

FCC PART 15.247 TEST REPORT

For

Beijing InHand Networks Technology Co., Ltd.

Room 501, floor 5, building 3, yard 18, ziyue road, chaoyang district, Beijing

FCC ID: 2AANYER805

Report Type: Original Report	Product Name: Edge Router
Report Number:	RSC210423001-0B
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant	Beijing InHand Networks Technology Co., Ltd.
Product	Edge Router
Tested Model	ER805
Multiple Model(s)	ER806, ER808, ER809, ER815, ER816, ER818, ER810 , ER825, ER826, ER828, ER820, ER855, ER856, ER858, ER865, ER866, ER868, ER895, ER896, ER898
FCC ID	2AANYER805
Radio Mode	Wi-Fi
Frequency*	2412-2462MHz (802.11b/g/n20) 2422-2452MHz (802.11n40)
RF Output Power*	802.11b: 18.07 dBm 802.11g: 23.48 dBm 802.11n20: 23.03 dBm 802.11n40: 22.19 dBm
Modulation Type*	802.11b: DSSS 802.11g/n20/n40: OFDM
Voltage Range	DC 9-48V (Typical:12V) from adapter
Measure approximately	210 mm (L) x 140 mm (W) x 35 mm (H)
Sample serial number	210423001/01 (assigned by the BACL, Chengdu)
Sample/EUT Status	The test sample was in good condition and received: 2021-04-23

Note: Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

Objective

This report is prepared on behalf of **Beijing InHand Networks Technology Co., Ltd.** in accordance with Part 2, Subpart J, Part 15, Subparts A and C of the Federal Communications Commission's rules.

The tests were performed in order to determine the compliance of the EUT with FCC Part 15-Subpart C, section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Related Submittal(s)/Grant(s)

FCC Part 15E NII submissions with FCC ID: 2AANYER805

Measurement Uncertainty

Item			Uncertainty
Power line conducted emission			2.48 dB
Radiated Emission(Field Strength)	30MHz-200MHz	H	4.31 dB
		V	4.57 dB
	200MHz-1GHz	H	4.68 dB
		V	5.78 dB
	1GHz-6GHz		4.56 dB
	6GHz-18GHz		4.57 dB
	18GHz-40GHz		5.44 dB
RF Frequency			$\pm 0.86 \times 10^{-7}$
RF output power, conducted			± 0.61 dB
Occupied Bandwidth			$\pm 5\%$
Power Spectrum Density, conducted			± 2.5 dB
Spurious emissions, conducted			± 2.5 dB
Humidity			$\pm 5\%$
Temperature			$\pm 1^{\circ}\text{C}$
Voltage(AC,<10kHz)			$\pm 1\%$
Time			$\pm 1\%$

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the corresponding inclusion factor K when the inclusion probability is about 95%.

Test Methodology

All measurements contained in this report were conducted with:

1. ANSI C63.10-2013 American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.
2. KDB558074 D01 DTS Meas Guidance v05r02.

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Chengdu) to collect test data is located No.5040, Huilongwan Plaza, No. 1, Shawan Road, Jinniu District, Chengdu, Sichuan, China.

Bay Area Compliance Laboratories Corp. (Chengdu) lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4324.01) and the FCC designation No. CN1186 under the FCC KDB 974614 D01. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

SYSTEM TEST CONFIGURATION

Description of Test Configuration*

The system was configured in testing mode, which was provided by manufacturer.

For 802.11b, 802.11g, and 802.11n-HT20 mode, 11 channels are provided to testing:

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

EUT were tested with Channel 1, 6 and 11.

For 802.11n-HT40 mode, 7 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
3	2422	7	2442
4	2427	8	2447
5	2432	9	2452
6	2437	-	-

802.11n HT40 was tested with Channel 3, 6 and 9.

The worst-case data rates are determined to be as follows for each mode based upon investigations by measuring the average power and PSD across all data rates, bandwidths and modulations.

Note:

802.11b/g supports SISO, 802.11n supports SISO and MIMO mode. For Radiated Emission, according to pretest, the worst case for 802.11b/g is chain 1, the worst case for 802.11n is MIMO mode. So 802.11b/g chain 1 & 802.11n MIMO mode test data were recorded in the report.

Equipment Modifications

No modification was made to the EUT tested.

EUT Exercise Software*

The software “Run CMD.exe and input related command” was used for testing, which was provided by applicant. The setting by the software as following table:

Test Mode	Test Software	Run CMD.exe and input related command		
802.11b	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	CCK 1M	CCK 1M	CCK 1M
	Power Level Chain 0	35	35	35
	Power Level Chain 1	35	35	35
802.11g	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	OFDM 6M	OFDM 6M	OFDM 6M
	Power Level Chain 0	35	35	35
	Power Level Chain 1	35	35	35
802.11n-HT20	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	MCS0	MCS0	MCS0
	Power Level Chain 0	30	30	30
	Power Level Chain 1	30	30	30
802.11n-HT40	Test Frequency	2422MHz	2437MHz	2452MHz
	Data Rate	MCS0	MCS0	MCS0
	Power Level Chain 0	32	32	32
	Power Level Chain 1	32	32	32

Duty Cycle information is below:

Chain 0:

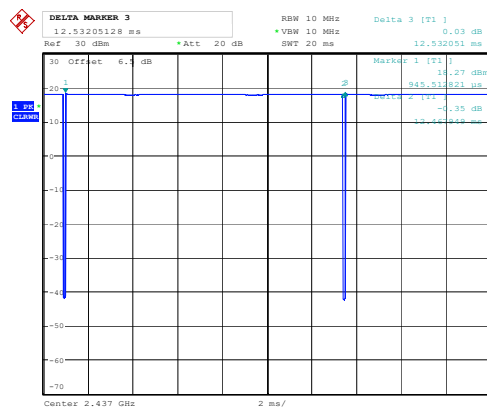
Mode	T _{on}	T _p	Duty Cycle	Duty Cycle Factor
	(ms)	(ms)	(%)	(dB)
802.11b	12.468	12.532	99.49	0.02
802.11g	2.066	2.155	95.87	0.18
802.11n-HT20	4.502	4.607	97.72	0.10
802.11n-HT40	3.269	3.365	97.15	0.13

Chain 1:

Mode	T_{on}	T_p	Duty Cycle	Duty Cycle Factor
	(ms)	(ms)	(%)	(dB)
802.11b	12.452	12.548	99.23	0.03
802.11g	2.067	2.163	95.56	0.20
802.11n-HT20	4.495	4.591	97.91	0.09
802.11n-HT40	3.261	3.357	97.14	0.13

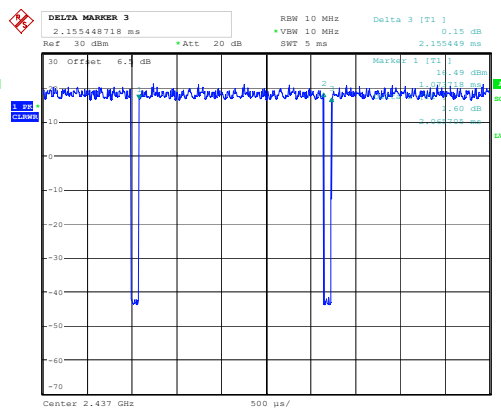
Chain 0:

802.11b



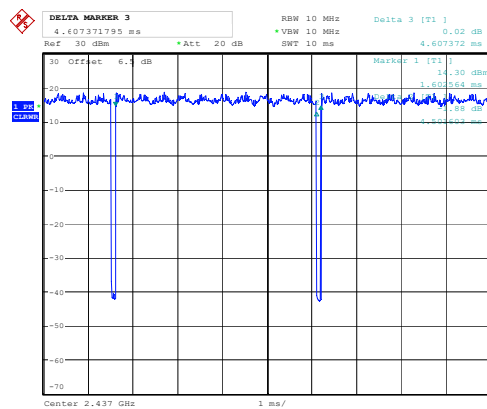
Date: 30.APR.2021 13:00:31

802.11g



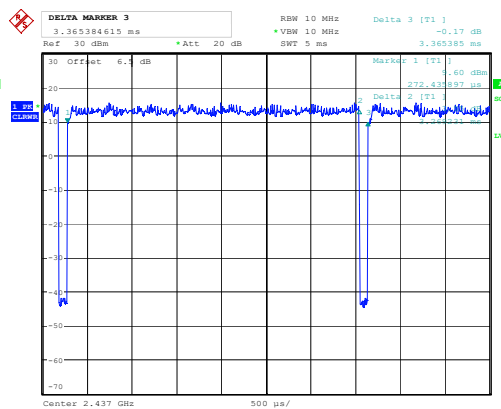
Date: 30.APR.2021 12:57:28

802.11n-HT20



Date: 30.APR.2021 12:58:10

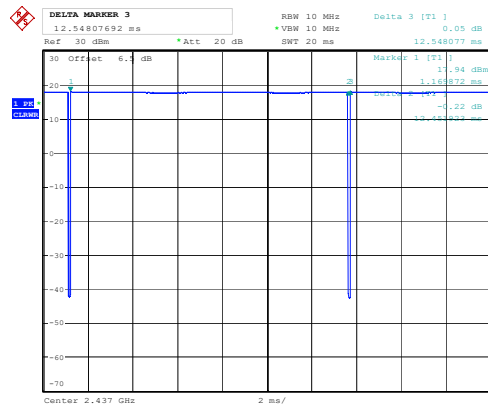
802.11n-HT40



Date: 30.APR.2021 12:59:13

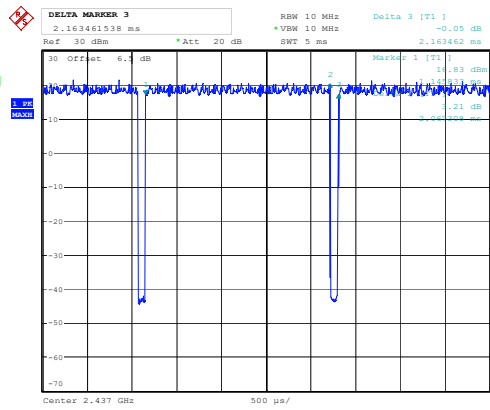
Chain 1:

802.11b



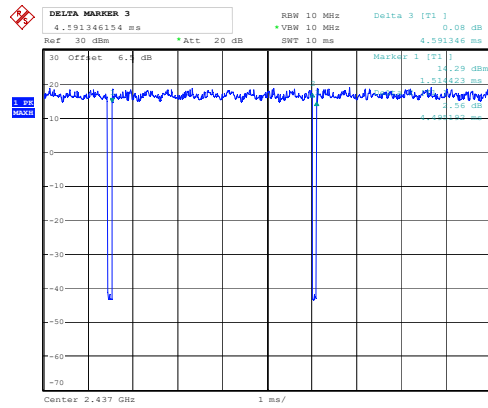
Date: 30.APR.2021 13:02:35

802.11g



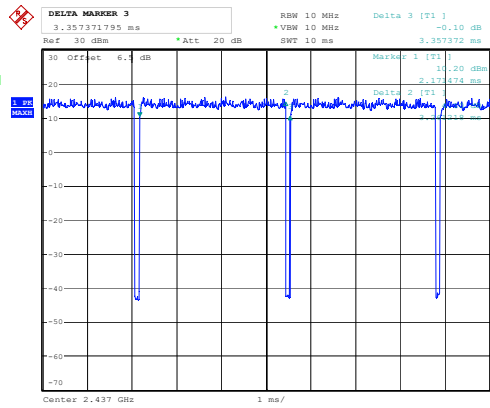
Date: 30.APR.2021 12:46:05

802.11n-HT20



Date: 30.APR.2021 12:48:02

802.11n-HT40



Date: 30.APR.2021 12:49:13

Support Test Devices Description

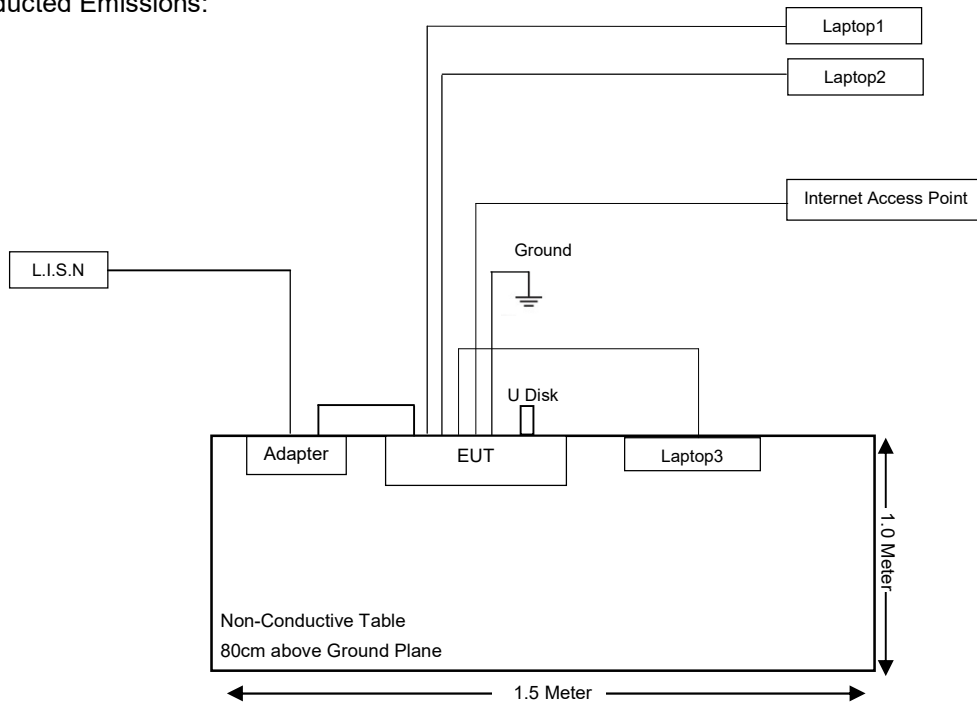
Manufacturer	Device Name	Model	Serial Number
DELL	Laptop1	Latitude E5430	BTXWLX1
DELL	Laptop2	E6410	353854366585
DELL	Laptop3	E6410	37417629385
SHENZHEN KUANTEN LIMITED	Adapter	KT241120150M2	2038
Kingston	U Disk	16G	Unknown
Unknown	Internet Access Point	Unknown	Unknown

Support Test Cable Description

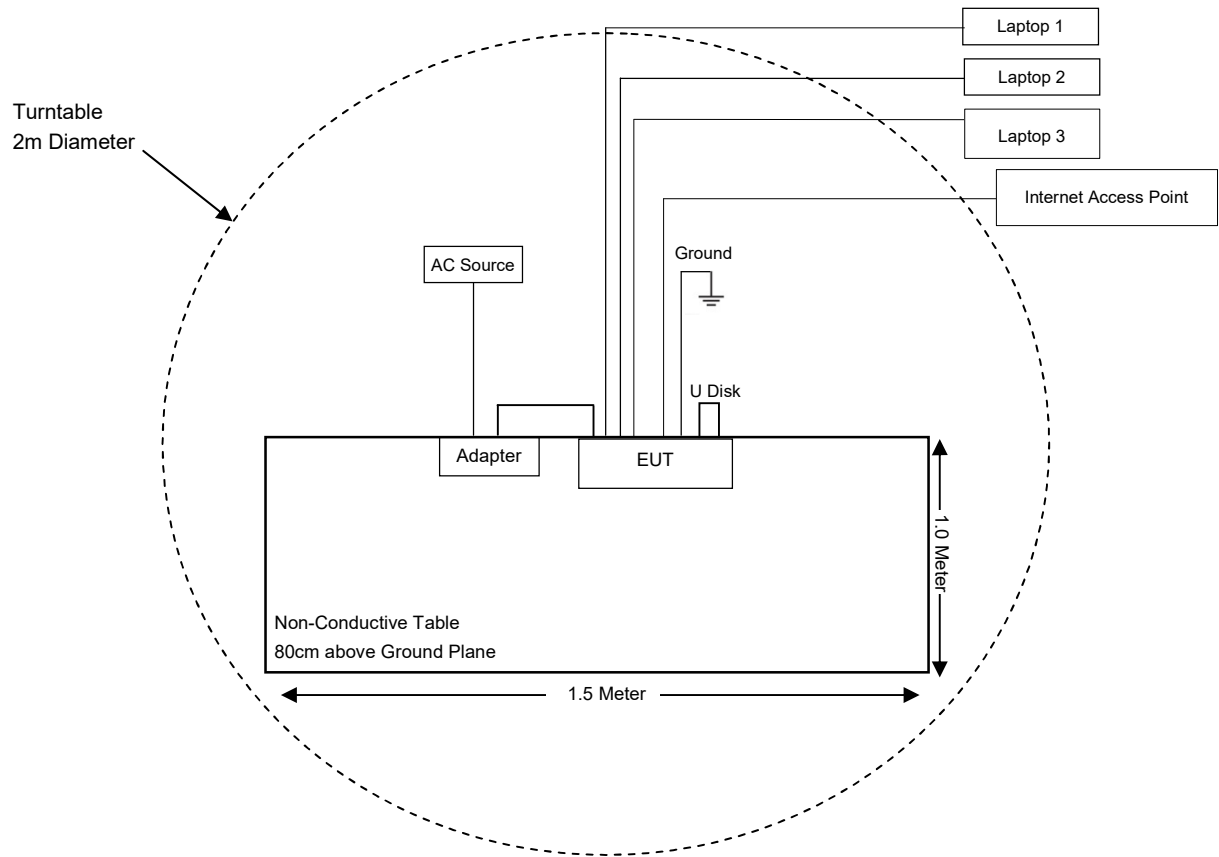
Cable Description	Length (m)	From / Port	To
Unshielded DC Power Cable	1.20	Adapter	EUT
Unshielded Ethernet Cable x 3	10.0(RE)	EUT	Laptop1,2,3
Unshielded Ethernet Cable x 2	10.0(CE)	EUT	Laptop1,2
Unshielded Ethernet Cable	1.20(CE)	EUT	Laptop3
Unshielded Ethernet Cable	10.0	EUT	Internet Access Point

Block Diagram of Test Setup

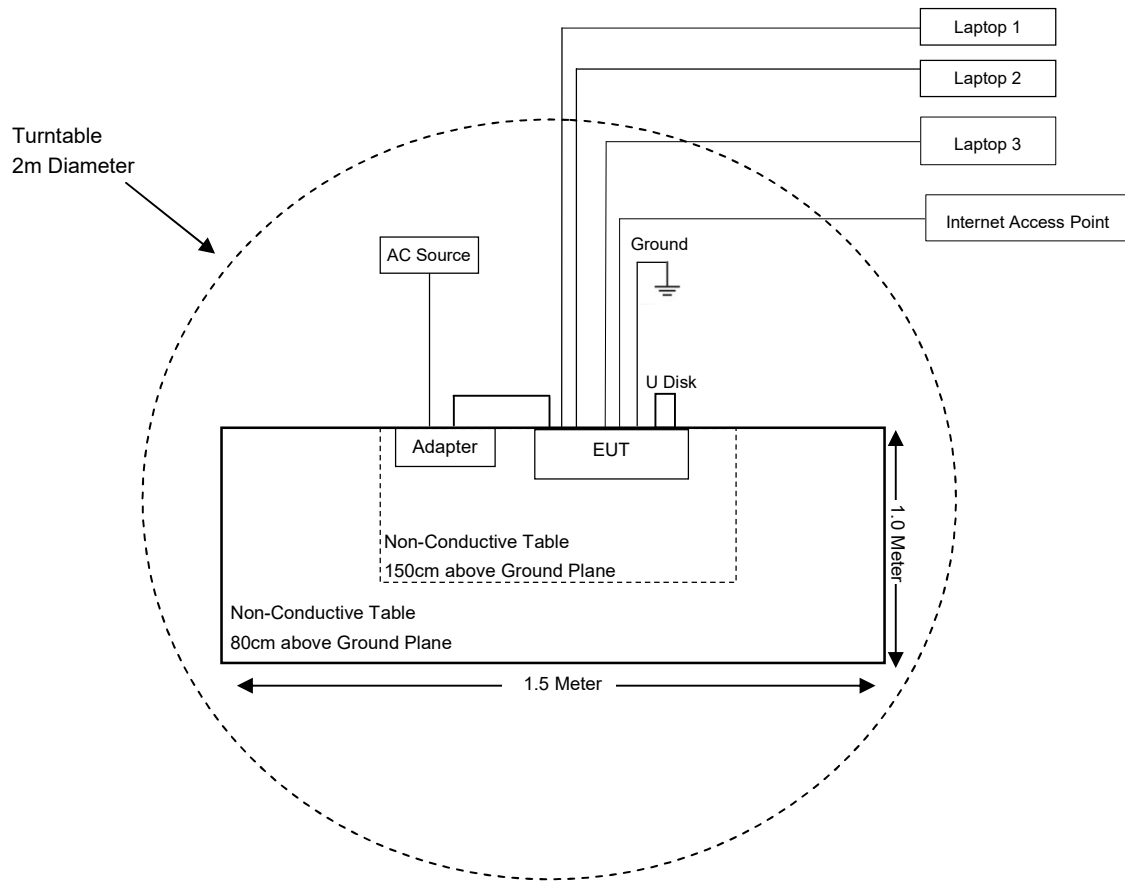
For Conducted Emissions:



For Radiated Emissions(Below 1GHz):



For Radiated Emissions(Above 1GHz):



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC §15.247 & §1.1310 & §2.1091	Maximum Permissible exposure (MPE)	Compliant
§15.203	Antenna Requirement	Compliant
§15.207 (a)	AC Line Conducted Emissions	Compliant
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliant
§15.247 (a)(2)	6 dB Emission Bandwidth	Compliant
§15.247(b)(3)	Maximum conducted output power	Compliant
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliant
§15.247(e)	Power Spectral Density	Compliant

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

TEST EQUIPMENTS LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emission					
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2021-04-12	2022-04-11
ROHDE&SCHWARZ	L.I.S.N.	ENV216	3560.6550.16	2021-01-13	2022-01-12
HP	RF Limiter	11947A	3107A01270	2020-08-13	2021-08-12
Unknown	Conducted Cable	L-E-003	000003	2020-08-04	2021-08-03
Rohde & Schwarz	EMC32	EMC32	V 8.52.0	NCR	NCR
Radiated Emission					
EMCT	Semi-Anechoic Chamber	966	001	2020-07-24	2025-07-23
SONOMA INSTRUMENT	Amplifier	310 N	186684	2020-08-10	2021-08-09
SUNOL SCIENCES	Broadband Antenna	JB3	A121808	2019-12-10	2022-12-09
Rohde & Schwarz	EMI Test Receiver	ESR3	102456	2021-04-12	2022-04-11
INMET	Attenuator	18N-6dB	NA	2019-12-10	2022-12-09
Unknown	RF Cable (Below 1GHz)	L-E-005	000005	2020-09-04	2021-09-03
Unknown	RF Cable (Below 1GHz)	T-E128	000128	2020-10-16	2021-10-15
MICRO-COAX	RF Cable (Below 1GHz)	T-E237	233522-001	2020-07-17	2021-07-16
Rohde & Schwarz	Spectrum Analyzer	FSU26	200835	2021-04-12	2022-04-11
EMCO	Horn Antenna	3115	2192	2019-09-25	2021-09-24
Mini-circuits	Amplifier	ZVA-183-S+	771001215	2020-09-20	2021-09-19
MICRO-TRONICS	2.4GHz Notch Filter	BRM50702	G396	2021-02-21	2022-02-20
SUHNER+HUBER	RF Cable (Above 1GHz)	SUCOFLEX 104PE	93533/4PE	2020-05-18	2021-05-17
IW-MICROWAVE	RF Cable (Above 1GHz)	SPS-2301	NA	2020-08-31	2021-08-30
Rohde & Schwarz	EMI Test Receiver	ESIB 40	100215	2021-04-12	2022-04-11
EM Electronics	Pre-Amplifier	EM18G40	060725	2020-07-23	2021-07-22
A.H. Systems, Inc	Horn Antenna	SAS-574	510	2019-09-02	2021-09-01
HUBER+SUHNER	RF Cable (Above 1GHz)	T-E222	2551/2	2020-07-18	2021-07-17
ORIDA RF Labs	RF Cable (Above 1GHz)	T-E210	1042	2020-07-18	2021-07-17
Rohde & Schwarz	EMC32	EMC32	V9.10.00	NCR	NCR

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	Spectrum Analyzer	FSU26	100113	2021-04-12	2022-04-11
Agilent	USB power sensor	U2021XA	MY53320008	2021-01-13	2022-01-12
Mini-circuits	6dB Attenuator	BW-S6W5+	00433	2020-09-10	2021-09-09
Unknown	RF Coaxial Cable	SMA-SMA	Unknown	Each Time	

FCC §15.247 & §1.1310 & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE

Applicable Standard

According to subpart 15.247 and subpart §1.1310, 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 of the Commission’s guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm²)	Averaging Time (minutes)
0.3–1.34	614	1.63	※(100)	30
1.34–30	824/f	2.19/f	※(180/f ²)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

f = frequency in MHz; ※ = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

Per 447498 D01 General RF Exposure Guidance v06, simultaneous transmission MPE test exclusion applies when the sum of the MPE for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0.

Calculated Formulary:

Predication of MPE limit at a given distance

$$S = PG/4\pi R^2$$

Where:

S = power density (in appropriate units, e.g. mW/cm²);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

Calculated Data:

WiFi +LTE module (FCC ID: 2AANYER805 contains FCC ID: XMR201807EP06A)

MPE evaluation for single transmission:

Radio Mode	Frequency Range (MHz)	Antenna Gain*		Tune-up Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)	Ratio
		(dBi)	(numeric)	(dBm)	(mW)				
WLAN	2412-2462	2.72	1.87	23.5	223.87	20	0.083	1.0	0.083
	5150-5250	0.21	1.05	16.0	39.81	20	0.008	1.0	0.008
	5725-5850	0.02	1.00	11.0	12.59	20	0.003	1.0	0.003
WCDMA BAND 5*	824-849	0.00	1.00	24.0	251.19	20	0.050	0.55	0.091
WCDMA BAND 2*	1850-1910	0.00	1.00	24.0	251.19	20	0.050	1.0	0.050
WCDMA BAND 4*	1710-1755	0.00	1.00	24.0	251.19	20	0.050	1.0	0.050
LTE Band 2*	1850-1910	0.00	1.00	24.0	251.19	20	0.050	1.0	0.050
LTE Band 4*	1710-1755	0.00	1.00	24.0	251.19	20	0.050	1.0	0.050
LTE Band 5*	824-849	0.00	1.00	24.0	251.19	20	0.050	0.55	0.091
LTE Band 7*	2500-2570	0.00	1.00	24.0	251.19	20	0.050	1.0	0.050
LTE Band 12*	699-716	0.00	1.00	24.0	251.19	20	0.050	0.47	0.106
LTE Band 13*	777-787	0.00	1.00	24.0	251.19	20	0.050	0.52	0.096
LTE Band 25*	1850-1915	0.00	1.00	24.0	251.19	20	0.050	1.0	0.050
LTE Band 26*	814-849	0.00	1.00	24.0	251.19	20	0.050	0.54	0.093
LTE Band 30*	2305-2315	0.00	1.00	24.0	251.19	20	0.050	1.0	0.050
LTE Band 66*	1710-1780	0.00	1.00	24.0	251.19	20	0.050	1.0	0.050

MPE evaluation for simultaneous transmission:

Note: WLAN, WWAN can transmit simultaneously, MPE evaluation is as below formula:

$$PD1/Limit1+PD2/Limit2+..... < 1, PD (Power Density)$$

The worst case is as below:

$$MPE \text{ of WLAN} + MPE \text{ of WWAN} = 0.083/1.0+0.050/0.47=0.189 < 1.0$$

Result: The device meets FCC MPE at ≥ 20 cm distance.

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

- a. Antenna must be permanently attached to the unit.
- b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

Antenna Information*

The EUT has two external Wi-Fi antennas and two LTE antennas, which fulfill the requirement of this section. Please refer to the table below and EUT photos.

Antenna	Manufacturer	Model Number	Antenna Gain (Max)	Impedance (ohm)	Antenna Connector	Antenna Type
Wi-Fi Ant. 0	SHENZHEN GUYOU TECHNOLOGY CO.LTD	GY-XPF-BCL2.5-GJG22	2.72 dBi 2412-2462MHz	50	RP-SMA(male)	Monopole
Wi-Fi Ant. 1			0.21 dBi 5150-5250MHz			
			0.02 dBi 5725-5850MHz			
LTE Main Ant LTE Diversity Ant.	SHENZHEN GUYOU TECHNOLOGY CO.LTD	GY-XPL-BDL2-AJG30	0 dBi	50	SMA-J(male)	Monopole

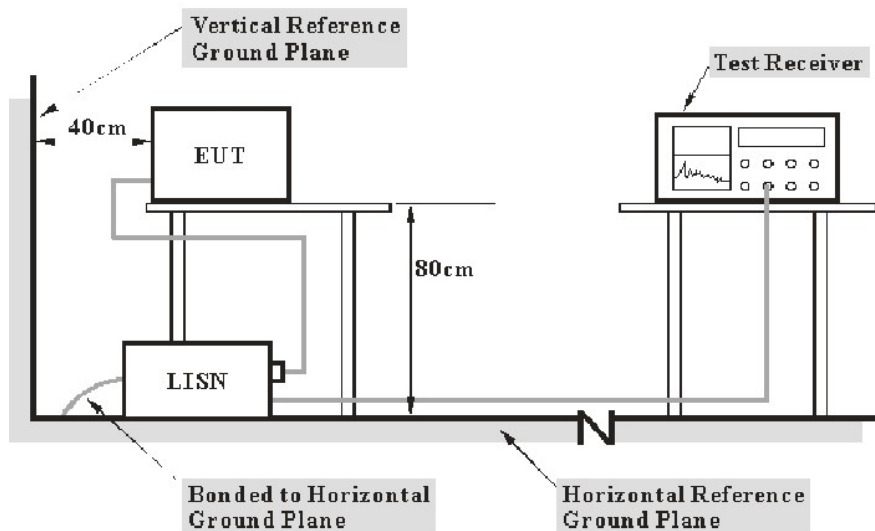
Result: Compliance

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the adapter was connected to the first L.I.S.N.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$V_C = V_R + A_C + VDF$$

$$C_f = A_C + VDF$$

Herein,

V_C (cord. Reading): corrected voltage amplitude

V_R : reading voltage amplitude

A_C : attenuation caused by cable loss

VDF: voltage division factor of AMN

C_f : Correction Factor

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Data

Test Environment Conditions

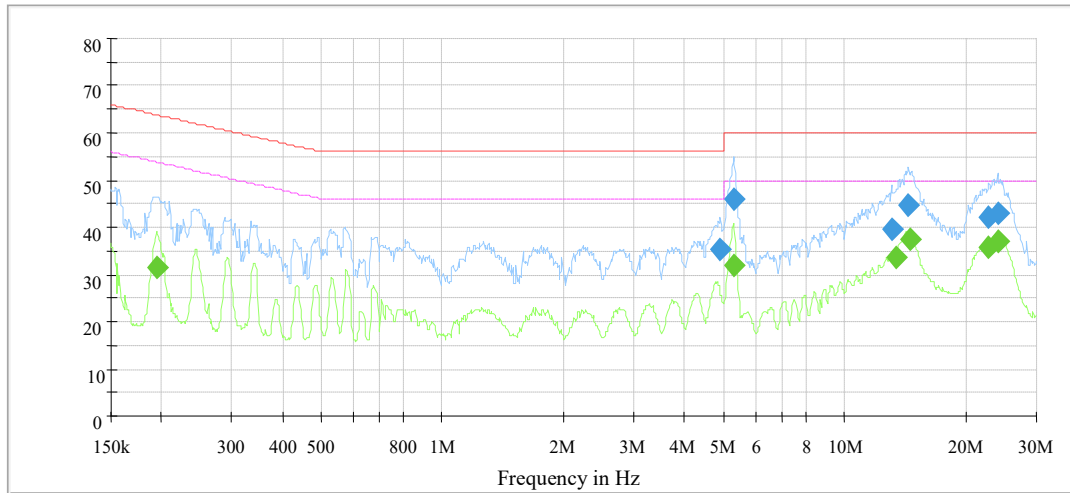
Temperature:	21°C
Relative Humidity:	51 %
ATM Pressure:	95.6 kPa

The testing was performed by Winfred Wang on 2021-04-25.

Test Mode: Transmitting

802.11g_High Channel-Chain 1-Worst Case

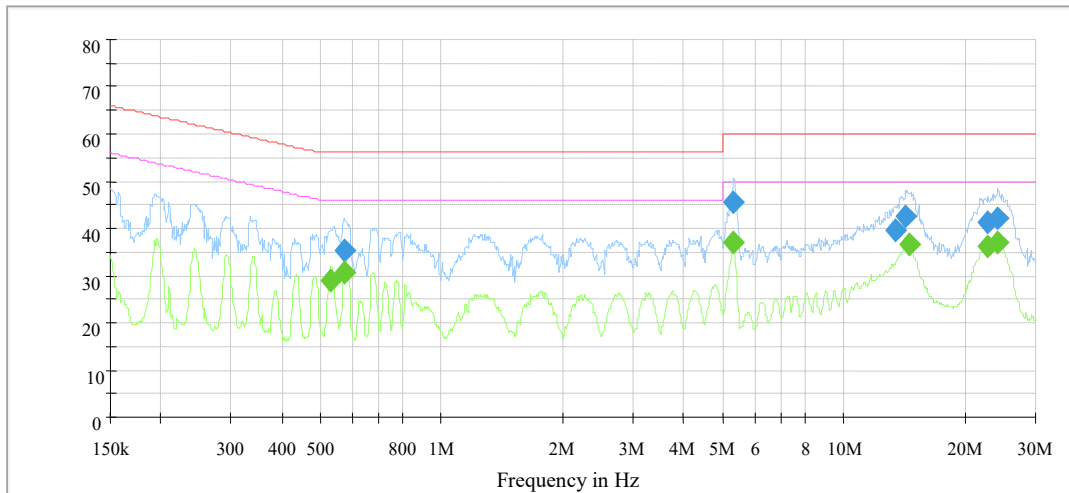
AC120V/60Hz, Line:



Frequency (MHz)	QuasiPeak (dB μV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μV)
4.899691	35.2	300.0	9.000	L1	19.6	20.8	56.0
5.306714	45.9	300.0	9.000	L1	19.6	14.1	60.0
13.088289	39.7	300.0	9.000	L1	19.6	20.3	60.0
14.461193	44.9	300.0	9.000	L1	19.6	15.1	60.0
22.881358	42.2	300.0	9.000	L1	19.7	17.8	60.0
24.051514	43.1	300.0	9.000	L1	19.7	16.9	60.0

Frequency (MHz)	Average (dB μV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μV)
0.195386	31.7	300.0	9.000	L1	19.5	22.1	53.8
5.280313	31.9	300.0	9.000	L1	19.6	18.1	50.0
13.485879	33.5	300.0	9.000	L1	19.6	16.5	50.0
14.533499	37.4	300.0	9.000	L1	19.6	12.6	50.0
22.881358	35.9	300.0	9.000	L1	19.7	14.1	50.0
24.051514	37.0	300.0	9.000	L1	19.7	13.0	50.0

AC120V/60Hz, Neutral:



Frequency (MHz)	QuasiPeak (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.570947	35.3	300.0	9.000	N	19.6	20.7	56.0
5.333248	45.5	300.0	9.000	N	19.5	14.5	60.0
13.485879	39.7	300.0	9.000	N	19.6	20.3	60.0
14.246426	42.4	300.0	9.000	N	19.6	17.6	60.0
22.881358	41.3	300.0	9.000	N	19.6	18.7	60.0
24.171771	42.2	300.0	9.000	N	19.7	17.8	60.0

Frequency (MHz)	Average (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.529792	28.9	300.0	9.000	N	19.6	17.1	46.0
0.576671	30.7	300.0	9.000	N	19.6	15.3	46.0
5.333248	37.0	300.0	9.000	N	19.5	13.0	50.0
14.606166	36.5	300.0	9.000	N	19.6	13.5	50.0
22.881358	36.0	300.0	9.000	N	19.6	14.0	50.0
24.051514	36.8	300.0	9.000	N	19.7	13.2	50.0

Note:

- 1) Correction Factor = LISN VDF (Voltage Division Factor) + Cable Loss + Transient Limiter Attenuation
The corrected factor has been input into the transducer of the test software.
- 2) Corrected Amplitude = Reading + Correction Factor
- 3) Margin = Limit – Corrected Amplitude

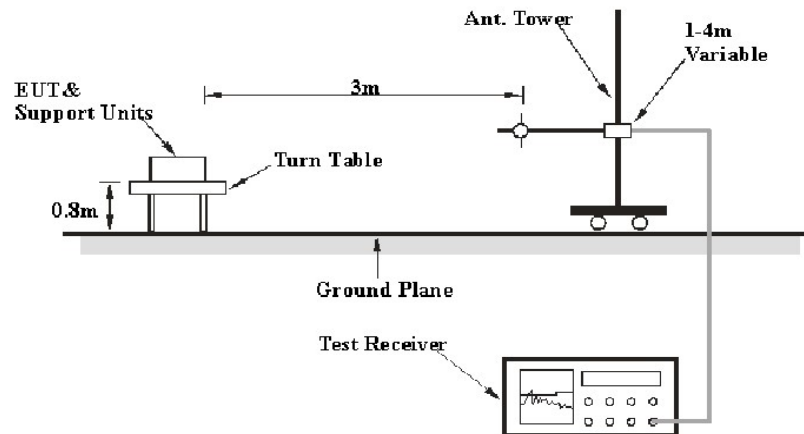
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

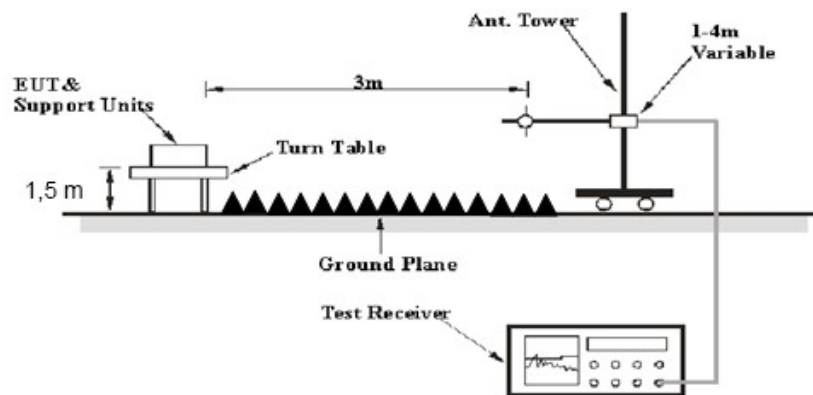
FCC §15.247 (d); §15.209; §15.205;

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.247 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

During the radiated emission test, the EMI test receiver Setup was set with the following configurations:

Frequency Range	RBW	Video B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	QP
Above 1 GHz	1MHz	3 MHz	PK
	1MHz	3 MHz	AV

If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1 GHz, peak and Average detection modes for frequencies above 1 GHz.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Loss and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected Amplitude = Meter Reading + Antenna Loss + Cable Loss - Amplifier Gain
or

Corrected Amplitude = Meter Reading + Antenna Loss + Cable Loss

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit –Corrected Amplitude

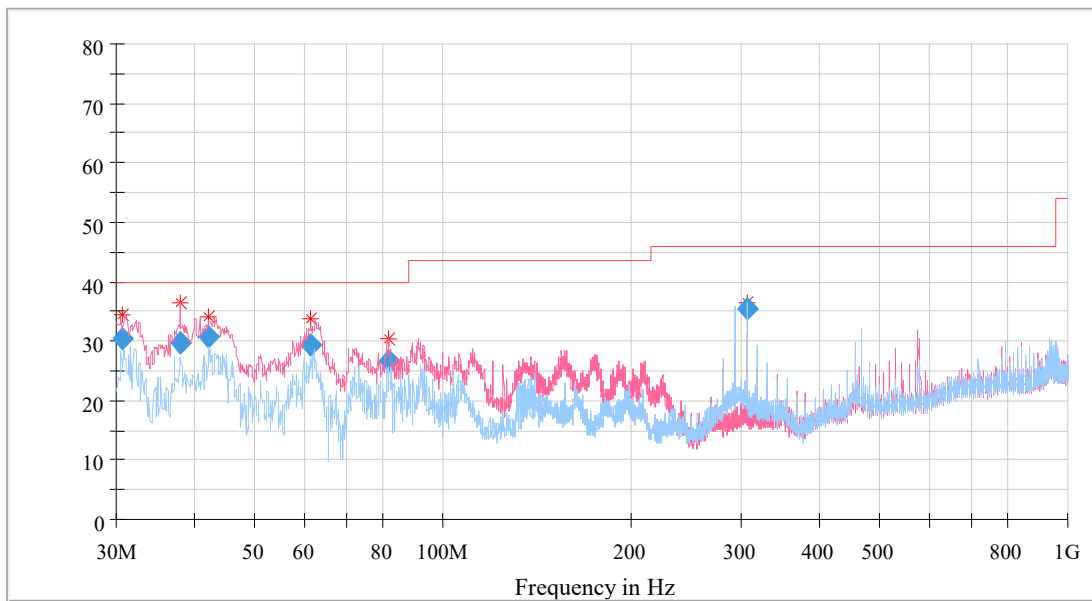
Test Data

Test Environment Conditions

Temperature:	22 °C
Relative Humidity:	42 %
ATM Pressure:	95.6 kPa

The testing was performed by Winfred Wang on 2021-04-24.

30 MHz-1 GHz: 802.11n-HT20_Middle Channel-Worst Case

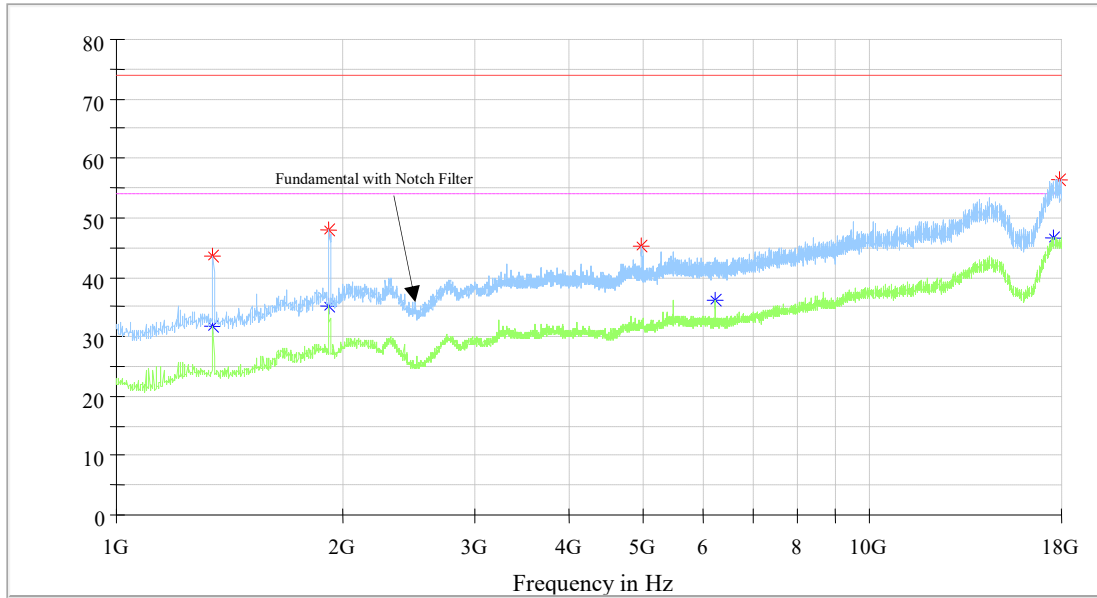


Frequency (MHz)	QuasiPeak (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.782217	30.27	40.00	9.73	1000.0	120.000	109.0	V	286.0	-5.1
37.998375	29.68	40.00	10.32	1000.0	120.000	104.0	V	314.0	-9.4
42.166750	30.56	40.00	9.44	1000.0	120.000	111.0	V	213.0	-12.3
61.616625	29.22	40.00	10.78	1000.0	120.000	124.0	V	348.0	-17.7
81.821000	26.64	40.00	13.36	1000.0	120.000	115.0	V	37.0	-17.9
306.23712	35.35	46.00	10.65	1000.0	120.000	107.0	H	263.0	-11.1

1 GHz to 18 GHz:

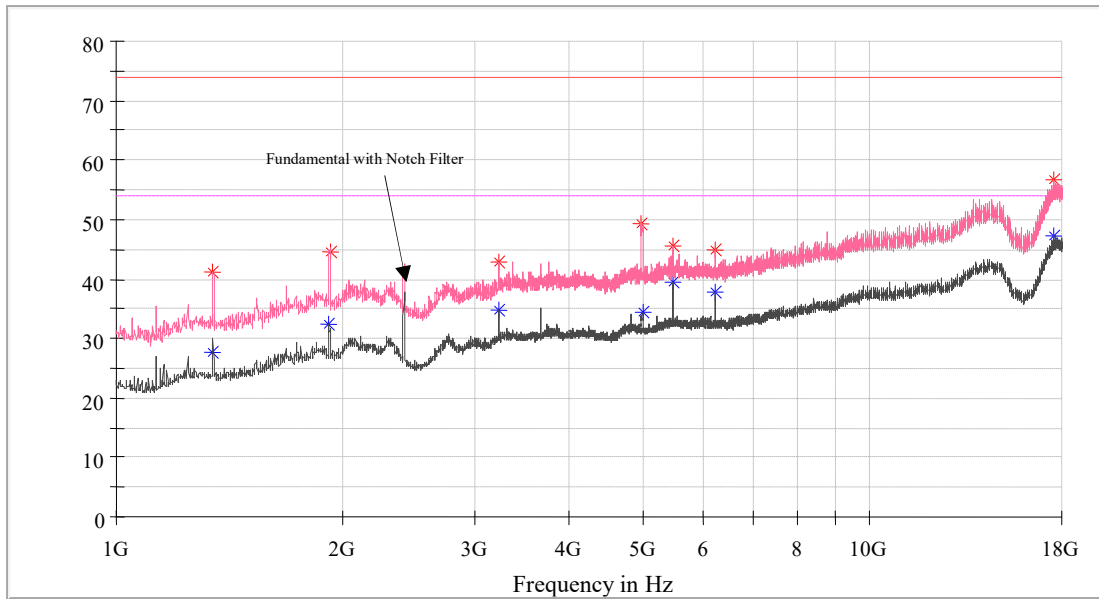
802.11b Mode: Chain 1_worst case

2412 MHz (Horizontal)



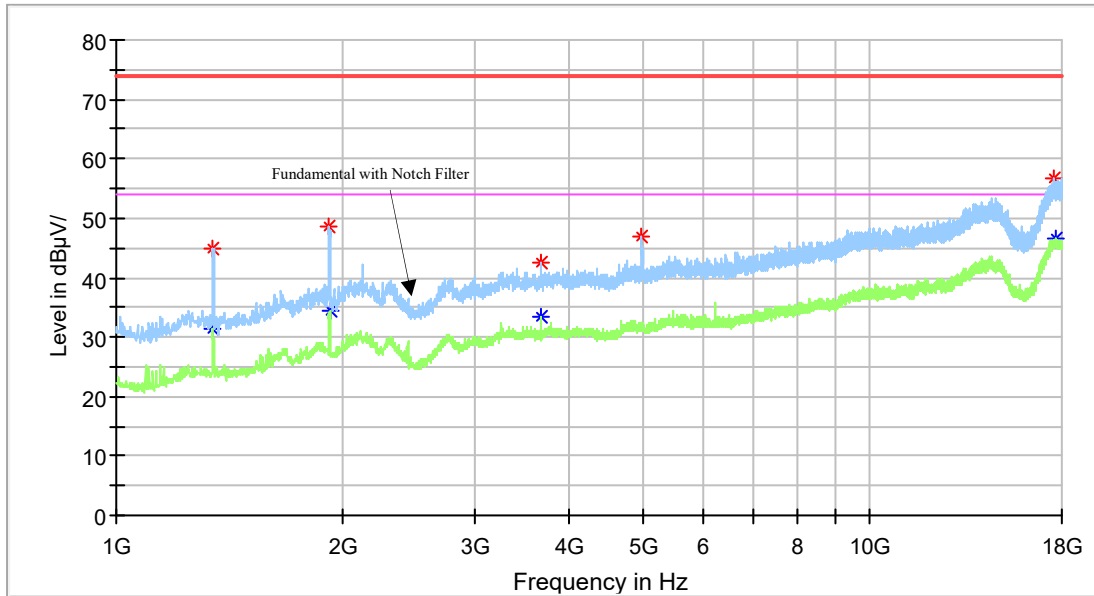
Frequency (MHz)	MaxPeak (dB μV/m)	Average (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1343.40000	43.61	---	74.00	30.39	161.0	H	305.0	0.9
1345.10000	---	31.78	54.00	22.22	161.0	H	305.0	0.9
1916.30000	47.80	---	74.00	26.20	161.0	H	129.0	5.2
1918.00000	---	34.97	54.00	19.03	161.0	H	117.0	5.2
4989.90000	45.38	---	74.00	28.62	161.0	H	195.0	12.4
6249.60000	---	36.09	54.00	17.91	161.0	H	0.0	13.8
17513.8000	---	46.62	54.00	7.38	161.0	H	22.0	29.2
17845.3000	56.49	---	74.00	17.51	161.0	H	195.0	29.2

2412 MHz (Vertical)



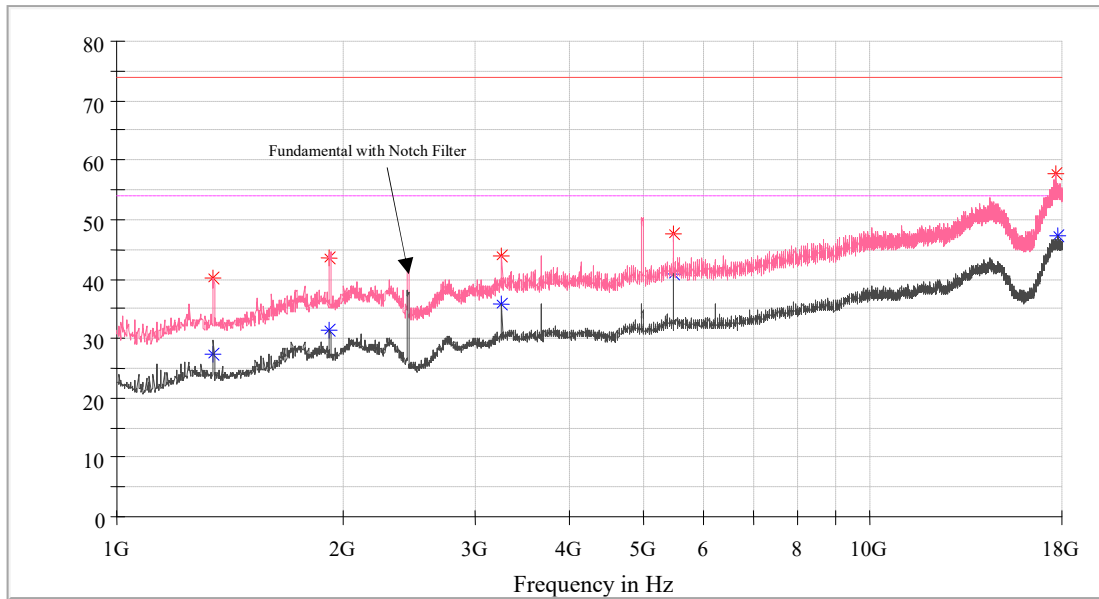
Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1340.000000	---	27.79	54.00	26.21	152.0	V	35.0	0.9
1340.000000	41.10	---	74.00	32.90	152.0	V	35.0	0.9
1918.000000	---	32.42	54.00	21.58	152.0	V	358.0	5.2
1924.800000	44.71	---	74.00	29.29	152.0	V	354.0	5.3
3215.100000	---	34.87	54.00	19.13	152.0	V	225.0	8.2
3215.100000	42.78	---	74.00	31.22	152.0	V	225.0	8.2
4981.400000	49.35	---	74.00	24.65	152.0	V	204.0	12.3
4991.600000	---	34.52	54.00	19.48	152.0	V	194.0	12.4
5499.900000	45.50	---	74.00	28.50	152.0	V	172.0	13.5
5499.900000	---	39.54	54.00	14.46	152.0	V	172.0	13.5
6249.600000	44.81	---	74.00	29.19	152.0	V	225.0	13.8
6249.600000	---	37.74	54.00	16.26	152.0	V	225.0	13.8
17566.50000	---	47.21	54.00	6.79	152.0	V	162.0	29.2
17573.30000	56.70	---	74.00	17.30	152.0	V	294.0	29.2

2437 MHz (Horizontal)



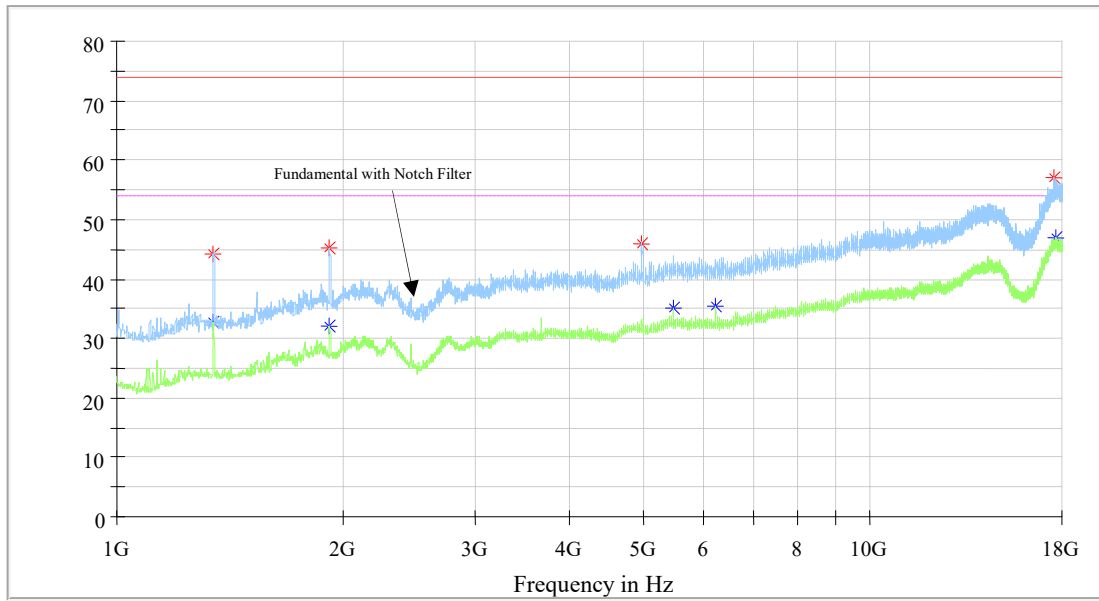
Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1341.70000	---	31.38	54.00	22.62	140.0	H	313.0	0.9
1343.40000	44.78	---	74.00	29.22	140.0	H	313.0	0.9
1916.30000	48.72	---	74.00	25.28	140.0	H	126.0	5.2
1921.40000	---	34.50	54.00	19.50	140.0	H	137.0	5.2
3665.60000	42.57	---	74.00	31.43	140.0	H	148.0	10.0
3665.60000	---	33.26	54.00	20.74	140.0	H	148.0	10.0
4983.10000	46.88	---	74.00	27.12	140.0	H	220.0	12.3
17537.6000	56.57	---	74.00	17.43	140.0	H	254.0	29.2
17726.3000	---	46.67	54.00	7.33	140.0	H	0.0	29.2

2437 MHz (Vertical)



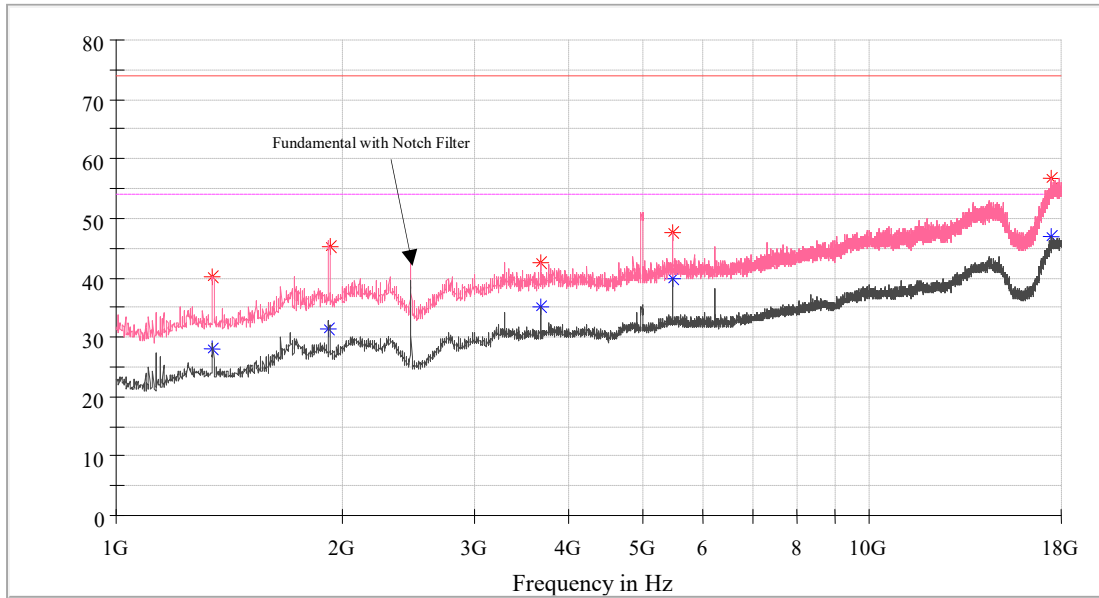
Frequency (MHz)	MaxPeak (dB μV/m)	Average (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1343.40000	---	27.49	54.00	26.51	133.0	V	36.0	0.9
1345.10000	40.19	---	74.00	33.81	133.0	V	60.0	0.9
1918.00000	---	31.54	54.00	22.46	133.0	V	0.0	5.2
1918.00000	43.62	---	74.00	30.38	133.0	V	0.0	5.2
3249.10000	---	35.73	54.00	18.27	133.0	V	187.0	8.3
3249.10000	43.93	---	74.00	30.07	133.0	V	187.0	8.3
5499.90000	---	40.78	54.00	13.22	133.0	V	165.0	13.5
5499.90000	47.71	---	74.00	26.29	133.0	V	165.0	13.5
17619.2000	57.79	---	74.00	16.21	133.0	V	304.0	29.2
17835.1000	---	47.32	54.00	6.68	133.0	V	221.0	29.2

2462 MHz (Horizontal)



Frequency (MHz)	MaxPeak (dB μV/m)	Average (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1341.70000	44.30	---	74.00	29.70	155.0	H	143.0	0.9
1345.10000	---	32.86	54.00	21.14	155.0	H	312.0	0.9
1918.00000	45.29	---	74.00	28.71	155.0	H	121.0	5.2
1919.70000	---	32.17	54.00	21.83	155.0	H	121.0	5.2
4978.00000	45.99	---	74.00	28.01	155.0	H	220.0	12.3
5499.90000	---	35.14	54.00	18.86	155.0	H	255.0	13.5
6249.60000	---	35.29	54.00	18.71	155.0	H	1.0	13.8
17525.7000	56.88	---	74.00	17.12	155.0	H	266.0	29.2
17653.2000	---	46.96	54.00	7.04	155.0	H	56.0	29.2

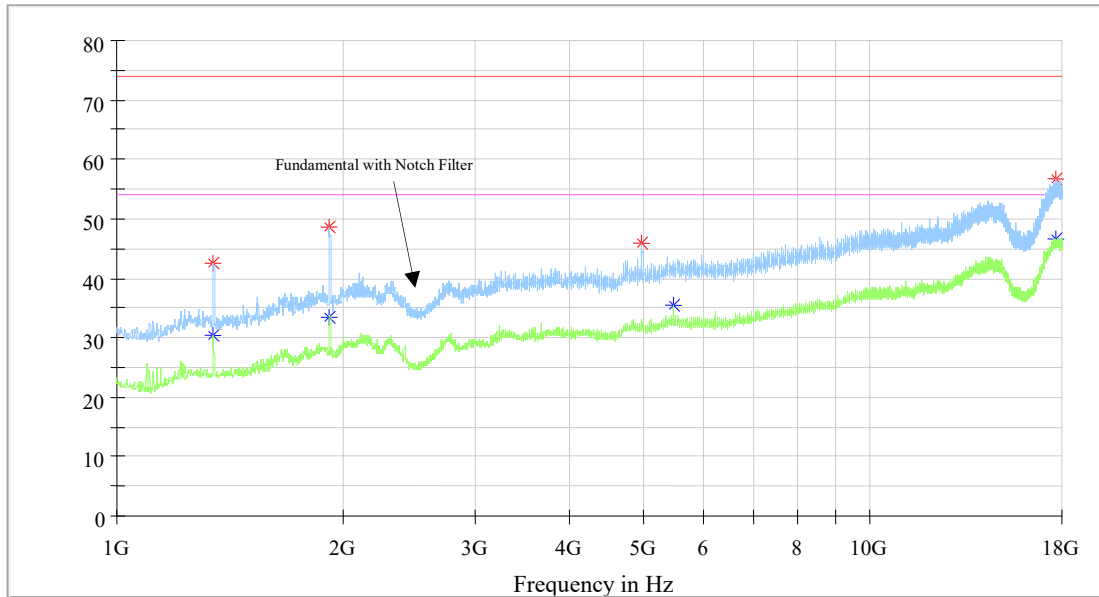
2462 MHz (Vertical)



Frequency (MHz)	MaxPeak (dB μV/m)	Average (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1340.000000	40.30	---	74.00	33.70	150.0	V	323.0	0.9
1343.400000	---	28.08	54.00	25.92	150.0	V	323.0	0.9
1919.700000	---	31.33	54.00	22.67	150.0	V	345.0	5.2
1923.100000	45.34	---	74.00	28.66	150.0	V	0.0	5.3
3665.600000	42.70	---	74.00	31.30	150.0	V	199.0	10.0
3665.600000	---	35.09	54.00	18.91	150.0	V	199.0	10.0
5499.900000	---	39.82	54.00	14.18	150.0	V	154.0	13.5
5499.900000	47.52	---	74.00	26.48	150.0	V	154.0	13.5
17491.700000	56.79	---	74.00	17.21	150.0	V	334.0	29.2
17505.300000	---	46.90	54.00	7.10	150.0	V	154.0	29.2

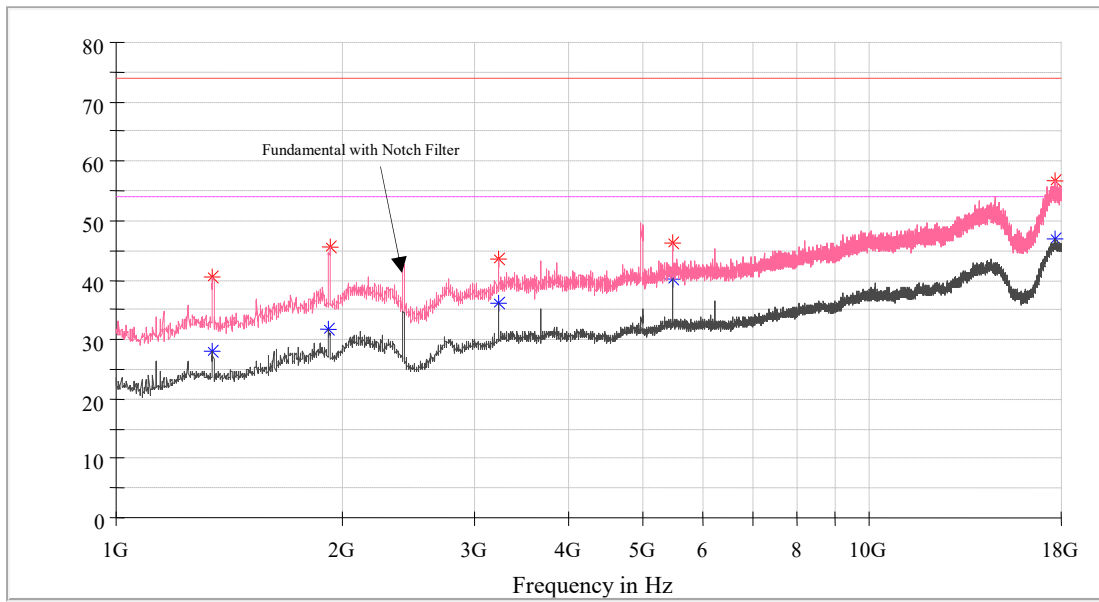
802.11g Mode: Chain 1_worst case

2412 MHz (Horizontal)



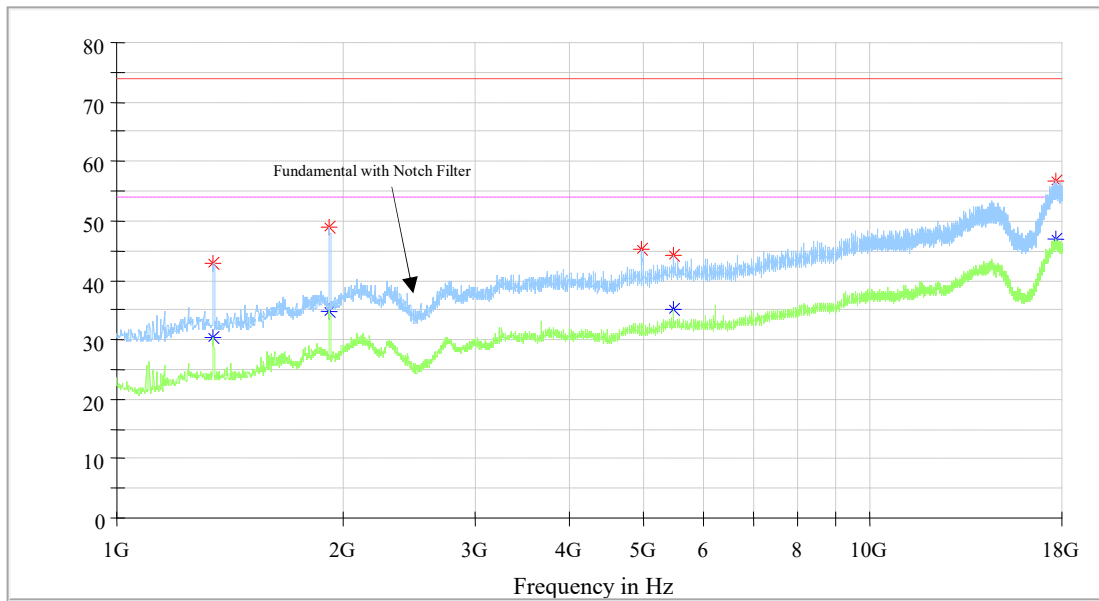
Frequency (MHz)	MaxPeak (dB μV/m)	Average (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1343.40000	42.46	---	74.00	31.54	161.0	H	313.0	0.9
1343.40000	---	30.39	54.00	23.61	161.0	H	313.0	0.9
1918.00000	48.72	---	74.00	25.28	161.0	H	132.0	5.2
1918.00000	---	33.56	54.00	20.44	161.0	H	132.0	5.2
4979.70000	45.78	---	74.00	28.22	161.0	H	143.0	12.3
5499.90000	---	35.56	54.00	18.44	161.0	H	200.0	13.5
17704.2000	---	46.74	54.00	7.26	161.0	H	132.0	29.2
17726.3000	56.73	---	74.00	17.27	161.0	H	266.0	29.2

2412 MHz (Vertical)



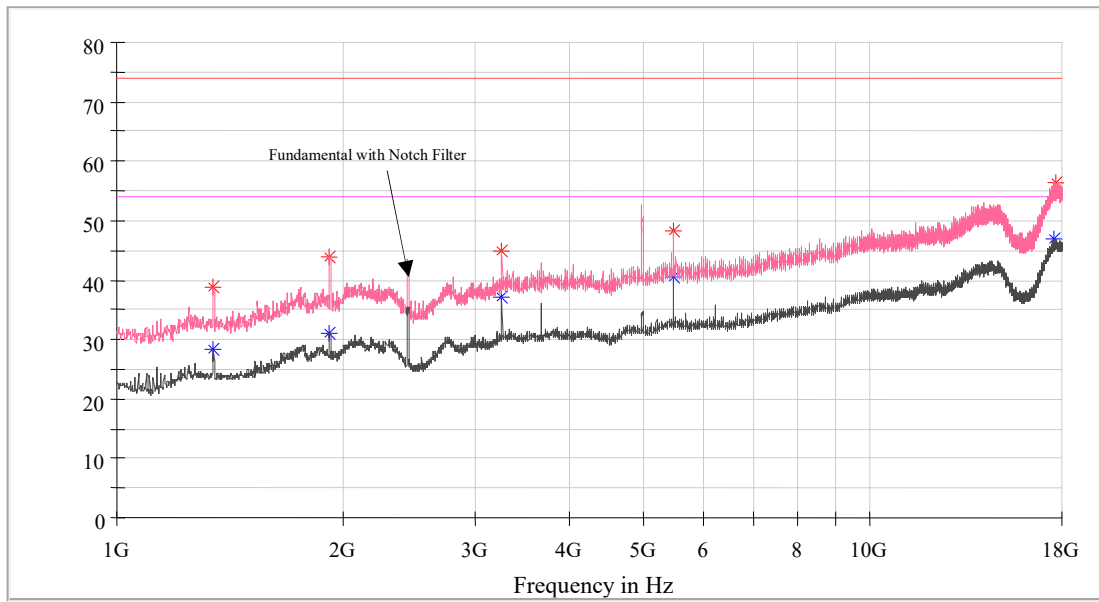
Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1341.70000	---	28.16	54.00	25.84	152.0	V	36.0	0.9
1345.10000	40.64	---	74.00	33.36	152.0	V	345.0	0.9
1916.30000	---	31.78	54.00	22.22	152.0	V	345.0	5.2
1923.10000	45.49	---	74.00	28.51	152.0	V	0.0	5.3
3215.10000	43.53	---	74.00	30.47	152.0	V	222.0	8.2
3215.10000	---	36.27	54.00	17.73	152.0	V	222.0	8.2
5499.90000	---	40.16	54.00	13.84	152.0	V	165.0	13.5
5499.90000	46.33	---	74.00	27.67	152.0	V	165.0	13.5
17660.0000	---	46.75	54.00	7.25	152.0	V	222.0	29.2
17692.3000	56.56	---	74.00	17.44	152.0	V	278.0	29.2

2437 MHz (Horizontal)



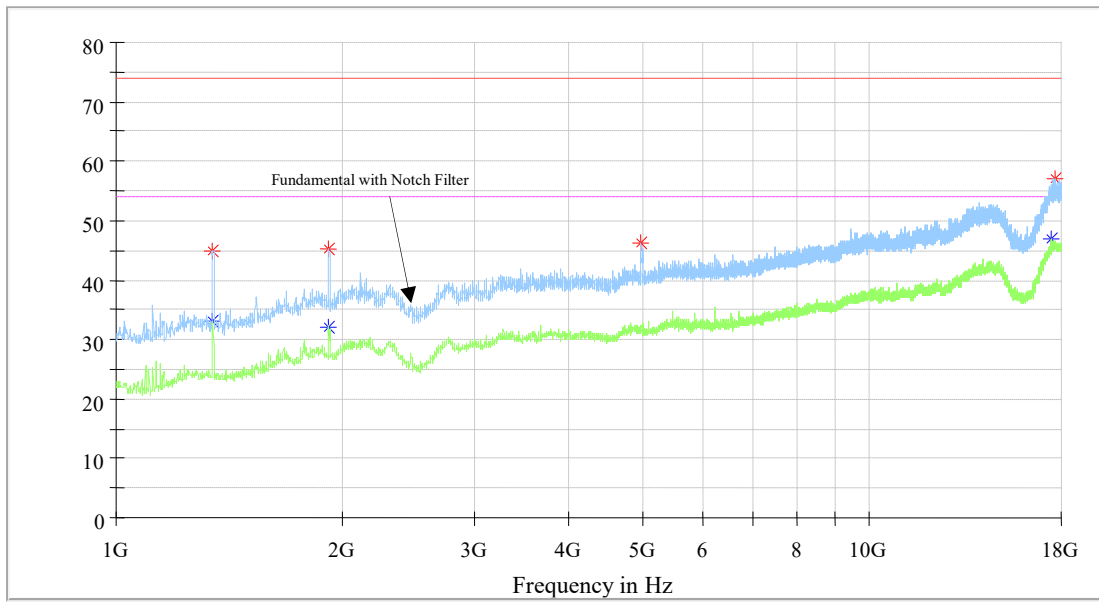
Frequency (MHz)	MaxPeak (dB μV/m)	Average (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1341.70000	---	30.47	54.00	23.53	140.0	H	315.0	0.9
1345.10000	42.84	---	74.00	31.16	140.0	H	315.0	0.9
1918.00000	48.99	---	74.00	25.01	140.0	H	128.0	5.2
1918.00000	---	34.91	54.00	19.09	140.0	H	128.0	5.2
4979.70000	45.38	---	74.00	28.62	140.0	H	0.0	12.3
5499.90000	---	34.98	54.00	19.02	140.0	H	206.0	13.5
5499.90000	44.36	---	74.00	29.64	140.0	H	206.0	13.5
17671.9000	56.60	---	74.00	17.40	140.0	H	326.0	29.2
17704.2000	---	46.76	54.00	7.24	140.0	H	34.0	29.2

2437 MHz (Vertical)



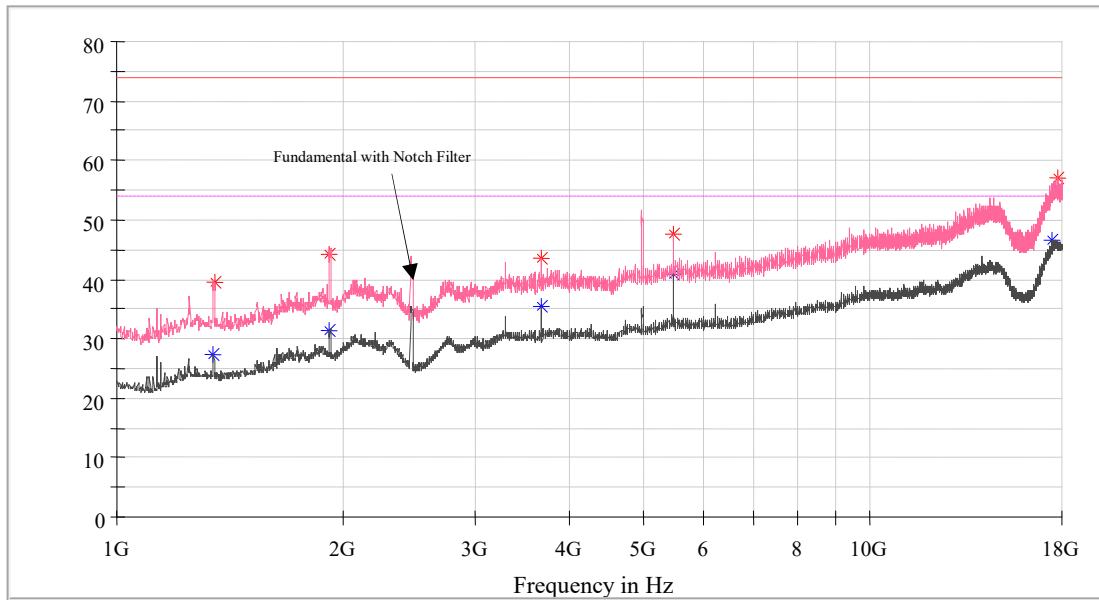
Frequency (MHz)	MaxPeak (dB μV/m)	Average (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1345.10000	---	28.21	54.00	25.79	133.0	V	0.0	0.9
1345.10000	38.91	---	74.00	35.09	133.0	V	0.0	0.9
1916.30000	---	30.92	54.00	23.08	133.0	V	350.0	5.2
1916.30000	43.73	---	74.00	30.27	133.0	V	350.0	5.2
3249.10000	---	37.02	54.00	16.98	133.0	V	194.0	8.3
3249.10000	44.93	---	74.00	29.07	133.0	V	194.0	8.3
5499.90000	---	40.67	54.00	13.33	133.0	V	172.0	13.5
5499.90000	48.42	---	74.00	25.58	133.0	V	172.0	13.5
17598.8000	---	47.08	54.00	6.92	133.0	V	0.0	29.2
17695.7000	56.48	---	74.00	17.52	133.0	V	13.0	29.2

2462 MHz (Horizontal)



Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1340.00000	44.88	---	74.00	29.12	155.0	H	309.0	0.9
1345.10000	---	32.94	54.00	21.06	155.0	H	309.0	0.9
1916.30000	45.31	---	74.00	28.69	155.0	H	128.0	5.2
1916.30000	---	32.17	54.00	21.83	155.0	H	128.0	5.2
4979.70000	46.10	---	74.00	27.90	155.0	H	139.0	12.3
17456.0000	---	46.76	54.00	7.24	155.0	H	359.0	28.9
17722.9000	57.13	---	74.00	16.87	155.0	H	357.0	29.2

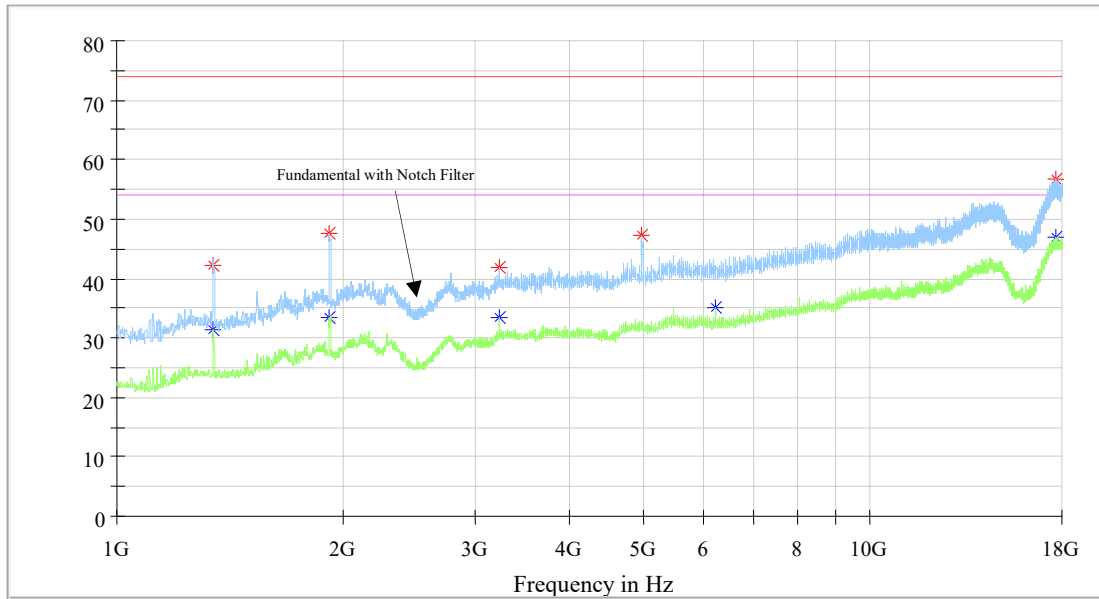
2462 MHz (Vertical)



Frequency (MHz)	MaxPeak (dB μV/m)	Average (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1343.40000	---	27.36	54.00	26.64	150.0	V	350.0	0.9
1346.80000	39.52	---	74.00	34.48	150.0	V	182.0	0.9
1916.30000	44.09	---	74.00	29.91	150.0	V	0.0	5.2
1918.00000	---	31.46	54.00	22.54	150.0	V	4.0	5.2
3665.60000	---	35.56	54.00	18.44	150.0	V	228.0	10.0
3665.60000	43.55	---	74.00	30.45	150.0	V	228.0	10.0
5499.90000	---	40.68	54.00	13.32	150.0	V	171.0	13.5
5499.90000	47.56	---	74.00	26.44	150.0	V	171.0	13.5
17505.3000	---	46.58	54.00	7.42	150.0	V	252.0	29.2
17787.5000	56.97	---	74.00	17.03	150.0	V	31.0	29.2

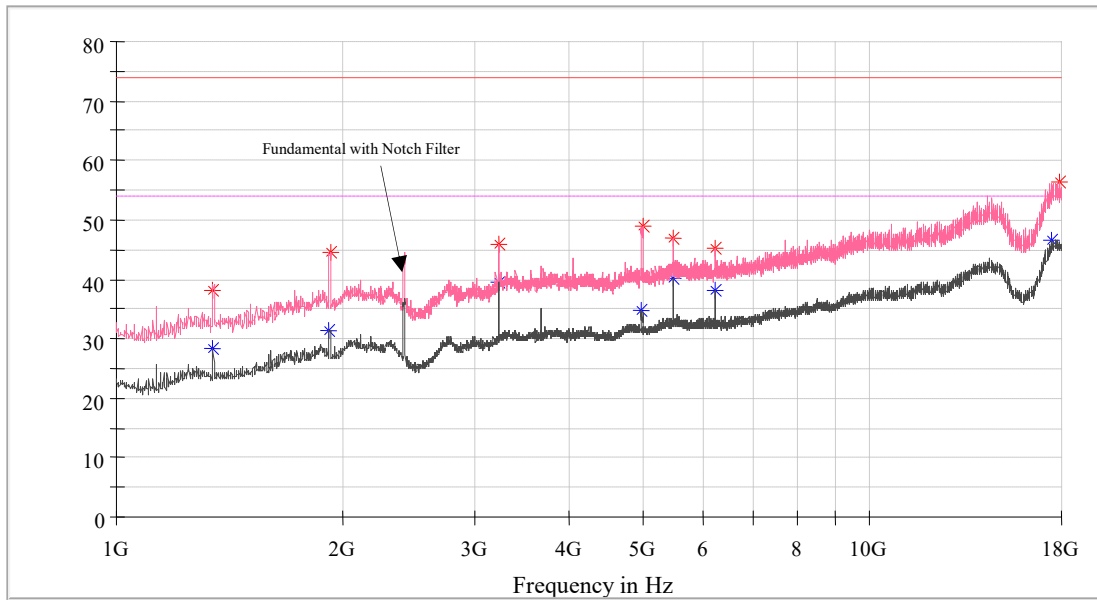
802.11n-HT20 Mode: Chain 0 + Chain 1

2412 MHz (Horizontal)



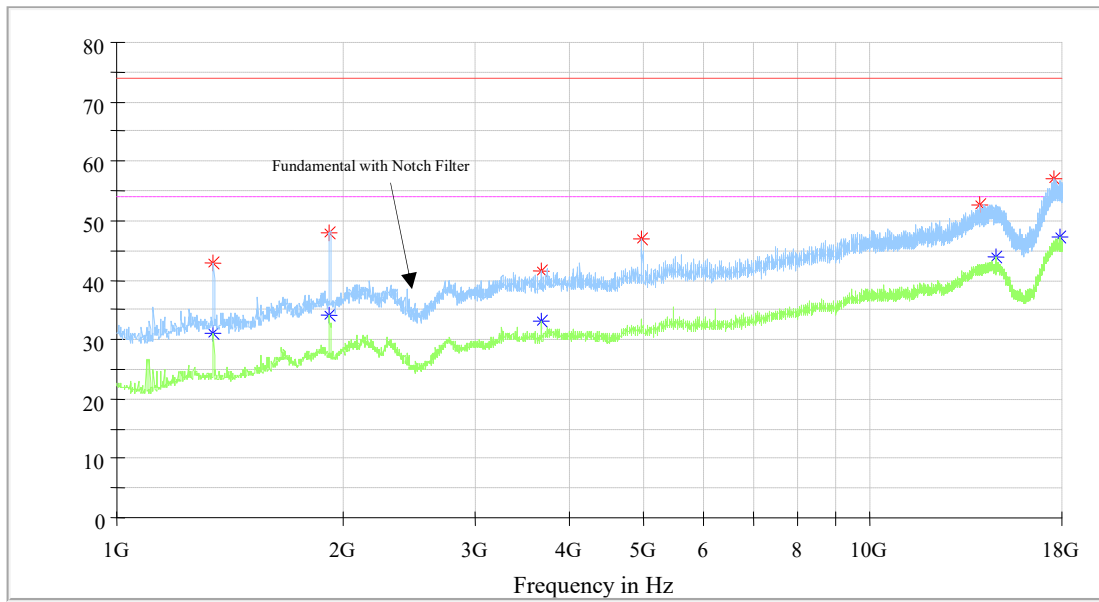
Frequency (MHz)	MaxPeak (dB μV/m)	Average (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1341.70000	42.26	---	74.00	31.74	161.0	H	152.0	0.9
1345.10000	---	31.27	54.00	22.73	161.0	H	311.0	0.9
1914.60000	47.72	---	74.00	26.28	161.0	H	130.0	5.2
1918.00000	---	33.44	54.00	20.56	161.0	H	118.0	5.2
3215.10000	---	33.58	54.00	20.42	161.0	H	311.0	8.2
3215.10000	41.84	---	74.00	32.16	161.0	H	311.0	8.2
4984.80000	47.14	---	74.00	26.86	161.0	H	218.0	12.3
6249.60000	---	35.05	54.00	18.95	161.0	H	0.0	13.8
17699.1000	---	46.76	54.00	7.24	161.0	H	231.0	29.2
17699.1000	56.84	---	74.00	17.16	161.0	H	231.0	29.2

2412 MHz (Vertical)



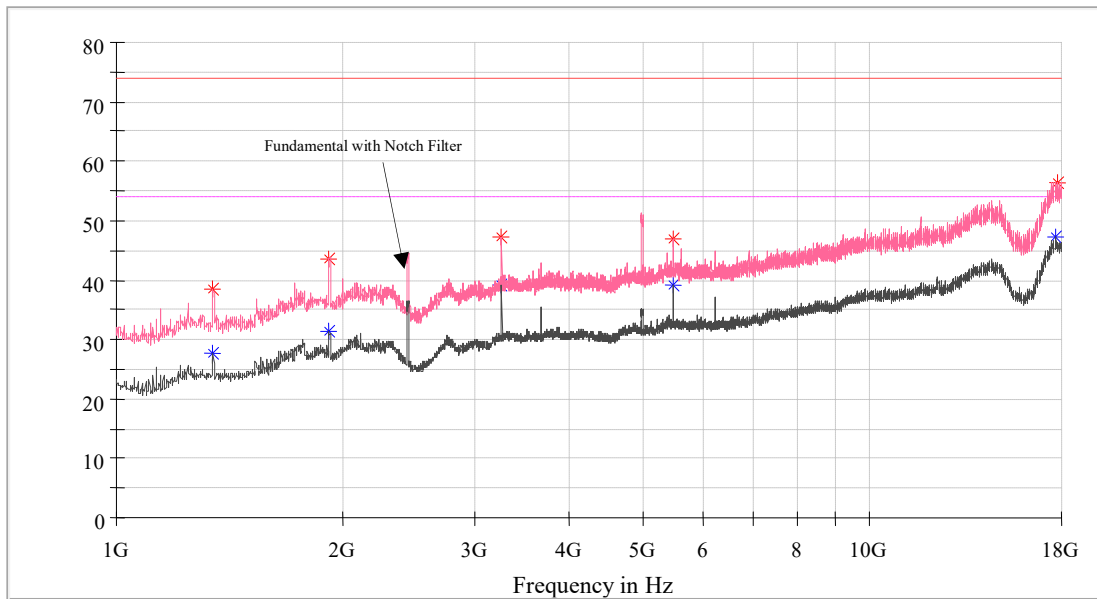
Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1341.70000	38.09	---	74.00	35.91	152.0	V	48.0	0.9
1343.40000	---	28.21	54.00	25.79	152.0	V	325.0	0.9
1918.00000	---	31.46	54.00	22.54	152.0	V	355.0	5.2
1923.10000	44.65	---	74.00	29.35	152.0	V	347.0	5.3
3215.10000	---	39.60	54.00	14.40	152.0	V	180.0	8.2
3215.10000	45.96	---	74.00	28.04	152.0	V	180.0	8.2
4979.70000	---	34.84	54.00	19.16	152.0	V	203.0	12.3
5000.10000	48.84	---	74.00	25.16	152.0	V	169.0	12.4
5499.90000	---	40.04	54.00	13.96	152.0	V	169.0	13.5
5499.90000	46.76	---	74.00	27.24	152.0	V	169.0	13.5
6249.60000	45.24	---	74.00	28.76	152.0	V	236.0	13.8
6249.60000	---	38.15	54.00	15.85	152.0	V	236.0	13.8
17467.9000	---	46.57	54.00	7.43	152.0	V	355.0	29.0
17932.0000	56.27	---	74.00	17.73	152.0	V	314.0	29.2

2437 MHz (Horizontal)



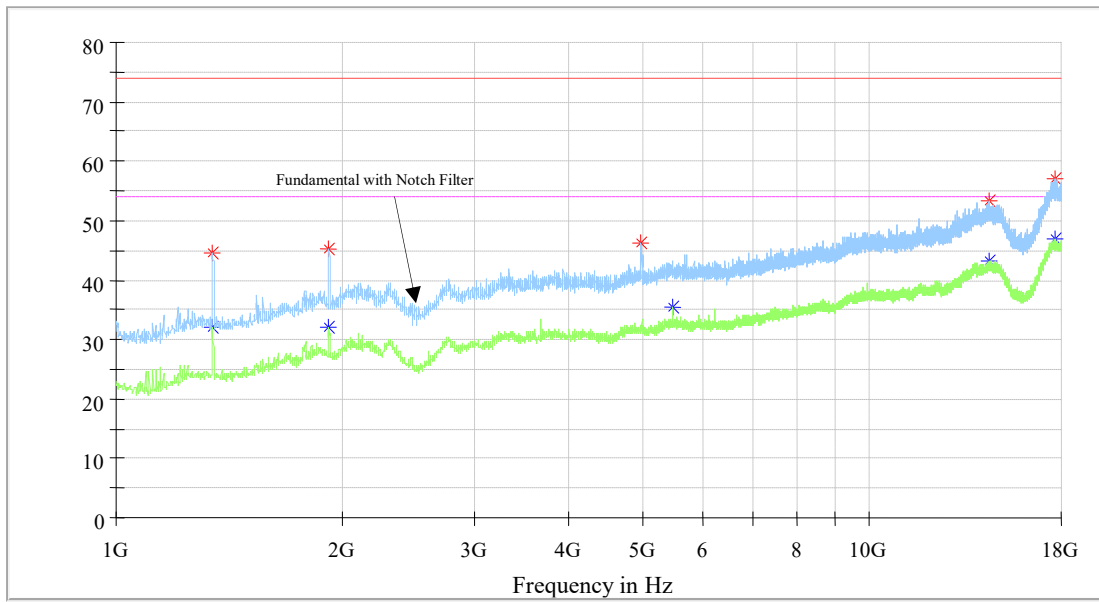
Frequency (MHz)	MaxPeak (dB μV/m)	Average (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1343.40000	42.93	---	74.00	31.07	140.0	H	312.0	0.9
1345.10000	---	31.10	54.00	22.90	140.0	H	312.0	0.9
1918.00000	---	34.24	54.00	19.76	140.0	H	132.0	5.2
1919.70000	47.92	---	74.00	26.08	140.0	H	122.0	5.2
3665.60000	41.38	---	74.00	32.62	140.0	H	144.0	10.0
3665.60000	---	33.21	54.00	20.79	140.0	H	144.0	10.0
4976.30000	46.90	---	74.00	27.10	140.0	H	220.0	12.3
13988.0000	52.74	---	74.00	21.26	140.0	H	45.0	25.0
14696.9000	---	43.74	54.00	10.26	140.0	H	144.0	25.4
17580.1000	56.90	---	74.00	17.10	140.0	H	111.0	29.2
17872.5000	---	47.41	54.00	6.59	140.0	H	0.0	29.2

2437 MHz (Vertical)



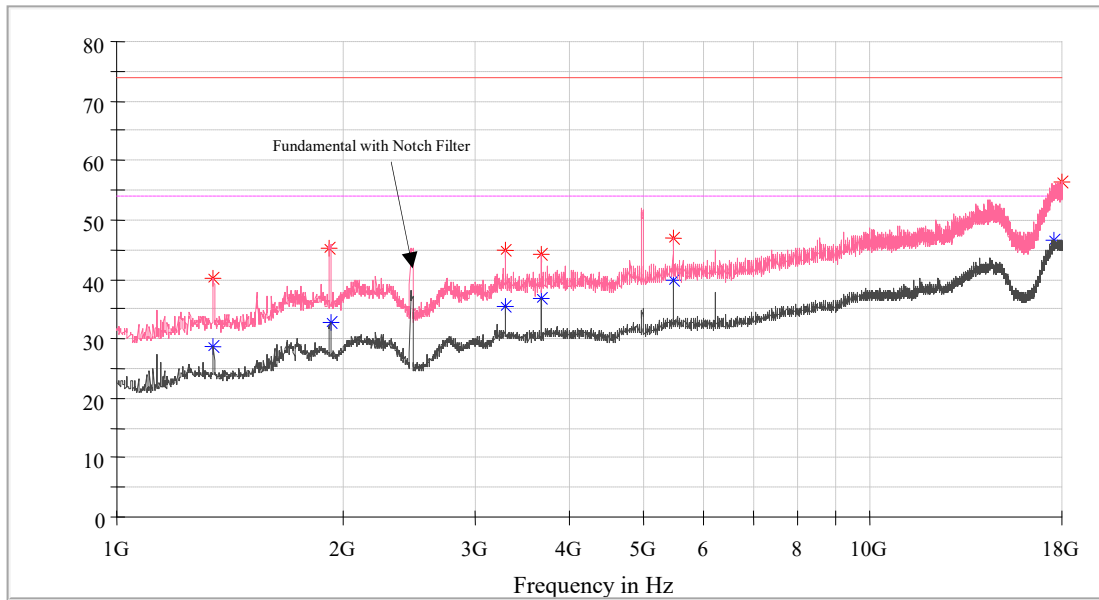
Frequency (MHz)	MaxPeak (dB μV/m)	Average (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1343.40000	38.48	---	74.00	35.52	133.0	V	287.0	0.9
1345.10000	---	27.79	54.00	26.21	133.0	V	66.0	0.9
1918.00000	---	31.46	54.00	22.54	133.0	V	1.0	5.2
1919.70000	43.60	---	74.00	30.40	133.0	V	359.0	5.2
3249.10000	---	39.09	54.00	14.91	133.0	V	201.0	8.3
3249.10000	47.24	---	74.00	26.76	133.0	V	201.0	8.3
5499.90000	---	39.23	54.00	14.77	133.0	V	167.0	13.5
5499.90000	47.00	---	74.00	27.00	133.0	V	167.0	13.5
17656.6000	---	47.20	54.00	6.80	133.0	V	1.0	29.2
17828.3000	56.44	---	74.00	17.56	133.0	V	0.0	29.2

2462 MHz (Horizontal)



Frequency (MHz)	MaxPeak (dB μV/m)	Average (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1343.40000	---	32.22	54.00	21.78	155.0	H	312.0	0.9
1343.40000	44.40	---	74.00	29.60	155.0	H	312.0	0.9
1919.70000	---	32.17	54.00	21.83	155.0	H	130.0	5.2
1919.70000	45.38	---	74.00	28.62	155.0	H	130.0	5.2
4986.50000	46.28	---	74.00	27.72	155.0	H	36.0	12.4
5499.90000	---	35.50	54.00	18.50	155.0	H	130.0	13.5
14428.3000	53.26	---	74.00	20.74	155.0	H	92.0	25.5
14470.8000	---	43.25	54.00	10.75	155.0	H	324.0	25.5
17636.2000	---	46.83	54.00	7.17	155.0	H	130.0	29.2
17688.9000	56.91	---	74.00	17.09	155.0	H	15.0	29.2

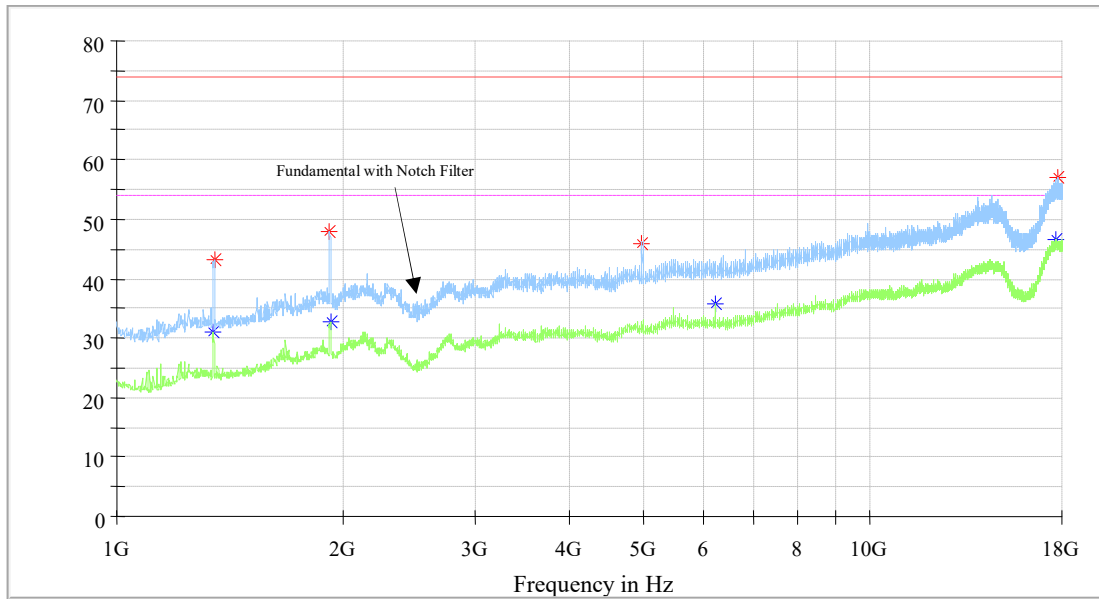
2462 MHz (Vertical)



Frequency (MHz)	MaxPeak (dB μV/m)	Average (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1341.70000	40.08	---	74.00	33.92	150.0	V	323.0	0.9
1345.10000	---	28.62	54.00	25.38	150.0	V	323.0	0.9
1916.30000	45.39	---	74.00	28.61	150.0	V	0.0	5.2
1921.40000	---	32.61	54.00	21.39	150.0	V	1.0	5.2
3281.40000	44.86	---	74.00	29.14	150.0	V	3.0	8.5
3283.10000	---	35.59	54.00	18.41	150.0	V	3.0	8.5
3665.60000	---	36.64	54.00	17.36	150.0	V	200.0	10.0
3665.60000	44.33	---	74.00	29.67	150.0	V	200.0	10.0
5499.90000	---	39.86	54.00	14.14	150.0	V	165.0	13.5
5499.90000	46.84	---	74.00	27.16	150.0	V	165.0	13.5
17541.0000	---	46.73	54.00	7.27	150.0	V	10.0	29.2
17949.0000	56.28	---	74.00	17.72	150.0	V	224.0	29.2

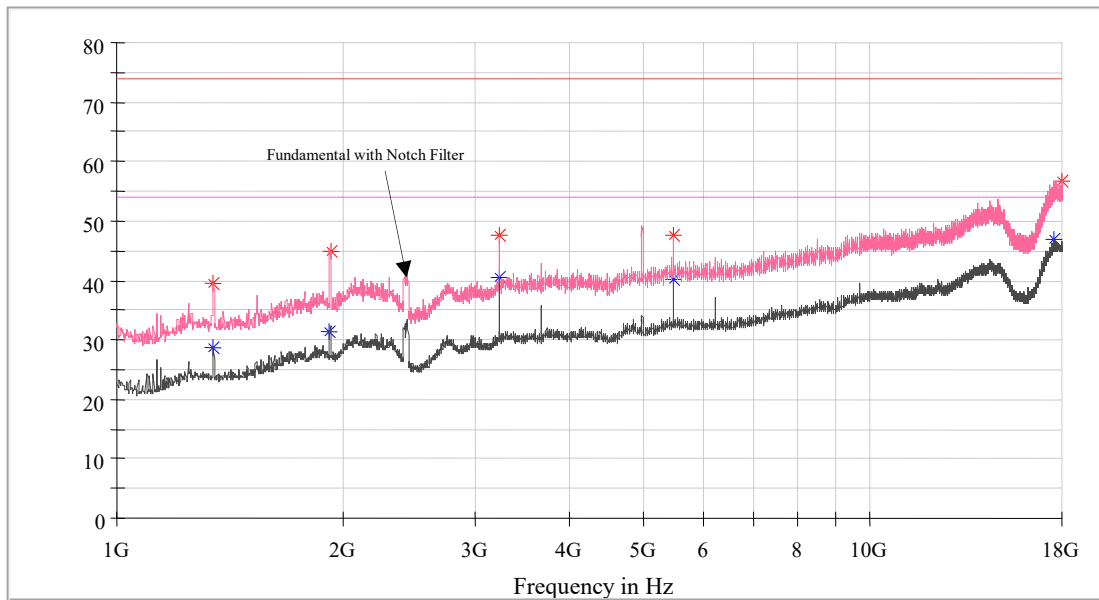
802.11n-HT40 Mode: Chain 0 + Chain 1

2422 MHz (Horizontal)



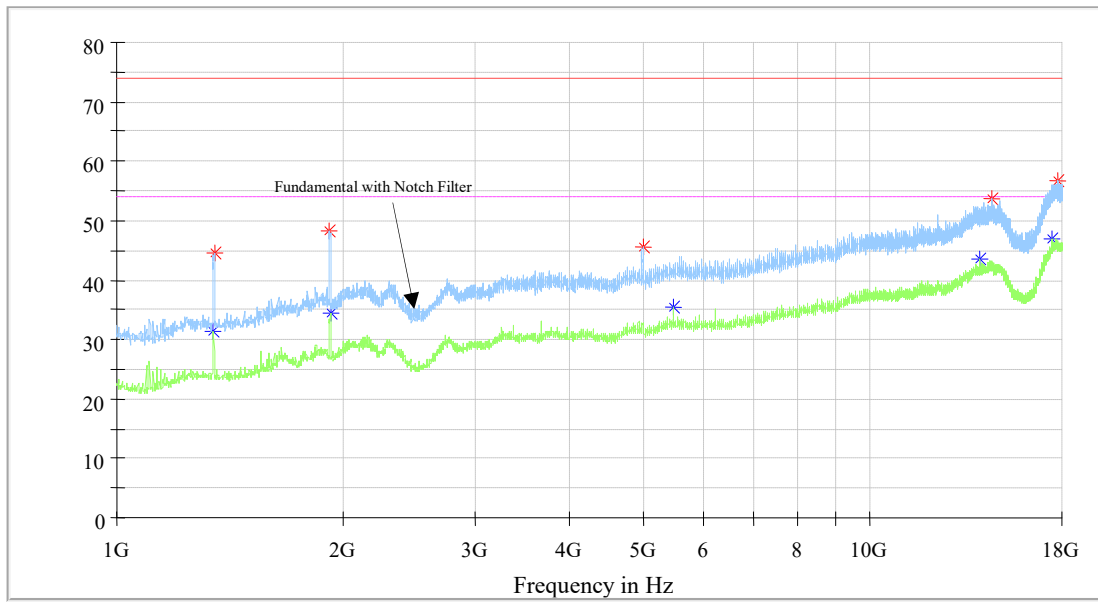
Frequency (MHz)	MaxPeak (dB μV/m)	Average (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1341.70000	---	31.09	54.00	22.91	161.0	H	301.0	0.9
1346.80000	43.13	---	74.00	30.87	161.0	H	301.0	0.9
1916.30000	47.78	---	74.00	26.22	161.0	H	122.0	5.2
1921.40000	---	32.72	54.00	21.28	161.0	H	122.0	5.2
4978.00000	45.79	---	74.00	28.21	161.0	H	134.0	12.3
6249.60000	---	35.85	54.00	18.15	161.0	H	290.0	13.8
17661.7000	---	46.69	54.00	7.31	161.0	H	168.0	29.2
17736.5000	57.14	---	74.00	16.86	161.0	H	333.0	29.2

2422 MHz (Vertical)



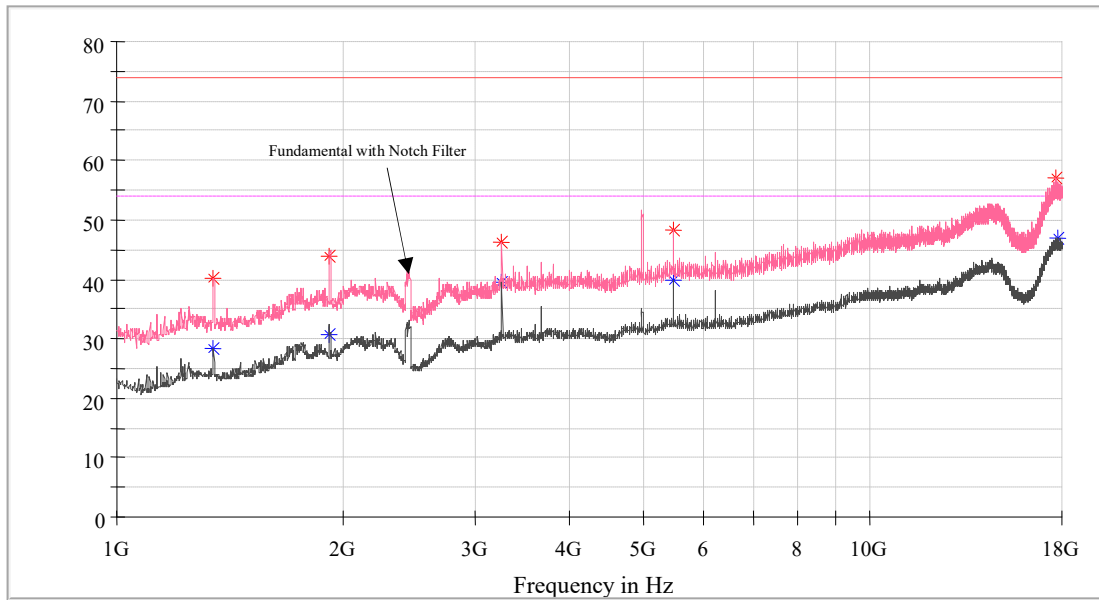
Frequency (MHz)	MaxPeak (dB μV/m)	Average (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1343.40000	39.49	---	74.00	34.51	152.0	V	38.0	0.9
1345.10000	---	28.67	54.00	25.33	152.0	V	38.0	0.9
1918.00000	---	31.29	54.00	22.71	152.0	V	0.0	5.2
1923.10000	44.92	---	74.00	29.08	152.0	V	4.0	5.3
3228.70000	---	40.62	54.00	13.38	152.0	V	49.0	8.2
3228.70000	47.52	---	74.00	26.48	152.0	V	49.0	8.2
5499.90000	---	40.26	54.00	13.74	152.0	V	173.0	13.5
5499.90000	47.53	---	74.00	26.47	152.0	V	173.0	13.5
17600.5000	---	46.84	54.00	7.16	152.0	V	26.0	29.2
17988.1000	56.78	---	74.00	17.22	152.0	V	196.0	29.2

2437 MHz (Horizontal)



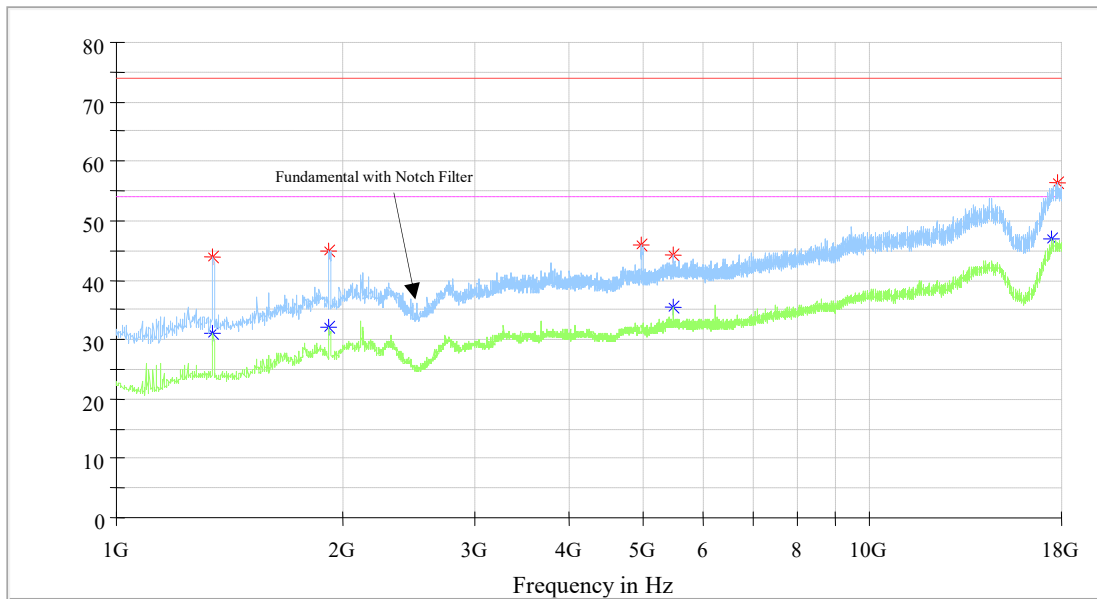
Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1345.10000	---	31.37	54.00	22.63	140.0	H	309.0	0.9
1346.80000	44.50	---	74.00	29.50	140.0	H	309.0	0.9
1914.60000	48.24	---	74.00	25.76	140.0	H	126.0	5.2
1921.40000	---	34.36	54.00	19.64	140.0	H	126.0	5.2
4996.70000	45.55	---	74.00	28.45	140.0	H	208.0	12.4
5499.90000	---	35.46	54.00	18.54	140.0	H	254.0	13.5
14001.6000	---	43.61	54.00	10.39	140.0	H	330.0	25.1
14492.9000	53.65	---	74.00	20.35	140.0	H	351.0	25.5
17490.0000	---	46.92	54.00	7.08	140.0	H	0.0	29.2
17835.1000	56.74	---	74.00	17.26	140.0	H	265.0	29.2

2437 MHz (Vertical)



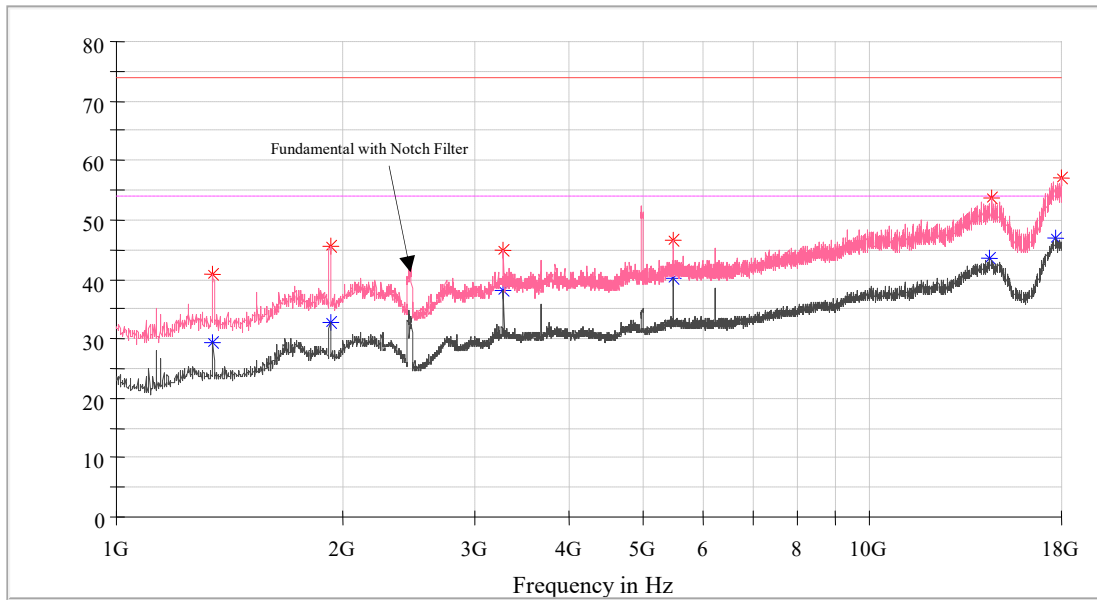
Frequency (MHz)	MaxPeak (dB μV/m)	Average (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1345.10000	---	28.41	54.00	25.59	133.0	V	237.0	0.9
1345.10000	40.08	---	74.00	33.92	133.0	V	237.0	0.9
1914.60000	43.91	---	74.00	30.09	133.0	V	356.0	5.2
1919.70000	---	30.88	54.00	23.12	133.0	V	0.0	5.2
3249.10000	---	39.64	54.00	14.36	133.0	V	193.0	8.3
3249.10000	46.23	---	74.00	27.77	133.0	V	193.0	8.3
5499.90000	---	39.80	54.00	14.20	133.0	V	170.0	13.5
5499.90000	48.39	---	74.00	25.61	133.0	V	170.0	13.5
17632.8000	56.92	---	74.00	17.08	133.0	V	99.0	29.2
17811.3000	---	46.81	54.00	7.19	133.0	V	122.0	29.2

2452 MHz (Horizontal)



Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1345.10000	---	31.18	54.00	22.82	155.0	H	311.0	0.9
1345.10000	43.80	---	74.00	30.20	155.0	H	311.0	0.9
1916.30000	44.96	---	74.00	29.04	155.0	H	122.0	5.2
1918.00000	---	32.23	54.00	21.77	155.0	H	134.0	5.2
4978.00000	46.02	---	74.00	27.98	155.0	H	212.0	12.3
5499.90000	44.10	---	74.00	29.90	155.0	H	212.0	13.5
5499.90000	---	35.47	54.00	18.53	155.0	H	212.0	13.5
17493.4000	---	46.87	54.00	7.13	155.0	H	311.0	29.2
17818.1000	56.30	---	74.00	17.70	155.0	H	63.0	29.2

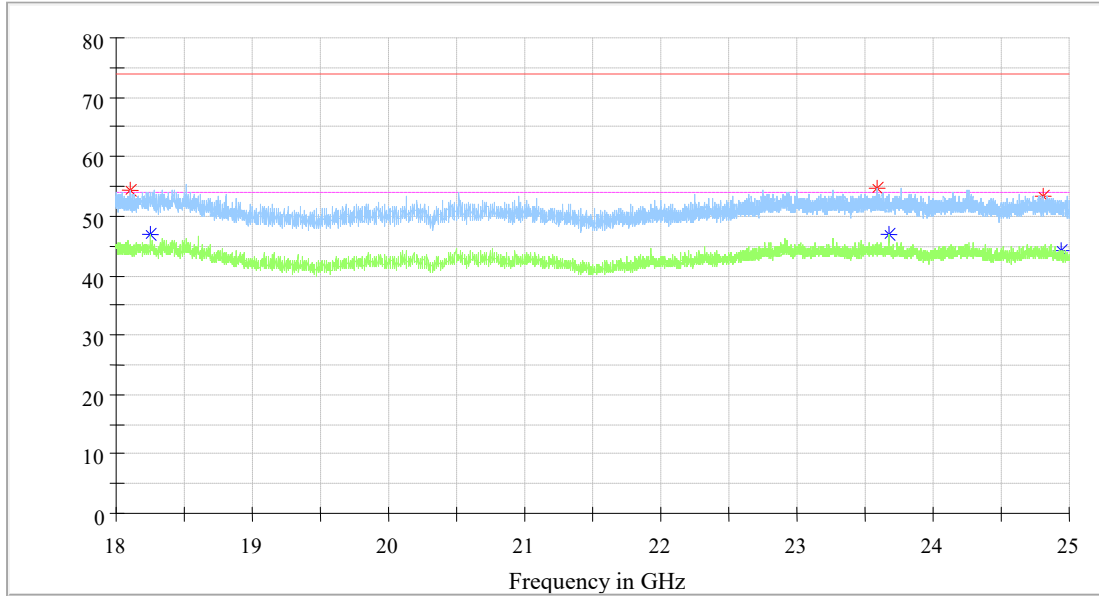
2452 MHz (Vertical)



Frequency (MHz)	MaxPeak (dB μV/m)	Average (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1341.700000	40.78	---	74.00	33.22	150.0	V	212.0	0.9
1345.100000	---	29.38	54.00	24.62	150.0	V	324.0	0.9
1921.400000	---	32.75	54.00	21.25	150.0	V	358.0	5.2
1923.100000	45.64	---	74.00	28.36	150.0	V	345.0	5.3
3269.500000	---	38.17	54.00	15.83	150.0	V	189.0	8.4
3269.500000	45.06	---	74.00	28.94	150.0	V	189.0	8.4
5499.900000	---	40.11	54.00	13.89	150.0	V	166.0	13.5
5499.900000	46.54	---	74.00	27.46	150.0	V	166.0	13.5
14457.20000	---	43.52	54.00	10.48	150.0	V	268.0	25.5
14492.90000	53.55	---	74.00	20.45	150.0	V	354.0	25.5
17673.60000	---	46.78	54.00	7.22	150.0	V	166.0	29.2
17966.00000	56.95	---	74.00	17.05	150.0	V	189.0	29.2

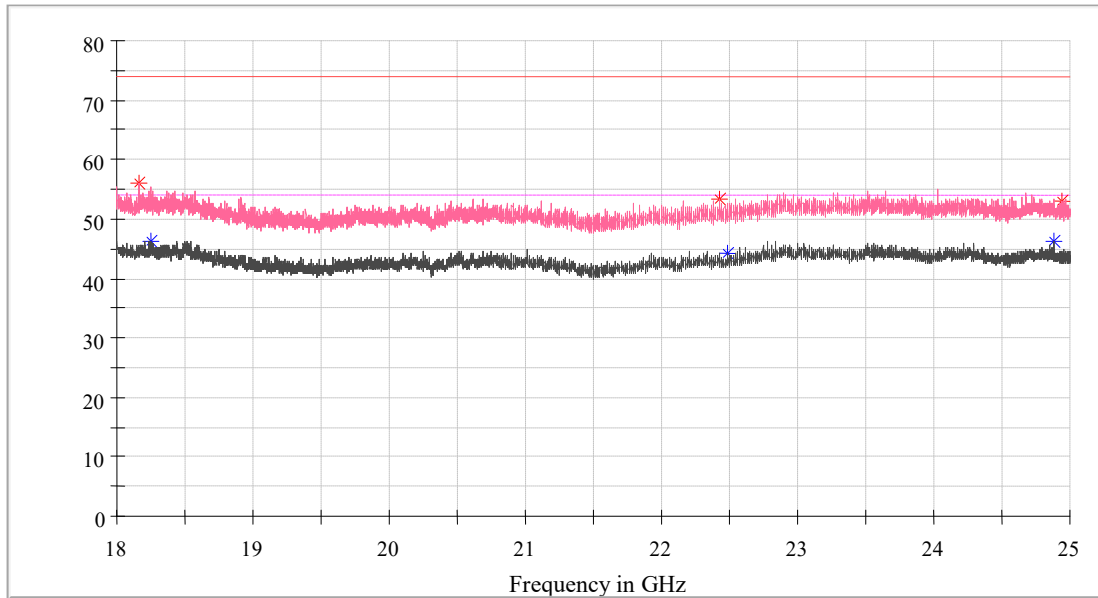
18 GHz to 25 GHz: 802.11g_High Channel-Chain 1-Worst Case

Horizontal



Frequency (MHz)	MaxPeak (dB μV/m)	Average (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
18098.00000	54.34	---	74.00	19.66	100.0	H	0.0	9.4
18255.50000	---	46.95	54.00	7.05	100.0	H	45.0	9.5
23586.70000	54.69	---	74.00	19.31	100.0	H	29.0	11.8
23672.10000	---	47.08	54.00	6.92	100.0	H	129.0	11.8
24807.50000	53.30	---	74.00	20.70	100.0	H	70.0	11.5
24948.20000	---	44.36	54.00	9.64	100.0	H	53.0	11.5

Vertical



Frequency (MHz)	MaxPeak (dB μV/m)	Average (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
18158.9000	56.08	---	74.00	17.92	100.0	V	352.0	9.4
18256.9000	---	46.39	54.00	7.61	100.0	V	133.0	9.5
22431.0000	53.29	---	74.00	20.71	100.0	V	4.0	10.0
22487.0000	---	44.37	54.00	9.63	100.0	V	312.0	10.1
24882.4000	---	46.10	54.00	7.90	100.0	V	124.0	11.5
24938.4000	53.06	---	74.00	20.94	100.0	V	224.0	11.5

Note:

Corrected Amplitude = Corrected Factor + Reading

Corrected Factor=Antenna factor (RX) + Cable Loss – Amplifier Factor or Antenna factor (RX) + Cable Loss

Margin = Limit- Corr. Amplitude

Band Edge Emission:

Chain 0:

802.11b Mode

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Limit	Margin
	Reading	Measurement	Polar	Factor					
MHz	dBµV	PK/AV	H/V	dB(1/m)	dB	dB	dBµV/m	dBµV/m	dB
Frequency: 2412 MHz									
2412	70.42	PK	V	29.12	3.02	0.00	102.56	N/A	N/A
2412	65.38	AV	V	29.12	3.02	0.00	97.52	N/A	N/A
2390	27.87	PK	V	29.15	3.01	0.00	60.03	74.00	13.97
2390	14.52	AV	V	29.15	3.01	0.00	46.68	54.00	7.32
Frequency: 2462 MHz									
2462	71.09	PK	V	29.05	3.06	0.00	103.20	N/A	N/A
2462	66.18	AV	V	29.05	3.06	0.00	98.29	N/A	N/A
2483.5	29.52	PK	V	29.02	3.07	0.00	61.61	74.00	12.39
2483.5	15.08	AV	V	29.02	3.07	0.00	47.17	54.00	6.83

802.11g Mode

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Limit	Margin
	Reading	Measurement	Polar	Factor					
MHz	dBµV	PK/AV	H/V	dB(1/m)	dB	dB	dBµV/m	dBµV/m	dB
Frequency:2412 MHz									
2412	72.82	PK	V	29.12	3.02	0.00	104.96	N/A	N/A
2412	58.97	AV	V	29.12	3.02	0.00	91.11	N/A	N/A
2390	28.54	PK	V	29.15	3.01	0.00	60.70	74.00	13.30
2390	14.91	AV	V	29.15	3.01	0.00	47.07	54.00	6.93
Frequency:2462 MHz									
2462	73.51	PK	V	29.05	3.06	0.00	105.62	N/A	N/A
2462	59.59	AV	V	29.05	3.06	0.00	91.70	N/A	N/A
2483.5	30.59	PK	V	29.02	3.07	0.00	62.68	74.00	11.32
2483.5	15.39	AV	V	29.02	3.07	0.00	47.48	54.00	6.52

Chain 1:

802.11b Mode

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Limit	Margin
	Reading	Measurement	Polar	Factor					
MHz	dBµV	PK/AV	H/V	dB(1/m)	dB	dB	dBµV/m	dBµV/m	dB
Frequency:2412 MHz									
2412	69.26	PK	V	29.12	3.02	0.00	101.40	N/A	N/A
2412	64.4	AV	V	29.12	3.02	0.00	96.54	N/A	N/A
2390	28.31	PK	V	29.15	3.01	0.00	60.47	74.00	13.53
2390	14.55	AV	V	29.15	3.01	0.00	46.71	54.00	7.29
Frequency:2462 MHz									
2462	70.07	PK	V	29.05	3.06	0.00	102.18	N/A	N/A
2462	65.36	AV	V	29.05	3.06	0.00	97.47	N/A	N/A
2483.5	29.15	PK	V	29.02	3.07	0.00	61.24	74.00	12.76
2483.5	15.15	AV	V	29.02	3.07	0.00	47.24	54.00	6.76

802.11g Mode

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Limit	Margin
	Reading	Measurement	Polar	Factor					
MHz	dBµV	PK/AV	H/V	dB(1/m)	dB	dB	dBµV/m	dBµV/m	dB
Frequency:2412 MHz									
2412	71.41	PK	V	29.12	3.02	0.00	103.55	N/A	N/A
2412	57.94	AV	V	29.12	3.02	0.00	90.08	N/A	N/A
2390	28.79	PK	V	29.15	3.01	0.00	60.95	74.00	13.05
2390	14.93	AV	V	29.15	3.01	0.00	47.09	54.00	6.91
Frequency:2462 MHz									
2462	73.10	PK	V	29.05	3.06	0.00	105.21	N/A	N/A
2462	59.16	AV	V	29.05	3.06	0.00	91.27	N/A	N/A
2483.5	31.03	PK	V	29.02	3.07	0.00	63.12	74.00	10.88
2483.5	15.43	AV	V	29.02	3.07	0.00	47.52	54.00	6.48

802.11n-HT20 Mode (Chain 0+Chain 1)

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Limit	Margin
	Reading	Measurement	Polar	Factor					
MHz	dBµV	PK/AV	H/V	dB(1/m)	dB	dB	dBµV/m	dBµV/m	dB
Frequency: 2412 MHz									
2412	74.13	PK	V	29.12	3.02	0.00	106.27	N/A	N/A
2412	61.75	AV	V	29.12	3.02	0.00	93.89	N/A	N/A
2390	28.37	PK	V	29.15	3.01	0.00	60.53	74.00	13.47
2390	14.83	AV	V	29.15	3.01	0.00	46.99	54.00	7.01
Frequency: 2462 MHz									
2462	74.81	PK	V	29.05	3.06	0.00	106.92	N/A	N/A
2462	62.81	AV	V	29.05	3.06	0.00	94.92	N/A	N/A
2483.5	29.66	PK	V	29.02	3.07	0.00	61.75	74.00	12.25
2483.5	15.48	AV	V	29.02	3.07	0.00	47.57	54.00	6.43

802.11n-HT40 Mode (Chain 0+Chain 1) (worst case)

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Limit	Margin
	Reading	Measurement	Polar	Factor					
MHz	dBµV	PK/AV	H/V	dB(1/m)	dB	dB	dBµV/m	dBµV/m	dB
Frequency: 2422 MHz									
2422	70.83	PK	V	29.11	3.03	0.00	102.97	N/A	N/A
2422	56.43	AV	V	29.11	3.03	0.00	88.57	N/A	N/A
2390	28.94	PK	V	29.15	3.01	0.00	61.10	74.00	12.90
2390	15.6	AV	V	29.15	3.01	0.00	47.76	54.00	6.24
Frequency: 2452 MHz									
2452	71.29	PK	V	29.07	3.05	0.00	103.41	N/A	N/A
2452	56.12	AV	V	29.07	3.05	0.00	88.24	N/A	N/A
2483.5	29.68	PK	V	29.02	3.07	0.00	61.77	74.00	12.23
2483.5	15.48	AV	V	29.02	3.07	0.00	47.57	54.00	6.43

Note:

Corrected Amplitude = Corrected Factor + Reading

Corrected Factor=Antenna factor (RX) + Cable Loss – Amplifier Factor or Antenna factor (RX) + Cable Loss

Margin = Limit- Corr. Amplitude

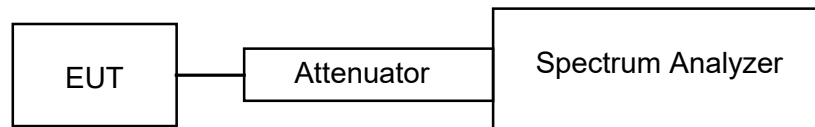
FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH

Applicable Standard

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

Test Procedure

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) $\geq 3 \times$ RBW
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.



Test Data

Environmental Conditions

Temperature:	20 °C
Relative Humidity:	60 %
ATM Pressure:	95.7 kPa

The testing was performed by Winfred Wang on 2021-04-28.

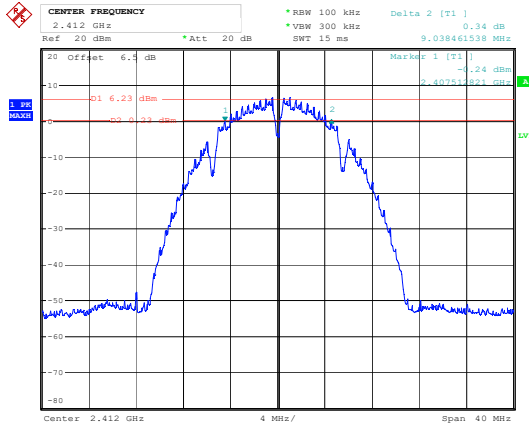
Test Mode: Transmitting

Test Result: Compliance. Please refer to the following table and plots.

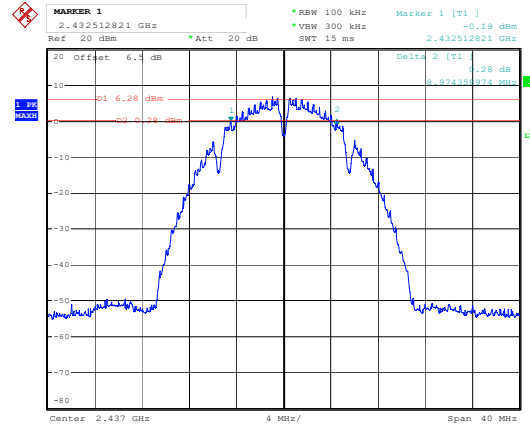
Mode	Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)		Limit (MHz)
			Chain 0	Chain 1	
802.11b	Low	2412	9.04	9.04	≥0.50
	Middle	2437	8.97	8.97	
	High	2462	9.04	9.04	
802.11g	Low	2412	16.41	16.41	
	Middle	2437	16.41	16.41	
	High	2462	16.35	16.35	
802.11n-HT20	Low	2412	17.63	17.63	
	Middle	2437	17.63	17.63	
	High	2462	17.37	17.63	
802.11n-HT40	Low	2422	35.38	35.38	
	Middle	2437	35.38	35.38	
	High	2452	35.38	35.38	

Chain 0

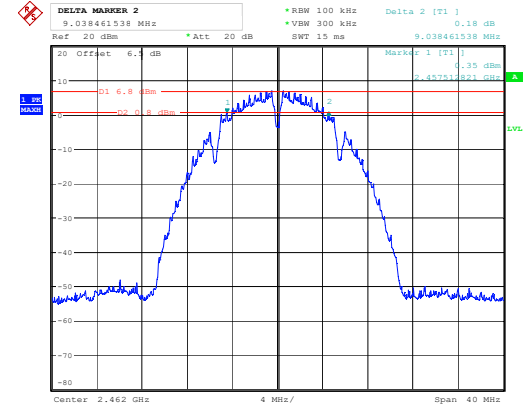
802.11b Low Channel



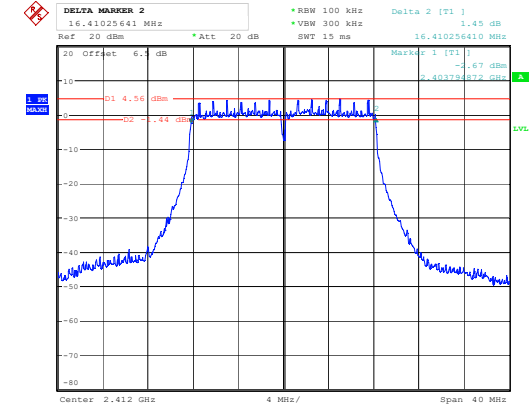
802.11b Middle Channel



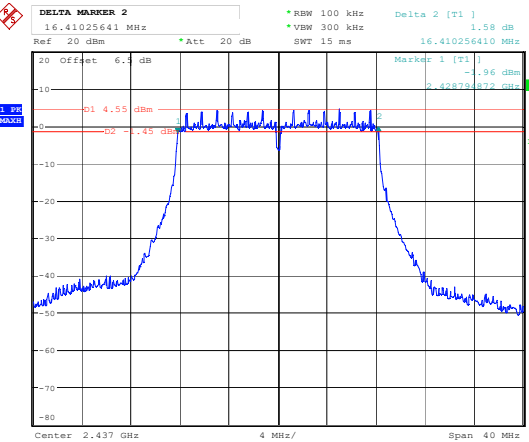
802.11b High Channel



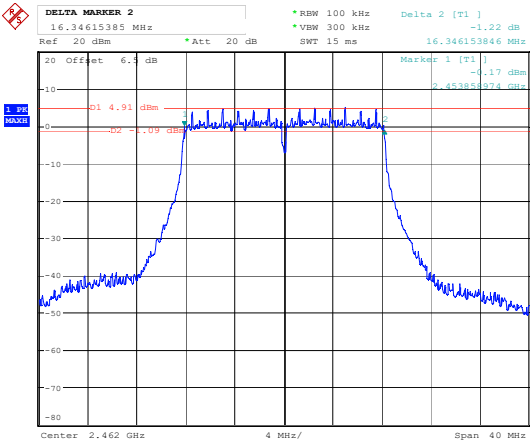
802.11g Low Channel



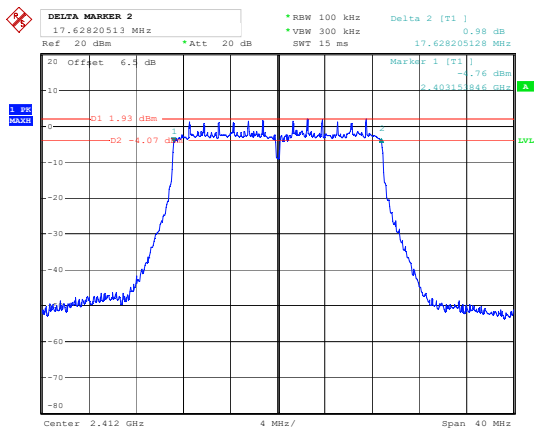
802.11g Middle Channel



802.11g High Channel

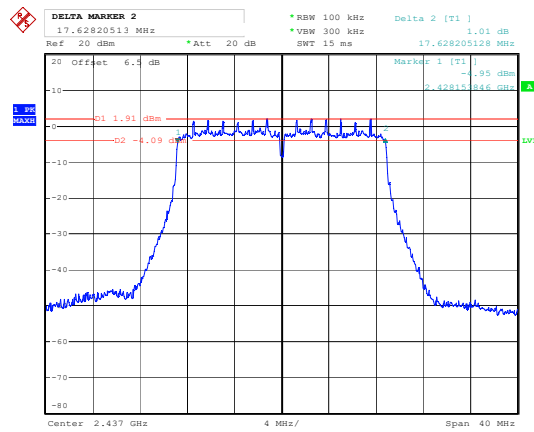


802.11n-HT20 Low Channel



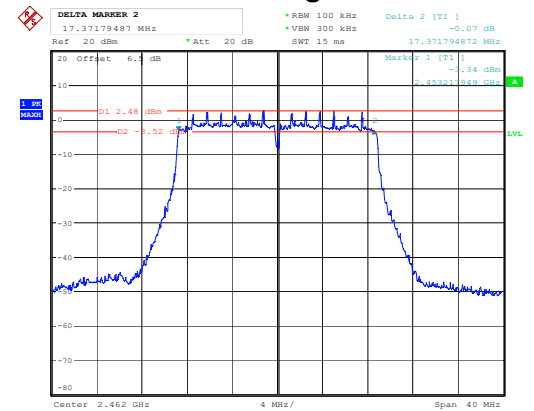
Date: 28.APR.2021 16:32:55

802.11n-HT20 Middle Channel



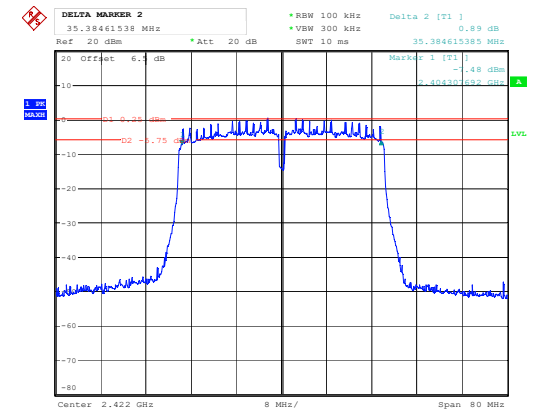
Date: 28.APR.2021 16:49:34

802.11n-HT20 High Channel



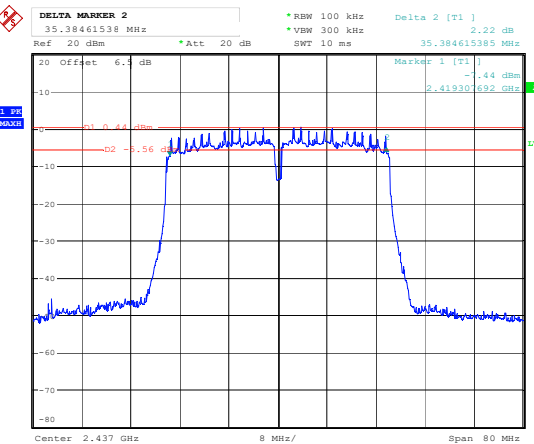
Date: 28.APR.2021 16:52:51

802.11n-HT40 Low Channel



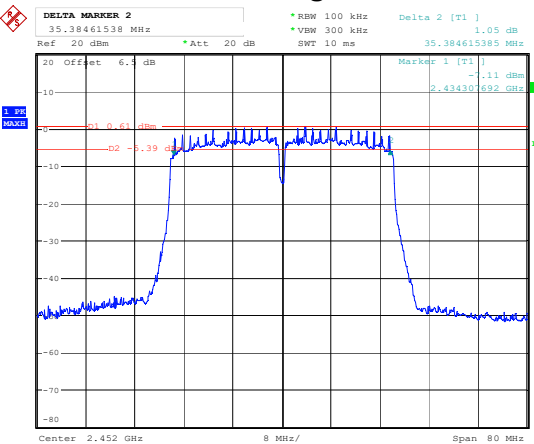
Date: 28.APR.2021 16:55:46

802.11n-HT40 Middle Channel



Date: 28.APR.2021 16:58:55

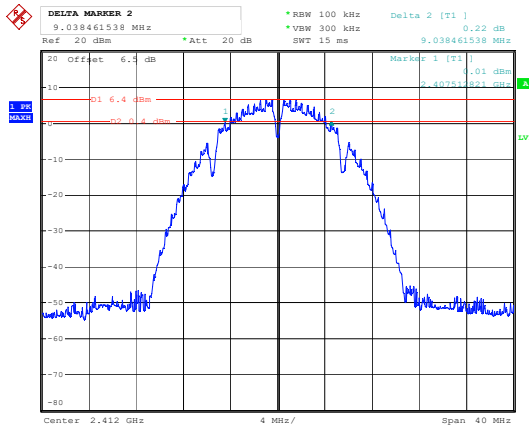
802.11n-HT40 High Channel



Date: 28.APR.2021 17:01:01

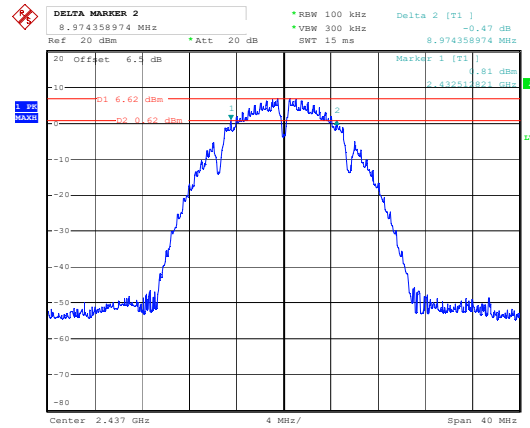
Chain 1

802.11b Low Channel



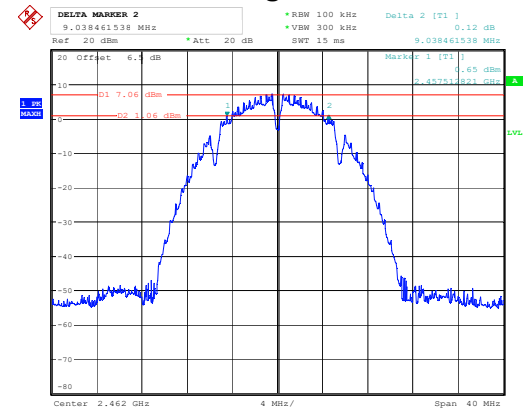
Date: 28.APR.2021 17:14:39

802.11b Middle Channel



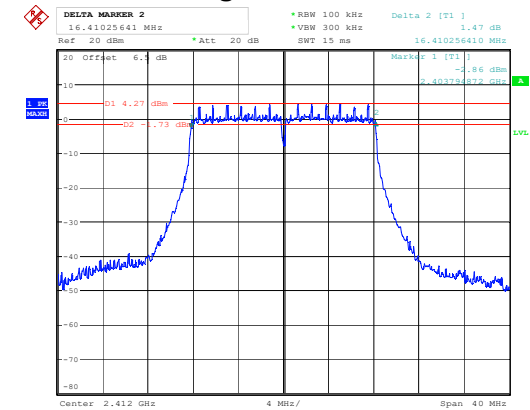
Date: 28.APR.2021 17:16:32

802.11b High Channel



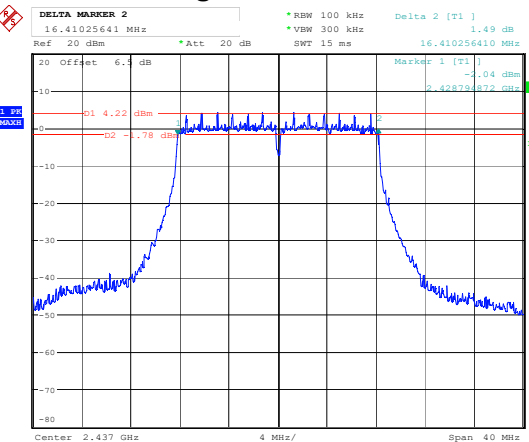
Date: 28.APR.2021 17:22:25

802.11g Low Channel



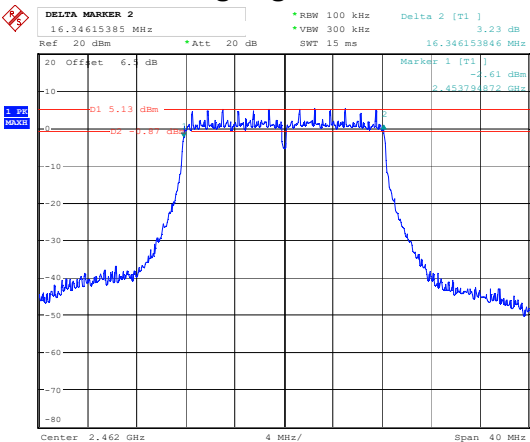
Date: 28.APR.2021 17:24:02

802.11g Middle Channel



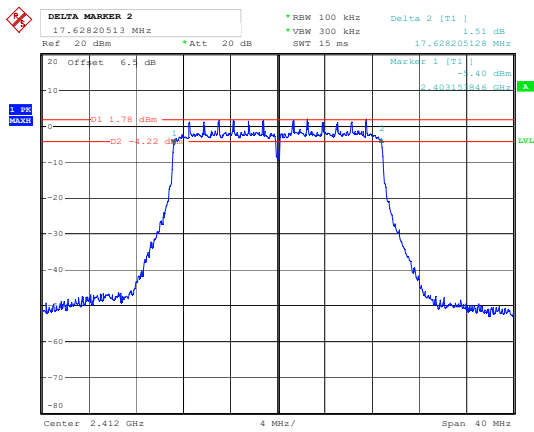
Date: 28.APR.2021 17:25:22

802.11g High Channel



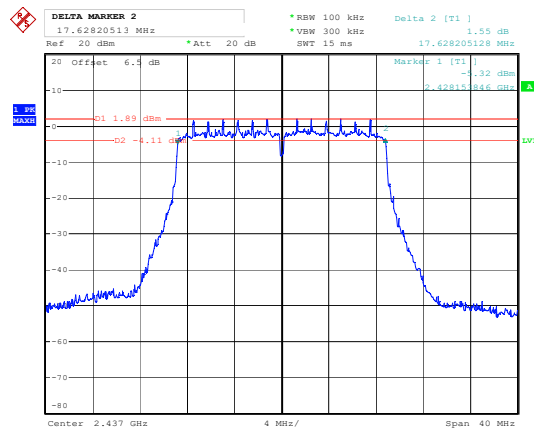
Date: 28.APR.2021 17:26:55

802.11n-HT20 Low Channel



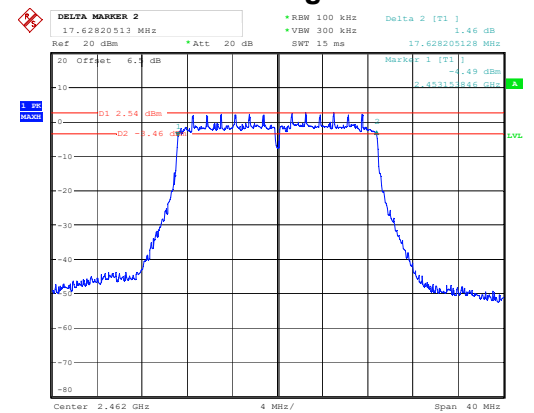
Date: 28.APR.2021 17:28:43

802.11n-HT20 Middle Channel



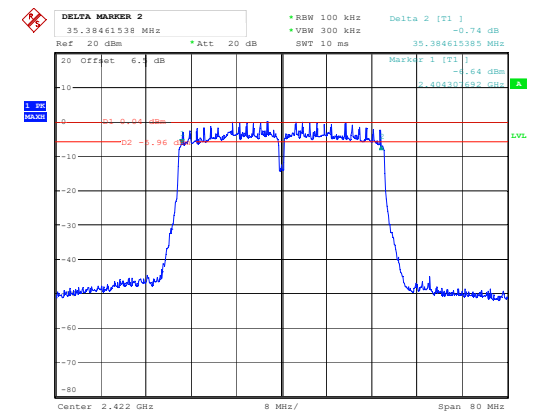
Date: 28.APR.2021 17:30:17

802.11n-HT20 High Channel



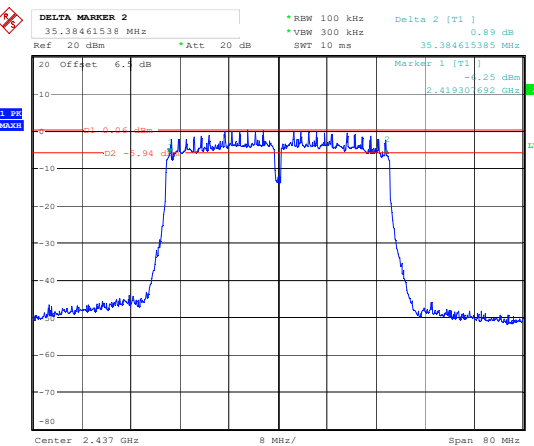
Date: 28.APR.2021 17:33:49

802.11n-HT40 Low Channel



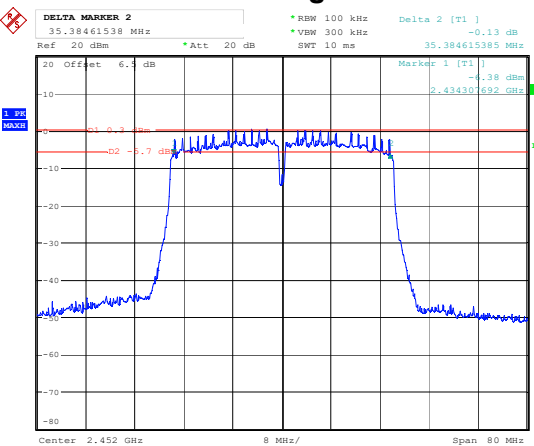
Date: 28.APR.2021 17:37:15

802.11n-HT40 Middle Channel



Date: 28.APR.2021 17:39:05

802.11n-HT40 High Channel



Date: 28.APR.2021 17:43:26

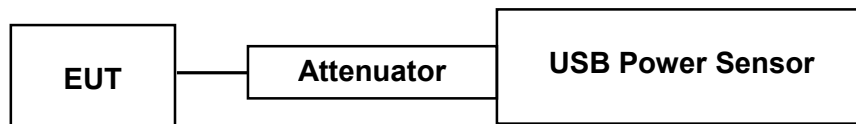
FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER

Applicable Standard

According to FCC §15.247(b) (3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

Test Procedure

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to test equipment.
3. Add a correction factor to the display.



Test Data

Environmental Conditions

Temperature:	20 °C
Relative Humidity:	60 %
ATM Pressure:	95.7 kPa

The testing was performed by Winfred Wang on 2021-04-28.

Test Mode: Transmitting

Test Result: Compliance. Please refer to the following table.

Mode	Channel	Frequency (MHz)	Max Peak Conducted Output Power (dBm)			Limit (dBm)
			Chain 0	Chain 1	Total	
802.11b	Low	2412	16.74	16.97	-	30
	Middle	2437	16.97	17.33	-	
	High	2462	17.29	18.07	-	
802.11g	Low	2412	21.59	22.21	-	
	Middle	2437	22.19	22.68	-	
	High	2462	22.52	23.48	-	
802.11n-HT20	Low	2412	19.09	19.42	22.27	
	Middle	2437	19.35	19.81	22.60	
	High	2462	19.76	20.26	23.03	
802.11n-HT40	Low	2422	18.66	19.01	21.85	
	Middle	2437	18.99	19.15	22.08	
	High	2452	19.15	19.21	22.19	

Mode	Channel	Frequency (MHz)	Max Average Conducted Output Power (dBm)			Limit (dBm)
			Chain 0	Chain 1	Total	
802.11b	Low	2412	14.16	14.37	-	30
	Middle	2437	14.43	14.86	-	
	High	2462	14.76	15.44	-	
802.11g	Low	2412	13.81	14.12	-	
	Middle	2437	14.11	14.48	-	
	High	2462	14.58	15.18	-	
802.11n-HT20	Low	2412	11.25	11.75	14.52	
	Middle	2437	11.58	12.12	14.87	
	High	2462	12.10	12.55	15.34	
802.11n-HT40	Low	2422	11.88	12.23	15.07	
	Middle	2437	12.01	12.44	15.24	
	High	2452	12.42	12.68	15.56	

Note:

1. The max antenna gain* is 2.72dBi
2. The duty cycle factor was added to the result.
3. The device employed Cyclic Delay Diversity (CDD) for 802.11 MIMO transmitting, per KDB 662911 D01 Multiple Transmitter Output v02r01, for power measurements on IEEE 802.11 devices:
 Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

So:

Directional gain = $G_{ANT} + \text{Array Gain} = 2.72\text{dBi} < 6.0\text{dBi}$.
 No power limit reduced in MIMO mode.

FCC §15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE

Applicable Standard

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

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Test Data

Environmental Conditions

Temperature:	22 °C
Relative Humidity:	59 %
ATM Pressure:	95.7 kPa

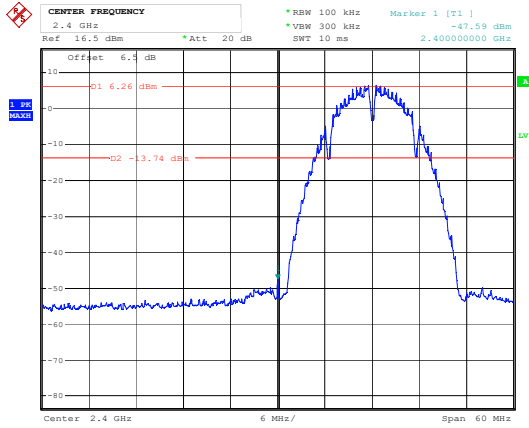
The testing was performed by Winfred Wang on 2021-04-30.

Test mode: Transmitting

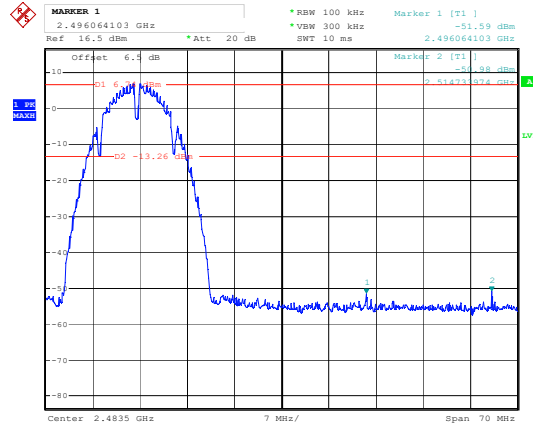
Test Result: Compliance. Please refer to following plots.

Chain 0

802.11b: Band Edge, Left Side

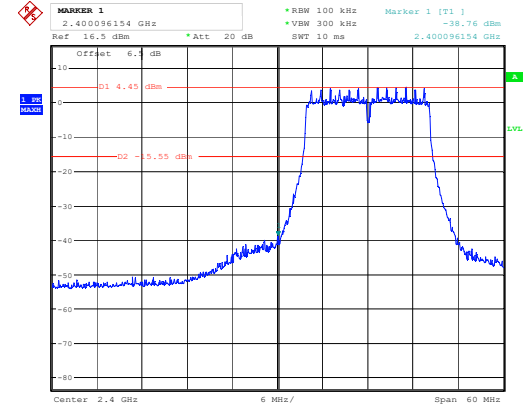


802.11b: Band Edge, Right Side



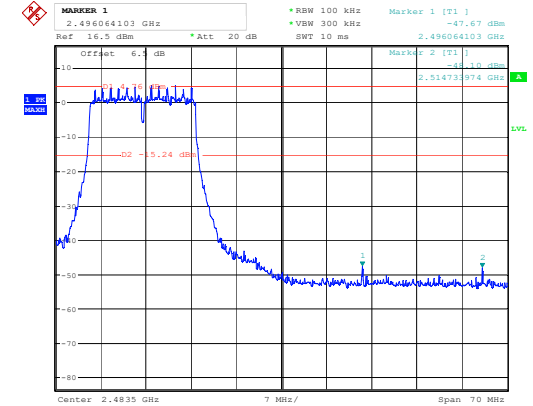
Date: 30.APR.2021 10:05:12

802.11g: Band Edge, Left Side



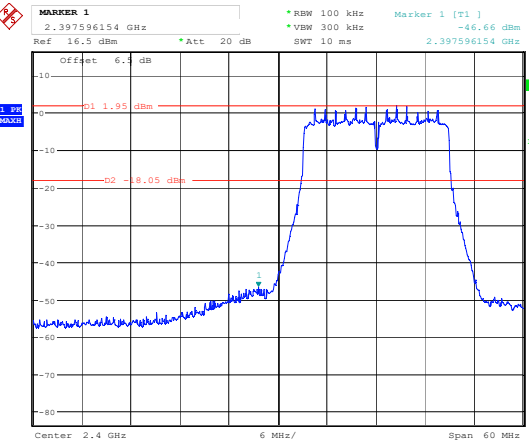
Date: 30.APR.2021 10:26:46

802.11g: Band Edge, Right Side



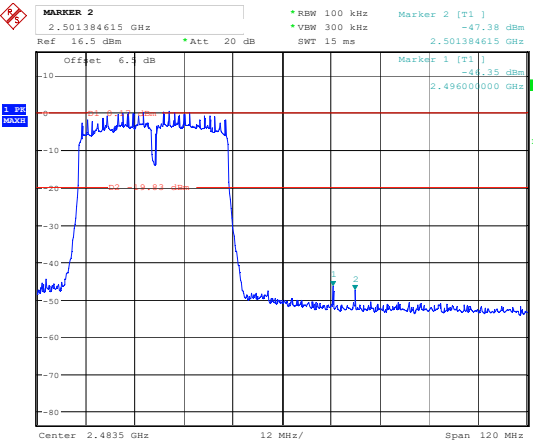
Date: 30.APR.2021 10:35:55

802.11n-HT20 Band Edge, Left Side



Date: 30.APR.2021 10:25:40

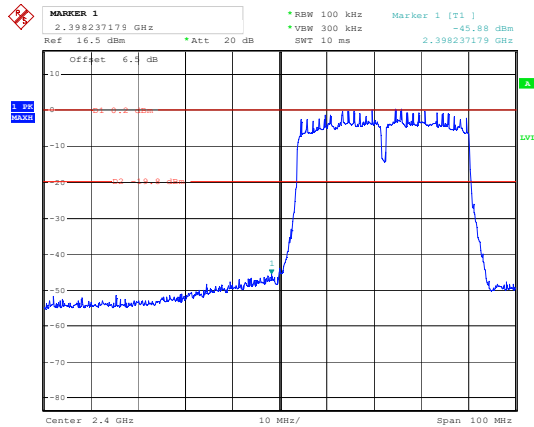
802.11n-HT20 Band Edge, Right Side



Date: 30.APR.2021 10:19:34

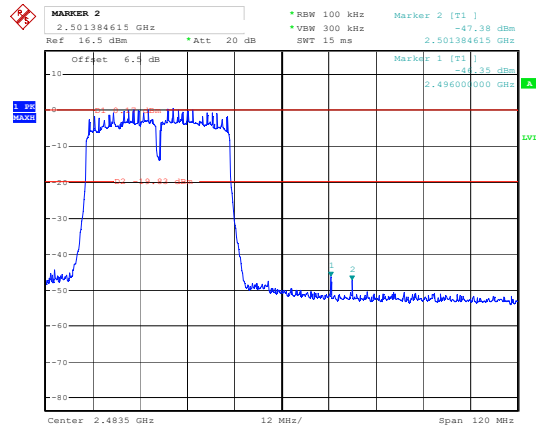
Date: 30.APR.2021 10:23:20

802.11n-HT40 Band Edge, Left Side



Date: 30.APR.2021 10:21:38

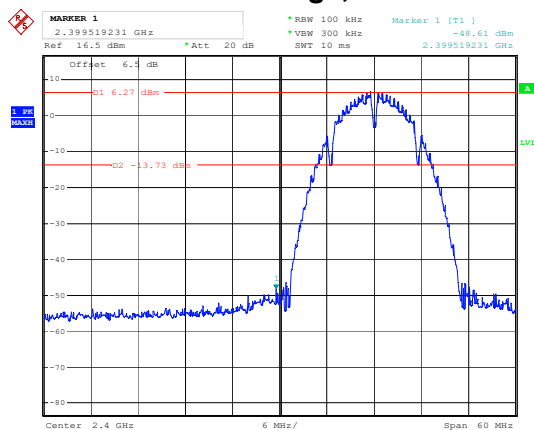
802.11n-HT40 Band Edge, Right Side



Date: 30.APR.2021 10:23:20

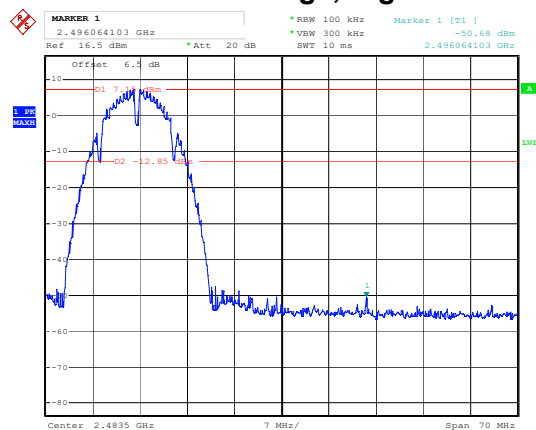
Chain 1

802.11b: Band Edge, Left Side



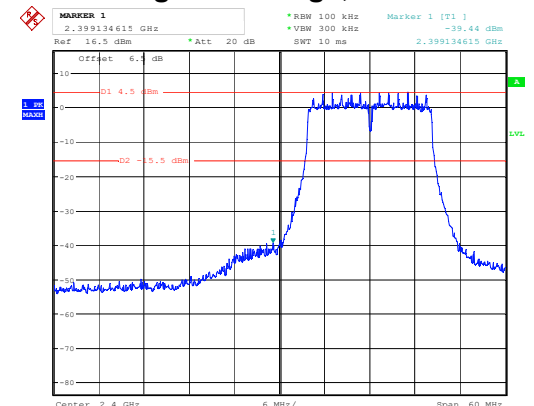
Date: 30.APR.2021 10:39:10

802.11b: Band Edge, Right Side



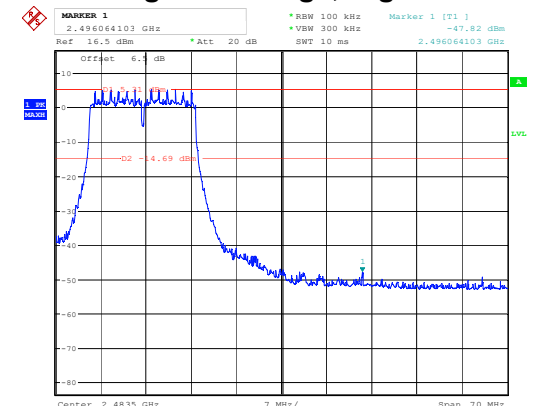
Date: 30.APR.2021 10:43:01

802.11g: Band Edge, Left Side



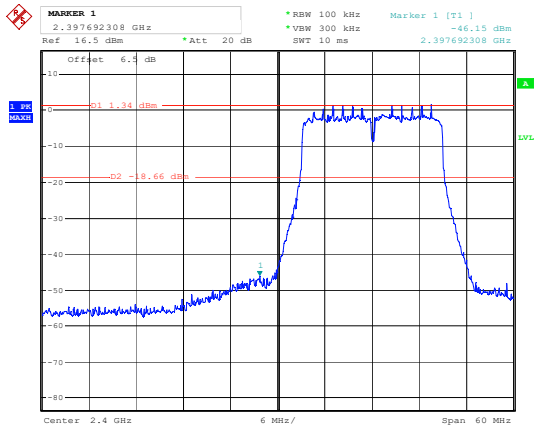
Date: 30.APR.2021 10:38:09

802.11g: Band Edge, Right Side



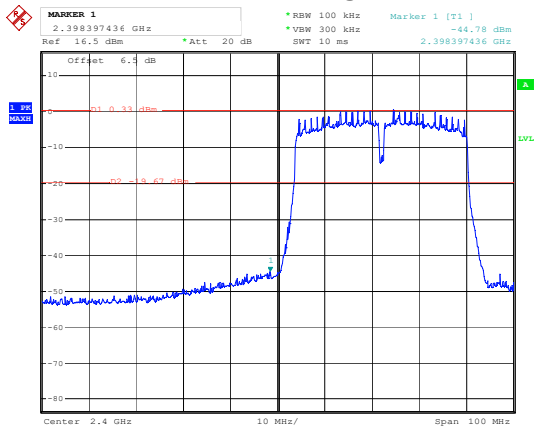
Date: 30.APR.2021 10:36:54

802.11n-HT20 Band Edge, Left Side



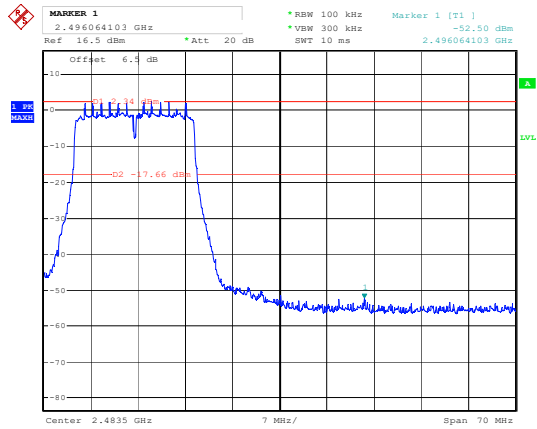
Date: 30.APR.2021 10:44:42

802.11n-HT40 Band Edge, Left Side



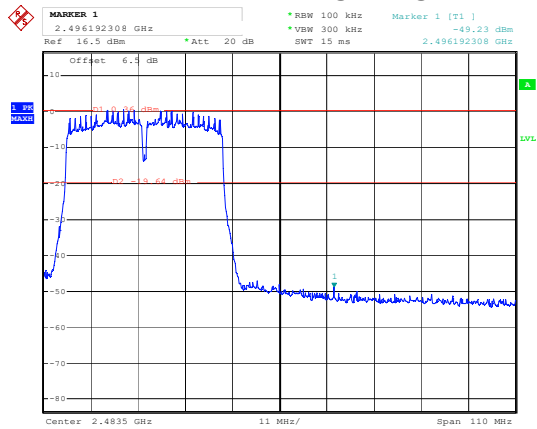
Date: 30.APR.2021 10:48:28

802.11n-HT20 Band Edge, Right Side



Date: 30.APR.2021 10:43:55

802.11n-HT40 Band Edge, Right Side



Date: 30.APR.2021 10:49:50

FCC §15.247(e) - POWER SPECTRAL DENSITY

Applicable Standard

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

Test Procedure

- a) Set analyzer center frequency to DTS channel center frequency.
- b) Set the span to 1.5 times the DTS bandwidth.
- c) Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- d) Set the VBW $\geq 3 \times \text{RBW}$.
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum amplitude level within the RBW.
- j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

Test Data

Environmental Conditions

Temperature:	20 °C
Relative Humidity:	60 %
ATM Pressure:	95.7 kPa

The testing was performed by Winfred Wang on 2021-04-28.

Test Mode: Transmitting

Test Result: Compliance. Please refer to the following table and plots

Mode	Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)			Limit (dBm/3kHz)
			Chain 0	Chain 1	Total	
802.11b	Low	2412	-10.61	-8.92	-	≤8
	Middle	2437	-8.33	-8.13	-	
	High	2462	-8.15	-7.55	-	
802.11g	Low	2412	-12.22	-11.17	-	
	Middle	2437	-11.90	-11.09	-	
	High	2462	-10.50	-11.55	-	
802.11n-HT20	Low	2412	-14.70	-14.37	-11.52	
	Middle	2437	-15.21	-14.47	-11.81	
	High	2462	-14.49	-13.52	-10.97	
802.11n-HT40	Low	2422	-16.45	-16.31	-13.37	
	Middle	2437	-17.26	-15.71	-13.41	
	High	2452	-15.54	-16.15	-12.82	

Note:

1. The max antenna gain* is 2.72 dBi
2. The device employed Cyclic Delay Diversity (CDD) for 802.11 MIMO transmitting, per KDB 662911 D01 Multiple Transmitter Output v02r01, for power spectral density (PSD) measurements on the devices:

$$\text{Array Gain} = 10 \log(N_{\text{ANT}}/N_{\text{SS}}) \text{ dB.}$$

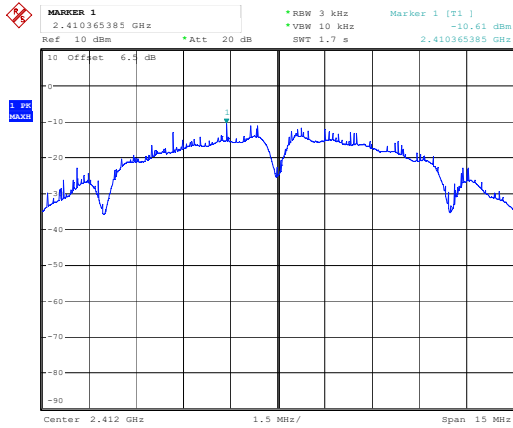
So:

$$\text{Directional gain} = G_{\text{ANT}} + \text{Array Gain} = 2.72 + 10 \times \log(2) = 5.73 \text{ dBi} < 6 \text{ dBi}$$

No power density limit reduced in MIMO mode.

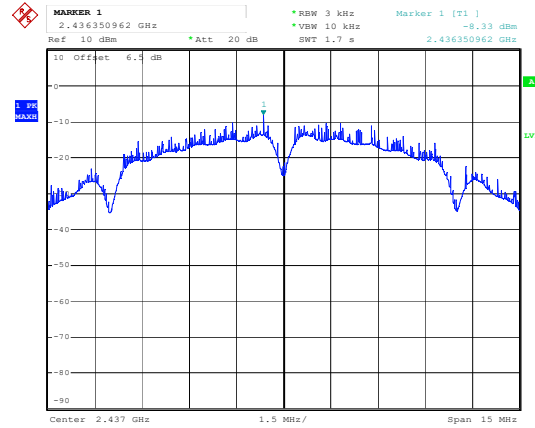
Chain 0

802.11b Low Channel



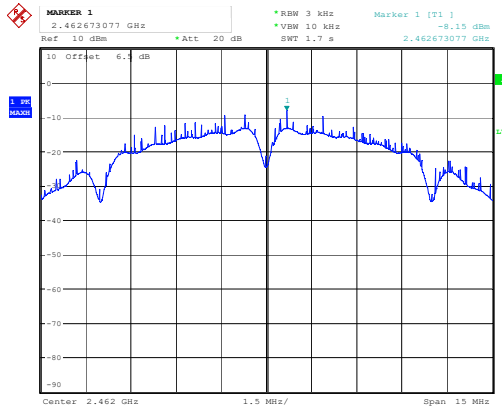
Date: 30.APR.2021 15:16:45

802.11b Middle Channel



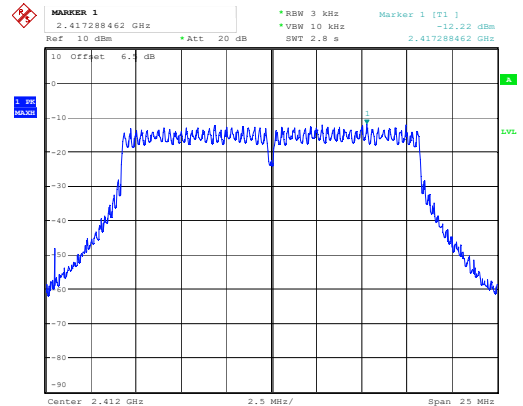
Date: 30.APR.2021 15:17:02

802.11b High Channel



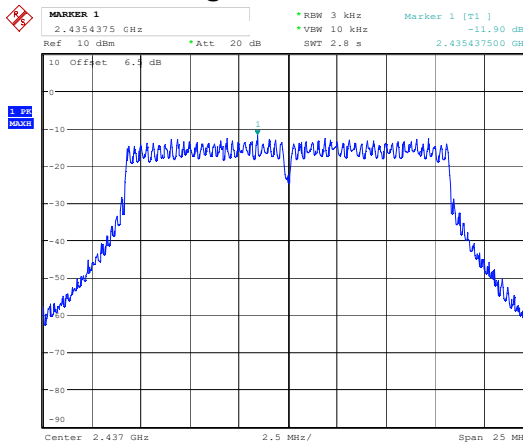
Date: 30.APR.2021 15:17:24

802.11g Low Channel



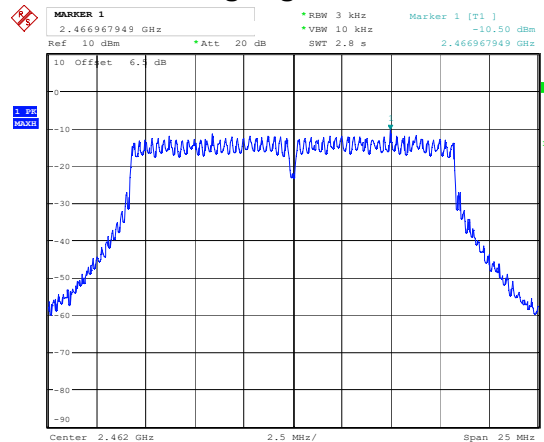
Date: 30.APR.2021 15:02:05

802.11g Middle Channel



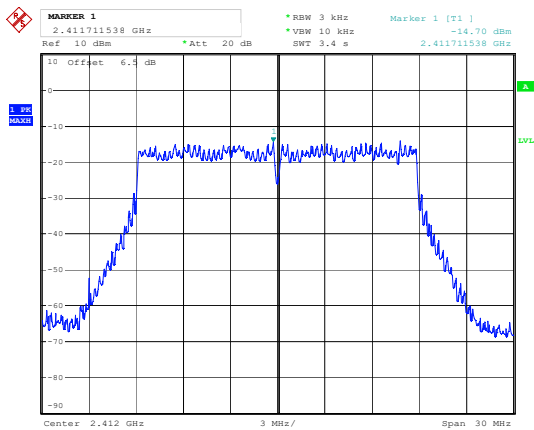
Date: 30.APR.2021 14:53:04

802.11g High Channel



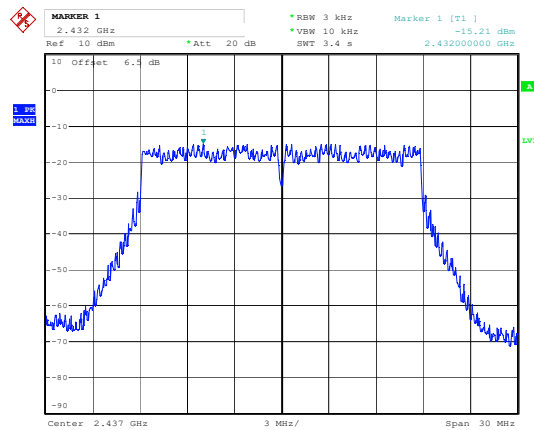
Date: 30.APR.2021 14:54:25

802.11n-HT20 Low Channel



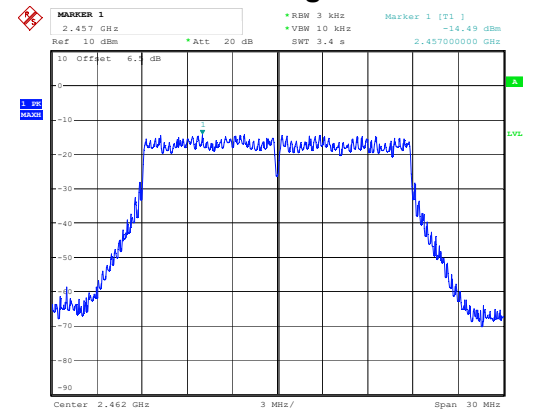
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802.11n-HT20 Middle Channel



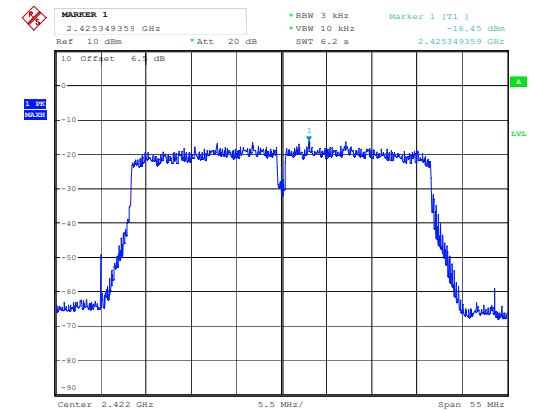
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802.11n-HT20 High Channel



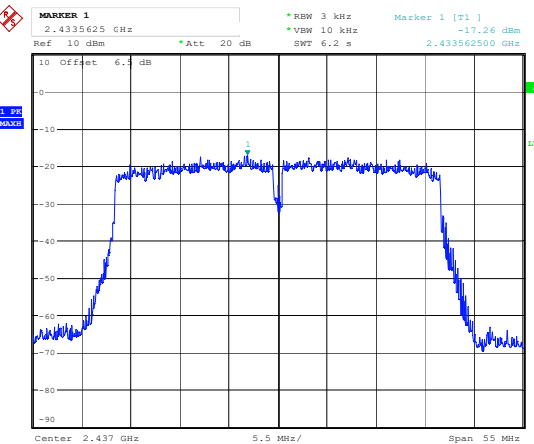
Date: 30.APR.2021 14:54:54

802.11n-HT40 Low Channel



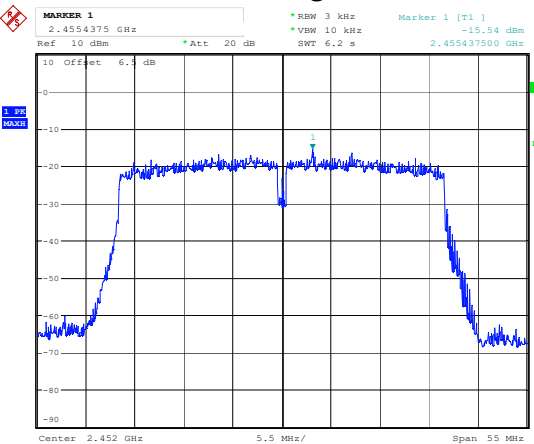
Date: 30.APR.2021 14:57:06

802.11n-HT40 Middle Channel



Date: 30.APR.2021 14:57:38

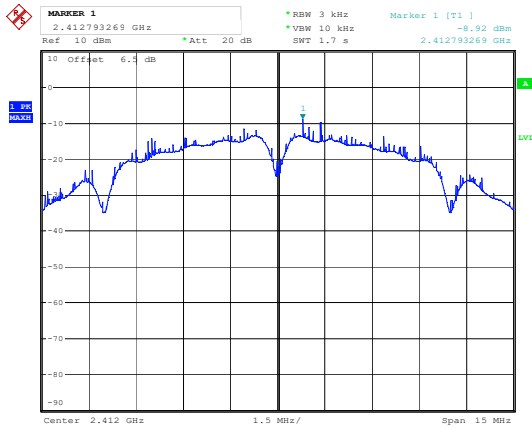
802.11n-HT40 High Channel



Date: 30.APR.2021 14:59:46

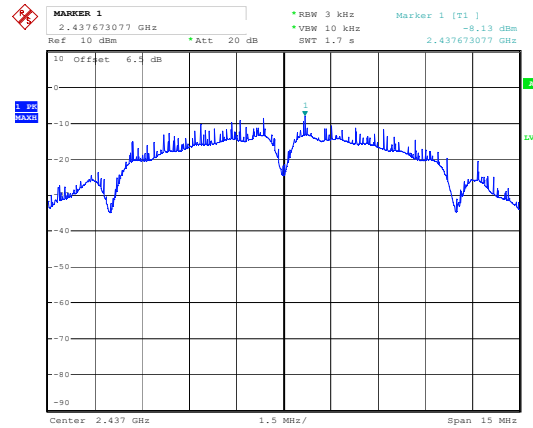
Chain 1

802.11b Low Channel



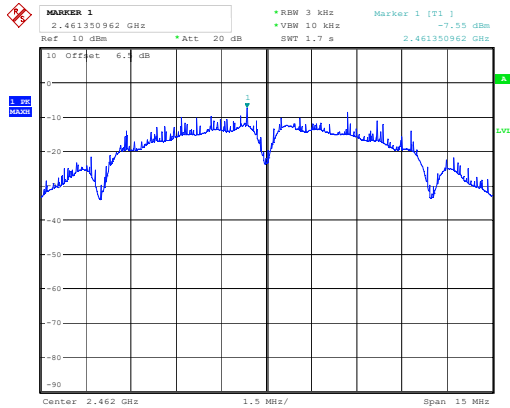
Date: 30.APR.2021 15:10:05

802.11b Middle Channel



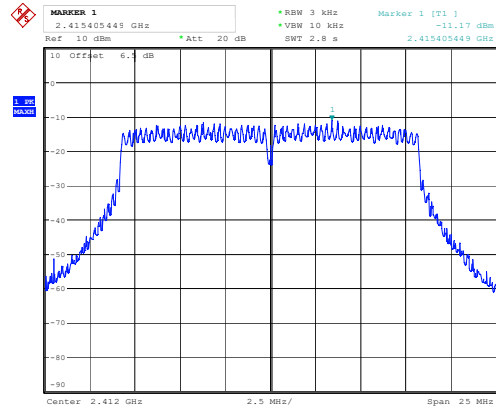
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802.11g High Channel



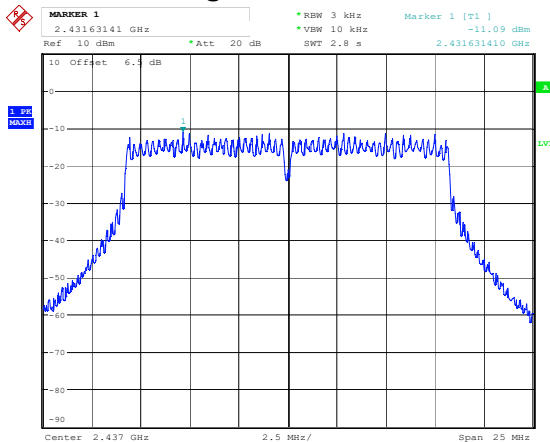
Date: 30.APR.2021 15:10:59

802.11g Low Channel



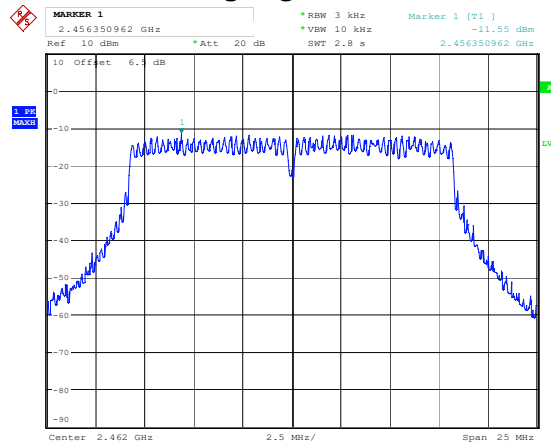
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802.11g Middle Channel



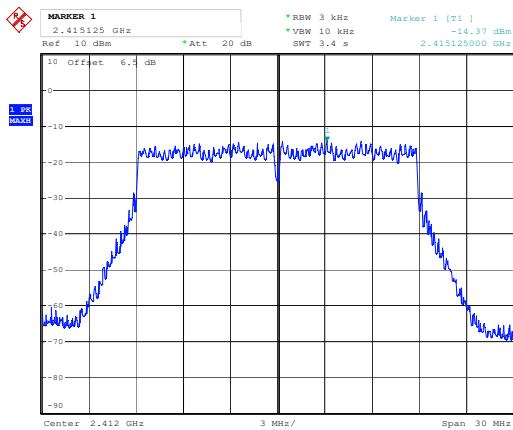
Date: 30.APR.2021 15:12:32

802.11g High Channel



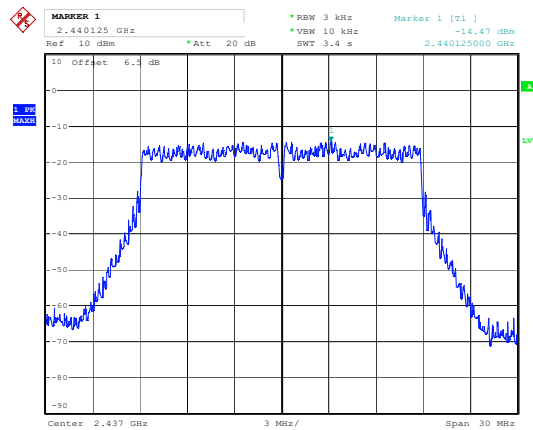
Date: 30.APR.2021 15:12:52

802.11n-HT20 Low Channel



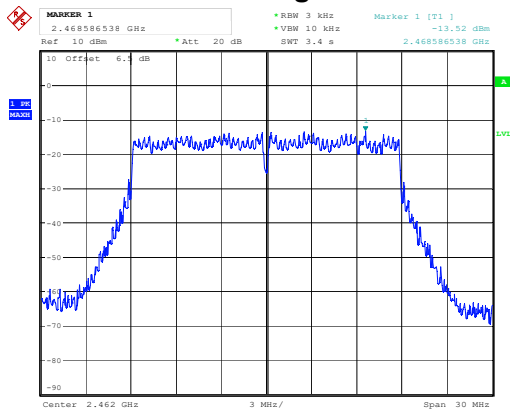
Date: 30.APR.2021 15:13:53

802.11n-HT20 Middle Channel



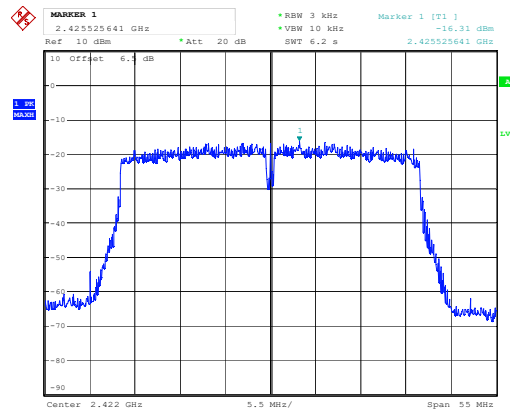
Date: 30.APR.2021 15:13:29

802.11n-HT20 High Channel



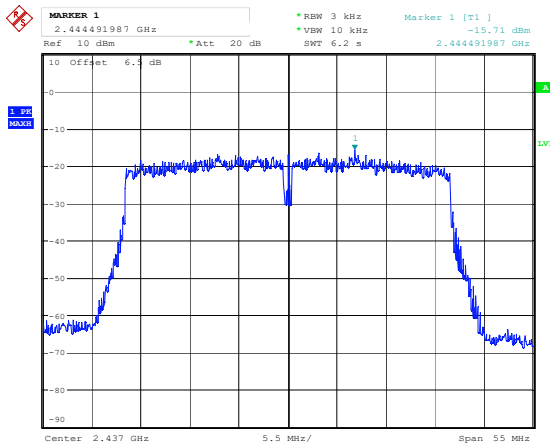
Date: 30.APR.2021 15:13:12

802.11n-HT40 Low Channel



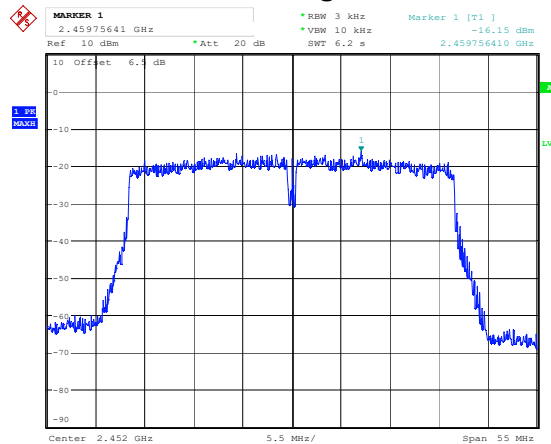
Date: 30.APR.2021 15:14:35

802.11n-HT40 Middle Channel



Date: 30.APR.2021 15:14:59

802.11n-HT40 High Channel



Date: 30.APR.2021 15:15:22

END OF REPORT