



# FCC TEST REPORT

**Test report  
On Behalf of  
Solaborate LLC  
For  
HELLO  
Model No.: HELLO**

**FCC ID: 2ALUI-HELLO**

**Prepared for :** Solaborate LLC  
8300 Utica Ave #283, Rancho Cucamonga, CA 91730

**Prepared By :** Laboratory of Shenzhen United Testing Technology Co., Ltd  
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**Date of Test:** April. 10, 2017 ~ April. 13, 2017

**Date of Report:** April. 13, 2017

**Report Number:** UNI170405086-E



### TEST RESULT CERTIFICATION

**Applicant's name** ..... : Solaborate LLC  
 Address ..... : 8300 Utica Ave #283, Rancho Cucamonga, CA 91730  
**Manufacture's Name**..... : Shenzhen Jinjiutianshi Industry Co.,Ltd.  
 Address ..... : 4/F, Block B, Dexinchang Industrial Park, Qingxiang Rd.,  
 Longhua District, Shenzhen 519109, China

**Product description**

Trade Mark: N/A  
 Product name ..... : HELLO  
 Model and/or type reference : HELLO

**Standards** ..... : FCC Rules and Regulations Part 15 Subpart C Section 15.407  
 ANSI C63.10: 2013

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**Date of Test** ..... :  
 Date (s) of performance of tests ..... : **April. 10, 2017 ~ April. 13, 2017**  
 Date of Issue..... : **April. 13, 2017**  
 Test Result..... : **Pass**

Testing Engineer : Eric Xie  
 (Eric Xie)

Technical Manager : Dora Qin  
 (Dora Qin)

Authorized Signatory : Kait Chen  
 (Kait Chen)

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## 1. TEST SUMMARY

### 1.1 TEST PROCEDURES AND RESULTS

DESCRIPTION OF TEST	RESULT
CONDUCTED EMISSIONS TEST	COMPLIANT
RADIATED EMISSION TEST	COMPLIANT
BAND EDGE	COMPLIANT
FREQUENCY STABILITY	COMPLIANT
OCCUPIED BANDWIDTH MEASUREMENT	COMPLIANT
POWER SPECTRAL DENSITY	COMPLIANT
PEAK OUTPUT POWER <sub>Peak</sub>	COMPLIANT
ANTENNA REQUIREMENT	COMPLIANT

### 1.2 TEST FACILITY

Test Firm : Dongguan Dongdian Testing Service Co., Ltd  
 Certificated by FCC, Registration No.: 270092  
 Address : No.17 Zongbu road 2, Songshan Lake Sci&Tech Park, DongGuan  
 City, Guangdong province,523808 China

### 1.3 MEASUREMENT UNCERTAINTY

Measurement Uncertainty  
 Conducted Emission Expanded Uncertainty = 2.23dB, k=2  
 Radiated emission expanded uncertainty(9kHz-30MHz) = 3.08dB, k=2  
 Radiated emission expanded uncertainty(30MHz-1000MHz) = 4.42dB, k=2  
 Radiated emission expanded uncertainty(Above 1GHz) = 4.06dB, k=2

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Equipment	HELLO
Model Name	HELLO
Serial No	/
Model Difference	/
FCC ID	<b>2ALUI-HELLO</b>
Antenna Type	Integral Antenna
Antenna Gain	2dBi
Operation frequency	802.11b/g/n 20:2412~2462 MHz 802.11n 40: 2422~2452MHz
Number of Channels	802.11b/g/n20: 11CH 802.11n 40: 7CH
Modulation Type	CCK/OFDM/DBPSK/DAPSK
Power Source	N/A
Power Rating	DC5V 2.5A from AC adapter with 100-240V~ 50/60Hz 0.3A

Equipment	HELLO
Model Name	HELLO
Serial No	/
Model Difference	/
FCC ID	<b>2ALUI-HELLO</b>
Antenna Type	Integral Antenna
Antenna Gain	2dBi
Operation frequency	2402-2480MHz
Number of Channels	40CH
Modulation Type	GFSK
Power Source	N/A
Power Rating	DC5V 2.5A from AC adapter with 100-240V~ 50/60Hz 0.3A

Equipment	HELLO
Model Name	HELLO
Serial No	/
Model Difference	/
FCC ID	<b>2ALUI-HELLO</b>
Antenna Type	Integral Antenna
Antenna Gain	2dBi
Operation frequency	2402-2480MHz
Number of Channels	79CH
Modulation Type	GFSK
Power Source	N/A
Power Rating	DC5V 2.5A from AC adapter with 100-240V~ 50/60Hz 0.3A

Equipment	HELLO
Model Name	HELLO
Serial No	/
Model Difference	/
FCC ID	<b>2ALUI-HELLO</b>
Antenna Type	Integral Antenna
Antenna Gain	2dBi
Operation frequency	802.11a/n 20:5180~5240 MHz; 802.11n 40: 5190~5230 MHz; 802.11ac:5210 MHz
Number of Channels	802.11a/n20: 4CH; 802.11n 40: 2CH; 802.11 ac: 1CH;
Modulation Type	CCK/OFDM/DBPSK/DAPSK
Power Source	N/A
Power Rating	DC5V 2.5A from AC adapter with 100-240V~ 50/60Hz 0.3A

Note: This report only 5G WIFI test report, /BT(40CH) and 2.4G WIFI/ BT(79CH) transmitters see the other test reports.

2.1.1 Carrier Frequency of Channels

Channel List for 802.11 a/n 20							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	40	5200	44	5220	48	5240
/	/	/	/	/	/	/	/

Channel List for 802.11 n 40							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	46	5230	/	/	/	/
/	/	/	/	/	/	/	/

Channel List for 802.11 ac with 5.2G							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	5210	/	/	/	/	/	/
/	/	/	/	/	/	/	/

Operation of EUT during testing

Operating Mode

The mode is used: **Transmitting mode for 802.11 a/n 20**

- Low Channel: 5180MHz
- Middle Channel: 5200MHz
- High Channel: 5240MHz

**Transmitting mode for 802.11 n 40**

- Low Channel: 5190MHz
- High Channel: 5230MHz

**Transmitting mode for 802.11 ac with 5.2G**

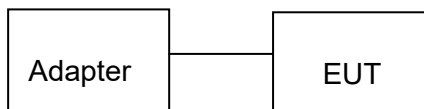
- Low Channel: 5210MHz

2.2 DESCRIPTION OF TEST SETUP

Operation of EUT during conducted and below 1GHz Radiation testing:



Operation of EUT during Above1GHz Radiation testing:





2.3 MEASUREMENT INSTRUMENTS LIST

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Receiver	Rohde & Schwarz	ESCI	100627	Feb. 18, 2017	1 Year
2.	LISN	SchwarzBeck	NSLK 8126	8126377	Feb. 18, 2017	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Feb. 18, 2017	1 Year
4.	EMI Test Software ES-K1	Rohde & Schwarz	N/A	N/A	N/A	N/A
5.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Feb. 18, 2017	1 Year
6.	Trilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Feb. 18, 2017	1 Year
7.	Pre-amplifier	Compliance Direction	PAP-0203	22008	Feb. 18, 2017	1 Year
8.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
9.	EMI Receiver	Rohde & Schwarz	ESCI	100627	Feb. 18, 2017	1 Year
10.	LISN	SchwarzBeck	NSLK 8126	8126377	Feb. 18, 2017	1 Year
11.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Feb. 18, 2017	1 Year
12.	EMI Test Software ES-K1	Rohde & Schwarz	N/A	N/A	N/A	N/A
13.	EMI Receiver	Rohde & Schwarz	ESCI	100627	Feb. 18, 2017	1 Year
14.	EMI Receiver	Rohde & Schwarz	ESCI	100627	Feb. 18, 2017	1 Year
15.	LISN	SchwarzBeck	NSLK 8126	8126377	Feb. 18, 2017	1 Year
16.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Feb. 18, 2017	1 Year
17.	EMI Test Software ES-K1	Rohde & Schwarz	N/A	N/A	N/A	N/A
18.	Power Meter	R&S	NRVD	SEL0069	Feb. 18, 2017	1 Year
19.	Power Sensor	R&S	URV5-Z2	SEL0071	Feb. 18, 2017	1 Year
20.	Power Sensor	R&S	URV5-Z2	SEL0072	Feb. 18, 2017	1 Year
21.	Software EMC32	R&S	EMC32-S	SEL0082	N/A	N/A
22.	Log-periodic Antenna	Amplifier Reasearch	AHELLO80	SEL0073	N/A	N/A
23.	Antenna Tripod	Amplifier Reasearch	TP1000A	SEL0074	N/A	N/A
24.	High Gain Horn Antenna(0.8-5GHz)	Amplifier Reasearch	AT4002A	SEL0075	N/A	N/A
25.	Spectrum analyzer	Agilent	N9020A	MY499110 048	Feb. 18, 2017	1 Year
26.	Spectrum analyzer	Agilent	E4407B	MY461843 26	Feb. 18, 2017	1 Year

### 3. CONDUCTED EMISSIONS TEST

#### 3.1 Conducted Power Line Emission Limit

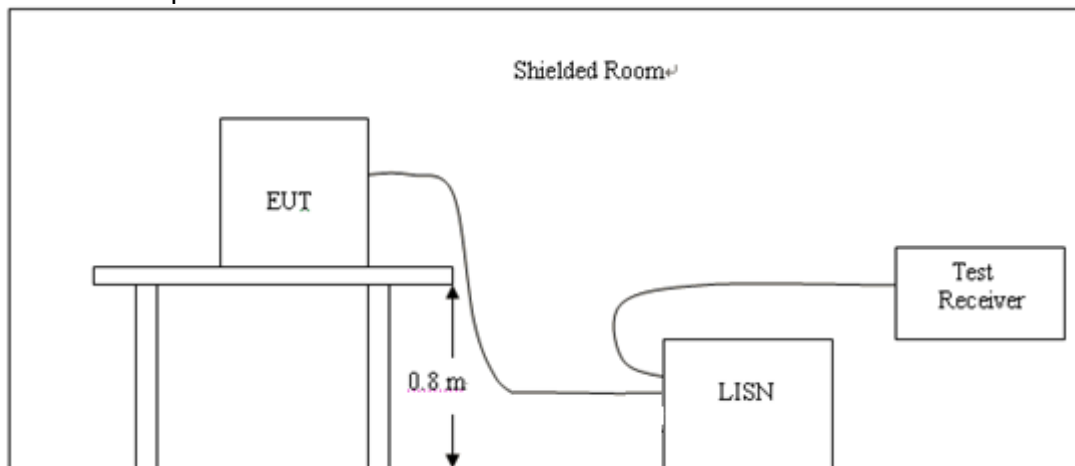
For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following

Frequency (MHz)	Maximum RF Line Voltage (dBµV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

\* Decreasing linearly with the logarithm of the frequency

For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

#### 3.2 Test Setup



#### 3.3 Test Procedure

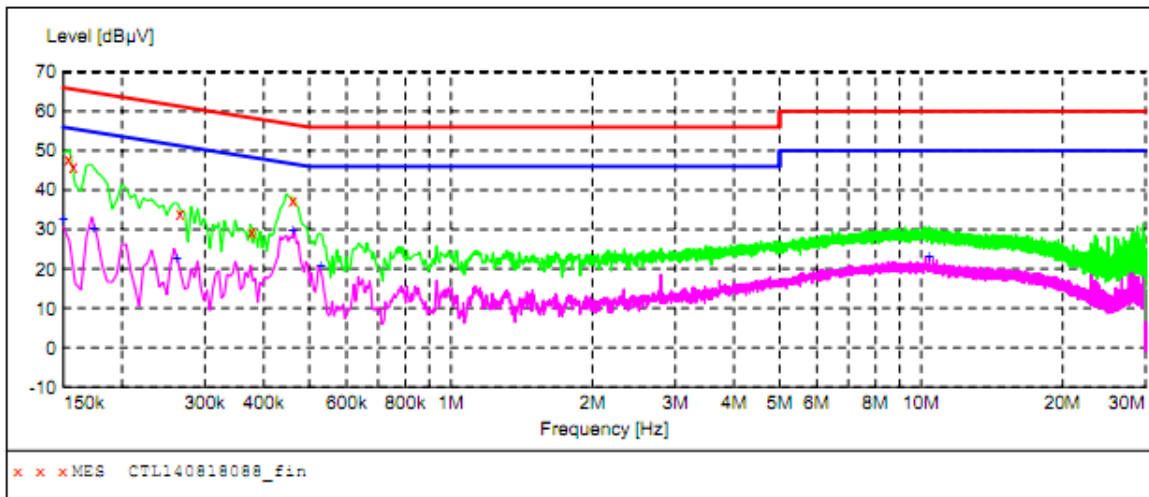
- 1, The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
- 2, Support equipment, if needed, was placed as per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

#### 3.4 Test Result

PASS

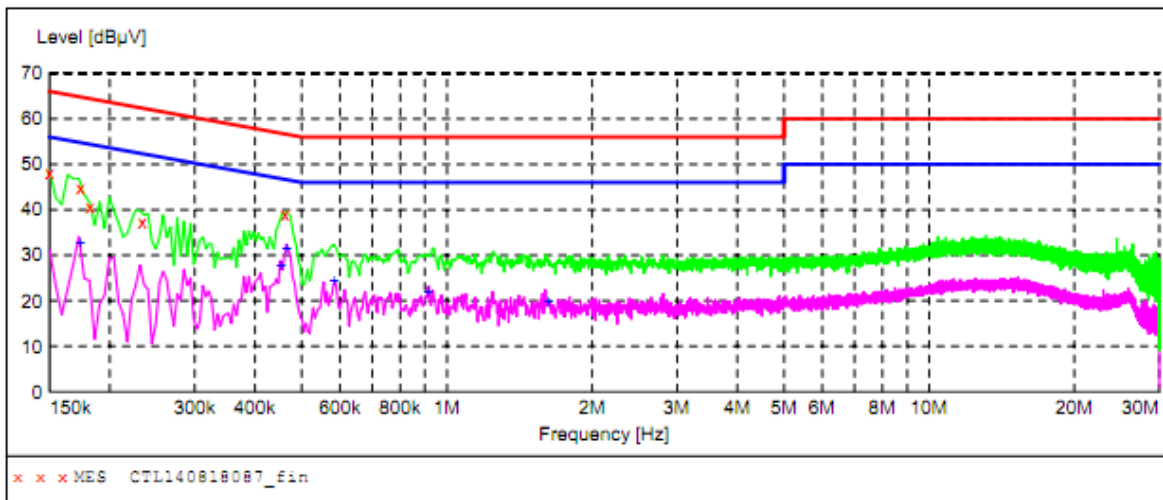
All the test modes completed for test.

Line



Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.154000	47.70	10.2	66	18.1	QP	L1	GND
0.158000	45.70	10.2	66	19.9	QP	L1	GND
0.266000	34.00	10.2	61	27.2	QP	L1	GND
0.378000	29.40	10.2	58	28.9	QP	L1	GND
0.462000	37.50	10.2	57	19.2	QP	L1	GND
0.150000	32.50	10.2	56	23.5	AV	L1	GND
0.174000	30.30	10.2	55	24.5	AV	L1	GND
0.262000	22.70	10.2	51	28.7	AV	L1	GND
0.462000	29.90	10.2	47	16.8	AV	L1	GND
0.530000	20.70	10.2	46	25.3	AV	L1	GND
10.400000	23.00	10.6	50	27.0	AV	L1	GND

Neutral



Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	48.10	10.2	66	17.9	QP	N	GND
0.174000	44.80	10.2	65	20.0	QP	N	GND
0.182000	40.50	10.2	64	23.9	QP	N	GND
0.234000	37.10	10.2	62	25.2	QP	N	GND
0.462000	38.80	10.2	57	17.9	QP	N	GND

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.174000	32.60	10.2	55	22.2	AV	N	GND
0.454000	27.60	10.2	47	19.2	AV	N	GND
0.466000	31.30	10.2	47	15.3	AV	N	GND
0.584000	24.20	10.2	46	21.8	AV	N	GND
0.914000	21.90	10.3	46	24.1	AV	N	GND
1.622000	19.70	10.3	46	26.3	AV	N	GND

## 4 RADIATED EMISSION TEST

### 4.1 Radiation Limit

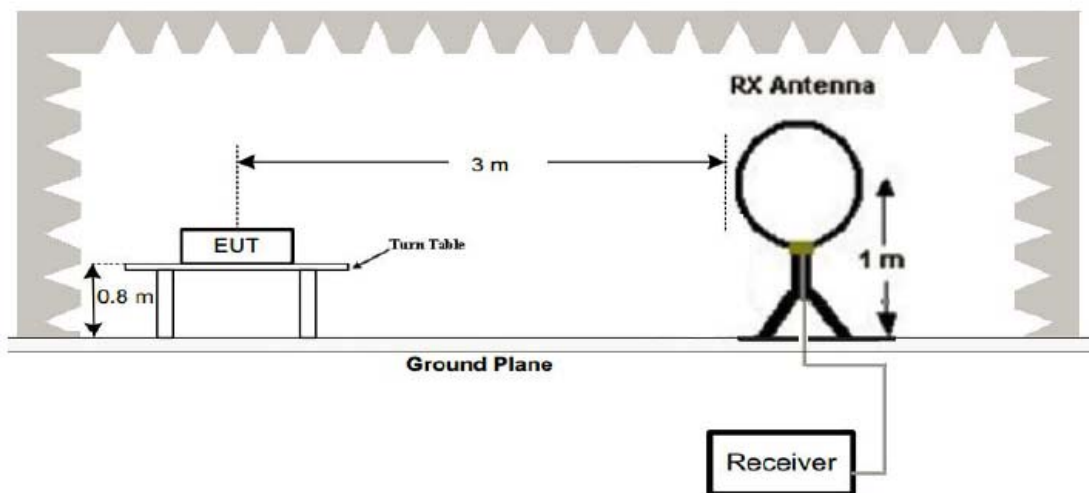
For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance (Meters)	Radiated (dB $\mu$ V/m)	Radiated ( $\mu$ V/m)
30-88	3	40	100
88-216	3	43.5	150
216-960	3	46	200
Above 960	3	54	500

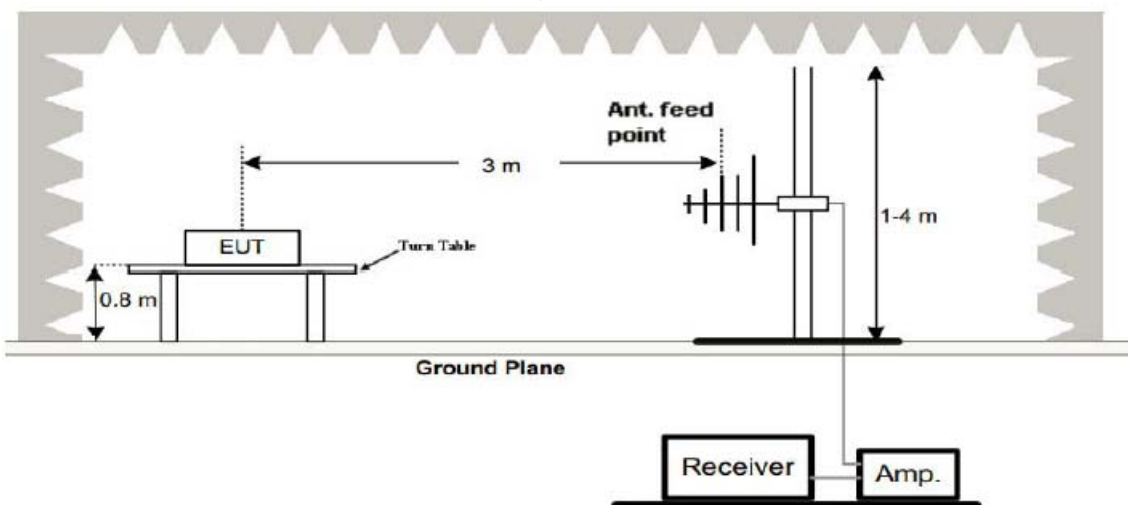
For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

### 4.2 Test Setup

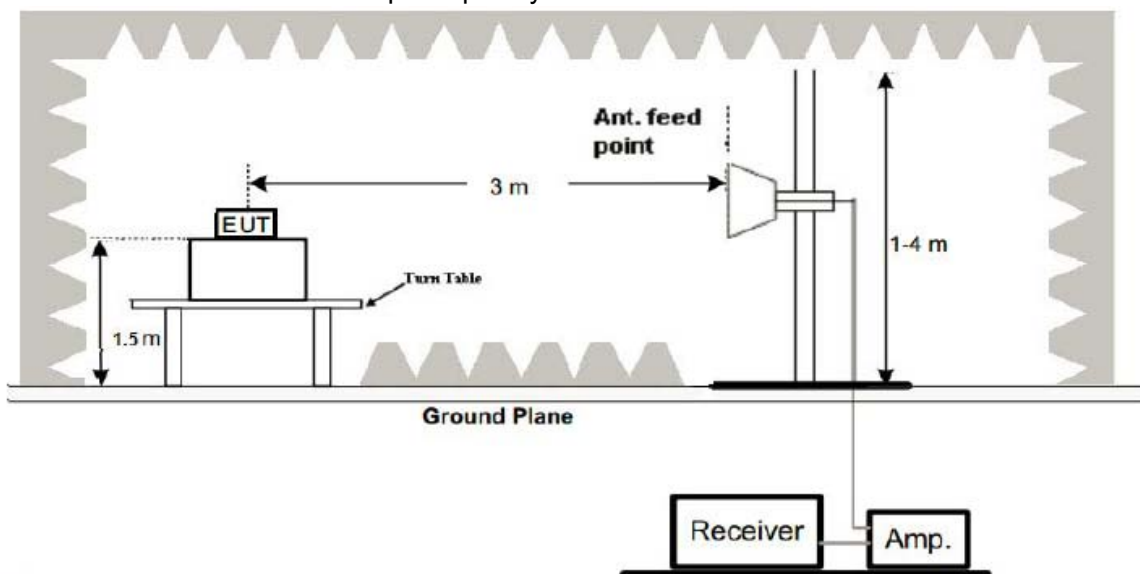
#### (1) Radiated Emission Test-Up Frequency Below 30MHz



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



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



4.3 Test Procedure

1. Below 1GHz measurement the EUT is placed on turntable which is 0.8m above ground plane. And above 1GHz measurement EUT was placed on low permittivity and low tangent turn table which is 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The test frequency range from 9KHz to 25GHz per FCC PART 15.33(a).

Note:

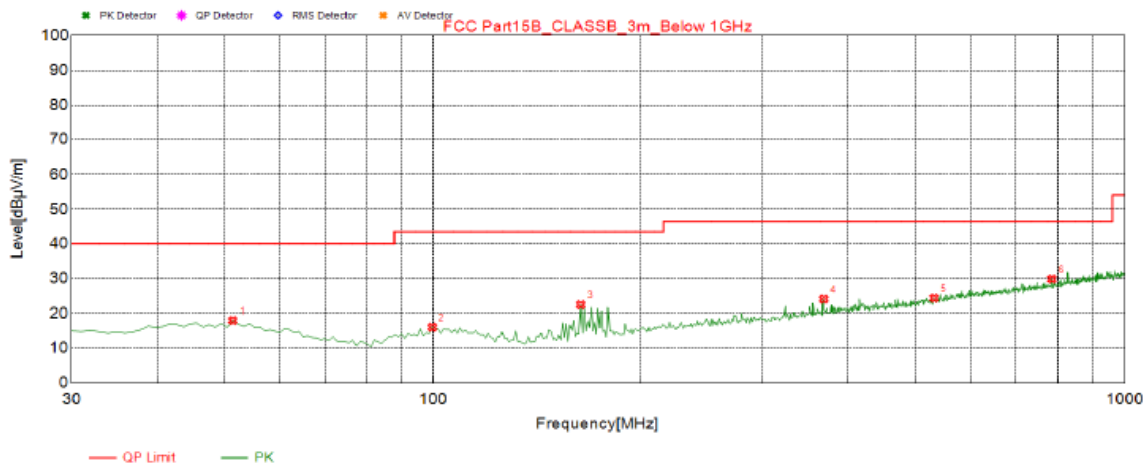
For battery operated equipment, the equipment tests shall be performed using a new battery.

4.4 Test Result

**PASS**

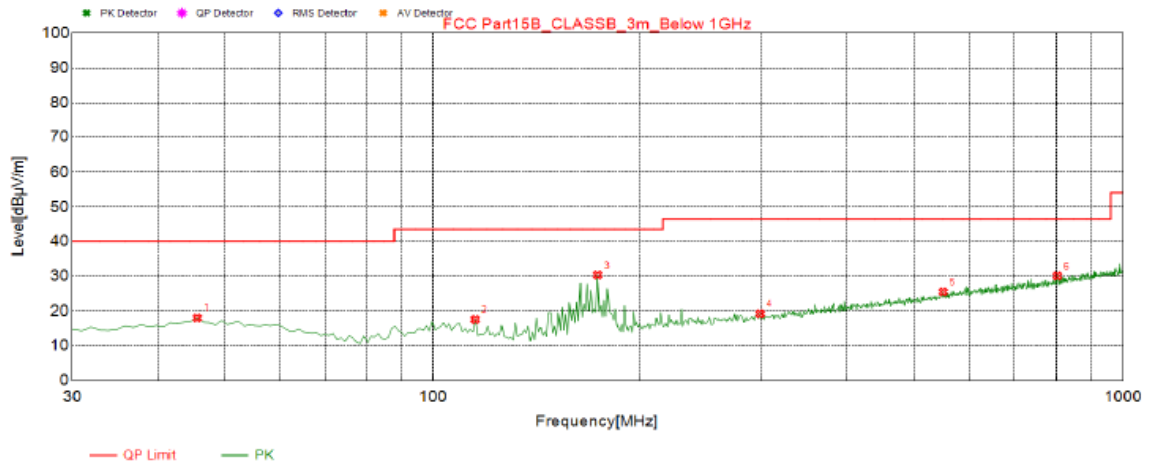
All the test modes completed for test. The worst case of Radiated Emission; the test data of this mode was reported.

Below 1GHz Test Results:  
Antenna polarity: H



Suspected List								
NO.	Freq. [MHz]	Result Level [dBµV]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	51.340	17.99	-14.38	40.00	22.01	300	316	Horizontal
2	99.840	16.06	-16.01	43.50	27.44	300	203	Horizontal
3	163.86	22.45	-18.45	43.50	21.05	300	51	Horizontal
4	368.53	24.06	-10.92	46.50	22.44	100	237	Horizontal
5	532.46	24.35	-7.26	46.50	22.15	100	70	Horizontal
6	784.66	29.92	-3.12	46.50	16.58	300	302	Horizontal

Antenna polarity: V



Suspected List								
NO.	Freq. [MHz]	Result Level [dBµV]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	45.520	18.05	-13.94	40.00	21.95	100	100	Vertical
2	115.36	17.6	-16.88	43.50	25.90	100	163	Vertical
3	173.56	30.4	-17.85	43.50	13.10	100	355	Vertical
4	298.69	19.27	-12.84	46.50	27.23	200	166	Vertical
5	550.89	25.44	-6.81	46.50	21.06	100	229	Vertical
6	803.09	30.14	-2.84	46.50	16.36	100	303	Vertical

Remark:

- (1) Measuring frequencies from 9 KHz to the 1 GHz, Radiated emission test from 9KHz to 30MHz was verified, and no any emission was found except system noise floor.
- (2) \* denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (3) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.



Above 1 GHz Test Results:

LOW CH 36 (802.11 a Mode)/5180

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3647	59.63	-4.59	55.04	74	-18.96	peak
3647	47.20	-4.59	42.61	54	-11.39	AVG
10360	52.74	3.74	56.48	74	-17.52	peak
10360	39.98	3.74	43.72	54	-10.28	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3647	59.11	-4.59	54.52	74	-19.48	peak
3647	46.04	-4.59	41.45	54	-12.55	AVG
10360	51.89	3.74	55.63	74	-18.37	peak
10360	39.07	3.74	42.81	54	-11.19	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

MID CH40 (802.11 a Mode)/5200  
Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3647	59.97	-4.59	55.38	74	-18.62	peak
3647	46.25	-4.59	41.66	54	-12.34	AVG
10400	52.99	3.74	56.73	74	-17.27	peak
10400	38.31	3.74	42.05	54	-11.95	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3647	60.16	-4.59	55.57	74	-18.43	peak
3647	45.15	-4.59	40.56	54	-13.44	AVG
10400	53.89	3.74	57.63	74	-16.37	peak
10400	39.71	3.74	43.45	54	-10.55	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

HIGH CH 48 (802.11a Mode)/5240  
Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3647	58.32	-4.59	53.73	74	-20.27	peak
3647	44.06	-4.59	39.47	54	-14.53	AVG
10480	52.01	3.75	55.76	74	-18.24	peak
10480	38.09	3.75	41.84	54	-12.16	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3647	59.02	-4.59	54.43	74	-19.57	peak
3647	45.21	-4.59	40.62	54	-13.38	AVG
10480	51.74	3.75	55.49	74	-18.51	peak
10480	37.82	3.75	41.57	54	-12.43	AVG
---	---	---	---	---	---	---
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Remark:

- (1) Measuring frequencies from 1 GHz to the 25 GHz.
- (2) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) \* denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (4) Data of measurement within this frequency range shown "----" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.
- (6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.

LOW CH 36 (802.11 n20 Mode)/5180  
Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3054	60.63	-4.79	55.84	74	-18.16	peak
3054	46.05	-4.79	41.26	54	-12.74	AVG
10360	53.67	3.74	57.41	74	-16.59	peak
10360	40.28	3.74	44.02	54	-9.98	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3054	59.07	-4.79	54.28	74	-19.72	peak
3054	46.40	-4.79	41.61	54	-12.39	AVG
10360	52.72	3.74	56.46	74	-17.54	peak
10360	38.59	3.74	42.33	54	-11.67	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

MID CH40 (802.11 n20 Mode)/5200  
Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3054	59.95	-4.79	55.16	74	-18.84	peak
3054	46.43	-4.79	41.64	54	-12.36	AVG
10400	53.99	3.74	57.73	74	-16.27	peak
10400	40.18	3.74	43.92	54	-10.08	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3054	58.51	-4.79	53.72	74	-20.28	peak
3054	44.30	-4.79	39.51	54	-14.49	AVG
10400	51.94	3.74	55.68	74	-18.32	peak
10400	38.53	3.74	42.27	54	-11.73	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

HIGH CH 48 (802.11 n20 Mode)/5240  
Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3054	58.94	-4.79	54.15	74	-19.85	peak
3054	46.14	-4.79	41.35	54	-12.65	AVG
10480	51.92	3.75	55.67	74	-18.33	peak
10480	38.98	3.75	42.73	54	-11.27	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3054	58.27	-4.79	53.48	74	-20.52	peak
3054	45.40	-4.79	40.61	54	-13.39	AVG
10480	51.67	3.75	55.42	74	-18.58	peak
10480	38.11	3.75	41.86	54	-12.14	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Remark:

- (1) Measuring frequencies from 1 GHz to the 25 GHz.
- (2) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) \* denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (4) Data of measurement within this frequency range shown "----" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.
- (6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.

LOW CH38 (802.11n40 Mode)/5190  
Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3432	59.39	-5.21	54.18	74	-19.82	peak
3432	46.17	-5.21	40.96	54	-13.04	AVG
10380	52.09	3.74	55.83	74	-18.17	peak
10380	39.53	3.74	43.27	54	-10.73	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3432	58.92	-5.21	53.71	74	-20.29	peak
3432	45.09	-5.21	39.88	54	-14.12	AVG
10380	51.53	3.74	55.27	74	-18.73	peak
10380	37.70	3.74	41.44	54	-12.56	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

HIGH CH46 (802.11n40 Mode)/5230  
Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3432	59.48	-5.21	54.27	74	-19.73	peak
3432	46.32	-5.21	41.11	54	-12.89	AVG
10460	53.09	3.75	56.84	74	-17.16	peak
10460	38.73	3.75	42.48	54	-11.52	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3432	59.95	-5.21	54.74	74	-19.26	peak
3432	46.74	-5.21	41.53	54	-12.47	AVG
10460	53.22	3.75	56.97	74	-17.03	peak
10460	39.59	3.75	43.34	54	-10.66	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Remark:

- (1) Measuring frequencies from 1 GHz to the 25 GHz.
- (2) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) \* denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (4) Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.
- (6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.



LOW CH 42 (802.11ac Mode)/5210  
Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2921	59.60	-6.18	53.42	74	-20.58	peak
2921	46.05	-6.18	39.87	54	-14.13	AVG
10420	51.60	3.75	55.35	74	-18.65	peak
10420	38.36	3.75	42.11	54	-11.89	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2921	60.72	-6.18	54.54	74	-19.46	peak
2921	46.84	-6.18	40.66	54	-13.34	AVG
10420	52.72	3.75	56.47	74	-17.53	peak
10420	38.98	3.75	42.73	54	-11.27	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Remark:

- (1) Measuring frequencies from 1 GHz to the 25 GHz.
- (2) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) \* denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (4) Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.
- (6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.

## 5 BAND EDGE

### 5.1 Limits

FCC PART 15.407 Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

Except as shown in paragraph (7) 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 5.15-5.25 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 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. The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.
6. Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.
7. The provisions of §15.205 apply to intentional radiators operating under this section.
8. When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits

### 5.2 Test Procedure

The band edge compliance of RF radiated emission should be measured by following the guidance in ANSI C63.10 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW to 100KHz and VBW to 300KHz to measure the peak field strength and set RBW to 1MHz and VBW to 10Hz to measure the average radiated field strength. The conducted RF band edge was measured by using a spectrum analyzer. Set span wide enough to capture the highest in-band emission and the emission at the band edge. Set RBW to 100 KHz and VBW to 300 KHz, to measure the conducted peak band edge.

### 5.3 Test Result

**PASS.**

Radiated Band Edge Test:  
 Operation Mode: 802.11a Mode TX CH Low  
 Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB $\mu$ V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)	
5150	52.28	-2.49	49.79	74	-24.21	peak
5150	/	-2.49	/	54	/	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB $\mu$ V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)	
5150	51.46	-2.49	48.97	74	-25.03	peak
5150	/	-2.49	/	54	/	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Operation Mode: TX CH High with 5.2G  
Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5250	52.96	-2.28	50.68	74	-23.32	peak
5250	/	-2.28	/	54	/	AVG
5350	48.66	-2.11	46.55	74	-27.45	peak
5350	/	-2.11	/	54	/	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5250	54.09	-2.28	51.81	74	-22.19	peak
5250	/	-2.28	/	54	/	AVG
5350	47.79	-2.11	45.68	74	-28.32	peak
5350	/	-2.11	/	54	/	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Operation Mode: 802.11n20 Mode TX CH Low  
Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB $\mu$ V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)	
5150	50.76	-2.49	48.27	74	-25.73	peak
5150	/	-2.49	/	54	/	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB $\mu$ V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)	
5150	50.01	-2.49	47.52	74	-26.48	peak
5150	/	-2.49	/	54	/	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Operation Mode: TX CH High  
Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
5250	53.55	-2.28	51.27	74	-22.73	peak
5250	/	-2.28	/	54	/	AVG
5350	49.22	-2.11	47.11	74	-26.89	peak
5350	/	-2.11	/	54	/	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
5250	52.53	-2.28	50.25	74	-23.75	peak
5250	/	-2.28	/	54	/	AVG
5350	48.27	-2.11	46.16	74	-27.84	peak
5350	/	-2.11	/	54	/	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Operation Mode: 802.11 n40 Mode TX CH Low  
Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB $\mu$ V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)	
5150	51.60	-2.49	49.11	74	-24.89	peak
5150	/	-2.49	/	54	/	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB $\mu$ V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)	
5150	51.11	-2.49	48.62	74	-25.38	peak
5150	/	-2.49	/	54	/	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Operation Mode: TX CH High  
Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB $\mu$ V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)	
5250	52.84	-2.28	50.56	74	-23.44	peak
5250	/	-2.28	/	54	/	AVG
5350	48.15	-2.11	46.04	74	-27.96	peak
5350	/	-2.11	/	54	/	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB $\mu$ V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)	
5250	52.16	-2.28	49.88	74	-24.12	peak
5250	/	-2.28	/	54	/	AVG
5350	47.29	-2.11	45.18	74	-28.82	peak
5350	/	-2.11	/	54	/	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.



Operation Mode: 802.11ac Mode TX CH Low  
Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB $\mu$ V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)	
5150	50.36	-2.49	47.87	74	-26.13	peak
5150	/	-2.49	/	54	/	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB $\mu$ V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)	
5150	49.71	-2.49	47.22	74	-26.78	peak
5150	/	-2.49	/	54	/	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Operation Mode: TX CH High  
Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5250	52.96	-2.28	50.68	74	-23.32	peak
5250	/	-2.28	/	54	/	AVG
5350	48.53	-2.11	46.42	74	-27.58	peak
5350	/	-2.11	/	54	/	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5250	52.33	-2.28	50.05	74	-23.95	peak
5250	/	-2.28	/	54	/	AVG
5350	47.69	-2.11	45.58	74	-28.42	peak
5350	/	-2.11	/	54	/	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

## 6 FREQUENCY STABILITY

### 6.1 Test 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 users manual.

### 6.2 Test Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyser. EUT have transmitted absence of modulation signal and fixed channelize. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth. Set RBW = 10 kHz, VBW =10 kHz with peak detector and maxhold settings.  $f_c$  is declaring of channel frequency. Then the frequency error formula is  $(f_c-f)/f_c \times 10^6$  ppm and the limit is less than  $\pm 20$ ppm (IEEE802.11a specification). The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value.
2. Extreme temperature rule is  $-30^{\circ}\text{C} \sim 50^{\circ}\text{C}$ .

### 6.3 Measurement Equipment Used

Same as Radiated Emission Measurement

### 6.4 Test Result

**PASS**

All the test modes completed for test.

Mode	Voltage (V)	FHL (5180MHz)	Deviation (KHz)	FHH (5240MHz)	Deviation (KHz)
5.2G Band	132 V	5179.983	17	5239.981	19
	120 V	5179.981	19	5239.979	21
	108 V	5179.982	18	5239.975	25

Mode	Temperature (°C)	FHL (5180MHz)	Deviation (KHz)	FHH (5240MHz)	Deviation (KHz)
5.2G Band	-30	5179.952	48	5239.951	49
	-20	5179.961	39	5239.964	36
	-10	5179.972	28	5239.972	28
	0	5179.975	25	5239.975	25
	10	5179.977	23	5239.979	21
	20	5179.984	14	5239.987	13
	30	5179.979	21	5239.982	18
	40	5179.973	27	5239.973	27
	50	5179.971	29	5239.971	29

## 7 OCCUPIED BANDWIDTH MEASUREMENT

### 7.1 Test Limit

Please refer section 15.407

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

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz

### 7.2 Test Procedure

Details see the KDB558074 D01 Meas Guidance

a) The bandwidth is measured at an amplitude level reduced 26dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

b) The test receiver set RBW = 1-5 % EBW, VBW ≥ 3RBW, Sweep time set auto, detail see the test plot.

### 7.3 Measurement Equipment Used

Same as Radiated Emission Measurement

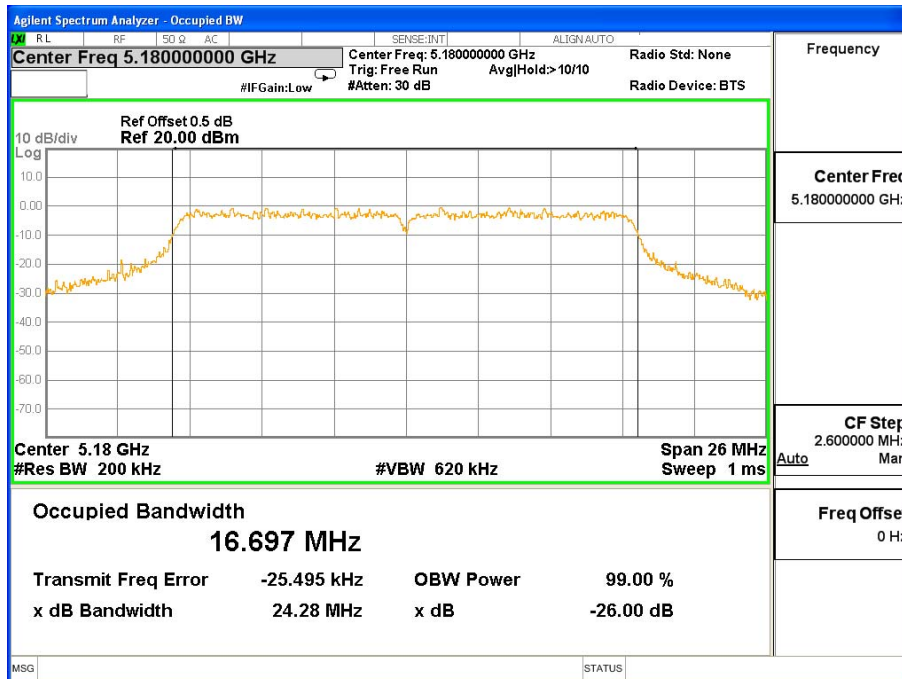
### 7.4 Test Result

**PASS**

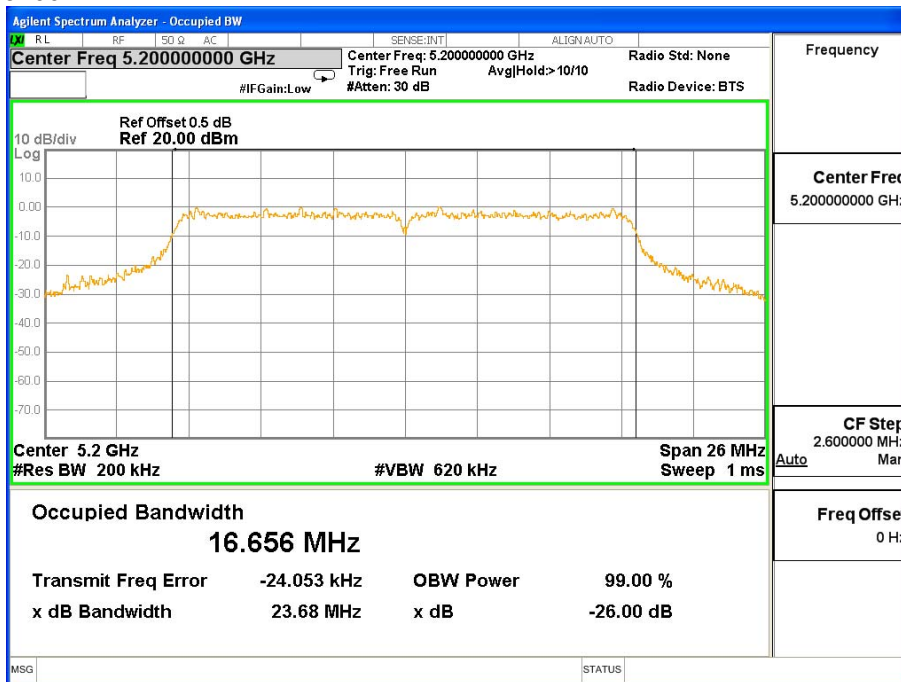
All the test modes completed for test.

TX 802.11a Mode			
Frequency	26dB Bandwidth (MHz)	Channel Separation (MHz)	Result
5180 MHz	24.28	/	PASS
5200 MHz	23.68	/	PASS
5240 MHz	23.39	/	PASS

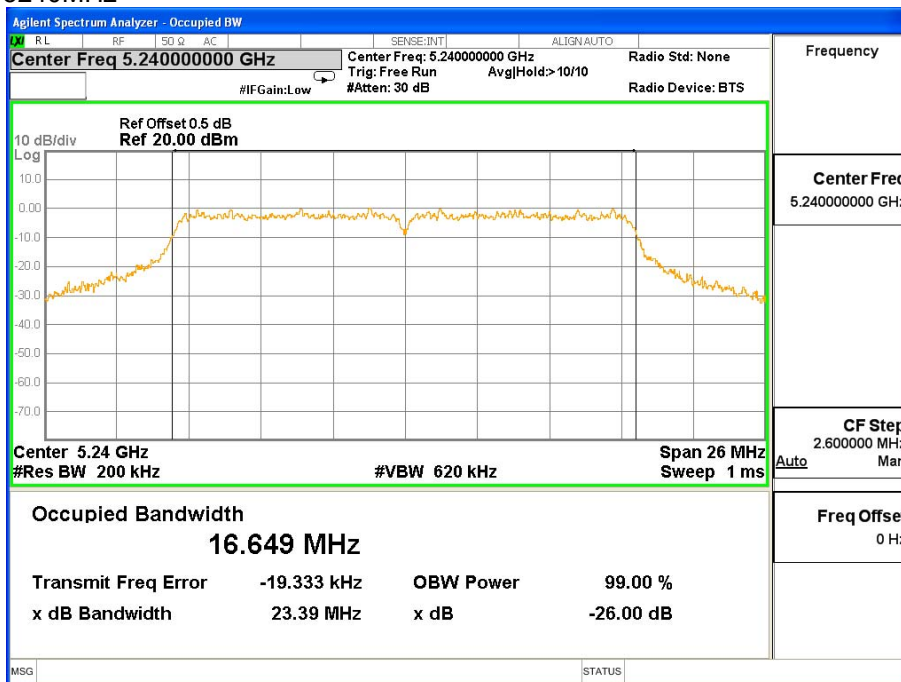
CH: 5180MHz



CH: 5200MHz

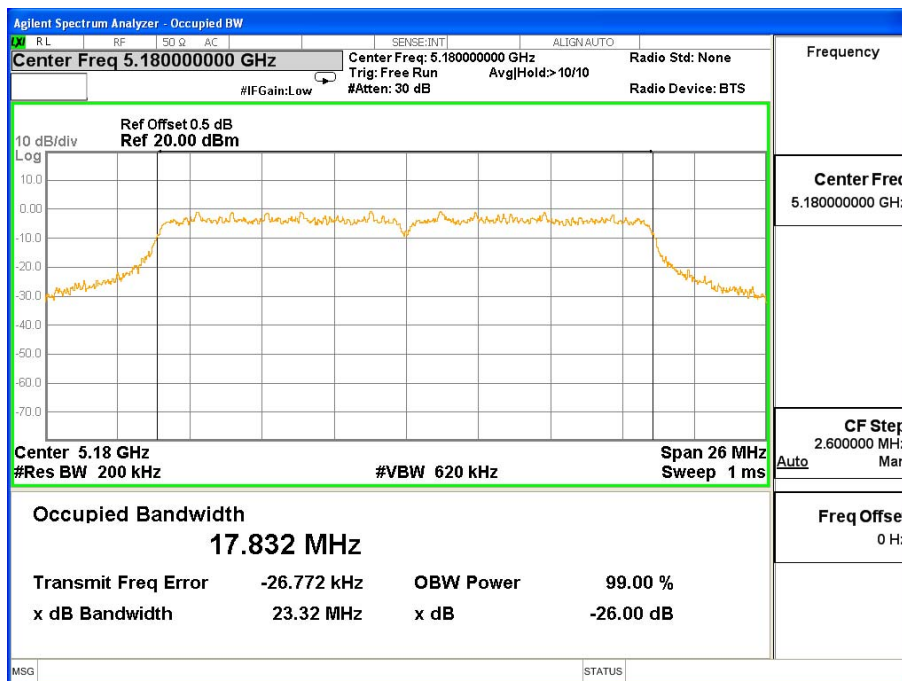


CH: 5240MHz



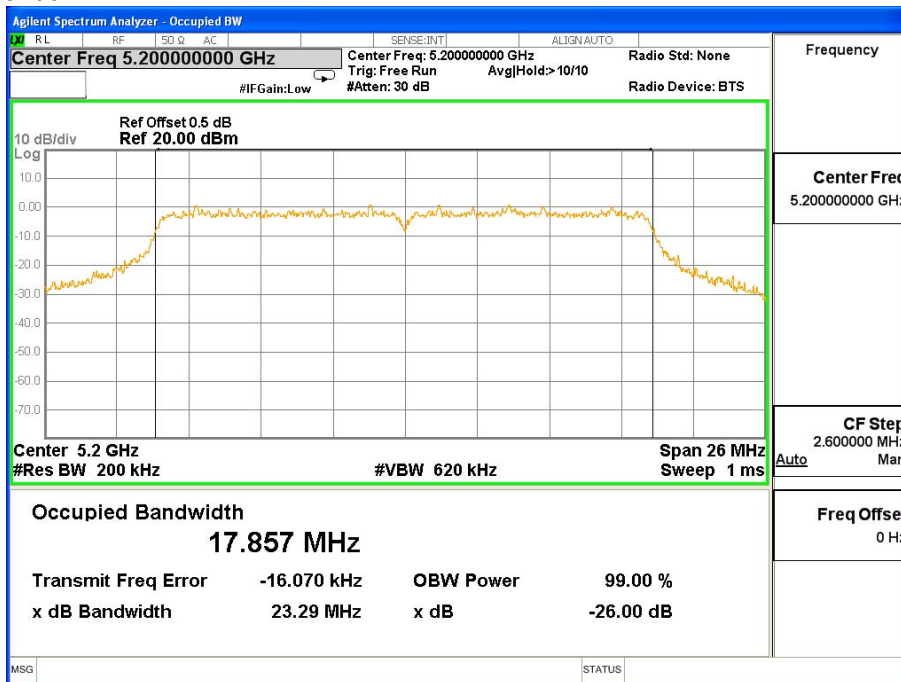
TX 802.11n20 Mode			
Frequency	26dB Bandwidth (MHz)	Channel Separation (MHz)	Result
5180 MHz	23.32	/	PASS
5200 MHz	23.29	/	PASS
5240 MHz	24.11	/	PASS

CH: 5180MHz

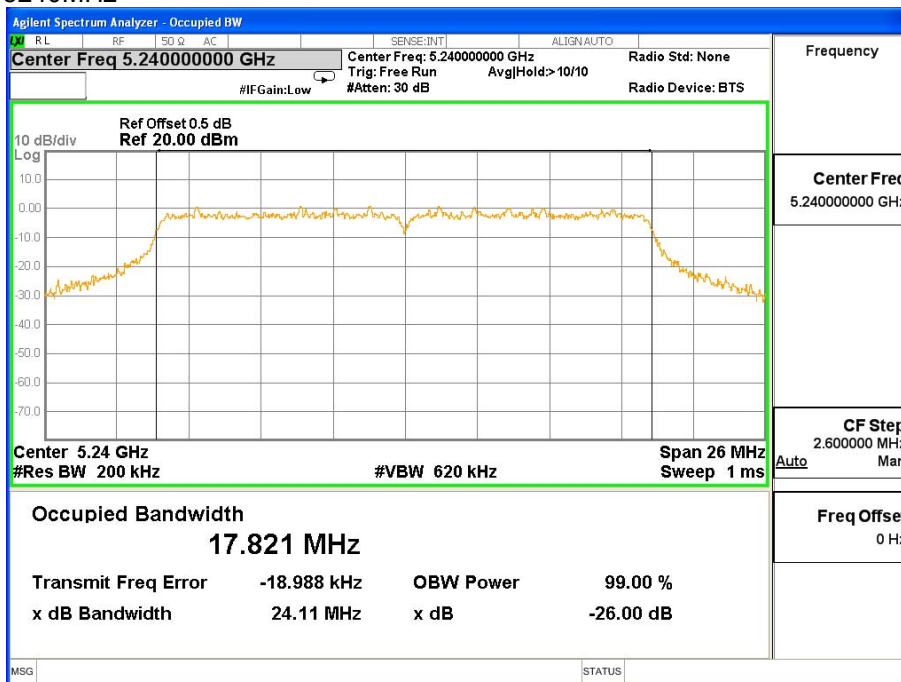




CH: 5200MHz

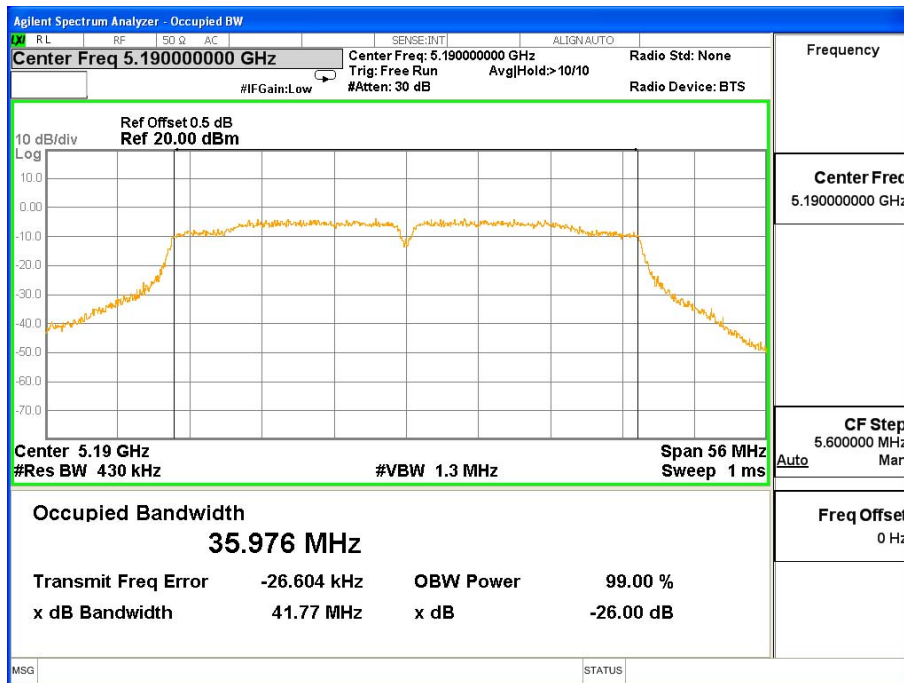


CH: 5240MHz

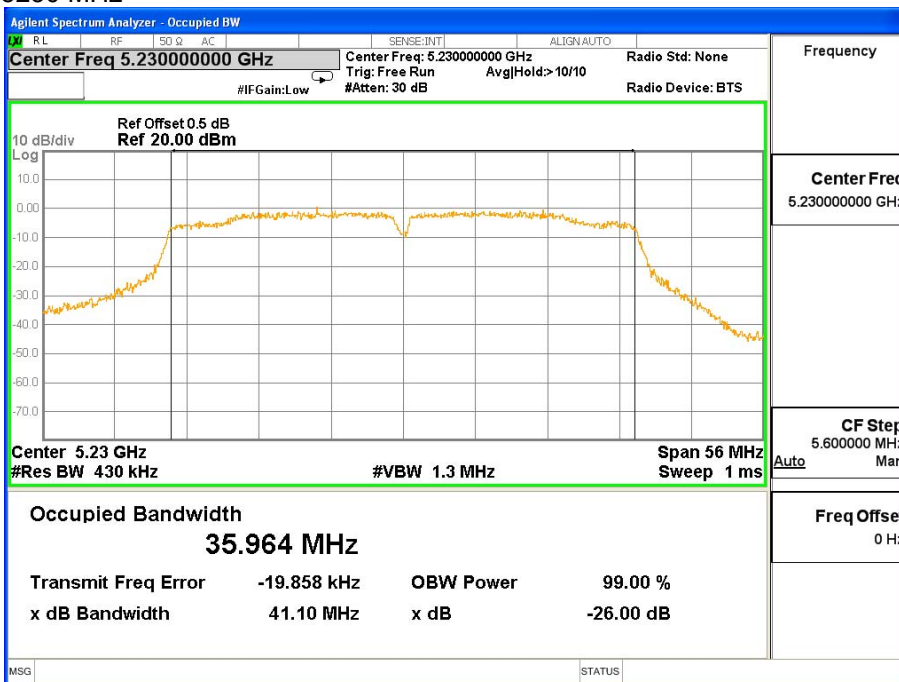


TX 802.11n40 Mode			
Frequency	26dB Bandwidth (MHz)	Channel Separation (MHz)	Result
5190 MHz	41.77	/	PASS
5230 MHz	41.10	/	PASS

CH: 5190 MHz

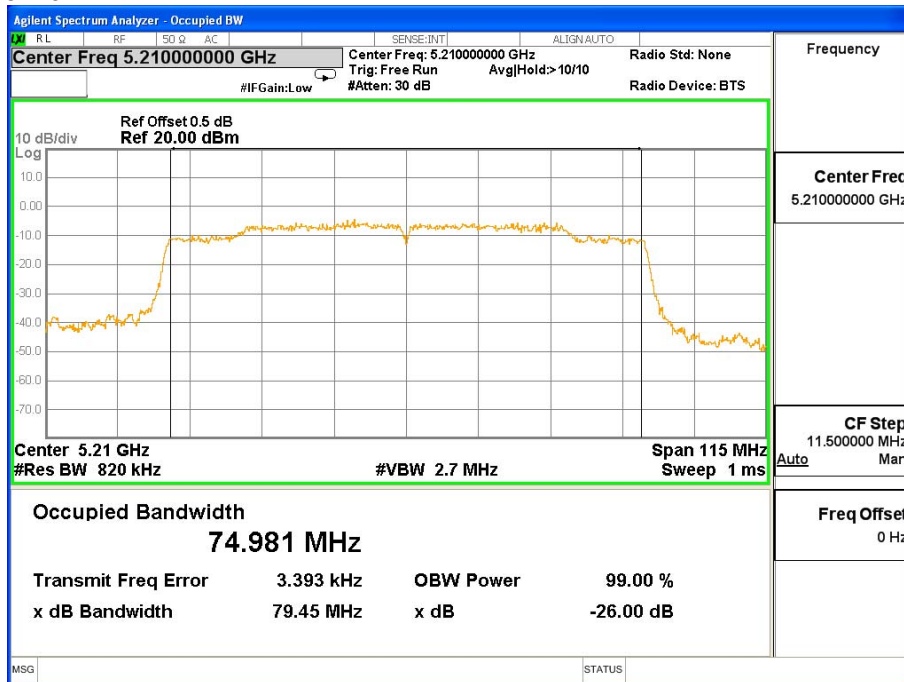


CH: 5230 MHz



TX 802.11ac Mode			
Frequency	26dB Bandwidth (MHz)	Channel Separation (MHz)	Result
5210 MHz	79.45	/	PASS

CH: 5210MHz



## 8 POWER SPECTRAL DENSITY TEST

### 8.1 Test Limit

#### Band 5150-5250MHz

For 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. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz 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

#### Band 5725-5850MHz

The maximum conducted output power shall not exceed 1 W. The power spectral density shall not exceed 30 dBm in any 500 kHz band

### 8.2 Test Procedure

Details see the KDB558074 DTS Meas Guidance V03

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 1MHz, VBW = 3MkHz, span=5-30%EBW, detail see the test plot.
4. Record the max reading.
5. Repeat the above procedure until the measurements for all frequencies are completed.

### 8.3 Measurement Equipment Used

Same as Radiated Emission Measurement

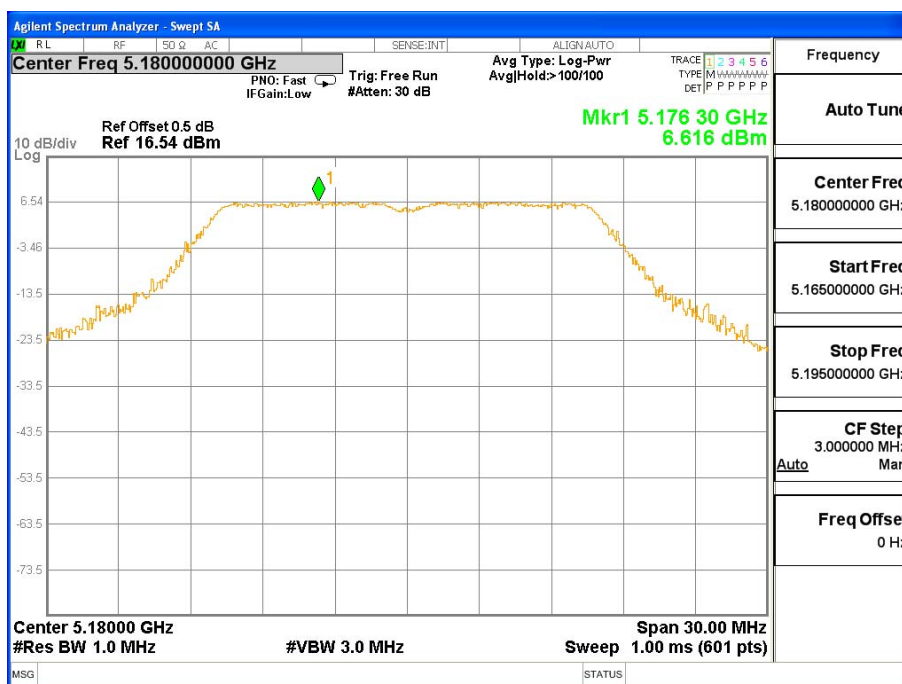
### 8.4 Test Result

**PASS**

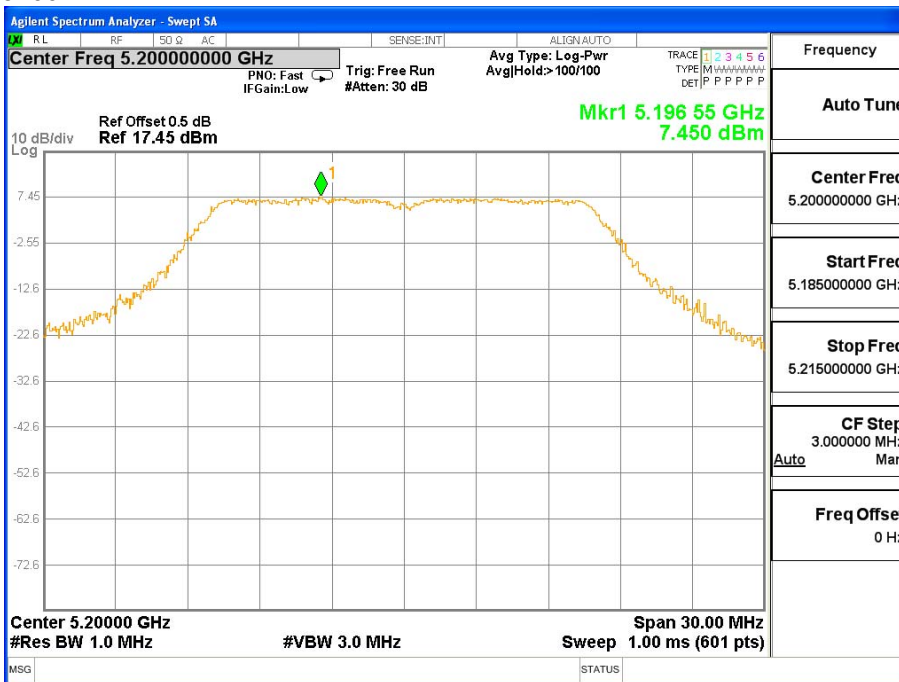
All the test modes completed for test.

TX 802.11a Mode			
Frequency	Power Density (dBm)	Limit (dBm)	Result
5180 MHz	6.616	11	PASS
5200 MHz	7.450	11	PASS
5240 MHz	7.106	11	PASS

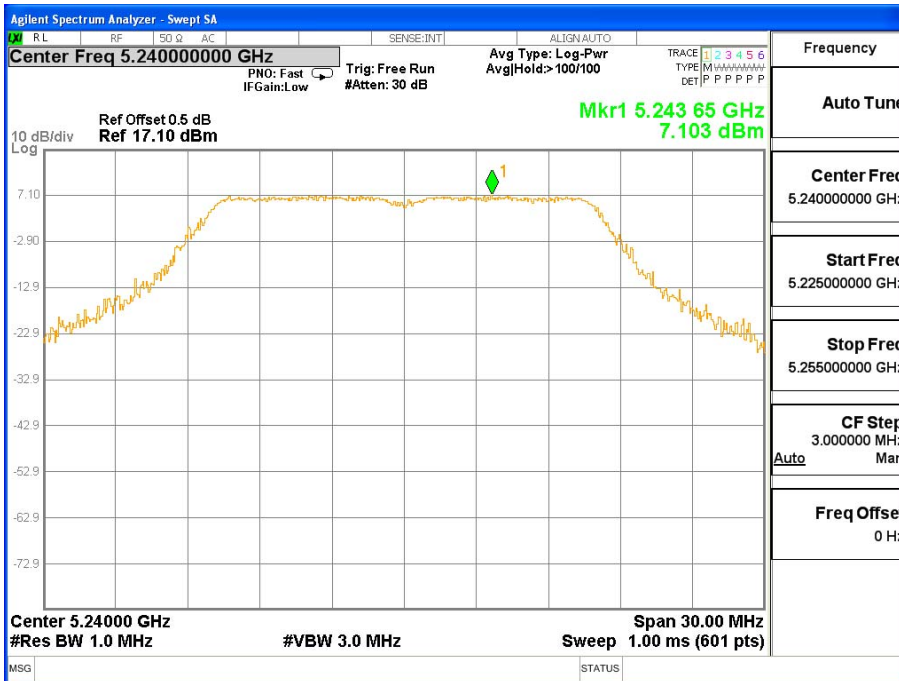
CH: 5180MHz



CH: 5200MHz

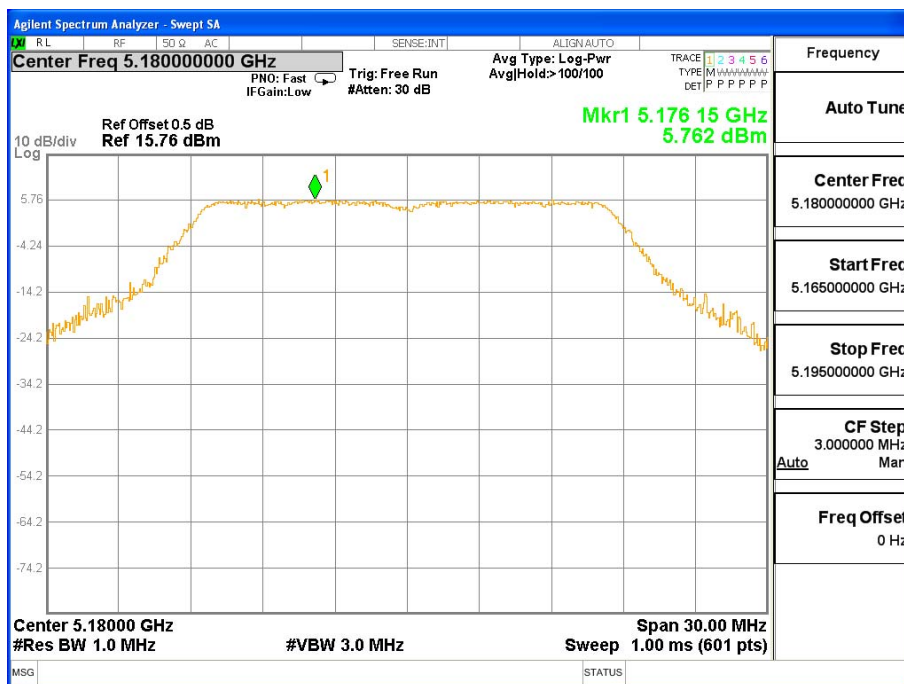


CH: 5240MHz



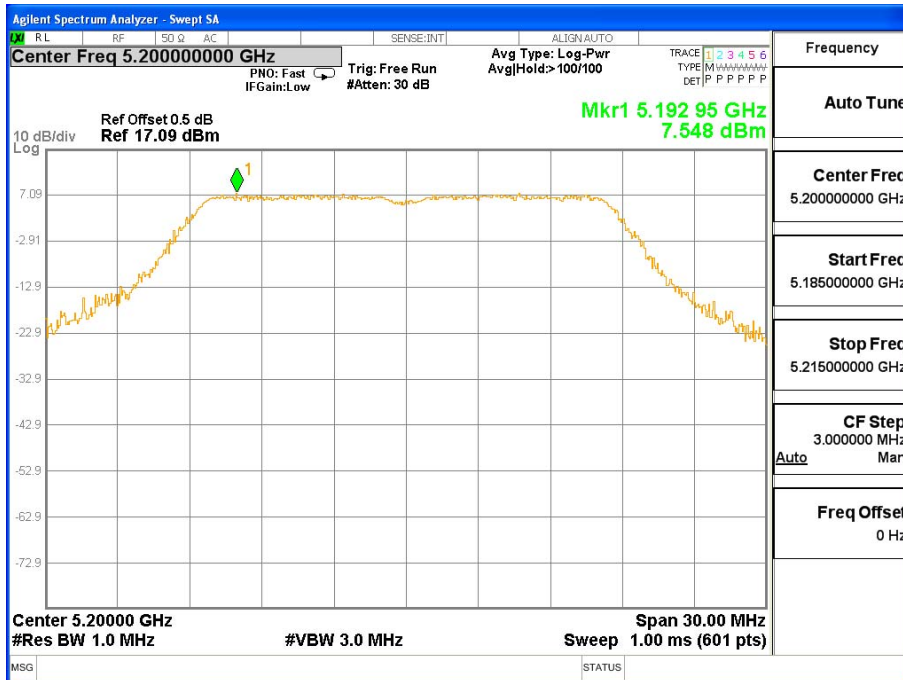
TX 802.11n20 Mode			
Frequency	Power Density (dBm)	Limit (dBm)	Result
5180 MHz	5.762	11	PASS
5200 MHz	7.548	11	PASS
5240 MHz	7.188	11	PASS

CH: 5180MHz

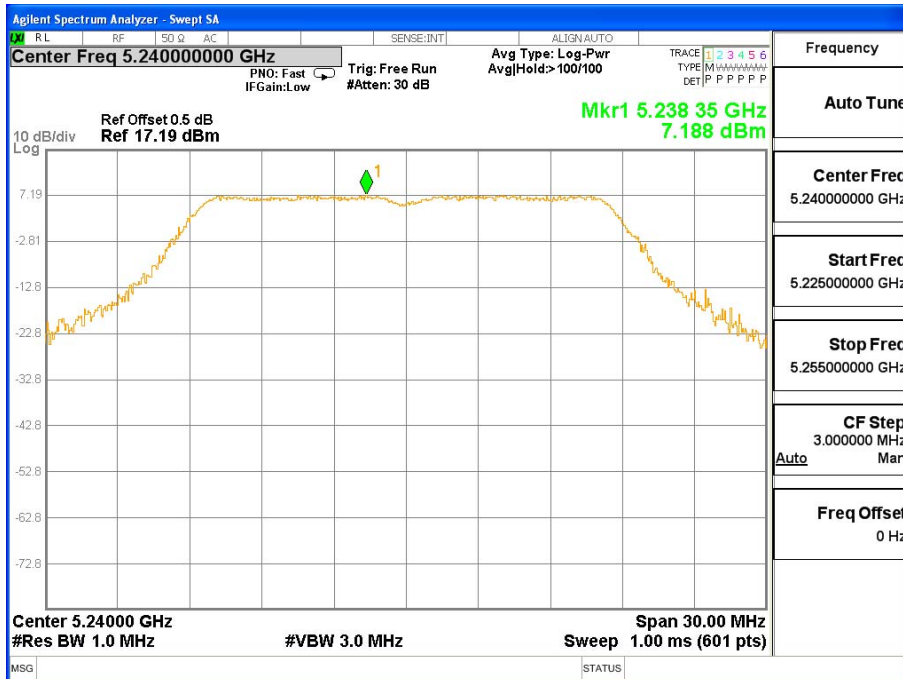




CH: 5200MHz

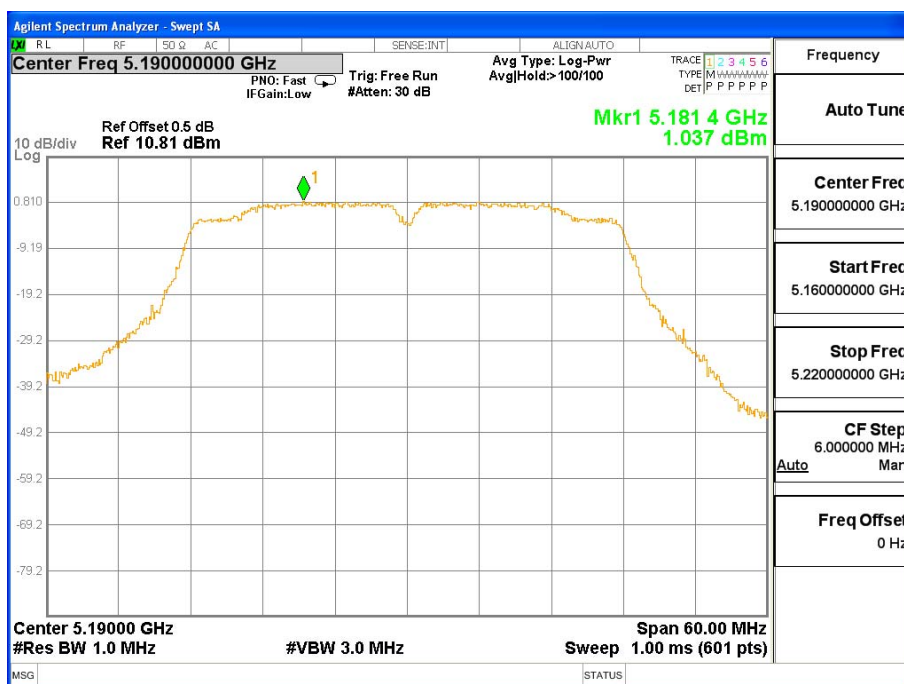


CH: 5240MHz

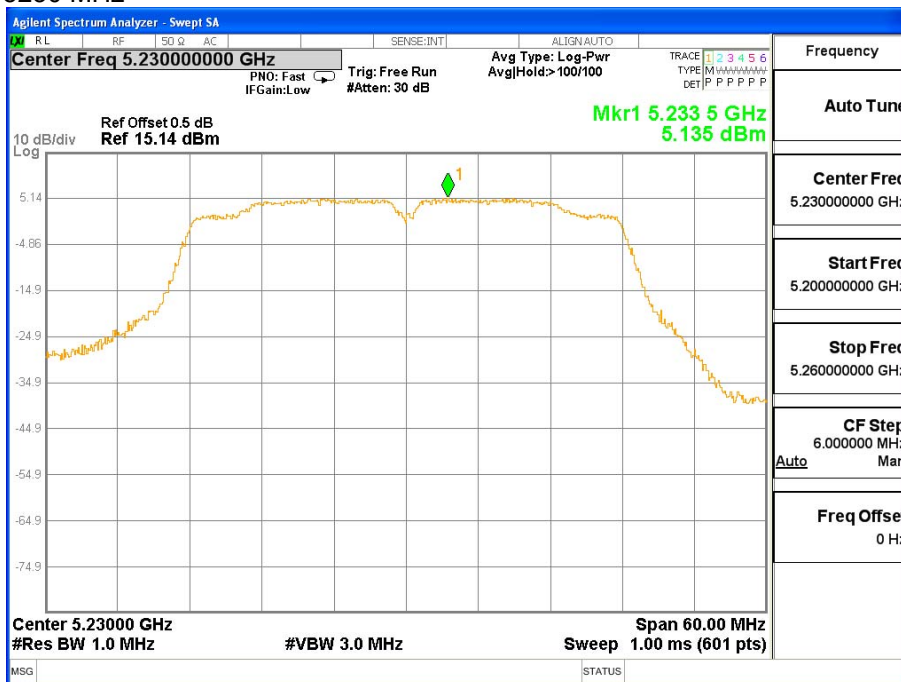


TX 802.11n40 Mode			
Frequency	Power Density (dBm)	Limit (dBm)	Result
5190 MHz	1.037	11	PASS
5230 MHz	5.135	11	PASS

CH: 5190 MHz

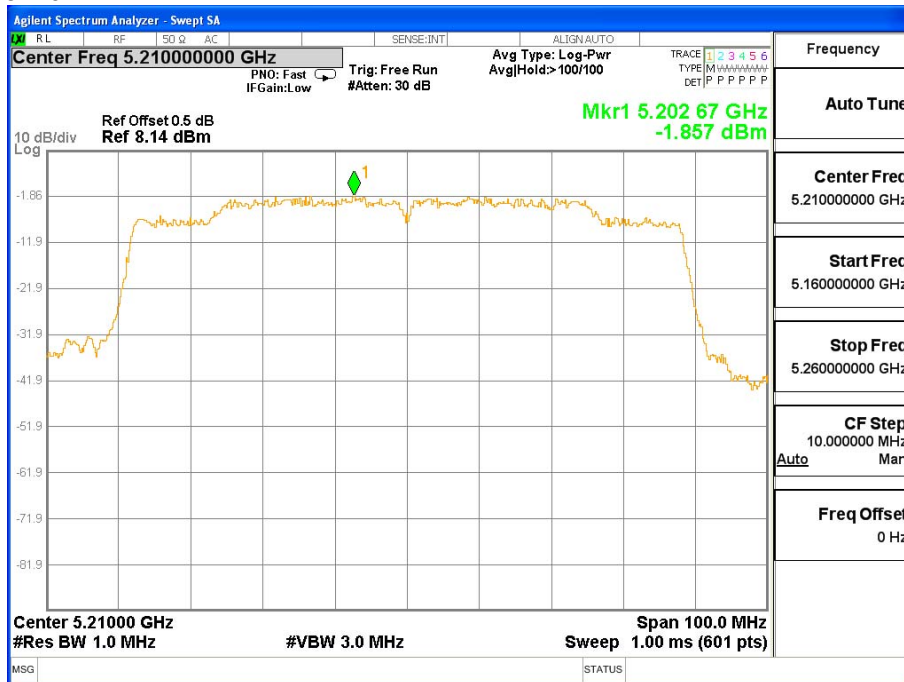


CH: 5230 MHz



TX 802.11ac Mode			
Frequency	Power Density (dBm)	Limit (dBm)	Result
5210 MHz	-1.857	11	PASS

CH: 5210MHz



## 9 PEAK OUTPUT POWER TEST

### 9.1 Test Limit

#### Band 5150-5250MHz

For 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. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz 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

#### Band 5725-5850MHz

The maximum conducted output power shall not exceed 1 W. The power spectral density shall not exceed 30 dBm in any 500 kHz band

### 9.2 Test Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The EUT was directly connected to the Power meter.

### 9.3 Measurement Equipment Used

Same as Radiated Emission Measurement

### 9.4 Test Result

#### **PASS**

All the test modes completed for test.

<b>TX 802.11a Mode</b>			
Test	Frequency	Maximum Peak Conducted Output Power	LIMIT
Channe	(MHz)	(dBm)	dBm
CH36	5180	16.81	24
CH40	5200	16.87	24
CH48	5240	16.93	24
<b>TX 802.11n20 Mode</b>			
CH36	5180	16.69	24
CH40	5200	16.72	24
CH48	5240	16.82	24
<b>TX 802.11n40 Mode</b>			
CH38	5190	16.46	24
CH46	5230	16.57	24
<b>TX 802.11ac Mode</b>			
CH42	5210	15.73	24

## 10 ANTENNA REQUIREMENT

### Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.249, if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

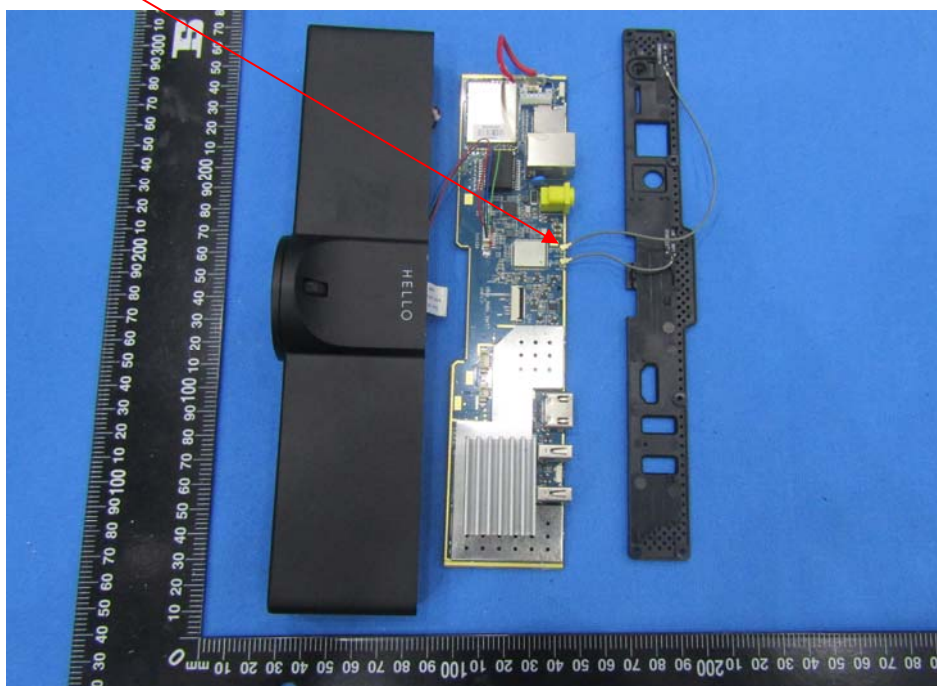
### Refer to statement below for compliance.

The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

### Antenna Connected Construction

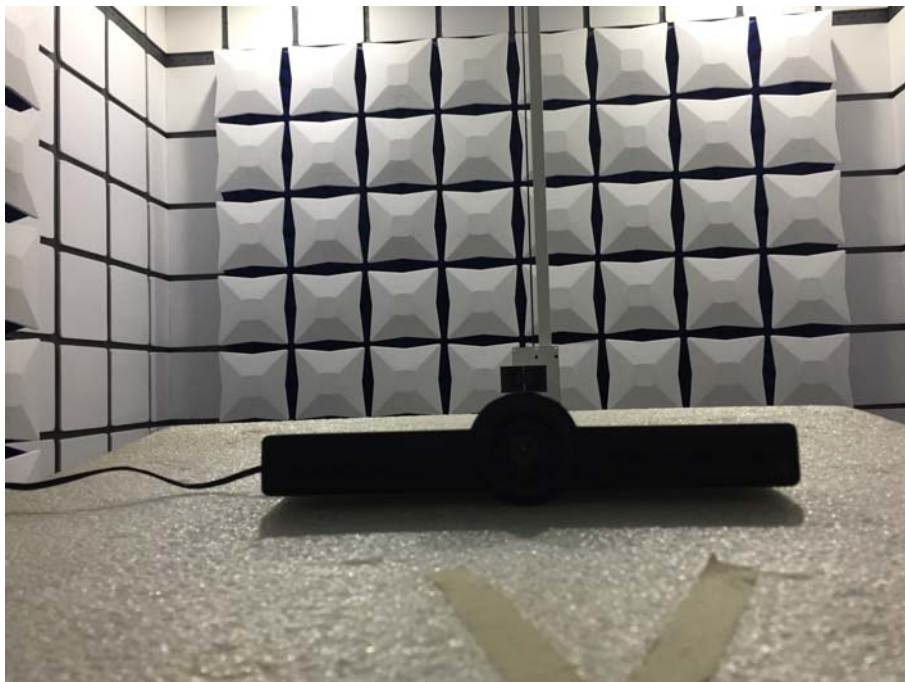
The antenna used in this product is a Integral Antenna, The directional gains of antenna used for transmitting is 2dBi.

### 5G WIFI ANTENNA



## 11 PHOTOGRAPH OF TEST

### 11.1 Radiated Emission





### 11.2 Conducted Emission

