65	6.67	-40.62	45.91	74.00	28.09	PK	Vertical
6	9176.500	40.58	38.55	7.36	-38.94	47.55	74.00	26.45	PK	Vertical

Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-11

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels 914.2MHz

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

DDT 3# Chamber

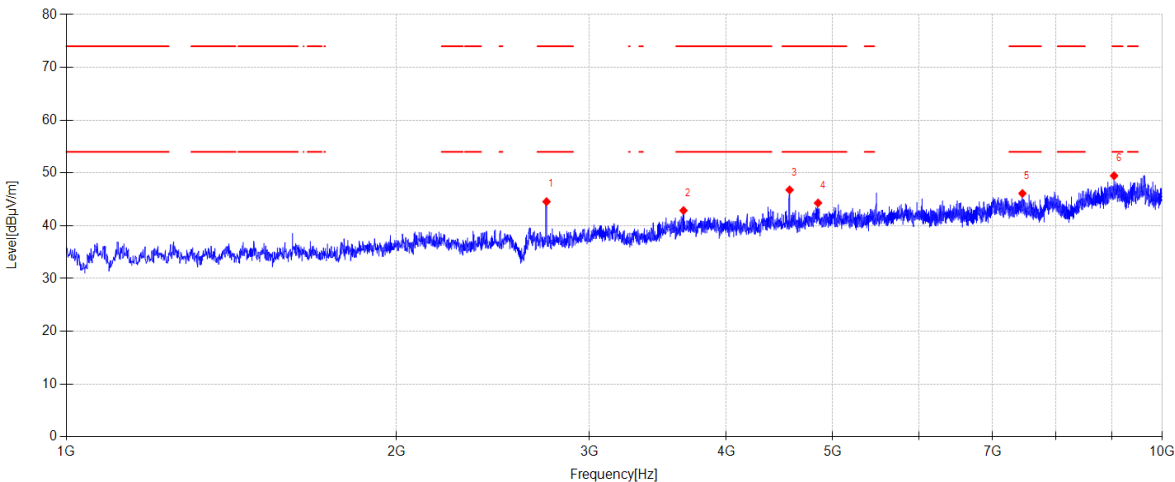
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Memo:

Sample Number:S24042326 Power Setting:20 (PCB Antenna)

Test Graph



Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	2742.400	51.04	27.58	5.06	-39.12	44.56	74.00	29.44	PK	Horizontal
2	3656.800	47.14	30.23	5.11	-39.60	42.88	74.00	31.12	PK	Horizontal
3	4570.300	49.12	31.90	5.39	-39.63	46.78	74.00	27.22	PK	Horizontal
4	4851.100	44.58	33.78	5.56	-39.61	44.31	74.00	29.69	PK	Horizontal
5	7453.000	43.44	36.59	6.68	-40.59	46.12	74.00	27.88	PK	Horizontal
6	9035.200	42.62	38.37	7.31	-38.83	49.47	74.00	24.53	PK	Horizontal

Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP

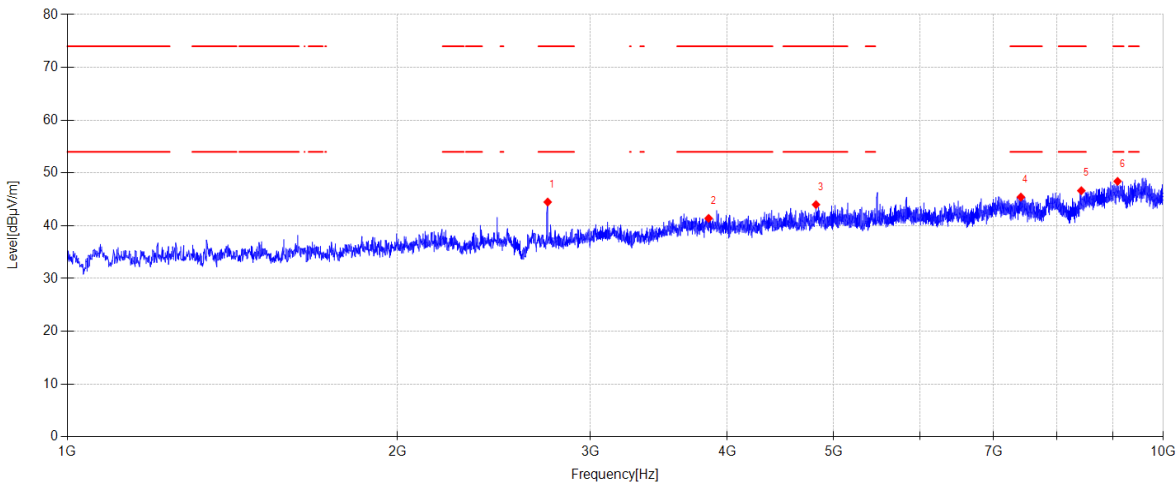
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date: 2024-12-11 Tested By: Genliu
EUT: wireless internet gateway Model Number: GW3
Test Mode: LoRa-8 channels 914.2MHz Power Supply: DC 12V
Condition: Temp:21.2°C;Humi:52.7% Test Site: DDT 3# Chamber
File Path: d:\ts\2024 report data\Q24092616-2E\1211 FCC ABOVE 1G\24
Memo: Sample Number:S24042326 Power Setting:20 (PCB Antenna)

Test Graph



Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	2743.300	50.96	27.59	5.06	-39.12	44.49	74.00	29.51	PK	Vertical
2	3846.700	45.07	30.89	5.08	-39.64	41.40	74.00	32.60	PK	Vertical
3	4820.500	45.04	33.03	5.54	-39.61	44.00	74.00	30.00	PK	Vertical
4	7413.400	42.73	36.67	6.66	-40.63	45.43	74.00	28.57	PK	Vertical
5	8416.900	41.59	37.50	7.11	-39.56	46.64	74.00	27.36	PK	Vertical
6	9083.800	41.48	38.47	7.33	-38.87	48.41	74.00	25.59	PK	Vertical

Note:
1. Level = Reading + Cable loss + Antenna Factor + AMP
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-16

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels 903MHz

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

DDT 3# Chamber

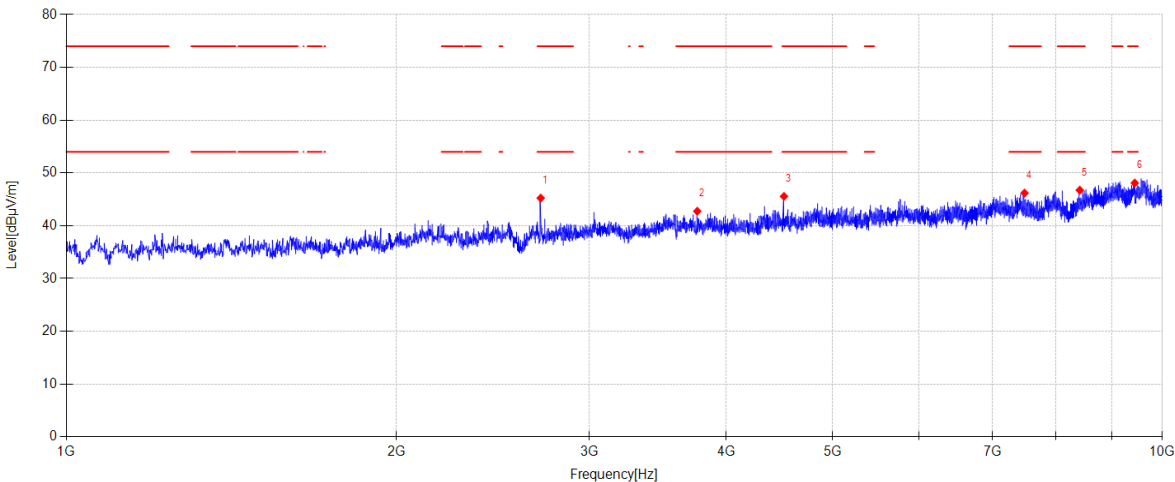
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Memo:

Sample Number:S24042326 Power Setting:20 (3dBi Antenna)

Test Graph



Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	2709.100	51.75	27.52	5.04	-39.07	45.24	74.00	28.76	PK	Horizontal
2	3763.900	46.72	30.56	5.09	-39.62	42.75	74.00	31.25	PK	Horizontal
3	4516.300	48.01	31.83	5.36	-39.64	45.56	74.00	28.44	PK	Horizontal
4	7486.300	43.52	36.53	6.70	-40.56	46.19	74.00	27.81	PK	Horizontal
5	8408.800	41.71	37.50	7.10	-39.57	46.74	74.00	27.26	PK	Horizontal
6	9437.500	41.10	38.70	7.44	-39.15	48.09	74.00	25.91	PK	Horizontal

Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-16

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels 903MHz

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

DDT 3# Chamber

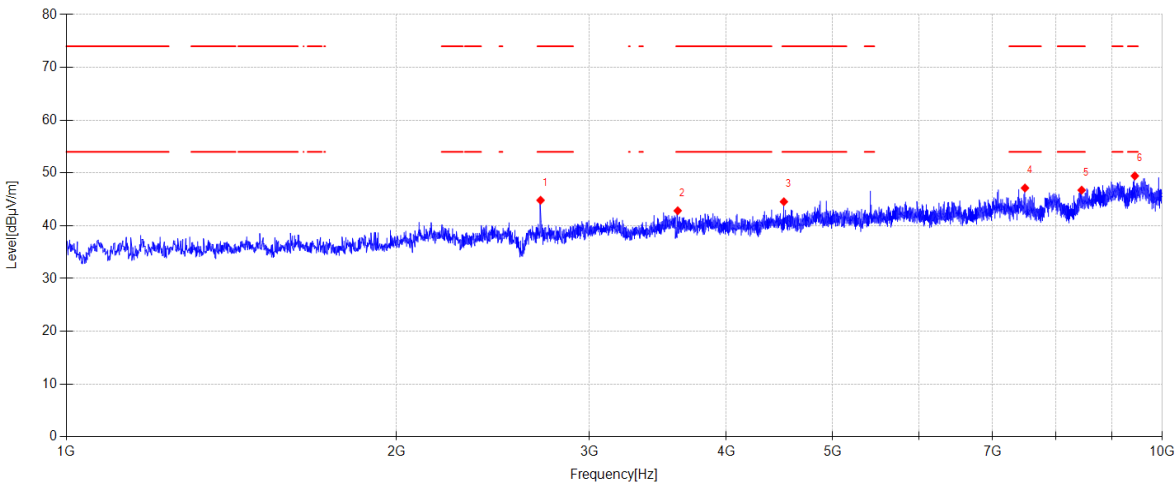
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Memo:

Sample Number:S24042326 Power Setting:20 (3dBi Antenna)

Test Graph



Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	2708.200	51.33	27.52	5.04	-39.07	44.82	74.00	29.18	PK	Vertical
2	3612.700	47.26	30.05	5.12	-39.59	42.84	74.00	31.16	PK	Vertical
3	4515.400	47.00	31.83	5.36	-39.64	44.55	74.00	29.45	PK	Vertical
4	7493.500	44.50	36.51	6.70	-40.56	47.15	74.00	26.85	PK	Vertical
5	8440.300	41.65	37.50	7.12	-39.53	46.74	74.00	27.26	PK	Vertical
6	9439.300	42.45	38.70	7.44	-39.15	49.44	74.00	24.56	PK	Vertical

Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-16

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels 907.8MHz

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

DDT 3# Chamber

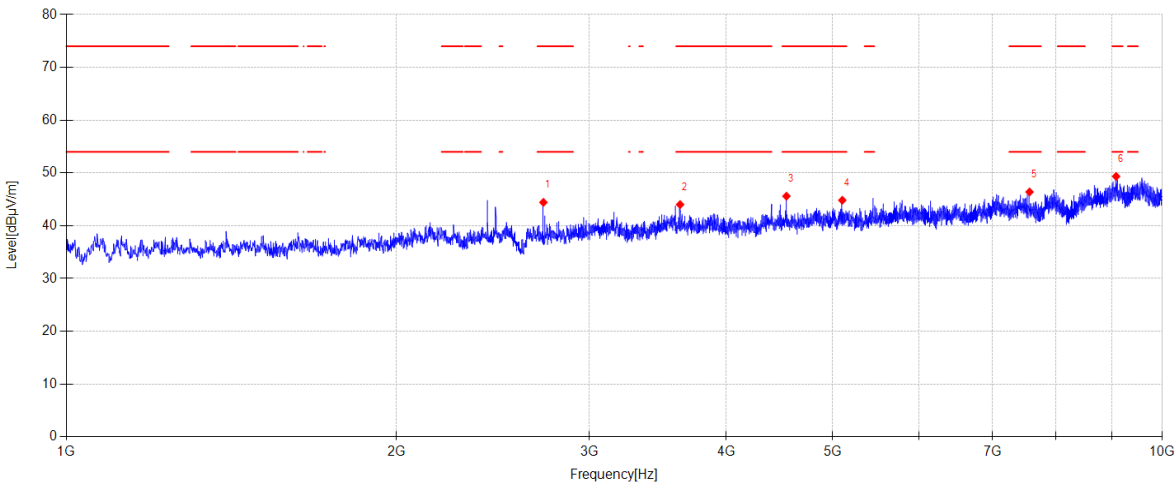
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Memo:

Sample Number:S24042326 Power Setting:20 (3dBi Antenna)

Test Graph



Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	2724.400	50.92	27.55	5.05	-39.09	44.43	74.00	29.57	PK	Horizontal
2	3630.700	48.37	30.12	5.11	-39.59	44.01	74.00	29.99	PK	Horizontal
3	4539.700	47.99	31.88	5.37	-39.64	45.60	74.00	28.40	PK	Horizontal
4	5104.900	45.32	33.40	5.71	-39.60	44.83	74.00	29.17	PK	Horizontal
5	7565.500	43.72	36.43	6.74	-40.49	46.40	74.00	27.60	PK	Horizontal
6	9074.800	42.44	38.45	7.32	-38.86	49.35	74.00	24.65	PK	Horizontal

Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-16

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels 907.8MHz

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

DDT 3# Chamber

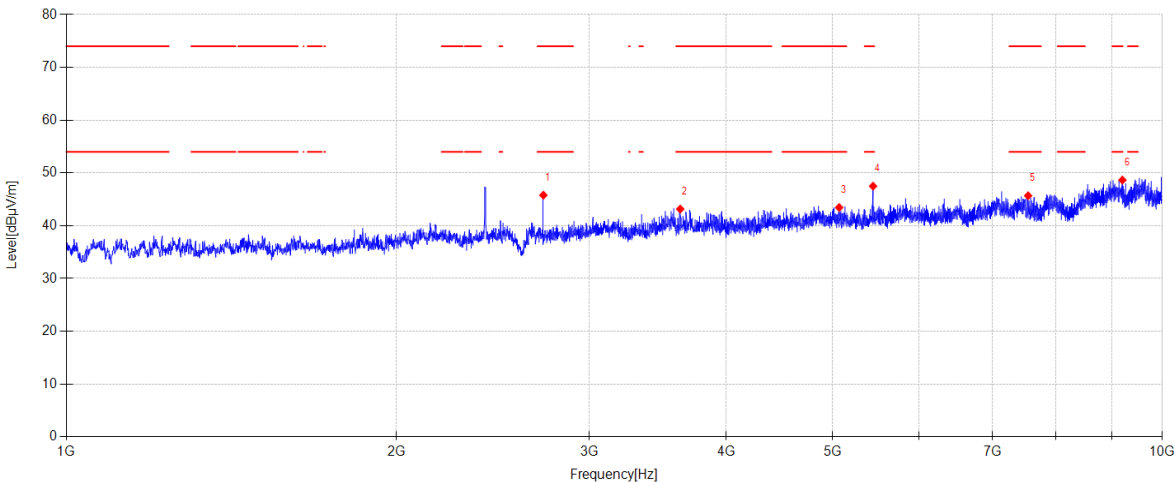
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Memo:

Sample Number:S24042326 Power Setting:20 (3dBi Antenna)

Test Graph



Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	2724.400	52.28	27.55	5.05	-39.09	45.79	74.00	28.21	PK	Vertical
2	3631.600	47.51	30.13	5.11	-39.59	43.16	74.00	30.84	PK	Vertical
3	5071.600	44.02	33.34	5.69	-39.60	43.45	74.00	30.55	PK	Vertical
4	5446.000	48.20	33.01	5.89	-39.60	47.50	74.00	26.50	PK	Vertical
5	7543.000	43.05	36.41	6.73	-40.51	45.68	74.00	28.32	PK	Vertical
6	9195.400	41.66	38.59	7.36	-38.96	48.65	74.00	25.35	PK	Vertical

Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-16

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels 914.2MHz

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

DDT 3# Chamber

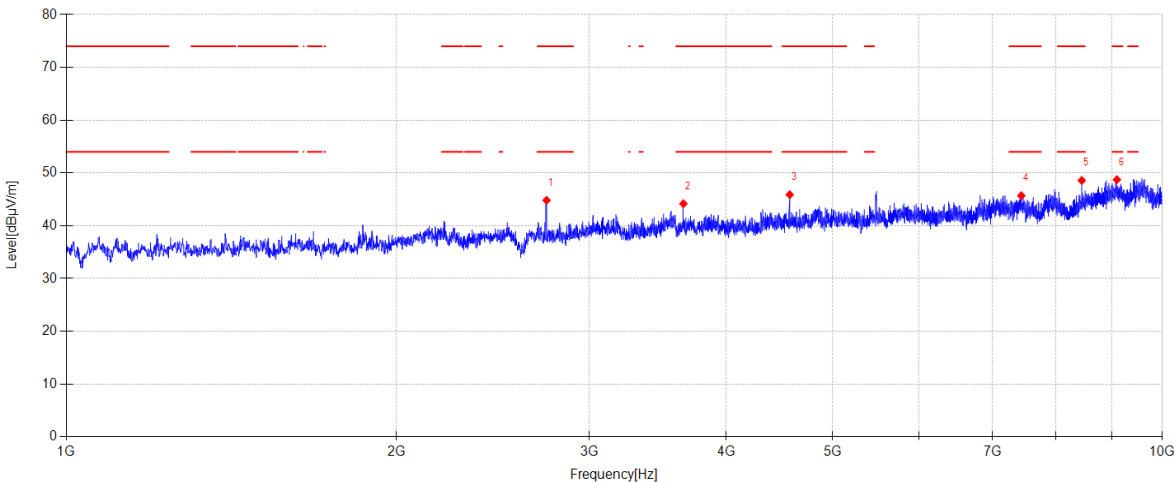
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Memo:

Sample Number:S24042326 Power Setting:20 (3dBi Antenna)

Test Graph



Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	2742.400	51.30	27.58	5.06	-39.12	44.82	74.00	29.18	PK	Horizontal
2	3655.900	48.44	30.22	5.11	-39.60	44.17	74.00	29.83	PK	Horizontal
3	4571.200	48.23	31.90	5.39	-39.63	45.89	74.00	28.11	PK	Horizontal
4	7435.900	43.01	36.63	6.67	-40.61	45.70	74.00	28.30	PK	Horizontal
5	8442.100	43.49	37.50	7.12	-39.53	48.58	74.00	25.42	PK	Horizontal
6	9089.200	41.79	38.48	7.33	-38.87	48.73	74.00	25.27	PK	Horizontal

Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-16

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels 914.2MHz

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

DDT 3# Chamber

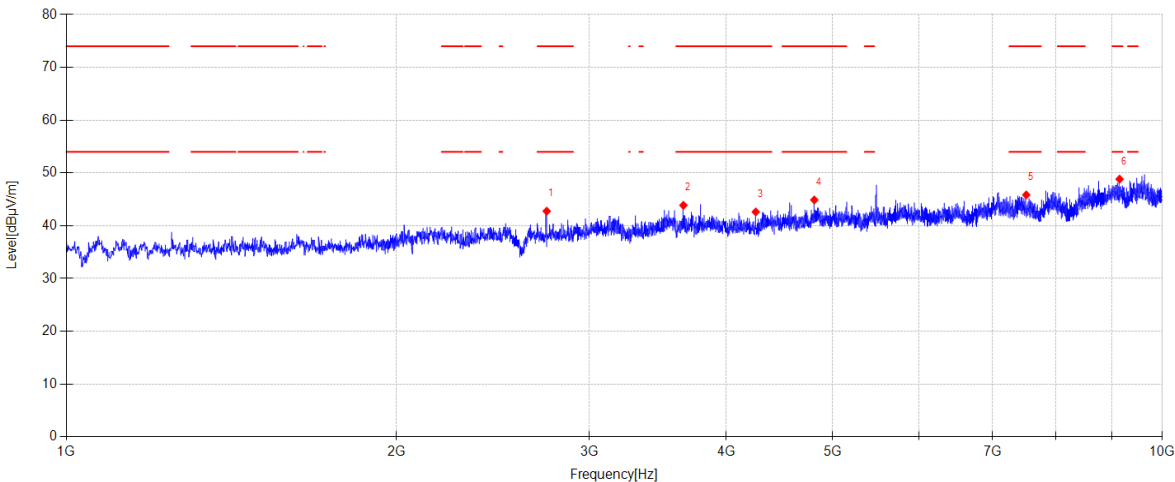
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Memo:

Sample Number:S24042326 Power Setting:20 (3dBi Antenna)

Test Graph



Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	2743.300	49.23	27.59	5.06	-39.12	42.76	74.00	31.24	PK	Vertical
2	3655.900	48.14	30.22	5.11	-39.60	43.87	74.00	30.13	PK	Vertical
3	4256.200	45.66	31.42	5.20	-39.66	42.62	74.00	31.38	PK	Vertical
4	4813.300	46.11	32.85	5.54	-39.61	44.89	74.00	29.11	PK	Vertical
5	7513.300	43.20	36.47	6.71	-40.54	45.84	74.00	28.16	PK	Vertical
6	9140.500	41.89	38.50	7.35	-38.91	48.83	74.00	25.17	PK	Vertical

Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-12

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels 903MHz

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

DDT 3# Chamber

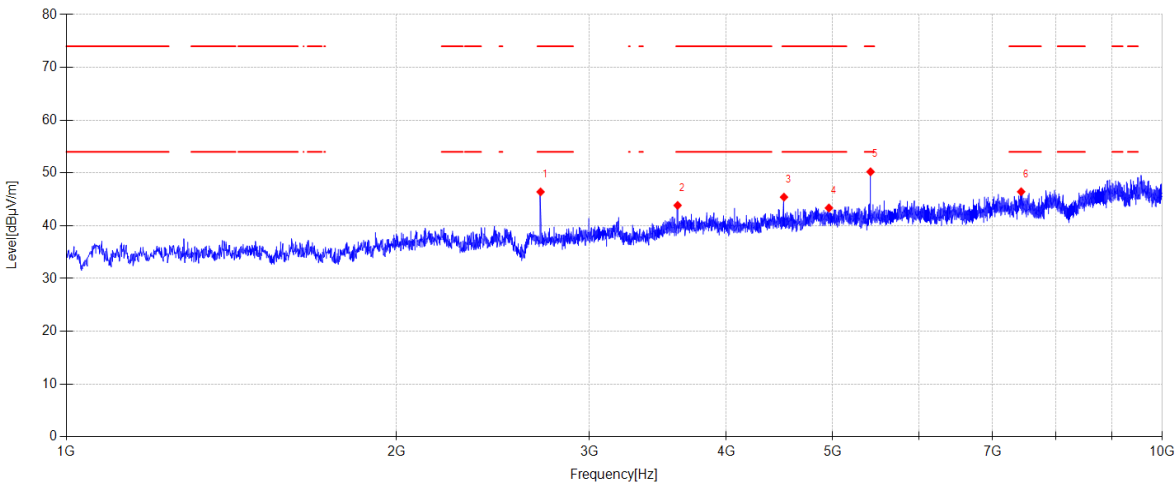
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Memo:

Sample Number:S24042326 Power Setting:20 (5dBi Antenna)

Test Graph



Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	2708.200	52.93	27.52	5.04	-39.07	46.42	74.00	27.58	PK	Horizontal
2	3611.800	48.27	30.05	5.12	-39.59	43.85	74.00	30.15	PK	Horizontal
3	4516.300	47.87	31.83	5.36	-39.64	45.42	74.00	28.58	PK	Horizontal
4	4963.600	44.20	33.13	5.63	-39.60	43.36	74.00	30.64	PK	Horizontal
5	5417.200	50.88	33.07	5.87	-39.60	50.22	74.00	23.78	PK	Horizontal
6	7433.200	43.75	36.63	6.67	-40.61	46.44	74.00	27.56	PK	Horizontal

Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-12

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels 903MHz

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

DDT 3# Chamber

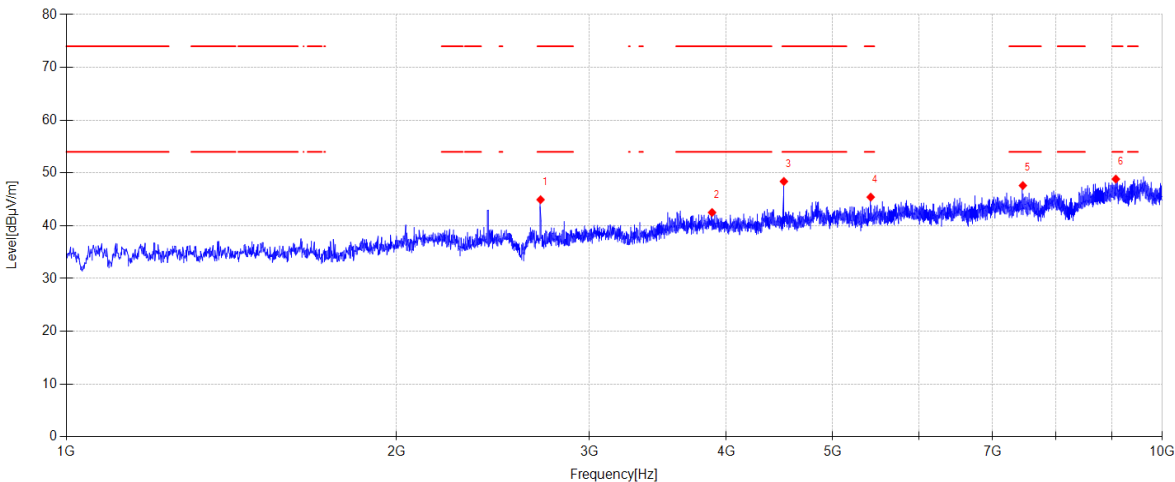
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d:\ts\2024 report data\Q24092616-2E\1211 FCC ABOVE 1G\50

Memo:

Sample Number:S24042326 Power Setting:20 (5dBi Antenna)

Test Graph



Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	2708.200	51.44	27.52	5.04	-39.07	44.93	74.00	29.07	PK	Vertical
2	3882.700	45.99	31.10	5.07	-39.65	42.51	74.00	31.49	PK	Vertical
3	4515.400	50.84	31.83	5.36	-39.64	48.39	74.00	25.61	PK	Vertical
4	5419.000	46.09	33.06	5.87	-39.60	45.42	74.00	28.58	PK	Vertical
5	7460.200	44.94	36.58	6.68	-40.59	47.61	74.00	26.39	PK	Vertical
6	9068.500	41.93	38.44	7.32	-38.85	48.84	74.00	25.16	PK	Vertical

Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-12

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels 907.8MHz

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

DDT 3# Chamber

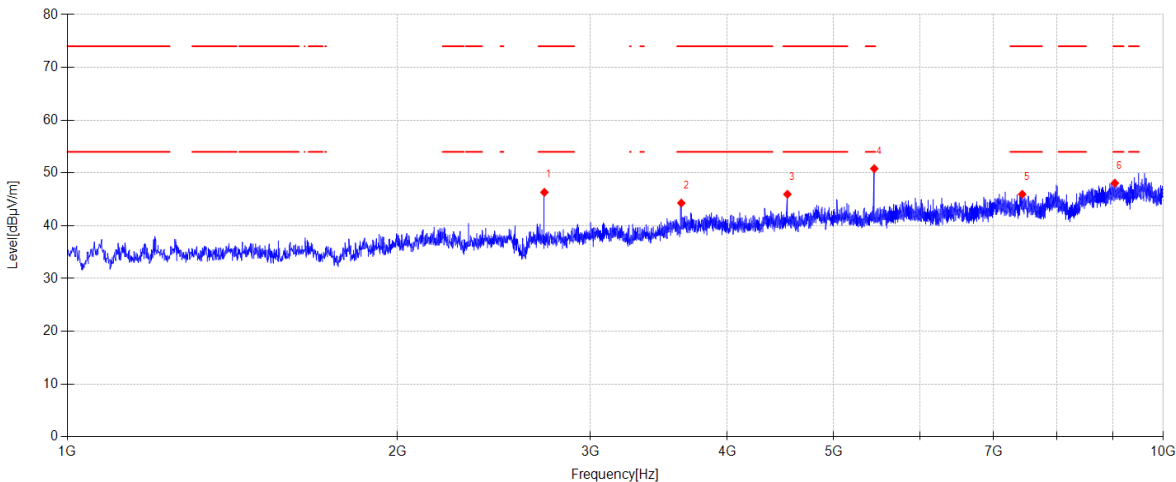
File Path:

d:\ts\2024 report data\Q24092616-2E\1211 FCC ABOVE 1G\51

Memo:

Sample Number:S24042326 Power Setting:20 (5dBi Antenna)

Test Graph



Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	2724.400	52.82	27.55	5.05	-39.09	46.33	74.00	27.67	PK	Horizontal
2	3632.500	48.65	30.13	5.11	-39.59	44.30	74.00	29.70	PK	Horizontal
3	4539.700	48.36	31.88	5.37	-39.64	45.97	74.00	28.03	PK	Horizontal
4	5447.800	51.53	33.00	5.89	-39.60	50.82	74.00	23.18	PK	Horizontal
5	7434.100	43.27	36.63	6.67	-40.61	45.96	74.00	28.04	PK	Horizontal
6	9032.500	41.22	38.37	7.31	-38.83	48.07	74.00	25.93	PK	Horizontal

Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-12

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels 907.8MHz

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

DDT 3# Chamber

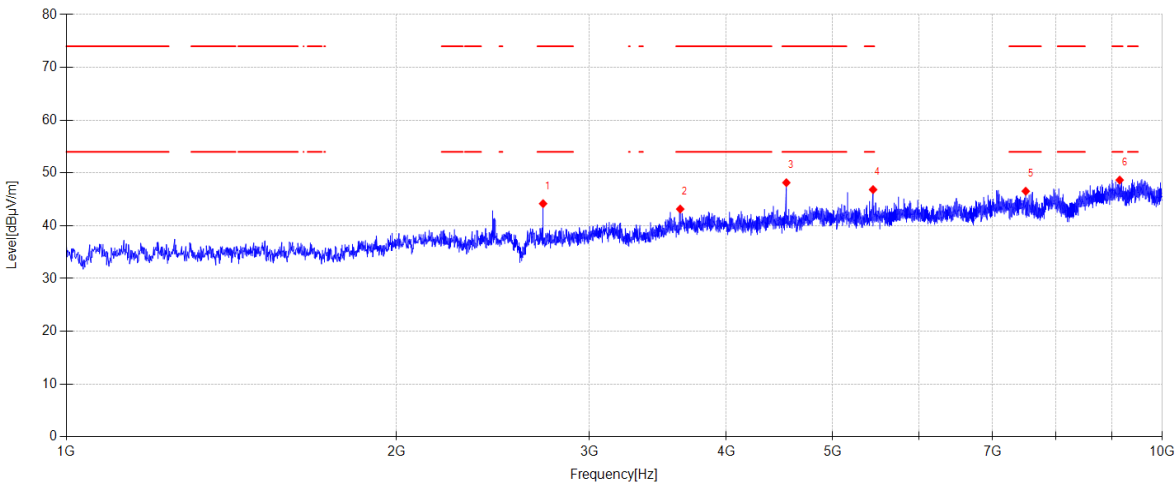
File Path:

d:\ts\2024 report data\Q24092616-2E\1211 FCC ABOVE 1G\52

Memo:

Sample Number:S24042326 Power Setting:20 (5dBi Antenna)

Test Graph



Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	2722.600	50.67	27.55	5.05	-39.09	44.18	74.00	29.82	PK	Vertical
2	3631.600	47.51	30.13	5.11	-39.59	43.16	74.00	30.84	PK	Vertical
3	4538.800	50.55	31.88	5.37	-39.64	48.16	74.00	25.84	PK	Vertical
4	5446.000	47.54	33.01	5.89	-39.60	46.84	74.00	27.16	PK	Vertical
5	7505.200	43.89	36.49	6.71	-40.55	46.54	74.00	27.46	PK	Vertical
6	9143.200	41.72	38.50	7.35	-38.91	48.66	74.00	25.34	PK	Vertical

Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-12

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels 914.2MHz

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

DDT 3# Chamber

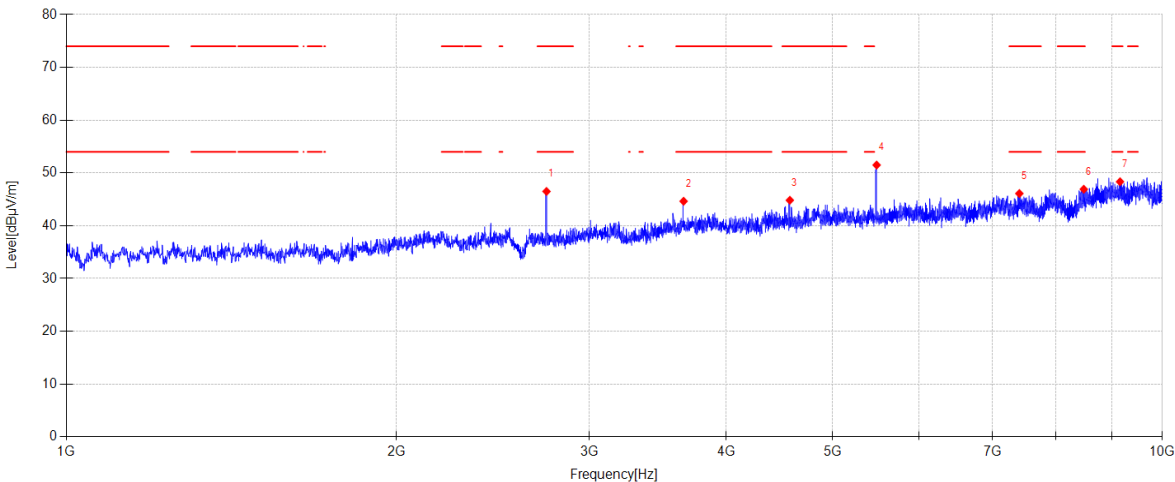
File Path:

d:\ts\2024 report data\Q24092616-2E\1211 FCC ABOVE 1G\53

Memo:

Sample Number:S24042326 Power Setting:20 (5dBi Antenna)

Test Graph



Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	2742.400	52.98	27.58	5.06	-39.12	46.50	74.00	27.50	PK	Horizontal
2	3657.700	48.90	30.23	5.11	-39.60	44.64	74.00	29.36	PK	Horizontal
3	4572.100	47.17	31.90	5.39	-39.63	44.83	74.00	29.17	PK	Horizontal
4	5486.500	52.19	33.00	5.91	-39.60	51.50	-	-	PK	Horizontal
5	7405.300	43.40	36.69	6.65	-40.64	46.10	74.00	27.90	PK	Horizontal
6	8479.000	41.65	37.62	7.13	-39.48	46.92	74.00	27.08	PK	Horizontal
7	9149.500	41.41	38.50	7.35	-38.92	48.34	74.00	25.66	PK	Horizontal

Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-12

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels 914.2MHz

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

DDT 3# Chamber

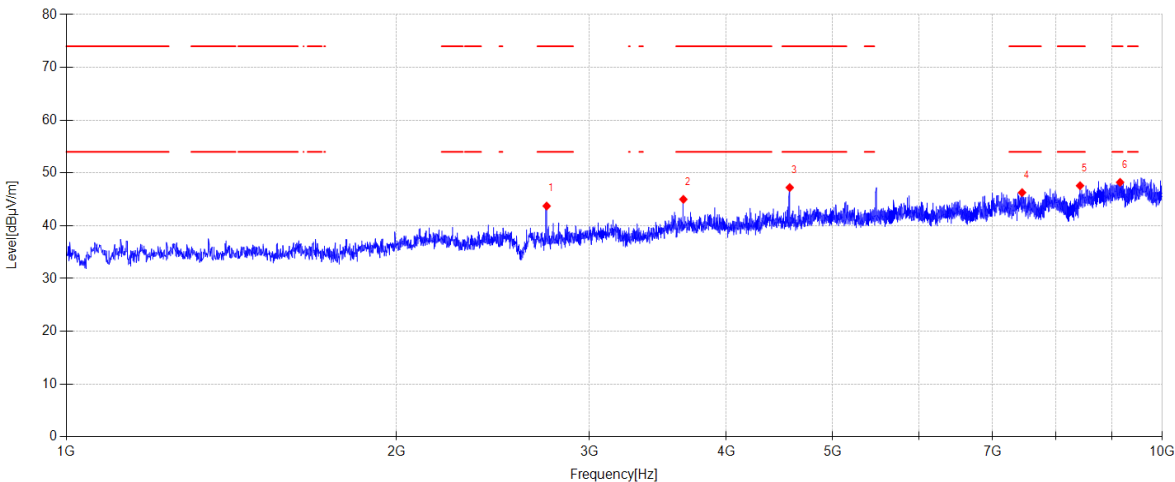
File Path:

d:\ts\2024 report data\Q24092616-2E\1211 FCC ABOVE 1G\54

Memo:

Sample Number:S24042326 Power Setting:20 (5dBi Antenna)

Test Graph



Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	2743.300	50.20	27.59	5.06	-39.12	43.73	74.00	30.27	PK	Vertical
2	3655.900	49.27	30.22	5.11	-39.60	45.00	74.00	29.00	PK	Vertical
3	4571.200	49.57	31.90	5.39	-39.63	47.23	74.00	26.77	PK	Vertical
4	7447.600	43.60	36.60	6.68	-40.60	46.28	74.00	27.72	PK	Vertical
5	8412.400	42.54	37.50	7.11	-39.56	47.59	74.00	26.41	PK	Vertical
6	9150.400	41.30	38.50	7.35	-38.92	48.23	74.00	25.77	PK	Vertical

Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

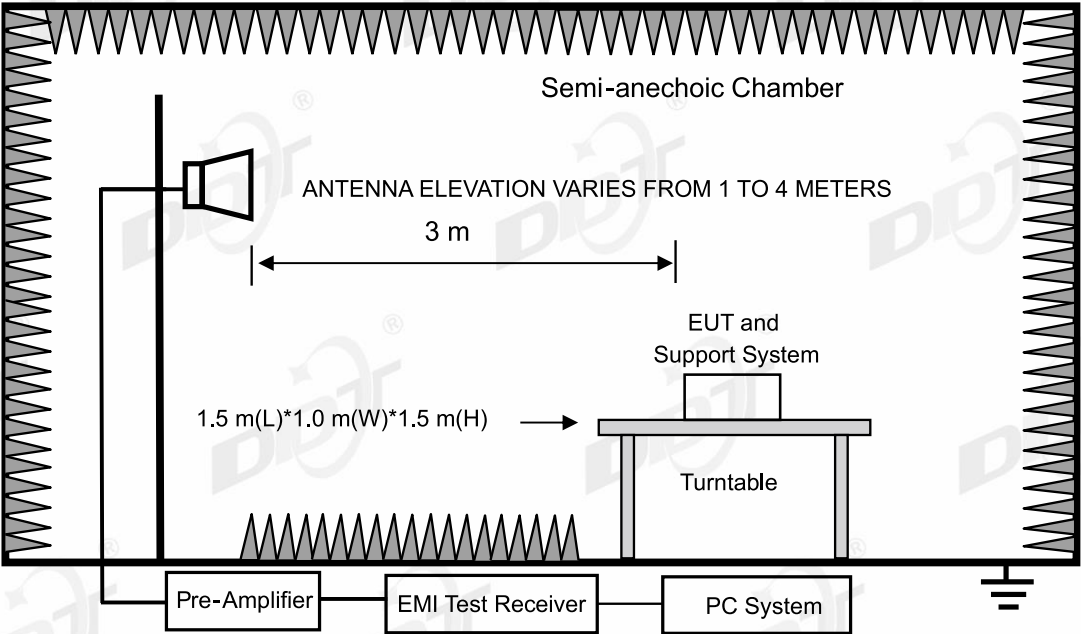
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

13.Band Edge Compliance

13.1. Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Cal Due To
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	DDT-ZC00506	2025/04/26
RF cable	Yuhu Technology	JCTB810-NJ-NJ-9M	DDT-ZC02538	2025/03/31
Micro-Tronics filters	REBES	BRM50702	DDT-ZC03242	/
High Pass filter	Xi'an Xingbo	XBLBQ-GTA67	DDT-ZC02179	2025/04/22
High pass filter	Micro-Tronics	HPM50108	DDT-ZC00560	2025/04/22
Hochgewinn-Hornantenne	SCHWARZBEC K	BBHA 9120 D	DDT-ZC02129	2025/09/18
Trilog Broadband Antenna	Schwarzbeck	VULB 9163	DDT-ZC02050	2025/07/11
RF Cable	N/A	W13.02 AP1-X2	DDT-ZC04023	2025/03/31
Pre-amplifier	COM-POWER	PAM-118A	DDT-ZC01293	2025/08/25
RF cable	Zhongke Junchuang	JCT26S-NJ-NJ-1.5M	DDT-ZC02762	2025/03/31
EMI TEST RECEIVER	R&S	ESU26	DDT-ZC01909	2025/03/31
High pass filter	Micro-Tronics	HPM50102	DDT-ZC00561	2025/04/22
Pre-amplifier	COM-POWER	PAM-840A	DDT-ZC01693	2025/03/31
Micro-Tronics filters	REBES	BRM50716	DDT-ZC03240	/
PSA Series Spectrum Analyzer	Agilent	E4447A	DDT-ZC00517	2025/03/31
RF Cable	N/A	W24.02 HL-562	DDT-ZC04022	2025/03/31
RF cable	Yuhu Technology	ZT26S-SMAJ-SMAJ-1M	DDT-ZC02037	2025/03/31
Active Loop Antenna	Schwarzbeck	FMZB1519	DDT-ZC00524	2025/09/11

13.2. Block diagram of test setup



13.3. Limits

All restriction band should comply with 15.209 limits, other emission should be at least 20 dB below the fundamental.

13.4. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	Description	other
/	/	/	/	/

13.5. Test procedure

Same with Radiated Emission except change investigated frequency range.
Remark: All restriction band have been tested, and only the worst case is shown in report.

13.6. Test result

PASS. (See below detailed test result)

13.7. Test data

TR-4-E-009 Radiated Emission Test Result

Test Date:

2025-01-03

Tested By:

Zhong Nan

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8channels 903MHz

Power Supply:

DC 12V

Condition:

Temp:23.2°C;Humi:62.7%

Test Site:

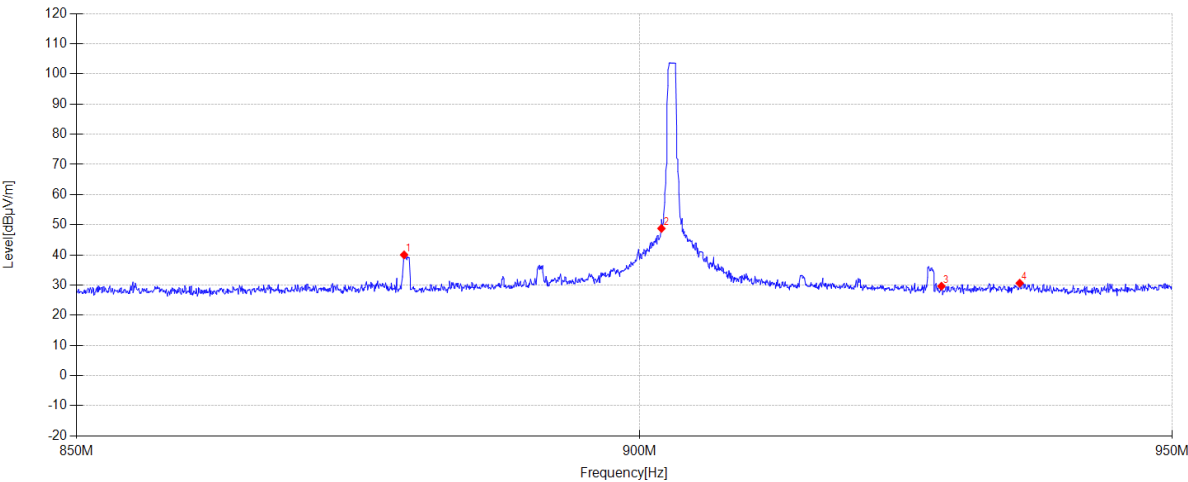
DDT 3# Chamber

File Path:

d:\ts\2024 report data\Q24092616-2E\FCC BELOW1G 0103\20250103-030932_H

Memo:

Sample Number:S24042326 Power Setting:20 (PCB Antenna)



Data List								
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Detector	Polarity
1	878.750	42.16	21.35	7.15	-30.67	39.99	PK	Horizontal
2	902.000	50.20	21.90	7.21	-30.56	48.75	PK	Horizontal
3	928.000	31.24	21.54	7.27	-30.44	29.61	PK	Horizontal
4	935.400	31.73	22.01	7.29	-30.40	30.63	PK	Horizontal

Note:

1. Result Level = Reading + Cable loss + Antenna Factor + AMP
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2025-01-03

Tested By:

Zhong Nan

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8channels 903MHz

Power Supply:

DC 12V

Condition:

Temp:23.2°C;Humi:62.7%

Test Site:

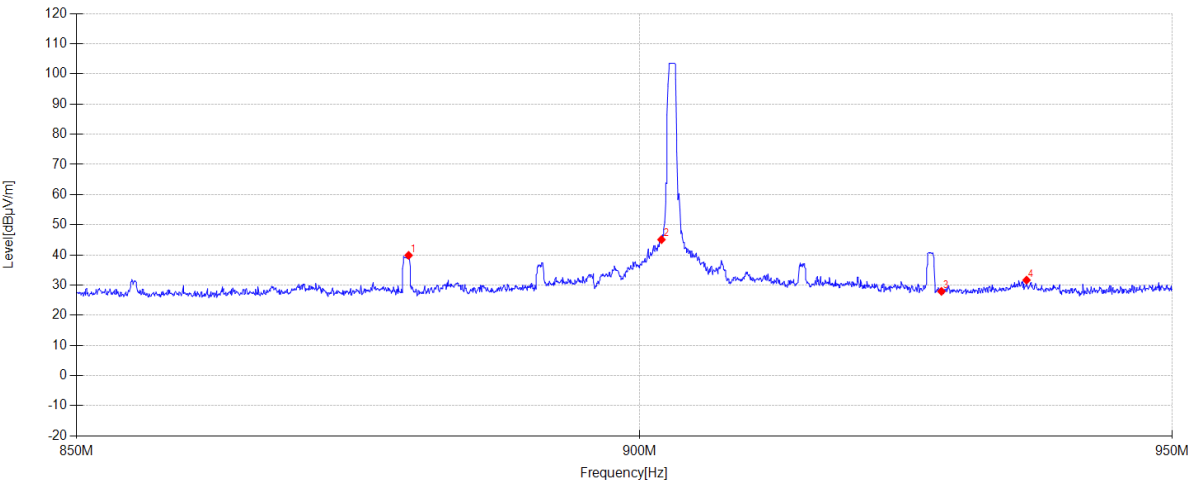
DDT 3# Chamber

File Path:

d:\ts\2024 report data\Q24092616-2E\FCC BELOW1G 0103\20250103-031017_V

Memo:

Sample Number:S24042326 Power Setting:20 (PCB Antenna)



Data List								
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Detector	Polarity
1	879.150	42.01	21.33	7.15	-30.66	39.83	PK	Vertical
2	902.000	46.50	21.90	7.21	-30.56	45.05	PK	Vertical
3	928.000	29.53	21.54	7.27	-30.44	27.90	PK	Vertical
4	936.050	32.87	21.87	7.29	-30.40	31.63	PK	Vertical

Note:

1. Result Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2025-01-03

Tested By:

Zhong Nan

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8channels 914.2MHz

Power Supply:

DC 12V

Condition:

Temp:23.2°C;Humi:62.7%

Test Site:

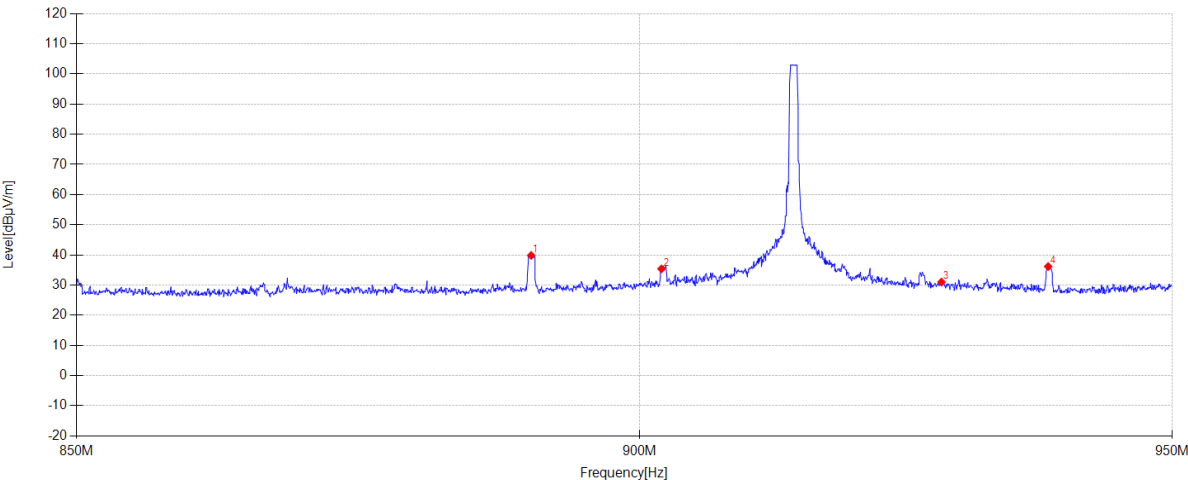
DDT 3# Chamber

File Path:

d:\ts\2024 report data\Q24092616-2E\FCC BELOW1G 0103\20250103-030657_H

Memo:

Sample Number:S24042326 Power Setting:20 (PCB Antenna)



Data List								
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Detector	Polarity
1	890.150	41.66	21.59	7.18	-30.61	39.82	PK	Horizontal
2	902.000	36.80	21.90	7.21	-30.56	35.35	PK	Horizontal
3	928.000	32.63	21.54	7.27	-30.44	31.00	PK	Horizontal
4	938.100	37.82	21.42	7.30	-30.39	36.15	PK	Horizontal

Note:

1. Result Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2025-01-03

Tested By:

Zhong Nan

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8channels 914.2MHz

Power Supply:

DC 12V

Condition:

Temp:23.2°C;Humi:62.7%

Test Site:

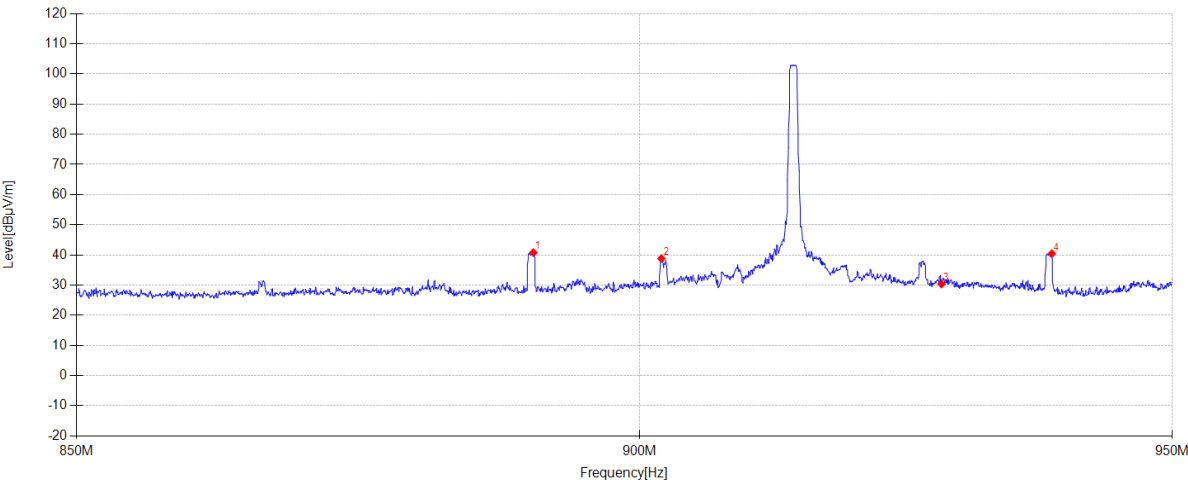
DDT 3# Chamber

File Path:

d:\ts\2024 report data\Q24092616-2E\FCC BELOW1G 0103\20250103-030742_V

Memo:

Sample Number:S24042326 Power Setting:20 (PCB Antenna)



Data List								
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Detector	Polarity
1	890.350	42.60	21.57	7.18	-30.61	40.74	PK	Vertical
2	902.000	40.23	21.90	7.21	-30.56	38.78	PK	Vertical
3	928.000	31.97	21.54	7.27	-30.44	30.34	PK	Vertical
4	938.450	42.14	21.34	7.30	-30.39	40.39	PK	Vertical

Note:

1. Result Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-16

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels 903MHz

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

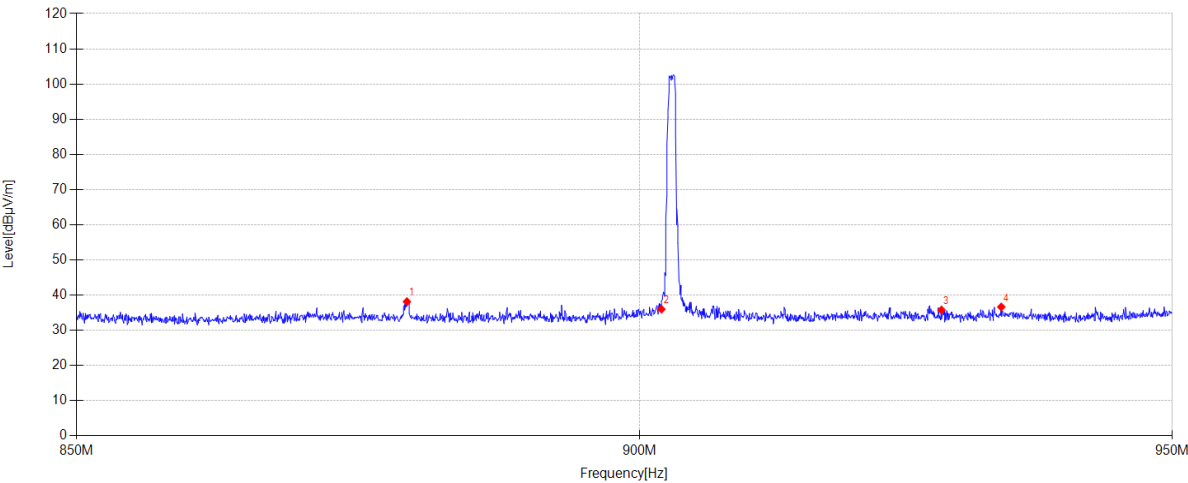
DDT 3# Chamber

File Path:

d:\ts\2024 report data\Q24092616-2E\1211 FCC BELOW 1G \20241216-224009_H

Memo:

Sample Number:S24042326 Power Setting:20 (3dBi Antenna)



Data List								
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Detector	Polarity
1	879.000	9.64	21.34	7.15	0.00	38.13	PK	Horizontal
2	902.000	6.88	21.90	7.21	0.00	35.99	PK	Horizontal
3	928.000	6.95	21.54	7.27	0.00	35.76	PK	Horizontal
4	933.650	7.39	21.94	7.29	0.00	36.62	PK	Horizontal

Note:

1. Result Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-16

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels 903MHz

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

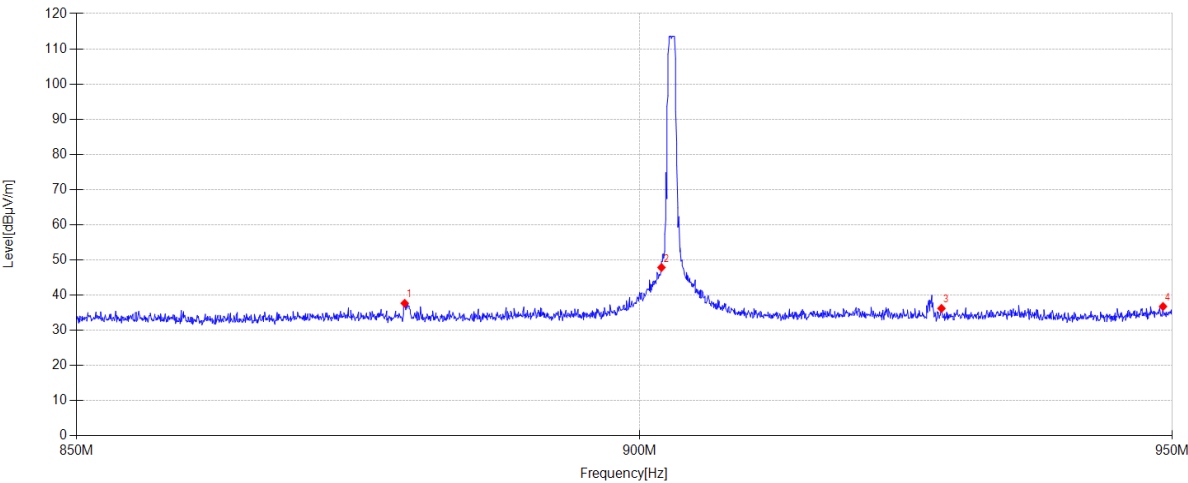
DDT 3# Chamber

File Path:

d:\ts\2024 report data\Q24092616-2E\1211 FCC BELOW 1G \20241216-224051_V

Memo:

Sample Number:S24042326 Power Setting:20 (3dBi Antenna)



Data List								
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Detector	Polarity
1	878.800	9.17	21.35	7.15	0.00	37.67	PK	Vertical
2	902.000	18.73	21.90	7.21	0.00	47.84	PK	Vertical
3	928.000	7.40	21.54	7.27	0.00	36.21	PK	Vertical
4	949.100	6.95	22.48	7.33	0.00	36.76	PK	Vertical

Note:

1. Result Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-16

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels 914.2MHz

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

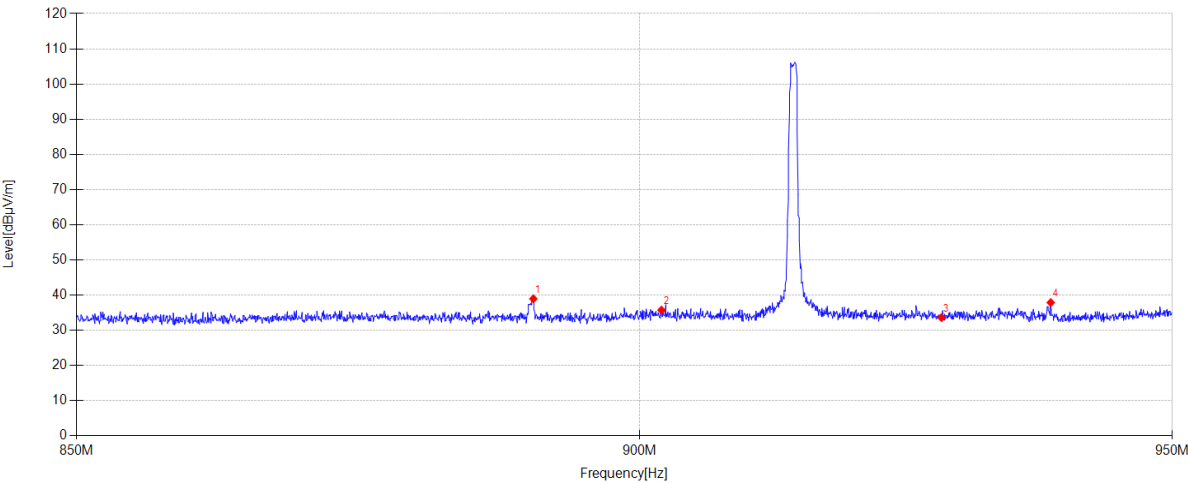
DDT 3# Chamber

File Path:

d:\ts\2024 report data\Q24092616-2E\1211 FCC BELOW 1G \20241216-224447_H

Memo:

Sample Number:S24042326 Power Setting:20 (3dBi Antenna)



Data List								
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Detector	Polarity
1	890.350	10.20	21.57	7.18	0.00	38.95	PK	Horizontal
2	902.000	6.62	21.90	7.21	0.00	35.73	PK	Horizontal
3	928.000	4.79	21.54	7.27	0.00	33.60	PK	Horizontal
4	938.350	9.21	21.36	7.30	0.00	37.87	PK	Horizontal

Note:

1. Result Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-16

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels 914.2MHz

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

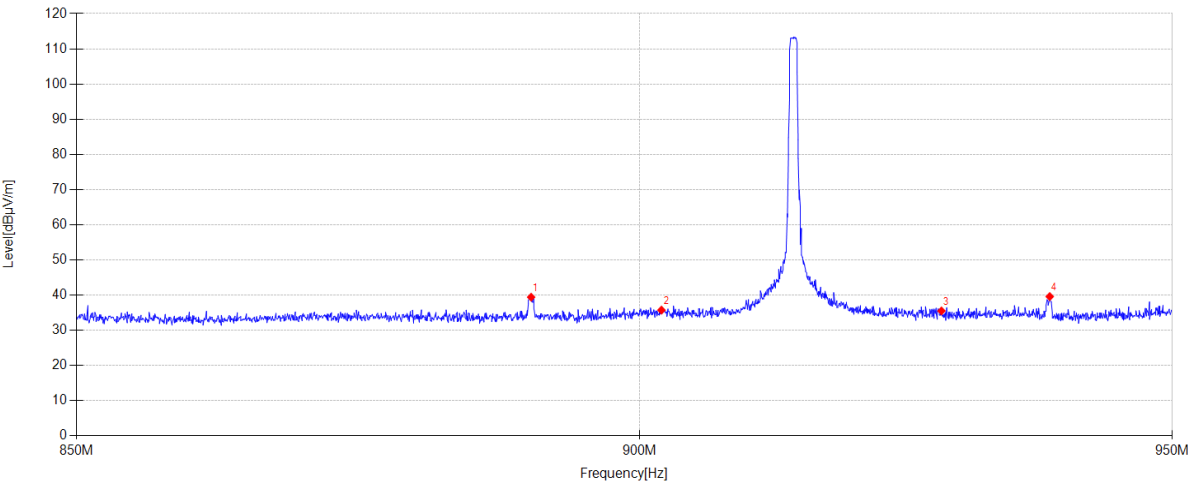
DDT 3# Chamber

File Path:

d:\ts\2024 report data\Q24092616-2E\1211 FCC BELOW 1G \20241216-224541_V

Memo:

Sample Number:S24042326 Power Setting:20 (3dBi Antenna)



Data List								
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Detector	Polarity
1	890.150	10.64	21.59	7.18	0.00	39.41	PK	Vertical
2	902.000	6.61	21.90	7.21	0.00	35.72	PK	Vertical
3	928.000	6.69	21.54	7.27	0.00	35.50	PK	Vertical
4	938.250	10.89	21.39	7.30	0.00	39.58	PK	Vertical

Note:

1. Result Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-16

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels 903MHz

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

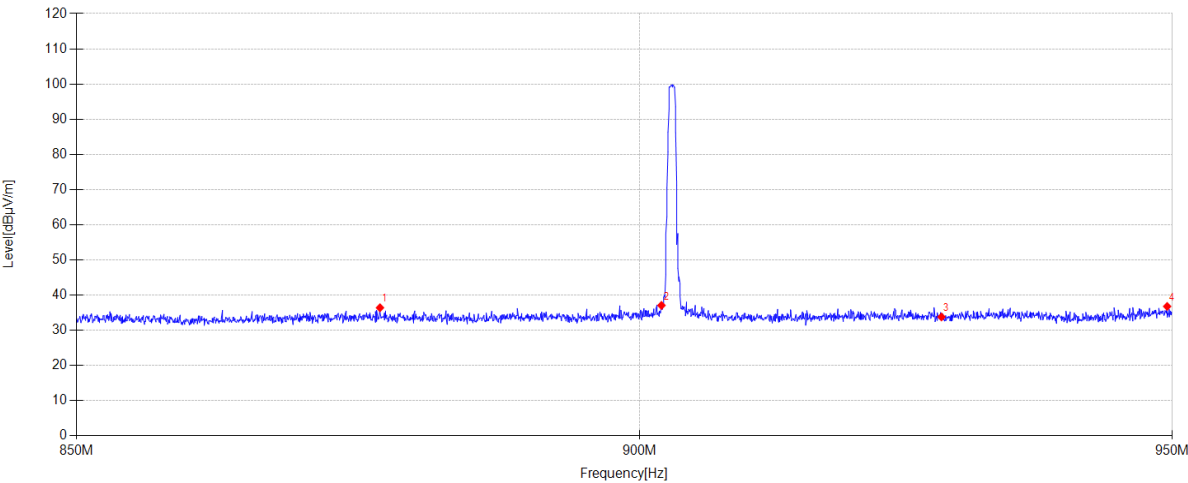
DDT 3# Chamber

File Path:

d:\ts\2024 report data\Q24092616-2E\1211 FCC BELOW 1G \20241216-233004_H

Memo:

Sample Number:S24042326 Power Setting:20 (5dBi Antenna)



Data List								
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Detector	Polarity
1	876.600	7.82	21.44	7.14	0.00	36.40	PK	Horizontal
2	902.000	7.96	21.90	7.21	0.00	37.07	PK	Horizontal
3	928.000	4.99	21.54	7.27	0.00	33.80	PK	Horizontal
4	949.500	6.86	22.58	7.33	0.00	36.77	PK	Horizontal

Note:

1. Result Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-16

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels 903MHz

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

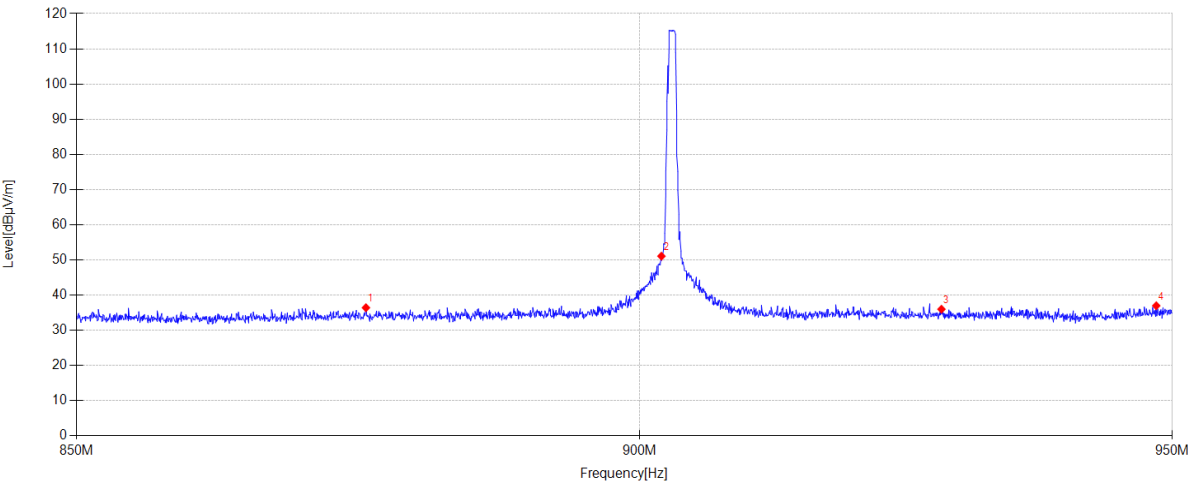
DDT 3# Chamber

File Path:

d:\ts\2024 report data\Q24092616-2E\1211 FCC BELOW 1G \20241216-233048_V

Memo:

Sample Number:S24042326 Power Setting:20 (5dBi Antenna)



Data List								
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Detector	Polarity
1	875.350	7.78	21.49	7.14	0.00	36.41	PK	Vertical
2	902.000	21.95	21.90	7.21	0.00	51.06	PK	Vertical
3	928.000	7.17	21.54	7.27	0.00	35.98	PK	Vertical
4	948.450	7.31	22.33	7.33	0.00	36.97	PK	Vertical

Note:

1. Result Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-16

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels 914.2MHz

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

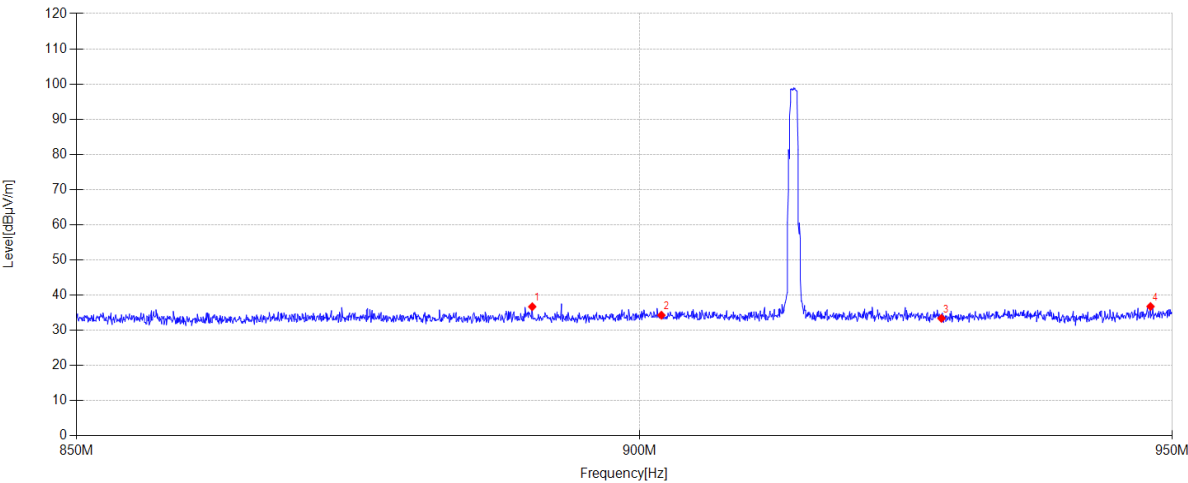
DDT 3# Chamber

File Path:

d:\ts\2024 report data\Q24092616-2E\1211 FCC BELOW 1G \20241216-233512_H

Memo:

Sample Number:S24042326 Power Setting:20 (5dBi Antenna)



Data List								
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Detector	Polarity
1	890.250	7.93	21.58	7.18	0.00	36.69	PK	Horizontal
2	902.000	5.17	21.90	7.21	0.00	34.28	PK	Horizontal
3	928.000	4.57	21.54	7.27	0.00	33.38	PK	Horizontal
4	947.900	7.23	22.20	7.32	0.00	36.75	PK	Horizontal

Note:

1. Result Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-12-16

Tested By:

Genliu

EUT:

wireless internet gateway

Model Number:

GW3

Test Mode:

LoRa-8 channels 914.2MHz

Power Supply:

DC 12V

Condition:

Temp:21.2°C;Humi:52.7%

Test Site:

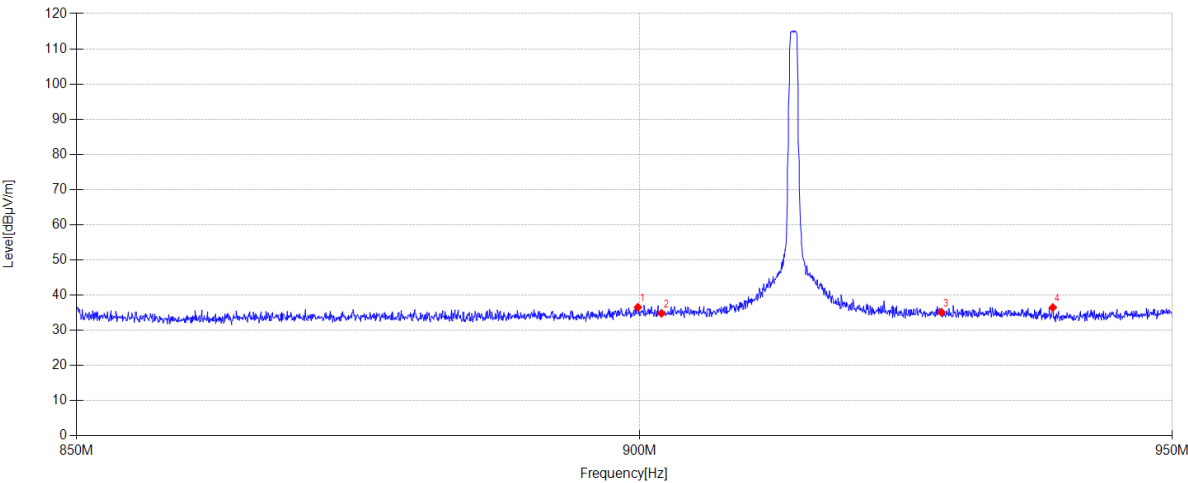
DDT 3# Chamber

File Path:

d:\ts\2024 report data\Q24092616-2E\1211 FCC BELOW 1G \20241216-233554_V

Memo:

Sample Number:S24042326 Power Setting:20 (5dBi Antenna)



Data List								
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Detector	Polarity
1	899.850	7.46	21.88	7.20	0.00	36.54	PK	Vertical
2	902.000	5.70	21.90	7.21	0.00	34.81	PK	Vertical
3	928.000	6.31	21.54	7.27	0.00	35.12	PK	Vertical
4	938.550	7.85	21.32	7.30	0.00	36.47	PK	Vertical

Note:

1. Result Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

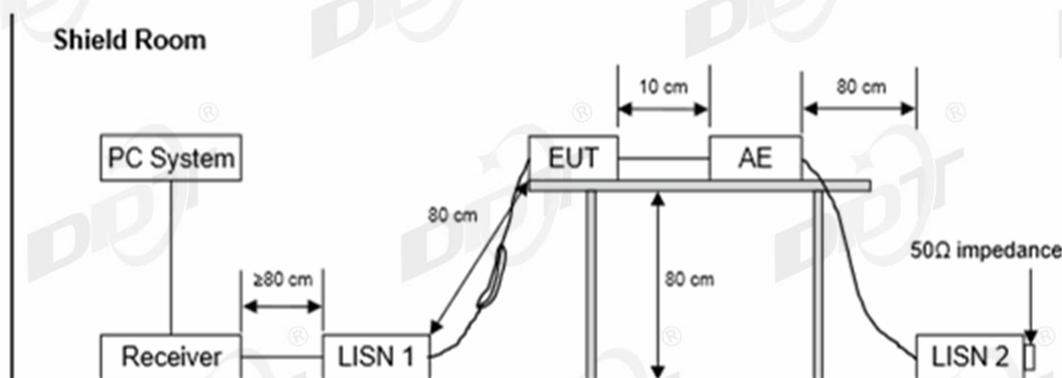
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

14.Power Line Conducted Emissions

14.1. Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Cal Due To
Pulse Limiter	SCHWARZBEC K	VTSD 9561	DDT-ZC02128	2025/07/08
Two Line V-Network	R&S	ENV216	DDT-ZC02059	2025/07/08
Two Line V-Network	R&S	ENV216	DDT-ZC02056	2025/07/08
Conducted Radiated Software	Audix	E3	DDT-ZC00562	/
Δ-shaped artificial power network	SCHWARZBEC K	PVDC 8301	DDT-ZC03939	2025/03/31
EMI Test Receiver	R&S	ESCI/E3	DDT-ZC01297	2025/07/08
RF Cable	Yuhu Technology	Z806-NJ-NJ-6M	DDT-ZC02004	2025/07/08
Three-phase artificial power network	SCHWARZBEC K	NSLK 8163	DDT-ZC01572	2025/07/08

14.2. Block diagram of test setup



14.3. Limits

Frequency	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150 kHz~500 kHz	66 ~ 56*	56 ~ 46*
500 kHz~5 MHz	56	46
5 MHz~30 MHz	60	50

Note 1: * Decreasing linearly with logarithm of frequency.

Note 2: The lower limit shall apply at the transition frequencies.

14.4. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	Description	other
/	/	/	/	/

14.5. Test procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30 MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

The test mode(s) described in clause 2.4 were scanned during the preliminary test.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions.

Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 9 kHz.

14.6. Test result

PASS. (See below detailed test result)

Note1: All emissions not reported below are too low against the prescribed limits.

Note2: “----” means Peak detection; “----” means Average detection.

Note3: Pre-test AC conducted emission at both voltage AC 120V/60Hz and AC 240V/50Hz, recorded the worst case.

14.7. Test data

TR-4-E-010 Conducted Emission Test Result

Test Site : DDT 6# Shield Room

D:\2024 Report Date\Q24092616-2E\1224 CE.EM6

Test Date : 2024-12-24

Tested By : Gen Liu

EUT : wireless internet gateway

Model Number : GW3

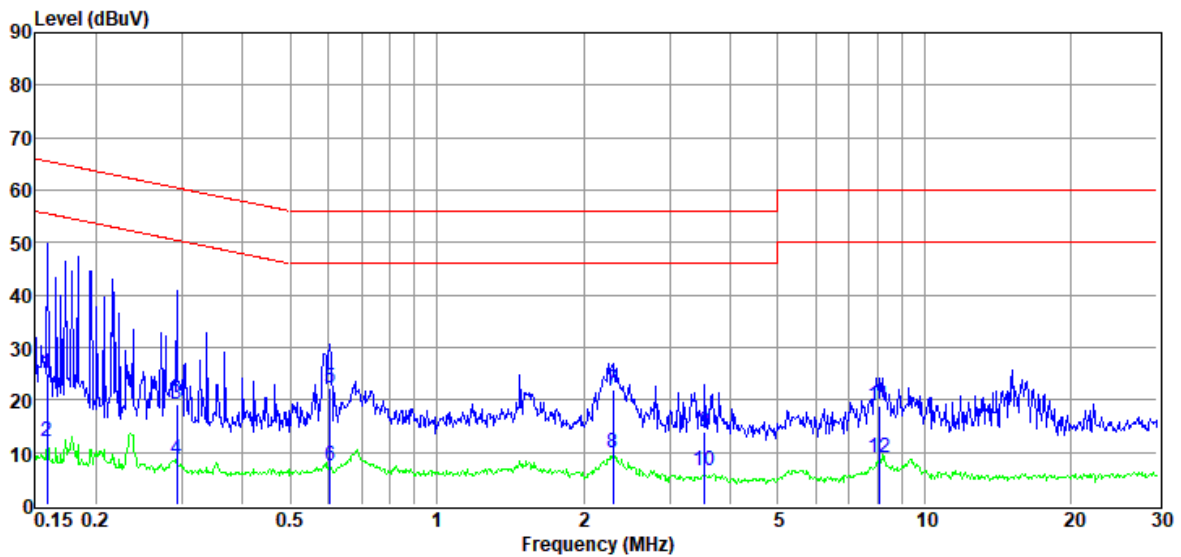
Power Supply : AC 120V/60Hz

Test Mode : LoRa-8 channels

Condition : Temp:21.9°C,Humi:56.2%

LISN : 2024 ENV216 3#/LINE

Memo :



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	LISN Factor (dB)	Cable Loss (dB)	Pulse Limiter Factor (dB)	Result Level (dBμV)	Limit Line (dBμV)	Over Limit (dB)	Detector	Phase
1	0.16	5.50	9.78	0.07	9.83	25.18	65.52	-40.34	QP	LINE
2	0.16	-7.57	9.78	0.07	9.83	12.11	55.52	-43.41	Average	LINE
3	0.29	-0.55	9.77	0.06	9.83	19.11	60.46	-41.35	QP	LINE
4	0.29	-11.11	9.77	0.06	9.83	8.55	50.46	-41.91	Average	LINE
5	0.60	2.73	9.75	0.09	9.83	22.40	56.00	-33.60	QP	LINE
6	0.60	-12.15	9.75	0.09	9.83	7.52	46.00	-38.48	Average	LINE
7	2.30	2.31	9.75	0.11	9.84	22.01	56.00	-33.99	QP	LINE
8	2.30	-9.82	9.75	0.11	9.84	9.88	46.00	-36.12	Average	LINE
9	3.55	-5.84	9.77	0.10	9.85	13.88	56.00	-42.12	QP	LINE
10	3.55	-13.10	9.77	0.10	9.85	6.62	46.00	-39.38	Average	LINE
11	8.06	-0.94	9.82	0.18	9.87	18.93	60.00	-41.07	QP	LINE
12	8.06	-10.92	9.82	0.18	9.87	8.95	50.00	-41.05	Average	LINE

Note: 1. Result Level = Read Level + LISN Factor + Pulse Limiter Factor + Cable loss.

2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).

4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

TR-4-E-010 Conducted Emission Test Result

Test Site : DDT 6# Shield Room

D:\2024 Report Date\Q24092616-2E\1224 CE.EM6

Test Date : 2024-12-24

Tested By : Gen Liu

EUT : wireless internet gateway

Model Number : GW3

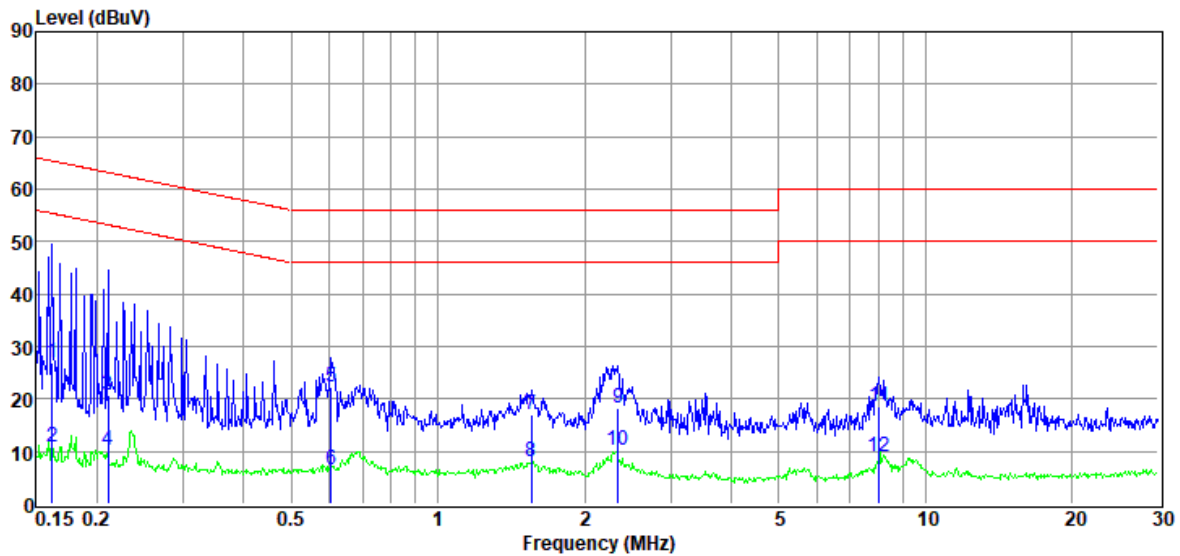
Power Supply : AC 120V/60Hz

Test Mode : LoRa-8 channels

Condition : Temp:21.9°C,Humi:56.2%

LISN : 2024 ENV216 3#/NEUTRAL

Memo :



Item	Freq.	Read Level	LISN Factor	Cable Loss	Pulse Limiter Factor	Result Level	Limit Line	Over Limit	Detector	Phase
(Mark)	(MHz)	(dBμV)	(dB)	(dB)	(dB)	(dBμV)	(dBμV)	(dB)		
1	0.16	7.18	9.77	0.07	9.83	26.85	65.38	-38.53	QP	NEUTRAL
2	0.16	-8.71	9.77	0.07	9.83	10.96	55.38	-44.42	Average	NEUTRAL
3	0.21	1.03	9.76	0.06	9.83	20.68	63.18	-42.50	QP	NEUTRAL
4	0.21	-9.59	9.76	0.06	9.83	10.06	53.18	-43.12	Average	NEUTRAL
5	0.60	2.55	9.75	0.09	9.83	22.22	56.00	-33.78	QP	NEUTRAL
6	0.60	-13.08	9.75	0.09	9.83	6.59	46.00	-39.41	Average	NEUTRAL
7	1.55	-2.64	9.77	0.11	9.84	17.08	56.00	-38.92	QP	NEUTRAL
8	1.55	-11.60	9.77	0.11	9.84	8.12	46.00	-37.88	Average	NEUTRAL
9	2.35	-1.45	9.77	0.11	9.84	18.27	56.00	-37.73	QP	NEUTRAL
10	2.35	-9.36	9.77	0.11	9.84	10.36	46.00	-35.64	Average	NEUTRAL
11	8.02	-1.37	9.83	0.17	9.87	18.50	60.00	-41.50	QP	NEUTRAL
12	8.02	-10.89	9.83	0.17	9.87	8.98	50.00	-41.02	Average	NEUTRAL

Note: 1. Result Level = Read Level + LISN Factor + Pulse Limiter Factor + Cable loss.

2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).

4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

16. Photos of the EUT

Please refer to DDT-Q24092616-2E appendix I

-----End Report-----