FCC Part 15C Test Report

FCC ID: 2AIE4AE-Q2

Product Name:	RC Quadcopter Drone
Trademark:	AFI
Model Name :	AE-Q2
Prepared For : Address :	Aeroview Electronic Technology Co., LTD NO.106 Zhenxiang Street, Yonger Village, Tanzhou Town, Zhongshan City, Guangdong Province, China
Prepared By : Address :	Shenzhen BCTC Technology Co., Ltd. No.101,Yousong Road,Longhua New District, Shenzhen,China
Test Date:	Jun. 22– Jun. 30, 2016
Date of Report :	Jul. 6, 2016
Report No.:	BCTC-160607737E

VERIFICATION OF COMPLIANCE

Applicant's name ..... :	Aeroview Electronic Technology Co., LTD
Address ..... :	NO.106 Zhenxiang Street, Yonger Village, Tanzhou Town, Zhongshan City, Guangdong Province, China
Manufacture's Name ..... :	Aeroview Electronic Technology Co., LTD
Address ..... :	NO.106 Zhenxiang Street, Yonger Village, Tanzhou Town, Zhongshan City, Guangdong Province, China
Product description	
Product name ..... :	RC Quadcopter Drone
Model Name ..... :..	AE-Q2
Test procedure ..... :	FCC Part15.407
	ANSI C63.10-2013
Standards ..... :	KDB789033 D02 General UNII Test Procedures New Rules v01r02

This device described above has been tested by BCTC, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Test Result : **Pass**

Testing Engineer : Eric Yang

Reviewer (Supervisor) : Jade Yang

Approved & Authorized Signer(Manager) : Carson Zhang

TABLE OF CONTENTS

1.TEST SUMMARY

Test Items	Test Requirement	Result
Conducted Emissions	15.207	PASS
Radiated Emissions	15.407(b), 15.209	PASS
26dB bandwidth and 99%dB Bandwidth	15.403(i) 15.407(e)	PASS
Power density	15.407 (a)	PASS
Maximum Peak Output Power	15.407 (a)	PASS
Emissions from out of band	15.407 (b)	PASS
Transmission in case of Absence of Information	15.407(c)	PASS
Frequency Stability	15.407(g)	PASS
Antenna Requirement	15.203	PASS

Note: N/A means not application.

2.GENERAL PRODUCT INFORMATION

2.1. Product Function

Refer to Technical Construction Form and User Manual.

2.2. Description of Device (EUT)

Product Name:	RC Quadcopter Drone
Model No.:	AE-Q2
Trade Name:	AFI
Operation Frequency:	5745-5840MHz(TX) 2409-2474MHz(RX)
Channel numbers:	See channel list
Modulation technology:	OFDM
Antenna Type:	Internal antenna
Antenna gain:	2.5dBi
Power supply:	DC 11.1V
Adapter:	Model:YZ1205000 I/P:AC 100-240V 1.8A(MAX) 50/60Hz O/P: DC 12V 4.0A

Channel List					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	5745	6	5780	11	5809
2	5752	7	5785	12	5820
3	5760	8	5790	13	5825
4	5765	9	5800	14	5828
5	5771	10	5805	15	5840

2.3. Test Supporting System

None.

2.4. Independent Operation Modes

The basic operation modes are:

Channel	Frequency
Low	5745MHz
Middle	5800MHz
High	5840MHz

2.5. Test Sites

2.5.1. Test Facilities

Lab Qualifications : FCC Registration No.:187086

2.6. List of Test and Measurement Instruments

Conduction test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Test Receiver	R&S	ESCI	1166.5950K03-101165-ha	2015.08.24	2016.08.23
2	LISN	R&S	NSLK8126	8126466	2015.08.24	2016.08.23
3	LISN	R&S	NSLK8126	8126487	2015.08.24	2016.08.23
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2015.07.06	2016.07.05
5	RF cables	R&S	R204	R20X	2015.07.06	2016.07.05

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

Item	Kind of equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer	Agilent	E4407B	MY45108040	2015.07.06	2016.07.05
2	Test Receiver	R&S	ESPI	101318	2015.07.06	2016.07.05
3	Bilog Antenna	R&S	VULB 9168	VULB9168-438	2015.07.06	2016.07.05
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2015.07.06	2016.07.05
5	Spectrum Analyzer	ADVANTEST	R3132	150900201	2015.07.06	2016.07.05
6	Horn Antenna	R&S	HF906	10027	2015.07.06	2016.07.05
7	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2015.07.06	2016.07.05
8	Amplifier	R&S	BBV9743	9743-019	2015.12.22	2016.12.21
9	Loop Antenna	ARA	PLA-1030/B	1029	2015.07.06	2016.07.05
10	RF cables	R&S	R203	R20X	2015.07.06	2016.07.05
11	Antenna connector	Florida RFLabs	Lab-Fle	RF 01#	2015.07.06	2016.07.05
12	Power Metter	ANRITSU	ML2487A	6K00001568	2015.07.06	2016.07.05
13	Power Sensor (AV)	ANRITSU	ML2491A	030989	2015.07.06	2016.07.05
14	Signal Analyzer	Agilent	N9010A	MY48030494	2015.07.06	2016.07.05

3. TEST SET-UP AND OPERATION MODES

3.1. Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

3.2. Block Diagram of Test Set-up

System Diagram of Connections between EUT and Simulators

EUT

(EUT: RC Quadcopter Drone)

3.3. Test Operation Mode and Test Software

None.

3.4. Special Accessories and Auxiliary Equipment

3.5. Countermeasures to Achieve EMC Compliance

None.

4. EMISSION TEST RESULTS

4.1. Conducted Emission Measurement

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

FREQUENCY (MHz)	Class B (dBuV)		Standard
	Quasi -peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -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

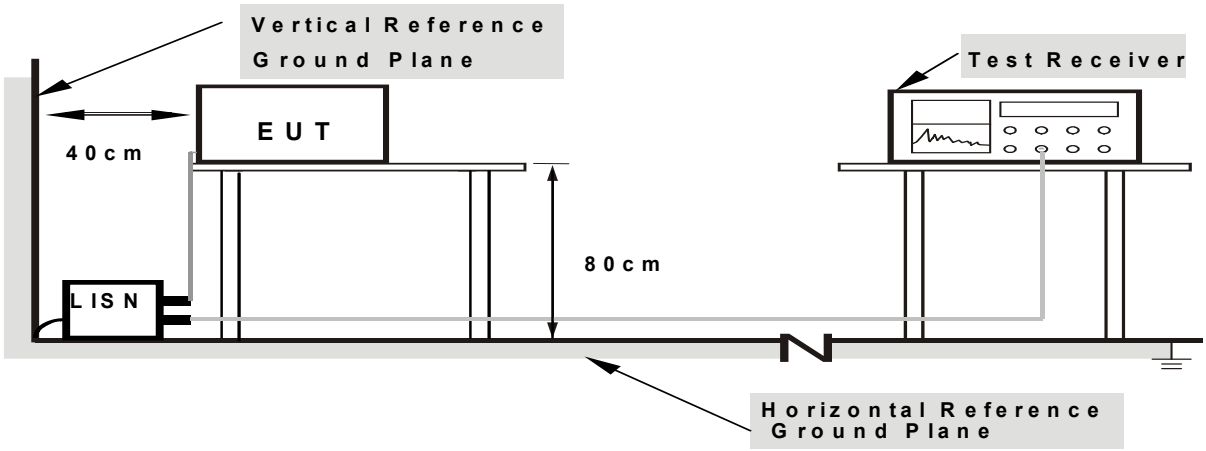
4.1.1. TEST PROCEDURE

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.

4.1.2. DEVIATION FROM TEST STANDARD

No deviation

4.1.3. TEST SETUP



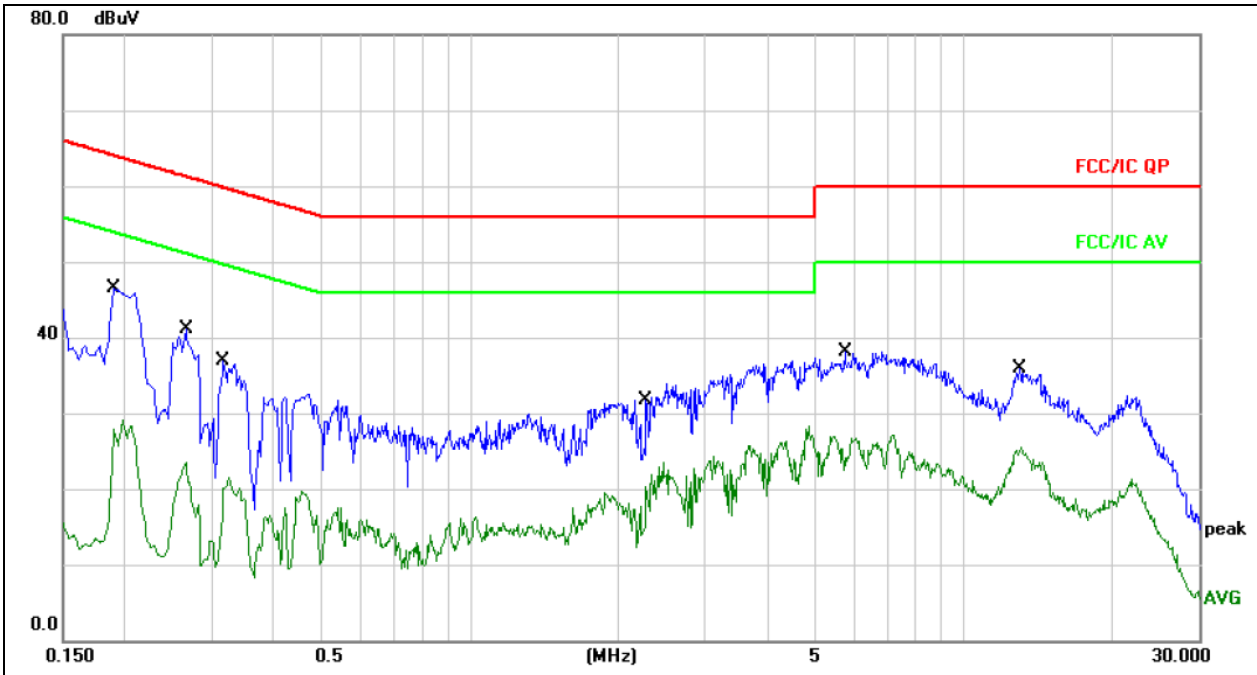
Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

4.1.4. 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 all adapter's emission, only the adapter 1's data was worst and the data was recording in the report.
The data only show the worst mode.
If peak level comply with Quasi-Peak limit, then the Quasi-Peak level is deemed to comply with Quasi-Peak limit.

4.1.5. TEST RESULTS

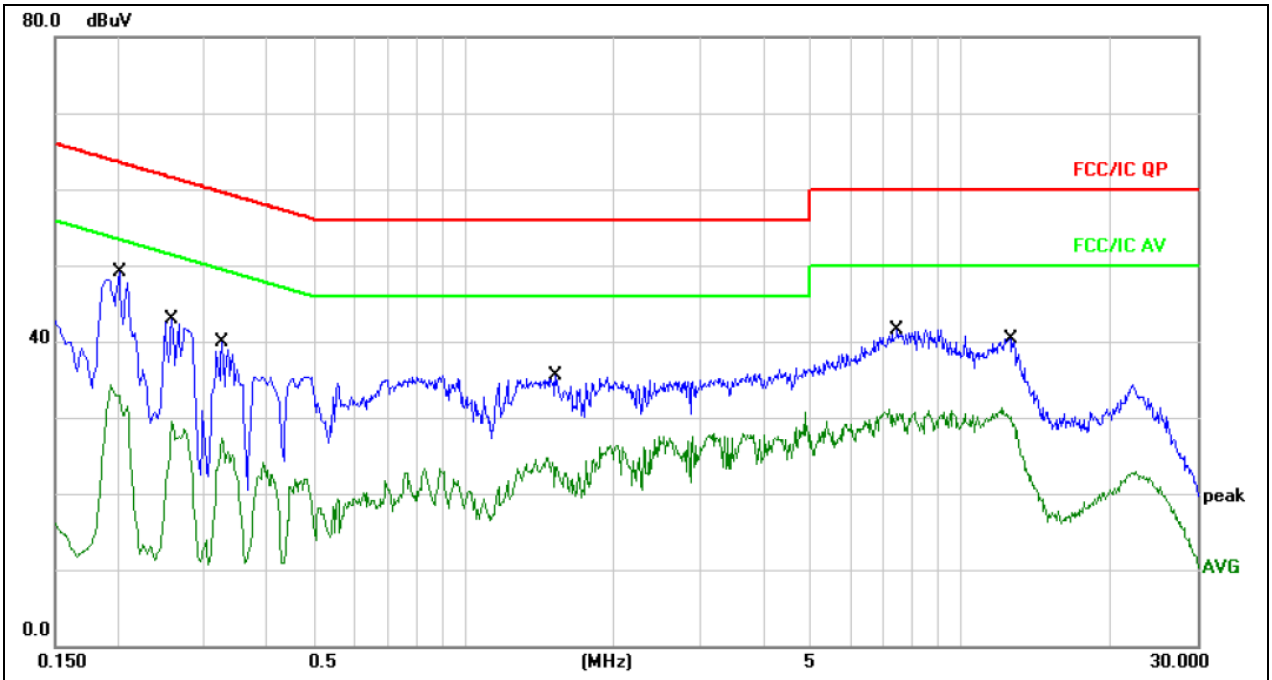
Temperature：	25 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	AC 120V/60Hz	Test Mode：	Mode 4



Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1900	36.42	10.06	46.48	64.03	-17.55	QP	
2		0.1900	17.71	10.06	27.77	54.03	-26.26	AVG	
3		0.2660	31.00	10.09	41.09	61.24	-20.15	QP	
4		0.2660	12.94	10.09	23.03	51.24	-28.21	AVG	
5		0.3180	26.88	10.10	36.98	59.76	-22.78	QP	
6		0.3180	9.99	10.10	20.09	49.76	-29.67	AVG	
7		2.2820	21.53	10.18	31.71	56.00	-24.29	QP	
8		2.2820	10.07	10.18	20.25	46.00	-25.75	AVG	
9		5.7619	27.95	10.10	38.05	60.00	-21.95	QP	
10		5.7619	13.10	10.10	23.20	50.00	-26.80	AVG	
11		13.0140	25.86	10.14	36.00	60.00	-24.00	QP	
12		13.0140	14.27	10.14	24.41	50.00	-25.59	AVG	

Temperature：	25 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	AC 120V/60Hz	Test Mode：	Mode 4



Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.2020	39.03	10.07	49.10	63.52	-14.42	QP	
2		0.2020	22.18	10.07	32.25	53.52	-21.27	AVG	
3		0.2580	32.73	10.08	42.81	61.49	-18.68	QP	
4		0.2580	19.40	10.08	29.48	51.49	-22.01	AVG	
5		0.3260	29.89	10.10	39.99	59.55	-19.56	QP	
6		0.3260	17.25	10.10	27.35	49.55	-22.20	AVG	
7		1.5339	25.28	10.17	35.45	56.00	-20.55	QP	
8		1.5339	13.36	10.17	23.53	46.00	-22.47	AVG	
9		7.4740	31.49	10.10	41.59	60.00	-18.41	QP	
10		7.4740	20.39	10.10	30.49	50.00	-19.51	AVG	
11		12.6100	30.13	10.14	40.27	60.00	-19.73	QP	
12		12.6100	19.81	10.14	29.95	50.00	-20.05	AVG	

4.2. Radiated Emission Measurement

4.2.1. Radiated Emission Limits (Frequency Range 9kHz-1000MHz)

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)	Class B (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).

FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
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

4.2.2. TEST PROCEDURE

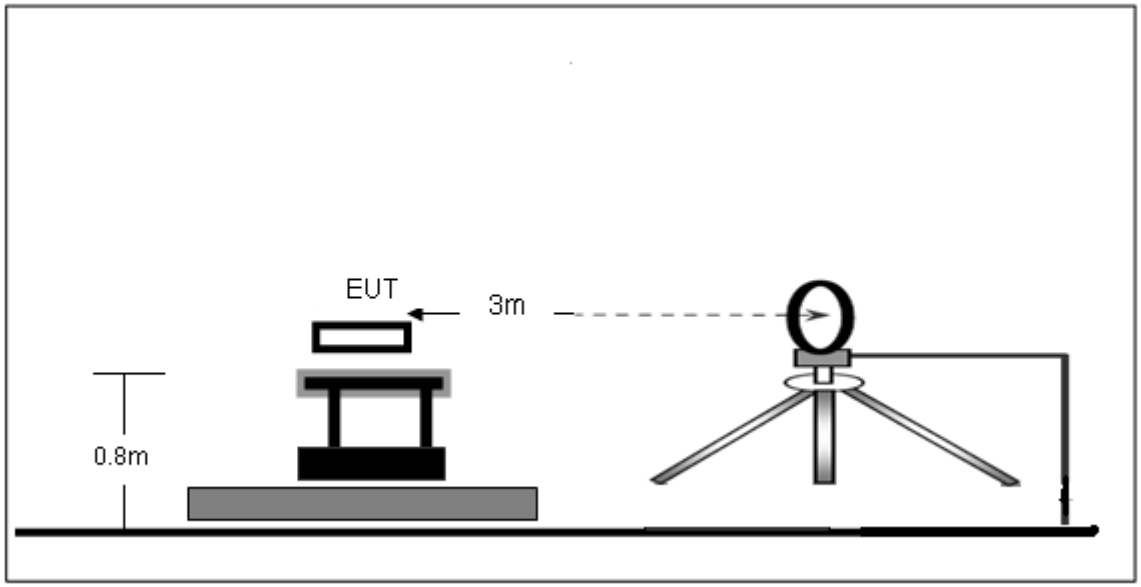
a. The measuring distance of at 3 m shall be used for measurements at frequency up to 25GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 1.5 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.
g. For the radiated emission test above 1GHz:
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.
The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
Note:
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

4.2.3. DEVIATION FROM TEST STANDARD

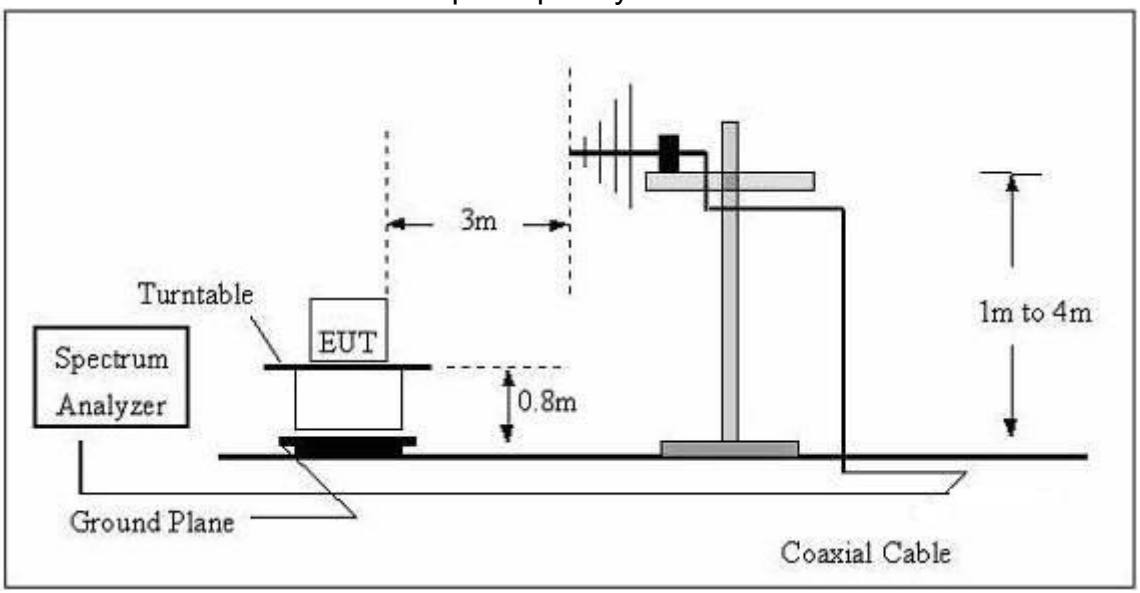
No deviation

4.2.4. TEST SETUP

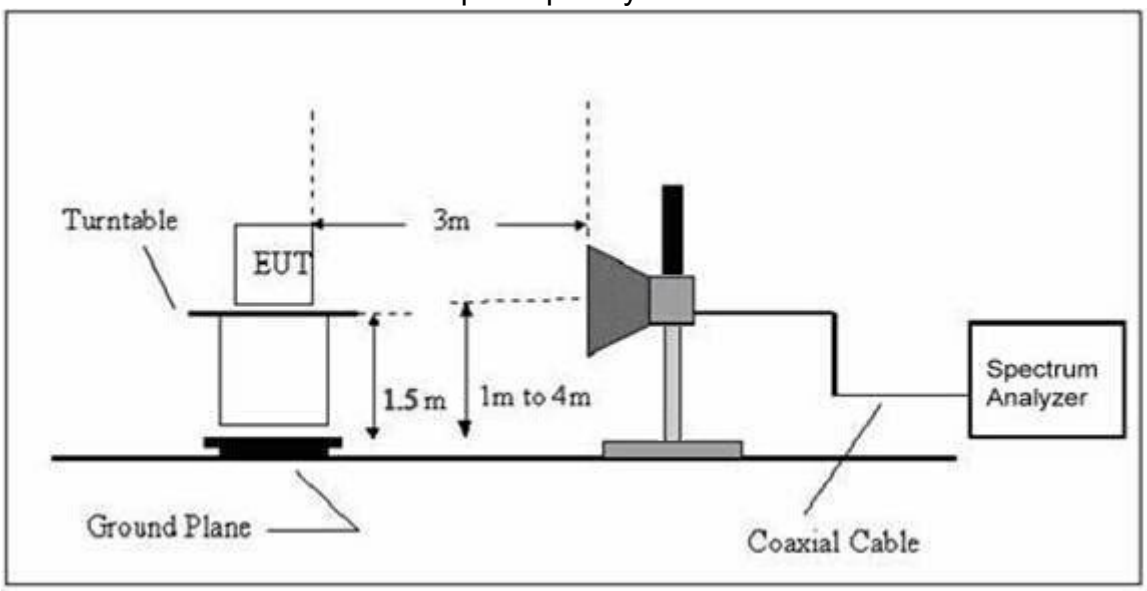
（A）Radiated Emission Test-Up Frequency Below 30MHz



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



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



4.2.5. EUT OPERATING 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.

We pretest all adapter's emission, only the adapter 1's data was worst and the data was recording in the report.

The data only show the worst mode.

Radiated Spurious Emission (Below 30MHz)

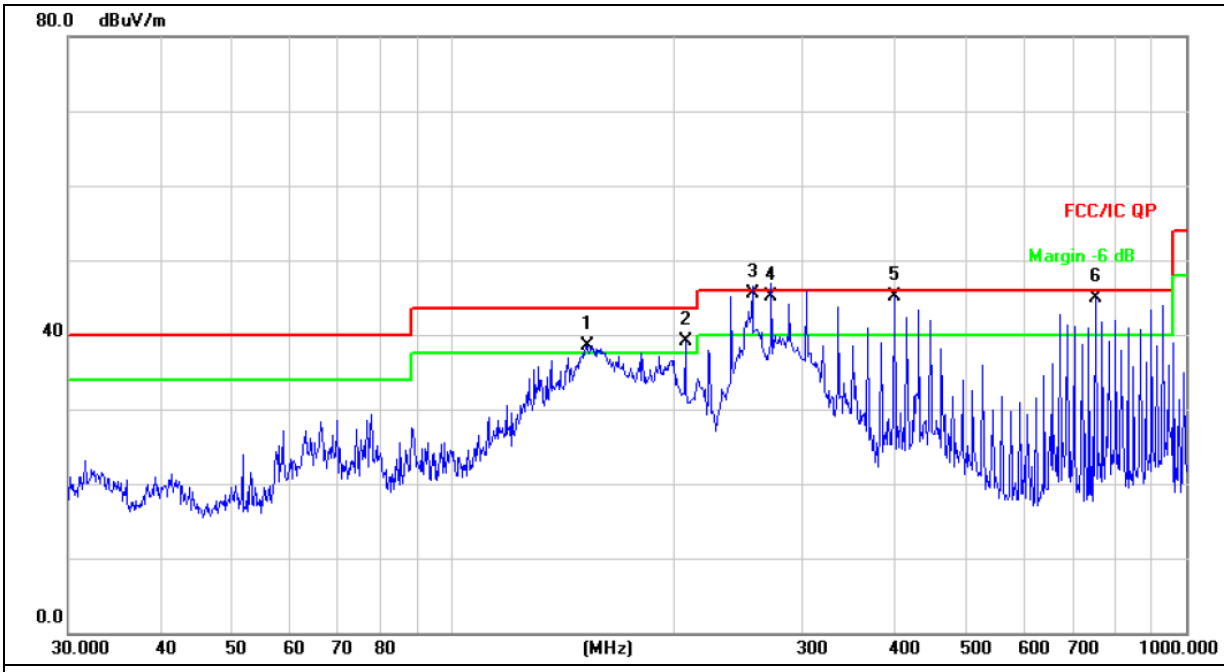
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Polarization：	---
Test Voltage ：	DC 11.1V		
Test Mode ：	TX		

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

Note:
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

Radiated Spurious Emission (Between 30MHz – 1GHz)

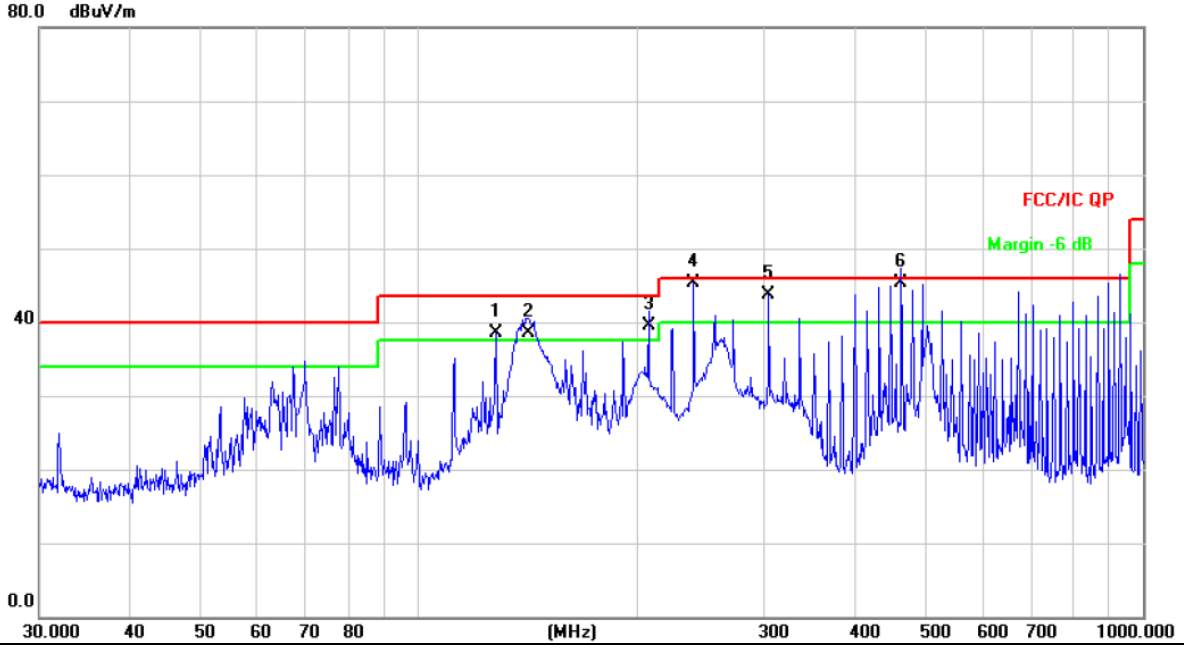
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Polarization：	Horizontal
Test Voltage ：	DC 11.1V		
Test Mode ： (Worst)	Link Mode		



Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.
All interfaces was connected, and BT TX mode was link.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	!	152.6640	51.36	-12.85	38.51	43.50	-4.99	QP			
2	!	207.8500	55.11	-15.98	39.13	43.50	-4.37	QP			
3	*	256.5210	59.43	-14.01	45.42	46.00	-0.58	QP			
4	!	272.2776	58.45	-13.42	45.03	46.00	-0.97	QP			
5	!	400.4318	55.30	-10.17	45.13	46.00	-0.87	QP			
6	!	752.7432	47.84	-3.03	44.81	46.00	-1.19	QP			

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Polarization：	Vertical
Test Voltage ：	DC 11.1V		
Test Mode ： (Worst)	Link Mode		



Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.
All interfaces was connected, and BT TX mode was link.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	!	128.1130	52.74	-14.22	38.52	43.50	-4.98	QP			
2	!	141.8262	51.84	-13.29	38.55	43.50	-4.95	QP			
3	!	207.8501	55.56	-15.98	39.58	43.50	-3.92	QP			
4	!	239.9874	59.70	-14.49	45.21	46.00	-0.79	QP			
5	!	304.6099	56.11	-12.47	43.64	46.00	-2.36	QP			
6	*	463.9696	54.04	-8.77	45.27	46.00	-0.73	QP			

Radiated Spurious Emission (1GHz to 5th harmonics)

	Freq.	Receiver Reading	Detector	Polar	Corrected Factor	Emission Level	Limit	Result
	(MHz)	(dBμV)	(PK/QP/Ave)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	
Lower Channel 5745MHz	11490.00	56.44	PK	H	2.32	58.76	74.00	Pass
	11490.00	47.47	Ave	H	2.32	49.79	54.00	Pass
	17235.00	58.10	PK	H	-2.15	55.95	74.00	Pass
	17235.00	47.41	Ave	H	-2.15	45.26	54.00	Pass
	11490.00	56.10	PK	V	2.32	58.42	74.00	Pass
	11490.00	47.30	Ave	V	2.32	49.62	54.00	Pass
	17235.00	58.34	PK	V	-2.15	56.19	74.00	Pass
	17235.00	47.61	Ave	V	-2.15	45.46	54.00	Pass
Middle Channel 5800MHz	11600.00	57.10	PK	H	2.54	59.64	74.00	Pass
	11600.00	47.71	Ave	H	2.54	50.25	54.00	Pass
	17400.00	57.71	PK	H	-1.98	55.73	74.00	Pass
	17400.00	48.18	Ave	H	-1.98	46.20	54.00	Pass
	11600.00	57.03	PK	V	2.54	59.57	74.00	Pass
	11600.00	47.49	Ave	V	2.54	50.03	54.00	Pass
	17400.00	58.59	PK	V	-1.98	56.61	74.00	Pass
	17400.00	47.23	Ave	V	-1.98	45.25	54.00	Pass
Upper Channel 5840MHz	11680.00	57.69	PK	H	2.68	60.37	74.00	Pass
	11680.00	47.70	Ave	H	2.68	50.38	54.00	Pass
	17520.00	59.35	PK	H	-1.27	58.08	74.00	Pass
	17520.00	47.66	Ave	H	-1.27	46.39	54.00	Pass
	11680.00	57.99	PK	V	2.68	60.67	74.00	Pass
	11680.00	48.56	Ave	V	2.68	51.24	54.00	Pass
	17520.00	58.79	PK	V	-1.27	57.52	74.00	Pass
	17520.00	47.90	Ave	V	-1.27	46.63	54.00	Pass

Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.
Emission Level = Meter Reading + Factor
Margin = Emission Level - Limit
Other harmonics emissions are lower than 20dB below the allowable limit.

5. BAND EDGE COMPLIANCE TEST

5.1. Limits

(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 within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

5.2. Test setup

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

Same as Clause 4.2.

5.3. Test Data

Please see data as below:

Note: we pretest horizontal and vertical, the worst was horizontal and show in the report.

Test Frequency (MHz)	Max Level Frequency (MHz)	Max Level (dBμV/m)	EIRP[dBm]	Limit[dBm]	Result
5745	5723.51	51.27	-43.93	-27.00	Pass
5840	5853.43	52.38	-42.82	-27.00	Pass

Remark: 1. According to KDB 789033 D02 section H) d) (iii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows: EIRP[dBm] = E[dBμV/m] - 95.2

6. 26DB AND 99% BANDWIDTH TEST

6.1. Measurement Procedure

The bandwidth at 26 dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating at its maximum power control level, as defined in KDB 789033, at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 26 dB bandwidth.

The 26 dB bandwidth is used to determine the conducted power limits.

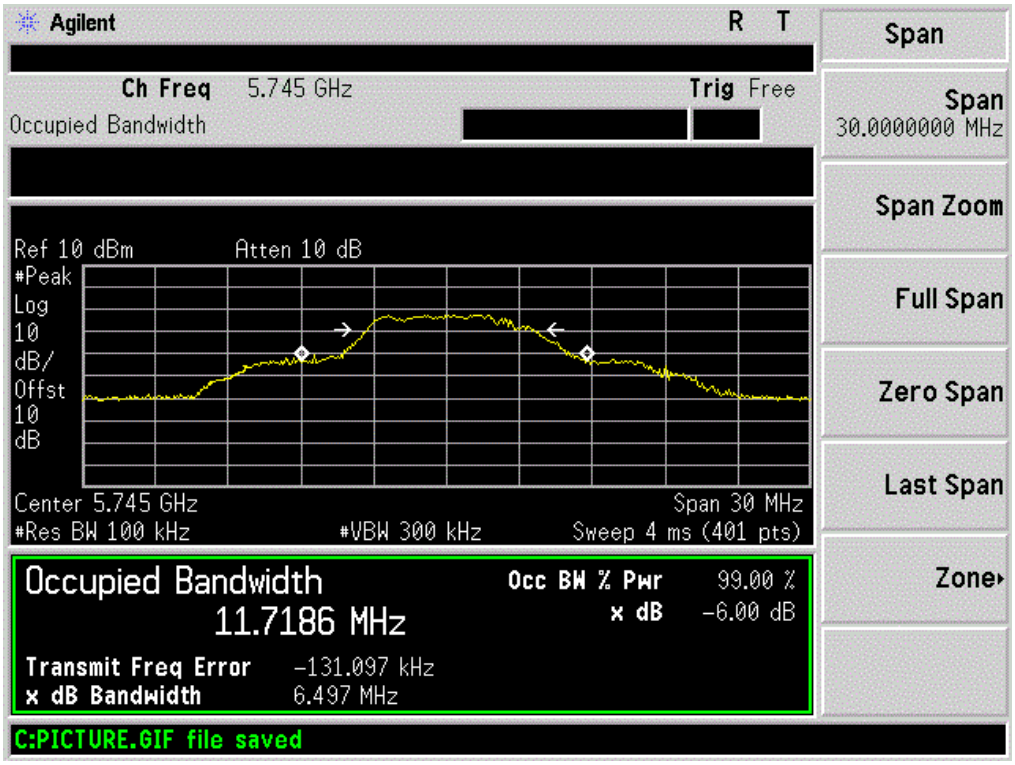
There is no limit bandwidth for U-NII-1, U-NII-2-A and U-NII-2-C.

The minimum of 6dB Bandwidth measurement is 0.5 MHz for U-NII-3

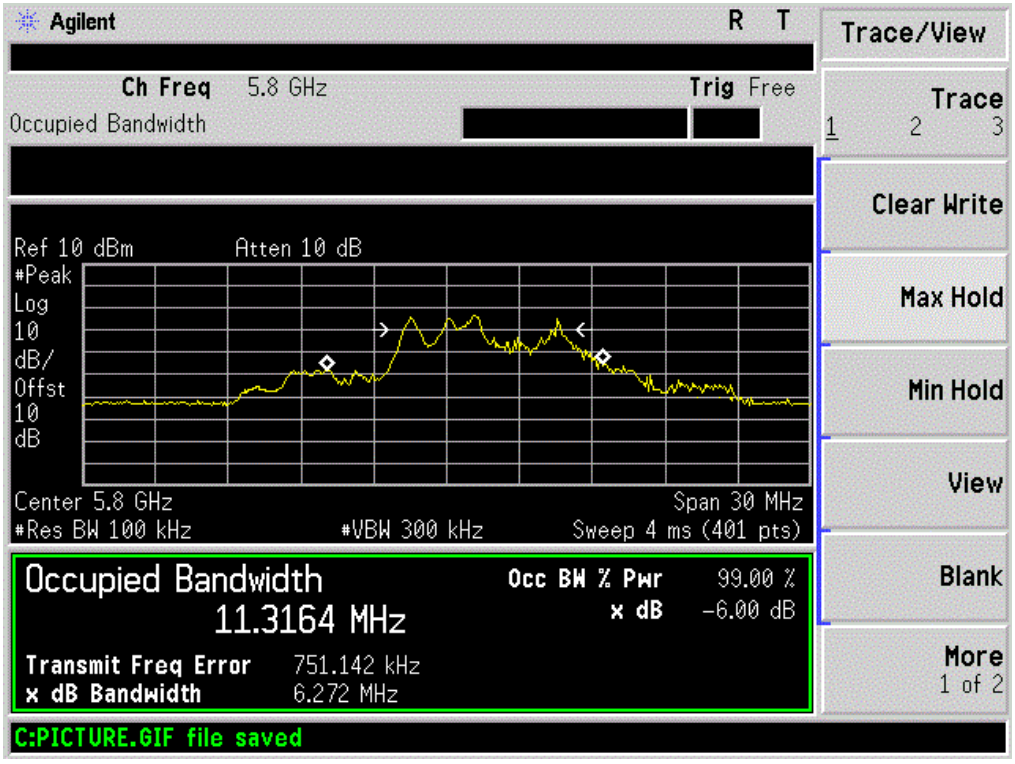
6dB bandwith

Frequency (MHz)	-6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)
5745	6.497	11.719	>0.5
5800	6.272	11.316	>0.5
5840	7.126	13.016	>0.5

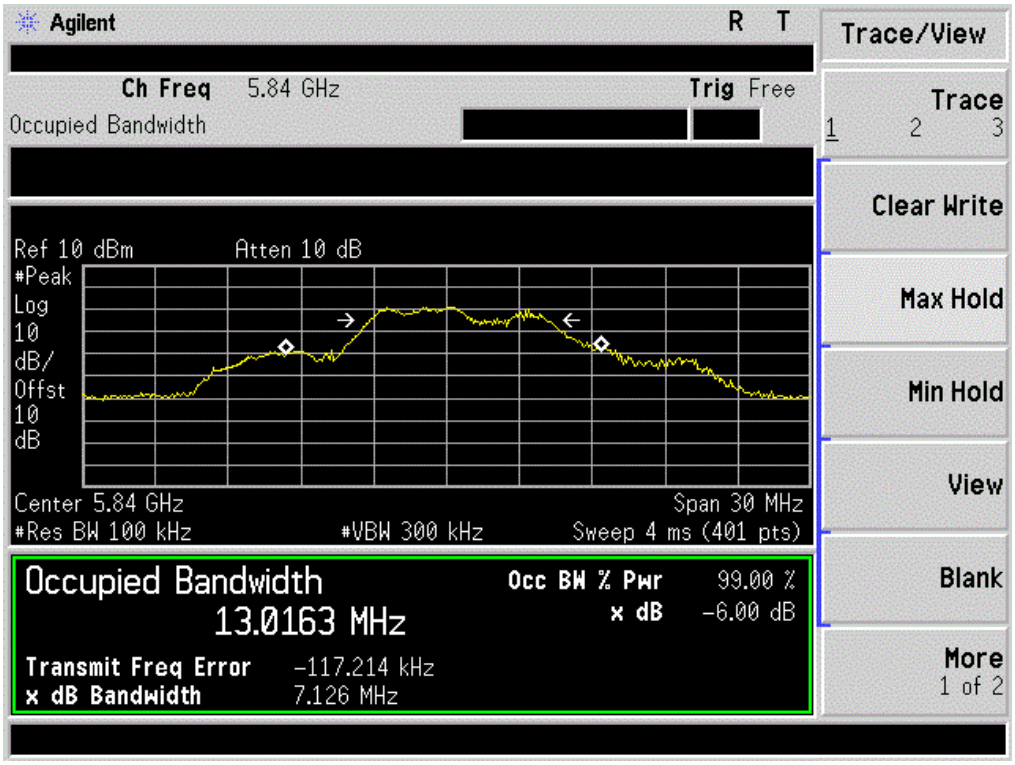
5745MHz



5800MHz



5840MHz


Agilent
R T
Trace/View
Ch Freq 5.84 GHz
Trig Free
Occupied Bandwidth
Trace
1 2 3
Clear Write
Ref 10 dBm
Atten 10 dB
#Peak
Log
10
dB/
Offst
10
dB
Max Hold
Min Hold
View
Center 5.84 GHz
Span 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 4 ms (401 pts)
Blank
Occupied Bandwidth
13.0163 MHz
Occ BW % Pwr 99.00 %
x dB -6.00 dB
More
1 of 2
Transmit Freq Error -117.214 kHz
x dB Bandwidth 7.126 MHz

7. OUTPUT POWER TEST

7.1. Limits

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.

7.2. Test setup

1. The maximum average conducted output power can be measured using Method PM-G (Measurement using a gated RF average power meter):
2. Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

a. The Transmitter output (antenna port) was connected to the power meter.

b. Turn on the EUT and power meter and then record the power value.

c. Repeat above procedures on all channels needed to be tested.

7.3. Test result

Frequency (MHz)	Average Output Power(dBm)	FCC Limit (dBm)	Result
5745	15.09	30.0	Pass
5800	15.02	30.0	Pass
5840	15.05	30.0	Pass

8. PEAK POWER SPECTRAL DENSITY TEST

8.1. Limits

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.

8.2. Test setup

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).

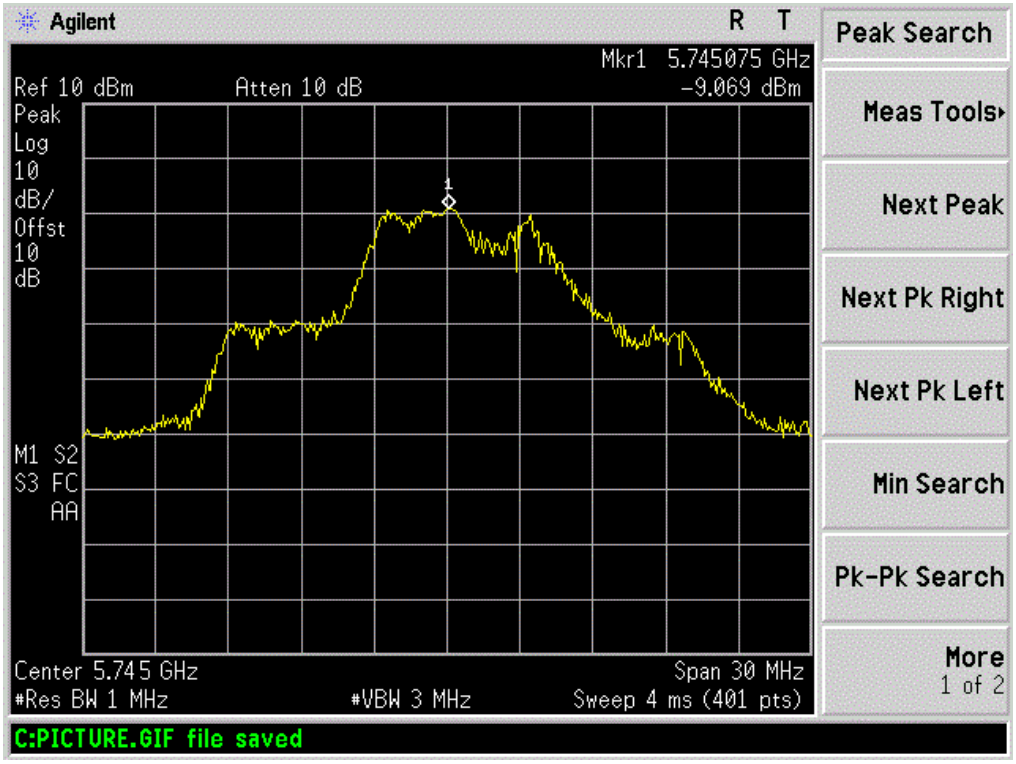
we test all antennas, the antenna 1 was worst mode and the data recording in the report.

8.3. Test data

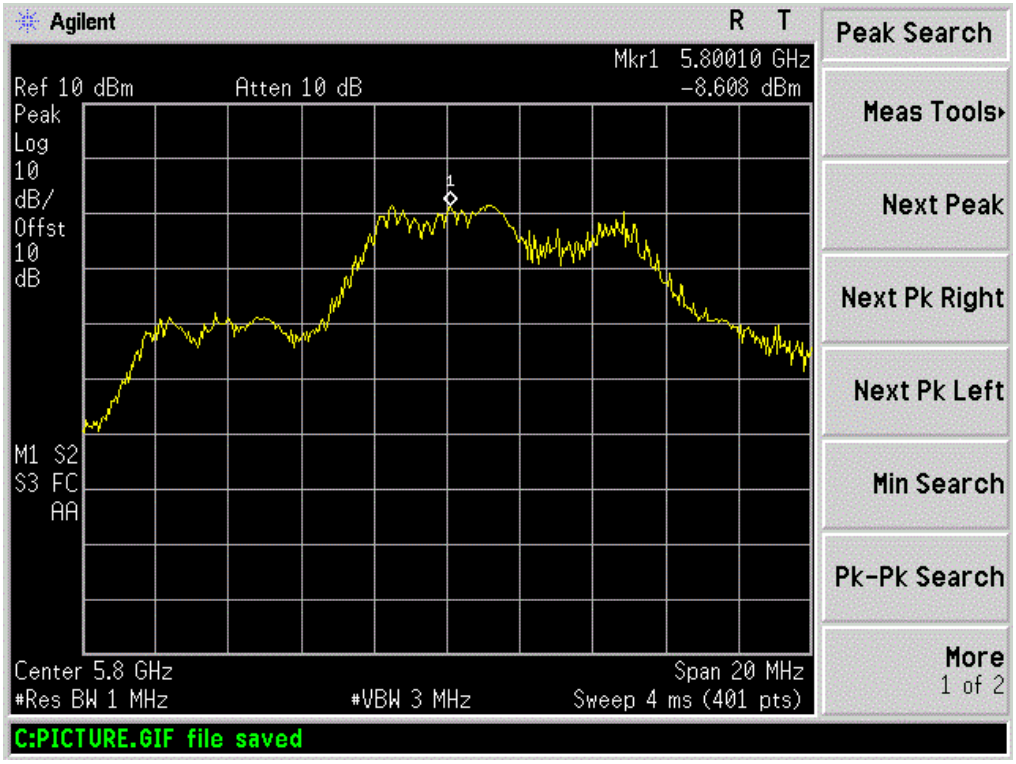
Test data as below

Frequency (MHz)	Reading Level (dBm)	FCC Limit (dBm)	Result
5745	-9.07	30.00	Pass
5800	-8.61	30.00	Pass
5840	-11.12	30.00	Pass

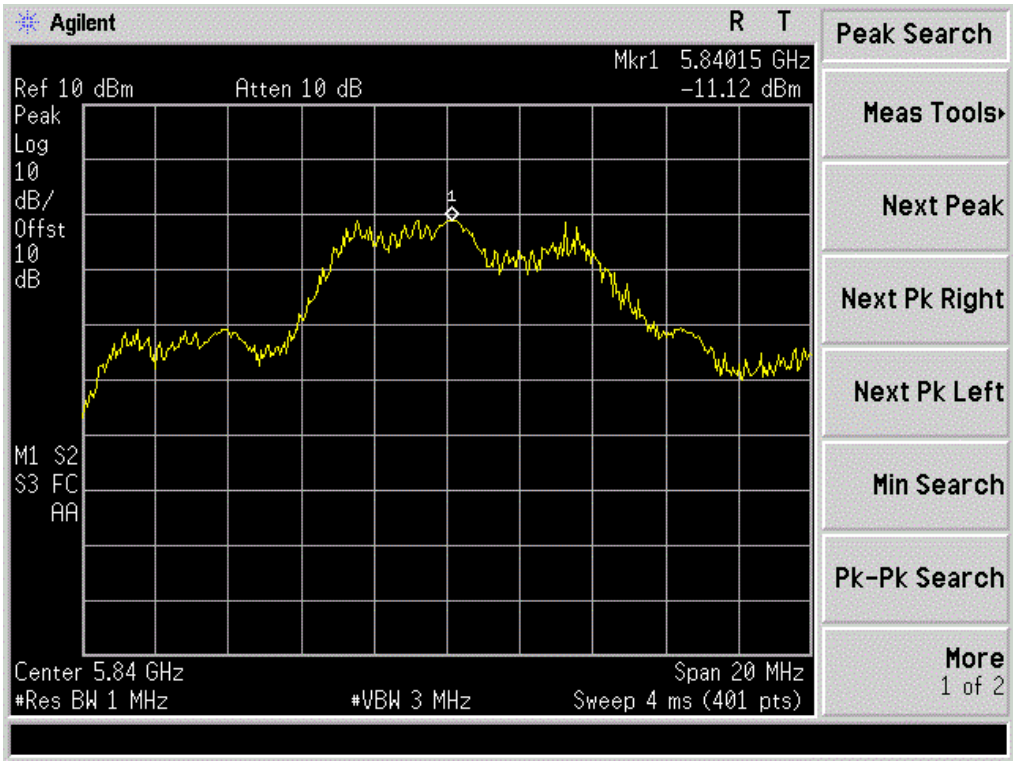
5745MHz



5800MHz



5840MHz


Agilent
R T
Mkr1 5.84015 GHz
-11.12 dBm
Ref 10 dBm
Atten 10 dB
Peak
Log
10
dB/
Offst
10
dB
M1 S2
S3 FC
AA
Center 5.84 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 20 MHz
Sweep 4 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

9. FREQUENCY STABILITY

9.1. Limits

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.

9.2. Test setup

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.

9.3. Test data

Test data as below

Test Voltage	Test Temp.	Measured Frequency (MHz)	Spectrum Frequency (MHz)	Δ Frequency (MHz)
4.255V	-20℃	5745.000	5745.0342	-0.0342
		5800.000	5800.0362	-0.0362
		5840.000	5840.0342	-0.0342
3.145V		5745.000	5745.0294	-0.0294
		5800.000	5800.0347	-0.0347
		5840.000	5840.0418	-0.0418
11.1V	25℃	5745.000	5745.0347	-0.0347
		5800.000	5800.0428	-0.0428
		5840.000	5840.0294	-0.0294
4.255V	50℃	5745.000	5745.0614	-0.0614
		5800.000	5800.0418	-0.0418
		5840.000	5840.0611	-0.0611
3.145V		5745.000	5745.0484	-0.0484
		5800.000	5800.0294	-0.0294
		5840.000	5840.0741	-0.0741

10. TRANSMISSION IN THE ABSENCE OF DATA

10.1. Limits

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.

10.2. Test result

No non-compliance noted:

Refer to the theory of operation.

11. DUTY CYCLE OF TEST SIGNAL

11.1. STANDARD REQUIREMENT

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.

1 Formula:

Duty Cycle = Ton / (Ton+Toff)

Measurement Procedure:

1. Set span = Zero
2. RBW = 8MHz
3. VBW = 8MHz,
4. Detector = Peak

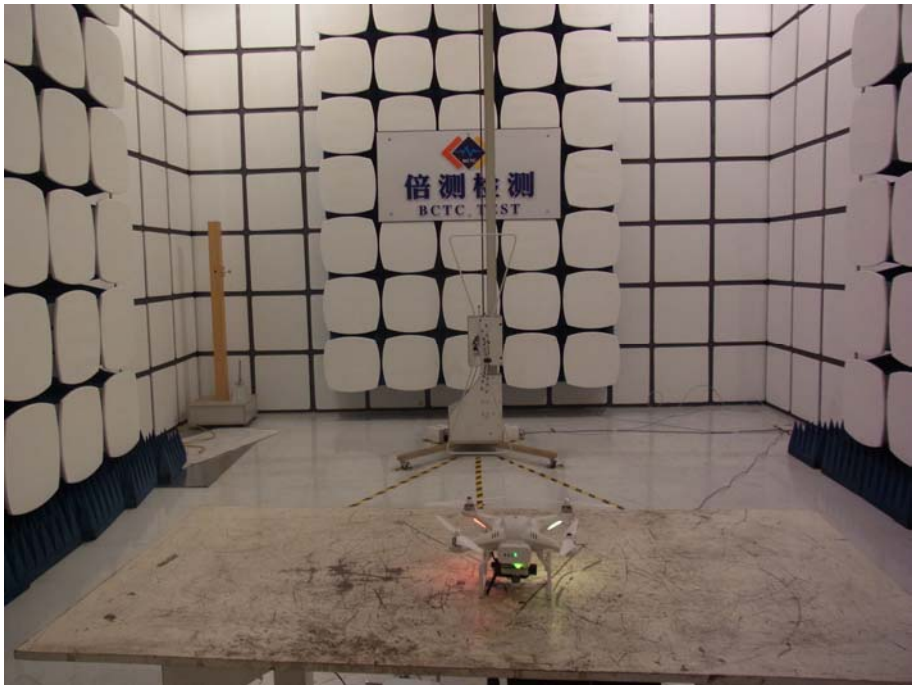
Duty Cycle:

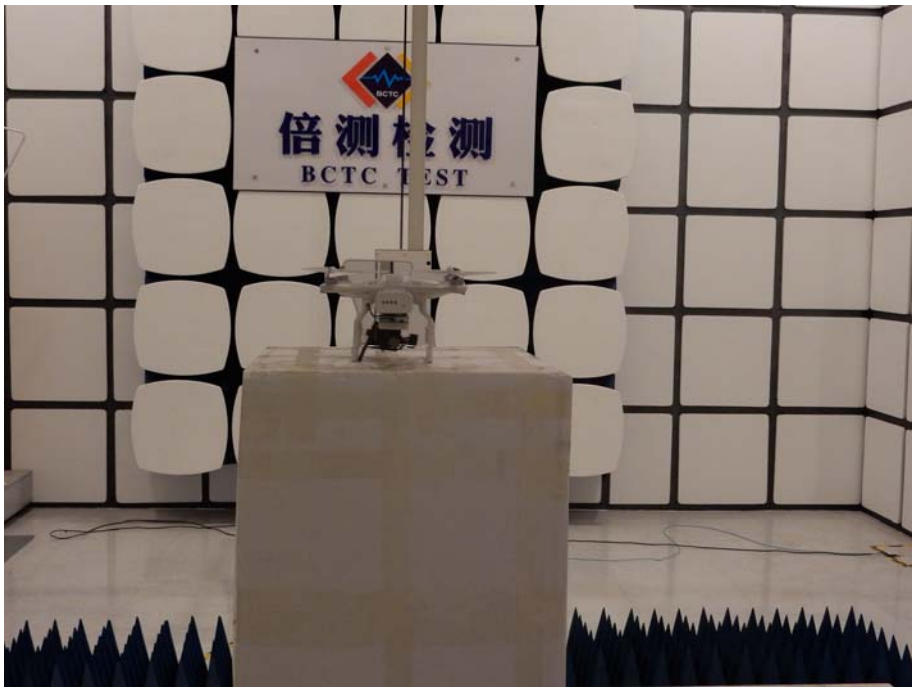
Frequency	Duty Cycle	Duty Fator (dB)
5800	99.5%	0.02

Duty Cycle Factor: 10 * log (1/0.995) = 0.02

12. PHOTOGRAPHS OF TEST SET-UP

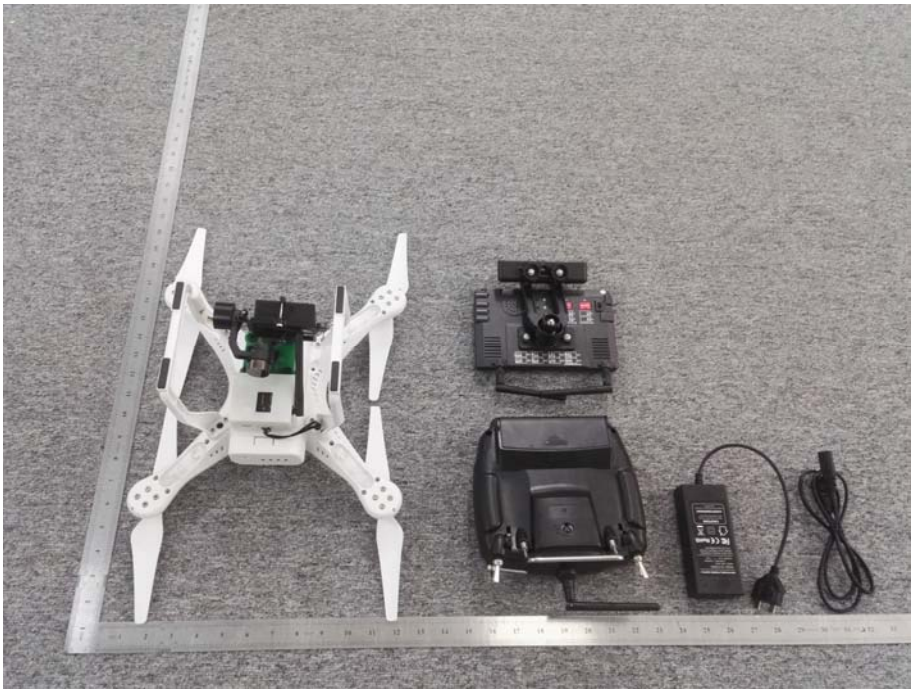
Radiated Emission Test





Conducted Emission Test

13. PHOTOGRAPHS OF THE EUT



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