

August 17, 2022

Roku, Inc.
1155 Coleman Ave
San Jose
CA 95110 USA

Dear Thien,

Enclosed is the EMC Wireless test report for compliance testing of the Roku, Inc., WiFi Remote Control as tested to the requirements of Title 47 of the CFR, Part 15 Subpart E for Intentional Radiators.

Thank you for using the services of Eurofins Electrical and Electronic Testing NA, Inc. If you have any questions regarding these results or if Eurofins Electrical and Electronic Testing NA, Inc. can be of further service to you, please feel free to contact me.

Gary Chou

Documentation Department
Eurofins Electrical and Electronic Testing NA, Inc.

Reference: WIR119780-ROKU_FCC-ISED-WLAN_5GHz_REV 1.0



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FCC/ ISED Test Report

Applicant name: Roku, Inc.

Product: WiFi Remote Control

Report: WIR119780-ROKU_FCC-WLAN_5GHz

Applicant Address:

1155 Coleman Ave., San Jose, CA 95110 USA

Manufacturer Address:

1155 Coleman Ave., San Jose, CA 95110 USA

Prepared By:
Eurofins Electrical and Electronic Testing NA, Inc.
3162 Belick St.
Santa Clara CA, 95054

FCC Test Report

Applicant name: Roku, Inc.

Product: WiFi Remote Control

Standard
47 CFR FCC Part 15, Subpart E (Section 15.407)
789033 D02 General UNII Test Procedures New Rules v02r01
ANSI C63.10:2013

Christopher Martin
Christopher Martin Test Engineer, Wireless Laboratory

Engineering Statement: The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements FCC Rules under normal use and maintenance.

Gary Chou
Gary Chou
Wireless Engineering Manager, Wireless Laboratory

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Release Control Record

Issue No.	Description	Date Issued
WIR119780-ROKU_FCC-WLAN_5GHz	Original release	8/ 17/2022
WIR119780-ROKU_FCC-WLAN_5GHz_REV 1.0	Add 18GHz-40GHz Data	08/ 31/ 2022

1 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
Standard Section	Test Item	Result	Remarks
15.203	Antenna Requirement	Pass	Meet the requirement of limit.
15.407 (b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit.
15.407 (b)(1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit.
15.407 (a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
-	Occupied Bandwidth	Pass	Meet the requirement of limit.
15.407 (e)	6 dB Emission Bandwidth	Pass	Meet the requirement of limit. (U-NII-3 only)
15.407 (a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.

Note:

1.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Test Method	Typical Expanded Uncertainty	K	Confidence Level
RF Frequencies	±4.52 Hz	2	95%
RF Power Conducted Emissions	±2.32 dB	2	95%
RF Power Conducted Spurious Emissions	±2.25 dB	2	95%
RF Power Radiated Emissions	±3.01 dB	2	95%

1.2 Modification Record

There were no modifications required for compliance.

2 General Information

2.1 General Description of EUT

Product:	WiFi Remote Control		
Brand:	Roku		
Model(s) Tested:	RC-MC1F, RC-MC5F		
Series Model:	N/A		
Sample Status:	Original		
EUT Specifications:	Primary Power:		5Vdc powered by Adaptor/ 3.8Vdc powered by battery
	Voltage Frequency:		N/A
	Technology / Type of Modulations:		256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM
	Operating Frequency :		5180 MHz~5240MHz, 5260 MHz~5320 MHz 5500 MHz~5725 MHz 5745 MHz~5825MHz
	FCC ID:		TC2-R1049
	Antenna Type:	Chip Antenna	5150 MHz: 5.18 dBi 5500 MHz: 5.04 dBi 5850 MHz: 4.09 dBi
	Antenna connector:		N/A
Analysis:	The results obtained relate only to the item(s) tested.		
Environmental Test Conditions:	Temperature: 20.3° C		
	Relative Humidity: 47.5%		
	Barometric Pressure: 860-1060 mbar		
Evaluated by:	Christopher Martin		
Issue Date(s):	August 31, 2022		

NOTE: The following modules can be chosen to be configured in the EUT.

	Model No.	FCC ID	Note
-	-	-	-
-	-	-	-

2.2 Description of Operation Modes

1TX 1RX

FOR 5180 ~ 5240MHz

4 channels are provided for 802.11a, 802.11n (20MHz):

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

FOR 5260 ~ 5320MHz

4 channels are provided for 802.11a, 802.11n (HT20):

Channel	Frequency	Channel	Frequency
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

FOR 5500 ~ 5700MHz

3 channels are provided for 802.11a, 802.11n (HT20):

Channel	Frequency	Channel	Frequency
100	5500 MHz	140	5700 MHz
120	5600 MHz		

FOR 5745 ~ 5825MHz:

5 channels are provided for 802.11a, 802.11n (20MHz):

Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz		

Power setting is as below:

802.11a		802.11n, ac(20MHz)	
Channel	Power Setting	Channel	Power Setting
36	84	36	83
40	82	40	83
48	83	48	84
52	82	52	84
56	83	56	84
64	85	64	84
100	77	100	77
120	80	120	79
140	85	140	85
149	75	149	75
157	72	157	69
165	80	165	80
802.11n, ac(40MHz)		802.11ac(80MHz)	
Channel	Power Setting	Channel	Power Setting
38	-	38	-
46	-	155	-
151	-	48	-
159	-	-	-

1. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

2.3 General Description of Applied Standard

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

47 CFR FCC Part 15, Subpart E (Section 15.407)

789033 D02 General UNII Test Procedures New Rules v02r01

ANSI C63.10:2013

All test items have been performed and recorded as per the above standards.

3 Test Types and Results

3.1 Antenna Requirement

Spec	Requirement	Applicable
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. Antenna requirement must meet at least one of the following: a) Antenna must be permanently attached to the device. b) The antenna must use a unique type of connector to attach to the device. c) Device must be professionally installed. The installer shall be responsible for ensuring that the correct antenna is employed by the device.	☒
Remark	The EUT uses a Chip Antenna antenna to permanently attach to the device.	
Result	☒ PASS ☐ FAIL	

3.2 Radiated Emission and Bandedge Measurement

3.2.1 Limits of Radiated Emission Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

- The lower limit shall apply at the transition frequencies.
- Emission level (dBuV/m) = 20 log Emission level (uV/m).
- For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

Limits of unwanted emission out of the restricted bands

Applicable To		Limit	
789033 D02 General UNII Test Procedure New Rules v02r01		Field Strength at 3m	
		PK:74 (dBμV/m)	AV:54 (dBμV/m)
Frequency Band	Applicable To	EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBμV/m)
5250~5350 MHz	15.407(b)(2)		
5470~5725 MHz	15.407(b)(3)		
5725~5850 MHz	☒ 15.407(b)(4)(i)	PK:-27 (dBm/MHz) ^{*1} PK:10 (dBm/MHz) ^{*2} PK:15.6 (dBm/MHz) ^{*3} PK:27 (dBm/MHz) ^{*4}	PK: 68.2(dBμV/m) ^{*1} PK:105.2 (dBμV/m) ^{*2} PK: 110.8(dBμV/m) ^{*3} PK:122.2 (dBμV/m) ^{*4}
	☐ 15.407(b)(4)(ii)	Emission limits in section 15.247(d)	
^{*1} beyond 75 MHz or more above of the band edge.		^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.	
^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.		^{*4} from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.	

Note:

The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts).}$$

3.2.2 Test Instruments

Asset #	Equipment	Manufacturer	Model	Last Cal Date	Cal Due Date
1S2003	EMI Test Receiver	Keysight	N9030B	10/08/2021	10/08/2022
1S2399	Turntable Controller	SUNOL SCIENCE	SC99V	Not Required	Not Required
1S2486	5 Meter Chamber Control Room	Panashield	5 Meter Control Room	Not Required	Not Required
1S2435	Horn Antenna	ETS-LINDGREN	3117	03/03/2021	03/09/2023
N/A	Preamplifier	EMC Instrument	EMC118A45SE	Note 1	Note 1
1S2668	Preamplifier	Sonoma Instrument	310N	Note 1	Note 1
1S2600	Antenna	TESEQ GmbH	D-12623	05/ 11/ 2021	05/ 11/ 2023
1S3983	Loop Antenna	ETS-LINDGREN	6512	10/ 14 /2021	10/ 14 /2023

Note 1: Verified by calibrated instrumentation at the time of testing

3.2.3 Test Procedure

For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

For Band edge Measurement

789033 D02 General U-NII Test Procedures New Rules v02r01, II.F. Method SA-1

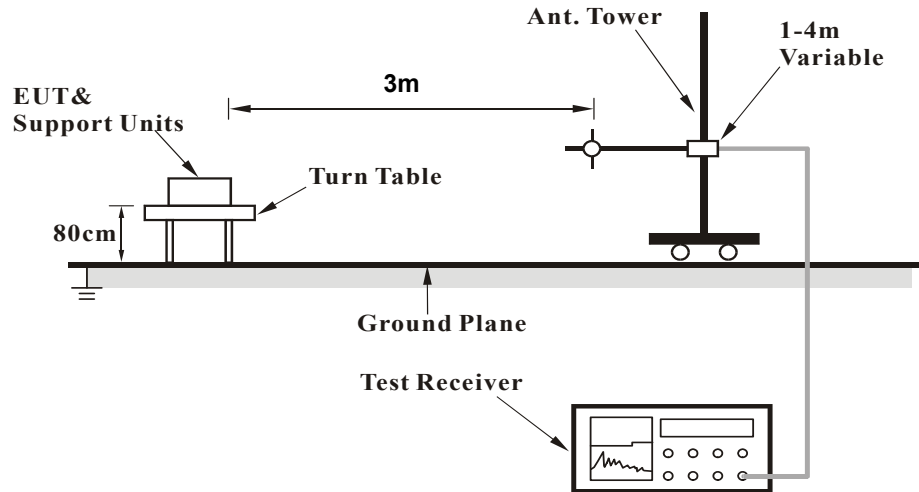
1. For average emissions measurements, follow the procedures described in section II.G.6., "Procedures for Average Unwanted Emissions Measurements above 1000 MHz", except for the following changes:
2. Set RBW=100 kHz
3. Set VBW=300 kHz
4. Perform a band-power integration across the 1 MHz bandwidth in which the band-edge emission level is to be measured.

3.2.4 Deviation from Test Standard

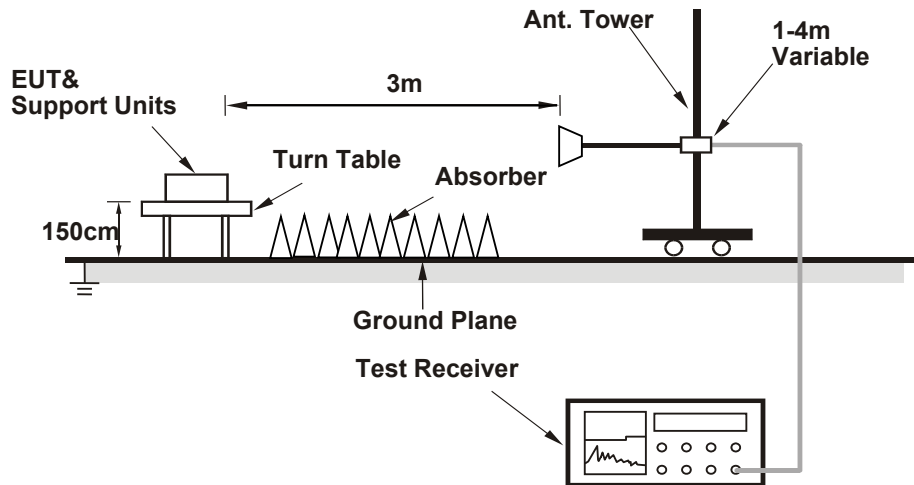
No deviation.

3.2.5 Test Setup

For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

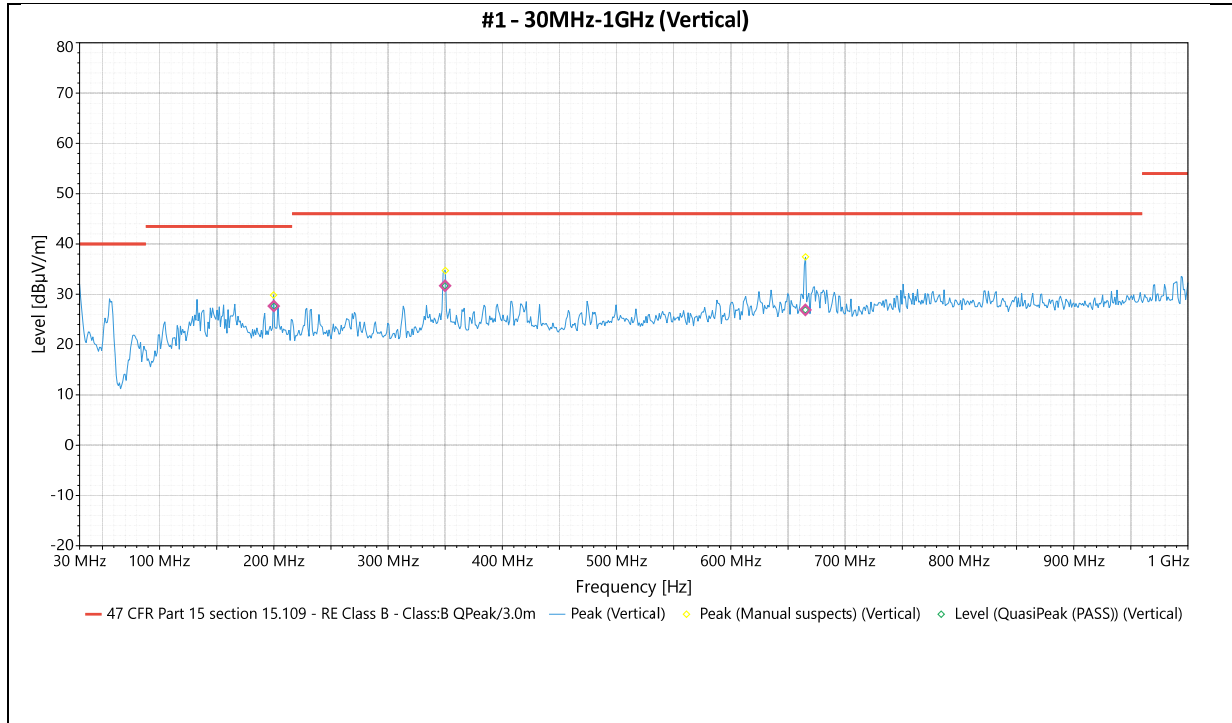
3.2.6 EUT Operating Condition

- Placed the EUT on the testing table.
- Prepared notebooks to act as communication partner and placed it outside of testing area.
- The communication partner connected with EUT via a USB cable and ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
- The necessary accessories enable the system in full functions.

3.2.7 Test Results

Below 1GHz Worst-Case Data:

CHANNEL	802.11n Channel 40	DETECTOR FUNCTION	Quasi Peak
FREQUENCY RANGE	30MHz – 1GHz		



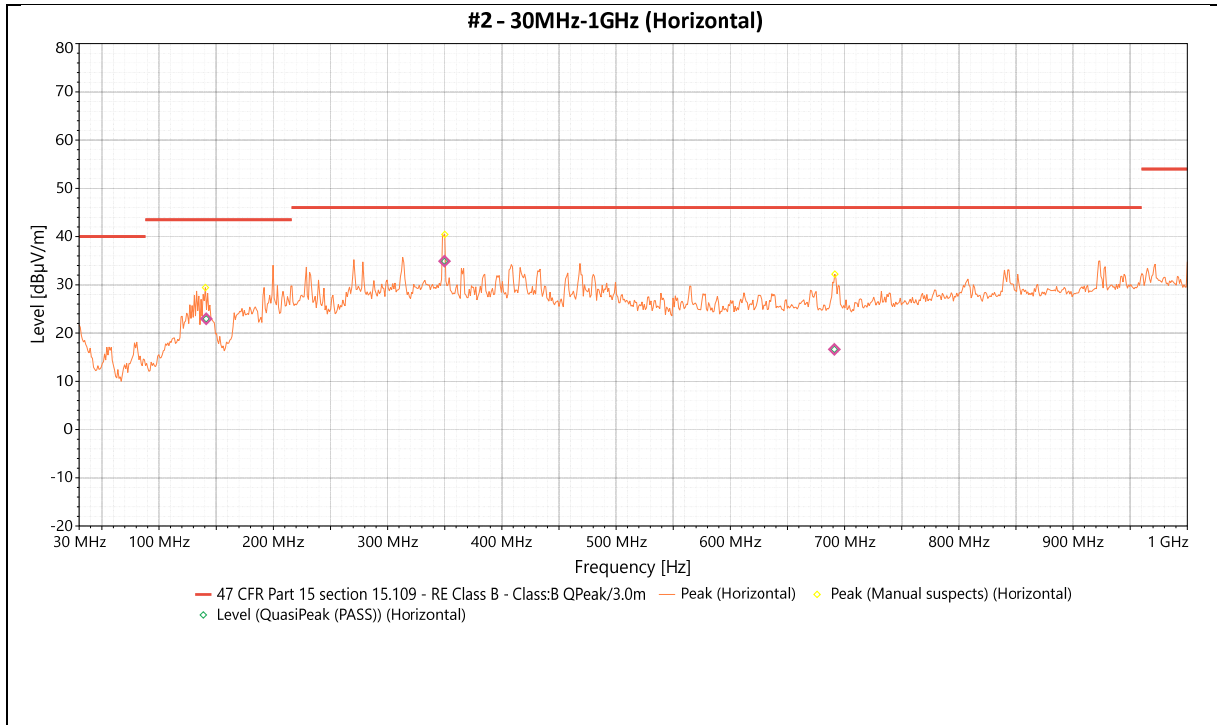
Antenna Polarity & Test Distance: Vertical at 3m									
No.	Frequency (MHz)	Polarization	Level Peak[dB(uV/m)]	Limit Peak dB(uV/m)	Margin Peak [dB]	Height (m)	Angle (Deg)	Factor [dB(1/m)]	Pass/Fail
1	199.99	Vertical	27.666	43.5	-15.834	3.19	322	-15.72	Pass
2	349.872	Vertical	31.697	46	-14.303	1.44	285	-10.27	Pass
3	665.254	Vertical	26.897	46	-19.103	3.36	158	-4.92	Pass

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Cable Loss (dB) + AF (dB)
2. AF (dB/m) = Antenna Factor (dB/m) – Preamplifier Gain (dB).
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)

Below 1GHz Worst-Case Data:

CHANNEL	802.11n Channel 40	DETECTOR FUNCTION	Quasi Peak
FREQUENCY RANGE	30MHz – 1GHz		



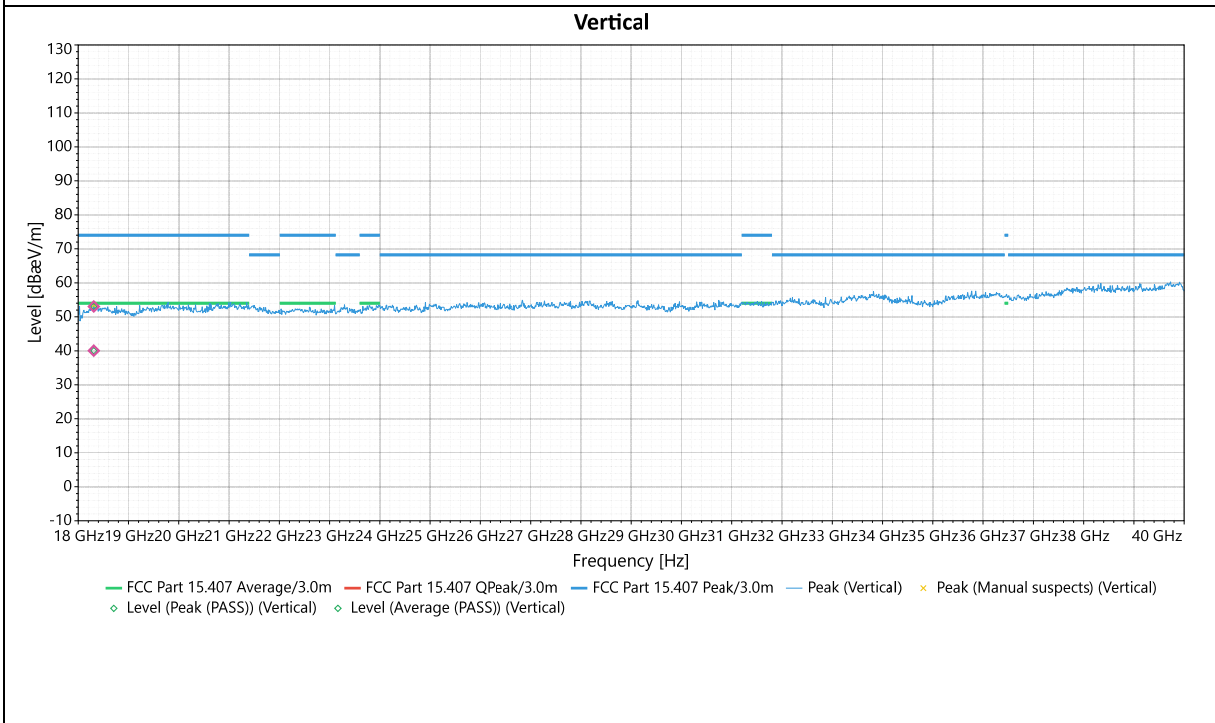
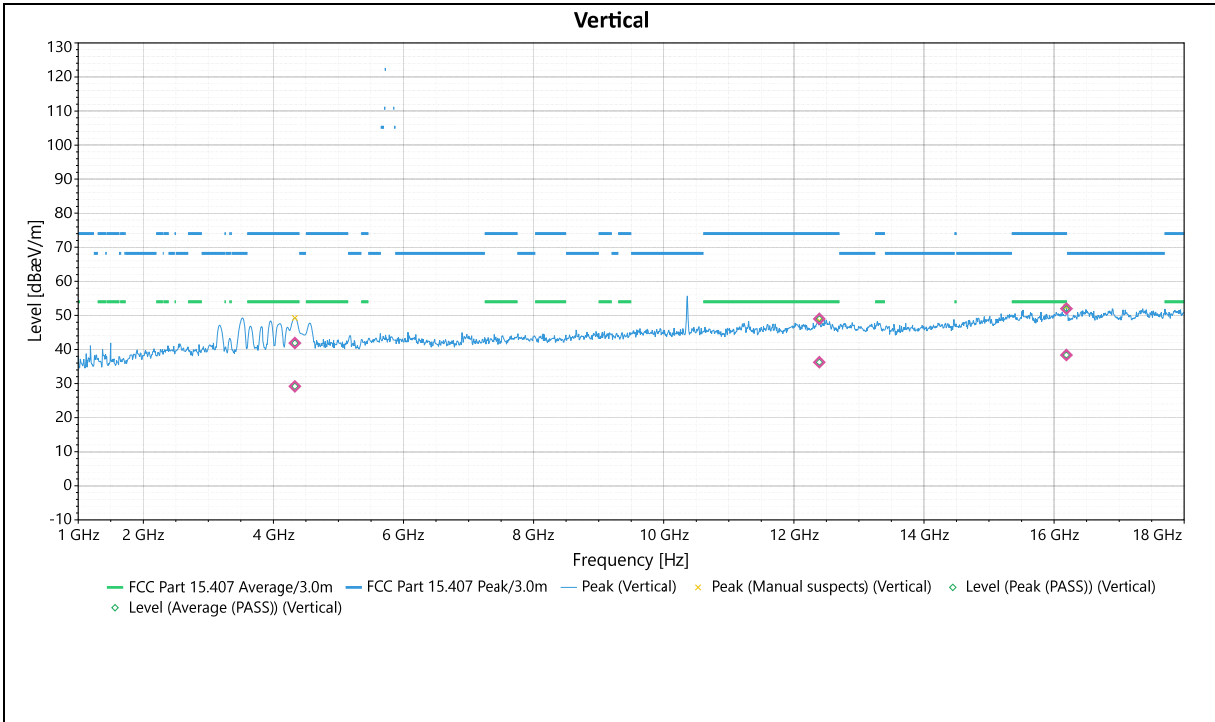
Antenna Polarity & Test Distance: Vertical at 3m									
No.	Frequency (MHz)	Polarization	Level Peak[dB(uV/m)]	Limit Peak dB(uV/m)	Margin Peak [dB]	Height (m)	Angle (Deg)	Factor [dB(1/m)]	Pass/Fail
1	141.276	Horizontal	22.954	43.5	-20.546	1	255	-14.98	Pass
2	349.812	Horizontal	34.914	46	-11.086	2.81	212	-9.88	Pass
3	691.072	Horizontal	16.631	46	-29.369	2.21	316	-4.3	Pass

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Cable Loss (dB) + AF (dB)
2. AF (dB/m) = Antenna Factor (dB/m) – Preamplifier Gain (dB).
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)

Above 1GHz Test Data:

CHANNEL	802.11a 5180 MHz	DETECTOR FUNCTION	Prak/Average
FREQUENCY RANGE	1GHz-40GHz		

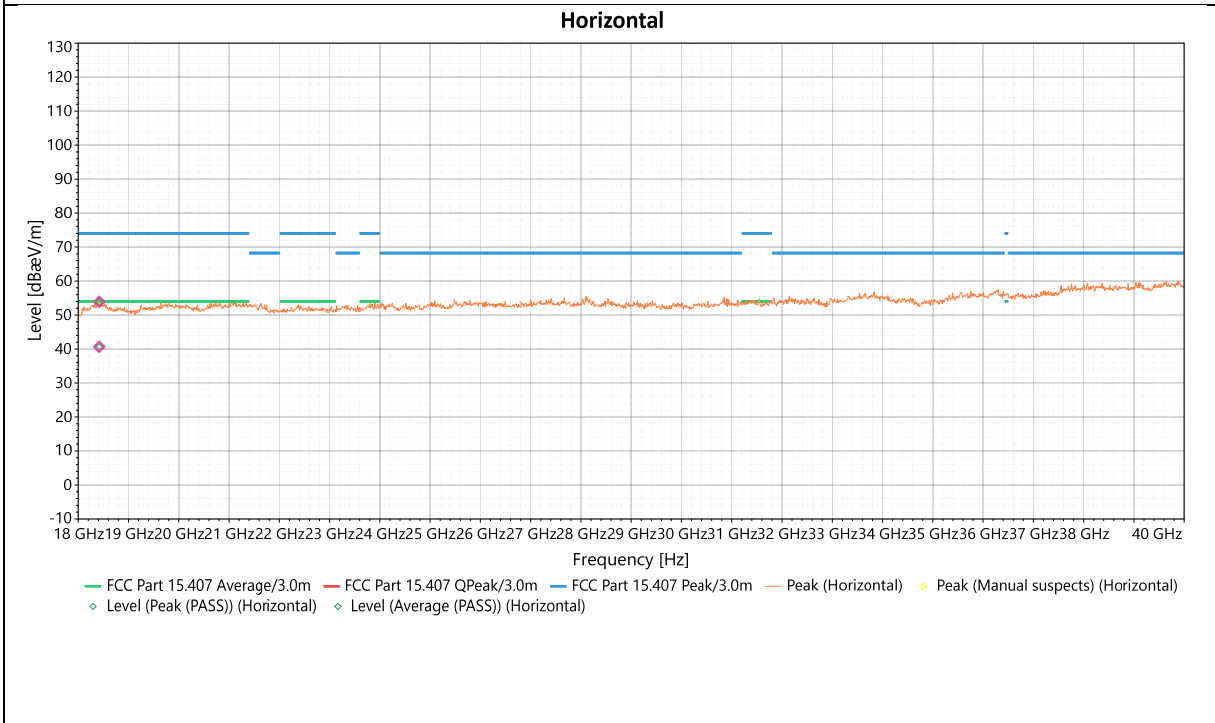
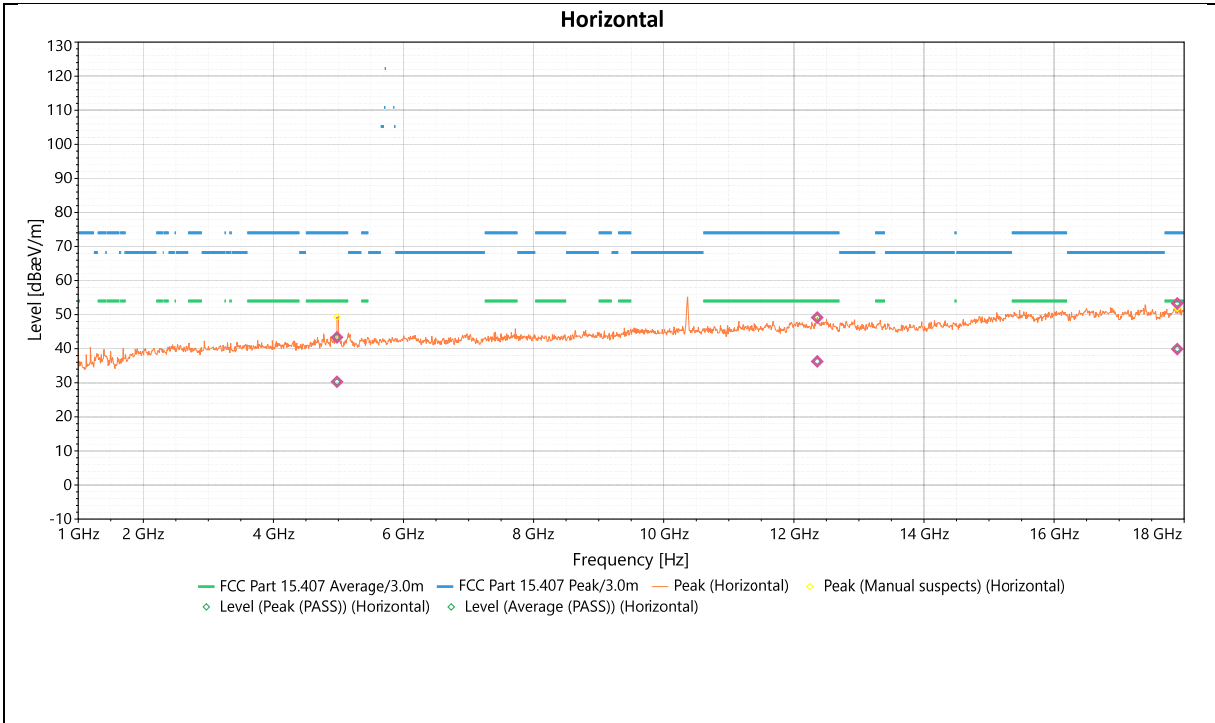


Antenna Polarity & Test Distance: Vertical at 3m									
No.	Frequency (MHz)	Polarization	Level [dB(uV/m)]	Limit dB(uV/m)	Margin [dB]	Height (m)	Angle (Deg)	Factor [dB(1/m)]	Measure Type/ Result
1	4330.209	Vertical	41.892	74	-32.108	3.16	55	-0.07	Peak (PASS)
2	4330.209	Vertical	29.201	54	-24.799	3.16	55	-0.07	Average (PASS)
3	12391.72	Vertical	48.991	74	-25.009	2.9	188	3.81	Peak (PASS)
4	12391.72	Vertical	36.275	54	-17.725	2.9	188	3.81	Average (PASS)
5	16189.54	Vertical	51.994	74	-22.006	2.05	0	4.8	Peak (PASS)
6	16189.54	Vertical	38.374	54	-15.626	2.05	0	4.8	Average (PASS)
7	18310.19	Vertical	53.03	74	-20.97	1	328	6.69	Peak (PASS)
8	18310.19	Vertical	40.039	54	-13.961	1	328	6.69	Average (PASS)

REMARKS:

1. Level (dBuV) = Reading (dBuV) + Factor (dB(1/m)).
2. Factor (dB(1/m)) = Antenna Factor(AF) (dB(1/m)) + Cable Loss (dB) +Preamplifier
3. Margin value = Emission level – Limit value.
4. The emission levels of other frequencies were less than 20dB margin agains

Frequency	802.11a 5180 MHz	DETECTOR FUNCTION	Prak/Average
FREQUENCY RANGE	1GHz-40GHz		

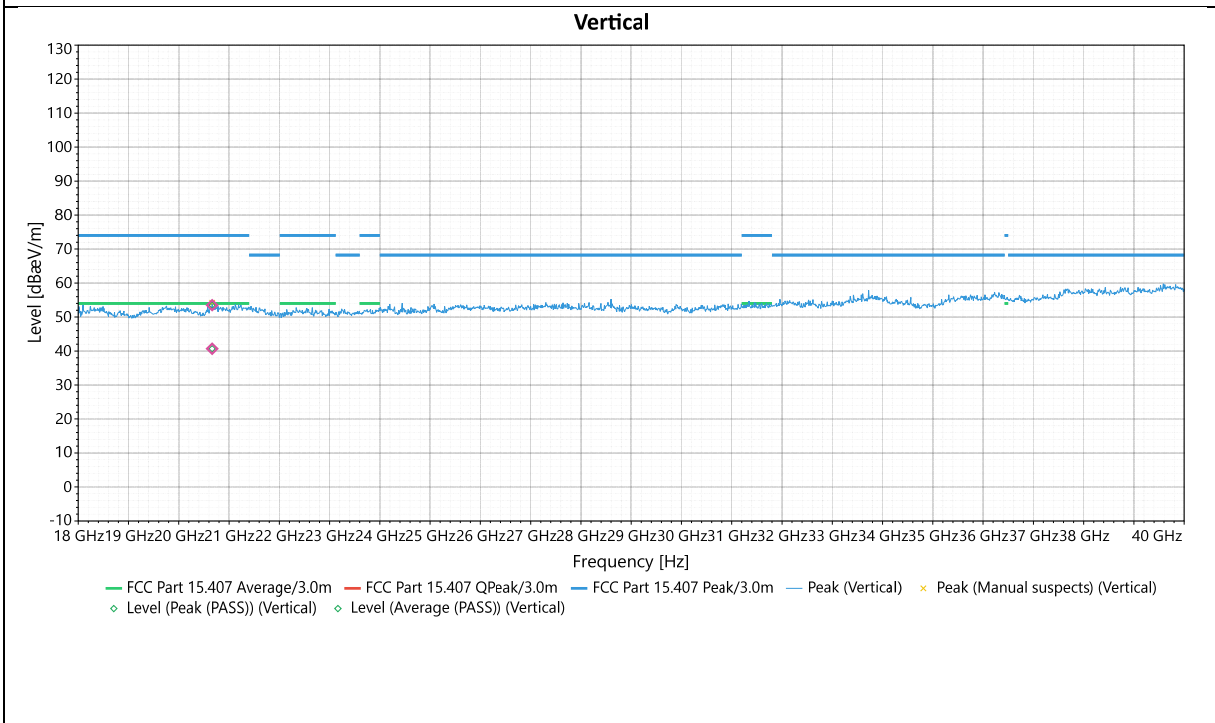
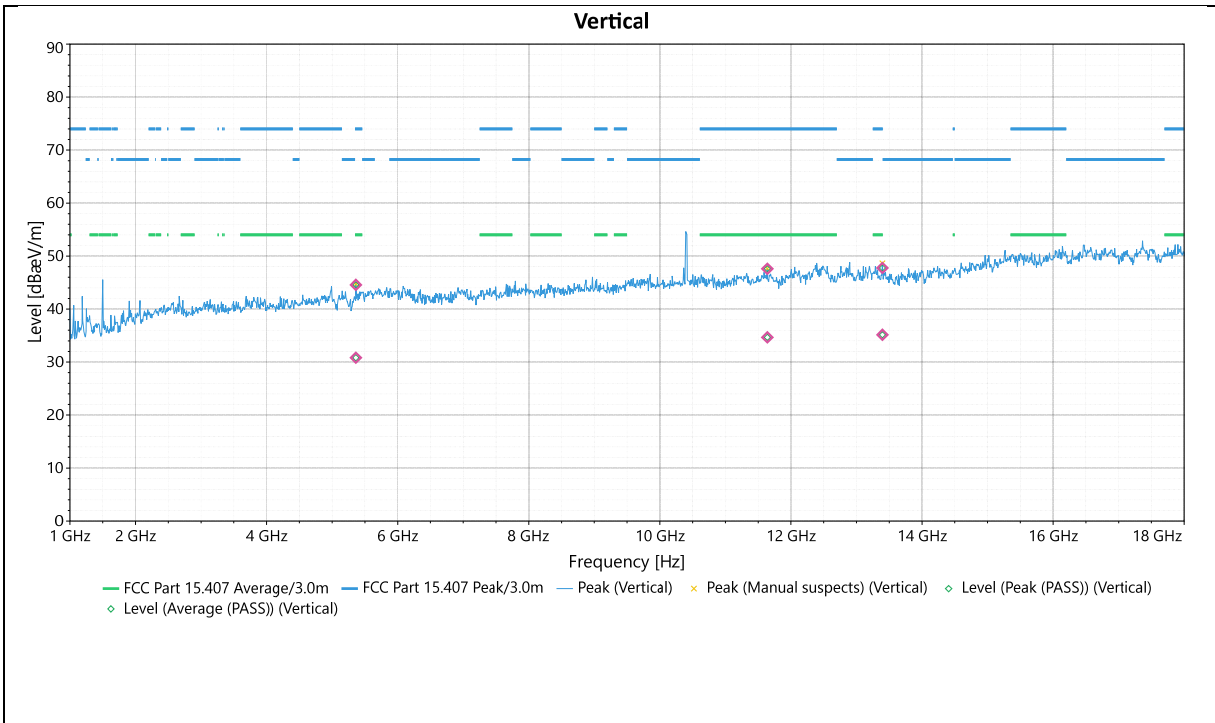


Antenna Polarity & Test Distance: Vertical at 3m									
No.	Frequency (MHz)	Polarization	Level [dB(uV/m)]	Limit dB(uV/m)	Margin [dB]	Height (m)	Angle (Deg)	Factor [dB(1/m)]	Measure Type/ Result
1	4977.925	Horizontal	43.34	74	-30.66	3.74	285	1.33	Peak (PASS)
2	4977.925	Horizontal	30.292	54	-23.708	3.74	285	1.33	Average (PASS)
3	12359.4	Horizontal	49.148	74	-24.852	1	189	3.92	Peak (PASS)
4	12359.4	Horizontal	36.27	54	-17.73	1	189	3.92	Average (PASS)
5	17892.88	Horizontal	53.277	74	-20.723	2.05	332	2.43	Peak (PASS)
6	17892.88	Horizontal	39.913	54	-14.087	2.05	332	2.43	Average (PASS)
7	18417.9	Horizontal	53.921	74	-20.079	1.44	127	6.46	Peak (PASS)
8	18417.9	Horizontal	40.663	54	-13.337	1.44	127	6.46	Average (PASS)

REMARKS:

1. Level (dBuV) = Reading (dBuV) + Factor (dB(1/m)).
2. Factor (dB(1/m)) = Antenna Factor(AF) (dB(1/m)) + Cable Loss (dB) +Preamplifier
3. Margin value = Emission level – Limit value.
4. The emission levels of other frequencies were less than 20dB margin agains

CHANNEL	802.11a 5200 MHz	DETECTOR FUNCTION	Prak/Average
FREQUENCY RANGE	1GHz-40GHz		

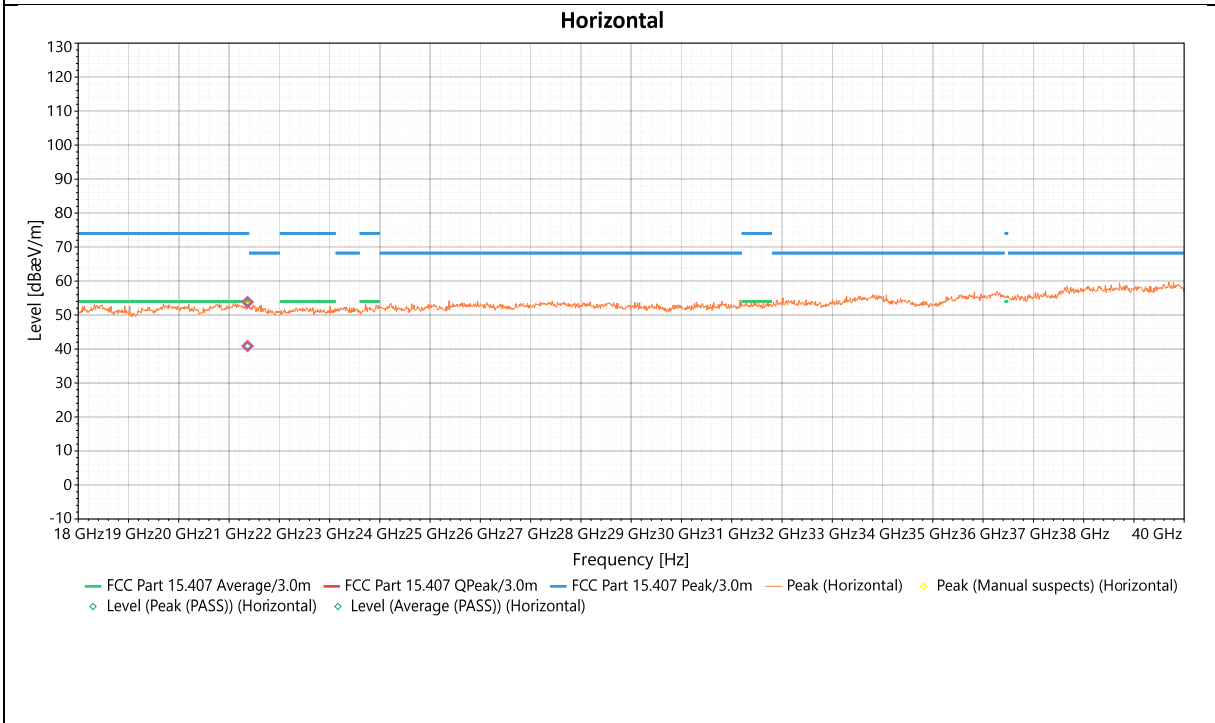
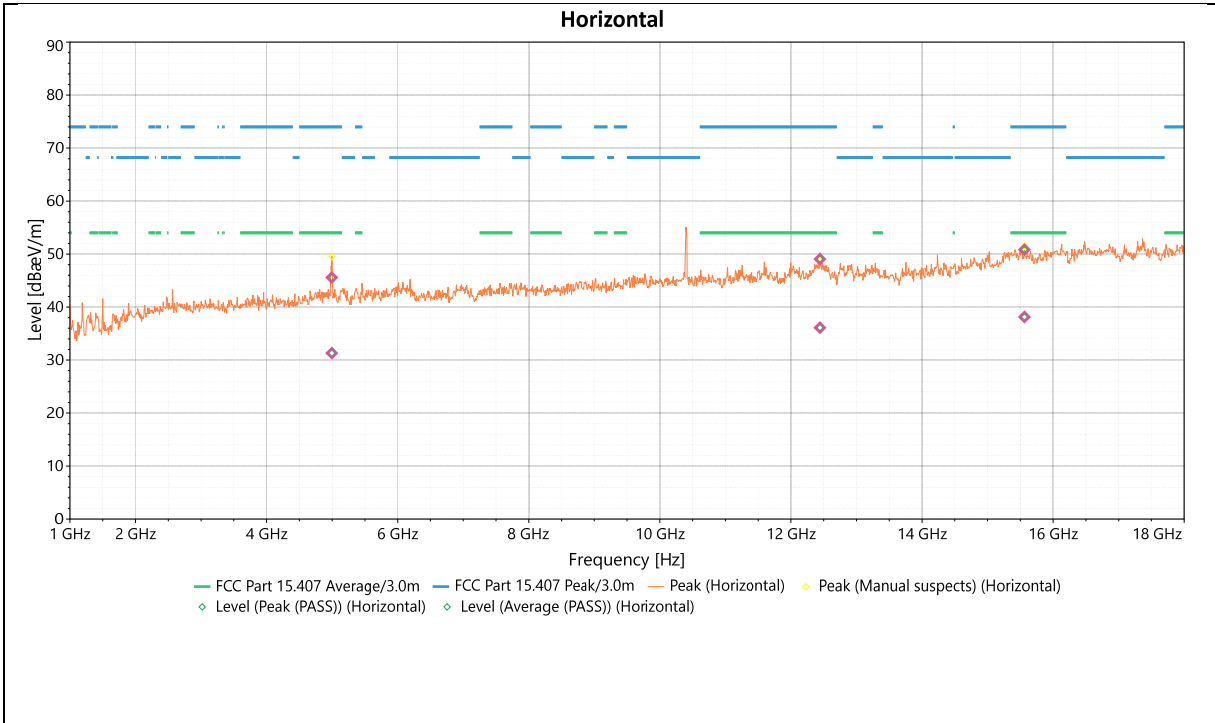


Antenna Polarity & Test Distance: Vertical at 3m									
No.	Frequency (MHz)	Polarization	Level [dB(uV/m)]	Limit dB(uV/m)	Margin [dB]	Height (m)	Angle (Deg)	Factor [dB(1/m)]	Measure Type/ Result
1	5362.159	Vertical	44.572	74	-29.428	2.05	359	0.86	Peak (PASS)
2	5362.159	Vertical	30.824	54	-23.176	2.05	359	0.86	Average (PASS)
3	11640.35	Vertical	47.598	74	-26.402	1	333	3.45	Peak (PASS)
4	11640.35	Vertical	34.673	54	-19.327	1	333	3.45	Average (PASS)
5	13396.41	Vertical	47.759	74	-26.241	2.06	285	3.15	Peak (PASS)
6	13396.41	Vertical	35.151	54	-18.849	2.06	285	3.15	Average (PASS)
7	21368.1	Vertical	53.803	74	-20.197	1.34	357	8.19	Peak (PASS)
8	21368.1	Vertical	40.865	54	-13.135	1.34	357	8.19	Average (PASS)

REMARKS:

1. Level (dBuV) = Reading (dBuV) + Factor (dB(1/m)).
2. Factor (dB(1/m)) = Antenna Factor(AF) (dB(1/m)) + Cable Loss (dB) +Preamplifier
3. Margin value = Emission level – Limit value.
4. The emission levels of other frequencies were less than 20dB margin agains

Frequency	802.11a 5200 MHz	DETECTOR FUNCTION	Prak/Average
FREQUENCY RANGE	1GHz-40GHz		

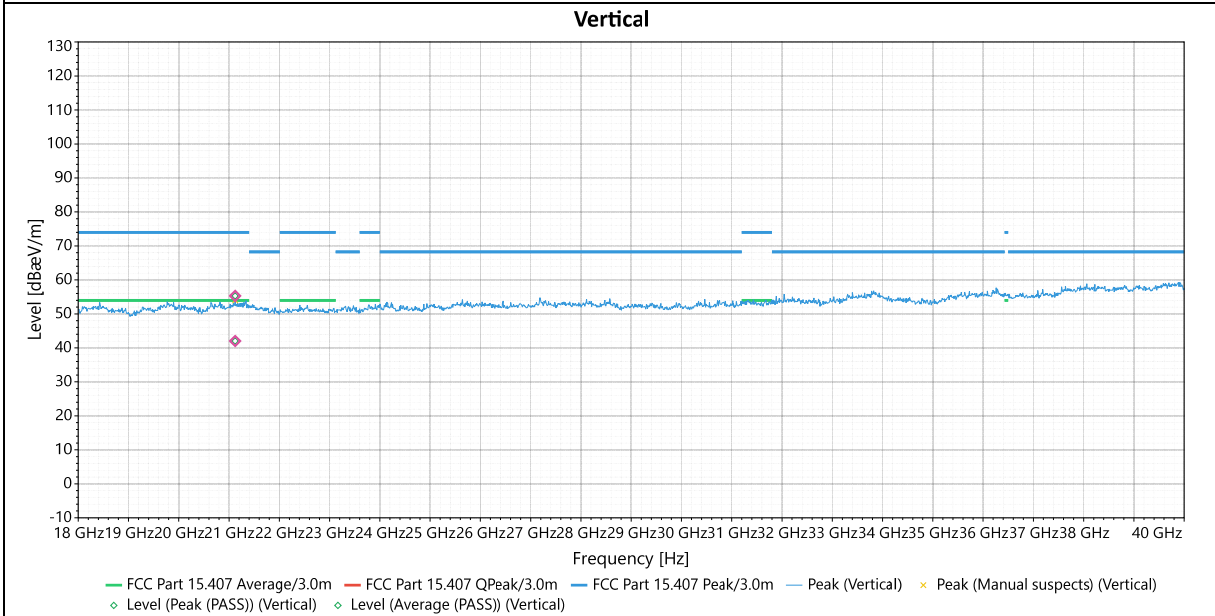
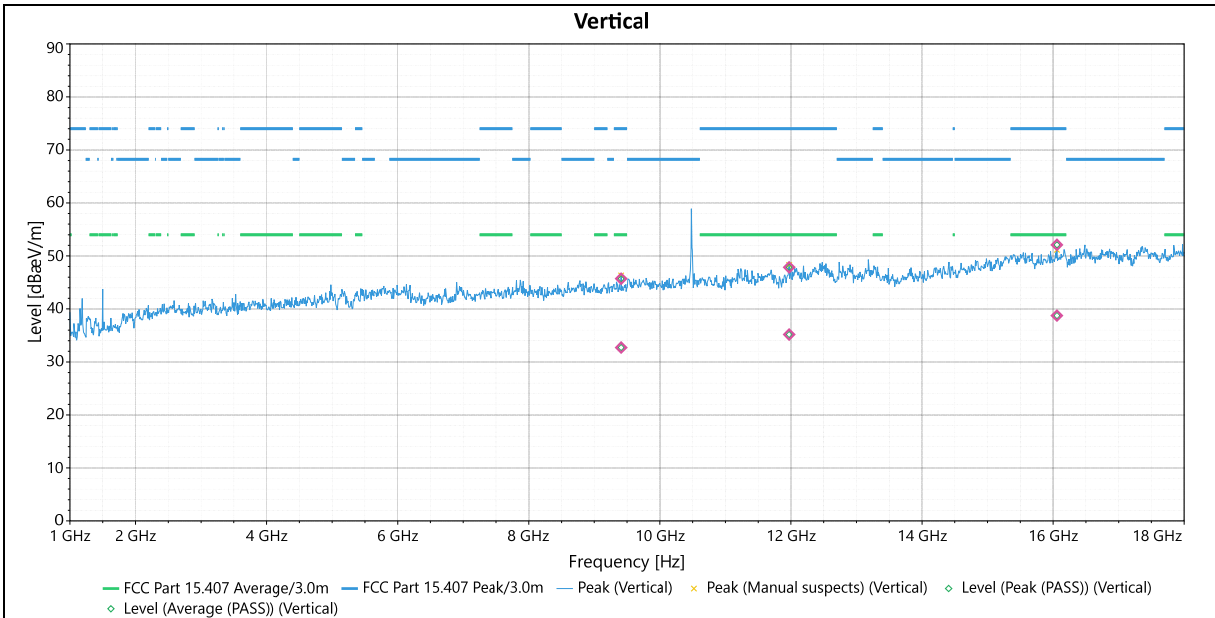


Antenna Polarity & Test Distance: Vertical at 3m									
No.	Frequency (MHz)	Polarization	Level [dB(uV/m)]	Limit dB(uV/m)	Margin [dB]	Height (m)	Angle (Deg)	Factor [dB(1/m)]	Measure Type/ Result
1	4995.013	Horizontal	45.575	74	-28.425	3.74	93	1.32	Peak (PASS)
2	4995.013	Horizontal	31.32	54	-22.68	3.74	93	1.32	Average (PASS)
3	12442.71	Horizontal	49.064	74	-24.936	4	45	3.93	Peak (PASS)
4	12442.71	Horizontal	36.115	54	-17.885	4	45	3.93	Average (PASS)
5	15562.15	Horizontal	50.839	74	-23.161	3.74	189	4.51	Peak (PASS)
6	15562.15	Horizontal	38.142	54	-15.858	3.74	189	4.51	Average (PASS)
7	21368.1	Horizontal	53.803	74	-20.197	1.34	357	8.19	Peak (PASS)
8	21368.1	Horizontal	40.865	54	-13.135	1.34	357	8.19	Average (PASS)

REMARKS:

1. Level (dBuV) = Reading (dBuV) + Factor (dB(1/m)).
2. Factor (dB(1/m)) = Antenna Factor(AF) (dB(1/m)) + Cable Loss (dB) +Preamplifier
3. Margin value = Emission level – Limit value.
4. The emission levels of other frequencies were less than 20dB margin agains

CHANNEL	802.11a 5240 MHz	DETECTOR FUNCTION	Prak/Average
FREQUENCY RANGE	1GHz-40GHz		



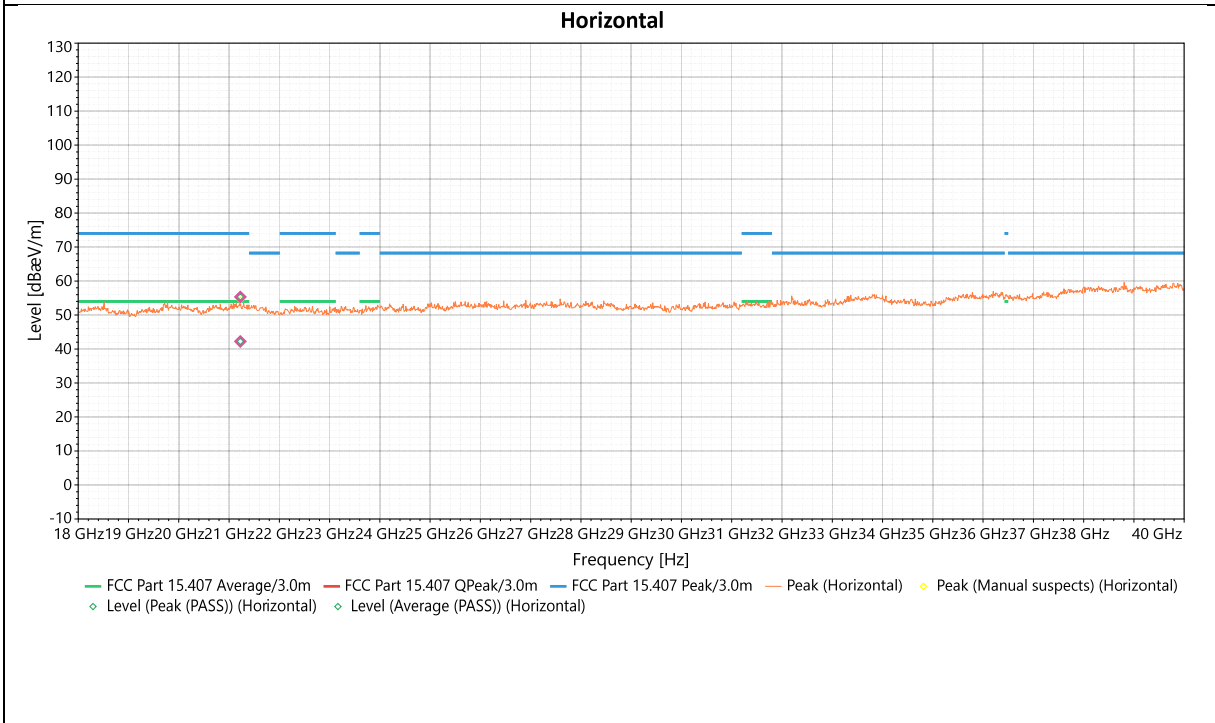
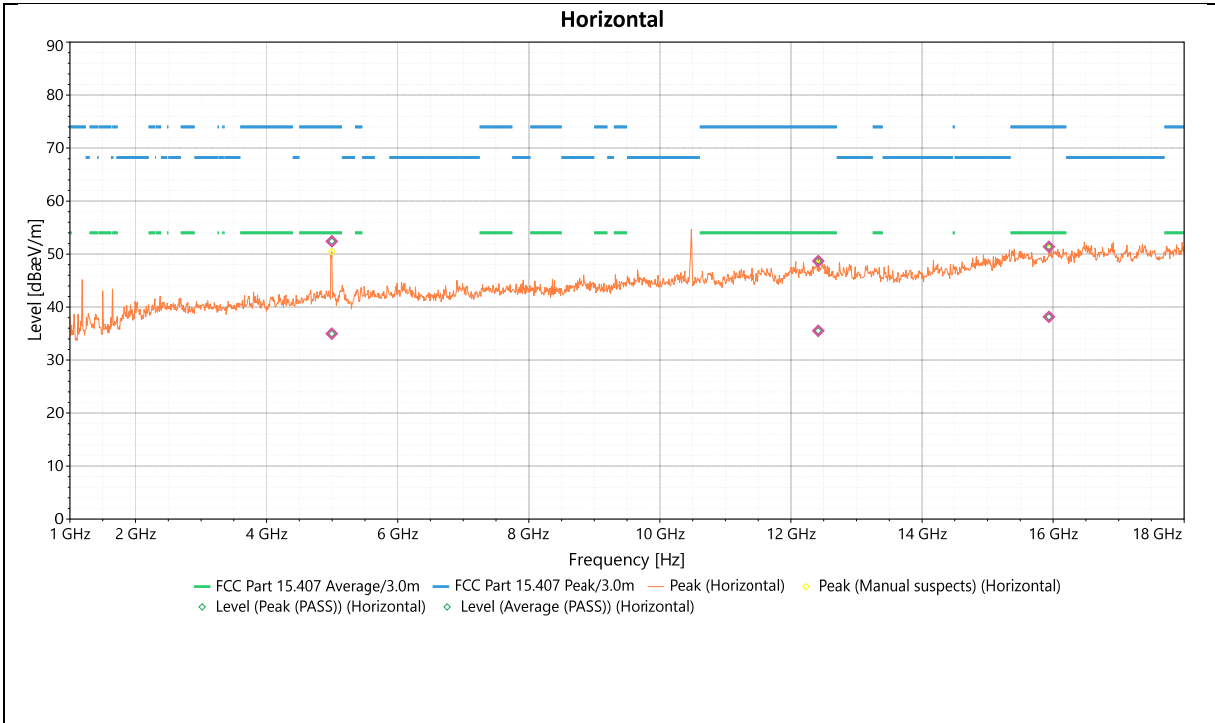
Antenna Polarity & Test Distance: Vertical at 3m

No.	Frequency (MHz)	Polarization	Level [dB(uV/m)]	Limit dB(uV/m)	Margin [dB]	Height (m)	Angle (Deg)	Factor [dB(1/m)]	Measure Type/ Result
1	9409.839	Vertical	45.696	74	-28.304	3.88	265	2.08	Peak (PASS)
2	9409.839	Vertical	32.708	54	-21.292	3.88	265	2.08	Average (PASS)
3	11973.49	Vertical	47.849	74	-26.151	2.89	317	3.57	Peak (PASS)
4	11973.49	Vertical	35.174	54	-18.826	2.89	317	3.57	Average (PASS)
5	16058.64	Vertical	52.102	74	-21.898	1	357	4.75	Peak (PASS)
6	16058.64	Vertical	38.745	54	-15.255	1	357	4.75	Average (PASS)
7	21121.7	Vertical	55.278	74	-18.722	1.02	85	8.59	Peak (PASS)
8	21121.7	Vertical	42.022	54	-11.978	1.02	85	8.59	Average (PASS)

REMARKS:

1. Level (dBuV) = Reading (dBuV) + Factor (dB(1/m)).
2. Factor (dB(1/m)) = Antenna Factor(AF) (dB(1/m)) + Cable Loss (dB) +Preamplifier
3. Margin value = Emission level – Limit value.
4. The emission levels of other frequencies were less than 20dB margin against

Frequency	802.11a 5240 MHz	DETECTOR FUNCTION	Prak/Average
FREQUENCY RANGE	1GHz-40GHz		



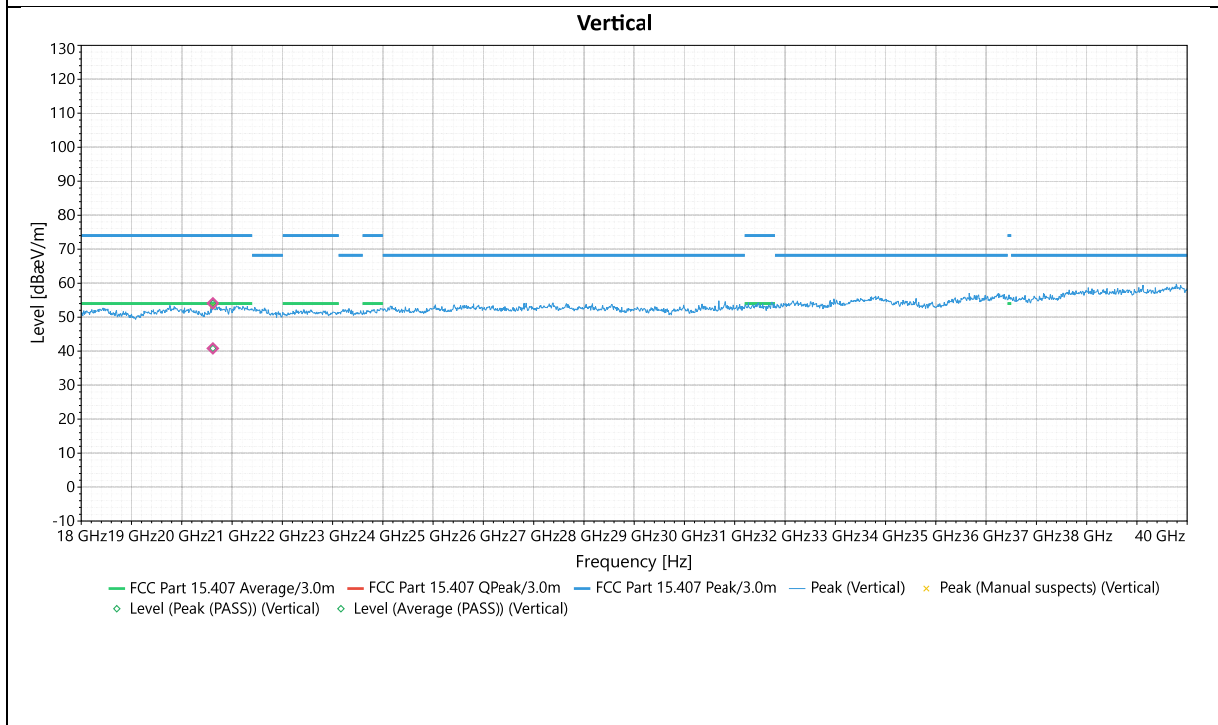
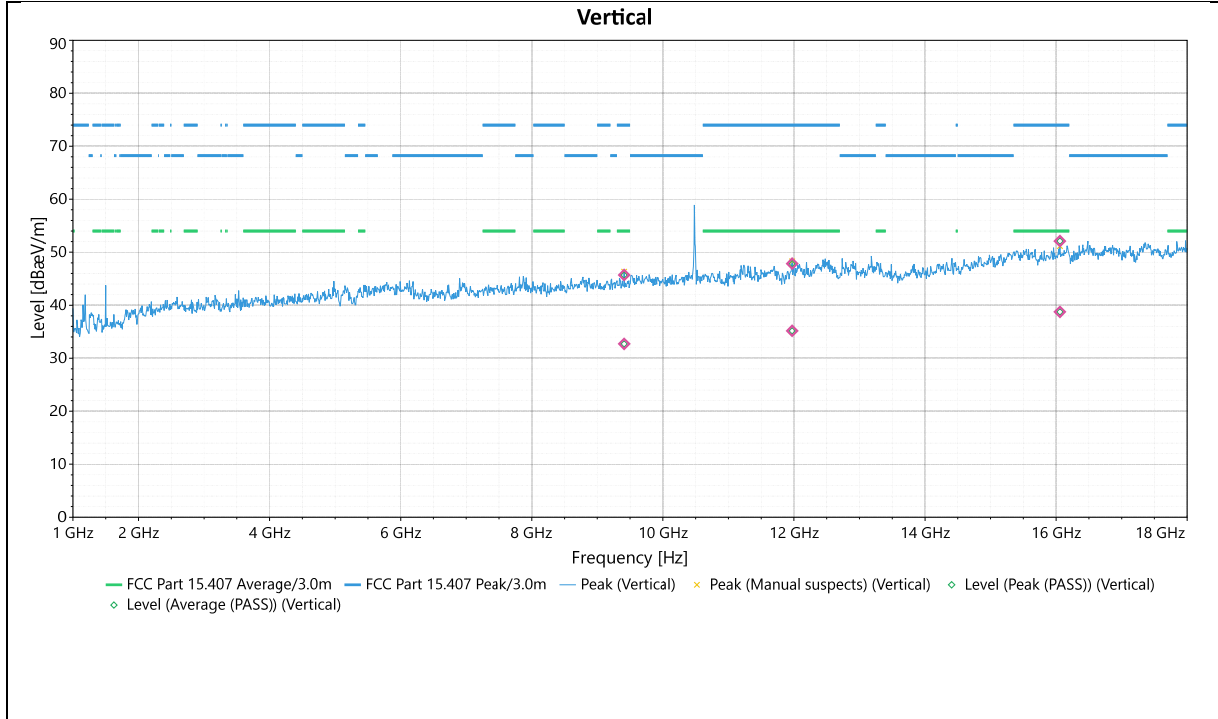
Antenna Polarity & Test Distance: Vertical at 3m

No.	Frequency (MHz)	Polarization	Level [dB(uV/m)]	Limit dB(uV/m)	Margin [dB]	Height (m)	Angle (Deg)	Factor [dB(1/m)]	Measure Type/ Result
1	4995.008	Horizontal	52.418	74	-21.582	1.21	316	1.32	Peak (PASS)
2	4995.008	Horizontal	34.983	54	-19.017	1.21	316	1.32	Average (PASS)
3	12417.12	Horizontal	48.68	74	-25.32	1.21	124	3.91	Peak (PASS)
4	12417.12	Horizontal	35.519	54	-18.481	1.21	124	3.91	Average (PASS)
5	15936.2	Horizontal	51.385	74	-22.615	2.33	360	4.68	Peak (PASS)
6	15936.2	Horizontal	38.163	54	-15.837	2.33	360	4.68	Average (PASS)
7	21225.1	Horizontal	55.317	74	-18.683	1.46	343	8.34	Peak (PASS)
8	21225.1	Horizontal	42.229	54	-11.771	1.46	343	8.34	Average (PASS)

REMARKS:

1. Level (dBuV) = Reading (dBuV) + Factor (dB(1/m)).
2. Factor (dB(1/m)) = Antenna Factor(AF) (dB(1/m)) + Cable Loss (dB) +Preamplifier
3. Margin value = Emission level – Limit value.
4. The emission levels of other frequencies were less than 20dB margin agains

CHANNEL	802.11a 5260 MHz	DETECTOR FUNCTION	Prak/Average
FREQUENCY RANGE	1GHz-40GHz		



Antenna Polarity & Test Distance: Vertical at 3m									
No.	Frequency (MHz)	Polarization	Level [dB(uV/m)]	Limit dB(uV/m)	Margin [dB]	Height (m)	Angle (Deg)	Factor [dB(1/m)]	Measure Type/ Result
1	5443.795	Vertical	43.402	74	-30.598	3.77	98	1.13	Peak (PASS)
2	5443.795	Vertical	30.92	54	-23.08	3.77	98	1.13	Average (PASS)
3	11983.72	Vertical	48.624	74	-25.376	2.89	360	3.58	Peak (PASS)
4	11983.72	Vertical	35.208	54	-18.792	2.89	360	3.58	Average (PASS)
5	16092.57	Vertical	51.036	74	-22.964	1.49	316	4.76	Peak (PASS)
6	16092.57	Vertical	38.19	54	-15.81	1.49	316	4.76	Average (PASS)
7	20618.05	Vertical	54.072	74	-19.928	1.14	160	8.4	Peak (PASS)
8	20618.05	Vertical	40.807	54	-13.193	1.14	160	8.4	Average (PASS)

REMARKS:

1. Level (dBuV) = Reading (dBuV) + Factor (dB(1/m)).
2. Factor (dB(1/m)) = Antenna Factor(AF) (dB(1/m)) + Cable Loss (dB) +Preamplifier
3. Margin value = Emission level – Limit value.
4. The emission levels of other frequencies were less than 20dB margin agains