

FCC RADIO TEST REPORT

Applicant..... : Nanjing Ruifanda New Energy Technology Co, Ltd.
Address..... : NO.6 Zhongke Road, Jiangning District, Nanjing China
Manufacturer..... : Nanjing Ruifanda New Energy Technology Co, Ltd.
Address..... : NO.6 Zhongke Road, Jiangning District, Nanjing China
Factory : Nanjing Ruifanda New Energy Technology Co, Ltd.
Address : NO.6 Zhongke Road, Jiangning District, Nanjing China
Product Name..... : RFID module
Brand Name..... : PRTDT
Model No. : RFID1H-01
FCC ID..... : 2BCPX-RFID01
Measurement Standard..... : 47 CFR FCC Part 15, Subpart C (Section 15.225)
Receipt Date of Samples..... : August 04, 2023
Date of Tested..... : August 04, 2023 to November 24, 2023
Date of Report..... : December 11, 2023

This report shows that above equipment is technically compliant with the requirements of the standards above. All test results in this report apply only to the tested sample(s). Without prior written approval of Dongguan Nore Testing Center Co., Ltd, this report shall not be reproduced except in full.



Prepared by
Rose Hu / Project Engineer



Approved by
Lori Fan / Authorized Signatory

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Revision History

Report Number	Description	Issued Date
NTC2308090FV00	Initial Issue	2023-12-11

1. Summary of Test Result

FCC Rules	Description of Test	Result	Remarks
§15.207 (a)	AC Power Line Conducted Emission	PASS	---
§15.225 & 15.209 & 15.205	Radiated Spurious Emission	PASS	---
§15.225(e)	Frequency Stability	N/A	---
§15.215(c)	20dB Emission Bandwidth Testing	N/A	---
§15.203	Antenna Requirement	N/A	---

Note:

1. N/A means not applicable.
2. According to the manufacturer, the EUT was integrated into the AC EV CHARGING STATION (model name: PEV-48A05US), and re-rested AC Power Line Conducted Emission and Radiated Spurious emission items as the host co-located a certified Wi-Fi & BT Internet of Things Module (FCC ID: 2AC7Z-ESP868504) within the host platform.
3. This test result is applicable to the same type, structure, PCB board, RF circuit host machine.

4. General Description of EUT

Product Information	
Product Name:	RFID module
Main Model Name:	RFID1H-01
Additional Model Name:	N/A
Model Difference:	N/A
S/N:	2305-2394
Brand Name:	N/A
Hardware Version:	Not stated
Software Version:	Not stated
Rating:	DC 3.3V
Typical arrangement:	Table-top
I/O Port:	Refer to the user manual
Accessories Information	
Adapter:	N/A
Cable:	N/A
Other:	N/A
Additional Information	
Note:	N/A
Remark:	All the information above are provided by the manufacturer. More detailed feature of the EUT please refers to the user manual.

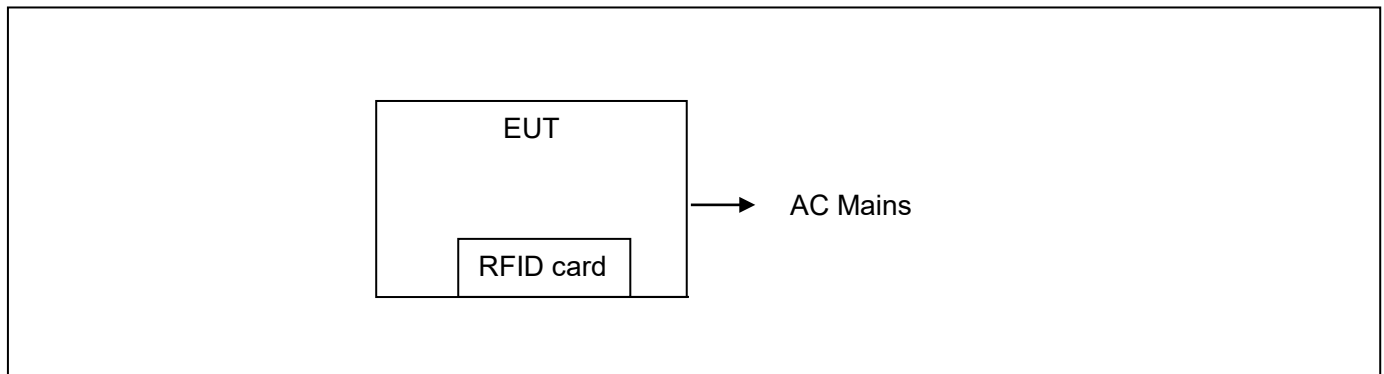
Technical Specification	
Declaring the Frequency:	13.5623MHz
Modulation Type:	ASK
Antenna Type:	PCB antenna
Antenna Gain:	0 dBi (Declared by manufacturer)
Number of Channels:	1

5. Test Channels and Modes Detail

Mode		Test Frequency (MHz)	Modulation	Data Rate (Mbps)
1.	TX (RFID+WIFI)	13.56MHz	ASK	---

Note: TX mode means that the EUT was programmed to be in simultaneously transmitting mode.

6. Configuration of EUT



7. Modification of EUT

No modifications are made to the EUT during all test items.

8. Description of Support Device

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

No.	Equipment	Brand	M/N	S/N	Cable Specification	Remarks
1.	AC EV CHARGING	---	PEV-48A05US	---	---	Provided by the manufacturer

9. Test Facility and Location

Test Site	:	Dongguan Nore Testing Center Co., Ltd. (Dongguan NTC Co., Ltd.)
Accreditations and Authorizations	:	The Laboratory has been assessed and proved to be in compliance with CNAS/CL01 Listed by CNAS, August 13, 2018 The Certificate Registration Number is L5795. The Certificate is valid until August 13, 2024 The Laboratory has been assessed and proved to be in compliance with ISO17025 Listed by A2LA, November 01, 2017 The Certificate Registration Number is 4429.01 Listed by FCC, November 06, 2017 Test Firm Registration Number: 907417 Listed by Industry Canada, June 08, 2017 The Certificate Registration Number. Is 46405-9743A
Test Site Location	:	Building D, Gaosheng Science and Technology Park, Hongtu Road, Nancheng District, Dongguan City, Guangdong Province, China

10. Applicable Standards and References

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

Test Standards:

47 CFR Part 15, Subpart C, 15.225

ANSI C63.10-2013

References Test Guidance:

N/A

11. Deviations and Abnormalities from Standard Conditions

No additions, deviations and exclusions from the standard.

12. Test Conditions

No.	Test Item	Test Mode	Test Voltage	Tested by	Remarks
1.	AC Power Conducted Emission	1	AC 240V/50Hz	Sean	See note 1
2.	Radiated Emission	1	AC 240V/50Hz	Sean	See note 1
Note: The testing climatic conditions for temperature, humidity, and atmospheric pressure are within: 15~35℃, 30~70%, 86~106kPa.					

13. Measurement Uncertainty

No.	Test Item	Frequency	Uncertainty	Remarks
1.	Conducted Emission	150KHz ~ 30MHz	±2.52 dB	---
2.	Radiated Emission Test	9kHz ~ 30MHz	±5.66 dB	---
		30MHz ~ 1GHz	±5.66 dB	---
		1GHz ~ 18GHz	±5.19 dB	---
		18GHz ~ 40GHz	±5.19 dB	

Note:

1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
2. The measurement uncertainty levels above are estimated and calculated according to CISPR 16-4-2.
3. The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

14. Sample Calculations

Conducted Emission						
Freq. (MHz)	Reading Level (dBUV)	Correct Factor (dB)	Measurement (dBUV)	Limit (dBUV)	Over (dB)	Detector
0.2058	35.69	10.61	46.30	63.37	-17.07	QP
Where, Freq. = Emission frequency in MHz Reading Level = Spectrum Analyzer/Receiver Reading Corrector Factor = Insertion loss of LISN + Cable Loss + RF Switching Unit attenuation Measurement = Reading + Corrector Factor Limit = Limit stated in standard Margin = Measurement - Limit Detector = Reading for Quasi-Peak / Average / Peak						

Radiated Spurious Emissions						
Freq. (MHz)	Reading Level (dBUV)	Correct Factor (dB/m)	Measurement (dBUV/m)	Limit (dBUV/m)	Over (dB)	Detector
50.3700	39.34	-6.94	32.40	40.00	-7.60	QP
Where, Freq. = Emission frequency in MHz Reading Level = Spectrum Analyzer/Receiver Reading Corrector Factor = Antenna Factor + Cable Loss - Pre-amplifier Measurement = Reading + Corrector Factor Limit = Limit stated in standard Over = Margin, which calculated by Measurement - Limit Detector = Reading for Quasi-Peak / Average / Peak						

Note: For all conducted test items, the spectrum analyzer offset or transducer is derived from RF cable loss and attenuator factor. The offset or transducer is equal to the RF cable loss plus attenuator factor.

15. Test Items and Results

15.1 Conducted Emissions Measurement

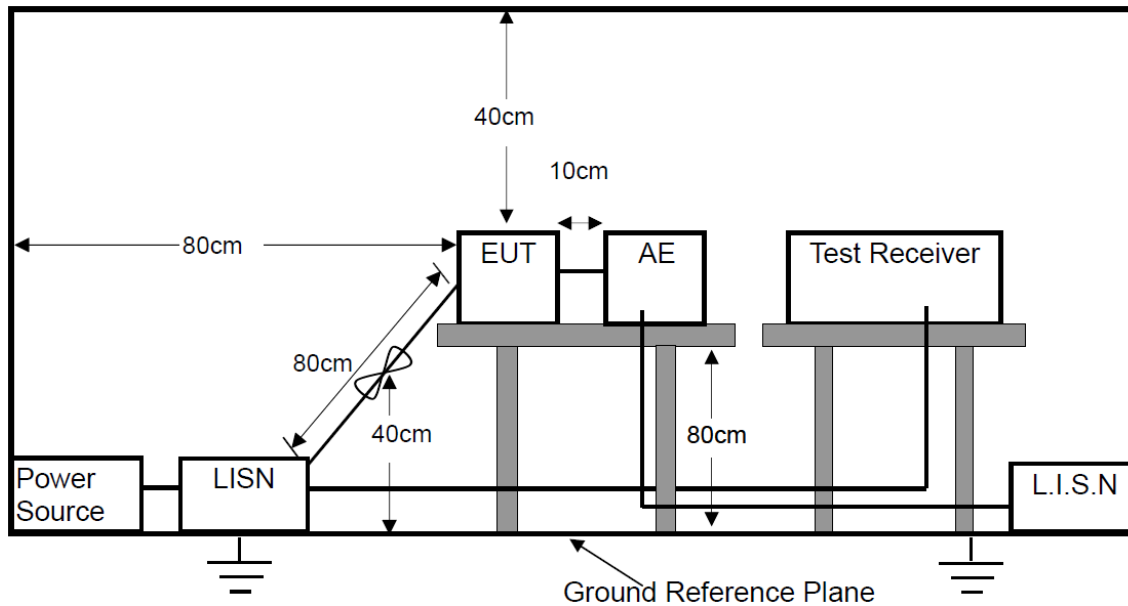
LIMIT

According to the requirements of FCC PART 15.207, the limits are as follows:

Frequency (MHz)	Quasi-peak	Average
0.15 to 0.5	66 to 56	56 to 46
0.5 to 5	56	46
5 to 30	60	50

- Note:
1. If the limits for the average detector are met when using the quasi-peak detector, then the limits for the measurements with the average detector are considered to be met.
 2. The lower limit shall apply at the transition frequencies.
 3. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5MHz.

BLOCK DIAGRAM OF TEST SETUP



TEST PROCEDURES

- a. The EUT was placed on a wooden table 0.8m height from the metal ground plan and 0.4m from the conducting wall of the shielding room and it was kept at 0.8m from any other grounded conducting surface.
- b. All I/O cables and support devices were positioned as per ANSI C63.10.
- c. Connect mains power port of the EUT to a line impedance stabilization network (LISN).
- d. Connect all support devices to the other LISN and AAN, if needed.
- e. Scan the frequency range from 150KHz to 30MHz at both sides of AC line for maximum conducted interference checking and record the test data.

TEST RESULTS

PASS

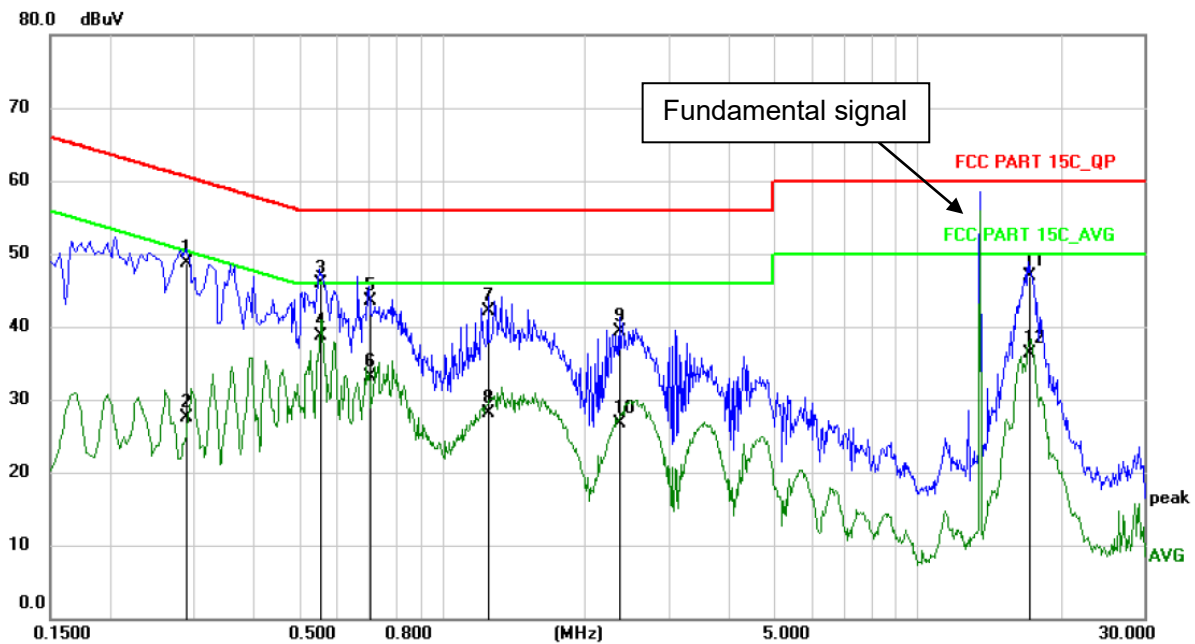
Please refer to the following pages

M/N: RFID1H-01	Testing Voltage: AC 240V/50Hz
Phase: L1	Detector: QP & AVG
Test Mode: 1	

Conducted Emission Measurement

Date: 2023/11/22

Time: 10:12:23



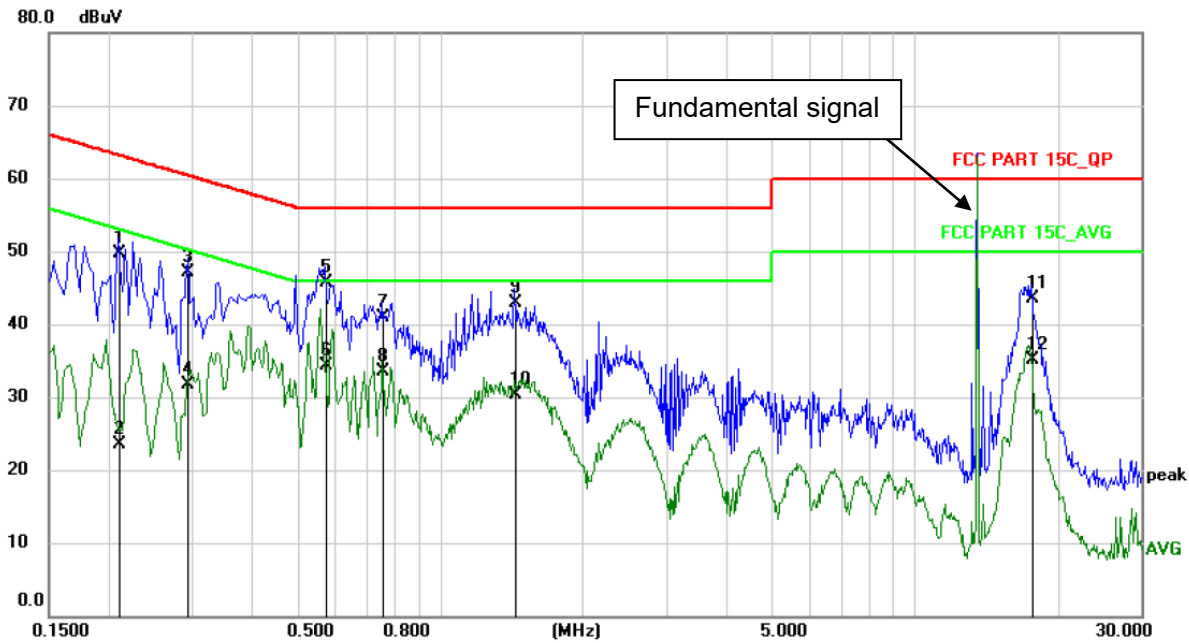
No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.2900	38.08	10.62	48.70	60.52	-11.82	QP	
2	0.2900	16.98	10.62	27.60	50.52	-22.92	AVG	
3	0.5540	35.30	10.60	45.90	56.00	-10.10	QP	
4 *	0.5540	28.20	10.60	38.80	46.00	-7.20	AVG	
5	0.7016	32.89	10.61	43.50	56.00	-12.50	QP	
6	0.7016	22.59	10.61	33.20	46.00	-12.80	AVG	
7	1.2540	31.49	10.61	42.10	56.00	-13.90	QP	
8	1.2540	17.59	10.61	28.20	46.00	-17.80	AVG	
9	2.3660	28.68	10.62	39.30	56.00	-16.70	QP	
10	2.3660	16.08	10.62	26.70	46.00	-19.30	AVG	
11	17.1900	36.09	10.81	46.90	60.00	-13.10	QP	
12	17.1900	25.59	10.81	36.40	50.00	-13.60	AVG	

M/N: RFID1H-01	Testing Voltage: AC 240V/50Hz
Phase: N	Detector: QP & AVG
Test Mode: 1	

Conducted Emission Measurement

Date: 2023/11/22

Time: 10:19:54



No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.2100	39.23	10.57	49.80	63.21	-13.41	QP	
2	0.2100	12.93	10.57	23.50	53.21	-29.71	AVG	
3	0.2938	36.52	10.58	47.10	60.42	-13.32	QP	
4	0.2938	21.12	10.58	31.70	50.42	-18.72	AVG	
5 *	0.5735	35.23	10.57	45.80	56.00	-10.20	QP	
6	0.5735	23.73	10.57	34.30	46.00	-11.70	AVG	
7	0.7580	30.43	10.57	41.00	56.00	-15.00	QP	
8	0.7580	22.93	10.57	33.50	46.00	-12.50	AVG	
9	1.4334	32.33	10.57	42.90	56.00	-13.10	QP	
10	1.4334	19.73	10.57	30.30	46.00	-15.70	AVG	
11	17.5700	32.79	10.71	43.50	60.00	-16.50	QP	
12	17.5700	24.39	10.71	35.10	50.00	-14.90	AVG	

15.2 Radiated Spurious Emissions Measurement

LIMIT

Frequency range MHz	Distance Meters	Field Strengths Limit (15.209)
		$\mu\text{V/m}$
0.009 ~ 0.490	300	$2400/F(\text{kHz})$
0.490 ~ 1.705	30	$24000/F(\text{kHz})$
1.705 ~ 30	30	30
30 ~ 88	3	100
88 ~ 216	3	150
216 ~ 960	3	200
Above 960	3	500

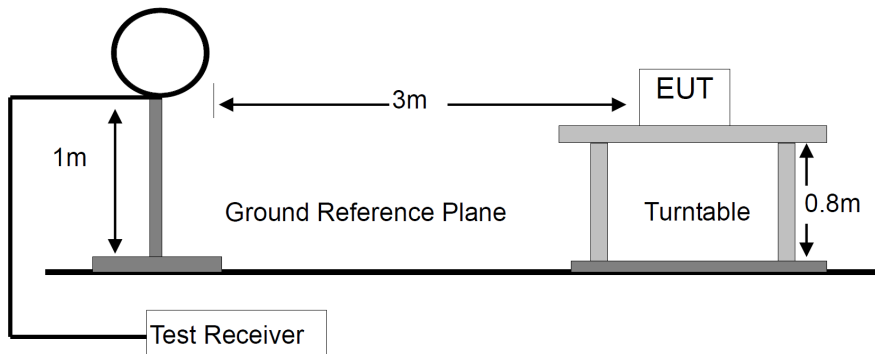
- Remark:
- (1) Emission level $(\text{dB})\mu\text{V} = 20 \log \text{Emission level } \mu\text{V/m}$
 - (2) The smaller limit shall apply at the cross point between two frequency bands.
 - (3) As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.
 - (4) The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.
 - (5) §15.247(d) specifies that emissions which fall in the restricted bands, as defined in §15.205 comply with radiated emission limits specified in §15.209.

According to 15.225, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

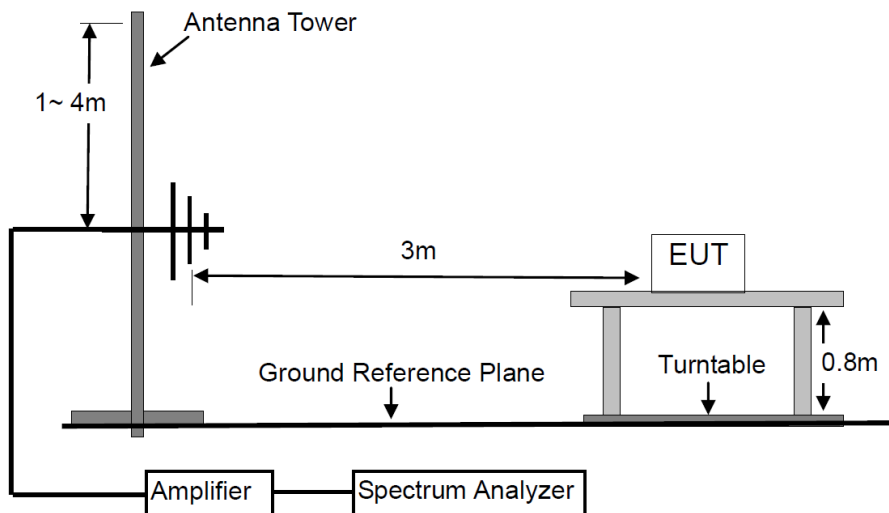
- (a) The field strength of any emissions within the band 13.553-13.567MHz shall not exceed 15,848 microvolts/meter at 30 meters.
- (b) Within the bands 13.410-13.553MHz and 13.567-13.710MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
- (c) Within the bands 13.110-13.410 MHz and 13.710-14.010MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
- (d) The field strength of any emissions appearing outside of the 13.110-14.010MHz band shall not exceed the general radiated emission limits in 15.209.

BLOCK DIAGRAM OF TEST SETUP

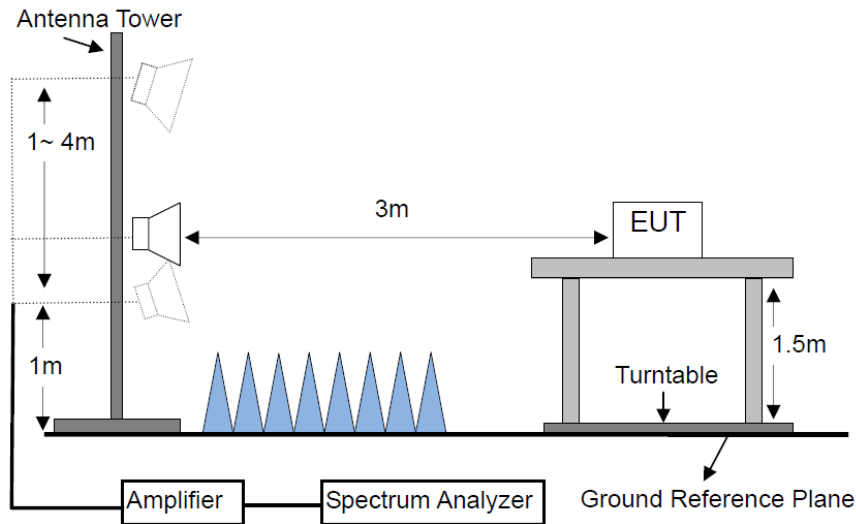
For Radiated Emission below 30MHz



For Radiated Emission 30-1000MHz



For Radiated Emission Above 1000MHz.



TEST PROCEDURES

- Below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi- anechoic chamber room.
- For the radiated emission test above 1GHz:

The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter full anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

- d. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to peak detect function and specified bandwidth with maximum hold mode.
- f. A Quasi-peak measurement was then made for that frequency point for below 1GHz test. PK and AV for above 1GHz emission test.
- g. Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and packet type.

The worst case was found when the EUT was positioned on X axis for radiated emission.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

Frequency Band (MHz)	Detector	Resolution Bandwidth	Video Bandwidth
0.009~0.15	QP & AVG	200Hz	1KHz
0.15 -30	QP & AVG	9KHz	30KHz
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	3 MHz
	Average	1 MHz	10 Hz

TEST RESULTS

PASS

Please refer to the following pages.

M/N: RFID1H-01

Testing Voltage: AC 240V / 50Hz

Polarization: Horizontal

Detector: Peak

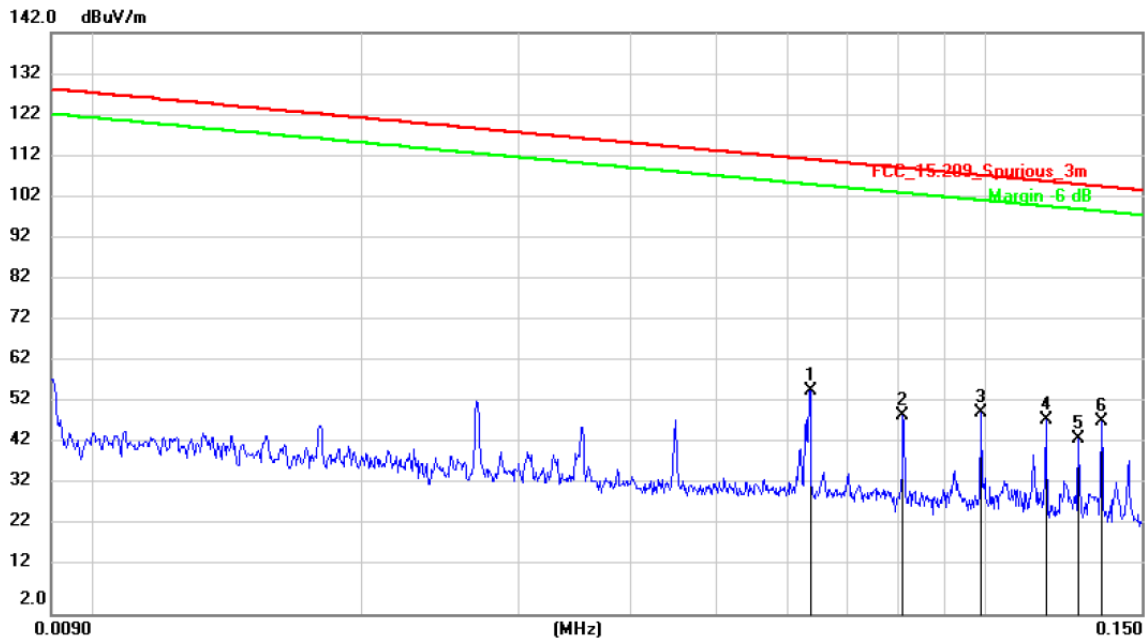
Test Mode: 1

Distance: 3m

Radiated Emission Measurement

Date: 2023/11/21

Time: 10:40:49



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	0.0637	35.21	20.52	55.73	111.42	-55.69	AVG
2		0.0810	29.35	20.53	49.88	109.35	-59.47	AVG
3		0.0990	29.79	20.54	50.33	107.61	-57.28	QP
4		0.1170	28.13	20.53	48.66	106.17	-57.51	AVG
5		0.1274	23.59	20.53	44.12	105.44	-61.32	AVG
6		0.1350	27.89	20.53	48.42	104.93	-56.51	AVG

M/N: RFID1H-01

Testing Voltage: AC 240V / 50Hz

Polarization: Vertical

Detector: Peak

Test Mode: 1

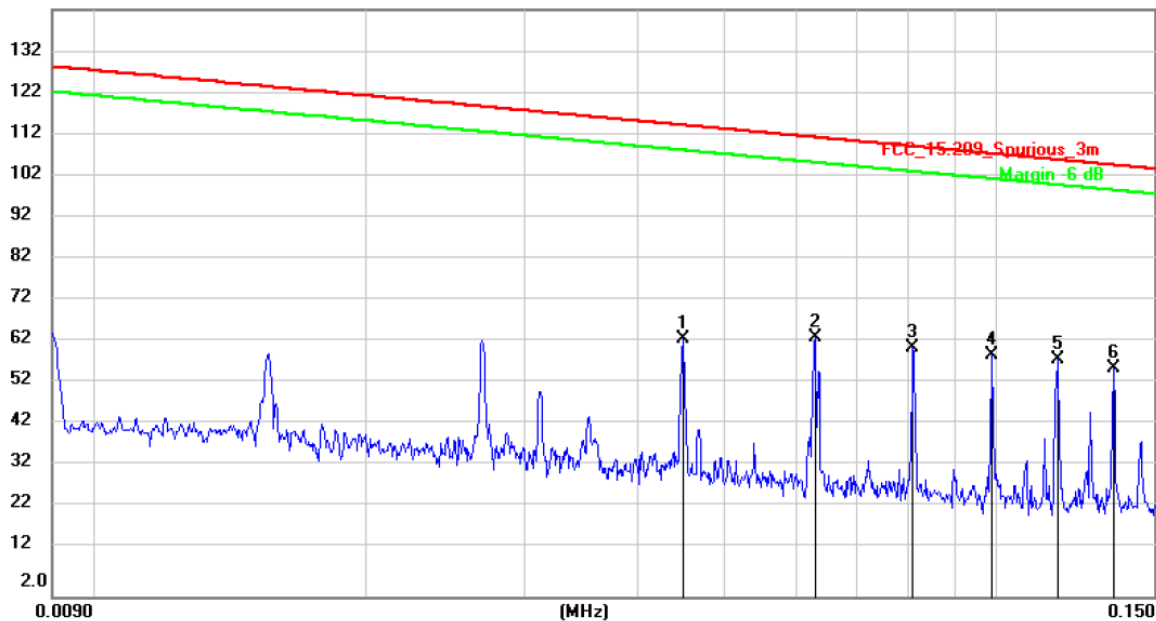
Distance: 3m

Radiated Emission Measurement

Date: 2023/11/21

Time: 11:12:41

142.0 dBuV/m



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.0449	42.92	20.59	63.51	114.44	-50.93	AVG	
2		0.0629	43.08	20.53	63.61	111.53	-47.92	AVG	
3		0.0810	40.84	20.53	61.37	109.35	-47.98	AVG	
4		0.0990	38.88	20.54	59.42	107.61	-48.19	QP	
5	*	0.1170	38.08	20.53	58.61	106.17	-47.56	AVG	
6		0.1350	36.03	20.53	56.56	104.93	-48.37	AVG	

M/N: RFID1H-01

Testing Voltage: AC 240V / 50Hz

Polarization: Horizontal

Detector: Peak

Test Mode: 1

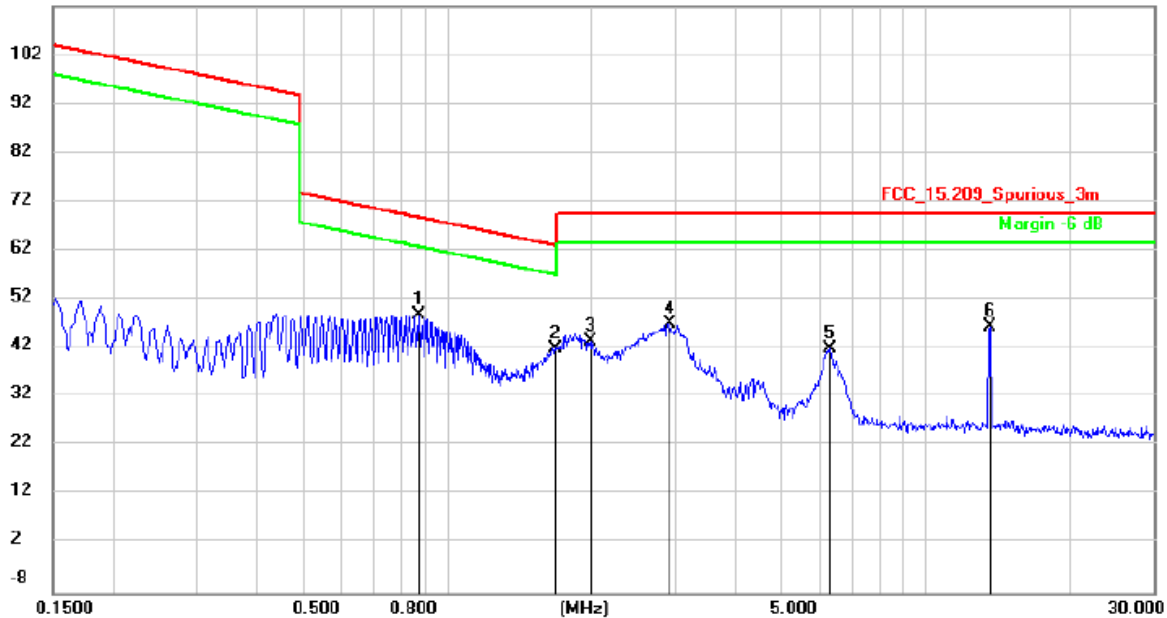
Distance: 3m

Radiated Emission Measurement

Date: 2023/11/21

Time: 10:50:50

112.0 dBuV/m



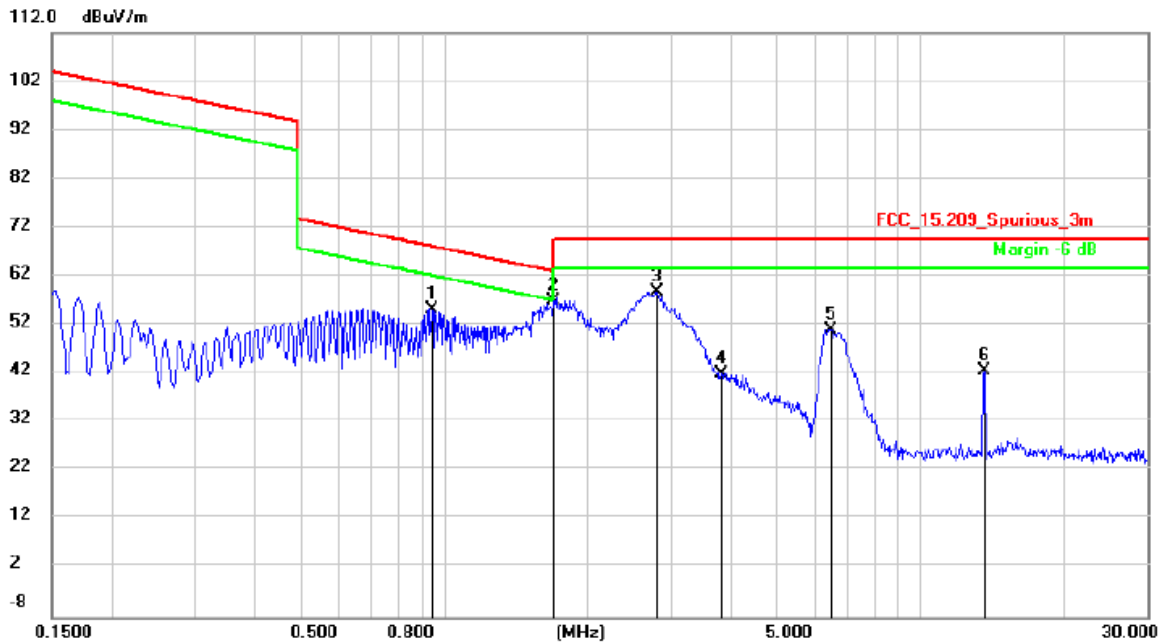
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	*	0.8709	28.44	20.40	48.84	68.80	-19.96	QP	
2		1.6800	21.70	20.40	42.10	63.10	-21.00	QP	
3		1.9901	23.17	20.40	43.57	69.50	-25.93	QP	
4		2.9150	26.79	20.40	47.19	69.50	-22.31	QP	
5		6.3185	21.55	20.47	42.02	69.50	-27.48	QP	
6		13.6227	25.88	20.56	46.44	69.50	-23.06	QP	

M/N: RFID1H-01	Testing Voltage: AC 240V / 50Hz
Polarization: Vertical	Detector: Peak
Test Mode: 1	Distance: 3m

Radiated Emission Measurement

Date: 2023/11/21

Time: 11:01:49



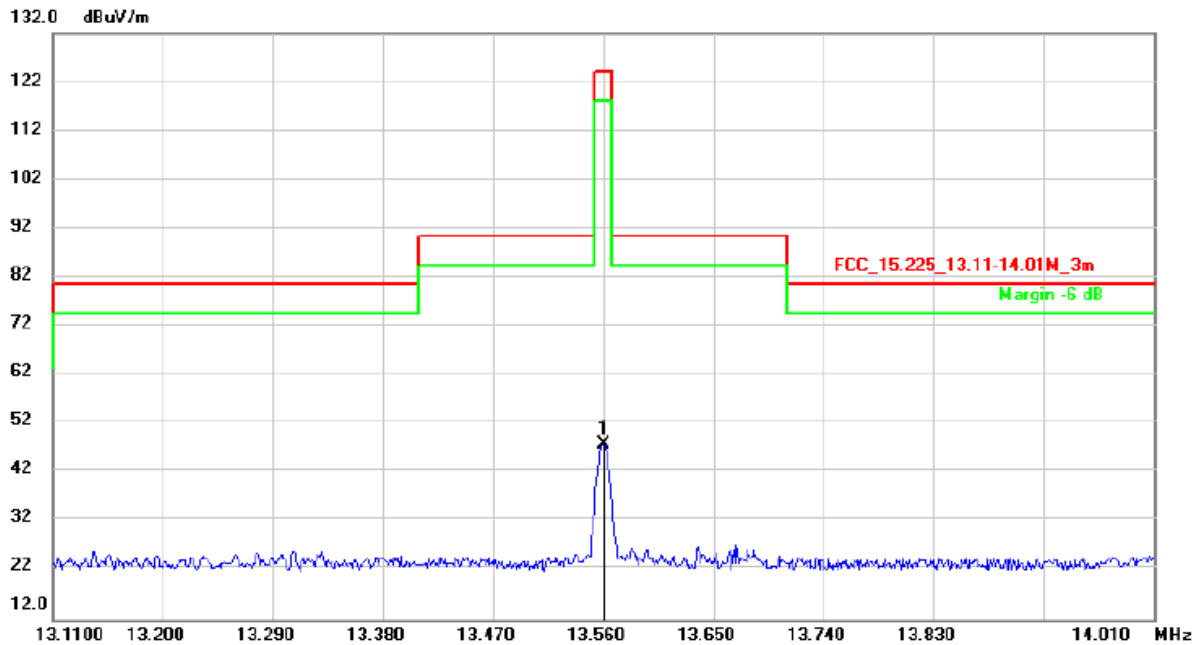
No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	0.9425	34.85	20.40	55.25	68.12	-12.87	QP	
2 *	1.6975	36.55	20.40	56.95	63.01	-6.06	QP	
3	2.8090	38.47	20.40	58.87	69.50	-10.63	QP	
4	3.8195	21.64	20.43	42.07	69.50	-27.43	QP	
5	6.4881	30.61	20.48	51.09	69.50	-18.41	QP	
6	13.6227	22.03	20.56	42.59	69.50	-26.91	QP	

M/N: RFID1H-01	Testing Voltage: AC 240V / 50Hz
Polarization: Horizontal	Detector: Peak
Test Mode: 1	Distance: 3m

Radiated Emission Measurement

Date: 2023/11/21

Time: 11:32:26



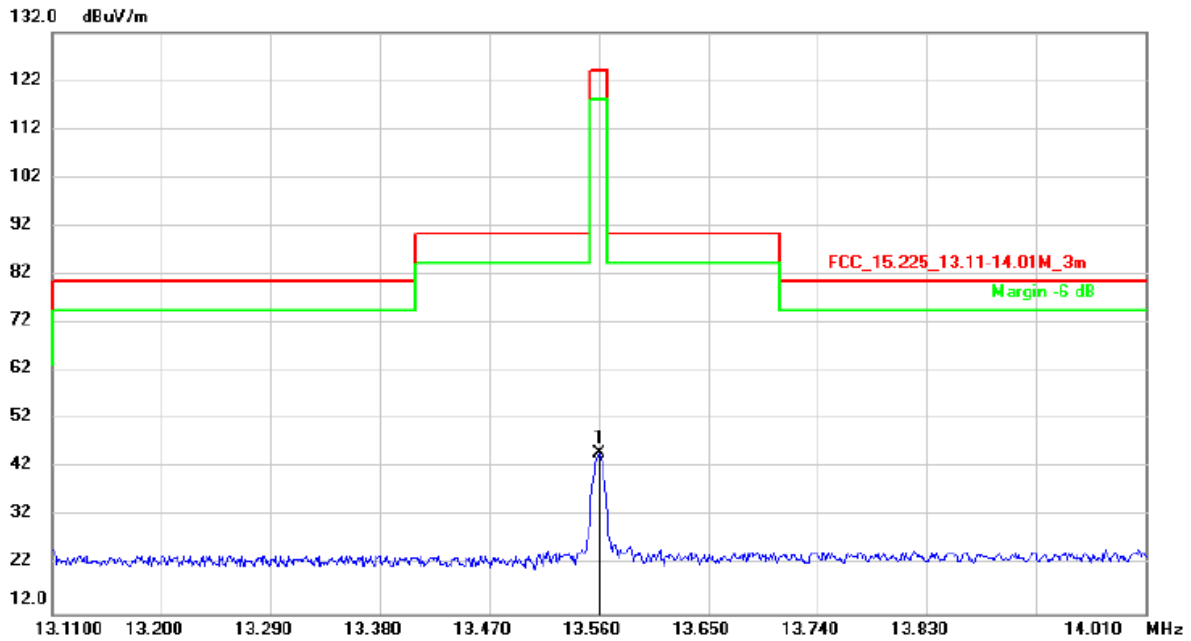
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	*	13.5600	27.43	20.56	47.99	124.00	-76.01	peak	

M/N: RFID1H-01	Testing Voltage: AC 240V / 50Hz
Polarization: Vertical	Detector: Peak
Test Mode: 1	Distance: 3m

Radiated Emission Measurement

Date: 2023/11/21

Time: 11:22:39



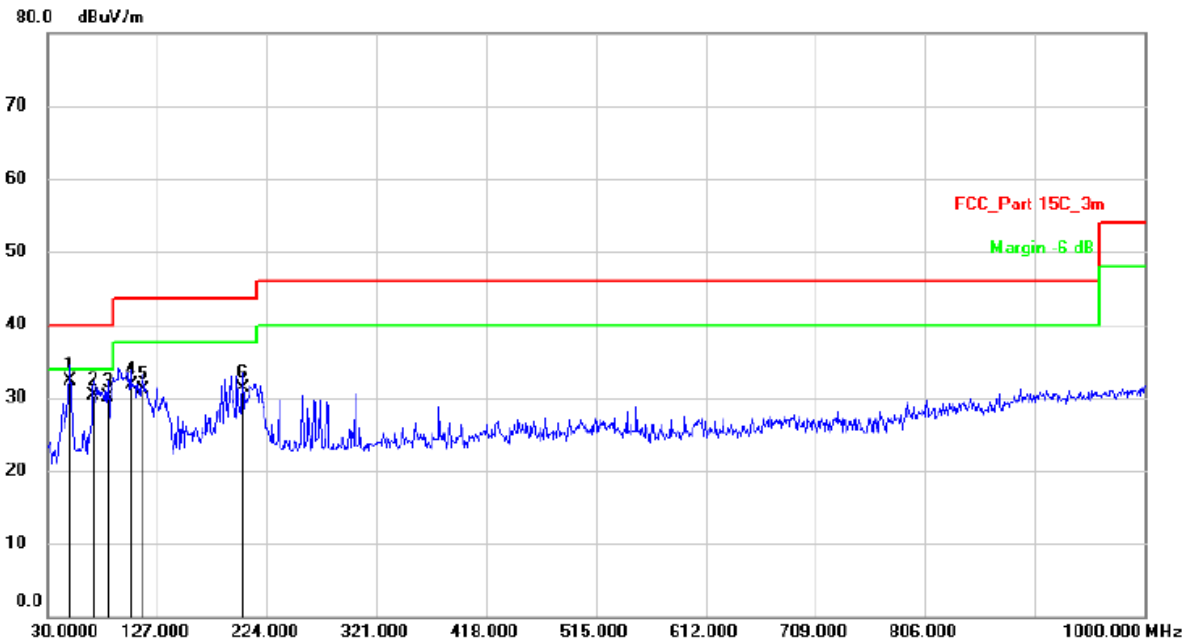
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	*	13.5600	24.51	20.56	45.07	124.00	-78.93	peak	

M/N: RFID1H-01	Testing Voltage: AC 240V / 50Hz
Polarization: Horizontal	Detector: QP
Test Mode: 1	Distance: 3m

Radiated Emission Measurement

Date: 2023/11/21

Time: 12:00:42



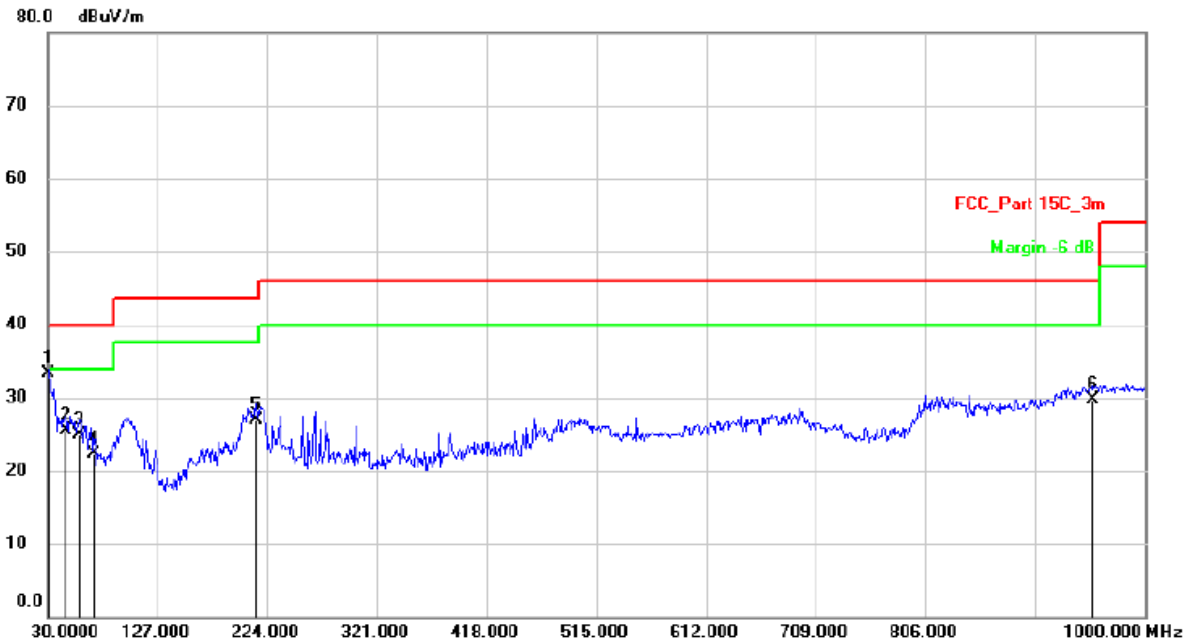
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	*	50.3700	39.34	-6.94	32.40	40.00	-7.60	QP	
2		70.7400	41.10	-10.80	30.30	40.00	-9.70	QP	
3		83.3500	41.27	-11.07	30.20	40.00	-9.80	QP	
4		103.7200	39.32	-7.52	31.80	43.50	-11.70	QP	
5		114.3900	39.34	-8.24	31.10	43.50	-12.40	QP	
6		202.6600	38.98	-7.68	31.30	43.50	-12.20	QP	

M/N: RFID1H-01	Testing Voltage: AC 240V / 50Hz
Polarization: Vertical	Detector: QP
Test Mode: 1	Distance: 3m

Radiated Emission Measurement

Date: 2023/11/21

Time: 11:49:41



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	30.0000	43.99	-10.69	33.30	40.00	-6.70	QP	
2		46.4900	32.96	-7.46	25.50	40.00	-14.50	QP	
3		58.1300	32.53	-7.63	24.90	40.00	-15.10	QP	
4		70.7400	32.98	-10.68	22.30	40.00	-17.70	QP	
5		214.3000	35.52	-8.52	27.00	43.50	-16.50	QP	
6		953.4400	24.61	5.09	29.70	46.00	-16.30	QP	

16. Test Equipment List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCI7	100837	Mar. 13, 2023	1 Year
2.	Antenna	Schwarzbeck	VULB9162	9162-010	Mar. 23, 2022	2 Year
3.	Spectrum Analyzer	Keysight	N9020A	MY54200831	Mar. 13, 2023	1 Year
4.	Spectrum Analyzer	Keysight	N9010B	1215146	Sep. 06, 2023	1 Year
5.	Horn Antenna+Amplifier	COM-Power	AHA-840	10100020	Sep.05,2022	2 Year
6.	Power Sensor	DARE	RPR3006W	15I00041SNO 64	Mar. 13, 2023	1 Year
7.	Horn Antenna	COM-Power	AH-118	071078	Mar. 23, 2022	2 Year
8.	Pre-Amplifier	HP	HP 8449B	3008A00964	Mar. 13, 2023	1 Year
9.	Pre-Amplifier	HP	HP 8447D	1145A00203	Mar. 13, 2023	1 Year
10.	Loop Antenna	Schwarzbeck	FMZB 1513	1513-272	Mar. 23, 2022	2 Year
11.	Temporary antenna connector	TESCOM	SS402	N/A	N/A	N/A
12.	Test Software	EZ	EZ EMC, NTC-3A1.1	N/A	N/A	N/A

Note: For photographs of EUT and measurement, please refer to appendix in separate documents.

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