

Prüfbericht-Nr.: <i>Test report no.:</i>	CN21N21D 001	Auftrags-Nr.: <i>Order no.:</i>	168325905	Seite 1 von 24 <i>Page 1 of 24</i>
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2021-07-06	
Auftraggeber: <i>Client:</i>	Dongguan LIFAair Technology Limited 2nd floor in the 6th district plant, No.2 East Industrial Road, Songshan Lake High-Tech Industrial Development Zone, Dongguan ,523808, Guangdong, CHINA			
Prüfgegenstand: <i>Test item:</i>	Smart Air Quality Monitoring Controller			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	LAM05, LAM05V, LAM06 (Trademark: LIFAair)			
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 February 2021 CFR47 FCC Part 15: Subpart C Section 15.209 RSS-102 Issue 5 February 2021 CFR47 FCC Part 2: Section 2.1091			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2021-07-09	Please refer to photo documents		
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003088741-001~007			
Prüfzeitraum: <i>Testing period:</i>	2021-07-19 – 2021-07-27			
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> 2021-08-16	 Signed by: Alex Lan		 Signed by: Lin Lin	
Stellung / Position	Senior Project Engineer	Ausstellungsdatum: <i>Issue date:</i> 2021-08-16		
Sonstiges / Other:				
FCC ID: 2A2LR-LF02 IC: 27494-LF02 HVIN: LAM05				
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) 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>				

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

Contents

1	GENERAL REMARKS	4
1.1	COMPLEMENTARY MATERIALS	4
2	TEST SITES.....	4
2.1	TEST FACILITIES.....	4
2.2	LIST OF TEST AND MEASUREMENT INSTRUMENTS	5
2.3	TRACEABILITY.....	7
2.4	CALIBRATION.....	7
2.5	MEASUREMENT UNCERTAINTY	7
2.6	LOCATION OF ORIGINAL DATA	7
2.7	STATUS OF FACILITY USED FOR TESTING.....	7
3	GENERAL PRODUCT INFORMATION.....	8
3.1	PRODUCT FUNCTION AND INTENDED USE.....	8
3.2	RATINGS AND SYSTEM DETAILS	8
3.3	INDEPENDENT OPERATION MODES	10
3.4	NOISE GENERATING AND NOISE SUPPRESSING PARTS.....	10
3.5	SUBMITTED DOCUMENTS.....	10
4	TEST SET-UP AND OPERATION MODES	11
4.1	PRINCIPLE OF CONFIGURATION SELECTION.....	11
4.2	TEST OPERATION AND TEST SOFTWARE	11
4.3	SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT.....	11
4.4	COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE.....	11
4.5	TEST SETUP DIAGRAM	12
5	TEST RESULTS.....	14
5.1	TRANSMITTER REQUIREMENT & TEST SUITES.....	14
5.1.1	Antenna Requirement.....	14
5.1.2	Maximum Peak Conducted Output Power.....	15
5.1.3	Conducted Power Spectral Density.....	16
5.1.4	99%dB Bandwidth.....	17
5.1.5	6dB Bandwidth.....	18
5.1.6	Conducted Spurious Emissions Measured in 100 kHz Bandwidth	19
5.1.7	Radiated Spurious Emission.....	20
5.1.8	Conducted Emission on AC Mains.....	21
6	SAFETY HUMAN EXPOSURE	22
6.1	RADIO FREQUENCY EXPOSURE COMPLIANCE	22
6.1.1	Electromagnetic Fields	22
7	PHOTOGRAPHS OF THE TEST SET-UP.....	24
8	LIST OF TABLES	24

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

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Conducted Emissions				
Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
EMI Test Receiver	R&S	ESR3	102680	22.04.2021
Artificial Mains Network	R&S	ENV216	101445	22.04.2021
EMC32 test software	R&S	EMC32(Ver.10.50.00)	N/A	N/A
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
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-	Steatite	QMS-00208	18313	02.09.2021

Prüfbericht - Nr.: CN21N21D 001
Test Report No.

Seite 6 von 24
Page 6 of 24

18 GHz)				
Test software	R&S	EMC32 (V10.60.10)	N/A	N/A
Control PC	Dell	OptiPlex 7050	36NV9P2	N/A
3m Semi-Anechoic Chamber	Albatross	SAC-3m	APC17151-SAC	06.21.2024

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.

Test	Parameters	Expanded uncertainty (U_{lab})	Expanded uncertainty (U_{Cispr})
Conducted Emission	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	± 3.70 dB ± 3.30 dB	± 3.8 dB ± 3.4 dB
Radiated Emission (3m SAC)	Level accuracy (30MHz to 1000MHz)	± 4.52 dB	± 6.3 dB
	Level accuracy (above 1000MHz)	± 4.37 dB	N/A

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A & B & C 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 EUTs are smart air quality monitoring controller for household or similar used, they operate at 2.4GHz ISM frequency band.

All models are identical except the sensor and related testing function.

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	Smart Air Quality Monitoring Controller
Type Designation	LAM05, LAM05V, LAM06
Trade Mark	LIFAair
FCC ID	2A2LR-LF02
IC	27494-LF02
HVIN	LAM05
Operating Voltage	DC 5V via marketed AC/DC adapter DC 3.7V, 5200mAh via rechargeable Li-ion battery pack
Testing Voltage	AC 120V, 60Hz
AC/DC Adapter	Model: GPE015K-050240-Z Input: AC 100-240V~50/60Hz 0.4A Output: DC 5V, 2.4A
Technical Specification of Wi-Fi 802.11 b/g/n	
Operating Frequency	2412 - 2462 MHz for 802.11b/g/n(HT20) 2422 - 2452 MHz for 802.11n(HT40)
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) 7 channels for 802.11n(HT40)
Channel Separation	5 MHz
Antenna Type	PCB antenna
Max. Antenna Gain	1.10 dBi

Technical Specification of Bluetooth Low Energy	
Operating frequency	2402-2480 MHz
Type of modulation	GFSK
Channel number	40 Channels
Channel separation	2MHz
Data Rate	1Mbps
Type of antenna	Chip Antenna
Antenna gain	2.50 dBi

Table 3: RF Channel and Frequency of Wi-Fi 802.11 b/g/n

RF Channel	802.11 b/g/n(HT20)	802.11 n(HT40)
	Frequency (MHz)	Frequency (MHz)
01	2412	/
02	2417	/
03	2422	2422
04	2427	2427
05	2432	2432
06	2437	2437
07	2442	2442
08	2447	2447
09	2452	2452
10	2457	/
11	2462	/

Table 4: RF Channel and Frequency of Bluetooth Low Energy

RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)
00	2402.00	10	2422.00	20	2442.00	30	2462.00
01	2404.00	11	2424.00	21	2444.00	31	2464.00
02	2406.00	12	2426.00	22	2446.00	32	2466.00
03	2408.00	13	2428.00	23	2448.00	33	2468.00
04	2410.00	14	2430.00	24	2450.00	34	2470.00
05	2412.00	15	2432.00	25	2452.00	35	2472.00
06	2414.00	16	2434.00	26	2454.00	36	2474.00
07	2416.00	17	2436.00	27	2456.00	37	2476.00
08	2418.00	18	2438.00	28	2458.00	38	2478.00
09	2420.00	19	2440.00	29	2460.00	39	2480.00

3.3 Independent Operation Modes

The basic operation modes are:

- A. On
 - 1. Wi-Fi transmitting mode
 - 1) Low Channel
 - 2) Middle Channel
 - 3) High Channel
 - 2. Bluetooth Low Energy mode
 - 1) Low Channel
 - 2) Middle Channel
 - 3) High Channel
- B. On, Wireless connecting mode (Bluetooth & Wi-Fi)
- C. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

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

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.

According to clause 3.1, all test were applied on model LAM05.

4.3 Special Accessories and Auxiliary Equipment

Table 5: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N
Mobile Phone	HTC	D626w	N/A
Notebook	Lenovo	ThinkPad T480	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)

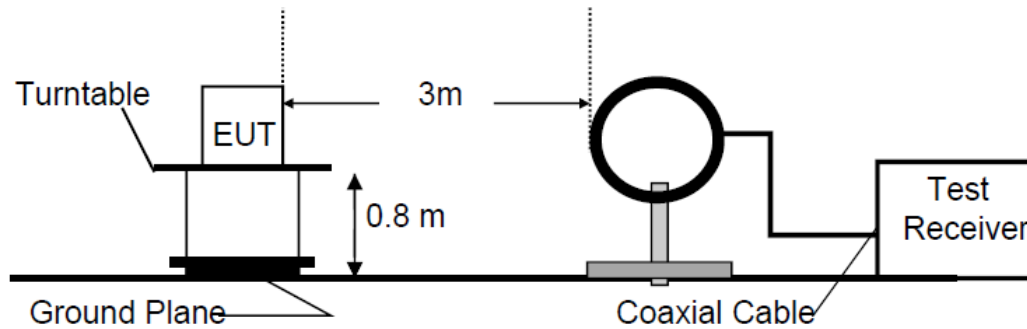


Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

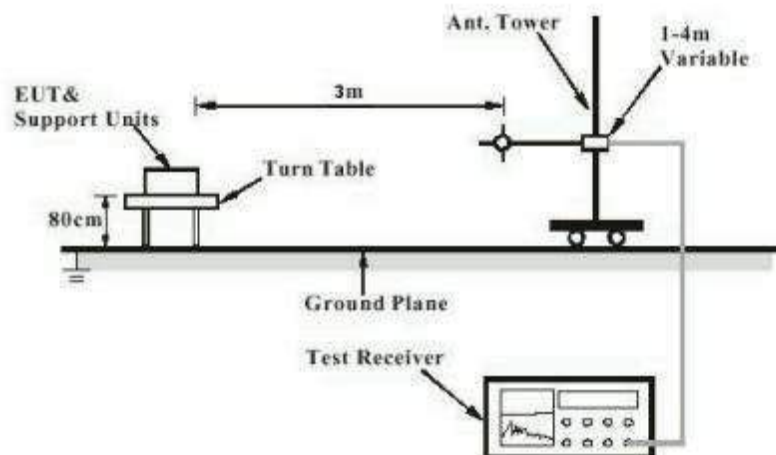


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

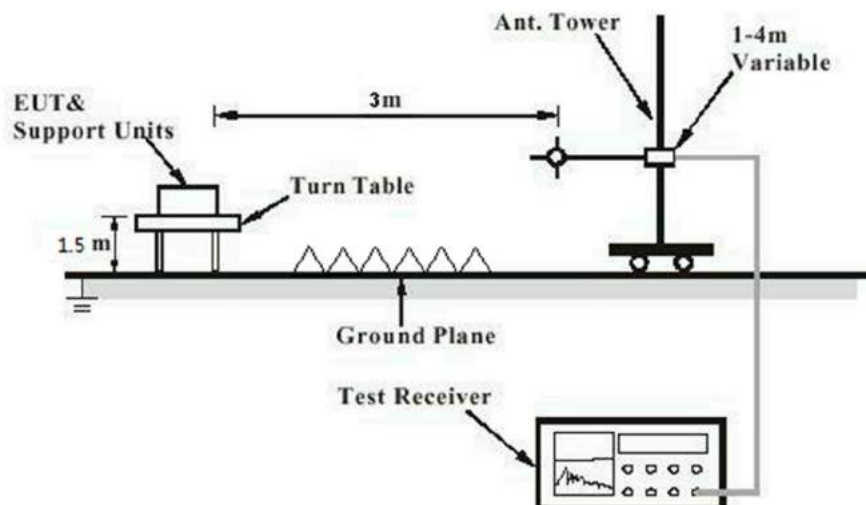


Diagram of Measurement Configuration for Mains Conduction Measurement

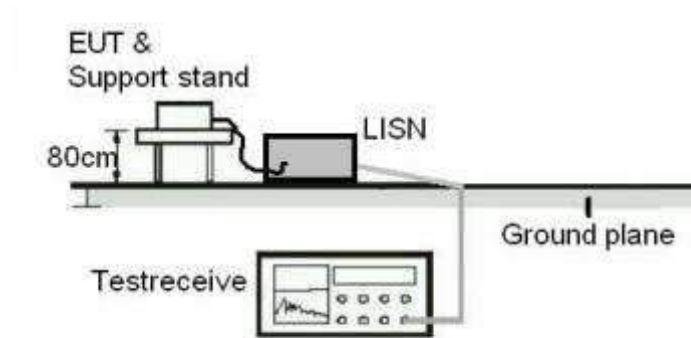
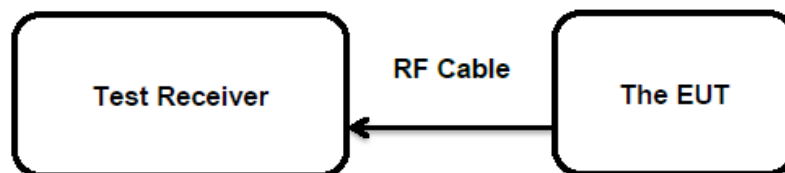


Diagram of Measurement Configuration for Conducted Transmitter Measurement



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
Limit	:	the use of antennas with directional gains that do not exceed 6 dBi

According to the manufacturer declared, the EUT has two internal antenna, the directional gain of antenna is 1.1 dBi for Wi-Fi 802.11 b/g/n and 2.5 dBi for Bluetooth Low Energy, 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.

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(2)&(4)
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	: 2021-07-21
Input voltage	: AC 120V, 60Hz
Operation mode	: A.1, A.2
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 Maximum Peak Conducted Output Power

Test Mode	Data Rate	Test Channel (MHz)	Measured Peak Power		Limit (W)
			(dBm)	(W)	
802.11b	1 Mbps	2412	16.7	0.0468	< 1.0
		2437	16.3	0.0427	
		2462	16.5	0.0447	
802.11g	6 Mbps	2412	21.7	0.1479	
		2437	21.1	0.1288	
		2462	21.5	0.1413	
802.11n (HT20)	MCS0	2412	20.5	0.1122	
		2437	20.1	0.1023	
		2462	20.3	0.1072	
802.11n (HT40)	MCS0	2422	18.1	0.0646	
		2437	17.3	0.0537	
		2452	17.5	0.0562	
Bluetooth Low Energy	1Mbps	2402	-5.7	0.0003	
		2440	-5.3	0.0003	
		2480	-4.7	0.0003	
Maximum Measured Value			21.70	0.1479	

Note: The cable loss is taken into account in results and the e.i.r.p. is 22.80 dBm for Wi-Fi 802.11 b/g/n and -2.2 dBm for Bluetooth Low Energy, both of them less than 4W (36 dBm).

5.1.3 Conducted Power Spectral Density

RESULT:

Pass

Test Specification

Test standard : FCC Part 15.247(e)
 : RSS-247 Clause 5.2(2)
 Basic standard : ANSI C63.10: 2013
 Limits : 8 dBm / 3kHz
 Kind of test site : Shielded Room

Test Setup

Date of testing : 2021-07-27
 Input voltage : AC 120V, 60Hz
 Operation mode : A.1, A.2
 Test channel : Low / Middle / High
 Ambient temperature : 25 °C
 Relative humidity : 56 %
 Atmospheric pressure : 101 kPa

For details refer to following test result.

Table 7: Test Result of Power Spectral Density

Test Mode	Data Rate	Frequency (MHz)	Measured Peak Power Spectral Density (dBm/3KHz)
802.11b	1 Mbps	2412	-1.42
		2437	-1.31
		2462	-0.76
802.11g	6 Mbps	2412	-12.03
		2437	-11.00
		2462	-12.03
802.11n (HT20)	MCS0	2412	-12.33
		2437	-11.68
		2462	-10.81
802.11n (HT40)	MCS0	2422	-16.21
		2437	-16.45
		2452	-15.99
Bluetooth Low Energy	1Mbps	2402	-22.00
		2440	-22.53
		2480	-20.02
Maximum Measured Value			-0.76

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

For the measurement records, refer to the appendix B.

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 : 2021-07-21
Input voltage : AC 120V, 60Hz
Operation mode : A.1, A.2
Test channel : Low / Middle / High
Ambient temperature : 25 °C
Relative humidity : 56 %
Atmospheric pressure : 101 kPa

Table 8: Test Result of 99% Bandwidth

Test Mode	Data Rate	Frequency (MHz)	99% Bandwidth (MHz)	Limit (MHz)
802.11b	1 Mbps	2412	12.20	/
		2437	12.20	
		2462	12.20	
802.11g	6 Mbps	2412	16.60	
		2437	16.60	
		2462	16.60	
802.11n (HT20)	MCS0	2412	17.70	
		2437	17.70	
		2462	17.70	
802.11n (HT40)	MCS0	2422	36.75	
		2437	36.75	
		2452	36.70	
Bluetooth Low Energy	1Mbps	2402	1.025	
		2440	1.025	
		2480	1.020	
Minimum Measured Value			1.020	

For the measurement records, refer to the appendix B.

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
Limits	: > 500 KHz
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 2021-07-21
Input voltage	: AC 120V, 60Hz
Operation mode	: A.1, A.2
Test channel	: Low / Middle / High
Ambient temperature	: 25 °C
Relative humidity	: 56 %
Atmospheric pressure	: 101 kPa

For details refer to following test result.

Table 9: Test Result of 6dB Bandwidth

Test Mode	Data Rate	Frequency (MHz)	-6dB Bandwidth (MHz)	Limit (kHz)
802.11b	1 Mbps	2412	10.15	> 500
		2437	10.15	
		2462	10.15	
802.11g	6 Mbps	2412	16.45	
		2437	16.45	
		2462	16.45	
802.11n (HT20)	MCS0	2412	17.65	
		2437	17.65	
		2462	17.40	
802.11n (HT40)	MCS0	2422	36.10	
		2437	36.35	
		2452	36.40	
Bluetooth Low Energy	1Mbps	2402	0.713	
		2440	0.693	
		2480	0.733	
Minimum Measured Value			0.693	

For the measurement records, refer to the appendix B.

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	: 2021-07-27
Input voltage	: AC 120V, 60Hz
Operation mode	: A.1, A.2
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.

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	: 2021-07-19 – 2021-07-20
Input voltage	: AC 120V, 60Hz
Operation mode	: A.1, A.2, B
Test channel	: Low / Middle / High
Ambient temperature	: 23°C
Relative humidity	: 51 %
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.

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	: 2021-07-22
Input voltage	: AC 120V, 60Hz
Operation mode	: B
Earthing	: Not connected
Ambient temperature	: 24 °C
Relative humidity	: 53 %
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: Section 2.1091
CFR47 FCC Part 1: Section 1.1310
FCC KDB Publication 447498 v06, section 7
RSS-102 Issue 5 February 2021, section 2.5.2

➤ **FCC requirements**

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 KDB 447498 v06

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)

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

$$S_{(mW/cm^2)} = PG/4\pi R^2$$

a) EUT RF Exposure Evaluation standalone operations

Test Mode	Maximum conducted Power		Antenna Gain (dBi)	Measured e.i.r.p		$S_{(mW/cm^2)} = PG/4\pi R^2$	Limit (mW/cm ²)
	(dBm)	(mW)		(dBm)	(mW)		
BLE	-4.7	0.339	2.5	-2.2	0.603	0.00012	1.0
2.4GHz Wi-Fi	21.70	147.911	1.1	22.8	190.546	0.038	0.601

b) EUT RF Exposure Evaluation simultaneous transmission operations

Simultaneous transmission mode	The sum of the ratios	Result
BLE + DTSSs	$0.00012/1 + 0.038/0.601 < 1$	Pass

➤ **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 BLE: 2.670 W
- RF exposure evaluation exempted power for DTSS: 1.37 W

a) EUT RF Exposure Evaluation standalone operations:

Test Mode	Measured Peak Power		Antenna Gain (dBi)	Measured e.i.r.p (mW)	
	(dBm)	(mW)		(dBm)	(mW)
BLE	-4.7	0.3	2.5	-2.2	0.603
2.4GHz Wi-Fi	21.70	147.9	1.1	22.8	190.546

b) EUT RF Exposure Evaluation simultaneous transmission operations

Simultaneous transmission mode	The sum of the ratios	Result
BLE + DTSS	$0.00603/2.67 + 0.0191/1.37 < 1$	Pass

The e.i.r.p. for BLE and DTSS are 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.

8 List of Tables

Table 1: List of Test and Measurement Equipment.....	5
Table 2: Technical Specification of EUT	8
Table 3: RF Channel and Frequency of Wi-Fi 802.11 b/g/n	9
Table 4: RF Channel and Frequency of Bluetooth Low Energy.....	9
Table 5: List of Accessories and Auxiliary Equipment.....	11
Table 6: Test Result of Maximum Peak Conducted Output Power.....	15
Table 7: Test Result of Power Spectral Density	16
Table 8: Test Result of 99% Bandwidth	17
Table 9: Test Result of 6dB Bandwidth.....	18

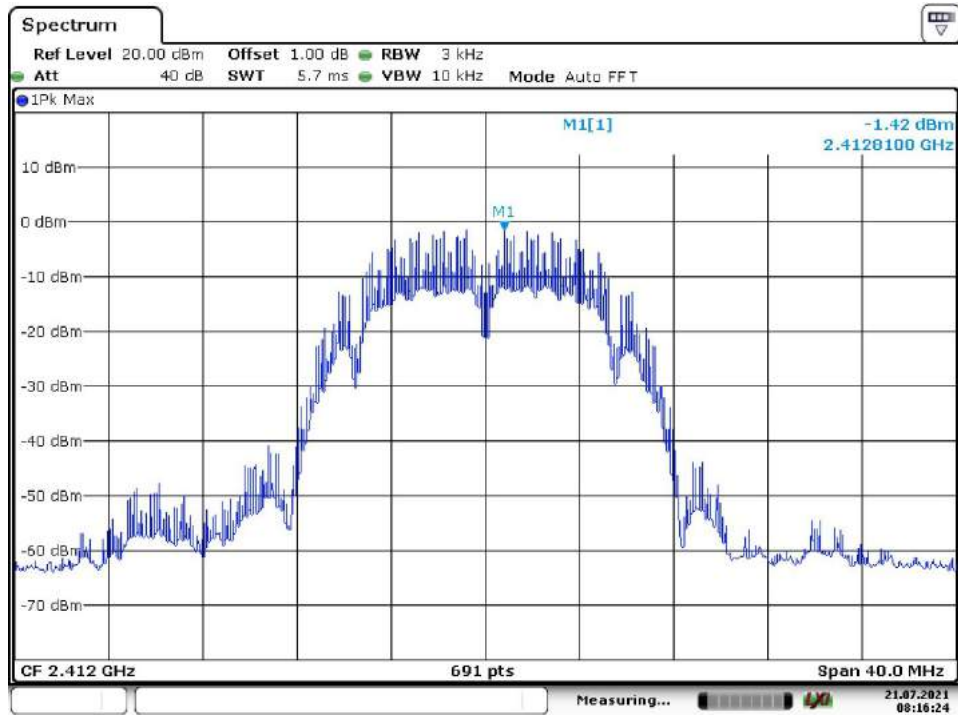
Appendix B: Test Results of Conducted Testing

APPENDIX B: TEST RESULTS OF CONDUCTED TESTING	1
APPENDIX B.1: CONDUCTED POWER SPECTRAL DENSITY	2
<i>Wi-Fi 802.11 b mode, 1 Mbps.....</i>	<i>2</i>
<i>Wi-Fi 802.11 g mode, 6 Mbps.....</i>	<i>3</i>
<i>Wi-Fi 802.11 n(HT20) mode, MCS0</i>	<i>5</i>
<i>Wi-Fi 802.11 n(HT40) mode, MCS0</i>	<i>6</i>
<i>Bluetooth Low Energy</i>	<i>8</i>
APPENDIX B.2: 99% BANDWIDTH	10
<i>Wi-Fi 802.11 b mode, 1 Mbps.....</i>	<i>10</i>
<i>Wi-Fi 802.11 g mode, 6 Mbps.....</i>	<i>11</i>
<i>Wi-Fi 802.11 n(HT20) mode, MCS0</i>	<i>13</i>
<i>Wi-Fi 802.11 n(HT40) mode, MCS0</i>	<i>14</i>
<i>Bluetooth Low Energy</i>	<i>16</i>
APPENDIX B.3: 6DB BANDWIDTH	18
<i>Wi-Fi 802.11 b mode, 1 Mbps.....</i>	<i>18</i>
<i>Wi-Fi 802.11 g mode, 6 Mbps.....</i>	<i>19</i>
<i>Wi-Fi 802.11 n(HT20) mode, MCS0</i>	<i>21</i>
<i>Wi-Fi 802.11 n(HT40) mode, MCS0</i>	<i>22</i>
<i>Bluetooth Low Energy</i>	<i>24</i>
APPENDIX B.4: CONDUCTED SPURIOUS EMISSIONS MEASURED IN 100 KHz BANDWIDTH	26
<i>Wi-Fi 802.11 b mode, 1 Mbps.....</i>	<i>26</i>
<i>Wi-Fi 802.11 g mode, 6 Mbps.....</i>	<i>29</i>
<i>Wi-Fi 802.11 n(HT20) mode, MCS0</i>	<i>32</i>
<i>Wi-Fi 802.11 n(HT40) mode, MCS0</i>	<i>35</i>
<i>Bluetooth Low Energy</i>	<i>38</i>
<i>Wi-Fi 802.11 b mode, Band Edge</i>	<i>41</i>
<i>Wi-Fi 802.11 g mode, Band Edge</i>	<i>42</i>
<i>Wi-Fi 802.11 n(HT20) mode, Band Edge</i>	<i>43</i>
<i>Wi-Fi 802.11 n(HT40) mode, Band Edge</i>	<i>44</i>
<i>Bluetooth Low Energy</i>	<i>45</i>

Appendix B.1: Conducted Power Spectral Density

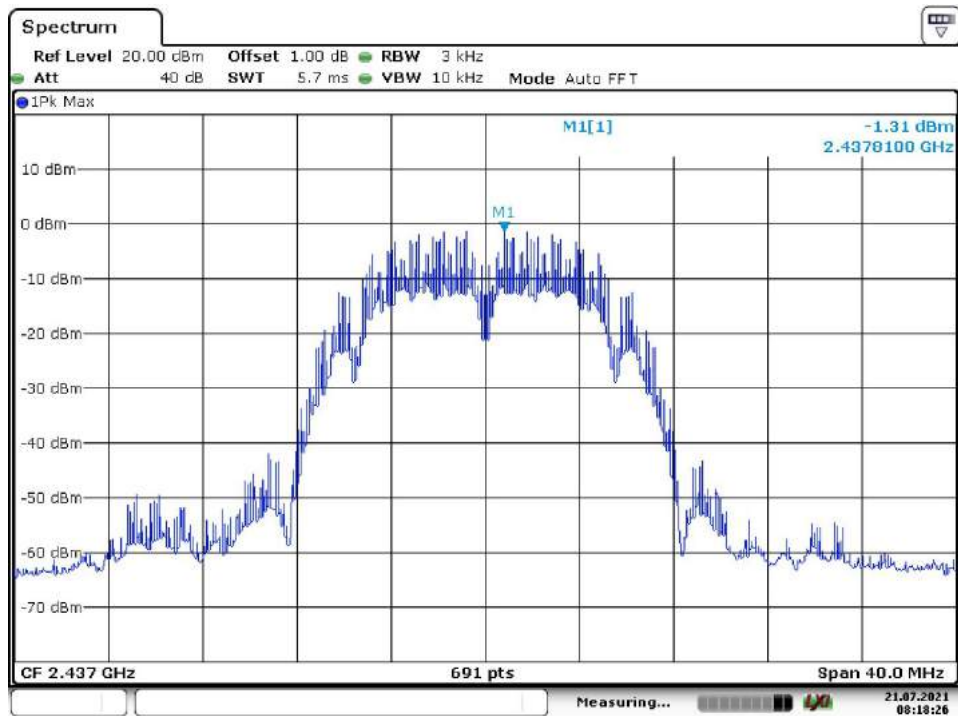
Wi-Fi 802.11 b mode, 1 Mbps

Low Channel



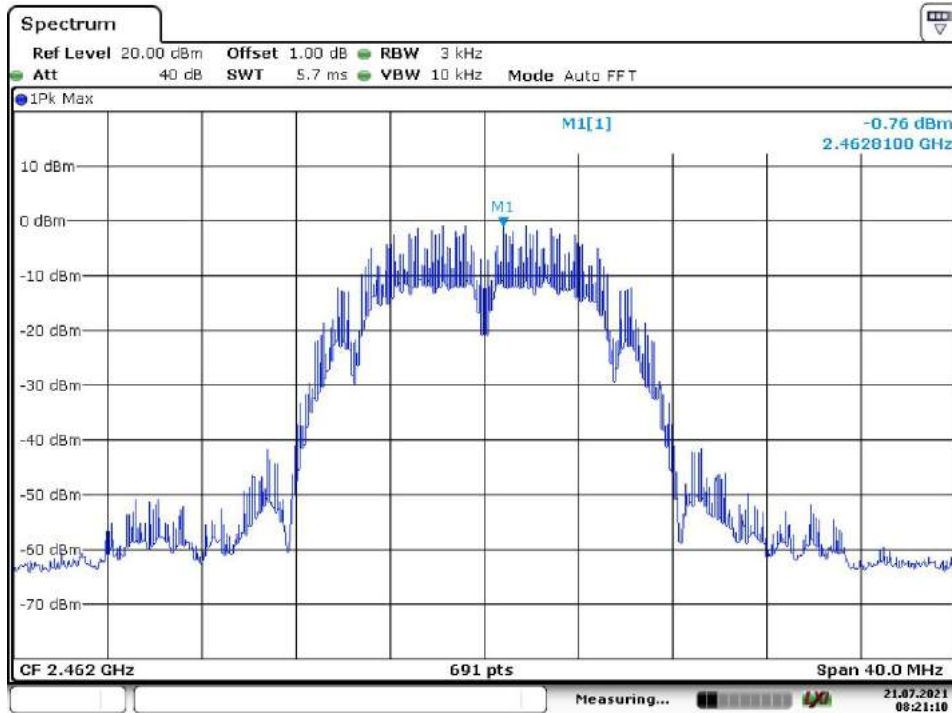
Date: 21.JUL.2021 08:16:24

Middle Channel



Date: 21.JUL.2021 08:18:26

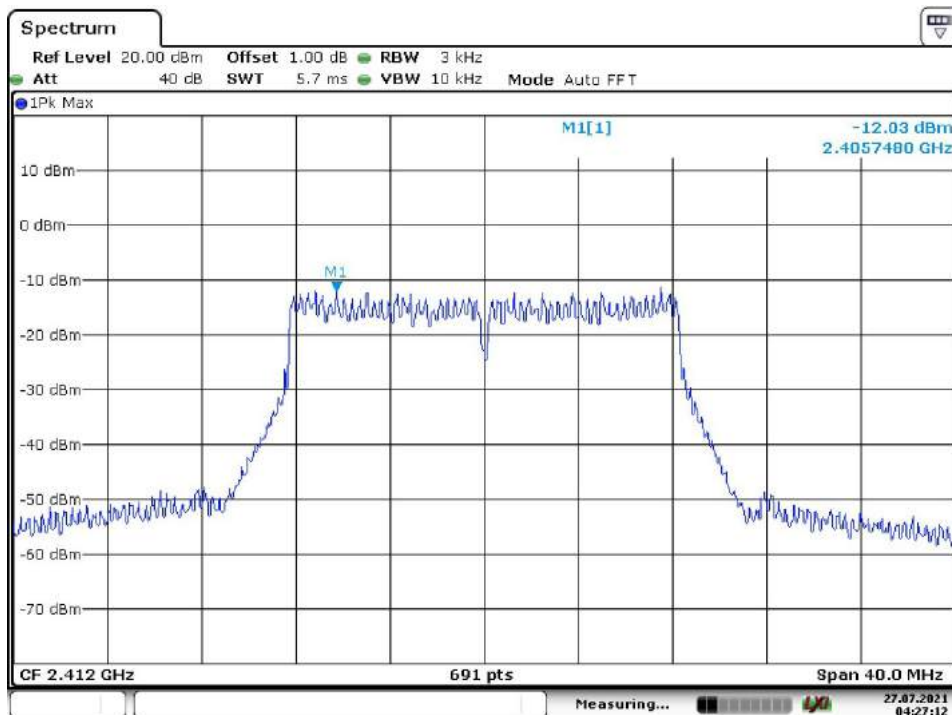
High Channel



Date: 21.JUL.2021 08:21:10

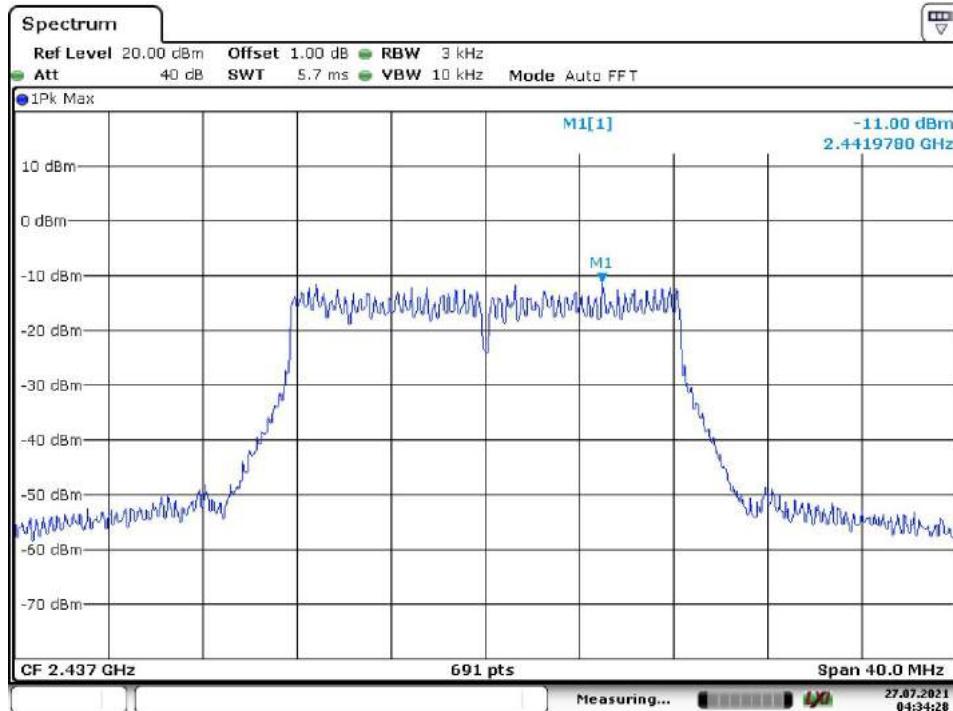
Wi-Fi 802.11 g mode, 6 Mbps

Low Channel



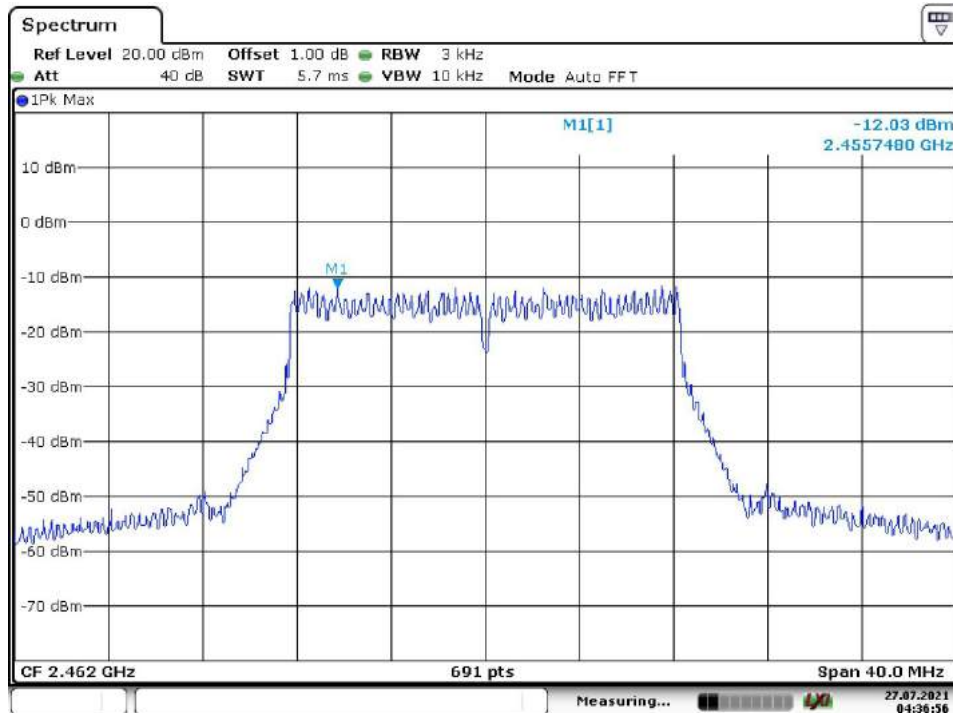
Date: 27.JUL.2021 04:27:12

Middle Channel



Date: 27.JUL.2021 04:34:28

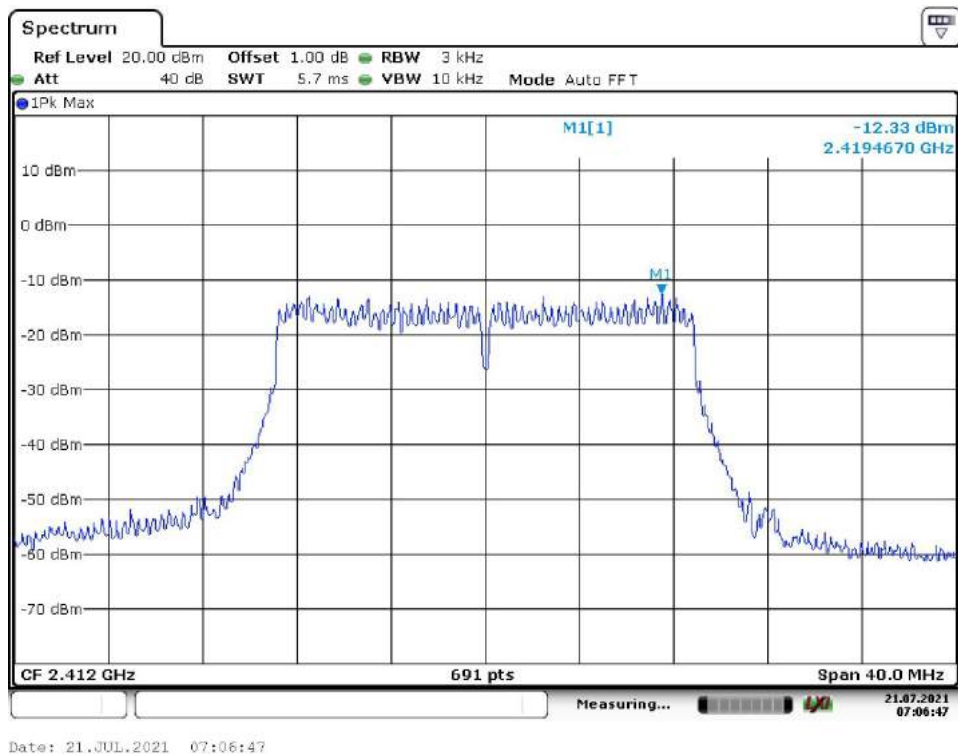
High Channel



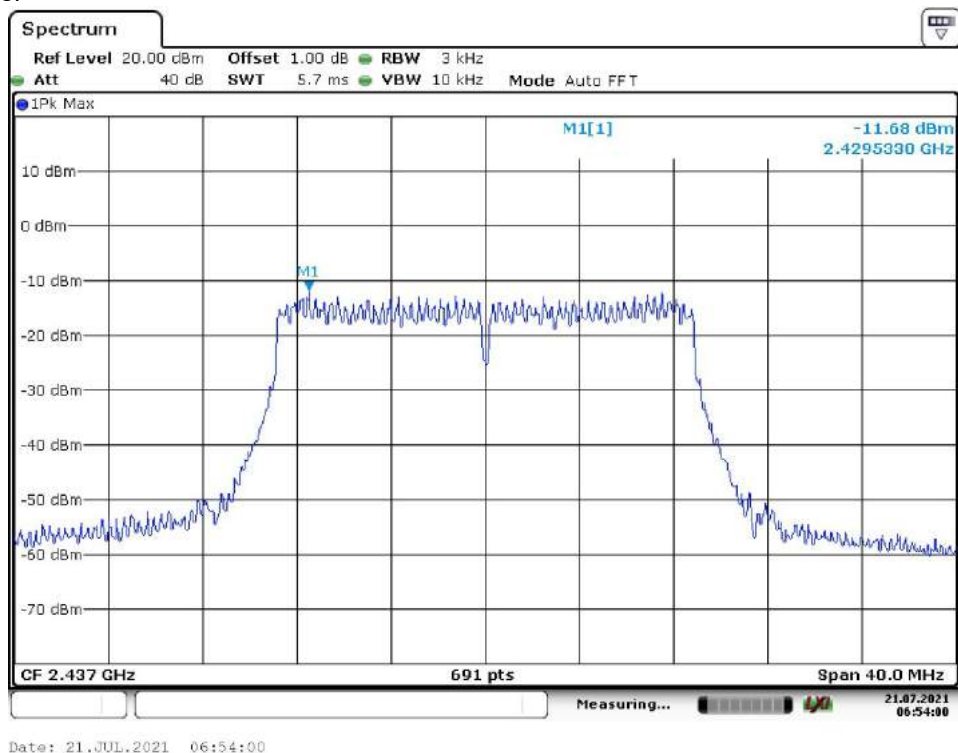
Date: 27.JUL.2021 04:36:56

Wi-Fi 802.11 n(HT20) mode, MCS0

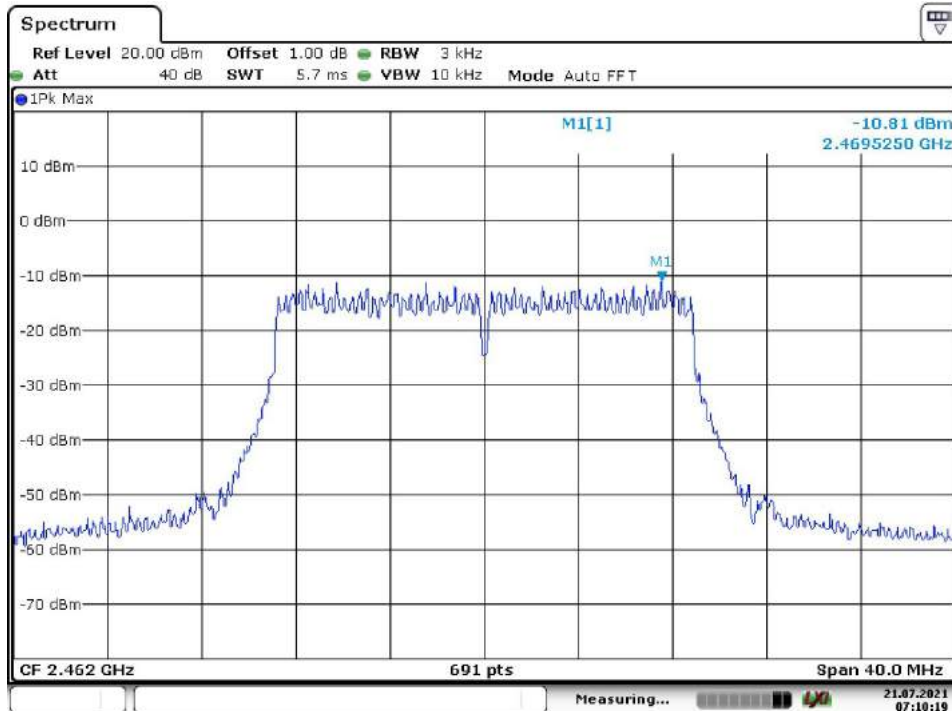
Low Channel



Middle Channel



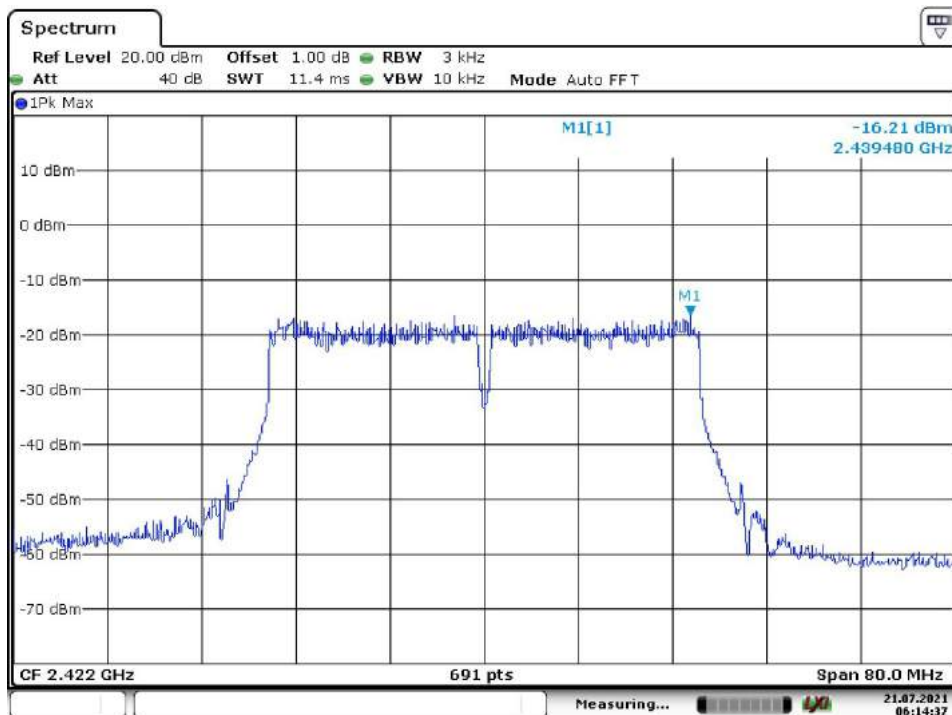
High Channel



Date: 21.JUL.2021 07:10:19

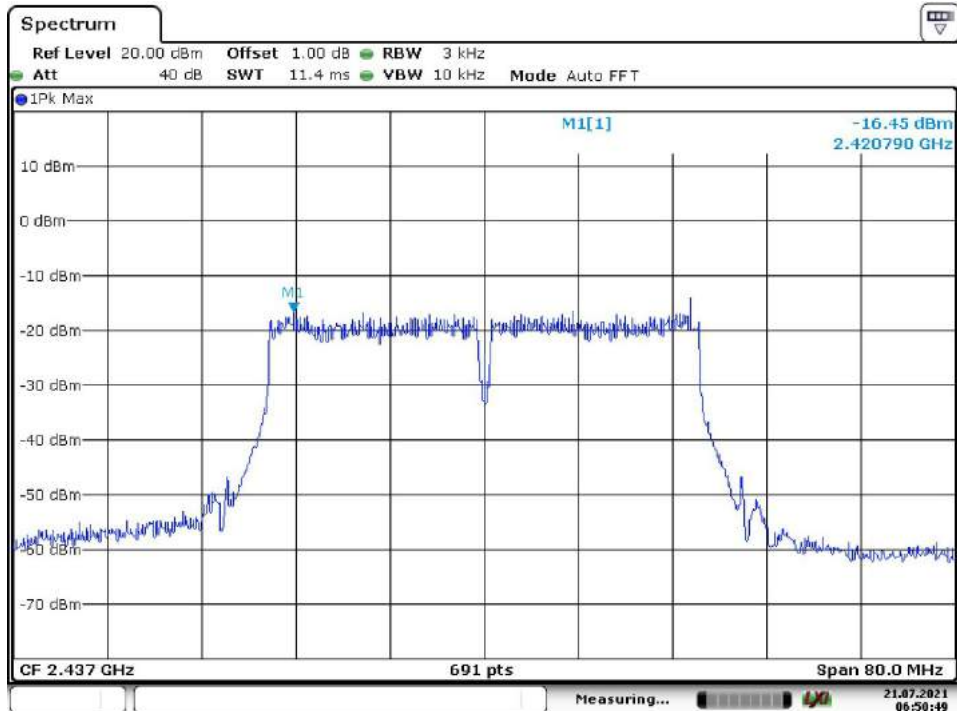
Wi-Fi 802.11 n(HT40) mode, MCS0

Low Channel



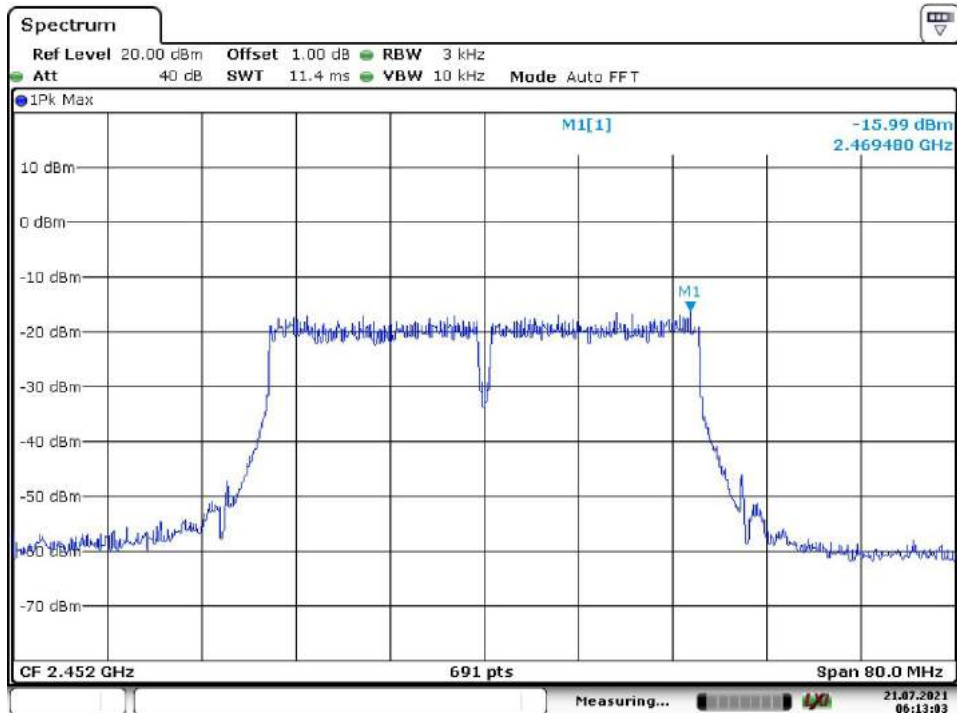
Date: 21.JUL.2021 06:14:37

Middle Channel



Date: 21.JUL.2021 06:50:49

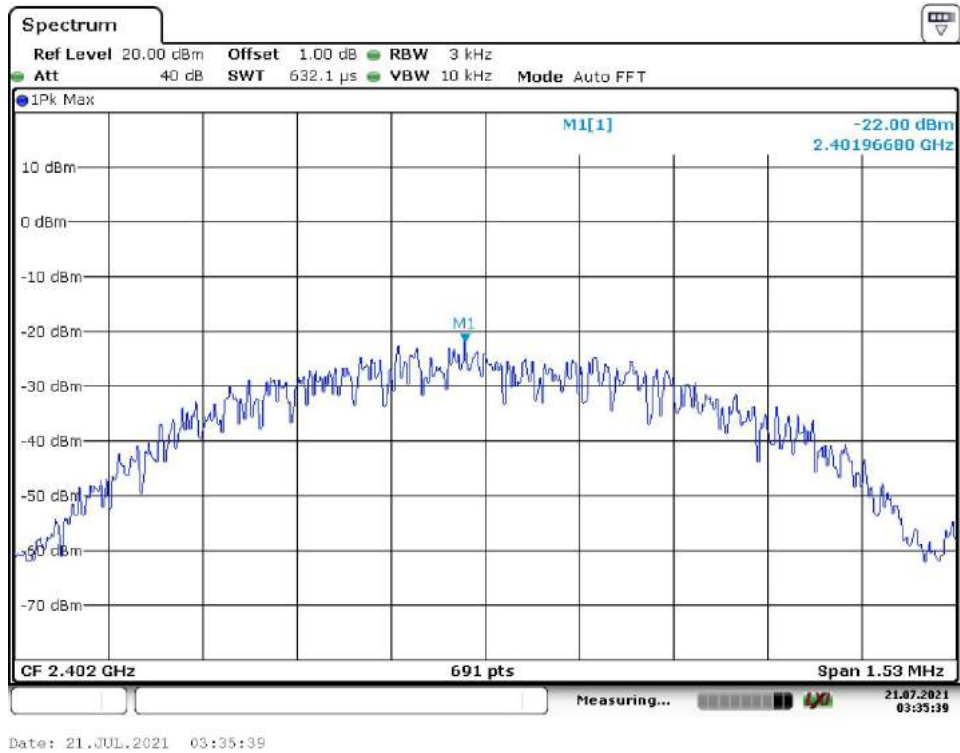
High Channel



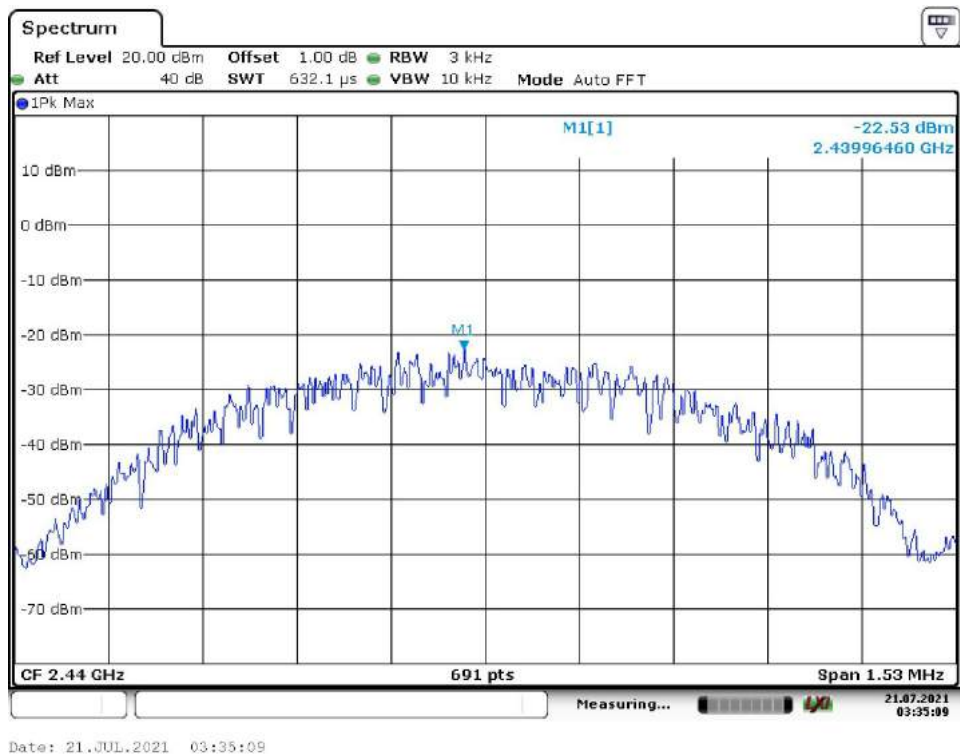
Date: 21.JUL.2021 06:13:03

Bluetooth Low Energy

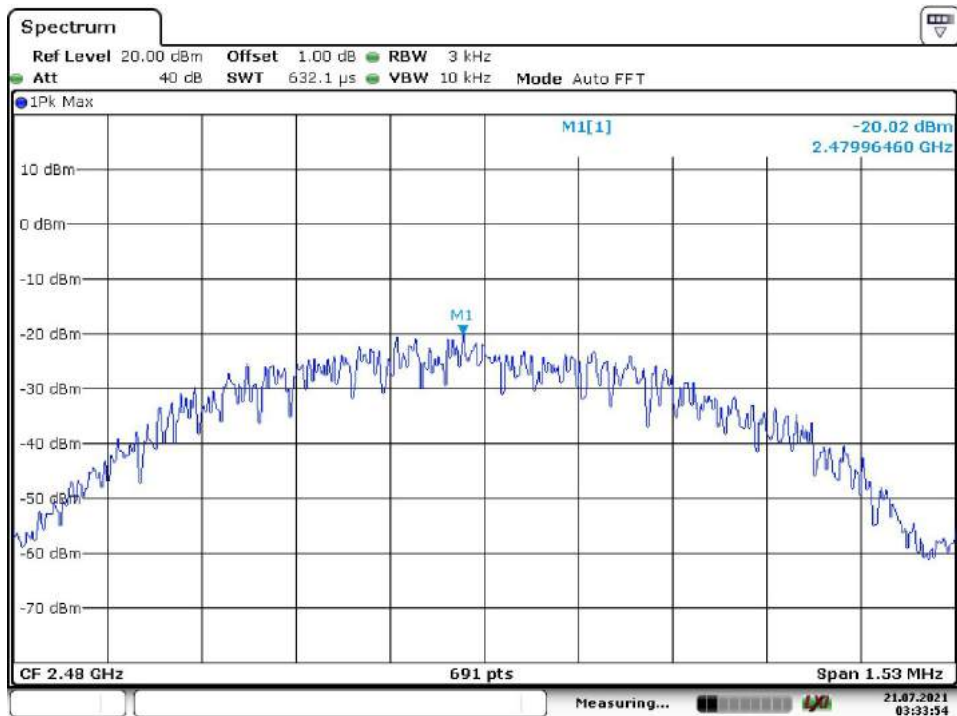
Low Channel



Middle Channel



High Channel



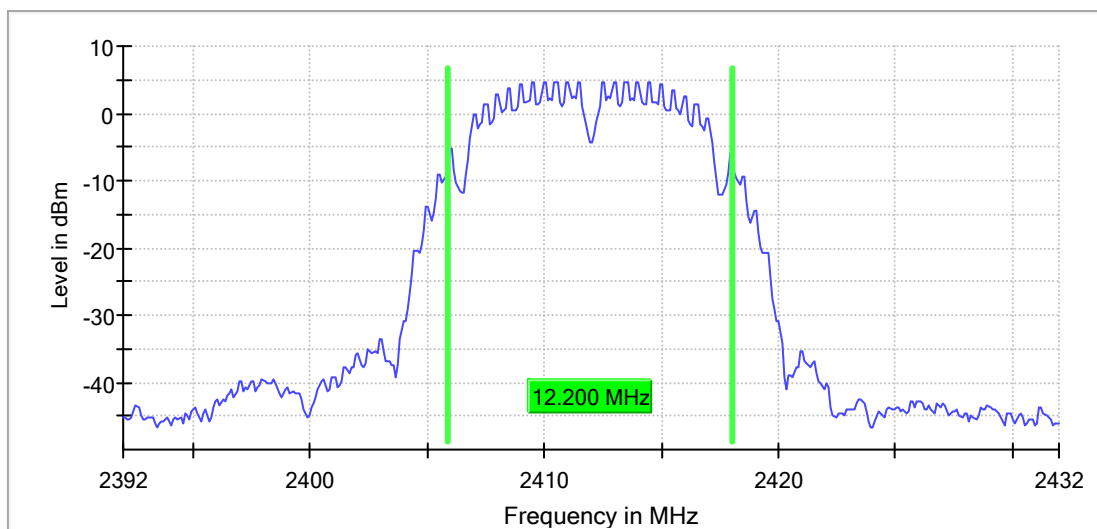
Date: 21.JUL.2021 03:33:54

Appendix B.2: 99% Bandwidth

Wi-Fi 802.11 b mode, 1 Mbps

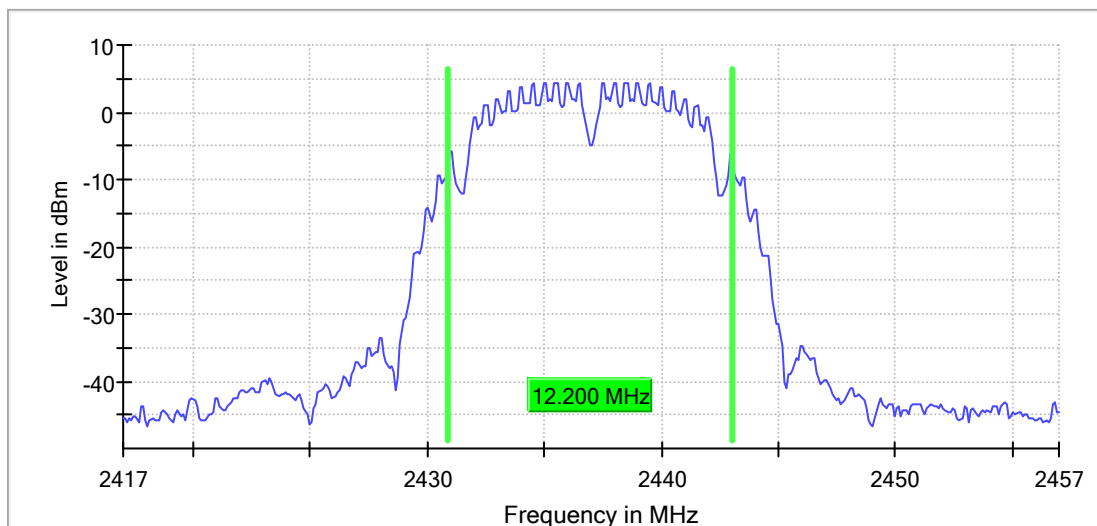
Low Channel
RBW=200KHz, VBW=1MHz

99 % Bandwidth



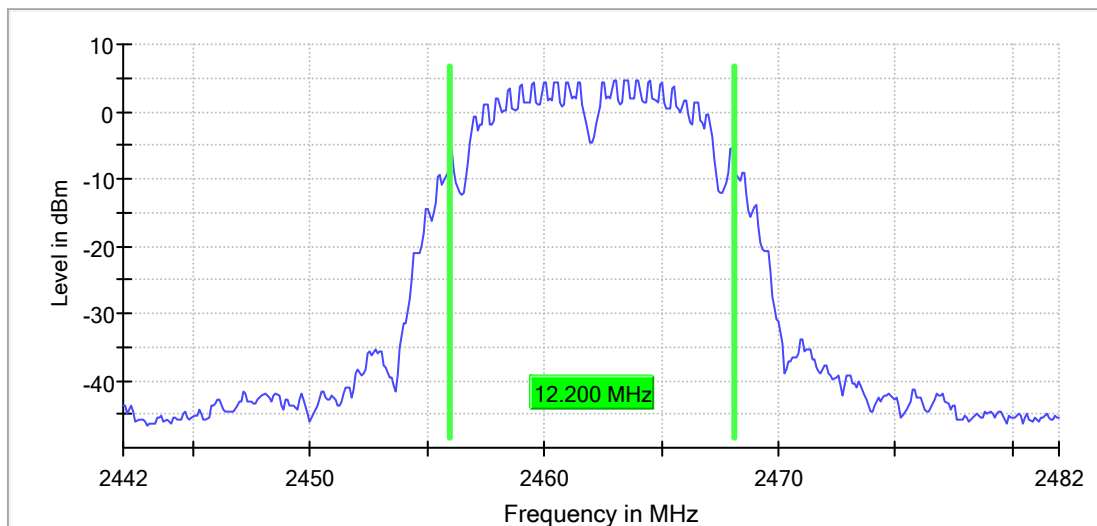
Middle Channel
RBW=200KHz, VBW=1MHz

99 % Bandwidth



High Channel
RBW=200KHz, VBW=1MHz

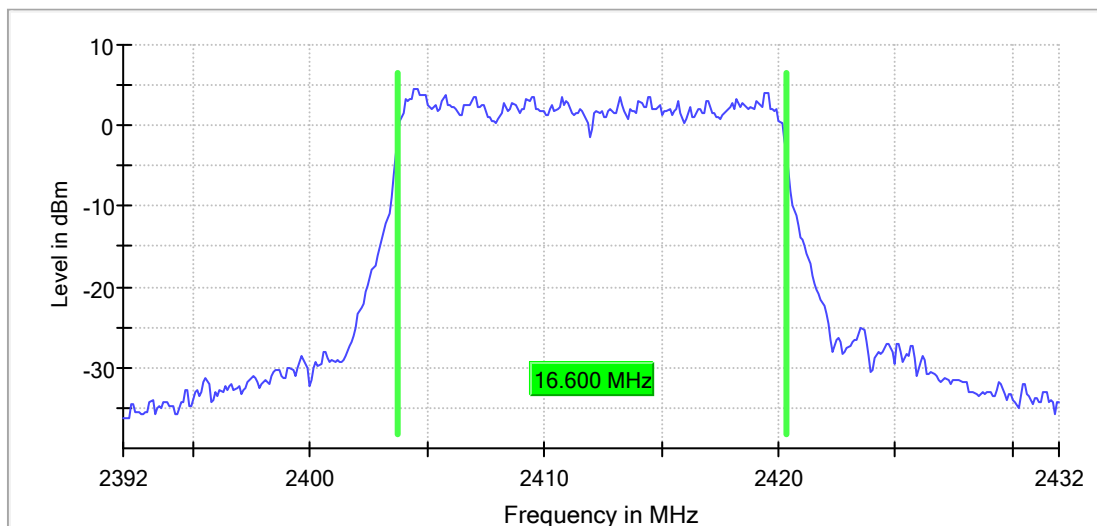
99 % Bandwidth



Wi-Fi 802.11 g mode, 6 Mbps

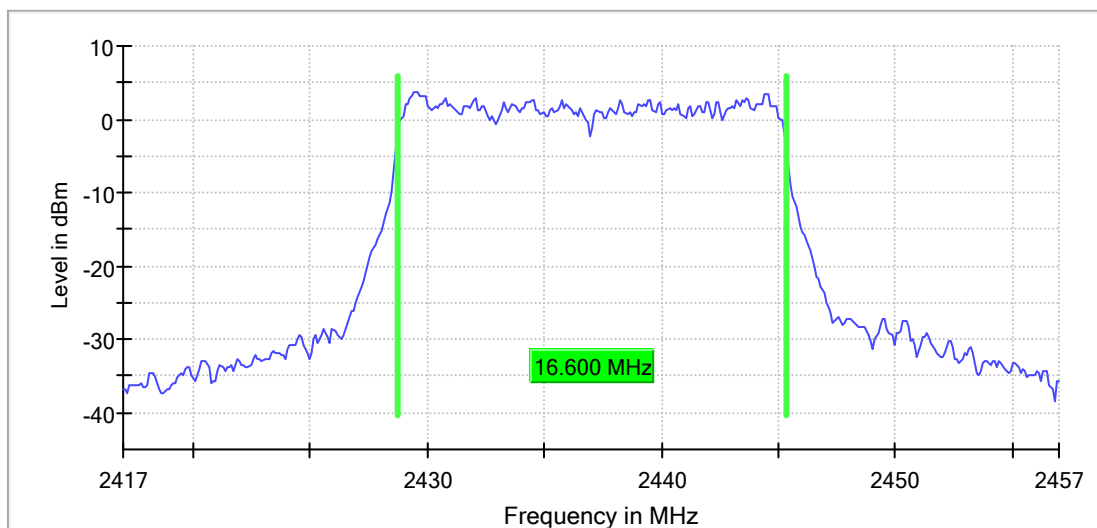
Low Channel
RBW=200KHz, VBW=1MHz

99 % Bandwidth



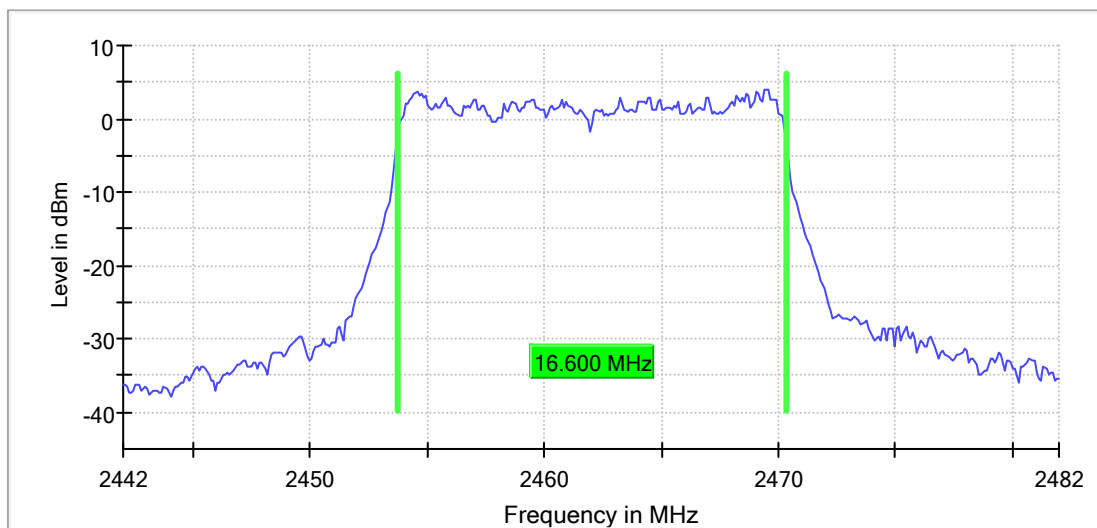
Middle Channel
RBW=200KHz, VBW=1MHz

99 % Bandwidth



High Channel
RBW=200KHz, VBW=1MHz

99 % Bandwidth

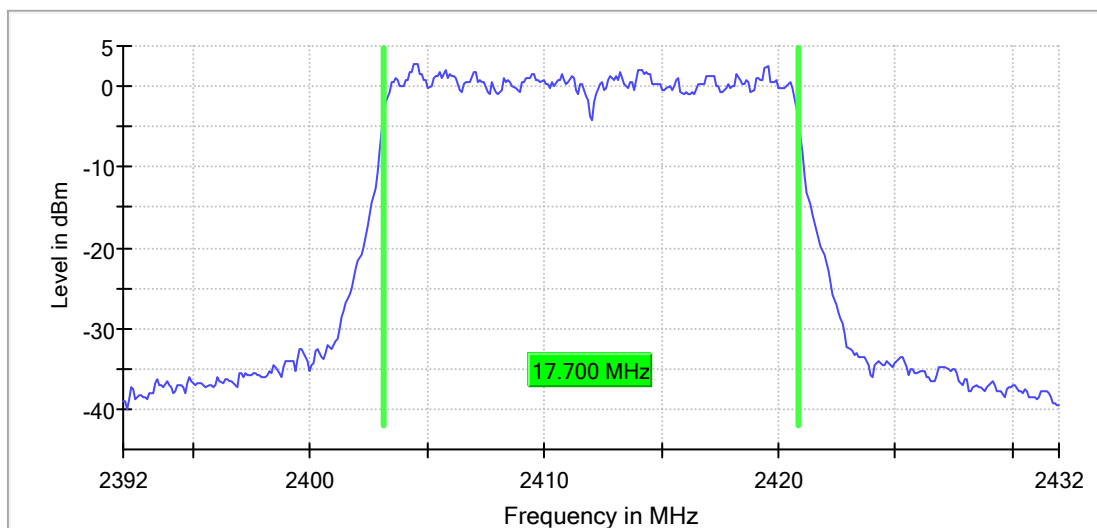


Wi-Fi 802.11 n(HT20) mode, MCS0

Low Channel

RBW=200KHz, VBW=1MHz

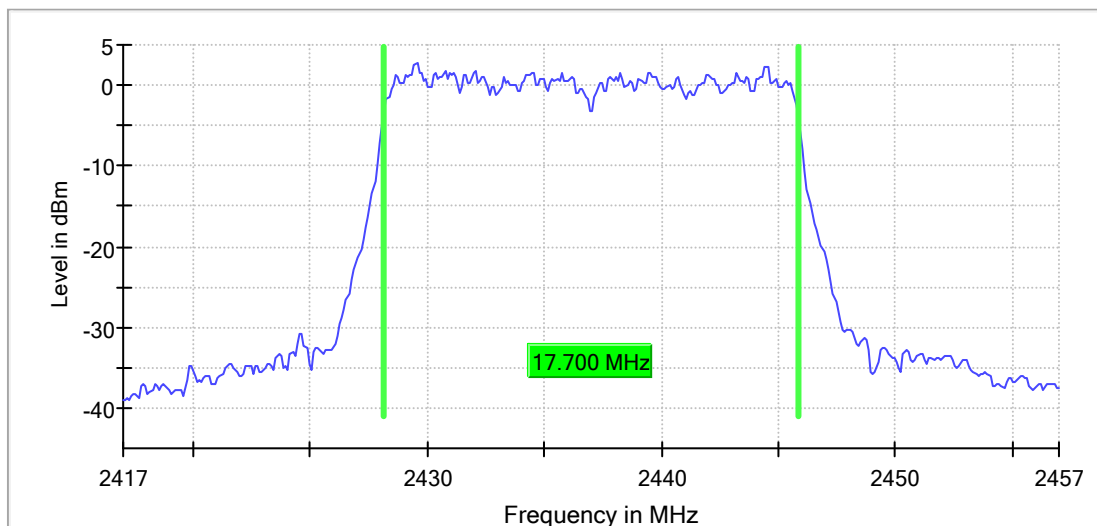
99 % Bandwidth



Middle Channel

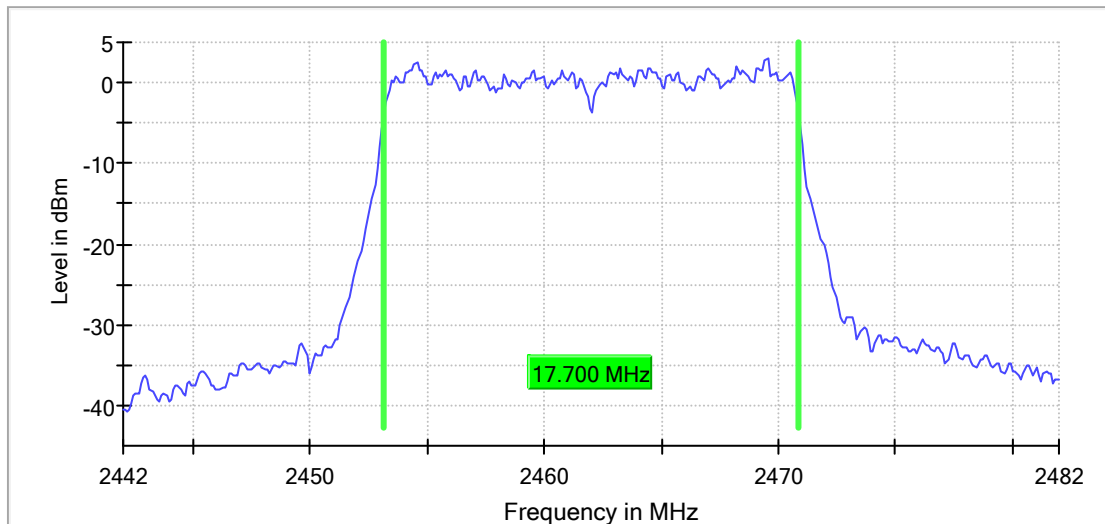
RBW=200KHz, VBW=1MHz

99 % Bandwidth



High Channel
RBW=200KHz, VBW=1MHz

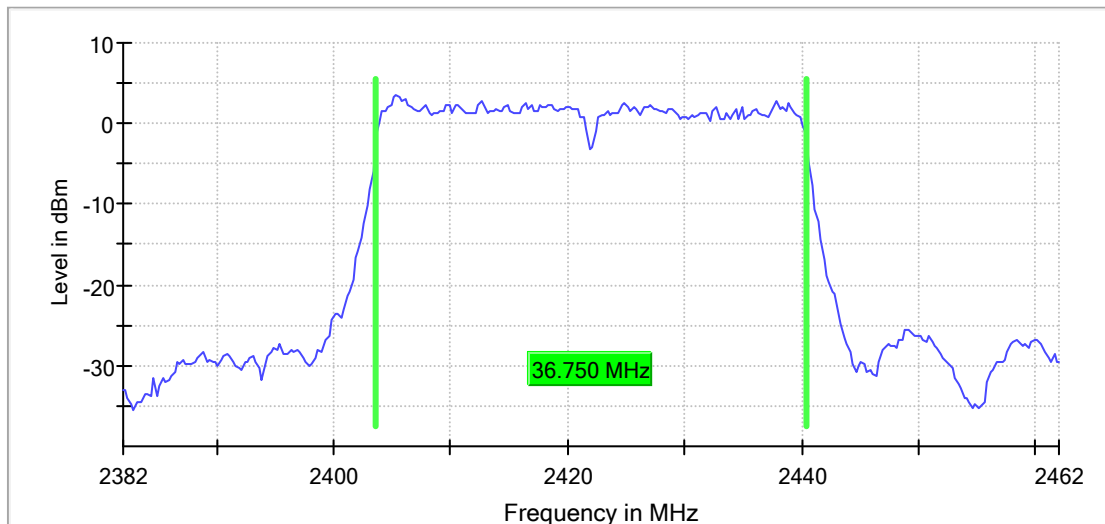
99 % Bandwidth



Wi-Fi 802.11 n(HT40) mode, MCS0

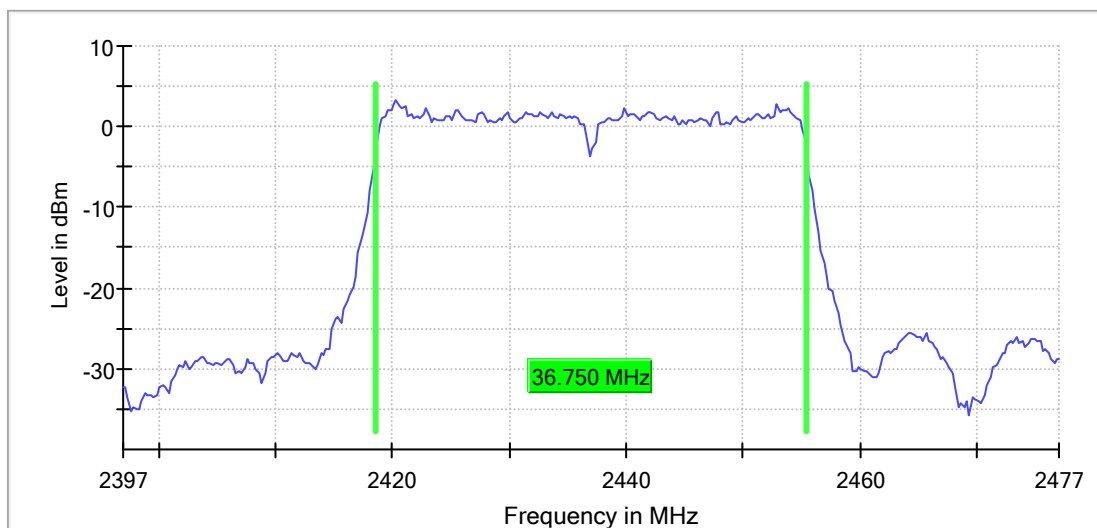
Low Channel
RBW=500KHz, VBW=2MHz

99 % Bandwidth



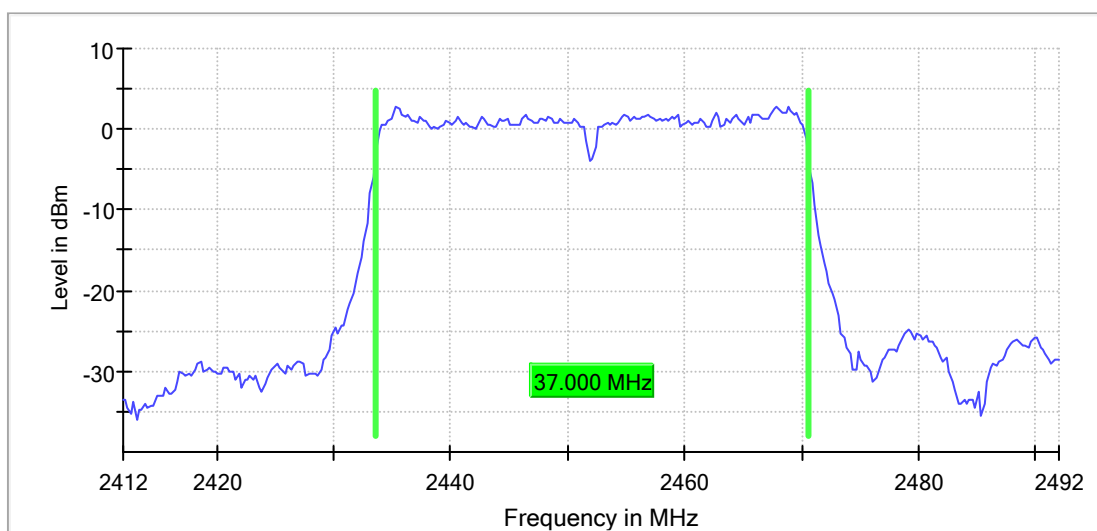
Middle Channel
RBW=500KHz, VBW=2MHz

99 % Bandwidth



High Channel
RBW=500KHz, VBW=2MHz

99 % Bandwidth

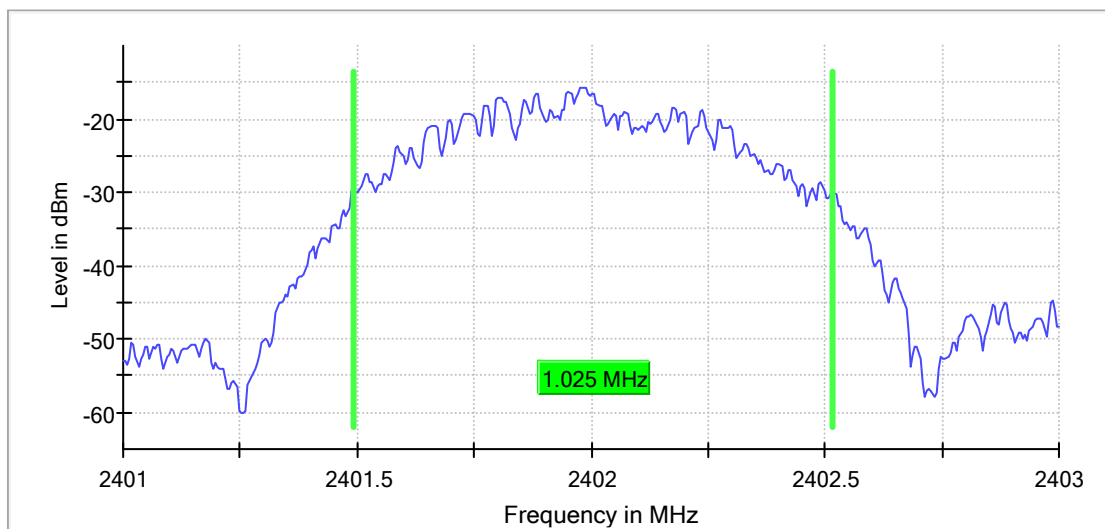


Bluetooth Low Energy

Low Channel

RBW=30KHz, VBW=100KHz

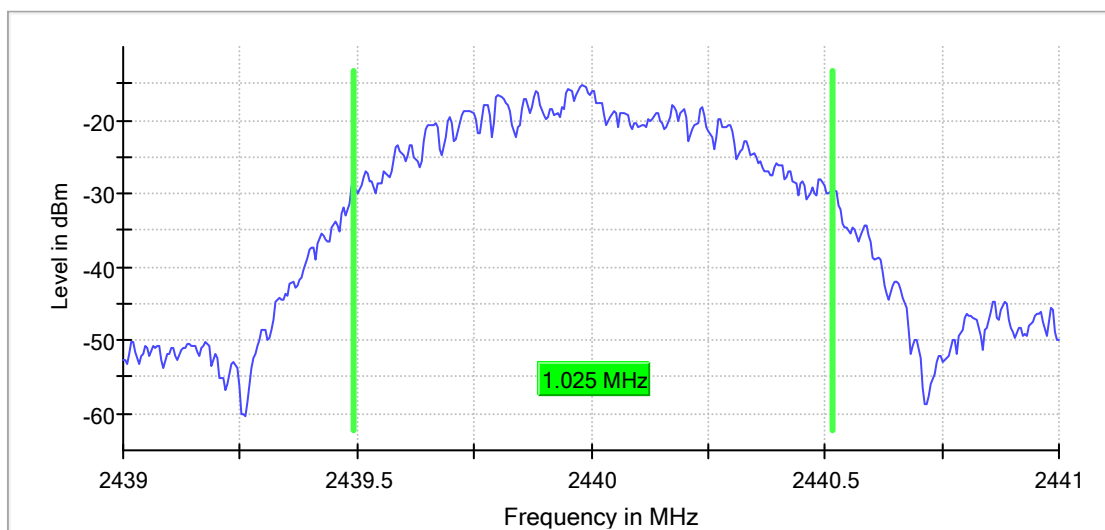
99 % Bandwidth



Middle Channel

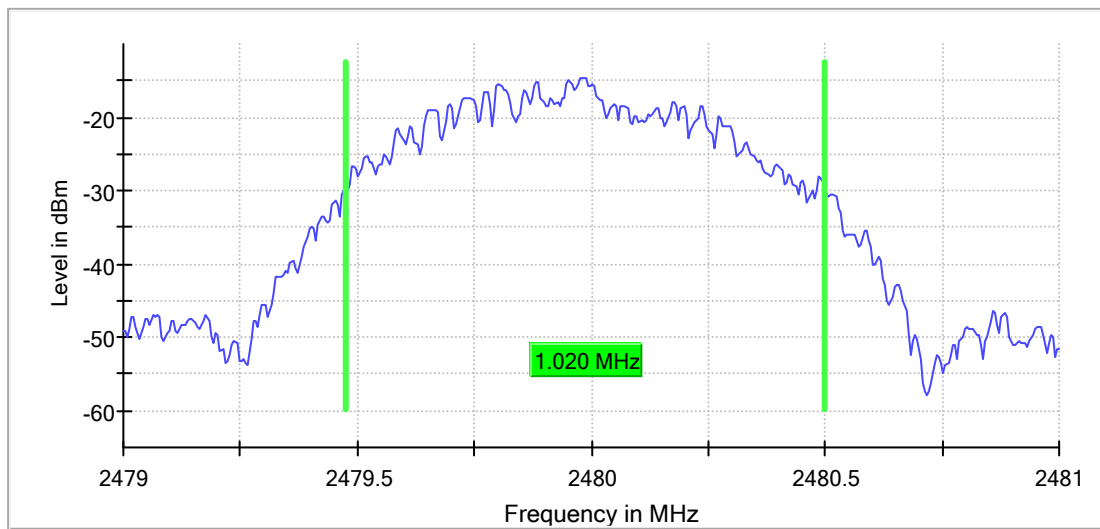
RBW=30KHz, VBW=100KHz

99 % Bandwidth



High Channel
RBW=30KHz, VBW=100KHz

99 % Bandwidth

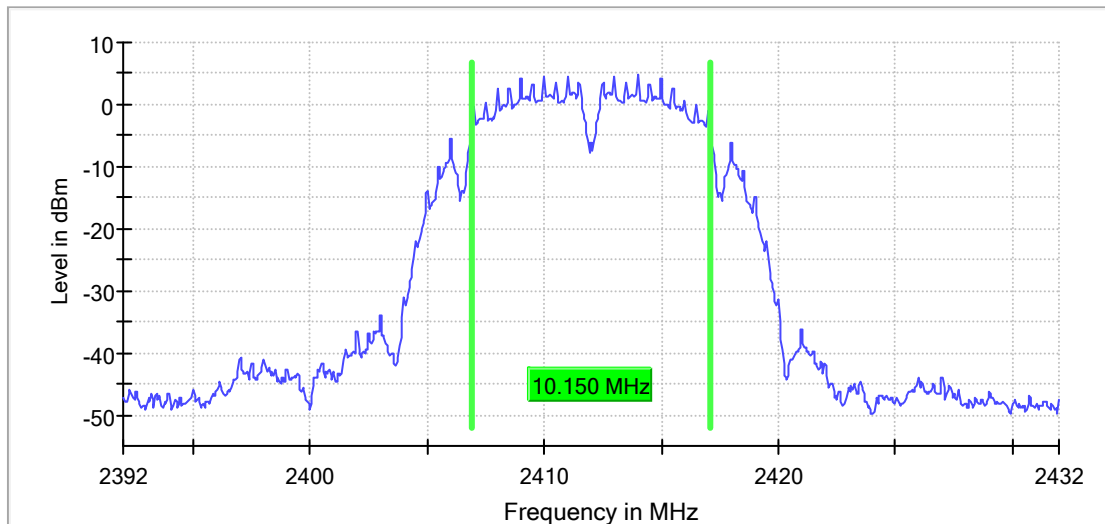


Appendix B.3: 6dB Bandwidth

Wi-Fi 802.11 b mode, 1 Mbps

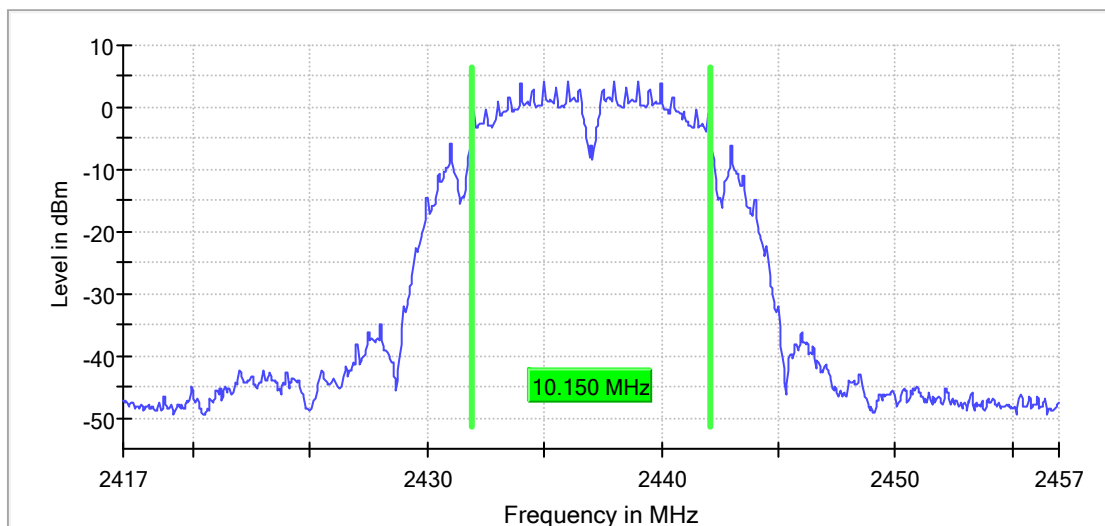
Low Channel
RBW=100KHz, VBW=300KHz

6 dB Bandwidth



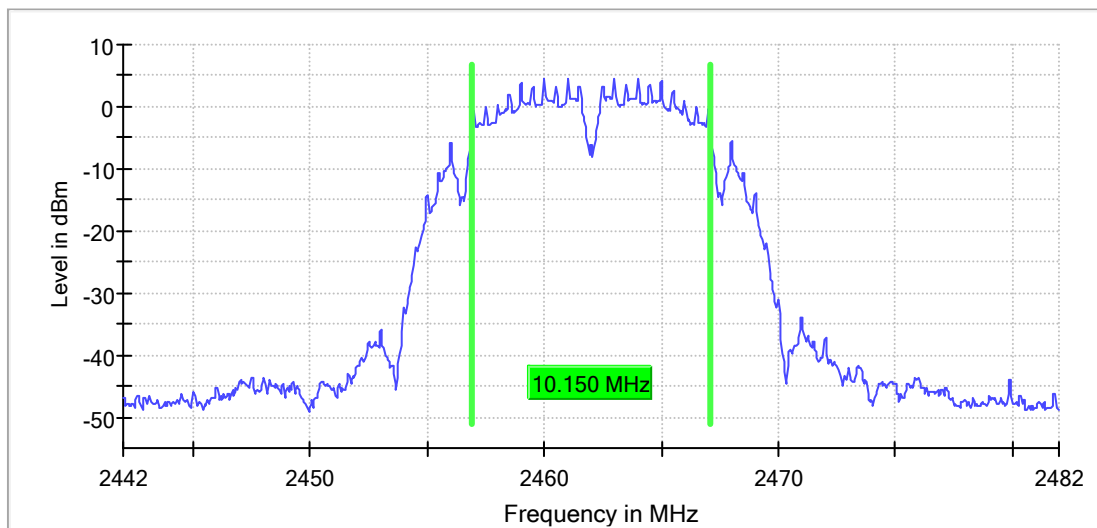
Middle Channel
RBW=100KHz, VBW=300KHz

6 dB Bandwidth



High Channel
RBW=100KHz, VBW=300KHz

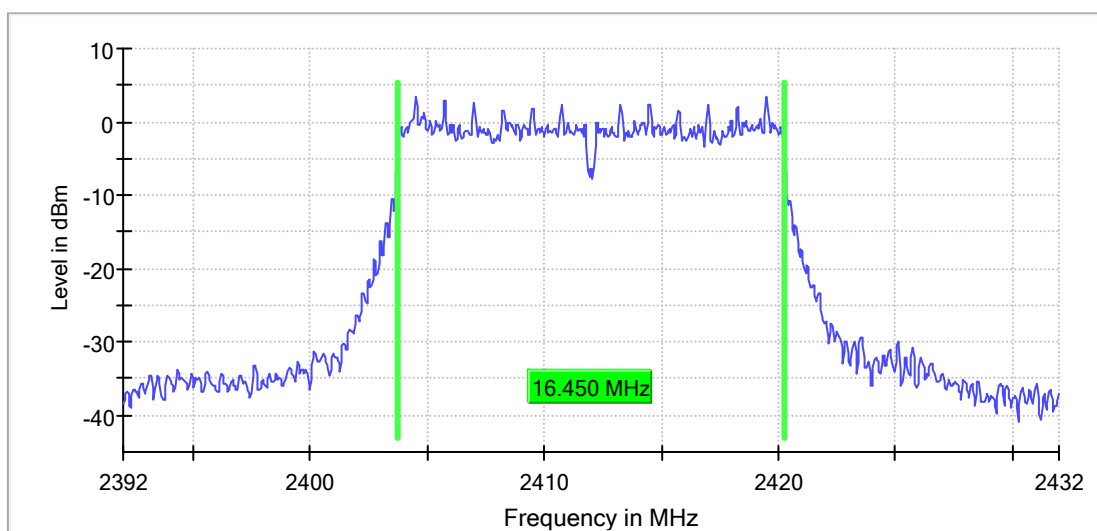
6 dB Bandwidth



Wi-Fi 802.11 g mode, 6 Mbps

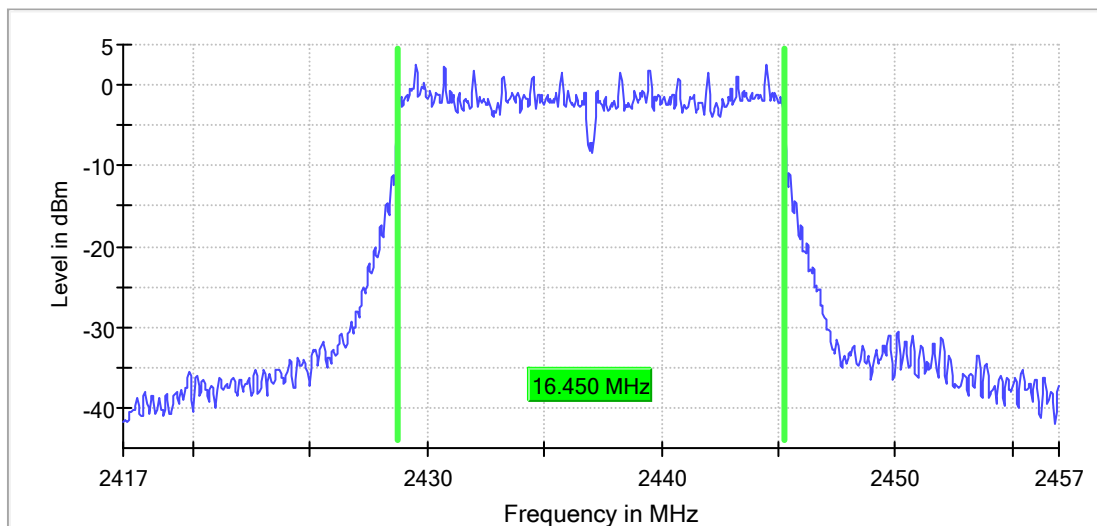
Low Channel
RBW=100KHz, VBW=300KHz

6 dB Bandwidth



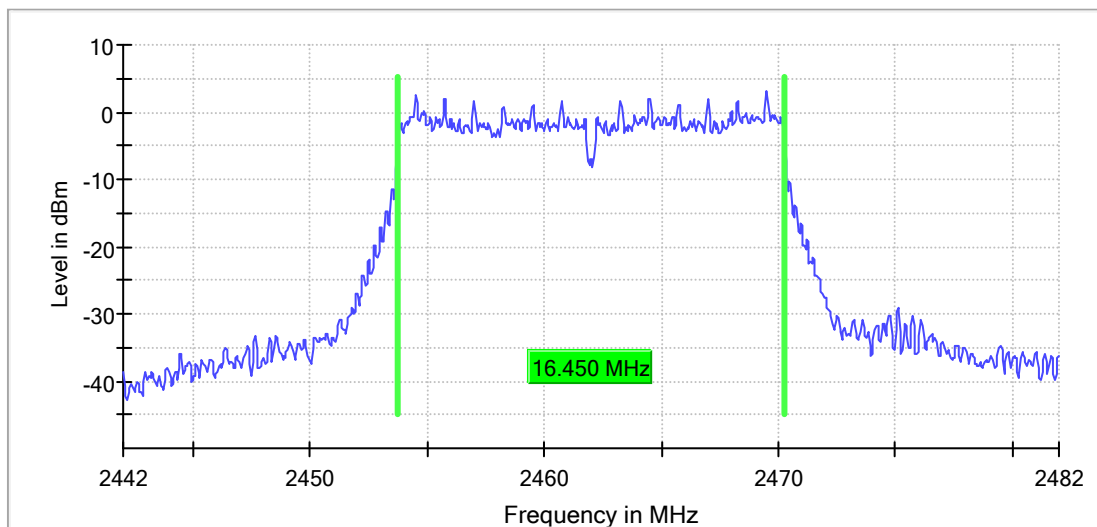
Middle Channel
RBW=100KHz, VBW=300KHz

6 dB Bandwidth



High Channel
RBW=100KHz, VBW=300KHz

6 dB Bandwidth

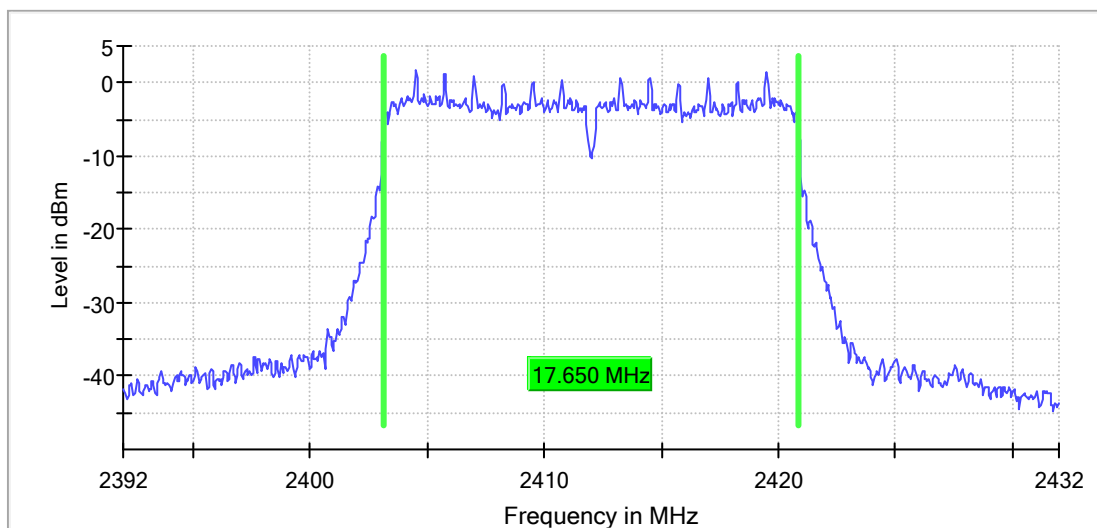


Wi-Fi 802.11 n(HT20) mode, MCS0

Low Channel

RBW=100KHz, VBW=300KHz

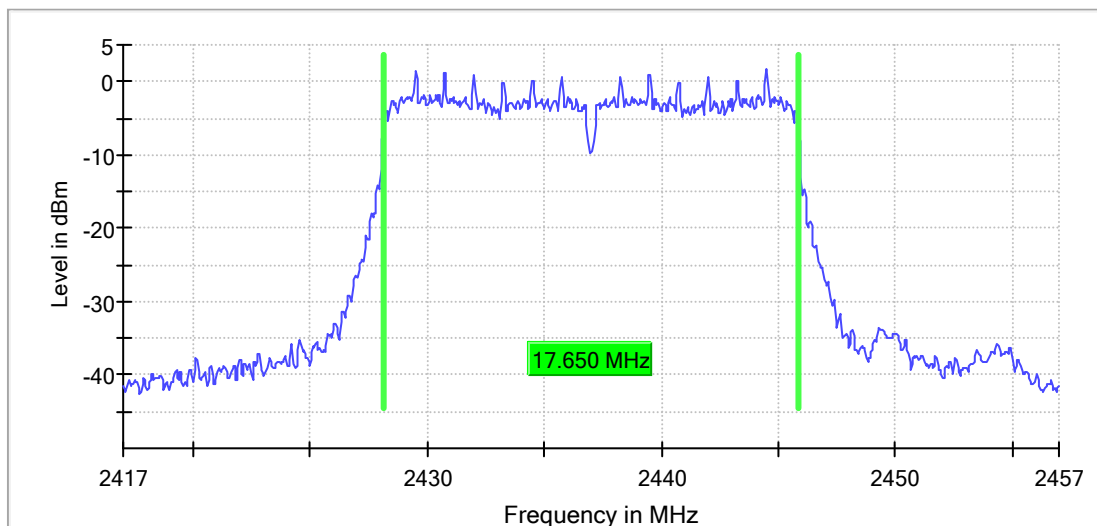
6 dB Bandwidth



Middle Channel

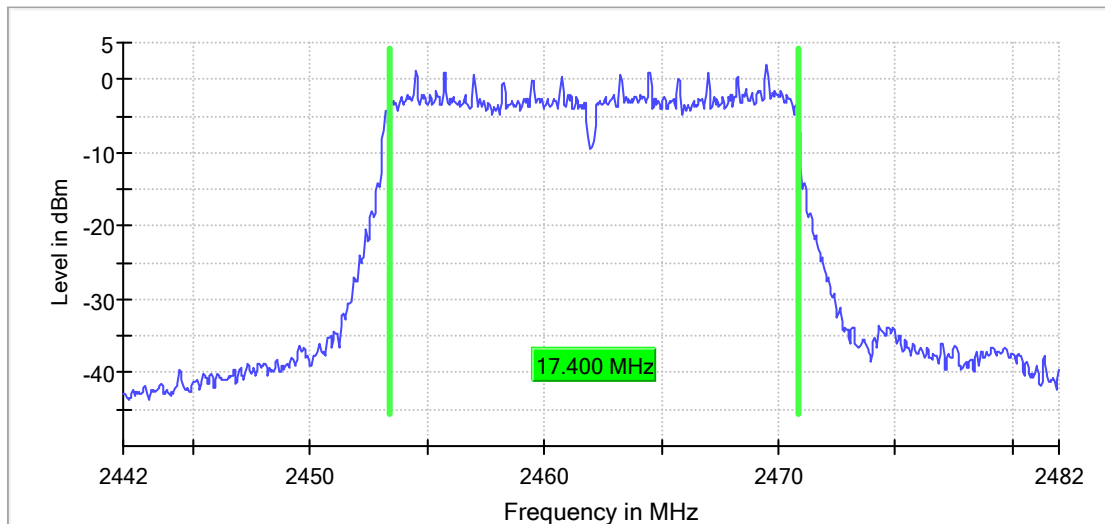
RBW=100KHz, VBW=300KHz

6 dB Bandwidth



High Channel
RBW=100KHz, VBW=300KHz

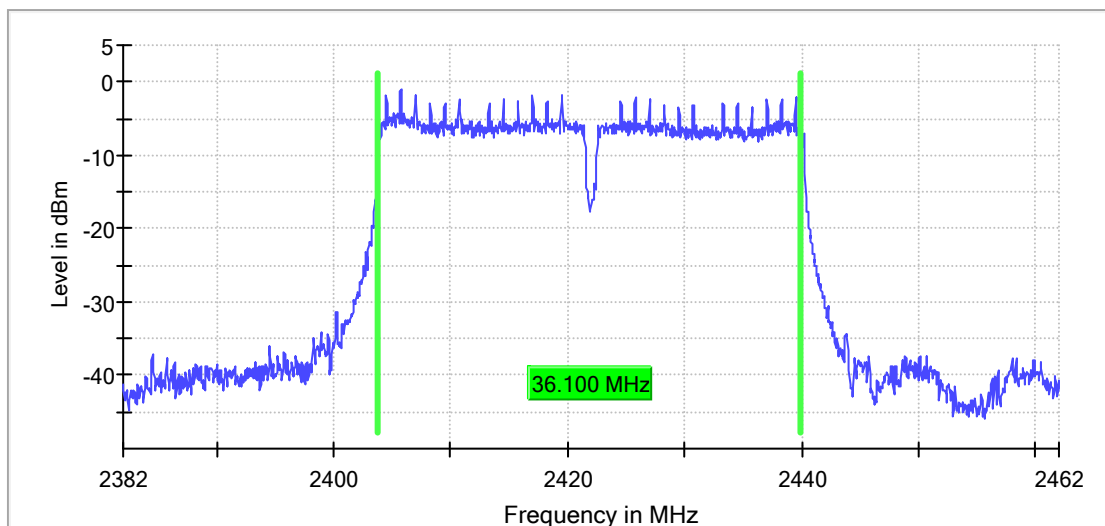
6 dB Bandwidth



Wi-Fi 802.11 n(HT40) mode, MCS0

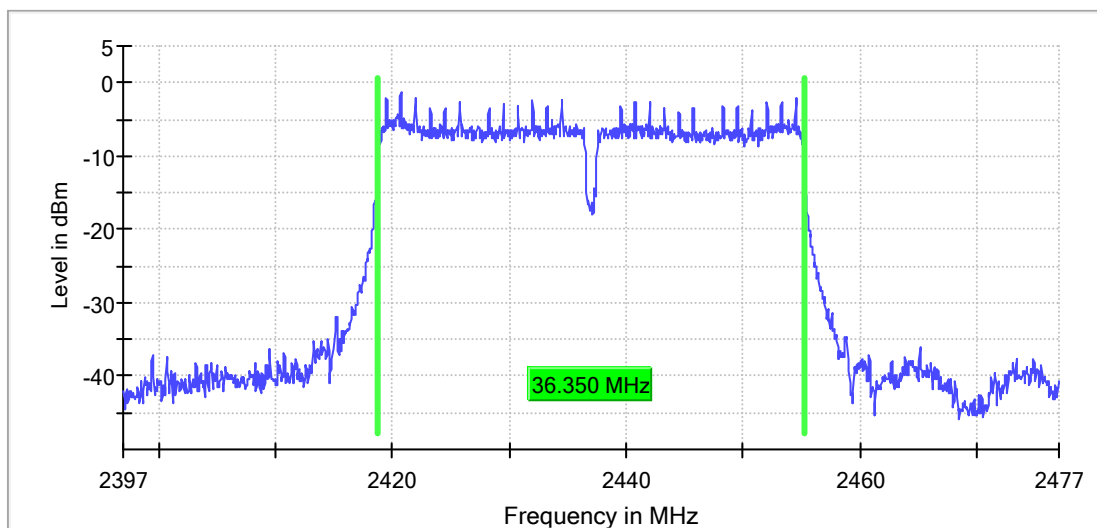
Low Channel
RBW=100KHz, VBW=300KHz

6 dB Bandwidth



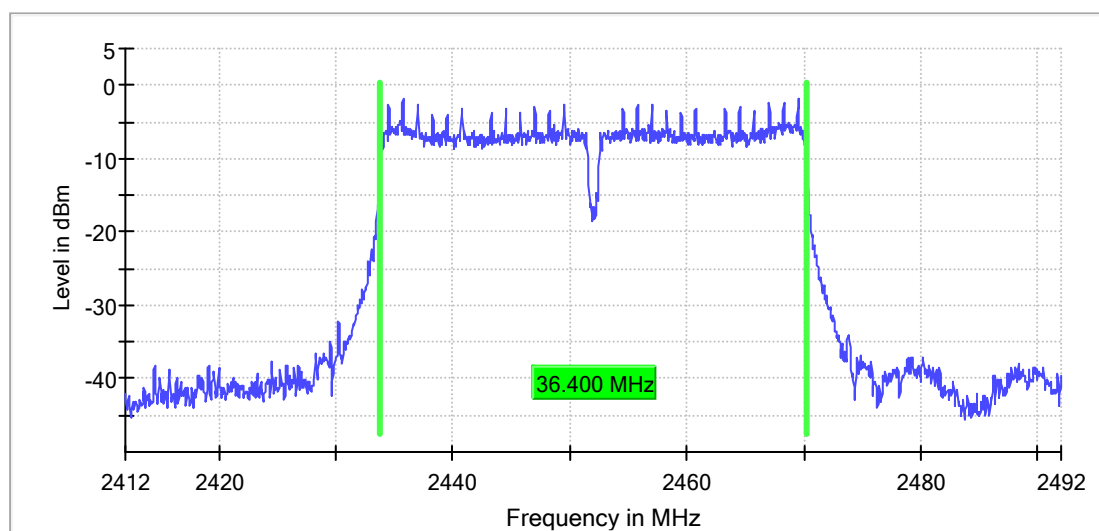
Middle Channel
RBW=100KHz, VBW=300KHz

6 dB Bandwidth



High Channel
RBW=100KHz, VBW=300KHz

6 dB Bandwidth

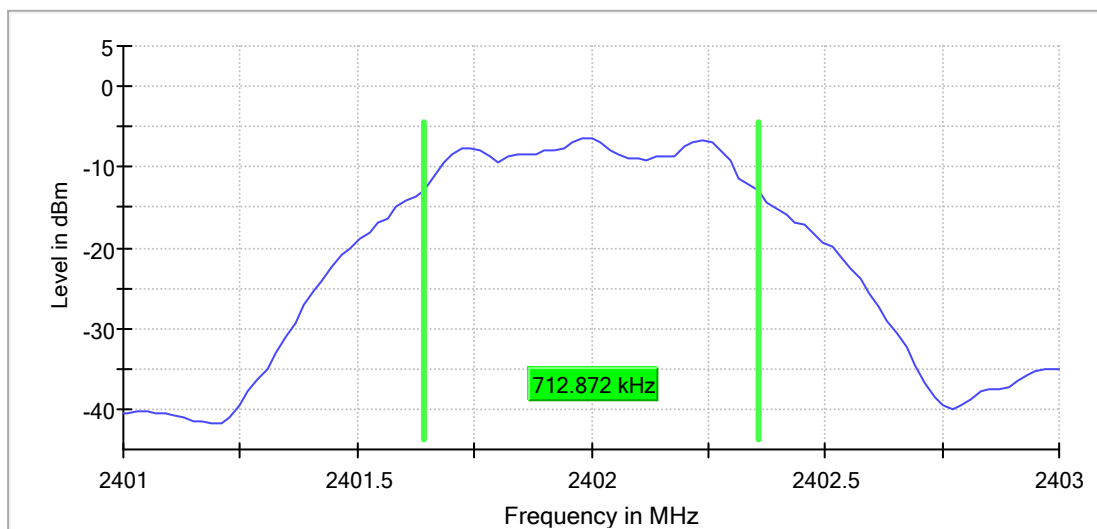


Bluetooth Low Energy

Low Channel

RBW=100KHz, VBW=300KHz

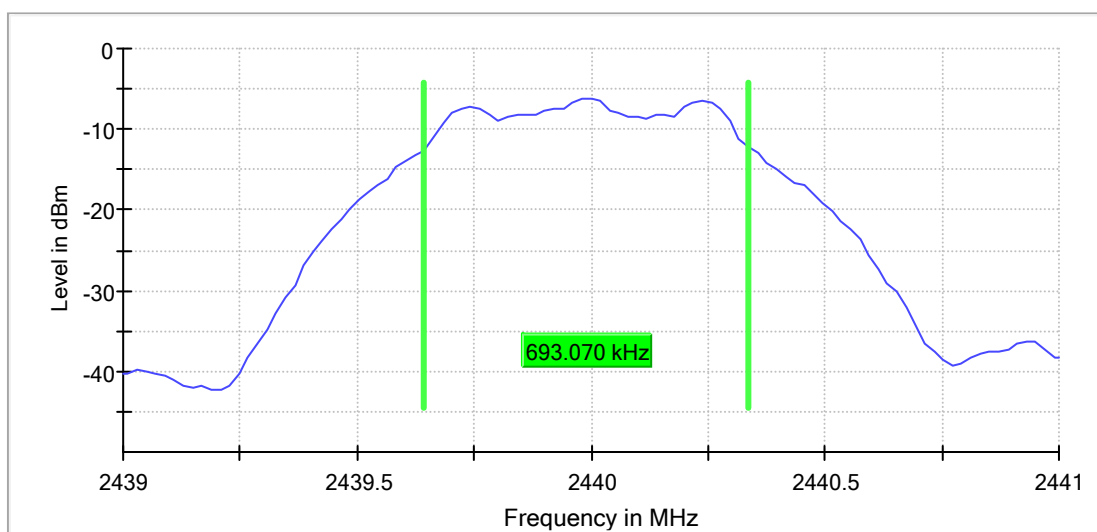
6 dB Bandwidth



Middle Channel

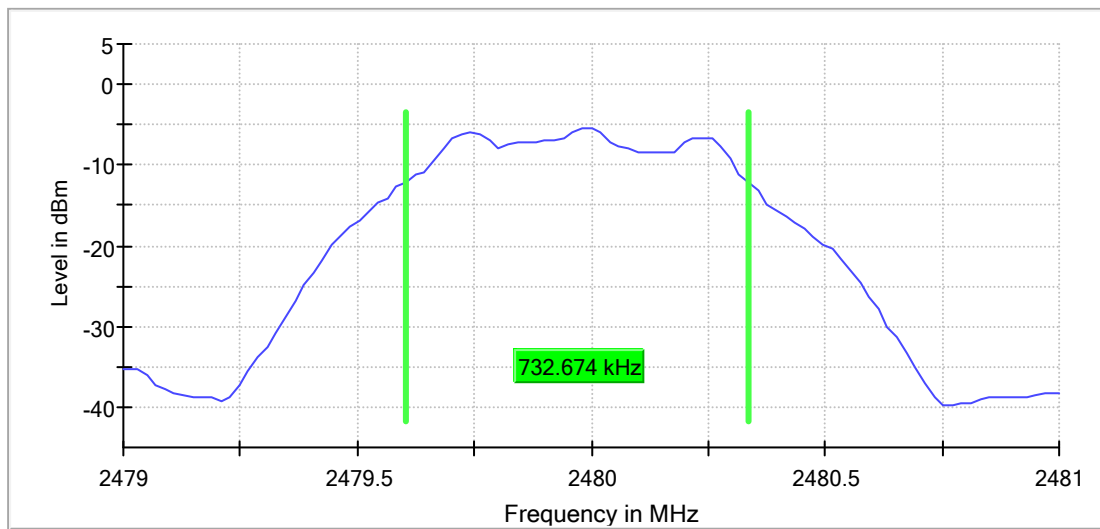
RBW=100KHz, VBW=300KHz

6 dB Bandwidth



High Channel
RBW=100KHz, VBW=300KHz

6 dB Bandwidth

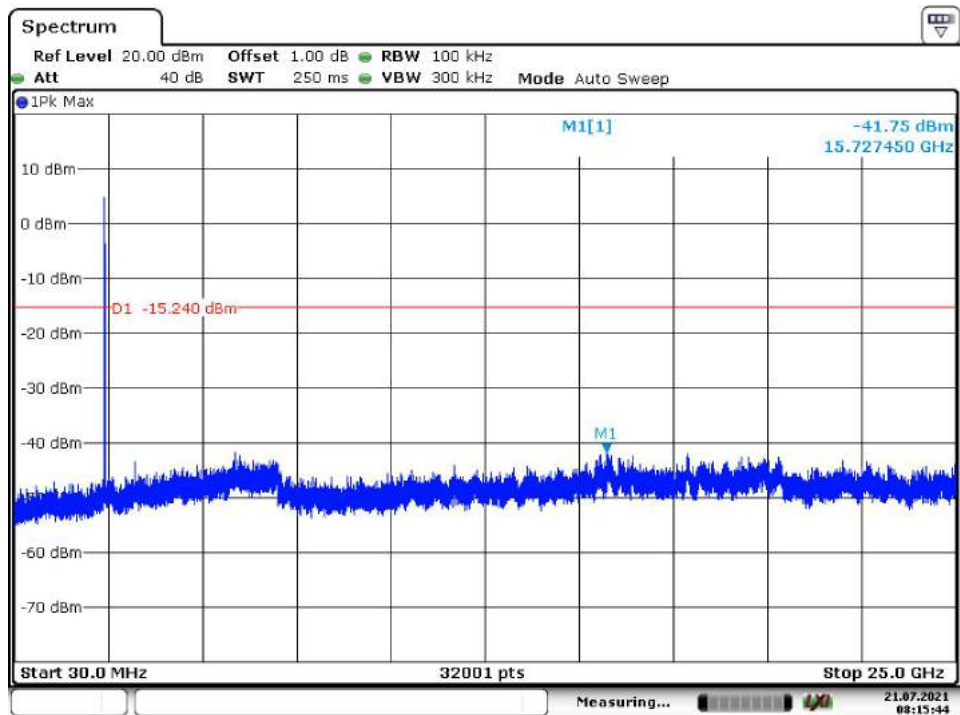


Appendix B.4: Conducted Spurious Emissions Measured in 100 kHz Bandwidth

Wi-Fi 802.11 b mode, 1 Mbps
Low Channel

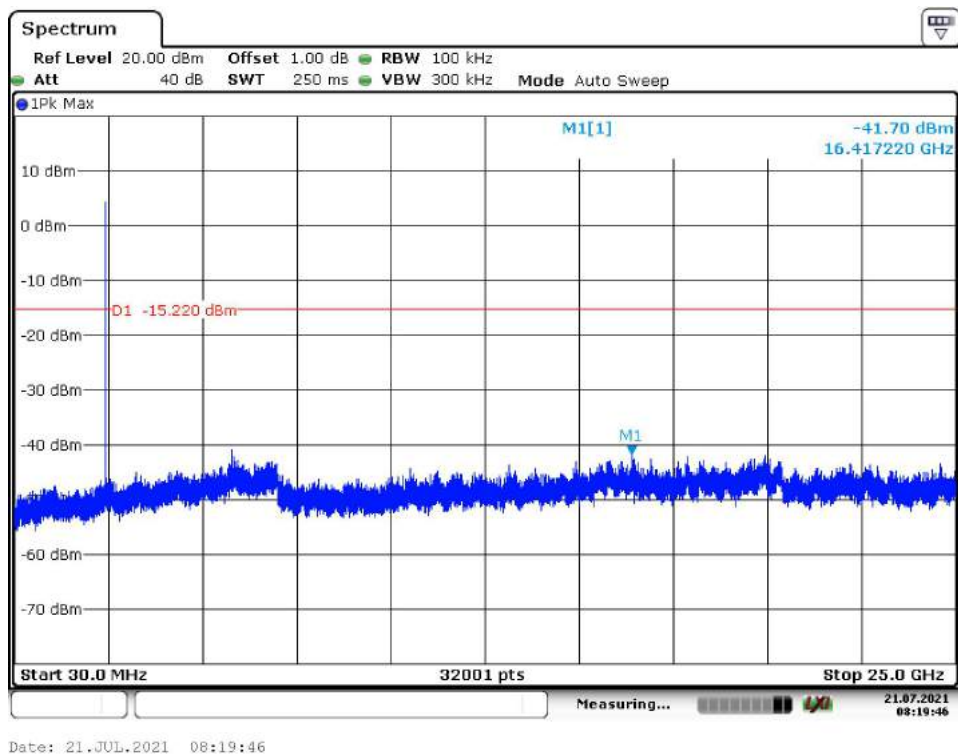


Date: 21.JUL.2021 08:14:23

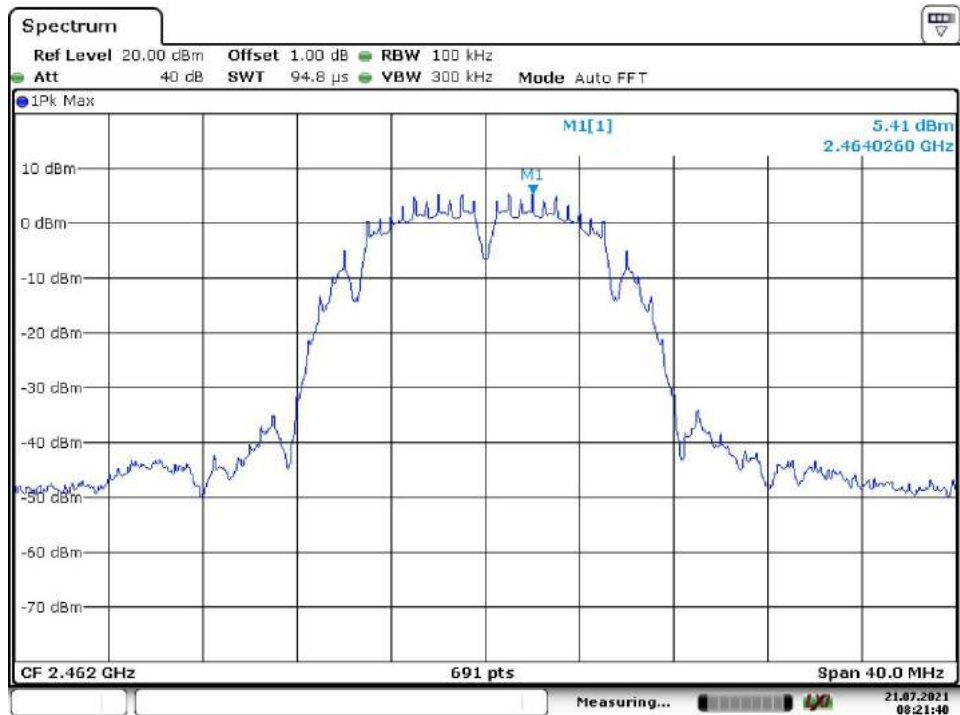


Date: 21.JUL.2021 08:15:44

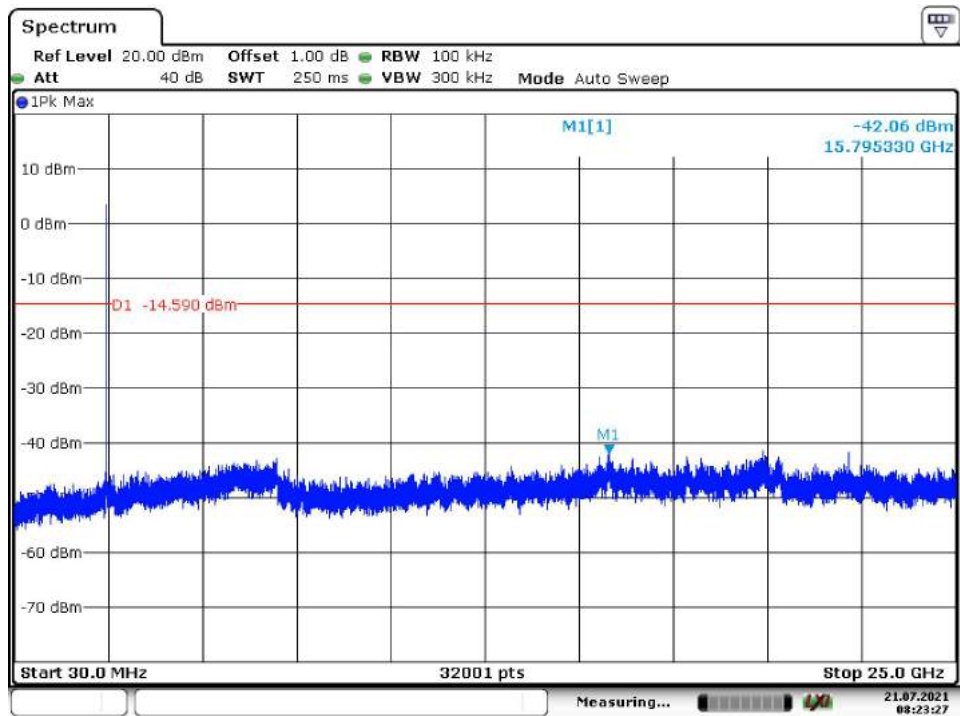
Middle Channel



High Channel

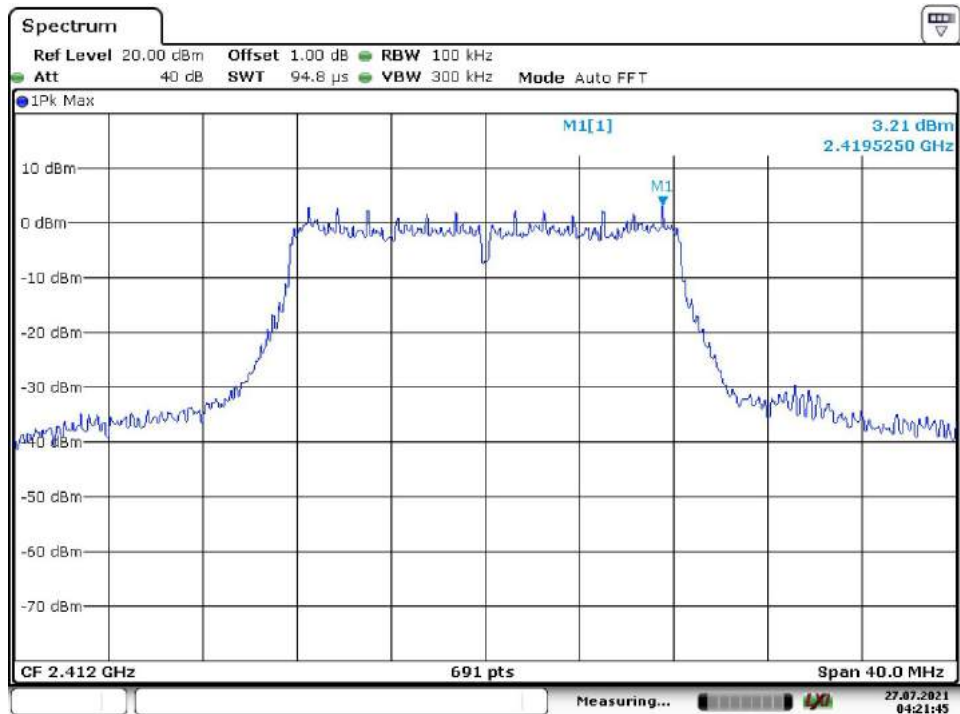


Date: 21.JUL.2021 08:21:40

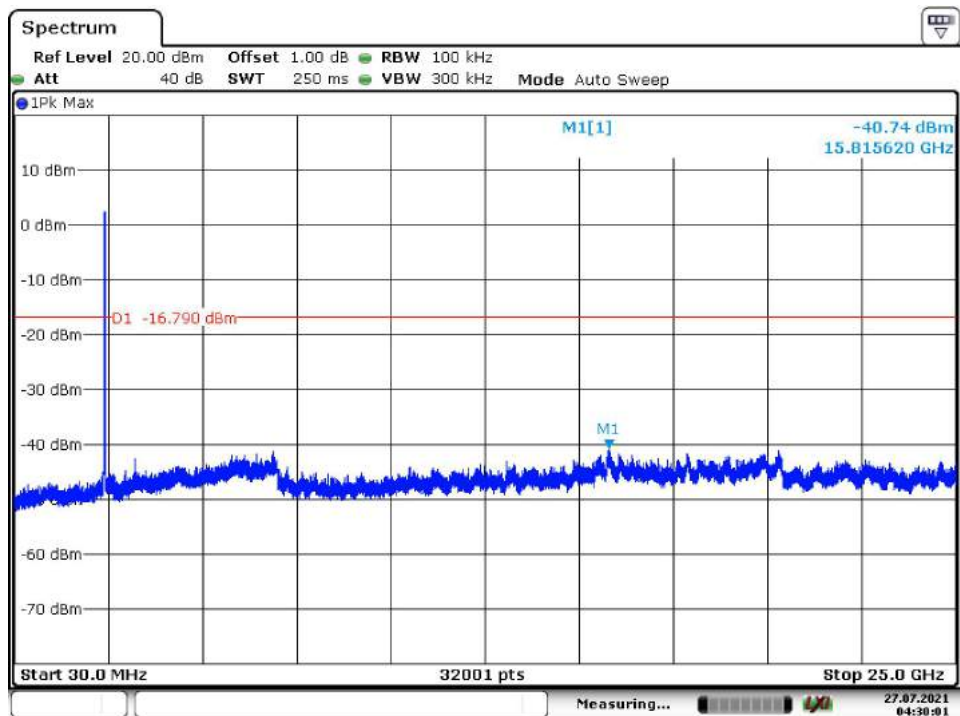


Date: 21.JUL.2021 08:23:27

Wi-Fi 802.11 g mode, 6 Mbps
Low Channel

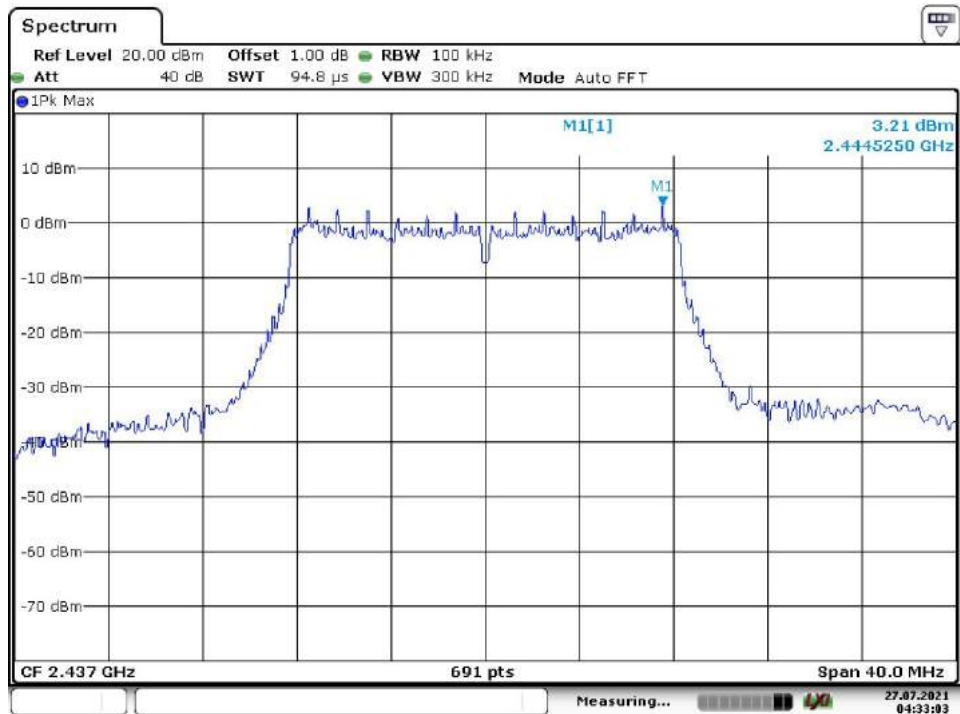


Date: 27.JUL.2021 04:21:46

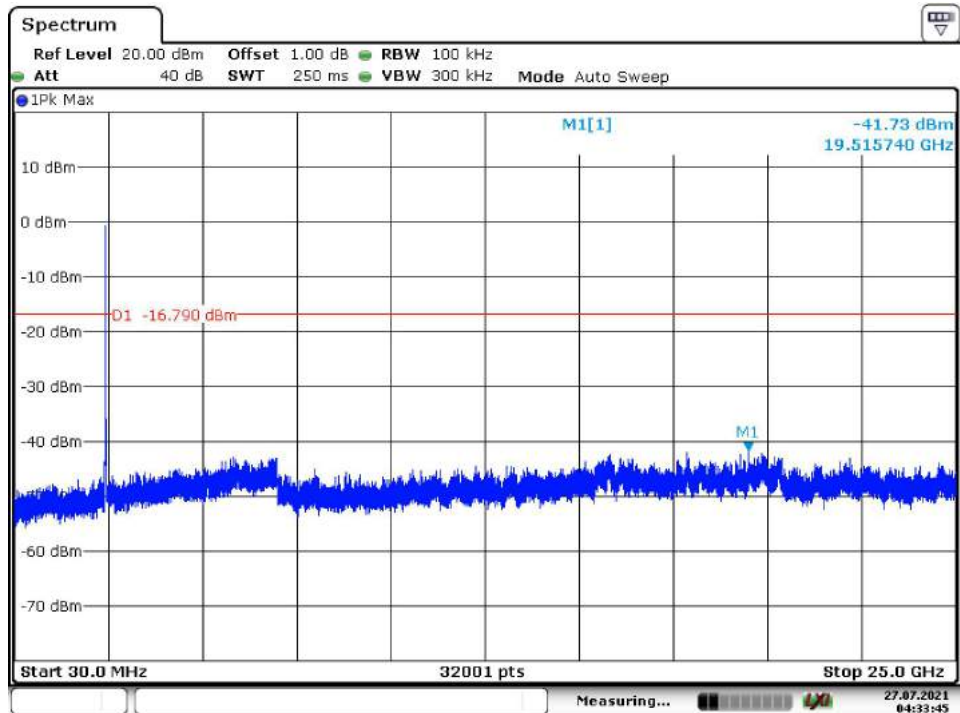


Date: 27.JUL.2021 04:30:02

Middle Channel

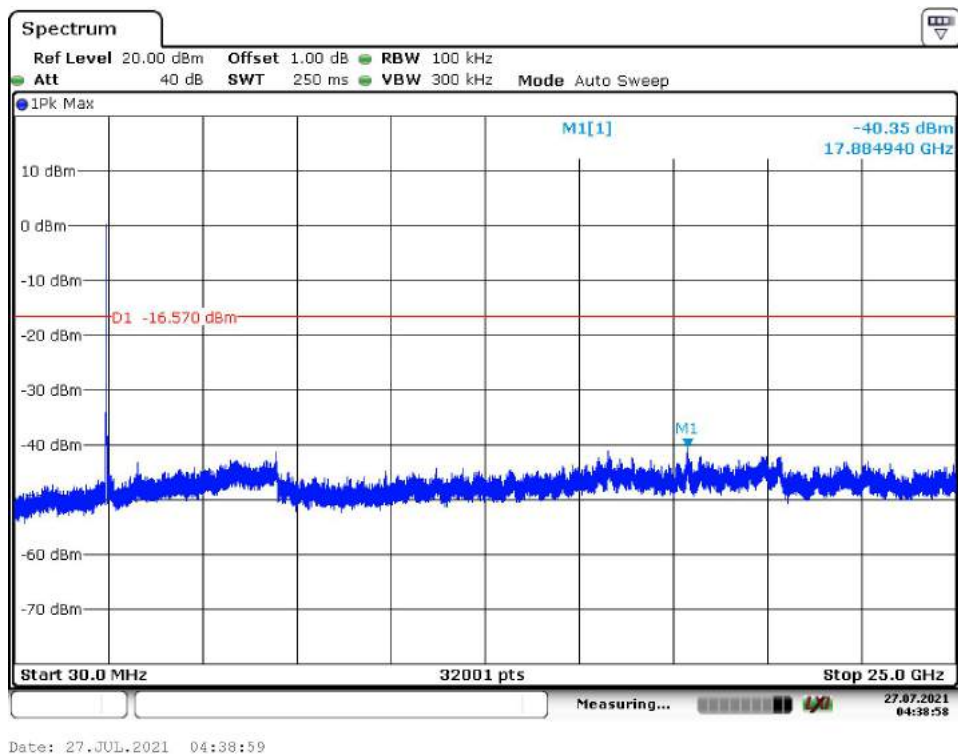
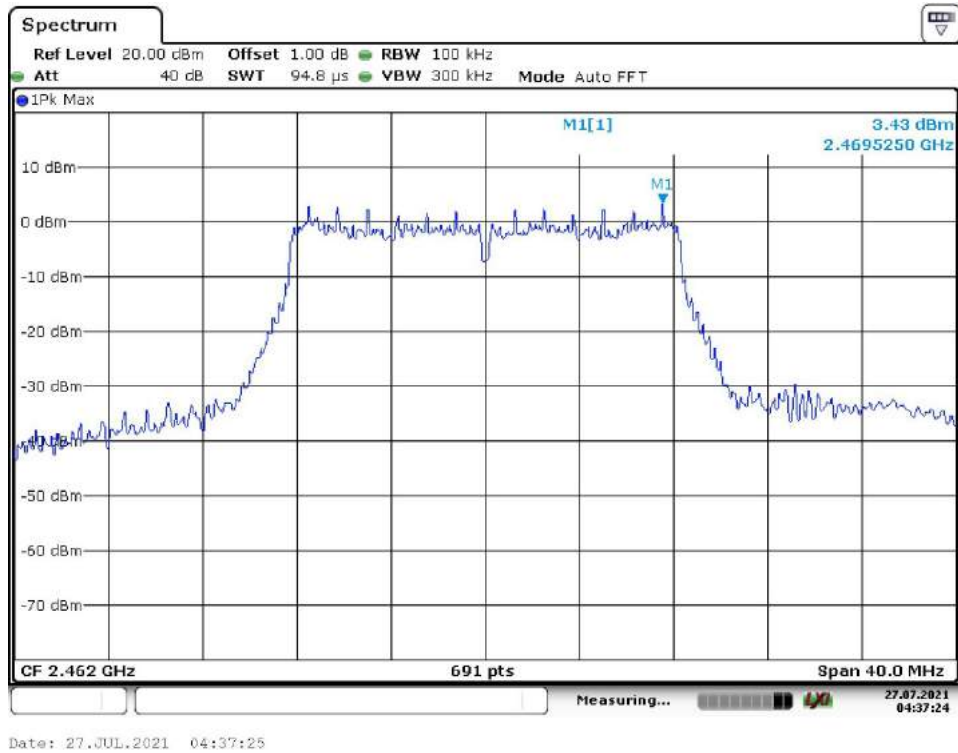


Date: 27.JUL.2021 04:33:04

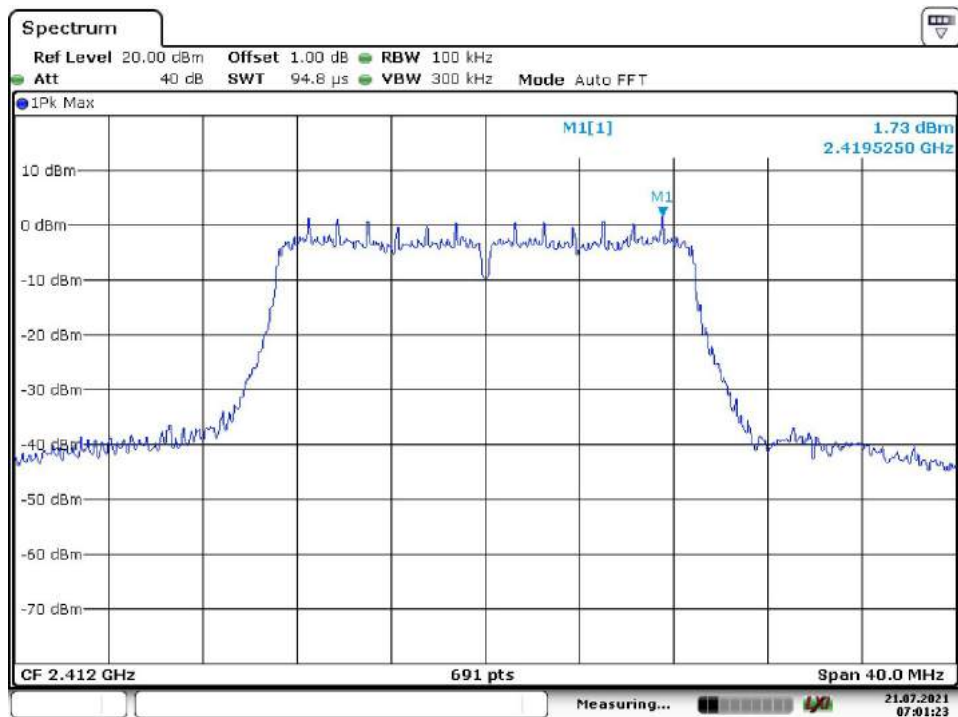


Date: 27.JUL.2021 04:33:46

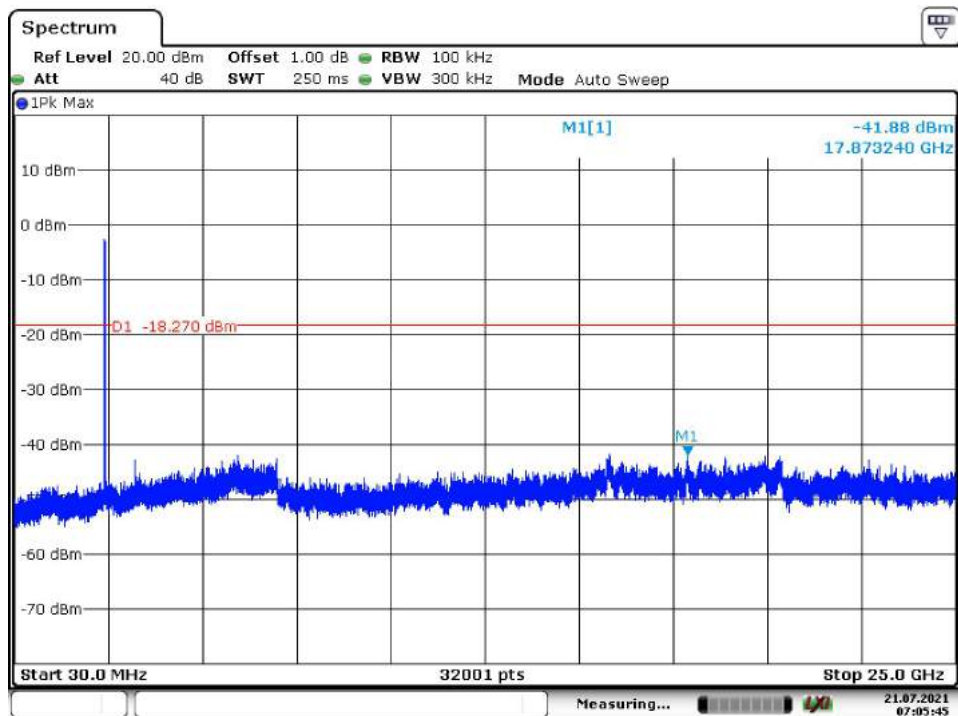
High Channel



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

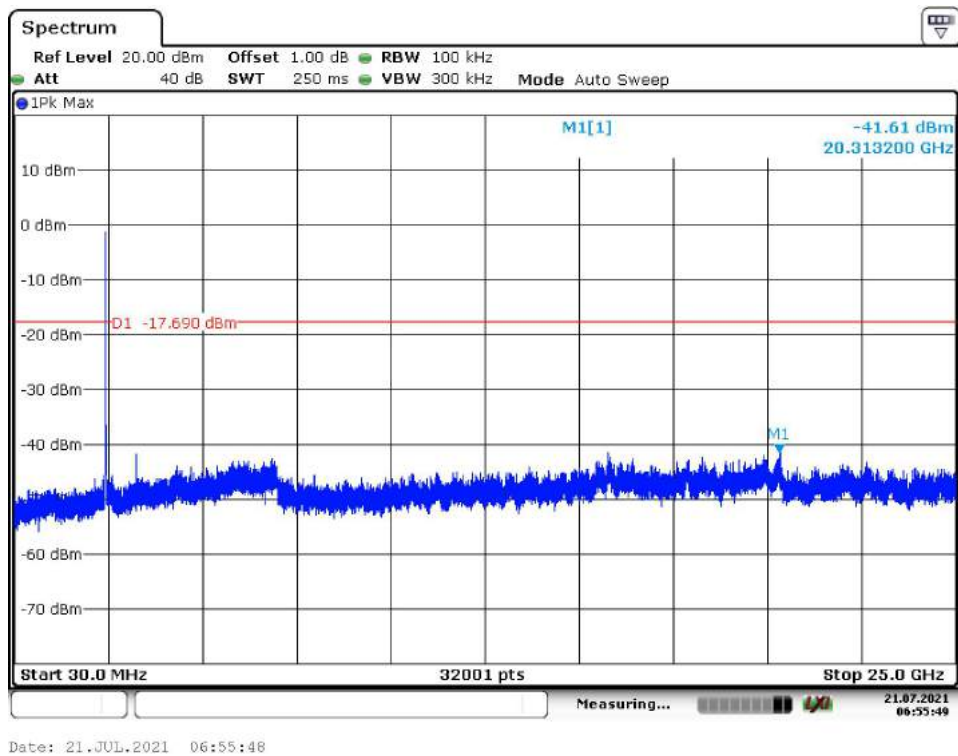
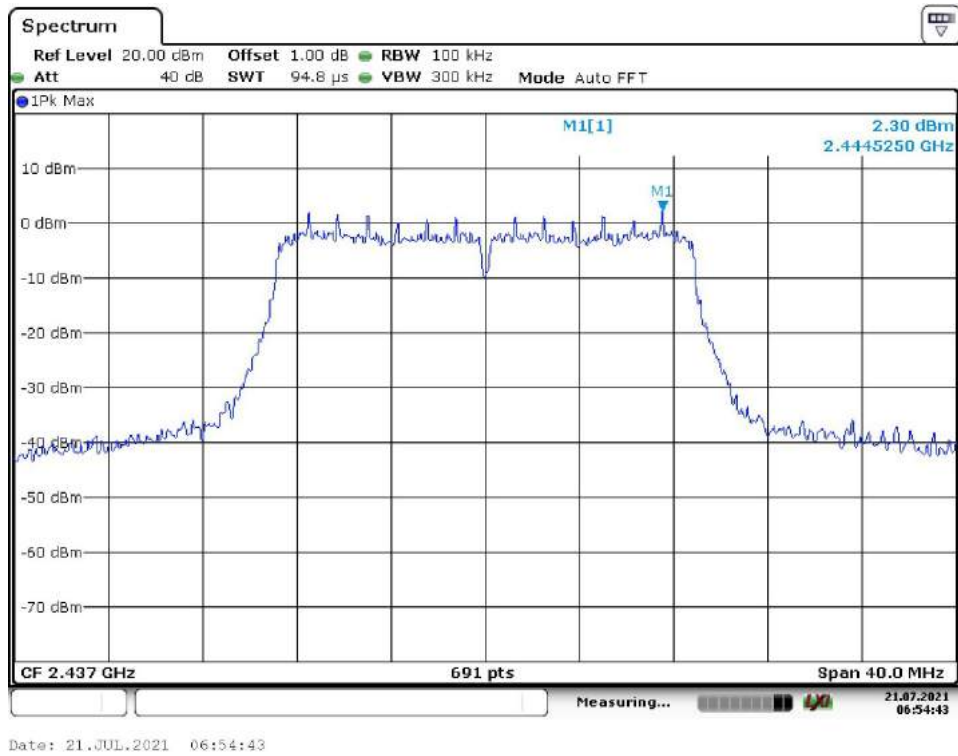


Date: 21.JUL.2021 07:01:23

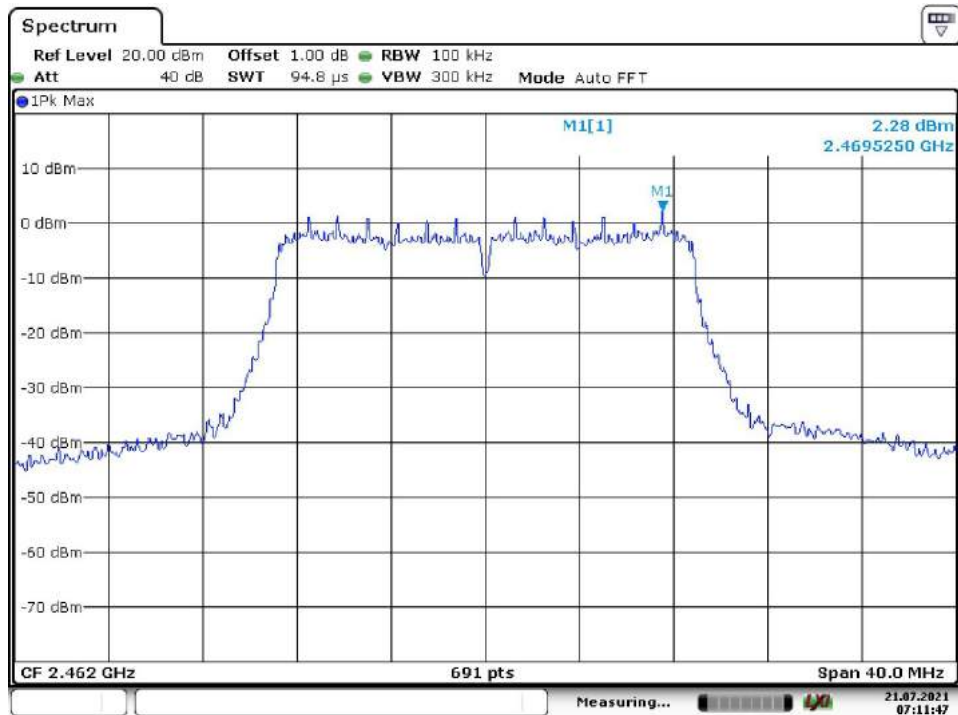


Date: 21.JUL.2021 07:05:45

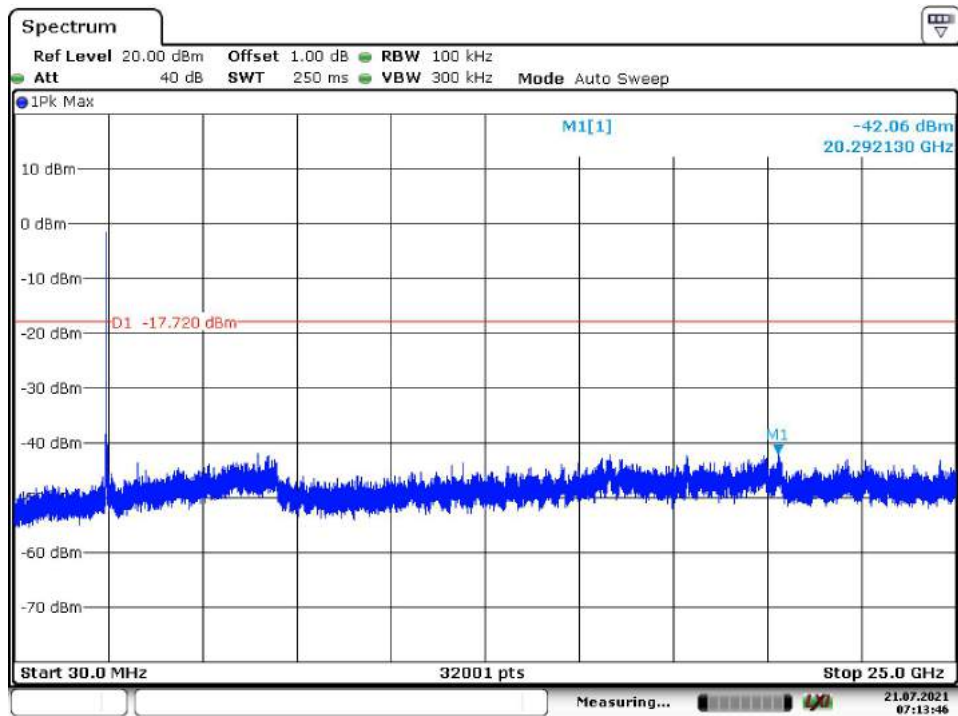
Middle Channel



High Channel

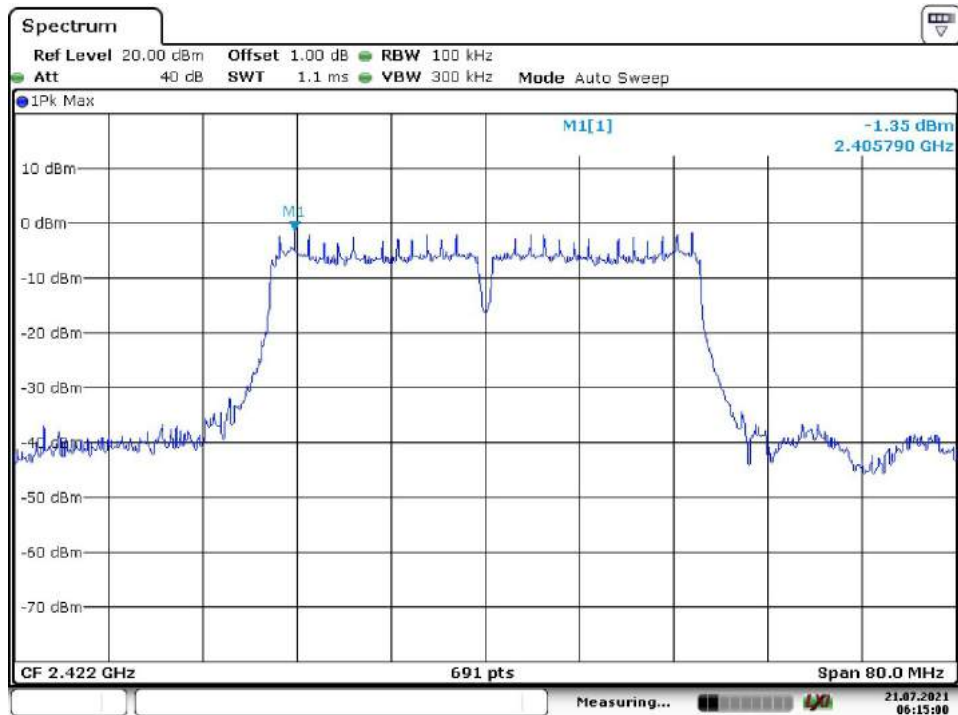


Date: 21.JUL.2021 07:11:46

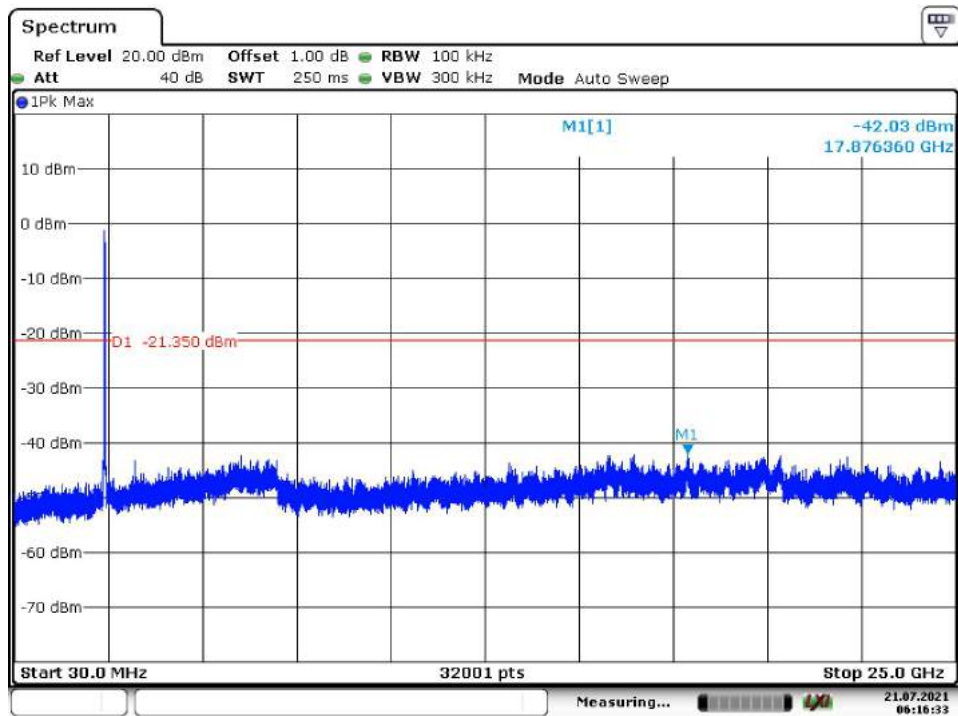


Date: 21.JUL.2021 07:13:46

Wi-Fi 802.11 n(HT40) mode, MCS0
Low Channel

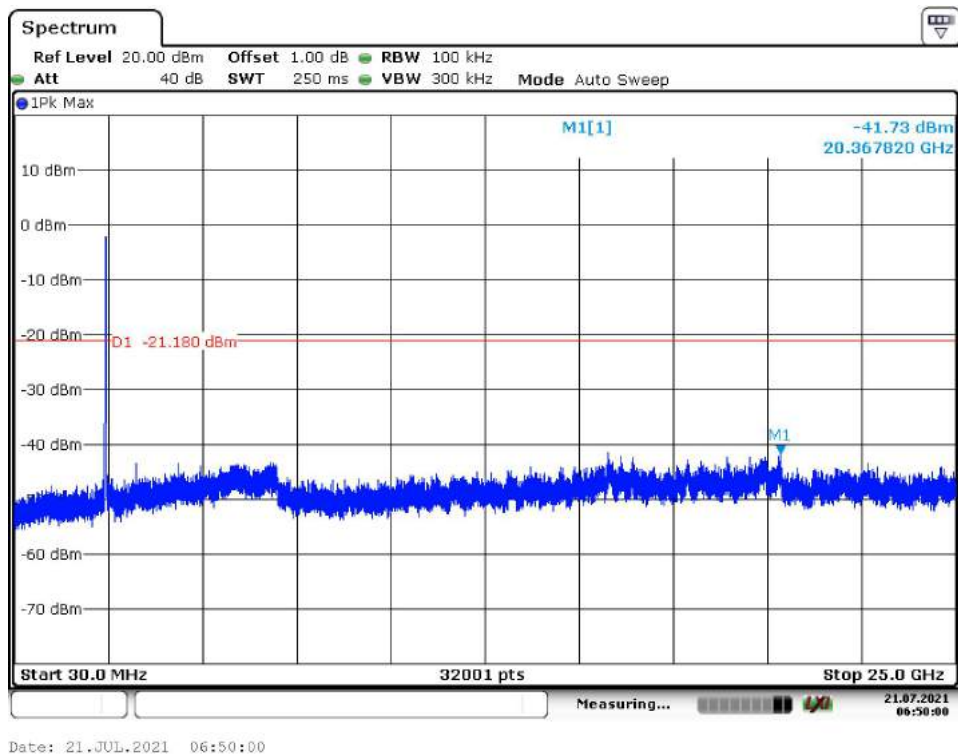
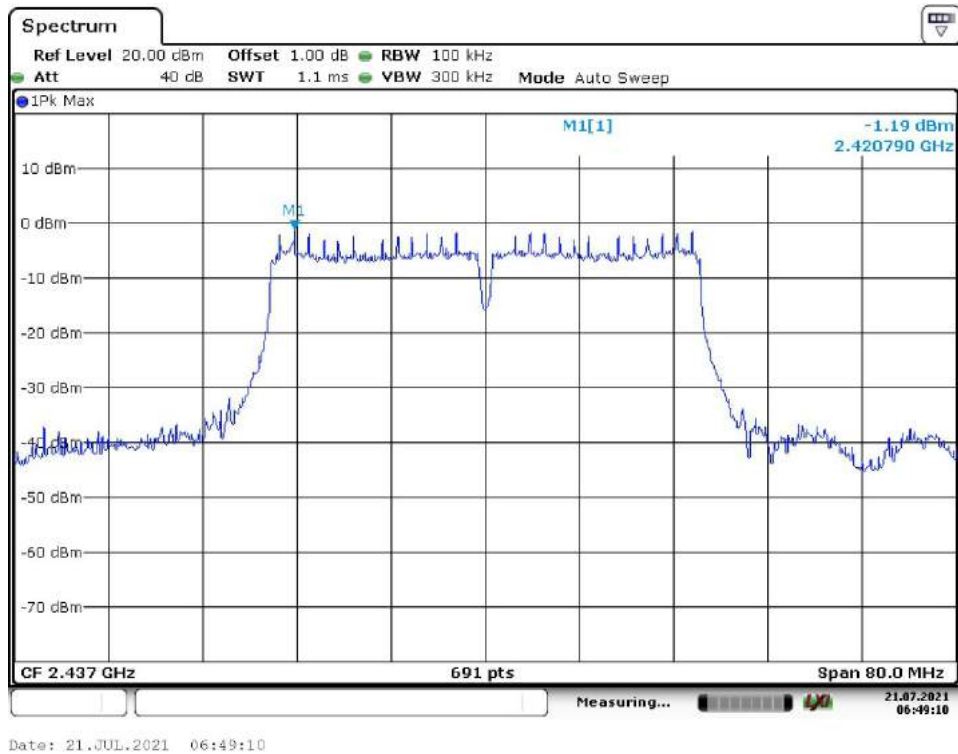


Date: 21.JUL.2021 06:14:59

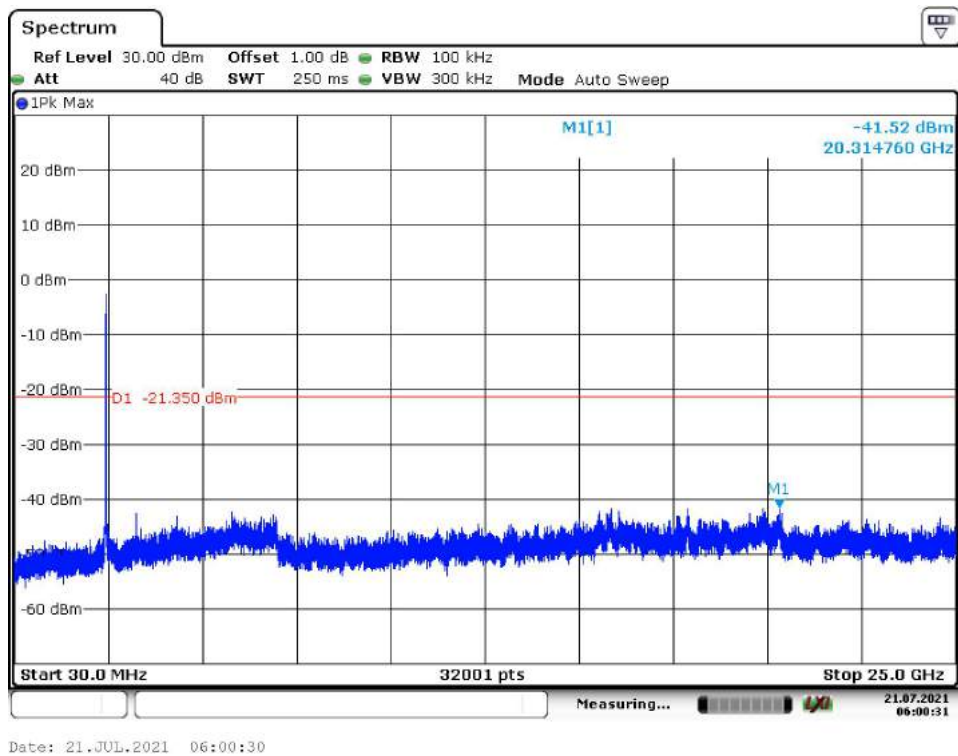
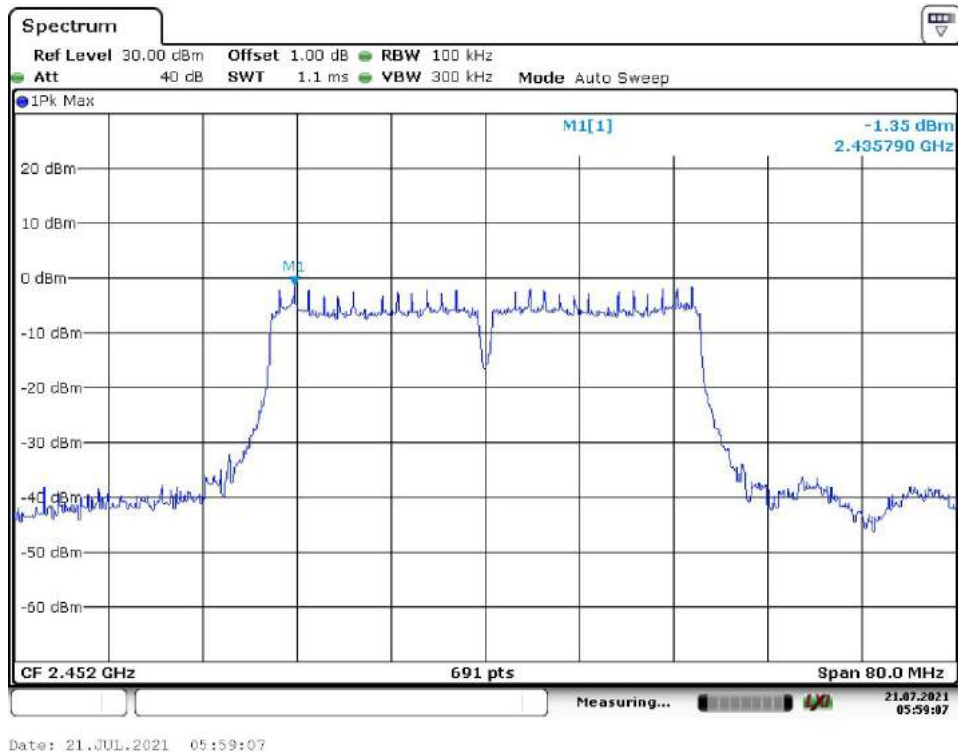


Date: 21.JUL.2021 06:16:32

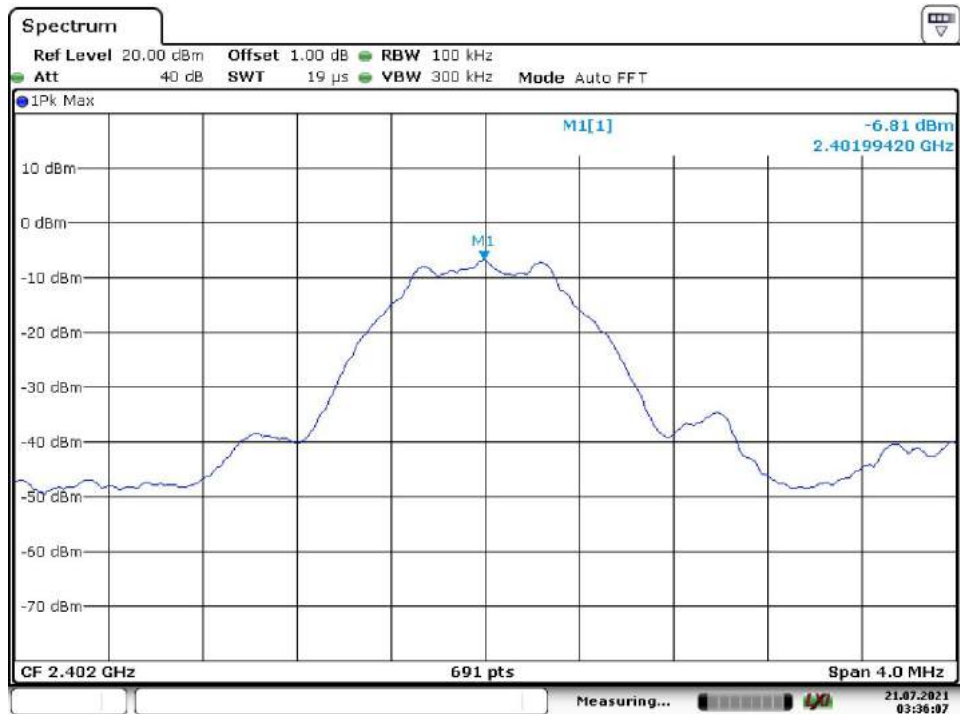
Middle Channel



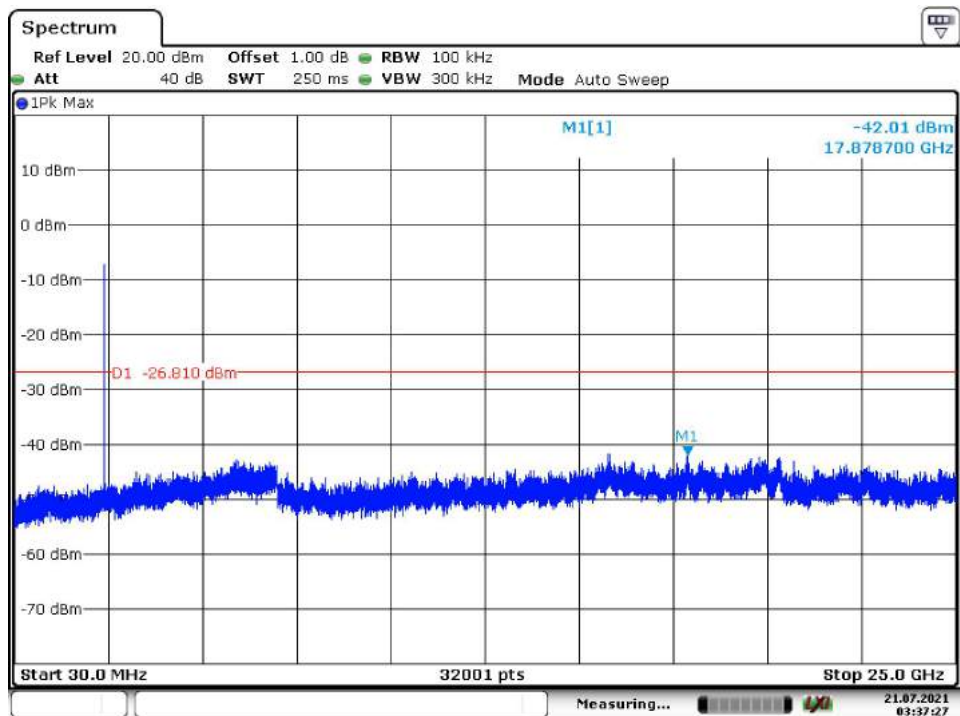
High Channel



Bluetooth Low Energy Low Channel

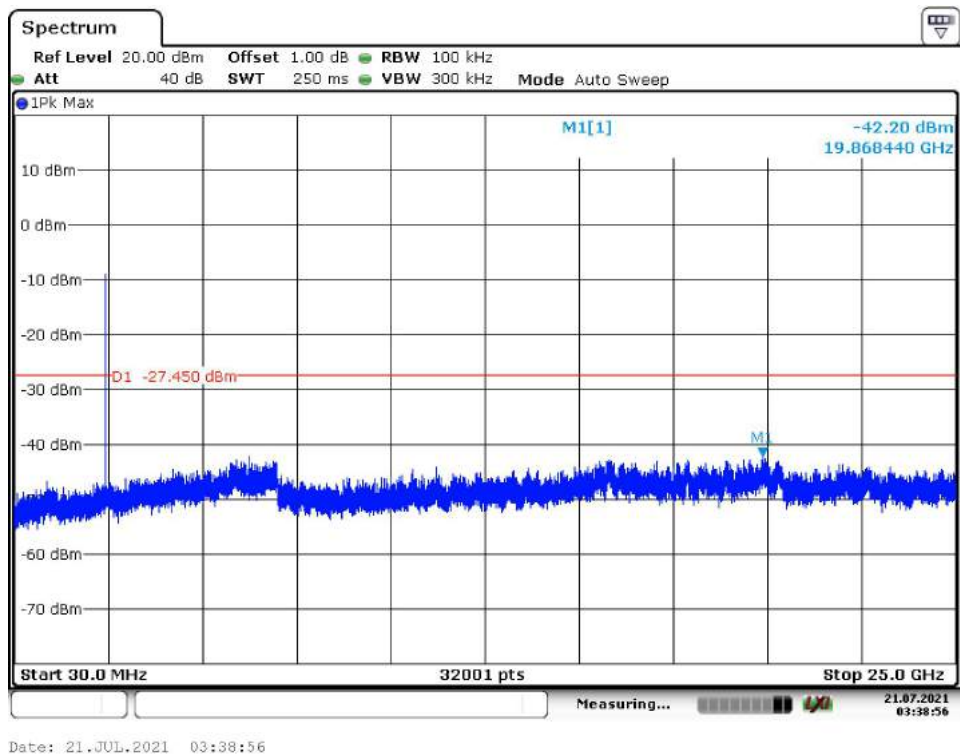
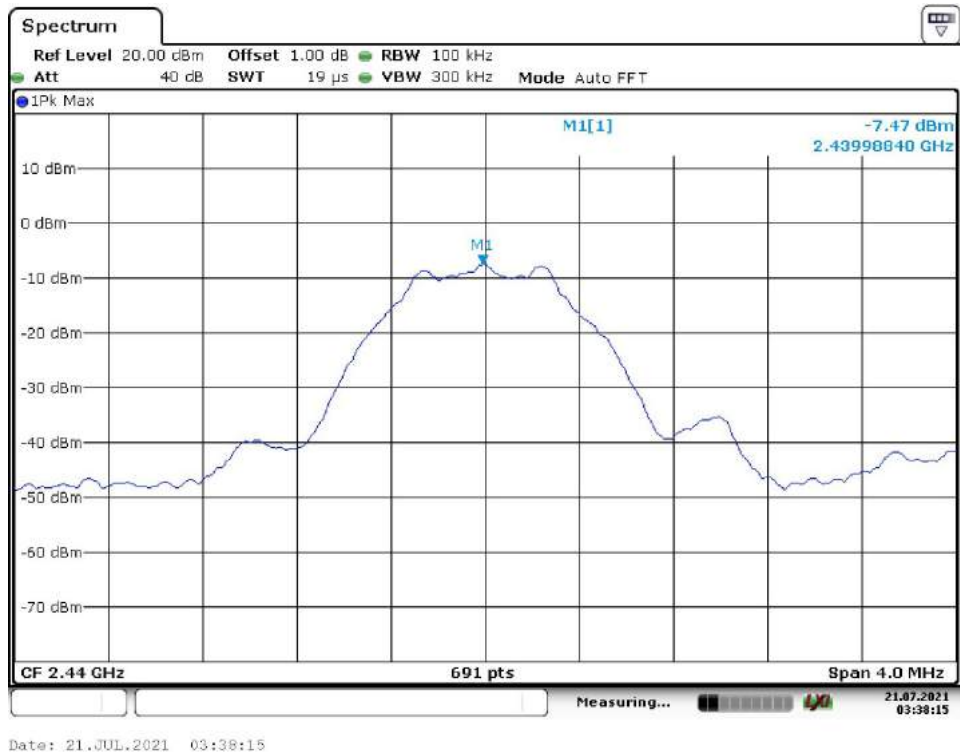


Date: 21.JUL.2021 03:36:07

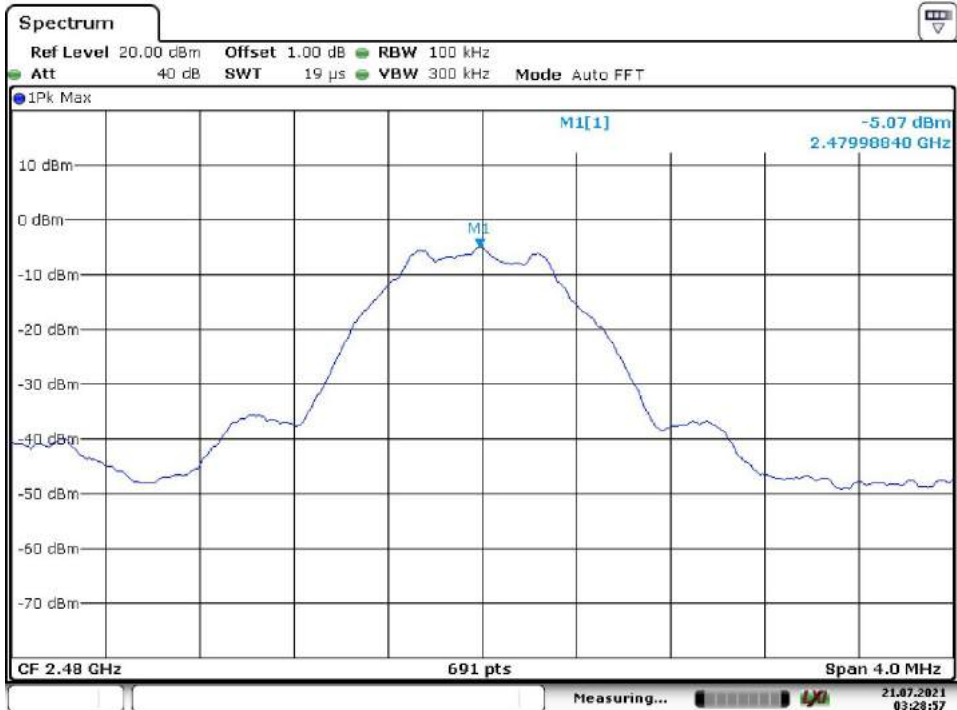


Date: 21.JUL.2021 03:37:28

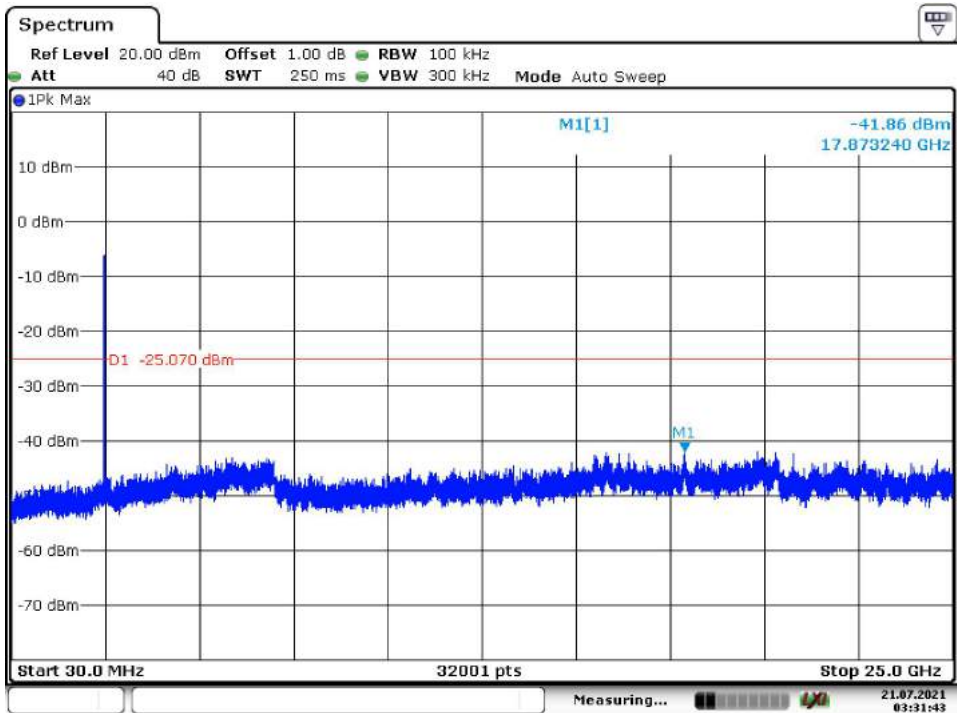
Middle Channel



High Channel

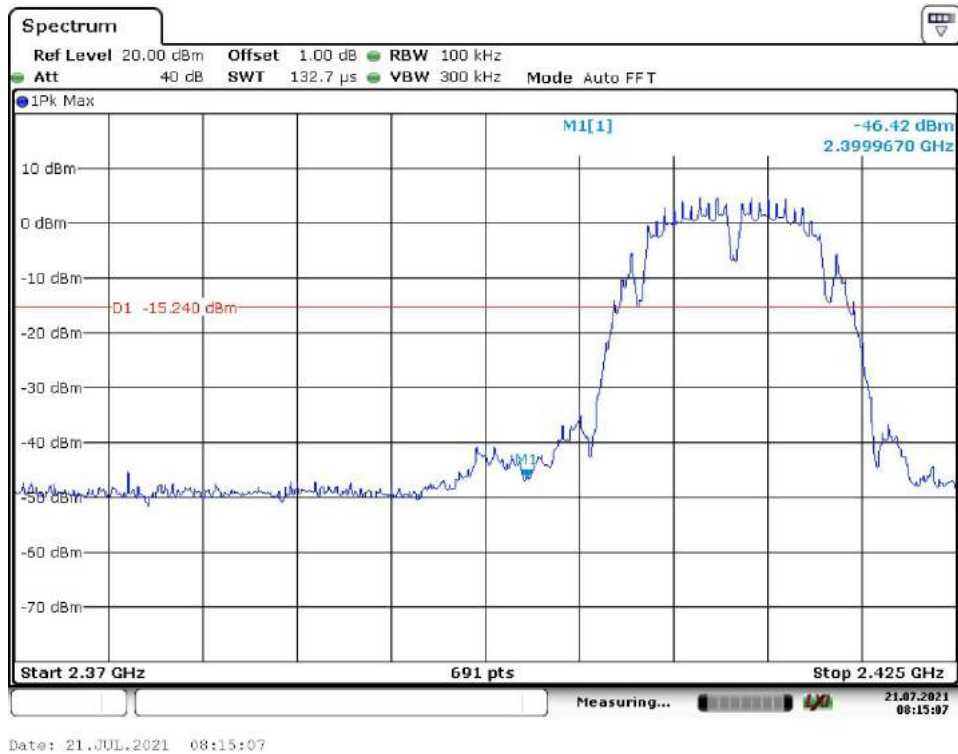


Date: 21.JUL.2021 03:28:56

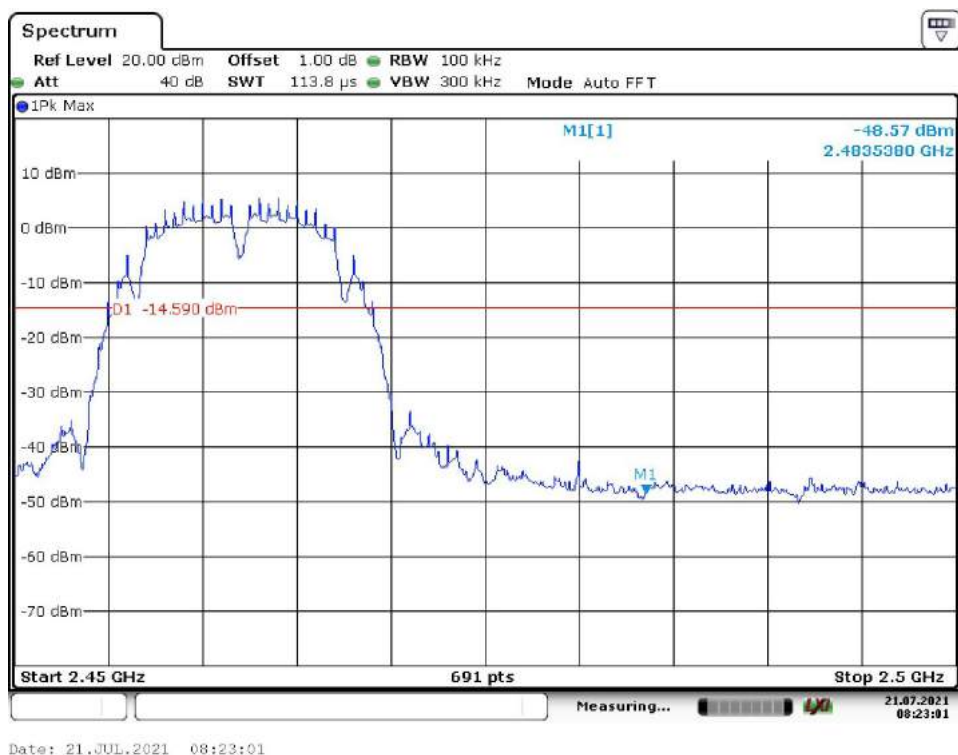


Date: 21.JUL.2021 03:31:43

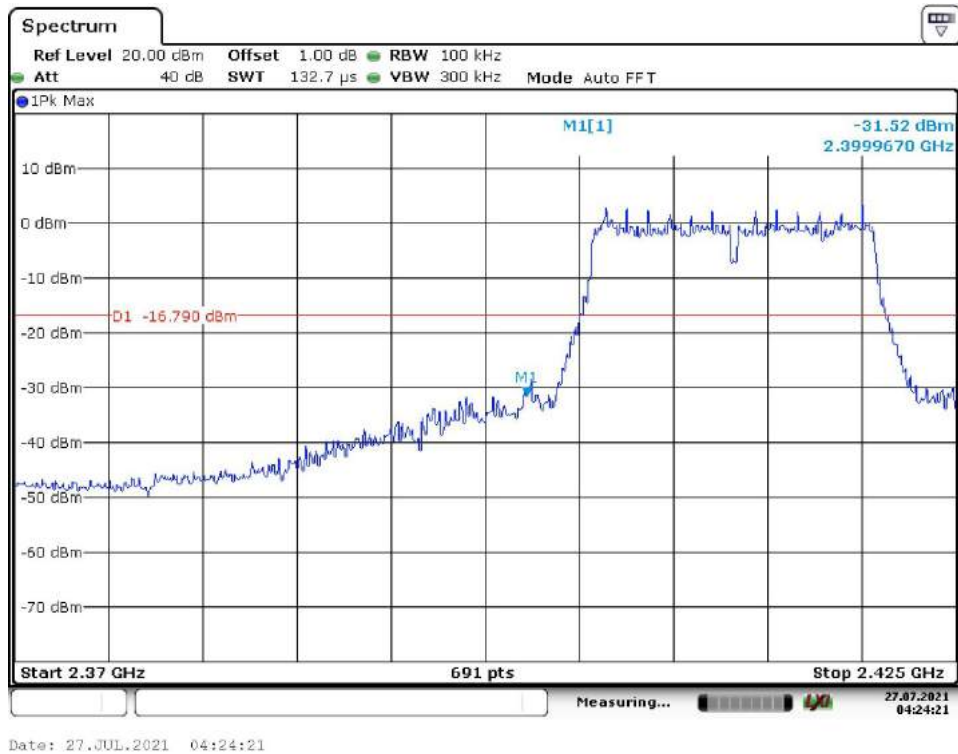
Wi-Fi 802.11 b mode, Band Edge
Low Channel



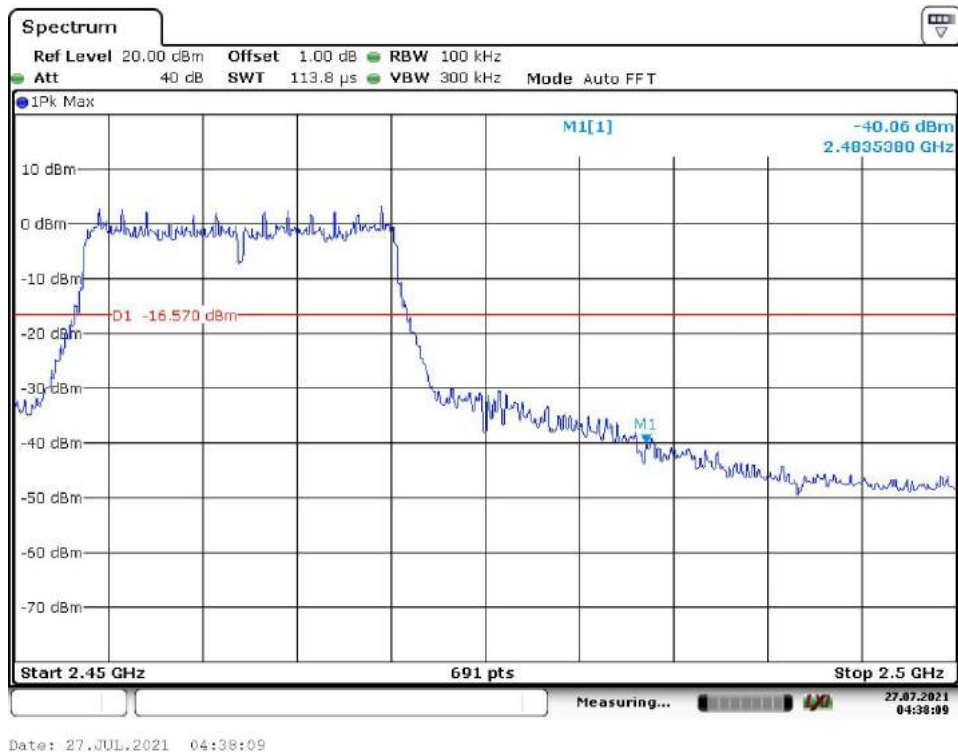
High Channel



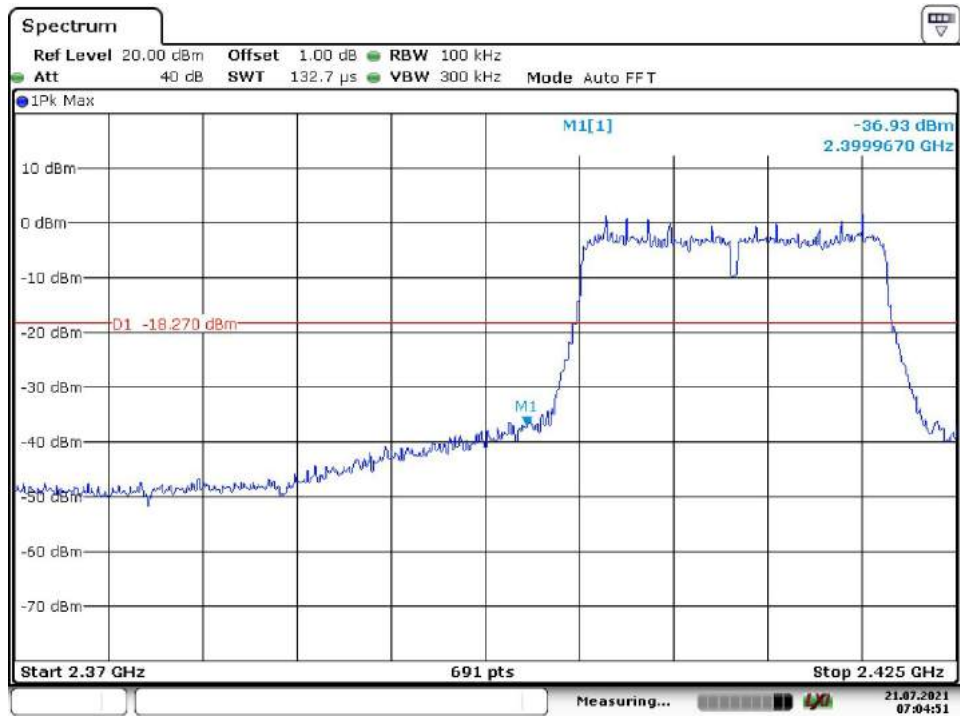
Wi-Fi 802.11 g mode, Band Edge
Low Channel



High Channel

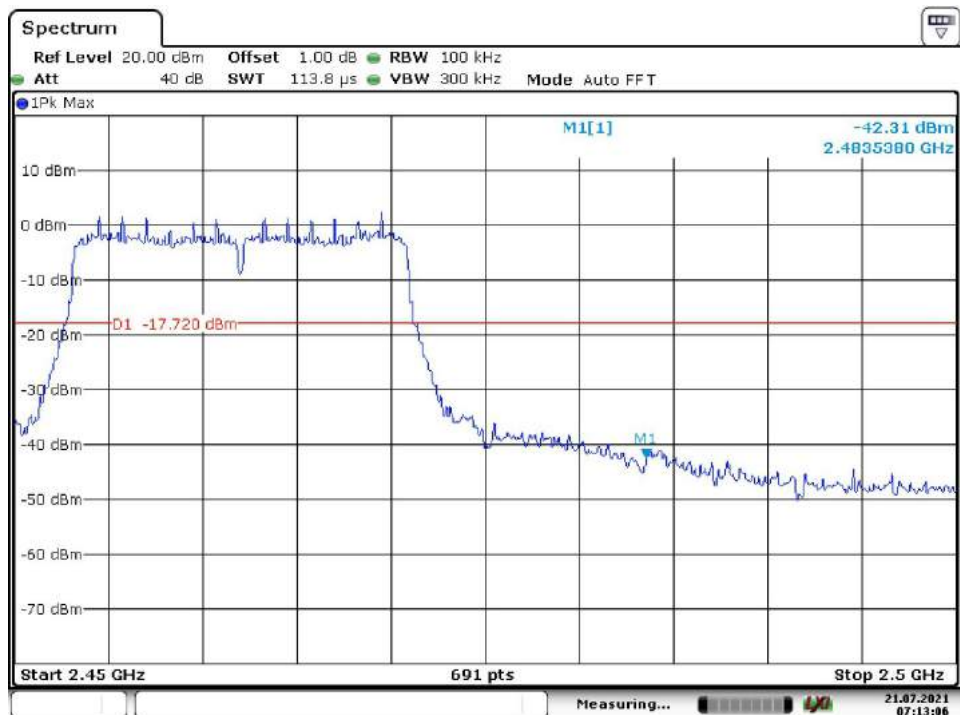


Wi-Fi 802.11 n(HT20) mode, Band Edge
Low Channel



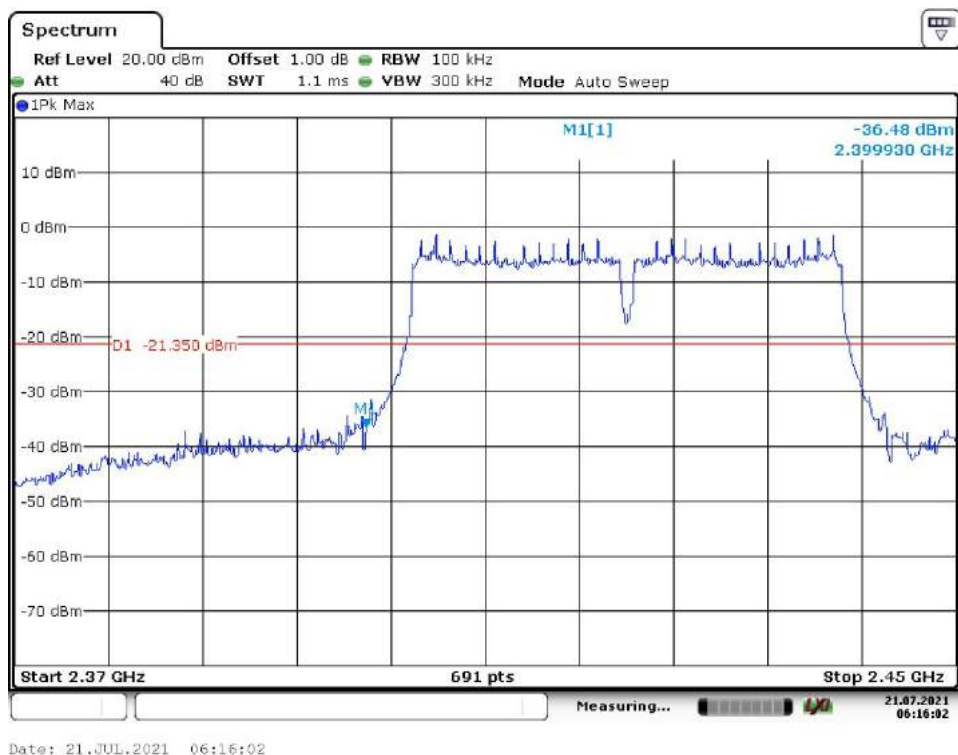
Date: 21.JUL.2021 07:04:51

High Channel

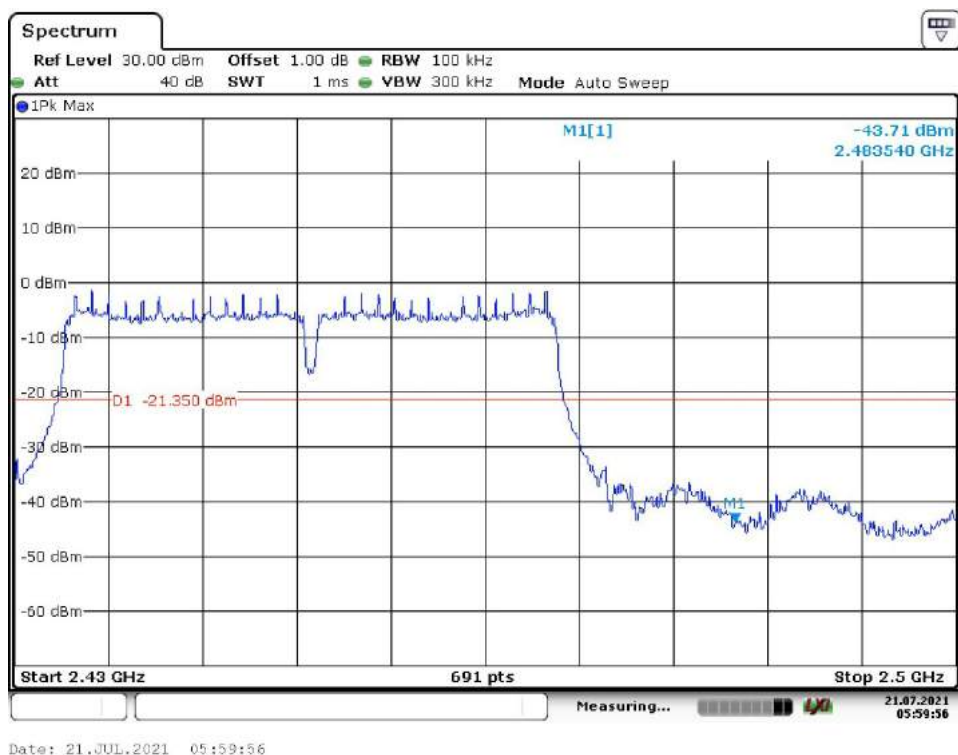


Date: 21.JUL.2021 07:13:06

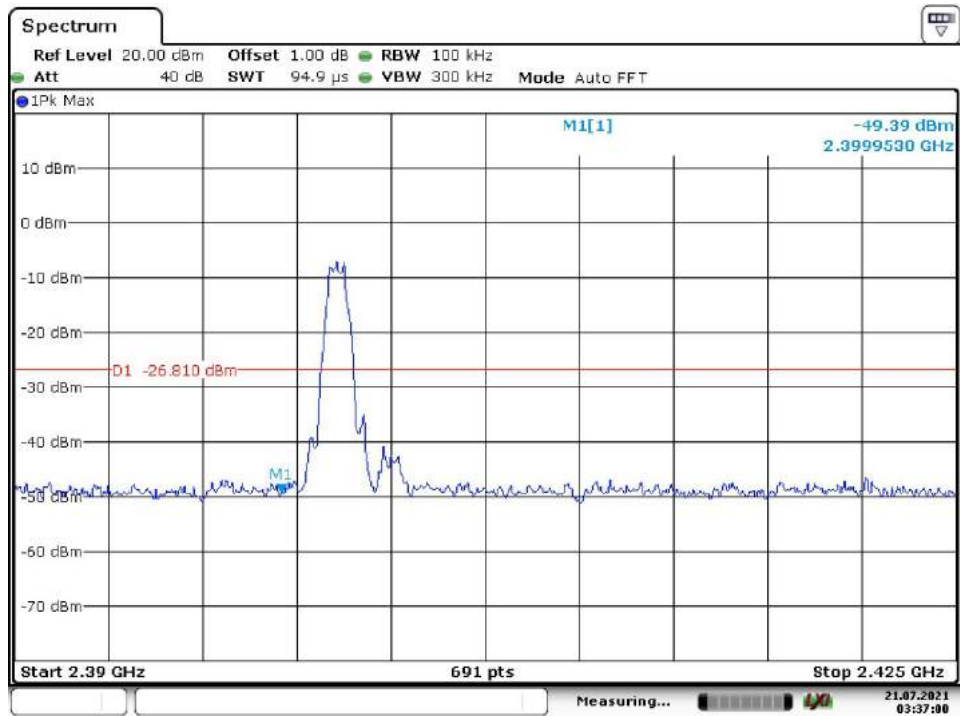
Wi-Fi 802.11 n(HT40) mode, Band Edge
Low Channel



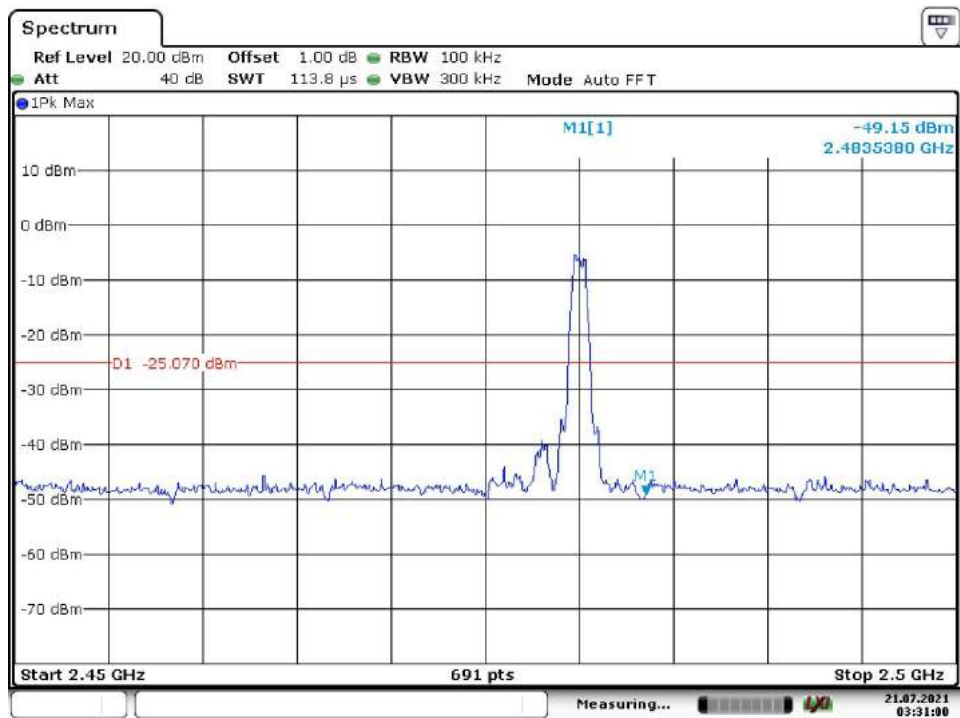
High Channel



Bluetooth Low Energy Low Channel



High Channel



Appendix C: Test Results of Radiated Testing

APPENDIX C: TEST RESULTS OF RADIATED TESTING	1
APPENDIX C.1: TEST RESULTS OF RADIATED SPURIOUS EMISSIONS	2
<i>Wi-Fi 802.11 b mode, 1 Mbps</i>	2
<i>Bluetooth Low Energy</i>	18
<i>Wi-Fi 802.11 + BLE (Simultaneous transmitting mode)</i>	34
APPENDIX C.2: TEST RESULTS OF RADIATED EMISSIONS IN RESTRICTED BANDS	38
<i>Wi-Fi 802.11 b mode, 1 Mbps</i>	38
<i>Wi-Fi 802.11 g mode, 6 Mbps</i>	42
<i>Wi-Fi 802.11 n(HT20) mode, MCS0</i>	46
<i>Wi-Fi 802.11 n(HT40) mode, MCS0</i>	50
<i>Bluetooth Low Energy</i>	54
APPENDIX C.3: TEST RESULTS OF CONDUCTED EMISSION ON AC MAINS	58

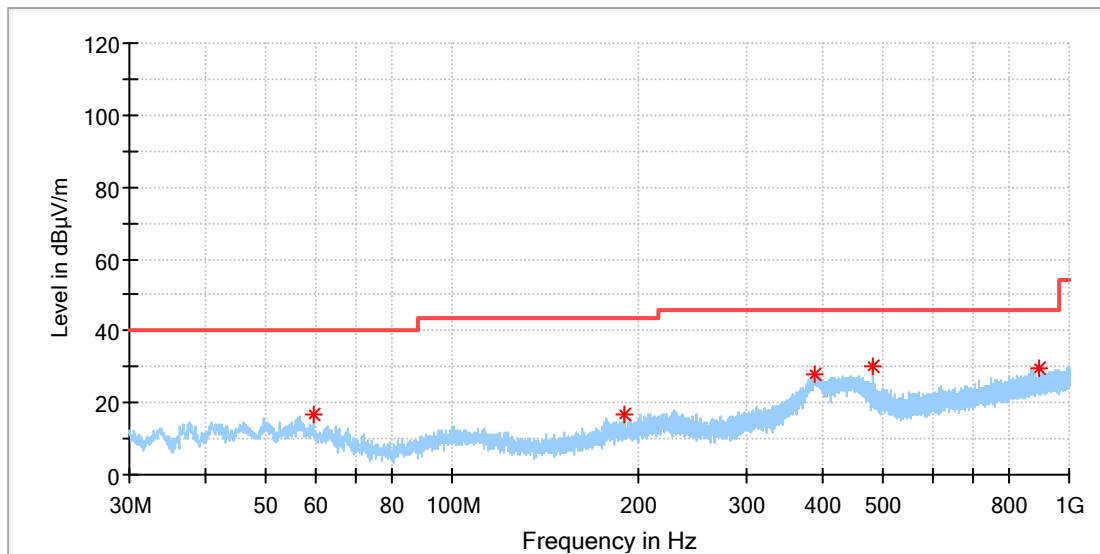
Note 1: Testing was carried out within frequency range 9 kHz to the tenth harmonics. The measurement results below 30MHz and above 18GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 18GHz were reported.

Appendix C.1: Test Results of Radiated Spurious Emissions

Wi-Fi 802.11 b mode, 1 Mbps
30MHz - 1GHz

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11b_Low channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

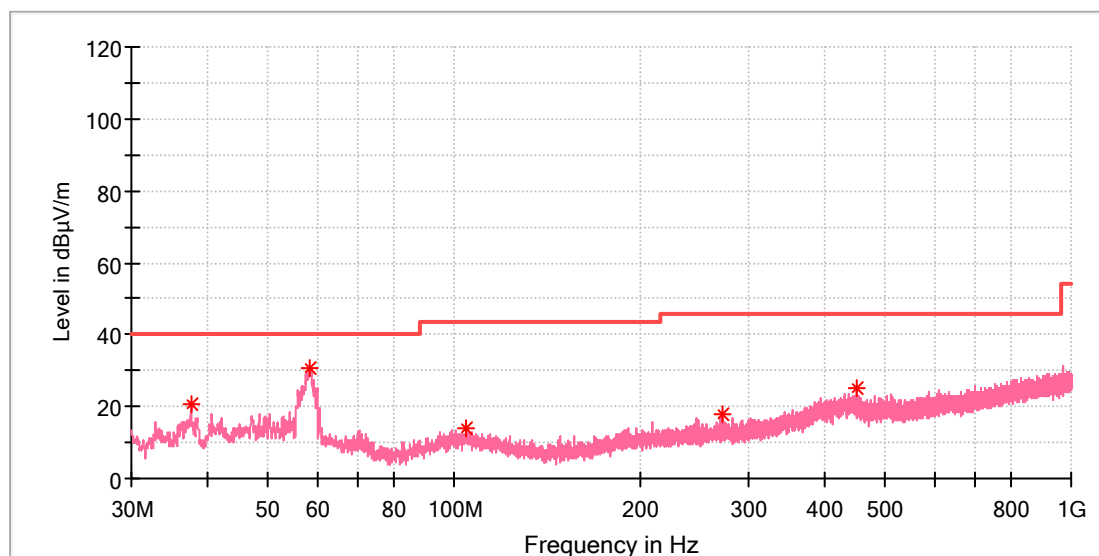


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
59.585000	16.90	40.00	23.10	100.0	H	136.0	-18.9
189.807500	16.59	43.50	26.91	100.0	H	169.0	-19.5
387.590500	27.96	46.00	18.04	100.0	H	2.0	-14.0
480.031500	29.88	46.00	16.12	100.0	H	30.0	-12.2
896.113000	29.54	46.00	16.46	100.0	H	13.0	-5.0

EUT Information

EUT Name: Smart Air Quality Monitoring Controller
Model: LAM05
Test Mode: WIFI 2.4G_11b_Low channel
Test Voltage:: Battery
Remark: Temp 23 Humi:51%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

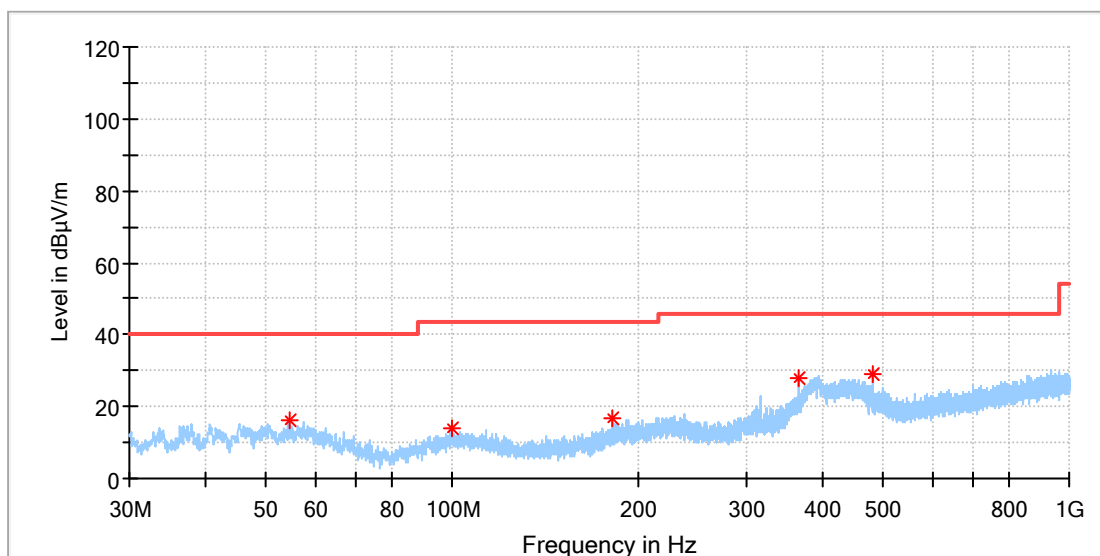


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
37.469000	20.91	40.00	19.09	100.0	V	5.0	-21.0
58.566500	30.82	40.00	9.18	100.0	V	310.0	-18.8
104.253500	13.97	43.50	29.53	100.0	V	28.0	-18.8
272.160500	17.59	46.00	28.41	100.0	V	310.0	-16.9
449.379500	25.03	46.00	20.97	100.0	V	317.0	-12.9

EUT Information

EUT Name: Smart Air Quality Monitoring Controller
Model: LAM05
Test Mode: WIFI 2.4G_11b_High channel
Test Voltage:: Battery
Remark: Temp 23 Humi:51%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

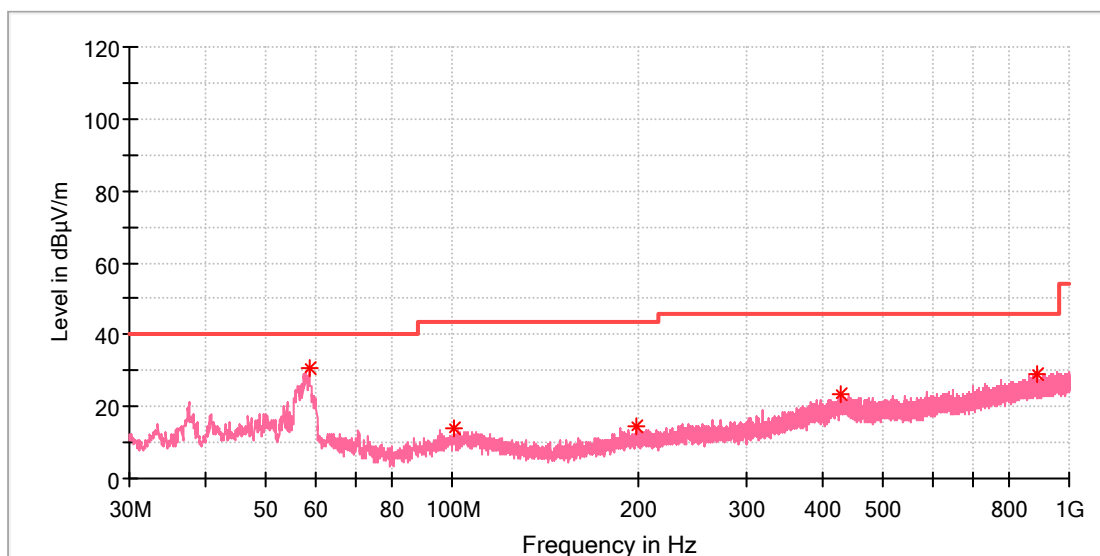


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
54.395500	16.44	40.00	23.56	100.0	H	351.0	-18.4
99.743000	13.75	43.50	29.75	100.0	H	106.0	-19.0
181.950500	16.54	43.50	26.96	100.0	H	351.0	-20.4
363.971000	27.97	46.00	18.03	100.0	H	329.0	-14.6
480.031500	29.01	46.00	16.99	100.0	H	46.0	-12.2

EUT Information

EUT Name: Smart Air Quality Monitoring Controller
Model: LAM05
Test Mode: WIFI 2.4G_11b_High channel
Test Voltage:: Battery
Remark: Temp 23 Humi:51%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin



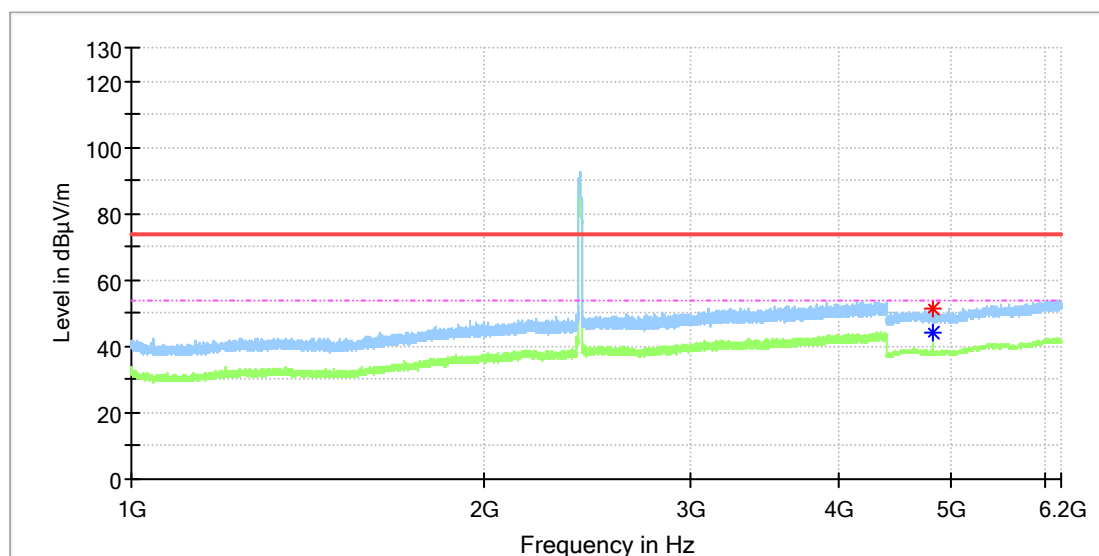
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
58.857500	30.61	40.00	9.39	100.0	V	51.0	-18.9
100.761500	13.87	43.50	29.63	100.0	V	96.0	-19.0
199.168000	14.53	43.50	28.97	100.0	V	321.0	-19.0
427.748500	23.40	46.00	22.60	100.0	V	305.0	-13.3
888.498500	29.19	46.00	16.81	100.0	V	331.0	-5.1

1GHz - 6.2GHz

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11b_Low channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

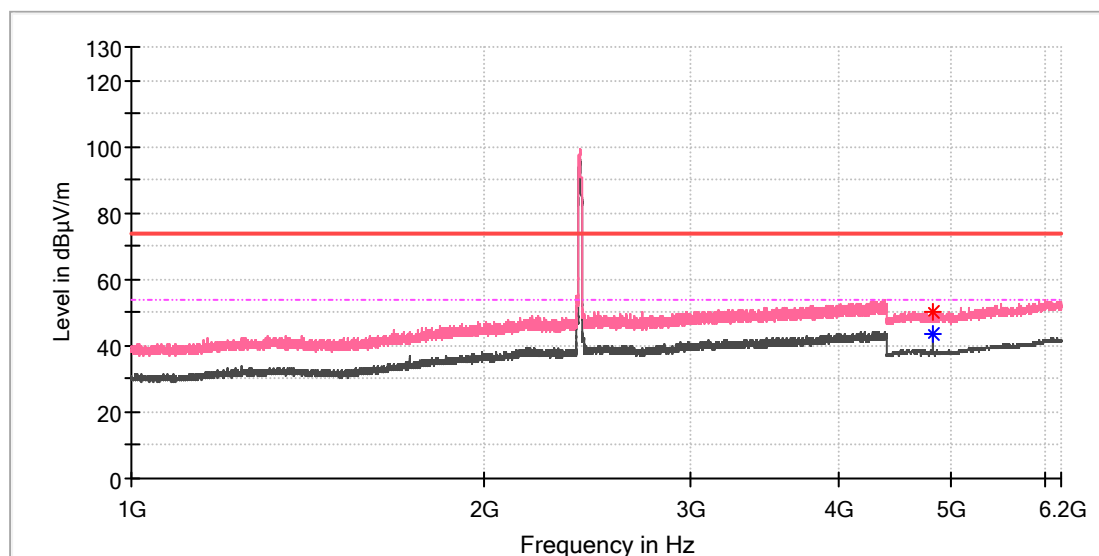


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4823.500000	---	44.37	54.00	9.63	150.0	H	23.0	11.8
4824.000000	51.50	---	74.00	22.50	150.0	H	23.0	11.8

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11b_Low channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

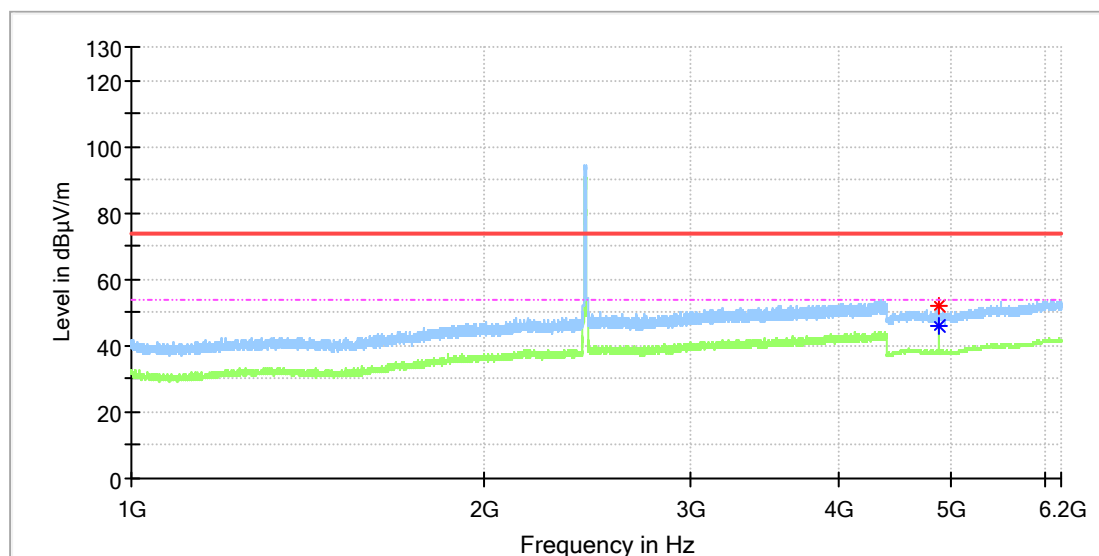


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4824.000000	---	43.59	54.00	10.41	150.0	V	248.0	11.8
4824.500000	49.91	---	74.00	24.09	150.0	V	248.0	11.8

EUT Information

EUT Name: Smart Air Quality Monitoring Controller
Model: LAM05
Test Mode: WIFI 2.4G_11b_Mid channel
Test Voltage:: Battery
Remark: Temp 23 Humi:51%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

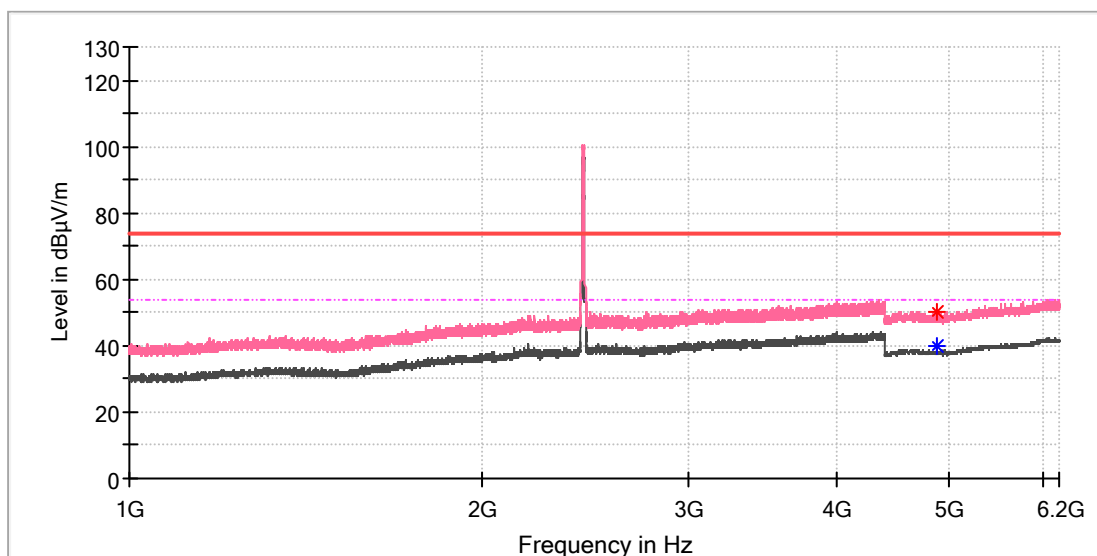


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4874.000000	---	45.74	54.00	8.26	150.0	H	340.0	11.8
4874.000000	52.16	---	74.00	21.84	150.0	H	340.0	11.8

EUT Information

EUT Name: Smart Air Quality Monitoring Controller
Model: LAM05
Test Mode: WIFI 2.4G_11b_Mid channel
Test Voltage:: Battery
Remark: Temp 23 Humi:51%
Test Standard: FCC 15.247
Tested By: Kei Zhang
Reviewed By: Terry Yin

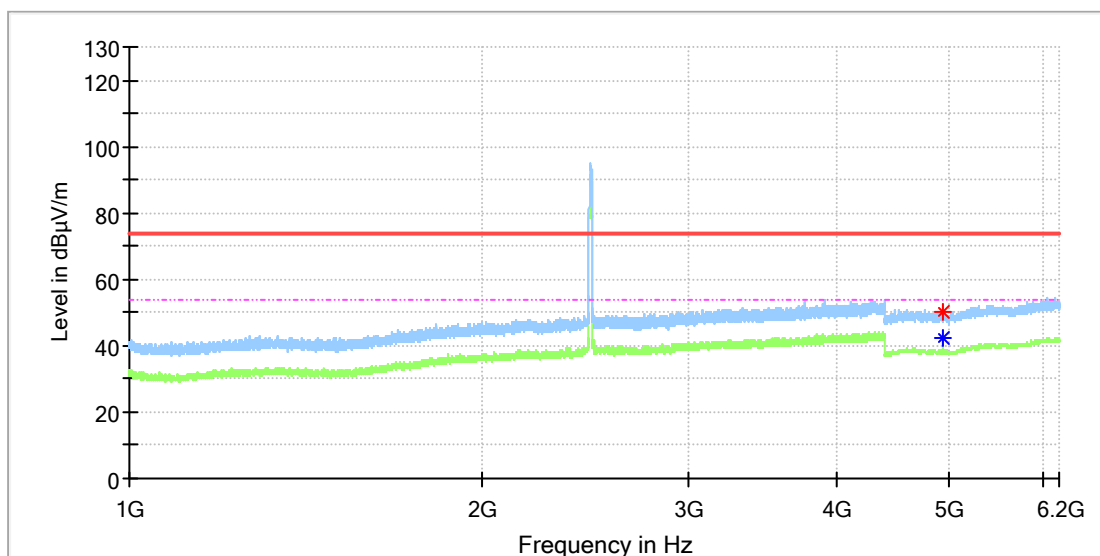


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4874.000000	50.08	---	74.00	23.92	150.0	V	272.0	11.8
4874.000000	---	39.90	54.00	14.10	150.0	V	272.0	11.8

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11b_High channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

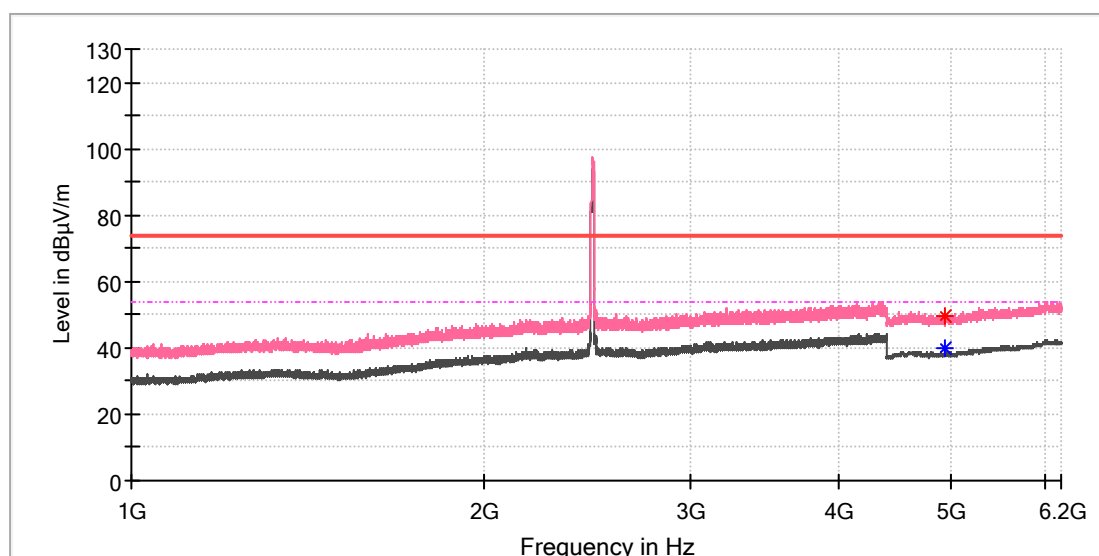


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4944.000000	49.94	---	74.00	24.06	150.0	H	2.0	11.8
4944.000000	---	42.10	54.00	11.90	150.0	H	2.0	11.8

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11b_High channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



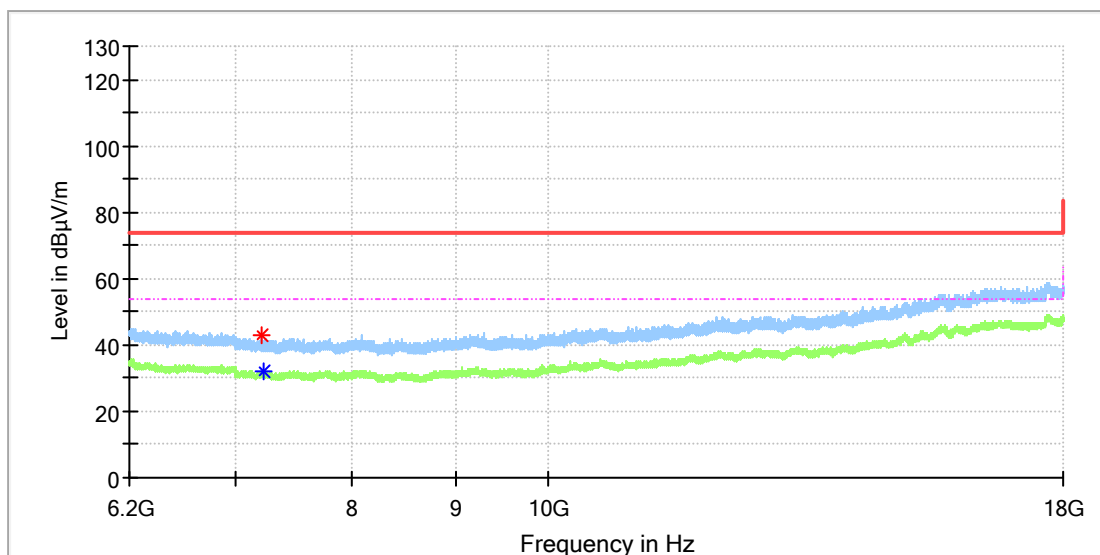
Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4943.500000	---	39.89	54.00	14.11	150.0	V	102.0	11.8
4944.000000	49.74	---	74.00	24.26	150.0	V	116.0	11.8

6.2GHz - 18GHz

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11b_Low channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

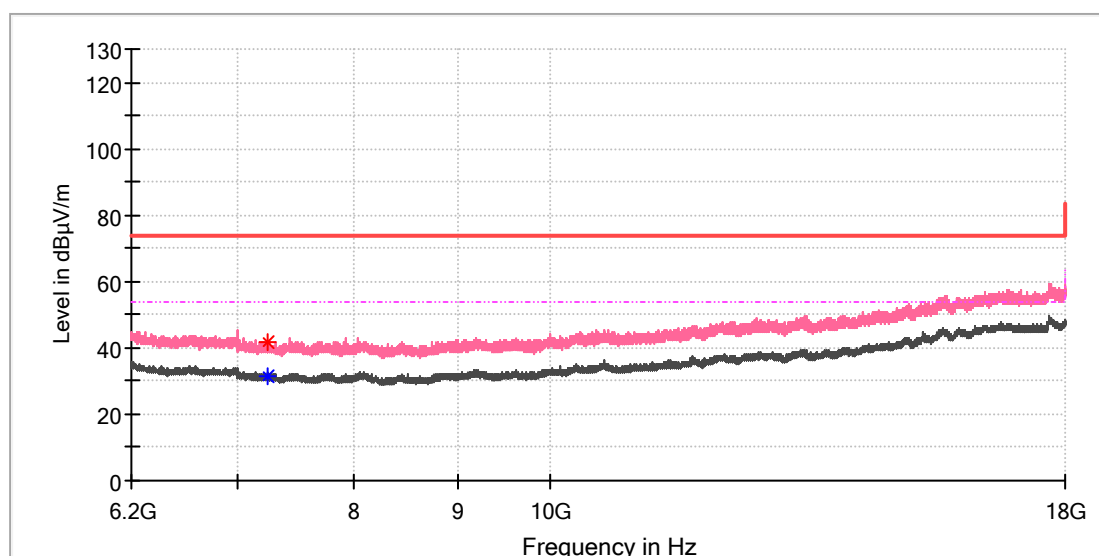


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7217.258333	42.90	---	74.00	31.10	150.0	H	142.0	8.7
7232.991667	---	31.97	54.00	22.03	150.0	H	74.0	8.6

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11b_Low channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

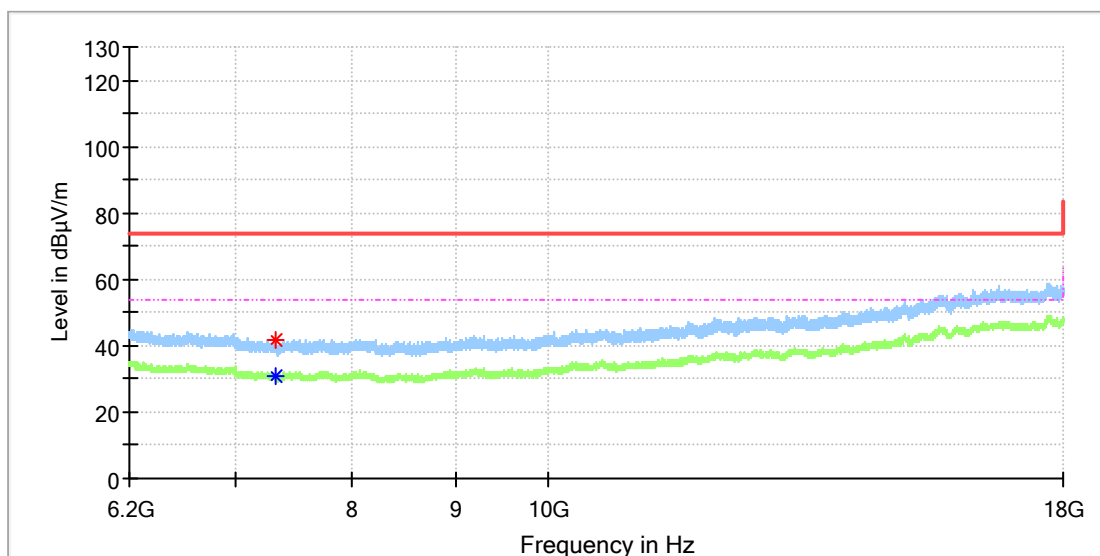


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7235.941667	---	31.55	54.00	22.45	150.0	V	90.0	8.6
7236.433333	41.45	---	74.00	32.56	150.0	V	48.0	8.6

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11b_Mid channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

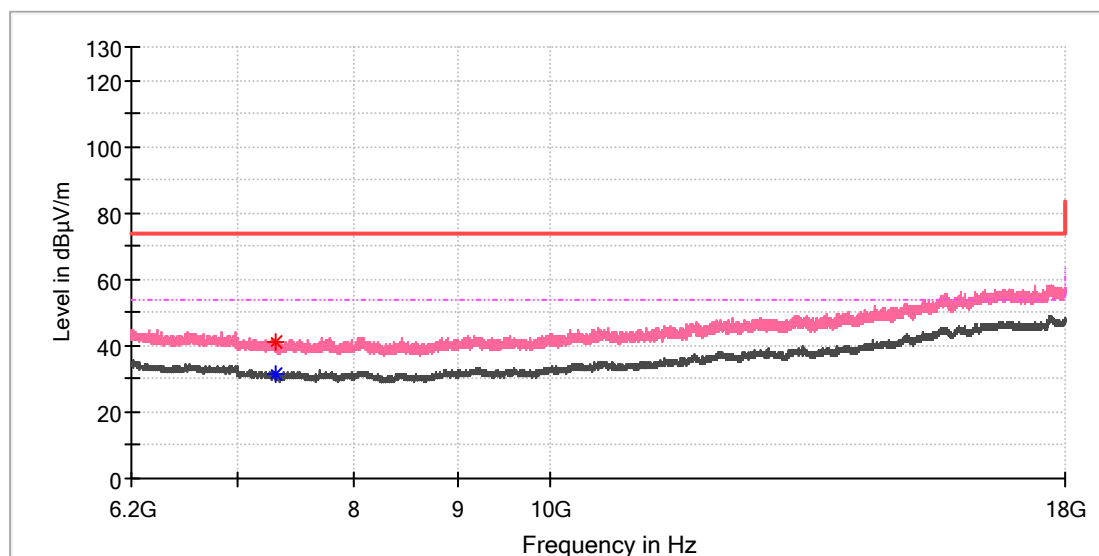


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7322.966667	41.48	---	74.00	32.52	150.0	H	208.0	8.2
7322.966667	---	31.11	54.00	22.89	150.0	H	208.0	8.2

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11b_Mid channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

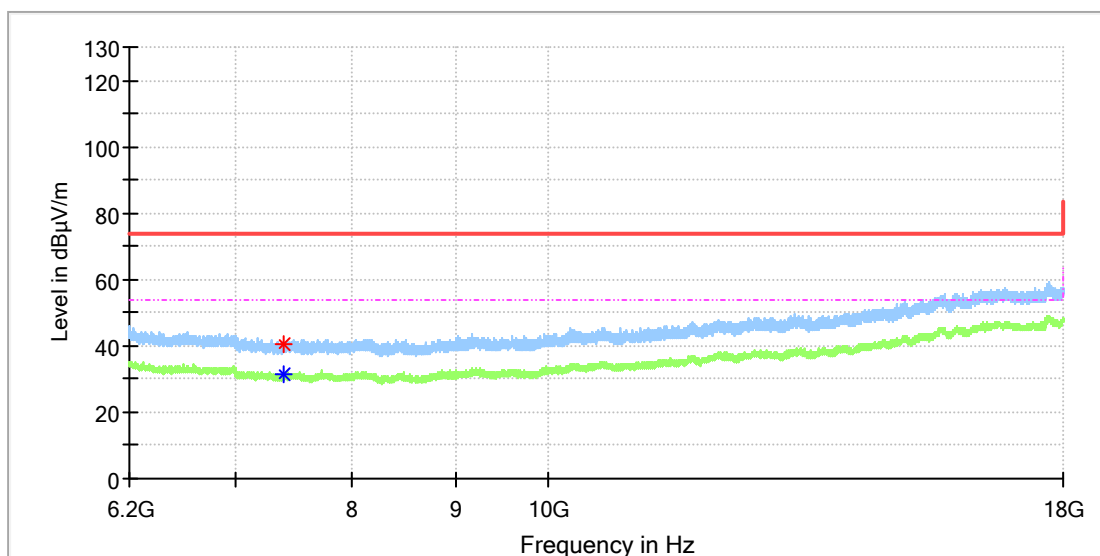


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7302.316667	41.38	---	74.00	32.62	150.0	V	219.0	8.3
7304.283333	---	31.65	54.00	22.35	150.0	V	233.0	8.3

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11b_High channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

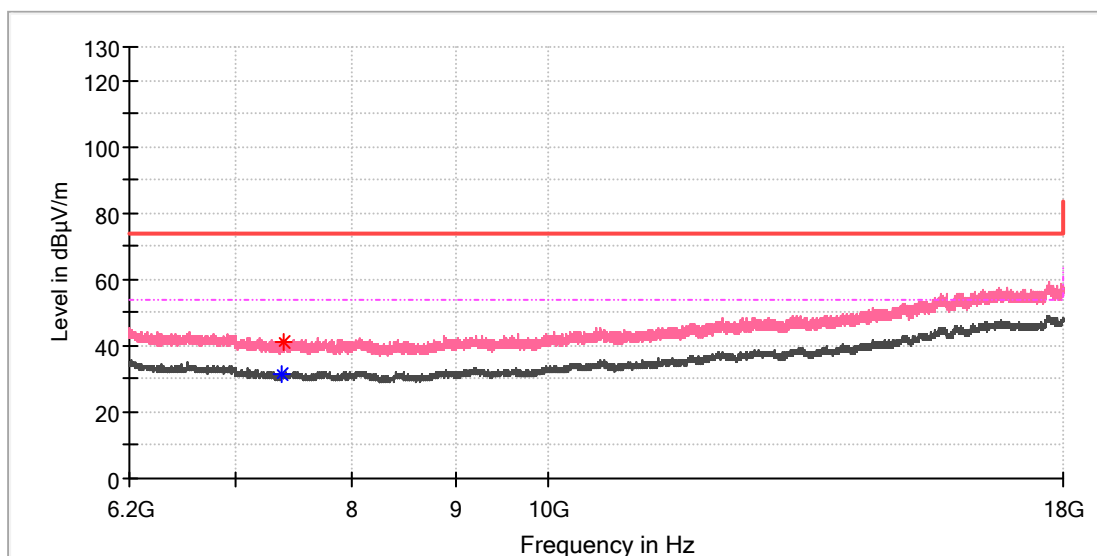


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7391.308333	40.31	---	74.00	33.69	150.0	H	263.0	8.3
7395.733333	---	31.37	54.00	22.63	150.0	H	315.0	8.3

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11b_High channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



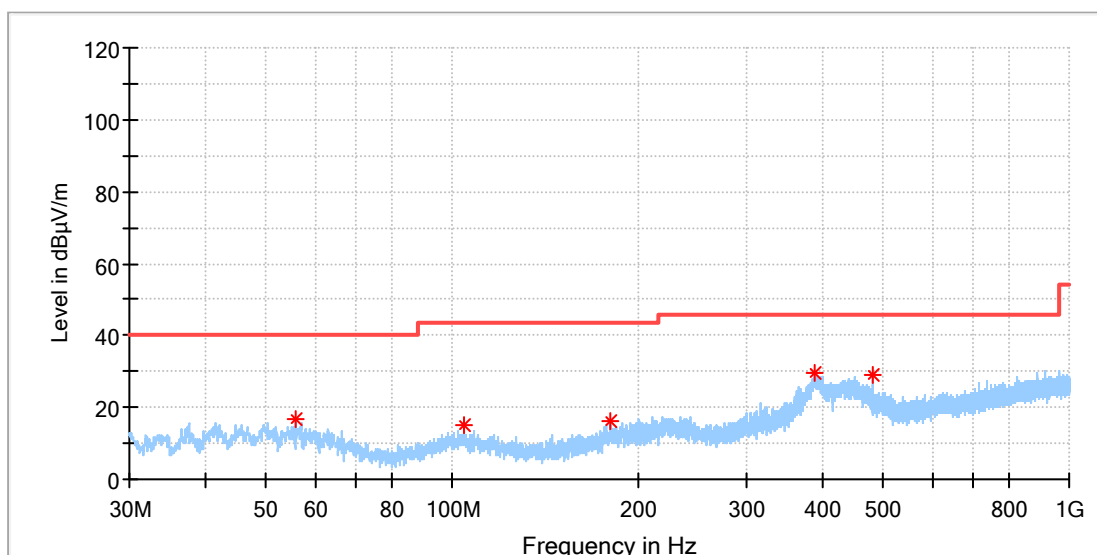
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7378.033333	---	31.51	54.00	22.49	150.0	V	226.0	8.2
7390.816667	41.15	---	74.00	32.85	150.0	V	212.0	8.3

Bluetooth Low Energy 30MHz - 1GHz

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	BLE 1M_Low channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

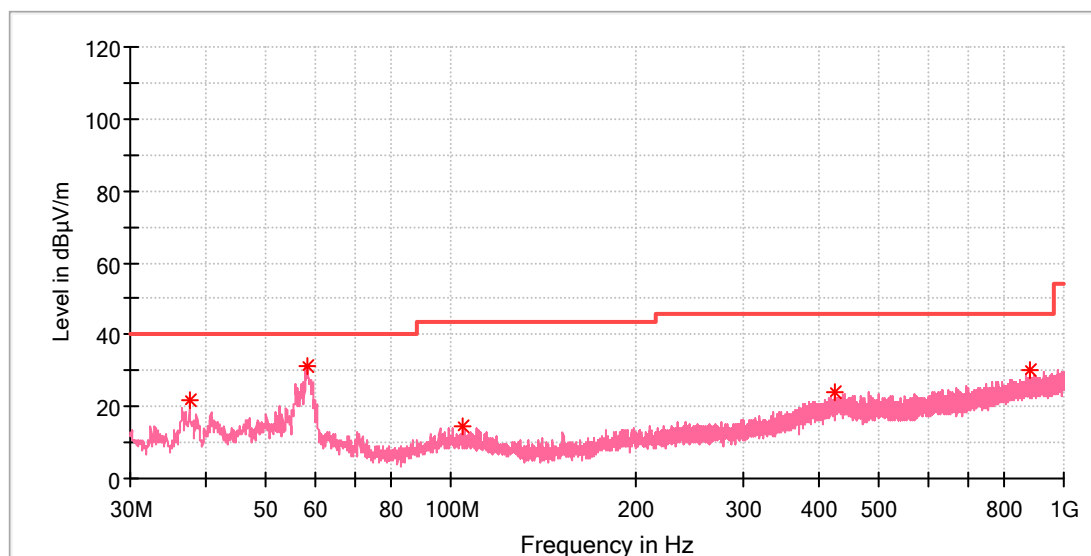


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
55.850500	16.72	40.00	23.28	100.0	H	259.0	-18.5
104.253500	15.12	43.50	28.38	100.0	H	9.0	-18.8
180.932000	16.15	43.50	27.35	100.0	H	1.0	-20.5
385.553500	29.68	46.00	16.32	100.0	H	156.0	-14.1
480.080000	29.30	46.00	16.70	100.0	H	204.0	-12.2

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	BLE 1M_Low channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

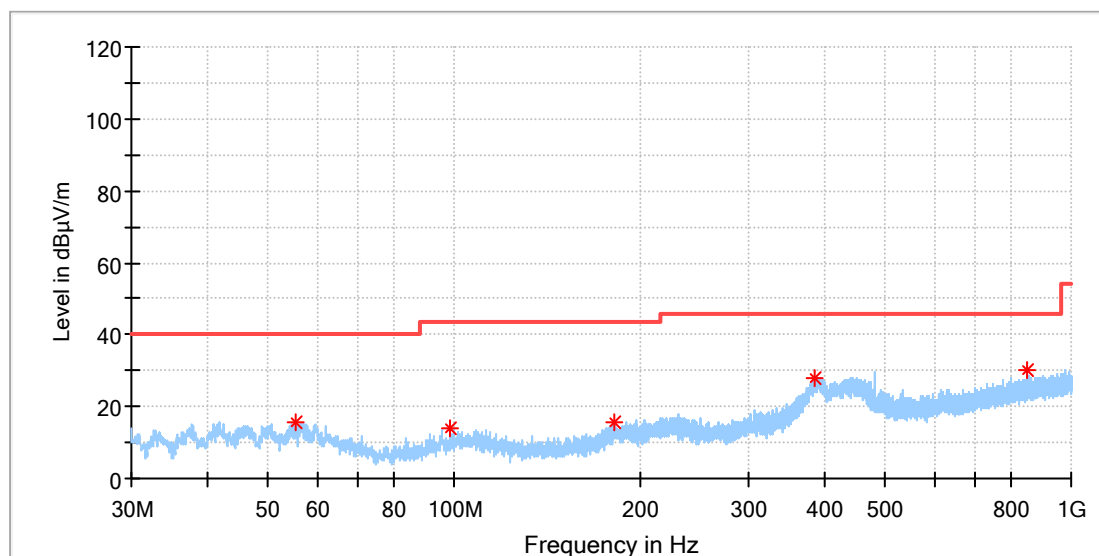


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
37.517500	21.77	40.00	18.23	100.0	V	149.0	-21.0
58.469500	31.28	40.00	8.72	100.0	V	251.0	-18.8
104.884000	14.57	43.50	28.93	100.0	V	276.0	-18.7
421.977000	23.79	46.00	22.21	100.0	V	351.0	-13.4
882.630000	30.09	46.00	15.91	100.0	V	194.0	-5.1

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	BLE 1M_High channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

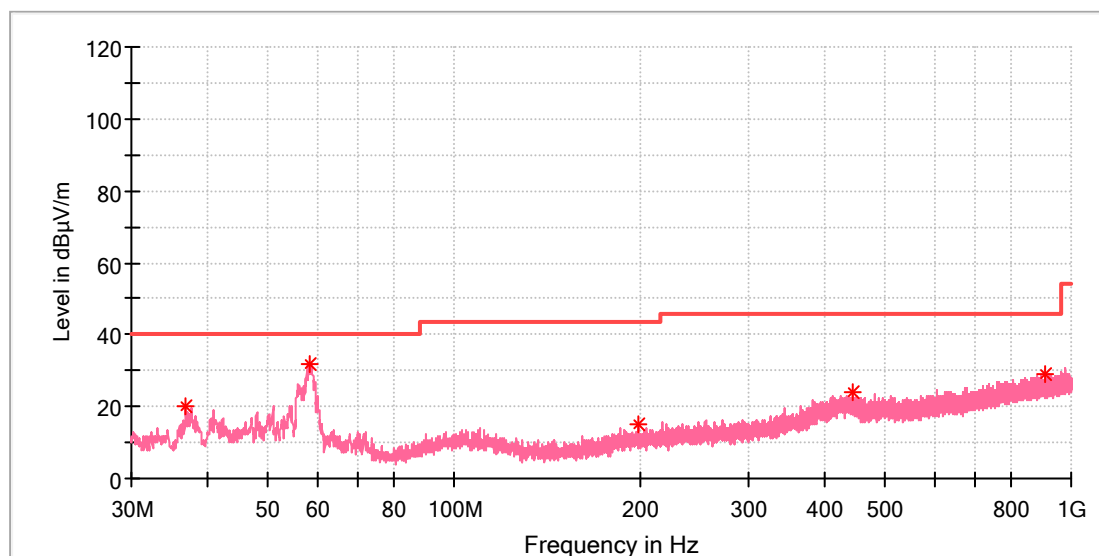


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
55.559500	15.65	40.00	24.35	100.0	H	179.0	-18.5
98.239500	13.87	43.50	29.63	100.0	H	358.0	-19.3
181.271500	15.57	43.50	27.93	100.0	H	0.0	-20.4
382.692000	28.07	46.00	17.94	100.0	H	5.0	-14.2
845.673000	29.93	46.00	16.07	100.0	H	272.0	-5.6

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	BLE 1M_High channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



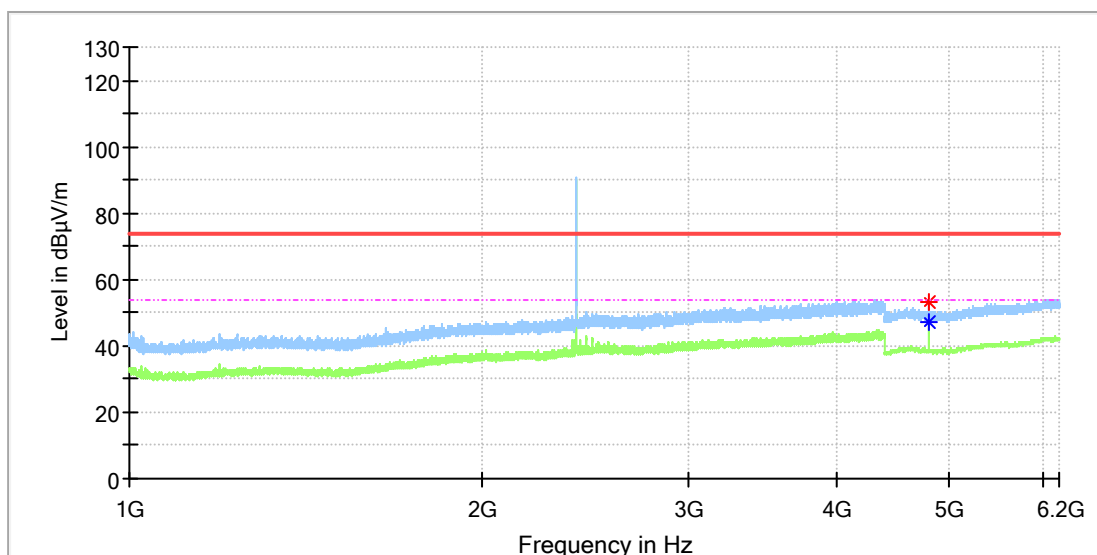
Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
36.741500	19.97	40.00	20.03	100.0	V	182.0	-21.3
58.566500	31.73	40.00	8.27	100.0	V	0.0	-18.8
198.634500	14.94	43.50	28.56	100.0	V	99.0	-19.0
442.735000	23.73	46.00	22.27	100.0	V	294.0	-13.1
906.540500	29.26	46.00	16.74	100.0	V	200.0	-4.9

1GHz - 6.2GHz

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	BLE 1M_Low channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

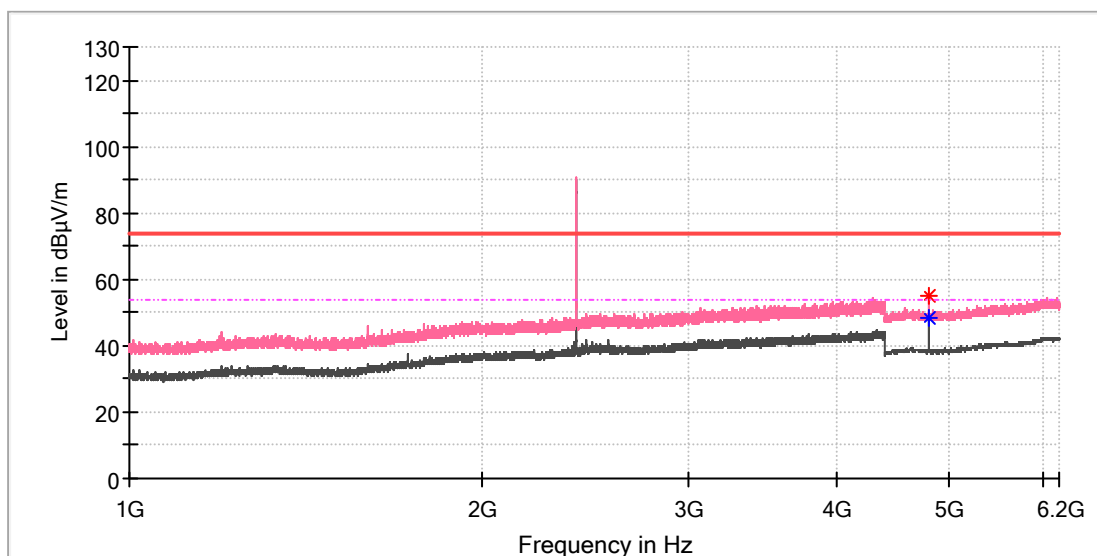


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4803.500000	53.31	---	74.00	20.69	150.0	H	245.0	11.8
4804.000000	---	47.25	54.00	6.75	150.0	H	238.0	11.8

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	BLE 1M_Low channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

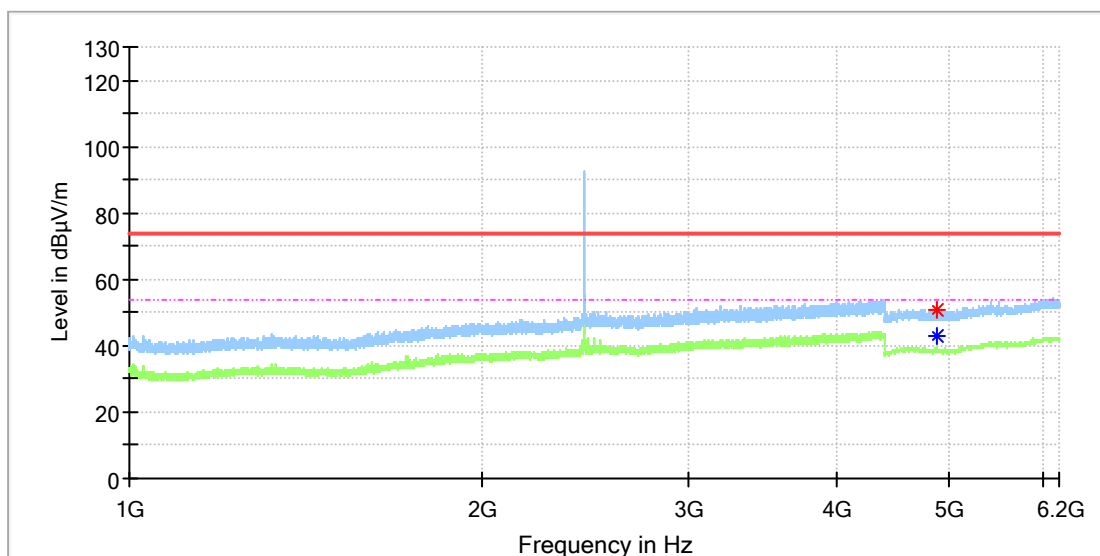


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4803.500000	55.16	---	74.00	18.84	150.0	V	89.0	11.8
4803.500000	---	48.28	54.00	5.72	150.0	V	89.0	11.8

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	BLE 1M_Mid channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

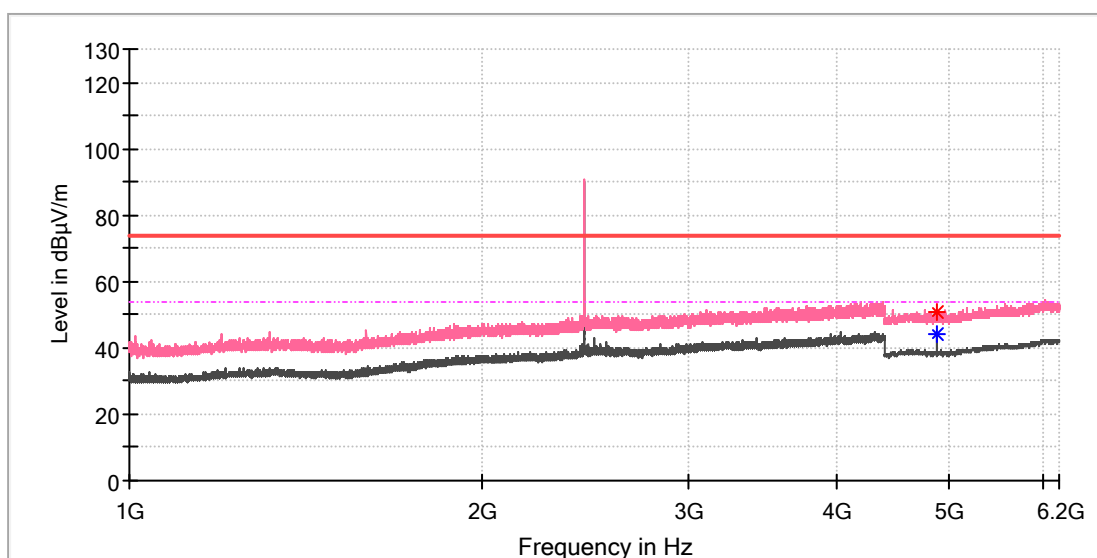


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4879.500000	50.54	---	74.00	23.46	150.0	H	276.0	11.8
4880.000000	---	42.69	54.00	11.31	150.0	H	227.0	11.8

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	BLE 1M_Mid channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

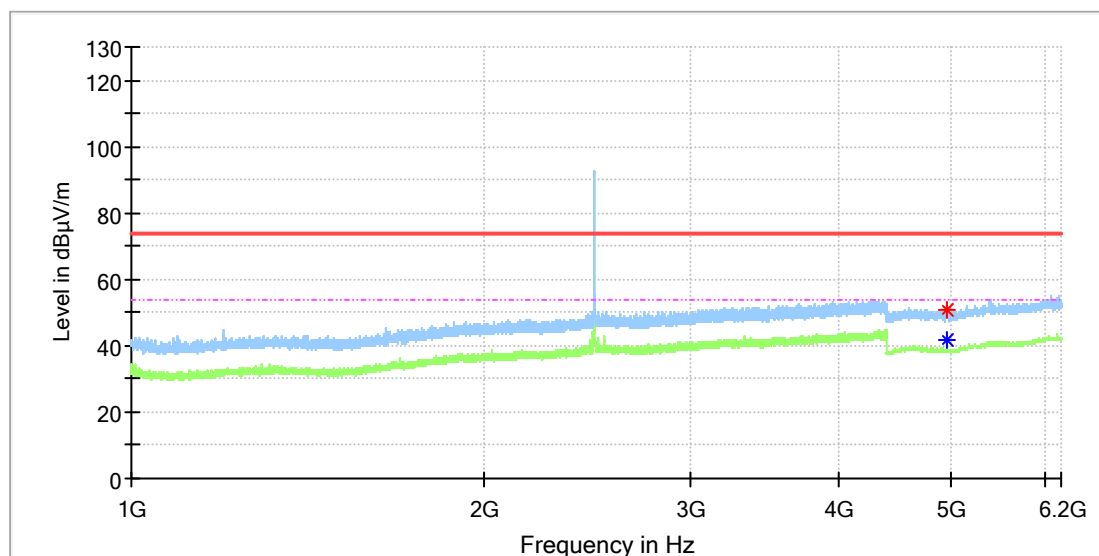


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4879.500000	50.88	---	74.00	23.12	150.0	V	251.0	11.8
4879.500000	---	43.98	54.00	10.02	150.0	V	251.0	11.8

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	BLE 1M_High channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

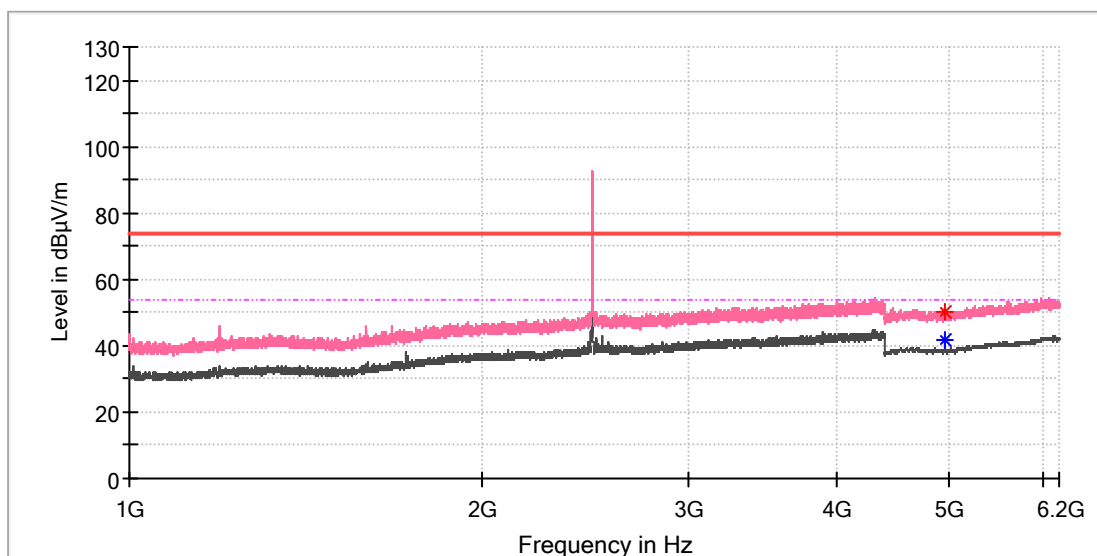


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4959.500000	50.51	---	74.00	23.49	150.0	H	0.0	11.8
4960.000000	---	41.69	54.00	12.31	150.0	H	41.0	11.8

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	BLE 1M_High channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



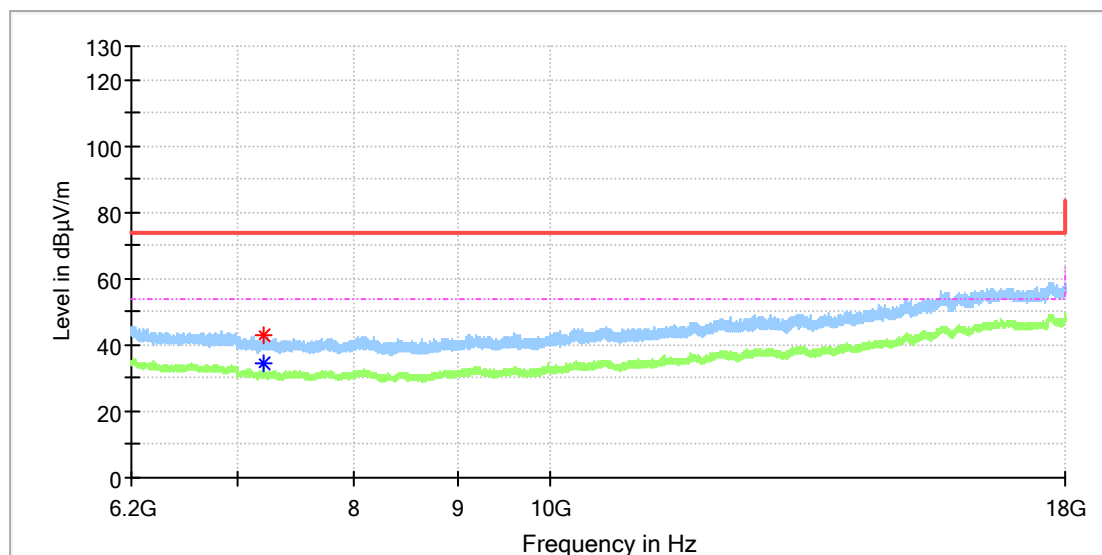
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4959.500000	50.31	---	74.00	23.69	150.0	V	315.0	11.8
4959.500000	---	41.62	54.00	12.38	150.0	V	315.0	11.8

6.2GHz - 18GHz

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	BLE 1M_Low channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

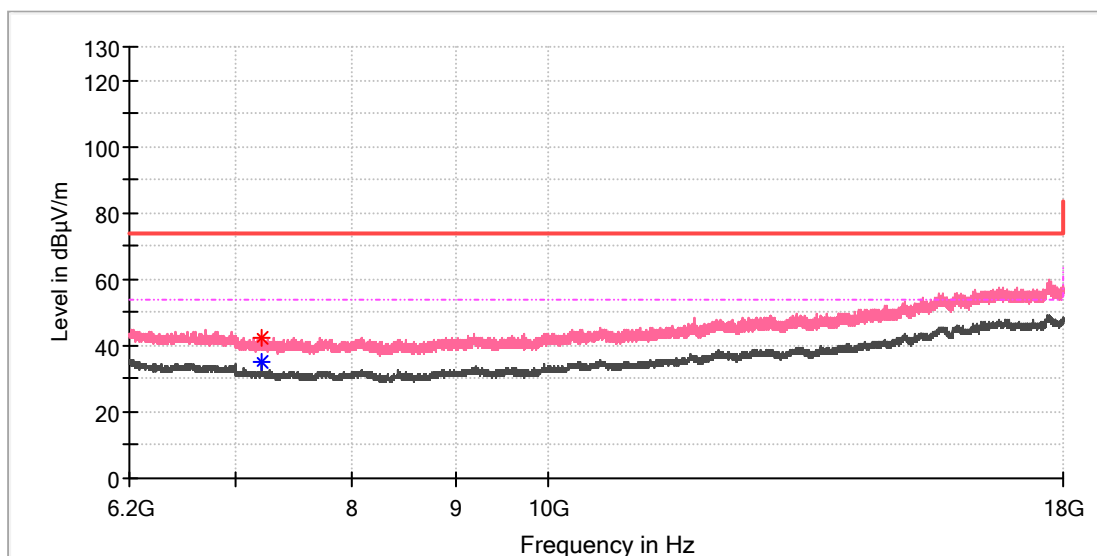


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7204.966667	42.70	---	74.00	31.30	150.0	H	193.0	8.8
7204.966667	---	34.55	54.00	19.45	150.0	H	193.0	8.8

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	BLE 1M_Low channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

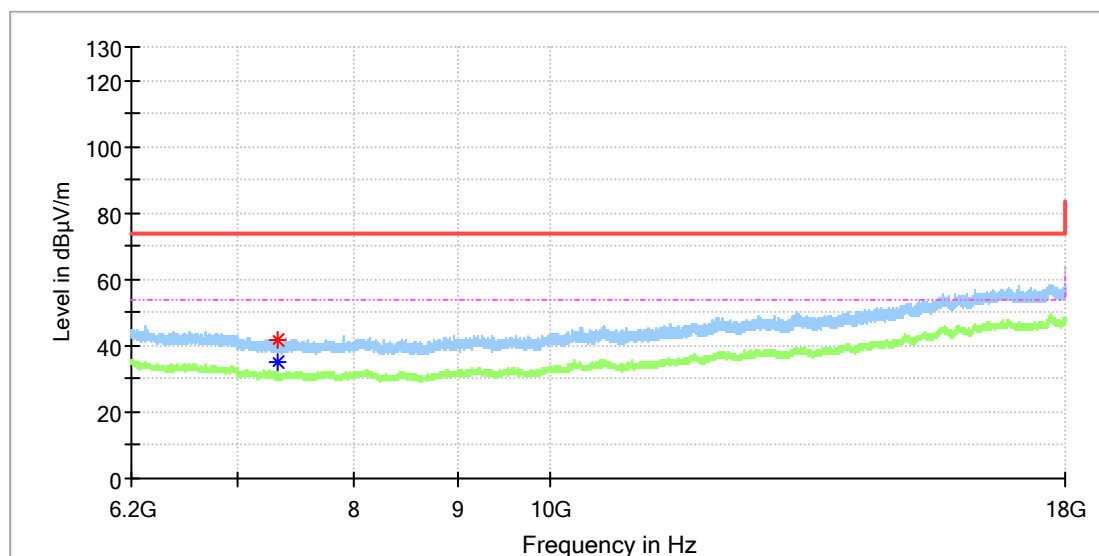


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7205.950000	42.11	---	74.00	31.89	150.0	V	326.0	8.8
7205.950000	---	35.07	54.00	18.93	150.0	V	326.0	8.8

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	BLE 1M_Mid channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

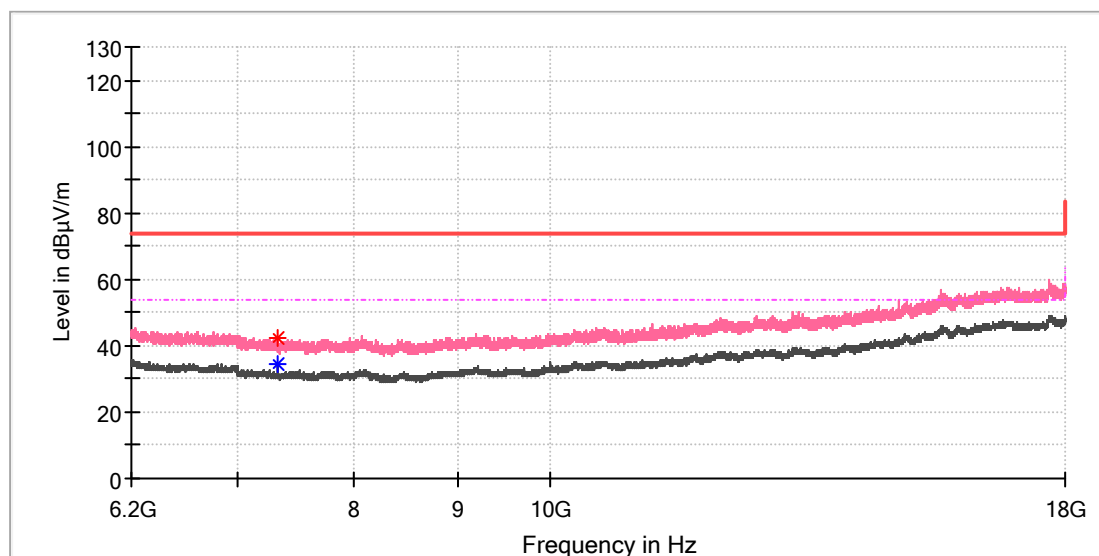


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7320.016667	---	35.33	54.00	18.67	150.0	H	167.0	8.2
7320.508333	41.97	---	74.00	32.04	150.0	H	16.0	8.2

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	BLE 1M_Mid channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

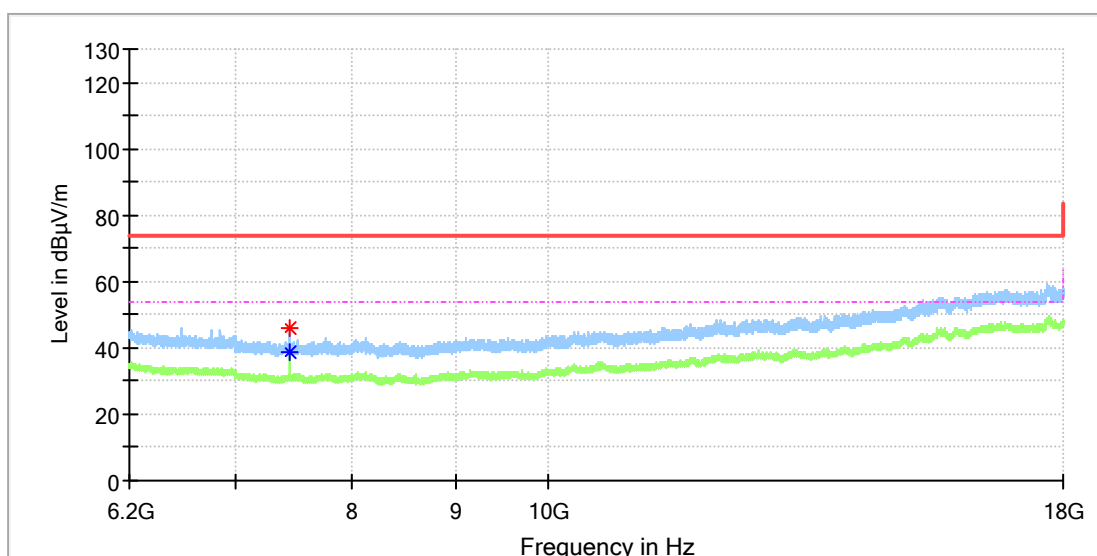


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7320.016667	---	34.41	54.00	19.59	150.0	V	190.0	8.2
7328.866667	42.14	---	74.00	31.86	150.0	V	0.0	8.1

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	BLE 1M_High channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

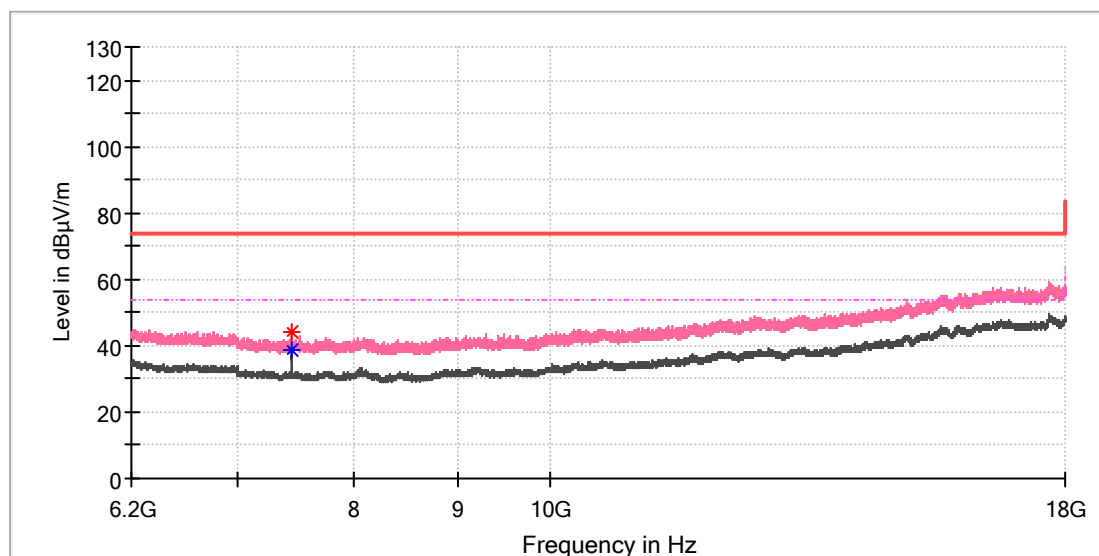


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7439.000000	---	38.60	54.00	15.40	150.0	H	239.0	8.4
7439.491667	45.83	---	74.00	28.17	150.0	H	239.0	8.4

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	BLE 1M_High channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



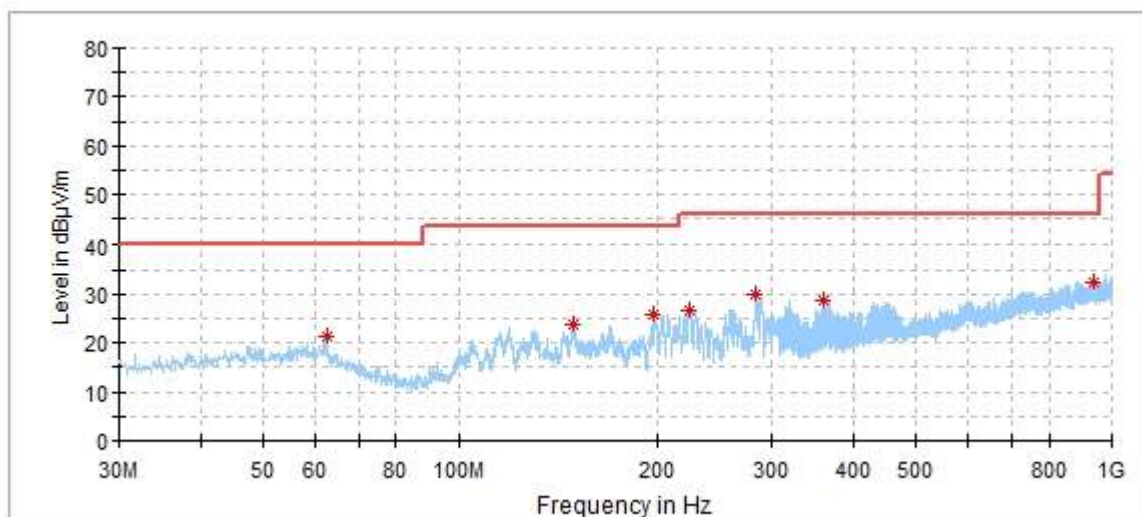
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7439.000000	44.40	---	74.00	29.60	150.0	V	133.0	8.4
7439.000000	---	38.81	54.00	15.19	150.0	V	133.0	8.4

Wi-Fi 802.11 + BLE (Simultaneous transmitting mode)

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model	LAM05
Order No:	168325905
Test Mode:	ON
Test Voltage:	AC 120V/60Hz
Test By:	Ouyang Wang
Review By:	Gary Chen
Remark:	3m Chamber

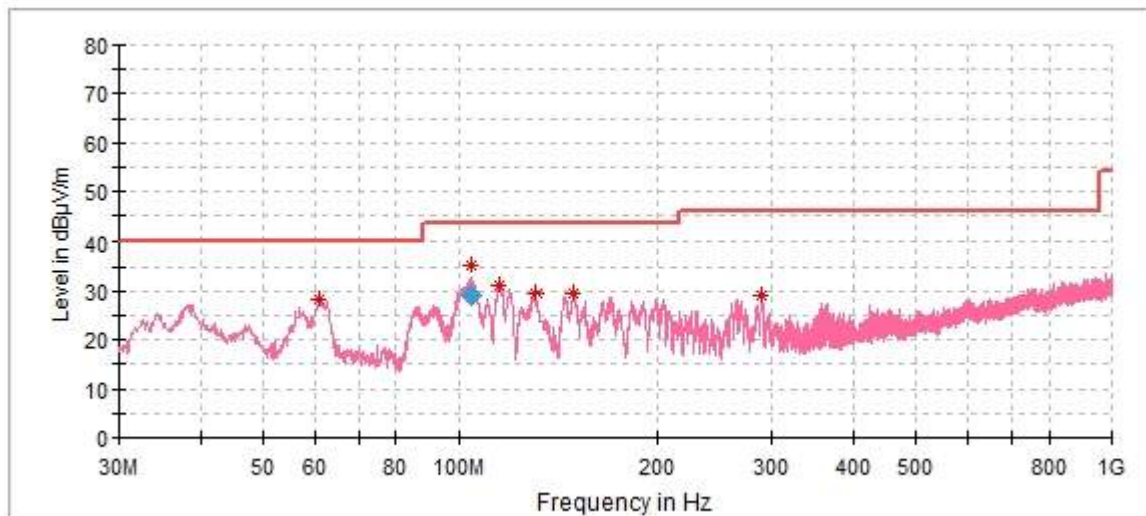


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
62.495000	21.33	40.00	18.67	200.0	H	111.0	20.5
148.631000	23.71	43.50	19.79	200.0	H	0.0	20.4
197.422000	25.92	43.50	17.58	200.0	H	353.0	17.0
223.612000	26.67	46.00	19.33	200.0	H	37.0	18.7
283.558000	29.74	46.00	16.26	100.0	H	166.0	19.9
360.382000	28.65	46.00	17.35	100.0	H	199.0	22.8
935.495000	32.58	46.00	13.42	100.0	H	39.0	32.2

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model	LAM05
Order No:	168325905
Test Mode:	ON
Test Voltage:	AC 120V/60Hz
Test By:	Ouyang Wang
Review By:	Gary Chen
Remark:	3m Chamber



Critical Freqs

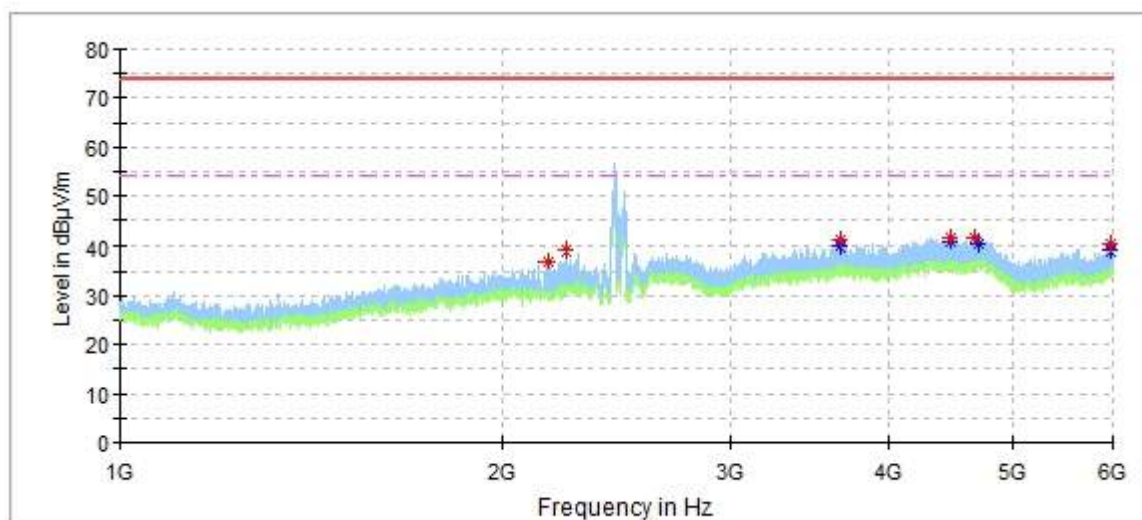
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
61.040000	28.45	40.00	11.55	100.0	V	220.0	20.7
104.031000	35.27	43.50	8.23	100.0	V	32.0	17.3
115.651000	31.15	43.50	12.35	100.0	V	44.0	19.1
130.686000	29.53	43.50	13.97	100.0	V	92.0	19.0
148.534000	29.64	43.50	13.86	100.0	V	100.0	20.4
289.669000	29.22	46.00	16.78	100.0	V	132.0	19.9

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)
104.031000	29.22	43.50	14.28	1000.0	120.000	100.0	V	32.0	17.3

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model	LAM05
Order No:	168325905
Test Mode:	ON
Test Voltage:	AC 120V/60Hz
Test By:	Ouyang Wang
Review By:	Gary Chen
Remark:	3m Chamber

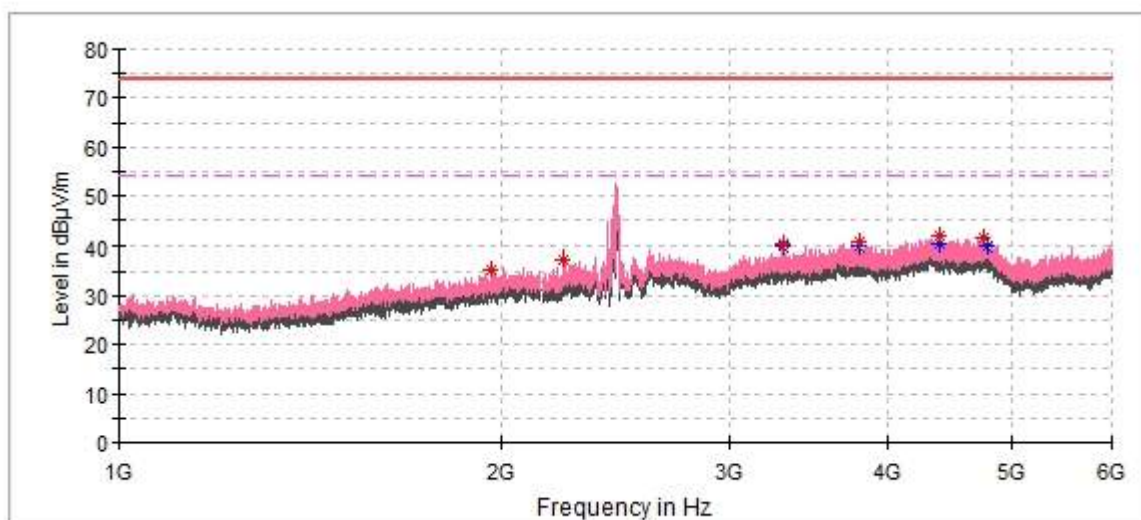


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2162.000000	36.74	---	74.00	37.26	100.0	H	233.0	-7.6
2232.500000	39.13	---	74.00	34.87	100.0	H	0.0	-7.1
3665.500000	41.18	---	74.00	32.82	100.0	H	62.0	0.0
3665.500000	---	39.71	54.00	14.29	100.0	H	62.0	0.0
4472.000000	41.55	---	74.00	32.45	200.0	H	74.0	2.0
4472.000000	---	40.66	54.00	13.34	200.0	H	74.0	2.0
4673.500000	41.64	---	74.00	32.36	200.0	H	97.0	2.4
4705.500000	---	40.20	54.00	13.80	100.0	H	50.0	2.7
5985.500000	---	39.05	54.00	14.95	100.0	H	340.0	2.4
5985.500000	40.33	---	74.00	33.67	100.0	H	340.0	2.4

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model	LAM05
Order No:	168325905
Test Mode:	ON
Test Voltage:	AC 120V/60Hz
Test By:	Ouyang Wang
Review By:	Gary Chen
Remark:	3m Chamber



Critical Freqs

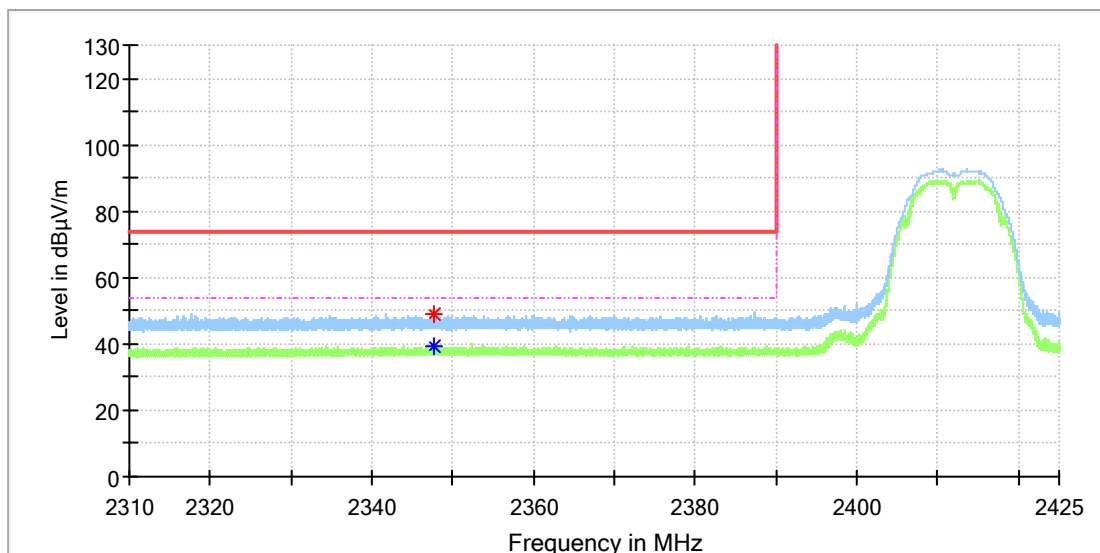
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1958.500000	35.42	---	74.00	38.58	100.0	V	135.0	-8
2225.000000	37.51	---	74.00	36.49	100.0	V	197.0	-7
3310.500000	---	39.71	54.00	14.29	200.0	V	256.0	-2
3310.500000	40.08	---	74.00	33.92	200.0	V	256.0	-2
3796.000000	---	39.80	54.00	14.20	200.0	V	290.0	0
3796.000000	40.69	---	74.00	33.31	200.0	V	290.0	0
4397.500000	---	40.27	54.00	13.73	100.0	V	105.0	2
4397.500000	41.97	---	74.00	32.03	100.0	V	105.0	2
4757.500000	41.35	---	74.00	32.65	100.0	V	339.0	3
4791.500000	---	39.81	54.00	14.19	100.0	V	294.0	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:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11b_Low channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

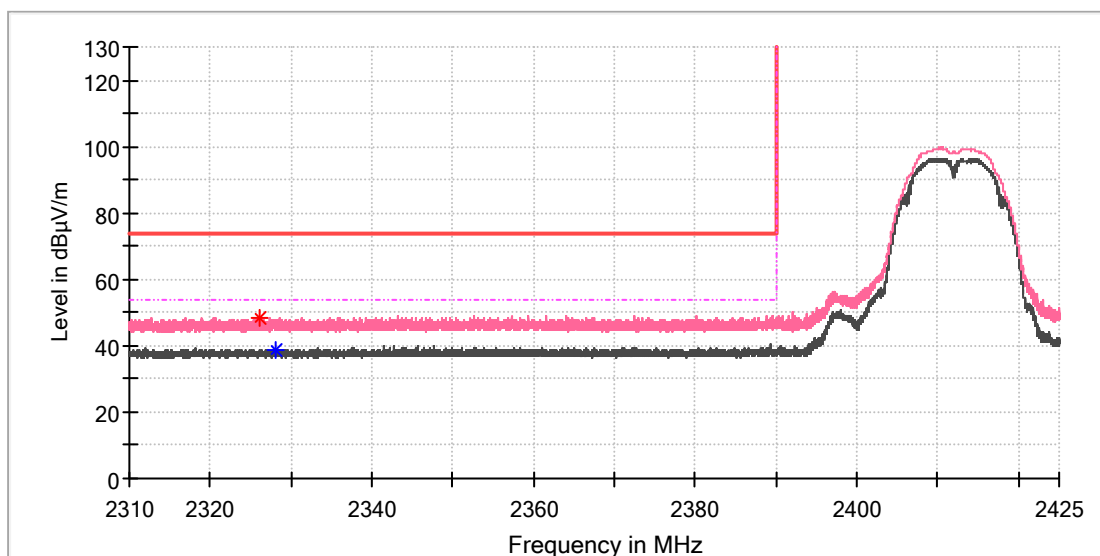


Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2347.639500	---	39.04	54.00	14.96	150.0	H	267.0	6.9
2347.685500	49.24	---	74.00	24.76	150.0	H	327.0	6.9

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11b_Low channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



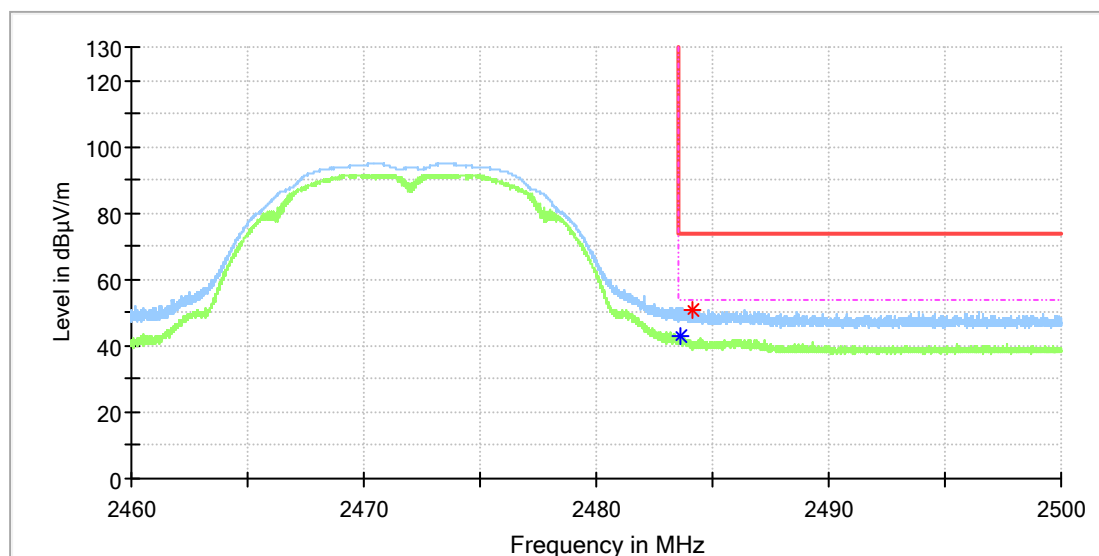
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2326.105750	48.60	---	74.00	25.40	150.0	V	47.0	6.7
2328.141250	---	38.78	54.00	15.22	150.0	V	317.0	6.7

High channel

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11b_High channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

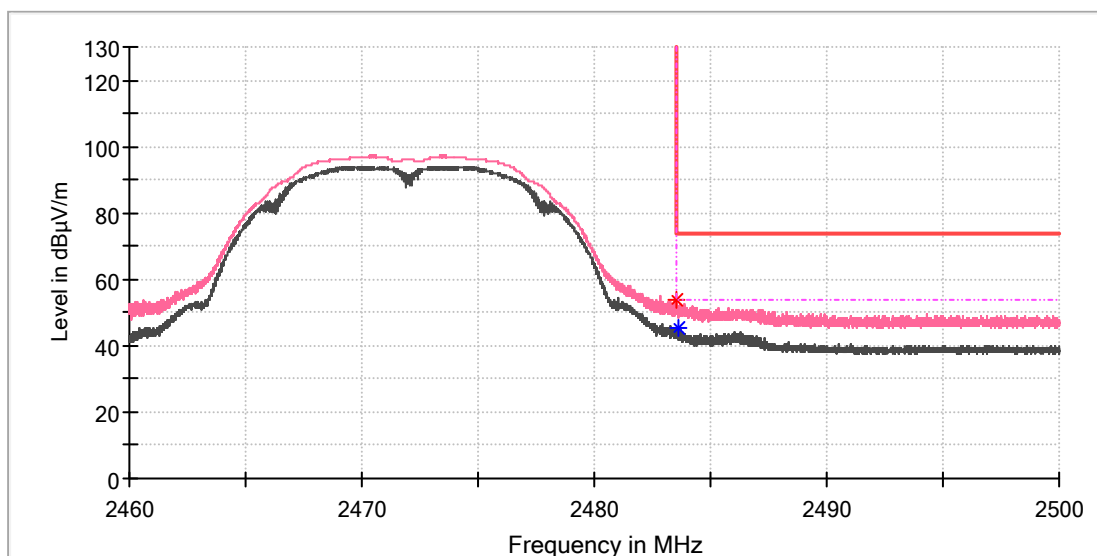


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.655000	---	42.68	54.00	11.32	150.0	H	135.0	7.4
2484.124000	50.84	---	74.00	23.16	150.0	H	124.0	7.4

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11b_High channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



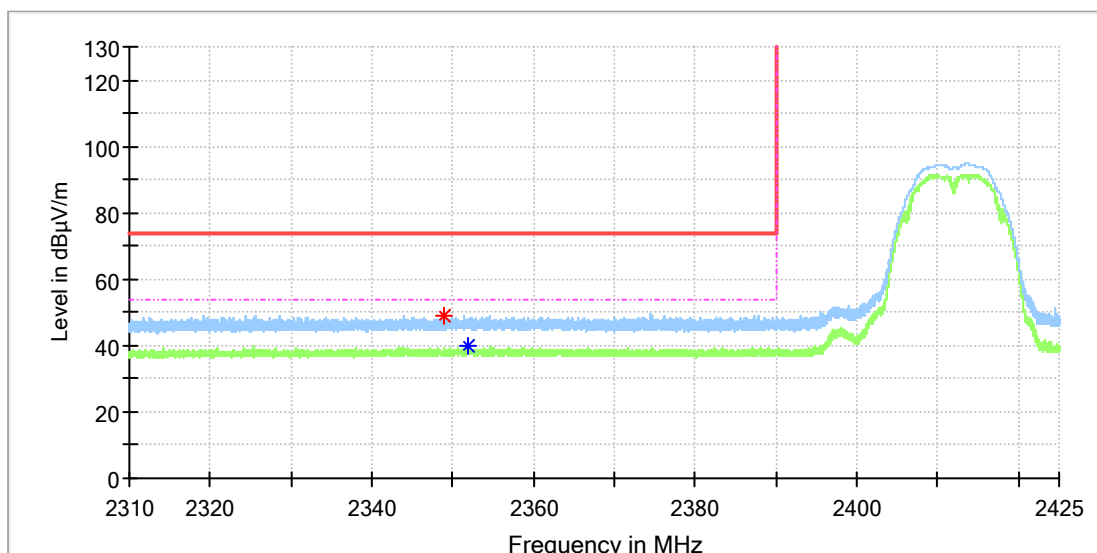
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.553500	53.60	---	74.00	20.40	150.0	V	143.0	7.4
2483.602500	---	45.26	54.00	8.74	150.0	V	143.0	7.4

**Wi-Fi 802.11 g mode, 6 Mbps
Low channel**

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11g_Low channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

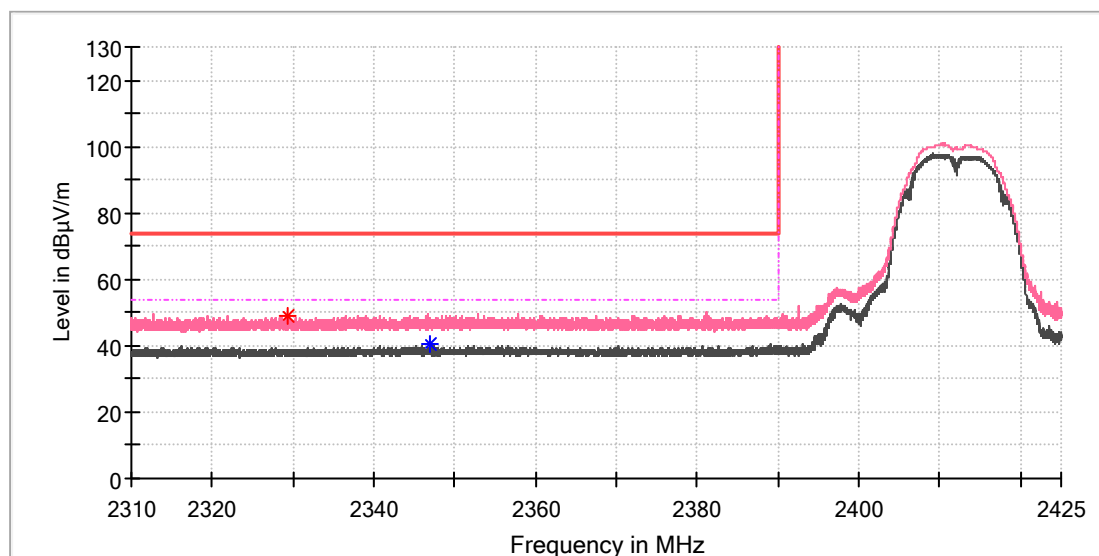


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2349.025250	48.80	---	74.00	25.20	150.0	H	244.0	6.9
2351.842750	---	39.63	54.00	14.37	150.0	H	130.0	6.9

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11g_Low channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



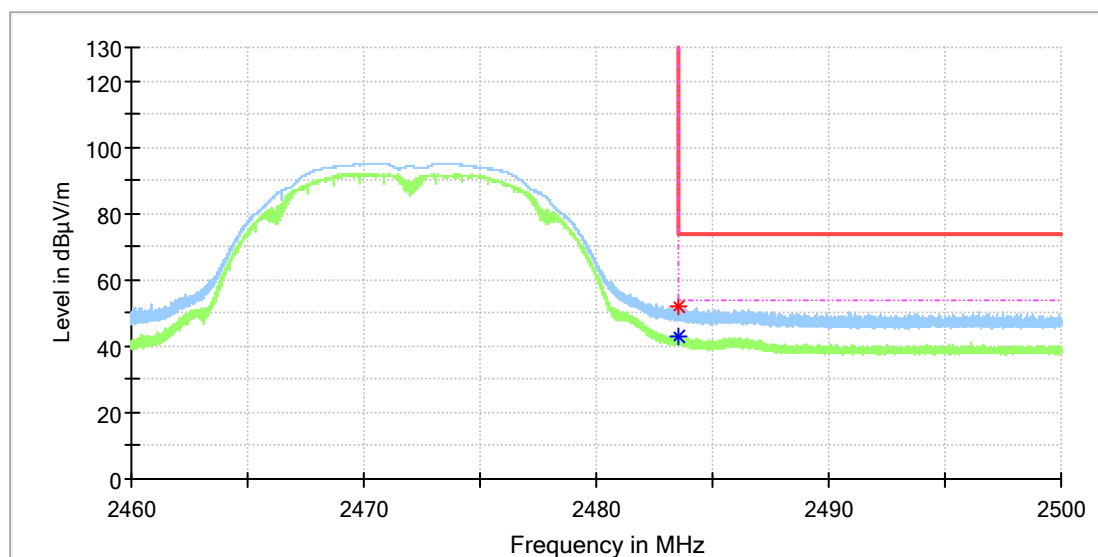
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2329.348750	49.11	---	74.00	24.89	150.0	V	320.0	6.7
2346.938000	---	40.59	54.00	13.41	150.0	V	0.0	6.9

High channel

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11g_High channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

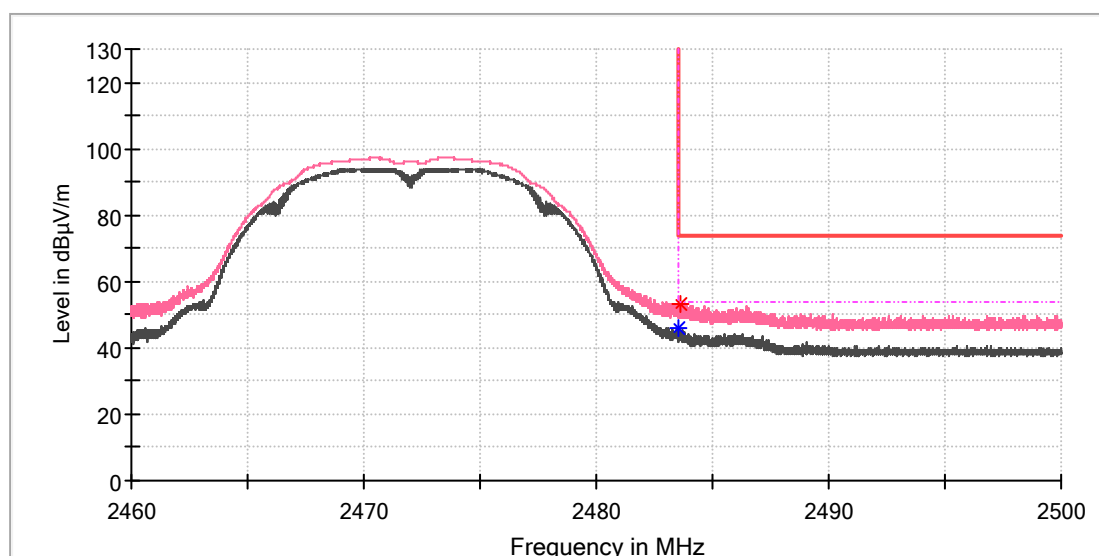


Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.524000	52.22	---	74.00	21.78	150.0	H	88.0	7.4
2483.544000	---	42.86	54.00	11.14	150.0	H	153.0	7.4

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11g_High channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



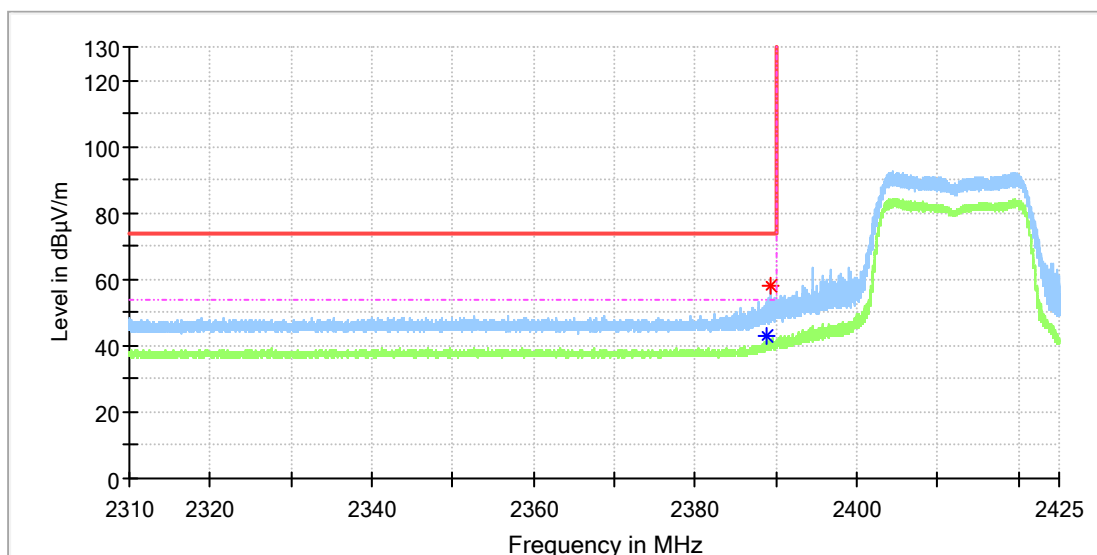
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.517500	---	45.79	54.00	8.21	150.0	V	176.0	7.4
2483.635000	53.00	---	74.00	21.00	150.0	V	193.0	7.4

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

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11n20_Low channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

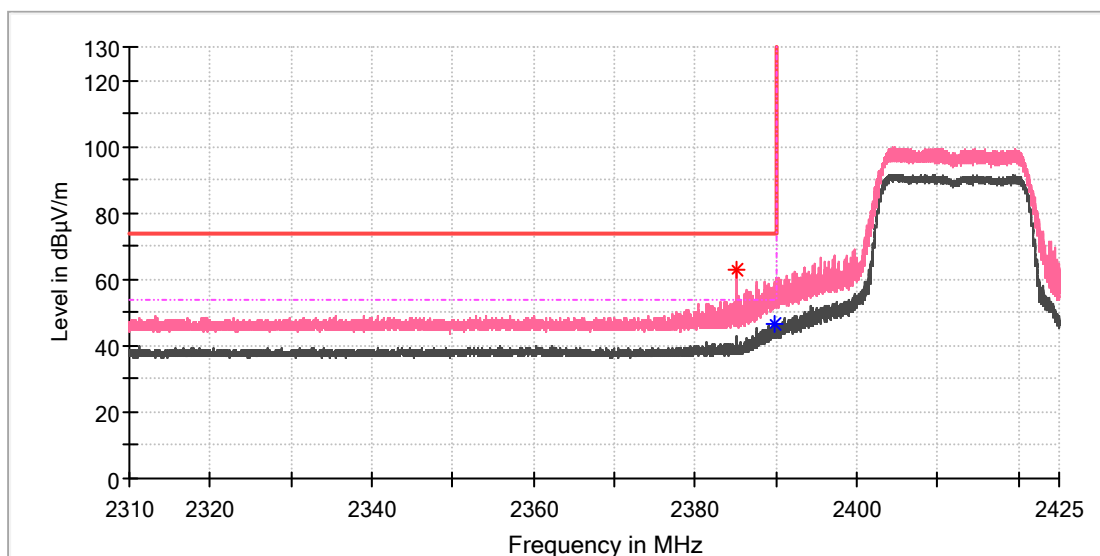


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2388.936000	---	42.86	54.00	11.14	150.0	H	110.0	7.0
2389.344250	58.27	---	74.00	15.73	150.0	H	41.0	7.0

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11n20_Low channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



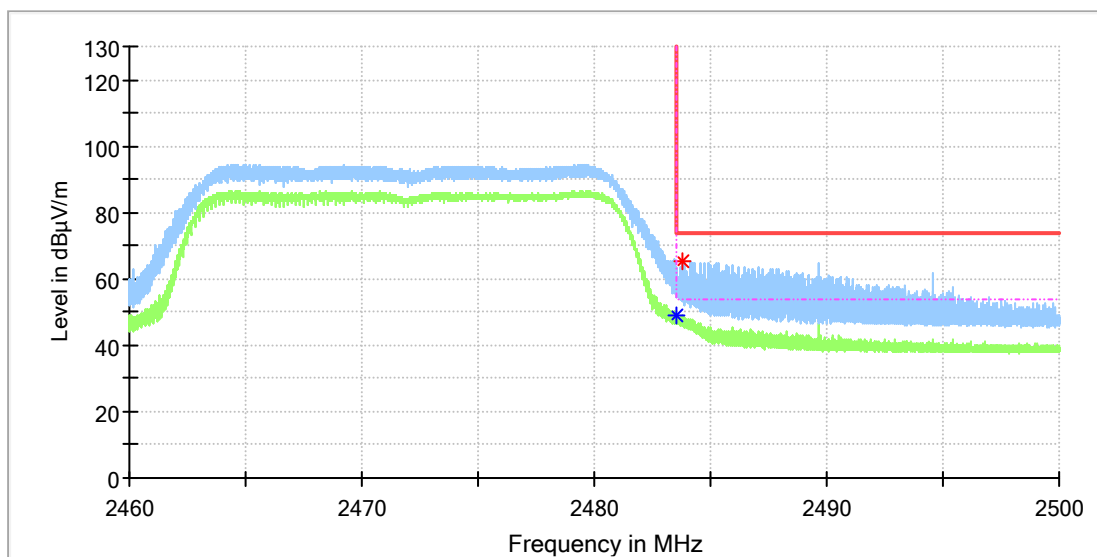
Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2385.141000	62.87	---	74.00	11.13	150.0	V	131.0	7.0
2389.838750	---	46.63	54.00	7.37	150.0	V	146.0	7.0

High channel

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11n20_High channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

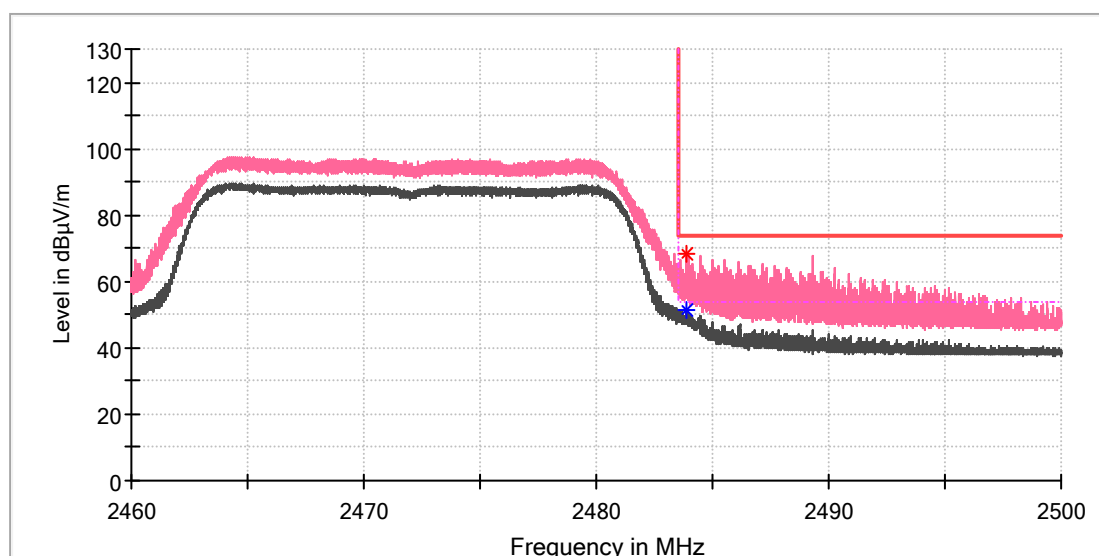


Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.560000	---	49.04	54.00	4.96	150.0	H	171.0	7.4
2483.790000	65.45	---	74.00	8.55	150.0	H	112.0	7.4

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11n20_High channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



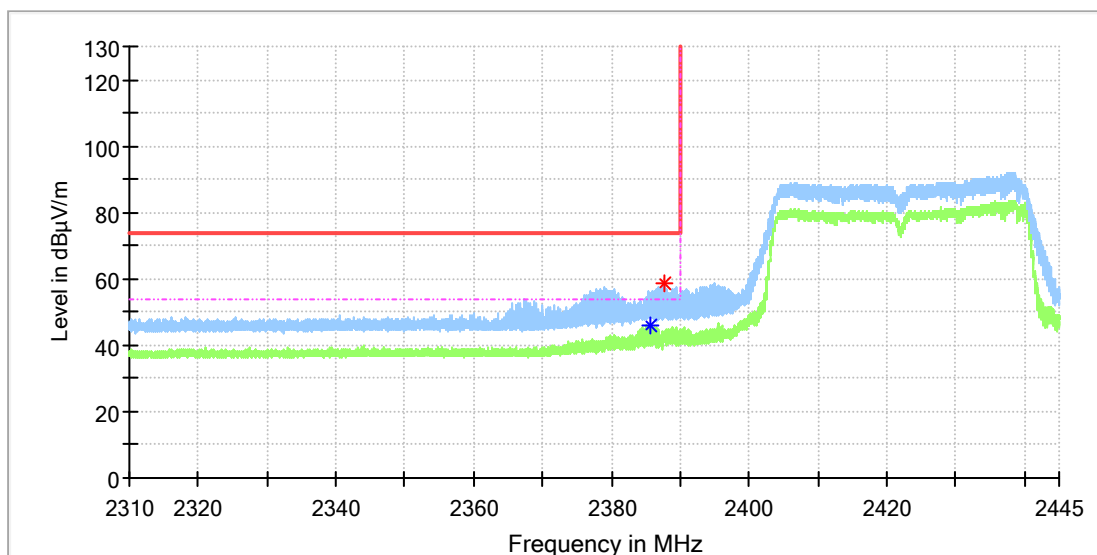
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.872500	68.33	---	74.00	5.67	150.0	V	149.0	7.4
2483.877500	---	51.38	54.00	2.62	150.0	V	149.0	7.4

**Wi-Fi 802.11 n(HT40) mode, MCS0
Low channel**

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11n40_Low channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

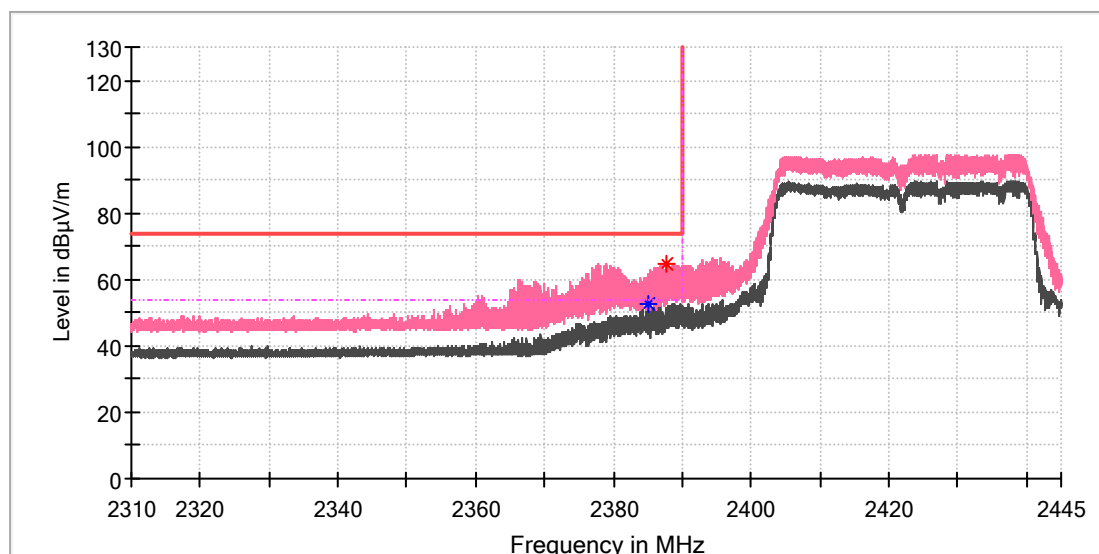


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2385.708000	---	45.93	54.00	8.07	150.0	H	234.0	7.0
2387.672250	58.42	---	74.00	15.58	150.0	H	58.0	7.0

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11n40_Low channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



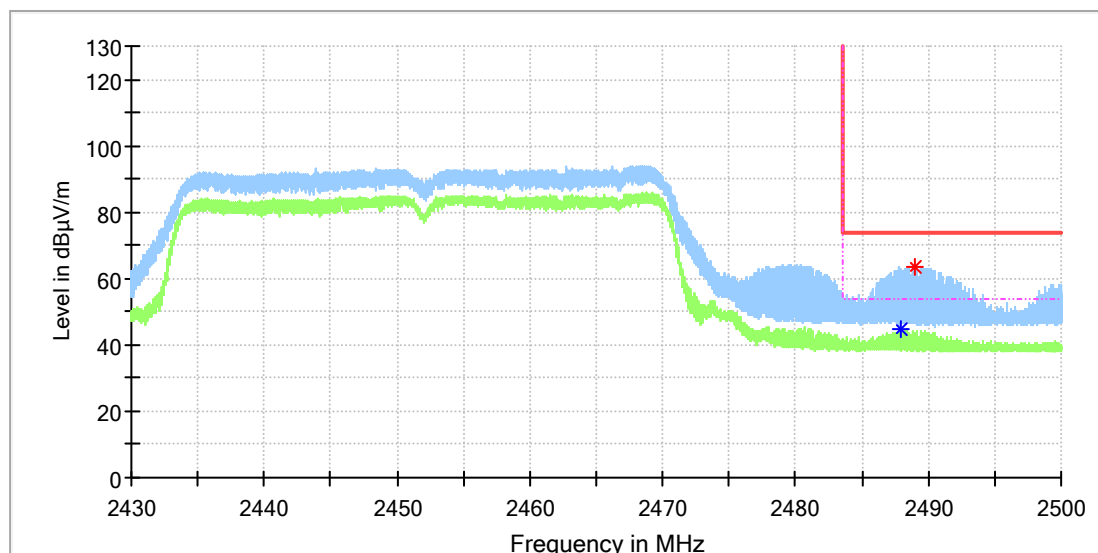
Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2385.080250	---	51.76	54.00	2.24	150.0	V	138.0	7.0
2387.739750	64.97	---	74.00	9.03	150.0	V	138.0	7.0

High channel

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11n40_High channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

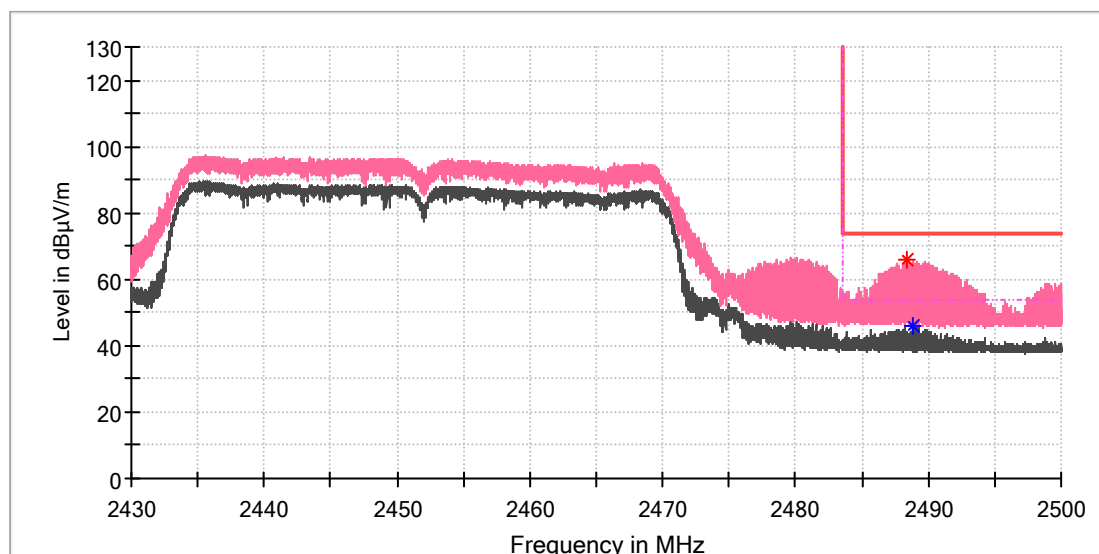


Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2488.005500	---	44.90	54.00	9.10	150.0	H	131.0	7.4
2488.985500	63.45	---	74.00	10.55	150.0	H	131.0	7.4

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	WIFI 2.4G_11n40_High channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



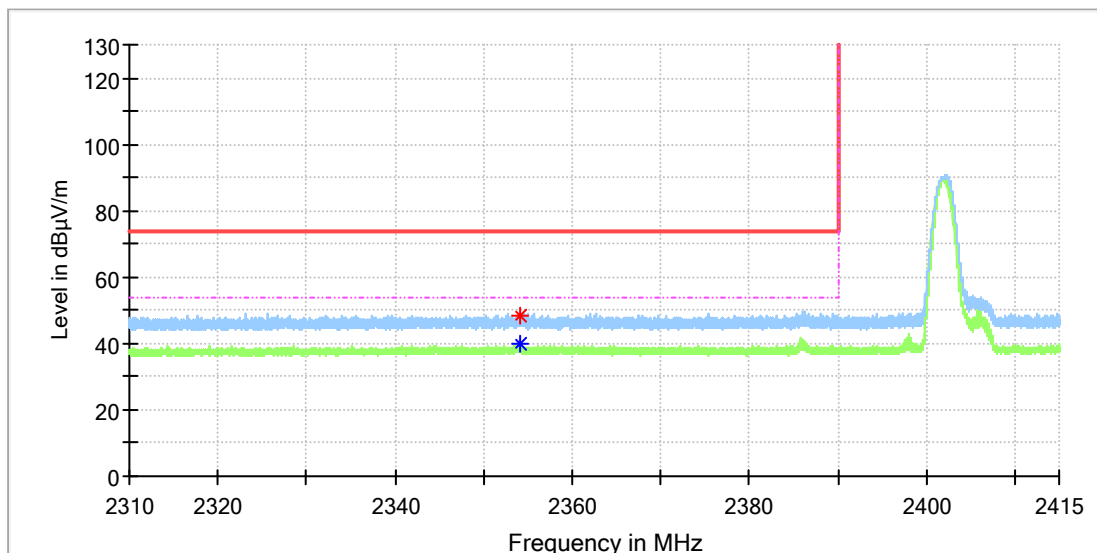
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2488.376500	65.69	---	74.00	8.31	150.0	V	154.0	7.4
2488.768500	---	45.90	54.00	8.10	150.0	V	154.0	7.4

Bluetooth Low Energy Low channel

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	BLE 1M_Low channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

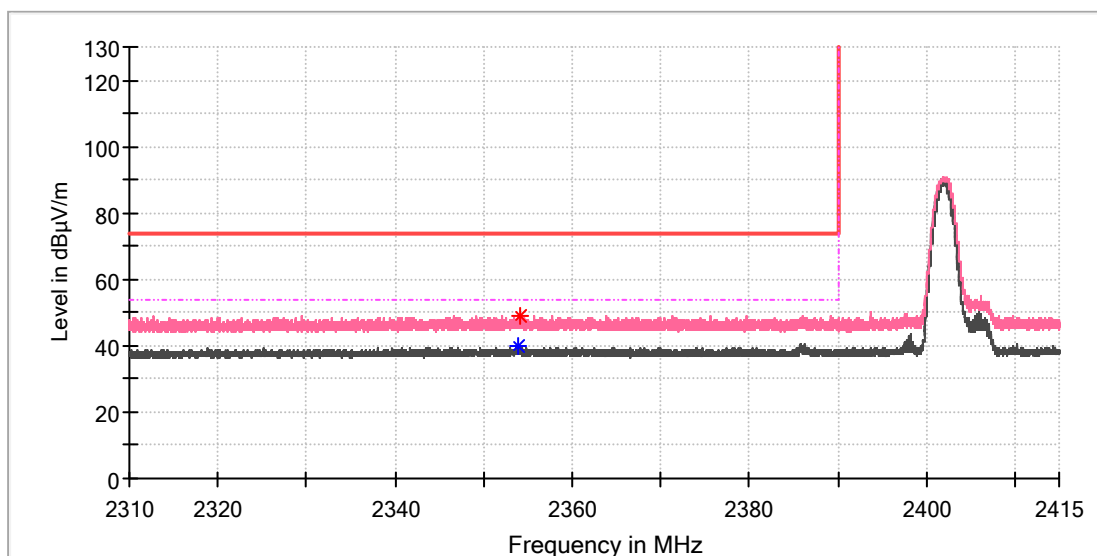


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2354.058000	---	39.76	54.00	14.24	150.0	H	156.0	6.9
2354.178750	48.24	---	74.00	25.76	150.0	H	144.0	6.9

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	BLE 1M_Low channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



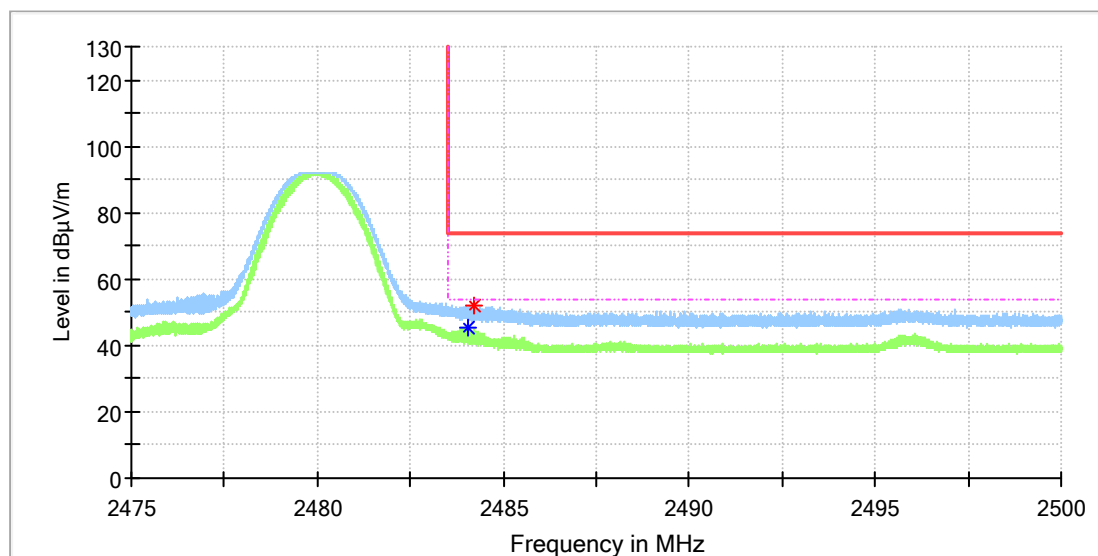
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2353.942500	---	40.17	54.00	13.83	150.0	V	331.0	6.9
2354.220750	48.83	---	74.00	25.17	150.0	V	319.0	6.9

High channel

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	BLE 1M_High channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

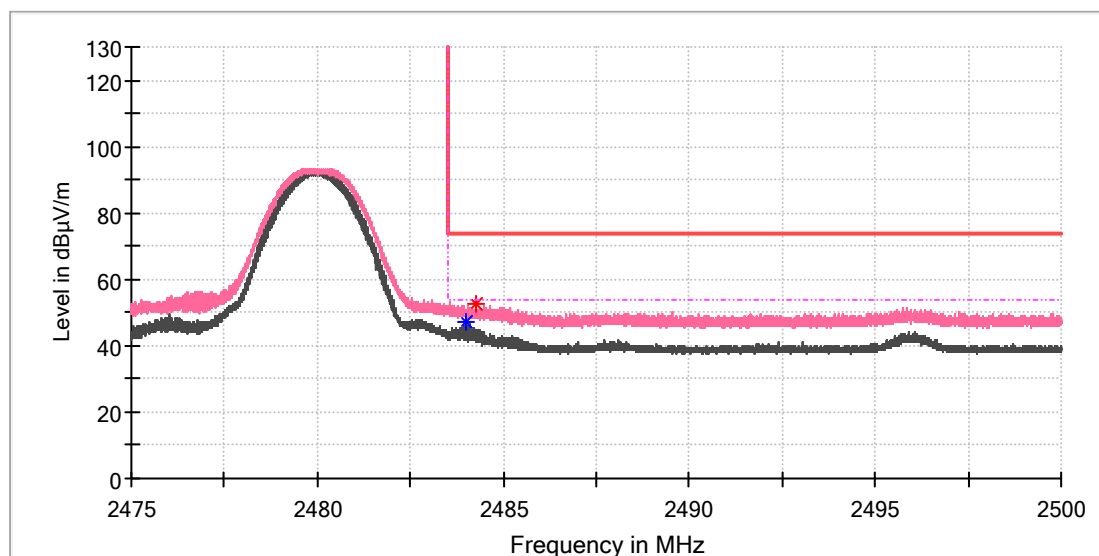


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2484.067500	---	45.10	54.00	8.90	150.0	H	27.0	7.4
2484.218750	51.94	---	74.00	22.06	150.0	H	210.0	7.4

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Model:	LAM05
Test Mode:	BLE 1M_High channel
Test Voltage::	Battery
Remark:	Temp 23 Humi:51%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



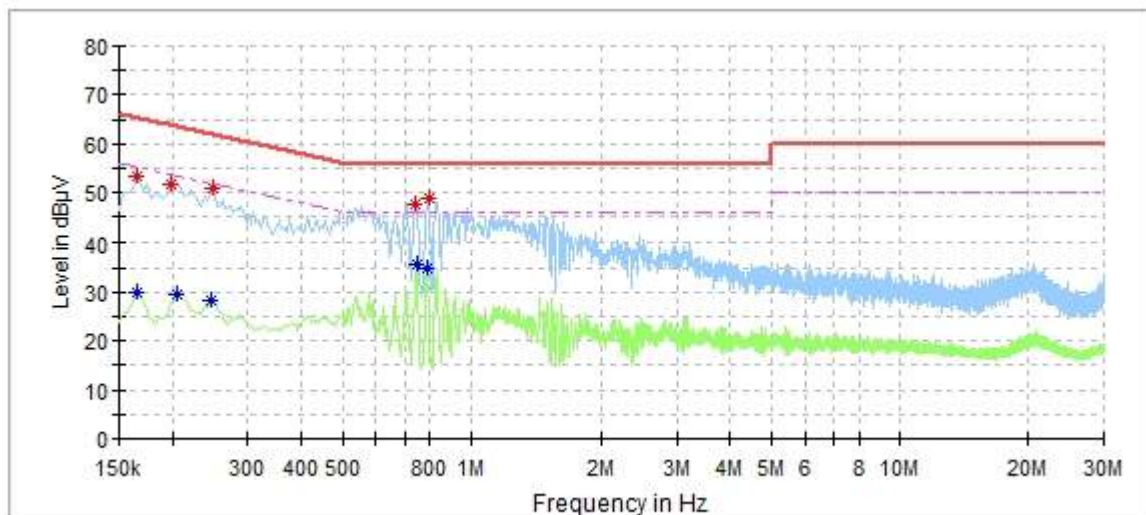
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.977500	---	47.25	54.00	6.75	150.0	V	331.0	7.4
2484.245000	52.87	---	74.00	21.13	150.0	V	331.0	7.4

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

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Order No.:	168325905
Model:	LAM05
Test Mode:	ON
Test Voltage:	AC 120V/60Hz
Test By:	Ouyang Wang
Review By:	Gary Chen
Remark:	SR1

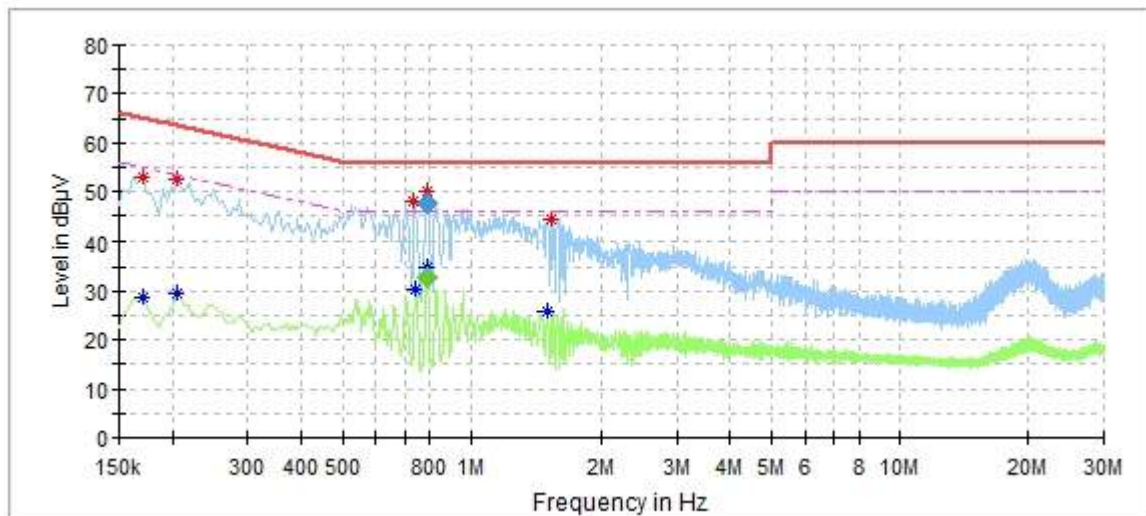


Critical Freqs

Frequency (MHz)	MaxPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.166000	---	29.79	55.16	25.37	L1	9.6
0.166000	53.24	---	65.16	11.91	L1	9.6
0.198000	51.71	---	63.69	11.98	L1	9.6
0.206000	---	29.73	53.37	23.64	L1	9.6
0.246000	---	28.23	51.89	23.66	L1	9.6
0.250000	50.85	---	61.76	10.91	L1	9.6
0.740000	47.60	---	56.00	8.40	L1	9.7
0.748000	---	35.60	46.00	10.40	L1	9.7
0.788000	---	34.85	46.00	11.15	L1	9.7
0.796000	48.88	---	56.00	7.12	L1	9.7

EUT Information

EUT Name:	Smart Air Quality Monitoring Controller
Order No.:	168325905
Model:	LAM05
Test Mode:	ON
Test Voltage:	AC 120V/60Hz
Test By:	Ouyang Wang
Review By:	Gary Chen
Remark:	SR1



Critical Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.170000	---	28.74	54.96	26.22	N	9.6
0.170000	52.91	---	64.96	12.05	N	9.6
0.206000	---	29.43	53.37	23.93	N	9.6
0.206000	52.45	---	63.37	10.91	N	9.6
0.736000	47.87	---	56.00	8.13	N	9.7
0.744000	---	30.31	46.00	15.69	N	9.7
0.786500	---	35.01	46.00	10.99	N	9.7
0.790500	50.11	---	56.00	5.89	N	9.7
1.488000	---	25.99	46.00	20.01	N	9.7
1.528000	44.51	---	56.00	11.49	N	9.7

Final Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.786500	---	32.76	46.00	13.24	1000.0	9.000	N	10
0.790500	47.75	---	56.00	8.25	1000.0	9.000	N	10