EMI – TEST REPORT

- FCC Part 15.407, 5150-5250 MHz, indoor -

Type / Model Name	:	Xirium Pro (NXP2TX)
Product Description	:	Digital Wireless Audio Network
Applicant	:	Neutrik AG
Address	:	Im alten Riet 143
		9494 SCHAAN, LIECHTENSTEIN
Manufacturer	:	Neutrik AG
Address	:	Im alten Riet 143
		9494 SCHAAN, LIECHTENSTEIN
Licence holder	:	Neutrik AG
Address	:	Im alten Riet 143
		9494 SCHAAN, LIECHTENSTEIN

Test Result according to the standards listed in clause 1 test standards:	**POSITIVE**

Test Report No. : T41996-01-00HS	29. March 2017 Date of issue

Deutsche Akkreditierungsstelle
D-PL-12030-01-01
D-PL-12030-01-02

The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test results without the written permission of the test laboratory.

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1 TEST STANDARDS

The tests were performed according to following standards:

FCC Rules and Regulations Part 15, Subpart A - General (September 2016)

Part 15, Subpart A, Section 15.31	Measurement standards
Part 15, Subpart A, Section 15.33	Frequency range of radiated measurements
Part 15, Subpart A, Section 15.35	Measurement detector functions and bandwidths

FCC Rules and Regulations Part 15, Subpart C - Intentional Radiators (September, 2016)

Part 15, Subpart C, Section 15.203	Antenna requirement
Part 15, Subpart C, Section 15.204	External radio frequency power amplifiers and antenna modifications
Part 15, Subpart C, Section 15.205	Restricted bands of operation
Part 15, Subpart C, Section 15.207	Conducted limits
Part 15, Subpart C, Section 15.209	Radiated emission limits, general requirements
Part 15, Subpart C, Section 15.212	Modular transmitters

FCC Rules and Regulations Part 15, Subpart E – Unlicensed National Information Infrastructure Devices (December, 2016)

Part 15, Subpart E, Section 15.407	Operation within the bands 5.15 - 5.25 GHz, 5.25 - 5.35 GHz, 5.47 - 5.725 GHz and 5.725 - 5.85 GHz

ANSI C63.10: 2013	Testing Unlicensed Wireless Devices
ETSI TR 100 028 V1.3.1: 2001-03	Electromagnetic Compatibility and Radio Spectrum Matters (ERM); Uncertainties in the Measurement of Mobile Radio Equipment Characteristics—Part 1 and Part 2
KDB 789033 D02 v01r03	Guidance for compliance Testing of U-NII devices, August 22, 2016.

2 EQUIPMENT UNDER TEST

2.1 Photo documentation of the EUT – Detailed photos see ATTACHMENT A

2.2 General remarks:

The motherboard is manufactured by another manufacturer, the PCB material has changed. Additional a new type of antenna, SOA-2456/360/1/0/V, 2.0 dBi gain (radiation pattern Omni), will be used. The intention of this test report is to demonstrate the further compliance to the FCC Part 15.407.
Therefore the radiated output power and spurious emissions f > 1 GHz are re-measured.

2.3 Equipment category

WLAN - AP

2.4 Short description of the equipment under test (EUT)

The EUT is part of a digital wireless audio network. The product represents a TX base station. The audio stream is transmitted in the band 5180 MHz to 5240 MHz. The EUT is controlled via 2.4 GHz WLAN interface. The 2.4 GHz functionality is not part of this test report.

Number of tested samples: 1 TX
Serial number: Host module 620007, TX module 515547
Firmware version: 3.0

EUT configuration:
(The CDF filled by the applicant can be viewed at the test laboratory.)

2.5 Variants of the EUT

There are no variants.

2.6 Operation frequency and channel plan

The operating frequency is 5150 MHz to 5250 MHz.

Channel plan:
WLAN Standard 802.11a:

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

Note: The marked frequencies are determined for final testing.

2.7 Transmit operating modes

The module use OFDM modulation and is capable to provide following data rates:
- 802.11a 24, 6 Mbps

2.8 Antenna

The following antennas shall be used with the EUT:

Number	Manufacturer Number	Characteristic	Model number	Connector	Frequency (GHz)	Gain 5 GHz	Cable loss (dB)	effective Gain 5 GHz (dBi)
1	ECO9-5500 Series	Omni	ECO9-5500-BLK-RN	N-male	5 GHz	9.0	0	9.0
2	WiFi Antenna 1399.17.0225	Omni	SOA-2456/360/1/0/V	N-male	5 GHz	2.0	0	2.0

2.9 Power supply system utilised

Power supply voltage, V_{nom} : 5 VDC Li-ion battery
Power supply voltage (alternative) : Input: 100-240 V, 50-60 Hz, 1ϕ Power supply,
Output: +5 VDC (charging and operation)

2.10 Peripheral devices and interface cables

The following peripheral devices and interface cables are connected during the measurements:

- - _____ Model : - _____
- _____ Model : _____
- _____ Model : _____

2.11 Determination of worst case conditions for final measurement

Measurements are made in all three orthogonal axes and the settings of the EUT are changed to locate at which position and at what setting of the EUT produce the maximum of the emissions.
The tests are carried out in the following frequency band:

5150 - 5250 MHz

Preliminary tests are performed to find the worst-case mode from all possible combinations between available modulations and data rates. The maximum output power depends on used data rate.
Following channels and test modes are selected for the final test as listed below:

WLAN	Available channel	Tested channels	Power setting	Modulation	Modulation type	Data rate
802.11a	36 to 48	36, 44, 48	Pmax	OFDM	BPSK	6 Mbps

- TX continuous mode, 802.11a

2.11.1 Test jig

No test jig is used.

2.11.2 Test software

The test software for the EUT provides the special test mode TX continuous mode, modulated, after switch on. The switch “XROC” is used for switch the channels 40, 44, 48. No other settings are available.

3 TEST RESULT SUMMARY

UNII device using the operating band 5150 MHz - 5250 MHz:

FCC Rule Part	RSS Rule Part	Description	Result
15.407(b)(6)	-	AC power line conducted emissions	passed
15.407(a)(5)	-	EBW 26 dB	Not tested
15.407(a)(1)	-	Maximum conducted output power	passed
15.407(a)(1)	-	Maximum PSD	Not tested
15.407(b)(1)	-	Undesirable emissions	Not tested
15.407(b)(7)	-	Emissions in restricted bands	passed
15.407(a)	-	Antenna requirement	passed
15.407(g)	-	Frequency stability	Not tested

3.1 Final assessment

The equipment under test fulfills the EMI requirements cited in clause 1 test standards.

Date of receipt of test sample : acc. to storage records

Testing commenced on : 02 February 2017

Testing concluded on : 06 February 2017

Checked by:

Klaus Gegenfurtner
I confirm the correctness and Integrity of this document
2017.03.29 14:33:07 +02'00'

Klaus Gegenfurtner
Teamleader Radio

Tested by:

Hermann Smetana
I am the author of this document.
2017.03.29 13:34:30 +02'00'

Hermann Smetana
Radio Team

4 TEST ENVIRONMENT

4.1 Address of the test laboratory

CSA Group Bayern GmbH
Ohmstrasse 1-4
94342 STRASSKIRCHEN
GERMANY

4.2 Environmental conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature:	15-35 °C
Humidity:	30-60 %
Atmospheric pressure:	86-106 kPa

4.3 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. It is noted that the expanded measurement uncertainty corresponds to the measurement results from the standard measurement uncertainty multiplied by the coverage factor k = 2. The true value is located in the corresponding interval with a probability of 95 % The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16-4-2 / 11.2003 „Uncertainties, statistics and limit modelling – Uncertainty in EMC measurements“ and is documented in the quality system acc. to DIN EN ISO/IEC 17025. For all measurements shown in this report, the measurement uncertainty of the test laboratory, CSA Group Bayern GmbH, is below the measurement uncertainty as defined by CISPR. Therefore, no special measures must be taken into consideration with regard to the limits according to CISPR. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Measurement Type	Range	Confidence Level	Calculated Uncertainty
AC power line conducted emissions	0.15 MHz to 30 MHz	95%	± 3.29 dB
EBW and OBW	2400 MHz to 3000 MHz	95%	± 2.5 x 10^{-7}
Maximum peak conducted output power	2400 MHz to 3000 MHz	95%	± 0.62 dB
Power spectral density	2400 MHz to 3000 MHz	95%	± 0.62 dB
Conducted Spurious Emissions	9 kHz to 10000 MHz	95%	± 2.15 dB
Conducted Spurious Emissions	10000 MHz to 40000 MHz	95%	± 3.47 dB
Radiated Spurious Emissions	9 kHz to 30 MHz	95%	± 3.53 dB
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	± 3.71 dB
Radiated Spurious Emissions	1000 MHz to 10000 MHz	95%	± 2.34 dB
Field strength of the fundamental	100 kHz to 100 MHz	95%	± 3.53 dB

4.4 Measurement protocol for FCC

4.4.1 General information

4.4.1.1 Test methodology

Conducted and radiated disturbance testing is performed according to the procedures set out by the International Special Committee on Radio Interference (CISPR) Publication 22, European Standard EN 55022 as shown under section 1 of this report.

4.4.1.2 Justification

The equipment under test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral using the appropriate impedance characteristic or left without termination. Where appropriate, cables are manually manipulated with respect to each other thus obtaining maximum disturbances from the unit.

4.4.1.3 Details of test procedures

The test methods used comply with CISPR Publication 22, EN 55022 - " Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement" and with ANSI C63.10 - "American national standard of procedures for compliance testing of unlicensed wireless devices". In compliance with 47 CFR Part 15 Subpart A, Section 15.38 testing for FCC compliance may be achieved by following the procedures set out in ANSI C63.10 and applying the CISPR 22 limits.

5 TEST CONDITIONS AND RESULTS

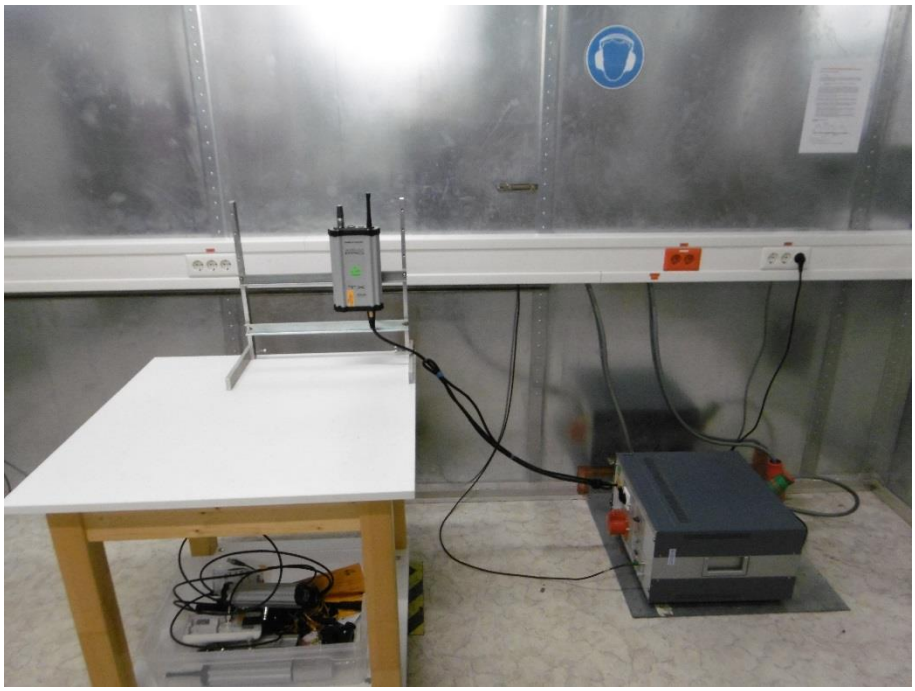
5.1 AC power line conducted emissions

For test instruments and accessories used see section 6 Part **A 4**.

5.1.1 Description of the test location

Test location: Shielded Room S2

5.1.2 Photo documentation of the test set-up



5.1.3 Applicable standard

According to FCC Part 15, Section 15.207(a):
Except as shown in paragraphs (b) and (c) of this Section, for an intentional radiator 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 given limits.

5.1.4 Description of Measurement

The measurements are performed following the procedures set out in ANSI C63.10 described under item 4.4.3. If the minimum limit margin appears to be less than 20 dB with a peak mode measurement, the emissions are re-measured using a tuned receiver with quasi-peak and average detection and recorded on the data sheets.

5.1.5 Test result

Frequency range: 0.15 MHz - 30 MHz

Min. limit margin 12.4 dB at 0.208 MHz

Limit according to FCC Part 15, Section 15.207(a):

FCC ID: 2ABA7XPT

Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

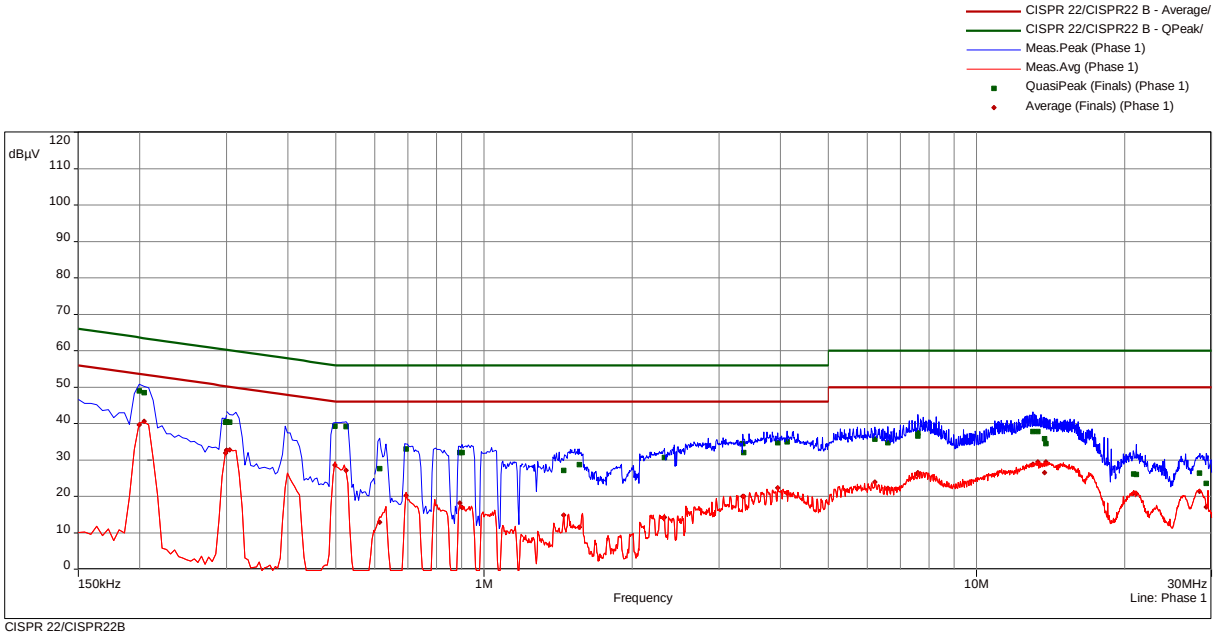
* Decreases with the logarithm of the frequency

The requirements are **FULFILLED.**

Remarks: For detailed test result please refer to following test protocols

5.1.6 Test protocol

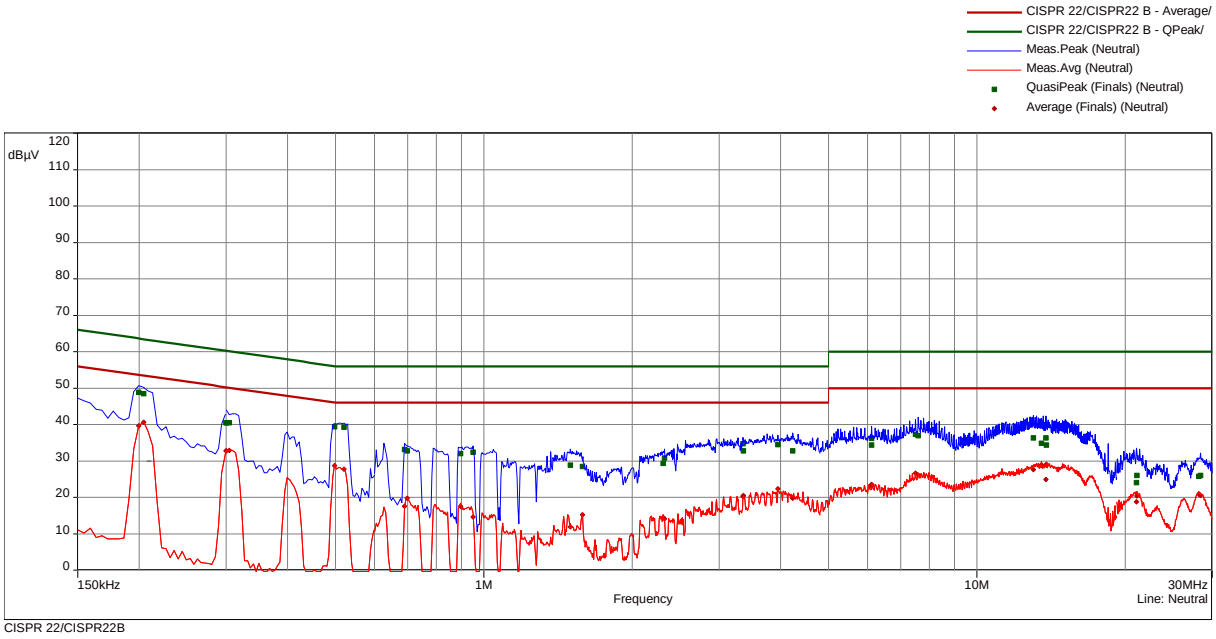
Test point L1 Result: passed
Operation mode: TX continuous mode 5 GHz
Remarks:



FCC ID: 2ABA7XPT

freq	SR	QP	margin	limit	AV	margin	limit	line	corr
MHz		dB(µV)	dB	dB	dB(µV)	dB	dB		dB
0.200	1	48.9	14.7	63.6	39.6	14.0	53.6	Phase 1	9.8
0.204	1	48.5	15.0	63.5	40.6	12.8	53.5	Phase 1	9.8
0.299	1	40.4	19.9	60.3	32.0	18.3	50.3	Phase 1	9.8
0.300	1	40.5	19.8	60.2	32.6	17.6	50.2	Phase 1	9.8
0.300	2	40.4	19.8	60.2	32.6	17.6	50.2	Phase 1	9.8
0.305	2	40.4	19.7	60.1	32.8	17.3	50.1	Phase 1	9.8
0.498	2	39.3	16.7	56.0	28.7	17.4	46.0	Phase 1	9.8
0.525	2	39.2	16.8	56.0	27.1	18.9	46.0	Phase 1	9.8
0.614	3	27.6	28.4	56.0	12.9	33.1	46.0	Phase 1	9.8
0.695	3	33.0	23.0	56.0	20.3	25.7	46.0	Phase 1	9.8
0.893	3	32.0	24.0	56.0	18.1	27.9	46.0	Phase 1	9.8
0.902	3	32.0	24.0	56.0	17.0	29.0	46.0	Phase 1	9.8
1.452	4	27.2	28.8	56.0	14.9	31.1	46.0	Phase 1	9.8
1.560	4	28.8	27.2	56.0	11.6	34.4	46.0	Phase 1	9.8
2.325	4	30.7	25.3	56.0	14.2	31.8	46.0	Phase 1	9.8
3.354	5	34.5	21.5	56.0	20.0	26.0	46.0	Phase 1	9.8
3.363	5	32.0	24.0	56.0	20.1	26.0	46.0	Phase 1	9.8
3.948	5	34.8	21.2	56.0	22.4	23.6	46.0	Phase 1	9.8
4.124	5	34.9	21.1	56.0	20.9	25.1	46.0	Phase 1	9.8
6.218	6	35.7	24.3	60.0	23.9	26.1	50.0	Phase 1	9.8
6.609	6	34.7	25.3	60.0	22.3	27.7	50.0	Phase 1	9.8
7.595	6	36.6	23.4	60.0	26.0	24.0	50.0	Phase 1	9.9
7.599	6	37.4	22.6	60.0	26.5	23.5	50.0	Phase 1	9.9
13.025	7	37.8	22.2	60.0	28.9	21.2	50.0	Phase 1	10.0
13.322	7	37.8	22.2	60.0	29.5	20.5	50.0	Phase 1	10.0
13.745	7	35.8	24.2	60.0	26.5	23.5	50.0	Phase 1	10.1
13.826	7	34.5	25.5	60.0	29.4	20.6	50.0	Phase 1	10.1
20.847	8	26.2	33.8	60.0	20.9	29.1	50.0	Phase 1	10.3
21.095	8	26.0	34.0	60.0	20.7	29.3	50.0	Phase 1	10.3
28.371	8	26.4	33.6	60.0	21.3	28.7	50.0	Phase 1	10.3
29.267	8	23.6	36.4	60.0	17.1	32.9	50.0	Phase 1	10.3

Test point N Result: passed
Operation mode: TX continuous mode 5 GHz
Remarks:



FCC ID: 2ABA7XPT

freq	SR	QP	margin	limit	AV	margin	limit	line	corr
MHz		dB(µV)	dB	dB	dB(µV)	dB	dB		dB
0.200	9	48.9	14.8	63.6	39.6	14.0	53.6	Neutral	9.8
0.204	9	48.4	15.0	63.5	40.6	12.9	53.5	Neutral	9.8
0.300	9	40.5	19.8	60.2	32.7	17.5	50.2	Neutral	9.8
0.300	10	40.5	19.8	60.2	32.7	17.5	50.2	Neutral	9.8
0.305	10	40.5	19.6	60.1	32.9	17.2	50.1	Neutral	9.8
0.498	10	39.3	16.7	56.0	28.7	17.3	46.0	Neutral	9.8
0.521	10	39.3	16.7	56.0	27.8	18.2	46.0	Neutral	9.8
0.690	11	33.2	22.8	56.0	17.6	28.5	46.0	Neutral	9.8
0.699	11	32.7	23.3	56.0	19.7	26.3	46.0	Neutral	9.8
0.897	11	32.0	24.0	56.0	17.6	28.4	46.0	Neutral	9.8
0.951	11	32.4	23.6	56.0	14.6	31.4	46.0	Neutral	9.8
1.497	12	28.9	27.1	56.0	11.9	34.1	46.0	Neutral	9.8
1.583	12	28.5	27.5	56.0	15.3	30.7	46.0	Neutral	9.8
2.312	12	29.3	26.7	56.0	14.5	31.6	46.0	Neutral	9.8
2.325	12	30.8	25.3	56.0	14.1	31.9	46.0	Neutral	9.8
3.354	13	34.7	21.3	56.0	20.3	25.8	46.0	Neutral	9.8
3.359	13	32.8	23.2	56.0	20.5	25.5	46.0	Neutral	9.8
3.948	13	34.5	21.5	56.0	22.4	23.6	46.0	Neutral	9.8
4.232	13	32.8	23.2	56.0	19.8	26.2	46.0	Neutral	9.8
6.114	14	34.4	25.7	60.0	23.1	26.9	50.0	Neutral	9.8
6.119	14	36.2	23.8	60.0	23.6	26.4	50.0	Neutral	9.8
7.500	14	37.3	22.7	60.0	26.7	23.3	50.0	Neutral	9.8
7.595	14	37.0	23.0	60.0	26.2	23.8	50.0	Neutral	9.8
13.007	15	36.3	23.7	60.0	27.6	22.4	50.0	Neutral	9.9
13.524	15	34.9	25.2	60.0	29.0	21.0	50.0	Neutral	9.9
13.812	15	36.3	23.7	60.0	24.9	25.1	50.0	Neutral	9.9
13.826	15	34.4	25.7	60.0	29.1	20.9	50.0	Neutral	9.9
21.077	16	24.1	35.9	60.0	18.7	31.3	50.0	Neutral	10.1
21.090	16	26.0	34.0	60.0	20.4	29.6	50.0	Neutral	10.1
28.160	16	25.8	34.2	60.0	20.8	29.2	50.0	Neutral	9.8
28.407	16	26.0	34.0	60.0	20.5	29.6	50.0	Neutral	9.8

5.2 EBW and OBW

For test instruments and accessories used see section 6 Part **MB**.

5.2.1 Description of the test location

Test location: NONE

Remarks: Not tested.

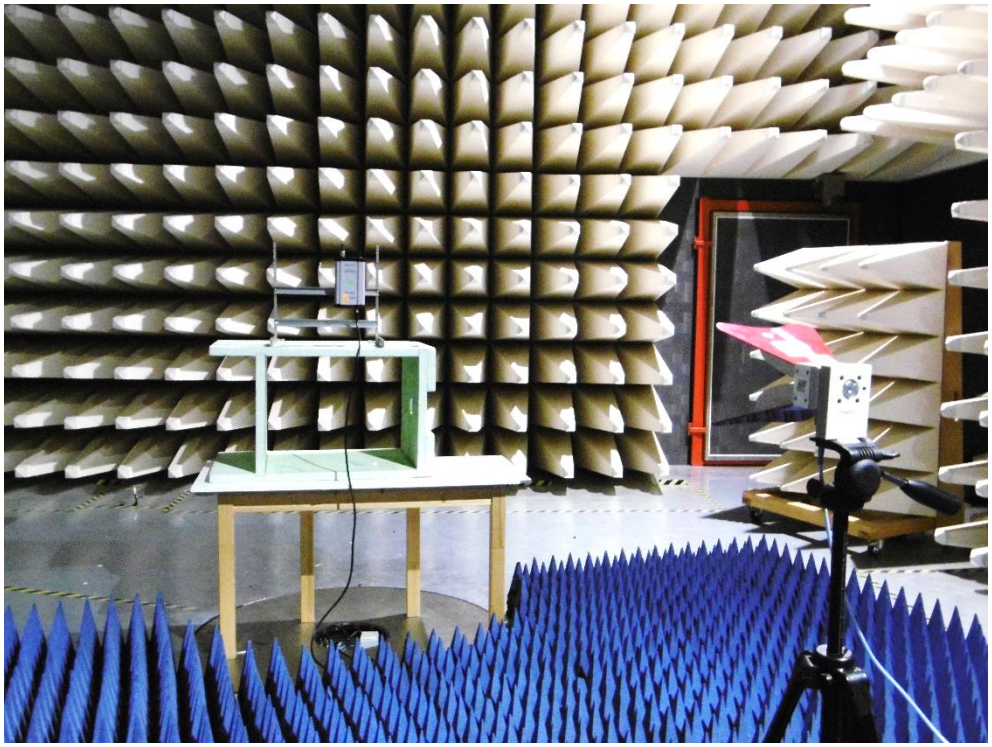
5.3 Maximum conducted output power

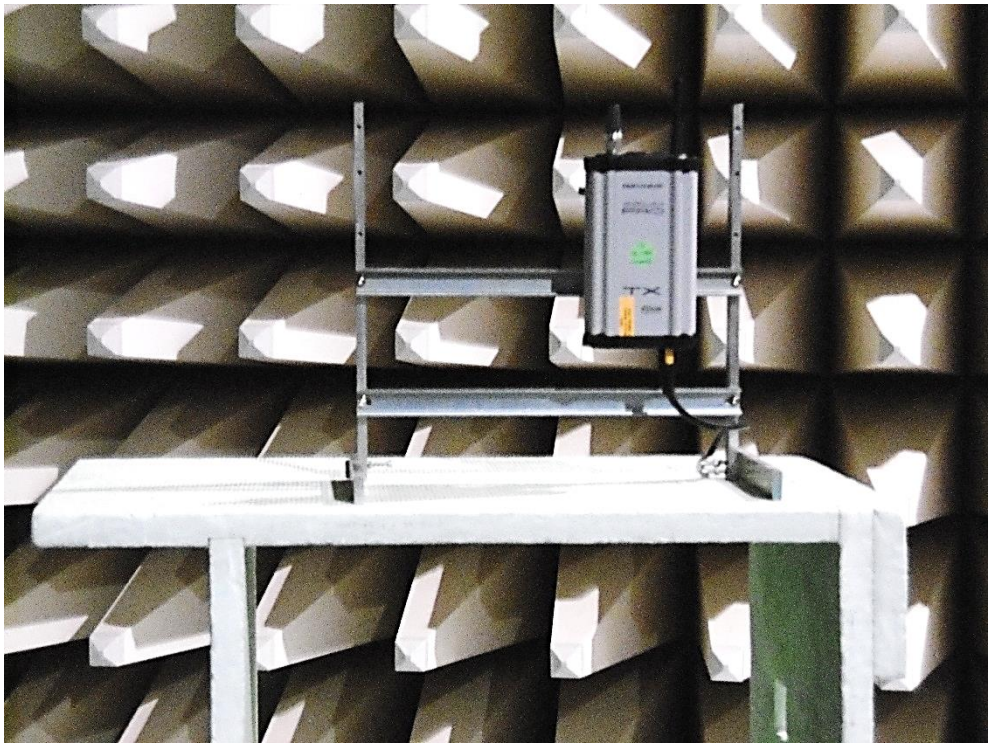
For test instruments and accessories used see section 6 Part **CPR 3**.

5.3.1 Description of the test location

Test location: Anechoic chamber 1
Test distance: 3 m

5.3.2 Photo documentation of the test set-up





5.3.3 Applicable standard

According to FCC Part 15E, Section 15.407(a):
For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.

5.3.4 Description of Measurement

The maximum conducted output power is measured using a spectrum analyser with the function “integrated band power measurement” following the procedure set out in KDB 789033 D02, item E b) Method SA-1, IF power trigger is used for DC < 98%. The EUT is set in TX continuous mode while measuring. The resulting values are listed in the following tables.

Spectrum analyser settings:
RBW: 1 MHz, VBW: 3 MHz, Detector: RMS (power averaging), Number of points: 10000,
Sweep time: 500 µs, Band power function;

5.3.5 Test result

802.11a, 6 Mbps, 1TX		Test results conducted				
Port 1		P [max] (dBm)	Gain (dBi)	A [max] (dBm)	Limit (dBm)	Min Margin (dB)
Lowest frequency:	CH36					
T_{nom}	V_{nom}	9.9	2.0	7.9	30.0	-22.1
Middle frequency:	CH44					
T_{nom}	V_{nom}	24.4	2.0	22.4	30.0	-7.6
Highest	CH48					
T_{nom}	V_{nom}	24.2	2.0	22.2	30.0	-7.8

P [max] in EIRP

Peak power limit according to FCC Part 15E, Section 15.407(a):

Frequency (MHz)	Maximum conducted power limit	
	(dBm)	(Watt)
5150 - 5250	30	1.0

The requirements are **FULFILLED.**

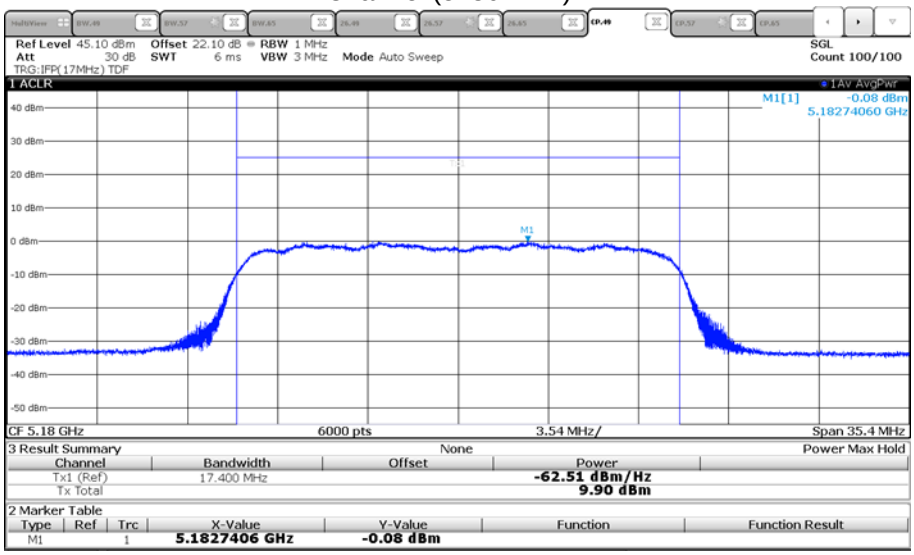
Remarks: The EUT complies with the indoor requirements..

For detailed test results please see the following test protocols.

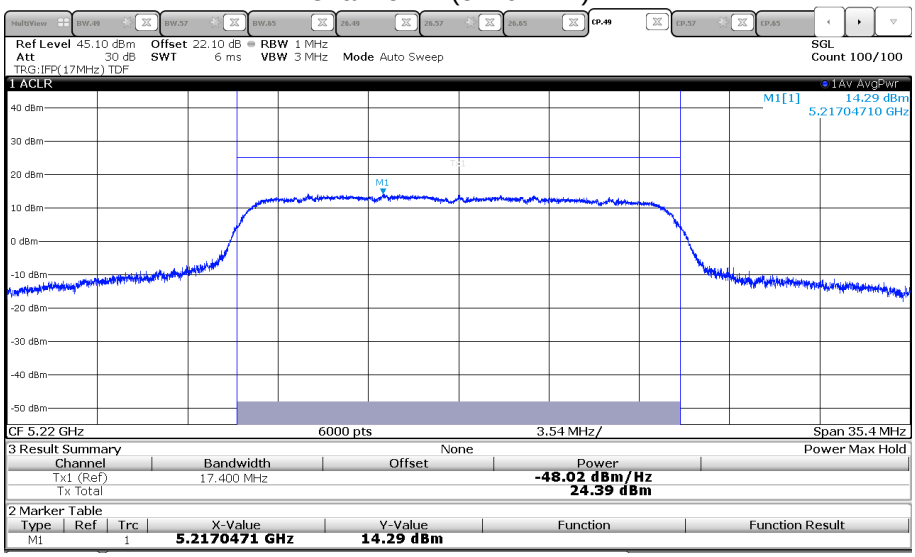
5.3.6 Test protocol maximum conducted output power

801.11a:

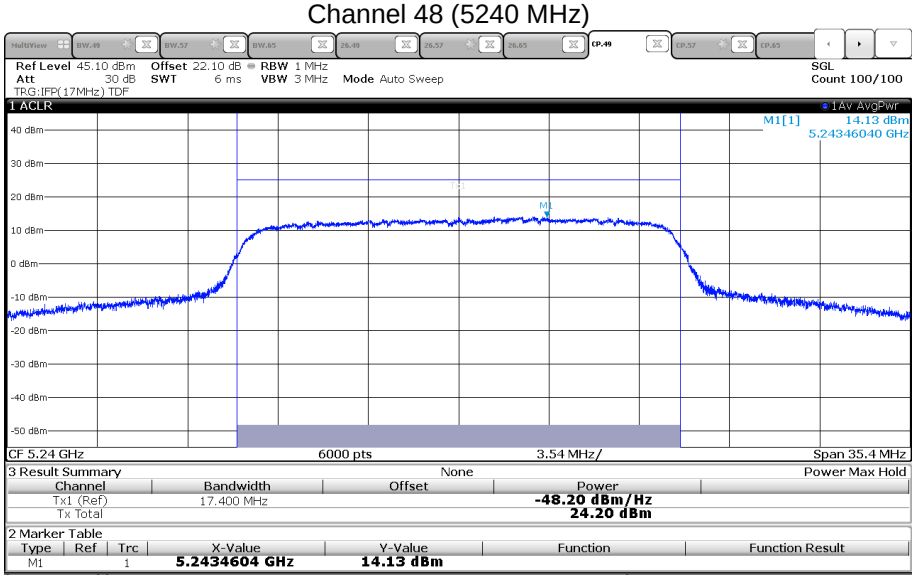
Channel (5180 MHz)



Channel 44 (5220 MHz)



Channel 48 (5240 MHz)



5.4 Maximum power spectral density

For test instruments and accessories used see section 6 Part **CPC 3**.

5.4.1 Description of the test location

Test location: NONE

Remarks: Not tested.

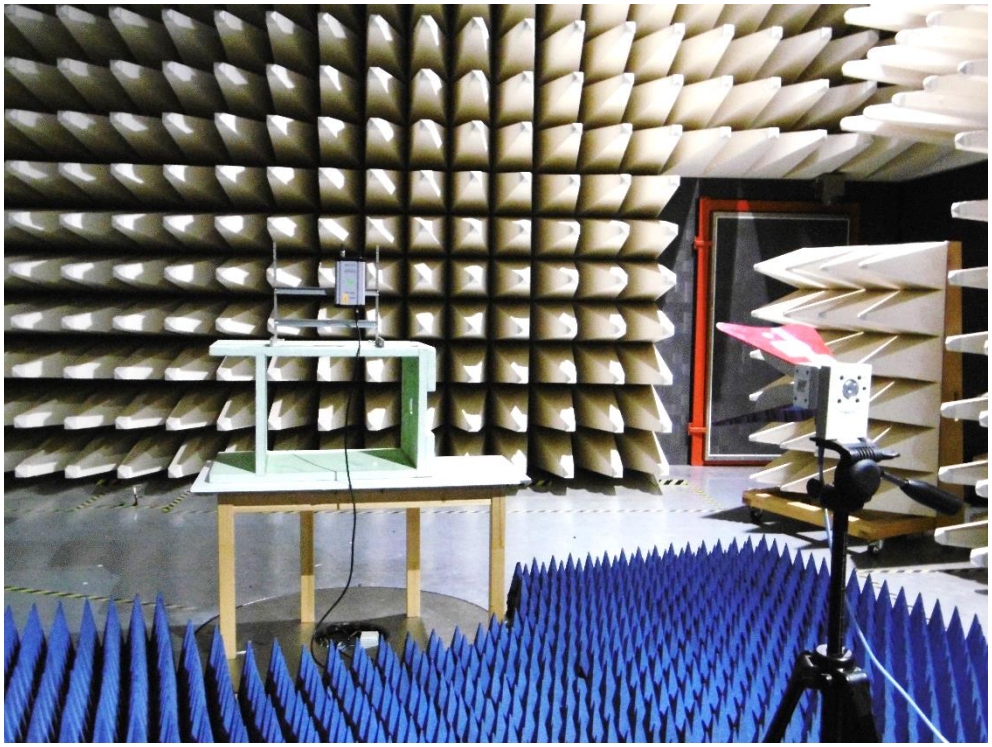
5.5 Defacto limit

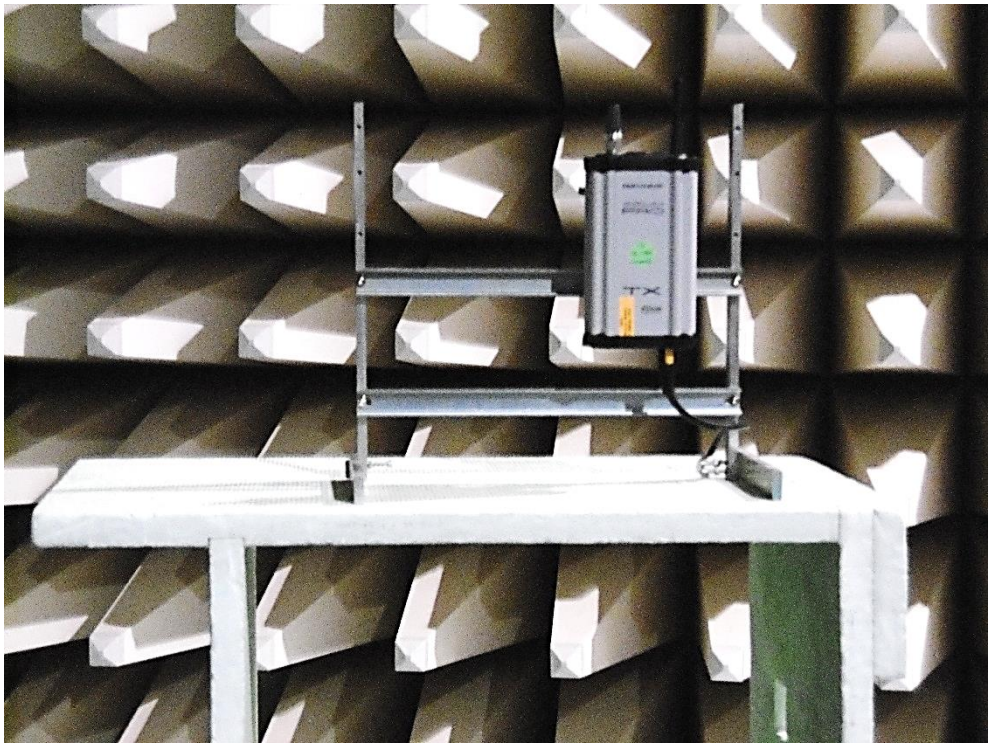
For test instruments and accessories used see section 6 Part **CPR 3**.

5.5.1 Description of the test location

Test location: Anechoic chamber 1
Test distance: 3 m

5.5.2 Photo documentation of the test set-up





5.5.3 Applicable standard

According to FCC Part 15, Section 15.407(a)(1):
If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.5.4 Test result

Antenna	Gx	Cond. limit	G	Amax	Limit P_{out}	Reduction	P set
	(dBi)	(dBm)	(dBi)	(dBm)	(dBm)	(dB)	5 GHz
SOA-2456/360/1/0/V	2.0	30.0	6.0	24.4	34.0	0.0	Pmax

Defacto limit according to FCC Part 15, Section 15.407(a)(1):
If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Frequency (MHz)	Defacto EIRP limit	
	(dBm)	(Watt)
5150 - 5250	36	4.0

The requirements are **FULFILLED.**

Remarks: No power reduction results using the listed antennas in combination with the mentioned power settings.

5.6 Unwanted emissions

For test instruments and accessories used see section 6 Part **SER 2 and SER 3**.

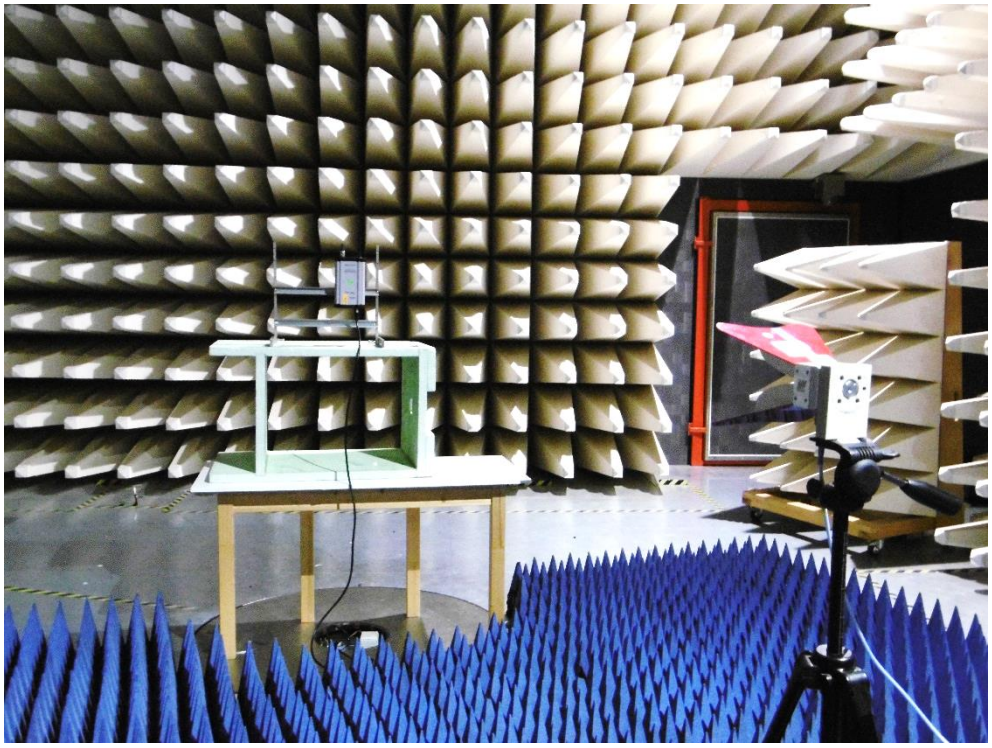
5.6.1 Description of the test location

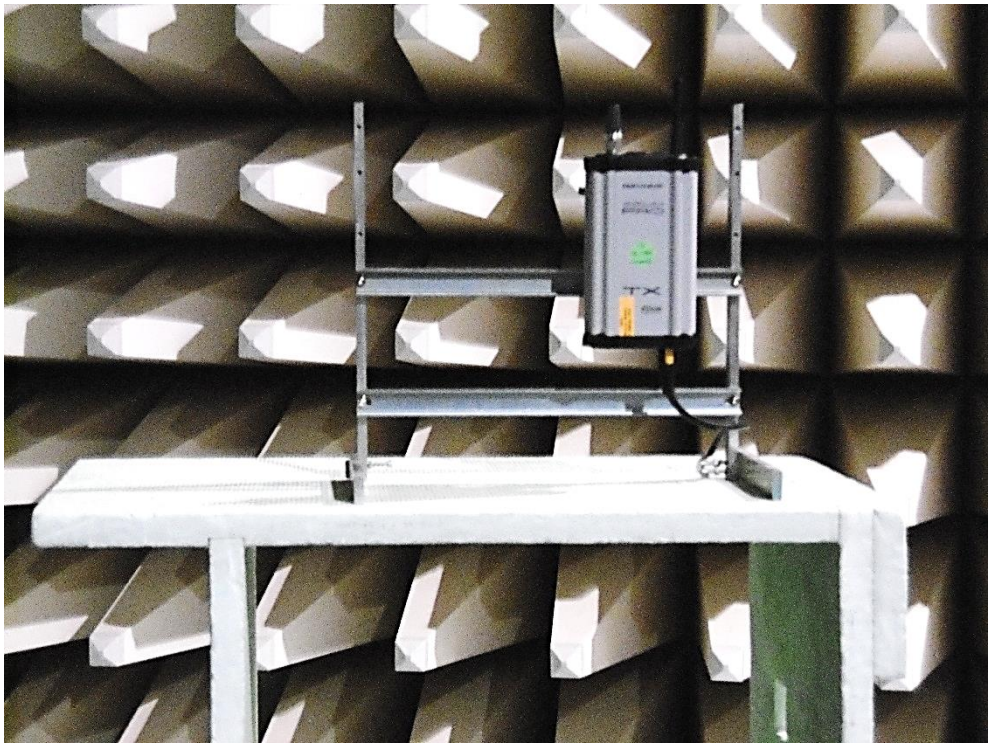
Test location: OATS 1
Test location: Anechoic chamber 1
Test distance: 3 m

5.6.2 Photo documentation of the test set-up

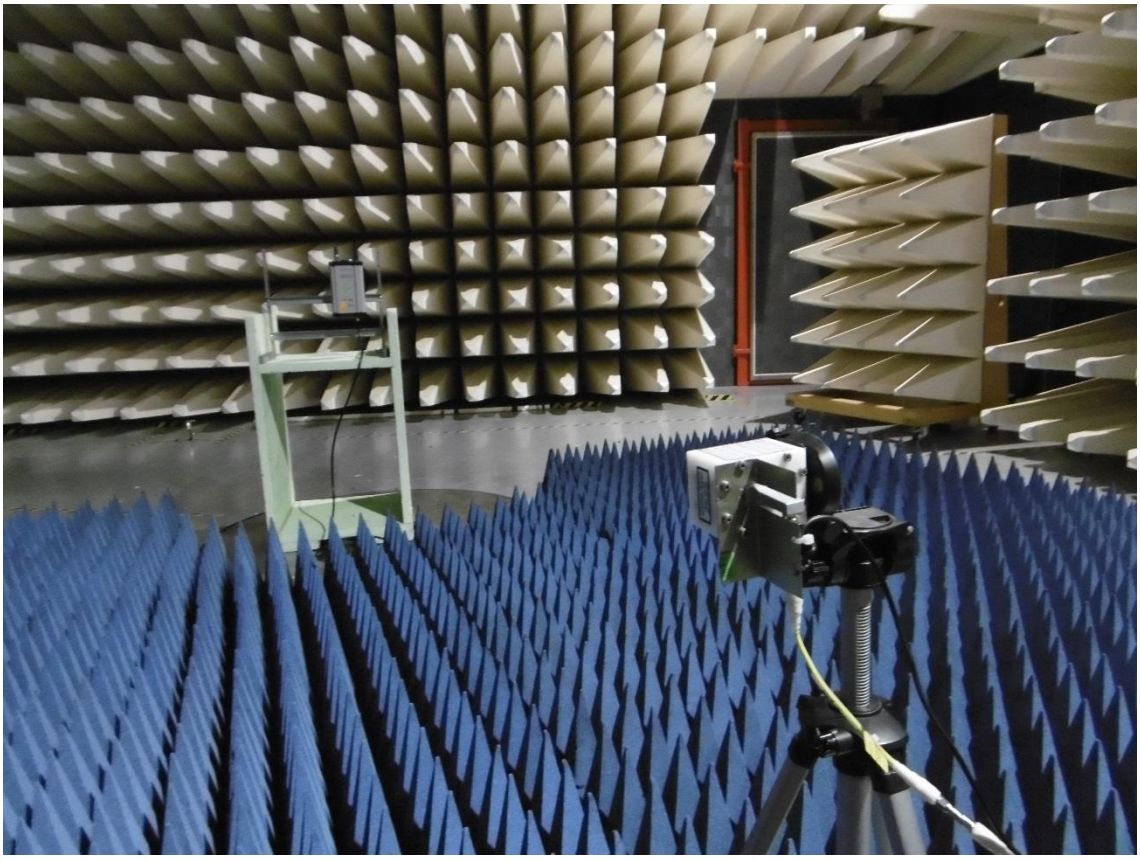
30 MHz – 1 GHz

1 GHz – 18 GHz





18 GHz – 40 GHz



5.6.1 Applicable standard

According to FCC Part 15E, Section 15.407(b):
For transmitters operating in the defined bands shall not exceed the appropriate emission limit outside of the operating bands.
In addition, radiated emissions which fall in the restricted bands, as defined in Section15.205(a), must also comply with the radiated emission limit specified in Section15.209(a) (see Section15.205(c)).

Section 15.407(b)(1-3) specifies the unwanted emissions limit for the U-NII-1 and 2 bands. As specified, emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz. However, an out-of-band emission that complies with both the average and peak limits of Section 15.209 is not required to satisfy the -27 dBm/MHz peak emission limit.

5.6.2 Description of Measurement

Undesirable emissions are measured using a spectrum analyser and following the procedures according the OET 789033, item G Up from 4-8 GHz a 3 HP filter is used. . If the emission level of the EUT in peak mode complies with the average limit then testing will be stopped and peak values of the EUT will be reported, otherwise, the emission will be measured in average mode again and reported.

Spectrum analyser settings for peak values 1 GHz – 40 GHz:
RBW: 1 MHz, VBW: 3 MHz, Detector: max peak, Sweep: 100 ms, Trace mode: max hold;

Spectrum analyser settings for average values 1 GHz – 40 GHz:
RBW: 1 MHz VBW: 3 MHz Detector: RMS, Sweep: 100 ms, Trace mode: max hold;

5.6.3 Test result

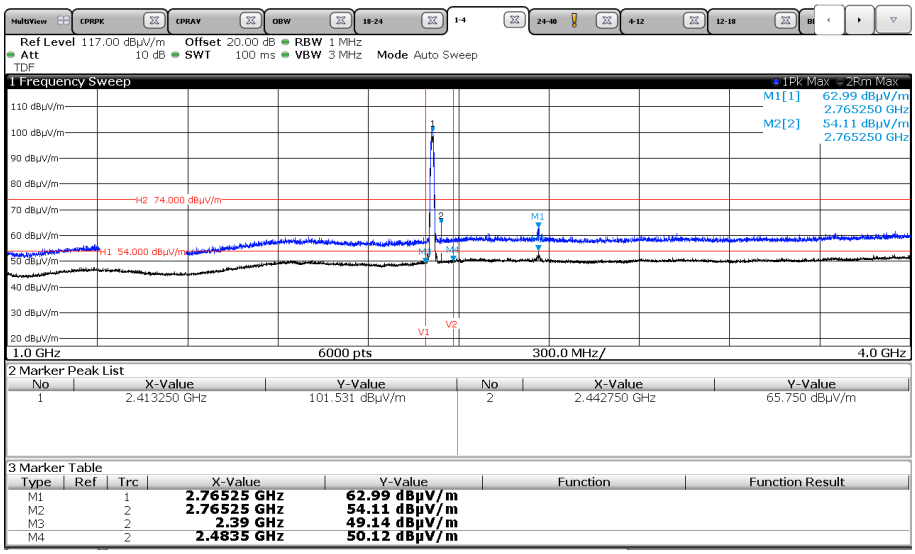
f < 1 GHz

Frequency (MHz)	Reading Vert. (dBµV)	Reading Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level Vert. (dBµV/m)	Level Hor. (dBµV/m)	Limit (dBµV/m)	Dlimit (dB)
39.11	9.7	-1.6	14.5	13.3	24.2	11.7	40.0	-15.8
49.20	9.4	-0.6	15.2	14.1	24.6	13.5	40.0	-15.4
114.88	23.6	20.6	11.5	12.2	35.1	32.8	43.5	-8.4
117.79	21.1	18.8	12.0	12.6	33.1	31.4	43.5	-10.4
250.00	27.3	23.6	13.8	14.0	41.1	37.6	46.0	-4.9
350.00	10.0	10.5	18.4	18.0	28.4	28.5	46.0	-17.5

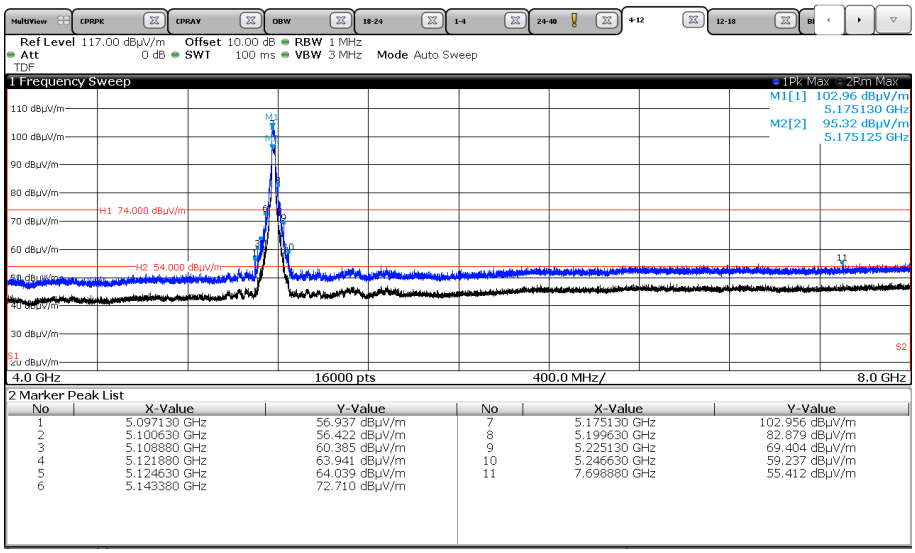
f > 1 GHz

801.11a:
Channel 36 (5180 MHz):

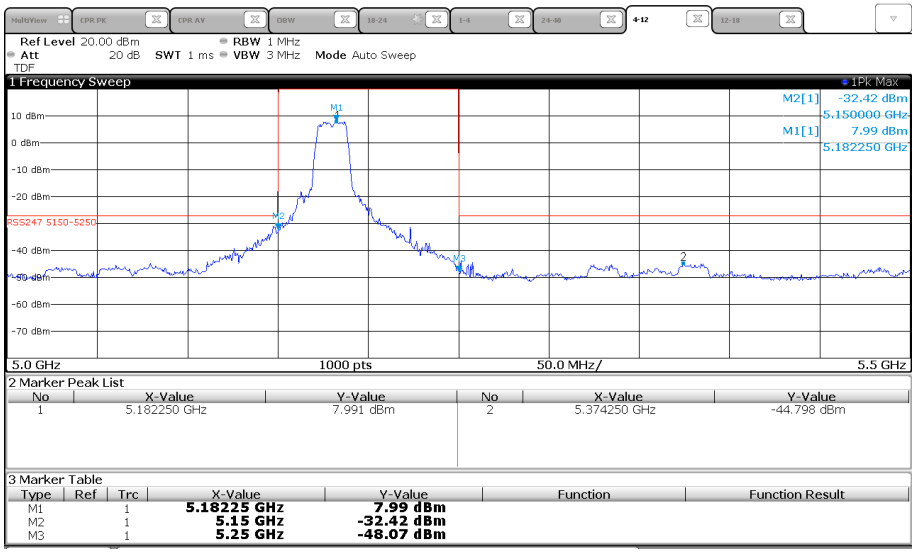
1-4-GHz



4-8 GHz

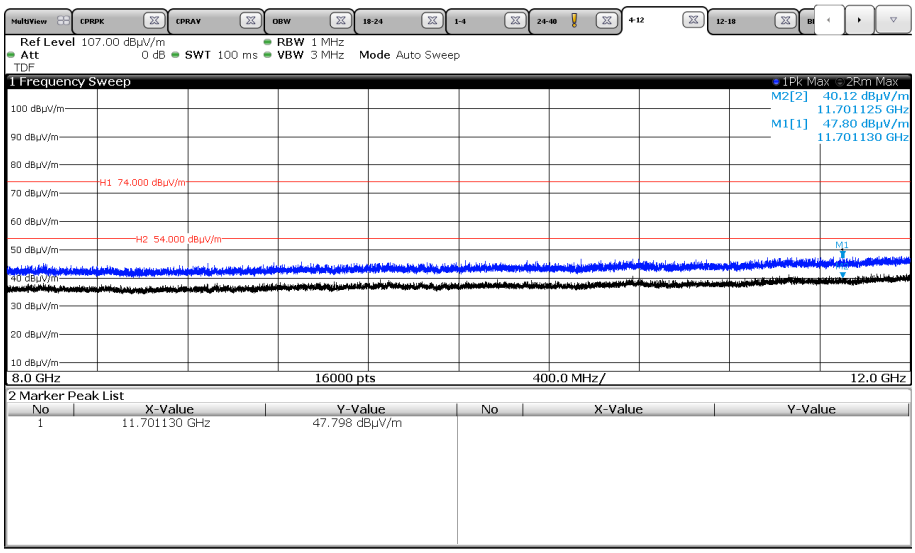


FCC ID: 2ABA7XPT

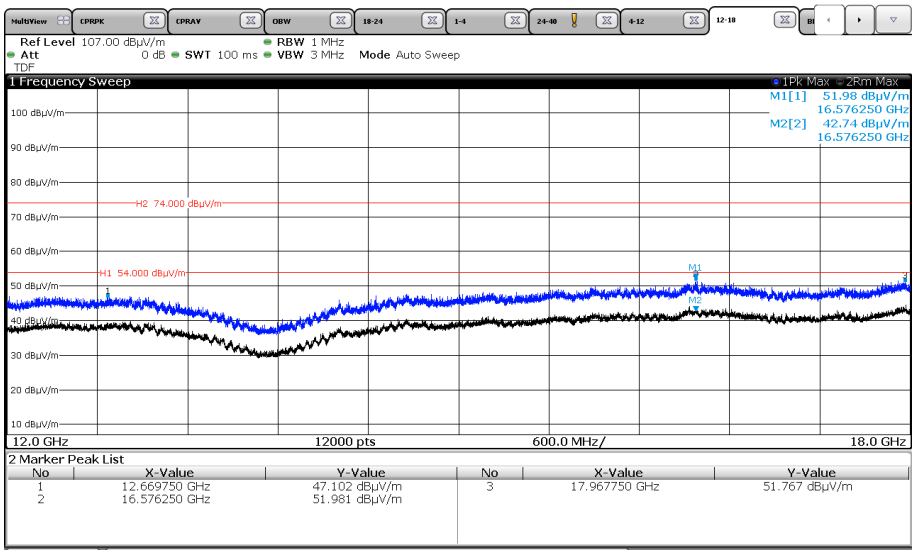


FCC ID: 2ABA7XPT

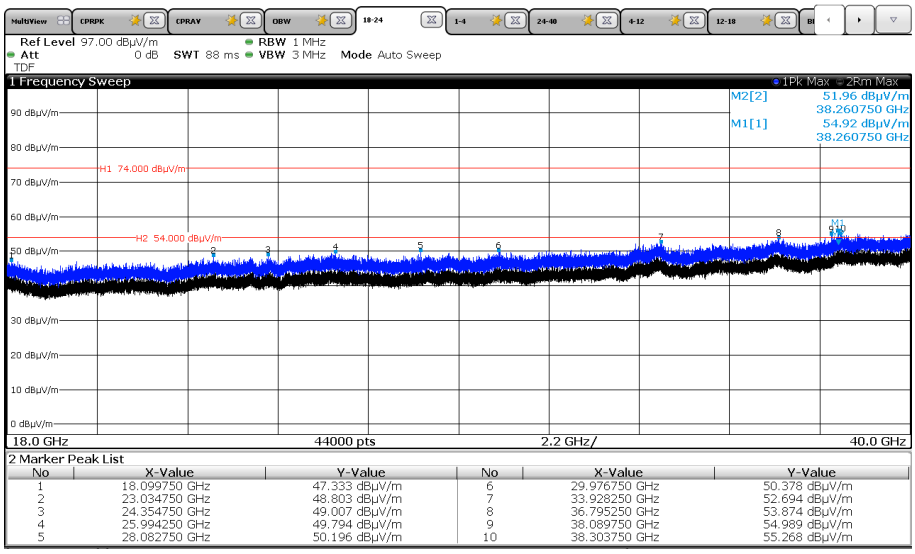
8-12 GHz



12-18 GHz



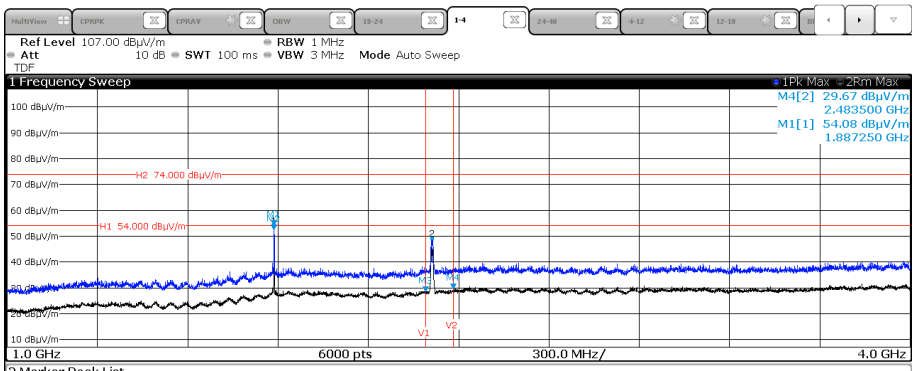
18-40 GHz



FCC ID: 2ABA7XPT

Channel 44 (5220 MHz)

1-4 GHz



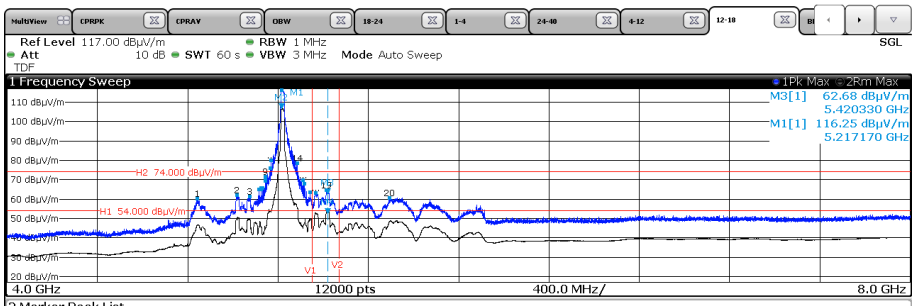
2 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	1.887250 GHz	54.078 dBµV/m	2	2.412250 GHz	49.235 dBµV/m

3 Marker Table

Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1		1	**1.88725 GHz**	**54.08 dBµV/m**		
M2		2	**1.88725 GHz**	**52.51 dBµV/m**		
M3		2	**2.39 GHz**	**28.45 dBµV/m**		
M4		2	**2.4835 GHz**	**29.67 dBµV/m**		

4-8 GHz



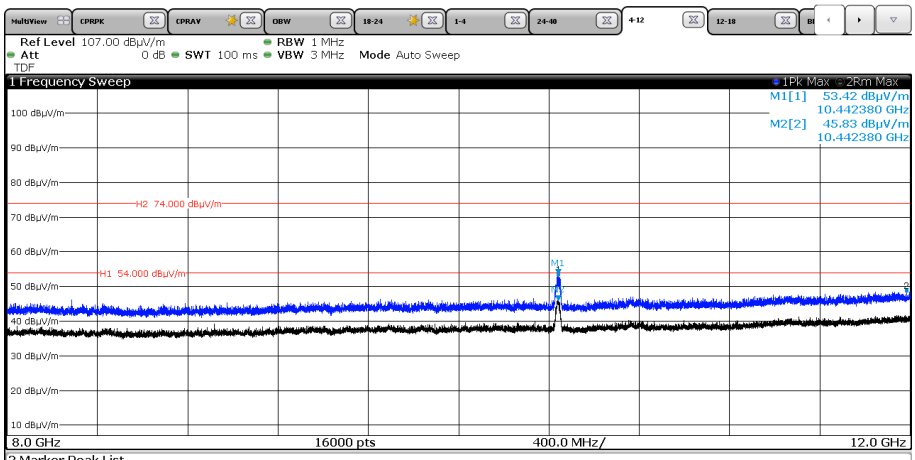
2 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	4.843170 GHz	60.096 dBµV/m	11	5.164500 GHz	76.084 dBµV/m
2	5.017830 GHz	61.914 dBµV/m	12	5.169170 GHz	80.141 dBµV/m
3	5.073500 GHz	61.184 dBµV/m	13	5.217170 GHz	116.248 dBµV/m
4	5.114170 GHz	65.112 dBµV/m	14	5.286170 GHz	78.679 dBµV/m
5	5.124170 GHz	65.107 dBµV/m	15	5.309500 GHz	69.719 dBµV/m
6	5.125830 GHz	65.886 dBµV/m	16	5.317830 GHz	67.902 dBµV/m
7	5.130170 GHz	65.824 dBµV/m	17	5.343170 GHz	63.452 dBµV/m
8	5.142830 GHz	69.394 dBµV/m	18	5.367500 GHz	63.129 dBµV/m
9	5.143500 GHz	71.507 dBµV/m	19	5.415500 GHz	64.440 dBµV/m
10	5.144830 GHz	69.900 dBµV/m	20	5.693170 GHz	60.735 dBµV/m

3 Marker Table

Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1		1	**5.21717 GHz**	**116.25 dBµV/m**		
M2		2	**5.21717 GHz**	**106.75 dBµV/m**		
M3		1	**5.42033 GHz**	**62.68 dBµV/m**		
M4		2	**5.42033 GHz**	**52.65 dBµV/m**		

8-12 GHz

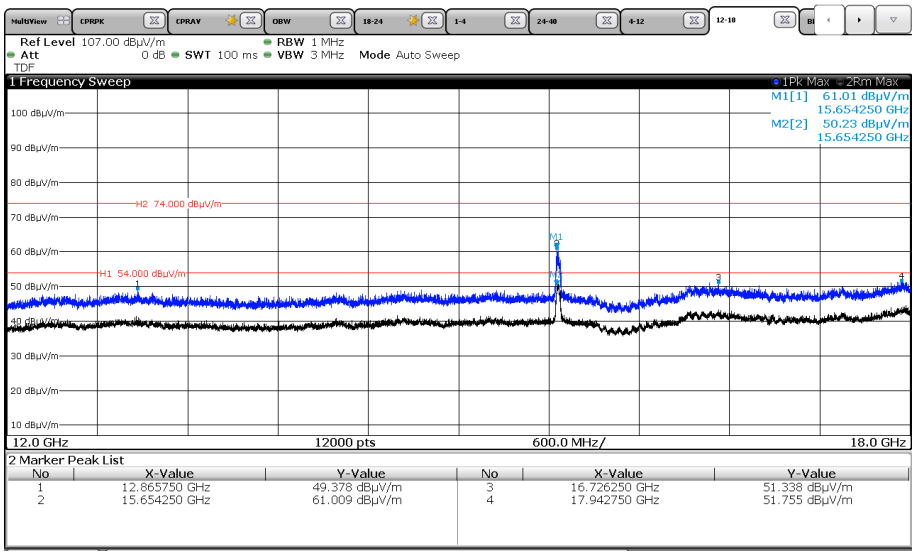


2 Marker Peak List

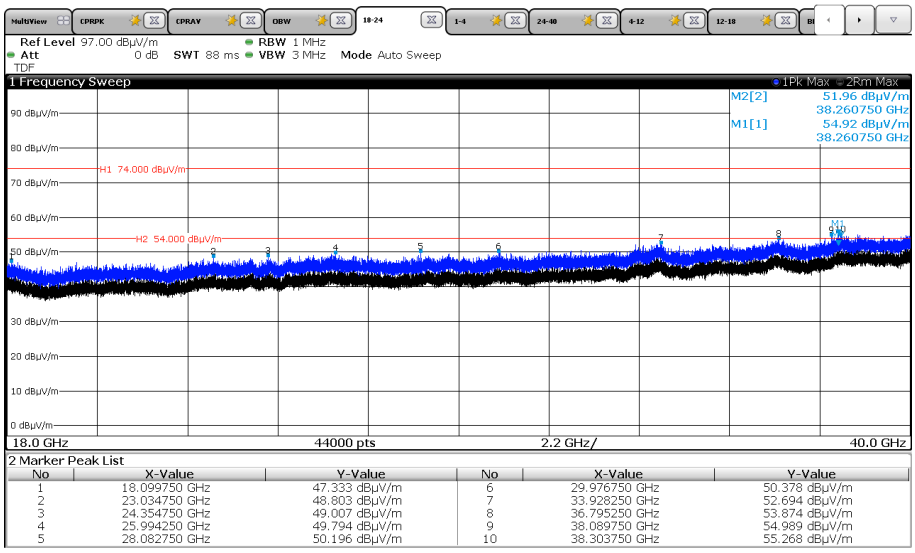
No	X-Value	Y-Value	No	X-Value	Y-Value
1	10.442380 GHz	53.422 dBµV/m	2	11.984880 GHz	48.862 dBµV/m

FCC ID: 2ABA7XPT

12-18 GHz

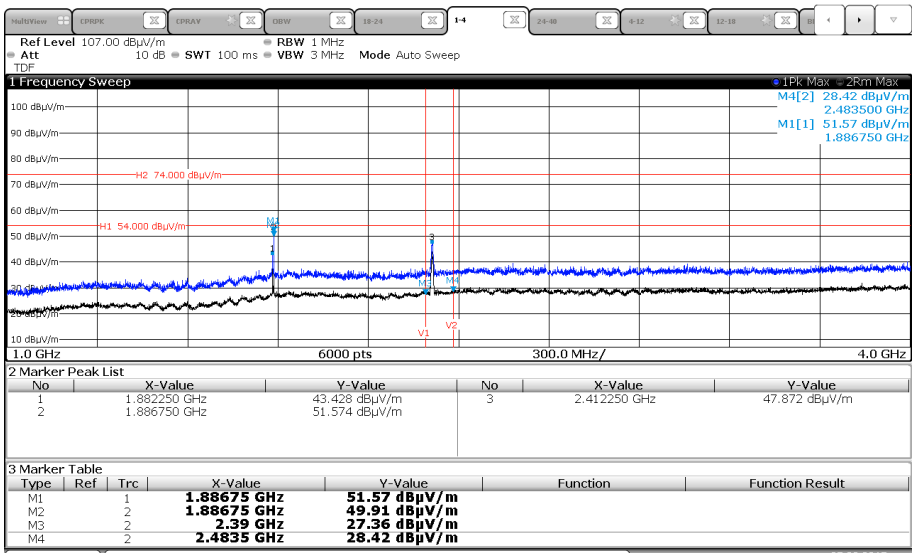


18-40 GHz



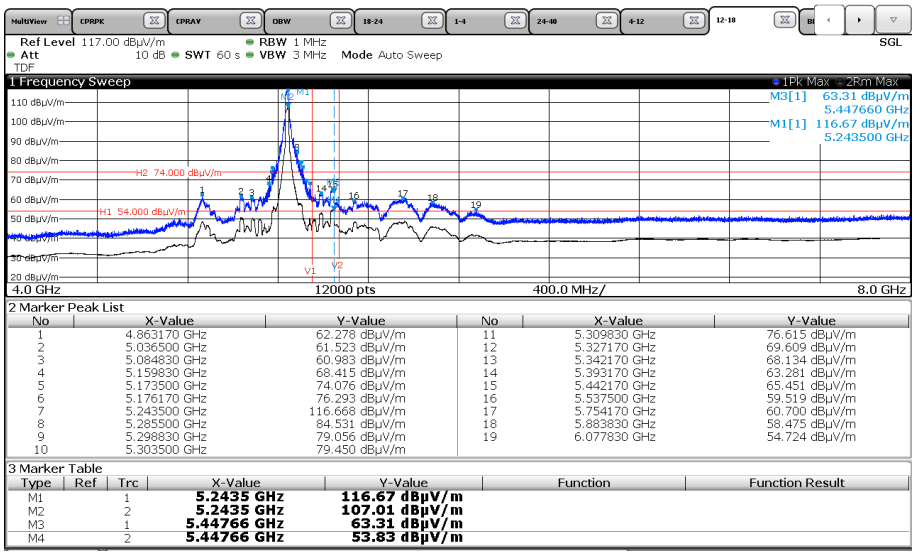
Channel 48 (5240 MHz)

1-4-GHz



FCC ID: 2ABA7XPT

4-8 GHz



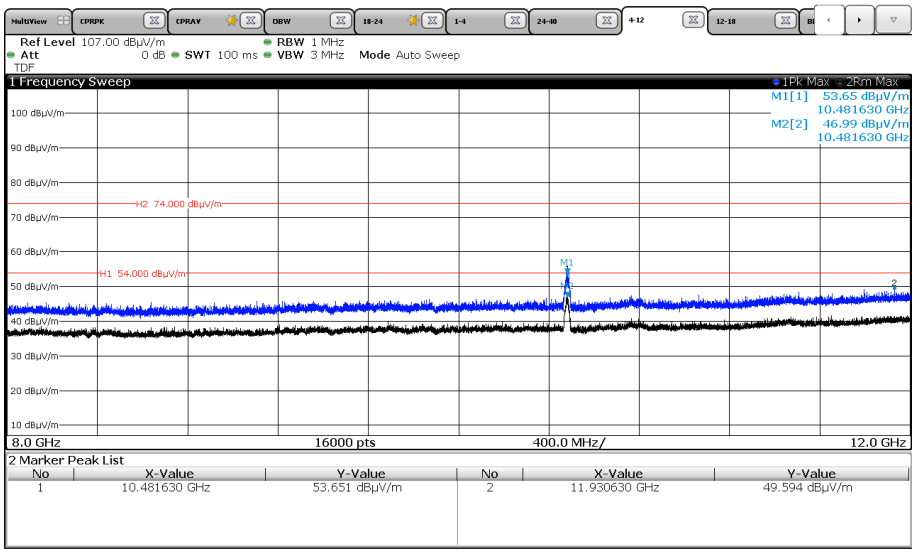
2 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	4.863170 GHz	62.278 dBµV/m	11	5.309830 GHz	76.615 dBµV/m
2	5.036500 GHz	61.523 dBµV/m	12	5.327170 GHz	69.609 dBµV/m
3	5.084830 GHz	60.983 dBµV/m	13	5.342170 GHz	68.134 dBµV/m
4	5.159830 GHz	68.415 dBµV/m	14	5.393170 GHz	63.281 dBµV/m
5	5.173500 GHz	74.076 dBµV/m	15	5.442170 GHz	65.451 dBµV/m
6	5.176170 GHz	76.293 dBµV/m	16	5.537500 GHz	59.519 dBµV/m
7	5.243500 GHz	116.668 dBµV/m	17	5.754170 GHz	60.700 dBµV/m
8	5.285500 GHz	84.531 dBµV/m	18	5.883830 GHz	58.475 dBµV/m
9	5.298830 GHz	79.056 dBµV/m	19	6.077830 GHz	54.724 dBµV/m
10	5.303500 GHz	79.450 dBµV/m			

3 Marker Table

Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1		1	**5.2435 GHz**	**116.67 dBµV/m**		
M2		2	**5.2435 GHz**	**107.01 dBµV/m**		
M3		1	**5.44766 GHz**	**63.31 dBµV/m**		
M4		2	**5.44766 GHz**	**53.83 dBµV/m**		

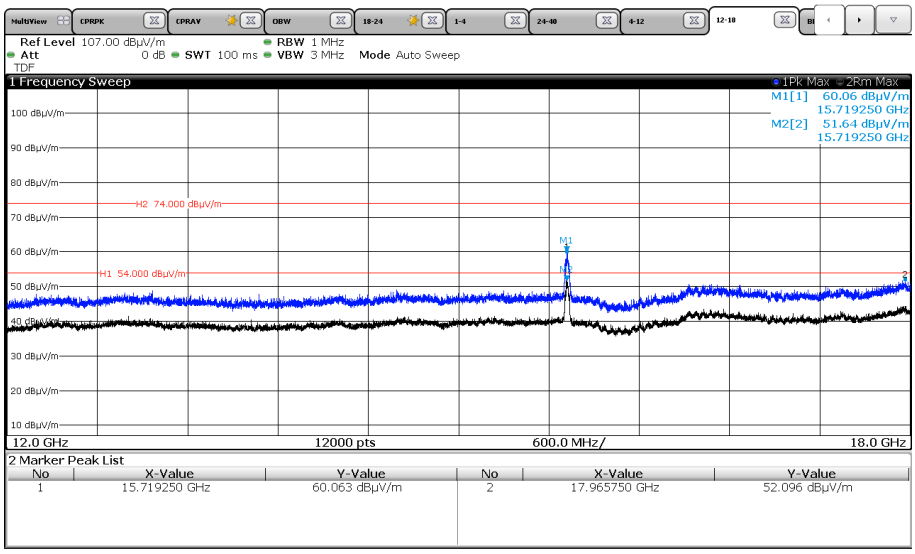
8-12 GHz



2 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	10.481630 GHz	53.651 dBµV/m	2	11.930630 GHz	49.594 dBµV/m

12-18 GHz

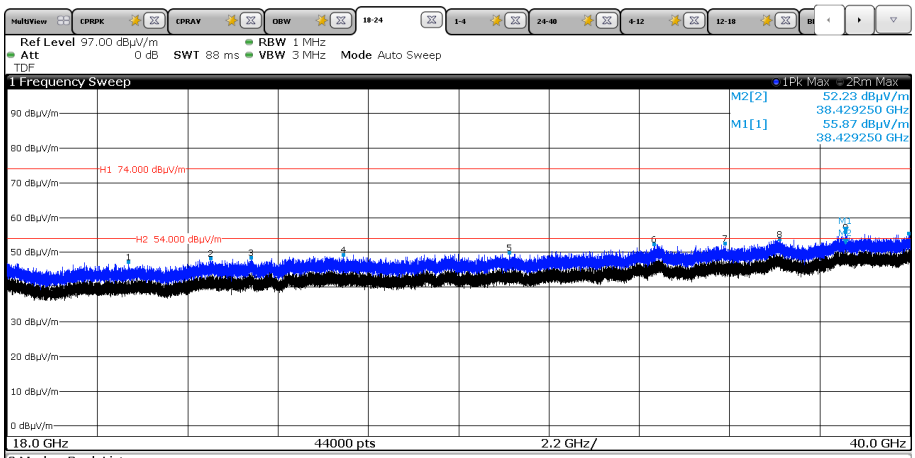


2 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	15.719250 GHz	60.063 dBµV/m	2	17.965750 GHz	52.096 dBµV/m

FCC ID: 2ABA7XPT

18-40 GHz



2 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	20.957750 GHz	47.264 dBµV/m	6	33.761750 GHz	52.269 dBµV/m
2	22.956750 GHz	48.213 dBµV/m	7	35.481750 GHz	52.628 dBµV/m
3	23.936750 GHz	48.395 dBµV/m	8	36.818250 GHz	53.730 dBµV/m
4	26.191250 GHz	49.261 dBµV/m	9	38.429250 GHz	55.865 dBµV/m
5	30.244250 GHz	49.927 dBµV/m	10	39.957750 GHz	55.356 dBµV/m

Limit according to FCC Part 15E, Section 15.407(b) for undesirable emissions:

Operating Frequency range	Undesirable emission limit, EIRP
(MHz)	(dBm/MHz)
5150 - 5250	-27.0

Remarks: The EUT holds the general limits of Part 15.209 and therefore the emission limits part 15.407(b), too.

5.7 Frequency stability

For test instruments and accessories used see section 6 Part **MB**.

5.7.1 Description of the test location

Test location: NONE

Remarks: Not tested.

5.8 Antenna application

5.8.1 Applicable standard

According to FCC Part 15C, 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 that the user can replace broken antennas, but the use of a standard antenna jack is prohibited.

The equipment connector for the 5 GHz Audio application is a N(f) connector for professional use.
The WLAN antenna connector is a SMA-R connector.

Remarks:

6 USED TEST EQUIPMENT AND ACCESSORIES

All test instruments used are calibrated and verified regularly. The calibration history is available on request.

Test ID	Model Type	Equipment No.	Next Calib.	Last Calib.	Next Verif.	Last Verif.
A 4	ESCI	02-02/03-15-001	23/05/2017	23/05/2016		
	ESH 2 - Z 5	02-02/20-05-004	26/10/2017	26/10/2015	24/05/2017	24/11/2016
	N-4000-BNC	02-02/50-05-138				
	N-1500-N	02-02/50-05-140				
	ESH 3 - Z 2	02-02/50-05-155	18/11/2019	18/11/2016	18/05/2017	18/11/2016
CPR 3	AFS5-12001800-18-10P-6	02-02/17-06-002				
	AFS4-01000400-10-10P-4	02-02/17-13-002				
	AMF-4F-04001200-15-10P	02-02/17-13-003				
	BBHA 9120 E 251	02-02/24-05-006	19/04/2017	19/04/2016	23/06/2017	23/12/2016
	WBH2-18NHG	02-02/24-08-002	19/04/2017	19/04/2016	23/06/2017	23/12/2016
	Sucoflex N-2000-SMA	02-02/50-05-075				
	SF104/11N/11N/1500MM	02-02/50-13-015				
	SF104/11SMA/11N/1500MM	02-02/50-13-016				
	SF104/11SMA/11N/1500MM	02-02/50-13-017				
SER 2	ESVS 30	02-02/03-05-003	08/07/2017	08/07/2016		
	VULB 9168	02-02/24-05-005	20/04/2017	20/04/2016	01/03/2017	01/09/2016
	NW-2000-NB	02-02/50-05-113				
	KK-EF393/U-16N-21N20 m	02-02/50-12-018				
	KK-SD_7/8-2X21N-33,0M	02-02/50-15-028				
SER 3	FSW43	02-02/11-15-001	25/07/2017	25/07/2016		
	JS4-18004000-30-5A	02-02/17-05-017				
	AFS5-12001800-18-10P-6	02-02/17-06-002				
	AFS4-01000400-10-10P-4	02-02/17-13-002				
	AMF-4F-04001200-15-10P	02-02/17-13-003				
	3117	02-02/24-05-009	24/05/2017	24/05/2016		
	BBHA 9170	02-02/24-05-014	02/06/2018	02/06/2015	09/12/2017	09/12/2016
	Sucoflex N-2000-SMA	02-02/50-05-075				
	WHK 3.0/18G-10EF	02-02/50-05-180				
	WHKX 7.5/18G-8SS	02-02/50-07-010				
	KMS102-0.2 m	02-02/50-11-020				
	SF104/11N/11N/1500MM	02-02/50-13-015				