



FCC PART 15.407

TEST REPORT

For

Winner Wave Limited

Unit 1615 Peninsula Tower, 538 Castle Peak Road, Lai Chi Kok, Kowloon, Hong Kong

FCC ID: 2ADFSTYWPBC1

Report Type: Original Report	Product Type: Wireless Presentation System
Report Number:	RSZ201207007-00
Report Date:	2020-12-30
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Wireless Presentation System
Tested Model	TY-WPBC1
Frequency Range	5G Wi-Fi: 5150-5250MHz; 5725-5850MHz
Maximum Conducted Output Power	Wi-Fi: 5150-5250 MHz: 11.83dBm (802.11a), 11.76dBm(802.11n20), 11.31 dBm(802.11n40) 11.67dBm (802.11ac20), 11.51dBm(802.11 ac40), 7.99dBm(802.11 ac80) 5725-5850 MHz: 11.12dBm (802.11a), 12.64dBm(802.11n20), 10.67dBm(802.11n40) 12.78dBm (802.11ac20), 11.00dBm(802.11 ac40), 11.56dBm(802.11 ac80)
Modulation Technique	OFDM
Antenna Specification*	1.52 dBi(It is provided by the applicant)
Voltage Range	DC 5.0V from USB port
Date of Test	2020-12-15 to 2020-12-30
Sample serial number	RSZ201207007-RF-S1 (Assigned by BAACL, Shenzhen)
Received date	2020-12-07
Sample/EUT Status	Good condition

Objective

This test report is 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.

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. And KDB789033 D02 General U-NII Test Procedures New Rules v02r01.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		±5%
RF Output Power with Power meter		±0.73dB
RF conducted test with spectrum		±1.6dB
AC Power Lines Conducted Emissions		±1.95dB
Emissions, Radiated	Below 1GHz	±4.75dB
	Above 1GHz	±4.88dB
Temperature		±1°C
Humidity		±6%
Supply voltages		±0.4%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. 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. (Shenzhen) to collect test data is located on the 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 342867, the FCC Designation No.: CN1221.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062B.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

The device support 802.11a/n20/n40/ac20/ac40/ac80 modes.

For 5150-5250MHz Band, 7 channels are provided to testing:

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

For 802.11a, 802.11n20, 802.11ac20 channel 36, 40, 48 were tested; For 802.11n40, 802.11ac40 channel 38, 46 were tested; For 802.11ac80, channel 42 was tested.

For 5725-5850MHz Band, 8 channels are provided to testing:

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

For 802.11a, 802.11n20, 802.11ac20 channel 149, 157, 165 were tested; For 802.11n40, 802.11ac40 channel 151, 159 were tested; For 802.11ac80, channel 155 was tested.

EUT Exercise Software

“Realtek 11ac 8821C USB WLAN MP Diagnostic Program”* exercise software was used.

The software and power level was provided by the applicant.

Test frequencies and power level were configured as below:

U-NII	Mode	Frequency (MHz)	Data Rate (Mbps)	Power Level*
5150 – 5250MHz	802.11 a	5180	6	45
		5200	6	45
		5240	6	45
	802.11 n20	5180	MCS0	45
		5200	MCS0	45
		5240	MCS0	45
	802.11 n40	5190	MCS0	38
		5230	MCS0	38
	802.11 ac20	5180	MCS0	45
		5200	MCS0	45
		5240	MCS0	45
	802.11 ac40	5190	MCS0	38
5230		MCS0	38	
802.11 ac8	5210	MCS0	33	
5725 – 5850MHz	802.11 a	5745	6	45
		5785	6	45
		5825	6	45
	802.11 n20	5745	MCS0	45
		5785	MCS0	45
		5825	MCS0	45
	802.11 n40	5755	MCS0	38
		5795	MCS0	38
	802.11 ac20	5745	MCS0	45
		5785	MCS0	45
		5825	MCS0	45
	802.11 ac40	5755	MCS0	38
		5795	MCS0	38
	802.11 ac80	5775	MCS0	33

Note: the above data rate was the worst case.

Equipment Modifications

No modification was made to the EUT tested.

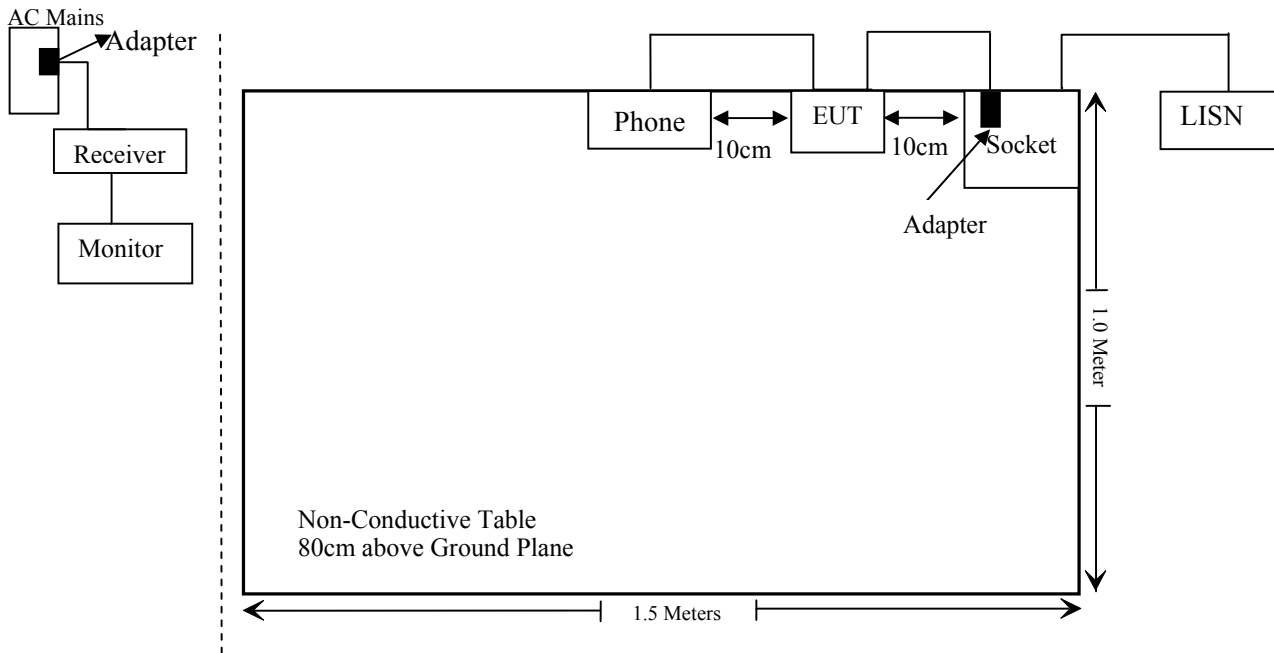
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Panasonic Corporation	Wireless Presentation System	TY-WPR1	TY-WPR1
BULL	Socket	GN-212	A37209315081183
ShenZhen Boshenggao Technology Co.,Ltd	Adapter	BX-0502000	BX-0502000
Nubia	Mobile Phone	NX549J	f4efaa79
SAMSUNG	Monitor	S24E390HL	ZZFRH4ZN303357K

External I/O Cable

Cable Description	Length (m)	From Port	To
Un-Shielding Detachable DC Cable	0.2	Adapter	EUT
Un-Shielding Detachable USB Cable	1.5	EUT	Mobile Phone
Un-Shielding Detachable DC Cable	1.5	Adapter	Receiver
Un-Shielding Detachable HDMI Cable	1.5	Receiver	Monitor

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307 (b) (1) & §2.1091	Maximum Permissible Exposure (MPE)	Compliance
§15.203	Antenna Requirement	Compliance
§15.407(b)(6)& §15.207(a)	Conducted Emissions	Compliance
§15.205& §15.209 &§15.407(b) (1), (4),(7)	Undesirable Emission& Restricted Bands	Compliance
§15.407(a) (1), (5),(e)	26 dB Emission Bandwidth & 6dB Bandwidth	Compliance*
§15.407(a)(1),(3)	Conducted Transmitter Output Power	Compliance*
§15.407 (a)(1),(3)	Power Spectral Density	Compliance*

Compliance*: The EUT (FCC ID: 2ADFSTYWPBC1) has the same Wi-Fi module with the certified device (FCC ID: 2ADFSTYWPB1), please refers to the report: RSZ200724002-00 which was issued by Bay Area Compliance Laboratories Corp. (Shenzhen) on 2020-09-18.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
AC Line Conducted test					
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2020/08/04	2021/08/03
Rohde & Schwarz	LISN	ENV216	101613	2020/08/04	2021/08/03
Rohde & Schwarz	Transient Limiter	ESH3Z2	DE25985	2020/11/29	2021/11/28
Unknown	CE Cable	CE Cable	UF A210B-1-0720-504504	2020/11/29	2021/11/28
Rohde & Schwarz	CE Test software	EMC 32	V8.53.0	NCR	NCR
Radiated Emission Test					
R&S	EMI Test Receiver	ESR3	102455	2020/08/04	2021/08/03
Sonoma instrument	Pre-amplifier	310 N	186238	2020/08/04	2021/08/03
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2017/12/22	2020/12/21
Unknown	Cable 2	RF Cable 2	F-03-EM197	2020/11/29	2021/11/28
Unknown	Cable	Chamber Cable 1	F-03-EM236	2020/11/29	2021/11/28
Rohde & Schwarz	Auto test software	EMC 32	V9.10	NCR	NCR
Rohde & Schwarz	Spectrum Analyzer	FSV40-N	102259	2020/08/04	2021/08/03
COM-POWER	Pre-amplifier	PA-122	181919	2020/11/29	2021/11/28
Quinstar	Amplifier	QLW-18405536-J0	15964001002	2020/11/29	2021/11/28
Sunol Sciences	Horn Antenna	DRH-118	A052604	2020/12/22	2023/12/21
Insulted Wire Inc.	RF Cable	SPS-2503-3150	02222010	2020/11/29	2021/11/28
Unknown	RF Cable	W1101-EQ1 OUT	F-19-EM005	2020/11/29	2021/11/28
Unknown	Signal Cable	RG-214	2	2020/11/29	2021/11/28
SNSD	Band Reject filter	BSF5150-5850MN-0899-004	5G filter	2020/04/20	2021/04/20
Ducommun Technologies	Horn antenna	ARH-4223-02	1007726-02 1304	2020/12/06	2023/12/05
Ducommun Technologies	Horn antenna	ARH-2823-02	1007726-02 1302	2020/12/06	2023/12/05

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

§1.1307 (b) (1) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 1.1307 (b)(1), 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

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

Result

Calculated Formulary:

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

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

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

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

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

Frequency (MHz)	Antenna Gain		Tune Up Conducted Output Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
	(dBi)	(numeric)	(dBm)	(mW)			
5150-5250	1.52	1.42	12	15.85	20	0.0045	1.0
5725-5850	1.52	1.42	13	19.95	20	0.0056	1.0

To maintain compliance with the FCC’s RF exposure guidelines, place the equipment at least 20cm from nearby persons.

Result: Compliance

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 (a), if the transmitting antennas of directional gain greater than 6dBi are used, the transmit power and power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has one internal antenna arrangement, which was permanently attached and the antenna gain is 1.52 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliance.

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

Applicable Standard

FCC §15.207, §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 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.

Test Data

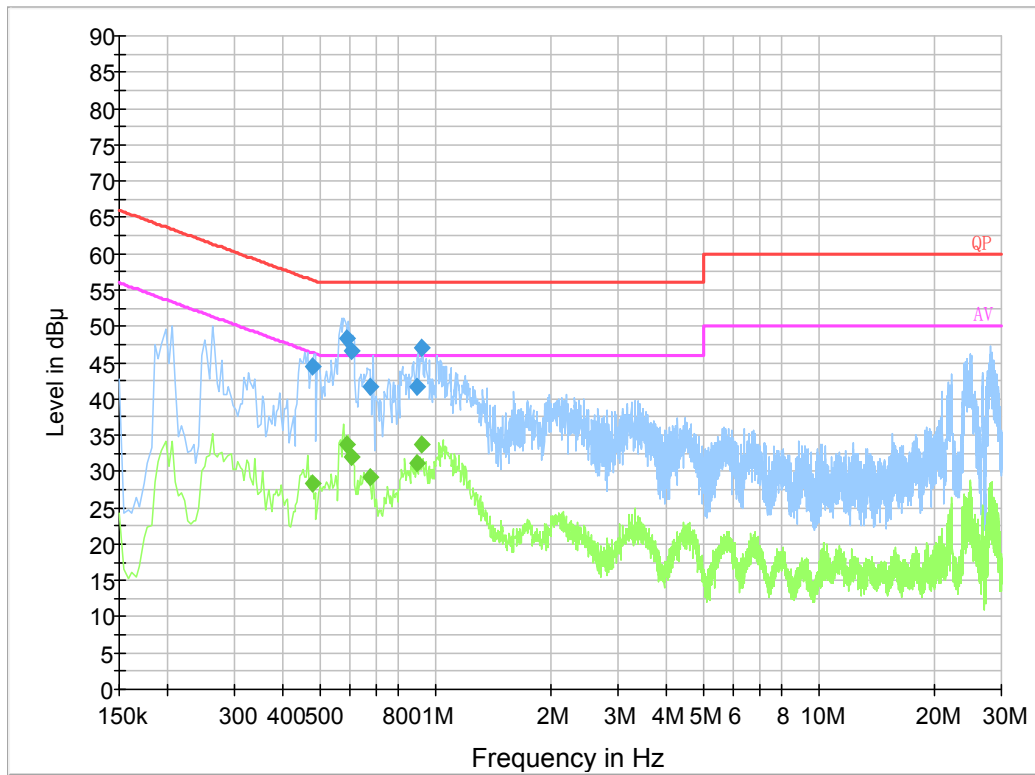
Environmental Conditions

Temperature:	25 °C
Relative Humidity:	65 %
ATM Pressure:	101.0 kPa

The testing was performed by Haiguo Li on 2020-12-15.

EUT operation mode: Transmitting

AC 120V/60 Hz, Line:



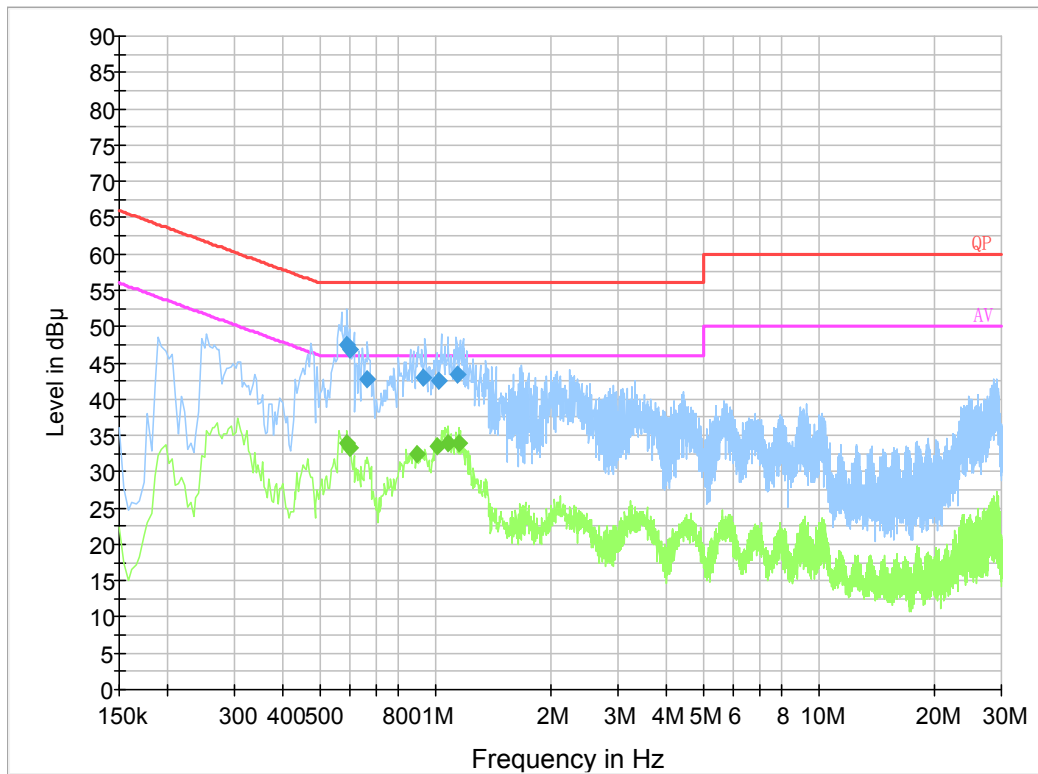
Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.478710	44.5	9.000	L1	19.8	11.9	56.4
0.586670	48.3	9.000	L1	19.8	7.7	56.0
0.604850	46.7	9.000	L1	19.8	9.3	56.0
0.679650	41.7	9.000	L1	19.8	14.3	56.0
0.892470	41.8	9.000	L1	19.8	14.2	56.0
0.920050	47.1	9.000	L1	19.8	8.9	56.0

Final Result 2

Frequency (MHz)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.478710	28.4	9.000	L1	19.8	18.0	46.4
0.586670	33.8	9.000	L1	19.8	12.2	46.0
0.604850	32.0	9.000	L1	19.8	14.0	46.0
0.679650	29.3	9.000	L1	19.8	16.7	46.0
0.892470	31.2	9.000	L1	19.8	14.8	46.0
0.920050	33.7	9.000	L1	19.8	12.3	46.0

AC 120V/60 Hz, Neutral:



Final Result 1

Frequency (MHz)	QuasiPeak (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.589030	47.6	9.000	N	19.8	8.4	56.0
0.597150	46.9	9.000	N	19.8	9.1	56.0
0.664010	42.7	9.000	N	19.8	13.3	56.0
0.931870	43.0	9.000	N	19.8	13.0	56.0
1.026430	42.5	9.000	N	19.8	13.5	56.0
1.144930	43.3	9.000	N	19.8	12.7	56.0

Final Result 2

Frequency (MHz)	Average (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.590000	33.9	9.000	N	19.8	12.1	46.0
0.602000	33.2	9.000	N	19.8	12.8	46.0
0.894000	32.5	9.000	N	19.7	13.5	46.0
1.010000	33.5	9.000	N	19.8	12.5	46.0
1.086000	33.9	9.000	N	19.8	12.1	46.0
1.150000	33.8	9.000	N	19.8	12.2	46.0

§15.205 & §15.209 & §15.407(B) (1), (2), (3), (4),(6),(7) – UNDESIRABLE EMISSION

Applicable Standard

FCC §15.407 (b) (1), (2), (3), (4), (6), (7); §15.209; §15.205;

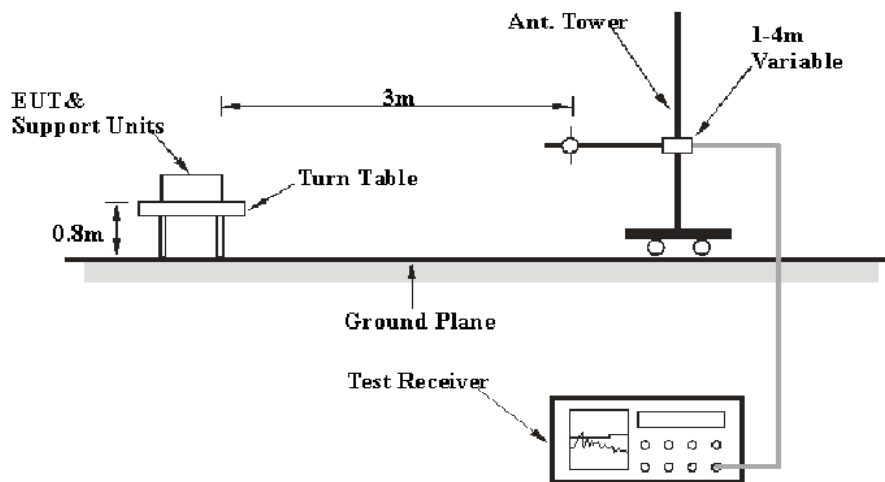
(b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band:
 - (i) 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.

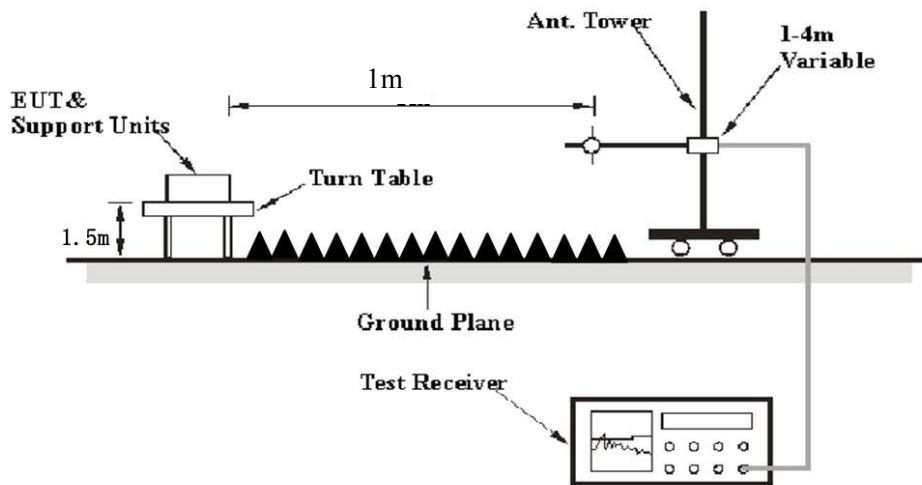
Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

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.

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 & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	PK
	1MHz	10 Hz ^{Note 1}	/	Average
	1MHz	> 1/T ^{Note 2}	/	Average

Note 1: when duty cycle is no less than 98%

Note 2: when duty cycle is less than 98%

Test Procedure

Radiated Spurious Emission

During the radiated emission test, the adapter was connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all the 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 Factor 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

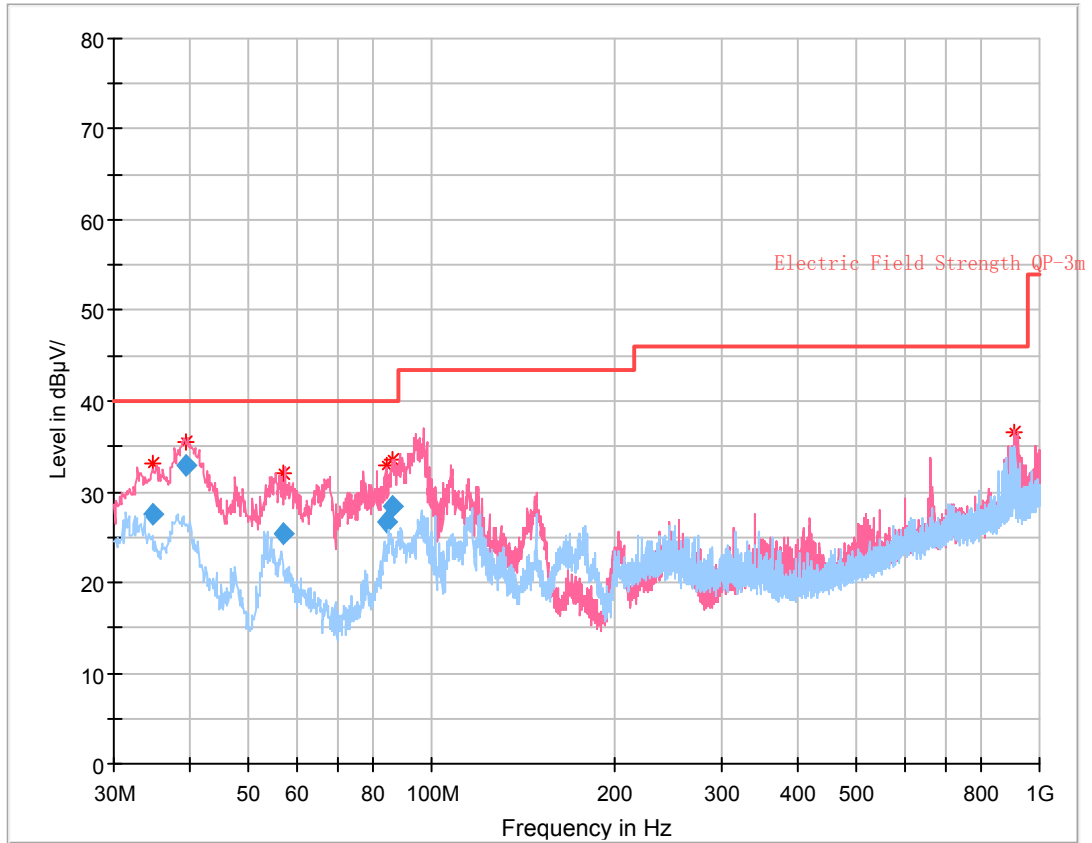
Environmental Conditions

Temperature:	26.1~27 °C
Relative Humidity:	42~51 %
ATM Pressure:	101.0~101.1 kPa

The testing was performed by Holland Yang on 2020-12-15 for below 1GHz and by Leven Gan on 12-30 for above 1GHz.

EUT operation mode: Transmitting

30 MHz – 1 GHz: (the worst case is 5.8G Wi-Fi 802.11ac20 Mode, High Channel)



Final Result

Frequency (MHz)	QuasiPeak (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
34.842000	27.55	40.00	12.45	110.0	V	235.0	-7.3
39.421500	32.91	40.00	7.09	101.0	V	129.0	-10.2
57.054375	25.32	40.00	14.68	107.0	V	223.0	-16.9
84.202250	26.56	40.00	13.44	130.0	V	71.0	-16.4
86.114375	28.41	40.00	11.59	101.0	V	314.0	-16.2
909.699625	30.82	46.00	15.18	111.0	V	322.0	1.5

1 ~ 40 GHz:

Note: The test distance is 1m, so the correct factor from 3m to 1m is $20\log(3/1)=9.5\text{dB}$ which was added into the final limit.

5150-5250 MHz:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H / V)				
802.11a									
5180 MHz									
5038.53	31.55	PK	292	1.9	H	38.14	69.69	83.5	13.81
5038.53	17.86	Ave.	292	1.9	H	38.14	56.00	63.5	7.50
5379.53	31.32	PK	331	2.4	H	39.09	70.41	83.5	13.09
5379.53	17.59	Ave.	331	2.4	H	39.09	56.68	63.5	6.82
10360.00	43.15	PK	71	1.2	H	17.48	60.63	77.7	17.07
5200 MHz									
10400.00	42.96	PK	215	1.6	H	17.58	60.54	77.7	17.16
5240 MHz									
5148.24	32.01	PK	206	2.0	H	38.36	70.37	83.5	13.13
5148.24	17.54	Ave.	206	2.0	H	38.36	55.90	63.5	7.60
5351.48	31.87	PK	66	1.2	H	39.09	70.96	83.5	12.54
5351.48	17.41	Ave.	66	1.2	H	39.09	56.50	63.5	7.00
10480.00	42.91	PK	110	1.4	H	16.98	59.89	77.7	17.81
802.11n20									
5180 MHz									
4621.82	31.23	PK	136	1.5	H	37.60	68.83	83.5	14.67
4621.82	17.89	Ave.	136	1.5	H	37.60	55.49	63.5	8.01
5413.12	32.13	PK	344	2.2	H	39.19	71.32	83.5	12.18
5413.12	17.77	Ave.	344	2.2	H	39.19	56.96	63.5	6.54
10360.00	42.62	PK	58	1.1	H	17.48	60.10	77.7	17.60
5200 MHz									
10400.00	42.56	PK	253	1.5	H	17.58	60.14	77.7	17.56
5240 MHz									
4625.17	31.39	PK	159	1.7	H	37.60	68.99	83.5	14.51
4625.17	17.95	Ave.	159	1.7	H	37.60	55.55	63.5	7.95
5415.46	32.35	PK	83	1.2	H	39.19	71.54	83.5	11.96
5415.46	17.87	Ave.	83	1.2	H	39.19	57.06	63.5	6.44
10480.00	42.49	PK	343	1.1	H	16.98	59.47	77.7	18.23

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/QP/Ave.		Height (m)	Polar (H / V)				
802.11n40									
5190 MHz									
5146.57	32.04	PK	35	2.0	H	38.36	70.40	83.5	13.10
5146.57	17.96	Ave.	35	2.0	H	38.36	56.32	63.5	7.18
5351.22	31.76	PK	97	1.3	H	39.09	70.85	83.5	12.65
5351.22	17.92	Ave.	97	1.3	H	39.09	57.01	63.5	6.49
10380.00	42.17	PK	317	1.8	H	17.42	59.59	77.7	18.11
5230 MHz									
5147.56	32.04	PK	64	2.5	H	38.36	70.40	83.5	13.10
5147.56	17.97	Ave.	64	2.5	H	38.36	56.33	63.5	7.17
5353.26	31.76	PK	237	2.2	H	39.09	70.85	83.5	12.65
5353.26	17.82	Ave.	237	2.2	H	39.09	56.91	63.5	6.59
10460.00	42.35	PK	293	1.1	H	17.15	59.50	77.7	18.20
802.11ac20									
5180 MHz									
5025.73	31.68	PK	130	1.0	H	38.14	69.82	83.5	13.68
5025.73	17.86	Ave.	130	1.0	H	38.14	56.00	63.5	7.50
5361.26	31.17	PK	125	1.3	H	39.09	70.26	83.5	13.24
5361.26	17.79	Ave.	125	1.3	H	39.09	56.88	63.5	6.62
10360.00	42.71	PK	66	1.2	H	17.48	60.19	77.7	17.51
5200 MHz									
10400.00	42.65	PK	37	2.4	H	17.58	60.23	77.7	17.47
5240 MHz									
5023.48	31.75	PK	100	1.7	H	38.14	69.89	83.5	13.61
5023.48	18.02	Ave.	100	1.7	H	38.14	56.16	63.5	7.34
5368.65	31.86	PK	334	2.0	H	39.09	70.95	83.5	12.55
5368.65	17.95	Ave.	334	2.0	H	39.09	57.04	63.5	6.46
10480.00	42.52	PK	189	2.4	H	16.98	59.50	77.7	18.20
802.11ac40									
5190 MHz									
5060.11	31.75	PK	252	2.1	H	38.16	69.91	83.5	13.59
5060.11	18.75	Ave.	252	2.1	H	38.16	56.91	63.5	6.59
5411.37	32.3	PK	61	1.5	H	39.19	71.49	83.5	12.01
5411.37	18.78	Ave.	61	1.5	H	39.19	57.97	63.5	5.53
10380.00	42.65	PK	188	2.4	H	17.48	60.13	77.7	17.57
5230 MHz									
5063.46	31.75	PK	277	2.2	H	38.16	69.91	83.5	13.59
5063.46	18.75	Ave.	277	2.2	H	38.16	56.91	63.5	6.59
5415.81	32.30	PK	352	2.1	H	39.19	71.49	83.5	12.01
5415.81	18.78	Ave.	352	2.1	H	39.19	57.97	63.5	5.53
10460.00	42.72	PK	283	1.5	H	16.88	59.60	77.7	18.10

Frequency (MHz)	Receiver		Turntable	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/QP/Ave.	Degree	Height (m)	Polar (H / V)				
802.11ac80									
5147.85	31.51	PK	85	1.2	H	38.36	69.87	83.5	13.63
5147.85	18.12	Ave.	85	1.2	H	38.36	56.48	63.5	7.02
5350.29	32.42	PK	319	2.4	H	39.09	71.51	83.5	11.99
5350.29	18.15	Ave.	319	2.4	H	39.09	57.24	63.5	6.26
10420.00	42.82	PK	202	2.1	H	17.58	60.40	77.7	17.30

5725-5850 MHz:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/QP/Ave.		Height (m)	Polar (H/V)				
802.11a									
5745 MHz									
5639.92	32.37	PK	51	2.3	H	39.46	71.83	77.7	5.87
5698.95	33.34	PK	305	1.2	H	39.49	72.83	113.92	41.09
5719.98	39.66	PK	236	2.2	H	39.49	79.15	120.29	41.14
5724.99	45.70	PK	165	2.2	H	39.49	85.19	131.68	46.49
11490.00	46.43	PK	90	1.1	H	17.47	63.90	83.5	19.60
11490.00	30.5	Ave.	90	1.1	V	17.47	47.97	63.5	15.53
5785 MHz									
11570.00	45.71	PK	347	1.0	H	17.51	63.22	83.5	20.28
11570.00	30.23	Ave.	347	1.0	H	17.51	47.74	63.5	15.76
5825 MHz									
5850.24	38.27	PK	264	1.7	H	39.87	78.14	131.15	53.01
5855.13	35.54	PK	36	1.1	H	39.87	75.41	120.26	44.85
5889.06	34.67	PK	246	1.1	H	39.87	74.54	104.3	29.76
5928.42	33.99	PK	144	1.7	H	39.97	73.96	77.7	3.74
11650.00	44.87	PK	142	1.7	H	16.18	61.05	83.5	22.45
11650.00	30.13	Ave.	142	1.7	H	16.18	46.31	63.5	17.19
802.11n20									
5745 MHz									
5634.48	32.38	PK	225	1.4	H	39.46	71.84	77.7	5.86
5683.61	33.15	PK	328	2.3	H	39.49	72.64	102.57	29.93
5719.98	40.29	PK	25	1.1	H	39.49	79.78	120.29	40.51
5722.82	50.11	PK	265	1.5	H	39.49	89.60	126.73	37.13
11490.00	45.29	PK	96	2.1	H	17.47	62.76	83.5	20.74
11490.00	28.85	Ave.	96	2.1	H	17.47	46.32	63.5	17.18
5785 MHz									
11570.00	45.13	PK	181	1.9	H	17.51	62.64	83.5	20.86
11570.00	28.72	AV	181	1.9	H	17.51	46.23	63.5	17.27
5825 MHz									
5850.12	38.21	PK	134	1.9	H	42.76	80.97	131.43	50.46
5855.01	34.50	PK	154	1.5	H	42.76	77.26	120.3	43.04
5875.13	32.86	PK	197	2.0	H	42.76	75.62	114.6	38.98
5940.82	32.41	PK	115	1.3	H	42.86	75.27	77.7	2.43
11650.00	45.08	PK	261	1.6	H	16.18	61.26	83.5	22.24
11650.00	28.65	Ave.	261	1.6	H	16.18	44.83	63.5	18.67

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/QP/Ave.		Height (m)	Polar (H/V)				
802.11n40									
5755 MHz									
5641.25	33.22	PK	246	2.3	H	39.46	72.68	77.7	5.02
5687.59	34.17	PK	75	1.3	H	39.49	73.66	105.52	31.86
5719.23	34.77	PK	244	1.4	H	39.49	74.26	120.08	45.82
5724.95	37.48	PK	325	2.2	H	39.49	76.97	131.59	54.62
11510.00	44.13	PK	21	2.2	H	17.47	61.60	83.5	21.90
11510.00	30.12	Ave.	21	2.2	H	17.47	47.59	63.5	15.91
5795 MHz									
5850.06	37.91	PK	115	1.7	H	39.87	77.78	131.56	53.78
5855.02	34.85	PK	270	2.4	H	39.87	74.72	120.29	45.57
5875.02	33.95	PK	356	1.6	H	39.87	73.82	114.69	40.87
5937.51	34.12	PK	2	2.2	H	39.97	74.09	77.7	3.61
11590.00	43.96	PK	275	1.5	H	17.51	61.47	83.5	22.03
11590.00	30.07	Ave.	275	1.5	H	17.51	47.58	63.5	15.92
802.11ac20									
5745 MHz									
5646.27	33.01	PK	81	1.6	H	39.46	72.47	77.7	5.23
5682.16	33.46	PK	92	2.5	H	39.49	72.95	101.5	28.55
5719.52	35.67	PK	248	2.3	H	39.49	75.16	120.17	45.01
5723.18	38.52	PK	32	1.5	H	39.49	78.01	127.55	49.54
11490.00	44.14	PK	190	1.8	H	17.47	61.61	83.5	21.89
11490.00	30.16	Ave.	190	1.8	H	17.47	47.63	63.5	15.87
5785 MHz									
11570.00	43.72	PK	177	1.3	H	17.51	61.23	83.5	22.27
11570.00	30.04	Ave.	177	1.3	H	17.51	47.55	63.5	15.95
5825 MHz									
5850.25	38.67	PK	238	2.4	H	39.87	78.54	131.13	52.59
5855.42	35.82	PK	210	1.4	H	39.87	75.69	120.18	44.49
5875.85	33.12	PK	190	2.0	H	39.87	72.99	114.07	41.08
5986.18	33.06	PK	30	2.0	H	39.84	72.90	77.7	4.80
11650.00	43.68	PK	96	1.7	H	16.18	59.86	83.5	23.64
11650.00	29.14	Ave.	96	1.7	H	16.18	45.32	63.5	18.18

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/QP/Ave.		Height (m)	Polar (H/V)				
802.11ac40									
5755 MHz									
5603.45	33.32	PK	337	2.5	H	39.46	72.78	77.7	4.92
5683.16	33.25	PK	254	1.6	H	39.49	72.74	102.24	29.50
5716.05	33.46	PK	41	2.3	H	39.49	72.95	119.19	46.24
5721.15	32.58	PK	183	2.2	H	39.49	72.07	122.92	50.85
11510.00	44.12	PK	210	2.3	H	17.47	61.59	83.5	21.91
11510.00	30.14	Ave.	210	2.3	H	17.47	47.61	63.5	15.89
5795 MHz									
5852.17	38.86	PK	168	1.7	H	39.87	78.73	126.75	48.02
5859.62	35.72	PK	31	1.8	H	39.87	75.59	119.01	43.42
5875.24	33.25	PK	94	2.1	H	39.87	73.12	114.52	41.40
5988.54	33.12	PK	359	1.1	H	39.84	72.96	77.7	4.74
11590.00	43.61	PK	140	2.0	H	17.51	61.12	83.5	22.38
11590.00	29.85	Ave.	140	2.0	H	17.51	47.36	63.5	16.14
802.11ac80									
5775 MHz									
5626.25	32.51	PK	354	2.2	H	39.46	71.97	77.7	5.73
5669.32	32.61	PK	283	2.1	H	39.49	72.10	106.39	34.29
5719.35	32.19	PK	215	2.0	H	39.49	71.68	120.14	48.46
5723.72	33.34	PK	139	2.3	H	39.49	72.83	128.78	55.95
5851.65	33.71	PK	251	2.2	H	39.87	73.58	127.94	54.36
5866.99	34.37	PK	69	2.0	H	39.87	74.34	116.94	42.60
5876.71	33.46	PK	8	1.6	H	39.87	73.33	113.43	40.10
5929.14	33.43	PK	12	2.2	H	39.97	73.40	77.7	4.30
11550.00	44.06	PK	179	2.0	H	17.51	61.57	83.5	21.93
11550.00	29.79	Ave.	179	2.0	H	17.51	47.30	63.5	16.20

Note:

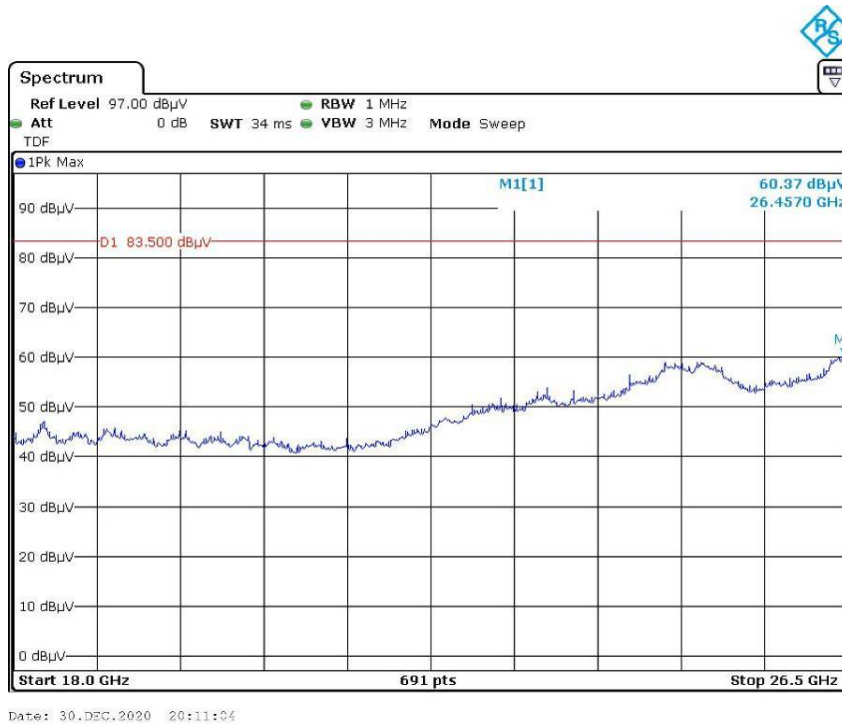
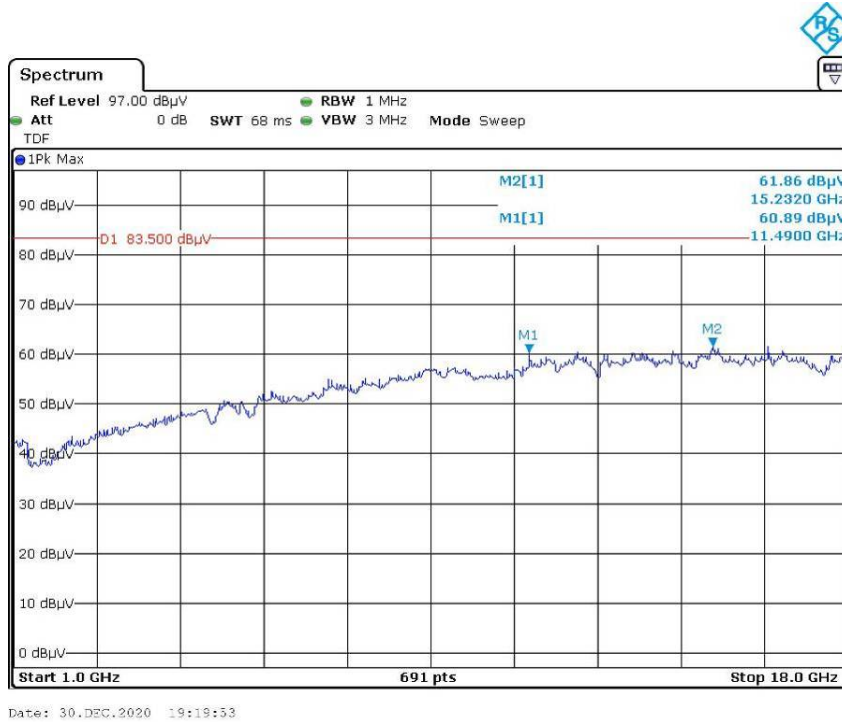
Corrected Amplitude = Corrected Factor + Reading

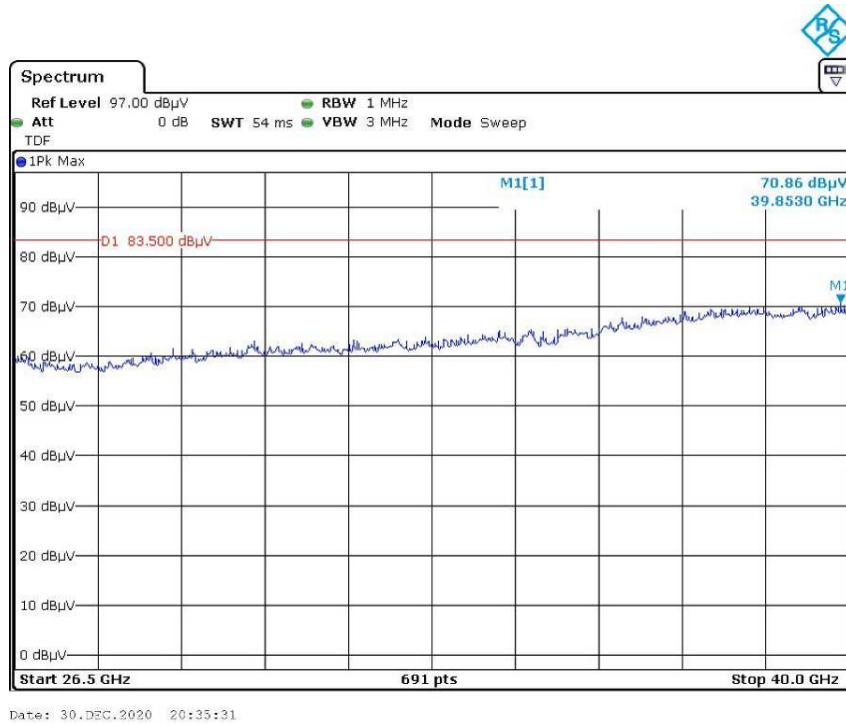
Corrected Factor=Antenna factor (RX) + Cable Loss – Amplifier Factor

Margin = Limit- Corr. Amplitude

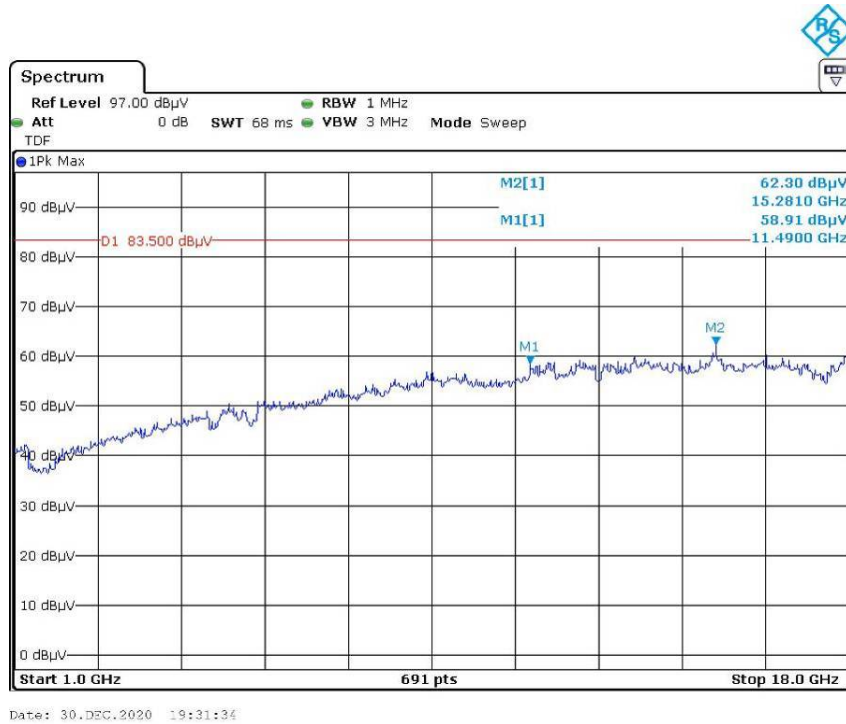
All other spurious emissions are 20 dB below the limit or are on the system noise floor level.

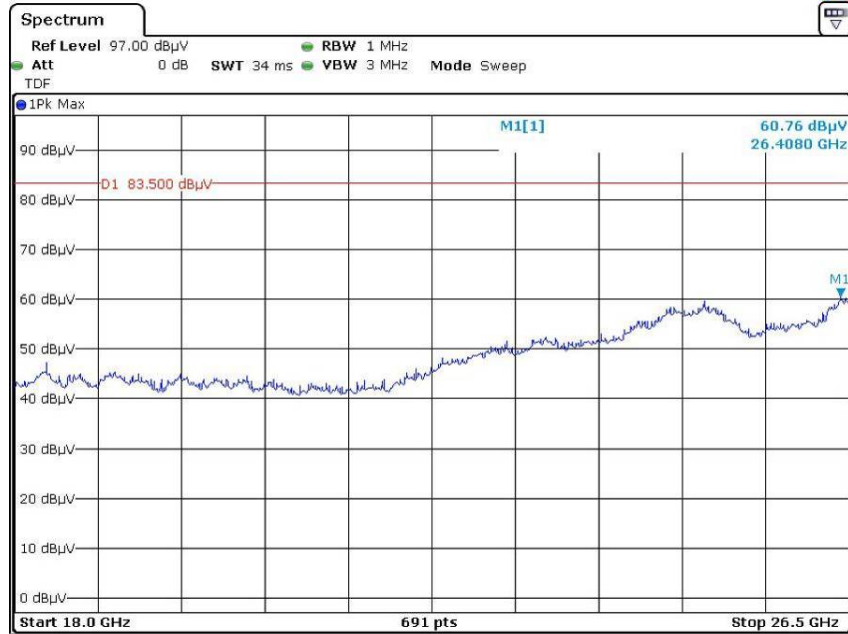
Peak
Pre-scan with 802.11a 5745MHz
Horizontal



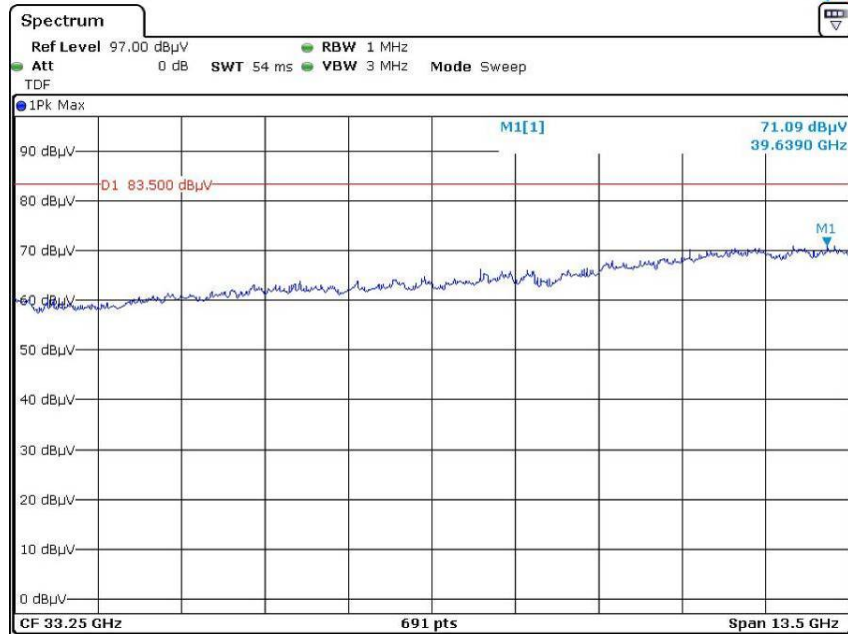


Vertical



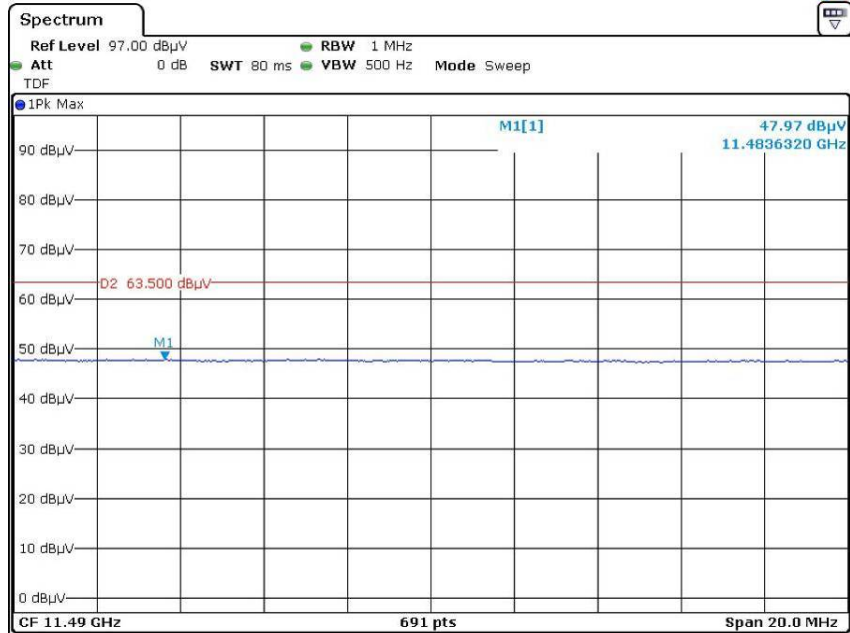


Date: 30.DECEMBER 2020 20:22:38

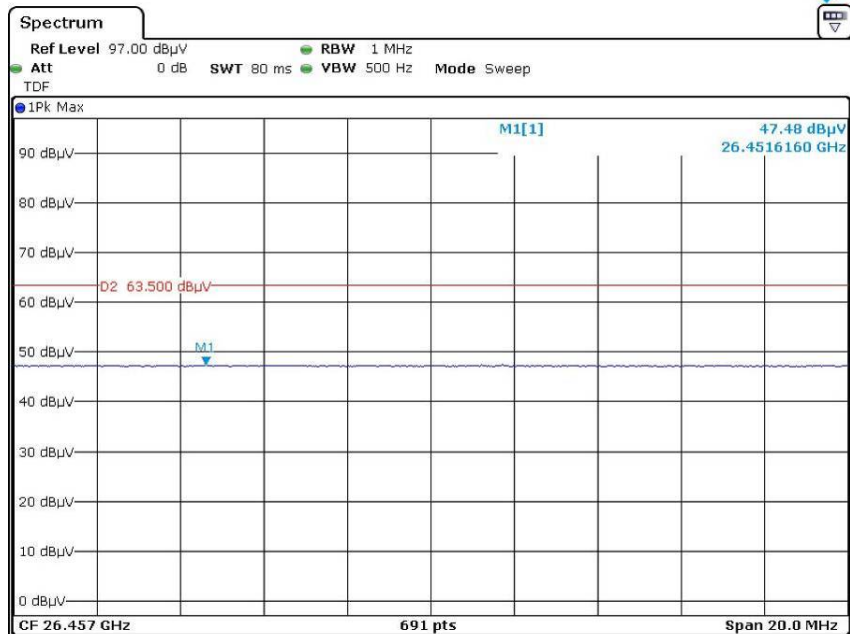


Date: 30.DECEMBER 2020 20:47:54

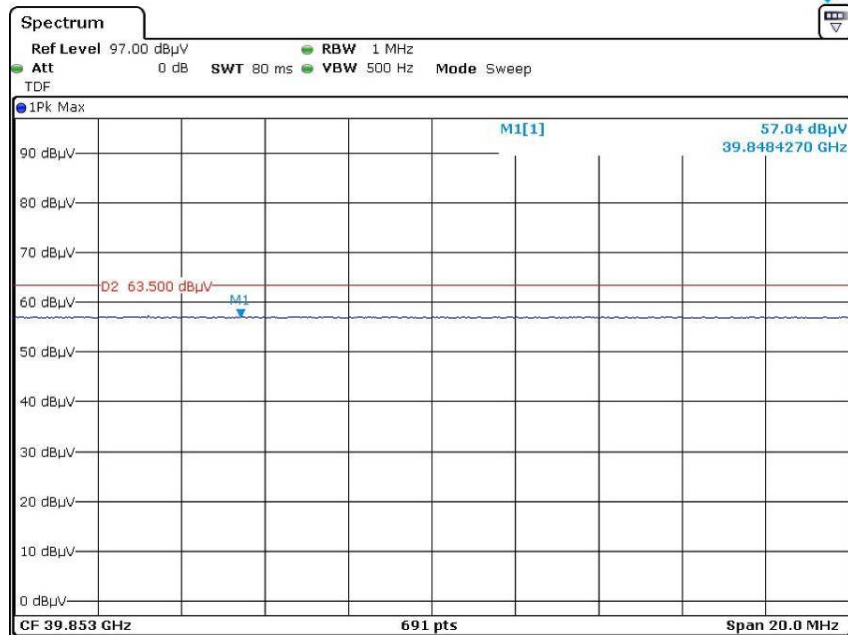
Average Horizontal



Date: 30. DEC. 2020 19:26:11

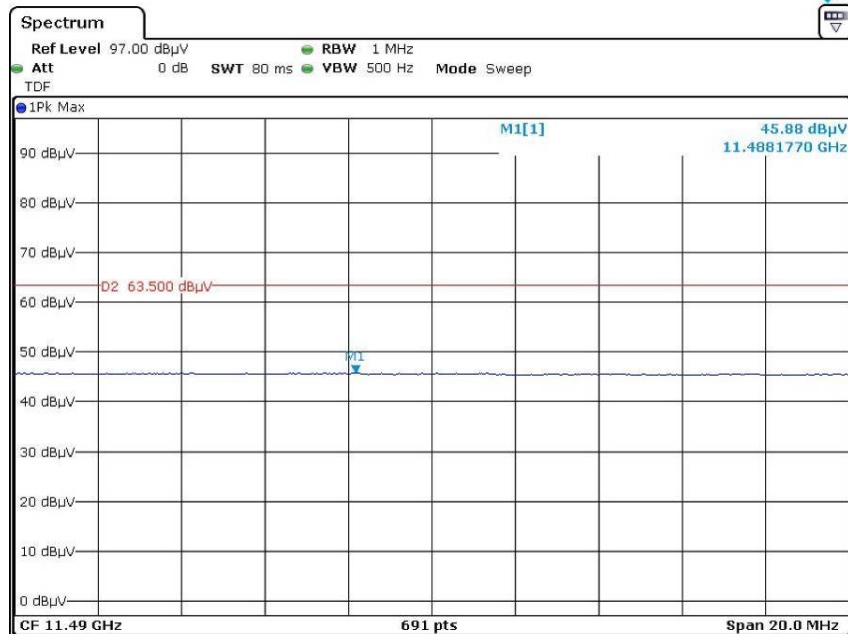


Date: 30. DEC. 2020 20:17:27

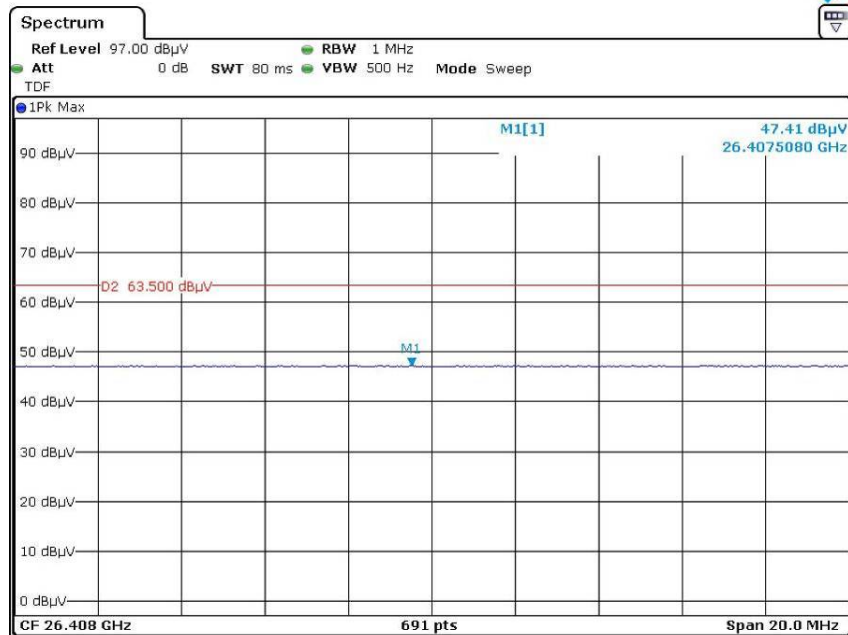


Date: 30. DEC. 2020 20:41:33

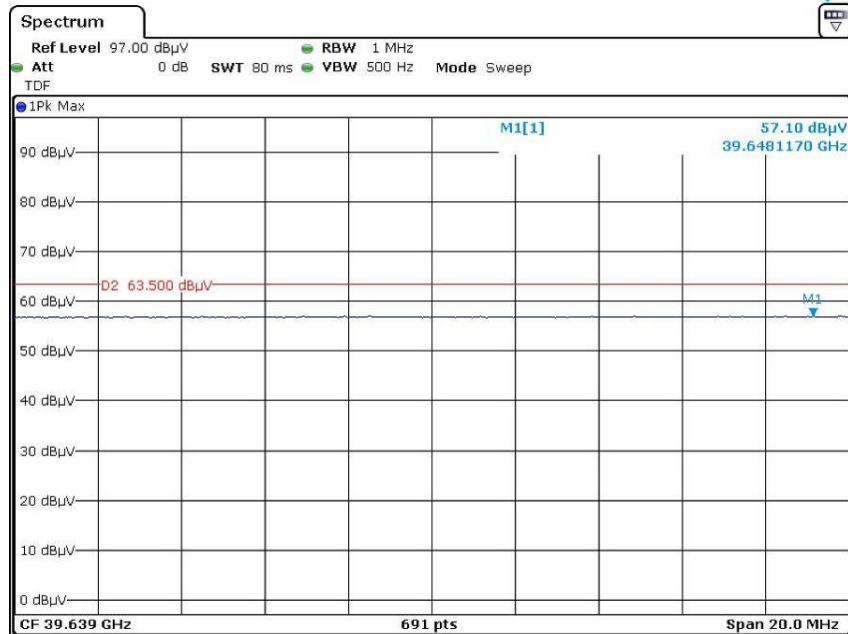
Vertical



Date: 30. DEC. 2020 19:37:04



Date: 30.DECEMBER.2020 20:28:20



Date: 30.DECEMBER.2020 20:52:27

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