

FCC PART 15.407

TEST REPORT

For

Beijing Wiseasy Technology CO., Ltd.

7th Floor, Block B, Wangxin Mansion, No.28 Xiaoyun Road, Chaoyang District, 100027, Beijing,
China

FCC ID: 2AXOJ-WISENET5

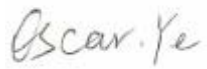
Report Type: Original Report	Product Type: WISENET5
Project Engineer:	Jack Jiao 
Report Number:	RKSA201130001-00E
Report Date:	2021-01-21
Reviewed By:	Oscar Ye  EMC Manager
Prepared By:	Bay Area Compliance Laboratories Corp. (Kunshan) No.248 Chenghu Road,Kunshan,Jiangsu province,China Tel: +86-0512-86175000 Fax: +86-0512-88934268 www.baclcorp.com.cn

TABLE OF CONTENTS

GENERAL INFORMATION.....	4
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	4
OBJECTIVE	4
RELATED SUBMITTAL(S)/GRANT(S).....	4
TEST METHODOLOGY	5
MEASUREMENT UNCERTAINTY	5
TEST FACILITY	5
SYSTEM TEST CONFIGURATION.....	6
DESCRIPTION OF TEST CONFIGURATION	6
EUT EXERCISE SOFTWARE	7
EQUIPMENT MODIFICATIONS	13
SUPPORT EQUIPMENT LIST AND DETAILS	13
EXTERNAL I/O CABLE.....	13
BLOCK DIAGRAM OF TEST SETUP	14
SUMMARY OF TEST RESULTS	16
TEST EQUIPMENT LIST	17
FCC §1.1307(b) & §2.1093 - RF EXPOSURE INFORMATION	18
TEST RESULT	18
FCC §15.203 – ANTENNA REQUIREMENT	19
APPLICABLE STANDARD	19
ANTENNA CONNECTOR CONSTRUCTION	19
FCC §15.407 (b) (8) §15.207 (a) – AC POWER LINE CONDUCTED EMISSIONS.....	20
APPLICABLE STANDARD	20
EUT SETUP	20
EMI TEST RECEIVER SETUP.....	20
TEST PROCEDURE	21
FACTOR & OVER LIMIT CALCULATION.....	21
TEST RESULTS SUMMARY	21
TEST DATA	21
§15.205 & §15.209 & §15.407(B) (1), (2), (4), (7), (8), (9) – UNDESIRABLE EMISSION & RESTRICTED BANDS	28
APPLICABLE STANDARD	28
EUT SETUP	28
EMI TEST RECEIVER & SPECTRUM ANALYZER SETUP	29
TEST PROCEDURE	29
CORRECTED AMPLITUDE & MARGIN CALCULATION	30
TEST DATA	30
FCC §15.407(a) & §15.407(e)–EMISSION BANDWIDTH.....	65
APPLICABLE STANDARD	65
TEST PROCEDURE	65
TEST DATA	66
FCC §15.407(a) (1) (2) (3) – CONDUCTED TRANSMITTER OUTPUT POWER.....	92
APPLICABLE STANDARD	92
TEST PROCEDURE	92
TEST DATA	93
FCC §15.407(a) (1) (2) (3) - POWER SPECTRAL DENSITY	94

APPLICABLE STANDARD	94
TEST PROCEDURE	94
TEST DATA	94

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant:	Beijing Wiseasy Technology CO., Ltd.
Test Model	WISENET5
Product Type:	WISENET5
Power Supply:	DC 5.0V from adapter and DC 3.8V from battery
RF Function:	5G Wi-Fi
Operating Band/Frequency:	5G Wi-Fi B1: 5180-5240MHz, B2: 5260-5320MHz, B4: 5745-5825MHz
Channel Number:	5G Wi-Fi B1: 6; B2:6; B4: 7
Channel Separation:	5G Wi-Fi: a/n-HT20: 20 MHz, n-HT40: 40 MHz
Modulation Type:	5GWi-Fi: OFDM
Antenna Type:	FPC Antenna
*Maximum Antenna Gain:	1.84 dBi

Adapter Information:

Model: RD0502000-USBA-87MG

Input: AC100-240V 50/60Hz 0.3A

Output: 5.0V, 2.0A

Note: The maximum antenna gain was declared by the manufacturer.

*All measurement and test data in this report was gathered from production sample serial number: RKSA201130001-1(Assigned by the BACL). The EUT supplied by the applicant was received on 2020-11-30.

Objective

This type approval report is prepared on behalf of *Beijing Wiseasy Technology CO., Ltd.* in accordance with Part 2-Subpart J, Part 15-Subparts A and E of the Federal Communication Commissions' rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart E, section 15.203, 15.205, 15.207, 15.209 and 15.407 rules.

Related Submittal(s)/Grant(s)

FCC Part 15.247 DSS submissions with FCC ID: 2AXOJ-WISENET5

FCC Part 15.247 DTS submissions with FCC ID: 2AXOJ-WISENET5

FCC Part 15.225 DXX submissions with FCC ID: 2AXOJ-WISENET5

FCC Part 22H24E27 PCB submissions with FCC ID: 2AXOJ-WISENET5

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Kunshan).

Measurement Uncertainty

Item		Uncertainty
AC Power Lines Conducted Emissions		3.19 dB
RF conducted test with spectrum		0.9dB
RF Output Power with Power meter		0.5dB
Radiated emission	30MHz~1GHz	6.11dB
	1GHz~6GHz	4.45dB
	6GHz~18GHz	5.23dB
	18GHz~40GHz	5.65dB
Occupied Bandwidth		0.5kHz
Temperature		1.0°C
Humidity		6%

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

Bay Area Compliance Laboratories Corp. (Kunshan) Lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4323.01), the FCC designation No. CN1185 under the FCC KDB 974614 D01 and CAB identifier CN0004 under the ISED requirement. 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 EUT was configured for testing in an engineering mode which was provided by the manufacturer.

In **5150~5250 MHz** band, test channel list is as below,

802.11a/n20 mode Channel 36, 40, 48 were tested.

802.11n40 mode Channel 38, 46 were tested.

Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220
38	5190	46	5230
40	5200	48	5240

In **5250~5350 MHz** band, test channel list is as below,

802.11a/n20 mode Channel 52, 56, 64 were tested.

802.11n40 mode Channel 54, 62 were tested.

Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	60	5300
54	5270	62	5310
56	5280	64	5320

For **5725~5850 MHz** band,

802.11a /n20 mode Channel 149, 157, 165 were tested.

802.11n40 mode Channel 151, 159 were tested.

Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	159	5795
151	5755	161	5805
153	5765	165	5825
157	5785	/	/

EUT Exercise Software

RF test tool: Secure CRT

*The worst case was performed under:

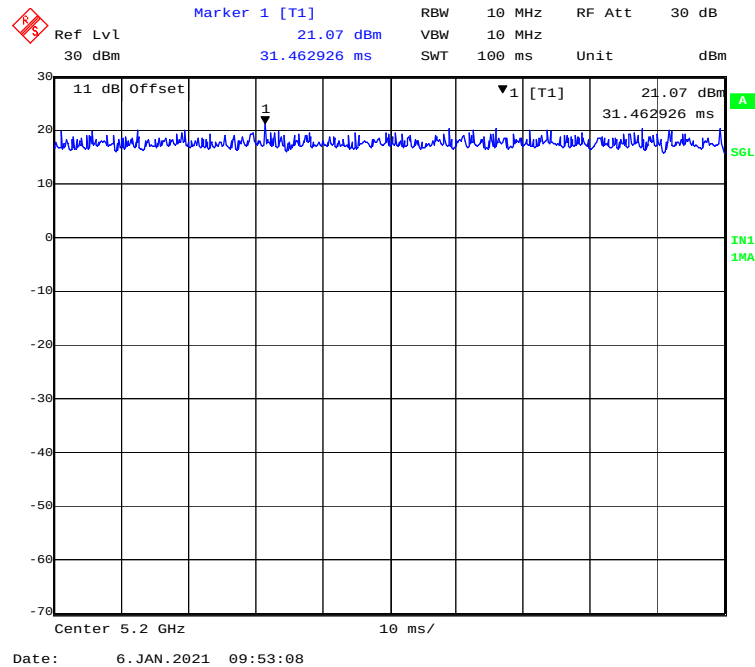
Mode	Data rate	Power Level Setting		
		5150-5250 Band	5250-5350 Band	5725-5850 Band
802.11a	6 Mbps	14	14	13
802.11n-HT20	MCS0	14	14	13
802.11n-HT40	MCS0	14	14	13

Note: The power level setting was declared by the applicant.

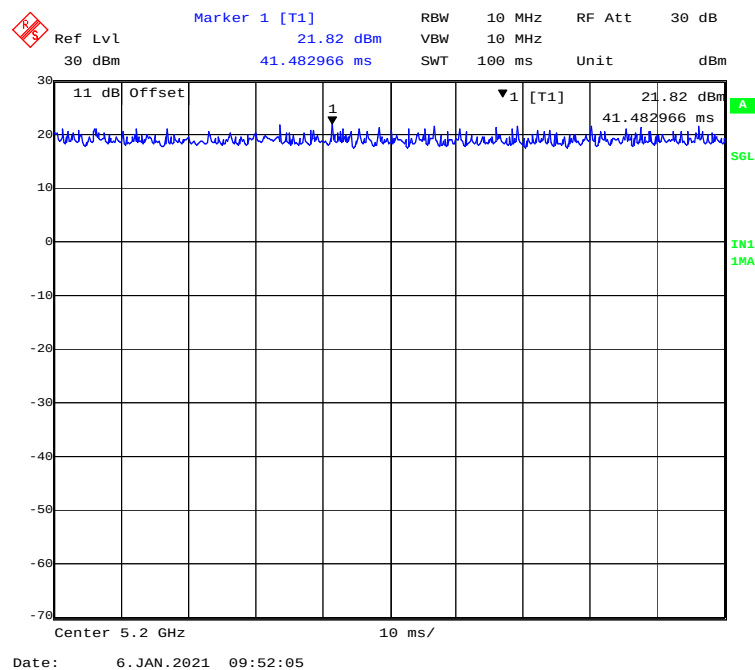
Duty Cycle:

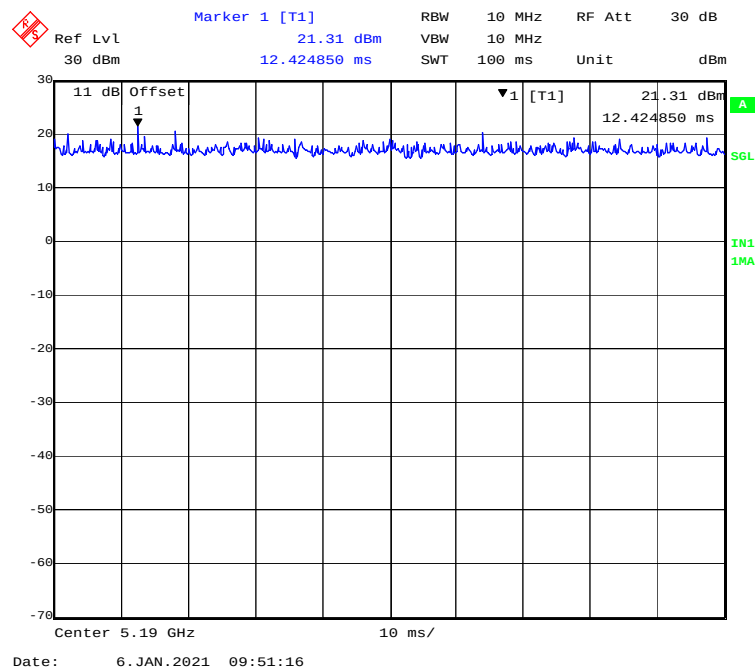
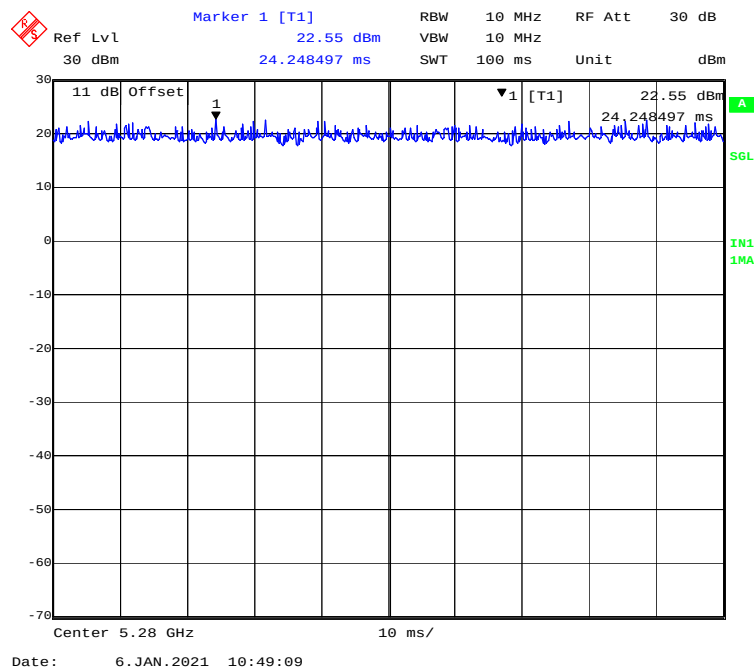
5150MHz-5250MHz Band:

802.11a mode

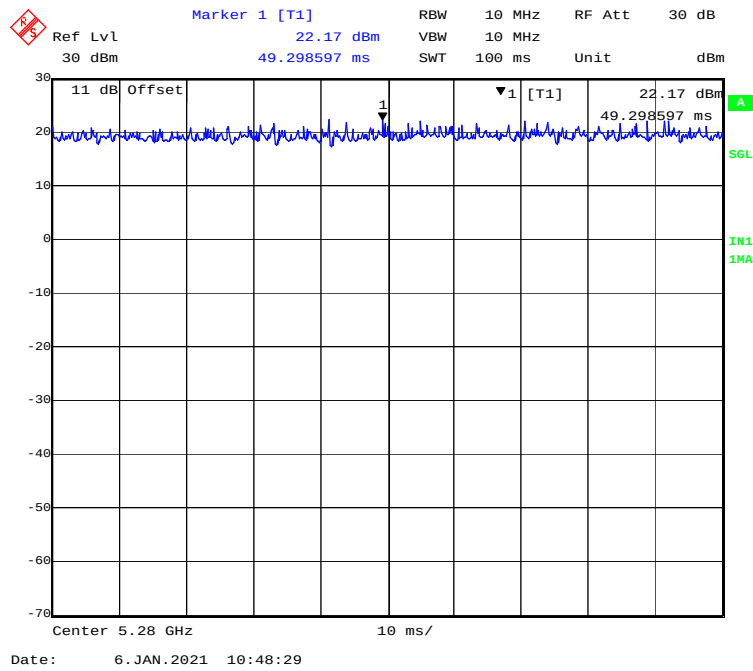


802.11n-HT20 mode

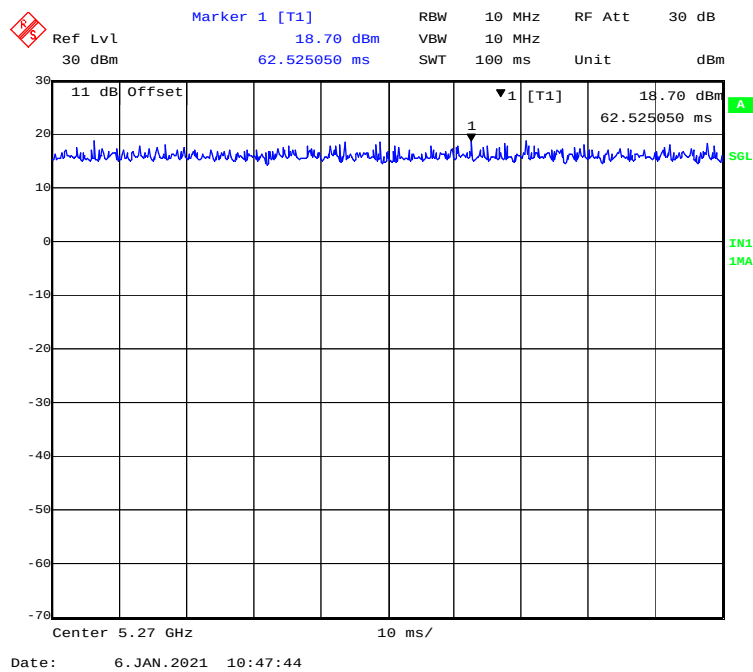


802.11n-HT40 mode**5250MHz-5350MHz Band:****802.11a mode**

802.11n-HT20 mode

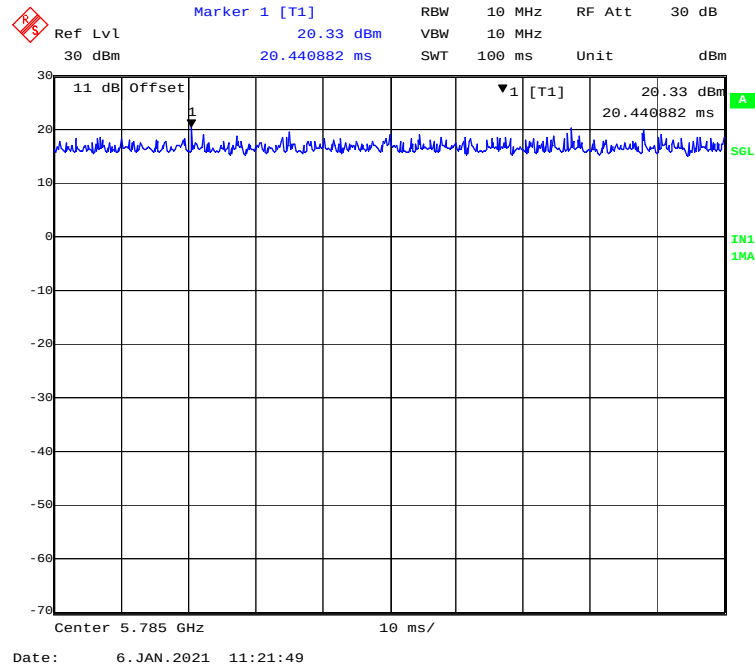


802.11n-HT40 mode

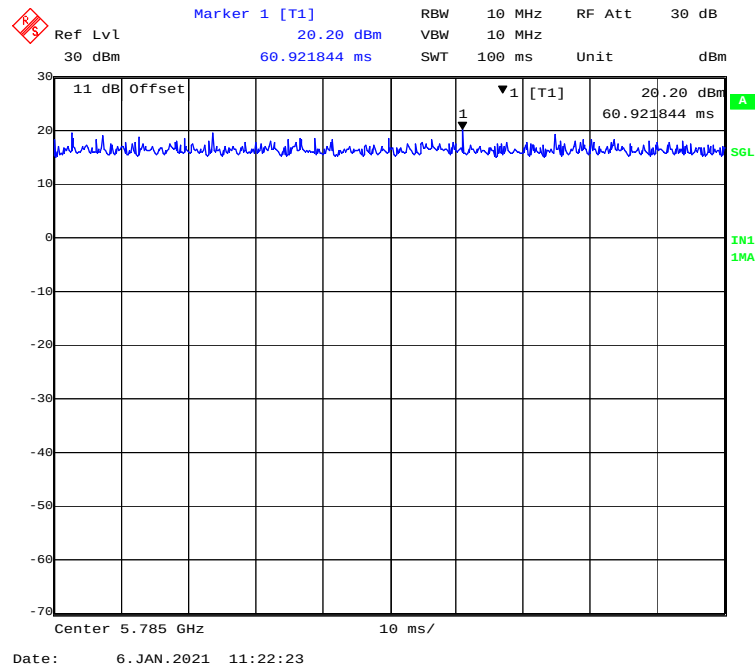


5725MHz-5850MHz Band:

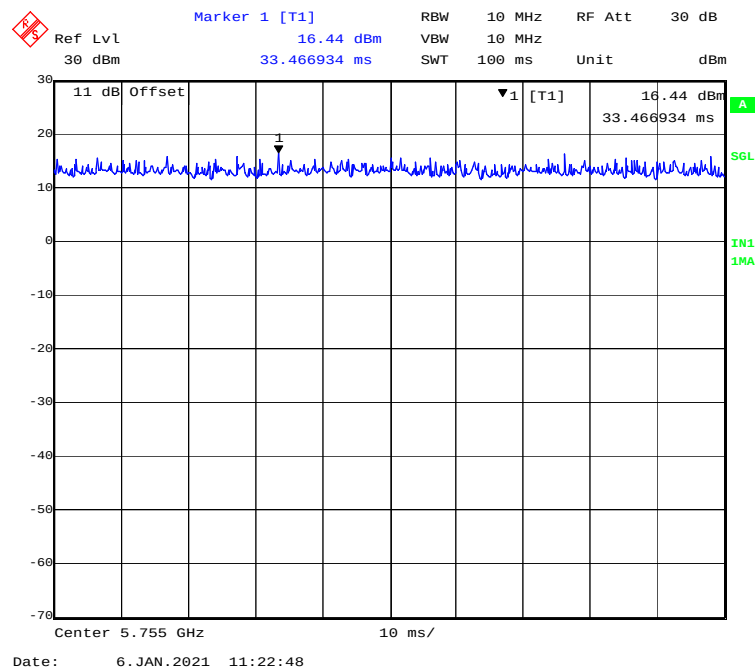
802.11a mode



802.11n-HT20 mode



802.11n-HT40 mode



Mode	Frequency Range (MHz)	Duty Cycle (%)	T (ms)	1/T (kHz)	10log(1/x)
802.11a	5150-5250	100	/	/	0
802.11n-HT20		100	/	/	0
802.11n-HT40		100	/	/	0
802.11a	5250-5350	100	/	/	0
802.11n-HT20		100	/	/	0
802.11n-HT40		100	/	/	0
802.11a	5725-5850	100	/	/	0
802.11n-HT20		100	/	/	0
802.11n-HT40		100	/	/	0

Note: “x” means duty cycle.

Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

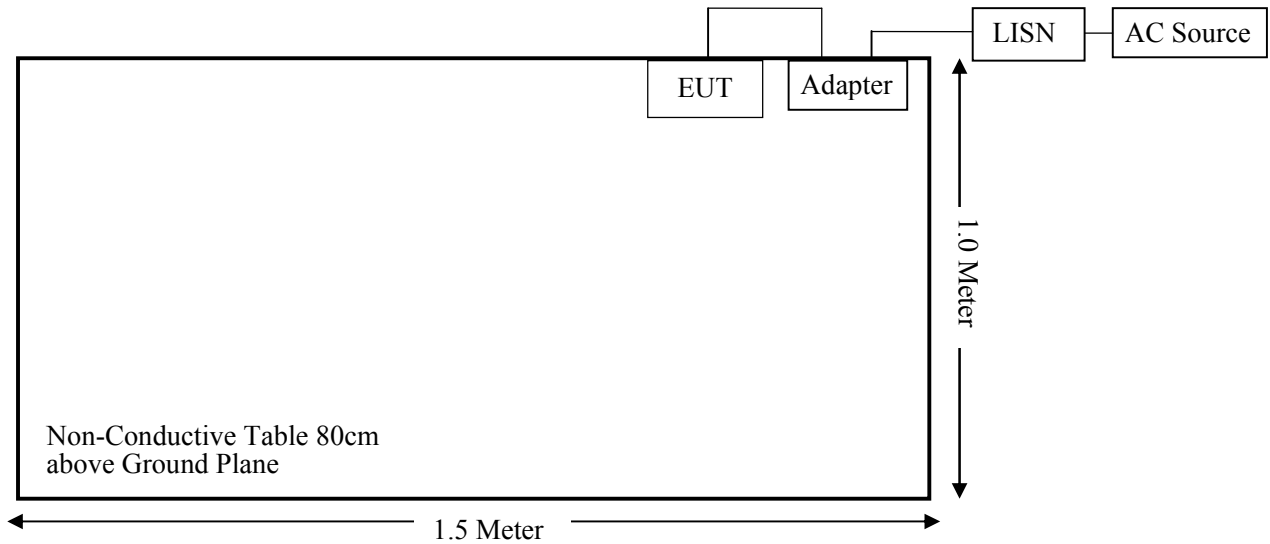
Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

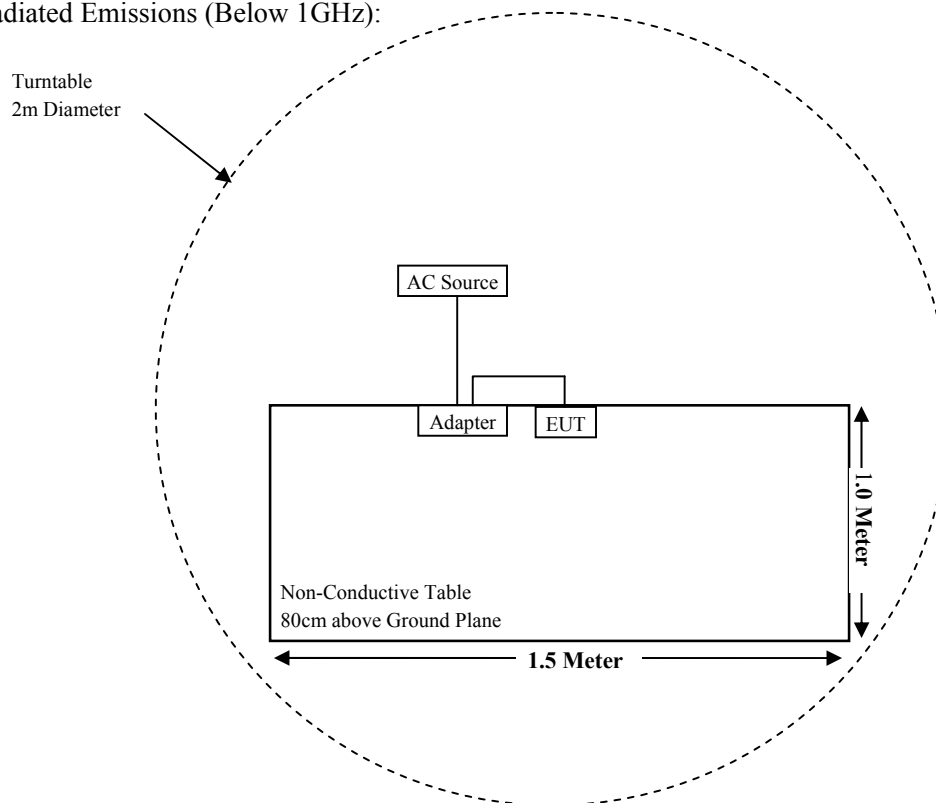
Cable Description	Length (m)	From Port	To
Power cable1	1.0	EUT	Adapter
Power cable2	1.5	Adapter	LISN/AC Source

Block Diagram of Test Setup

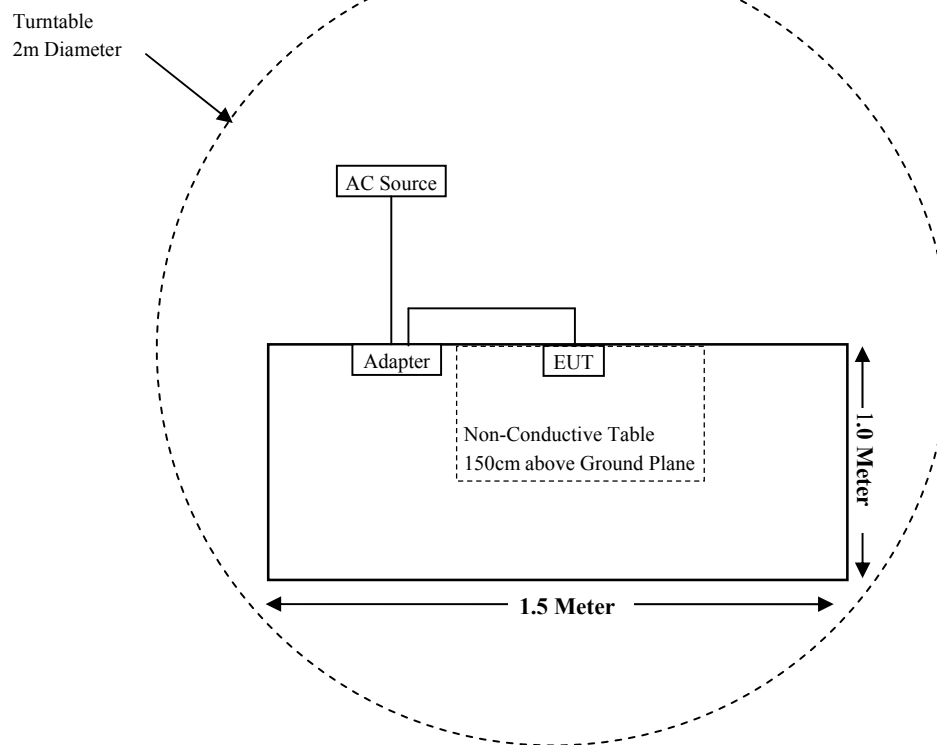
For Conducted Emissions:



For Radiated Emissions (Below 1GHz):



For Radiated Emissions (Above 1GHz):



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307(b)(1) & §2.1093	RF Exposure Information	Compliant
§15.203	Antenna Requirement	Compliant
§15.207 & §15.407(b) (8)	AC Power Line Conducted Emissions	Compliant
§ 15.205 & §15.209 & §15.407(b) (1), (2), (4), (7), (8),(9)	Undesirable Emission & Restricted Bands	Compliant
§§15.407(a) &§15.407(e)	Emission Bandwidth	Compliant
§15.407(a) (1) (2) (3)	Conducted Transmitter Output Power	Compliant
§15.407(a) (1) (2) (3)	Power Spectral Density	Compliant

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test (Chamber 1#)					
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2020-11-27	2021-11-26
Sunol Sciences	Broadband Antenna	JB3	A090314-1	2020-08-05	2023-08-04
Sonoma Instrument	Pre-amplifier	310N	171205	2020-08-14	2021-08-13
Rohde & Schwarz	Auto Test Software	EMC32	100361	N/A	N/A
MICRO-COAX	Coaxial Cable	Cable-8	008	2020-08-15	2021-08-14
MICRO-COAX	Coaxial Cable	Cable-9	009	2020-08-15	2021-08-14
MICRO-COAX	Coaxial Cable	Cable-10	010	2020-08-15	2021-08-14
Radiated Emission Test (Chamber 2#)					
Rohde & Schwarz	EMI Test Receiver	ESU40	100207	2020-04-01	2021-03-31
ETS-LINDGREN	Horn Antenna	3115	9207-3900	2020-07-15	2023-07-14
ETS-LINDGREN	Horn Antenna	3116	00084159	2019-12-12	2022-12-11
A.H.Systems,inc	Amplifier	PAM-0118P	512	2020-02-20	2021-02-19
SELECTOR	Amplifier	EM18G40G	060726	2020-03-22	2021-03-21
MICRO-TRONICS	Band Reject Filter	BRC50703	G094	2020-08-05	2021-08-04
MICRO-TRONICS	Band Reject Filter	BRC50705	G085	2020-08-05	2021-08-04
Narda	Attenuator	10dB	010	2020-08-05	2021-08-04
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-6	006	2020-08-15	2021-08-14
MICRO-COAX	Coaxial Cable	Cable-11	011	2020-08-15	2021-08-14
MICRO-COAX	Coaxial Cable	Cable-12	012	2020-08-15	2021-08-14
MICRO-COAX	Coaxial Cable	Cable-13	013	2020-08-15	2021-08-14
RF Conducted Test					
Rohde & Schwarz	EMI Test Receiver	ESIB26	100146	2020-11-27	2021-11-26
Agilent	Power Meter	N1912A	MY5000492	2020-11-18	2021-11-17
Agilent	Power Sensor	N1921A	MY54210024	2020-11-18	2021-11-17
Narda	Attenuator	10dB	010	2020-08-15	2021-08-14
Beijing Wiseasy	RF Cable	Beijing Wiseasy C01	C01	Each Time	/
Conducted Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESR	1316.3003K03-101746-zn	2020-07-28	2021-07-27
Rohde & Schwarz	LISN	ENV216	101115	2020-11-27	2021-11-26
Audix	Test Software	e3	V9	--	--
Rohde & Schwarz	Pulse limiter	ESH3-Z2	0357.8810.54	2020-08-10	2021-08-09
MICRO-COAX	Coaxial Cable	Cable-15	015	2020-08-15	2021-08-14

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §1.1307(b) & §2.1093 - RF EXPOSURE INFORMATION

Applicable Standard

FCC§1.1307, §2.1093.

Test Result

Compliant, please refer to the SAR report: RKSA201130001-20A.

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.

And according to FCC 47 CFR section 15.407, if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

Antenna Connector Construction

The EUT has an FPC antenna for 5G Wi-Fi and antenna gain is 1.84dBi which was permanently attached, fulfill the requirement of this section. Please refer to the EUT photos.

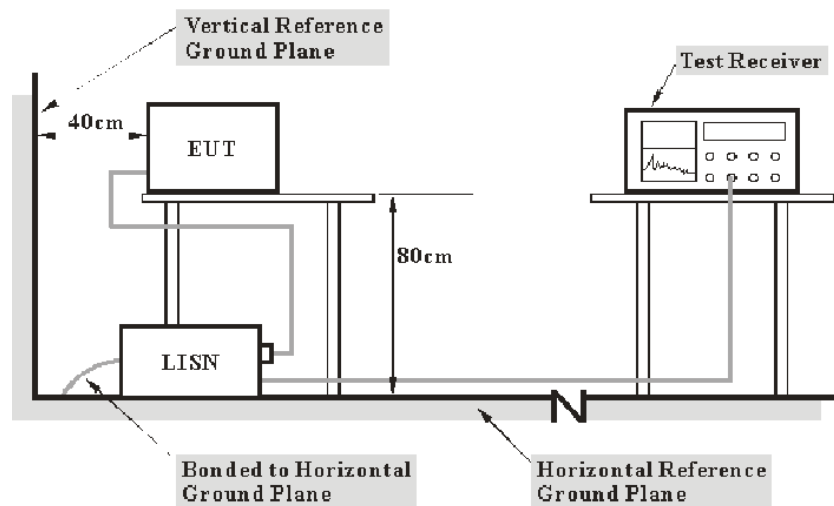
Result: Compliant.

FCC §15.407 (b) (8) §15.207 (a) – AC POWER LINE CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207(a), §15.407(b) (8)

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 outlet of the LISN.

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.

Factor & Over Limit Calculation

The Corrected factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)

The “**Over Limit**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, an over limit of 7dB means the emission is 7 dB above the limit. The equation for over limit calculation is as follows:

Over Limit (dB) = Read level (dBμV) + Factor (dB) - Limit (dBμV)

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207.

Test Data

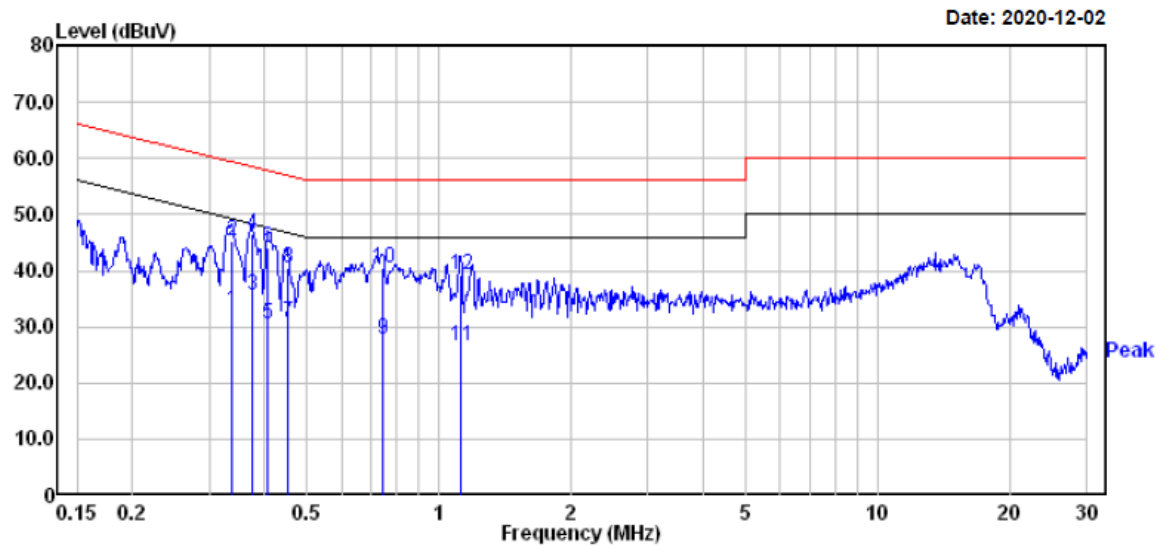
Environmental Conditions

Temperature:	24.2 °C
Relative Humidity:	50 %
ATM Pressure:	101.5 kPa

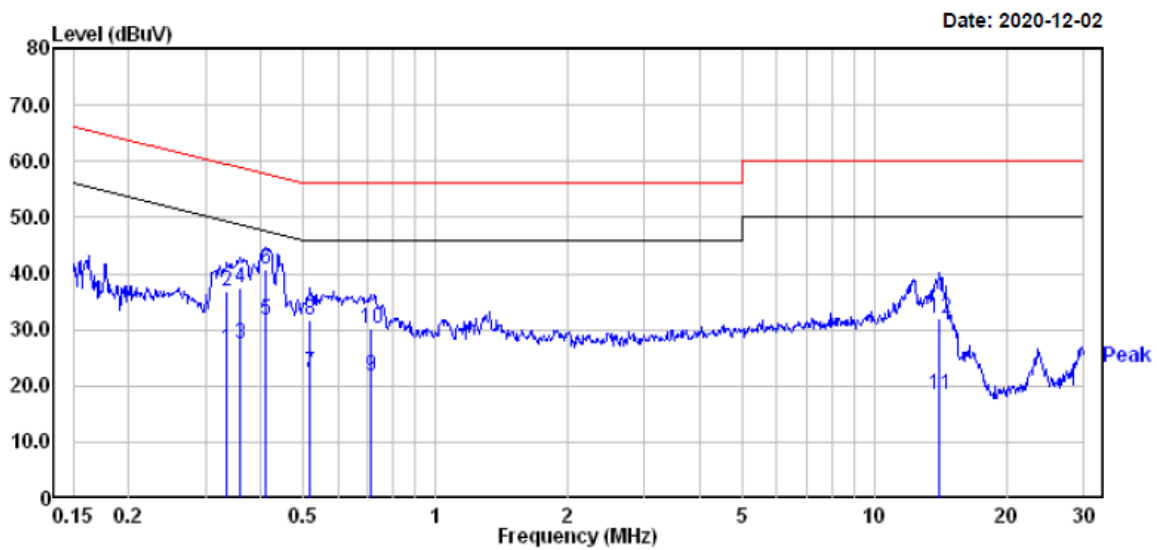
The testing was performed by Jack Jiao on 2020-12-02.

EUT operation mode: Transmitting in 802.11n-HT40 mode low channel of 5150~5250MHz (worst case).

AC 120V/60 Hz, Line



		Read		Limit	Over	
	Freq	Level	Factor	Level	Line	Limit Remark
	MHz	dBuV	dB	dBuV	dBuV	dB
1	0.337	13.10	19.81	32.91	49.27	-16.36 Average
2	0.337	25.40	19.81	45.21	59.27	-14.06 QP
3	0.375	15.90	19.77	35.67	48.39	-12.72 Average
4	0.375	26.70	19.77	46.47	58.39	-11.92 QP
5	0.408	10.70	19.74	30.44	47.68	-17.24 Average
6	0.408	24.30	19.74	44.04	57.68	-13.64 QP
7	0.452	11.00	19.75	30.75	46.85	-16.10 Average
8	0.452	20.80	19.75	40.55	56.85	-16.30 QP
9	0.743	8.00	19.73	27.73	46.00	-18.27 Average
10	0.743	20.80	19.73	40.53	56.00	-15.47 QP
11	1.123	6.80	19.81	26.61	46.00	-19.39 Average
12	1.123	19.50	19.81	39.31	56.00	-16.69 QP

AC 120V/60 Hz, Neutral

		Read			Limit	Over	
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.334	6.89	19.82	26.71	49.35	-22.64	Average
2	0.334	16.89	19.82	36.71	59.35	-22.64	QP
3	0.360	7.69	19.80	27.49	48.74	-21.25	Average
4	0.360	17.69	19.80	37.49	58.74	-21.25	QP
5	0.410	12.00	19.74	31.74	47.64	-15.90	Average
6	0.410	21.10	19.74	40.84	57.64	-16.80	QP
7	0.518	2.50	19.76	22.26	46.00	-23.74	Average
8	0.518	12.00	19.76	31.76	56.00	-24.24	QP
9	0.712	2.00	19.74	21.74	46.00	-24.26	Average
10	0.712	10.40	19.74	30.14	56.00	-25.86	QP
11	14.063	-1.20	19.62	18.42	50.00	-31.58	Average
12	14.063	12.50	19.62	32.12	60.00	-27.88	QP

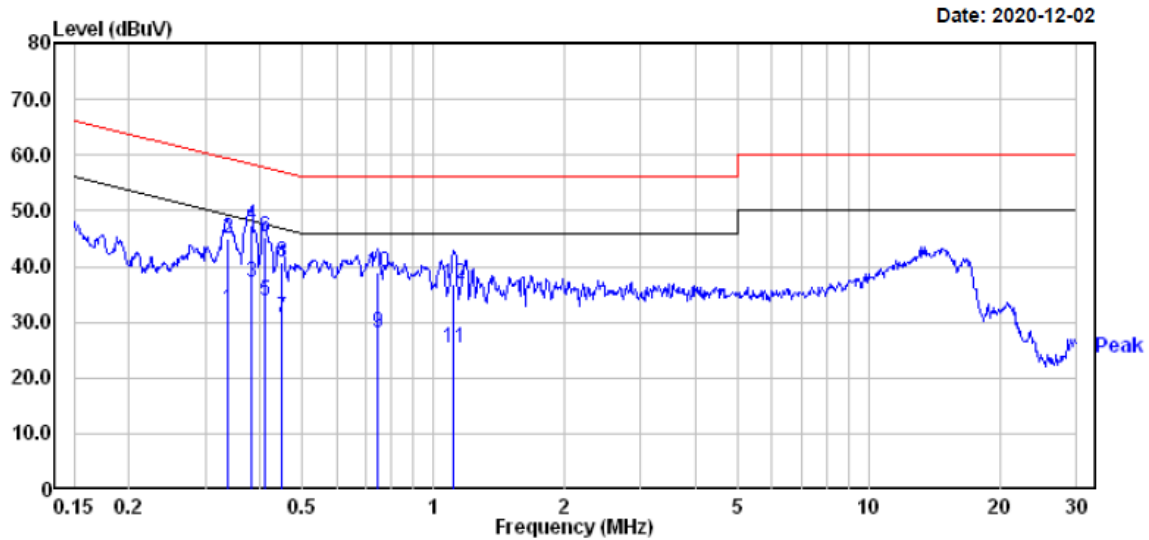
Note:

1) Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)

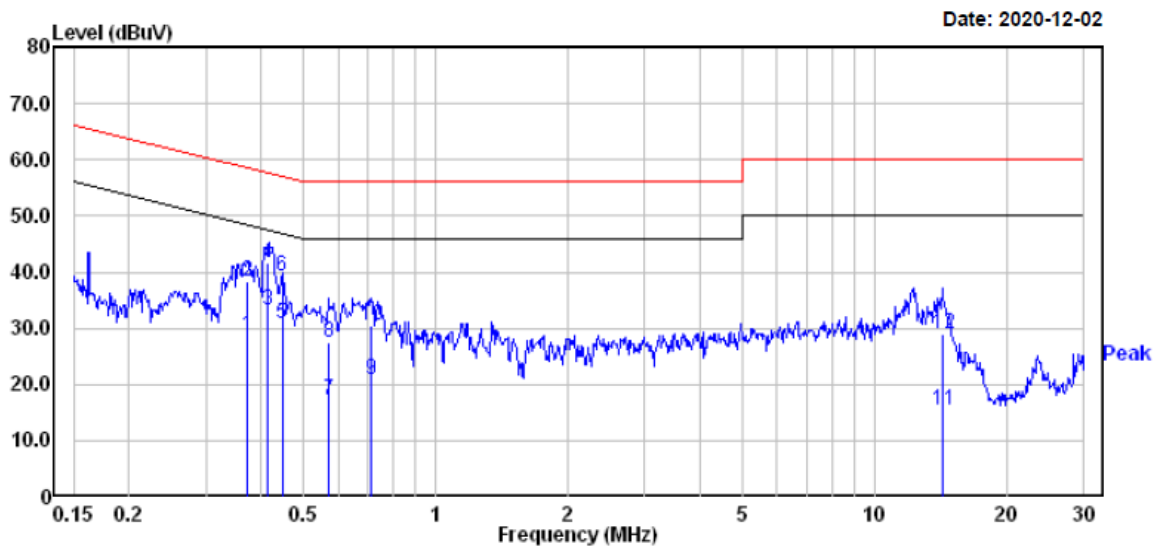
2) Over Limit (dB) = Read level (dBuV) + Factor (dB) - Limit (dBuV)

EUT operation mode: Transmitting in 802.11a mode middle channel of 5250~5350MHz (worst case).

AC 120V/60 Hz, Line



		Read			Limit	Over	
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.337	12.50	19.81	32.31	49.27	-16.96	Average
2	0.337	25.20	19.81	45.01	59.27	-14.26	QP
3	0.381	17.49	19.77	37.26	48.25	-10.99	Average
4	0.381	27.69	19.77	47.46	58.25	-10.79	QP
5	0.410	14.00	19.74	33.74	47.64	-13.90	Average
6	0.410	25.60	19.74	45.34	57.64	-12.30	QP
7	0.449	10.90	19.75	30.65	46.89	-16.24	Average
8	0.449	20.90	19.75	40.65	56.89	-16.24	QP
9	0.743	8.30	19.73	28.03	46.00	-17.97	Average
10	0.743	19.20	19.73	38.93	56.00	-17.07	QP
11	1.117	5.61	19.81	25.42	46.00	-20.58	Average
12	1.117	17.01	19.81	36.82	56.00	-19.18	QP

AC 120V/60 Hz, Neutral

		Read			Limit	Over	
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.371	8.80	19.78	28.58	48.47	-19.89	Average
2	0.371	18.70	19.78	38.48	58.47	-19.99	QP
3	0.415	13.60	19.74	33.34	47.55	-14.21	Average
4	0.415	21.80	19.74	41.54	57.55	-16.01	QP
5	0.447	11.10	19.75	30.85	46.93	-16.08	Average
6	0.447	19.60	19.75	39.35	56.93	-17.58	QP
7	0.570	-2.40	19.75	17.35	46.00	-28.65	Average
8	0.570	7.70	19.75	27.45	56.00	-28.55	QP
9	0.716	1.10	19.74	20.84	46.00	-25.16	Average
10	0.716	10.80	19.74	30.54	56.00	-25.46	QP
11	14.288	-4.30	19.62	15.32	50.00	-34.68	Average
12	14.288	9.50	19.62	29.12	60.00	-30.88	QP

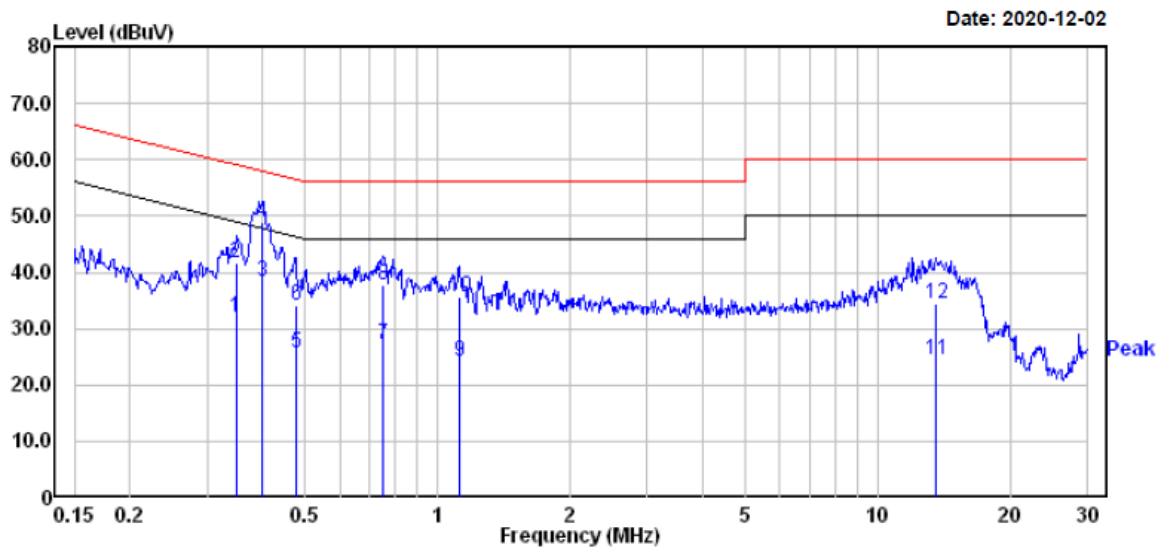
Note:

1) Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)

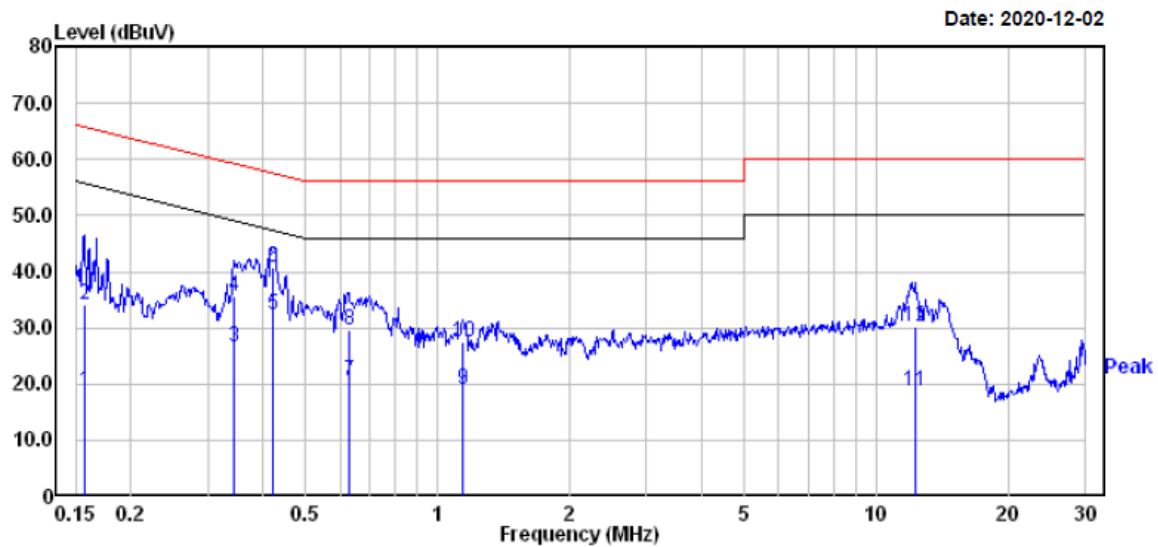
2) Over Limit (dB) = Read level (dBuV) + Factor (dB) - Limit (dBuV)

EUT operation mode: Transmitting in 802.11n-HT40 mode low channel of 5725~5850MHz (worst case).

AC 120V/60 Hz, Line



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.348	12.30	19.81	32.11	49.00	-16.89	Average
2	0.348	21.80	19.81	41.61	59.00	-17.39	QP
3	0.400	18.70	19.74	38.44	47.86	-9.42	Average
4	0.400	29.20	19.74	48.94	57.86	-8.92	QP
5	0.476	6.00	19.76	25.76	46.41	-20.65	Average
6	0.476	14.50	19.76	34.26	56.41	-22.15	QP
7	0.751	7.40	19.72	27.12	46.00	-18.88	Average
8	0.751	17.90	19.72	37.62	56.00	-18.38	QP
9	1.123	4.20	19.81	24.01	46.00	-21.99	Average
10	1.123	15.80	19.81	35.61	56.00	-20.39	QP
11	13.623	4.80	19.61	24.41	50.00	-25.59	Average
12	13.623	14.90	19.61	34.51	60.00	-25.49	QP

AC 120V/60 Hz, Neutral

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.156	-1.10	19.82	18.72	55.65	-36.93	Average
2	0.156	14.20	19.82	34.02	65.65	-31.63	QP
3	0.343	6.80	19.81	26.61	49.13	-22.52	Average
4	0.343	15.90	19.81	35.71	59.13	-23.42	QP
5	0.421	12.70	19.74	32.44	47.42	-14.98	Average
6	0.421	21.00	19.74	40.74	57.42	-16.68	QP
7	0.627	0.90	19.75	20.65	46.00	-25.35	Average
8	0.627	9.80	19.75	29.55	56.00	-26.45	QP
9	1.147	-0.70	19.81	19.11	46.00	-26.89	Average
10	1.147	7.80	19.81	27.61	56.00	-28.39	QP
11	12.253	-1.01	19.60	18.59	50.00	-31.41	Average
12	12.253	10.59	19.60	30.19	60.00	-29.81	QP

Note:

1) Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)

2) Over Limit (dB) = Read level (dBuV) + Factor (dB) - Limit (dBuV)

§15.205 & §15.209 & §15.407(B) (1), (2), (4), (7), (8), (9) – UNDESIRABLE EMISSION & RESTRICTED BANDS

Applicable Standard

FCC §15.407 (b) (1), (2), (4), (7), (8), (9); §15.209; §15.205;

For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

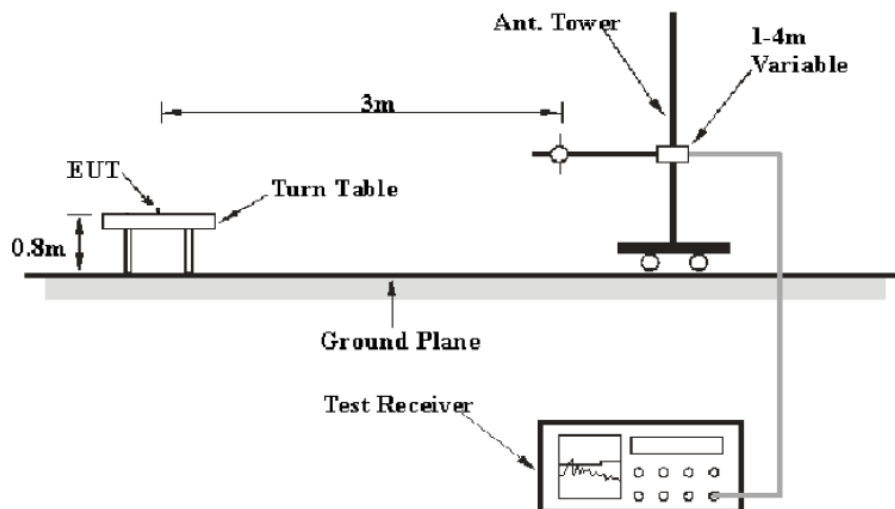
For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

As per FCC §15.35(d): Unless otherwise specified, on any frequency or frequencies above 1000MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000MHz shall be performed using a minimum resolution bandwidth of 1MHz.

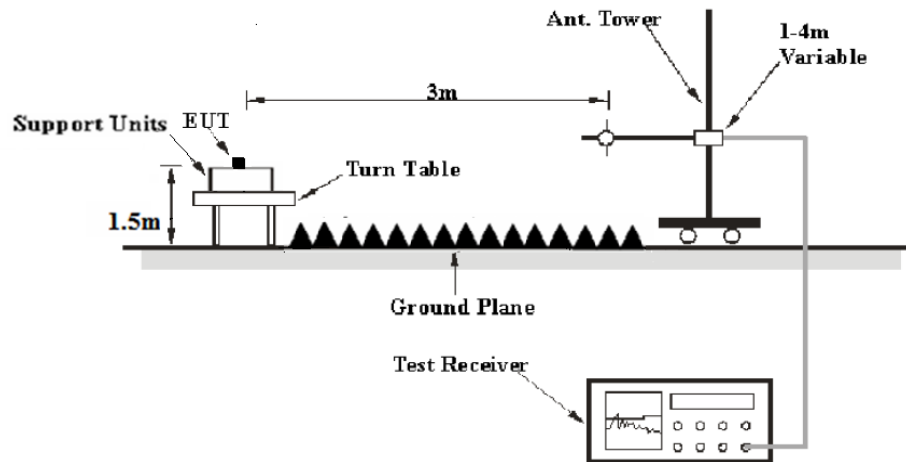
According to 789033 D02 General UNII Test Procedures New Rules v02r01, emission shall be computed as: $E \text{ [dB}\mu\text{V/m]} = \text{EIRP [dBm]} + 95.2$, for $d = 3$ meters.

EUT Setup

Below 1 GHz:



Above 1 GHz:



The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC 15.209 and FCC 15.407 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 40 GHz.

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

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

Test Procedure

During the radiated emission test, the adapter was connected to the first AC floor outlet and the other support equipments were connected to the second AC floor outlet.

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-1GHz, peak and Average detection modes for frequencies above 1GHz.

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:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

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:

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

Test Data

Environmental Conditions

Temperature:	23.2-24.3 °C
Relative Humidity:	49-51 %
ATM Pressure:	101.3-101.6 kPa

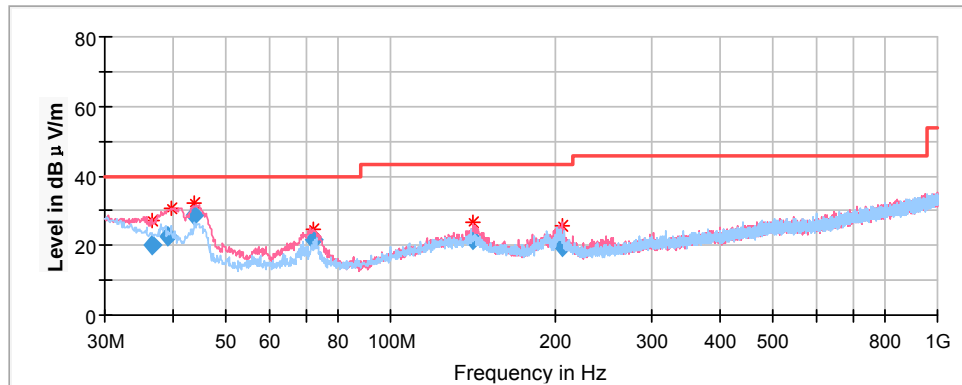
The testing was performed by Jack Jiao from 2021-01-11 to 2021-01-21.

Test Mode: Transmitting

Spurious Emission Test

30MHz-1GHz (5150-5250MHz Band):

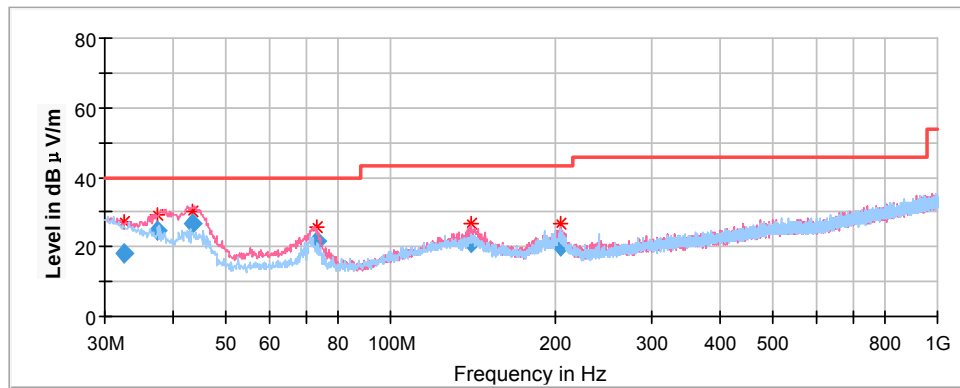
Pre-scan with 802.11a, 802.11n-HT20 and 802.11n-HT40 modes of operation in the X,Y and Z axes of orientation, the worst case 802.11 n-HT40 mode low channel in X-axis of orientation was recorded



Frequency (MHz)	Corrected Amplitude	Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	QuasiPeak (dBμV/m)	Height (cm)	Polar (H/V)				
36.543150	19.90	100.0	V	134.0	-9.0	40.00	20.10
39.229000	22.88	100.0	V	277.0	-10.8	40.00	17.12
43.649550	28.46	100.0	V	234.0	-13.7	40.00	11.54
72.272950	21.63	100.0	V	7.0	-17.3	40.00	18.37
141.832650	21.46	100.0	V	206.0	-12.0	43.50	22.04
205.981200	19.70	100.0	V	182.0	-12.1	43.50	23.80

30MHz-1GHz (5250-5350MHz Band):

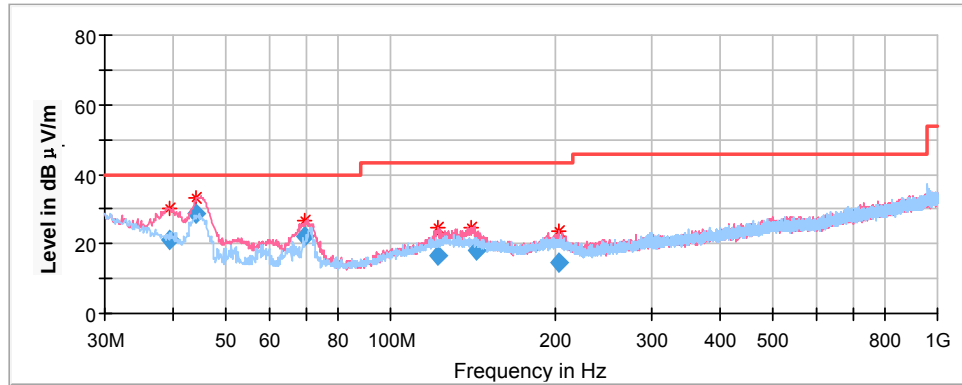
Pre-scan with 802.11a, 802.11n-HT20 and 802.11n-HT40 modes of operation in the X,Y and Z axes of orientation, the worst case 802.11a mode middle channel in X-axis of orientation was recorded



Frequency (MHz)	Corrected Amplitude	Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	QuasiPeak (dBμV/m)	Height (cm)	Polar (H/V)				
32.507350	17.97	100.0	V	310.0	-6.3	40.00	22.03
37.568650	24.77	100.0	V	59.0	-9.6	40.00	15.23
43.428000	26.52	100.0	V	169.0	-13.6	40.00	13.48
73.194350	21.72	100.0	V	102.0	-17.4	40.00	18.28
140.733000	21.35	100.0	V	212.0	-11.9	43.50	22.15
204.669350	20.33	100.0	V	224.0	-11.9	43.50	23.17

30MHz-1GHz (5725-5850MHz Band):

Pre-scan with 802.11a, 802.11n-HT20 and 802.11n-HT40 modes of operation in the X,Y and Z axes of orientation, the worst case 802.11n-HT20 mode in low channel in X-axis of orientation was recorded



Frequency (MHz)	Corrected Amplitude	Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	QuasiPeak (dBμV/m)	Height (cm)	Polar (H/V)				
39.458000	21.37	100.0	V	149.0	-9.8	40.00	18.63
44.186000	28.47	100.0	V	161.0	-13.9	40.00	11.53
69.698850	22.16	100.0	V	70.0	-17.0	40.00	17.84
122.053650	16.50	100.0	V	191.0	-11.6	43.50	27.00
143.080350	18.04	100.0	V	310.0	-12.0	43.50	25.46
202.694200	14.80	200.0	V	159.0	-11.7	43.50	28.70

1GHz-18GHz (5150-5250MHz Band):**802.11a Mode:**

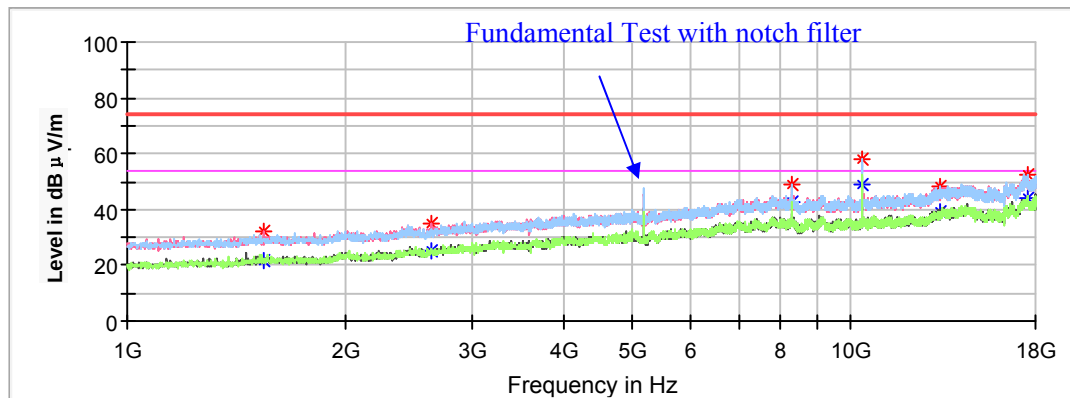
(Pre-scan in the X, Y and Z axes of orientation, the worst case **X-axis of orientation** was recorded.)

Note:

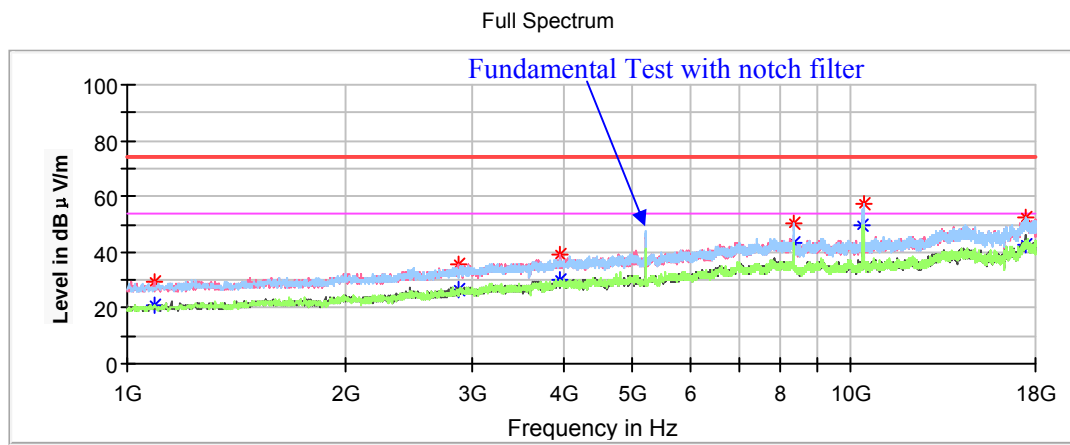
1. This test was performed with the 5150-5250MHz band reject filter.
2. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Limit - Corrected. Amplitude

Low Channel: 5180MHz

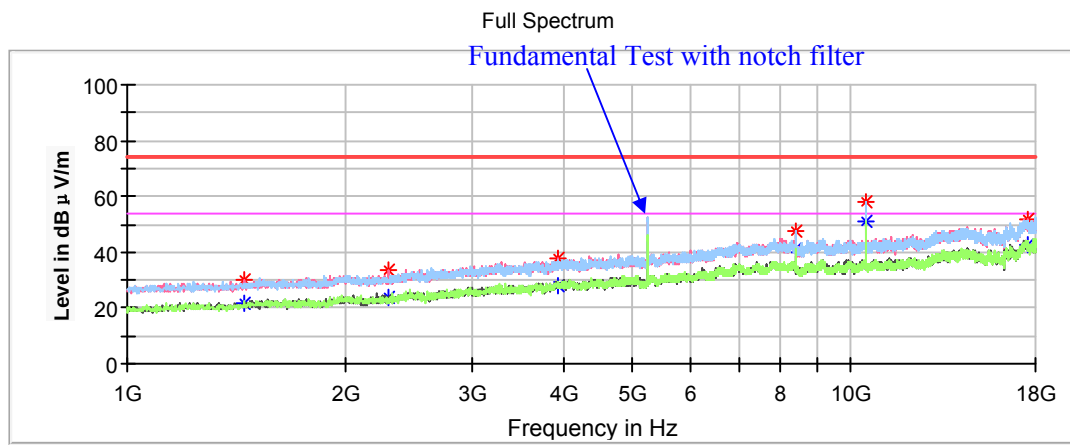
Full Spectrum



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1544.00	31.87	---	200	V	32.0	-16.2	74.00	42.13
1544.00	---	21.85	200	V	32.0	-16.2	54.00	32.15
2637.10	34.81	---	200	V	47.0	-11.8	68.20	33.39
8287.90	48.69	---	200	H	81.0	1.5	74.00	25.31
8287.90	---	42.75	200	H	81.0	1.5	54.00	11.25
10361.90	58.38	---	150	H	294.0	2.2	68.20	9.82
13304.60	47.96	---	200	H	358.0	5.5	74.00	26.04
13304.60	---	39.46	200	H	358.0	5.5	54.00	14.54
17515.50	52.34	---	150	H	0.0	8.9	68.20	15.86

Middle Channel: 5200MHz

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1091.80	---	20.87	200	V	324.0	-18.6	54.00	33.13
1091.80	29.49	---	200	V	324.0	-18.6	74.00	44.51
2861.50	---	26.37	200	V	93.0	-10.7	54.00	27.63
2861.50	35.36	---	200	V	93.0	-10.7	74.00	38.64
3975.00	---	29.85	150	H	139.0	-7.1	54.00	24.15
3975.00	39.03	---	150	H	129.0	-7.1	74.00	34.97
8320.20	---	43.17	200	H	81.0	1.5	54.00	10.83
8320.20	50.16	---	200	H	81.0	1.5	74.00	23.84
10401.00	57.37	---	200	H	354.0	2.2	68.20	10.83
17420.30	52.32	---	150	H	32.0	8.6	68.20	15.88

High Channel: 5240MHz

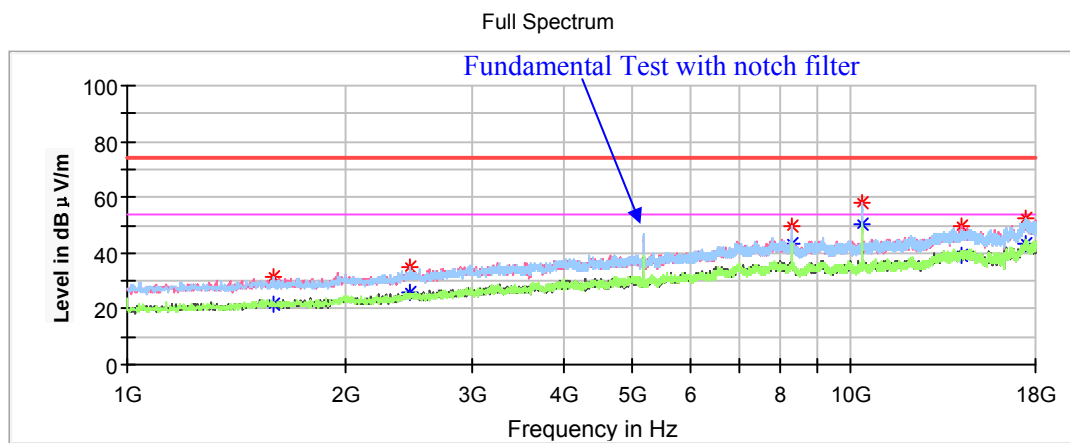
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1453.90	30.05	---	150	V	144.0	-16.6	74.00	43.95
1453.90	---	21.64	150	V	144.0	-16.6	54.00	32.36
2302.20	33.22	---	150	V	328.0	-13.2	68.20	34.98
3929.10	---	27.66	200	H	319.0	-7.3	54.00	26.34
3929.10	37.66	---	200	H	319.0	-7.3	74.00	36.34
8383.10	---	41.10	200	H	81.0	1.4	54.00	12.90
8383.10	47.84	---	200	H	81.0	1.4	74.00	26.16
10480.90	58.17	---	150	H	306.0	2.3	68.20	10.03
17529.10	52.03	---	200	V	0.0	8.9	68.20	16.17

802.11n-HT20 Mode:

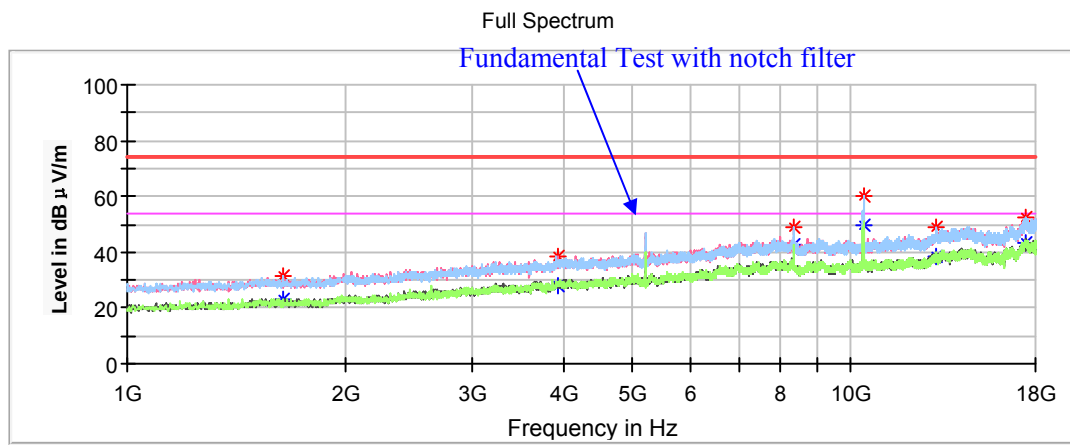
Pre-scan with X,Y and Z axes of orientation, the worst case **X-axis of orientation** was recorded

Note:

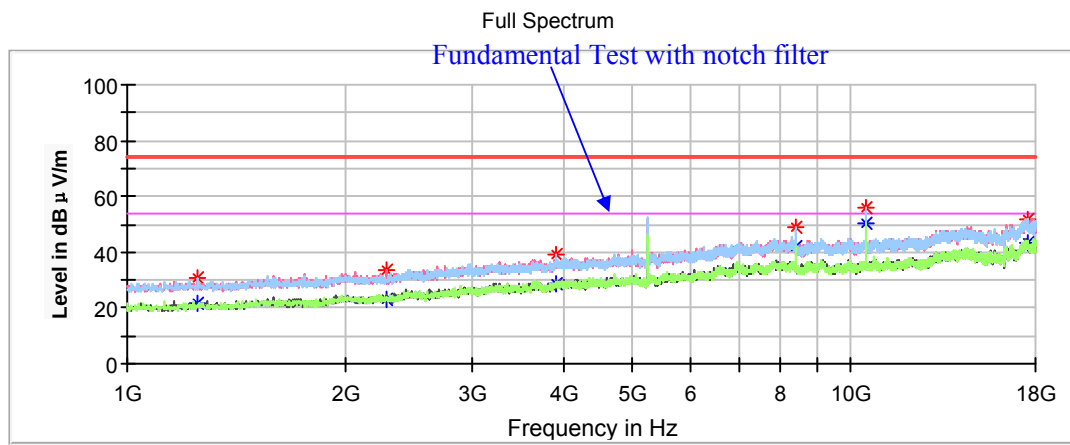
1. This test was performed with the 5150-5250MHz band reject filter.
2. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Limit - Corrected. Amplitude

Low Channel: 5180MHz

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
	MaxPeak (dBµV/m)	Average (dBµV/m)	Height (cm)	Polar (H/V)				
1589.90	---	21.59	200	H	145.0	-16.0	54.00	32.41
1589.90	31.40	---	200	H	145.0	-16.0	74.00	42.60
2458.60	35.28	---	200	H	334.0	-12.6	68.20	32.92
8287.90	---	43.66	150	H	91.0	1.5	54.00	10.34
8287.90	49.43	---	150	H	91.0	1.5	74.00	24.57
10355.10	57.99	---	200	H	304.0	2.2	74.00	16.01
10356.80	---	50.40	200	H	289.0	2.2	54.00	3.60
14183.50	49.58	---	200	V	140.0	6.3	68.20	18.62
17488.30	52.29	---	200	H	0.0	8.8	68.20	15.91

Middle Channel: 5200MHz

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dB μ V/m)	Margin (dB)
	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Height (cm)	Polar (H/V)				
1642.60	31.73	---	150	H	102.0	-15.8	68.20	36.47
3947.80	---	28.22	150	V	26.0	-7.2	54.00	25.78
3947.80	38.41	---	150	V	26.0	-7.2	74.00	35.59
8320.20	---	42.33	200	H	97.0	1.5	54.00	11.67
8320.20	48.76	---	200	H	97.0	1.5	74.00	25.24
10404.40	59.93	---	200	H	284.0	2.2	68.20	8.27
13158.40	48.68	---	200	H	192.0	5.4	68.20	19.52
17461.10	52.21	---	200	H	330.0	8.8	68.20	15.99

High Channel: 5240MHz

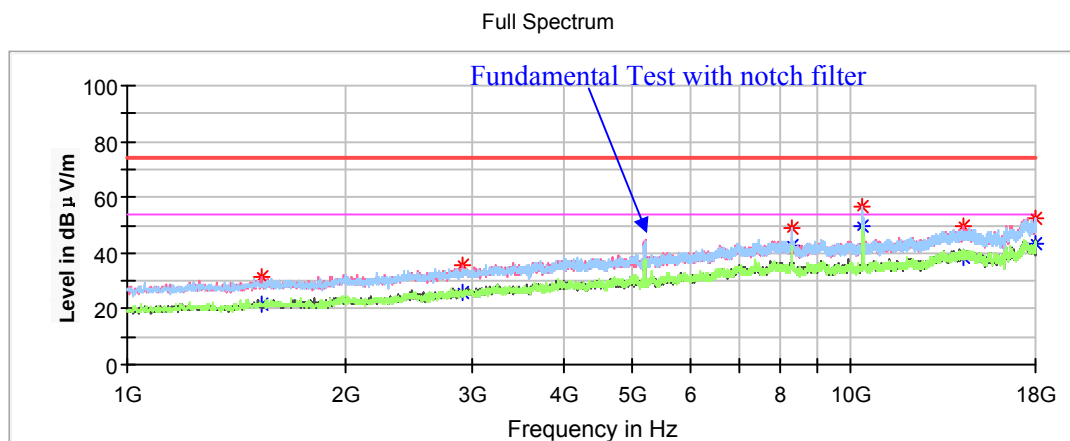
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1253.30	30.59	---	150	H	200.0	-17.7	68.20	37.61
2278.40	---	23.12	200	V	199.0	-13.3	54.00	30.88
2278.40	33.91	---	200	V	199.0	-13.3	74.00	40.09
3920.60	---	28.84	150	V	252.0	-7.3	54.00	25.16
3920.60	38.82	---	150	V	252.0	-7.3	74.00	35.18
8383.10	48.97	---	200	H	81.0	1.4	74.00	25.03
8383.10	---	41.77	200	H	81.0	1.4	54.00	12.23
10475.80	56.13	---	150	H	279.0	2.3	68.20	12.07
17524.00	52.10	---	150	V	0.0	8.9	68.20	16.10

802.11n-HT40 Mode:

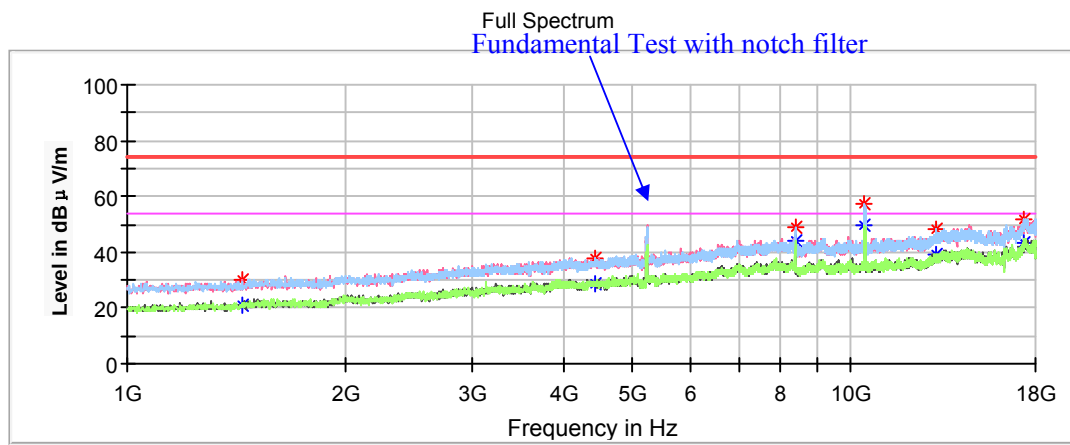
Pre-scan with X,Y and Z axes of orientation, the worst case **X-axis of orientation** was recorded

Note:

1. This test was performed with the 5150-5250MHz band reject filter.
2. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Limit - Corrected. Amplitude

Low Channel: 5190MHz

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1532.10	---	21.35	200	V	55.0	-16.2	54.00	32.65
1532.10	31.16	---	200	V	55.0	-16.2	74.00	42.84
2914.20	35.99	---	150	V	222.0	-10.5	68.20	32.21
8303.20	---	42.35	150	H	92.0	1.5	54.00	11.65
8303.20	48.96	---	150	H	92.0	1.5	74.00	25.04
10380.60	56.36	---	150	H	262.0	2.2	68.20	11.84
14270.20	49.46	---	200	V	0.0	6.4	68.20	18.74
17986.40	---	43.42	150	V	144.0	8.8	54.00	10.58
17986.40	52.78	---	150	V	144.0	8.8	74.00	21.22

High Channel: 5230MHz

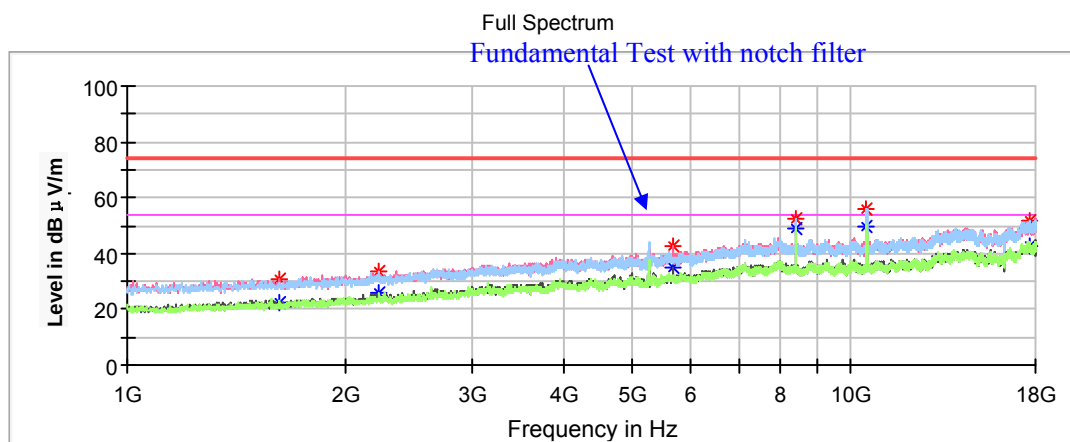
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dB μ V/m)	Margin (dB)
	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Height (cm)	Polar (H/V)				
1440.30	---	21.30	150	H	26.0	-16.7	54.00	32.70
1440.30	29.97	---	150	H	26.0	-16.7	74.00	44.03
4437.40	37.87	---	150	V	0.0	-6.3	68.20	30.33
8367.80	---	43.72	200	H	81.0	1.5	54.00	10.28
8367.80	48.62	---	200	H	81.0	1.5	74.00	25.38
10460.50	57.31	---	200	H	283.0	2.3	68.20	10.89
13104.00	48.46	---	150	H	201.0	5.3	68.20	19.74
17323.40	51.74	---	200	V	76.0	8.3	68.20	16.46

1GHz-18GHz (5250-5350MHz Band):**802.11a Mode:**

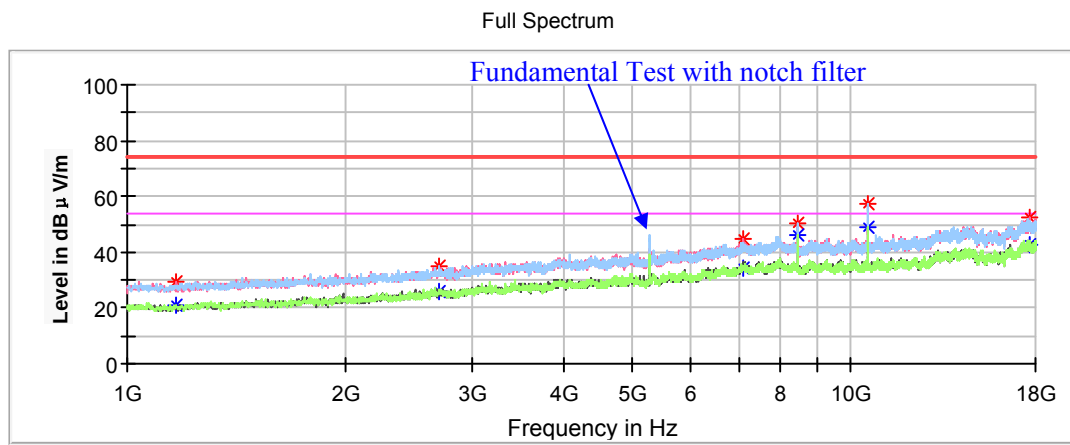
(Pre-scan in the X, Y and Z axes of orientation, the worst case **X-axis of orientation** was recorded.)

Note:

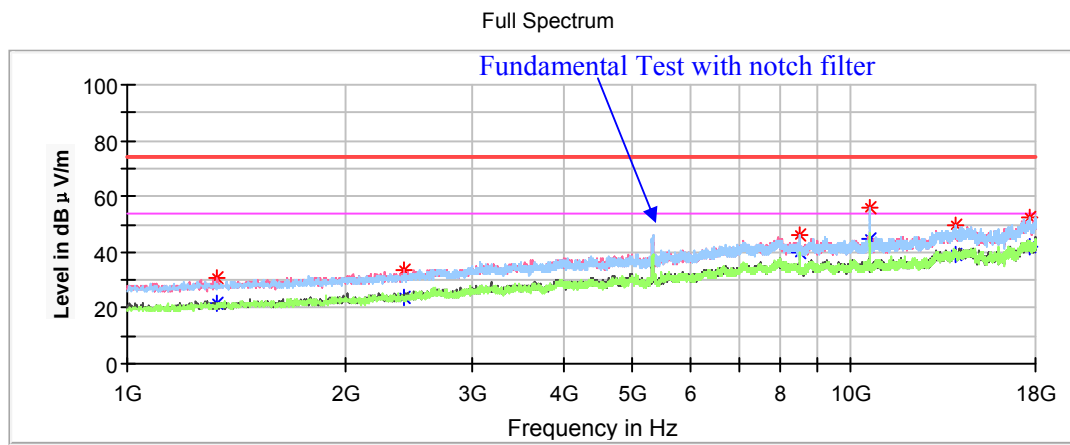
1. This test was performed with the 5250-5350MHz band reject filter.
2. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Limit - Corrected. Amplitude

Low Channel: 5260MHz

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1622.20	---	22.33	150	V	161.0	-15.9	54.00	31.67
1622.20	30.92	---	150	V	161.0	-15.9	74.00	43.08
2232.50	---	25.94	200	H	2.0	-13.5	54.00	28.06
2232.50	33.68	---	200	H	2.0	-13.5	74.00	40.32
5683.50	42.43	---	200	V	145.0	-3.6	68.20	25.77
8415.40	---	49.10	150	H	95.0	1.4	54.00	4.90
8415.40	52.58	---	150	H	95.0	1.4	74.00	21.42
10520.00	55.84	---	200	H	283.0	2.3	68.20	12.36
17637.90	51.72	---	200	H	232.0	8.9	68.20	16.48

Middle Channel: 5280MHz

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1170.00	---	20.71	200	V	164.0	-18.1	54.00	33.29
1170.00	29.45	---	200	V	164.0	-18.1	74.00	44.55
2696.60	35.05	---	200	H	91.0	-11.5	74.00	38.95
2696.60	---	26.10	200	H	91.0	-11.5	54.00	27.90
7094.50	44.74	---	150	V	161.0	0.1	68.20	23.46
8447.70	---	46.38	200	H	78.0	1.4	54.00	7.62
8447.70	50.61	---	200	H	78.0	1.4	74.00	23.39
10557.40	57.54	---	200	H	297.0	2.4	68.20	10.66
17631.10	52.22	---	200	V	37.0	8.9	68.20	15.98

High Channel: 5320MHz

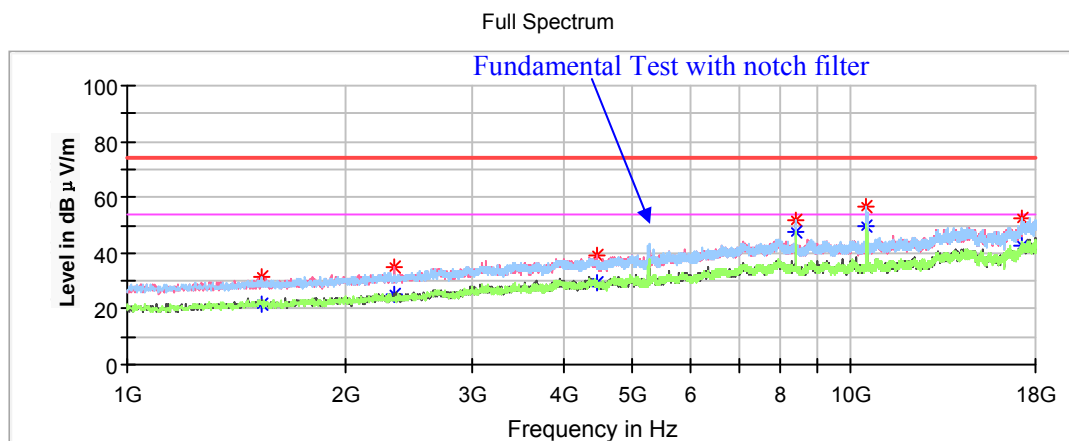
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1333.20	---	21.54	200	H	251.0	-17.3	54.00	32.46
1333.20	30.66	---	200	H	251.0	-17.3	74.00	43.34
2412.70	33.34	---	150	V	285.0	-12.8	68.20	34.86
8512.30	46.33	---	200	H	64.0	1.3	68.20	21.87
10640.70	---	44.55	200	H	276.0	2.5	54.00	9.45
10640.70	55.65	---	200	H	276.0	2.5	74.00	18.35
13998.20	49.38	---	150	H	140.0	6.1	68.20	18.82
17692.30	52.17	---	200	H	340.0	8.9	68.20	16.03

802.11n-HT20 Mode:

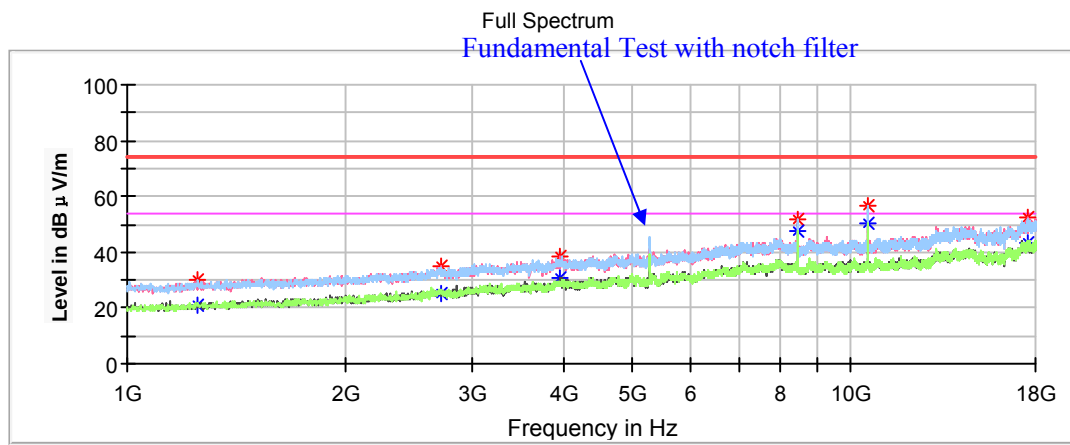
Pre-scan with X,Y and Z axes of orientation, the worst case X-axis of orientation was recorded

Note:

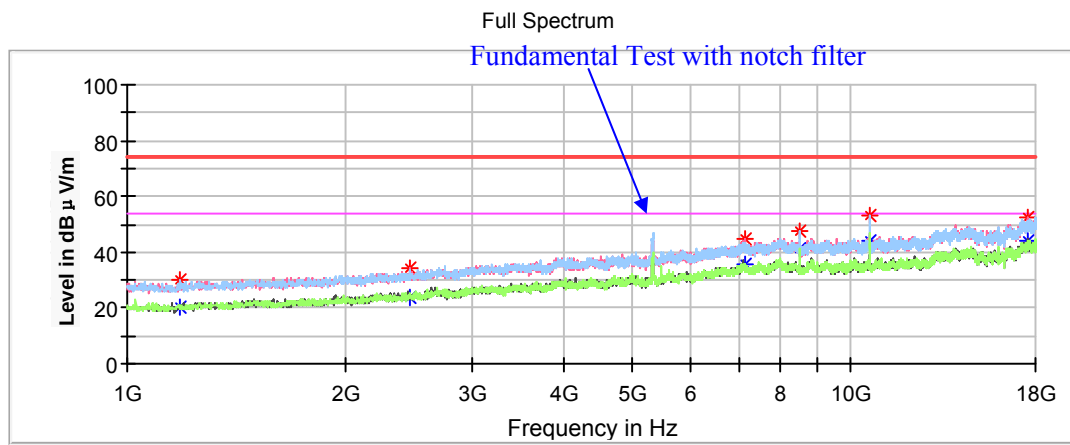
1. This test was performed with the 5250-5350MHz band reject filter.
2. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Limit - Corrected. Amplitude

Low Channel: 5260MHz

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1530.40	---	21.90	200	H	359.0	-16.2	54.00	32.10
1530.40	31.19	---	200	H	359.0	-16.2	74.00	42.81
2341.30	---	25.34	150	V	175.0	-13.1	54.00	28.66
2341.30	34.74	---	150	V	175.0	-13.1	74.00	39.26
4461.20	39.00	---	150	V	350.0	-6.3	68.20	29.20
8415.40	---	47.24	150	H	88.0	1.4	54.00	6.76
8415.40	51.57	---	150	H	88.0	1.4	74.00	22.43
10516.60	56.87	---	150	H	282.0	2.3	68.20	11.33
17253.70	52.12	---	150	H	255.0	8.0	68.20	16.08

Middle Channel: 5280MHz

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dB μ V/m)	Margin (dB)
	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Height (cm)	Polar (H/V)				
1253.30	30.22	---	150	H	0.0	-17.7	68.20	37.98
2713.60	---	24.89	150	H	139.0	-11.4	54.00	29.11
2713.60	34.97	---	200	V	0.0	-11.4	74.00	39.03
3954.60	---	30.51	200	V	310.0	-7.2	54.00	23.49
3954.60	38.42	---	200	V	310.0	-7.2	74.00	35.58
8447.70	---	47.27	200	H	78.0	1.4	54.00	6.73
8447.70	51.42	---	200	H	78.0	1.4	74.00	22.58
10555.70	56.66	---	150	H	296.0	2.4	68.20	11.54
17605.60	52.18	---	150	V	238.0	8.9	68.20	16.02

High Channel: 5320MHz

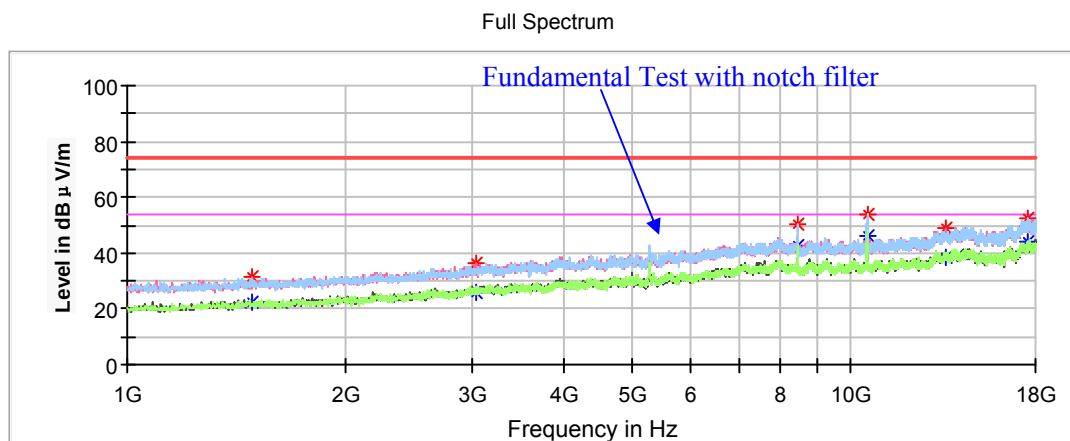
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1185.30	---	20.36	200	H	272.0	-18.1	54.00	33.64
1185.30	29.89	---	200	H	272.0	-18.1	74.00	44.11
2455.20	34.12	---	200	V	331.0	-12.6	68.20	34.08
7128.50	44.55	---	150	V	357.0	0.2	68.20	23.65
8512.30	47.26	---	200	H	78.0	1.3	68.20	20.94
10635.60	---	43.87	200	H	285.0	2.5	54.00	10.13
10635.60	53.00	---	200	H	285.0	2.5	74.00	21.00
17581.80	52.73	---	150	V	171.0	8.9	68.20	15.47

802.11n-HT40 Mode:

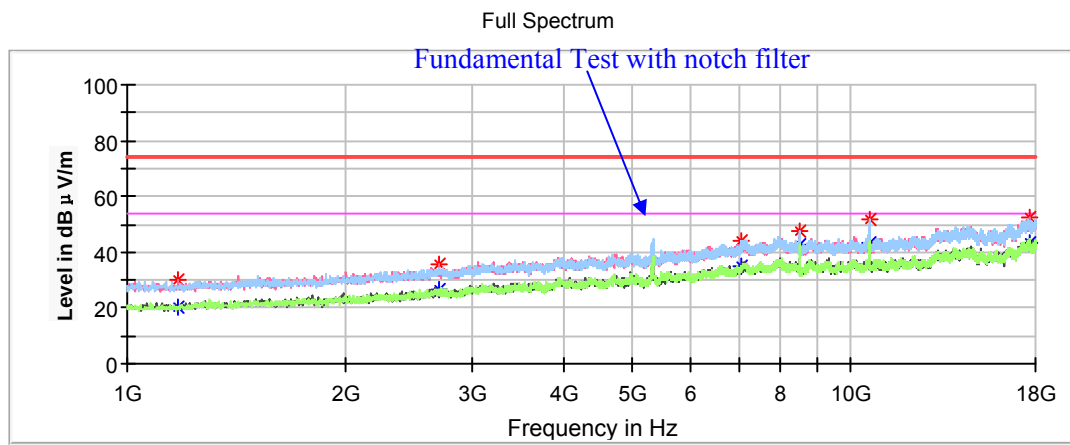
Pre-scan with X,Y and Z axes of orientation, the worst case **X-axis of orientation** was recorded

Note:

1. This test was performed with the 5250-5350MHz band reject filter.
2. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Limit - Corrected. Amplitude

Low Channel: 5270MHz

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
	MaxPeak (dBµV/m)	Average (dBµV/m)	Height (cm)	Polar (H/V)				
1491.30	---	22.10	200	V	352.0	-16.4	54.00	31.90
1491.30	31.15	---	200	V	352.0	-16.4	74.00	42.85
3043.40	36.04	---	150	V	259.0	-10.0	68.20	32.16
8430.70	50.31	---	150	H	83.0	1.4	74.00	23.69
8430.70	---	42.39	150	H	83.0	1.4	54.00	11.61
10542.10	53.87	---	150	H	282.0	2.4	68.20	14.33
13491.60	48.62	---	150	V	233.0	5.7	68.20	19.58
17609.00	52.49	---	200	H	346.0	8.9	68.20	15.71

High Channel: 5310MHz

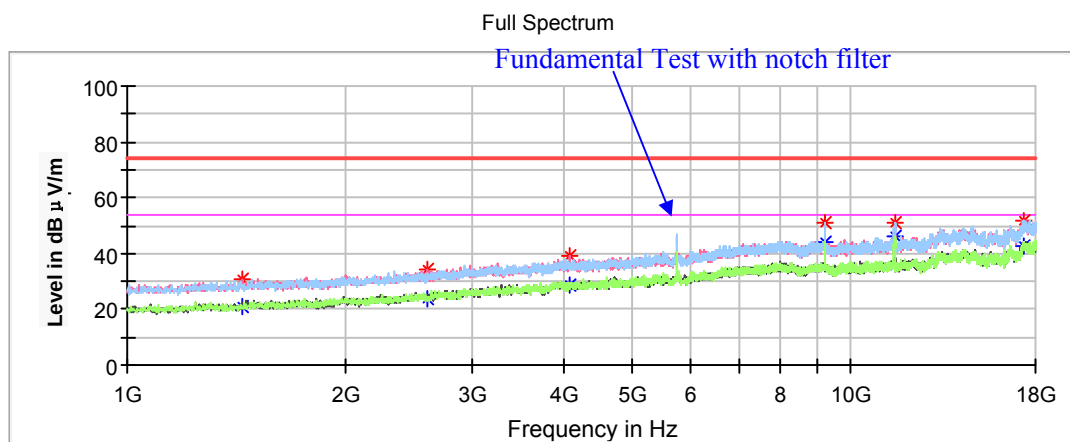
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1175.10	30.38	---	150	V	208.0	-18.1	74.00	43.62
1175.10	---	20.45	150	V	208.0	-18.1	54.00	33.55
2700.00	---	26.38	150	V	234.0	-11.5	54.00	27.62
2700.00	35.39	---	150	V	234.0	-11.5	74.00	38.61
7072.40	44.12	---	150	H	177.0	0.1	68.20	24.08
8495.30	---	42.91	150	H	88.0	1.3	54.00	11.09
8495.30	47.65	---	150	H	88.0	1.3	74.00	26.35
10620.30	---	43.36	200	H	289.0	2.5	54.00	10.64
10620.30	51.44	---	200	H	289.0	2.5	74.00	22.56
17665.10	52.33	---	150	V	130.0	8.9	68.20	15.87

1GHz-18GHz (5725-5850MHz Band):**802.11a Mode:**

(Pre-scan in the X, Y and Z axes of orientation, the worst case **X-axis of orientation** was recorded.)

Note:

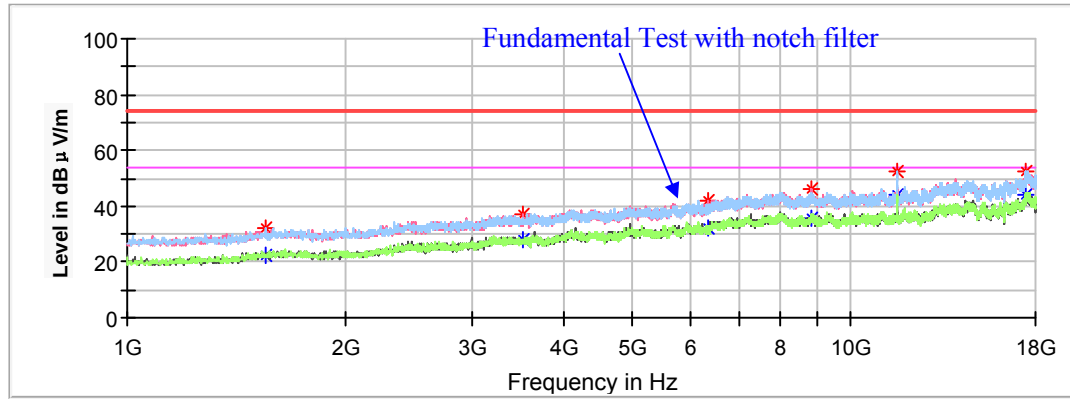
1. This test was performed with the 5725-5850MHz band reject filter.
2. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Limit - Corrected. Amplitude

Low Channel: 5745MHz

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1445.40	---	20.94	200	V	359.0	-16.7	54.00	33.06
1445.40	30.45	---	200	V	359.0	-16.7	74.00	43.55
2591.20	34.42	---	200	V	355.0	-12.0	68.20	33.78
4095.70	---	28.50	150	V	132.0	-6.8	54.00	25.50
4095.70	39.34	---	150	V	132.0	-6.8	74.00	34.66
9192.30	---	44.21	150	H	76.0	2.0	54.00	9.79
9192.30	51.06	---	150	H	76.0	2.0	74.00	22.94
11490.70	---	45.82	200	H	321.0	2.8	54.00	8.18
11490.70	51.28	---	200	H	321.0	2.8	74.00	22.72
17362.50	51.81	---	150	H	0.0	8.4	68.20	16.39

Middle Channel: 5785MHz

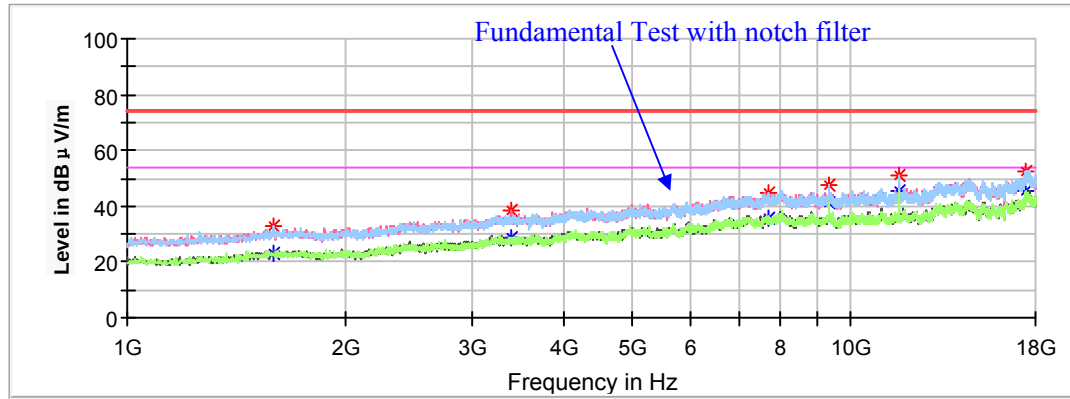
Full Spectrum



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dB μ V/m)	Margin (dB)
	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Height (cm)	Polar (H/V)				
1550.80	32.17	---	200	H	77.0	-16.2	74.00	41.83
1550.80	---	22.26	200	H	77.0	-16.2	54.00	31.74
3517.70	36.90	---	150	V	74.0	-8.8	68.20	31.30
6351.60	42.13	---	200	V	310.0	-1.7	68.20	26.07
8835.30	46.41	---	200	V	259.0	1.7	68.20	21.79
11567.20	52.30	---	150	H	313.0	2.9	74.00	21.70
11567.20	---	44.17	150	H	313.0	2.9	54.00	9.83
17490.00	52.55	---	150	V	74.0	8.9	68.20	15.65

High Channel: 5825MHz

Full Spectrum



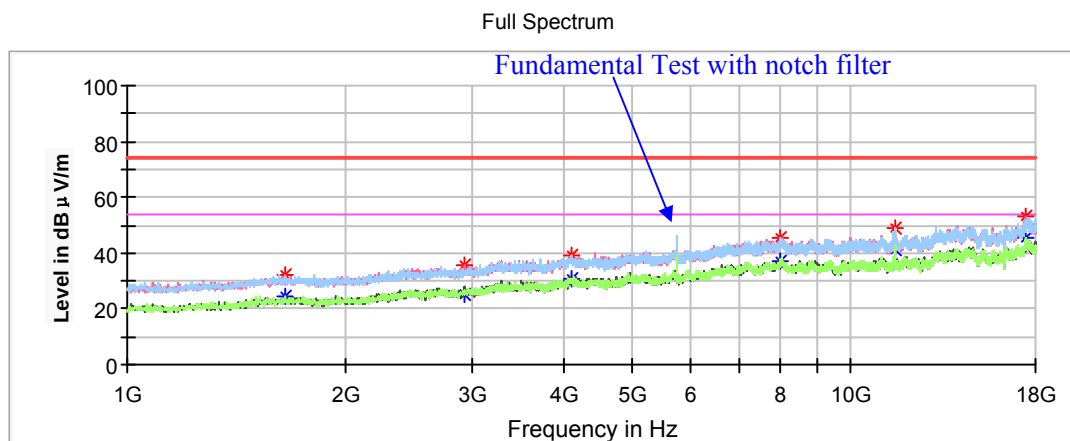
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dB μ V/m)	Margin (dB)
	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Height (cm)	Polar (H/V)				
1595.00	---	23.33	150	H	8.0	-16.0	54.00	30.67
1595.00	33.02	---	150	H	8.0	-16.0	74.00	40.98
3388.50	38.79	---	150	V	336.0	-9.1	68.20	29.41
7674.20	---	35.52	200	H	166.0	1.3	54.00	18.48
7674.20	44.91	---	200	H	166.0	1.3	74.00	29.09
9319.80	---	40.97	150	H	95.0	2.0	54.00	13.03
9319.80	47.38	---	150	H	95.0	2.0	74.00	26.62
11648.80	---	45.47	200	H	324.0	3.1	54.00	8.53
11648.80	51.07	---	150	H	326.0	3.1	74.00	22.93
17498.50	52.69	---	150	V	22.0	8.9	68.20	15.51

802.11n-HT20 Mode:

Pre-scan with X,Y and Z axes of orientation, the worst case X-axis of orientation was recorded

Note:

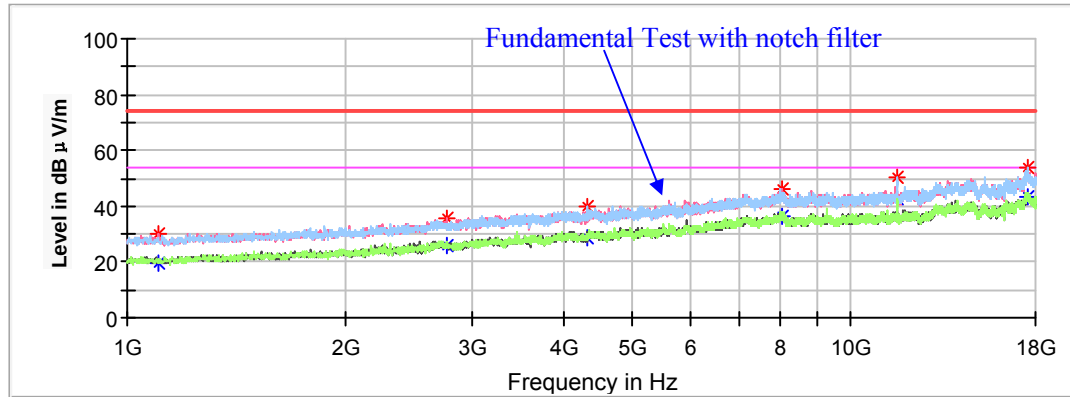
1. This test was performed with the 5725-5850MHz band reject filter.
2. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Limit - Corrected. Amplitude

Low Channel: 5745MHz

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
	MaxPeak (dBµV/m)	Average (dBµV/m)	Height (cm)	Polar (H/V)				
1649.40	32.50	---	150	V	192.0	-15.8	68.20	35.70
2922.70	35.61	---	150	V	116.0	-10.5	68.20	32.59
4116.10	---	30.78	200	H	218.0	-6.8	54.00	23.22
4116.10	39.30	---	200	H	218.0	-6.8	74.00	34.70
7997.20	45.48	---	150	H	357.0	1.8	68.20	22.72
11489.00	---	41.23	200	H	345.0	2.8	54.00	12.77
11489.00	49.27	---	200	H	345.0	2.8	74.00	24.73
17496.80	52.84	---	150	V	311.0	8.9	68.20	15.36

Middle Channel: 5785MHz

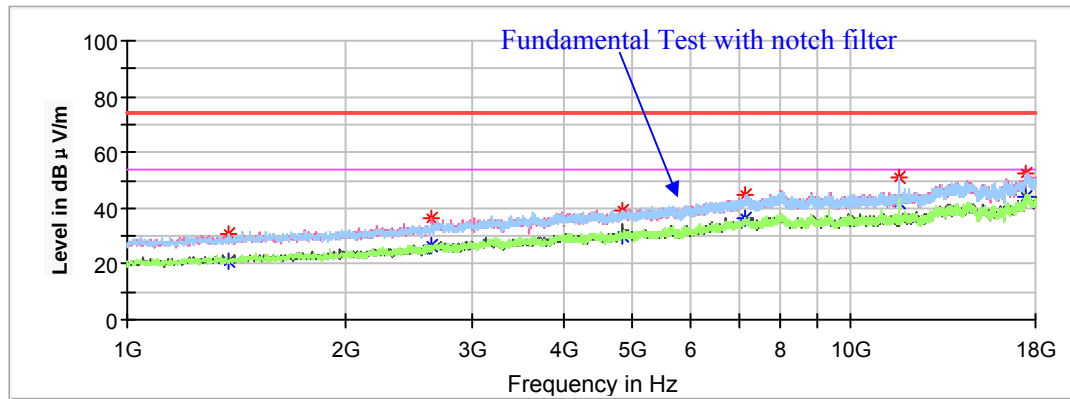
Full Spectrum



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dB μ V/m)	Margin (dB)
	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Height (cm)	Polar (H/V)				
1105.40	---	19.80	150	H	182.0	-18.5	54.00	34.20
1105.40	30.02	---	150	H	182.0	-18.5	74.00	43.98
2761.20	35.75	---	200	V	181.0	-11.2	74.00	38.25
2761.20	---	25.53	200	V	181.0	-11.2	54.00	28.47
4326.90	---	28.65	200	V	77.0	-6.5	54.00	25.35
4326.90	39.72	---	200	V	77.0	-6.5	74.00	34.28
8029.50	46.38	---	150	V	116.0	1.8	74.00	27.62
8029.50	---	36.30	150	V	116.0	1.8	54.00	17.70
11570.60	---	42.51	200	H	311.0	2.9	54.00	11.49
11570.60	50.41	---	200	H	311.0	2.9	74.00	23.59
17573.30	54.04	---	150	H	322.0	8.9	68.20	14.16

High Channel: 5825MHz

Full Spectrum



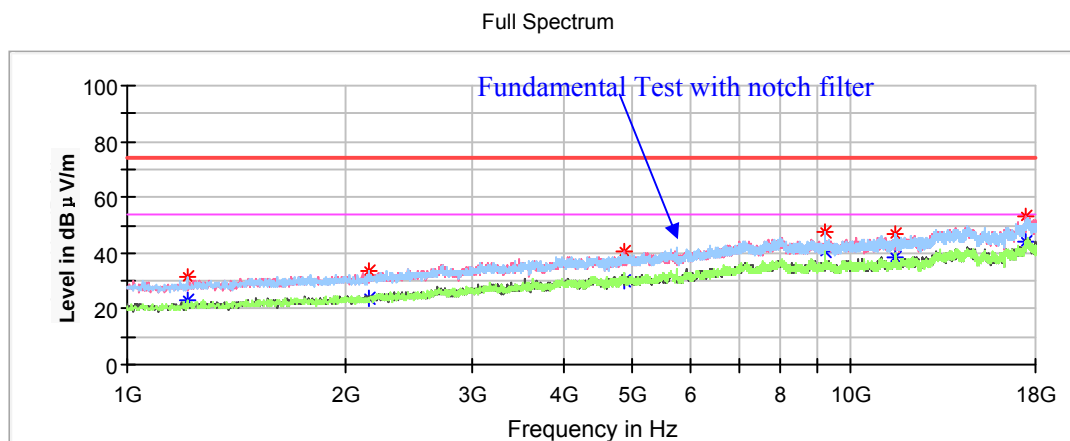
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dB μ V/m)	Margin (dB)
	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Height (cm)	Polar (H/V)				
1382.50	---	21.23	150	H	24.0	-17.0	54.00	32.77
1382.50	30.62	---	150	H	24.0	-17.0	74.00	43.38
2633.70	36.65	---	150	V	27.0	-11.8	68.20	31.55
4843.70	39.39	---	200	H	174.0	-5.5	74.00	34.61
4843.70	---	30.41	200	H	174.0	-5.5	54.00	23.59
7130.20	44.95	---	200	V	250.0	0.2	68.20	23.25
11653.90	---	41.70	150	H	326.0	3.1	54.00	12.30
11653.90	51.22	---	150	H	326.0	3.1	74.00	22.78
17496.80	52.48	---	150	V	128.0	8.9	68.20	15.72

802.11n-HT40 Mode:

Pre-scan with X,Y and Z axes of orientation, the worst case X-axis of orientation was recorded

Note:

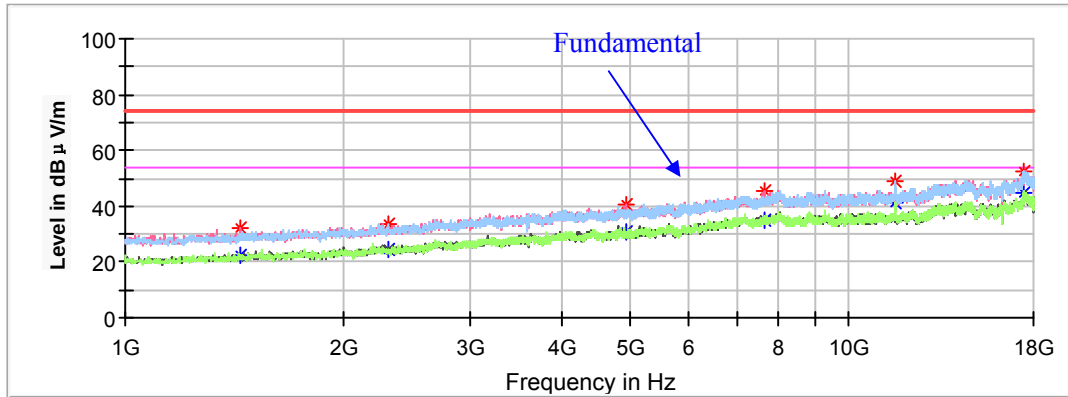
1. This test was performed with the 5725-5850MHz band reject filter.
2. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Limit - Corrected. Amplitude

Low Channel: 5755MHz

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1209.10	---	23.05	200	H	4.0	-17.9	54.00	30.95
1209.10	31.31	---	200	H	4.0	-17.9	74.00	42.69
2161.10	33.56	---	150	H	68.0	-13.8	68.20	34.64
4865.80	---	29.86	200	V	245.0	-5.5	54.00	24.14
4865.80	40.29	---	200	V	245.0	-5.5	74.00	33.71
9207.60	47.35	---	150	H	81.0	2.0	68.20	20.85
11507.70	46.81	---	200	H	345.0	2.8	74.00	27.19
11507.70	---	38.34	200	H	345.0	2.8	54.00	15.66
17486.60	53.04	---	200	V	233.0	8.8	68.20	15.16

High Channel: 5795MHz

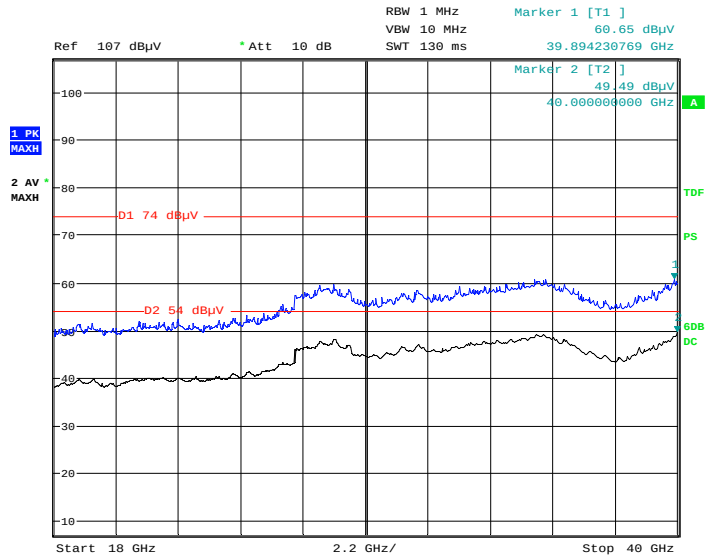
Full Spectrum



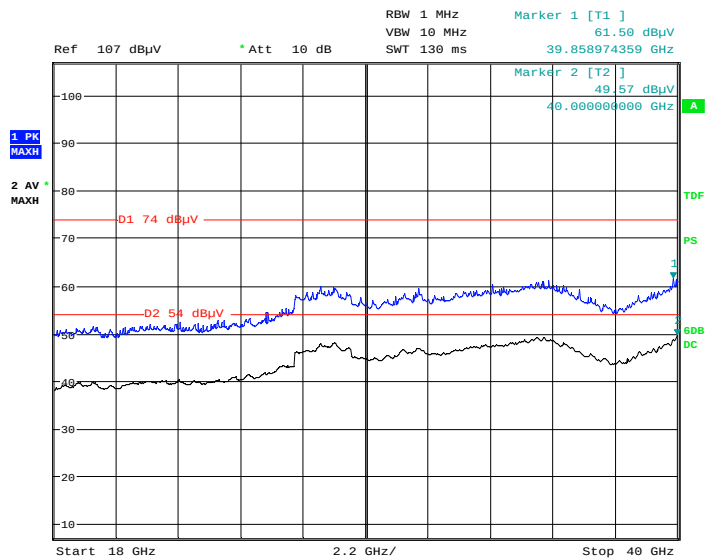
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
	MaxPeak (dBµV/m)	Average (dBµV/m)	Height (cm)	Polar (H/V)				
1442.00	31.89	---	200	V	325.0	-16.7	74.00	42.11
1442.00	---	22.13	200	V	325.0	-16.7	54.00	31.87
2305.60	33.80	---	150	H	359.0	-13.2	68.20	34.40
4921.90	40.27	---	150	V	280.0	-5.3	74.00	33.73
4921.90	---	31.07	150	V	280.0	-5.3	54.00	22.93
7633.40	45.17	---	200	V	294.0	1.2	74.00	28.83
7633.40	---	34.65	200	V	294.0	1.2	54.00	19.35
11587.60	---	41.48	200	H	307.0	3.0	54.00	12.52
11587.60	48.96	---	200	H	307.0	3.0	74.00	25.04
17501.90	52.74	---	150	H	242.0	8.9	68.20	15.46

18GHz-40GHz (5150-5250MHz Band):

Pre-scan with 802.11a, 802.11n-HT20 and 802.11n-HT40 modes of operation in the X,Y and Z axes of orientation, the worst case **802.11 n-HT40 mode low channel** in X-axis of orientation was recorded

Horizontal

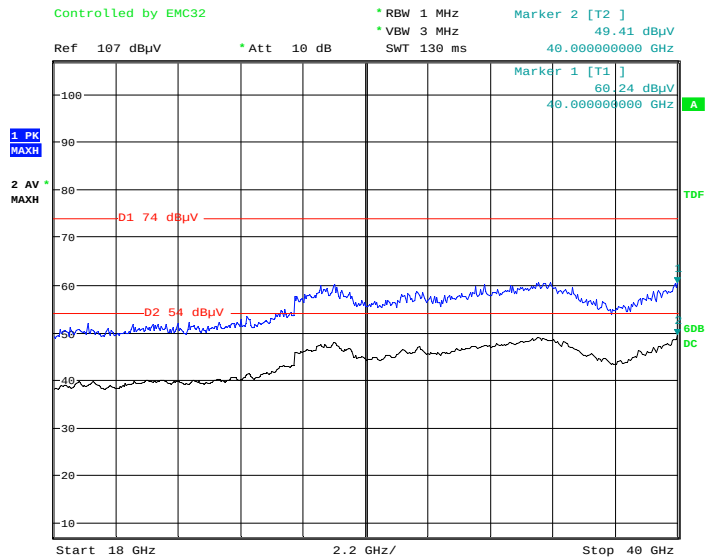
Date: 11.JAN.2021 15:56:00

Vertical

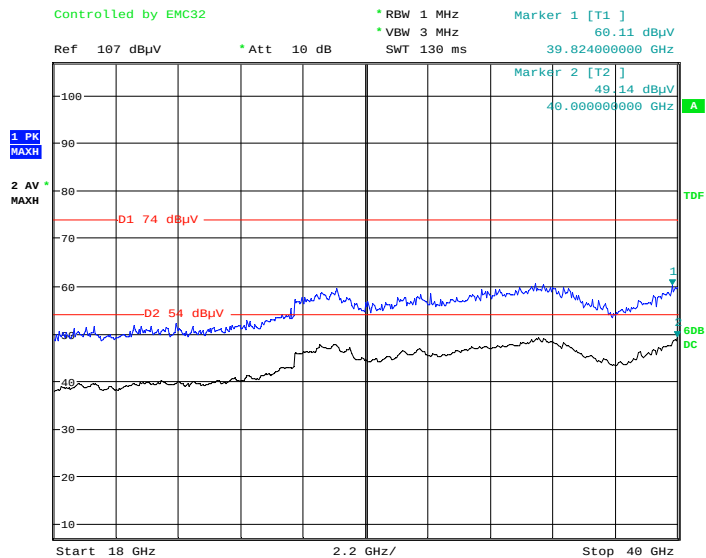
Date: 11.JAN.2021 15:36:52

18GHz-40GHz (5250-5350MHz Band):

Pre-scan with 802.11a, 802.11n-HT20 and 802.11n-HT40 modes of operation in the X,Y and Z axes of orientation, the worst case **802.11a mode middle channel** in X-axis of orientation was recorded

Horizontal

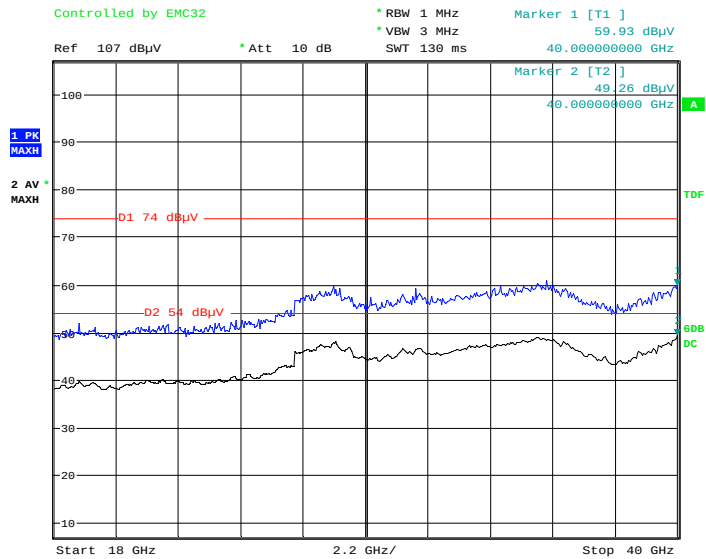
Date: 21.JAN.2021 11:34:46

Vertical

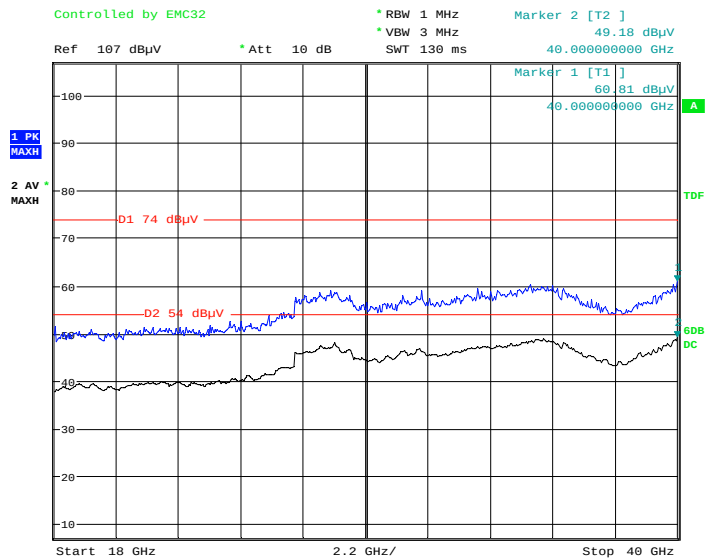
Date: 21.JAN.2021 11:06:19

18GHz-40GHz (5725-5850MHz Band):

Pre-scan with 802.11a, 802.11n-HT20 and 802.11n-HT40 modes of operation in the X,Y and Z axes of orientation, the worst case **802.11 n-HT40 mode low channel** in X-axis of orientation was recorded

Horizontal

Date: 21.JAN.2021 10:11:50

Vertical

Date: 21.JAN.2021 10:38:20

Restricted Bands Emissions Test (5150-5250MHz Band):

Note:

1. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
2. Corrected Amplitude = Corrected Factor + Reading
3. Margin = Limit - Corrected. Amplitude

802.11a Mode: (Pre-scan in the X, Y and Z axes of orientation, the worst case in X-axis of orientation was recorded)

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
Low Channel: 5180MHz								
5150.00	52.91	---	200.0	H	11.0	5.2	74.00	21.09
5150.00	---	50.46	200.0	H	11.0	5.2	54.00	3.54
High Channel: 5240MHz								
5350.00	53.64	---	150.0	H	29.0	5.7	74.00	20.36
5350.00	---	49.93	150.0	H	29.0	5.7	54.00	4.07

802.11n-HT20 Mode: (Pre-scan in the X, Y and Z axes of orientation, the worst case in X-axis of orientation was recorded)

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
Low Channel: 5180MHz								
5150.00	53.70	---	150.0	V	27.0	5.2	74.00	20.30
5150.00	---	49.83	150.0	V	27.0	5.2	54.00	4.17
High Channel: 5240MHz								
5350.00	52.29	---	150.0	V	268.0	5.9	74.00	21.71
5350.00	---	50.48	150.0	V	268.0	5.9	54.00	3.52

802.11n-HT40 Mode: (Pre-scan in the X, Y and Z axes of orientation, the worst case in X-axis of orientation was recorded)

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
Low Channel: 5190MHz								
5150.00	55.67	---	200.0	H	0.0	5.2	74.00	18.33
5150.00	---	50.32	200.0	H	0.0	5.2	54.00	3.68
High Channel: 5230MHz								
5350.00	52.47	---	150.0	V	31.0	5.8	74.00	21.53
5350.00	---	50.75	150.0	V	31.0	5.8	54.00	3.25

Restricted Bands Emissions Test (5250-5350MHz Band):

Note:

1. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
2. Corrected Amplitude = Corrected Factor + Reading
3. Margin = Limit - Corrected. Amplitude

802.11a Mode: (Pre-scan in the X, Y and Z axes of orientation, the worst case in X-axis of orientation was recorded)

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
Low Channel: 5260MHz								
5150.00	53.50	---	200.0	V	39.0	5.2	74.00	20.50
5150.00	---	49.11	200.0	V	39.0	5.2	54.00	4.89
High Channel: 5320MHz								
5350.00	54.42	---	150.0	V	55.0	5.7	74.00	19.58
5350.00	---	50.11	150.0	V	55.0	5.7	54.00	3.89

802.11n-HT20 Mode: (Pre-scan in the X, Y and Z axes of orientation, the worst case in X-axis of orientation was recorded)

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
Low Channel: 5260MHz								
5150.00	53.74	---	150.0	V	271.0	5.1	74.00	20.26
5150.00	---	50.00	150.0	V	271.0	5.1	54.00	4.00
High Channel: 5320MHz								
5350.00	54.36	---	150.0	V	282.0	5.7	74.00	19.64
5350.00	---	50.10	150.0	V	282.0	5.7	54.00	3.90

802.11n-HT40 Mode: (Pre-scan in the X, Y and Z axes of orientation, the worst case in X-axis of orientation was recorded)

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
Low Channel: 5270MHz								
5150.00	53.95	---	150.0	V	271.0	5.1	74.00	20.05
5150.00	---	49.52	150.0	V	271.0	5.1	54.00	4.48
High Channel: 5310MHz								
5350.00	56.30	---	150.0	H	107.0	5.7	74.00	17.70
5350.00	---	52.03	150.0	H	107.0	5.7	54.00	1.97

Restricted Bands Emissions Test (5725-5850MHz Band):

Note:

1. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
2. Corrected Amplitude = Corrected Factor + Reading
3. Margin = Limit - Corrected. Amplitude

802.11a Mode: (Pre-scan in the X, Y and Z axes of orientation, the worst case in X-axis of orientation was recorded)

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
Low Channel: 5745MHz								
5650.00	53.20	---	150.0	V	52.0	6.4	68.20	15.00
5700.00	52.84	---	150.0	H	357.0	6.5	105.20	52.36
5720.00	54.07	---	150.0	V	247.0	6.5	110.80	56.73
5725.00	61.17	---	150.0	H	62.0	6.5	122.20	61.03
High Channel: 5825MHz								
5850.00	61.05	---	150.0	H	75.0	6.7	122.20	61.15
5855.00	53.76	---	150.0	V	0.0	6.7	110.80	57.04
5875.00	55.96	---	150.0	V	50.0	6.8	105.20	49.24
5925.00	54.92	---	150.0	V	67.0	6.9	68.20	13.28

802.11n-HT20 Mode: (Pre-scan in the X, Y and Z axes of orientation, the worst case in X-axis of orientation was recorded)

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
Low Channel: 5745MHz								
5650.00	54.50	---	150.0	H	157.0	6.4	68.20	13.70
5700.00	54.08	---	150.0	H	348.0	6.5	105.20	51.12
5720.00	54.74	---	150.0	H	0.0	6.5	110.80	56.06
5725.00	64.22	---	150.0	H	357.0	6.5	122.20	57.98
High Channel: 5825MHz								
5850.00	60.32	---	150.0	H	2.0	6.7	122.20	61.88
5855.00	55.37	---	150.0	H	107.0	6.7	110.80	55.43
5875.00	54.71	---	150.0	V	281.0	6.8	105.20	50.49
5925.00	54.30	---	150.0	V	84.0	6.9	68.20	13.90

802.11n-HT40 Mode: (Pre-scan in the X, Y and Z axes of orientation, the worst case in X-axis of orientation was recorded)

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
Low Channel: 5755MHz								
5650.00	53.84	---	150.0	H	181.0	6.4	68.20	14.36
5700.00	58.79	---	150.0	H	165.0	6.5	105.20	46.41
5720.00	64.32	---	150.0	H	41.0	6.5	110.80	46.48
5725.00	66.03	---	150.0	H	84.0	6.5	122.20	56.17
High Channel: 5795MHz								
5850.00	55.86	---	150.0	H	40.0	6.7	122.20	66.34
5855.00	54.82	---	150.0	H	242.0	6.7	110.80	55.98
5875.00	53.53	---	150.0	V	61.0	6.8	105.20	51.67
5925.00	53.00	---	150.0	V	297.0	6.9	68.20	15.20

FCC §15.407(a) & §15.407(e)–EMISSION BANDWIDTH

Applicable Standard

The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

Test Procedure

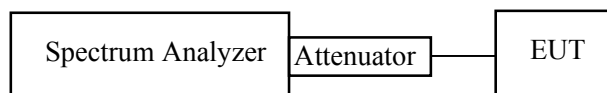
1. Emission Bandwidth (EBW)

- a) Set RBW = approximately 1% of the emission bandwidth.
- b) Set the VBW > RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission.
Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

2. Minimum Emission Bandwidth for the band 5.725-5.85 GHz

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.725-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

- 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:	23.5 °C
Relative Humidity:	52 %
ATM Pressure:	101. 3 kPa

The testing was performed by Jack Jiao on 2021-01-06.

Test Result: Compliant

5150-5250 MHz:

Test mode	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
802.11a	5180	20.040	16.914
	5200	20.120	16.994
	5240	20.120	16.994
802.11n-HT20	5180	21.563	17.876
	5200	20.200	17.796
	5240	20.601	17.796
802.11n-HT40	5190	53.066	36.393
	5230	50.180	36.553

5250-5350 MHz:

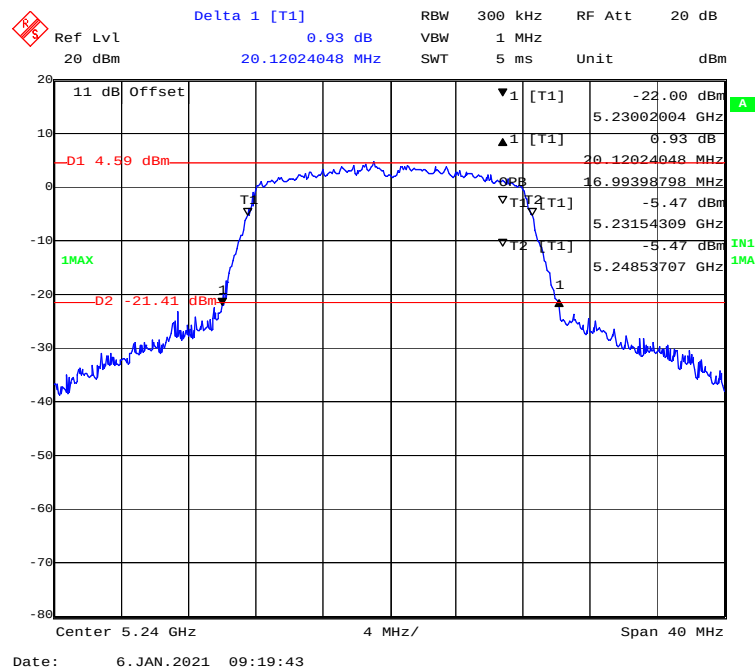
Test mode	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)
802.11a	5260	20.120	16.914	≥0.5
	5280	20.040	16.914	≥0.5
	5320	19.880	16.914	≥0.5
802.11n-HT20	5260	20.120	17.876	≥0.5
	5280	20.281	17.796	≥0.5
	5320	20.200	17.876	≥0.5
802.11n-HT40	5270	41.202	36.393	≥0.5
	5310	40.401	36.393	≥0.5

5750-5850 MHz:

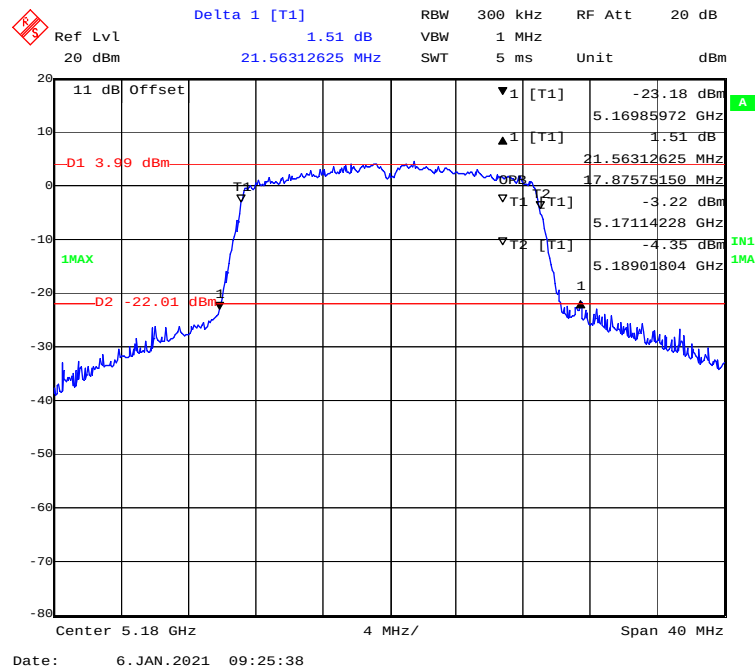
Test mode	Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)
802.11a	5745	16.593	17.074	≥ 0.5
	5785	16.593	17.074	≥ 0.5
	5825	16.513	17.074	≥ 0.5
802.11n-HT20	5745	17.796	17.956	≥ 0.5
	5785	17.715	17.956	≥ 0.5
	5825	17.796	17.956	≥ 0.5
802.11n-HT40	5755	36.553	36.553	≥ 0.5
	5795	36.553	36.393	≥ 0.5

Note: No transmitted signal in the 99% bandwidth extends into U-NII-2C band.

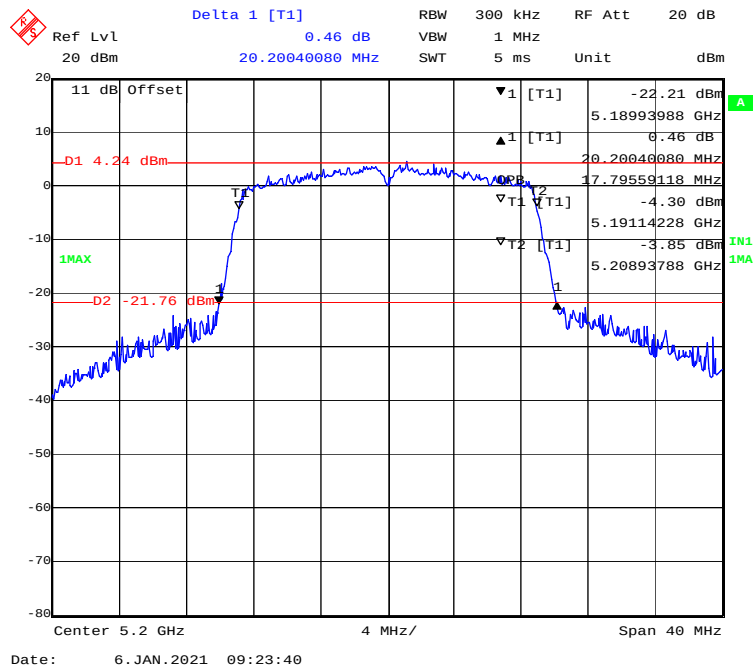
802.11a mode, 5240MHz



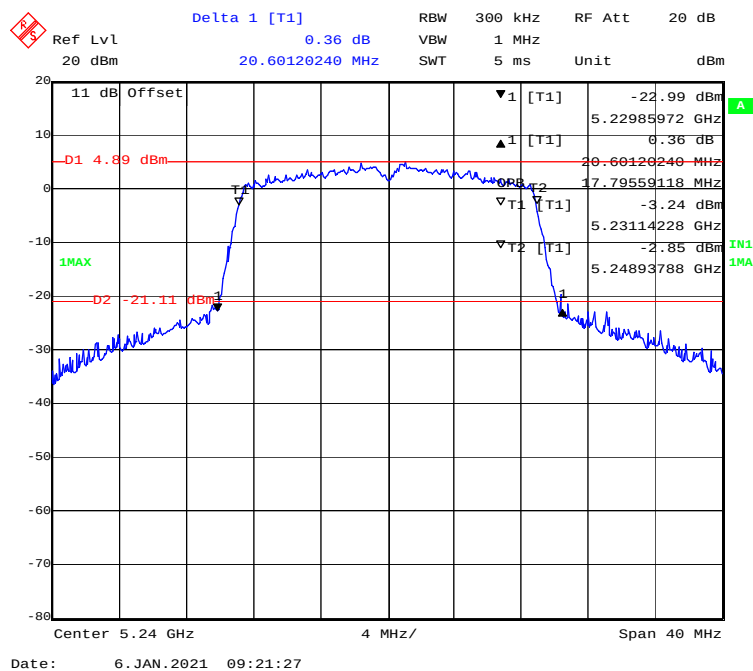
802.11n-HT20 mode, 5180MHz



802.11n-HT20 mode, 5200MHz



802.11n-HT20 mode, 5240MHz



Delta 1 [T1] 0.78 dB

Ref Lvl 20 dBm

53.06613226 MHz

RBW 500 kHz

SWT 2 MHz

RF Att 20 dB

Unit dBm

11 dB Offset

D1 4.61 dBm

1MAX

D2 -21.39 dBm

▼1 [T1] -21.95 dBm

▲1 [T1] 0.78 dB

53.06613226 MHz

OPB T2 36.39278557 MHz

▽T1 [T1] -2.08 dBm

5.17196393 GHz

▽T2 [T1] -1.85 dBm

5.20835671 GHz

1

Center 5.19 GHz

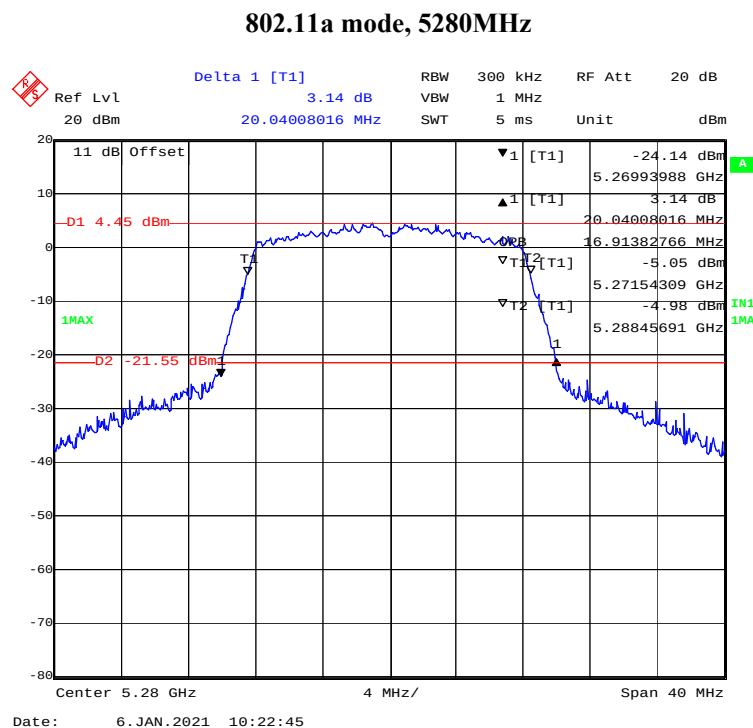
8 MHz/

Span 80 MHz

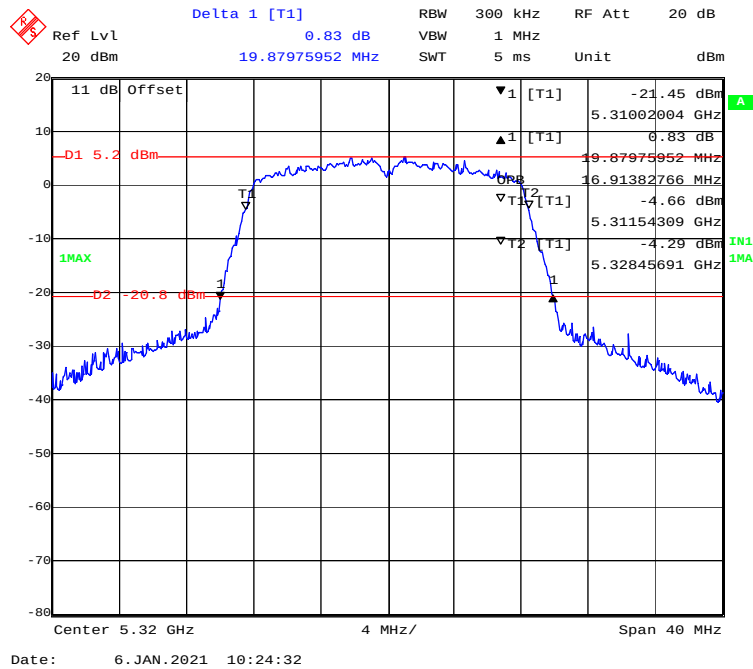
Date: 6. JAN. 2021 09:27:27

[illegible]

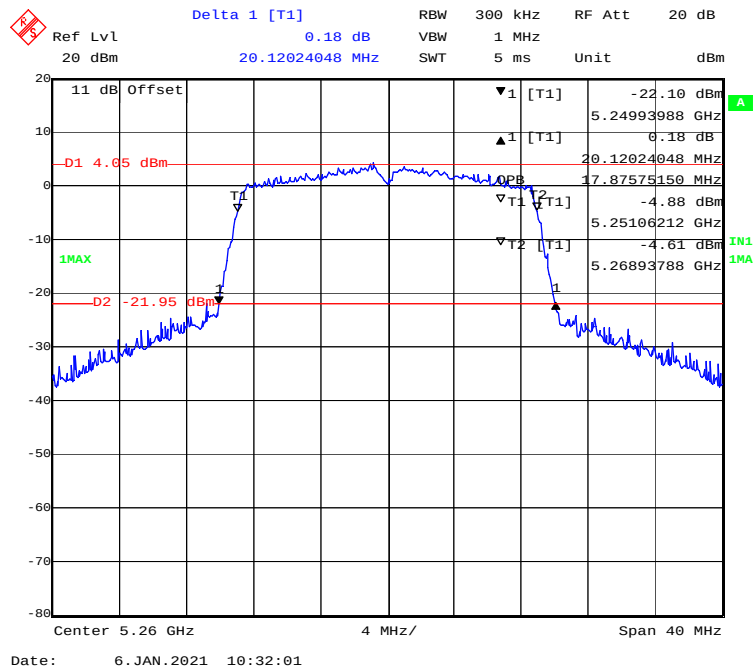
802.11a mode, 5260MHz



802.11a mode, 5320MHz



802.11n-HT20 mode, 5260MHz



Delta 1 [T1]

Ref Lvl 20 dBm

1.49 dB

RBW 300 kHz

RF Att 20 dB

20.28056112 MHz

SWT 5 ms

Unit dBm

11 dB Offset

D1 4.65 dBm

D2 -21.35 dBm

1MAX

▼1 [T1] -22.73 dBm

▲1 [T1] 1.49 dBm

▽T1 [T1] -1.96 dBm

▽T2 [T1] -3.42 dBm

5.26985972 GHz

5.28056112 MHz

5.27114228 GHz

5.28893788 GHz

Center 5.28 GHz

4 MHz/

Span 40 MHz

Date: 6. JAN. 2021 10:30:22

Delta 1 [T1]

Ref Lvl 20 dBm

2.19 dB

20.20040080 MHz

RBW 300 kHz

VBW 1 MHz

SWT 5 ms

RF Att 20 dB

Unit dBm

11 dB Offset

D1 4.57 dBm

1MAX

D2 -21.43 dBm

▼1 [T1]

▲1 [T1]

GRS

▼T1 [T1]

▼T2 [T1]

1

-23.04 dBm

5.30985972 GHz

2.19 dB

20.20040080 MHz

17.87575150 MHz

-3.70 dBm

5.31106212 GHz

-3.64 dBm

5.32893788 GHz

IN1

1MA

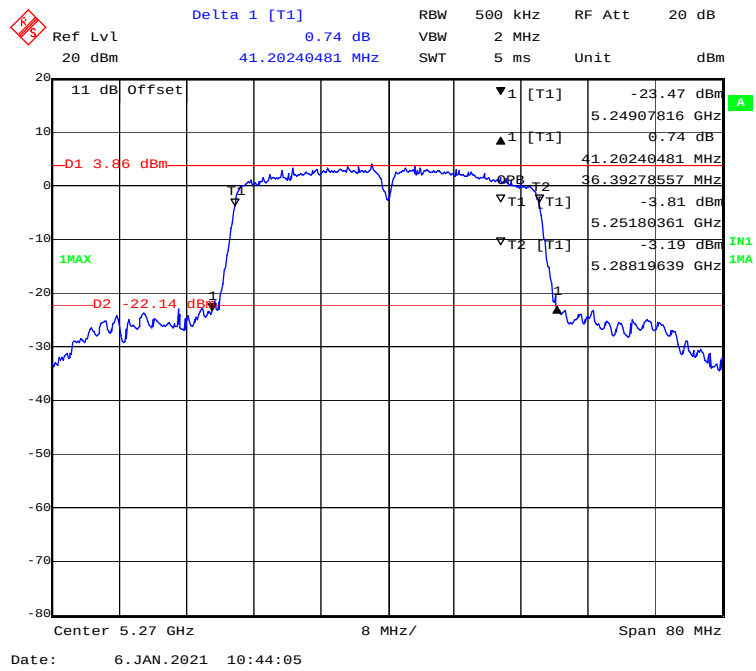
Center 5.32 GHz

4 MHz/

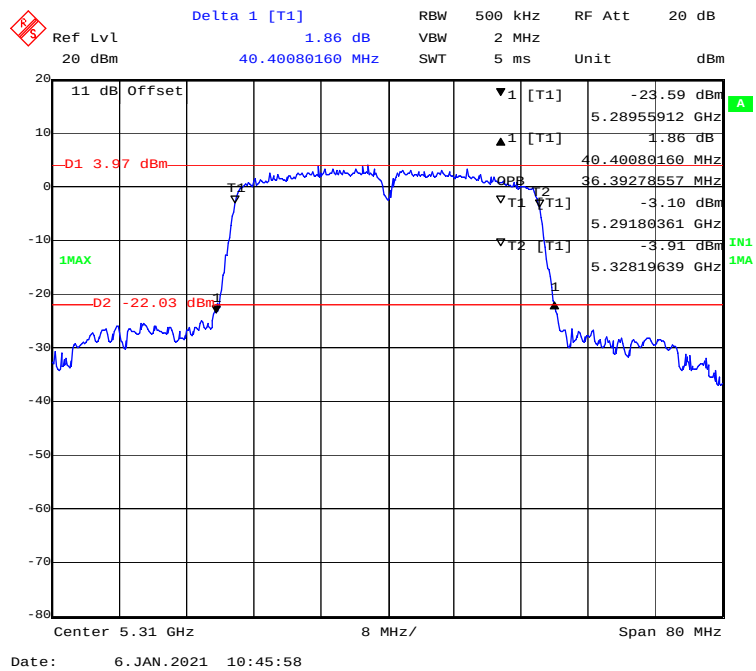
Span 40 MHz

Date: 6. JAN. 2021 10:28:52

802.11n-HT40 mode, 5270MHz

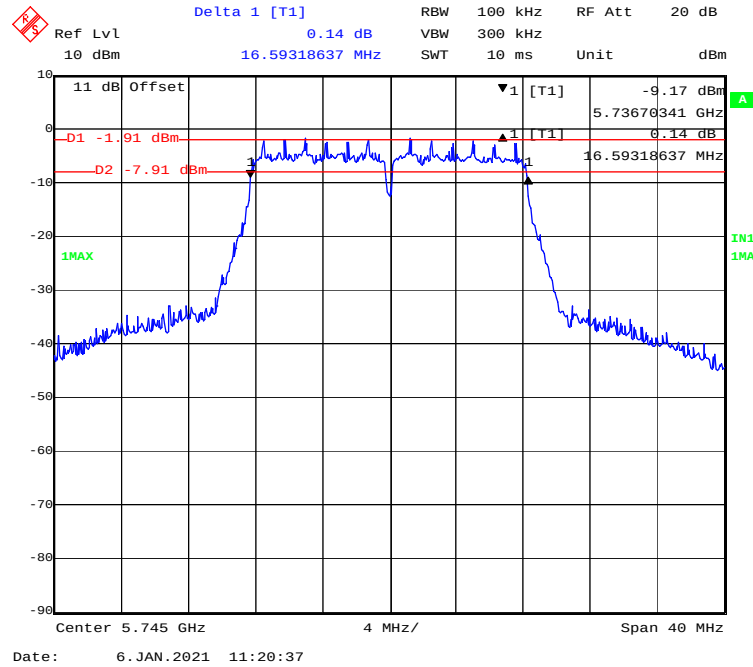


802.11n-HT40 mode, 5310MHz

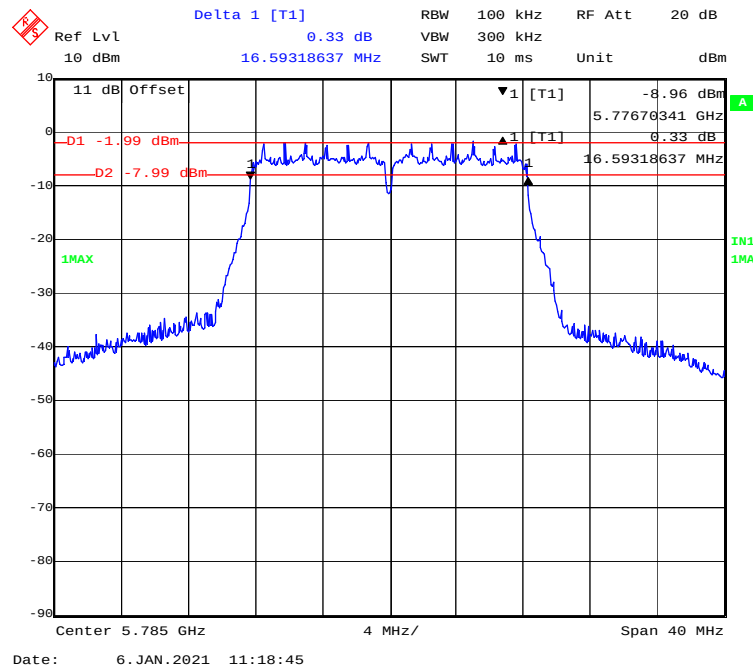


6 Bandwidth
5725-5850 MHz Band:

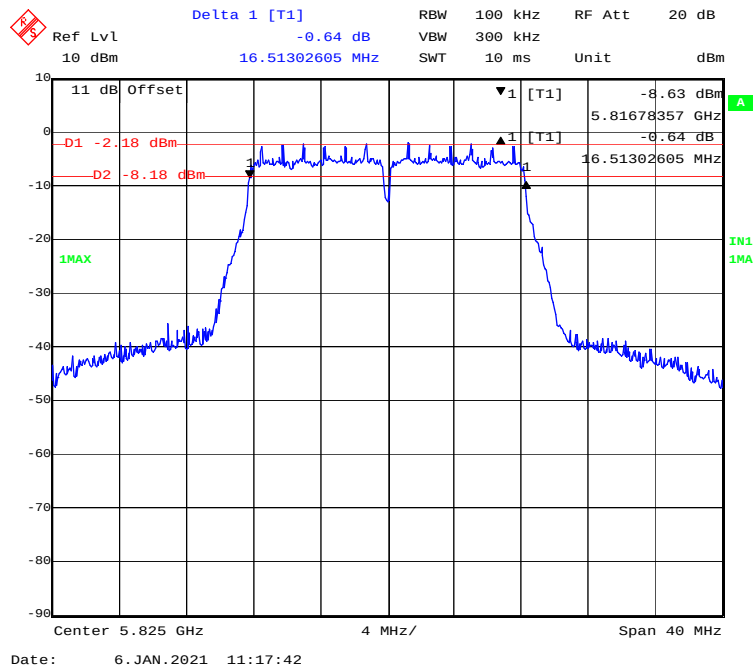
802.11a mode, 5745MHz



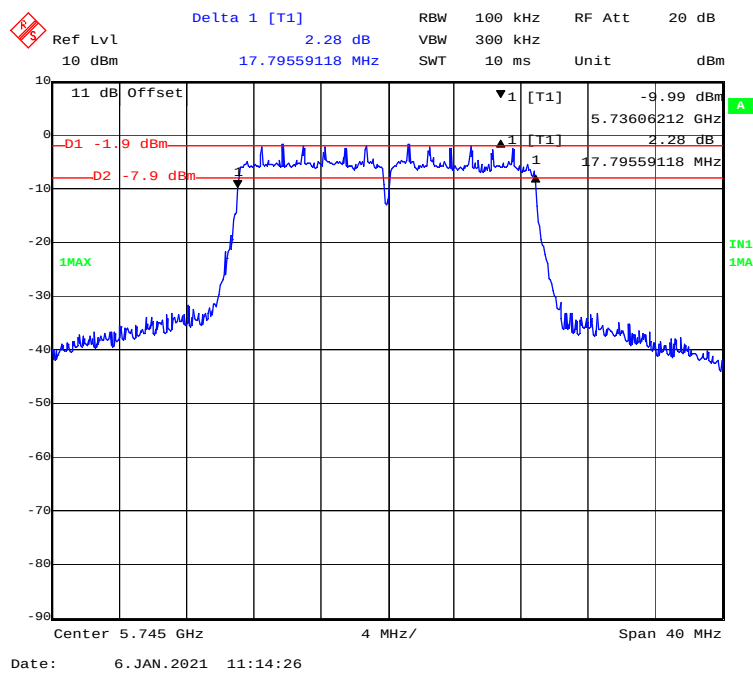
802.11a mode, 5785MHz



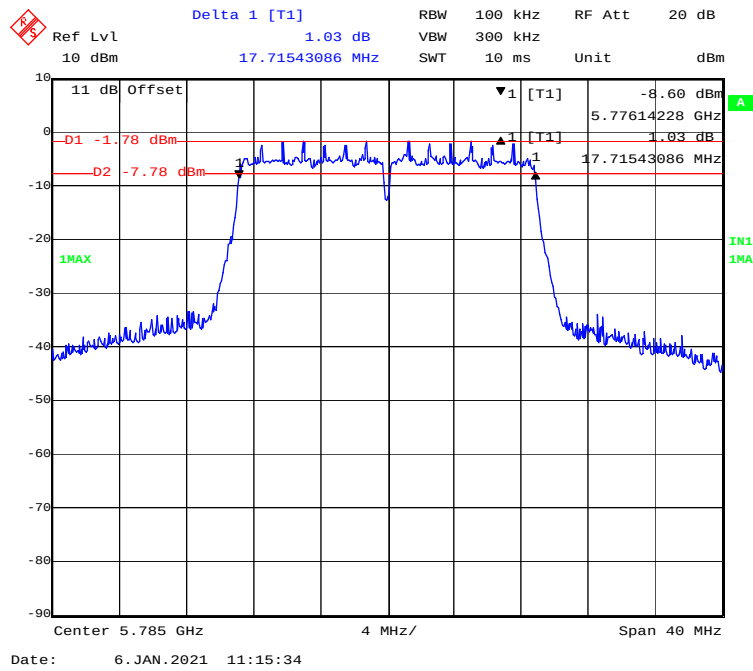
802.11a mode, 5825MHz



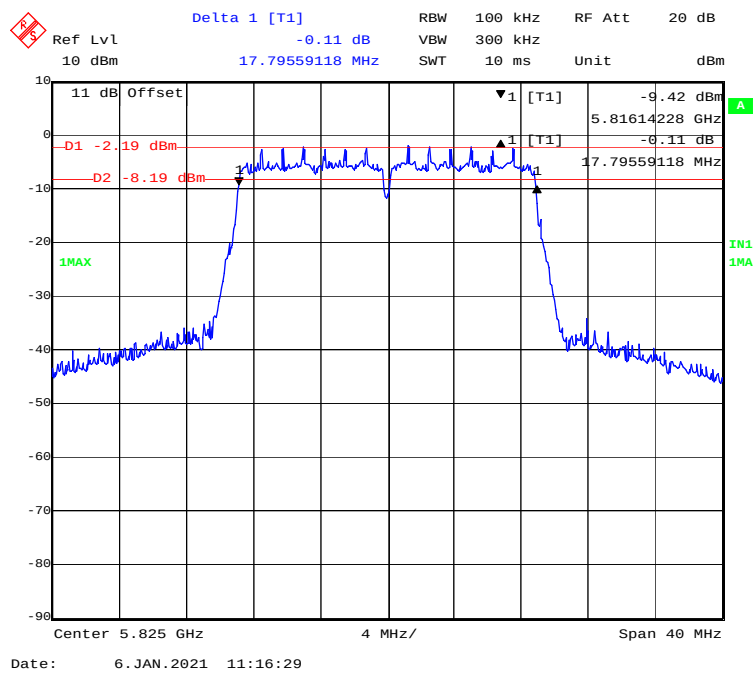
802.11n-HT20 mode, 5745MHz



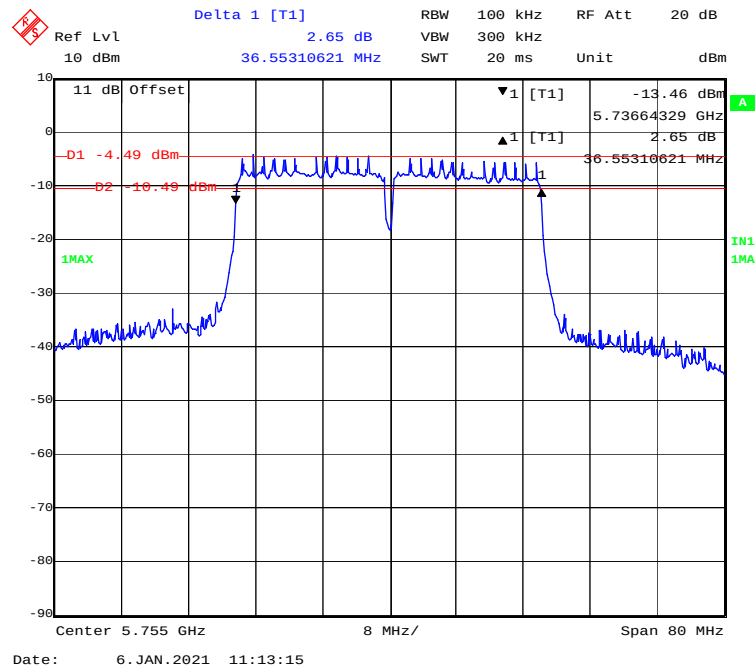
802.11n-HT20 mode, 5785MHz



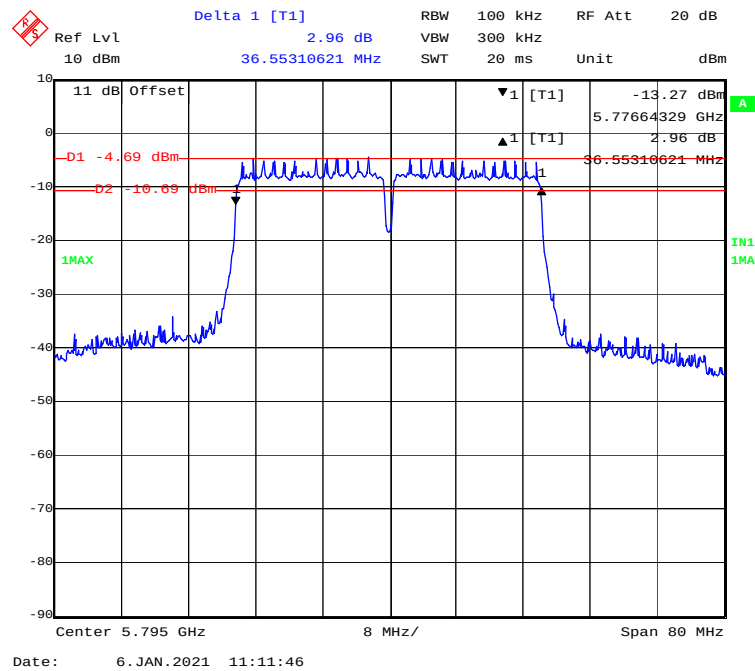
802.11n-HT20 mode, 5825MHz



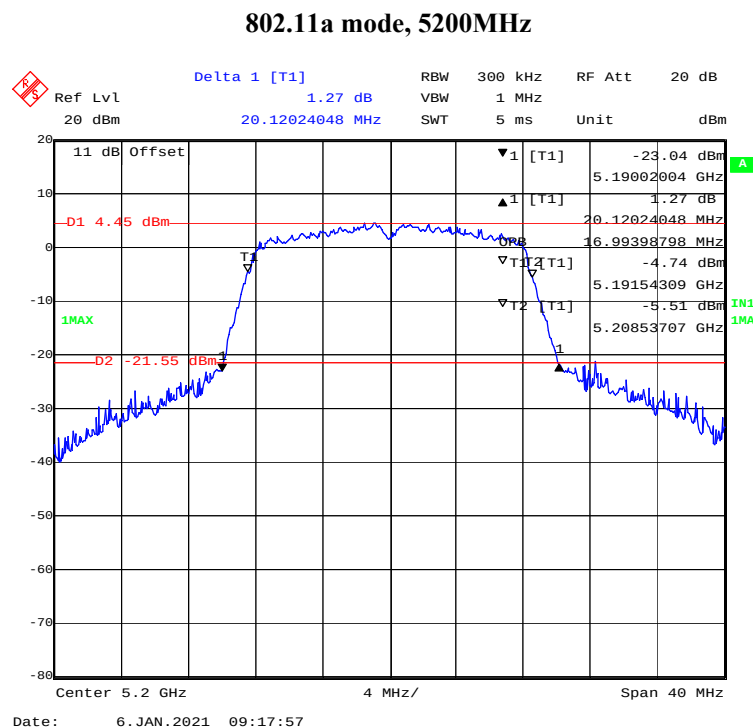
802.11n-HT40 mode, 5755MHz



802.11n-HT40 mode, 5795MHz



802.11a mode, 5180MHz



[illegible]

Ref Lvl 20 dBm
 Delta 1 [T1] 1.51 dB
 RBW 300 kHz
 RF Att 20 dB
 Unit dBm
 SWT 5 ms

11 dB Offset
 D1 3.99 dBm
 D2 -22.01 dBm
 1MAX

▼1 [T1] -23.18 dBm
 ▲1 [T1] 1.51 dB
 21.56312625 MHz
 5.16985972 GHz
 17.87575150 MHz
 ∇T1 [T1] -3.22 dBm
 ∇T2 [T1] -4.35 dBm
 5.17114228 GHz
 5.18991804 GHz

Center 5.18 GHz
 4 MHz/
 Span 40 MHz

Date: 6. JAN. 2021 09:25:38

Delta 1 [T1]

Ref Lvl 0.46 dB

20 dBm

20.20040080 MHz

RBW 300 kHz

SWT 5 ms

RF Att 20 dB

Unit dBm

11 dB Offset

D1 4.24 dBm

1MAX

D2 -21.76 dBm

▼1 [T1] -22.21 dBm

▲1 [T1] 0.46 dB

20.20040080 MHz

▼T1 [T1] 17.79559118 MHz

▼T1 [T1] -4.30 dBm

▼T2 [T1] 5.19114228 GHz

▼T2 [T1] -3.85 dBm

1 5.20893788 GHz

IN1

1MA

Center 5.2 GHz

4 MHz/

Span 40 MHz

Date: 6. JAN. 2021 09:23:40

Delta 1 [T1]

Ref Lvl 20 dBm RBW 300 kHz RF Att 20 dB Unit dBm

20.60120240 MHz

11 dB Offset

D1 4.89 dBm

1MAX

D2 -21.11 dBm

▼1 [T1] -22.99 dBm

▲1 [T1] 0.36 dB

20.60120240 MHz

5.22985972 GHz

17.79559118 MHz

▼T1 [T1] -3.24 dBm

5.23114228 GHz

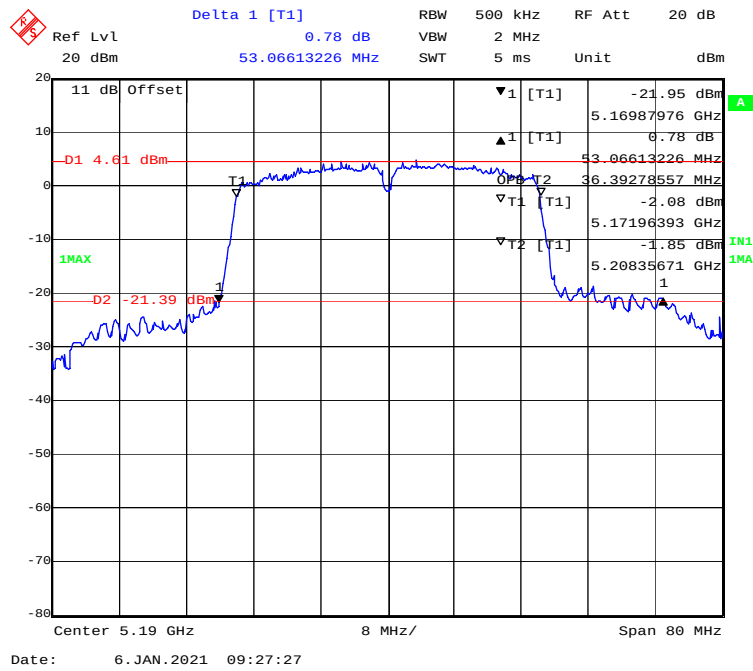
▼T2 [T1] -2.85 dBm

5.24893788 GHz

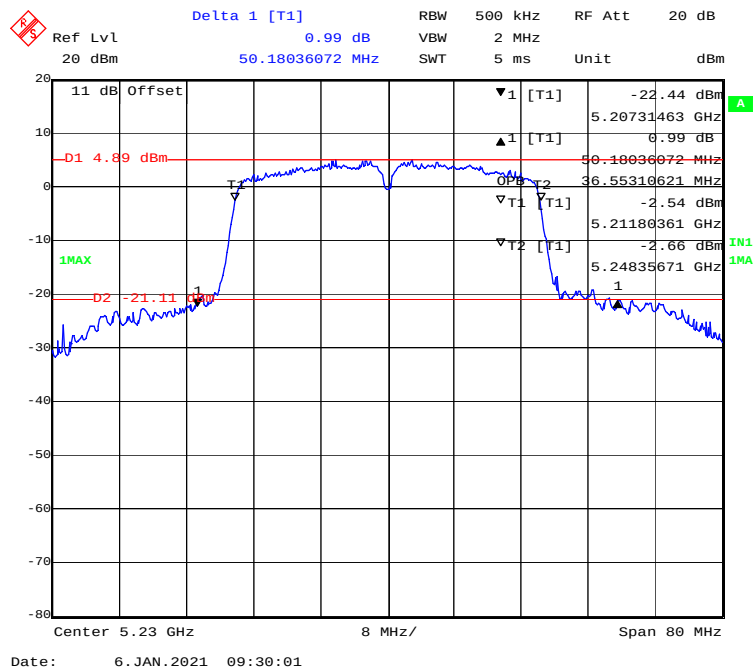
Center 5.24 GHz 4 MHz/ Span 40 MHz

Date: 6. JAN. 2021 09:21:27

802.11n-HT40 mode, 5190MHz

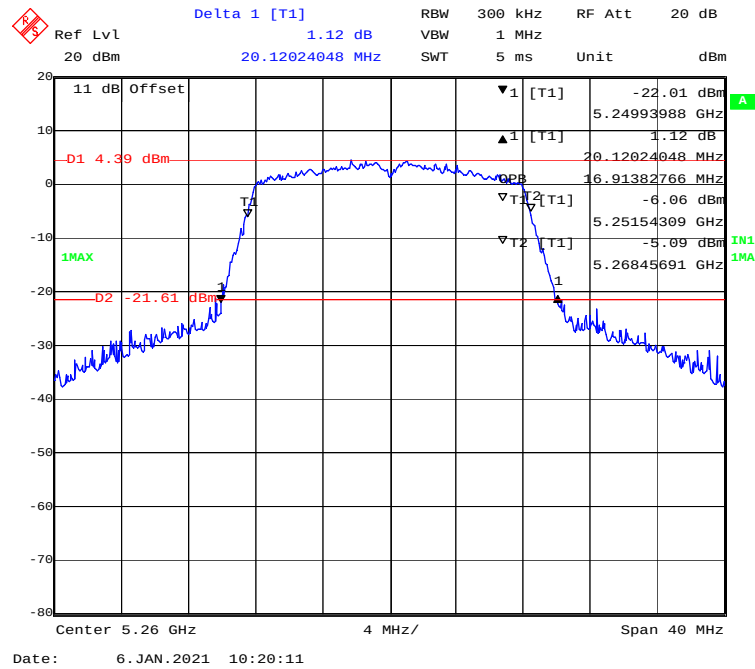


802.11n-HT40 mode, 5230MHz

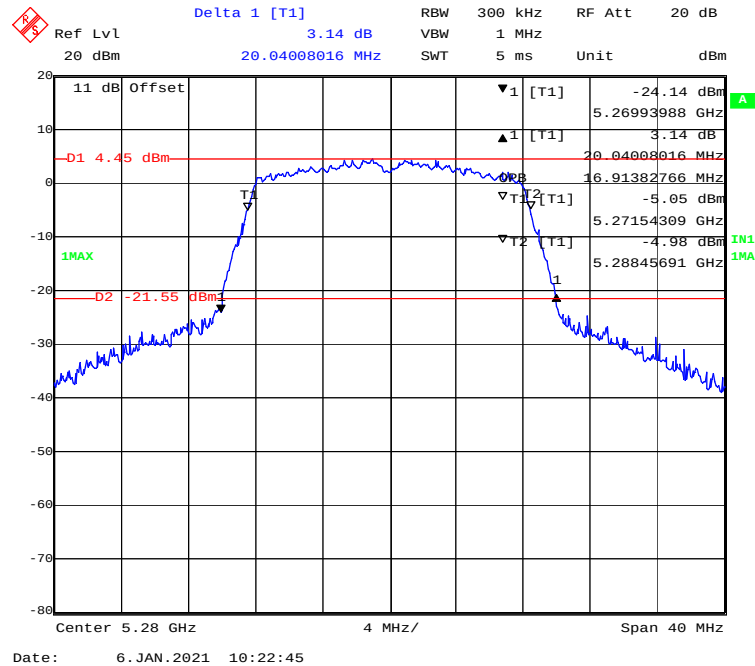


5250-5350 MHz Band:

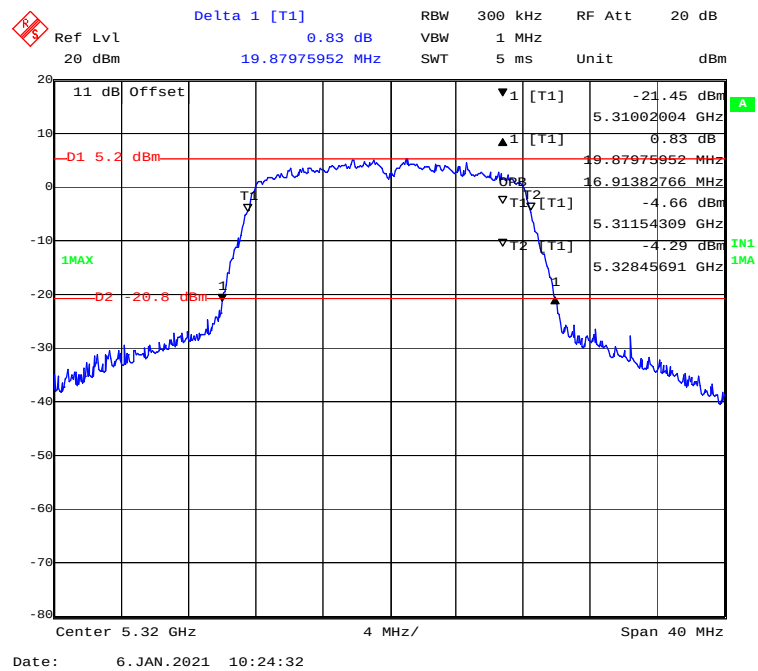
802.11a mode, 5260MHz



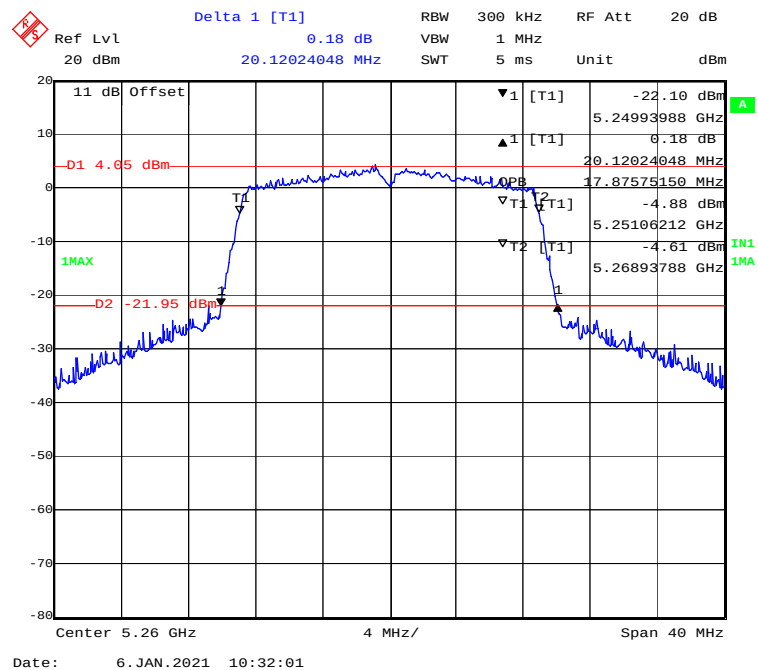
802.11a mode, 5280MHz



802.11a mode, 5320MHz



802.11n-HT20 mode, 5260MHz



Delta 1 [T1] 2.19 dB

RBW 300 kHz RF Att 20 dB

Ref Lvl 20 dBm

20.20040080 MHz

SWT 5 ms Unit dBm

11 dB Offset

D1 4.57 dBm

1MAX

D2 -21.43 dBm

▼1 [T1] -23.04 dBm

▲1 [T1] 2.19 dB

20.20040080 MHz

▽T1 [T1] -3.70 dBm

▽T2 [T1] -3.64 dBm

5.30985972 GHz

5.31106212 GHz

5.32893788 GHz

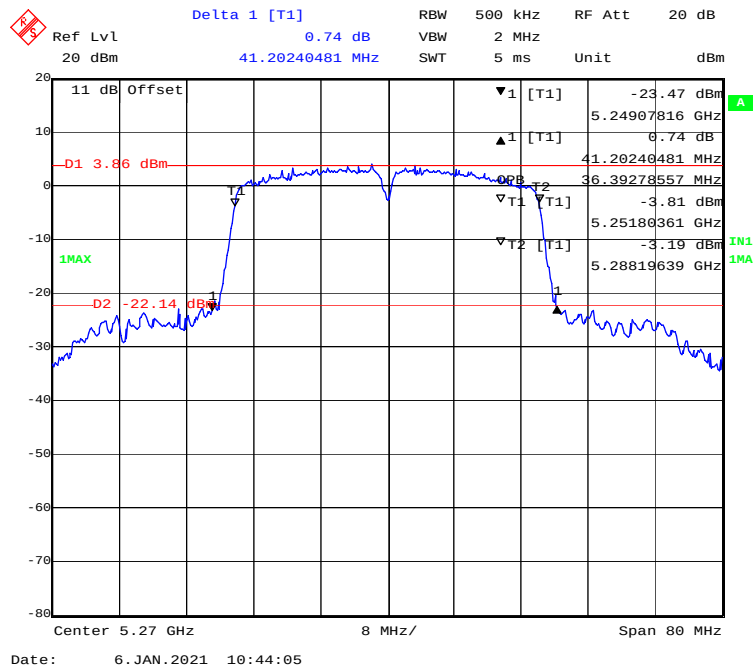
Center 5.32 GHz

4 MHz/

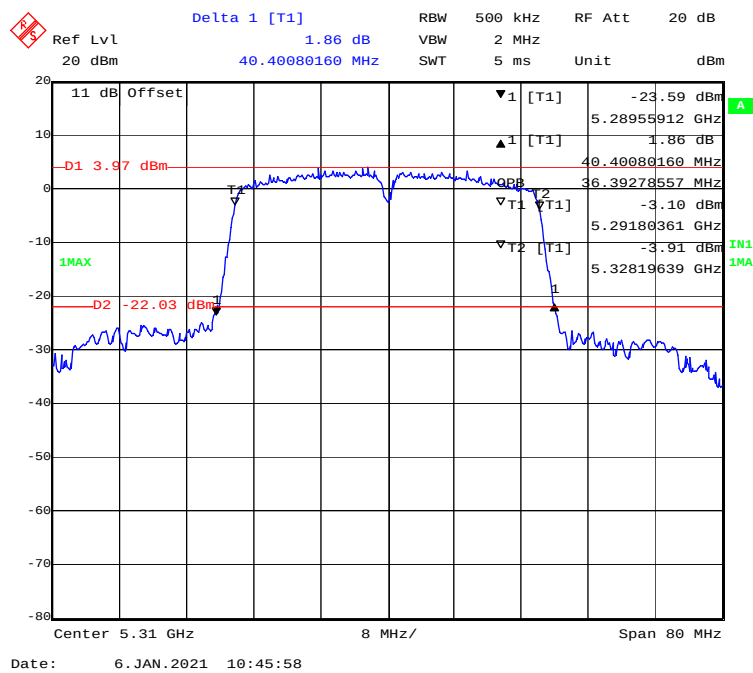
Span 40 MHz

Date: 6 JAN 2021 10:28:52

802.11n-HT40 mode, 5270MHz

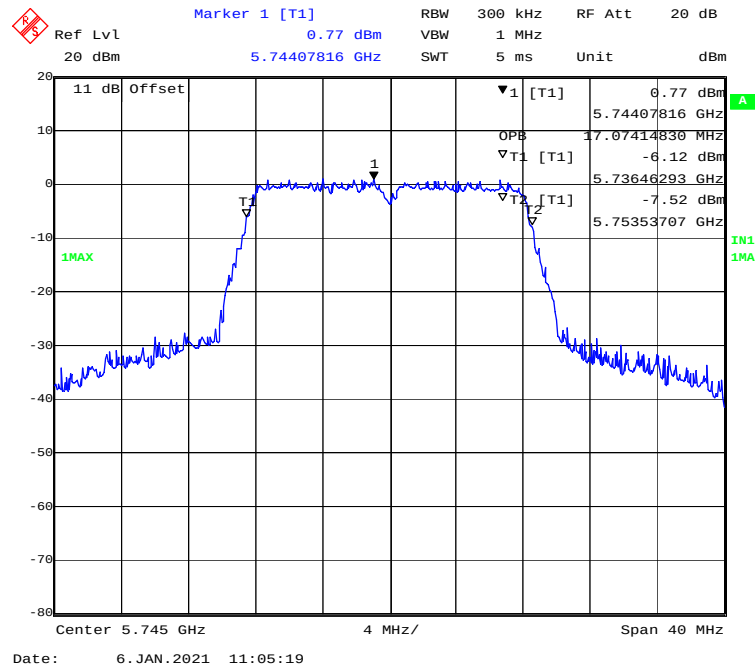


802.11n-HT40 mode, 5310MHz

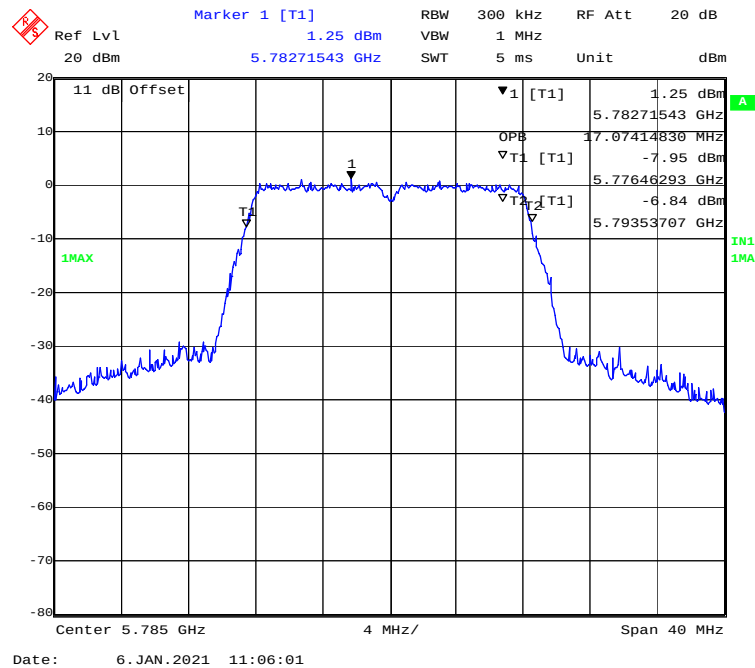


5725-5850 MHz Band:

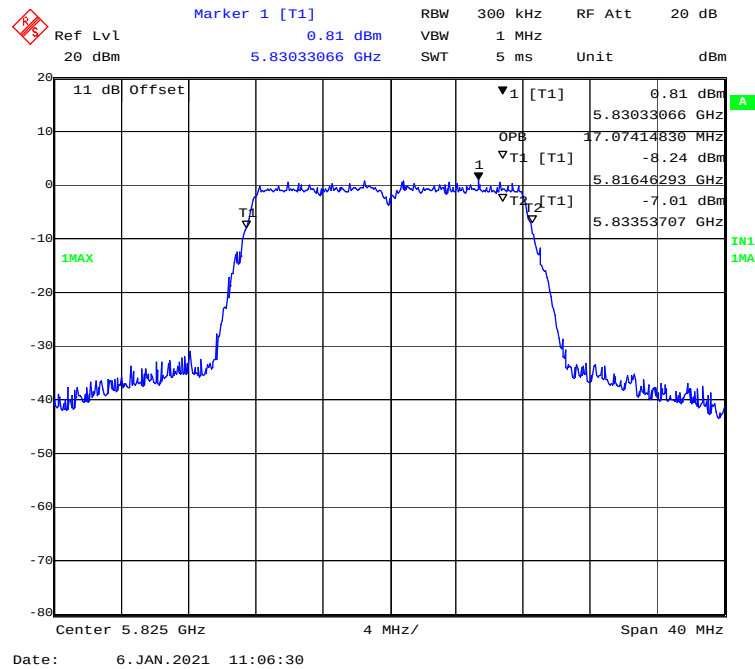
802.11a mode, 5745MHz



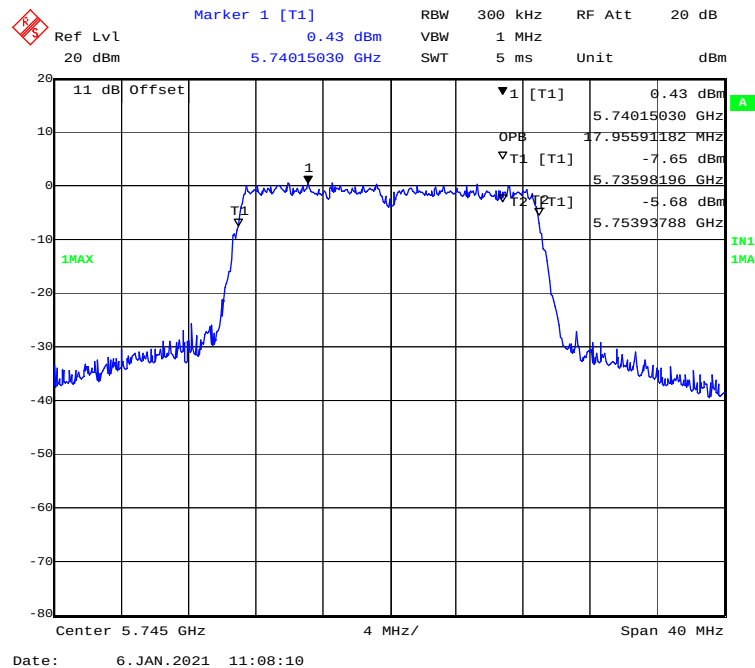
802.11a mode, 5785MHz



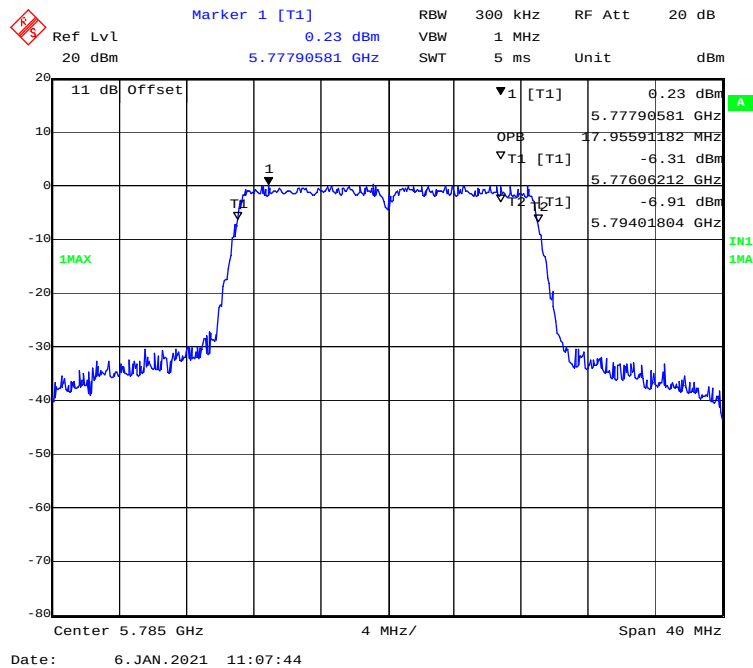
802.11a mode, 5825MHz



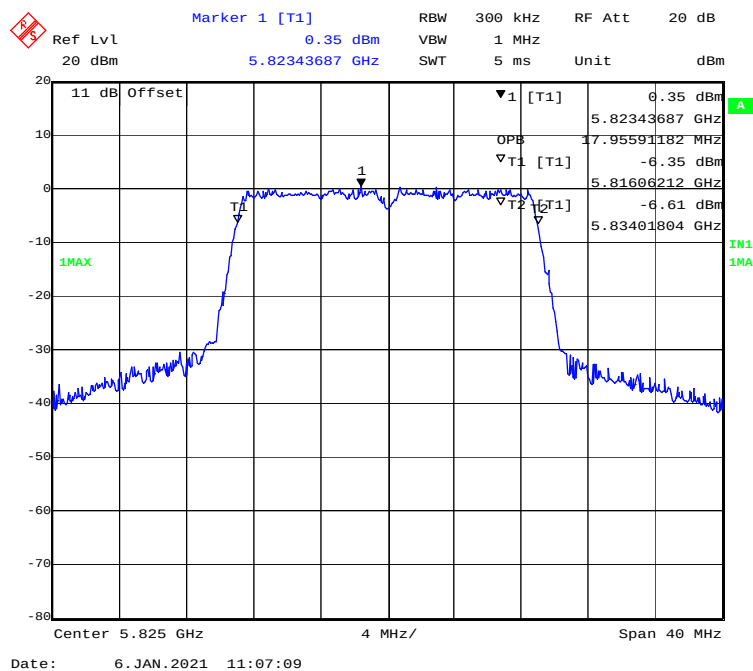
802.11n-HT20 mode, 5745MHz



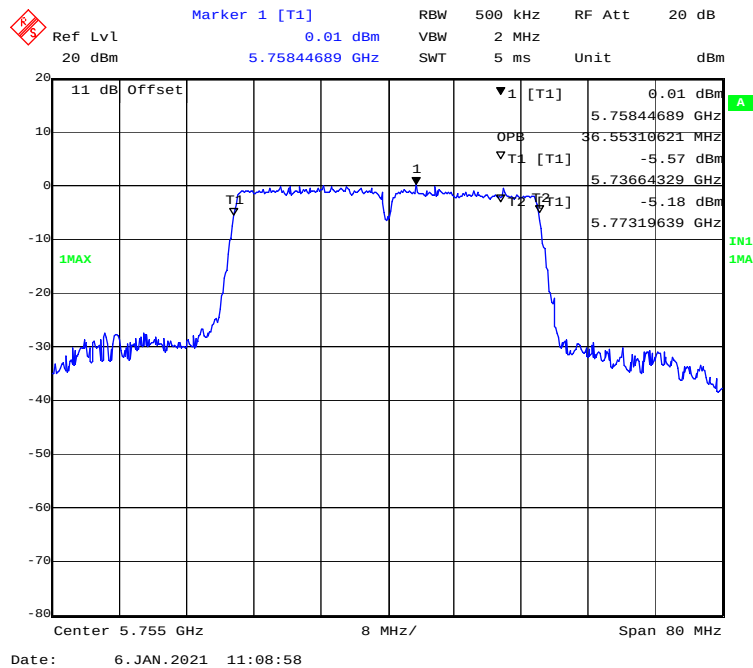
802.11n-HT20 mode, 5785MHz



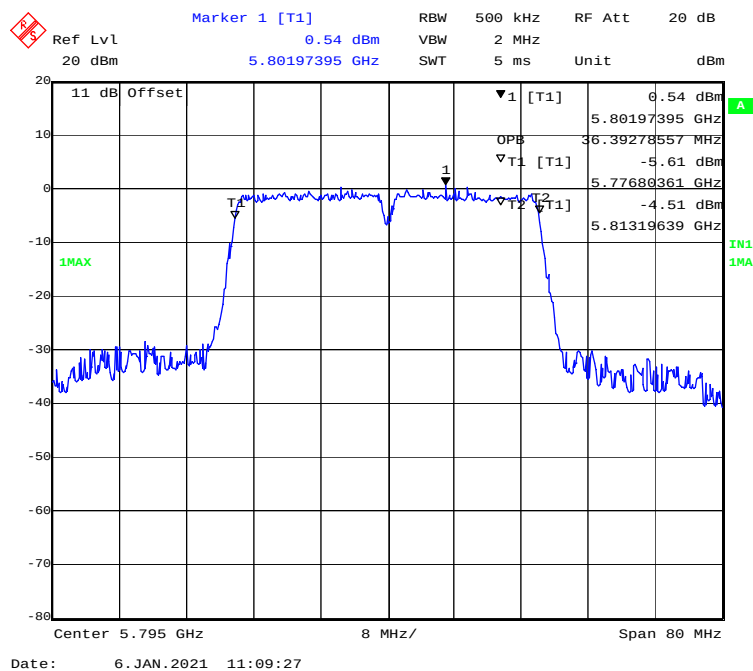
802.11n-HT20 mode, 5825MHz



802.11n-HT40 mode, 5755MHz



802.11n-HT40 mode, 5795MHz



FCC §15.407(a) (1) (2) (3) – CONDUCTED TRANSMITTER OUTPUT POWER**Applicable Standard**

According to §15.407(a)(1)

(iv) For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to §15.407(a)(2)

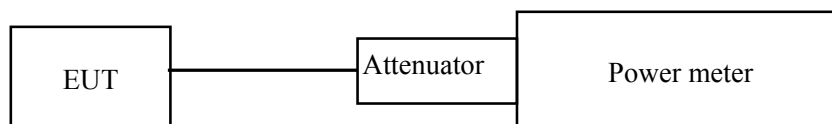
For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to §15.407(a) (3)

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

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 one test equipment.
3. Add a correction factor to the display.



Test Data**Environmental Conditions**

Temperature:	23.5 °C
Relative Humidity:	52 %
ATM Pressure:	101.3 kPa

The testing was performed by Jack Jiao on 2021-01-06.

Test Mode: Transmitting

Test mode	Band	Channel	Frequency (MHz)	Average Conducted Output Power (dBm)	Limit	Result
802.11a	5150-5250 MHz	Low	5180	12.58	24	PASS
		Middle	5200	12.19	24	PASS
		High	5240	13.24	24	PASS
	5250-5350 MHz	Low	5260	12.39	24	PASS
		Middle	5280	13.12	24	PASS
		High	5320	12.85	24	PASS
	5725-5850 MHz	Low	5745	10.27	30	PASS
		Middle	5785	10.33	30	PASS
		High	5825	10.09	30	PASS
802.11n-HT20	5150-5250 MHz	Low	5180	12.48	24	PASS
		Middle	5200	12.88	24	PASS
		High	5240	12.50	24	PASS
	5250-5350 MHz	Low	5260	12.57	24	PASS
		Middle	5280	12.14	24	PASS
		High	5320	12.56	24	PASS
	5725-5850 MHz	Low	5745	10.40	30	PASS
		Middle	5785	10.29	30	PASS
		High	5825	10.06	30	PASS
802.11n-HT40	5150-5250 MHz	Low	5190	13.76	24	PASS
		High	5230	14.23	24	PASS
	5250-5350 MHz	Low	5270	12.96	24	PASS
		High	5310	12.37	24	PASS
	5725-5850 MHz	Low	5755	10.57	30	PASS
		High	5795	10.45	30	PASS

Note: The maximum antenna gain is 1.84dBi.

FCC §15.407(a) (1) (2) (3) - POWER SPECTRAL DENSITY**Applicable Standard**

According to §15.407(a) (1)

(iv) For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to §15.407(a)(2)

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to §15.407(a) (3)

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

Test Procedure

The measurements are base on FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices section F: Maximum power spectral density (PPSD)

Test Data**Environmental Conditions**

Temperature:	23.5 °C
Relative Humidity:	52 %
ATM Pressure:	101. 3 kPa

The testing was performed by Jack Jiao on 2021-01-06.

Test Mode: Transmitting

5150MHz-5250MHz:

Mode	Channel	Frequency (MHz)	PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11a	Low	5180	2.98	11	PASS
	Middle	5200	2.27	11	PASS
	High	5240	2.62	11	PASS
802.11n-HT20	Low	5180	2.15	11	PASS
	Middle	5200	2.45	11	PASS
	High	5240	2.77	11	PASS
802.11n-HT40	Low	5190	0.45	11	PASS
	High	5230	0.30	11	PASS

5250MHz-5350MHz:

Mode	Channel	Frequency (MHz)	PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11a	Low	5260	2.95	11	PASS
	Middle	5280	2.95	11	PASS
	High	5320	3.16	11	PASS
802.11n-HT20	Low	5260	2.38	11	PASS
	Middle	5280	2.97	11	PASS
	High	5320	2.57	11	PASS
802.11n-HT40	Low	5270	-1.25	11	PASS
	High	5310	-1.30	11	PASS

5725MHz-5850MHz:

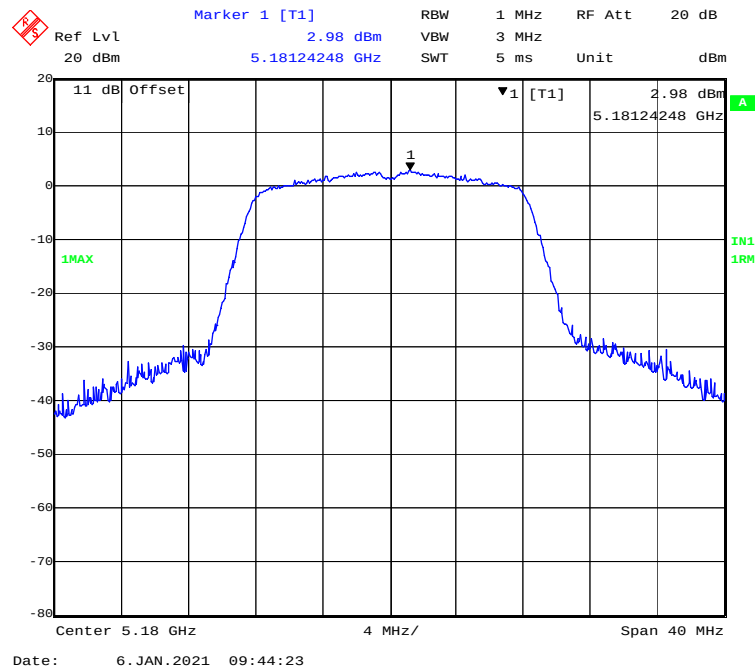
Mode	Channel	Frequency (MHz)	PSD (dBm/500kHz)	Limit (dBm/500kHz)	Result
802.11a	Low	5745	-1.84	30	PASS
	Middle	5785	-1.68	30	PASS
	High	5825	-1.83	30	PASS
802.11n-HT20	Low	5745	-1.74	30	PASS
	Middle	5785	-0.62	30	PASS
	High	5825	-2.05	30	PASS
802.11n-HT40	Low	5755	-4.32	30	PASS
	High	5795	-3.74	30	PASS

Note:

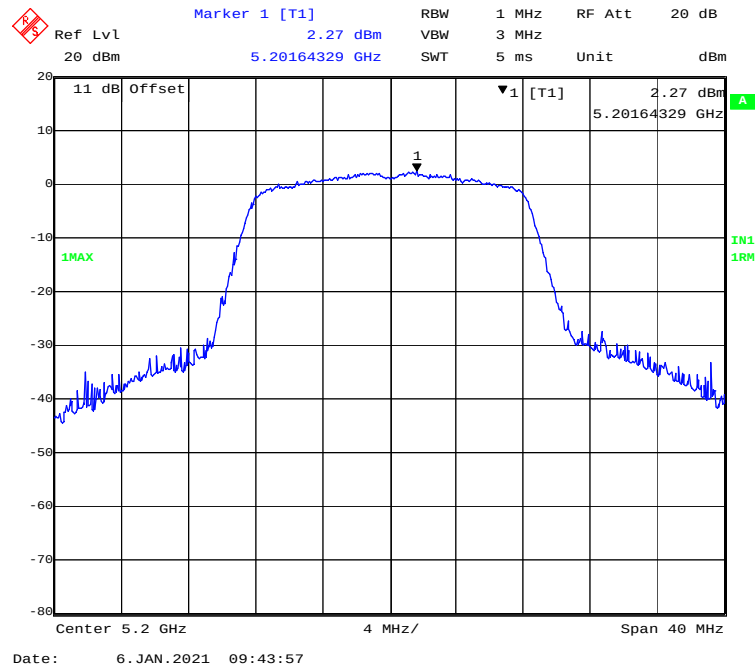
The maximum antenna gain is 1.84dBi.

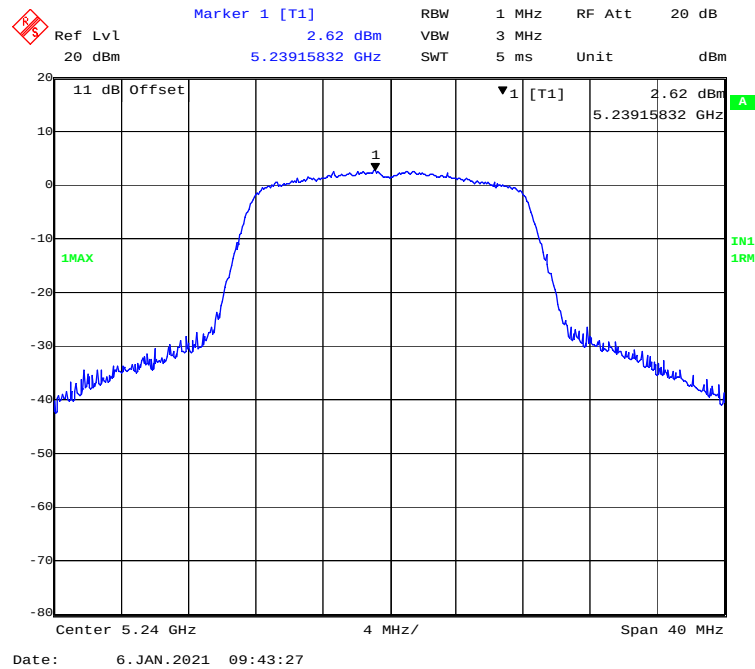
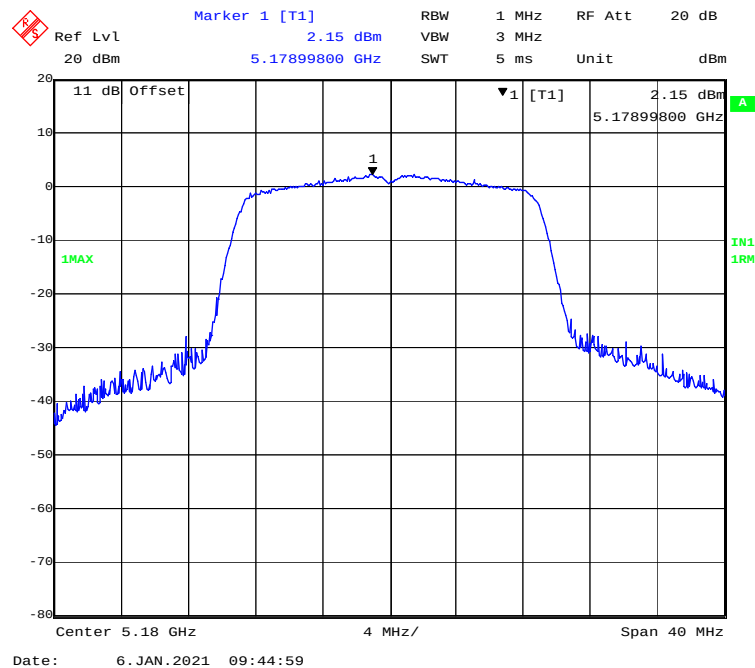
5150MHz-5250MHz:

802.11a mode, Power spectral density-5180MHz

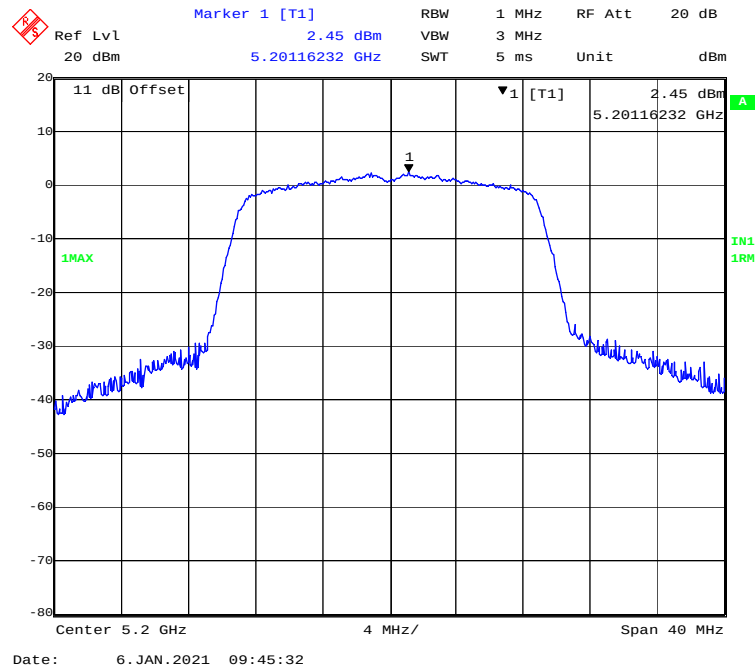


802.11a mode, Power spectral density-5200MHz

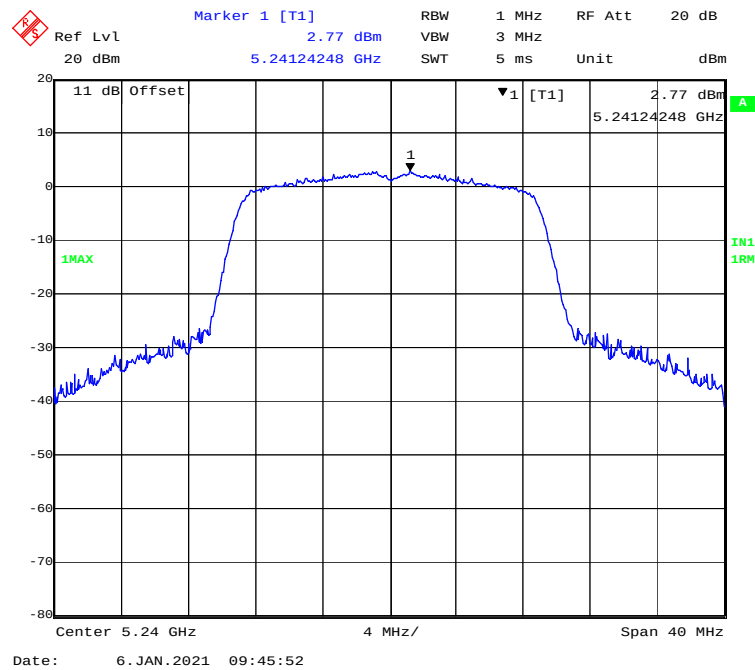


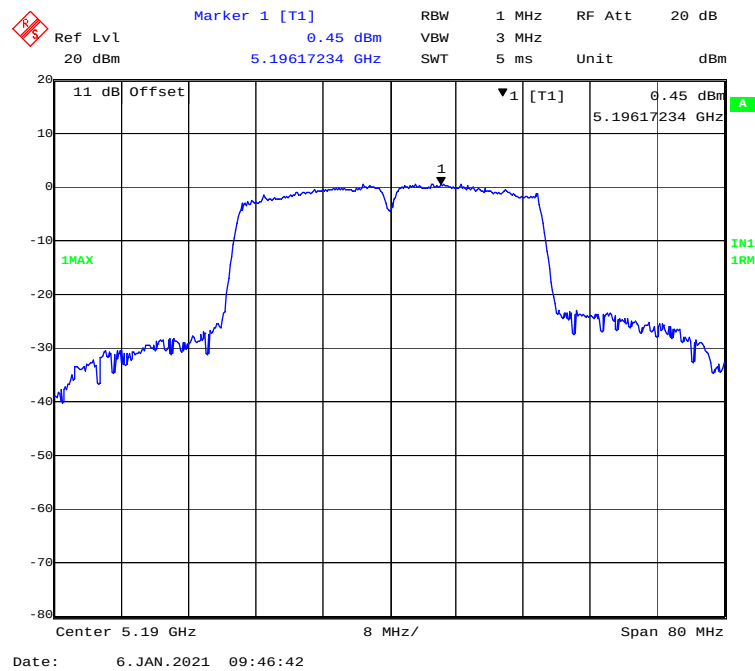
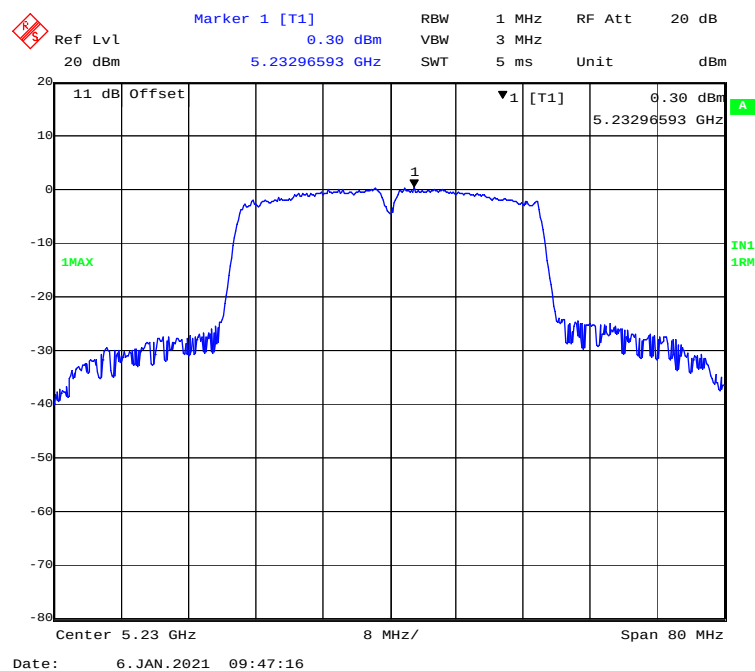
802.11a mode, Power spectral density-5240MHz**802.11n-HT20 mode, Power spectral density-5180MHz**

802.11n-HT20 mode, Power spectral density-5200MHz



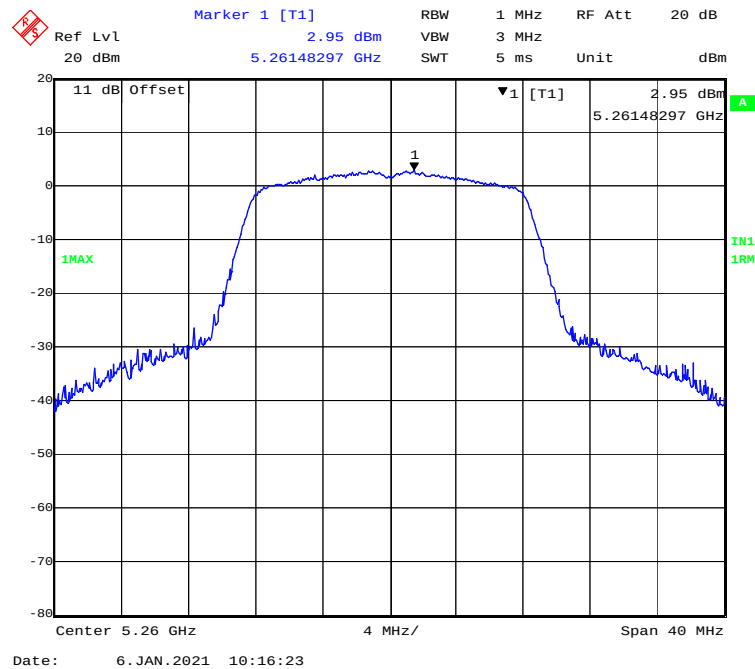
802.11n-HT20 mode, Power spectral density-5240MHz



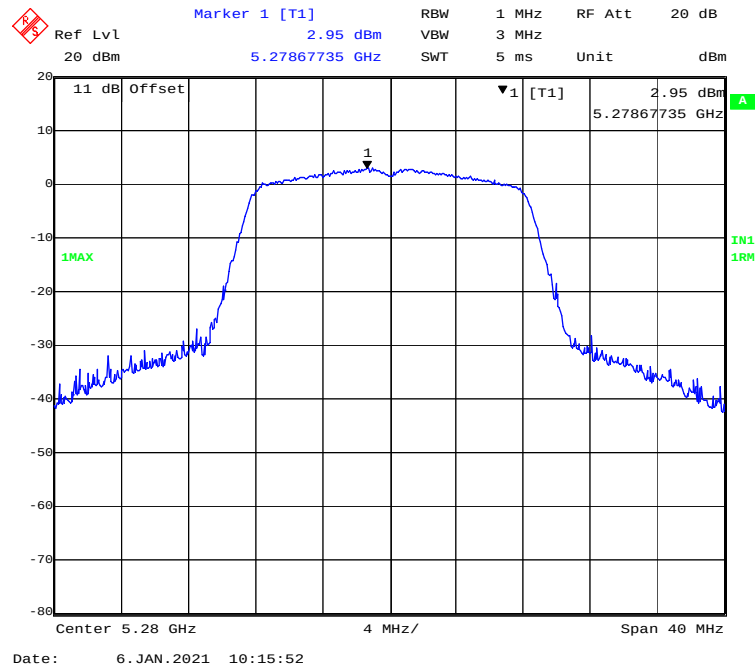
802.11n-HT40 mode, Power spectral density-5190MHz**802.11n-HT40 mode, Power spectral density-5230MHz**

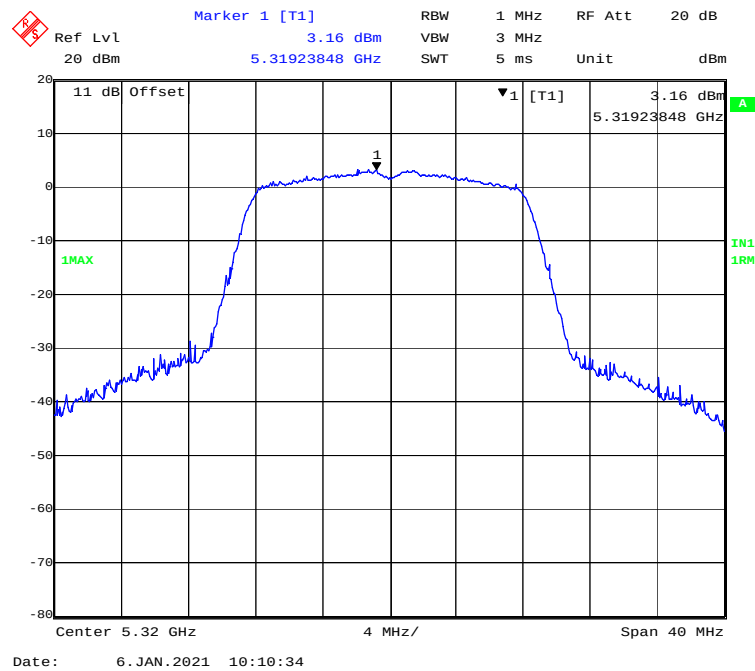
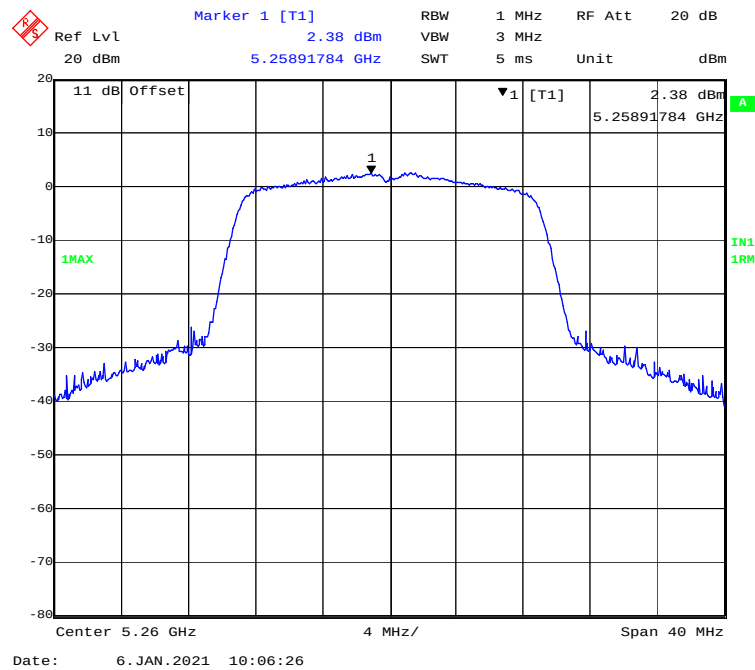
5250MHz-5350MHz:

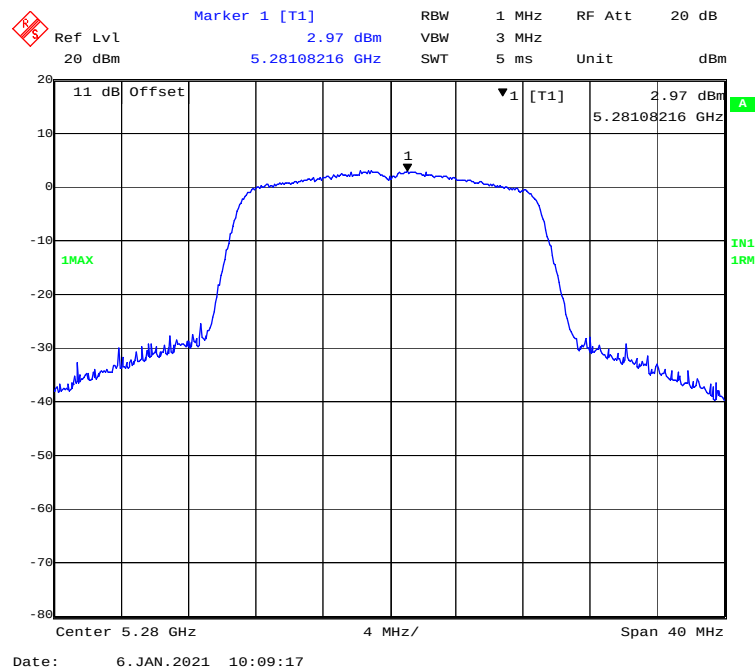
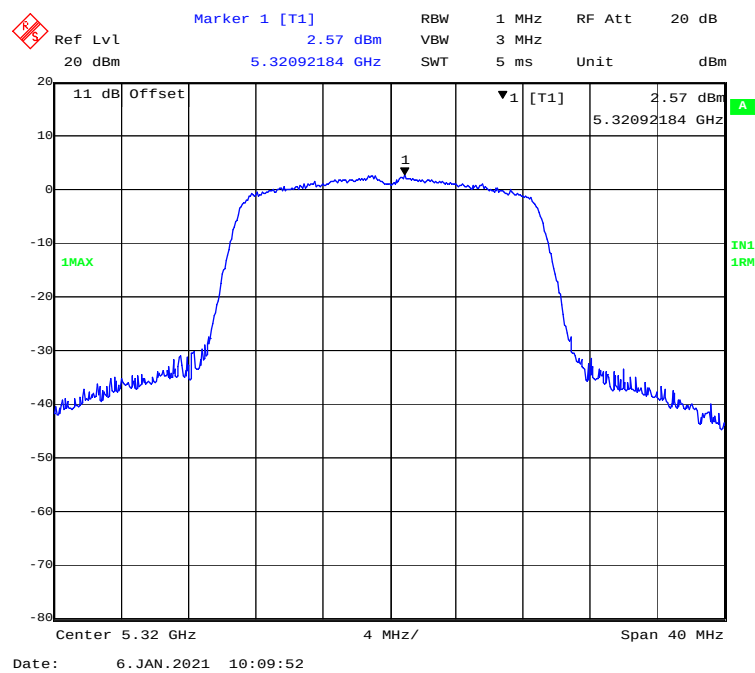
802.11a mode, Power spectral density-5260MHz



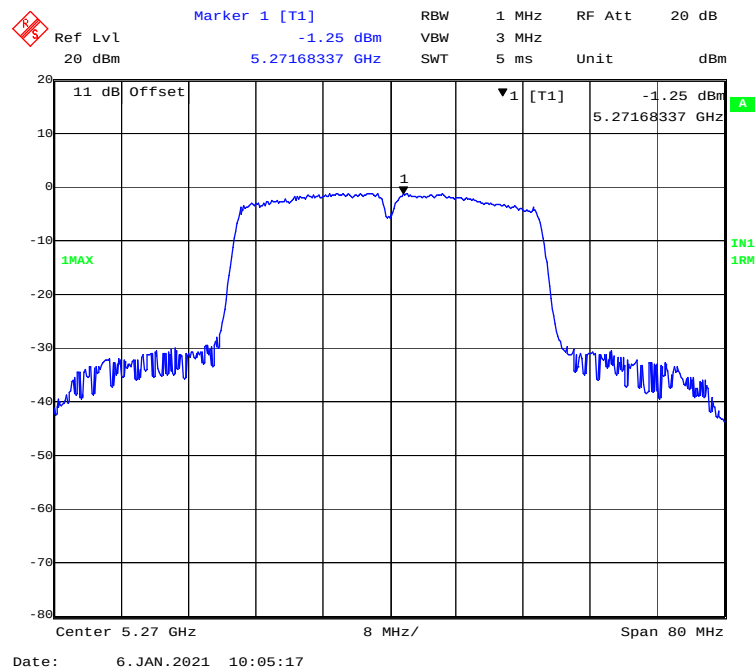
802.11a mode, Power spectral density-5280MHz



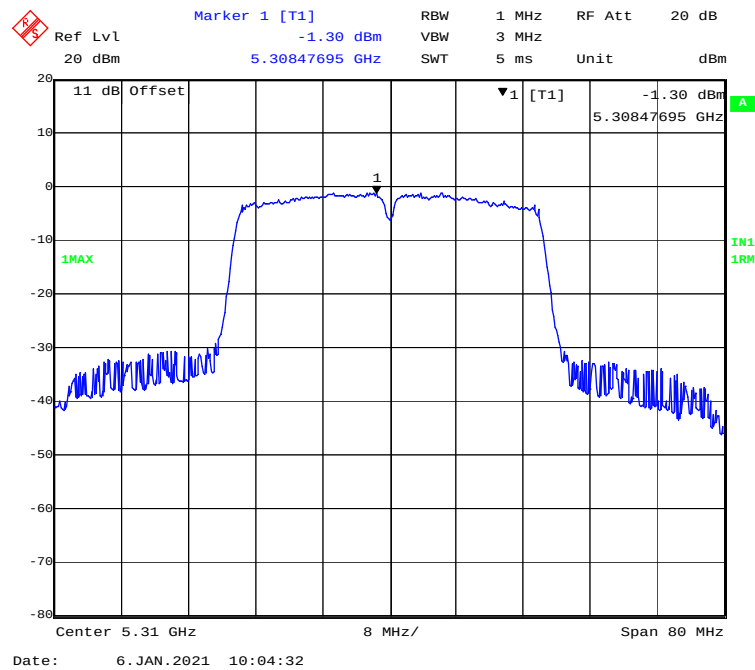
802.11a mode, Power spectral density-5320MHz**802.11n-HT20 mode, Power spectral density-5260MHz**

802.11n-HT20 mode, Power spectral density-5280MHz**802.11n-HT20 mode, Power spectral density-5320MHz**

802.11n-HT40 mode, Power spectral density-5270MHz

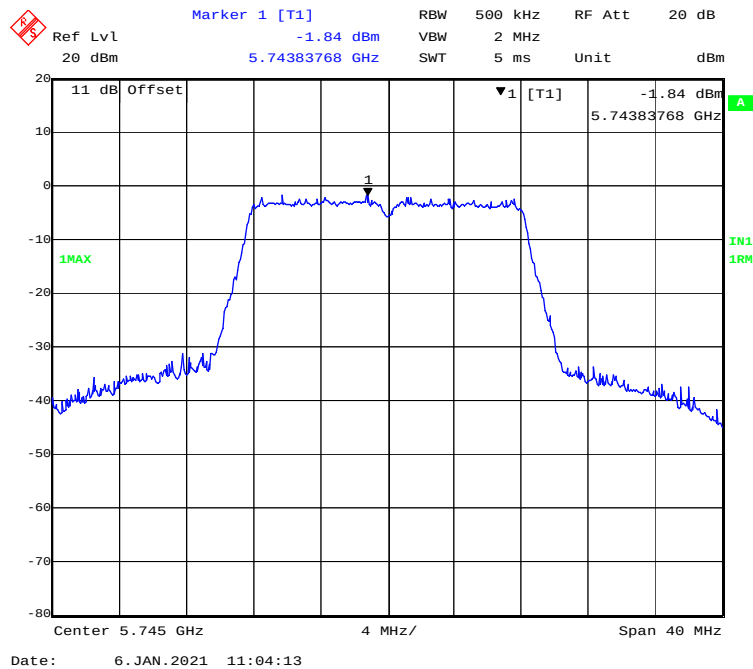


802.11n-HT40 mode, Power spectral density-5310MHz

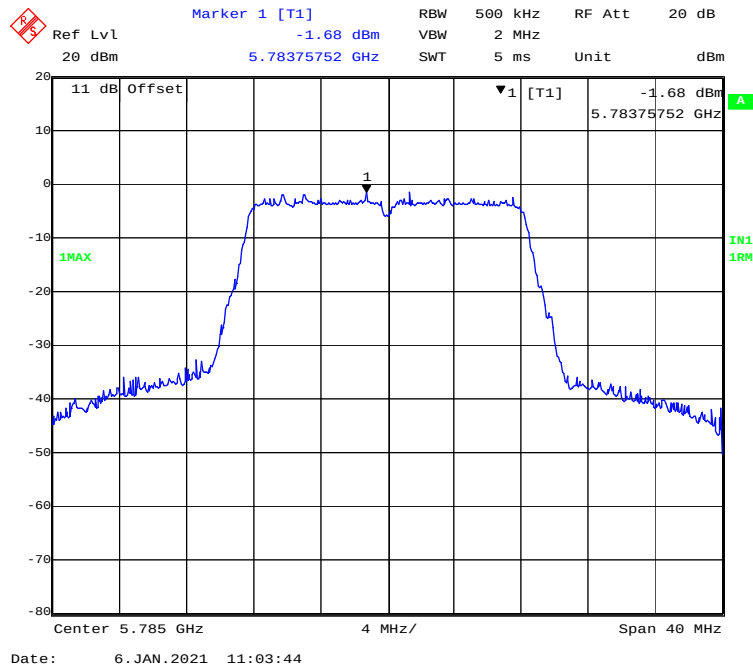


5725MHz-5850MHz:

802.11a mode, Power spectral density-5745MHz



802.11a mode, Power spectral density-5785MHz



Ref Lvl 20 dBm
 20 dBm
 11 dB Offset
 Marker 1 [T1]
 -1.83 dBm
 5.82632265 GHz
 RBW 500 kHz
 VBW 2 MHz
 SWT 5 ms
 RF Att 20 dB
 Unit dBm
 -1.83 dBm
 5.82632265 GHz
 1MAX
 IN1
 1RM
 Center 5.825 GHz
 4 MHz/
 Span 40 MHz
 Date: 6. JAN. 2021 11:01:52

Ref Lvl 20 dBm

Marker 1 [T1]

-1.74 dBm

5.74632265 GHz

RBW 500 kHz

VBW 2 MHz

SWT 5 ms

RF Att 20 dB

Unit dBm

11 dB Offset

▼1 [T1]

-1.74 dBm

5.74632265 GHz

1MAX

1

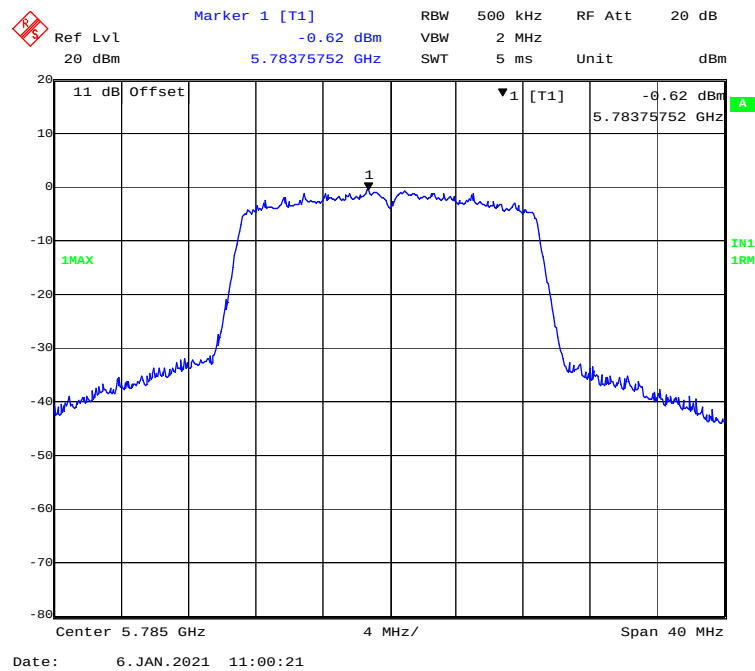
Center 5.745 GHz

Span 40 MHz

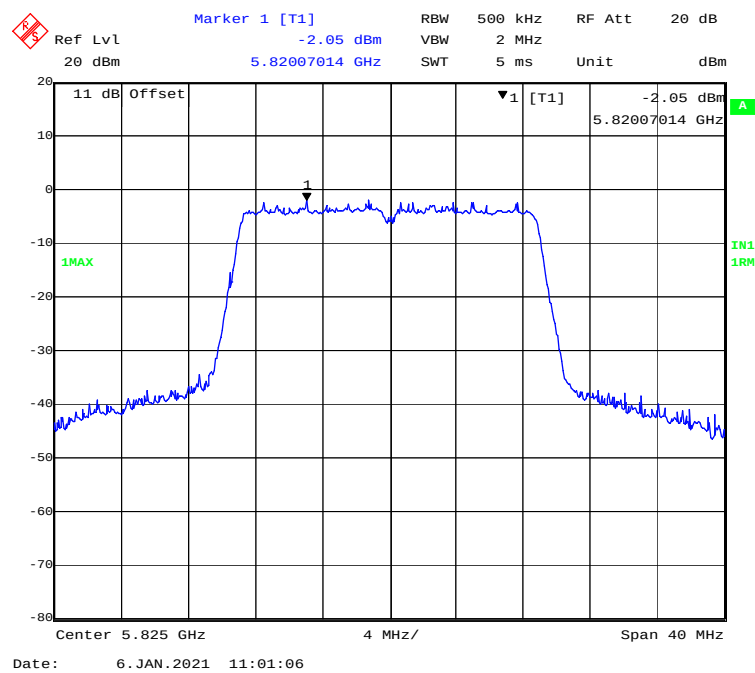
4 MHz/

Date: 6. JAN. 2021 10:59:33

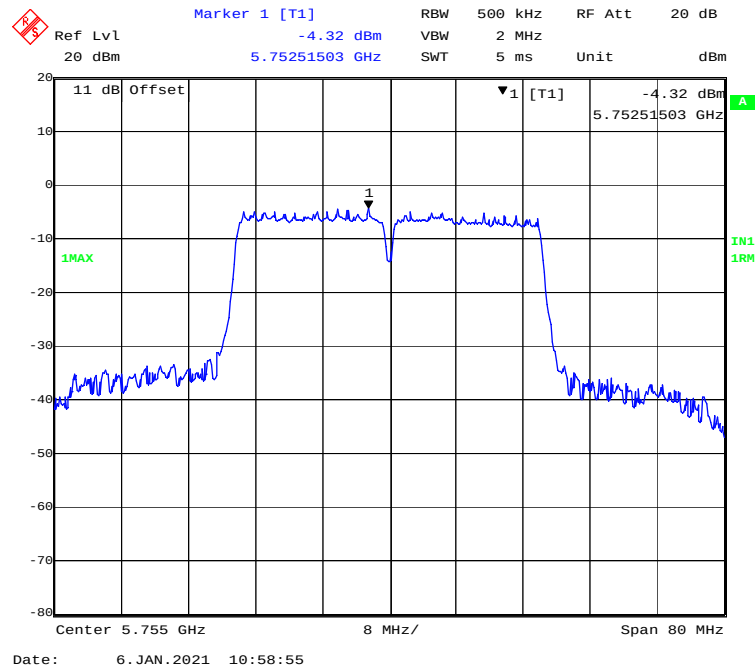
802.11n-HT20 mode, Power spectral density-5785MHz



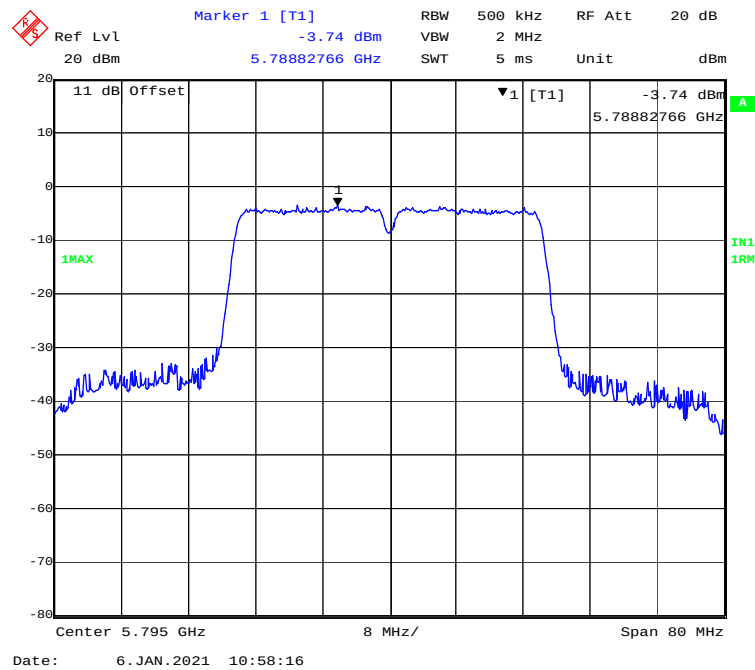
802.11n-HT20 mode, Power spectral density-5825MHz



802.11n-HT40 mode, Power spectral density-5755MHz



802.11n-HT40 mode, Power spectral density-5795MHz



Declarations

- 1: BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with an asterisk '*'. Customer model name, addresses, names, trademarks etc. are not considered data.
- 2: Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.
- 3: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.
- 4: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.
- 5: This report cannot be reproduced except in full, without prior written approval of the Company.
- 6: This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

******* END OF REPORT *******