



TESTING LABORATORY
CERTIFICATE#4323.01



FCC PART 15.407

TEST REPORT

For

Shanghai Sunmi Technology Co.,Ltd.

Room 605, Block 7, KIC Plaza, No.388 Song Hu Road, Yang Pu District, Shanghai 200433 China

FCC ID: 2AH25K2MINI

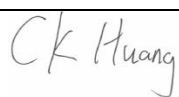
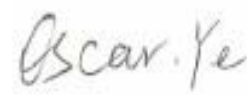
Report Type: Original Report	Product Type: Self-Checkout Kiosk
Test Engineer:	<u>CK Huang</u> 
Report Number:	<u>RKSA200706003-00D</u>
Report Date:	<u>2020-08-27</u>
Reviewed By:	<u>Oscar Ye</u>  <u>EMC Manager</u>
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant:	Shanghai Sunmi Technology Co.,Ltd.
Product Type:	Self-Checkout Kiosk
Test Model	F4501
Series Model:	F4502
Model Difference	See declaration letter
Power Supply:	DC 24 V from Adapter
RF Function:	5G Wi-Fi
Operating Band/Frequency:	5G Wi-Fi B1: 5150-5250 MHz, B4: 5725-5850 MHz
Channel Number:	5G Wi-Fi B1: 7, B4: 8
Channel Separation:	802.11a/802.11ac20/n20: 20MHz; 802.11n40/802.11ac40:40 MHz, 802.11ac80: 80 MHz
Modulation Type:	OFDM
Antenna Type:	FPC Antenna
Maximum Antenna Gain:	2.6 dBi

Adapter Information:

Model: CYSE65-240250

Input: AC100-240 V, 50/60Hz, 1.7A

Output: DC24V, 2.5A

**All measurement and test data in this report was gathered from production sample serial number: 20200706003. (Assigned by the BACL). The EUT supplied by the applicant was received on 2020-07-06.*

Objective

This type approval report is prepared on behalf of *Shanghai Sunmi 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: 2AH25K2MINI

FCC Part 15.247 DTS submissions with FCC ID: 2AH25K2MINI

FCC Part 15B JAB submissions with FCC ID: 2AH25K2MINI

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/802.11ac20/n20 mode Channel 36, 40, 48 were tested.

802.11n40/802.11ac40 mode Channel 38, 46 were tested.

802.11ac80 mode Channel 42 was tested

Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220
38	5190	46	5230
40	5200	48	5240
42	5210	/	/

For **5725~5850 MHz** band,

802.11a/802.11ac20/n20 mode Channel 149, 157, 165 were tested.

802.11n40/802.11ac40 mode Channel 151, 159 were tested.

802.11ac80 mode Channel 155 was tested.

Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	159	5795
151	5755	161	5805
153	5765	165	5825
155	5775	/	/
157	5785	/	/

EUT Exercise Software

RF test tool: CMD

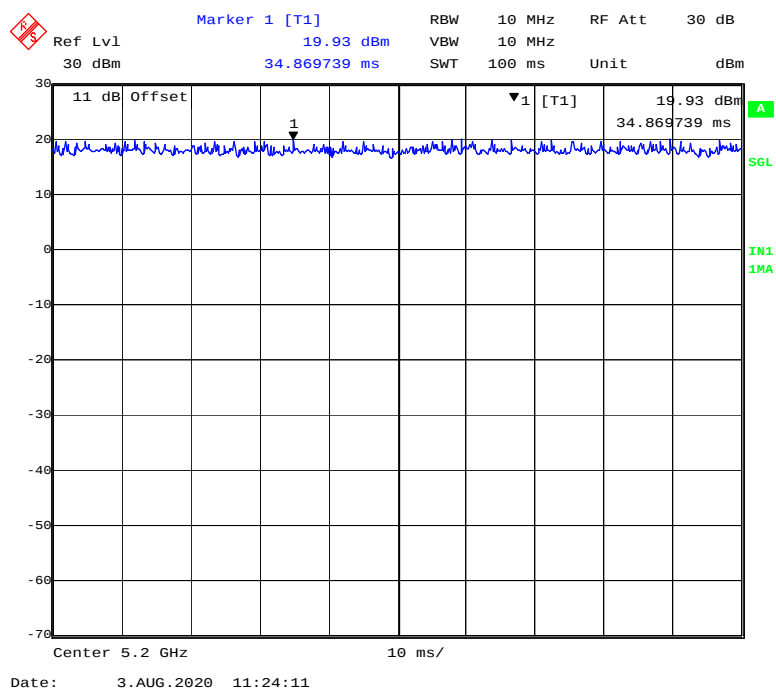
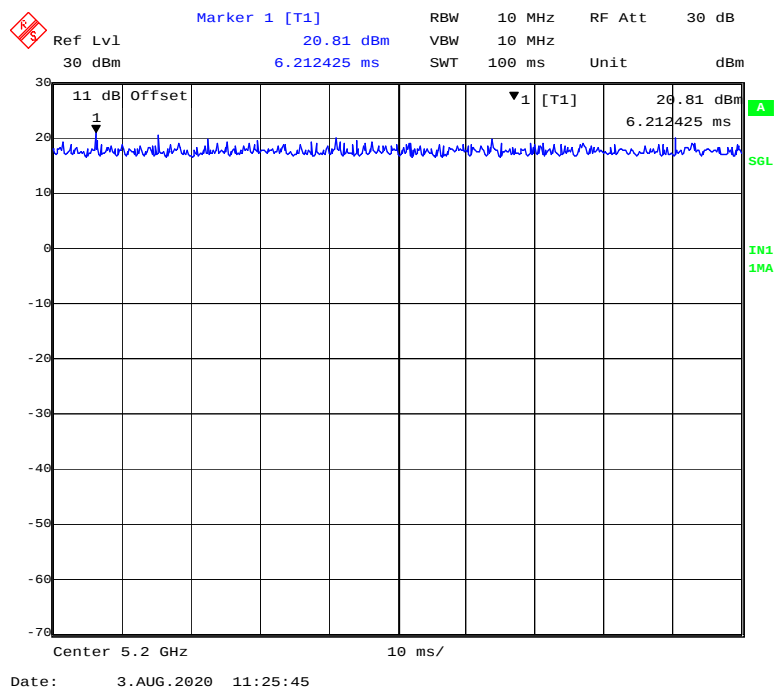
The worst case was performed under:

5150MHz-5250MHz Band:

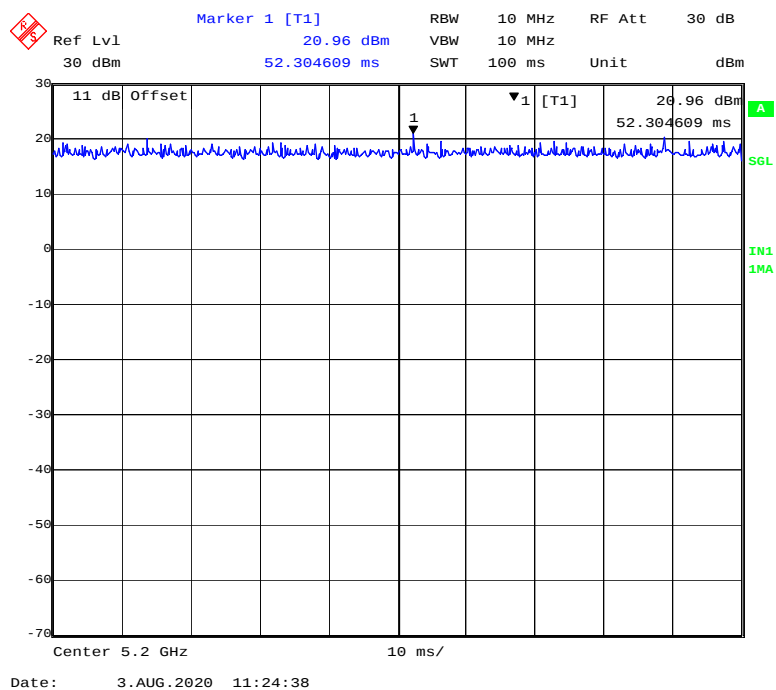
Mode	Data rate	Channel	Power Setting
802.11a	6 Mbps	5180	18
		5200	
		5240	
802.11ac20	MCS0	5180	18
		5200	
		5240	
802.11n-HT20	MCS0	5180	18
		5200	
		5240	
802.11ac40	MCS0	5190	17
		5230	
802.11n-HT40	MCS0	5190	17
		5230	
802.11ac80	MCS0	5210	15

5725MHz-5850MHz Band:

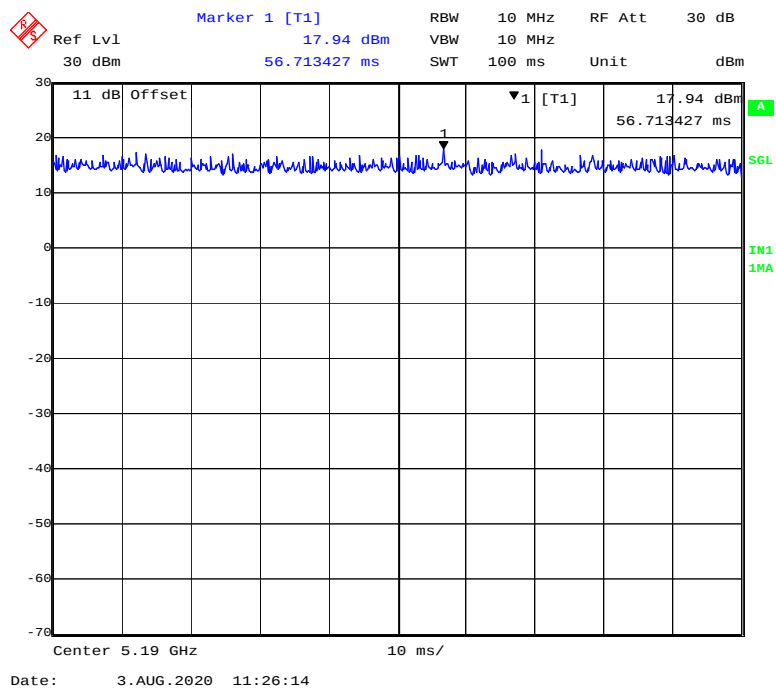
Mode	Data rate	Channel	Power Setting
802.11a	6 Mbps	5745	20
		5785	
		5825	
802.11ac20	MCS0	5745	20
		5785	
		5825	
802.11n-HT20	MCS0	5745	20
		5785	
		5825	
802.11ac40	MCS0	5755	19
		5795	
802.11n-HT40	MCS0	5755	19
		5795	
802.11ac80	MCS0	5775	17

Duty Cycle**5150MHz-5250MHz Band:****802.11a mode****802.11ac20 mode**

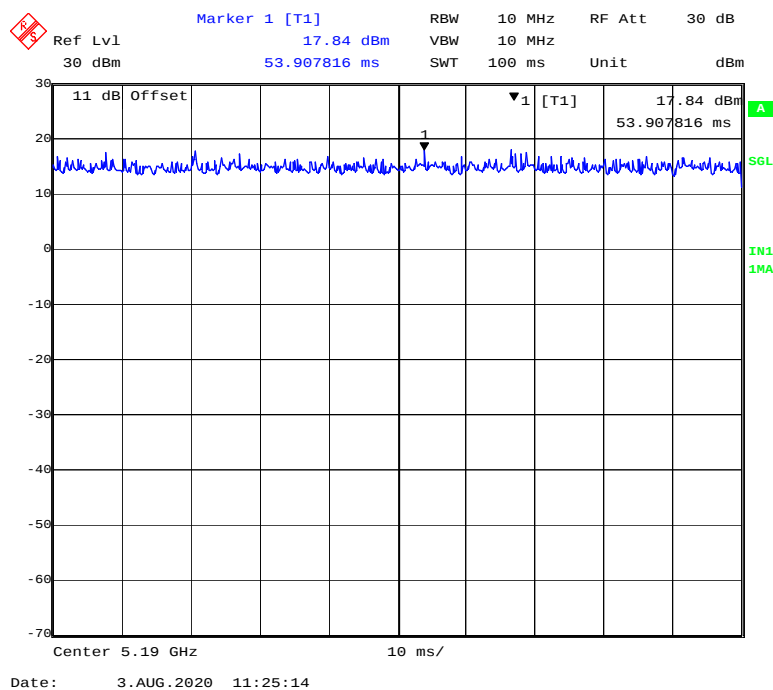
802.11n-HT20 mode



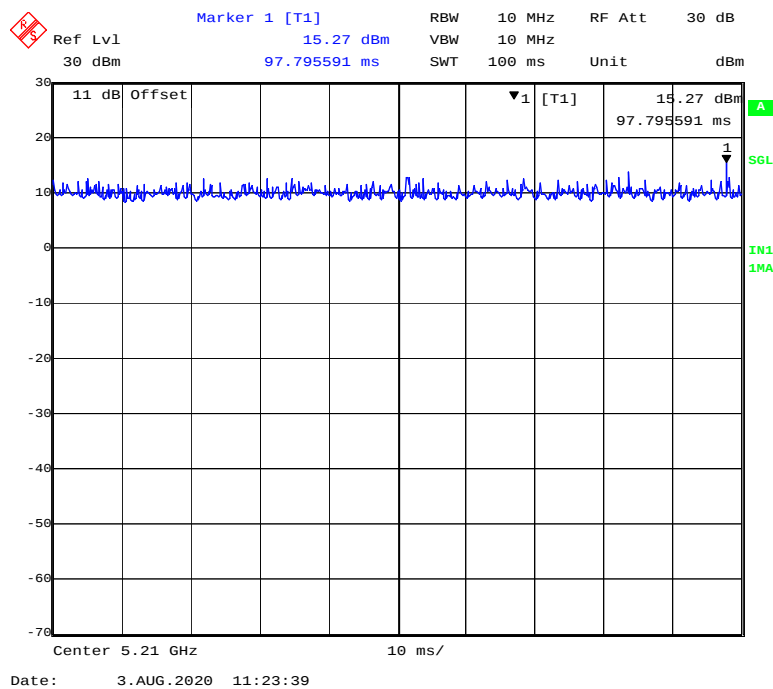
802.11 ac40 mode

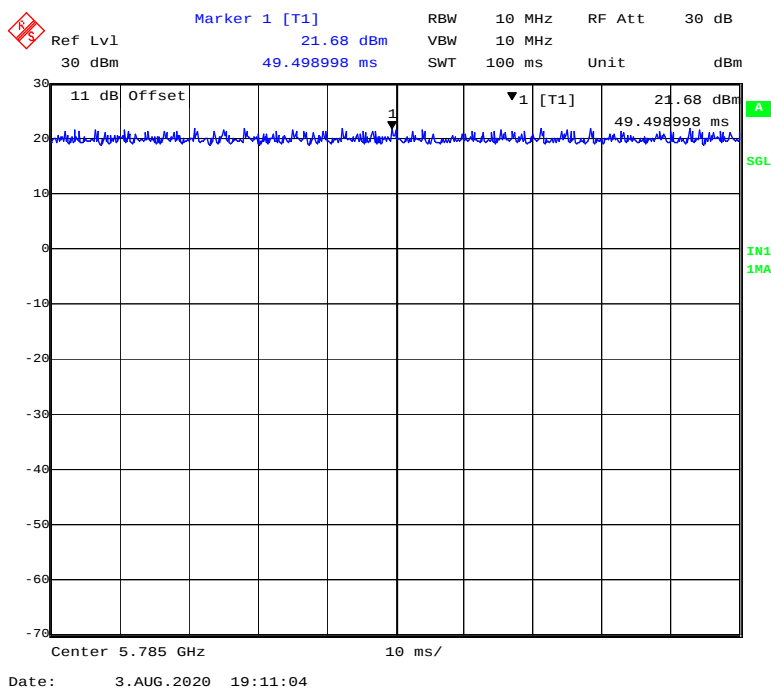
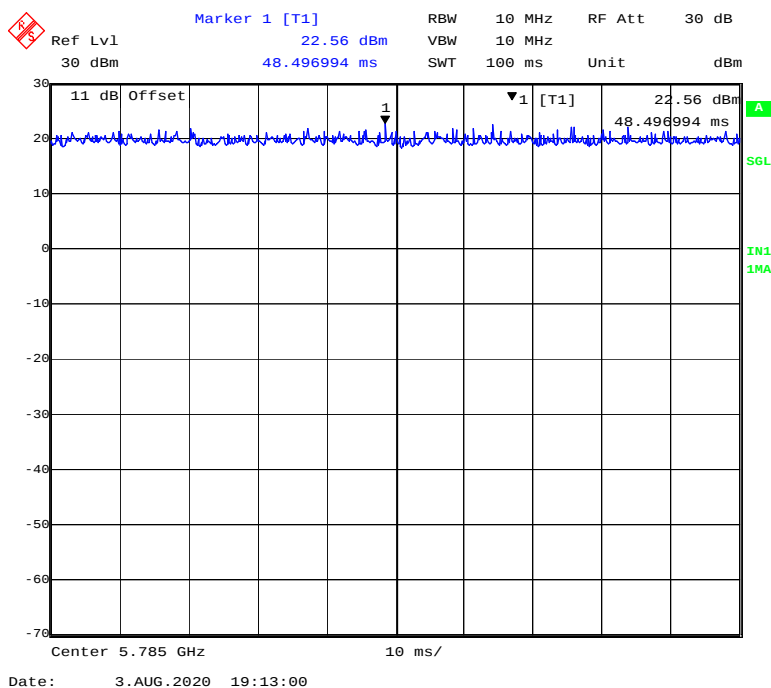


802.11n-HT40 mode

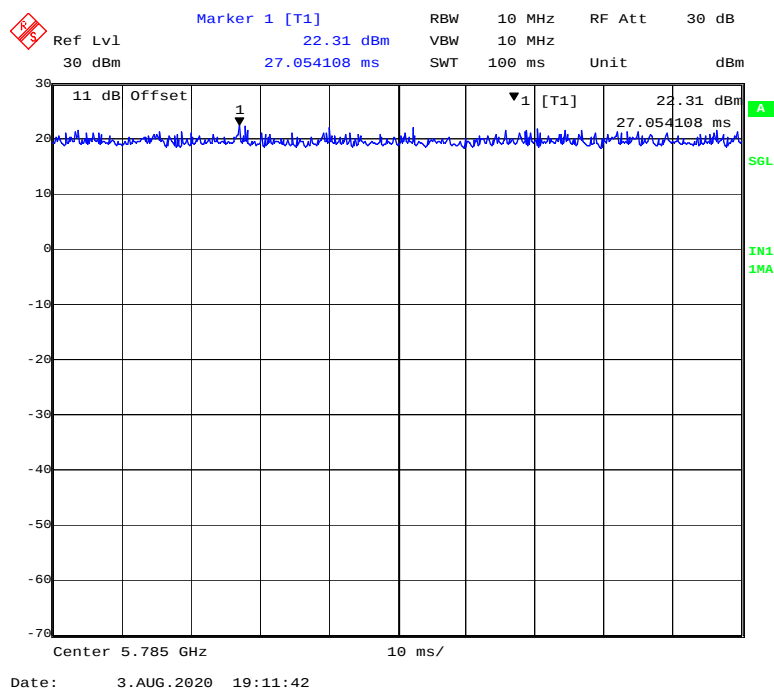


802.11 ac80 mode

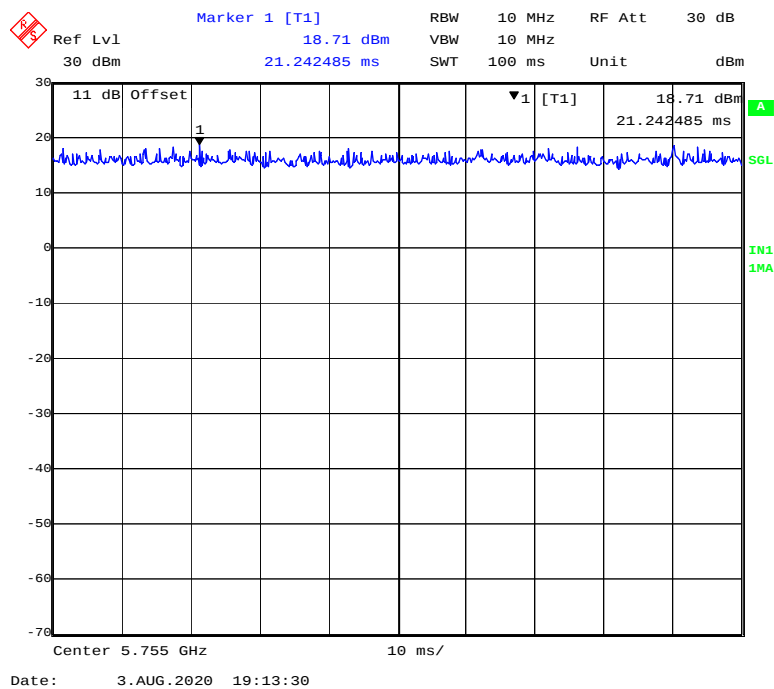


5725MHz-5850MHz Band:**802.11a mode****802.11ac20 mode**

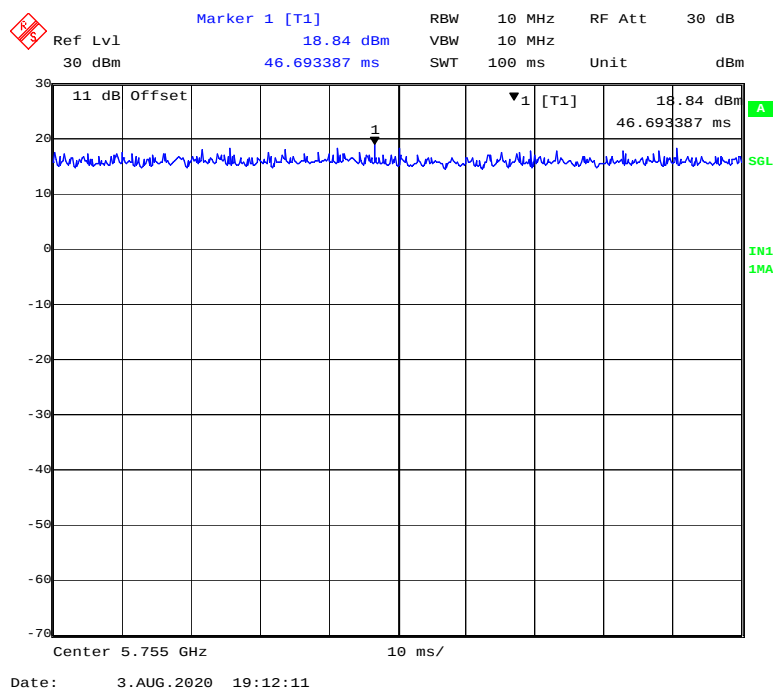
802.11n-HT20 mode



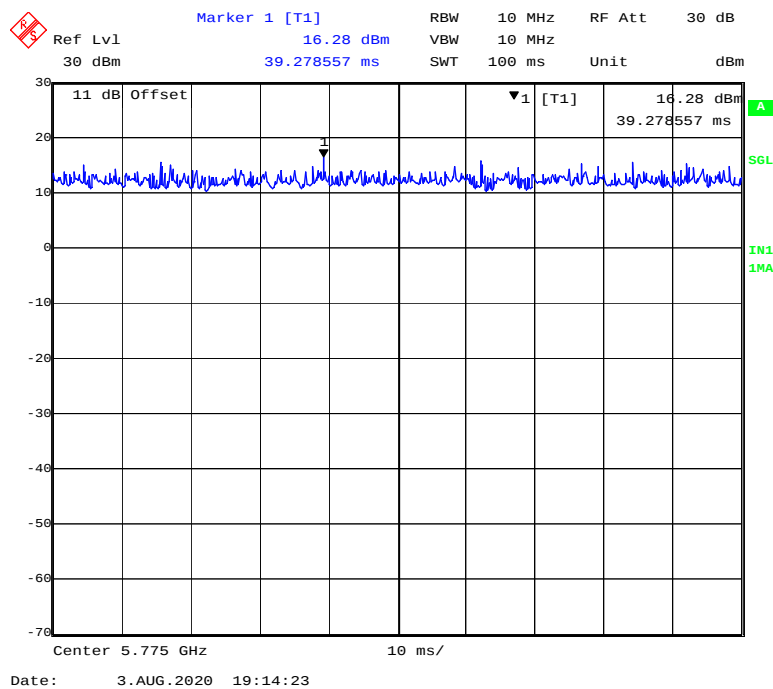
802.11 ac40 mode



802.11n-HT40 mode



802.11n- ac80 mode



Mode	Frequency Range (MHz)	Duty Cycle (%)	T (ms)	1/T (kHz)	10log(1/x)
802.11a	5150-5250	100	/	/	0
802.11ac20		100	/	/	0
802.11n-HT20		100	/	/	0
802.11ac40		100	/	/	0
802.11n-HT40		100	/	/	0
802.11ac80		100	/	/	0
802.11a	5725-5850	100	/	/	0
802.11ac20		100	/	/	0
802.11n-HT20		100	/	/	0
802.11ac40		100	/	/	0
802.11n-HT40		100	/	/	0
802.11ac80		100	/	/	0

Note: “x” means duty cycle.

Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

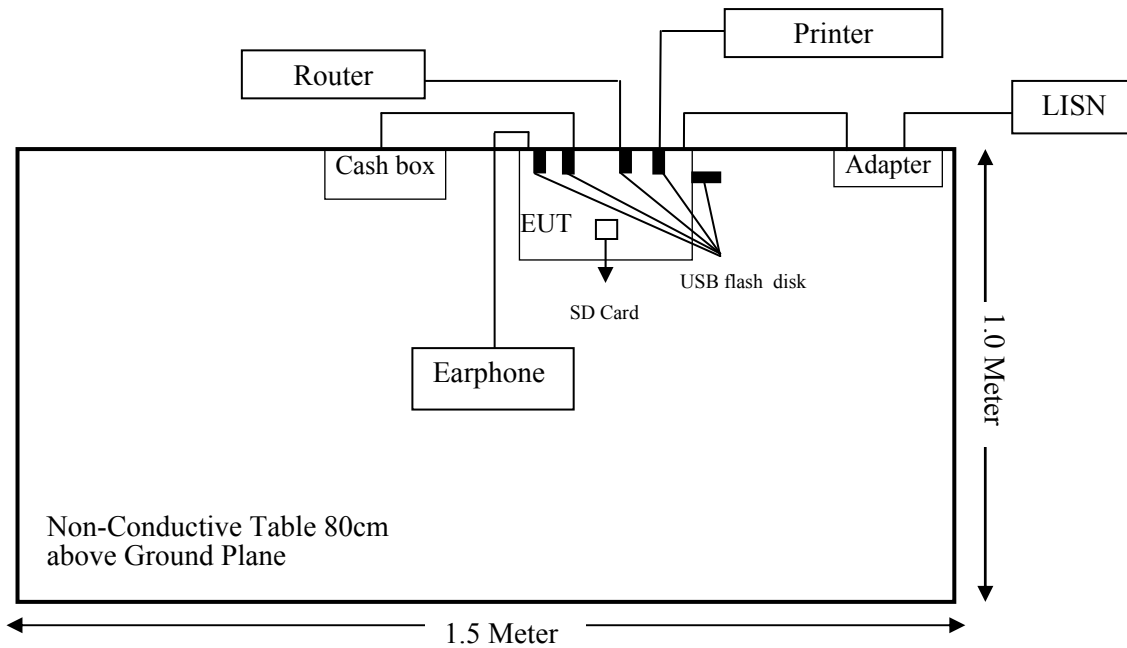
Manufacturer	Description	Model	Serial Number
Shanghai Sunmi Technology Co.,Ltd.	Cash Box	/	/
TP-LINK	Router	EC26CA652860	1153150000000
/	Printer	/	/
BOLD	Earphone	/	/
Sandisk	USB flash disk	/	/
Sandisk	SD card	SDSQUNC-032G-ZN6MA	/

External I/O Cable

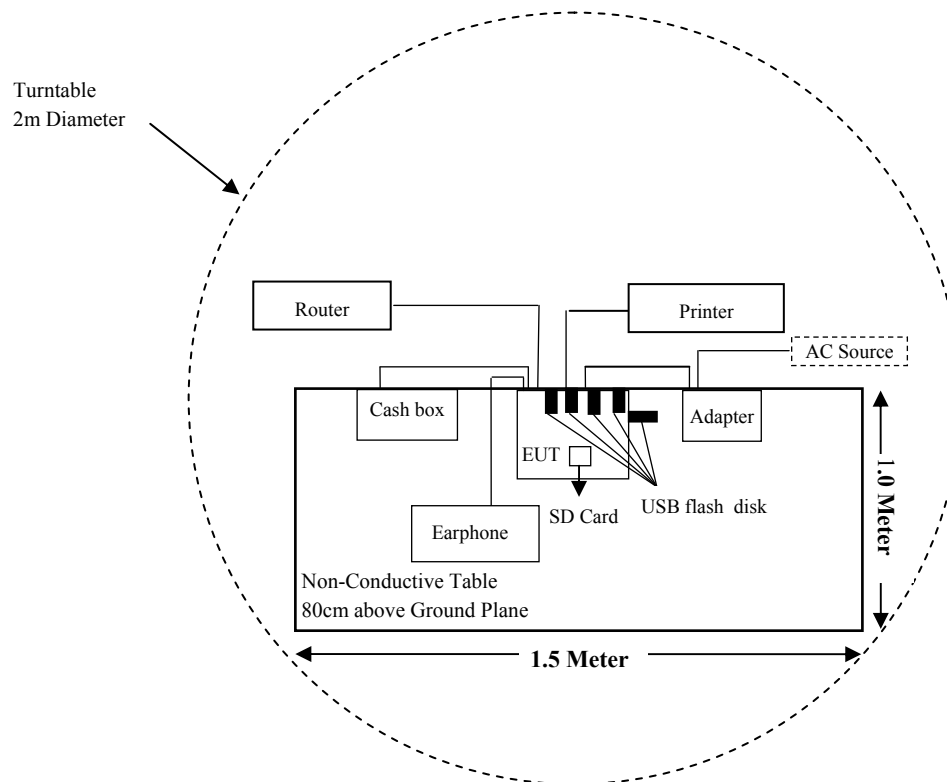
Cable Description	Length (m)	From Port	To
RJ11 Cable	0.5	EUT	Cash Box
USB Cable	1.0	EUT	Adapter
Power Cable	1.0	Adapter	LISN/ AC Source
Audio Cable	1.0	EUT	Earphone
Data Cable	1.0	EUT	Printer
RJ45 Cable	1.0	EUT	Router

Block Diagram of Test Setup

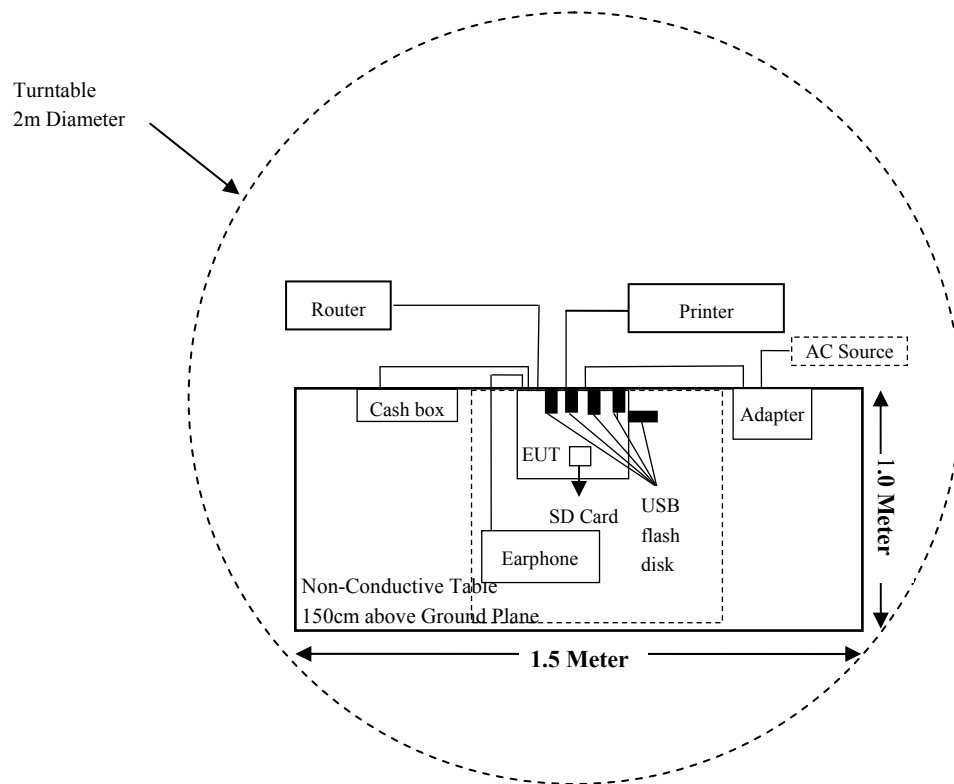
For Conducted Emissions:



For Radiated Emissions (Below 1GHz):



For Radiated Emissions (Above 1GHz):



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1310 & §2.1091	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) (8)(9)	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 Instrument	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	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	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
Narda	Attenuator	10dB	010	2020-08-15	2021-08-14
Sunmi Co.,Ltd.	RF Cable	Sunmi 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).

§1.1310& §2.1091 - MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

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

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

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

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

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

Calculated Formulary:

Predication of MPE limit at a given distance

$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm²);

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

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

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

Calculated Data:**2.4G WiFi&BLE/BT:**

Mode	Frequency Range (MHz)	Antenna Gain		Tune-up Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)	MPE Ratio
		(dBi)	(numeric)	(dBm)	(mW)				
802.11b	2412-2462	1.7	1.48	20.50	112.20	20	0.0330	1.0	802.11b
802.11g		1.7	1.48	20.00	100.00	20	0.0294	1.0	802.11g
802.11n-HT20		1.7	1.48	20.00	100.00	20	0.0294	1.0	802.11n-HT20
BLE	2402-2480	1.7	1.48	6.00	3.98	20	0.0012	1.0	BLE
BT	2402-2480	1.7	1.48	6.00	3.98	20	0.0012	1.0	BT

5G Wi-Fi:

Mode	Frequency Range (MHz)	Antenna Gain		Tune-up Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
802.11a	5150~5250	2.60	1.82	20.00	100.00	20	0.0362	1.0
	5725~5850	2.60	1.82	22.50	177.83	20	0.0644	1.0
802.11ac20	5150~5250	2.60	1.82	19.50	89.13	20	0.0323	1.0
	5725~5850	2.60	1.82	22.50	177.83	20	0.0644	1.0
802.11n20	5150~5250	2.60	1.82	19.50	89.13	20	0.0323	1.0
	5725~5850	2.60	1.82	22.00	158.49	20	0.0574	1.0
802.11ac40	5150~5250	2.60	1.82	18.50	70.79	20	0.0256	1.0
	5725~5850	2.60	1.82	21.50	141.25	20	0.0511	1.0
802.11n40	5150~5250	2.60	1.82	18.50	70.79	20	0.0256	1.0
	5725~5850	2.60	1.82	21.00	125.89	20	0.0456	1.0
802.11ac80	5210	2.60	1.82	16.00	39.81	20	0.0144	1.0
	5775	2.60	1.82	18.50	70.79	20	0.0256	1.0

Note: 1. For the above tune up power were declared by the manufacturer.
2. Wi-Fi and BT/BLE can't transmit simultaneously.

Result: The device meet FCC MPE at 20 cm distance.

FCC §15.203 – ANTENNA REQUIREMENT

Applicable Standard

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

- a. Antenna must be permanently attached to the unit.
 - b. Antenna must use a unique type of connector to attach to the EUT.
- Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

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

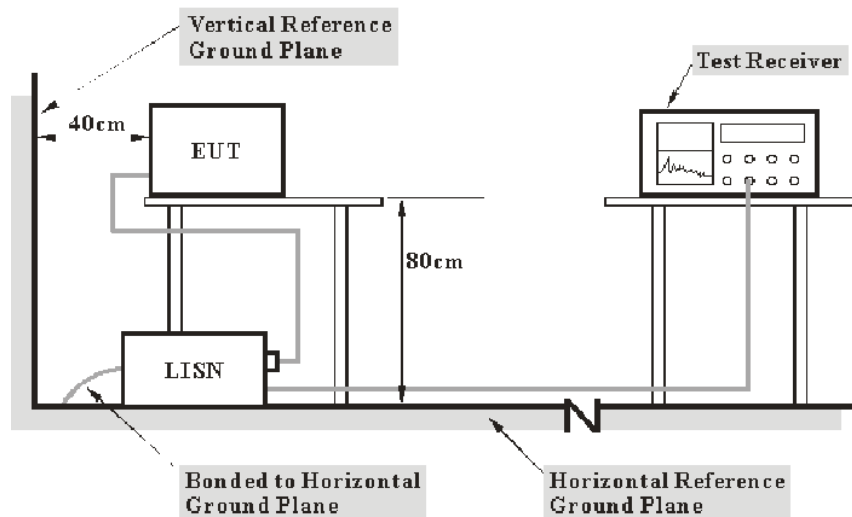
Result: Compliant.

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:

$$\text{Factor (dB)} = \text{LISN VDF (dB)} + \text{Cable Loss (dB)} + \text{Transient Limiter Attenuation (dB)}$$

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:

$$\text{Over Limit (dB)} = \text{Read level (dB}\mu\text{V)} + \text{Factor (dB)} - \text{Limit (dB}\mu\text{V)}$$

Test Results Summary

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

Test Data

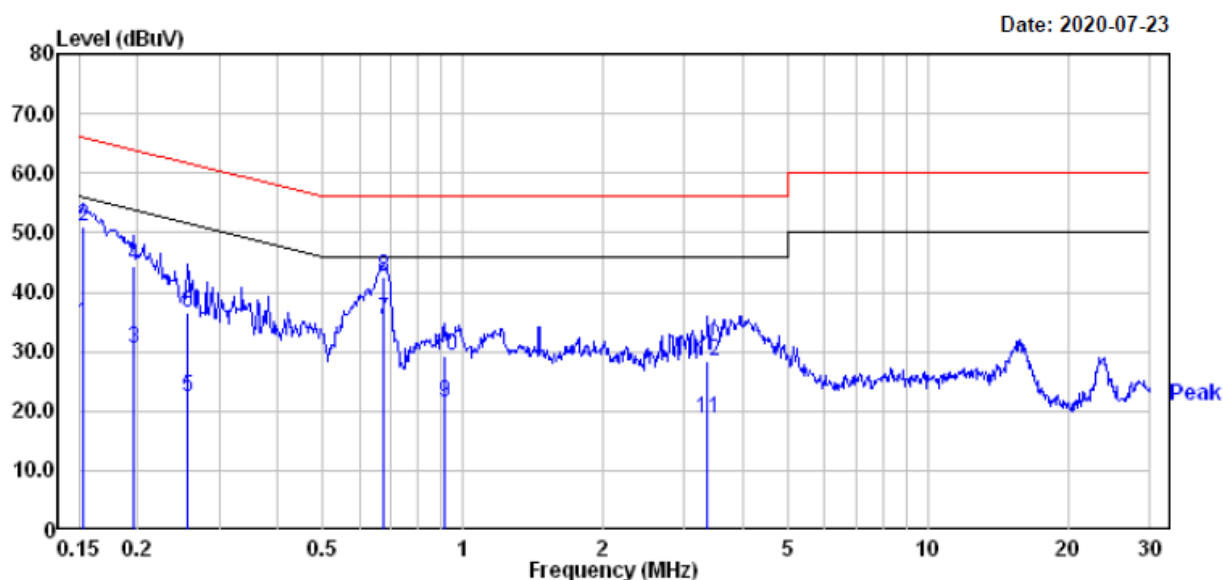
Environmental Conditions

Temperature:	24.5 °C
Relative Humidity:	51 %
ATM Pressure:	100.9 kPa

The testing was performed by CK Huang on 2020-07-23.

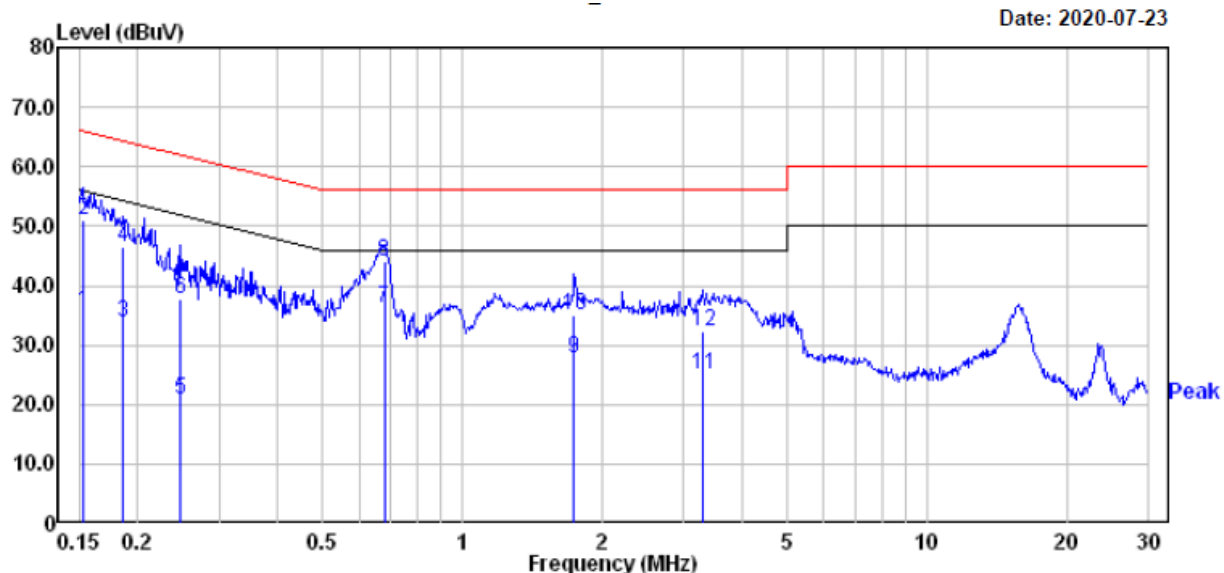
EUT operation mode: Transmitting in 802.11n-HT20 mode middle channel of 5150~5250MHz (worst case)

AC 120V/60 Hz, Line



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.152	14.80	19.82	34.62	55.87	-21.25	Average
2	0.152	31.20	19.82	51.02	65.87	-14.85	QP
3	0.197	10.60	19.82	30.42	53.76	-23.34	Average
4	0.197	24.70	19.82	44.52	63.76	-19.24	QP
5	0.256	2.50	19.82	22.32	51.56	-29.24	Average
6	0.256	16.70	19.82	36.52	61.56	-25.04	QP
7	0.675	15.50	19.75	35.25	46.00	-10.75	Average
8	0.675	22.70	19.75	42.45	56.00	-13.55	QP
9	0.918	1.79	19.75	21.54	46.00	-24.46	Average
10	0.918	9.49	19.75	29.24	56.00	-26.76	QP
11	3.364	-0.80	19.46	18.66	46.00	-27.34	Average
12	3.364	9.00	19.46	28.46	56.00	-27.54	QP

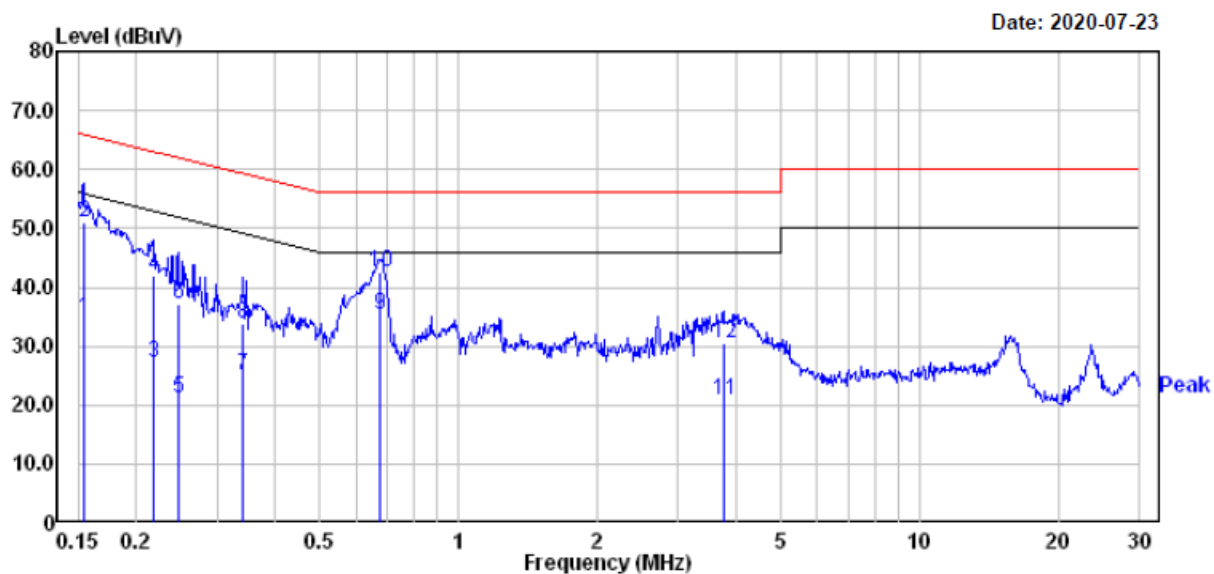
AC 120V/60 Hz, Neutral



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.152	15.90	19.82	35.72	55.87	-20.15	Average
2	0.152	31.10	19.82	50.92	65.87	-14.95	QP
3	0.185	13.91	19.82	33.73	54.24	-20.51	Average
4	0.185	26.71	19.82	46.53	64.24	-17.71	QP
5	0.248	1.10	19.82	20.92	51.82	-30.90	Average
6	0.248	17.80	19.82	37.62	61.82	-24.20	QP
7	0.679	16.40	19.75	36.15	46.00	-9.85	Average
8	0.679	24.40	19.75	44.15	56.00	-11.85	QP
9	1.744	8.00	19.84	27.84	46.00	-18.16	Average
10	1.744	15.20	19.84	35.04	56.00	-20.96	QP
11	3.310	5.50	19.46	24.96	46.00	-21.04	Average
12	3.310	12.90	19.46	32.36	56.00	-23.64	QP

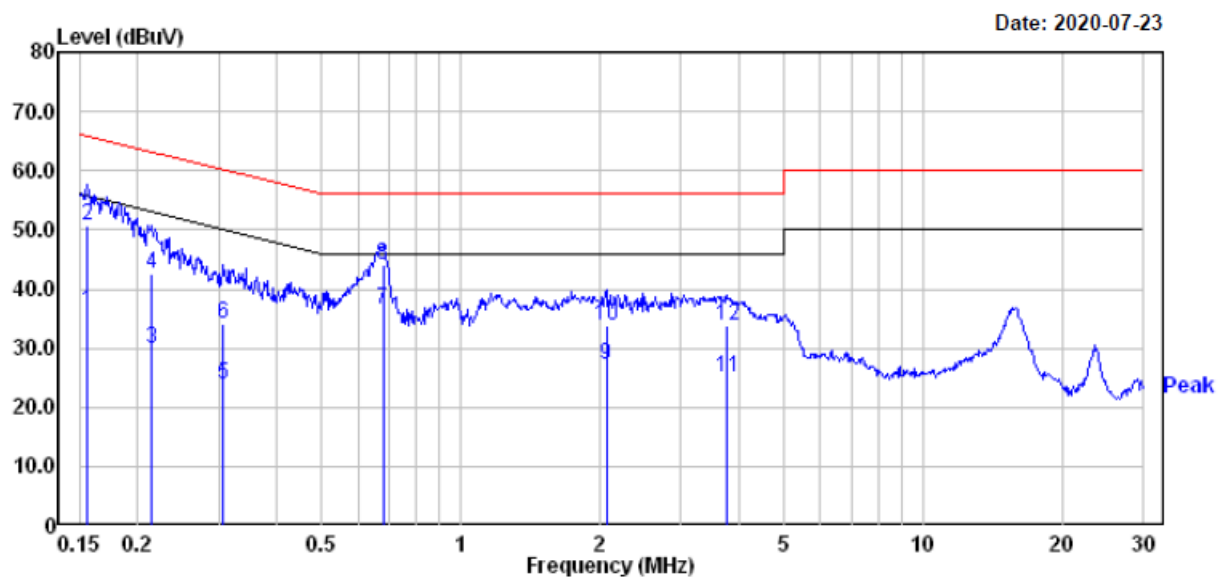
EUT operation mode: Transmitting in 802.11n-HT20 mode middle channel of 5725-5850MHz (worst case)

AC 120V/60 Hz, Line



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.154	14.80	19.82	34.62	55.78	-21.16	Average
2	0.154	31.10	19.82	50.92	65.78	-14.86	QP
3	0.217	7.40	19.82	27.22	52.92	-25.70	Average
4	0.217	22.00	19.82	41.82	62.92	-21.10	QP
5	0.247	1.40	19.82	21.22	51.86	-30.64	Average
6	0.247	17.40	19.82	37.22	61.86	-24.64	QP
7	0.341	5.10	19.81	24.91	49.18	-24.27	Average
8	0.341	13.90	19.81	33.71	59.18	-25.47	QP
9	0.675	15.60	19.75	35.35	46.00	-10.65	Average
10	0.675	22.70	19.75	42.45	56.00	-13.55	QP
11	3.759	1.40	19.47	20.87	46.00	-25.13	Average
12	3.759	11.00	19.47	30.47	56.00	-25.53	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	16.50	19.82	36.32	55.69	-19.37	Average
2	0.156	30.90	19.82	50.72	65.69	-14.97	QP
3	0.215	10.20	19.82	30.02	53.01	-22.99	Average
4	0.215	22.80	19.82	42.62	63.01	-20.39	QP
5	0.307	3.99	19.83	23.82	50.06	-26.24	Average
6	0.307	14.29	19.83	34.12	60.06	-25.94	QP
7	0.679	16.80	19.75	36.55	46.00	-9.45	Average
8	0.679	24.30	19.75	44.05	56.00	-11.95	QP
9	2.066	7.40	19.78	27.18	46.00	-18.82	Average
10	2.066	13.90	19.78	33.68	56.00	-22.32	QP
11	3.759	5.50	19.47	24.97	46.00	-21.03	Average
12	3.759	14.20	19.47	33.67	56.00	-22.33	QP

§15.205 & §15.209 & §15.407(B)(1)(4) (8)(9) – 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.

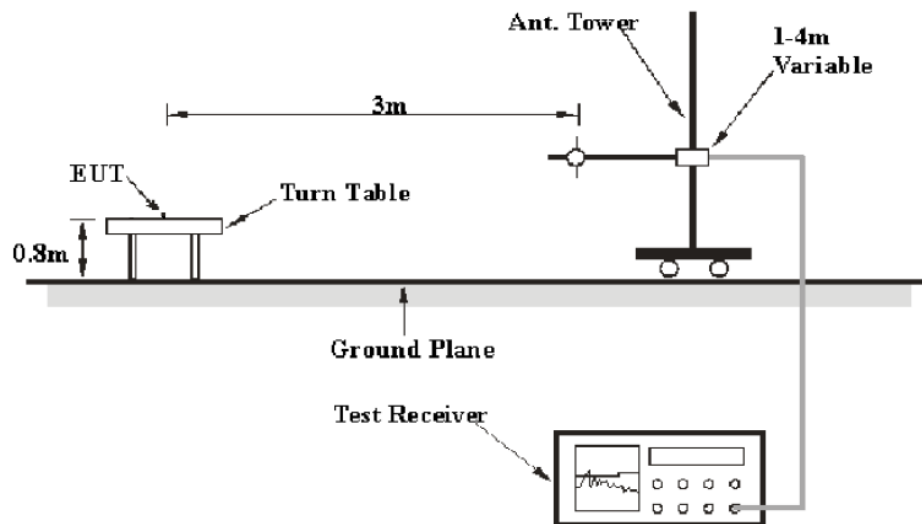
Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

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.

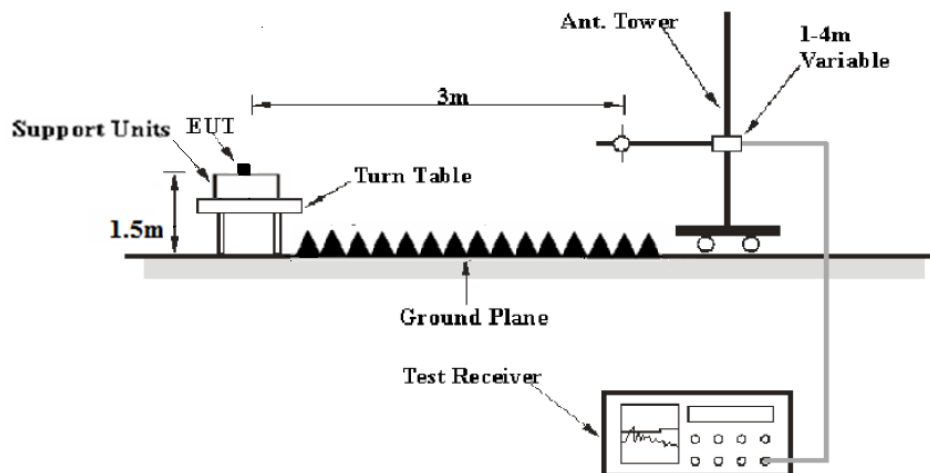
According to 789033 D02 General UNII Test Procedures New Rules v02r01, emission shall be computed as: $E [dB\mu V/m] = EIRP [dBm] + 95.2$, for $d = 3$ meters.

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:

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

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:	24.6~25.0°C
Relative Humidity:	48~53%
ATM Pressure:	100.7~101.3 kPa

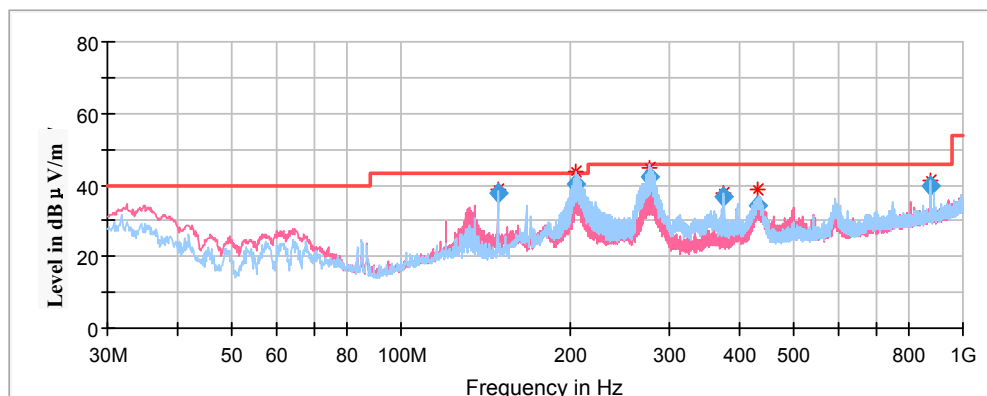
The testing was performed by CK Huang on 2020-08-03.

Test Mode: Transmitting

Spurious Emission Test

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

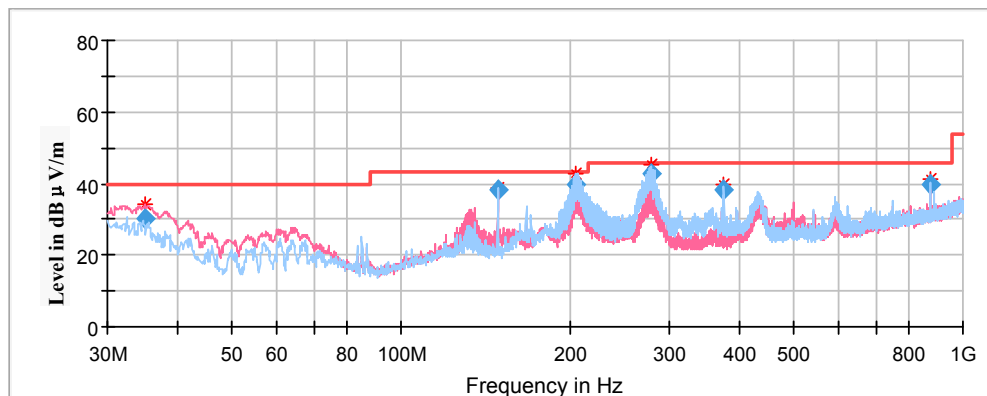
Pre-scan with 802.11a, 802.11ac20, 802.11n-HT20, 802.11ac40, 802.11n-HT40 and 802.11 ac80 modes of operation in the X,Y and Z axes of orientation, the worst case 802.11a mode in channel 5240MHz in Z-axis of orientation was recorded.



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)				
148.52	37.86	200.0	H	264.0	-12.7	43.50	5.64
205.17	40.21	100.0	H	221.0	-12.8	43.50	3.29
277.47	42.44	100.0	H	143.0	-11.7	46.00	3.56
375.90	36.97	200.0	H	164.0	-9.2	46.00	9.03
432.30	34.29	100.0	H	105.0	-7.8	46.00	11.71
875.00	39.80	100.0	H	197.0	-0.2	46.00	6.20

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

Pre-scan with 802.11a, 802.11ac20, 802.11n-HT20, 802.11ac40, 802.11n-HT40 and 802.11 ac80 modes of operation in the X,Y and Z axes of orientation, the worst case 802.11a mode in channel 5825MHz in Z-axis of orientation was recorded



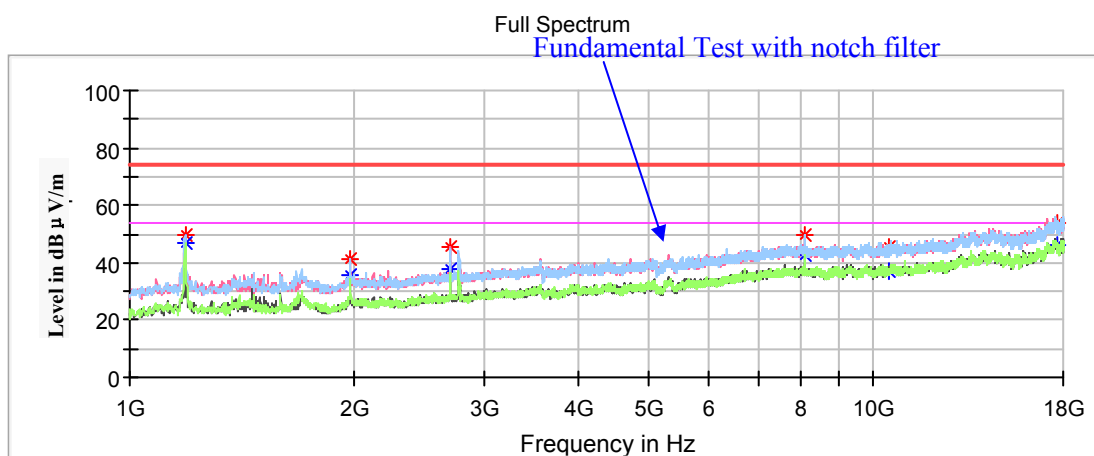
Frequency (MHz)	Corrected Amplitude	Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	QuasiPeak (dBμV/m)	Height (cm)	Polar (H/V)				
35.14	30.18	100.0	V	172.0	-7.9	40.00	9.82
148.50	38.23	200.0	H	244.0	-12.7	43.50	5.27
205.17	39.63	100.0	H	120.0	-12.8	43.50	3.87
277.98	42.83	100.0	H	131.0	-11.7	46.00	3.17
375.90	38.34	200.0	H	200.0	-9.2	46.00	7.66
875.00	39.86	200.0	H	206.0	-0.2	46.00	6.14

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

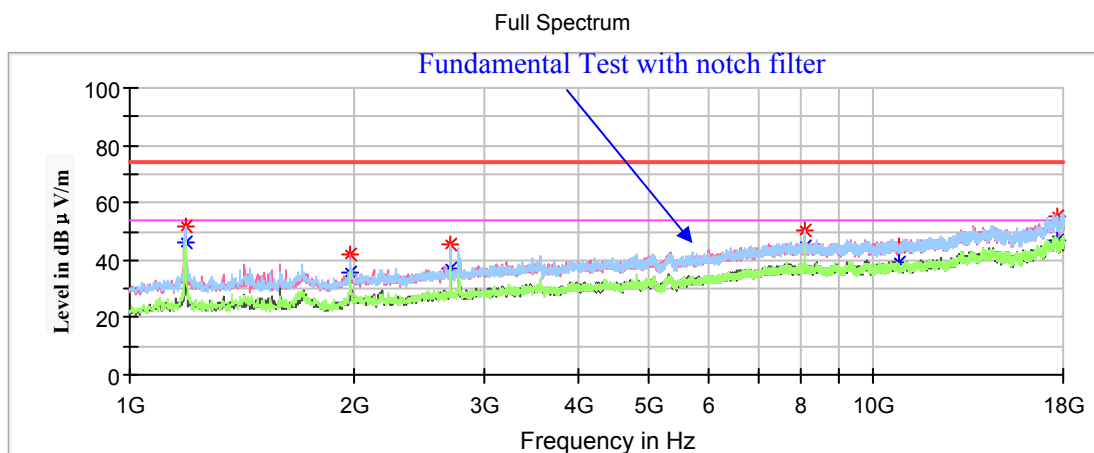
(Pre-scan in the X, Y and Z axes of orientation, the worst case **Z-axis of orientation** was recorded.)

Note:

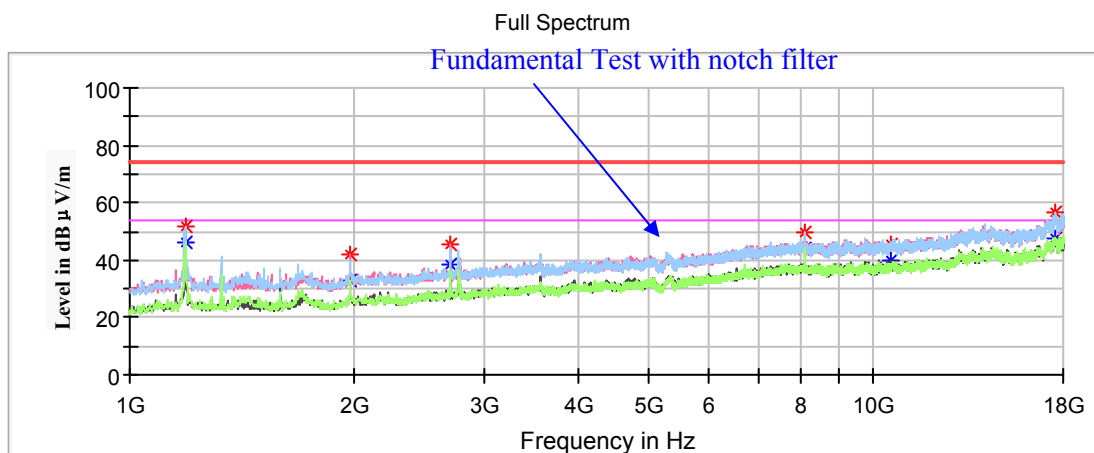
1. This test was performed with the 5150-5250MHz band reject filter.
2. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Limit - Corrected. Amplitude

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)				
1187.00	49.72	---	200.0	H	296.0	-18.1	74.00	24.28
1187.00	---	46.59	200.0	H	296.0	-18.1	54.00	7.41
1979.20	41.46	---	150.0	H	201.0	-14.5	68.20	26.74
2698.30	---	37.63	150.0	V	146.0	-11.5	54.00	16.37
2698.30	45.13	---	150.0	V	146.0	-11.5	74.00	28.87
8099.20	---	42.65	200.0	H	125.0	1.7	54.00	11.35
8099.20	49.55	---	200.0	H	125.0	1.7	74.00	24.45
10501.30	45.59	---	150.0	V	0.0	2.3	68.20	22.61
17666.80	54.15	---	150.0	H	122.0	8.9	68.20	14.05

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)				
1187.00	---	46.12	150.0	H	276.0	-18.1	54.00	7.88
1187.00	51.89	---	150.0	H	276.0	-18.1	74.00	22.11
1979.20	41.69	---	200.0	V	215.0	-14.5	68.20	26.51
2698.30	---	37.38	150.0	V	159.0	-11.5	54.00	16.62
2698.30	45.13	---	150.0	V	159.0	-11.5	74.00	28.87
8099.20	50.12	---	200.0	H	125.0	1.7	74.00	23.88
8099.20	---	44.78	200.0	H	125.0	1.7	54.00	9.22
10800.50	---	39.38	150.0	H	121.0	2.7	54.00	14.62
10800.50	44.88	---	150.0	H	121.0	2.7	74.00	29.12
17648.10	55.47	---	200.0	H	113.0	8.9	68.20	12.73

High Channel: 5240MHz

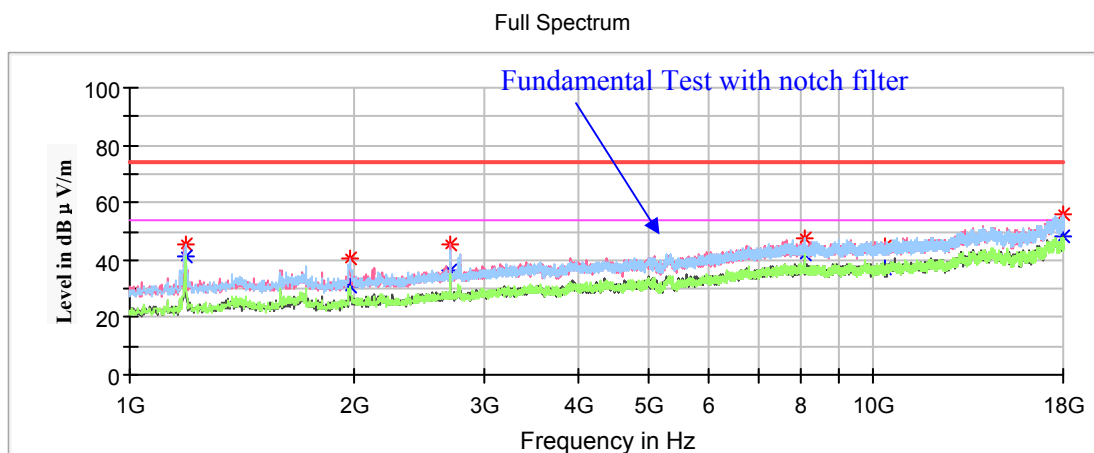
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1187.00	51.93	---	200.0	H	282.0	-18.1	74.00	22.07
1187.00	---	45.94	200.0	H	282.0	-18.1	54.00	8.06
1979.20	41.88	---	150.0	V	323.0	-14.5	68.20	26.32
2698.30	45.62	---	200.0	V	129.0	-11.5	74.00	28.38
2698.30	---	38.11	200.0	V	129.0	-11.5	54.00	15.89
8099.20	---	44.04	200.0	H	147.0	1.7	54.00	9.96
8099.20	49.83	---	200.0	H	147.0	1.7	74.00	24.17
10571.00	45.49	---	150.0	V	100.0	2.4	68.20	22.71
17612.40	56.41	---	150.0	H	209.0	8.9	68.20	11.79

802.11ac20 Mode:

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

Note:

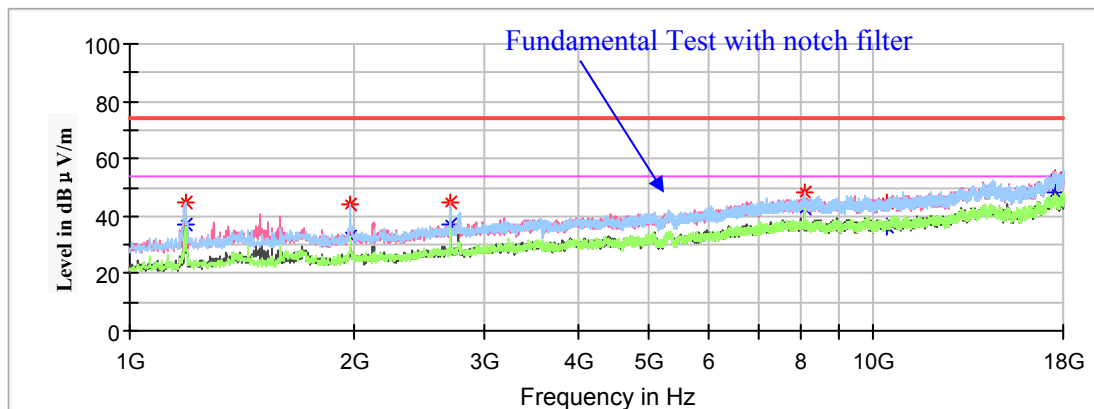
1. This test was performed with the 5150-5250MHz band reject filter.
2. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Limit - Corrected. Amplitude

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)				
1187.00	---	41.16	150.0	H	0.0	-18.1	54.00	12.84
1187.00	45.12	---	150.0	H	0.0	-18.1	74.00	28.88
1979.20	40.32	---	200.0	V	331.0	-14.5	68.20	27.88
2698.30	---	36.59	150.0	V	251.0	-11.5	54.00	17.41
2698.30	45.24	---	150.0	V	251.0	-11.5	74.00	28.76
8099.20	47.87	---	150.0	H	178.0	1.7	74.00	26.13
8099.20	---	41.86	150.0	H	178.0	1.7	54.00	12.14
10360.00	44.65	---	200.0	V	7.0	2.2	68.20	23.55
17957.50	55.83	---	150.0	V	7.0	8.8	74.00	18.17
17957.50	---	48.05	150.0	V	7.0	8.8	54.00	5.95

Middle Channel: 5200MHz

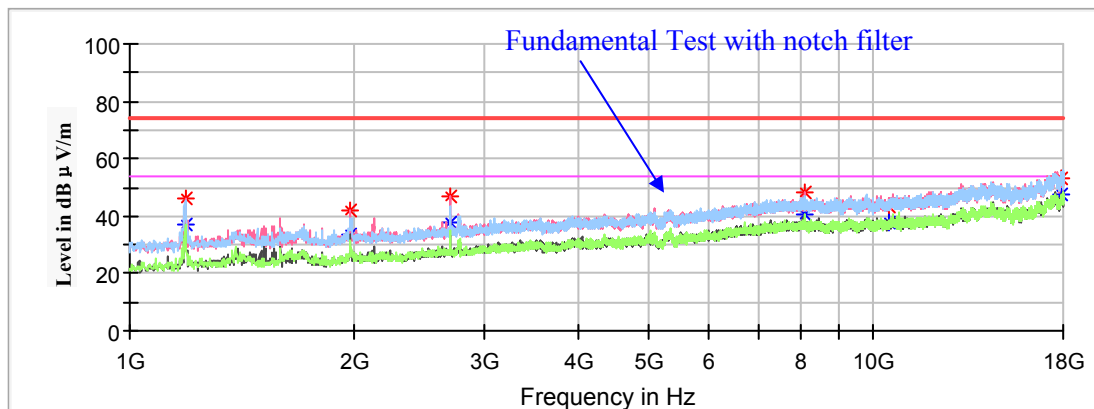
Full Spectrum



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)				
1187.00	---	37.03	150.0	V	323.0	-18.1	54.00	16.97
1187.00	44.89	---	150.0	V	323.0	-18.1	74.00	29.11
1979.20	44.40	---	150.0	H	249.0	-14.5	68.20	23.8
2698.30	---	36.91	200.0	V	250.0	-11.5	54.00	17.09
2698.30	44.60	---	200.0	V	250.0	-11.5	74.00	29.4
8099.20	---	42.83	150.0	H	183.0	1.7	54.00	11.17
8099.20	48.52	---	150.0	H	183.0	1.7	74.00	25.48
10400.00	44.49	---	150.0	V	3.0	2.2	68.20	23.71
17527.40	52.80	---	200.0	V	81.0	8.9	68.20	15.4

High Channel: 5240MHz

Full Spectrum



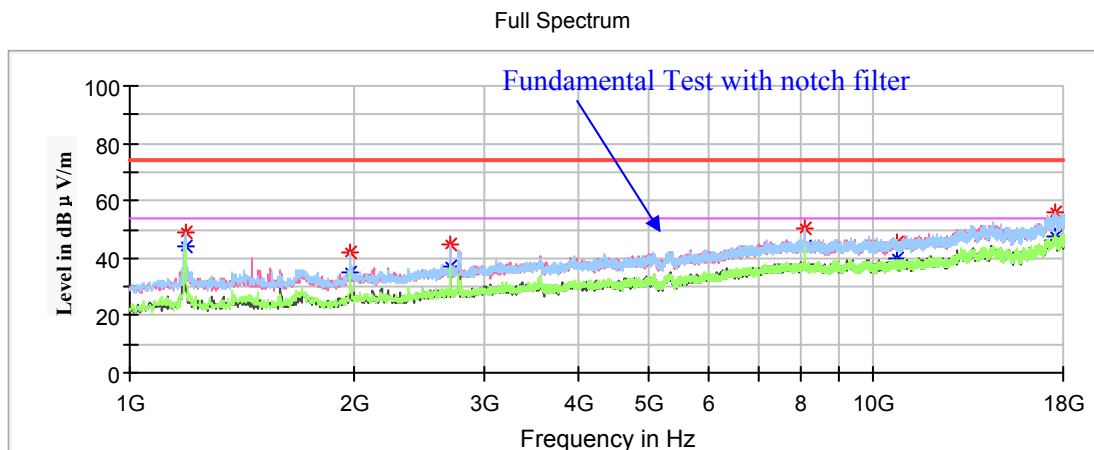
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1187.00	---	37.33	150.0	H	0.0	-18.1	54.00	16.67
1187.00	46.13	---	150.0	H	0.0	-18.1	74.00	27.87
1979.20	42.22	---	200.0	V	323.0	-14.5	68.20	25.98
2698.30	---	37.90	150.0	V	251.0	-11.5	54.00	16.1
2698.30	46.71	---	150.0	V	251.0	-11.5	74.00	27.29
8099.20	---	40.57	200.0	V	108.0	1.7	54.00	13.43
8099.20	48.14	---	200.0	V	108.0	1.7	74.00	25.86
10480.00	43.34	---	150.0	V	70.0	2.3	68.20	24.86
17860.60	53.20	---	150.0	V	159.0	8.8	74.00	20.8
17860.60	---	47.55	150.0	V	159.0	8.8	54.00	6.45

802.11n-HT20 Mode:

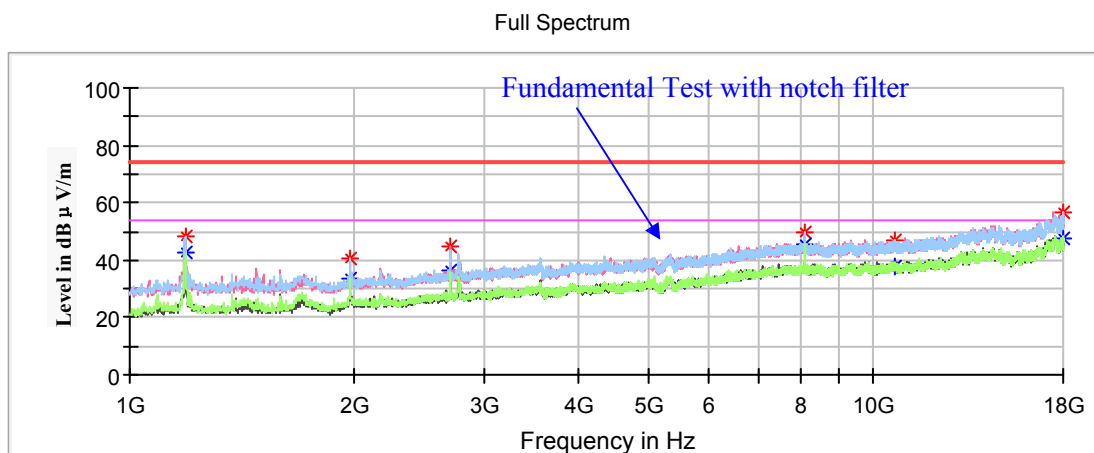
Pre-scan with X,Y and Z axes of orientation, the worst case **Z-axis of orientation** was recorded

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

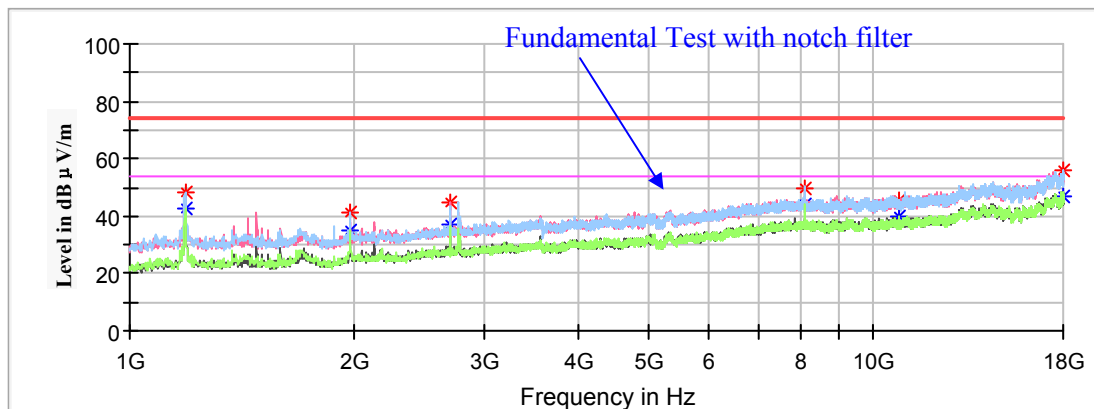
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1187.00	49.23	---	150.0	H	272.0	-18.1	74.00	24.77
1187.00	---	44.16	150.0	H	272.0	-18.1	54.00	9.84
1979.20	42.16	---	200.0	H	256.0	-14.5	68.20	26.04
2698.30	45.05	---	200.0	V	144.0	-11.5	74.00	28.95
2698.30	---	37.37	200.0	V	144.0	-11.5	54.00	16.63
8099.20	50.23	---	200.0	H	121.0	1.7	74.00	23.77
8099.20	---	44.38	200.0	H	121.0	1.7	54.00	9.62
10747.80	---	39.79	150.0	V	6.0	2.6	54.00	14.21
10747.80	45.30	---	150.0	V	6.0	2.6	74.00	28.7
17513.80	55.95	---	200.0	H	243.0	8.9	68.20	12.25

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)				
1187.00	---	42.46	150.0	H	259.0	-18.1	54.00	11.54
1187.00	48.55	---	150.0	H	259.0	-18.1	74.00	25.45
1979.20	40.41	---	150.0	H	182.0	-14.5	68.20	27.79
2698.30	44.85	---	200.0	V	144.0	-11.5	74.00	29.15
2698.30	---	36.39	200.0	V	144.0	-11.5	54.00	17.61
8099.20	49.66	---	200.0	H	122.0	1.7	74.00	24.34
8099.20	---	45.73	200.0	H	122.0	1.7	54.00	8.27
10686.60	---	37.84	150.0	H	196.0	2.5	54.00	16.16
10686.60	47.12	---	150.0	H	196.0	2.5	74.00	26.88
17952.40	---	47.83	200.0	V	118.0	8.8	54.00	6.17
17952.40	56.47	---	200.0	V	118.0	8.8	74.00	17.53

High Channel: 5240MHz

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)				
1187.00	48.42	---	150.0	H	301.0	-18.1	74.00	25.58
1187.00	---	42.91	150.0	H	301.0	-18.1	54.00	11.09
1979.20	41.55	---	150.0	H	186.0	-14.5	68.20	26.65
2698.30	44.87	---	200.0	V	144.0	-11.5	74.00	29.13
2698.30	---	37.06	200.0	V	144.0	-11.5	54.00	16.94
8099.20	49.66	---	150.0	H	186.0	1.7	74.00	24.34
8099.20	---	44.18	150.0	H	186.0	1.7	54.00	9.82
10800.50	45.36	---	200.0	H	216.0	2.7	74.00	28.64
10800.50	---	40.05	200.0	H	216.0	2.7	54.00	13.95
17957.50	55.97	---	150.0	H	186.0	8.8	74.00	18.03
17957.50	---	46.77	150.0	H	186.0	8.8	54.00	7.23

802.11ac40 Mode:

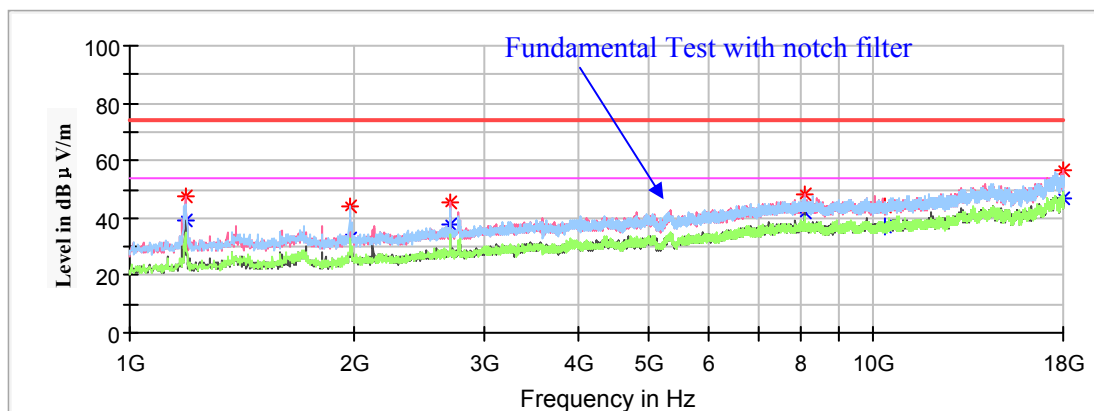
(Pre-scan in the X, Y and Z axes of orientation, the worst case **Z-axis of orientation** was recorded.)

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

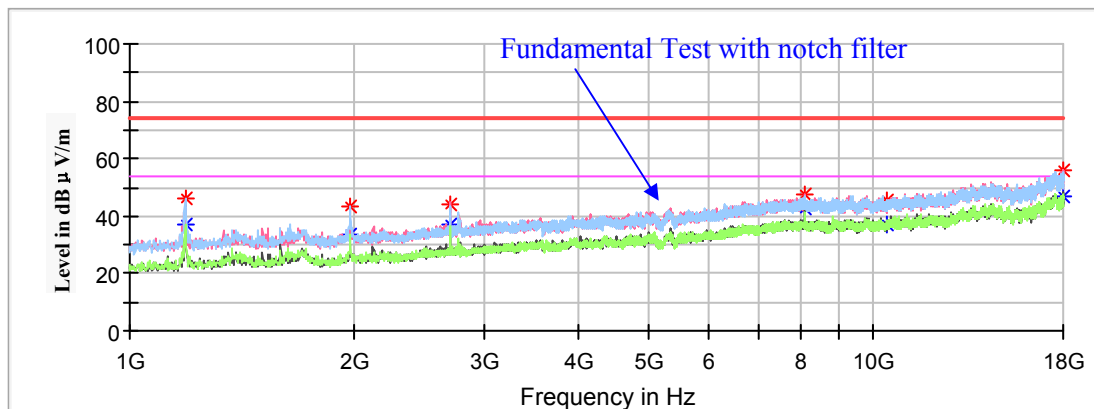
Full Spectrum



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)				
1187.00	47.24	---	150.0	V	324.0	-18.1	74.00	26.76
1187.00	---	39.41	150.0	V	324.0	-18.1	54.00	14.59
1982.60	43.84	---	150.0	H	238.0	-14.5	68.20	24.36
2698.30	---	37.64	200.0	V	243.0	-11.5	54.00	16.36
2698.30	45.42	---	200.0	V	243.0	-11.5	74.00	28.58
8099.20	---	41.88	150.0	V	177.0	1.7	54.00	12.12
8099.20	48.37	---	150.0	V	177.0	1.7	74.00	25.63
10380.00	44.27	---	150.0	H	2.0	2.2	68.20	23.93
17971.10	---	46.98	200.0	V	139.0	8.8	54.00	7.02
17971.10	56.44	---	200.0	V	139.0	8.8	74.00	17.56

High Channel: 5230MHz

Full Spectrum



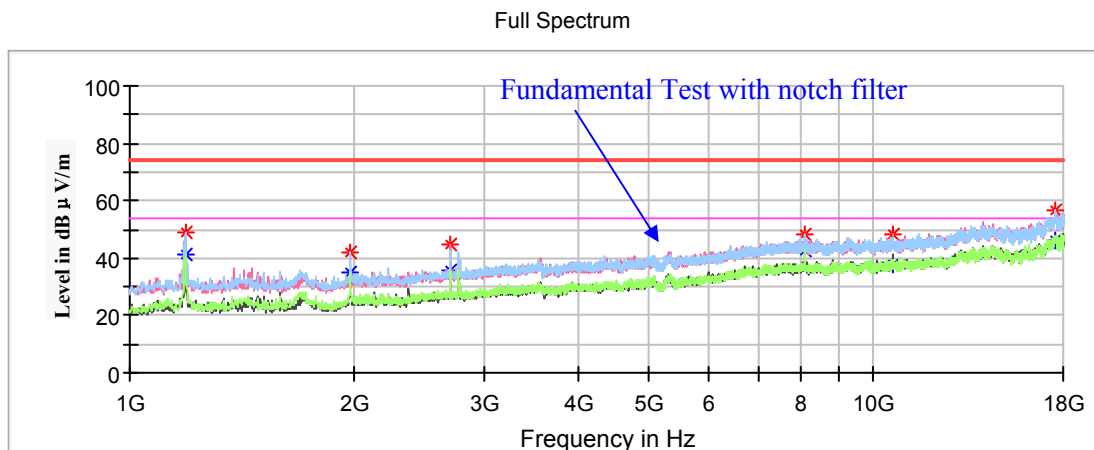
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1187.00	46.44	---	150.0	H	0.0	-18.1	74.00	27.56
1187.00	---	37.15	150.0	H	0.0	-18.1	54.00	16.85
1979.20	43.39	---	150.0	H	248.0	-14.5	68.20	24.81
2698.30	44.20	---	200.0	V	244.0	-11.5	74.00	29.8
2698.30	---	37.21	200.0	V	244.0	-11.5	54.00	16.79
8099.20	---	42.94	150.0	V	164.0	1.7	54.00	11.06
8099.20	47.51	---	150.0	V	164.0	1.7	74.00	26.49
10460.00	45.30	---	200.0	V	297.0	2.3	68.20	22.9
17955.80	---	46.80	150.0	V	191.0	8.8	54.00	7.2
17955.80	56.01	---	150.0	V	191.0	8.8	74.00	17.99

802.11n-HT40 Mode:

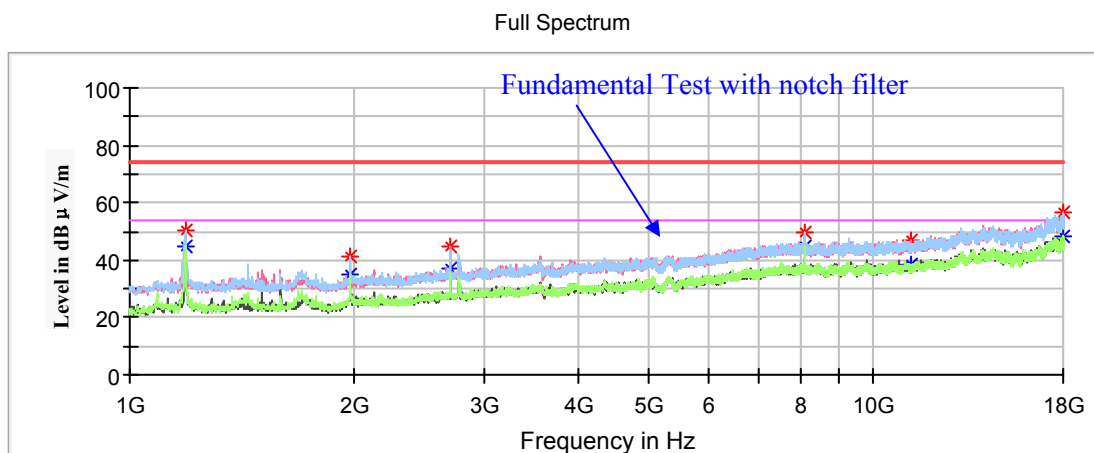
Pre-scan with X,Y and Z axes of orientation, the worst case **Z-axis of orientation** was recorded

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)				
1187.00	48.86	---	150.0	H	277.0	-18.1	74.00	25.14
1187.00	---	41.54	150.0	H	277.0	-18.1	54.00	12.46
1979.20	41.93	---	200.0	H	163.0	-14.5	68.20	26.27
2698.30	44.56	---	150.0	H	264.0	-11.5	74.00	29.44
2698.30	---	35.68	150.0	H	264.0	-11.5	54.00	18.32
8099.20	48.49	---	150.0	H	170.0	1.7	74.00	25.51
8099.20	---	42.73	150.0	H	170.0	1.7	54.00	11.27
10616.90	48.06	---	200.0	V	289.0	2.4	74.00	25.94
10616.90	---	37.77	200.0	V	289.0	2.4	54.00	16.23
17507.00	56.73	---	200.0	V	264.0	8.9	68.20	11.47

High Channel: 5230MHz

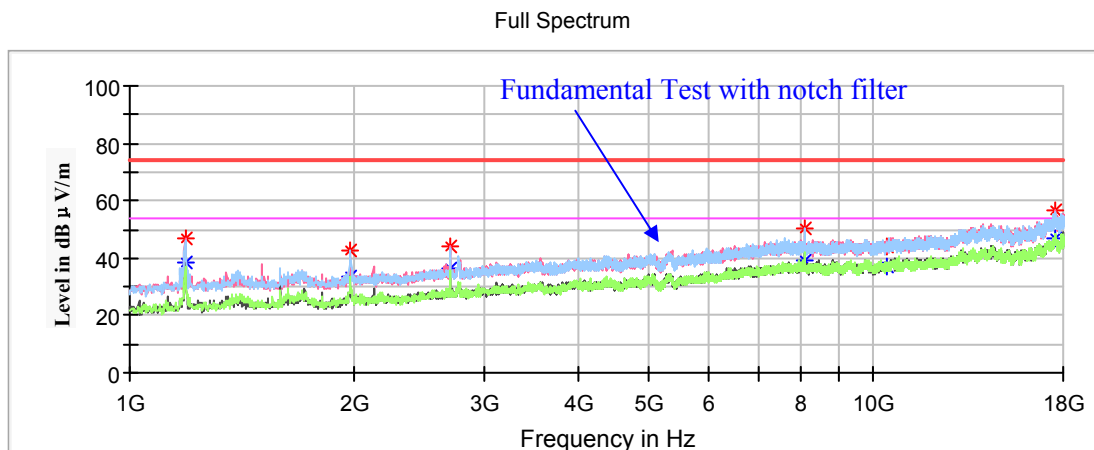
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1187.00	---	44.44	200.0	H	292.0	-18.1	54.00	9.56
1187.00	50.23	---	200.0	H	292.0	-18.1	74.00	23.77
1979.20	41.43	---	150.0	H	91.0	-14.5	68.20	26.77
2698.30	---	37.26	150.0	V	151.0	-11.5	54.00	16.74
2698.30	44.71	---	150.0	V	151.0	-11.5	74.00	29.29
8099.20	49.53	---	200.0	H	199.0	1.7	74.00	24.47
8099.20	---	44.49	200.0	H	199.0	1.7	54.00	9.51
11232.30	---	38.46	150.0	V	230.0	2.9	54.00	15.54
11232.30	47.04	---	150.0	V	230.0	2.9	74.00	26.96
17959.20	---	48.27	200.0	H	146.0	8.8	54.00	5.73
17959.20	56.57	---	200.0	H	146.0	8.8	74.00	17.43

802.11ac80 Mode:

Pre-scan with X,Y and Z axes of orientation, the worst case **Z-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: 5210MHz

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)				
1187.00	46.66	---	200.0	V	324.0	-18.1	74.00	27.34
1187.00	---	38.60	200.0	V	324.0	-18.1	54.00	15.4
1977.50	42.59	---	150.0	H	250.0	-14.6	68.20	25.61
2698.30	44.14	---	200.0	V	256.0	-11.5	74.00	29.86
2698.30	---	36.44	200.0	V	256.0	-11.5	54.00	17.56
8100.90	---	38.85	150.0	V	172.0	1.7	54.00	15.15
8100.90	50.54	---	150.0	V	172.0	1.7	74.00	23.46
10420.00	43.85	---	200.0	H	339.0	2.2	68.20	24.35
17576.70	56.66	---	150.0	V	0.0	8.9	68.20	11.54

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

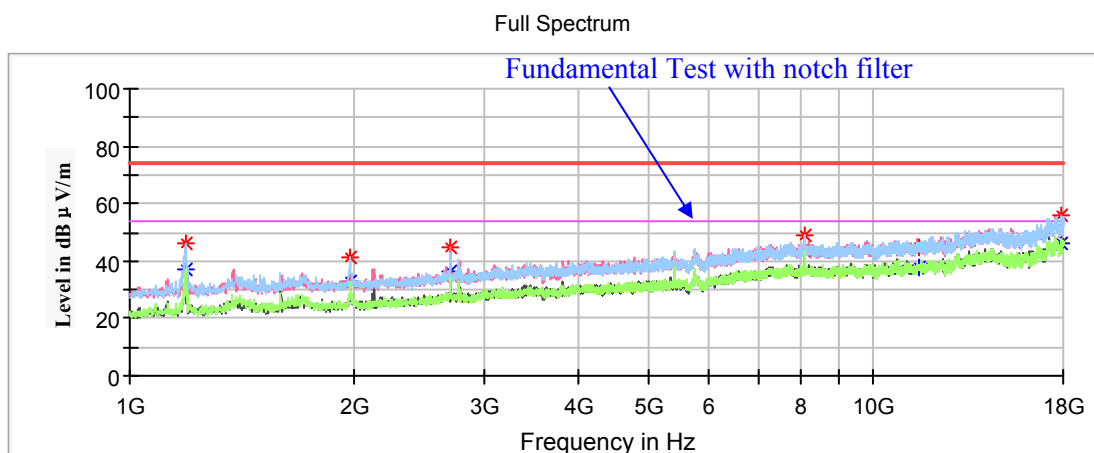
802.11a Mode:

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

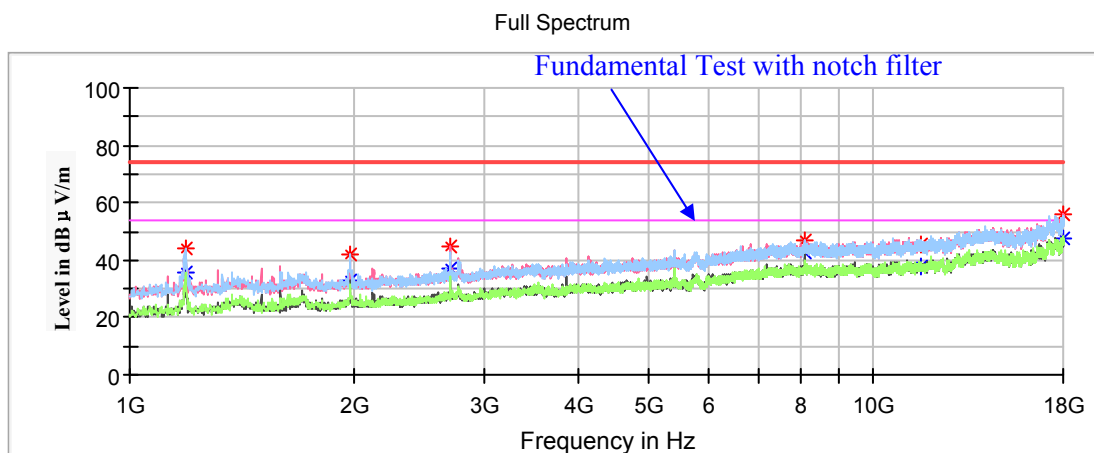
Note:

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

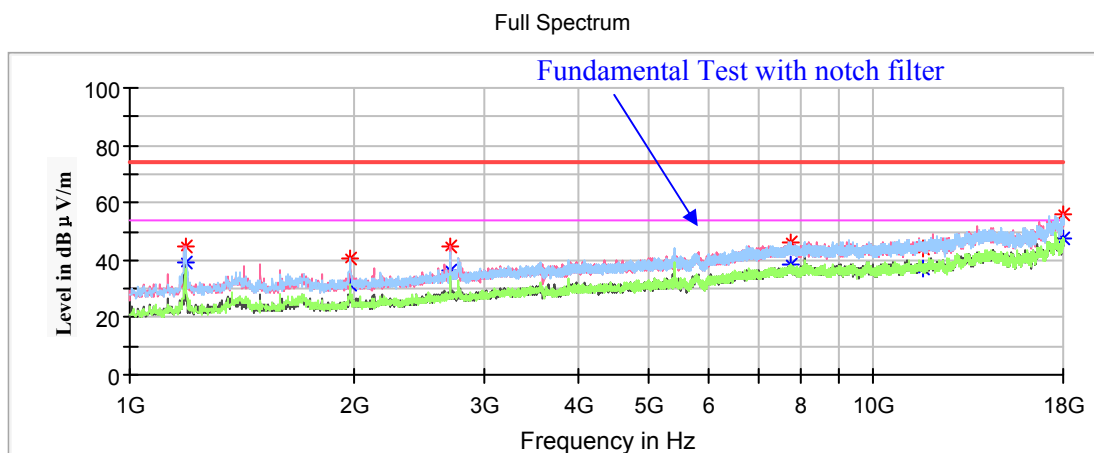
Low Channel: 5745MHz



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)				
1187.00	46.21	---	150.0	H	358.0	-18.1	74.00	27.79
1187.00	---	37.17	150.0	H	358.0	-18.1	54.00	16.83
1979.20	41.12	---	150.0	H	269.0	-14.5	68.20	27.08
2698.30	44.53	---	200.0	V	243.0	-11.5	74.00	29.47
2698.30	---	36.42	200.0	V	243.0	-11.5	54.00	17.58
8099.20	49.09	---	150.0	H	190.0	1.7	74.00	24.91
8099.20	---	43.03	150.0	H	190.0	1.7	54.00	10.97
11490.00	---	38.11	200.0	V	139.0	2.8	54.00	15.89
11490.00	44.48	---	200.0	V	139.0	2.8	74.00	29.52
17937.10	---	46.47	150.0	V	0.0	8.8	54.00	7.53
17937.10	56.23	---	150.0	V	0.0	8.8	74.00	17.77

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)				
1187.00	---	35.90	200.0	V	304.0	-18.1	54.00	18.1
1187.00	44.34	---	200.0	V	304.0	-18.1	74.00	29.66
1979.20	41.93	---	150.0	V	317.0	-14.5	68.20	26.27
2698.30	44.89	---	200.0	V	241.0	-11.5	74.00	29.11
2698.30	---	36.83	200.0	V	241.0	-11.5	54.00	17.17
8099.20	---	42.46	150.0	V	159.0	1.7	54.00	11.54
8099.20	47.16	---	150.0	V	159.0	1.7	74.00	26.84
11570.00	---	38.09	200.0	H	97.0	3.0	54.00	15.91
11570.00	45.13	---	200.0	H	97.0	3.0	74.00	28.87
17966.00	---	47.40	150.0	V	0.0	8.8	54.00	6.6
17966.00	56.15	---	150.0	V	0.0	8.8	74.00	17.85

High Channel: 5825MHz

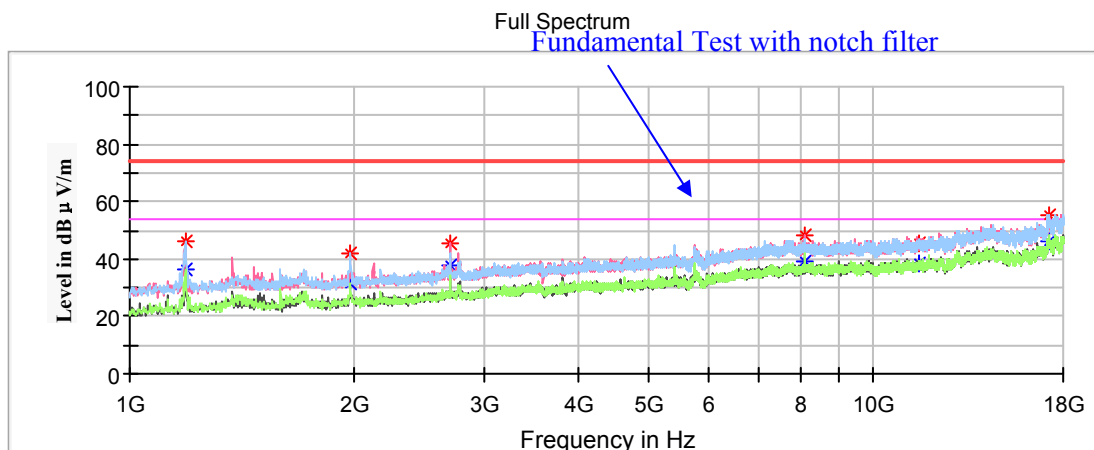
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1187.00	45.09	---	200.0	V	310.0	-18.1	74.00	28.91
1187.00	---	38.89	200.0	V	310.0	-18.1	54.00	15.11
1977.50	40.24	---	150.0	H	213.0	-14.6	68.20	27.96
2698.30	44.85	---	150.0	V	237.0	-11.5	74.00	29.15
2698.30	---	36.62	150.0	V	237.0	-11.5	54.00	17.38
7721.80	---	38.67	200.0	V	286.0	1.4	54.00	15.33
7721.80	46.06	---	200.0	V	286.0	1.4	74.00	27.94
11650.00	---	36.99	200.0	H	174.0	3.1	54.00	17.01
11650.00	44.08	---	200.0	H	174.0	3.1	74.00	29.92
17971.10	---	47.62	150.0	H	46.0	8.8	54.00	6.38
17971.10	55.98	---	150.0	H	46.0	8.8	74.00	18.02

802.11ac20 Mode:

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

Note:

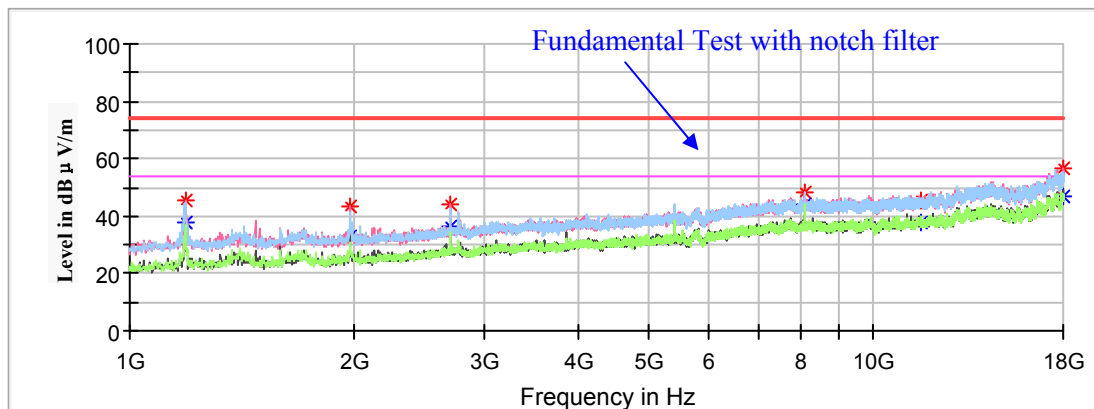
1. This test was performed with the 5725-5850MHz band reject filter.
2. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Limit - Corrected. Amplitude

Low Channel: 5745MHz

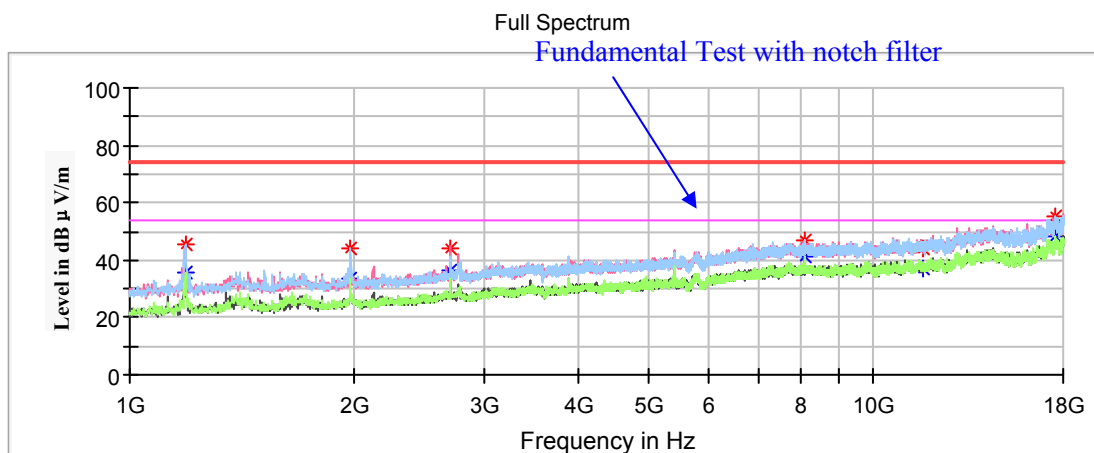
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1187.00	46.25	---	200.0	H	5.0	-18.1	74.00	27.75
1187.00	---	36.58	200.0	H	5.0	-18.1	54.00	17.42
1979.20	41.88	---	150.0	H	242.0	-14.5	68.20	26.32
2698.30	45.27	---	150.0	V	241.0	-11.5	74.00	28.73
2698.30	---	37.61	150.0	V	241.0	-11.5	54.00	16.39
8100.90	---	38.88	150.0	V	164.0	1.7	54.00	15.12
8100.90	48.03	---	150.0	V	164.0	1.7	74.00	25.97
11490.00	---	38.24	200.0	H	88.0	2.8	54.00	15.76
11490.00	45.38	---	200.0	H	88.0	2.8	74.00	28.62
17214.60	55.53	---	150.0	H	100.0	7.9	68.20	12.67

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)				
1187.00	---	37.62	150.0	V	312.0	-18.1	54.00	16.38
1187.00	45.71	---	150.0	V	312.0	-18.1	74.00	28.29
1979.20	43.33	---	200.0	V	312.0	-14.5	68.20	24.87
2698.30	43.76	---	150.0	V	236.0	-11.5	74.00	30.24
2698.30	---	36.18	150.0	V	236.0	-11.5	54.00	17.82
8099.20	---	43.80	200.0	H	177.0	1.7	54.00	10.2
8099.20	48.43	---	200.0	H	177.0	1.7	74.00	25.57
11570.00	---	37.49	150.0	V	299.0	2.9	54.00	16.51
11570.00	45.23	---	150.0	V	299.0	2.9	74.00	28.77
17971.10	---	46.73	150.0	H	296.0	8.8	54.00	7.27
17971.10	56.50	---	150.0	H	296.0	8.8	74.00	17.5

High Channel: 5825MHz

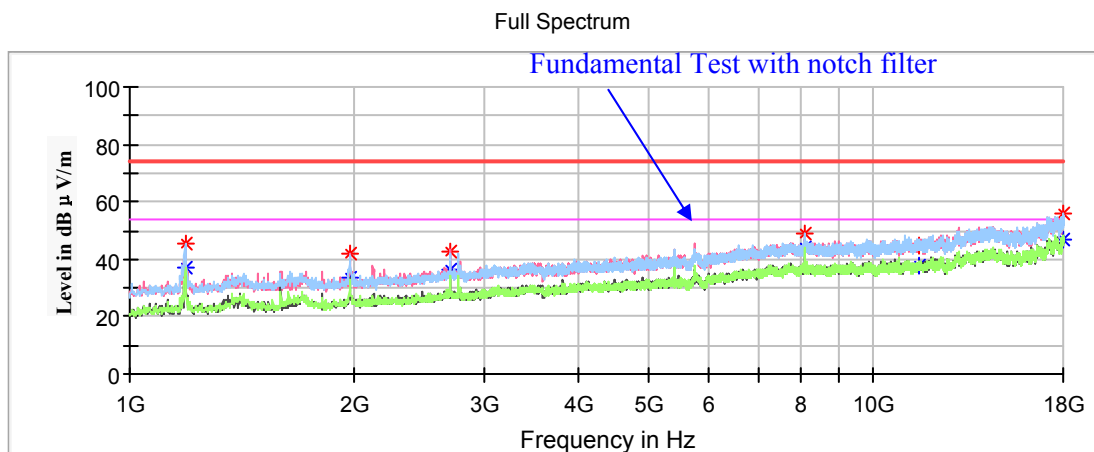
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1187.00	45.66	---	200.0	H	0.0	-18.1	74.00	28.34
1187.00	---	35.96	200.0	H	0.0	-18.1	54.00	18.04
1979.20	44.12	---	150.0	H	251.0	-14.5	68.20	24.08
2698.30	44.34	---	150.0	V	242.0	-11.5	74.00	29.66
2698.30	---	36.44	150.0	V	242.0	-11.5	54.00	17.56
8099.20	47.19	---	200.0	H	121.0	1.7	74.00	26.81
8099.20	---	41.56	200.0	H	121.0	1.7	54.00	12.44
11650.00	---	37.21	150.0	H	283.0	3.1	54.00	16.79
11650.00	44.08	---	150.0	H	283.0	3.1	74.00	29.92
17597.10	55.44	---	200.0	H	134.0	8.9	68.20	12.76

802.11n-HT20 Mode:

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

Note:

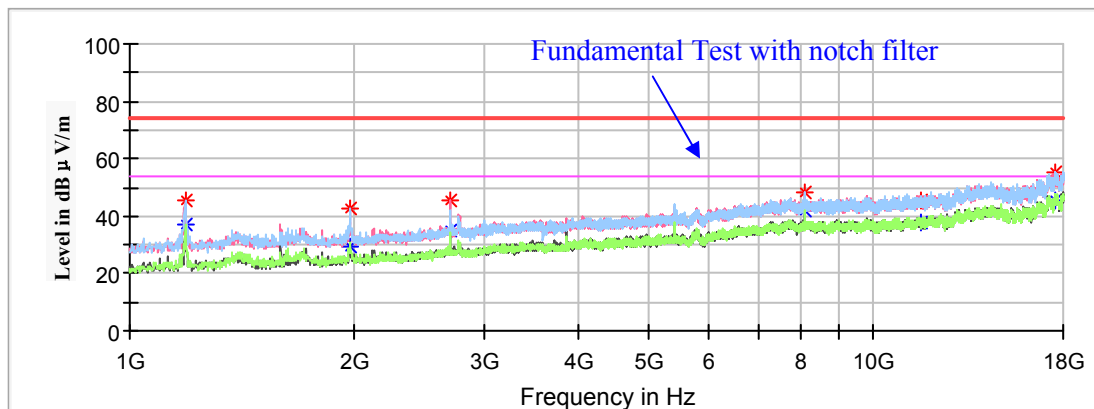
1. This test was performed with the 5725-5850MHz band reject filter.
2. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Limit - Corrected. Amplitude

Low Channel: 5745MHz

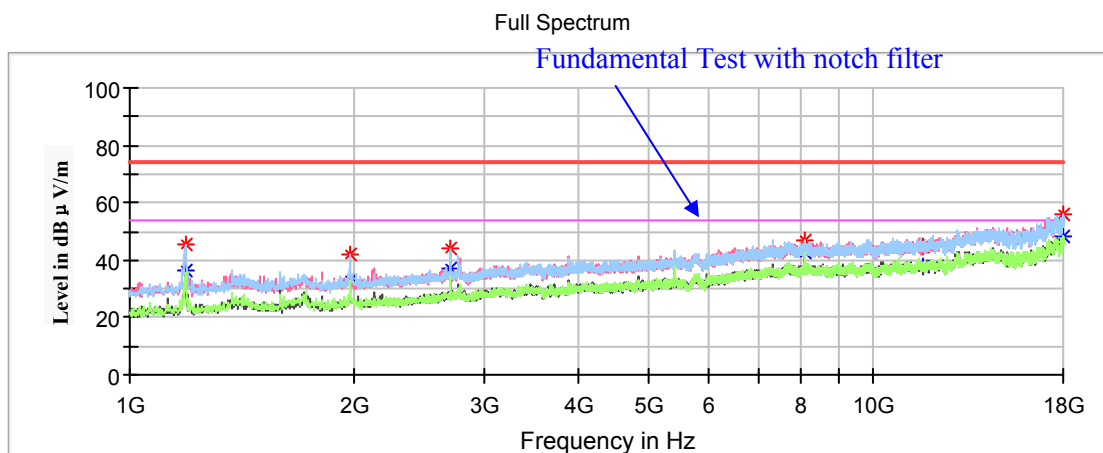
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1187.00	45.62	---	200.0	H	0.0	-18.1	74.00	28.38
1187.00	---	37.08	200.0	H	0.0	-18.1	54.00	16.92
1979.20	41.94	---	150.0	V	25.0	-14.5	68.20	26.26
2698.30	42.95	---	200.0	V	244.0	-11.5	74.00	31.05
2698.30	---	36.23	200.0	V	244.0	-11.5	54.00	17.77
8099.20	---	44.13	150.0	H	190.0	1.7	54.00	9.87
8099.20	49.11	---	150.0	H	190.0	1.7	74.00	24.89
11490.00	---	37.78	200.0	V	232.0	2.8	54.00	16.22
11490.00	44.72	---	200.0	V	232.0	2.8	74.00	29.28
17950.70	---	46.51	150.0	H	37.0	8.8	54.00	7.49
17950.70	56.17	---	150.0	H	37.0	8.8	74.00	17.83

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)				
1187.00	45.61	---	150.0	H	0.0	-18.1	74.00	28.39
1187.00	---	37.13	150.0	H	0.0	-18.1	54.00	16.87
1974.10	42.60	---	200.0	H	82.0	-14.6	68.20	25.6
2700.00	---	35.04	150.0	V	239.0	-11.5	54.00	18.96
2700.00	45.11	---	150.0	V	239.0	-11.5	74.00	28.89
8099.20	47.95	---	200.0	H	120.0	1.7	74.00	26.05
8099.20	---	41.84	200.0	H	120.0	1.7	54.00	12.16
11570.00	45.14	---	150.0	V	0.0	2.9	74.00	28.86
11570.00	---	37.41	150.0	V	0.0	2.9	54.00	16.59
17575.00	55.43	---	150.0	V	222.0	8.9	68.20	12.77

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)				
1187.00	45.71	---	200.0	V	150.0	-18.1	74.00	28.29
1187.00	---	36.14	200.0	V	150.0	-18.1	54.00	17.86
1979.20	41.82	---	150.0	H	243.0	-14.5	68.20	26.38
2698.30	44.32	---	200.0	V	241.0	-11.5	74.00	29.68
2698.30	---	36.84	200.0	V	241.0	-11.5	54.00	17.16
8099.20	47.16	---	200.0	H	190.0	1.7	74.00	26.84
8099.20	---	42.47	200.0	H	190.0	1.7	54.00	11.53
11650.00	---	38.06	150.0	H	1.0	3.1	54.00	15.94
11650.00	44.60	---	150.0	H	1.0	3.1	74.00	29.4
17983.00	---	48.09	200.0	H	50.0	8.8	54.00	5.91
17983.00	55.62	---	200.0	H	50.0	8.8	74.00	18.38

802.11ac40 Mode:

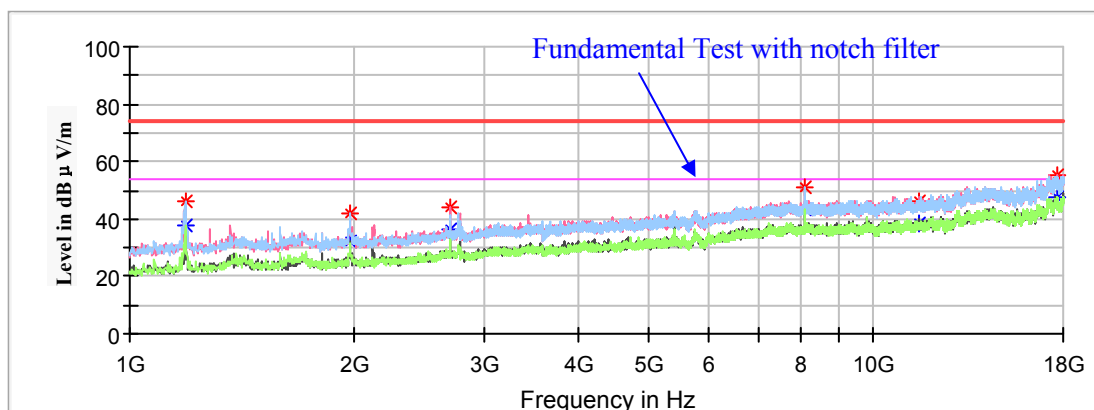
(Pre-scan in the X,Y and Z axes of orientation, the worst case **Z-axis of orientation** was recorded.)

Note:

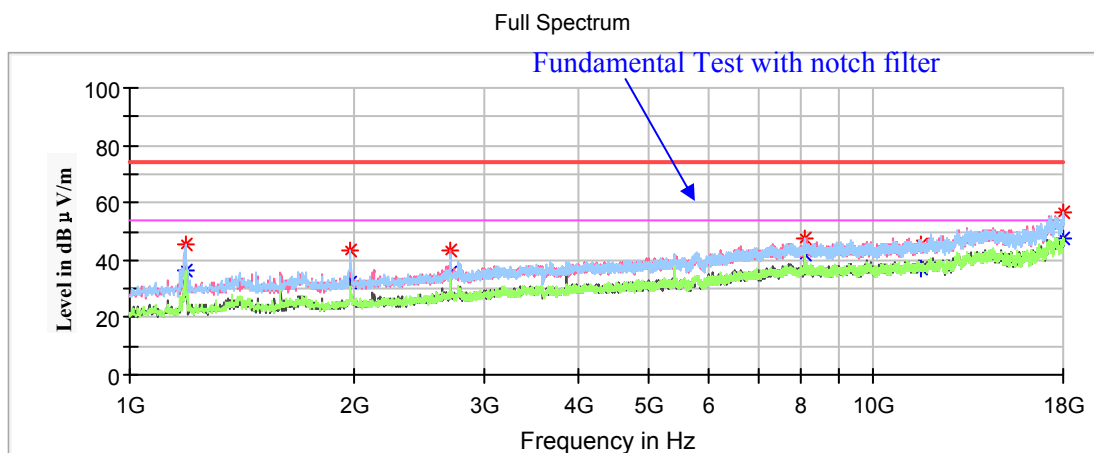
1. This test was performed with the 5725-5850MHz band reject filter.
2. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Limit - Corrected. Amplitude

Low Channel: 5755MHz

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)				
1187.00	46.30	---	150.0	H	282.0	-18.1	74.00	27.7
1187.00	---	38.05	150.0	H	282.0	-18.1	54.00	15.95
1979.20	41.71	---	200.0	H	323.0	-14.5	68.20	26.49
2698.30	43.73	---	150.0	V	243.0	-11.5	74.00	30.27
2698.30	---	36.35	150.0	V	243.0	-11.5	54.00	17.65
8099.20	51.13	---	150.0	H	190.0	1.7	74.00	22.87
8099.20	---	43.48	150.0	H	190.0	1.7	54.00	10.52
11510.00	---	38.39	200.0	H	139.0	2.8	54.00	15.61
11510.00	46.08	---	200.0	H	139.0	2.8	74.00	27.92
17624.30	55.26	---	150.0	V	0.0	8.9	68.20	12.94

High Channel: 5795MHz

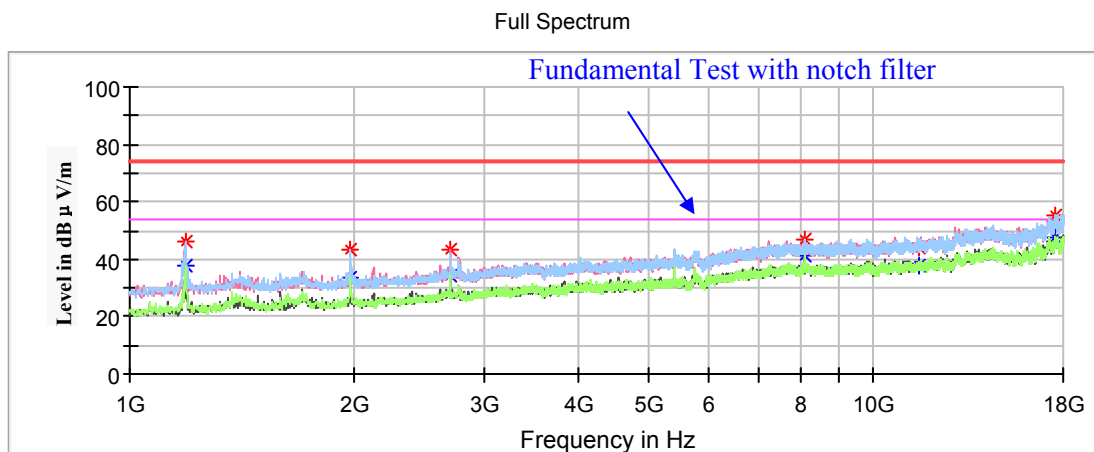
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1187.00	45.54	---	200.0	H	256.0	-18.1	74.00	28.46
1187.00	---	36.70	200.0	H	256.0	-18.1	54.00	17.3
1979.20	43.58	---	150.0	V	316.0	-14.5	68.20	24.62
2698.30	43.50	---	150.0	V	240.0	-11.5	74.00	30.5
2698.30	---	35.85	150.0	V	240.0	-11.5	54.00	18.15
8099.20	47.50	---	200.0	H	178.0	1.7	74.00	26.5
8099.20	---	42.01	200.0	H	178.0	1.7	54.00	11.99
11590.00	---	36.72	150.0	V	28.0	3.0	54.00	17.28
11590.00	45.73	---	150.0	V	28.0	3.0	74.00	28.27
17952.40	---	47.63	150.0	H	353.0	8.8	54.00	6.37
17952.40	56.78	---	150.0	H	353.0	8.8	74.00	17.22

802.11n-HT40 Mode:

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

Note:

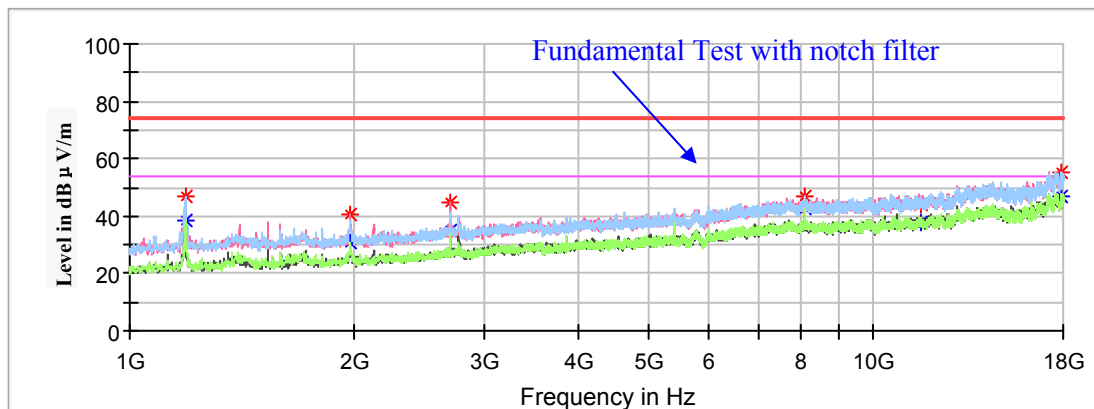
1. This test was performed with the 5725-5850MHz band reject filter.
2. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Limit - Corrected. Amplitude

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)				
1187.00	46.49	---	200.0	H	280.0	-18.1	74.00	27.51
1187.00	---	37.88	200.0	H	280.0	-18.1	54.00	16.12
1979.20	43.26	---	150.0	H	241.0	-14.5	68.20	24.94
2700.00	---	34.04	200.0	V	235.0	-11.5	54.00	19.96
2700.00	43.23	---	200.0	V	235.0	-11.5	74.00	30.77
8099.20	47.07	---	150.0	V	171.0	1.7	74.00	26.93
8099.20	---	41.57	150.0	V	171.0	1.7	54.00	12.43
11510.00	---	37.66	150.0	V	210.0	2.8	54.00	16.34
11510.00	44.35	---	150.0	V	210.0	2.8	74.00	29.65
17568.20	55.25	---	200.0	H	23.0	8.9	68.20	12.95

High Channel: 5795MHz

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)				
1187.00	46.57	---	200.0	H	278.0	-18.1	74.00	27.43
1187.00	---	38.17	200.0	H	278.0	-18.1	54.00	15.83
1979.20	40.66	---	150.0	V	26.0	-14.5	68.20	27.54
2698.30	44.90	---	200.0	V	241.0	-11.5	74.00	29.1
2698.30	---	35.12	200.0	V	241.0	-11.5	54.00	18.88
8099.20	46.75	---	150.0	H	119.0	1.7	74.00	27.25
8099.20	---	42.37	150.0	H	119.0	1.7	54.00	11.63
11590.00	---	37.66	200.0	H	101.0	3.0	54.00	16.34
11590.00	44.28	---	200.0	H	101.0	3.0	74.00	29.72
17943.90	---	46.99	150.0	V	332.0	8.8	54.00	7.01
17943.90	55.42	---	150.0	V	332.0	8.8	74.00	18.58

802.11ac80 Mode:

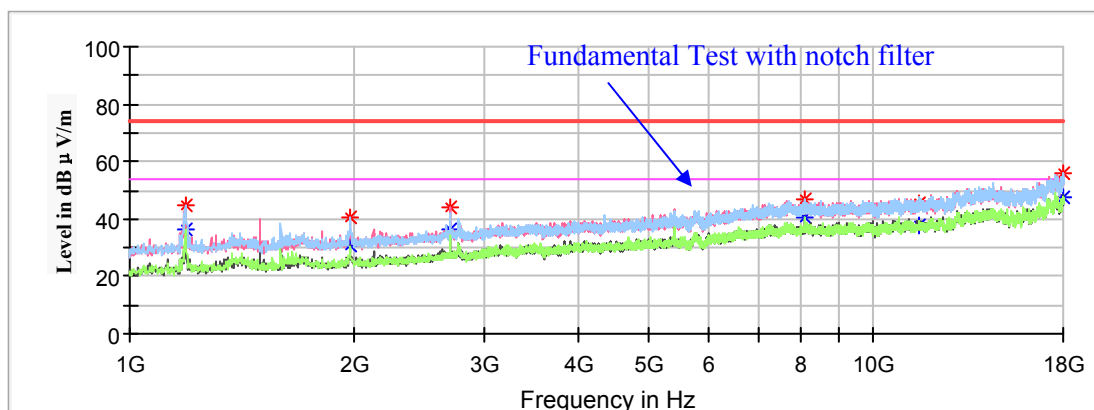
(Pre-scan in the X,Y and Z axes of orientation, the worst case **Z-axis of orientation** was recorded.)

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: 5775MHz

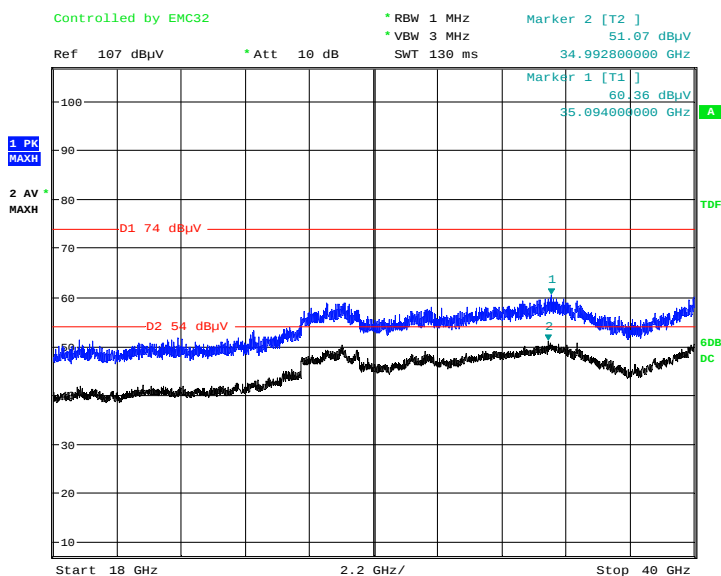
Full Spectrum



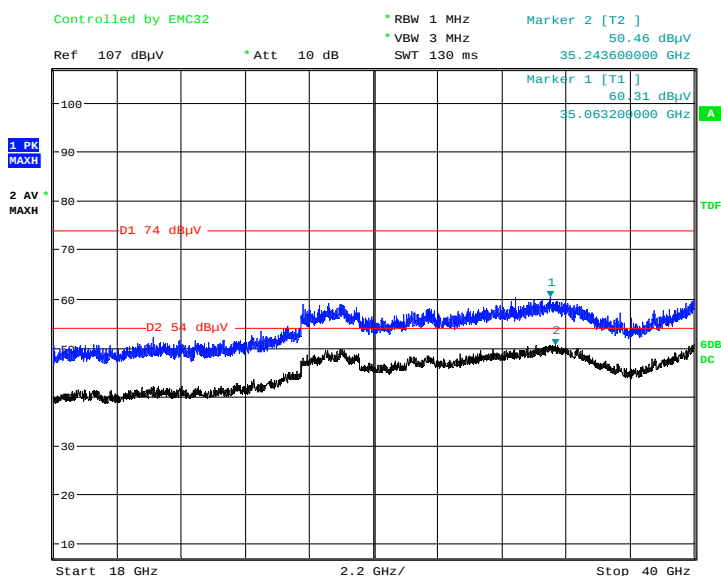
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1187.00	44.87	---	200.0	H	83.0	-18.1	74.00	29.13
1187.00	---	36.68	200.0	H	83.0	-18.1	54.00	17.32
1979.20	40.39	---	150.0	H	243.0	-14.5	68.20	27.81
2698.30	43.75	---	200.0	V	236.0	-11.5	74.00	30.25
2698.30	---	36.09	200.0	V	236.0	-11.5	54.00	17.91
8099.20	47.20	---	150.0	H	121.0	1.7	74.00	26.8
8099.20	---	40.82	150.0	H	121.0	1.7	54.00	13.18
11550.00	---	37.77	150.0	V	158.0	2.9	54.00	16.23
11550.00	45.16	---	150.0	V	158.0	2.9	74.00	28.84
17981.30	---	47.59	200.0	V	198.0	8.8	54.00	6.41
17981.30	56.22	---	200.0	V	198.0	8.8	74.00	17.78

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

Pre-scan with 802.11a, 802.11ac20, 802.11n-HT20, 802.11ac40, 802.11n-HT40 and 802.11 ac80 modes of operation in the X,Y and Z axes of orientation, the worst case 802.11a mode in channel 5240 in Z-axis of orientation was recorded.

Horizontal

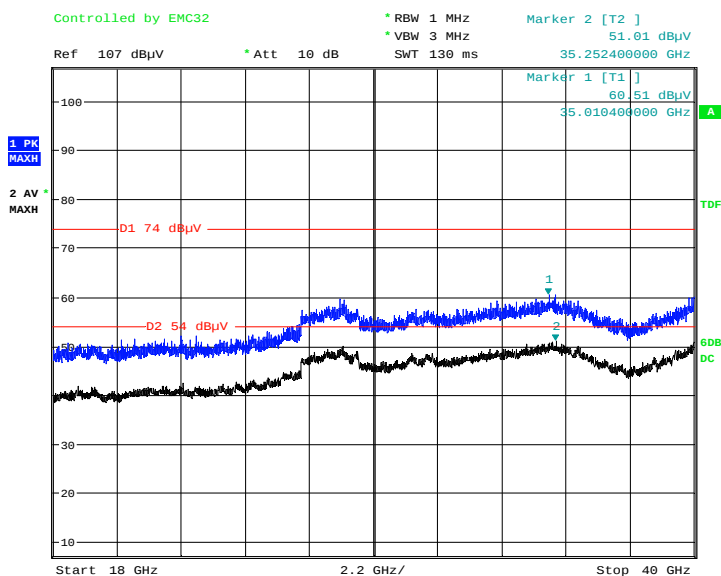
Date: 3.AUG.2020 17:22:19

Vertical

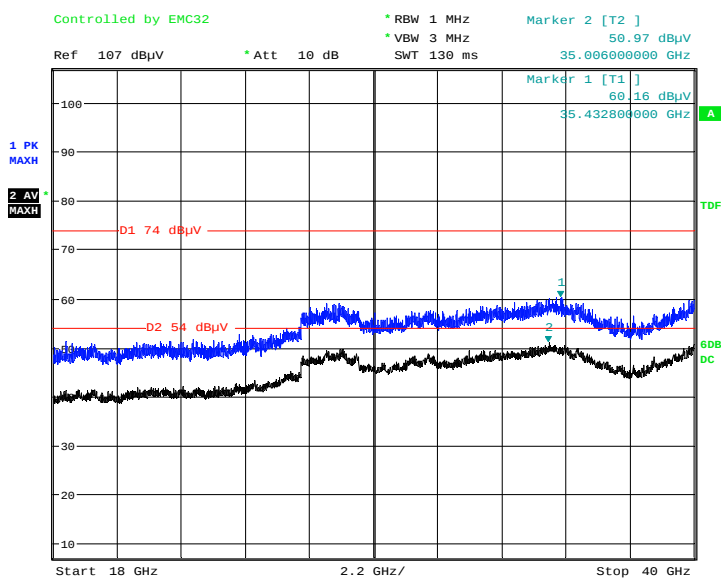
Date: 3.AUG.2020 17:43:14

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

Pre-scan with 802.11a, 802.11ac20, 802.11n-HT20, 802.11ac40, 802.11n-HT40 and 802.11 ac80 modes of operation in the X,Y and Z axes of orientation, the worst case 802.11a mode in channel 5825 in Z-axis of orientation was recorded.

Horizontal

Date: 3.AUG.2020 17:57:07

Vertical

Date: 3.AUG.2020 18:16:08

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 Z-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	---	50.18	200	H	340	5.2	54	3.82
5150.00	56.33	---	200	H	340	5.2	74	17.67
High Channel: 5240MHz								
5350.00	48.76	---	200	V	1	5.8	74	25.24
5350.00	---	43.55	200	V	1	5.8	54	10.45

802.11ac20 Mode : (Pre-scan in the X, Y and Z axes of orientation, the worst case in Z-axis of orientation was recorded)

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
Low Channel: 5180MHz								
5150.00	---	47.36	150	H	312	5.2	54	6.64
5150.00	51.45	---	150	H	312	5.2	74	22.55
High Channel: 5240MHz								
5350.00	49.67	---	200	V	217	5.8	74	24.33
5350.00	---	43.49	200	V	217	5.8	54	10.51

802.11n-HT20 Mode: (Pre-scan in the X, Y and Z axes of orientation, the worst case in Z-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	---	47.77	200	H	311	5.2	54	6.23
5150.00	52.76	---	200	H	311	5.2	74	21.24
High Channel: 5240MHz								
5350.00	48.81	---	200	V	144	5.8	74	25.19
5350.00	---	43.93	200	V	144	5.8	54	10.07

802.11ac40 Mode : (Pre-scan in the X, Y and Z axes of orientation, the worst case in Z-axis of orientation was recorded)

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
Low Channel: 5190MHz								
5150.00	---	52.63	200	H	345	5.2	54	1.37
5150.00	59.97	---	200	H	345	5.2	74	14.03
High Channel: 5230MHz								
5350.00	49.97	---	150	V	8	5.8	74	24.03
5350.00	---	43.52	150	V	8	5.8	54	10.48

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

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
Low Channel: 5190MHz								
5150.00	---	52.95	150	H	337	5.2	54	1.05
5150.00	62.09	---	150	H	337	5.2	74	11.91
High Channel: 5230MHz								
5350.00	49.39	---	200	V	193	5.8	74	24.61
5350.00	---	43.42	200	V	193	5.8	54	10.58

802.11ac80 Mode : (Pre-scan in the X, Y and Z axes of orientation, the worst case in Z-axis of orientation was recorded)

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
Low Channel: 5210MHz								
5150.00	60.03	---	150.0	H	340.0	5.2	74.00	13.97
5150.00	---	52.38	150.0	H	340.0	5.2	54.00	1.62
5350.00	48.52	---	200.0	V	122.0	5.7	74.00	25.48
5350.00	---	42.36	200.0	V	122.0	5.7	54.00	11.64

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 Z-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	50.12	---	150	H	346	6.4	68.2	18.08
5700.00	55.91	---	200	H	11	6.5	105.2	49.29
5720.00	65.41	---	150	H	173	6.5	110.8	45.39
5725.00	67.9	---	200	V	247	6.5	122.2	54.3
High Channel: 5825MHz								
5850.00	54.52	---	150	V	250	6.7	122.2	67.68
5855.00	51.39	---	200	V	274	6.7	110.8	59.41
5875.00	48.94	---	150	H	222	6.8	105.2	56.26
5925.00	49.18	---	150	V	320	6.9	68.2	19.02

802.11ac20 Mode: (Pre-scan in the X, Y and Z axes of orientation, the worst case in Z-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	48.92	---	150	V	233	6.4	68.2	19.28
5700.00	54.77	---	200	V	70	6.5	105.2	50.43
5720.00	64.32	---	150	H	315	6.5	110.8	46.48
5725.00	70.05	---	200	V	308	6.5	122.2	52.15
High Channel: 5825MHz								
5850.00	55.62	---	150	V	256	6.7	122.2	66.58
5855.00	50.28	---	150	H	358	6.7	110.8	60.52
5875.00	49.5	---	200	H	117	6.8	105.2	55.70
5925.00	49.48	---	150	V	358	6.9	68.2	18.72

802.11n-HT20 Mode: (Pre-scan in the X, Y and Z axes of orientation, the worst case in Z-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	49.24	---	150	H	186	6.4	68.2	18.96
5700.00	54.98	---	200	H	175	6.5	105.2	50.22
5720.00	62.97	---	150	H	175	6.5	110.8	47.83
5725.00	72.99	---	200	V	70	6.5	122.2	49.21
High Channel: 5825MHz								
5850.00	55.72	---	150	V	250	6.7	122.2	66.48
5855.00	50.39	---	200	V	319	6.7	110.8	60.41
5875.00	50.4	---	150	V	98	6.8	105.2	54.8
5925.00	50.38	---	200	V	151	6.9	68.2	17.82

802.11ac40 Mode: (Pre-scan in the X, Y and Z axes of orientation, the worst case in Z-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	49.94	---	150	H	147	6.4	68.2	18.26
5700.00	57.17	---	150	V	264	6.5	105.2	48.03
5720.00	65.16	---	200	H	314	6.5	110.8	45.64
5725.00	70.32	---	200	V	264	6.5	122.2	51.88
High Channel: 5795MHz								
5850.00	51.87	---	150	V	57	6.7	122.2	70.33
5855.00	50.12	---	150	H	1	6.7	110.8	60.68
5875.00	48.86	---	200	H	358	6.8	105.2	56.34
5925.00	50.73	---	150	H	152	6.9	68.2	17.47

802.11n-HT40 Mode: (Pre-scan in the X, Y and Z axes of orientation, the worst case in Z-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	50.19	---	150	H	215	6.4	68.2	18.01
5700.00	60.94	---	200	H	310	6.5	105.2	44.26
5720.00	69.82	---	150	V	249	6.5	110.8	40.98
5725.00	70.33	---	200	V	249	6.5	122.2	51.87
High Channel: 5795MHz								
5850.00	55.26	---	200	V	249	6.7	122.2	66.94
5855.00	50.53	---	150	V	262	6.7	110.8	60.27
5875.00	50.64	---	200	V	350	6.8	105.2	54.56
5925.00	51.82	---	150	H	59	6.9	68.2	16.38

802.11ac80 Mode: (Pre-scan in the X, Y and Z axes of orientation, the worst case in Z-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: 5775MHz								
5650.00	50.92	---	150	V	311	6.4	68.2	17.28
5700.00	57.62	---	200	H	338	6.5	105.2	47.58
5720.00	61.49	---	150	V	251	6.5	110.8	49.31
5725.00	61.84	---	200	V	265	6.5	122.2	60.36
5850.00	55.42	---	150	V	265	6.7	122.2	66.78
5855.00	54.52	---	150	H	167	6.7	110.8	56.28
5875.00	50.52	---	200	V	251	6.8	105.2	54.68
5925.00	49.82	---	150	V	288	6.9	68.2	18.38

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

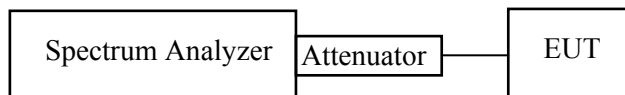
1. Emission Bandwidth (EBW)

- Set RBW = approximately 1% of the emission bandwidth.
- Set the VBW > RBW.
- Detector = Peak.
- Trace mode = max hold.
- 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:

- Set RBW = 100 kHz.
 - Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
 - Detector = Peak.
 - Trace mode = max hold.
 - Sweep = auto couple.
 - 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:	24.8°C
Relative Humidity:	54%
ATM Pressure:	101.5 kPa

The testing was performed by CK Huang from 2020-08-03 to 2020-08-27 .

Test Result: Compliant

5150-5250 MHz:

Test mode	Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
802.11a	Low	5180	30.261	18.437
	Middle	5200	28.958	18.938
	High	5240	27.555	18.236
802.11ac20	Low	5180	32.665	19.038
	Middle	5200	31.764	19.038
	High	5240	30.361	18.938
802.11n-HT20	Low	5180	32.665	19.238
	Middle	5200	30.361	19.238
	High	5240	28.657	18.938
802.11ac40	Low	5190	64.770	37.074
	High	5230	58.036	37.074
802.11n-HT40	Low	5190	57.074	37.074
	High	5230	63.327	37.074
802.11ac80	Low	5210	95.291	76.834

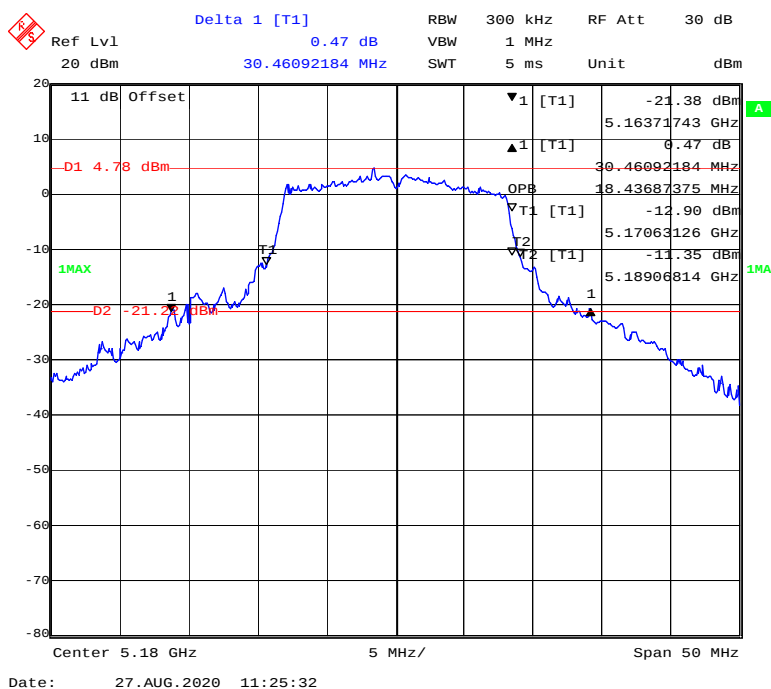
5725-5850MHz:

Test mode	Channel	Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)
802.11a	Low	5745	16.232	20.842	≥ 0.5
	Middle	5785	16.232	19.739	≥ 0.5
	High	5825	16.132	19.739	≥ 0.5
802.11ac20	Low	5745	17.234	20.040	≥ 0.5
	Middle	5785	17.335	19.539	≥ 0.5
	High	5825	17.635	19.539	≥ 0.5
802.11n-HT20	Low	5745	17.335	20.341	≥ 0.5
	Middle	5785	17.435	19.639	≥ 0.5
	High	5825	17.234	19.238	≥ 0.5
802.11ac40	Low	5755	35.912	37.355	≥ 0.5
	High	5795	35.912	37.034	≥ 0.5
802.11n-HT40	Low	5755	35.912	39.439	≥ 0.5
	High	5795	35.912	38.477	≥ 0.5
802.11ac80	Low	5775	75.451	76.052	≥ 0.5

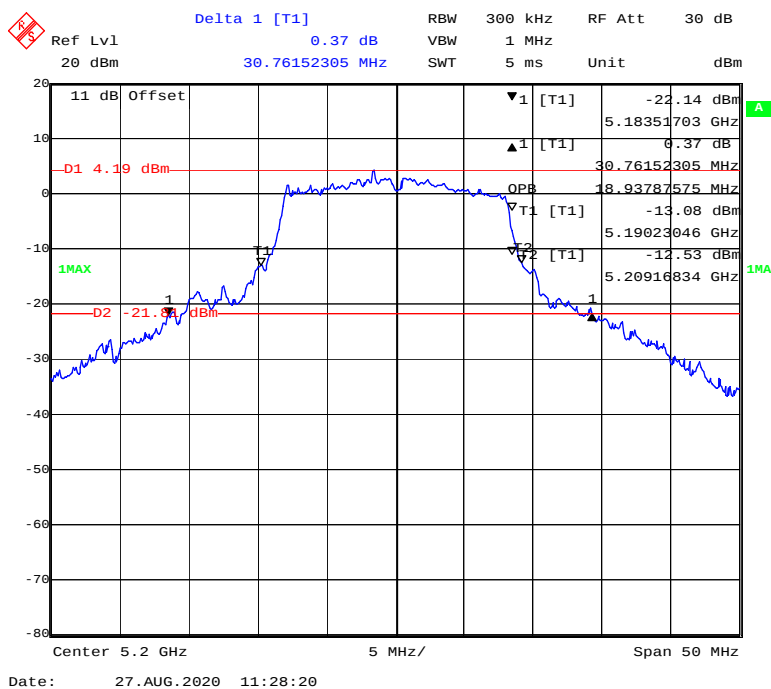
5150-5250 MHz Band:

26 Bandwidth&99% Occupied Bandwidth

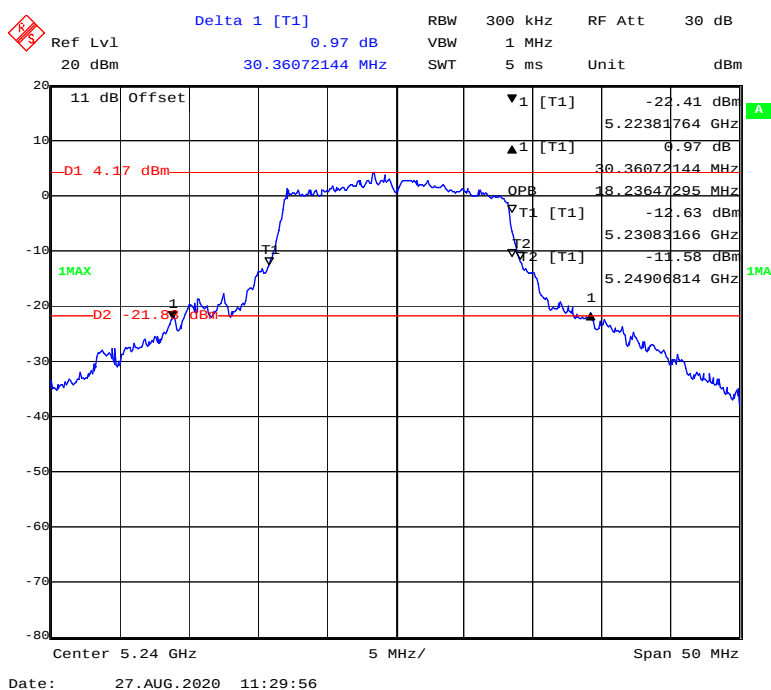
802.11a mode, 5180MHz



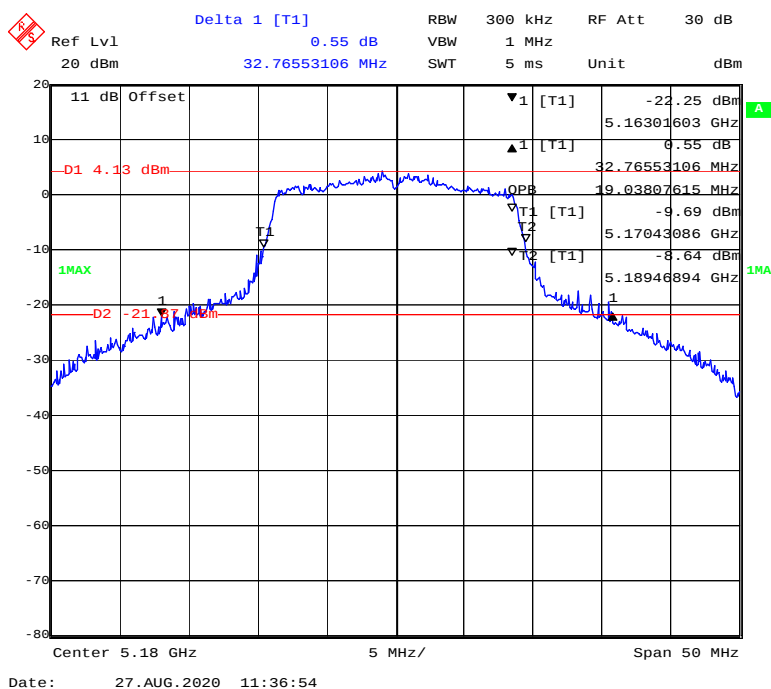
802.11a mode, 5200MHz



802.11a mode, 5240MHz



802.11ac20 mode, 5180MHz



Delta 1 [T1]
 Ref Lvl -0.67 dB
 20 dBm 30.46092184 MHz
 RBW 300 kHz RF Att 30 dB
 VBW 1 MHz
 SWT 5 ms Unit dBm

11 dB Offset
 -22.52 dBm
 5.18431864 GHz
 -0.67 dB
 30.46092184 MHz
 19.03807615 MHz
 -11.39 dBm
 5.19043086 GHz
 -10.70 dBm
 5.20946894 GHz
 -22.29 dBm

Center 5.2 GHz 5 MHz/ Span 50 MHz

Date: 27.AUG.2020 11:38:04

Delta 1 [T1] 0.85 dB

RBW 300 kHz RF Att 30 dB

VBW 1 MHz

SWT 5 ms Unit dBm

Ref Lvl 20 dBm

33.16633267 MHz

11 dB Offset

D1 3.24 dBm

1MAX

D2 -22.7 dBm

1 [T1]

1 [T1]

OPB

T1 [T1]

T2

T2 [T1]

1

1MAX

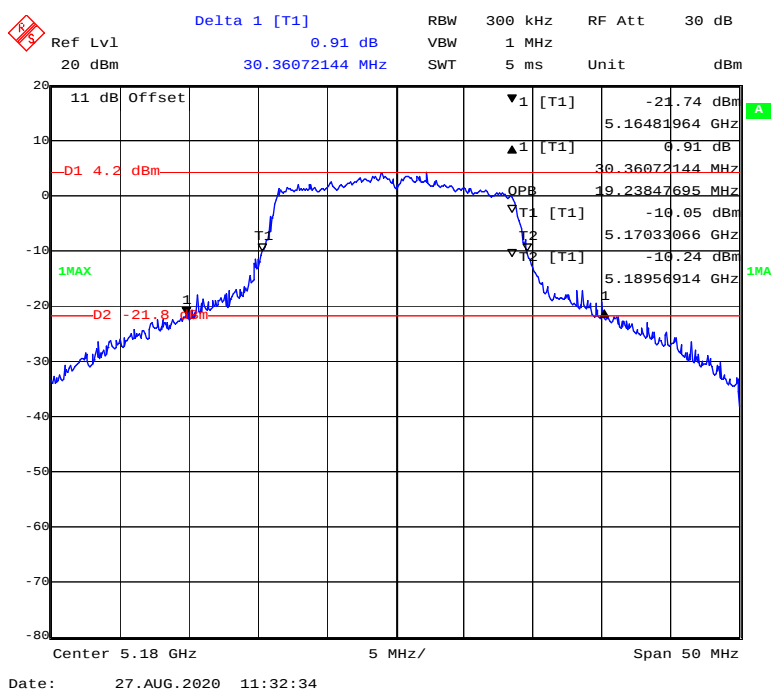
Center 5.24 GHz

5 MHz/

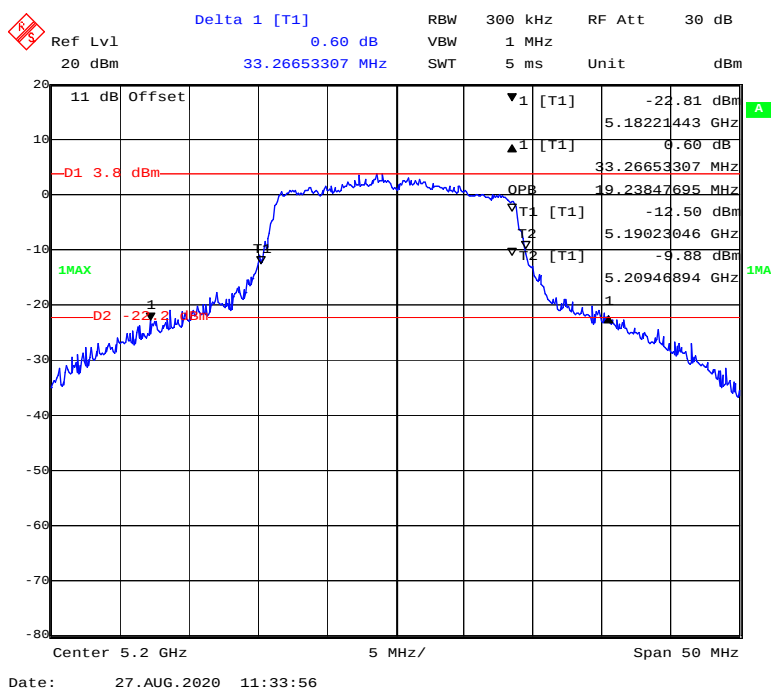
Span 50 MHz

Date: 27.AUG.2020 11:39:23

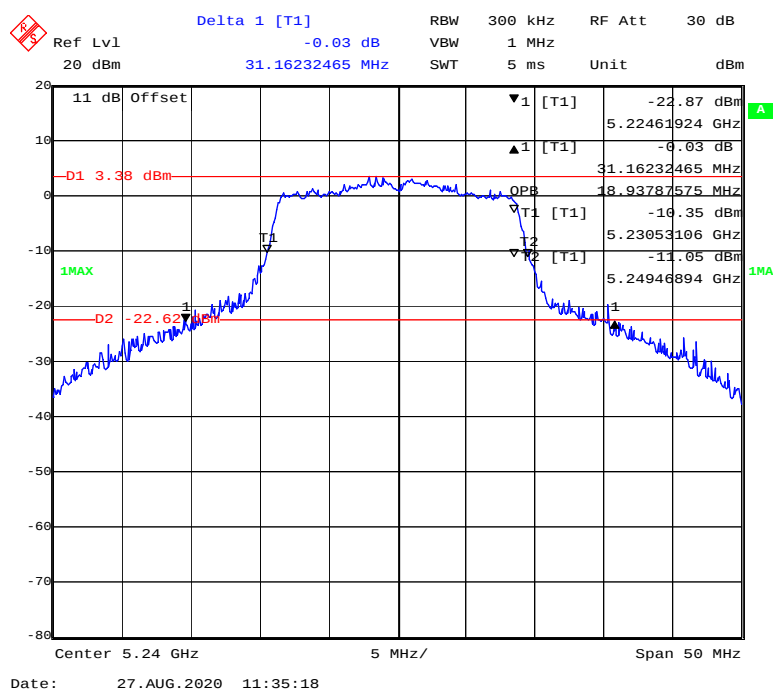
802.11n-HT20 mode, 5180MHz



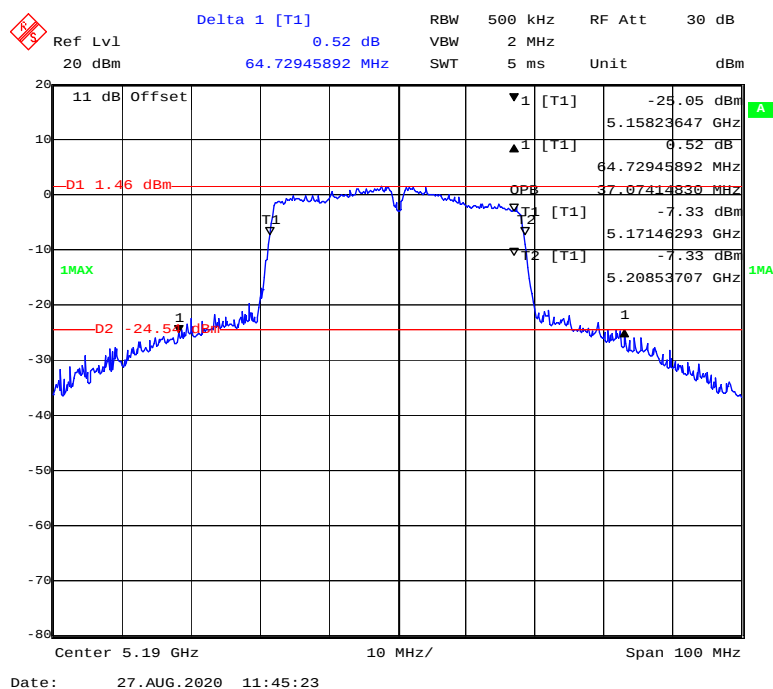
802.11n-HT20 mode, 5200MHz



802.11n-HT20 mode, 5240MHz



802.11ac40 mode, 5190MHz



[illegible][illegible]

Delta 1 [T1]

Ref Lvl 20 dBm

1.01 dB

63.12625251 MHz

RBW 500 kHz

VBW 2 MHz

SWT 5 ms

RF Att 30 dB

Unit dBm

11 dB Offset

D1 1.9 dBm

1MAX

D2 -24.1 dBm

▼1 [T1]

▲1 [T1]

OPB

▼T1 [T1]

▼T2 [T1]

1

-24.76 dBm

5.19703407 GHz

1.01 dB

63.12625251 MHz

37.07414830 MHz

-7.67 dBm

5.21146293 GHz

-6.52 dBm

5.24853707 GHz

1MAX

Center 5.23 GHz

10 MHz/

Span 100 MHz

Date: 27.AUG.2020 11:44:17

[illegible]

Delta 1 [T1]

Ref Lvl -0.74 dB

20 dBm 16.13226453 MHz

RBW 100 kHz RF Att 30 dB

SWT 12.5 ms Unit dBm

11 dB Offset

D1 3.95 dBm

D2 -2.05 dBm

1MAX

▼1 [T1] -1.45 dBm

▲1 [T1] -0.74 dB

5.81693387 GHz

16.13226453 MHz

Center 5.825 GHz

5 MHz/

Span 50 MHz

Date: 3.AUG.2020 18:23:01

Delta 1 [T1] -0.22 dB

RBW 100 kHz RF Att 30 dB

VBW 300 kHz

SWT 12.5 ms Unit dBm

Ref Lvl 20 dBm

17.23446894 MHz

11 dB Offset

▼1 [T1] -3.12 dBm

▲1 [T1] -0.22 dB

17.23446894 MHz

D1 2.72 dBm

D2 -3.28 dBm

1MAX

IN1 1MA

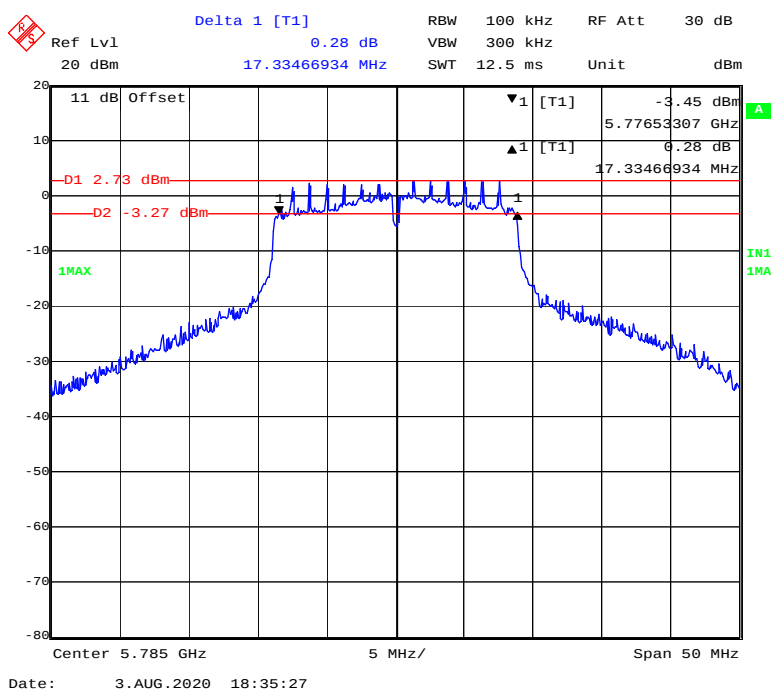
Center 5.745 GHz

5 MHz/

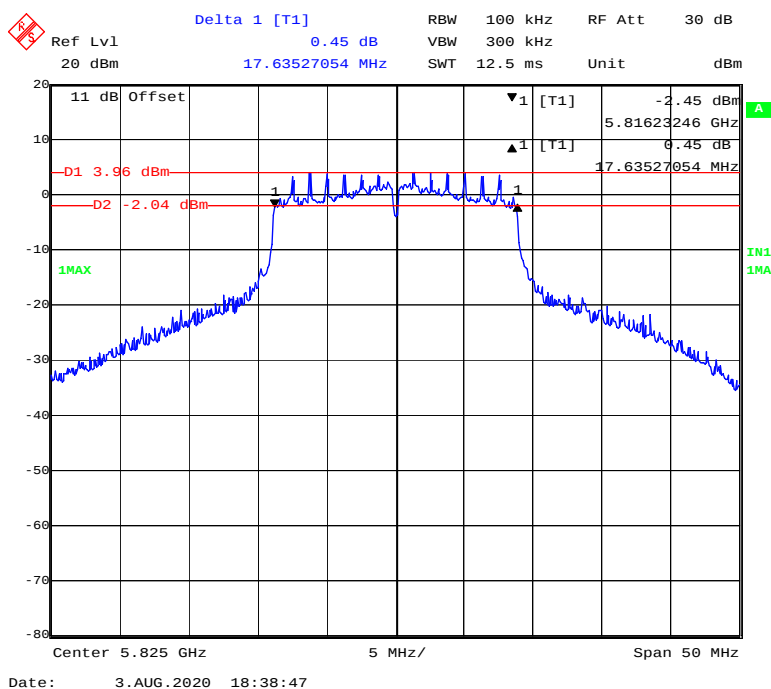
Span 50 MHz

Date: 3.AUG.2020 18:36:30

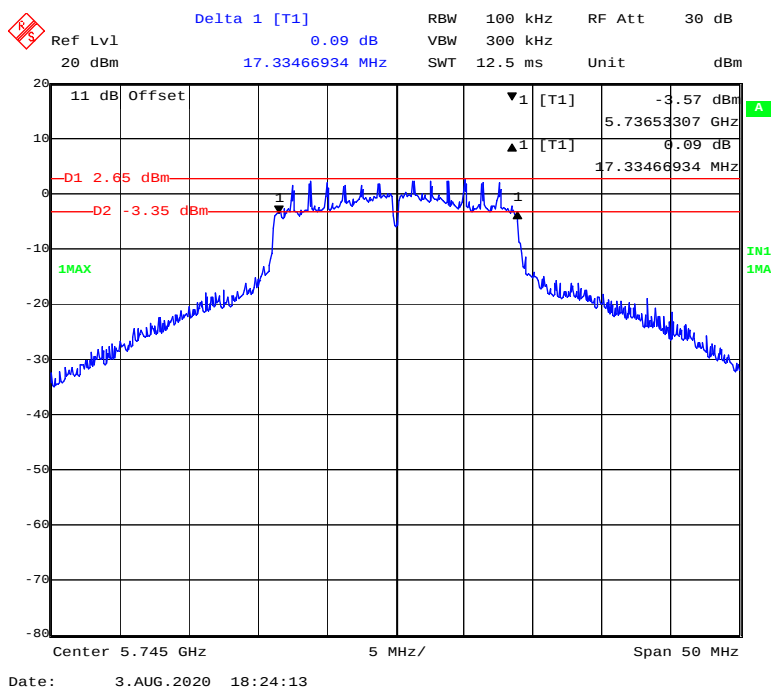
802.11 ac20 mode, 5785MHz



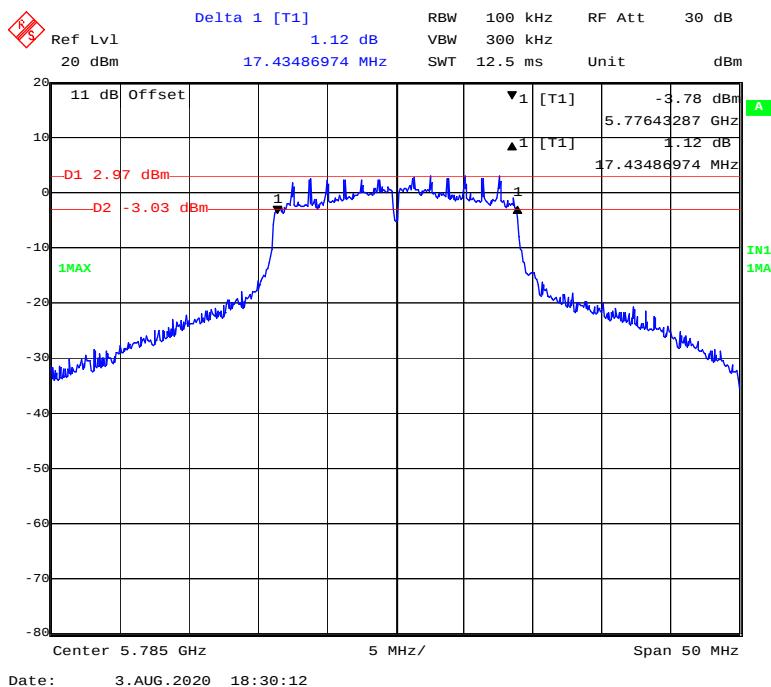
802.11 ac20 mode, 5825MHz

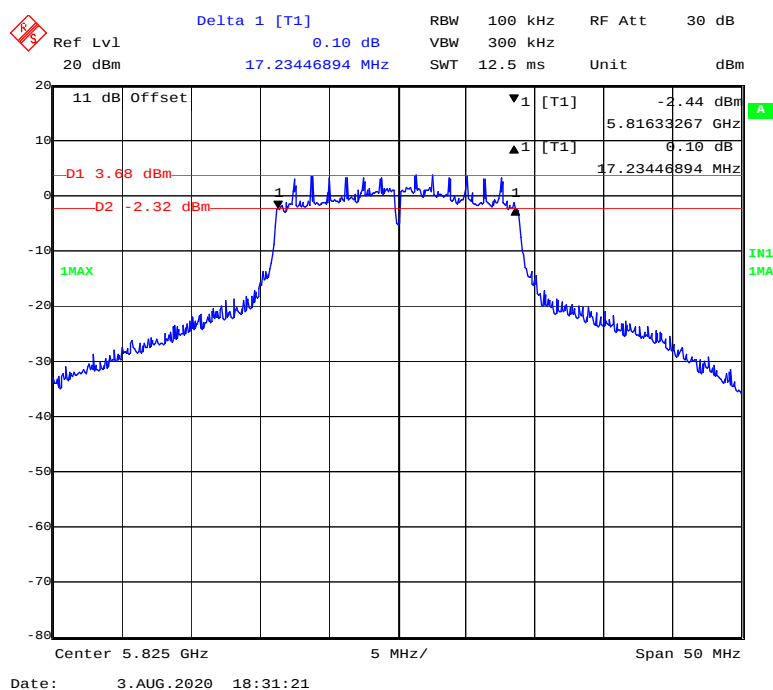
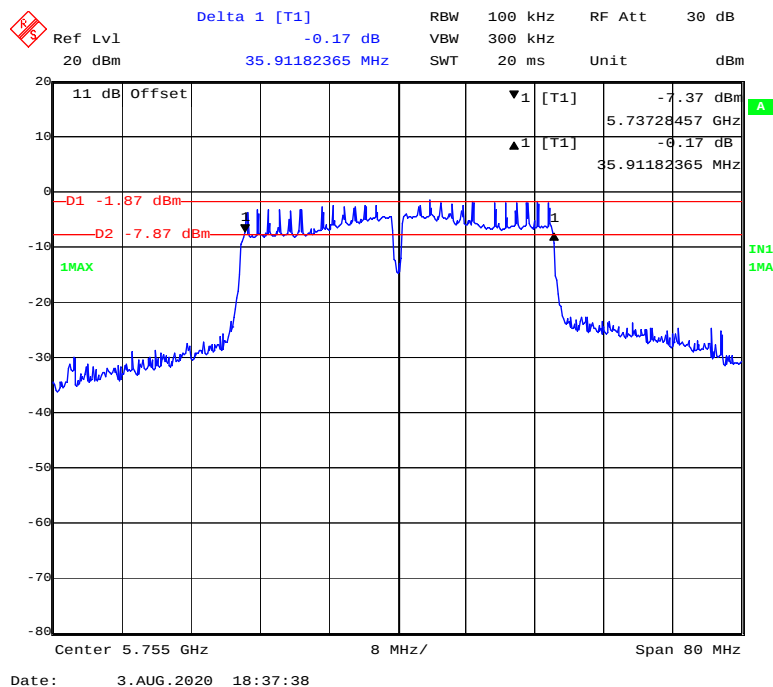


802.11n-HT20 mode, 5745MHz

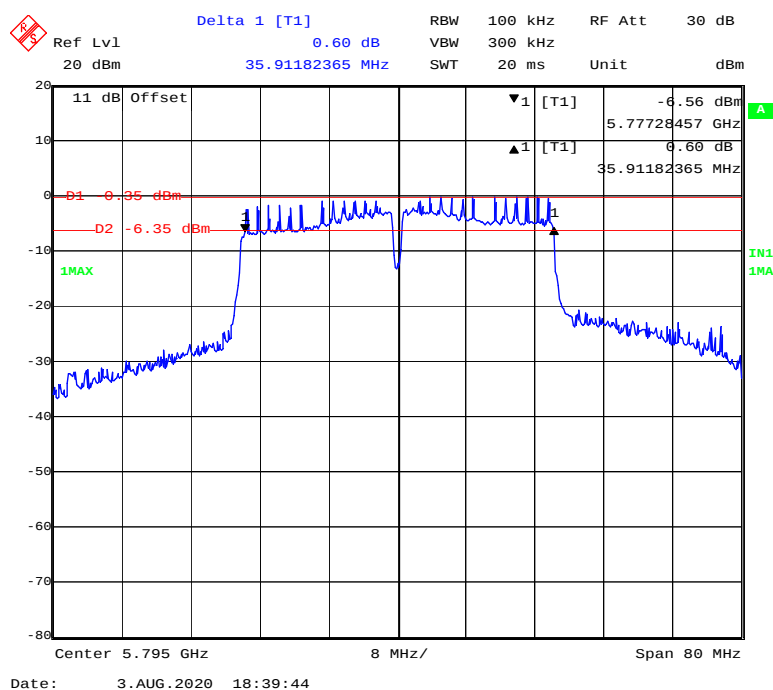


802.11n-HT20 mode, 5785MHz

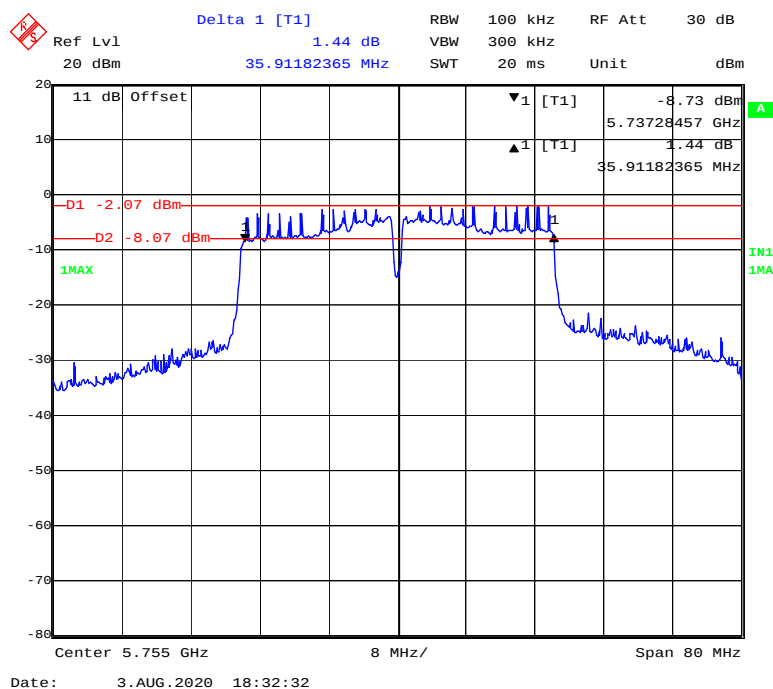


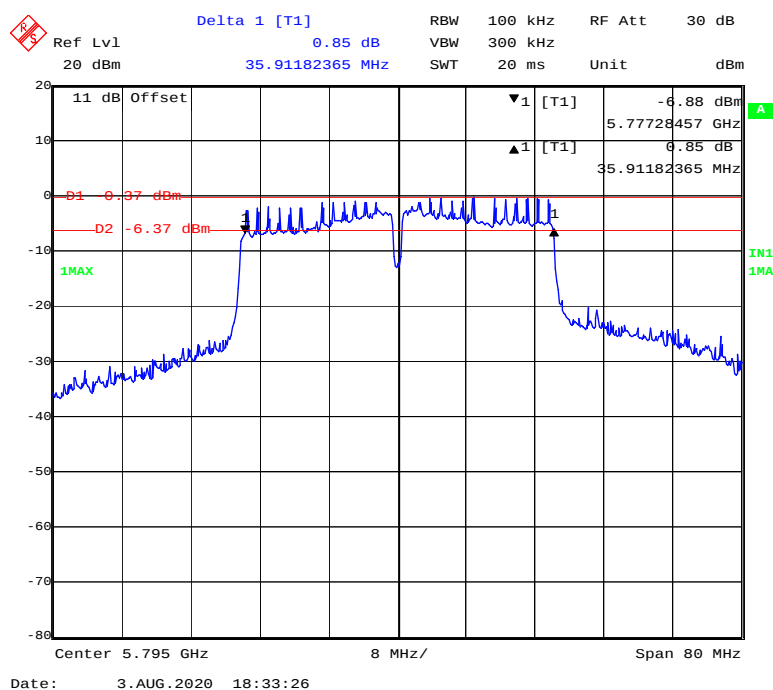
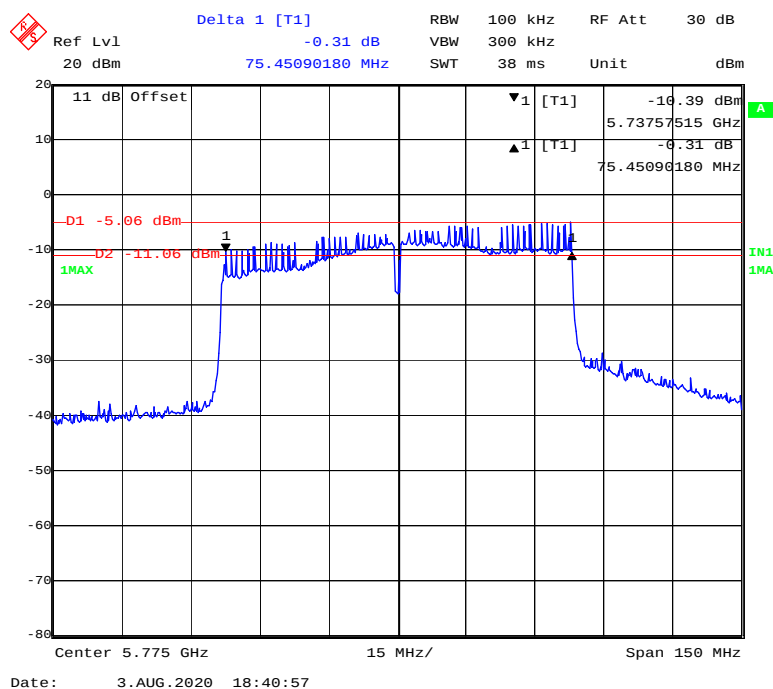
802.11n-HT20 mode, 5825MHz**802.11ac40 mode, 5755MHz**

802.11 ac40 mode, 5795MHz



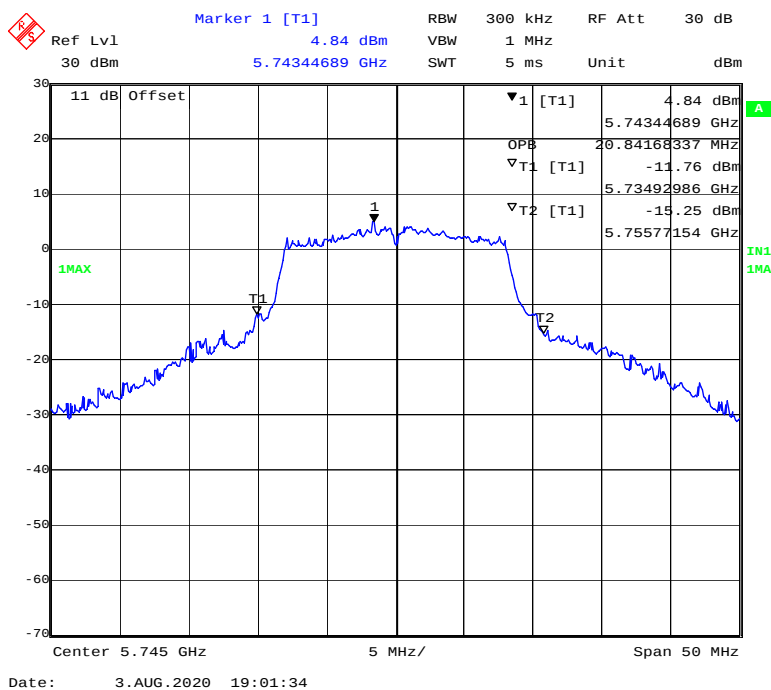
802.11n-HT40 mode, 5755MHz



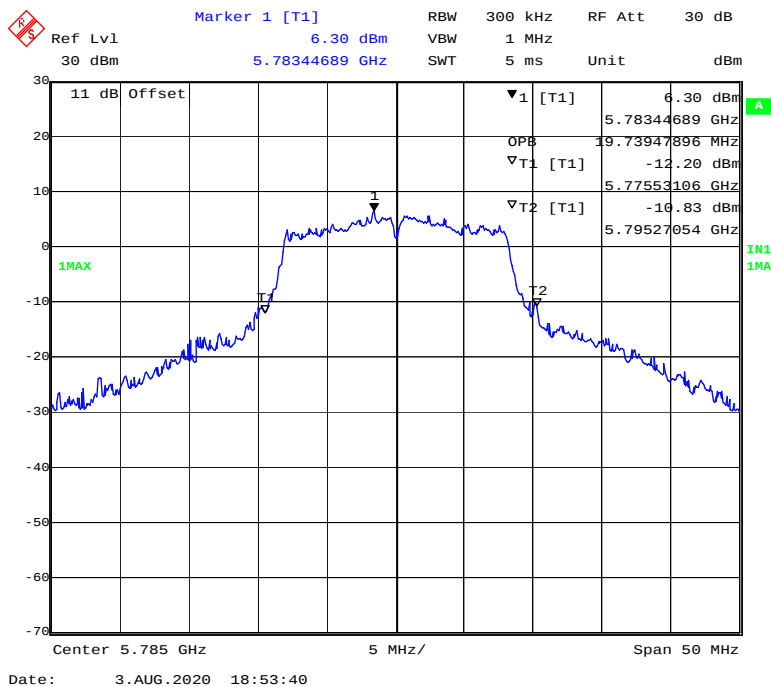
802.11n-HT40 mode, 5795MHz**802.11ac80 mode, 5775MHz**

99% Occupied Bandwidth:

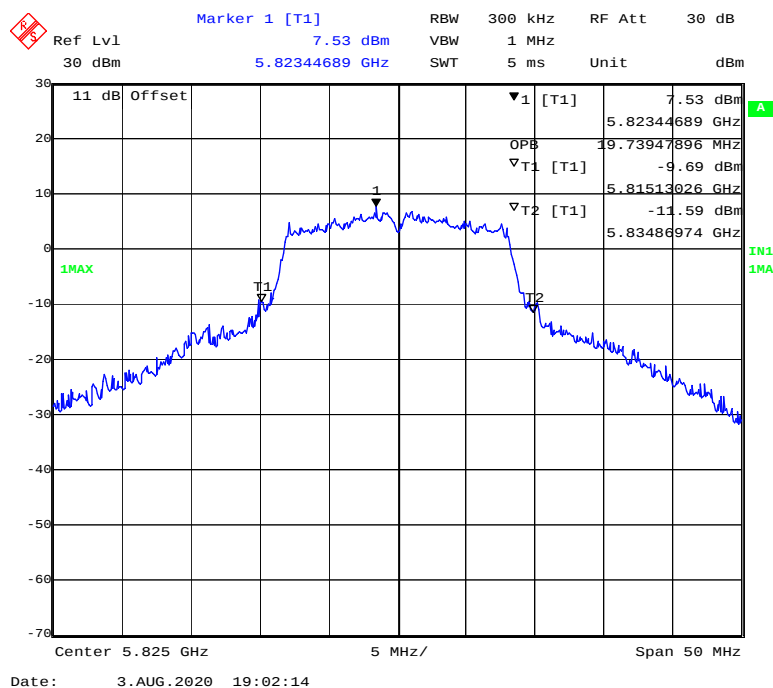
802.11a mode, 5745MHz



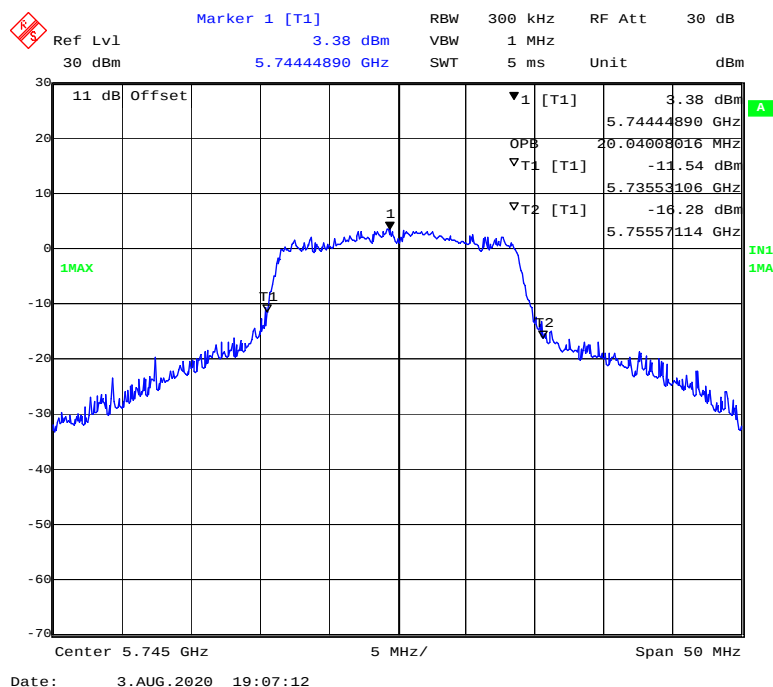
802.11a mode, 5785MHz



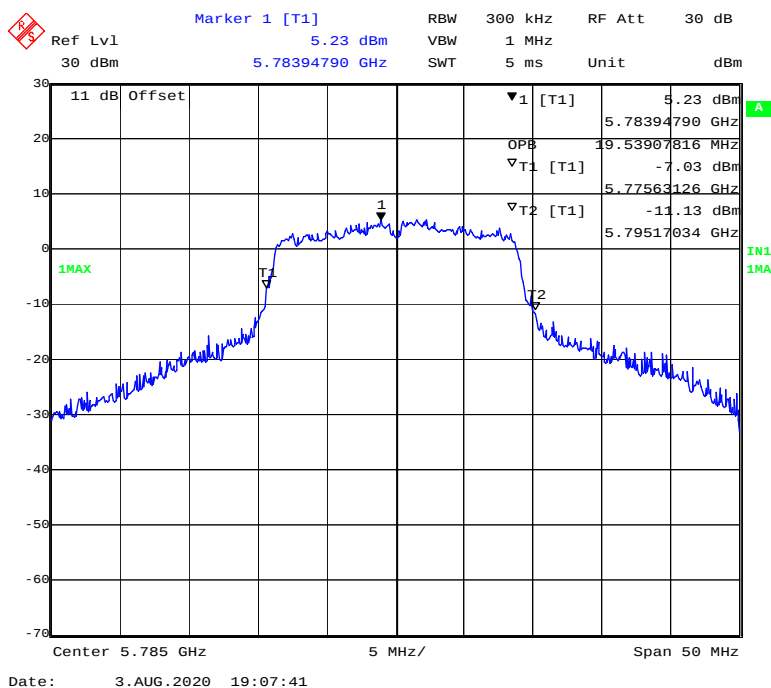
802.11a mode, 5825MHz



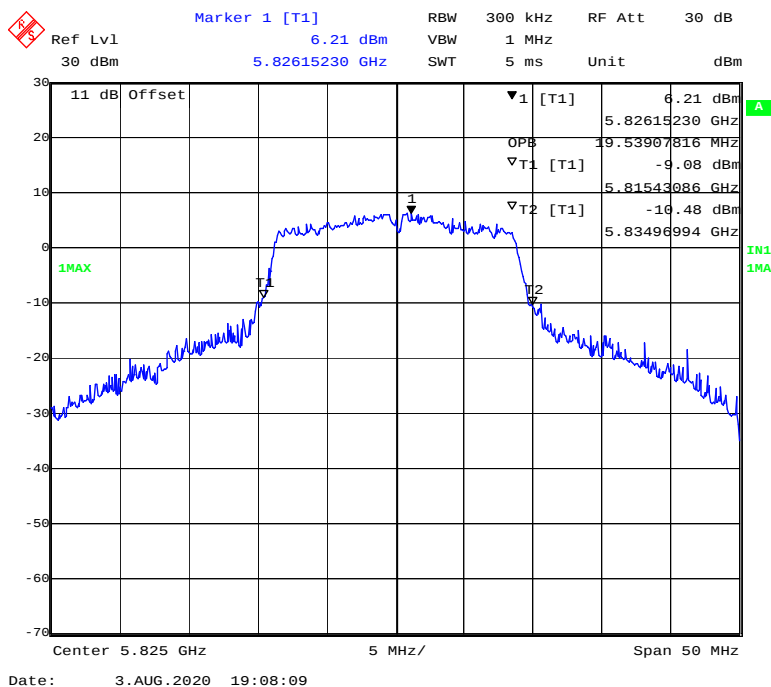
802.11ac20 mode, 5745MHz

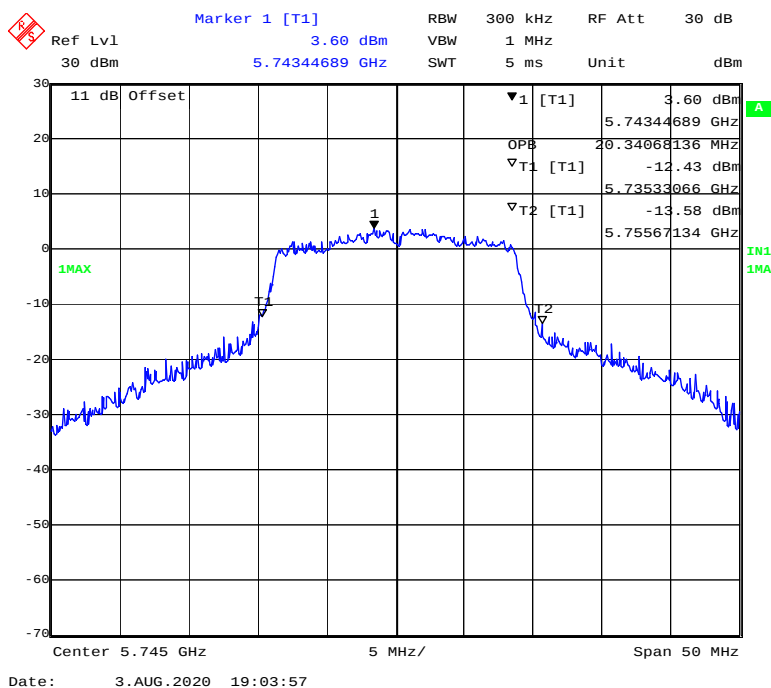
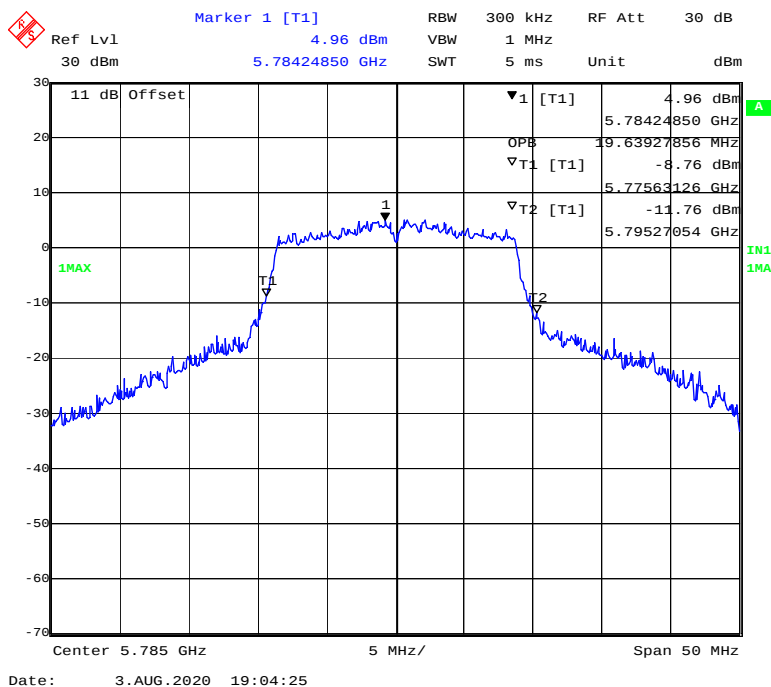


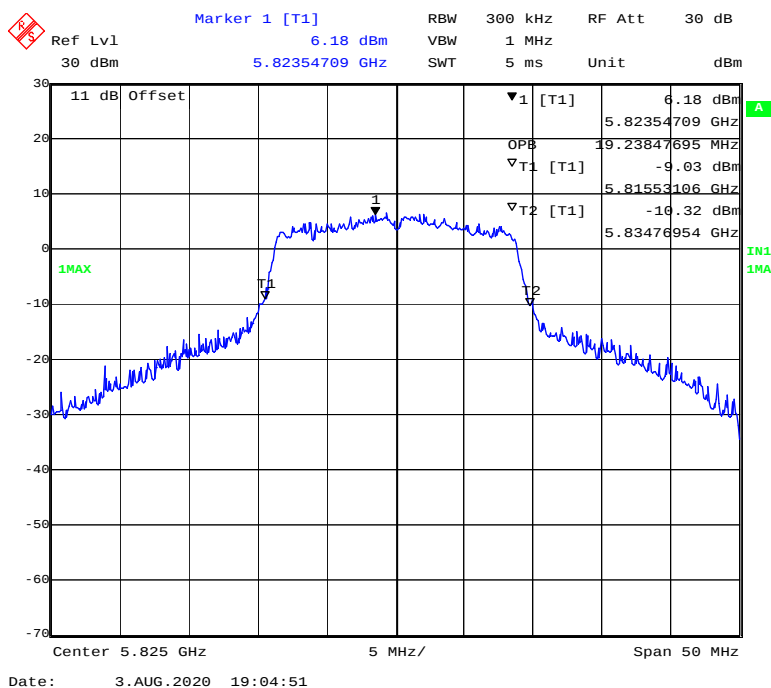
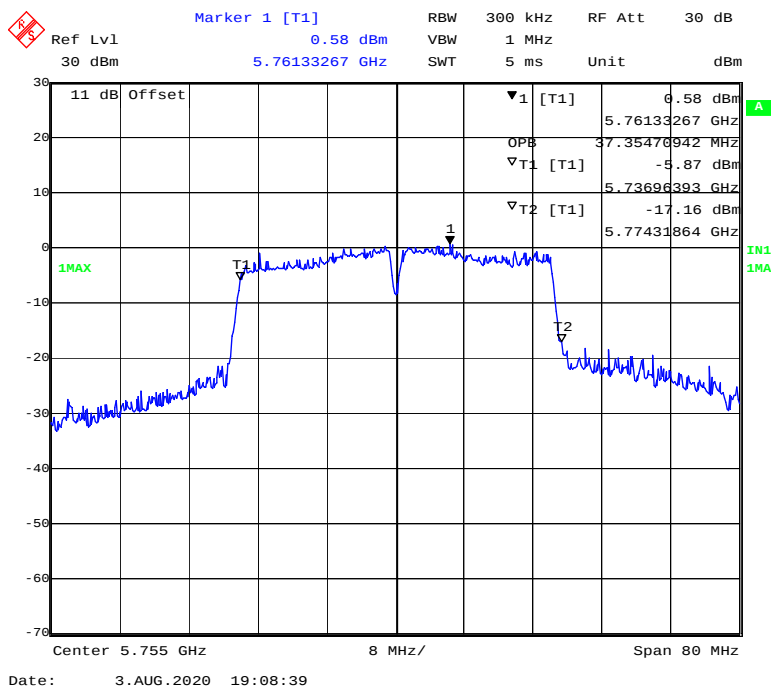
802.11 ac20 mode, 5785MHz

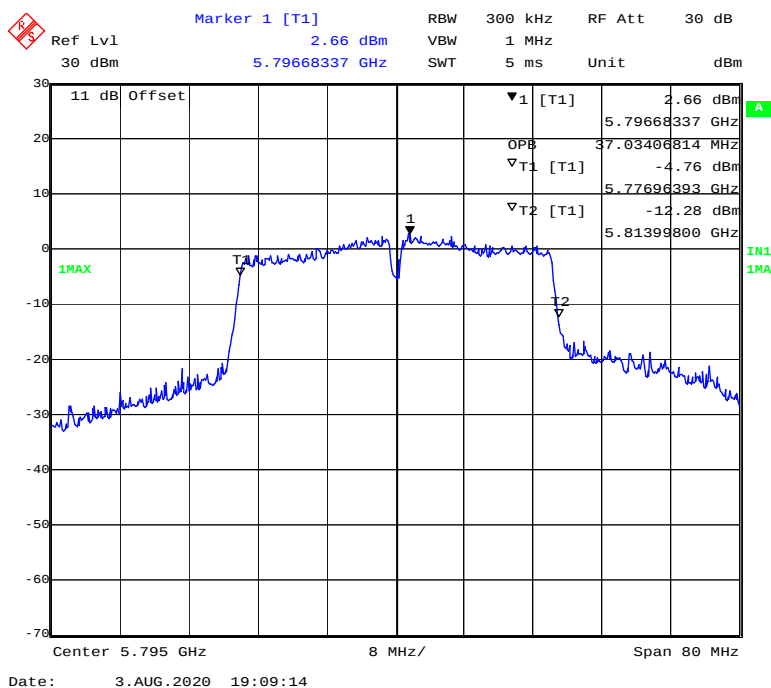
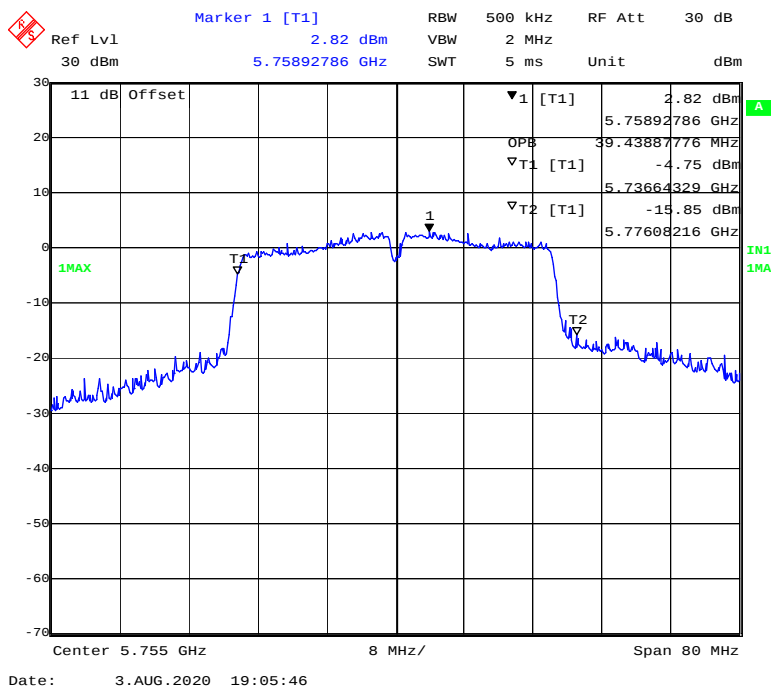


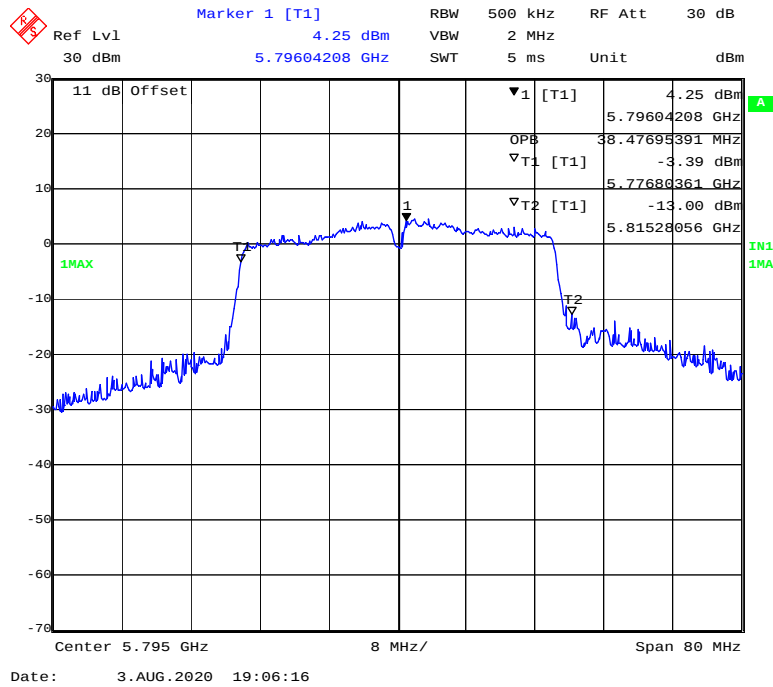
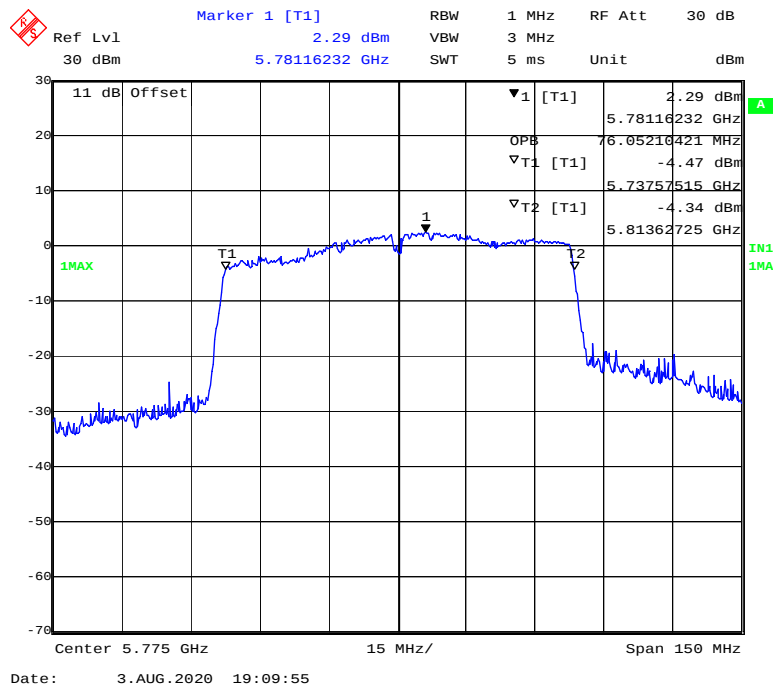
802.11 ac20 mode, 5825MHz



802.11n-HT20 mode, 5745MHz**802.11n-HT20 mode, 5785MHz**

802.11n-HT20 mode, 5825MHz**802.11ac40 mode, 5755MHz**

802.11 ac40 mode, 5795MHz**802.11n-HT40 mode, 5755MHz**

802.11n-HT40 mode, 5795MHz**802.11n-ac80 mode, 5775MHz**

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:	24.8°C~25°C
Relative Humidity:	49%~50%
ATM Pressure:	101.2 kPa ~101.5 kPa

The testing was performed by CK Huang from 2020-08-03 to 2020-08-05.

Test Mode: Transmitting

Test Mode: Transmitting

Test mode	Band	Channel	Frequency (MHz)	Average Conducted Output Power (dBm)	Limit (dBm)	Result
802.11a	5150-5250 MHz	Low	5180	19.58	24	PASS
		Middle	5200	19.18	24	PASS
		High	5240	19.16	24	PASS
	5725-5850 MHz	Low	5745	21.81	30	PASS
		Middle	5785	21.51	30	PASS
		High	5825	22.39	30	PASS
802.11n-HT20	5150-5250 MHz	Low	5180	19.15	24	PASS
		Middle	5200	18.91	24	PASS
		High	5240	19.04	24	PASS
	5725-5850 MHz	Low	5745	20.57	30	PASS
		Middle	5785	21.02	30	PASS
		High	5825	22.00	30	PASS
802.11n-HT40	5150-5250 MHz	Low	5190	18.19	24	PASS
		High	5230	17.90	24	PASS
	5725-5850 MHz	Low	5755	19.71	30	PASS
		High	5795	20.89	30	PASS
802.11ac20	5150-5250 MHz	Low	5180	19.48	24	PASS
		Middle	5200	18.75	24	PASS
		High	5240	18.75	24	PASS
	5725-5850 MHz	Low	5745	20.50	30	PASS
		Middle	5785	21.19	30	PASS
		High	5825	22.44	30	PASS
802.11ac40	5150-5250 MHz	Low	5190	18.18	24	PASS
		High	5230	17.90	24	PASS
	5725-5850 MHz	Low	5755	19.61	30	PASS
		High	5795	21.13	30	PASS
802.11ac80	5150-5250 MHz	/	5210	16.00	24	PASS
	5725-5850 MHz	/	5775	18.48	30	PASS

Note: The maximum antenna gain is 2.6 dBi.

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:	24.8°C
Relative Humidity:	54%
ATM Pressure:	101.5 kPa

The testing was performed by CK Huang on 2020-08-03.

Test Mode: Transmitting

5150MHz-5250MHz:

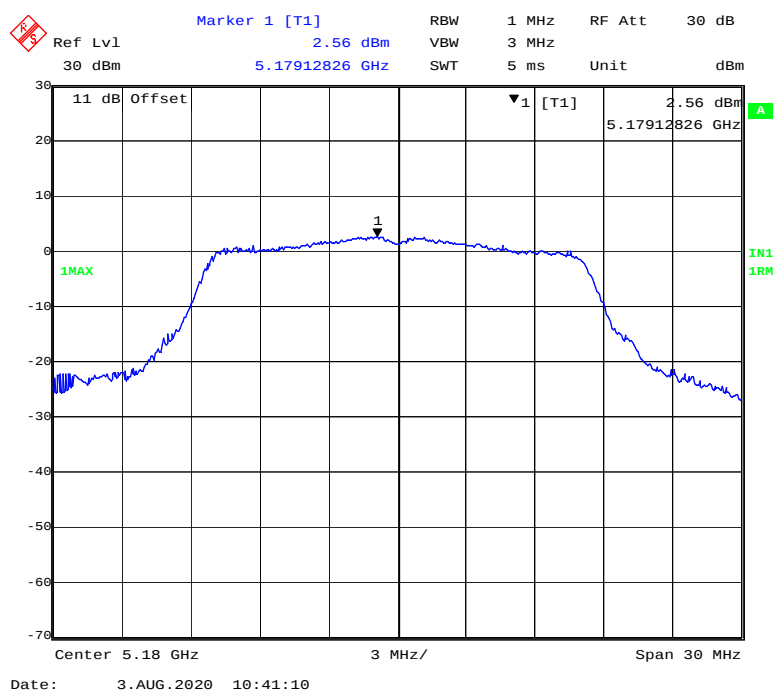
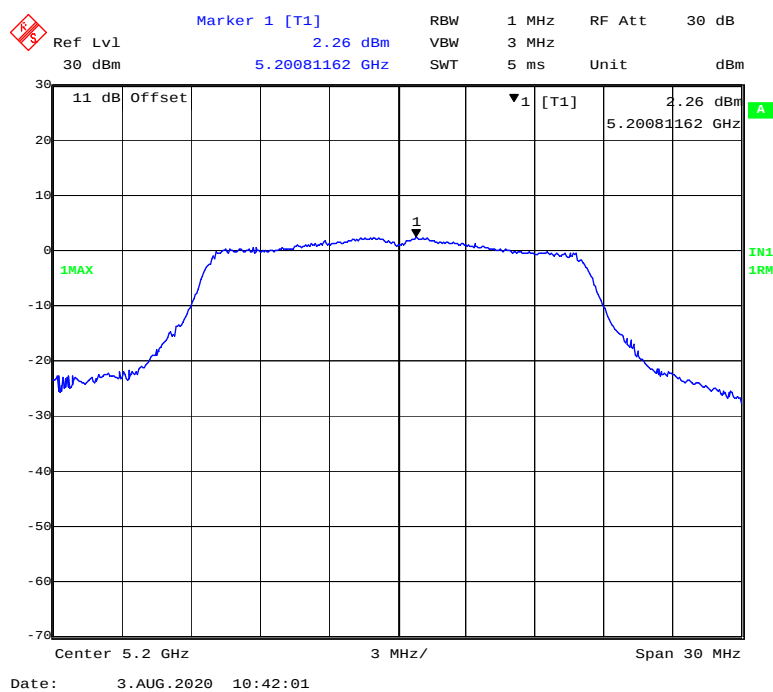
Mode	Channel	Frequency (MHz)	PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11a	Low	5180	2.56	11	PASS
	Middle	5200	2.26	11	PASS
	High	5240	2.24	11	PASS
802.11ac20	Low	5180	2.61	11	PASS
	Middle	5200	1.85	11	PASS
	High	5240	1.85	11	PASS
802.11n20	Low	5180	1.98	11	PASS
	Middle	5200	1.65	11	PASS
	High	5240	1.89	11	PASS
802.11ac40	Low	5190	-2.07	11	PASS
	High	5230	-2.32	11	PASS
802.11n40	Low	5190	-1.87	11	PASS
	High	5230	-2.34	11	PASS
802.11ac80	/	5210	-6.89	11	PASS

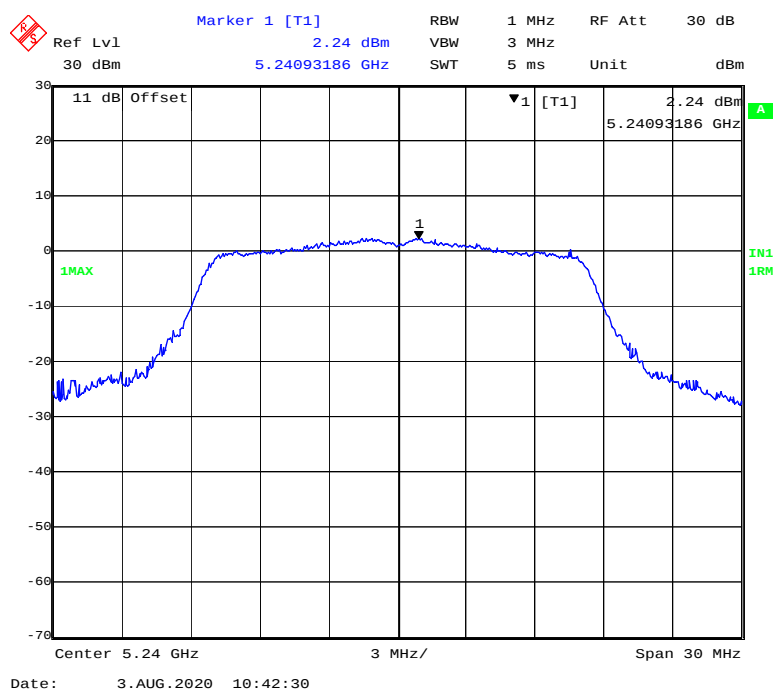
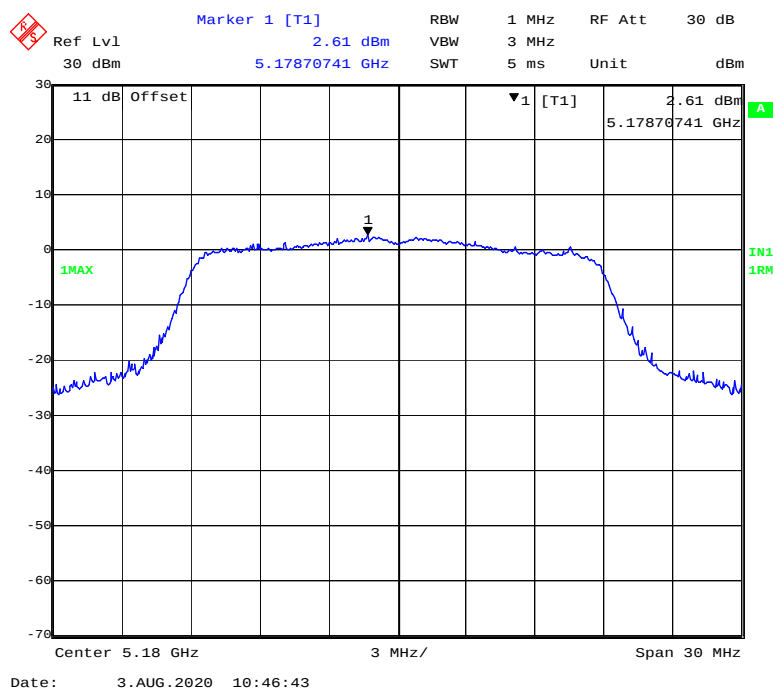
5725MHz-5850MHz:

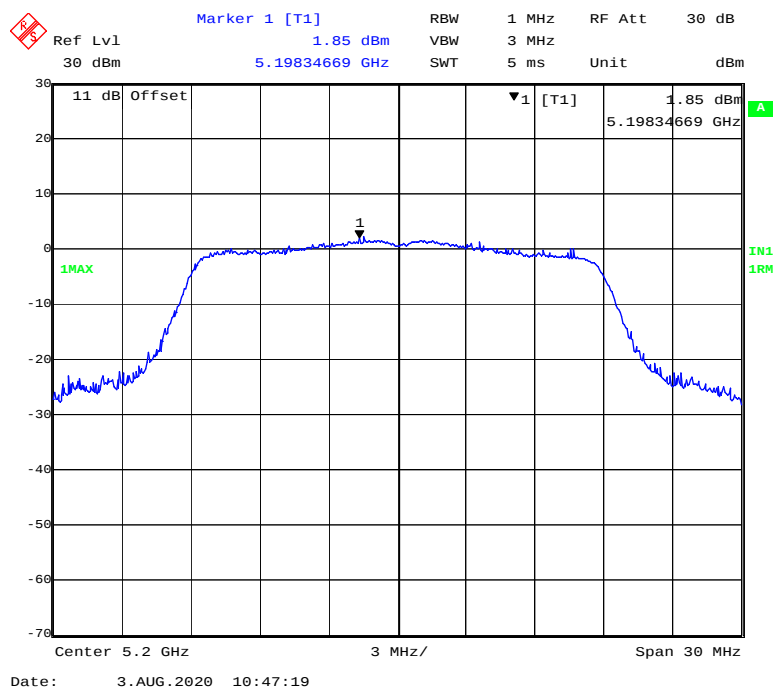
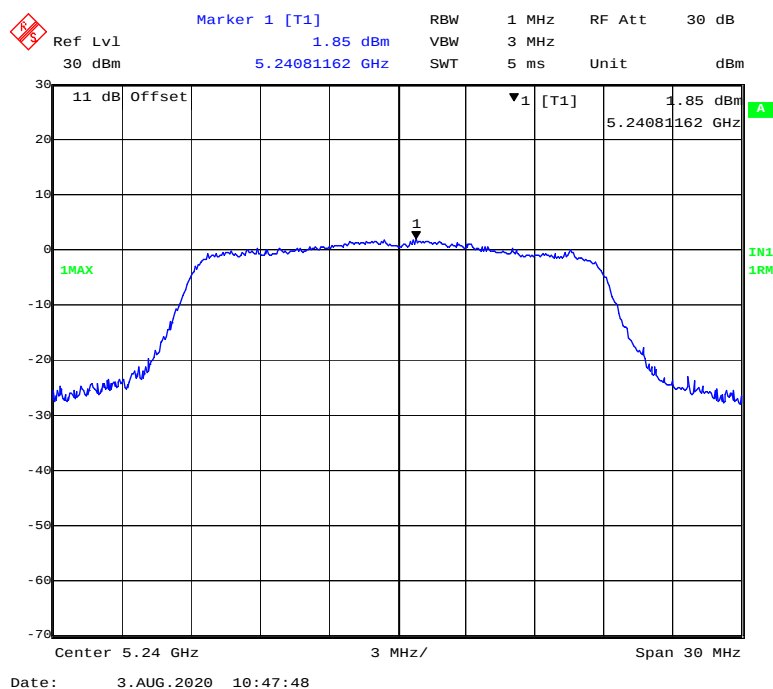
Mode	Channel	Frequency MHz	PSD (dBm/500kHz)	Limit (dBm/500kHz)	Result
802.11a	Low	5745	2.63	30	PASS
	Middle	5785	2.73	30	PASS
	High	5825	3.79	30	PASS
802.11ac20	Low	5745	2.23	30	PASS
	Middle	5785	3.08	30	PASS
	High	5825	3.84	30	PASS
802.11n20	Low	5745	2.36	30	PASS
	Middle	5785	2.52	30	PASS
	High	5825	4.15	30	PASS
802.11ac40	Low	5755	-2.21	30	PASS
	High	5795	-0.68	30	PASS
802.11n40	Low	5755	-1.90	30	PASS
	High	5795	-0.43	30	PASS
802.11ac80	/	5775	-5.08	30	PASS

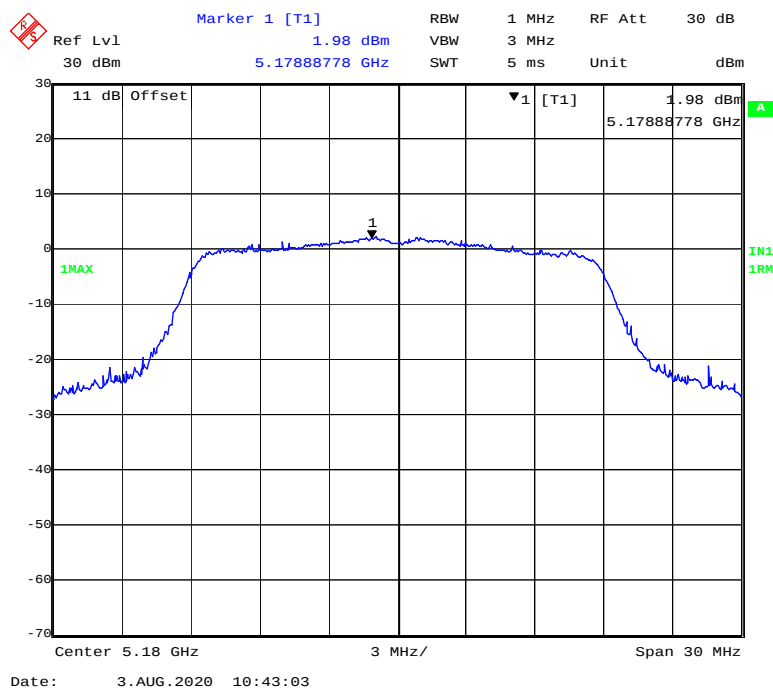
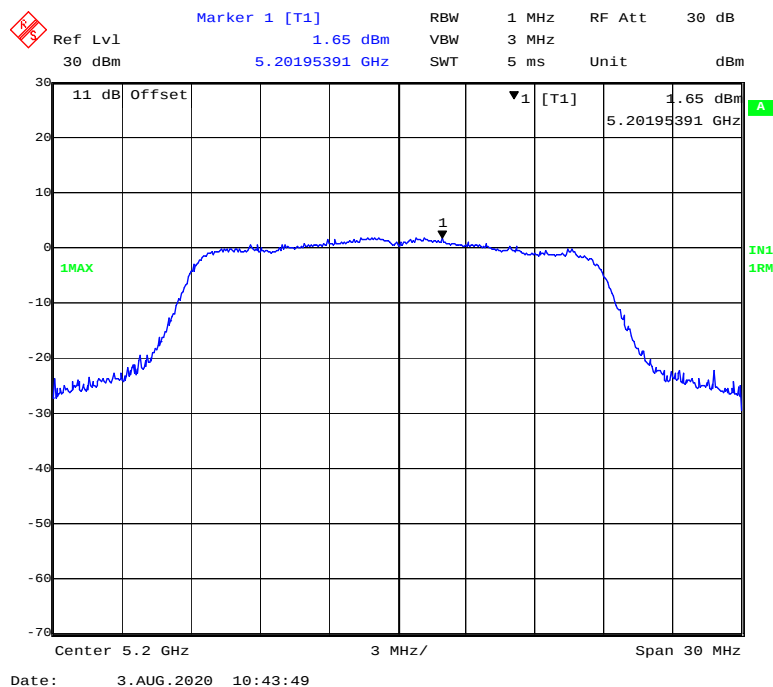
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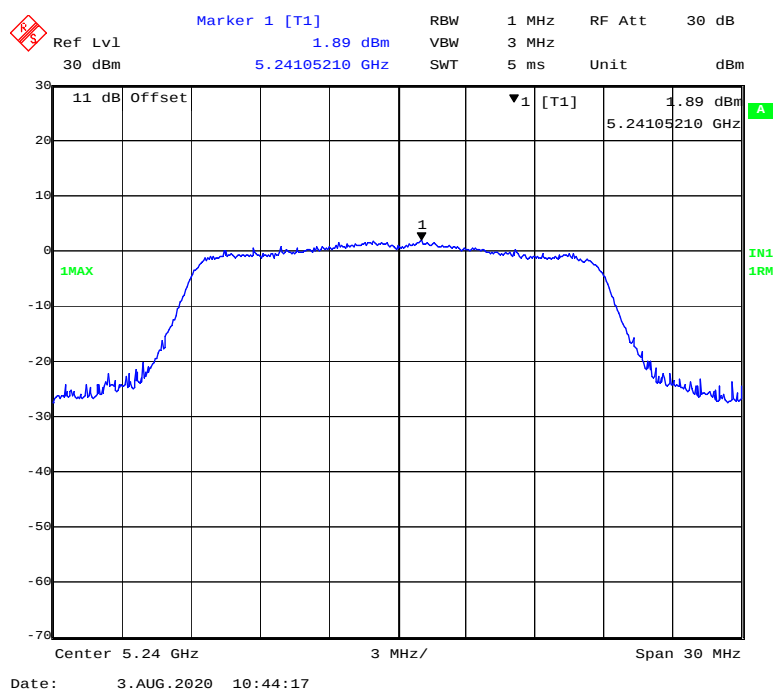
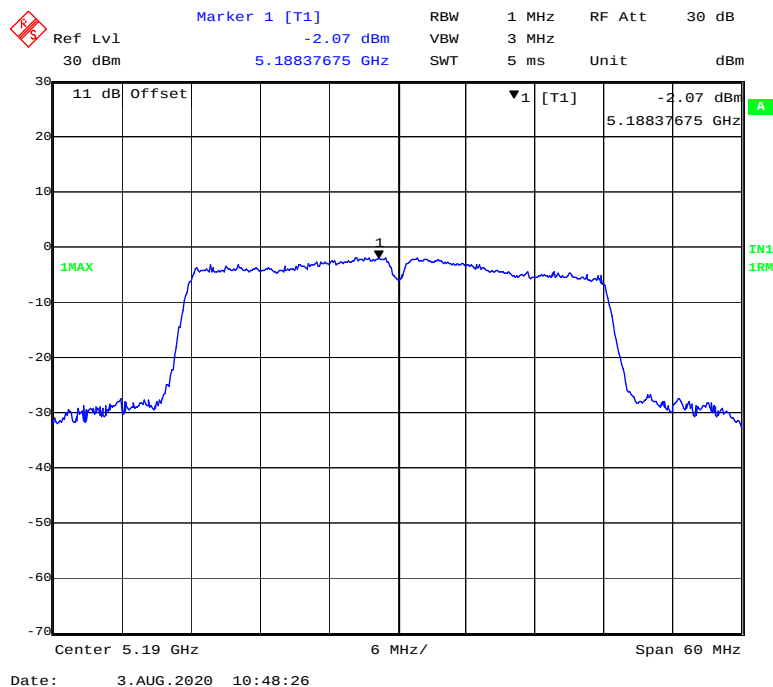
The maximum antenna gain is 2.6 dBi.

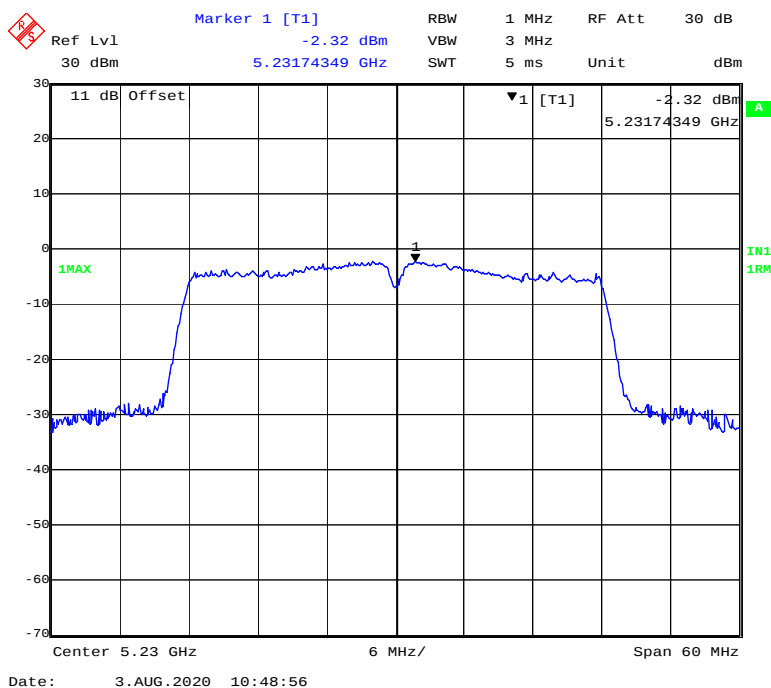
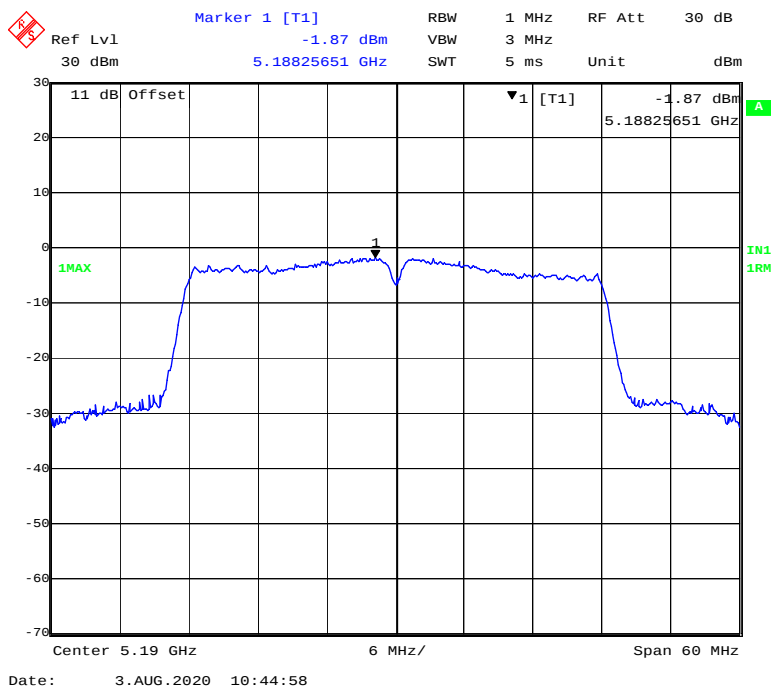
5150MHz-5250MHz Band :**802.11a mode, Power spectral density-5180MHz****802.11a mode, Power spectral density-5200MHz**

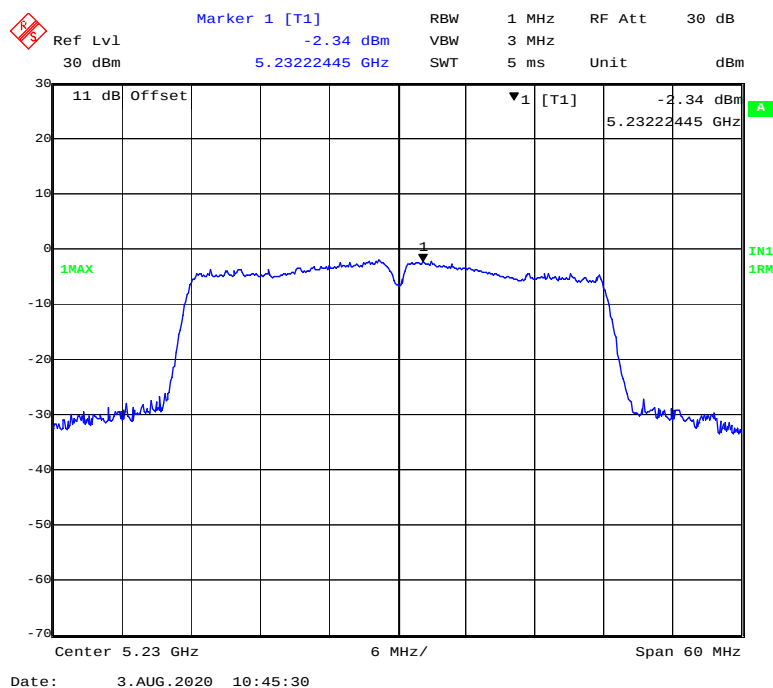
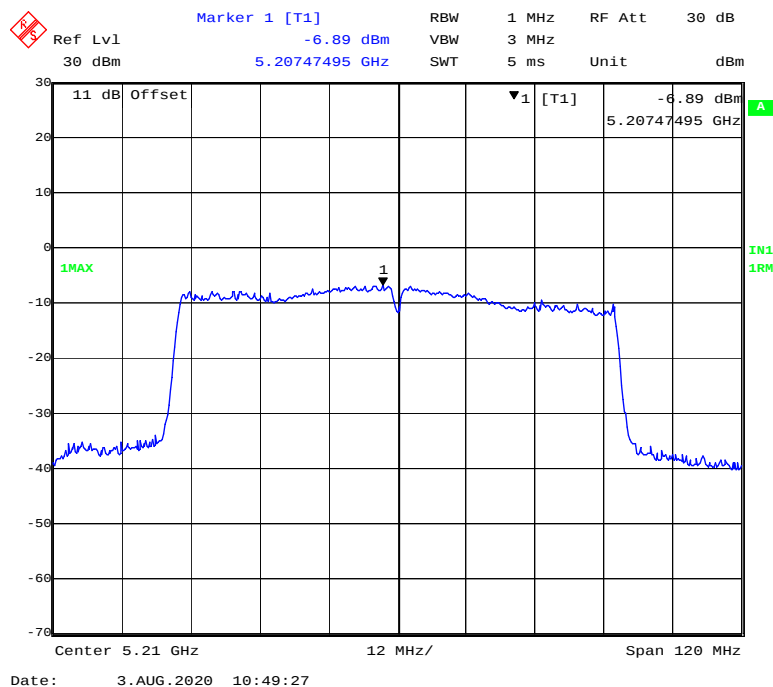
802.11a mode, Power spectral density-5240MHz**802.11ac20 mode, Power spectral density-5180MHz**

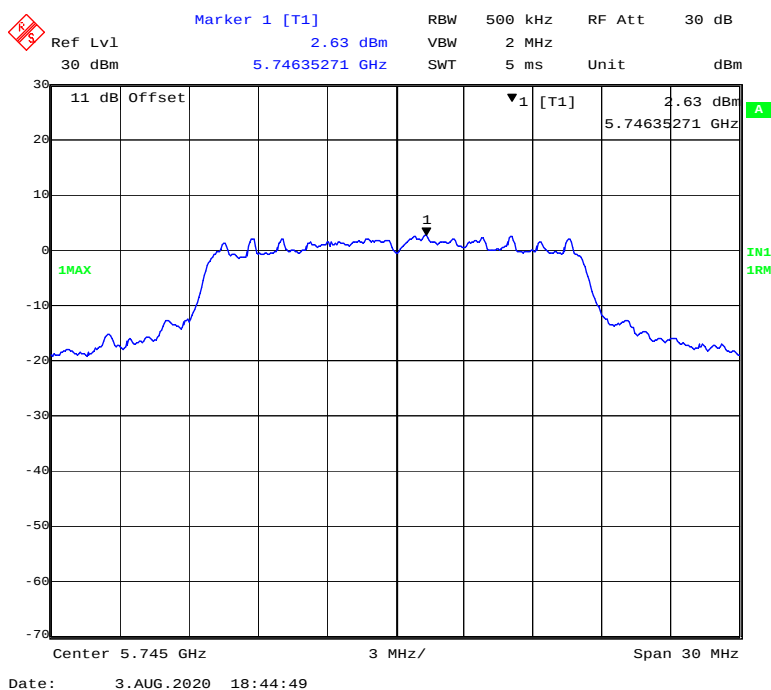
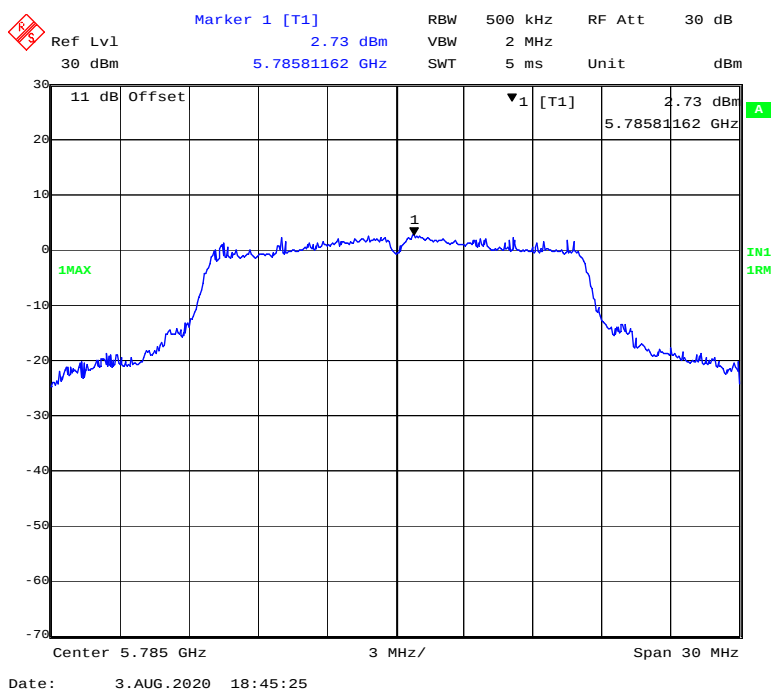
802.11 ac20 mode, Power spectral density-5200MHz**802.11ac20 mode, Power spectral density-5240MHz**

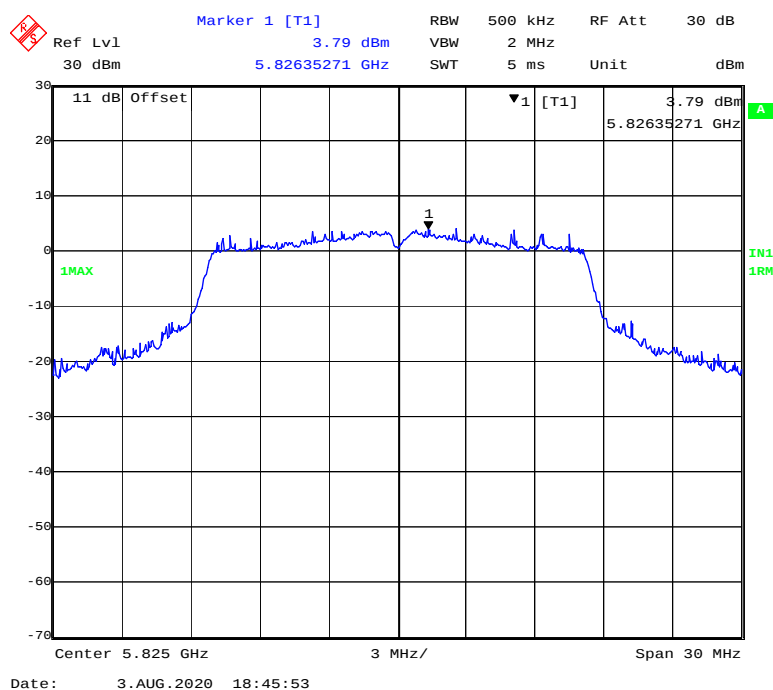
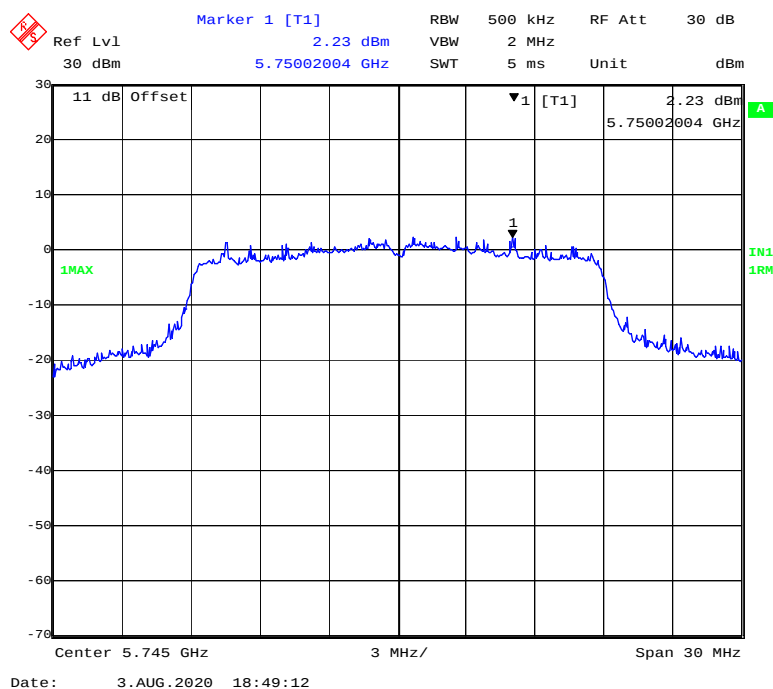
802.11n-HT20 mode, Power spectral density-5180MHz**802.11n-HT20 mode, Power spectral density-5200MHz**

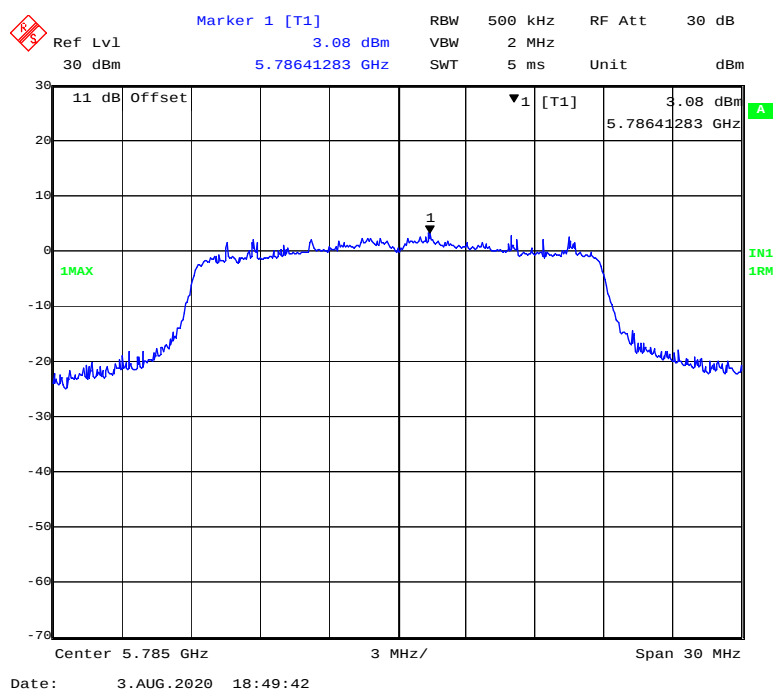
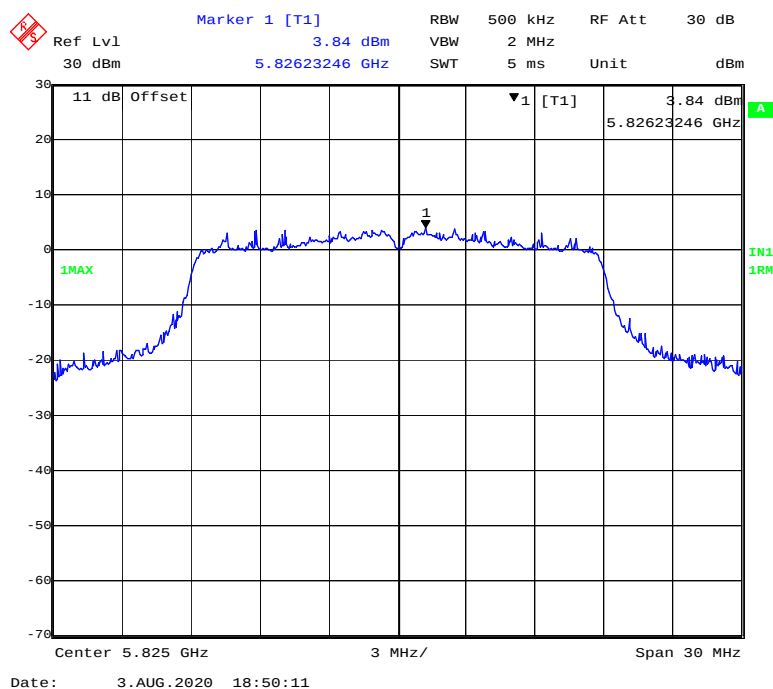
802.11n-HT20 mode, Power spectral density-5240MHz**802.11ac40 mode, Power spectral density-5190MHz**

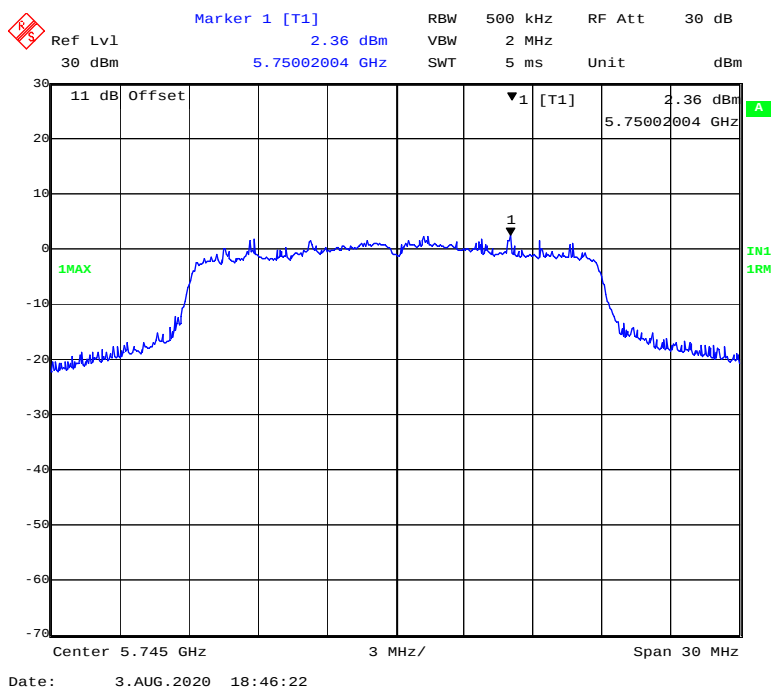
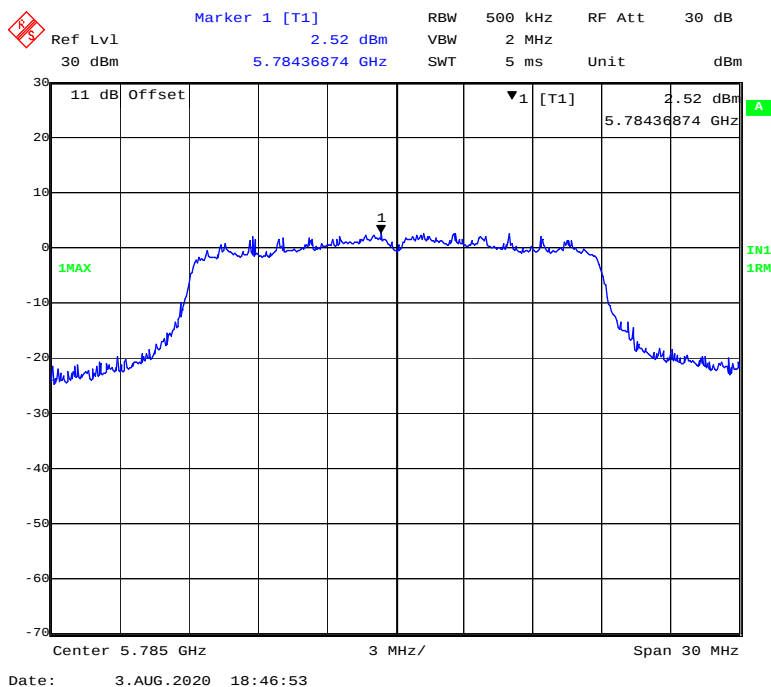
802.11 ac40 mode, Power spectral density-5230MHz**802.11n-HT40 mode, Power spectral density-5190MHz**

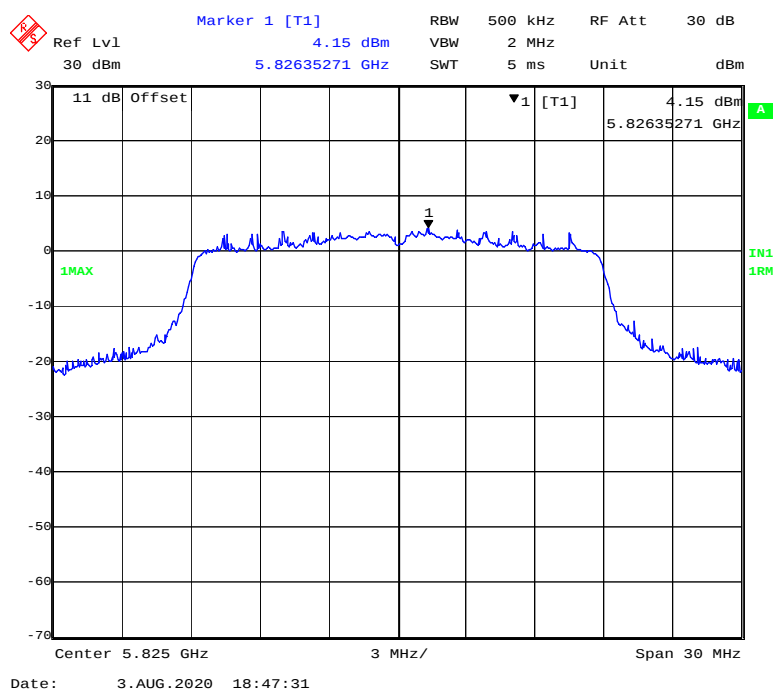
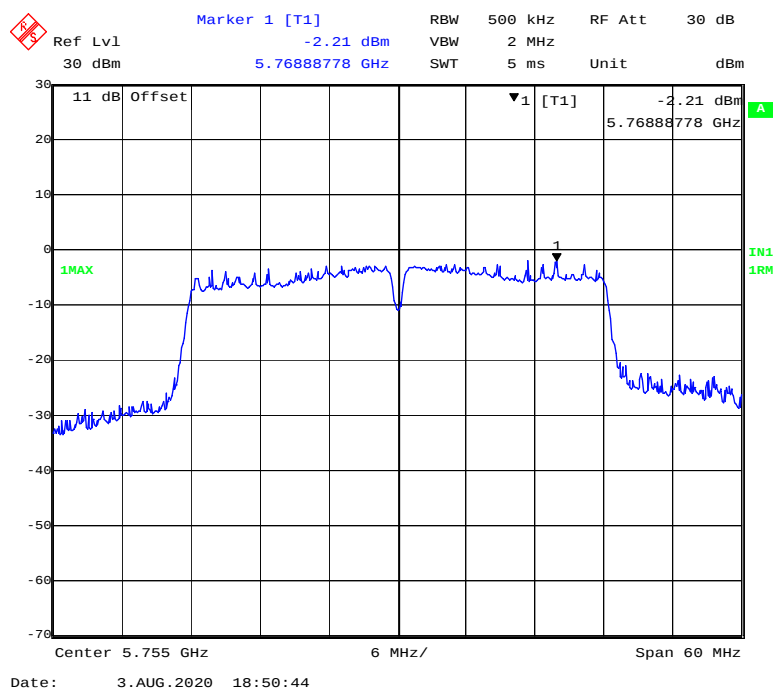
802.11n-HT40 mode, Power spectral density-5230MHz**802.11n- ac80 mode, Power spectral density-5210MHz**

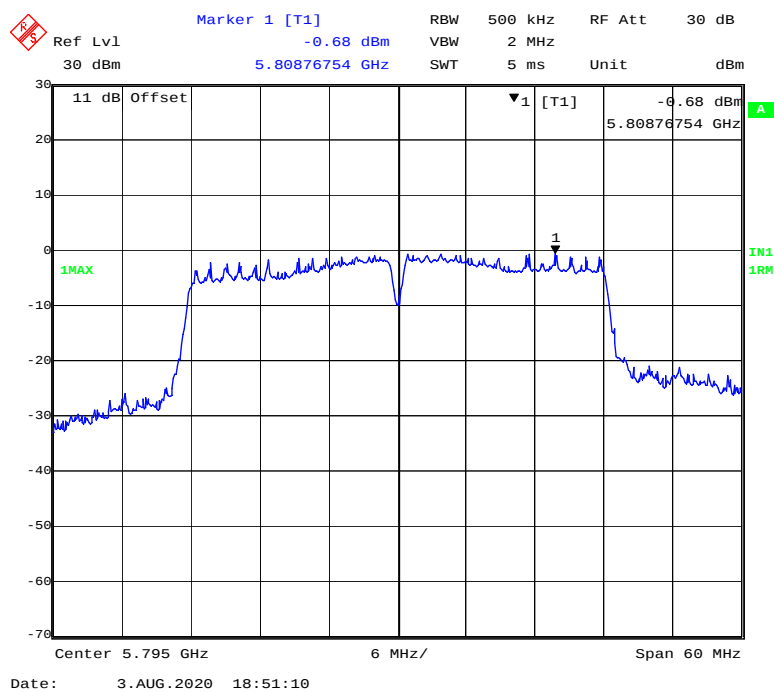
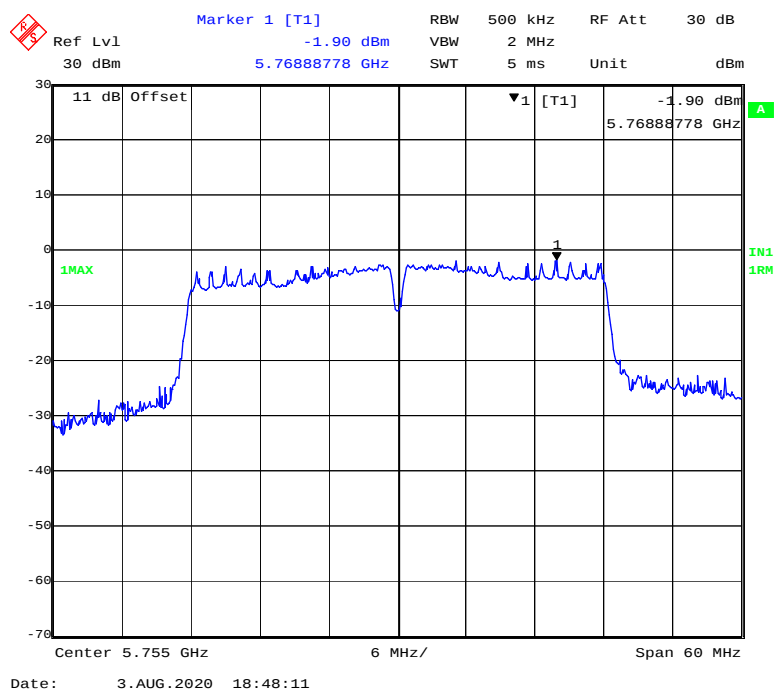
5725MHz-5850 MHz Band:**802.11a mode, Power spectral density-5745MHz****802.11a mode, Power spectral density-5785MHz**

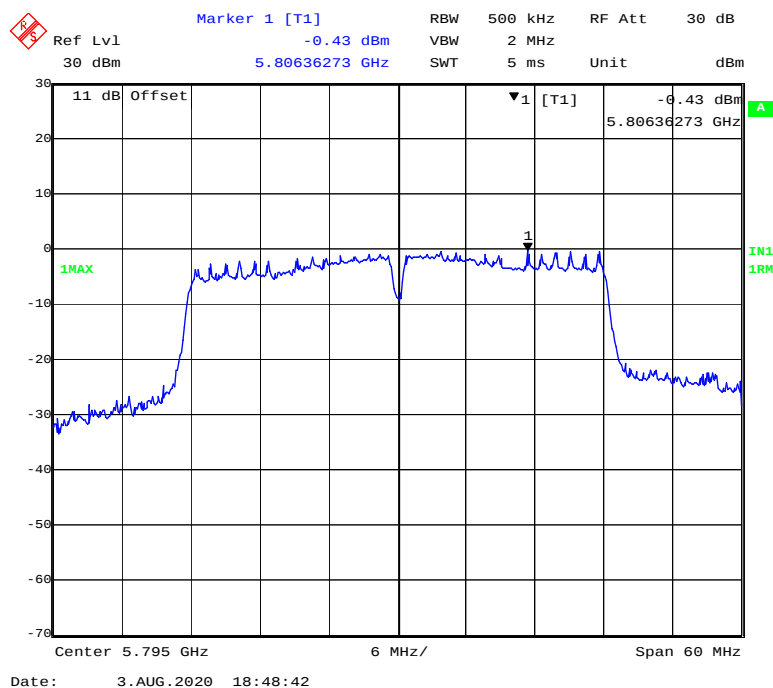
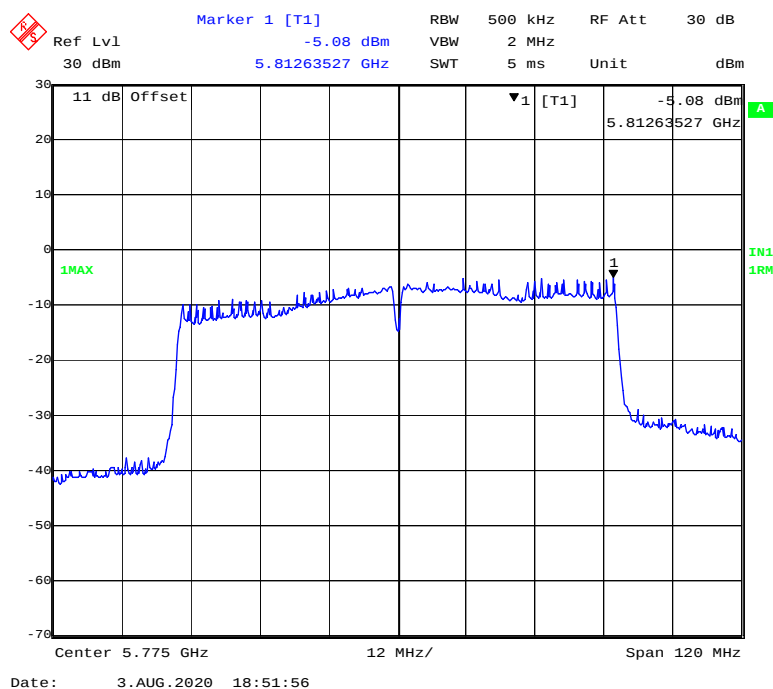
802.11a mode, Power spectral density-5825MHz**802.11ac20 mode, Power spectral density-5745MHz**

802.11 ac20 mode, Power spectral density-5785MHz**802.11 ac20 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**802.11ac40 mode, Power spectral density-5755MHz**

802.11 ac40 mode, Power spectral density-5795MHz**802.11n-HT40 mode, Power spectral density-5755MHz**

802.11n-HT40 mode, Power spectral density-5795MHz**802.11 ac80 mode, Power spectral density-5775MHz**

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