



TEST REPORT

FCC ID: V2V-1807 IC: 7607A-1807

Applicant : LigoWave LLC

Address : 138 Mountain Brook Dr Canton, GA 30115 United States

Equipment under Test (EUT):

Name : Broadband Digital Transmission System
Model : NFT 2ac

Standards : FCC PART 15, SUBPART C : 2015 (Section 15.247)
RSS-247 ISSUE 1 MAY 2015
ANSI C63.4:2014 ; ANSI C63.10:2013

Report No. : T1861433 06

Date of Test : July 25, 2016- August 05, 2016

Date of Issue : August 08, 2016

Test Result :	PASS *
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* In the configuration tested, the EUT complied with the standards specified above

Authorized Signature

A handwritten signature in black ink that appears to read "Mark Zhu".

(Mark Zhu)
General Manager

The manufacturer should ensure that all the products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of Shenzhen Alpha Product Testing Co., Ltd. Or test done by Shenzhen Alpha Product Testing Co., Ltd. Approvals in connection with, distribution or use of the product described in this report must be approved by Shenzhen Alpha Product Testing Co., Ltd. Approvals in writing.

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TEST REPORT VERIFICATION

Applicant : LigoWave LLC
Manufacturer : LigoWave LLC
EUT Description : Broadband Digital Transmission System

- (A) Model No. : NFT 2ac
(B) Trademark : N/A
(C) Ratings Supply : DC 48V From External power
(D) Test Voltage : DC 48V From External power

Measurement Standard Used:

FCC Rules and Regulations Part 15 Subpart C 2015, RSS-247 ISSUE 1 MAY 2015,
ANSI C63.4-2014, ANSI C63.10-2013

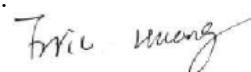
The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits both conducted and radiated emissions. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After the test, our opinion is that EUT compliance with the requirement of the above standards.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature).....:

Eric Huang
Test Engineer



Approved by (name + signature).....:

Simple Guan
Project Manager



Date of issue.....

August 08, 2016

1 General Information

1.1 Description of Device (EUT)

Trade Name	: N/A
EUT	: Broadband Digital Transmission System
Model No.	NFT 2ac
DIFF.	: N/A
Operation Type	: MIMO Tx mode
Antenna Type	: Integrated antenna with two antennas, antenna gain 2dBi. Directional gain 5dBi.
Operation Frequency	IEEE 802.11b/g: 2412MHz-2462MHz IEEE 802.11n HT20: 2412MHz-2462MHz IEEE 802.11n HT40: 2422MHz-2452MHz IEEE 802.11b/g:11Channels
Channel number	IEEE 802.11n HT20: 11 Channels IEEE 802.11n HT40: 7Channels IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK)
Modulation type	IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n :OFDM(64QAM, 16QAM, QPSK, BPSK)
Power Supply	: DC 48V From External power
Adapter	Model No.: GRT-POE20-480050A, G0720-480-050
Applicant	: LigoWave LLC
Address	: 138 Mountain Brook Dr Canton, GA 30115 United States
Manufacturer	: LigoWave LLC
Address	: 138 Mountain Brook Dr Canton, GA 30115 United States

1.2 Description of Test Facility

Shenzhen Alpha Product Testing Co., Ltd
 Building B, East Area of Nanchang Second, Industrial Zone, Gushu 2nd Road,
 Bao'an, Shenzhen, China

August 11, 2014 File on Federal Communication Commission
 Registration Number: 203110

July 18, 2014 Certificated by IC
 Registration Number: 12135A

2 EMC Equipment List

Equipment	Manufacture	Model No.	Serial No.	Last cal. Due to	Cal Interval
3m Semi-Anechoic	CHENYU	N/A	N/A	2018.01.18	2Year
Spectrum analyzer	Agilent	E4407B	MY46185649	2017.01.16	1Year
Receiver	R&S	ESPI	101873	2017.01.16	1Year
Receiver	R&S	ESCI	101165	2017.01.16	1Year
Bilog Antenna	SCHWARZBECK	VULB 9168	VULB9168-438	2018.01.18	2Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D(1201)	2017.01.20	2Year
Cable	Resenberger	N/A	No.1	2017.01.16	1Year
Cable	SCHWARZBECK	N/A	No.2	2017.01.16	1Year
Cable	SCHWARZBECK	N/A	No.3	2017.01.16	1Year
Pre-amplifier	HP	HP8347A	2834A00455	2017.01.18	1Year
Pre-amplifier	Agilent	8449B	3008A02664	2017.01.18	1Year
vector Signal Generator	Agilent	N5182A	MY49060042	2016.11.16	1 Year
vector Signal Generator	Agilent	E4438C	US44271917	2016.11.16	1 Year
X-series USB Peak and Average Power Sensor	Agilent	U2021XA	MY54080020	2016.11.16	1 Year

X-series USB Peak and Average Power Sensor	Agilent	U2021XA	MY54110001	2016.11.16	1 Year
Signal Analyzer	Agilent	N9020A	MY48030494	2016.11.16	1 Year
L.I.S.N.#1	Schwarzbeck	NSLK8126	8126466	2017.01.16	1 Year
L.I.S.N.#2	ROHDE&SCHWABERZ	ENV216	101043	2017.01.16	1 Year

3 Test Procedure

POWER LINE CONDUCTED INTERFERENCE: The test procedure used was ANSI Standard ANSI C63.4:2014 using a 50 μ H LISN. Both Lines were observed. The bandwidth of the receiver was 10kHz with an appropriate sweep speed. The ambient temperature of the EUT was 25°C with a humidity of 58%.

RADIATION INTERFERENCE: The test procedure used was ANSI Standard ANSI C63.4:2014 using a ANRITSU spectrum analyzer with a pre-selector. The analyzer was calibrated in dB above a micro volt at the output of the antenna. The resolution bandwidth was 100kHz and the video bandwidth was 300 kHz up to 1 GHz and 1 MHz with a video BW of 3MHz above 1 GHz. The ambient temperature of the EUT was 25°C with a humidity of 58%.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer and cable loss. The antenna correction factors and cable loss are stated in terms of dB. The gain of the Pre-selector was accounted for in the Spectrum Analyzer Meter Reading.

Example:

$$\text{Freq (MHz) METER READING} + \text{ACF} + \text{CABLE} = \text{FS}$$

$$33.20 \text{ dBuV} + 10.36 \text{ dB} + 0.9 \text{ dB} = 44.46 \text{ dBuV/m @ 3m}$$

ANSI STANDARD ANSI C63.4:2014 10.1.7 MEASUREMENT PROCEDURES: The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The EUT was placed in the center of the table (1.5m side). The table used for radiated measurements is capable of continuous rotation. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes. The situation was similar for the conducted measurement except that the table did not rotate. The EUT was setup as described in ANSI Standard ANSI C63.4:2014 10.1.7 with the EUT 40 cm from the vertical ground wall.

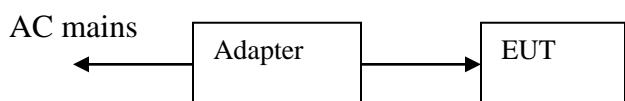
4 Summary of Measurement

4.1 Summary of test result

Test Item	Test Requirement	Standards Paragraph	Result
Spurious Emission	FCC PART 15 : 2014 & IC RSS-247	Section 15.247&15.209 & RSS-247 Section 5.5	Compliance
Conduction Emission	FCC PART 15 : 2015 & IC RSS Gen	Section 15.207&8.9	Compliance
Bandwidth Test	FCC PART 15 : 2015 & IC RSS-247	Section 15.247& RSS-247 5.2	Compliance
Peak Power	FCC PART 15 : 2015 & IC RSS-247	Section 15.247 & RSS-247 5.2	Compliance
Power Density	FCC PART 15 : 2015 & IC RSS-247	Section 15.247 & Section 5.2	Compliance
Band Edge	FCC PART 15 : 2015 & IC RSS-247	Section 15.247 & Section 5.5	Compliance
Antenna Requirement	FCC PART 15 : 2015 & IC RSS Gen	Section 15.203	Compliance

Note: The EUT has been tested as an independent unit. And Continual Transmitting in maximum power (The adapter be used during Test)

4.2 Test connection



4.3 Assistant equipment used for test

Description	:	Adapter
Manufacturer	:	N/A
Model No.	:	GRT-POE20-480050A

Description	:	Adapter
Manufacturer	:	N/A
Model No.	:	G0720-480-050

4.4 Test mode

Dutycycle :100% Keeping MIMO TX mode			
Mode	data rate (Mbps)(see Note)	Channel	Frequency (MHz)
IEEE 802.11b	1	Low :CH1	2412
	1	Middle: CH6	2437
	1	High: CH11	2462
IEEE 802.11g	6	Low :CH1	2412
	6	Middle: CH6	2437
	6	High: CH11	2462
IEEE 802.11 n/HT20 with 2.4G	6.5	Low :CH1	2412
	6.5	Middle: CH6	2437
	6.5	High: CH11	2462
IEEE 802.11 n/HT40 with 2.4G	13.5	Low :CH3	2422
	13.5	Middle:CH6	2437
	13.5	High:CH9	2452
Note: According exploratory test, EUT will have maximum output power in those data rate. so those data rate were used for all test.			

4.5 Channel list

For IEEE 802.11b/g and IEEE 802.11n/HT20 with 2.4G					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
CH1	2412	CH5	2432	CH9	2452
CH2	2417	CH6	2437	CH10	2457
CH3	2422	CH7	2442	CH11	2462
CH4	2427	CH8	2447		

For IEEE 802.11n/HT40 with 2.4G					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
CH1	/	CH5	2432	CH9	2452
CH2	/	CH6	2437	/	/
CH3	2422	CH7	2442	/	/
CH4	2427	CH8	2447	/	/

4.6 Test Conditions

Temperature range	21-25°C
Humidity range	40-75%
Pressure range	86-106kPa

4.7 Measurement Uncertainty (95% confidence levels, k=2)

Item	MU	Remark
Uncertainty for Power point Conducted Emissions Test	2.42dB	
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	2.13 dB	Polarize: V
	2.57dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.54dB	Polarize: V
	4.1dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	2.08dB	Polarize: H
	2.56dB	Polarize: V
Uncertainty for radio frequency	1×10^{-9}	
Uncertainty for conducted RF Power	0.65dB	
Uncertainty for temperature	0.2°C	
Uncertainty for humidity	1%	
Uncertainty for DC and low frequency voltages	0.06%	

5 Spurious Emission

5.1 Radiation Emission

5.1.1 Radiation Emission Limits(15.209)

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

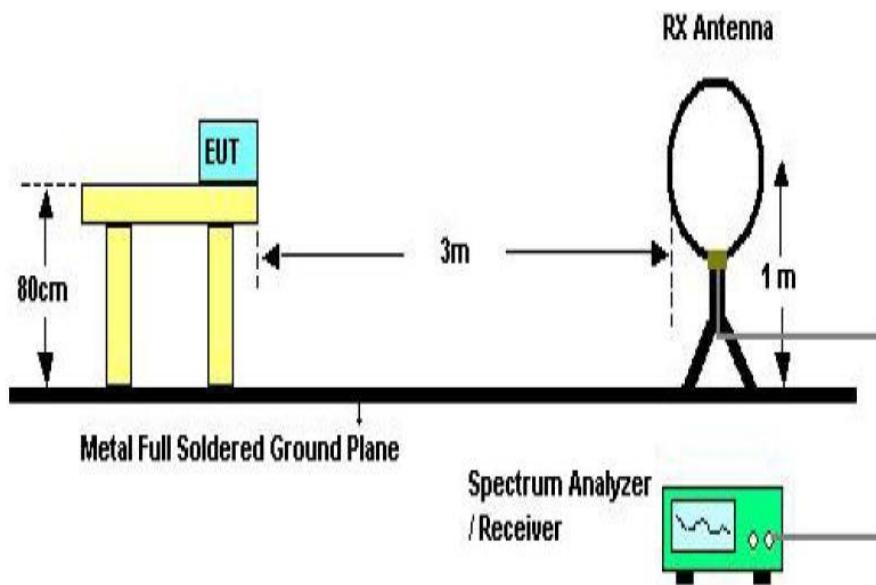
Harmonic emissions limits comply with below 54 dBuV/m at 3m. Other emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or comply with the radiated emissions limits specified in section 15.209(a) limit in the table below has to be followed.

NOTE:

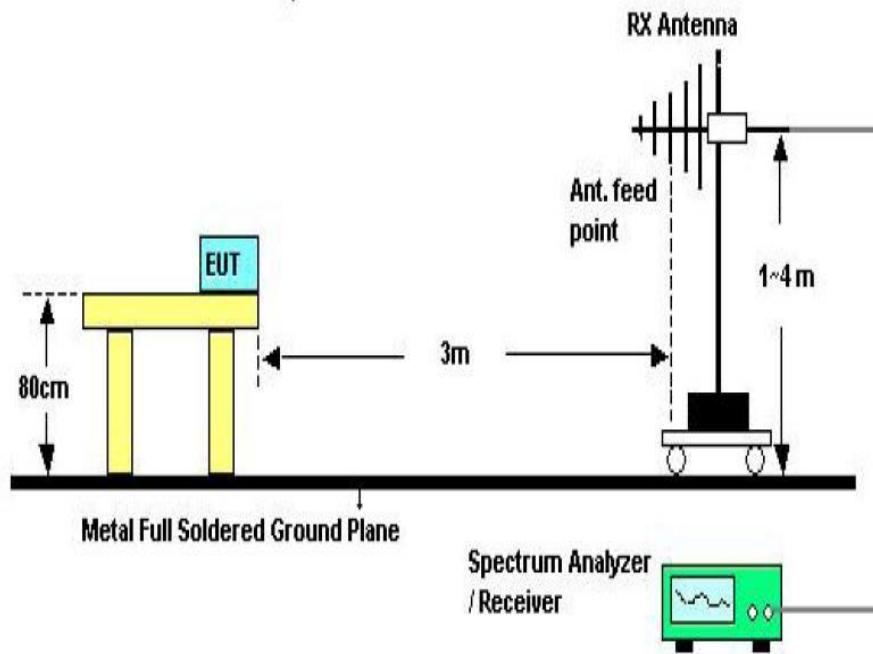
- a) The tighter limit applies at the band edges.
- b) Emission Level(dB uV/m)=20log Emission Level(Uv/m)

5.1.2 Test Setup

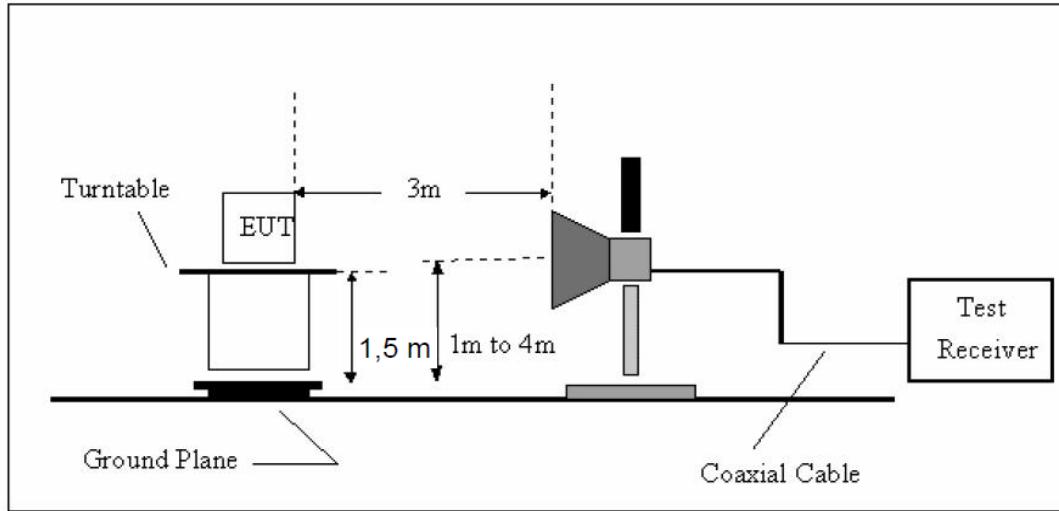
See the next page



Below 30MHz Test Setup



Above 30MHz Test Setup



Above 1GHz Test Setup

5.1.3 Test Procedure

- The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1GHz, The EUT was placed on a rotating 0.8 m high above ground, The table was rotated 360 degrees to determine the position of the highest radiation
- The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set of make measurement.
- 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 Qusia Peak Detector mode premeasured
- If Peak value comply with QP limit Below 1GHz. The EUT deemed to comply with QP limit. But the Peak value and average value both need to comply with applicable limit above 1GHz.
- For the actual test configuration, please see the test setup photo.

5.1.4 Test Equipment Setting For emission test Result

9KHz~150KHz	RBW 200Hz	VBW1KHz
150KHz~30MHz	RBW 9KHz	VBW 30KHz
30MHZ~1GHz	RBW 120KHz	VBW 300KHz
Above 1GHz	RBW 1MHz	VBW 3MHz

5.1.5 Test Condition

Continual Transmitting in maximum power.

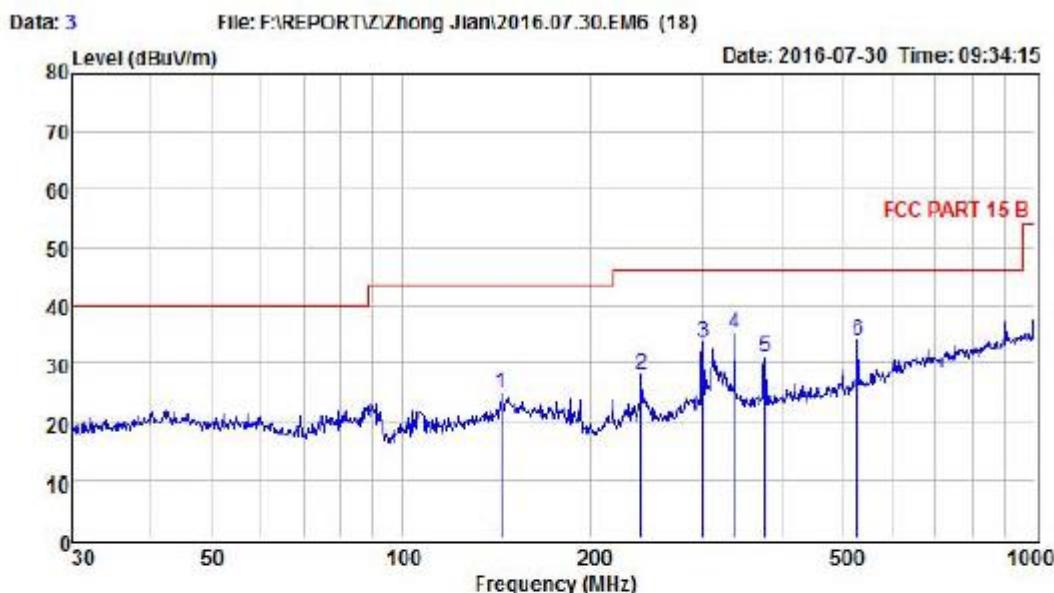
5.1.6 Test Result

We have scanned the 9KHz from 25GHz to the EUT.
Detailed information please see the following page.

From 9KHz to 30MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

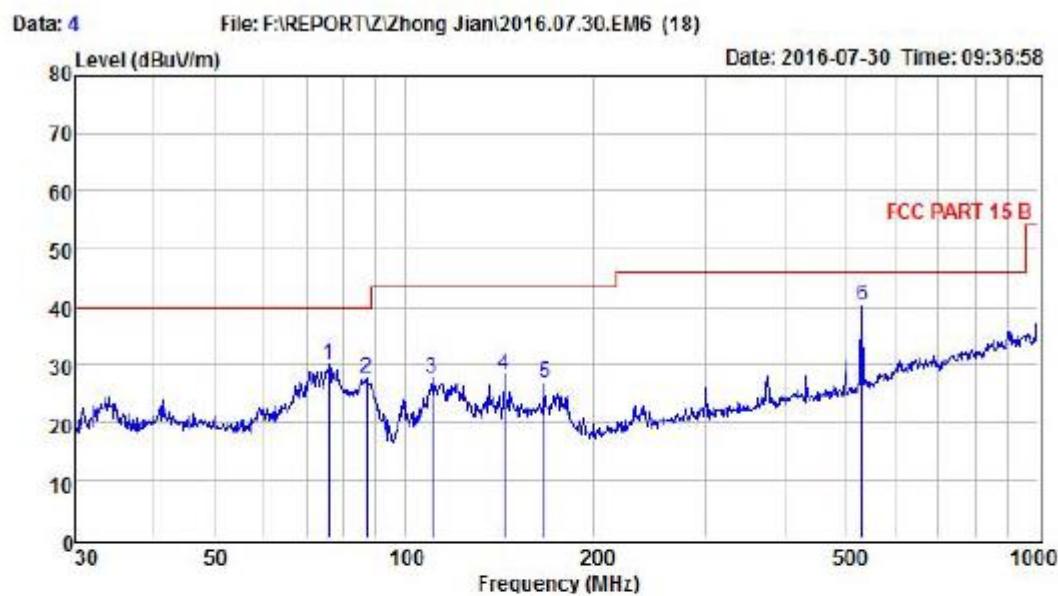
Data with GRT-POE20-480050A adapter



Condition : FCC PART 15 B
 EUT :
 Model No :
 Test Mode :
 Power :
 Test Engineer :
 Remark :
 Temp : 22°C
 Hum : 51%

Item	Freq	Read	Antenna	Preamp	Cable	Level	Limit	Margin	Remark
		Level	Factor	Factor	Cable	dBuV	dBuV	dBuV	
	MHz	dBuV	dB	dB	Loss				
1	143.83	39.83	13.77	29.39	0.38	24.59	43.50	-18.91	Peak
2	239.99	44.21	11.45	28.25	0.53	27.94	46.00	-18.06	Peak
3	300.37	47.99	12.85	28.02	0.64	33.46	46.00	-12.54	Peak
4	336.04	48.45	13.61	27.84	0.78	35.00	46.00	-11.00	Peak
5	375.94	43.12	14.35	27.42	0.96	31.01	46.00	-14.99	Peak
6	528.25	43.05	17.03	27.20	1.07	33.95	46.00	-12.05	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss



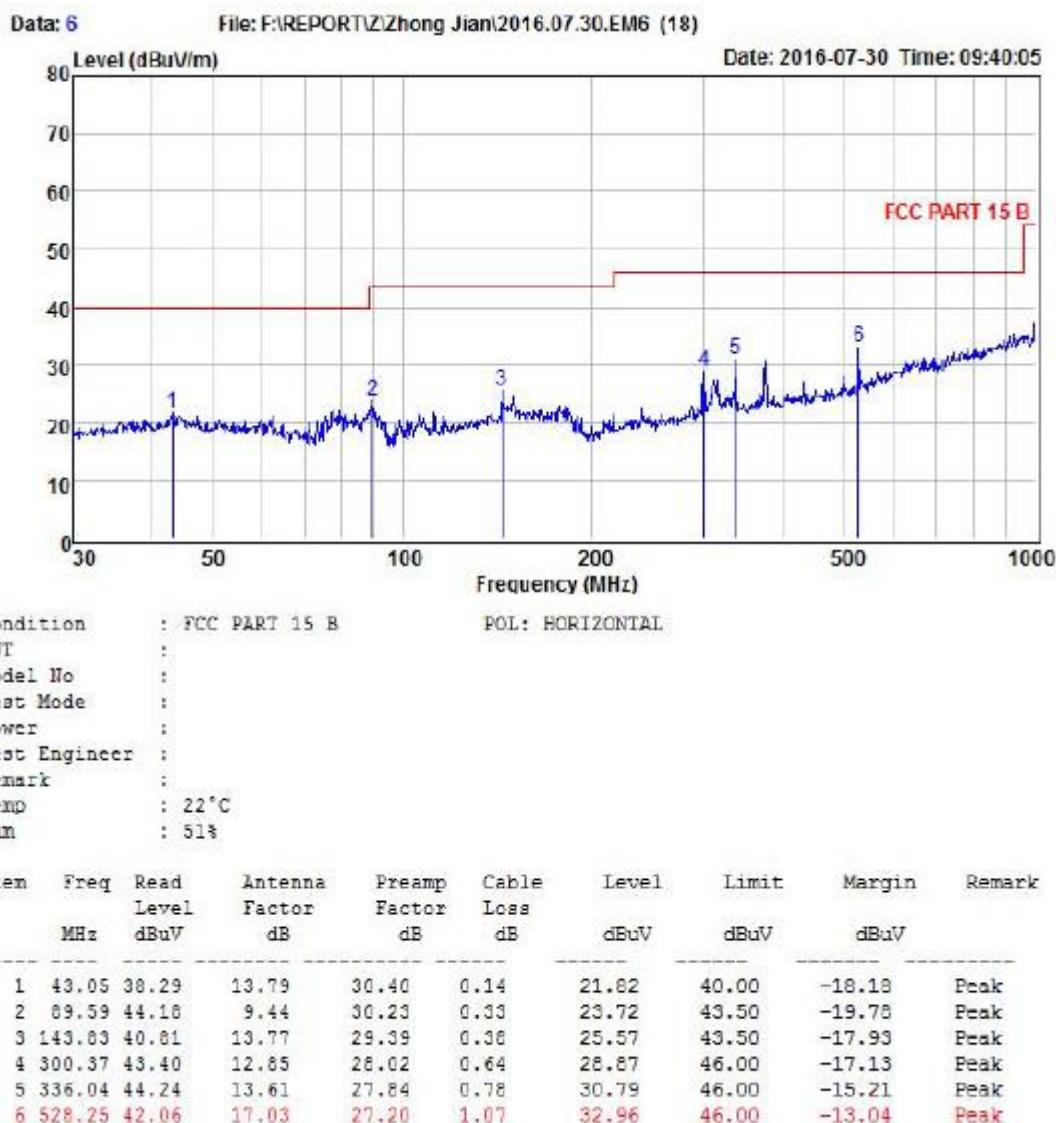
Condition : FCC PART 15 B POL: VERTICAL
 EUT :
 Model No :
 Test Mode :
 Power :
 Test Engineer :
 Remark :
 Temp : 22°C
 Hum : 51%

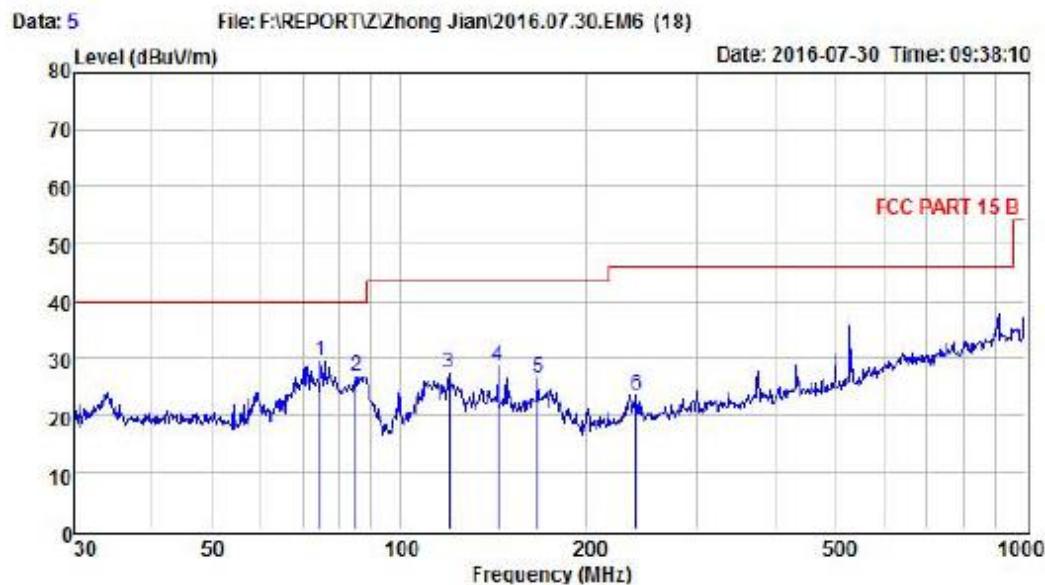
Item	Freq	Read	Antenna	Preamp	Cable	Level	Limit	Margin	Remark
		Level	Factor	Factor	Loss				
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	75.71	49.81	9.90	30.06	0.25	29.90	40.00	-10.10	Peak
2	87.11	48.08	9.41	30.14	0.32	27.67	40.00	-12.33	Peak
3	110.57	45.81	11.32	29.93	0.41	27.61	43.50	-15.89	Peak
4	143.83	43.52	13.77	29.39	0.38	28.28	43.50	-15.22	Peak
5	166.65	41.96	13.56	29.13	0.40	26.79	43.50	-16.71	Peak
6	531.96	49.04	17.09	27.14	1.11	40.10	46.00	-5.90	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

Remark: All modes and channels have been tested and only worst data of 802.11b, 2412MHz with ant 1 chain is listed in this report.

Data with G0720-480-050 adapter





Condition	:	FCC PART 15 B	POL:	VERTICAL					
EUT	:								
Model No	:								
Test Mode	:								
Power	:								
Test Engineer	:								
Remark	:								
Temp	:	22°C							
Hum	:	51%							
Item	Freq	Read Level	Antenna Factor	Preampl Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	74.66	49.39	9.90	30.09	0.25	29.45	40.00	-10.55	Peak
2	85.00	47.22	9.38	30.09	0.29	26.80	40.00	-13.20	Peak
3	119.06	44.56	12.06	29.68	0.36	27.30	43.50	-16.20	Peak
4	143.83	43.74	13.77	29.39	0.38	28.50	43.50	-15.00	Peak
5	166.65	41.63	13.56	29.13	0.40	26.46	43.50	-17.04	Peak
6	239.99	39.75	11.45	28.25	0.53	23.48	46.00	-22.52	Peak

Remark: Level = Read Level + Antenna Factor - Preampl Factor + Cable Loss

Remark: All modes and channels have been tested and only worst data of 802.11b, 2412MHz with ant 1 chain is listed in this report.

From 1G-25GHz

EUT	Broadband Digital Transmission System	Model Name	NFT 2ac
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 48V From adapter
Test Mode	MIMO TX Low		

IEEE 802.11b

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1103	V	44.74	---	-11.24	33.5	---	74	54	40.5	Peak
4824	V	37.12	---	0.64	37.76	---	74	54	36.24	Peak
N/A										

EUT	Broadband Digital Transmission System	Model Name	NFT 2ac
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 48V From adapter
Test Mode	MIMO TX Low		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1103	H	44.26	---	-11.24	33.02	---	74	54	40.98	Peak
4824	H	36.85	---	0.64	37.49	---	74	54	36.51	Peak
N/A										

Notes: AV Means AV detector test data, Peak Means Peak detector test data.

Emissions attenuated more than 20 dB below the permissible value are not reported.

EUT	Broadband Digital Transmission System	Model Name	NFT 2ac
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 48V From adapter
Test Mode	MIMO TX Mid		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1103	V	43.71	---	-11.24	32.47	---	74	54	41.53	Peak
4874	V	39.45	---	0.76	40.21	---	74	54	33.79	Peak

EUT	Broadband Digital Transmission System	Model Name	NFT 2ac
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 48V From adapter
Test Mode	MIMO TX Mid		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1103	H	43.87	---	-11.24	32.63	---	74	54	41.37	Peak
4874	H	40.45	---	0.76	41.21	---	74	54	32.79	Peak

Notes: AV Means AV detector test data, Peak Means Peak detector test data.

Emissions attenuated more than 20 dB below the permissible value are not reported.

EUT	Broadband Digital Transmission System	Model Name	NFT 2ac
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 48V From adapter
Test Mode	MIMO TX High		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1103	V	43.66	---	-11.24	32.42	---	74	54	41.58	Peak
4924	V	35.08	---	0.87	35.95	---	74	54	38.05	Peak

EUT	Broadband Digital Transmission System	Model Name	NFT 2ac
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 48V From adapter
Test Mode	MIMO TX High		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1103	H	44.07	---	-11.24	32.83	---	74	54	41.17	Peak
4924	H	33.92	---	0.87	34.79	---	74	54	39.21	Peak

Notes: AV Means AV detector test data, Peak Means Peak detector test data.

Emissions attenuated more than 20 dB below the permissible value are not reported.

IEEE 802.11 g:

EUT	Broadband Digital Transmission System	Model Name	NFT 2ac
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 48V From adapter
Test Mode	MIMO TX Low		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1145	V	44.54	---	-11.24	33.3	---	74	54	40.7	Peak
2586	V	46.61	---	-7.13	39.48	---	74	54	34.52	Peak
3062	V	44.67	---	-5.74	38.93	---	74	54	35.07	Peak
4824	V	44.27	---	0.64	44.91	---	74	54	29.09	Peak
N/A										

EUT	Broadband Digital Transmission System	Model Name	NFT 2ac
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 48V From adapter
Test Mode	MIMO TX Low		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1294	H	43.88	---	-10.96	32.92	---	74	54	41.08	Peak
2038	H	44.07	---	-8.58	35.49	---	74	54	38.51	Peak
3483	H	42.97	---	-4.95	38.02	---	74	54	35.98	Peak
4824	H	41.77	---	0.64	42.41	---	74	54	31.59	Peak
N/A										

Notes: AV Means AV detector test data, Peak Means Peak detector test data.

Emissions attenuated more than 20 dB below the permissible value are not reported.

EUT	Broadband Digital Transmission System	Model Name	NFT 2ac
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 48V From adapter
Test Mode	MIMO TX Mid		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1374	V	44.07	---	-10.43	33.64	---	74	54	40.36	Peak
2589	V	44.66	---	-7.13	37.53	---	74	54	36.47	Peak
3365	V	44.04	---	-5.18	38.86	---	74	54	35.14	Peak
4874	V	43.26	---	0.76	44.02	---	74	54	29.98	Peak

EUT	Broadband Digital Transmission System	Model Name	NFT 2ac
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 48V From adapter
Test Mode	MIMO TX Mid		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1321	H	44.07	---	-10.84	33.23	---	74	54	40.77	Peak
2314	H	44.77	---	-7.46	37.31	---	74	54	36.69	Peak
3577	H	43.06	---	-4.76	38.3	---	74	54	35.7	Peak
4874	H	40.77	---	0.76	41.53	---	74	54	32.47	Peak

Notes: AV Means AV detector test data, Peak Means Peak detector test data.

Emissions attenuated more than 20 dB below the permissible value are not reported.

EUT	Broadband Digital Transmission System	Model Name	NFT 2ac
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 48V From adapter
Test Mode	MIMO TX High		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1302	V	44.07	---	-10.84	33.23	---	74	54	40.77	Peak
2982	V	44.61	---	-5.86	38.75	---	74	54	35.25	Peak
3831	V	43.67	---	-3.96	39.71	---	74	54	34.29	Peak
4924	V	42.07	---	0.87	42.94	---	74	54	31.06	Peak

EUT	Broadband Digital Transmission System	Model Name	NFT 2ac
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 48V From adapter
Test Mode	MIMO TX High		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1446	H	44.25	---	-10.29	33.96	---	74	54	40.04	Peak
2198	H	43.07	---	-8.24	34.83	---	74	54	39.17	Peak
3905	H	44.17	---	-3.68	40.49	---	74	54	33.51	Peak
4924	H	41.65	---	0.87	42.52	---	74	54	31.48	Peak

Notes: AV Means AV detector test data, Peak Means Peak detector test data.

Emissions attenuated more than 20 dB below the permissible value are not reported.

IEEE 802.11n/HT20 with 2.4G

EUT	Broadband Digital Transmission System	Model Name	NFT 2ac
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 48V From adapter
Test Mode	MIMO TX Low		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1492	V	44.25	---	-10.27	33.98	---	74	54	40.02	Peak
2671	V	43.84	---	-6.94	36.9	---	74	54	37.1	Peak
3948	V	44.03	---	-3.68	40.35	---	74	54	33.65	Peak
4824	V	42.78	---	0.64	43.42	---	74	54	30.58	Peak
N/A										

EUT	Broadband Digital Transmission System	Model Name	NFT 2ac
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 48V From adapter
Test Mode	MIMO TX Low		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1451	H	44.28	---	-10.27	34.01	---	74	54	39.99	Peak
2839	H	44.55	---	-6.17	38.38	---	74	54	35.62	Peak
3607	H	44.12	---	-4.52	39.6	---	74	54	34.4	Peak
4824	H	43.04	---	0.64	43.68	---	74	54	30.32	Peak
N/A										

Notes: AV Means AV detector test data, Peak Means Peak detector test data.

Emissions attenuated more than 20 dB below the permissible value are not reported.

EUT	Broadband Digital Transmission System	Model Name	NFT 2ac
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 48V From adapter
Test Mode	MIMO TX Mid		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1262	V	43.97	---	-10.96	33.01	---	74	54	40.99	Peak
2013	V	44.41	---	-8.58	35.83	---	74	54	38.17	Peak
3798	V	43.65	---	-4.07	39.58	---	74	54	34.42	Peak
4874	V	42.77	---	0.76	43.53	---	74	54	30.47	Peak

EUT	Broadband Digital Transmission System	Model Name	NFT 2ac
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 48V From adapter
Test Mode	MIMO TX Mid		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1511	H	43.87	---	-10.14	33.73	---	74	54	40.27	Peak
2353	H	44.03	---	-7.59	36.44	---	74	54	37.56	Peak
3266	H	44.3	---	-5.39	38.91	---	74	54	35.09	Peak
4874	H	43.04	---	0.76	43.8	---	74	54	30.2	Peak

Notes: AV Means AV detector test data, Peak Means Peak detector test data.

Emissions attenuated more than 20 dB below the permissible value are not reported.

EUT	Broadband Digital Transmission System	Model Name	NFT 2ac
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 48V From adapter
Test Mode	MIMO TX High		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1477	V	45.3	---	-10.27	35.03	---	74	54	38.97	Peak
2703	V	44.18	---	-6.43	37.75	---	74	54	36.25	Peak
3561	V	44.07	---	-4.76	39.31	---	74	54	34.69	Peak
4924	V	42.9	---	0.87	43.77	---	74	54	30.23	Peak

EUT	Broadband Digital Transmission System	Model Name	NFT 2ac
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 48V From adapter
Test Mode	MIMO TX High		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1503	H	43.85	---	-10.14	33.71	---	74	54	40.29	Peak
3588	H	44.15	---	-4.96	39.19	---	74	54	34.81	Peak
4153	H	43.96	---	-2.48	41.48	---	74	54	32.52	Peak
4924	H	42.01	---	0.87	42.88	---	74	54	31.12	Peak

Notes: AV Means AV detector test data, Peak Means Peak detector test data.

Emissions attenuated more than 20 dB below the permissible value are not reported.

IEEE 802.11n/HT40 with 2.4G

EUT	Broadband Digital Transmission System	Model Name	NFT 2ac
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 48V From adapter
Test Mode	MIMO TX Low		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1551	V	44.31	---	-10.07	34.24	---	74	54	39.76	Peak
2695	V	44.18	---	-6.94	37.24	---	74	54	36.76	Peak
3463	V	43.47	---	-4.95	38.52	---	74	54	35.48	Peak
4844	V	42.06	---	0.64	42.7	---	74	54	31.3	Peak
N/A										

EUT	Broadband Digital Transmission System	Model Name	NFT 2ac
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 48V From adapter
Test Mode	MIMO TX Low		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1542	H	44.08	---	-10.14	33.94	---	74	54	40.06	Peak
2358	H	43.94	---	-7.59	36.35	---	74	54	37.65	Peak
3096	H	44.35	---	-5.74	38.61	---	74	54	35.39	Peak
4844	H	42.75	---	0.64	43.39	---	74	54	30.61	Peak
N/A										

Notes: AV Means AV detector test data, Peak Means Peak detector test data.

Emissions attenuated more than 20 dB below the permissible value are not reported.

EUT	Broadband Digital Transmission System	Model Name	NFT 2ac
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 48V From adapter
Test Mode	MIMO TX Mid		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1628	V	44.64	---	-9.84	34.8	---	74	54	39.2	Peak
2593	V	44.06	---	-7.13	36.93	---	74	54	37.07	Peak
3301	V	44.2	---	-5.31	38.89	---	74	54	35.11	Peak
4874	V	43.05	---	0.76	43.81	---	74	54	30.19	Peak

EUT	Broadband Digital Transmission System	Model Name	NFT 2ac
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 48V From adapter
Test Mode	MIMO TX Mid		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1564	H	44.27	---	-10.07	34.2	---	74	54	39.8	Peak
2248	H	44.61	---	-8.13	36.48	---	74	54	37.52	Peak
3159	H	43.57	---	-5.52	38.05	---	74	54	35.95	Peak
4874	H	42.82	---	0.76	43.58	---	74	54	30.42	Peak

Notes: AV Means AV detector test data, Peak Means Peak detector test data.

Emissions attenuated more than 20 dB below the permissible value are not reported.

EUT	Broadband Digital Transmission System	Model Name	NFT 2ac
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 48V From adapter
Test Mode	MIMO TX High		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1645	V	44.7	---	-9.84	34.86	---	74	54	39.14	Peak
2590	V	44.23	---	-7.13	37.1	---	74	54	36.9	Peak
3851	V	43.65	---	-3.84	39.81	---	74	54	34.19	Peak
4904	V	42	---	0.87	42.87	---	74	54	31.13	Peak

EUT	Broadband Digital Transmission System	Model Name	NFT 2ac
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 48V From adapter
Test Mode	MIMO TX High		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1792	H	44.37	---	-9.27	35.1	---	74	54	38.9	Peak
2804	H	44.55	---	-6.17	38.38	---	74	54	35.62	Peak
3743	H	44.91	---	-4.24	40.67	---	74	54	33.33	Peak
4904	H	43.34	---	0.87	44.21	---	74	54	29.79	Peak

Notes: AV Means AV detector test data, Peak Means Peak detector test data.

Emissions attenuated more than 20 dB below the permissible value are not reported.

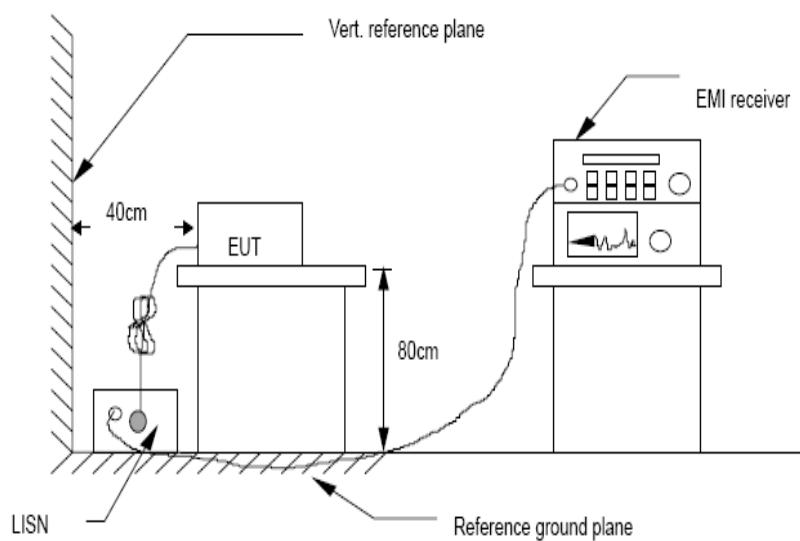
6 POWER LINE CONDUCTED EMISSION

6.1 Conducted Emission Limits(15.207)

Frequency MHz	Limits dB(μ V)	
	Quasi-peak Level	Average Level
0.15 -0.50	66 -56*	56 - 46*
0.50 -5.00	56	46
5.00 -30.00	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.
 2. The lower limit shall apply at the transition frequencies.
 3.The limit decreases in line with the logarithm of the frequency in the rang of 0.15 to 0.50 MHz.

6.2 Test Setup



6.3 Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI ANSI C63.4:2014 on Conducted Emission Measurement.

The bandwidth of test receiver is set at 9 kHz.

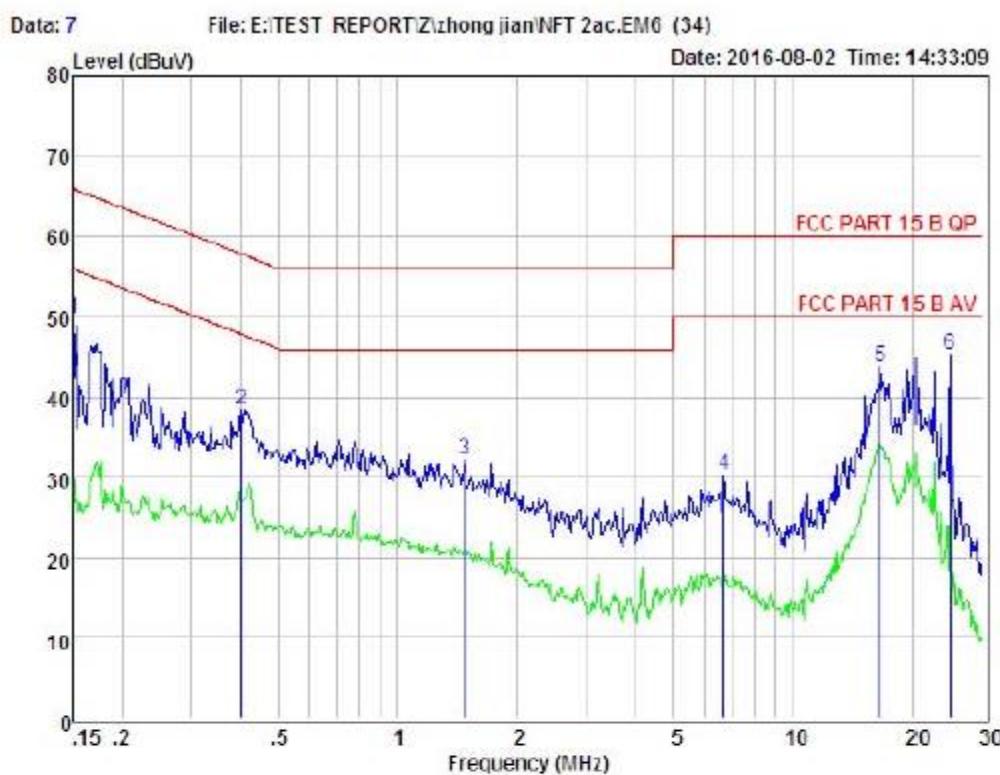
6.4 Test Results

Worse case is reported only

PASS

Detailed information please see the following page.

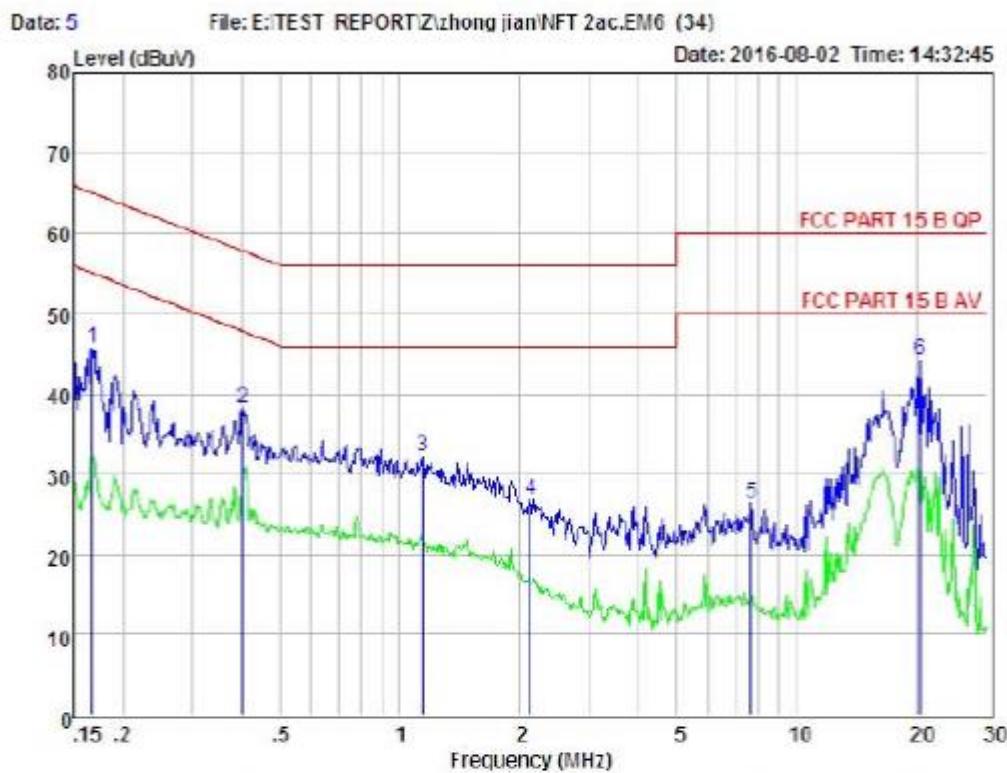
Data with GRT-POE20-480050A adapter



Condition : FCC PART 15 B QP POL: LINE Temp: 25°C Hum: 51 %
 EUT :
 Model No : NFT2ac
 Test Mode :
 Power : DC48V From POE Adapter with AC 120V/60Hz
 Test Engineer :
 Remark : POE G0720-480-050

Item	Freq	Level	LISN Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	0.150	40.21	0.03	-9.49	0.10	49.83	66.00	-16.17	Peak
2	0.402	28.65	0.03	-9.57	0.10	38.35	57.81	-19.46	Peak
3	1.480	22.43	0.05	-9.68	0.10	32.26	56.00	-23.74	Peak
4	6.698	20.10	0.12	-9.97	0.15	30.34	60.00	-29.66	Peak
5	16.661	33.40	0.26	-9.83	0.28	43.77	60.00	-16.23	Peak
6	24.790	34.52	0.46	-9.82	0.47	45.27	60.00	-14.73	Peak

Remark: Level = Read Level + LISN Factor - Preamp Factor + Cable Loss



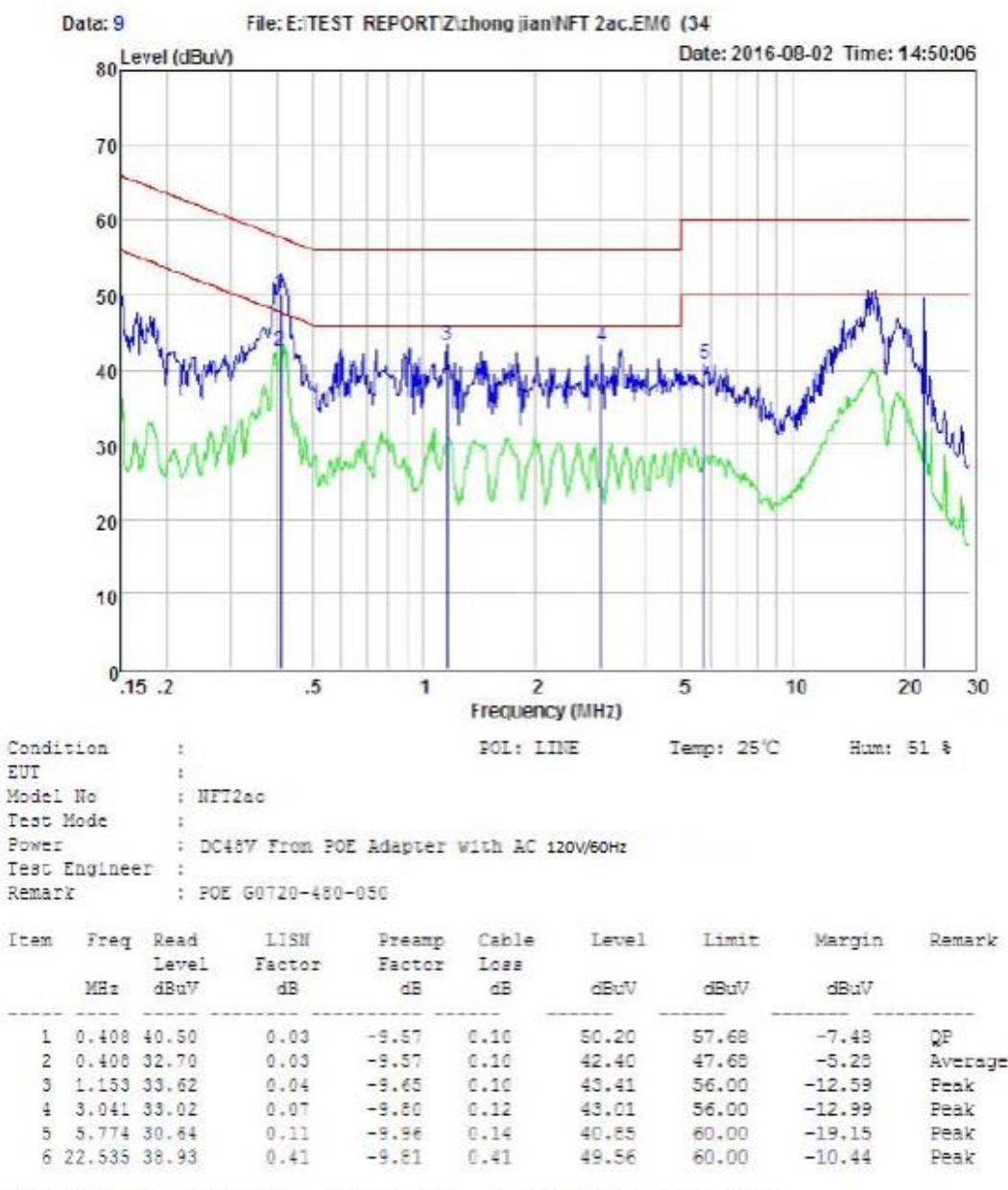
Condition : FCC PART 15 B QP POL: NEUTRAL Temp: 25°C Hum: 51 %
 EUT :
 Model No : NFT2ac
 Test Mode :
 Power : DC48V From POE Adapter with AC 120V/60Hz
 Test Engineer :
 Remark : POE G0720-480-050

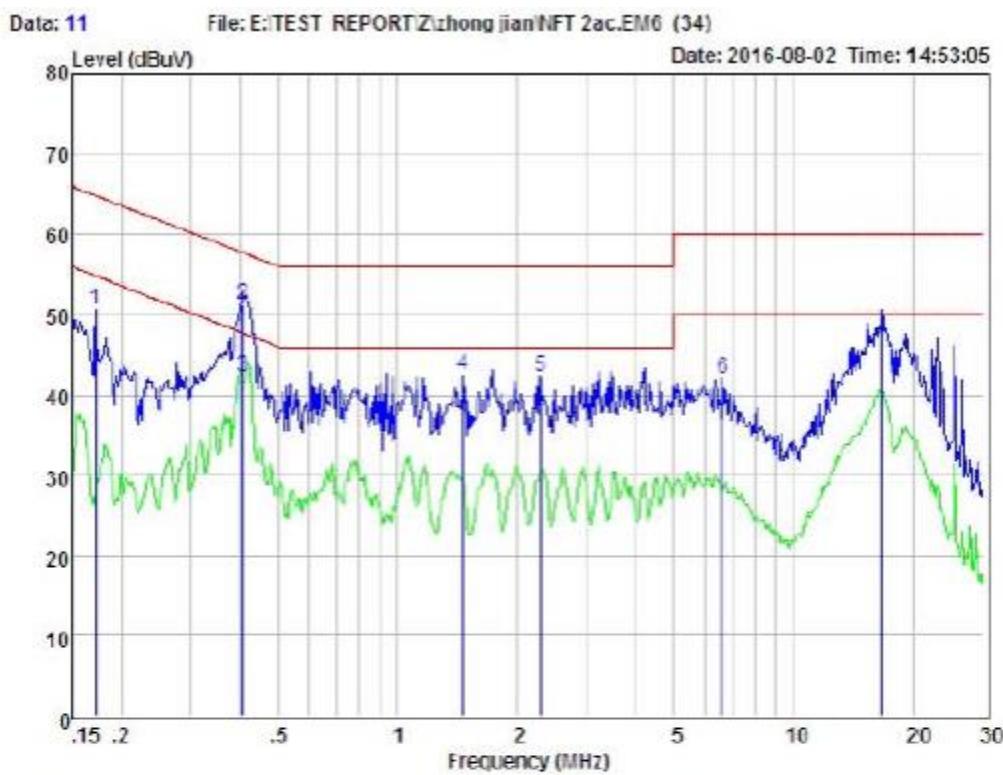
Item	Freq	Read	LISN	Preamp	Cable	Level	Limit	Margin	Remark
			Level						
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	0.168	36.00	0.03	-9.52	0.10	45.65	65.08	-19.43	Peak
2	0.402	28.49	0.03	-9.57	0.10	38.19	57.81	-19.62	Peak
3	1.141	22.48	0.04	-9.64	0.10	32.26	56.00	-23.74	Peak
4	2.133	16.86	0.06	-9.73	0.10	26.75	56.00	-29.25	Peak
5	7.687	16.18	0.14	-9.96	0.16	26.44	60.00	-33.56	Peak
6	20.377	33.68	0.32	-9.80	0.36	44.16	60.00	-15.84	Peak

Remark: Level = Read Level + LISN Factor - Preamp Factor + Cable Loss

Remark: All modes and channels have been tested and only worst data of 802.11b, 2412MHz with ant 1 chain is listed in this report.

Data with G0720-480-050 adapter





Condition : POL: NEUTRAL Temp: 25°C Hum: 51 %
 EUT :
 Model No : NFT2ac
 Test Mode :
 Power : DC48V From POE Adapter with AC 120V/60Hz
 Test Engineer :
 Remark : POE G0720-480-050

Item	Freq	Read Level	LISN Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dsuv	dB	dB	dB	dBuV	dBuV	dBuV	
1	0.172	41.05	0.03	-9.52	0.10	50.70	64.86	-14.16	Peak
2	0.406	41.50	0.03	-9.57	0.10	51.20	57.73	-6.53	QP
3	0.406	32.50	0.03	-9.57	0.10	42.20	47.73	-5.53	Average
4	1.484	32.65	0.05	-9.68	0.10	42.48	56.00	-13.52	Peak
5	2.309	32.35	0.06	-9.74	0.11	42.26	56.00	-13.74	Peak
6	6.627	31.75	0.12	-9.97	0.15	41.99	60.00	-18.01	Peak
7	16.839	40.31	0.27	-9.83	0.29	50.70	60.00	-9.30	Peak

Remark: Level = Read Level + LISN Factor - Preamp Factor + Cable Loss

Remark: All modes and channels have been tested and only worst data of 802.11b, 2412MHz with ant 1 chain is listed in this report.

7 Conducted Maximum Output Power

7.1 Test limit

Please refer section 15.247.

Regulation 15.247(b) The limit of Maximum Peak Output Power Measurement is 1W(30dBm)

7.2 Test Procedure

Details see the KDB558074 Meas Guidance V03

7.2.1 Place the EUT on the table and set it in transmitting mode.

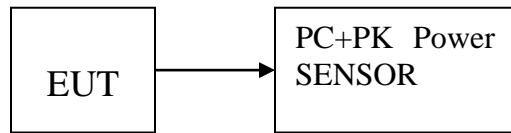
7.2.2 Connect the EUT's antenna port to peak power meter by 20dB attenuator.

7.2.3 Measure out each mode and each bands peak output power of EUT.

Note: The cable loss and attenuator loss were offset into measure device as amplitude offset.

Details see the KDB558074 DTS Meas Guidance V03

7.3 Test Setup



7.4 Test Results

PASS

Detailed information please see the following page.

EUT: Broadband Digital Transmission System			M/N: NFT 2ac			
Test date: 2016-08-02		Test site: RF site		Tested by: Simple Guan		
Mode	Frequency (MHz)	Ant Port	PK Output power(dBm)		Limit (dBm)	Margin (dB)
IEEE 802.11 b	CH1: 2412	0	22.89	26.06	30	3.94
		1	23.21			
	CH6: 2437	0	26.53	29.61	30	0.39
		1	26.66			
	CH11: 2462	0	22.17	24.80	30	5.20
		1	21.38			
IEEE 802.11 g	CH1: 2412	0	22.81	25.79	30	4.21
		1	22.75			
	CH6: 2437	0	26.35	29.48	30	0.52
		1	26.59			
	CH11: 2462	0	22.79	25.62	30	4.38
		1	22.42			
IEEE 802.11 n/HT20 with 2.4G	CH1: 2412	0	22.39	25.50	30	4.50
		1	22.59			
	CH6: 2437	0	26.93	29.86	30	0.14
		1	26.76			
	CH11: 2462	0	22.21	25.38	30	4.62
		1	22.53			
IEEE 802.11 n/HT40 with 2.4G	CH1: 2422	0	22.32	25.45	30	4.55
		1	22.55			
	CH4: 2437	0	26.36	29.48	30	0.52
		1	26.57			
	CH7: 2452	0	22.79	25.84	30	4.16
		1	22.86			

8 PEAK POWER SPECTRAL DENSITY

8.1 Test limit

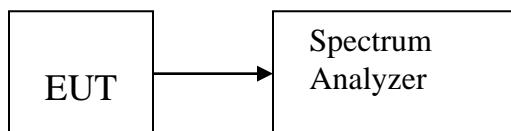
- 8.1.1 Please refer section 15.247.
- 8.1.2 For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.
- 8.1.3 The direct sequence operating of the hybrid system, with the frequency hopping operation turned off, shall comply with the power density requirements of paragraph (d) of this section.

8.2 Method of measurement

Details see the KDB558074 DTS Meas Guidance V03

- 8.2.1 Place the EUT on the table and set it in transmitting mode.
- 8.2.2 Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 8.2.3 Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, span=5-30% EBW, detail see the test plot.
- 8.2.4 Record the max reading.
- 8.2.5 Repeat the above procedure until the measurements for all frequencies are completed.

8.3 Test Setup



8.4 Test Results

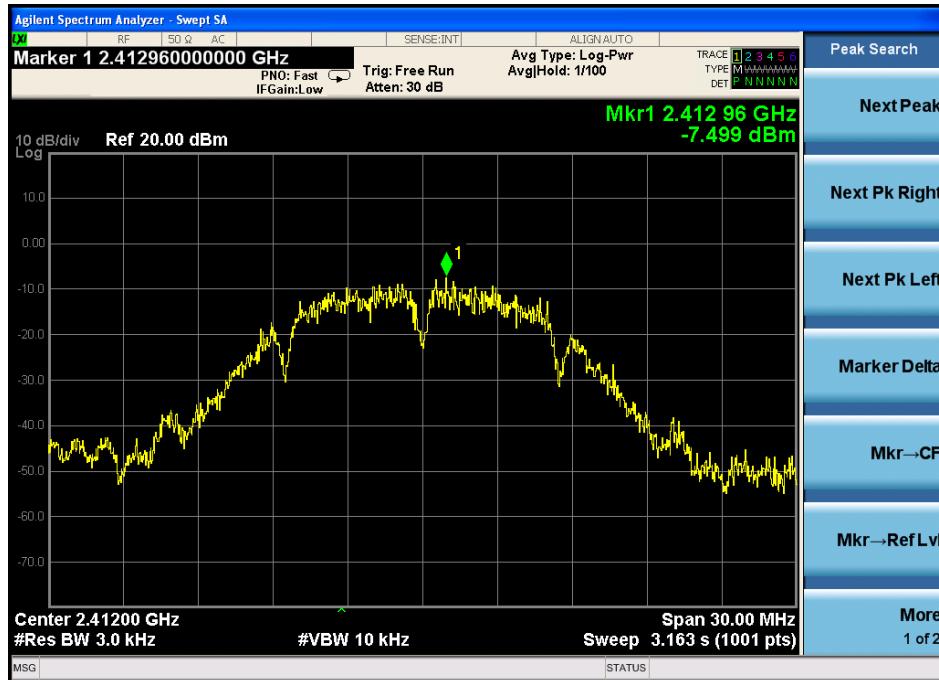
PASS.

Detailed information please see the following page.

Port 0 antenna

IEEE 802.11b :

CH Low :



CH Mid:

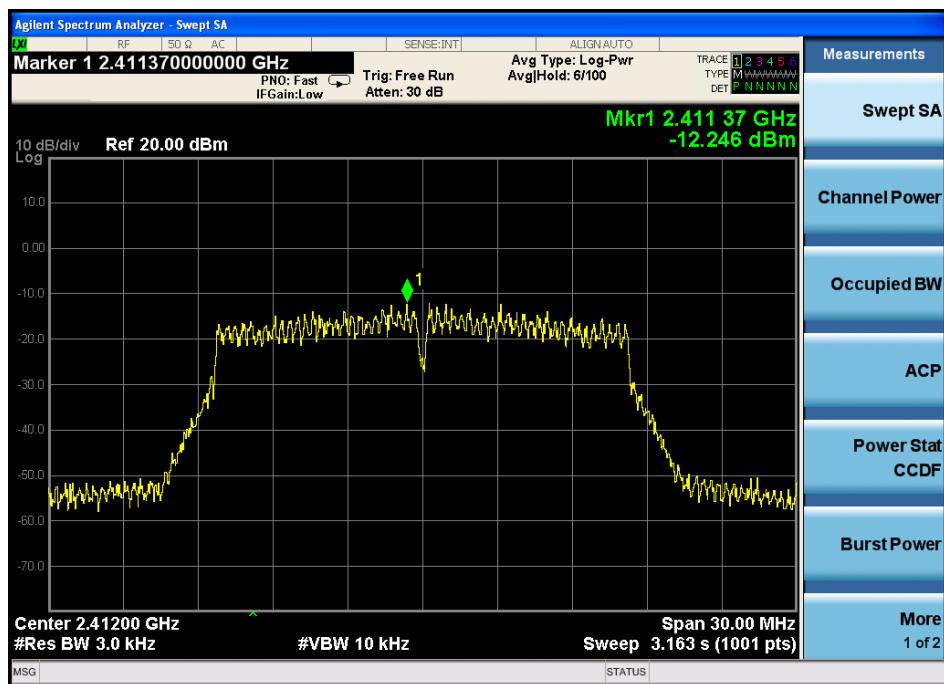


CH Hig:

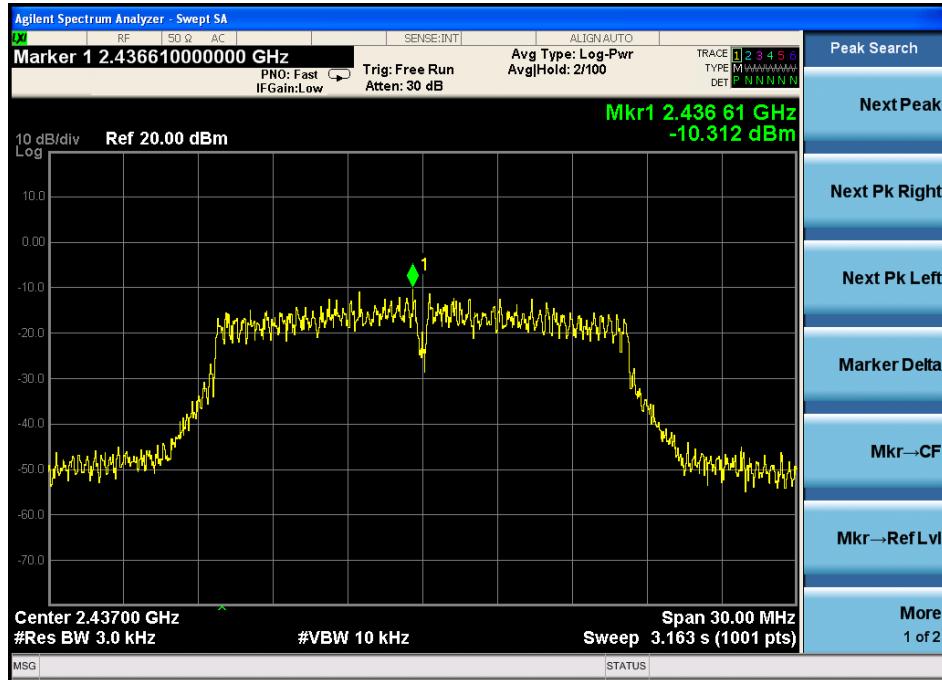


IEEE 802.11g :

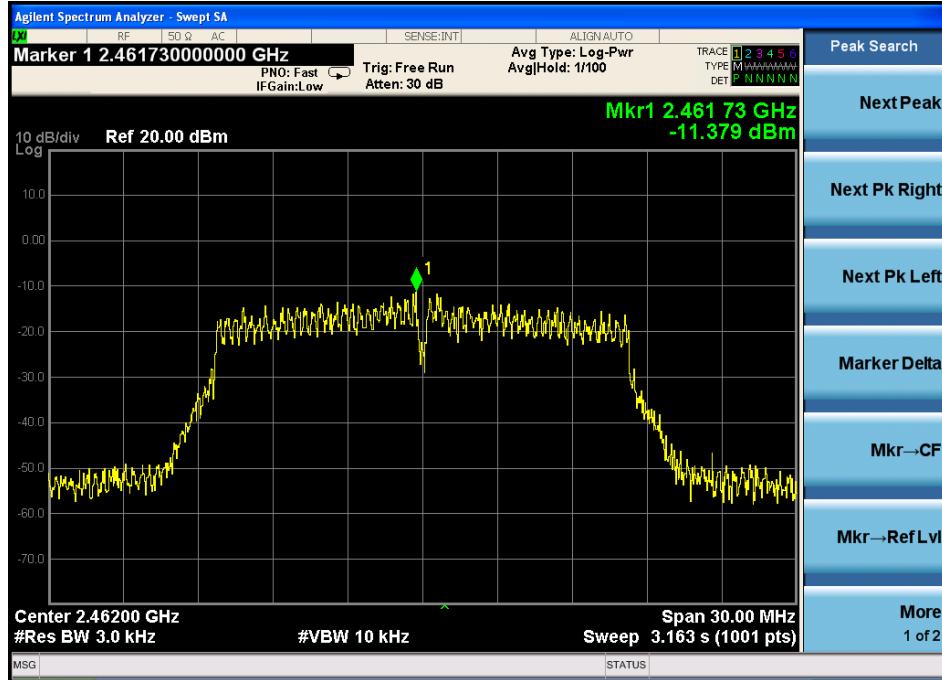
CH Low



CH Mid:

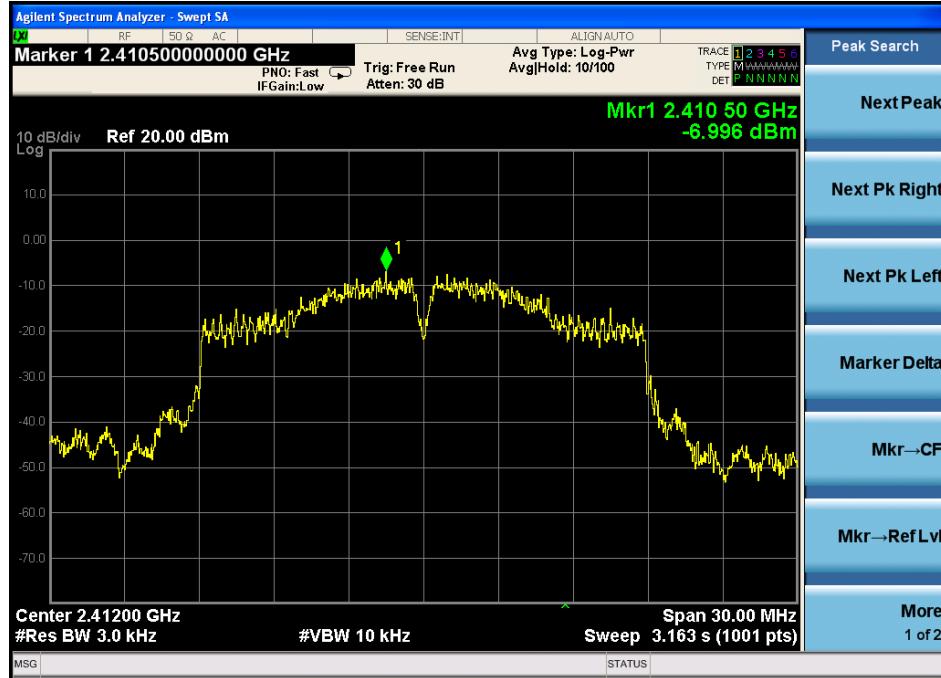


CH Hig:

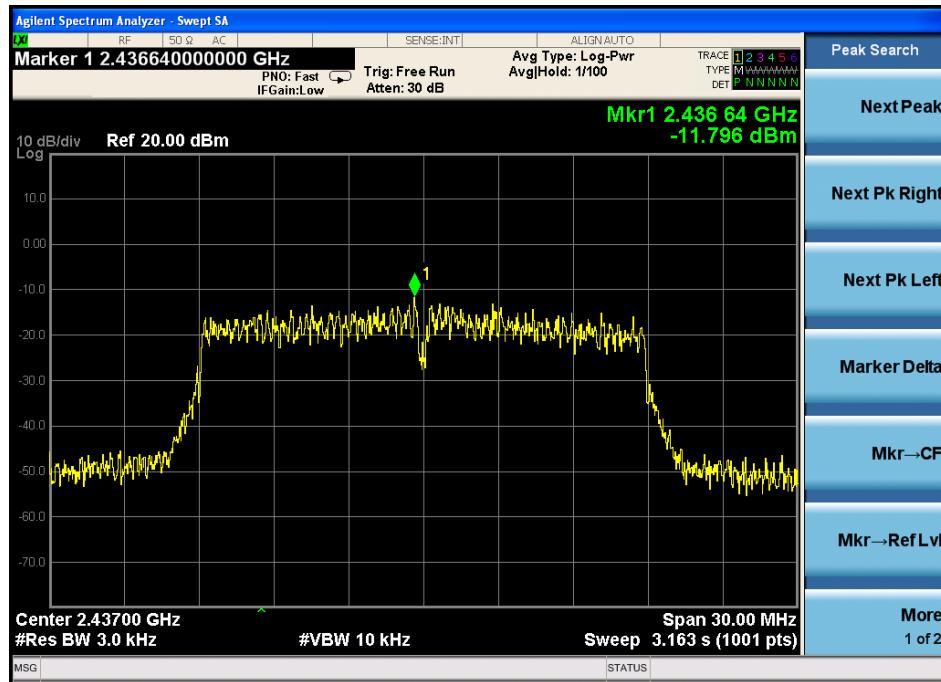


IEEE 802.11n HT20 :

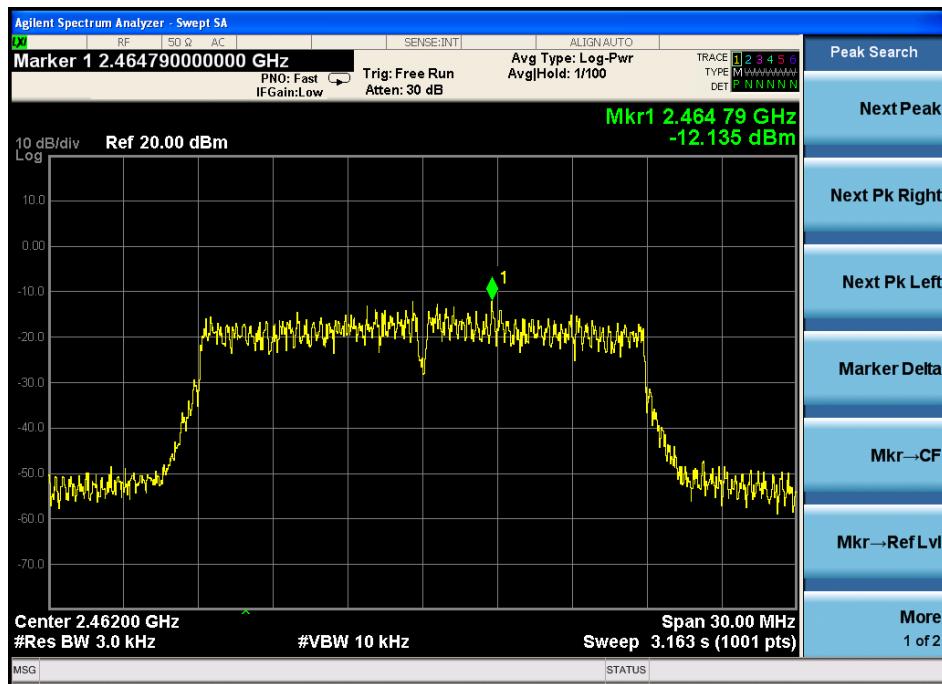
CH Low :



CH Mid:

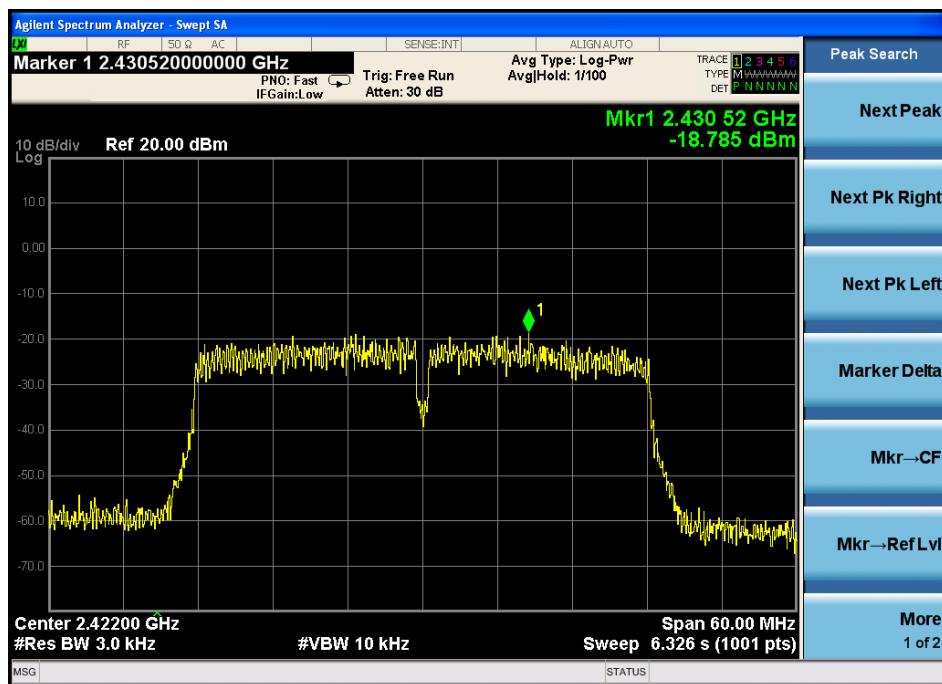


CH Hig:

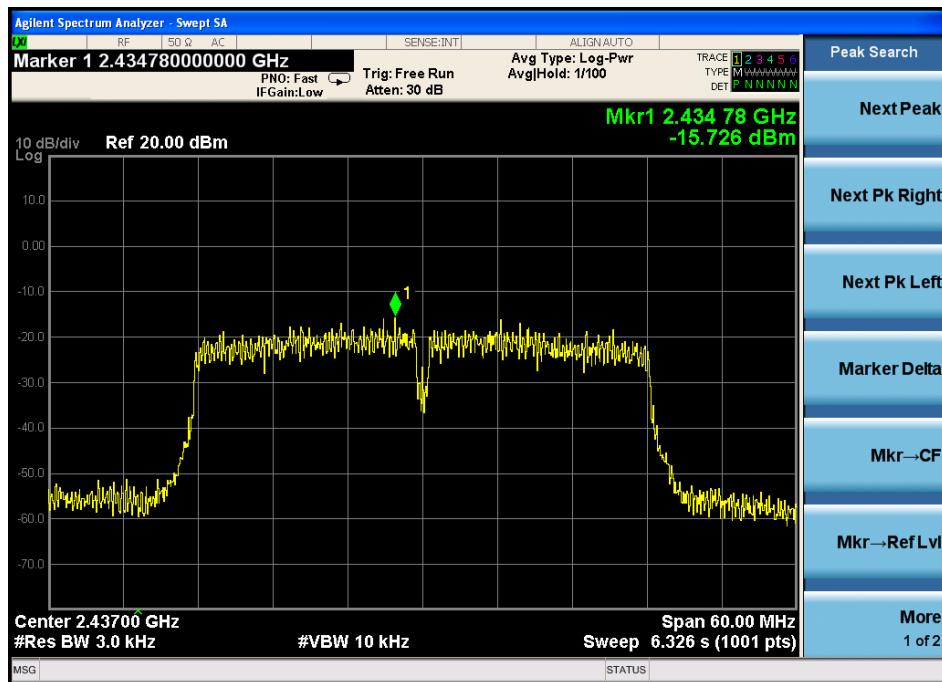


IEEE 802.11n HT40 :

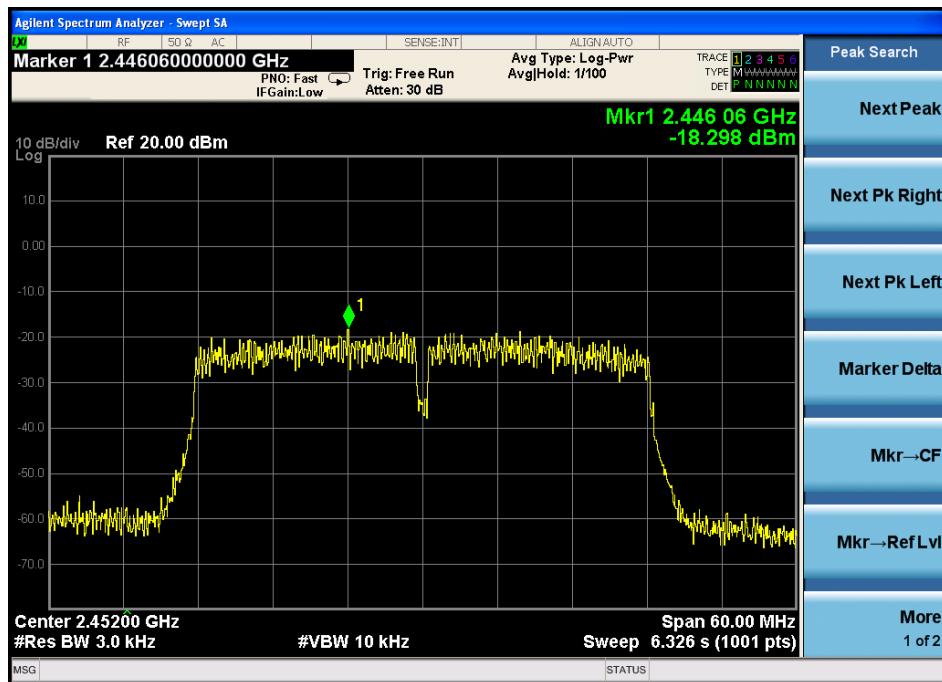
CH Low:



CH Mid:



CH Hig:



port 1 antenna
 IEEE 802.11b :
 CH Low :



CH Mid:

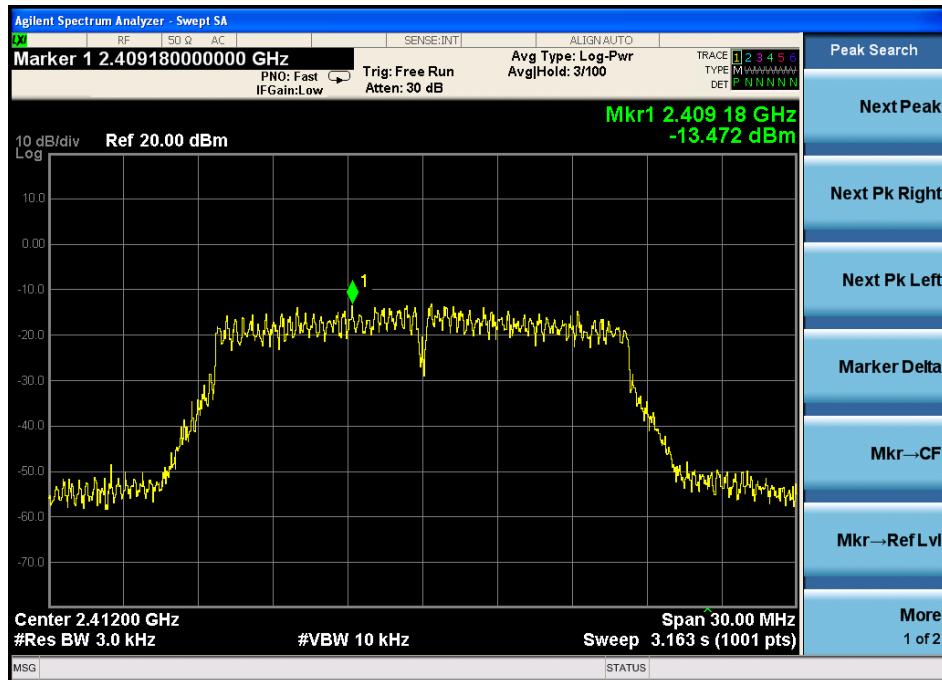


CH Hig:

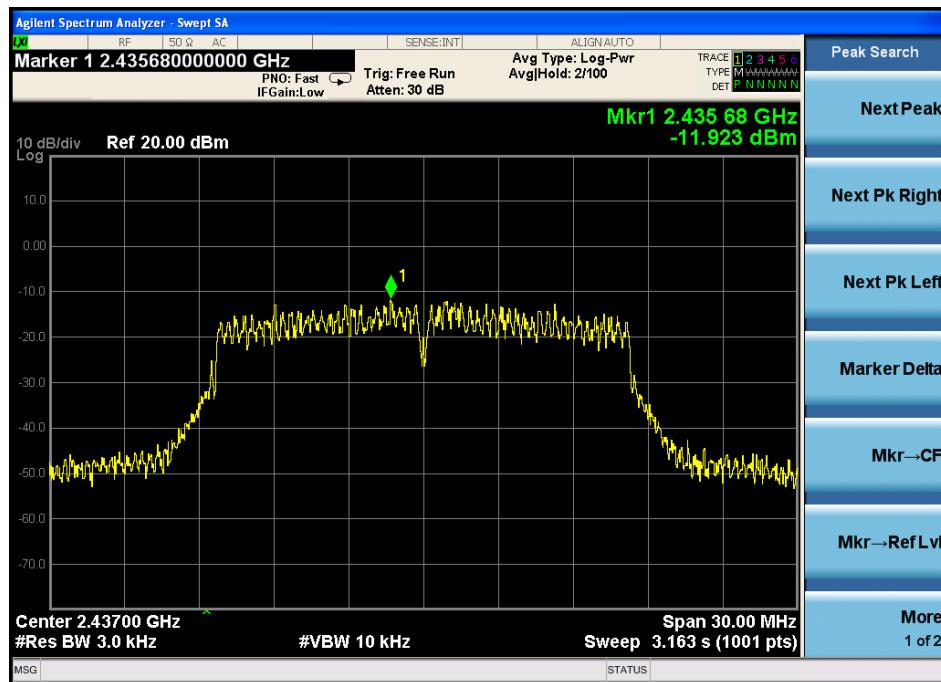


IEEE 802.11g :

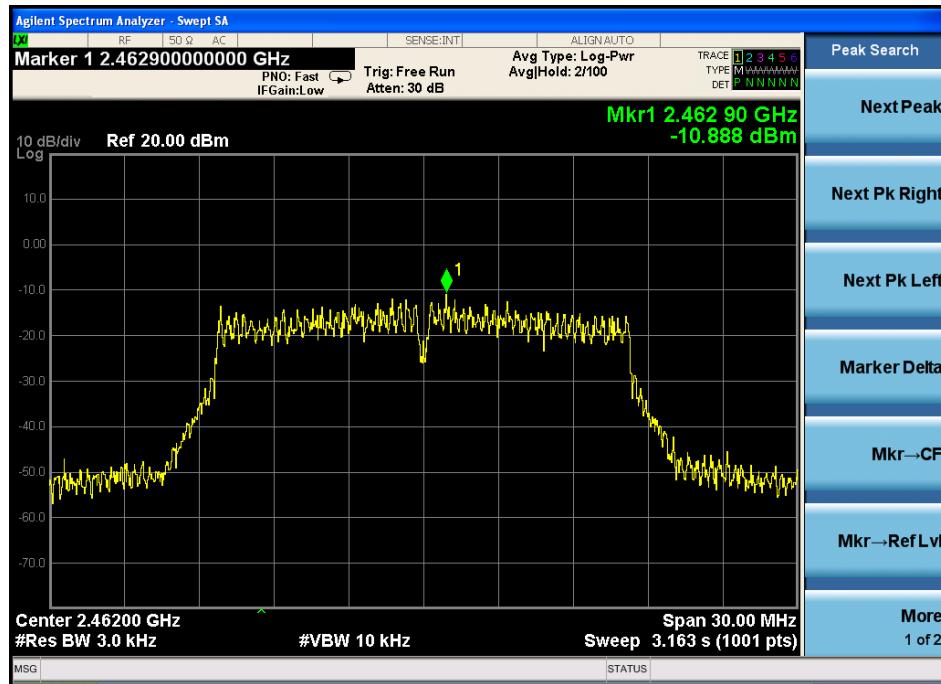
CH Low:



CH Mid:

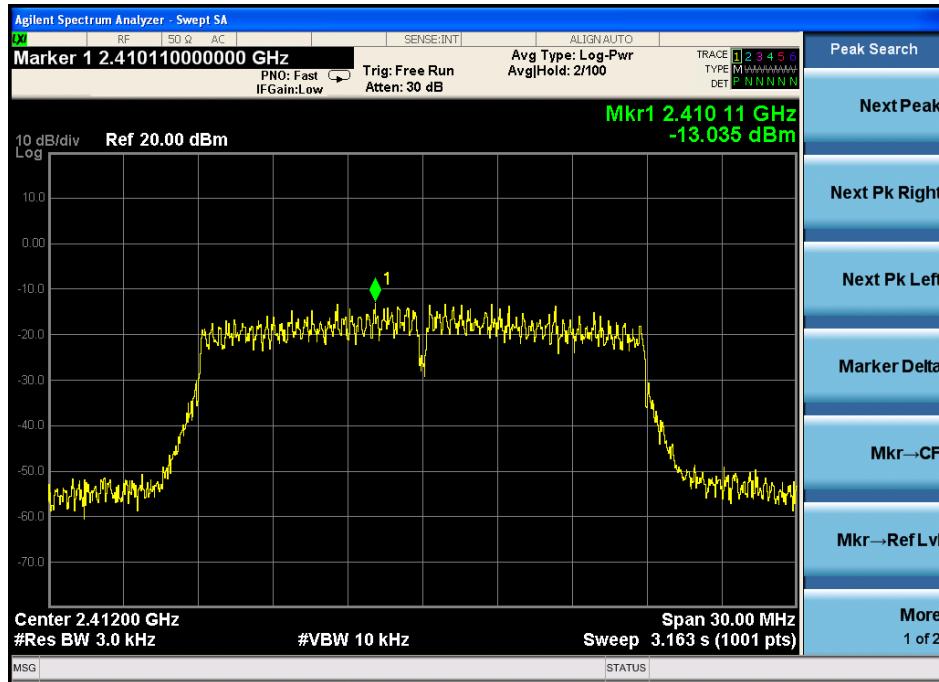


CH Hig:

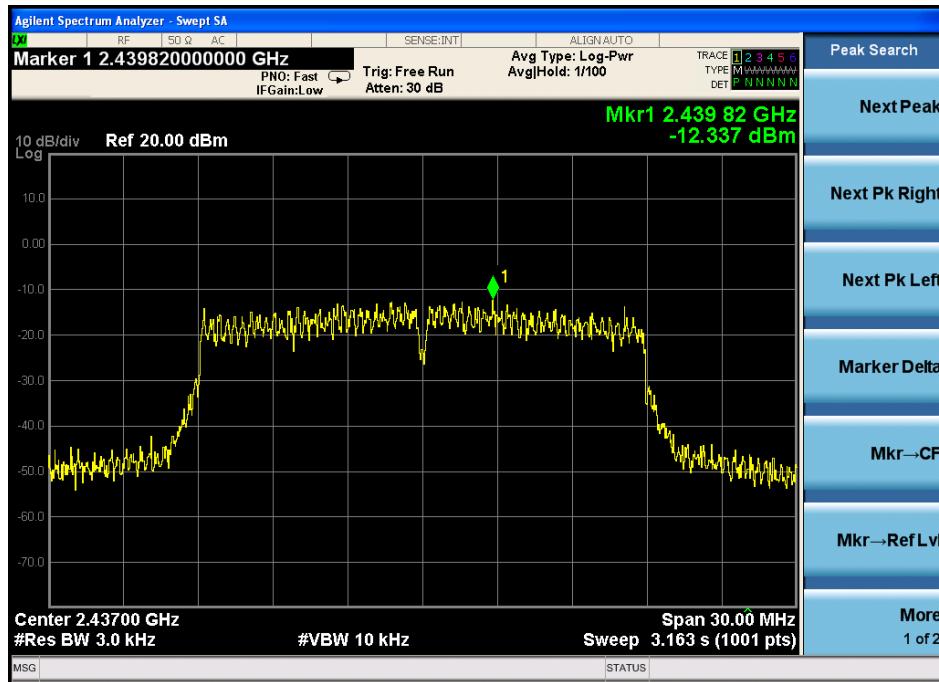


IEEE 802.11n HT20 :

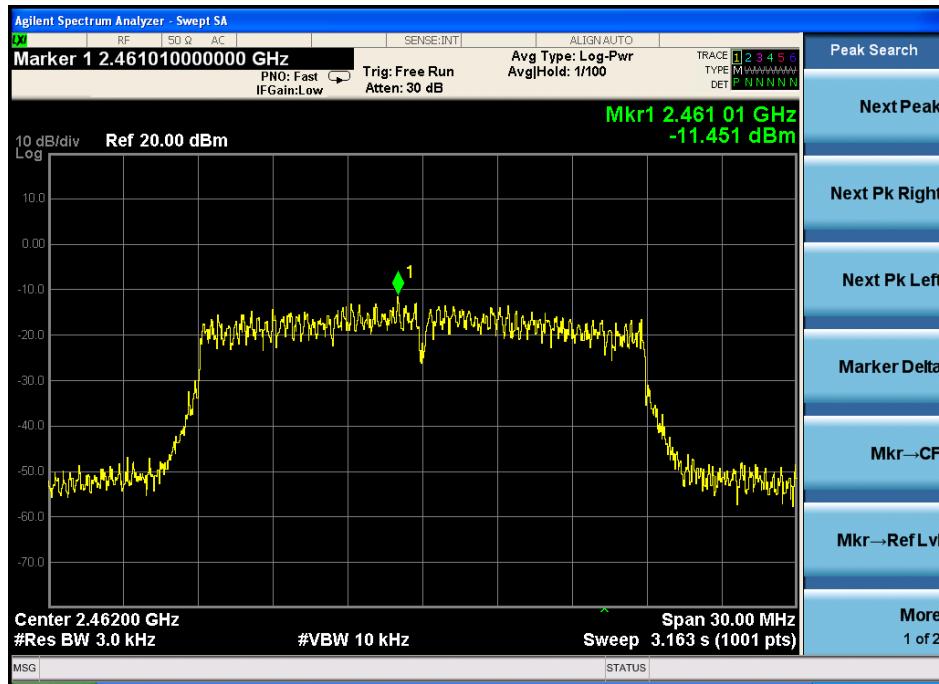
CH Low :



CH Mid:

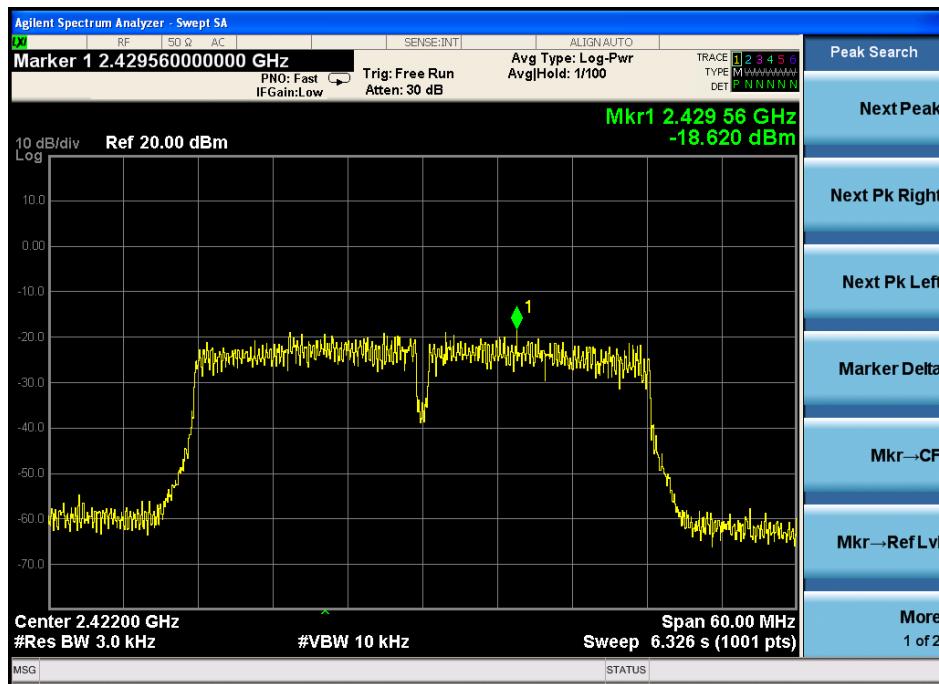


CH Hig:

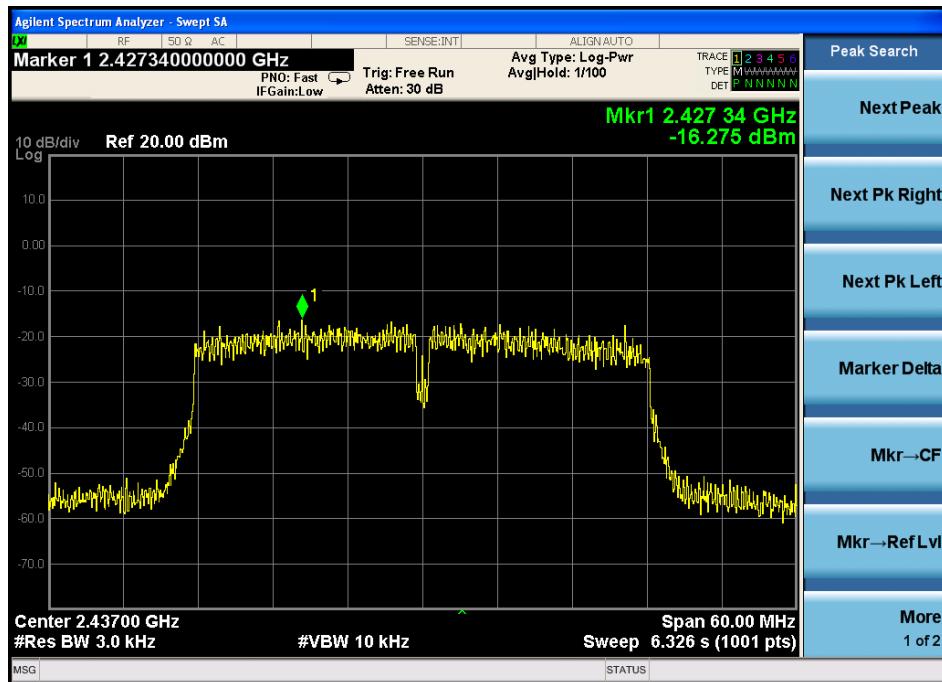


IEEE 802.11n HT40 :

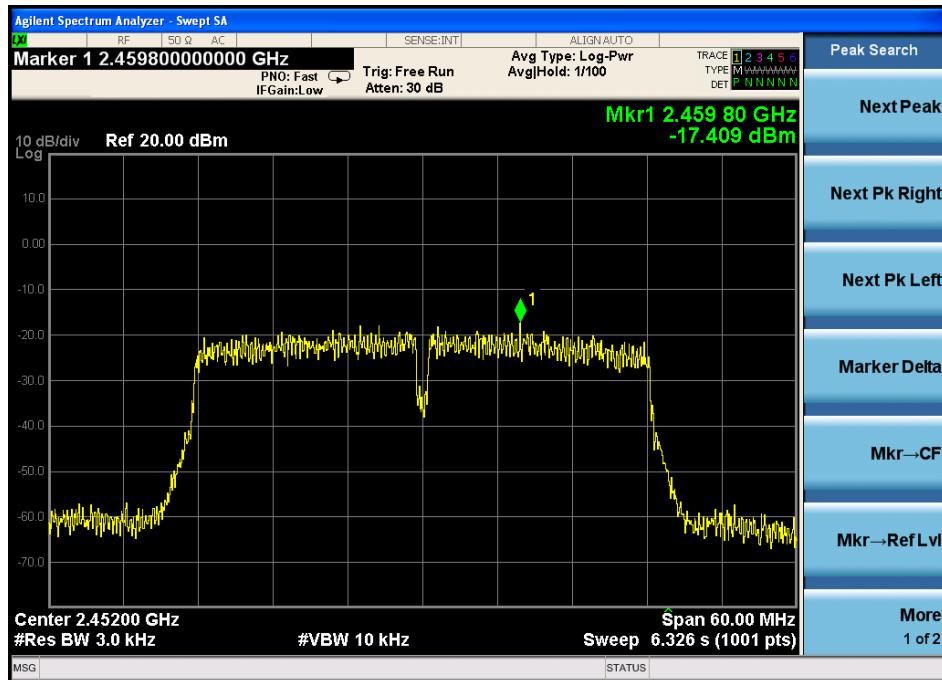
CH Low :



CH Mid:



CH Hig:



9 Bandwidth

9.1 Test limit

Please refer section 15.247

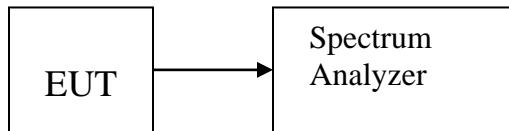
For direct sequence systems, the minimum 6dB bandwidth shall be at least 500 kHz.

9.2 Method of measurement

Details see the KDB558074 D01 Meas Guidance

- a) The bandwidth is measured at an amplitude level reduced 20dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.
- b) The test receiver set RBW = 1-5 % EBW, VBW \geq 3RBW, Peak Detector, Sweep time set auto, detail see the test plot.

9.3 Test Setup



9.4 Test Results

PASS.

All mode has been tested ,
only worse case is reported

Detailed information please see the following page.

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit (MHz)	Result
IEEE 802.11b:					
Low	2412	9.564	15.838	0.5	PASS
Mid	2437	10.05	13.180	0.5	PASS
High	2462	9.573	13.177	0.5	PASS
IEEE 802.11g					
Low	2412	15.56	16.372	0.5	PASS
Mid	2437	16.32	16.39	0.5	PASS
High	2462	15.13	16.38	0.5	PASS
IEEE 802.11n/HT20:					
Low	2412	16.39	17.537	0.5	PASS
Mid	2437	15.09	17.583	0.5	PASS
High	2462	16.26	17.571	0.5	PASS
IEEE 802.11n/HT40:					
Low	2422	35.17	35.770	0.5	PASS
Mid	2437	35.17	35.852	0.5	PASS
High	2452	35.18	35.822	0.5	PASS

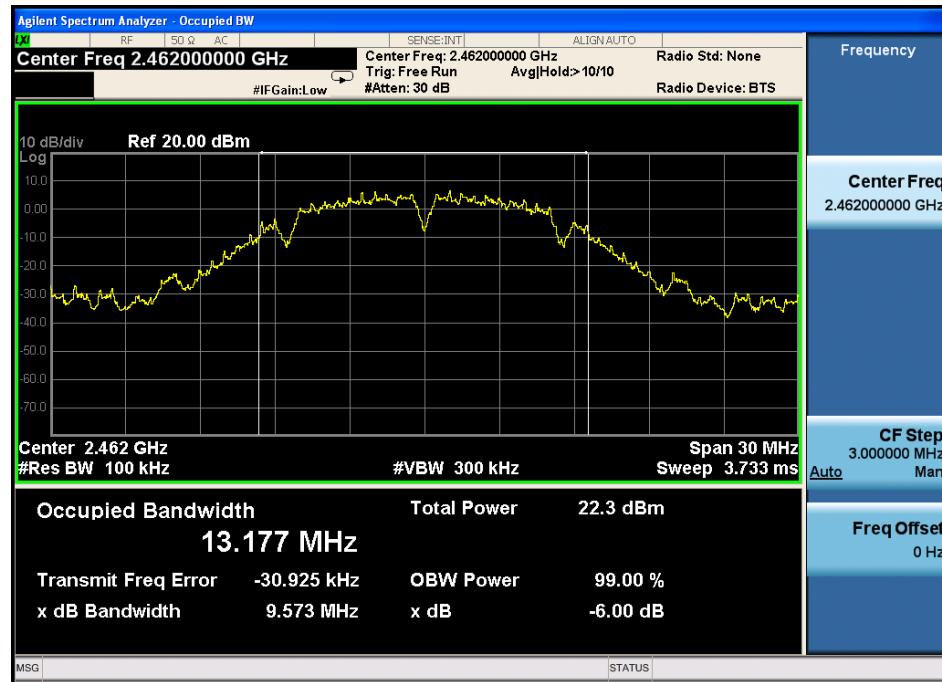
IEEE 802.11b:
CH Low :



CH Mid :

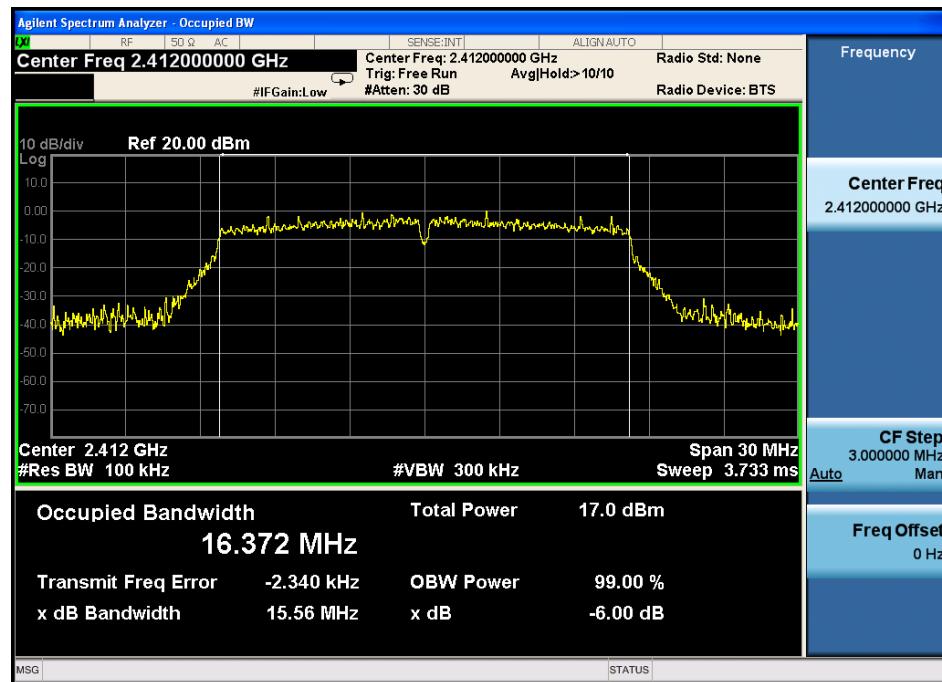


CH High :

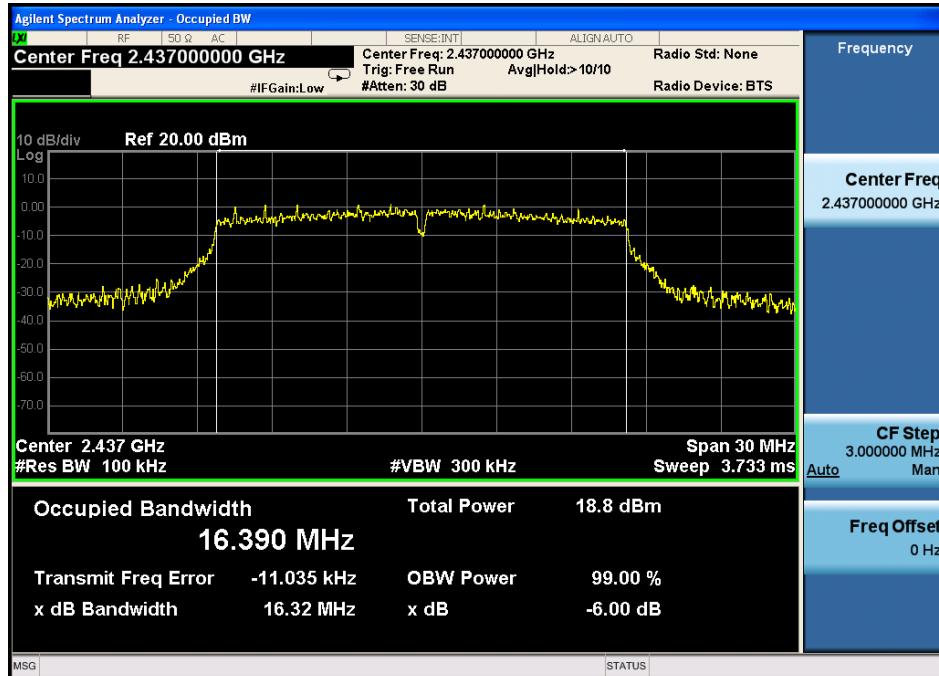


IEEE 802.11g:

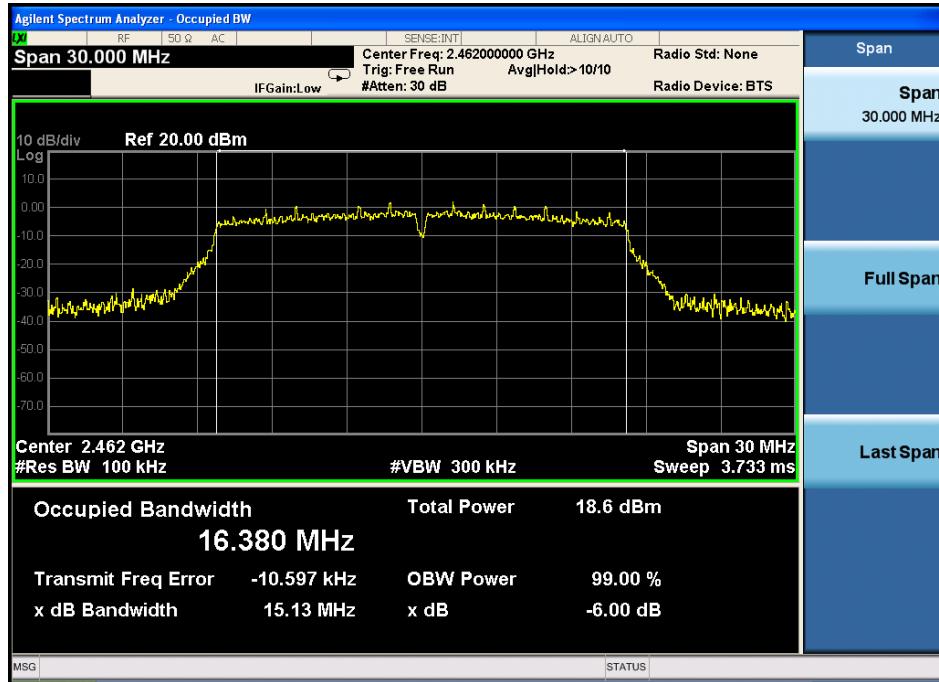
CH Low :



CH Mid:

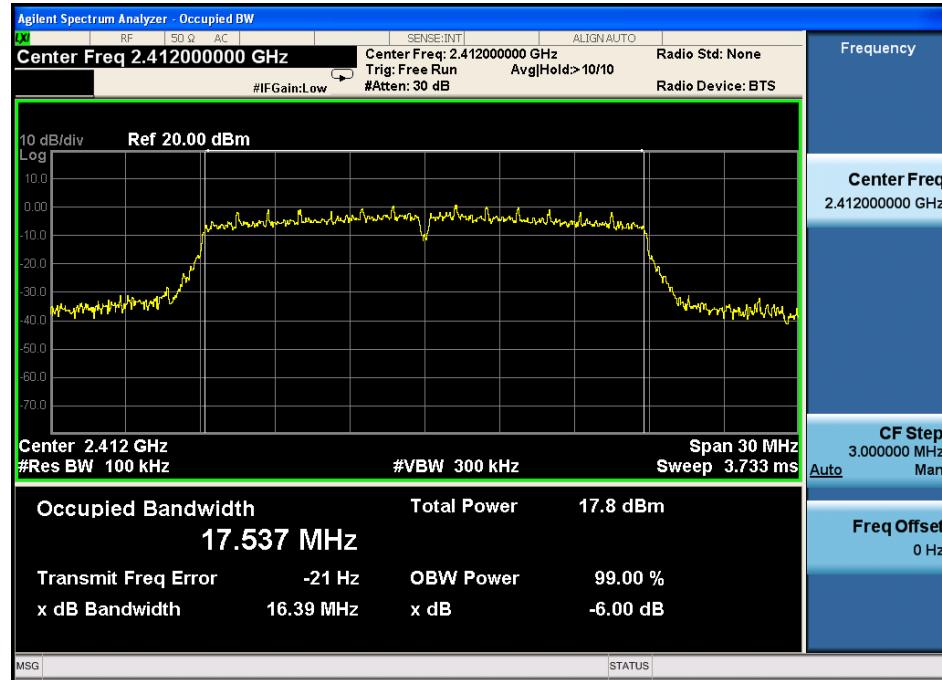


CH Hig:

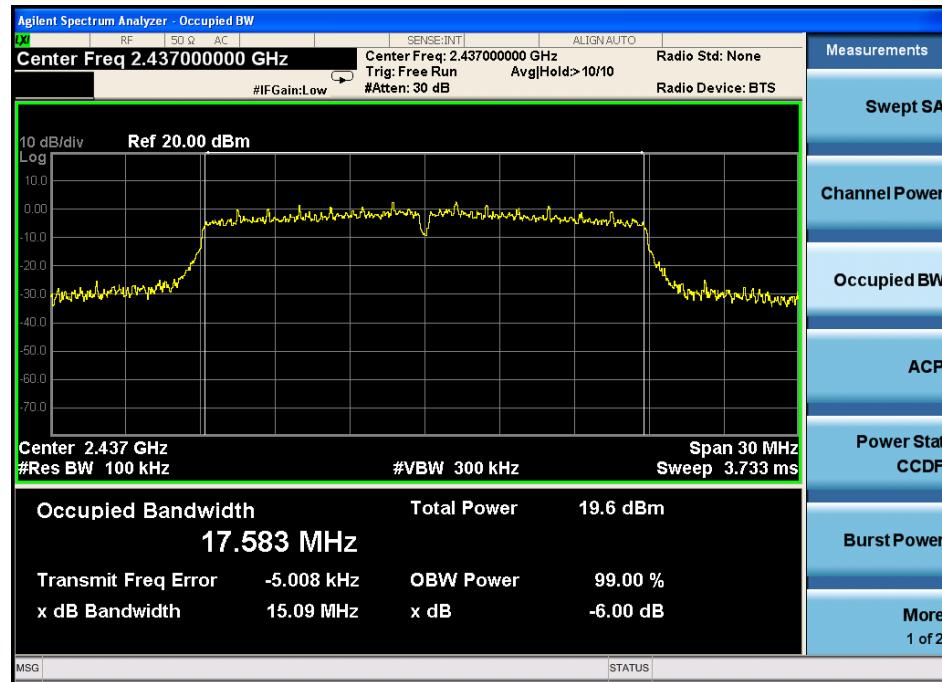


IEEE 802.11n HT20:

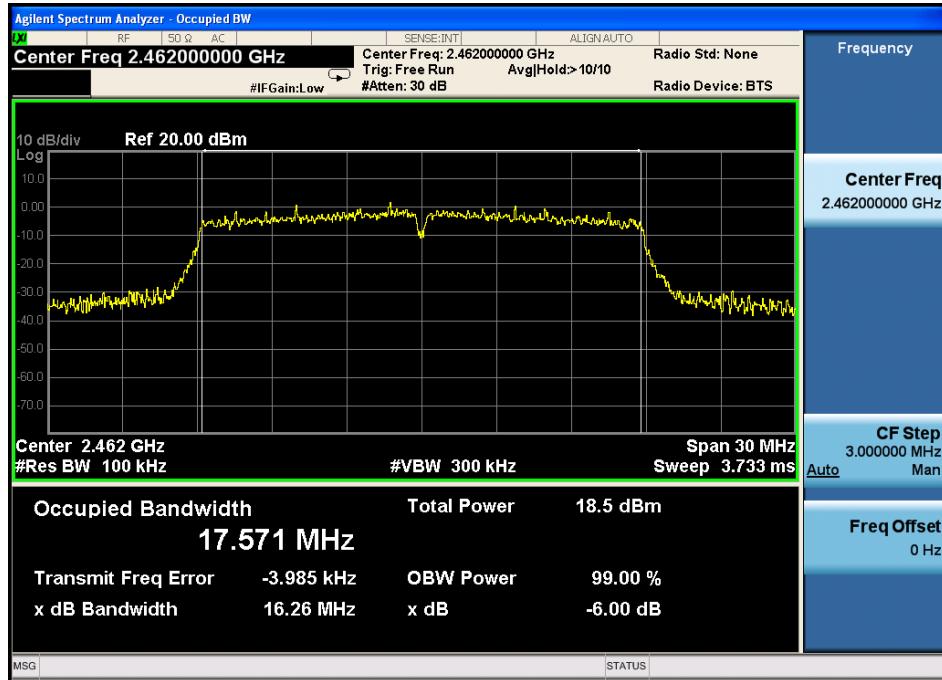
CH Low :



CH Mid :

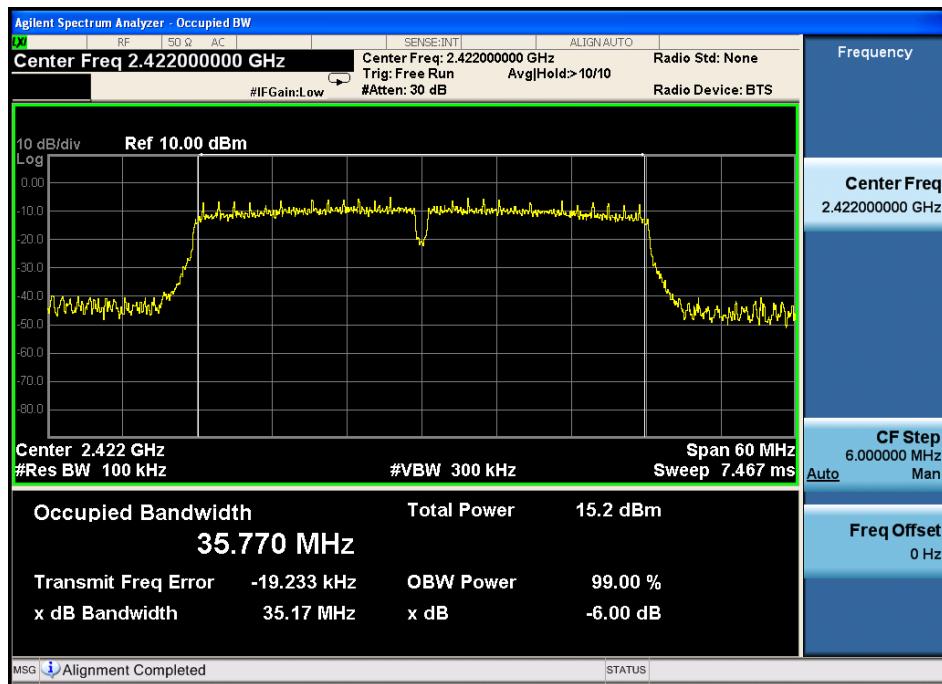


CH High :

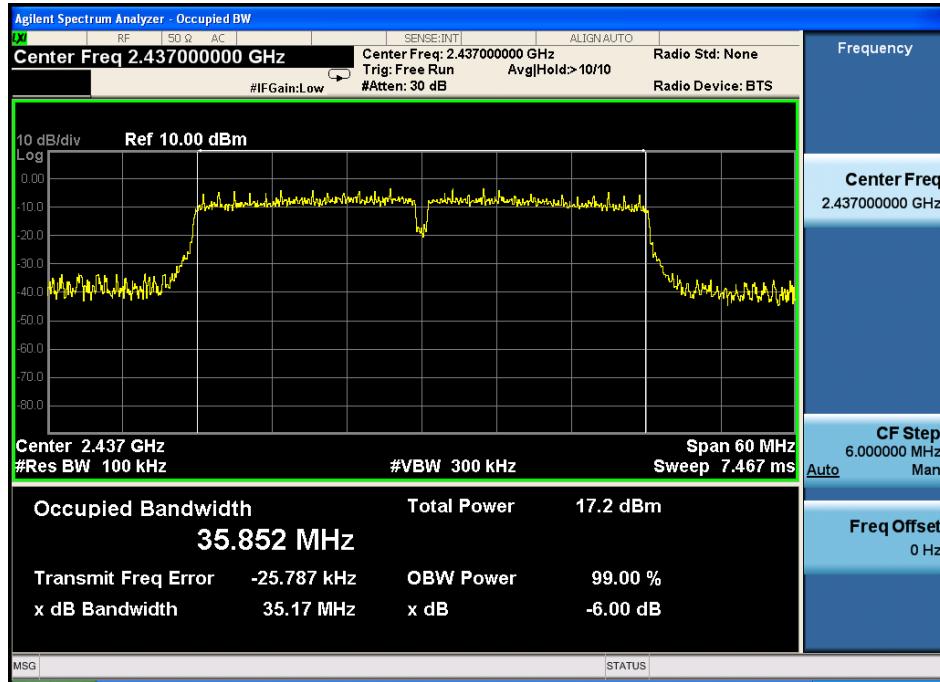


IEEE 802.11n/HT40:

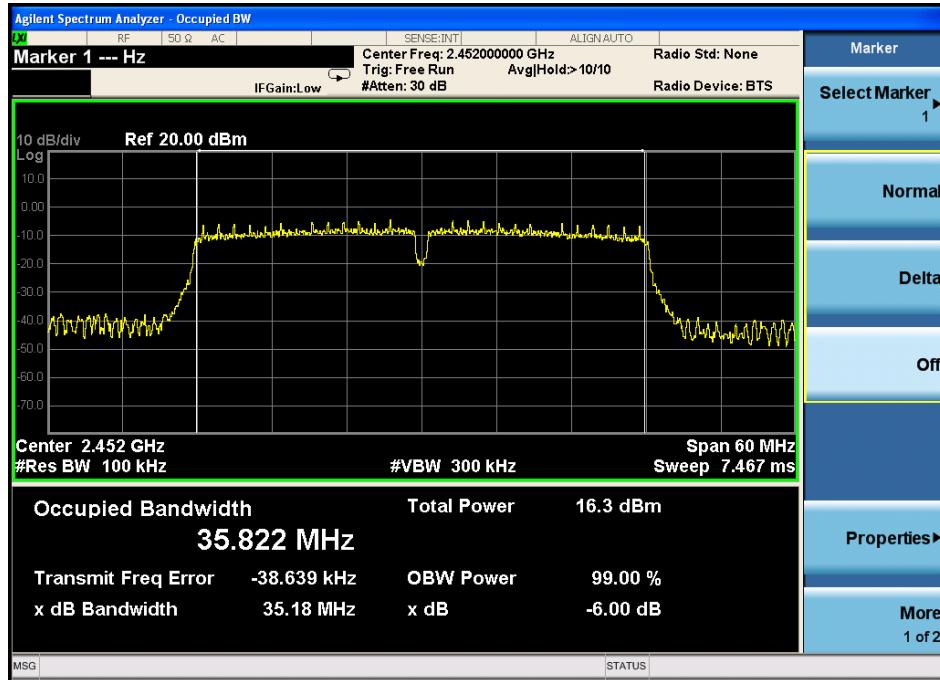
CH Low :



CH Mid:



CH High :



10 Band Edge Check

10.1 Test limit

Please refer section 15.247

All the lower and upper band-edges emissions appearing within 2310MHz to 2390MHz and 2483.5MHz to 2500MHz restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation frequency band 2400MHz to 2483.5MHz and 5725MHz to 5850MHz shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

10.2 Test Procedure

- 12.2.1 Put the EUT on a 1.5m high table, power on the EUT. Emissions were scanned and measured rotating the EUT to 360 degrees, Find the maximum Emission
- 12.2.2 Check the spurious emissions out of band.
- 12.2.3 RBW 1MHz ,VBW 3MHz ,peak detector for peak value , RBW 1MHz ,VBW 3MHz , RMS detector for AV value.

10.3 Test Setup

Same as 5.2.2.

10.4 Test Result

PASS.

Detailed information please see the following page.

Radiated Method:
IEEE 802.11b CH LOW

IEEE 802.11b CH High

IEEE 802.11g CH LOW

IEEE 802.11g CH High

IEEE 802.11n HT20 CH Low

IEEE 802.11n HT20 CH High

IEEE 802.11n HT40 CH Low

IEEE 802.11n HT40 CH High

Conducted Method: ANT PORT 0 and 1 all have been tested, only report worse case

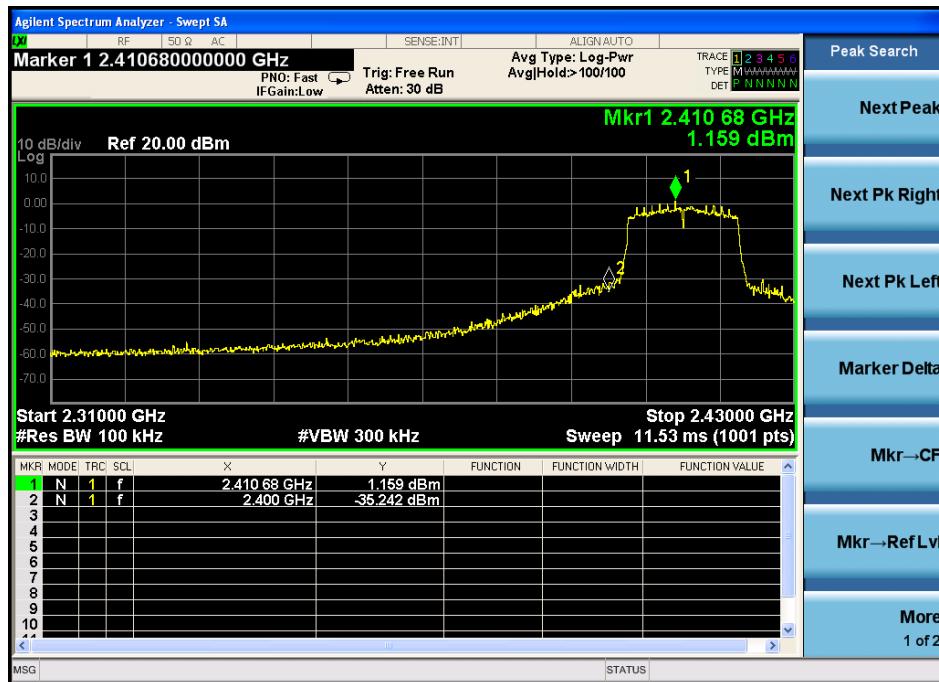
802.11b



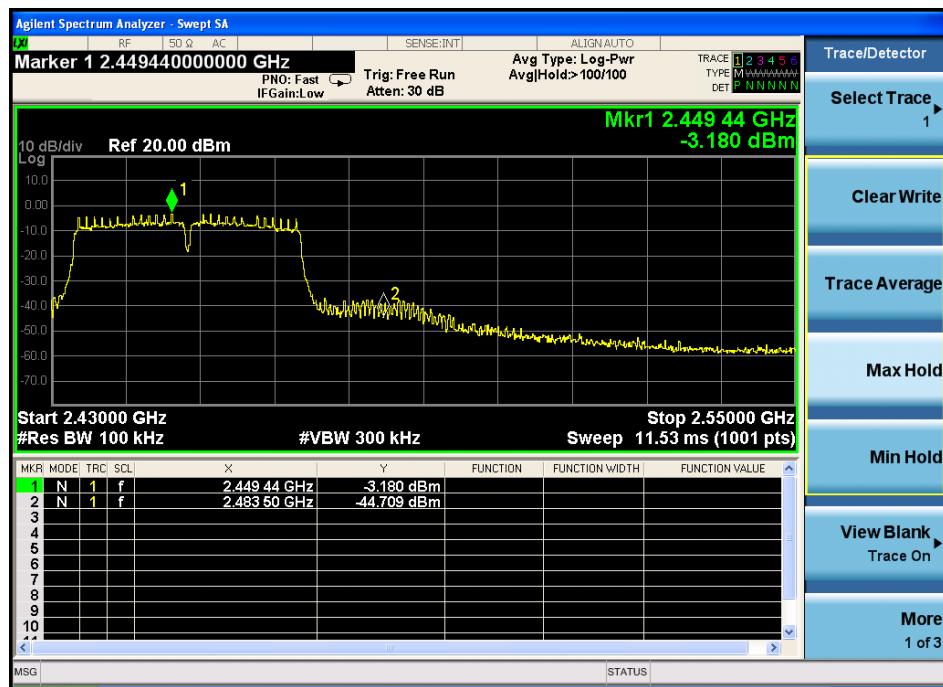
802.11g



802.11n HT20



802.11n HT40



11 Antenna Requirement

11.1 Standard 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. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

11.2 Antenna Connected Construction

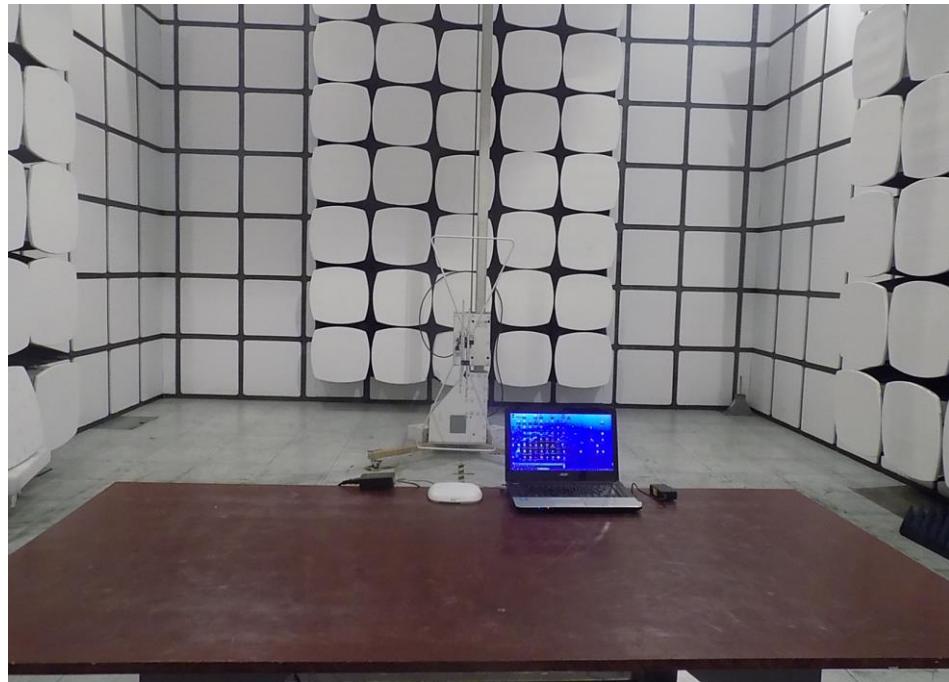
The antenna connector is unique antenna and no consideration of replacement. Please see EUT photo for details.

11.3 Result

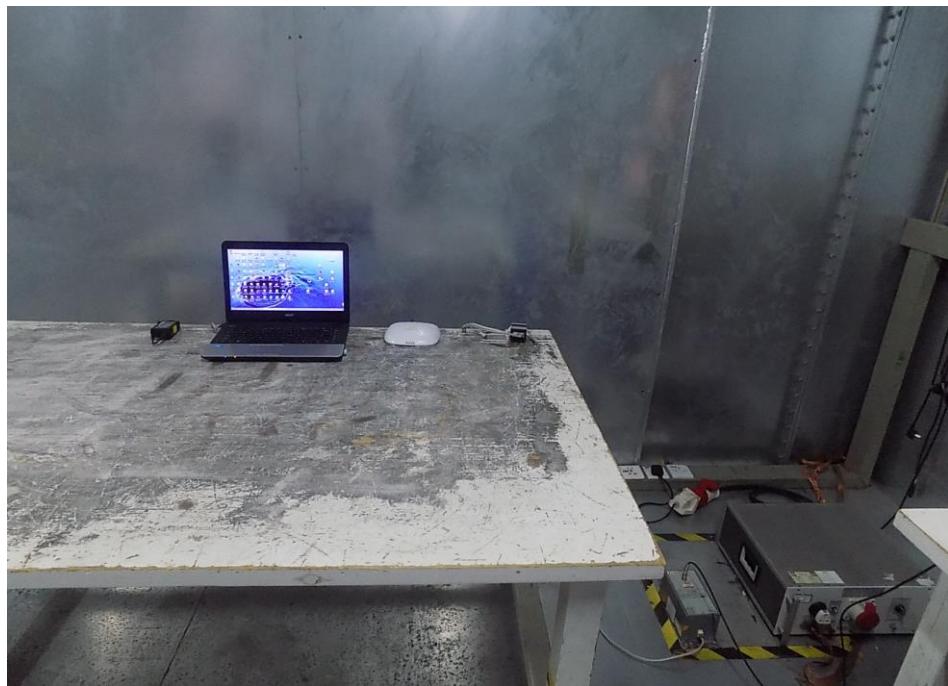
The EUT antenna is unique Antenna. It comply with the standard requirement.

12 Test setup photo

12.1 Photos of Radiated emission

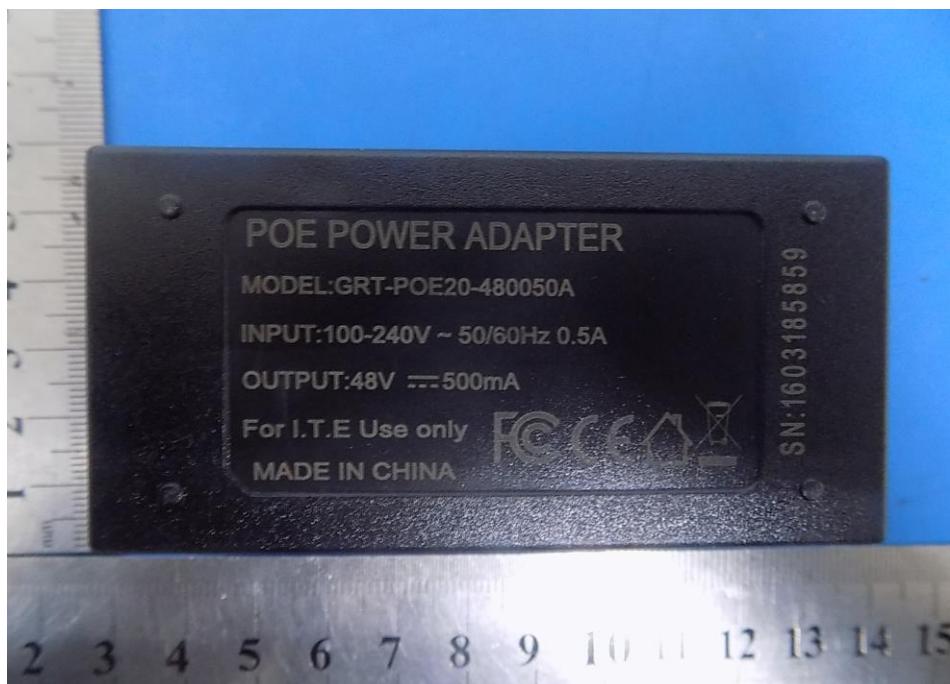


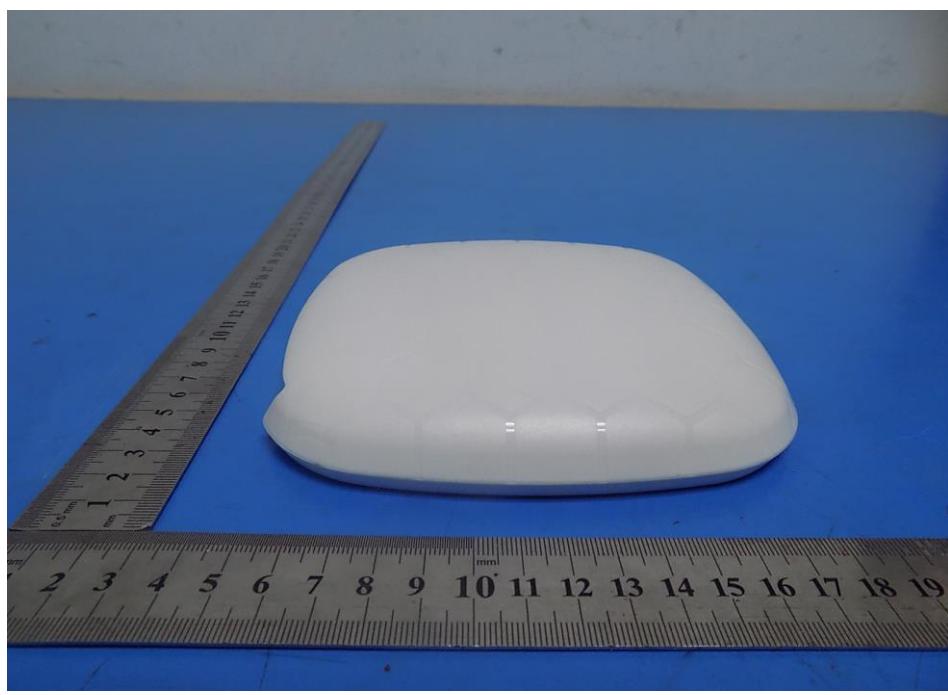
12.2 Photos of Conducted Emission test

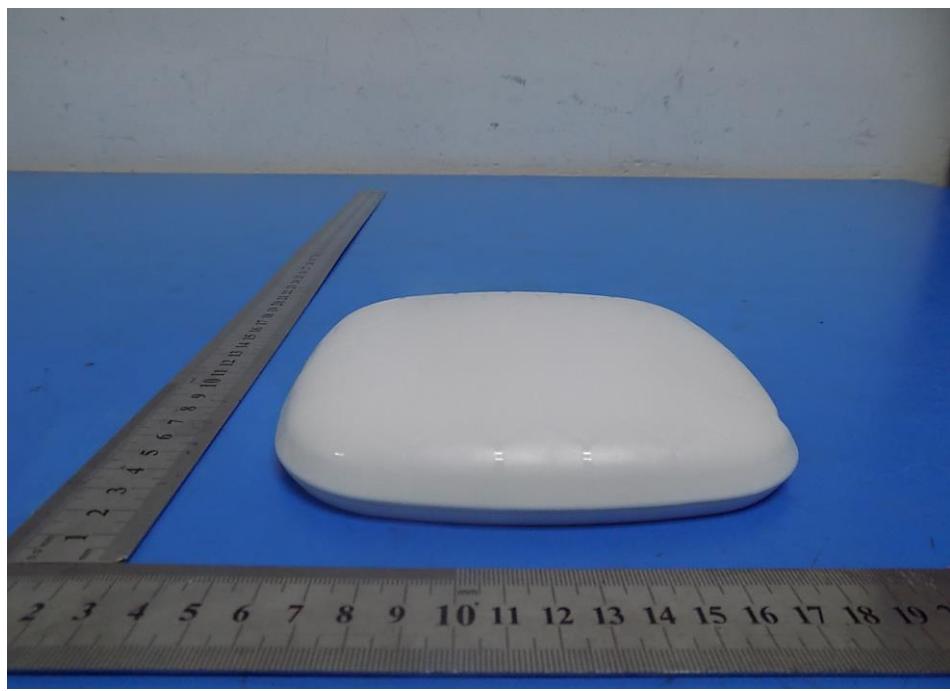
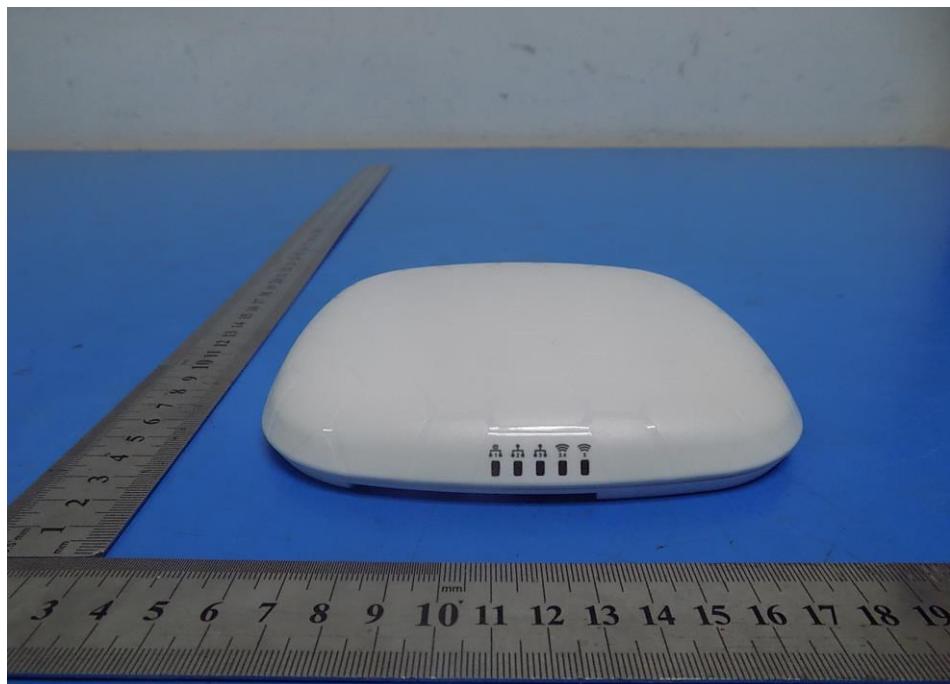


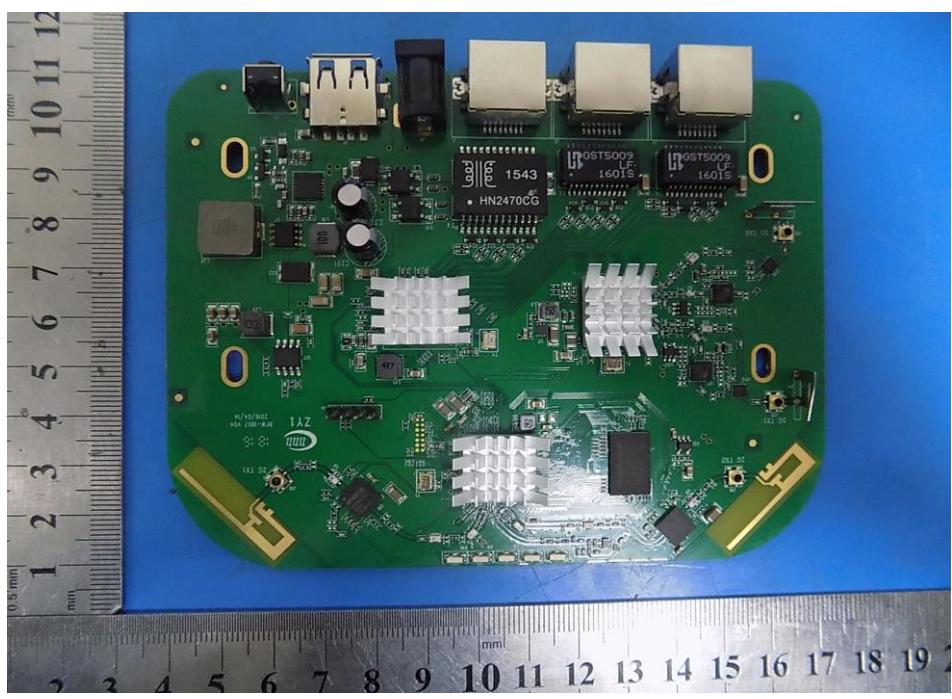
13 Photographs of EUT

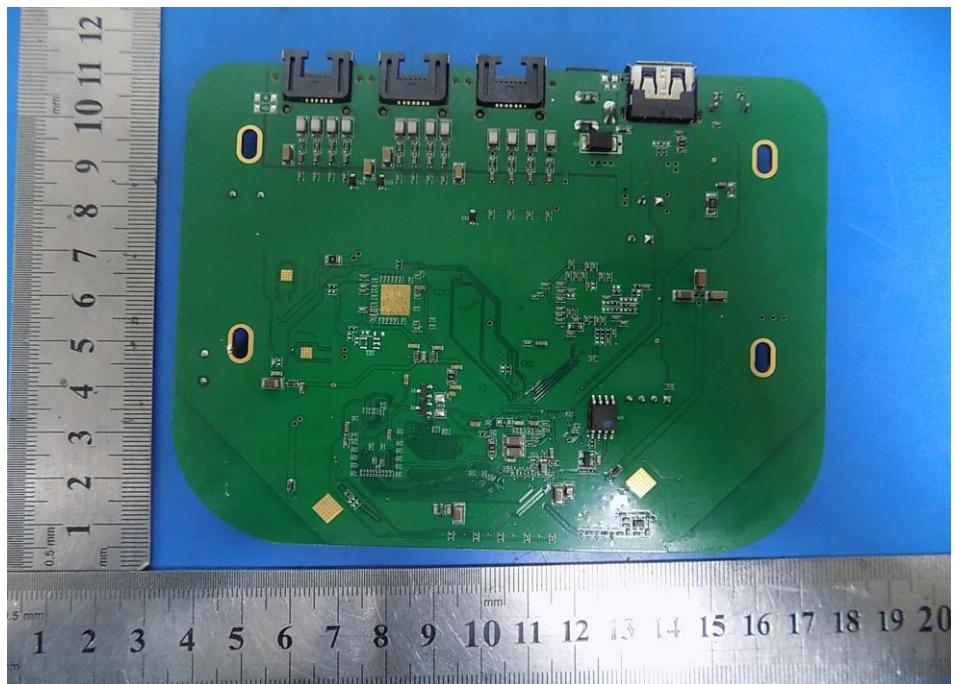












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