FCC / ISED Test Report

For:
Rosemount Aerospace, Inc.

Model Name:
8910B1-11

Product Description:
Wireless Transceiver Module

FCC ID: 2AEAK8910B1-11
ISED: 12766A-8910B111

Applied Rules and Standards:
47 CFR Part 15.247 (DTS)
RSS-247 Issue 2 (DTSs) & RSS-Gen Issue 5

REPORT #: EMC_UTCAE_035_23001_15_247_WIFI_DTS_Rev1

DATE: 2024-04-19

A2LA Accredited

IC recognized #
3462B

***CETECOM* Inc.**
411 Dixon Landing Road ◆ Milpitas, CA 95035 ◆ U.S.A.
Phone: + 1 (408) 586 6200 ◆ Fax: + 1 (408) 586 6299 ◆ E-mail: info@cetecom.com ◆ http://www.cetecom.com
CETECOM Inc. is a Delaware Corporation with Corporation number: 2905571

TABLE OF CONTENTS

1 Assessment

The following device was evaluated against the applicable criteria specified in FCC rules Parts 15.247 of Title 47 of the Code of Federal Regulations and the relevant ISED Canada standard RSS-247.

No deviations were ascertained.

Company	Description	Model #
Rosemount Aerospace, Inc.	Wireless Transceiver Module	8910B1-11

Responsible for the Report:

Date	Section	Name	Signature
2024-04-19	Compliance	Art Thammanavarat (Senior EMC Engineer)	art. thammanavarat @cetecom.com Digitally signed by: art. thammanavarat@cetecom.com DN: CN = art. thammanavarat@cetecom.com Date: 2024.04.19 16:45:04 -07'00'

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the EMC Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Street Address:	411 Dixon Landing Road
City/Zip Code	Milpitas, CA 95035
Country	USA
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
EMC Lab Manager:	Issa Ghama
Responsible Project Leader:	Rami Saman

2.2 Identification of the Client

Client Firm/Name:	Rosemount Aerospace, Inc.
Street Address:	14300 Judicial Road
City/Zip Code	Burnsville, MN 55306
Country	USA

2.3 Identification of the Manufacturer

Manufacturer's Name:	Same as Client
Manufacturers Address:	
City/Zip Code	
Country	

3 Equipment Under Test (EUT)

3.1 EUT Specifications

Model No:	8910B1-11
HW Version :	08910-0013-0011
SW Version :	08910-1011-0001
FCC-ID :	2AEAK8910B1-11
ISED:	12766A-8910B111
Product Description:	Wireless Transceiver Module
Frequency Range / number of channels:	Nominal band: 2400 MHz – 2483.5 MHz; Center to center: 2412 MHz (ch 1) – 2462 MHz (ch 11), 11 channels
Radio Information:	WLAN (WiFi): • Module Name: RMTAERO M.2 WTM 802.11 • Module Number: 8910B1-11 • Modes of Operation: 802.11b,g,n
Antenna Information as declared:	Frequency Range: 2400 – 2500 MHz Antenna gain SMA Dipole Antenna: 2.1 dBi Integrated Antenna Adapter: 5.7 dBi PCB Trace Antenna: 2.03 dBi
Max. Conducted Output Power:	Peak measurement: 17.88 dBm Average measurement: 14.01 dBm
Power Supply/ Rated Operating Voltage Range:	3.3 VDC nominal (2.7VDC to 3.4VDC)
Operating Temperature Range	-40 °C to +85 °C
Other Radios included in the device:	No
EUT Dimensions	30mm x 30mm x 4.6mm
Weight	6.8 grams
Sample Revision	■Production Unit; ☐Pre-Production

3.2 EUT Sample details

EUT #	Serial Number	HW Version	SW Version	Notes/Comments
1	8910B1-11-00009	08910-0013-0011	08910-1011-0001	-

3.3 Accessory Equipment (AE) details

AE #	Equipment Description	Manufacturer	Part Number	Serial Number
1	Surface Pro Tablet PC w/ Power Supply	Microsoft	1796	027837185253
2	WTM Breakout Card	Collins Aerospace	BTR-57638	0009
3	USB Serial Interface Cable	FTDI	TTL-234X-3V3	N/A
4	U.FL Antenna Cable	Wurth Electronik	636201070250	N/A
5	SMA Dipole Antenna	TE Connectivity	MAF94271	N/A
6	PCB Trace Antenna	Ethertronics/AVX	1001932PT-AA10L0100	N/A
7	Integrated Antenna Adapter w/ WTM (Collins software)	Collins Aerospace	08910-0001-0011	DI2112877

3.4 Test Sample Configuration

EUT Set-up #	Combination of AE used for test set up	Comments
1	EUT#1+AE#1,2,3,4,5	The radio of the EUT was configured to a fixed channel transmission with highest possible duty cycle using software that is not available to the end user. The external antenna was connected.
2	EUT#1+AE#1,2,3,4,6	The radio of the EUT was configured to a fixed channel transmission with highest possible duty cycle using software that is not available to the end user. The external antenna was connected.
3	EUT#1+AE#1,2,3,4,7	The radio of the EUT was configured to a fixed channel transmission with highest possible duty cycle using software that is not available to the end user. The external antenna was connected.

3.5 Justification for Worst Case Mode of Operation

During the testing process, the EUT was tested with transmitter sets on low, mid and high channels, and highest possible duty cycle. For radiated measurements, all data in this report show the worst case between horizontal and vertical antenna polarizations and for all orientations of the EUT.

The channels and modulation schemes of the EUT were set with highest Duty Cycle possible using diagnostic software (not available to the end user).

4 Subject of Investigation

The objective of the measurements done by CETECOM Inc. was to assess the performance of the EUT according to the relevant requirements specified in FCC rules Part 15.247 of Title 47 of the Code of Federal Regulations and Radio Standard Specification RSS-247 of ISED Canada.

This test report is to support a request for new equipment authorization under the FCC ID: 2AEAK8910B1-11 ISED: 12766A-8910B111.

Testing procedures are based on 558074 D01 15.247 Meas Guidance v05r02 – "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" - April 2, 2019, by the Federal Communications Commission, Office of Engineering and Technology, Laboratory Division.

5 Measurement Results Summary

Test Specification	Test Case	Temperature and Voltage Conditions	Mode	Pass	NA	NP	Result
§15.247(a)(1) RSS-247 5.2(a)	Emission Bandwidth	Nominal	802.11b,g,n	■	☐	☐	Complies
§15.247(e) RSS-247 5.2(b)	Power Spectral Density	Nominal	802.11b,g,n	■	☐	☐	Complies
§15.247(b)(1) RSS-247 5.4(d)	Maximum Conducted Output Power and EIRP	Nominal	802.11b,g,n	■	☐	☐	Complies
§15.247(d) RSS-247 5.5	Band edge compliance Unrestricted Band Edges	Nominal	802.11b,g,n	■	☐	☐	Complies
§15.247; 15.209; 15.205 RSS-Gen 8.9; 8.10	Band edge compliance Restricted Band Edges	Nominal	802.11b,g,n	■	☐	☐	Complies
§15.247(d); §15.209 RSS-Gen 6.13	TX Spurious emissions-Radiated	Nominal	802.11g	■	☐	☐	Complies
§15.207(a) RSS Gen 8.8	AC Conducted Emissions	Nominal	802.11g	■	☐	☐	Complies

Note: NA= Not Applicable; NP= Not Performed.

6 Measurement Uncertainty

6.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus, with 95% confidence interval (in dB delta to result), based on a coverage factor k=2.

Measurement System		EMC 1	EMC 2
Conducted emissions (mains port)		1.12 dB	0.46 dB
Radiated emissions	(< 30 MHz)	3.66 dB	3.88 dB
	(30 MHz – 1GHz)	3.17 dB	3.34 dB
	(1 GHz – 3 GHz)	5.01 dB	4.45 dB
	(>3 GHz)	4.0 dB	4.79 dB

6.2 Environmental Conditions during Testing:

The following environmental conditions were maintained during the course of testing:

- Ambient Temperature: 20-25°C
- Relative humidity: 40-60%

Deviating test conditions are indicated at individual test description where applicable.+

6.3 Date of Testing:

2023-05-22 – 2024-04-04

6.4 Decision Rule:

Cetecom advanced follows ILAC G8:2019 chapter 4.2.1 (Simple Acceptance Rule).

Only the measured values related to their corresponding limits will be used to decide whether the equipment under test meets the requirements of the test standards listed in chapter 3. The measurement uncertainty is mentioned in this test report, See chapter 9, but is not taken into account – neither to the limits nor to the measurement results. Measurement results with a smaller margin to the corresponding limits than the measurement uncertainty have a potential risk of more than 5% that the decision might be wrong.

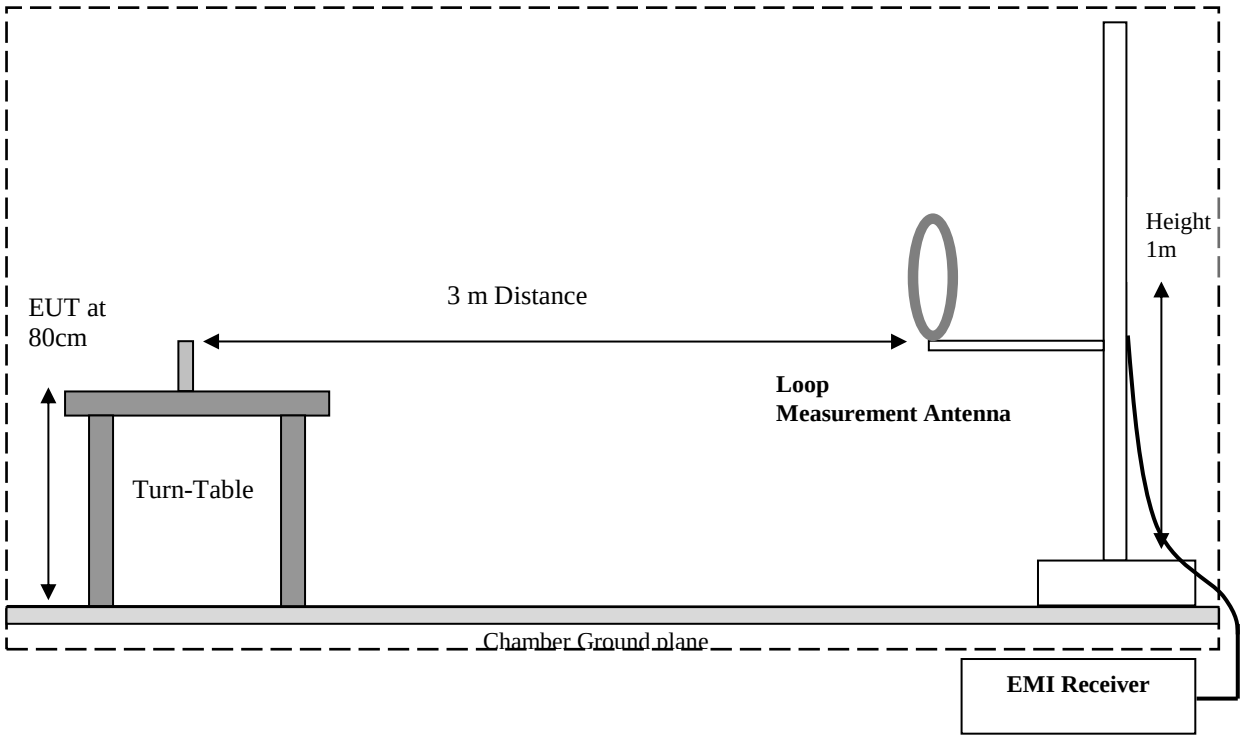
7 Measurement Procedures

7.1 Radiated Measurement

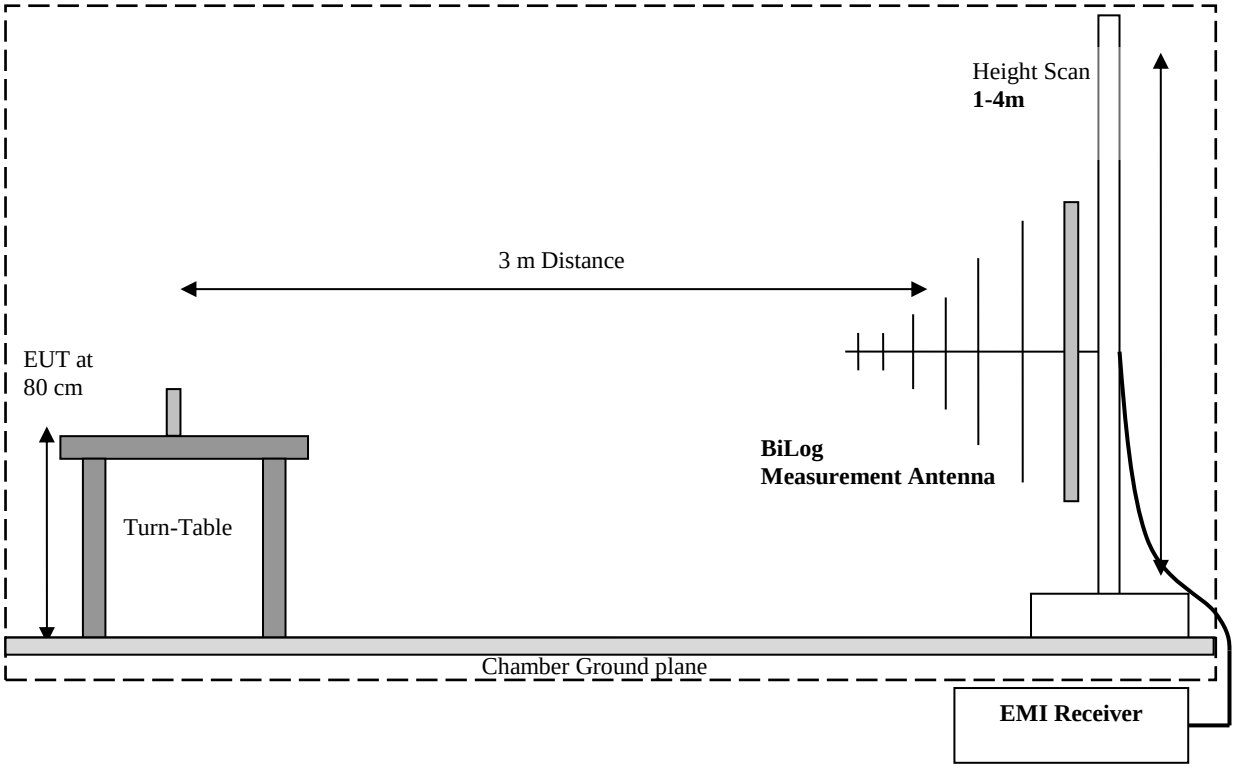
The radiated measurement is performed according to ANSI C63.10 (2013)

- The exploratory measurement is accomplished by running a matrix of 16 sweeps over the required frequency range with R&S Test-SW EMC32 for 4 positions of the turntable, two orthogonal positions of the EUT and both antenna polarizations. This procedure exceeds the requirement of the above standards to cover the 3 orthogonal axis of the EUT. A max peak detector is utilized during the exploratory measurement. The Test-SW creates an overall maximum trace for all 12 sweeps and saves the settings for each point of this trace. The maximum trace is part of the test report.
- The 10 highest emissions are selected with an automatic algorithm of EMC32 searching for peaks in the noise floor and ensuring that broadband signals are not selected multiple times.
- The maxima are then put through the final measurement and again maximized in a 90deg range of the turntable, fine search in frequency domain and height scan between 1m and 4m.
- The above procedure is repeated for all possible ways of power supply to EUT and for all supported modulations.
- In case there are no emissions above noise floor level only the maximum trace is reported as described above.
- The results are split up into up to 4 frequency ranges due to antenna bandwidth restrictions. A magnetic loop is used from 9 kHz to 30 MHz, a Biconilog antenna is used from 30 MHz to 1 GHz, and two different horn antennas are used to cover frequencies up to 40 GHz.

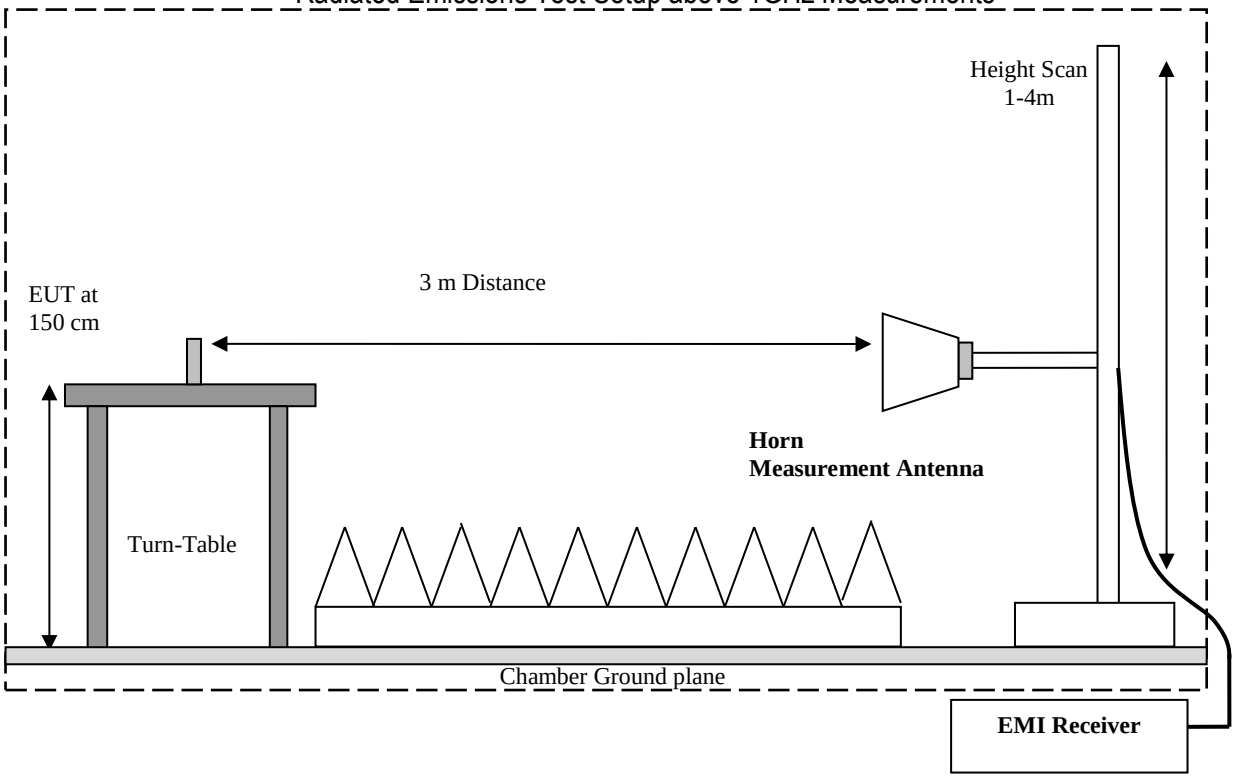
Radiated Emissions Test Setup below 30MHz Measurements



Radiated Emissions Test Setup 30MHz-1GHz Measurements



Radiated Emissions Test Setup above 1GHz Measurements



7.1.1 Sample Calculations for Field Strength Measurements

Field Strength is calculated from the Spectrum Analyzer/ Receiver readings, taking into account the following parameters:

1. Measured reading in dBµV
2. Cable Loss between the receiving antenna and SA in dB and
3. Antenna Factor in dB/m

All radiated measurement plots in this report are taken from a test SW that calculates the Field Strength based on the following equation:

FS (dBµV/m) = Measured Value on SA (dBµV) + Cable Loss (dB) + Antenna Factor (dB/m)

Example:

Frequency (MHz)	Measured SA (dBµV)	Cable Loss (dB)	Antenna Factor Correction (dB)	Field Strength Result (dBµV/m)
1000	80.5	3.5	14	98.0

7.2 Power Line Conducted Measurement Procedure

AC Power Line conducted emissions measurements performed according to: ANSI C63.4 (2014)

8 Test Result Data

8.1 Maximum Conducted (Average) Output Power

8.1.1 Measurement according to FCC 558074 D01 15.247 Meas Guidance v05r02

Spectrum Analyzer settings:

- RBW = 1% to 5% of the OBW, not to exceed 1 MHz
- VBW ≥ 3 x RBW
- Span = at least 1.5 times the OBW
- Sweep = Auto couple
- Detector function = RMS
- Trace = Average (at least 100 traces in power averaging (rms) mode)
- Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function with band limits set equal to the OBW band edges
- Add [10 log (1 / D)], where D is the duty cycle, to the measured power to compute the average power during the actual transmission times

8.1.2 Limits:

Maximum Output Power:

- FCC §15.247 (b)(1): 1 W
- IC RSS-247: 1 W

8.1.3 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input	Antenna Gain
23.8°C	1	802.11b,g,n	3.3 VDC	2.10 dBi
	2	802.11b,g,n	3.3 VDC	2.03 dBi
	3	802.11b,g,n	3.3 VDC	5.70 dBi

8.1.4 Measurement result for Peak power

SMA Dipole Antenna

Plot #	Frequency (MHz)	EUT Operating Mode	Peak Output Power (dBm)	EIRP (dBm)	Limit (dBm)	Result
1	2412	802.11b	16.20	18.30	30 (Avg) / 36 (EIRP)	Pass
2	2437	802.11b	16.73	18.83	30 (Avg) / 36 (EIRP)	Pass
3	2462	802.11b	16.89	18.99	30 (Avg) / 36 (EIRP)	Pass
4	2412	802.11g	13.07	15.17	30 (Avg) / 36 (EIRP)	Pass
5	2437	802.11g	**17.88**	**19.98**	30 (Avg) / 36 (EIRP)	Pass
6	2462	802.11g	13.46	15.56	30 (Avg) / 36 (EIRP)	Pass
7	2412	802.11n HT20	13.34	15.44	30 (Avg) / 36 (EIRP)	Pass
8	2437	802.11n HT20	16.58	18.68	30 (Avg) / 36 (EIRP)	Pass
9	2462	802.11n HT20	13.30	15.40	30 (Avg) / 36 (EIRP)	Pass

PCB Trace Antenna

Plot #	Frequency (MHz)	EUT Operating Mode	Peak Output Power (dBm)	EIRP (dBm)	Limit (dBm)	Result
1	2412	802.11b	16.20	18.23	30 (Avg) / 36 (EIRP)	Pass
2	2437	802.11b	16.73	18.76	30 (Avg) / 36 (EIRP)	Pass
3	2462	802.11b	16.89	18.92	30 (Avg) / 36 (EIRP)	Pass
4	2412	802.11g	13.07	15.10	30 (Avg) / 36 (EIRP)	Pass
5	2437	802.11g	**17.88**	**19.91**	30 (Avg) / 36 (EIRP)	Pass
6	2462	802.11g	13.46	15.49	30 (Avg) / 36 (EIRP)	Pass
7	2412	802.11n HT20	13.34	15.37	30 (Avg) / 36 (EIRP)	Pass
8	2437	802.11n HT20	16.58	18.61	30 (Avg) / 36 (EIRP)	Pass
9	2462	802.11n HT20	13.30	15.33	30 (Avg) / 36 (EIRP)	Pass

Integrated Antenna

Plot #	Frequency (MHz)	EUT Operating Mode	Peak Output Power (dBm)	EIRP (dBm)	Limit (dBm)	Result
1	2412	802.11b	16.20	21.90	30 (Avg) / 36 (EIRP)	Pass
2	2437	802.11b	16.73	22.43	30 (Avg) / 36 (EIRP)	Pass
3	2462	802.11b	16.89	22.59	30 (Avg) / 36 (EIRP)	Pass
4	2412	802.11g	13.07	18.77	30 (Avg) / 36 (EIRP)	Pass
5	2437	802.11g	**17.88**	**23.58**	30 (Avg) / 36 (EIRP)	Pass
6	2462	802.11g	13.46	19.16	30 (Avg) / 36 (EIRP)	Pass
7	2412	802.11n HT20	13.34	19.04	30 (Avg) / 36 (EIRP)	Pass
8	2437	802.11n HT20	16.58	22.28	30 (Avg) / 36 (EIRP)	Pass
9	2462	802.11n HT20	13.30	19.00	30 (Avg) / 36 (EIRP)	Pass

8.1.5 Measurement result for Average power

SMA Dipole Antenna

Plot #	Frequency (MHz)	EUT Operating Mode	Average Output Power (dBm)	EIRP (dBm)	Limit (dBm)	Result
10	2412	802.11b	13.17	15.27	30 (Avg) / 36 (EIRP)	Pass
11	2437	802.11b	13.65	15.75	30 (Avg) / 36 (EIRP)	Pass
12	2462	802.11b	**14.01**	**16.11**	30 (Avg) / 36 (EIRP)	Pass
13	2412	802.11g	7.88	9.98	30 (Avg) / 36 (EIRP)	Pass
14	2437	802.11g	12.60	14.70	30 (Avg) / 36 (EIRP)	Pass
15	2462	802.11g	8.60	10.70	30 (Avg) / 36 (EIRP)	Pass
16	2412	802.11n HT20	7.63	9.73	30 (Avg) / 36 (EIRP)	Pass
17	2437	802.11n HT20	11.37	13.47	30 (Avg) / 36 (EIRP)	Pass
18	2462	802.11n HT20	8.46	10.56	30 (Avg) / 36 (EIRP)	Pass

PCB Trace Antenna

Plot #	Frequency (MHz)	EUT Operating Mode	Average Output Power (dBm)	EIRP (dBm)	Limit (dBm)	Result
10	2412	802.11b	13.17	15.20	30 (Avg) / 36 (EIRP)	Pass
11	2437	802.11b	13.65	15.68	30 (Avg) / 36 (EIRP)	Pass
12	2462	802.11b	**14.01**	**16.04**	30 (Avg) / 36 (EIRP)	Pass
13	2412	802.11g	7.88	9.91	30 (Avg) / 36 (EIRP)	Pass
14	2437	802.11g	12.60	14.63	30 (Avg) / 36 (EIRP)	Pass
15	2462	802.11g	8.60	10.63	30 (Avg) / 36 (EIRP)	Pass
16	2412	802.11n HT20	7.63	9.66	30 (Avg) / 36 (EIRP)	Pass
17	2437	802.11n HT20	11.37	13.40	30 (Avg) / 36 (EIRP)	Pass
18	2462	802.11n HT20	8.46	10.49	30 (Avg) / 36 (EIRP)	Pass

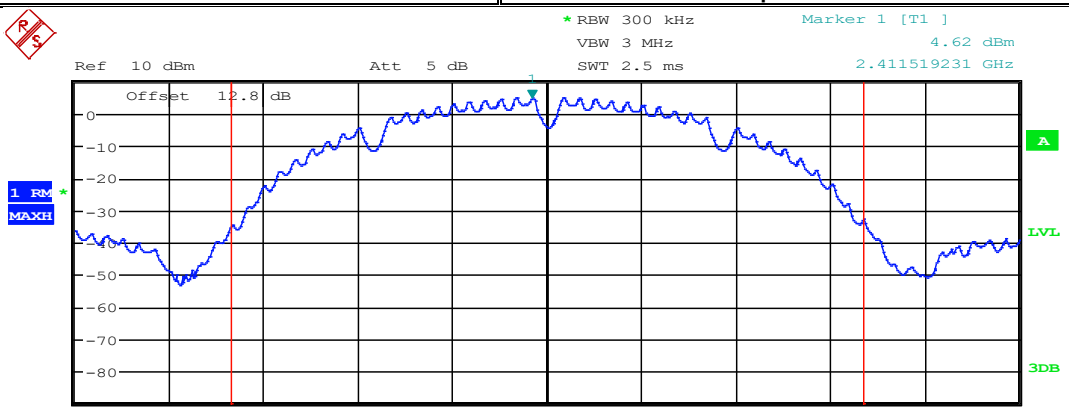
Integrated Antenna

Plot #	Frequency (MHz)	EUT Operating Mode	Average Output Power (dBm)	EIRP (dBm)	Limit (dBm)	Result
10	2412	802.11b	13.17	18.87	30 (Avg) / 36 (EIRP)	Pass
11	2437	802.11b	13.65	19.35	30 (Avg) / 36 (EIRP)	Pass
12	2462	802.11b	**14.01**	**19.71**	30 (Avg) / 36 (EIRP)	Pass
13	2412	802.11g	7.88	13.58	30 (Avg) / 36 (EIRP)	Pass
14	2437	802.11g	12.60	18.30	30 (Avg) / 36 (EIRP)	Pass
15	2462	802.11g	8.60	14.30	30 (Avg) / 36 (EIRP)	Pass
16	2412	802.11n HT20	7.63	13.33	30 (Avg) / 36 (EIRP)	Pass
17	2437	802.11n HT20	11.37	17.07	30 (Avg) / 36 (EIRP)	Pass
18	2462	802.11n HT20	8.46	14.16	30 (Avg) / 36 (EIRP)	Pass

8.1.6 Measurement Plots:

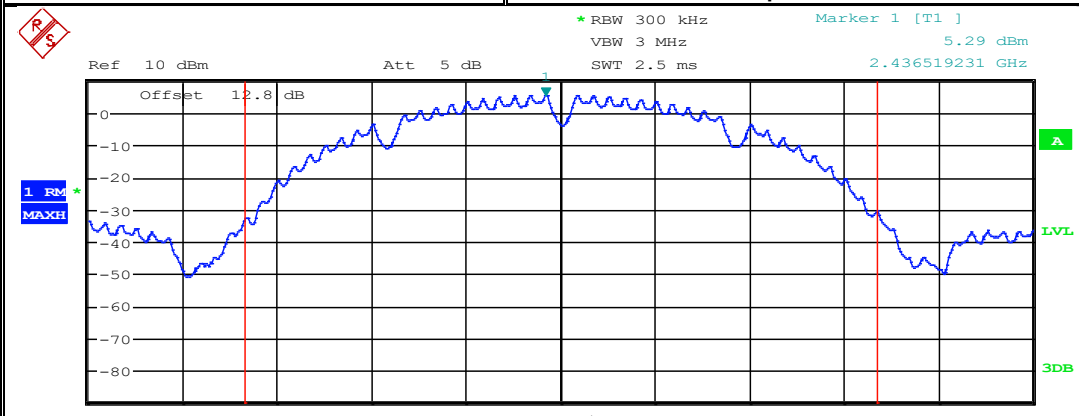
Plot #1

Low channel / 2412 MHz	Mode of Operation: 802.11b



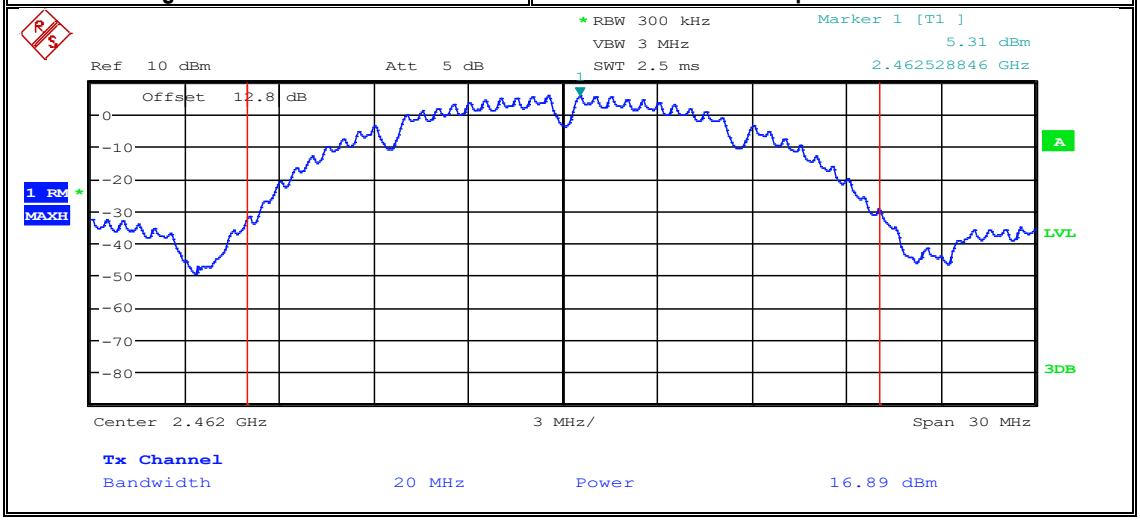
Plot #2

Mid channel / 2437 MHz	Mode of Operation: 802.11b



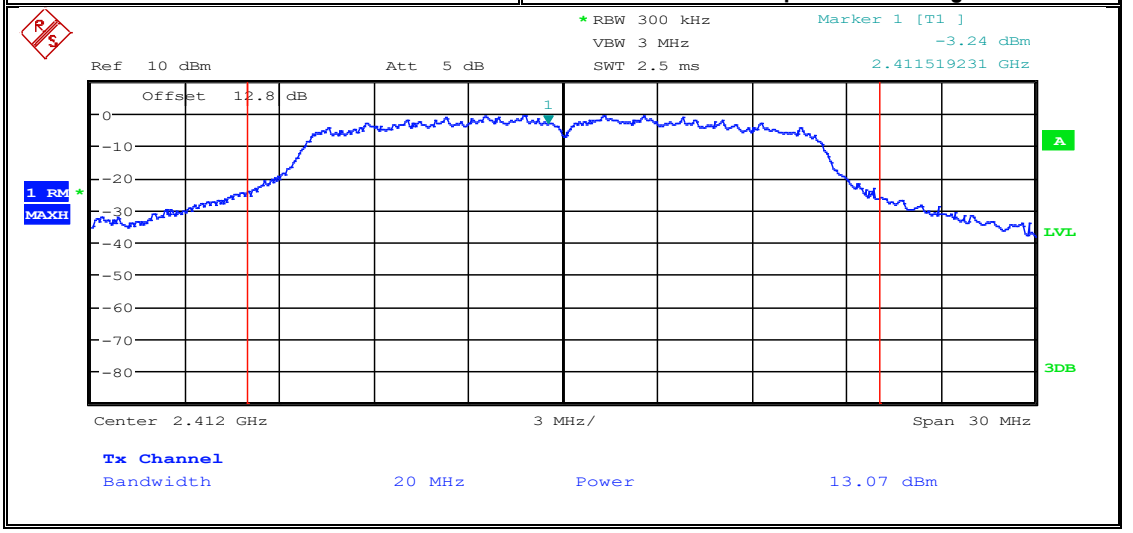
Plot #3

High channel / 2462 MHz	Mode of Operation: 802.11b



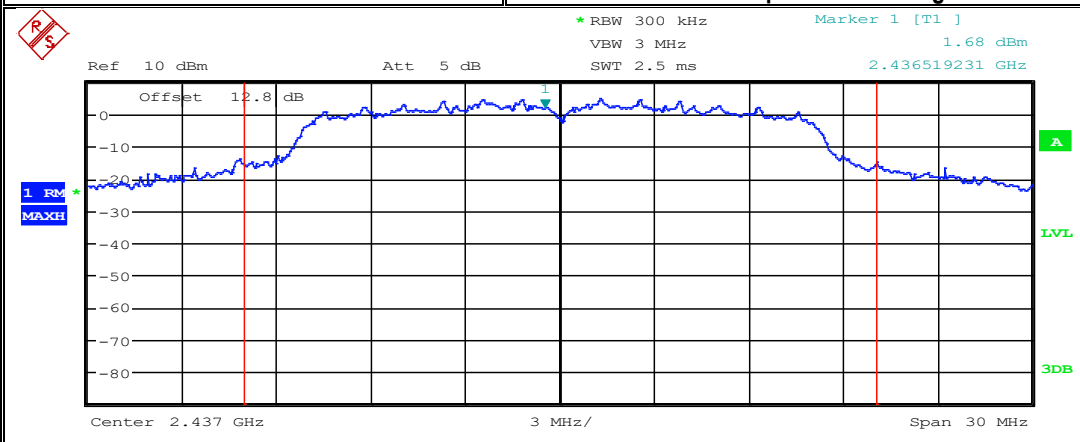
Plot #4

Low channel / 2412 MHz	Mode of Operation: 802.11g



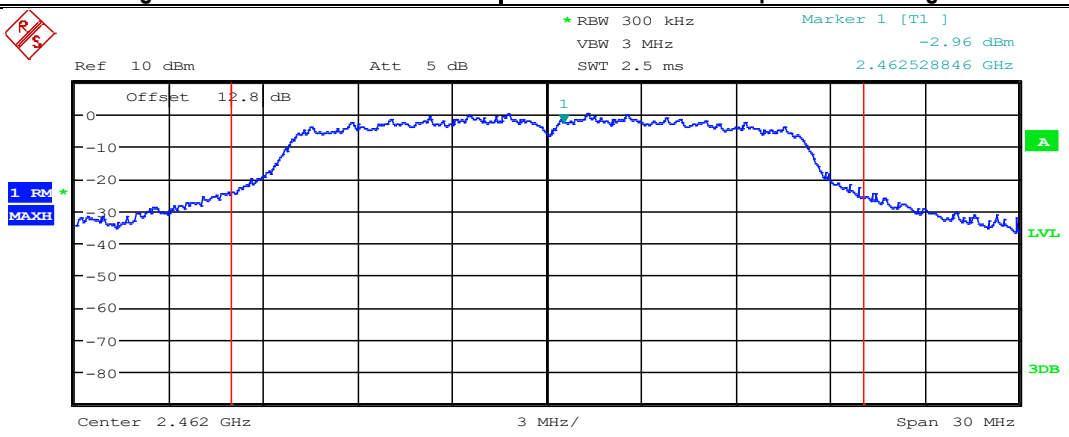
Plot #5

Mid channel / 2437 MHz	Mode of Operation: 802.11g



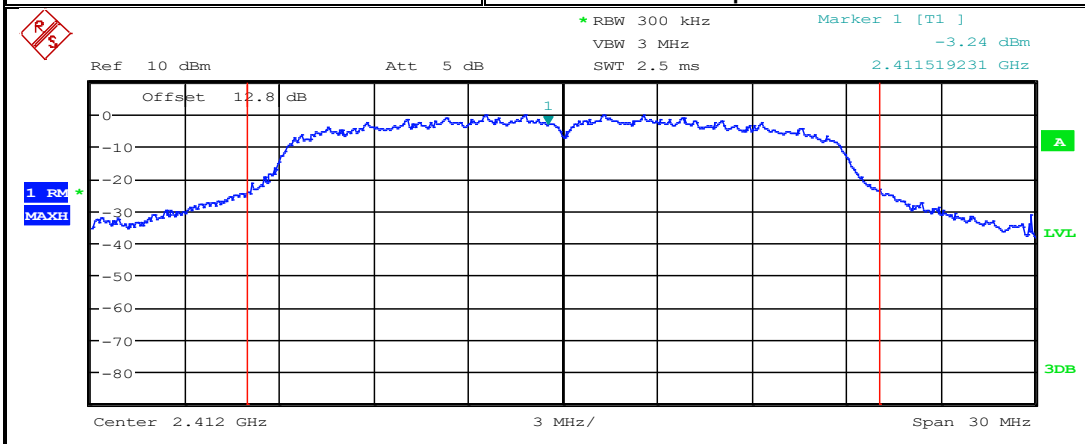
Plot #6

High channel / 2462 MHz	Mode of Operation: 802.11g



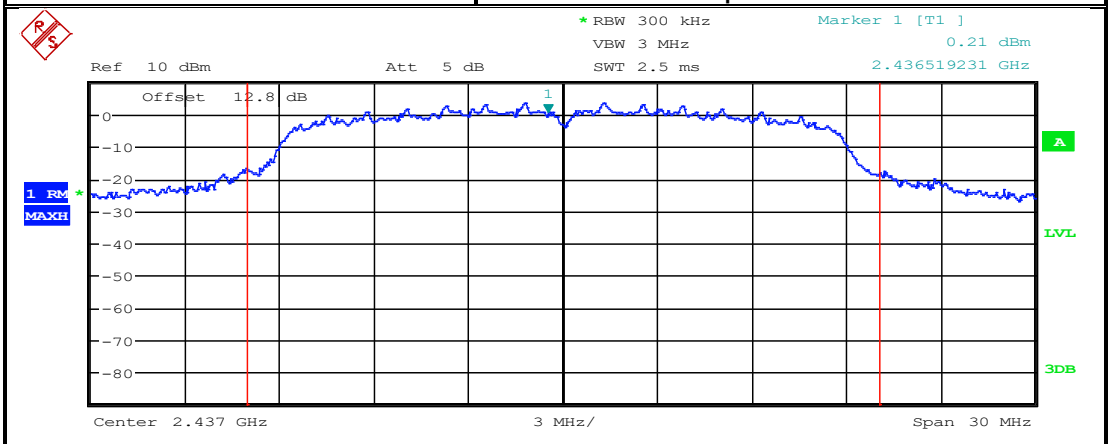
Plot #7

Low channel / 2412 MHz	Mode of Operation: 802.11n HT20



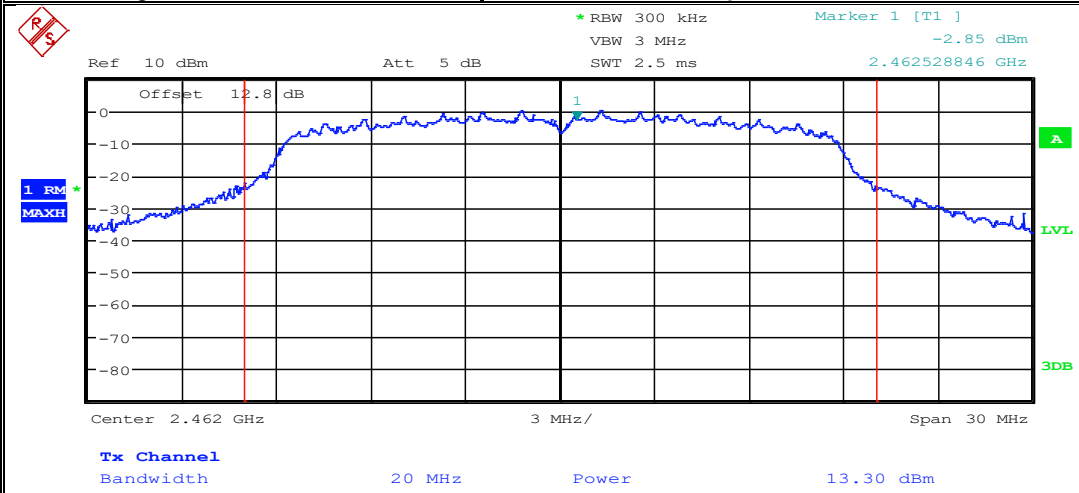
Plot #8

Mid channel / 2437 MHz	Mode of Operation: 802.11n HT20



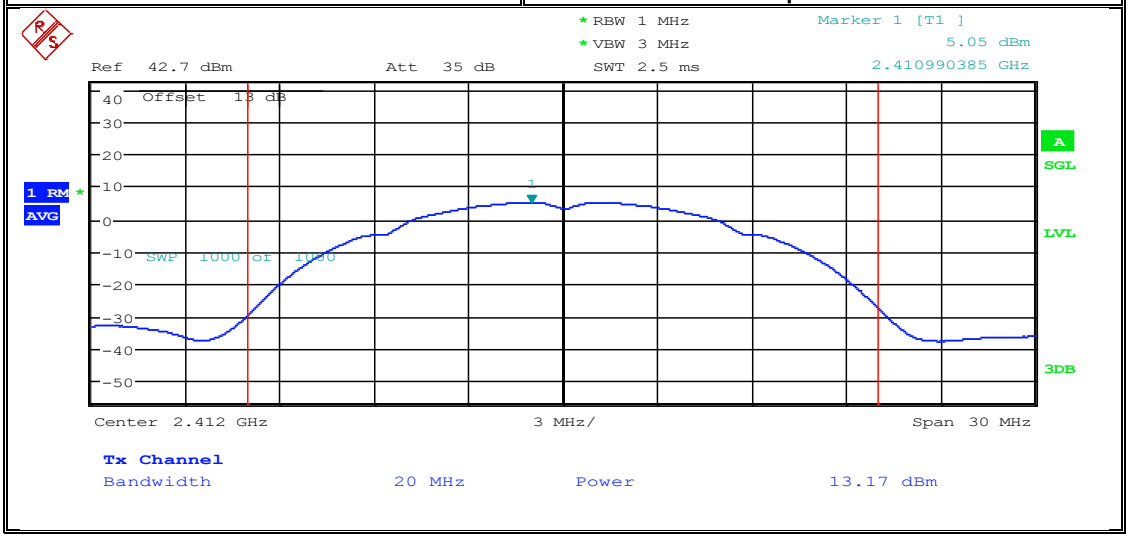
Plot #9

High channel / 2462 MHz	Mode of Operation: 802.11n HT20



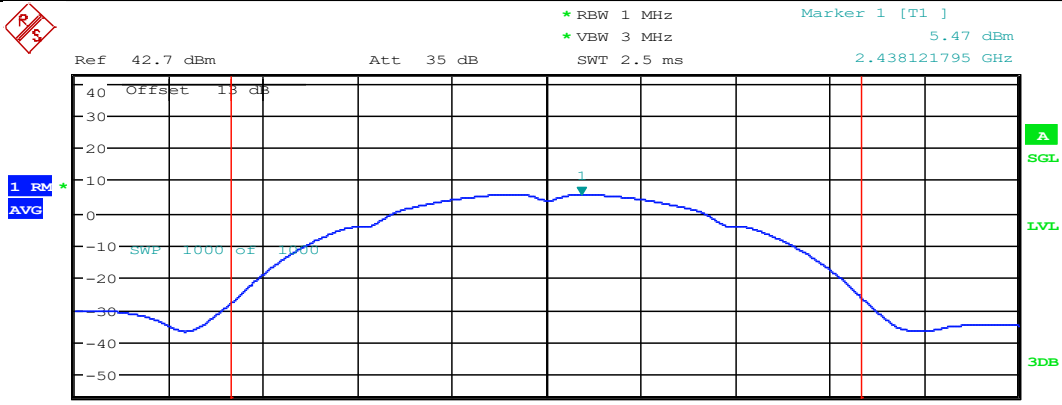
Plot #10

Low channel / 2412 MHz	Mode of Operation: 802.11b



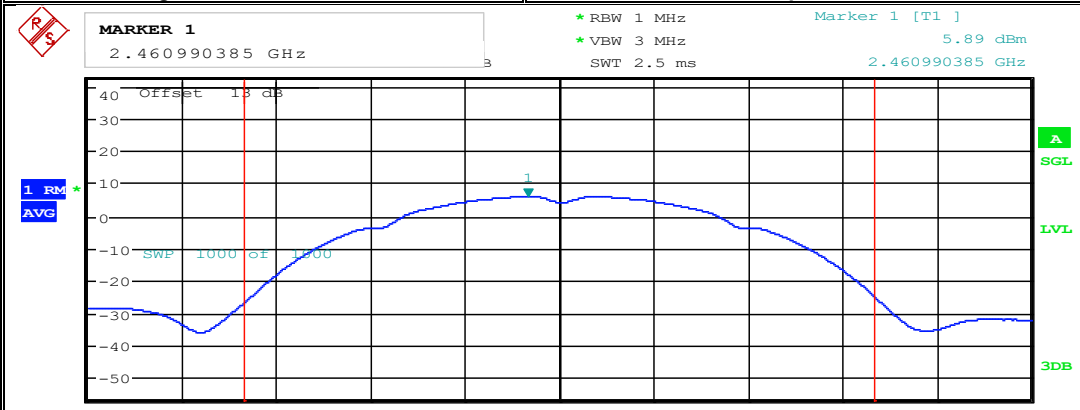
Plot #11

Mid channel / 2437 MHz	Mode of Operation: 802.11b



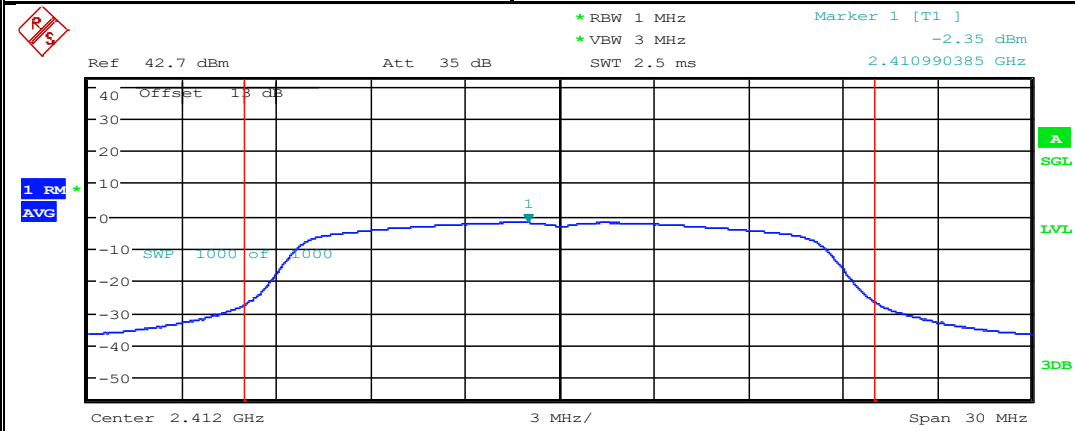
Plot #12

High channel / 2462 MHz	Mode of Operation: 802.11b



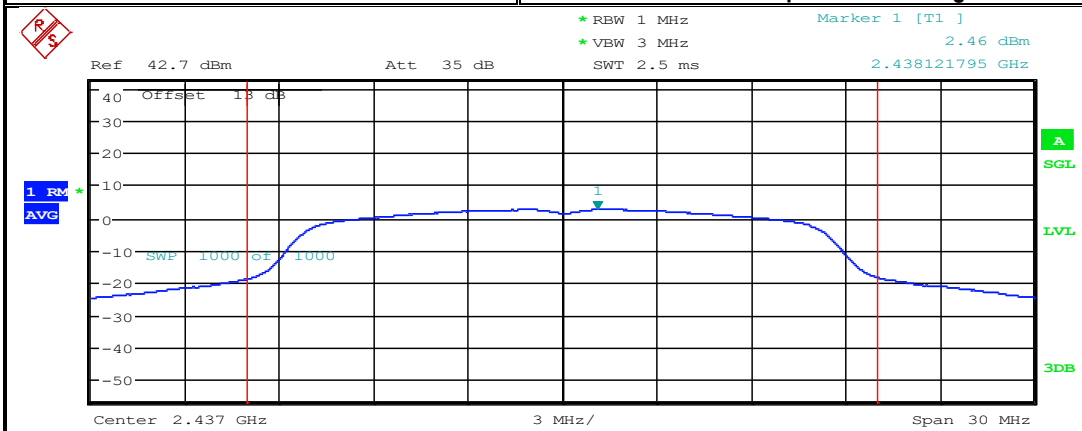
Plot #13

Low channel / 2412 MHz	Mode of Operation: 802.11g



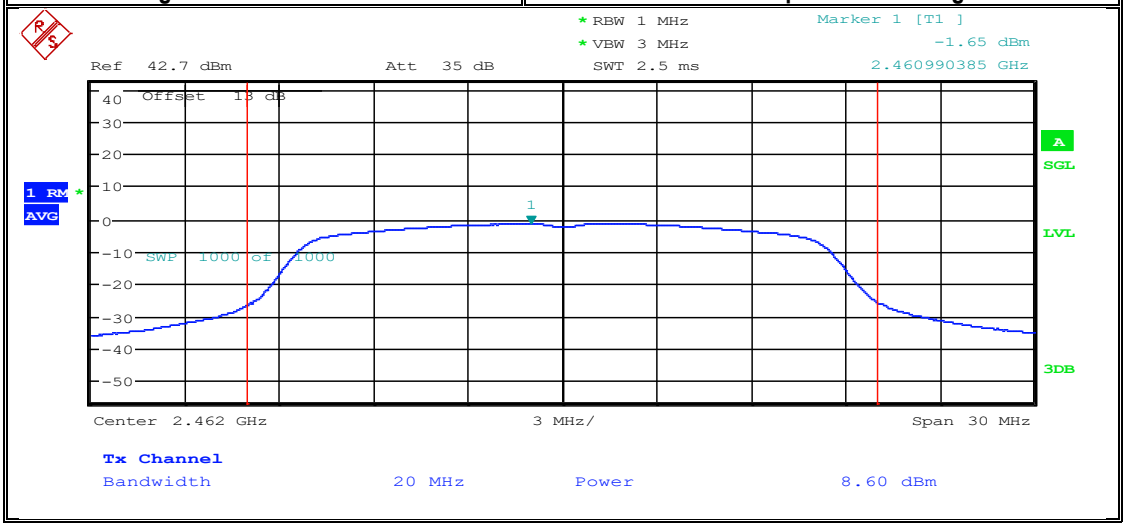
Plot #14

Mid channel / 2437 MHz	Mode of Operation: 802.11g



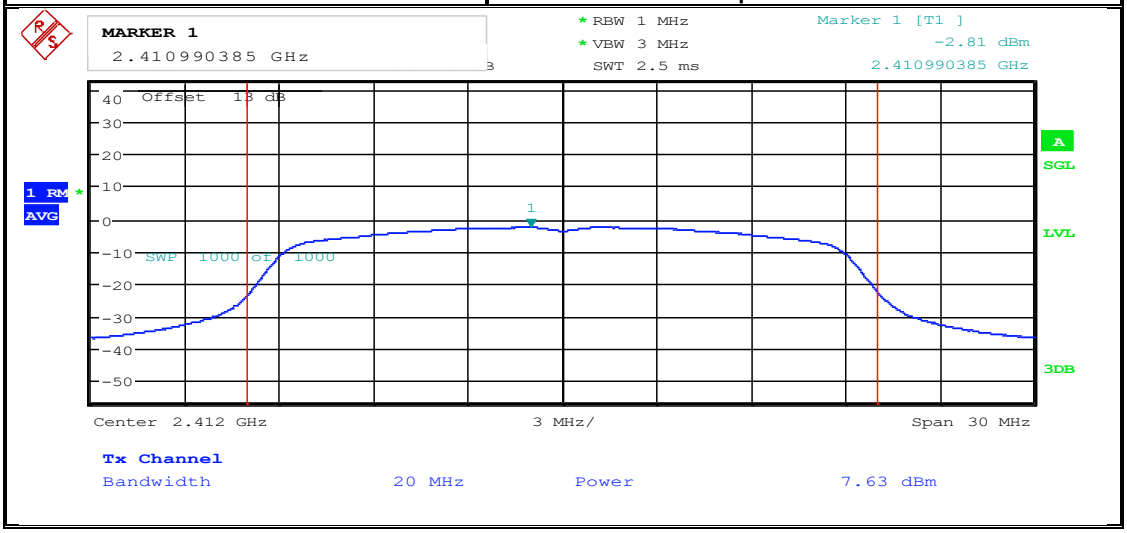
Plot #15

High channel / 2462 MHz	Mode of Operation: 802.11g



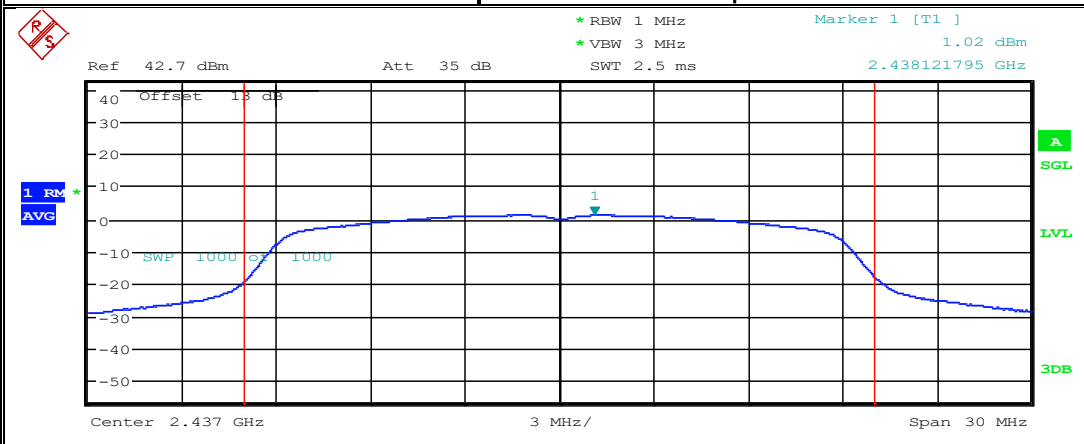
Plot #16

Low channel / 2412 MHz	Mode of Operation: 802.11n HT20



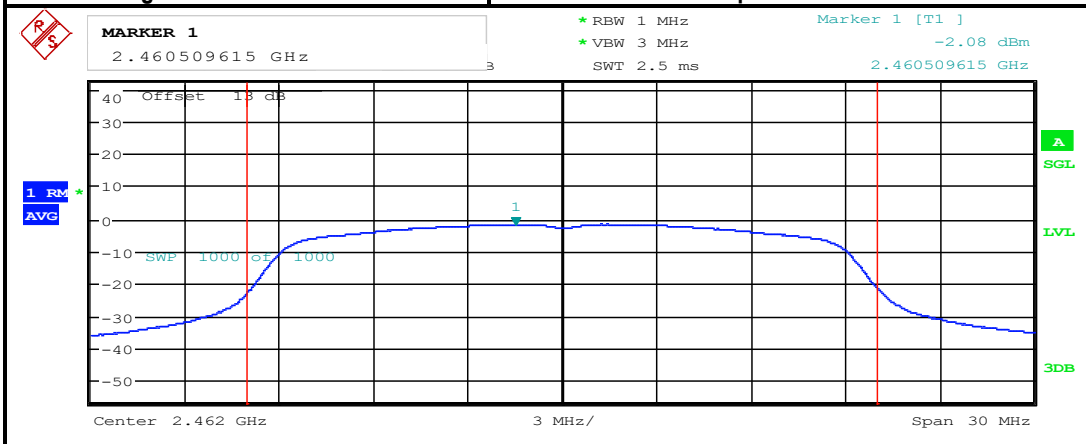
Plot #17

Mid channel / 2437 MHz	Mode of Operation: 802.11n HT20



Plot #18

High channel / 2462 MHz	Mode of Operation: 802.11n HT20



8.2 Power Spectral Density

8.2.1 Measurement according to FCC 558074 D01 15.247 Meas Guidance v05r02

Spectrum Analyzer settings for Peak PSD method:

- Set analyzer center frequency to DTS channel center frequency
- Set the span to 1.5 x OBW
- Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz
- Set the VBW ≥ 3 x RBW
- Detector = RMS
- Ensure that the number of measurement points in the sweep [2 × span / RBW].
- Sweep time = Auto couple
- Trace mode = Max hold
- Allow trace to fully stabilize
- Use the peak marker function to determine the maximum amplitude level.
- If the measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span to meet the minimum measurement point requirement as the RBW is reduced).

8.2.2 Limits:

FCC §15.247(e) & RSS-247 5.2(b):

- For digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

8.2.3 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input	Antenna Gain
23.8°C	1	802.11b,g,n	3.3 VDC	2.10 dBi
	2	802.11b,g,n	3.3 VDC	2.03 dBi
	3	802.11b,g,n	3.3 VDC	5.70 dBi

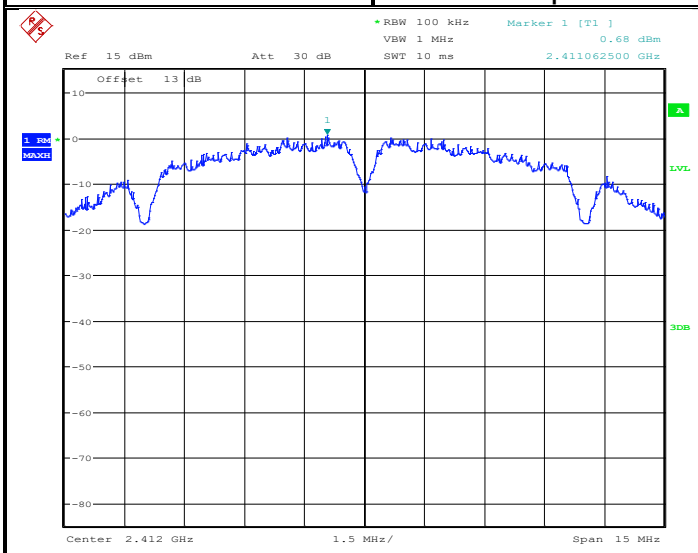
8.2.4 Measurement result :

Plot #	Frequency (MHz)	EUT Operating Mode	PSD (dBm / 3 kHz)	Limit (dBm / 3 kHz)	Result
1	2412	802.11b	0.68	8	Pass
2	2437	802.11b	1.36	8	Pass
3	2462	802.11b	1.56	8	Pass
4	2412	802.11g	-4.96	8	Pass
5	2437	802.11g	0.46	8	Pass
6	2462	802.11g	-4.44	8	Pass
7	2412	802.11n HT20	-5.53	8	Pass
8	2437	802.11n HT20	-0.84	8	Pass
9	2462	802.11n HT20	-4.55	8	Pass

8.2.5 Measurement Plots:

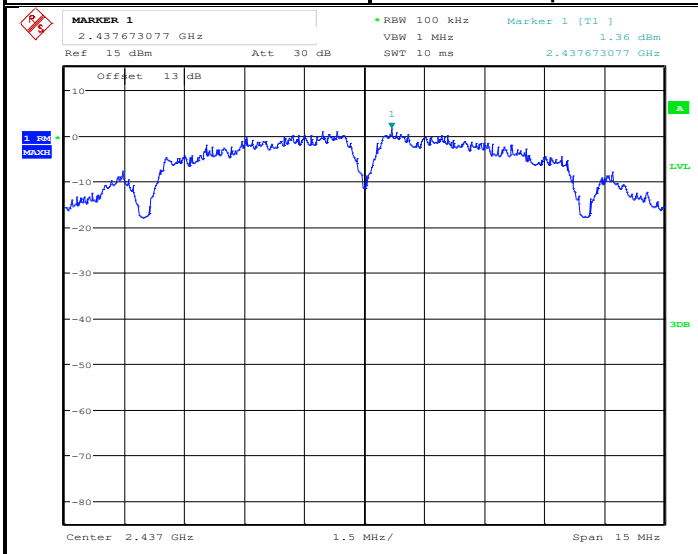
Plot #1

Low channel / 2412 MHz	Mode of Operation: 802.11b



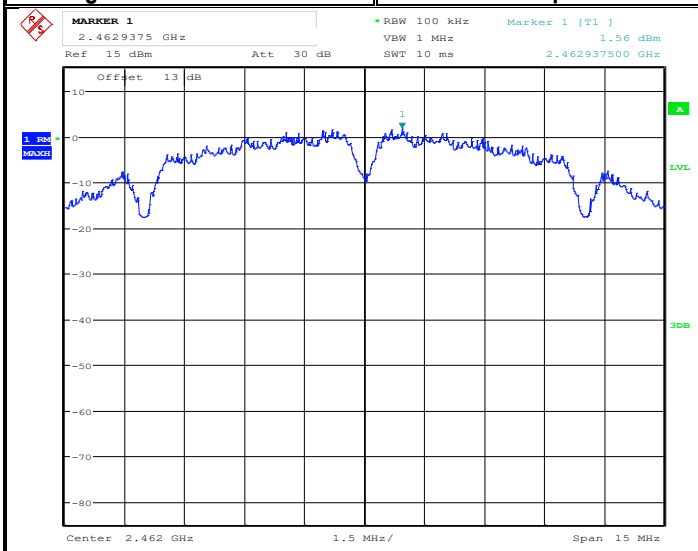
Plot #2

Mid channel / 2437 MHz	Mode of Operation: 802.11b



Plot #3

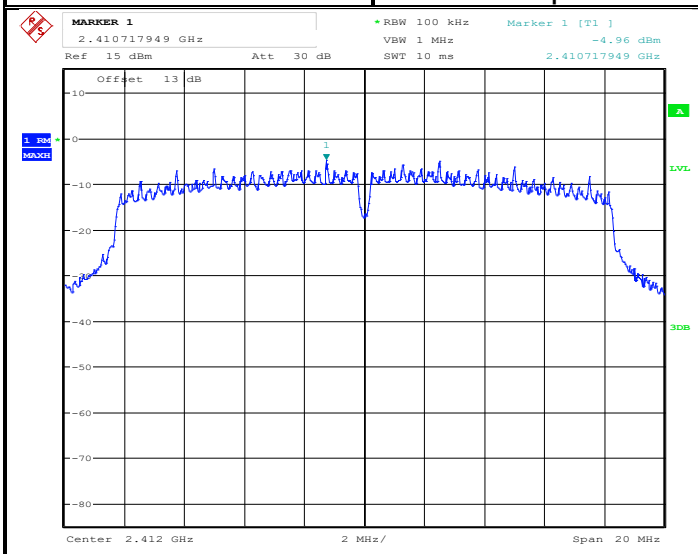
High channel / 2462 MHz	Mode of Operation: 802.11b



Date: 3.OCT.2023 10:38:56

Plot #4

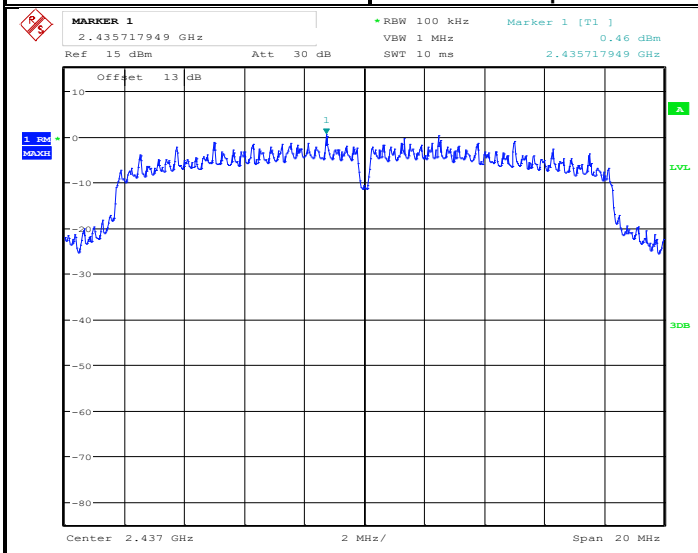
Low channel / 2412 MHz	Mode of Operation: 802.11g



Date: 3.OCT.2023 10:32:53

Plot #5

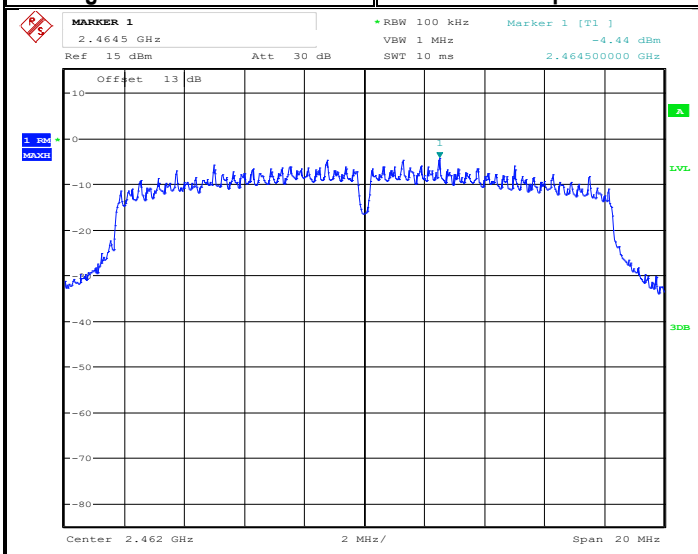
Mid channel / 2437 MHz	Mode of Operation: 802.11g



Date: 3.OCT.2023 10:36:18

Plot #6

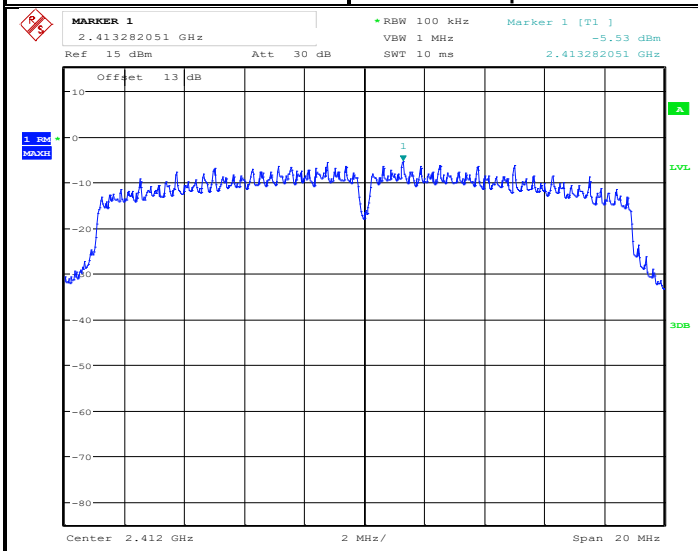
High channel / 2462 MHz	Mode of Operation: 802.11g



Date: 3.OCT.2023 10:39:54

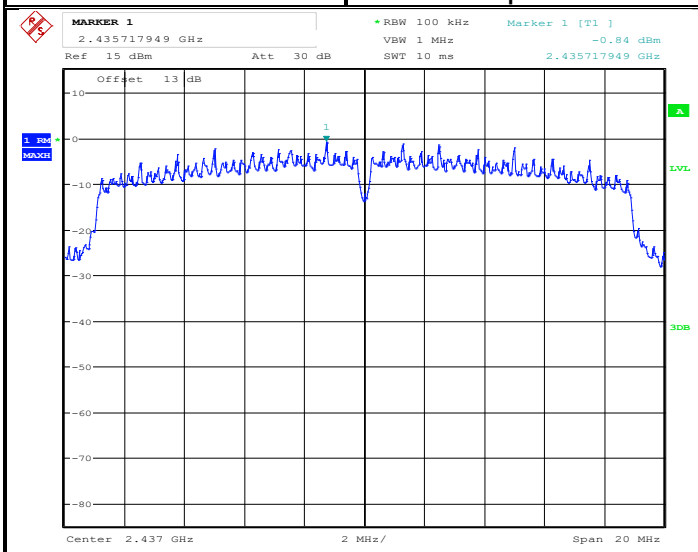
Plot #7

Low channel / 2412 MHz	Mode of Operation: 802.11n HT20



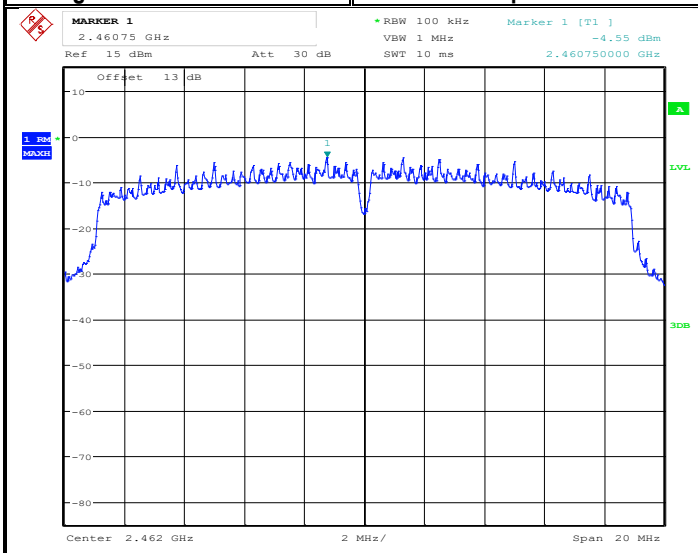
Plot #8

Mid channel / 2437 MHz	Mode of Operation: 802.11n HT20



Plot #9

High channel / 2462 MHz	Mode of Operation: 802.11n HT20



8.3 Duty cycle

8.3.1 Measurement according to FCC 558074 D01 15.247 Meas Guidance v05r02

Spectrum Analyzer settings:

- Set the center frequency and of the instrument to the center frequency of the transmission
- Zero span
- Set RBW >=OBW if possible; otherwise, set RBW to the largest available value
- Detector = Peak or average

8.3.2 Measurement result

Plot #	Frequency (MHz)	EUT Operating Mode	Gate RMS (dBm)	Duty Cycle (%)	Result
1	2412	802.11b	12.9	96.52	Pass
2	2437	802.11b	12.9	96.34	Pass
3	2462	802.11b	12.9	96.44	Pass
4	2412	802.11g	8.6	91.74	Pass
5	2437	802.11g	13.2	91.54	Pass
6	2462	802.11g	9.0	91.46	Pass
7	2412	802.11n HT20	8.4	90.99	Pass
8	2437	802.11n HT20	12	91.20	Pass
9	2462	802.11n HT20	9	91.05	Pass

8.3.3 Measurement Plots

Plot#1 Duty cycle measurement

Mid channel / 2412 MHz	Modulation/Packet Type: 802.11b

OSP PowerMeter settings

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 µs	1.000 µs

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	DutyCycle (%)	Result
2412.000000	12.9	30.0	12.9	96.519	PASS

Plot#2 Duty cycle measurement

Mid channel / 2437 MHz | **Modulation/Packet Type: 802.11b**

OSP PowerMeter settings

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 µs	1.000 µs

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	DutyCycle (%)	Result
2437.000000	12.9	30.0	12.9	96.338	PASS

Plot#3 Duty cycle measurement

Mid channel / 2462 MHz	Modulation/Packet Type: 802.11b

OSP PowerMeter settings

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 µs	1.000 µs

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	DutyCycle (%)	Result
2462.000000	12.9	30.0	12.9	96.438	PASS

Plot#4 Duty cycle measurement

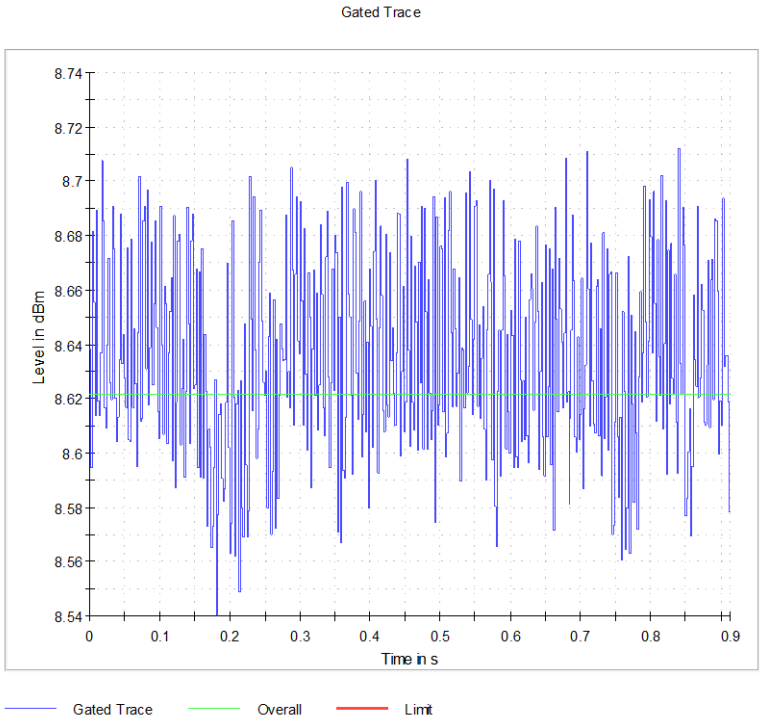
Mid channel / 2412 MHz	Modulation/Packet Type: 802.11b

OSP PowerMeter settings

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 µs	1.000 µs

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	DutyCycle (%)	Result
2412.000000	8.6	30.0	8.6	91.736	PASS



Plot#5 Duty cycle measurement

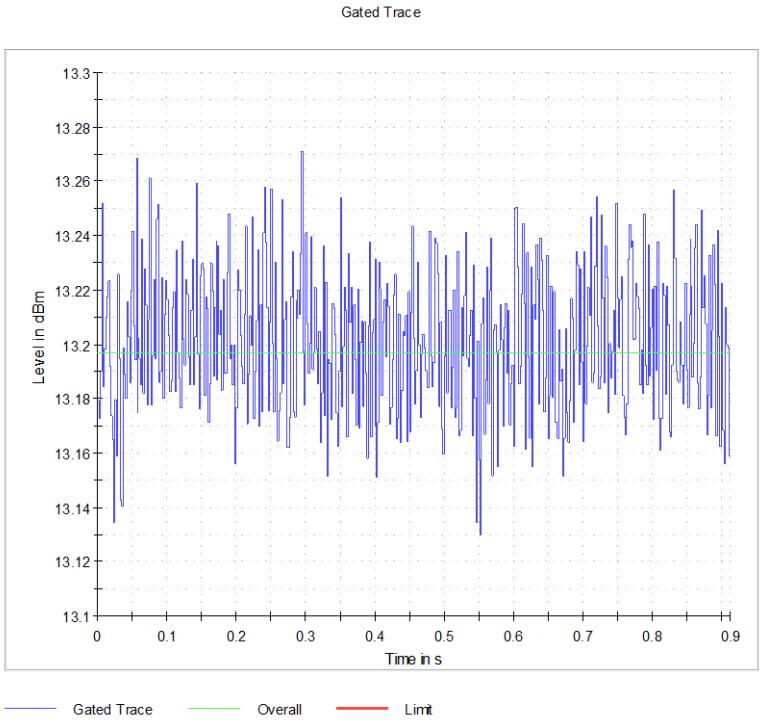
Mid channel / 2437 MHz	Modulation/Packet Type: 802.11b

OSP PowerMeter settings

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 µs	1.000 µs

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	DutyCycle (%)	Result
2437.000000	13.2	30.0	13.2	91.544	PASS



Plot#6 Duty cycle measurement

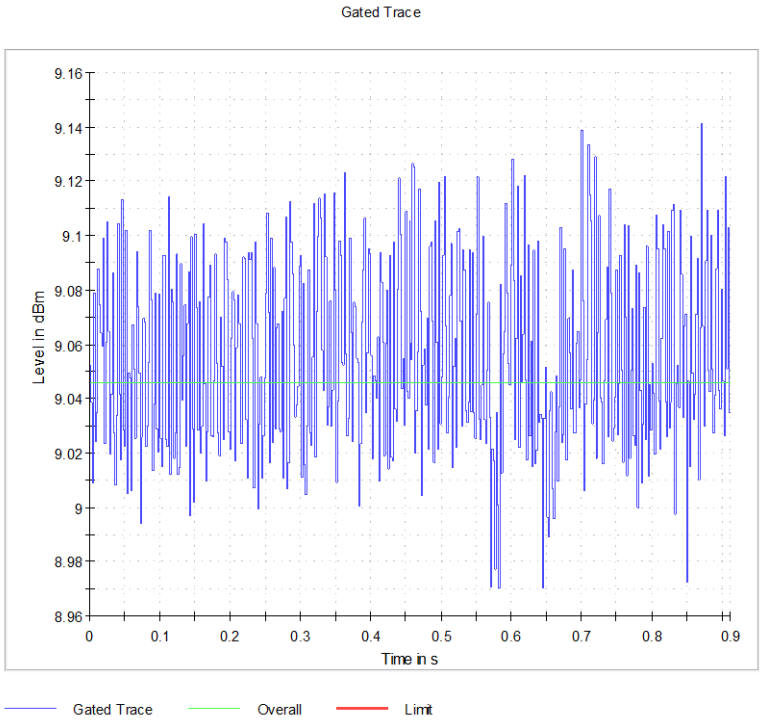
Mid channel / 2462 MHz	Modulation/Packet Type: 802.11b

OSP PowerMeter settings

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 µs	1.000 µs

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	DutyCycle (%)	Result
2462.000000	9.0	30.0	9.0	91.464	PASS



Plot#7 Duty cycle measurement

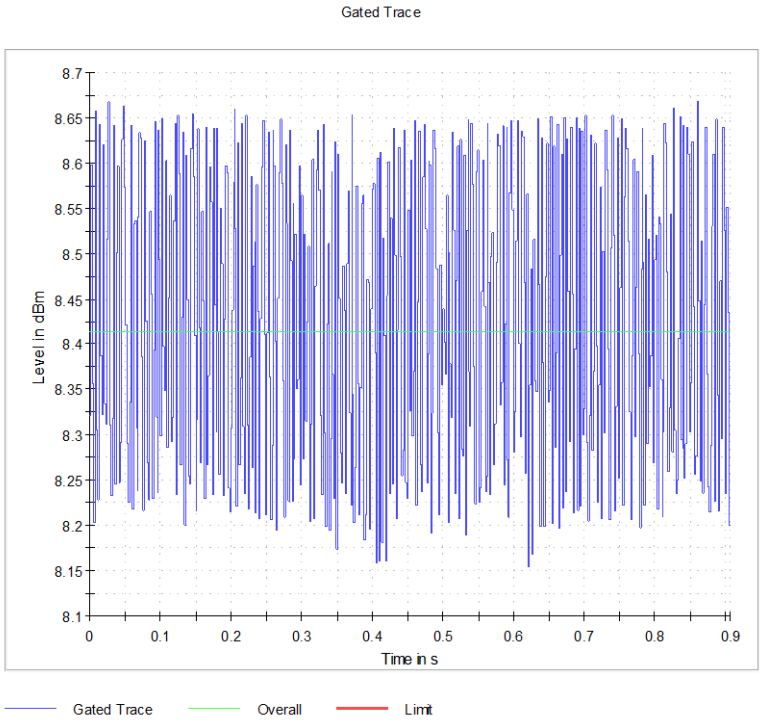
Mid channel / 2412 MHz	Modulation/Packet Type: 802.11b

OSP PowerMeter settings

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 µs	1.000 µs

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	DutyCycle (%)	Result
2412.000000	8.4	30.0	8.4	90.986	PASS



Plot#8 Duty cycle measurement

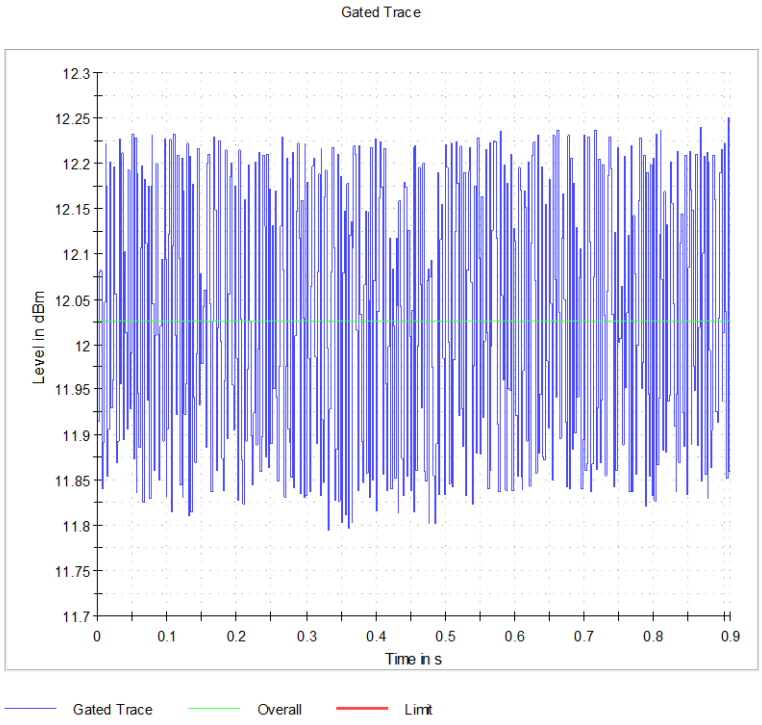
Mid channel / 2437 MHz | **Modulation/Packet Type: 802.11b**

OSP PowerMeter settings

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 µs	1.000 µs

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	DutyCycle (%)	Result
2437.000000	12.0	30.0	12.0	91.195	PASS



Plot#9 Duty cycle measurement

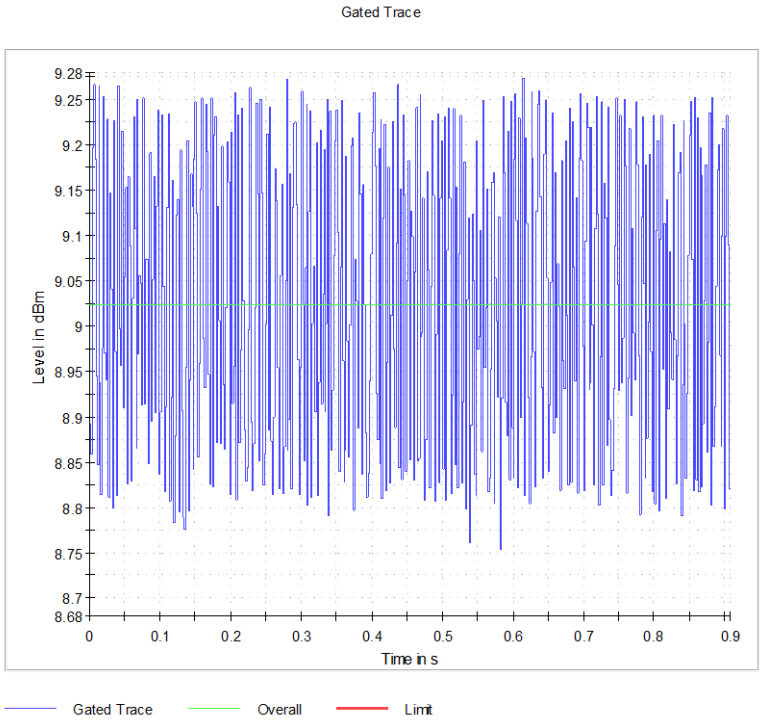
Mid channel / 2462 MHz	Modulation/Packet Type: 802.11b

OSP PowerMeter settings

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 µs	1.000 µs

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	DutyCycle (%)	Result
2462.000000	9.0	30.0	9.0	91.049	PASS



8.4 Band Edge Compliance

8.4.1 Measurement according to FCC 558074 D01 15.247 Meas Guidance v05r02

Spectrum Analyzer settings for band edge:

- Set the center frequency and span to encompass frequency range to be measured
- RBW = 100 kHz
- VBW ≥ 3 x RBW
- Sweep Time: Auto couple
- Detector = Peak
- Trace = Max hold
- Allow trace to fully stabilize
- Use the peak marker function to determine the maximum amplitude level
- Set the marker on the emission at the band edge, or on the highest modulation product outside of the band, if this level is greater than that at the band edge

8.4.2 Limits non restricted band:

FCC§15.247 (d)

- In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

RSS-247 5/5

- In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30dB instead of 20dB.

Spectrum Analyzer settings for restricted band:

- Peak measurements are made using a peak detector and RBW=1 MHz

8.4.3 Limits restricted band §15.247/15.209/15.205 and RSS-Gen 8.9/8.10

- *PEAK LIMIT= 74 dBµV/m @3m =-21.23 dBm
- *AVG. LIMIT= 54 dBµV/m @3m =-41.23 dBm
- Start frequency & stop frequency according to frequency range specified in the restricted band table in FCC section 15.205 & RSS-Gen 8.10
- Measurements with a peak detector were used to show compliance to average limits, thus showing compliance to both peak and average limits.

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

8.4.4 Test conditions and setup:

Non-Restricted Band:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input	Antenna Gain
23.8°C	1	802.11b,g,n	3.3 VDC	2.10 dBi
	2	802.11b,g,n	3.3 VDC	2.03 dBi
	3	802.11b,g,n	3.3 VDC	5.70 dBi

Restricted Band:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input	Antenna Gain
23.8°C	1	802.11b,g,n	3.3 VDC	2.10 dBi
	2	802.11b,g,n	3.3 VDC	2.03 dBi
	3	802.11b,g,n	3.3 VDC	5.70 dBi

8.4.5 Measurement result:

Plot #	EUT operating mode	Band Edge	Band Edge Delta (dBc)	Limit (dBc)	Result
1	802.11b	Lower, Non-restricted	39.62	30	Pass
2	802.11g	Lower, Non-restricted	29.26	30	Pass
3	802.11n HT20	Lower, Non-restricted	29.54	30	Pass

SMA Dipole Antenna

Plot #	EUT operating mode	Band Edge	Measured Peak Value (dBµV/m)	Measured Average Value (dBµV/m)	Limit (dBµV/m)	Result
4	802.11b	Upper Restricted Peak and Average	49.87	39.79	See section 8.4.3	Pass
5	802.11g	Upper Restricted Peak and Average	55.71	38.05	See section 8.4.3	Pass
6	802.11n HT20	Upper Restricted Peak and Average	56.94	39.51	See section 8.4.3	Pass

PCB Trace Antenna

Plot #	EUT operating mode	Band Edge	Measured Peak Value (dBµV/m)	Measured Average Value (dBµV/m)	Limit (dBµV/m)	Result
7	802.11b	Upper Restricted Peak and Average	53.18	43.19	See section 8.4.3	Pass
8	802.11g	Upper Restricted Peak and Average	60.47	42.95	See section 8.4.3	Pass
9	802.11n HT20	Upper Restricted Peak and Average	61.50	43.89	See section 8.4.3	Pass

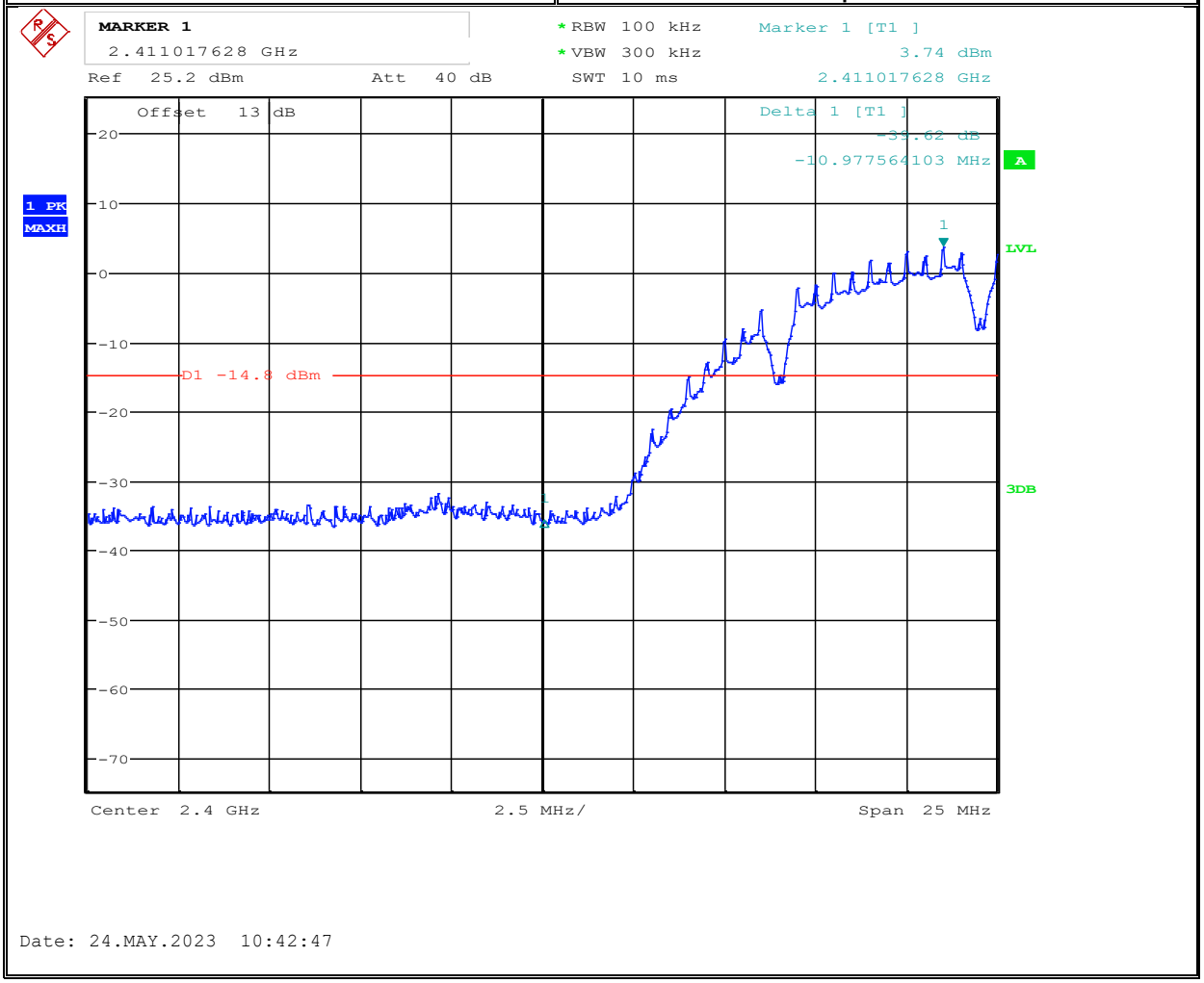
Integrated Antenna

Plot #	EUT operating mode	Band Edge	Measured Peak Value (dBµV/m)	Measured Average Value (dBµV/m)	Limit (dBµV/m)	Result
10	802.11b	Upper Restricted Peak and Average	50.70	39.21	See section 8.4.3	Pass
11	802.11g	Upper Restricted Peak and Average	50.57	34.02	See section 8.4.3	Pass
12	802.11n HT20	Upper Restricted Peak and Average	53.91	37.50	See section 8.4.3	Pass

8.4.6 Measurement Plots:

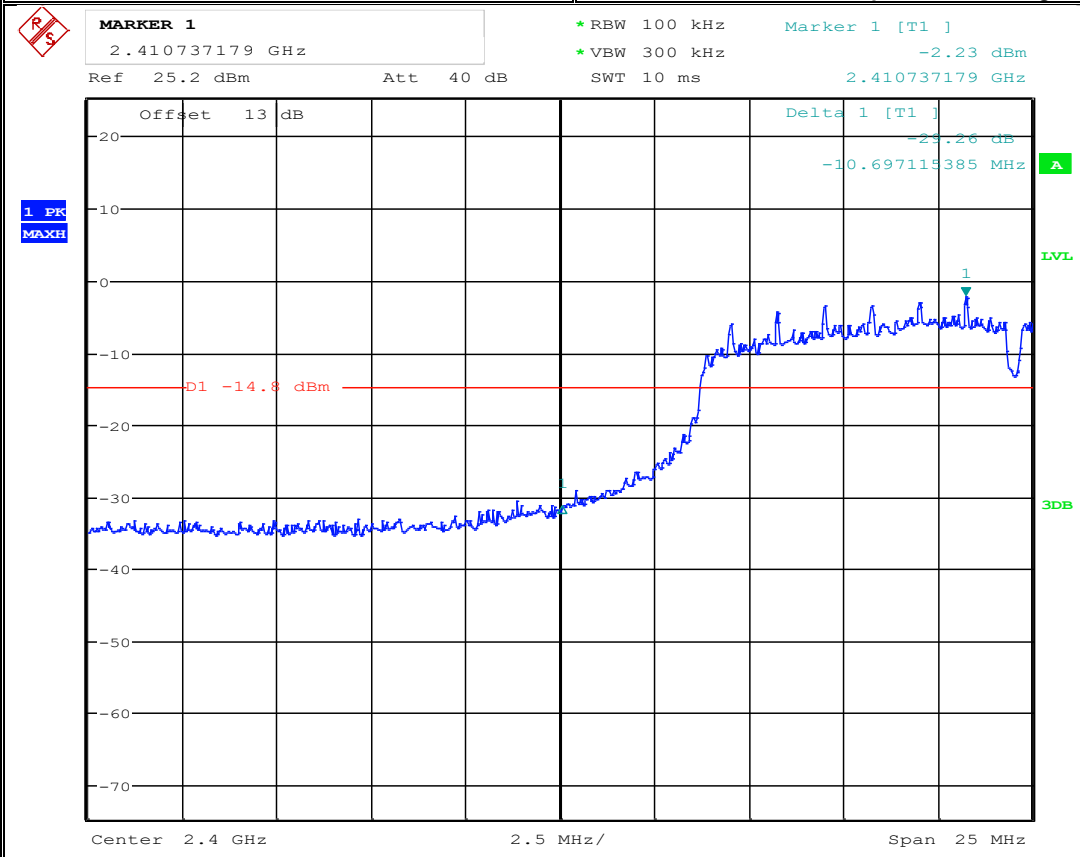
Plot #1

Low channel / 2412 MHz	Mode of Operation: 802.11b



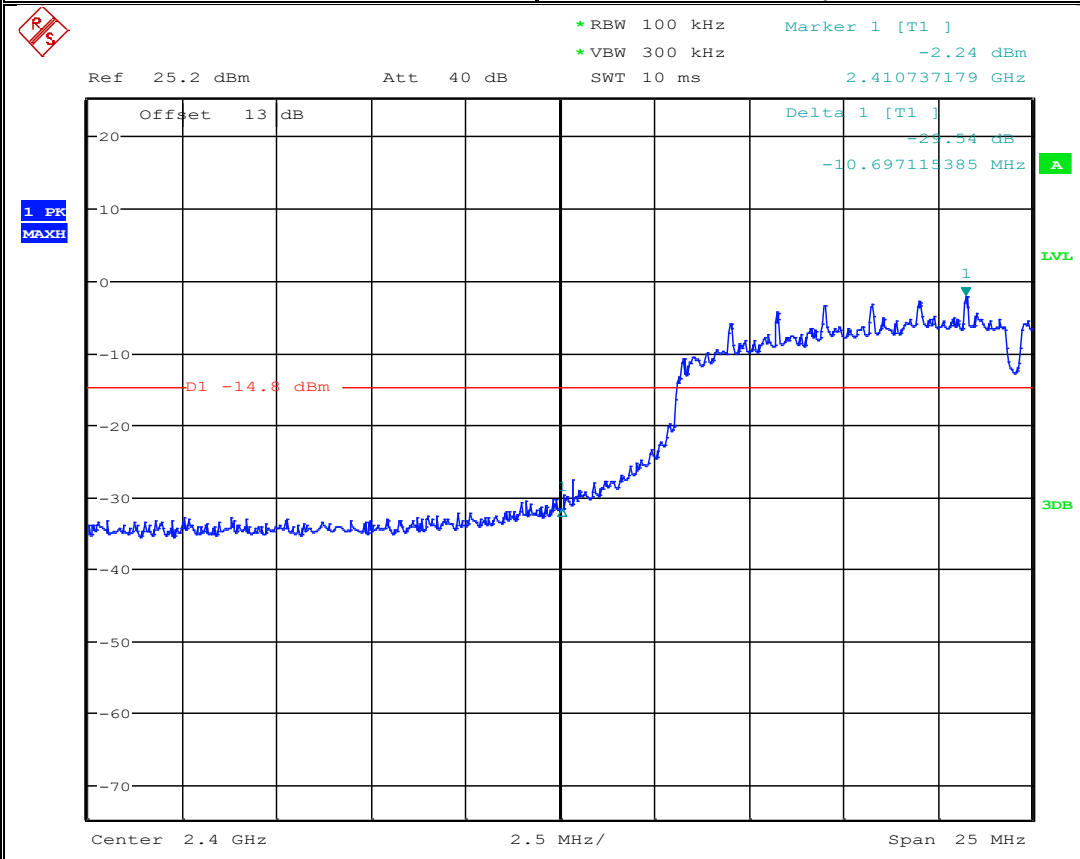
Plot #2

Low channel / 2412 MHz	Mode of Operation: 802.11g



Plot #3

Low channel / 2412 MHz	Mode of Operation: 802.11n HT20

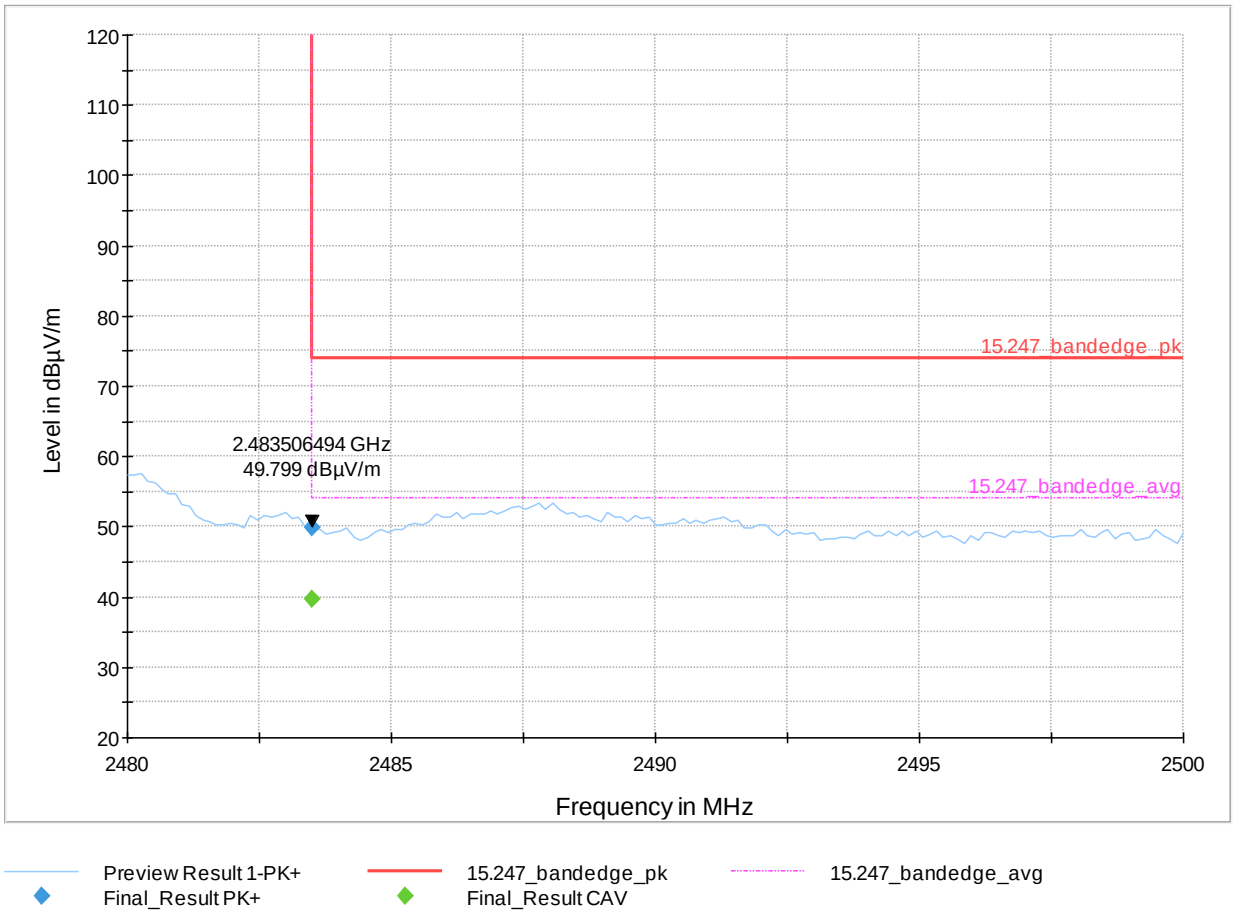


Plot #4

High channel 2462 MHz | **Mode of Operation: 802.11b**

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
2483.506	---	39.788	54.00	14.21	500.0	1000.000	149.0	V	112.0	8.7	
2483.506	49.869	---	74.00	24.13	500.0	1000.000	149.0	V	112.0	8.7	

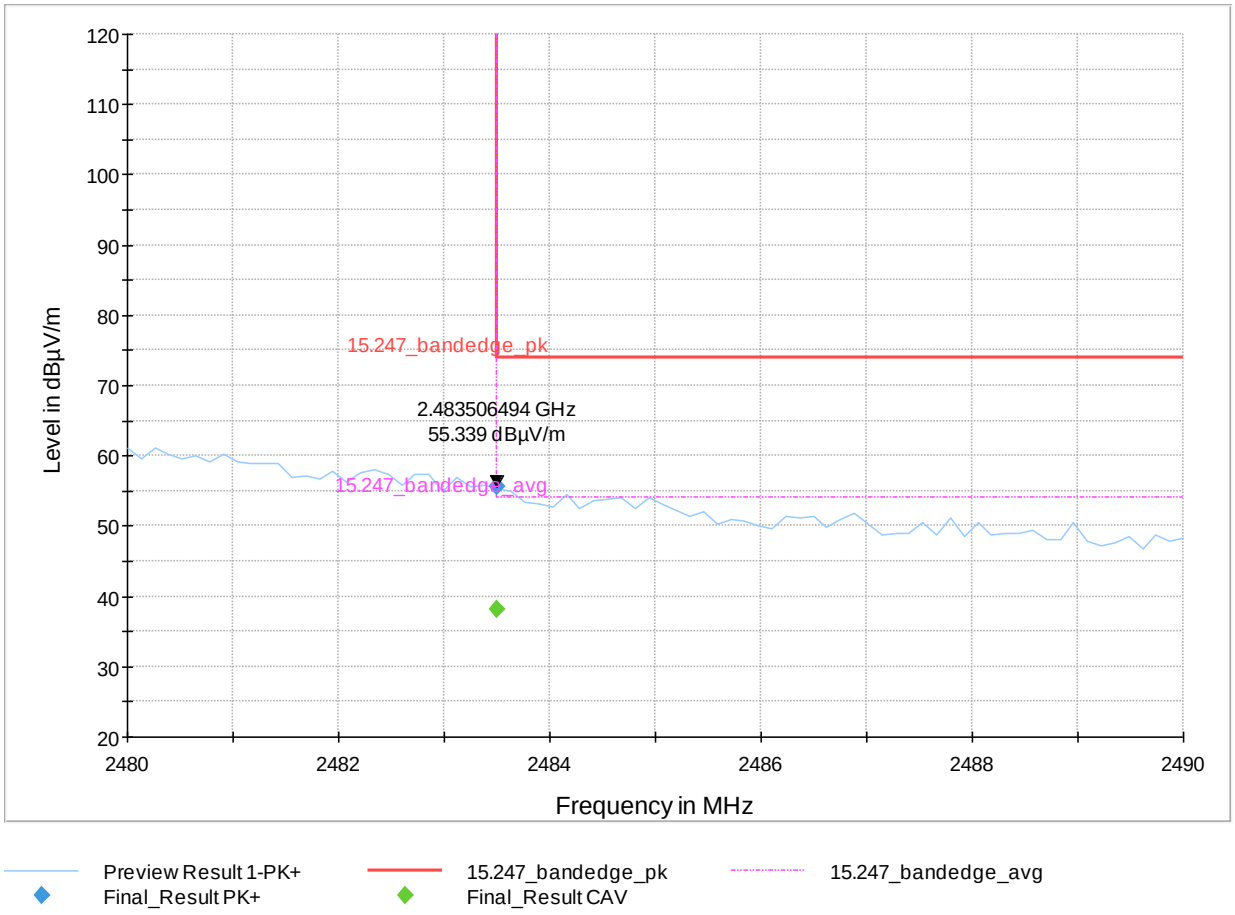


Plot #5

High channel 2462 MHz | **Mode of Operation: 802.11g**

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
2483.506	55.710	---	74.00	18.29	500.0	1000.000	163.0	V	-13.0	8.7	
2483.506	---	38.050	54.00	15.95	500.0	1000.000	163.0	V	-13.0	8.7	

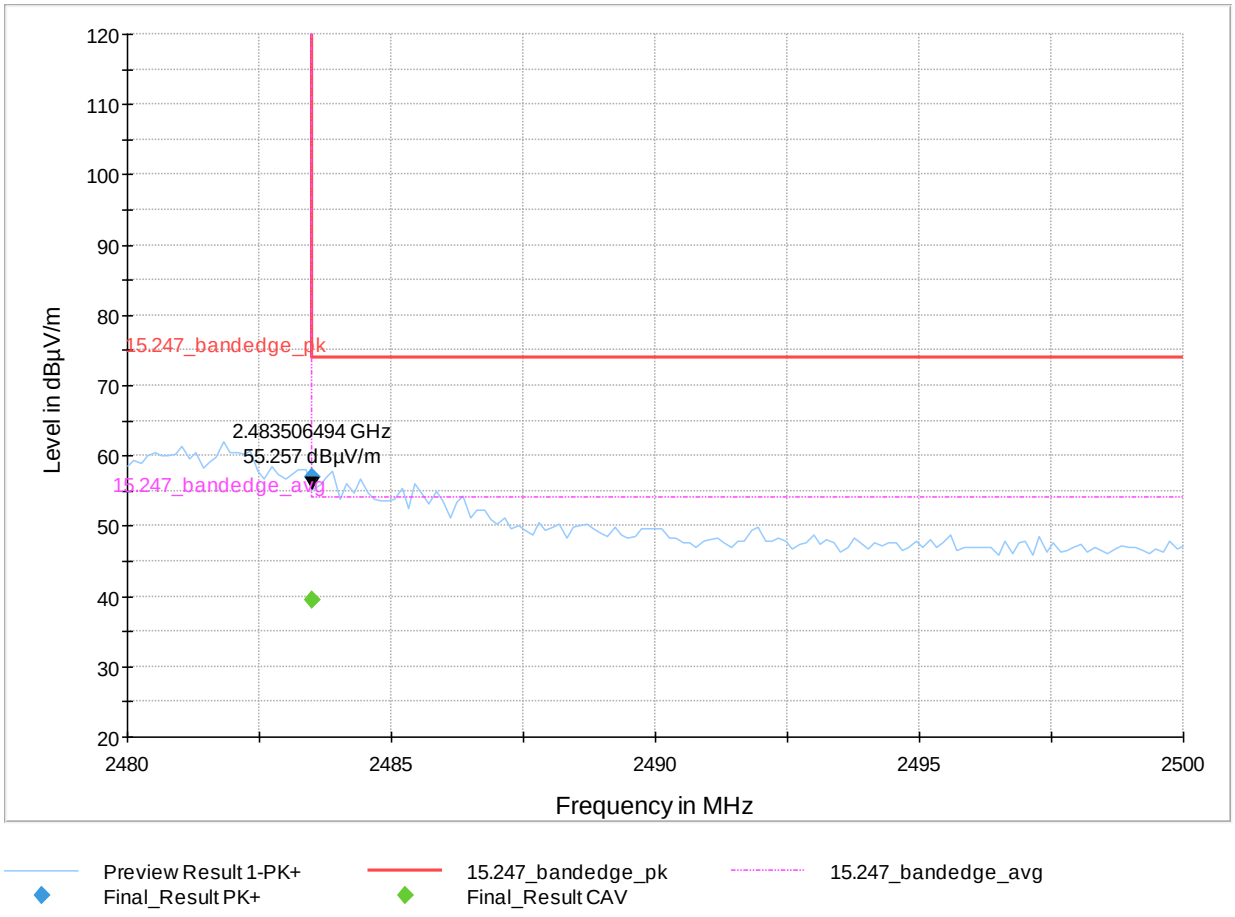


Plot #6

High channel 2462 MHz | **Mode of Operation: 802.11n HT20**

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
2483.506	56.939	---	74.00	17.06	500.0	1000.000	149.0	V	179.0	8.7	
2483.506	---	39.509	54.00	14.49	500.0	1000.000	149.0	V	179.0	8.7	

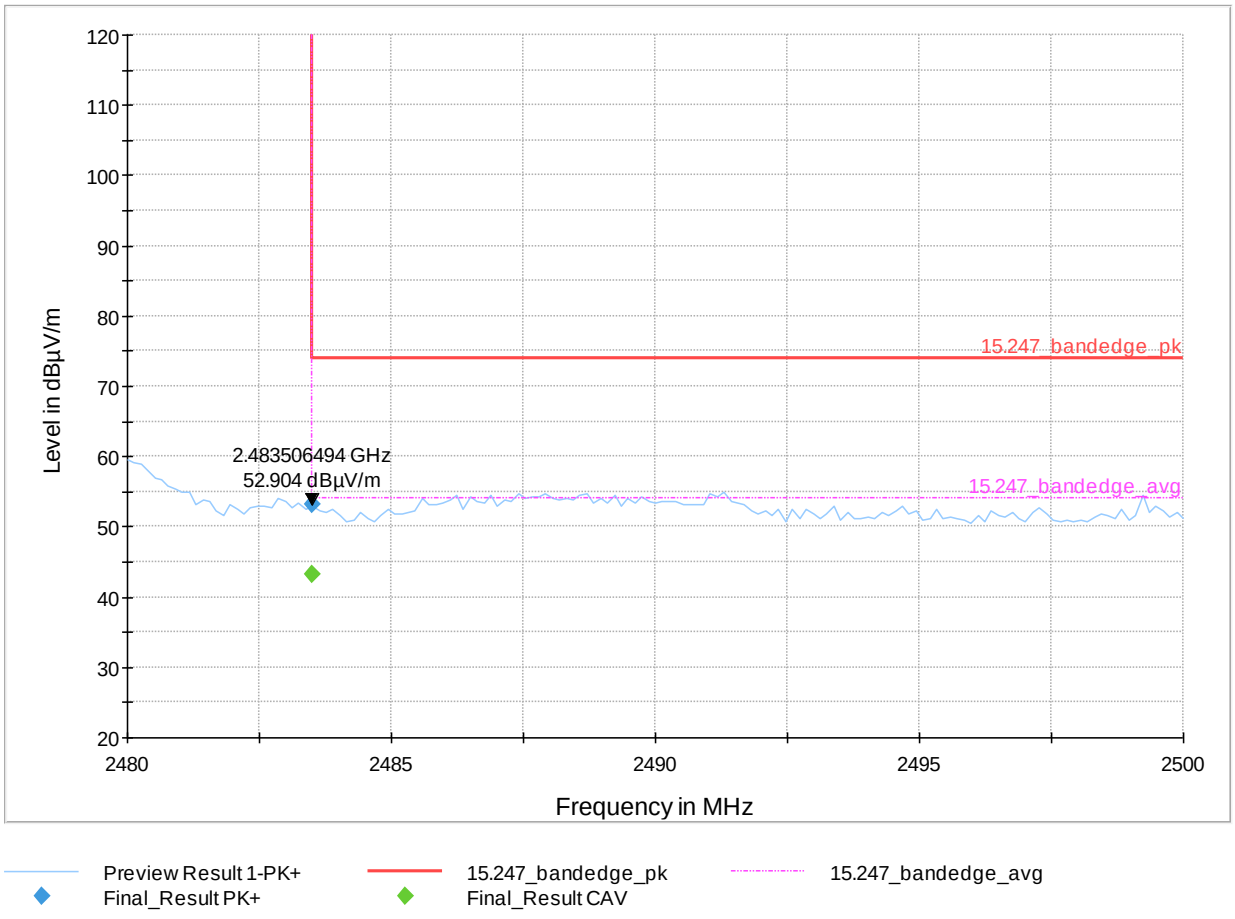


Plot #7

High channel 2462 MHz | **Mode of Operation: 802.11b**

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
2483.506	---	43.187	54.00	10.81	500.0	1000.000	208.0	H	322.0	9.2	
2483.506	53.176	---	74.00	20.82	500.0	1000.000	208.0	H	322.0	9.2	

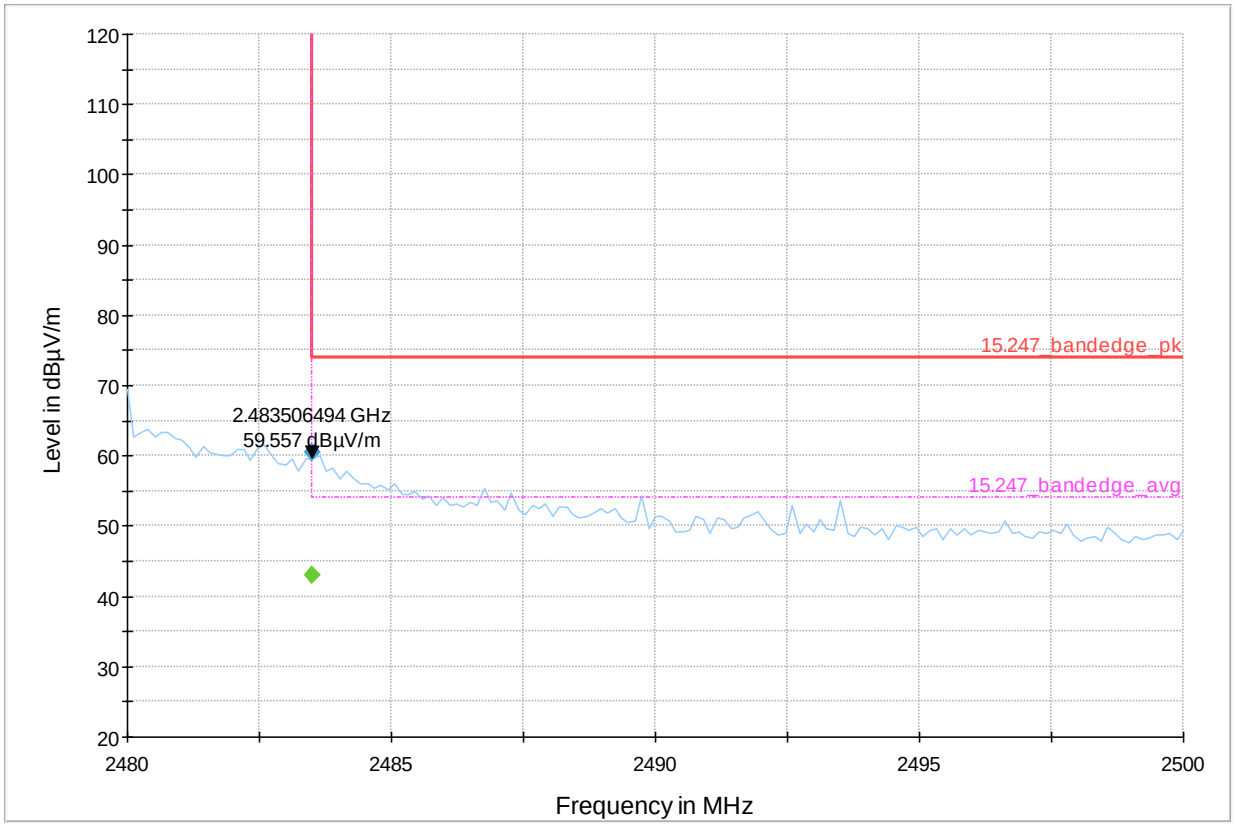


Plot #8

High channel 2462 MHz | **Mode of Operation: 802.11g**

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
2483.506	---	42.947	54.00	11.05	500.0	1000.000	205.0	H	322.0	9.2	
2483.506	60.471	---	74.00	13.53	500.0	1000.000	205.0	H	322.0	9.2	

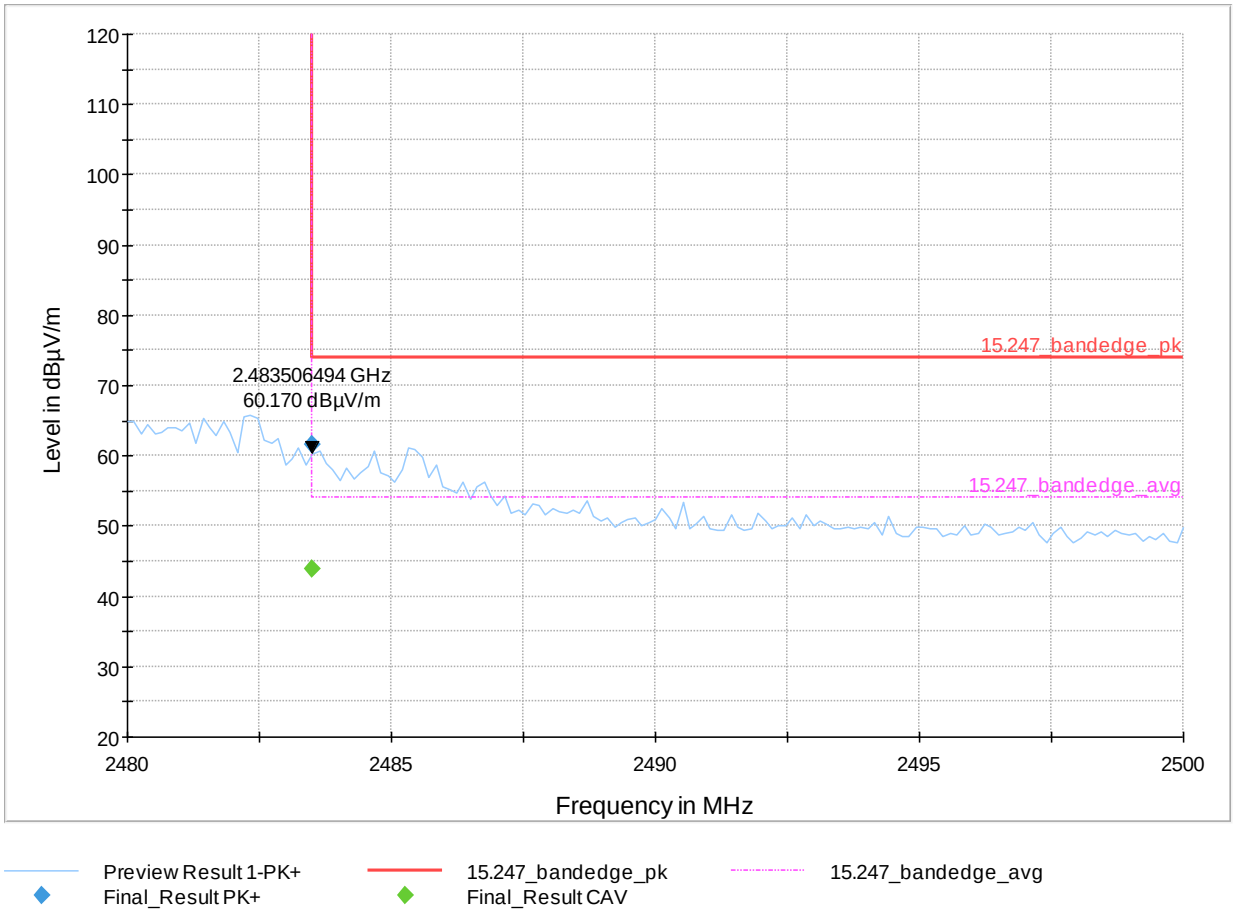


Plot #9

High channel 2462 MHz | **Mode of Operation: 802.11n HT20**

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
2483.506	---	43.890	54.00	10.11	500.0	1000.000	262.0	H	324.0	9.2	
2483.506	61.496	---	74.00	12.50	500.0	1000.000	262.0	H	324.0	9.2	

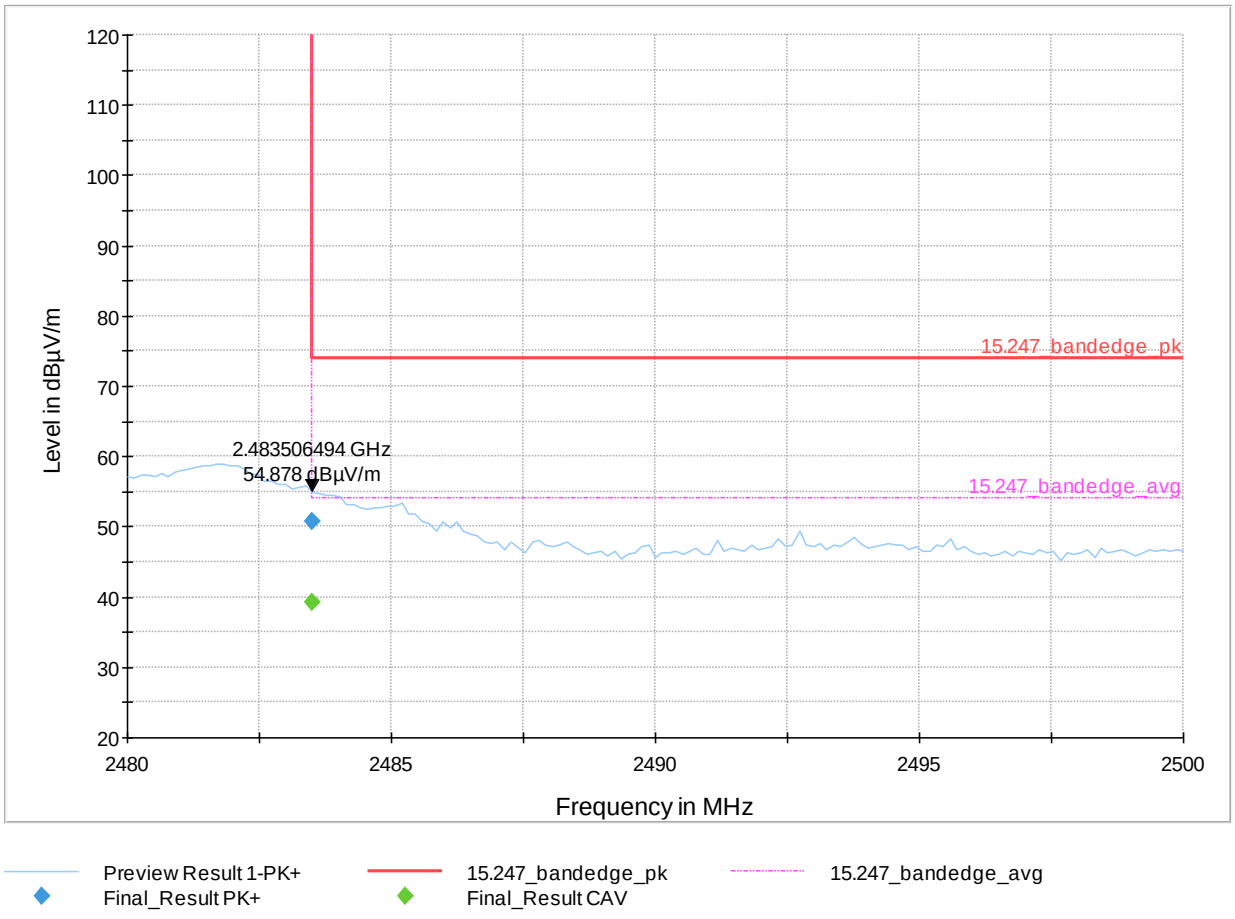


Plot #10

High channel 2462 MHz | **Mode of Operation: 802.11b**

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
2483.506	---	39.211	54.00	14.79	500.0	1000.000	173.0	H	218.0	9.2	
2483.506	50.696	---	74.00	23.30	500.0	1000.000	173.0	H	218.0	9.2	

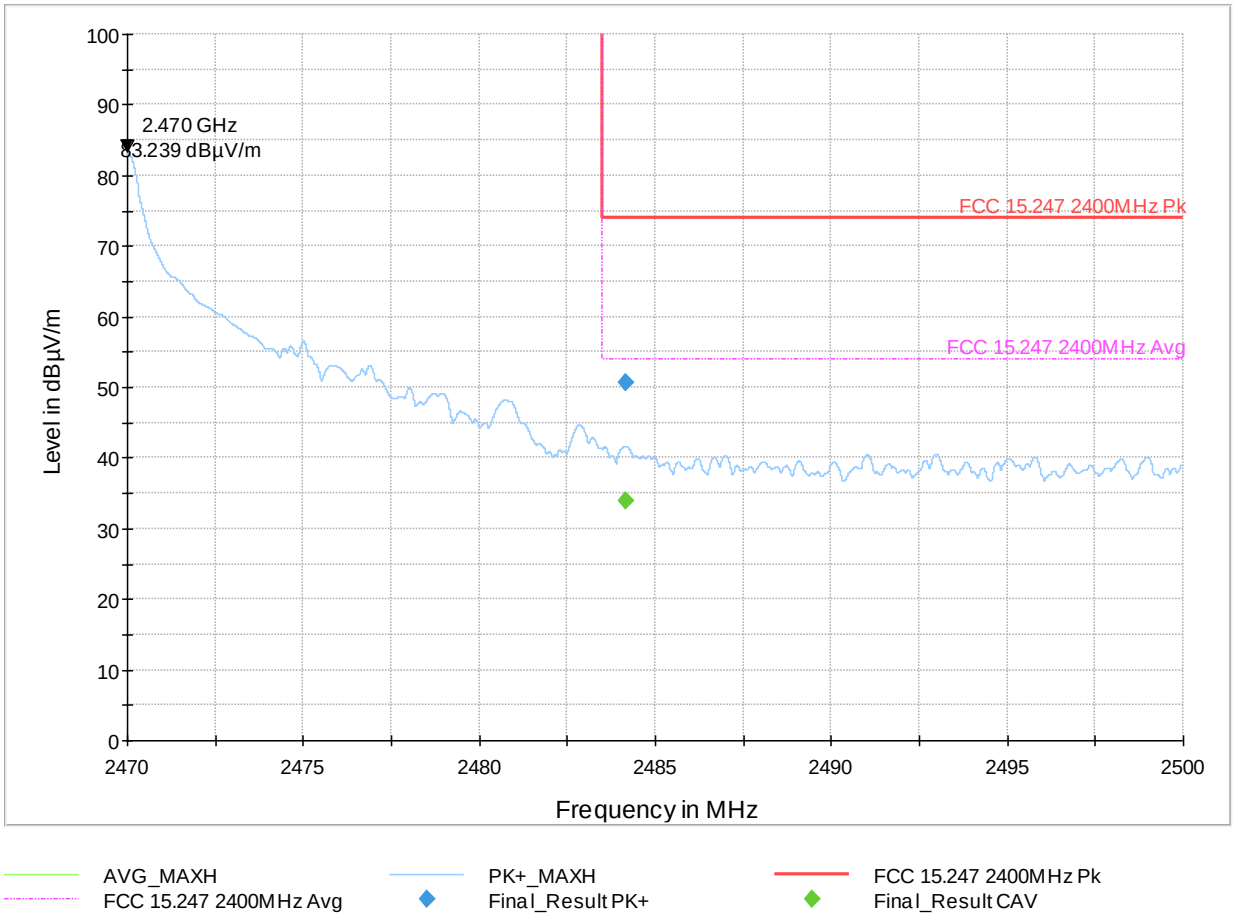


Plot #11

High channel 2462 MHz | **Mode of Operation: 802.11g**

Final_Result

Frequency	MaxPeak (dBµV/m	CAverage	Limit (dBµV/m	Margin	Meas.	Bandwidth	Height	Pol	Azimuth	Corr. (dB/m	Sig Pat	Preamp	Trd Corr.	Raw Rec
2484.160	---	34.02	54.00	19.98	500.0	1000.000	200.0	V	186.0	6.0	-	0.0	28.5	28.1
2484.160	50.57	---	74.00	23.43	500.0	1000.000	200.0	V	186.0	6.0	-	0.0	28.5	44.6

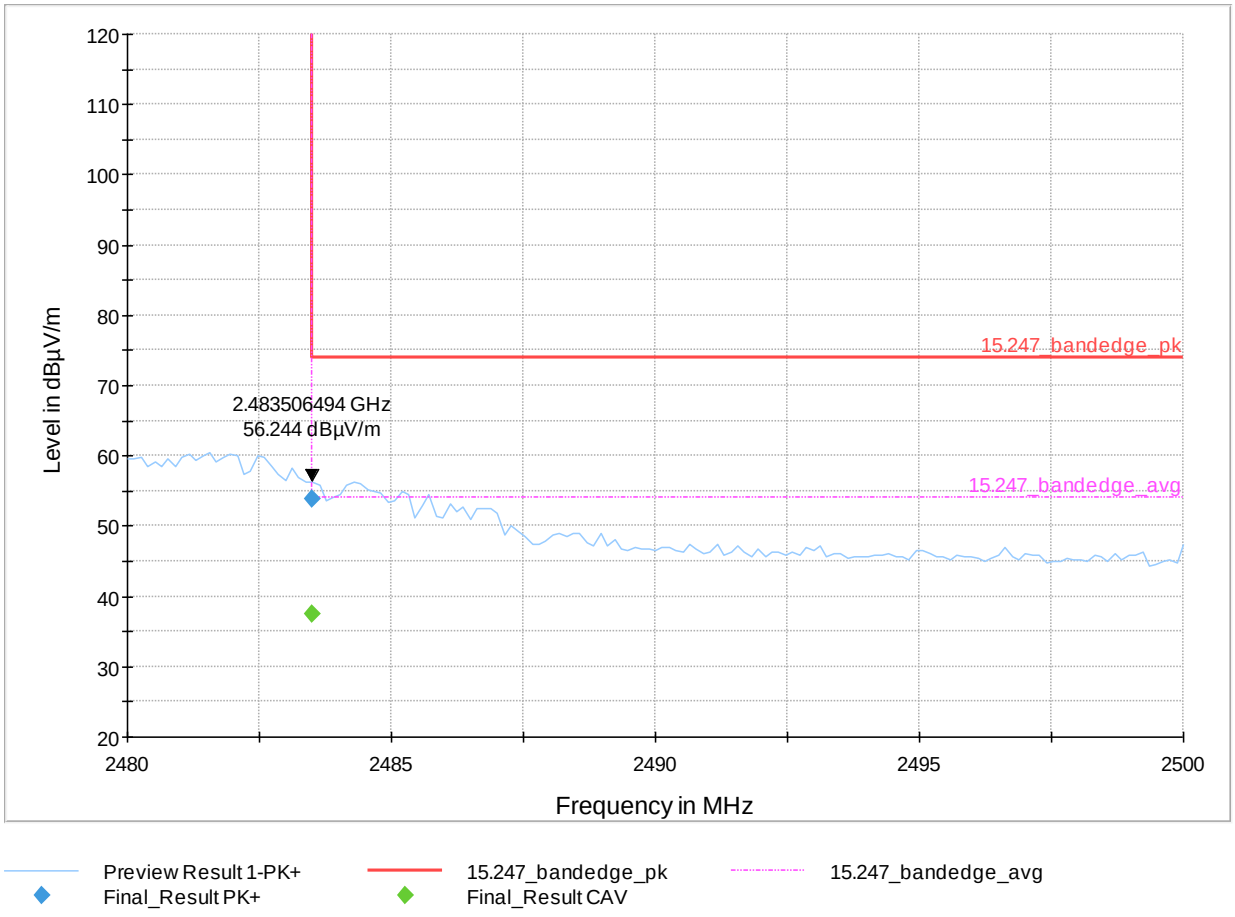


Plot #12

High channel 2462 MHz | **Mode of Operation: 802.11n HT20**

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
2483.506	---	37.496	54.00	16.50	500.0	1000.000	207.0	V	14.0	8.7	
2483.506	53.907	---	74.00	20.09	500.0	1000.000	207.0	V	14.0	8.7	



8.5 Emission Bandwidth 6dB and 99% Occupied Bandwidth

8.5.1 Measurement according to FCC 558074 D01 15.247 Meas Guidance v05r02

Spectrum Analyzer settings:

6dB (DTS) Bandwidth:

- Set RBW = 100 kHz
- Set the video bandwidth (VBW) ≥ 3 x RBW
- Detector = Peak
- Trace mode = Max hold
- Sweep = Auto couple
- Allow the trace to stabilize
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

99% Occupied Bandwidth:

- Set frequency = nominal EUT channel center frequency
- Set Span = 1.5 x to 5.0 x OBW
- Set RBW = 1% to 5% of OBW
- Set the video bandwidth (VBW) ≈ 3 x RBW
- Detector = Peak
- Trace mode = Max hold
- Sweep = Auto couple
- Allow the trace to stabilize
- Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth
- If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies.

8.5.2 Limits:

FCC §15.247(a)(2) and RSS-247 5.2(a)

- Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

8.5.3 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input	Antenna Gain
23.8°C	1	802.11b,g,n	3.3 VDC	2.10 dBi
	2	802.11b,g,n	3.3 VDC	2.03 dBi
	3	802.11b,g,n	3.3 VDC	5.70 dBi

8.5.4 Measurement result:

Plot #	Frequency (MHz)	EUT Operating Mode	6dB Emission Bandwidth (MHz)	Limit (MHz)	Result
1	2412	802.11b	9.20	> 0.5	Pass
2	2437	802.11b	9.20	> 0.5	Pass
3	2462	802.11b	9.20	> 0.5	Pass
4	2412	802.11g	15.20	> 0.5	Pass
5	2437	802.11g	15.20	> 0.5	Pass
6	2462	802.11g	15.20	> 0.5	Pass
7	2412	802.11n HT20	15.20	> 0.5	Pass
8	2437	802.11n HT20	15.20	> 0.5	Pass
9	2462	802.11n HT20	15.20	> 0.5	Pass

Plot #	Frequency (MHz)	EUT Operating Mode	99% Occupied Bandwidth (MHz)	Limit (MHz)	Result
10	2412	802.11b	14.10	N/A	Pass
11	2437	802.11b	14.10	N/A	Pass
12	2462	802.11b	14.10	N/A	Pass
13	2412	802.11g	16.50	N/A	Pass
14	2437	802.11g	17.30	N/A	Pass
15	2462	802.11g	16.50	N/A	Pass
16	2412	802.11n HT20	17.50	N/A	Pass
17	2437	802.11n HT20	17.80	N/A	Pass
18	2462	802.11n HT20	17.50	N/A	Pass

8.5.5 Measurement Plots:

6 dB Emission Bandwidth

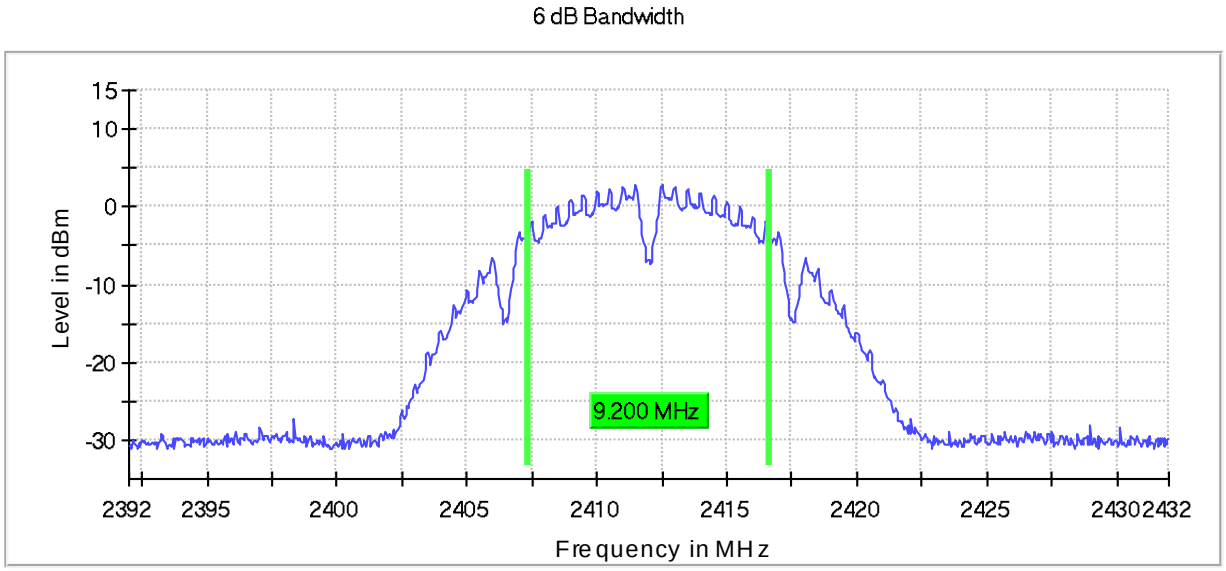
Plot #1

2412 MHz	Mode: 802.11b

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.39200 GHz	2.39200 GHz
Stop Frequency	2.43200 GHz	2.43200 GHz
Span	40.000 MHz	40.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	801	~ 800
Sweeptime	15.000 ms	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	35.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	25 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.24 dB	0.50 dB

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2412.000000	9.200000	0.500000	---	2407.400000	2416.600000



Plot #2

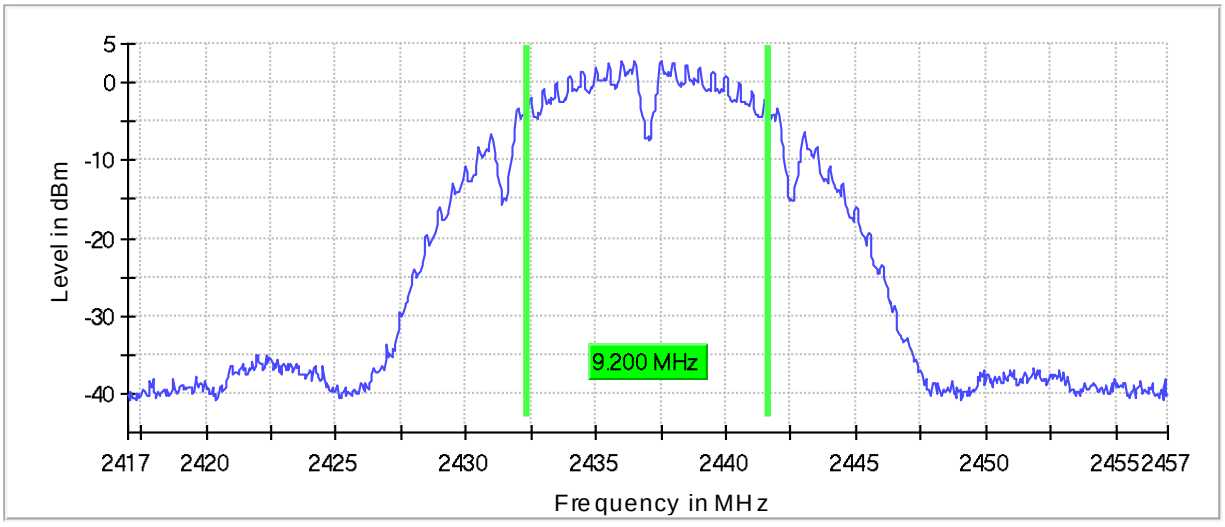
2437 MHz	Mode: 802.11b

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.41700 GHz	2.41700 GHz
Stop Frequency	2.45700 GHz	2.45700 GHz
Span	40.000 MHz	40.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	801	~ 800
Sweeptime	15.000 ms	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	25.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	24 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.19 dB	0.50 dB

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2437.000000	9.200000	0.500000	---	2432.400000	2441.600000

6 dB Bandwidth



Plot #3

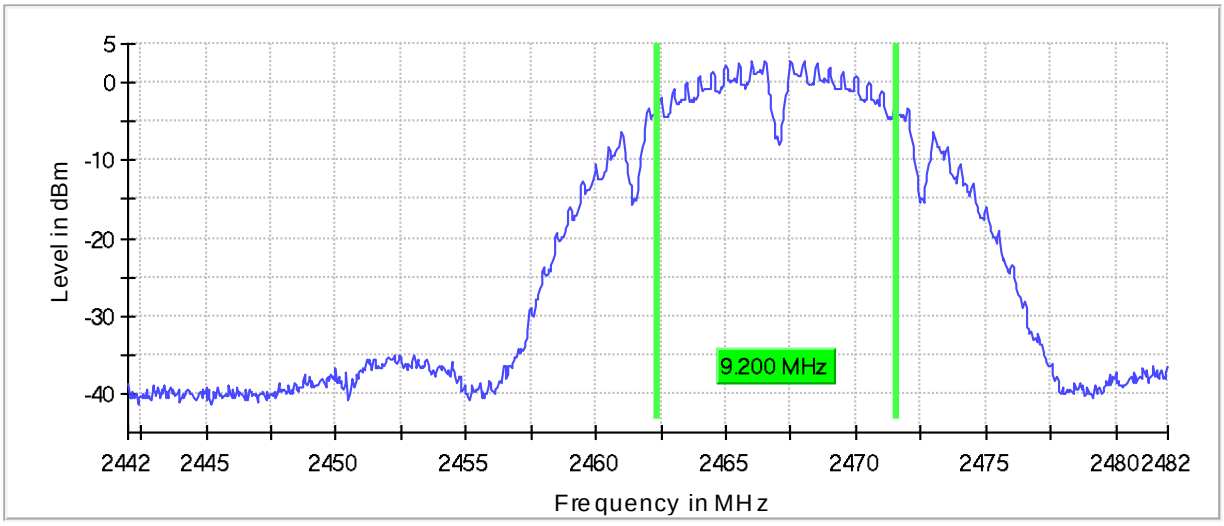
2462 MHz	Mode: 802.11b

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.44200 GHz	2.44200 GHz
Stop Frequency	2.48200 GHz	2.48200 GHz
Span	40.000 MHz	40.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	801	~ 800
Sweeptime	15.000 ms	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	25.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	18 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.13 dB	0.50 dB

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2462.000000	9.200000	0.500000	---	2462.400000	2471.600000

6 dB Bandwidth



Plot #4

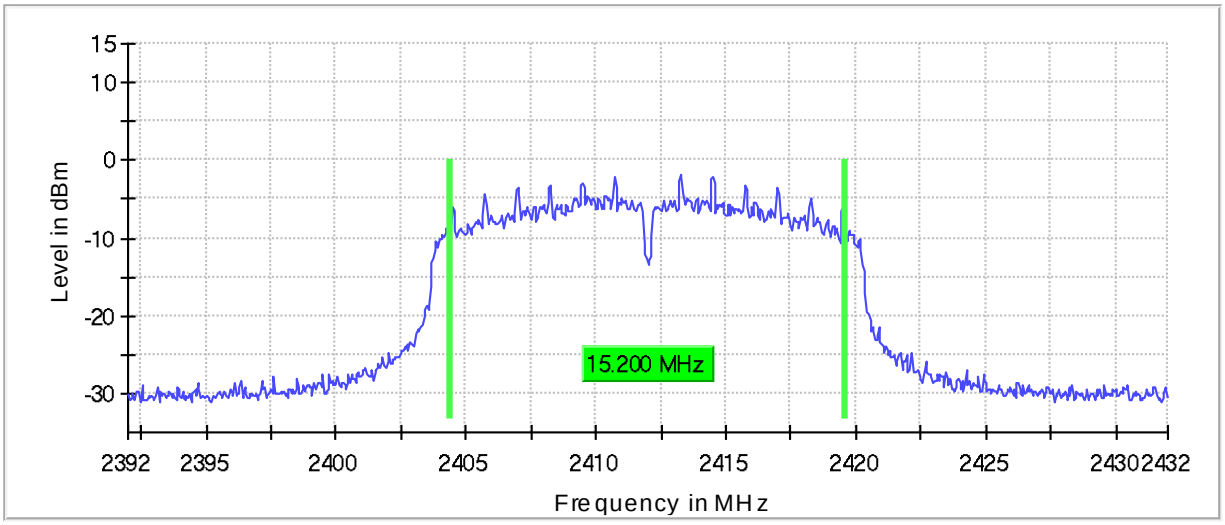
2412 MHz	Mode: 802.11g

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.39200 GHz	2.39200 GHz
Stop Frequency	2.43200 GHz	2.43200 GHz
Span	40.000 MHz	40.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	801	~ 800
Sweeptime	15.000 ms	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	35.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	32 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.21 dB	0.50 dB

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2412.000000	15.200000	0.500000	---	2404.400000	2419.600000

6 dB Bandwidth



Plot #5

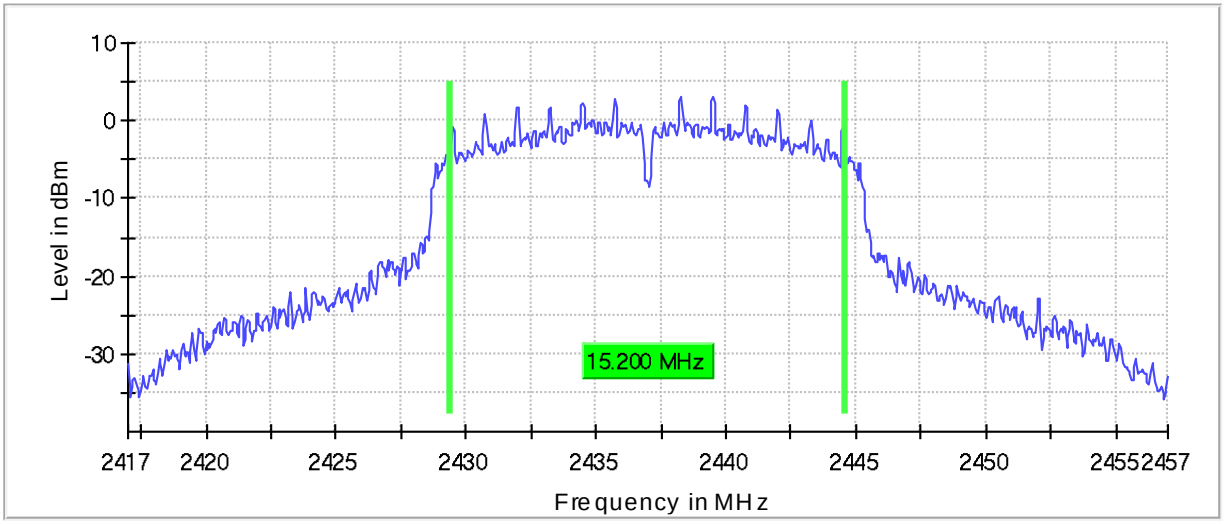
2437 MHz	Mode: 802.11g

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.41700 GHz	2.41700 GHz
Stop Frequency	2.45700 GHz	2.45700 GHz
Span	40.000 MHz	40.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	801	~ 800
Sweeptime	15.000 ms	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	15.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	19 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.30 dB	0.50 dB

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2437.000000	15.200000	0.500000	---	2429.400000	2444.600000

6 dB Bandwidth



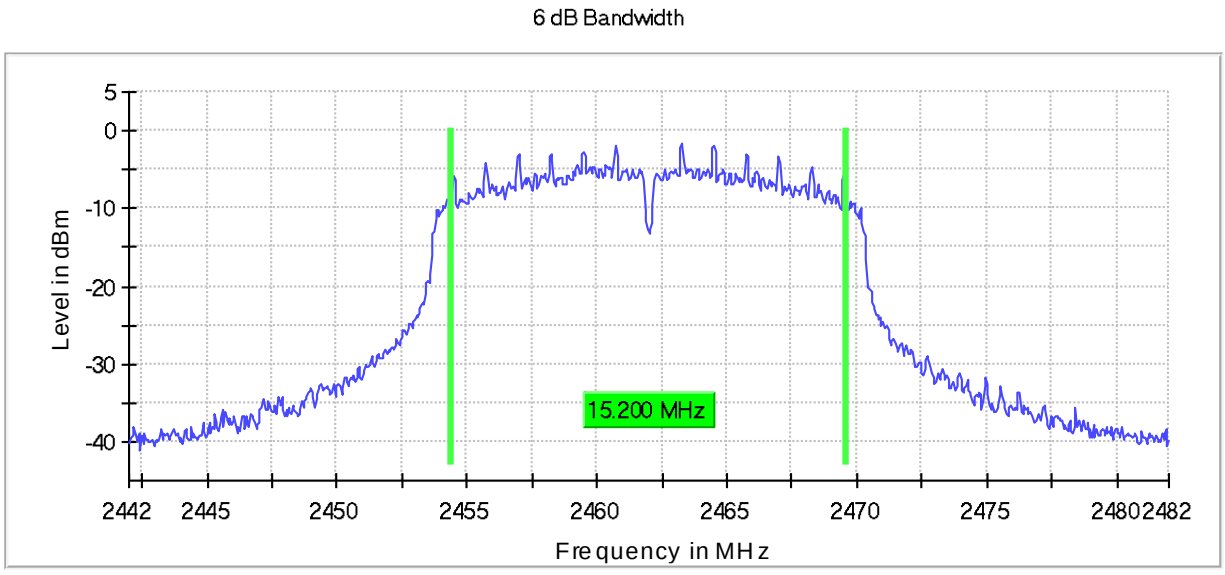
Plot #6

2462 MHz	Mode: 802.11g

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.44200 GHz	2.44200 GHz
Stop Frequency	2.48200 GHz	2.48200 GHz
Span	40.000 MHz	40.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	801	~ 800
Sweeptime	15.000 ms	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	25.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	20 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.49 dB	0.50 dB

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2462.000000	15.200000	0.500000	---	2454.400000	2469.600000



Plot #7

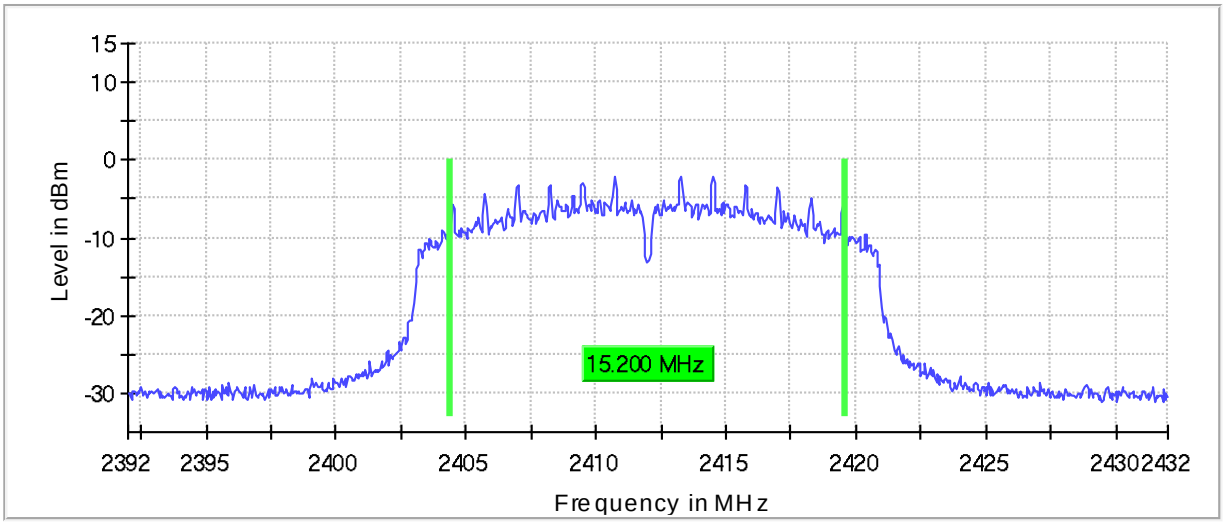
2412 MHz	Mode: 802.11n HT20

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.39200 GHz	2.39200 GHz
Stop Frequency	2.43200 GHz	2.43200 GHz
Span	40.000 MHz	40.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	801	~ 800
Sweeptime	15.000 ms	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	35.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	32 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.28 dB	0.50 dB

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2412.000000	15.200000	0.500000	---	2404.400000	2419.600000

6 dB Bandwidth



Plot #8

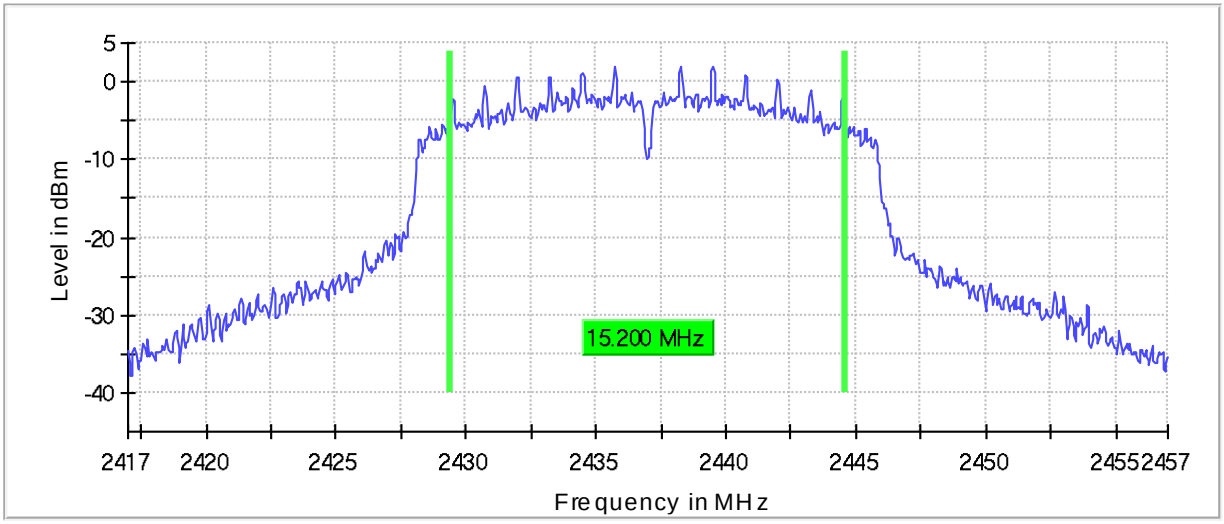
2437 MHz	Mode: 802.11n HT20

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.41700 GHz	2.41700 GHz
Stop Frequency	2.45700 GHz	2.45700 GHz
Span	40.000 MHz	40.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	801	~ 800
Sweeptime	15.000 ms	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	15.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	32 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.00 dB	0.50 dB

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2437.000000	15.200000	0.500000	---	2429.400000	2444.600000

6 dB Bandwidth



Plot #9

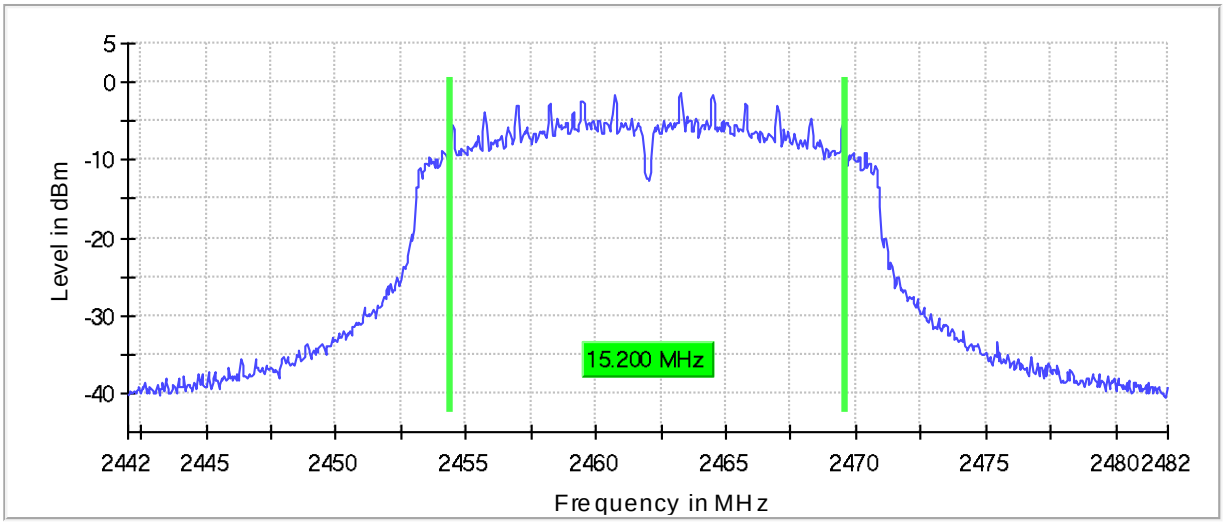
2462 MHz	Mode: 802.11HT20

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.44200 GHz	2.44200 GHz
Stop Frequency	2.48200 GHz	2.48200 GHz
Span	40.000 MHz	40.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	801	~ 800
Sweeptime	15.000 ms	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	25.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	21 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.14 dB	0.50 dB

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2462.000000	15.200000	0.500000	---	2454.400000	2469.600000

6 dB Bandwidth



99% Occupied Bandwidth

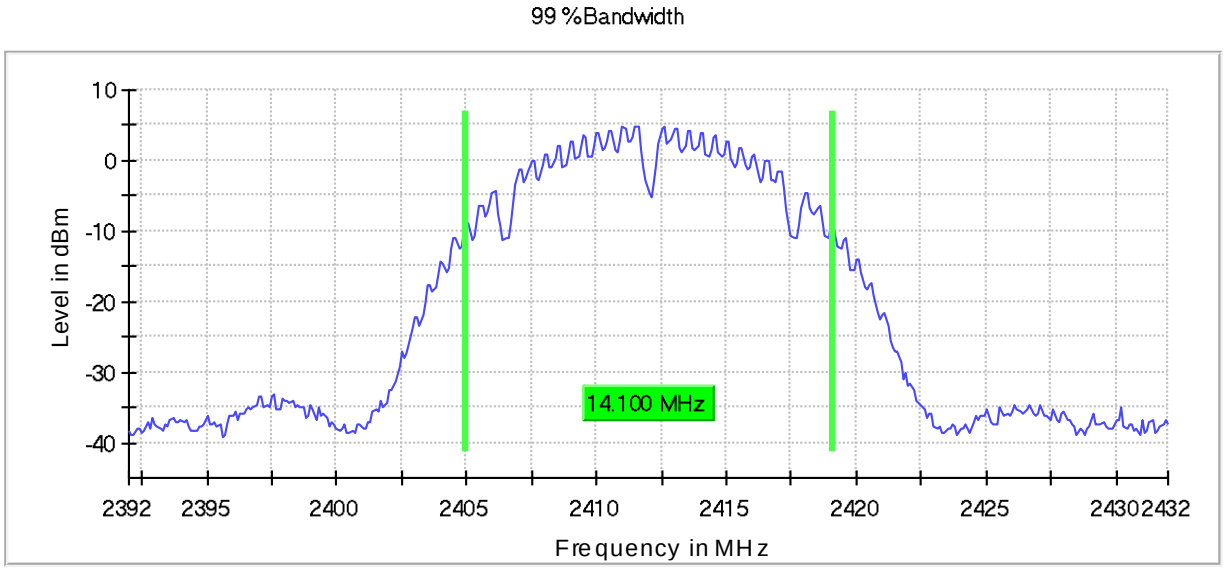
Plot #10

2412 MHz	Mode: 802.11b

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.39200 GHz	2.39200 GHz
Stop Frequency	2.43200 GHz	2.43200 GHz
Span	40.000 MHz	40.000 MHz
RBW	200.000 kHz	>= 200.000 kHz
VBW	1.000 MHz	>= 600.000 kHz
SweepPoints	401	~ 400
Sweeptime	2.500 ms	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	25.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	5 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.12 dB	0.30 dB

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2412.000000	14.100000	---	---	2405.000000	2419.100000



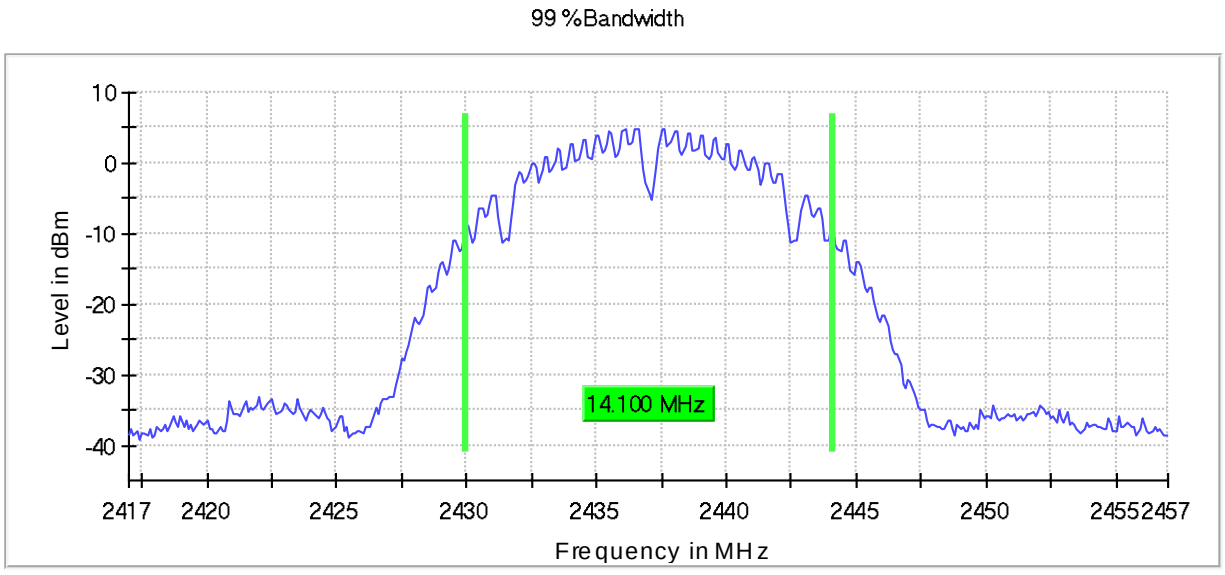
Plot #11

2437 MHz	Mode: 802.11b

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.41700 GHz	2.41700 GHz
Stop Frequency	2.45700 GHz	2.45700 GHz
Span	40.000 MHz	40.000 MHz
RBW	200.000 kHz	>= 200.000 kHz
VBW	1.000 MHz	>= 600.000 kHz
SweepPoints	401	~ 400
Sweeptime	2.500 ms	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	25.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	5 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.16 dB	0.30 dB

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2437.000000	14.100000	---	---	2430.000000	2444.100000



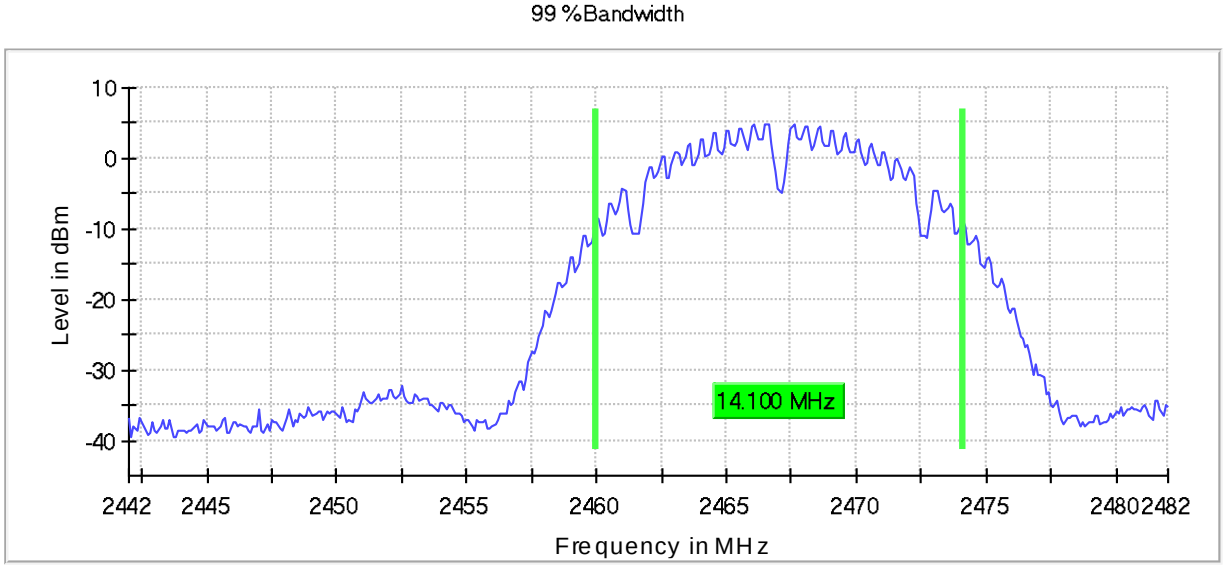
Plot #12

2462 MHz	Mode: 802.11b

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.44200 GHz	2.44200 GHz
Stop Frequency	2.48200 GHz	2.48200 GHz
Span	40.000 MHz	40.000 MHz
RBW	200.000 kHz	>= 200.000 kHz
VBW	1.000 MHz	>= 600.000 kHz
SweepPoints	401	~ 400
Sweeptime	2.500 ms	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	25.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	4 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.27 dB	0.30 dB

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2462.000000	14.100000	---	---	2460.000000	2474.100000



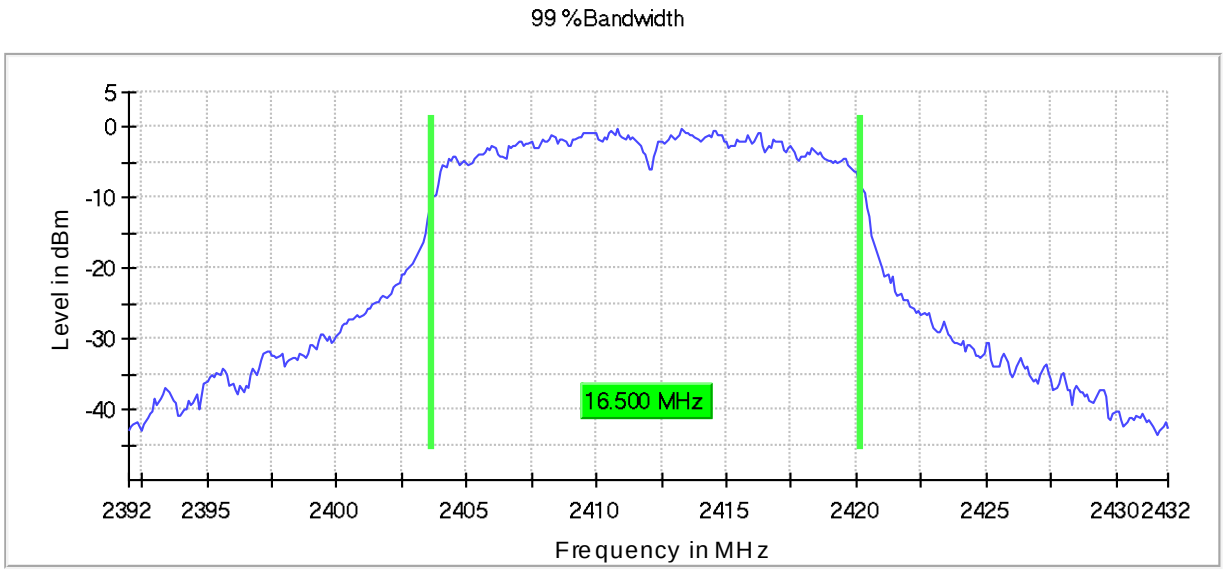
Plot #13

2412 MHz	Mode: 802.11g

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.39200 GHz	2.39200 GHz
Stop Frequency	2.43200 GHz	2.43200 GHz
Span	40.000 MHz	40.000 MHz
RBW	200.000 kHz	>= 200.000 kHz
VBW	1.000 MHz	>= 600.000 kHz
SweepPoints	401	~ 400
Sweeptime	2.500 ms	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	15.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	20 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.27 dB	0.30 dB

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2412.000000	16.500000	---	---	2403.700000	2420.200000



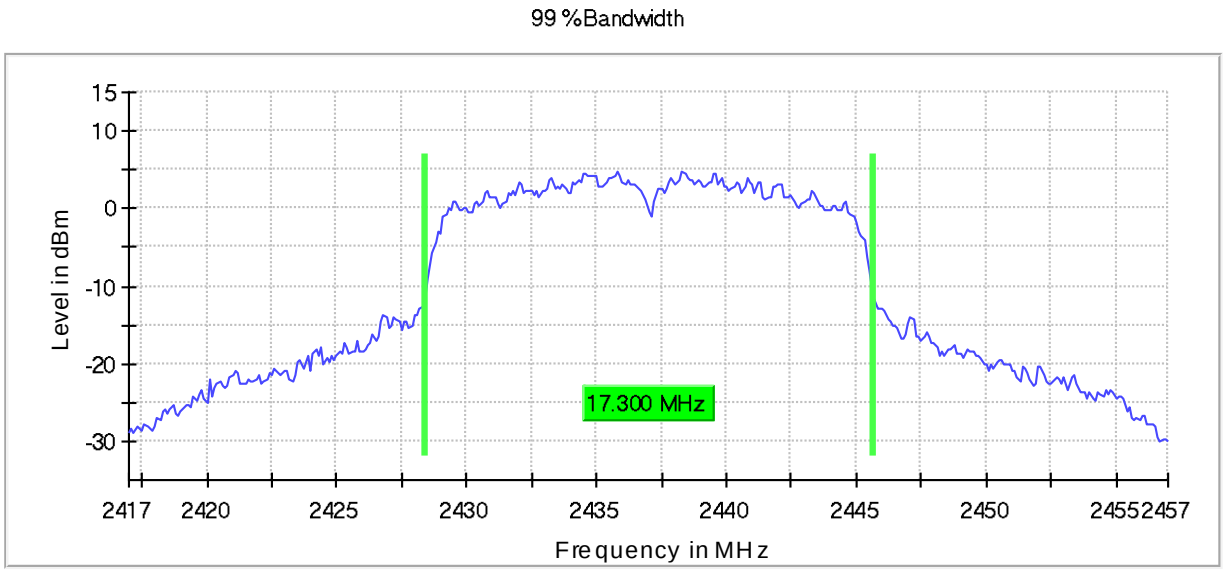
Plot #14

2437 MHz	Mode: 802.11g

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.41700 GHz	2.41700 GHz
Stop Frequency	2.45700 GHz	2.45700 GHz
Span	40.000 MHz	40.000 MHz
RBW	200.000 kHz	>= 200.000 kHz
VBW	1.000 MHz	>= 600.000 kHz
SweepPoints	401	~ 400
Sweeptime	2.500 ms	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	25.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	26 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.08 dB	0.30 dB

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2437.000000	17.300000	---	---	2428.400000	2445.700000



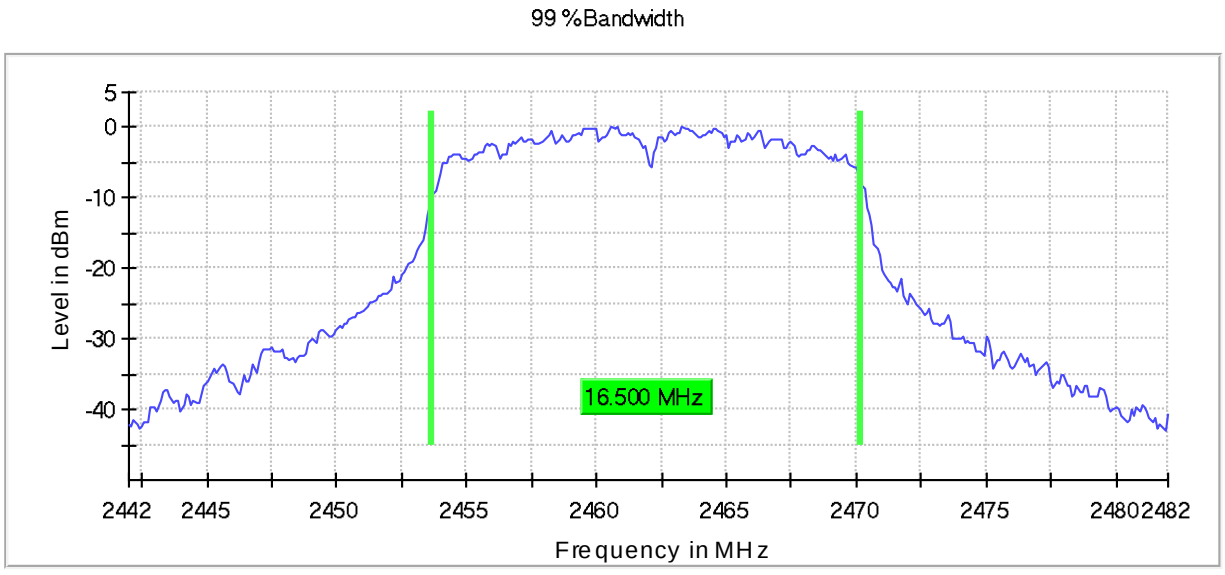
Plot #15

2462 MHz	Mode: 802.11g

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.44200 GHz	2.44200 GHz
Stop Frequency	2.48200 GHz	2.48200 GHz
Span	40.000 MHz	40.000 MHz
RBW	200.000 kHz	>= 200.000 kHz
VBW	1.000 MHz	>= 600.000 kHz
SweepPoints	401	~ 400
Sweeptime	2.500 ms	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	15.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	23 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.26 dB	0.30 dB

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2462.000000	16.500000	---	---	2453.700000	2470.200000



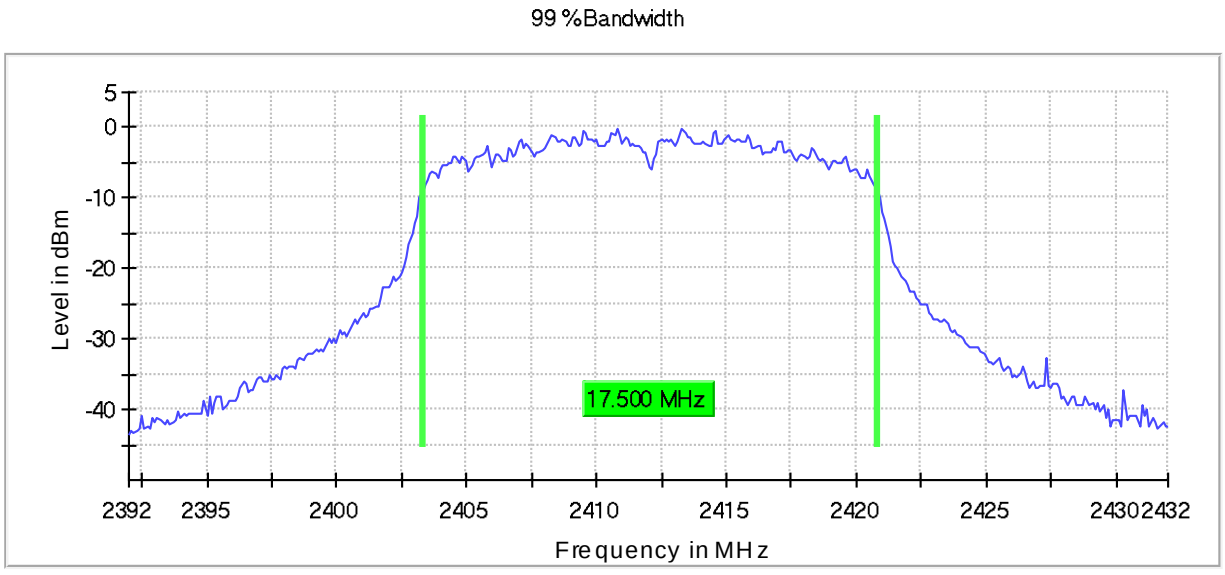
Plot #16

2412 MHz	Mode: 802.11n HT20

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.39200 GHz	2.39200 GHz
Stop Frequency	2.43200 GHz	2.43200 GHz
Span	40.000 MHz	40.000 MHz
RBW	200.000 kHz	>= 200.000 kHz
VBW	1.000 MHz	>= 600.000 kHz
SweepPoints	401	~ 400
Sweeptime	2.500 ms	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	15.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	31 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.17 dB	0.30 dB

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2412.000000	17.500000	---	---	2403.300000	2420.800000



Plot #17

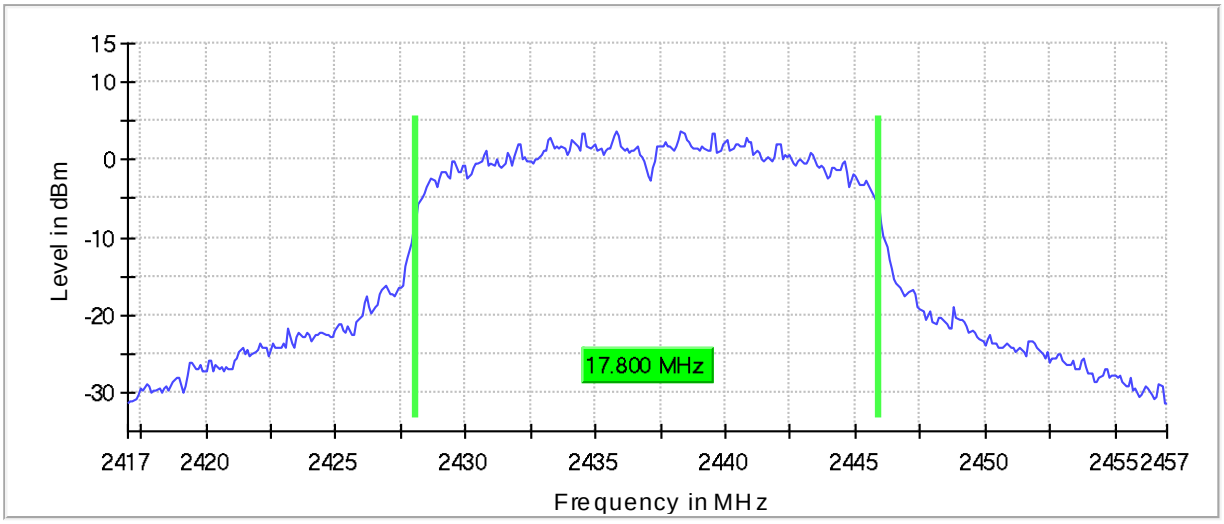
2437 MHz	Mode: 802.11n HT20

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.41700 GHz	2.41700 GHz
Stop Frequency	2.45700 GHz	2.45700 GHz
Span	40.000 MHz	40.000 MHz
RBW	200.000 kHz	>= 200.000 kHz
VBW	1.000 MHz	>= 600.000 kHz
SweepPoints	401	~ 400
Sweeptime	2.500 ms	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	25.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	23 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.18 dB	0.30 dB

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2437.000000	17.800000	---	---	2428.100000	2445.900000

99 %Bandwidth



Plot #18

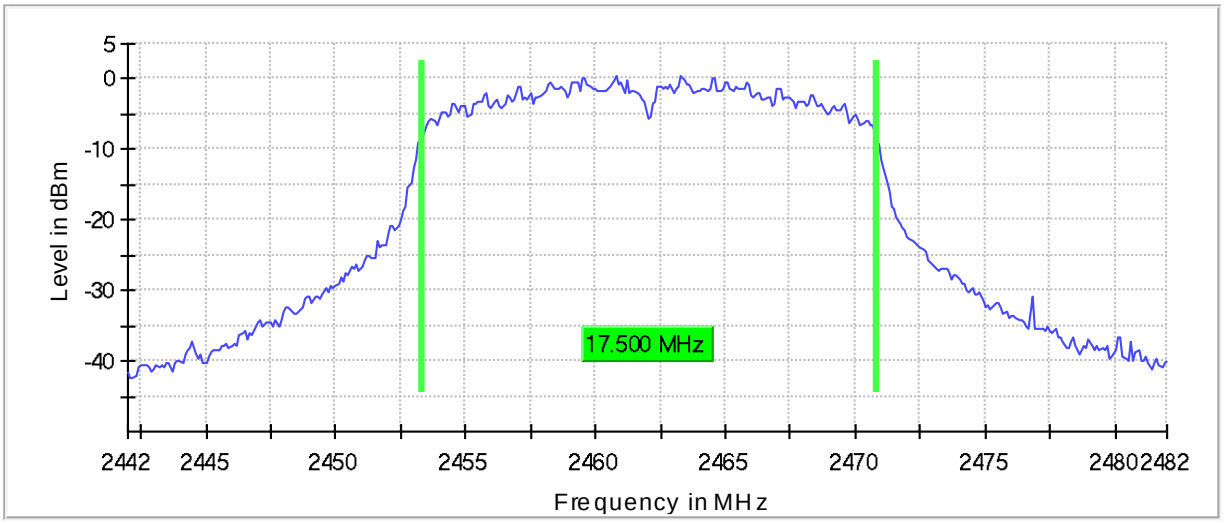
2462 MHz	Mode: 802.11HT20

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.44200 GHz	2.44200 GHz
Stop Frequency	2.48200 GHz	2.48200 GHz
Span	40.000 MHz	40.000 MHz
RBW	200.000 kHz	>= 200.000 kHz
VBW	1.000 MHz	>= 600.000 kHz
SweepPoints	401	~ 400
Sweeptime	2.500 ms	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	15.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	35 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.09 dB	0.30 dB

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2462.000000	17.500000	---	---	2453.300000	2470.800000

99 %Bandwidth



8.6 Radiated Transmitter Spurious Emissions and Restricted Bands

8.6.1 Measurement according to ANSI C63.10 (2013)

Spectrum Analyzer Settings:

- Frequency = 9 KHz – 30 MHz
- RBW = 9 KHz
- Detector: Peak

- Frequency = 30 MHz – 1 GHz
- Detector = Peak / Quasi-Peak
- RBW= 120 KHz (<1GHz)

- Frequency > 1 GHz
- Detector = Peak / Average
- RBW = 1 MHz

- Radiated spurious emissions shall be measured for the transmit frequencies, transmit power, and data rate for the lowest, middle and highest channel in each frequency band of operation and for the highest gain antenna for each antenna type, and using the appropriate parameters and test requirements.
- The highest (or worst-case) data rate shall be recorded for each measurement.
- For testing frequencies below 30 MHz at distance other than the specified in the standard, the limit conversion is calculated by using the FCC materials for the ANSI 63 committee issued on January, 27 1991.

8.6.2 Limits:

FCC §15.247

- In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

FCC §15.209 & RSS-Gen 8.9

- Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency of emission (MHz)	Field strength (µV/m)	Measurement Distance (m)	Field strength @ 3m (dBµV/m)
0.009–0.490	2400/F(kHz) / ---------	300	-
0.490–1.705	24000/F(kHz) / --------	30	-
1.705–30.0	30 / (29.5)	30	-
30–88	100	3	40 dBµV/m
88–216	150	3	43.5 dBµV/m
216–960	200	3	46 dBµV/m
Above 960	500	3	54 dBµV/m

FCC §15.205 & RSS-Gen 8.10

- Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

- Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
  *PEAK LIMIT= 74 dBµV/m
  *AVG. LIMIT= 54 dBµV/m

8.6.3 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input	Antenna Gain
23.8°C	1	802.11b,g,n	3.3 VDC	2.10 dBi
	2	802.11b,g,n	3.3 VDC	2.03 dBi
	3	802.11b,g,n	3.3 VDC	5.70 dBi

8.6.4 Measurement result:

Plot #	EUT Set-Up #	Channel #	Scan Frequency	Lowest Margin Emission (dBµV/m)	Limit	Result
1-3	1	Low	30 MHz – 18 GHz	28.45	See section 8.6.2	Pass
4-8		Mid	9 kHz – 26 GHz	33.43	See section 8.6.2	Pass
9-11		High	30 MHz – 18 GHz	33.42	See section 8.6.2	Pass
12-14	2	Low	30 MHz – 18 GHz	40.61	See section 8.6.2	Pass
15-19		Mid	9 kHz – 26 GHz	***40.61***	See section 8.6.2	Pass
20-22		High	30 MHz – 18 GHz	33.43	See section 8.6.2	Pass
23-25	3	Low	30 MHz – 18 GHz	29.67	See section 8.6.2	Pass
26-30		Mid	9 kHz – 26 GHz	33.31	See section 8.6.2	Pass
31-33		High	30 MHz – 18 GHz	33.31	See section 8.6.2	Pass

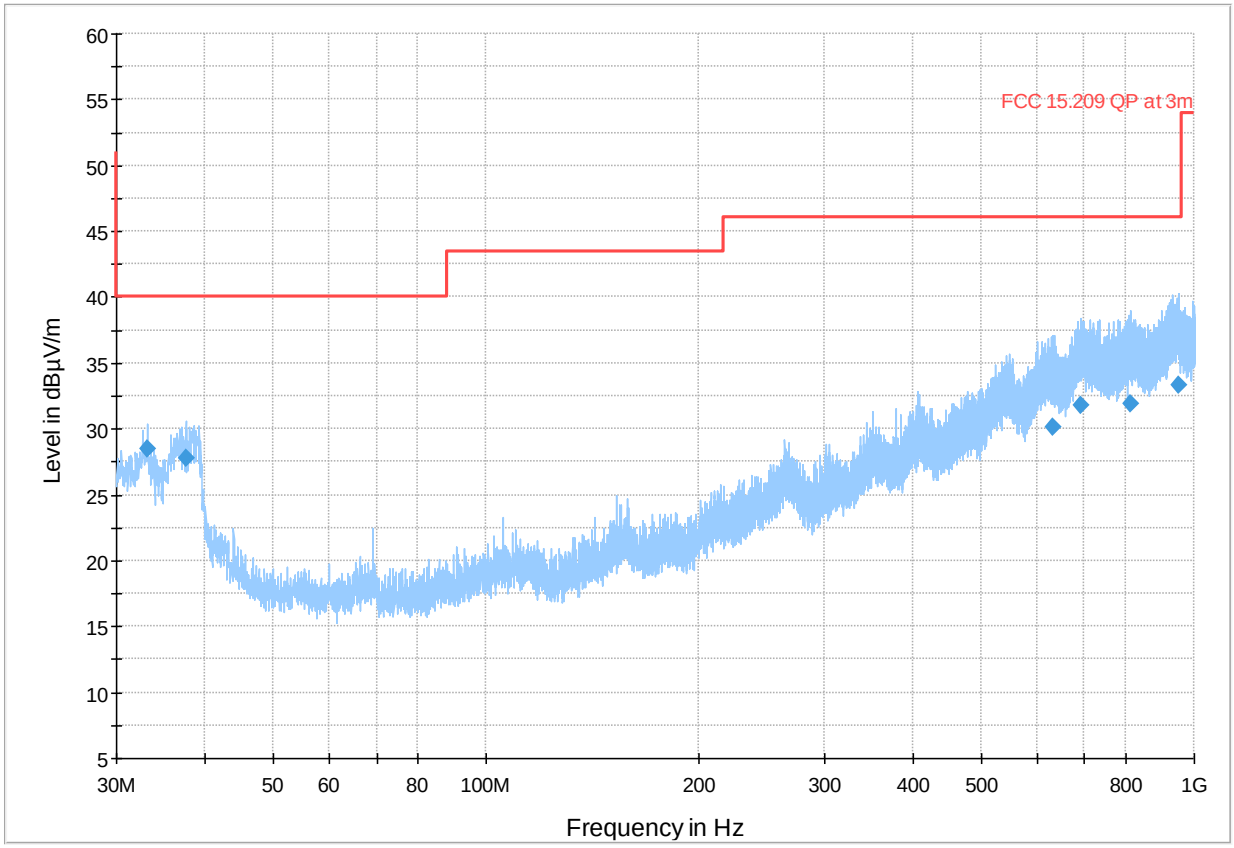
8.6.5 Measurement Plots:

Plot # 1 Radiated Emissions: 30 MHz – 1 GHz

Tx Frequency: 2412 MHz	802.11g

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
33.20	28.45	40.00	11.55	500.0	120.0	175.0	V	244.0	20.41
37.57	27.79	40.00	12.21	500.0	120.0	150.0	V	171.0	17.83
631.21	30.13	46.02	15.89	500.0	120.0	252.0	H	125.0	30.28
691.67	31.77	46.02	14.25	500.0	120.0	325.0	H	50.0	32.09
814.21	31.88	46.02	14.14	500.0	120.0	230.0	H	244.0	32.33
951.53	33.28	46.02	12.74	500.0	120.0	150.0	H	296.0	33.58

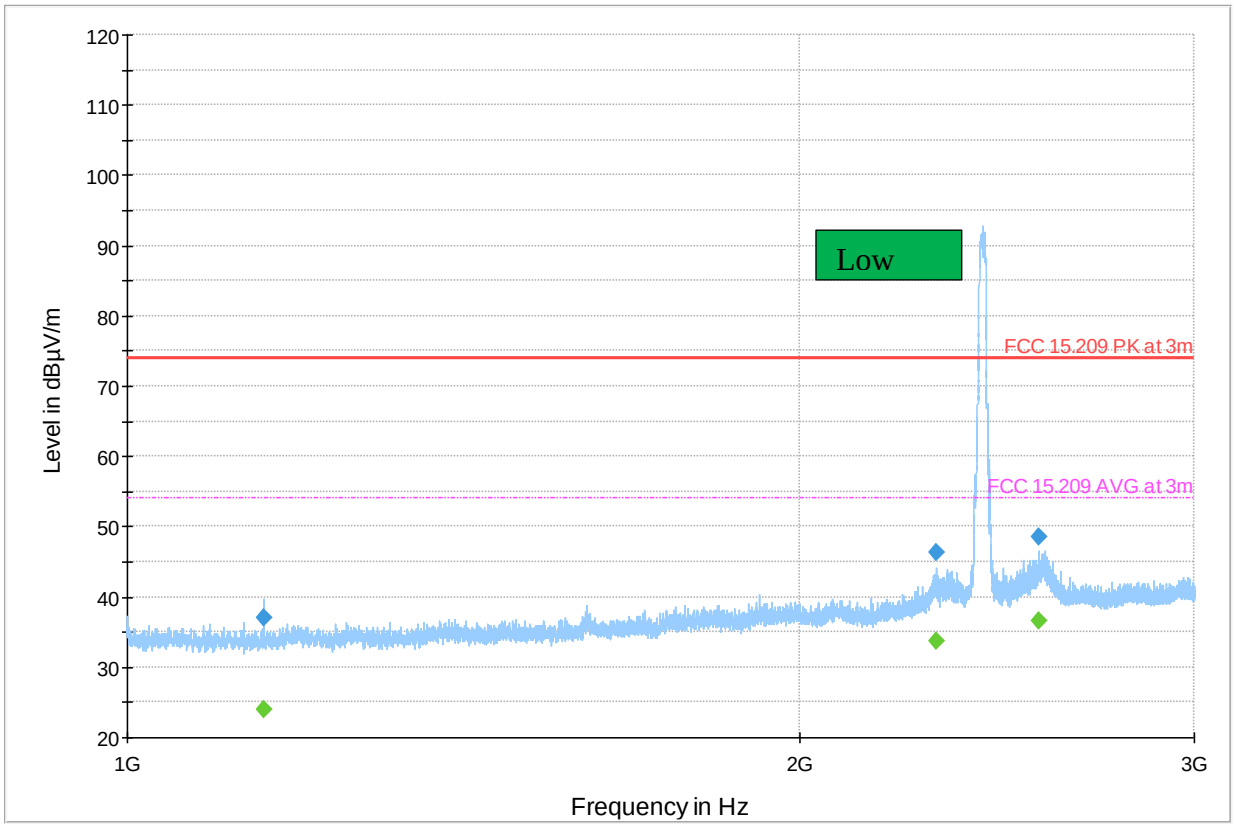


Plot # 2 Radiated Emissions: 1 – 3 GHz

Tx Frequency: 2412 MHz	802.11g

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1151.43	---	24.07	53.98	29.91	500.0	1000.0	206.0	H	59.0	4.18
1151.43	36.95	---	73.98	37.03	500.0	1000.0	206.0	H	59.0	4.18
2299.71	46.31	---	73.98	27.67	500.0	1000.0	149.0	H	253.0	8.68
2299.71	---	33.79	53.98	20.19	500.0	1000.0	149.0	H	253.0	8.68
2556.43	48.59	---	73.98	25.39	500.0	1000.0	150.0	H	233.0	9.70
2556.43	---	36.50	53.98	17.48	500.0	1000.0	150.0	H	233.0	9.70

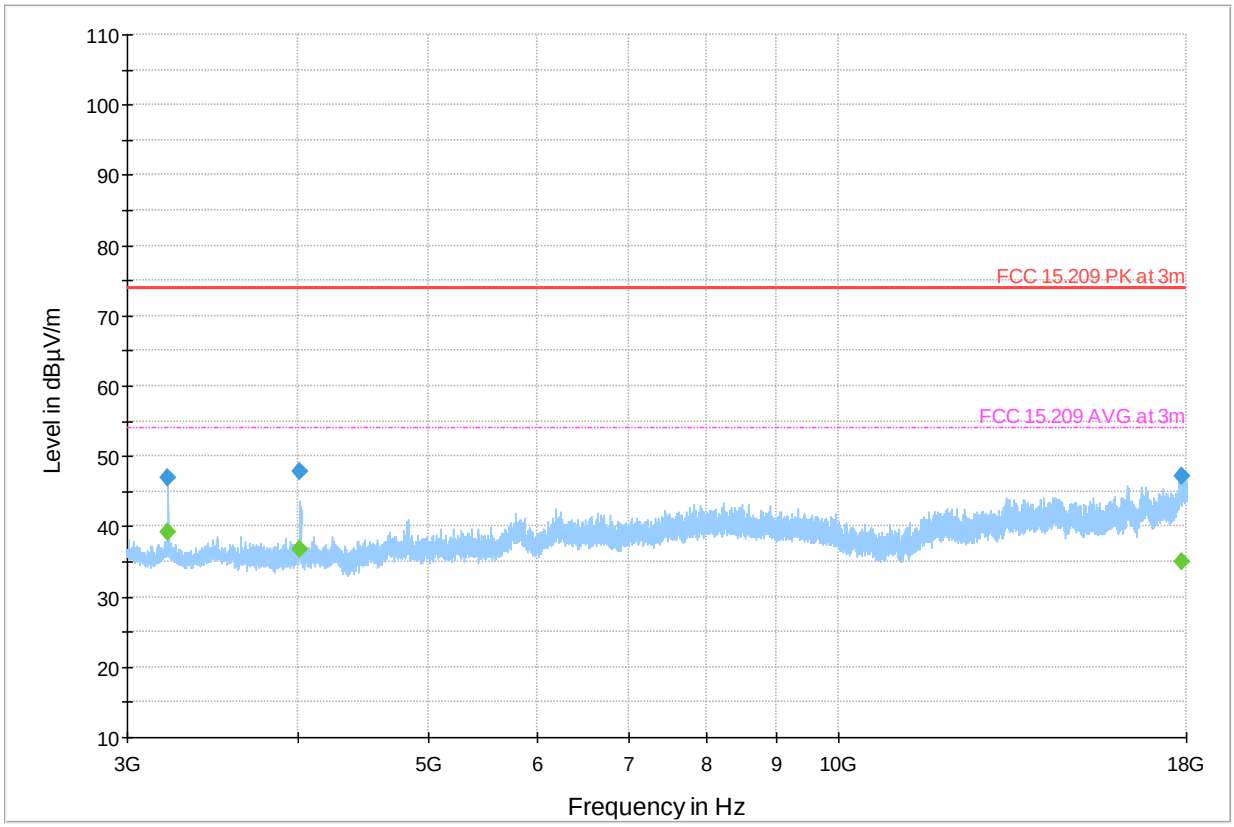


Plot # 3 Radiated Emissions: 3 – 18 GHz

Tx Frequency: 2412 MHz | **802.11g**

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3215.50	---	39.15	53.98	14.83	500.0	1000.0	221.0	V	261.0	-7.55
3215.50	46.99	---	73.98	26.99	500.0	1000.0	221.0	V	261.0	-7.55
4017.00	47.77	---	73.98	26.21	500.0	1000.0	149.0	H	179.0	-5.27
4017.00	---	36.73	53.98	17.25	500.0	1000.0	149.0	H	179.0	-5.27
17842.00	47.23	---	73.98	26.75	500.0	1000.0	315.0	V	254.0	11.72
17842.00	---	35.09	53.98	18.89	500.0	1000.0	315.0	V	254.0	11.72

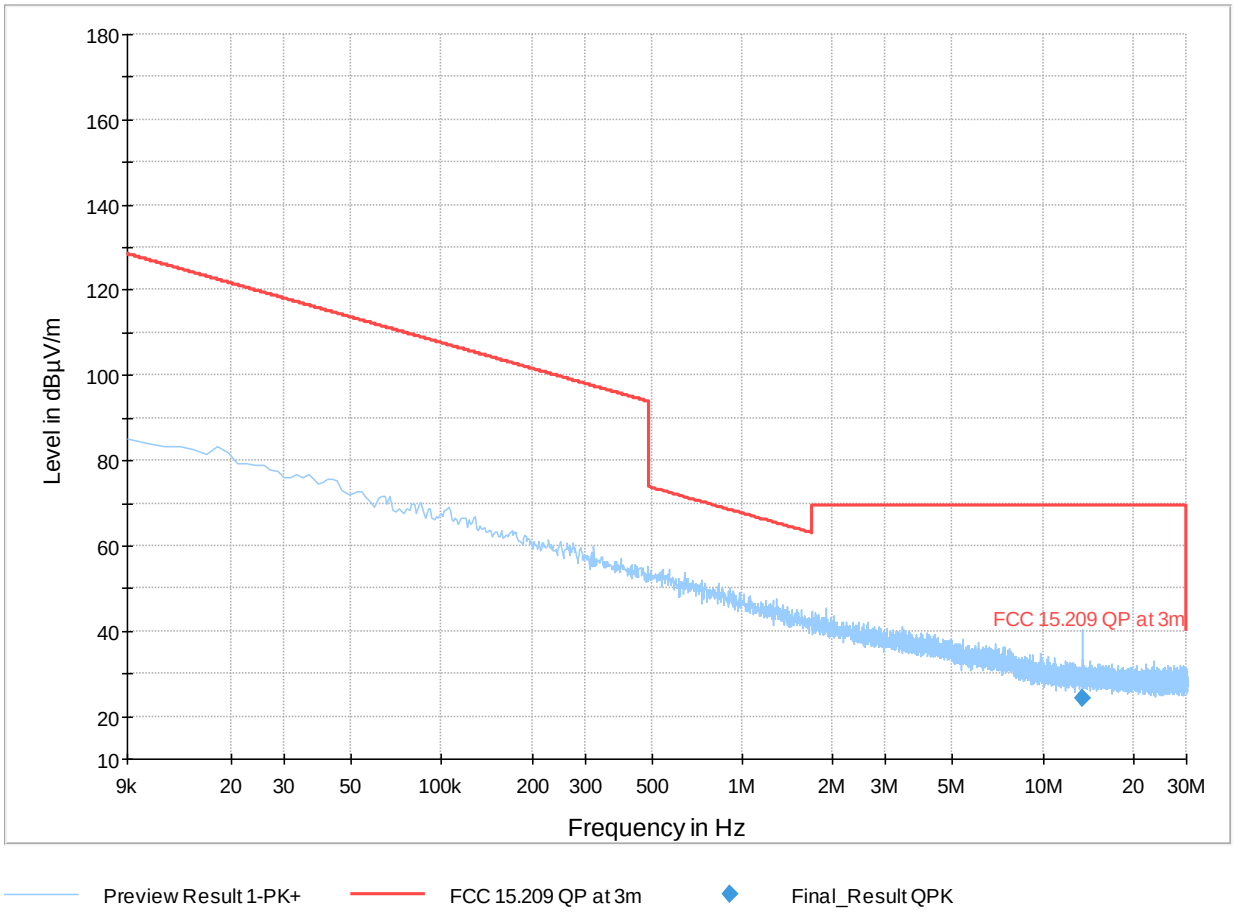


Plot # 4 Radiated Emissions: 9kHz - 30 MHz

Tx Frequency: 2437 MHz | **802.11g**

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
13.55	24.29	69.50	45.21	500.0	9.0	220.0	V	258.0	17.04

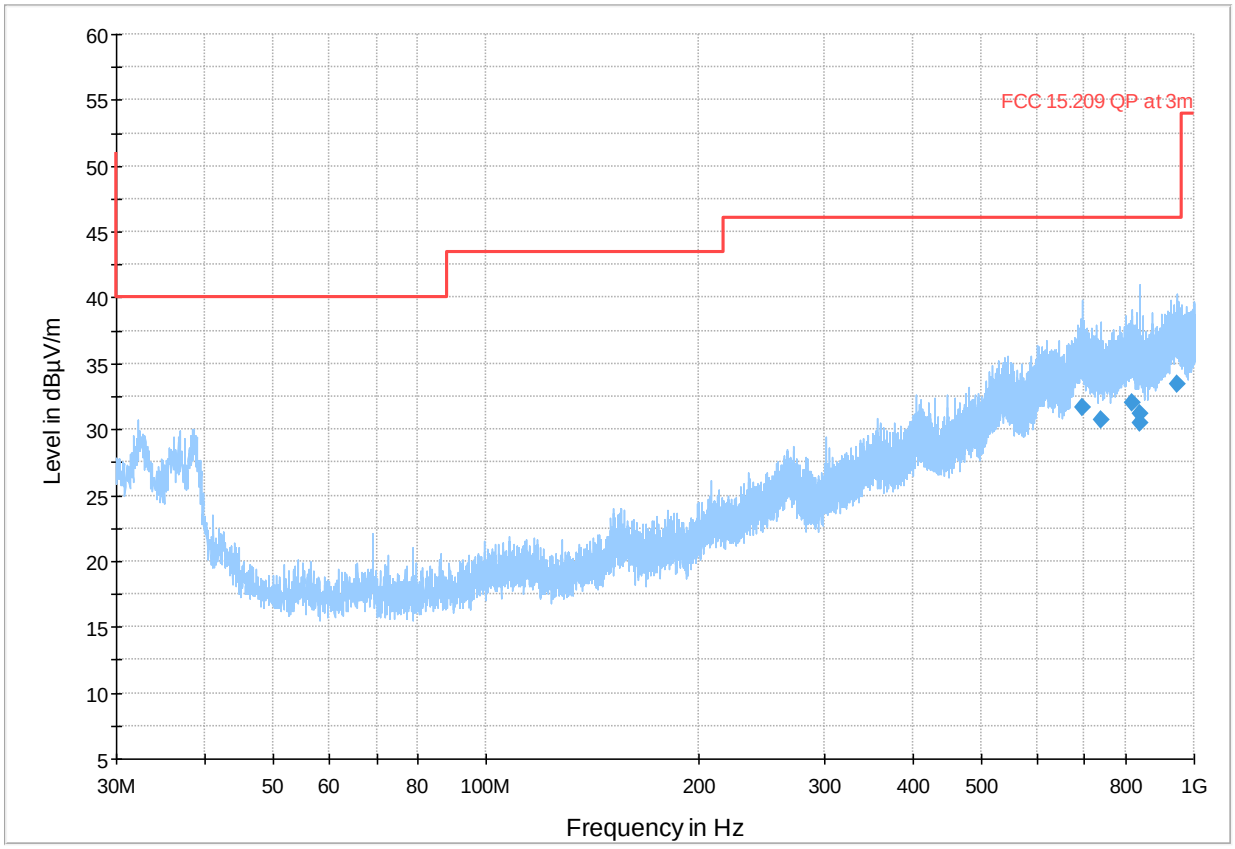


Plot # 5 Radiated Emissions: 30 MHz – 1 GHz

Tx Frequency: 2437 MHz	802.11g

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
694.29	31.70	46.02	14.32	500.0	120.0	248.0	H	72.0	32.09
737.00	30.75	46.02	15.27	500.0	120.0	287.0	H	291.0	31.11
815.31	32.01	46.02	14.01	500.0	120.0	164.0	H	130.0	32.40
837.46	30.44	46.02	15.58	500.0	120.0	163.0	V	100.0	30.91
839.04	31.16	46.02	14.87	500.0	120.0	275.0	H	247.0	31.70
946.33	33.43	46.02	12.59	500.0	120.0	308.0	H	247.0	33.77

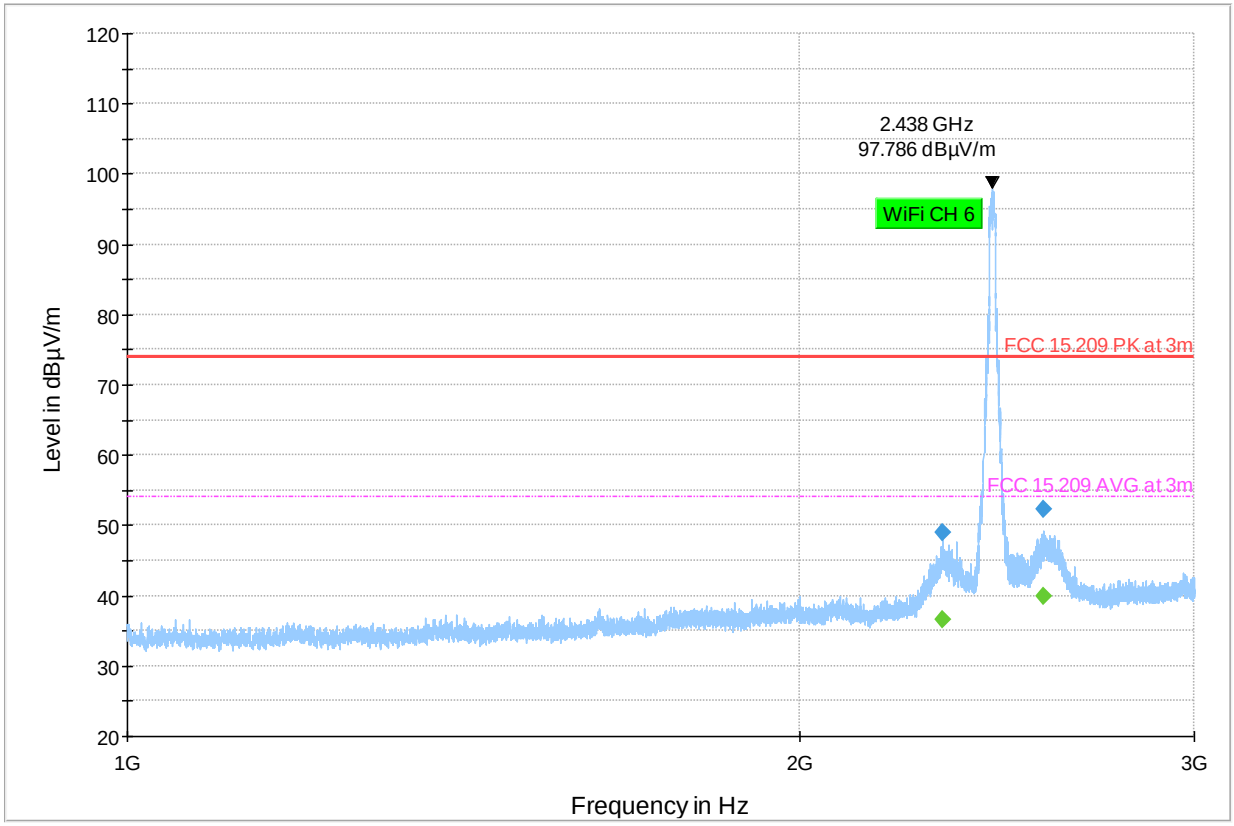


Plot # 6 Radiated Emissions: 1 – 3 GHz

Tx Frequency: 2437 MHz	802.11g

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2315.14	49.04	---	73.98	24.94	500.0	1000.0	185.0	H	251.0	8.58
2315.14	---	36.69	53.98	17.29	500.0	1000.0	185.0	H	251.0	8.58
2569.86	52.22	---	73.98	21.76	500.0	1000.0	149.0	H	236.0	9.80
2569.86	---	39.94	53.98	14.04	500.0	1000.0	149.0	H	236.0	9.80

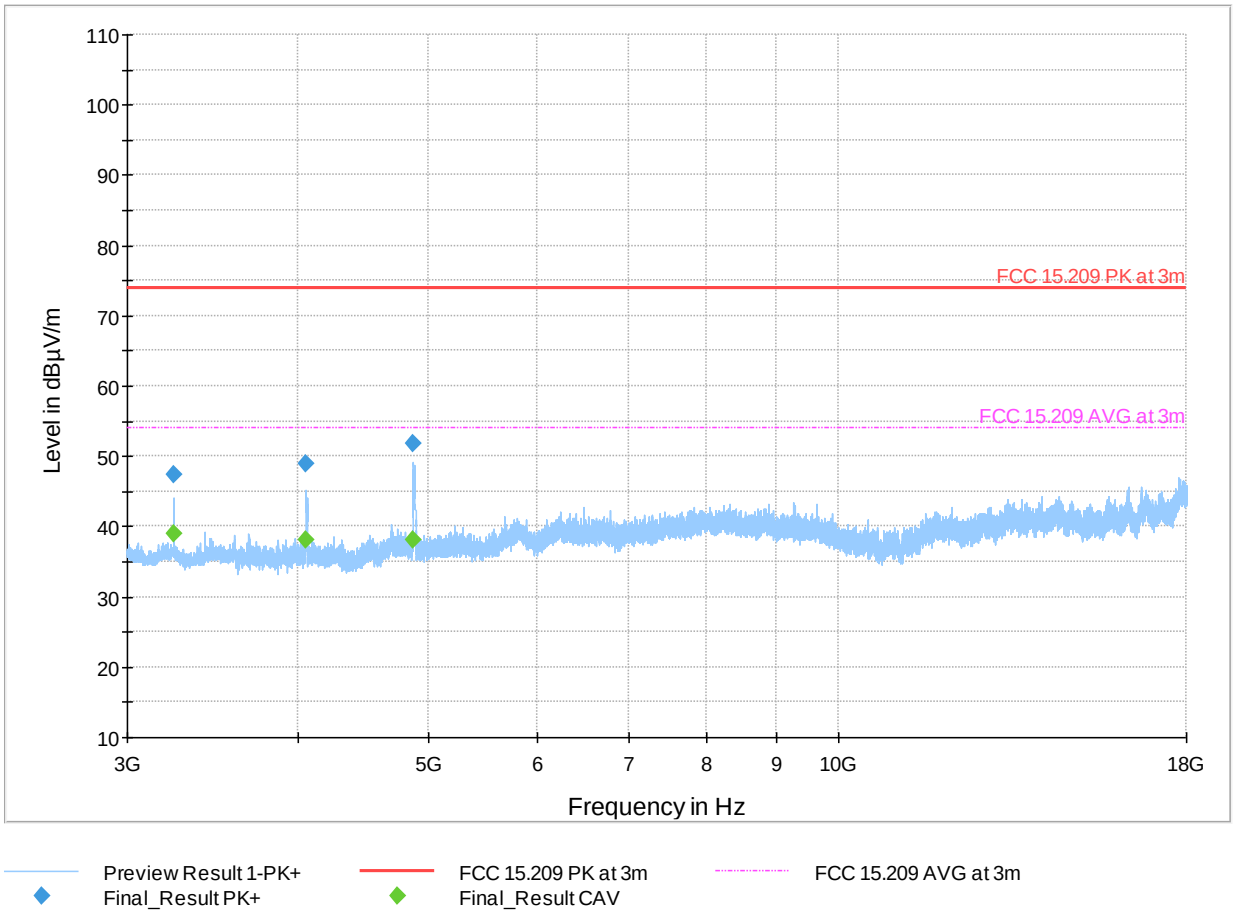


Plot # 7 Radiated Emissions: 3 – 18 GHz

Tx Frequency: 2437 MHz	802.11g

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3249.00	47.43	---	73.98	26.55	500.0	1000.0	242.0	V	258.0	-8.07
3249.00	---	38.88	53.98	15.10	500.0	1000.0	242.0	V	258.0	-8.07
4059.50	---	38.09	53.98	15.89	500.0	1000.0	150.0	H	315.0	-5.21
4059.50	48.87	---	73.98	25.11	500.0	1000.0	150.0	H	315.0	-5.21
4871.00	51.72	---	73.98	22.26	500.0	1000.0	149.0	H	275.0	-4.40
4871.00	---	38.15	53.98	15.83	500.0	1000.0	149.0	H	275.0	-4.40

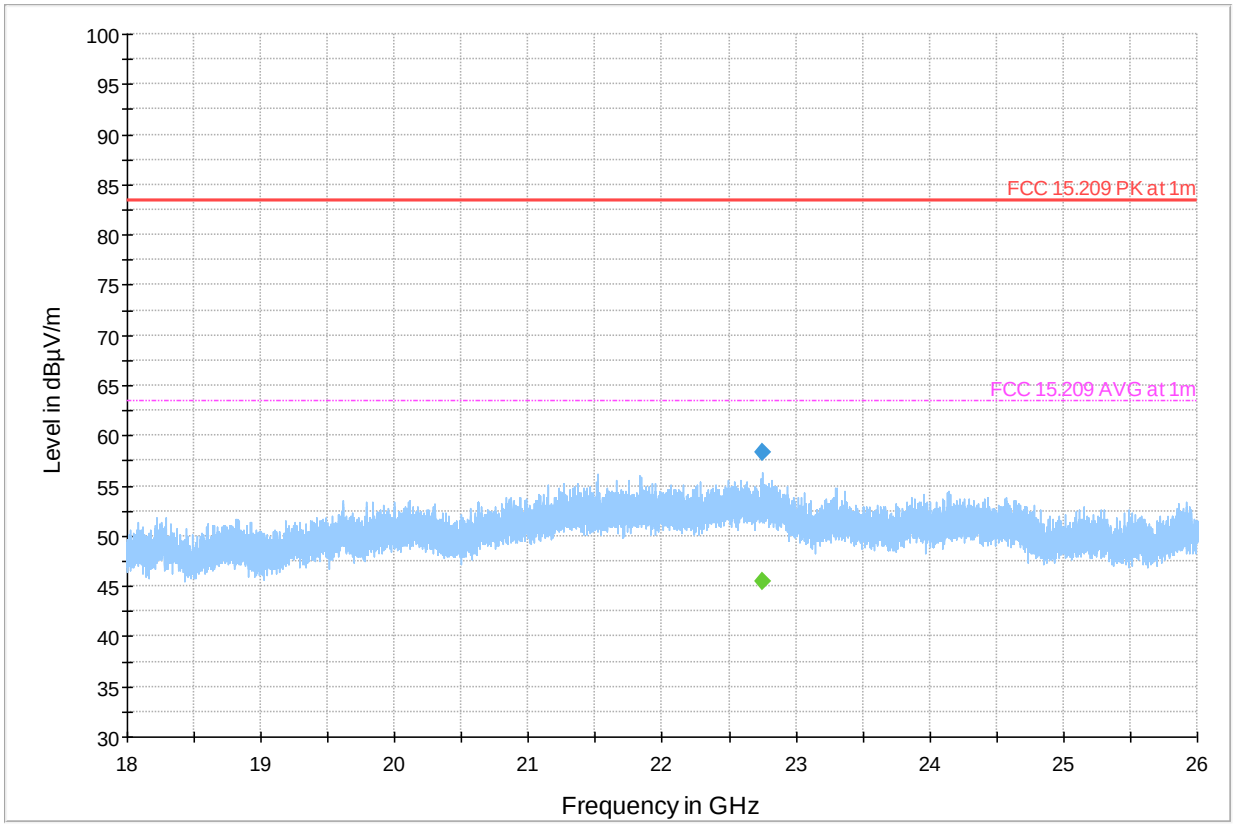


Plot # 8 Radiated Emissions: 18 – 26 GHz

Tx Frequency: 2437 MHz	802.11g

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
22745.25	---	45.53	63.50	17.97	500.0	1000.0	140.0	H	64.0	20.05
22745.25	58.38	---	83.50	25.12	500.0	1000.0	140.0	H	64.0	20.05

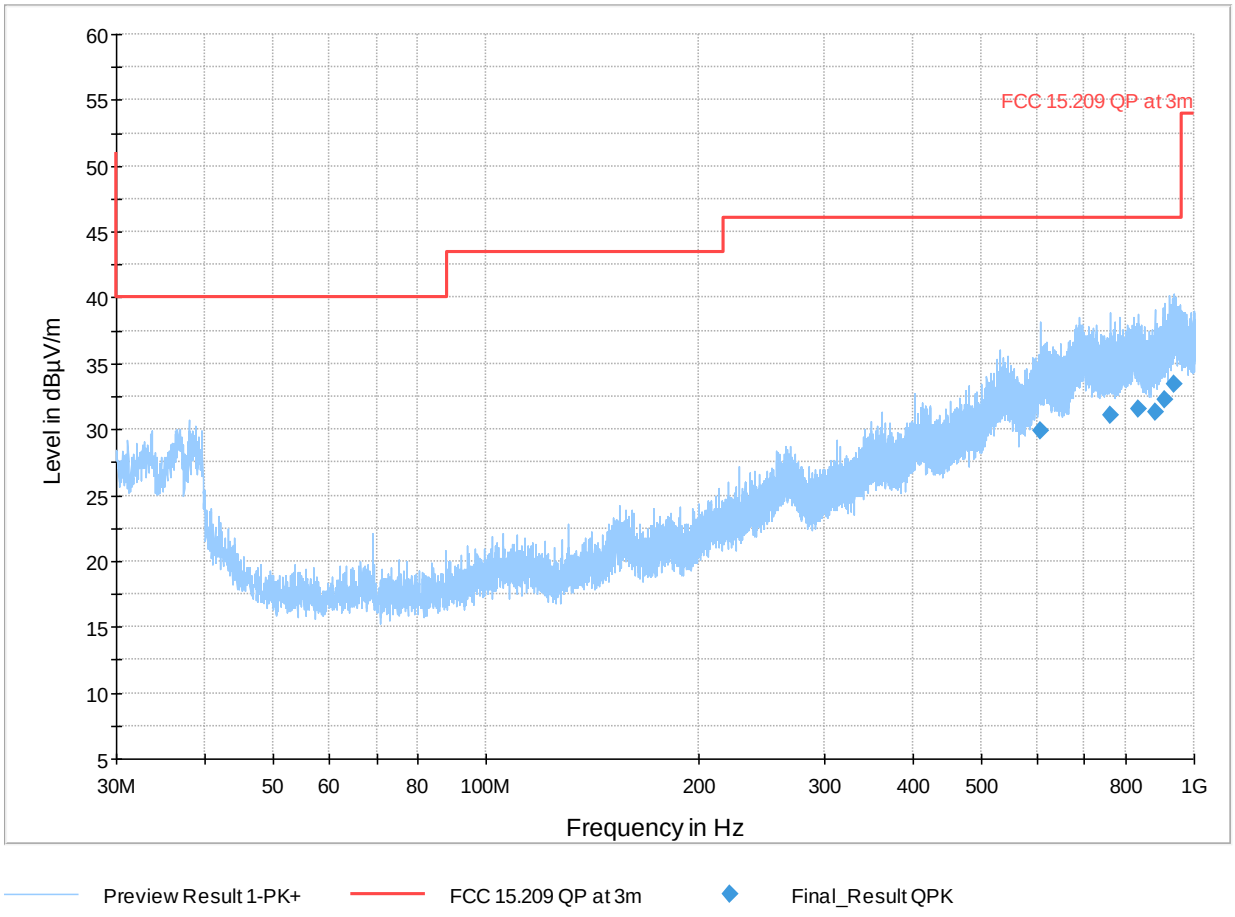


Plot # 9 Radiated Emissions: 30 MHz – 1 GHz

Tx Frequency: 2462 MHz	802.11g

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
605.89	29.96	46.02	16.06	500.0	120.0	229.0	H	28.0	29.86
760.70	31.08	46.02	14.94	500.0	120.0	219.0	H	313.0	31.29
832.19	31.60	46.02	14.42	500.0	120.0	186.0	H	258.0	32.03
879.14	31.30	46.02	14.72	500.0	120.0	240.0	H	261.0	31.73
909.21	32.22	46.02	13.80	500.0	120.0	240.0	H	133.0	32.48
937.89	33.42	46.02	12.60	500.0	120.0	272.0	H	43.0	33.72

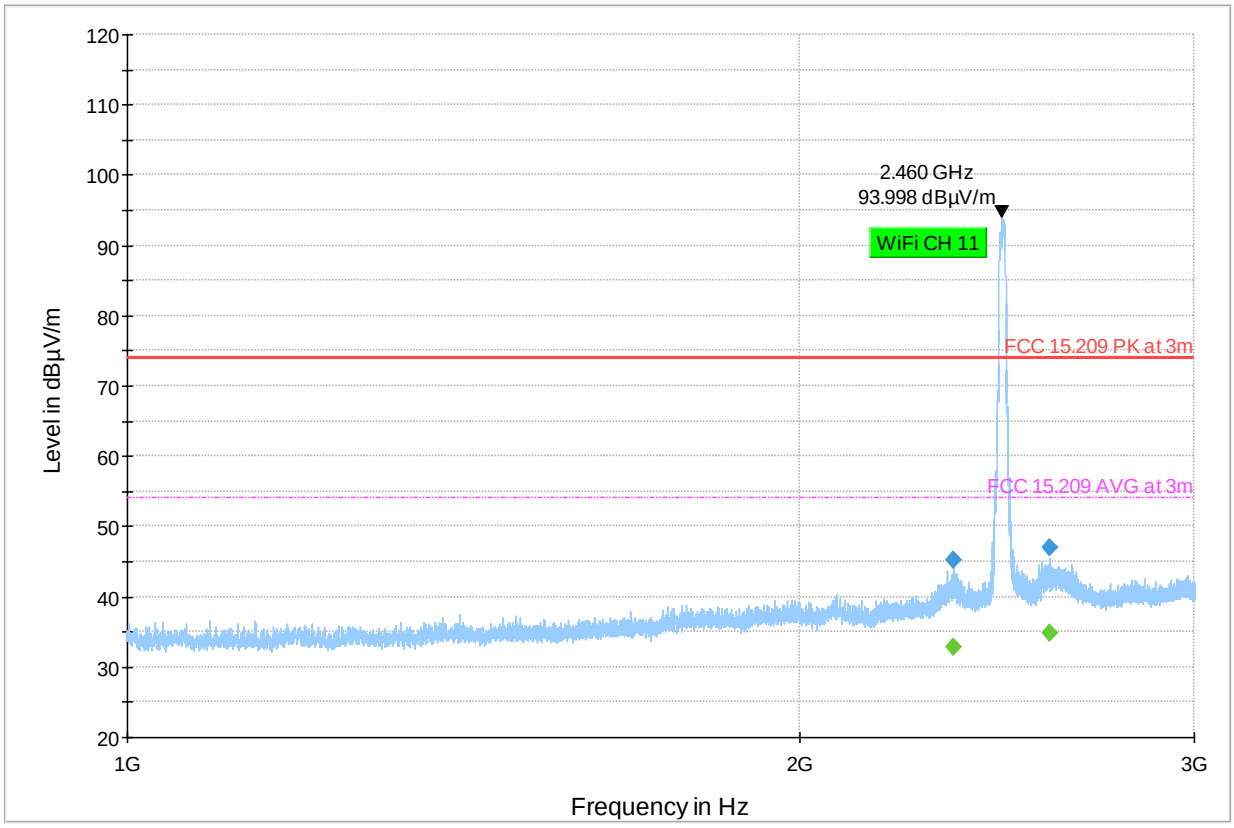


Plot # 10 Radiated Emissions: 1 – 3 GHz

Tx Frequency: 2462 MHz	802.11g

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2342.43	45.23	---	73.98	28.75	500.0	1000.0	218.0	H	253.0	8.47
2342.43	---	32.77	53.98	21.21	500.0	1000.0	218.0	H	253.0	8.47
2586.29	46.96	---	73.98	27.02	500.0	1000.0	150.0	H	232.0	9.88
2586.29	---	34.85	53.98	19.13	500.0	1000.0	150.0	H	232.0	9.88

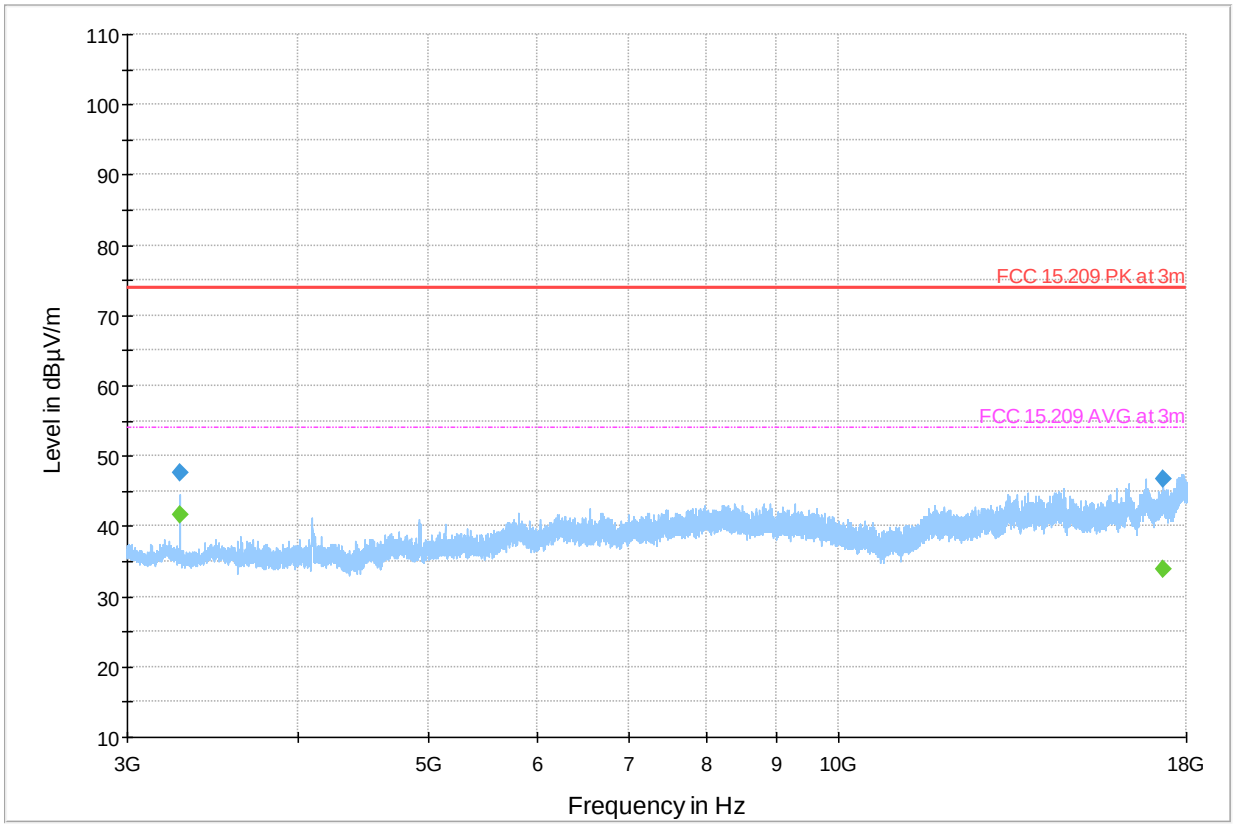


Plot # 11 Radiated Emissions: 3 – 18 GHz

Tx Frequency: 2462 MHz	802.11g

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3282.50	---	41.55	53.98	12.42	500.0	1000.0	149.0	V	245.0	-8.24
3282.50	47.51	---	73.98	26.47	500.0	1000.0	149.0	V	245.0	-8.24
17302.50	---	33.79	53.98	20.19	500.0	1000.0	220.0	V	356.0	8.67
17302.50	46.78	---	73.98	27.20	500.0	1000.0	220.0	V	356.0	8.67

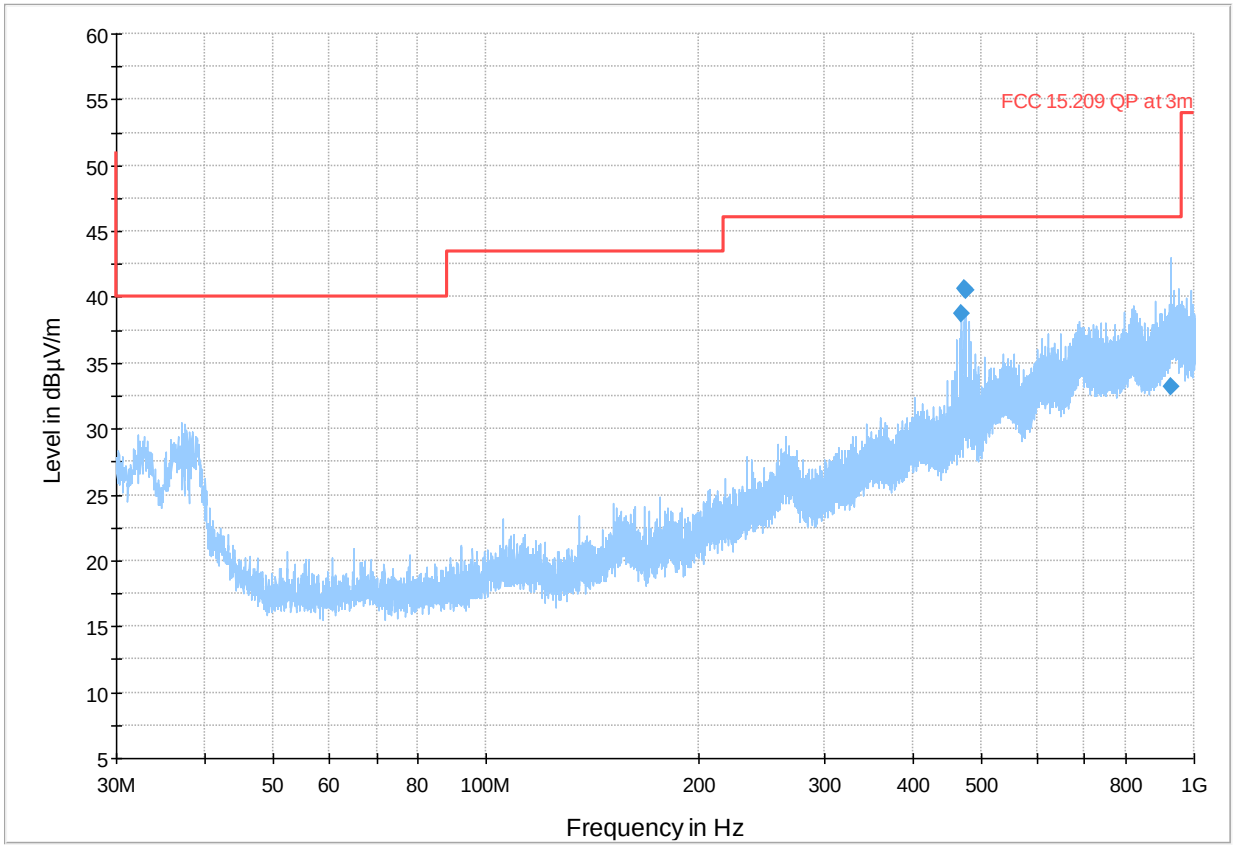


Plot # 12 Radiated Emissions: 30 MHz – 1 GHz

Tx Frequency: 2412 MHz | **802.11g**

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
468.86	38.72	46.02	7.31	500.0	120.0	174.0	H	56.0	26.53
472.61	40.61	46.02	5.41	500.0	120.0	196.0	H	68.0	26.73
476.14	40.58	46.02	5.44	500.0	120.0	197.0	H	264.0	26.91
928.22	33.22	46.02	12.80	500.0	120.0	206.0	H	81.0	33.53

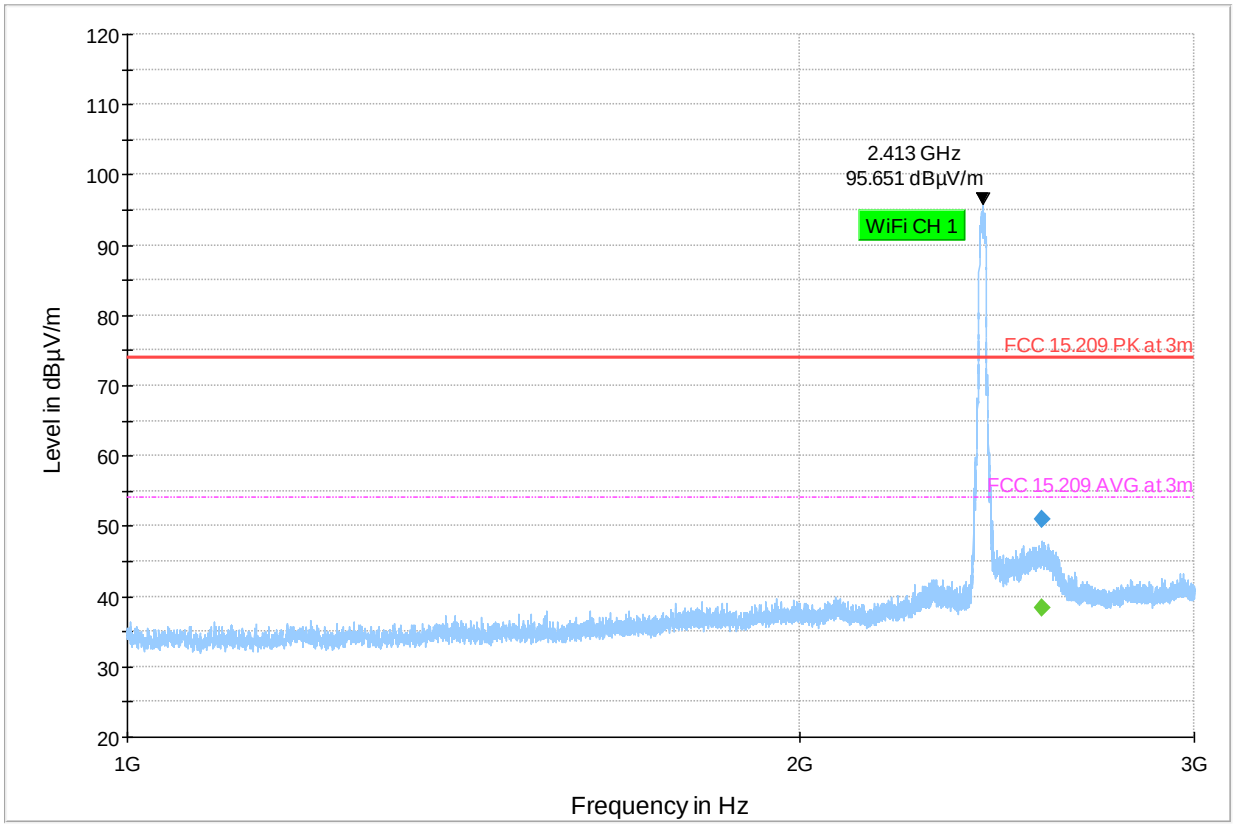


Plot # 13 Radiated Emissions: 1 – 3 GHz

Tx Frequency: 2412 MHz	802.11g

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2564.14	---	38.38	53.98	15.60	500.0	1000.0	195.0	H	341.0	9.76
2564.14	50.97	---	73.98	23.00	500.0	1000.0	195.0	H	341.0	9.76

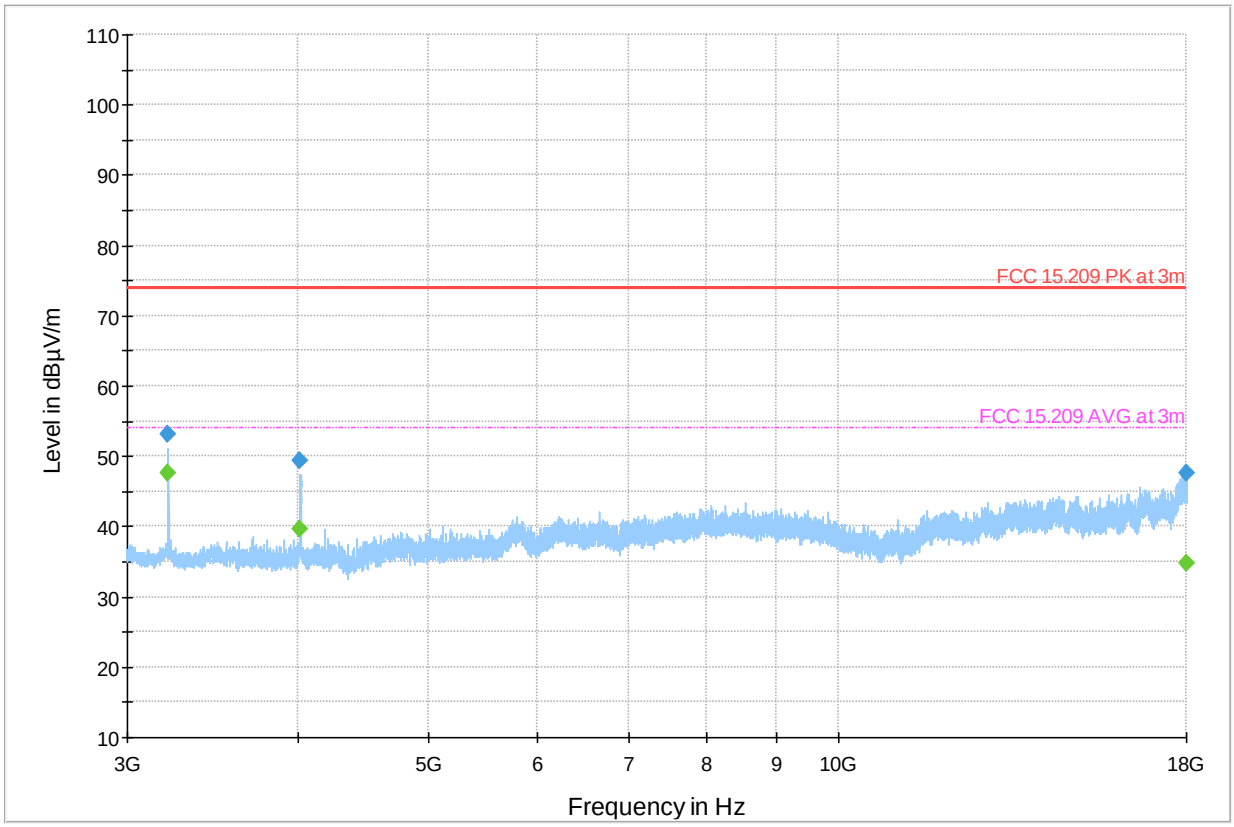


Plot # 14 Radiated Emissions: 3 – 18 GHz

Tx Frequency: 2412 MHz	802.11g

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3216.00	---	47.59	53.98	6.39	500.0	1000.0	149.0	H	3.0	-7.56
3216.00	53.18	---	73.98	20.80	500.0	1000.0	149.0	H	3.0	-7.56
4020.50	---	39.75	53.98	14.23	500.0	1000.0	149.0	H	-15.0	-5.27
4020.50	49.44	---	73.98	24.54	500.0	1000.0	149.0	H	-15.0	-5.27
17984.00	---	34.89	53.98	19.09	500.0	1000.0	273.0	V	86.0	11.62
17984.00	47.61	---	73.98	26.37	500.0	1000.0	273.0	V	86.0	11.62

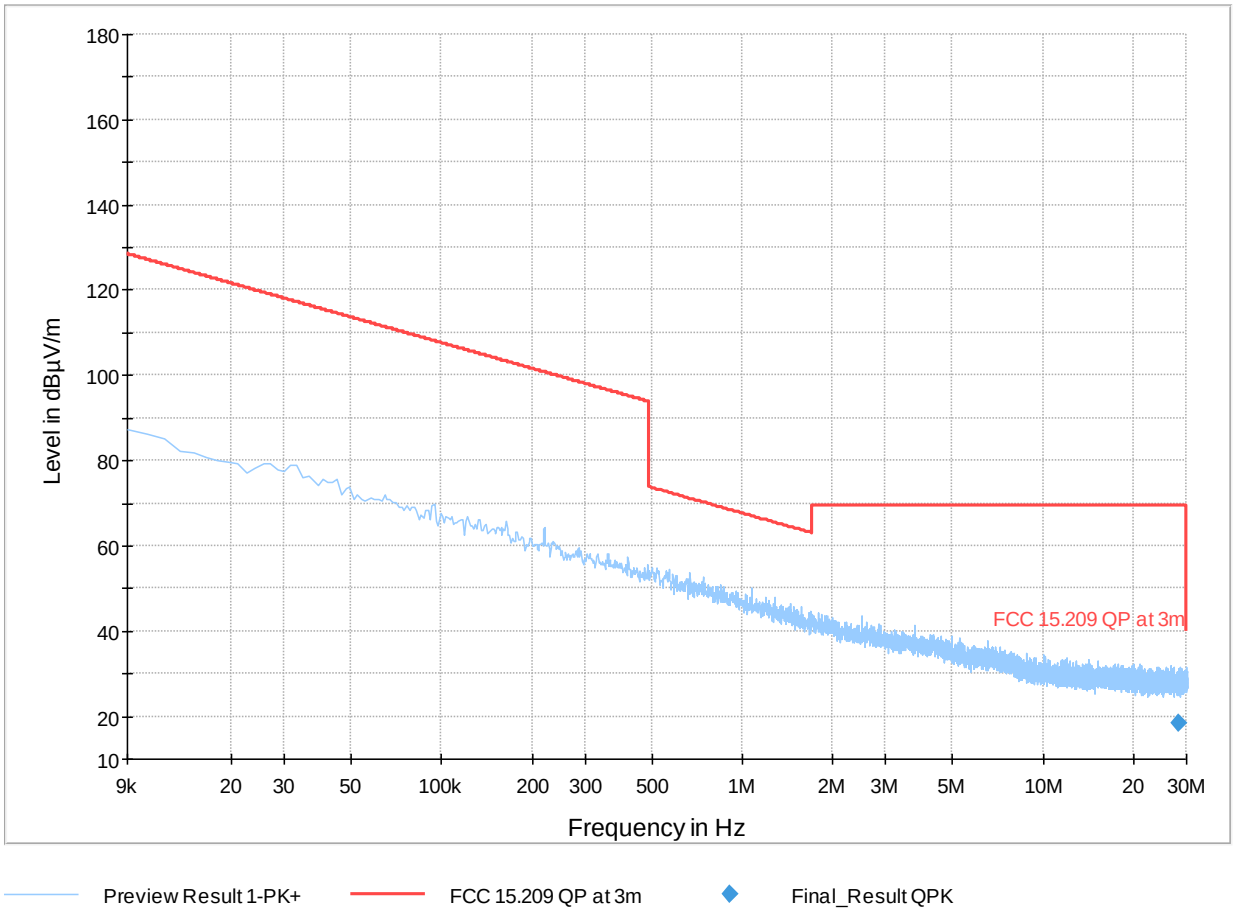


Plot # 15 Radiated Emissions: 9kHz - 30 MHz

Tx Frequency: 2437 MHz	802.11g

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
28.20	18.45	69.50	51.05	500.0	9.0	183.0	V	311.0	16.13

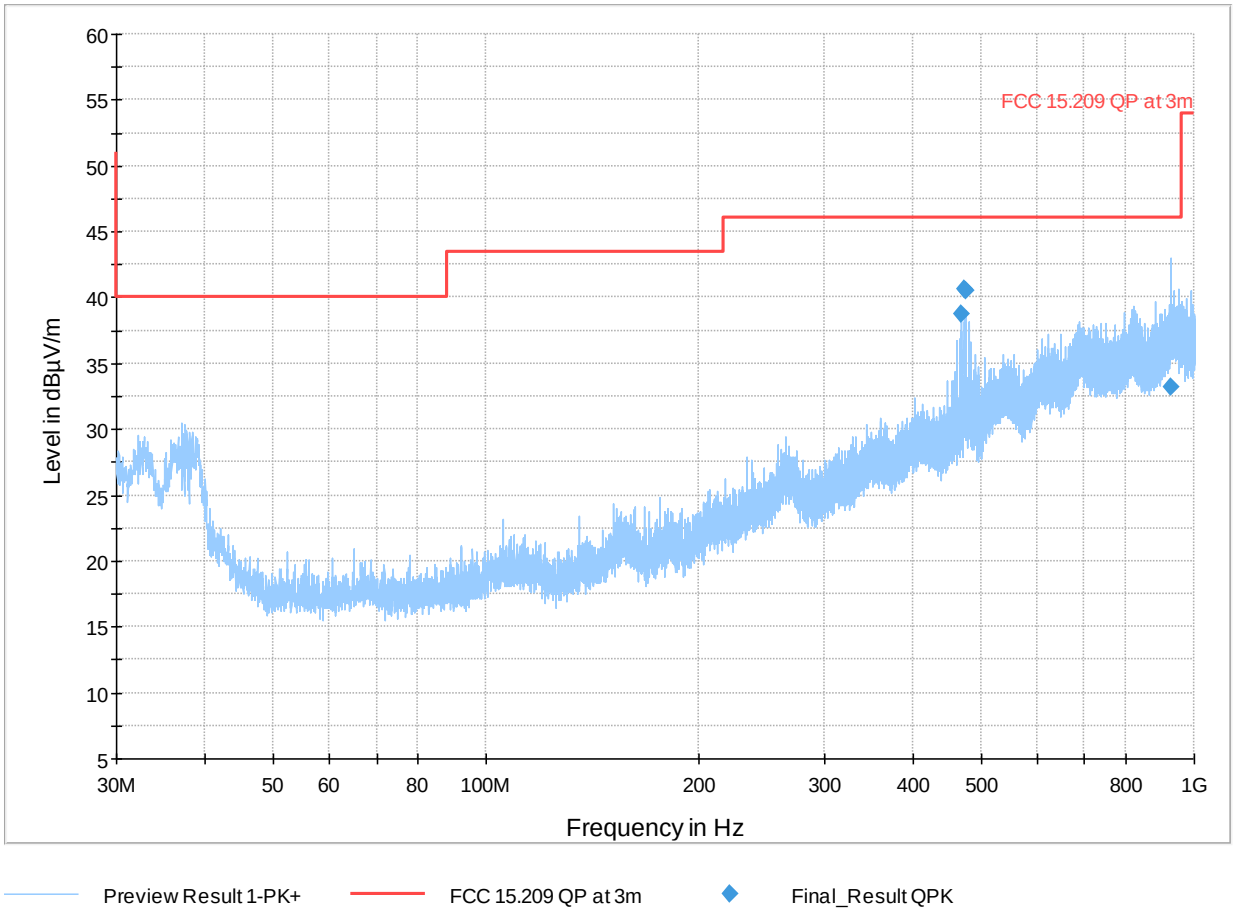


Plot # 16 Radiated Emissions: 30 MHz – 1 GHz

Tx Frequency: 2437 MHz	802.11g

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
468.86	38.72	46.02	7.31	500.0	120.0	174.0	H	56.0	26.53
472.61	40.61	46.02	5.41	500.0	120.0	196.0	H	68.0	26.73
476.14	40.58	46.02	5.44	500.0	120.0	197.0	H	264.0	26.91
928.22	33.22	46.02	12.80	500.0	120.0	206.0	H	81.0	33.53

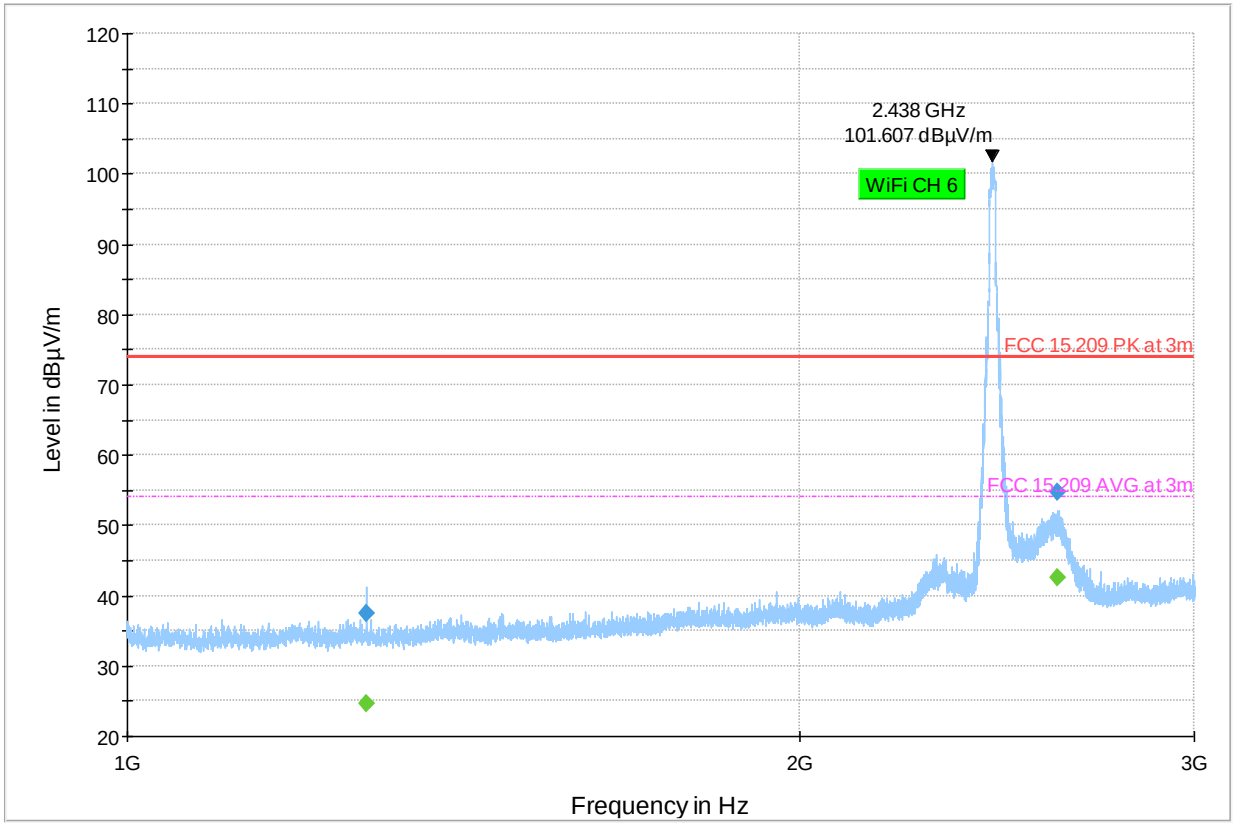


Plot # 17 Radiated Emissions: 1 – 3 GHz

Tx Frequency: 2437 MHz	802.11g

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1279.29	37.39	---	73.98	36.59	500.0	1000.0	228.0	V	-11.0	3.98
1279.29	---	24.58	53.98	29.40	500.0	1000.0	228.0	V	-11.0	3.98
2607.57	54.74	---	73.98	19.24	500.0	1000.0	162.0	H	2.0	9.97
2607.57	---	42.64	53.98	11.34	500.0	1000.0	162.0	H	2.0	9.97

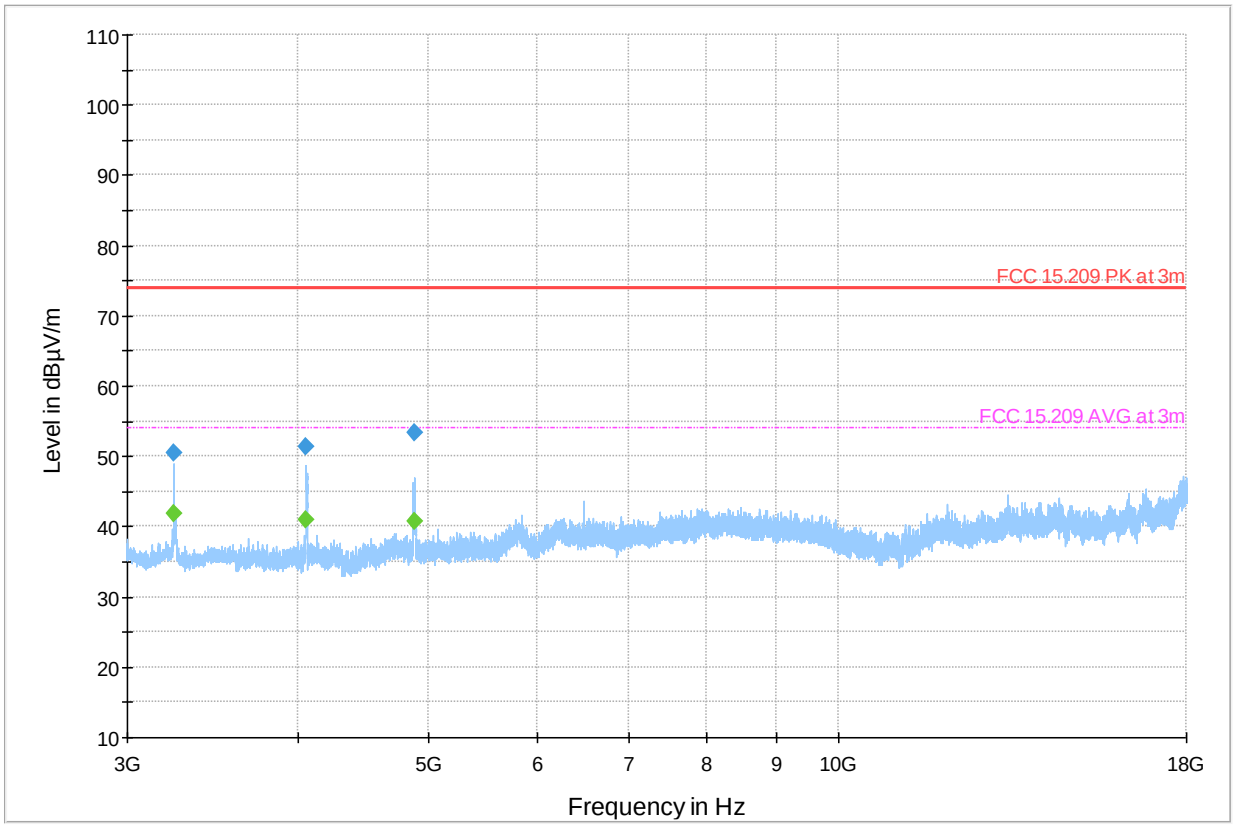


Plot # 18 Radiated Emissions: 3 – 18 GHz

Tx Frequency: 2437 MHz	802.11g

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3249.00	---	41.77	53.98	12.21	500.0	1000.0	149.0	H	3.0	-8.07
3249.00	50.40	---	73.98	23.58	500.0	1000.0	149.0	H	3.0	-8.07
4062.50	---	40.91	53.98	13.07	500.0	1000.0	150.0	H	-20.0	-5.19
4062.50	51.43	---	73.98	22.55	500.0	1000.0	150.0	H	-20.0	-5.19
4874.50	---	40.76	53.98	13.22	500.0	1000.0	295.0	V	254.0	-4.41
4874.50	53.44	---	73.98	20.54	500.0	1000.0	295.0	V	254.0	-4.41

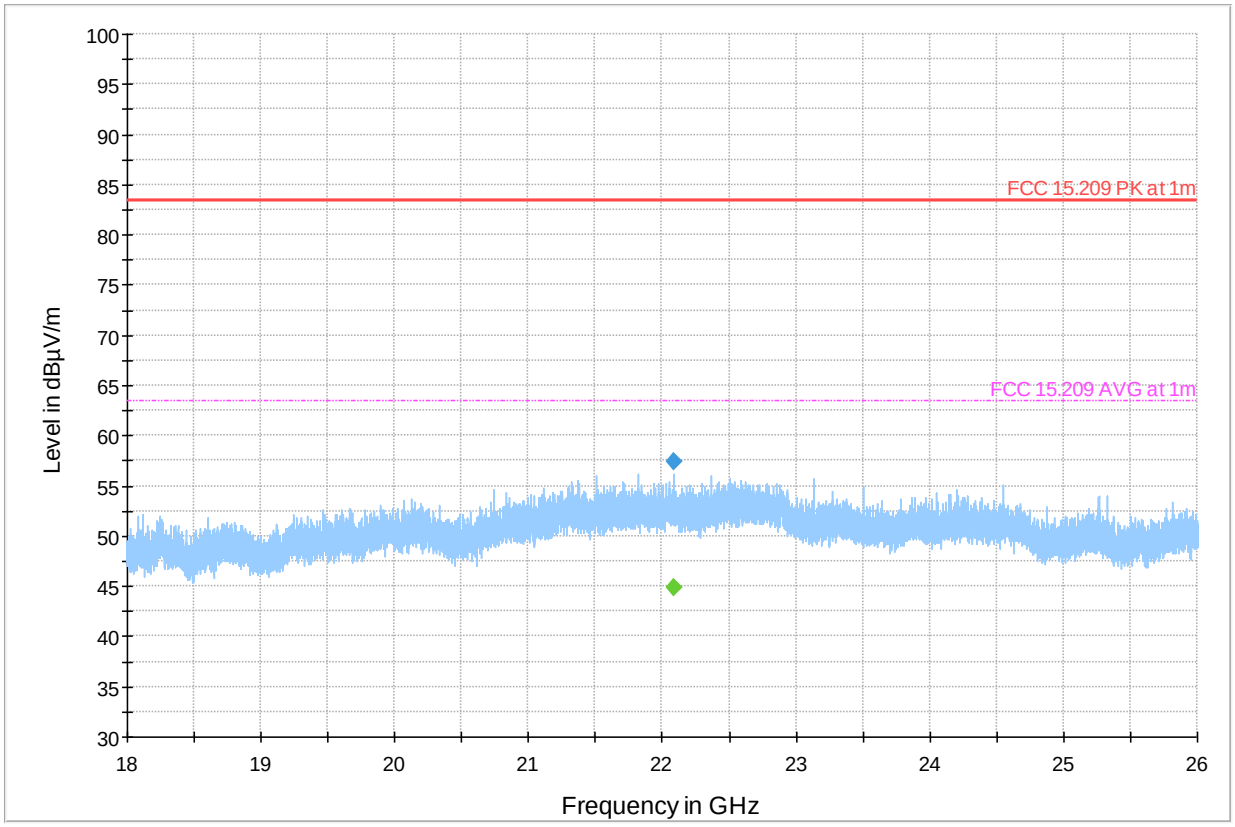


Plot # 19 Radiated Emissions: 18 – 26 GHz

Tx Frequency: 2437 MHz	802.11g

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
22085.50	---	44.83	63.50	18.67	500.0	1000.0	140.0	V	22.0	18.84
22085.50	57.46	---	83.50	26.04	500.0	1000.0	140.0	V	22.0	18.84

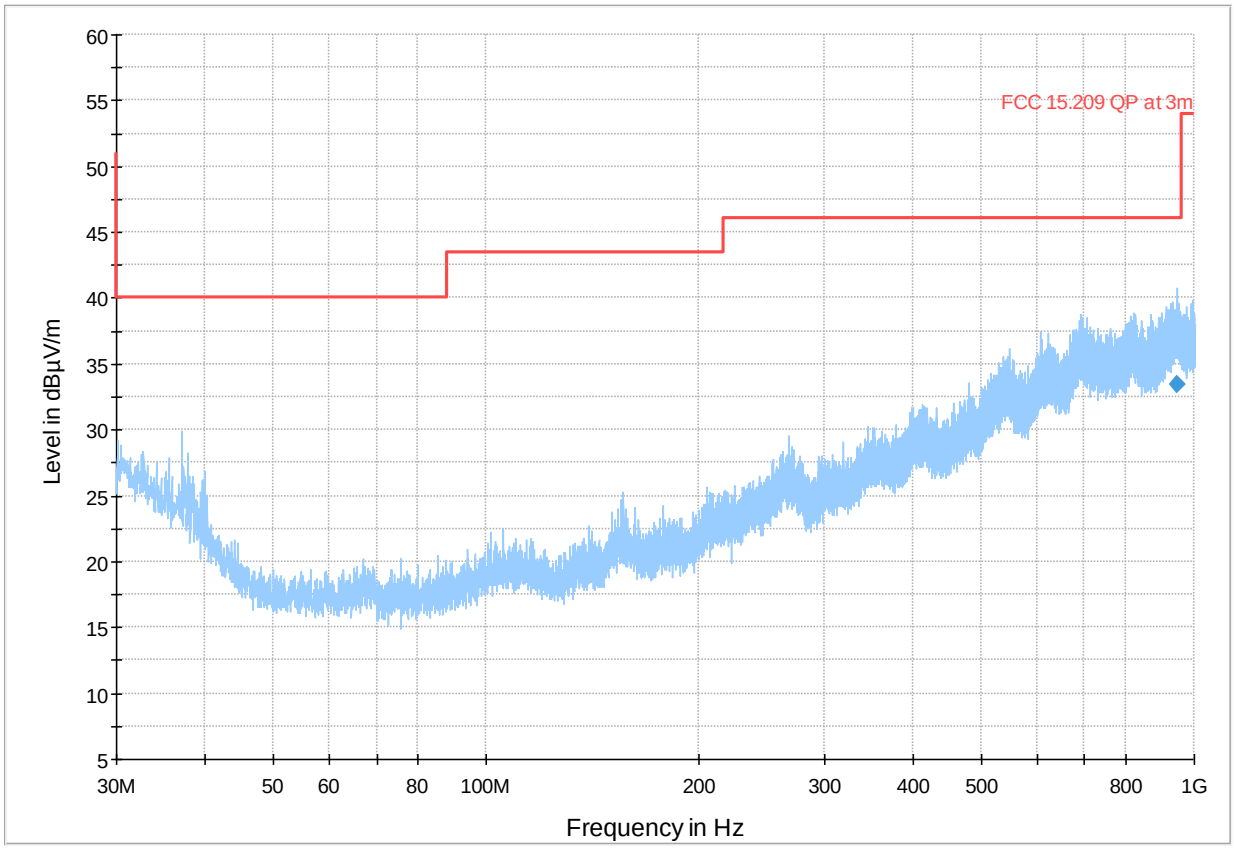


Plot # 20 Radiated Emissions: 30 MHz – 1 GHz

Tx Frequency: 2462 MHz	802.11g

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
946.52	33.43	46.02	12.59	500.0	120.0	325.0	H	22.0	33.77

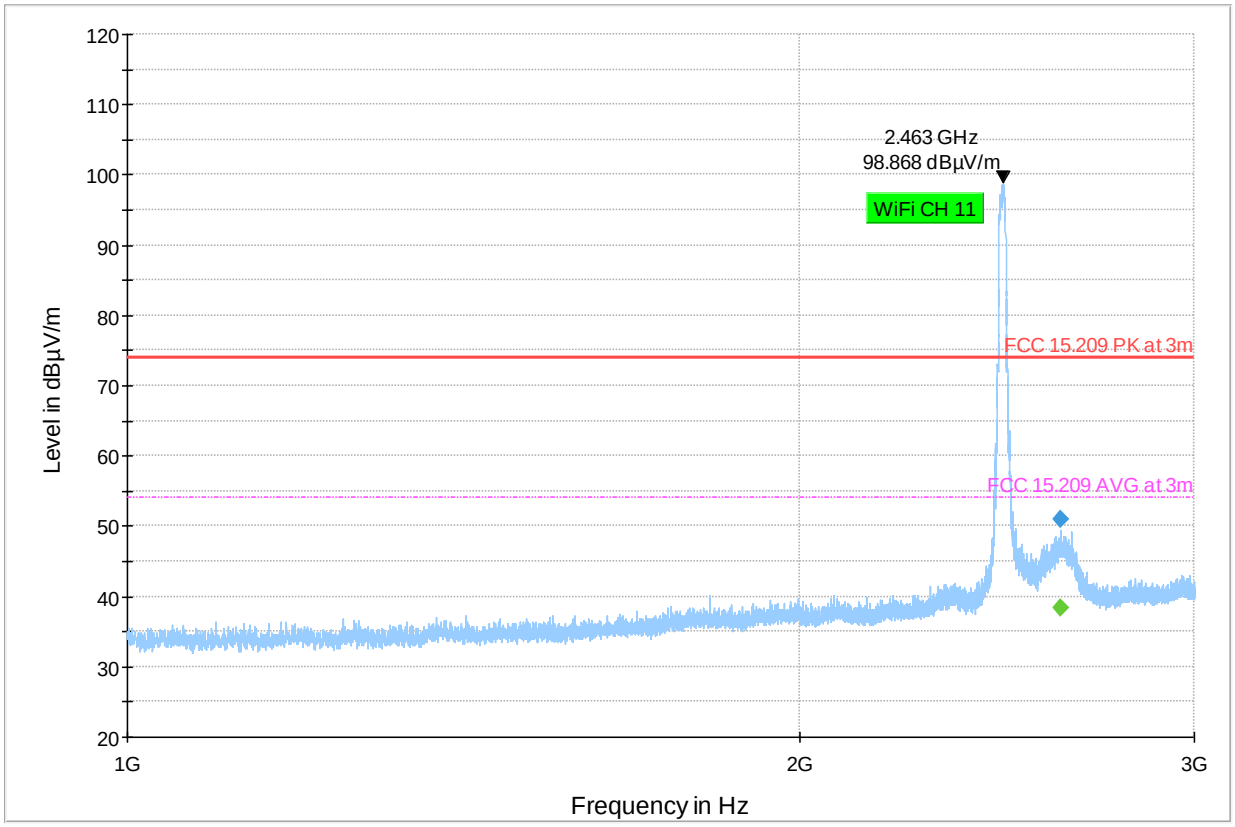


Plot # 21 Radiated Emissions: 1 – 3 GHz

Tx Frequency: 2462 MHz	802.11g

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2616.00	---	38.42	53.98	15.56	500.0	1000.0	205.0	H	2.0	10.03
2616.00	51.03	---	73.98	22.95	500.0	1000.0	205.0	H	2.0	10.03

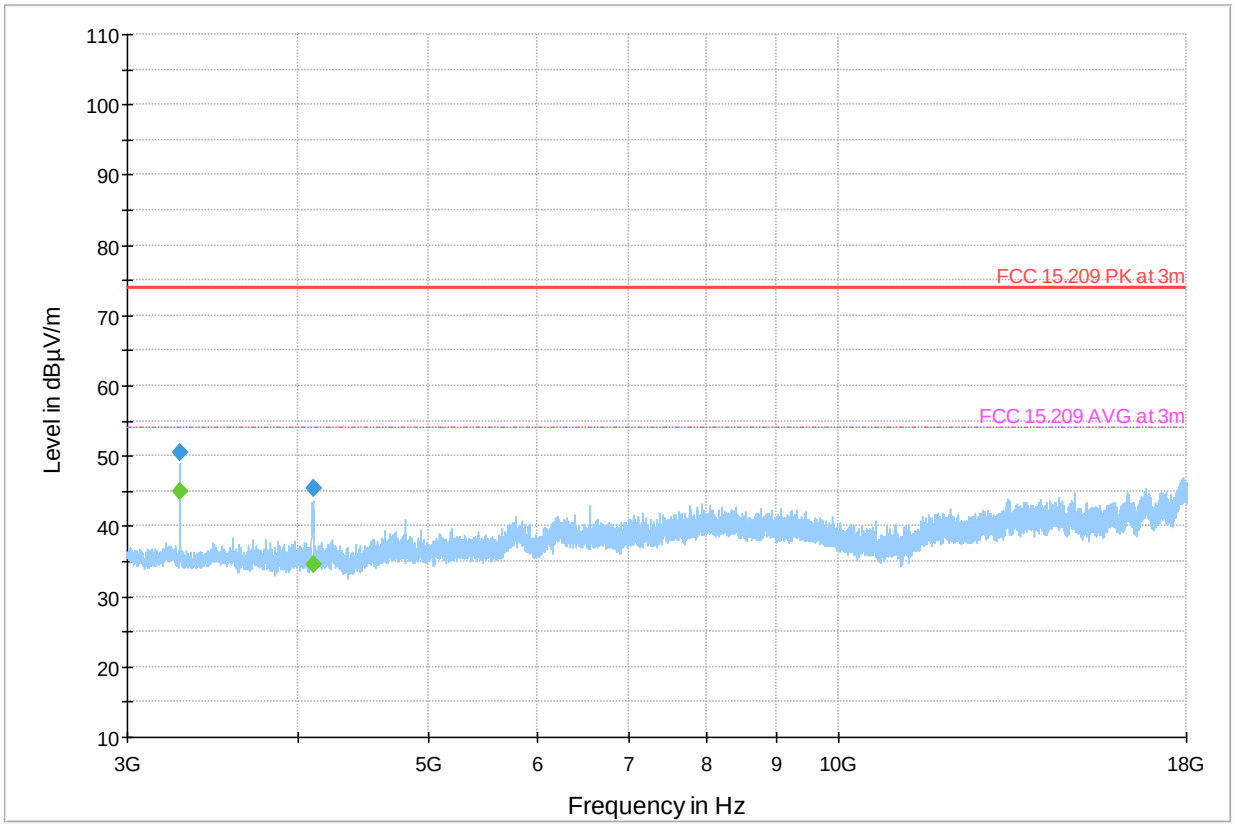


Plot # 22 Radiated Emissions: 3 – 18 GHz

Tx Frequency: 2462 MHz	802.11g

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3282.50	50.52	---	73.98	23.46	500.0	1000.0	149.0	H	354.0	-8.24
3282.50	---	44.88	53.98	9.10	500.0	1000.0	149.0	H	354.0	-8.24
4106.50	45.37	---	73.98	28.61	500.0	1000.0	150.0	H	337.0	-4.94
4106.50	---	34.57	53.98	19.41	500.0	1000.0	150.0	H	337.0	-4.94

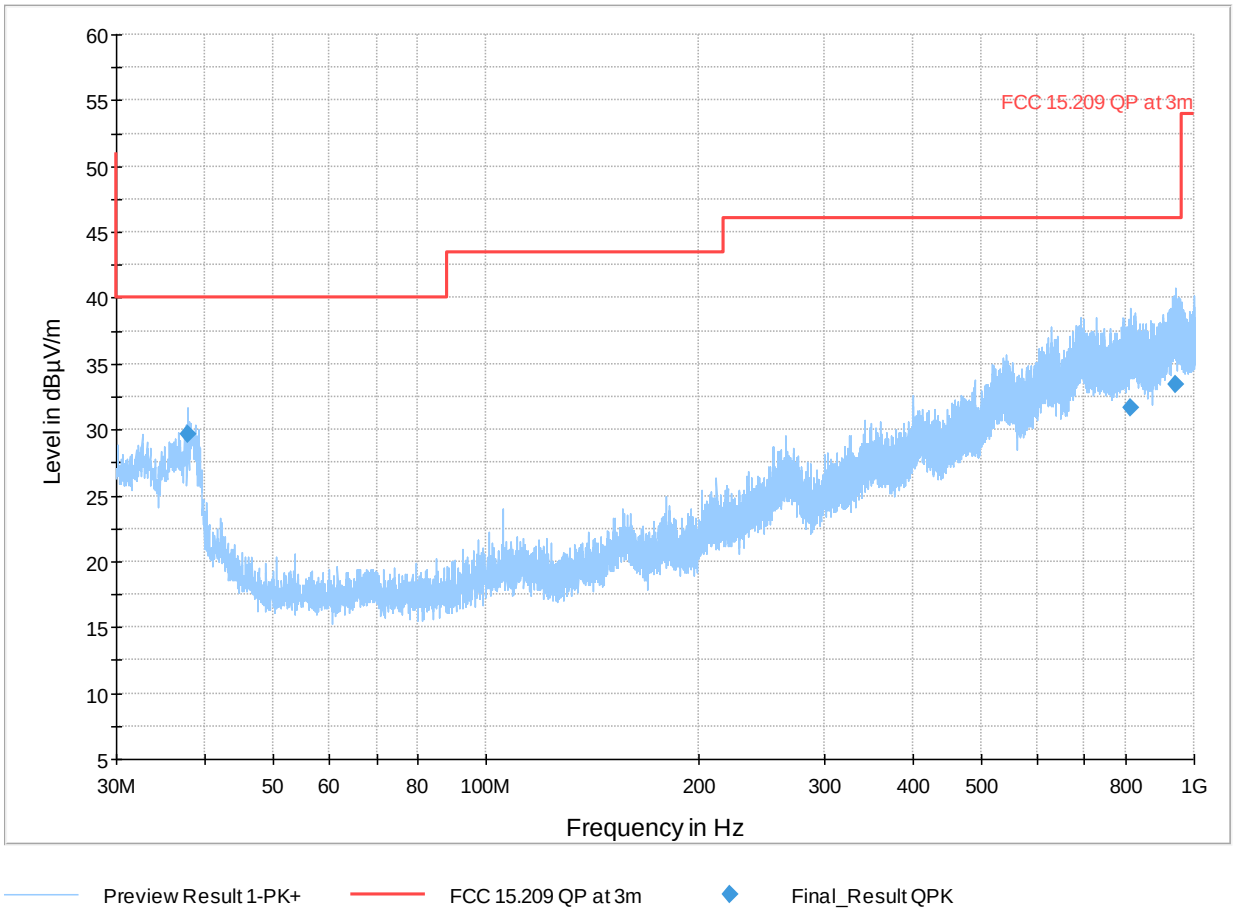


Plot # 23 Radiated Emissions: 30 MHz – 1 GHz

Tx Frequency: 2412 MHz	802.11g

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
37.82	29.67	40.00	10.33	500.0	120.0	149.0	V	148.0	17.70
812.79	31.72	46.02	14.30	500.0	120.0	317.0	H	0.0	32.22
941.06	33.42	46.02	12.60	500.0	120.0	231.0	H	91.0	33.79

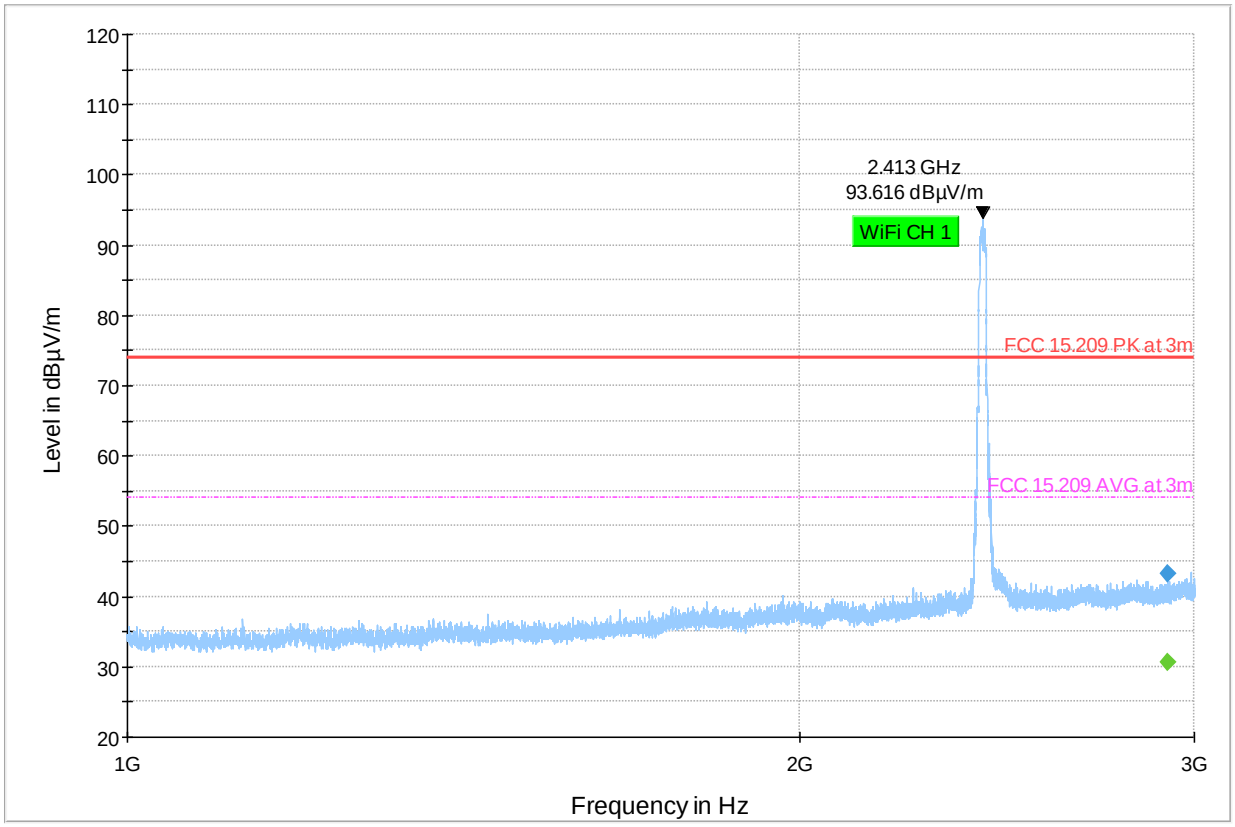


Plot # 24 Radiated Emissions: 1 – 3 GHz

Tx Frequency: 2412 MHz | **802.11g**

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2920.00	---	30.70	53.98	23.28	500.0	1000.0	195.0	H	-14.0	10.77
2920.00	43.21	---	73.98	30.77	500.0	1000.0	195.0	H	-14.0	10.77

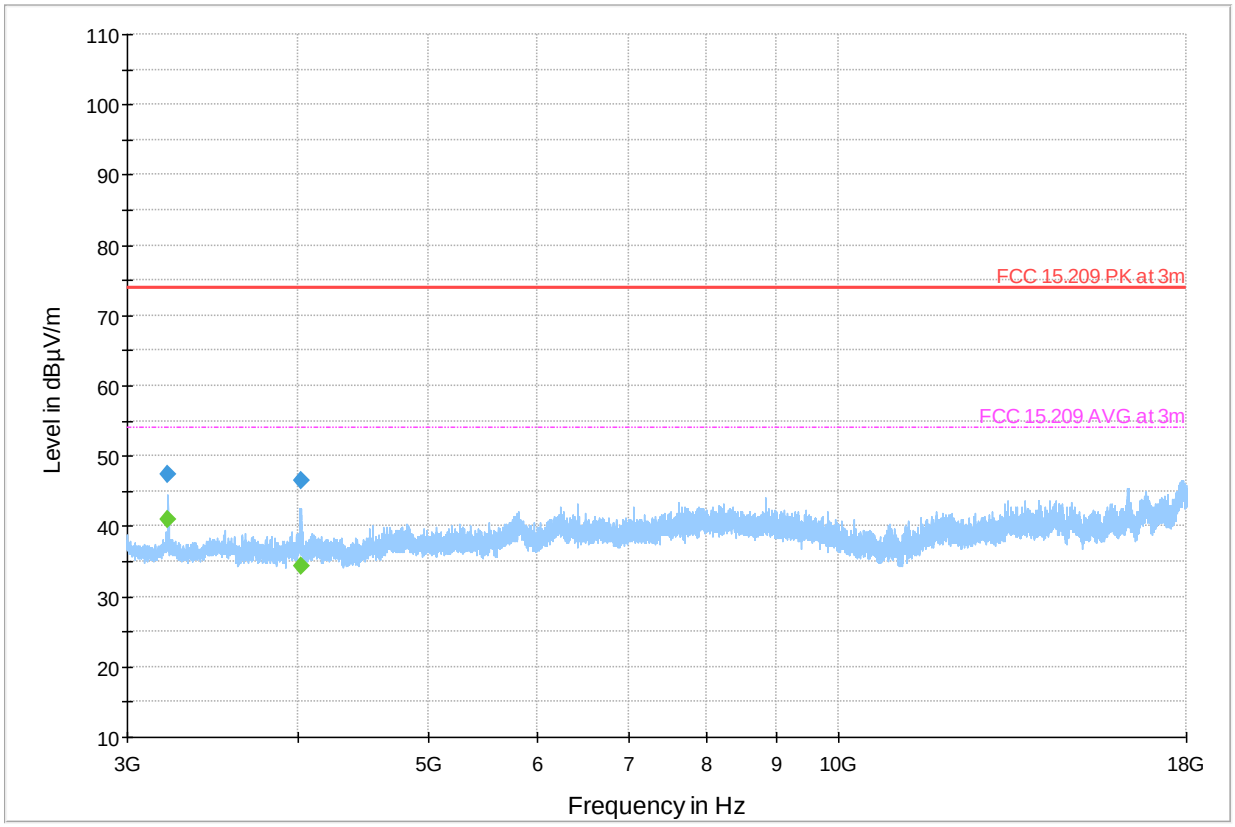


Plot # 25 Radiated Emissions: 3 – 18 GHz

Tx Frequency: 2412 MHz	802.11g

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3216.00	47.43	---	73.98	26.55	500.0	1000.0	149.0	V	211.0	-7.56
3216.00	---	40.92	53.98	13.06	500.0	1000.0	149.0	V	211.0	-7.56
4022.50	46.54	---	73.98	27.44	500.0	1000.0	150.0	V	252.0	-5.27
4022.50	---	34.37	53.98	19.61	500.0	1000.0	150.0	V	252.0	-5.27

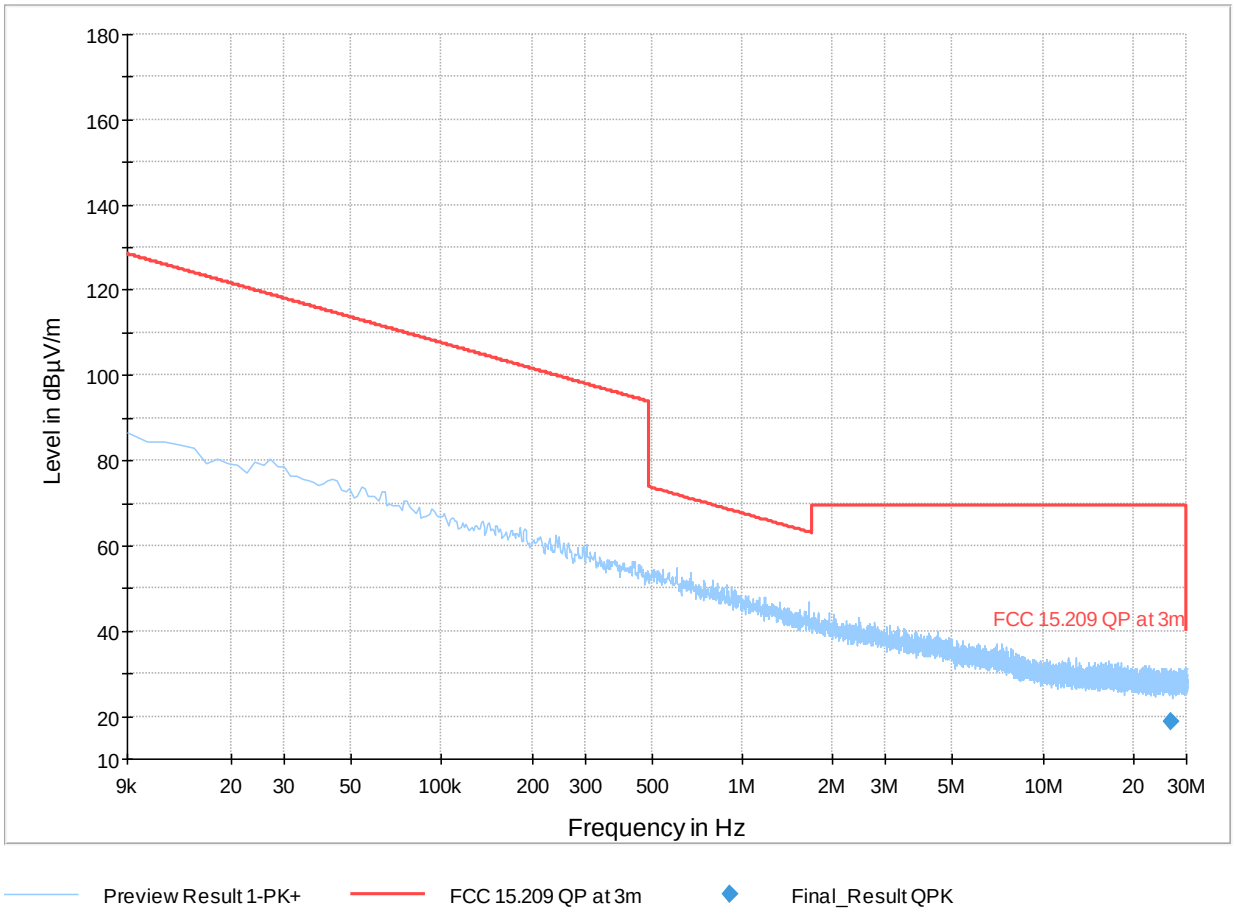


Plot # 26 Radiated Emissions: 9kHz - 30 MHz

Tx Frequency: 2437 MHz	802.11g

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
26.51	18.86	69.50	50.64	500.0	9.0	185.0	V	287.0	16.16

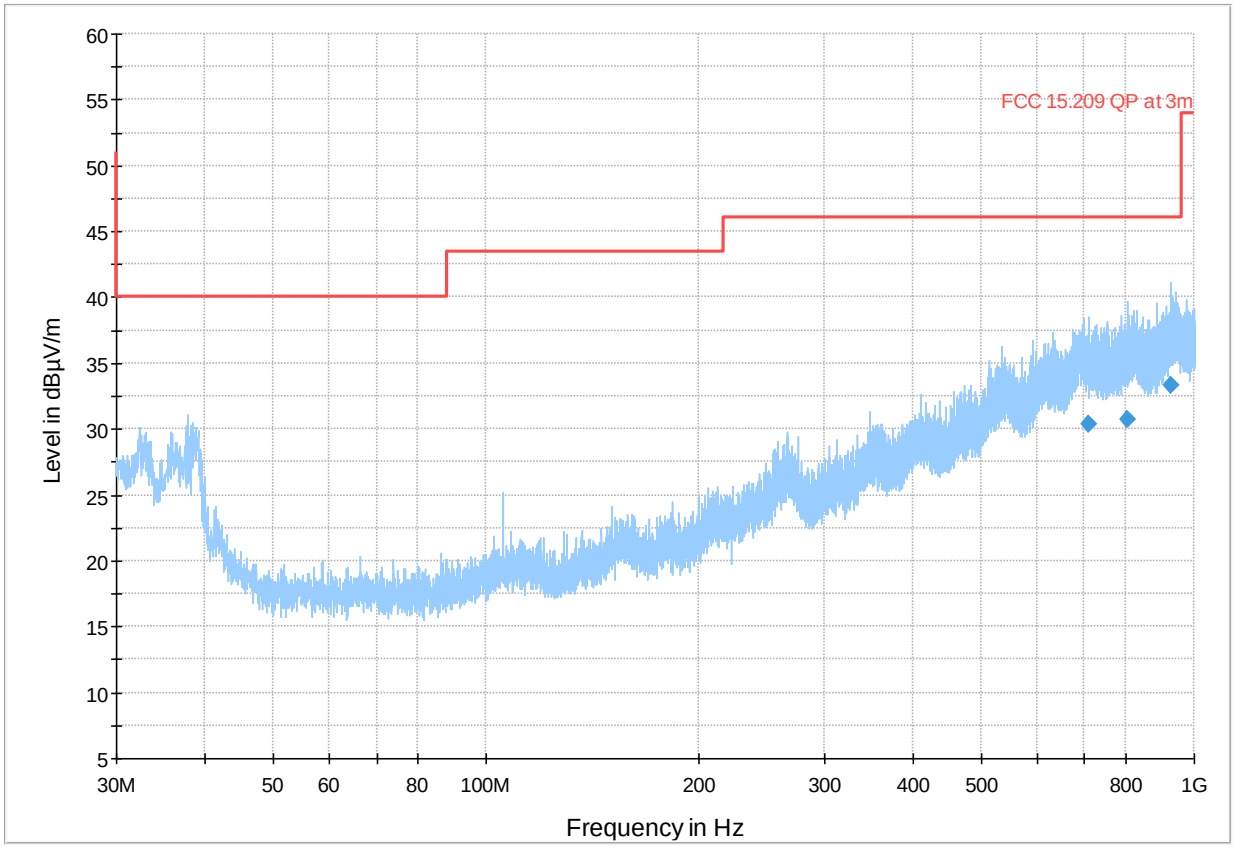


Plot # 27 Radiated Emissions: 30 MHz – 1 GHz

Tx Frequency: 2437 MHz	802.11g

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
709.68	30.37	46.02	15.65	500.0	120.0	163.0	V	42.0	30.89
805.68	30.70	46.02	15.32	500.0	120.0	175.0	V	45.0	31.14
927.15	33.31	46.02	12.72	500.0	120.0	252.0	H	108.0	33.47

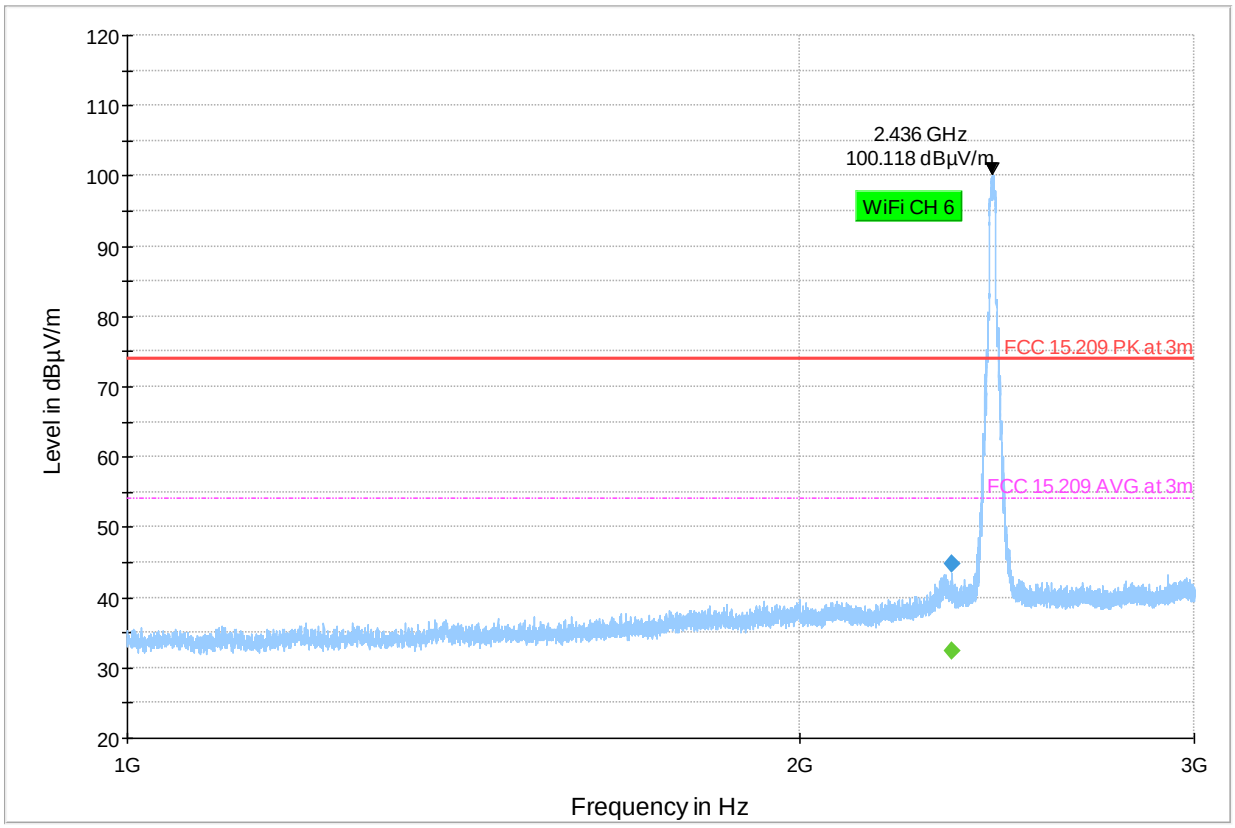


Plot # 28 Radiated Emissions: 1 – 3 GHz

Tx Frequency: 2437 MHz	802.11g

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2336.71	---	32.45	53.98	21.53	500.0	1000.0	325.0	V	177.0	8.22
2336.71	44.77	---	73.98	29.21	500.0	1000.0	325.0	V	177.0	8.22

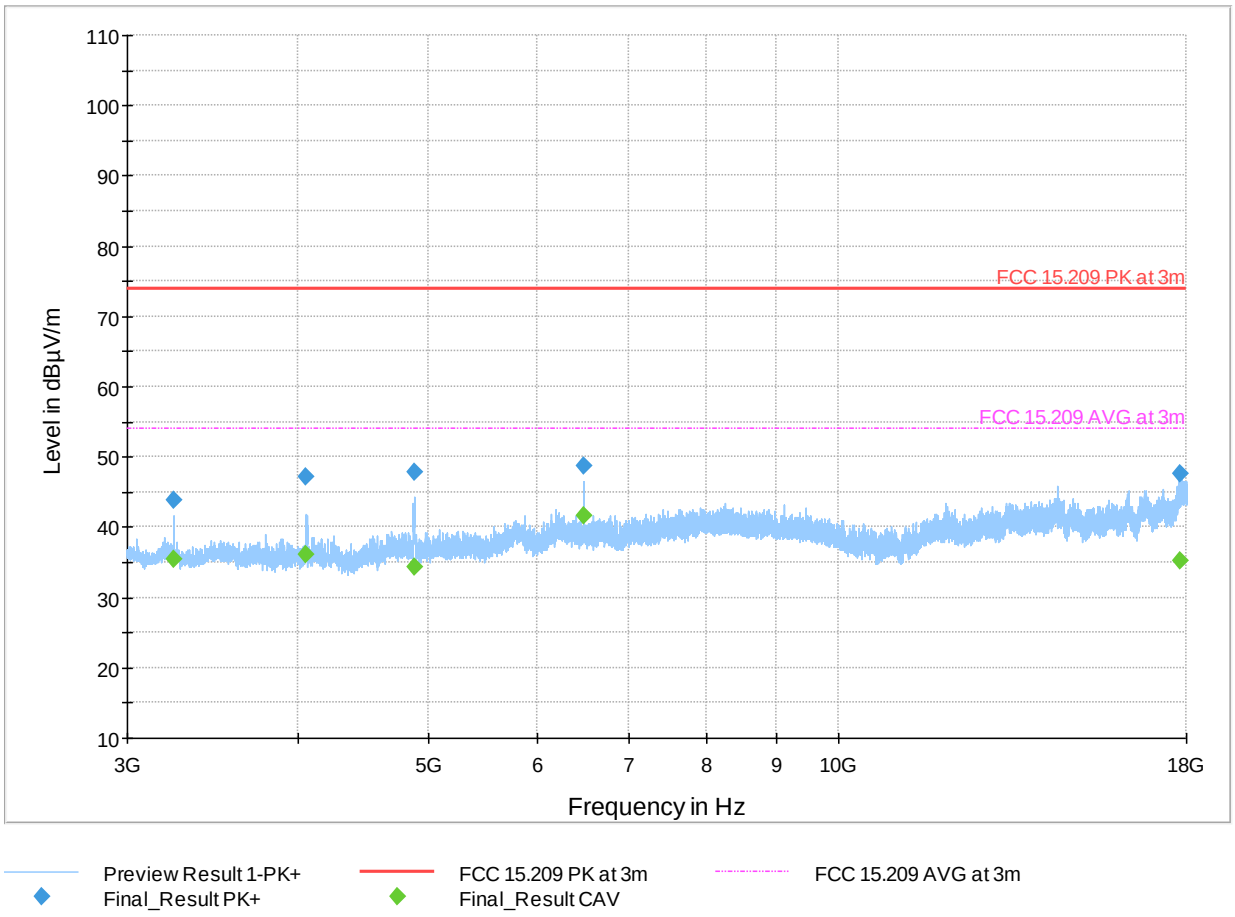


Plot # 29 Radiated Emissions: 3 – 18 GHz

Tx Frequency: 2437 MHz	802.11g

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3249.00	---	35.38	53.98	18.59	500.0	1000.0	150.0	V	4.0	-8.07
3249.00	43.80	---	73.98	30.18	500.0	1000.0	150.0	V	4.0	-8.07
4063.50	---	36.03	53.98	17.95	500.0	1000.0	150.0	V	148.0	-5.18
4063.50	47.21	---	73.98	26.77	500.0	1000.0	150.0	V	148.0	-5.18
4875.50	47.85	---	73.98	26.13	500.0	1000.0	150.0	V	54.0	-4.42
4875.50	---	34.30	53.98	19.68	500.0	1000.0	150.0	V	54.0	-4.42
6499.00	48.64	---	73.98	25.34	500.0	1000.0	149.0	V	125.0	-0.16
6499.00	---	41.73	53.98	12.25	500.0	1000.0	149.0	V	125.0	-0.16
17811.00	---	35.13	53.98	18.85	500.0	1000.0	199.0	V	15.0	11.56
17811.00	47.66	---	73.98	26.32	500.0	1000.0	199.0	V	15.0	11.56

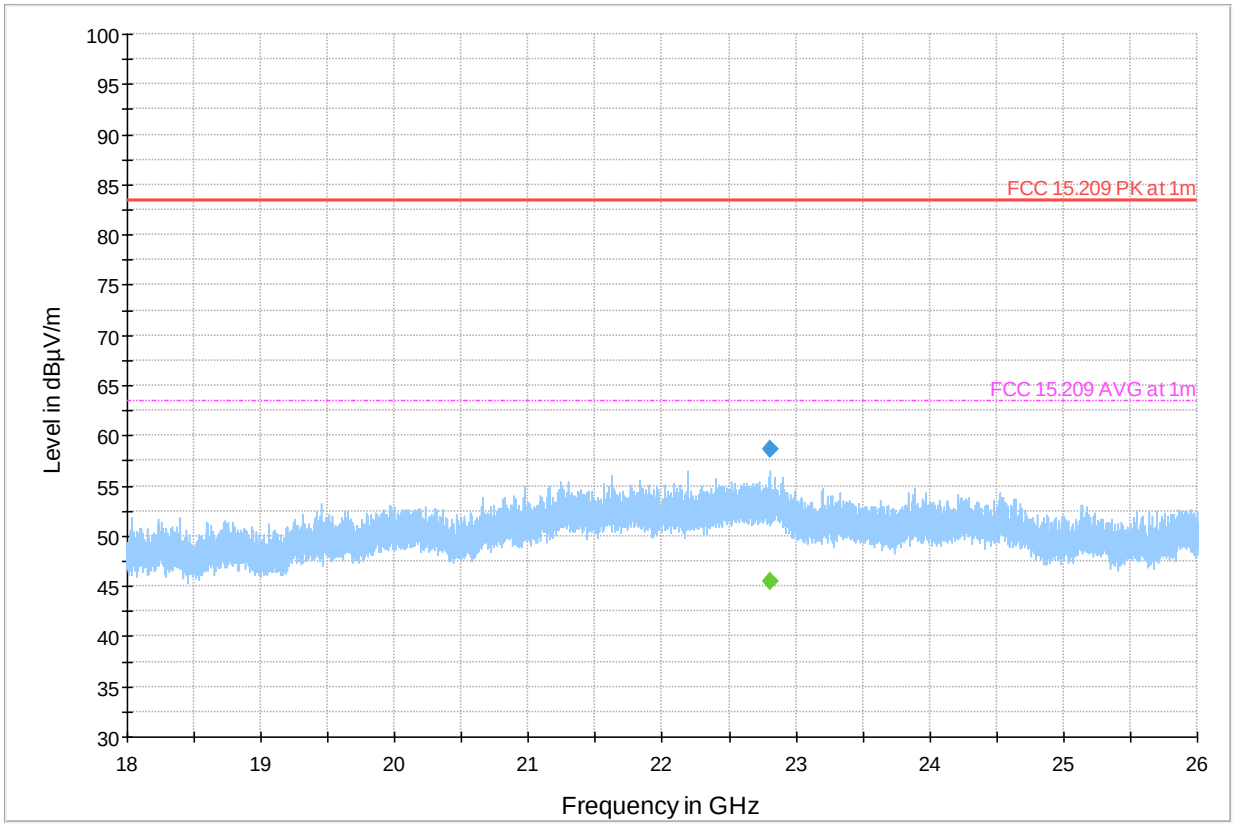


Plot # 30 Radiated Emissions: 18 – 26 GHz

Tx Frequency: 2437 MHz	802.11g

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
22808.00	---	45.41	63.50	18.09	500.0	1000.0	140.0	V	220.0	19.86
22808.00	58.70	---	83.50	24.80	500.0	1000.0	140.0	V	220.0	19.86

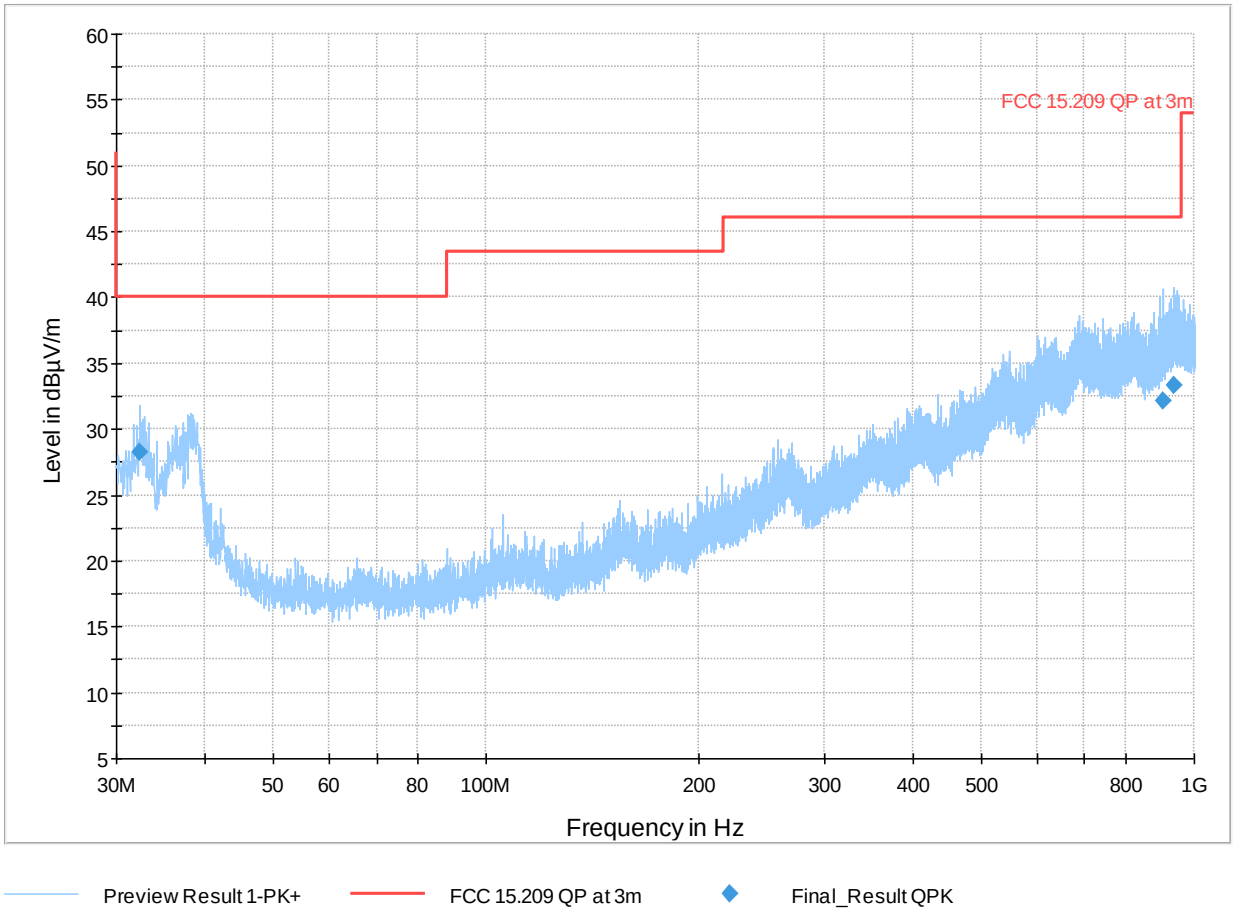


Plot # 31 Radiated Emissions: 30 MHz – 1 GHz

Tx Frequency: 2462 MHz	802.11g

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
32.39	28.29	40.00	11.71	500.0	120.0	149.0	V	238.0	20.83
904.16	32.16	46.02	13.87	500.0	120.0	259.0	H	31.0	32.43
935.37	33.31	46.02	12.71	500.0	120.0	209.0	H	283.0	33.64

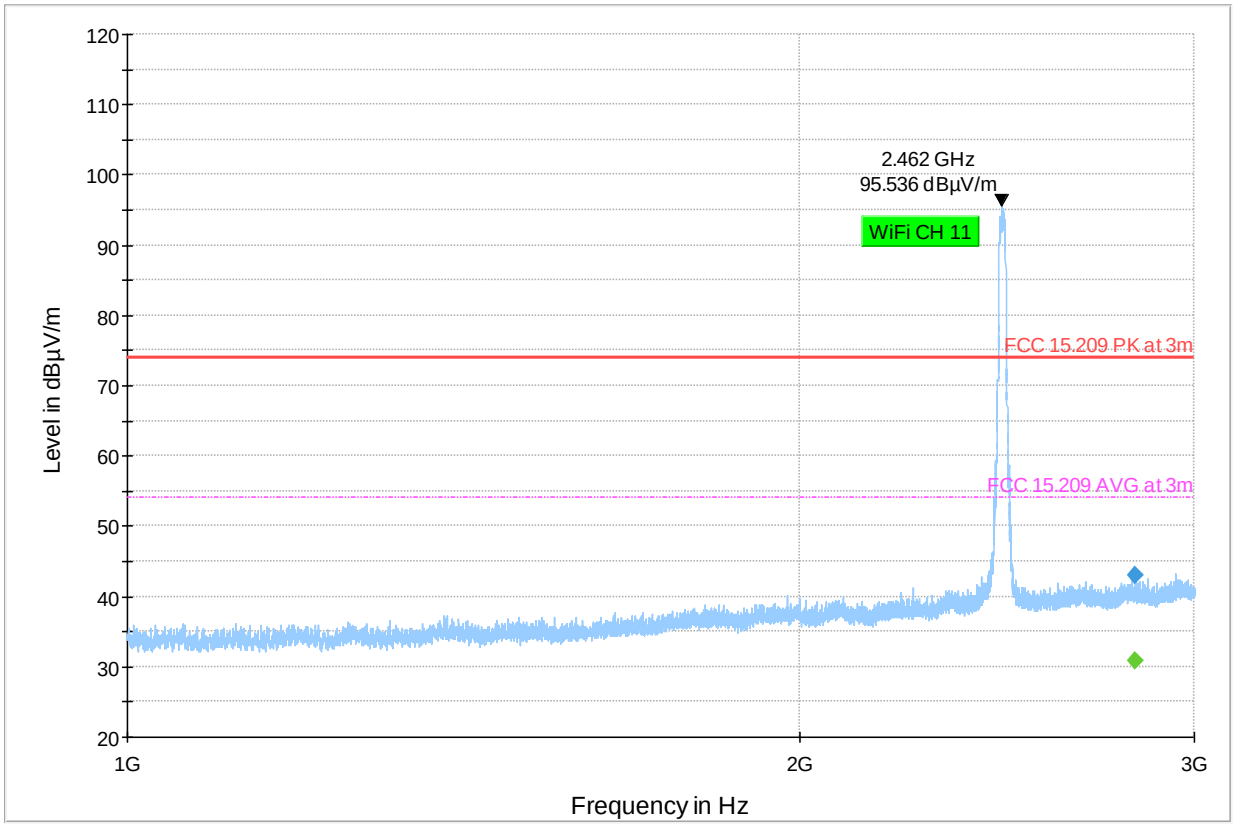


Plot # 32 Radiated Emissions: 1 – 3 GHz

Tx Frequency: 2462 MHz	802.11g

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2822.71	---	30.82	53.98	23.15	500.0	1000.0	286.0	H	77.0	10.39
2822.71	42.98	---	73.98	31.00	500.0	1000.0	286.0	H	77.0	10.39

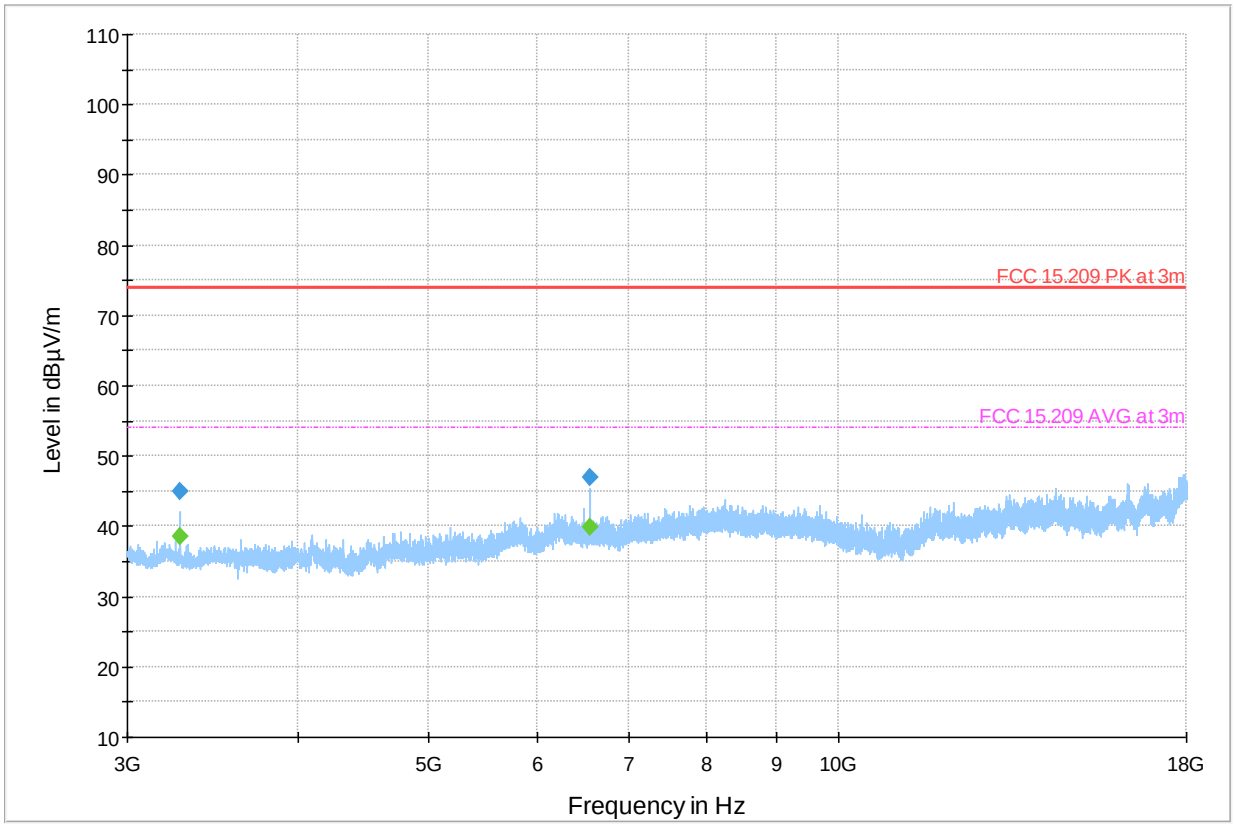


Plot # 33 Radiated Emissions: 3 – 18 GHz

Tx Frequency: 2462 MHz	802.11g

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3282.50	---	38.61	53.98	15.37	500.0	1000.0	149.0	V	4.0	-8.24
3282.50	44.94	---	73.98	29.04	500.0	1000.0	149.0	V	4.0	-8.24
6565.50	---	39.90	53.98	14.08	500.0	1000.0	149.0	V	124.0	-0.06
6565.50	46.87	---	73.98	27.11	500.0	1000.0	149.0	V	124.0	-0.06



8.7 AC Power Line Conducted Emissions

8.7.1 Measurement according to ANSI C63.4

Analyzer Settings:

- RBW = 9 KHz (CISPR Bandwidth)
- Detector: Peak / Average for Pre-scan
- Quasi-Peak/Average for Final Measurements

8.7.2 Limits: §15.207 & RSS-Gen 8.8

FCC §15.207(a) & RSS-Gen 8.8

- Except as shown in paragraphs (b) and (c) of this section of the CFR, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table (1), as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between frequency ranges.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	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.

8.7.3 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power line (L1, L2, L3, N)	Power Input
23.8°C	1	802.11g	Line & Neutral	110V / 60Hz
	2	802.11g	Line & Neutral	110V / 60Hz
	3	802.11g	Line & Neutral	110V / 60Hz

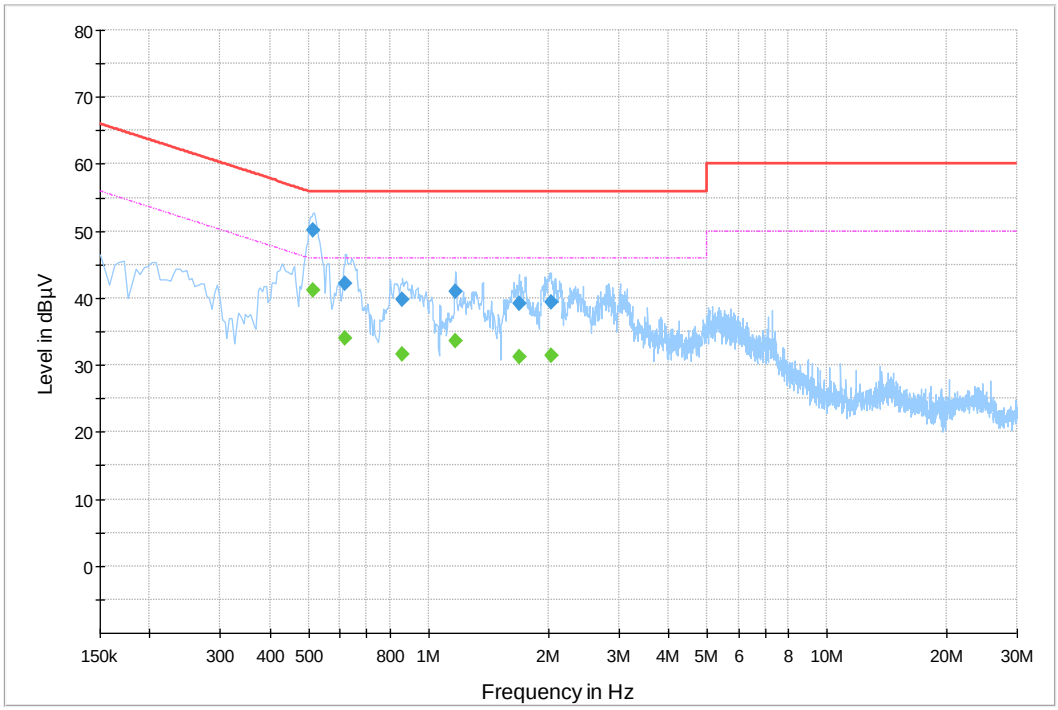
8.7.4 Measurement Result:

Plot #	Port	EUT Set-Up #:	EUT operating mode	Scan Frequency	Limit	Result
1	AC Mains	1	802.11g	150 kHz – 30 MHz	See section 8.7.2	Pass
2	AC Mains	2	802.11g	150 kHz – 30 MHz	See section 8.7.2	Pass
3	AC Mains	3	802.11g	150 kHz – 30 MHz	See section 8.7.2	Pass

8.7.5 Measurement Plots:

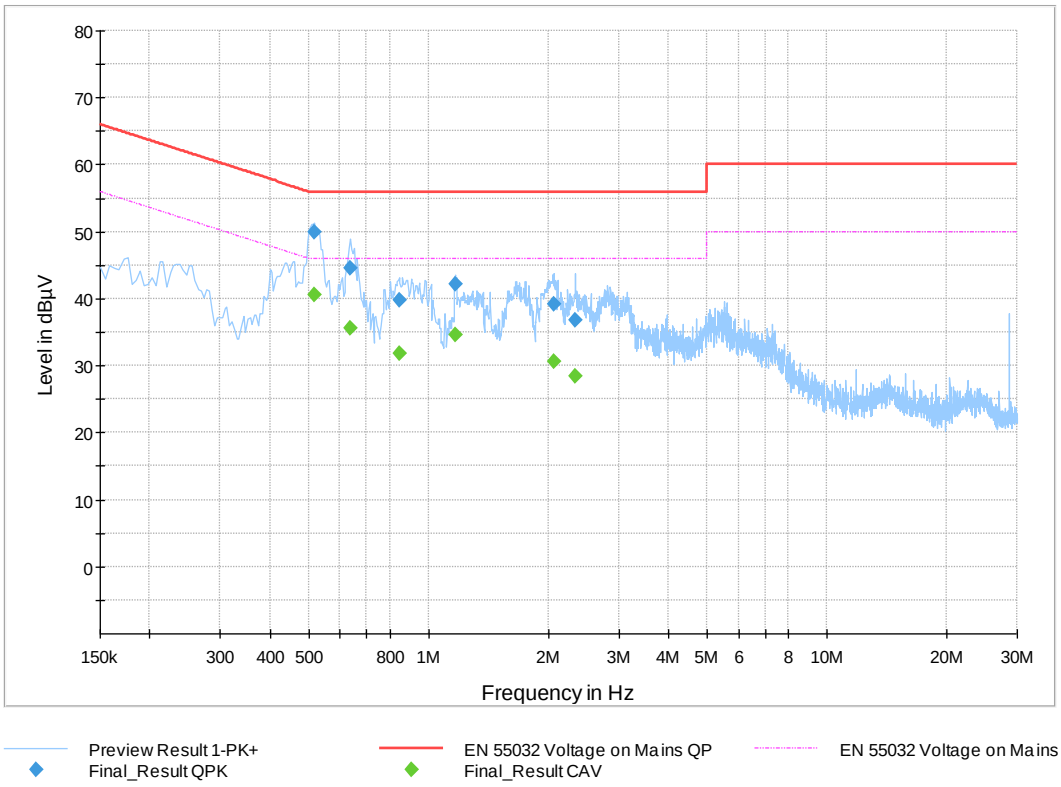
Plot # 1 Conducted Emissions: 150kHz – 30 MHz - SMA Dipole Antenna

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)
0.514	50.070	---	56.00	5.93	500.0	9.000	N	GND	10.0
0.514	---	41.172	46.00	4.83	500.0	9.000	N	GND	10.0
0.620	---	33.999	46.00	12.00	500.0	9.000	L1	GND	10.0
0.620	42.159	---	56.00	13.84	500.0	9.000	L1	GND	10.0
0.861	39.856	---	56.00	16.14	500.0	9.000	L1	GND	10.0
0.861	---	31.603	46.00	14.40	500.0	9.000	L1	GND	10.0
1.173	---	33.509	46.00	12.49	500.0	9.000	N	GND	10.1
1.173	41.002	---	56.00	15.00	500.0	9.000	N	GND	10.1
1.686	---	31.154	46.00	14.85	500.0	9.000	N	GND	10.1
1.686	39.121	---	56.00	16.88	500.0	9.000	N	GND	10.1
2.029	---	31.398	46.00	14.60	500.0	9.000	N	GND	10.1
2.029	39.475	---	56.00	16.52	500.0	9.000	N	GND	10.1



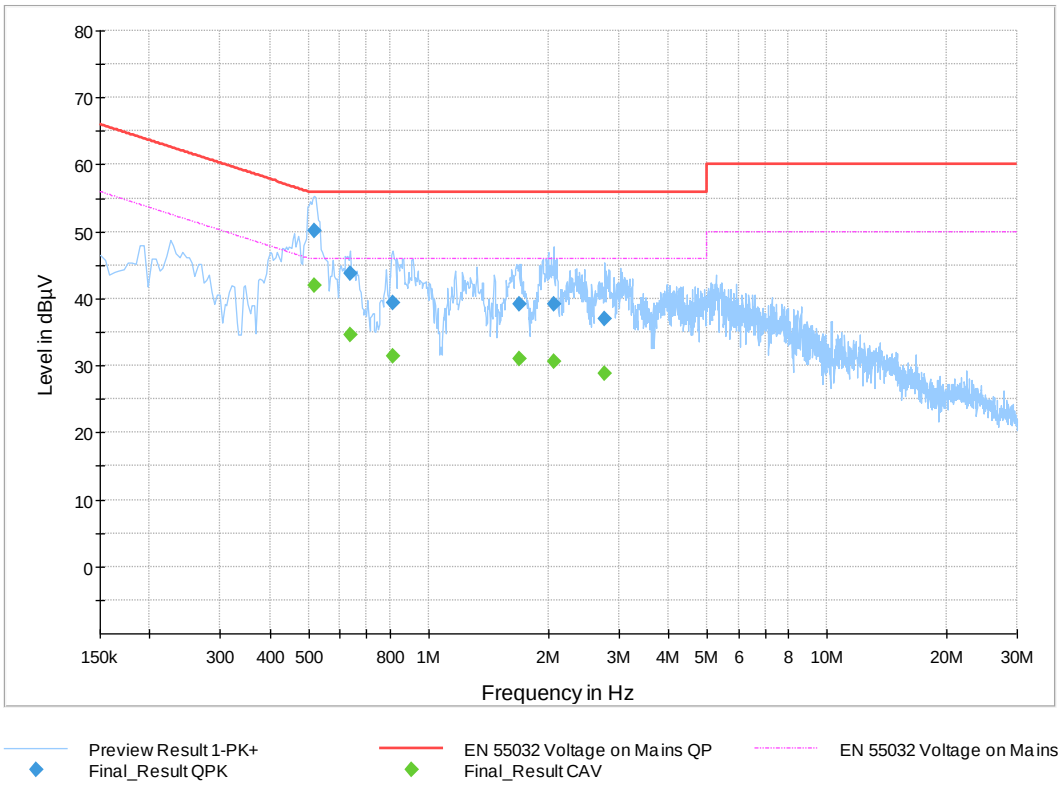
Plot # 2 Conducted Emissions: 150kHz – 30 MHz - PCB Trace Antenna

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)
0.519	---	40.622	46.00	5.38	500.0	9.000	L1	GND	10.0
0.519	50.001	---	56.00	6.00	500.0	9.000	L1	GND	10.0
0.637	---	35.694	46.00	10.31	500.0	9.000	L1	GND	10.0
0.637	44.576	---	56.00	11.42	500.0	9.000	L1	GND	10.0
0.844	39.770	---	56.00	16.23	500.0	9.000	N	GND	10.0
0.844	---	31.891	46.00	14.11	500.0	9.000	N	GND	10.0
1.168	42.212	---	56.00	13.79	500.0	9.000	L1	GND	10.1
1.168	---	34.607	46.00	11.39	500.0	9.000	L1	GND	10.1
2.064	39.223	---	56.00	16.78	500.0	9.000	L1	GND	10.1
2.064	---	30.605	46.00	15.39	500.0	9.000	L1	GND	10.1
2.336	36.771	---	56.00	19.23	500.0	9.000	L1	GND	10.1
2.336	---	28.424	46.00	17.58	500.0	9.000	L1	GND	10.1



Plot # 3 Conducted Emissions: 150kHz – 30 MHz - Integrated Antenna Adapter

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)
0.519	---	41.968	46.00	4.03	500.0	9.000	N	GND	10.0
0.519	50.105	---	56.00	5.89	500.0	9.000	N	GND	10.0
0.637	---	34.648	46.00	11.35	500.0	9.000	N	GND	10.0
0.637	43.772	---	56.00	12.23	500.0	9.000	N	GND	10.0
0.817	---	31.373	46.00	14.63	500.0	9.000	N	GND	10.0
0.817	39.325	---	56.00	16.67	500.0	9.000	N	GND	10.0
1.691	---	30.929	46.00	15.07	500.0	9.000	N	GND	10.1
1.691	39.130	---	56.00	16.87	500.0	9.000	N	GND	10.1
2.064	---	30.531	46.00	15.47	500.0	9.000	N	GND	10.1
2.064	39.230	---	56.00	16.77	500.0	9.000	N	GND	10.1
2.766	---	28.898	46.00	17.10	500.0	9.000	N	GND	10.1
2.766	36.988	---	56.00	19.01	500.0	9.000	N	GND	10.1



9 Test setup photos

Setup photos are included in supporting file name: "EMC_UTCAE_035_23001_15_247_DTS_Setup_Photos.pdf"

10 Test Equipment And Ancillaries Used For Testing

Equipment Type	Manufacturer	Model	Serial #	Calibration Cycle	Last Calibration Date
ACTIVE LOOP ANTENNA	ETS LINDGREN	6507	00161344	3 YEARS	10/30/2020
BILOG ANTENNA	ETS.LINDGREN	3142E	00166067	3 YEARS	10/21/2021
HORN ANTENNA	EMCO	3115	00035111	3 YEARS	09/30/2021
HORN ANTENNA	ETS.LINDGREN	3117	00215984	3 YEARS	01/31/2021
HORN ANTENNA	ETS.LINDGREN	3116	00070497	3 YEARS	11/23/2020
TEST RECEIVER	R&S	ESU40	100251	3 YEARS	09/13/2021
DIGITAL THRMOMETER	CONTROL COMPANY	36934-164	181230565	3 YEARS	10/20/2021
LISN	FCC	N/A	08014	3 YEARS	08/31/2021

Note: Equipment used meets the measurement uncertainty requirements as required per applicable standards for 95% confidence levels.
Calibration due dates, unless defined specifically, falls on the last day of the month. Items indicated "N/A" for cal status either do not specifically require calibration or is internally characterized before use.

11 History

Date	Template Revision	Changes to report	Prepared by
2023-10-10	EMC_UTCAE_035_23001_15_247_WIFI_DTS	Initial Version	Art Thammanavarat
2024-04-19	EMC_UTCAE_035_23001_15_247_WIFI_DTS_Rev1	**Report Revised** 1. Section 1: Removed Report Reviewer. 2. Section 2: Updated Lab Manger 3. Section 5: Updated Complies for AC conducted Emission. 4. Section 8.1: Added Average power and plots. 5. Section 8.3: Updated Duty Cycle values and plots. 6. Section 8.4.5: Corrected Typo. 7. Section 8.5: Updated values and plots 8. Section 8.7: Added Section.	Art Thammanavarat

<<< The End >>>