RF TEST REPORT

Report number		RAPA24-O-003
Applicant	Name	NZIA Connect Inc.
	Logo	N/A
	Address	#1302, 286, Beotkkot-ro, Geumcheon-gu, Seoul, Republic of Korea
Manufacturer	Name	NZIA Connect Inc.
	Address	#1302, 286, Beotkkot-ro, Geumcheon-gu, Seoul, Republic of Korea
Type of equipment		TVWS Wireless Networking Radio System
Basic model name		NZC-WS20
Multi model name		N/A
Serial number		N/A
FCC ID		2AUON-NZC-WS20
Test duration		Nov 16, 2023 to Feb 6, 2024
Date of issue		Feb 8, 2024
Total page		32 Pages (including this page)

SUMMARY

The equipment complies with the regulation; FCC Part 15 Subpart H

This test report only contains the result of a single test of the sample supplied for the examination.
It is not a general valid assessment of the features of the respective products of the mass-production.

Feb 8, 2028

Tested by MinGu Ji
Tester

Feb 8, 2024

Reviewed by Wooyeol- Ryu
Executive Manager

Test Report Version History

Version	Date	Reason for revision
1.0	Feb 8, 2024	Original Document

CONTENTS

1. Description of EUT

1.1 Applicant

• Company name : NZIA Connect Inc.
• Address : #1302, 286, Beotkkot-ro, Geumcheon-gu, Seoul, Republic of Korea
• Contact person : Lee Nam Ku / Senior Researcher / kevin@nzia.kr
• Phone/Fax : +82-70-4282-4700 / +82-2-851-3873

1.2 Manufacturer

• Company name : NZIA Connect Inc.
• Address : #1302, 286, Beotkkot-ro, Geumcheon-gu, Seoul, Republic of Korea
• Phone/Fax : +82-70-4282-4700 / +82-2-851-3873

1.3 Basic description

• Product name : TVWS Wireless Networking Radio System
• Basic model name : NZC-WS20
• Alternative model name : N/A

1.4 General description

• EQUIPMENT CLASS : WGF – White Space Device with Geo-location - Fixed

• Frequency Range : 470 MHz ~ 698 MHz
• Output Power : 16.03 dBm
• Modulation Type : QPSK
• Antenna Type : Patch Antenna
• Antenna Gain : 8.28 dBi
• Power Supply : AC 110.0 ~ 230.0 V

Start of Frequency range, MHz	End of Frequency range, MHz	Frequency range Bandwidth, MHz	Channel size, MHz	Low channel	Mid channel	High channel
470	698	228	6	473	587	695

1.5 Alternative type(s)/model(s)

There is no alternative type(s) and/or model(s).

2. General information of test

2.1 Test standards and results

Applied Standards : FCC Part 15 Subpart H		
Section	**Description of Test**	**Result**
ANSI 63.10 6.9.3	99 % Occupied Bandwidth	Pass
15.709 (b) (ii)	OUTPUT POWER AND POWER SPECTRAL DENSITY	Pass
15.709 (d)	BAND-EDGE and ADJACENT CHANNEL EMISSIONS	Pass
15.709 (d)	Radiated Emission which fall in the Restricted Band	Pass
15.207	Conducted Limits	Pass
15.209	Radiated Emission Limits	Pass
15.203	Antenna Requirement	Pass

2.2 Description of EUT during the test

During the test, keep the EUT in continuously transmitting mode.
There was no mechanical or circuitry modification to improve RF and spurious characteristic, and any RF and spurious suppression device(s) was not added against the device tested.
The EUT was moved throughout the X, Y, and Z axis and worst case data was recorded in this report.

2.3 Test configuration

• Type of peripheral equipment used

Model	Manufacturer	Description	Connected to
650G1	HP	Notebook	EUT
PA-1900-32HT	LITE-ON TECHNOLOGY(CHANGZHOU_Co., Ltd.	Power Adapter	Notebook

2.4 Test Facility

• FCC Registration No: 927453
• IC Company address code: 9355B
• RRA Designation Number: KR0027

• Place of Test
Anyang Test Site(RF Test Room)
#101 & B104 Anyang Megavalley, 268, Hagui-ro, Dongan-gu, Anyang-si, Gyeonggi-do, 14056, Korea

2.5 PRELIMINARY TEST

• Product description and theory of operation

- The TVWS base station is a outdoor unit that transmits independent carriers. Each carrier provides up to 32 Mbps by TVWS channels. The base station is deployed with an external SISO antenna. It is connected to the network through a SFP with AC input. The base station includes an GPS an external antenna. The base station main features include up to 32 Mbps throughput, up to 256 QAM modulation rates in 6 MHz channel bandwidths. The TVWS subscriber unit delivers up to 32 Mbps and includes a directional integrated flat panel antenna for quick and easy installation. TVWS is highly robust, a mandatory requirement for maintaining low operational costs in remote rural networks. The TVWS incorporates an embedded GPS, enabling dynamic spectrum allocation according to the regulation.

2.5.1 AC Power line Conducted Emissions Tests

Operation Mode	The Worse operating condition (Please check one only)
Transmitting mode.	X

2.5.2 General Radiated Emissions Tests

During Preliminary Tests, the following operating modes were investigated

Operation Mode	The Worse operating condition (Please check one only)
Transmitting mode.	X

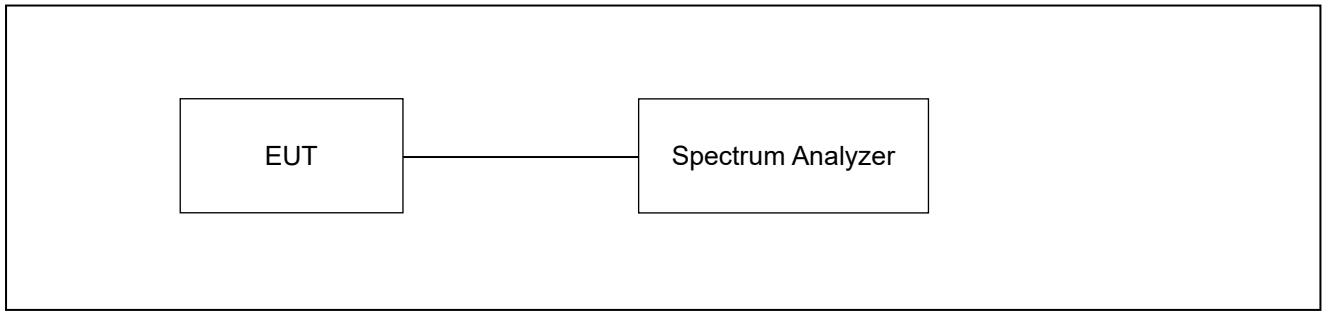
3. Measurement data

3.1 Occupied bandwidth

3.1.1 Requirement

- FCC Part15 subpart H , ANSI 63.10 6.9.3

3.1.2 Test Procedure



The occupied bandwidth or the “99% emission bandwidth” is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained.

Set the analyzer as follows for measuring 99% BW:

1. Set RBW to 1-5 % of OBW
2. Set the VBW ≥ [3 × RBW].
3. Detector = peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Use instrument 99% BW function to measure BW.

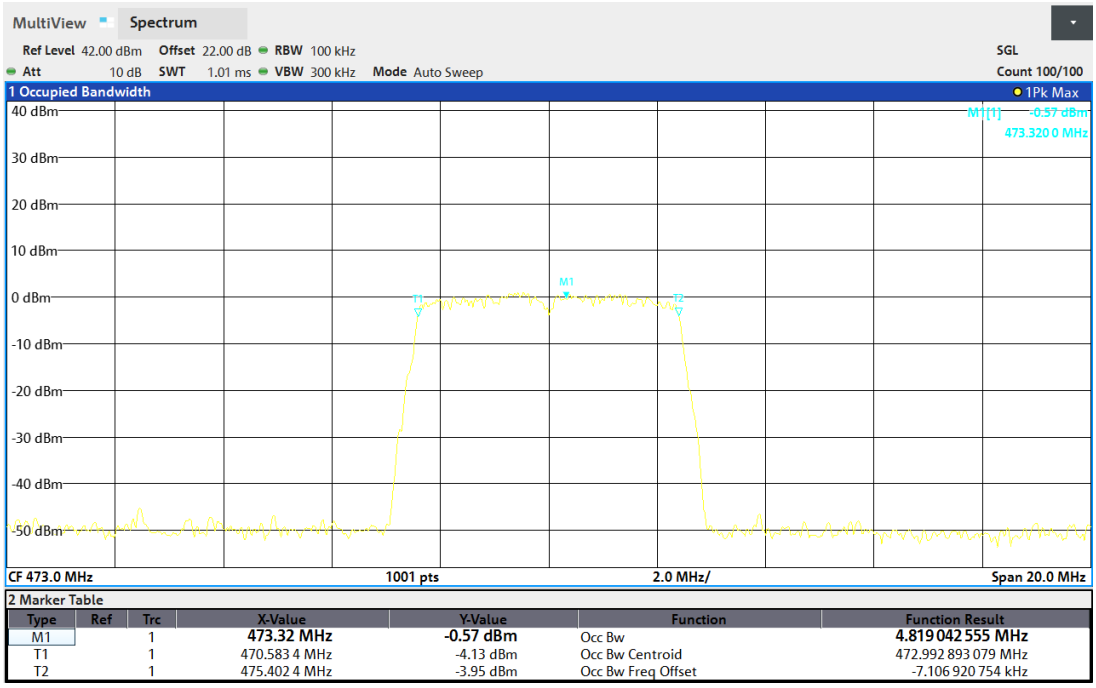
3.1.3 Test environment

- 22 °C, 43 % R.H.

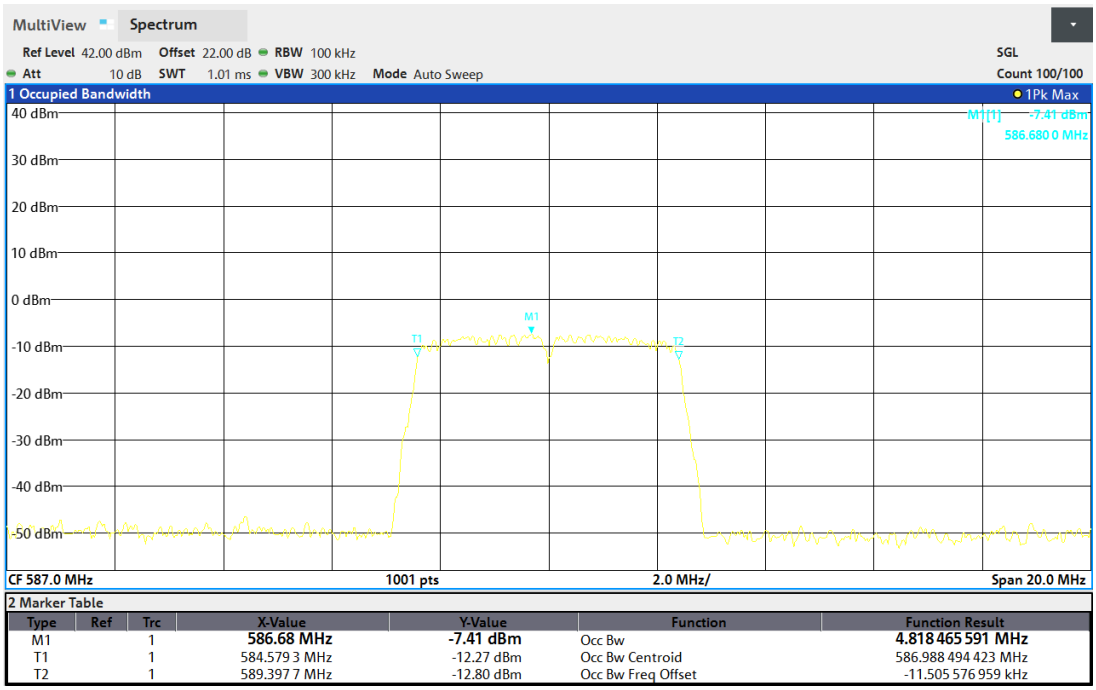
3.1.4 Test results

Frequency [MHz]		Measured Value [MHz]	Limit [dBm]	Result
Low	473	4.82	6.00	PASS
Middle	587	4.82	6.00	
High	695	4.82	6.00	

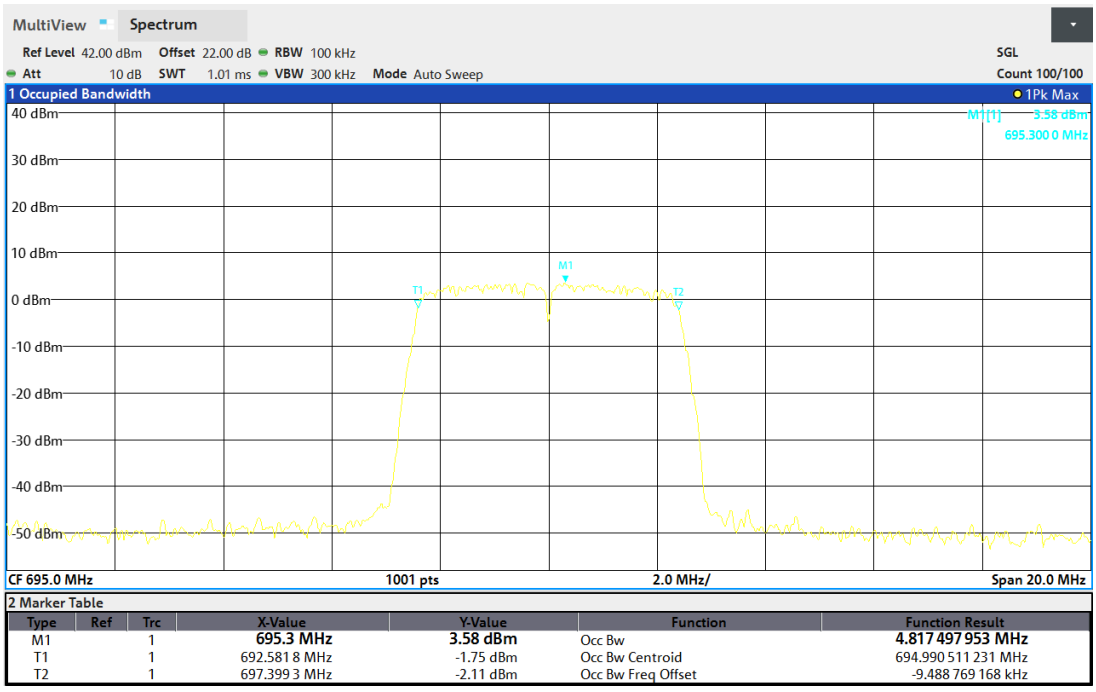
3.1.5 Test Plots



Low Channel



Middle Channel



High Channel

3.2 Output Power and Power Spectral Density

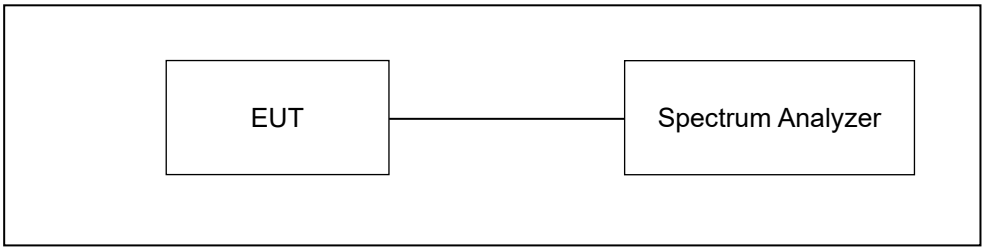
3.2.1 Requirement

• FCC Part15 subpart H Section 15.709

EIRP (6 MHz)	Conducted power limit[1] (6 MHz)	Conducted PSD limit (100 kHz)	Conducted adjacent channel emission limit (100 kHz)
16 dBm (40 mW)	10 dBm (10 mW)	−7.4 dBm	−62.8 dBm
20 dBm (100 mW)	14 dBm (25 mW)	−3.4 dBm	−58.8 dBm
24 dBm (250 mW)	18 dBm (63 mW)	0.6 dBm	−54.8 dBm
28 dBm (625 mW)	22 dBm (158 mW)	4.6 dBm	−50.8 dBm
32 dBm (1600 mW)	26 dBm (400 mW)	8.6 dBm	−46.8 dBm
36 dBm (4000 mW)	30 dBm (1000 mW)	12.6 dBm	−42.8 dBm
40 dBm (10000 mW)	30 dBm (1000 mW)	12.6 dBm	−42.8 dBm

[1]The conducted power spectral density from a fixed white space device shall not be greater than the values shown in the table when measured in any 100 kHz band during any time interval of continuous transmission, except that a 40 mW fixed white space device operating in a four megahertz channel within a seven megahertz guard band must comply with a conducted power spectral density limit of −5.4 dBm.

3.2.2 Test Procedure



1. Connect a patch cable of known attenuation (at the specific frequencies under consideration) between the antenna port of the DUT and a spectrum analyzer. For a fixed White Space device, it may be necessary to insert an external attenuator in the signal path to prevent overload damage to the analyzer.
2. Select the analyzer's power averaging (RMS) detector, a span of 10-MHz, a resolution bandwidth (RBW) of 100-kHz, a video bandwidth of 300 kHz, and a sweep speed that provides one millisecond per trace point integration time.
3. Activate the DUT test mode that provides continuous transmission of the output signal (no time bursting or signal gating) on the operating channel under investigation, as required by §15.709(c).
Low, middle, and high channels within tuning range must be examined.
4. Employ trace averaging over a minimum of 100 traces.
5. Use the integrated band/channel power analyzer function to determine the average power within the 6-MHz channel bandwidth.
6. Use the peak marker function to determine the maximum power spectral density (PSD) in any 100 kHz band segment.
7. Make the necessary corrections to the measured amplitude levels to account for externalities inserted into the signal path (e.g., signal attenuation in patch cable and/or external attenuator).
Record the adjusted amplitude levels as the power levels measured for power and PSD in 6-MHz and 100-kHz band, respectively.
8. If the device has multiple antenna ports, power must be summed across all antennas and antenna elements (§15.709(c)(2))
9. Compare the total conducted power levels and PSDs to the applicable conducted power and PSD limits to assess compliance. Add the necessary antenna gain of the DUT to determine EIRP levels.
10. Repeat until data is accumulated for the low, middle and high channels in the DUT tuning range.

3.2.3 Test environment

• 22 °C, 43 % R.H.

3.2.4 Test results

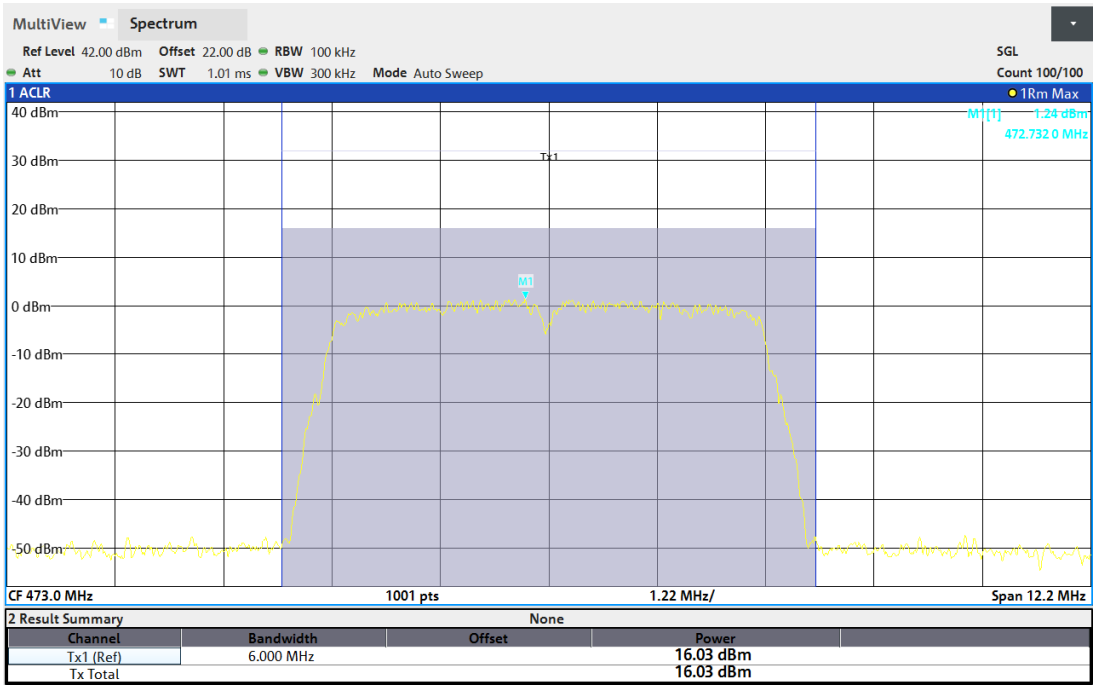
• 3.2.4.1 Output Power Results

Frequency [MHz]		Measured Value [dBm]	Limit [dBm/6 MHz]	Antenna Gain [dBi]	EIRP [dBm]	EIRP Limit dBm/6 MHz	Result
Low	473	16.03	27.72	8.28	24.31	36.00	PASS
Middle	587	7.97	27.72	8.28	16.25	36.00	
High	695	9.85	27.72	8.28	18.13	36.00	

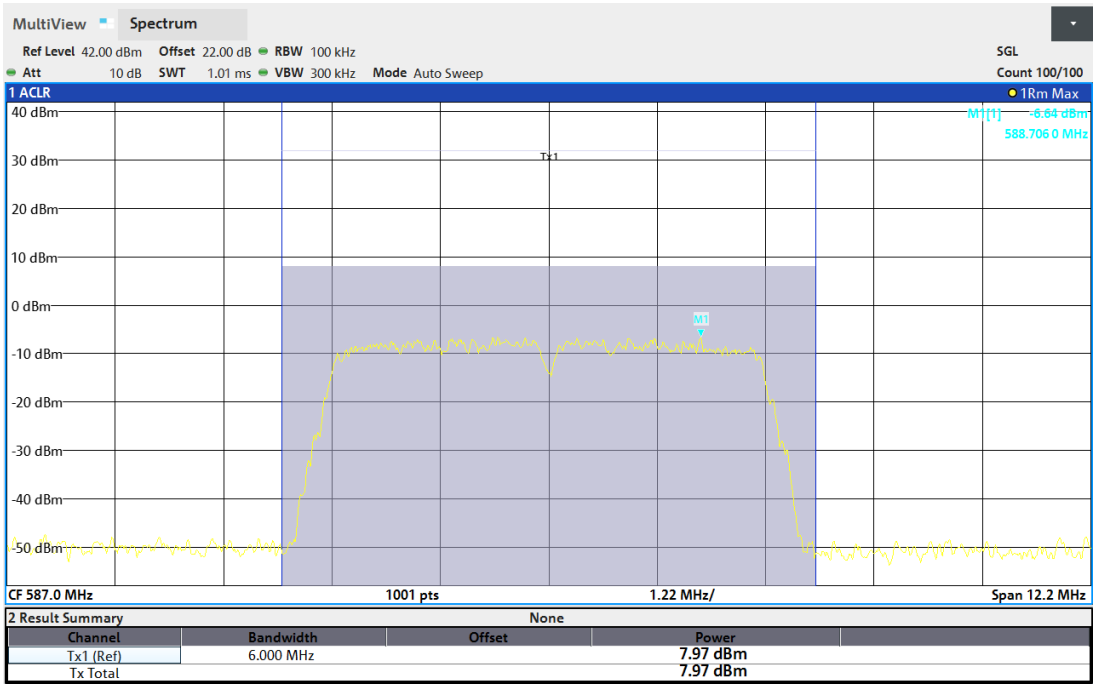
• 3.2.4.2 PSD Results

Frequency [MHz]		Measured Value [dBm]	Limit [dBm]	Result
Low	473	1.24	12.60	PASS
Middle	587	-6.64	12.60	
High	695	-4.87	12.60	

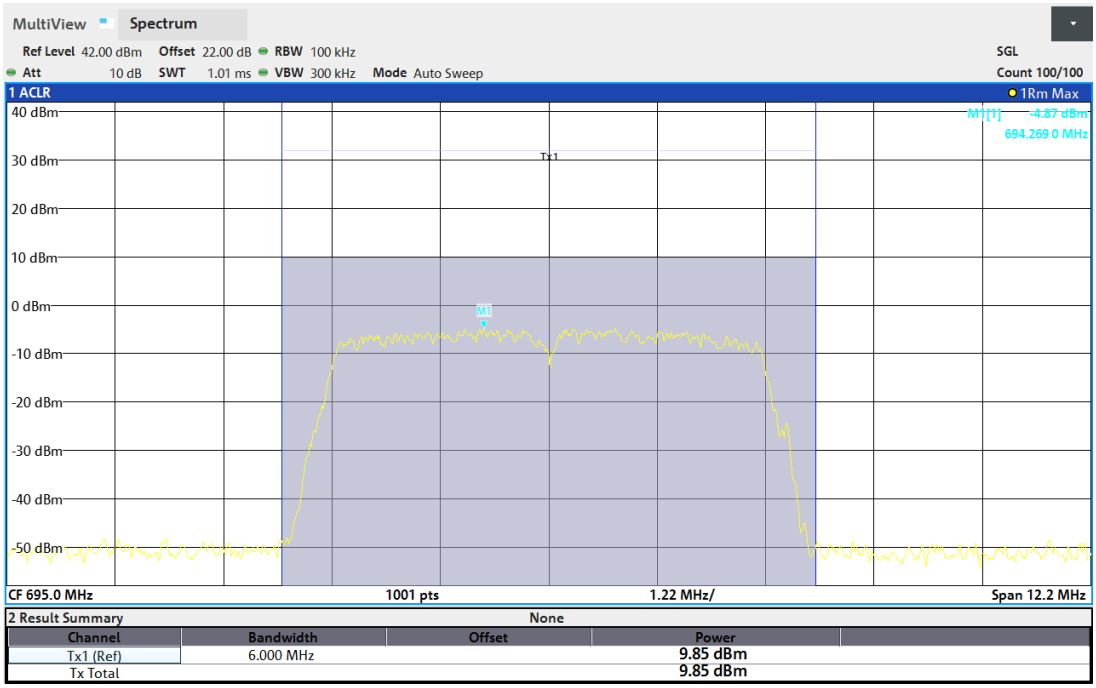
3.1.5 Test Plots



Low Channel



Middle Channel



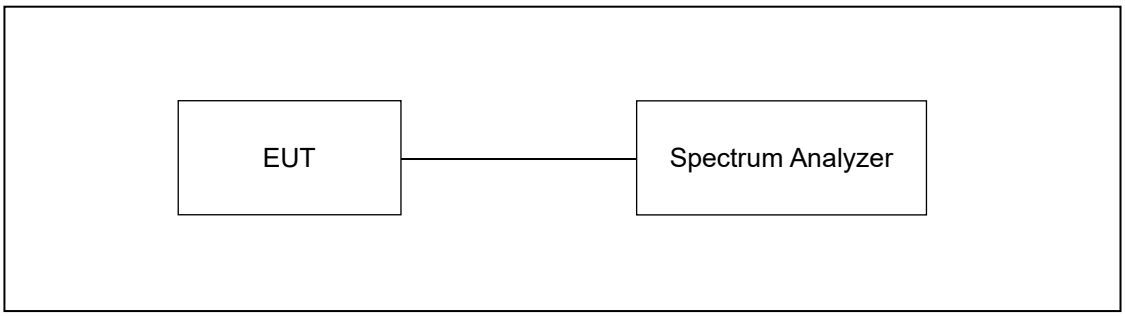
High Channel

3.3 Band Edge and Adjacent Channel power

3.3.1 Requirement

- FCC Part15 subpart H Section 15.709 (d)

3.3.2 Test Procedure



Adjacent channel measurement:
1. Select the power averaging (RMS) detector, a start frequency of fL- 6 MHz and a stop frequency of fL- 100 kHz (where fL is the lower edge frequency of the operating channel), a resolution bandwidth (RBW) of 100-kHz, a minimum video bandwidth of 300-kHz and a sweep speed that provides one millisecond per trace point integration time.
2. Employ trace averaging over a minimum of 10 traces.
3. Use the peak marker function of the analyzer to determine the maximum power spectral density in any 100-kHz segment within the frequency span.
4. Adjust the measured amplitude level to account for externalities in the signal path (e.g., attenuation in the patch cable for conducted measurements and the measurement antenna gain for radiated tests).
5. Repeat the procedure with the analyzer start frequency set to fU + 100 kHz and the stop frequency set to fU + 6 MHz.
6. Repeat the entire procedure until data is accumulated for the lower, middle and upper channels in the DUT tuning range.

Band edge measurement:
1. Select the power averaging (RMS) detector, a start frequency of fL- 100 kHz and a stop frequency of fL (where fL is the lower edge frequency of the operating channel), a resolution bandwidth (RBW) of 10 kHz, a minimum video bandwidth of 30 kHz and a sweep speed that
provides one millisecond per trace point integration time.
2. Employ trace averaging over a minimum of 100 traces.
3. Use the integrated band/channel power function of the analyzer to determine the maximum average power spectral density over the 100 kHz frequency span.
4. Adjust the measured amplitude level to account for externalities in the signal path (e.g., attenuation in the patch cable for conducted measurements) to include measurement antenna
gain for radiated tests.
5. Repeat the procedure with the analyzer start frequency set to fU and the stop frequency set to fU + 100 kHz.
6. Repeat the entire procedure until data is accumulated for the lower, middle, and upper channels in the DUT tuning range.

3.3.3 Test environment

- 22 °C, 43 % R.H.

3.3.4 Test results

• 3.3.4.1 Lower ACP

Frequency [MHz]		Measured Value [dBm]	Limit [dBm]	Result
Low	470	-49.41	-42.80	PASS
Middle	584	-49.68	-42.80	
High	692	-45.20	-42.80	

• 3.3.4.2 Upper ACP

Frequency [MHz]		Measured Value [dBm]	Limit [dBm]	Result
Low	476	-50.74	-42.80	PASS
Middle	590	-49.98	-42.80	
High	698	-46.04	-42.80	

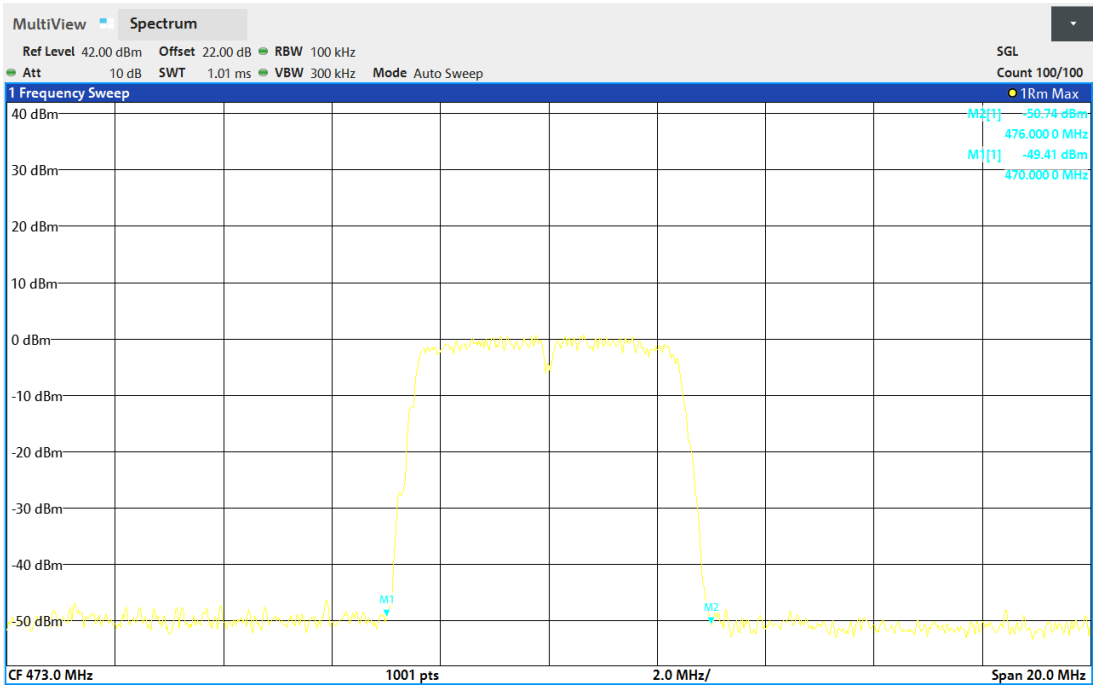
• 3.3.4.3 Lower Band-Edge

Frequency [MHz]		Measured Value [dBm]	Limit [dBm]	Result
Low	473	-61.79	-42.80	PASS
Middle	587	-66.28	-42.80	
High	695	-63.07	-42.80	

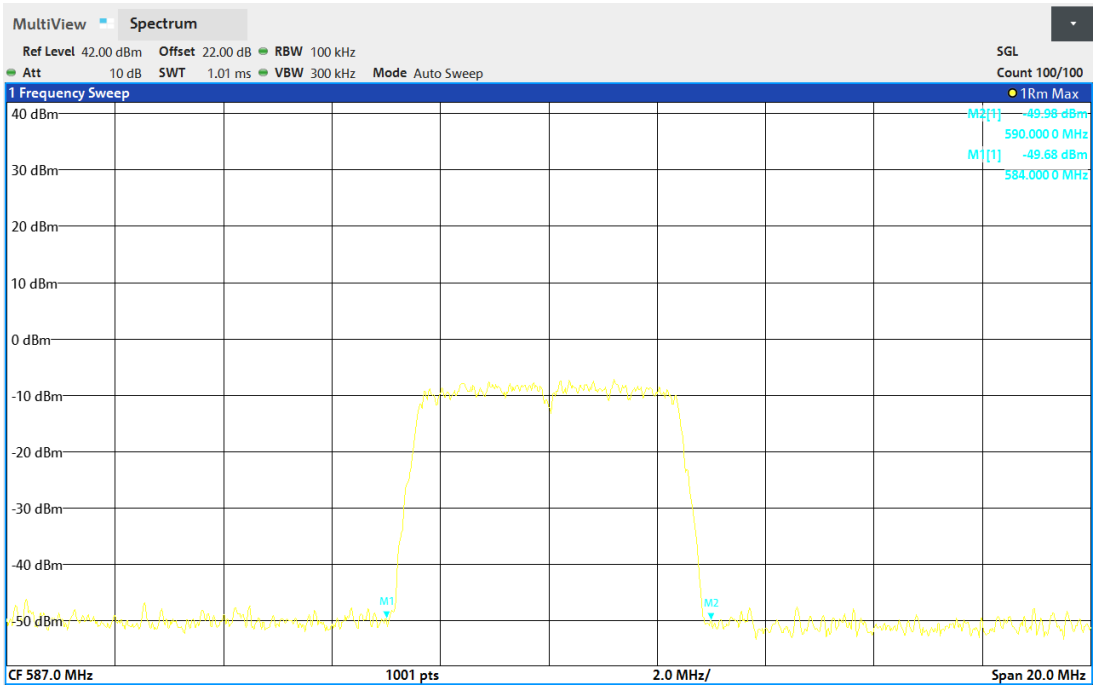
• 3.3.4.4 Upper Band-Edge

Frequency [MHz]		Measured Value [dBm]	Limit [dBm]	Result
Low	473	-61.94	-42.80	PASS
Middle	587	-66.11	-42.80	
High	695	-63.89	-42.80	

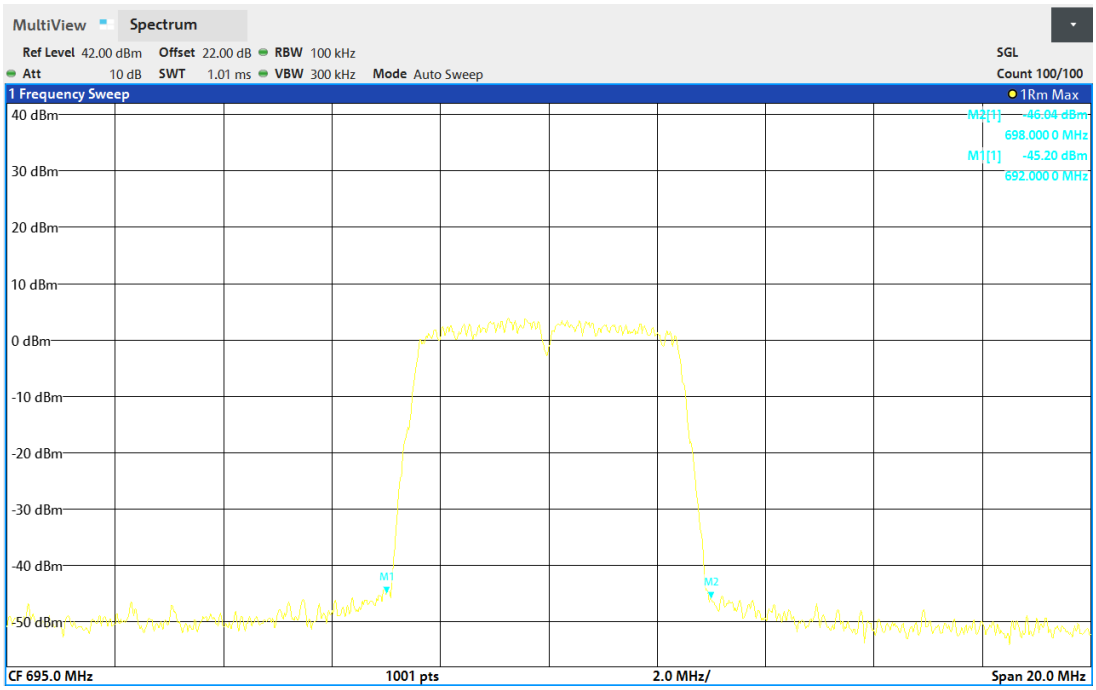
3.3.4 Test Plots



Low Channel

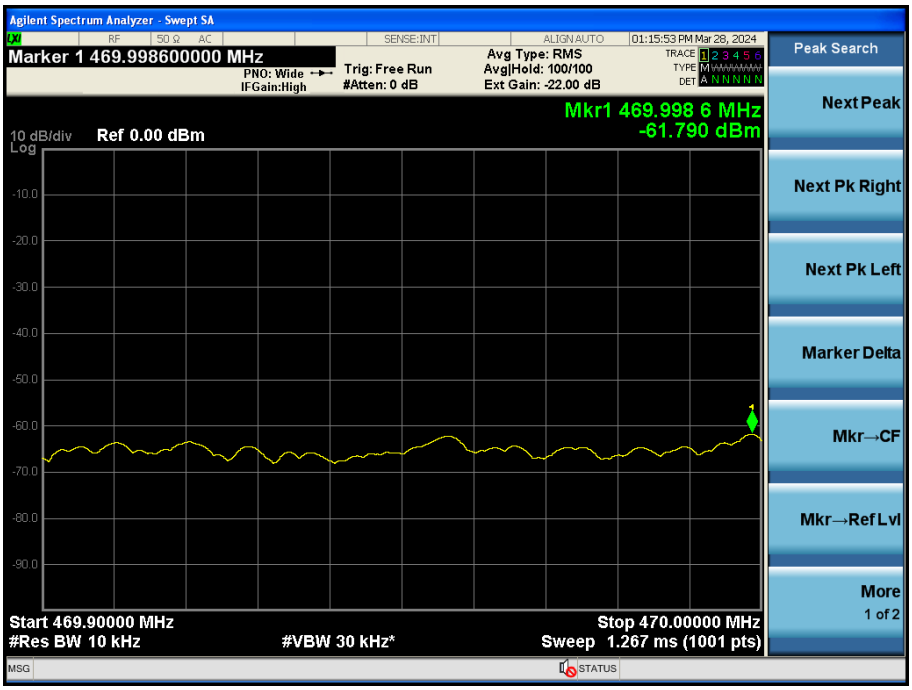


Middle Channel



High Channel

Band Edge Test Plot



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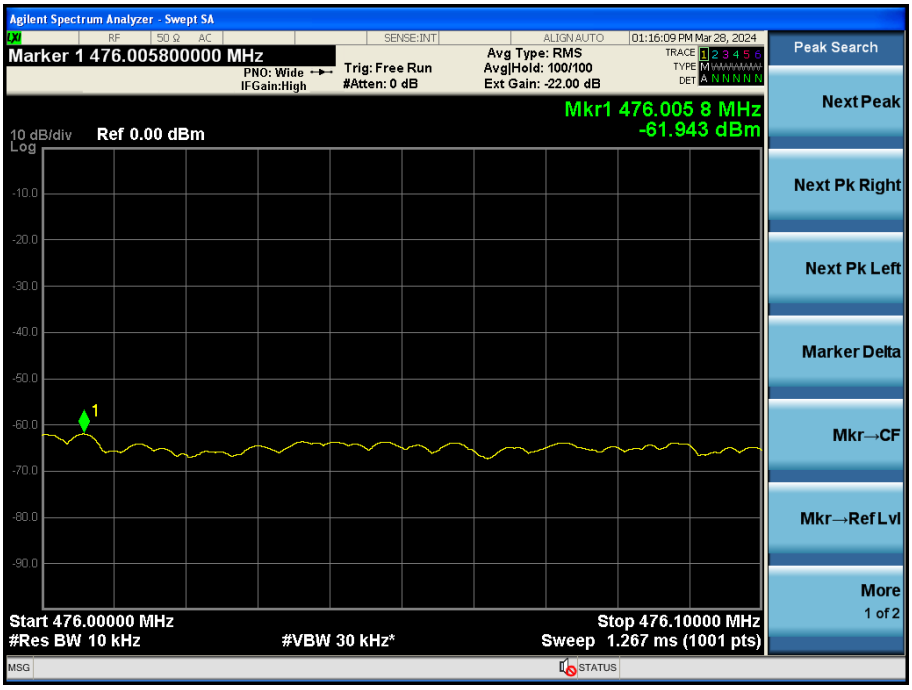
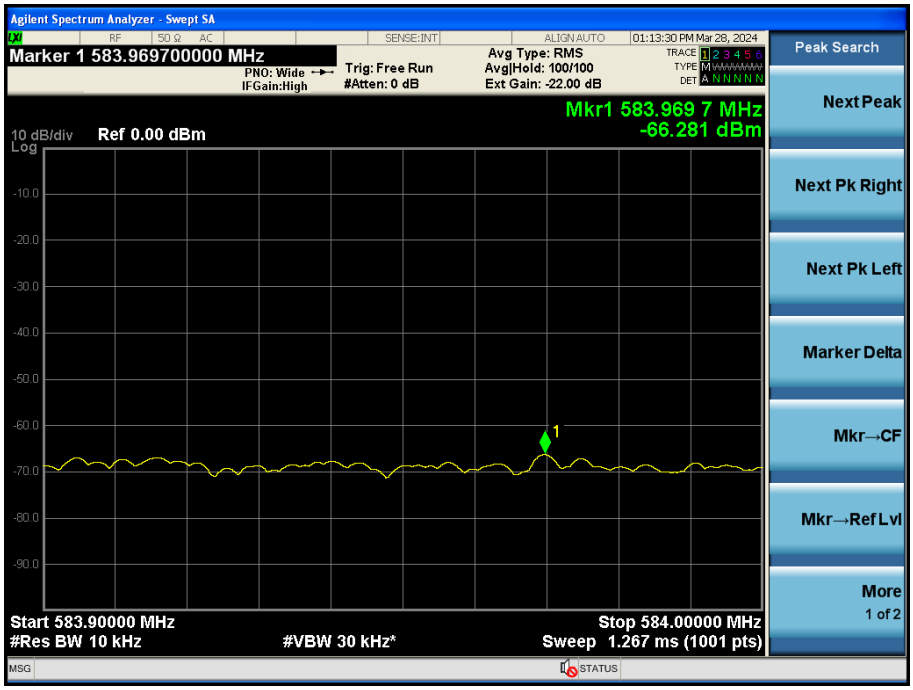
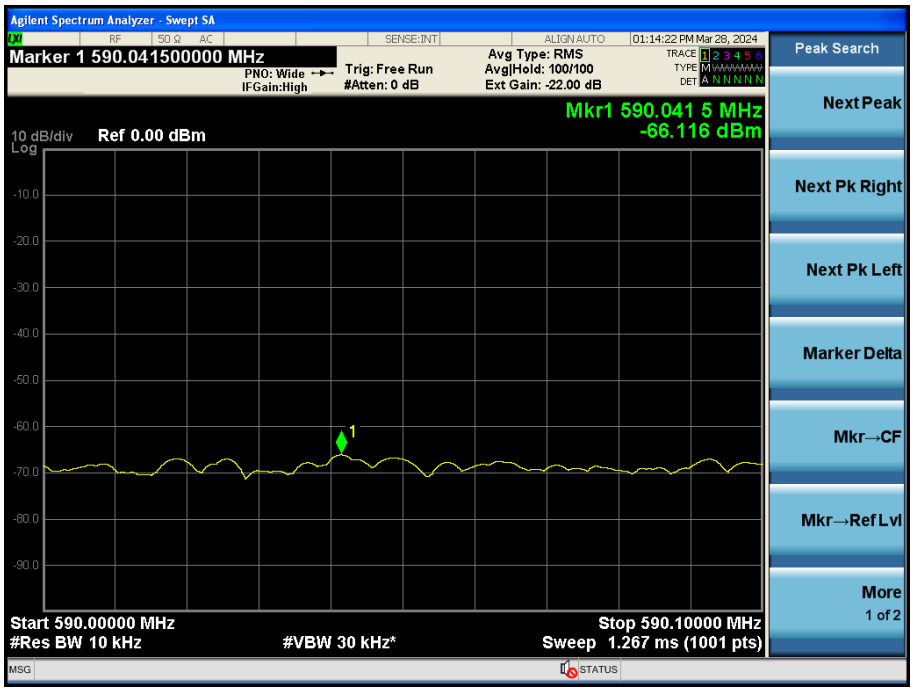


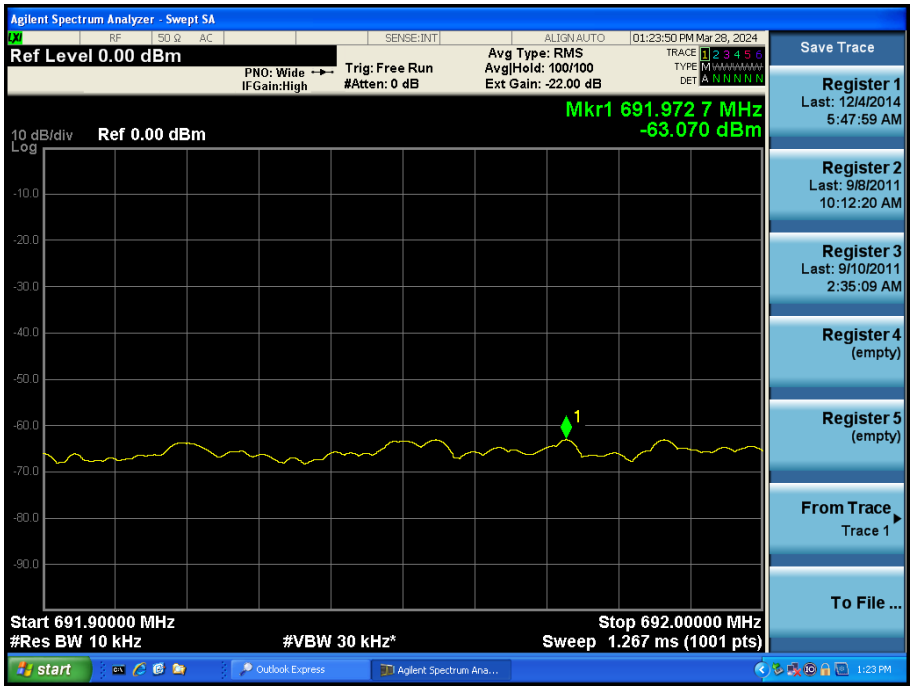
Low Channel



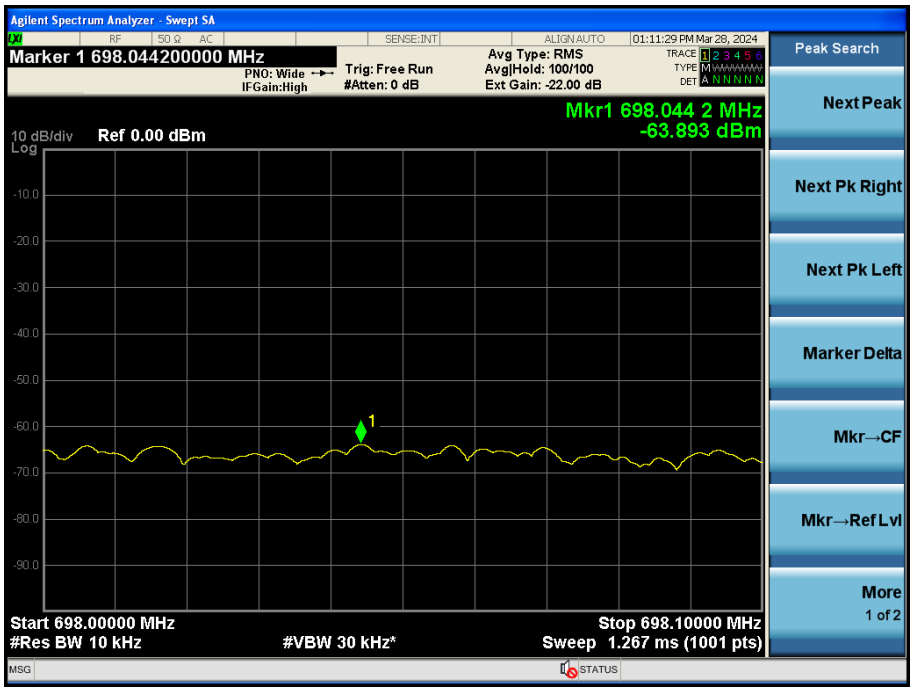
MID Channel



MID Channel



High Channel



High Channel

3.4 Radiated Emission

3.4.1 Requirement

• FCC Part15 subpart H Section 15.709 (d)

3.4.2 Test Procedure

The radiated emissions measurements were performed on the 3 m anechoic chamber. The EUT was placed on a non-conductive turntable above the ground plane. The frequency spectrum from 30 kHz to 7.0 GHz was scanned and maximum emission levels at each frequency recorded. The system was rotated 360°, and the antenna was varied in the height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for horizontal and vertical polarization of the receiving antenna.

3.4.3 Test environment

• 24 °C, 41 % R.H.

3.4.4 Test results

3.4.4.1 Spurious Radiated Emission

3.4.4.1.1 Test Data for Below 30 MHz

•. Detector : Quasi-Peak (6 dB Bandwidth: 200 Hz, 9 kHz)

•.Measurement distance : 3 m

•.Frequency range : 9 kHz ~ 30 MHz

•.Operating Condition : Highest Output Power Transmitting Mode

•.Result : PASS

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Factor (dB/m)	Cable Loss	Amp Gain	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
Emissions observed were below the limit and thus not reported								

3.4.4.1.2 Test Data for 30 MHz ~ 1000 MHz

•. Detector : Quasi-Peak (6 dB Bandwidth: 120 kHz)

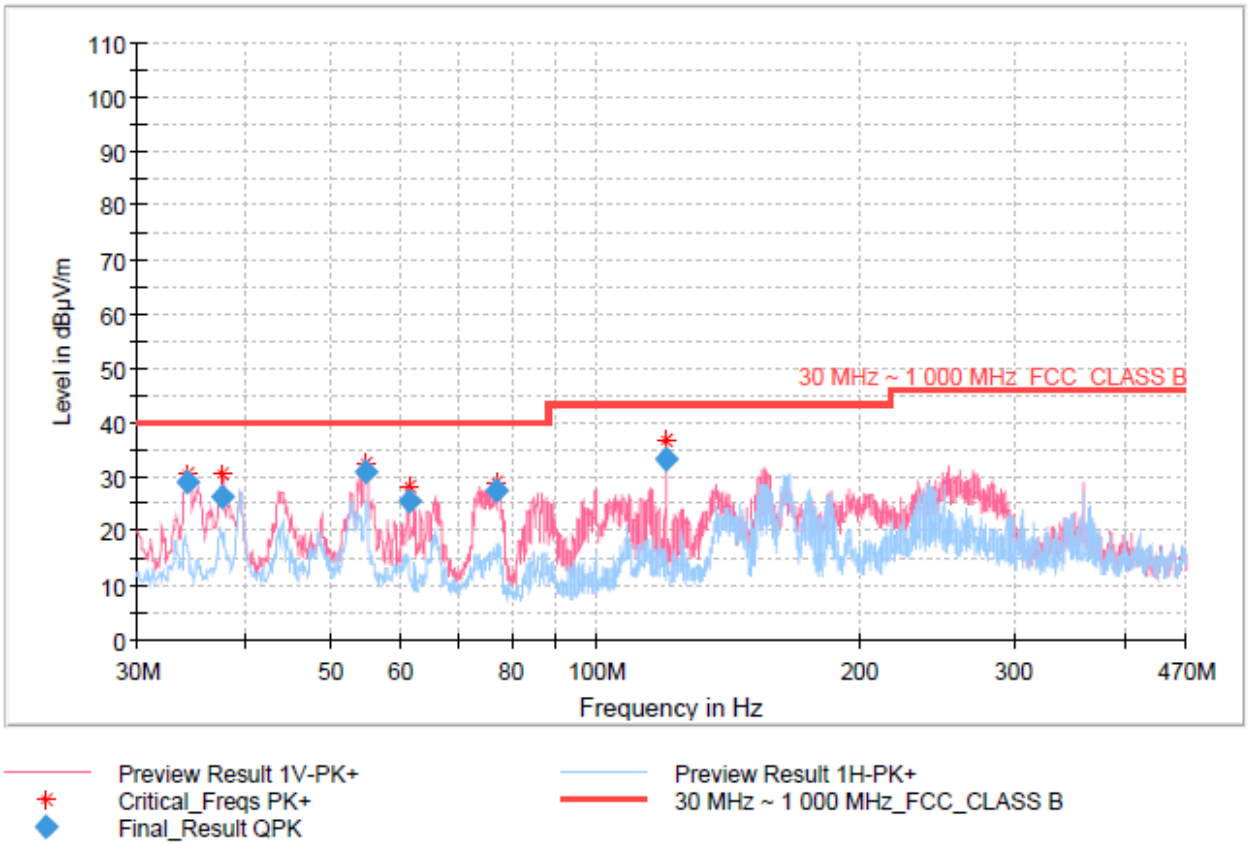
•.Measurement distance : 3 m

•.Frequency range : 30 MHz ~ 470 MHz

•.Operating Condition : Highest Output Power Transmitting Mode

•.Result : PASS

RE Test Report

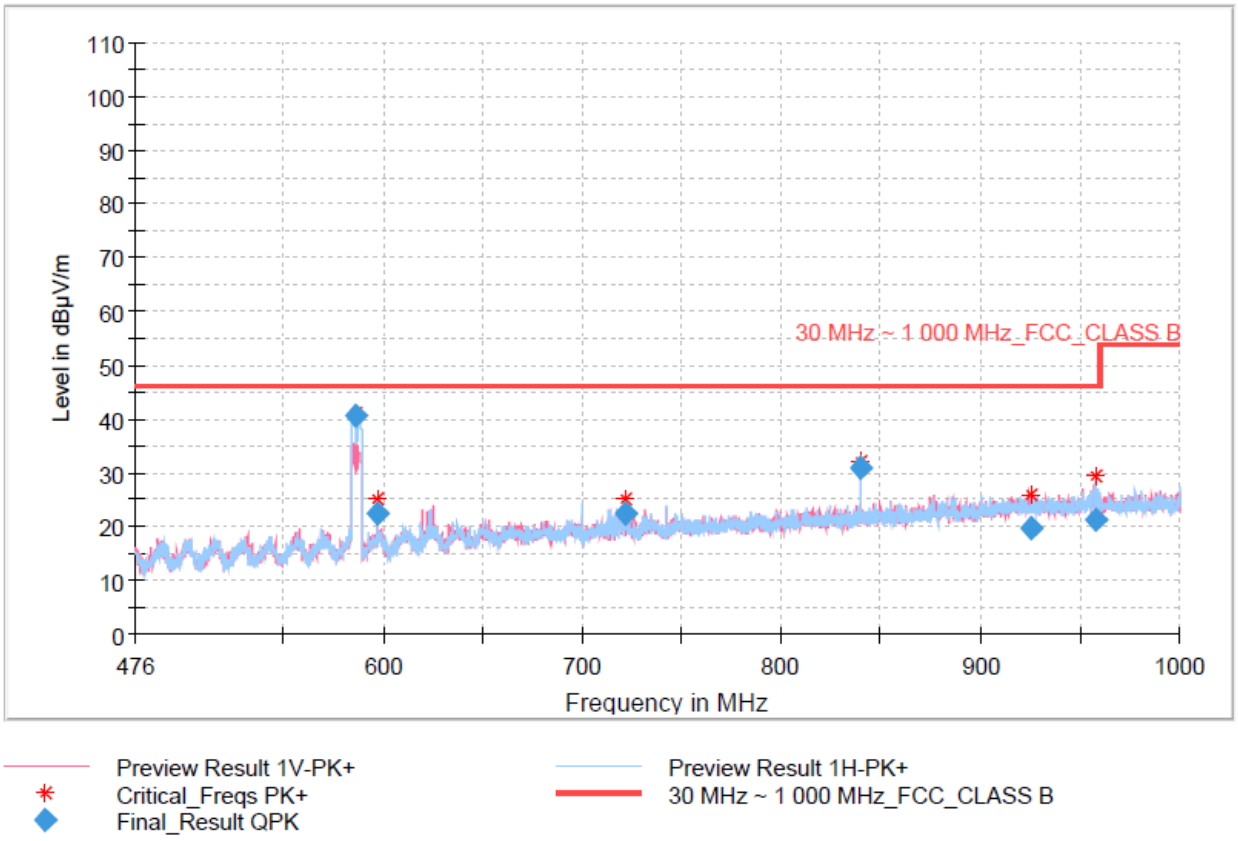


Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
34.29	28.99	40.00	11.01	15000.0	99.9	V	26.0	-15.0
37.48	26.49	40.00	13.51	15000.0	99.9	V	26.0	-15.4
54.75	31.16	40.00	8.84	15000.0	99.9	V	230.0	-17.2
61.08	25.68	40.00	14.32	15000.0	99.9	V	213.0	-18.4
77.14	27.64	40.00	12.36	15000.0	200.2	V	202.0	-22.9
119.98	33.41	43.50	10.09	15000.0	300.2	V	52.0	-24.0

•. Detector : Quasi-Peak (6 dB Bandwidth: 120 kHz)
•.Measurement distance : 3 m
•.Frequency range : 476 MHz ~ 1000 MHz
•.Operating Condition : Highest Output Power Transmitting Mode
•.Result : PASS

RE Test Report

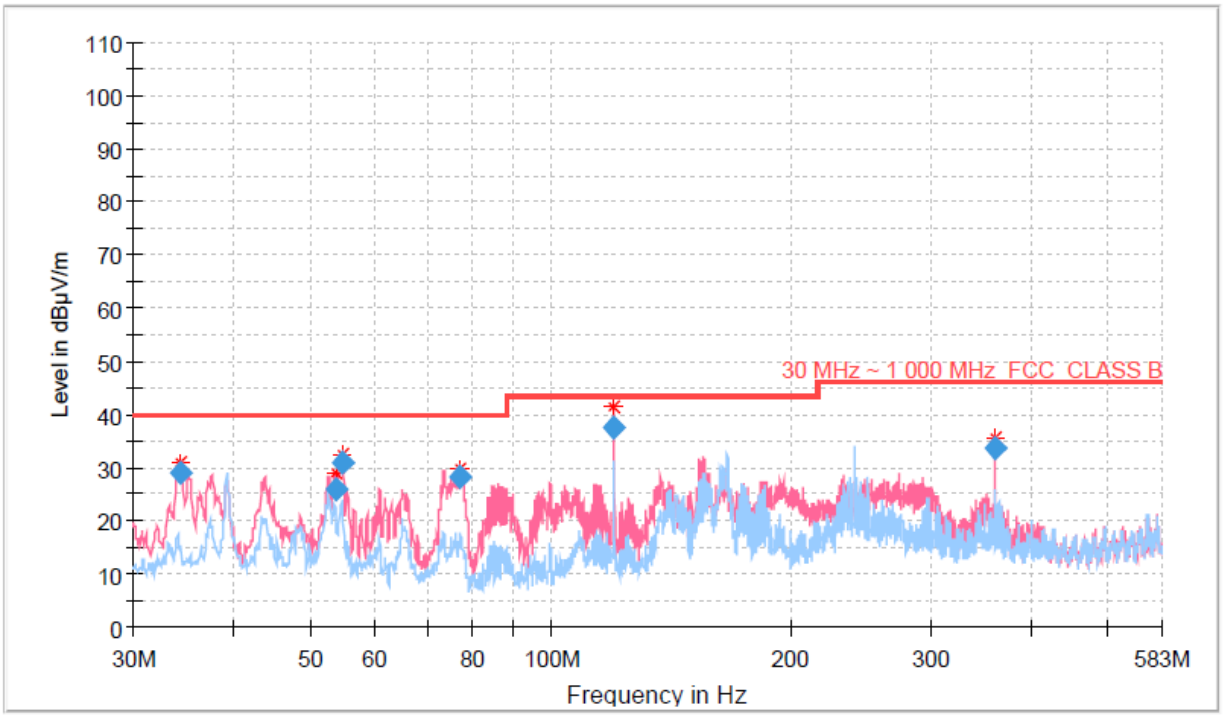


Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
586.43	40.63	46.00	5.37	15000.0	300.0	H	281.0	-14.1
597.18	22.43	46.00	23.57	15000.0	400.2	H	12.0	-13.8
722.02	22.51	46.00	23.49	15000.0	99.8	V	87.0	-10.8
840.05	30.89	46.00	15.11	15000.0	99.9	H	357.0	-8.3
925.46	19.81	46.00	26.19	15000.0	400.2	H	174.0	-6.3
957.36	21.26	46.00	24.74	15000.0	99.9	H	92.0	-6.0

•. Detector : Quasi-Peak (6 dB Bandwidth: 120 kHz)
•.Measurement distance : 3 m
•.Frequency range : 30 MHz ~ 583 MHz
•.Operating Condition : Highest Output Power Transmitting Mode
•.Result : PASS

RE Test Report



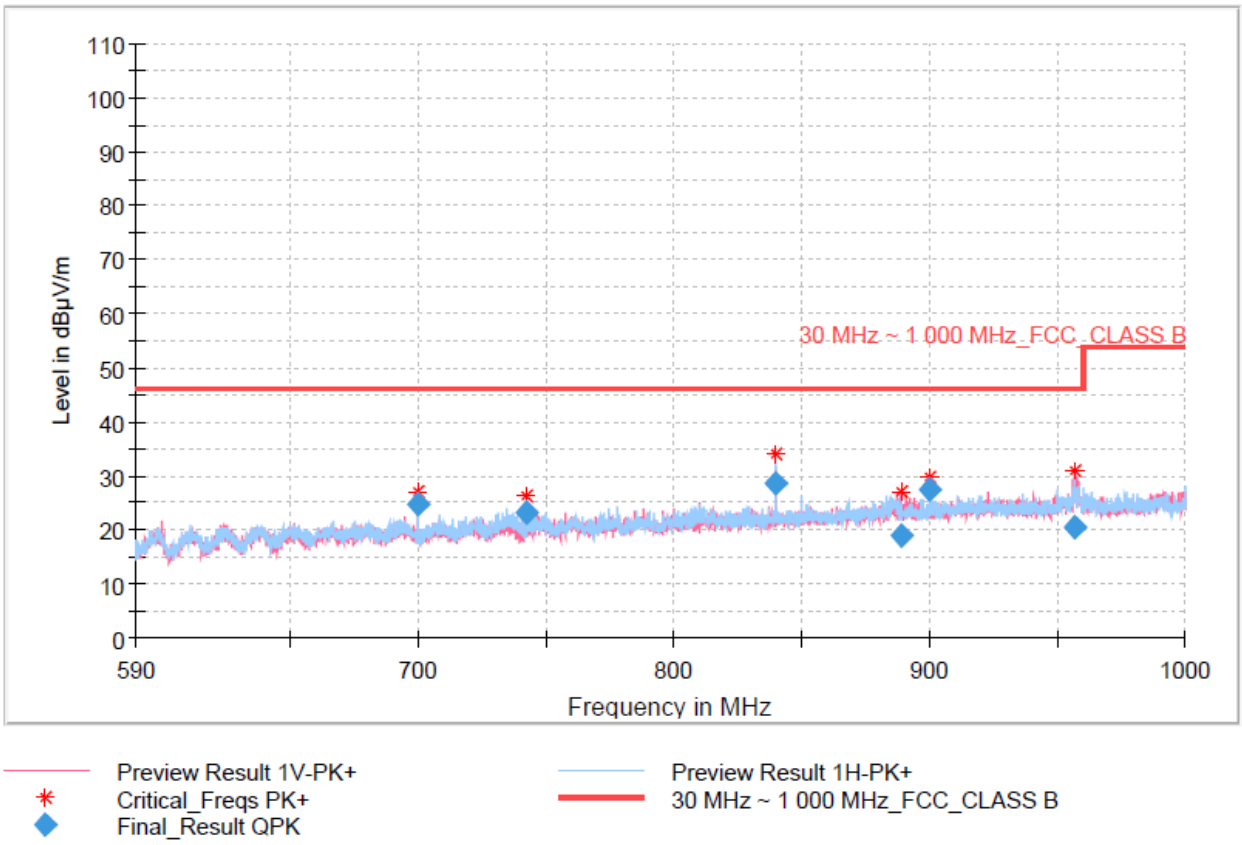
Preview Result 1V-PK+
Critical_Freqs PK+
Final_Result QPK
Preview Result 1H-PK+
30 MHz ~ 1 000 MHz_FCC_CLASS B

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
34.29	29.01	40.00	10.99	15000.0	99.9	V	37.0	-15.0
53.71	25.94	40.00	14.06	15000.0	99.9	V	326.0	-17.1
54.75	30.98	40.00	9.02	15000.0	99.9	V	237.0	-17.2
77.14	28.13	40.00	11.87	15000.0	99.9	V	134.0	-22.9
120.00	37.40	43.50	6.10	15000.0	99.9	V	0.0	-24.0
360.00	33.87	46.00	12.13	15000.0	99.9	V	185.0	-21.1

•. Detector : Quasi-Peak (6 dB Bandwidth: 120 kHz)
•.Measurement distance : 3 m
•.Frequency range : 590 MHz ~ 1000 MHz
•.Operating Condition : Highest Output Power Transmitting Mode
•.Result : PASS

RE Test Report

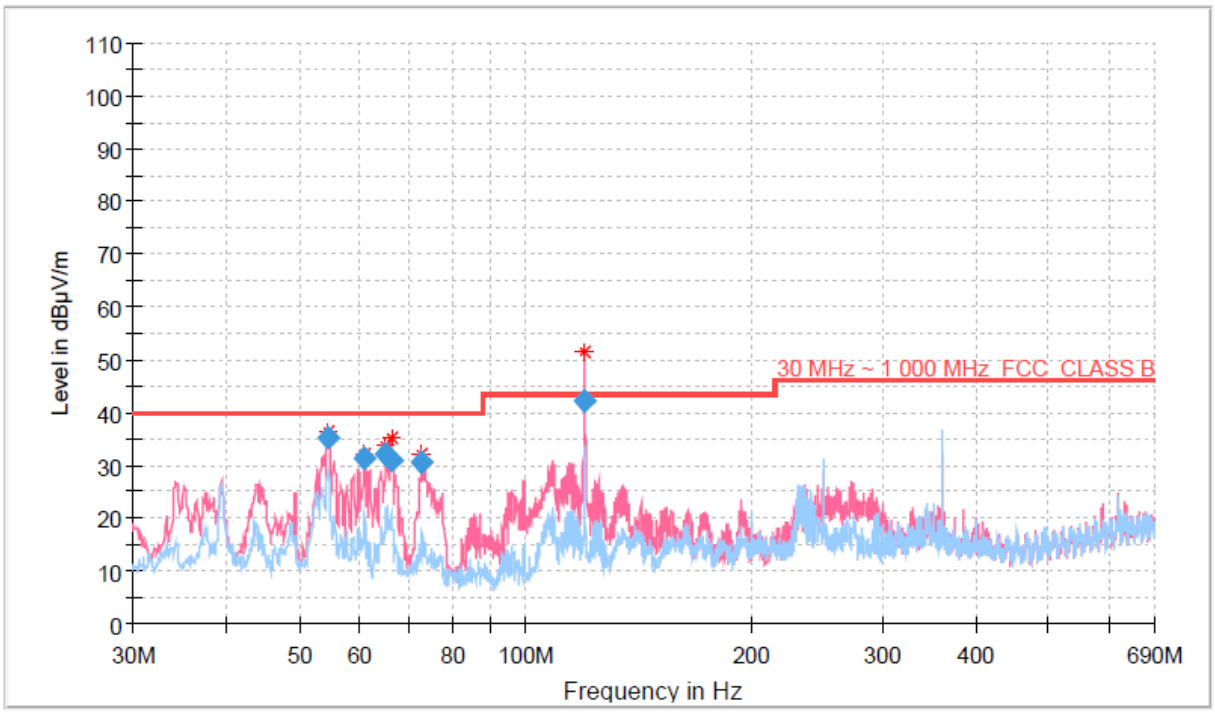


Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
699.98	24.75	46.00	21.25	15000.0	99.7	H	210.0	-11.3
742.52	23.26	46.00	22.75	15000.0	99.7	H	114.0	-10.4
840.00	28.50	46.00	17.50	15000.0	400.2	H	277.0	-8.3
888.69	18.85	46.00	27.15	15000.0	99.7	V	157.0	-7.5
900.01	27.63	46.00	18.37	15000.0	99.7	H	223.0	-7.1
956.64	20.69	46.00	25.31	15000.0	400.2	V	291.0	-6.0

•. Detector : Quasi-Peak (6 dB Bandwidth: 120 kHz)
•.Measurement distance : 3 m
•.Frequency range : 30 MHz ~ 690 MHz
•.Operating Condition : Highest Output Power Transmitting Mode
•.Result : PASS

RE Test Report



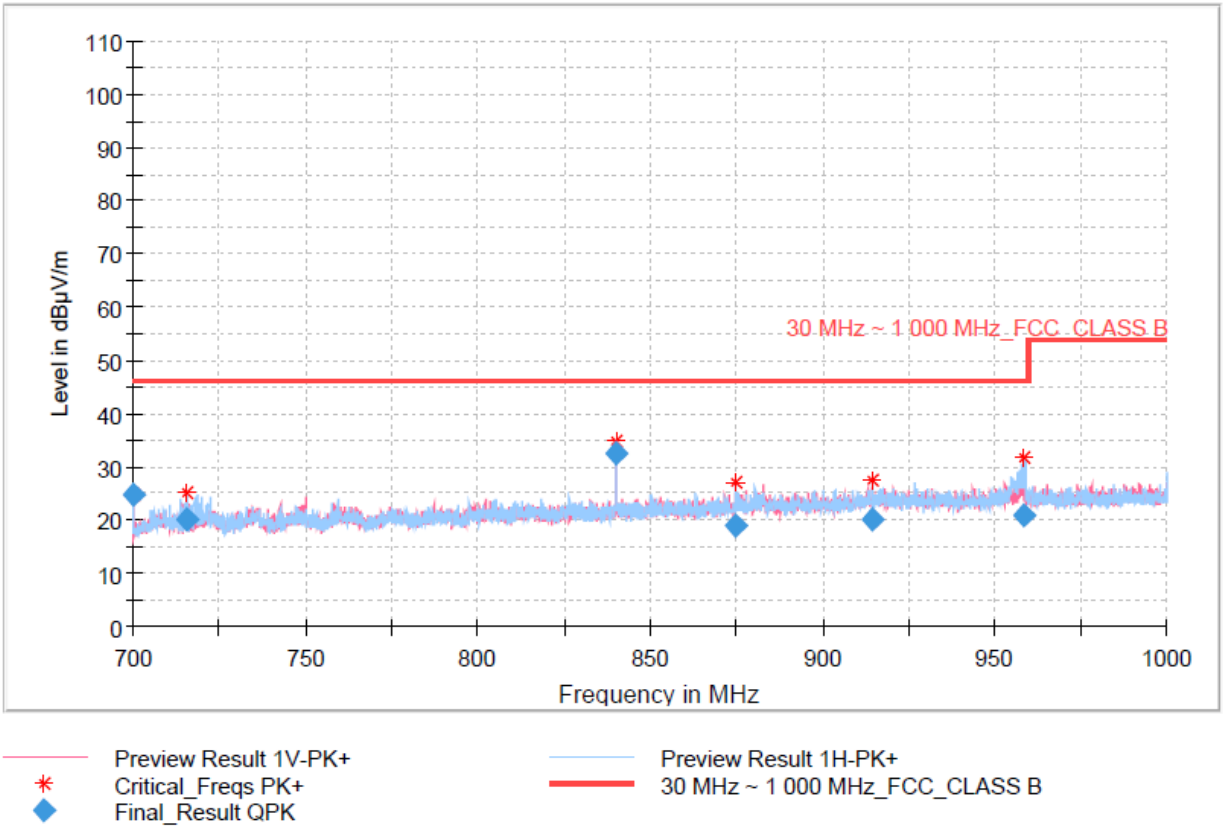
Preview Result 1V-PK+
Critical_Freqs PK+
Final_Result QPK
Preview Result 1H-PK+
30 MHz ~ 1 000 MHz_FCC_CLASS B

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
54.75	35.20	40.00	4.80	15000.0	99.8	V	183.0	-17.2
61.02	31.52	40.00	8.48	15000.0	99.8	V	230.0	-18.4
65.15	32.11	40.00	7.89	15000.0	99.8	V	202.0	-19.2
66.14	30.81	40.00	9.19	15000.0	300.1	V	0.0	-19.5
72.90	30.47	40.00	9.53	15000.0	99.8	V	261.0	-21.4
119.93	42.15	43.50	1.35	15000.0	99.8	V	161.0	-24.0

•. Detector : Quasi-Peak (6 dB Bandwidth: 120 kHz)
•.Measurement distance : 3 m
•.Frequency range : 700 MHz ~ 1000 MHz
•.Operating Condition : Highest Output Power Transmitting Mode
•.Result : PASS

RE Test Report



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
700.00	24.62	46.00	21.38	15000.0	99.8	H	143.0	-11.3
715.64	20.05	46.00	25.95	15000.0	99.8	H	327.0	-11.0
840.06	32.51	46.00	13.49	15000.0	99.8	V	182.0	-8.3
874.71	18.88	46.00	27.13	15000.0	99.8	H	325.0	-7.6
914.46	20.08	46.00	25.92	15000.0	99.8	H	127.0	-6.2
958.75	21.10	46.00	24.90	15000.0	200.2	H	247.0	-6.0

3.4.4.1.3 Test Data for Avove 1 GHz(Worst Case)

•. Detector : Peak, Average (6 dB Bandwidth: 1 MHz)

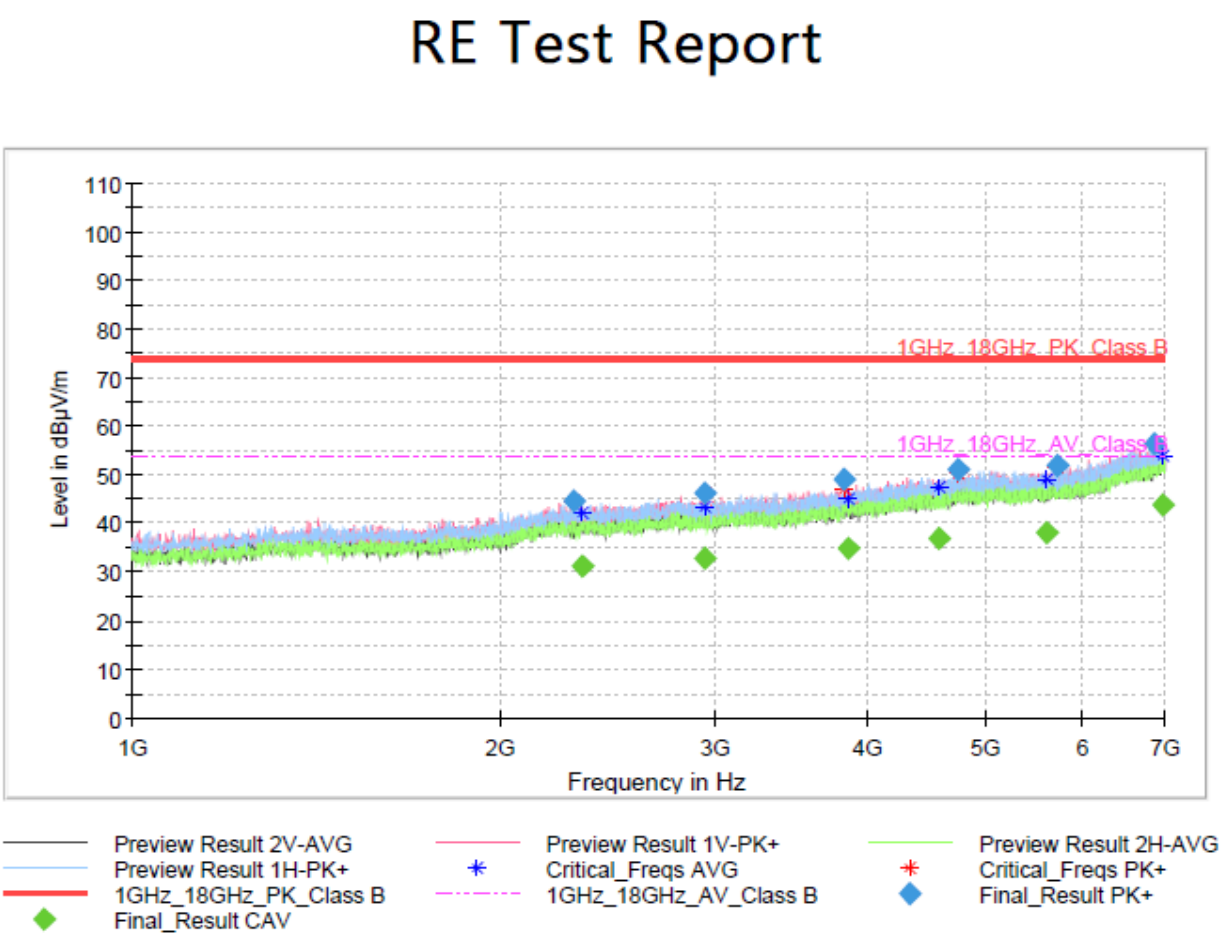
•.Measurement distance : 3 m

•.Frequency range : 1 GHz ~ 7.0 GHz

•.Operating Condition : Highest Output Power Transmitting Mode

•.Result : PASS

•. 1 GHz ~ 7 GHz



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
2296.00	44.76	---	74.00	29.24	15000.0	99.9	H	184.0	0.9
2330.50	---	31.37	54.00	22.63	15000.0	99.9	H	256.0	0.9
2939.50	46.29	---	74.00	27.71	15000.0	200.1	V	43.0	2.4
2939.50	---	32.74	54.00	21.26	15000.0	199.8	V	43.0	2.4
3816.25	49.14	---	74.00	24.86	15000.0	300.2	H	154.0	5.5
3849.25	---	34.96	54.00	19.04	15000.0	199.8	V	48.0	5.7
4574.50	---	36.93	54.00	17.07	15000.0	199.8	V	56.0	7.9
4741.75	51.34	---	74.00	22.66	15000.0	300.2	H	0.0	8.9
5602.00	---	38.33	54.00	15.67	15000.0	400.3	H	91.0	9.8
5707.75	51.99	---	74.00	22.01	15000.0	99.9	V	358.0	10.0
6872.50	56.57	---	74.00	17.43	15000.0	400.3	V	327.0	14.4
6970.00	---	43.97	54.00	10.03	15000.0	300.0	V	96.0	15.1

3.5 Conducted Emission Test

3.5.1 Requirement

- FCC Part15 subpart C Section 15.207

3.5.2 Test Procedure

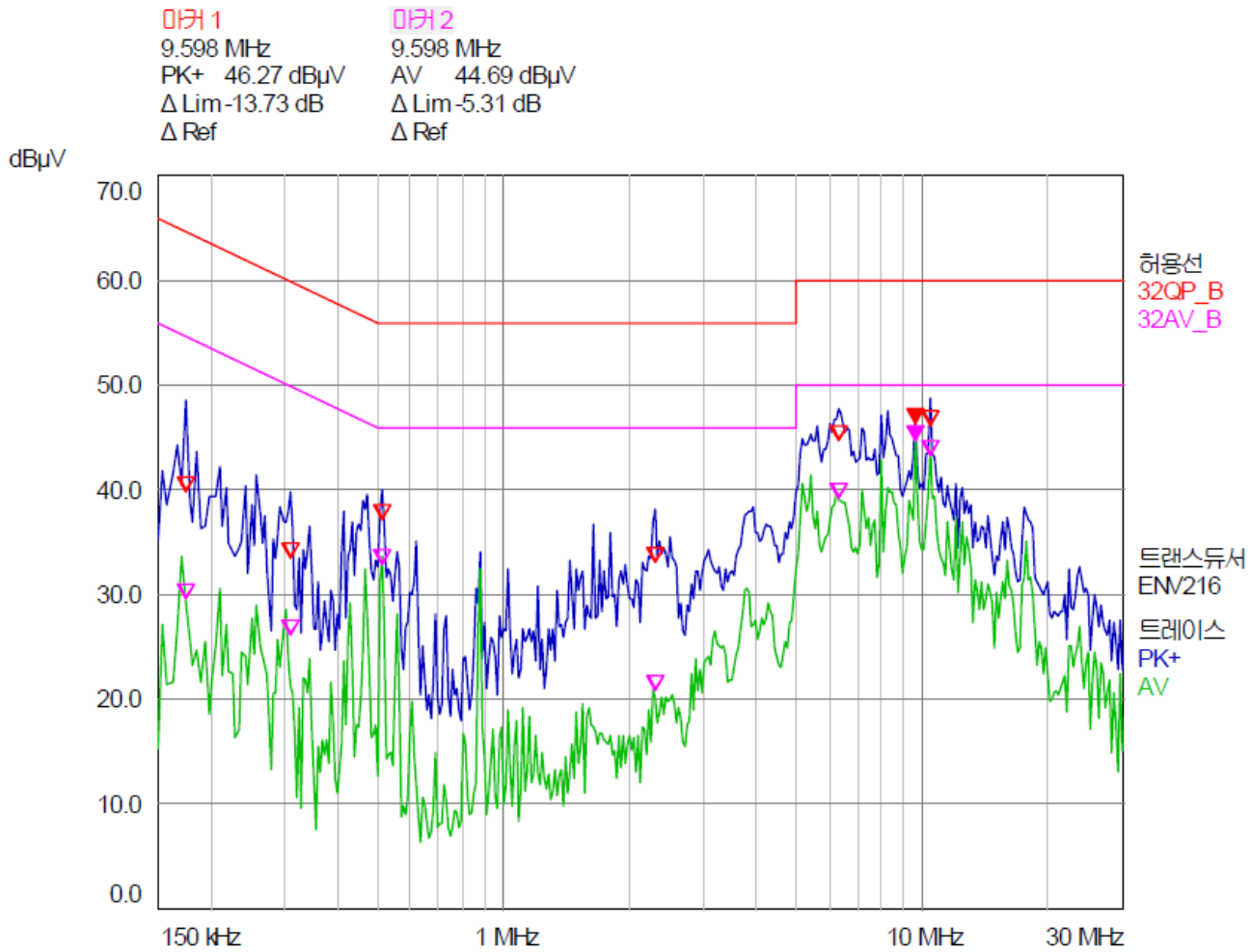
The EUT was placed on a wooden table, 0.8 m height above the floor. Power was fed to the EUT through a 50 Ω / 50 μH + 5 Ω Artificial Mains Network (AMN). The ground plane was electrically bonded to the reference ground system and all power lines were filtered from ambient.

3.6.3 Test data

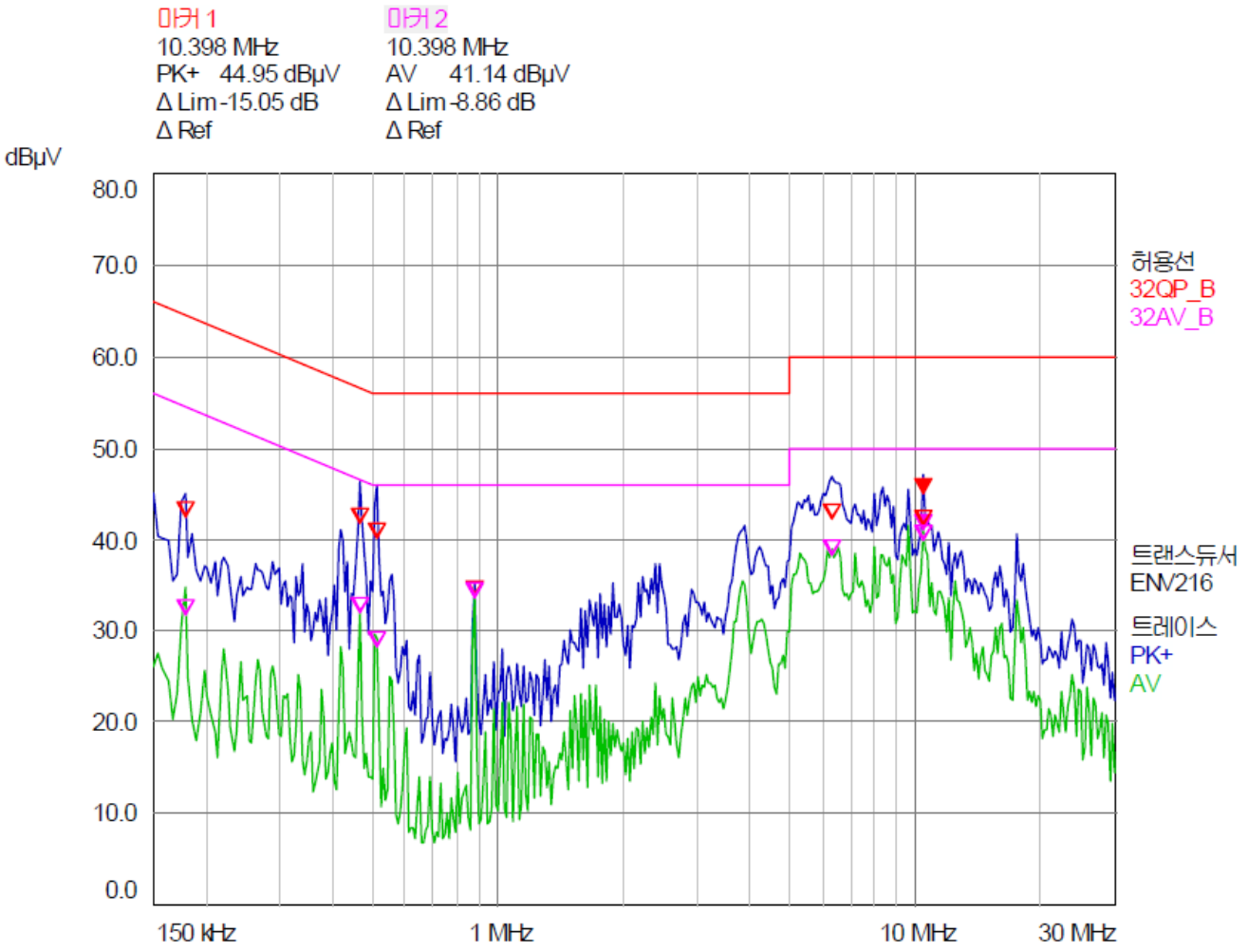
-. Resolution bandwidth : 9 kHz

-. Frequency range : 0.15 MHz ~ 30 MHz

-. Tested Line : HOT LINE



-. Tested Line : NEUTRAL LINE



FREQ	Corr.Fator [dB]		[H/N]	Quasi-peak [dBuV]			C-Average [dBuV]		
[MHz]	LISN	cables		Measured	limit	Margin	Measured	limit	Margin
0.18	9.41	9.91	N	42.56	64.58	22.02	31.84	54.58	22.74
0.47	9.44	9.93	N	41.83	56.58	14.75	31.90	46.58	14.68
0.51	9.44	9.93	N	40.11	56.00	15.89	28.21	46.00	17.79
0.88	9.45	9.95	N	33.90	56.00	22.10	33.61	46.00	12.39
6.31	9.54	10.09	N	42.26	60.00	17.74	38.23	50.00	11.77
10.39	9.61	10.20	H	46.07	60.00	13.93	43.30	50.00	6.70

3.6 Antenna Requirement

3.6.1 Requirement

- FCC Part15 subpart H Section 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 use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

3.6.2 Result

- Must the EUT be professionally installed? ☒ YES ☐ NO
- Does the EUT have detachable antenna(s)? ☒ YES ☐ NO
- If detachable, is the antenna connector(s) non-standard? ☐ YES ☒ NO ☐ N/A

4. Test equipment list

Use	Model Number	Manufacturer	Description	Serial Number	Cal. Date.(Interval)
☒	AMP 20-1000	INFINITECH	BROADBAND PRE-AMP	2013 05 00003	Dec 21, 2023(1Y)
☒	DS 2000S	Innco GmbH	Turn Table	N/A	N/A
☒	MA4000-EP-HS	Innco GmbH	Antenna Mast	N/A	N/A
☒	MA4640-XP-ET	Innco GmbH	Tilt Antenna Mast	N/A	N/A
☒	CO3000	Innco GmbH	Controller	N/A	N/A
☒	CO3000	Innco GmbH	Controller	N/A	N/A
☒	N9020A	Agilent	Spectrum Analyzer	MY50200260	Dec 21, 2023(1Y)
☒	FSV3007	R&S	Spectrum Analyzer	101334	Aug 22, 2023(1Y)
☒	6502	EMCO	Loop Antenna	9609-3087	Oct 23, 2023(2Y)
☒	VULB 9168	SCHWARZBECK	Bi-Log Antenna	180	Nov 16, 2022(2Y)
☒	8449B	Agilent	Preamplifier	3008A02013	Dec 21, 2023(1Y)
☒	3115	EMCO	Horn Antenna	9402-4229	Oct 23, 2023(2Y)
☒	ESCI7	Rohde & Schwarz	EMI Test Receiver	100938	Dec 21, 2023(1Y)
☒	ESH-Z2	Rohde & Schwarz	Pulse Limter	101631	Dec 21, 2023(1Y)
☒	ENV216	Rohde & Schwarz	LISN	101264	Jun 29, 2023(1Y)
☒	PE7019-20	PASTERNACK	Attenuator	TEMP_1	Jun 27, 2023(1Y)
☒	ES-SCAN	Rohde & Schwarz	EMI Software	N/A	N/A
☒	EMC32	Rohde & Schwarz	EMI Software	N/A	N/A
☐	SAS-574	A.H.Systems	Horn Antenna	595	Jun 27, 2023(2Y)
☐	PAM-840A	Com-power	Preamplifier	461334	Dec 23, 2022(1Y)