

TEST REPORT

Applicant: Wyrestorm Technologies LLC

Address of Applicant: 23 Wood Rd, Round Lake, New York 12151, United States

Manufacturer/Factory: Shen Zhen Proitav Technology Co.,Ltd

Address of Manufacturer/Factory: 301-401, Building 16, Hejing Industrial Park, No.87, Hexiu West Road, Heping Community, Fuhai St., Baoan District, Shenzhen, China

Equipment Under Test (EUT)

Product Name: Speakerphone

Model No.: APO-210-UC(UAV-G708-A00)

Trade Mark: WyreStorm

FCC ID: 2A2CW-APO210UC

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247

Date of sample receipt: September 22, 2021

Date of Test: September 23, 2021-February 17, 2022

Date of report issued: February 18, 2022

Test Result : PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

A red circular stamp with the text "GTS Global United Technology Services Co., Ltd." around the perimeter. In the center, there is a signature in black ink that appears to read "Robinson Luo". Below the signature, there is a red star and the text "检验检测专用章" (Inspection and Testing Special Seal) and "Inspection and Testing Services".

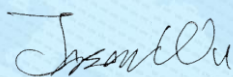
Robinson Luo
Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

2 Version

Version No.	Date	Description
00	February 18, 2022	Original

Prepared By:



Project Engineer

Date:

February 18, 2022

Check By:



Reviewer

Date:

February 18, 2022

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4 Test Summary

Test Item	Section	Result
Antenna requirement	FCC part 15.203/15.247 (c)	Pass
AC Power Line Conducted Emission	FCC part 15.207	Pass
Conducted Peak Output Power	FCC part 15.247 (b)(3)	Pass
Channel Bandwidth & 99% OCB	FCC part 15.247 (a)(2)	Pass
Power Spectral Density	FCC part 15.247 (e)	Pass
Band Edge	FCC part 15.247(d)	Pass
Spurious Emission	FCC part 15.205/15.209	Pass

Remark: Test according to ANSI C63.10:2013

Test according: KDB 662911 D01 Multiple Transmitter Output v02r01

Pass: The EUT complies with the essential requirements in the standard.

Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz-30MHz	3.1dB	(1)
Radiated Emission	30MHz-200MHz	3.8039dB	(1)
Radiated Emission	200MHz-1GHz	3.9679dB	(1)
Radiated Emission	1GHz-18GHz	4.29dB	(1)
Radiated Emission	18GHz-40GHz	3.30dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	3.44dB	(1)

Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

5 General Information

5.1 General Description of EUT

Product Name:	Speakerphone
Model No.:	APO-210-UC(UAV-G708-A00)
Serial No.:	WS2136000074
Test sample(s) ID:	GTS202109000193-1
Sample(s) Status	Engineer sample
Operation Frequency:	802.11n(HT20): 2412MHz~2462MHz
Channel numbers:	802.11n(HT20): 11
Channel separation:	5MHz
Modulation technology:	802.11n(HT20) : Orthogonal Frequency Division Multiplexing (OFDM)
Antenna Type:	Integral Antenna
Antenna gain:	ANT 1: 2dBi ANT 2: 2dBi
Power supply:	SWITCH MODE POWER SUPPLY: Model: S120-1A240500M2 Input: AC100-240V, 50/60Hz, 2.0A Output: DC24.0V, 5.0A

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Test channel	Frequency (MHz)
	802.11n(HT20)
Lowest channel	2412MHz
Middle channel	2437MHz
Highest channel	2462MHz

5.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode
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We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Pre-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.

Mode	802.11n(HT20)
Data rate	6.5Mbps

5.3 Description of Support Units

Manufacturer	Description	Model	Serial Number
Lenovo	Notebook PC	E40-80	N/A

5.4 Deviation from Standards

None.

5.5 Abnormalities from Standard Conditions

None.

5.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC—Registration No.: 381383**

Designation Number: CN5029

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files.

- **IC —Registration No.: 9079A**

CAB identifier: CN0091

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

- **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

5.7 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

Tel: 0755-27798480

Fax: 0755-27798960

6 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July. 02 2020	July. 01 2025
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June. 24 2021	June. 23 2022
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 24 2021	June. 23 2022
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 24 2021	June. 23 2022
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 24 2021	June. 23 2022
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 24 2021	June. 23 2022
9	Coaxial Cable	GTS	N/A	GTS211	June. 24 2021	June. 23 2022
10	Coaxial cable	GTS	N/A	GTS210	June. 24 2021	June. 23 2022
11	Coaxial Cable	GTS	N/A	GTS212	June. 24 2021	June. 23 2022
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 24 2021	June. 23 2022
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 24 2021	June. 23 2022
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 24 2021	June. 23 2022
15	Band filter	Amindeon	82346	GTS219	June. 24 2021	June. 23 2022
16	Power Meter	Anritsu	ML2495A	GTS540	June. 24 2021	June. 23 2022
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 24 2021	June. 23 2022
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 24 2021	June. 23 2022
19	Splitter	Agilent	11636B	GTS237	June. 24 2021	June. 23 2022
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 24 2021	June. 23 2022
21	Breitband hornantenne	SCHWARZBECK	BBHA 9170	GTS579	Oct. 17 2021	Oct. 16 2022
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 17 2021	Oct. 16 2022
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 17 2021	Oct. 16 2022
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June. 24 2021	June. 23 2022

Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.15 2019	May.14 2022
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 24 2021	June. 23 2022
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 24 2021	June. 23 2022
4	ENV216 2-L-V-NETZNACHB.DE	ROHDE&SCHWARZ	ENV216	GTS226	June. 24 2021	June. 23 2022
5	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	June. 24 2021	June. 23 2022
8	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	June. 24 2021	June. 23 2022
9	ISN	SCHWARZBECK	NTFM 8158	GTS565	June. 24 2021	June. 23 2022
10	High voltage probe	SCHWARZBECK	TK9420	GTS537	July. 09 2021	July. 08 2022

RF Conducted Test:						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	June. 24 2021	June. 23 2022
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 24 2021	June. 23 2022
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June. 24 2021	June. 23 2022
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	June. 24 2021	June. 23 2022
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	June. 24 2021	June. 23 2022
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	June. 24 2021	June. 23 2022
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	June. 24 2021	June. 23 2022
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	June. 24 2021	June. 23 2022

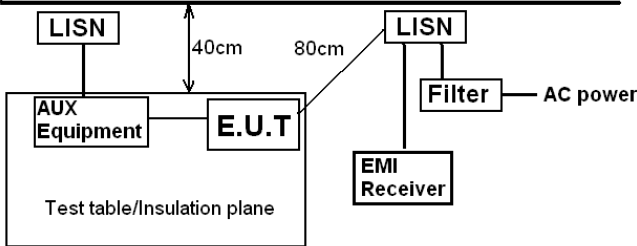
General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 24 2021	June. 23 2022
2	Barometer	ChangChun	DYM3	GTS255	June. 24 2021	June. 23 2022

7 Test results and Measurement Data

7.1 Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203 /247(c)
15.203 requirement: <p>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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.</p>	
15.247(c) (1)(i) requirement: <p>(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.</p>	
EUT Antenna:	
<i>The antenna is Integral antenna, the best case gain of the antenna is 2dBi, reference to the appendix II for details</i>	

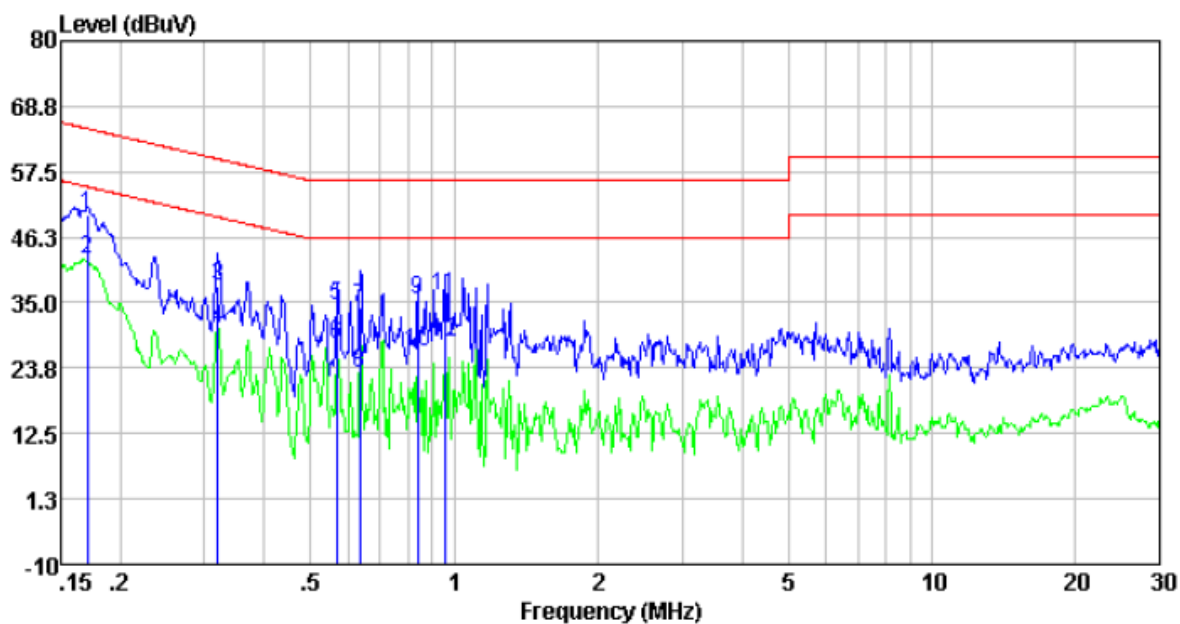
7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207					
Test Method:	ANSI C63.10:2013					
Test Frequency Range:	150KHz to 30MHz					
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto					
Limit:	Frequency range (MHz)		Limit (dBuV)			
			Quasi-peak		Average	
	0.15-0.5		66 to 56*		56 to 46*	
	0.5-5		56		46	
	5-30		60		50	
* Decreases with the logarithm of the frequency.						
Test setup:	<div><p style="text-align: center;">Reference Plane</p><p>Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p></div>					
Test procedure:	<div><div>1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.</div><div>2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).</div><div>3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.</div></div>					
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	AC 120V, 60Hz					
Test results:	Pass					

Remark: Both high and low voltages have been tested to show only the worst low voltage test data.

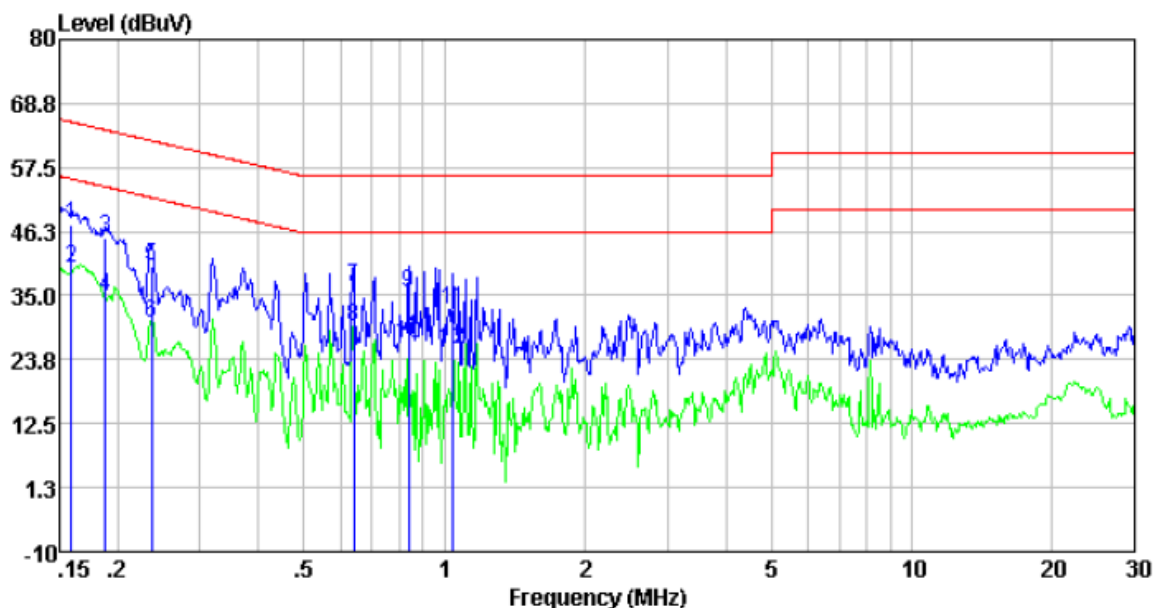
Measurement data

Line:



Freq	Reading	LISN/ISN	Cable		Limit	Over	
level	factor	loss	Level	level	limit	Remark	
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
0.17	39.75	10.40	0.01	50.16	64.94	-14.78	QP
0.17	32.16	10.40	0.01	42.57	54.94	-12.37	Average
0.32	27.56	10.39	0.01	37.96	59.71	-21.75	QP
0.32	20.22	10.39	0.01	30.62	49.71	-19.09	Average
0.57	24.08	10.29	0.02	34.39	56.00	-21.61	QP
0.57	17.65	10.29	0.02	27.96	46.00	-18.04	Average
0.63	23.84	10.28	0.02	34.14	56.00	-21.86	QP
0.63	12.60	10.28	0.02	22.90	46.00	-23.10	Average
0.84	25.12	10.23	0.03	35.38	56.00	-20.62	QP
0.84	16.27	10.23	0.03	26.53	46.00	-19.47	Average
0.95	26.06	10.21	0.03	36.30	56.00	-19.70	QP
0.95	17.92	10.21	0.03	28.16	46.00	-17.84	Average

Neutral:

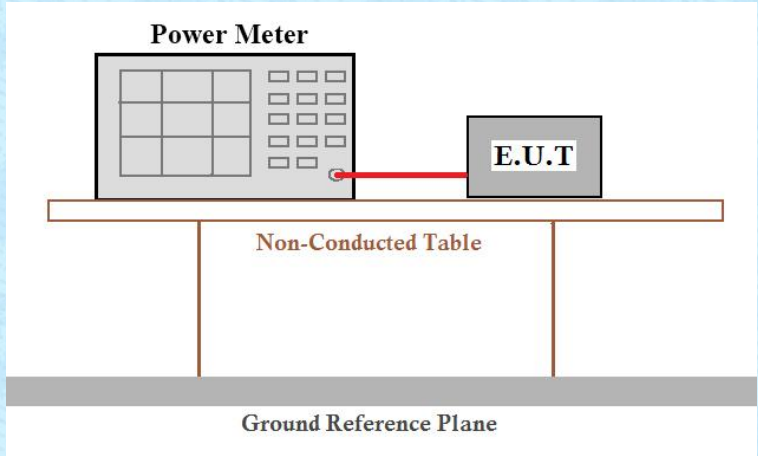


Freq	Reading	LISN/ISN	Cable	Level	Limit	Over	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
0.16	37.02	10.40	0.01	47.43	65.52	-18.09	QP
0.16	29.54	10.40	0.01	39.95	55.52	-15.57	Average
0.19	34.64	10.40	0.01	45.05	64.11	-19.06	QP
0.19	24.35	10.40	0.01	34.76	54.11	-19.35	Average
0.24	29.82	10.40	0.01	40.23	62.22	-21.99	QP
0.24	19.92	10.40	0.01	30.33	52.22	-21.89	Average
0.64	26.15	10.27	0.02	36.44	56.00	-19.56	QP
0.64	19.15	10.27	0.02	29.44	46.00	-16.56	Average
0.84	25.09	10.23	0.03	35.35	56.00	-20.65	QP
0.84	16.22	10.23	0.03	26.48	46.00	-19.52	Average
1.04	22.41	10.20	0.03	32.64	56.00	-23.36	QP
1.04	15.37	10.20	0.03	25.60	46.00	-20.40	Average

Notes:

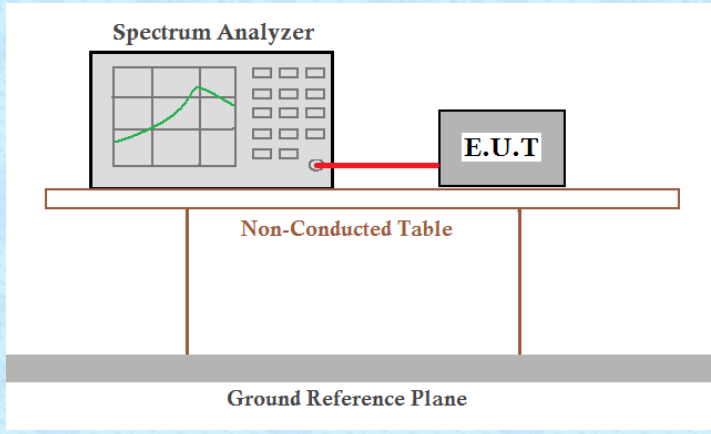
1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss
4. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

7.3 Conducted Peak Output Power

Test Requirement :	FCC Part15 C Section 15.247 (b)(3)
Test Method :	KDB558074 D01 15.247 Meas Guidance v05r02
Limit:	30dBm
Test setup:	 <p>The diagram illustrates the test setup. A 'Power Meter' is connected to an 'E.U.T.' (Equipment Under Test) by a red cable. Both the power meter and the E.U.T. are positioned on a 'Non-Conducted Table'. This table is supported by a 'Ground Reference Plane'.</p>
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

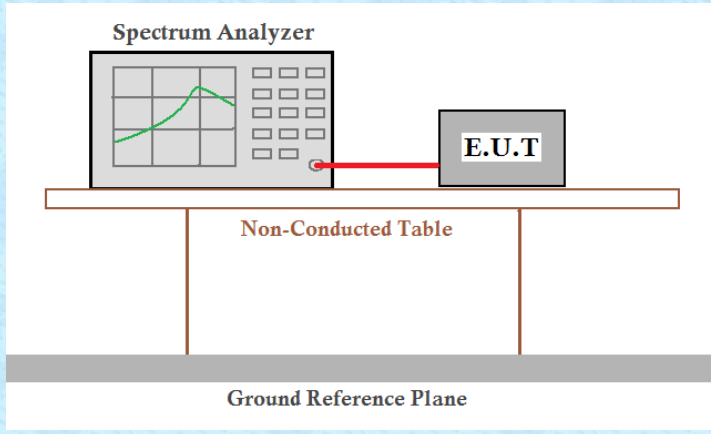
Measurement Data: The detailed test data see Appendix for WIFI_2.4G.

7.4 Channel Bandwidth & 99% Occupancy Bandwidth

Test Requirement :	FCC Part15 C Section 15.247 (a)(2)
Test Method :	KDB558074 D01 15.247 Meas Guidance v05r02
Limit:	>500KHz
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer, shown with a grid and a green signal trace, is connected to an E.U.T (Equipment Under Test) by a red cable. Both the Spectrum Analyzer and the E.U.T are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane, represented by a grey shaded area.</p>
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data: The detailed test data see Appendix for WIFI_2.4G.

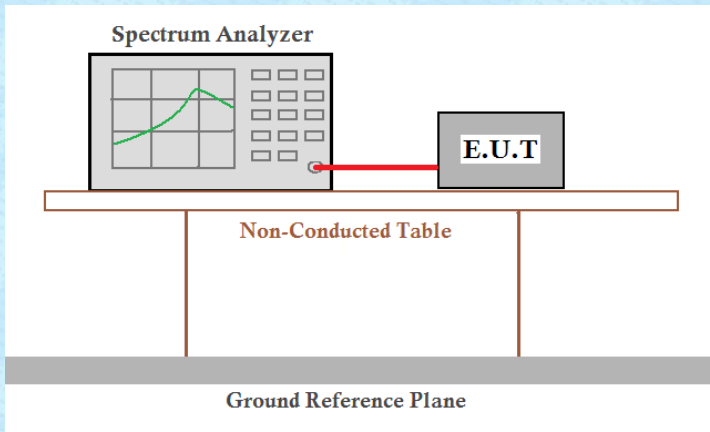
7.5 Power Spectral Density

Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	KDB558074 D01 15.247 Meas Guidance v05r02
Limit:	8dBm/3kHz
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.</p>
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data: The detailed test data see Appendix for WIFI_2.4G.

7.6 Spurious Emission Spurious Emission in Non-restricted & restricted Bands

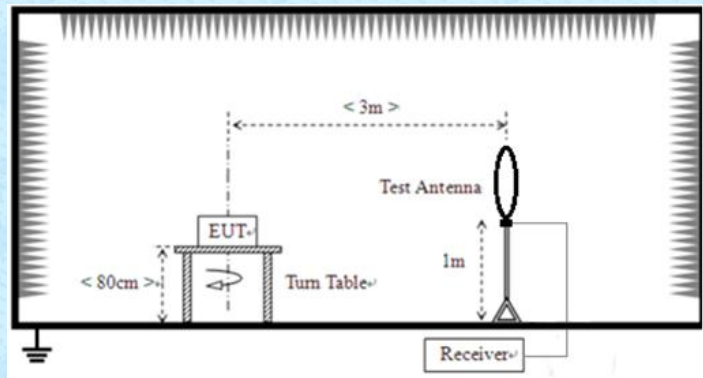
7.6.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB558074 D01 15.247 Meas Guidance v05r02
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by two vertical legs and sits on a Ground Reference Plane.</p>
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

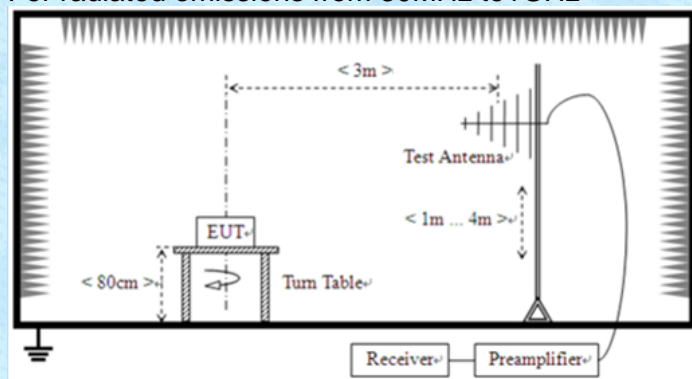
Measurement Data: The detailed test data see Appendix for WIFI_2.4G.

7.6.2 Radiated Emission Method

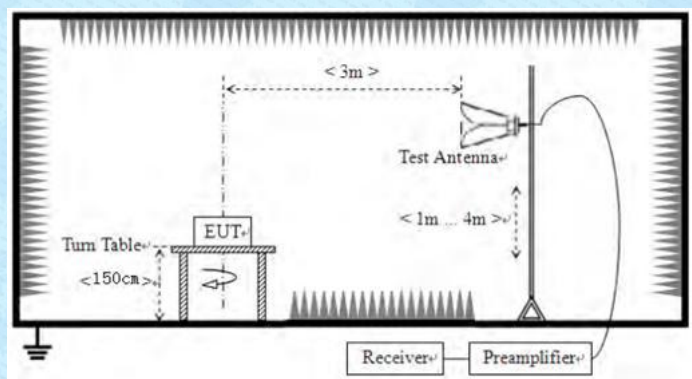
Test Requirement:	FCC Part15 C Section 15.209																												
Test Method:	ANSI C63.10: 2013																												
Test Frequency Range:	9kHz to 25GHz																												
Test site:	Measurement Distance: 3m																												
Receiver setup:	Frequency	Detector	RBW	VBW	Value																								
	9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak																								
	150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak																								
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak																								
	Above 1GHz	Peak	1MHz	3MHz	Peak																								
		Peak	1MHz	10Hz	Average																								
FCC Limit:	<table><tr><th>Frequency (MHz)</th><th>Field strength (microvolts/meter)</th><th>Measurement distance (meters)</th></tr><tr><td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td></tr><tr><td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td></tr><tr><td>1.705-30.0</td><td>30</td><td>30</td></tr><tr><td>30-88</td><td>100**</td><td>3</td></tr><tr><td>88-216</td><td>150**</td><td>3</td></tr><tr><td>216-960</td><td>200**</td><td>3</td></tr><tr><td>Above 960</td><td>500</td><td>3</td></tr></table>					Frequency (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
	Frequency (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																											
	The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.																												
IC Limit:	<p>Table 5 – General field strength limits at frequencies above 30 MHz</p> <table><tr><th>Frequency (MHz)</th><th>Field strength (µV/m at 3 m)</th></tr><tr><td>30 – 88</td><td>100</td></tr><tr><td>88 – 216</td><td>150</td></tr><tr><td>216 – 960</td><td>200</td></tr><tr><td>Above 960</td><td>500</td></tr></table>					Frequency (MHz)	Field strength (µV/m at 3 m)	30 – 88	100	88 – 216	150	216 – 960	200	Above 960	500														
	Frequency (MHz)	Field strength (µV/m at 3 m)																											
30 – 88	100																												
88 – 216	150																												
216 – 960	200																												
Above 960	500																												
	<p>Table 6 – General field strength limits at frequencies below 30 MHz</p> <table><tr><th>Frequency</th><th>Magnetic field strength (H-Field) (µA/m)</th><th>Measurement distance (m)</th></tr><tr><td>9 - 490 kHz ¹</td><td>6.37/F (F in kHz)</td><td>300</td></tr><tr><td>490 - 1705 kHz</td><td>63.7/F (F in kHz)</td><td>30</td></tr><tr><td>1.705 - 30 MHz</td><td>0.08</td><td>30</td></tr></table> <p>Note 1: The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.</p>					Frequency	Magnetic field strength (H-Field) (µA/m)	Measurement distance (m)	9 - 490 kHz ¹	6.37/F (F in kHz)	300	490 - 1705 kHz	63.7/F (F in kHz)	30	1.705 - 30 MHz	0.08	30												
Frequency	Magnetic field strength (H-Field) (µA/m)	Measurement distance (m)																											
9 - 490 kHz ¹	6.37/F (F in kHz)	300																											
490 - 1705 kHz	63.7/F (F in kHz)	30																											
1.705 - 30 MHz	0.08	30																											
Test setup:	For radiated emissions from 9kHz to 30MHz																												



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



Test Procedure:

1. The EUT was placed on the top of a rotating table (0.8m for below 1G and 1.5m for above 1G) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna height 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.

	<p>4. 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 rota table was turned from 0 degrees to 360 degrees to find the maximum reading.</p> <p>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</p>					
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test voltage:	AC120V 60Hz					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	AC 120V, 60Hz					
Test results:	Pass					

Remarks:

- Only the worst case Main Antenna test data.
- Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.

Measurement data:

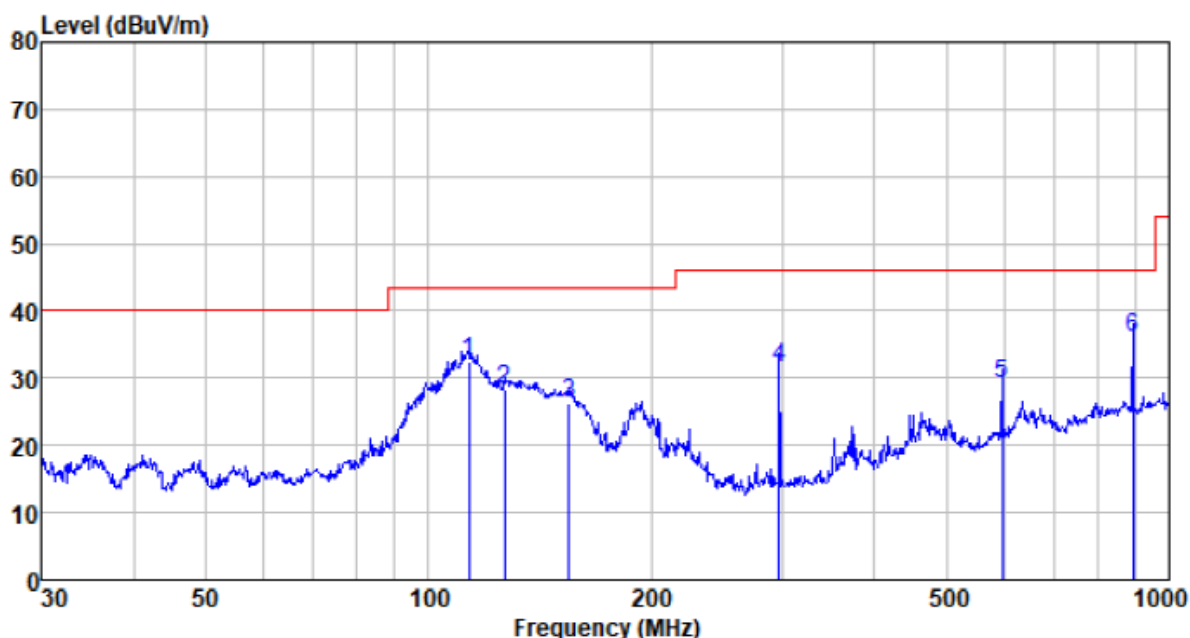
■ 9kHz~30MHz

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o), the test result no need to reported.

All antennas have test, only the worst case ANT 1 report.

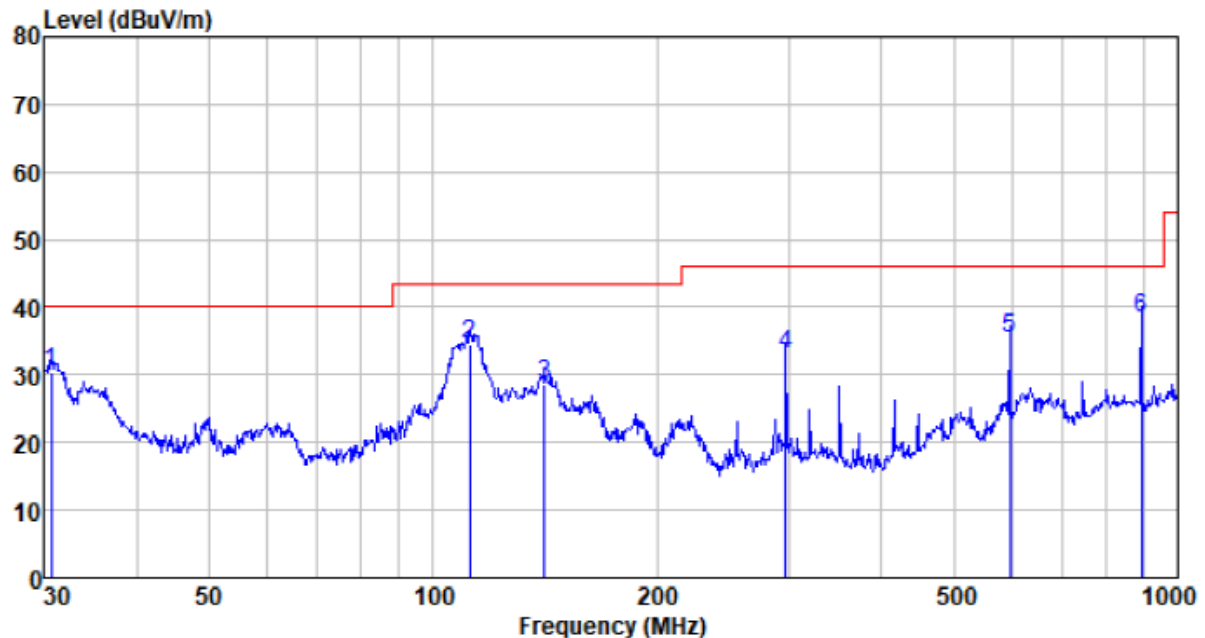
■ Below 1GHz

Test channel:	Lowest	Polarization:	Horizontal
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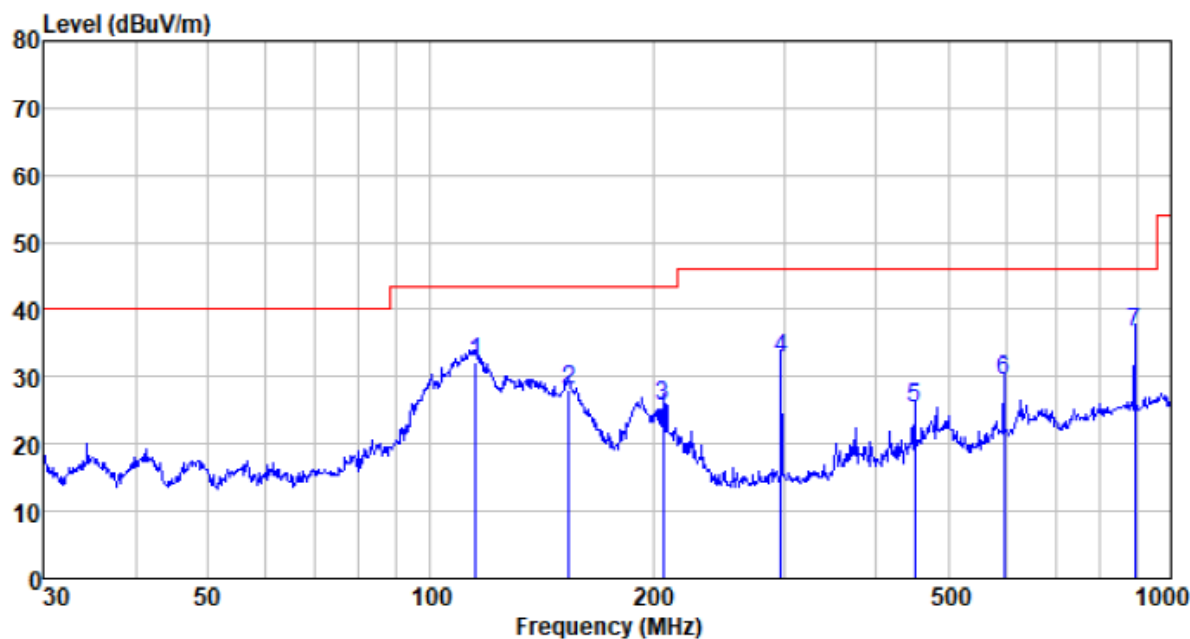
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
113.316	57.68	10.31	1.31	36.83	32.47	43.50	-11.03	QP
126.772	52.33	11.42	1.41	36.93	28.23	43.50	-15.27	QP
154.821	48.96	12.79	1.60	37.10	26.25	43.50	-17.25	QP
297.224	54.32	12.32	2.35	37.42	31.57	46.00	-14.43	QP
595.133	43.93	19.11	3.70	37.54	29.20	46.00	-16.80	QP
893.857	46.00	22.91	4.83	37.60	36.14	46.00	-9.86	QP

Test channel:	Lowest	Polarization:	Vertical
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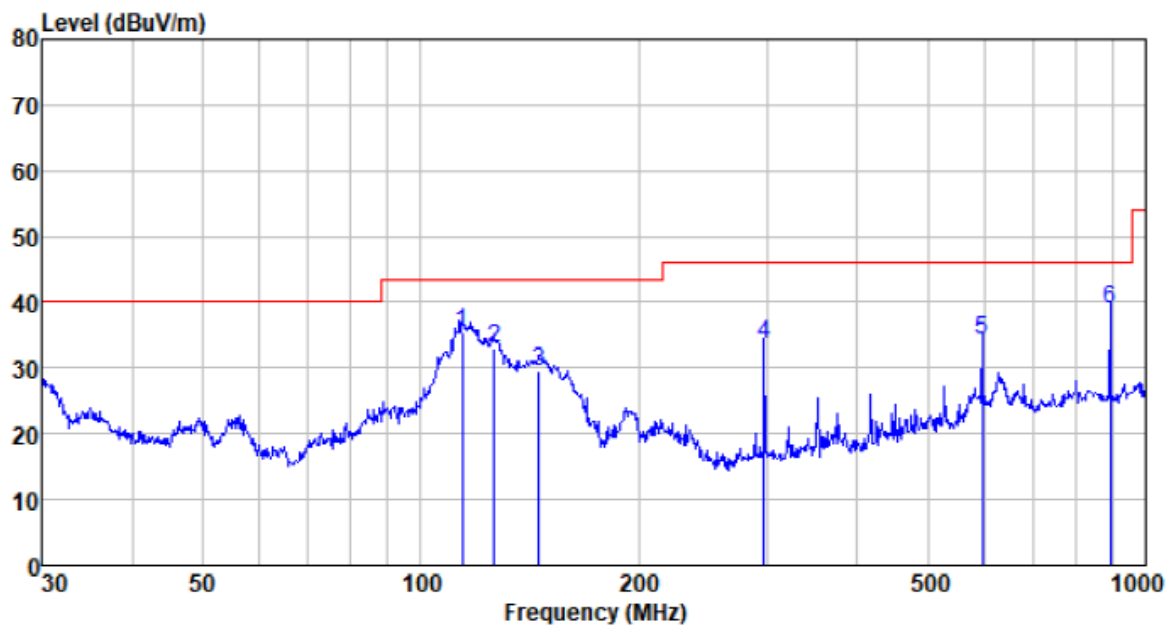
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
30.745	52.65	12.22	0.56	35.06	30.37	40.00	-9.63	QP
112.131	59.92	10.20	1.30	36.82	34.60	43.50	-8.90	QP
141.330	52.11	12.12	1.51	37.02	28.72	43.50	-14.78	QP
297.224	55.69	12.32	2.35	37.42	32.94	46.00	-13.06	QP
595.133	50.05	19.11	3.70	37.54	35.32	46.00	-10.68	QP
893.857	48.15	22.91	4.83	37.60	38.29	46.00	-7.71	QP

Test channel:	Middle	Polarization:	Horizontal
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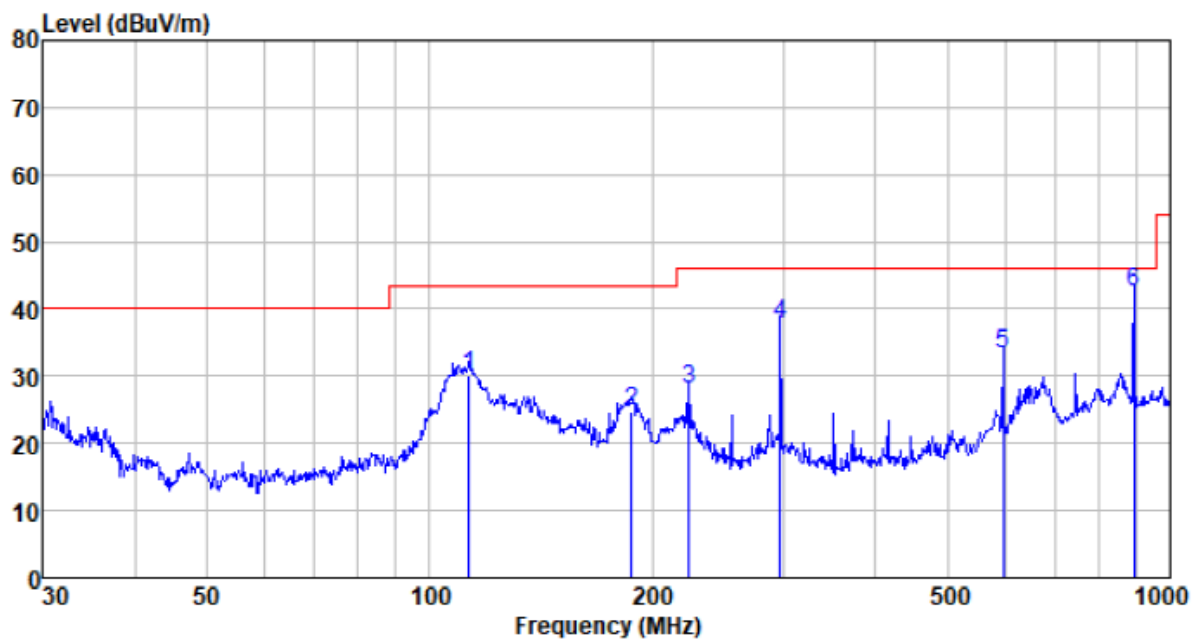
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
115.321	57.07	10.52	1.32	36.85	32.06	43.50	-11.44	QP
153.739	50.73	12.79	1.59	37.10	28.01	43.50	-15.49	QP
206.398	51.97	9.06	1.88	37.34	25.57	43.50	-17.93	QP
297.224	55.61	12.32	2.35	37.42	32.86	46.00	-13.14	QP
451.135	43.75	16.02	3.09	37.51	25.35	46.00	-20.65	QP
595.133	44.21	19.11	3.70	37.54	29.48	46.00	-16.52	QP
893.857	46.51	22.91	4.83	37.60	36.65	46.00	-9.35	QP

Test channel:	Middle	Polarization:	Vertical
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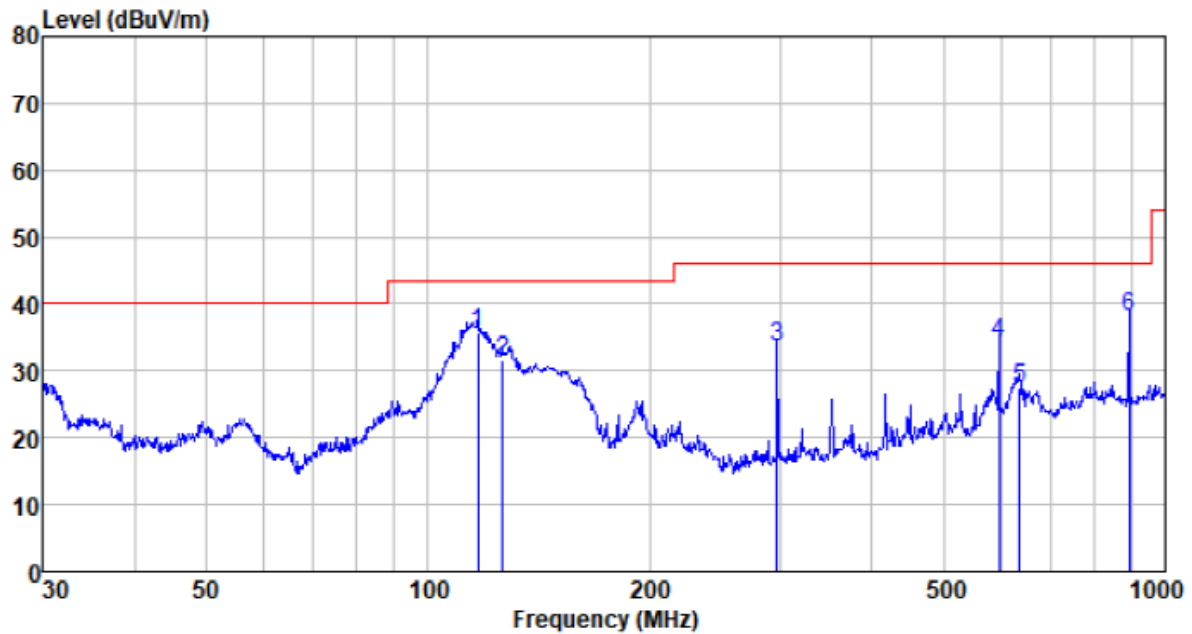
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
114.114	60.50	10.40	1.31	36.84	35.37	43.50	-8.13	QP
126.329	57.07	11.40	1.41	36.93	32.95	43.50	-10.55	QP
145.351	52.58	12.44	1.54	37.05	29.51	43.50	-13.99	QP
297.224	56.31	12.32	2.35	37.42	33.56	46.00	-12.44	QP
595.133	48.83	19.11	3.70	37.54	34.10	46.00	-11.90	QP
893.857	48.72	22.91	4.83	37.60	38.86	46.00	-7.14	QP

Test channel:	Highest	Polarization:	Horizontal
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Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
112.920	55.39	10.27	1.30	36.83	30.13	43.50	-13.37	QP
187.096	50.27	10.16	1.78	37.27	24.94	43.50	-18.56	QP
223.733	54.10	9.17	1.98	37.35	27.90	46.00	-18.10	QP
297.224	60.61	12.32	2.35	37.42	37.86	46.00	-8.14	QP
595.133	48.21	19.11	3.70	37.54	33.48	46.00	-12.52	QP
893.857	52.30	22.91	4.83	37.60	42.44	46.00	-3.56	QP

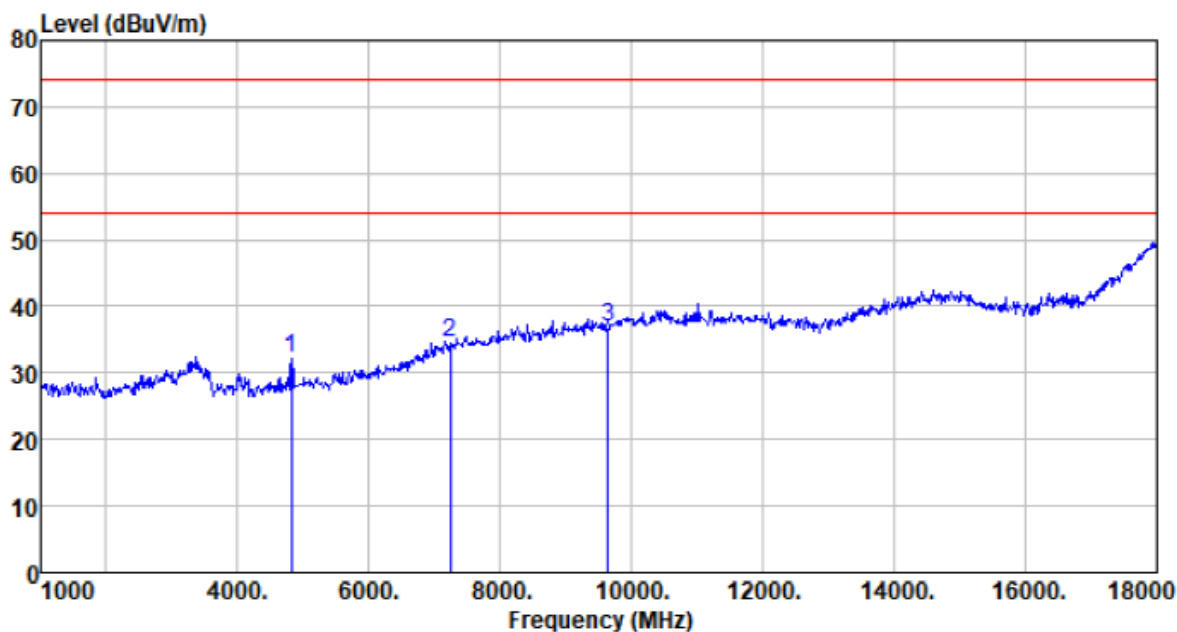
Test channel:	Highest	Polarization:	Vertical
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Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
116.950	60.45	10.68	1.34	36.86	35.61	43.50	-7.89	QP
126.329	55.74	11.40	1.41	36.93	31.62	43.50	-11.88	QP
297.224	56.33	12.32	2.35	37.42	33.58	46.00	-12.42	QP
595.133	49.02	19.11	3.70	37.54	34.29	46.00	-11.71	QP
633.907	41.42	19.79	3.85	37.57	27.49	46.00	-18.51	QP
893.857	48.06	22.91	4.83	37.60	38.20	46.00	-7.80	QP

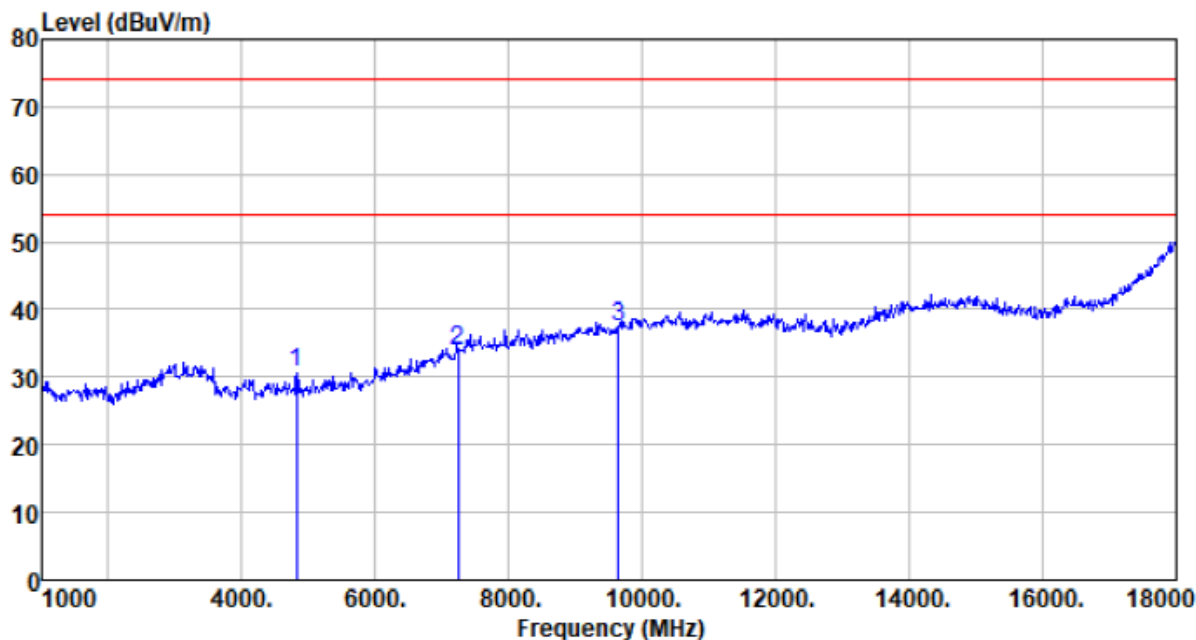
■ Above 1GHz

Test channel:	Lowest	Polarization:	Horizontal
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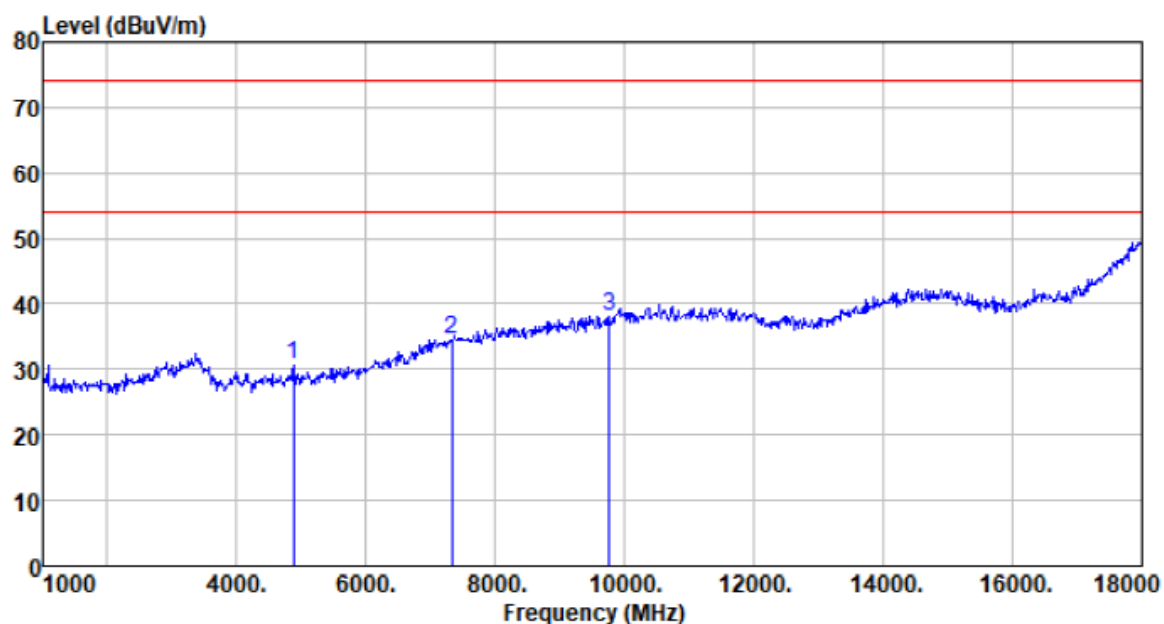
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4824.000	34.18	31.22	4.63	37.73	32.30	74.00	-41.70	Peak
7236.000	27.44	36.25	6.52	35.62	34.59	74.00	-39.41	Peak
9648.000	25.89	37.97	7.99	34.95	36.90	74.00	-37.10	Peak

Test channel:	Lowest	Polarization:	Vertical
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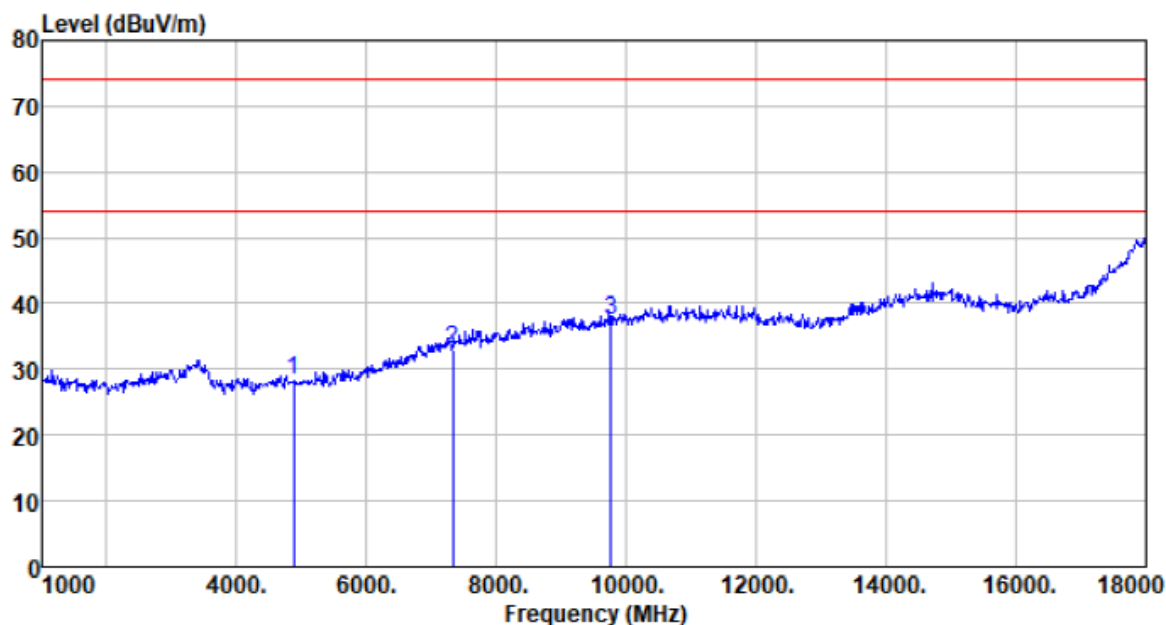
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4824.000	32.56	31.22	4.63	37.73	30.68	74.00	-43.32	Peak
7236.000	26.86	36.25	6.52	35.62	34.01	74.00	-39.99	Peak
9648.000	26.55	37.97	7.99	34.95	37.56	74.00	-36.44	Peak

Test channel:	Middle	Polarization:	Horizontal
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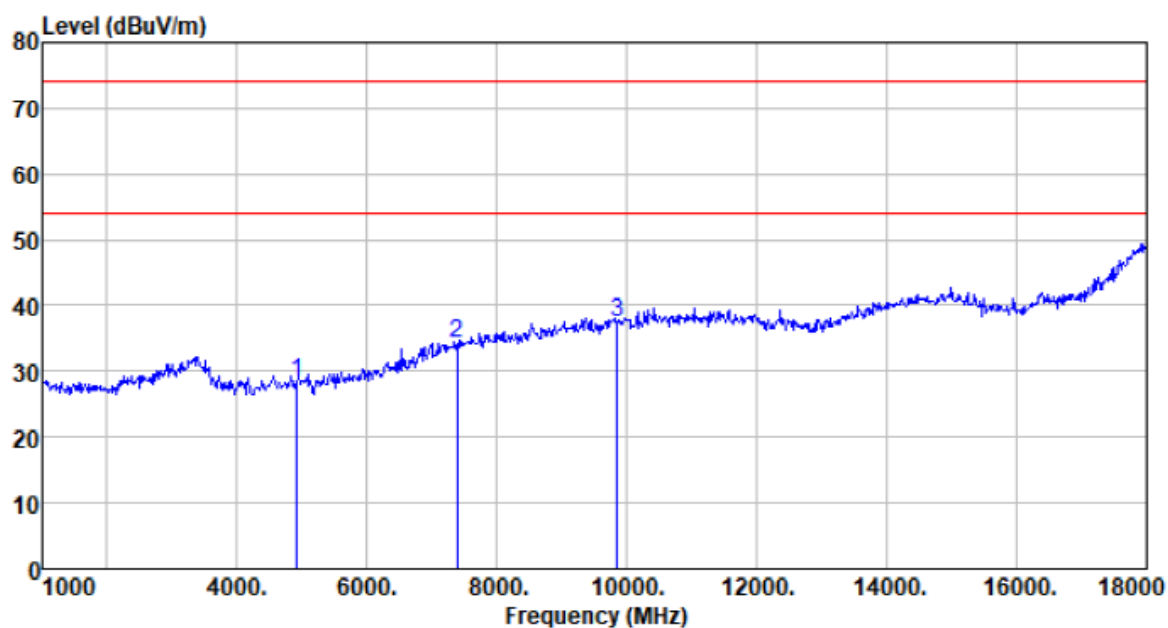
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamplifier factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4884.000	32.59	31.33	4.69	37.76	30.85	74.00	-43.15	Peak
7326.000	26.96	36.43	6.63	35.60	34.42	74.00	-39.58	Peak
9768.000	27.09	38.13	8.03	35.05	38.20	74.00	-35.80	Peak

Test channel:	Middle	Polarization:	Vertical
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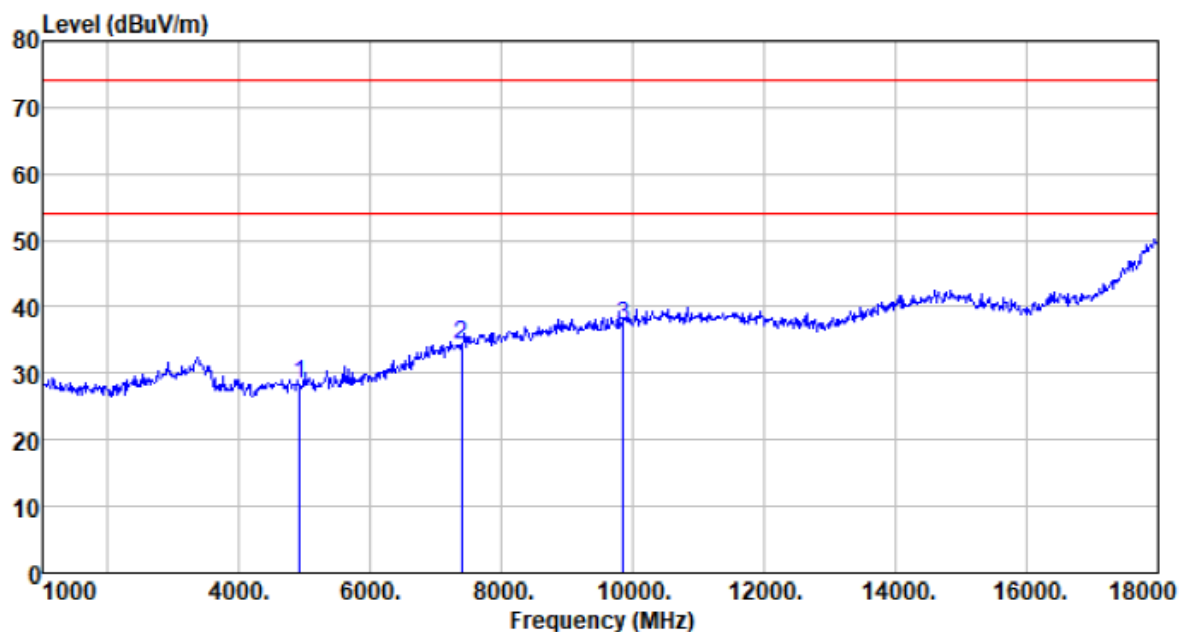
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4884.000	29.96	31.33	4.69	37.76	28.22	74.00	-45.78	Peak
7326.000	25.67	36.43	6.63	35.60	33.13	74.00	-40.87	Peak
9768.000	26.44	38.13	8.03	35.05	37.55	74.00	-36.45	Peak

Test channel:	Highest	Polarization:	Horizontal
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Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4924.000	29.91	31.39	4.75	37.77	28.28	74.00	-45.72	Peak
7386.000	26.43	36.57	6.71	35.58	34.13	74.00	-39.87	Peak
9848.000	26.25	38.20	8.06	35.09	37.42	74.00	-36.58	Peak

Test channel:	Highest	Polarization:	Vertical
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Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4924.000	29.92	31.39	4.75	37.77	28.29	74.00	-45.71	Peak
7386.000	26.67	36.57	6.71	35.58	34.37	74.00	-39.63	Peak
9848.000	26.16	38.20	8.06	35.09	37.33	74.00	-36.67	Peak

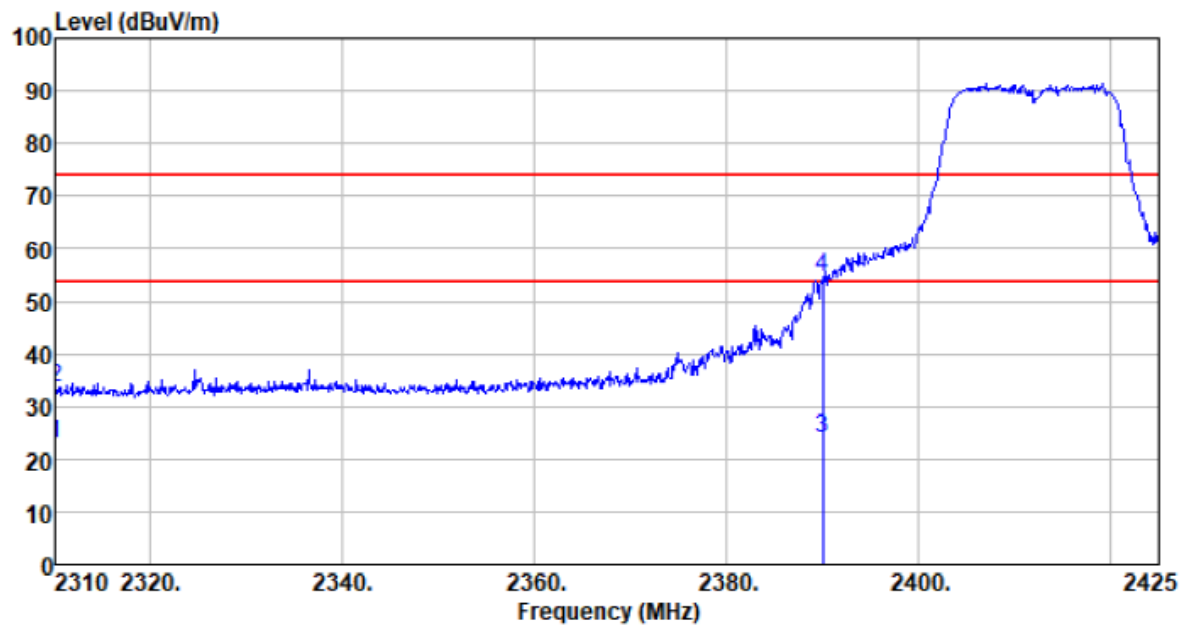
Remark:

- 1 Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- 2 “*”, means this data is the too weak instrument of signal is unable to test.
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

■ Unwanted Emissions in restricted Frequency Bands

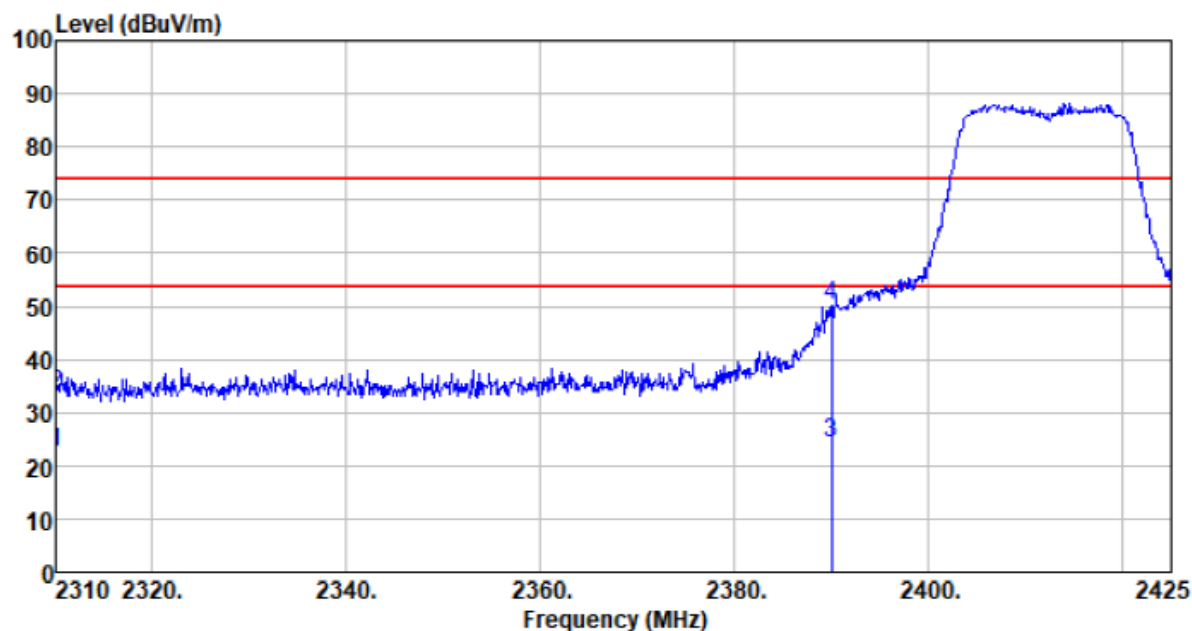
ANT 1:

Test channel:	Lowest	Polarization:	Horizontal
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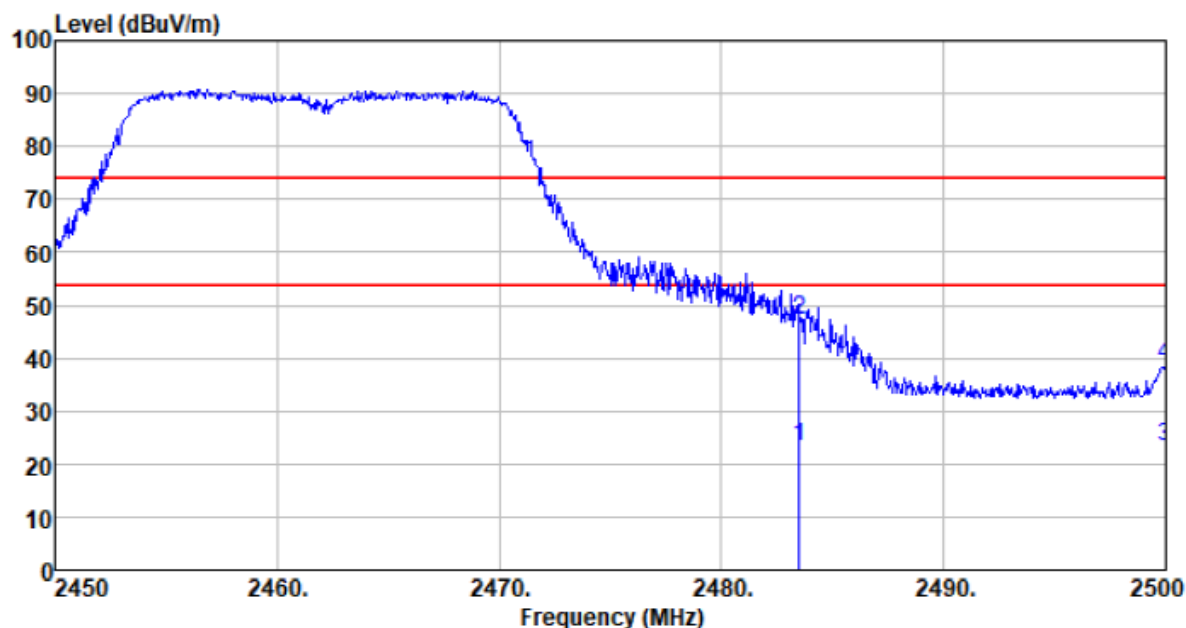
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	31.58	27.14	2.81	38.64	22.89	54.00	-31.11	Average
2310.000	42.39	27.14	2.81	38.64	33.70	74.00	-40.30	Peak
2390.000	32.66	27.37	2.91	38.84	24.10	54.00	-29.90	Average
2390.000	63.30	27.37	2.91	38.84	54.74	74.00	-19.26	Peak

Test channel:	Lowest	Polarization:	Vertical
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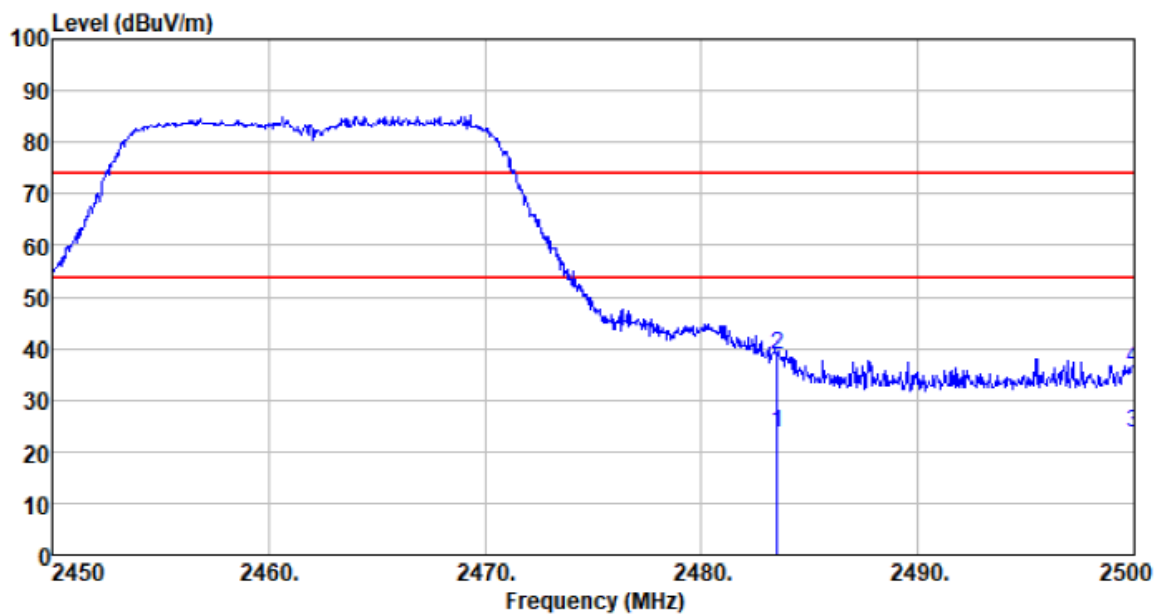
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	31.25	27.14	2.81	38.64	22.56	54.00	-31.44	Average
2310.000	42.19	27.14	2.81	38.64	33.50	74.00	-40.50	Peak
2390.000	32.84	27.37	2.91	38.84	24.28	54.00	-29.72	Average
2390.000	58.57	27.37	2.91	38.84	50.01	74.00	-23.99	Peak

Test channel:	Highest	Polarization:	Horizontal
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Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2483.500	31.58	27.66	2.99	39.06	23.17	54.00	-30.83	Average
2483.500	55.54	27.66	2.99	39.06	47.13	74.00	-26.87	Peak
2500.000	31.58	27.70	3.01	39.10	23.19	54.00	-30.81	Average
2500.000	47.00	27.70	3.01	39.10	38.61	74.00	-35.39	Peak

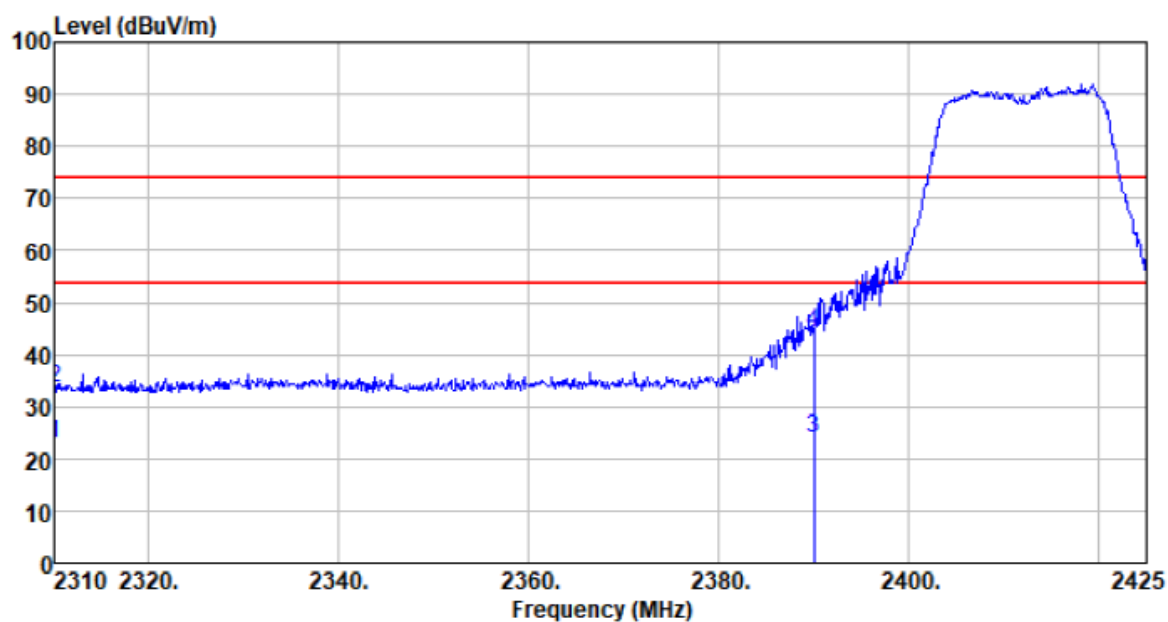
Test channel:	Highest	Polarization:	Vertical
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Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2483.500	31.98	27.66	2.99	39.06	23.57	54.00	-30.43	Average
2483.500	47.11	27.66	2.99	39.06	38.70	74.00	-35.30	Peak
2500.000	31.87	27.70	3.01	39.10	23.48	54.00	-30.52	Average
2500.000	44.47	27.70	3.01	39.10	36.08	74.00	-37.92	Peak

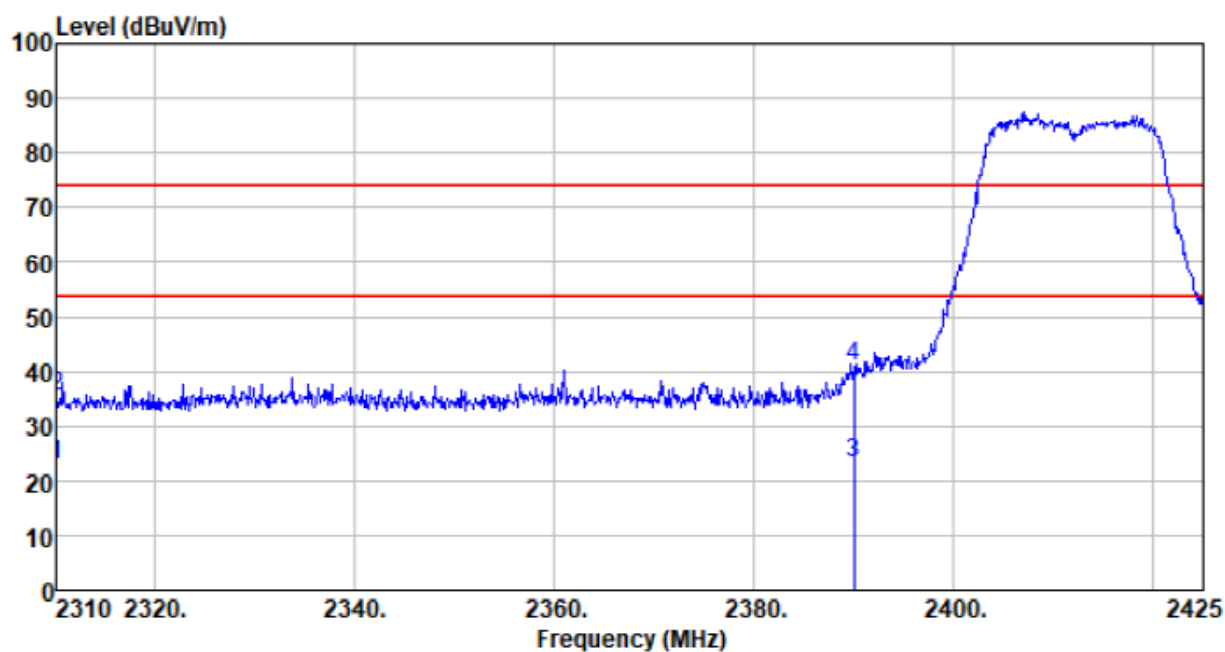
ANT 2:

Test channel:	Lowest	Polarization:	Horizontal
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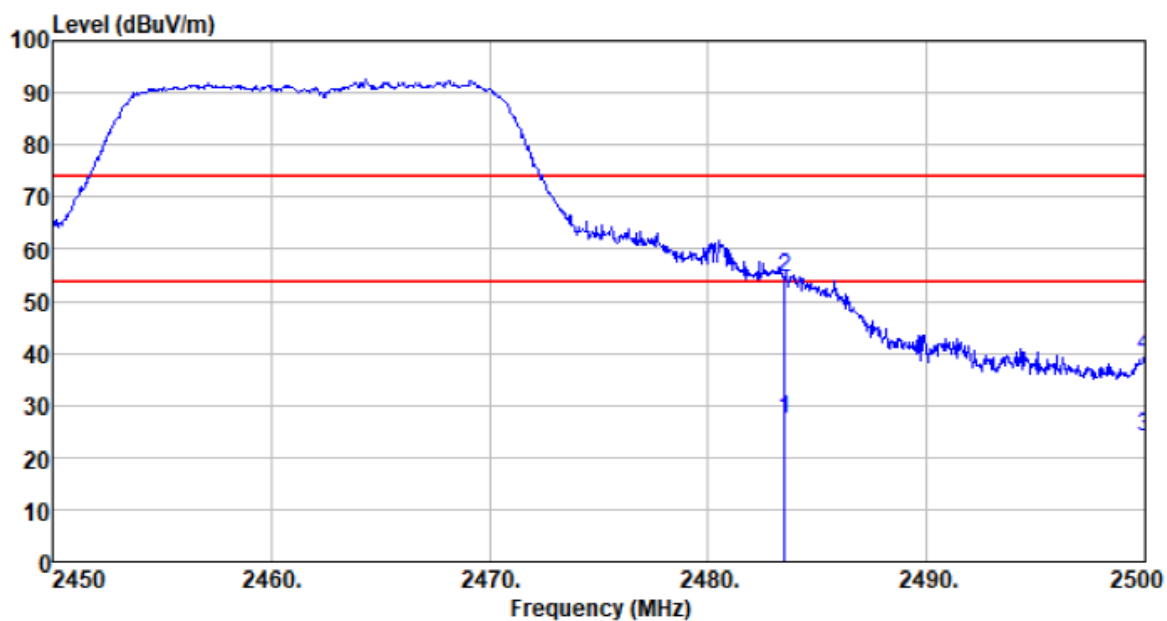
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	31.68	27.14	2.81	38.64	22.99	54.00	-31.01	Average
2310.000	42.40	27.14	2.81	38.64	33.71	74.00	-40.29	Peak
2390.000	32.59	27.37	2.91	38.84	24.03	54.00	-29.97	Average
2390.000	52.85	27.37	2.91	38.84	44.29	74.00	-29.71	Peak

Test channel:	Lowest	Polarization:	Vertical
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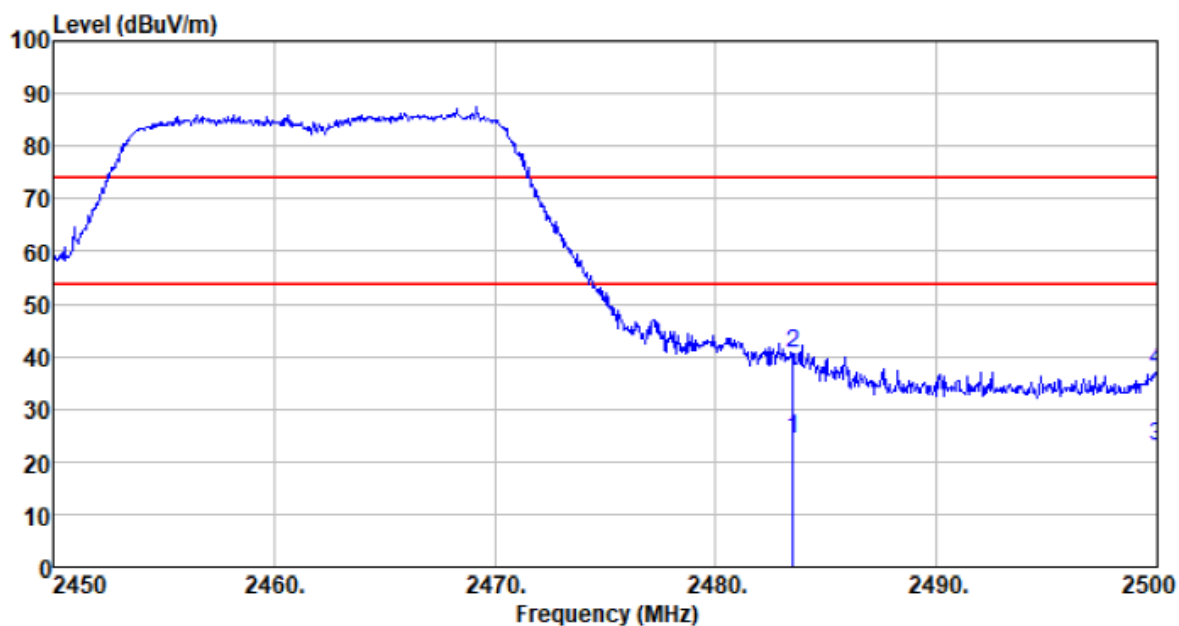


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	31.57	27.14	2.81	38.64	22.88	54.00	-31.12	Average
2310.000	44.18	27.14	2.81	38.64	35.49	74.00	-38.51	Peak
2390.000	31.99	27.37	2.91	38.84	23.43	54.00	-30.57	Average
2390.000	49.50	27.37	2.91	38.84	40.94	74.00	-33.06	Peak

Test channel:	Highest	Polarization:	Horizontal
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Test channel:	Highest	Polarization:	Vertical
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Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2483.500	32.59	27.66	2.99	39.06	24.18	54.00	-29.82	Average
2483.500	48.93	27.66	2.99	39.06	40.52	74.00	-33.48	Peak
2500.000	31.26	27.70	3.01	39.10	22.87	54.00	-31.13	Average
2500.000	45.52	27.70	3.01	39.10	37.13	74.00	-36.87	Peak

Remarks:

1. Only the worst case Main Antenna test data.
2. The pre-test were performed on lowest, middle and highest frequencies, only the worst case's (lowest and highest frequencies) data was showed.
3. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

-----End-----