FCC TEST REPORT

Report No: STS1710138W04

Issued for

Protempo Ltd

21 Taylors Road, Morningside, Auckland 1025, New Zealand.

Product Name:	Ultra Mini 4K Streaming PC / Mini Smart Cloud PC
Brand Name:	Ollee
Test Model Name:	MAHMG
Series Model:	MAPMG
FCC ID:	2AN4T-MPC-AMG
Test Standard:	FCC Part 15.407

Shenzhen STS Test Services Co., Ltd.
1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road,
Fuyong Street, Bao'an District, Shenzhen, Guangdong, China
TEL: +86-755 3688 6288 FAX: +86-755 3688 6277 E-mail:sts@stsapp.com

TEST RESULT CERTIFICATION

Applicant's name	:	Protempo Ltd
Address	:	21 Taylors Road, Morningside, Auckland 1025, New Zealand.
Manufacture's Name	:	ILIFE Technology (HK) Limited
Address	:	3rd Floor, Bld.3, LiJinChen Industrial Park, The East of Gong Ye Road, Longhua, shenzhen, China
Product description		
Product name	:	Ultra Mini 4K Streaming PC / Mini Smart Cloud PC
Trade mark	:	Ollee
Test model name	:	MAHMG
Series model	:	MAPMG
Standards	:	FCC Part15.407
Test procedure		ANSI C63.10-2013

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

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Date of Test	:	
Date (s) of performance of tests	:	21 Oct. 2017 ~25 Oct. 2017
Date of Issue	:	27 Oct. 2017
Test Result	:	**Pass**

Testing Engineer : Sean She

(Sean she)

Technical Manager : Hakim. hou

(Hakim.hou)

Authorized Signatory : Vita Li

(Vita Li)

Table of Contents **Page**

Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	27 Oct. 2017	STS1710138W04	ALL	Initial Issue

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:
§ 15.407,KDB 789033 D02 General U-NII Test Procedures New Rules v01r04

FCC Part 15.407		
FCC standard	Test Item	Results
15.207	AC Conducted Emission	PASS
§ 15.407 (2) (26 dB) / § 15.407 (e) (6 dB)/ § 15.407 (a) (99%)	26dB/6dB &99% Bandwidth	PASS
15.407(a) (1).(2).(3).(4).(5)	Maximum Conducted Output Power	PASS
15.407(b)	Peak Excursion Ratio	PASS
15.407(b)& 15.209	Radiated Emission And (bandedge Emissions) Measurement	PASS
15.407(b)7	Conducted Emission And (bandedge Emissions) Measurement	PASS
15.407(a) (1).(2).(3).(4).(5)	Power Spectral Density	PASS
15.407(g)	Frequency Stability	PASS
15.407(c)	Automatically Discontinue Transmission	PASS
15.203/15.204	Antenna Requirement	PASS

NOTE:

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

(2)all tests are according to ANSI C63.10-2013

1.1 TEST FACTORY

Shenzhen STS Test Services Co., Ltd.
Add. : 1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road,
Fuyong Street, Bao'an District, Shenzhen, Guangdong, China
CNAS Registration No.: L7649; FCC Registration No.: 625569
IC Registration No.: 12108A; A2LA Certificate No.: 4338.01;

1.2 MEASUREMENT UNCERTAINTY

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

No.	Item	Uncertainty
1	Conducted Emission (9KHz-150KHz)	±2.88dB
2	Conducted Emission (150KHz-30MHz)	±2.67dB
3	RF power,conducted	±0.71dB
4	Spurious emissions,conducted	±0.63dB
5	All emissions,radiated(<1G) 30MHz-200MHz	±3.80dB
6	All emissions,radiated(<1G) 200MHz-1000MHz	±3.97dB
7	All emissions,radiated(>1G)	±3.03dB

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

<table>
<tr><td>Equipment</td><td>Ultra Mini 4K Streaming PC / Mini Smart Cloud PC</td></tr>
<tr><td>Trade Name</td><td>Ollee</td></tr>
<tr><td>Model Name</td><td>MAHMG</td></tr>
<tr><td>Series Model</td><td>MAPMG</td></tr>
<tr><td>Model Difference</td><td>Only in different Windows OS and model name (MAHMG is Windows 10 Home /MAPMG is Windows 10 Pro)</td></tr>
<tr><td>Product Description</td><td>The EUT is Ultra Mini 4K Streaming PC / Mini Smart Cloud PC
<table>
<tr><td>Operation Frequency:</td><td>IEEE 802.11a/ n/ac(HT20) 5.180GHz-5.240GHz
IEEE 802.11n/ac(HT40) 5.190GHz-5.230GHz
IEEE 802.11ac(HT80) 5.210GHz</td></tr>
<tr><td>Modulation Type:</td><td>IEEE for 802.11a/n/ac: OFDM(BPSK/QPSK/16QAM)</td></tr>
<tr><td>Antenna Designation:</td><td>See Note 3</td></tr>
<tr><td>Max.Output Power(Conducted):</td><td>13.41dBm</td></tr>
<tr><td colspan="2">The duty cycle of WLAN 802.11a/n were >98 %</td></tr>
</table>
More details of EUT technical specification, please refer to the User's Manual.</td></tr>
<tr><td>Test Channel</td><td>Please refer to the Note 2.</td></tr>
<tr><td>Adapter</td><td>Input: AC100-240V, 0.45A,50/60Hz
Output: DC 12V, 2000mA</td></tr>
<tr><td>Battery</td><td>Rated Voltage: 3V</td></tr>
<tr><td>Hardware version number</td><td>N/A</td></tr>
<tr><td>Software version number</td><td>N/A</td></tr>
<tr><td>Connecting I/O Port(s)</td><td>Please refer to the User's Manual</td></tr>
</table>

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

1.

Operation Frequency of channel			
5.180GHz-5.240GHz			
Channel	Frequency		
36	5180		
38	5190		
40	5200		
42	5210		
44	5220		
46	5230		
48	5240		

Note:
In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:
Carrier Frequency Channel

5GHz:

For 802.11a/n/ac (HT20)			
Channel	Freq.(MHz)	Channel	Freq.(MHz)
36	5180		
40	5200		
48	5240		

For 802.11n/ac (HT40)			
Channel	Freq.(MHz)	Channel	Freq.(MHz)
38	5190		
46	5230		

For 802.11ac (HT80)			
Channel	Freq.(MHz)	Channel	Freq.(MHz)
42	5210		

2. KDB 662911 D01 Multiple Transmitter Output v02r01

2) Directional Gain Calculations for In-Band Measurements

a) Basic methodology with NANT transmit antennas, each with the same directional gain GA NT dBi, being driven by NANT transmitter outputs of equal power. Directional gain is to be co mputed as follows:

(i) If any transmit signals are correlated with each other,

Directional gain = GANT + 10 log(NANT) dBi

(ii) If all transmit signals are completely uncorrelated with each other,

Directional gain = GANT

ANT A=0 dBi

ANT B=0 dBi

GANT + 10 log(NANT) dBi

Directional gain= 0+10log2=3.01dBi

Brand	Model Name	Ant Type	Connector	NOTE
Ollee	MAHMG	PIFA Ant	N/A	WLAN Ant

2.2 DESCRIPTION OF TEST MODES

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

Worst Mode	Description	Data Rate
Mode 1	TX IEEE 802.11a HT20 CH36&CH40&CH48	6 Mbps
Mode 2	TX IEEE 802.11n HT20 CH36&CH40&CH48	MCS 0
Mode 3	TX IEEE 802.11ac HT20 CH36&CH40&CH48	NSS1 MCS0
Mode 4	TX IEEE 802.11n HT40 CH38&CH46	MCS 0
Mode 5	TX IEEE 802.11ac HT40 CH38&CH46	NSS1 MCS0
Mode 6	TX IEEE 802.11ac HT80 CH42	NSS1 MCS0

Note: (1) The measurements are performed at the highest, middle, lowest available channels.

(2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported

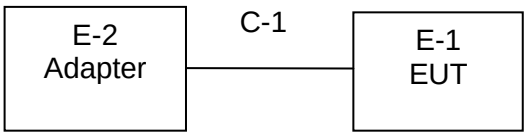
(3) We have be tested for all avaiable U.S. voltage and frequencies(For 120V,50/60Hz and 240V, 50/60Hz) for which the device is capable of operation.

AC Conducted Emission

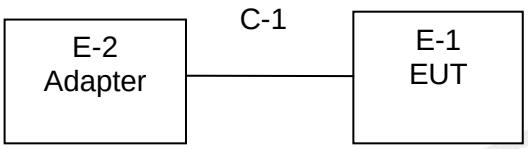
Test Case	
AC Conducted Emission	Mode 7: Keeping TX + WLAN Link

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious EmissionTest



Conducted Emission Test



2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-2	Adapter	N/A	JHD-AP024E-120200BA-B	N/A	N/A

Item	Shielded Type	Ferrite Core	Length	Note
C-1	Power line	NO	90cm	N/A

Note:

(1) The support equipment was authorized by Declaration of Confirmation.

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

(3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESW	101535	2017.06.01	2018.05.31
Bilog Antenna	TESEQ	CBL6111D	34678	2017.03.24	2018.03.23
Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-1343	2017.03.06	2018.03.05
Horn Antenna	Schwarzbeck	BBHA 9170	9170-0741	2016.03.06	2019.03.03
50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2017.10.15	2018.10.14
PreAmplifier	Agilent	8449B	60538	2017.10.15	2018.10.14
Operational Manual Passive Loop (9K--30MHz)	ETS	6512	00165355	2017.03.06	2018.03.05
Low frequency cable	EM	R01	N/A	NCR	NCR
High frequency cable	SCHWARZBECK	AK9515H	SN-96286/96287	NCR	NCR

Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2017.10.15	2018.10.14
LISN	R&S	ENV216	101242	2017.10.15	2018.10.14
Conduction Cable	EM	C01	N/A	2017.03.12	2018.03.11

RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
USB RF power sensor	DARE	RPR3006W	15I00041SNO03	2017.10.15	2018.10.14
Spectrum Analyzer	Agilent	E4407B	MY50140340	2017.03.11	2018.03.10
Signal Analyzer	Agilent	N9020A	MY49100060	2017.03.11	2018.03.10

3. EMC EMISSION TEST

3.1CONDUCTED EMISSION MEASUREMENT

3.1.1 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 *	CISPR
0.50 -5.0	56.00	46.00	CISPR
5.0 -30.0	60.00	50.00	CISPR

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

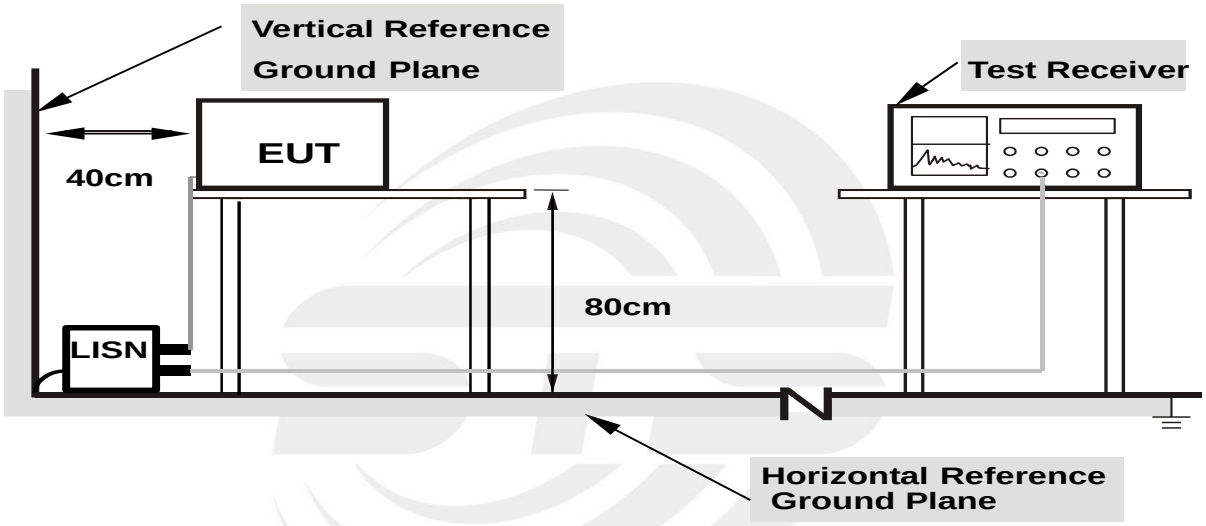
3.1.2 TEST PROCEDURE

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.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 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

3.1.5 EUT OPERATING CONDITIONS

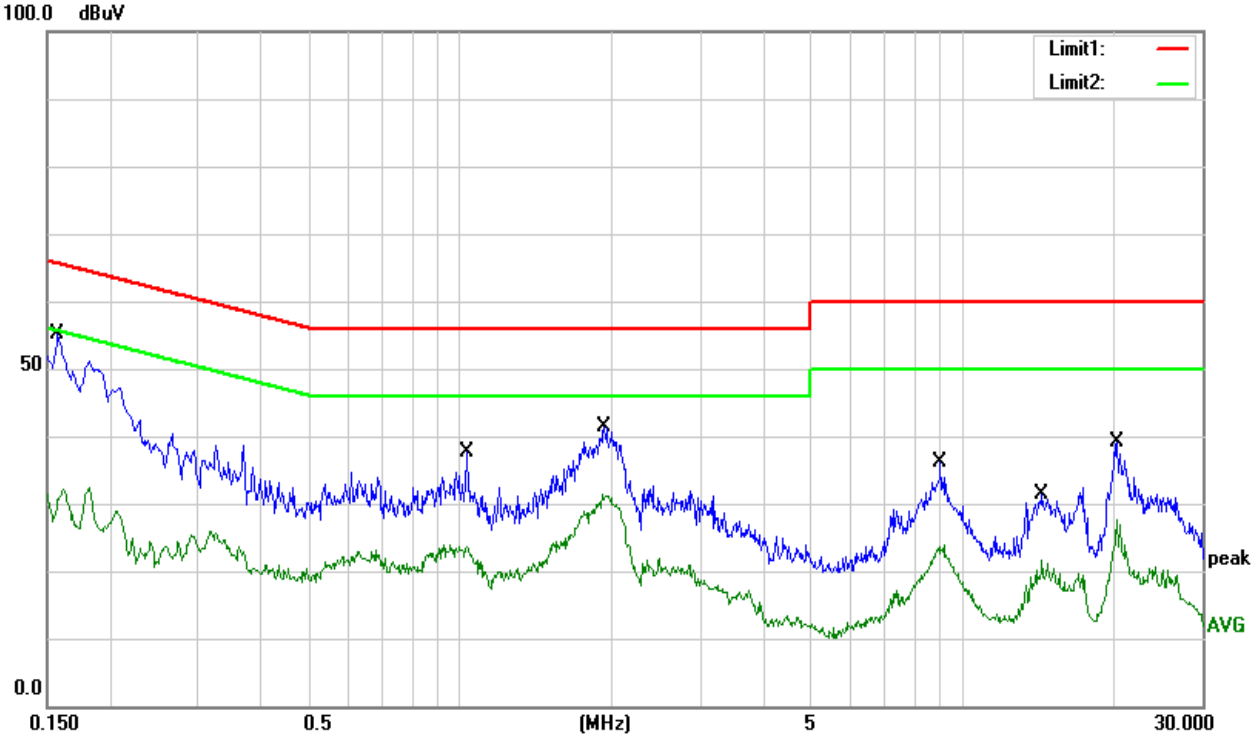
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.6 TEST RESULTS

Temperature:	23 ℃	Relative Humidity:	61%
Pressure:	1010hPa	Phase:	L
Test Voltage :	AC 120V/60Hz	Test Mode :	Mode 7

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.1580	45.87	9.23	55.10	65.57	-10.47	QP
0.1580	21.39	9.23	30.62	55.57	-24.95	AVG
1.0300	28.34	9.25	37.59	56.00	-18.41	QP
1.0300	14.32	9.25	23.57	46.00	-22.43	AVG
1.9380	32.18	9.25	41.43	56.00	-14.57	QP
1.9380	21.48	9.25	30.73	46.00	-15.27	AVG
9.0220	26.65	9.36	36.01	60.00	-23.99	QP
9.0220	14.30	9.36	23.66	50.00	-26.34	AVG
14.4340	21.88	9.43	31.31	60.00	-28.69	QP
14.4340	12.07	9.43	21.50	50.00	-28.50	AVG
20.3620	29.29	9.78	39.07	60.00	-20.93	QP
20.3620	17.73	9.78	27.51	50.00	-22.49	AVG

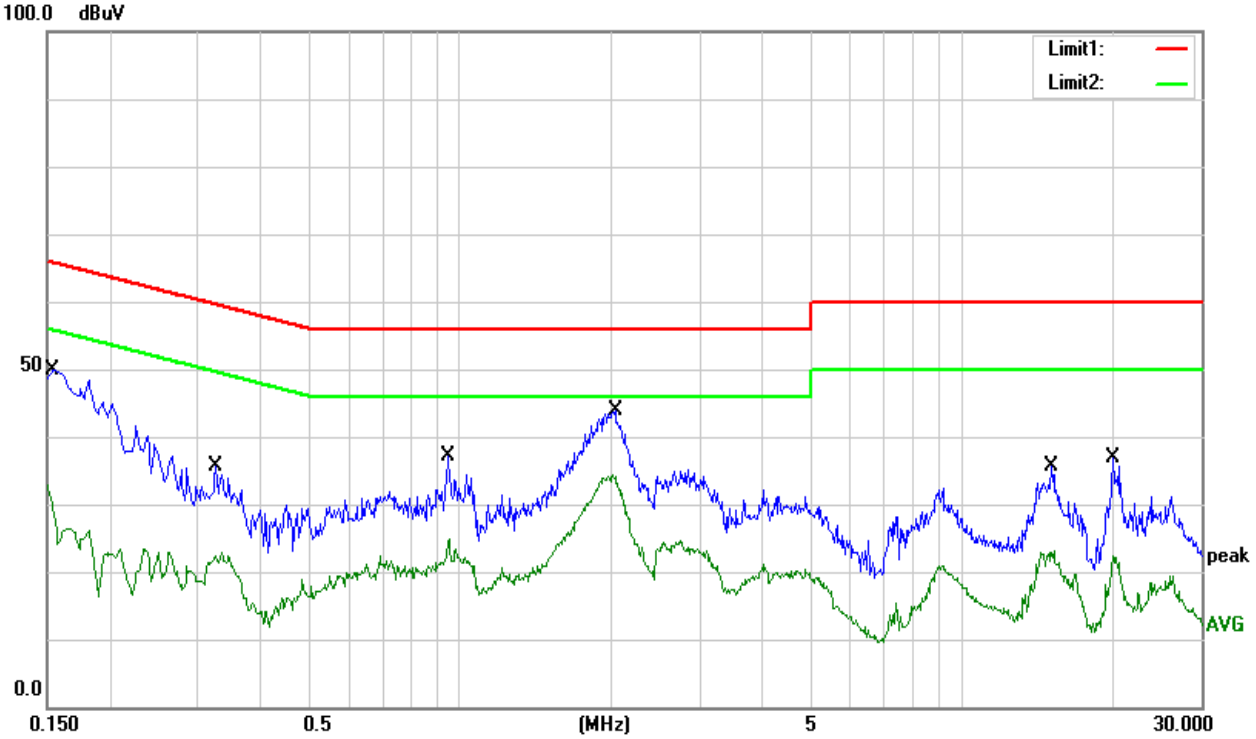
Remark:
1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	23 ℃	Relative Humidity:	61%
Pressure:	1010hPa	Phase:	N
Test Voltage	AC 120V/60Hz	Test Mode	Mode 7

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.1547	40.56	9.23	49.79	65.74	-15.95	QP
0.1547	18.10	9.23	27.33	55.74	-28.41	AVG
0.3260	26.56	9.16	35.72	59.55	-23.83	QP
0.3260	12.62	9.16	21.78	49.55	-27.77	AVG
0.9460	27.92	9.25	37.17	56.00	-18.83	QP
0.9460	15.23	9.25	24.48	46.00	-21.52	AVG
2.0380	34.69	9.26	43.95	56.00	-12.05	QP
2.0380	23.80	9.26	33.06	46.00	-12.94	AVG
15.1140	26.27	9.45	35.72	60.00	-24.28	QP
15.1140	12.09	9.45	21.54	50.00	-28.46	AVG
19.9860	27.08	9.77	36.85	60.00	-23.15	QP
19.9860	12.34	9.77	22.11	50.00	-27.89	AVG

Remark:
1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result =Reading + Factor)–Limit



3.2 RADIATED EMISSION AND (BANDEDGE) MEASUREMENT

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

In case the emission fall within the restricted band specified on 15.407(b)7& 15.205/209(a), then the (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 15E.

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

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

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak
Start Frequency	1000 MHz(Peak/AV)
Stop Frequency	10th carrier harmonic(Peak/AV)
RB / VB (emission in restricted band)	1 MHz / 1 MHz, AV=1 MHz /3 MHz

For Band edge

Spectrum Parameter	Setting
Detector	Peak
RB / VB (emission in restricted band)	1 MHz / 1 MHz, AV=1 MHz /3 MHz

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

a. The measuring distance of at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters(above 1GHz is 1.5 m) above the ground at a 3 meter anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment shall be 0.8 m(above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. 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.

Note:

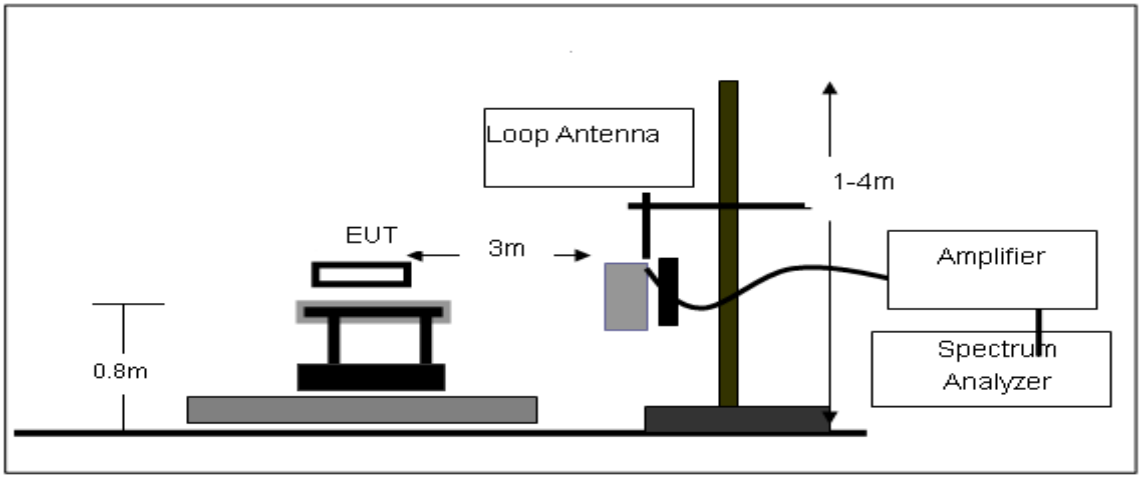
Both horizontal and vertical antenna polarities were tested and performed test to three orthogonal axis. The worst case emissions were reported

3.2.3 DEVIATION FROM TEST STANDARD

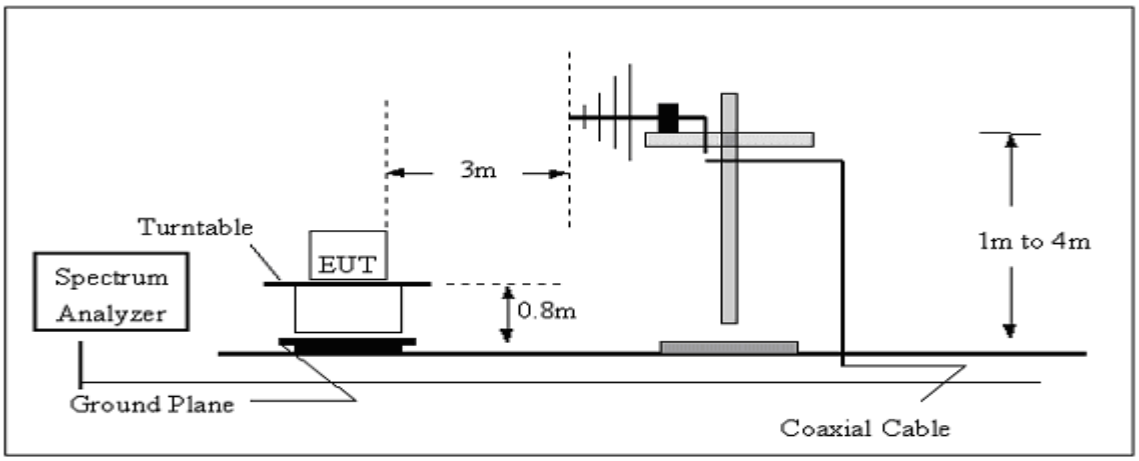
No deviation

3.2.4 TEST SETUP

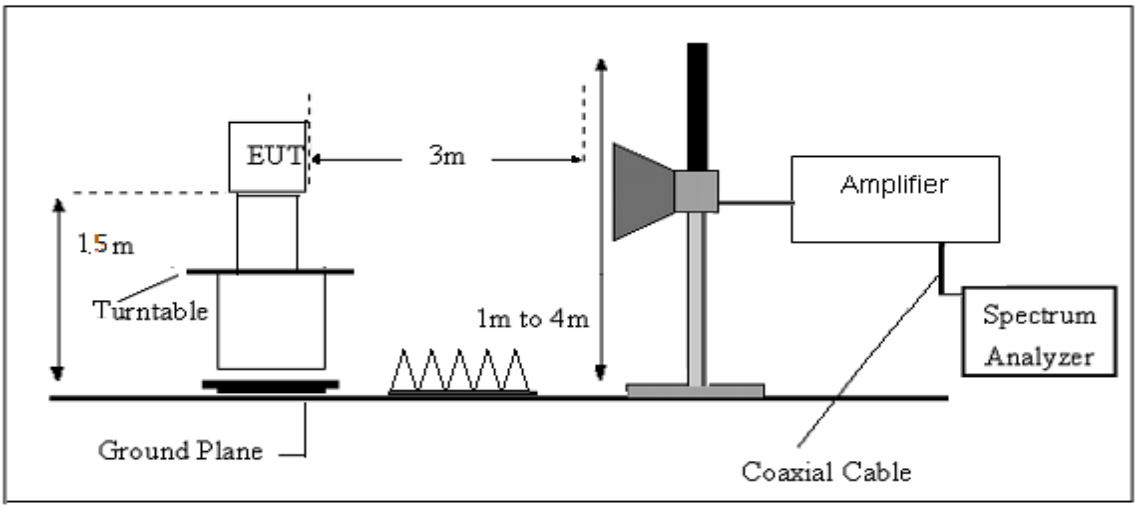
（A）Radiated Emission Test-Up Frequency Below 30MHz



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



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



3.2.5 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.

3.2.6 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where

FS = Field Strength

CL = Cable Attenuation Factor (Cable Loss)

RA = Reading Amplitude

AG = Amplifier Gain

AF = Antenna Factor

For example

Frequency	FS	RA	AF	CL	AG	Factor
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dB)	(dB)	(dB)
300	40	58.1	12.2	1.6	31.9	-18.1

Factor=AF+CL-AG

3.2.7 TEST RESULTS (Between 9KHz – 30 MHz)

Temperature：	24 ℃	Relative Humidtity：	58%
Pressure：	1010 hPa	Test Voltage ：	DC 12V from Adapter
Test Mode ：	TX Mode	Polarization :	--

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);

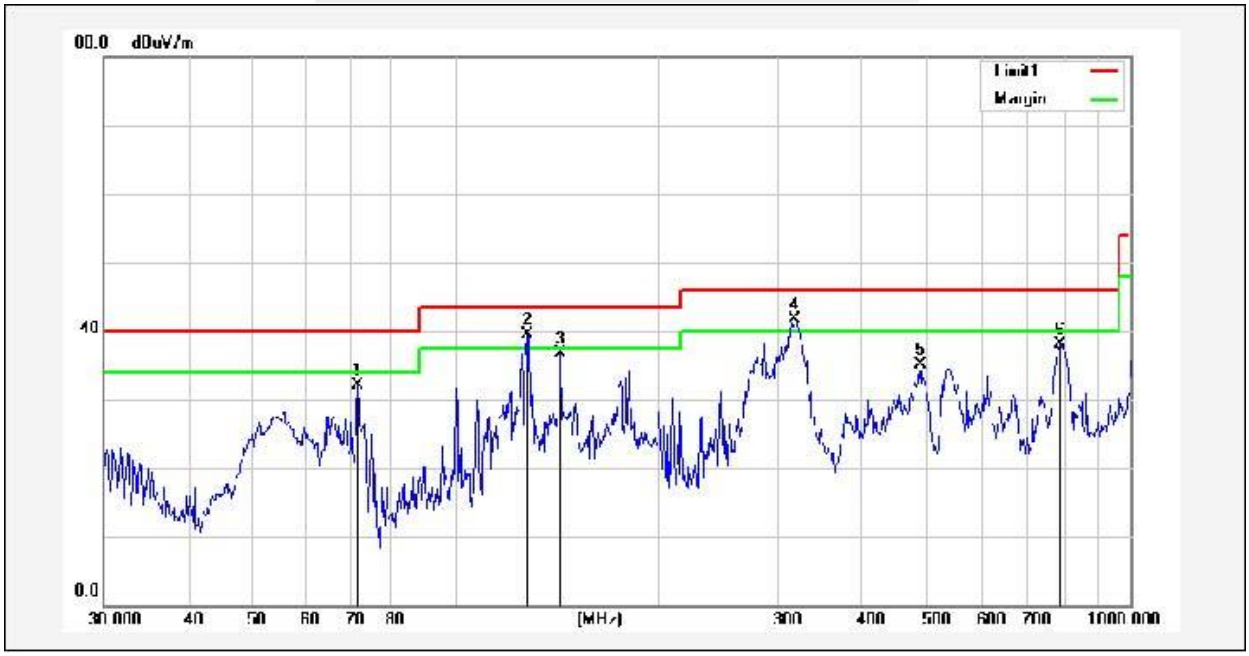
Limit line = specific limits(dBuv) + distance extrapolation factor.

3.2.8 TEST RESULTS (Between 30MHz – 1GHz)

Temperature	24 ℃	Relative Humidity	58%
Pressure	1010 hPa	Test Voltage	DC 12V from Adapter
Test Mode	Mode 1-6(Mode 1-6M worst mode)	Polarization	Horizontal

Frequency	Reading	Correct	Result	Limit	Margin	Remark
(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
71.3300	56.06	-23.91	32.15	40.00	-7.85	QP
127.6645	57.00	-17.58	39.42	43.50	-4.08	QP
142.8240	54.25	-17.64	36.61	43.50	-6.89	QP
317.7010	55.97	-14.25	41.72	46.00	-4.28	QP
487.3150	44.29	-9.21	35.08	46.00	-10.92	QP
785.0932	41.36	-3.20	38.16	46.00	-7.84	QP

Remark:
1. Margin = Result (Result =Reading + Factor)–Limit



Temperature	24 ℃	Relative Humidity	58%
Pressure	1010 hPa	Test Voltage	DC 12V from Adapter
Test Mode	Mode 1-6(Mode 1-6M worst mode)	Polarization	Horizontal

Frequency	Reading	Correct	Result	Limit	Margin	Remark
(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
30.8535	47.64	-11.62	36.02	40.00	-3.98	QP
46.9947	51.54	-19.94	31.60	40.00	-8.40	QP
142.8243	56.99	-17.64	39.35	43.50	-4.15	QP
308.9125	50.45	-14.53	35.92	46.00	-10.08	QP
533.8320	40.09	-7.58	32.51	46.00	-13.49	QP
782.3451	40.86	-3.15	37.71	46.00	-8.29	QP

Remark:
1. Margin = Result (Result =Reading + Factor)–Limit

3.2.9 TEST RESULTS (Above 1000 MHz)

Band I 5150-5250MHz

Band I(5.15-5.25) GHz										
Frequency (MHz)	Reading (dBuV)	Amplifier （dB）	Loss （dB）	Antenna Factor （dB/m）	Orrected Factor （dB）	Emission Level (dBμV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Comment
Low Channel (802.11n (HT-20)/ 5180 MHz)										
3256.96	44.45	44.70	6.70	28.20	-9.80	34.65	74.00	-39.35	PK	Vertical
3256.96	41.47	44.70	6.70	28.20	-9.80	31.67	54.00	-22.33	AV	Vertical
3257.10	44.92	44.70	6.70	28.20	-9.80	35.12	74.00	-38.88	PK	Horizontal
3257.10	41.43	44.70	6.70	28.20	-9.80	31.63	54.00	-22.37	AV	Horizontal
3998.63	39.00	44.20	7.90	29.70	-6.60	32.40	74.00	-41.60	PK	Vertical
3998.63	35.93	44.20	7.90	29.70	-6.60	29.33	54.00	-24.67	AV	Vertical
3992.98	38.88	44.20	7.90	29.70	-6.60	32.28	74.00	-41.72	PK	Horizontal
3992.98	36.38	44.20	7.90	29.70	-6.60	29.78	54.00	-24.22	AV	Horizontal
7235.43	36.86	43.50	11.40	35.50	3.40	40.26	74.00	-33.74	PK	Vertical
7235.43	33.66	43.50	11.40	35.50	3.40	37.06	54.00	-16.94	AV	Vertical
7218.09	36.77	43.50	11.40	35.50	3.40	40.17	74.00	-33.83	PK	Horizontal
7218.09	33.73	43.50	11.40	35.50	3.40	37.13	54.00	-16.87	AV	Horizontal
10360.30	39.20	44.50	13.80	38.80	8.10	47.30	74.00	-26.70	PK	Vertical
10360.30	35.97	44.50	13.80	38.80	8.10	44.07	54.00	-9.93	AV	Vertical
10360.26	38.85	44.50	13.80	38.80	8.10	46.95	74.00	-27.05	PK	Horizontal
10360.26	36.05	44.50	13.80	38.80	8.10	44.15	54.00	-9.85	AV	Horizontal
11025.61	33.57	43.60	14.30	39.50	10.20	43.77	74.00	-30.23	PK	Vertical
11025.61	29.83	43.60	14.30	39.50	10.20	40.03	54.00	-13.97	AV	Vertical
11020.72	33.27	43.60	14.30	39.50	10.20	43.47	74.00	-30.53	PK	Horizontal
11020.72	29.88	43.60	14.30	39.50	10.20	40.08	54.00	-13.92	AV	Horizontal
13292.74	31.53	42.60	15.90	38.90	12.20	43.73	74.00	-30.27	PK	Vertical
13292.74	29.46	42.60	15.90	38.90	12.20	41.66	54.00	-12.34	AV	Vertical
13287.19	32.50	42.60	15.90	38.90	12.20	44.70	74.00	-29.30	PK	Horizontal
13287.19	29.54	42.60	15.90	38.90	12.20	41.74	54.00	-12.26	AV	Horizontal

Mid Channel (802.11n (HT-20)/ 5200 MHz)										
3253.96	43.77	44.70	6.70	28.20	-9.80	33.97	74.00	-40.03	PK	Vertical
3253.96	41.19	44.70	6.70	28.20	-9.80	31.39	54.00	-22.61	AV	Vertical
3249.24	43.94	44.70	6.70	28.20	-9.80	34.14	74.00	-39.86	PK	Horizontal
3249.24	42.23	44.70	6.70	28.20	-9.80	32.43	54.00	-21.57	AV	Horizontal
3996.51	39.87	44.20	7.90	29.70	-6.60	33.27	74.00	-40.73	PK	Vertical
3996.51	37.14	44.20	7.90	29.70	-6.60	30.54	54.00	-23.46	AV	Vertical
3997.32	38.92	44.20	7.90	29.70	-6.60	32.32	74.00	-41.68	PK	Horizontal
3997.32	35.73	44.20	7.90	29.70	-6.60	29.13	54.00	-24.87	AV	Horizontal
7235.36	36.53	43.50	11.40	35.50	3.40	39.93	74.00	-34.07	PK	Vertical
7235.36	34.51	43.50	11.40	35.50	3.40	37.91	54.00	-16.09	AV	Vertical
7230.87	37.82	43.50	11.40	35.50	3.40	41.22	74.00	-32.78	PK	Horizontal
7230.87	34.50	43.50	11.40	35.50	3.40	37.90	54.00	-16.10	AV	Horizontal
10400.28	39.35	44.50	13.80	38.80	8.10	47.45	74.00	-26.55	PK	Vertical
10400.28	35.89	44.50	13.80	38.80	8.10	43.99	54.00	-10.01	AV	Vertical
10400.00	40.14	44.50	13.80	38.80	8.10	48.24	74.00	-25.76	PK	Horizontal
10400.00	35.78	44.50	13.80	38.80	8.10	43.88	54.00	-10.12	AV	Horizontal
11028.82	33.88	43.60	14.30	39.50	10.20	44.08	74.00	-29.92	PK	Vertical
11028.82	30.40	43.60	14.30	39.50	10.20	40.60	54.00	-13.40	AV	Vertical
11022.72	34.01	43.60	14.30	39.50	10.20	44.21	74.00	-29.79	PK	Horizontal
11022.72	30.50	43.60	14.30	39.50	10.20	40.70	54.00	-13.30	AV	Horizontal
13288.04	31.80	42.60	15.90	38.90	12.20	44.00	74.00	-30.00	PK	Vertical
13288.04	28.63	42.60	15.90	38.90	12.20	40.83	54.00	-13.17	AV	Vertical
13295.15	32.70	42.60	15.90	38.90	12.20	44.90	74.00	-29.10	PK	Horizontal
13295.15	30.02	42.60	15.90	38.90	12.20	42.22	54.00	-11.78	AV	Horizontal

Mid Channel (802.11n (HT-20)/ 5240 MHz)										
3248.85	44.51	44.70	6.70	28.20	-9.80	34.71	74.00	-39.29	PK	Vertical
3248.85	41.68	44.70	6.70	28.20	-9.80	31.88	54.00	-22.12	AV	Vertical
3247.35	43.76	44.70	6.70	28.20	-9.80	33.96	74.00	-40.04	PK	Horizontal
3247.35	41.01	44.70	6.70	28.20	-9.80	31.21	54.00	-22.79	AV	Horizontal
3986.05	38.97	44.20	7.90	29.70	-6.60	32.37	74.00	-41.63	PK	Vertical
3986.05	36.61	44.20	7.90	29.70	-6.60	30.01	54.00	-23.99	AV	Vertical
3989.12	38.69	44.20	7.90	29.70	-6.60	32.09	74.00	-41.91	PK	Horizontal
3989.12	36.27	44.20	7.90	29.70	-6.60	29.67	54.00	-24.33	AV	Horizontal
7235.27	36.80	43.50	11.40	35.50	3.40	40.20	74.00	-33.80	PK	Vertical
7235.27	33.67	43.50	11.40	35.50	3.40	37.07	54.00	-16.93	AV	Vertical
7231.18	36.69	43.50	11.40	35.50	3.40	40.09	74.00	-33.91	PK	Horizontal
7231.18	34.19	43.50	11.40	35.50	3.40	37.59	54.00	-16.41	AV	Horizontal
10480.39	39.33	44.50	13.80	38.80	8.10	47.43	74.00	-26.57	PK	Vertical
10480.39	36.31	44.50	13.80	38.80	8.10	44.41	54.00	-9.59	AV	Vertical
10480.30	38.77	44.50	13.80	38.80	8.10	46.87	74.00	-27.13	PK	Horizontal
10480.30	35.94	44.50	13.80	38.80	8.10	44.04	54.00	-9.96	AV	Horizontal
11024.83	34.11	43.60	14.30	39.50	10.20	44.31	74.00	-29.69	PK	Vertical
11024.83	29.80	43.60	14.30	39.50	10.20	40.00	54.00	-14.00	AV	Vertical
11028.60	33.22	43.60	14.30	39.50	10.20	43.42	74.00	-30.58	PK	Horizontal
11028.60	30.55	43.60	14.30	39.50	10.20	40.75	54.00	-13.25	AV	Horizontal
13290.07	32.22	42.60	15.90	38.90	12.20	44.42	74.00	-29.58	PK	Vertical
13290.07	28.88	42.60	15.90	38.90	12.20	41.08	54.00	-12.92	AV	Vertical
13299.46	31.89	42.60	15.90	38.90	12.20	44.09	74.00	-29.91	PK	Horizontal
13299.46	29.05	42.60	15.90	38.90	12.20	41.25	54.00	-12.75	AV	Horizontal

Remark:
1.Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Scan with 802.11a,802.11n (HT-20),802.11n (HT-40), 802.11ac (HT-20),802.11ac (HT-40), 802.11ac (HT-80) the worst case is 802.11n (HT-20)
3. The emissions above 18GHz are too small to be measured and are at least 10 dB below the limit.
The frequency is mainly from the environment noise.

3.2.10 Band Edge

Band I (5.15-5.25)GHz

Band I(5.15-5.25) GHz										
Frequency (MHz)	Meter Reading (dBμV)	Amplifier （dB）	Loss （dB）	Antenna Factor （dB/m）	Orrected Factor （dB）	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
802.11a BW20MHz										
5150	41.77	44.20	8.98	31.60	-3.62	38.15	74	-35.85	Peak	Vertical
5150	31.01	44.20	8.98	31.60	-3.62	27.39	54	-26.61	AVG	Vertical
5150	41.08	44.20	8.98	31.60	-3.62	37.46	74	-36.54	Peak	Horizontal
5150	30.95	44.20	8.98	31.60	-3.62	27.33	54	-26.67	AVG	Horizontal
5250	44.99	44.20	9.35	31.60	-3.25	41.74	74	-32.26	Peak	Vertical
5250	30.06	44.20	9.35	31.60	-3.25	26.81	54	-27.19	AVG	Vertical
5250	39.93	44.20	9.35	31.60	-3.25	36.68	74	-37.32	Peak	Horizontal
5250	31.99	44.20	9.35	31.60	-3.25	28.74	54	-25.26	AVG	Horizontal
802.11n BW20MHz										
5150	40.26	44.20	8.98	31.60	-3.62	36.64	74	-37.36	Peak	Vertical
5150	28.48	44.20	8.98	31.60	-3.62	24.86	54	-29.14	AVG	Vertical
5150	41.13	44.20	8.98	31.60	-3.62	37.51	74	-36.49	Peak	Horizontal
5150	29.39	44.20	8.98	31.60	-3.62	25.77	54	-28.23	AVG	Horizontal
5250	46.08	44.20	9.35	31.60	-3.25	42.83	74	-31.17	Peak	Vertical
5250	28.34	44.20	9.35	31.60	-3.25	25.09	54	-28.91	AVG	Vertical
5250	39.78	44.20	9.35	31.60	-3.25	36.53	74	-37.47	Peak	Horizontal
5250	29.13	44.20	9.35	31.60	-3.25	25.88	54	-28.12	AVG	Horizontal
802.11n BW40MHz										
5150	38.81	44.20	8.98	31.60	-3.62	35.19	74	-38.81	Peak	Vertical
5150	27.91	44.20	8.98	31.60	-3.62	24.29	54	-29.71	AVG	Vertical
5150	38.70	44.20	8.98	31.60	-3.62	35.08	74	-38.92	Peak	Horizontal
5150	28.53	44.20	8.98	31.60	-3.62	24.91	54	-29.09	AVG	Horizontal
5250	46.75	44.20	9.35	31.60	-3.25	43.50	74	-30.50	Peak	Vertical
5250	32.04	44.20	9.35	31.60	-3.25	28.79	54	-25.21	AVG	Vertical
5250	40.33	44.20	9.35	31.60	-3.25	37.08	74	-36.92	Peak	Horizontal
5250	27.99	44.20	9.35	31.60	-3.25	24.74	54	-29.26	AVG	Horizontal

802.11ac BW20MHz										
5150	40.10	44.20	8.98	31.60	-3.62	36.48	74	-37.52	Peak	Vertical
5150	30.93	44.20	8.98	31.60	-3.62	27.31	54	-26.69	AVG	Vertical
5150	38.16	44.20	8.98	31.60	-3.62	34.54	74	-39.46	Peak	Horizontal
5150	29.73	44.20	8.98	31.60	-3.62	26.11	54	-27.89	AVG	Horizontal
5250	44.97	44.20	9.35	31.60	-3.25	41.72	74	-32.28	Peak	Vertical
5250	30.11	44.20	9.35	31.60	-3.25	26.86	54	-27.14	AVG	Vertical
5250	40.07	44.20	9.35	31.60	-3.25	36.82	74	-37.18	Peak	Horizontal
5250	27.84	44.20	9.35	31.60	-3.25	24.59	54	-29.41	AVG	Horizontal
802.11ac BW40MHz										
5150	38.95	44.20	8.98	31.60	-3.62	35.33	74	-38.67	Peak	Vertical
5150	31.29	44.20	8.98	31.60	-3.62	27.67	54	-26.33	AVG	Vertical
5150	39.90	44.20	8.98	31.60	-3.62	36.28	74	-37.72	Peak	Horizontal
5150	30.07	44.20	8.98	31.60	-3.62	26.45	54	-27.55	AVG	Horizontal
5250	46.19	44.20	9.35	31.60	-3.25	42.94	74	-31.06	Peak	Vertical
5250	30.07	44.20	9.35	31.60	-3.25	26.82	54	-27.18	AVG	Vertical
5250	40.27	44.20	9.35	31.60	-3.25	37.02	74	-36.98	Peak	Horizontal
5250	30.34	44.20	9.35	31.60	-3.25	27.09	54	-26.91	AVG	Horizontal
802.11ac BW80MHz										
5150	39.66	44.20	8.98	31.60	-3.62	36.04	74	-37.96	Peak	Vertical
5150	27.97	44.20	8.98	31.60	-3.62	24.35	54	-29.65	AVG	Vertical
5150	41.70	44.20	8.98	31.60	-3.62	38.08	74	-35.92	Peak	Horizontal
5150	28.40	44.20	8.98	31.60	-3.62	24.78	54	-29.22	AVG	Horizontal
5250	42.98	44.20	9.35	31.60	-3.25	39.73	74	-34.27	Peak	Vertical
5250	31.63	44.20	9.35	31.60	-3.25	28.38	54	-25.62	AVG	Vertical
5250	39.97	44.20	9.35	31.60	-3.25	36.72	74	-37.28	Peak	Horizontal
5250	29.90	44.20	9.35	31.60	-3.25	26.65	54	-27.35	AVG	Horizontal

4. CONDUCTED SPURIOUS EMISSIONS AND BANDEDGE

4.1 APPLIED PROCEDURES / LIMIT

Undesirable emission limits. Except as shown in paragraph (b)(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:

(i) 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.

4.1.1 TEST PROCEDURE

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	30 MHz to 10th carrier harmonic
RB / VB (emission in restricted band)	1000 KHz/3000 KHz
Trace-Mode:	Max hold

.

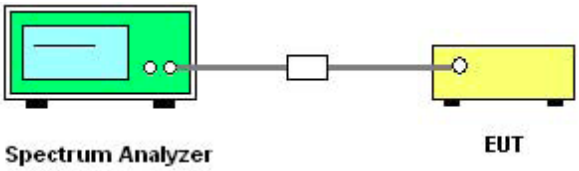
For Band edge

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	Lower Band Edge: 5140 to 5240 MHz Upper Band Edge: 5180 to 5360 MHz
RB / VB (emission in restricted band)	1000 KHz/3000 KHz
Trace-Mode:	Max hold

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



The EUT which is powered by the Battery, is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.
Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 1000 kHz. In order to make an accurate measurement, set the span greater than RBW.

4.1.4 EUT OPERATION CONDITIONS

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

4.1.5 TEST RESULTS

Data See Appendix A

5. POWER SPECTRAL DENSITY TEST

5.1 APPLIED PROCEDURES / LIMIT

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. 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.
2. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, 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.
3. For the band 5.725-5.850 GHz, the peak power spectral density shall not exceed 30 dBm in any 500KHz band. If transmitting antenna directional gain is greater than 6 dBi, 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 6 dBi.

5.1.1 TEST PROCEDURE

1. The setting follows Method SA-1 of FCC KDB D02 General UNII Test Procedures New Rules v01r04.

For devices operating in the band, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (*i.e.,* 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

a) Set RBW ≥ 1/*T*, where *T* is defined in section II.B.l.a).

b) Set VBW ≥ 3 RBW.

c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10 log (500kHz/RBW) to the measured result, whereas RBW (< 500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10 log (1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.

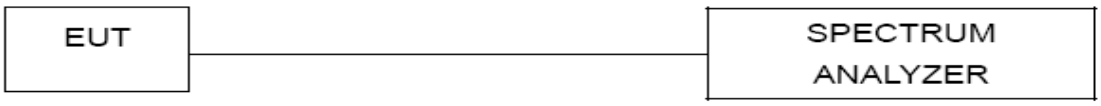
e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 kHz for the sections5.c) and 5.d) above, since RBW=100 KHZ is available on nearly all spectrum analyzers.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



5.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

5.1.5 TEST RESULTS

Data see Appendix B

6. BANDWIDTH MEASUREMENT

6.1 EMISSION BANDWIDTH (EBW) 26 BANDWID PROCEDURES / LIMIT

See list of measuring instruments of this test report.

6.1.1 TEST PROCEDURE

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW > =RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP

6.1.4 EUT OPERATION CONDITIONS

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

6.1.5 TEST RESULTS

Data see Appendix C

6.2 OCCUPIED BANDWIDTH (99%) TEST APPLIED PROCEDURES / LIMIT

The following procedure shall be used for measuring (99 %) power bandwidth:

6.2.1 TEST PROCEDURE

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures v01r04.
The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.

2. Set span = 1.5 times to 5.0 times the OBW.

3. Set RBW = 1 % to 5 % of the OBW

4. Set VBW ≥ 3 · RBW

5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.

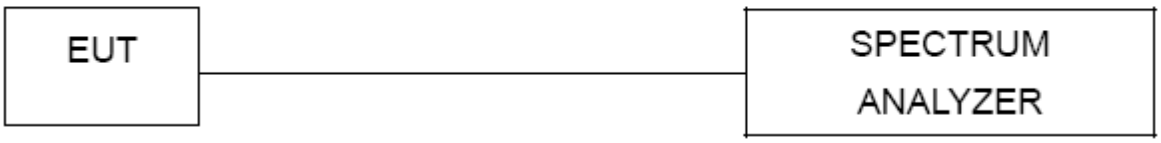
6. Use the 99 % power bandwidth function of the instrument (if available).

7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

6.2.2 DEVIATION FROM STANDARD

No deviation.

6.2.3 TEST SETUP



6.2.4 EUT OPERATION CONDITIONS

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

6.2.5 TEST RESULTS

Data See Appendix C

6.3 MINIMUM EMISSION BANDWIDTH(6 DB) PROCEDURES / LIMIT

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.725-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

6.3.1 TEST PROCEDURE

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures v01r04.

a) Set RBW = 100 kHz.

b) Set the video bandwidth (VBW) ≥ 3 × RBW.

c) Detector = Peak.

d) Trace mode = max hold.

e) Sweep = auto couple.

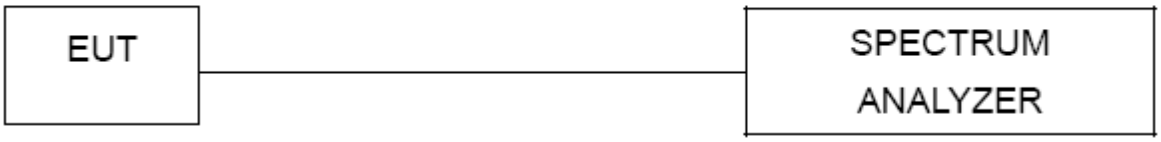
f) Allow the trace to stabilize.

g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

6.3.2 DEVIATION FROM STANDARD

No deviation.

6.3.3 TEST SETUP



6.3.4 EUT OPERATION CONDITIONS

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

6.3.5 TEST RESULTS

The EUT is not applicable

7. MAXIMUM CONDUCTED OUTPUT POWER

7.1 APPLIED PROCEDURES / LIMIT

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

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 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz,If transmitting antennas of directional gain greater than 6 dBi are used.

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 6 dBi are used.

FCC Part15 (15.407) , Subpart E				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.407(a) (1) (iv)	Peak Output Power	0.25 watt	5150-5250	PASS
		The lesser of 250 mW or 11 dBm + 10 log (26 dB emission bandwidth)	5250-5350 5470-5725	
15.407(a) (3)		1 watt	5725-5825	

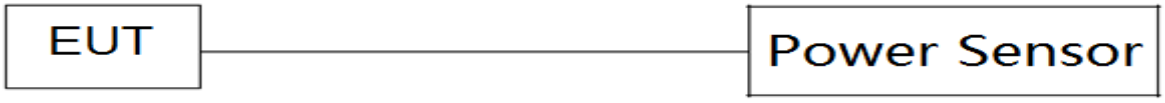
7.1.1 TEST PROCEDURE

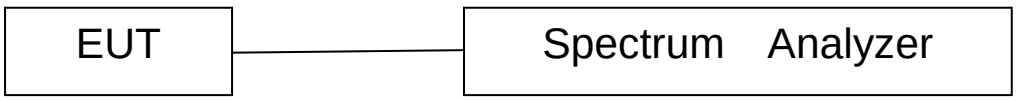
The EUT was directly connected to the Power Sensor&PC

7.1.2 DEVIATION FROM STANDARD

No deviation.

7.1.3 TEST SETUP





7.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 5 Unless otherwise a special operating condition is specified in the follows during the testing.

7.1.5 TEST RESULTS

NOTE: 1. Antenna A Power> Antenna B Power, Both antenna A and B have been test

2. 802.11a model cannot output Power at the same time.

Band I (5.15-5.25GHz)

Power

Test Channel	Frequency (MHz)	PK Power A(dBm)	PK Power B(dBm)	PK Power Total(dBm)	AV Power (dBm)	AV Power B(dBm)	AV Power Total(dBm)	LIMIT (dBm)
802.11a								
36	5180	10.52	10.31	--	8.28	9.01	--	23.98
40	5200	11.20	11.18	--	9.75	9.21	--	23.98
48	5240	10.30	10.07	--	8.57	8.67	--	23.98
802.11n(HT20)								
36	5180	10.32	9.90	13.13	9.31	8.82	12.08	23.98
40	5200	10.54	10.19	13.38	9.91	9.28	12.62	23.98
48	5240	10.20	9.97	13.10	8.58	8.92	11.76	23.98
802.11n(HT40)								
38	5190	10.30	10.01	13.17	9.10	8.44	11.79	23.98
46	5230	10.00	9.84	12.93	8.45	8.35	11.41	23.98
802.11ac(HT20)								
36	5180	10.35	10.14	13.26	9.60	8.51	12.10	23.98
40	5200	10.42	10.37	13.41	8.87	8.23	11.57	23.98
48	5240	10.12	10.04	13.09	9.19	8.44	11.84	23.98
802.11ac(HT40)								
38	5190	10.21	10.03	13.13	8.83	8.72	11.79	23.98
46	5230	9.90	9.87	12.90	8.68	8.05	11.39	23.98
802.11ac(HT80)								
42	5210	9.84	9.29	12.58	7.93	8.17	11.06	23.98

Note:

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 the lesser of 0.25 W.

Antenna A 802.11ac HT80(5210MHz)

Antenna B 802.11ac HT80 (5210MHz)

Duty cycle

TX 802.11a Mode				
Test Channel	Channel (MHz)	ON Time (msec)	Period (msec)	Duty cycle (%)
36	5180	2.073	2.088	99.28
40	5200	2.082	2.091	99.57
48	5240	2.076	2.091	99.28

TX 802.11n(HT20) Mode				
Test Channel	Channel (MHz)	ON Time (msec)	Period (msec)	Duty cycle (%)
36	5180	1.932	1.941	99.54
40	5200	1.938	1.944	99.69
48	5240	1.935	1.950	99.23

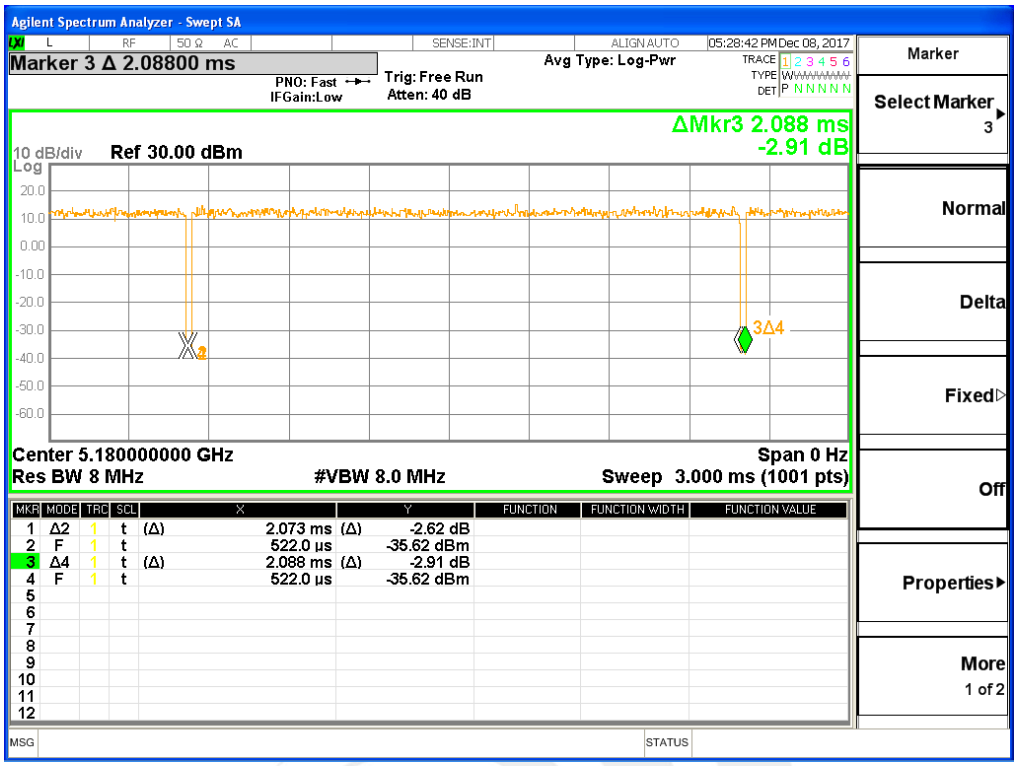
TX 802.11n(HT40) Mode				
Test Channel	Channel (MHz)	ON Time (msec)	Period (msec)	Duty cycle (%)
38	5190	972	975	99.69
46	5230	963	966	99.69

TX 802.11ac(HT20) Mode				
Test Channel	Channel (MHz)	ON Time (msec)	Period (msec)	Duty cycle (%)
36	5180	1.950	1.959	99.54
40	5200	1.947	1.962	99.24
48	5240	1.947	1.950	99.85

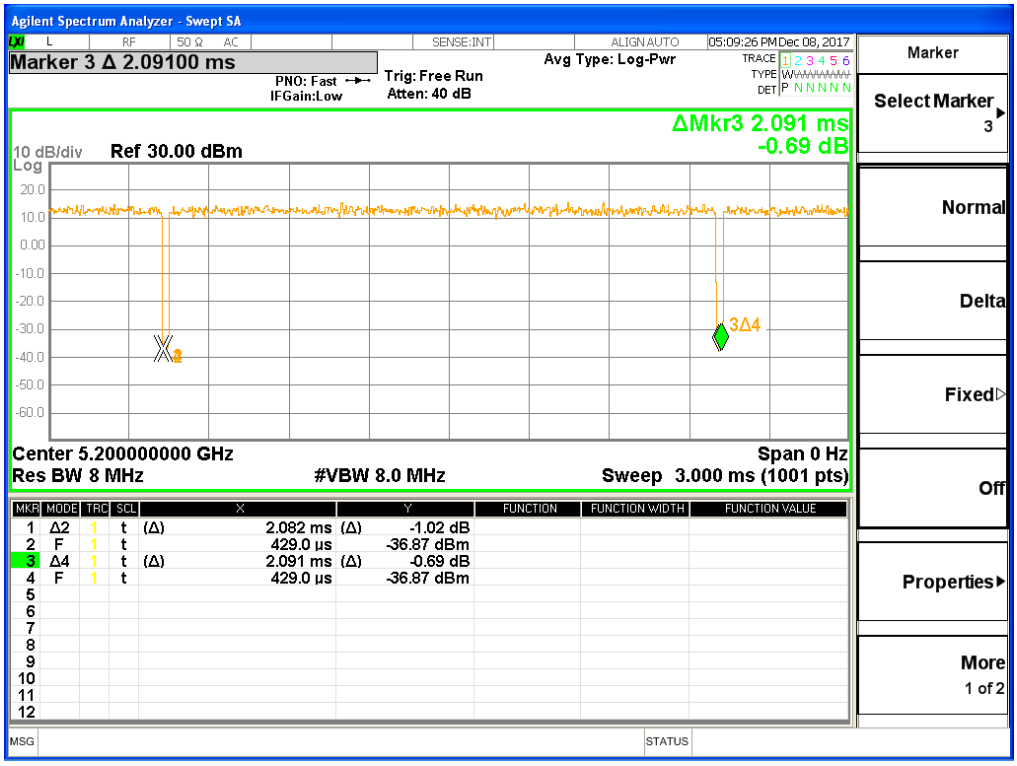
TX 802.11ac(HT40) Mode				
Test Channel	Channel (MHz)	ON Time (msec)	Period (msec)	Duty cycle (%)
38	5190	972	975	99.69
46	5230	969	975	99.38

TX 802.11ac(HT80) Mode				
Test Channel	Channel (MHz)	ON Time (msec)	Period (msec)	Duty cycle (%)
42	5210	462	474	98.52

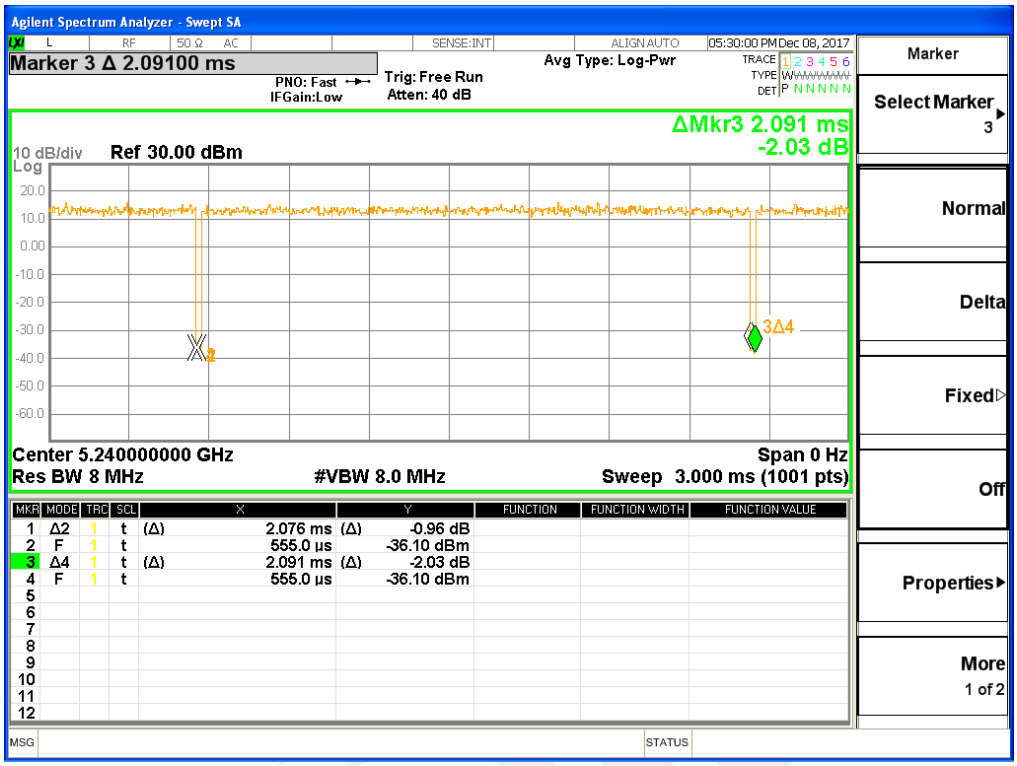
802.11a (5180MHz)



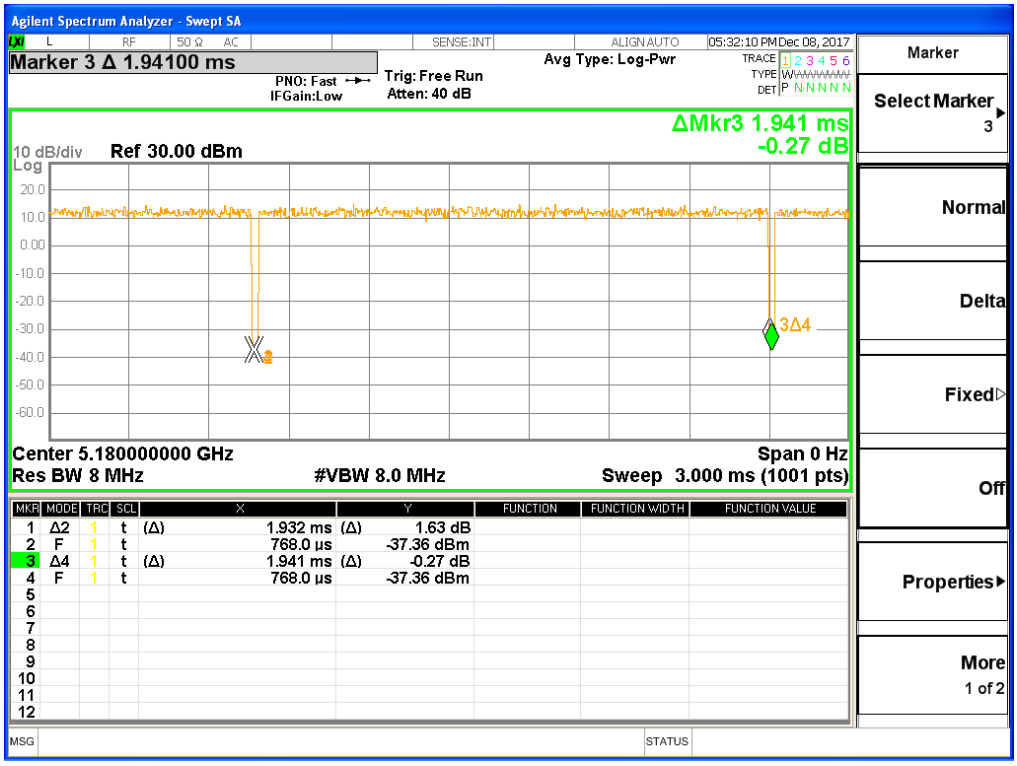
802.11a (5200MHz)



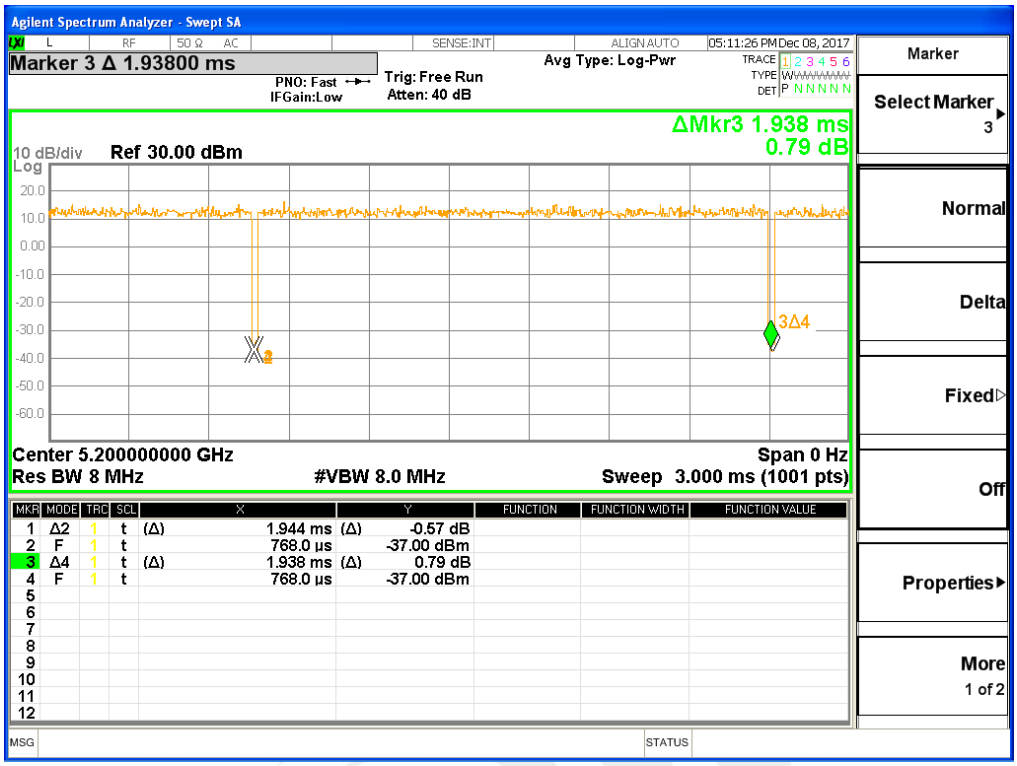
802.11a (5240MHz)



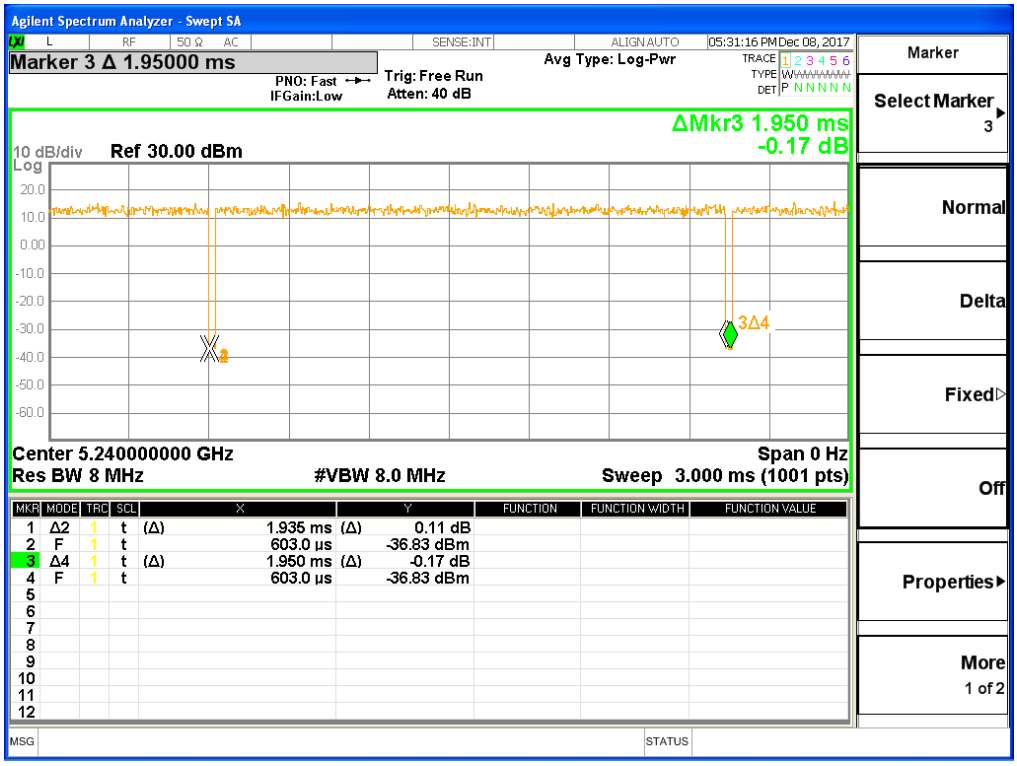
802.11n HT20 (5180MHz)



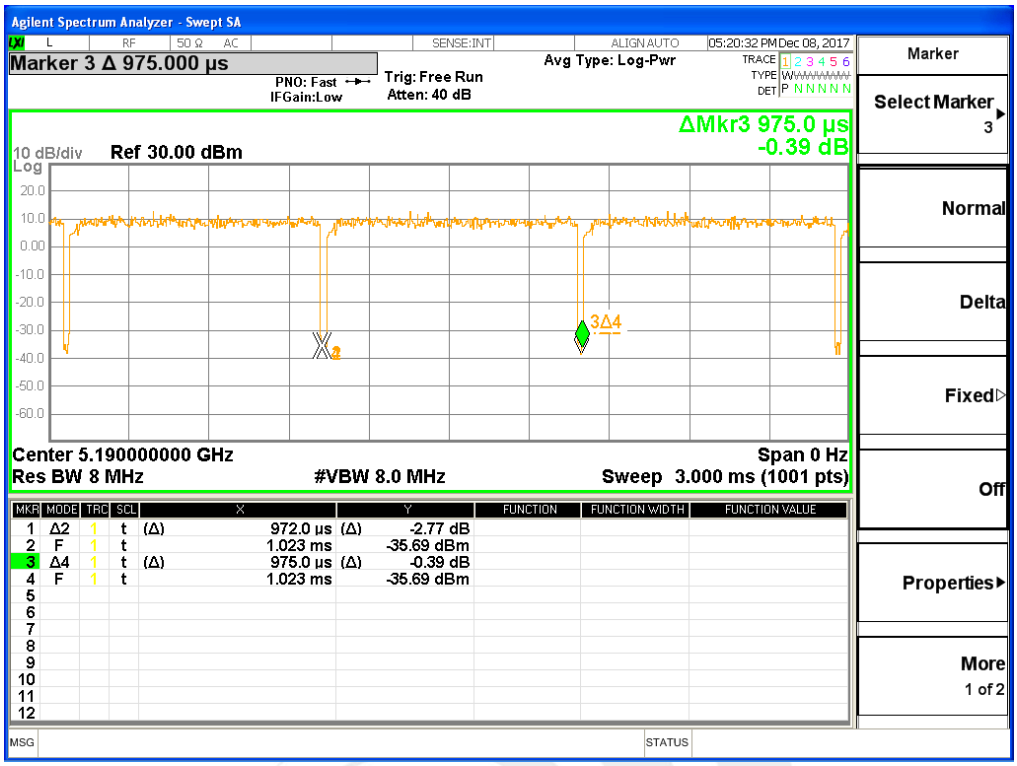
802.11n HT20 (5200MHz)



802.11n HT20 (5240MHz)

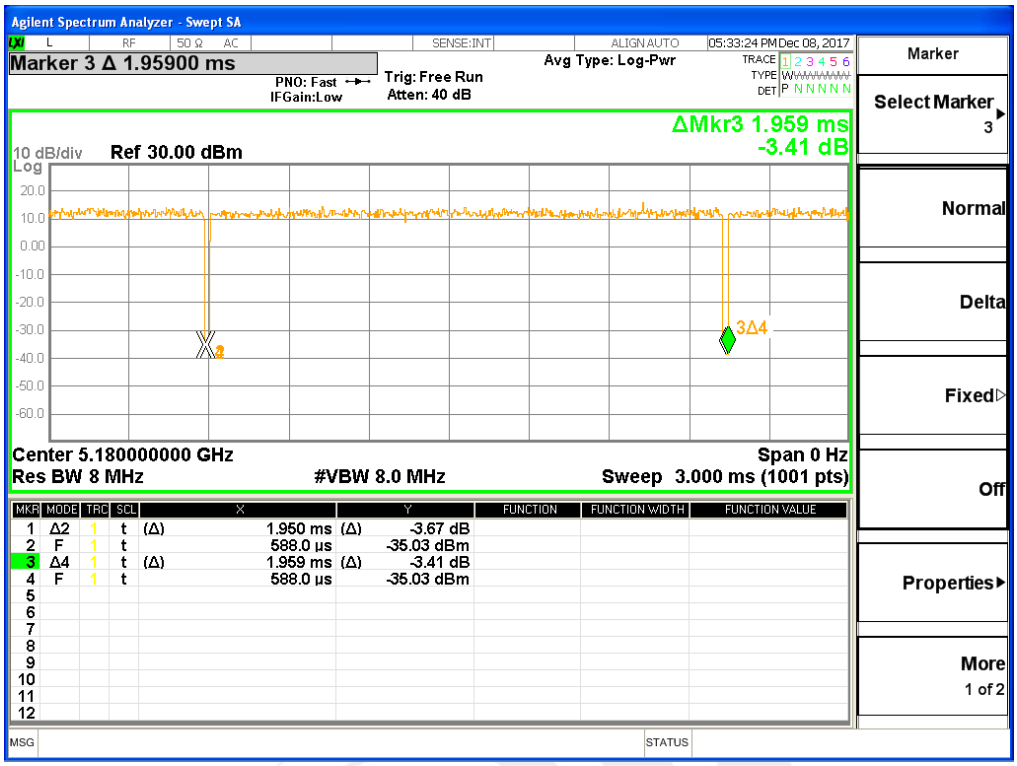


802.11n HT40 (5190MHz)

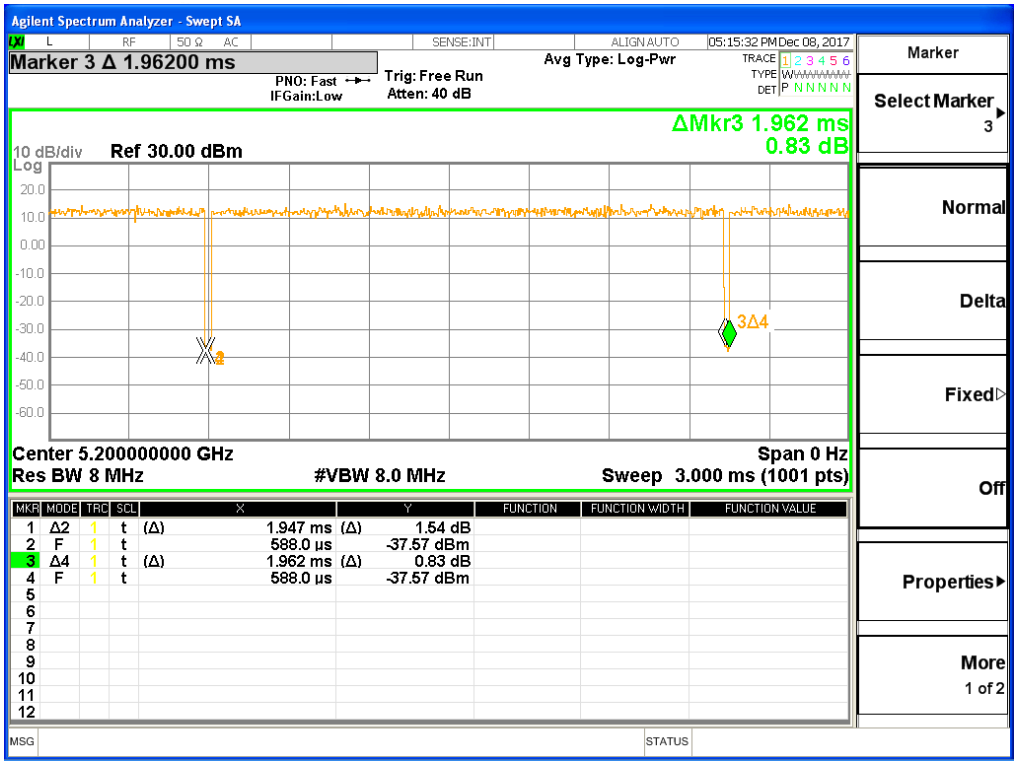


802.11n HT40 (5230MHz)

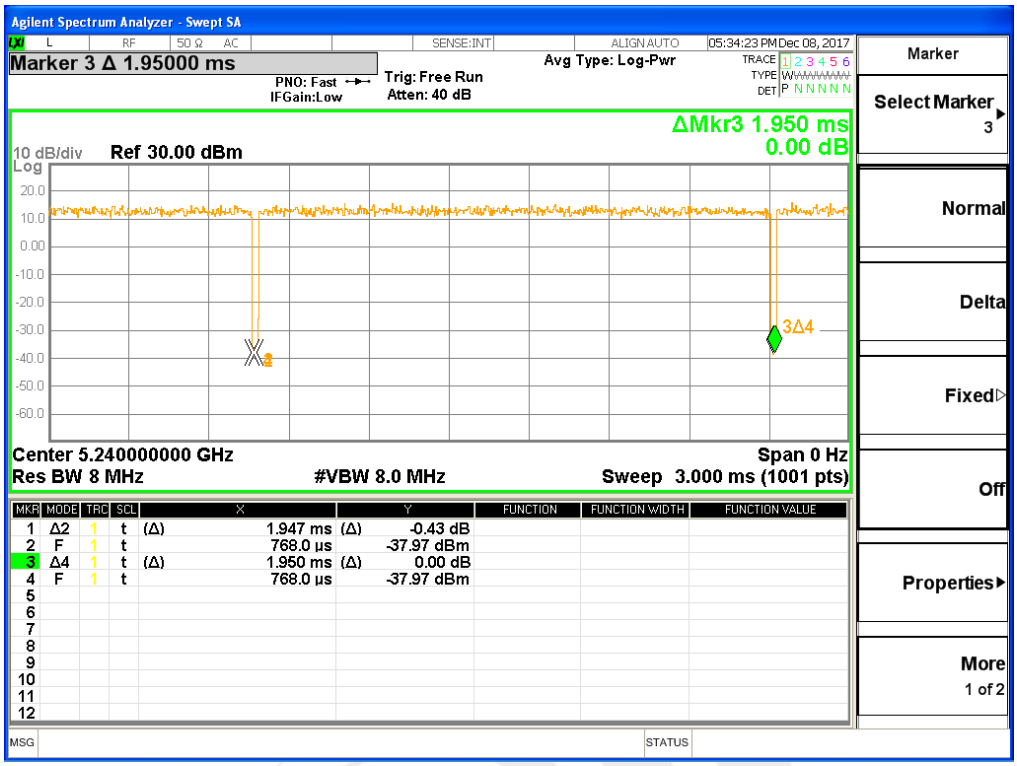
802.11ac HT20 (5180MHz)



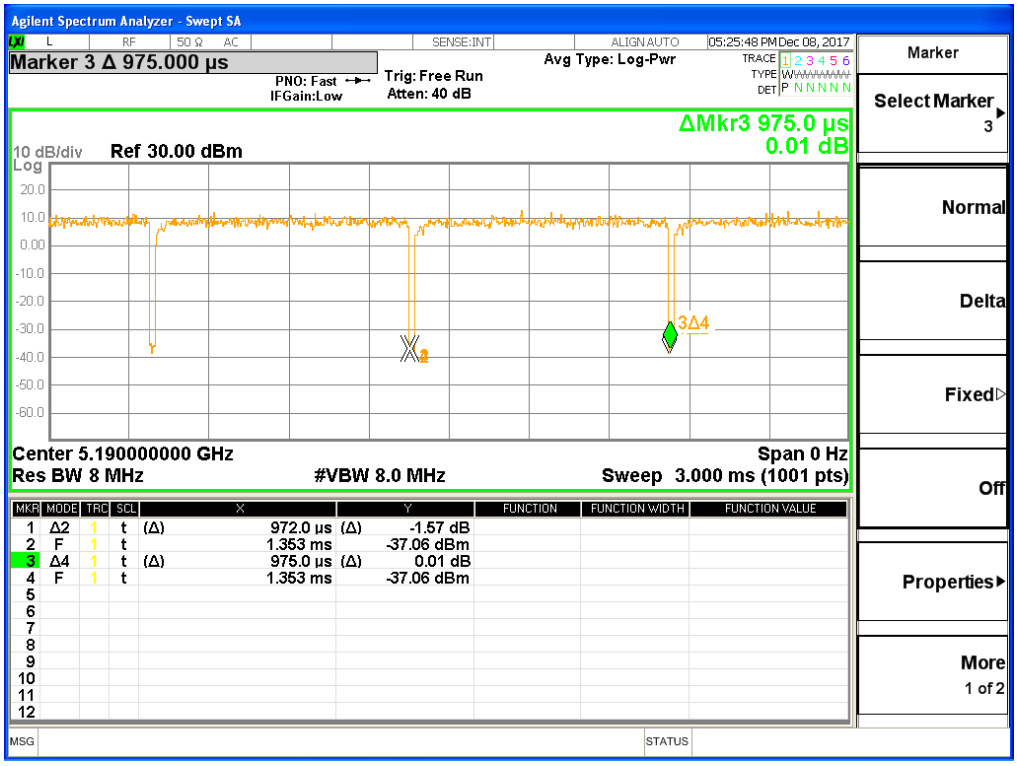
802.11ac HT20 (5200MHz)



802.11ac HT20 (5240MHz)

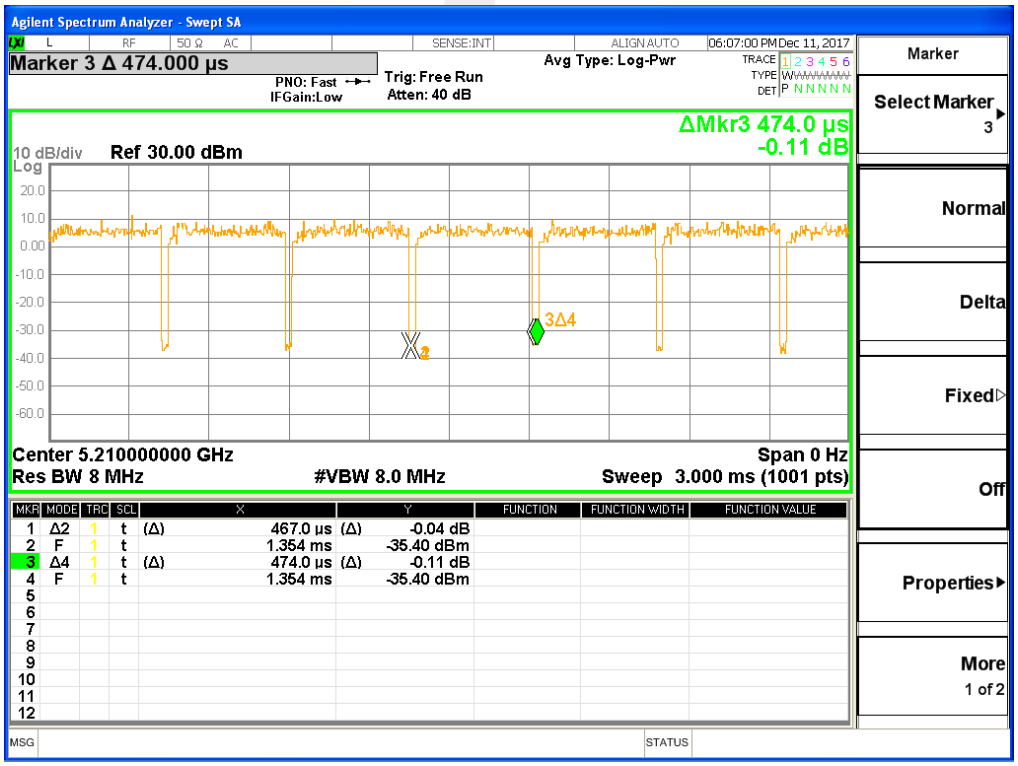


802.11ac HT40 (5190MHz)



802.11ac HT40 (5230MHz)

802.11ac HT80 (5210MHz)



8. FREQUENCY STABILITY MEASUREMENT

8.1 LIMIT OF FREQUENCY STABILITY

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.

8.1.1 MEASURING INSTRUMENTS

See list of measuring instruments of this test report.

8.1.2 TEST PROCEDURES

1. To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
2. The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10dB lower than the measured peak value.
3. The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

8.1.3 TEST SETUP

8.1.4 TEST RESULTS

Voltage	Band I (5.15-5.25GHz)Measurement Frequency(MHz)
AC (V)	5200
MAX	5199.9258
Nom	5199.9248
MIN	5199.9273
Max.Deviation(MHz)	0.0752
Max.Deviation(ppm)	14.46

Temperature Vs. Frequency Stabilty:

Temperature	Measurement Frequency(MHz)
(^{o}C)	5200
-30	5199.9812
-20	5199.9793
-10	5199.9784
0	5199.9758
10	5199.9747
20	5199.978
30	5199.9784
40	5199.9784
50	5199.9744
Max.Deviation(MHz)	0.0256
Max.Deviation(ppm)	4.92

9. AUTOMATICALLY DISCONTINUE TRANSMISSION

9.1 LIMIT OF AUTOMATICALLY DISCONTINUE TRANSMISSION

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 to describe how this requirement is met.

9.2 TEST RESULT OF AUTOMATICALLY DISCONTINUE TRANSMISSION

During no any information transmission, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission

10. ANTENNA REQUIREMENT

10.1 STANDARD REQUIREMENT

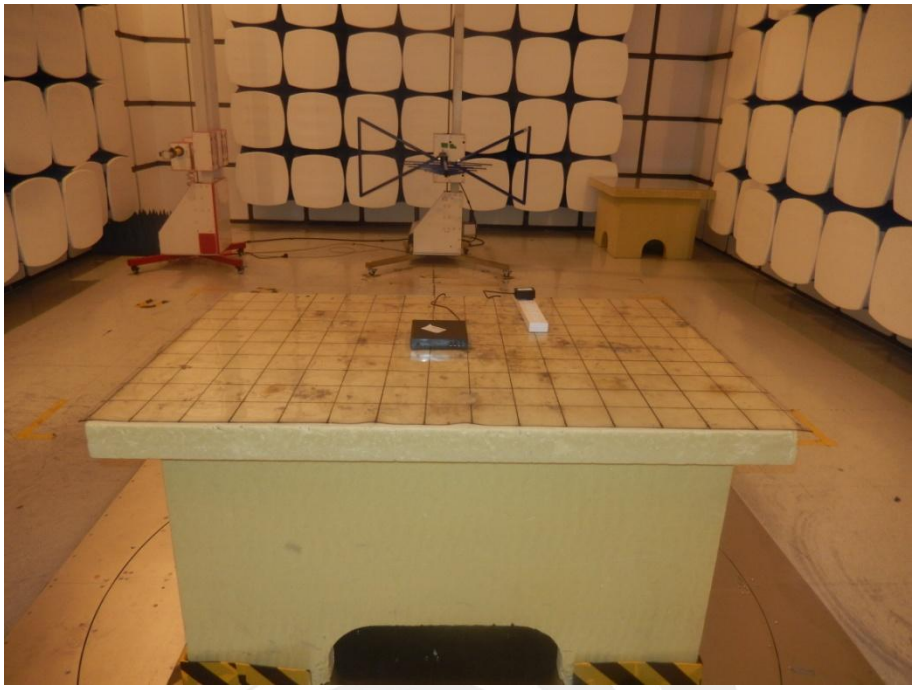
15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

10.2 EUT ANTENNA

The EUT antenna is PIFA Antenna. It comply with the standard requirement.

APPENDIX - PHOTOS OF TEST SETUP

Radiated Measurement Photos



Conducted Measurement Photos

※※※※※END OF THE REPORT※※※※※