

Prüfbericht-Nr.: <i>Test Report No.:</i>	NL2233BJ 001	Auftrags-Nr.: <i>Order No.:</i>	89220582	Seite 1 von 35 <i>Page 1 of 35</i>
Kunden-Referenz-Nr.: <i>Client Reference No.:</i>	PO # 3002167780	Auftragsdatum: <i>Order date:</i>	February 11, 2022	
Auftraggeber: <i>Client:</i>	Intel Corporation SAS, Le Cargo B6 / 424 Rue de Goa, 06600 Antibes, France			
Prüfgegenstand: <i>Test item:</i>	Wireless Network Card			
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	AX211D2WH			
Auftrags-Inhalt: <i>Order content:</i>	Testing compliance with EMC Standards			
Prüfgrundlage: <i>Test specification:</i>	47 CFR PART 15 (10-1-19 EDITION), Subpart 15B ICES-003 (Issue 7, October 2020)			

Wareneingangsdatum: <i>Date of receipt:</i>	February 28, 2022	
Prüfmuster-Nr.: <i>Test sample No.:</i>	A003219191-001	
Prüfzeitraum: <i>Testing period:</i>	Feb. 28, 2022 – March 02, 2022	
Ort der Prüfung: <i>Place of testing:</i>	Leek	
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland Nederland B.V. Leek Laboratory	
Prüfergebnis*: <i>Test result*:</i>	Pass	

Geprüft von / Tested by: W. Brouwer	Genehmigt von / Authorized by: A.J.K. Hut
Ausstelldatum: <i>Issue date:</i> March 02, 2022	Ausstellungsdatum: <i>Issue date:</i> March 07, 2022
Stellung / Position: EMC Expert	Stellung / Position: EMC Expert
Sonstiges / Other: None	
Zustand des Prüfgegenstandes bei Anlieferung: 1 <i>Condition of the test item at delivery: 1</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>
* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. Test specification(s) F(ail) a.m. test specification(s) N/A = not applicable N/T = not tested	
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a.m. testsample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This report does not entitle to carry any test mark</i>	

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Liste der verwendeten Prüfmittel
List of used test equipment

Prüfmittel Nr. / ID-Nr. Equipment No. / ID-No.		Prüfmittel Test equipment		Nächste Kalibrierung Next calibration
Conducted emission				
2789083	Rohde & Schwarz	ESCI	Measurement Receiver (9kHz-3GHz)	April 12, 2022
2790495	Rohde & Schwarz	ESH3-Z2	Impulse Limiter	April 28, 2022
2789124	Rohde & Schwarz	ESH2-Z5	LISN- artificial Network	August 12, 2022
2788866	COMTEST	1415	Conducted Reference Source 9kHz-50MHz	April 28, 2022
2789211	Extech	SD 500	Humidity / Temperature Data logger	June 28, 2022
Radiated emission				
2790260	R&S	FSV40	Signal Analyzer/Spectrum Analyzer	August 5, 2022
2788801	Emco	4610	Gen. field source	February 10, 2022
2789009	Siepel	FCC	FCC Test Site Registration nr 786213	March 8, 2022
2789082	Comtest		Site registration filing Industry Canada	May 8, 2023
2789206	Siepel		S-AR	May 4, 2023
2789217	Gigalink	APG0500	RF Cable S-AR	March 12, 2022
2789237	Teseq	CBL 6111D	Antenne S-AR, BiLog 30MHz-1GHz	August 18, 2022
2790499	Rohde & Schwarz	ESR7	EMI Test Receiver 7GHz	August 19, 2022
2788776	Emco	3115	Guide ant. 1-18GHz	July 14, 2023
2788777	Emco	3115	Guide ant. 1-18GHz	February 26, 2022
2788779	Emco	3116	Guide ant. 18-40GHz	March 8, 2024
2788780	Emco	3160-09	Gain horn 18-26.5GHz	March 8, 2024
2788982	Emco	3160-09	Gain horn 18-26.5GHz	March 8, 2024
2788983	Emco	3160-10	Gain horn 26.5-40GHz	March 8, 2024
2789108	H&S	Sucotest 18/Sucoflex 102	Cable RF S-AR >1G setup	June 28, 2022
2789109	H&S	Sucotest 18/Sucoflex 102	Cable RF	June 28, 2022
2789110	H&S	Sucotest 18/Sucoflex 102	Cable RF	June 28, 2022
2789214	Extech	SD 500	Humidity / Temperature Data logger	June 28, 2022

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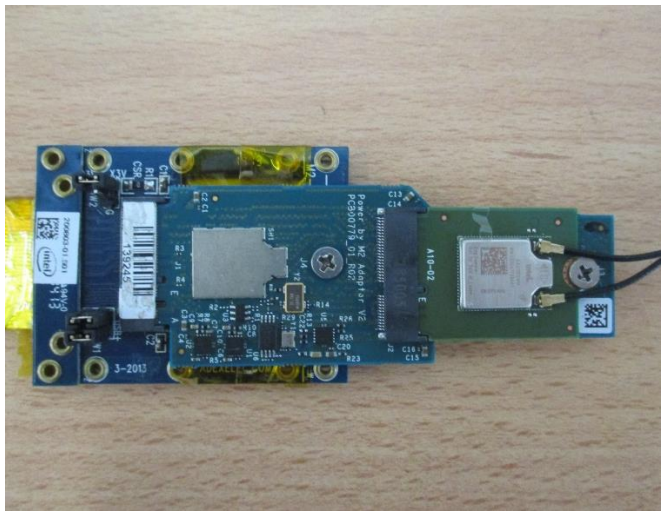
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1	Produktdetails <i>Product details</i>	Wireless Network Card AX211D2WH
2	Maße / Gewicht <i>Dimensions / Weight</i>	<< 50 gr
3	Bedienelemente <i>Operating elements</i>	Built inside Extender, processed by laptop
4	Ausstattung / Zubehör <i>Equipment / Accessories</i>	Extender card
5	Verwendete Materialien <i>Used materials</i>	None
6	Sonstiges <i>Other</i>	None
7	Dieser raport betrifft: <i>This report concerns:</i>	EMC Verification

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Absatz	Anforderungen – Prüfungen / Requirements - Tests		
Clause			
1	47 CFR Part 15 (10-1-19 Edition) - 15.107(a) ICES-003 (Issue 7, October 2020) – Section 6.1 Table 2	AC Power Line Conducted Emissions	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
2	47 CFR Part 15 (10-1-19 Edition) - 15.109 ICES-003 (Issue 7, October 2020) – Section 6.2.1 Table 5	Radiated unwanted emissions	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>

EUT:	EUT in Extender card:
 <p>intel. AX211D2WH WM:2C0DA7F5B8A1 ICN:GIP2-HAG Eng.Sample- Not for Sale or Lease</p>	 <p>Power by M2 Adapter V2 Positivo, DL 1027</p>

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Zusammenfassung der Prüfergebnisse <i>Summary of test results</i>					
Prüfung <i>Test</i>	Anwendbar <i>Applicable</i>	Prüfergebnis <i>Test result</i>	Paragraf <i>Paragraph</i>	Messungen unter Akkreditierung ausgeführt <i>under accreditation</i>	Kommentar <i>Remark</i>
Radiated emission < 1000 MHz	Yes	Pass	3.1	Yes	
Radiated emission > 1000 GHz	Yes	Pass	3.2	Yes	
Conducted emission AC port	Yes	Pass	3.3	Yes	

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Revisions <i>Revisions</i>			
Revision Revision	Datum Date	Anmerkung Remark	Verfasser Author
00	March 02, 2022	First Release	W. Brouwer

Note: Latest revision report will replace all previous reports

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CONDITIONS FOR TESTING

1 General test configuration.

Communication with WIFI 6E access point is established and data is transferred and monitored with Iperf. Three modes were tested. 1 : 2.4GHz WIFI communication. 2: 5GHz WIFI communication including Bluetooth (receiving dummy file from smartphone). 3: 6GHz WIFI communication.

Remarks

All EMC Emission and Immunity testing has taken place:

- 1) within an environmental temperature range between 15 and 35 degrees Celsius
- 2) within an environmental relative humidity range between 20 and 85%
- 3) within an environmental air pressure range between 860 and 1060 mbar

List of tested cables

Number	Function	From	To	Length	Remarks
1	AC	Mains	Laptop	< 3m	

1.1 Tested system auxiliary details.

Details and an overview of the system and all of its components, as it has been tested, may be found below.

Description of test configuration.

Test item (EUT1)	: Wireless Communication Card 6E
Manufacturer	: Intel Corporation SAS
Brand mark	: Intel
Model	: AX211D2WH
Serial number	: Engineering Sample
Remark	: Tested with Laptop (AUX1)
Test item (AUX1)	: Extender board
Manufacturer	: Intel Corporation SAS
Brand mark	: Intel
Remark	: Used to have a functional EUT outside a laptop
Test item (AUX2)	: Laptop including PSU
Manufacturer	: Dell
Brand mark	: Dell
Model	: E5401
Remark	: Used as Host for EUT1
Test item (AUX3)	: Mobile Phone
Manufacturer	: Samsung
Brand mark	: Samsung
Model	: Galaxy J7 (2016)
Remark	: Used for BT communication

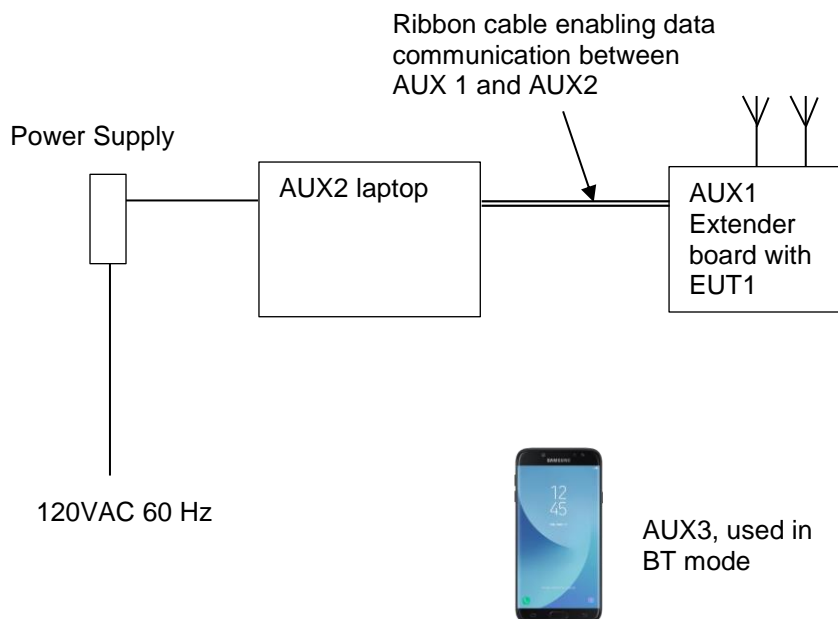


Figure 1. Total set-up used during testing

1.2 Test methodology.

The test methodology used is based on the requirements of 47 CFR Part 15 (10-1-19 Edition), sections 15.31, 15.107 and 15.109 and ICES-003 Issue 7 (October 2020) Sections 6.1 and 6.2. The EUT was tested in horizontal position only and is regarded as floor standing equipment.

The test methods, which have been used, are based on ANSI C63.4-2014.

Radiated emission tests were performed at a measurement distance of 3 meters.

The receivers are switching automatically to the right bandwidth in accordance with CISPR 16. This is implemented in the receiver. The antenna factors are programmed in the test receiver. The receiver automatically calculates the appropriate correction factor for the utilized antenna and also the appropriate antenna factor for the cable loss. The total correction is automatically added to the measured value.

1.3 Test facility.

The Federal Communications Commission and Industry Canada has reviewed the technical characteristics of the test facilities at TÜV Rheinland Nederland B.V., located at Eiberkamp 10, 9351 VT Leek, The Netherlands, and has found these test facilities to be in compliance with the requirements of 47 CFR Part 15, section 2.948.

The description of the test facilities has been filed at the Office of the Federal Communications Commission under registration number 786213. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

The description of the test facilities has been filed to Industry Canada under registration number 2932G-2. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

1.4 Test conditions.

Normal test conditions:

Temperature (*)	: +15°C to +35°C
Relative humidity(*)	: 20 % to 75 %
Supply voltage	: 120 Vac / 60 Hz

**When it was impracticable to carry out the tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests are stated separately.*

2 System test configuration.

2.1 Justification.

The system was configured for testing in a typical situation as a customer would normally use it. The test sample was configured by the applicant to enable continuous transmit.

The justification and manipulation of cables and equipment in order to simulate a worst-case behaviour of the test setup has been carried out as prescribed in ANSI C63.4-2014.

2.2 EUT mode of operation.

The unintentional radiator tests have been performed with a complete functioning EUT.

2.3 Special accessories.

No special accessories are used and/or needed to achieve compliance.

2.4 Equipment modifications.

No modifications have been made to the equipment.

3 Test results Emission according to FCC CRF47 Part 15B

3.1 Enclosure Radiated Emission 30-1000 MHz

3.1.1 Definition

Result of the measurements concerning radiated electromagnetic fields (electric component) emitted by the total set-up of the EUT.

3.1.2 Basic standard

The test is performed according to FCC CRF 47 Part 15B § 15.109

3.1.3 Limit

FCC 15.109(a) and IC ICES-003 section 6.2

Except for Class A digital devices, the field strength of radiated emissions from an unintentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (µV/meter)	Field strength (dBµV/m)	Measurement distance (meters)
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

Table of applicable limits

3.1.4 Test procedures

ANSI C63.4-2014.

Before final measurements of radiated emissions were performed, the EUT was scanned to determine its emission spectrum profile. The physical arrangement of the test system, the associated cabling and the EUT orientation (X, Y, Z) were varied in order to ensure that maximum emission amplitudes were attained.

The spectrum was examined from 30MHz to 35625 MHz, the fifth harmonic of the highest intentional generated frequency. Final radiated emission measurements were made at 3m distance.

At each frequency where a spurious emission was found, the EUT was rotated 360° and the antenna was raised and lowered from 1 to 4m in order to determine the emission's maximum level. Measurements were taken using both horizontal and vertical antenna polarizations.

The highest emission amplitudes relative to the appropriate limit were recorded in this report. Field strength values of radiated emissions at frequencies not listed in the tables are more than 20 dB below the applicable limit.

3.1.5 Test deviation

There is no deviation with the original standard

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3.1.6 Test results

Test conditions			
		Test location	Leek
Applied Standard(s)	FCC CRF 47 Part 15B § 15.109		
Test engineer	W. Brouwer	Test result	Pass
Test date	February 28 – March 01, 2022		

Results and limits 2.4GHz mode						
Frequency (MHz)	Result (dB μ V/m)	Antenna polarization	Limit (dB μ V/m)	Margin	Height (m)	Angle (deg)
30.888	22.418	Vertical	40	-17.582	1.028	212.2
86.53	26.815	Horizontal	40	-13.185	2.506	156.1
203.193	27.28	Horizontal	43.5	-16.22	1.335	252.3
209.622	25.714	Horizontal	43.5	-17.786	1.102	11.4
218.526	28.713	Horizontal	46	-17.287	1.481	91.3
424.674	32.07	Vertical	46	-13.93	1.071	243.5

Table 1 Results Enclosure Radiated Emission 30.0 – 1000 MHz, 2.4GHz mode

Results and limits 5GHz + Bluetooth mode						
Frequency (MHz)	Result (dB μ V/m)	Antenna polarization	Limit (dB μ V/m)	Margin	Height (m)	Angle (deg)
31.646	21.65	Vertical	40	-18.35	1.296	274.5
100.991	32.901	Vertical	43.5	-10.599	1.052	78.7
208.856	26.713	Horizontal	43.5	-16.787	1.562	282.4
213.782	26.438	Horizontal	43.5	-17.062	1.006	269.6
423.457	34.395	Vertical	46	-11.605	1.18	239.3
955.271	34.165	Vertical	46	-11.835	2.145	353.1

Table 2 Results Enclosure Radiated Emission 30.0 – 1000 MHz, 5GHz + BT mode

Results and limits 5GHz + Bluetooth mode						
Frequency (MHz)	Result (dB μ V/m)	Antenna polarization	Limit (dB μ V/m)	Margin	Height (m)	Angle (deg)
30.24	20.387	Vertical	40	-19.613	1.702	40.2
101.015	33.234	Vertical	43.5	-10.266	1.063	8.9
211.213	23.342	Horizontal	43.5	-20.158	1.539	182.6
230.498	25.044	Horizontal	46	-20.956	1.318	246.4
423.576	33.686	Vertical	46	-12.314	1.228	245.2
955.247	39.458	Vertical	46	-6.542	2.63	358.2

Table 3 Results Enclosure Radiated Emission 30.0 – 1000 MHz, 6GHz mode

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Used Equipment

2790499	2789109	2789237	2789217	2789110	2789029	2789206	2789214
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Notes:

1. Field strength values of radiated emissions at frequencies not listed in the table above are more than 20 dB below the applicable limit.
2. Measurement uncertainty is +/- 5.22 dB.
3. The EUT was tested in horizontal orientation only-it's normal operation orientation, the measuring antenna was varied in horizontal and vertical orientations and also around its axis and height. The reported value is the worst case found at the reported frequency.
4. A selection of Photos and Graphical Displays is provided on the next pages.

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3.1.7 Photograph test setup

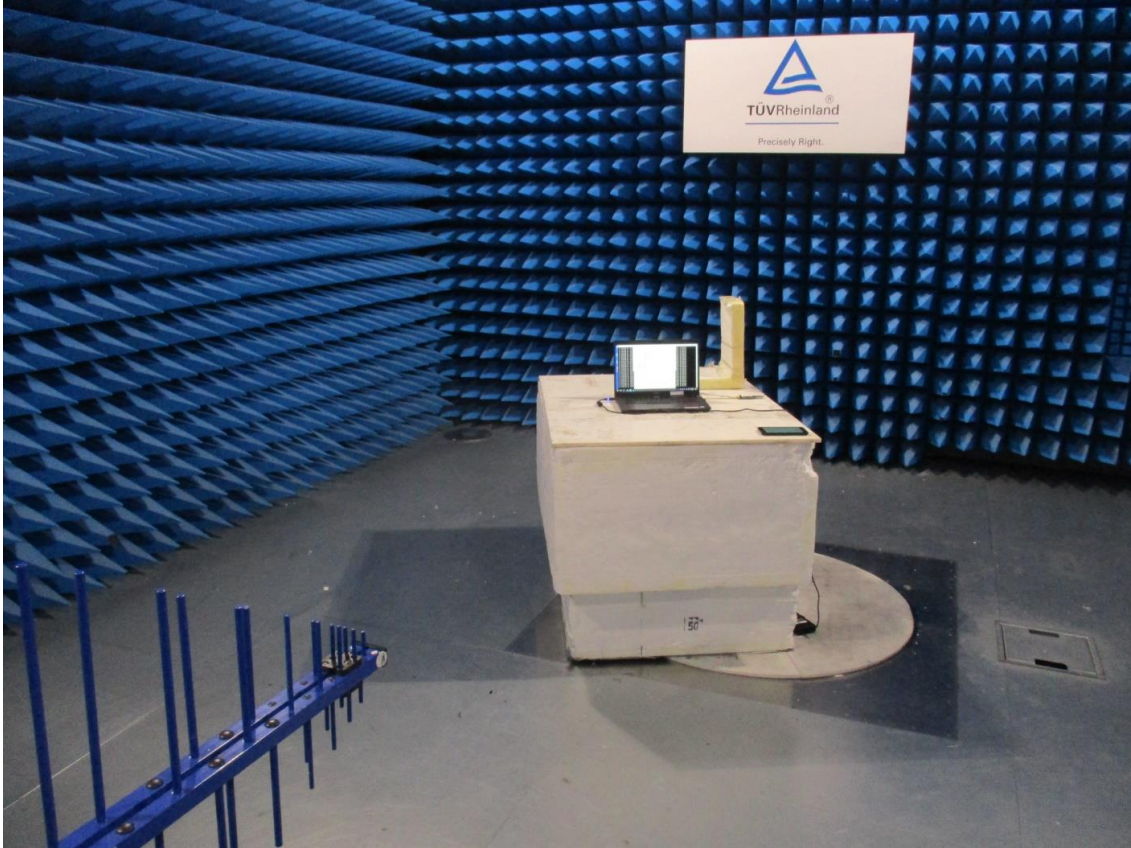
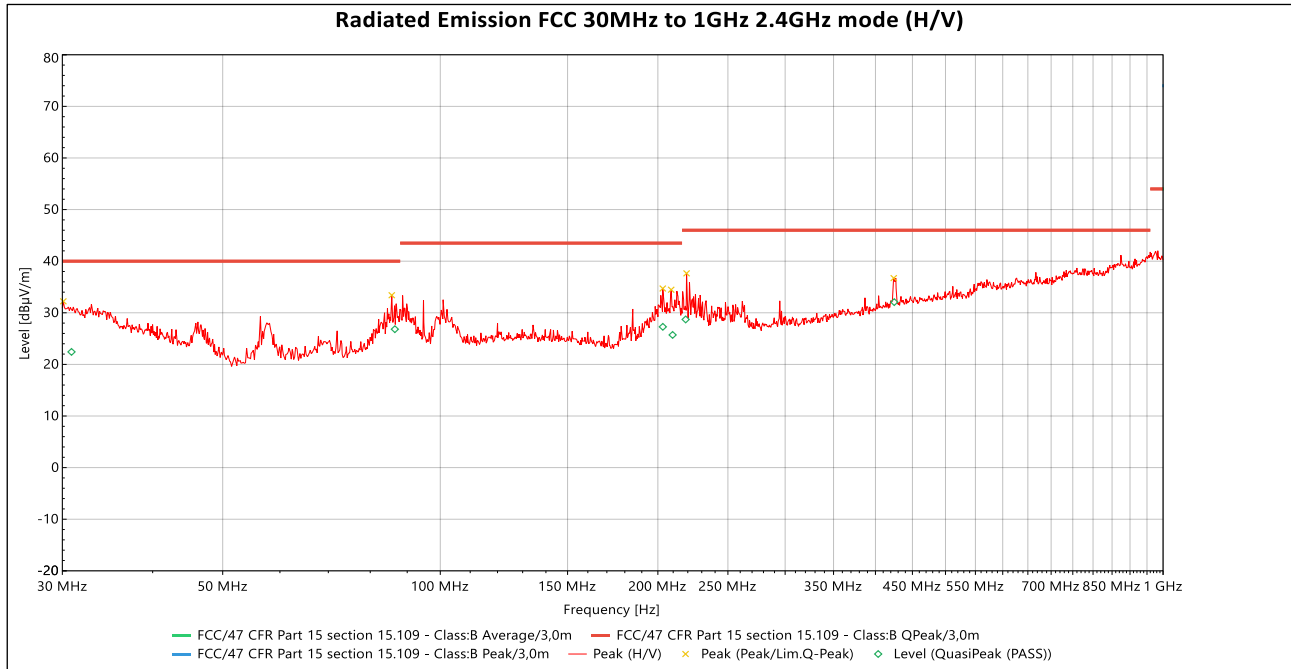
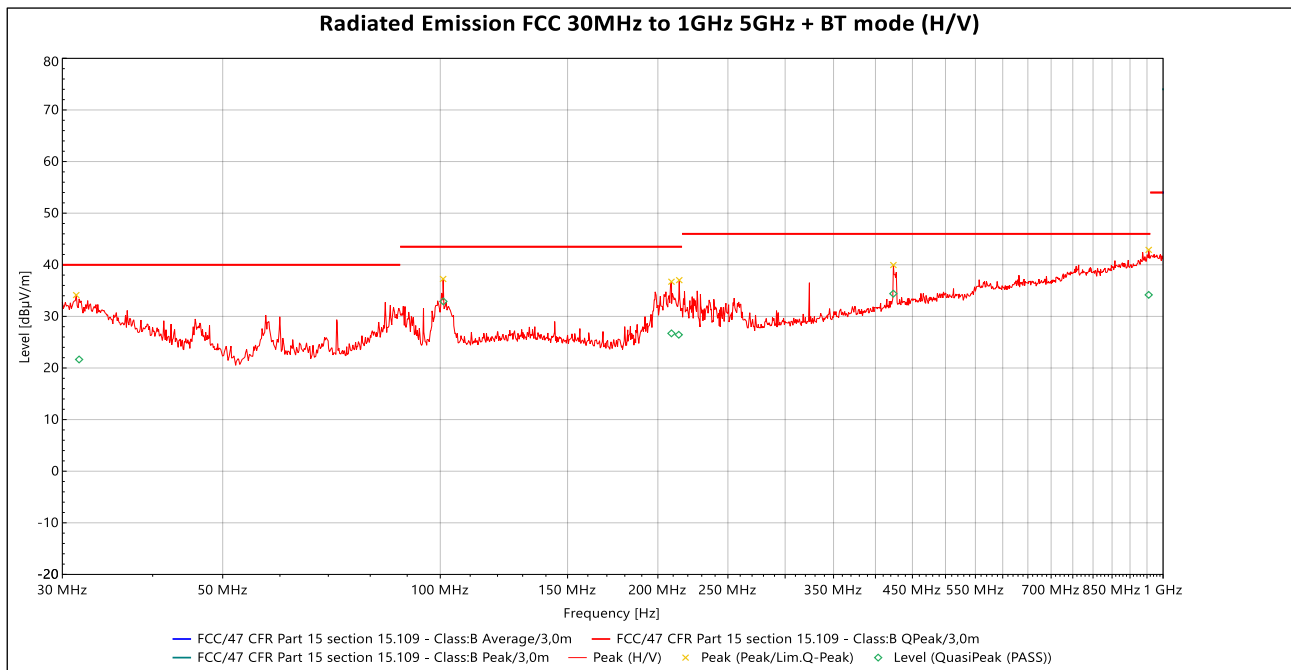


Photo 1 Photograph test setup radiated emissions 30-1000 MHz

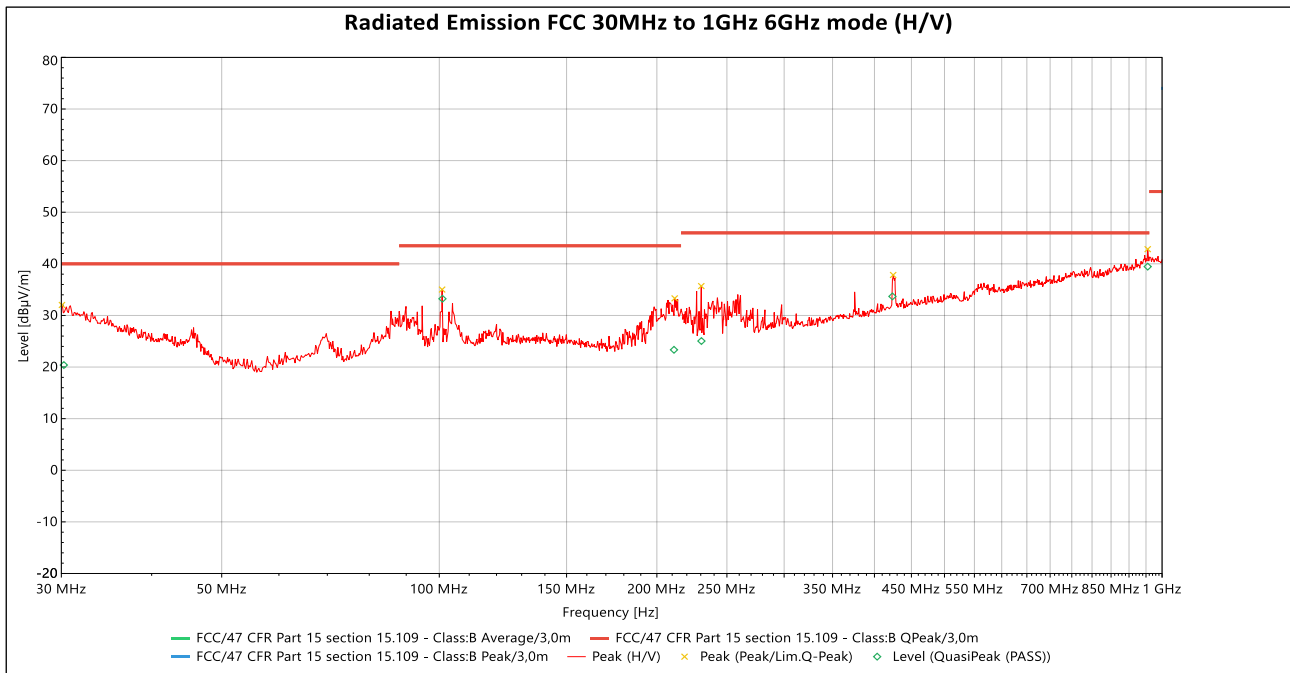
3.1.8 Spectrum plot



Plot 1: Pre-scan plot with peak detector. Radiated emissions from 30 MHz to 1000 MHz, 2.4GHz mode



Plot 2: Pre-scan plot with peak detector. Radiated emissions from 30 MHz to 1000 MHz, 5GHz + BT mode



Plot 3: Pre-scan plot with peak detector. Radiated emissions from 30 MHz to 1000 MHz, 6GHz mode

3.2 Enclosure Radiated emission 1000 MHz – 35625 MHz results

Results and limits 2.4GHz mode						
Frequency (GHz)	Peak Results			Average Results		
	Vertical (dB μ V/m)	Horizontal (dB μ V/m)	Limit (dB μ V/m)	Vertical (dB μ V/m)	Horizontal (dB μ V/m)	Limit (dB μ V/m)
2.258	56.4	52.5	74.0	31.5	31.3	54.0
4.829	57.2	57.7	74.0	43.3	43.3	54.0
11.396	65.0	65.5	74.0	52.9	52.9	54.0
13.94	57.6	58.2	74.0	46.4	46.4	54.0
17.80	65.1	65.5	74.0	52.8	52.9	54.0
20.43	53.2	52.0	74.0	40.5	40.5	54.0

Table 4 Results Enclosure Radiated Emission 1000.0 – 35625 MHz, 2.4GHz mode

Results and limits 5GHz + Bluetooth mode						
Frequency (GHz)	Peak Results			Average Results		
	Vertical (dB μ V/m)	Horizontal (dB μ V/m)	Limit (dB μ V/m)	Vertical (dB μ V/m)	Horizontal (dB μ V/m)	Limit (dB μ V/m)
1.33	47.0	42.7	74.0	26.3	25.9	54.0
1.958	44.2	44.4	74.0	30.2	30.1	54.0
5.489	69.3	62.5	74.0	44.8	44.7	54.0
11.367	65.7	64.6	74.0	52.4	52.4	54.0
13.94	58.0	59.2	74.0	46.5	46.5	54.0
17.45	64.1	63.9	74.0	52.1	52.1	54.0
17.81	65.2	64.7	74.0	52.9	53.1	54.0
20.27	53.7	53.0	74.0	40.5	40.5	54.0

Table 5 Results Enclosure Radiated Emission 1000.0 – 35625 MHz, 5GHz + BT mode

Results and limits 6GHz mode						
Frequency (GHz)	Peak Results			Average Results		
	Vertical (dB μ V/m)	Horizontal (dB μ V/m)	Limit (dB μ V/m)	Vertical (dB μ V/m)	Horizontal (dB μ V/m)	Limit (dB μ V/m)
1.711	47.9	43.5	74.0	28.0	27.9	54.0
5.469	70.1	62.5	74.0	45.6	45.5	54.0
11.367	65.6	64.4	74.0	52.4	52.4	54.0
13.92	57.6	59.6	74.0	46.4	46.4	54.0
17.75	65.7	66.8	74.0	52.9	52.9	54.0
20.16	53.0	52.7	74.0	40.5	40.4	54.0

Table 6 Results Enclosure Radiated Emission 1000.0 – 35625 MHz, 6GHz mode

Notes:

Field strength values of radiated emissions at frequencies not listed in the table above are more than 20 dB below the applicable limit.

1. Measurement uncertainty is +/- 5.1 dB
2. The reported field strength values are the worst case values at the indicated frequency. The receiving antenna was varied in horizontal and vertical orientations and also in height (between 1m and 4m).
3. A Peak and Average detector was used with a resolution bandwidth of 1MHz.

Used Equipment

2790499	2789109	2788776	2789217	2789110	2789029	2789206	2789108	2789214
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3.2.1 Photograph test setup

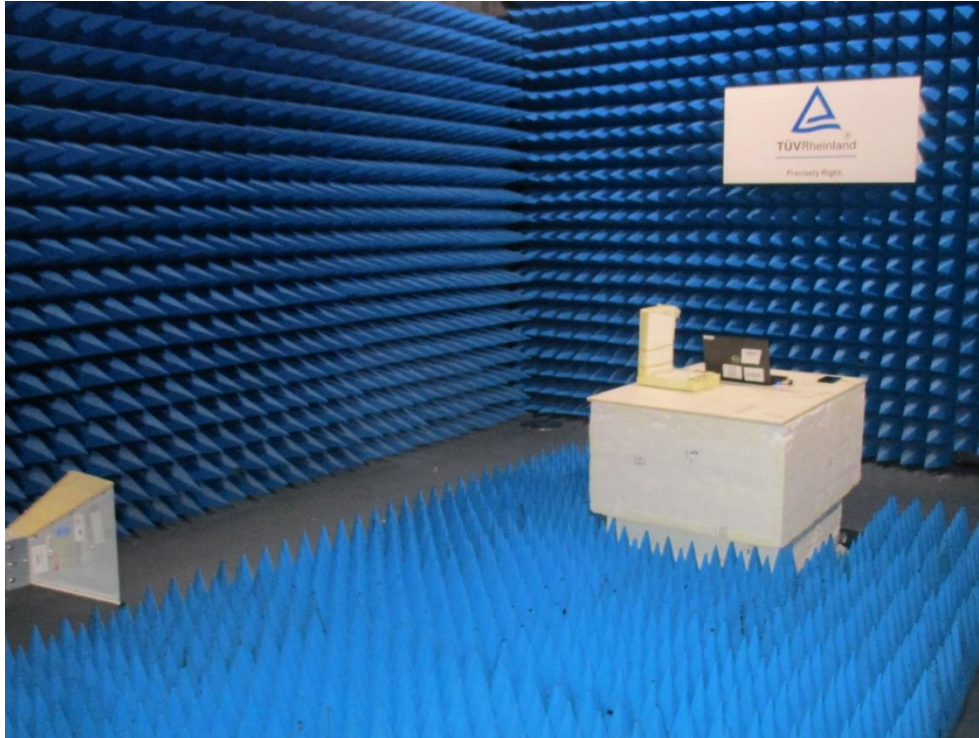


Photo 2: Photograph radiated emissions 1 – 18 GHz

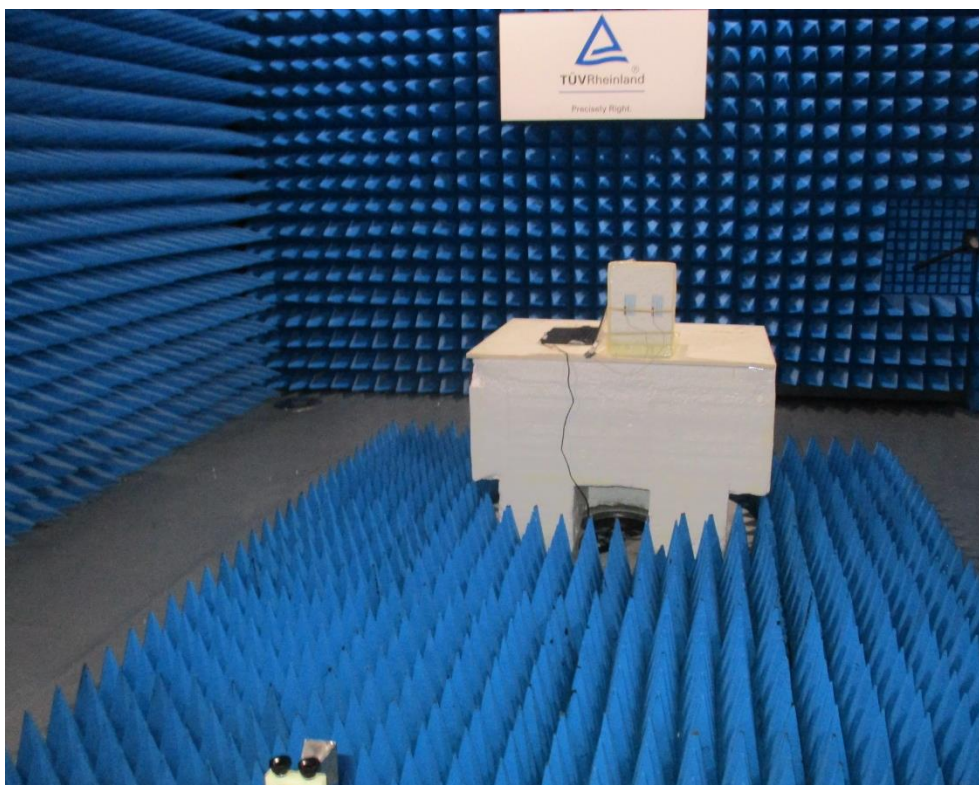


Photo 3: Photograph radiated emissions 18 – 26.5 GHz

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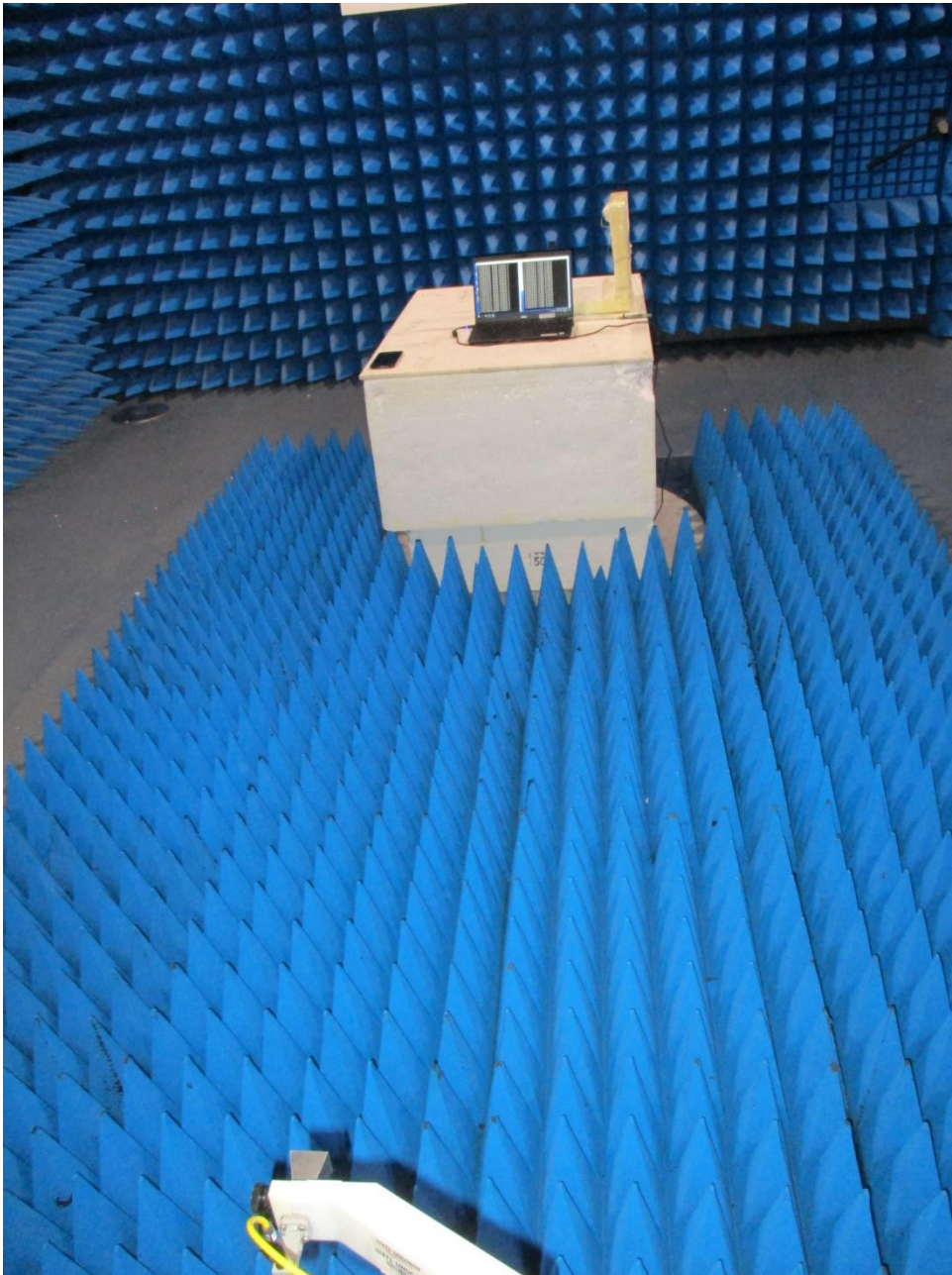
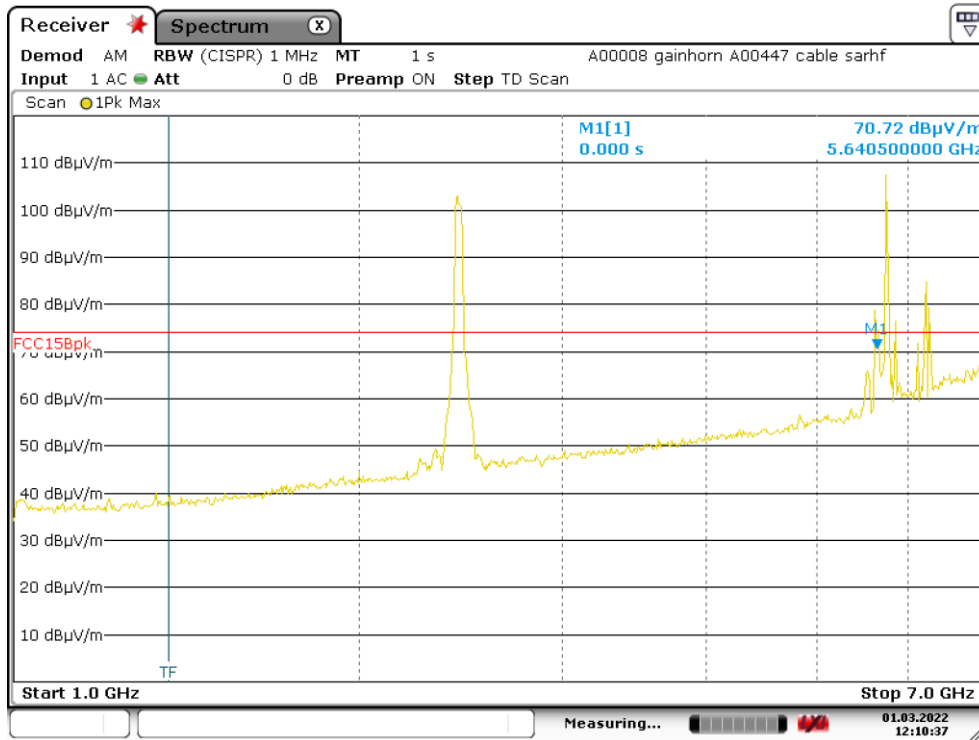


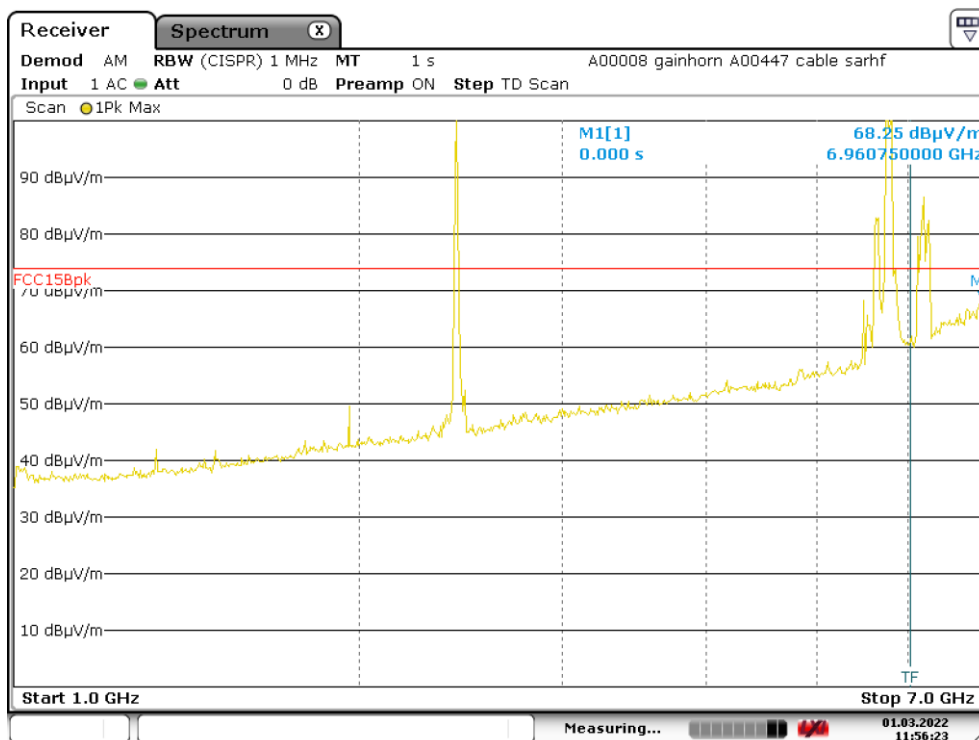
Photo 4: Photograph radiated emissions 26.5 – 36 GHz

3.2.2 Spectrum plot



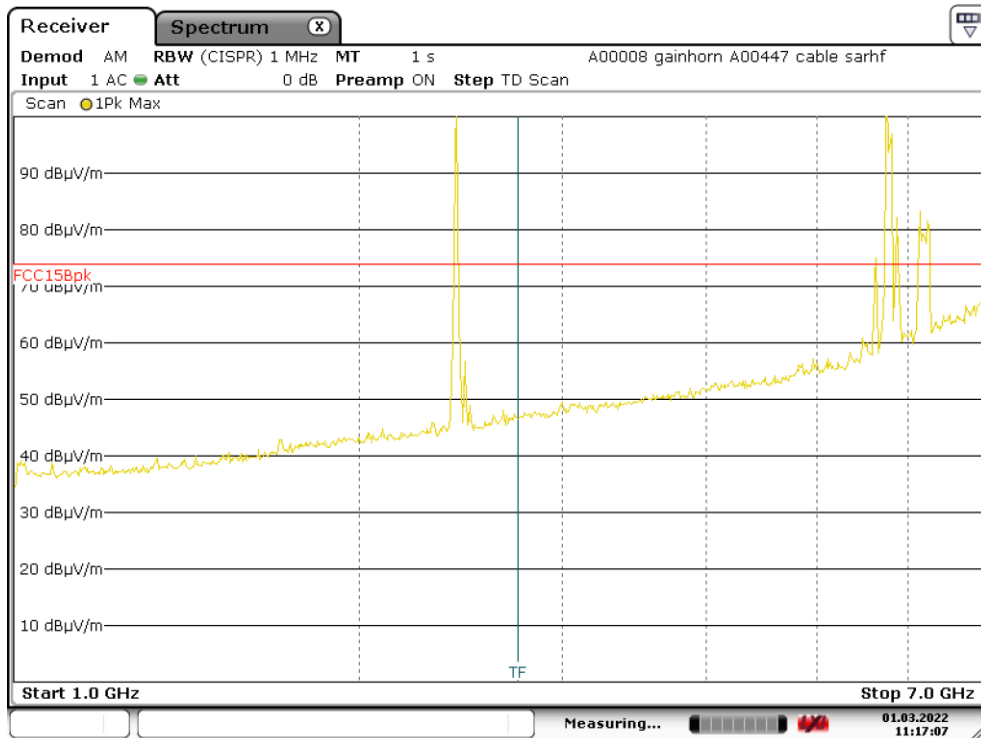
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Plot 4: Pre-scan plot with peak detector. Radiated emissions from 1 GHz – 7 GHz, 2.4GHz mode



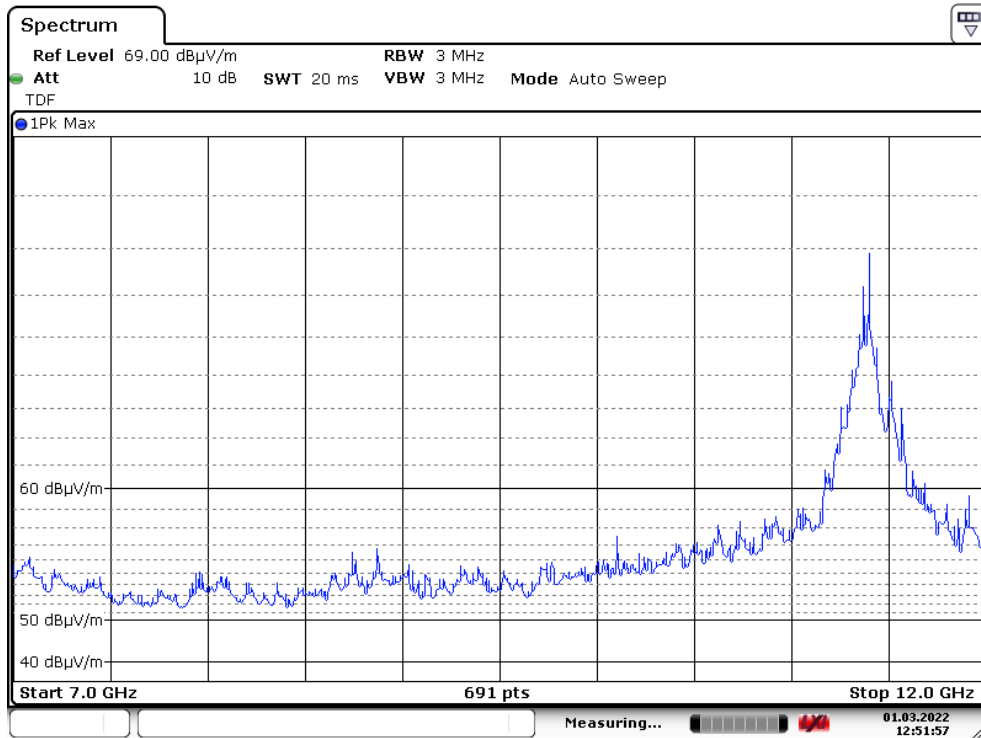
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Plot 5: Pre-scan plot with peak detector. Radiated emissions from 1 GHz – 7 GHz, 5GHz + BT mode



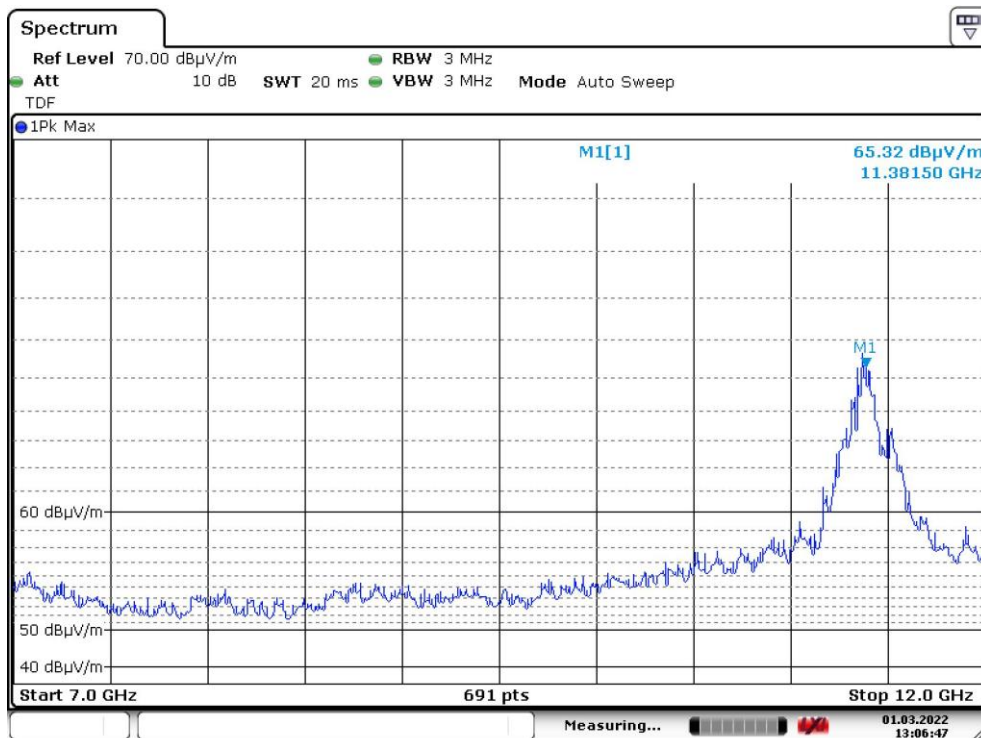
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Plot 6: Pre-scan plot with peak detector. Radiated emissions from 1 GHz – 7 GHz, 6GHz Mode



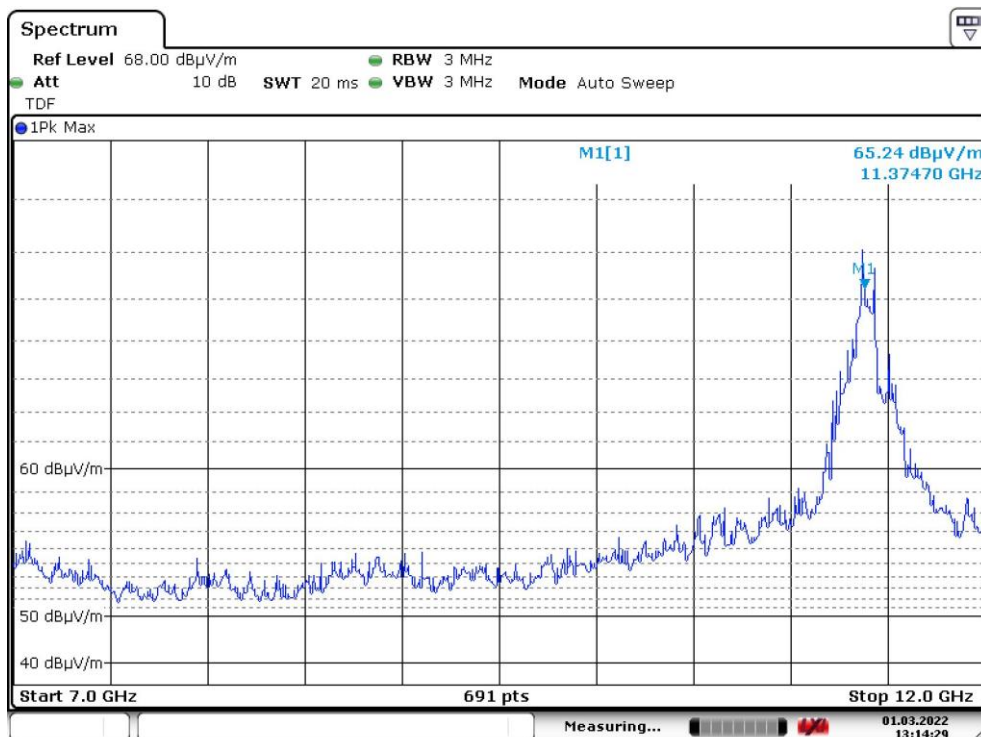
Date: 1 MAR 2022 12:51:57

Plot 7: Pre-scan plot with peak detector. Radiated emissions from 7 GHz – 12 GHz, 2.4GHz mode



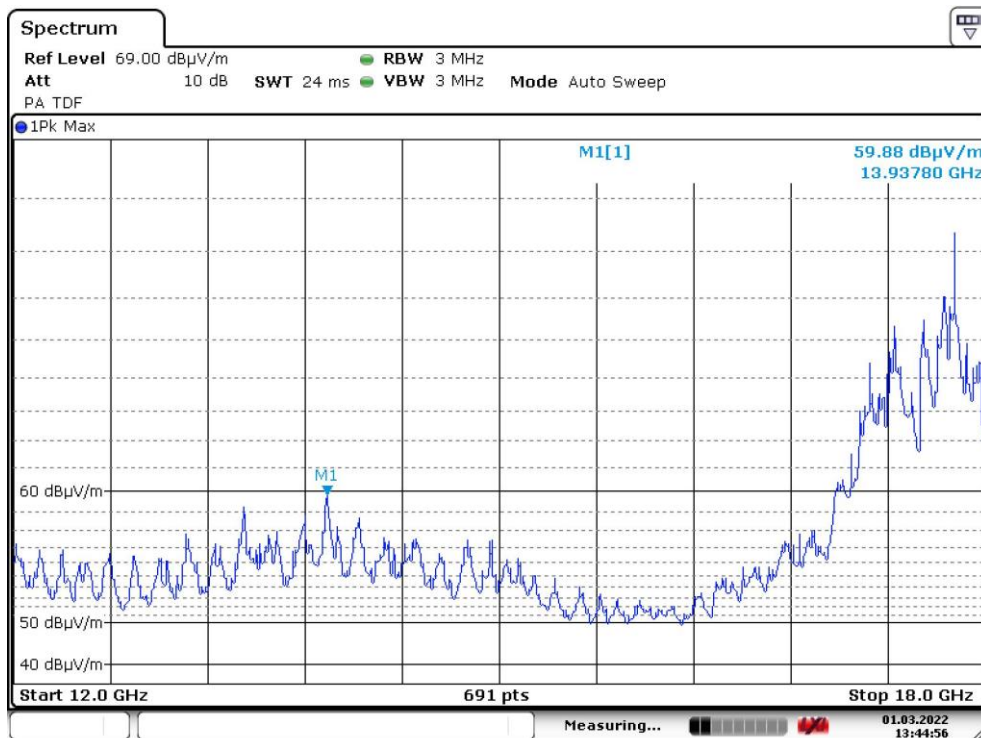
Date: 1.MAR.2022 13:06:47

Plot 8: Pre-scan plot with peak detector. Radiated emissions from 7 GHz – 12 GHz, 5GHz + BT mode



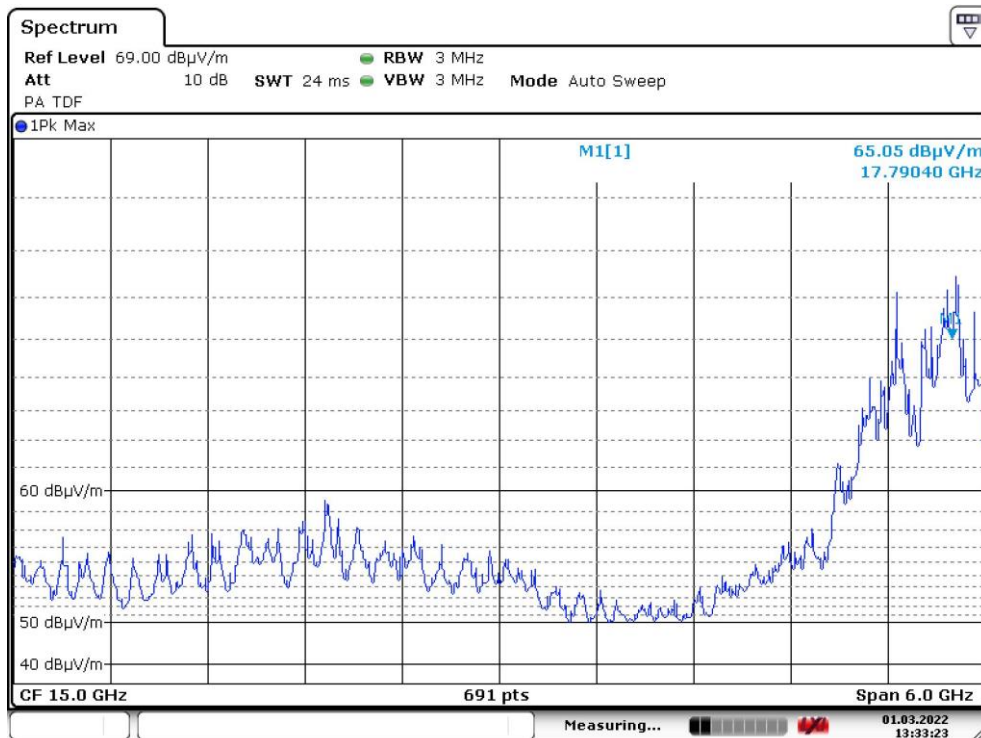
Date: 1.MAR.2022 13:14:29

Plot 9: Pre-scan plot with peak detector. Radiated emissions from 7 GHz – 12 GHz, 6GHz mode



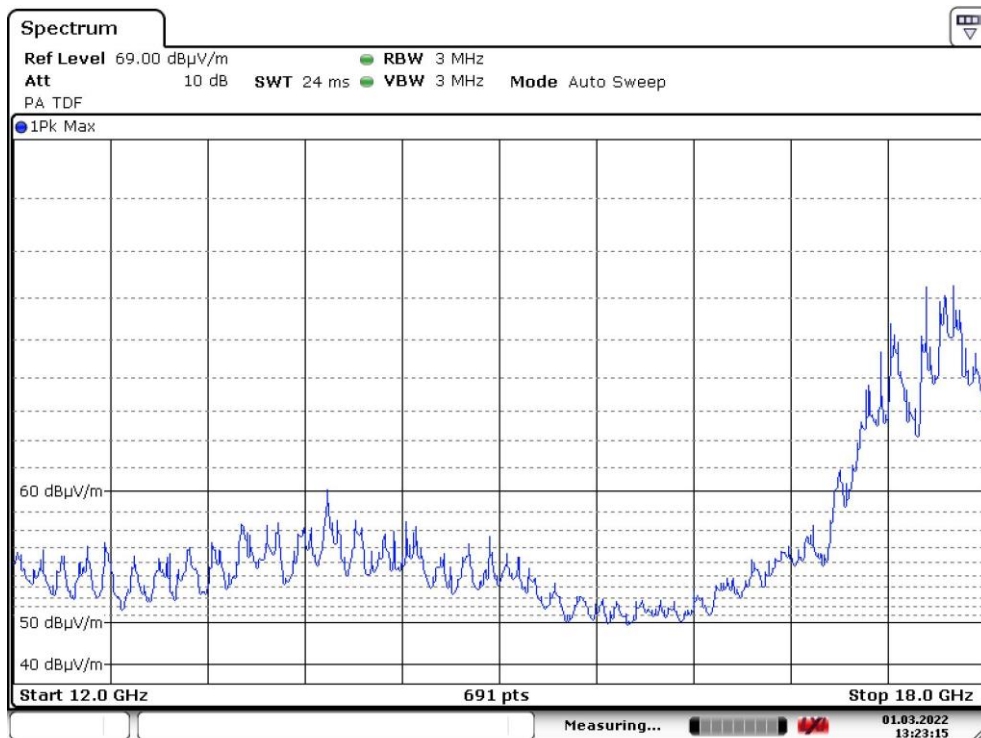
Date: 1.MAR.2022 13:44:56

Plot 10: Pre-scan plot with peak detector. Radiated emissions from 12 GHz – 18 GHz, 2.4GHz mode



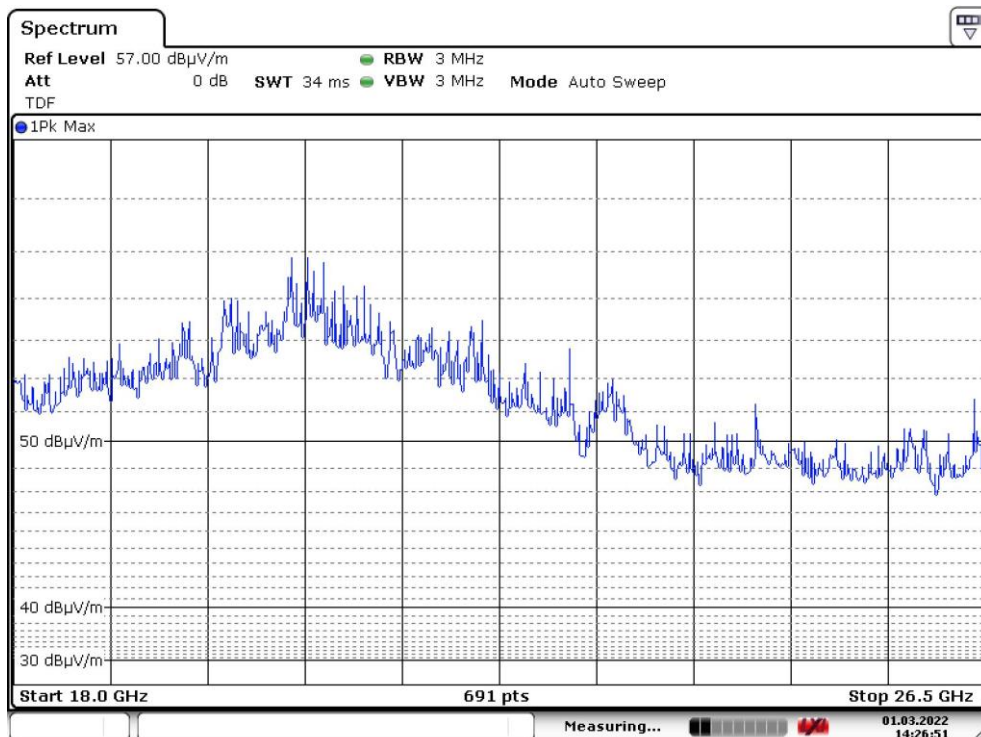
Date: 1.MAR.2022 13:33:23

Plot 11: Pre-scan plot with peak detector. Radiated emissions from 12 GHz – 18 GHz, 5GHz + BT mode



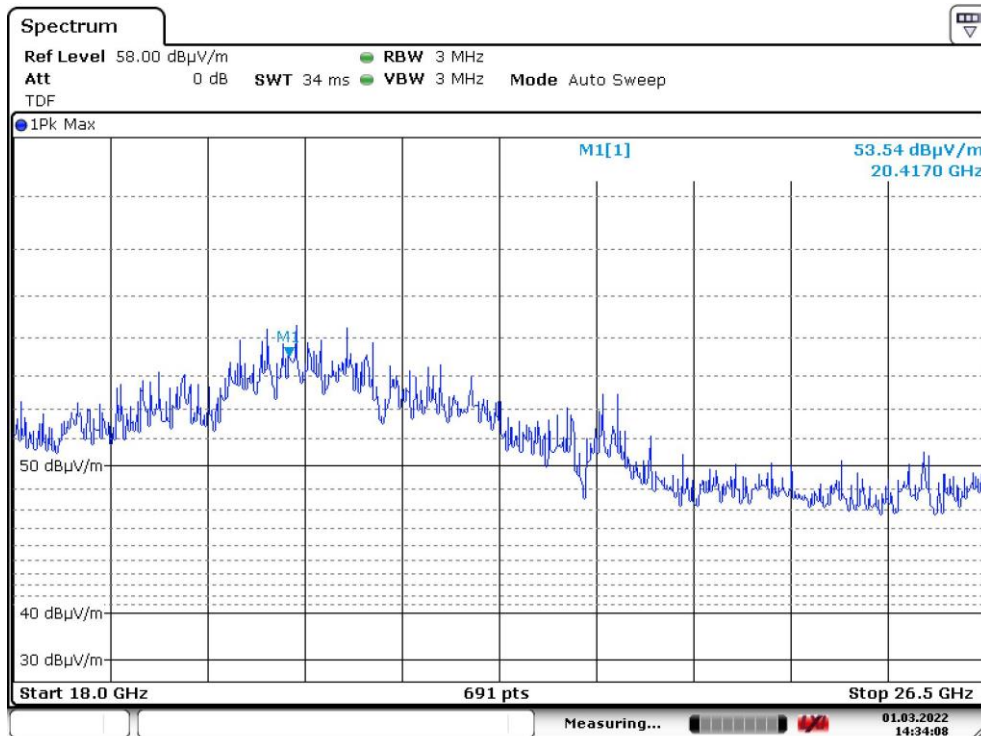
Date: 1.MAR.2022 13:23:15

Plot 12: Pre-scan plot with peak detector. Radiated emissions from 12 GHz – 18 GHz, 6GHz mode



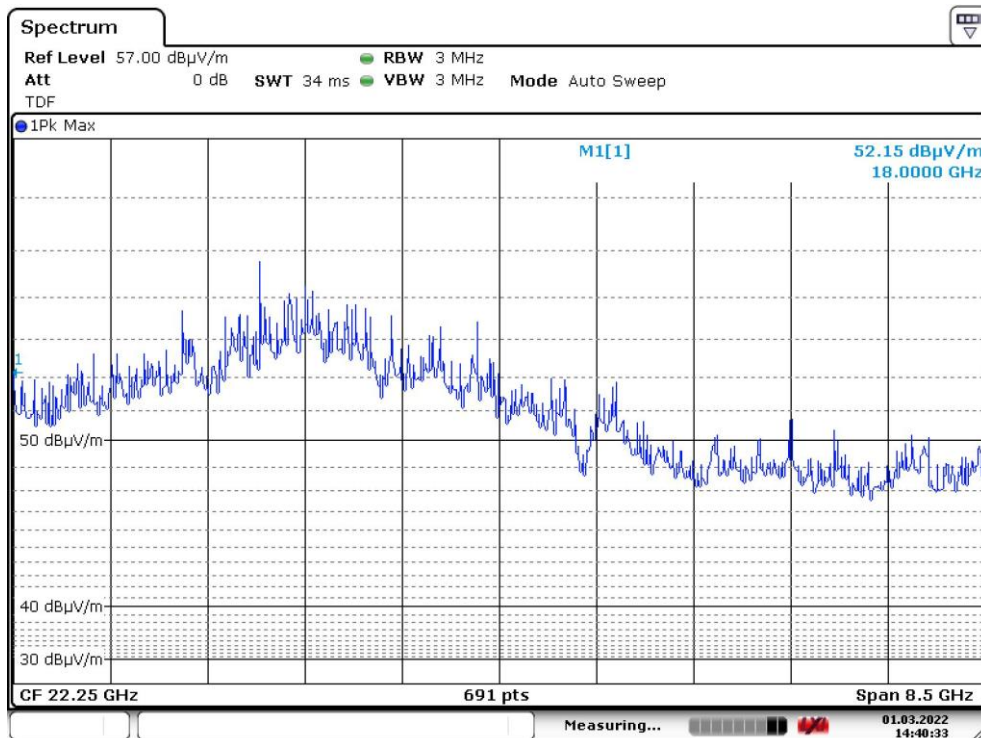
Date: 1.MAR.2022 14:26:52

Plot 13: Pre-scan plot with peak detector. Radiated emissions from 18 GHz – 26.5 GHz, 2.4GHz mode



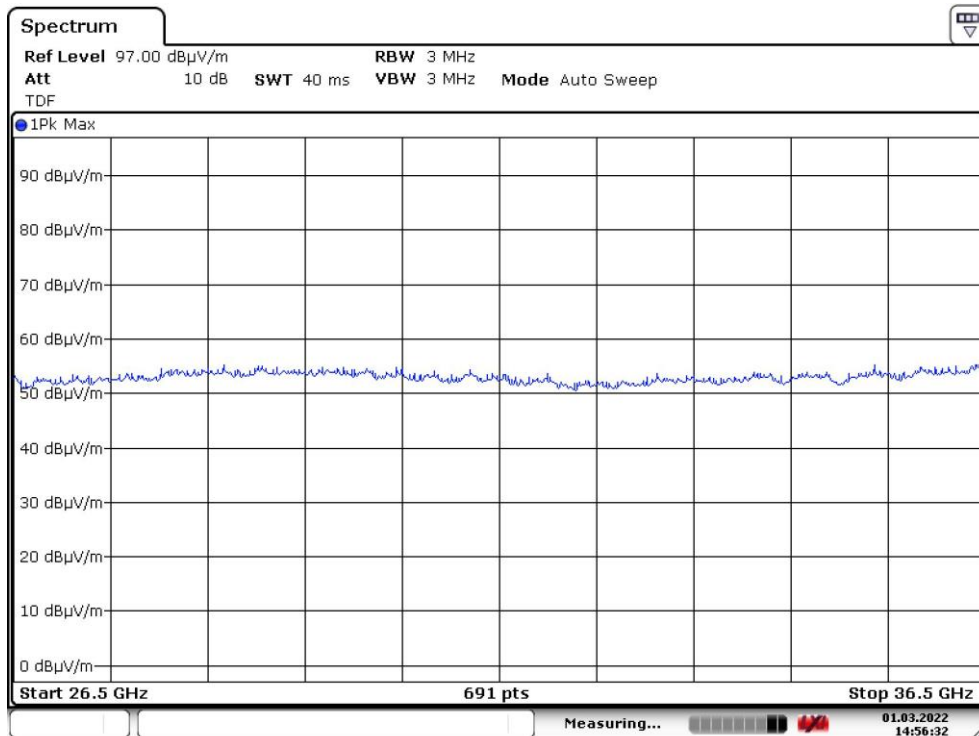
Date: 1.MAR.2022 14:34:09

Plot 14: Pre-scan plot with peak detector. Radiated emissions from 18 GHz – 26.5 GHz, 5GHz + BT mode



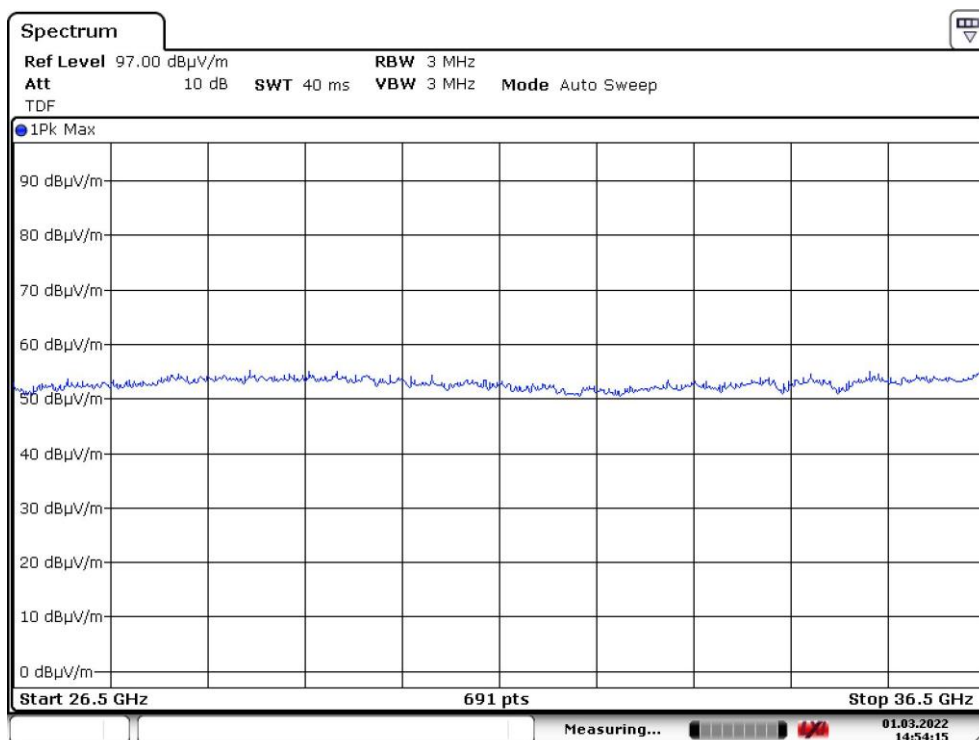
Date: 1.MAR.2022 14:40:33

Plot 15: Pre-scan plot with peak detector. Radiated emissions from 18 GHz – 26.5 GHz, 6GHz mode



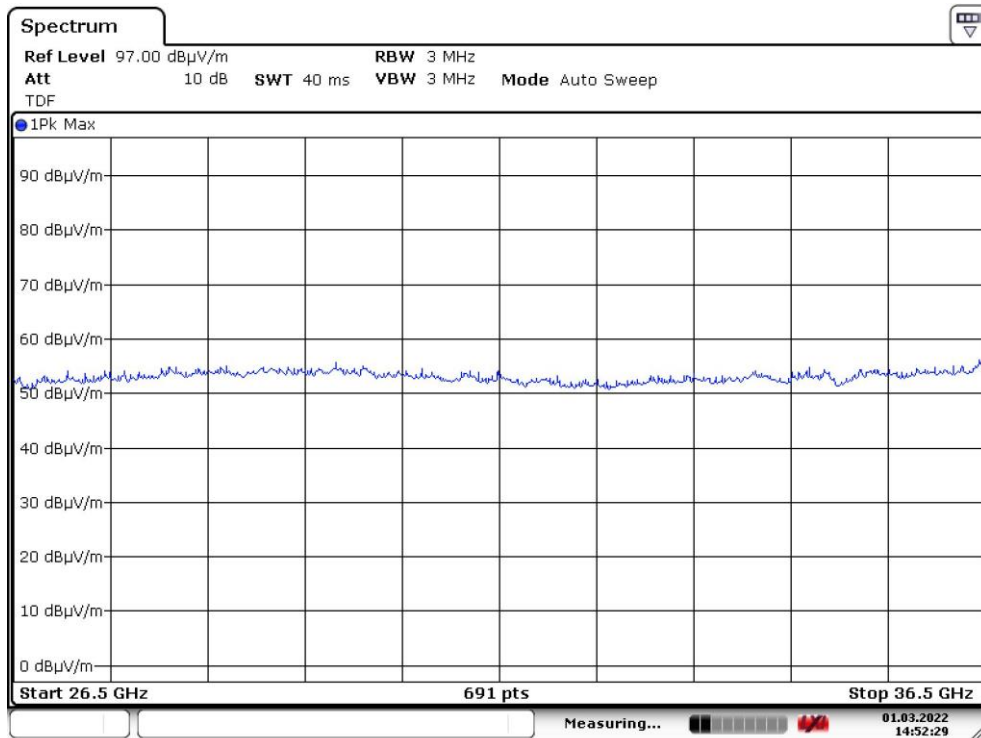
Date: 1. MAR.2022 14:56:32

Plot 16: Pre-scan plot with peak detector without correction factor.
Radiated emissions from 26.5 GHz – 36 GHz, 2.4GHz mode



Date: 1. MAR.2022 14:54:16

Plot 17: Pre-scan plot with peak detector without correction factor.
Radiated emissions from 26.5 GHz – 36 GHz, 5GHz + BT mode



Date: 1.MAR.2022 14:52:29

Plot 18: Pre-scan plot with peak detector without correction factor.
Radiated emissions from 26.5 GHz – 36 GHz, 6GHz mode

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3.3 AC Mains Conducted Emission 0.15-30 MHz

3.3.1 Definition

Result of the measurements concerning the disturbance voltage level at the power input port emitted by the total set-up of the EUT.

3.3.2 Basic standard

The test is performed according to FCC CRF 47 Part 15B § 15.107

3.3.3 Limit

Frequency (MHz)	Limit Quasi-peak(dBµV)	Limit Average(dBµV)
0.15 - 0.50	66.0 – 56.0	56.0 – 46.0
0.50 - 5.0	56.0	46.0
5.0 – 30.0	60.0	50.0

3.3.4 Test procedures

Requirements: 15.107 (a) Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the table above, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

Test procedure according to ANSI C63.4-2014: Each phase and neutral of the AC power line were measured with respect to ground. Measurements were performed using a 50 µH / 50 Ω LISN. The frequency range from 150kHz to 30MHz was examined. The six highest EUT emissions relative to the limit were noted. The EUT was positioned at least 40cm from a vertical ground reference plane and at least 80cm from the LISN.

3.3.5 Test deviation

There is no deviation with the original standard

3.3.6 Test results

Test conditions			
		Test location	Leek
Applied Standard(s)	to FCC CRF 47 Part 15B § 15.107		
Test engineer	W. Brouwer	Test result	Pass
Test date	March 02, 2022		

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Results and limits, 2.4 GHz mode								
Frequency	Meas. Q-Peak (dBuV)	Limit QPeak (dBuV)	MeasQP. -Lim (dB)	Meas. AVG (dBuV)	Limit AVG (dBuV)	MeasAVG.-Lim (dB)	Line	Comments
314.118 kHz	29.917	59.859	-29.943	11.161	49.859	-38.698	Neutral	Pass
649.987 kHz	41.749	56	-14.251	25.993	46	-20.007	Neutral	Pass
1.369462 MHz	37.321	56	-18.679	22.36	46	-23.64	Neutral	Pass
2.3088 MHz	34.111	56	-21.889	13.5	46	-32.5	Neutral	Pass
6.791568 MHz	33.492	60	-26.508	17.817	50	-32.183	Neutral	Pass
17.673375 MHz	31.103	60	-28.897	21.293	50	-28.707	Neutral	Pass
371.681 kHz	36.696	58.498	-21.801	29.073	48.498	-19.425	Phase 1	Pass
607.518 kHz	37.682	56	-18.318	23.587	46	-22.413	Phase 1	Pass
1.041712 MHz	32.883	56	-23.117	9.283	46	-36.717	Phase 1	Pass
2.318512 MHz	34.463	56	-21.537	13.969	46	-32.031	Phase 1	Pass
6.22305 MHz	31.041	60	-28.959	17.221	50	-32.779	Phase 1	Pass
17.317481 MHz	27.414	60	-32.586	18.234	50	-31.766	Phase 1	Pass

Table 7 Results Conducted Emission 0.15 - 30 MHz, 2.4GHz mode

Results and limits, 5 GHz + BT mode								
Frequency	Meas. Q-Peak (dBuV)	Limit QPeak (dBuV)	MeasQP. -Lim (dB)	Meas. AVG (dBuV)	Limit AVG (dBuV)	MeasAVG.-Lim (dB)	Line	Comments
328.274 kHz	30.887	59.474	-28.586	21.319	49.474	-28.155	Neutral	Pass
860.474 kHz	38.864	56	-17.136	28.384	46	-17.616	Neutral	Pass
1.082756 MHz	37.511	56	-18.489	23.246	46	-22.754	Neutral	Pass
2.635781 MHz	33.125	56	-22.875	22.746	46	-23.254	Neutral	Pass
6.634912 MHz	32.749	60	-27.251	23.365	50	-26.635	Neutral	Pass
17.361431 MHz	31.511	60	-28.489	23.304	50	-26.696	Neutral	Pass
375.468 kHz	37.576	58.414	-20.838	28.661	48.414	-19.754	Phase 1	Pass
498.431 kHz	31.377	56.05	-24.673	21.926	46.05	-24.124	Phase 1	Pass
969.393 kHz	29.497	56	-26.503	20.153	46	-25.847	Phase 1	Pass
2.13195 MHz	35.482	56	-20.518	24.012	46	-21.988	Phase 1	Pass
6.869325 MHz	31.529	60	-28.471	22.547	50	-27.453	Phase 1	Pass
16.8153 MHz	27.319	60	-32.681	20.739	50	-29.261	Phase 1	Pass

Table 8 Results Conducted Emission 0.15 - 30 MHz, 5GHz + BT mode

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Results and limits, 6 GHz mode								
Frequency	Meas. Q-Peak (dBuV)	Limit QPeak (dBuV)	MeasQP.-Lim (dB)	Meas.A VG (dBuV)	Limit AVG (dBuV)	MeasAVG.-Lim (dB)	Line	Comments
226.818 kHz	34.94	62.509	-27.569	22.058	52.509	-30.451	Neutral	Pass
616.406 kHz	39.496	56	-16.504	30.07	46	-15.93	Neutral	Pass
1.1052 MHz	38.981	56	-17.019	27.574	46	-18.426	Neutral	Pass
3.063337 MHz	31.94	56	-24.06	21.814	46	-24.186	Neutral	Pass
6.263268 MHz	31.658	60	-28.342	22.863	50	-27.137	Neutral	Pass
17.247356 MHz	31.067	60	-28.933	23.231	50	-26.769	Neutral	Pass
290.962 kHz	30.102	60.473	-30.372	20.711	50.473	-29.763	Phase 1	Pass
606.693 kHz	38.059	56	-17.941	26.122	46	-19.878	Phase 1	Pass
1.632843 MHz	36.191	56	-19.809	24.301	46	-21.699	Phase 1	Pass
2.358243 MHz	34.406	56	-21.594	23.227	46	-22.773	Phase 1	Pass
6.511725 MHz	33.073	60	-26.927	24.053	50	-25.947	Phase 1	Pass
17.986087 MHz	27.262	60	-32.738	20.531	50	-29.469	Phase 1	Pass

Table 9 Results Conducted Emission 0.15 - 30 MHz, 6GHz mode

The results of the AC power line conducted emission tests, carried out in accordance with 47 CFR Part 15 section 15.107 and ICES-003 Section 6.1, at the 120 Volts AC mains connection terminals of the system, are depicted in Table 4. Maximum values were recorded. The system is tested as in whole, so with all equipment as shown in Figure 1 in place and functioning. Being the worst case situation.

Notes:

1. Measurement uncertainty is ± 3.5 dB
2. The resolution bandwidth used was 9 kHz.
3. The six highest values relative to the applicable limits were noted.
4. Photo and Graphical Display is provided on the next page.

Used Equipment

2789421	2790495	2788791	2789124	2788866	2790513	2789211
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3.3.7 Photograph test setup

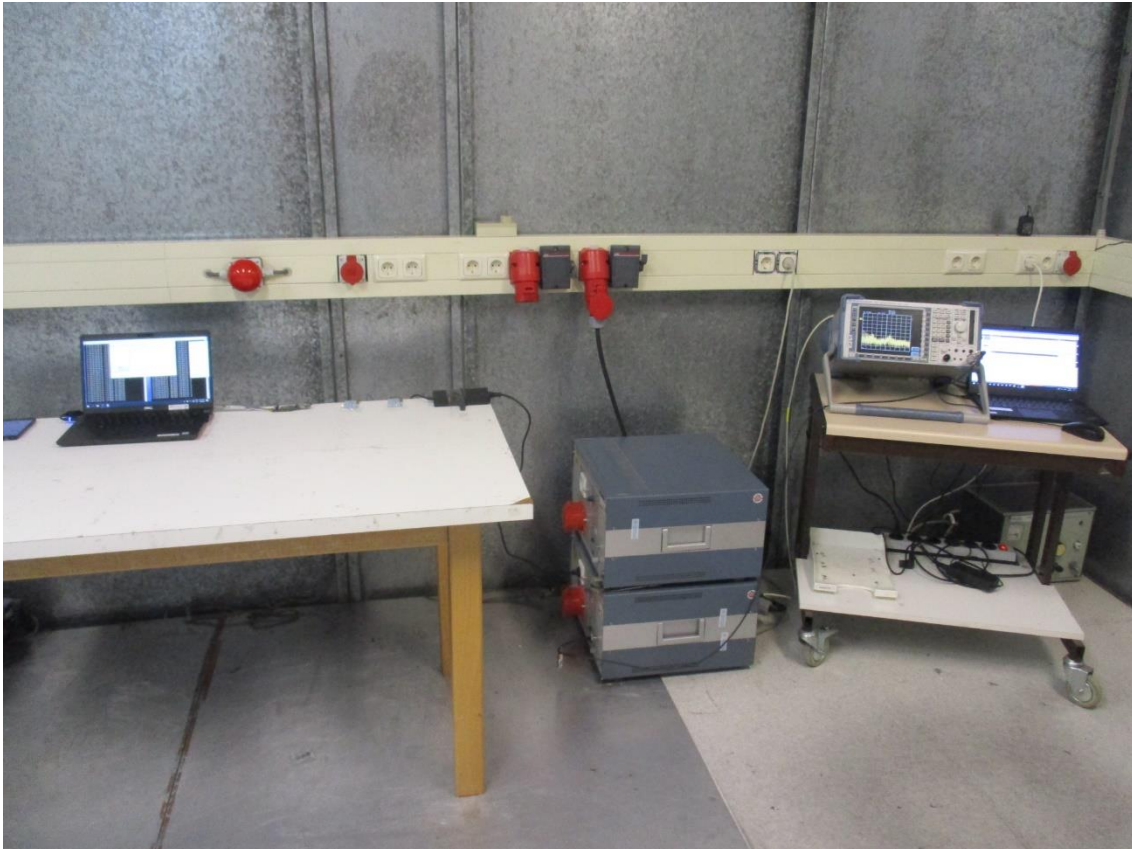
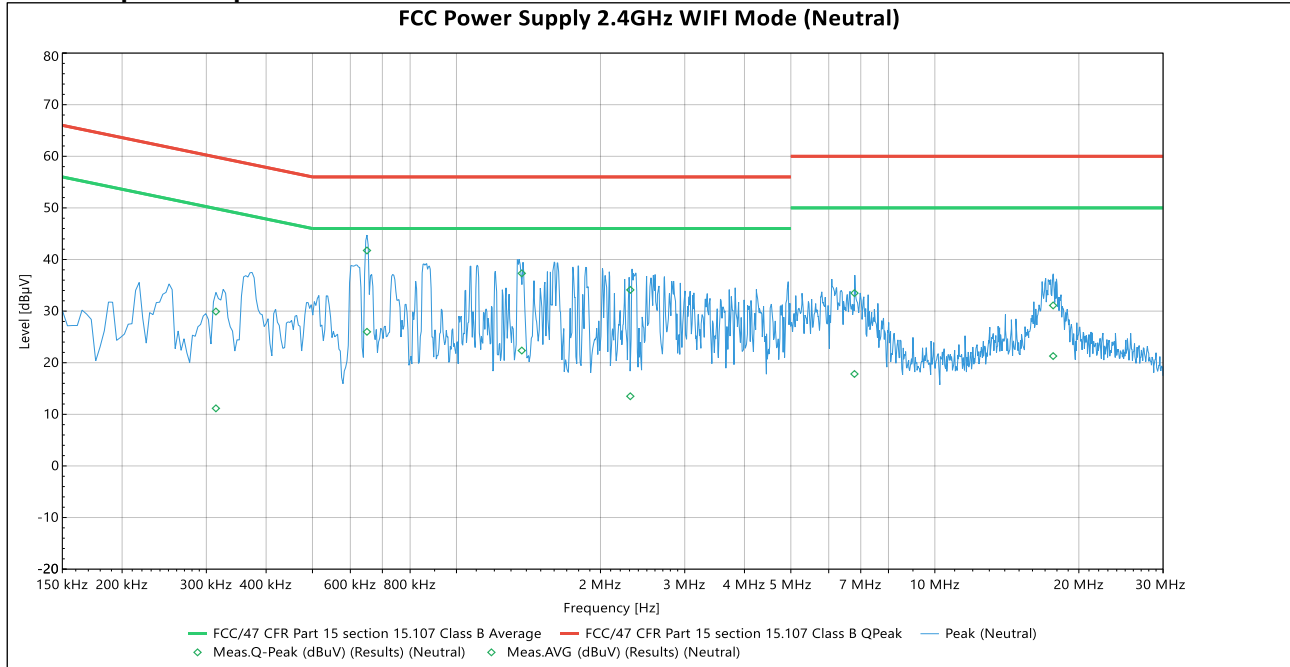
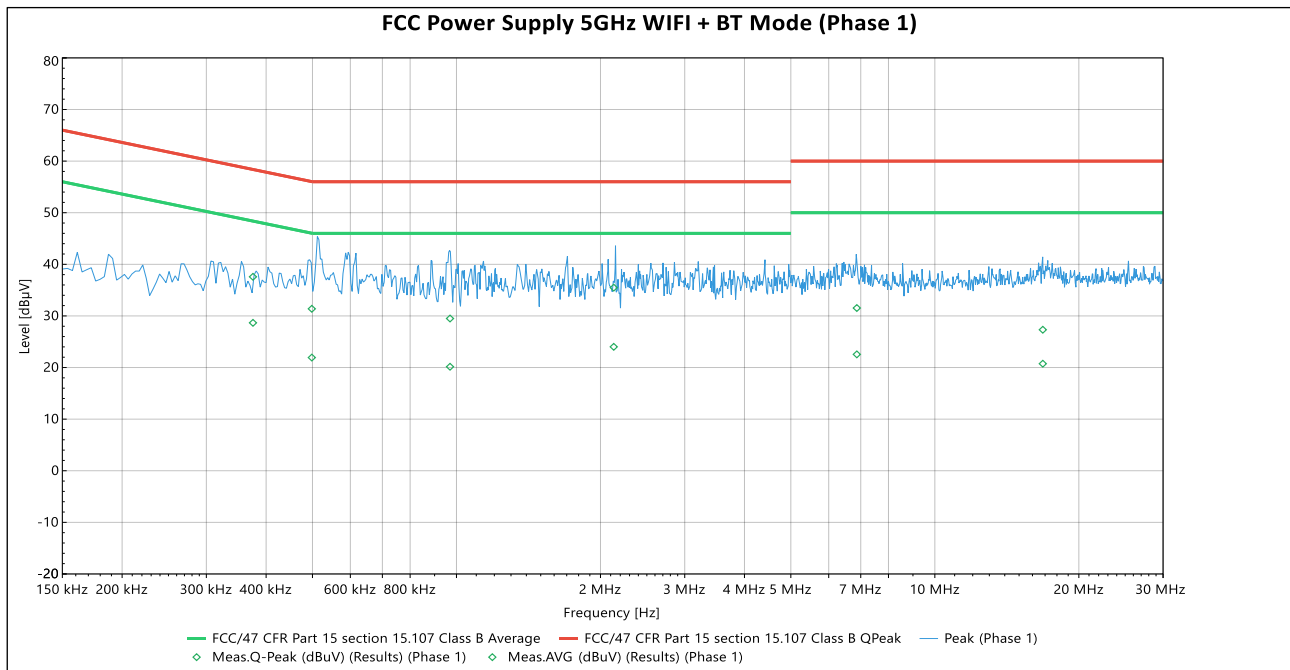


Photo 5: Photograph conducted emissions 0.15-30 MHz

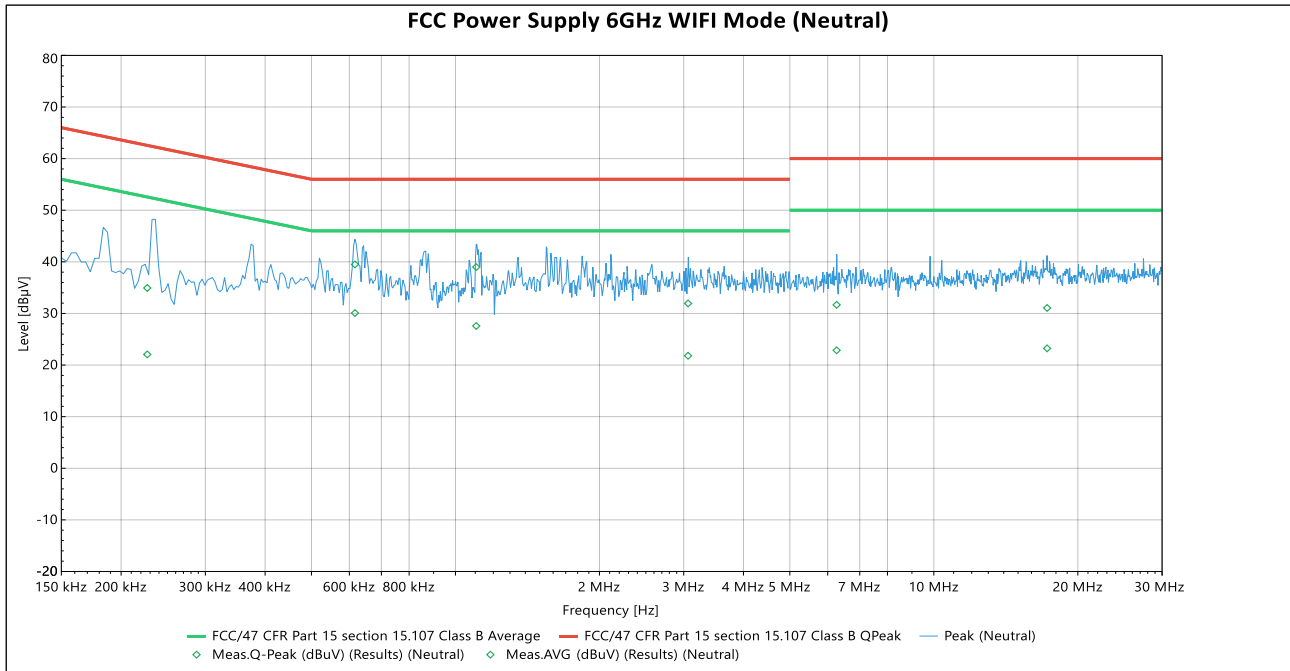
3.3.8 Spectrum plot



Plot 19: Pre-scan plot with peak detector. Conducted emissions from 0.15 - 30 MHz, 2.4GHz mode



Plot 20: Pre-scan plot with peak detector. Conducted emissions from 0.15 - 30 MHz, 5GHz + BT mode



Plot 21: Pre-scan plot with peak detector. Conducted emissions from 0.15 - 30 MHz, 6GHz mode

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