



Report No.SH16110074W03

FCC RF TEST REPORT

Issued to

Shanghai Sunly Technology Co., Ltd.

For

Alpha CAM Drone

Model Name : SUNLY17A
Trade Name : SUNLYTECH
Brand Name : Alpha CAM
Standard : 47 CFR Part 15, Subpart E
ANSI C63.10-2013
FCC ID : 2AKX4-SUNLY17A
Test date : Jan.26,2017 - Feb.6,2017
Issue date : Feb.10, 2017



Tested by Wu Hongfei

Approved by Gu Yeping

Review by Xiao Dong Mei

The report refers only to the sample tested and does not apply to the bulk. This report is issued in confidence to the client and it will be strictly treated as such by the Shanghai Skylabs Co., Ltd. It may not be reproduced either in its entirety or in part and it may not be used for advertising. The client to whom the report is issued may, however, show or send it or a certified copy thereof prepared by the Shanghai Skylabs Co., Ltd. to his customer. Supplier or other persons directly concerned. Shanghai Skylabs Co., Ltd. will not, without the consent of the client enter into any discussion of correspondence with any third party concerning the contents of the report. In the event of the improper use of the report, Shanghai Skylabs Co., Ltd. reserves the rights to withdraw it and to adopt any other remedies which may be appropriate.



DIRECTORY

1.	General Information	4
1.1	Applicant	4
1.2	Manufacturer	4
1.3	Description of EUT	4
2.	Facilities and Accreditations	6
2.1	Test Facility	6
2.2	Environmental Conditions	6
2.3	Measurement Uncertainty	6
2.4	List of Equipments Used	7
3.	Test Standards and Results	8
4.	47 CFR Part 15C	9
4.1	Antenna requirement	9
5.	Test Result.....	10
5.1	Maximum Conducted Output Power	10
5.2	Emission Bandwidth	11
5.3	Peak Power Spectral Density	15
5.4	Frequency Stability	19
5.5	Band Edge Emissions Measurement.....	21
5.6	Conducted Emission	24
5.7	Radiated Emission.....	28
Annex A	Photos of the EUT	32
Annex B	Photos of Setup	32

**Change History**

Issue	Date	Reason for change
1.0	Feb.10,2017	First edition



1. General Information

1.1 Applicant

Shanghai Sunly Technology Co., Ltd.

D1106.D-1108.Minggu Science&Technology Park,No.7001 Zhongchun Rd.,Shanghai,China

1.2 Manufacturer

Shanghai Sunly Technology Co., Ltd.

D1106.D-1108.Minggu Science&Technology Park,No.7001 Zhongchun Rd.,Shanghai,China

1.3 Description of EUT

EUT Name.....: Alpha CAM Drone
Model Name.....: SUNLY17A
Brand Name.....: Alpha CAM
Trade Name.....: SUNLYTECH
Hardware Version.....: V1.05
Software Version.....: V1.0.5
Modulation Type.....: OFDM (802.11a)
Frequency Range.....: 5.725GHz – 5.85GHz
Channel Number.....: 5
Antenna Type.....: FPCB antenna
Antenna Gain.....: 2.3 dBi
Antenna Number.....: 2

Charger

Brand Name.....: RUIDIR
Mode No.....: RD0882500-USBA-62GB
Electrical Rating [Input].....: 100-240V, 0.7A
Electrical Rating [Output]: 9V, 2.5A
Manufacturer.....: Shenzhen Ruide Electronic Industrial Co., Ltd
Manufacturer Address.....: 10A-1001,F1 Block ,TCL International E City.Zhong Shan Yuan Road NanShanDistrict, ShenZhen, China

NOTE 1:

The EUT contains WIFI Module, it supports 802.11a and tested in this report.

NOTE 2:

The following tables are the channel number and frequency of the EUT, the black bold channels were selected for test.

*20MHz Bandwidth*

Frequency Range	5725~5850 MHz				
Channel Number	149	153	157	161	165
Frequency (MHz)	5745	5765	5785	5805	5825

NOTE 3:

For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacture.



2. Facilities and Accreditations

2.1 Test Facility

Shanghai Skylabs Co., Ltd. (Skylabs Laboratory) is a third party testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025; FCC Registered Number: 196218. IC Registered Number: 21609.

The accreditation certificate number is L6644. A 9*6*6(m) full/semi-anechoic chamber was used for the radiated emissions test.

2.2 Environmental Conditions

Ambient temperature: 15~35°C

Relative humidity: 30~60%

Atmosphere pressure: 86-106kPa

2.3 Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

Uncertainty of Conducted Emission: $\pm 1.76\text{dB}$

Uncertainty of Radiated Emission: $\pm 3.16\text{dB}$



2.4 List of Equipments Used

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Service Simulator	Agilent	N4010A	MY47230669	2016.9.21	1year
Spectrum Analyzer	R&S	FSU26	200880	2016.2.25	1year
Power Splitter	Weinschel	1506A	NW521	(n.a.)	(n.a.)
Power Splitter	Mini-Circuits	ZFRSC-183-S+	76500F1016	(n.a.)	(n.a.)
Attenuator 1	Resnet	10dB	(n.a.)	(n.a.)	(n.a.)
Attenuator 2	Resnet	3dB	(n.a.)	(n.a.)	(n.a.)
Power supplier	NF	ES2000S	9087735	2016.9.24	1year
Full/Semi-Anechoic Chamber	CHENGYU	9.2×6.25×6.15m	SAR	2015.9.14	3year
EMI Test Receiver	R&S	ESCI7	100787	2016.2.55	1year
Receiver	R&S	ESI 40	200777	2016.7.24	1year
Personal Computer	HP	6300P	CNG24296YW	(n.a.)	(n.a.)
Test Antenna-Horn	Schwarzbeck	BBHA9170	BBHA91970171	2016.9.21	1year
Test Antenna-Log	Schwarzbeck	VULB 9163	9163-561	2016.9.24	1year
Test Antenna-Loop	Rohde&Schwarz	FMZB 1519	1519-025	2016.9.21	1year
Test Antenna-Horn	Schwarzbeck	BBHA 9120D	9120D-1033	2016.7.24	1year
Standard Gain Horn 17.9-26.7GHz	Flann Microwave	20240-20	417	2016.7.24	1year
Standard Gain Horn 26.7-40.1GHz	Flann Microwave	20240-20	769	2016.7.24	1year
EPM Series Power Meter	Agilent	E4418B	GB43318055	2016.5.23	1year
Power Sensor	Agilent	8482A	MY41091706	2016.5.23	1year
RF Cable	(n.a.)	0-40GHz	(n.a.)	(n.a.)	(n.a.)

NOTE:

Equipments listed above have been calibrated and are in the period of validation.



3. Test Standards and Results

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

FCC Part 15 Subpart E §15.407

ANSI C63.10-2013

These RF tests were performed according to the method of measurements prescribed in KDB789033 D02 v01r02 (08/04/2016) and KDB905462 D07 v01r01 (08/04/2016).

NOTE:

(1) All test items were verified and recorded according to the standards and without any deviation during the test.

(2) This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart E, recorded in a separate test report.

Test items and the results are as bellow:

No.	FCC Rules	Description	Result
1	15.203	Antenna Requirement	Pass
2	15.407(a)	Maximum Conducted Output Power	Pass
3	15.407(a) (e)	Emission Bandwidth	Pass
4	15.407(a)	Peak Power Spectral Density	Pass
5	15.407(g)	Frequency Stability	Pass
6	15.407(b)	Band Edge Emissions Measurement	Pass
7	15.207	Conducted Emission	Pass
8	15.407(b)	Radiated Emission	Pass



4. 47 CFR Part 15C

4.1 Antenna requirement

4.1.1 Applicable standard

According to FCC 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by 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 shall be considered sufficient to comply with the provisions of this section.

4.1.2 Result: Compliant

The EUT has a permanently and irreplaceable attached antenna. Please refer to the EUT internal photos.



5. Test Result

5.1 Maximum Conducted Output Power

5.1.1 Requirement

(1) 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.

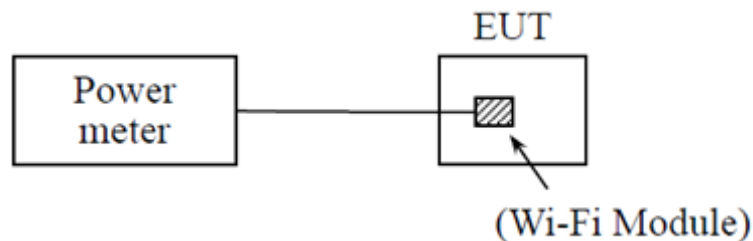
(2) For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or 11dBm + 10log B, where B is the 26 dB emission bandwidth in megahertz.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

5.1.2 Test Description

Test Setup:



The EUT (Equipment under the test) is coupled to the Power Meter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading, all test result in power meter.

5.1.3 Test Result

Mode	Channel	Frequency (MHz)	Measured Output Peak Power (dBm)		Total Power (dBm)	Limit (dBm)	Verdict
			Ant1	Ant2			
802.11a	149	5745	11.96	8.93	13.71	30	Pass
	157	5785	11.05	8.04	12.81		Pass
	165	5825	11.57	7.98	13.15		Pass

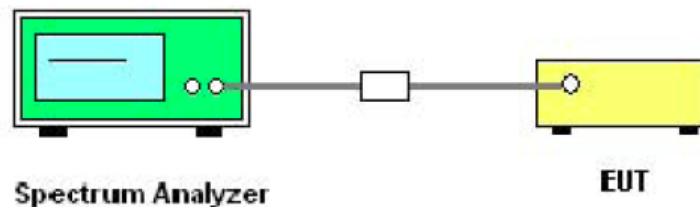


5.2 Emission Bandwidth

5.2.1 Requirement

For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Determination of the emissions bandwidth is based on the use of measurement instrumentation employing a peak detector function with an instrument resolution bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement. Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

5.2.2 Test Description



5.2.3 Test Result

The lowest, middle and highest channels are selected to perform testing to record the 6 dB bandwidth of the Module.

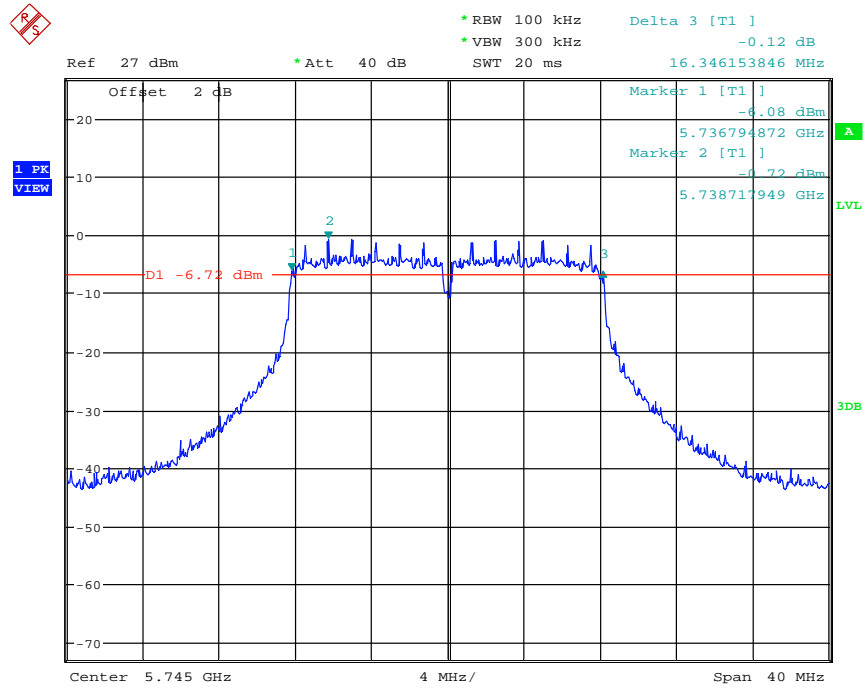
A. Test Verdict:

Ant1

Test mode	Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Refer to plot	Limit (KHz)	Result
802.11a	149	5745	16.346	Plot A1	≥ 500	Pass
	157	5785	16.346	Plot B1		Pass
	165	5825	16.474	Plot C1		Pass

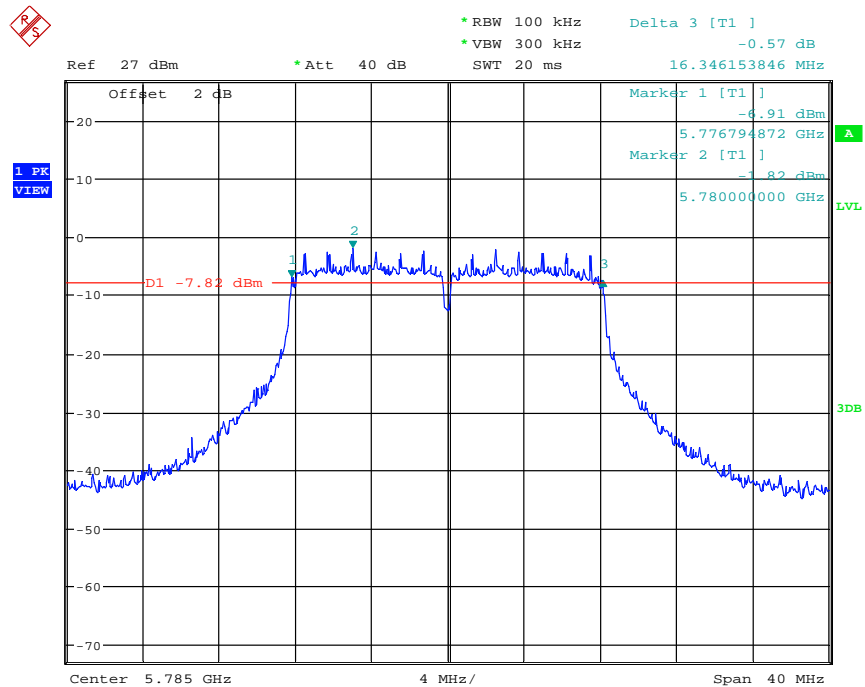
Ant2

Test mode	Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Refer to plot	Limit (KHz)	Result
802.11a	149	5745	16.346	Plot A2	≥ 500	Pass
	157	5785	16.346	Plot B2		Pass
	165	5825	16.346	Plot C2		Pass

**B. Test Plots:**

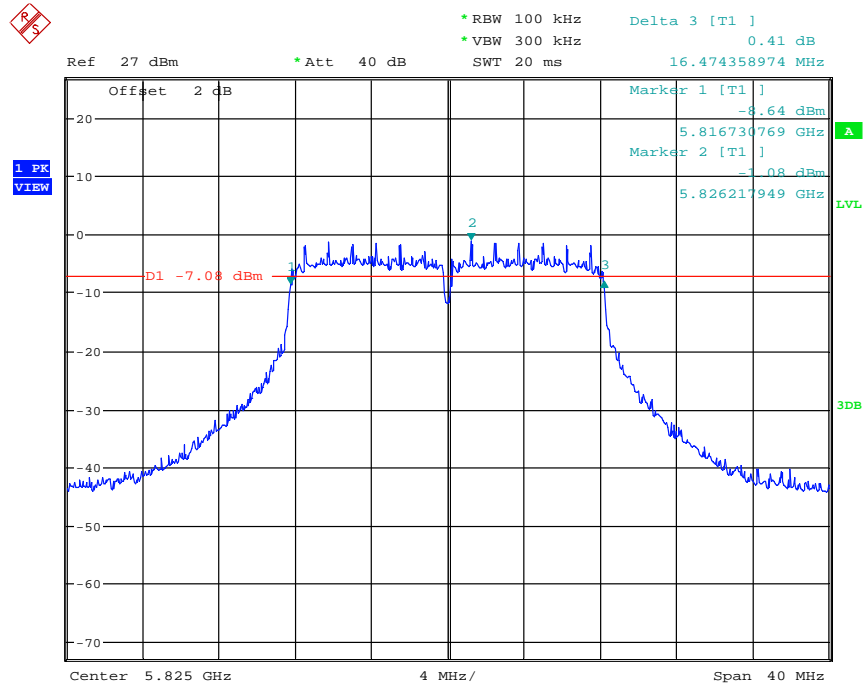
Date: 15.FEB.2017 13:05:33

Plot A1



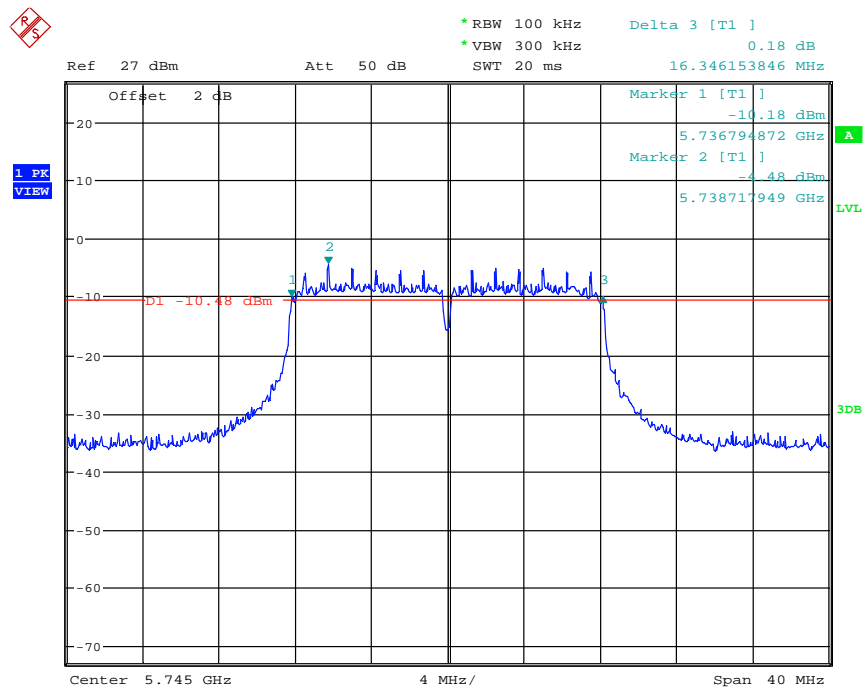
Date: 15.FEB.2017 13:04:29

Plot B1



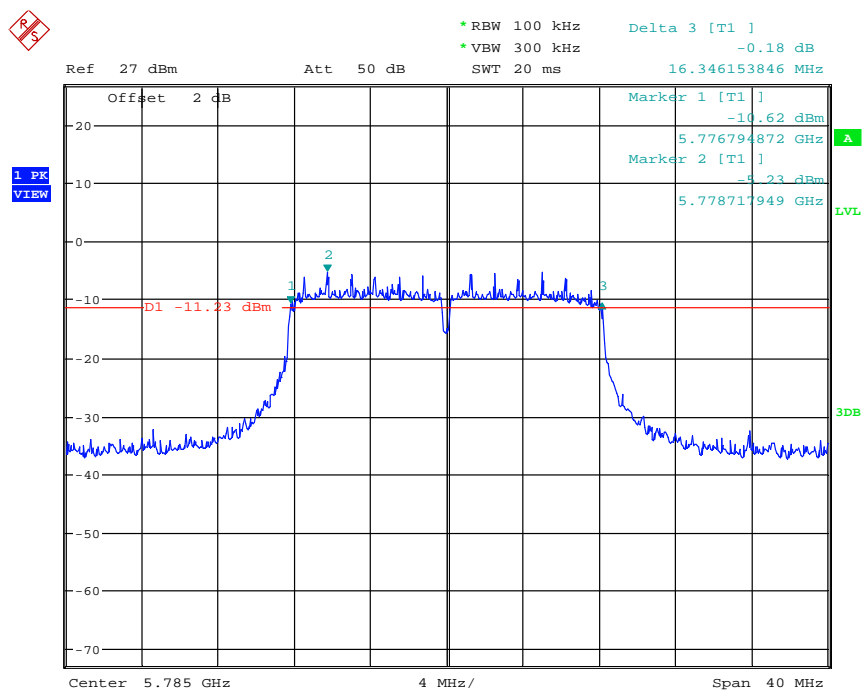
Date: 15.FEB.2017 13:03:21

Plot C1



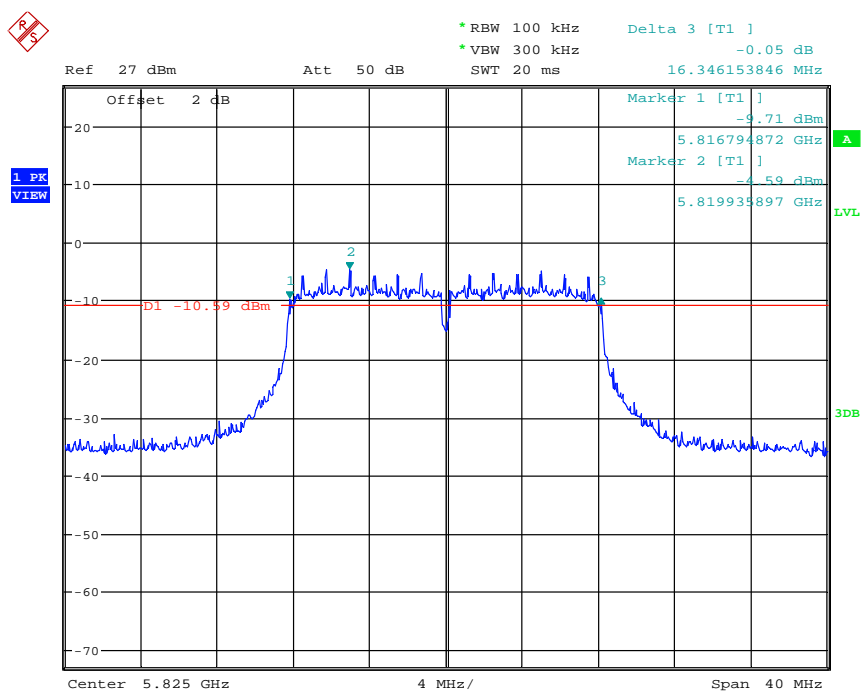
Date: 15.FEB.2017 13:47:51

Plot A2



Date: 15.FEB.2017 13:46:44

Plot B2



Date: 15.FEB.2017 13:45:44

Plot C2



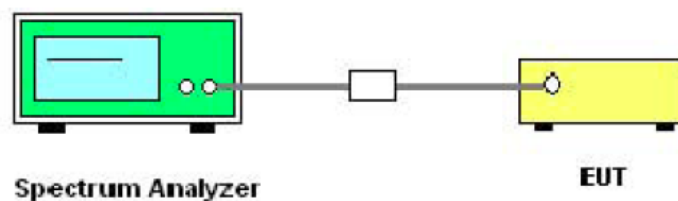
5.3 Peak Power Spectral Density

5.3.1 Requirement

- (1) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.
- (2) For the 5.25–5.35 GHz and 5.47–5.725GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.
- (3) For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500KHz band.

If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.3.2 Test Description



5.3.3 Test Result

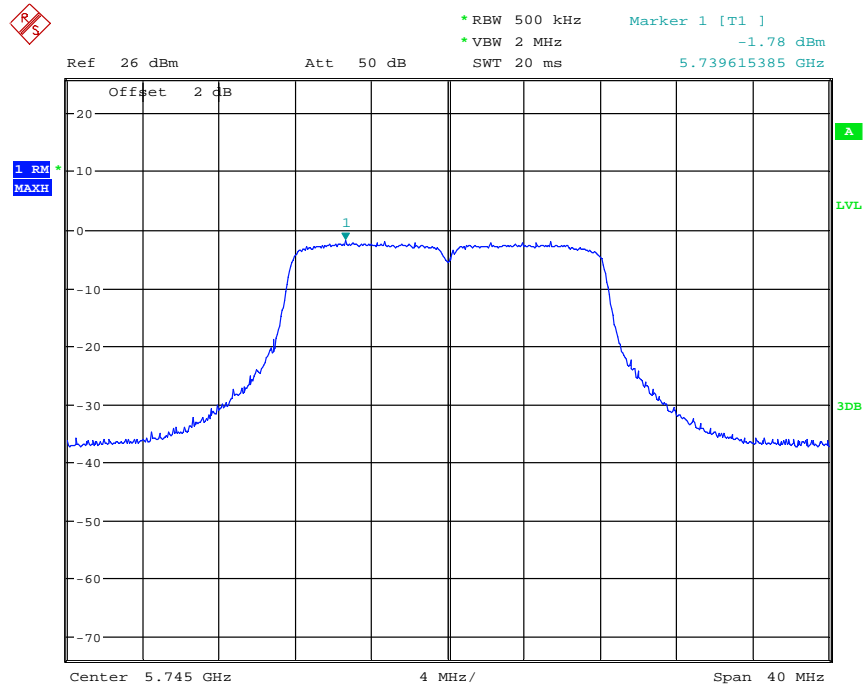
A. Test Verdict

Ant1

Test mode	Channel	Frequency (MHz)	Measured PPSD (dBm/500kHz)		Refer to plot	Total PPSD (dBm/500 kHz)	Limit (dBm/500k Hz)	Result
			Ant1	Ant2				
802.11a	149	5745	-1.78	-5.05	Plot A1/A2	-0.10	30	Pass
	157	5785	-2.96	-5.94	Plot B1/B2	-1.19		Pass
	165	5825	-2.32	-5.53	Plot C1/C2	-0.62		Pass

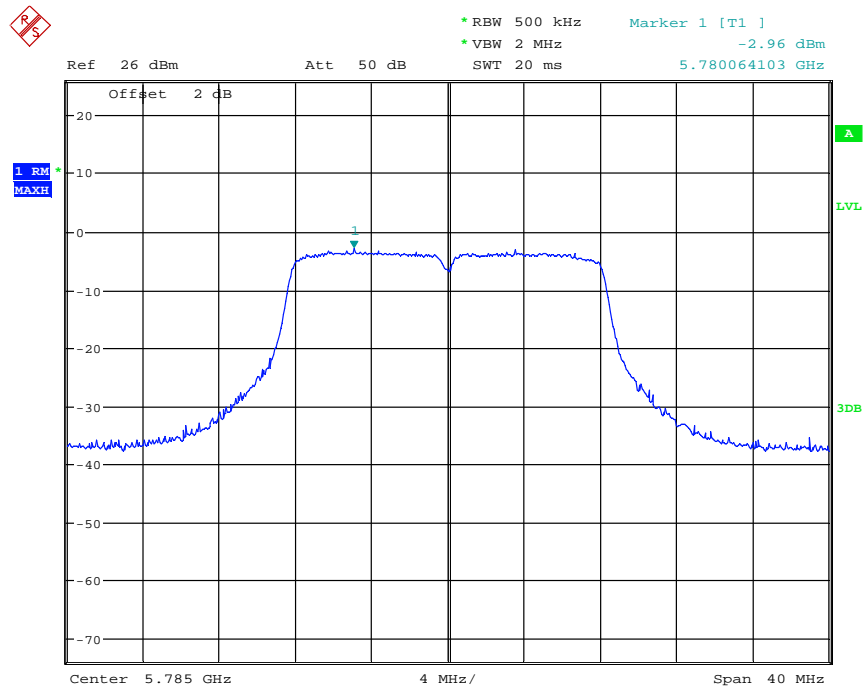


B. Test Plot



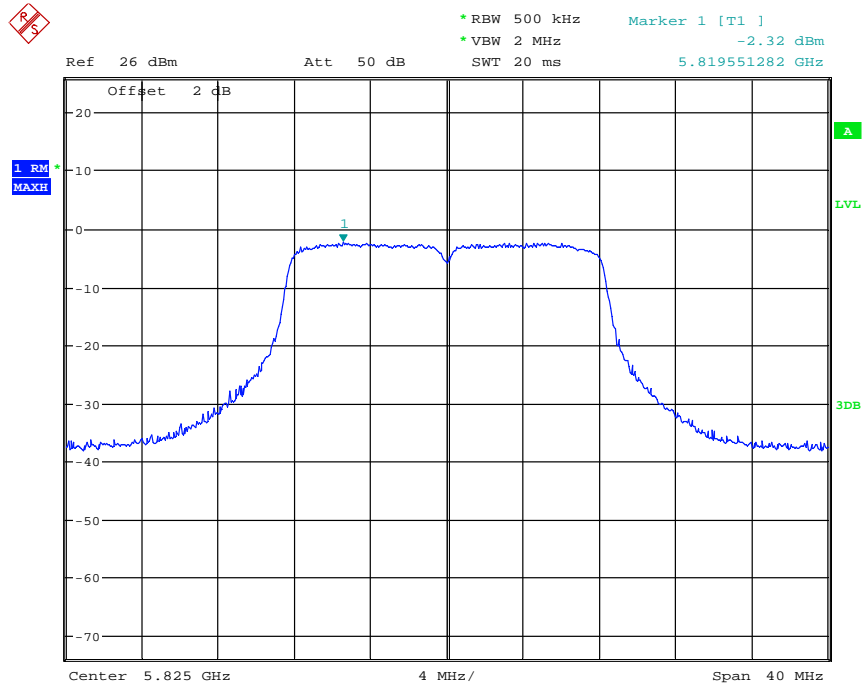
Date: 15.FEB.2017 19:13:10

Plot A1



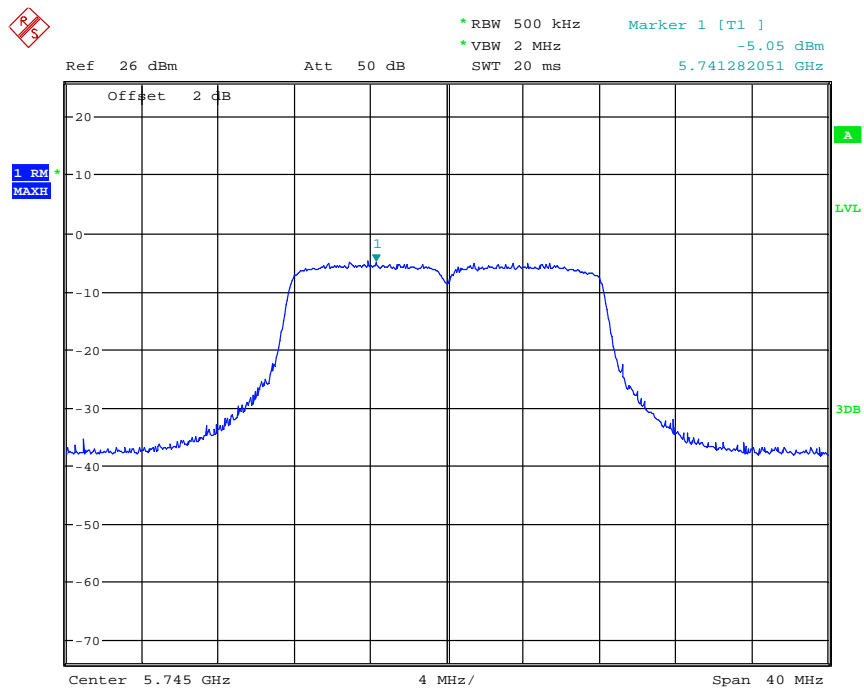
Date: 15.FEB.2017 19:12:32

Plot B1



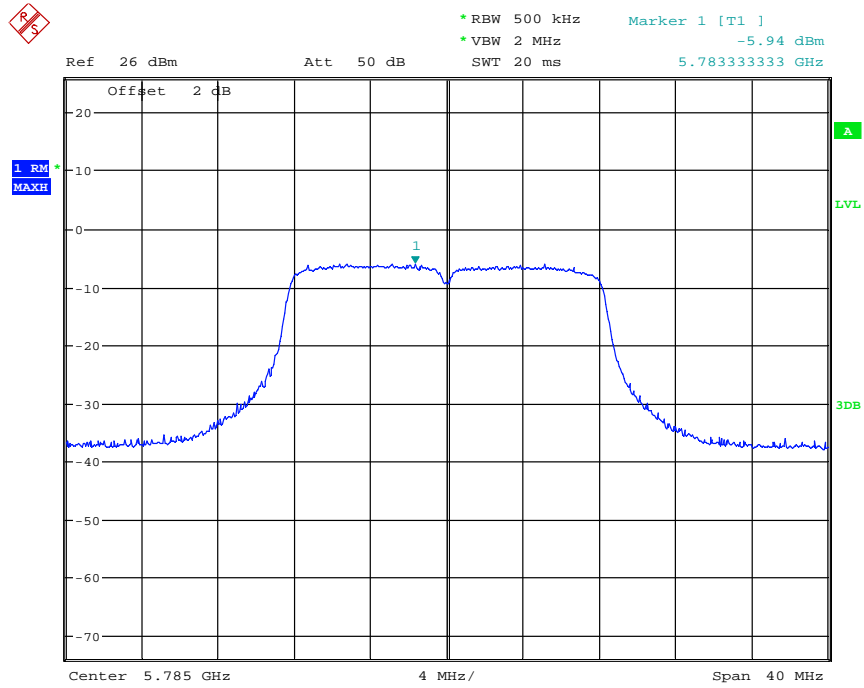
Date: 15.FEB.2017 19:11:47

Plot C1



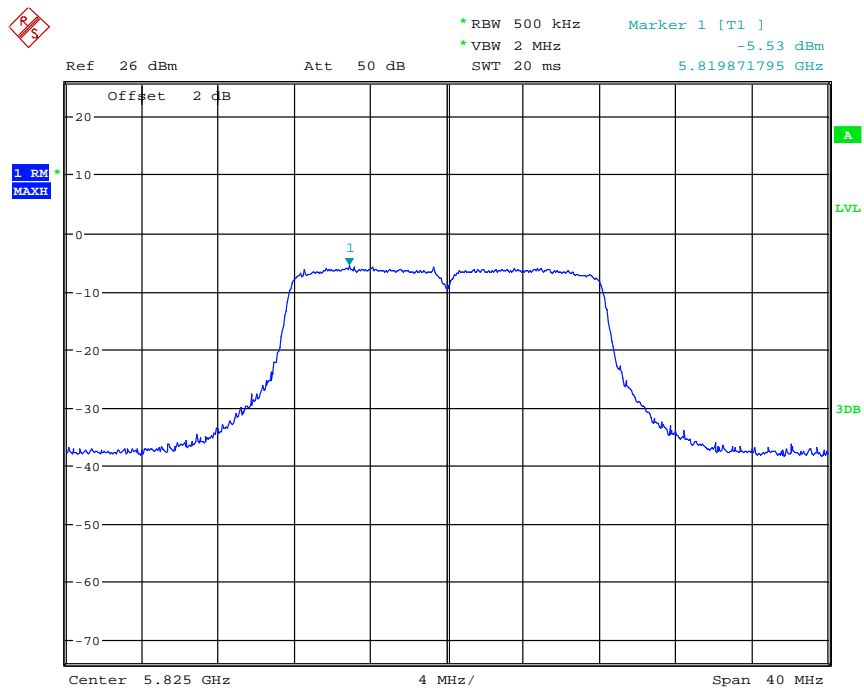
Date: 15.FEB.2017 19:10:39

Plot A2



Date: 15.FEB.2017 19:09:57

Plot B2



Date: 15.FEB.2017 19:11:16

Plot C2



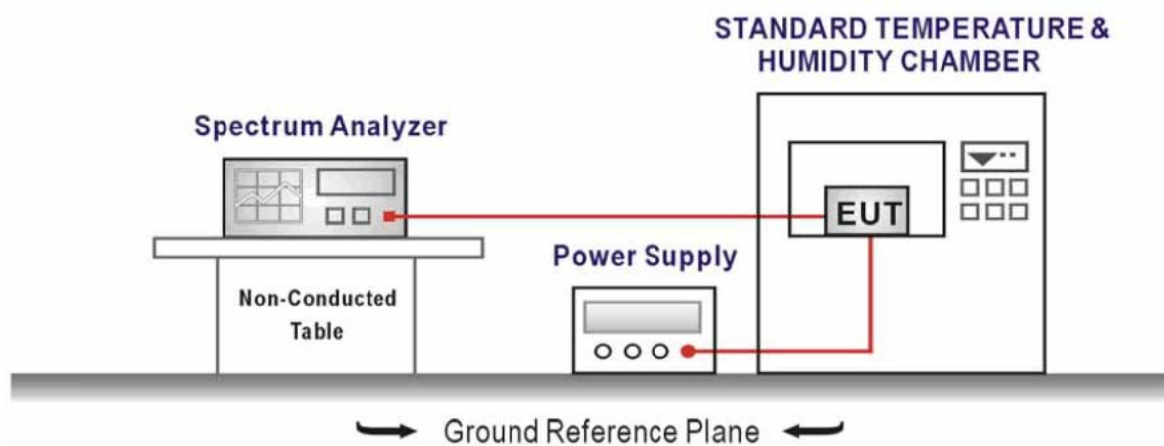
5.4 Frequency Stability

5.4.1 Requirement

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.

The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band (IEEE 802.11n specification).

5.4.2 Test Description



The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between 0°C and +40°C. The temperature was incremented by 10°C intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded. Data for the worst case channel is shown below.

5.4.3 Test Result

Ant1 5745MHz

POWER (VDC)	TEMP (°C)	Frequency (MHz)	Maximum Frequency Deviation (MHz)	Maximum Deviation (ppm)
8	0	5744.9650	0.0350	-6.09
	10	5744.9653	0.0347	-6.04
	20	5744.9654	0.0346	-6.02
	30	5744.9651	0.0349	-6.07
	40	5744.9654	0.0346	-6.02
8.7	20	5744.9653	0.0347	-6.04
7.6 (End Point)	20	5744.9651	0.0349	-6.07



Ant2 5745MHz

POWER (VDC)	TEMP (°C)	Frequency (MHz)	Maximum Frequency Deviation (MHz)	Maximum Deviation (ppm)
8	0	5744.9682	0.0318	-5.54
	10	5744.9679	0.0321	-5.59
	20	5744.9673	0.0327	-5.69
	30	5744.9678	0.0322	-5.60
	40	5744.9670	0.0330	-5.74
8.7	20	5744.9681	0.0319	-5.55
7.6 (End Point)	20	5744.9679	0.0321	-5.59



5.5 Band Edge Emissions Measurement

5.5.1 Requirement

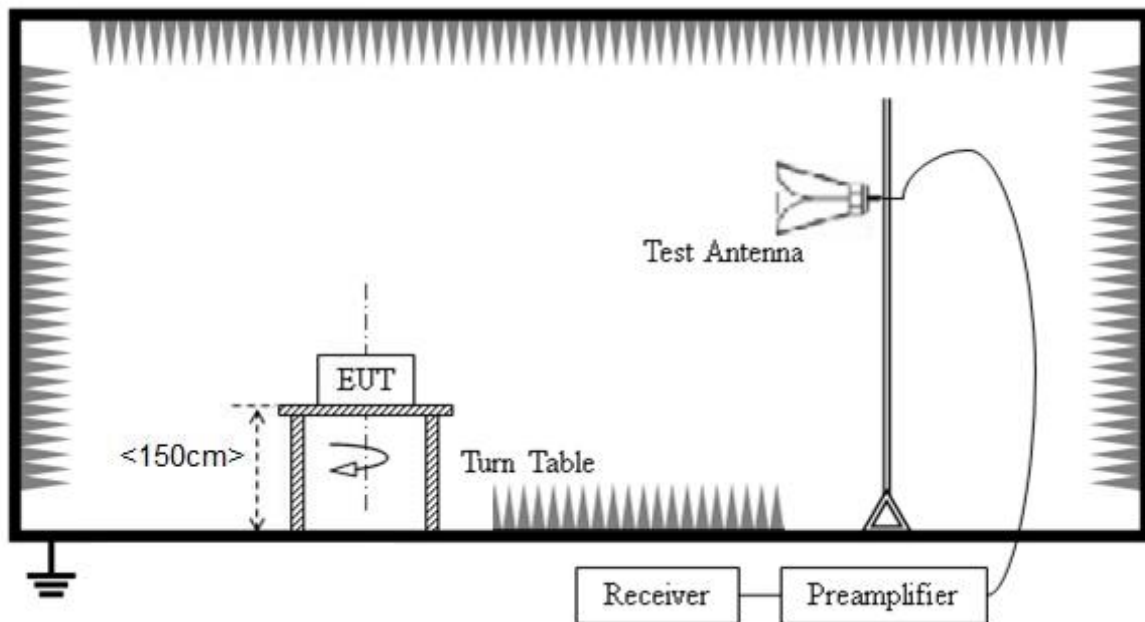
- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725 GHz 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 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 10 dBm/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.

The following formula is used to convert the equipment isotropic radiated power(eirp) to field strength (dB μ V/m)

$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m, where } P \text{ is the eirp (Watts).}$$

5.5.2 Test Description



The Module is located in a 3m Semi-Anechoic Chamber; the antenna factors, cable loss and so on of the site as factors are calculated to correct the reading.

For the Test Antenna:

Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength.



5.5.3 Test Result

The lowest and highest channels are tested to verify the band edge emissions measurement.

The measurement results are obtained as below:

$$E [\text{dBV/m}] = \text{UR} + \text{AT} + \text{AFactor} [\text{dB}]; \text{AT} = \text{LCable loss} [\text{dB}] - \text{Gpreamp} [\text{dB}]$$

AT: Total correction Factor except Antenna

UR: Receiver Reading

Gpreamp: Preamplifier Gain

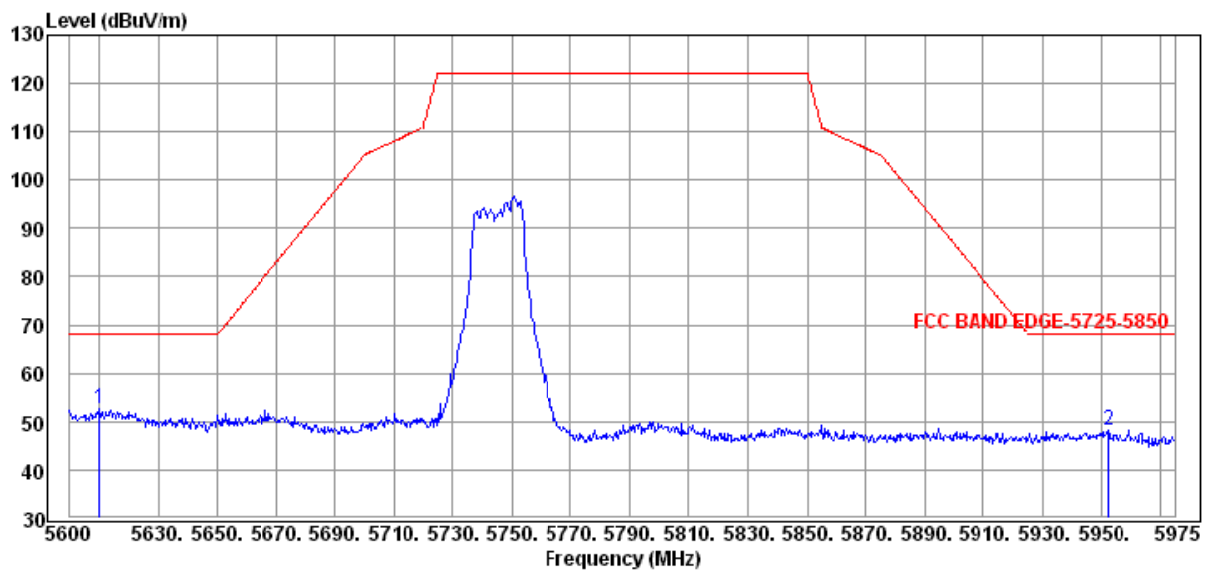
AFactor: Antenna Factor at 3m

Note:

1. Band edge emissions measurement were performed when antenna was at vertical and horizontal polarity, and only the worse test condition (vertical) was recorded in this test report.
2. The lowest, middle and highest channels are tested to verify the band edge emissions measurement.
3. C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

A. Test Verdict

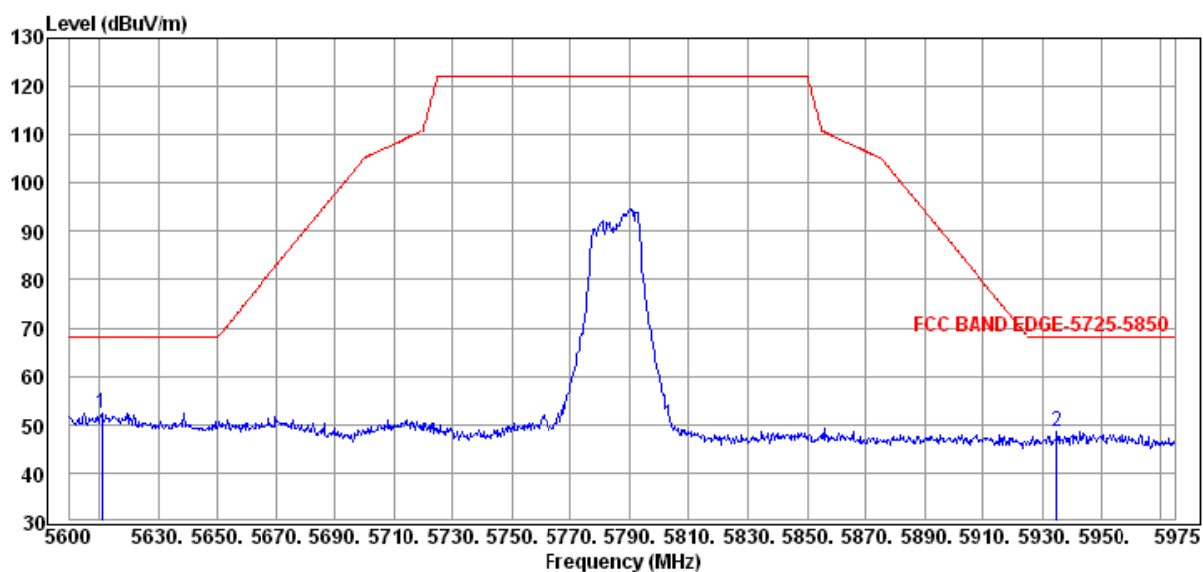
ANT 1+2, 5745MHz



Freq MHz	Reading dB μ V	C.F dB	Result dB μ V	Limit dB μ V	Margin dB	Detector
5610.13	47.76	4.90	52.66	68.23	15.57	Peak
5952.13	42.03	6.17	48.20	68.23	20.03	Peak

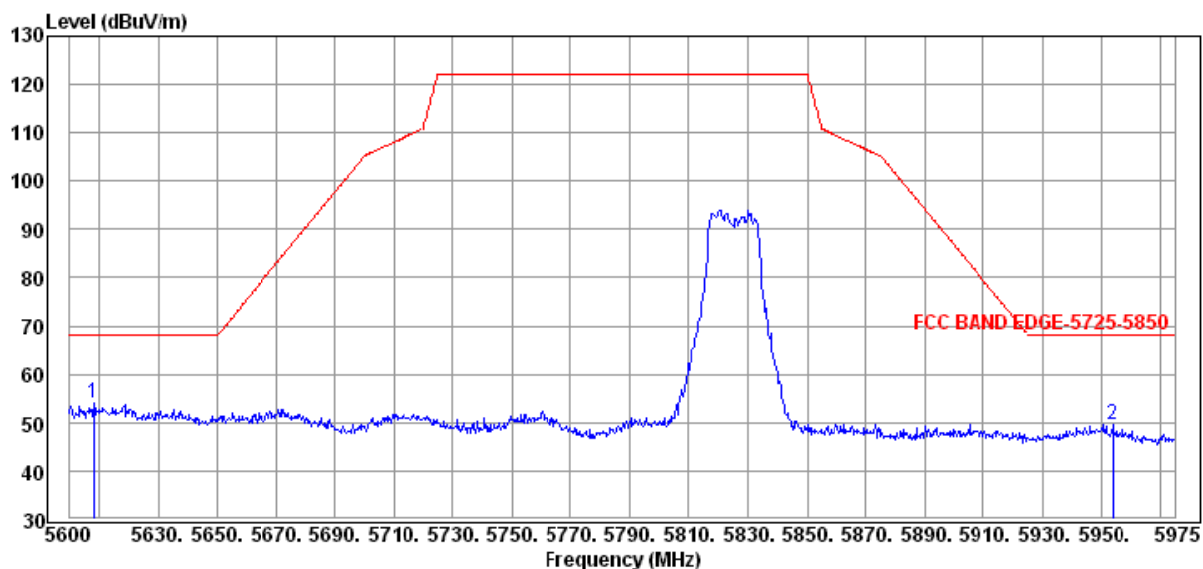


ANT 1+2, 5785MHz



Freq MHz	Reading dB μ V	C.F dB	Result dB μ V	Limit dB μ V	Margin dB	Detector
5610.88	47.44	4.89	52.33	68.23	15.90	Peak
5934.88	42.38	6.05	48.43	68.23	19.80	Peak

ANT 1+2, 5825MHz



Freq MHz	Reading dB μ V	C.F dB	Result dB μ V	Limit dB μ V	Margin dB	Detector
5608.25	49.33	4.89	54.22	68.23	14.01	Peak
5953.63	43.50	6.19	49.69	68.23	18.54	Peak



5.6 Conducted Emission

5.6.1 Requirement

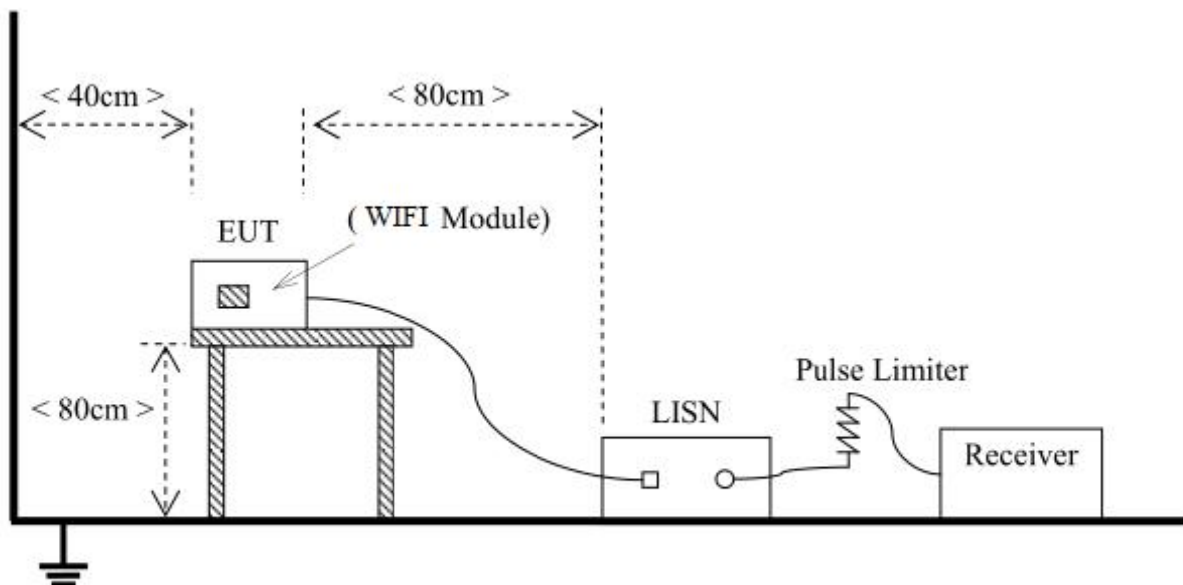
According to FCC section 15.207, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 Ω line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dB μ V)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

NOTE:

- (a) The lower limit shall apply at the band edges.
- (b) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

5.6.2 Test Description



The EUT was placed upon a non-metallic table 0.8m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. Power supplier is setting to 120V/60Hz. The set-up and test methods were according to ANSI C63.10:2013

With testing software which was provided by the applicant and installed on a laptop PC, the equipment under test (EUT) could be set to a continuous transmit mode with a certain modulation scheme and data rate on a certain frequency.



For this test report, all configurations of the EUT were tested in 2.4G frequency band which was able to operate according to the specification of 802.11 a. The mode below is the worst case operation mode during the tests:

Operation Mode	Description of the Operation Mode	Modulation	Data Rate
On Ground	TX Mode 5745MHz(Channel 149) + Charger + USB data exchange	64QAM	54Mbps

NOTE:

In this model, the battery of EUT is at low power level, the Charger is charging the battery in common conditions similar to the way did by USER.

Mains supply for Adaptor: 120V, AC 60Hz

5.6.3 Test result

Test Verdict Recorded for Suspicious Points:

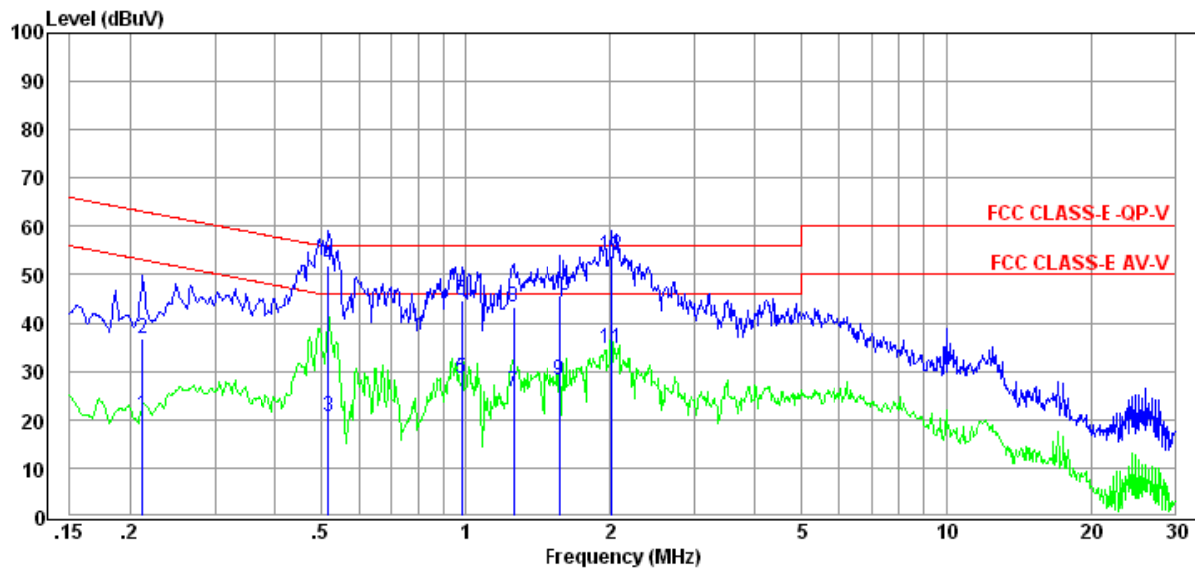
Frequency (MHz)	Level (dBμV)	Limit Line (dBμV)	Margin (dB)	Phase line	Detector
0.21	20.92	53.10	32.18	L	Average
0.21	36.80	63.10	26.30	L	QP
0.52	20.79	46.00	25.21	L	Average
0.52	52.04	56.00	3.96	L	QP
0.98	28.62	46.00	17.38	L	Average
0.98	44.83	56.00	11.17	L	QP
1.26	25.67	46.00	20.33	L	Average
1.26	43.33	56.00	12.67	L	QP
1.57	28.32	46.00	17.68	L	Average
1.57	45.75	56.00	10.25	L	QP
2.01	34.83	46.00	11.17	L	Average
2.01	54.10	56.00	1.90	L	QP
0.26	24.76	51.34	26.58	N	Average
0.26	39.77	61.34	21.57	N	QP
0.49	39.60	46.14	6.54	N	Average
0.49	52.45	56.14	3.69	N	QP
0.53	34.13	46.00	11.87	N	Average
0.53	54.49	56.00	1.51	N	QP
0.95	24.52	46.00	21.48	N	Average
0.95	44.20	56.00	11.80	N	QP
1.29	31.64	46.00	14.36	N	Average
1.29	44.29	56.00	11.71	N	QP
2.01	39.15	46.00	6.85	N	Average



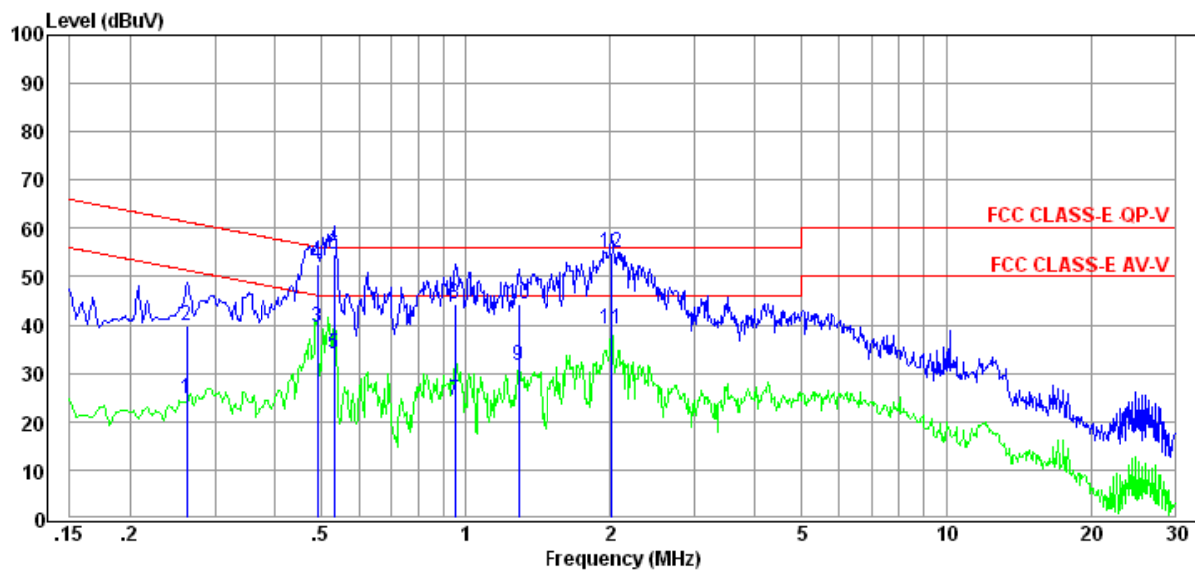
Frequency (MHz)	Level (dB μ V)	Limit Line (dB μ V)	Margin (dB)	Phase line	Detector
2.01	54.91	56.00	1.09	N	QP



5.6.4 Test Plot



L Line



N Line

5.6.5 Conclusion: Pass



5.7 Radiated Emission

5.7.1 Requirement

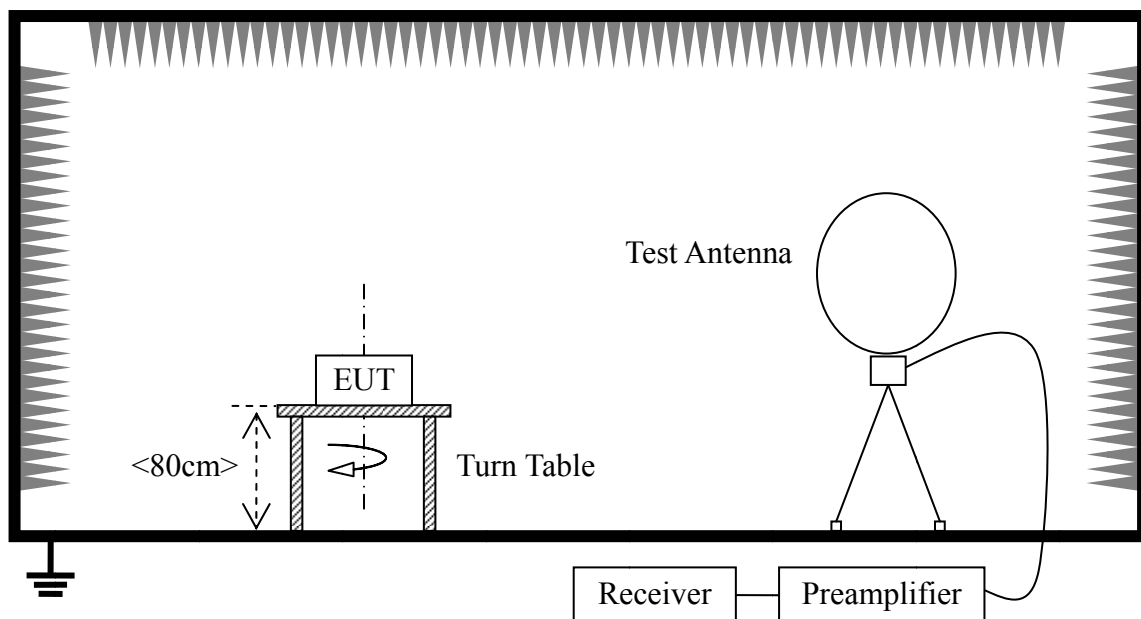
According to FCC section 15.247(c), radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table

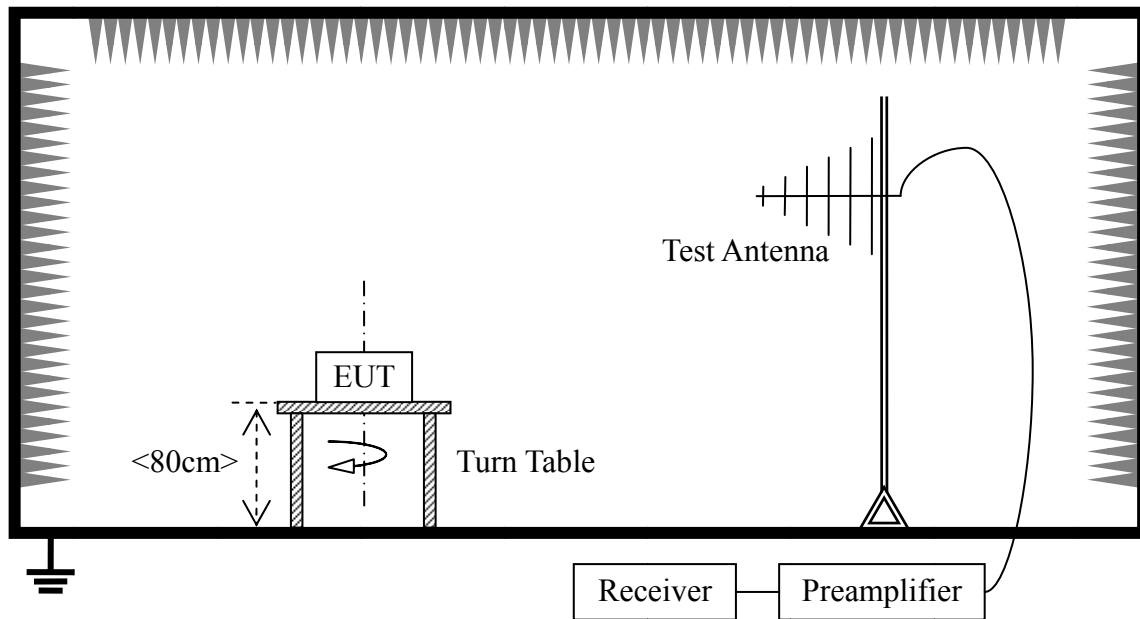
Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (m)	Limit($\text{dB}\mu\text{V/m}$)	Detector
0.009-0.490	2400/F(kHz)	300	/	/
0.490-1.705	24000/F(kHz)	30	/	/
1.705-30	30	30	/	/
30 - 88	100	3	40	QP
88 - 216	150	3	43.5	QP
216 - 960	200	3	46	QP
960 - 1000	500	3	54	QP
Above 1000	500	3	54	AV

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

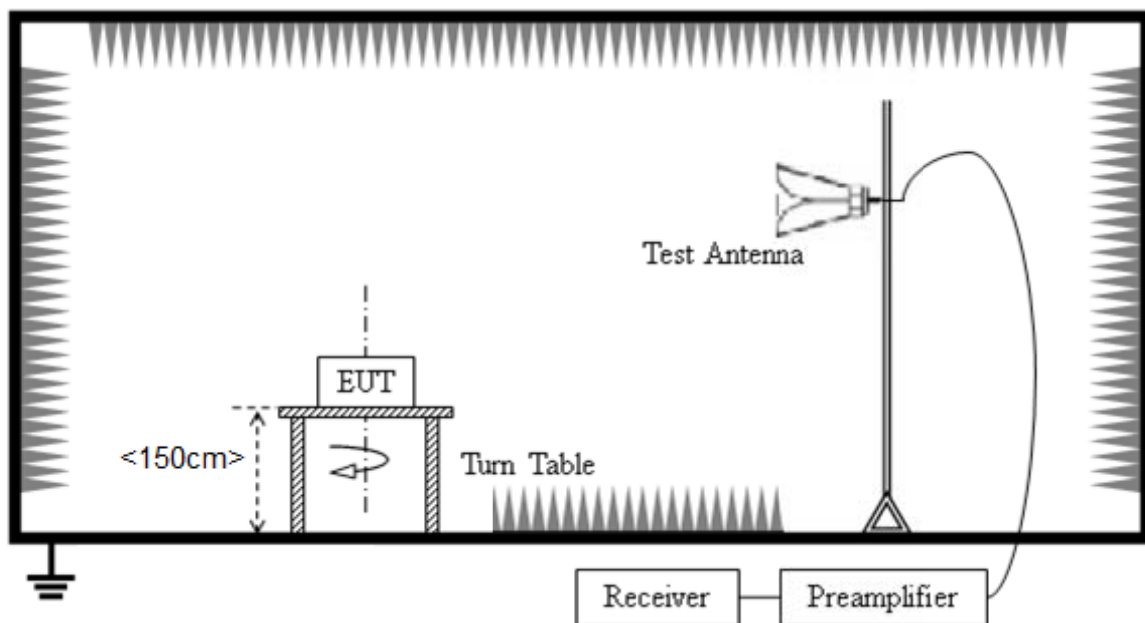
5.7.2 Test setup



Radiated Emissions Below 30MHz



Radiated Emissions 30-1000MHz



Radiated Emissions above 1000MHz

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.10-2013. Below 1GHz, the EUT was set-up on insulator 80cm above the Ground Plane. Above 1GHz, the EUT was set-up on insulator 150cm above the Ground Plane. The set-up and test methods were according to ANSI C63.10

The EUT is located in a 3m Semi-Anechoic Chamber; the antenna factors, cable loss and so on of the site as factors are calculated to correct the reading. During the measurement, the Wifi Module is activated and controlled by the Wifi Service Supplier (SS) via a Common Antenna, and is set to



operate under transmitting at maximum power.

For the Test Antenna: In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength, the azimuth range of turntable was 0o to 360o, the receive antenna has two polarizations horizontal and vertical. When doing measurements above 1GHz, the EUT was placed within the 3dB beam width range of the horn antenna, and the EUT was tested in 3 orthogonal positions as recommended in ANSI C63.10 for Radiated Emissions and the worst-case data was presented.

With testing software which was provided by the applicant and installed on a laptop PC, the equipment under test (EUT) could be set to a continuous transmit mode with a certain modulation scheme and data rate on a certain frequency.

For this test report, all configurations of the EUT were tested in 2.4G frequency band which was able to operate according to the specification of 802.11 a. The mode below is the worst case operation mode during the tests:

Operation Mode	Description of the Operation Mode	Modulation	Data Rate
On Ground	TX Mode 5745MHz(Channel 149) + Charger + USB data exchange	64QAM	54Mbps

NOTE:

In this model, the battery of EUT is at low power level, the Charger is charging the battery in common conditions similar to the way did by USER.

Mains supply for Adaptor: 120V, AC 60Hz

5.7.3 Test Result

A. Test Result for 9kHz~30MHz

Frequency (MHz)	Level (dBμV)	Over Limit (dB)	Limit Line (dBμV)	Remark
--	--	20	--	See Note

Note:

- The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.*
- Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB);*
- Limit line = specific limits (dBμV) + distance extrapolation factor.*



Frequency (MHz)	Level (dBμV)	Limit Line (dBμV)	Margin (dB)	Antenna Polarization	Detector	Result
45.54	29.81	40.00	10.19	H	QP	PASS
62.65	32.75	40.00	7.25	H	QP	PASS
114.92	31.92	40.00	8.08	H	QP	PASS
236.65	33.62	47.00	13.38	H	QP	PASS
400.43	38.23	47.00	8.77	H	QP	PASS
601.43	36.38	47.00	10.62	H	QP	PASS
4804.64	20.07	54.00	33.93	H	Average	PASS
4804.64	30.70	74.00	43.30	H	Peak	PASS
4962.12	21.60	54.00	32.40	H	Average	PASS
4962.12	32.52	74.00	41.48	H	Peak	PASS
5349.95	35.19	54.00	18.81	H	Average	PASS
5349.95	46.54	74.00	27.46	H	Peak	PASS
5446.67	34.82	54.00	19.18	H	Average	PASS
5446.67	45.98	74.00	28.02	H	Peak	PASS
10565.4	45.7	54.00	8.30	H	Average	PASS
10565.4	53.3	74.00	20.70	H	Peak	PASS
19696.3	41.2	54.00	12.80	H	Average	PASS
19696.3	46.5	74.00	27.50	H	Peak	PASS
37.55	27.26	40.00	12.74	V	QP	PASS
42.60	27.57	40.00	12.43	V	QP	PASS
63.98	27.31	40.00	12.69	V	QP	PASS
68.39	26.71	40.00	13.29	V	QP	PASS
114.11	26.71	40.00	13.29	V	QP	PASS
146.89	30.49	40.00	9.51	V	QP	PASS
1660.42	11.01	54.00	42.99	V	Average	PASS
1660.42	25.49	74.00	48.51	V	Peak	PASS
2338.00	11.51	54.00	42.49	V	Average	PASS
2338.00	21.49	74.00	52.51	V	Peak	PASS
3718.65	14.09	54.00	39.91	V	Average	PASS
3718.65	24.87	74.00	49.13	V	Peak	PASS
5283.27	38.68	54.00	15.32	V	Average	PASS
5283.27	49.42	74.00	24.58	V	Peak	PASS
11130.80	48.20	54.00	5.80	V	Average	PASS
11130.80	51.20	74.00	22.80	V	Peak	PASS

B. Test Result for above 30MHz ~ 10th Harmonic

5.7.4 Conclusion: Pass



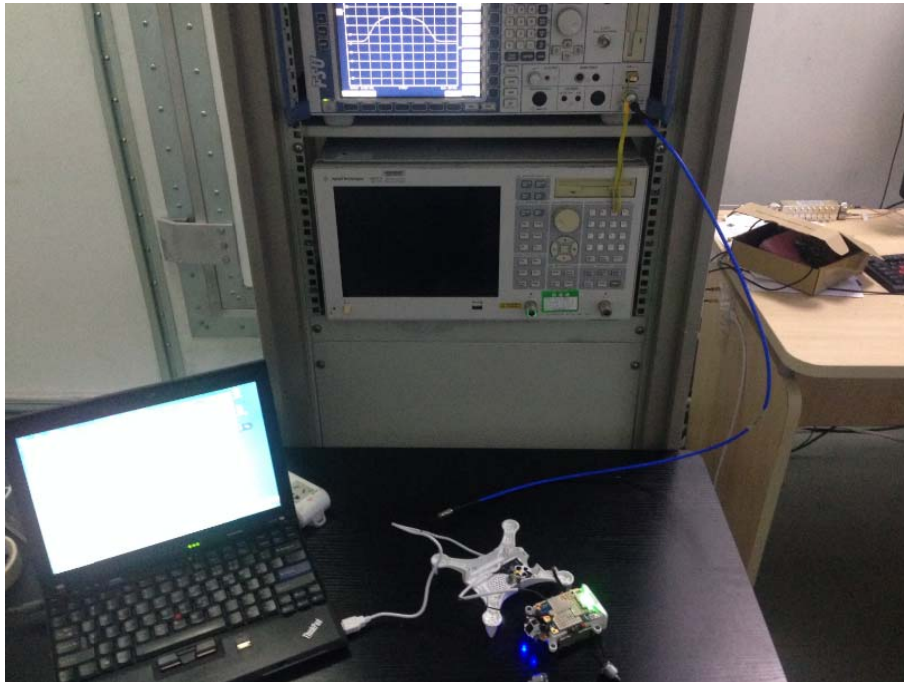
Annex A Photos of the EUT





Annex B Photos of Setup

1. RF



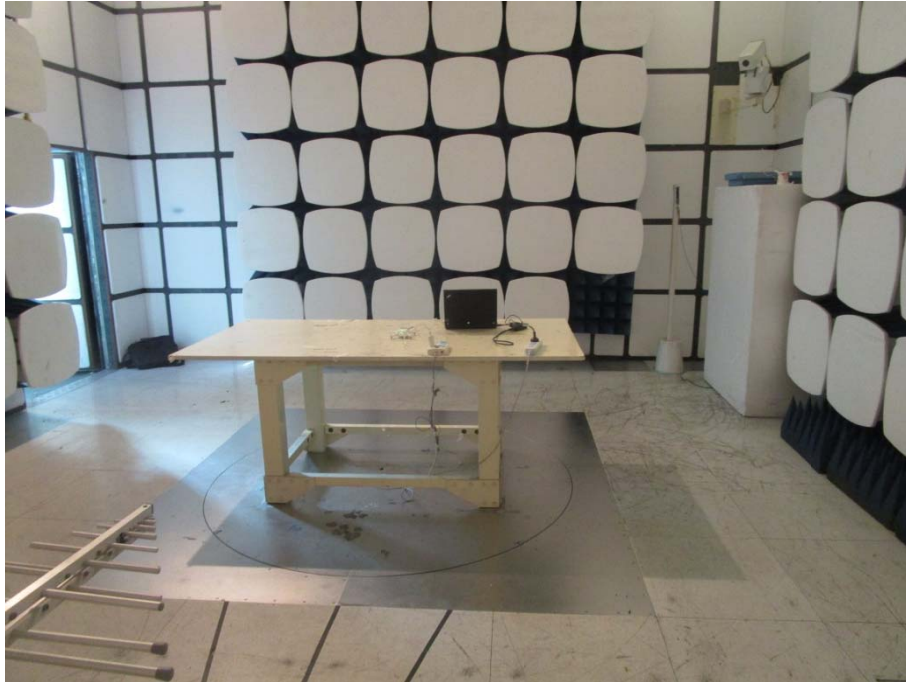
2. Conducted Emission



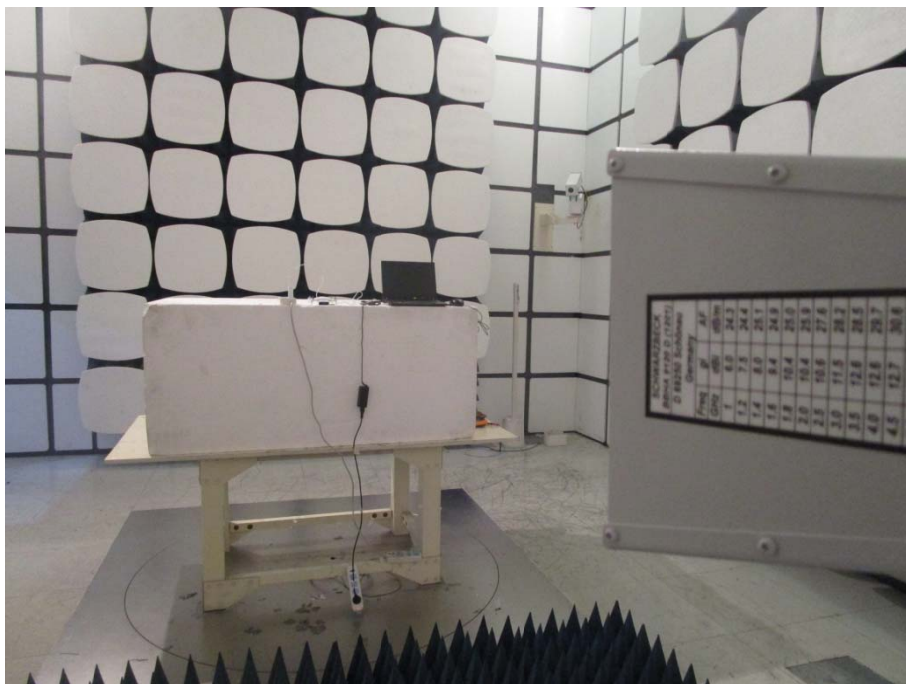
150k~30MHz



3. Radiated Emission



30M~1GHz



1G~18GHz

**** END OF REPORT ****