TEST REPORT

Product Name	:	Smart Doorbell
Brand Name	:	anyfree
Model/HVIN	:	anyfree-ML01-M
Series Model	:	anyfree-ML01-O, anyfree-ML01-Y
FCC ID	:	2AMJYANYFREEML
Applicant	:	**Zhuhai Taichuan Cloud Technology Co., Ltd**
Address	:	Bldg1 Taichuan Technopark No.611Huawei Road Qianshan Xiangzhou 519075 Zhuhai Guangdong China
Manufacturer	:	**Zhuhai Taichuan Cloud Technology Co., Ltd**
Address	:	Bldg1 Taichuan Technopark No.611Huawei Road Qianshan Xiangzhou 519075 Zhuhai Guangdong China
Standard(s)	:	FCC CFR Title 47 Part 15 Subpart C Section 15.247
Date of Receipt	:	Oct. 09, 2024
Date of Test	:	Oct. 10, 2024~ Nov. 11, 2024
Issued Date	:	Nov. 12, 2024

Issued By: **Guangdong Asia Hongke Test Technology Limited**
B1/F, Building 11, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
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Approved by: Sean She
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Report Revise Record

Report Version	Issued Date	Notes
M1	Nov. 12, 2024	Initial Release

Contents

1 TEST 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

KDB558074 D01 15.247 Meas Guidance v05r02: Guidance for Compliance Measurements on Digital Transmission System, Frequency Hopping Spreda Spectrum System, and Hybrid System Devices Operating Under Section 15.247 of the FCC Rules

1.2 Test Summary

Test Item	Section in 47 CRF	Result
Antenna requirement	§15.203	Pass
On Time and Duty Cycle	/	/
AC Power Line Conducted Emission	§ 15.207(a)	Pass
Maximum Conducted Peak Output Power	§15.247 (b)(3)	Pass
-6dB Bandwidth	§15.247 (a)(2)	Pass
Power Spectral Density	§15.247 (e)	Pass
Transmitter Radiated Spurious Emission	§15.205/15.209	Pass
Restricted Bands	§15.205/15.209	PASS
Conducted Unwanted emissions and Bandedge	§15.205, §15.247(d)	Pass

1.3 Test Facility

Test Laboratory:
Guangdong Asia Hongke Test Technology Limited
B1/F, Building 11, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

The test facility is recognized, certified or accredited by the following organizations:
FCC-Registration No.: 251906 Designation Number: CN1376
Guangdong Asia Hongke Test Technology Limited 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.

IC —Registration No.: 31737 CAB identifier: CN0165
The 3m Semi-anechoic chamber of Guangdong Asia Hongke Test Technology Limited has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 31737

A2LA-Lab Cert. No.: 7133.01
Guangdong Asia Hongke Test Technology Limited has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

1.4 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 according 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 Guangdong Asia Hongke Test Technology Limited’s quality system according 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 Asia Hongke laboratory is reported:

Test	Measurement Uncertainty	Notes
Power Line Conducted Emission	150KHz~30MHz ±1.20 dB	(1)
Radiated Emission	9KHz~30Hz ±3.10dB	(1)
Radiated Emission	9KHz~1GHz ±3.75dB	(1)
Radiated Emission	1GHz~18GHz ±3.88 dB	(1)
Radiated Emission	18GHz-40GHz ±3.88dB	(1)
RF power, conducted	30MHz~6GHz ±0.16dB	(1)
RF power density, conducted	±0.24dB	(1)
Spurious emissions, conducted	±0.21dB	(1)
Temperature	±1℃	(1)
Humidity	±3%	(1)
DC and low frequency voltages	±1.5%	(1)
Time	±2%	(1)
Duty cycle	±2%	(1)

The report uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty Multiplied by a coverage factor of k=2 , providing a level of confidence of approximately 95%

2 GENGENERAL 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:	Smart Doorbell
Model/Type reference:	anyfree-ML01-M
Serial Model:	anyfree-ML01-O, anyfree-ML01-Y
Power Supply:	DC 3.7V from battery
Rating:	DC 5v2A
Hardware Version:	TC-U9ML-A-DB-Z-V06
Software Version:	V1.1.0
Sample(s) Status:	AiTSZ-241009013-1(Normal sample) AiTSZ-241009013-2(Engineer sample)
HaLow:	
Supported type:	802.11ah(1MHz channel bandwidth) 802.11ah(2MHz channel bandwidth) 802.11ah(4MHz channel bandwidth) 802.11ah(8MHz channel bandwidth)
Modulation:	OFDM with BPSK/QPSK/16QAM/64QAM
Operation frequency:	903.5-926.5MHz for 802.11ah(1MHz channel bandwidth); 905-925MHz for 802.11ah(2MHz channel bandwidth); 906-926MHz for 802.11ah(4MHz channel bandwidth); 908-924MHz for 802.11ah(8MHz channel bandwidth)
Channel number:	24 channels for 802.11ah(1MHz channel bandwidth); 11 Channels for 802.11ah(2MHz channel bandwidth); 6 Channels for 802.11ah(4MHz channel bandwidth); 3 Channels for 802.11ah(8MHz channel bandwidth);
Antenna type:	FPC antenna
Antenna gain:	0.27dBi
Remark: The above DUT's information was declared by manufacturer. For more detailed features description, please refer to the manufacturer's specifications or the User's Manual.	

2.3 Description of Test Modes and Test Frequency

The EUT has been tested under its typical operating condition. The manufacturer provides software to control the EUT for staying in continuous transmitting and receiving mode.
The channel of lowest and middle and highest frequency is selected to perform the test for each bandwidth operation mode.

Operation Frequency List:802.11ah(1MHz channel bandwidth):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	**903.5**	9	911.5	17	919.5
2	904.5	10	912.5	18	920.5
3	905.5	11	913.5	19	921.5
4	906.5	12	914.5	20	922.5
5	907.5	**13**	**915.5**	21	923.5
6	908.5	14	916.5	22	924.5
7	909.5	15	917.5	23	925.5
8	910.5	16	918.5	**24**	**926.5**

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

Operation Frequency List:802.11ah(2MHz channel bandwidth):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	**905**	5	913	9	921
2	907	**6**	**915**	10	923
3	909	7	917	**11**	**925**
4	911	8	919		

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

Operation Frequency List:802.11ah(4MHz channel bandwidth):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	**906**	**3**	**914**	5	922
2	910	4	918	**6**	**926**

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

Operation Frequency List:802.11ah(8MHz channel bandwidth):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	**908**	**2**	**916**	**3**	**924**

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

Exploratory testing was performed under each mode combination test channel; only the final measurement of the worst combination was made and recorded in this report.

Test case	Exploratory measurement		Final measurement Recorded In Report	
	Mode	Channel	Mode	Channel
Maximum output power	802.11ah 1M 802.11ah 2M 802.11ah 4M 802.11ah 8M	☒ Lowest ☒ Middle ☒ Highest	802.11ah 1M 802.11ah 2M 802.11ah 4M 802.11ah 8M	☒ Lowest ☒ Middle ☒ Highest
Power spectral density	802.11ah 1M 802.11ah 2M 802.11ah 4M 802.11ah 8M	☒ Lowest ☒ Middle ☒ Highest	802.11ah 1M 802.11ah 2M 802.11ah 4M 802.11ah 8M	☒ Lowest ☒ Middle ☒ Highest
-6dB bandwidth	802.11ah 1M 802.11ah 2M 802.11ah 4M 802.11ah 8M	☒ Lowest ☒ Middle ☒ Highest	802.11ah 1M 802.11ah 2M 802.11ah 4M 802.11ah 8M	☒ Lowest ☒ Middle ☒ Highest
Conducted Spurious Emissions	802.11ah 1M 802.11ah 2M 802.11ah 4M 802.11ah 8M	☒ Lowest ☒ Middle ☒ Highest	802.11ah 1M 802.11ah 2M 802.11ah 4M 802.11ah 8M	☒ Lowest ☒ Middle ☒ Highest
Conducted Band edge	802.11ah 1M 802.11ah 2M 802.11ah 4M 802.11ah 8M	☒ Lowest ☒ Highest	802.11ah 1M 802.11ah 2M 802.11ah 4M 802.11ah 8M	☒ Lowest ☒ Highest
Radiated Emissions Below 1GHz& Radiated Band edge	802.11ah 1M 802.11ah 2M 802.11ah 4M 802.11ah 8M	☒ Lowest ☒ Middle ☒ Highest	802.11ah 8M	☒ Lowest ☒ Highest
Radiated Emissions Above 1GHz	802.11ah 1M 802.11ah 2M 802.11ah 4M 802.11ah 8M	☒ Lowest ☒ Middle ☒ Highest	802.11ah 8M	☒ Lowest ☒ Middle ☒ Highest
Conducted Emissions 9KHz-30 MHz	802.11ah 1M 802.11ah 2M 802.11ah 4M 802.11ah 8M	☒ Lowest ☒ Middle ☒ Highest	802.11ah 8M	☒ Lowest

Power setting during the test:

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Power Parameters:

Test Software Version	SecureCRT		
Channel	Low	Middle	High
Level	default	default	default

2.4 Special Accessories

Follow auxiliary equipment(s) test with EUT that provided by the manufacturer or laboratory is listed as follow:

Description	Manufacturer	Model	Serial No.	Provided by	Other
Adapter	HNT	HNT-QC530	/	Test lab	/
/	/	/	/	/	/

2.5 Equipment List for the Test

No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	EMI Measuring Receiver	R&S	ESR	101160	2024.09.25	2025.09.24
2	Spectrum Analyzer	R&S	FSV40	101470	2024.09.23	2025.09.22
3	Low Noise Pre Amplifier	SCHWARZBECK	BBV 9745	00282	2024.09.25	2025.09.24
4	Low Noise Pre Amplifier	CESHENG	CSKJLNA231016A	CSKJLNA231016A	2024.09.25	2025.09.24
5	Passive Loop	ETS	6512	00165355	2024.08.29	2027.08.28
6	TRILOG Super Broadband test Antenna	SCHWARZBECK	VULB9168	01434	2024.08.29	2027.08.28
7	Broadband Horn Antenna	Schwarzbeck	BBHA 9120D	452	2024.08.29	2027.08.28
8	Horn Antenna 15-40GHz	SCHWARZBECK	BBHA9170	BBHA9170367	2024.08.28	2027.08.27
9	6dB Attenuator	JFW	50FPE-006	4360846-949-1	2024.09.24	2025.09.23
10	EMI Test Receiver	R&S	ESPI	100771	2024.09.25	2025.09.24
11	LISN	R&S	NNLK 8129	8130179	2024.09.24	2025.09.23
12	LISN	R&S	ESH3-Z5	892785/016	2024.09.23	2025.09.22
13	Pulse Limiter	R&S	ESH3-Z2	102789	2024.09.24	2025.09.23
14	RF Automatic Test system	TST	TSTPASS	21033016	2024.09.25	2025.09.24
15	Vector Signal Generator	Agilent	N5182A	MY50143009	2024.09.25	2025.09.24
16	Analog signal generator	Agilent	E8257	MY51554256	2024.09.25	2025.09.24
17	Spectrum Analyzer	Agilent	N9020A	MY51289843	2024.09.25	2025.09.24
18	Spectrum Analyzer	Agilent	N9020A	MY53421570	2024.09.25	2025.09.24
19	Power Sensor	Agilent	8481A	MY41097697	2024.09.25	2025.09.24
20	Wideband Radio communication tester	R&S	CMW500	1201.0002K50	2024.09.24	2025.09.23
21	DC power supply	ZHAOXIN	RXN-305D-2	28070002559	N/A	N/A
22	RE Software	EZ	EZ-EMC_RE	Ver.AIT-03A	N/A	N/A
23	CE Software	EZ	EZ-EMC_CE	Ver.AIT-03A	N/A	N/A

24	RF Software	TST	TSTPASS	Version 2.0	N/A	N/A
25	RF Software	cesheng	WCS-WCN	Version 2024.6.20	N/A	N/A
26	temporary antenna connector(Note)	NTS	R001	N/A	N/A	N/A
Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.						

3 TEST CONDITIONS AND RESULTS

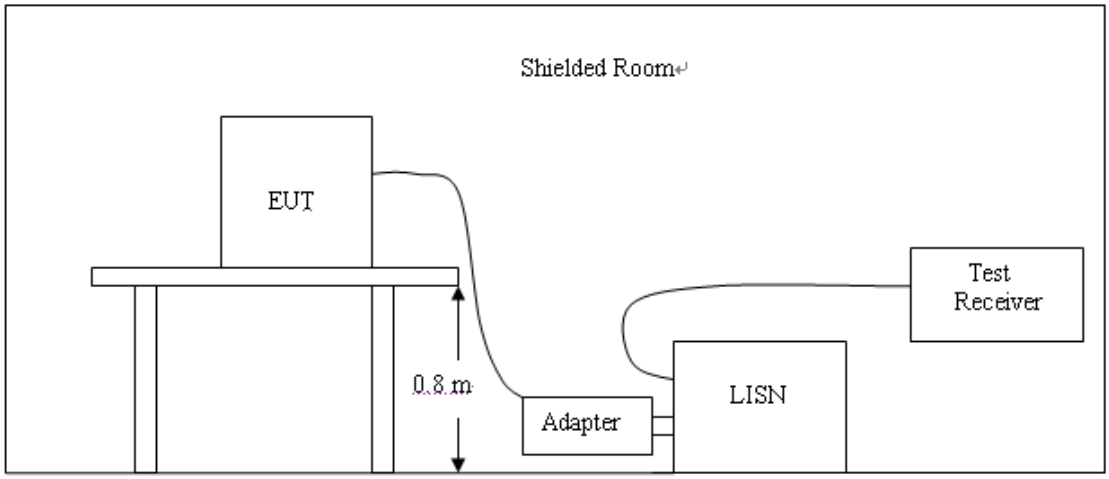
3.1 Conducted Emissions Test

LIMIT

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



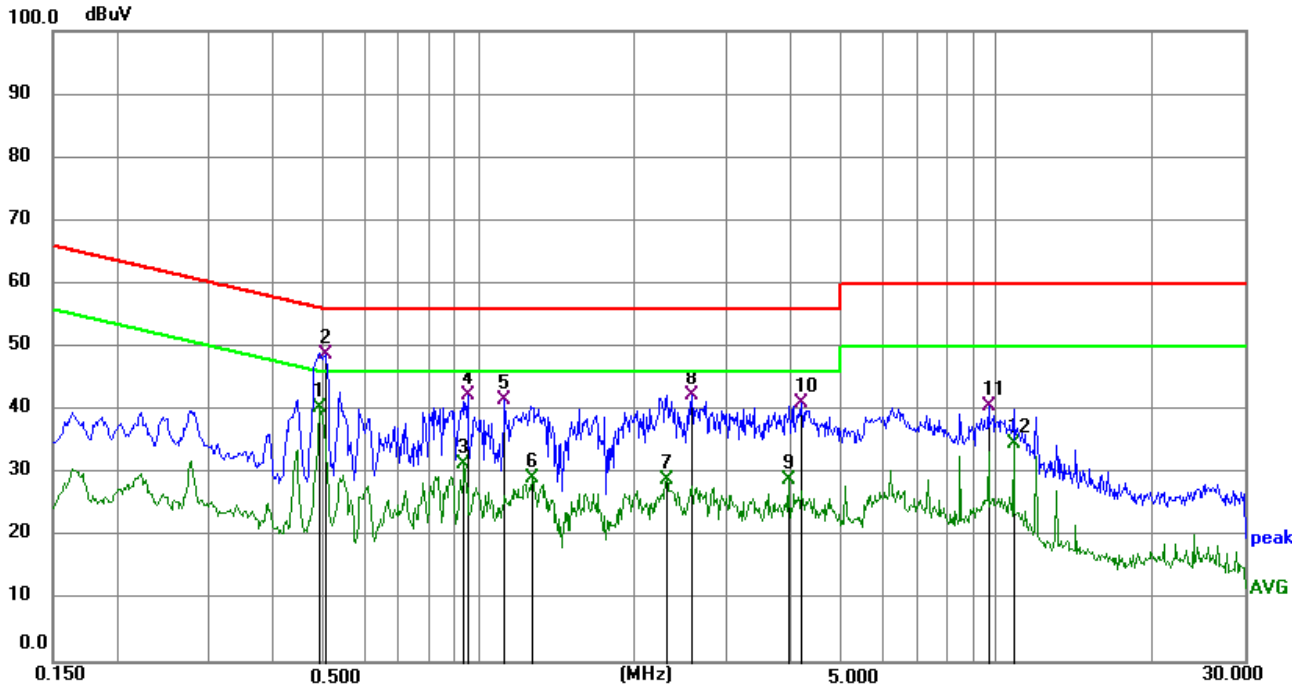
TEST PROCEDURE

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: Both 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz power supply have been tested, only the worst result of 120 VAC, 60 Hz was reported as below:

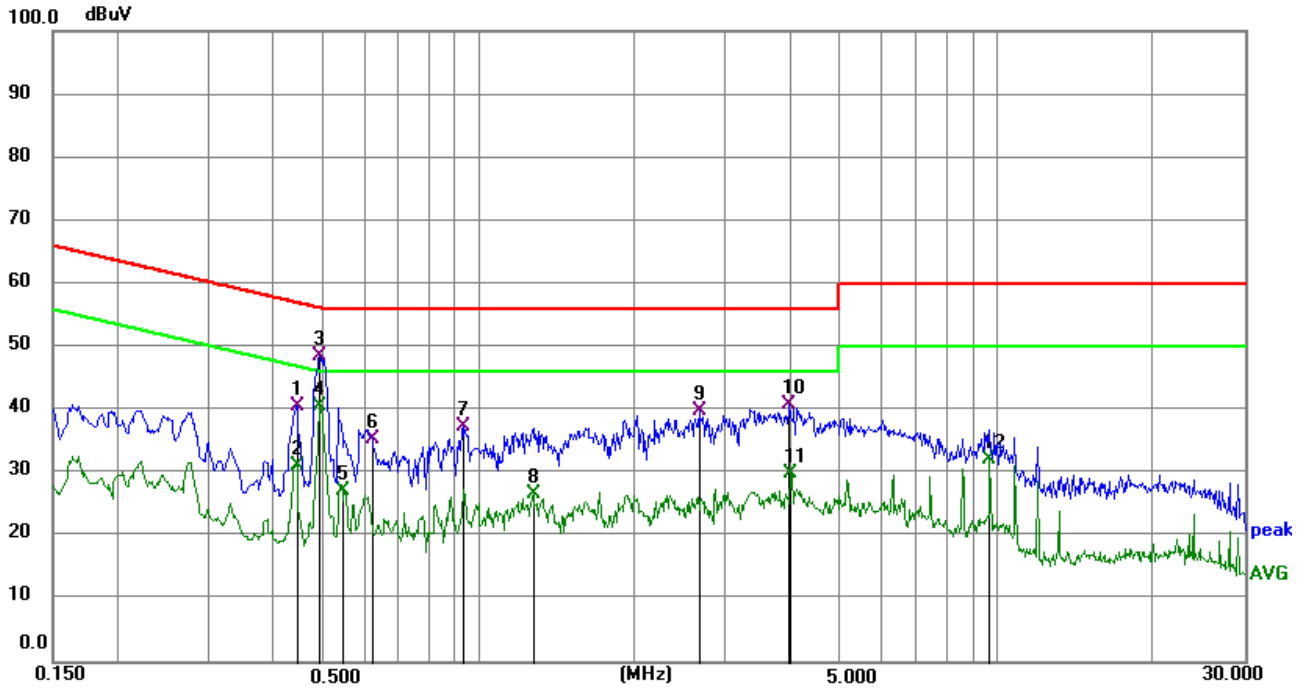
Test Mode	802.11ah TX	Line:	L



Remark: Correct Factor = Insertion loss of LISN + Cable loss + Insertion loss of Pulse Limiter;
Measurement Result = Reading Level +Correct Factor;
Margin = Measurement Result- Limit

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.4920	29.54	10.69	40.23	46.13	-5.90	AVG
2	0.5053	38.11	10.69	48.80	56.00	-7.20	QP
3	0.9375	20.67	10.65	31.32	46.00	-14.68	AVG
4	0.9510	31.62	10.65	42.27	56.00	-13.73	QP
5	1.1220	30.90	10.66	41.56	56.00	-14.44	QP
6	1.2660	18.37	10.68	29.05	46.00	-16.95	AVG
7	2.3054	18.13	10.79	28.92	46.00	-17.08	AVG
8	2.5754	31.51	10.79	42.30	56.00	-13.70	QP
9	3.9570	17.85	11.00	28.85	46.00	-17.15	AVG
10	4.1910	29.97	11.00	40.97	56.00	-15.03	QP
11	9.6225	29.51	10.97	40.48	60.00	-19.52	QP
12	10.7565	23.43	11.15	34.58	50.00	-15.42	AVG

Test Mode	802.11ah TX	Line:	N



Remark: Correct Factor = Insertion loss of LISN + Cable loss + Insertion loss of Pulse Limiter;
Measurement Result = Reading Level +Correct Factor;
Margin = Measurement Result- Limit

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.4425	29.87	10.69	40.56	57.01	-16.45	QP
2	0.4425	20.41	10.69	31.10	47.01	-15.91	AVG
3	0.4920	37.89	10.69	48.58	56.13	-7.55	QP
4	0.4920	29.79	10.69	40.48	46.13	-5.65	AVG
5	0.5503	16.57	10.68	27.25	46.00	-18.75	AVG
6	0.6225	24.78	10.68	35.46	56.00	-20.54	QP
7	0.9284	26.79	10.65	37.44	56.00	-18.56	QP
8	1.2703	15.99	10.67	26.66	46.00	-19.34	AVG
9	2.6520	28.94	10.79	39.73	56.00	-16.27	QP
10	3.9794	29.81	10.99	40.80	56.00	-15.20	QP
11	3.9930	18.95	10.99	29.94	46.00	-16.06	AVG
12	9.7035	21.28	10.96	32.24	50.00	-17.76	AVG

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)

For intentional device, according to RSS-Gen section 8.9, 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.

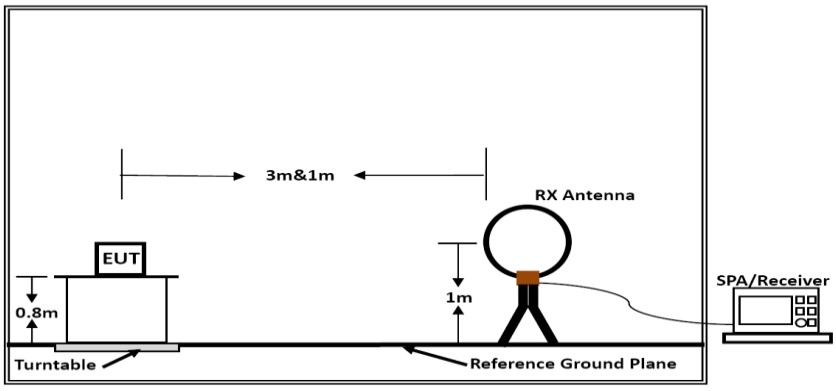
In addition, radiated emissions which fall in the restricted bands, as defined in RSS-Gen section 8.10, must also comply with the radiated emission limits specified in RSS-Gen section 8.9

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

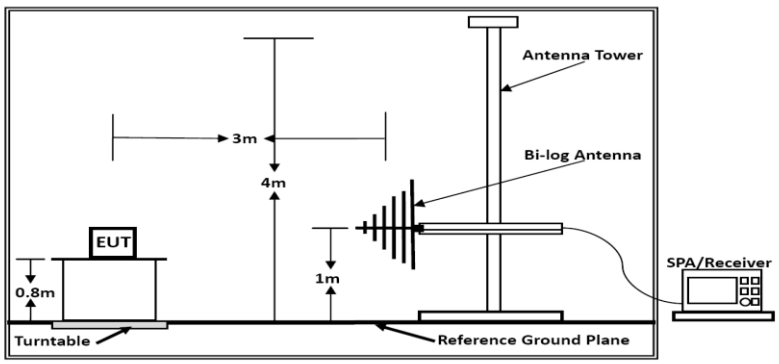
TEST CONFIGURATION

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



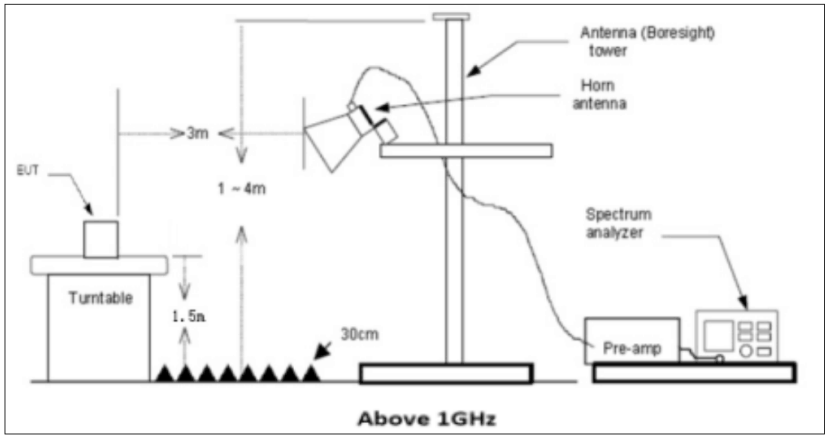
Below 30MHz

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



Below 1GHz

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



Test Procedure

1. Below 1GHz measurement the EUT is placed on a turntable which is 0.8m above ground plane, and above 1GHz measurement EUT was placed on a low permittivity and low loss tangent turn table which is 1.5m above ground plane.
2. 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
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.
5. Radiated emission test frequency band from 9KHz to 10GHz.
6. The distance between test antenna and EUT as following table states:

Test Frequency range	Test Antenna Type	Test Distance
9KHz-30MHz	Active Loop Antenna	3
30MHz-1GHz	Bilog Antenna	3
1GHz-18GHz	Horn Antenna	3

7. Setting test receiver/spectrum as following table states:

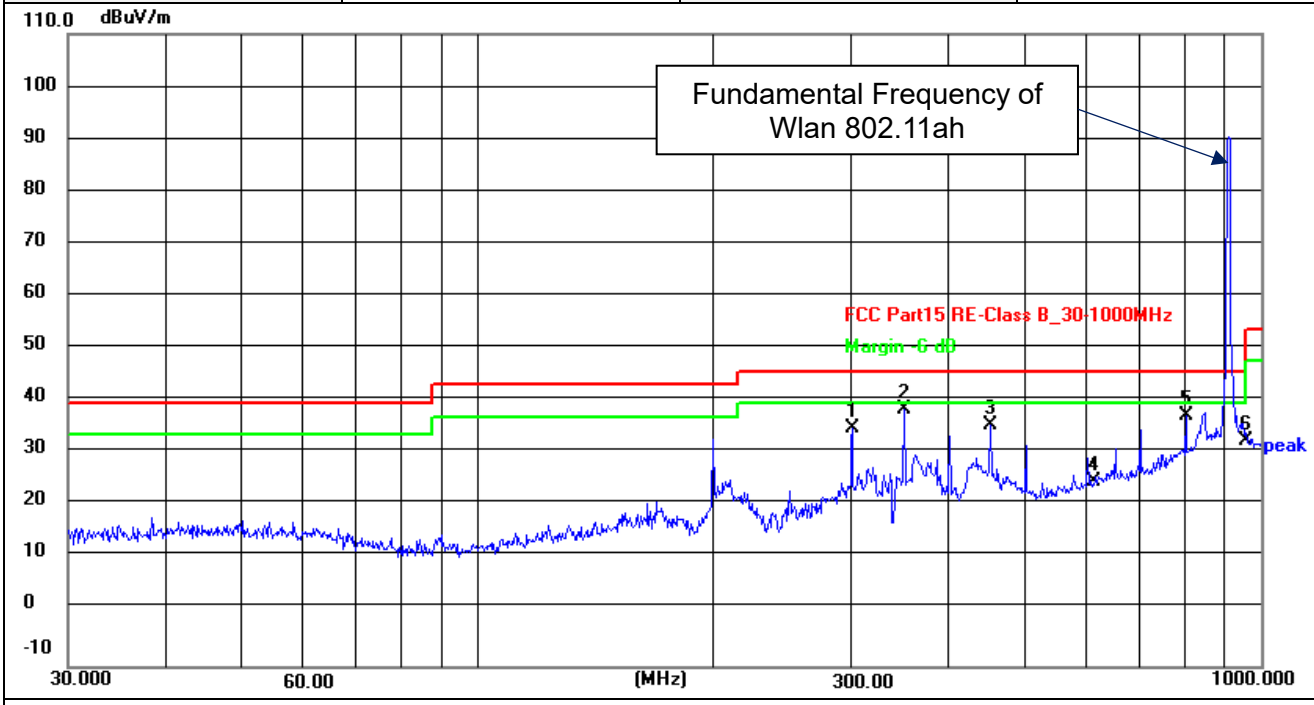
Test Frequency range	Test Receiver/Spectrum Setting	Detector
9KHz-150KHz	RBW=200Hz/VBW=3KHz,Sweep time=Auto	QP
150KHz-30MHz	RBW=9KHz/VBW=100KHz,Sweep time=Auto	QP
30MHz-1GHz	RBW=120KHz/VBW=1000KHz,Sweep time=Auto	QP
Above 1GHz	Peak Value: RBW=1MHz/VBW=3MHz, Sweep time=Auto Average Value: RBW=1MHz/VBW=10Hz, Sweep time=Auto	Peak

TEST RESULTS

Remark:
1. Radiated emission test from 9 KHz to 10th harmonic of fundamental was verified, and The emission levels from 9kHz to 30MHz are attenuated 20dB below the limit and not recorded in report.

For 30MHz-1GHz

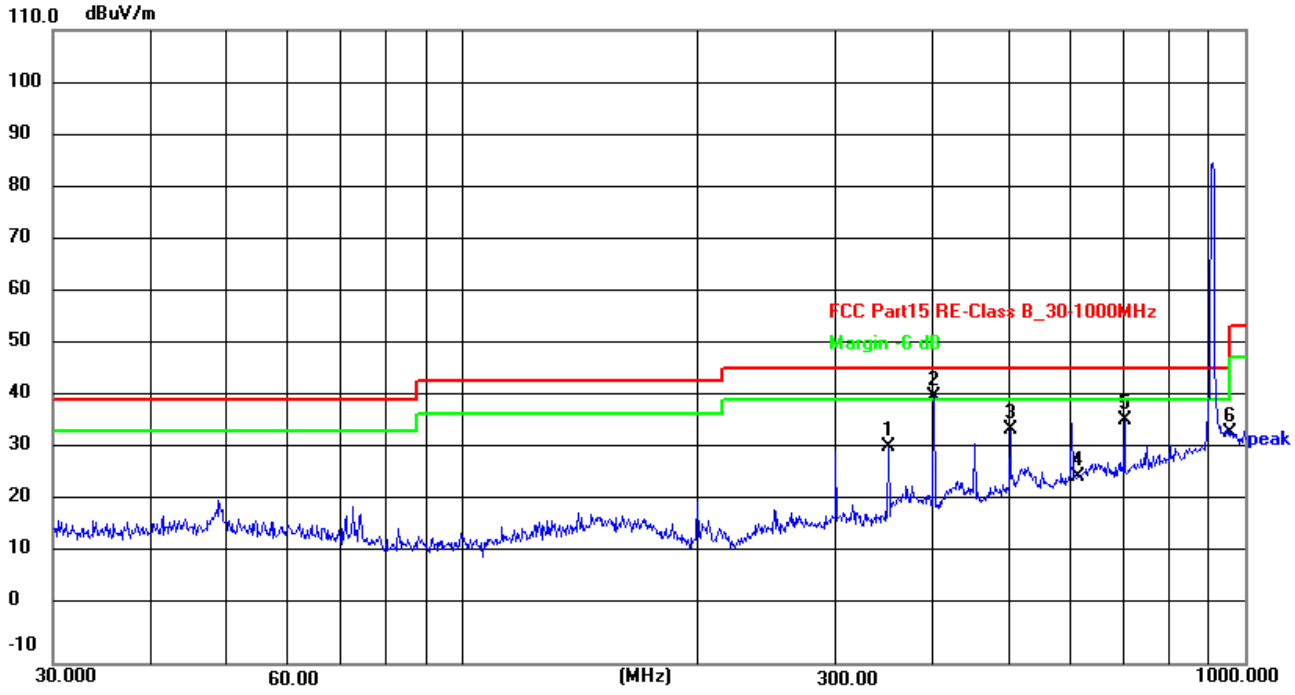
Test Frequency:	908MHz	Polarization:	Horizontal



Remark:
Emission Level = Reading + Factor;
Factor = Antenna Factor + Cable Loss – Pre-amplifier;
Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	300.3672	51.81	-16.94	34.87	46.00	-11.13	peak
2	350.4768	54.58	-15.75	38.83	46.00	-7.17	peak
3	451.1350	49.03	-13.19	35.84	46.00	-10.16	peak
4	614.0000	34.55	-9.41	25.14	46.00	-20.86	peak
5	801.7863	43.52	-5.96	37.56	46.00	-8.44	peak
6	960.0000	36.34	-3.47	32.87	46.00	-13.13	peak

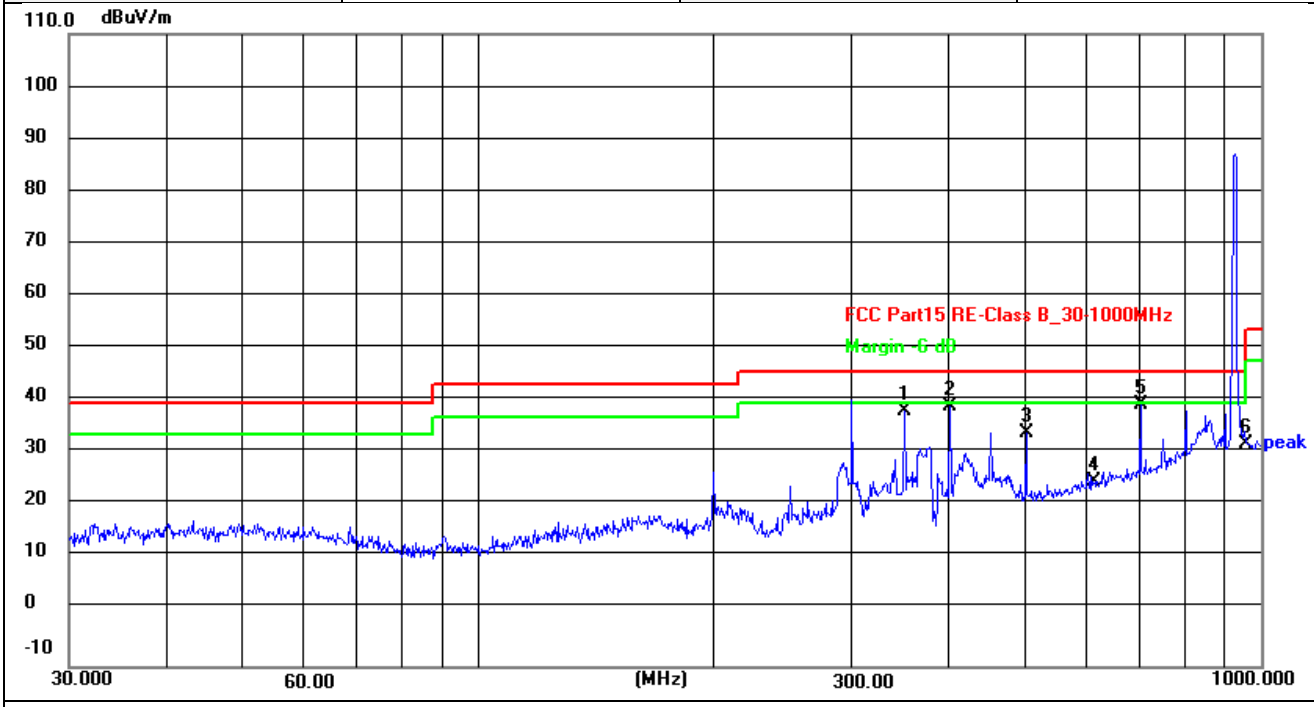
Test Frequency:	908MHz	Polarization:	Vertical



Remark:
Emission Level = Reading + Factor;
Factor = Antenna Factor + Cable Loss – Pre-amplifier;
Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	350.4768	46.91	-15.75	31.16	46.00	-14.84	peak
2	400.4319	55.24	-14.56	40.68	46.00	-5.32	peak
3	501.1790	46.92	-12.50	34.42	46.00	-11.58	peak
4	614.0000	34.97	-9.41	25.56	46.00	-20.44	peak
5	701.7610	44.27	-8.19	36.08	46.00	-9.92	peak
6	960.0000	37.25	-3.47	33.78	46.00	-12.22	peak

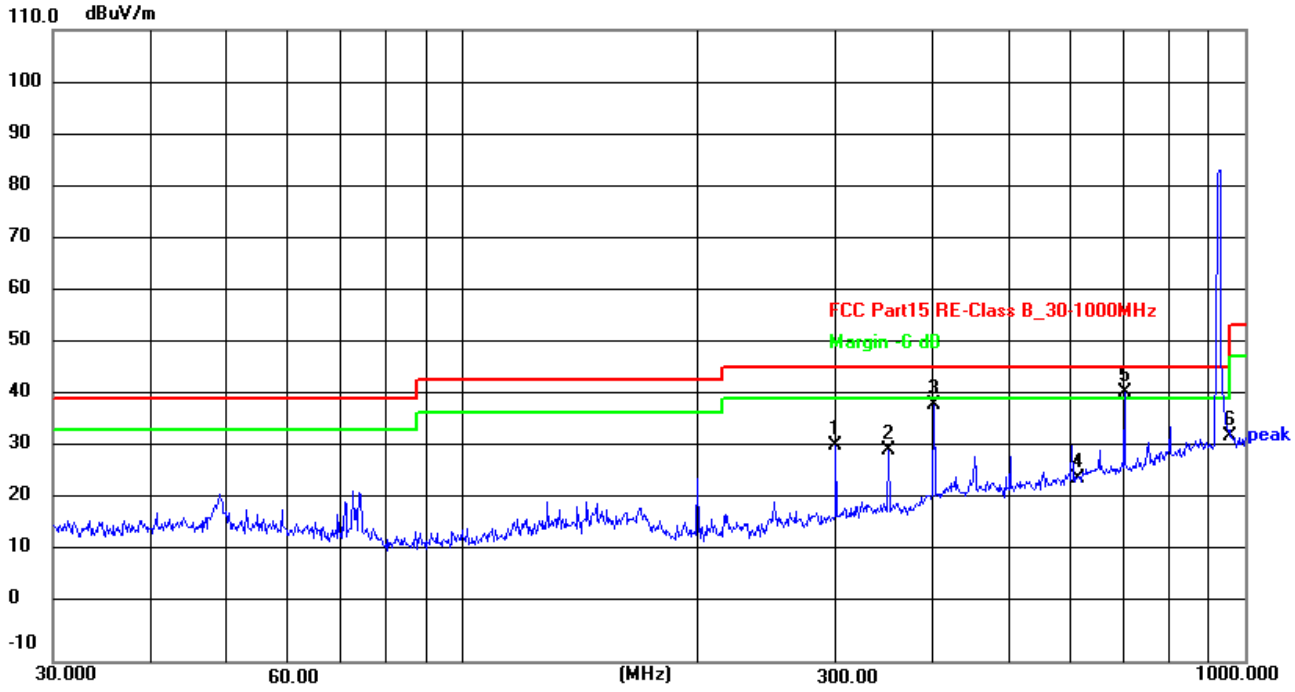
Test Frequency:	924MHz	Polarization:	Horizontal



Remark:
Emission Level = Reading + Factor;
Factor = Antenna Factor + Cable Loss – Pre-amplifier;
Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	350.4768	54.36	-15.75	38.61	46.00	-7.39	peak
2	400.4319	53.96	-14.56	39.40	46.00	-6.60	peak
3	501.1790	47.00	-12.50	34.50	46.00	-11.50	peak
4	614.0000	34.50	-9.41	25.09	46.00	-20.91	peak
5	701.7610	48.03	-8.19	39.84	46.00	-6.16	peak
6	960.0000	35.82	-3.47	32.35	46.00	-13.65	peak

Test Frequency:	924MHz	Polarization:	Vertical



Remark:
Emission Level = Reading + Factor;
Factor = Antenna Factor + Cable Loss – Pre-amplifier;
Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	300.3672	48.20	-16.94	31.26	46.00	-14.74	peak
2	350.4768	46.11	-15.75	30.36	46.00	-15.64	peak
3	400.4319	53.28	-14.56	38.72	46.00	-7.28	peak
4	614.0000	34.38	-9.41	24.97	46.00	-21.03	peak
5	701.7610	49.49	-8.19	41.30	46.00	-4.70	peak
6	960.0000	36.30	-3.47	32.83	46.00	-13.17	peak

For 1GHz to 10GHz

Above 1GHz

Frequency(MHz):		908.00		Polarity:	Horizontal	
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	
1815.40	72.04	-16.62	55.42	74	-18.58	PEAK
1815.40	62.32	-16.62	45.70	54	-8.30	AVG
2724.00	62.40	-12.81	49.59	74	-24.41	PEAK
--	--	--	--	--	--	AVG

Frequency(MHz):		908.00		Polarity:	VERTICAL	
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	
1815.40	72.13	-16.62	55.51	74	-18.49	PEAK
1815.40	61.57	-16.62	44.95	54	-9.05	AVG
2724.00	62.50	-12.81	49.69	74	-24.31	PEAK
--	--	--	--	--	--	AVG

Frequency(MHz):		916		Polarity:	Horizontal	
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	
1832.45	70.55	-16.44	54.11	74	-19.89	PEAK
1832.45	61.86	-16.44	45.42	54	-8.58	AVG
2747.35	60.03	-12.5	47.53	74	-26.47	PEAK
--	--	--	--	--	--	AVG

Frequency(MHz):		916		Polarity:	VERTICAL	
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	
1832.45	70.94	-16.44	54.50	74	-19.50	PEAK
1832.45	61.06	-16.44	44.62	54	-9.38	AVG
2747.35	60.39	-12.5	47.89	74	-26.11	PEAK
--	--	--	--	--	--	AVG

Frequency(MHz):		924.00		Polarity:	Horizontal	
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	
1848.75	47.02	-16.47	55.20	74	-18.80	PEAK
1848.75	64.27	-16.47	47.80	54	-6.20	AVG
2772.45	46.47	-12.55	52.61	74	-21.39	PEAK
--	--	--	--	--	--	AVG

Frequency(MHz):		924.00		Polarity:	VERTICAL	
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	
1848.75	45.63	-16.47	55.85	74	-18.15	PEAK
1848.75	65.82	-16.47	49.35	54	-4.65	AVG
2772.45	45.02	-12.55	53.45	74	-20.55	PEAK
--	--	--	--	--	--	AVG

REMARKS:

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

3.3 Maximum Conducted Output Power

Limit

The Maximum Peak Output Power Measurement is 30dBm.

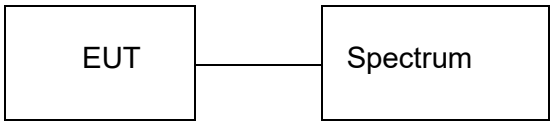
Test Procedure

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Spectrum.
Set the Spectrum as follow:

- RBW ≥ DTS bandwidth.
- VBW ≥ 3 RBW.
- span ≥ 3 x RBW
- Sweep time = auto couple.
- Detector = peak.
- Trace mode = max hold.

Allow trace to fully stabilize.

Test Configuration



Test Results

☒ **Pass** ☐ **Not Applicable**

Note:
For test data, please refer to Appendix RF test data for WLAN 802.11ah.

3.4 Power Spectral Density

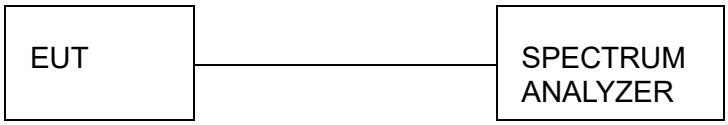
Limit

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

☒ **Pass** ☐ **Not Applicable**

Note:
For test data, please refer to Appendix RF test data for WLAN 802.11ah.

3.5 6dB Bandwidth

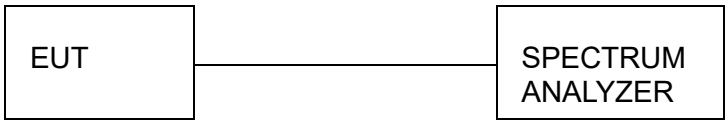
Limit

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

☒ **Pass** ☐ **Not Applicable**

Note:
For test data, please refer to Appendix RF test data for WLAN 802.11ah.

3.6 Out-of-band Emissions

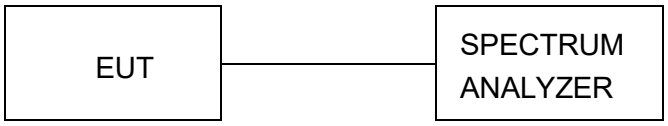
Limit

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

☒ **Pass** ☐ **Not Applicable**

Note:
For test data, please refer to Appendix RF test data for WLAN 802.11ah.

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 0.27dBi with impedance 50Ω.

4 Test Setup Photographs of EUT

Please refer to separated files for Test Setup Photos of the EUT.

5 External Photographs of EUT

Please refer to separated files for External Photos of the EUT.

6 Internal Photographs of EUT

Please refer to separated files for Internal Photos of the EUT.

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