FCC Test Report

Report No.: 2405X44367EB

Applicant: Sindcon (Singapore) IoT Technology Pte. Ltd.

Address: 7 Tampines Industrial Drive, #03-01 Zulin Building, Singapore, 528547

Product Name: LoRaWAN Bridge

Product Model: NPL-IN(AC)

Multiple Models: N/A

Trade Mark: sindcon

FCC ID: 2BHSMST0301

Standards: FCC CFR Title 47 Part 15C (§15.249)

Test Date: 2024-09-27 to 2024-10-16

Test Result: Complied

Report Date: 2024-10-17

Reviewed by:

Abel Chen

Abel Chen
Project Engineer

Approved by:

Jacob Kong

Jacob Kong
Manager

Prepared by:

World Alliance Testing & Certification (Shenzhen) Co., Ltd

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NVLAP TESTING NVLAP LAB CODE 600335-0

ilac-MRA

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Revision History

Version No.	Issued Date	Description
00	*2024-10-17*	*Original*

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1 General Information

1.1 Client Information

Applicant:	Sindcon (Singapore) IoT Technology Pte. Ltd.
Address:	7 Tampines Industrial Drive, #03-01 Zulin Building, Singapore, 528547
Manufacturer:	Sindcon (Singapore) IoT Technology Pte. Ltd.
Address:	7 Tampines Industrial Drive, #03-01 Zulin Building, Singapore, 528547

1.2 Product Description of EUT

The EUT is LoRaWAN Bridge that contains a Lora radio, this report covers the full testing of the Lora radio.

Sample Serial Number	2RZQ-1 (assigned by WATC)
Sample Received Date	2024-09-24
Sample Status	Good Condition
Frequency Range	921.4~924.6MHz
Maximum E-field Strength:	91.66dBuV/m@3m
Modulation Technology	LoRa (CSS)
Antenna Gain#	2.28dBi
Spatial Streams#	SISO (1TX, 1RX)
Power Supply	AC 85~250V/60Hz
Adapter Information	N/A
Modification	Sample No Modification by the test lab

1.3 Antenna information

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.

Device Antenna information:	

The antenna is an external antenna which with unique antenna connector. Please see product internal photos for details.

1.4 Related Submittal(s)/Grant(s)

No Related Submittal(s)/Grant(s)

1.5 Measurement Uncertainty

Parameter		Expanded Uncertainty (Confidence of 95%(U = 2Uc(y)))
AC Power Lines Conducted Emissions		±3.14dB
Emissions, Radiated	Below 30MHz	±2.78dB
	Below 1GHz	±4.84dB
	Above 1GHz	±5.44dB
Bandwidth		0.34%

Note 1: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Note 2: The Decision Rule is based on simple acceptance with ISO Guide 98-4:2012 Clause 8.2 (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

1.6 Laboratory Location

World Alliance Testing & Certification (Shenzhen) Co., Ltd

No. 1002, East Block, Laobing Building, Xingye Road 3012, Xixiang street, Bao'an District, Shenzhen, Guangdong, People's Republic of China

Tel: +86-755-29691511, Email: qa@watc.com.cn

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 463912, the FCC Designation No. : CN5040.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0160.

1.7 Test Methodology

FCC CFR 47 Part 2

FCC CFR 47 Part 15

ANSI C63.10-2020

2 Description of Measurement

2.1 Test Configuration

Operating channels:					
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	921.4	7	922.6	13	924.0
2	921.6	8	922.8	14	924.2
3	921.8	9	923.2	15	924.4
4	922.0	10	923.4	16	924.6
5	922.2	11	923.6	/	/
6	922.4	12	923.8	/	/

According to ANSI C63.10-2020 chapter 5.6.1 Table 11 requirement, select lowest//highest frequency in the frequency range in which device operates for testing. The detailed frequency points are as follows:

Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	921.4	/	/	16	924.6

Test Mode:			
Transmitting mode:	Keep the EUT in continuous transmitting with modulation		
Exercise software#:	host_V5.3.6		
Mode	**Power Level Setting#**		
	Low Channel	**Middle Channel**	**High Channel**
SRD	16	/	16
The exercise software and the maximum power setting that provided by manufacturer.			

Worst-Case Configuration:
For radiated emissions, EUT was investigated in three orthogonal orientation, the worst-case orientation was recorded in report For AC line conducted emission and radiated emission 9kHz-30MHz were performed with the EUT transmits at the channel with highest output power as worst-case scenario.

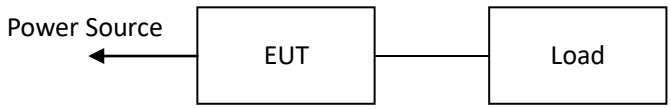
2.2 Test Auxiliary Equipment

Manufacturer	Description	Model	Serial Number
unknown	Load	unknown	unknown

2.3 Interconnecting Cables

Manufacturer	Description	Length(m)	From	To
Unknown	AC Power Cable	1.0	Power source	EUT
Unknown	DC Cable	2.0	EUT	Load

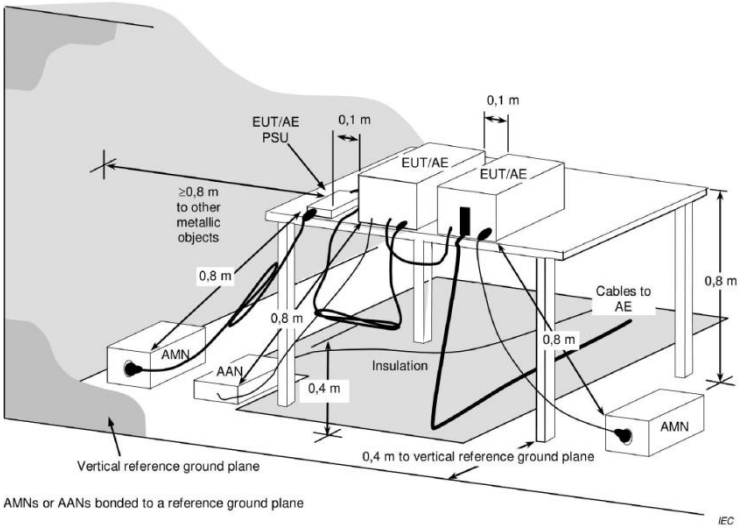
2.4 Block Diagram of Connection between EUT and AE



Note: for reference only, the actual connection setup used for testing please refer to the test photos.

2.5 Test Setup

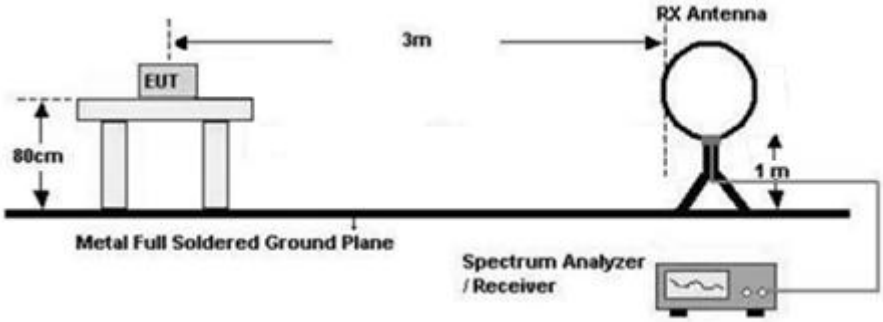
1) Conducted emission measurement:



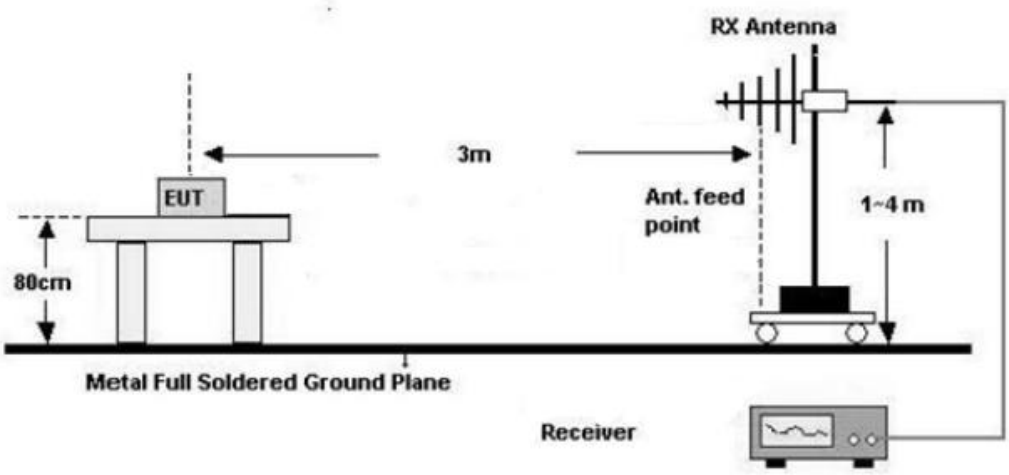
Note: The 0.8 m distance specified between EUT/AE/PSU and AMN/AAN, is applicable only to the EUT being measured. If the device is AE then it shall be >0.8 m.

2) Radiated emission measurement:

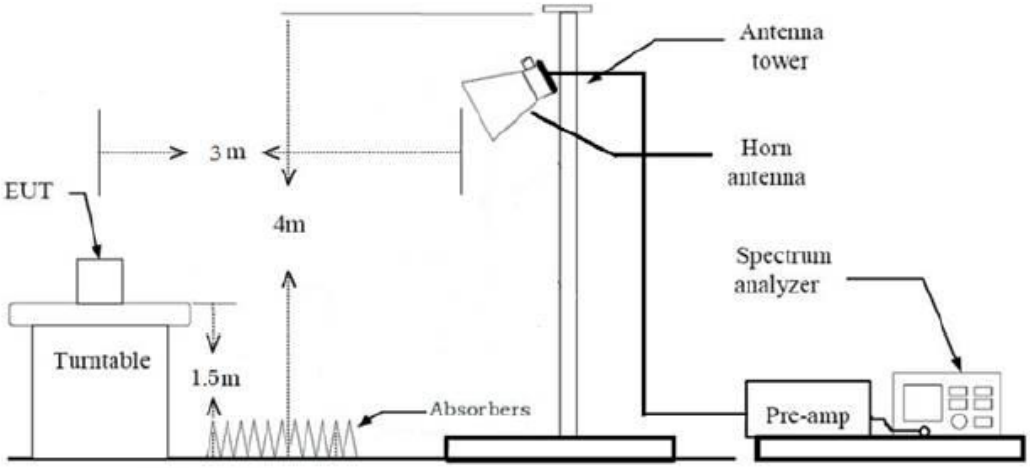
Below 30MHz (3m SAC)



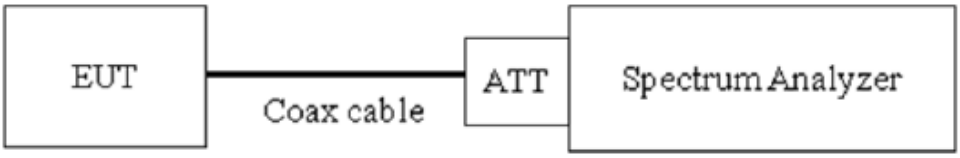
30MHz-1GHz (3m SAC)



1GHz-10GHz(3m FAC)



3) RF Conducted Test



2.6 Test Procedure

Conducted emission:

1. The E.U.T is placed on a non-conducting table 40cm from the vertical ground plane and 80cm above the horizontal ground plane (Please refer to the block diagram of the test setup and photographs).
2. 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 on conducted measurement.

3. Line conducted data is recorded for both Line and Neutral

Radiated Emission Procedure:

a) For below 30MHz

1. All measurements were made at a test distance of 3 m. The measured data was extrapolated from the test distance (3m) to the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz- 30 MHz) to clearly show the relative levels of fundamental and spurious emissions and demonstrate compliance with the requirement that the level of any spurious emissions be below the level of the intentionally transmitted signal. The extrapolation factor for the limits were 40*Log (test distance / specification distance).
2. Loop antenna use, investigation was done on the three antenna orientations (parallel, perpendicular, gound-parallel)

b) For 30MHz-1GHz:

1. The EUT was placed on the tabletop of a rotating table 0.8 m the ground at a 3 m semi anechoic chamber. The measurement distance from the EUT to the receiving antenna is 3 m.
2. EUT works in each mode of operation that needs to be tested. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations.

c) For above 1GHz:

1. The EUT was placed on the tabletop of a rotating table 1.5 m the ground at a 3 m fully anechoic room. The measurement distance from the EUT to the receiving antenna is 3 m (1-18GHz) and 1.5 m (above 18GHz).
2. EUT works in each mode of operation that needs to be tested， and having the EUT continuously working. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations.
3. Open the test software to control the test antenna and test turntable. Perform the test, save the test results, and export the test data.
4. Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

Bandwidth Test:

1. The antenna port of EUT was connected to the RF port of the Spectrum analyzer through Attenuator and RF cable.
2. The EUT is keeping in continuous transmission mode.
3. Test the bandwidth and record the result

2.7 Measurement Method

Description of Test	Measurement Method
AC Line Conducted Emissions	ANSI C63.10-2020 Section 6.2
20dB Emission Bandwidth	ANSI C63.10-2020 Section 6.9.2
Field strength of fundamental and Radiated emission	ANSI C63.10-2020 Section 6.3&6.4&6.5&6.6&7.5

2.8 Measurement Equipment

Manufacturer	Description	Model	Management No.	Calibration Date	Calibration Due Date
AC Line Conducted Emission Test					
ROHDE& SCHWARZ	EMI TEST RECEIVER	ESR	101817	2024/6/4	2025/6/3
R&S	LISN	ENV216	101748	2024/6/4	2025/6/3
N/A	Coaxial Cable	NO.12	N/A	2024/6/4	2025/6/3
Farad	Test Software	EZ-EMC	Ver. EMEC-3A1	/	/
Radiated Emission Test					
R&S	EMI test receiver	ESR3	102758	2024/6/4	2025/6/3
ROHDE& SCHWARZ	SPECTRUM ANALYZER	FSV40-N	101608	2024/6/4	2025/6/3
SONOMA INSTRUMENT	Low frequency amplifier	310	186014	2024/6/4	2025/6/3
A.H. Systems	PREAMPLIFIER	PAM-0118P	531	2024/6/4	2025/6/3
BACL	Loop Antenna	1313-1A	4010611	2024/2/7	2027/2/6
SCHWARZBECK	Log - periodic wideband antenna	VULB 9163	9163-872	2023/7/7	2026/7/6
Astro Antenna Ltd	Horn antenna	AHA-118S	3015	2023/7/6	2026/7/5
N/A	Coaxial Cable	NO.9	N/A	2024/6/4	2025/6/3
N/A	Coaxial Cable	NO.15	N/A	2024/6/4	2025/6/3
N/A	Coaxial Cable	NO.16	N/A	2024/6/4	2025/6/3
N/A	Coaxial Cable	NO.17	N/A	2024/6/4	2025/6/3
Audix	Test Software	E3	191218 V9	/	/
RF Conducted Test					
ROHDE& SCHWARZ	SPECTRUM ANALYZER	FSU-26	200680/026	2024/6/4	2025/6/3
narda	6dB attenuator	603-06-1	N/A	2024/6/4	2025/6/3

Note: All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or International standards.

3 Test Results

3.1 Test Summary

FCC Rules	Description of Test	Result
FCC §15.203	Antenna Requirement	Compliance
FCC §15.207(a)	AC Line Conducted Emissions	Compliance
FCC §15.215(c)	20dB Emission Bandwidth	Compliance
FCC §15.205, §15.209, §15.249	Field strength of fundamental and Radiated emission	Compliance

3.2 Limit

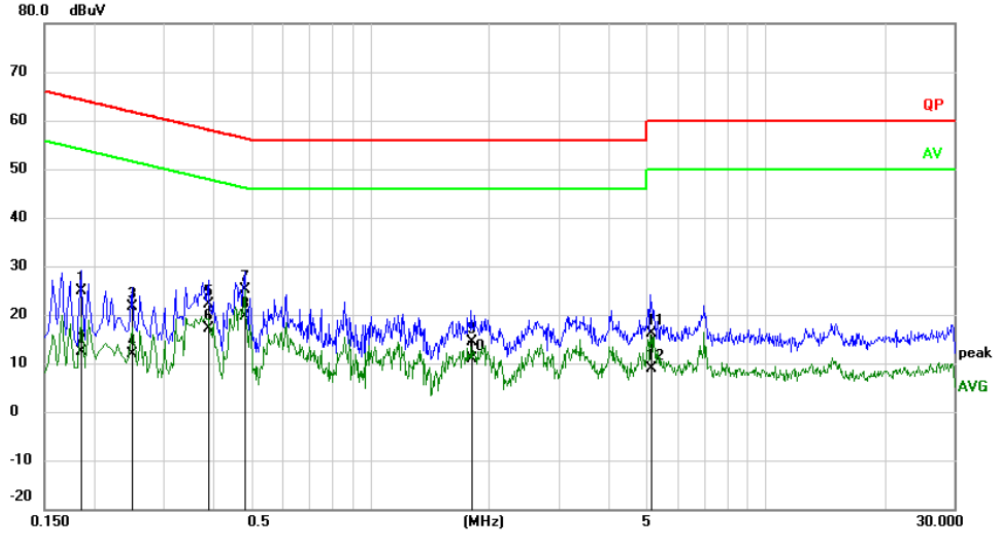
<table>
<tr><th>Test items</th><th>Limit</th></tr>
<tr><td>AC Line Conducted Emissions</td><td>See details §15.207 (a)</td></tr>
<tr><td>Field strength of fundamental and Radiated emission</td><td>The field strength of fundamental and harmonic emissions measured at 3 m shall not exceed the limits as below:
<table>
<tr><th>Fundamental frequency</th><th>Field strength of fundamental (millivolts/meter)</th><th>Field strength of harmonics (microvolts/meter)</th></tr>
<tr><td>902–928 MHz</td><td>50</td><td>500</td></tr>
<tr><td>2400–2483.5 MHz</td><td>50</td><td>500</td></tr>
<tr><td>5725–5875 MHz</td><td>50</td><td>500</td></tr>
<tr><td>24.0–24.25 GHz</td><td>250</td><td>2500</td></tr>
</table>
The field strength shall be measured using an average detector, except for the fundamental emission in the frequency band 902-928 MHz, which is based on measurements using an International Special Committee on Radio Interference (CISPR) quasi-peak detector.
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 § 15.209, whichever is the lesser attenuation.
For frequencies above 1000 MHz, the field strength limits in above table are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.</td></tr>
<tr><td>20dB Emission Bandwidth</td><td>Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.</td></tr>
</table>

3.3 AC Line Conducted Emissions Test Data

Test Date:	2024-09-27	Test By:	Lirou Li
Environment condition:	Temperature: 23.2°C; Relative Humidity:61%; ATM Pressure: 101.3kPa		

Conducted Emission Measurement

File :2405X44367E Data :#4 Date: 2024/9/27 Time: 10:31:03



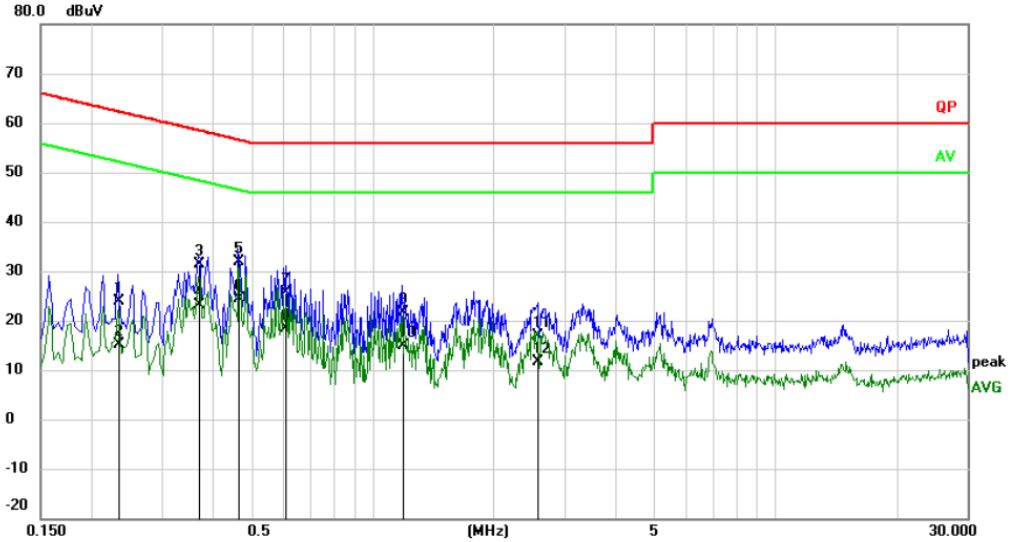
Limit: QP Phase: L1 Temperature: 23.2 ℃
Mode:transmitting Power: AC 120V/60Hz Humidity: 61 %
Note: LORA 924.6MHz Air Pressure: 1013 hpa

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over Limit		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1860	14.50	10.34	24.84	64.21	-39.37	QP	
2		0.1860	2.00	10.34	12.34	54.21	-41.87	AVG	
3		0.2500	11.21	10.36	21.57	61.76	-40.19	QP	
4		0.2500	1.50	10.36	11.86	51.76	-39.90	AVG	
5		0.3899	11.77	10.48	22.25	58.07	-35.82	QP	
6		0.3899	6.55	10.48	17.03	48.07	-31.04	AVG	
7		0.4820	14.53	10.51	25.04	56.30	-31.26	QP	
8	*	0.4820	9.21	10.51	19.72	46.30	-26.58	AVG	
9		1.8020	3.53	10.76	14.29	56.00	-41.71	QP	
10		1.8020	0.14	10.76	10.90	46.00	-35.10	AVG	
11		5.1180	5.72	10.53	16.25	60.00	-43.75	QP	
12		5.1180	-1.66	10.53	8.87	50.00	-41.13	AVG	

*:Maximum data x:Over limit !:over margin Engineer Signature: Lirou

Conducted Emission Measurement

File :2405X44367E Data :#3 Date: 2024/9/27 Time: 11:47:59



Limit: QP
Mode:transmitting
Note: LORA 924.6MHz

Phase: N
Power: AC 120V/60Hz

Temperature: 23.2 ℃
Humidity: 61 %
Air Pressure: 1013 hpa

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over Limit		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2340	13.64	10.34	23.98	62.31	-38.33	QP	
2		0.2340	4.88	10.34	15.22	52.31	-37.09	AVG	
3		0.3700	20.81	10.46	31.27	58.50	-27.23	QP	
4		0.3700	12.70	10.46	23.16	48.50	-25.34	AVG	
5		0.4660	21.31	10.50	31.81	56.58	-24.77	QP	
6	*	0.4660	13.96	10.50	24.46	46.58	-22.12	AVG	
7		0.6100	15.21	10.48	25.69	56.00	-30.31	QP	
8		0.6100	7.88	10.48	18.36	46.00	-27.64	AVG	
9		1.1860	11.01	10.59	21.60	56.00	-34.40	QP	
10		1.1860	4.21	10.59	14.80	46.00	-31.20	AVG	
11		2.5700	6.36	10.61	16.97	56.00	-39.03	QP	
12		2.5700	0.99	10.61	11.60	46.00	-34.40	AVG	

*:Maximum data x:Over limit !:over margin

Engineer Signature: Lirou

Remark:

Measurement (dBuV)= Reading Level (dBuV) + Correct Factor(dB)

Correct Factor (dB)= LISN Voltage Division Factor (dB)+ Cable loss(dB)

Over Limit= Measurement – Limit

3.4 Radiated emission Test Data

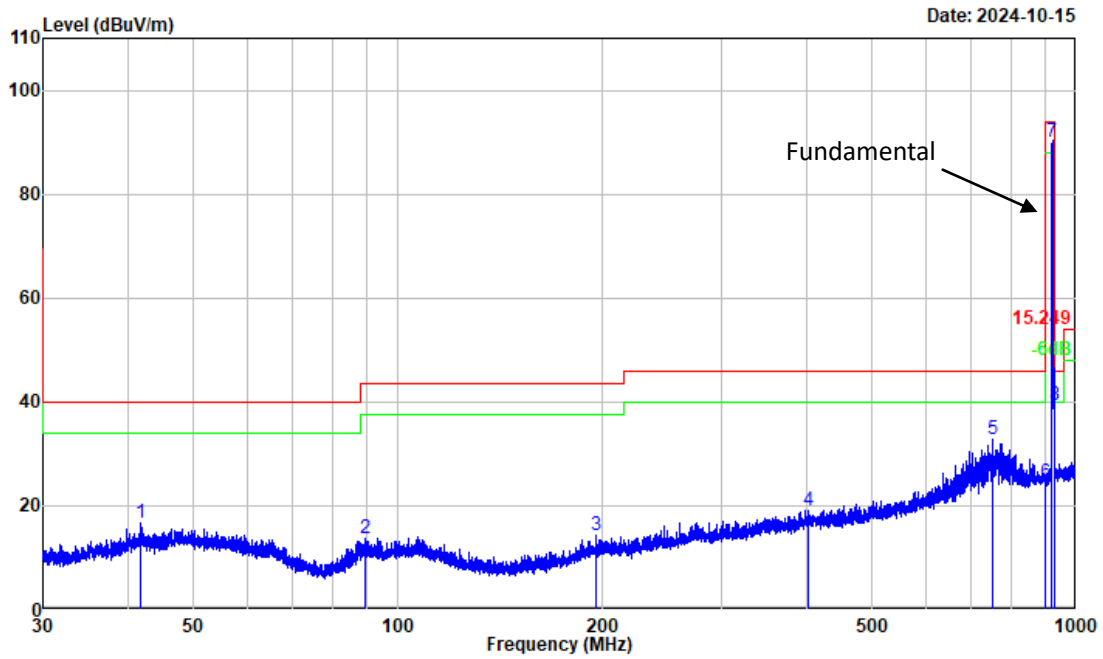
9 kHz-30MHz:

Test Date:	2024-10-15	**Test By:**	Bard Huang
Environment condition:	Temperature: 22.7°C; Relative Humidity:61%; ATM Pressure: 100.5kPa		

For radiated emissions below 30MHz, there were no emissions found within 20dB of limit.

30MHz-1GHz:

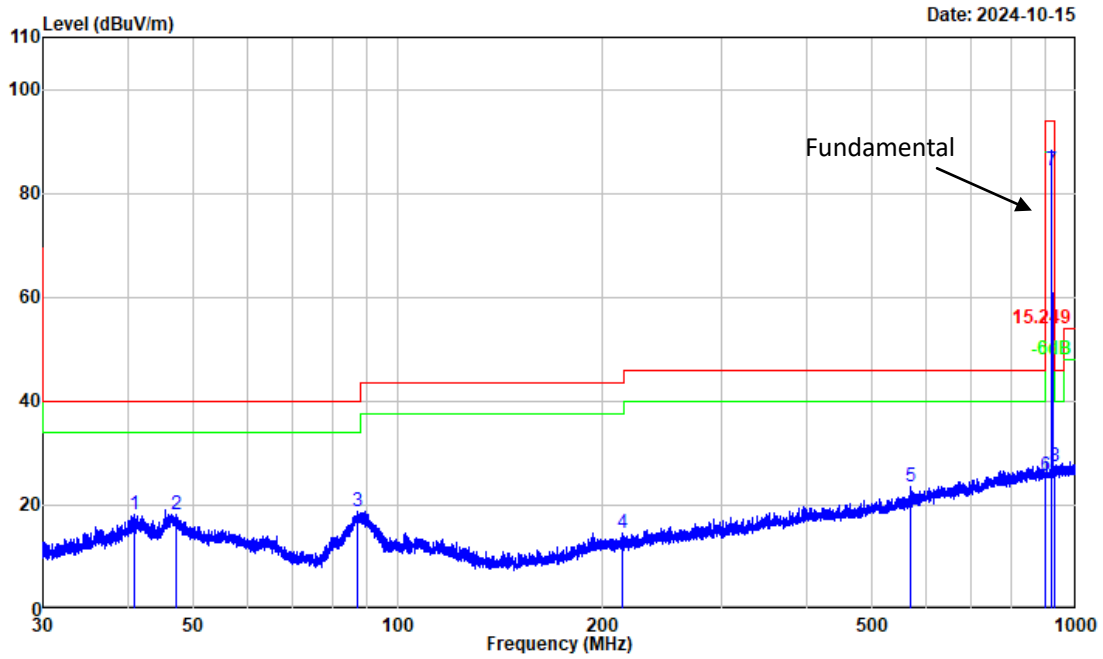
Test Date:	2024-10-15	Test By:	Bard Huang
Environment condition:	Temperature: 22.7°C; Relative Humidity:61%; ATM Pressure: 100.5kPa		



Project No. : 2405X44367E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.7℃/61%R.H./100.5kPa
Tested by : Bard Huang
Polarization : Horizontal
Remark : 921.4

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	41.823	29.13	-12.53	16.60	40.00	-23.40	Peak
2	89.511	29.60	-15.83	13.77	43.50	-29.73	Peak
3	196.424	28.19	-14.00	14.19	43.50	-29.31	Peak
4	403.073	27.65	-8.61	19.04	46.00	-26.96	Peak
5	754.395	35.47	-2.78	32.69	46.00	-13.31	Peak
6	902.000	25.88	-1.32	24.56	46.00	-21.44	Peak
7	921.400	90.84	-0.93	89.91	94.00	-4.09	QP
8	928.000	40.05	-0.77	39.28	46.00	-6.72	Peak

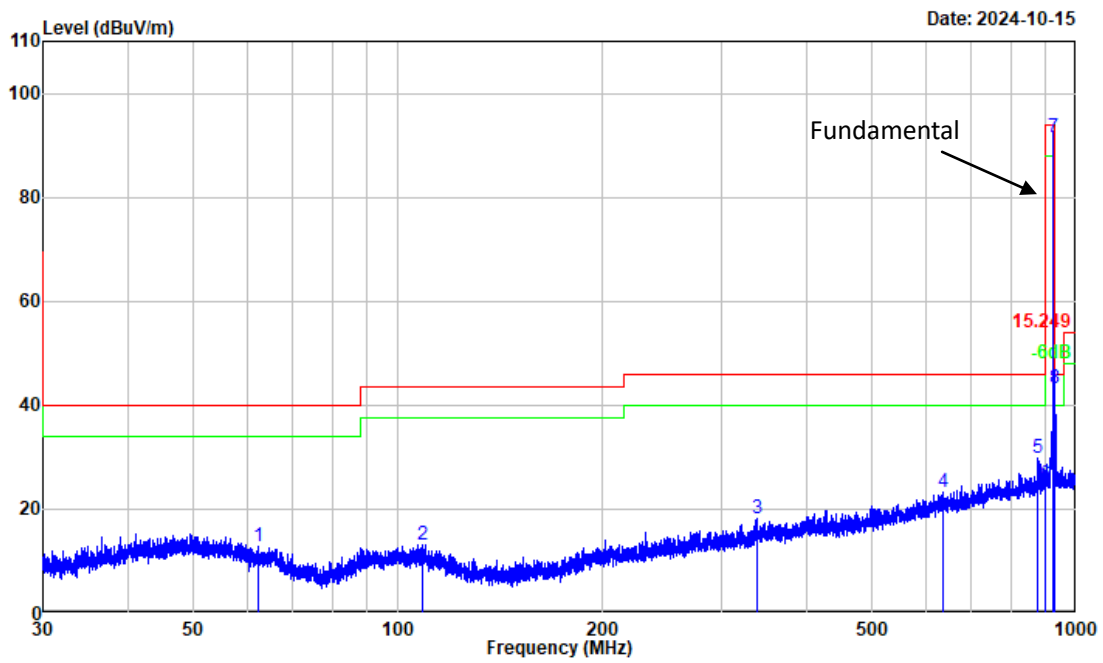
Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit



Project No. : 2405X44367E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.7℃/61%R.H./100.5kPa
Tested by : Bard Huang
Polarization : Vertical
Remark : 921.4

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	40.988	30.91	-12.79	18.12	40.00	-21.88	Peak
2	47.098	30.45	-12.16	18.29	40.00	-21.71	Peak
3	87.265	35.36	-16.52	18.84	40.00	-21.16	Peak
4	214.514	28.44	-13.85	14.59	43.50	-28.91	Peak
5	571.111	29.66	-6.15	23.51	46.00	-22.49	Peak
6	902.000	26.96	-1.32	25.64	46.00	-20.36	Peak
7	921.400	85.20	-0.93	84.27	94.00	-9.73	QP
8	928.000	28.12	-0.77	27.35	46.00	-18.65	Peak

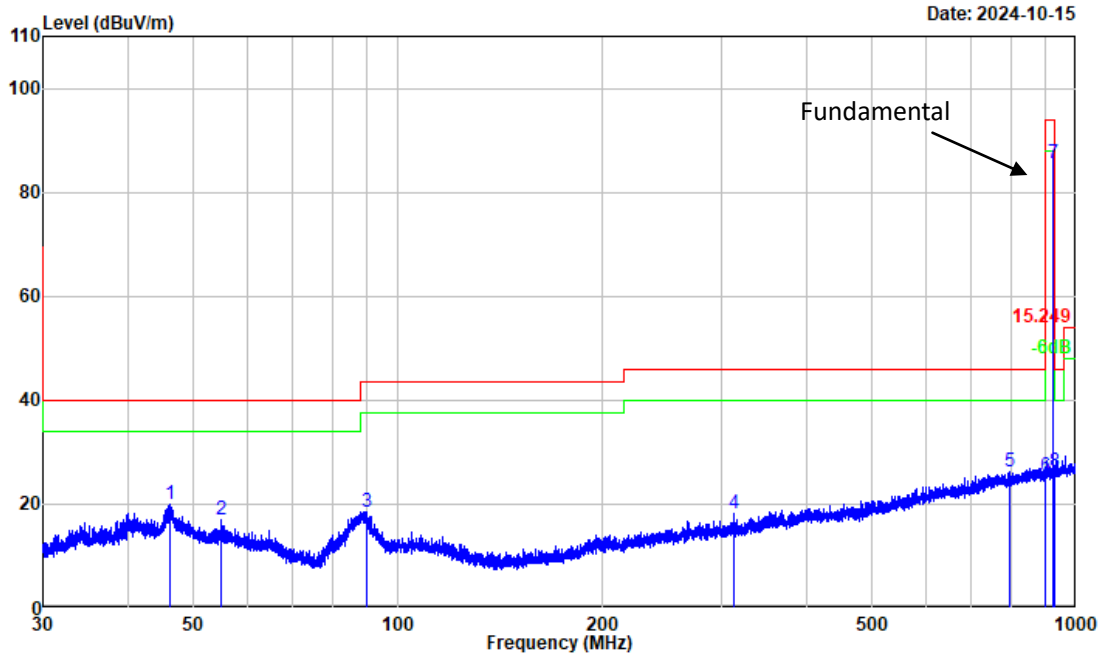
Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit



Project No. : 2405X44367E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.7℃/61%R.H./100.5kPa
Tested by : Bard Huang
Polarization : Horizontal
Remark : 924.6

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	62.295	26.90	-13.98	12.92	40.00	-27.08	Peak
2	108.599	27.30	-14.06	13.24	43.50	-30.26	Peak
3	338.994	28.26	-10.10	18.16	46.00	-27.84	Peak
4	635.020	27.83	-4.69	23.14	46.00	-22.86	Peak
5	877.937	31.19	-1.52	29.67	46.00	-16.33	Peak
6	902.000	26.17	-1.32	24.85	46.00	-21.15	Peak
7	924.600	92.49	-0.83	91.66	94.00	-2.34	QP
8	928.000	43.90	-0.77	43.13	46.00	-2.87	QP

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit



Project No. : 2405X44367E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.7℃/61%R.H./100.5kPa
Tested by : Bard Huang
Polarization : Vertical
Remark : 924.6

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	46.117	32.15	-12.17	19.98	40.00	-20.02	Peak
2	55.052	29.70	-12.71	16.99	40.00	-23.01	Peak
3	89.826	34.30	-15.73	18.57	43.50	-24.93	Peak
4	313.688	29.18	-11.09	18.09	46.00	-27.91	Peak
5	798.280	28.70	-2.50	26.20	46.00	-19.80	Peak
6	902.000	26.64	-1.32	25.32	46.00	-20.68	Peak
7	924.600	86.31	-0.83	85.48	94.00	-8.52	QP
8	928.000	26.86	-0.77	26.09	46.00	-19.91	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

Above 1GHz:

Test Date:	2024-10-16	**Test By:**	Luke Li
Environment condition:	Temperature: 24.7°C; Relative Humidity:66%; ATM Pressure: 100.7kPa		

Frequency (MHz)	**Reading level (dBμV)**	**Polar (H/V)**	**Corrected Factor (dB/m)**	**Corrected Amplitude (dBμV/m)**	**Limit (dBμV/m)**	**Margin (dB)**	**Remark**
921.4MHz							
1842.800	62.79	horizontal	-4.12	58.67	74.00	-15.33	Peak
2764.200	67.48	horizontal	-2.64	64.84	74.00	-9.16	Peak
3685.600	51.72	horizontal	-2.91	48.81	74.00	-25.19	Peak
1842.800	58.74	vertical	-4.12	54.62	74.00	-19.38	Peak
2764.200	66.98	vertical	-2.64	64.34	74.00	-9.66	Peak
3685.600	50.50	vertical	-2.91	47.59	74.00	-26.41	Peak
924.6MHz							
1849.200	65.70	horizontal	-4.14	61.56	74.00	-12.44	Peak
2773.800	62.98	horizontal	-2.65	60.33	74.00	-13.67	Peak
3698.400	50.15	horizontal	-2.89	47.26	74.00	-26.74	Peak
1849.200	63.49	vertical	-4.14	59.35	74.00	-14.65	Peak
2773.800	60.79	vertical	-2.65	58.14	74.00	-15.86	Peak
3698.400	49.76	vertical	-2.89	46.87	74.00	-27.13	Peak

Note: Corrected factor=Antenna factor + Cable loss - Amplifier Gain

Corrected Amplitude=Reading level + Correct factor

Margin= Corrected Amplitude-Limit

Field strength of average:

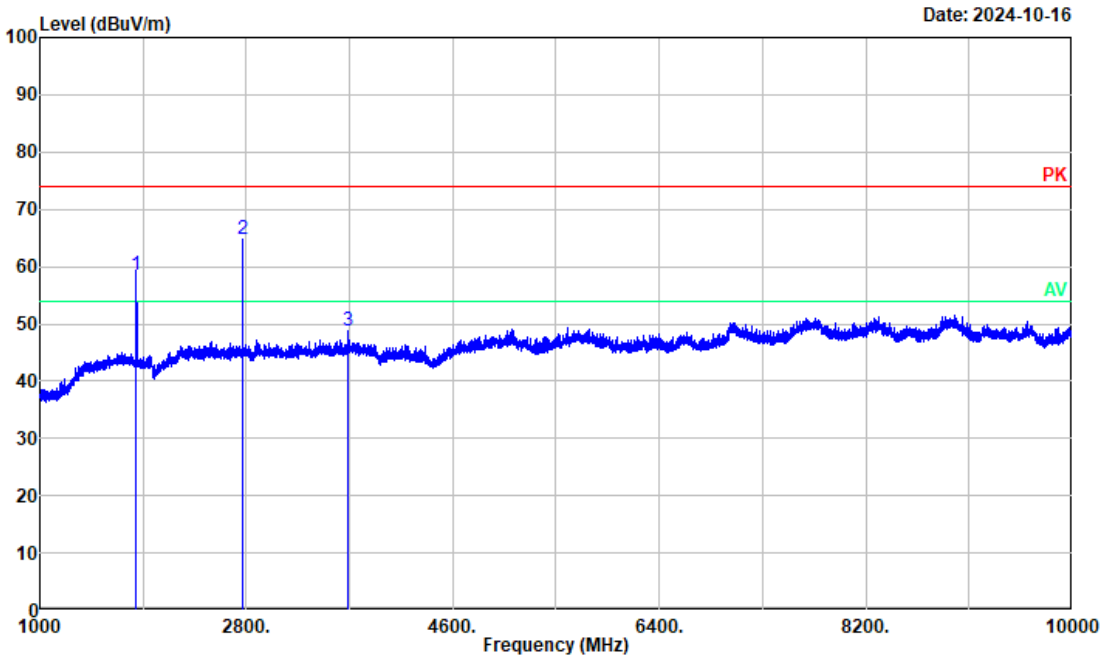
Frequency (MHz)	Peak level (dBμV/m)	Polar (H/V)	Duty Cycle Factor (dB)	Average Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark
921.4MHz							
1842.800	58.67	horizontal	-17.48	41.19	54.00	-12.81	Average
2764.200	64.84	horizontal	-17.48	47.36	54.00	-6.64	Average
3685.600	48.81	horizontal	-17.48	31.33	54.00	-22.67	Average
1842.800	54.62	vertical	-17.48	37.14	54.00	-16.86	Average
2764.200	64.34	vertical	-17.48	46.86	54.00	-7.14	Average
3685.600	47.59	vertical	-17.48	30.11	54.00	-23.89	Average
924.6MHz							
1849.200	61.56	horizontal	-17.48	44.08	54.00	-9.92	Average
2773.800	60.33	horizontal	-17.48	42.85	54.00	-11.15	Average
3698.400	47.26	horizontal	-17.48	29.78	54.00	-24.22	Average
1849.200	59.35	vertical	-17.48	41.87	54.00	-12.13	Average
2773.800	58.14	vertical	-17.48	40.66	54.00	-13.34	Average
3698.400	46.87	vertical	-17.48	29.39	54.00	-24.61	Average

Note: Average Amplitude=Peak level + duty cycle factor

Margin= Average Amplitude – Limit

Test plot for example as below:

Mode:	SRD	Channel:	921.4MHz

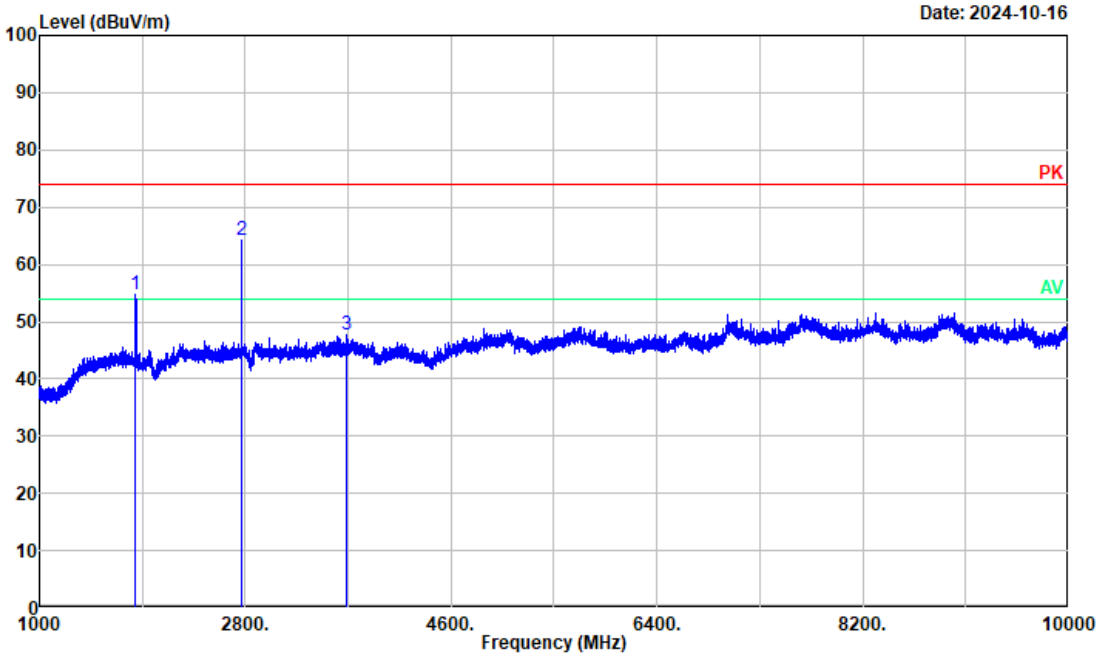


Project No. : 2405X44367E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 24.7℃/66%R.H./100.7kPa
Tested by : Luke Li
Polarization : horizontal
Remark : 921.4

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	1842.800	62.79	-4.12	58.67	74.00	-15.33	Peak
2	2764.200	67.48	-2.64	64.84	74.00	-9.16	Peak
3	3685.600	51.72	-2.91	48.81	74.00	-25.19	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

Mode:	SRD	Channel:	921.4MHz

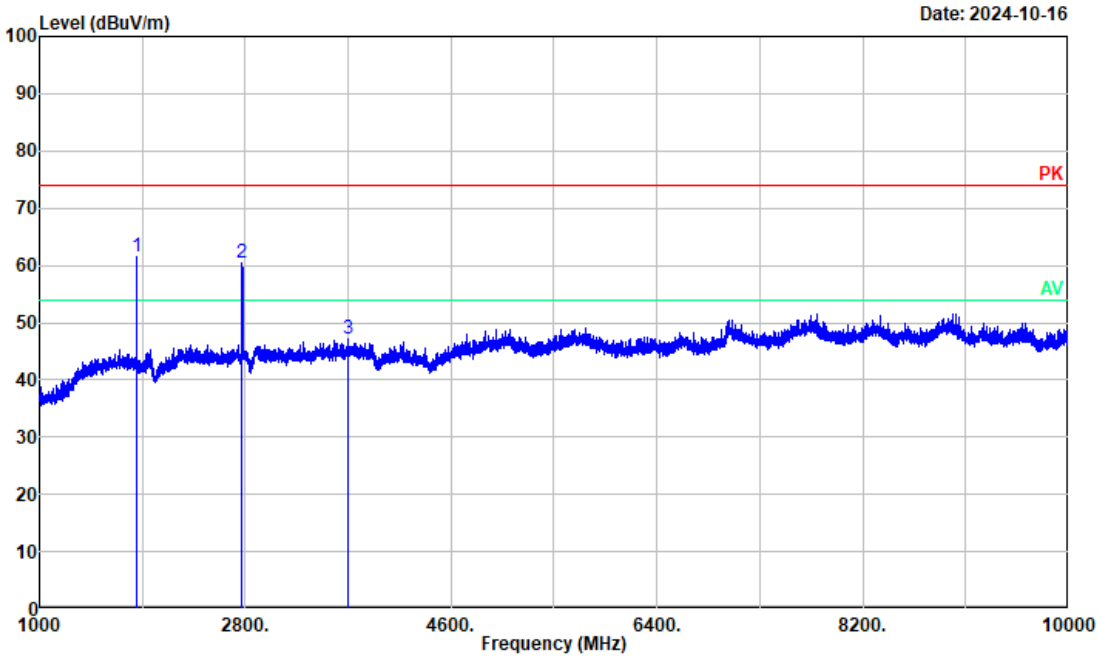


Project No. : 2405X44367E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 24.7℃/66%R.H./100.7kPa
Tested by : Luke Li
Polarization : vertical
Remark : 921.4

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	1842.800	58.74	-4.12	54.62	74.00	-19.38	Peak
2	2764.200	66.98	-2.64	64.34	74.00	-9.66	Peak
3	3685.600	50.50	-2.91	47.59	74.00	-26.41	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

Mode:	SRD	Channel:	924.6MHz

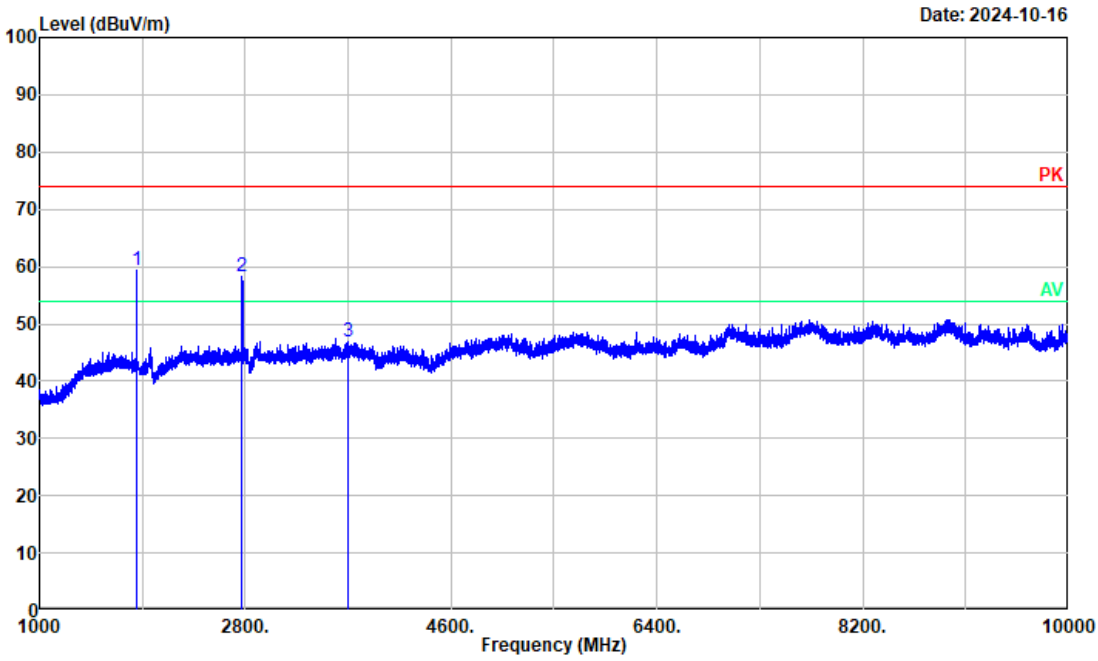


Project No. : 2405X44367E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 24.7℃/66%R.H./100.7kPa
Tested by : Luke Li
Polarization : horizontal
Remark : 924.6

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	1849.200	65.70	-4.14	61.56	74.00	-12.44	Peak
2	2773.800	62.98	-2.65	60.33	74.00	-13.67	Peak
3	3698.400	50.15	-2.89	47.26	74.00	-26.74	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

Mode:	SRD	Channel:	924.6MHz



Project No. : 2405X44367E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 24.7℃/66%R.H./100.7kPa
Tested by : Luke Li
Polarization : vertical
Remark : 924.6

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	1849.200	63.49	-4.14	59.35	74.00	-14.65	Peak
2	2773.800	60.79	-2.65	58.14	74.00	-15.86	Peak
3	3698.400	49.76	-2.89	46.87	74.00	-27.13	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

3.5 Duty cycle factor

Total On time [ms]	Period of the pulse train [ms]	Duty Cycle [%]
13.37	100	13.37
Duty cycle Factor[dB]:	-17.48	

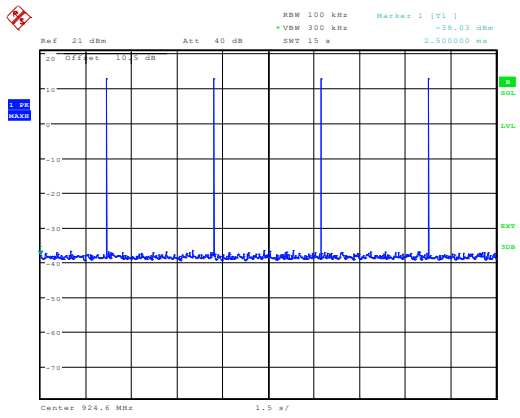
Note:

Duty Cycle=(Total On time)/Tp

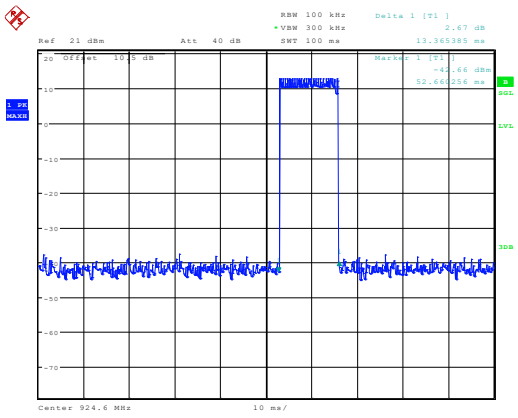
Duty Cycle Factor=20*log(Duty Cycle)

Test Plots:

Duty cycle



ProjectNo.: 2405X44367E Tester:Ryan Zhang
Date: 16.OCT.2024 14:38:52



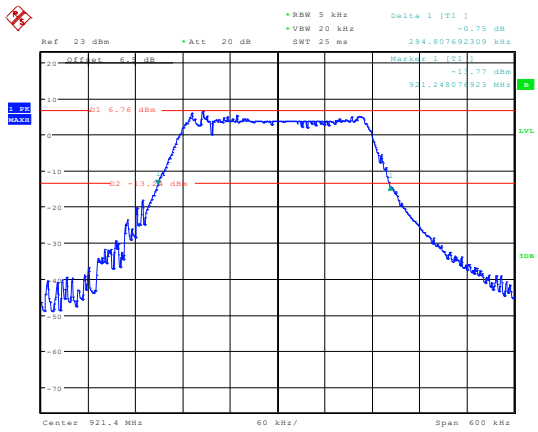
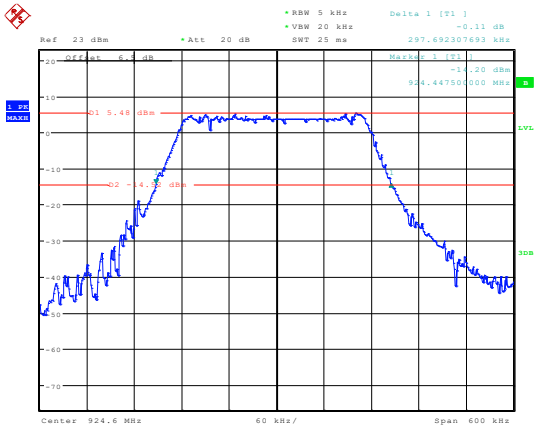
ProjectNo.: 2405X44367E Tester:Ryan Zhang
Date: 16.OCT.2024 14:40:50

3.6 Bandwidth Test Data

Test Date:	2024-10-15~2024-10-16	**Test By:**	Ryan Zhang
Environment condition:	Temperature: 23.9~24.8°C; Relative Humidity:57~60%; ATM Pressure: 100.1~100.3kPa		

Test Channel	Channel frequency [MHz]	20dB BW [kHz]
Low	921.4	294.808
High	924.6	297.692

Test Plots:

20dB BW	
921.4MHz	924.6MHz
 ProjectNo.:2405X44367E Tester:Ryan Zhang Date: 15.OCT.2024 18:53:51	 ProjectNo.:2405X44367E Tester:Ryan Zhang Date: 16.OCT.2024 18:58:20

Test Setup Photo

Please refer to the attachment 2405X44367E Test Setup photo.

4 E.U.T Photo

Please refer to the attachment 2405X44367E External photo and 2405X44367E Internal photo.

---End of Report---