Shenzhen CTL Testing Technology Co., Ltd.
Tel: +86-755-89486194 E-mail: ctl@ctl-lab.com

TEST REPORT

FCC PART 15 SUBPART C 15.247

Report Reference No......: **CTL2108301031-WF**

Compiled by: (position+printed name+signature)	Happy Guo (File administrators)
Tested by: (position+printed name+signature)	Cary Gao (Test Engineer)
Approved by: (position+printed name+signature)	Ivan Xie (Manager)

Product Name..... :	Ripple Smart Diffuser
Model/Type reference..... :	RPL
List Model(s)..... :	N/A
Trade Mark..... :	VOCOlinc
FCC ID..... :	2AXT8-RPL
Applicant's name..... :	**Felion Technologies Company Limited.**
Address of applicant..... :	304,3/F, Fuxing Office Building, No.6 Binglang Road, Fubao Community, Futian District, Shenzhen, China.
Test Firm..... :	**Shenzhen CTL Testing Technology Co., Ltd.**
Address of Test Firm..... :	Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055
Test specification..... :	
Standard..... :	**47 CFR FCC Part 15 Subpart C 15.247**
TRF Originator..... :	Shenzhen CTL Testing Technology Co., Ltd.
Master TRF..... :	Dated 2011-01
Date of receipt of test item..... :	Sep. 01, 2021
Date of sampling..... :	Sep. 01, 2021
Date of Test Date..... :	Sep. 01, 2021–Sep. 09, 2021
Date of Issue..... :	Sep. 09, 2021
Result..... :	Pass

TEST REPORT

Test Report No. :	CTL2108301031-WF	Sep. 09, 2021 Date of issue

Equipment under Test	:	Ripple Smart Diffuser
Sample No	:	CTL210830103-1-S001
Model /Type	:	RPL
Listed Models	:	N/A
Applicant	:	**Felion Technologies Company Limited.**
Address	:	304,3/F, Fuxing Office Building, No.6 Binglang Road, Fubao Community, Futian District, Shenzhen, China.
Manufacturer	:	**Felion Technologies Company Limited.**
Address	:	304,3/F, Fuxing Office Building, No.6 Binglang Road, Fubao Community, Futian District, Shenzhen, China.

Test result	Pass *

* In the configuration tested, the EUT complied with the standards specified page 5.

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

** Modified History **

Revisions	Description	Issued Data	Report No.	Remark
Version 1.0	Initial Test Report Release	2021-09-09	CTL2108301031-WF	Tracy Qi

Table of Contents Page

1. SUMMARY

1.1. TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

ANSI C63.10: 2013: American National Standard for Testing Unlicensed Wireless Devices

KDB 558074 D01 15.247 Meas Guidance v05r02 :KDB558074 D01 15.247 Meas Guidance v05r02

1.2. Test Description

FCC PART 15.247		
FCC Part 15.207	AC Power Conducted Emission	PASS
FCC Part 15.247(a)(2)	6dB Bandwidth	PASS
FCC Part 15.247(d)	Spurious RF Conducted Emission	PASS
FCC Part 15.247(b)	Maximum Conducted Output Power	PASS
FCC Part 15.247(e)	Power Spectral Density	PASS
FCC Part 15.109/ 15.205/ 15.209	Radiated Emissions	PASS
FCC Part 15.247(d)	Band Edge	PASS
FCC Part 15.203/15.247 (b)	Antenna Requirement	PASS

1.3. Test Facility

1.3.1 Address of the test laboratory

Shenzhen CTL Testing Technology Co., Ltd.
Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen 518055 China

There is one 3m semi-anechoic chamber and two line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.10 and CISPR 22/EN 55022 requirements.

1.3.2 Laboratory accreditation

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

CNAS-Lab Code: L7497

Shenzhen CTL Testing Technology Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No. 4343.01

Shenzhen CTL Testing Technology Co., Ltd, EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

IC Registration No.: 9618B

CAB identifier: CN0041

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements with Registration No.: 9618B on Jan. 22, 2019.

FCC-Registration No.: 399832

Designation No.: CN1216

Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 399832, December 08, 2017.

1.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CTL laboratory is reported:

Test	Measurement Uncertainty	Notes
Transmitter power conducted	±0.57 dB	(1)
Transmitter power Radiated	±2.20 dB	(1)
Conducted spurious emission 9KHz-40 GHz	±2.20 dB	(1)
Occupied Bandwidth	±0.01ppm	(1)
Radiated Emission 30~1000MHz	±4.10dB	(1)
Radiated Emission Above 1GHz	±4.32dB	(1)

Conducted Disturbance0.15~30MHz	±3.20dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

2. GENERAL INFORMATION

2.1. Environmental conditions

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

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

2.2. General Description of EUT

Product Name:	Ripple Smart Diffuser
Model/Type reference:	RPL
Power supply:	MODEL:RSF-DY077C-2400650US INPUT:100-240V~50/60Hz 0.5A OUTPUT:24V==0.65A
2.4G WIFI	
Supported type:	802.11b/802.11g/802.11n(H20)
Modulation:	802.11b: DSSS 802.11g/802.11n(H20): OFDM
Operation frequency:	802.11b/802.11g/802.11n(H20): 2412MHz~2462MHz
Channel number:	802.11b/802.11g/802.11n(H20): 11
Channel separation:	5MHz
Antenna type:	PCB Antenna
Antenna gain:	0dBi

Note1: For more details, please refer to the user's manual of the EUT.
Note2: Antenna gain provided by the applicant.

2.3. Description of Test Modes and Test Frequency

The Applicant provides communication tools software to control the EUT for staying in continuous transmitting (Duty Cycle more than 98%) and receiving mode for testing.

All test performed at the low, middle and high of operational frequency range of each mode.

Operation Frequency WIFI：

Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	**2412**	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	**11**	**2462**
5	2432		
6	**2437**		
7	2442		

Note: The line display in grey were the channel selected for testing

Data Rate Used:

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel
Maximum Conducted Output Power Power Spectral Density 6dB Bandwidth Spurious RF conducted emission Radiated Emission 9kHz~1GHz& Radiated Emission 1GHz~10th Harmonic	11b/DSSS	1 Mbps	1/6/11
	11g/OFDM	6 Mbps	1/6/11
	11n(20MHz)/OFDM	6.5Mbps	1/6/11
Band Edge	11b/DSSS	1 Mbps	1/11
	11g/OFDM	6 Mbps	1/11
	11n(20MHz)/OFDM	6.5Mbps	1/11

2.4. Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
LISN	R&S	ESH2-Z5	860014/010	2021/05/15	2022/05/14
Bilog Antenna	Sunol Sciences Corp.	JB1	A061713	2021/04/08	2022/04/07
EMI Test Receiver	R&S	ESCI	1166.5950.03	2021/05/18	2022/05/17
Spectrum Analyzer	Agilent	E4407B	MY41440676	2021/05/14	2022/05/13
Spectrum Analyzer	Agilent	N9020A	US46220290	2021/05/14	2022/05/13
Spectrum Analyzer	Keysight	N9020A	MY53420874	2021/05/14	2022/05/13
Controller	EM Electronics	EM 1000	060859	2021/05/20	2022/05/19
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2021/05/20	2022/05/19
Active Loop Antenna	Da Ze	ZN30900A	/	2021/05/20	2022/05/19
Amplifier	Agilent	8449B	3008A02306	2021/05/15	2022/05/14
Amplifier	Agilent	8447D	2944A10176	2021/05/15	2022/05/14
Temperature/Humidity Meter	Gangxing	CTH-608	02	2021/05/16	2022/05/15
Power Sensor	Agilent	U2021XA	MY55130004	2021/05/14	2022/05/13
Power Sensor	Agilent	U2021XA	MY55130006	2021/05/14	2022/05/13
Spectrum Analyzer	RS	FSP	1164.4391.38	2021/05/15	2022/05/14
Horn Antenna	Sunol Sciences Corp	OBH100400	26999002	2021/05/18	2024/05/17

Test Software	
Name of Software	Version
TST-PASS	1.1.0
ES-K1(Below 1GHz)	V1.71
e3(Above 1GHz)	6.111221a

The calibration interval was one year

2.5. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended to comply with Section 15.247 of the FCC Part 15 Subpart C Rules, RSS Gen and RSS 247 Rules.

2.6. Modifications

No modifications were implemented to meet testing criteria.

3. TEST CONDITIONS AND RESULTS

3.1. Conducted Emissions Test

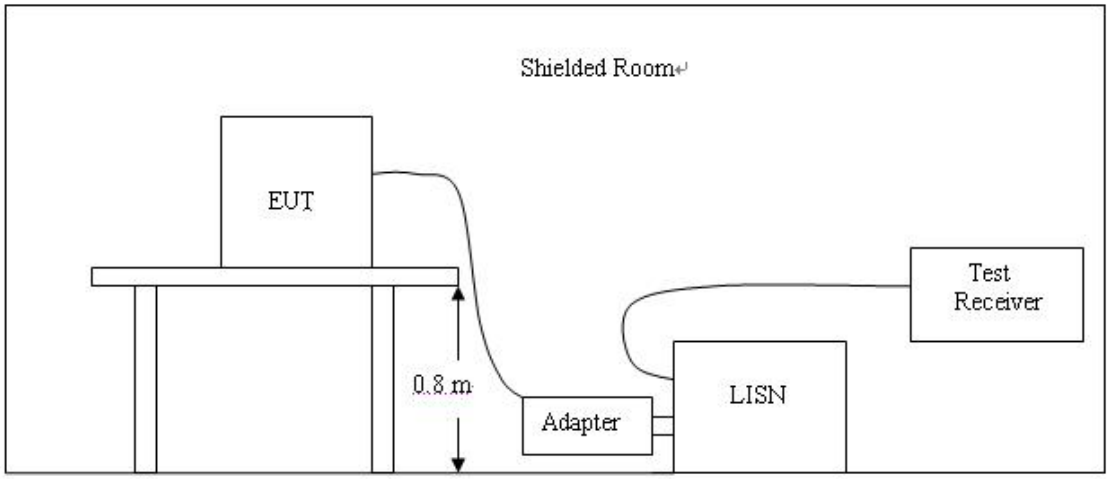
LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.207

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

* Decreases with the logarithm of the frequency.

TEST CONFIGURATION



TEST PROCEDURE

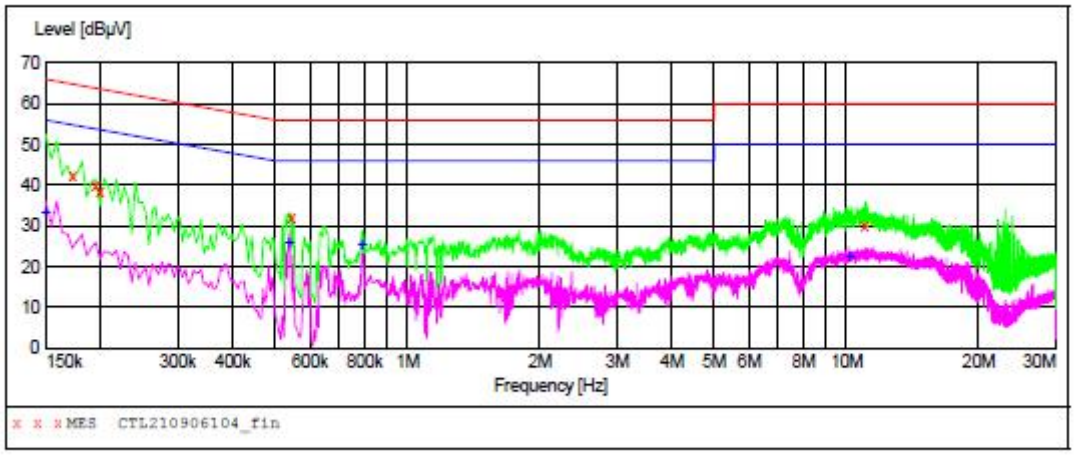
1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10:2013.
2. Support equipment, if needed, was placed as per ANSI C63.10:2013
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10:2013.
4. The adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.

TEST RESULTS

Remark:802.11b/802.11g/802.11n(H20) /802.11n(H40) mode all have been tested, only worse case of 802.11b High Channel was reported.

Line:	L

SCAN TABLE: "Voltage (9K-30M)FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL210906104_fin"

9/6/2021 9:08AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.172500	42.60	10.0	65	22.2	QP	L1	GND
0.195000	39.90	10.0	64	23.9	QP	L1	GND
0.199500	38.50	10.0	64	25.1	QP	L1	GND
0.546000	32.10	10.1	56	23.9	QP	L1	GND
11.031000	30.10	10.8	60	29.9	QP	L1	GND

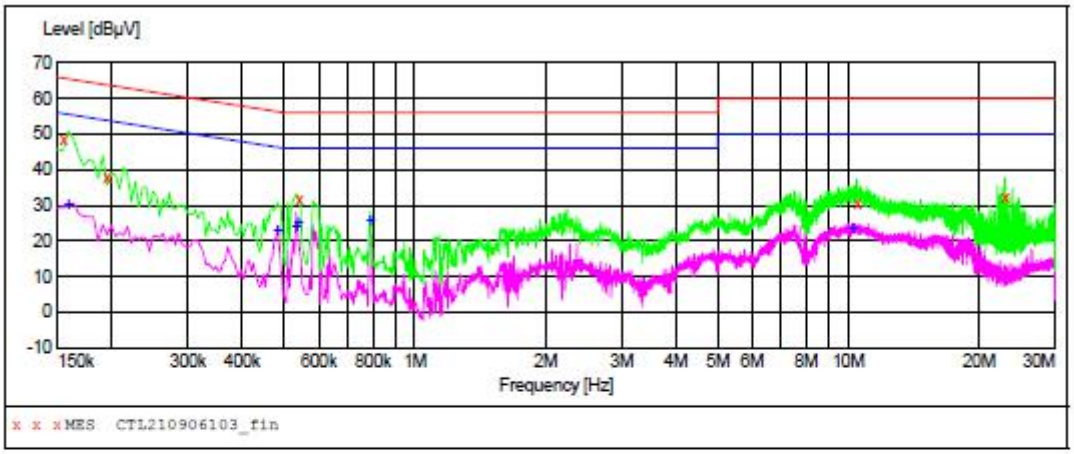
MEASUREMENT RESULT: "CTL210906104_fin2"

9/6/2021 9:08AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	33.30	10.0	56	22.7	AV	L1	GND
0.537000	26.30	10.1	46	19.7	AV	L1	GND
0.789000	25.50	10.1	46	20.5	AV	L1	GND
10.167000	22.70	10.7	50	27.3	AV	L1	GND

Line:	N

SCAN TABLE: "Voltage (9K-30M)FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL210906103_fin"

9/6/2021 9:05AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.154500	48.50	10.0	66	17.3	QP	N	GND
0.195000	37.70	10.0	64	26.1	QP	N	GND
0.541500	31.50	10.1	56	24.5	QP	N	GND
10.513500	30.40	10.7	60	29.6	QP	N	GND
22.996500	32.10	11.4	60	27.9	QP	N	GND

MEASUREMENT RESULT: "CTL210906103_fin2"

9/6/2021 9:05AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.159000	30.70	10.0	56	24.8	AV	N	GND
0.483000	23.50	10.0	46	22.8	AV	N	GND
0.532500	24.60	10.1	46	21.4	AV	N	GND
0.537000	25.50	10.1	46	20.5	AV	N	GND
0.789000	26.10	10.1	46	19.9	AV	N	GND
10.248000	23.60	10.7	50	26.4	AV	N	GND

3.2. Radiated Emissions and Band Edge

Limit

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission out of authorized band shall not exceed the following table at a 3 meters measurement distance.

In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Except when the requirements applicable to a given device state otherwise, emissions from licence-exempt transmitters shall comply with the field strength limits shown in table below. Additionally, the level of any transmitter emission shall not exceed the level of the transmitter's fundamental emission

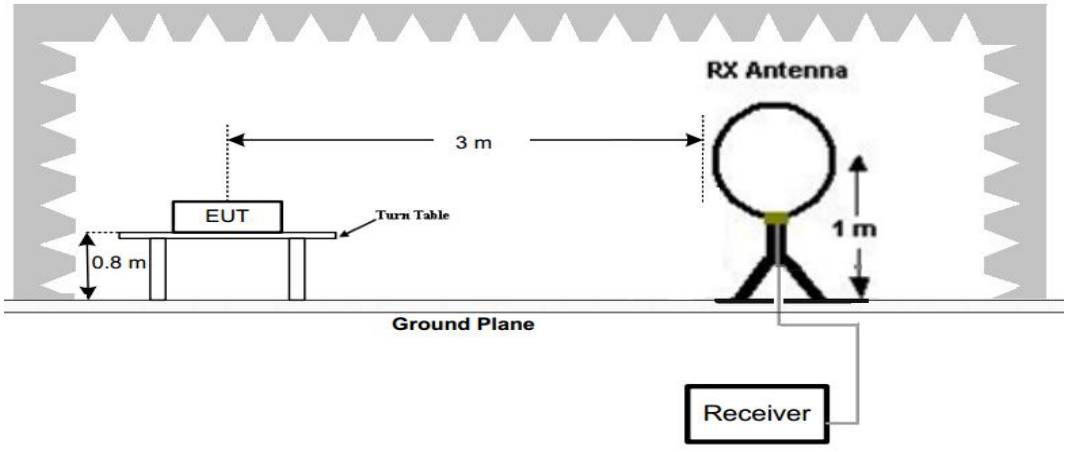
Unwanted emissions that fall into restricted bands shall comply with the limits specified in RSS-Gen; and Unwanted emissions that do not fall within the restricted frequency bands shall comply either with the limits specified in the applicable RSS or with those specified in this RSS-Gen.

Radiated emission limits

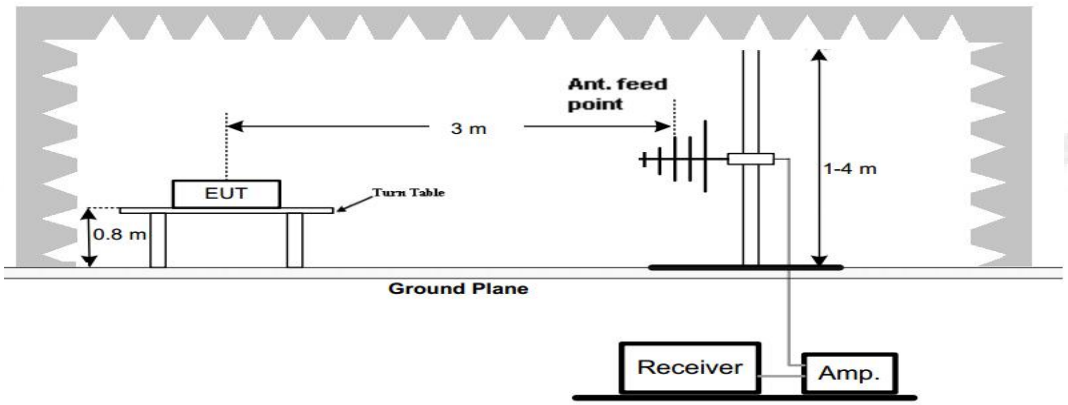
Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-30	3	20log(30)+ 40log(30/3)	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

TEST CONFIGURATION

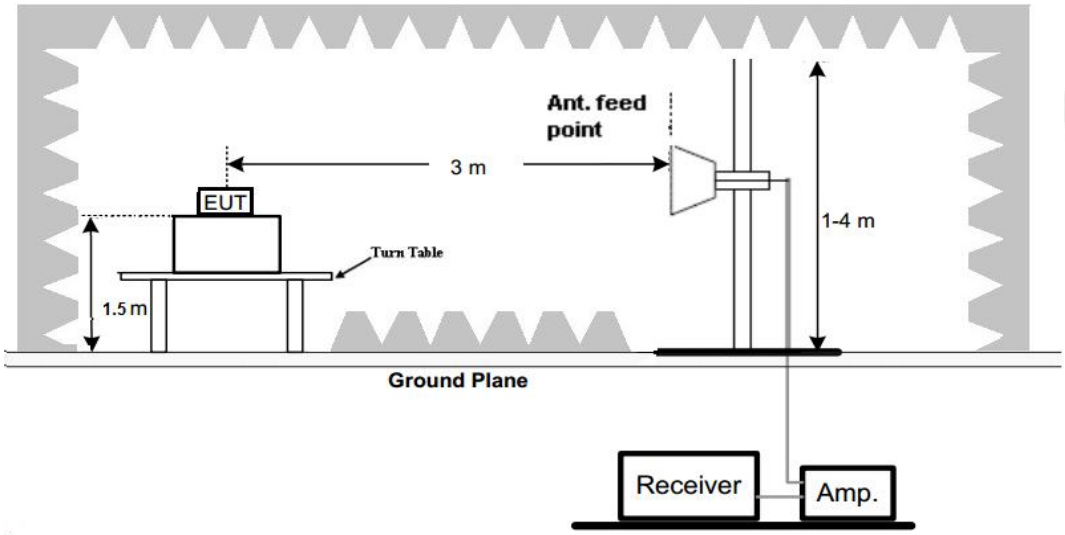
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



Test Procedure

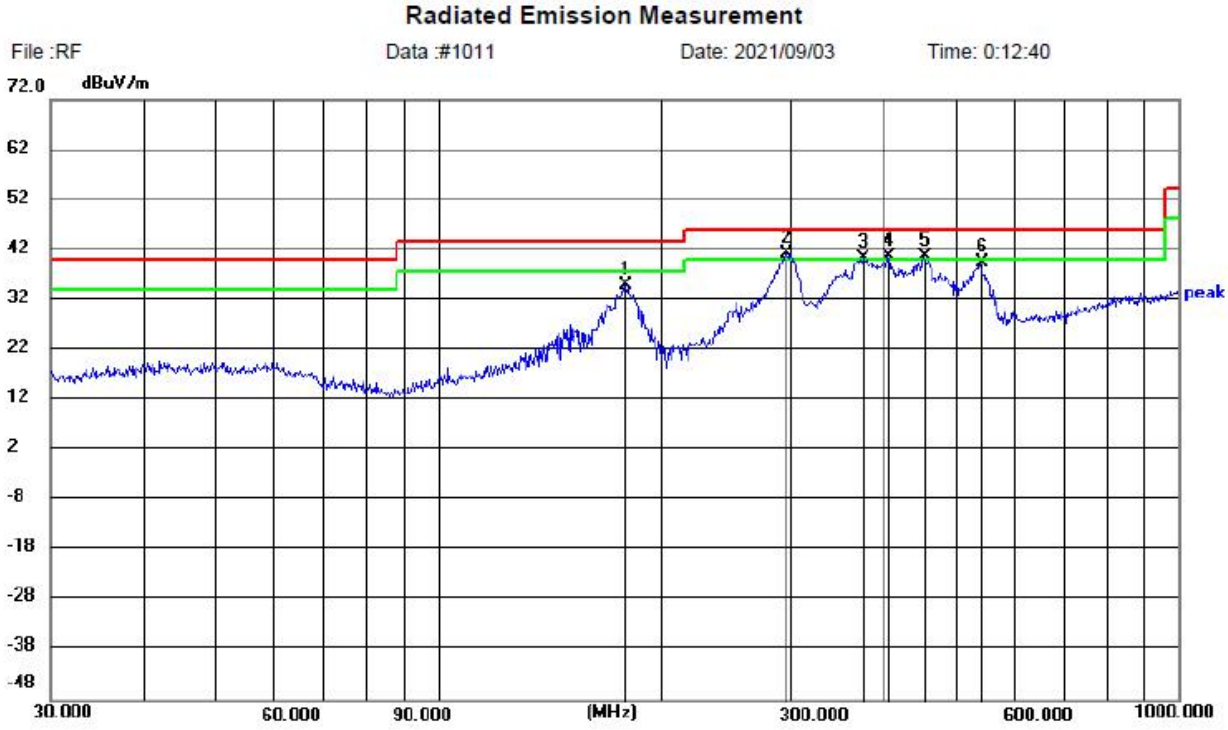
1. The EUT was placed on turn table which is 0.8m above ground plane for below 1GHz test, and on a low permittivity and low loss tangent turn table which is 1.5m above ground plane for above 1GHz test.
2. The EUT was divided into three directions for radiation emission tests.
3. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0℃ to 360℃ to acquire the highest emissions from EUT
4. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
5. Repeat above procedures until all frequency measurements have been completed.

TEST RESULTS

Remark:
1. We tested three channels (lowest/middle/highest) of each mode and recorded worst case for below 1GHz measurement.
2. For WIFI test we tested three channels (lowest/middle/highest) of each mode and recorded worst case at 802.11b mode above 1GHz.
3. Radiated emission test from 9KHz to 10th harmonic of fundamental was verified, Found the emission level are attenuated 20dB below the limits from 9kHz to 30MHz, so it does not recorded in report.

For 30MHz-1GHz

Test mode:	WIFI	Polarization:	Horizontal

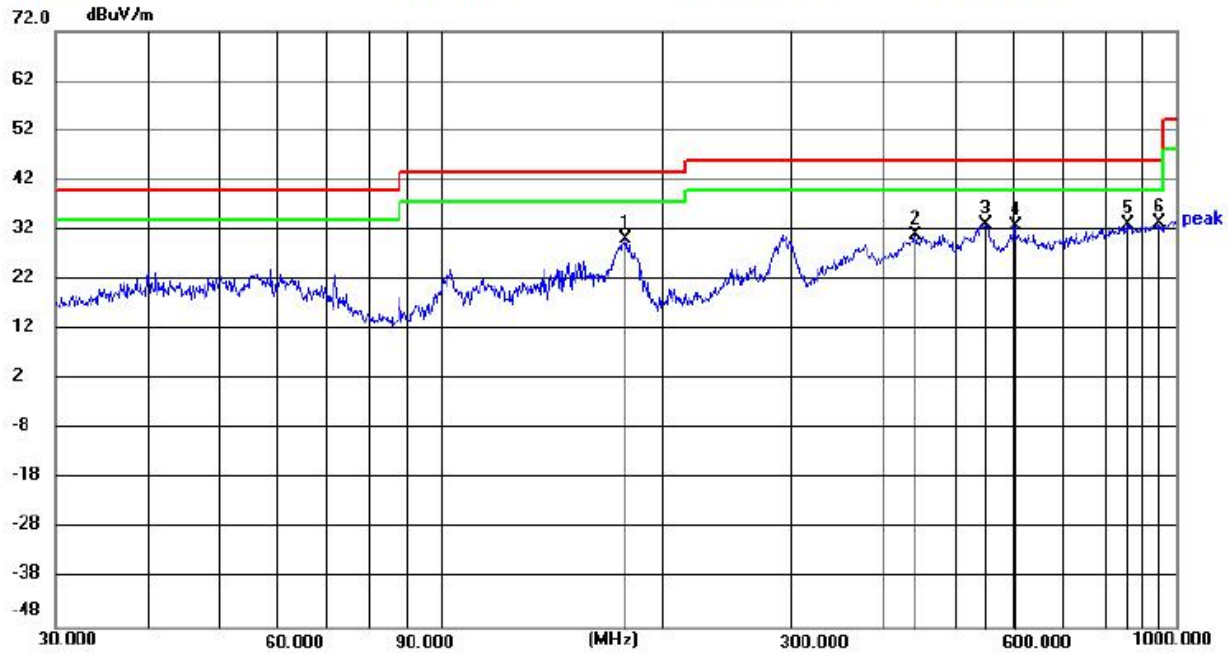


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	179.3863	22.78	12.24	35.02	43.50	8.48	peak	100	325	P	
2	296.1836	26.89	14.45	41.34	46.00	4.66	peak	100	283	P	
3	374.6225	23.68	16.72	40.40	46.00	5.60	peak	100	325	P	
4	404.6665	22.66	18.04	40.70	46.00	5.30	peak	100	203	P	
5	452.7197	21.85	18.94	40.79	46.00	5.21	peak	100	138	P	
6	541.3725	19.36	20.17	39.53	46.00	6.47	peak	100	90	P	

Test mode:	WIFI	Polarization:	Vertical

Radiated Emission Measurement

File :RF Data :#1012 Date: 2021/09/03 Time: 0:13:51



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	178.7584	17.68	12.41	30.09	43.50	13.41	peak	100	233	P	
2	440.1963	12.59	18.52	31.11	46.00	14.89	peak	100	328	P	
3	550.9480	12.89	20.32	33.21	46.00	12.79	peak	100	8	P	
4	603.5392	11.11	21.89	33.00	46.00	13.00	peak	100	253	P	
5	857.0247	6.78	26.33	33.11	46.00	12.89	peak	100	128	P	
6	942.1305	6.33	27.03	33.36	46.00	12.64	peak	100	82	P	

For 1GHz to 25GHz

802.11b Mode (above 1GHz)

Note: 802.11b/802.11g/802.11n (H20) all have been tested, only worse case 802.11b is reported

Frequency(MHz):			2412		Polarity:			HORIZONTAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4824.00	47.2	PK	74	26.8	42.65	33.52	6.92	35.89	4.55
4824.00	--	AV	54	--	--	--	--	--	--
5441.00	45.36	PK	74	28.64	38.16	34.38	7.10	34.28	7.20
5441.00	--	AV	54	--	--	--	--	--	--
7236.00	46.02	PK	74	27.98	34.75	37.1	9.19	35.02	11.27
7236.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):			2412		Polarity:			VERTICAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4824.00	48.21	PK	74	25.79	43.66	33.52	6.92	35.89	4.55
4824.00	--	AV	54	--	--	--	--	--	--
5632.00	44.65	PK	74	29.35	37.45	34.38	7.10	34.28	7.20
5632.00	--	AV	54	--	--	--	--	--	--
7236.00	46.03	PK	74	27.97	34.76	37.1	9.19	35.02	11.27
7236.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):			2437		Polarity:			HORIZONTAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4874.00	48.01	PK	74	25.99	41.77	33.59	6.95	34.3	6.24
4874.00	--	AV	54	--	--	--	--	--	--
5329.00	46.26	PK	74	27.74	38.66	34.56	7.15	34.11	7.60
5329.00	--	AV	54	--	--	--	--	--	--
7311.00	46.02	PK	74	27.98	34.36	37.44	9.22	35	11.66
7311.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):			2437		Polarity:			VERTICAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4874.00	48.05	PK	74	25.95	41.71	33.59	6.95	34.2	6.34
4874.00	--	AV	54	--	--	--	--	--	--
5784.00	45.21	PK	74	28.79	38.31	34.07	7.05	34.22	6.90
5784.00	--	AV	54	--	--	--	--	--	--
7311.00	46.11	PK	74	27.89	34.45	37.44	9.22	35	11.66
7311.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):			2462		Polarity:			HORIZONTAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4924.00	47.98	PK	74	26.02	53.55	33.71	6.98	35.91	4.78
4924.00	--	AV	54	--	--	--	--	--	--
5428.00	44.65	PK	74	29.35	41.24	34.34	7.09	34.27	7.17
5428.00	--	AV	54	--	--	--	--	--	--
7386.00	45.07	PK	74	28.93	37.4	37.61	9.25	34.98	11.88
7386.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):			2462		Polarity:			VERTICAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4924.00	48.17	PK	74	25.83	43.39	33.71	6.98	35.91	4.78
4924.00	--	AV	54	--	--	--	--	--	--
5636.00	45.26	PK	74	28.74	38.09	34.34	7.09	34.27	7.17
5636.00	--	AV	54	--	--	--	--	--	--
7386.00	47.23	PK	74	26.77	35.35	37.61	9.25	34.98	11.88
7386.00	--	AV	54	--	--	--	--	--	--

REMARKS:

1. Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
3. Margin value = Limit value- Emission level.
4. -- Mean the PK detector measured value is below average limit.
5. Other emissions are attenuated 20dB below the limits, so it does not recorded in report.
6. RBW1MHz VBW3MHz Peak detector is for PK value; RBW 1MHz VBW10Hz Peak detector is for AV value.

Results of Band Edges Test (Radiated)

Note: 802.11b/802.11g/802.11n (H20) all have been tested, only worse case 802.11b is reported

Frequency(MHz):			2412		Polarity:			HORIZONTAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2412.00	101.26	PK	--	--	67.87	28.78	4.61	0	33.39
2412.00	89.02	AV	--	--	55.63	28.78	4.61	0	33.39
2348.00	44.02	PK	74	29.98	10.94	28.52	4.56	0	33.08
2348.00	--	AV	54	--	--	--	--	--	--
2390.00	46.51	PK	74	27.49	13.19	28.72	4.6	0	33.32
2390.00	--	AV	54	--	--	--	--	--	--
2400.00	48.18	PK	74	25.82	14.79	28.78	4.61	0	33.39
2400.00	--	AV	--	--	--	--	--	--	--

Frequency(MHz):			2412		Polarity:			VERTICAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2412.00	101.15	PK	--	--	67.76	28.78	4.61	0	33.39
2412.00	91.02	AV	--	--	57.63	28.78	4.61	0	33.39
2365.00	43.26	PK	74	30.74	10.18	28.52	4.56	0	33.08
2365.00	--	AV	54	--	--	--	--	--	--
2390.00	45.98	PK	74	28.02	12.66	28.72	4.60	0	33.32
2390.00	--	AV	54	--	--	--	--	--	--
2400.00	48.17	PK	74	25.83	14.78	28.78	4.61	0	33.39
2400.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):			2462		Polarity:			HORIZONTAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2462.00	103.05	PK	--	--	69.43	28.92	4.7	0	33.62
2462.00	94.66	AV	--	--	61.04	28.92	4.7	0	33.62
2483.50	46.21	PK	74	27.79	12.58	28.93	4.7	0	33.63
2483.50	--	AV	54	--	--	--	--	--	--
2491.00	45.95	PK	74	28.05	12.31	28.94	4.71	0	33.64
2491.00	--	AV	54	--	--	--	--	--	--
2500.00	43.26	PK	74	30.74	9.58	28.96	4.72	0	33.68
2500.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):			2462		Polarity:			VERTICAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2462.00	102.33	PK	--	--	68.71	28.92	4.7	0	33.62
2462.00	91.26	AV	--	--	57.64	28.92	4.7	0	33.62
2483.50	46.32	PK	74	27.68	12.69	28.93	4.7	0	33.63
2483.50	--	AV	54	--	--	--	--	--	--
2493.00	45.16	PK	74	28.84	11.52	28.94	4.71	0	33.64
2493.00	--	AV	54	--	--	--	--	--	--
2500.00	43.68	PK	74	30.32	10	28.96	4.72	0	33.68
2500.00	--	AV	54	--	--	--	--	--	--

REMARKS:

1. Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
3. Margin value = Limit value- Emission level.
4. -- Mean the PK detector measured value is below average limit.
5. Other emissions are attenuated 20dB below the limits, so it does not recorded in report.
6. RBW1MHz VBW3MHz Peak detector is for PK value; RBW 1MHz VBW10Hz Peak detector is for AV value.
7. For fundamental frequency, RBW 3MHz VBW 3MHz Peak detector is for PK Value; RMS detector is for AV value.

3.3. Maximum Conducted Output Power

Limit

The Maximum Peak Output Power Measurement is 30dBm.

Test Procedure

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power sensor.

Test Configuration

Test Results

Raw data reference to Section 2 from Appendix for 2.4G wifi.

3.4. Power Spectral Density

Limit

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.

Test Procedure

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW ≥ 3 kHz.
3. Set the VBW ≥ 3× RBW.
4. Set the span to 1.5 times the DTS channel bandwidth.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum power level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.
11. The resulting peak PSD level must be 8dBm.

Test Configuration

Test Results

Raw data reference to Section 3 from Appendix for 2.4G wifi.

3.5. 6dB Bandwidth

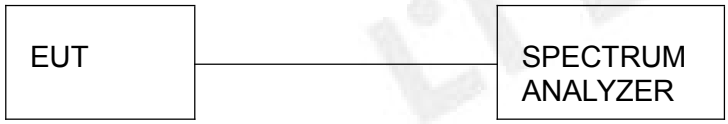
Limit

For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz

Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 KHz RBW and 300 KHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

Test Configuration



Test Results

Raw data reference to Section 1 from Appendix for 2.4G wifi.

3.6. Out-of-band Emissions

Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF con-ducted or a radiated measurement, pro-vided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter com-plies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

Test Procedure

Connect the transmitter output to spectrum analyzer using a low loss RF cable, and set the spectrum analyzer to RBW=100 kHz, VBW= 300 kHz, peak detector , and max hold. Measurements utilizing these setting are made of the in-band reference level, bandedge and out-of-band emissions.

Test Configuration

Test Results

Raw data reference to Section 4 from Appendix for 2.4G wifi.

3.7. Antenna Requirement

Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203:

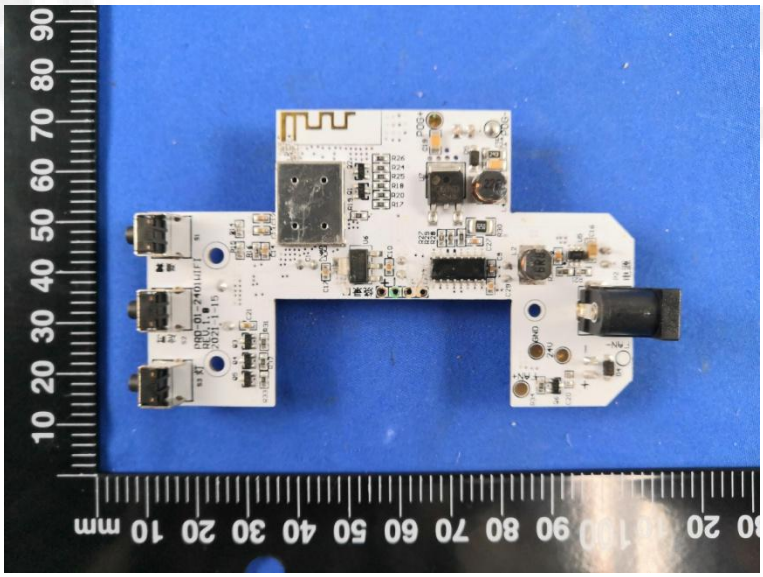
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit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

FCC CFR Title 47 Part 15 Subpart C Section 15.247(b) (4) :

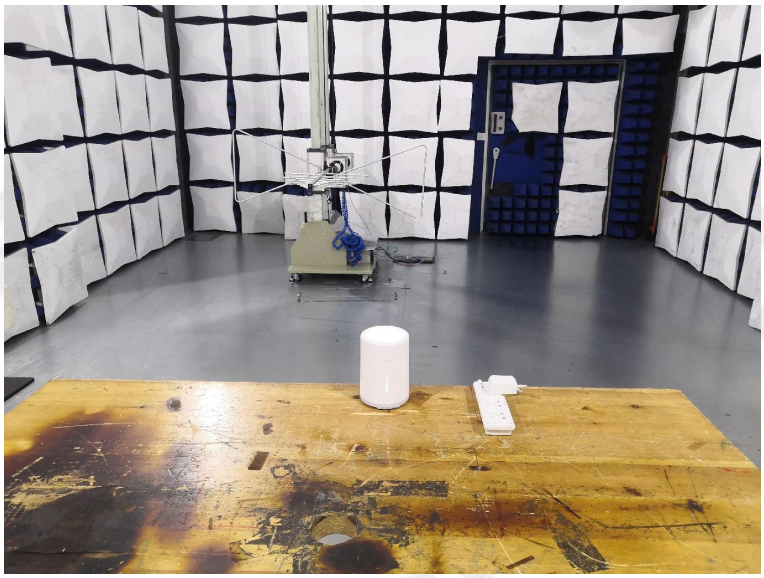
(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

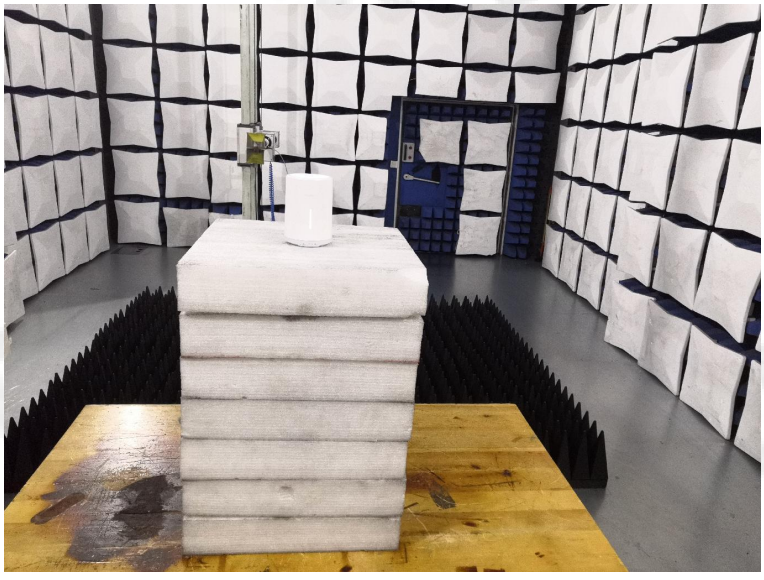
Test Result:

The maximum gain of antenna was 0dBi.



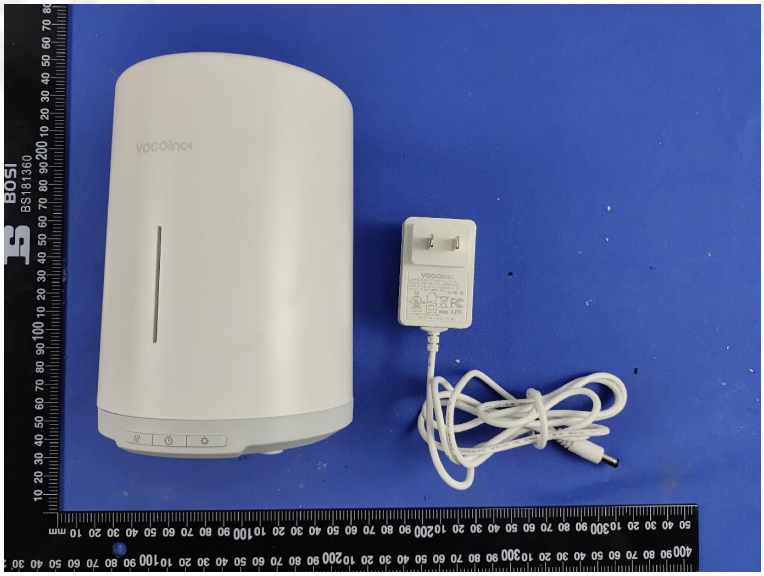
4. Test Setup Photos of the EUT

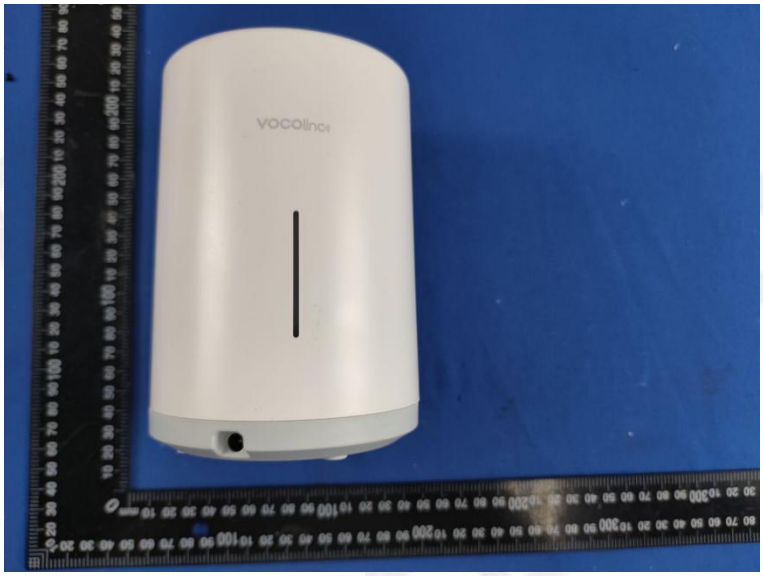


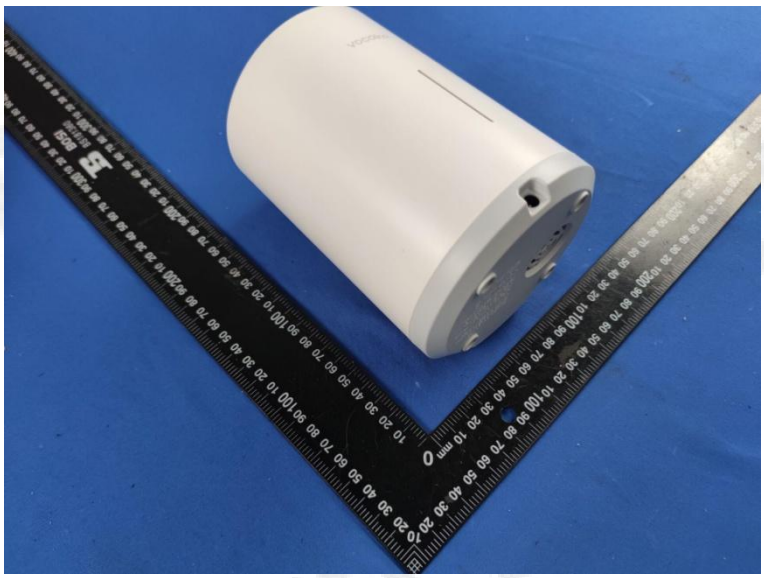


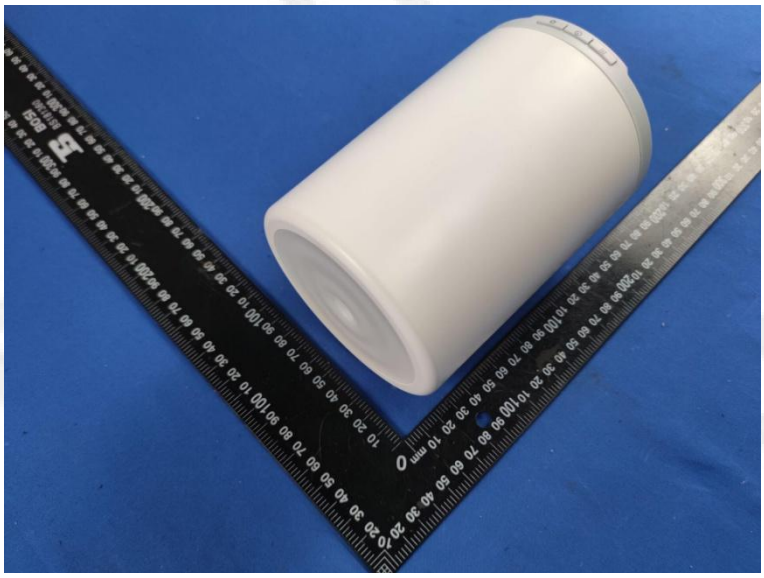
5. External and Internal Photos of the EUT

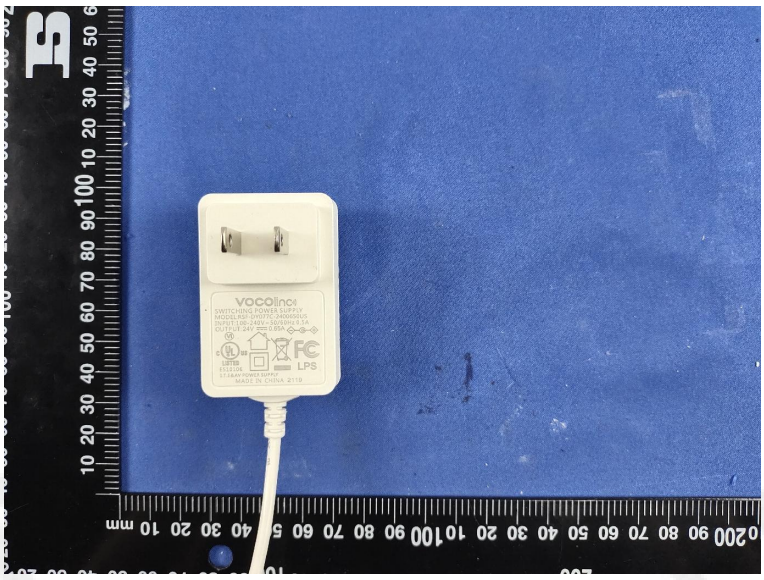
External Photos of EUT



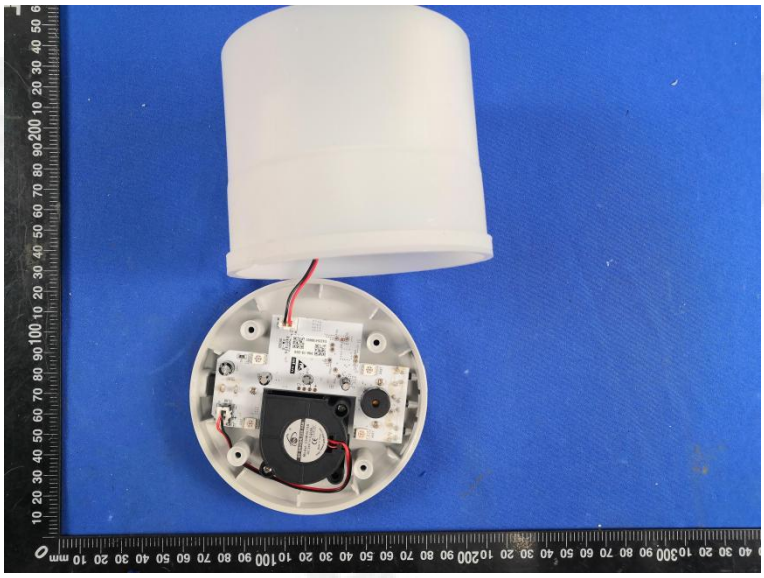


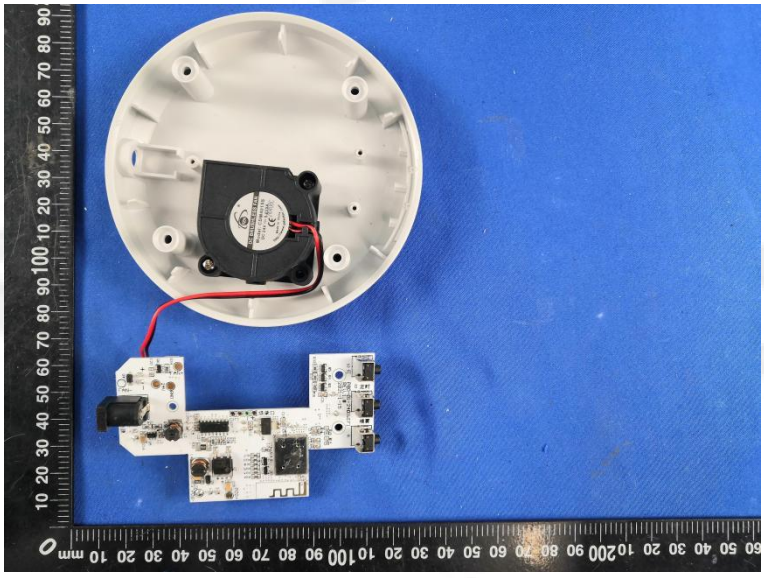


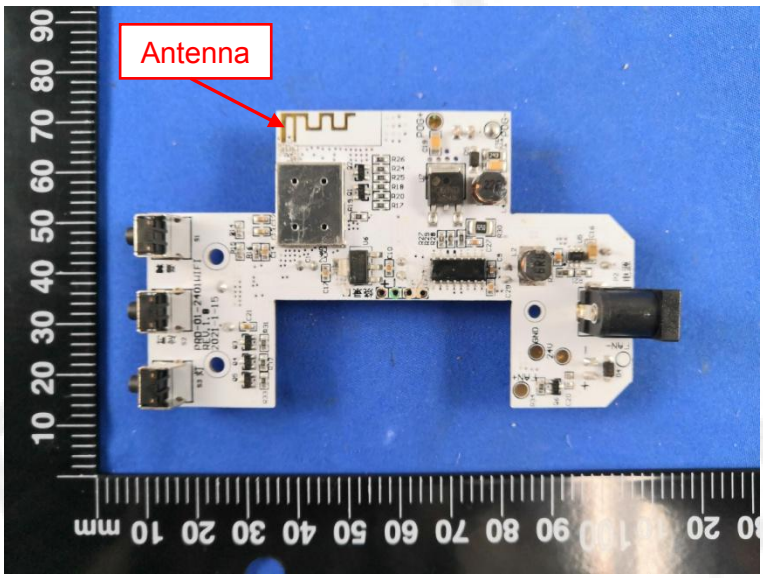


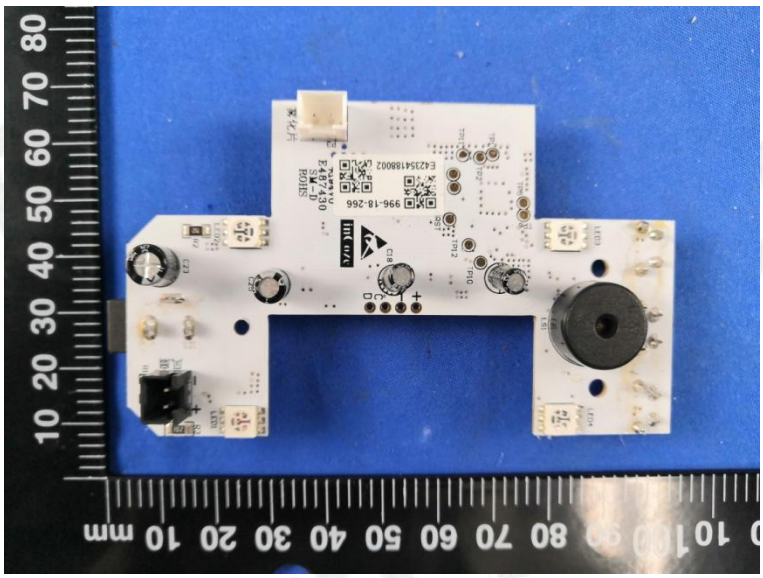


Internal Photos of EUT









**********End of Report**********