

Prüfbericht-Nr.: <i>Test report no.:</i>	CN21RYZ6 001	Auftrags-Nr.: <i>Order no.:</i>	168306674	Seite 1 von 23 <i>Page 1 of 23</i>
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2021-02-01	
Auftraggeber: <i>Client:</i>	Felion Technologies Company Limited 304, 3/F, Fuxing Office Building, No.6 Binglang Road, Fubao Community, Futian District, Shenzhen 518017, Peoples Republic Of China			
Prüfgegenstand: <i>Test item:</i>	SmartBar Plug			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	VP5X (Trademark: VOCOLinc)			
Auftrags-Inhalt: <i>Order content:</i>	FCC and IC approval			
Prüfgrundlage: <i>Test specification:</i>	CFR47 FCC Part 15: Subpart C Section 15.247 RSS-247 Issue 2 February 2017 CFR47 FCC Part 15: Subpart C Section 15.207 RSS-Gen Issue 5 March 2019 CFR47 FCC Part 15: Subpart C Section 15.209 RSS-102 Issue 5 March 2015 CFR47 FCC Part 2.1091			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2021-02-05	Please refer to photo documents		
Prüfmuster-Nr.: <i>Test sample no.:</i>	A002999100-001, 002			
Prüfzeitraum: <i>Testing period:</i>	2021-02-19 – 2021-03-09			
Ort der Prüfung: <i>Place of testing:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	genehmigt von: <i>authorized by:</i>			
Datum: <i>Date:</i> 2021-03-26	 Signed by: Alex Lan		 Signed by: Winnie Hou	
Stellung / Position	Senior Project Engineer	Ausstellungsdatum: <i>Issue date:</i> 2021-03-26		
Stellung / Position		Department Manager		
Sonstiges / Other:				
FCC ID: 2AXT8-VP5X IC: 26783-VP5X HVIN: VP5X				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged:</i>		
* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. test specifications(s) F(ail) = failed a.m. test specifications(s) N/A = not applicable N/T = not tested				
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

V05

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Test Summary

5.1.1 ANTENNA REQUIREMENT

RESULT: Pass

5.1.2 MAXIMUM PEAK CONDUCTED OUTPUT POWER

RESULT: Pass

5.1.3 CONDUCTED POWER SPECTRAL DENSITY

RESULT: Pass

5.1.4 99%dB BANDWIDTH

RESULT: Pass

5.1.5 6dB BANDWIDTH

RESULT: Pass

5.1.6 CONDUCTED SPURIOUS EMISSIONS MEASURED IN 100 KHz BANDWIDTH

RESULT: Pass

5.1.7 RADIATED SPURIOUS EMISSION

RESULT: Pass

5.1.8 CONDUCTED EMISSION ON AC MAINS

RESULT: Pass

6.1.1 ELECTROMAGNETIC FIELDS

RESULT: Pass

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1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Photographs of the Test Set-up

Appendix B: Test Results of Conducted Testing

Appendix C: Test Results of Radiated Testing and conducted emission on AC mains

2 Test Sites

2.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.

No. 362 Huanguan Road Middle, Longhua District, Shenzhen 518110, People's Republic of China

FCC Registration No.: 694916

IC Registration No.: 25069

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2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Radio Spectrum Testing				
Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
Wireless Connectivity Tester	R&S	CMW270	101375	10.08.2021
Signal Analyzer	R&S	FSV 40	101441	10.08.2021
Vector Signal Generator	R&S	SMBV100A	263301	10.08.2021
Signal Generator	R&S	SMB100A	115186	10.08.2021
OSP	R&S	OSP 150	101017	10.12.2021
Control PC	DELL	OptiPlex 7050	FTJZ9P2	N/A
Test Software	R&S	WMS32 (V11.00.00)	N/A	N/A
Power Meter	R&S	NRP2	107105	10.12.2021
Power Sensor	R&S	NRP-Z81	105677	10.09.2021
Humid & Temp Programmable Tester	BOST	NTH090-60	19040801	10.04.2021
Shielding Room 8#	Albatross	SR8	APC17151-SR8	23.07.2021
Unwanted Emission Testing				
Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
EMI Test Receiver	R&S	ESR 7	102021	11.08.2021
Signal Analyzer	R&S	FSV 40	101439	10.08.2021
System Controller Interface	R&S	SCI-100	S10010038	N/A
Filterbank	R&S	Wlan	100759	10.08.2021
OSP	R&S	OSP 120	102040	N/A
Pre-amplifier	R&S	SCU08F1	08320031	10.08.2021
Amplifier	R&S	SCU-18F	180070	10.08.2021
Amplifier	R&S	SCU40A	100475	10.09.2021
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	08.08.2022
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	08.08.2022
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	08.08.2022
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	13.09.2022
Wideband Ridged Horn Antenna (12-18 GHz)	Steatite	QMS-00208	18313	02.09.2021
Test software	R&S	EMC32 (V10.60.10)	N/A	N/A

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Control PC	Dell	OptiPlex 7050	36NV9P2	N/A
3m Semi-Anechoic Chamber	Albatross	SAC-3m	APC17151-SAC	06.07.2021
Conducted Emissions				
Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
EMI Test Receiver	R&S	ESR3	102428	03.09.2021
Artificial Mains Network	R&S	ENV216	102333	19.08.2021
Artificial Mains Network	R&S	ENV432	101411	19.08.2021
Current Probe	R&S	EZ-17	101247	19.08.2021
Voltage Probe	R&S	ESH2-Z3	100557	19.08.2021
Attenuator	R&S	ESH2Z31	100300	19.08.2021
EMC32 test software	R&S	EMC32(Ver.10.50.01)	N/A	N/A

2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table.

Item		Extended Uncertainty
Conducted Emission		± 2.74 dB
Radiated Emission (30-1000MHz)	Field strength (dB μ V/m)	4.27dB
Radiated Emission (above 1000MHz)	Field strength (dB μ V/m)	4.46dB
Radio Spectrum		± 1.5 dB

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A & B of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) file for certification follow-up purposes.

2.7 Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. Test facility located at No. 362 Huanguan Road Middle, Longhua District, Shenzhen 518110, People's Republic of China. is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3 General Product Information

3.1 Product Function and Intended Use

The EUT is a SmartBar Plug, it supports 2.4GHz Wi-Fi technology.

For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 Ratings and System Details

Table 2: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment	SmartBar Plug
Type Designation	VP5X
FCC ID	2AXT8-VP5X
IC	26783-VP5X
HVIN	VP5X
Input Voltage	AC 120V, 60Hz
Output Voltage	AC 120V, 15A Max, 1800W (Pure Resistive Load)
Technical Specification of Wi-Fi 802.11 b/g/n	
Operating Frequency	2412 - 2462 MHz for 802.11b/g/n(HT20)
Type of Modulation	DSSS(DBPSK/DQPSK/CCK) OFDM(BPSK/QPSK/16QAM/64QAM)
Data Rate	1/2/5.5/11 Mbps for 802.11b 6/9/12/18/24/36/48/54 Mbps for 802.11g MCS0 ~ MCS7 for 802.11n
Channel Number	11 channels for 802.11b/g/n(HT20)
Channel Separation	5 MHz
Antenna Type	Integral Antenna
Antenna Gain	3 dBi

Table 3: RF Channel and Frequency of Bluetooth Low Energy

RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)
01	2412.00	04	2427.00	07	2442.00	10	2457.00
02	2417.00	05	2432.00	08	2447.00	11	2462.00
03	2422.00	06	2437.00	09	2452.00		

Test frequencies are lowest channel: 2412 MHz, middle channel: 2437 MHz and highest channel: 2462 MHz for 802.11b/g/n(HT20)

3.3 Independent Operation Modes

The basic operation modes are:

- A. On, transmitting mode
 - 1. Low channel
 - 2. Middle channel
 - 3. High channel
- B. On, Operating
- C. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- Application Form
- Block Diagram
- FCC/IC Label and Location Info
- Operation Description
- Photo Document
- Schematics
- User Manual

4 Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All testing were performed according to the procedures in ANSI C63.10: 2013.

4.3 Special Accessories and Auxiliary Equipment

Table 4: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N
Notebook	Lenovo	ThinkPad X260	N/A

4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 30MHz)

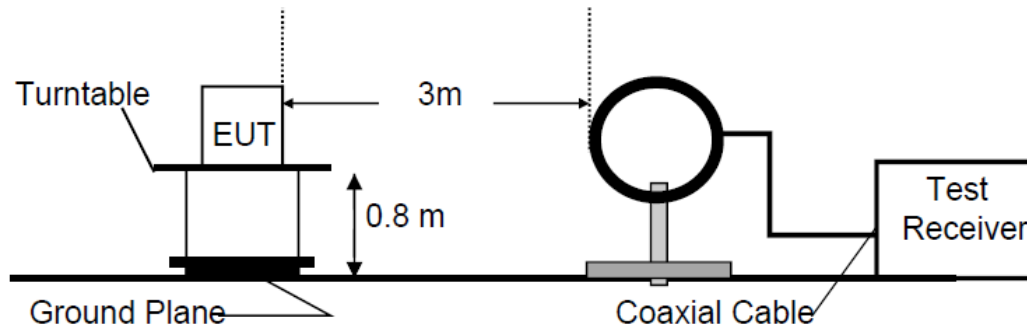


Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

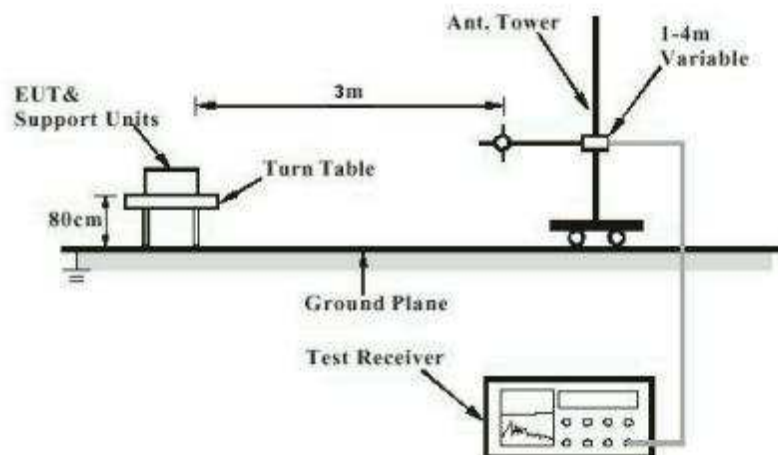


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

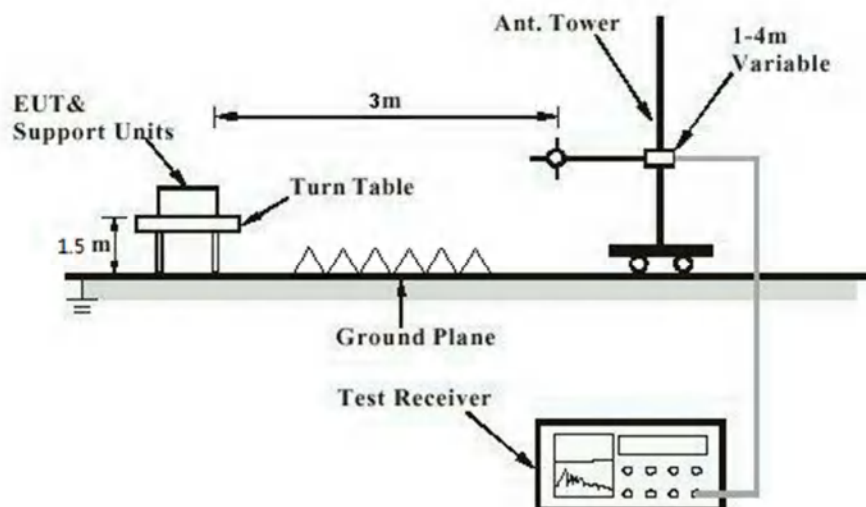


Diagram of Measurement Configuration for Mains Conduction Measurement

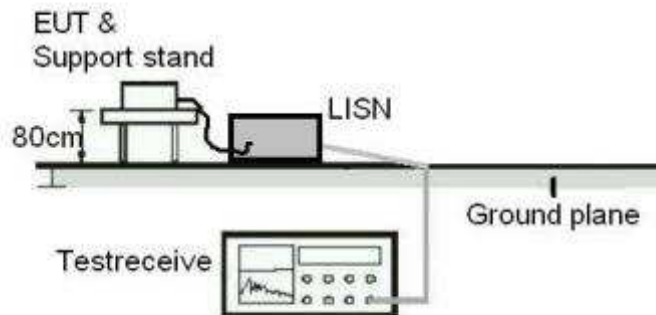
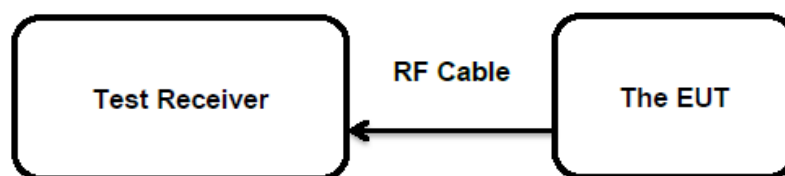


Diagram of Measurement Configuration for Conducted Transmitter Measurement



5 Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT:

Pass

Test Specification

Test standard	:	FCC Part 15.247(b)(4) and Part 15.203
	:	RSS-Gen Clause 6.7
Limit	:	the use of antennas with directional gains that do not exceed 6 dBi

According to the manufacturer declared, the EUT has an internal antenna, the directional gain of antenna is 3 dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

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5.1.2 Maximum Peak Conducted Output Power

RESULT:

Pass

Test Specification

Test standard : FCC Part 15.247(b)(3)
RSS-247 Clause 5.4(b)
Basic standard : ANSI C63.10: 2013
Limits : < 1 Watt (Maximum Conducted Peak Power)
e.i.r.p. <4W
Kind of test site : Shielded Room

Test Setup

Date of testing : 01.03.2021
Input voltage : AC 120V, 60Hz
Operation mode : A
Test channel : Low / Middle / High
Ambient temperature : 24.3 °C
Relative humidity : 52 %
Atmospheric pressure : 101 kPa

For details refer to following test result.

Table 5: Test Result of Maximum Peak Conducted Output Power,

Mode	802.11b			802.11g		
Data Rate	1Mbps			6Mbps		
Channel	1	6	11	1	6	11
Frequency (MHz)	2412	2437	2462	2412	2437	2462
Peak. Power (dBm)	18.20	17.60	17.40	21.20	20.60	20.60
Avg. Power (dBm)	16.35	15.63	15.45	13.54	12.82	12.87
Mode	802.11n HT20					
Data Rate	MCS0 6.5Mbps					
Channel	1	6	11			
Frequency(MHz)	2412	2437	2462			
Peak. Power (dBm)	20.30	19.90	20.00			
Avg. Power (dBm)	12.62	12.04	12.27			

Note: The cable loss is taken into account in results and the e.i.r.p. is 24.20 dBm less than 4W (36 dBm).

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5.1.3 Conducted Power Spectral Density

RESULT:

Pass

Test Specification

Test standard : FCC Part 15.247(e)
RSS-247 Clause 5.2(b)
Basic standard : ANSI C63.10: 2013
Limits : 8 dBm / 3kHz
Kind of test site : Shielded Room

Test Setup

Date of testing : 01.03.2021
Input voltage : AC 120V, 60Hz
Operation mode : A
Test channel : Low / Middle / High
Ambient temperature : 25 °C
Relative humidity : 56 %
Atmospheric pressure : 101 kPa

For details refer to following test result.

Table 6: Test Result of Power Spectral Density

Test Mode	Data Rate	Frequency (MHz)	Measured Peak Power Spectral Density (dBm/3KHz)
802.11b	1 Mbps	2412	-6.11
		2437	-6.36
		2462	-6.66
802.11g	6 Mbps	2412	-12.54
		2437	-12.46
		2462	-12.57
802.11n (HT20)	MCS0	2412	-13.32
		2437	-13.46
		2462	-13.66
Maximum Measured Value			-6.11

Note: The cable loss is taken into account in results.

For the measurement records, refer to the appendix B.

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5.1.4 99%dB Bandwidth

RESULT:

Pass

Test Specification

Test standard : RSS-Gen clause 6.7
Basic standard : ANSI C63.10: 2013
Kind of test site : Shielded Room

Test Setup

Date of testing : 01.03.2021
Input voltage : AC 120V, 60Hz
Operation mode : A
Test channel : Low / Middle / High
Ambient temperature : 25 °C
Relative humidity : 56 %
Atmospheric pressure : 101 kPa

Table 7: Test Result of 99% Bandwidth

Test Mode	Data Rate	Frequency (MHz)	99% Bandwidth (MHz)	Limit (MHz)
802.11b	1 Mbps	2412	13.0	/
		2437	13.0	
		2462	13.1	
802.11g	6 Mbps	2412	16.7	
		2437	16.7	
		2462	16.7	
802.11n (HT20)	MCS0	2412	17.7	
		2437	17.7	
		2462	17.7	
Minimum Measured Value			13.0	

For the measurement records, refer to the appendix B.

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5.1.5 6dB Bandwidth

RESULT:

Pass

Test Specification

Test standard : FCC Part 15.247(a)(2)
RSS-247 Clause 5.2(a)
Basic standard : ANSI C63.10: 2013
Kind of test site : Shielded Room

Test Setup

Date of testing : 01.03.2021
Input voltage : AC 120V, 60Hz
Operation mode : A
Test channel : Low / Middle / High
Ambient temperature : 25 °C
Relative humidity : 56 %
Atmospheric pressure : 101 kPa

Table 8: Test Result of 6dB Bandwidth

Test Mode	Data Rate	Frequency (MHz)	-6dB Bandwidth (MHz)	Limit (kHz)
802.11b	1 Mbps	2412	9.10	> 500
		2437	9.10	
		2462	9.10	
802.11g	6 Mbps	2412	16.40	
		2437	16.40	
		2462	16.40	
802.11n (HT20)	MCS0	2412	17.60	
		2437	17.65	
		2462	17.60	
Minimum Measured Value				

For the measurement records, refer to the appendix B.

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5.1.6 Conducted Spurious Emissions Measured in 100 kHz Bandwidth

RESULT:

Pass

Test Specification

Test standard	: FCC Part 15.247(d) RSS-247 Clause 5.5
Basic standard	: ANSI C63.10: 2013
Limits	: 20dB (below that in the 100kHz bandwidth within the band that contains the highest level of the desired power); In addition, radiated emissions which fall in the restricted bands, must also comply with the radiated emission limits specified in 15.209(a)
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 01.03.2021
Input voltage	: AC 120V, 60Hz
Operation mode	: A
Test channel	: Low / Middle / High
Ambient temperature	: 25 °C
Relative humidity	: 56 %
Atmospheric pressure	: 101 kPa

Test results of 100kHz Bandwidth of Frequency Band Edge by Conducted method refer to test plots, and compliance is achieved as well.

For the measurement records, refer to the appendix B.

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5.1.7 Radiated Spurious Emission

RESULT:

Pass

Test Specification

Test standard	: FCC Part 15.247(d) & FCC Part 15.205 RSS-247 Clause 3.3 & 5.5
Basic standard	: ANSI C63.10: 2013
Limits	: Refer to 15.209(a) of FCC part 15.247(d) RSS-Gen Table 4 & Table 5
Kind of test site	: 3m Semi-anechoic Chamber

Test Setup

Date of testing	: 19.02.2021 to 09.03.2021
Input voltage	: AC 120V, 60Hz
Operation mode	: A
Test channel	: Low / Middle / High
Ambient temperature	: 23°C
Relative humidity	: 55 %
Atmospheric pressure	: 101 kPa

Remark:

Testing was carried out within frequency range 9kHz to the tenth harmonics. Only the worst case spurious emissions configuration of the each mode were reported.

For the measurement records, refer to the appendix C.

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5.1.8 Conducted Emission on AC Mains

RESULT:

Pass

Test Specification

Test standard	: FCC Part 15.207(a) RSS-Gen Clause 8.8
Basic standard	: ANSI C63.10: 2013
Frequency range	: 0.15 – 30MHz
Limits	: FCC Part 15.207(a) RSS-Gen Table 4
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 05.03.2021
Input voltage	: AC 120V/60Hz
Operation mode	: B
Earthing	: Not connected
Ambient temperature	: 24.3 °C
Relative humidity	: 52 %
Atmospheric pressure	: 101 kPa

For the measurement records, refer to the appendix C.

6 Safety Human Exposure

6.1 Radio Frequency Exposure Compliance

6.1.1 Electromagnetic Fields

RESULT:

Pass

Test Specification

Test standard : CFR47 FCC Part 2.1091
RSS-102 Issue 5 March 2015
FCC KDB Publication 447498 v06
Limit : CFR47 FCC Part 1.1310

FCC requirement: Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 20cm normally can be maintained between the user and the device.

MPE Calculation Method according to OET Bulletin 65

Power Density: $S_{(mW/cm^2)} = PG/4\pi R^2$ or $EIRP/4\pi R^2$

Where:

S = power density (mW/cm²)

P = power input to the antenna (mW)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna (cm)

The nominal maximum conducted output power specified:

802.11b/g/n: 21.20 dBm

From the peak RF output power, the minimum mobile separation distance, d=20 cm, as well as the antenna gain (3.00 dBi), the RF power density can be calculated as below:

For 802.11b/g/n: $S_{(mW/cm^2)} = PG/4\pi R^2 = 0.052 \text{ mW/cm}^2$

Limits for Maximum Permissible Exposure (MPE) according to FCC Part 1.1310: 1.0 mW/cm²

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➤ **IC requirements:** The EUT shall comply with the requirement of RSS-102 section 2.5.2.

Exemption from Routine Evaluation Limits – RF Exposure Evaluation

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;

- RF exposure evaluation exempted power for 2.4G DTS: 2.676 W

The nominal maximum conducted output power specified:

802.11b/g/n: 21.20 dBm

Antenna Gain: 3.00 dBi

The Max. e.i.r.p. for 802.11b/g/n: 24.20dBm = 0.263 W

The e.i.r.p. of EUT is less than the RF exposure evaluation exempted power. So RF exposure evaluation is not required.

“RF Radiation Exposure Statement Caution: This Transmitter must be installed to provide a separation distance of at least 20 cm from all persons.”

7 Photographs of the Test Set-Up

For photographs of the test set-up, refer to the appendix A.

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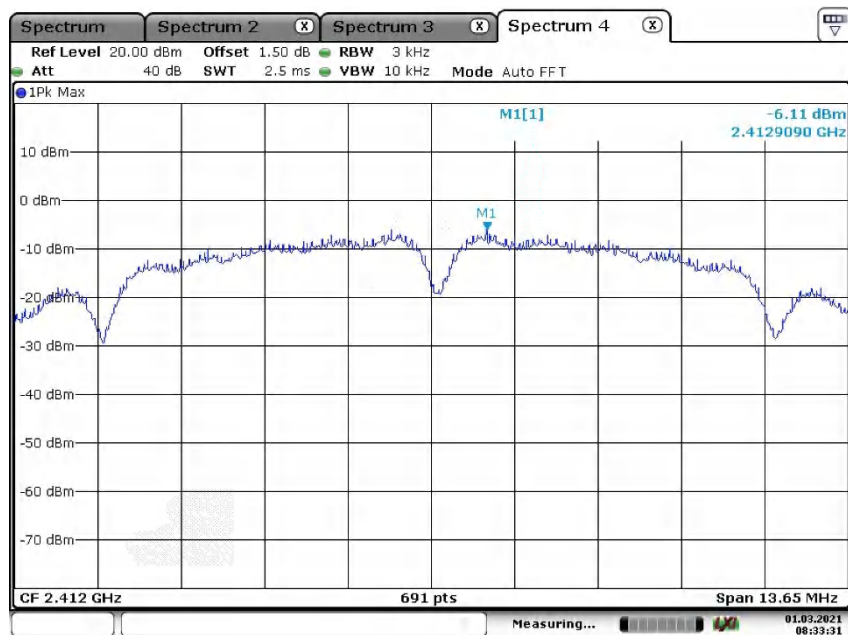
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Appendix B.1: Conducted Power Spectral Density

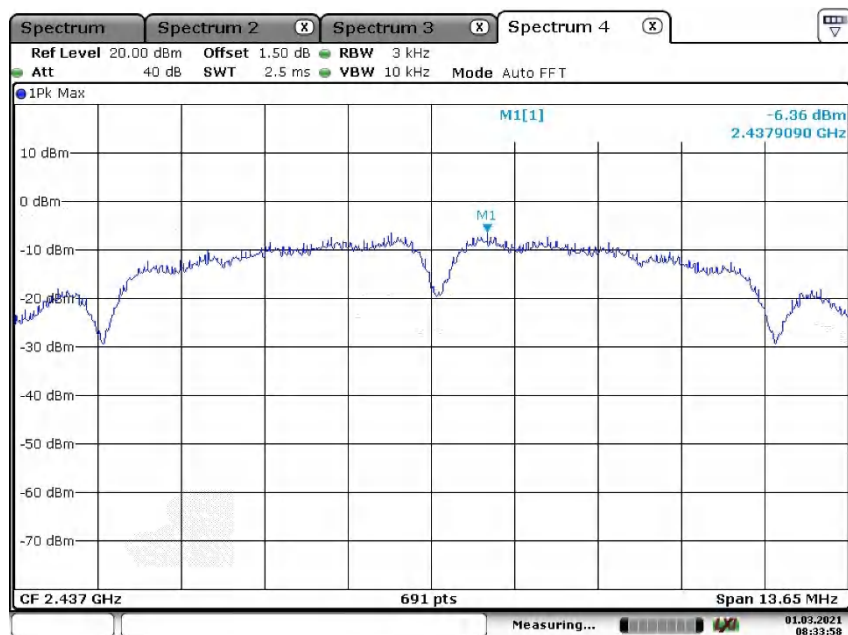
Wi-Fi 802.11 b mode, 1 Mbps

Low Channel



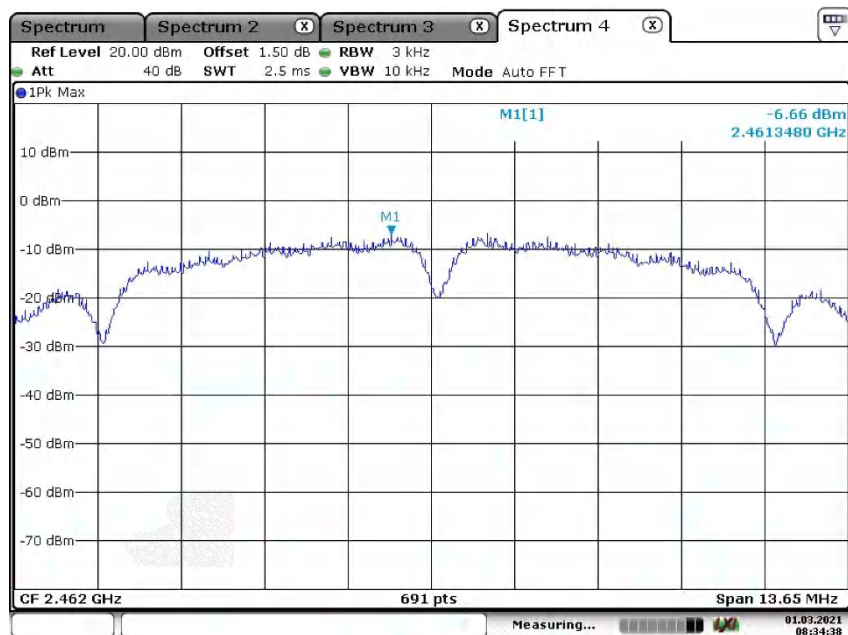
Date: 1.MAR.2021 08:33:32

Middle Channel



Date: 1.MAR.2021 08:33:59

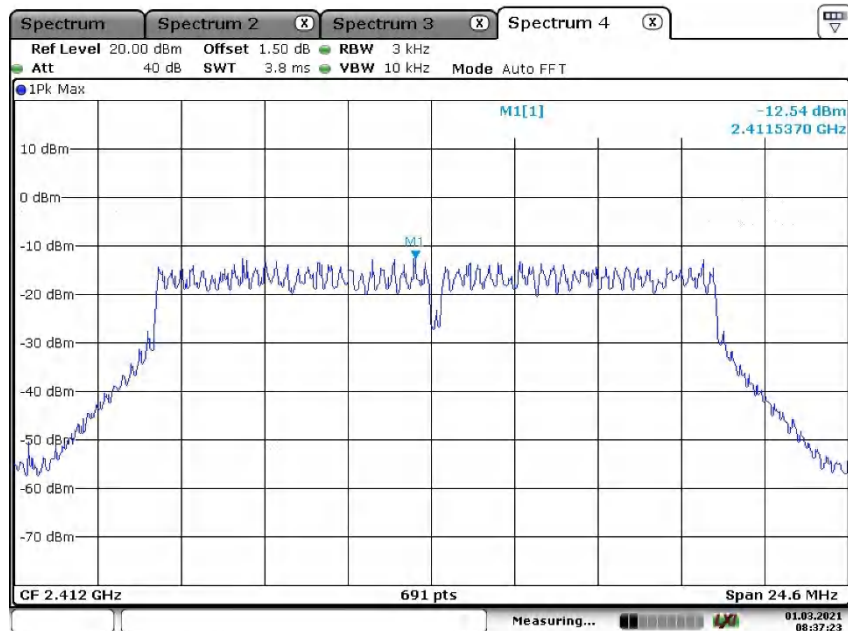
High Channel



Date: 1.MAR.2021 08:34:38

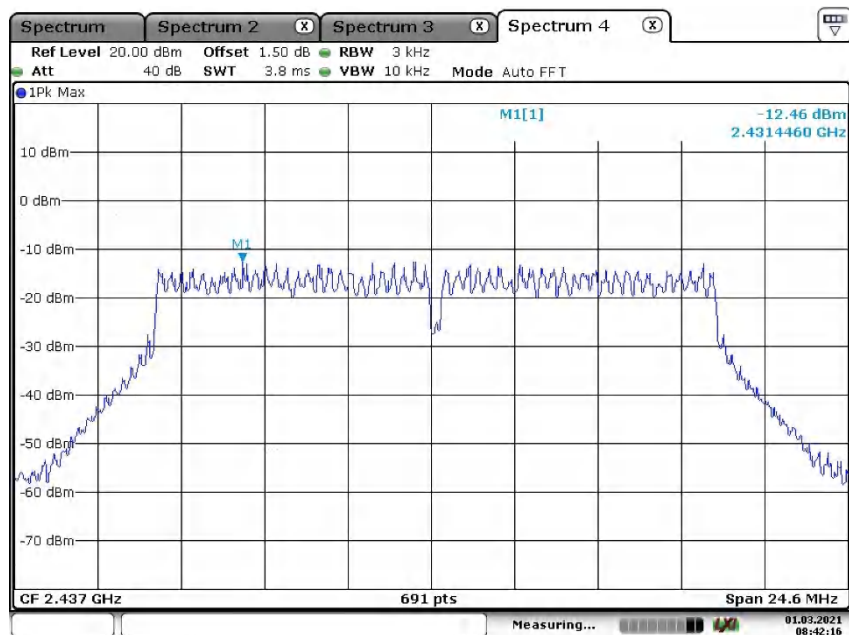
Wi-Fi 802.11 g mode, 6 Mbps

Low Channel

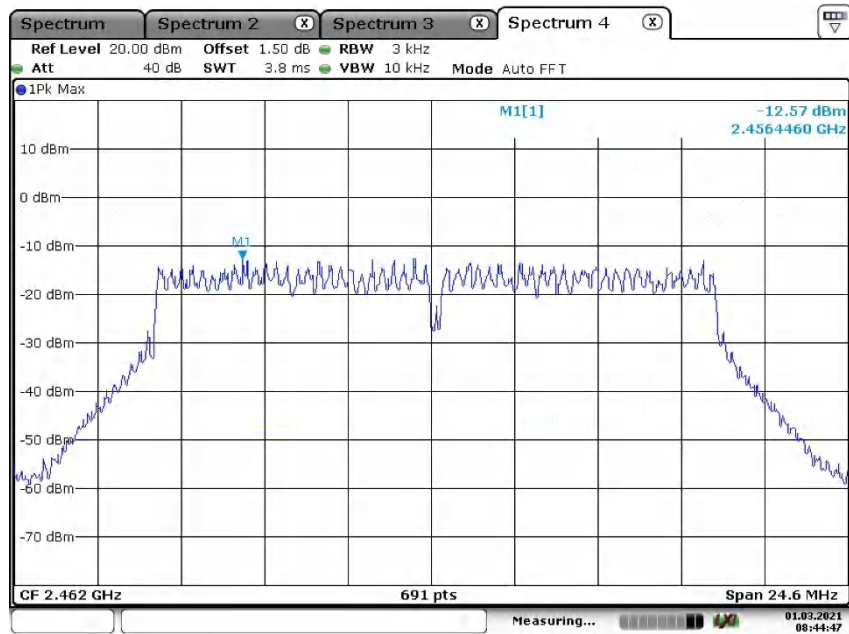


Date: 1.MAR.2021 08:37:23

Middle Channel

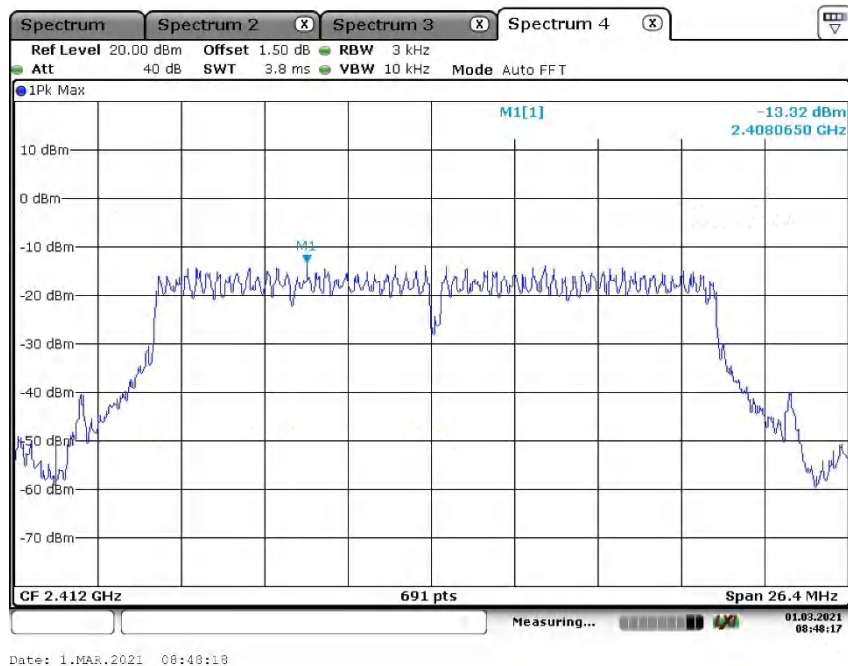


High Channel

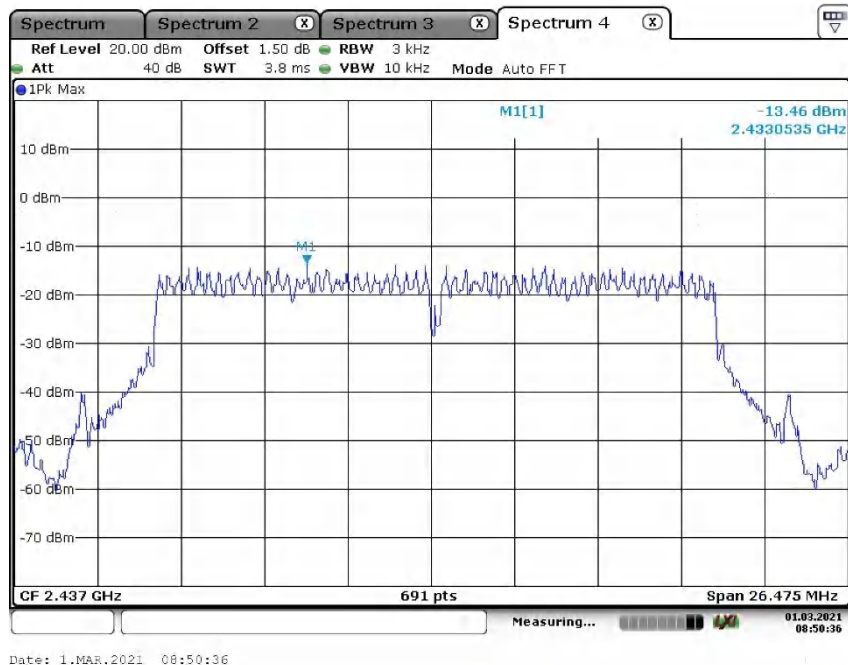


Wi-Fi 802.11 n(HT20) mode, MCS0

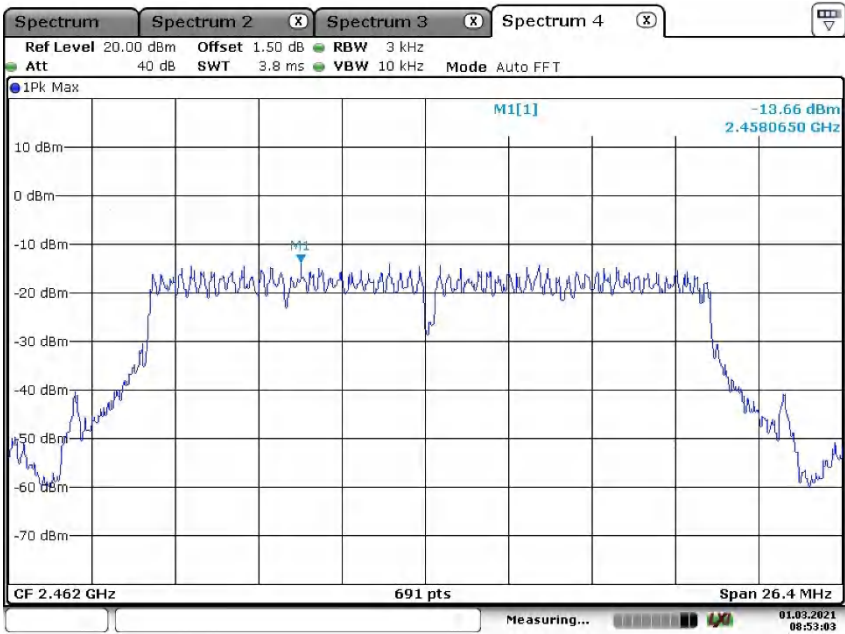
Low Channel



Middle Channel



High Channel



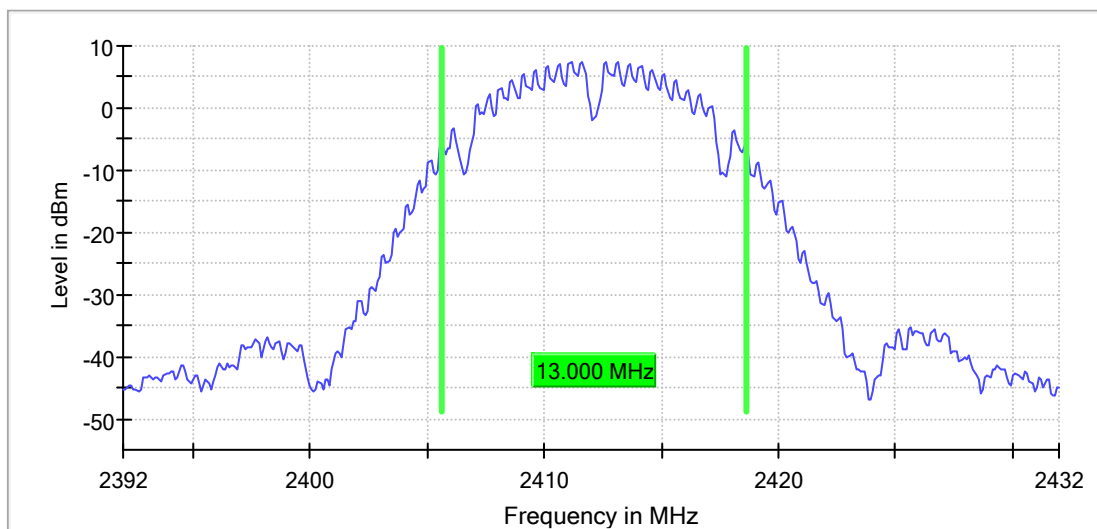
Date: 1.MAR.2021 08:53:03

Appendix B.2: 99% Bandwidth

Wi-Fi 802.11 b mode, 1 Mbps

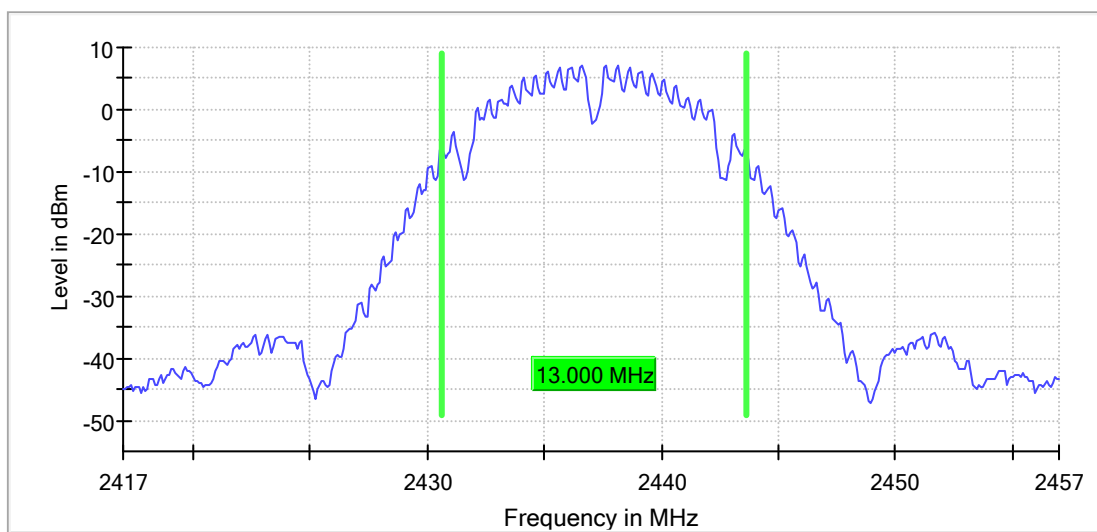
Low Channel
RBW=200KHz, VBW=1MHz

99 % Bandwidth

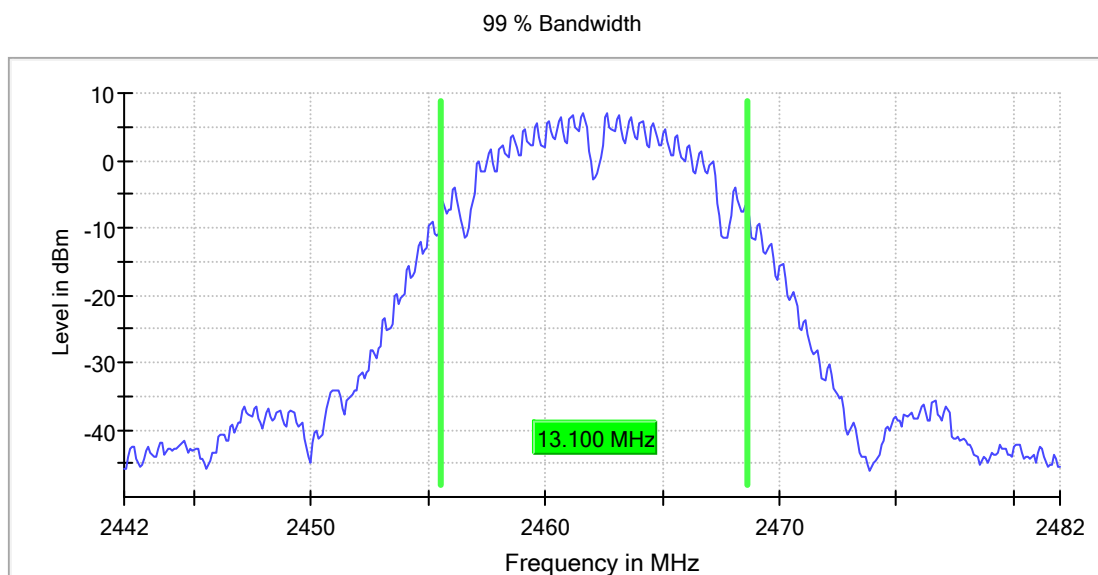


Middle Channel
RBW=200KHz, VBW=1MHz

99 % Bandwidth

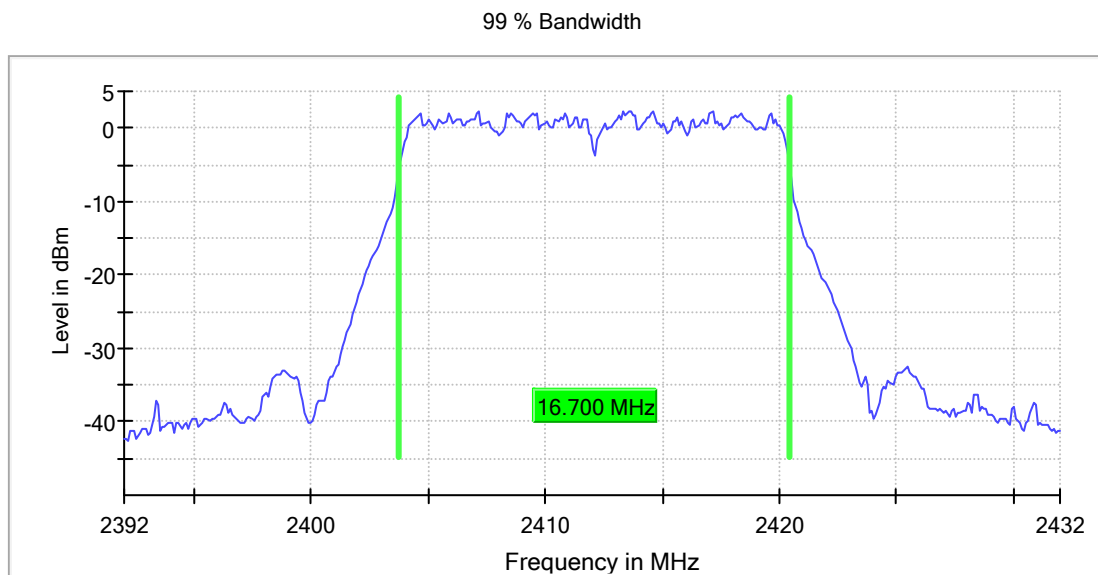


High Channel
RBW=200KHz, VBW=1MHz



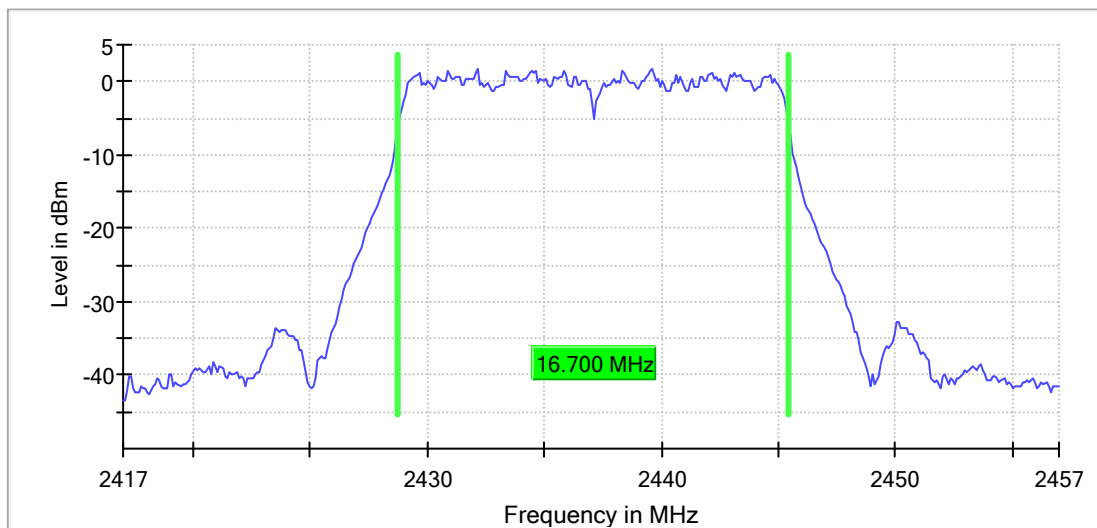
Wi-Fi 802.11 g mode, 6 Mbps

Low Channel
RBW=200KHz, VBW=1MHz



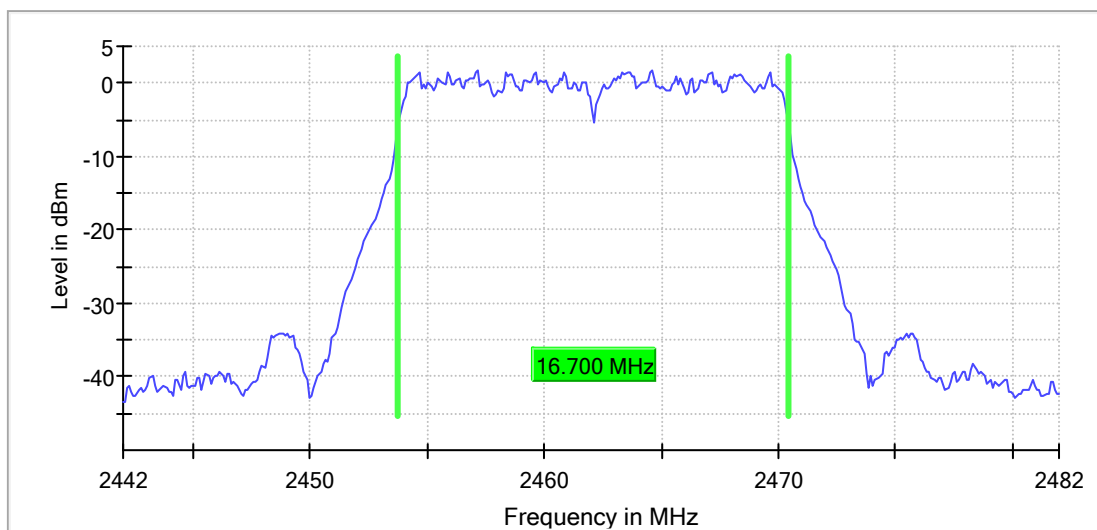
Middle Channel
RBW=200KHz, VBW=1MHz

99 % Bandwidth



High Channel
RBW=200KHz, VBW=1MHz

99 % Bandwidth

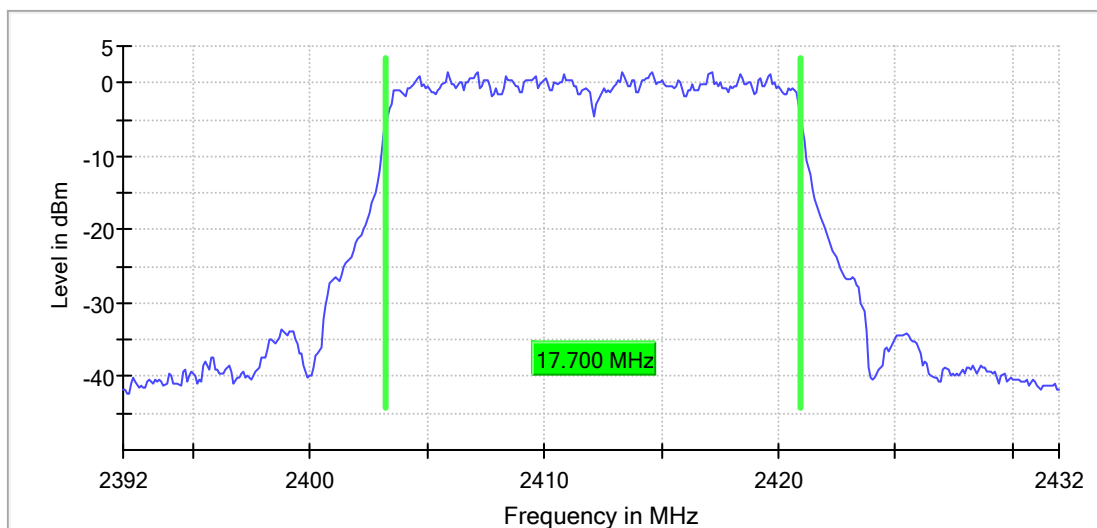


Wi-Fi 802.11 n(HT20) mode, MCS0

Low Channel

RBW=200KHz, VBW=1MHz

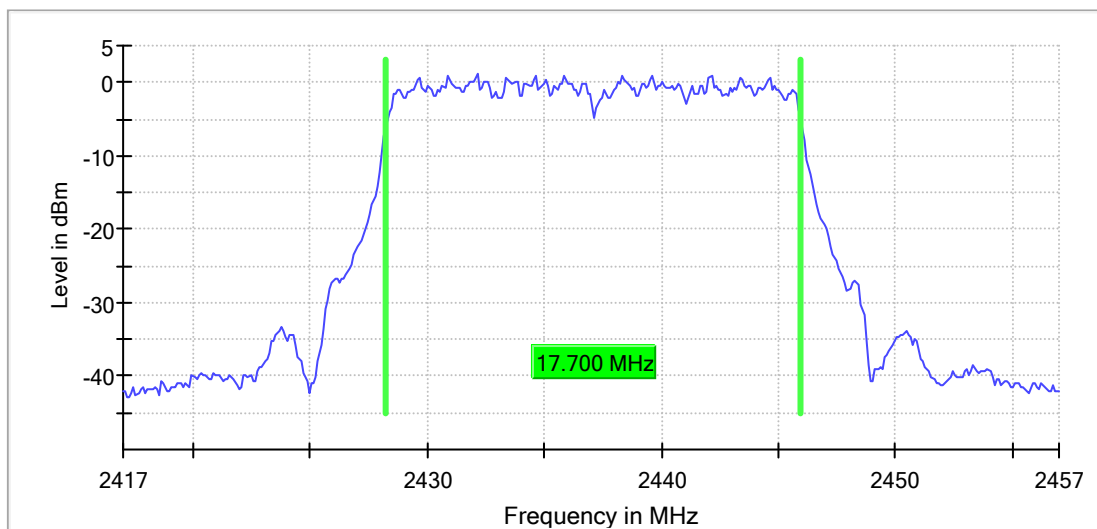
99 % Bandwidth



Middle Channel

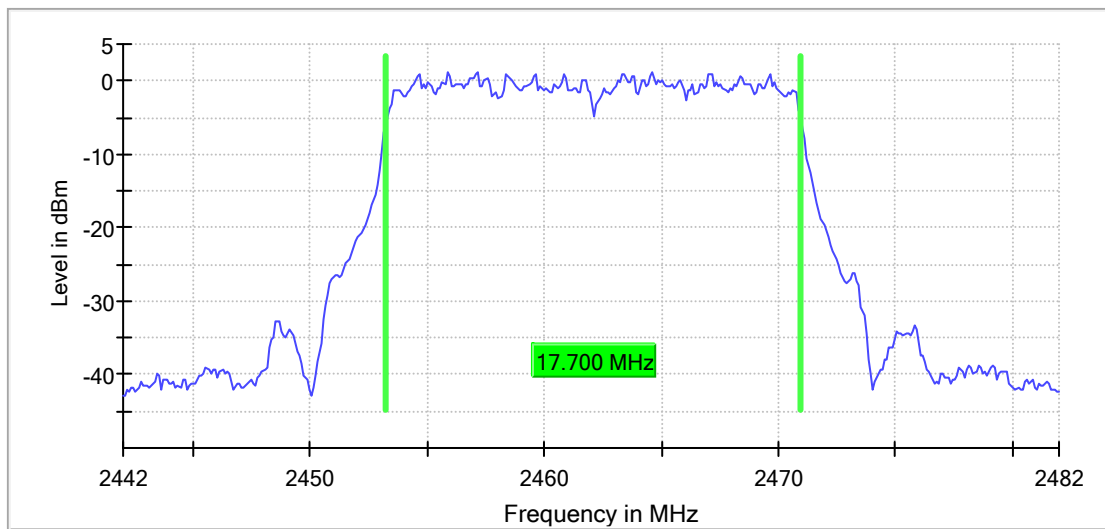
RBW=200KHz, VBW=1MHz

99 % Bandwidth



High Channel
RBW=200KHz, VBW=1MHz

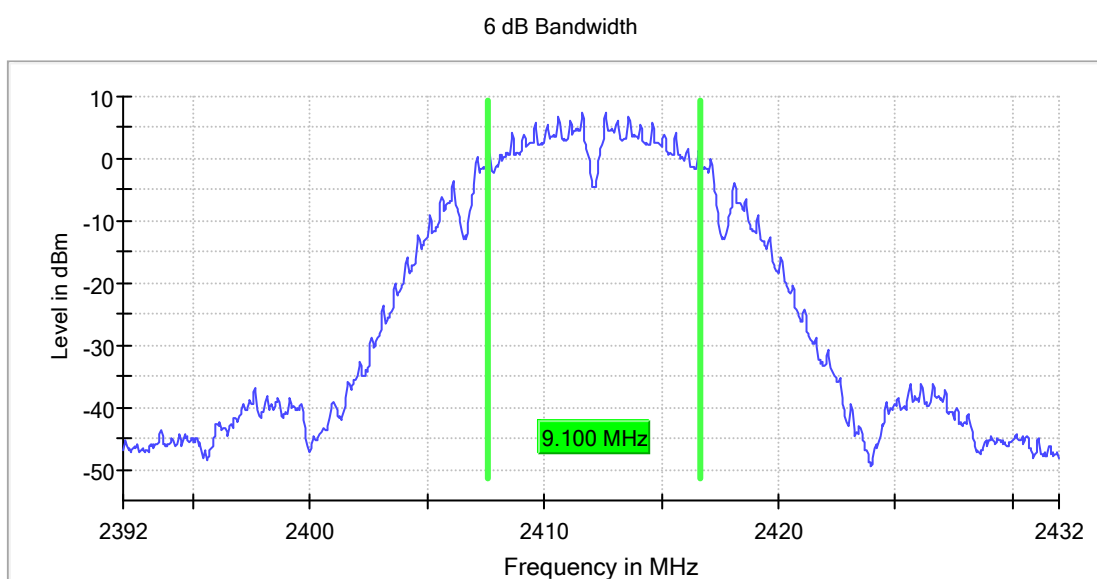
99 % Bandwidth



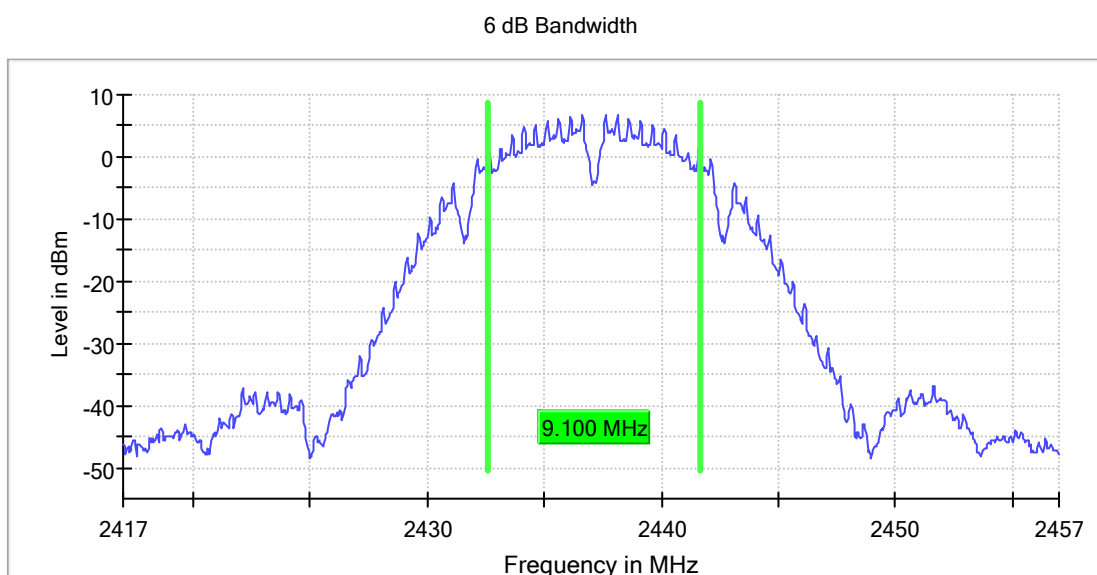
Appendix B.3: 6dB Bandwidth

Wi-Fi 802.11 b mode, 1 Mbps

Low Channel
RBW=100KHz, VBW=300KHz

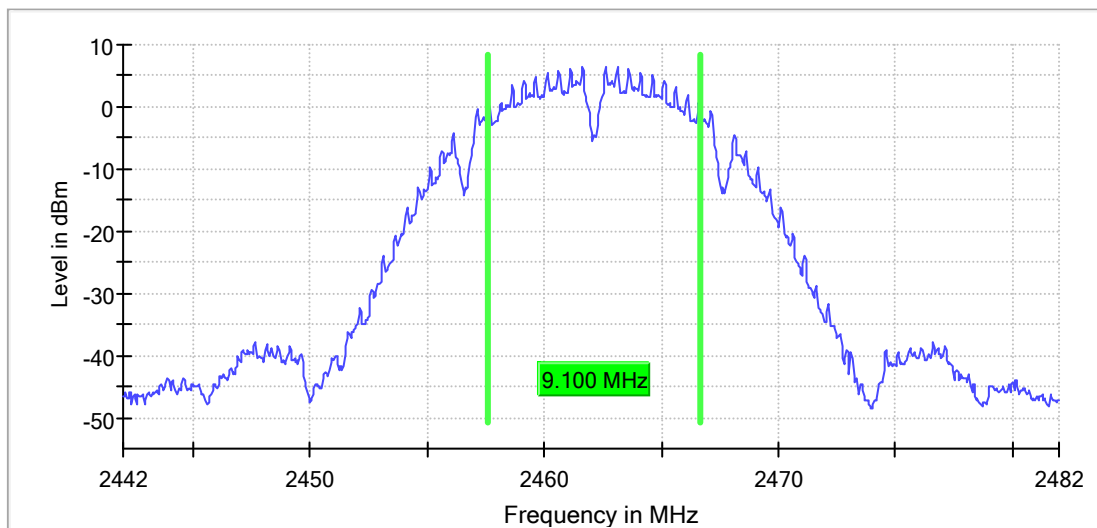


Middle Channel
RBW=100KHz, VBW=300KHz



High Channel
RBW=100KHz, VBW=300KHz

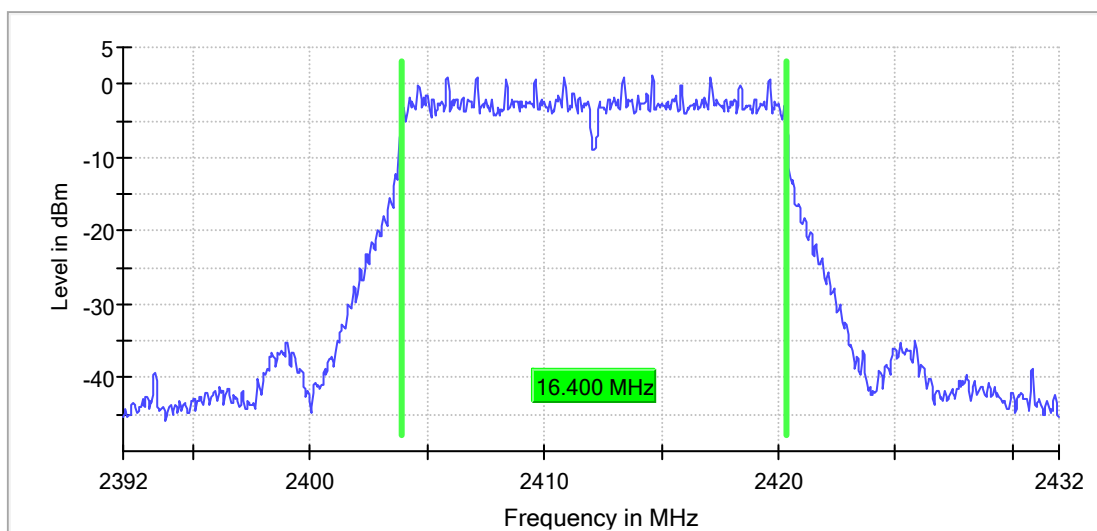
6 dB Bandwidth



Wi-Fi 802.11 g mode, 6 Mbps

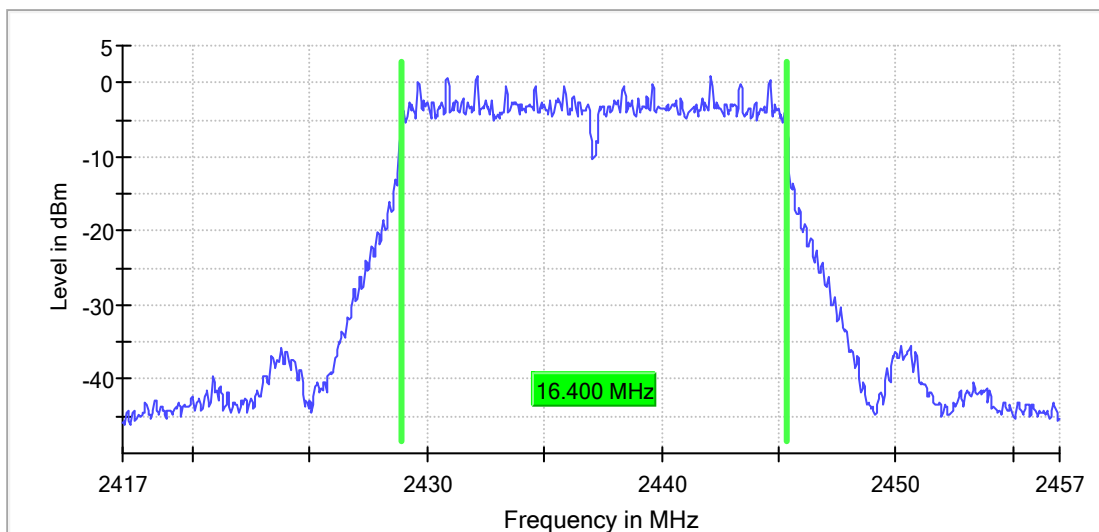
Low Channel
RBW=100KHz, VBW=300KHz

6 dB Bandwidth



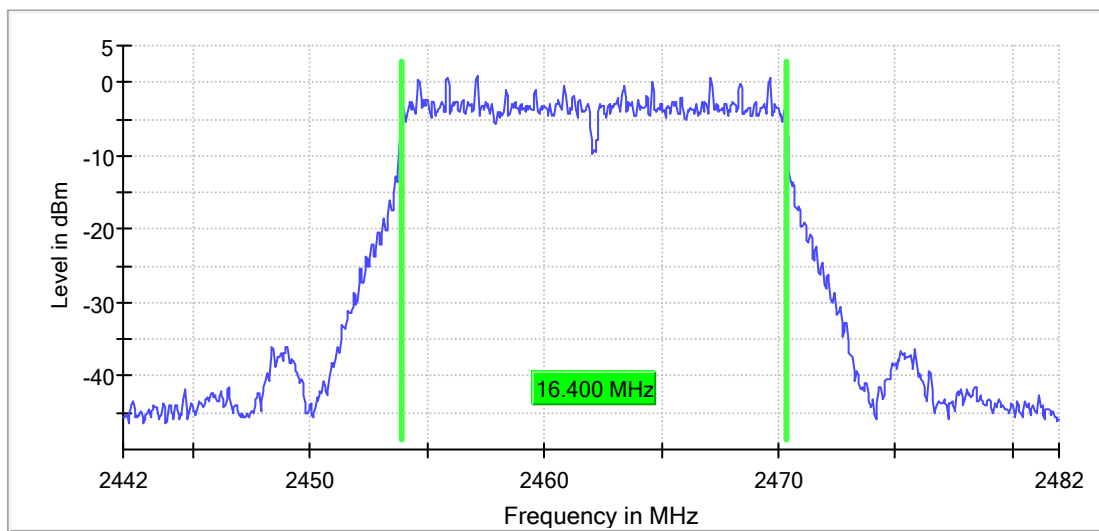
Middle Channel
RBW=100KHz, VBW=300KHz

6 dB Bandwidth



High Channel
RBW=100KHz, VBW=300KHz

6 dB Bandwidth

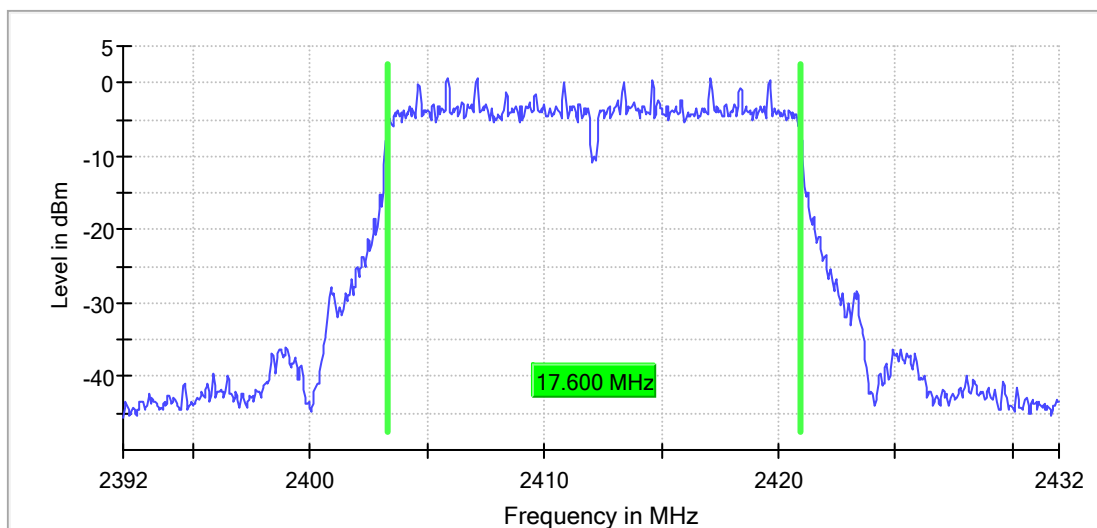


Wi-Fi 802.11 n(HT20) mode, MCS0

Low Channel

RBW=100KHz, VBW=300KHz

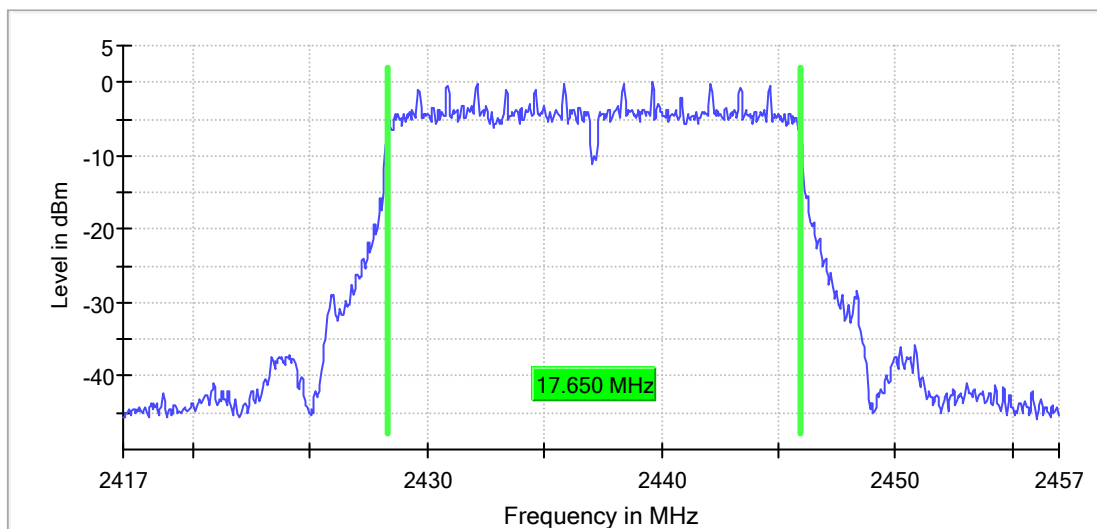
6 dB Bandwidth



Middle Channel

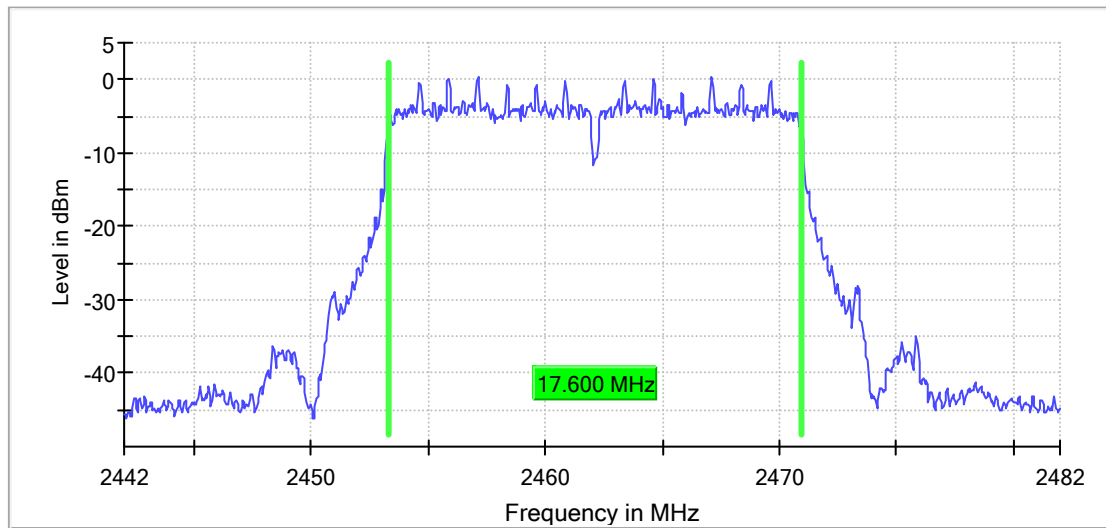
RBW=100KHz, VBW=300KHz

6 dB Bandwidth



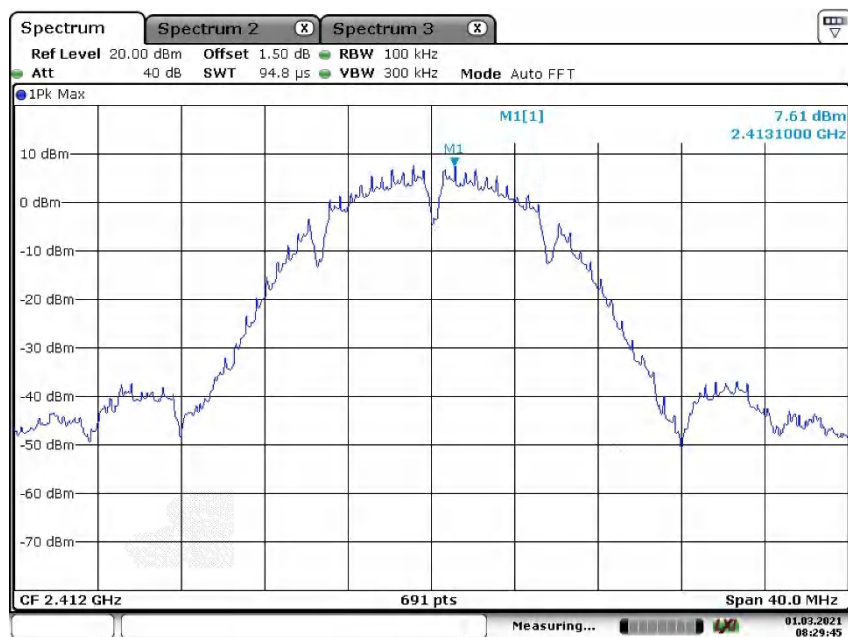
High Channel
RBW=100KHz, VBW=300KHz

6 dB Bandwidth

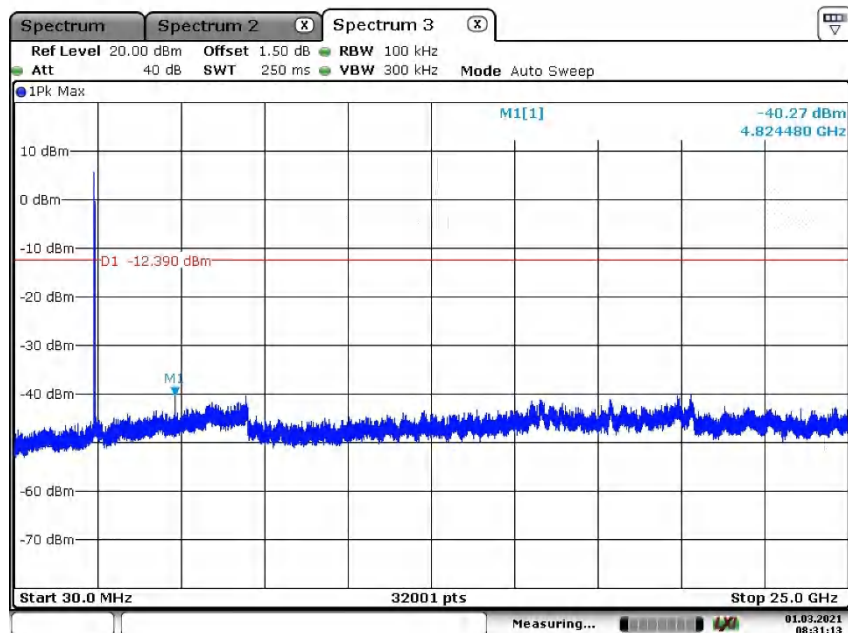


Appendix B.4: Conducted Spurious Emissions Measured in 100 kHz Bandwidth

Wi-Fi 802.11 b mode, 1 Mbps
Low Channel

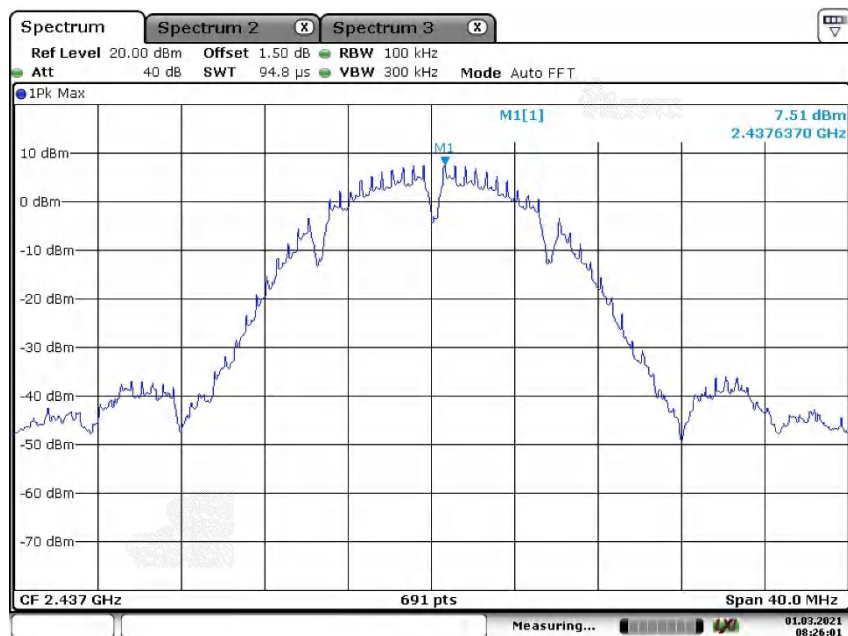


Date: 1.MAR.2021 08:29:45

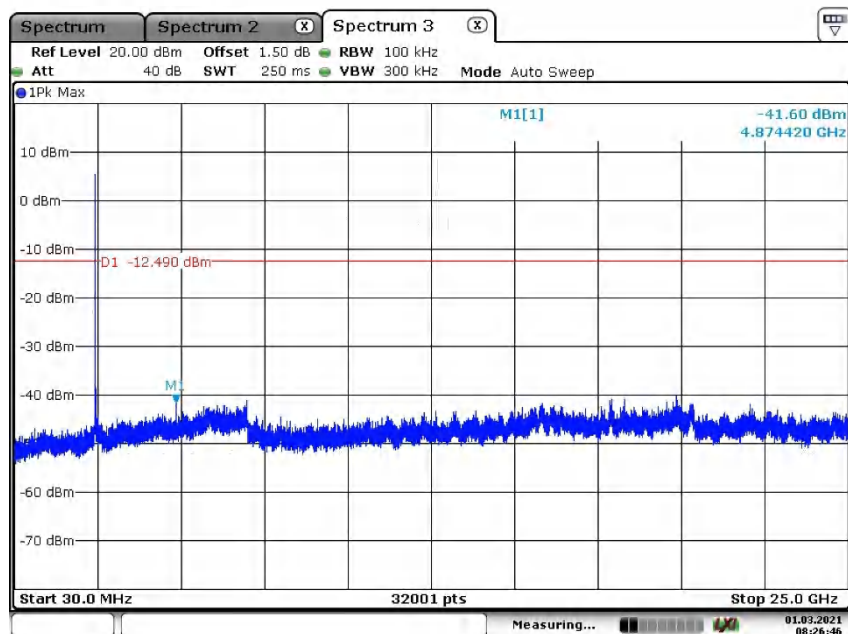


Date: 1.MAR.2021 08:31:14

Middle Channel

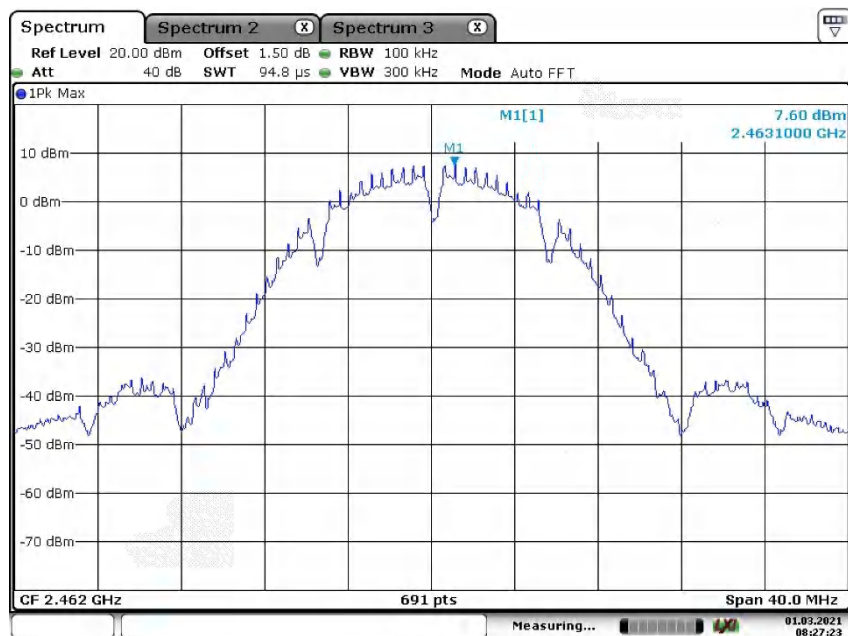


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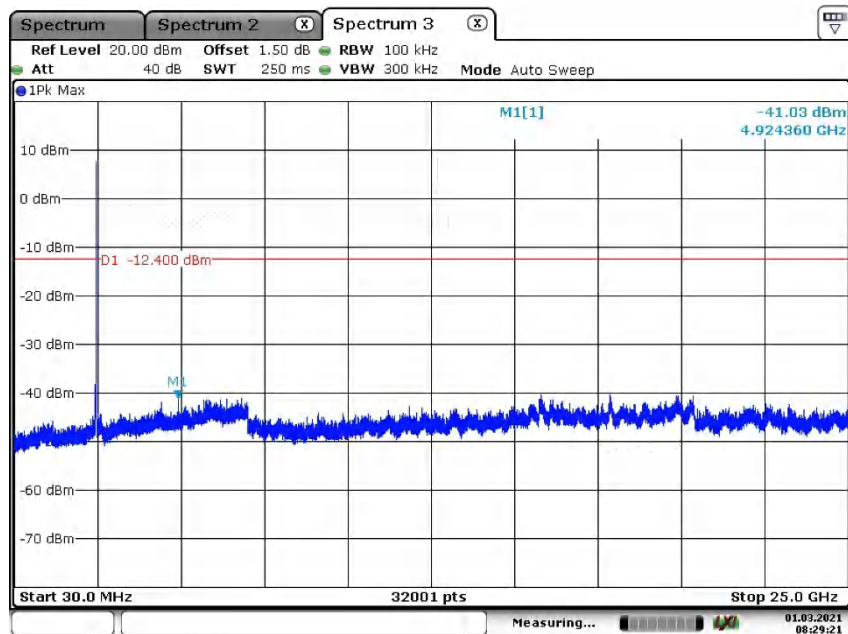


Date: 1.MAR.2021 08:26:47

High Channel

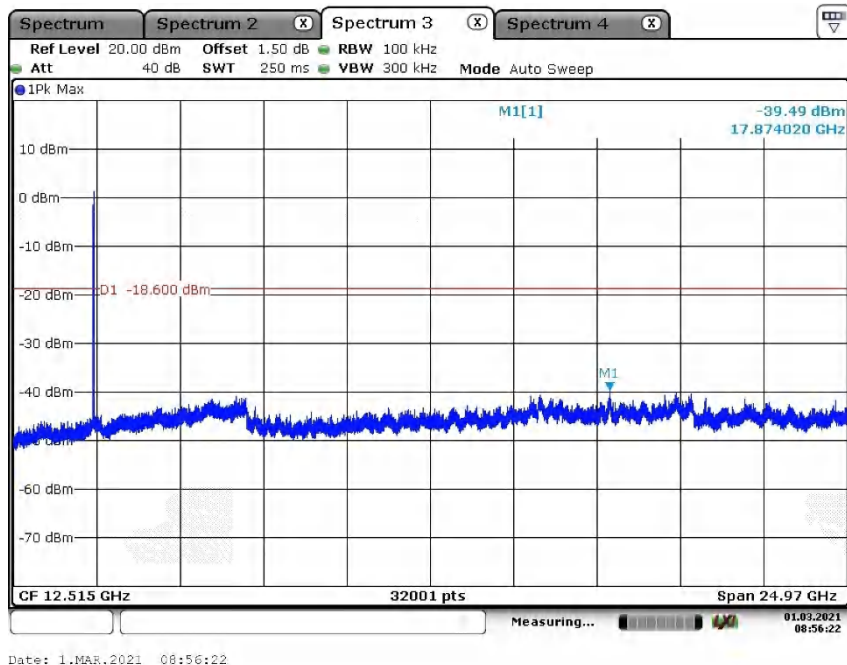
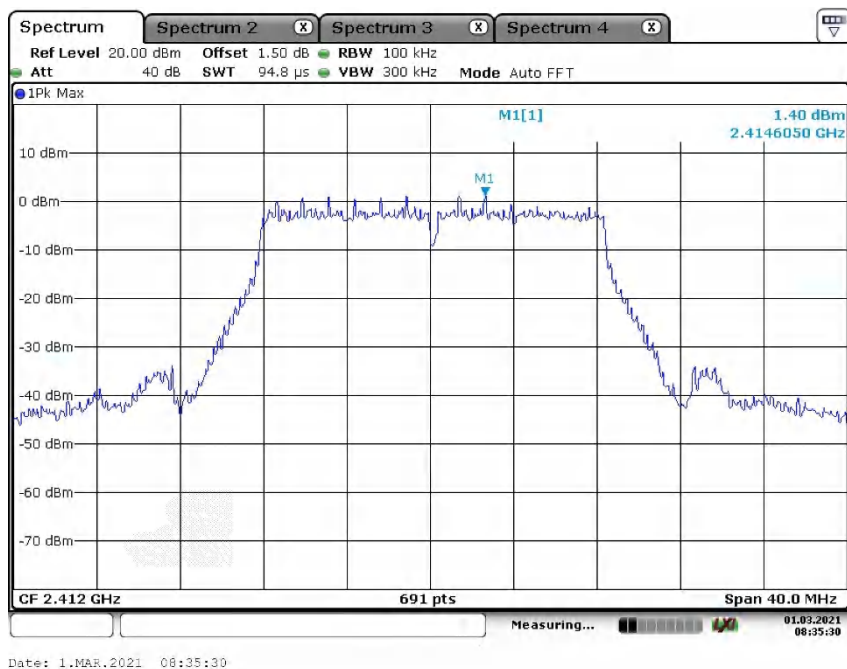


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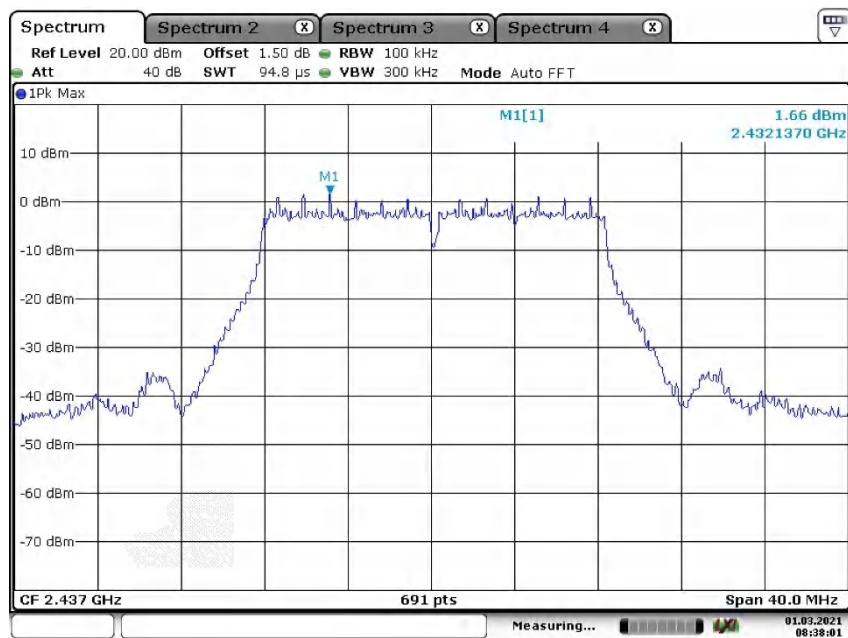


Date: 1.MAR.2021 08:29:21

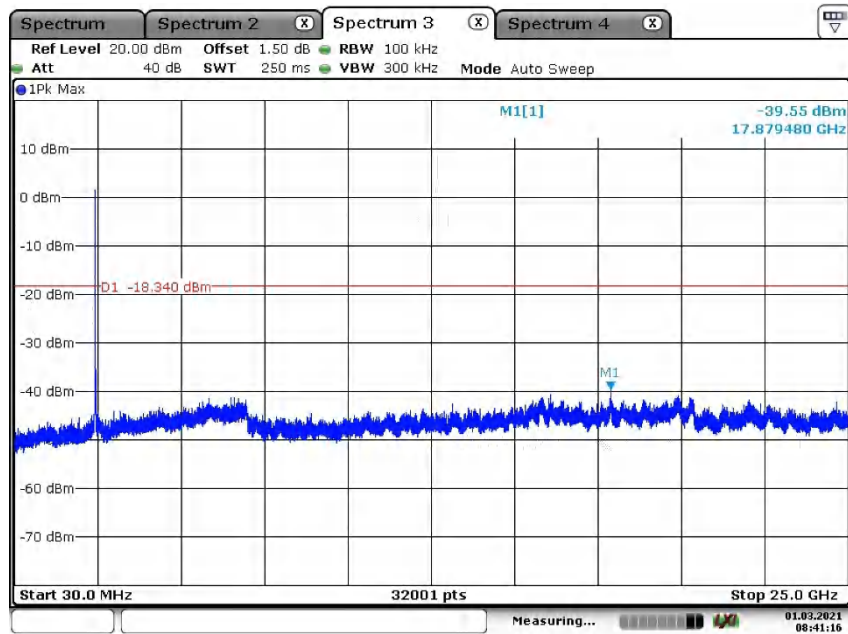
Wi-Fi 802.11 g mode, 6 Mbps
Low Channel



Middle Channel

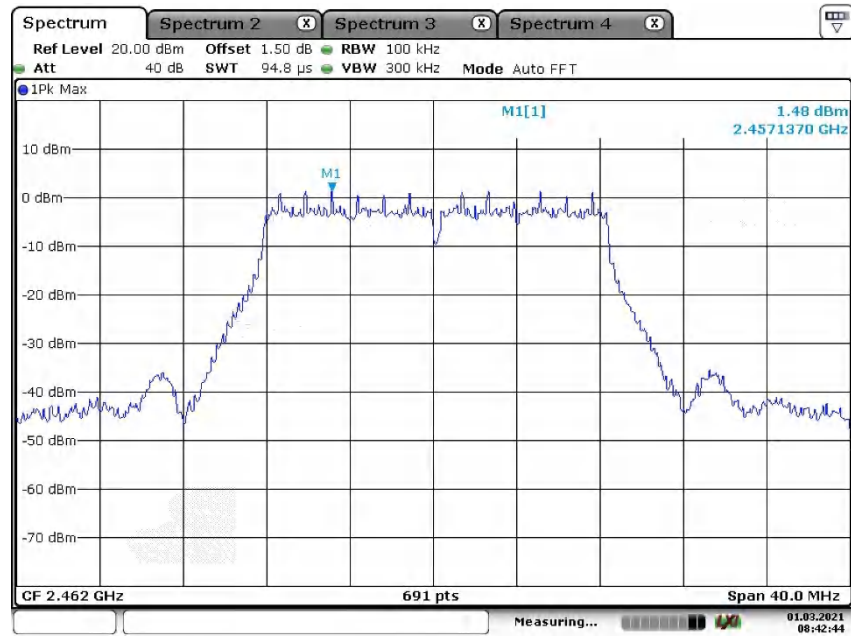


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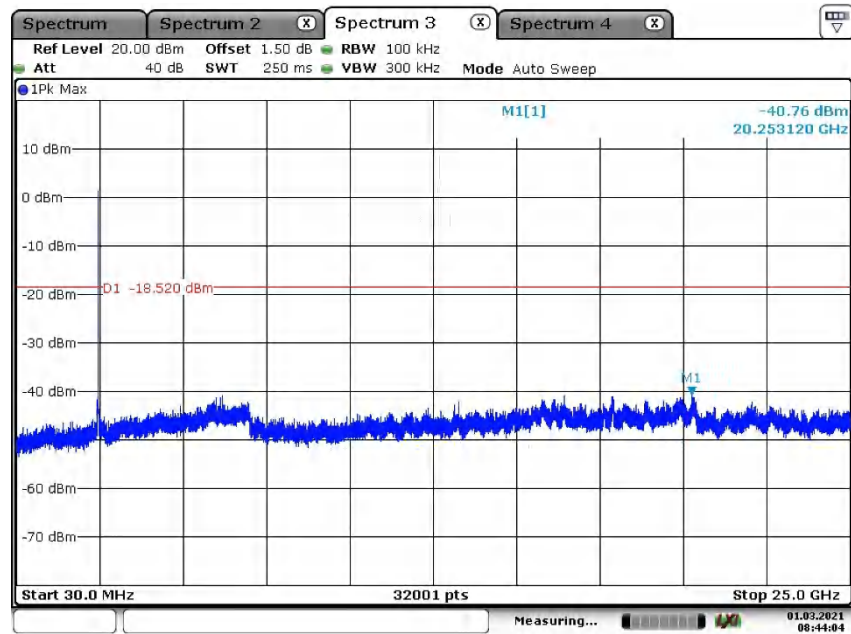


Date: 1.MAR.2021 08:41:16

High Channel

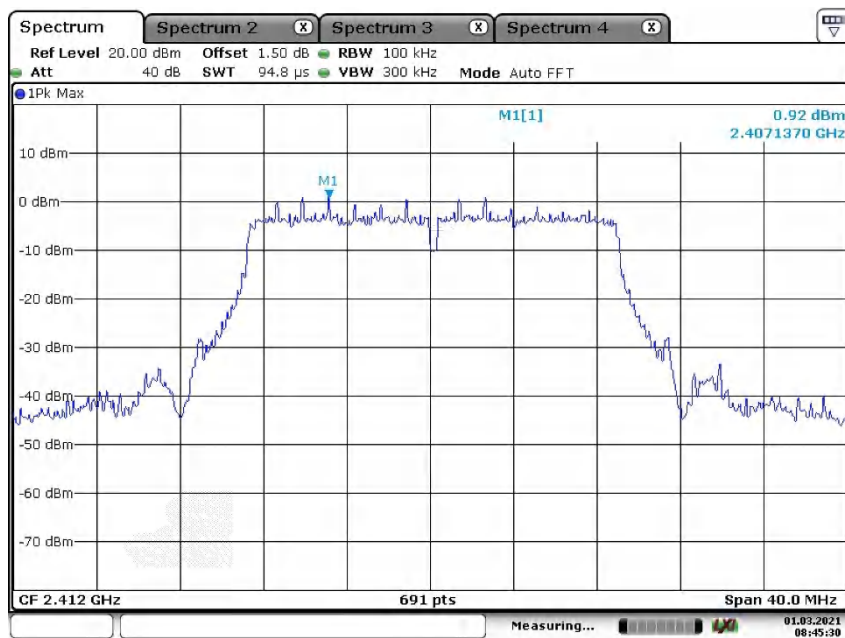


Date: 1.MAR.2021 08:42:44

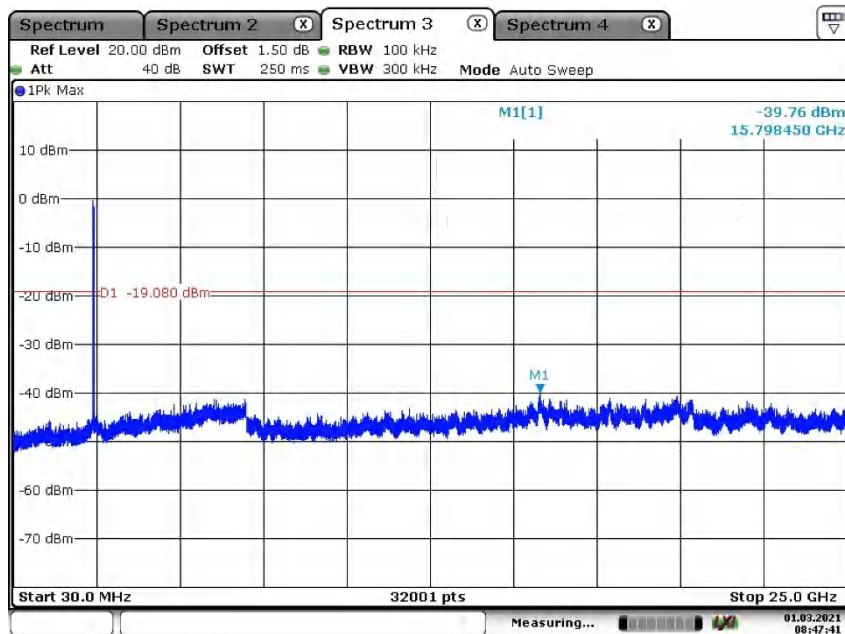


Date: 1.MAR.2021 08:44:04

Wi-Fi 802.11 n(HT20) mode, MCS0
Low Channel

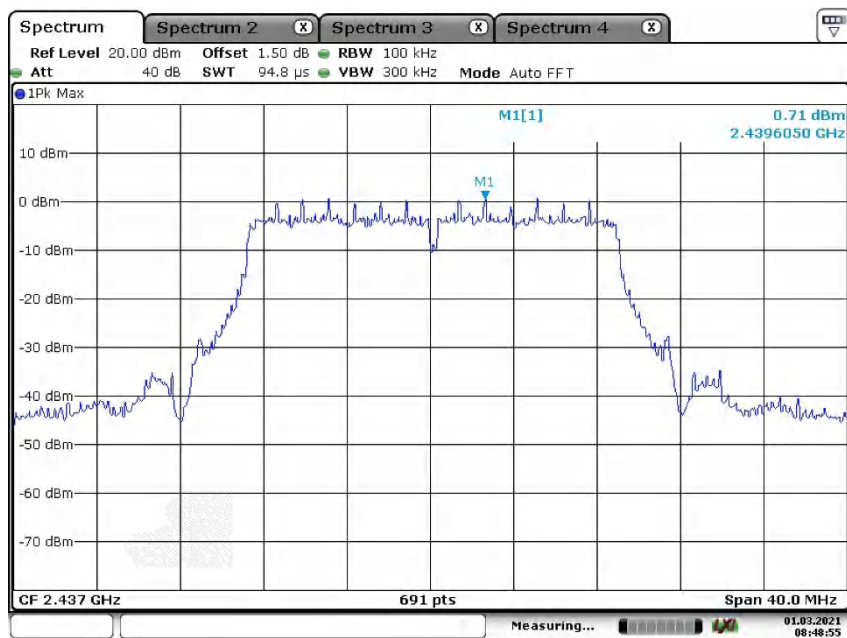


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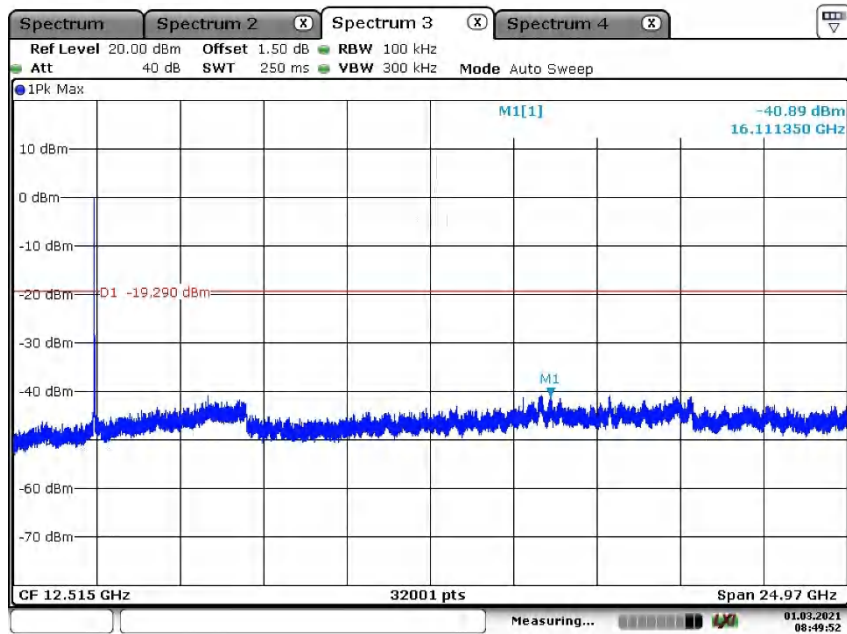


Date: 1.MAR.2021 08:47:41

Middle Channel

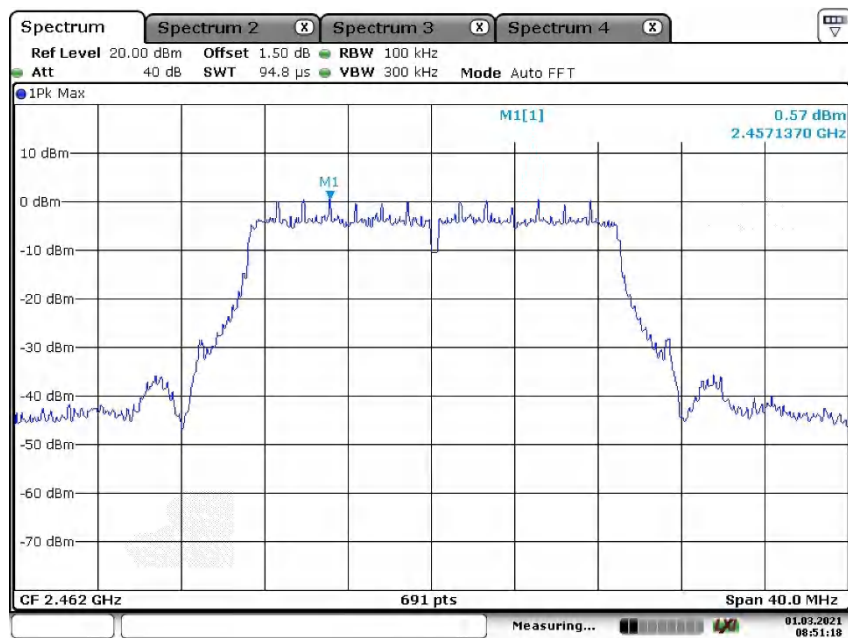


Date: 1.MAR.2021 08:48:55

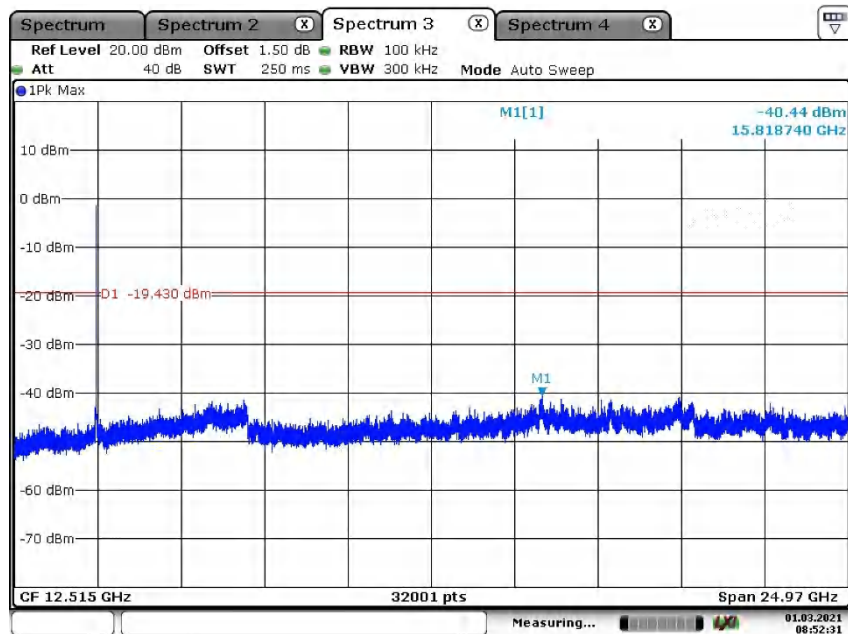


Date: 1.MAR.2021 08:49:52

High Channel

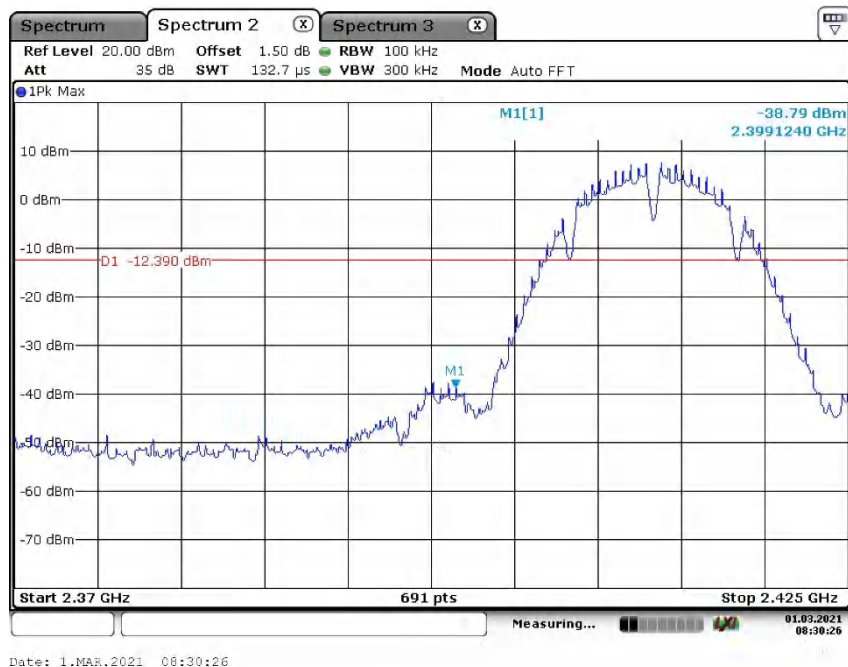


Date: 1.MAR.2021 08:51:18



Date: 1.MAR.2021 08:52:31

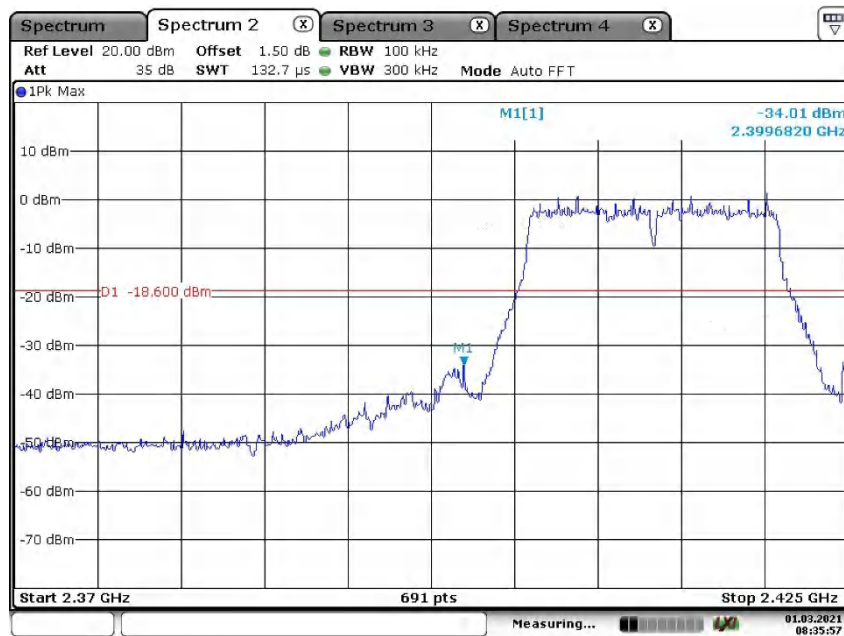
Wi-Fi 802.11 b mode, Band Edge
Low Channel



High Channel

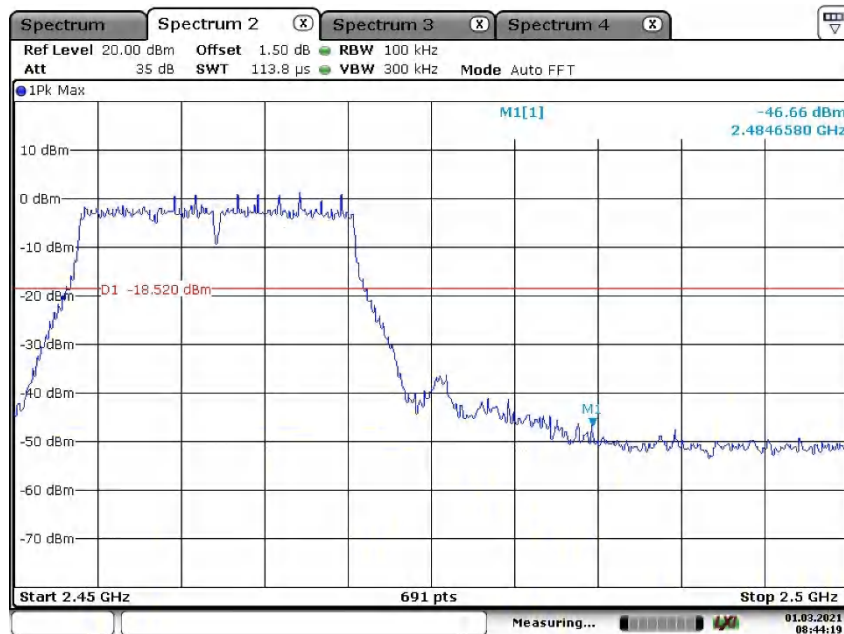


Wi-Fi 802.11 g mode, Band Edge Low Channel



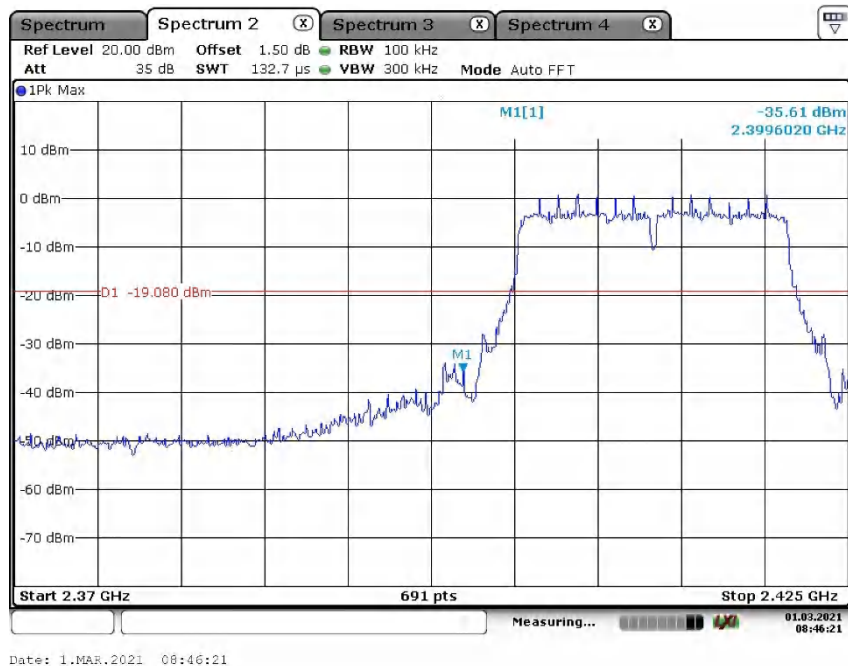
Date: 1.MAR.2021 08:35:57

High Channel

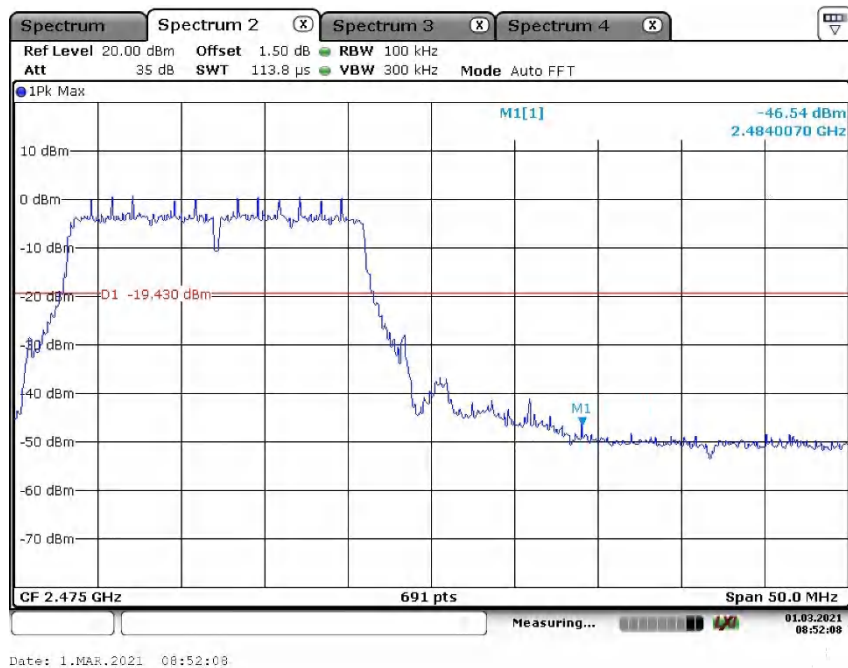


Date: 1.MAR.2021 08:44:19

Wi-Fi 802.11 n(HT20) mode, Band Edge
Low Channel



High Channel



Appendix C: Test Results of Radiated Testing and Conduced Emissions on AC mains

APPENDIX C: TEST RESULTS OF RADIATED TESTING AND CONDUCTED EMISSIONS ON AC MAINS	1
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Note 1: Testing was carried out within frequency range 9 kHz to the tenth harmonics. The measurement results below 30MHz and above 18GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 18GHz were reported.

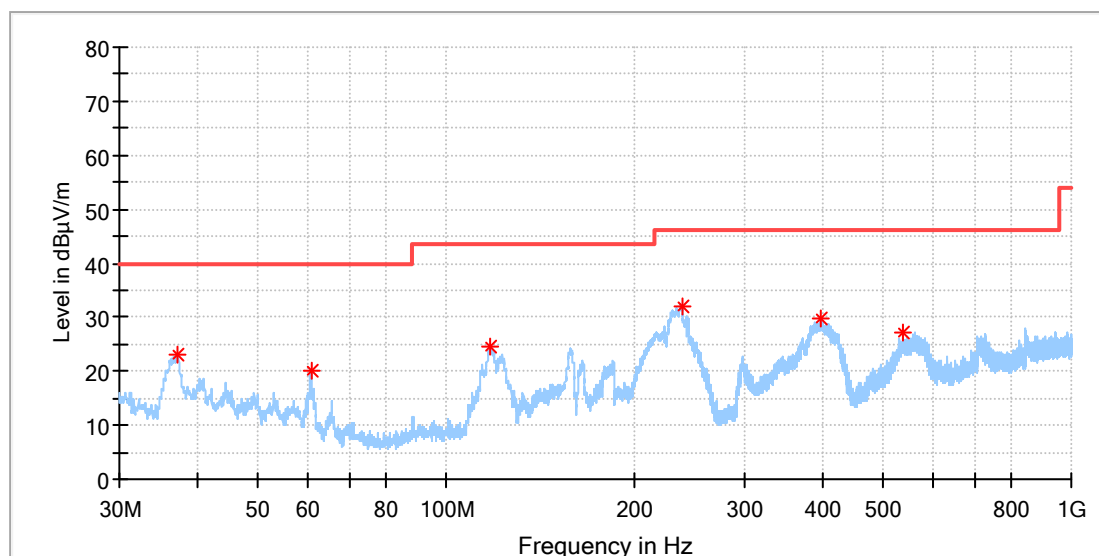
Appendix C.1: Test Results of Radiated Spurious Emissions

Wi-Fi 802.11 b mode, 1 Mbps

30MHz - 1GHz

EUT Information

EUT Name:	SmartBar Plug
Model:	VP5X
Test Mode:	WiFi 2.4G_High channel
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

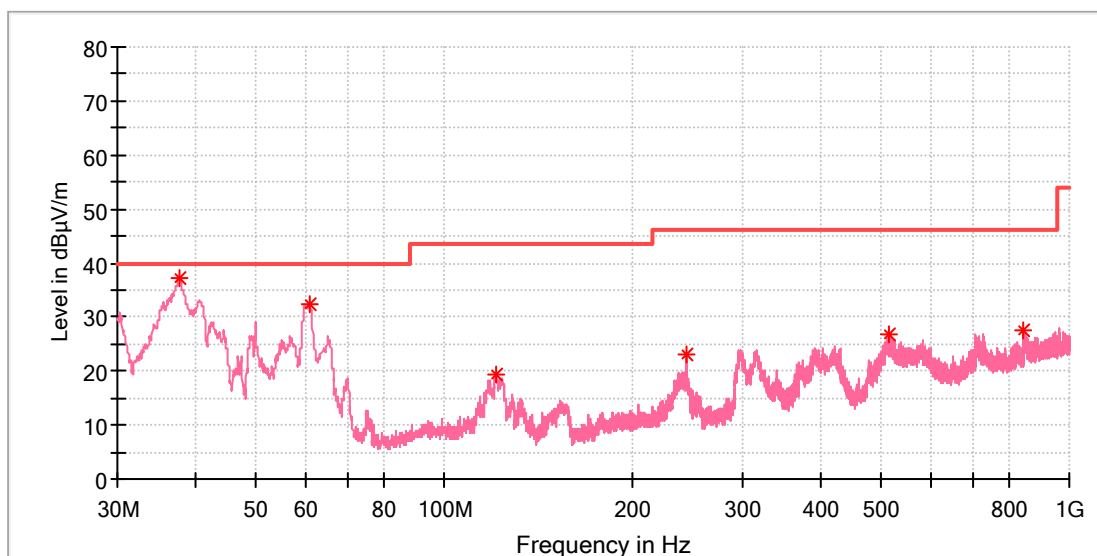


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
37.178000	23.07	40.00	16.93	100.0	H	174.0	-21.4
60.749000	20.09	40.00	19.91	100.0	H	354.0	-19.5
117.930500	24.54	43.50	18.96	100.0	H	346.0	-20.7
238.453000	31.83	46.00	14.17	100.0	H	137.0	-18.1
398.066500	29.86	46.00	16.14	100.0	H	315.0	-14.2
537.164500	27.17	46.00	18.83	100.0	H	174.0	-11.5

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_High channel
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:48%
Test Standard: FCC 15.247
Tested By: Alano Qu
Reviewed By: Terry Yin

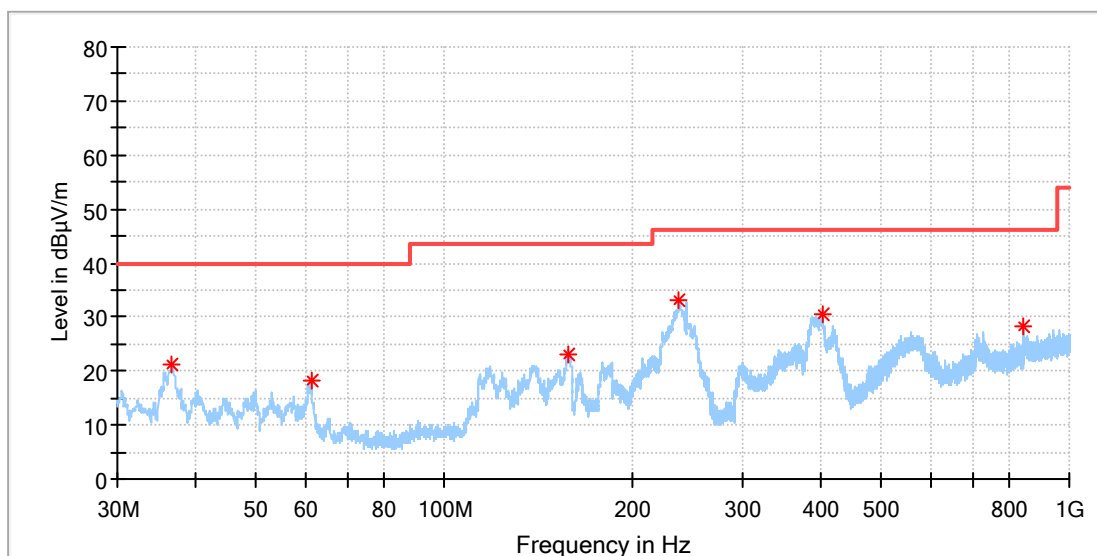


Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
37.663000	36.85	40.00	3.15	100.0	V	138.0	-21.2
61.040000	32.31	40.00	7.69	100.0	V	107.0	-19.5
121.180000	19.19	43.50	24.31	100.0	V	256.0	-21.2
243.400000	23.00	46.00	23.00	100.0	V	147.0	-17.9
514.321000	26.89	46.00	19.11	100.0	V	138.0	-12.0
844.994000	27.67	46.00	18.33	100.0	V	156.0	-6.0

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G Low channel
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

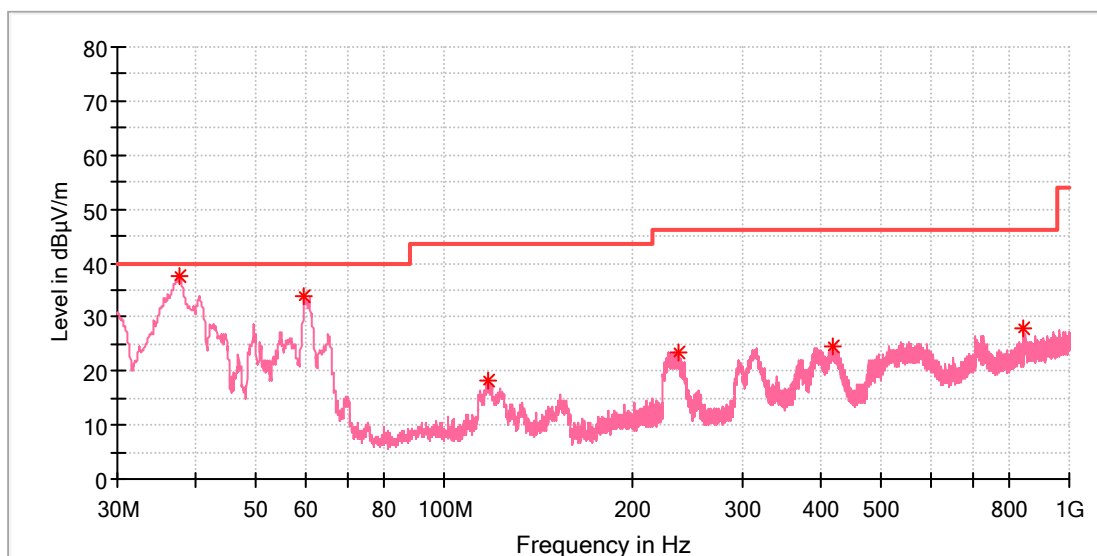


Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
36.693000	21.32	40.00	18.68	100.0	H	311.0	-21.6
61.185500	18.07	40.00	21.93	100.0	H	235.0	-19.6
157.555000	23.14	43.50	20.36	100.0	H	164.0	-22.1
237.774000	33.26	46.00	12.74	100.0	H	256.0	-18.1
402.771000	30.43	46.00	15.57	100.0	H	0.0	-14.1
844.848500	28.18	46.00	17.82	100.0	H	224.0	-6.0

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G Low channel
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:48%
Test Standard: FCC 15.247
Tested By: Alano Qu
Reviewed By: Terry Yin



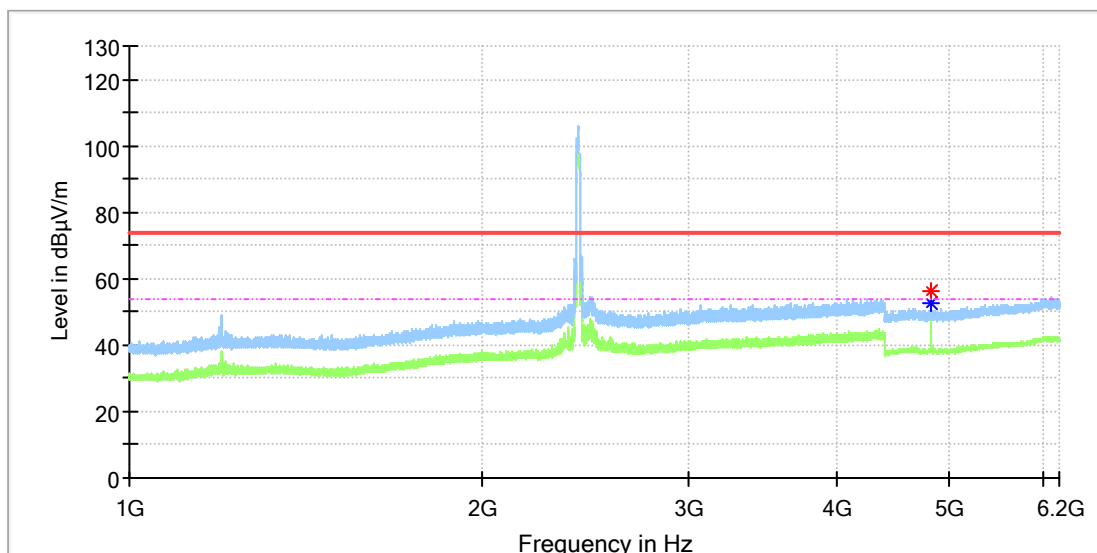
Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
37.760000	36.90	40.00	3.10	100.0	V	57.0	-21.1
59.779000	33.68	40.00	6.32	100.0	V	340.0	-19.3
117.882000	18.09	43.50	25.41	100.0	V	172.0	-20.6
237.143500	23.57	46.00	22.43	100.0	V	340.0	-18.1
420.037000	24.41	46.00	21.59	100.0	V	6.0	-13.7
844.848500	27.92	46.00	18.08	100.0	V	349.0	-6.0

1GHz - 6.2GHz

EUT Information

EUT Name:	SmartBar Plug
Model:	VP5X
Test Mode:	WiFi 2.4G_11b_Ch1
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

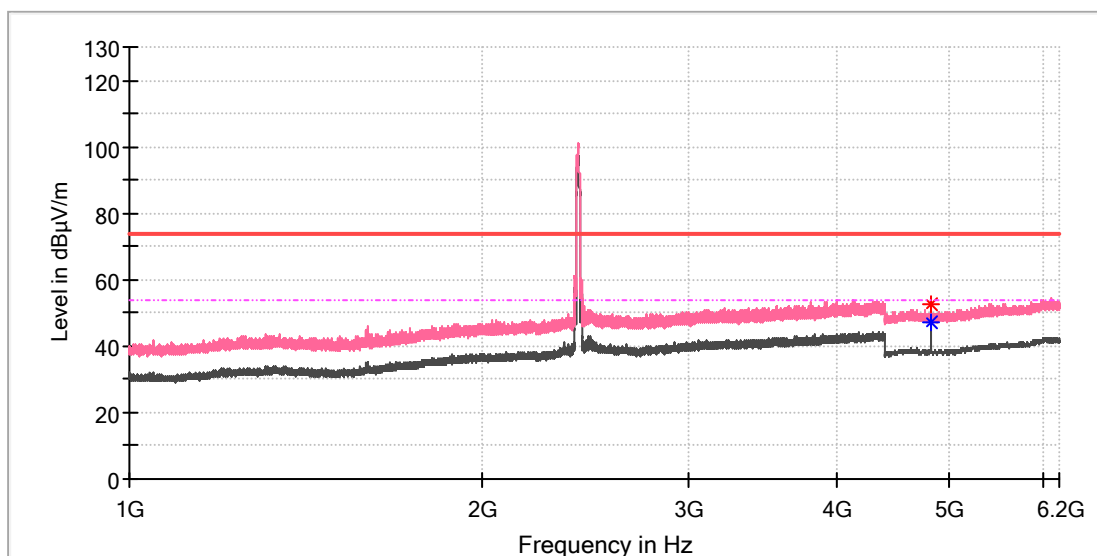


Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4824.000000	56.20	---	74.00	17.80	100.0	H	47.0	11.8
4824.000000	---	52.43	54.00	1.57	100.0	H	47.0	11.8

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11b_Ch1
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

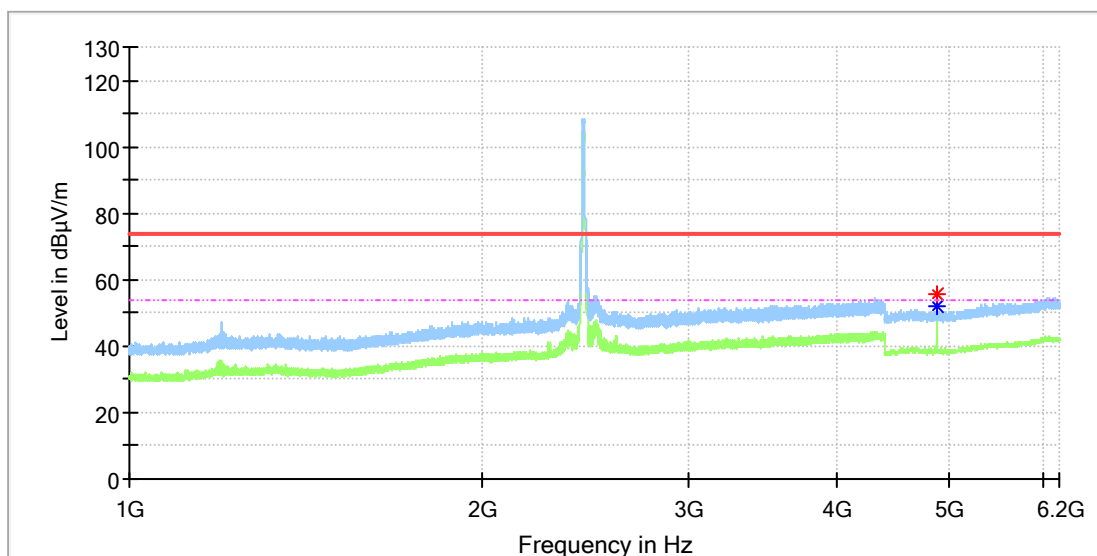


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4823.500000	52.64	---	74.00	21.36	100.0	V	355.0	11.8
4824.000000	---	47.17	54.00	6.83	100.0	V	42.0	11.8

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11b_Ch6
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

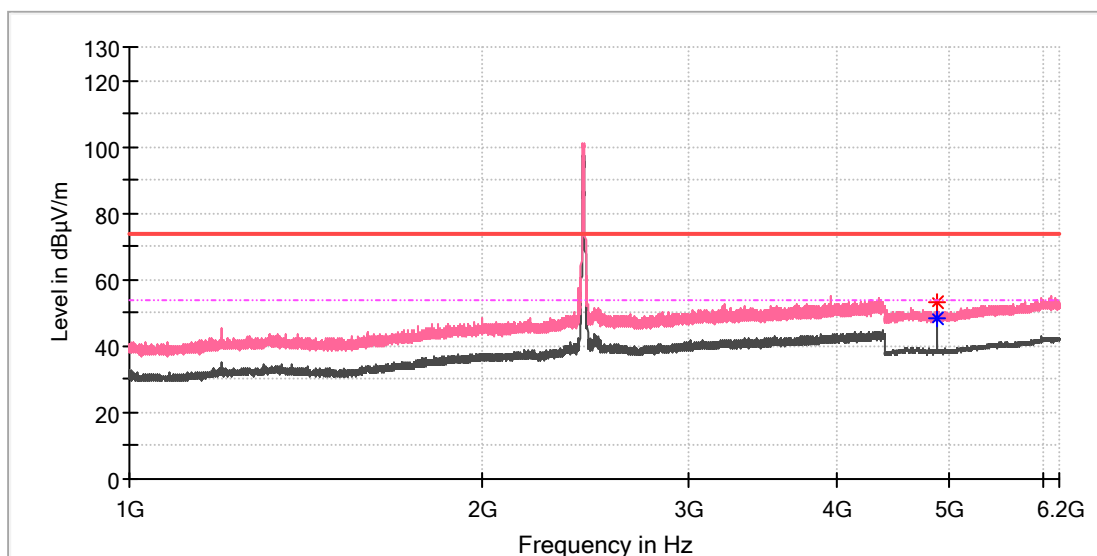


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4874.000000	55.58	---	74.00	18.42	100.0	H	283.0	11.8
4874.000000	---	51.93	54.00	2.07	100.0	H	283.0	11.8

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11b_Ch6
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

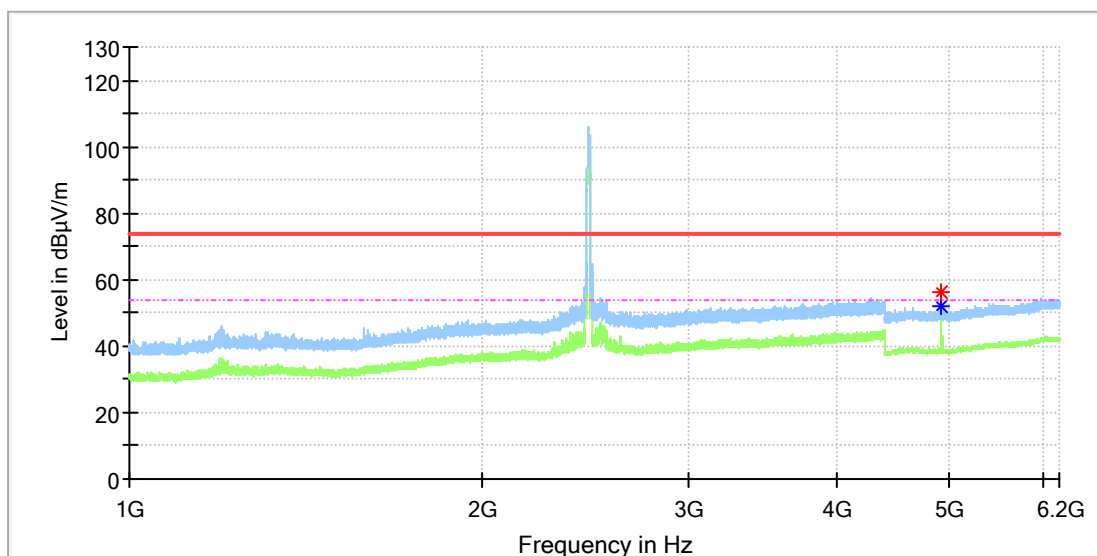


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4874.000000	52.97	---	74.00	21.03	100.0	V	43.0	11.8
4874.000000	---	48.08	54.00	5.92	100.0	V	43.0	11.8

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11b_Ch11
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

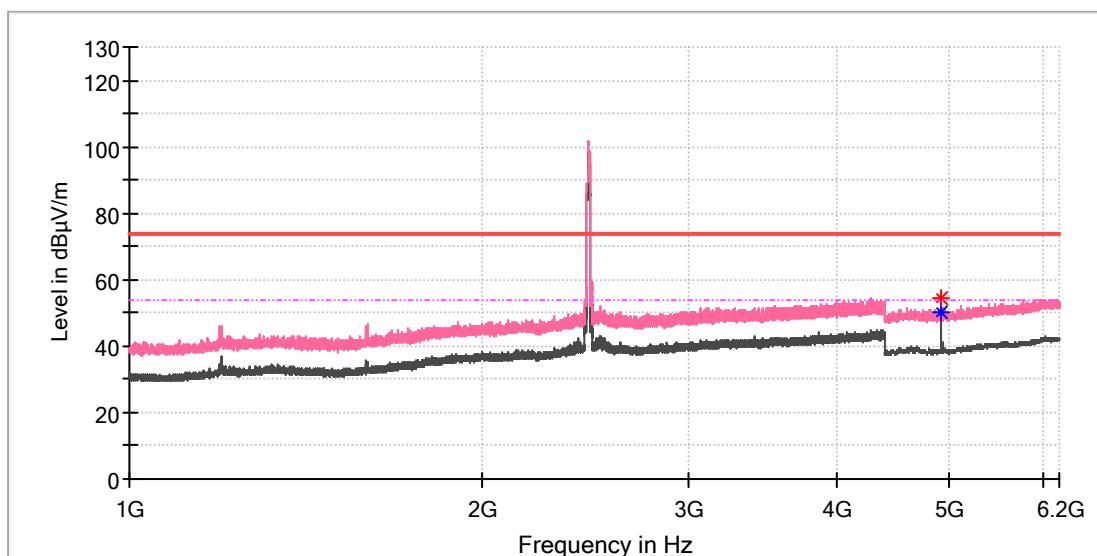


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4924.000000	55.95	---	74.00	18.05	100.0	H	233.0	11.8
4924.000000	---	52.24	54.00	1.76	100.0	H	233.0	11.8

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11b_Ch11
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



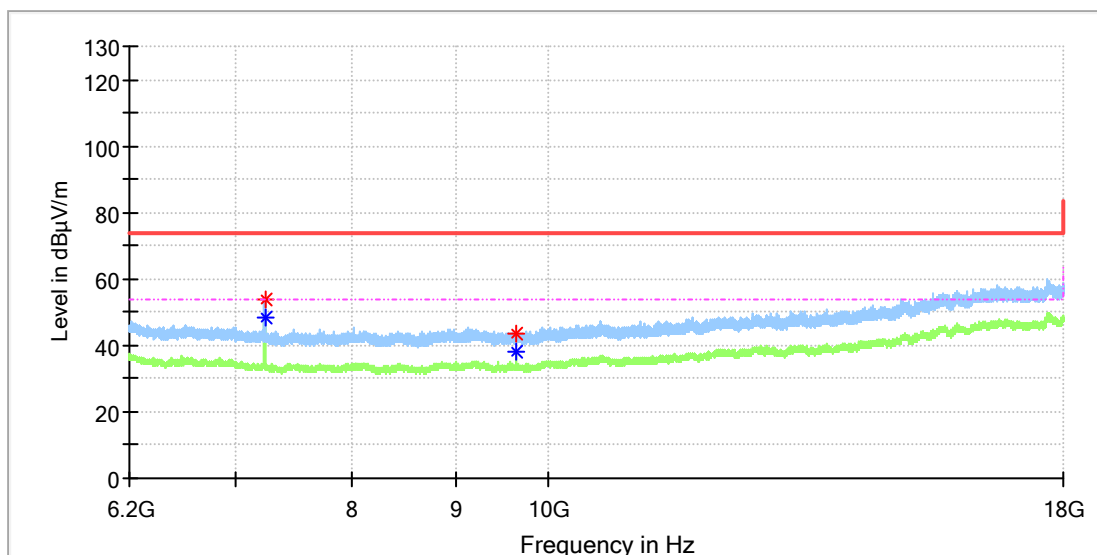
Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4924.000000	54.24	---	74.00	19.76	100.0	V	36.0	11.8
4924.000000	---	50.04	54.00	3.96	100.0	V	36.0	11.8

6.2GHz - 18GHz

EUT Information

EUT Name:	SmartBar Plug
Model:	VP5X
Test Mode:	WiFi 2.4G_11b_Ch1
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

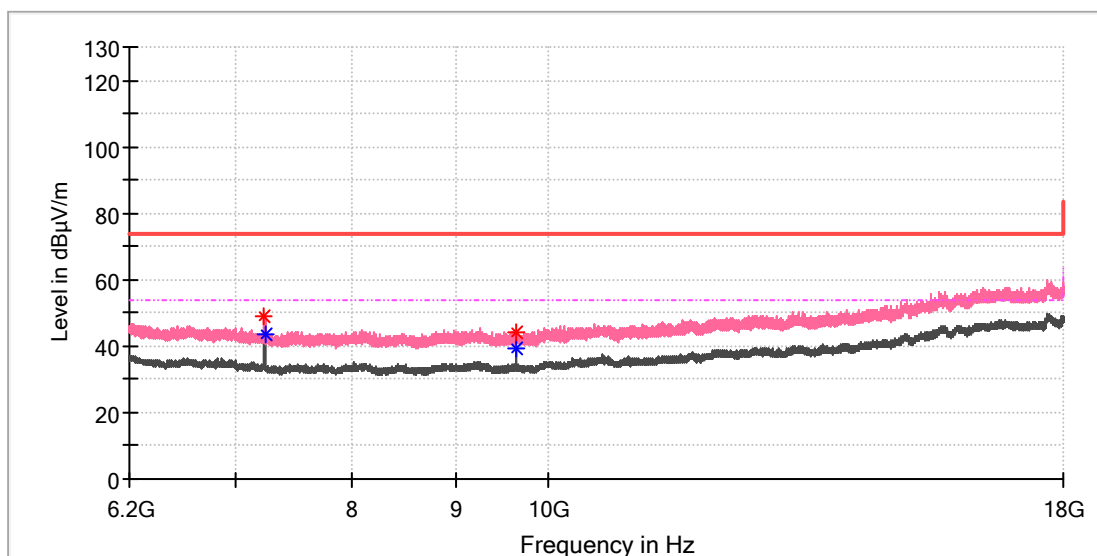


Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7237.908333	53.87	---	74.00	20.13	100.0	H	138.0	8.6
7237.908333	---	48.32	54.00	5.68	100.0	H	138.0	8.6
9648.058333	43.75	---	74.00	30.25	100.0	H	138.0	10.4
9648.550000	---	38.30	54.00	15.70	100.0	H	138.0	10.4

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11b_Ch1
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

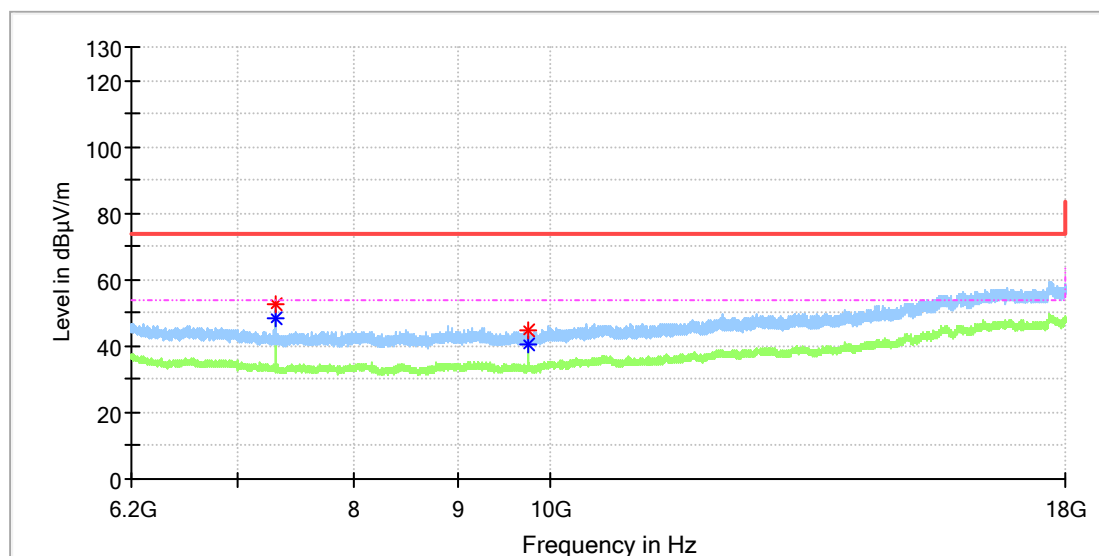


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7234.466667	49.05	---	74.00	24.95	100.0	V	152.0	8.6
7236.925000	---	43.29	54.00	10.71	100.0	V	152.0	8.6
9648.058333	44.41	---	74.00	29.59	100.0	V	0.0	10.4
9648.550000	---	39.26	54.00	14.74	100.0	V	296.0	10.4

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11b_Ch6
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

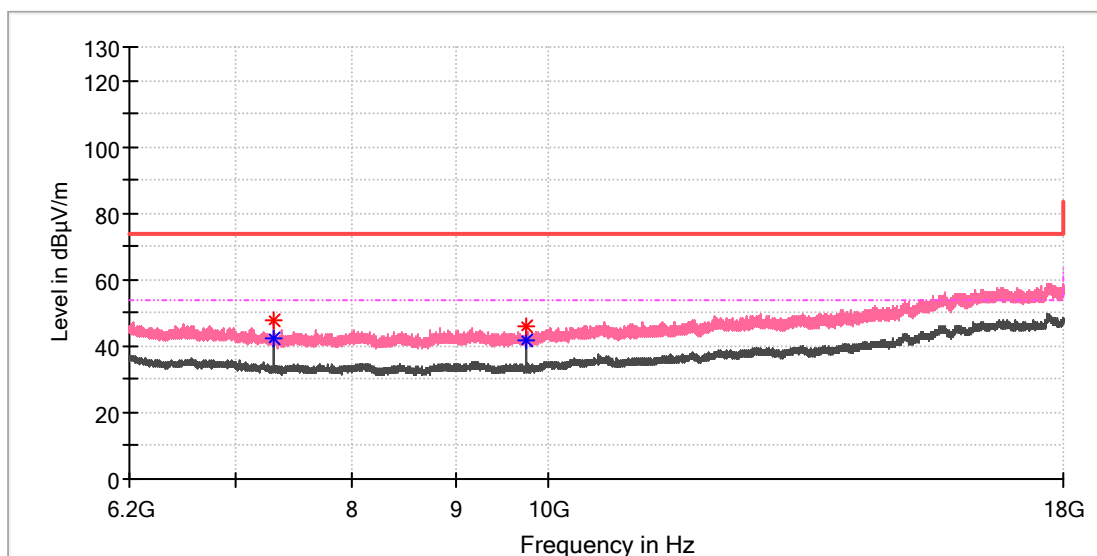


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7311.166667	52.87	---	74.00	21.13	100.0	H	145.0	8.2
7312.150000	---	48.13	54.00	5.87	100.0	H	145.0	8.2
9748.358333	44.92	---	74.00	29.08	100.0	H	145.0	10.4
9748.358333	---	40.49	54.00	13.51	100.0	H	145.0	10.4

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11b_Ch6
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

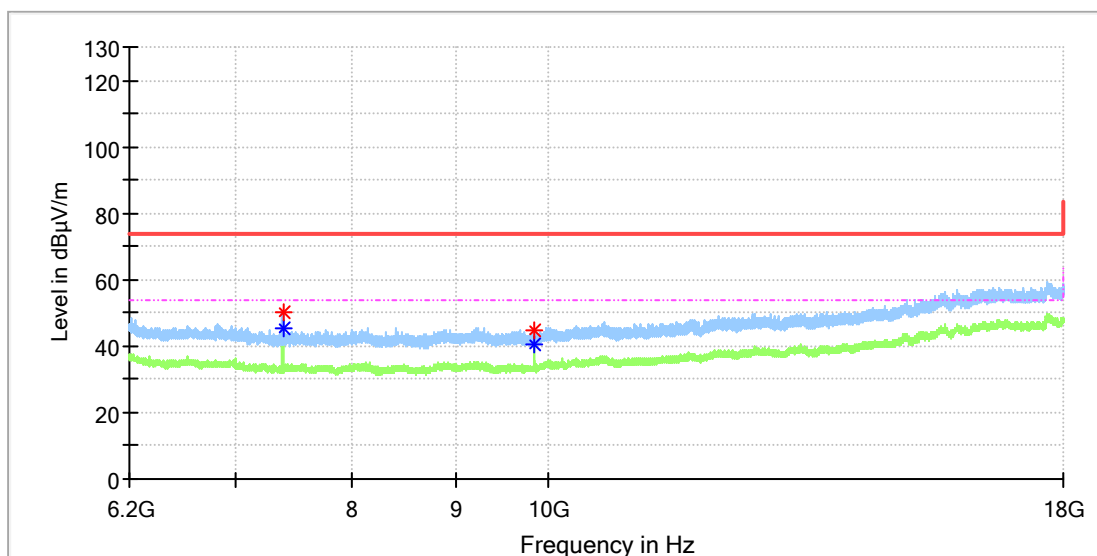


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7312.150000	47.58	---	74.00	26.42	100.0	V	298.0	8.2
7312.150000	---	42.34	54.00	11.66	100.0	V	298.0	8.2
9748.358333	45.69	---	74.00	28.31	100.0	V	283.0	10.4
9748.358333	---	41.55	54.00	12.45	100.0	V	283.0	10.4

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11b_Ch11
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

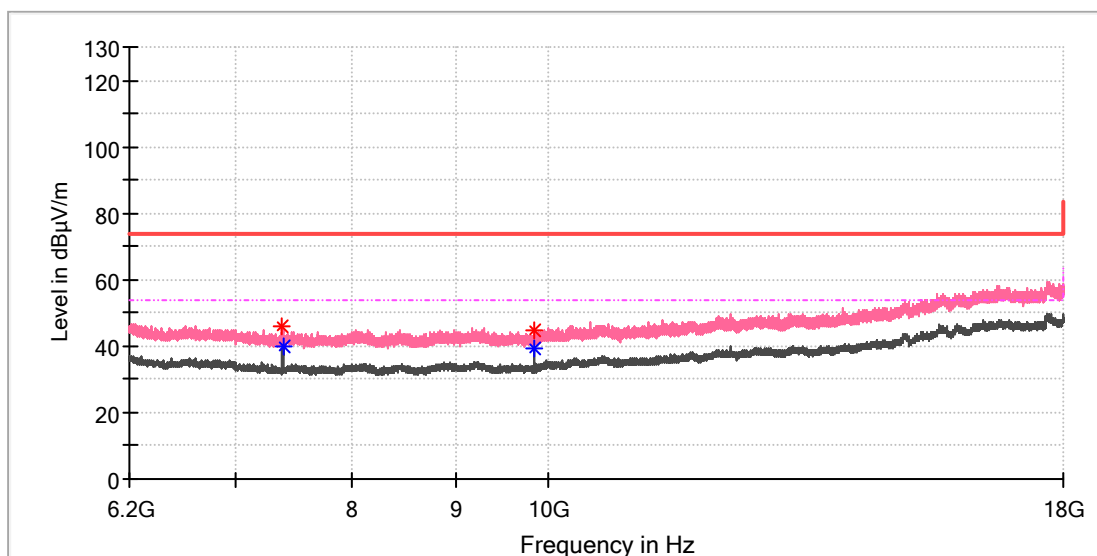


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7387.375000	---	45.31	54.00	8.69	100.0	H	149.0	8.2
7387.866667	50.30	---	74.00	23.70	100.0	H	149.0	8.2
9848.166667	44.85	---	74.00	29.15	100.0	H	149.0	10.6
9848.166667	---	40.31	54.00	13.69	100.0	H	149.0	10.6

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11b_Ch11
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



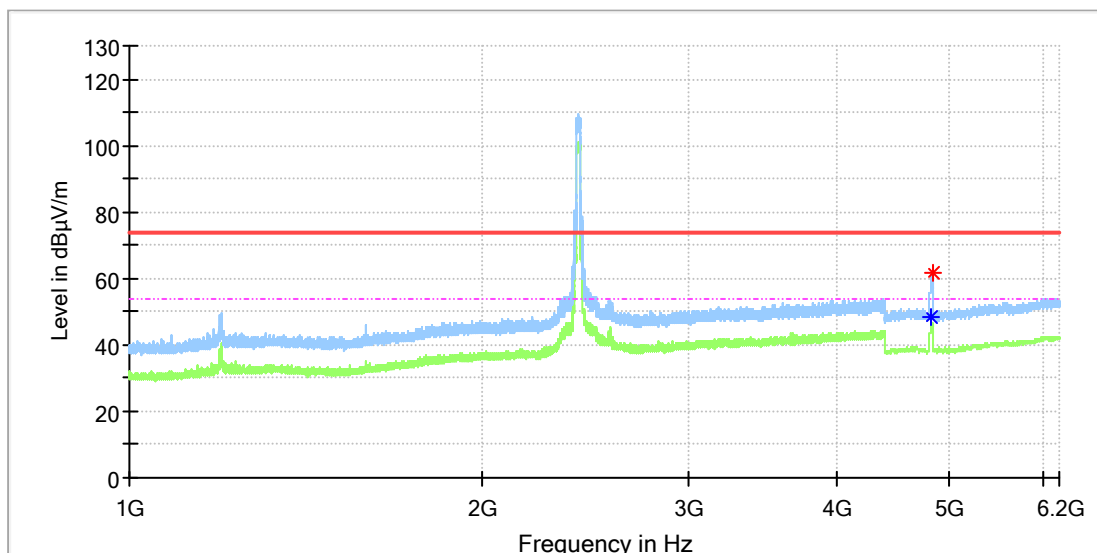
Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7384.916667	46.01	---	74.00	27.99	100.0	V	348.0	8.2
7387.375000	---	39.69	54.00	14.31	100.0	V	348.0	8.2
9848.166667	44.97	---	74.00	29.03	100.0	V	281.0	10.6
9848.658333	---	39.10	54.00	14.90	100.0	V	266.0	10.6

Wi-Fi 802.11 g mode, 6Mbps
1GHz - 6.2GHz

EUT Information

EUT Name:	SmartBar Plug
Model:	VP5X
Test Mode:	WiFi 2.4G_11g_Ch1
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

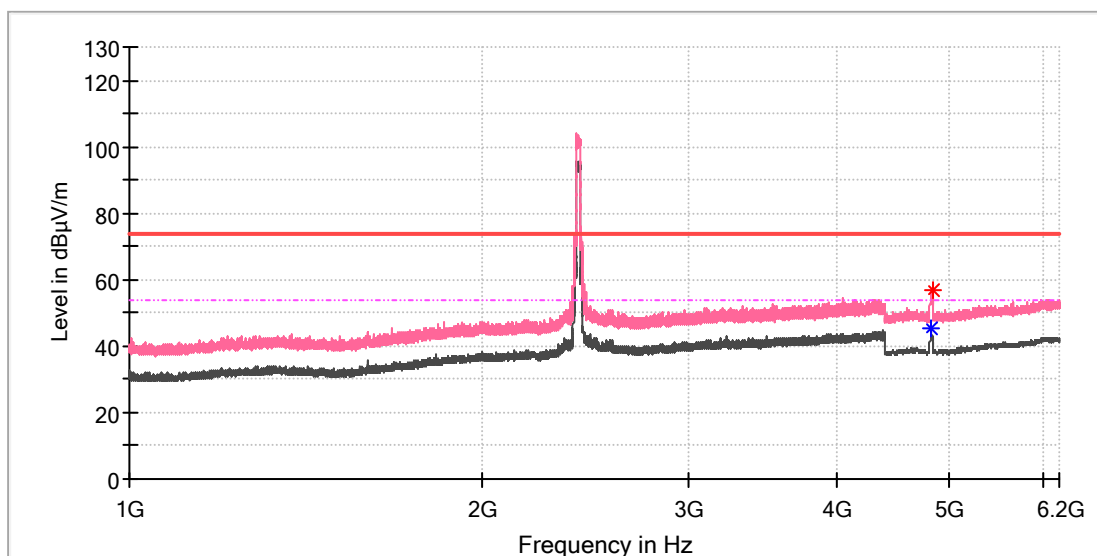


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4824.000000	---	48.51	54.00	5.49	100.0	H	38.0	11.8
4831.000000	61.47	---	74.00	12.53	100.0	H	38.0	11.8

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11g_Ch1
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

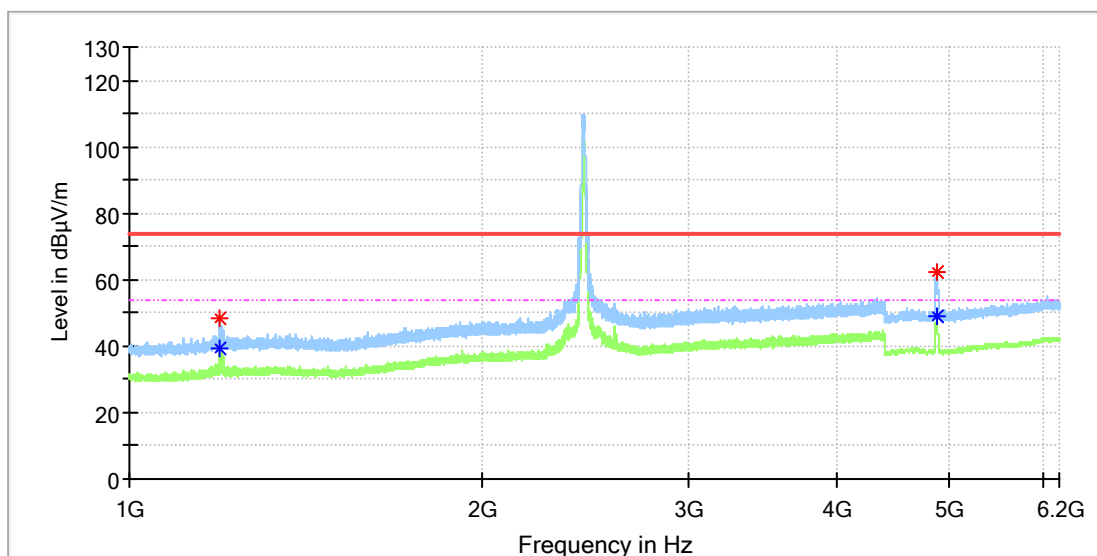


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4823.500000	---	45.36	54.00	8.64	100.0	V	36.0	11.8
4832.500000	56.65	---	74.00	17.35	100.0	V	36.0	11.8

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11g_Ch6
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

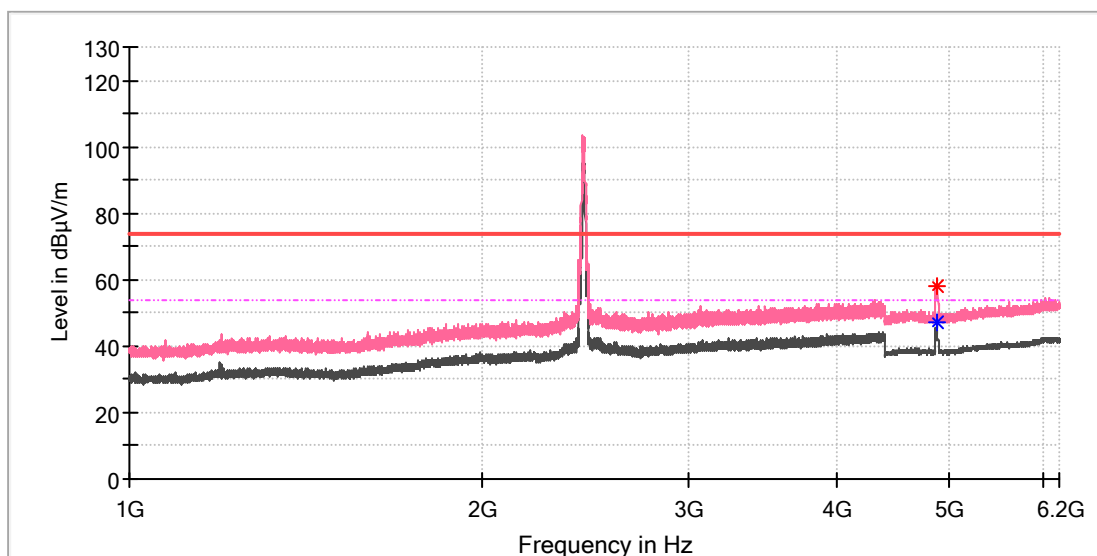


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1195.500000	48.34	---	74.00	25.66	100.0	H	50.0	1.1
1195.500000	---	39.52	54.00	14.48	100.0	H	50.0	1.1
4873.500000	62.12	---	74.00	11.88	100.0	H	39.0	11.8
4873.500000	---	49.25	54.00	4.75	100.0	H	39.0	11.8

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11g_Ch6
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

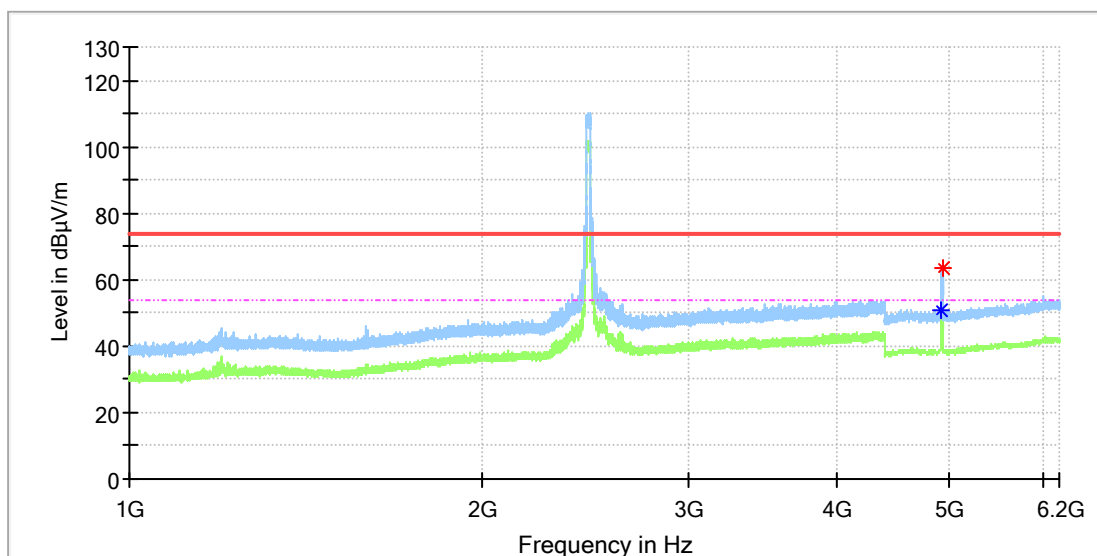


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4871.500000	58.32	---	74.00	15.68	100.0	V	349.0	11.8
4872.000000	---	46.94	54.00	7.06	100.0	V	341.0	11.8

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11g_Ch11
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

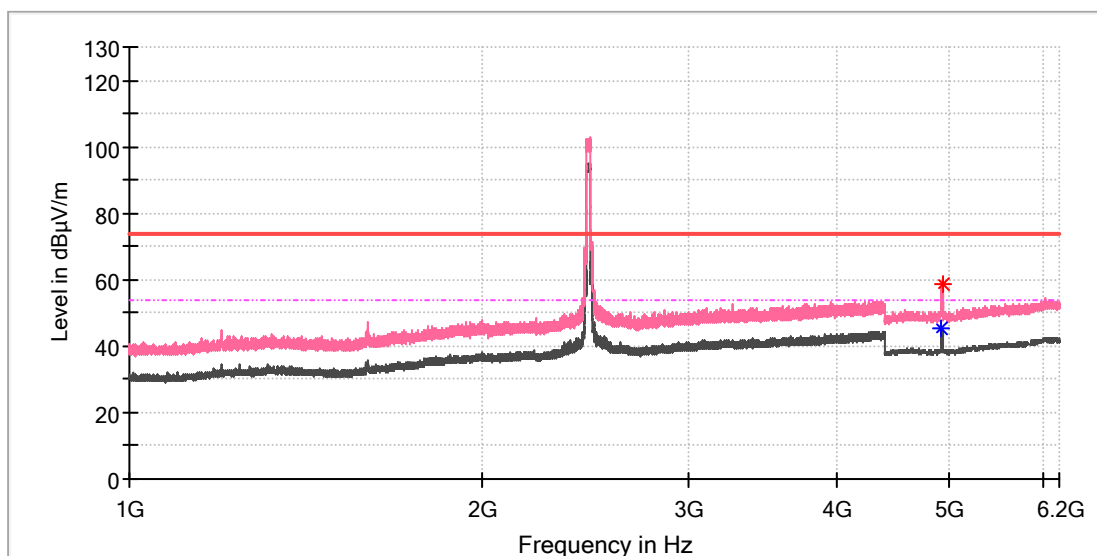


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4924.000000	---	50.60	54.00	3.40	100.0	H	211.0	11.8
4930.500000	63.20	---	74.00	10.80	100.0	H	217.0	11.8

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11g_Ch11
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



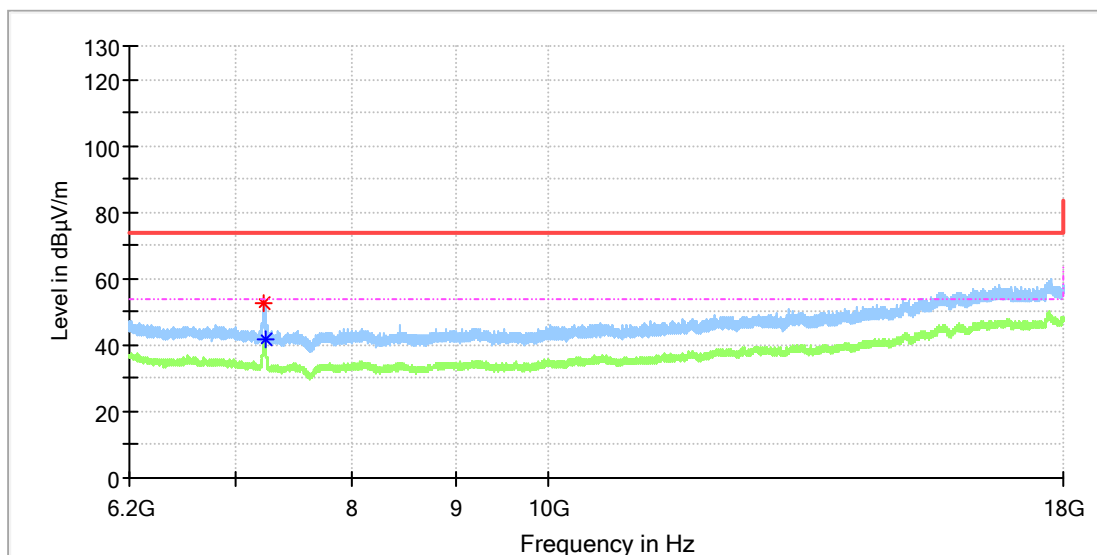
Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4924.000000	---	45.31	54.00	8.69	100.0	V	49.0	11.8
4927.500000	58.46	---	74.00	15.54	100.0	V	21.0	11.8

6.2GHz - 18GHz

EUT Information

EUT Name:	SmartBar Plug
Model:	VP5X
Test Mode:	WiFi 2.4G_11g_Ch1
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

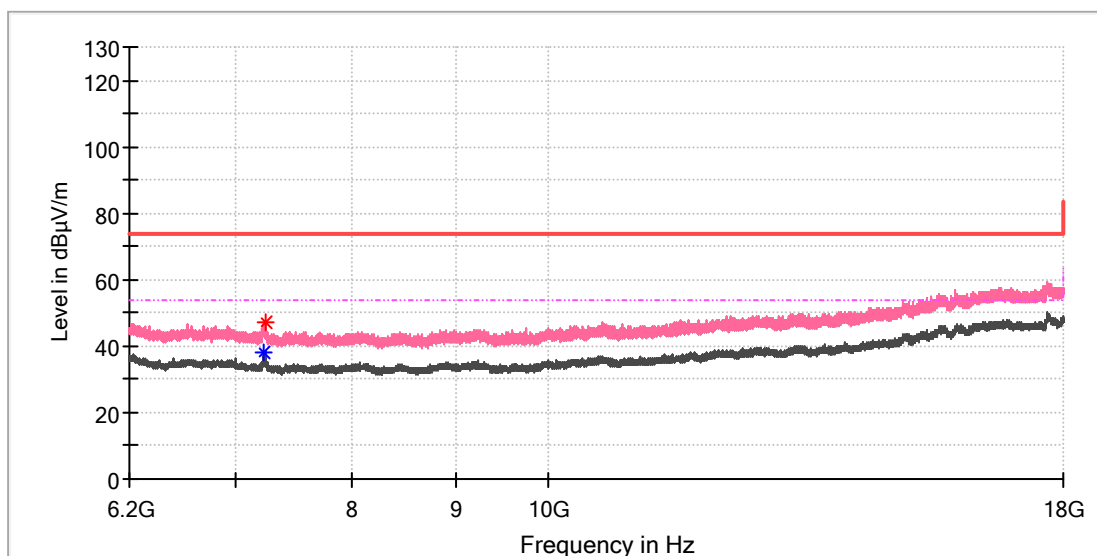


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7234.958333	52.83	---	74.00	21.17	100.0	H	142.0	8.6
7236.925000	---	41.59	54.00	12.41	100.0	H	142.0	8.6

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11g_Ch1
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

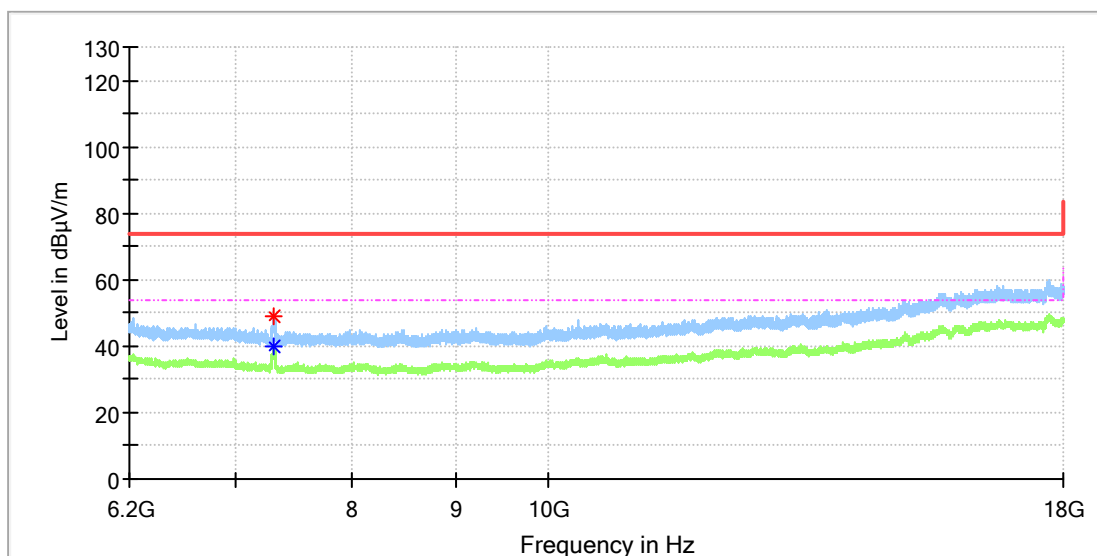


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7233.483333	---	38.17	54.00	15.83	100.0	V	265.0	8.6
7235.450000	47.04	---	74.00	26.96	100.0	V	293.0	8.6

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11g_Ch6
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

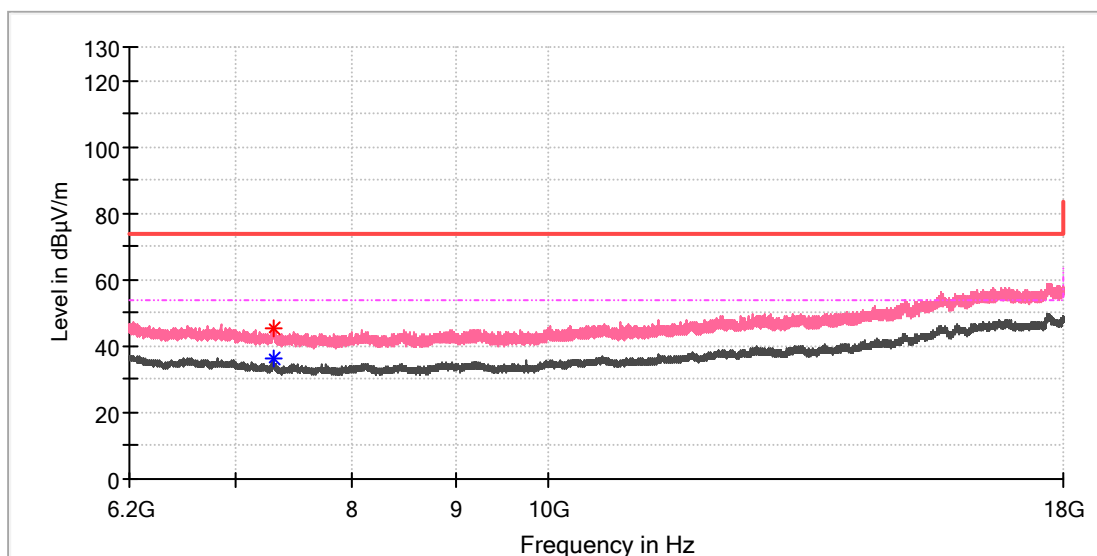


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7309.200000	---	40.03	54.00	13.97	100.0	H	151.0	8.2
7312.150000	49.08	---	74.00	24.92	100.0	H	151.0	8.2

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11g_Ch6
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

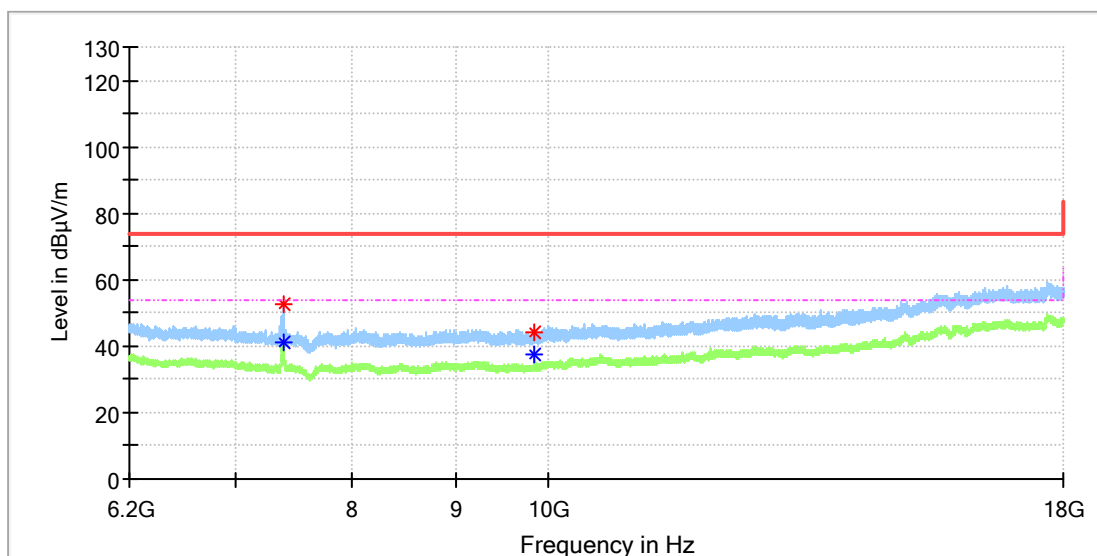


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7312.150000	45.49	---	74.00	28.51	100.0	V	216.0	8.2
7314.608333	---	36.32	54.00	17.68	100.0	V	34.0	8.2

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11g_Ch11
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

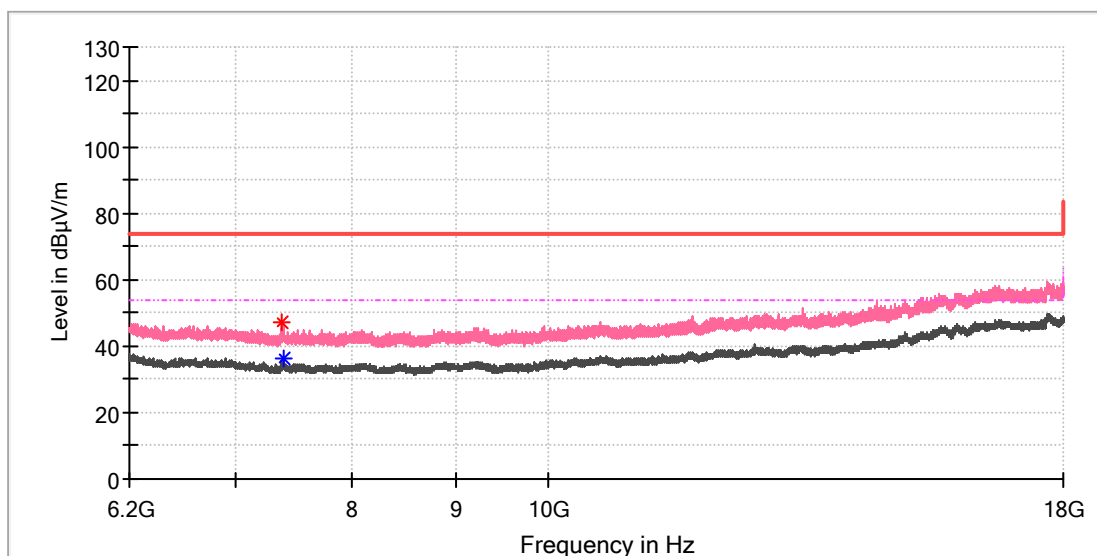


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7387.866667	---	41.14	54.00	12.86	100.0	H	142.0	8.2
7389.833333	52.66	---	74.00	21.34	100.0	H	142.0	8.2
9848.658333	---	37.51	54.00	16.49	100.0	H	142.0	10.6
9850.625000	43.91	---	74.00	30.09	100.0	H	142.0	10.6

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11g_Ch11
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



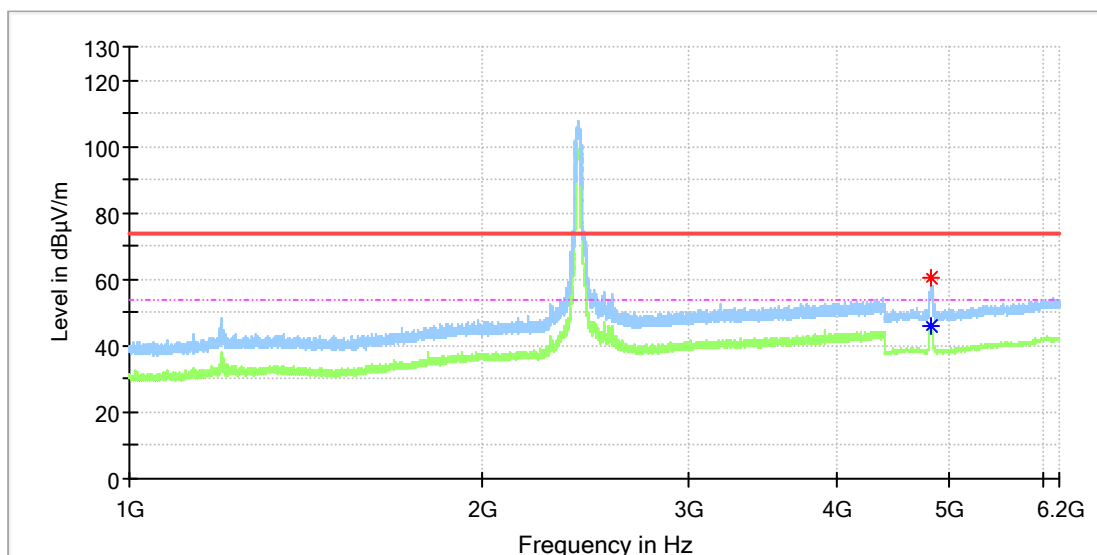
Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7378.525000	47.30	---	74.00	26.70	100.0	V	155.0	8.2
7388.850000	---	36.39	54.00	17.61	100.0	V	155.0	8.2

Wi-Fi 802.11 n(HT20) mode, MCS0
1GHz - 6.2GHz

EUT Information

EUT Name:	SmartBar Plug
Model:	VP5X
Test Mode:	WiFi 2.4G_11n_Ch1
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

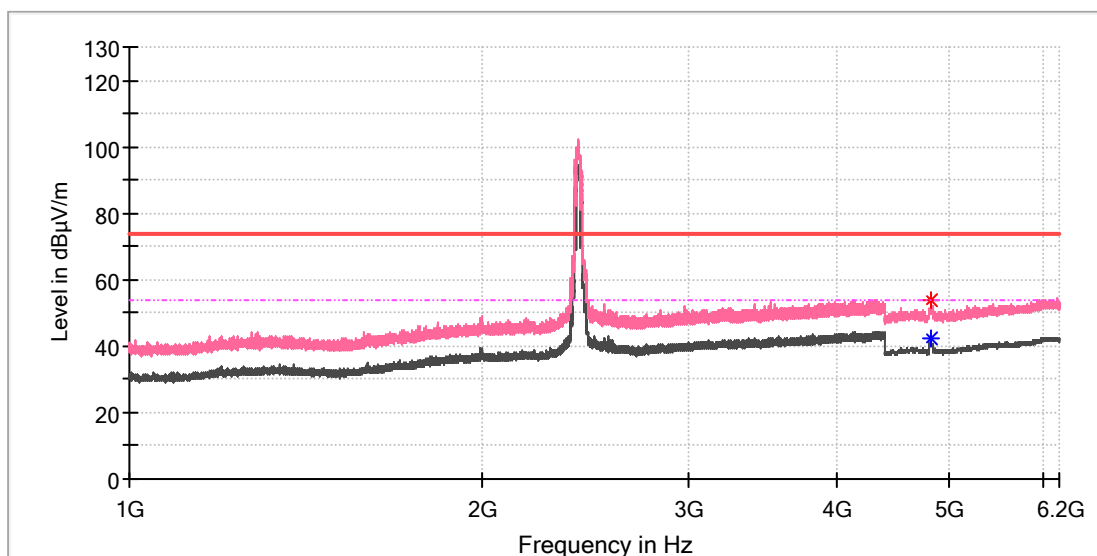


Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4824.000000	---	46.18	54.00	7.82	100.0	H	322.0	11.8
4824.500000	60.36	---	74.00	13.64	100.0	H	309.0	11.8

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11n_Ch1
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

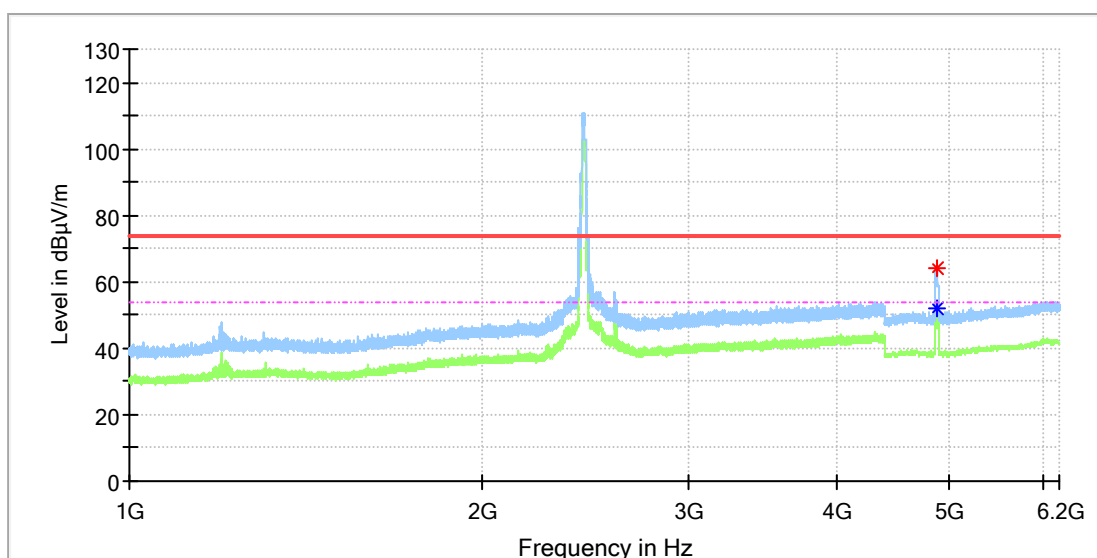


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4824.000000	53.94	---	74.00	20.06	100.0	V	94.0	11.8
4824.500000	---	42.08	54.00	11.92	100.0	V	355.0	11.8

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11n_Ch6
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

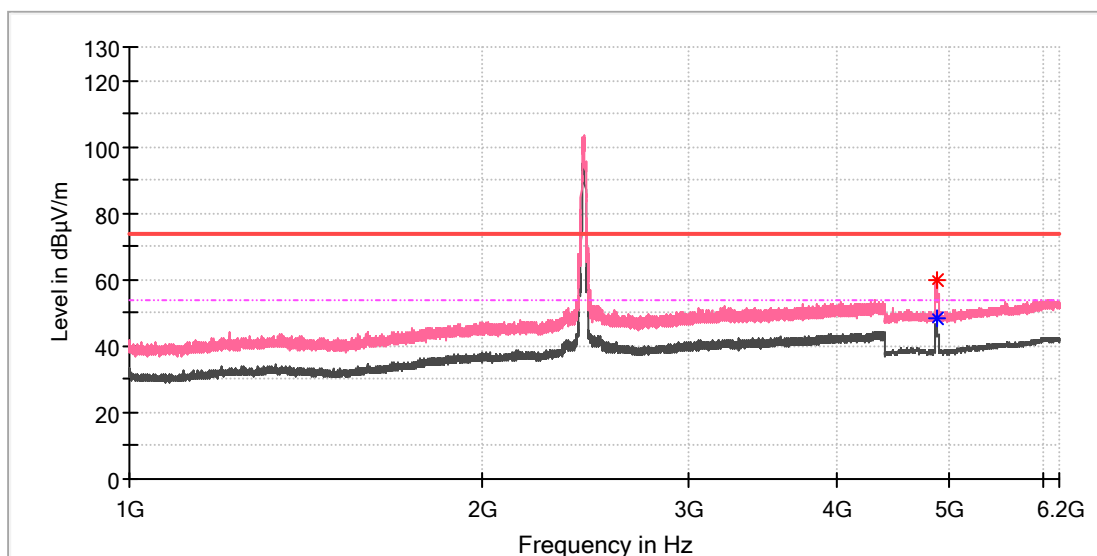


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4873.000000	64.15	---	74.00	9.85	100.0	H	139.0	11.8
4875.000000	---	52.22	54.00	1.78	100.0	H	139.0	11.8

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11n_Ch6
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

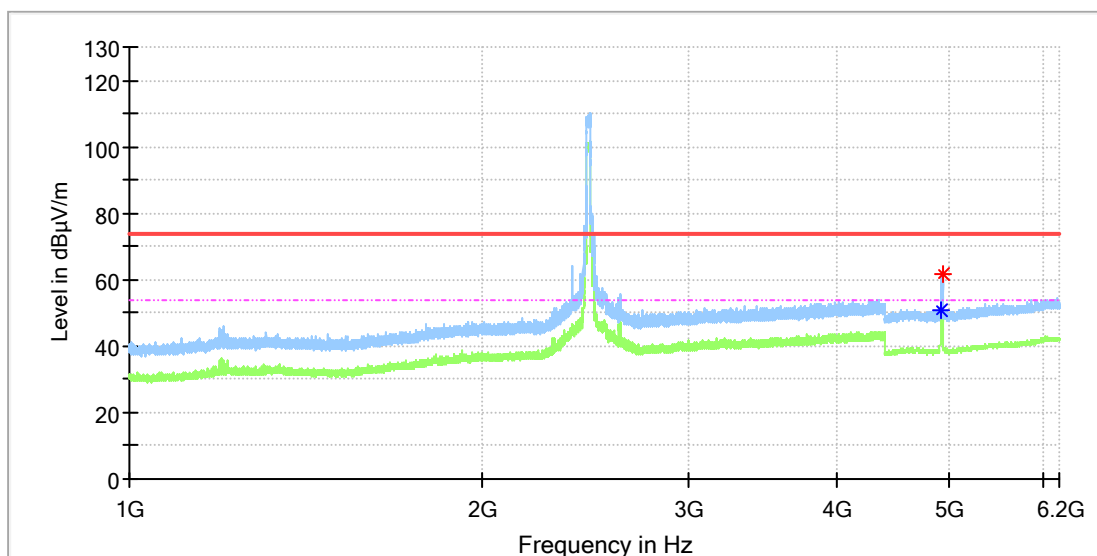


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4873.500000	---	48.65	54.00	5.35	100.0	V	46.0	11.8
4874.000000	59.78	---	74.00	14.22	100.0	V	46.0	11.8

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11n_Ch11
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

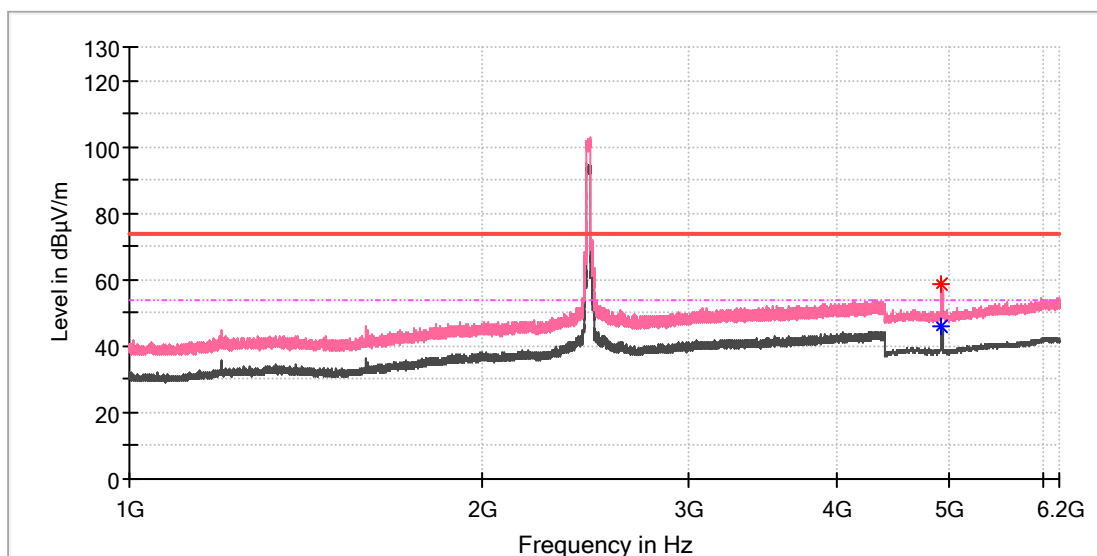


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4924.000000	---	50.80	54.00	3.20	100.0	H	142.0	11.8
4926.500000	61.46	---	74.00	12.54	100.0	H	142.0	11.8

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11n_Ch11
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



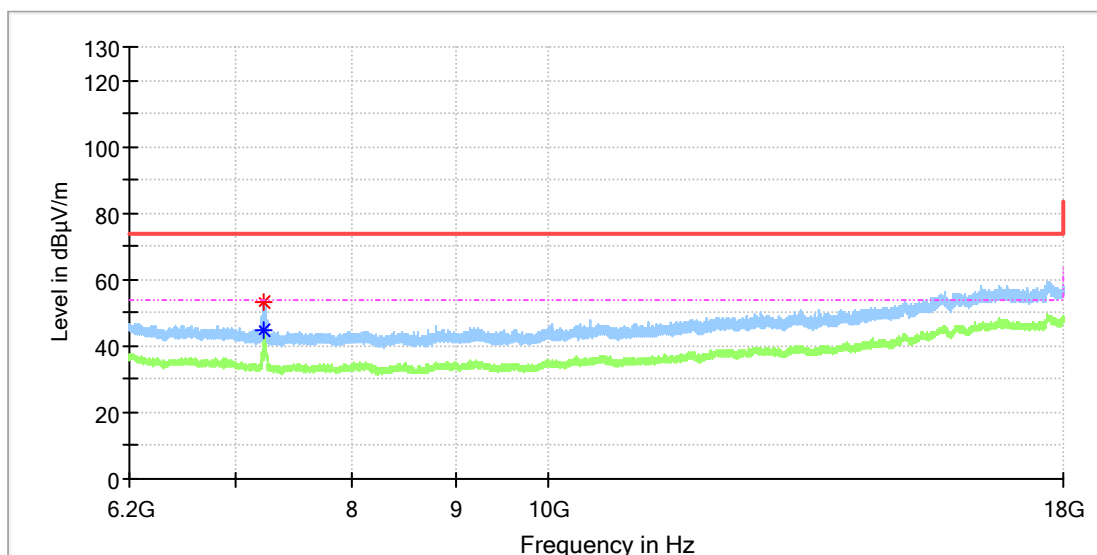
Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4920.500000	58.39	---	74.00	15.61	100.0	V	51.0	11.8
4925.000000	---	46.19	54.00	7.81	100.0	V	51.0	11.8

6.2GHz - 18GHz

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11n_Ch1
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

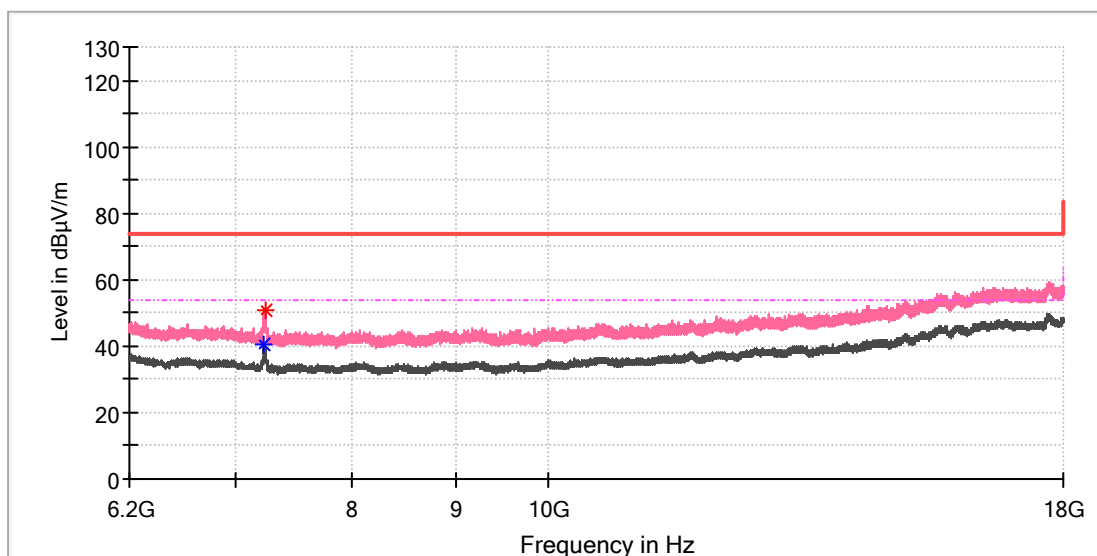


Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7229.550000	53.41	---	74.00	20.59	100.0	H	151.0	8.6
7231.516667	---	44.85	54.00	9.15	100.0	H	151.0	8.6

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11n_Ch1
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

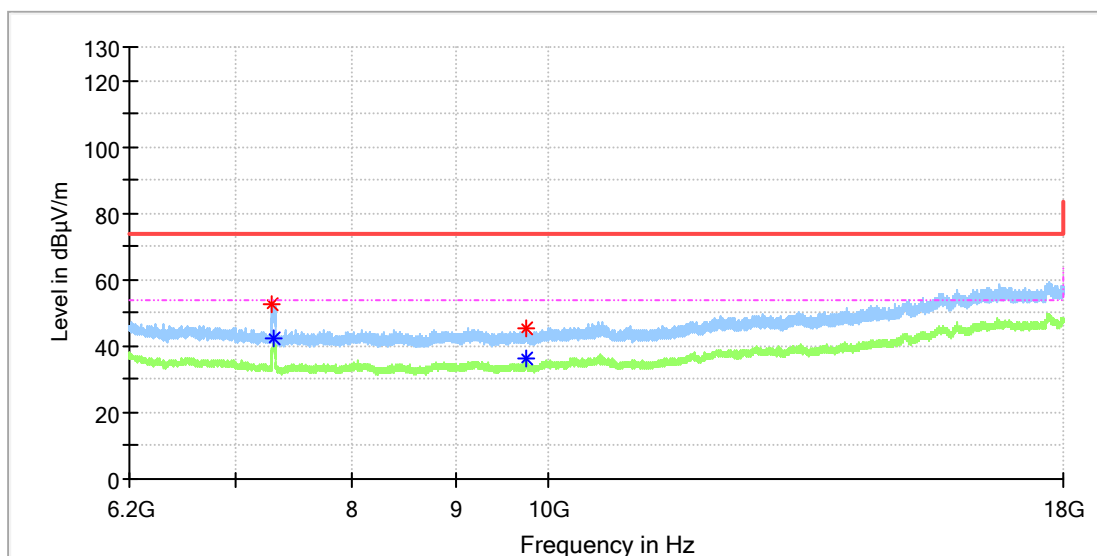


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7233.483333	---	40.76	54.00	13.24	100.0	V	155.0	8.6
7237.416667	50.54	---	74.00	23.46	100.0	V	155.0	8.6

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11n_Ch6
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

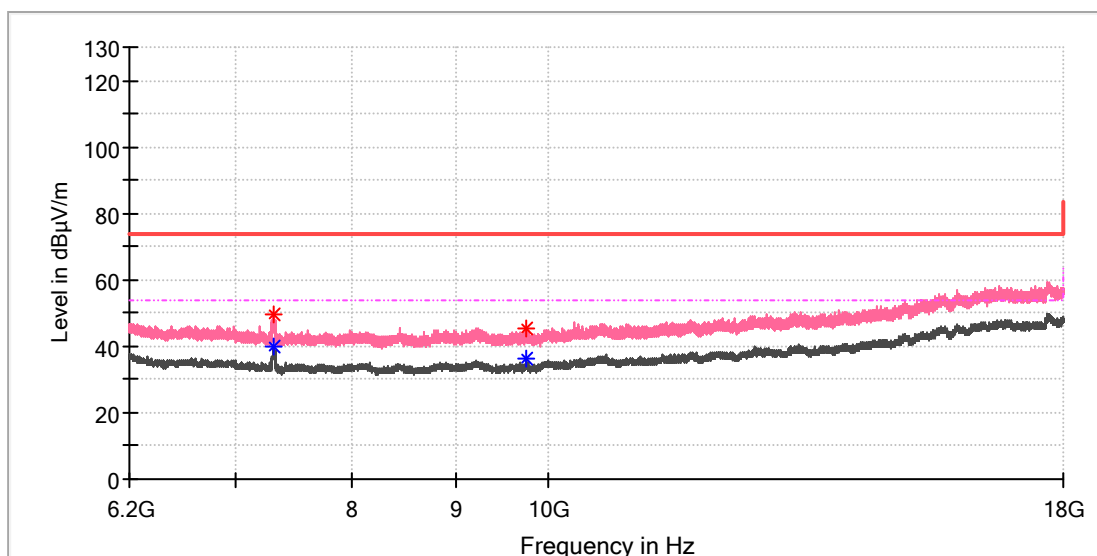


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7296.908333	52.47	---	74.00	21.53	100.0	H	233.0	8.3
7312.150000	---	42.62	54.00	11.38	100.0	H	148.0	8.2
9747.866667	---	36.20	54.00	17.80	100.0	H	163.0	10.4
9748.850000	45.11	---	74.00	28.89	100.0	H	163.0	10.4

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11n_Ch6
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

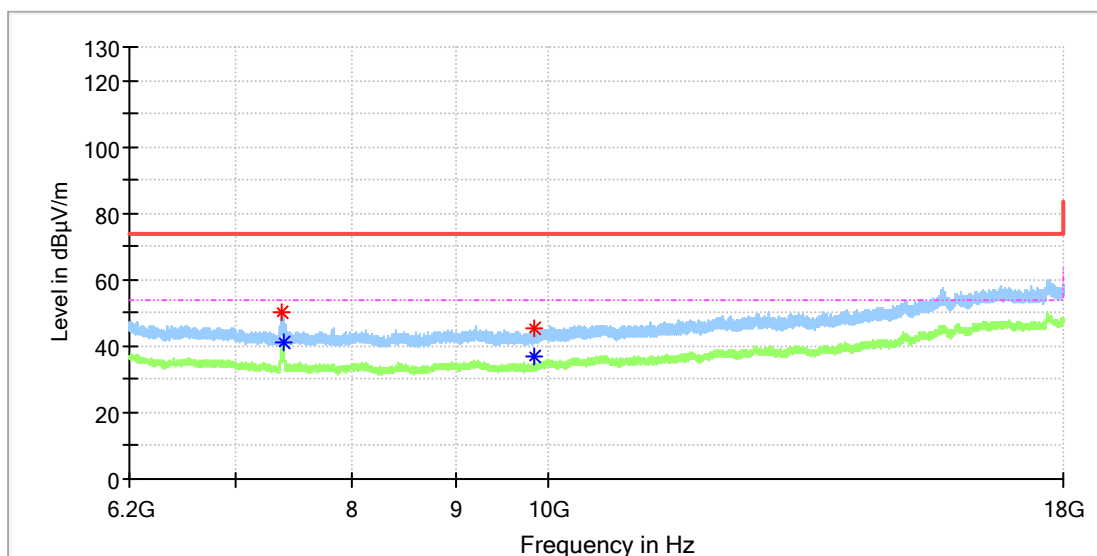


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7310.183333	---	39.62	54.00	14.38	100.0	V	151.0	8.2
7315.591667	49.41	---	74.00	24.59	100.0	V	303.0	8.2
9748.358333	45.57	---	74.00	28.43	100.0	V	288.0	10.4
9748.358333	---	36.39	54.00	17.61	100.0	V	288.0	10.4

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11n_Ch11
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

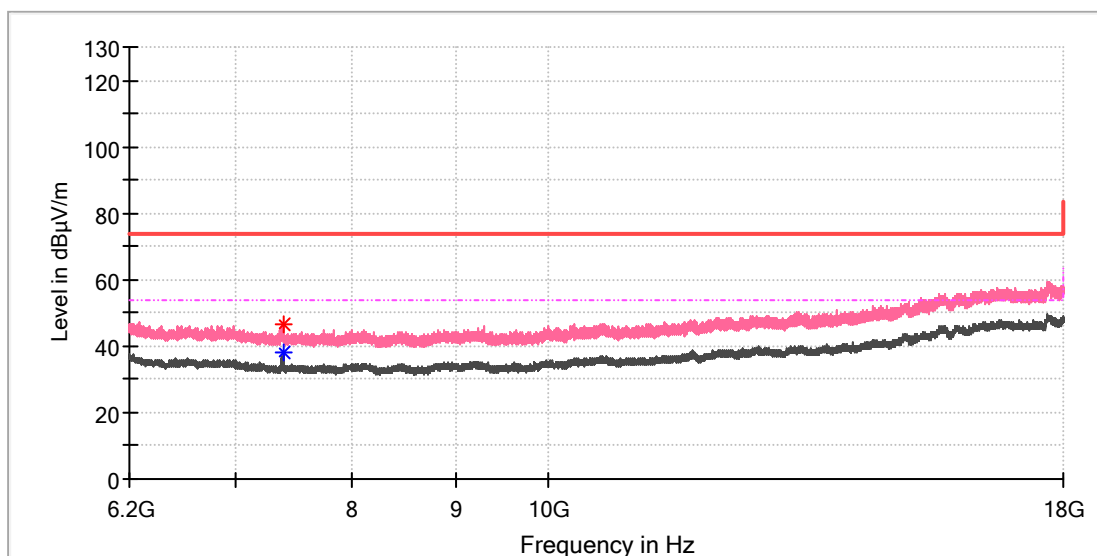


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7384.916667	49.98	---	74.00	24.02	100.0	H	150.0	8.2
7389.833333	---	40.84	54.00	13.16	100.0	H	122.0	8.2
9848.166667	---	36.98	54.00	17.02	100.0	H	122.0	10.6
9849.150000	45.57	---	74.00	28.43	100.0	H	150.0	10.6

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11n_Ch11
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



Critical Freqs

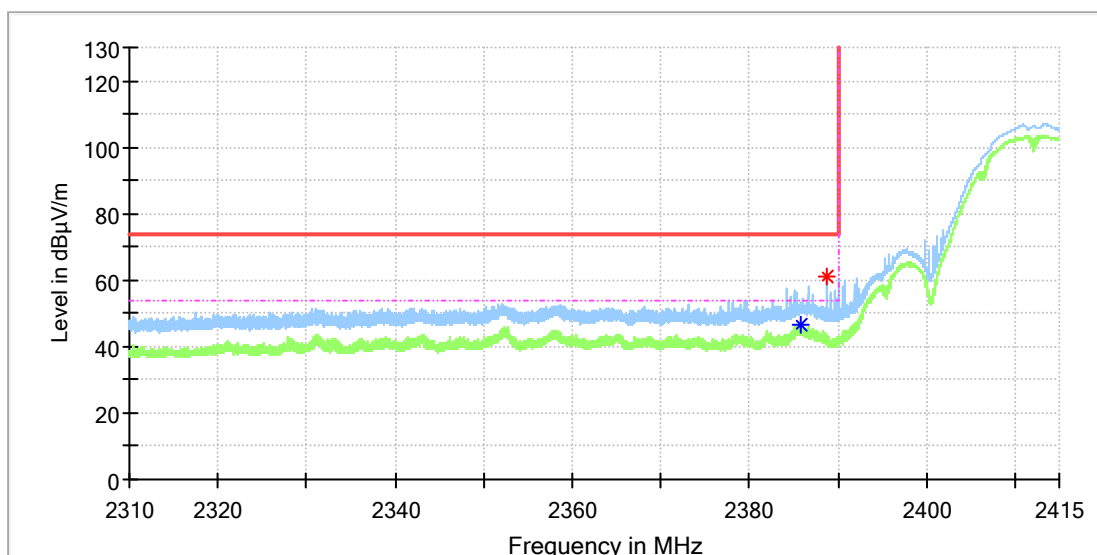
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7390.816667	46.49	---	74.00	27.51	100.0	V	150.0	8.3
7390.816667	---	37.80	54.00	16.20	100.0	V	150.0	8.3

Appendix C.2: Test Results of Radiated Emissions in Restricted Bands

Wi-Fi 802.11 b mode, 1 Mbps
Low channel

EUT Information

EUT Name:	SmartBar Plug
Model:	VP5X
Test Mode:	WiFi 2.4G_11b_Ch1
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

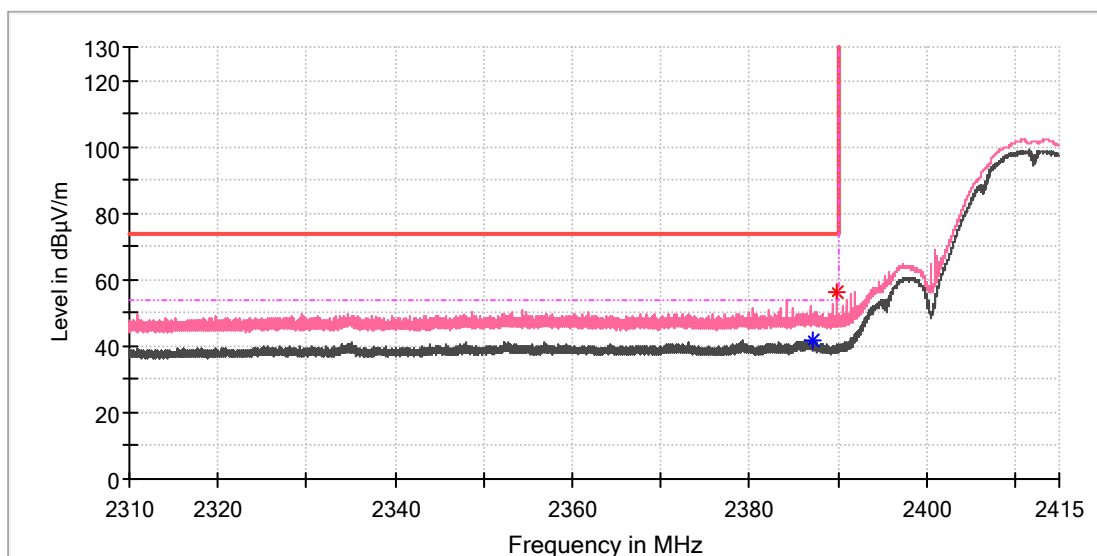


Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2385.857250	---	46.49	54.00	7.51	100.0	H	198.0	7.0
2388.750000	61.11	---	74.00	12.89	100.0	H	198.0	7.0

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11b_Ch1
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



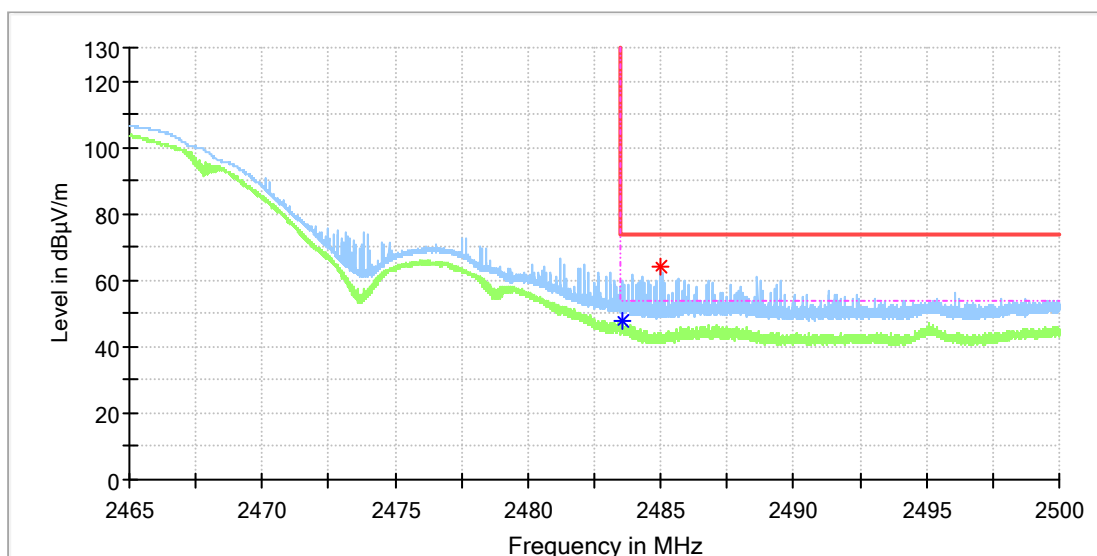
Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2387.070000	---	41.70	54.00	12.30	100.0	V	141.0	7.0
2389.857750	55.97	---	74.00	18.03	100.0	V	127.0	7.0

High channel

EUT Information

EUT Name:	SmartBar Plug
Model:	VP5X
Test Mode:	WiFi 2.4G_11b_Ch11
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

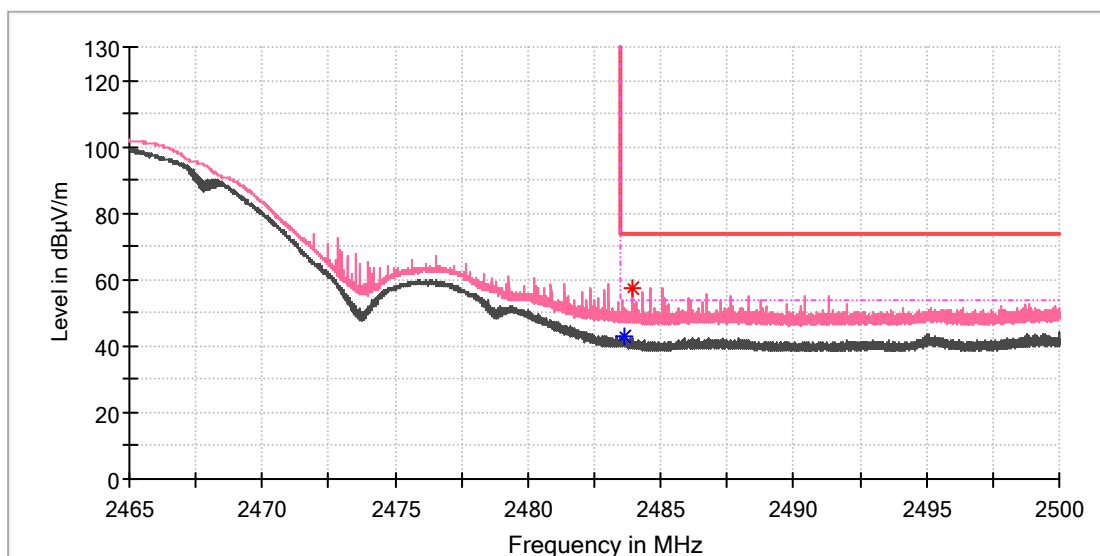


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.571000	---	47.63	54.00	6.37	100.0	H	191.0	7.4
2484.957000	64.02	---	74.00	9.98	100.0	H	191.0	7.4

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11b_Ch11
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



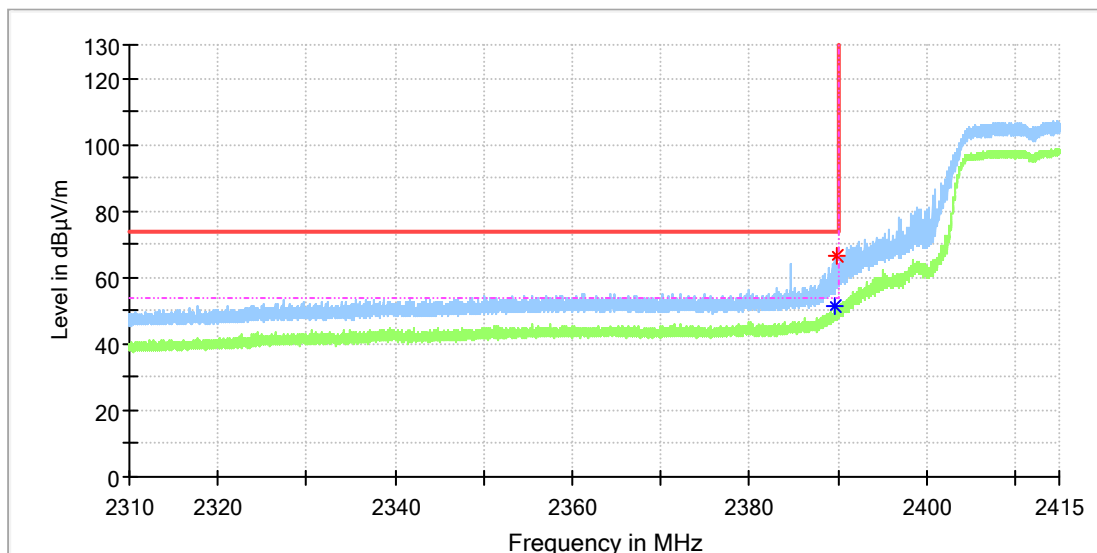
Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.630500	---	42.94	54.00	11.06	100.0	V	129.0	7.4
2483.917500	57.25	---	74.00	16.75	100.0	V	143.0	7.4

Wi-Fi 802.11 g mode, 6 Mbps
Low channel

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11g_Ch1
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

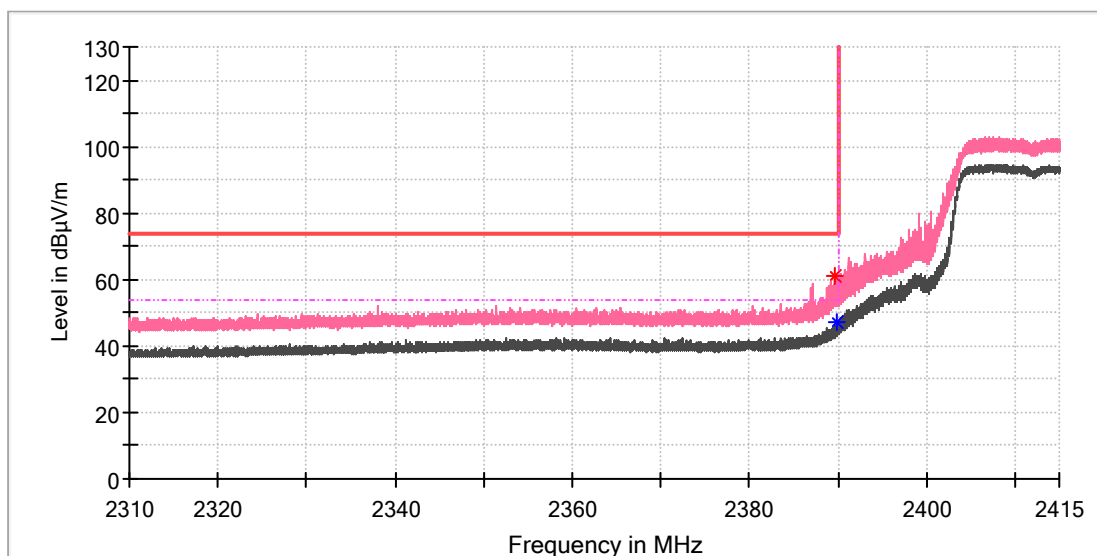


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2389.716000	---	51.17	54.00	2.83	100.0	H	21.0	7.0
2389.784250	66.76	---	74.00	7.24	100.0	H	11.0	7.0

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11g_Ch1
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



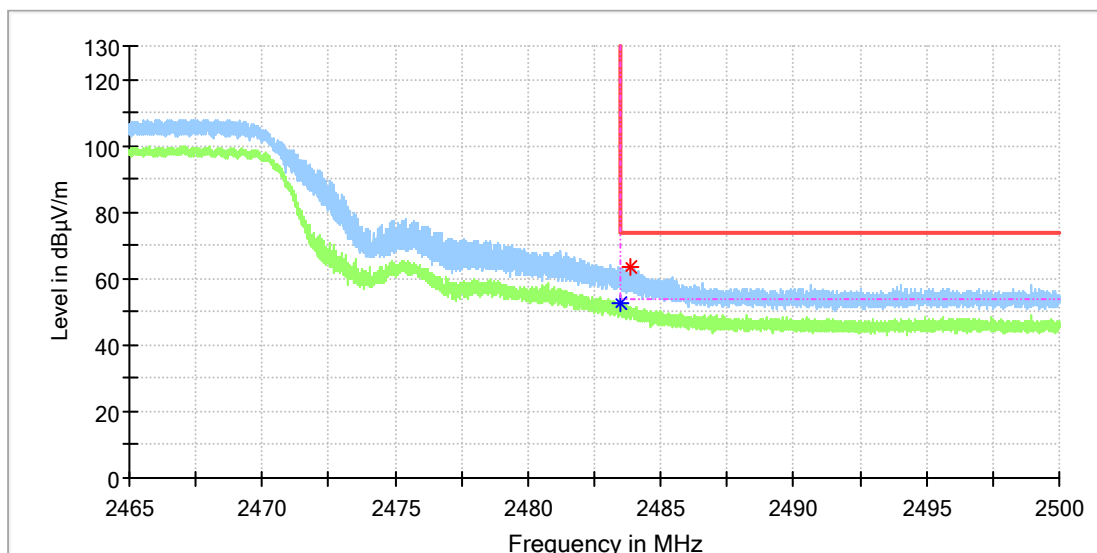
Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2389.642500	60.93	---	74.00	13.07	100.0	V	132.0	7.0
2389.973250	---	46.90	54.00	7.10	100.0	V	132.0	7.0

High channel

EUT Information

EUT Name:	SmartBar Plug
Model:	VP5X
Test Mode:	WiFi 2.4G_11g_Ch11
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

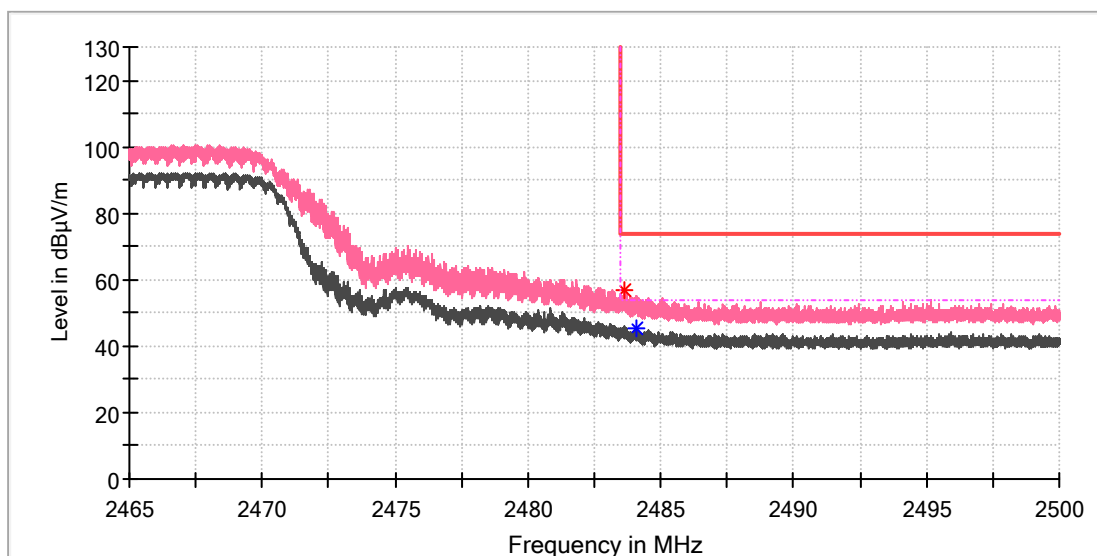


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.516750	---	52.81	54.00	1.19	100.0	H	32.0	7.4
2483.859750	63.47	---	74.00	10.53	100.0	H	32.0	7.4

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11g_Ch11
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



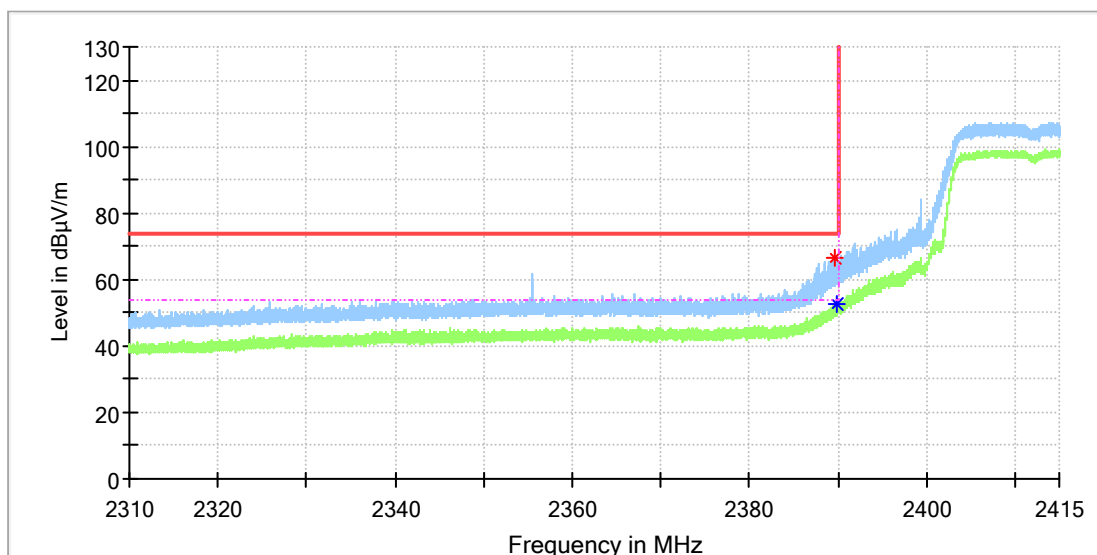
Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.597250	56.92	---	74.00	17.08	100.0	V	342.0	7.4
2484.106500	---	45.64	54.00	8.36	100.0	V	342.0	7.4

Wi-Fi 802.11 n(HT20) mode, MCS0
Low channel

EUT Information

EUT Name:	SmartBar Plug
Model:	VP5X
Test Mode:	WiFi 2.4G_11n_Ch1
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

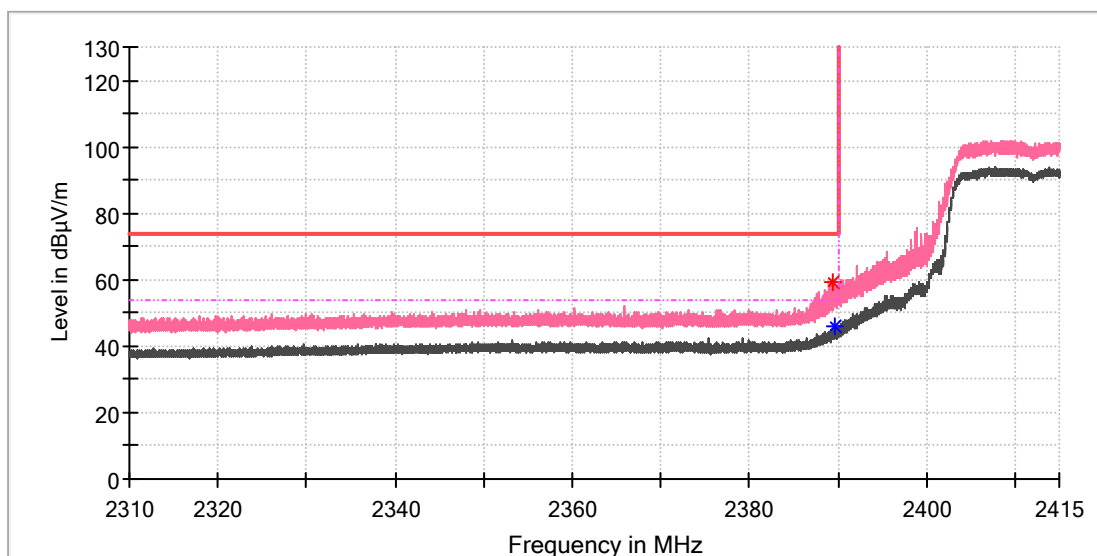


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2389.600500	66.37	---	74.00	7.63	100.0	H	210.0	7.0
2389.947000	---	52.47	54.00	1.53	100.0	H	210.0	7.0

EUT Information

EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11n_Ch1
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



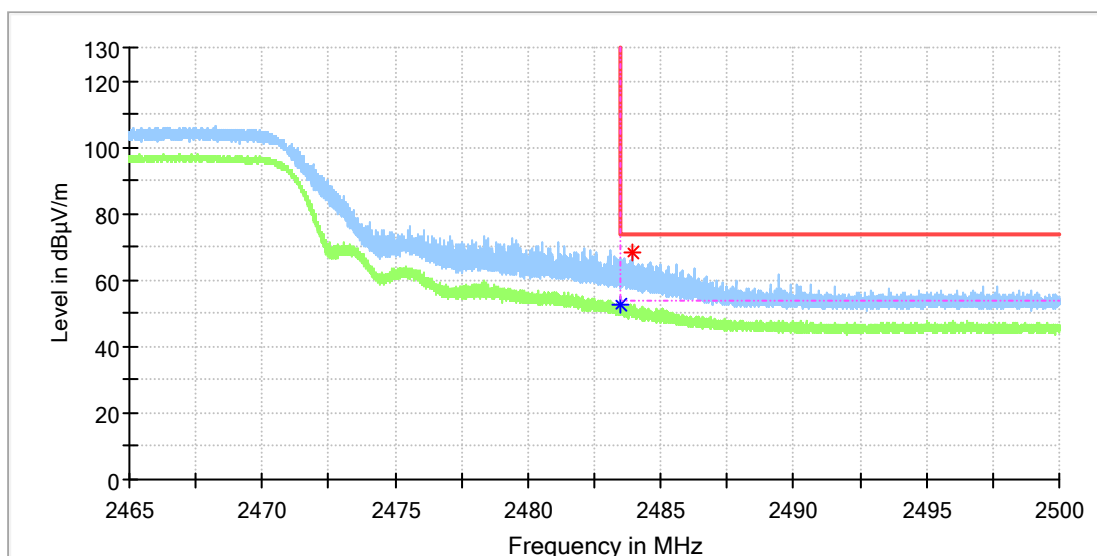
Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2389.495500	59.36	---	74.00	14.64	100.0	V	345.0	7.0
2389.637250	---	45.74	54.00	8.26	100.0	V	127.0	7.0

High channel

EUT Information

EUT Name:	SmartBar Plug
Model:	VP5X
Test Mode:	WiFi 2.4G_11n_Ch11
Test Voltage::	120V/60Hz
Remark:	Temp 23 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

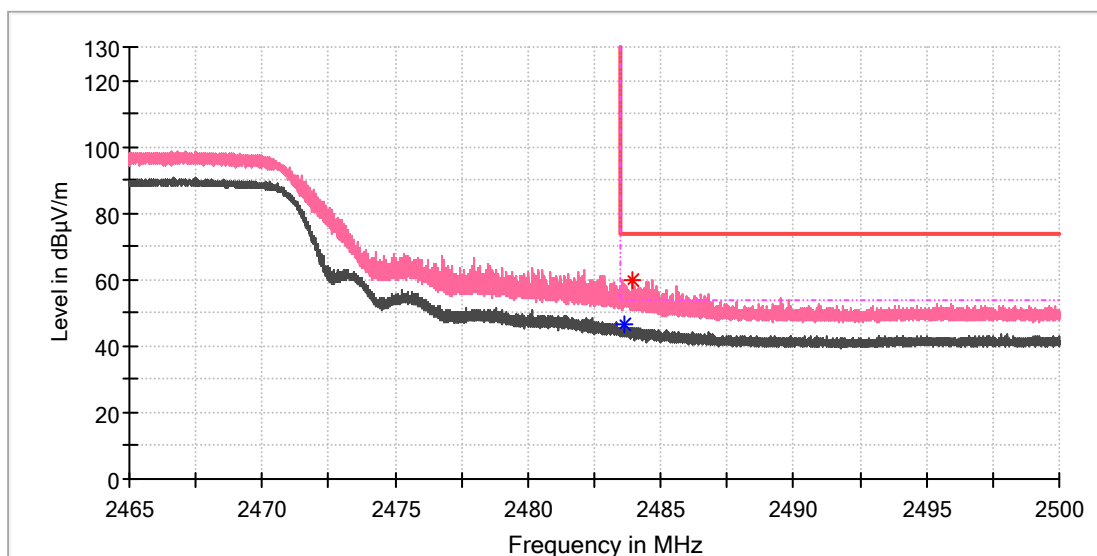


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.508000	---	52.66	54.00	1.34	100.0	H	213.0	7.4
2483.901750	68.10	---	74.00	5.90	100.0	H	225.0	7.4

EUT Information

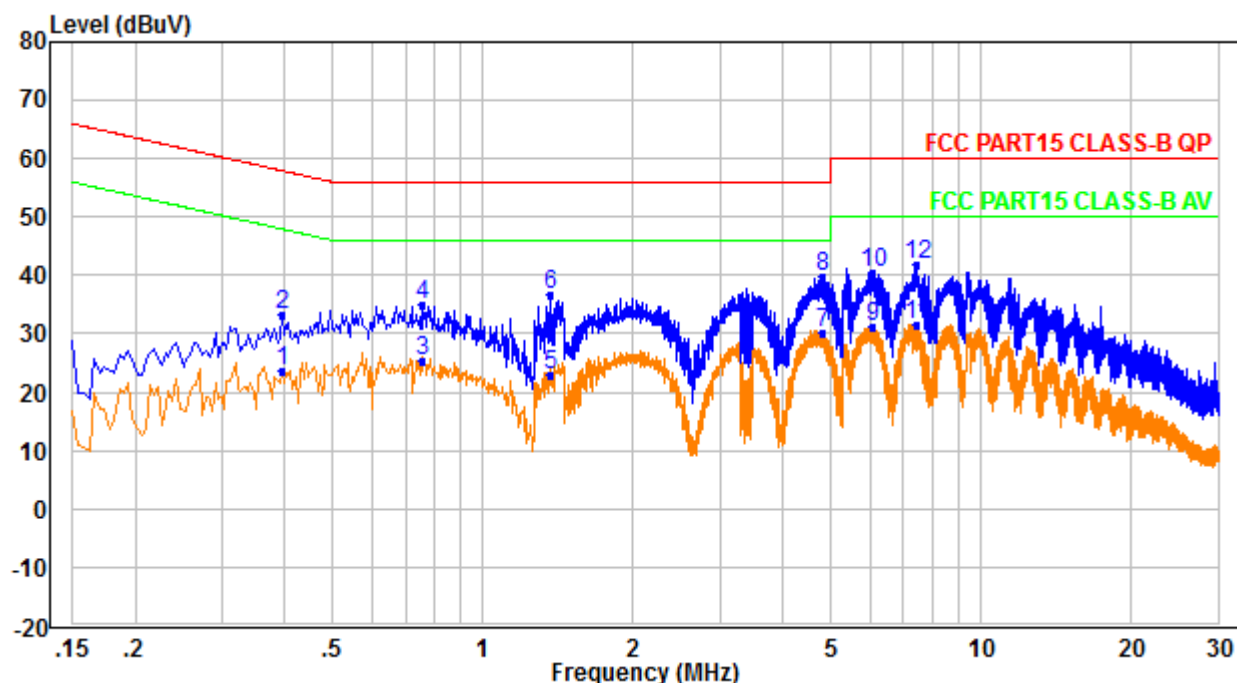
EUT Name: SmartBar Plug
Model: VP5X
Test Mode: WiFi 2.4G_11n_Ch11
Test Voltage:: 120V/60Hz
Remark: Temp 23 Humi:55%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



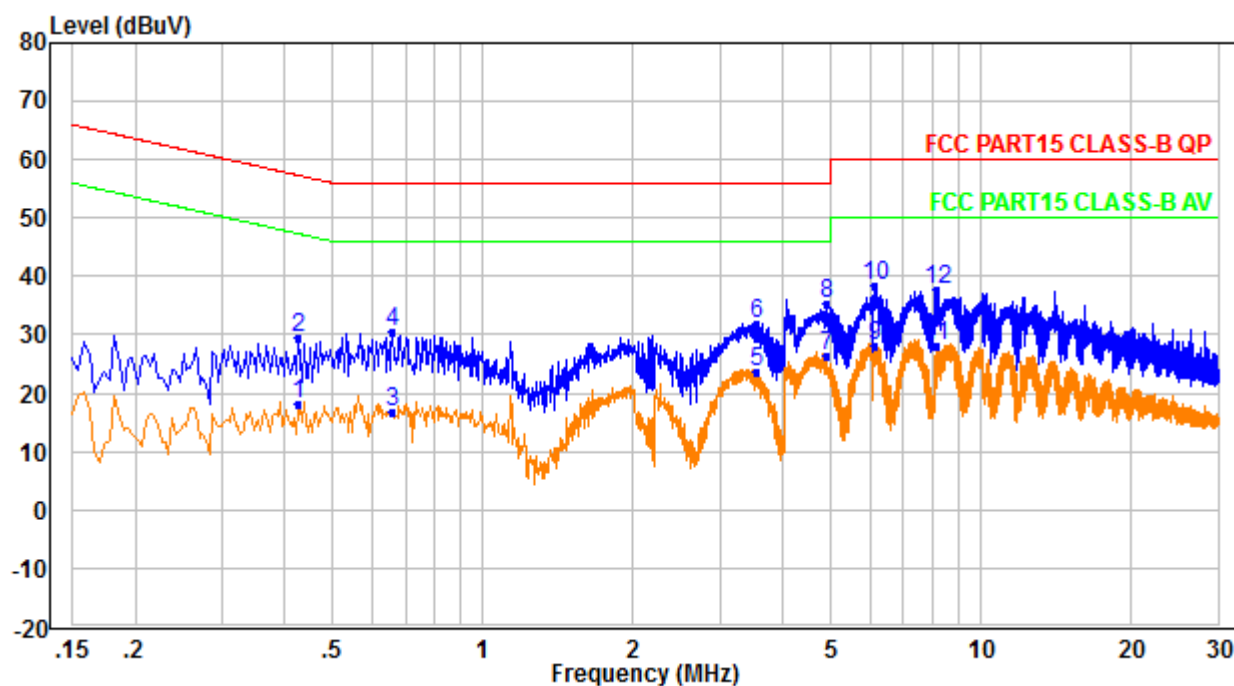
Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.621750	---	46.57	54.00	7.43	100.0	V	329.0	7.4
2483.963000	59.82	---	74.00	14.18	100.0	V	340.0	7.4

Appendix C.3: Test Results of Conducted Emission on AC Mains



freq(mhz)	LISN factor	Cable Loss	Aux factor	Reading Level	level	limit	Over limit	remark	
0.39398	-0.75	0.02	9.93	14.35	23.55	47.98	-24.43	Average	Line
0.39398	-0.75	0.02	9.93	24.03	33.23	57.98	-24.75	QP	Line
0.75396	-0.53	0.02	9.93	15.83	25.25	46	-20.75	Average	Line
0.75396	-0.53	0.02	9.93	25.68	35.1	56	-20.9	QP	Line
1.366	-0.45	0.03	9.92	13.36	22.86	46	-23.14	Average	Line
1.366	-0.45	0.03	9.92	27.34	36.84	56	-19.16	QP	Line
4.81	-0.25	0.06	9.78	20.44	30.03	46	-15.97	Average	Line
4.81	-0.25	0.06	9.78	30.03	39.62	56	-16.38	QP	Line
6.078	-0.22	0.07	9.76	21.61	31.22	50	-18.78	Average	Line
6.078	-0.22	0.07	9.76	30.77	40.38	60	-19.62	QP	Line
7.434	-0.18	0.08	9.76	22.04	31.7	50	-18.3	Average	Line
7.434	-0.18	0.08	9.76	32.09	41.75	60	-18.25	QP	Line



freq(mhz)	LISN factor	Cable Loss	Aux factor	Reading Level	level	limit	Over limit	remark	
0.42598	-0.72	0.02	9.93	8.87	18.1	47.33	-29.23	Average	Neutral
0.42598	-0.72	0.02	9.93	20.08	29.31	57.33	-28.02	QP	Neutral
0.65797	-0.56	0.02	9.93	7.42	16.81	46	-29.19	Average	Neutral
0.65797	-0.56	0.02	9.93	21.14	30.53	56	-25.47	QP	Neutral
3.554	-0.28	0.05	9.84	14.17	23.78	46	-22.22	Average	Neutral
3.554	-0.28	0.05	9.84	22.41	32.02	56	-23.98	QP	Neutral
4.918	-0.25	0.06	9.77	16.86	26.44	46	-19.56	Average	Neutral
4.918	-0.25	0.06	9.77	25.88	35.46	56	-20.54	QP	Neutral
6.118	-0.22	0.07	9.76	18.65	28.26	50	-21.74	Average	Neutral
6.118	-0.22	0.07	9.76	28.86	38.47	60	-21.53	QP	Neutral
8.141	-0.18	0.08	9.75	18.44	28.09	50	-21.91	Average	Neutral
8.141	-0.18	0.08	9.75	28.05	37.7	60	-22.3	QP	Neutral