



Certificate Number: 5055.02

TEST REPORT FOR WLAN TESTING

Report No.: SRTC2021-9004(F)-21111505(F)

Product Name: BT/Wi-Fi Module

Product Model: MW503

Applicant: Hisense Communication Co., Ltd.

Manufacturer: Hisense Communication Co., Ltd.

Specification: FCC Part 15 Subpart C (2019)

FCC ID: SARMW503

The State Radio_monitoring_center Testing Center (SRTC)

15th Building, No.30 Shixing Street, Shijingshan District,

Beijing, P.R.China

Tel: 86-10-57996183 Fax: 86-10-57996388

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1. GENERAL INFORMATION

1.1 Notes of the test report

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1.2 Information about the testing laboratory

Company:	The State Radio_monitoring_center Testing Center (SRTC)
Address:	15th Building, No.30 Shixing Street, Shijingshan District, P.R.China
City:	Beijing
Country or Region:	P.R.China
Contacted person:	Liu Jia
Tel:	+86 10 57996183
Fax:	+86 10 57996388
Email:	liujiaf@srtc.org.cn

1.3 Applicant's details

Company:	Hisense Communication Co., Ltd.
Address:	Hisense Infor. Industrial Park Economic Technology Dev. District, Qingdao, China

1.4 Manufacturer's details

Company:	Hisense Communication Co., Ltd.
Address:	Hisense Infor. Industrial Park Economic Technology Dev. District, Qingdao, China



1.5 Test Environment

Date of Receipt of test sample at SRTC:	2021-02-22
Testing Start Date:	2021-02-23
Testing End Date:	2021-03-09

Environmental Data:	Temperature (°C)	Humidity (%)
Ambient	25	45

Normal Supply Voltage (V d.c.):	3.3
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2 DESCRIPTION OF THE DEVICE UNDER TEST

2.1 Final Equipment Build Status

Frequency Band	2.412GHz~2.462GHz
Number of Channel For 20MHz	11
Number of Channel For 40MHz	7
Modulation Type	802.11b 802.11g 802.11n (HT20/HT40)
Power Supply	DC Adapter
Hardware Version	V1.00C
Software Version	---
IMEI or Sample	#1
Antenna type	Refer to Note
Antenna connector	Refer to Note

Note:

The modified product and the variant product, is different on

1.The WLAN Chipset

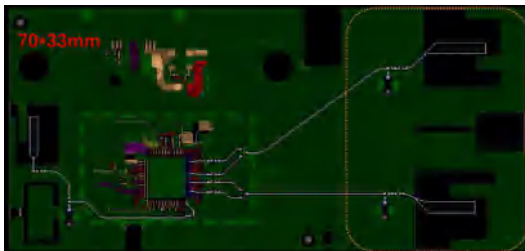
The main chip of the module MW503 is changed from the RTL8822CU-CG to the RTL8822CU-VB-CG,they are all compatible pin-to-pin in hardware design.The main difference is that the RTL8822CU-VB-CG supports Google authentication and Android 11,but the RTL8822CU-CG cannot.

2.PCB Size

The PCB size of the module MW503 is changed from 55*33mm to 70*33mm,as shown below:



V1.00B



V1.00C

3. PCB on-board antenna design

The Wi-Fi Antenna of the module MW503 is changed from V1.00B to V1.00C , the identification part in the frame as shown above.

4.Antenna gain

	Initial	Variant	
BT/BLE:	0.7dBi	0.09dBi	
WLAN2.4GHz	Ant0: 0.5dBi Ant1: 0.5dBi	Ant0: 0.5dBi Ant1: -0.62dBi	
WLAN5GHz	Ant0: 0.3dBi Ant1: 0.3dBi	Ant0: 1.1dBi Ant1: -1dBi	

5. Other

Apart from the above three points, nothing has changed compared with before.

It is verified that these differences will not make the RF performance of the product worse.

Note: The test results of variant product derive from original product Report

No.: SRTC2021-9004(F)-21022201(F).

All test data are not updated.

Note: Antenna requirement (FCC part 15.203)

An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can 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 antenna(s) of the EUT are permanently attached.
- There are no provisions for connection to an external antenna.

Note: The antenna provides to the EUT, please refer to the following table:

Brand	Model	Antenna gain	Frequency band (GHz)	Antenna type	Connector Type
N/A	N/A	Chain1:0.5dBi Chain2:-0.62dBi	2.4GHz~2.4835GHz	Fixed Internal Antenna	N/A

The antenna gain is provided by the customer and involved in the calculation and influence of the test results. Our laboratory takes the value declared by the customer as the criterion, and the customer is responsible for the antenna gain value. Manufacturers ensure that their designs will not be modified by the user or third party's arbitrary antenna parameters and performance.

2.2 Description of Test Modes

11 channels are provided to this EUT:

CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437	---	---

2.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE ≥ 1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where

RE ≥ 1G: Radiated Emission above 1GHz

RE<1G: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission

APCM: Antenna Port Conducted Measurement

Radiated Emission Test (Above 1GHz):

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)
1 to 11	1/6/11 For HT20 3/6/9 For HT40	DBPSK/BPSK	1,6, 6.5,13.5 8.6,17.2

Radiated Emission Test (Below 1GHz):

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)
1 to 11	1/6/11 For HT20 3/6/9 For HT40	DBPSK/BPSK	1,6, 6.5,13.5 8.6,17.2

Power Line Conducted Emission Test:

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)
1 to 11	6	DBPSK	1

Antenna Port Conducted Measurement:

This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)
1 to 11	1/6/11 For HT20 3/6/9 For HT40	DBPSK/BPSK	1,6, 6.5,13.5 8.6,17.2

2.3 EUT Operating conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

2.4 Support Equipment

The following support equipment was used to exercise the DUT during testing:

NA

3 REFERENCE SPECIFICATION

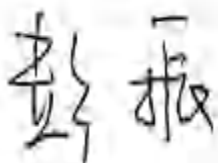
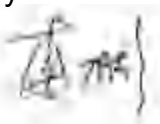
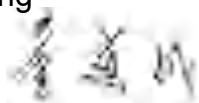
Specification	Version	Title
FCC part15 Subpart C	2019	Intentional radiators
ANSI C63.10	2013	Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
KDB 558074D01 V05R02	April 2, 2019	Guidance for compliance measurements on Digital transmission system, frequency hopping spread spectrum system, and hybrid system devices operating under section 15.247 of the FCC rules

4 KEY TO NOTES AND RESULT CODES

Code	Meaning
PASS	Test result shows that the requirements of the relevant specification have been met.
FAIL	Test result shows that the requirements of the relevant specification have not been met.
N/T	Test case is not tested.

5 RESULT SUMMARY

No.	Test case	Reference	Verdict
1	Transmitter Output Power	15.247(b)(3)	Pass
2	6dB Bandwidth	15.247(a)(2)	Pass
3	Transmitter Power Spectral Density	15.247(e)	Pass
4	Conducted Out of band emission measurement	15.247(d)	Pass
5	Band Edge	15.247(d)	Pass
6	Spurious Radiated Emissions	15.205/15.209	Pass
7	AC Power line Conducted Emission	15.207	Pass
8	Antenna requirement	15.203	Pass(refer to section 2.1)

This Test Report Is Issued by: Mr. Peng Zhen 	Checked by: Mr. Li Bin 
Tested by: Mr. Tong Daocheng 	Issued date: 20211206

6 TEST RESULT

6.1 Peak Power Output

6.1.1 Ambient condition

Temperature	Relative humidity	Pressure
25°C	45%	101.5kPa

6.2.2 Test limit

Part15.247 (b) (3)

The maximum permissible conducted output power is 1 Watt.

6.2.3 Test Procedure Used

ANSI C63.10-2013 – Section 11.9.1.3

ANSI C63.10-2013 – Section 11.9.2.3.2

KDB 558074 D01 v05r02 – Section 8.3.1.3

6.2.4 Test Settings

Peak Power Measurement

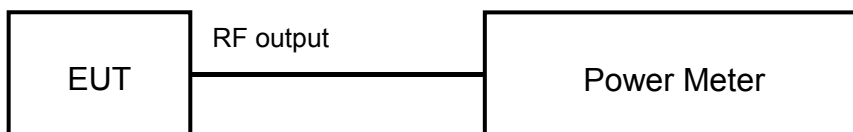
The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

Average Power Measurement

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

6.2.5 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



6.2.6 Test result

The test results are shown in Appendix A.

6.2 6dB Bandwidth

6.2.1 Ambient condition

Temperature	Relative humidity	Pressure
25°C	45%	101.5kPa

6.1.2 Test limit

Part15.247 (a) (2)

The minimum permissible 6dB bandwidth is 500 kHz

6.1.3 Test Procedure Used

ANSI C63.10-2013 – Section 11.8.2 Option 2

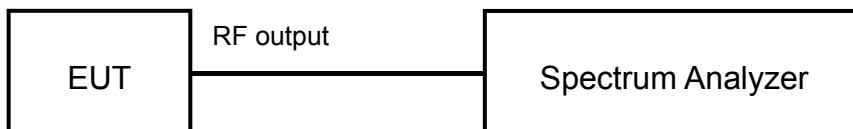
KDB 558074 D01 v05r02 – Section 8.2

6.1.4 Test Settings

1. The signal analyzers' automatic bandwidth measurement capability of the spectrum analyzer was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 6. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 100 kHz
3. VBW \geq 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize

6.1.5 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



6.1.6 Test result

The test results are shown in Appendix A.

6.3 Transmitter Power Spectral Density

6.3.1 Ambient condition

Temperature	Relative humidity	Pressure
25°C	45%	101.5kPa

6.3.2 Test limit

Part15.247 (e)

The maximum permissible power spectral density is 8.0dBm in any 3 kHz band.

6.3.3 Test Procedure Used

ANSI C63.10-2013 – Section 11.10.2 Method PKPSD

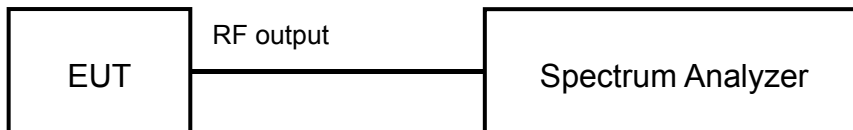
KDB 558074 D01 v05r02 – Section 8.4

6.3.4 Test Settings

1. Analyzer was set to the center frequency of the DTS channel under investigation
2. Span = 1.5 times the DTS channel bandwidth
3. RBW = 3 kHz
4. VBW = 10 kHz
5. Detector = peak
6. Sweep time = auto couple
7. Trace mode = max hold
8. Trace was allowed to stabilize

6.3.5 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



6.3.7 Test result

The test results are shown in Appendix A.

6.4 Conducted Out of band emission measurement

6.4.1 Ambient condition

Temperature	Relative humidity	Pressure
25°C	45%	101.5kPa

6.4.2 Test limit

Part 15.247(d): The limit for out-of-band spurious emissions at the band edge is 20dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100 kHz bandwidth.

6.4.3 Test Procedure Used

ANSI C63.10-2013 – Section 11.11.3

KDB 558074 D01 v05r02 – Section 8.5

6.4.4 Reference level measurement Settings

Establish a reference level by using the following procedure:

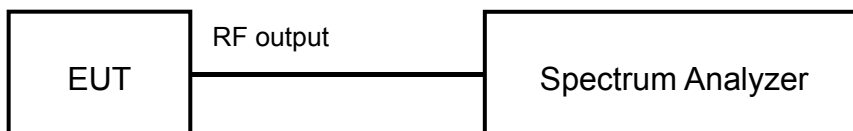
- Set instrument center frequency to DTS channel center frequency.
- Set the span to ≥ 1.5 MHz
- Set the RBW = 100 kHz.
- Set the VBW ≥ 300 kHz.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum PSD level.

6.4.5 Test Settings

- Set the center frequency and span to encompass frequency range to be measured.
- Set the RBW = 100 kHz.
- Set the VBW ≥ 300 kHz.
- Detector = peak.
- Set span to encompass the spectrum to be examined
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level.

6.4.6 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



6.4.7 Test result

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement. The test results are shown in Appendix A.

6.5 Band-edge measurement

6.5.1 Ambient condition

Temperature	Relative humidity	Pressure
25°C	45%	101.5kPa

6.5.2 Test limit

Part 15.247(d): The limit for out-of-band spurious emissions at the band edge is 20dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100 kHz bandwidth.

6.5.3 Test Procedure Used

ANSI C63.10-2013 – Section 11.11.3

KDB 558074 D01 v05r02 – Section 8.7.2

6.5.4 Reference level measurement Settings

Establish a reference level by using the following procedure:

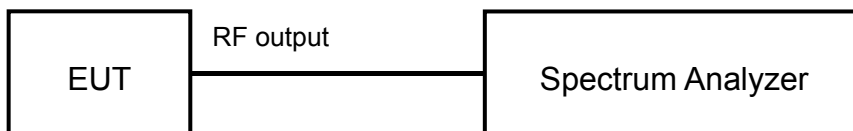
- Set instrument center frequency to DTS channel center frequency.
- Set the span to ≥ 1.5 MHz
- Set the RBW = 100 kHz.
- Set the VBW ≥ 300 kHz.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum PSD level.

6.5.5 Test Settings

- Set the center frequency and span to encompass frequency range to be measured.
- Set the RBW = 100 kHz.
- Set the VBW ≥ 300 kHz.
- Detector = peak.
- Set span to encompass the spectrum to be examined
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level.

6.5.6 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



6.5.7 Test result

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement. The test results are shown in Appendix A.

6.6 Spurious Radiated Emissions

6.6.1 Ambient condition

Temperature	Relative humidity	Pressure
25°C	45%	101.5kPa

6.6.2 Test Description

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at maximum power and at the appropriate frequencies. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

6.6.3 Test limit

Part15.205, 15.209, 15.247(d)

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in below Table per Section 15.209. The spectrum shall be investigated from the lowest radio frequency signal generated in the device

Frequency [MHz]	Field strength [$\mu\text{V/m}$]	Measured 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

Radiated Limits

Part15.35(b):

There is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit

Used conversion factor: Limit (dB $\mu\text{V/m}$) = 20 log (Limit ($\mu\text{V/m}$)/1 $\mu\text{V/m}$)

Frequency [MHz]	Detector	Unit (dB $\mu\text{V/m}$)
30~88	Quasi-peak	40.0
88~216	Quasi-peak	43.5
216~960	Quasi-peak	46.0
960~1000	Quasi-peak	54.0
1000~5th harmonic of the highest frequency or 40GHz, whichever is lower	Average	54.0
	Peak	74.0

Conversion Radiated limits

6.6.4 Test Procedure Used

ANSI C63.10-2013

For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 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 recorded the reading with Maximum Hold Mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer complied the following setting:

Frequency	RBW
9-150kHz	200-300Hz
0.15-30MHz	9-10kHz

2. Signals below 30MHz are not recorded in the report because they are lower than the limits by more than 20dB.

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 in 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 recorded the reading with Maximum Hold Mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detector and recorded the reading 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.

For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz 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 3 MHz for Average detection (AV) at frequency above 1GHz. If duty cycle of test signal is < 98%, the duty factor need added to measured value.
4. All modes of operation were investigated and the worst-case emissions are reported.

6.6.5 Test Settings

Average Field Strength Measurements

Frequency	Detector
<1000MHz	Quasi-peak
>1000MHz	Peak and average

Peak Field Strength Measurements

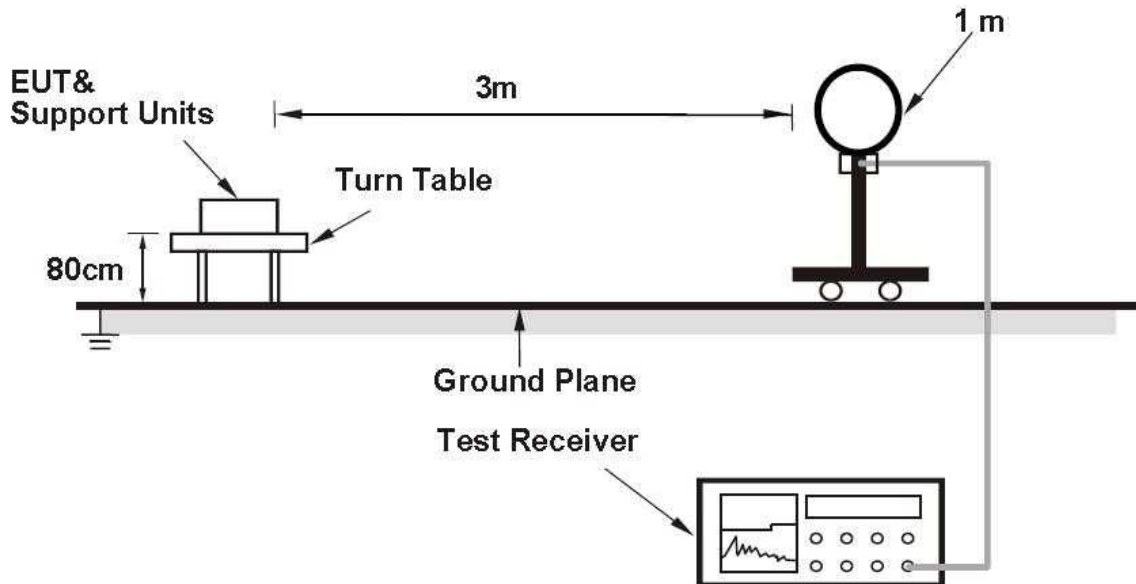
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW is set depending on measurement frequency, as specified in following table

Frequency	RBW
9-150kHz	200-300Hz
0.15-30MHz	9-10kHz
30-1000MHz	100-120kHz
>1000MHz	1MHz

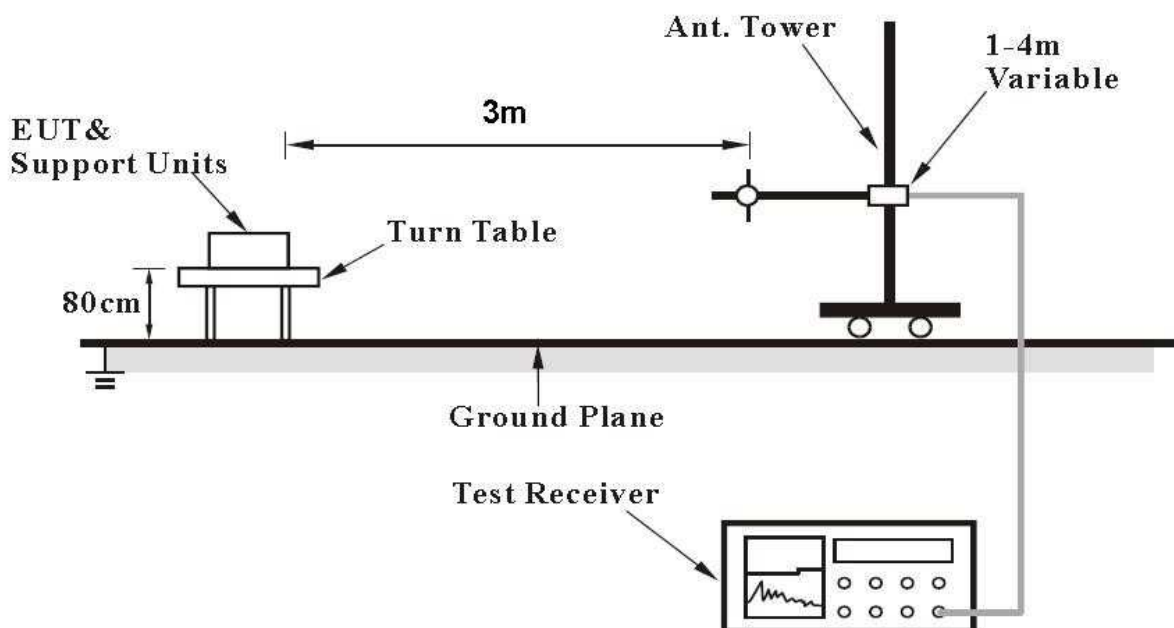
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

6.6.6 Test Setup

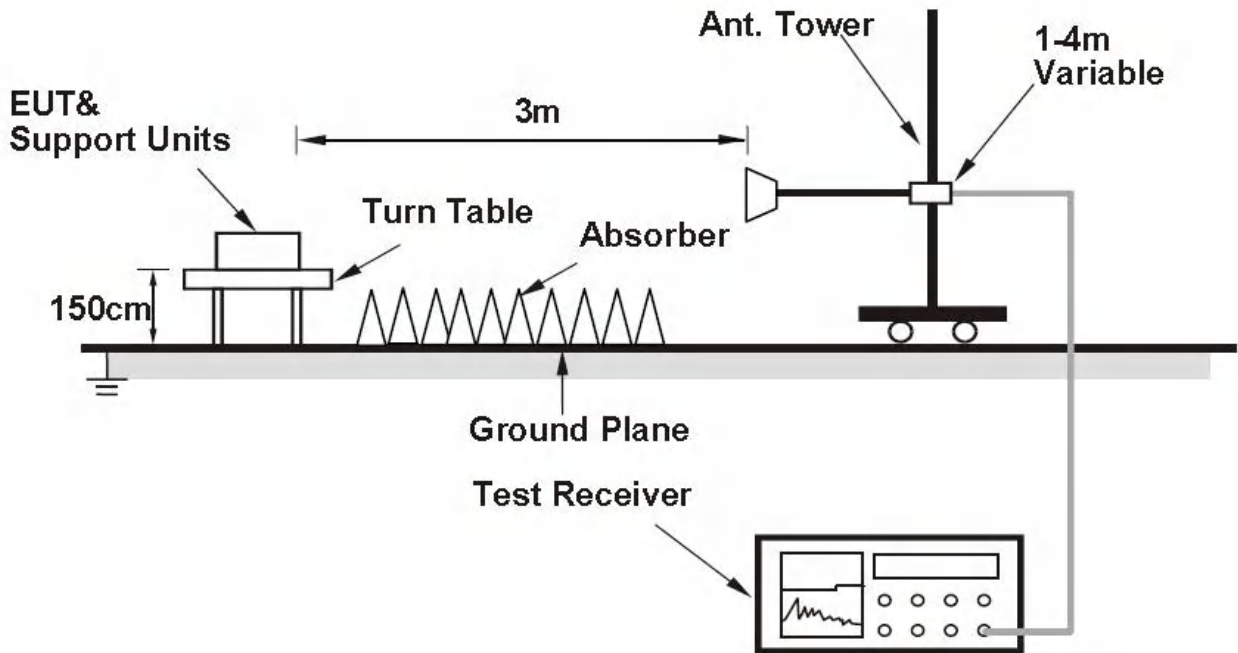
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



6.6.7 Test result

The test results are shown in Appendix B.

6.7 AC Power line Conducted Emission

6.7.1 Ambient condition

Temperature	Relative humidity	Pressure
25°C	45%	101.5kPa

6.7.2 Test limit

FCC Part15.207

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

The measurement is made according to ANSI C63.10-2013

6.7.3 Test Procedures

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

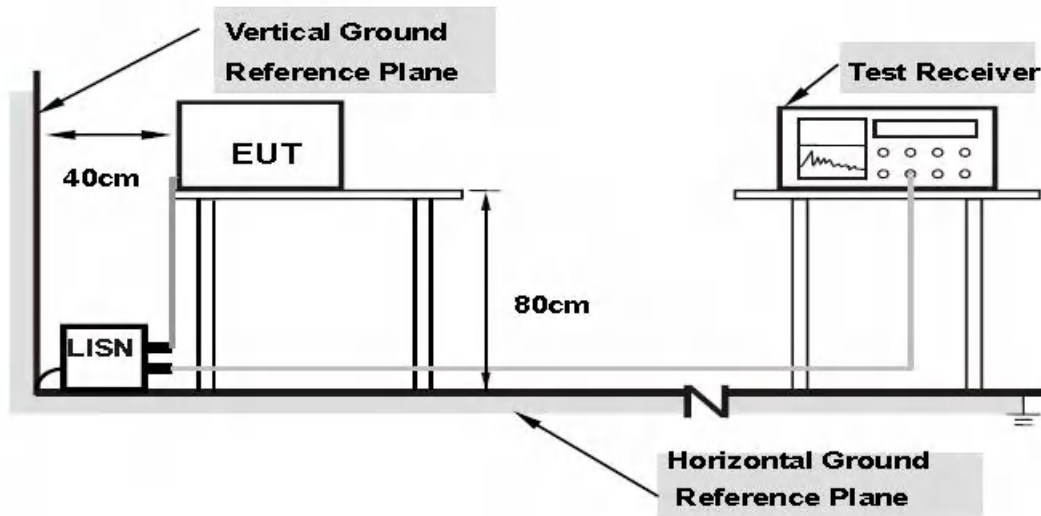
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

NOTE: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

The EUT shall test under the power AC120V/240V/60Hz.

6.7.4 Test Setup



For the actual test configuration, please refer to the attached file (Test Setup Photo).

6.7.5 Test result

The test results are shown in Appendix B.

7 MEASUREMENT UNCERTAINTIES

Items	Uncertainty	
Occupied Bandwidth	3kHz	
Peak power output	0.67dB	
Band edge compliance	1.20dB	
Spurious emissions	30MHz~1GHz	2.83dB
	1GHz~12.75GHz	2.50dB
	12.75GHz~25GHz	2.75dB

8 TEST EQUIPMENTS

No.	Name/ Model	Manufacturer	S/N	Cal date	Cal Due date
1.	Spectrum Analyzer / FSV	ROHDE & SCHWARZ	101065	2021.06.21	2022.06.20
2.	Signal Analyzer / N9020A	Agilent	MY48010771	2021.05.18	2022.05.17
3.	Bluetooth Test Set / MT8852B	Anritsu	1329003	2021.06.21	2022.06.20
4.	Power Divider / 11667A	HP	19632	2021.06.21	2022.06.20
5.	Power Meter E4416A	Agilent	MY52370013	2021.04.13	2022.04.12
6.	Power Sensor E9323A	Agilent	MY52150008	2021.04.13	2022.04.12
7.	Signal Generator / SMBV100A	R&S	260910	2021.06.21	2022.06.20
8.	Temperature chamber / SH241	ESPEC	92013758	2021.06.21	2022.06.20
9.	Fully-Anechoic Chamber / 12.65m×8.03m×7.50m	FRANKONIA	----	----	----
10.	Semi-Anechoic/Chamber / 23.18m×16.88m×9.60m	FRANKONIA	---	----	----
11.	Turn table Diameter:1m	FRANKONIA	----	----	----
12.	Turn table Diameter:5m	FRANKONIA	----	----	----
13.	Antenna master FAC(MA4.0)	MATURO	----	----	----
14.	Antenna master SAC(MA4.0)	MATURO	----	----	----
15.	Shielding room / 9.080m×5.255m×3.525m	FRANKONIA	----	----	----
16.	Double-Ridged Waveguide Horn Antenna / HF 907	R&S	100512	2021.06.21	2022.06.20
17.	Double-Ridged Waveguide Horn Antenna / HF 907	R&S	100513	2021.06.21	2022.06.20
18.	Ultra log antenna / HL562	R&S	100016	2021.06.21	2022.06.20
19.	Receive antenna /3160-09	SCHWARZ-BECK	002058-002	2021.06.21	2022.06.20
20.	EMI test receiver / ESI 40	R&S	100015	2021.06.21	2022.06.20
21.	EMI test receiver / ESCS30	R&S	100029	2021.06.21	2022.06.20
22.	Receive antenna / HL562	R&S	100167	2021.06.21	2022.06.20
23.	AMN / ENV216	R&S	3560.6550.12	2021.06.21	2022.06.20
24.	WLAN AP WIA3300-20	SKSpruce	8152017060700339	---	---
25.	Notebook E470c	Lenovo	PF10UZW7	---	---

APPENDIX A – TEST DATA OF CONDUCTED EMISSION

In order to find the worst case condition, Pre-tests are needed at the presence of different data rate. Data rate below means worst-case rate of each test item.

Worst-case data rates are shown as following table.

Test Mode	Data Rate
802.11b	1Mbps
802.11g	6Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0

Directional gain

Band	Chain1 Ant Gain (dBi)	Chain2 Ant Gain (dBi)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm/3kHz)
2.4GHz	0.5	-0.62	1.92	30.0	8.0

Duty cycle

Test Mode	Duty Cycle (%)	Correction Factor(dB)
802.11b	94.22	0.26
802.11g	73.14	1.36
802.11n HT20	71.85	1.39
802.11n HT40	65.87	1.52

Conducted power

Mode	Freq(MHz)	Chain	Peak power output (dBm)	Average power output (dBm)
802.11b	2412MHz	Chain0	19.98	16.68
		Chain1	19.68	16.28
	2437MHz	Chain0	19.44	16.08
		Chain1	19.09	15.66
	2462MHz	Chain0	19.15	15.84
		Chain1	18.67	15.25
802.11g	2412MHz	Chain0	25.53	16.15
		Chain1	24.92	15.62
	2437MHz	Chain0	24.76	15.45
		Chain1	24.47	15.05
	2462MHz	Chain0	24.66	15.35
		Chain1	23.95	14.52
802.11n20M	2412MHz	Chain0	25.34	16.02
		Chain1	24.92	15.63
		MIMO	28.15	18.84
	2437MHz	Chain0	24.67	15.34
		Chain1	24.35	15.04
		MIMO	27.52	18.20
	2462MHz	Chain0	24.58	15.26
		Chain1	23.87	14.56
		MIMO	27.25	17.93
802.11n40M	2422MHz	Chain0	25.62	15.17
		Chain1	25.18	14.65
		MIMO	28.42	17.93
	2437MHz	Chain0	25.03	14.67
		Chain1	24.78	14.25
		MIMO	27.92	17.48
	2452MHz	Chain0	24.92	14.54
		Chain1	24.63	14.14
		MIMO	27.79	17.35

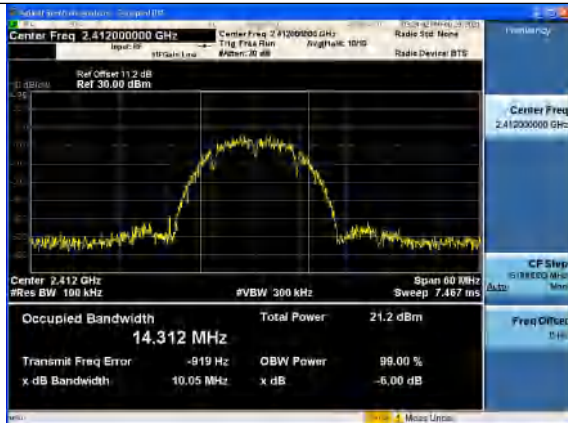
6dB Bandwidth

Offset 11.2dB =Attenuator 10dB+ Temporary antenna connector loss 0.2dB+ Cable loss 1dB

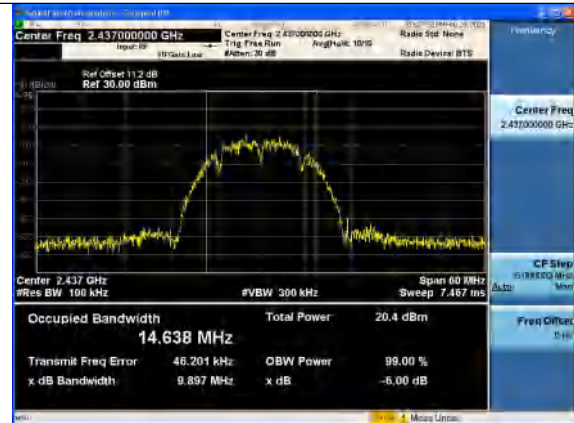
Test Mode:802.11b

Carrier frequency (MHz)	Channel No.	Chain	6 dB bandwidth (MHz)
2412MHz	1	Chain0	10.05
		Chain1	9.89
2437MHz	6	Chain0	9.90
		Chain1	9.84
2462MHz	11	Chain0	9.52
		Chain1	9.52

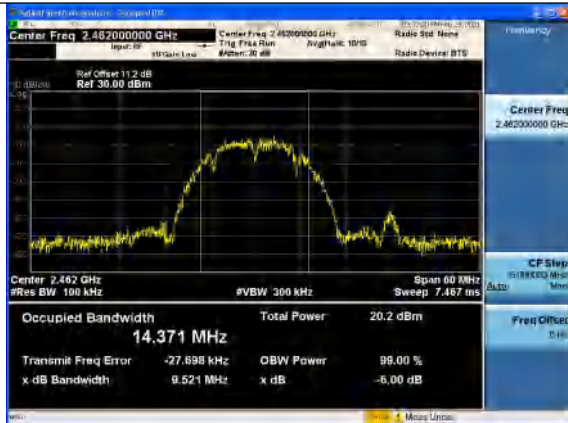
Test Mode:802.11b Chain0



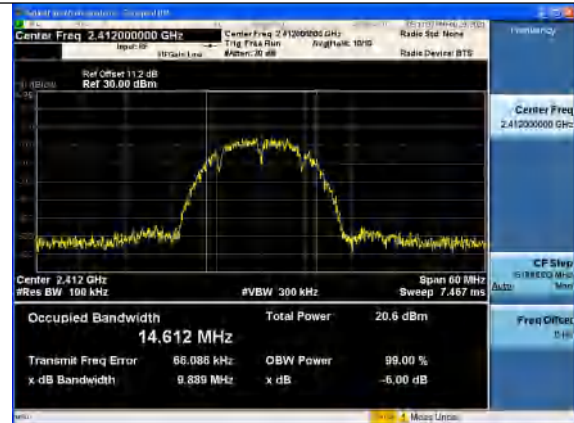
Test Mode:802.11b Chain0



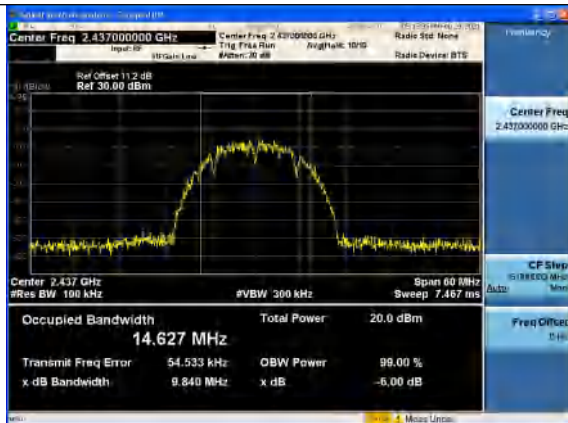
Test Mode:802.11b Chain0



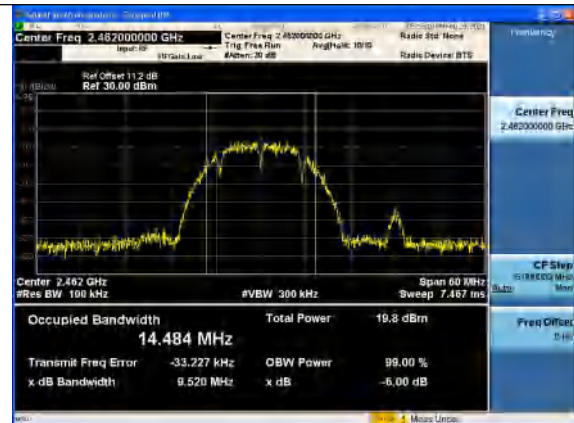
Test Mode:802.11b Chain1



Test Mode:802.11b Chain1



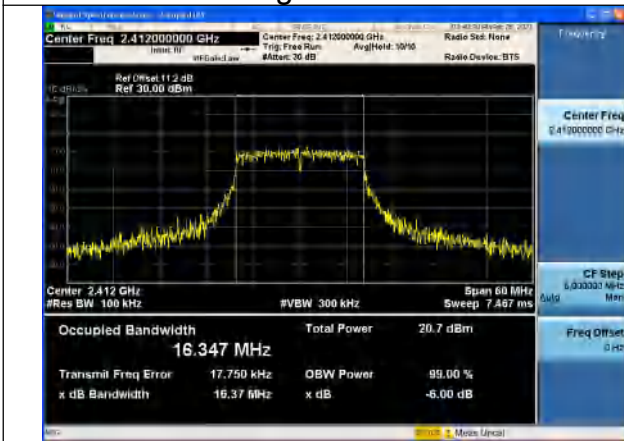
Test Mode:802.11b Chain1



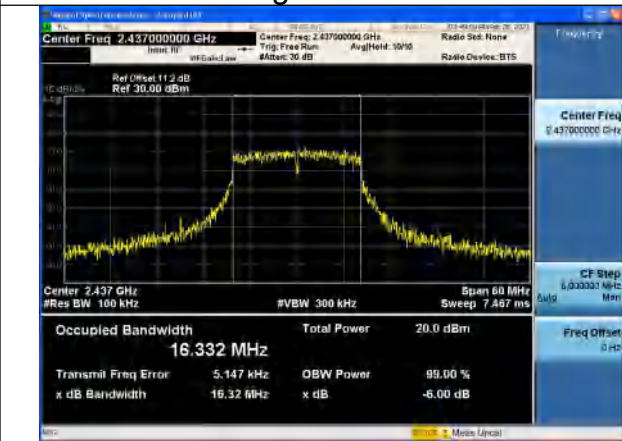
Test Mode:802.11g

Carrier frequency (MHz)	Channel No.	Chain	6 dB bandwidth (MHz)
2412MHz	1	Chain0	16.37
		Chain1	16.41
2437MHz	6	Chain0	16.32
		Chain1	16.33
2462MHz	11	Chain0	16.46
		Chain1	16.11

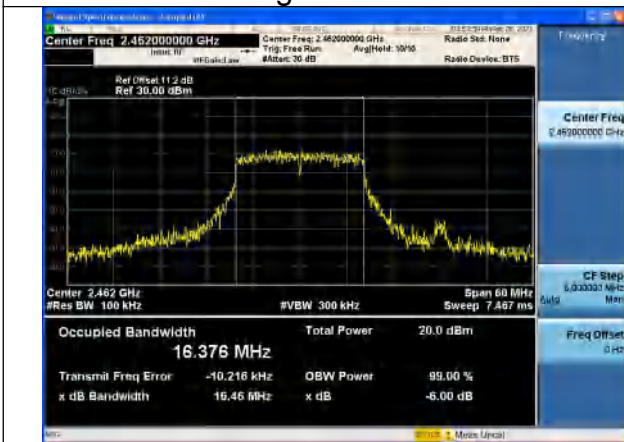
Test Mode:802.11g Chain0



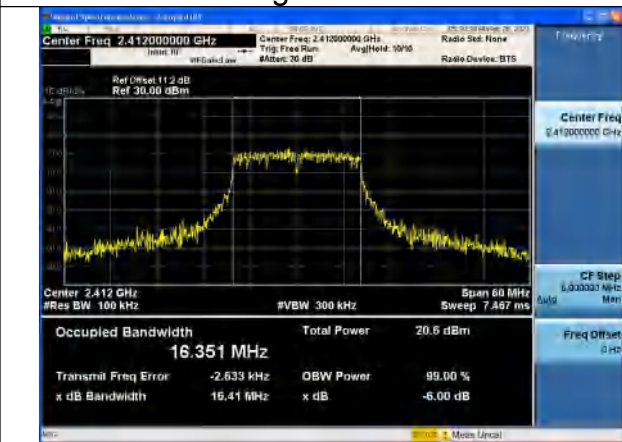
Test Mode:802.11g Chain0



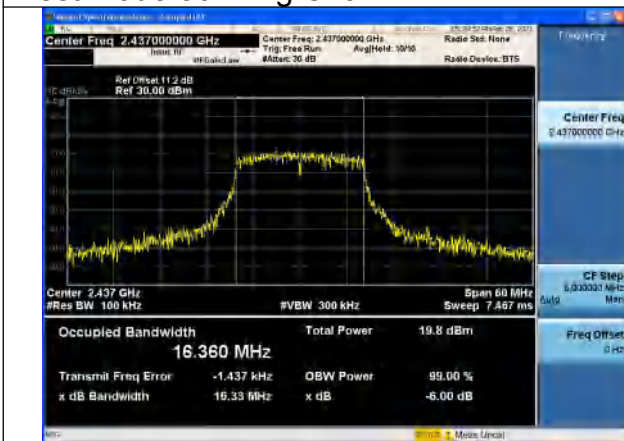
Test Mode:802.11g Chain0



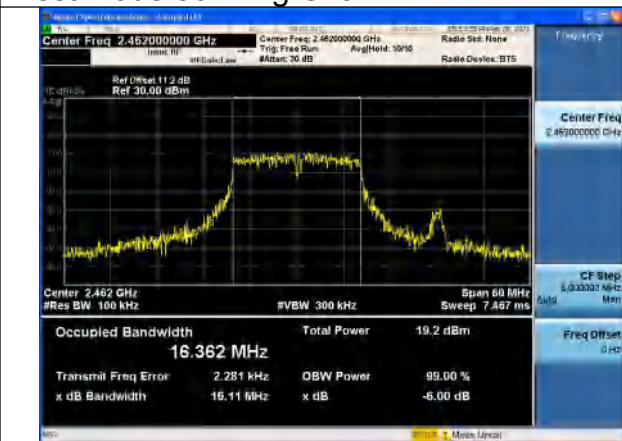
Test Mode:802.11g Chain1



Test Mode:802.11g Chain1



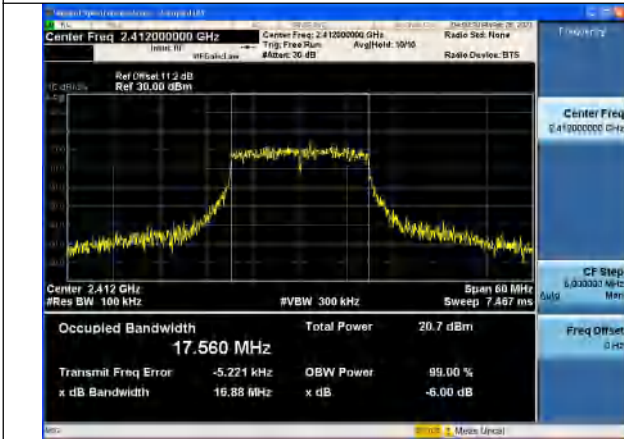
Test Mode:802.11g Chain1



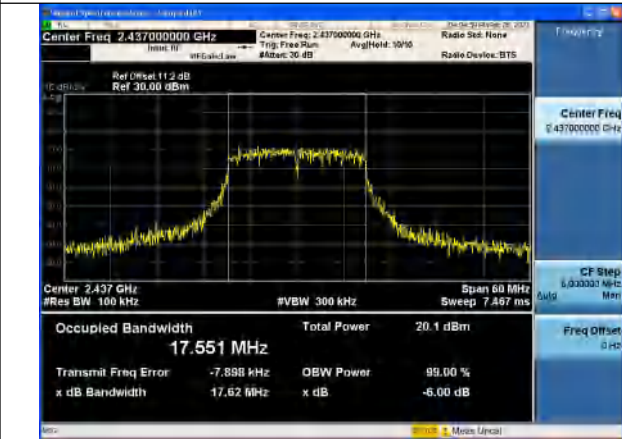
Test Mode:802. 11n HT20

Carrier frequency (MHz)	Channel No.	Chain	6 dB bandwidth (MHz)
2412MHz	1	Chain0	16.88
		Chain1	16.99
2437MHz	6	Chain0	17.62
		Chain1	17.57
2462MHz	11	Chain0	16.54
		Chain1	17.62

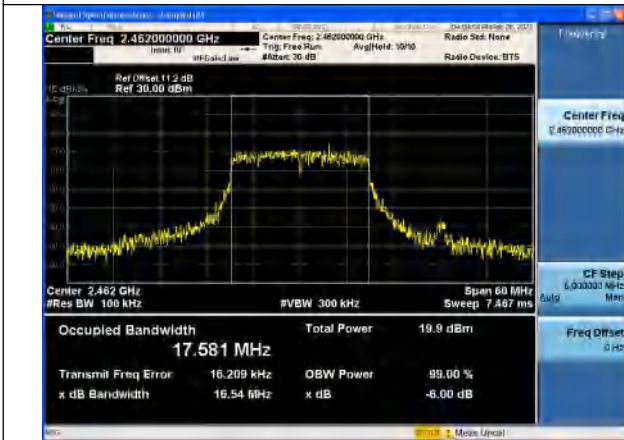
Test Mode:802. 11n HT20 Chain0



Test Mode:802. 11n HT20 Chain0



Test Mode:802. 11n HT20 Chain0



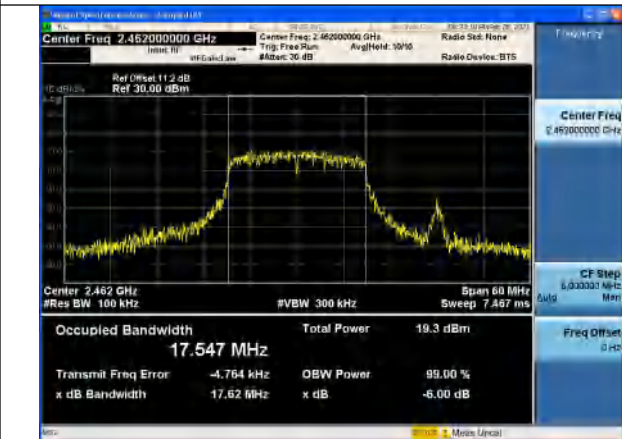
Test Mode:802. 11n HT20 Chain1



Test Mode:802. 11n HT20 Chain1



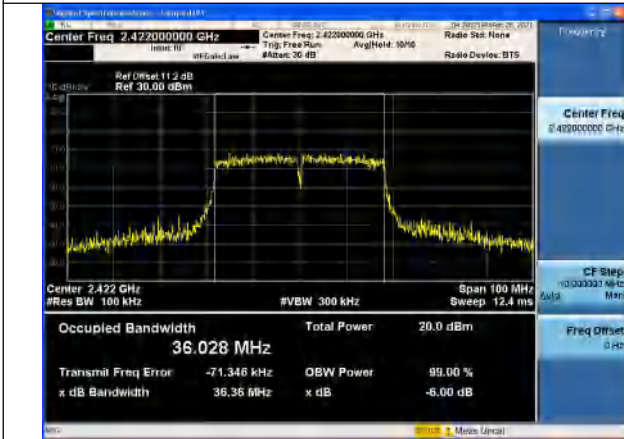
Test Mode:802. 11n HT20 Chain1



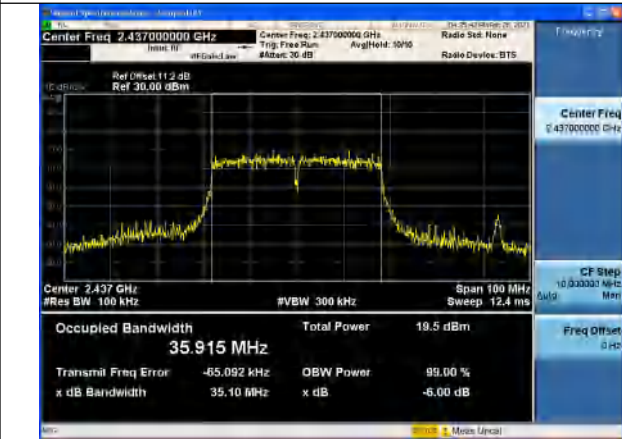
Test Mode:802. 11n HT40

Carrier frequency (MHz)	Channel No.	Chain	6 dB bandwidth (MHz)
2422MHz	3	Chain0	36.36
		Chain1	31.33
2437MHz	6	Chain0	35.10
		Chain1	34.85
2452MHz	9	Chain0	26.43
		Chain1	35.13

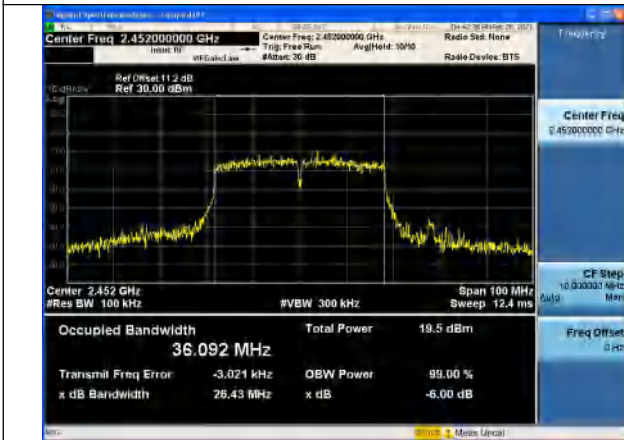
Test Mode:802. 11n HT40 Chain0



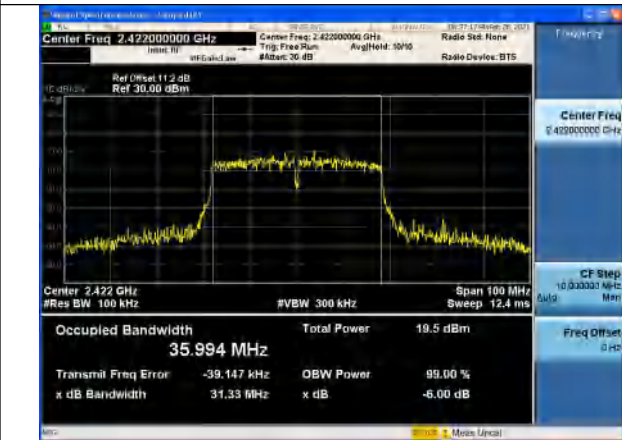
Test Mode:802. 11n HT40 Chain0



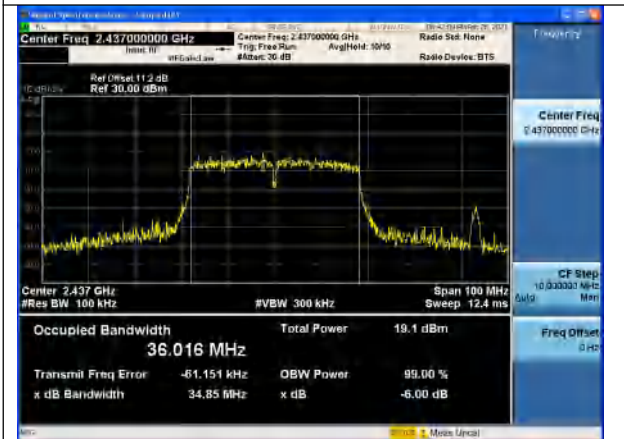
Test Mode:802. 11n HT40 Chain0



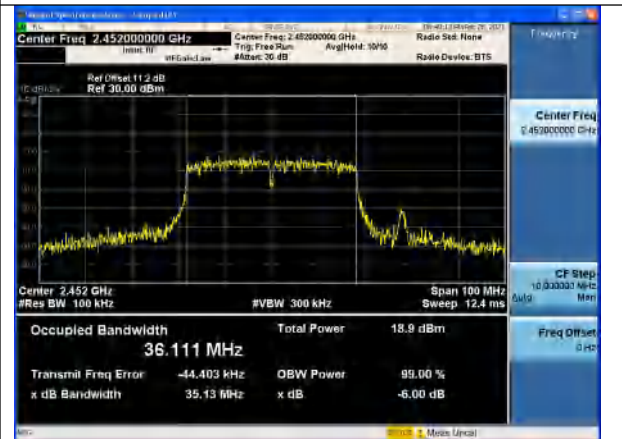
Test Mode:802. 11n HT40 Chain1



Test Mode:802. 11n HT40 Chain1



Test Mode:802. 11n HT40 Chain1



Transmitter Power Spectral Density

Offset 11.2dB =Attenuator 10dB+ Temporary antenna connector loss 0.2dB+ Cable loss 1dB

Test Mode:802.11b

Carrier frequency (MHz)	Channel No.	Chain	Power Density (dBm)
2412MHz	1	Chain0	-5.261
		Chain1	-5.187
2437MHz	6	Chain0	-5.961
		Chain1	-6.487
2462MHz	11	Chain0	-4.912
		Chain1	-6.805

Test Mode:802.11b Chain0



Test Mode:802.11b Chain0



Test Mode:802.11b Chain0

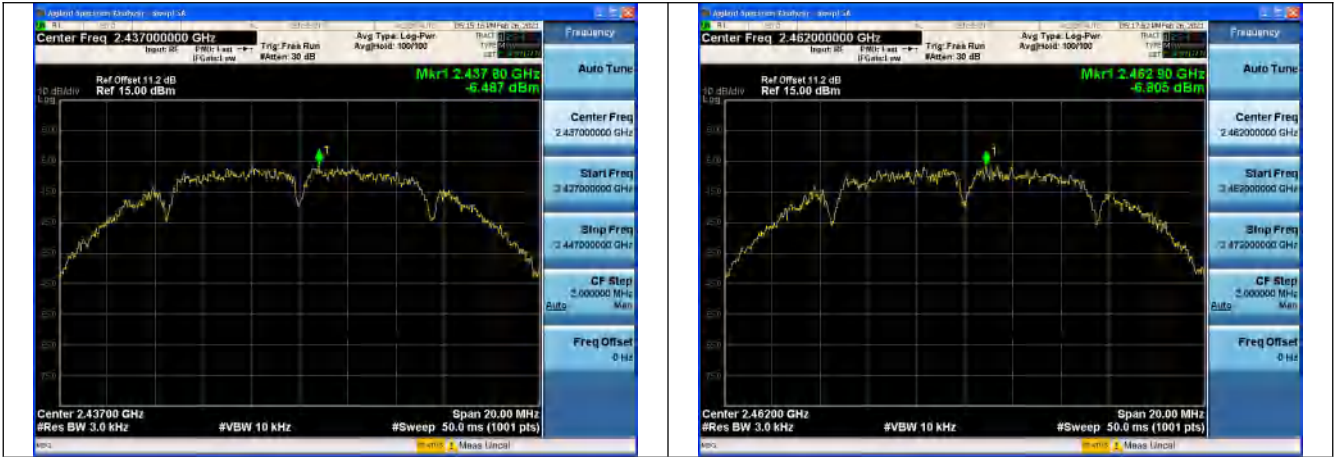


Test Mode:802.11b Chain1



Test Mode:802.11b Chain1

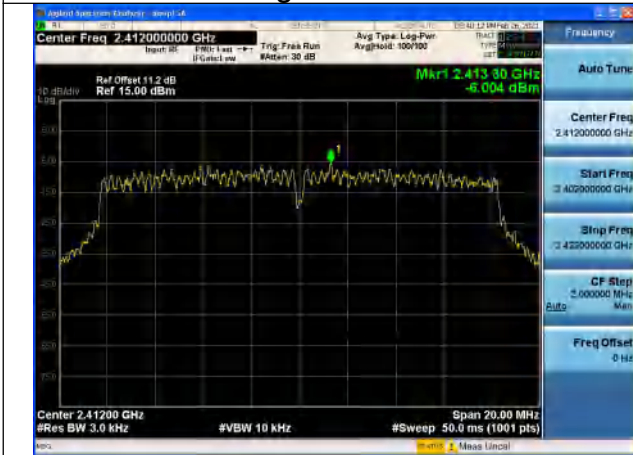
Test Mode:802.11b Chain1



Test Mode:802.11g

Carrier frequency (MHz)	Channel No.	Chain	Power Density (dBm)
2412MHz	1	Chain0	-6.004
		Chain1	-6.736
2437MHz	6	Chain0	-6.388
		Chain1	-7.266
2462MHz	11	Chain0	-6.723
		Chain1	-6.827

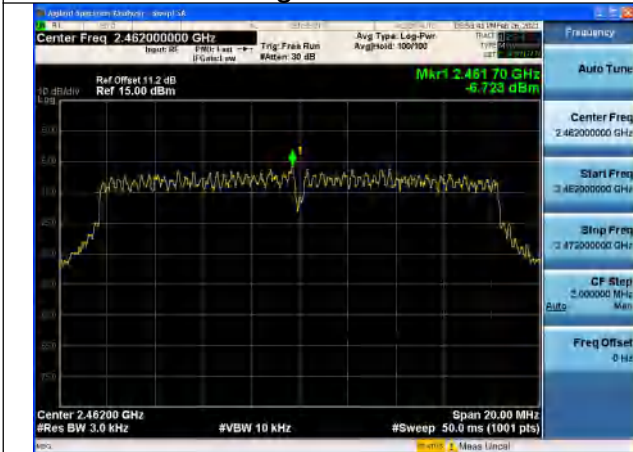
Test Mode:802.11g Chain0



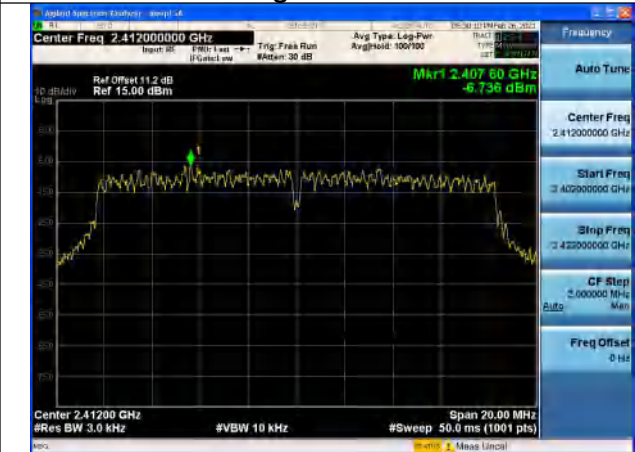
Test Mode:802.11g Chain0



Test Mode:802.11g Chain0



Test Mode:802.11g Chain1



Test Mode:802.11g Chain1



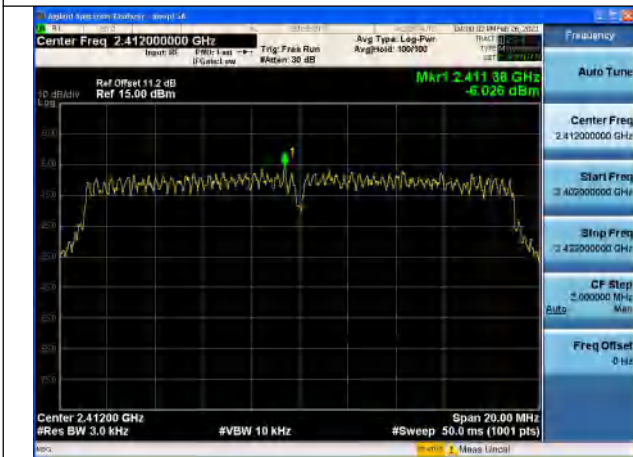
Test Mode:802.11g Chain1



Test Mode:802. 11n HT20

Carrier frequency (MHz)	Channel No.	Chain	Power Density (dBm)
2412MHz	1	Chain0	-6.026
		Chain1	-6.833
		MIMO	-3.400
2437MHz	6	Chain0	-6.405
		Chain1	-7.232
		MIMO	-3.789
2462MHz	11	Chain0	-6.606
		Chain1	-7.387
		MIMO	-3.969

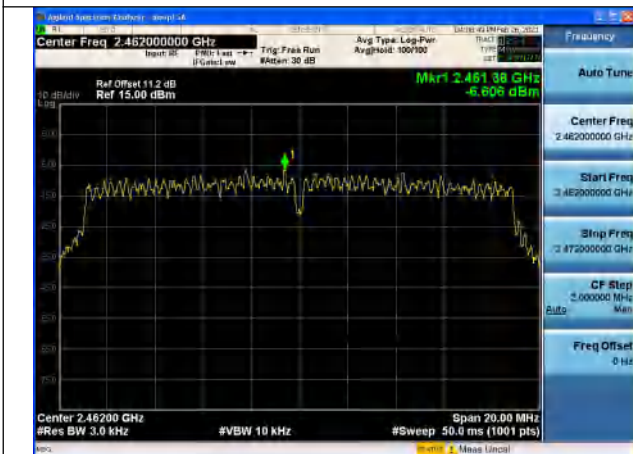
Test Mode:802. 11n HT20 Chain0



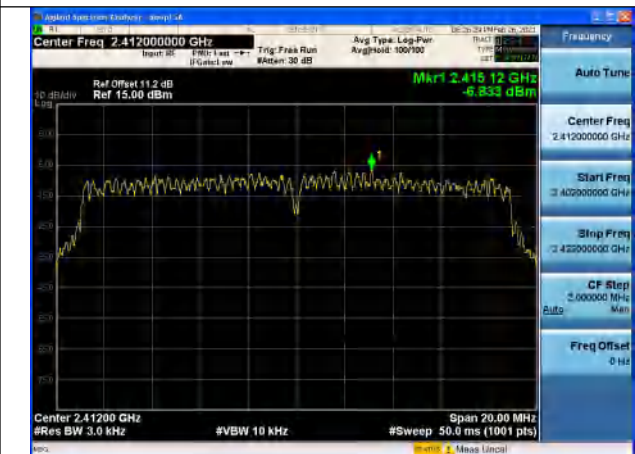
Test Mode:802. 11n HT20 Chain0



Test Mode:802. 11n HT20 Chain0



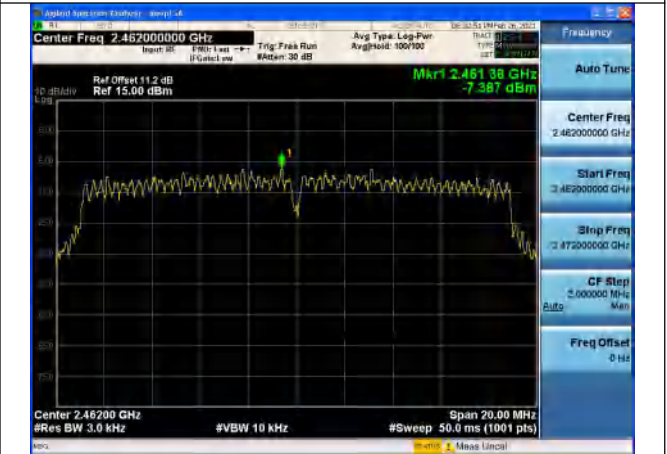
Test Mode:802. 11n HT20 Chain1



Test Mode:802. 11n HT20 Chain1



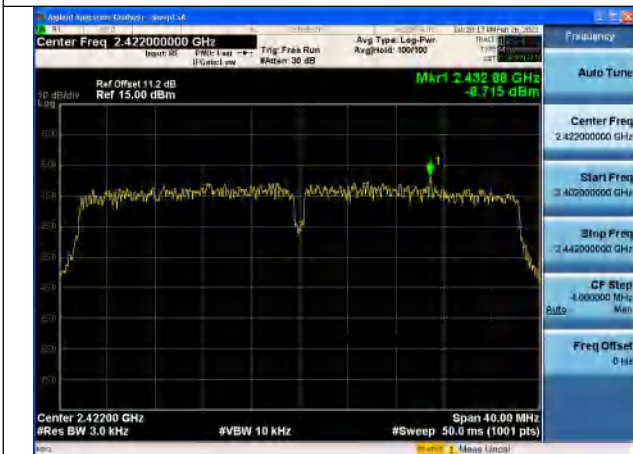
Test Mode:802. 11n HT20 Chain1



Test Mode:802. 11n HT40

Carrier frequency (MHz)	Channel No.	Chain	Power Density (dBm)
2422MHz	3	Chain0	-8.715
		Chain1	-10.613
		MIMO	-6.55
2437MHz	6	Chain0	-9.888
		Chain1	-10.985
		MIMO	-7.39
2452MHz	9	Chain0	-9.896
		Chain1	-11.438
		MIMO	-7.59

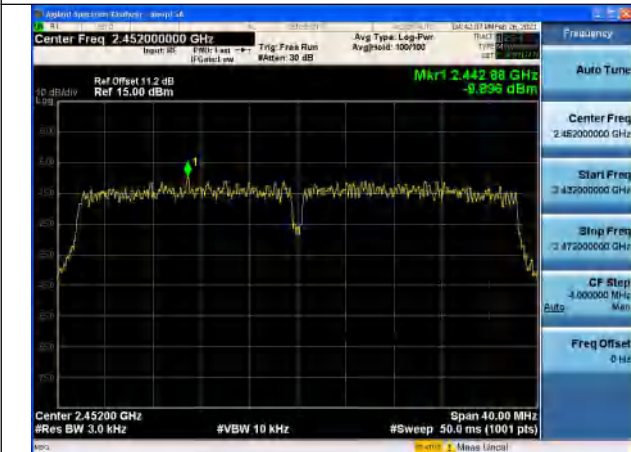
Test Mode:802. 11n HT40 Chain0



Test Mode:802. 11n HT40 Chain0



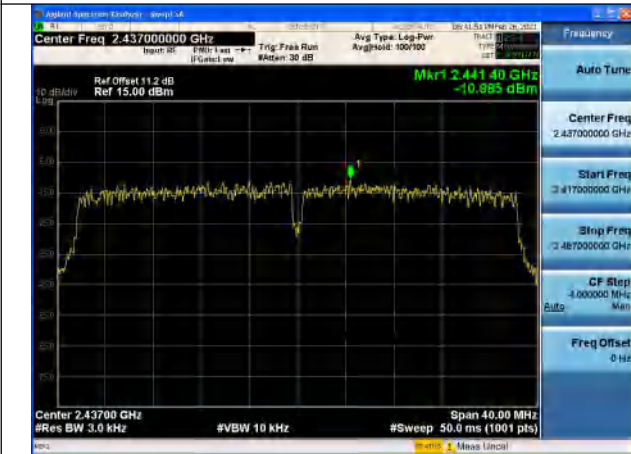
Test Mode:802. 11n HT40 Chain0



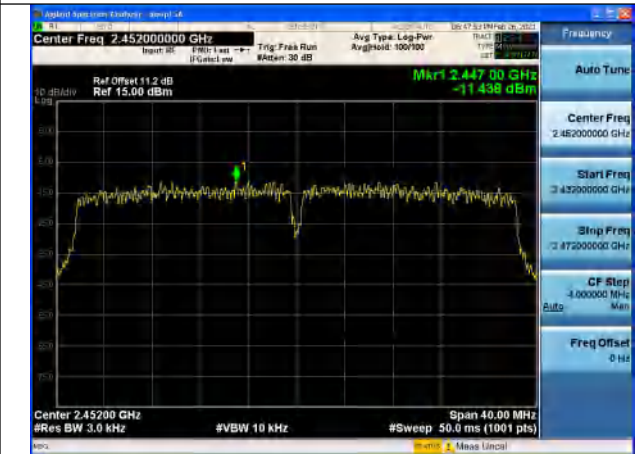
Test Mode:802. 11n HT40 Chain1



Test Mode:802. 11n HT40 Chain1



Test Mode:802. 11n HT40 Chain1

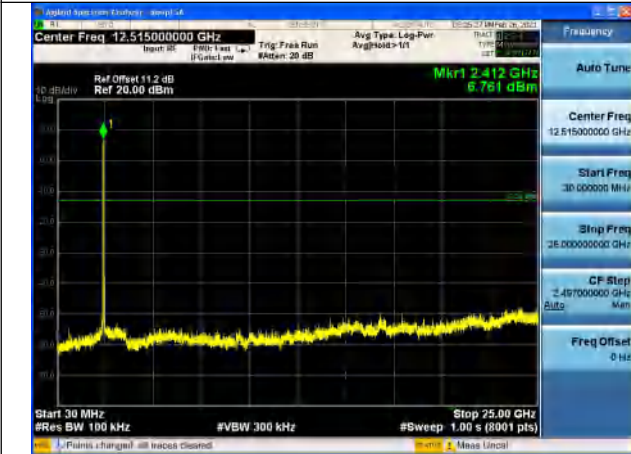


Conducted Out of band emission measurement

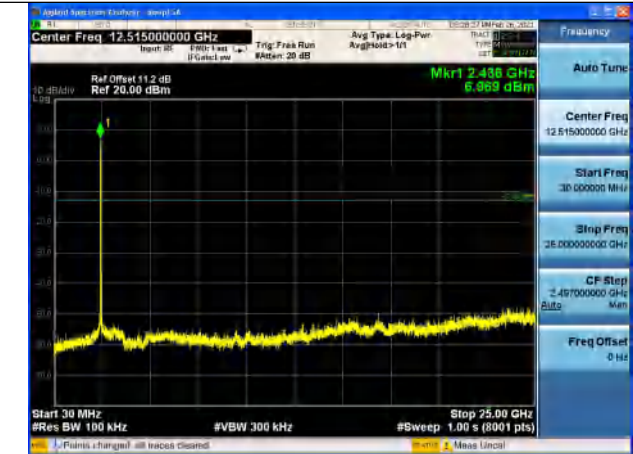
Offset 11.2dB =Attenuator 10dB+ Temporary antenna connector loss 0.2dB+ Cable loss 1.0dB

Test Mode:802.11b

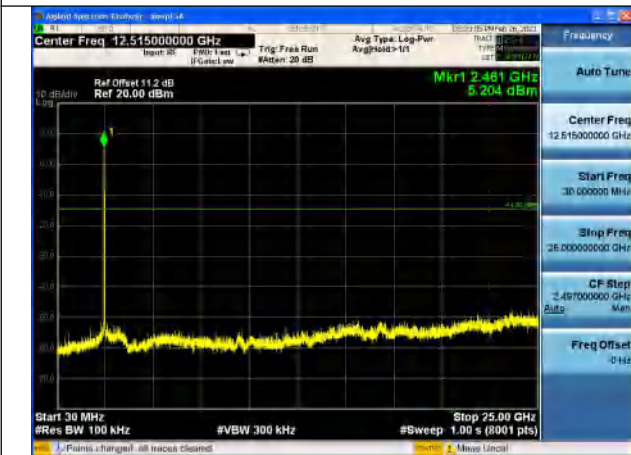
Test Mode:802.11b Chain0 CH1



Test Mode:802.11b Chain0 CH6



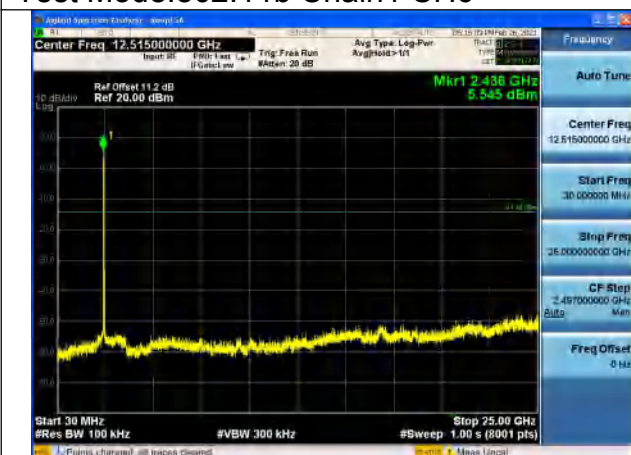
Test Mode:802.11b Chain0 CH11



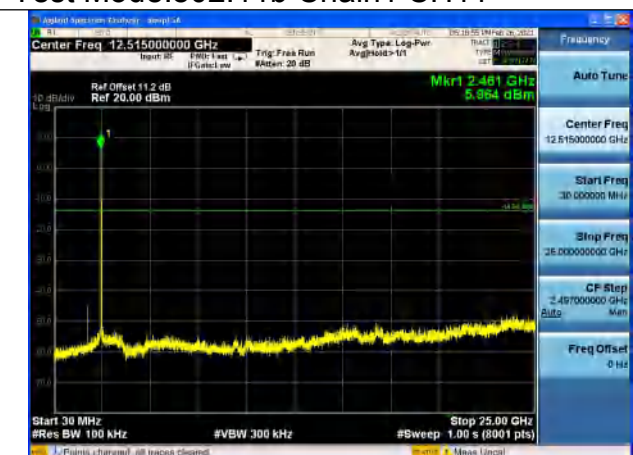
Test Mode:802.11b Chain1 CH1



Test Mode:802.11b Chain1 CH6

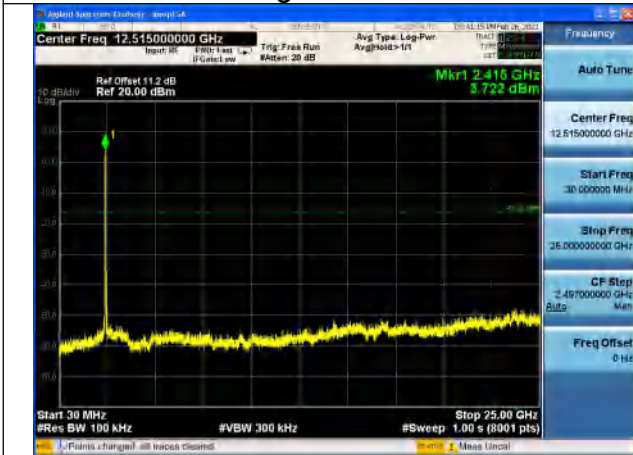


Test Mode:802.11b Chain1 CH11

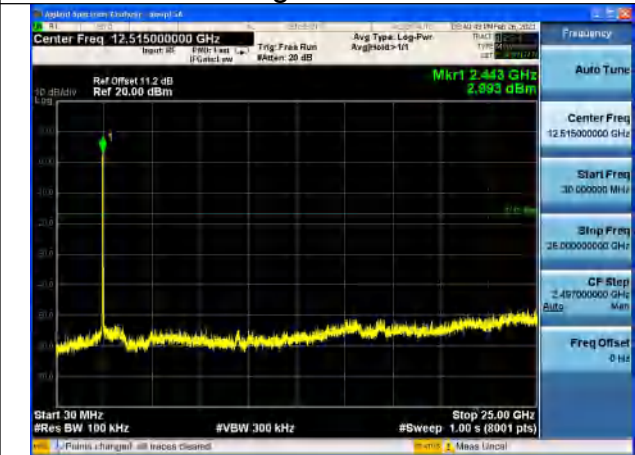


Test Mode:802.11g

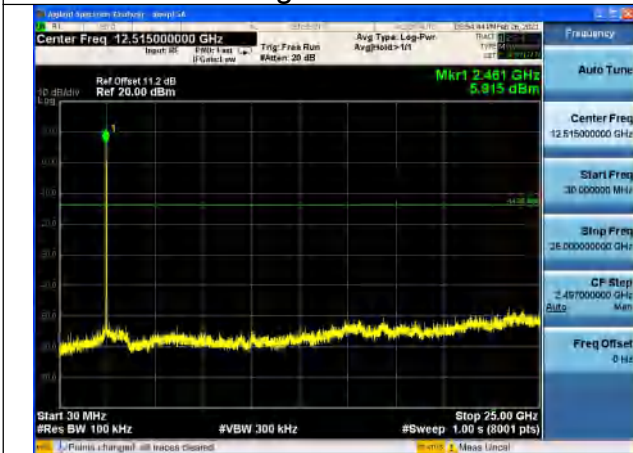
Test Mode:802.11g Chain0 CH1



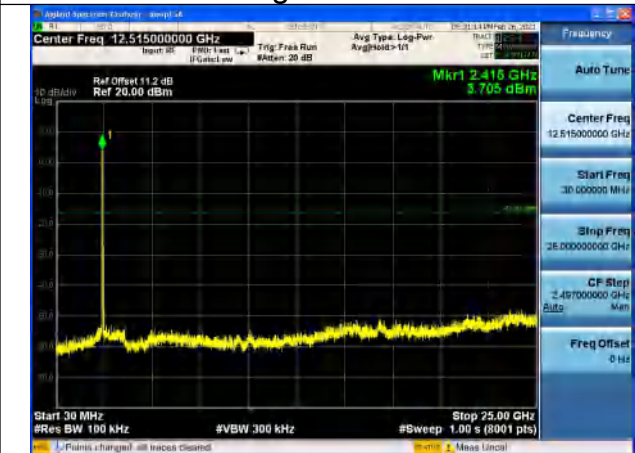
Test Mode:802.11g Chain0 CH6



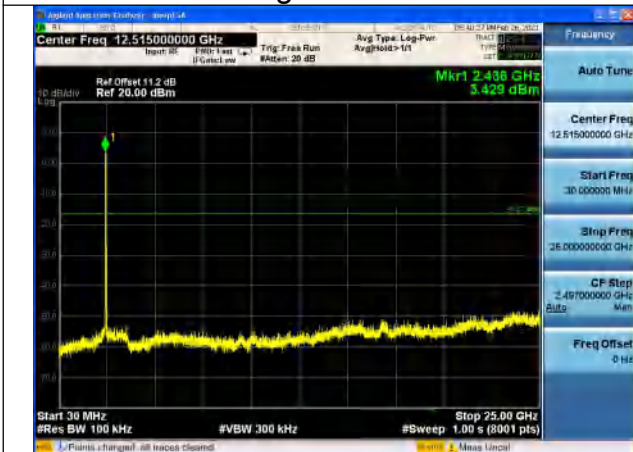
Test Mode:802.11g Chain0 CH11



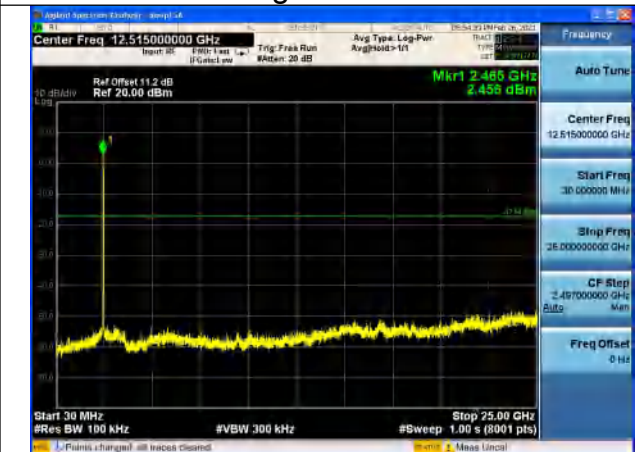
Test Mode:802.11g Chain1 CH1



Test Mode:802.11g Chain1 CH6



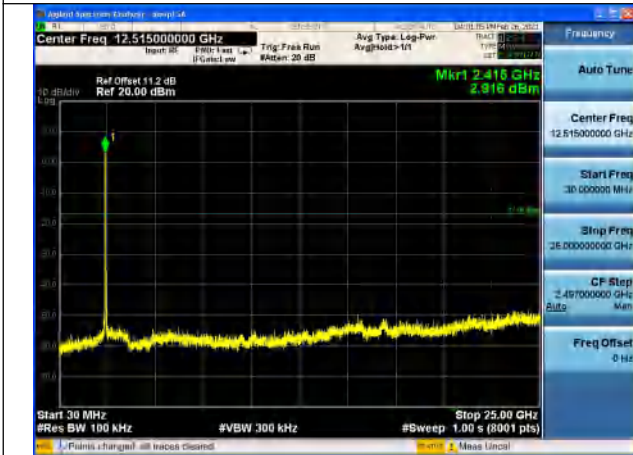
Test Mode:802.11g Chain1 CH11



Test Mode:802. 11n HT20

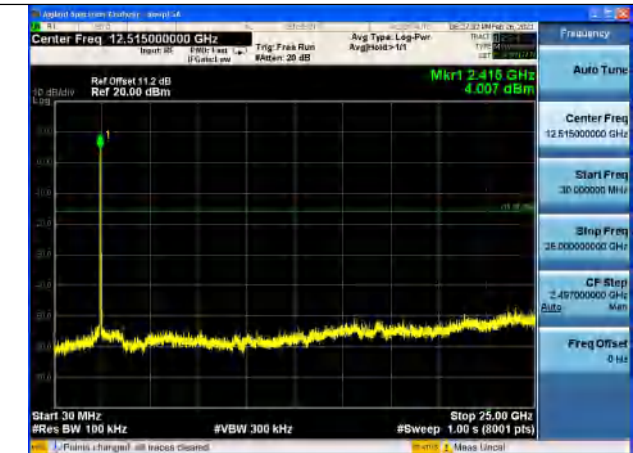
Test Mode:802. 11n HT20 Chain0 CH1

Test Mode:802. 11n HT20 Chain0 CH6



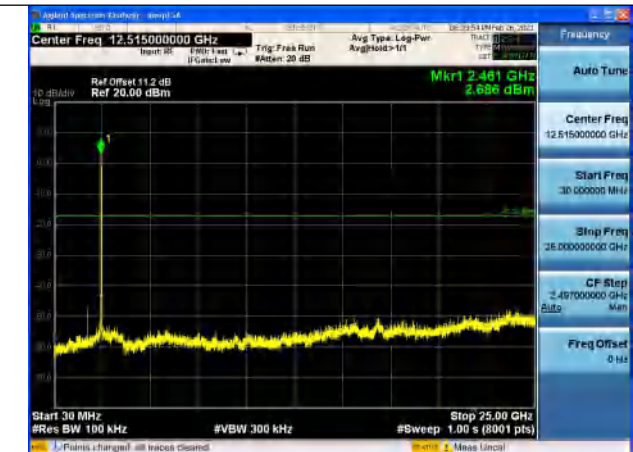
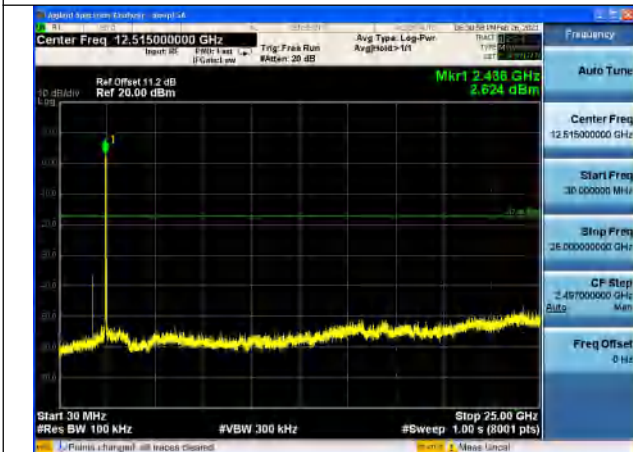
Test Mode:802. 11n HT20 Chain0 CH11

Test Mode:802. 11n HT20 Chain1 CH1



Test Mode:802. 11n HT20 Chain1 CH6

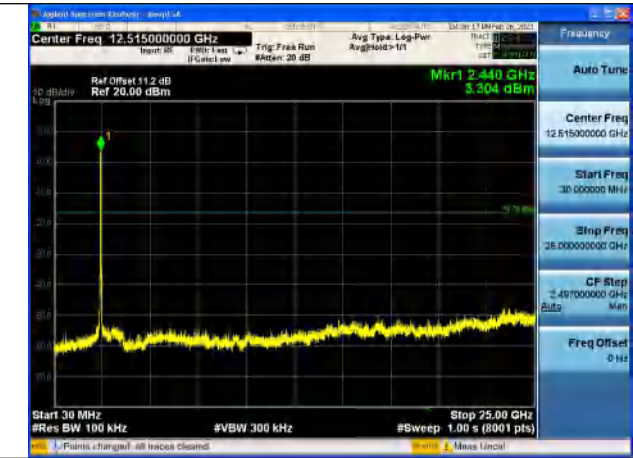
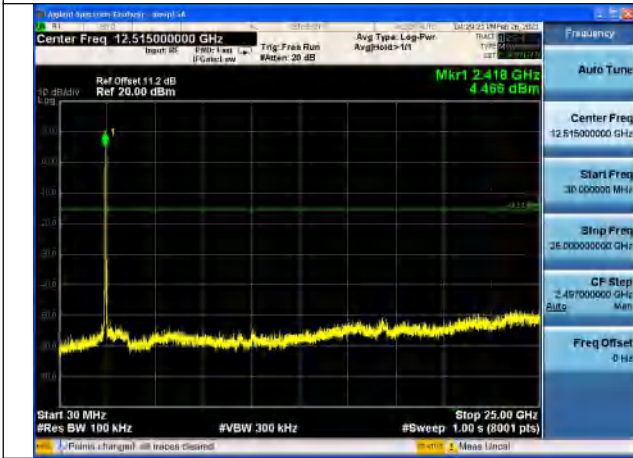
Test Mode:802. 11n HT20 Chain1 CH11



Test Mode:802. 11n HT40

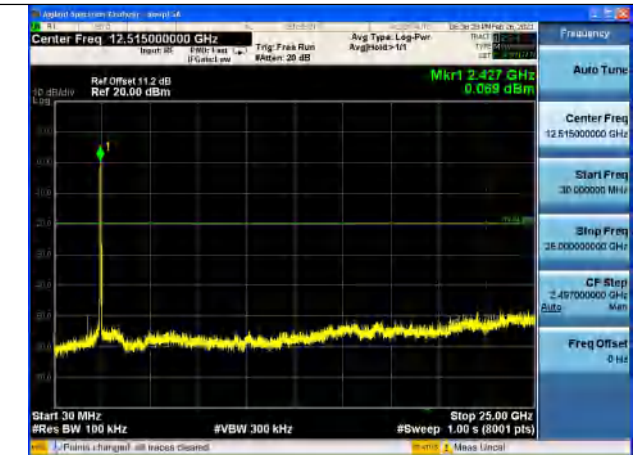
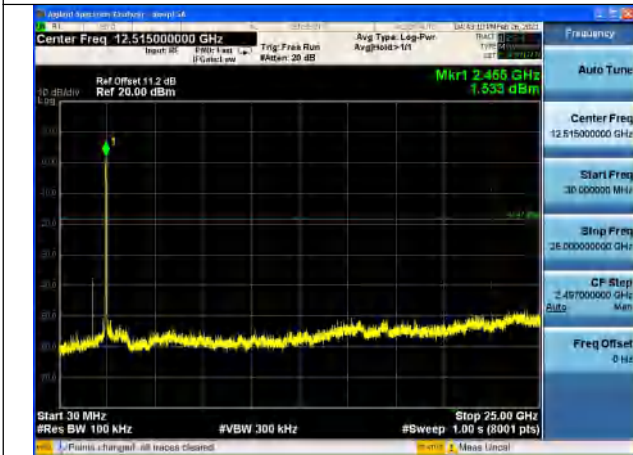
Test Mode:802. 11n HT40 Chain0 CH3

Test Mode:802. 11n HT40 Chain0 CH6



Test Mode:802. 11n HT40 Chain0 CH9

Test Mode:802. 11n HT40 Chain1 CH3



Test Mode:802. 11n HT40 Chain1 CH6

Test Mode:802. 11n HT40 Chain1 CH9



Band edge measurement (RF Conducted measurement)

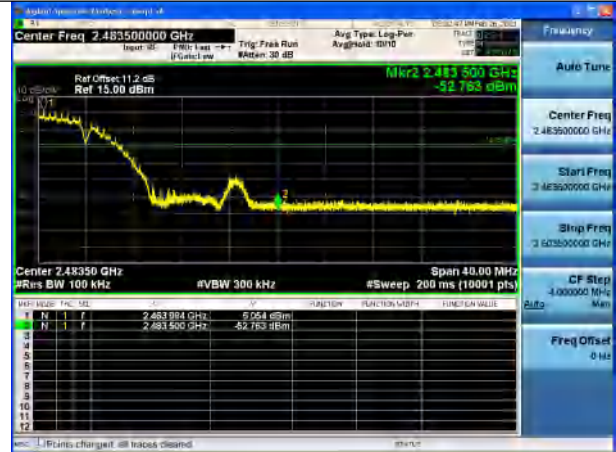
Offset 11.2dB = Attenuator 10dB+ Temporary antenna connector loss 0.2dB+ Cable loss 1.0dB

Test Mode:802.11b

Test Mode:802.11b Chain0 CH1



Test Mode:802.11b Chain0 CH11



Test Mode:802.11b Chain1 CH1



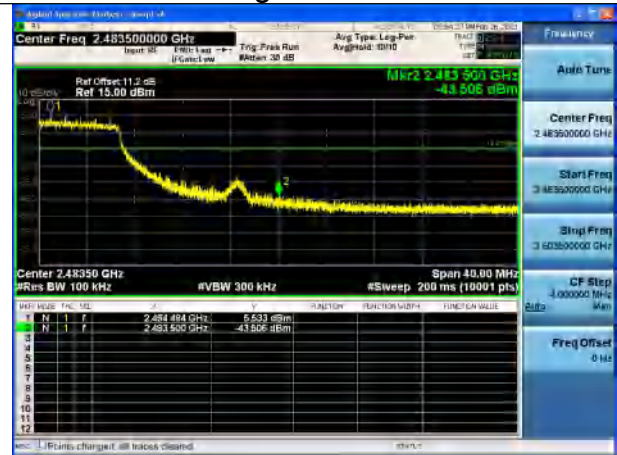
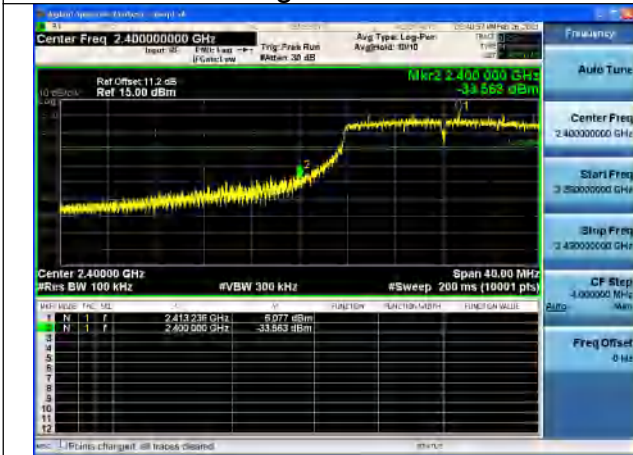
Test Mode:802.11b Chain1 CH11



Test Mode:802.11g

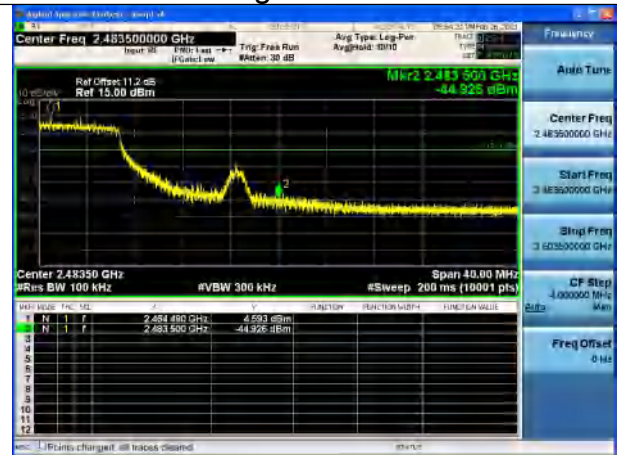
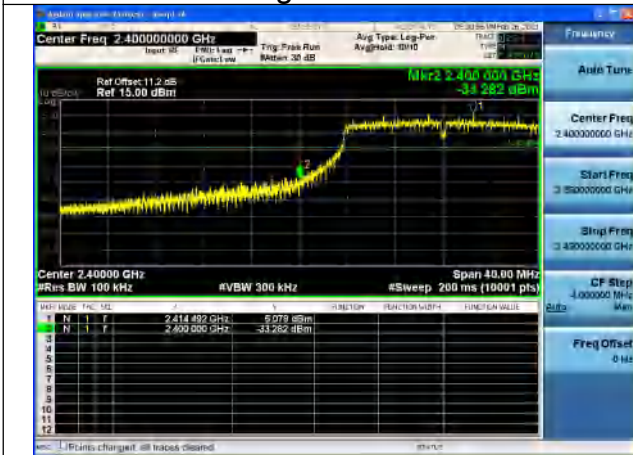
Test Mode:802.11g Chain0 CH1

Test Mode:802.11g Chain0 CH11



Test Mode:802.11g Chain1 CH1

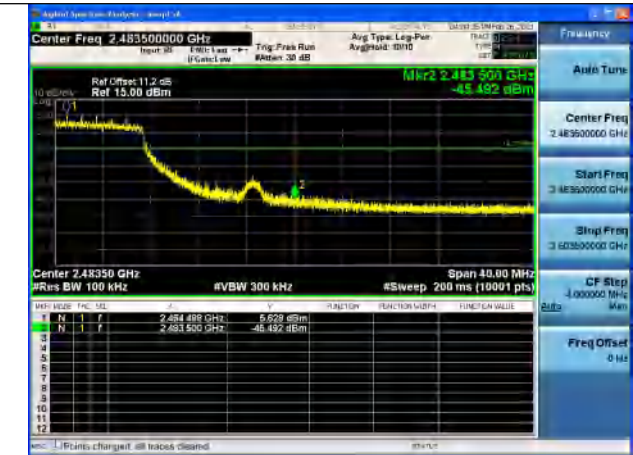
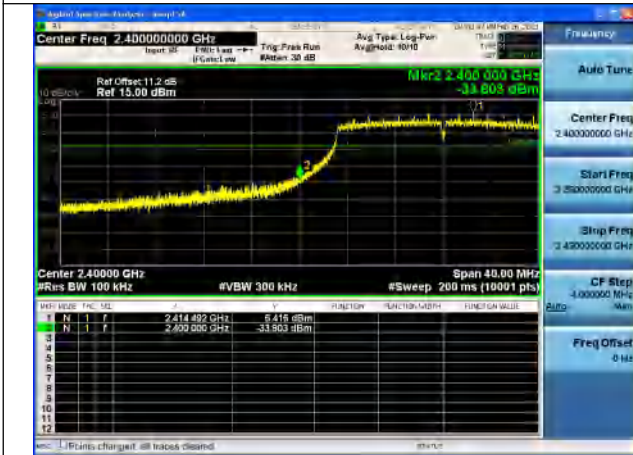
Test Mode:802.11g Chain1 CH11



Test Mode:802. 11n HT20

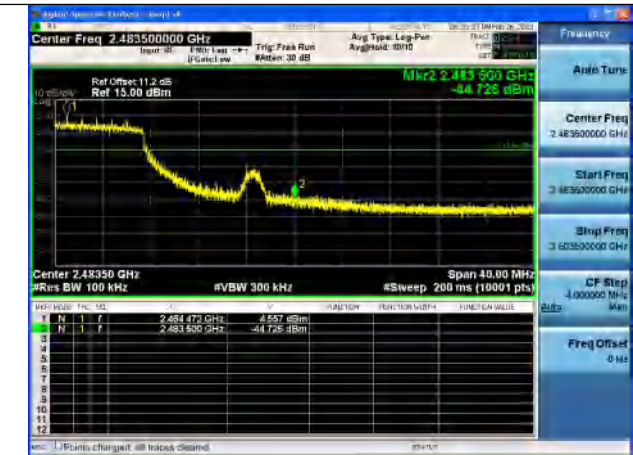
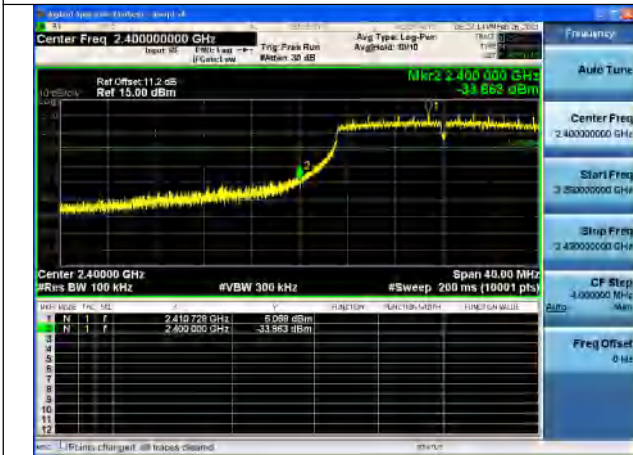
Test Mode:802. 11n HT20 Chain0 CH1

Test Mode:802. 11n HT20 Chain0 CH11



Test Mode:802. 11n HT20 Chain1 CH1

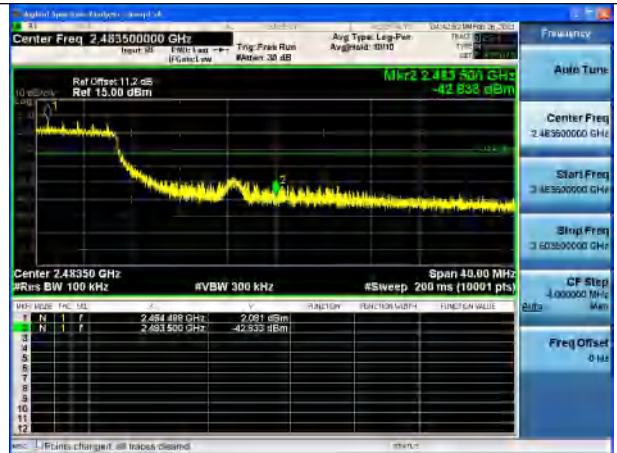
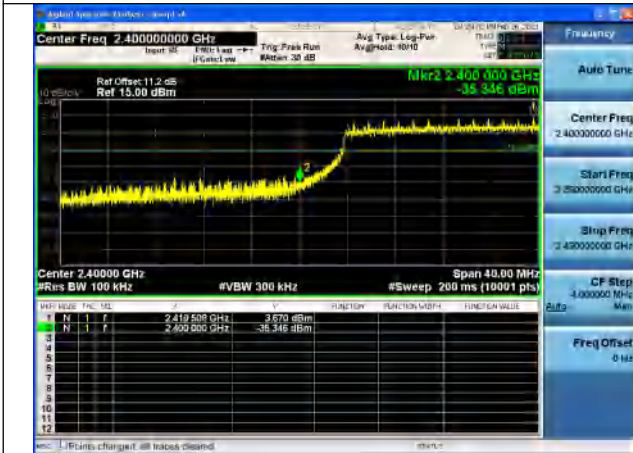
Test Mode:802. 11n HT20 Chain1 CH11



Test Mode:802. 11n HT40

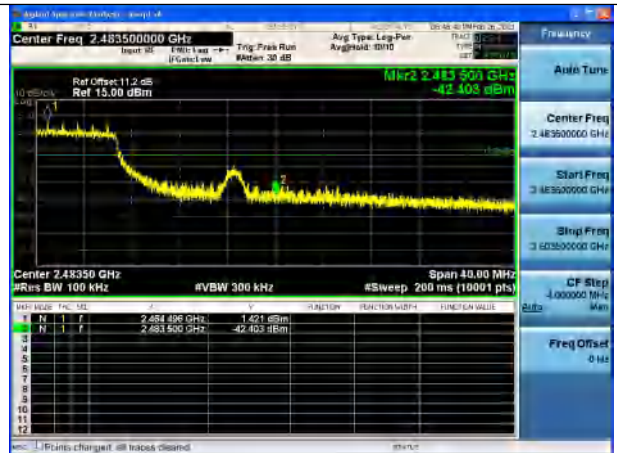
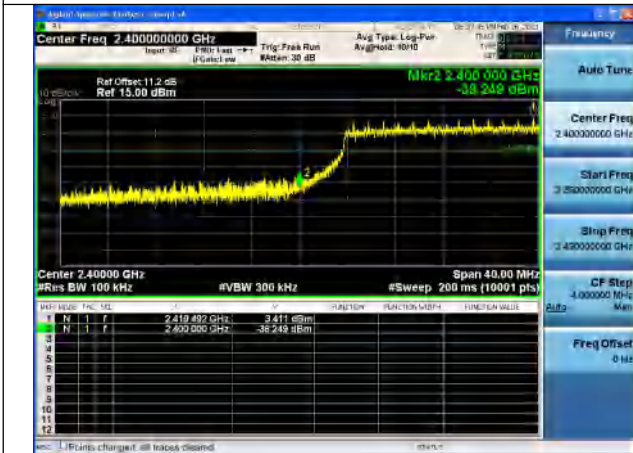
Test Mode:802. 11n HT40 Chain0 CH3

Test Mode:802. 11n HT40 Chain0 CH9



Test Mode:802. 11n HT40 Chain1 CH3

Test Mode:802. 11n HT40 Chain1 CH9





APPENDIX B – TEST DATA OF RADIATED EMISSION

Radiated Emission Band Edge

The measurement results are obtained as described below:

Measure Level = Reading Level + cable loss + antenna factor

Sample calculation: (86.09 dBuV/m) = (52.09 dBμV) + (8.90 dB) + (25.10 dB), the corresponding frequency is 2412MHz.

The measurement results contain the correction factor of the duty cycle.

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11b

Polarity:Vertical

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	88.81	54.81	N/A	N/A	8.90	25.10
2	2390	28.32	-5.68	-45.68	74.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11b

Polarity:Horizontal

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	86.21	52.21	N/A	N/A	8.90	25.10
2	2390	29.01	-4.99	-44.99	74.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11b

Polarity:Vertical

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	83.34	49.34	N/A	N/A	8.90	25.10
2	2390	23.53	-10.47	-30.47	54.00	8.90	25.10



Carrier frequency (MHz): 2412
Channel No.:1
Test Mode: 802.11b
Polarity:Horizontal
Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	80.47	46.47	N/A	N/A	8.90	25.10
2	2390	23.47	-10.53	-30.53	54.00	8.90	25.10

Carrier frequency (MHz): 2462
Channel No.:11
Test Mode: 802.11b
Polarity:Vertical
Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	88.59	54.59	N/A	N/A	8.90	25.10
2	2483.5	27.64	-6.36	-46.36	74.00	8.90	25.10

Carrier frequency (MHz): 2462
Channel No.:11
Test Mode: 802.11b
Polarity:Horizontal
Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	85.78	51.78	N/A	N/A	8.90	25.10
2	2483.5	27.11	-6.89	-46.89	74.00	8.90	25.10

Carrier frequency (MHz): 2462
Channel No.:11
Test Mode: 802.11b
Polarity:Vertical
Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	83.75	49.75	N/A	N/A	8.90	25.10
2	2483.5	23.34	-10.66	-30.66	54.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11b

Polarity:Horizontal

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	81.04	47.04	N/A	N/A	8.90	25.10
2	2483.5	22.92	-11.08	-31.08	54.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11g

Polarity: Vertical

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	89.07	55.07	N/A	N/A	8.90	25.10
2	2390	27.86	-6.14	-46.14	74.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11g

Polarity:Horizontal

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	86.44	52.44	N/A	N/A	8.90	25.10
2	2390	27.31	-6.69	-46.69	74.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11g

Polarity: Vertical

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	84.22	50.22	N/A	N/A	8.90	25.10
2	2390	22.92	-11.08	-31.08	54.00	8.90	25.10

Carrier frequency (MHz): 2412
Channel No.:1
Test Mode: 802.11g
Polarity:Horizontal
Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	81.53	47.53	N/A	N/A	8.90	25.10
2	2390	23.60	-10.40	-30.40	54.00	8.90	25.10

Carrier frequency (MHz): 2462
Channel No.:11
Test Mode: 802.11g
Polarity: Vertical
Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	88.11	54.11	N/A	N/A	8.90	25.10
2	2483.5	28.26	-5.74	-45.74	74.00	8.90	25.10

Carrier frequency (MHz): 2462
Channel No.:11
Test Mode: 802.11g
Polarity:Horizontal
Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	85.55	51.55	N/A	N/A	8.90	25.10
2	2483.5	29.20	-4.80	-44.80	74.00	8.90	25.10

Carrier frequency (MHz): 2462
Channel No.:11
Test Mode: 802.11g
Polarity: Vertical
Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	83.21	49.21	N/A	N/A	8.90	25.10
2	2483.5	23.14	-10.86	-30.86	54.00	8.90	25.10



Carrier frequency (MHz): 2462
Channel No.:11
Test Mode: 802.11g
Polarity:Horizontal
Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuv/m)	cable loss (dB)	antenna factor (dB)
1	2462	80.96	46.96	N/A	N/A	8.90	25.10
2	2483.5	22.15	-11.85	-31.85	54.00	8.90	25.10

Carrier frequency (MHz): 2412
Channel No.:1
Test Mode: 802.11n(HT20)
Polarity: Vertical
Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuv/m)	cable loss (dB)	antenna factor (dB)
1	2412	89.98	55.98	N/A	N/A	8.90	25.10
2	2390	28.14	-5.86	-45.86	74.00	8.90	25.10

Carrier frequency (MHz): 2412
Channel No.:1
Test Mode: 802.11n(HT20)
Polarity:Horizontal
Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuv/m)	cable loss (dB)	antenna factor (dB)
1	2412	87.87	53.87	N/A	N/A	8.90	25.10
2	2390	27.45	-6.55	-46.55	74.00	8.90	25.10

Carrier frequency (MHz): 2412
Channel No.:1
Test Mode: 802.11n(HT20)
Polarity: Vertical
Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuv/m)	cable loss (dB)	antenna factor (dB)
1	2412	83.06	49.06	N/A	N/A	8.90	25.10
2	2390	22.97	-11.03	-31.03	54.00	8.90	25.10



Carrier frequency (MHz): 2412
Channel No.:1
Test Mode: 802.11n(HT20)
Polarity:Horizontal
Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuv/m)	cable loss (dB)	antenna factor (dB)
1	2412	80.54	46.54	N/A	N/A	8.90	25.10
2	2390	23.53	-10.47	-30.47	54.00	8.90	25.10

Carrier frequency (MHz): 2462
Channel No.:11
Test Mode: 802.11n(HT20)
Polarity: Vertical
Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuv/m)	cable loss (dB)	antenna factor (dB)
1	2462	88.98	54.98	N/A	N/A	8.90	25.10
2	2483.5	27.30	-6.70	-46.70	74.00	8.90	25.10

Carrier frequency (MHz): 2462
Channel No.:11
Test Mode: 802.11n(HT20)
Polarity:Horizontal
Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuv/m)	cable loss (dB)	antenna factor (dB)
1	2462	86.62	52.62	N/A	N/A	8.90	25.10
2	2483.5	26.70	-7.30	-47.30	74.00	8.90	25.10

Carrier frequency (MHz): 2462
Channel No.:11
Test Mode: 802.11n(HT20)
Polarity: Vertical
Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuv/m)	cable loss (dB)	antenna factor (dB)
1	2462	83.04	49.04	N/A	N/A	8.90	25.10
2	2483.5	23.73	-10.27	-30.27	54.00	8.90	25.10



Carrier frequency (MHz): 2462
 Channel No.:11
 Test Mode: 802.11n(HT20)
 Polarity:Horizontal
 Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuv/m)	cable loss (dB)	antenna factor (dB)
1	2462	80.65	46.65	N/A	N/A	8.90	25.10
2	2483.5	24.66	-9.34	-29.34	54.00	8.90	25.10

Carrier frequency (MHz): 2422
 Channel No.:3
 Test Mode: 802.11n(HT40)
 Polarity: Vertical
 Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuv/m)	cable loss (dB)	antenna factor (dB)
1	2412	88.52	54.52	N/A	N/A	8.90	25.10
2	2390	28.56	-5.44	-45.44	74.00	8.90	25.10

Carrier frequency (MHz): 2422
 Channel No.:3
 Test Mode: 802.11n(HT40)
 Polarity:Horizontal
 Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuv/m)	cable loss (dB)	antenna factor (dB)
1	2412	86.27	52.27	N/A	N/A	8.90	25.10
2	2390	27.71	-6.29	-46.29	74.00	8.90	25.10

Carrier frequency (MHz): 2422
 Channel No.:3
 Test Mode: 802.11n(HT40)
 Polarity: Vertical
 Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuv/m)	cable loss (dB)	antenna factor (dB)
1	2412	84.23	50.23	N/A	N/A	8.90	25.10
2	2390	23.64	-10.36	-30.36	54.00	8.90	25.10

Carrier frequency (MHz): 2422
Channel No.:3
Test Mode: 802.11n(HT40)
Polarity:Horizontal
Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	82.09	48.09	N/A	N/A	8.90	25.10
2	2390	23.77	-10.23	-30.23	54.00	8.90	25.10

Carrier frequency (MHz): 2452
Channel No.:9
Test Mode: 802.11n(HT40)
Polarity: Vertical
Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	88.21	54.21	N/A	N/A	8.90	25.10
2	2483.5	28.89	-5.11	-45.11	74.00	8.90	25.10

Carrier frequency (MHz): 2452
Channel No.:9
Test Mode: 802.11n(HT40)
Polarity:Horizontal
Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	86.16	52.16	N/A	N/A	8.90	25.10
2	2483.5	27.53	-6.47	-46.47	74.00	8.90	25.10

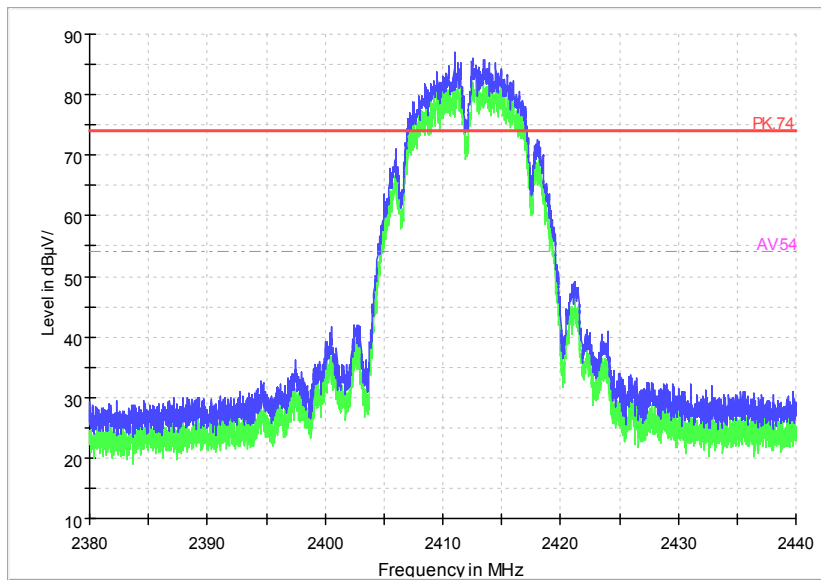
Carrier frequency (MHz): 2452
Channel No.:9
Test Mode: 802.11n(HT40)
Polarity: Vertical
Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	83.82	49.82	N/A	N/A	8.90	25.10
2	2483.5	22.09	-11.91	-31.91	54.00	8.90	25.10

Carrier frequency (MHz): 2452
 Channel No.:9
 Test Mode: 802.11n(HT40)
 Polarity:Horizontal
 Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	80.82	46.82	N/A	N/A	8.90	25.10
2	2483.5	21.40	-12.60	-32.60	54.00	8.90	25.10

Copy of 002C_FCC



Radiated Emission Band Edge for 2412MHz

Sample Calculations

Determining Spurious Emissions Levels

A “reference path loss” is established and the A_{Rpl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

The measurement results are obtained as described below:

$$\text{Result} = P_{\text{mea}} + A_{Rpl}$$

Sample calculation: $(15.26 \text{ dB}\mu\text{V/m}) = (35.86 \text{ dB}\mu\text{V}) + (-20.6 \text{ dB/m})$, the corresponding frequency is 43.677MHz.

For 802.11b Channel No.:1

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
45.414	7.24	-17.9	25.14	Vertical	40
59.228	6.47	-18.7	25.17	Vertical	40
100.6555	5.45	-19.2	24.65	Vertical	43.5
300.0195	15.38	-16.1	31.48	Vertical	46
521.85	13.48	-10.1	23.58	Vertical	46
918.044	19.29	-2.9	22.19	Vertical	46

For 802.11g Channel No.:1

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
51.326	7.44	-17.7	25.14	Vertical	40
58.0905	6.44	-18.6	25.04	Vertical	40
100.687	5.41	-19.2	24.61	Vertical	43.5
300.0195	15.32	-16.1	31.42	Vertical	46
539.9975	16.87	-9.5	26.37	Vertical	46
950.4845	19.44	-2.6	22.04	Vertical	46

For 802.11n(HT20 MIMO) Channel No.:1

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
44.941	7.41	-17.9	25.31	Vertical	40
60.449	5.19	-19	24.19	Vertical	40
100.162	5.57	-19.2	24.77	Vertical	43.5
300.0195	15.31	-16.1	31.41	Vertical	46
542.591	13.88	-9.4	23.28	Vertical	46
938.9295	19.66	-2.7	22.36	Vertical	46

For 802.11b Channel No.:6

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
45.1605	7.32	-17.9	25.22	Vertical	40
59.0425	6.52	-18.7	25.22	Vertical	40
150.009	5.7	-22.3	28	Vertical	43.5
300.0195	15.31	-16.1	31.41	Vertical	46
420.0085	15.62	-12.4	28.02	Vertical	46
945.649	19.58	-2.6	22.18	Vertical	46

For 802.11g Channel No.:6

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
50.6215	7.16	-17.6	24.76	Vertical	40
59.308	6.32	-18.7	25.02	Vertical	40
99.957	5.57	-19.2	24.77	Vertical	43.5
300.0195	15.34	-16.1	31.44	Vertical	46
549.7035	13.84	-9.3	23.14	Vertical	46
928.52	19.36	-2.8	22.16	Vertical	46

For 802.11n(HT20 MIMO) Channel No.:6

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
51.6485	7.35	-17.7	25.05	Vertical	40
58.099	6.37	-18.6	24.97	Vertical	40
99.752	5.45	-19.2	24.65	Vertical	43.5
300.0195	15.31	-16.1	31.41	Vertical	46
539.9975	16.89	-9.5	26.39	Vertical	46
890.153	18.47	-3.4	21.87	Vertical	46

For 802.11b Channel No.:11

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
46.467	6.53	-17.8	24.33	Vertical	40
57.6365	6.15	-18.5	24.65	Vertical	40
100.0995	5.45	-19.2	24.65	Vertical	43.5
299.9995	15.5	-16.1	31.6	Vertical	46
543.518	13.86	-9.4	23.26	Vertical	46
957.8305	19.38	-2.5	21.88	Vertical	46

For 802.11g Channel No.:11

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
44.8725	7.33	-17.9	25.23	Vertical	40
58.2755	6.45	-18.6	25.05	Vertical	40
108.547	3.97	-20.1	24.07	Vertical	43.5
299.9995	15.54	-16.1	31.64	Vertical	46
529.978	13.78	-9.8	23.58	Vertical	46
938.776	19.64	-2.7	22.34	Vertical	46

For 802.11n(HT20 MIMO) Channel No.:11

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
52.578	7.07	-17.9	24.97	Vertical	40
57.571	6.13	-18.5	24.63	Vertical	40
106.6045	4.67	-19.9	24.57	Vertical	43.5
299.991	15.3	-16.1	31.4	Vertical	46
540.0175	17.04	-9.5	26.54	Vertical	46
841.8585	17.52	-4.2	21.72	Vertical	46

For 802.11n(HT40 MIMO) Channel No.:3

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
51.705	7.42	-17.7	25.12	Vertical	40
59.5935	6.12	-18.8	24.92	Vertical	40
100.1395	5.44	-19.2	24.64	Vertical	43.5
299.991	15.32	-16.1	31.42	Vertical	46
546.1855	13.44	-9.4	22.84	Vertical	46
924.557	19.29	-2.8	22.09	Vertical	46

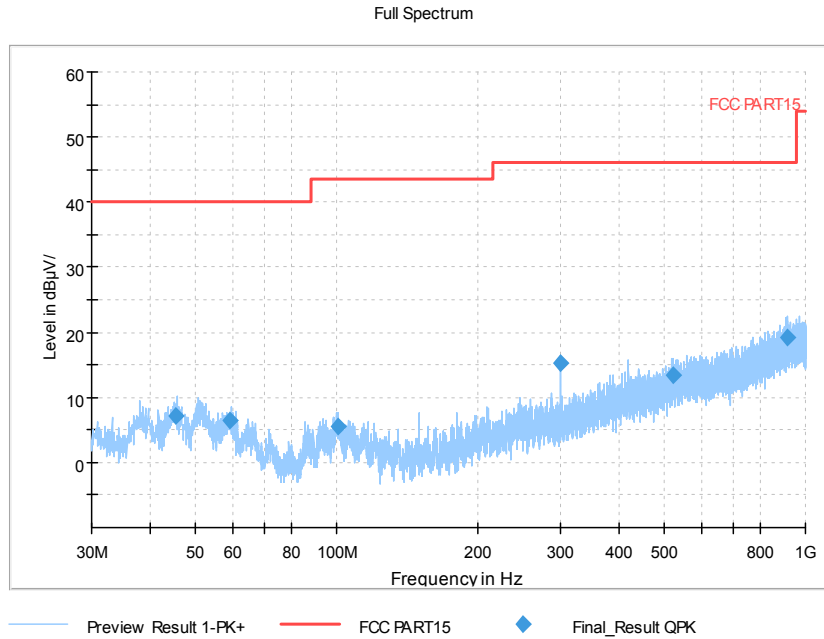
For 802.11n(HT40 MIMO) Channel No.:6

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
44.67	7.3	-18	25.3	Vertical	40
58.6865	6.55	-18.7	25.25	Vertical	40
99.6775	5.44	-19.2	24.64	Vertical	43.5
299.9995	15.55	-16.1	31.65	Vertical	46
545.047	13.68	-9.4	23.08	Vertical	46
865.193	17.78	-3.8	21.58	Vertical	46

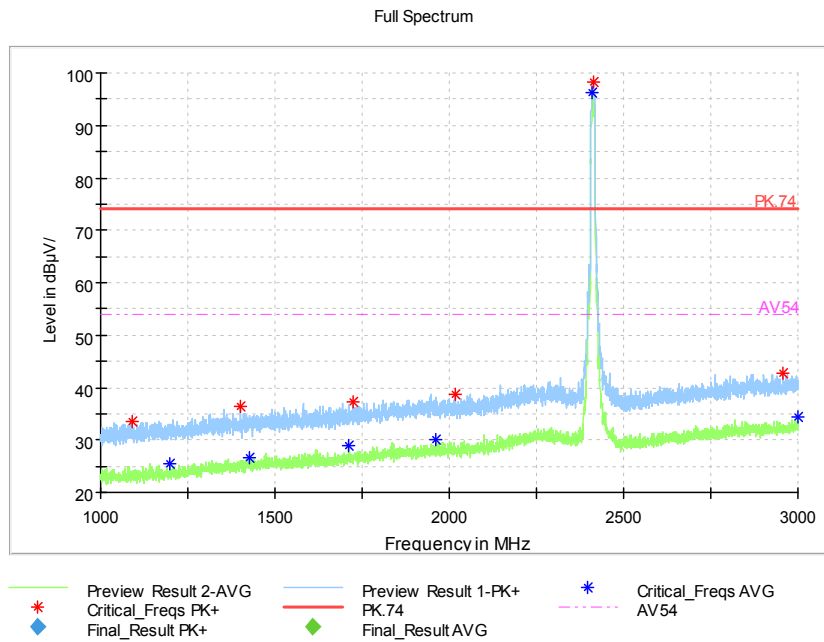
For 802.11n(HT40 MIMO) Channel No.:9

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
45.132	7.29	-17.9	25.19	Vertical	40
58.364	6.53	-18.6	25.13	Vertical	40
107.286	4.73	-19.9	24.63	Vertical	43.5
299.991	15.29	-16.1	31.39	Vertical	46
540.0175	17.05	-9.5	26.55	Vertical	46
936.585	19.49	-2.7	22.19	Vertical	46

Carrier frequency (MHz): 2412
 Channel No.:1

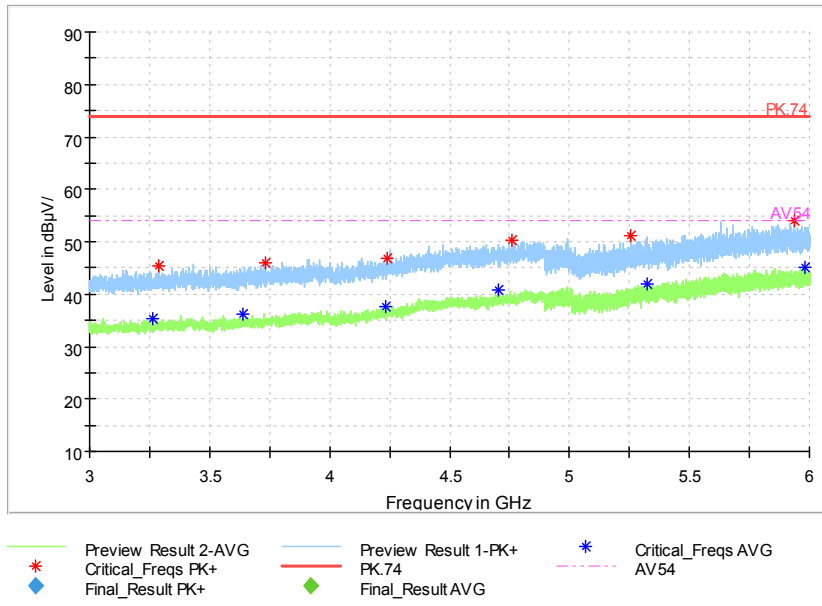


Frequency Range: 30MHz -1GHz
Detector: QP mode
Test Mode: 802.11b



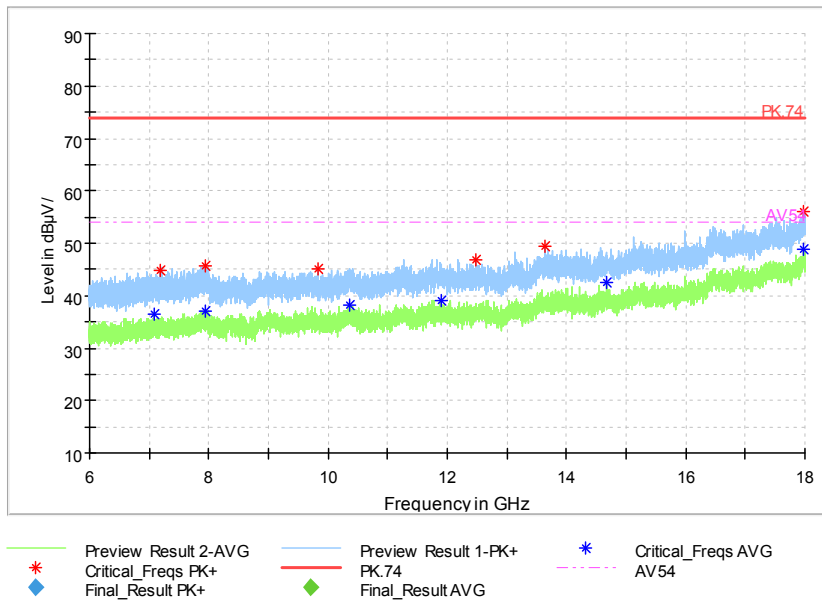
Frequency Range: 1GHz -3GHz
Detector: Av mode and PK mode
Modulation type: 802.11b

Full Spectrum



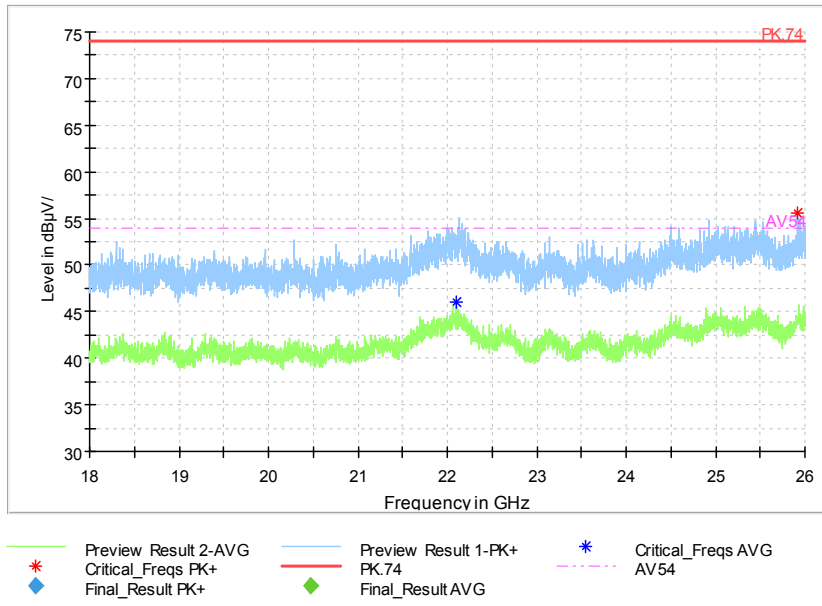
Frequency Range: 3GHz -6GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11b

Full Spectrum



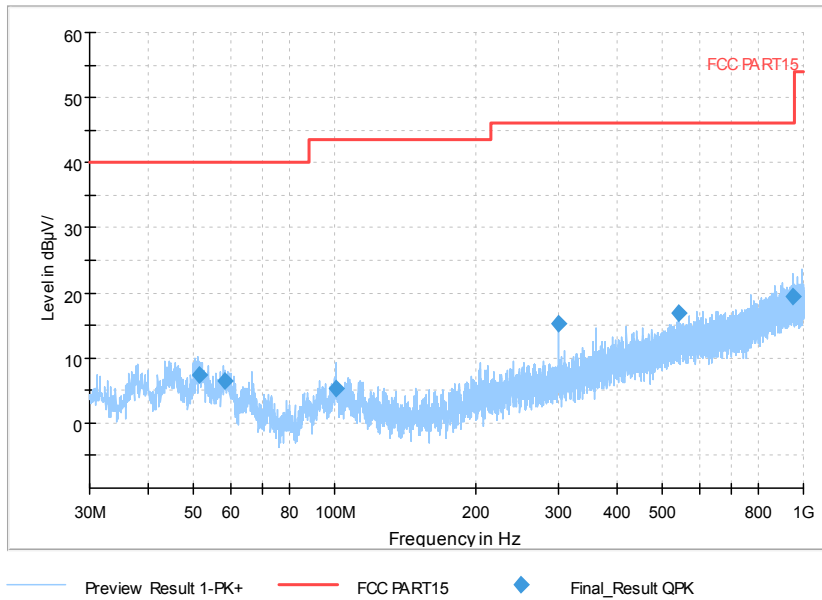
Frequency Range: 6GHz -18GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11b

Full Spectrum



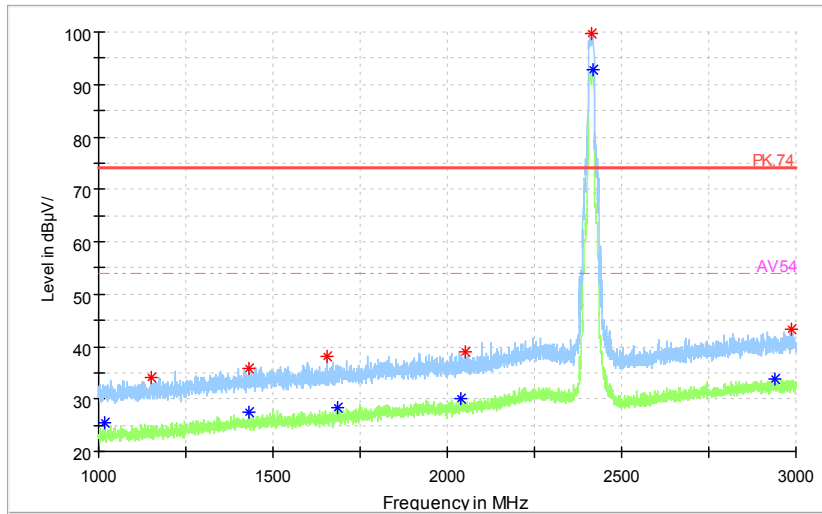
Frequency Range: 18GHz-26GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11b

Full Spectrum



Frequency Range: 30MHz -1GHz
 Detector: QP mode
 Modulation type: 802.11g

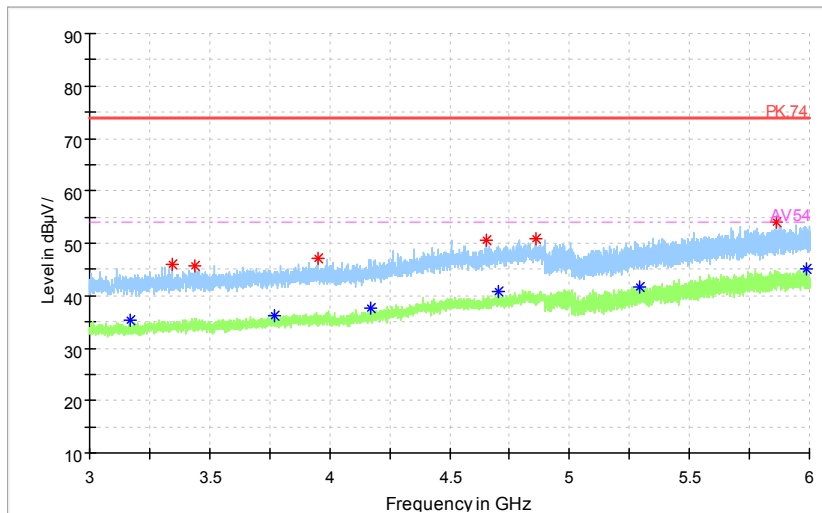
Full Spectrum



* Preview Result 2-AVG * Preview Result 1-PK+ * Critical_Freqs AVG
♦ Critical_Freqs PK+ — PK.74 - - - AV54
♦ Final_Result PK+ ♦ Final_Result AVG

Frequency Range: 1GHz -3GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11g

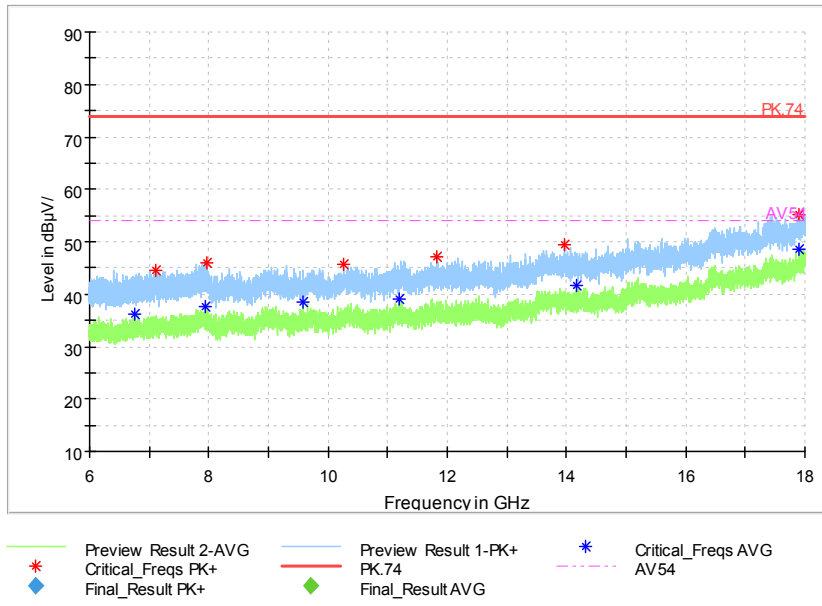
Full Spectrum



* Preview Result 2-AVG * Preview Result 1-PK+ * Critical_Freqs AVG
♦ Critical_Freqs PK+ — PK.74 - - - AV54
♦ Final_Result PK+ ♦ Final_Result AVG

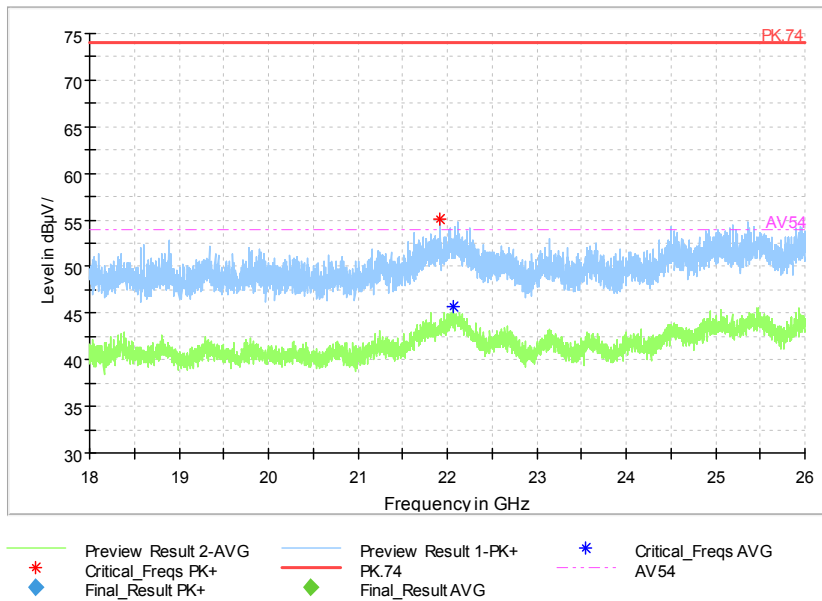
Frequency Range: 3GHz -6GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11g

Full Spectrum



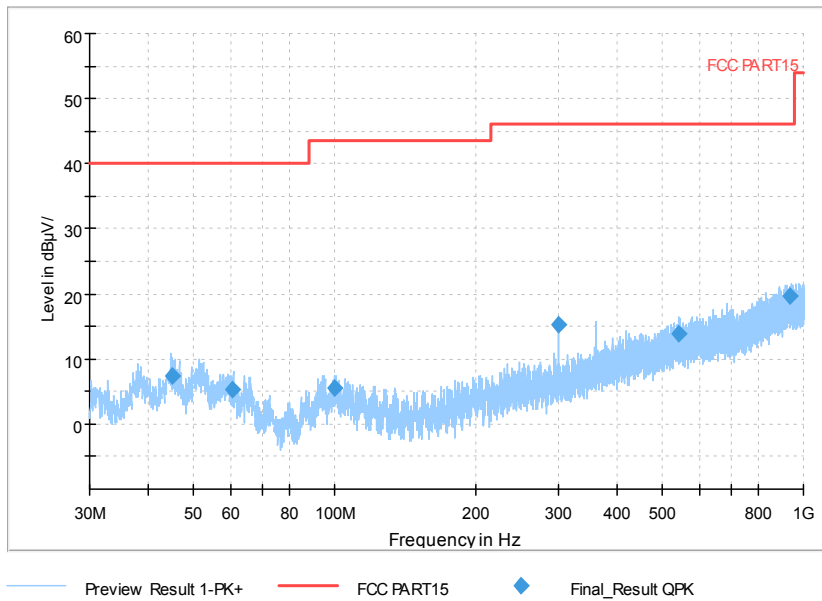
Frequency Range: 6GHz -18GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11g

Full Spectrum



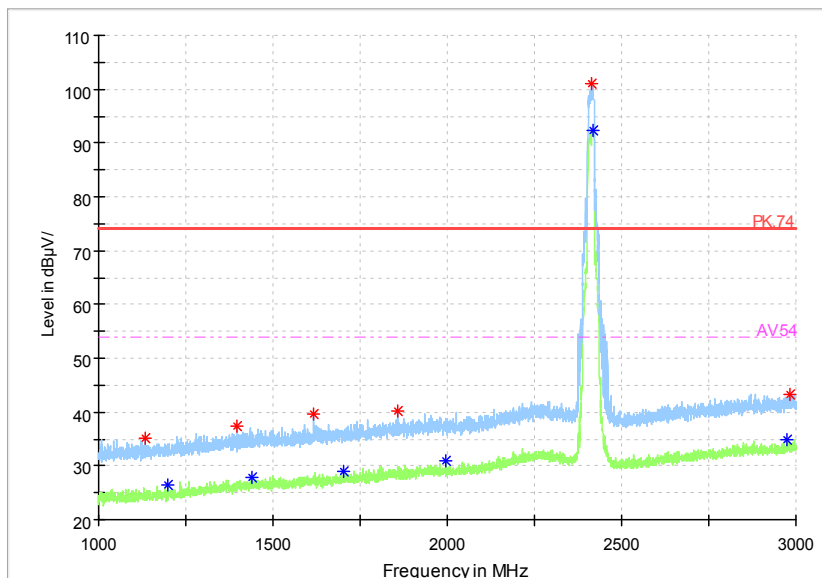
Frequency Range: 18GHz-26GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11g

Full Spectrum



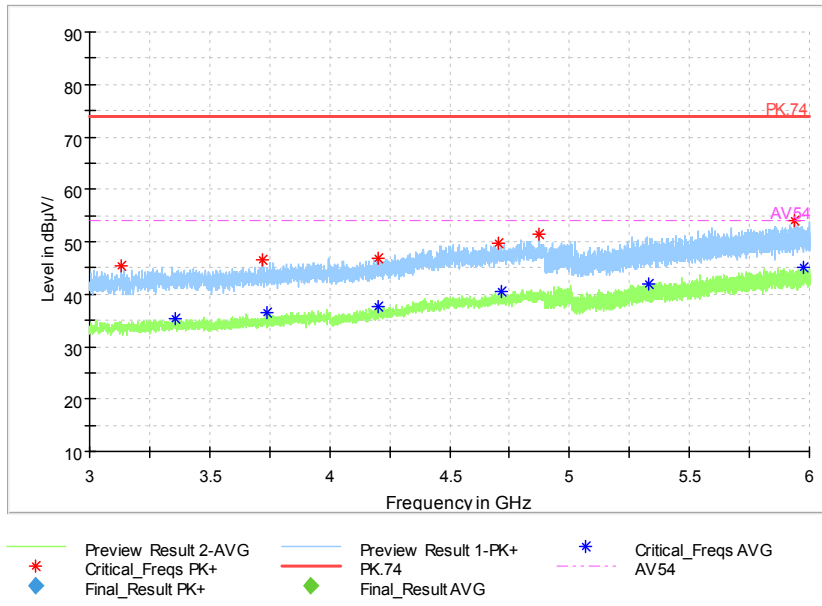
Frequency Range: 30MHz -1GHz
 Detector: QP mode
 Test Mode: 802.11n(HT20 MIMO)

Full Spectrum



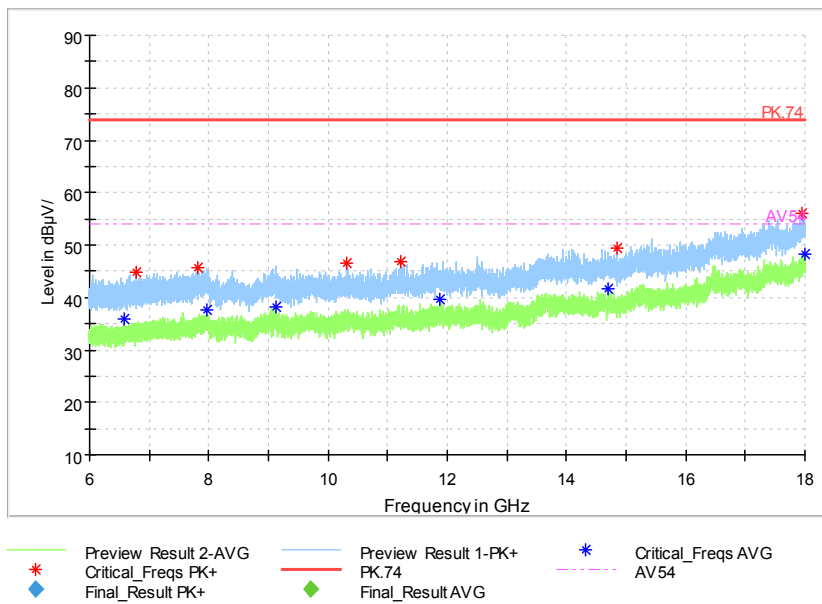
Frequency Range: 1GHz -3GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11n(HT20 MIMO)

Full Spectrum



Frequency Range: 3GHz -6GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11n(HT20 MIMO)









Full Spectrum



Frequency Range: 6GHz -18GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11n(HT20 MIMO)

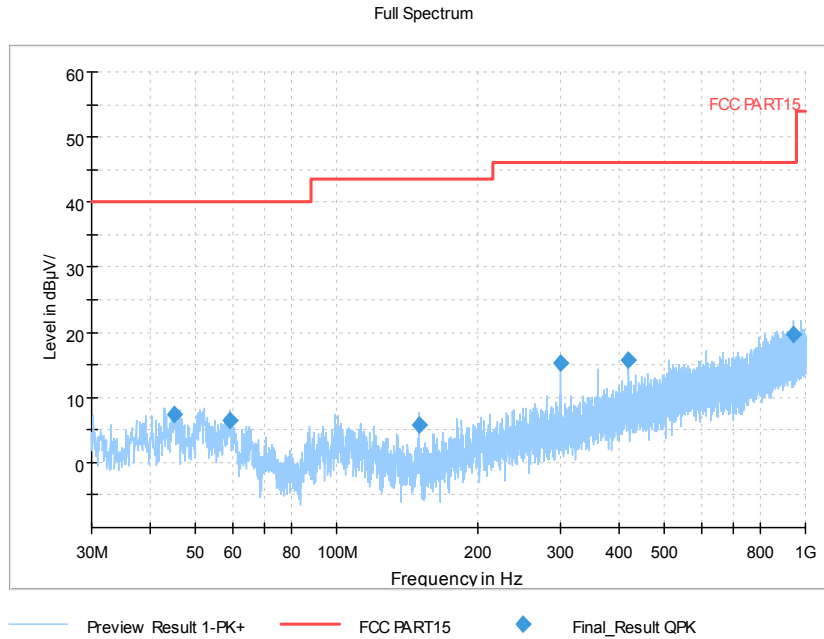
Full Spectrum



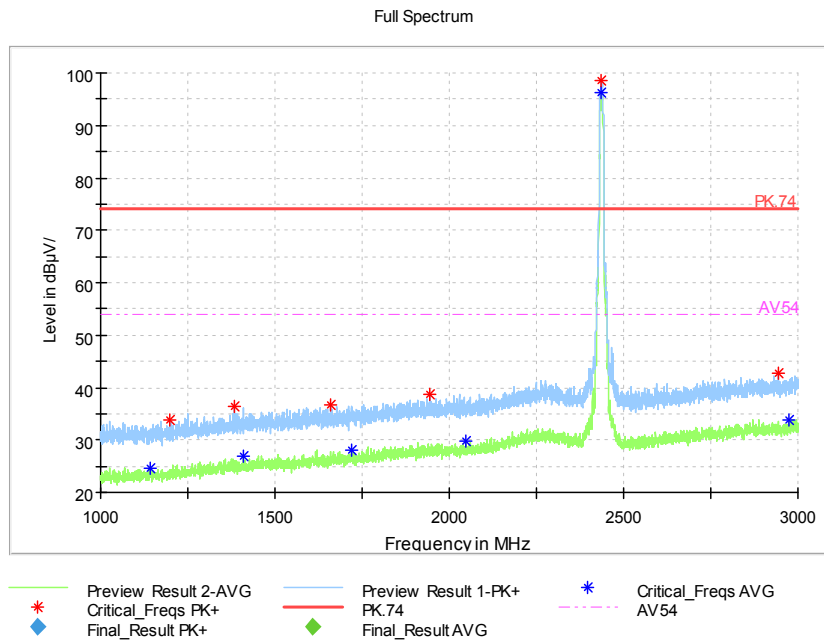
	Preview Result 2-AVG		Preview Result 1-PK+		Critical_Freqs AVG
	Critical_Freqs PK+		PK.74		AV54
	Final_Result PK+		Final_Result AVG		

Frequency Range: 18GHz-26GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11n(HT20 MIMO)

Carrier frequency (MHz): 2437
 Channel No.:6

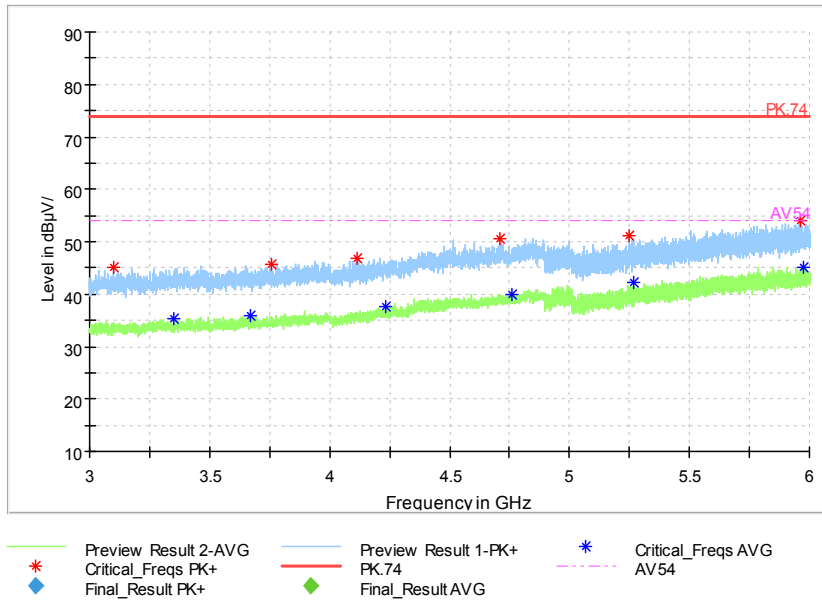


Frequency Range: 30MHz -1GHz
Detector: QP mode
Test Mode: 802.11b



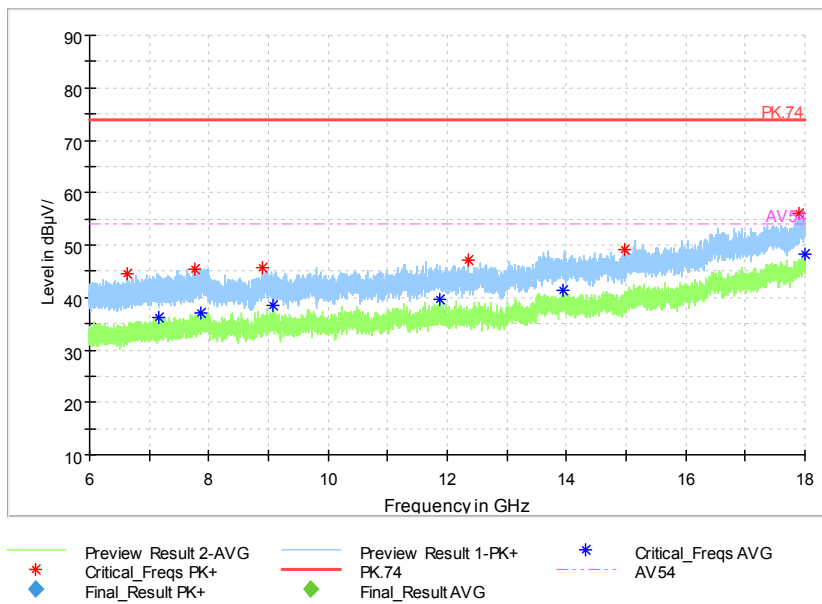
Frequency Range: 1GHz -3GHz
Detector: Av mode and PK mode
Modulation type: 802.11b

Full Spectrum



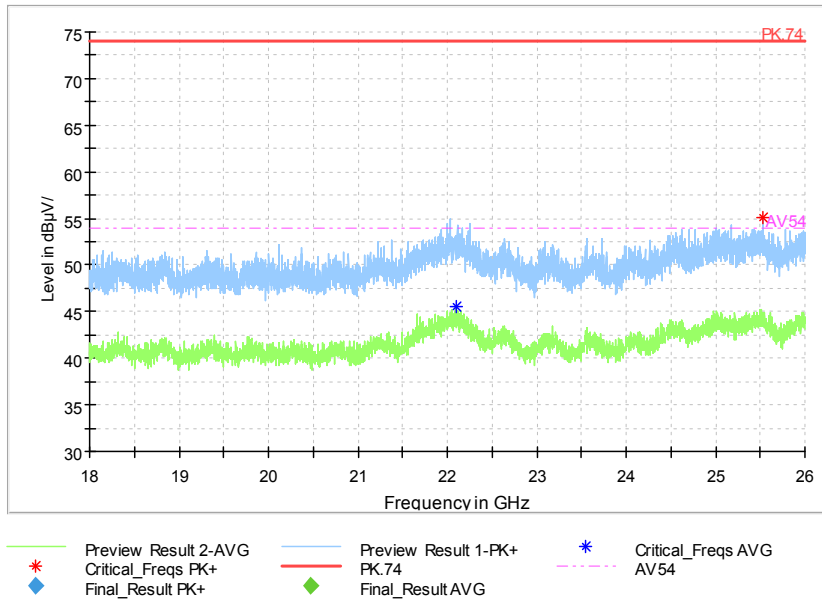
Frequency Range: 3GHz -6GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11b

Full Spectrum



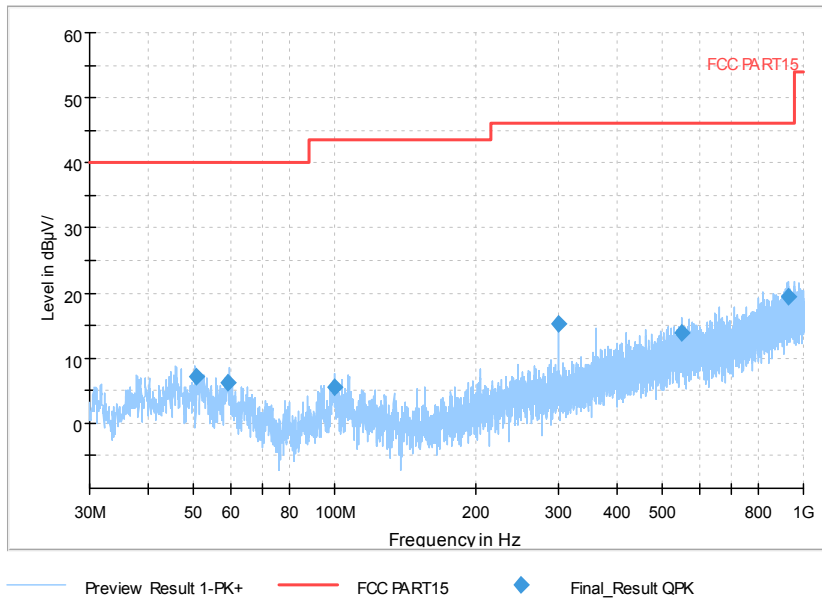
Frequency Range: 6GHz -18GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11b

Full Spectrum



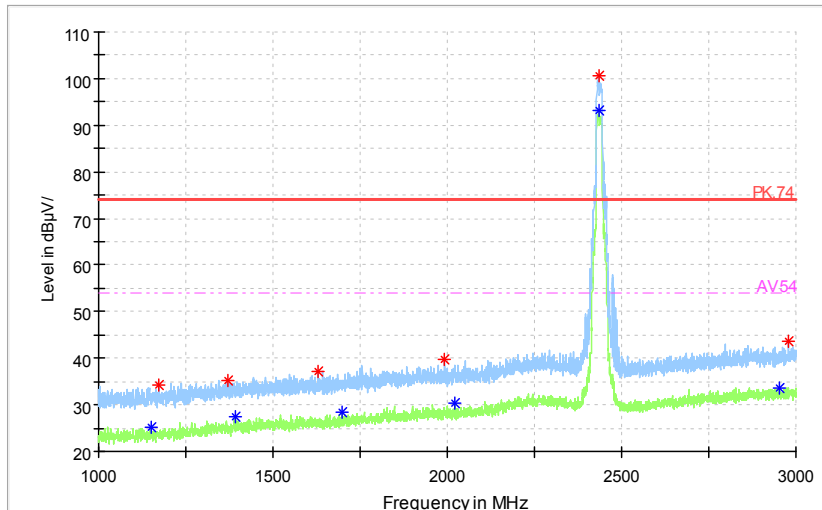
Frequency Range: 18GHz-26GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11b

Full Spectrum



Frequency Range: 30MHz -1GHz
 Detector: QP mode
 Modulation type: 802.11g

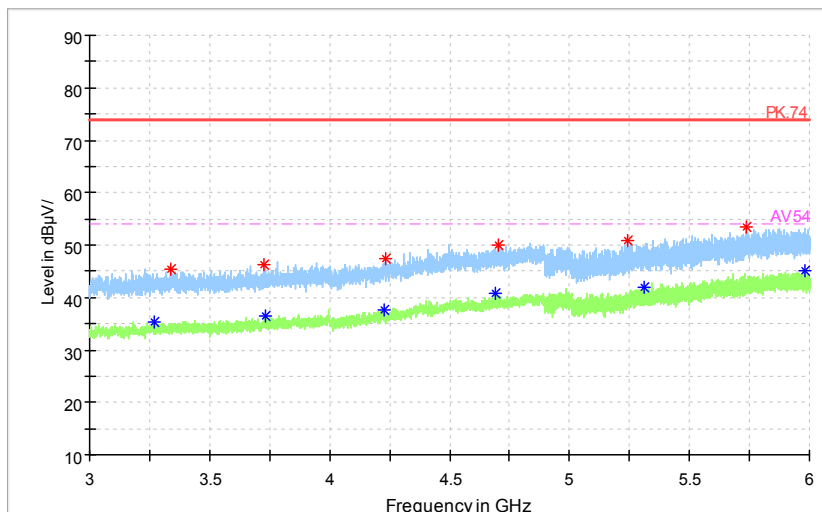
Full Spectrum



* Preview Result 2-AVG * Preview Result 1-PK+ * Critical_Freqs AVG
♦ Critical_Freqs PK+ ♦ PK.74 - - - AV.54
♦ Final_Result PK+ ♦ Final_Result AVG

Frequency Range: 1GHz -3GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11g

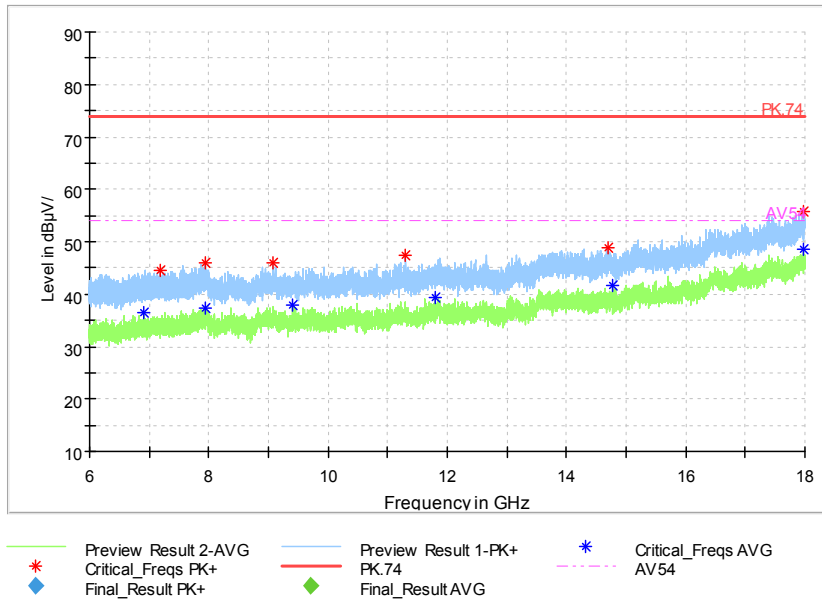
Full Spectrum



* Preview Result 2-AVG * Preview Result 1-PK+ * Critical_Freqs AVG
♦ Critical_Freqs PK+ ♦ PK.74 - - - AV.54
♦ Final_Result PK+ ♦ Final_Result AVG

Frequency Range: 3GHz -6GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11g

Full Spectrum



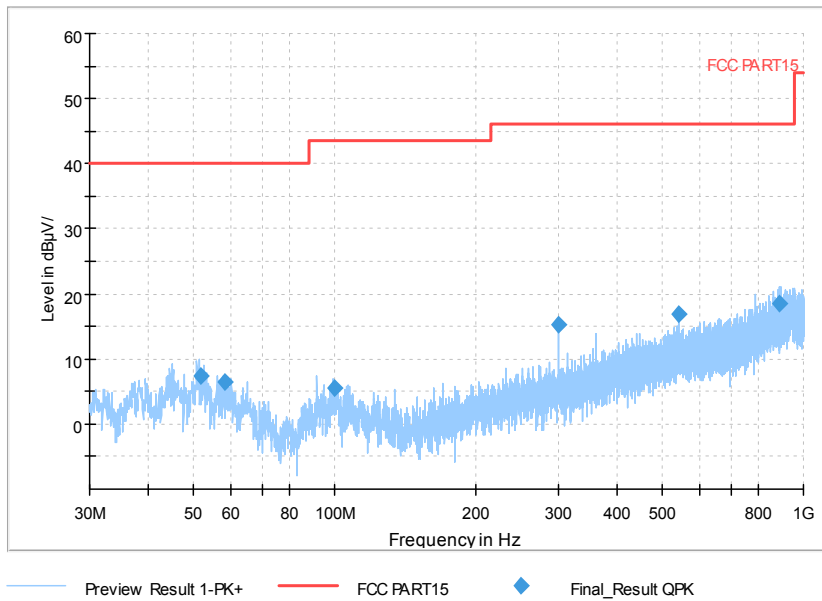
Frequency Range: 6GHz -18GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11g

Full Spectrum



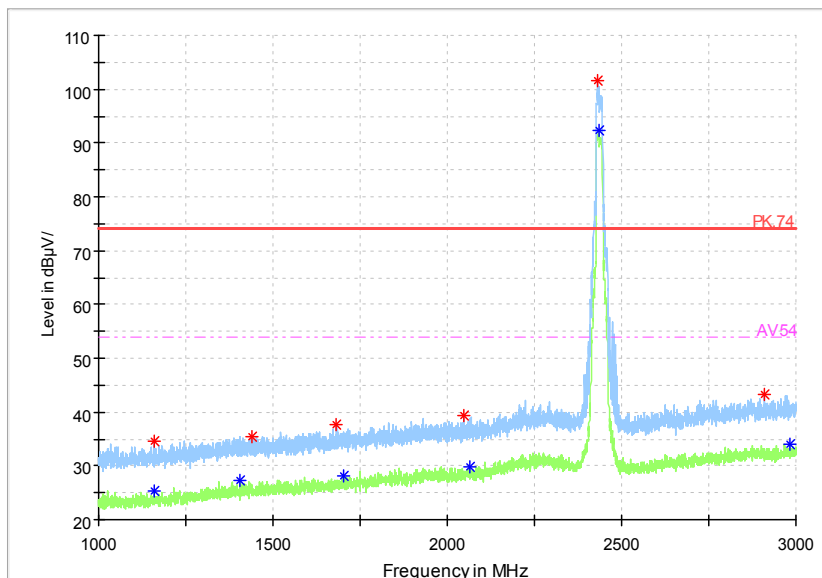
Frequency Range: 18GHz-26GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11g

Full Spectrum



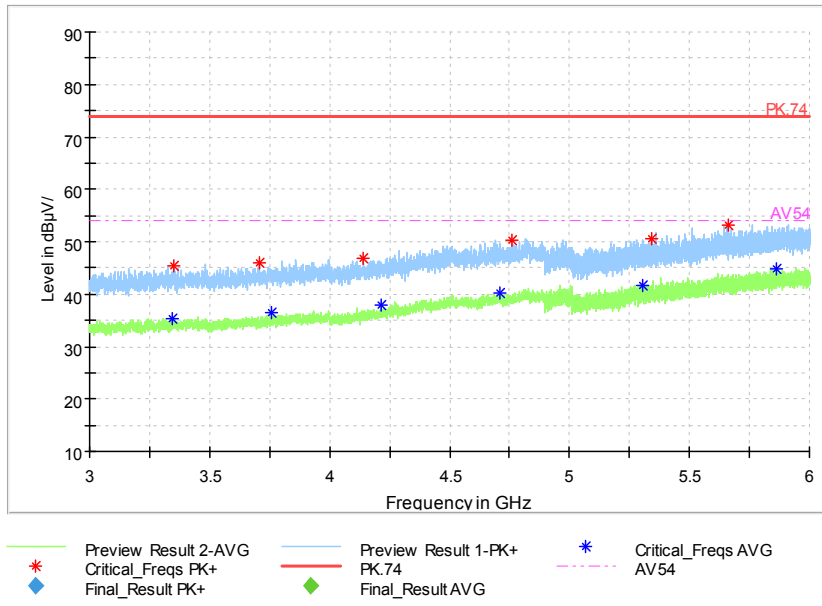
Frequency Range: 30MHz -1GHz
 Detector: QP mode
 Test Mode: 802.11n(HT20 MIMO)

Full Spectrum



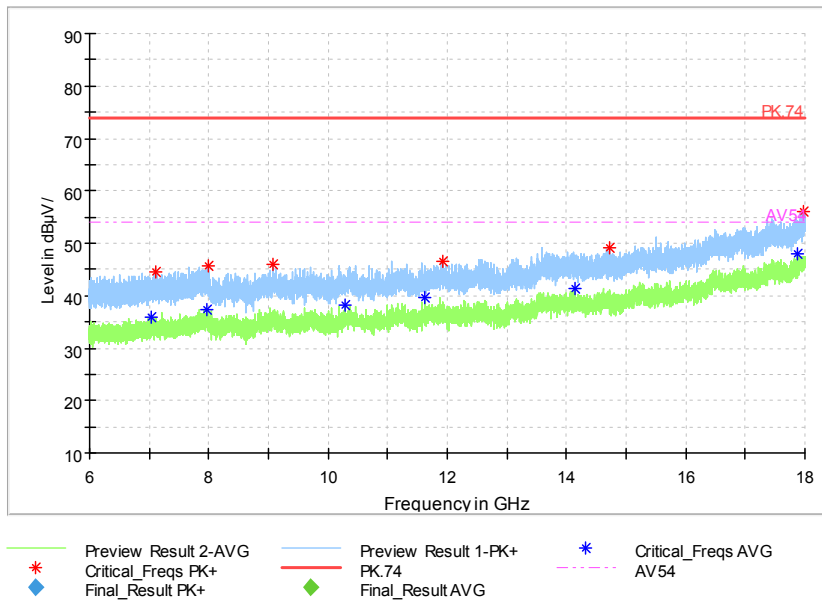
Frequency Range: 1GHz -3GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11n(HT20 MIMO)

Full Spectrum



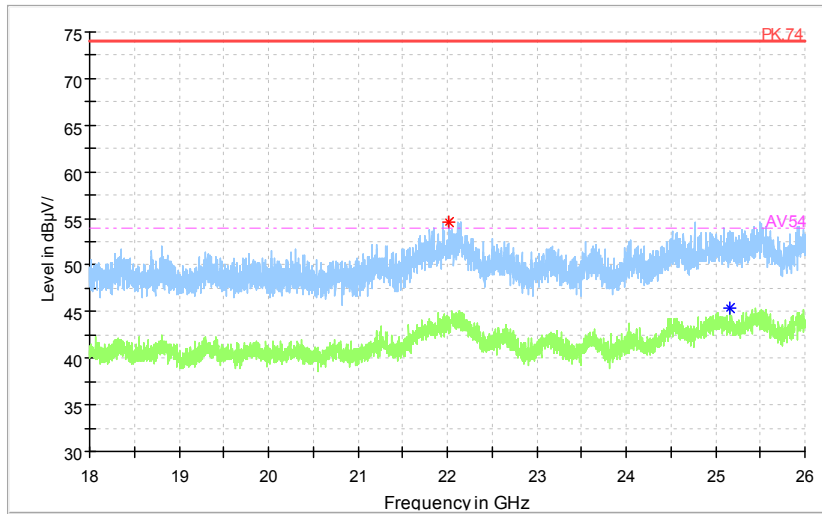
Frequency Range: 3GHz -6GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11n(HT20 MIMO)









Full Spectrum



Frequency Range: 6GHz -18GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11n(HT20 MIMO)

Full Spectrum

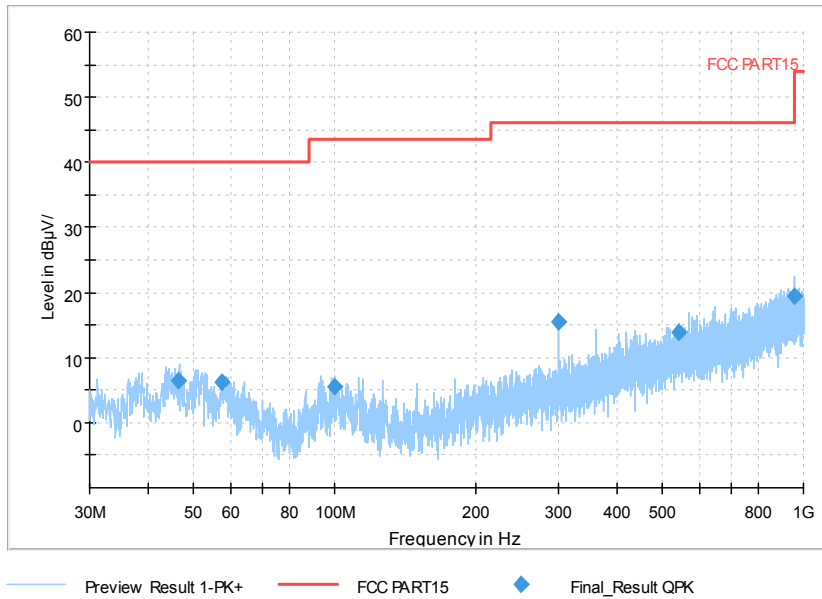


	Preview Result 2-AVG		Preview Result 1-PK+		Critical_Freqs AVG
	Critical_Freqs PK+		PK.74		AV54
	Final_Result PK+		Final_Result AVG		

Frequency Range: 18GHz-26GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11n(HT20 MIMO)

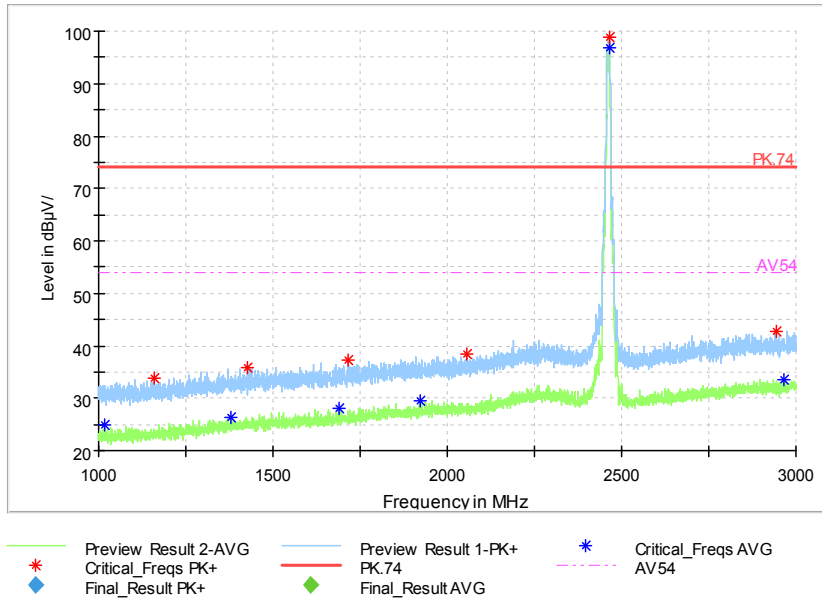
Carrier frequency (MHz): 2462
 Channel No.:11

Full Spectrum



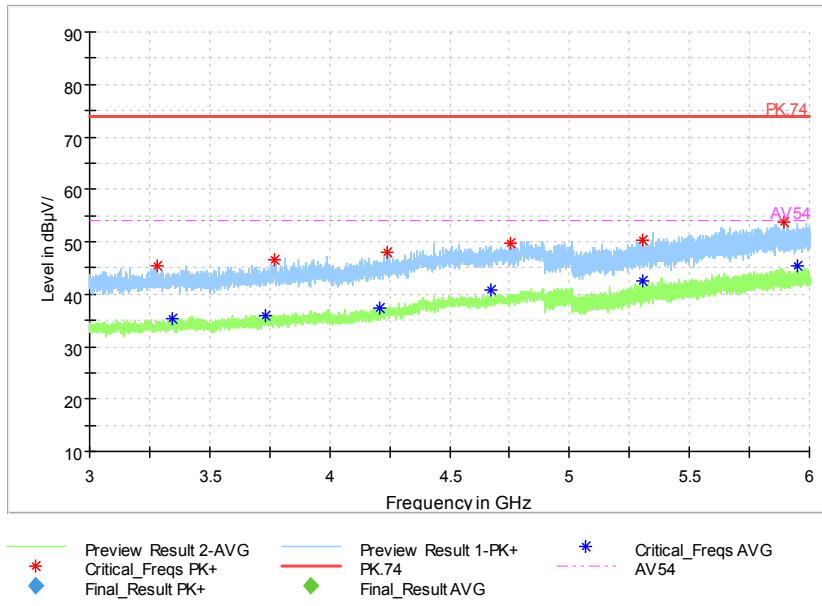
Frequency Range: 30MHz -1GHz
 Detector: QP mode
 Test Mode: 802.11b

Full Spectrum



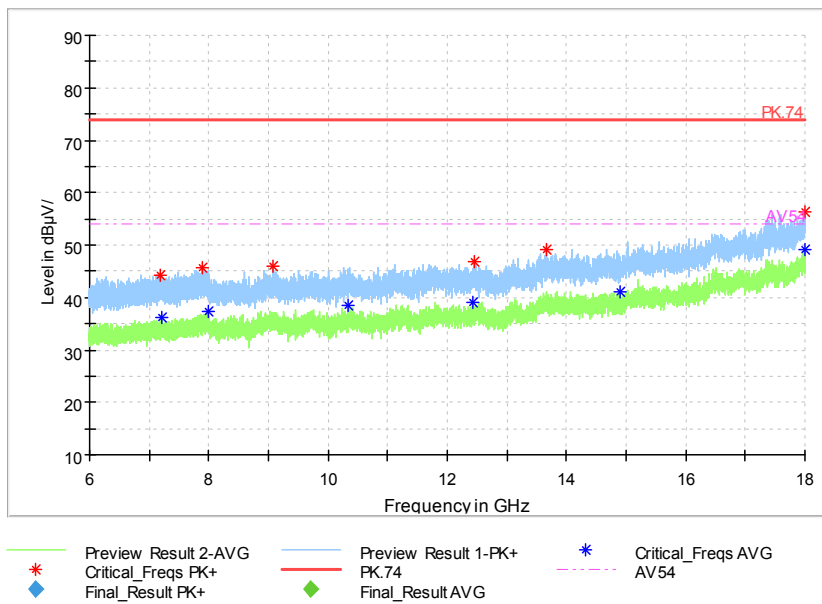
Frequency Range: 1GHz -3GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11b

Full Spectrum



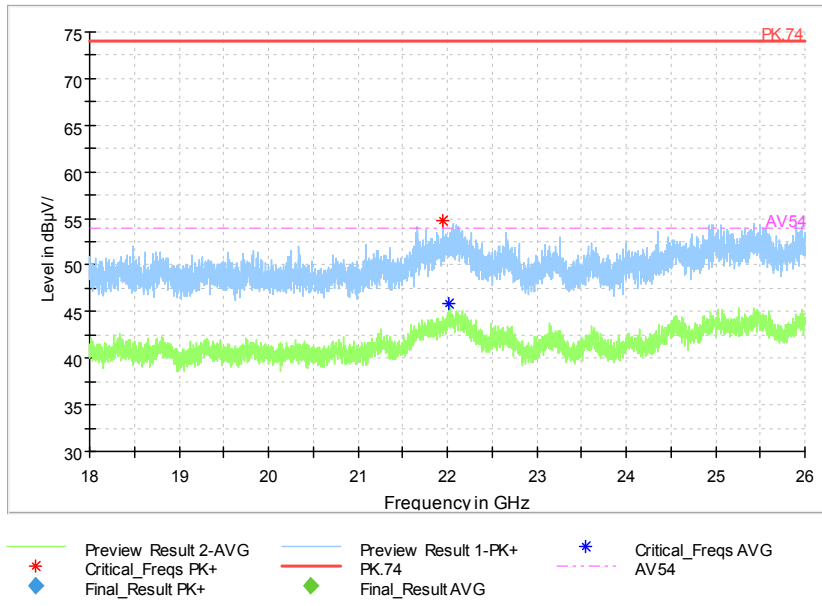
Frequency Range: 3GHz -6GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11b

Full Spectrum



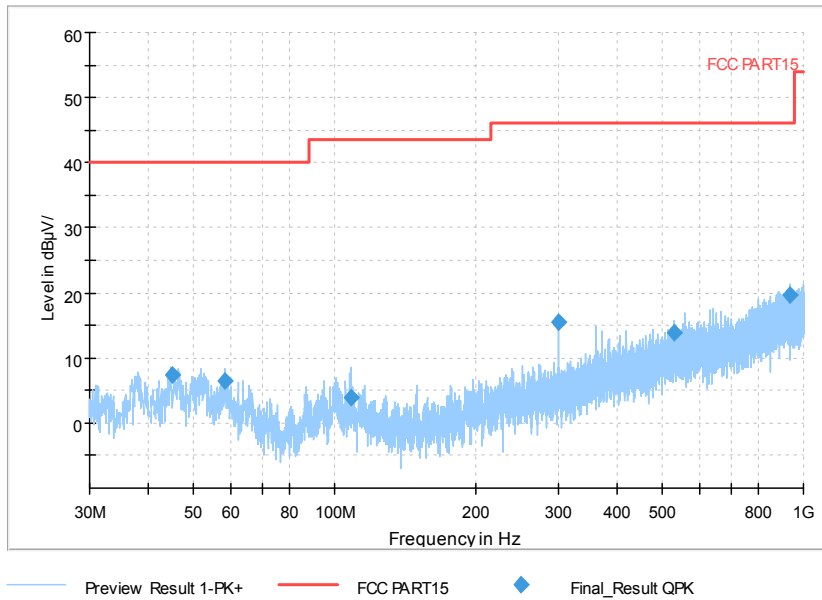
Frequency Range: 6GHz -18GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11b

Full Spectrum



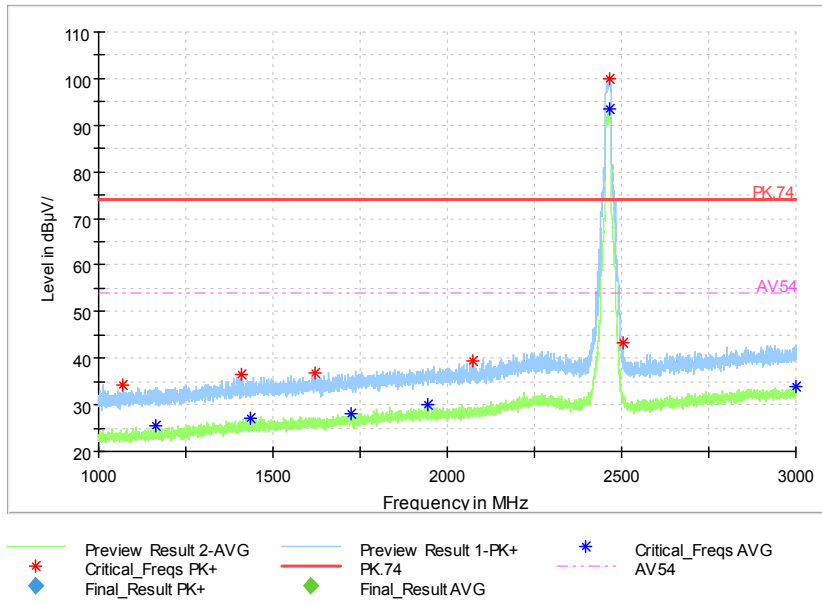
Frequency Range: 18GHz-26GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11b

Full Spectrum



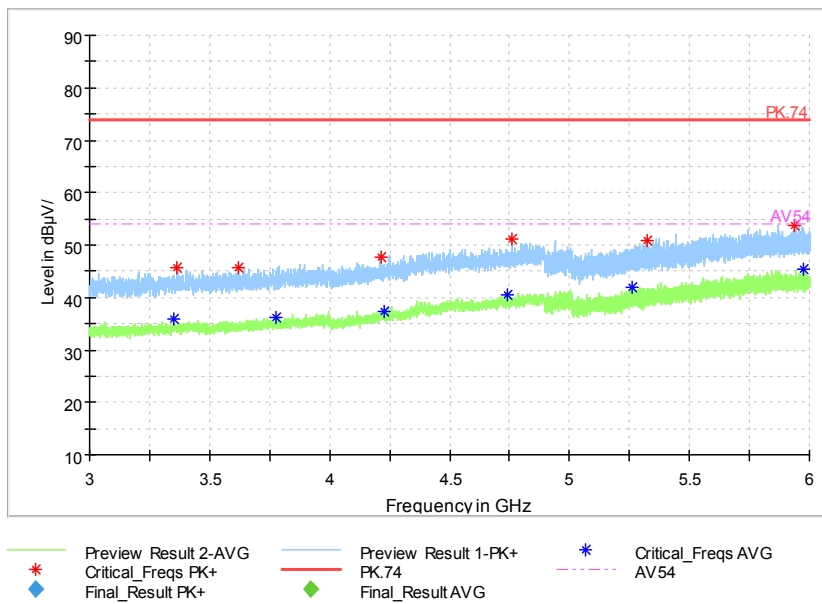
Frequency Range: 30MHz -1GHz
 Detector: QP mode
 Modulation type: 802.11g

Full Spectrum



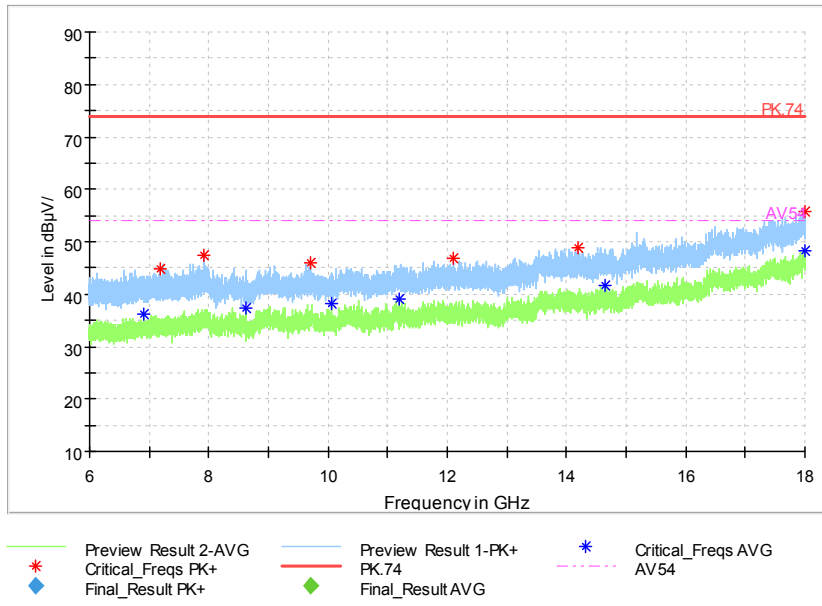
Frequency Range: 1GHz -3GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11g

Full Spectrum



Frequency Range: 3GHz -6GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11g

Full Spectrum

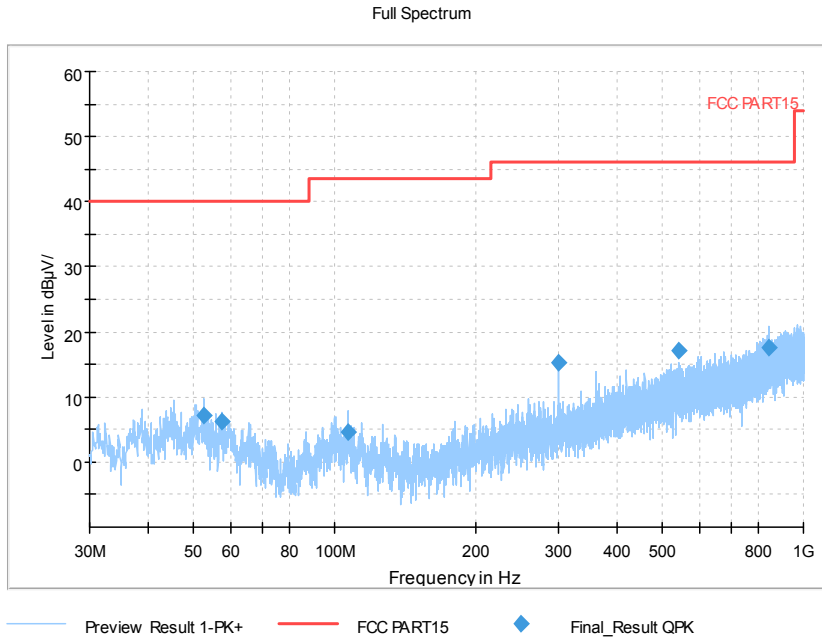


Frequency Range: 6GHz -18GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11g

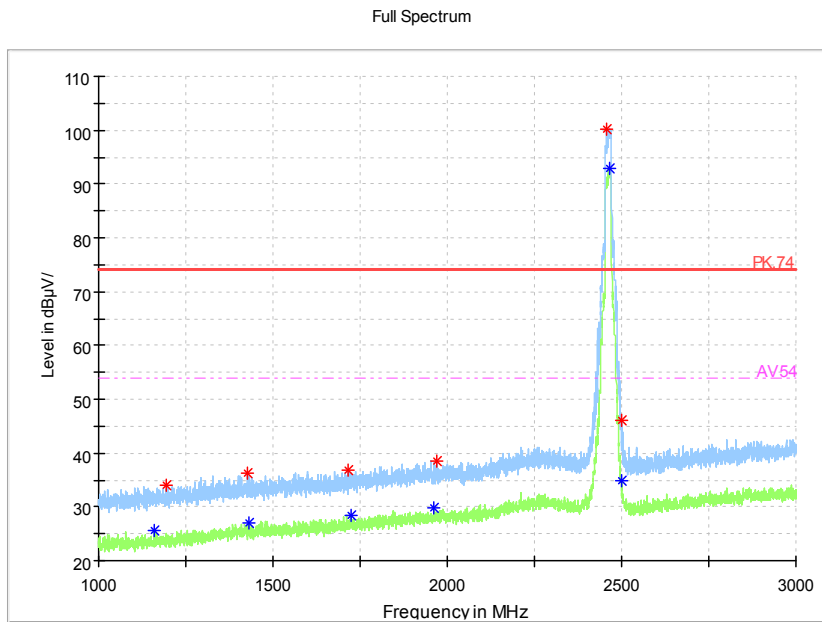
Full Spectrum



Frequency Range: 18GHz-26GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11g

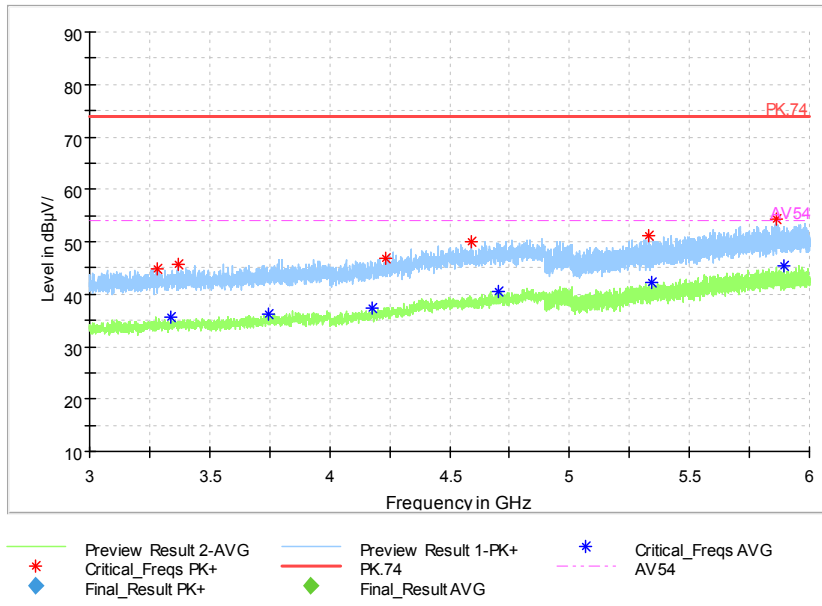


Frequency Range: 30MHz -1GHz
 Detector: QP mode
 Test Mode: 802.11n(HT20 MIMO)



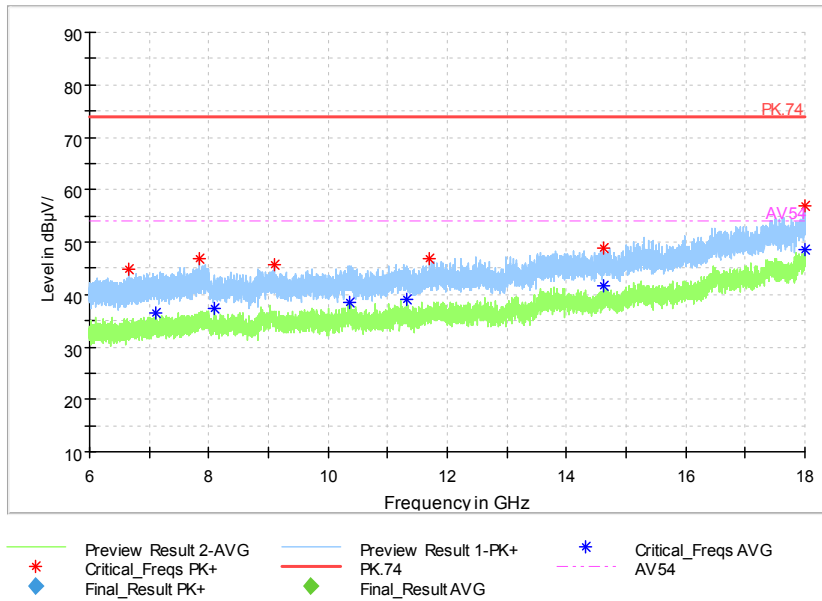
Frequency Range: 1GHz -3GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11n(HT20 MIMO)

Full Spectrum



Frequency Range: 3GHz -6GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11n(HT20 MIMO)








Full Spectrum



Frequency Range: 6GHz -18GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11n(HT20 MIMO)

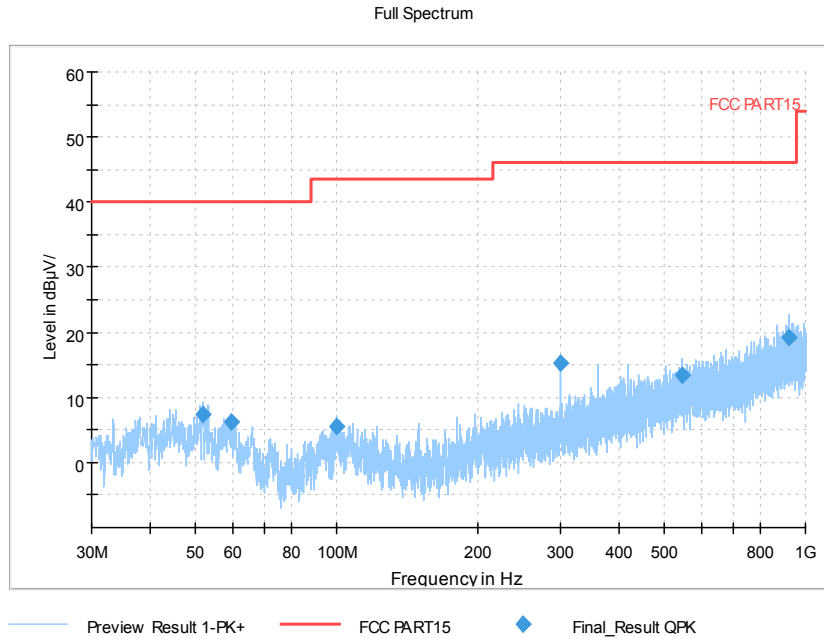
Full Spectrum



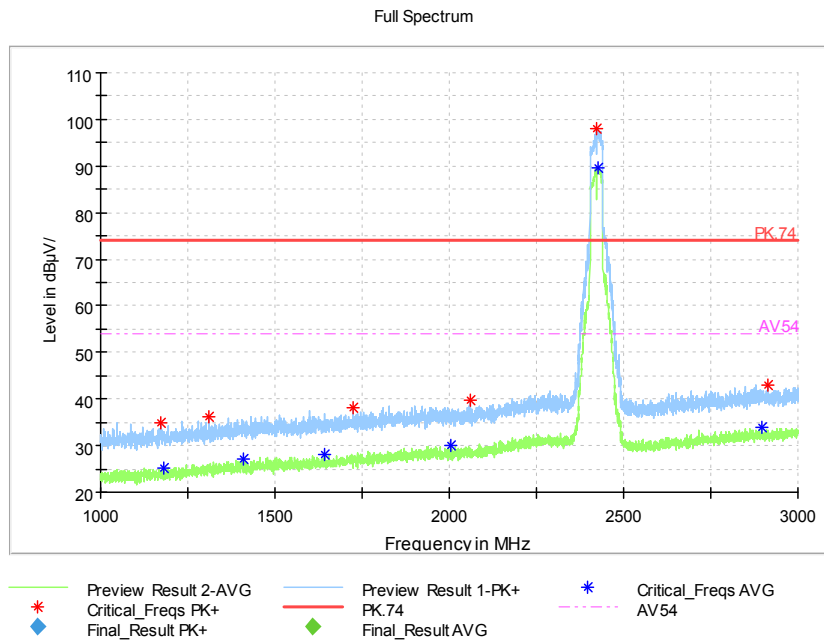
	Preview Result 2-AVG		Preview Result 1-PK+		Critical_Freqs AVG
	Critical_Freqs PK+		PK.74		AV54
	Final_Result PK+		Final_Result AVG		

Frequency Range: 18GHz-26GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11n(HT20 MIMO)

Carrier frequency (MHz): 2422
 Channel No.:3

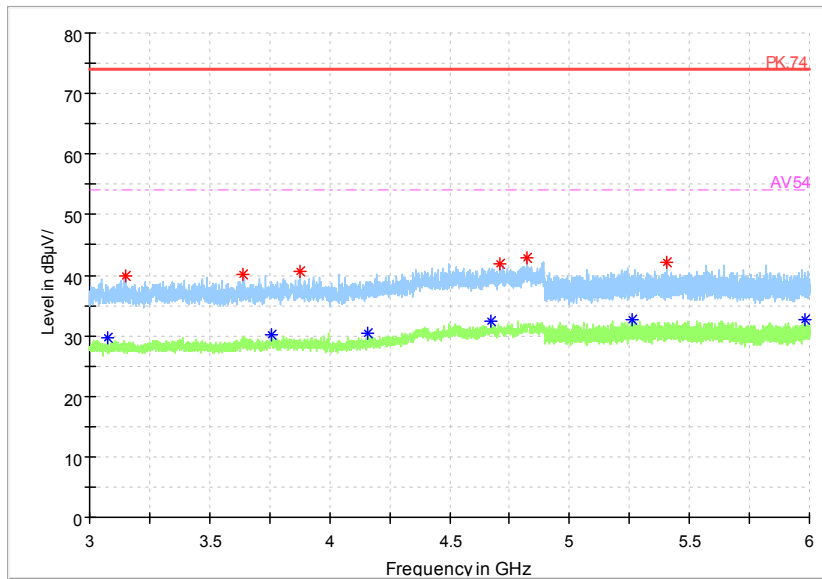


Frequency Range: 30MHz -1GHz
 Detector: QP mode
 Test Mode: 802.11n(HT40 MIMO)



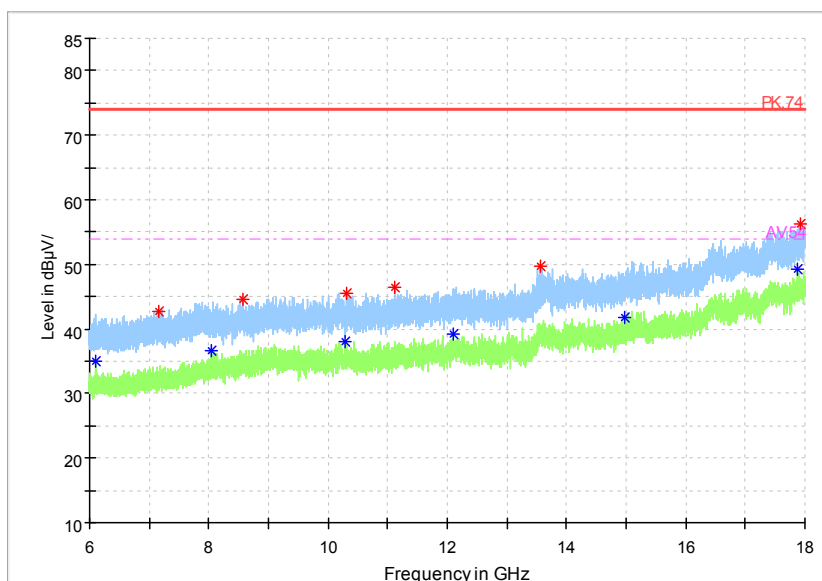
Frequency Range: 1GHz -3GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11n(HT40 MIMO)

Full Spectrum



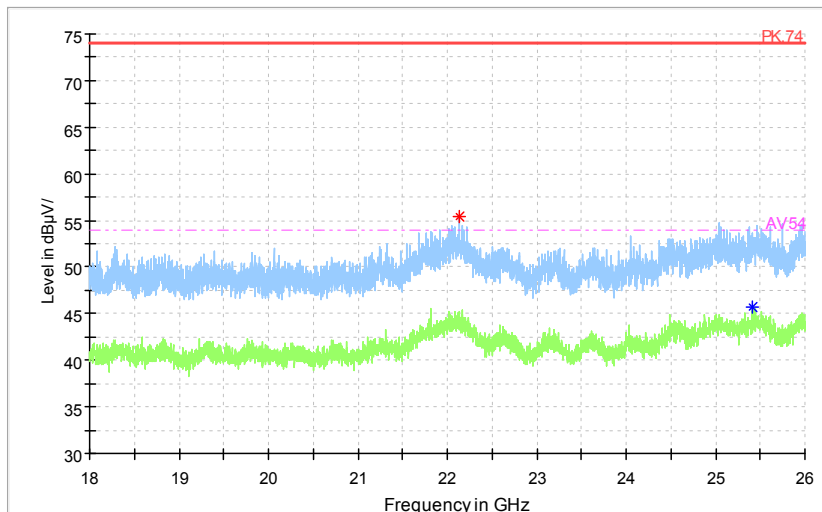
Frequency Range: 3GHz -6GHz
Detector: Av mode and PK mode
Modulation type: 802.11n(HT40 MIMO)








Full Spectrum



Frequency Range: 6GHz -18GHz
Detector: Av mode and PK mode
Modulation type: 802.11n(HT40 MIMO)

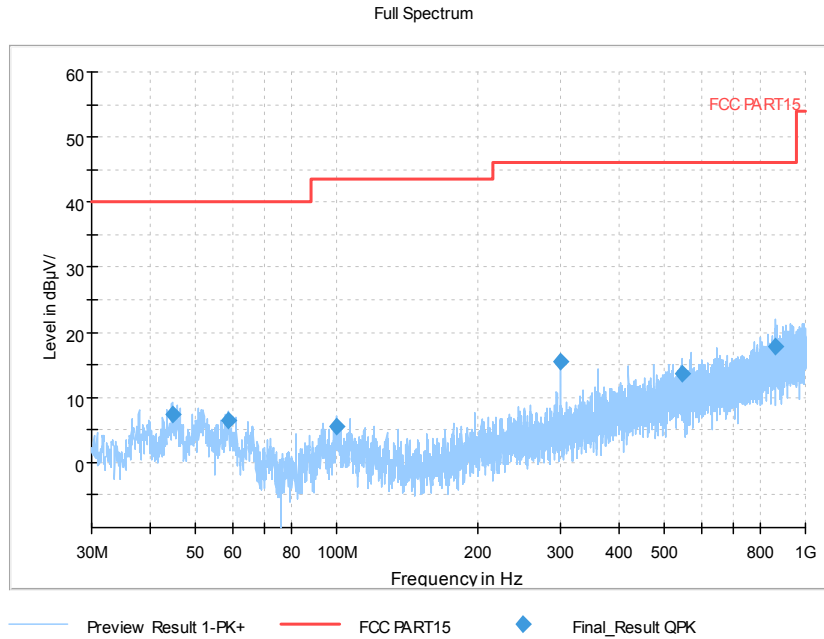
Full Spectrum



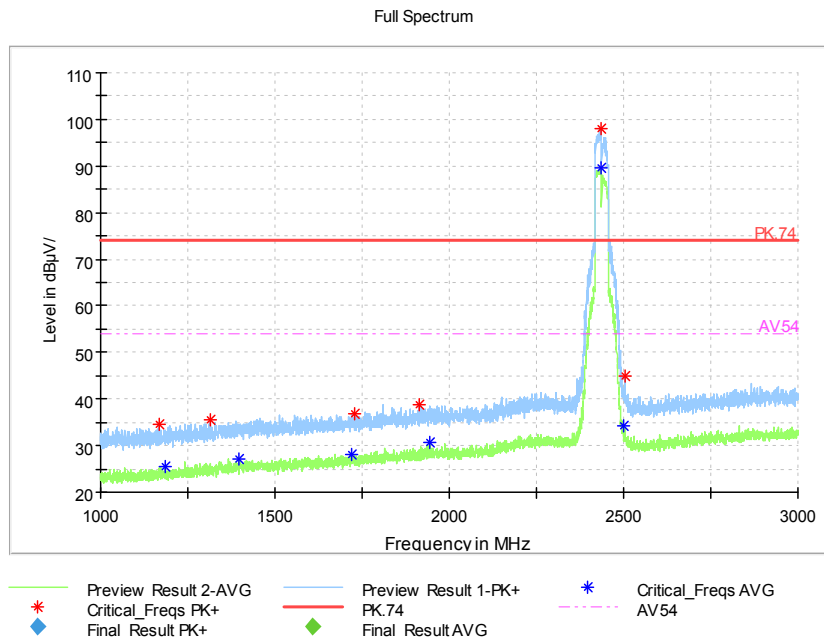
	Preview Result 2-AVG		Preview Result 1-PK+		Critical_Freqs AVG
	Critical_Freqs PK+		PK.74		AV54
	Final_Result PK+		Final_Result AVG		

Frequency Range: 18GHz-26GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11n(HT40 MIMO)

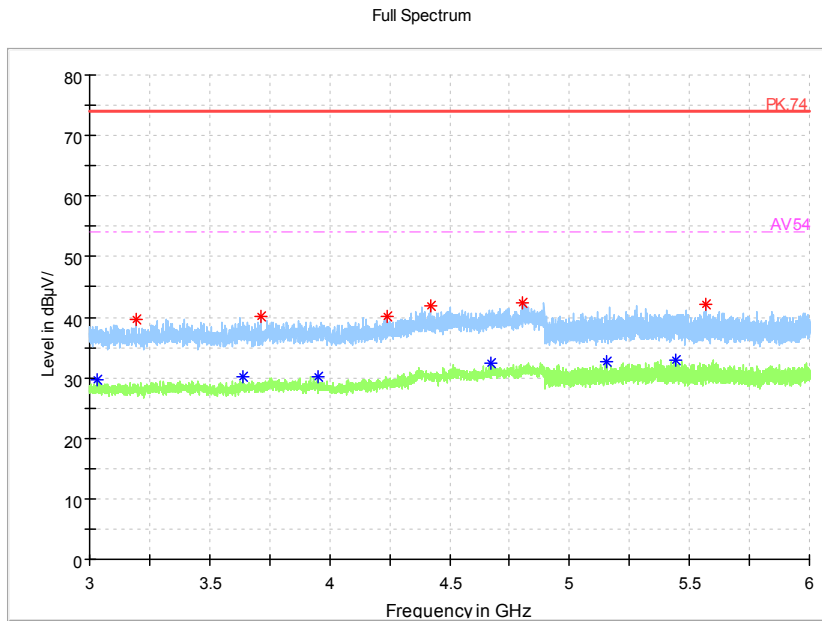
Carrier frequency (MHz): 2437
 Channel No.:6



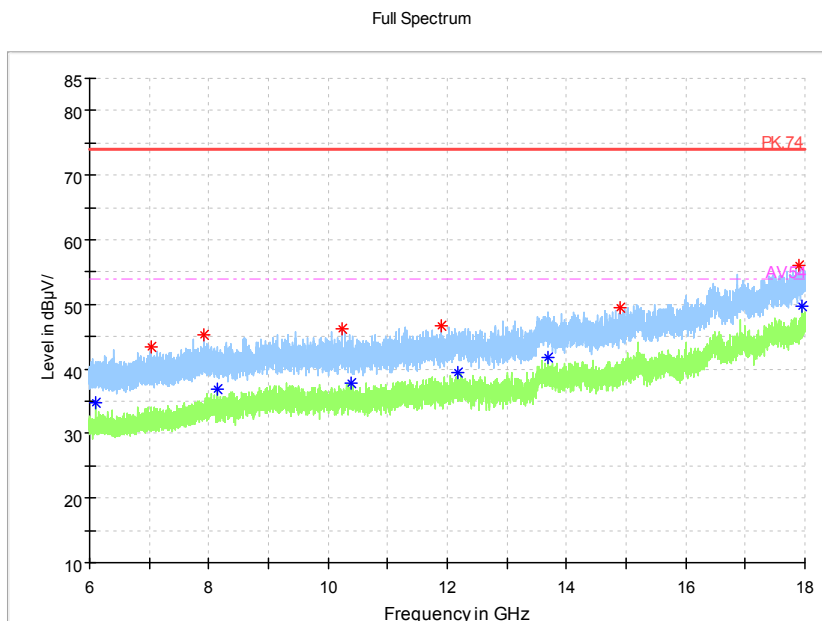
Frequency Range: 30MHz -1GHz
 Detector: QP mode
 Test Mode: 802.11n(HT40 MIMO)



Frequency Range: 1GHz -3GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11n(HT40 MIMO)

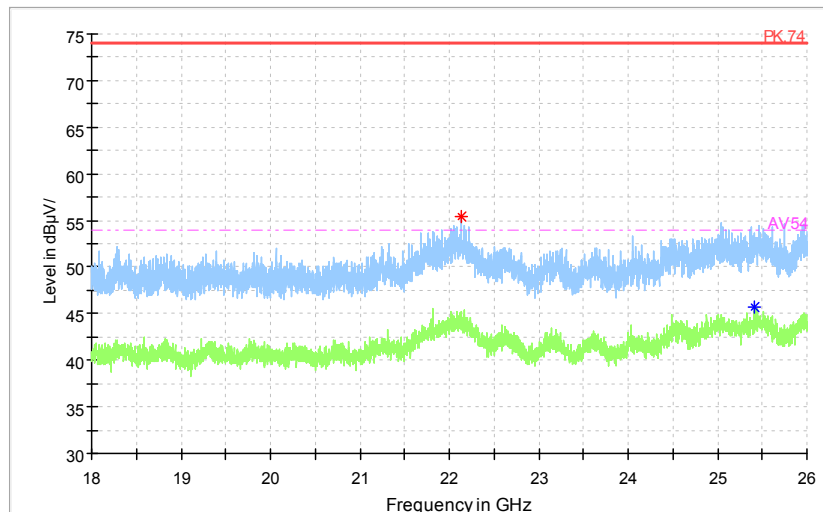










Frequency Range: 3GHz -6GHz
Detector: Av mode and PK mode
Modulation type: 802.11n(HT40 MIMO)



Frequency Range: 6GHz -18GHz
Detector: Av mode and PK mode
Modulation type: 802.11n(HT40 MIMO)

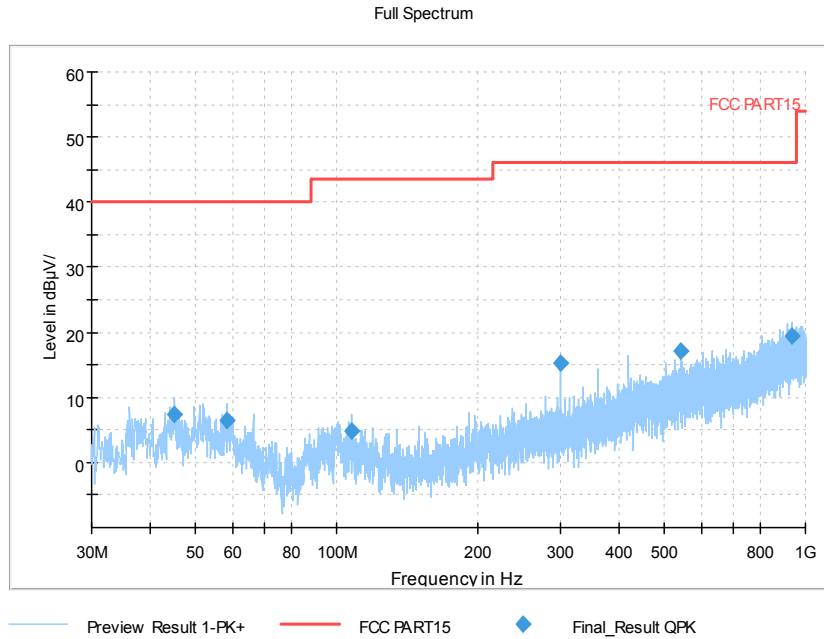
Full Spectrum



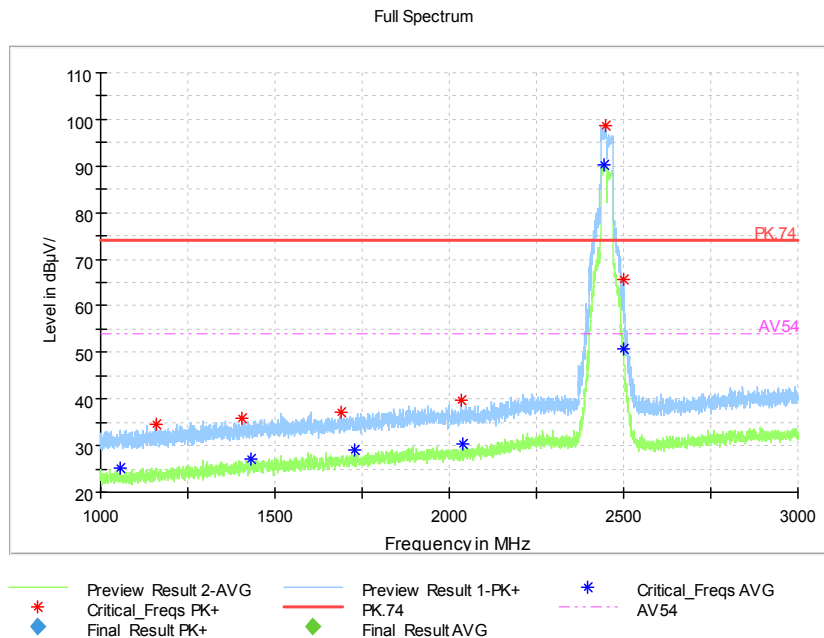
 Preview Result 2-AVG	 Preview Result 1-PK+	 Critical_Freqs AVG
 Critical_Freqs PK+	 PK.74	 AV54
 Final_Result PK+	 Final_Result AVG	

Frequency Range: 18GHz-26GHz
Detector: Av mode and PK mode
Modulation type: 802.11n(HT40 MIMO)

Carrier frequency (MHz): 2452
 Channel No.:9

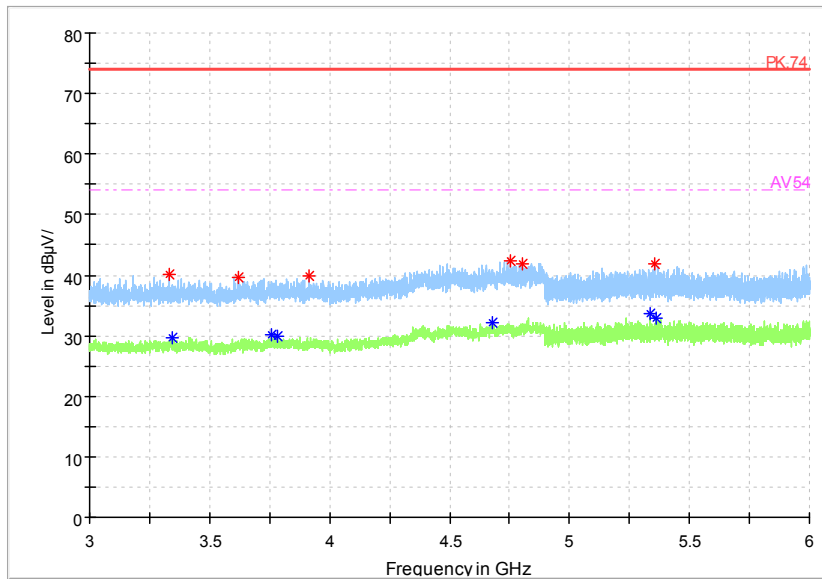


Frequency Range: 30MHz -1GHz
 Detector: QP mode
 Test Mode: 802.11n(HT40 MIMO)



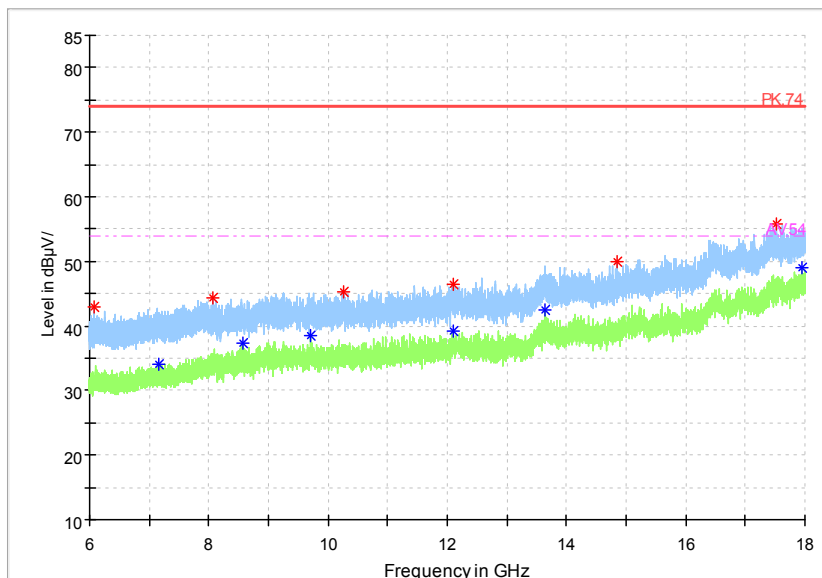
Frequency Range: 1GHz -3GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11n(HT40 MIMO)

Full Spectrum



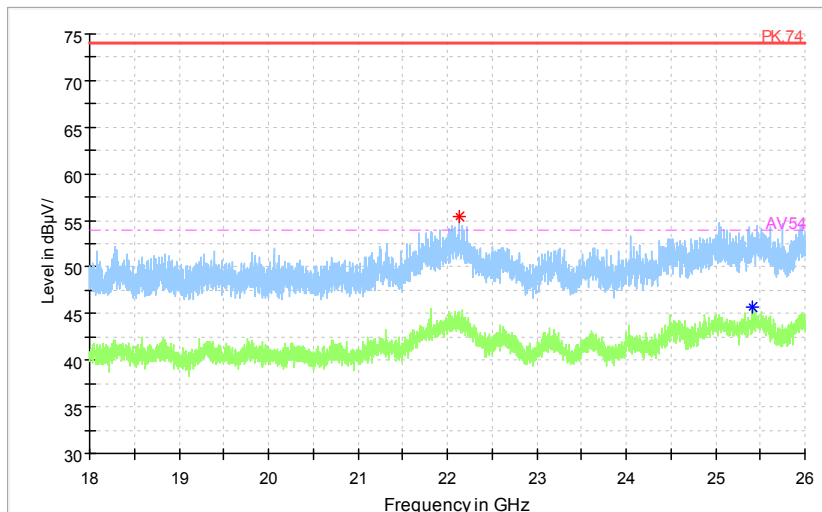
Frequency Range: 3GHz -6GHz
Detector: Av mode and PK mode
Modulation type: 802.11n(HT40 MIMO)








Full Spectrum



Frequency Range: 6GHz -18GHz
Detector: Av mode and PK mode
Modulation type: 802.11n(HT40 MIMO)

Full Spectrum



	Preview Result 2-AVG		Preview Result 1-PK+		Critical_Freqs AVG
	Critical_Freqs PK+		PK.74		AV54
	Final_Result PK+		Final_Result AVG		

Frequency Range: 18GHz-26GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11n(HT40 MIMO)

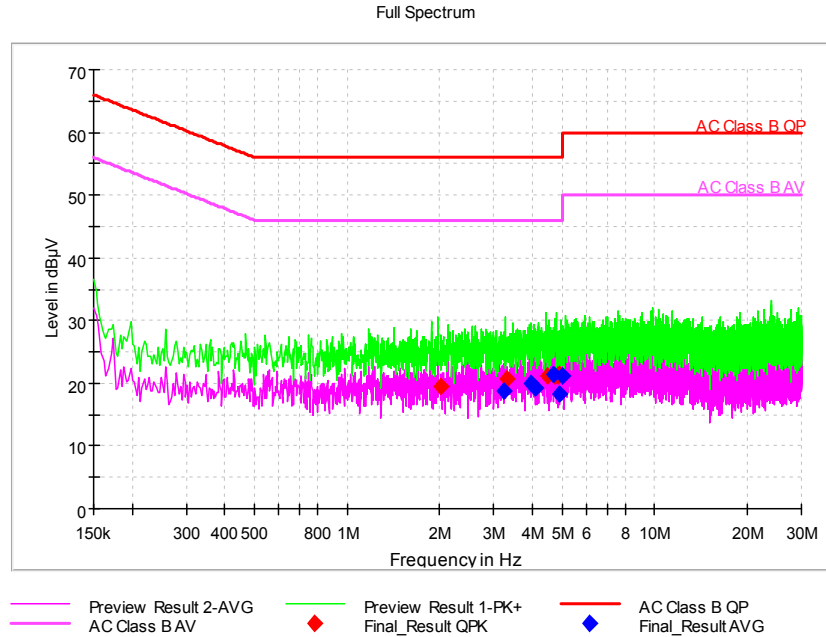
DC Power line Conducted Emission

A “reference path loss” Corr.(dB) is established and the $L_{cable}+ATT+VDF$ is the attenuation of “reference path loss”, and including the cable loss, the attenuation of the attenuator, the voltage division factor of AMN.

The measurement results are obtained as described below:

$$P_{result} = P_{mea} + Corr.(dB)$$

Sample calculation: $(19.58 \text{ dB}\mu\text{V}) = (15.49 \text{ dB}\mu\text{V}) + (-10.82 \text{ dB})$, the corresponding frequency is 2.024805MHz.



L+N Line

MEASUREMENT RESULT:

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	Pme a Quas iPea k (dBu)	Pme a Aver age (dBµ V)
2.024805	19.58	---	56.00	36.42	N	30.4	-10.8	---
3.251250	---	18.85	46.00	27.15	N	30.4	---	-11.5
3.299250	20.77	---	56.00	35.23	N	30.4	-9.63	---
3.960070	---	19.90	46.00	26.10	N	30.4	---	-10.5
4.106335	---	19.31	46.00	26.69	N	30.4	---	-11.0
4.467460	21.12	---	56.00	34.88	N	30.4	-9.28	---
4.697960	---	21.40	46.00	24.60	L3	30.4	---	-9
4.766020	21.17	---	56.00	34.83	L3	30.4	-9.23	---
4.860555	21.18	---	56.00	34.82	L3	30.4	-9.22	---
4.909895	21.49	---	56.00	34.51	L3	30.4	-8.91	---
4.911865	---	18.34	46.00	27.66	N	30.4	---	-12.0
5.013715	---	21.05	50.00	28.95	N	30.4	---	-9.35

---End of the test report---