FCC Part 15E Test Report
FCC ID:2BGEJ-GTHDWL30

Applicant:	Zhuhai Bigway Electronic Co.,Ltd.
Address:	Guangtai Electronics, Room 401, 4th Floor, Building 7, Wanqu Intl Ind. Park, Doumen, Zhuhai China
Manufacturer:	Zhuhai Bigway Electronic Co.,Ltd.
Address:	Guangtai Electronics, Room 401, 4th Floor, Building 7, Wanqu Intl Ind. Park, Doumen, Zhuhai China
EUT:	Wireless HDMI transmitter and receiver
Trade Mark:	N/A
Model Number:	GT-HDWL30
Date of Receipt:	Mar. 01, 25
Test Date:	Mar. 01, 2025 to Mar. 11, 2025
Date of Report:	Mar. 11, 2025
Prepared By:	Shenzhen DL Testing Technology Co., Ltd.
Address:	101-201, Building C, Shuanghuan, No.8, Baoqing Road, Baolong Industrial Zone, Baolong Street, Longgang District, Shenzhen, Guangdong, China
Applicable Standards:	FCC PART 15 E 15.407 ANSI C63.10:2013
Test Result:	Pass
Report Number:	DLE-250407016R

Prepared (Test Engineer):	Alisa Song
Reviewer (Supervisor):	Jack Bu
Approved (Manager):	Jade Yang

This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Shenzhen DL Testing Technology Co., Ltd.

Table of Contents **Page**

1. SUMMARY OF TEST RESULTS 5
MEASUREMENT UNCERTAINTY 5
2. GENERAL INFORMATION 6
GENERAL DESCRIPTION OF EUT 6
DESCRIPTION OF TEST MODES 8
BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED 8
DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE) 9
EQUIPMENTS LIST FOR ALL TEST ITEMS 10
3. EMC EMISSION TEST 11
3.1CONDUCTED EMISSION MEASUREMENT 11
POWER LINE CONDUCTED EMISSION Limits 11
TEST PROCEDURE 11
DEVIATION FROM TEST STANDARD 11
TEST SETUP 12
EUT OPERATING CONDITIONS 12
TEST RESULTS 13
3.2 RADIATED EMISSION MEASUREMENT 15
RADIATED EMISSION LIMITS 15
TEST PROCEDURE 16
DEVIATION FROM TEST STANDARD 16
TEST SETUP 17
EUT OPERATING CONDITIONS 18
TEST RESULTS (BETWEEN 9KHZ – 30 MHZ) 18
TEST RESULTS (BETWEEN 30MHZ – 1GHZ) 19
TEST RESULTS (1GHZ- 40GHZ) 21
3.3.1 TEST REQUIREMENT: 23
3.3.2 TEST PROCEDURE 23
3.3.3 DEVIATION FROM TEST STANDARD 23
3.3.4 TEST SETUP 24
3.3.5 EUT OPERATING CONDITIONS 24
3.3.6 TEST RESULT 25
3.4 CONDUCTED BAND EMISSION MEASUREMENT 27
3.4.1 TEST REQUIREMENT: 27
3.4.2 TEST PROCEDURE 27
3.4.3 DEVIATION FROM TEST STANDARD 27
3.4.4 TEST SETUP 27
3.4.5 EUT OPERATING CONDITIONS 27
4. AVERAGING OUTPUT POWER 28
APPLIED PROCEDURES / LIMIT 28

Table of Contents **Page**

TEST PROCEDURE 28
DEVIATION FROM STANDARD 28
TEST SETUP 28
EUT OPERATION CONDITIONS 28
TEST RESULTS 28

5. POWER SPECTRAL DENSITY TEST 29
APPLIED PROCEDURES / LIMIT 29
TEST PROCEDURE 29
DEVIATION FROM STANDARD 29
TEST SETUP 29
EUT OPERATION CONDITIONS 29
TEST RESULTS 29

6. 6DB&26DB&99% BANDWIDTH TEST 30
APPLIED PROCEDURES / LIMIT 30
TEST PROCEDURE 30
DEVIATION FROM STANDARD 31
TEST SETUP 31
EUT OPERATION CONDITIONS 31
TEST RESULTS 31

7. DUTY CYCLE TEST SIGNAL 32
APPLIED PROCEDURES / LIMIT 32
TEST PROCEDURE 32
DEVIATION FROM STANDARD 32
TEST SETUP 32
EUT OPERATION CONDITIONS 32
TEST RESULTS 32
APPLIED PROCEDURES / LIMIT 33
TEST PROCEDURE 33
DEVIATION FROM STANDARD 33
TEST SETUP 33
EUT OPERATION CONDITIONS 33
TEST RESULTS 33

8. TRANSMISSION IN THE ABSENCE OF DATA 34
STANDARD REQUIREMENT 34
TEST RESULT 34

9. ANTENNA REQUIREMENT 34
STANDARD REQUIREMENT 34
EUT ANTENNA 34

Table of Contents **Page**

10. TEST SEUUP PHOTO 34

11. EUT PHOTO 34

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.407) , Subpart E			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	N/A	
15.407(b), 15.209	Radiated Spurious Emission	PASS	
15.407 (b)	Band Edge Emission	PASS	
15.407 (a)	Averaging Output Power	PASS	
15.407 (a)	Power Spectral Density	PASS	
15.407(a) (e)	26dB bandwidth and 99%dB Bandwidth 6dB bandwidth and 99%dB Bandwidth	PASS	
15.407(g)	Frequency Stability	PASS	
15.407(c)	Transmission in case of Absence of Information	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

Test lab: Shenzhen DL Testing Technology Co., Ltd.

Address: 101-201, Building C, Shuanghuan, No.8, Baoqing Road, Baolong Industrial Zone, Baolong Street, Longgang District, Shenzhen, Guangdong, China

FCC Test Firm Registration Number: 854456
Designation Number: CN1307
IC Registered No.: 27485
CAB ID.: CN0118

MEASUREMENT UNCERTAINTY

The reported 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** %。

No.	Item	Uncertainty
1	Conducted Emission Test	±2.56dB
2	RF power,conducted	±0.42dB
3	Spurious emissions,conducted	±2.76dB
4	All emissions,radiated(<30MHz)	±3.54dB
5	All emissions,radiated(<1G)	±3.65dB
6	All emissions,radiated(>1G)	±4.89dB
7	Occupied bandwidth	±1.28MHz
8	PSD	±0.69dB
9	Temperature	±0.5°C
10	Humidity	±2%

2. GENERAL INFORMATION

GENERAL DESCRIPTION OF EUT

Product Name:	Wireless HDMI transmitter and receiver
Trademark	N/A
Model No.:	GT-HDWL30
Model Difference	N/A
Operation Frequency:	IEEE 802.11a/n(HT20)/ac(HT20): 5745-5825MHz IEEE 802.11n(HT40)/ac(HT40): 5755-5795MHz
Channel numbers:	See channel list
Channel separation:	20MHz/40MHz
Modulation technology:	802.11a(OFDM): BPSK,QPSK,16-QAM,64-QAM 802.11n(OFDM): BPSK,QPSK,16-QAM,64-QAM 802.11ac(OFDM): BPSK,QPSK,16-QAM,64-QAM,256-QAM
Rate of Transmitter	802.11a: 6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps,54Mbps 802.11n/ac: Up to 500Mbps
Antenna Type:	PCB antenna
Antenna gain:	2.03 dBi
Power Supply:	DC 5V by USB
Sample Number:	DLE-250407016R01

Note:

1.For a more detailed features description, please refer to the manufacturer’s specifications or the User's Manual.

2.The EUT’s all information provided by client.

2. Channel List

Channel List for 802.11 a/n(HT20)/ac(HT20)			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220
40	5200	48	5240

Channel List for 802.11 n(HT40)/ac(HT40)			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	46	5230

Channel List for 802.11 a/n(HT20)/ac(HT20)			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	161	5805
153	5765	165	5825
157	5785		

Channel List for 802.11 n(HT40)/ac(HT40)			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	159	5795

DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	802.11a/ac /n 20 CH149/ CH157/ CH 165
Mode 2	802.11ac / n 40 CH 151 / CH 159
Mode 3	Working mode

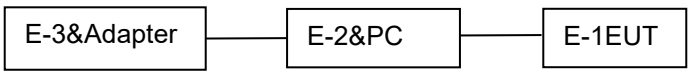
Conducted Emission	
Final Test Mode	Description
Mode 1	802.11a/ac /n 20 CH149/ CH157/ CH 165
Mode 2	802.11ac / n 40 CH 151 / CH 159
Mode 3	Working mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11a/ac /n 20 CH149/ CH157/ CH 165
Mode 2	802.11ac / n 40 CH 151 / CH 159
Mode 3	Working mode

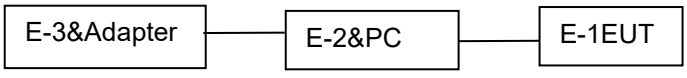
Note: 1. The measurements are performed at the highest, middle, lowest available channels.
2. During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.

BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

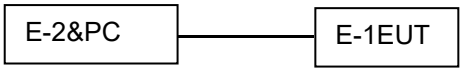
Conducted Emission



Radiated Emission



Conducted Spurious



DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

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.

Item	Equipment	Model/Type No.	Series No.	Note
E-1	Wireless HDMI transmitter and receiver	GT-HDWL30	N/A	EUT
E-2	PC	THinkPad R490	N/A	AE
E-3	Adapter	HW-059200CHQ	N/A	AE

Item	Shielded Type	Ferrite Core	Length	Note

Note:

(1) For detachable type I/O cable should be specified the length in cm in『Length』column.

EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation test, Band-edge test and 6db bandwidth test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	Agilent	E4408B	MY50140780	Nov. 01, 2024	Oct. 31, 2025
2	Test Receiver (9kHz-7GHz)	R&S	ESRP7	101393	Nov. 01, 2024	Oct. 31, 2025
3	Bilog Antenna (30MHz-1GHz)	R&S	VULB9162	00306	Nov. 01, 2024	Oct. 31, 2025
4	Horn Antenna (1GHz-18GHz)	Schwarzbeck	BBHA9120D	02139	Nov. 01, 2024	Oct. 31, 2025
5	Horn Antenna (18GHz-40GHz)	A.H. Systems	SAS-574	588	Nov. 01, 2024	Oct. 31, 2025
6	Amplifier (9KHz-6GHz)	Schwarzbeck	BBV9743B	00153	Nov. 01, 2024	Oct. 31, 2025
7	Amplifier (1GHz-18GHz)	EMEC	EM01G8GA	00270	Nov. 01, 2024	Oct. 31, 2025
8	Amplifier (18GHz-40GHz)	Quanjuda	DLE-161	97	Nov. 01, 2024	Oct. 31, 2025
9	Loop Antenna (9KHz-30MHz)	Schwarzbeck	FMZB1519B	00014	Nov. 01, 2024	Oct. 31, 2025
10	RF cables1 (9kHz-1GHz)	ChengYu	966	004	Nov. 01, 2024	Oct. 31, 2025
11	RF cables2 (1GHz-40GHz)	ChengYu	966	003	Nov. 01, 2024	Oct. 31, 2025
12	Antenna connector	Florida RF Labs	N/A	RF 01#	Nov. 01, 2024	Oct. 31, 2025
13	Power probe	KEYSIGHT	U2021XA	MY55210018	Nov. 01, 2024	Oct. 31, 2025
14	Signal Analyzer 9kHz-26.5GHz	Agilent	N9020A	MY55370280	Nov. 01, 2024	Oct. 31, 2025
15	Test Receiver 20kHz-40GHz	R&S	ESU 40	100376	Nov. 01, 2024	Oct. 31, 2025
16	D.C. Power Supply	LongWei	PS-305D	010964729	Nov. 01, 2024	Oct. 31, 2025

Conduction Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	843 Shielded Room	YIHENG	843 Room	843	Nov. 05, 2023	Nov. 04, 2026
2	EMI Receiver	R&S	ESR	101421	Nov. 01, 2024	Oct. 31, 2025
3	LISN	R&S	ENV216	102417	Nov. 01, 2024	Oct. 31, 2025
4	843 Cable 1#	ChengYu	CE Cable	001	Nov. 01, 2024	Oct. 31, 2025

Other

Item	Name	Manufacturer	Model	Software version
1	EMC Conduction Test System	FALA	EZ_EMC	EMC-CON 3A1.1
2	EMC radiation test system	FALA	EZ_EMC	FA-03A2
3	RF test system	MAIWEI	MTS8310	2.0.0.0
4	RF communication test system	MAIWEI	MTS8200	2.0.0.0

3. EMC EMISSION TEST

3.1CONDUCTED EMISSION MEASUREMENT

POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Limit (dBuV)		Standard
	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.5 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

TEST PROCEDURE

a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

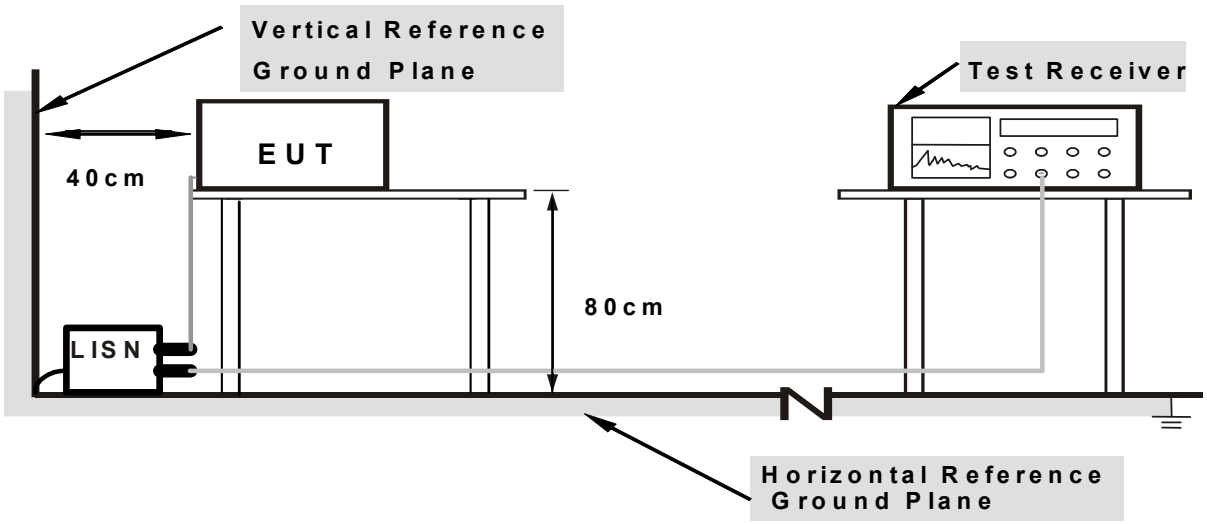
d. LISN at least 80 cm from nearest part of EUT chassis.

e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

DEVIATION FROM TEST STANDARD

No deviation

TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

EUT OPERATING CONDITIONS

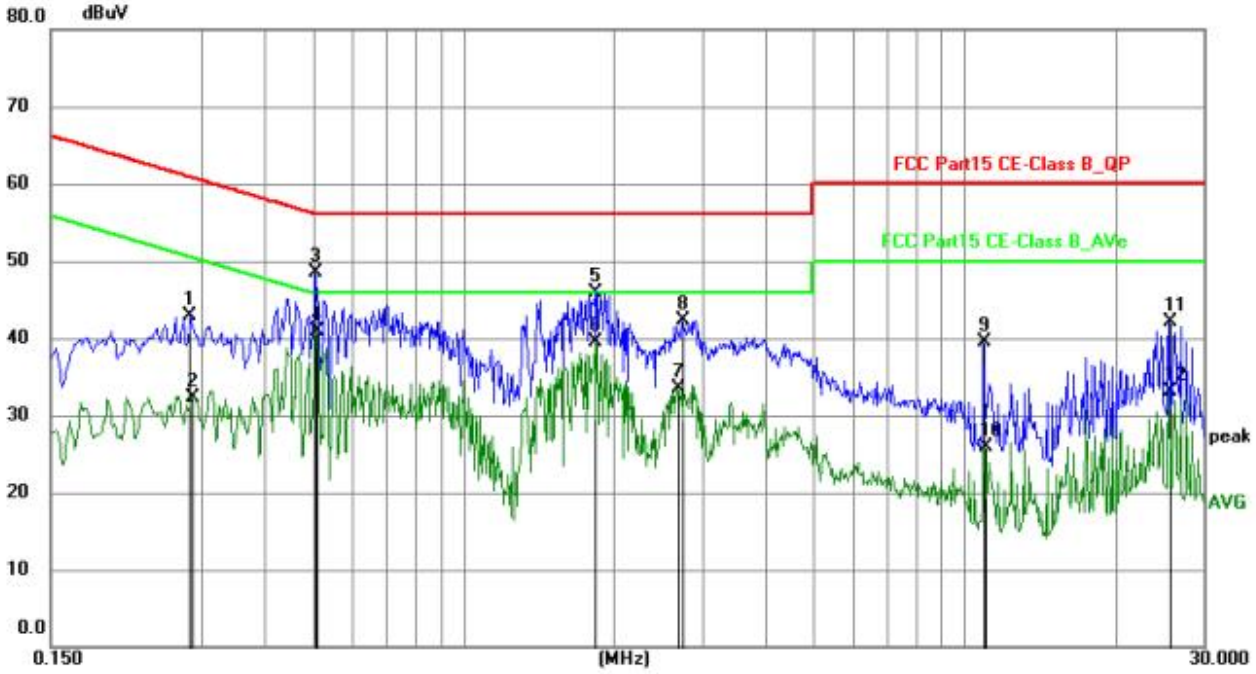
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

We pretest AC 120V and AC 230V, the worst voltage was AC 120V and the data recording in the report.

TEST RESULTS

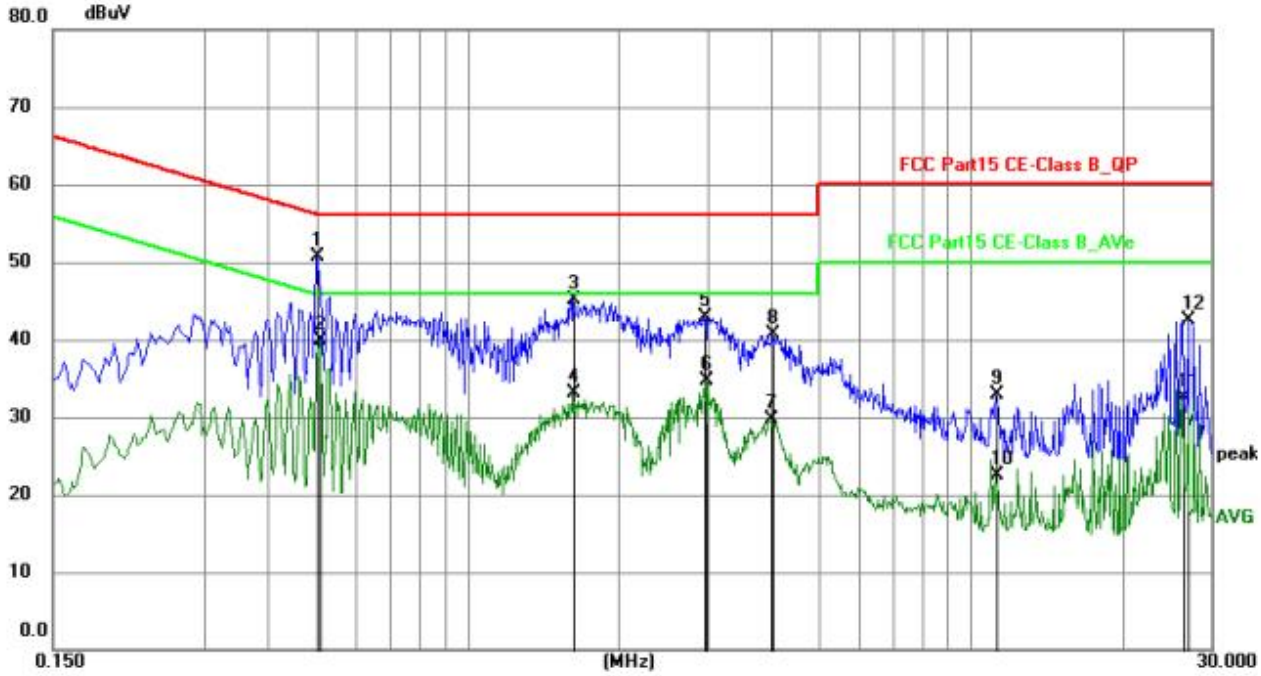
Temperature：	26℃	Relative Humidity：	54%
Pressure：	101kPa	Phase :	L
Test Voltage ：	AC 120V/60Hz		

Note: Pre-scan all modes and recorded the worst case results in this report which is 802.11a mode 5745MHz channel.



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.2847	22.58	20.35	42.93	60.68	-17.75	QP	P
2	0.2878	12.03	20.35	32.38	50.59	-18.21	AVG	P
3	0.5050	28.28	20.30	48.58	56.00	-7.42	QP	P
4	0.5100	20.51	20.30	40.81	46.00	-5.19	AVG	P
5	1.8326	25.62	20.31	45.93	56.00	-10.07	QP	P
6	1.8326	19.11	20.31	39.42	46.00	-6.58	AVG	P
7	2.6655	13.12	20.32	33.44	46.00	-12.56	AVG	P
8	2.7330	22.01	20.32	42.33	56.00	-13.67	QP	P
9	10.9275	19.06	20.46	39.52	60.00	-20.48	QP	P
10	10.9770	5.53	20.46	25.99	50.00	-24.01	AVG	P
11	25.6064	21.37	20.64	42.01	60.00	-17.99	QP	P
12	25.6064	12.54	20.64	33.18	50.00	-16.82	AVG	P

Temperature：	26℃	Relative Humidity：	54%
Pressure：	101kPa	Phase :	N
Test Voltage ：	AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.5010	30.47	20.30	50.77	56.00	-5.23	QP	P
2	0.5100	19.55	20.30	39.85	46.00	-6.15	AVG	P
3	1.6250	24.72	20.30	45.02	56.00	-10.98	QP	P
4	1.6250	12.72	20.30	33.02	46.00	-12.98	AVG	P
5	2.9580	22.49	20.33	42.82	56.00	-13.18	QP	P
6	2.9759	14.28	20.33	34.61	46.00	-11.39	AVG	P
7	4.0155	9.34	20.33	29.67	46.00	-16.33	AVG	P
8	4.0335	20.41	20.33	40.74	56.00	-15.26	QP	P
9	11.2469	12.40	20.47	32.87	60.00	-27.13	QP	P
10	11.2469	2.08	20.47	22.55	50.00	-27.45	AVG	P
11	26.3445	11.82	20.69	32.51	50.00	-17.49	AVG	P
12	27.0015	21.86	20.71	42.57	60.00	-17.43	QP	P

3.2 RADIATED EMISSION MEASUREMENT

RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

15.407(b)Undesirable emission limits. Except as shown in paragraph (b) (10) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1)For transmitters operating in the 5.15-5.25GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(2)For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(3)For transmitters operating in the 5.47-5.725GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(4)For transmitters operating solely in the 5.725-5.850GHz band:
All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to10dBm/MHzat25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Limit (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	40GHz
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

TEST PROCEDURE

Below 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height 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.
d. 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre.
h. Test the EUT in the lowest channel, the middle channel, the Highest channel

Note:

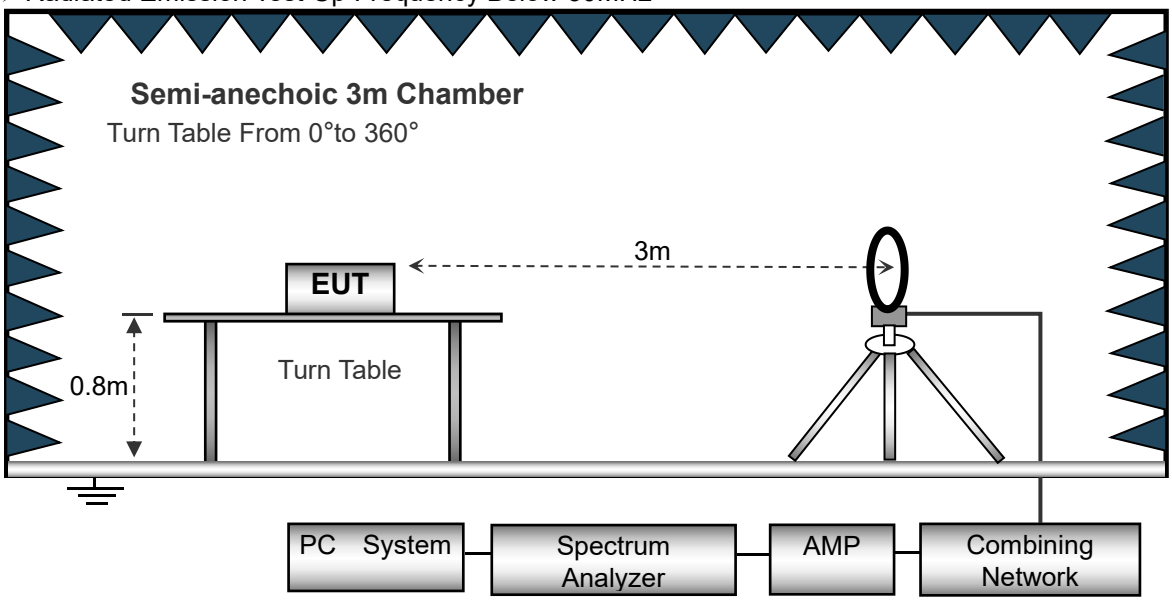
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

DEVIATION FROM TEST STANDARD

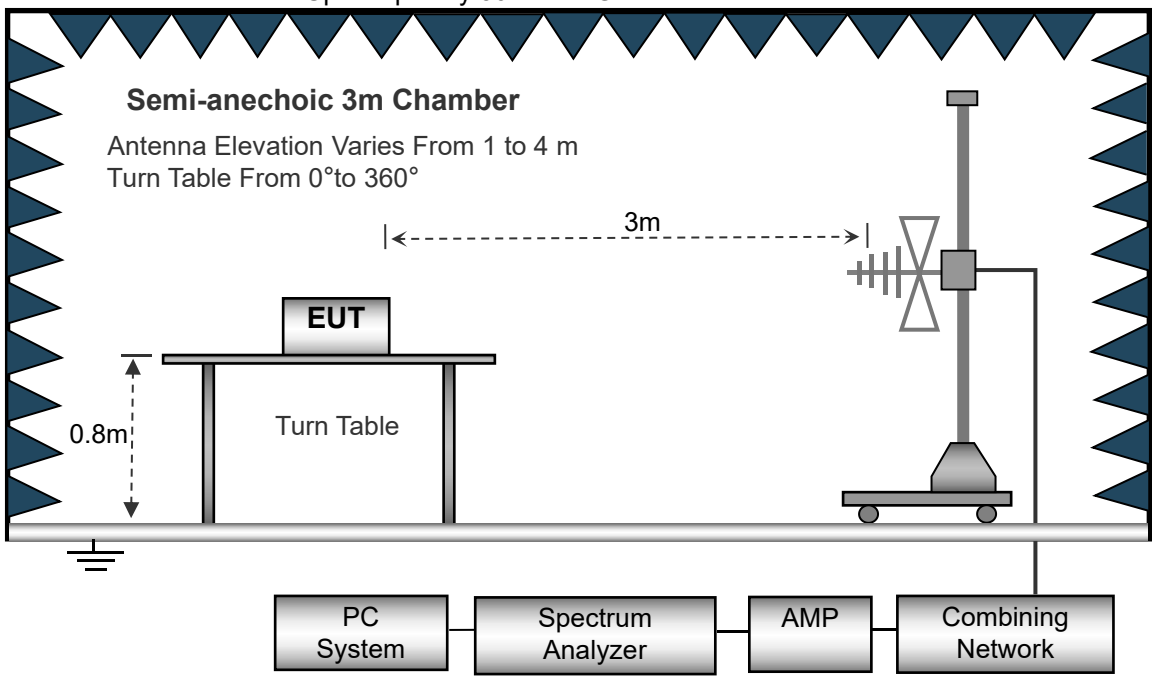
No deviation

TEST SETUP

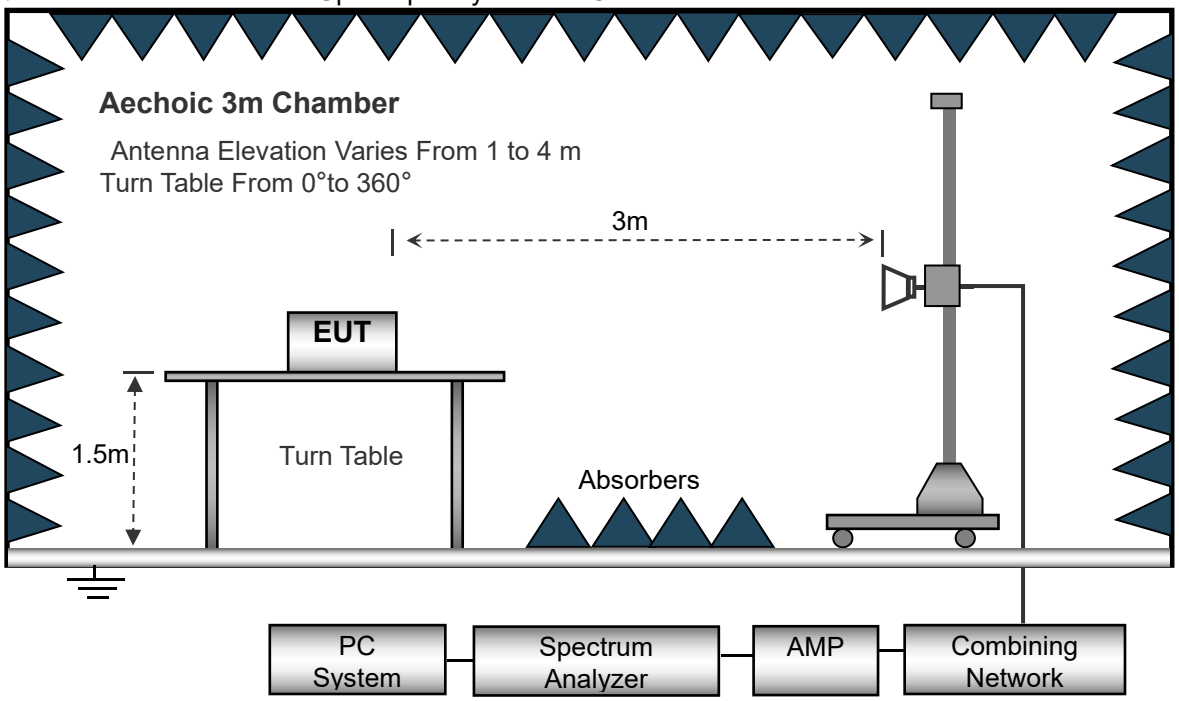
（A）Radiated Emission Test-Up Frequency Below 30MHz



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



（C）Radiated Emission Test-Up Frequency Above 1GHz



EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

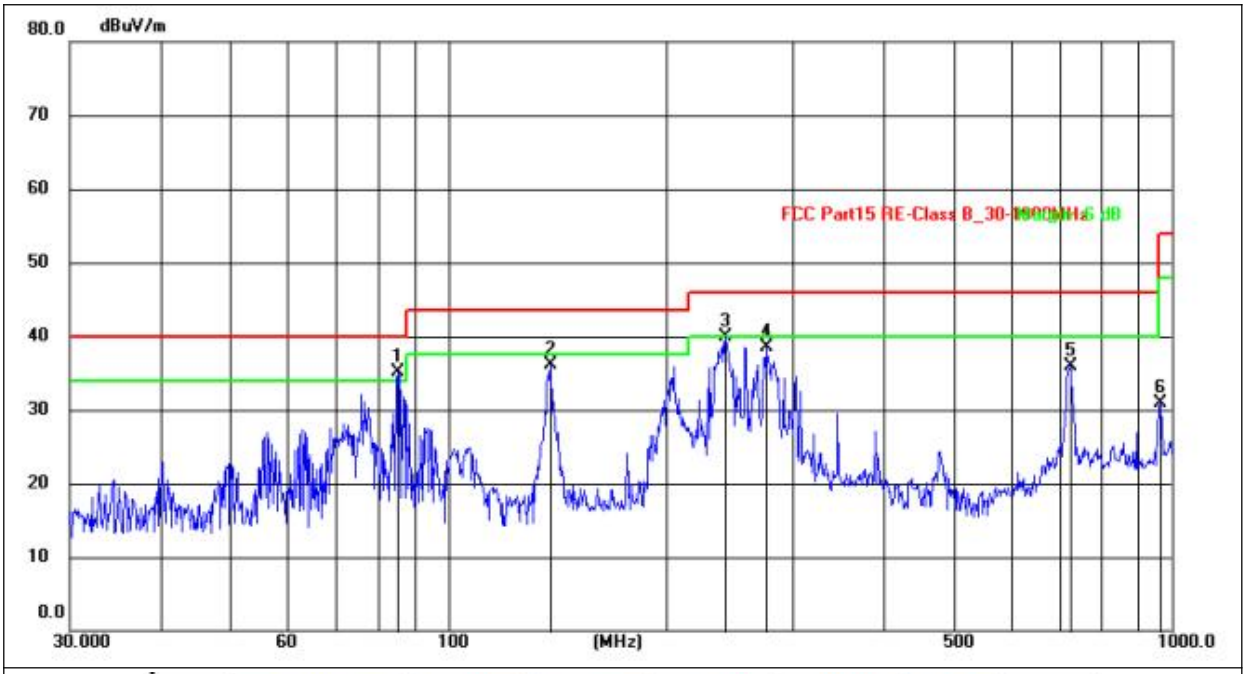
TEST RESULTS (Between 9KHz – 30 MHz)

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o) & RSS-Gen 6.13, the test result no need to reported.

TEST RESULTS (Between 30MHz – 1GHz)

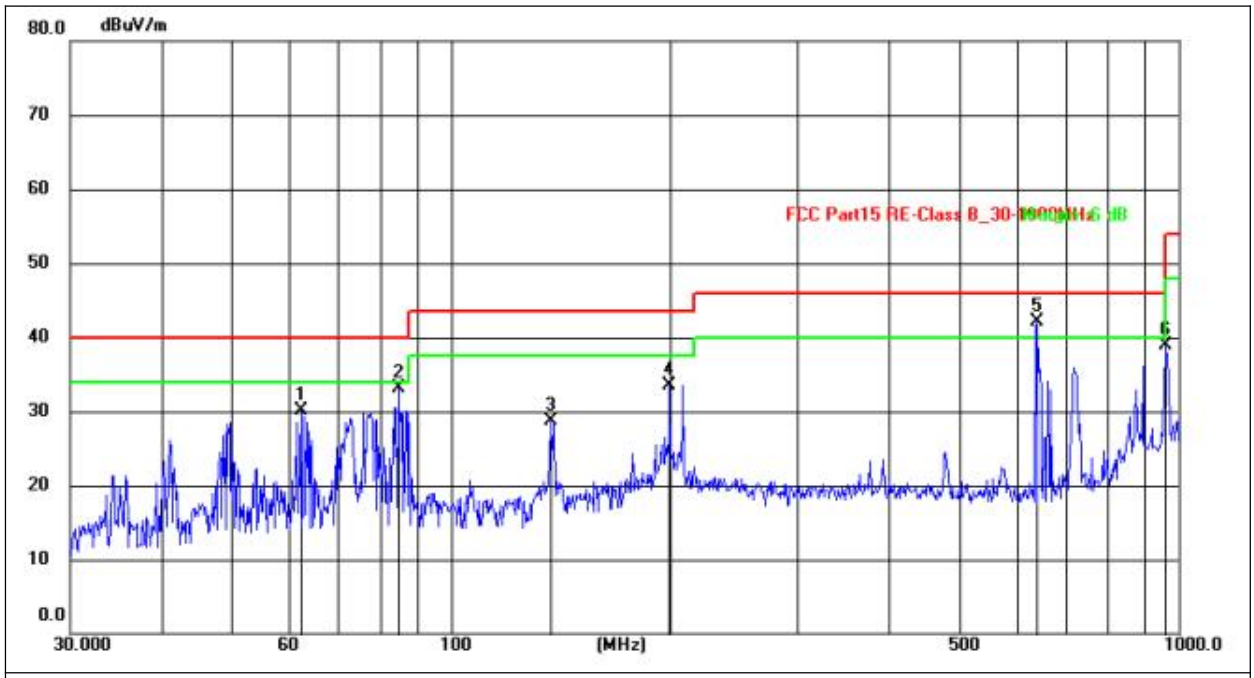
Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Horizontal
Test Voltage:	DC 5V		

Note: Pre-scan all modes and recorded the worst case results in this report which is 802.11a mode 5745MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	85.2980	54.85	-19.73	35.12	40.00	-4.88	QP
2	138.8734	53.00	-16.83	36.17	43.50	-7.33	QP
3	241.6759	55.73	-15.86	39.87	46.00	-6.13	QP
4	275.1569	52.69	-14.24	38.45	46.00	-7.55	QP
5	724.2607	42.36	-6.49	35.87	46.00	-10.13	QP
6	965.5420	36.18	-5.29	30.89	54.00	-23.11	QP

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage:	DC 5V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	62.2128	48.48	-18.43	30.05	40.00	-9.95	QP
2	84.7018	54.71	-21.57	33.14	40.00	-6.86	QP
3	137.4200	49.46	-20.80	28.66	43.50	-14.84	QP
4	199.9855	53.94	-20.40	33.54	43.50	-9.96	QP
5	640.6109	49.44	-7.35	42.09	46.00	-3.91	QP
6	962.1621	39.05	-0.11	38.94	54.00	-15.06	QP

Remarks:
1.Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2.The emission levels of other frequencies are very lower than the limit and not show in test report.
3.The test data shows only the worst case 802.11a20 mode 5745MHz

TEST RESULTS (1GHz- 40GHz)

Temperature：	26℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	DC 5V
Test Mode ：	5.8G TX- 802.11n20		

Note: Pre-scan all modes and recorded the worst case results in this report which is 802.11a mode 802.11a20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel:5745MHz									
V	11490.00	52.05	30.55	5.77	24.66	51.93	74.00	-22.07	PK
V	11490.00	40.96	30.55	5.77	24.66	40.84	54.00	-13.16	AV
V	17233.30	51.07	30.33	6.32	24.55	51.61	74.00	-22.39	PK
V	17233.30	48.34	30.33	6.32	24.55	48.88	54.00	-5.12	AV
H	11490.00	48.4	30.55	5.77	24.66	48.28	74.00	-25.72	PK
H	11490.00	39.27	30.55	5.77	24.66	39.15	54.00	-14.85	AV
H	17233.30	48.53	30.33	6.32	24.55	49.07	74.00	-24.93	PK
H	17233.30	40.36	30.33	6.32	24.55	40.9	54.00	-13.1	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Middle Channel:5785MHz									
V	11570.00	49.95	30.55	5.77	24.66	49.83	74.00	-24.17	PK
V	11570.00	39.47	30.55	5.77	24.66	39.35	54.00	-14.65	AV
V	17353.30	49.66	30.33	6.32	24.55	50.2	74.00	-23.8	PK
V	17353.30	40.38	30.33	6.32	24.55	40.92	54.00	-13.08	AV
H	11570.00	49.23	30.55	5.77	24.66	49.11	74.00	-24.89	PK
H	11570.00	41.17	30.55	5.77	24.66	41.05	54.00	-12.95	AV
H	17353.30	48.23	30.33	6.32	24.55	48.77	74.00	-25.23	PK
H	17353.30	40.17	30.33	6.32	24.55	40.71	54.00	-13.29	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
High Channel:5825MHz									
V	11650.00	49.86	30.55	5.77	24.66	49.74	74.00	-24.26	PK
V	11650.00	39.38	30.55	5.77	24.66	39.26	54.00	-14.74	AV
V	17473.30	49.57	30.33	6.32	24.55	50.11	74.00	-23.89	PK
V	17473.30	40.29	30.33	6.32	24.55	40.83	54.00	-13.17	AV
H	11650.00	51.26	30.55	5.77	24.66	51.14	74.00	-22.86	PK
H	11650.00	41.08	30.55	5.77	24.66	40.96	54.00	-13.04	AV
H	17473.30	48.59	30.33	6.32	24.55	49.13	74.00	-24.87	PK
H	17473.30	40.08	30.33	6.32	24.55	40.62	54.00	-13.38	AV

Remark:
1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
4. The test data shows only the worst case 802.11a20 mode

Radiated Band Edge:

Worse case mode:		802.11a					
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5650	49.21	-0.12	49.09	68.2	-19.11	peak	H
5700	87.63	-0.12	87.51	105.2	-17.69	peak	H
5720	87.52	-0.12	87.4	110.8	-23.4	peak	H
5725	96.71	-0.12	96.59	122.2	-25.61	peak	H
5650	41.16	-0.12	41.04	68.2	-27.16	peak	V
5700	88.01	-0.12	87.89	105.2	-17.31	peak	V
5720	89.24	-0.12	89.12	110.8	-21.68	peak	V
5725	91.68	-0.12	91.56	122.2	-30.64	peak	V
5850	99.24	-0.12	99.12	122.2	-23.08	peak	H
5855	83.71	-0.12	83.59	110.8	-27.21	peak	H
5875	80.59	-0.12	80.47	105.2	-24.73	peak	H
5925	53.1	-0.12	52.98	68.2	-15.22	peak	H
5850	101.59	-0.12	101.47	122.2	-20.73	peak	V
5855	89.14	-0.12	89.02	110.8	-21.78	peak	V
5875	84.74	-0.12	84.62	105.2	-20.58	peak	V
5925	53.19	-0.12	53.07	68.2	-15.13	peak	V

Remark:

1.Factor =Antenna Factor + Cable Loss – Pre-amplifier

2.The worst mode is 802.11a20, only the worst data is recorded.

3.3 RADIATED BAND EMISSION MEASUREMENT

3.3.1 TEST REQUIREMENT:

15.407 (b)

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Limit (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	5000MHz
Stop Frequency	5420MHz
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

3.3.2 TEST PROCEDURE

Above 1GHz test procedure as below:

a. 1. The EUT was placed on the top of a rotating table 0.1 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.

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

c. The antenna height 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.

d. 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 rota table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

g. Test the EUT in the lowest channel,the Highest channel

Note:

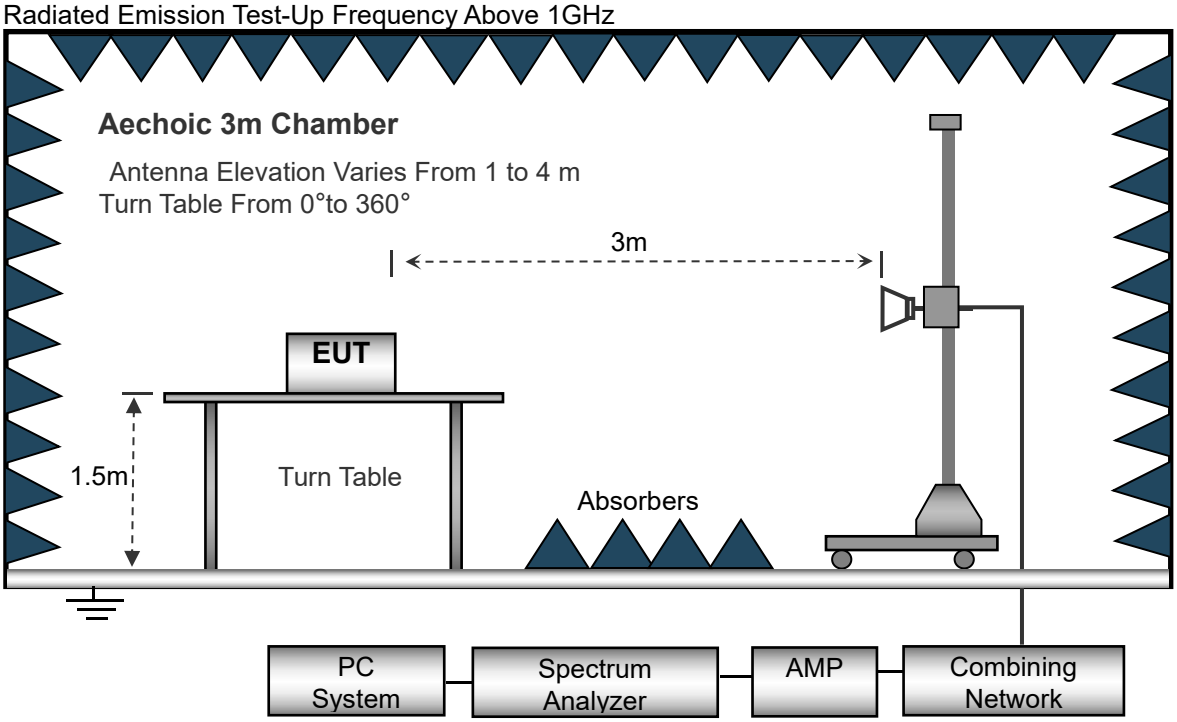
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

3.3.3 DEVIATION FROM TEST STANDARD

No deviation

3.3.4 TEST SETUP

Radiated Emission Test-Up Frequency Above 1GHz



3.3.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

3.3.6 TEST RESULT

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1012 hPa	Test Voltage ：	DC 5V

(802.11a) 5.745~5.825 GHz			
Test CH.	Test Segment MHz	Result	Limit
		dBm/MHz	dBm/MHz
Lowest	Below 5650	-39.97	-27
	5650 to 5700	-34.69	10
	5700 to 5720	-33.49	15.6
Highest	5855 to 5875	-36.75	15.6
	5875 to 5925	-34.85	10
	Above 5925	-42.94	-27
Note: the data just list the worst cases			

(802.11n HT20) 5.745~5.825 GHz			
Test CH.	Test Segment MHz	Result	Limit
		dBm/MHz	dBm/MHz
Lowest	Below 5650	-41.07	-27
	5650 to 5700	-32.05	10
	5700 to 5720	-31.49	15.6
Highest	5855 to 5875	-36.35	15.6
	5875 to 5925	-39.25	10
	Above 5925	-42.58	-27
Note: the data just list the worst cases			

(802.11n HT40) 5.745~5.825 GHz			
Test CH.	Test Segment MHz	Result	Limit
		dBm/MHz	dBm/MHz
Lowest	Below 5650	-40.17	-27
	5650 to 5700	-37.5	10
	5700 to 5720	-34.69	15.6
Highest	5855 to 5875	-39.18	15.6
	5875 to 5925	-42.03	10
	Above 5925	-43.68	-27
Note: the data just list the worst cases			

(802.11ac VHT20) 5.745~5.825 GHz			
Test CH.	Test Segment MHz	Result	Limit
		dBm/MHz	dBm/MHz
Lowest	Below 5650	-39.25	-27
	5650 to 5700	-38.02	10
	5700 to 5720	-33.47	15.6
Highest	5855 to 5875	-39.57	15.6
	5875 to 5925	-41.99	10
	Above 5925	-41.69	-27
Note: the data just list the worst cases			

(802.11ac VHT40) 5.745~5.825 GHz			
Test CH.	Test Segment MHz	Result	Limit
		dBm/MHz	dBm/MHz
Lowest	Below 5650	-38.66	-27
	5650 to 5700	-37.43	10
	5700 to 5720	-32.88	15.6
Highest	5855 to 5875	-38.98	15.6
	5875 to 5925	-41.4	10
	Above 5925	-41.1	-27
Note: the data just list the worst cases			

3.4 CONDUCTED BAND EMISSION MEASUREMENT

3.4.1 TEST REQUIREMENT:

FCC Part15 C Section 15.209 and 15.407

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(4) For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Spectrum Parameter	Setting	
Attenuation	Auto	
Start Frequency	5150MHz	5725MHz
Stop Frequency	5250MHz	5850MHz
RB / VB (emission in restricted band)	1 MHz / 3 MHz for Peak, 1 MHz / 10Hz for Average	

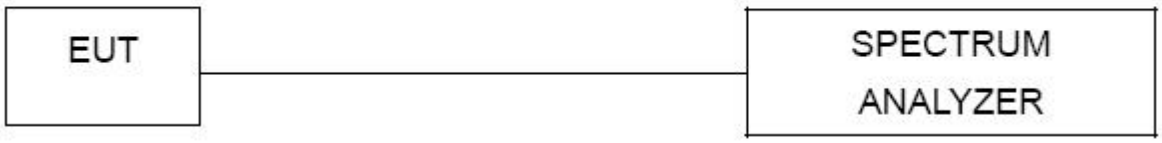
3.4.2 TEST PROCEDURE

Test method: FCC KDB 789033 G)& Parts 15.407(b)(4) & 15.209(a)

3.4.3 DEVIATION FROM TEST STANDARD

No deviation

3.4.4 TEST SETUP



3.4.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

3.4.6 TEST RESULT

Measurement Data : The detailed test data see Appendix I

4. AVERAGING OUTPUT POWER

APPLIED PROCEDURES / LIMIT

For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.
For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

TEST PROCEDURE

a. The EUT was directly connected to the power meter and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW = 1MHz
Span≥99%OBW(30MHz/60MHz/120MHz etc.)
VBW≥3*RBW
Sweep = auto
Detector function = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
Trace = max hold

DEVIATION FROM STANDARD

No deviation.

TEST SETUP

EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

TEST RESULTS

Measurement Data : The detailed test data see Appendix I

5. POWER SPECTRAL DENSITY TEST

APPLIED PROCEDURES / LIMIT

In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.
In addition, the maximum power spectral density shall not exceed 30 dBm in any 500 kHz band.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	= the frequency band of operation
RB	RBW ≥ 1MHz for band 1 RBW ≥ 510KHz for band 4
VB	VBW ≥ 3RBW
Detector	RMS (i.e., power averaging).
Trace	Max Hold
Sweep Time	Auto

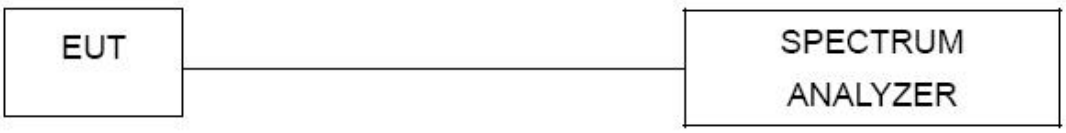
TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows FCC KDB 789033 D02.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to Spectrum.
4. For U-NII1, U-NII-2A, U-NII-2C Band:
Set RBW=1MHz, VBW=3MHz, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)
For U-NII-3 Band:
Set RBW=510 kHz, VBW=3*RBW, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)
5. User the cursor on spectrum to peak search the highest level of trace
6. Record the max. reading and add 10 log(1/duty cycle).
we test all antennas, the antenna 1 was worst mode and the data recording in the report.
7. Duty factor Reference is made to the test results in Section 7.1.5.

DEVIATION FROM STANDARD

No deviation.

TEST SETUP



EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

TEST RESULTS

Measurement Data : The detailed test data see Appendix I

6. 6DB&26DB&99% BANDWIDTH TEST

APPLIED PROCEDURES / LIMIT

The 26 dB bandwidth is used to determine the conducted power limits. There is no limit bandwidth for U-NII-1, U-NII-2-A and U-NII-2-C. The minimum of 6dB Bandwidth measurement is 0.5 MHz for U-NII-3

TEST PROCEDURE

6dB Bandwidth	
Spectrum Parameters	Setting
RBW	100KHz
VBW	300KHz
Span	30MHz(20MHz Bandwidth mode) 60MHz(40MHz Bandwidth mode) 120MHz(80MHz Bandwidth mode)
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

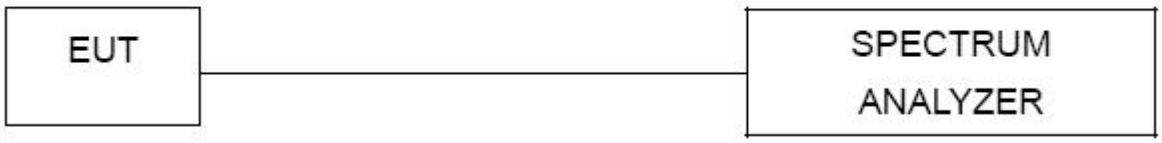
26dB Bandwidth	
Spectrum Parameters	Setting
RBW	approximately 1% of the emission bandwidth
VBW	>RBW
Span	30MHz(20MHz Bandwidth mode) 60MHz(40MHz Bandwidth mode) 120MHz(80MHz Bandwidth mode)
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

99% Occupied Bandwidth	
Spectrum Parameters	Setting
RBW	1% to 5% of the OBW
VBW	Approximately three times the RBW
Span	between 1.5 times and 5.0 times the OBW
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

DEVIATION FROM STANDARD

No deviation.

TEST SETUP



EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

TEST RESULTS

Measurement Data : The detailed test data see Appendix I

7. DUTY CYCLE TEST SIGNAL

APPLIED PROCEDURES / LIMIT

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle. All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

TEST PROCEDURE

1. Set RBW = 1 MHz.
2. Set the video bandwidth (VBW) ≥RBW.
3. Detector = Peak.
4. Sweep = auto couple.
5. Allow the trace to stabilize.
6. Span=0

DEVIATION FROM STANDARD

No deviation.

TEST SETUP

EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

TEST RESULTS

Measurement Data : The detailed test data see Appendix I

APPLIED PROCEDURES / LIMIT

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

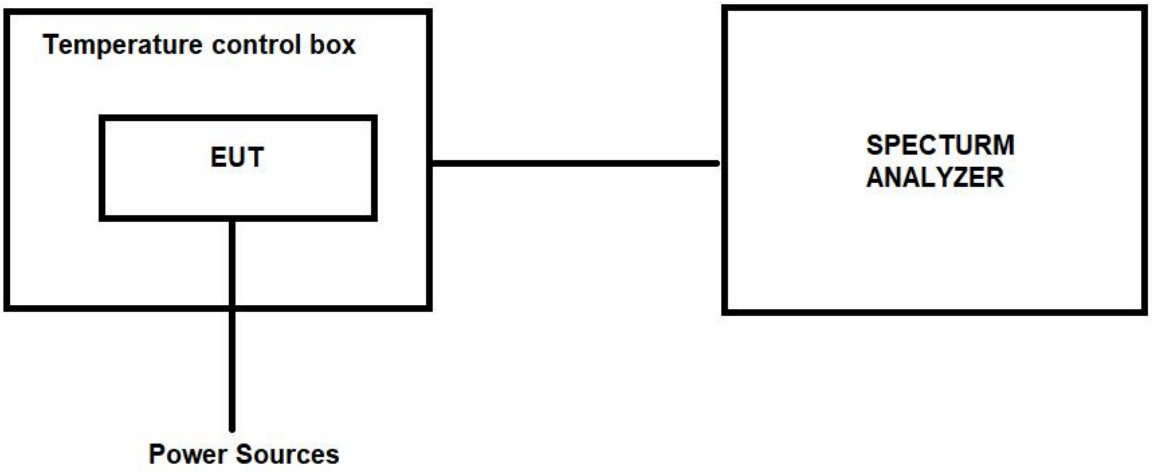
TEST PROCEDURE

1. The EUT was placed inside temperature chamber and powered and powered by nominal DC voltage.
2. Set EUT as normal operation.
3. Turn the EUT on and couple its output to spectrum.
4. Turn the EUT off and set the chamber to the highest temperature specified.
5. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT and measure the operating frequency.
6. Repeat step with the temperature chamber set to the lowest temperature.

DEVIATION FROM STANDARD

No deviation.

TEST SETUP



EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

TEST RESULTS

Measurement Data : The detailed test data see Appendix I

8. TRANSMISSION IN THE ABSENCE OF DATA

STANDARD REQUIREMENT

According to §15.407(c)
The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

TEST RESULT

No non-compliance noted:
Refer to the theory of operation.

9. ANTENNA REQUIREMENT

STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 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.

EUT ANTENNA

The antenna is PCB antenna, the best case gain of the antenna is 2.03 dBi, reference to the appendix II for details

10. TEST SEUUP PHOTO

Reference to the appendix I for details.

11. EUT PHOTO

Reference to the appendix II for details.

※※※※※ END OF REPORT ※※※※※