

FCC RADIO TEST REPORT

No. 171001519SHA-002

Applicant : Qingdao Intelligent&Precise Electronics Co., Ltd
No.218, Qianwangang Road, Qingdao Economic&Technological
Development Zone, Shandong, China.

Manufacturing site : Qingdao Intelligent&Precise Electronics Co., Ltd
No.218, Qianwangang Road, Qingdao Economic&Technological
Development Zone, Shandong, China.

Product Name : WiFi module

Type/Model : ZDGFMT7618BU

TEST RESULT : PASS

SUMMARY

The equipment complies with the requirements according to the following standard(s) or specification:

47CFR Part 15 (2016): Radio Frequency Devices (Subpart E)

ANSI C63.10 (2013): American National Standard of Procedures for Compliance Testing of Unlicensed
Wireless Devices

Date of issue: November 23, 2017

Prepared by:



Nemo Li (Project engineer)

Reviewed by:



Daniel Zhao (Reviewer)

Contents

SUMMARY	1
REVISION HISTORY.....	4
1 GENERAL INFORMATION	5
1.1 DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)	5
1.2 RF TECHNICAL INFORMATION	5
1.3 DESCRIPTION OF TEST FACILITY	6
2 TEST SPECIFICATIONS.....	7
2.1 STANDARDS OR SPECIFICATION	7
2.2 MODE OF OPERATION DURING THE TEST.....	7
2.3 TEST ENVIRONMENT CONDITION:.....	9
2.4 TEST PERIPHERALS USED	9
2.5 TEST SOFTWARE LIST:	9
2.6 INSTRUMENT LIST	10
2.7 MEASUREMENT UNCERTAINTY	11
2.8 TEST SUMMARY	12
3 26 DB BANDWIDTH & 99% OCCUPIED BANDWIDTH	13
3.1 LIMIT	13
3.2 MEASUREMENT PROCEDURE	13
3.3 TEST CONFIGURATION	14
3.4 THE RESULTS OF 26 DB BANDWIDTH & 99% OCCUPIED BANDWIDTH	14
4 MINIMUM 6DB BANDWIDTH.....	15
4.1 LIMIT	15
4.2 MEASUREMENT PROCEDURE	15
4.3 TEST CONFIGURATION	15
4.4 THE RESULTS OF MINIMUM 6DB BANDWIDTH	15
5 MAXIMUM CONDUCTED OUTPUT POWER AND E.I.R.P.....	16
5.1 LIMIT	16
5.2 MEASUREMENT PROCEDURE	16
5.3 TEST CONFIGURATION	17
5.4 TEST RESULTS OF MAXIMUM CONDUCTED OUTPUT POWER.....	17
6 POWER SPECTRUM DENSITY	18
6.1 LIMIT	18
6.2 MEASUREMENT PROCEDURE	18
6.3 TEST CONFIGURATION	19
6.4 TEST RESULTS OF POWER SPECTRUM DENSITY	19
7 RADIATED EMISSIONS	20
7.1 LIMIT	20
7.2 MEASUREMENT PROCEDURE	21
7.3 TEST CONFIGURATION	23
7.4 TEST RESULTS OF RADIATED EMISSIONS	25
8 POWER LINE CONDUCTED EMISSION.....	36

8.1 MEASUREMENT PROCEDURE 36

8.2 TEST CONFIGURATION 36

8.3 TEST RESULTS OF POWER LINE CONDUCTED EMISSION..... 37

9 FREQUENCY STABILITY38

9.1 LIMIT 38

9.2 TEST RESULT: 38

10 ANTENNA REQUIREMENT.....39

APPENDIX A: TEST RESULTS40

Revision History

Issue No.	Version	Description	Date Issued
171001519SHA-002	Rev. 01	Initial issue of report	November 23, 2017

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Product name : WiFi module
Type/Model : ZDGFMT7618BU
Description of EUT : EUT is a wifi module and has only one model.
Rating : DC 5V
Sample received date : October 30, 2017
Date of test : October 30, 2017 ~ November 23, 2017

1.2 RF Technical Information

Assigned Frequency : 5150 ~ 5250MHz
Band : 5250 ~ 5350MHz
5470 ~ 5725MHz
5725 ~ 5850MHz
EUT Modes of : 802.11a
Modulation : 802.11n/ac(HT20)
802.11n/ac(HT40)
802.11ac(VHT80)
Channel Number : For 5150 ~ 5250MHz band: Channel 36 - 48
For 5250 ~ 5350MHz Band: Channel 52 - 64
For 5470 ~ 5725MHz Band: Channel 100 - 140
For 5725 ~ 5850MHz band: Channel 149 - 165
Type of Modulation : OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Antenna Type : PIFA antenna
Antenna Gain : Antenna 0: 3.07dBi
Antenna 1: 3.08dBi
FCC ID : 2AJVQ-7618BU

1.3 Description of Test Facility

Name : Intertek Testing Services Shanghai
Address : Building 86, No. 1198 Qinzhou Road(North), Shanghai 200233, P.R. China
Telephone : 86 21 61278200
Telefax : 86 21 54262353

The test facility is : CNAS Accreditation Lab
recognized, certified, or Registration No. CNAS L0139
accredited by these FCC Accredited Lab
organizations Designation Number: CN1175
IC Registration Lab
Registration code No.: 2042B-1
VCCI Registration Lab
Registration No.: R-4243, G-845, C-4723, T-2252
NVLAP Accreditation Lab
NVLAP LAB CODE: 200849-0
A2LA Accreditation Lab
Certificate Number: 3309.02

2 TEST SPECIFICATIONS

2.1 Standards or specification

47CFR Part 15 (2016)
ANSI C63.10 (2013)
KDB 789033 D02 v01r04
KDB 662911 D01 (v02r01)

2.2 Mode of operation during the test

While testing transmitting mode of EUT, the continuously transmission was applied by following software.

Software name	Manufacturer	Version	Supplied by
QA Tool	-	-	Client

The lowest, middle and highest channel were tested as representatives.

Frequency Band (MHz)	Mode	Lowest (MHz)	Middle (MHz)	Highest (MHz)
5150~5250MHz	802.11a	5180	5220	5240
	802.11n20	5180	5220	5240
	802.11n40	5190	/	5230
	802.11ac80	5210	/	/
5250~5350MHz	802.11a	5260	5300	5320
	802.11n20	5260	5300	5320
	802.11n40	5270	/	5310
	802.11ac80	5290	/	/
5470~5725MHz	802.11a	5500	5600	5700
	802.11n20	5500	5600	5700
	802.11n40	5510	5590	5670
	802.11ac80	5530	/	5610
5725~5850MHz	802.11a	5745	5785	5825
	802.11n20	5745	5785	5825
	802.11n40	5755	/	5795
	802.11ac80	5775	/	/

MIMO Function Description:

Frequency Band (MHz)	Mode	Tx/Rx Function	Beamforming function	CDD function	Directional gain (dBi)	Note
5150~5250MHz	802.11a	1TX/1RX	NO	NO	3.08	Antenna 1 is worse
5250~5350MHz	802.11n/ac(HT20)	2TX/2RX	NO	NO	3.08	-
5470~5725MHz	802.11n/ac(HT40)	2TX/2RX	NO	NO	3.08	-
5725~5850MHz	802.11ac(VHT80)	2TX/2RX	NO	NO	3.08	-
Note: all transmit signals are completely uncorrelated with each other, Directional gain= G_{ANT} .						

After this pre-scan, the following data rate was chosen to do the test as the worst case.

Frequency Band (MHz)	Mode	Worst case data rate
5150~5250	802.11a	6Mbps
	802.11n20	MCS8
	802.11n40	MCS8
	802.11ac80	MCS0NSS2
5250~5350	802.11a	6Mbps
	802.11n20	MCS8
	802.11n40	MCS8
	802.11ac80	MCS0NSS2
5500~5725	802.11a	6Mbps
	802.11n20	MCS8
	802.11n40	MCS8
	802.11ac80	MCS0NSS2
5725~5850	802.11a	6Mbps
	802.11n20	MCS8
	802.11n40	MCS8
	802.11ac80	MCS0NSS2

2.3 Test environment condition:

Temperature:	20-26°C
Humidity:	52-60% RH
Atmospheric Pressure:	101-102kPa

2.4 Test peripherals used

Item No	Description	Manufacturer	Model No.	Serial Number
1	Laptop computer	HP	4230s	-

2.5 Test software list:

Test Items	Software	Manufacturer	Version
Conducted emission	ESxS-K1	R&S	V2.1.0
Radiated emission	ES-K1	R&S	V1.71

2.6 Instrument list

Conducted Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Test Receiver	R&S	ESCS 30	EC 2107	2018-09-12
☒	A.M.N.	R&S	ESH2-Z5	EC 3119	2017-12-01
☐	A.M.N.	R&S	ENV 216	EC 3393	2018-07-30
Radiated Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Test Receiver	R&S	ESIB 26	EC 3045	2018-09-12
☒	Bilog Antenna	TESEQ	CBL 6112D	EC 4206	2018-05-30
☒	Horn antenna	R&S	HF 906	EC 3049	2018-09-23
☒	Horn antenna	ETS	3117	EC 4792-1	2018-08-24
☒	Horn antenna	TOYO	HAP18-26W	EC 4792-3	2020-07-09
☒	Pre-amplifier	R&S	Pre-amp 18	EC5881	2018-06-19
☒	Active loop antenna	Schwarzbeck	FMZB1519	EC 5345	2018-01-25
RF test					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	PXA Signal Analyzer	Keysight	N9030A	EC 5338	2018-09-10
☐	Power sensor/ Power meter	Agilent	N1911A/ N1921A	EC4318	2018-05-12
☐	Test Receiver	R&S	ESCI 7	EC 4501	2018-09-12
Tet Site					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☐	Shielded room	Zhongyu	-	EC 2838	2018-01-08
☒	Semi-anechoic chamber	Albatross project	-	EC 3048	2018-03-09
Additional instrument					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☐	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3323	2018-06-14
☐	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3324	2018-04-09
☒	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3325	2018-03-23
☒	Pressure meter	YM3	Shanghai Mengde	EC 3320	2018-06-28

2.7 Measurement Uncertainty

Test Items	Expanded Uncertainty (k=2) ($\pm$)
Maximum conducted output power	0.74dB
Radiated Emissions in restricted frequency bands below 1GHz	4.90dB
Radiated Emissions in restricted frequency bands above 1GHz	5.02dB
Emission outside the frequency band	2.89dB
Power line conducted emission	3.19dB

2.8 Test Summary

This report applies to tested sample only. The test results have been compared directly with the limits, and the measurement uncertainty is recorded. This report shall not be reproduced in part without written approval of Intertek Testing Service Shanghai.

TEST ITEM	FCC REFERENCE	RESULT
26 dB Bandwidth & 99% Occupied Bandwidth	15.407(a)	Tested
Minimum 6dB Bandwidth	15.407(e)	Pass
Maximum Conducted Output Power	15.407(a)	Pass
Power spectral density	15.407(a)	Pass
Radiated emission	15.407(b) 15.205 15.209	Pass
Power line conducted emission	15.407(b) 15.207	NA
Frequency Stability	15.407(g)	Pass
Antenna requirement	15.203	Pass

Notes: 1: NA =Not Applicable

2: This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

3 26 dB Bandwidth & 99% Occupied Bandwidth

Test result: Pass

3.1 Limit

None

3.2 Measurement Procedure

The EUT was tested according to test procedure of "KDB789033 D02 General UNII Test Procedures New Rules"

26 dB Bandwidth

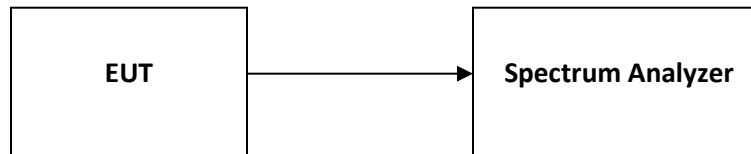
- a) Set RBW = approximately 1% of the emission bandwidth.
- b) Set the VBW > RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

99% Occupied Bandwidth

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 $\geq 3 \cdot$ 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.

3.3 Test Configuration



3.4 The results of 26 dB Bandwidth & 99% Occupied Bandwidth

Please refer to Appendix A

4 Minimum 6dB Bandwidth

Test result: Pass

4.1 Limit

For systems using digital modulation techniques that may operate in the 5725 - 5850 MHz band, the minimum 6 dB bandwidth shall be at least 500 kHz.

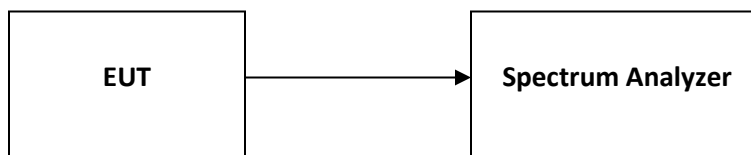
4.2 Measurement Procedure

The EUT was tested according to test procedure of “KDB789033 D02 General UNII Test Procedures New Rules”

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) $\geq 3 \times$ 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.

Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

4.3 Test Configuration



4.4 The results of Minimum 6dB Bandwidth

Please refer to Appendix A

5 Maximum conducted output power and e.i.r.p.

Test result: Pass

5.1 Limit

☐ For an outdoor access point operating in the band 5.15-5.25GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1W provided the maximum antenna gain does not exceed 6dBi.

The maximum e.i.r.p. at any elevation angle above 30 degrees from the horizon must not exceed 125mW (21 dBm).

☐ For an indoor access point operating in the band 5.15-5.25GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6dBi.

☐ For fixed point-to-point access points operating in the band 5.15-5.25GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1W.

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

☒ For the 5.25-5.35GHz and 5.47-5.725GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or $11\text{dBm} + 10\log B$, where B is the 26dB emission bandwidth in megahertz.

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

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

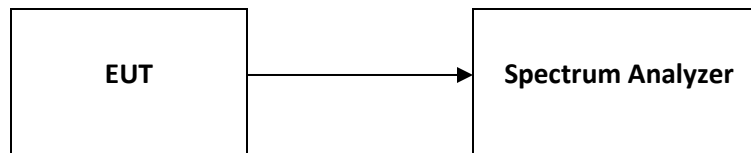
5.2 Measurement Procedure

The EUT was tested according to test procedure of "KDB789033 D02 General UNII Test Procedures New Rules"

- (i) Measure the duty cycle, x, of the transmitter output signal as described in II.B.
- (ii) Set span to encompass the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
- (iii) Set RBW = 1 MHz.
- (iv) Set VBW $\geq$ 3 MHz.
- (v) Number of points in sweep $\geq 2 \times \text{span} / \text{RBW}$. (This ensures that bin-to-bin spacing is $\leq \text{RBW}/2$, so that narrowband signals are not lost between frequency bins.)
- (vi) Sweep time = auto.

- (vii) Detector = power averaging (rms), if available. Otherwise, use sample detector mode.
- (viii) Do not use sweep triggering. Allow the sweep to “free run.”
- (ix) Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed to ensure that the average accurately represents the true average over the on and off periods of the transmitter.
- (x) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
- (xi) Add $10 \log (1/x)$, where x is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add $10 \log (1/0.25) = 6 \text{ dB}$ if the duty cycle is 25%.

5.3 Test Configuration



5.4 Test Results of Maximum conducted output power

Please refer to Appendix A

6 Power spectrum density

Test result: Pass

6.1 Limit

☐ For an outdoor access point operating in the band 5.15-5.25GHz, the maximum power spectral density shall not exceed 17dBm in any 1 megahertz band.

☐ For an indoor access point operating in the band 5.15-5.25GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.

☒ For client devices in the 5.15-5.25GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

☒ For the 5.25-5.35 GHz and 5.47-5.725GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

☒ For the band 5.725-5.85GHz, the maximum power spectral density shall not exceed 30dBm in any 500kHz band.

If the transmitting antenna of directional gain greater than 6dBi is used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. If there have a beam forming type, the limit should be the less of original and original + (6 - antenna gain - beamforming gain).

6.2 Measurement Procedure

The EUT was tested according to test procedure of "KDB789033 D02 General UNII Test Procedures New Rules"

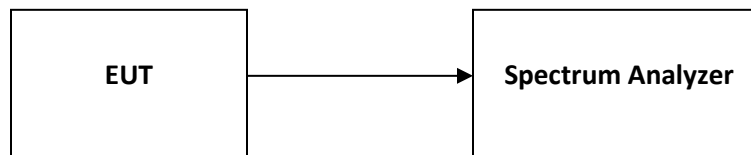
1. Create an average power spectrum for the EUT operating mode being tested by following the instructions in II.E.2. for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, "Compute power...." (This procedure is required even if the maximum conducted output power measurement was performed using a power meter, method PM.)
2. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
3. Make the following adjustments to the peak value of the spectrum, if applicable:
 - a) If Method SA-2 or SA-2 Alternative was used, add 10 log (1/x), where x is the duty cycle, to the peak of the spectrum.
 - b) If Method SA-3 Alternative was used and the linear mode was used in step II.E.2.g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging.
4. The result is the Maximum PSD over 1 MHz reference bandwidth.
5. For devices operating in the bands 5.15 5.25 GHz, 5.25 5.35 GHz, and 5.47 5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in Section

15.407(a)(5). For devices operating in the band 5.725 – 5.85 GHz, 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 $RBW \geq 1/T$, where T is defined in II.B.I.a).
- b) Set $VBW \geq 3 RBW$.
- c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10 \log (500 \text{ kHz}/RBW)$ 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 $10 \log (1\text{MHz}/RBW)$ 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 steps 5.c) and 5.d) above, since RBW=100 KHz is available on nearly all spectrum analyzers.

6.3 Test Configuration



6.4 Test Results of Power spectrum density

Please refer to Appendix A

7 Radiated Emissions

Test result: Pass

7.1 Limit

The radiated emissions which fall in the restricted bands as defined in §15.205(a), and the radiated emissions below 1GHz, must comply with the radiated emission limits specified in §15.209(a) showed as below:

Frequencies (MHz)	Field Strength (microvolts/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

The radiated emissions which fall outside the restrict bands, should comply with the EIRP limit as below:

For transmitters operating in the 5.15 - 5.25 / 5.25 - 5.35 / 5.47 - 5.725GHz band:

Frequency (MHz)	EIRP Limit (dBm)	Equivalent Field Strength (3m) (dBμV/m)
<5150	-27	68.20
>5350		
<5470		
>5725		

For transmitters operating in the 5.725 - 5.85GHz band:

Frequency (MHz)	EIRP Limit (dBm/MHz)	Equivalent Field Strength (3m) (dBμV/m)
<5650	-27	68.20
5650 ~ 5700	-27 ~ 10	68.20 ~ 105.20
5700 ~ 5720	10 ~ 15.6	105.20 ~ 110.80
5720 ~ 5725	15.6 ~ 27	110.80 ~ 122.20
5850 ~ 5855	27 ~ 15.6	122.20 ~ 110.80
5855 ~ 5875	15.6 ~ 10	110.80 ~ 105.20
5875 ~ 5925	10 ~ -27	105.20 ~ 68.20
>5925	-27	68.20

7.2 Measurement Procedure

For Radiated emission below 30MHz:

- a) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c) Both X and Y axes of the antenna are set to make the measurement.
- d) For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e) The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz:

- a) The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c) The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e) The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f) The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

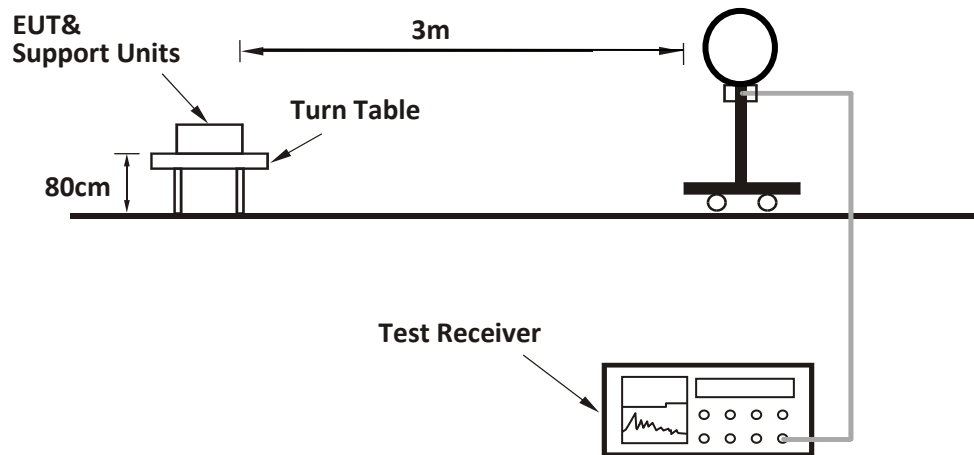
Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.

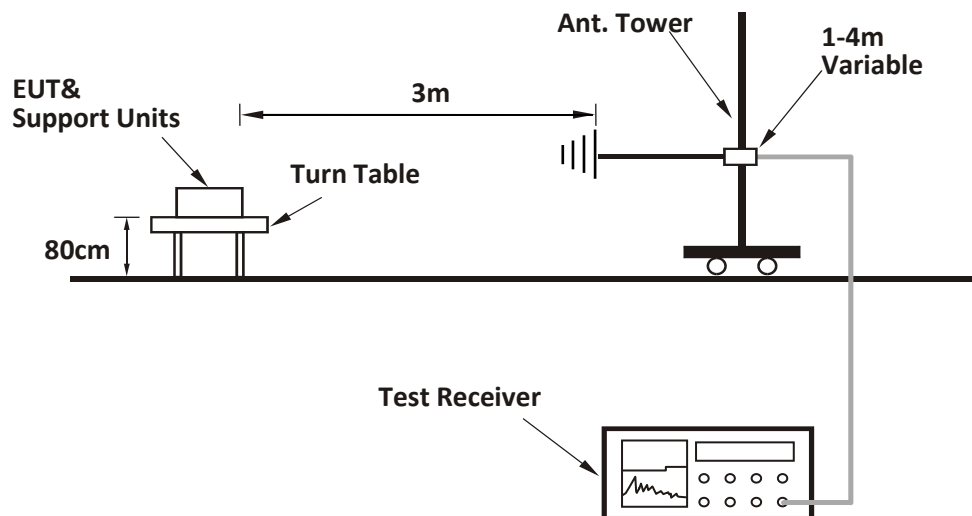
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or $3 \times \text{RBW}$ (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported

7.3 Test Configuration

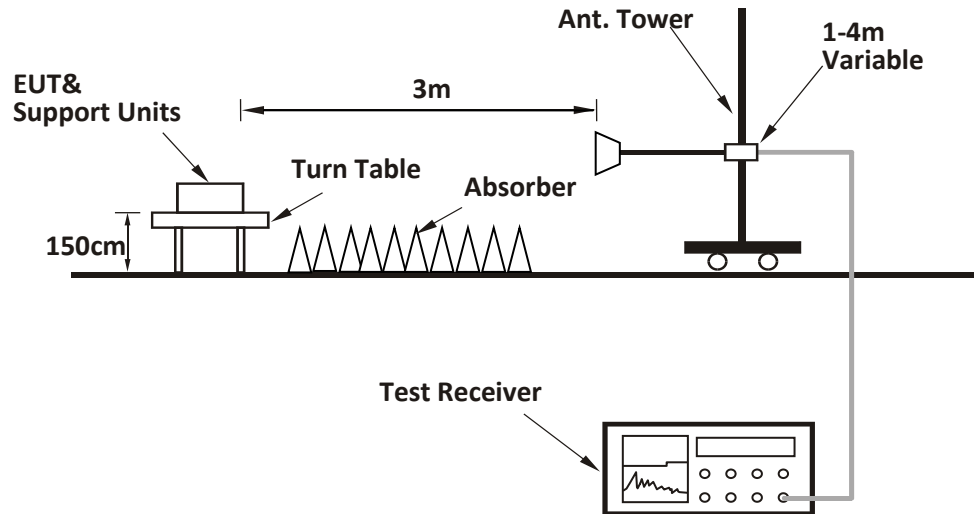
For Radiated emission below 30MHz:



For Radiated emission 30MHz to 1GHz:



For Radiated emission above 1GHz:

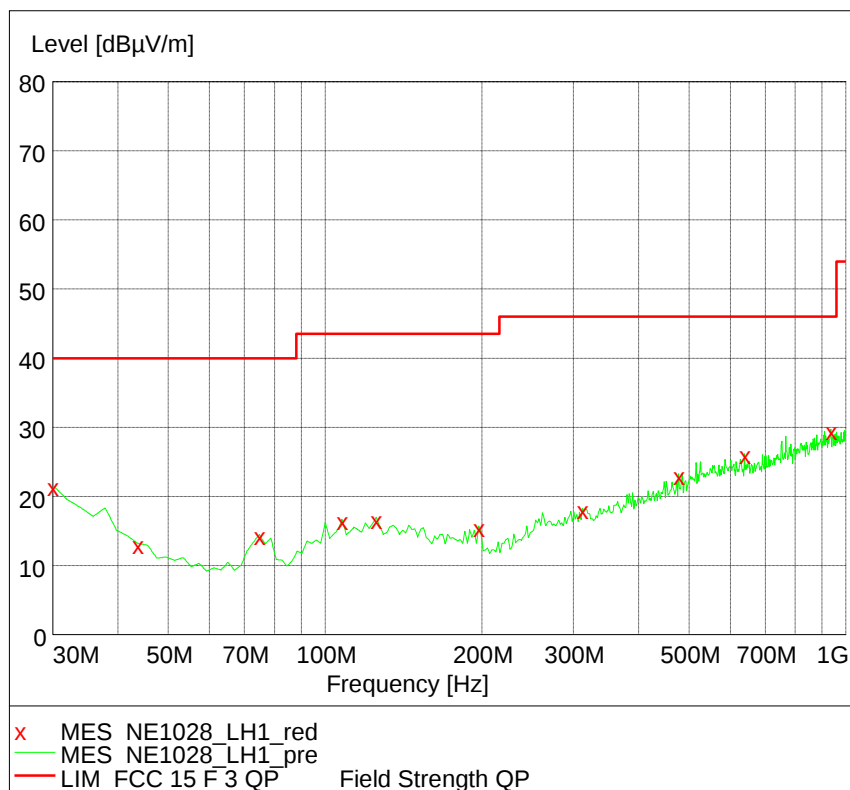


7.4 Test Results of Radiated Emissions

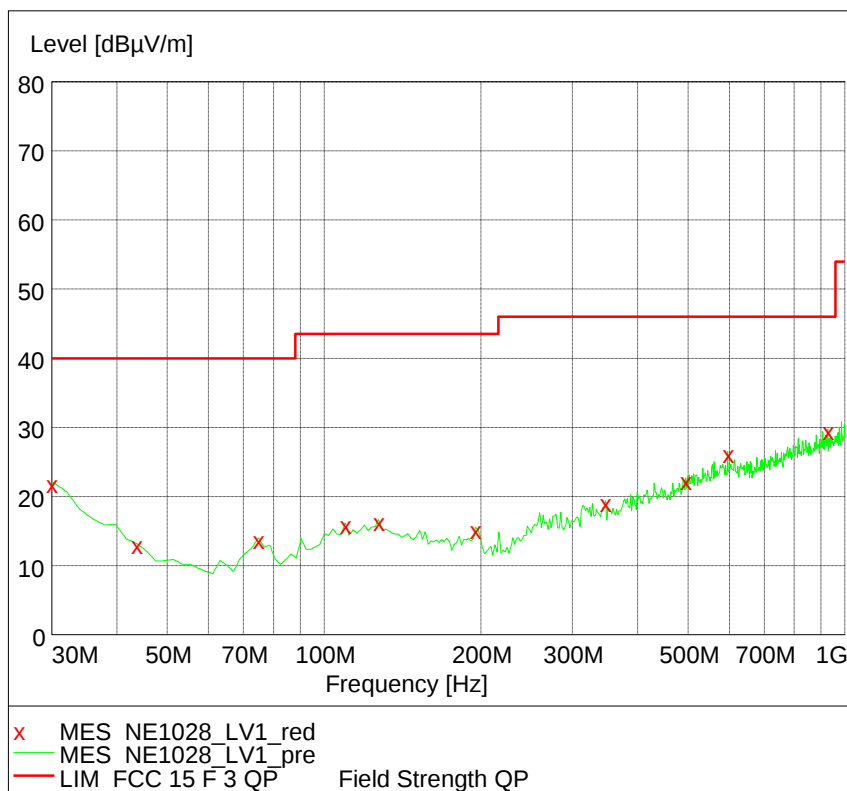
The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

The worst waveform from 30MHz to 1000MHz is listed as below:

Horizontal



Vertical



Test data below 1GHz

Antenna	Frequency (MHz)	Corrected Reading (dBuV/m)	Correct Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector
H	30.00	21.60	19.20	40.00	18.40	PK
H	43.61	13.20	11.60	40.00	26.80	PK
H	74.71	14.50	7.50	40.00	25.50	PK
H	125.25	16.90	13.10	43.50	26.60	PK
H	638.44	26.20	20.70	46.00	19.80	PK
H	935.85	29.70	23.30	46.00	16.30	PK
V	30.00	22.10	19.20	40.00	17.90	PK
V	43.61	13.20	11.60	40.00	26.80	PK
V	74.71	14.00	7.50	40.00	26.00	PK

V	494.59	22.60	19.20	46.00	23.40	PK
V	595.67	26.50	20.50	46.00	19.50	PK
V	928.08	29.70	23.30	46.00	16.30	PK

Test result above 1GHz:

The emission was conducted from 1GHz to 40GHz

U-NII-1 Band:

802.11a

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5180	40.80	105.40	Fundamental	/	PK
	H	5150.00	40.70	61.50	74.00	12.50	PK
	H	5150.00	40.70	51.02	54.00	3.98	AV
	H	10363.65	14.50	45.70	74.00	28.30	PK
	V	10363.84	14.50	45.50	74.00	28.50	PK
M	H	5200	40.90	105.40	Fundamental	/	PK
	H	5150.00	40.70	52.60	74.00	21.40	PK
	H	10403.75	14.50	47.50	74.00	26.50	PK
	V	10403.43	14.50	47.00	74.00	27.00	PK
H	H	5240	41.00	105.50	Fundamental	/	PK
	H	5150.00	40.70	52.45	74.00	22.55	PK
	H	10483.16	14.50	47.90	74.00	26.10	PK
	V	10483.16	14.50	47.85	74.00	26.15	PK

802.11n20

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5180	40.80	106.80	Fundamental	/	PK
	H	5150.00	40.70	60.91	74.00	13.09	PK
	H	5150.00	40.70	51.54	54.00	3.46	AV

	H	10364.30	14.50	45.70	74.00	28.30	PK
	V	10364.25	14.50	45.60	74.00	28.40	PK
M	H	5200	40.90	106.60	Fundamental	/	PK
	H	5150.00	40.70	52.60	74.00	21.40	PK
	H	10404.75	14.50	47.70	74.00	26.30	PK
	V	10404.43	14.50	47.40	74.00	26.60	PK
H	H	5240	41.00	106.70	Fundamental	/	PK
	H	5150.00	40.70	52.75	74.00	21.25	PK
	H	10484.29	14.50	47.80	74.00	26.20	PK
	V	10484.79	14.50	47.67	74.00	26.33	PK

802.11n40

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5190	40.80	105.70	Fundamental	/	PK
	H	5150.00	40.70	70.79	74.00	3.21	PK
	H	5150.00	40.70	52.00	54.00	2.00	AV
	H	10387.14	14.50	45.90	74.00	28.10	PK
	V	10387.68	14.50	45.80	74.00	28.20	PK
H	H	5230	41.00	122.75	Fundamental	/	PK
	H	5150.00	40.70	52.80	74.00	21.20	PK
	H	10466.95	14.50	45.80	74.00	28.20	PK
	V	10466.85	14.50	45.70	74.00	28.30	PK

802.11ac80

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5210	40.90	102.50	Fundamental	/	PK
	H	5150.00	40.70	66.96	74.00	7.04	PK
	H	5150.00	40.70	51.00	54.00	3.00	AV

	H	10432.15	14.50	48.10	74.00	25.90	PK
	V	10432.65	14.50	48.00	74.00	26.00	PK

U-NII-2A Band:

802.11a

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5260	40.80	105.50	Fundamental	/	PK
	H	5350.00	40.80	52.80	74.00	21.20	PK
	H	10524.10	14.40	48.10	74.00	25.90	PK
	V	10524.25	14.40	48.20	74.00	25.80	PK
M	H	5300	40.80	105.60	Fundamental	/	PK
	H	5350.00	40.80	52.90	74.00	21.10	PK
	H	10604.67	14.40	48.20	74.00	25.80	PK
	V	10604.53	14.40	48.20	74.00	25.80	PK
H	H	5320	40.80	105.70	Fundamental	/	PK
	H	5350.00	40.80	61.56	74.00	22.44	PK
	H	5350.00	40.80	51.57	54.00	2.43	PK
	H	10644.67	14.40	48.30	74.00	25.70	PK
	V	10644.53	14.40	48.30	74.00	25.70	PK

802.11n20

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5260	40.80	106.50	Fundamental	/	PK
	H	5350.00	40.80	52.80	74.00	21.20	PK
	H	10526.18	14.40	48.10	74.00	25.90	PK
	V	10526.25	14.40	48.00	74.00	26.00	PK
M	H	5300	40.80	106.60	Fundamental	/	PK
	H	5350.00	40.80	52.90	74.00	21.10	PK

	H	10606.60	14.40	48.10	74.00	25.90	PK
	V	10606.59	14.40	48.10	74.00	25.90	PK
H	H	5320	40.80	106.70	Fundamental	/	PK
	H	5350.00	40.80	60.66	74.00	13.34	PK
	H	5350.00	40.80	51.09	54.00	3.91	AV
	H	10646.60	14.40	48.20	74.00	25.80	PK
	V	10646.50	14.40	48.20	74.00	25.80	PK

802.11n40

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5270	40.80	119.50	Fundamental	/	PK
	H	5350.00	40.80	52.90	74.00	21.10	PK
	H	10546.89	14.40	48.10	74.00	25.90	PK
	V	10546.55	14.40	48.10	74.00	25.90	PK
H	H	5310	40.80	117.50	Fundamental	/	PK
	H	5350.00	40.80	71.48	74.00	2.52	PK
	H	5350.00	40.80	52.00	54.00	2.00	AV
	H	10626.46	14.40	48.20	74.00	25.80	PK
	V	10626.14	14.40	48.20	74.00	25.80	PK

802.11ac80

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5290	40.80	102.10	Fundamental	/	PK
	H	5350.34	40.70	70.70	74.00	3.30	PK
	H	5350.34	40.70	53.50	54.00	0.50	AV
	H	10589.78	14.40	48.10	74.00	25.90	PK
	V	10589.25	14.40	48.20	74.00	25.80	PK

U-NII-2C Band:

802.11a

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5500	40.50	105.30	Fundamental	/	PK
	H	5470.00	40.60	61.62	68.20	6.58	PK
	H	1103.68	14.20	48.30	74.00	25.70	PK
	V	1103.54	14.20	48.30	74.00	25.70	PK
M	H	5600	40.50	105.80	Fundamental	/	PK
	H	11203.57	14.10	48.50	74.00	25.50	PK
	V	11203.15	14.10	48.40	74.00	25.60	PK
H	H	5700	40.50	106.10	Fundamental	/	PK
	H	5725.00	40.60	62.79	68.20	5.41	PK
	H	11403.74	14.00	48.60	74.00	25.40	PK
	V	11403.74	14.00	48.50	74.00	25.50	PK

802.11n20

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5500	40.50	105.40	Fundamental	/	PK
	H	5470.00	40.60	62.42	68.20	5.78	PK
	H	1106.32	14.20	48.40	74.00	25.60	PK
	V	1103.35	14.20	48.30	74.00	25.70	PK
M	H	5600	40.50	105.70	Fundamental	/	PK
	H	11206.57	14.10	48.40	74.00	25.60	PK
	V	11207.15	14.10	48.40	74.00	25.60	PK
H	H	5700	40.50	105.90	Fundamental	/	PK
	H	5725.00	40.60	62.34	68.20	5.86	PK
	H	11406.65	14.00	48.70	74.00	25.30	PK
	V	11404.36	14.00	48.50	74.00	25.50	PK

802.11n40

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5510	40.50	104.60	Fundamental	/	PK
	H	5470.00	40.50	67.89	68.20	0.31	PK
	H	11028.31	14.20	48.50	74.00	25.50	PK
	V	11026.79	14.20	48.40	74.00	25.60	PK
M	H	5590	40.50	105.70	Fundamental	/	PK
	H	11188.30	14.10	48.50	74.00	25.50	PK
	V	11187.70	14.10	48.50	74.00	25.50	PK
H	H	5670	40.50	106.70	Fundamental	/	PK
	H	5725.00	40.20	61.96	68.20	37.24	PK
	H	11348.68	14.00	48.70	74.00	25.30	PK
	V	11347.61	14.00	48.60	74.00	25.40	PK

802.11ac80

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5530	40.50	101.40	Fundamental	/	PK
	H	5470.00	40.60	67.20	68.20	1.00	PK
	H	11065.45	14.10	48.60	74.00	25.40	PK
	V	11072.25	14.10	48.50	74.00	25.50	PK
H	H	5610	40.50	100.70	Fundamental	/	PK
	H	5725.00	40.30	64.59	68.20	3.61	PK
	H	11209.41	14.00	48.70	74.00	25.30	PK
	V	11205.97	14.00	48.60	74.00	25.40	PK

U-NII-3 Band:

802.11a

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5745	40.80	108.68	Fundamental	/	PK
	H	5648.25	40.80	61.20	68.20	7.00	PK
	H	5719.99	40.50	81.90	110.80	28.90	PK
	H	11495.14	13.80	48.90	74.00	25.10	PK
	V	11490.58	13.80	48.70	74.00	25.30	PK
M	H	5785	40.80	108.60	Fundamental	/	PK
	H	11515.14	13.70	48.80	74.00	25.20	PK
	V	11508.58	13.70	48.70	74.00	25.30	PK
H	H	5825	40.90	108.70	Fundamental	/	PK
	H	5926.16	41.00	61.80	68.20	6.40	PK
	H	5855.00	40.90	82.20	110.80	28.60	PK
	H	11660.14	13.70	48.80	74.00	25.20	PK
	V	11656.58	13.70	48.90	74.00	25.10	PK

802.11n20

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5745	40.80	111.90	Fundamental	/	PK
	H	5649.25	40.80	60.60	68.20	7.60	PK
	H	5719.99	40.50	82.30	110.80	28.50	PK
	H	11490.14	13.80	48.90	74.00	25.10	PK
	V	11452.58	13.80	48.80	74.00	25.20	PK
M	H	5785	40.80	111.70	Fundamental	/	PK
	H	11521.78	13.70	48.80	74.00	25.20	PK
	V	11518.58	13.70	48.90	74.00	25.10	PK
H	H	5825	40.90	111.80	Fundamental	/	PK

	H	5855.00	40.90	82.40	110.80	28.40	PK
	H	5927.24	41.00	62.10	68.20	6.10	PK
	H	11660.14	13.70	48.80	74.00	25.20	PK
	V	11656.58	13.70	48.90	74.00	25.10	PK

802.11n40

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5755	40.80	107.14	Fundamental	/	PK
	H	5638.12	40.80	65.20	68.20	3.00	PK
	H	5720.00	40.50	82.10	110.80	28.70	PK
	H	11516.20	13.70	49.10	74.00	24.90	PK
	V	11521.60	13.70	48.90	74.00	25.10	PK
H	H	5795	40.80	107.10	Fundamental	/	PK
	H	5855.00	40.90	82.30	110.80	28.50	PK
	H	5928.12	40.80	62.20	68.20	6.00	PK
	H	11598.20	13.70	49.10	74.00	24.90	PK
	V	11604.60	13.70	49.00	74.00	25.00	PK

802.11ac80

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5775	40.80	103.43	Fundamental	/	PK
	H	5718.34	40.50	82.00	110.30	28.30	PK
	H	5649.45	40.80	62.73	68.20	5.47	PK
	H	11563.26	13.70	49.10	74.00	24.90	PK
	V	11560.79	13.70	48.90	74.00	25.10	PK

Remark: 1. Correct Factor = Antenna Factor + Cable Loss (+ Amplifier, for higher than 1GHz), the value was added to Original Receiver Reading by the software automatically.

2. Corrected Reading = Original Receiver Reading + Correct Factor

3. Margin = Limit - Corrected Reading

4. If the PK Corrected Reading is lower than AV limit, the AV test can be elided.

Example: Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,
Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10.00dBuV,
Limit = 40.00dBuV/m.
Then Correct Factor = $30.20 + 2.00 - 32.00 = 0.20\text{dB/m}$;
Corrected Reading = $10\text{dBuV} + 0.20\text{dB/m} = 10.20\text{dBuV/m}$;
Margin = $40.00\text{dBuV/m} - 10.20\text{dBuV/m} = 29.80\text{dB}$.

8 Power line conducted emission

Test result: NA

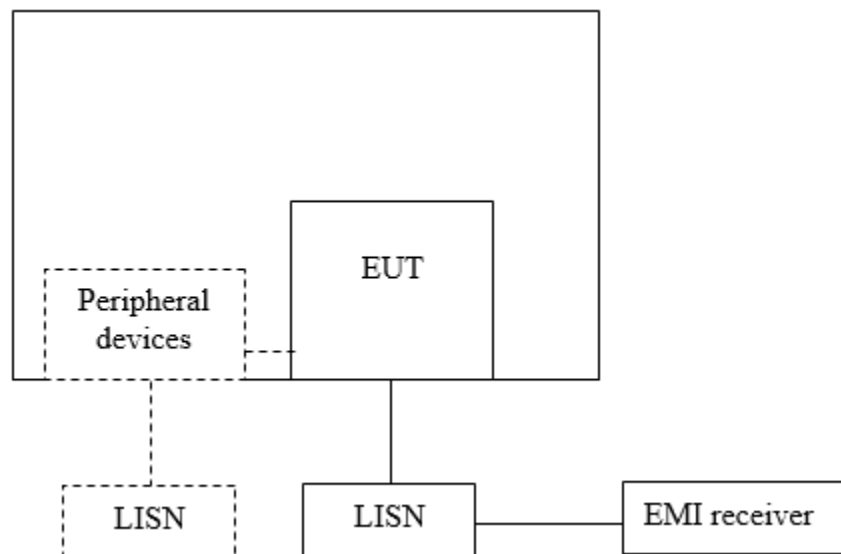
8.1 Measurement Procedure

Measured levels of ac power-line conducted emission shall be the emission voltages from the voltage probe, where permitted, or across the 50 Ω LISN port (to which the EUT is connected), where permitted, terminated into a 50 Ω measuring instrument. All emission voltage and current measurements shall be made on each current-carrying conductor at the plug end of the EUT power cord by the use of mating plugs and receptacles on the LISN, if used. Equipment shall be tested with power cords that are normally supplied or recommended by the manufacturer and that have electrical and shielding characteristics that are the same as those cords normally supplied or recommended by the manufacturer. For those measurements using a LISN, the 50 Ω measuring port is terminated by a measuring instrument having 50 Ω input impedance. All other ports are terminated in 50 Ω loads.

Tabletop devices shall be placed on a platform of nominal size 1 m by 1.5 m, raised 80 cm above the reference ground plane. The vertical conducting plane or wall of an RF-shielded (screened) room shall be located 40 cm to the rear of the EUT. Floor-standing devices shall be placed either directly on the reference ground-plane or on insulating material as described in ANSI C63.4. All other surfaces of tabletop or floor-standing EUTs shall be at least 80 cm from any other grounded conducting surface, including the case or cases of one or more LISNs.

The bandwidth of the test receiver is set at 9 kHz.

8.2 Test Configuration



Test Curve:

Test Data:

Frequency (MHz)	Quasi-peak			Average			Line
	Corrected Reading (dBuV)	Limit (dBuV)	Margin (dB)	Corrected Reading (dBuV)	Limit (dBuV)	Margin (dB)	

Note: * means the emission level 20dB below the relevant limit.

Remark: 1. Correct Factor = LISN Factor + Cable Loss, the value was added to Original Receiver Reading by the software automatically.

2. Corrected Reading = Original Receiver Reading + Correct Factor

3. Margin = Limit - Corrected Reading

4. If the PK Corrected Reading is lower than AV limit, the AV test can be elided.

Example: Assuming LISN Factor = 10.00dB, Cable Loss = 2.00dB,
Original Receiver Reading = 10.00dBuV, Limit = 66.00dBuV.
Then Correct Factor = 10.00 + 2.00 = 12.00dB;
Corrected Reading = 10dBuV + 12.00dB = 22.00dBuV;
Margin = 66.00dBuV – 22.00dBuV = 44.00dB.

9 Frequency Stability

Test result: Pass

9.1 Limit

The frequency stability shall be sufficient to ensure that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

9.2 Test Result:

Frequency Error - Temperature Variation

Supply Voltage DC (V)	Temperature (°C)	Frequency Stability (Hz)
		Channel (5180MHz)
5	-30	-18.345
	-20	-14.549
	-10	-12.439
	0	8.120
	10	-14.320
	20	-15.440
	30	-19.235
	40	-24.876
	50	-32.576

Frequency Error - Voltage Variation

Supply Voltage DC (V)	Temperature (°C)	Frequency Stability (Hz)
		Channel (5180MHz)
4.25	20	-16.245
5		-15.440
5.75		-15.897

10 Antenna requirement

Requirement:

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

Result:

EUT uses permanently attached antenna to the intentional radiator, so it can comply with the provisions of this section.

Appendix A: Test results

U-NII-1

1. Duty Cycle

1.1 Test Data

ANT 1:

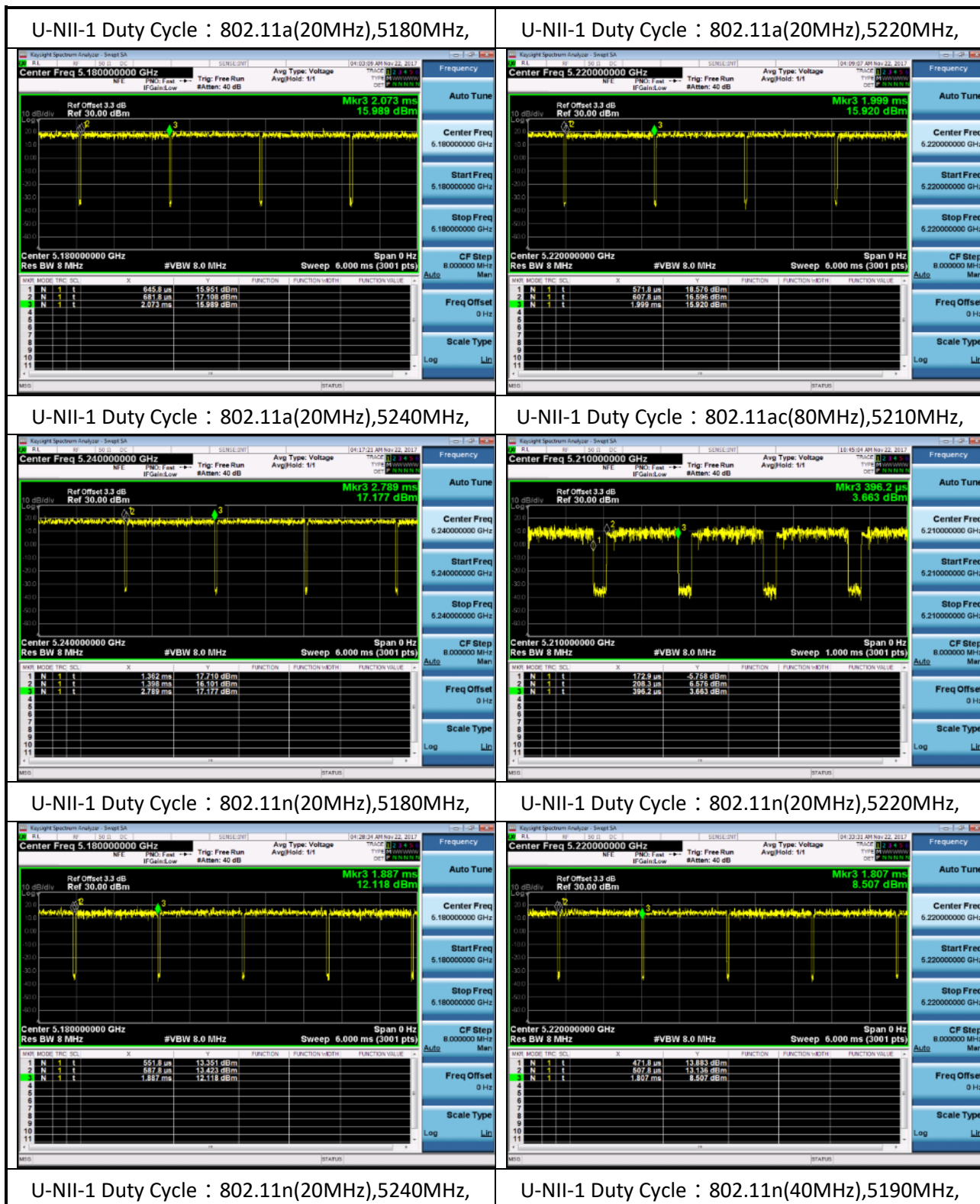
U-NII-1 Duty Cycle			
Mode	Test Frequency(MHz)	Duty Cycle(%)	Result
802.11n(20MHz)	5180	97.31	-
802.11n(20MHz)	5220	97.31	-
802.11n(20MHz)	5240	97.31	-
802.11n(40MHz)	5190	95.01	-
802.11n(40MHz)	5230	94.74	-
802.11ac(80MHz)	5210	84.18	-
802.11a(20MHz)	5180	97.48	-
802.11a(20MHz)	5220	97.48	-
802.11a(20MHz)	5240	97.48	-

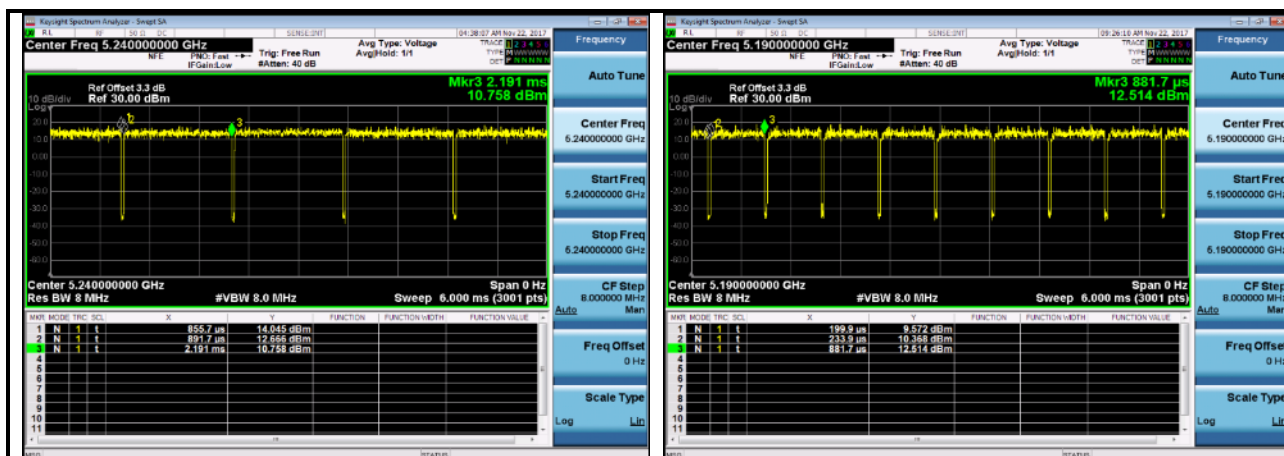
ANT 0:

U-NII-1 Duty Cycle ANT 0			
Mode	Test Frequency(MHz)	Duty Cycle(%)	Result
802.11n(20MHz)	5180	97.38	-
802.11n(20MHz)	5220	97.38	-
802.11n(20MHz)	5240	97.38	-
802.11n(40MHz)	5190	94.88	-
802.11n(40MHz)	5230	94.88	-
802.11ac(80MHz)	5210	84.18	-

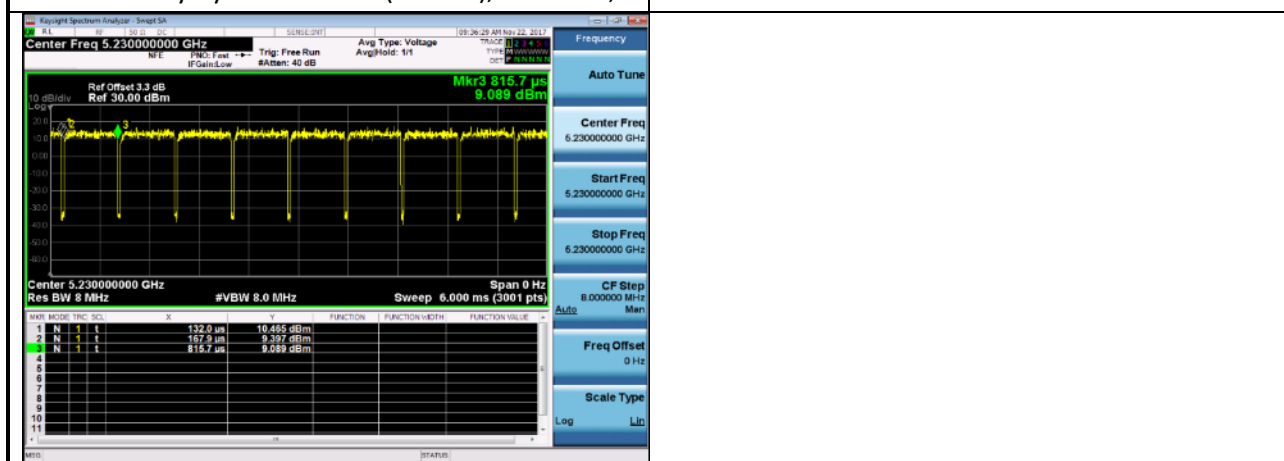
1.2 Test Plots

ANT 1:

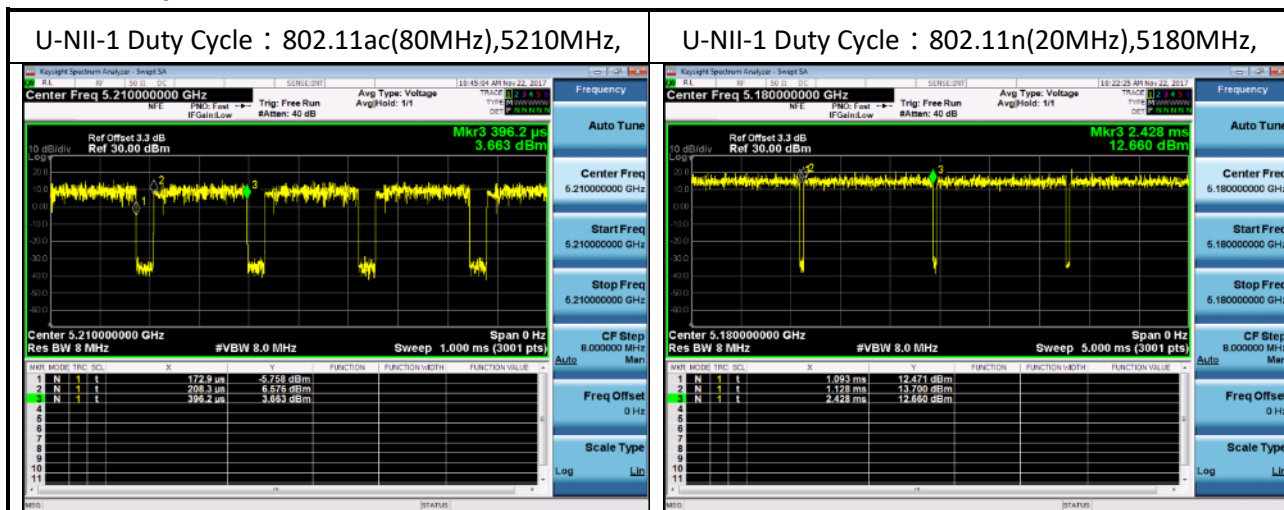




U-NII-1 Duty Cycle : 802.11n(40MHz),5230MHz,

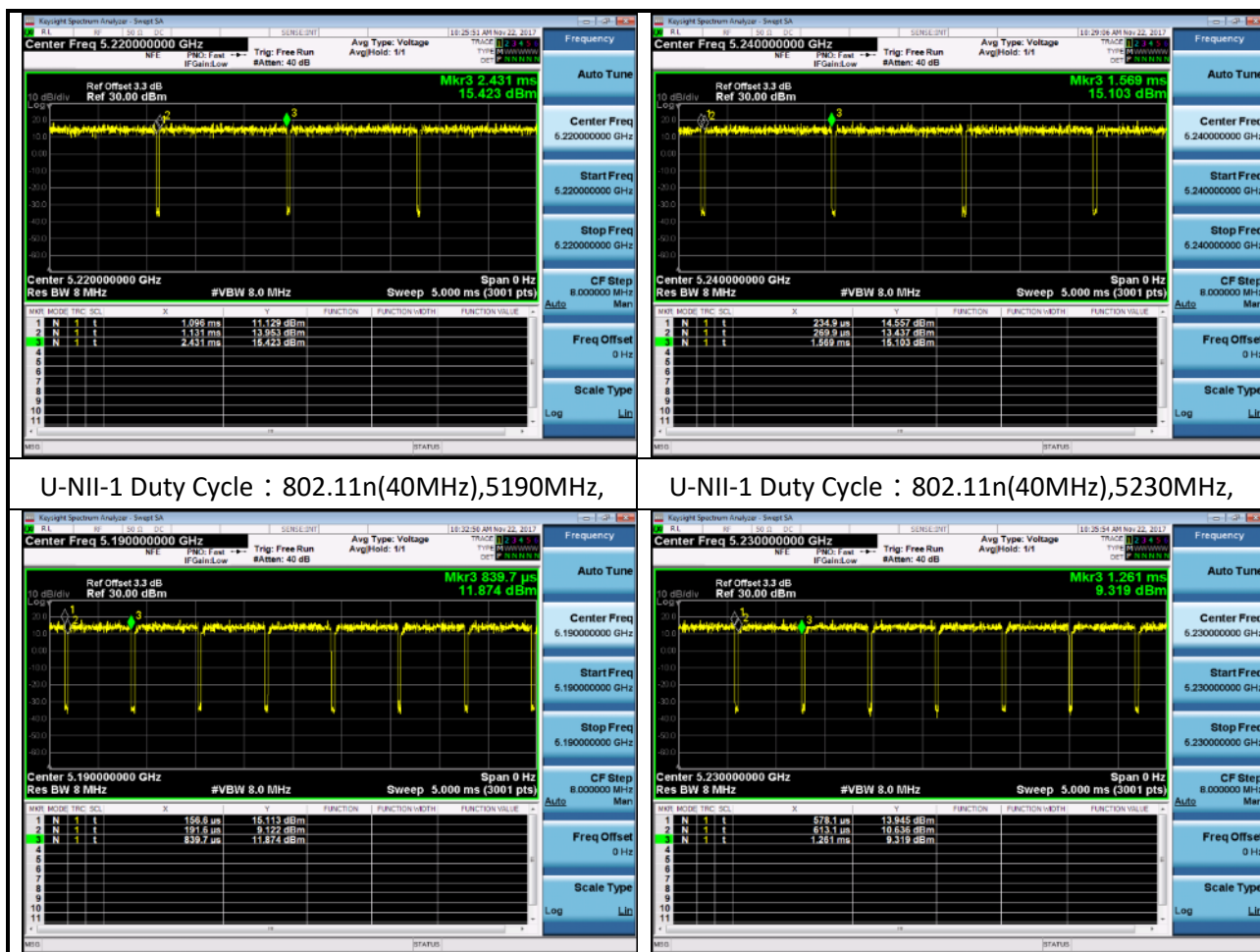


ANT 0:



U-NII-1 Duty Cycle : 802.11n(20MHz),5220MHz,

U-NII-1 Duty Cycle : 802.11n(20MHz),5240MHz,



2. 26dB bandwidth

2.1 Test Data

ANT 1:

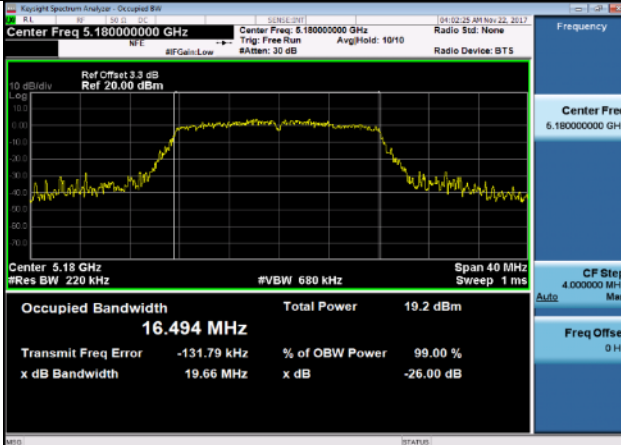
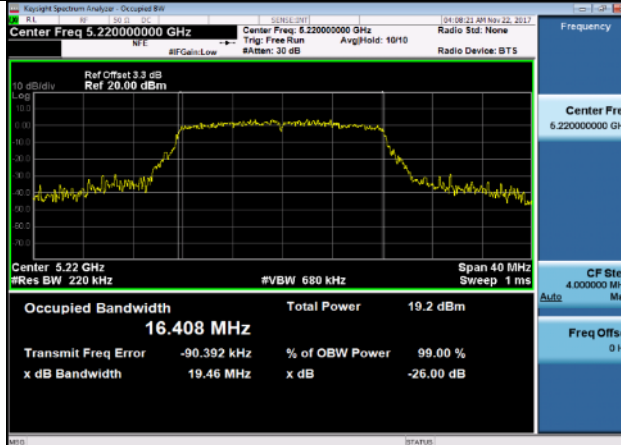
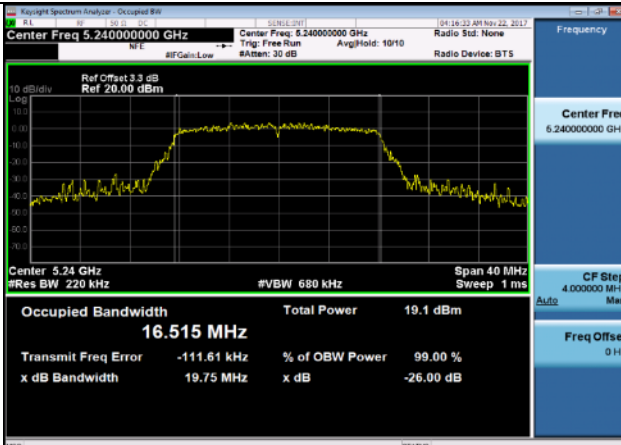
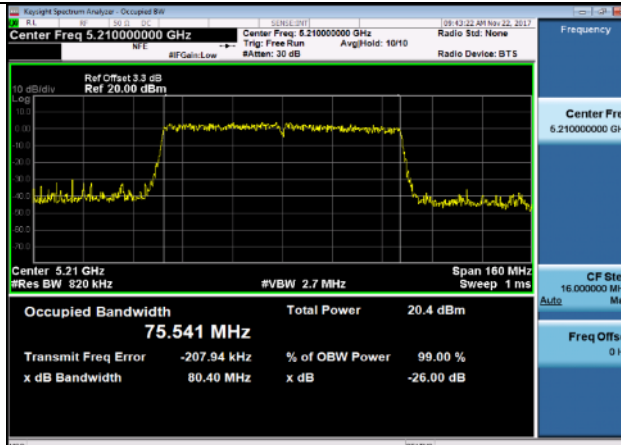
U-NII-1 26dB bandwidth			
Mode	Test Frequency(MHz)	26dB bandwidth (MHz)	Result
802.11n(20MHz)	5180	19.80	Pass
802.11n(20MHz)	5220	19.86	Pass
802.11n(20MHz)	5240	19.66	Pass
802.11n(40MHz)	5190	39.61	Pass
802.11n(40MHz)	5230	39.59	Pass
802.11ac(80MHz)	5210	80.40	Pass
802.11a(20MHz)	5180	19.66	Pass
802.11a(20MHz)	5220	19.46	Pass
802.11a(20MHz)	5240	19.75	Pass

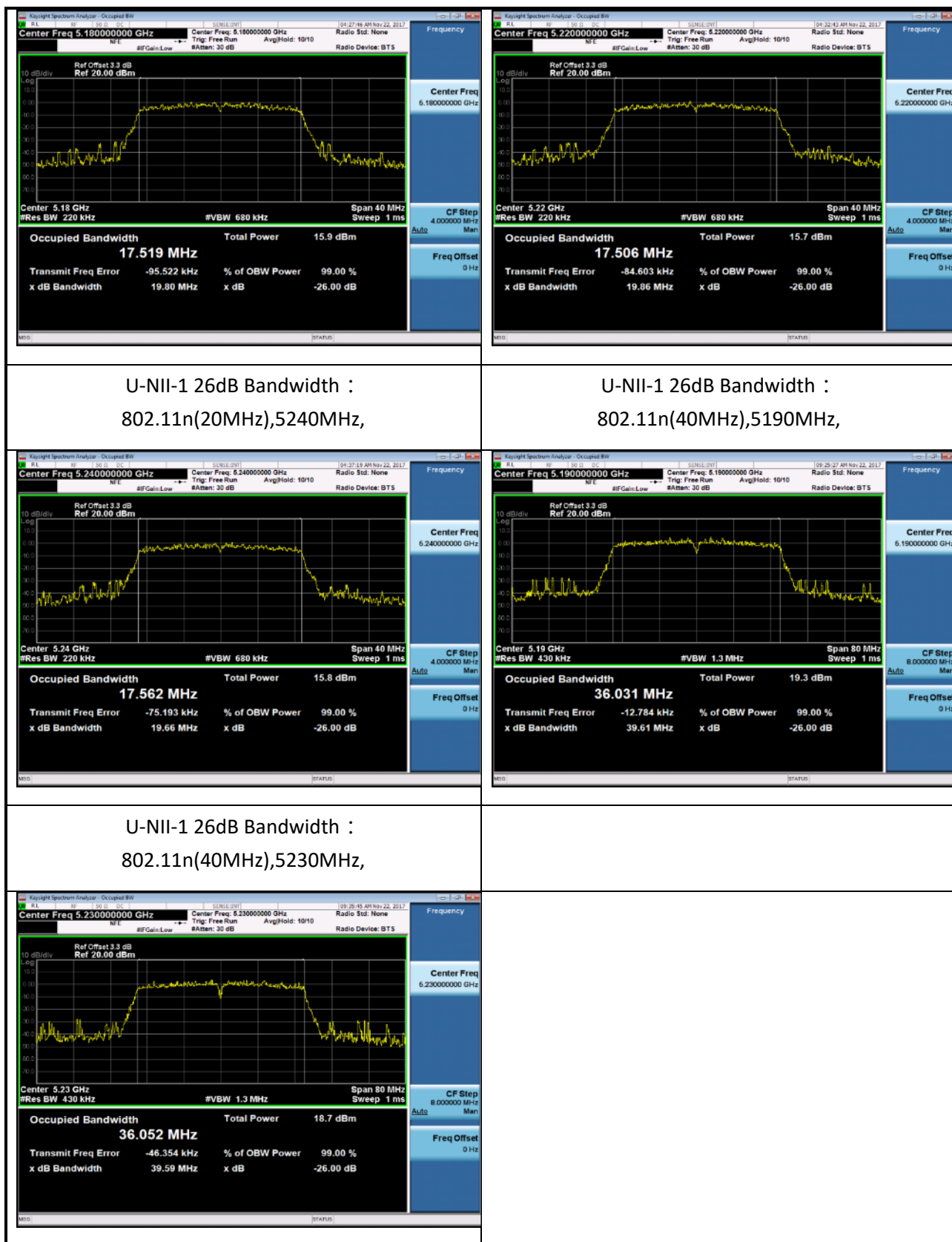
ANT 0:

U-NII-1 26dB bandwidth			
Mode	Test Frequency(MHz)	26dB bandwidth (MHz)	Result
802.11n(20MHz)	5180	20.21	Pass
802.11n(20MHz)	5220	20.08	Pass
802.11n(20MHz)	5240	20.16	Pass
802.11n(40MHz)	5190	40.34	Pass
802.11n(40MHz)	5230	43.40	Pass
802.11ac(80MHz)	5210	80.29	Pass

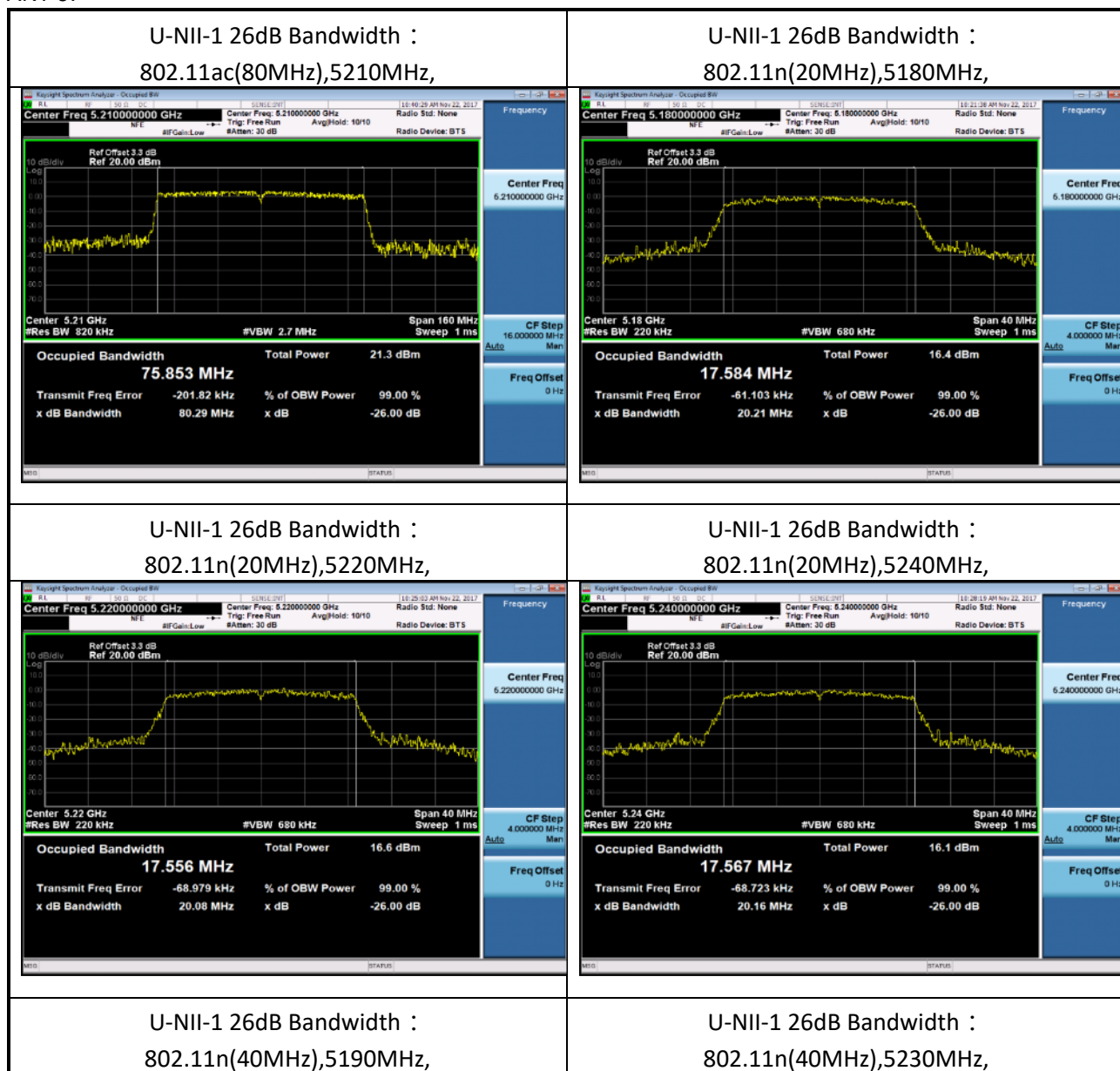
2.2 Test Plots

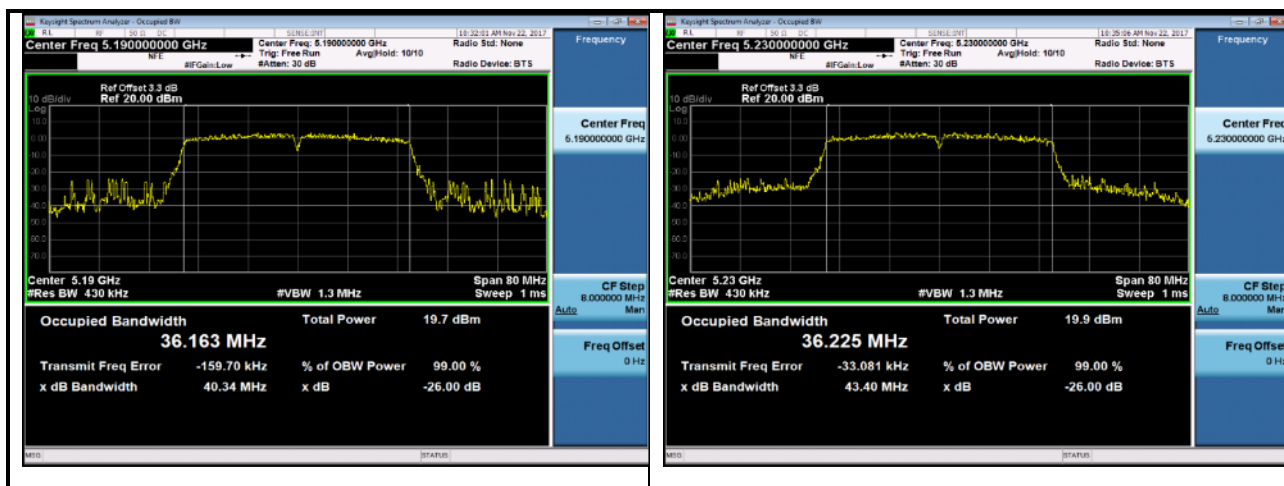
ANT 1:

U-NII-1 26dB Bandwidth : 802.11a(20MHz),5180MHz,  Center Freq 5.18000000 GHz Res BW 220 kHz Span 40 MHz Occupied Bandwidth 16.494 MHz Total Power 19.2 dBm Transmit Freq Error -131.79 kHz x dB Bandwidth 19.66 MHz	U-NII-1 26dB Bandwidth : 802.11a(20MHz),5220MHz,  Center Freq 5.22000000 GHz Res BW 220 kHz Span 40 MHz Occupied Bandwidth 16.408 MHz Total Power 19.2 dBm Transmit Freq Error -90.392 kHz x dB Bandwidth 19.46 MHz
U-NII-1 26dB Bandwidth : 802.11a(20MHz),5240MHz,  Center Freq 5.24000000 GHz Res BW 220 kHz Span 40 MHz Occupied Bandwidth 16.515 MHz Total Power 19.1 dBm Transmit Freq Error -111.61 kHz x dB Bandwidth 19.75 MHz	U-NII-1 26dB Bandwidth : 802.11ac(80MHz),5210MHz,  Center Freq 5.21000000 GHz Res BW 520 kHz Span 160 MHz Occupied Bandwidth 75.541 MHz Total Power 20.4 dBm Transmit Freq Error -207.94 kHz x dB Bandwidth 80.40 MHz
U-NII-1 26dB Bandwidth : 802.11n(20MHz),5180MHz,	U-NII-1 26dB Bandwidth : 802.11n(20MHz),5220MHz,



ANT 0:





3. 99% Occupied Bandwidth

3.1 Test Data

ANT 1:

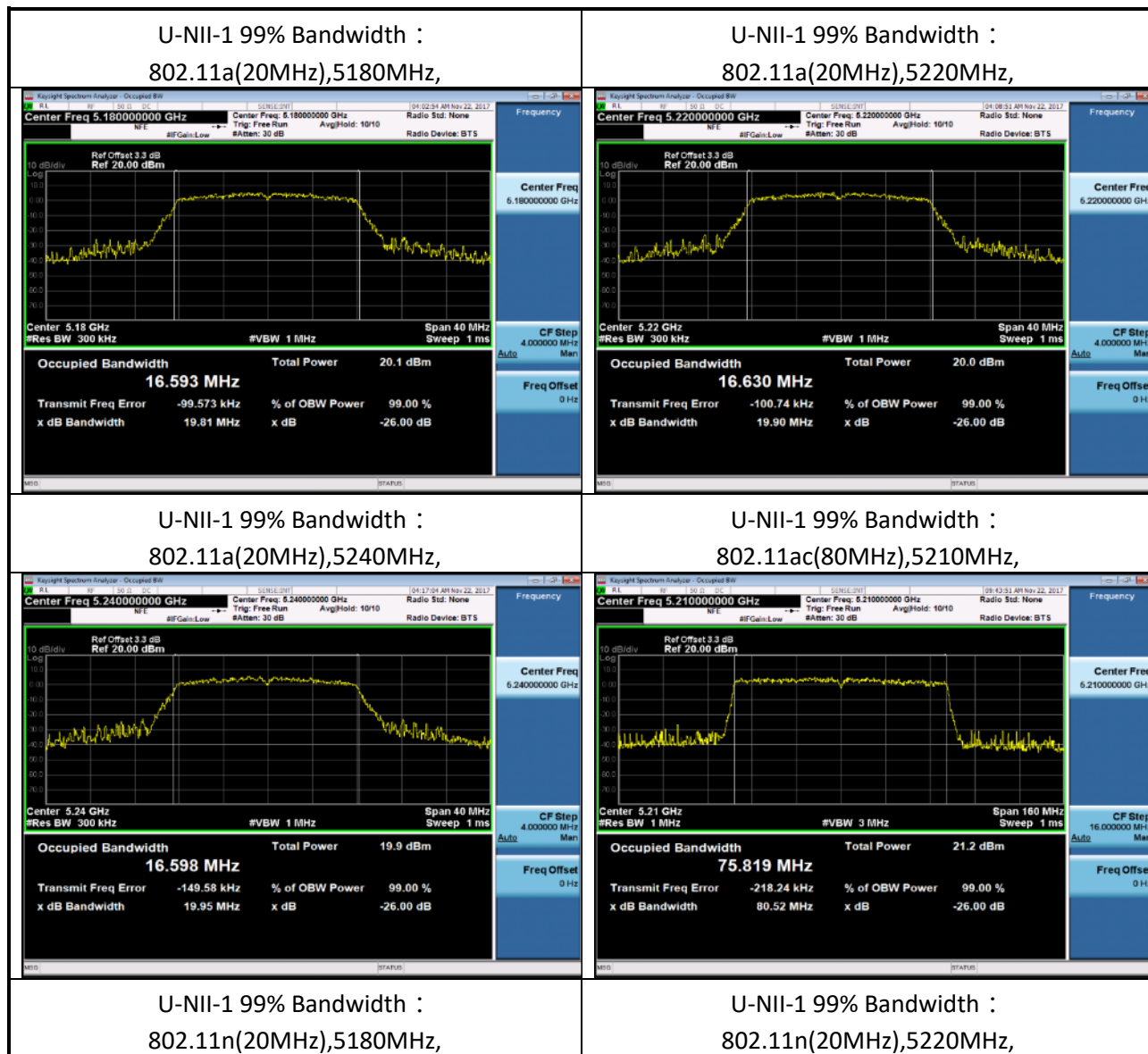
U-NII-1 99% Occupied Bandwidth			
Mode	Test Frequency(MHz)	99% Occupy Bandwidth(MHz)	Result
802.11n(20MHz)	5180	17.514	Pass
802.11n(20MHz)	5220	17.535	Pass
802.11n(20MHz)	5240	17.545	Pass
802.11n(40MHz)	5190	36.491	Pass
802.11n(40MHz)	5230	36.462	Pass
802.11ac(80MHz)	5210	75.819	Pass
802.11a(20MHz)	5180	16.593	Pass
802.11a(20MHz)	5220	16.630	Pass
802.11a(20MHz)	5240	16.598	Pass

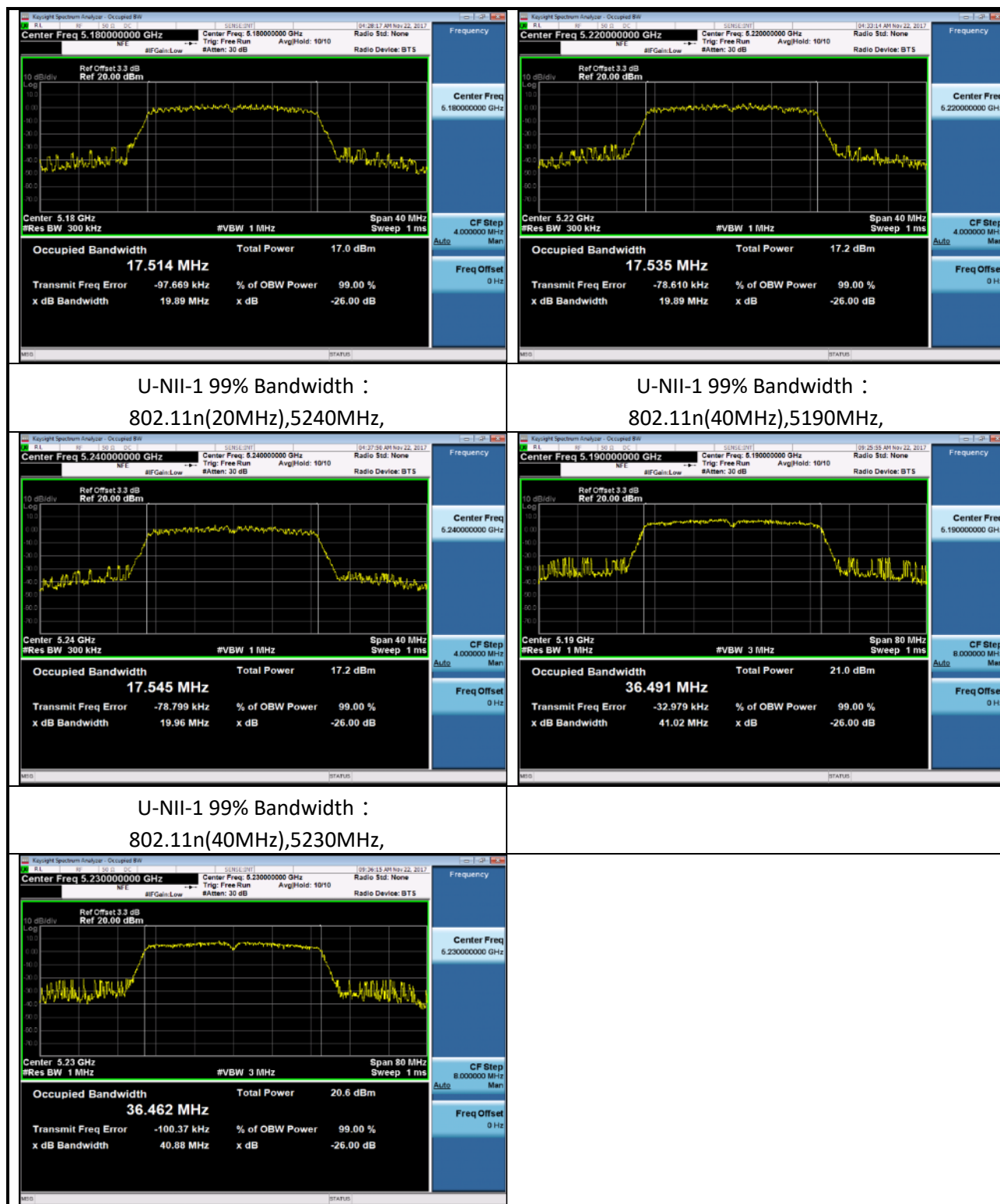
ANT 0:

U-NII-1 99% Occupied Bandwidth			
Mode	Test Frequency(MHz)	99% Occupy Bandwidth(MHz)	Result
802.11n(20MHz)	5180	17.651	Pass
802.11n(20MHz)	5220	17.679	Pass
802.11n(20MHz)	5240	17.697	Pass
802.11n(40MHz)	5190	36.418	Pass
802.11n(40MHz)	5230	36.550	Pass
802.11ac(80MHz)	5210	75.853	Pass

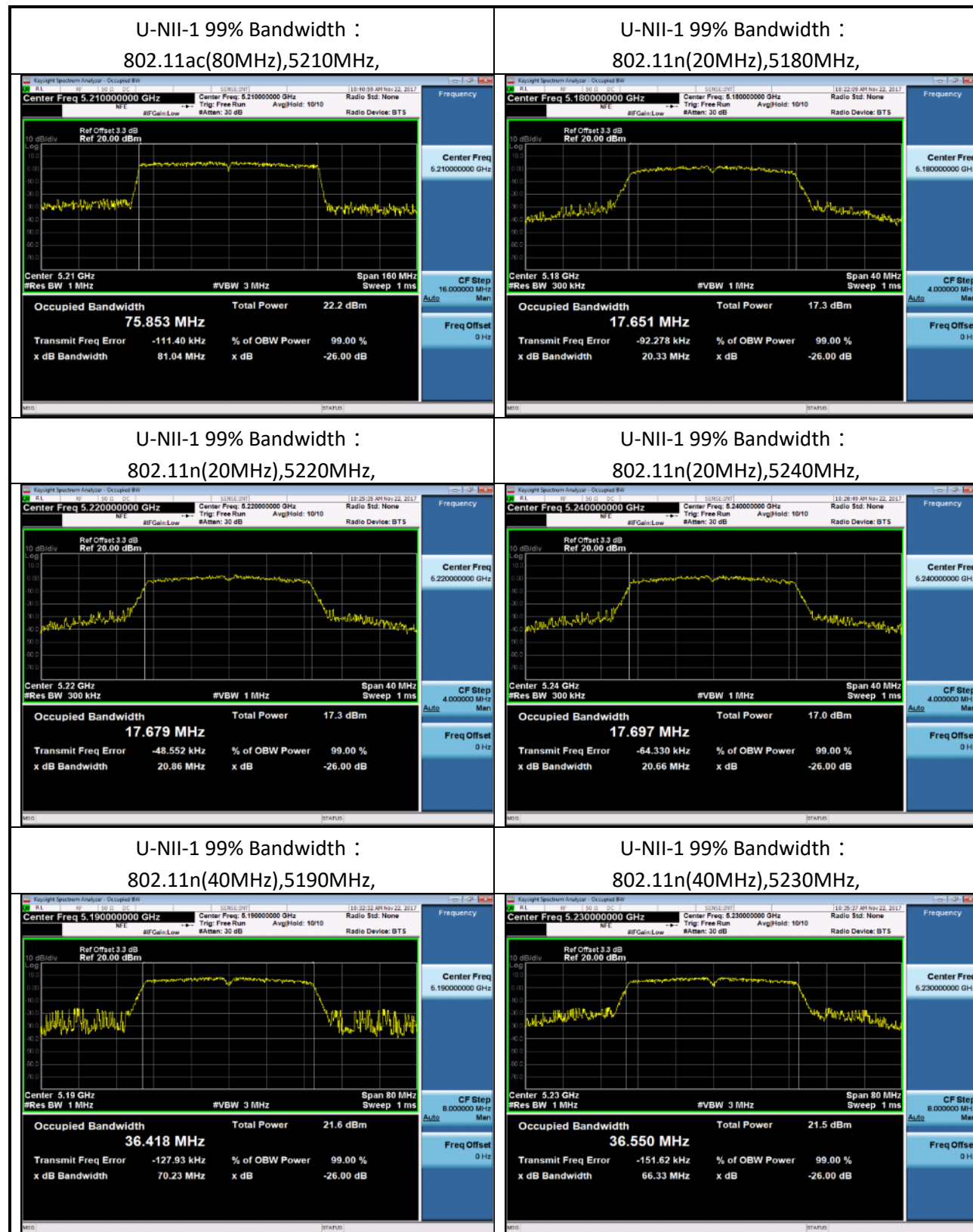
3.2 Test Plots

ANT 1:





ANT 0:



4. Maximum conducted output power and e.i.r.p

4.1 Test Data

ANT 1:

U-NII-1 AVGSA Output Power						
Mode	Test Frequency (MHz)	Ant	Duty Cycle (%)	Max Power (dBm)	Limit (dBm)	Result
802.11n(20MHz)	5180	Ant1	97.31	10.62	24	-
802.11n(20MHz)	5220	Ant1	97.31	10.58	24	-
802.11n(20MHz)	5240	Ant1	97.31	10.70	24	-
802.11n(40MHz)	5190	Ant1	95.01	13.52	24	-
802.11n(40MHz)	5230	Ant1	94.74	13.31	24	-
802.11ac(80MHz)	5210	Ant1	84.18	13.03	24	-
802.11a(20MHz)	5180	Ant1	97.48	14.15	24	Pass
802.11a(20MHz)	5220	Ant1	97.48	14.06	24	Pass
802.11a(20MHz)	5240	Ant1	97.48	14.04	24	Pass

ANT 0:

U-NII-1 AVGSA Output Power						
Mode	Test Frequency (MHz)	Ant	Duty Cycle (%)	Max Power (dBm)	Limit (dBm)	Result
802.11n(20MHz)	5180	Ant0	97.38	11.28	24	-
802.11n(20MHz)	5220	Ant0	97.38	11.35	24	-
802.11n(20MHz)	5240	Ant0	97.38	11.18	24	-
802.11n(40MHz)	5190	Ant0	94.88	14.54	24	-
802.11n(40MHz)	5230	Ant0	94.88	14.53	24	-
802.11ac(80MHz)	5210	Ant0	84.18	14.14	24	-

MIMO mode:

U-NII-1 AVGSA Output Power					
Mode	Test Frequency (MHz)	Ant	Max Power (dBm)	Limit (dBm)	Result
802.11n(20MHz)	5180	0+1	13.97	24	Pass
802.11n(20MHz)	5220	0+1	13.99	24	Pass

802.11n(20MHz)	5240	0+1	13.96	24	Pass
802.11n(40MHz)	5190	0+1	17.07	24	Pass
802.11n(40MHz)	5230	0+1	16.97	24	Pass
802.11ac(80MHz)	5210	0+1	16.63	24	Pass

4.2 Test Plots

ANT 1:

