TESTING LABORATORY
CERTIFICATE#4323.01

FCC PART 15.407

TEST REPORT

For

BBPOS International Limited

Suite 1903-04, 19/F, Tower 2, Nina Tower, No.8 Yeung UK Road, Tsuen Wan, N.T. HK

FCC ID: 2AB7X-WISEPOSE

Report Type:	**Product Type:**
Original Report	WisePOS E

Test Engineer:	Stone Zhang
Report Number:	RKSA200310001-00C
Report Date:	2020-05-26
Reviewed By:	Oscar Ye EMC Manager
Test Laboratory:	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

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. 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.

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant:	BBPOS International Limited
Test Model	WisePOS E
Product Type:	WisePOS E
Power Supply:	DC 3.7V from battery
RF Function:	5G Wi-Fi
Operating Band/Frequency:	5G Wi-Fi B1: 5180-5240MHz, B4: 5745-5825MHz
Channel Number:	5G Wi-Fi B1: 4, B4: 5
Channel Separation:	5G Wi-Fi: a/n-HT20: 20 MHz
Modulation Type:	OFDM
Antenna Type:	FPC Antenna
Maximum Antenna Gain:	0.5dBi

**All measurement and test data in this report was gathered from production sample serial number: 20200310001. (Assigned by the BACL). The EUT supplied by the applicant was received on 2020-03-10.*

Objective

This type approval report is prepared on behalf of *BBPOS International Limited* 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: 2AB7X-WISEPOSE
FCC Part 15.247 DTS submissions with FCC ID: 2AB7X-WISEPOSE
FCC Part 15.225 DXX submissions with FCC ID: 2AB7X-WISEPOSE
FCC Part 22H24E27 PCB submissions with FCC ID: 2AB7X-WISEPOSE

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℃
Humidity		6%

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

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.

Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220
40	5200	48	5240

For **5725~5850 MHz** band,

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

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

EUT Exercise Software

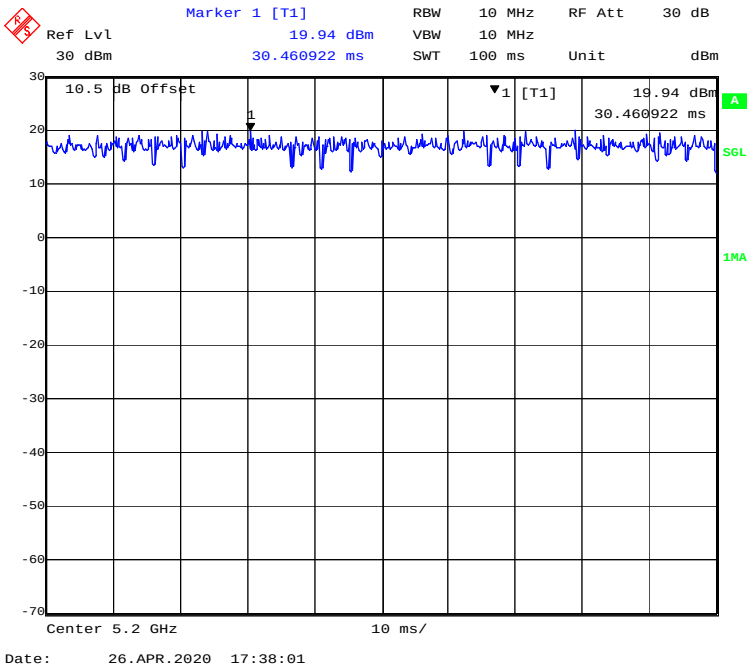
RF test tool: Engineering mode

The worst case was performed under:

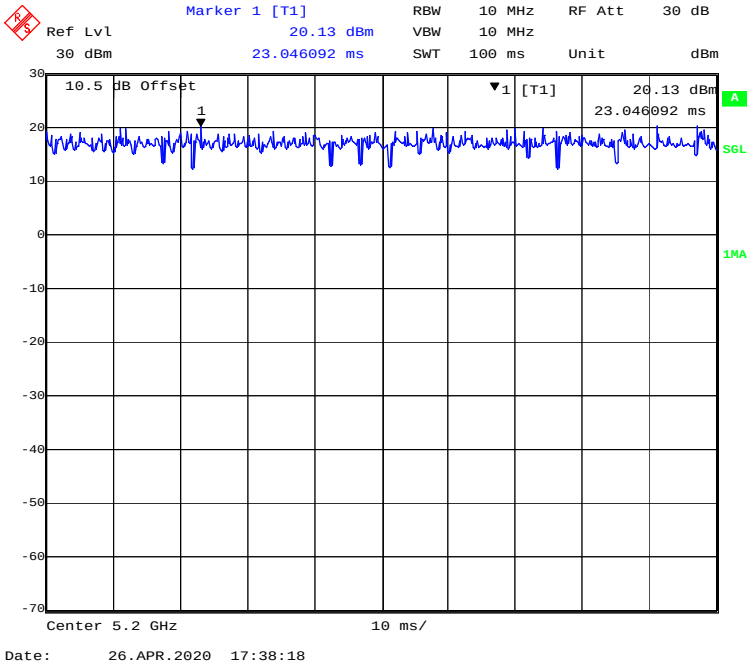
Mode	Data rate	Power level	
		5150-5250 Band	5725-5850 Band
802.11a	6 Mbps	12	12
802.11n-HT20	MCS0	12	12

Duty Cycle:
5150MHz-5250MHz Band:

802.11a mode

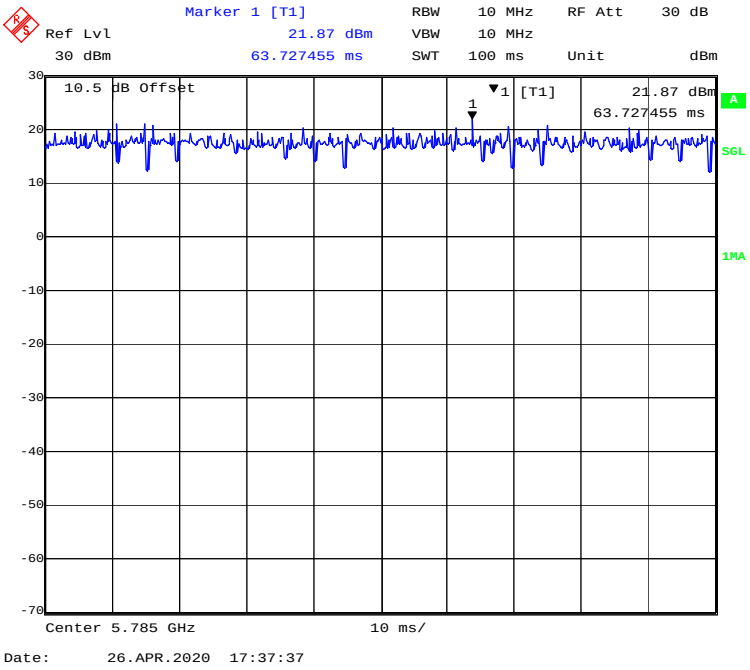


802.11n-HT20 mode

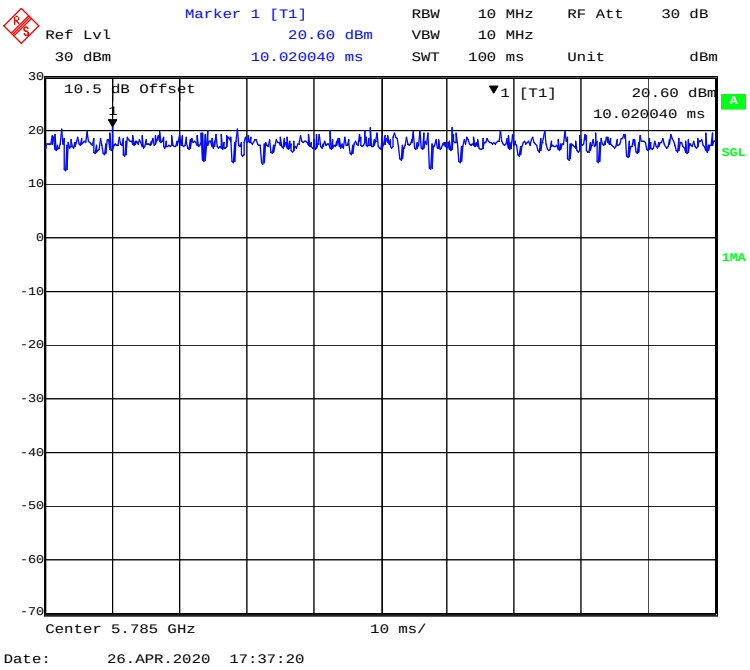


5725MHz-5850MHz Band:

802.11a mode



802.11n-HT20 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
802.11a	5725-5850	100	/	/	0
802.11n-HT20		100	/	/	0

Note: "x" means duty cycle.

Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

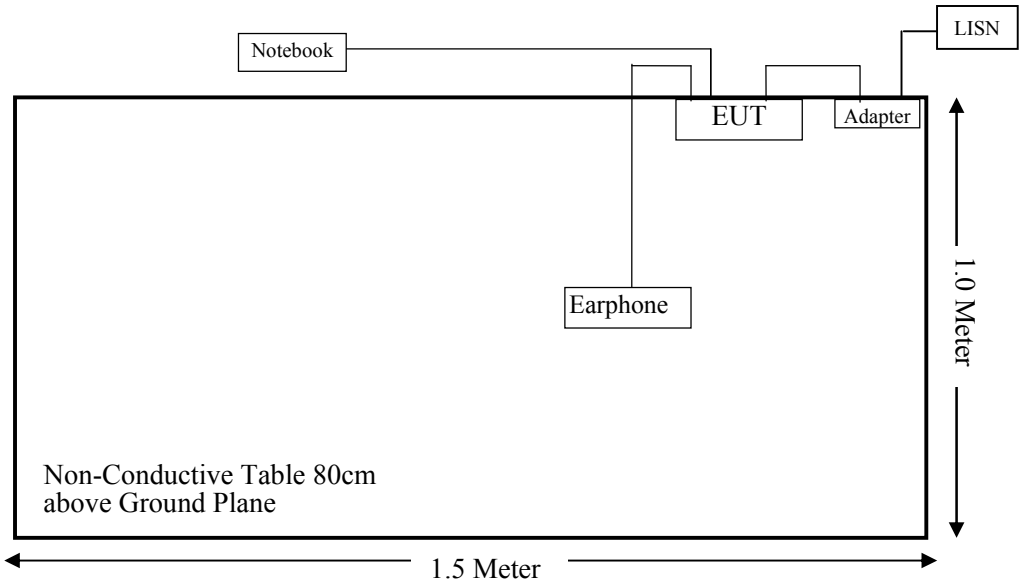
Manufacturer	Description	Model	Serial Number
MASON	Adapter	/	/
Bold	Earphone	/	/
DELL	Notebook	GX620	D65874152

External I/O Cable

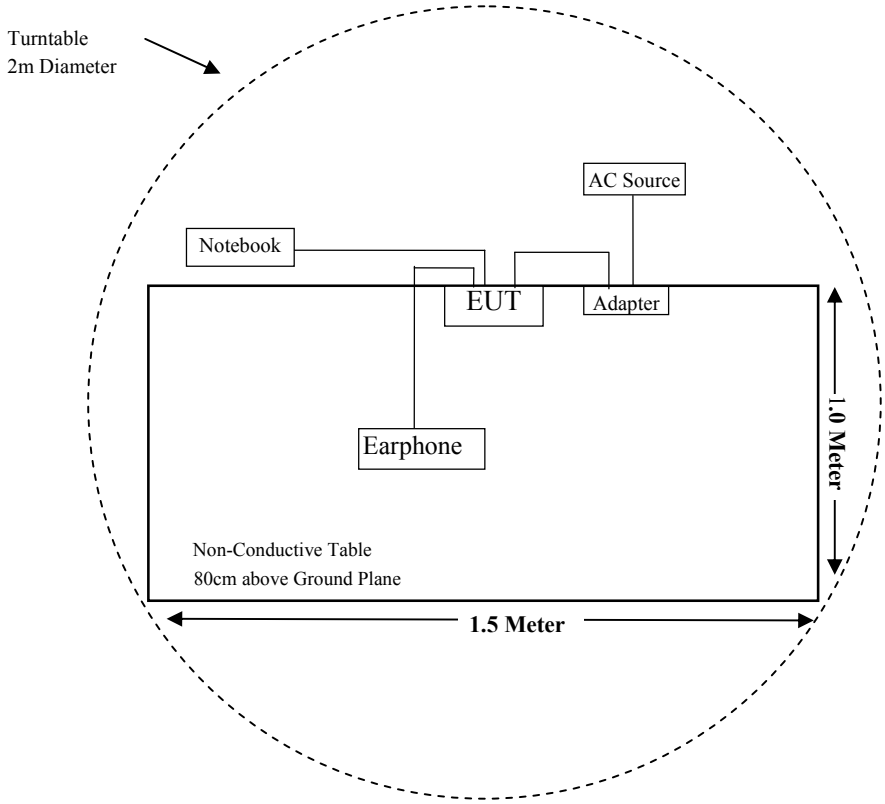
Cable Description	Length (m)	From Port	To
USB Cable	1.2	EUT	Adapter
Power Cable	1.0	Adapter	AC Source

Block Diagram of Test Setup

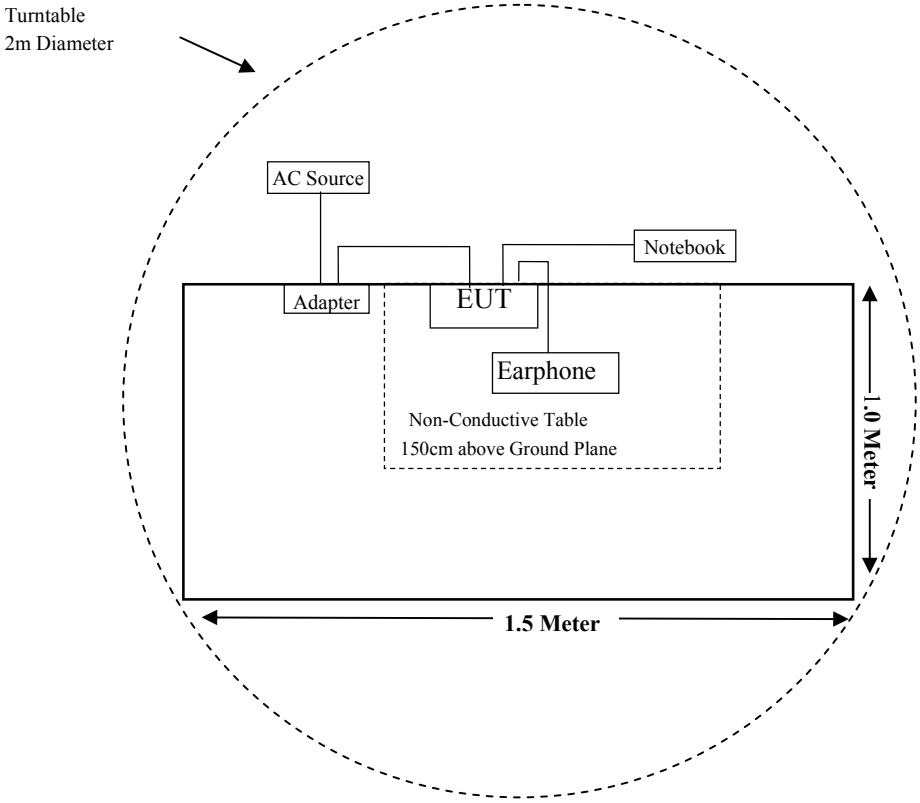
For Conducted Emissions:



For Radiated Emissions (Below 1GHz):



For Radiated Emissions (Above 1GHz):



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1310 & §2.1093	RF Exposure	Compliant
§15.203	Antenna Requirement	Compliant
§15.207 & §15.407(b) (6)	AC Power Line Conducted Emissions	Compliant
§ 15.205 & §15.209 & §15.407(b) (1) (4)(6)(7)	Undesirable Emission & Restricted Bands	Compliant
§15.407(a)(1) (5) & §15.407 (e)	Emission Bandwidth	Compliant
§15.407(a) (1) (3)	Conducted Transmitter Output Power	Compliant
§15.407(a) (1) (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	2019-12-14	2020-12-13
Sunol Sciences	Broadband Antenna	JB3	A090413-1	2017-12-26	2020-12-25
Sonoma Instrunent	Pre-amplifier	310N	171205	2019-08-14	2020-08-13
Rohde & Schwarz	Auto Test Software	EMC32	100361	N/A	N/A
MICRO-COAX	Coaxial Cable	Cable-8	008	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-9	009	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-10	010	2019-08-15	2020-08-14
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	2017-07-15	2020-07-14
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	2019-08-05	2020-08-04
MICRO-TRONICS	Band Reject Filter	BRC50705	G085	2019-08-05	2020-08-04
Narda	Attenuator	10dB	010	2019-08-15	2020-08-14
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-6	006	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-11	011	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-12	012	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-13	013	2019-08-15	2020-08-14
RF Conducted Test					
Rohde & Schwarz	EMI Test Receiver	ESIB26	100146	2019-12-14	2020-12-13
Agilent	Power Meter	N1912A	MY5000492	2019-11-18	2020-11-17
Agilent	Power Sensor	N1921A	MY54210024	2019-11-18	2020-11-17
Narda	Attenuator	10dB	010	2019-08-15	2020-08-14
BBPOS International Limited	RF Cable	BBPOS International Limited C01	C01	Each Time	/
Conducted Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESR	1316.3003K03-101746-zn	2019-08-05	2020-08-04
Rohde & Schwarz	LISN	ENV216	3560655016	2019-11-30	2020-11-29
Audix	Test Software	e3	V9	--	--
Rohde & Schwarz	Pulse limiter	ESH3-Z2	0357.8810.54	2020-04-03	2021-04-02
MICRO-COAX	Coaxial Cable	Cable-15	015	2019-08-15	2020-08-14

*** 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 §1.1310 & §2.1093 - RF EXPOSURE

Applicable Standard

According to§1.1310, systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB447498 D01 General RF Exposure Guidance v06:

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to 5) in section 4.1 is applied to determine SAR test exclusion.

Measurement Result

Please refer to SAR Report: RKSA200310001-20C.

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 0.5dBi which was permanently attached, fulfill the requirement of this section. Please refer to the EUT photos.

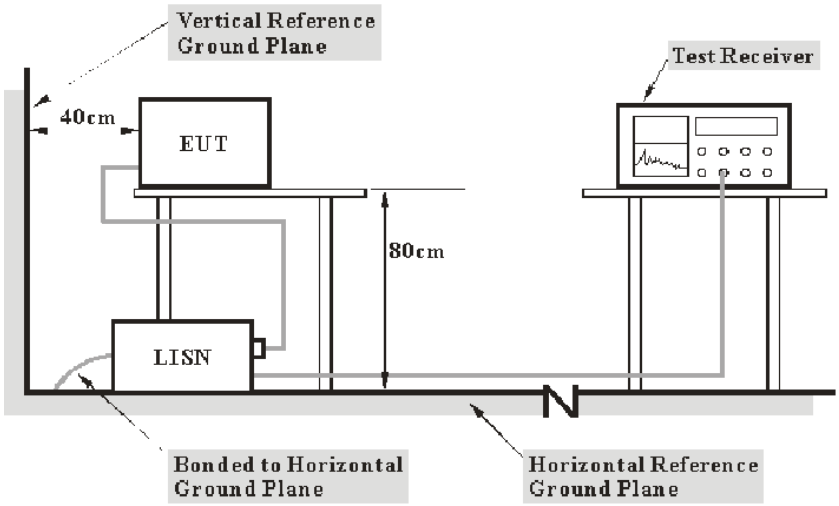
Result: Compliant.

FCC §15.407 (b) (6) §15.207 (a) – AC POWER LINE CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207(a), §15.407(b) (6)

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

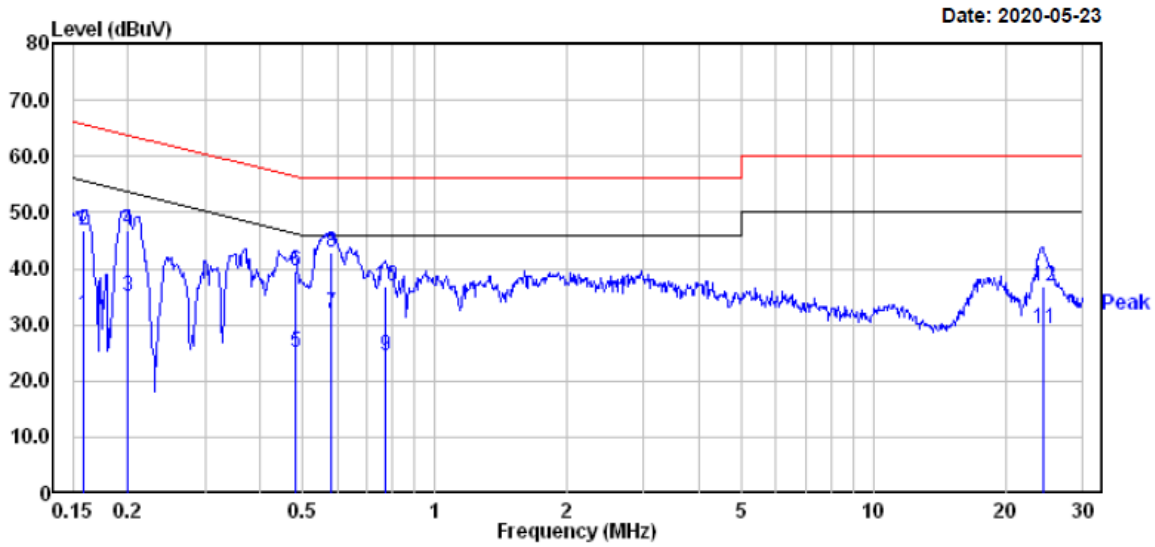
Environmental Conditions

Temperature:	24.2 ℃
Relative Humidity:	50 %
ATM Pressure:	101.5 kPa

The testing was performed by Stone Zhang on 2020-05-23.

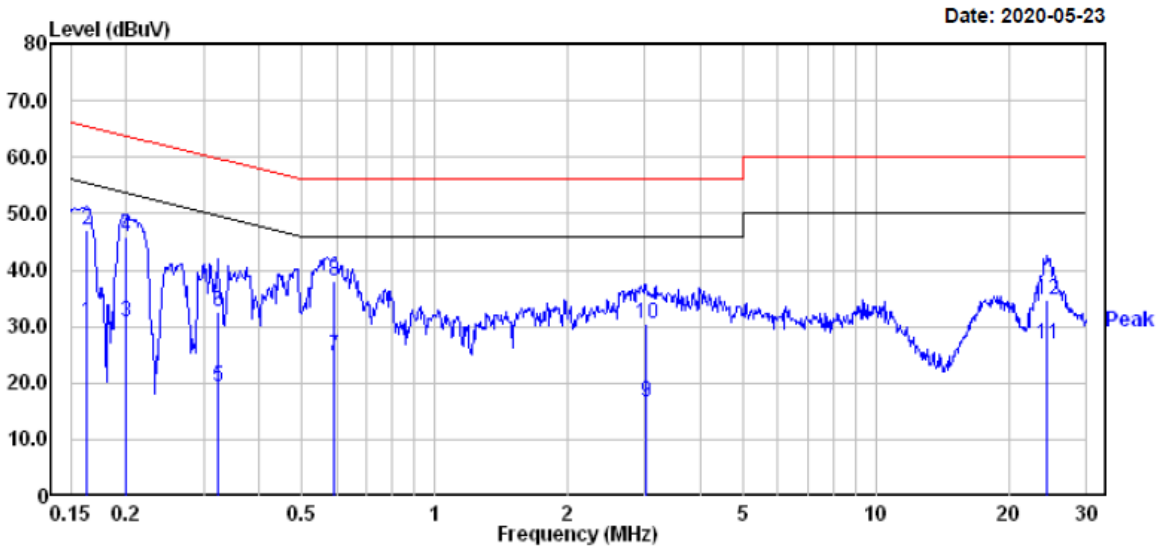
EUT operation mode: Transmitting in 802.11a mode high channel of 5150~5250MHz (worst case).

AC 120V/60 Hz, Line



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.159	12.00	19.82	31.82	55.52	-23.70	Average
2	0.159	26.90	19.82	46.72	65.52	-18.80	QP
3	0.200	15.20	19.82	35.02	53.62	-18.60	Average
4	0.200	26.90	19.82	46.72	63.62	-16.90	QP
5	0.481	5.30	19.76	25.06	46.32	-21.26	Average
6	0.481	19.70	19.76	39.46	56.32	-16.86	QP
7	0.579	12.10	19.75	31.85	46.00	-14.15	Average
8	0.579	23.00	19.75	42.75	56.00	-13.25	QP
9	0.775	4.80	19.71	24.51	46.00	-21.49	Average
10	0.775	17.00	19.71	36.71	56.00	-19.29	QP
11	24.400	9.70	19.72	29.42	50.00	-20.58	Average
12	24.400	17.10	19.72	36.82	60.00	-23.18	QP

AC 120V/60 Hz, Neutral

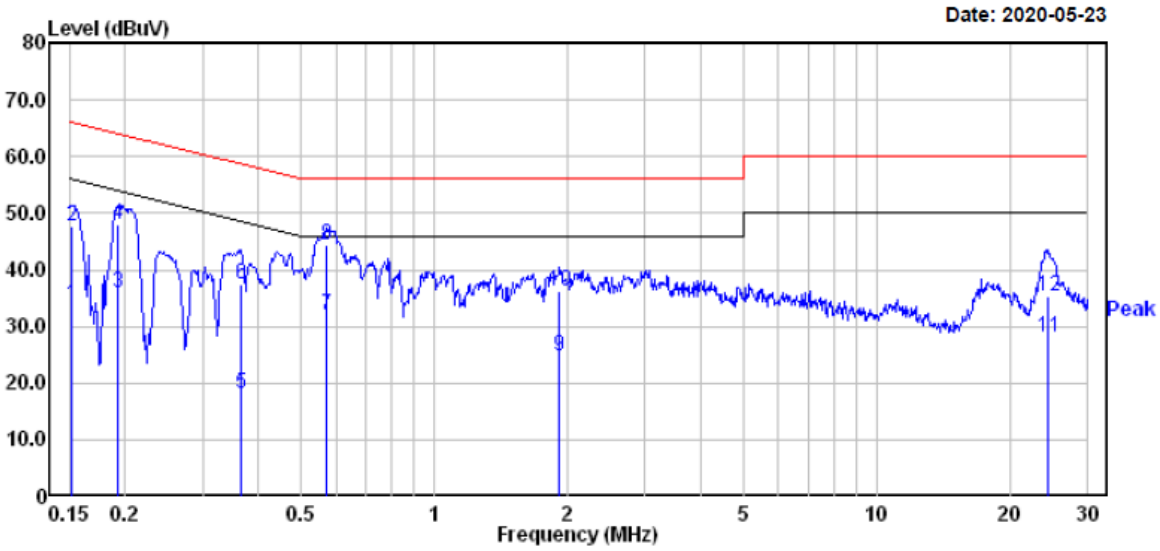


	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.162	11.10	19.83	30.93	55.34	-24.41	Average
2	0.162	27.30	19.83	47.13	65.34	-18.21	QP
3	0.200	11.10	19.82	30.92	53.62	-22.70	Average
4	0.200	26.10	19.82	45.92	63.62	-17.70	QP
5	0.322	-0.60	19.82	19.22	49.66	-30.44	Average
6	0.322	12.90	19.82	32.72	59.66	-26.94	QP
7	0.592	5.00	19.75	24.75	46.00	-21.25	Average
8	0.592	18.30	19.75	38.05	56.00	-17.95	QP
9	3.009	-2.80	19.46	16.66	46.00	-29.34	Average
10	3.009	11.00	19.46	30.46	56.00	-25.54	QP
11	24.529	7.20	19.72	26.92	50.00	-23.08	Average
12	24.529	15.10	19.72	34.82	60.00	-25.18	QP

Note:
1) Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)
2) Over Limit (dB) = Read level (dBµV) + Factor (dB) - Limit (dBµV)

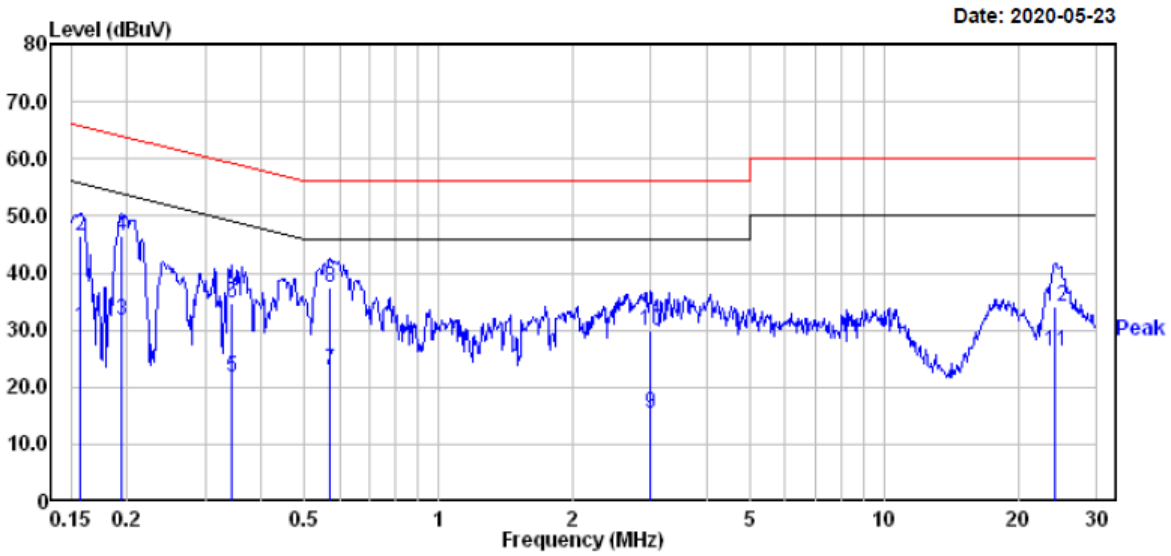
EUT operation mode: Transmitting in 802.11a mode low channel of 5725~5850MHz (worst case).

AC 120V/60 Hz, Line



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.152	14.00	19.82	33.82	55.91	-22.09	Average
2	0.152	28.00	19.82	47.82	65.91	-18.09	QP
3	0.193	16.10	19.82	35.92	53.89	-17.97	Average
4	0.193	28.20	19.82	48.02	63.89	-15.87	QP
5	0.365	-1.60	19.79	18.19	48.61	-30.42	Average
6	0.365	17.70	19.79	37.49	58.61	-21.12	QP
7	0.573	12.10	19.75	31.85	46.00	-14.15	Average
8	0.573	24.60	19.75	44.35	56.00	-11.65	QP
9	1.918	4.80	19.83	24.63	46.00	-21.37	Average
10	1.918	16.40	19.83	36.23	56.00	-19.77	QP
11	24.529	8.50	19.72	28.22	50.00	-21.78	Average
12	24.529	15.70	19.72	35.42	60.00	-24.58	QP

AC 120V/60 Hz, Neutral



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.157	10.70	19.82	30.52	55.60	-25.08	Average
2	0.157	26.80	19.82	46.62	65.60	-18.98	QP
3	0.194	12.00	19.82	31.82	53.84	-22.02	Average
4	0.194	26.80	19.82	46.62	63.84	-17.22	QP
5	0.343	1.80	19.81	21.61	49.13	-27.52	Average
6	0.343	14.80	19.81	34.61	59.13	-24.52	QP
7	0.570	3.20	19.75	22.95	46.00	-23.05	Average
8	0.570	17.70	19.75	37.45	56.00	-18.55	QP
9	2.993	-4.00	19.46	15.46	46.00	-30.54	Average
10	2.993	10.40	19.46	29.86	56.00	-26.14	QP
11	24.271	6.50	19.73	26.23	50.00	-23.77	Average
12	24.271	14.50	19.73	34.23	60.00	-25.77	QP

Note:
1) Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)
2) Over Limit (dB) = Read level (dBµV) + Factor (dB) - Limit (dBµV)

§15.205 & §15.209 & §15.407(B)(1)(4) (6)(7) – UNDESIRABLE EMISSION & RESTRICTED BANDS

Applicable Standard

FCC §15.407 (b)(1)(4) (6) (7); §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 EIRP of –27dBm/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.

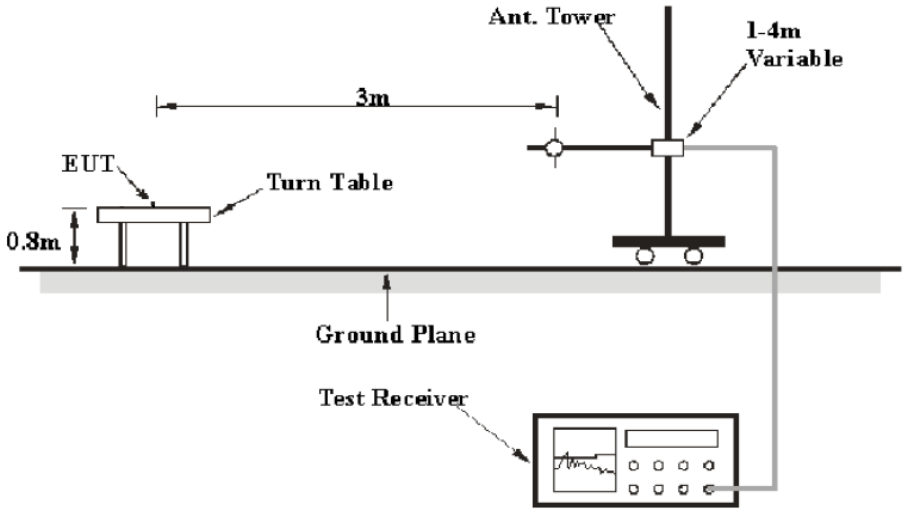
Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

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.

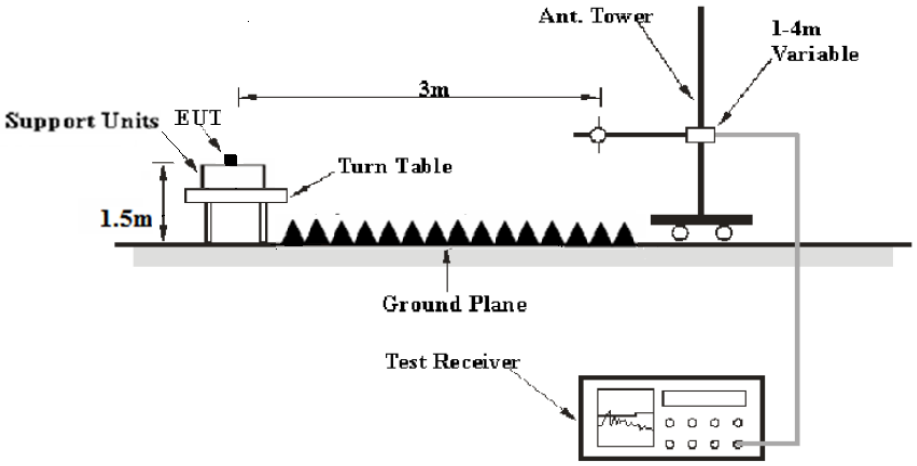
According to 789033 D02 General UNII Test Procedures New Rules v02r01, emission shall be computed as: E [dBμV/m] = EIRP [dBm] + 95.2, for d = 3 meters.

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:

Corrected Amplitude = Meter Reading + Antenna factor + Cable Loss - 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:

Margin = Limit –Corrected Amplitude

Test Data

Environmental Conditions

Temperature:	24.2-24.6 ℃
Relative Humidity:	49-51 %
ATM Pressure:	101.3-101.6 kPa

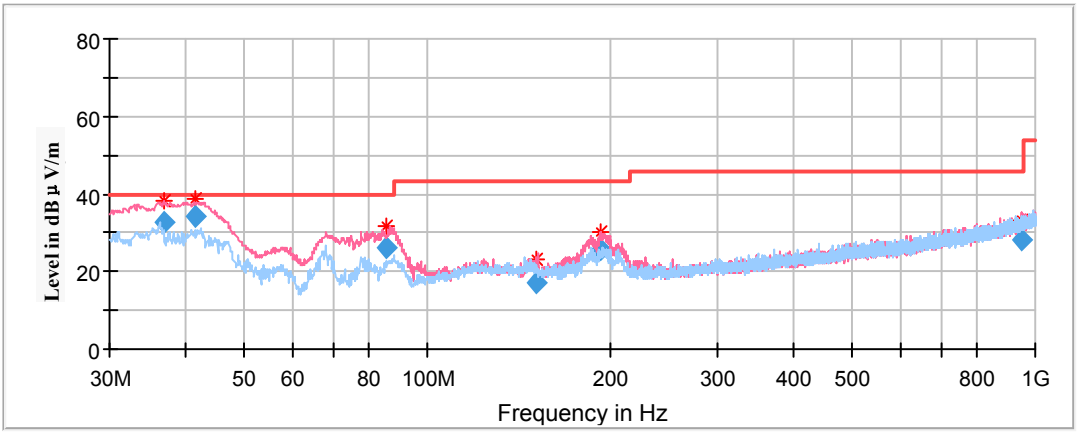
The testing was performed by Stone Zhang from 2020-04-28 to 2020-05-24.

Test Mode: Transmitting

Spurious Emission Test

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

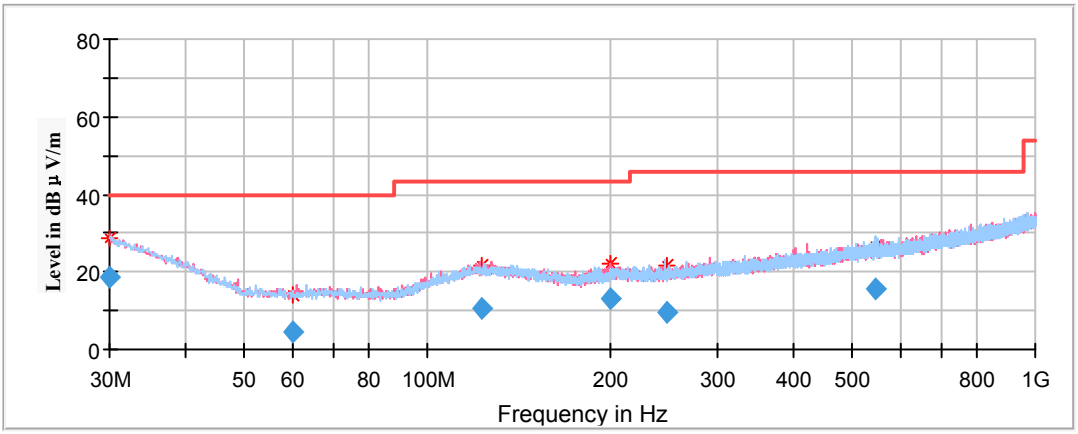
Pre-scan with 802.11a and 802.11n-HT20 modes of operation in the X,Y and Z axes of orientation, the worst case 802.11a mode in X-axis of orientation was recorded



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)				
36.856300	32.80	100.0	V	344.0	-8.6	40.00	7.20
41.640100	33.97	100.0	V	142.0	-11.8	40.00	6.03
85.495450	26.01	100.0	V	210.0	-17.6	40.00	13.99
151.365750	16.98	100.0	V	205.0	-12.4	43.50	26.52
192.950650	25.77	100.0	V	199.0	-12.8	43.50	17.73
947.420750	28.18	200.0	V	55.0	1.2	46.00	17.82

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

Pre-scan with 802.11a and 802.11n-HT20 modes of operation in the X,Y and Z axes of orientation, the worst case 802.11a mode in channel 5825 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)				
30.001500	18.74	200.0	V	325.0	-3.9	40.00	21.26
60.092550	4.54	200.0	V	263.0	-17.9	40.00	35.46
122.649400	10.38	200.0	V	84.0	-11.3	43.50	33.12
200.208750	13.23	200.0	V	155.0	-12.3	43.50	30.27
246.895100	9.59	200.0	H	304.0	-12.1	46.00	36.41
544.257500	15.76	200.0	H	181.0	-5.7	46.00	30.24

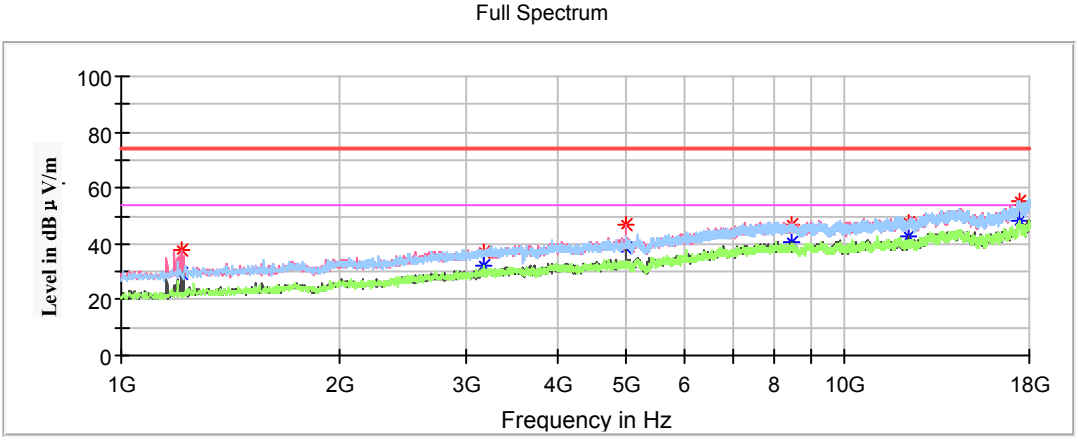
1GHz-18GHz(5150-5250MHz Band):

802.11a Mode:

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

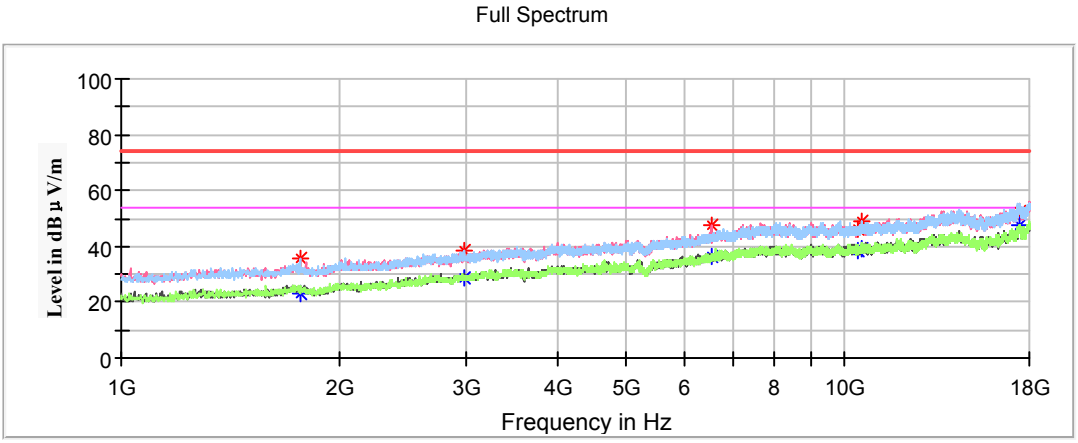
Note:
1. This test was performed with the 5150-5250MHz band reject filter.
2. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
   Corrected Amplitude = Corrected Factor + Reading
   Margin = Limit - Corrected. Amplitude

Low Channel: 5180MHz



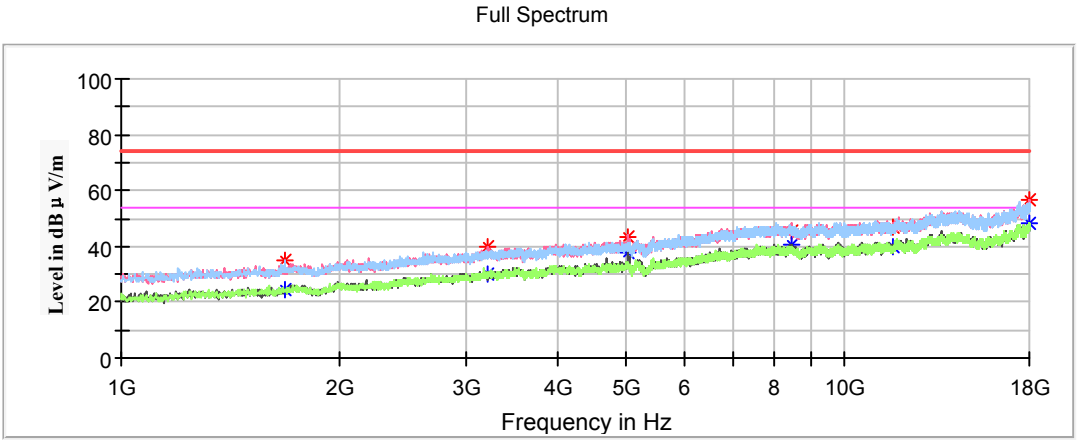
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
	MaxPeak (dBµV/m)	Average (dBµV/m)	Height (cm)	Polar (H/V)				
1209.10	---	29.65	100	V	66.0	-17.9	54.00	24.35
1209.10	37.66	---	100	V	66.0	-17.9	74.00	36.34
3164.10	37.36	---	100	H	126.0	-9.7	68.20	30.84
4993.30	---	38.18	150	V	258.0	-5.2	54.00	15.82
4993.30	47.08	---	150	V	258.0	-5.2	74.00	26.92
8442.60	---	40.62	100	V	241.0	1.4	54.00	13.38
8442.60	47.06	---	100	V	241.0	1.4	74.00	26.94
12277.80	---	42.91	150	V	214.0	3.3	54.00	11.09
12277.80	47.34	---	150	V	214.0	3.3	74.00	26.66
17452.60	54.97	---	150	H	341.0	8.7	68.20	13.23

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)				
1765.00	35.37	---	150	H	189.0	-15.4	68.20	32.83
2978.80	38.50	---	150	H	296.0	-10.2	68.20	29.70
6530.10	47.76	---	100	V	0.0	-1.1	68.20	20.44
10401.00	45.98	---	150	V	70.0	2.2	68.20	22.22
10555.70	49.06	---	150	H	29.0	2.4	68.20	19.14
17452.60	52.56	---	100	H	80.0	8.7	68.20	15.64

High Channel: 5240MHz



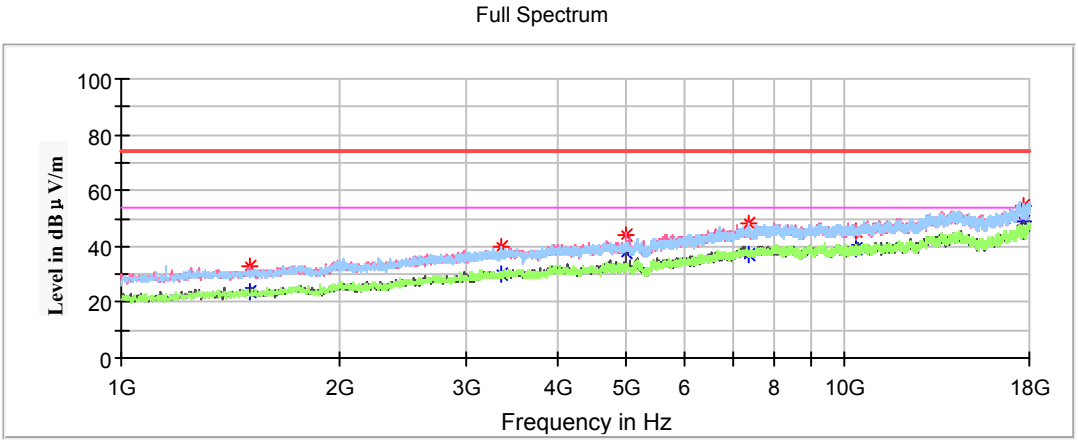
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
	MaxPeak (dBµV/m)	Average (dBµV/m)	Height (cm)	Polar (H/V)				
1686.80	---	24.56	100	H	48.0	-15.7	54.00	29.44
1686.80	34.93	---	100	H	48.0	-15.7	74.00	39.07
3201.50	39.64	---	150	V	48.0	-9.6	68.20	28.56
5022.20	---	37.86	150	V	354.0	-5.1	54.00	16.14
5022.20	43.28	---	150	V	354.0	-5.1	74.00	30.72
8464.70	---	40.44	150	V	244.0	1.4	54.00	13.56
8464.70	45.34	---	150	V	244.0	1.4	74.00	28.66
11638.60	---	40.11	100	V	344.0	3.1	54.00	13.89
11638.60	46.84	---	100	V	344.0	3.1	74.00	27.16
17991.50	---	48.32	150	H	95.0	8.8	54.00	5.68
17991.50	56.57	---	150	H	95.0	8.8	74.00	17.43

802.11n-HT20 Mode:

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

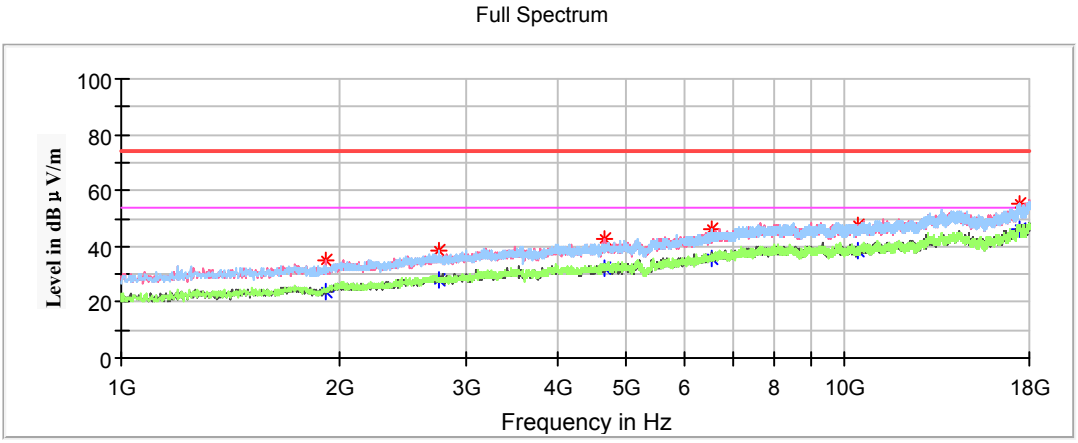
Note:
1. This test was performed with the 5150-5250MHz band reject filter.
2. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
   Corrected Amplitude = Corrected Factor + Reading
   Margin = Limit - Corrected. Amplitude

Low Channel: 5180MHz



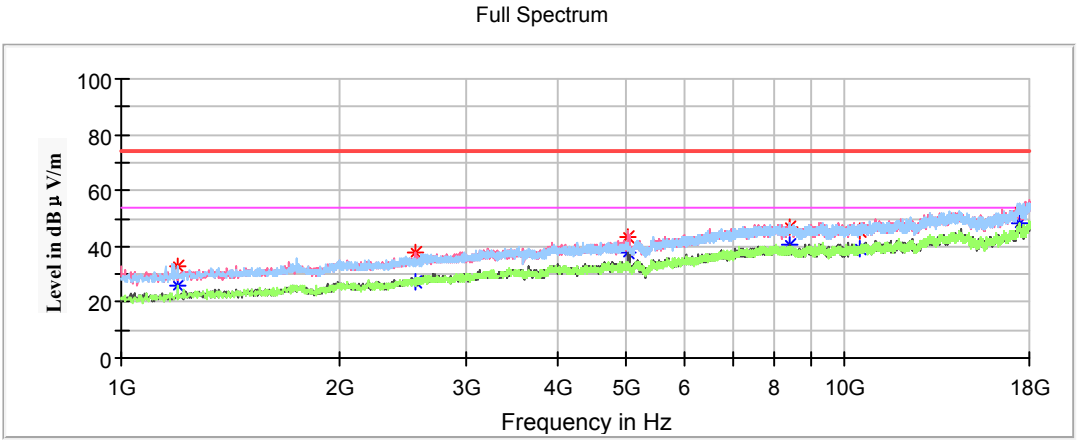
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
	MaxPeak (dBµV/m)	Average (dBµV/m)	Height (cm)	Polar (H/V)				
1501.50	---	23.65	100	V	186.0	-16.4	54.00	30.35
1501.50	33.10	---	100	V	186.0	-16.4	74.00	40.90
3349.40	---	30.13	150	H	53.0	-9.2	54.00	23.87
3349.40	39.57	---	150	H	53.0	-9.2	74.00	34.43
4991.60	---	38.07	100	V	261.0	-5.2	54.00	15.93
4991.60	44.07	---	100	V	261.0	-5.2	74.00	29.93
7368.20	---	37.03	150	H	216.0	0.7	54.00	16.97
7368.20	47.91	---	150	H	216.0	0.7	74.00	26.09
10360.20	45.32	---	150	V	257.0	2.2	68.20	22.88
17651.50	54.48	---	150	V	213.0	8.9	68.20	13.72

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)				
1914.60	34.82	---	150	V	225.0	-14.8	68.20	33.38
2751.00	38.43	---	100	H	274.0	-11.3	68.20	29.77
4661.80	---	32.19	150	V	328.0	-5.9	54.00	21.81
4661.80	42.53	---	150	V	328.0	-5.9	74.00	31.47
6552.20	46.35	---	150	H	3.0	-1.1	68.20	21.85
10443.50	47.52	---	100	V	234.0	2.3	68.20	20.68
17425.40	55.51	---	100	V	234.0	8.6	68.20	12.69

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)				
1198.90	---	25.67	100	H	265.0	-18.0	54.00	28.33
1198.90	32.65	---	100	H	265.0	-18.0	74.00	41.35
2552.10	37.58	---	100	V	72.0	-12.2	68.20	30.62
5030.70	---	37.66	100	V	327.0	-5.1	54.00	16.34
5030.70	43.30	---	100	V	327.0	-5.1	74.00	30.70
8400.10	---	40.49	150	V	357.0	1.4	54.00	13.51
8400.10	46.81	---	150	V	357.0	1.4	74.00	27.19
10484.30	45.61	---	150	V	0.0	2.3	68.20	22.59
17399.90	52.79	---	150	V	0.0	8.5	68.20	15.41

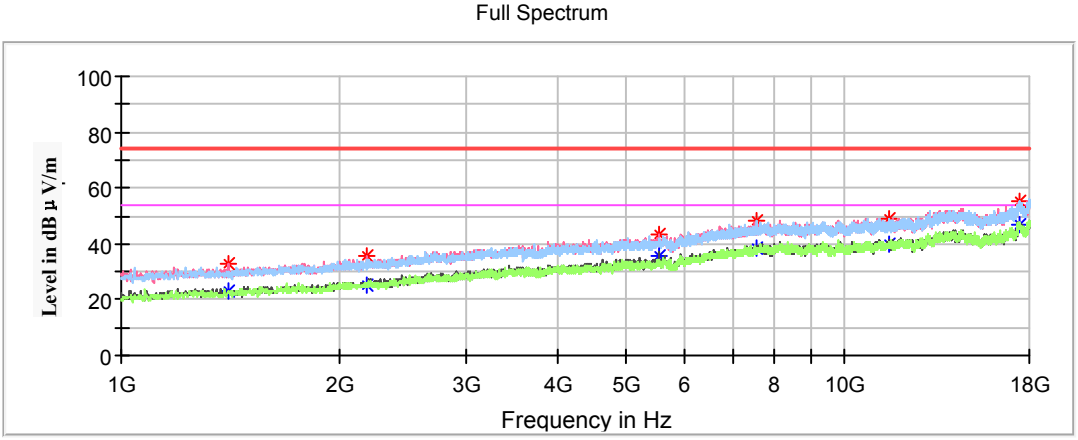
1GHz-18GHz(5725-5850MHz Band):

802.11a Mode:

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

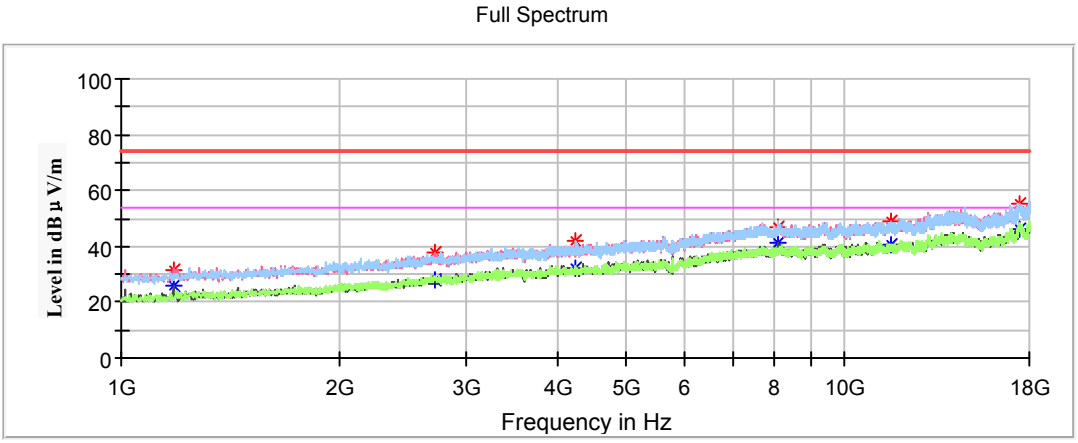
Note:
1. This test was performed with the 5725-5850MHz band reject filter.
2. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
   Corrected Amplitude = Corrected Factor + Reading
   Margin = Limit - Corrected. Amplitude

Low Channel: 5745MHz



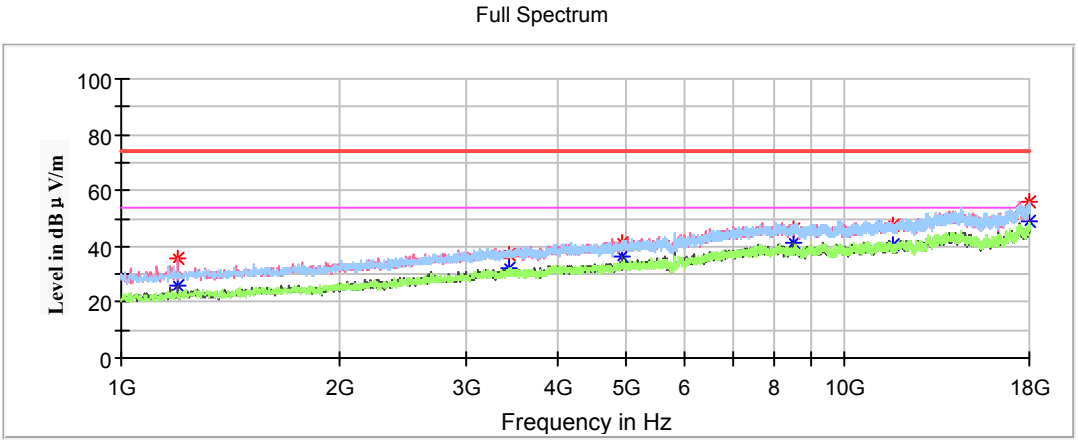
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
	MaxPeak (dBµV/m)	Average (dBµV/m)	Height (cm)	Polar (H/V)				
1406.30	---	22.93	150	V	287.0	-16.9	54.00	31.07
1406.30	32.66	---	150	V	287.0	-16.9	74.00	41.34
2190.00	35.70	---	100	V	0.0	-13.7	68.20	32.50
5545.80	43.27	---	100	V	0.0	-3.8	68.20	24.93
7573.90	---	38.47	100	H	144.0	1.1	54.00	15.53
7573.90	48.57	---	100	H	144.0	1.1	74.00	25.43
11490.70	---	39.75	100	H	130.0	2.8	54.00	14.25
11490.70	48.93	---	100	H	130.0	2.8	74.00	25.07
17498.50	55.49	---	100	V	213.0	8.9	68.20	12.71

Middle Channel: 5785MHz



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)				
1181.90	---	26.04	100	V	33.0	-18.1	54.00	27.96
1181.90	31.22	---	100	V	33.0	-18.1	74.00	42.78
2706.80	---	28.27	150	V	0.0	-11.5	54.00	25.73
2706.80	37.64	---	150	V	0.0	-11.5	74.00	36.36
4255.50	---	32.08	150	H	337.0	-6.6	54.00	21.92
4255.50	41.66	---	150	H	337.0	-6.6	74.00	32.34
8111.10	---	41.18	100	V	33.0	1.7	54.00	12.82
8111.10	46.75	---	100	V	33.0	1.7	74.00	27.25
11574.00	---	40.54	100	V	231.0	3.0	54.00	13.46
11574.00	48.90	---	100	V	231.0	3.0	74.00	25.10
17462.80	55.45	---	100	V	142.0	8.8	68.20	12.75

High Channel: 5825MHz



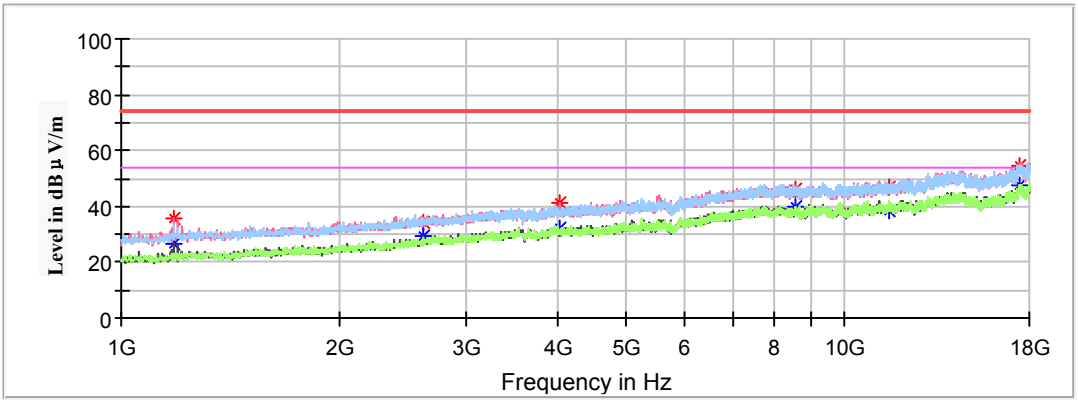
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
	MaxPeak (dBµV/m)	Average (dBµV/m)	Height (cm)	Polar (H/V)				
1198.90	---	25.53	100	V	80.0	-18.0	54.00	28.47
1198.90	35.77	---	100	V	80.0	-18.0	74.00	38.23
3425.90	37.07	---	150	H	236.0	-9.0	68.20	31.13
4923.60	---	36.08	150	V	67.0	-5.3	54.00	17.92
4923.60	40.96	---	150	V	67.0	-5.3	74.00	33.04
8505.50	46.31	---	150	V	265.0	1.3	68.20	21.89
11650.50	---	40.62	100	H	177.0	3.1	54.00	13.38
11650.50	47.40	---	100	H	177.0	3.1	74.00	26.60
17979.60	---	49.18	150	V	0.0	8.8	54.00	4.82
17979.60	56.27	---	150	V	0.0	8.8	74.00	17.73

802.11n-HT20 Mode:

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

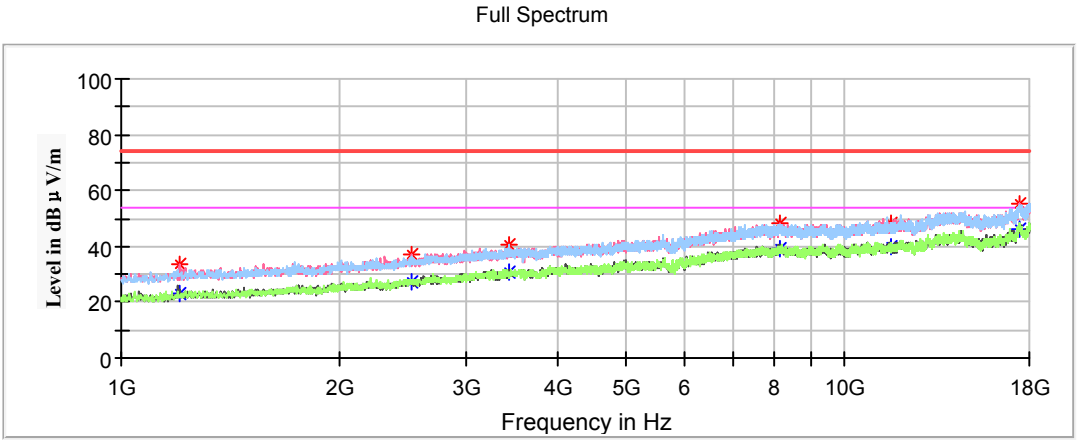
Note:
1. This test was performed with the 5725-5850MHz band reject filter.
2. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
   Corrected Amplitude = Corrected Factor + Reading
   Margin = Limit - Corrected. Amplitude

Low Channel: 5745MHz



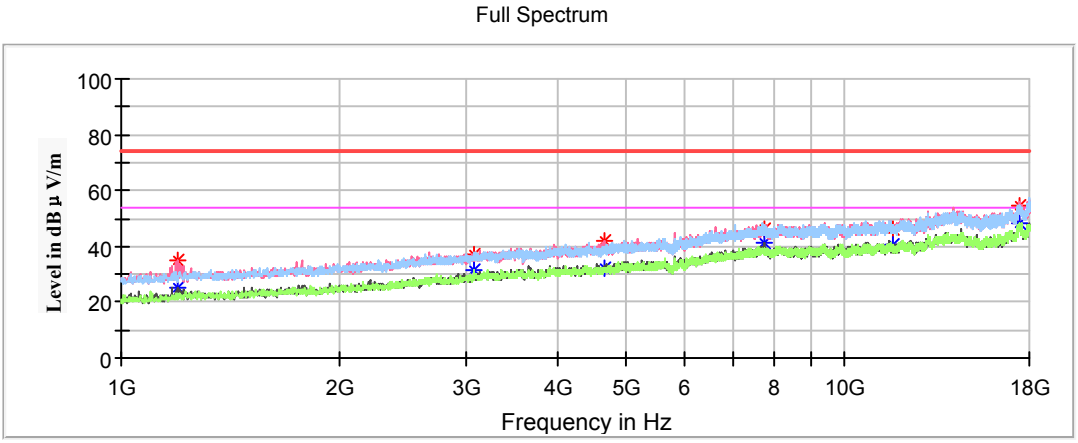
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
	MaxPeak (dBµV/m)	Average (dBµV/m)	Height (cm)	Polar (H/V)				
1183.60	---	26.72	100	V	162.0	-18.1	54.00	27.28
1183.60	35.56	---	100	V	162.0	-18.1	74.00	38.44
2618.40	34.07	---	150	V	189.0	-11.9	68.20	34.13
4027.70	---	31.98	150	V	234.0	-7.0	54.00	22.02
4027.70	41.12	---	150	V	234.0	-7.0	74.00	32.88
8548.00	45.87	---	100	V	117.0	1.4	68.20	22.33
11492.40	---	38.53	100	V	0.0	2.8	54.00	15.47
11492.40	47.17	---	100	V	0.0	2.8	74.00	26.83
17442.40	54.74	---	150	V	43.0	8.7	68.20	13.46

Middle Channel: 5785MHz



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)				
1207.40	---	23.31	100	V	0.0	-17.9	54.00	30.69
1207.40	33.49	---	100	V	0.0	-17.9	74.00	40.51
2524.90	37.06	---	100	V	4.0	-12.3	68.20	31.14
3442.90	40.22	---	100	H	260.0	-9.0	68.20	27.98
8112.80	---	39.04	150	V	259.0	1.7	54.00	14.96
8112.80	48.41	---	150	V	259.0	1.7	74.00	25.59
11572.30	---	39.63	150	H	48.0	2.9	54.00	14.37
11572.30	48.44	---	150	H	48.0	2.9	74.00	25.56
17491.70	55.33	---	100	V	218.0	8.9	68.20	12.87

High Channel: 5825MHz

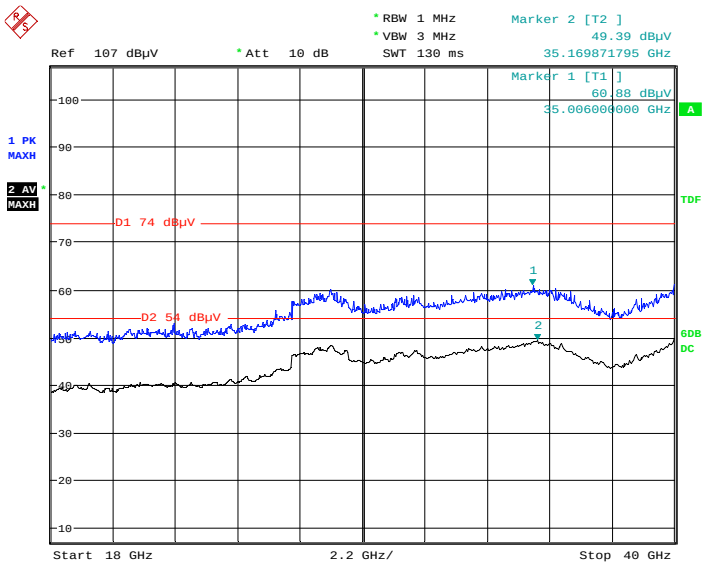


Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
	MaxPeak (dBµV/m)	Average (dBµV/m)	Height (cm)	Polar (H/V)				
1198.90	---	25.48	100	V	359.0	-18.0	54.00	28.52
1198.90	35.20	---	100	V	359.0	-18.0	74.00	38.80
3080.80	36.73	---	100	H	264.0	-9.9	68.20	31.74
4644.80	---	32.25	100	V	354.0	-5.9	54.00	21.75
4644.80	41.66	---	100	V	354.0	-5.9	74.00	32.34
7745.60	---	40.92	150	V	115.0	1.4	54.00	13.08
7745.60	46.03	---	150	V	115.0	1.4	74.00	27.97
11653.90	---	40.70	150	V	235.0	3.1	54.00	13.30
11653.90	45.99	---	150	V	235.0	3.1	74.00	28.01
17444.10	54.74	---	150	H	19.0	8.7	68.20	13.46

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

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

Horizontal



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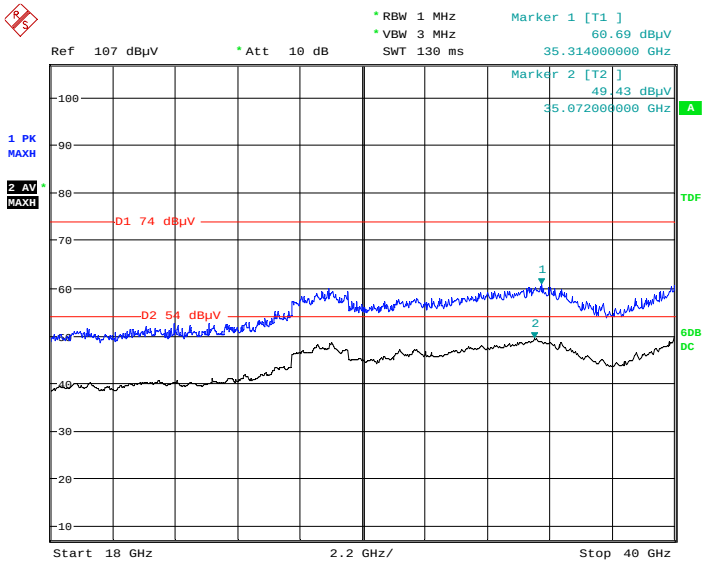
Vertical

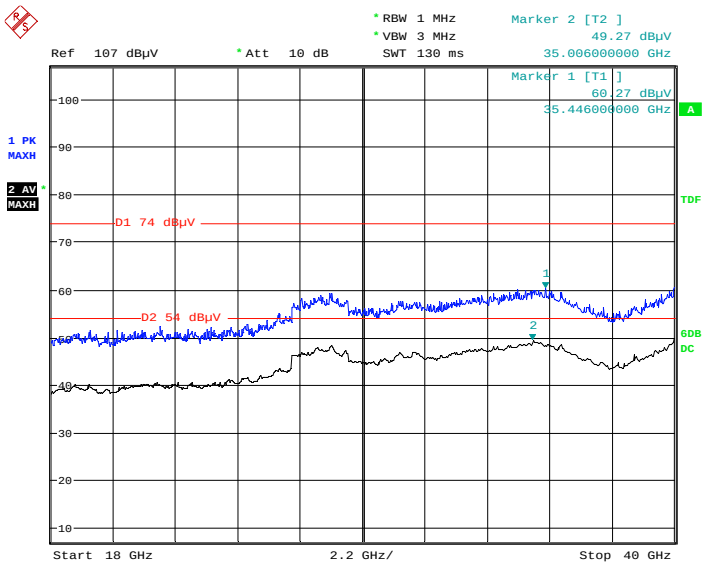


Date: 24.MAY.2020 02:36:48

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

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

Horizontal



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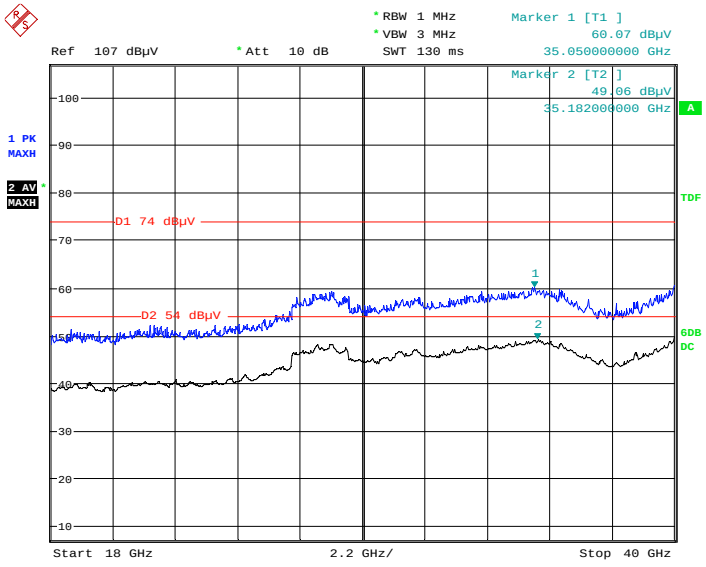
Vertical



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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	---	51.20	200	V	317	5.20	54.00	2.80
5150.00	61.34	---	200	V	317	5.20	74.00	12.66
High Channel: 5240MHz								
5350.00	55.09	---	200	V	265	5.80	74.00	18.91
5350.00	---	47.53	200	V	358	5.80	54.00	6.47

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	---	51.32	200	V	353	5.20	54.00	2.68
5150.00	61.69	---	200	V	317	5.20	74.00	12.31
High Channel: 5240MHz								
5350.00	55.42	---	200	V	136	5.80	74.00	18.58
5350.00	---	48.27	200	V	31	5.80	54.00	5.73

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	55.64	---	200	V	241	6.40	68.20	12.56
5700.00	55.36	---	150	V	144	6.50	105.20	49.84
5720.00	66.48	---	150	V	0	6.50	110.80	44.32
5725.00	77.36	---	150	V	304	6.50	122.20	44.84
High Channel: 5825MHz								
5850.00	67.40	---	200	V	299	6.70	122.20	54.80
5855.00	60.22	---	150	V	69	6.70	110.80	50.58
5875.00	56.38	---	200	V	58	6.80	105.20	48.82
5925.00	54.20	---	200	V	182	6.90	68.20	14.00

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	54.89	---	200	V	313	6.40	68.20	13.31
5700.00	54.56	---	150	V	354	6.50	105.20	50.64
5720.00	70.81	---	200	V	69	6.50	110.80	39.99
5725.00	75.87	---	150	V	341	6.50	122.20	46.33
High Channel: 5825MHz								
5850.00	64.20	---	200	V	19	6.70	122.20	58.00
5855.00	60.81	---	150	V	29	6.70	110.80	49.99
5875.00	54.68	---	150	V	114	6.80	105.20	50.52
5925.00	54.60	---	200	V	189	6.90	68.20	13.60

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.

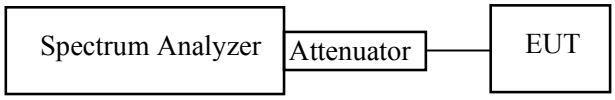
Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

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) ≥ 3 × 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℃
Relative Humidity:	50%
ATM Pressure:	101.5 kPa

The testing was performed by Stone Zhang on 2020-04-26.

Test Result: Compliant

5150-5250 MHz:

Test mode	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
802.11a	5180	23.206	17.435
	5200	23.086	17.435
	5240	22.966	17.435
802.11n-HT20	5180	24.77	18.397
	5200	23.567	18.277
	5240	22.966	18.397

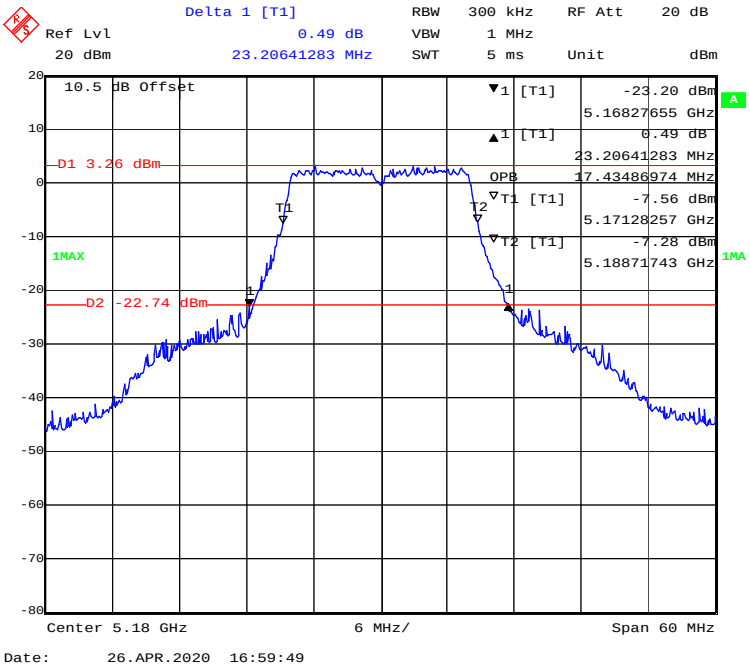
5750-5850 MHz:

Test mode	Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)
802.11a	5745	16.513	17.315	≥0.5
	5785	16.513	17.315	≥0.5
	5825	16.513	17.315	≥0.5
802.11n-HT20	5745	17.796	18.357	≥0.5
	5785	17.796	18.277	≥0.5
	5825	17.796	18.277	≥0.5

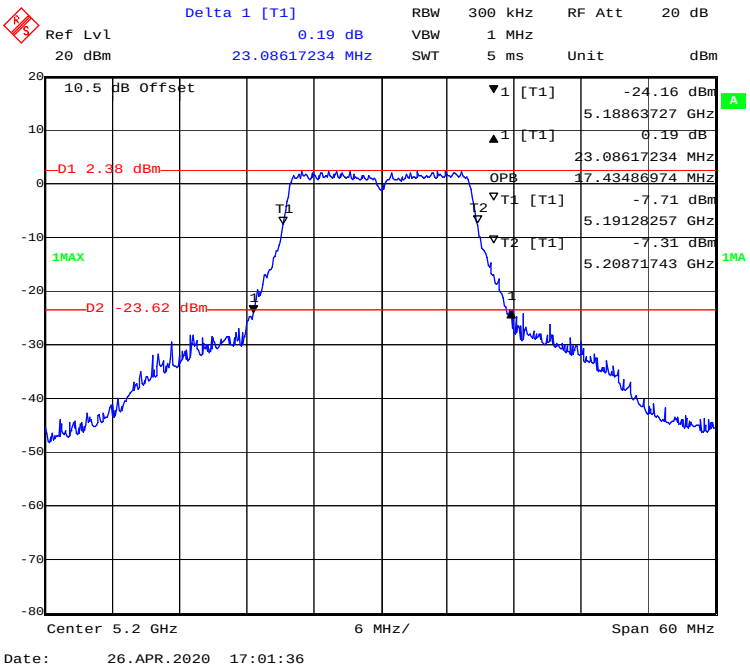
Note: No transmitted signal in the 99% bandwidth extends into the U-NII-2A and U-NII-2C band.

26 Bandwidth
5150-5250 MHz Band:

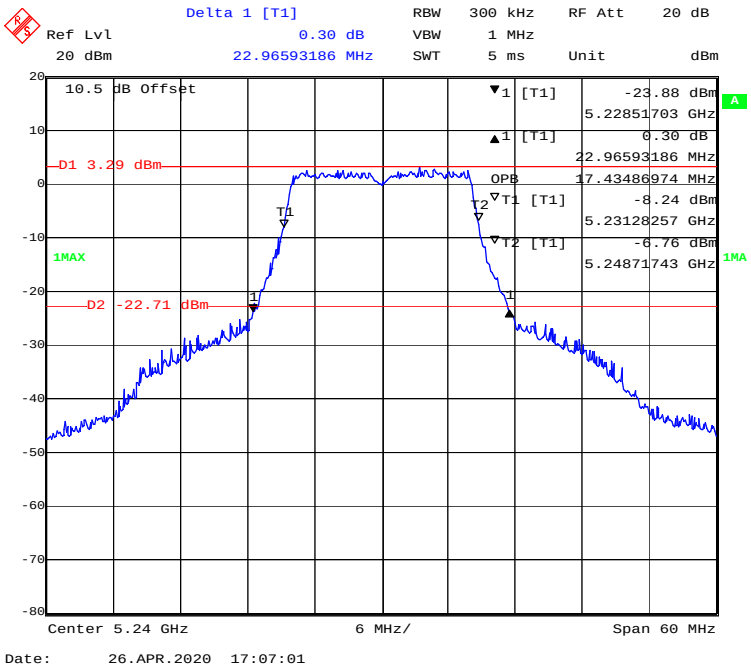
802.11a mode, 5180MHz



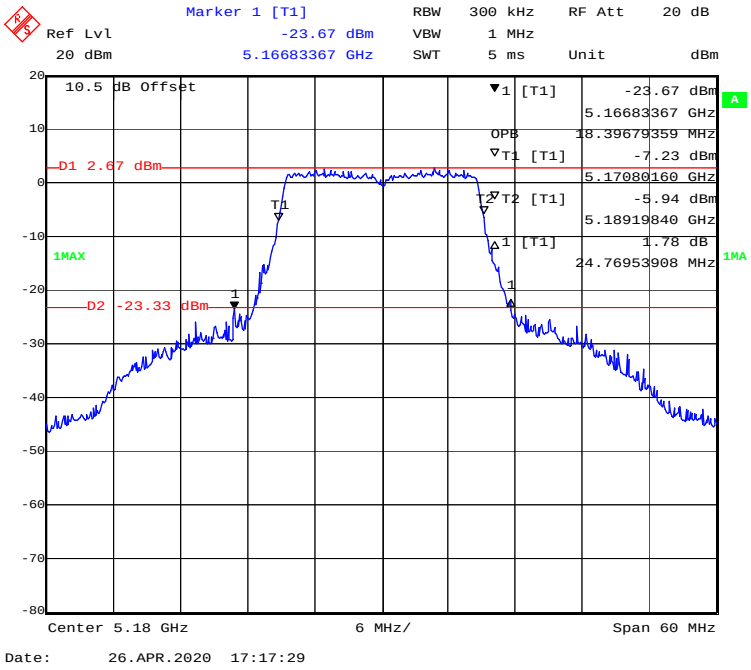
802.11a mode, 5200MHz



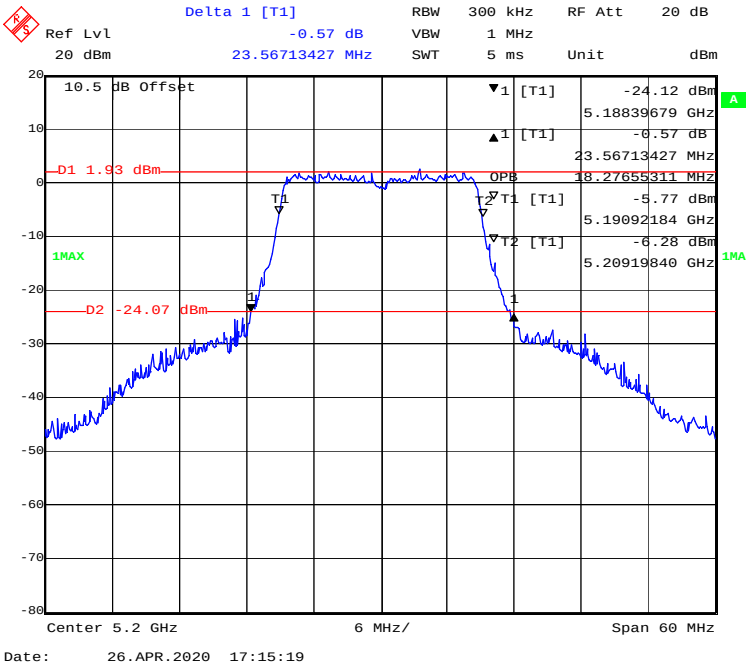
802.11a mode, 5240MHz



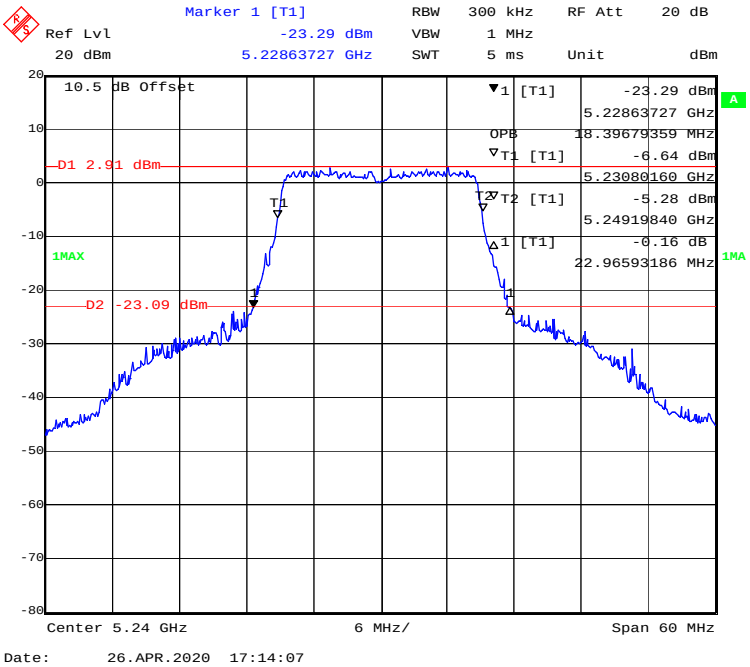
802.11n-HT20 mode, 5180MHz



802.11n-HT20 mode, 5200MHz



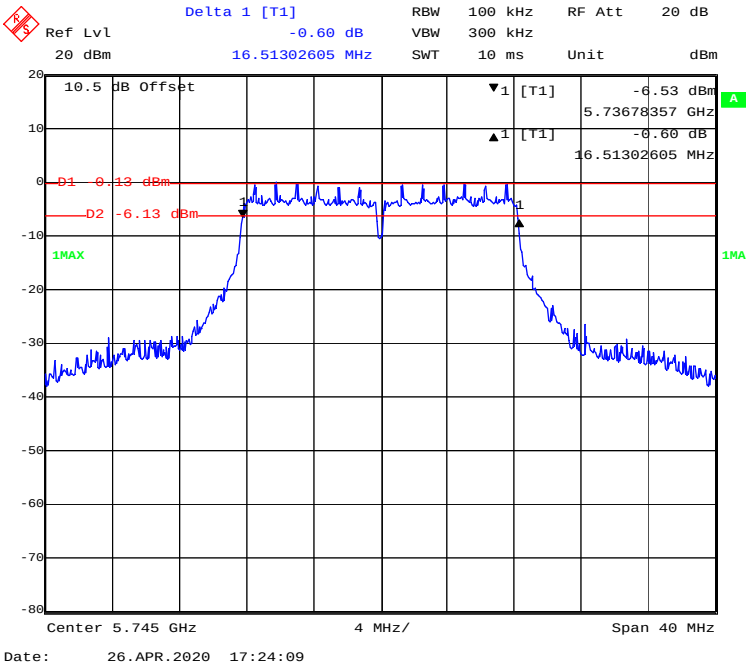
802.11n-HT20 mode, 5240MHz



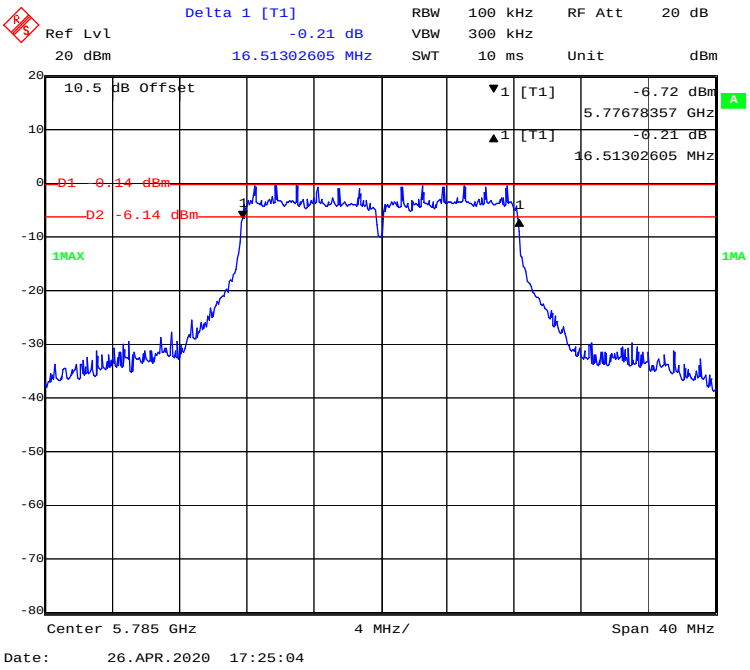
6 Bandwidth

5725-5850 MHz Band:

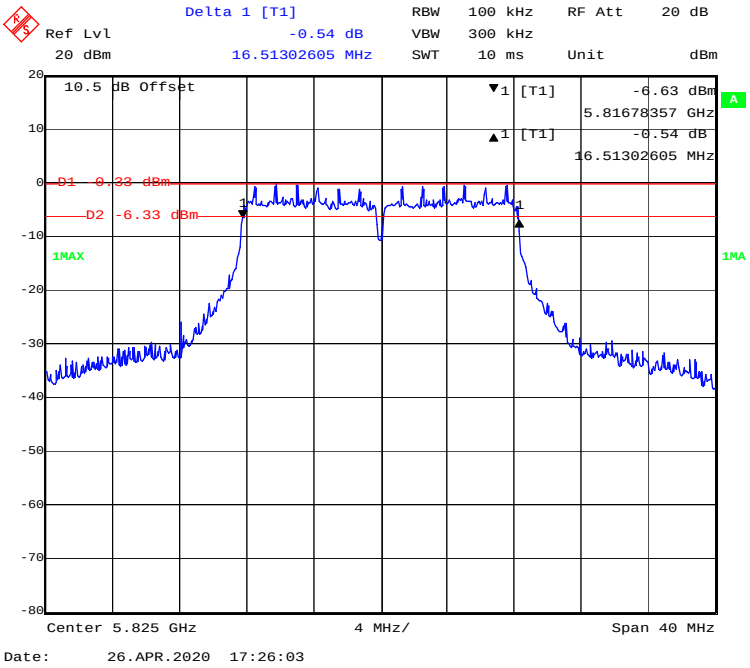
802.11a mode, 5745MHz



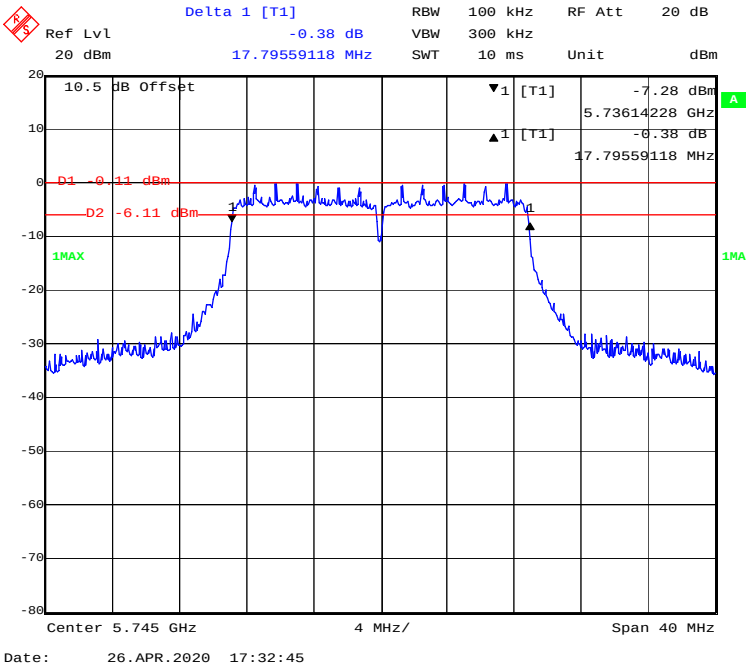
802.11a mode, 5785MHz



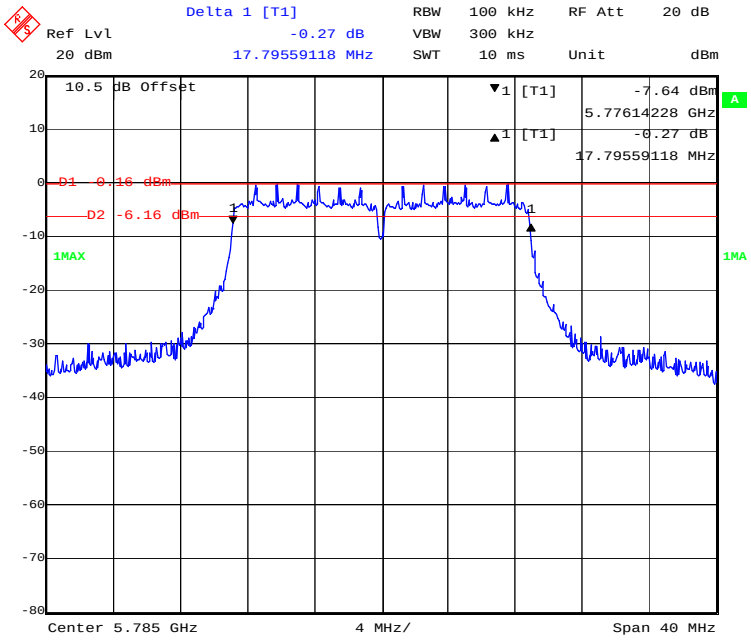
802.11a mode, 5825MHz



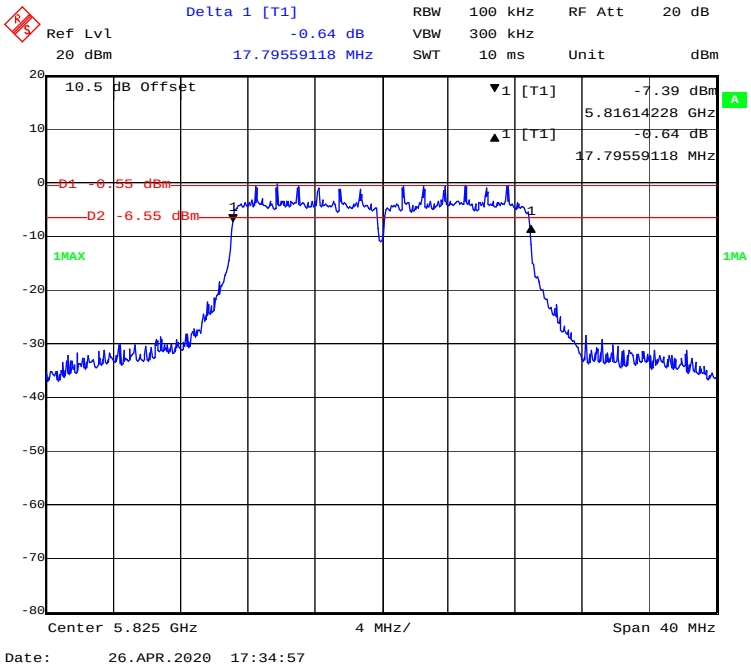
802.11n-HT20 mode, 5745MHz



802.11n-HT20 mode, 5785MHz

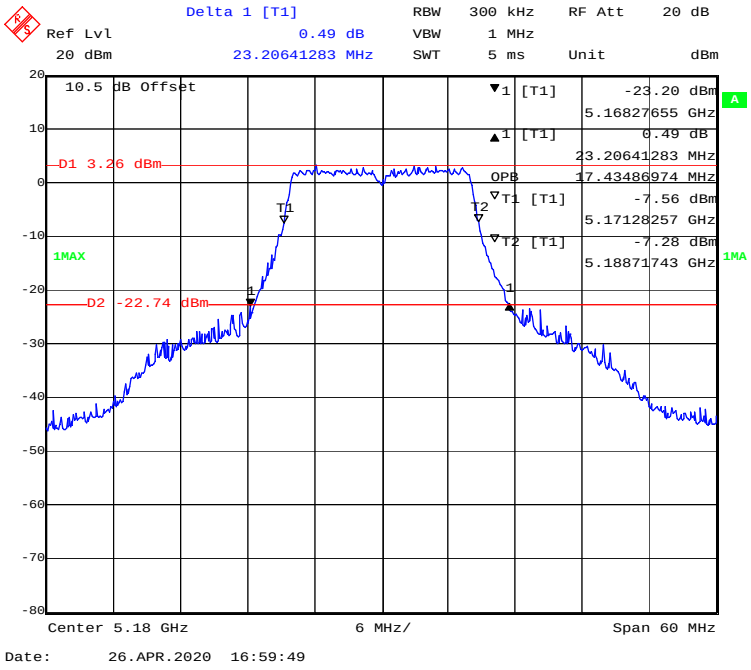


802.11n-HT20 mode, 5825MHz

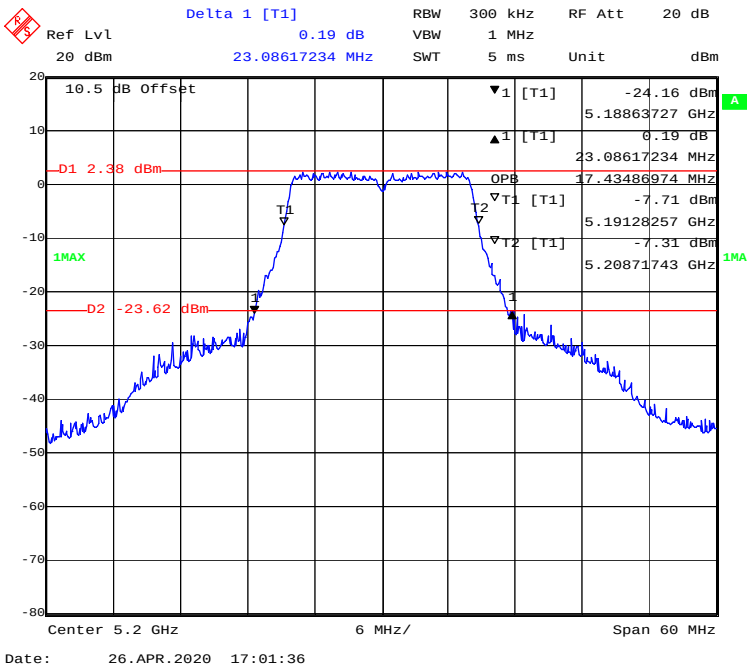


99% Occupied Bandwidth
5150-5250 MHz Band:

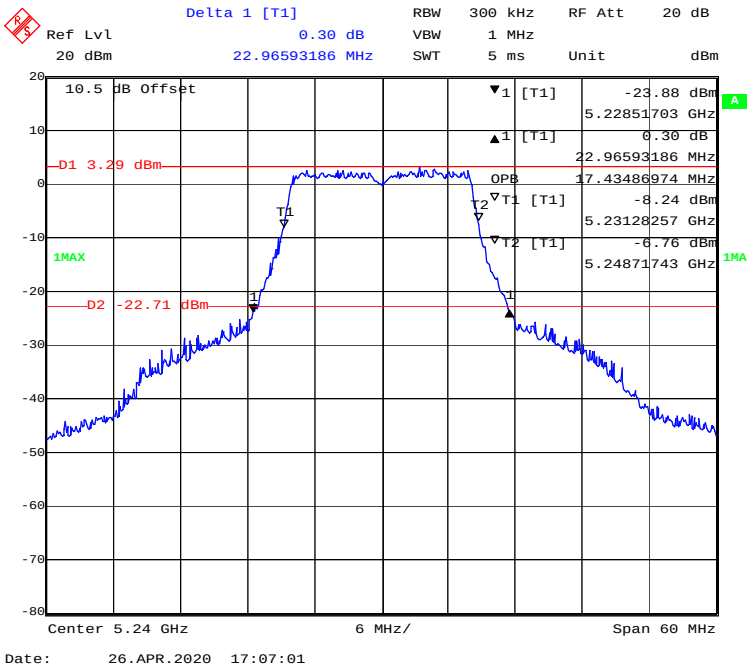
802.11a mode, 5180MHz



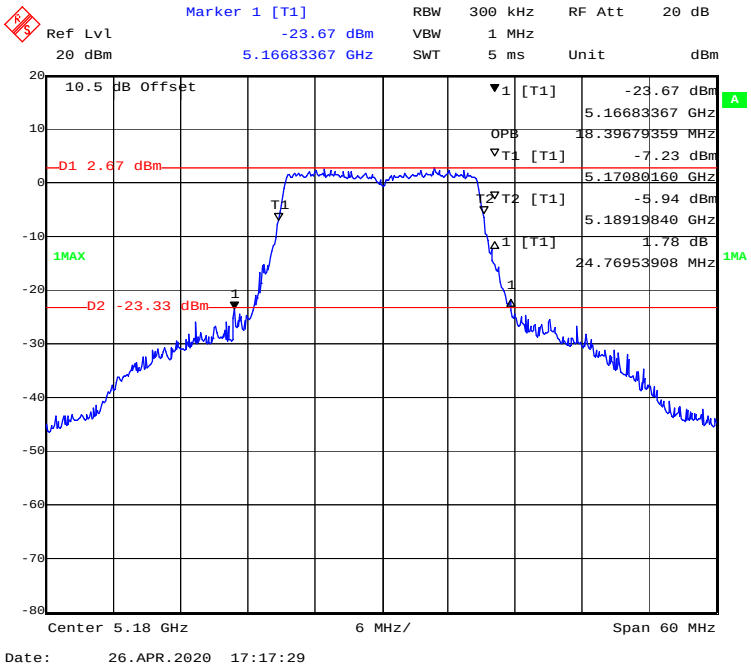
802.11a mode, 5200MHz



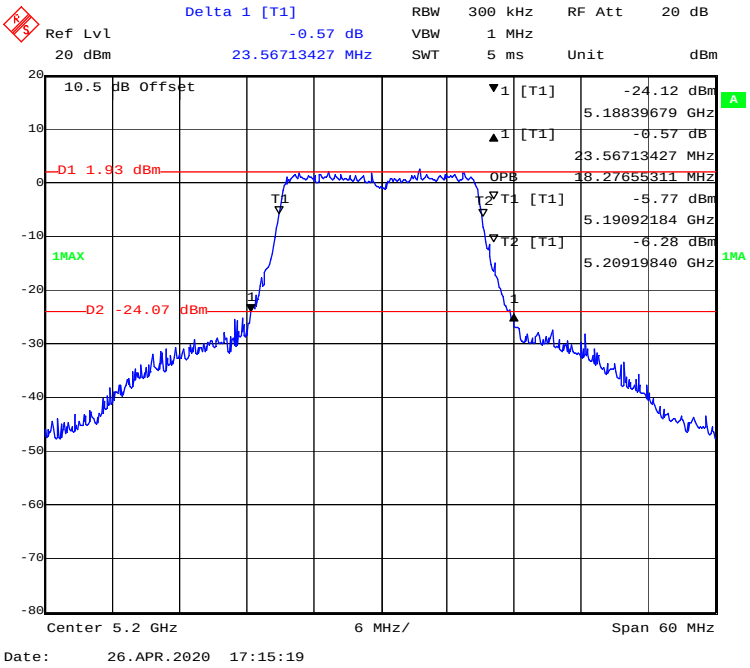
802.11a mode, 5240MHz



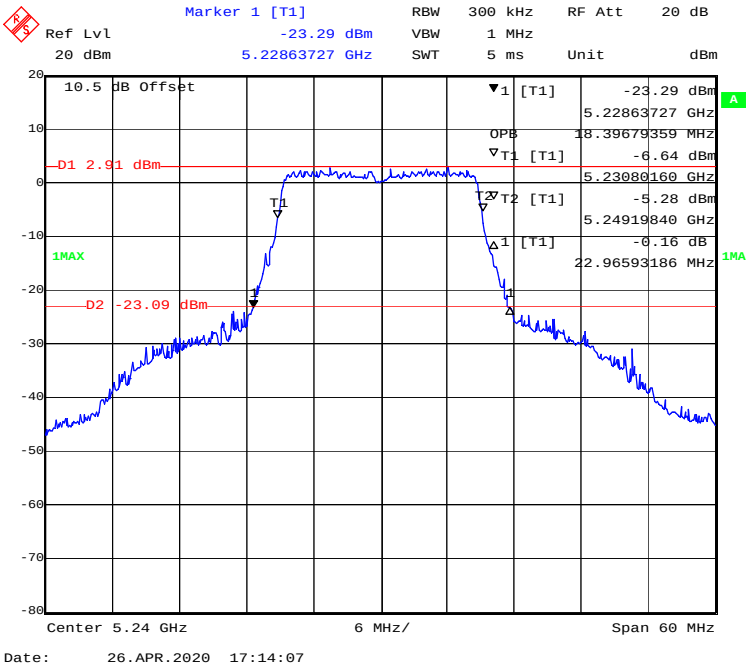
802.11n-HT20 mode, 5180MHz



802.11n-HT20 mode, 5200MHz

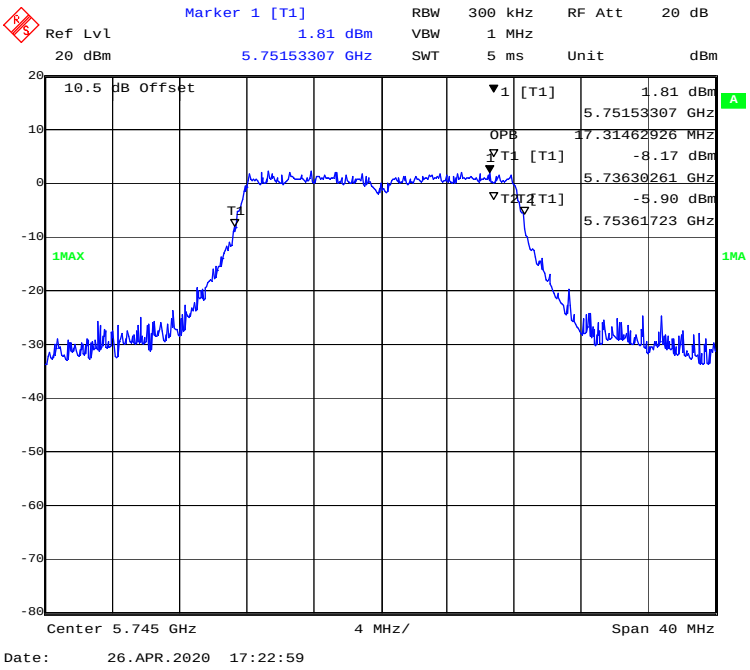


802.11n-HT20 mode, 5240MHz

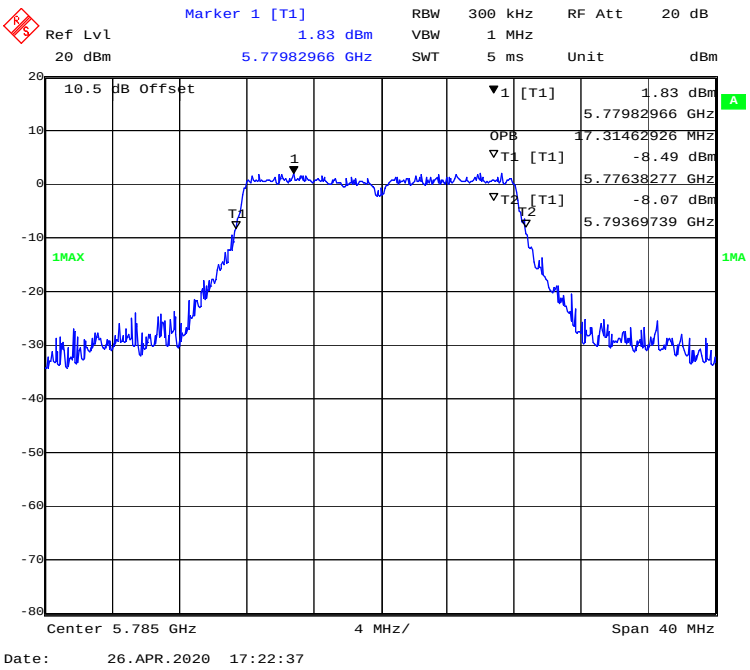


5725-5850 MHz Band:

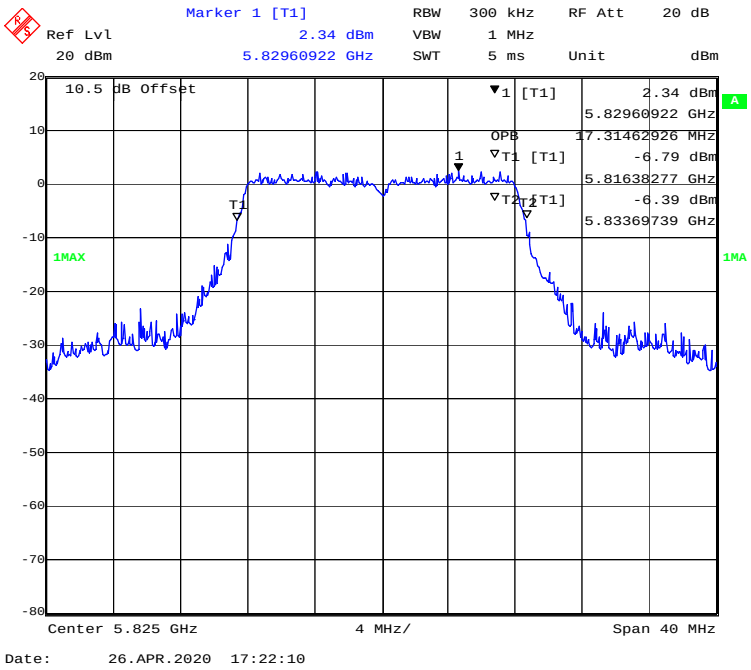
802.11a mode, 5745MHz



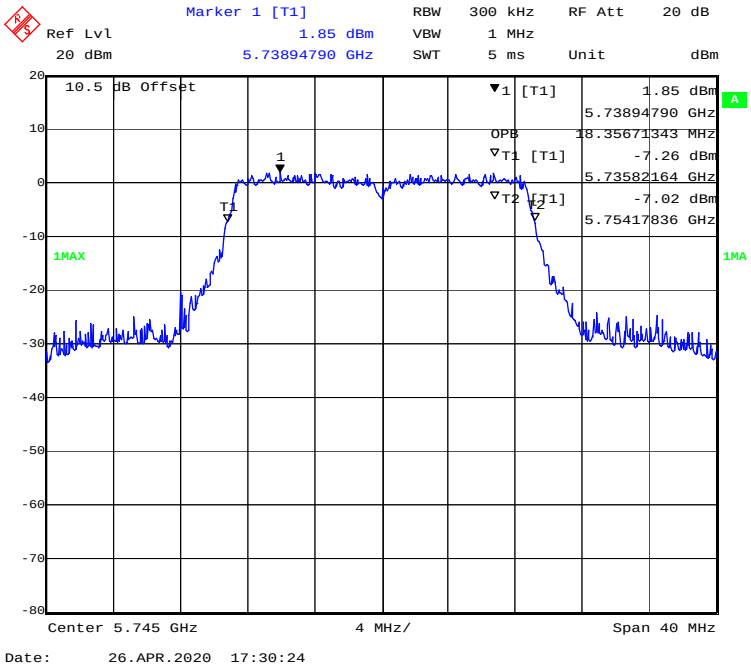
802.11a mode, 5785MHz



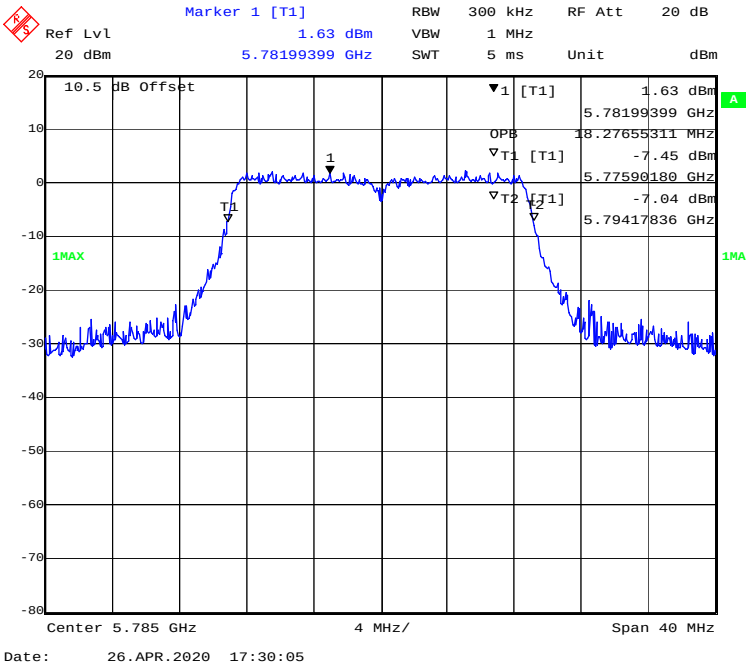
802.11a mode, 5825MHz



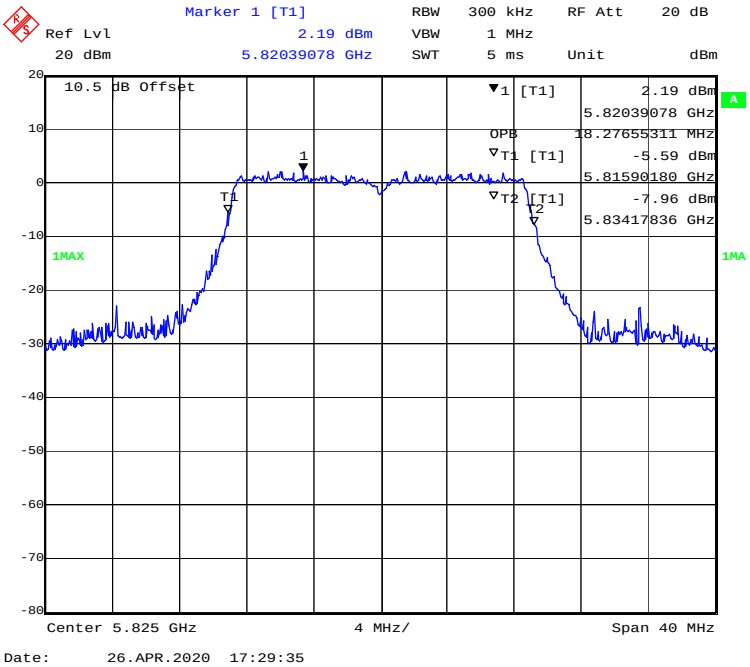
802.11n-HT20 mode, 5745MHz



802.11n-HT20 mode, 5785MHz



802.11n-HT20 mode, 5825MHz



FCC §15.407(a) (1) (3) – CONDUCTED TRANSMITTER OUTPUT POWER

Applicable Standard

According to §15.407(a)(1)

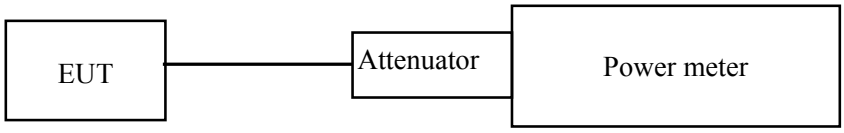
(iv) For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. 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) (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℃
Relative Humidity:	50%
ATM Pressure:	101.5 kPa

The testing was performed by Stone Zhang on 2020-04-26.

Test Mode: Transmitting

Test Mode: Transmitting

Test mode	Band	Channel	Frequency (MHz)	Average Conducted Output Power (dBm)	Limit	Result
802.11a	5150-5250 MHz	Low	5180	19.23	24	PASS
		Middle	5200	18.82	24	PASS
		High	5240	20.18	24	PASS
	5725-5850 MHz	Low	5745	19.25	30	PASS
		Middle	5785	19.06	30	PASS
		High	5825	18.90	30	PASS
802.11n-HT20	5150-5250 MHz	Low	5180	19.22	24	PASS
		Middle	5200	18.74	24	PASS
		High	5240	19.22	24	PASS
	5725-5850 MHz	Low	5745	19.10	30	PASS
		Middle	5785	19.03	30	PASS
		High	5825	18.09	30	PASS

Note: The maximum antenna gain is 0.5dBi.

FCC §15.407(a) (1) (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) (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℃
Relative Humidity:	50%
ATM Pressure:	101.5 kPa

The testing was performed by Stone Zhang on 2020-04-26.

Test Mode: Transmitting

5150MHz-5250MHz:

Mode	Channel	Frequency (MHz)	PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11a	Low	5180	1.59	11	PASS
	Middle	5200	0.65	11	PASS
	High	5240	1.22	11	PASS
802.11n-HT20	Low	5180	0.71	11	PASS
	Middle	5200	0.60	11	PASS
	High	5240	0.78	11	PASS

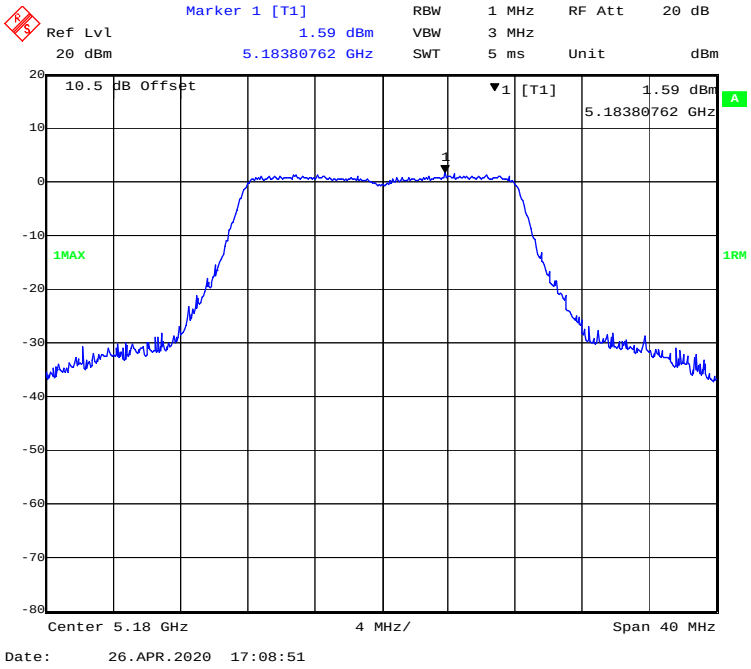
5725MHz-5850MHz:

Mode	Channel	Frequency (MHz)	PSD (dBm/500kHz)	Limit (dBm/500kHz)	Result
802.11a	Low	5745	-0.38	30	PASS
	Middle	5785	-0.08	30	PASS
	High	5825	-0.73	30	PASS
802.11n-HT20	Low	5745	-0.16	30	PASS
	Middle	5785	-0.50	30	PASS
	High	5825	-0.49	30	PASS

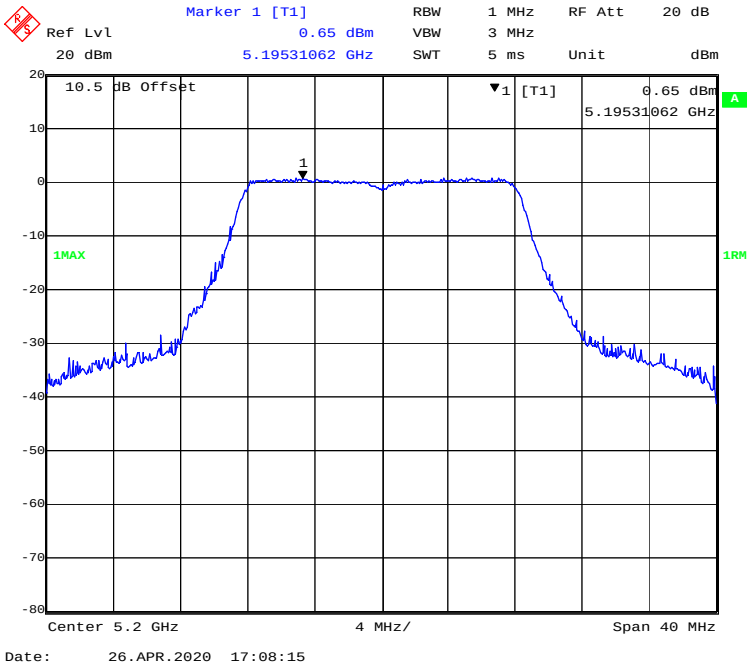
Note:
The maximum antenna gain is 0.5dBi.

5150MHz-5250MHz:

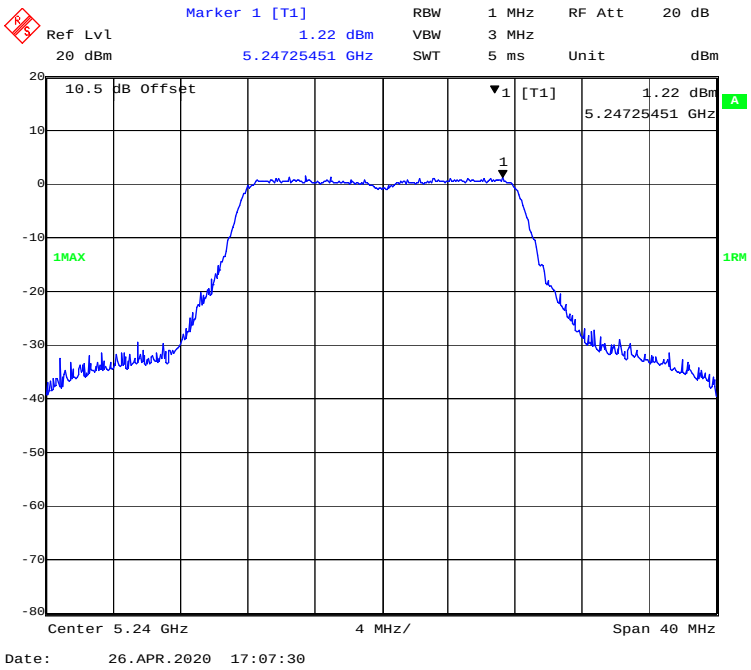
802.11a mode, Power spectral density-5180MHz



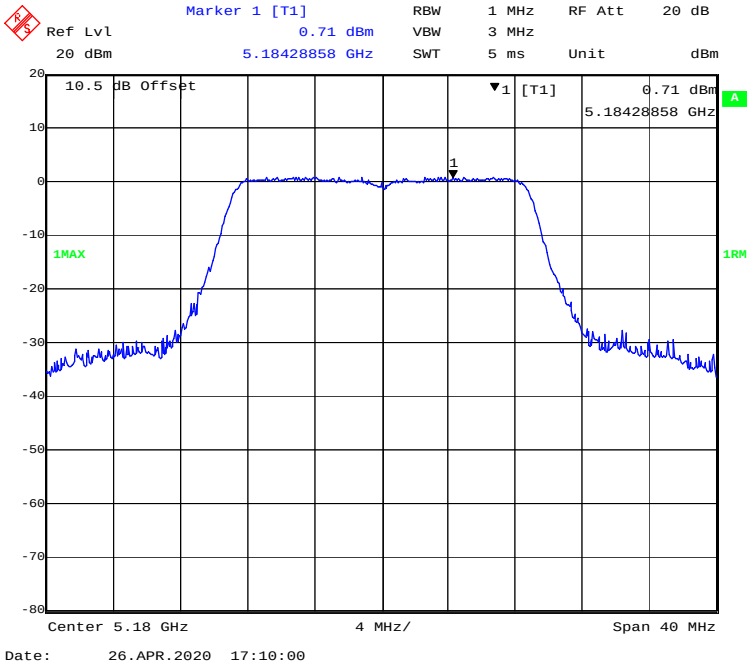
802.11a mode, Power spectral density-5200MHz



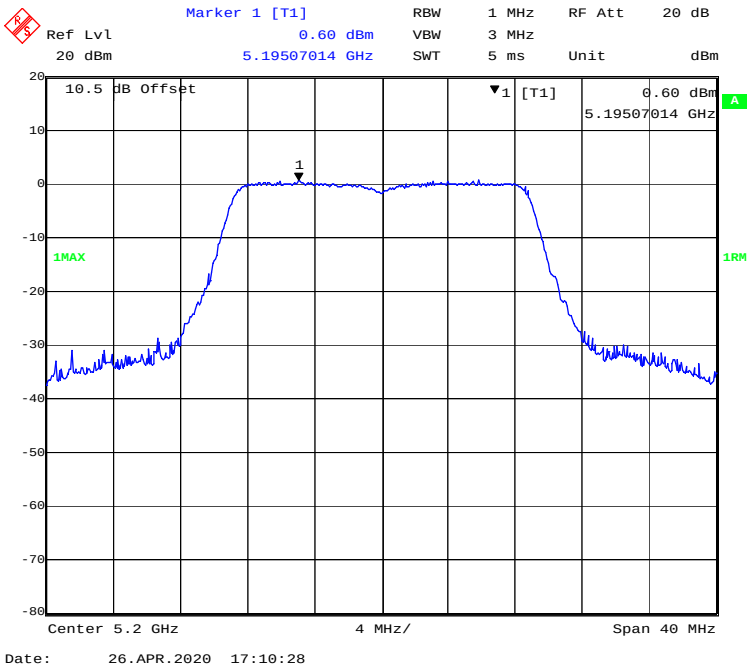
802.11a mode, Power spectral density-5240MHz



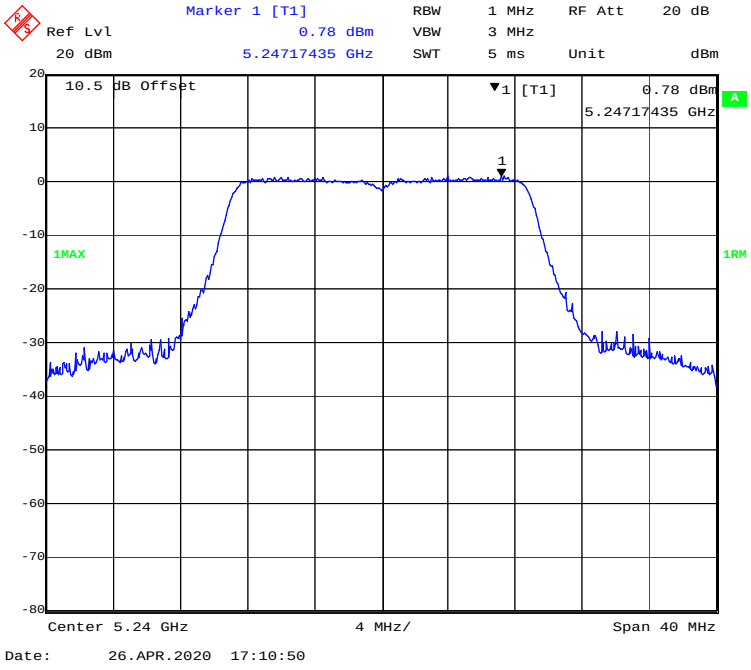
802.11n-HT20 mode, Power spectral density-5180MHz



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

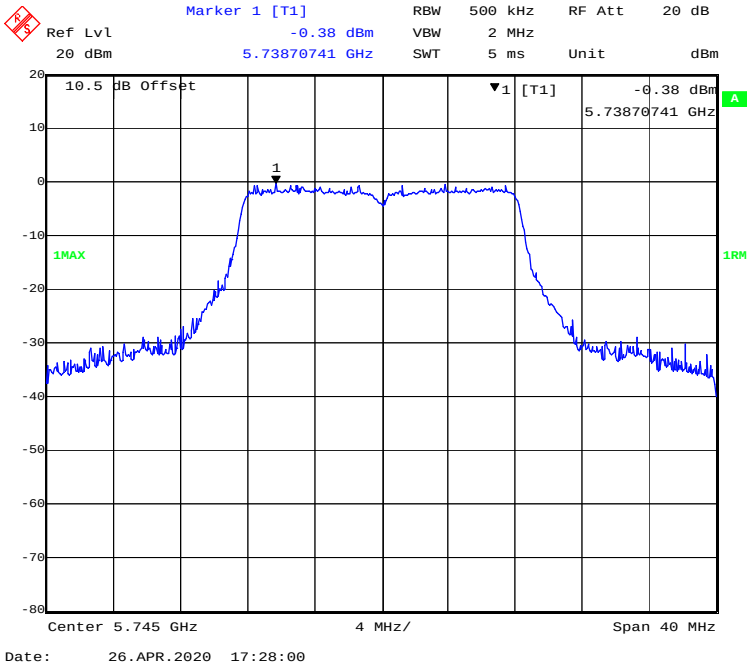


802.11n-HT20 mode, Power spectral density-5240MHz

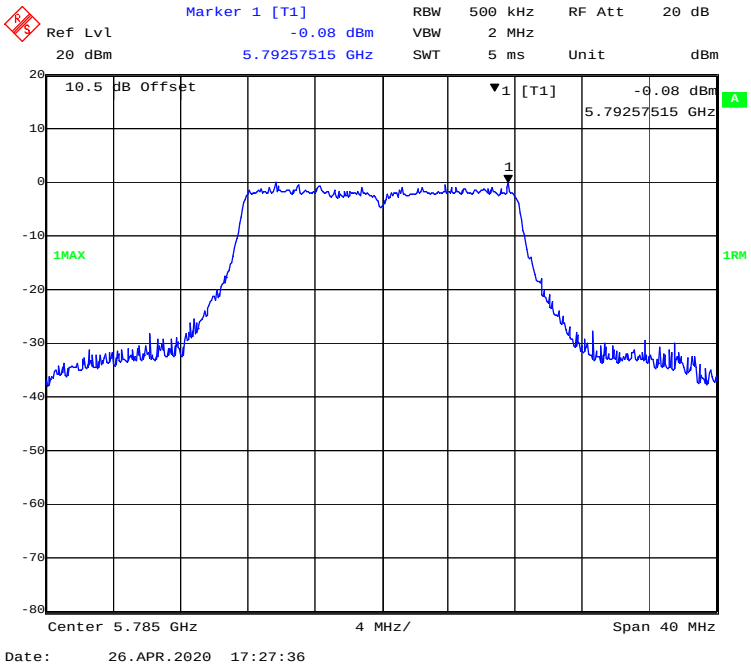


5725MHz-5850MHz:

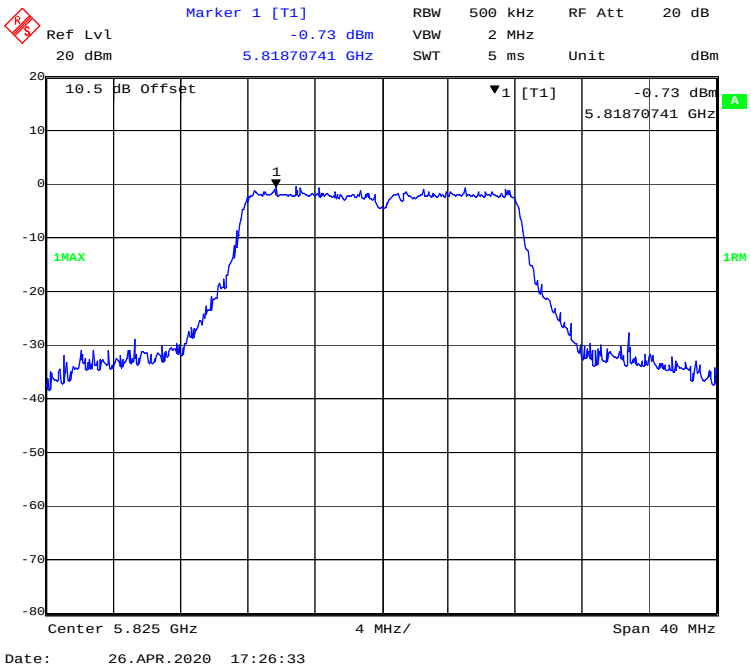
802.11a mode, Power spectral density-5745MHz



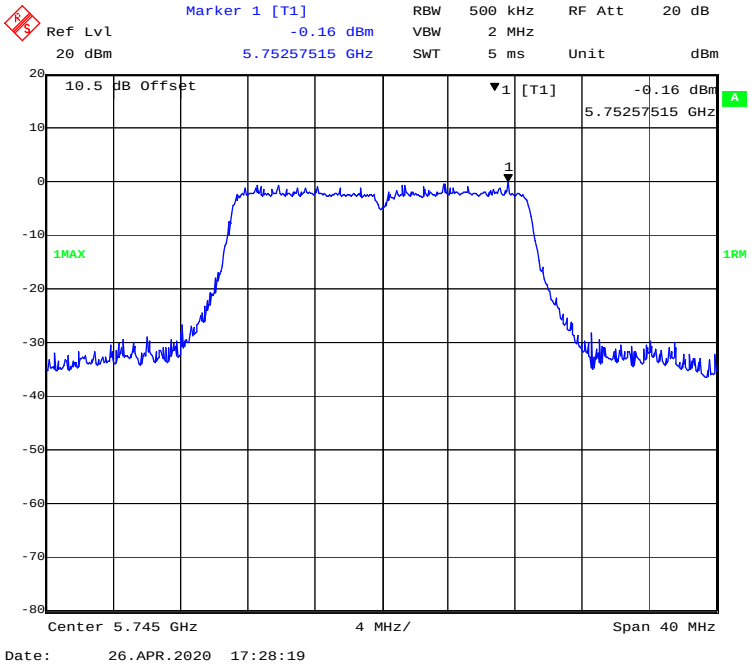
802.11a mode, Power spectral density-5785MHz



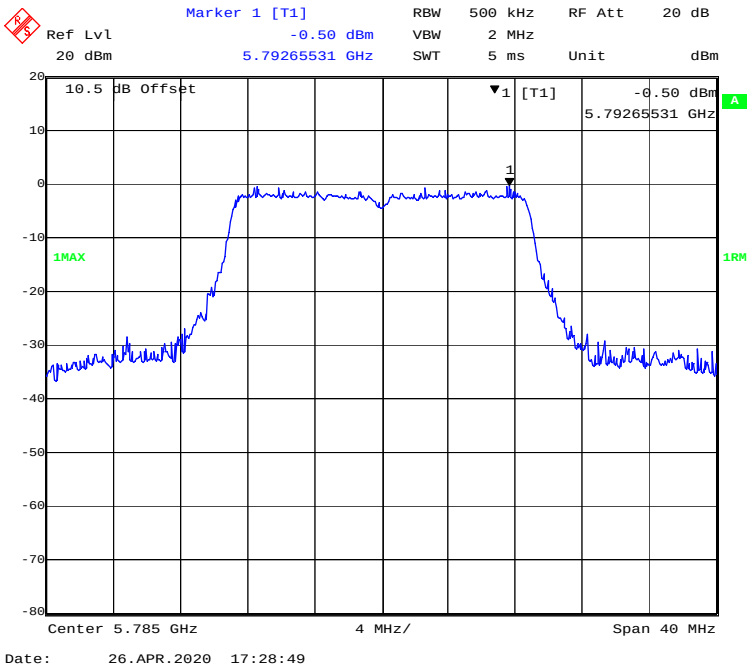
802.11a mode, Power spectral density-5825MHz



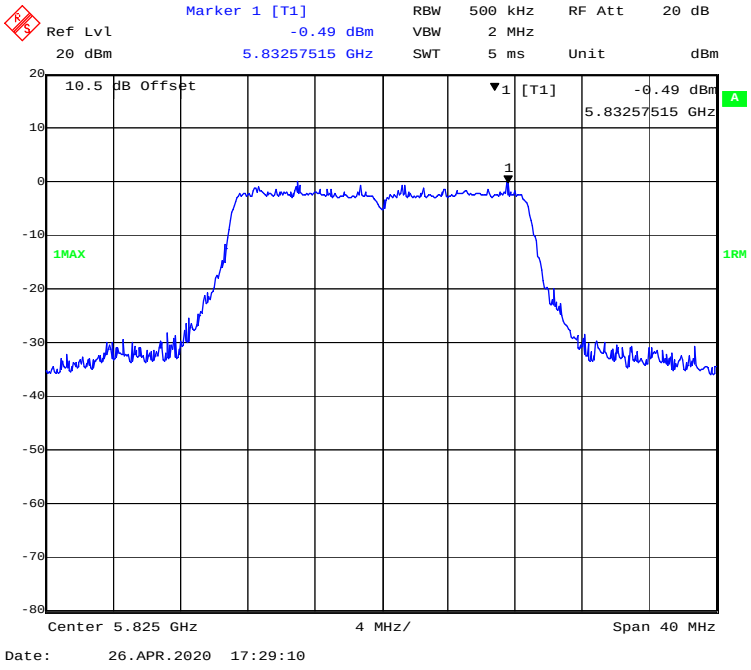
802.11n-HT20 mode, Power spectral density-5745MHz



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



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



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