



RF - TEST REPORT

- FCC Part 15.517, RSS-220 -

Type / Model Name : Radio frequency module/ MUPS-RF

Product Description : Probing system with UWB transmission

Applicant : Marposs S.p.A.

Address : Via Saliceto 13

40010 BENTIVOGLIO, ITALY

Manufacturer : Marposs S.p.A.

Address : Via Saliceto 13

40010 BENTIVOGLIO, ITALY

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

POSITIVE

Test Report No. : **80234415-01 Rev_2**

16. October 2025

Date of issue



Deutsche
Akkreditierungsstelle
D-PL-12030-01-00

FCC ID: NXIMUPS

IC: 3066A-MUPS

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ATTACHMENT A as separate supplements

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 C - Intentional Radiators (September 2021)

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 15.207	Conducted limits
Part 15, Subpart C, Section 15.209	Radiated emission limits, general requirements

FCC Rules and Regulations Part 15, Subpart F – Ultra Wideband Operation (October 2021)

Part 15, Subpart F, Section 15.517	Technical requirements for indoor UWB systems
Part 15, Subpart F, Section 15.521	Technical requirements applicable to all UWB devices

Industry Canada – Radio equipment standards

RSS-Gen, Issue 5 + A1 + A2, March 2019	General Requirements for Compliance of Radio Apparatus
RSS-220, Issue 1 + A1, July 2018	Devices Using Ultra-Wideband (UWB) Technology
ANSI C63.10-2020+Cor. 1-2023+ C63.10a-2024 + Errata to C63.10a-2024	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 393764 D01 v02r01 (April 25, 2022)	Ultra-Wideband (UWB) Devices – Frequently Asked Questions

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2 EQUIPMENT UNDER TEST

2.1 Information provided by the Client

Please note, we do not take any responsibility for information provided by the client or his representative which may have an influence on the validity of the test results.

2.2 Sampling

The customer is responsible for the choice of samples. Sample configuration, start-up and operation is carried out by the customer or according to his/her instructions.

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

2.4 Equipment type

UWB module for indoor use

According to RSS-220 classification of UWB devices, the EUT belongs to the subclass 5.2 “Indoor Communication Devices”. The EUT has no data ports.

2.5 Short description of the equipment under test (EUT)

The EUT is a radio frequency module which integrates two synchronous and identical low power UWB transceivers, each one with its reference crystal and its antenna, together on the same PCB.

Number of tested samples: 1
 Serial number: n. a. (pre-production sample, radiated)
 Firmware version: v0.014

2.6 Variants of the EUT

There are no variants.

2.7 Operation frequency and channel plan

The operating frequency band is 3100 MHz to 10600 MHz for FCC.

Channel plan FCC and ISSED:

Channel number	f _c (MHz)
Channel 5	6489.6
Channel 6	6988.8
Channel 8	7488.0
Channel 9	7987.2

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2.8 Transmit operating modes

Modulation: variable pulse position modulation (PPM) in combination with binary phase shift keying (BPSK).

Data rate: 250 kbit/s

2.9 Antenna

The following antennas shall be used with the EUT:

Number	Characteristic	Type	Plug	f-range (GHz)	Max. Gain (dBi)
1	Omni	Johanson Technology p/n 7000AT18A1600	PCB	6.2 -7.8	2.0

2.10 Power supply system utilised

Power supply voltage, V_{nom} : 2.5 V DC

2.11 Peripheral devices and interface cables

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

- WLC Cable Model : 618092W003
- Programming and debug board Model : 6303323340
- AC adapter Model : UMEC UP0551A-24P

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2.12 Determination of worst case conditions for final measurement

Measurements are made in all three orthogonal axes with horizontal and vertical antenna positions to determine the worst case condition. For the further measurement the EUT is set in X position.

2.12.1 Test jig

No test jig is used.

2.12.2 Test software

The device has special firmware allowing us to set channels for conducted and radiated tests. The EUT shows a fixed power setting to perform the test modes TX continuous, modulated and RX continuous for the channels listed in section 2.8.

The following power settings are chosen for the EUT:

Channel number	f _c (MHz)	setting
Channel 5	6489.6	0x7777
Channel 6	6988.8	0x4444
Channel 8	7488.0	0x5555
Channel 9	7987.2	0x6666

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3 TEST RESULT SUMMARY

FCC Rule Part	RSS Rule Part	Description	Result
15.207(a) 15.521(j)	RSS-Gen, 8.8	AC power line conducted emissions	passed
15.517(b) 15.521(e)	RSS-220, 2, 5.1(a)	UWB Bandwidth	passed
---	RSS-Gen, 6.6	99 % Bandwidth	passed
15.209(a) 15.517(c) 15.521(c)(d)(h)	RSS-Gen, 8.9 RSS-220, 3.4, 5.2.1(c), 5.2.1(d)	Radiated Emissions 9 kHz to 40 GHz	passed
15.517(d)	RSS-220, 5.2.1(e)	Radiated Emissions at 1164-1240 MHz and 1559-1610 MHz	passed
15.517(e) 15.521(g)	RSS-220, 5.2.1(g)	Peak Power radiated	passed
15.203 15.521(b)	---	Antenna requirement	not applicable *1
15.204 15.521(b)	---	External radio frequency power amplifiers and antenna modifications	not applicable *1
15.521(a)(f)(i)	---	Technical requirements applicable to all UWB devices	not applicable *2

*1 According to the applicant, the EUT has an internal PCB antenna. No other antennas can be connected to the EUT. Therefore, the requirements are regarded as fulfilled.

*2 According to the applicant, the EUT will not be used in toys, onboard an aircraft, a ship, a satellite. The EUT is no imaging system.

3.1 Revision history of test report

Test report No	Rev.	Issue Date	Changes
80234415-01	0	08 January 2025	Initial test report
	1	08 October 2025	Changing from hand-held to indoor regulation, update of latest regulation
	2	16 October 2025	Section 2.9: antenna type corrected Section 5.2.5: typo corrected in table Section 5.3.4: typo corrected Section 5.3.5: typo corrected in remark section

The test report with the highest revision number replaces the previous test reports.

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3.2 Final assessment

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

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

Testing commenced on : 21 November 2024

Testing concluded on : 08 January 2025

Checked by:



Klaus Gegenfurtner
I confirm the correctness
and integrity of this
document
2025.10.16 09:02:18
+02'00'

Klaus Gegenfurtner
Teamleader Radio

Tested by:



I am the author of
this document
2025.10.16 08:51:09
+02'00'

Franz-Xaver Schrettenbrunner
Radio Team

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4 TEST ENVIRONMENT

4.1 Address of the test laboratory

**CSA Group Bayern GmbH
Straubinger Straße 100
94447 PLATTILING
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: 2011 + A1: 2014 „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.

4.4 Conformity Decision Rule

The applied conformity decision rule is based on ILAC G8:09/2019 clause 4.2.1 Binary Statement for Simple Acceptance Rule ($w = 0$).

Details can be found in the procedure CSA_B_V50_29.

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4.5 Measurement protocol for FCC and ISED

4.5.1 General information

CSA Group Bayern GmbH is recognized as wireless testing laboratory under the CAB identifier:

FCC: DE 0011
ISED: DE0009

4.5.2 General Standard information

The test methods used comply with ANSI C63.10 - "Testing Unlicensed Wireless Devices".

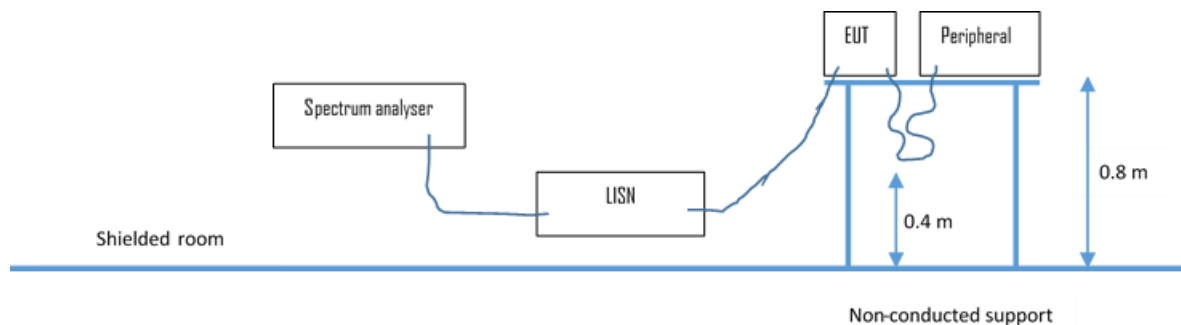
4.5.2.1 Justification

The equipment under test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions.

4.5.3 Details of test procedures

4.5.3.1 Conducted emission

Test setup according ANSI C63.10



The final level, expressed in dB μ V, is arrived at by taking the reading directly from the Spectrum analyser. This level is compared to the limit.

To convert between dB μ V and μ V, the following conversions apply:

$$\text{dB}\mu\text{V} = 20(\log \mu\text{V})$$

$$\mu\text{V} = \text{Inverse log}(\text{dB}\mu\text{V}/20)$$

Conducted emissions on the 50 Hz and/or 60 Hz power interface of the EUT are measured in the frequency range of 150 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi-peak detection and a Line Impedance Stabilization Network (LISN) with 50 Ω / 50 μ H (CISPR 16) characteristics. The receiver is protected by means of an impedance matched pulse limiter connected directly to the RF input. Table top equipment is placed on a non-conducting table 80 centimetres above the floor and is positioned 40 centimetres from the vertical ground plane (wall) of the screen room. If the minimum limit margin appears to be less than 20 dB with a peak mode measurement, the emission is re-measured using a tuned receiver with quasi-peak and average detection and recorded on the data sheets.

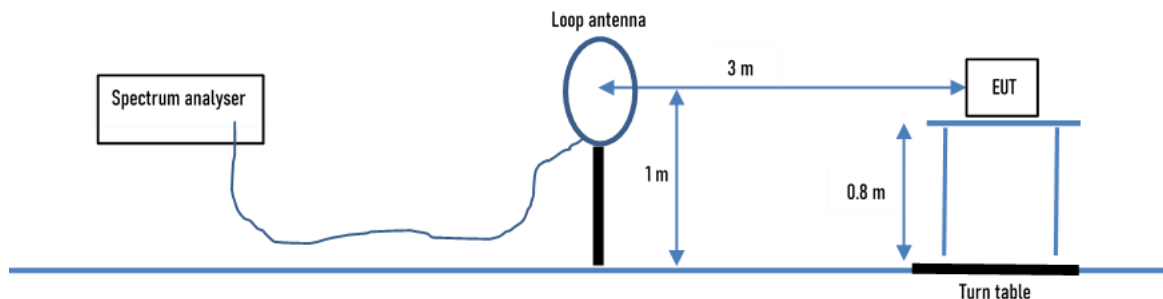
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4.5.3.2 Radiated emission

4.5.3.2.1 Anechoic chamber test site (9 kHz - 30 MHz):

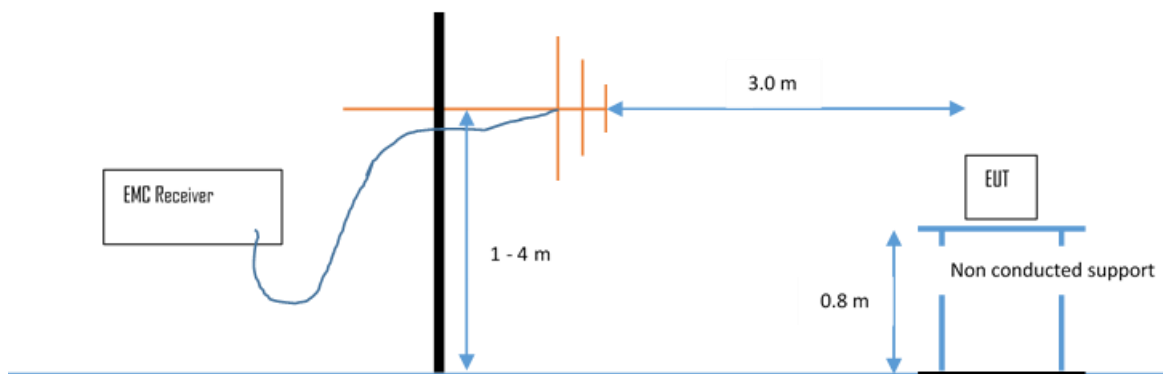
Test setup according ANSI C63.10



Emissions from the EUT are measured in the frequency range of 9 MHz to 30 MHz using a tuned receiver and a calibrated loop antenna. Table top equipment is placed on a 1.0 X 1.5 m non-conducting table 80 centimetres above the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screened room located outside the test area. The antenna is positioned 3, 10 or 30 metres horizontally from the EUT and is repeated vertically. To locate maximum emissions from the test sample the antenna is varied along the site axis and the EUT is rotated 360 degrees.

4.5.3.2.2 Anechoic chamber (30 MHz - 1 GHz):

Test setup according ANSI C63.10.



Spurious emissions from the EUT are measured in the frequency range of 30 MHz to 1000 MHz using a tuned receiver and appropriate broadband linearly polarised antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection. Table top equipment is placed on a 1.0 X 1.5 m non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screened room located outside the test area. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 metres and the EUT is rotated 360 degrees. The final level in dBµV/m is calculated by taking the reading from the EMI receiver (Level dBµV) and adding the correction factors and cable loss factor (dB). The FCC limit is subtracted from this result in order to provide the limit margin listed in the measurement protocol.

The resolution bandwidth setting:

30 MHz – 1000 MHz: RBW: 120 kHz

Example:

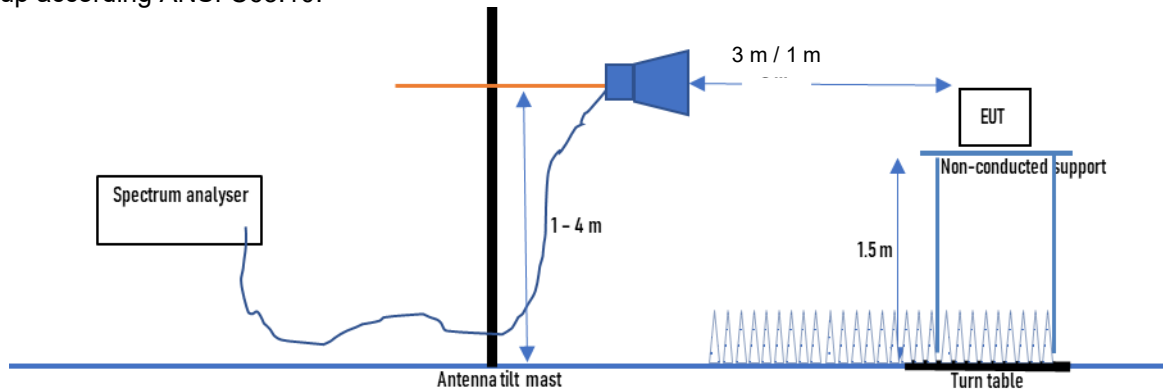
Frequency (MHz)	Level (dBµV)	+	Factor (dB)	=	Level (dBµV/m)	-	Limit (dBµV/m)	=	Delta (dB)
719.0	75.0	+	32.6	=	107.6	-	110.0	=	-2.4

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4.5.3.2.3 Anechoic chamber (1000 MHz – 18000 MHz)

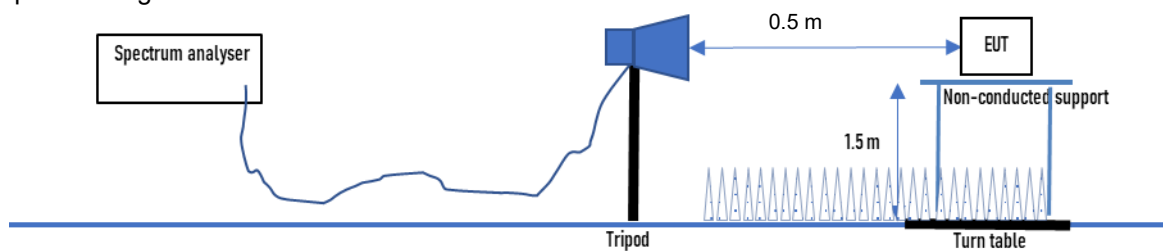
Test setup according ANSI C63.10.



Radiated emissions from the EUT are measured in the frequency range 1 GHz up to 18 GHz as specified in 47 CFR Part 15, Subpart A, Section 15.33, using a spectrum analyser and appropriate linearly polarized antennas. Table top equipment is placed on a non-conducting table, 1.5 metre above the ground plane. The turntable is fully covered with the appropriate absorber (Type VHP-12). Any controlling device is positioned such that it does not significantly influence the measurement results. Interconnecting cables that hang closer than 40 cm to the ground plane are folded back and forth in the center, forming a bundle 30 cm to 40 cm long. Measurements are made in three orientations of the EUT and the horizontal and vertical polarization planes of measurement antenna in a fully anechoic room. The measurement antenna is adjusted and the EUT orientated to permit the measurement of the maximum emission from the EUT. The conditions determined as worst-case will then be used for the final measurements.

4.5.3.2.4 Anechoic chamber (18 GHz – 40 GHz)

Test setup according ANSI C63.10



Emissions from the EUT are measured in the frequency range 18 GHz up to 40 GHz as specified in 47 CFR Part 15, Subpart A, Section 15.33, using a spectrum analyser and appropriate linearly polarized antennas. Table top equipment is placed on a non-conducting table, 1.5 metre above the ground plane. The turntable is fully covered with the appropriate absorber (Type VHP-12). Any controlling device is positioned such that it does not significantly influence the measurement results. Interconnecting cables that hang closer than 40 cm to the ground plane are folded back and forth in the center, forming a bundle 30 cm to 40 cm long. Measurements are made in in three orientations of the EUT and the horizontal and vertical polarization planes of measurement antenna in a fully anechoic room. The measurement antenna is adjusted and the EUT orientated to permit the measurement of the maximum emission from the EUT. The conditions determined as worst-case will then be used for the final measurements. Where appropriate, the test distance may be reduced in order to detect emissions under better uncertainty. The limit are adopted.

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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 SR2

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.

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5.1.5 Test result

Frequency range: 0.15 MHz - 30 MHz

Min. limit margin -1.9 dB at 615.5 MHz

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

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

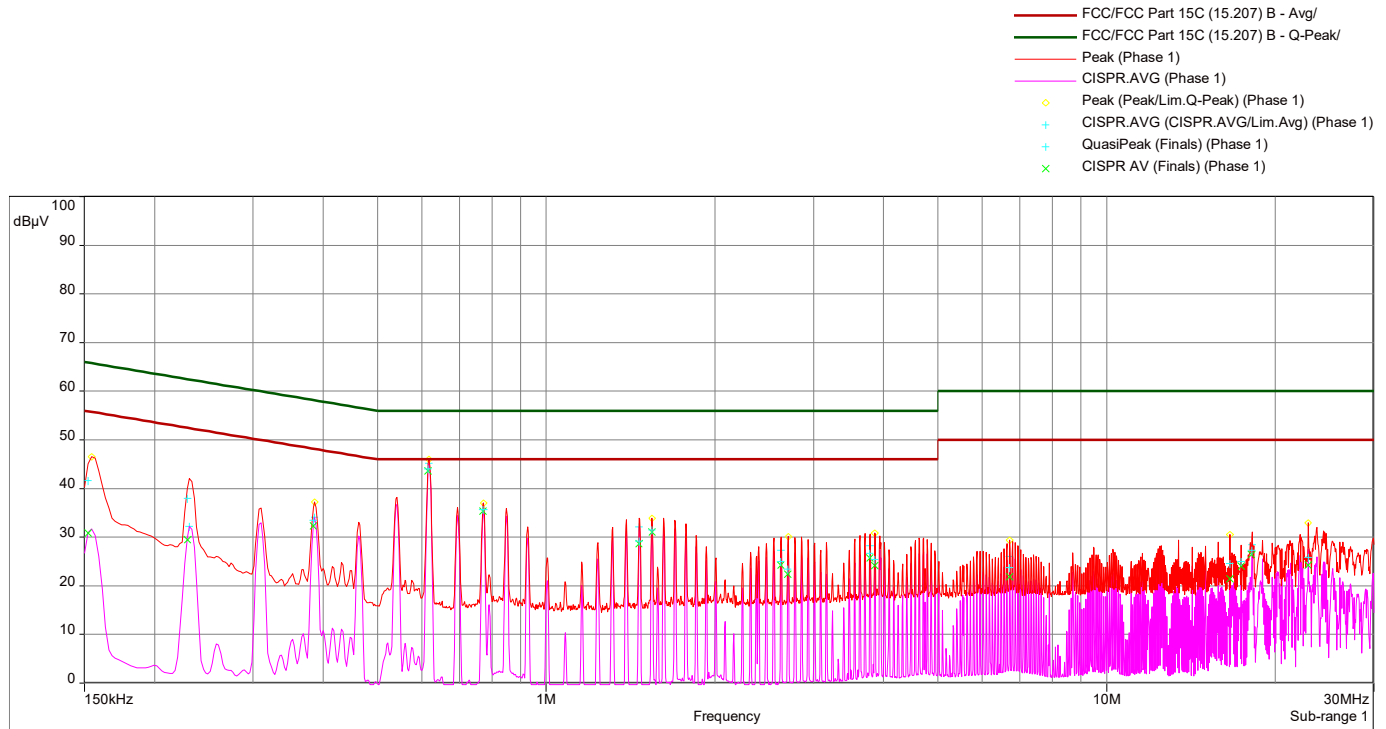
The requirements are **FULFILLED**.

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

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5.1.6 Test protocol



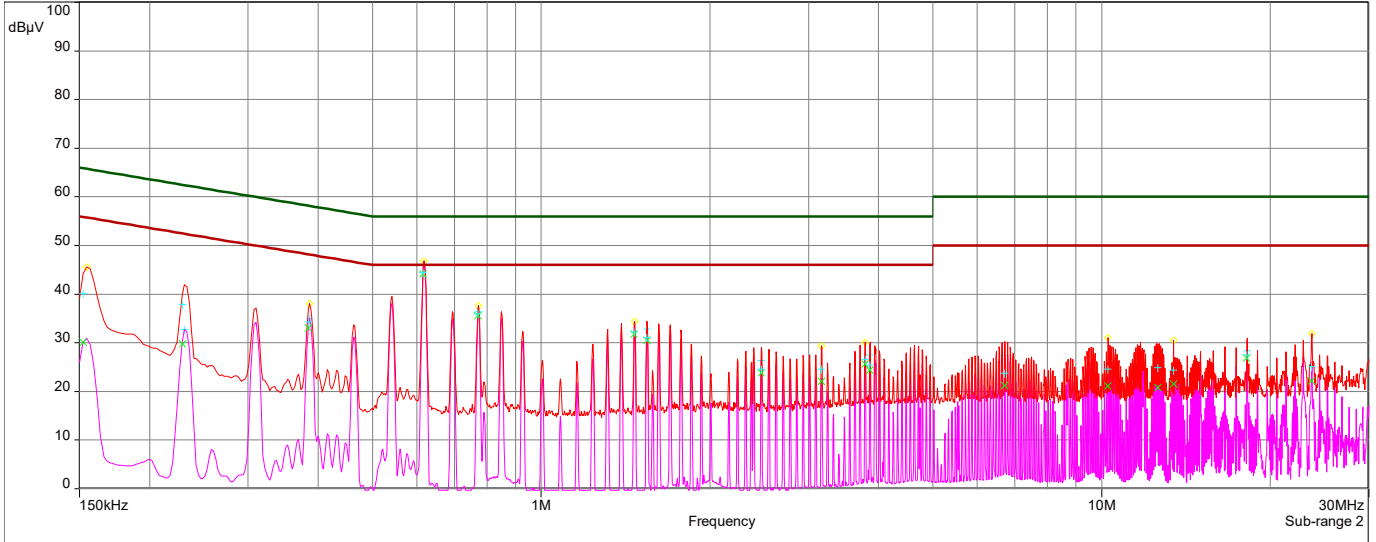
FCC/FCC Part 15C (15.207)B

Frequency (Hz)	QuasiPeak (dBμV)	QP Margin	QP Limit (dBμV)	CISPR AV (dBμV)	CISPR AV Margin	AV Limit (dBμV)	RBW (Hz)	Meas.Time (s)	Correction (dB)
152.0036 k	41.595	-24.282	65.876	30.916	-24.96	55.876	9000	1	10.331
228.5036 k	37.999	-24.496	62.495	29.466	-23.029	52.495	9000	1	10.314
383.7536 k	33.483	-24.709	58.192	32.289	-15.904	48.192	9000	1	10.33
615.5036 k	44.026	-11.974	56	43.677	-2.323	46	9000	1	10.357
770.7536 k	35.729	-20.271	56	35.346	-10.654	46	9000	1	10.374
1.4637536 M	29.207	-26.793	56	28.665	-17.335	46	9000	1	10.431
1.5425036 M	31.514	-24.486	56	31.07	-14.93	46	9000	1	10.435
2.6225036 M	25.022	-30.978	56	24.233	-21.767	46	9000	1	10.503
2.6990036 M	23.392	-32.608	56	22.397	-23.603	46	9000	1	10.506
3.7812536 M	26.631	-29.369	56	25.722	-20.278	46	9000	1	10.536
3.8577536 M	25.396	-30.604	56	24.206	-21.794	46	9000	1	10.536
6.7152536 M	23.774	-36.226	60	21.866	-28.134	50	9000	1	10.448
16.5995036 M	24.565	-35.435	60	21.426	-28.574	50	9000	1	10.721
17.3915036 M	25.023	-34.977	60	24.112	-25.888	50	9000	1	10.763
18.1812536 M	27.298	-32.702	60	26.492	-23.508	50	9000	1	10.804
22.9242536 M	25.866	-34.134	60	24.233	-25.767	50	9000	1	10.96

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- FCC/FCC Part 15C (15.207) B - Avg/
- FCC/FCC Part 15C (15.207) B - Q-Peak/
- Peak (Neutral)
- CISPR.AVG (Neutral)
- ◇ Peak (Peak/Lim.Q-Peak) (Neutral)
- + CISPR.AVG (CISPR.AVG/Lim.Avg) (Neutral)
- + quasipeak (finals) (phase 1) (Neutral)
- x cispr av (finals) (phase 1) (Neutral)



FCC/FCC Part 15C (15.207)B

Frequency (Hz)	QuasiPeak (dBμV)	QP Margin	QP Limit (dBμV)	CISPR AV (dBμV)	CISPR AV Margin	AV Limit (dBμV)	RBW (Hz)	Meas.Time (s)	Correction (dB)
152.0036 k	40.215	-25.661	65.876	30.1	-25.776	55.876	9000	1	10.322
228.5036 k	37.84	-24.655	62.495	29.795	-22.7	52.495	9000	1	10.329
383.7536 k	34.269	-23.923	58.192	33.105	-15.088	48.192	9000	1	10.336
615.5036 k	44.46	-11.54	56	44.125	-1.875	46	9000	1	10.358
770.7536 k	35.939	-20.061	56	35.604	-10.396	46	9000	1	10.377
1.4660036 M	32.228	-23.772	56	31.801	-14.199	46	9000	1	10.42
1.5425036 M	31.052	-24.948	56	30.573	-15.427	46	9000	1	10.425
2.4695036 M	24.54	-31.46	56	23.813	-22.187	46	9000	1	10.505
3.1625036 M	24.598	-31.402	56	22.052	-23.948	46	9000	1	10.531
3.7835036 M	26.587	-29.413	56	25.619	-20.381	46	9000	1	10.546
3.8600036 M	25.4	-30.6	56	24.341	-21.659	46	9000	1	10.546
6.7175036 M	23.717	-36.283	60	21.219	-28.781	50	9000	1	10.457
10.2725036 M	24.62	-35.38	60	21.145	-28.855	50	9000	1	10.467
12.5900036 M	24.857	-35.143	60	20.866	-29.134	50	9000	1	10.545
13.4382536 M	24.406	-35.594	60	21.54	-28.46	50	9000	1	10.576
18.1812536 M	27.516	-32.484	60	26.884	-23.116	50	9000	1	10.724
23.7140036 M	25.075	-34.925	60	22.185	-27.815	50	9000	1	10.831

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5.2 UWB Bandwidth

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

5.2.1 Description of the test location

Test location: Fully anechoic room FAR1

5.2.2 Photo documentation of the test set-up



5.2.3 Applicable standard

According to FCC Part 15, Section 15.517(b):

The UWB bandwidth of a UWB system operating under the provisions of this section must be contained between 3100 MHz and 10,600 MHz.

According to FCC Part 15, Section 15.503(d):

Ultra-wideband (UWB) transmitter. An intentional radiator that, at any point in time, has a fractional bandwidth equal to or greater than 0.20 or has a UWB bandwidth equal to or greater than 500 MHz, regardless of the fractional bandwidth.

5.2.4 Description of Measurement

The bandwidth is measured following the procedure set out in ANSI C63-10, Item 10.1. The measurement was performed radiated at a distance of 3 m. The bandwidth was measured at an amplitude level reduced from the reference level of a modulated channel by a ratio of -10 dB. The EUT is set in TX continuous mode while measuring.

Spectrum analyser settings:

RBW: 1 MHz, VBW: 3 MHz, Detector: Peak

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5.2.5 Test result

channel	lowest frequency f_L (MHz)	highest frequency f_H (MHz)	permitted frequency range (GHz)	UWB bandwidth (MHz)	required UWB bandwidth (MHz)	result
5	6290.0	6889.0	3.1 – 10.6	599.0	> 500	passed
6	6733.8	7391.4	3.1 – 10.6	657.6	> 500	passed
8	7226.9	7914.3	3.1 – 10.6	687.4	> 500	passed
9	7670.8	8359.9	3.1 – 10.6	689.0	> 500	passed

The requirements are **FULFILLED**.

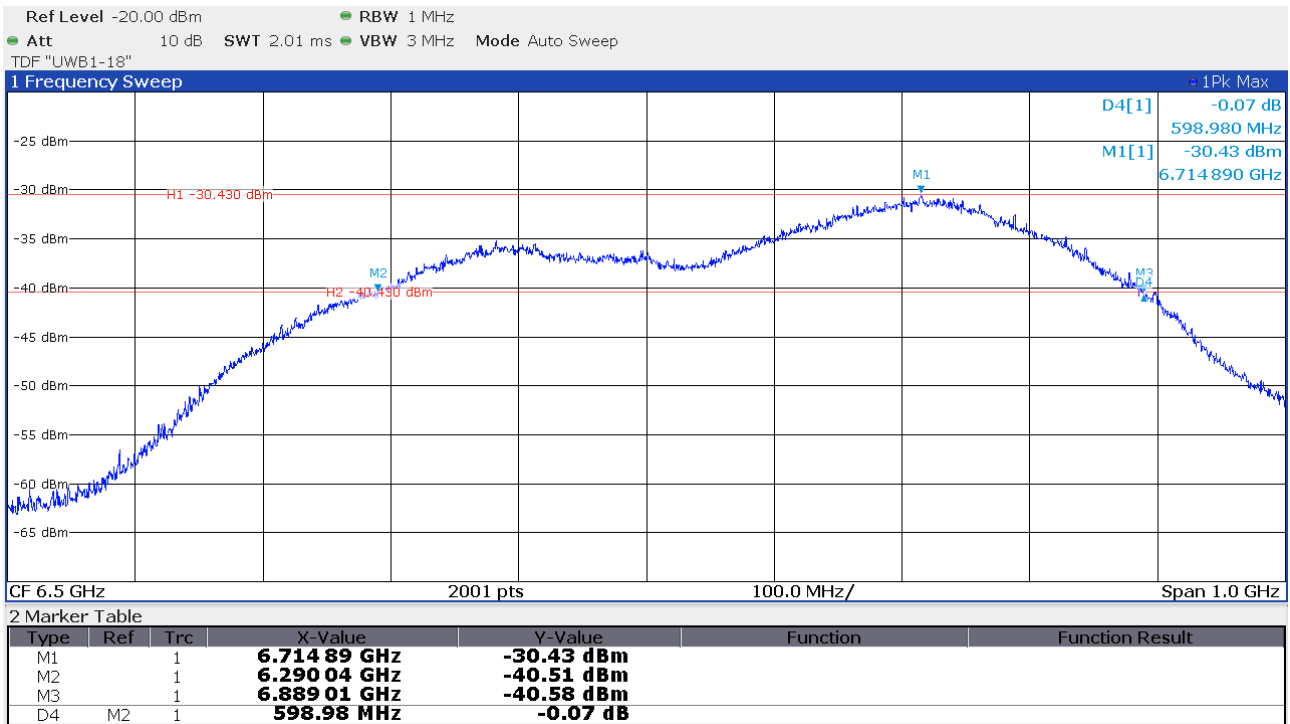
Remarks:
For detailed test results please refer to following test protocols.

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.

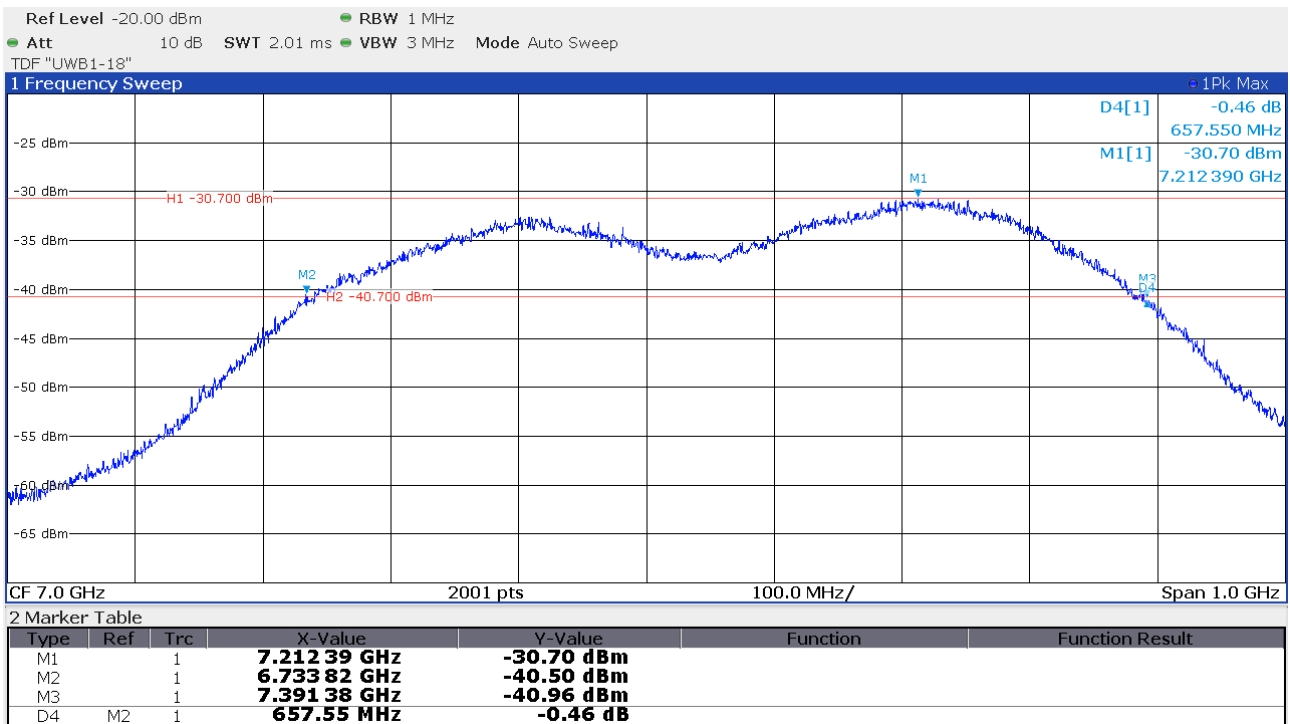
FCC ID: NXIMUPS
IC: 3066A-MUPS

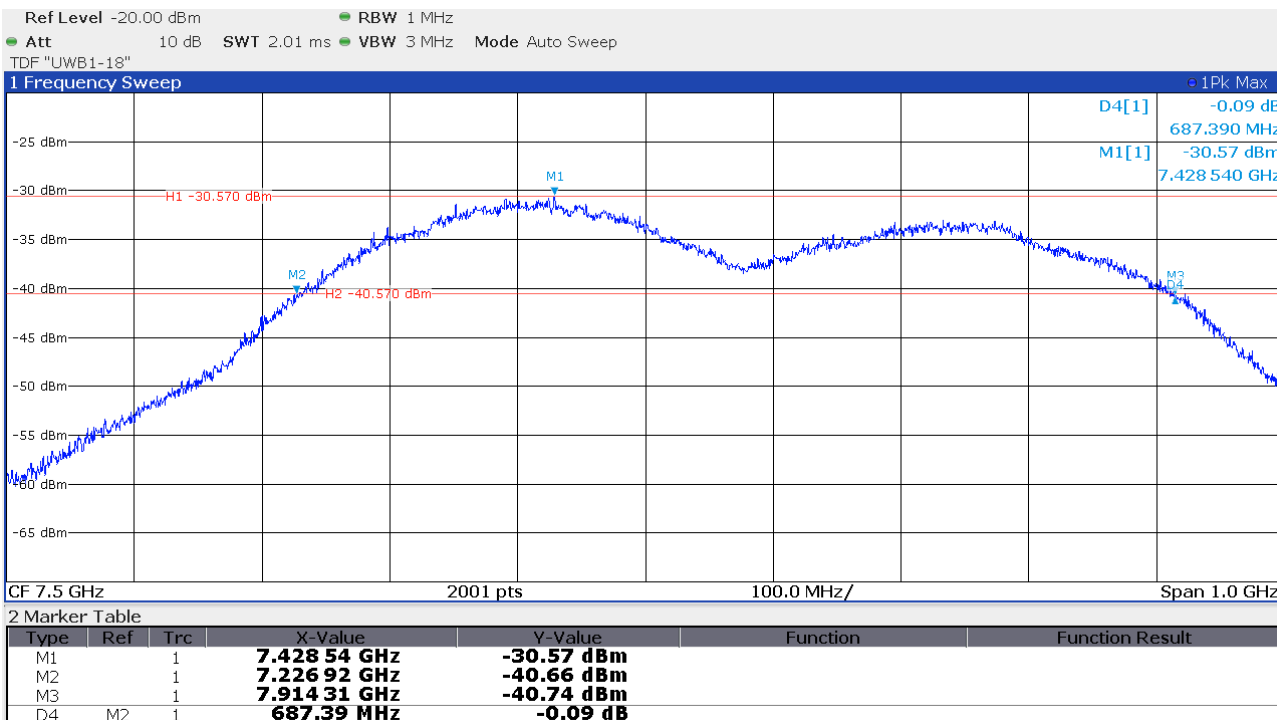
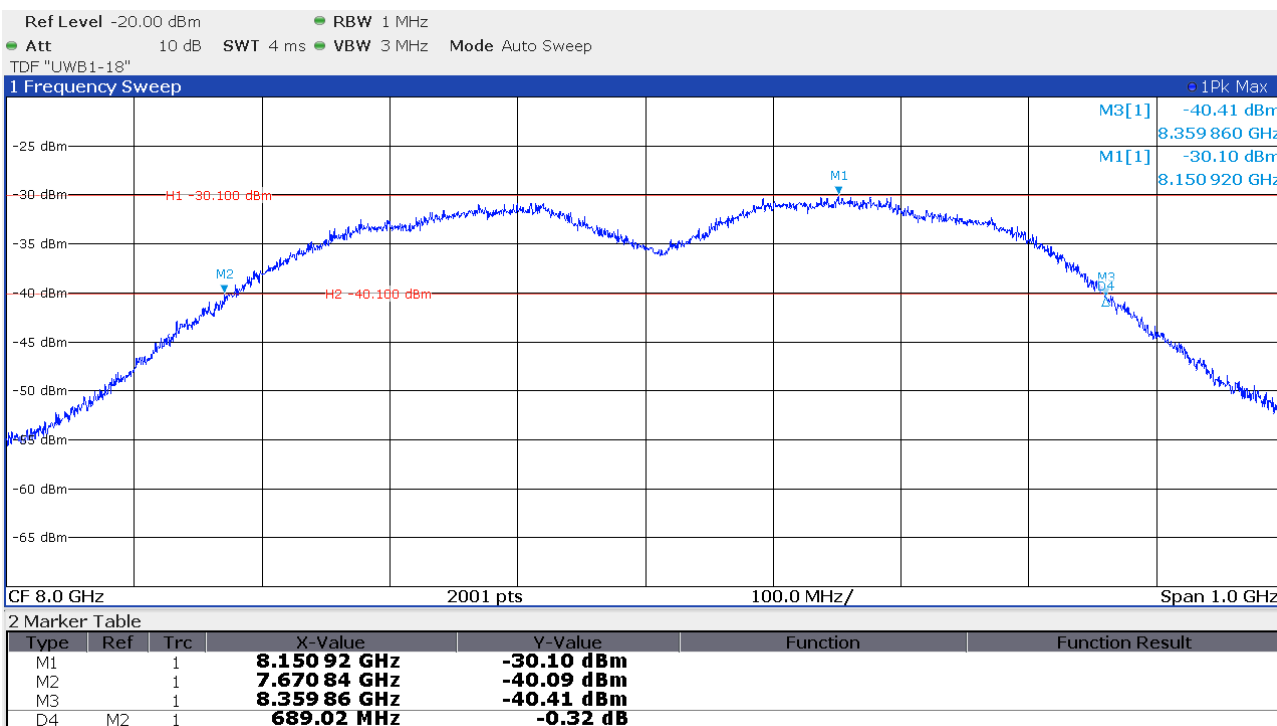
5.2.6 Test protocols EBW

Channel 5

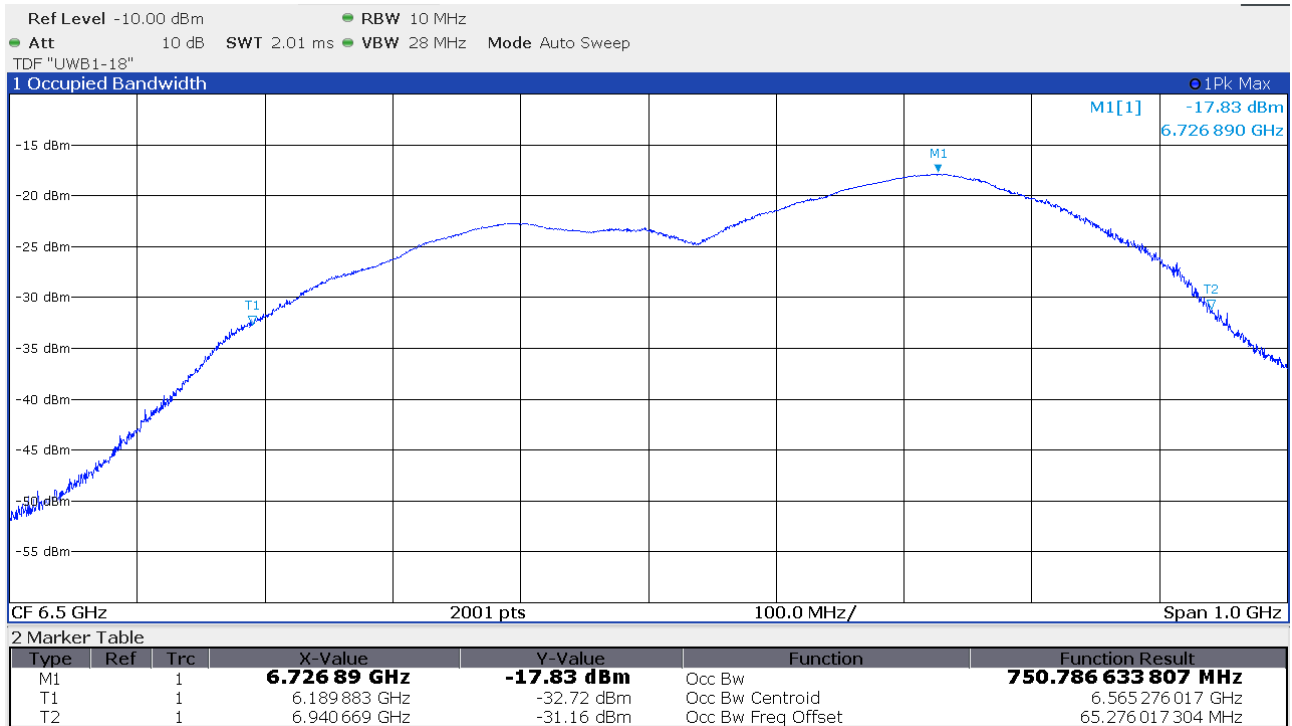
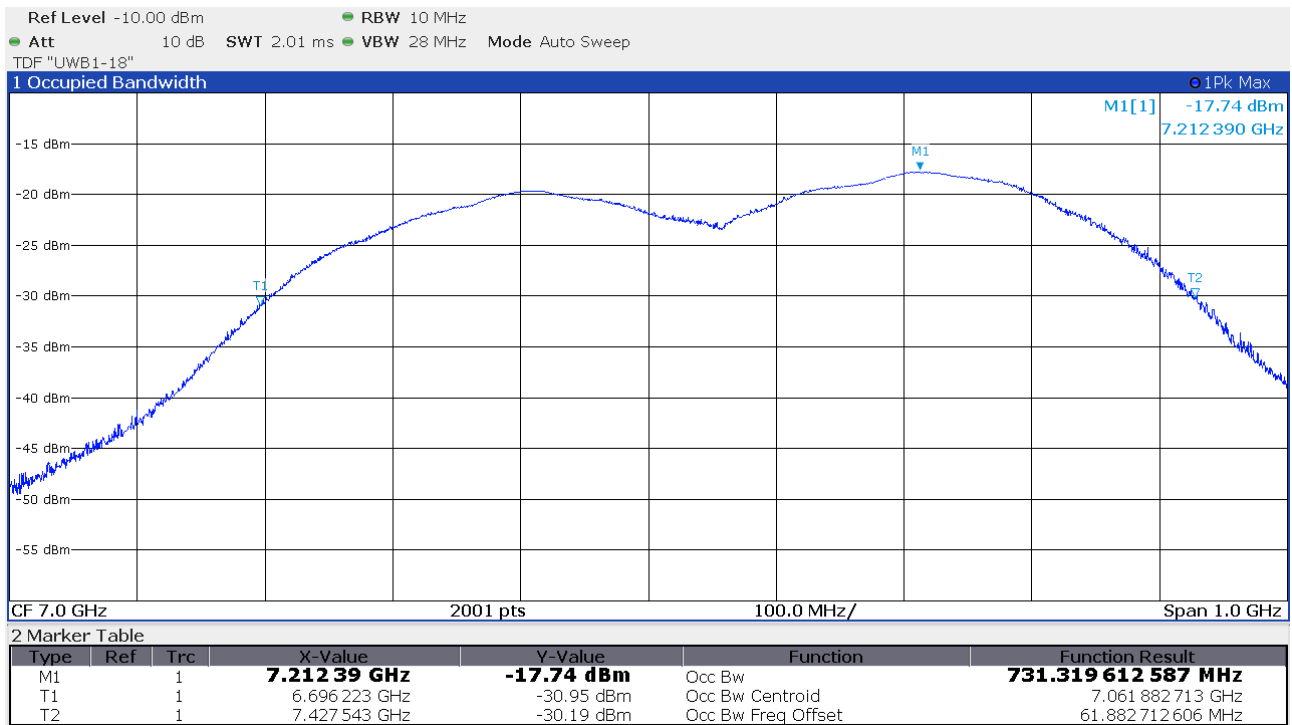


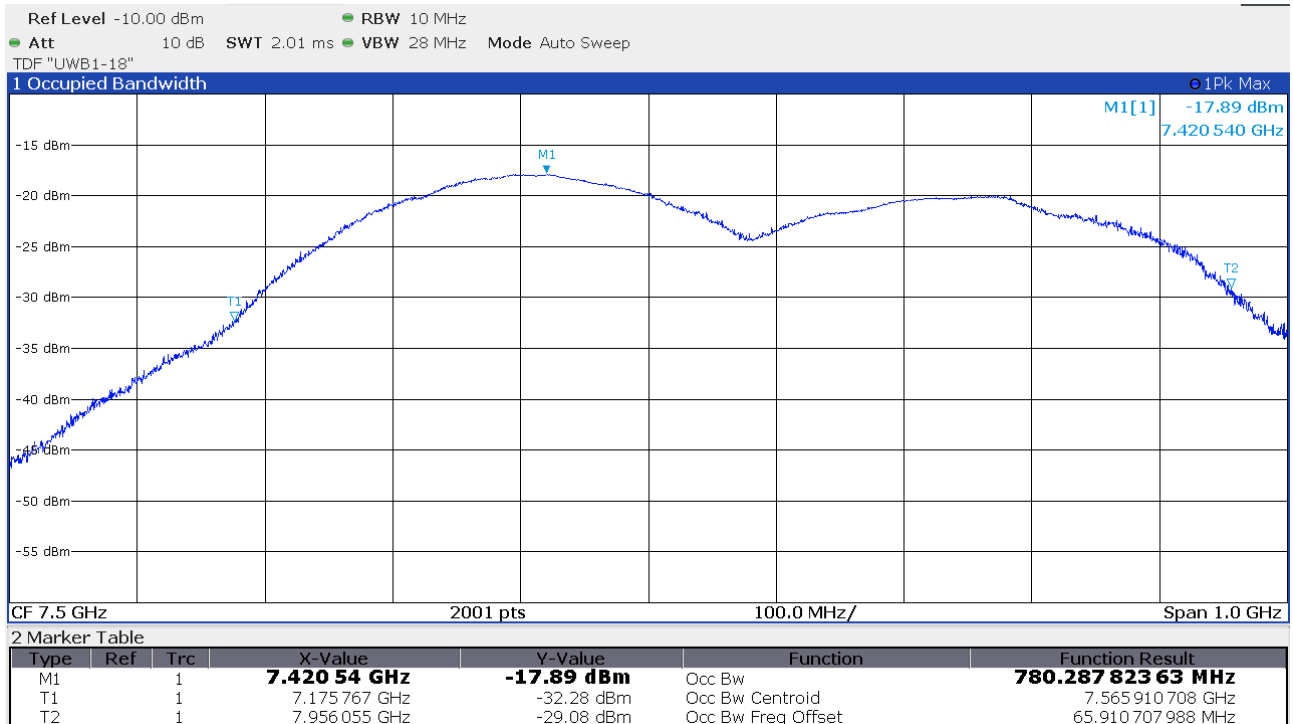
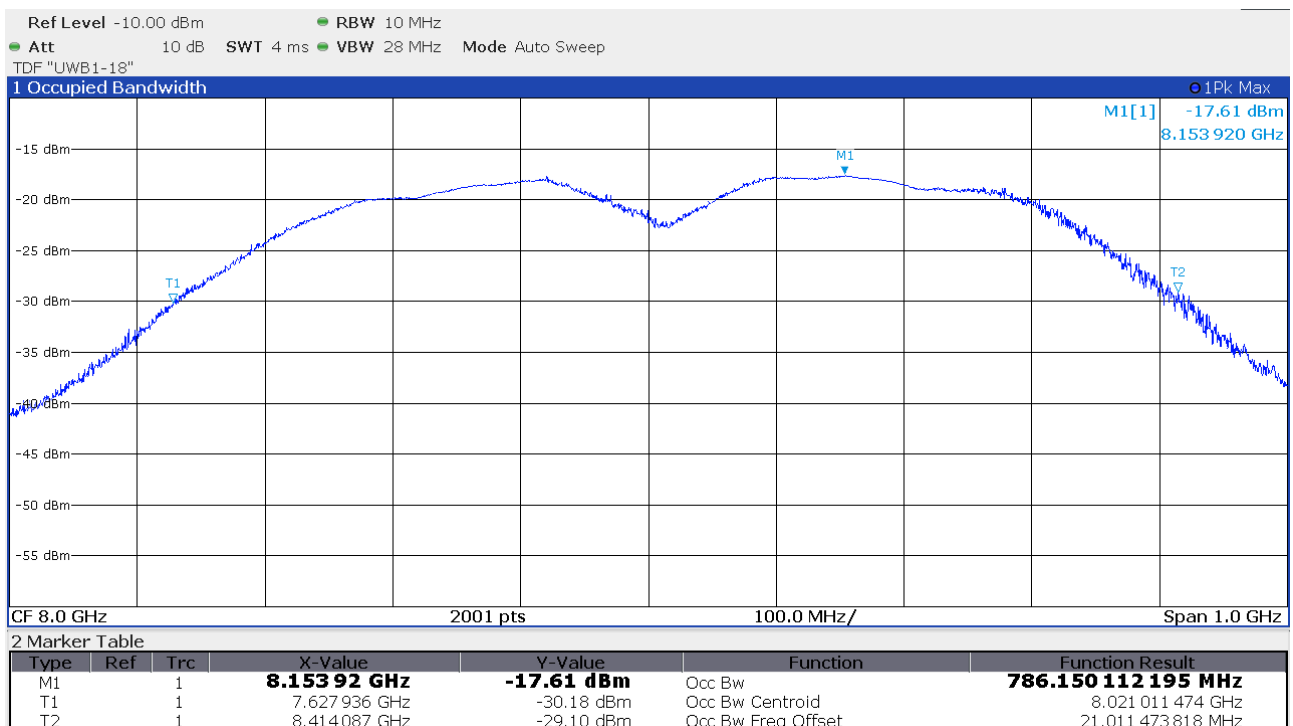
Channel 6



FCC ID: NXIMUPS
IC: 3066A-MUPS
Channel 8

Channel 9


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.

FCC ID: NXIMUPS
IC: 3066A-MUPS
5.2.7 Test protocols OBW
Channel 5

Channel 6


FCC ID: NXIMUPS
IC: 3066A-MUPS
Channel 8

Channel 9


FCC ID: NXIMUPS

IC: 3066A-MUPS

5.3 Radiated Emissions 9 kHz to 40 GHz

For test instruments and accessories used see section 6 Part **SER 1**, **SER 2**, and **SER 3**.

5.3.1 Description of the test location

Test location: Semianechoic chamber SAC2
Test location: Fully anechoic room FAR1

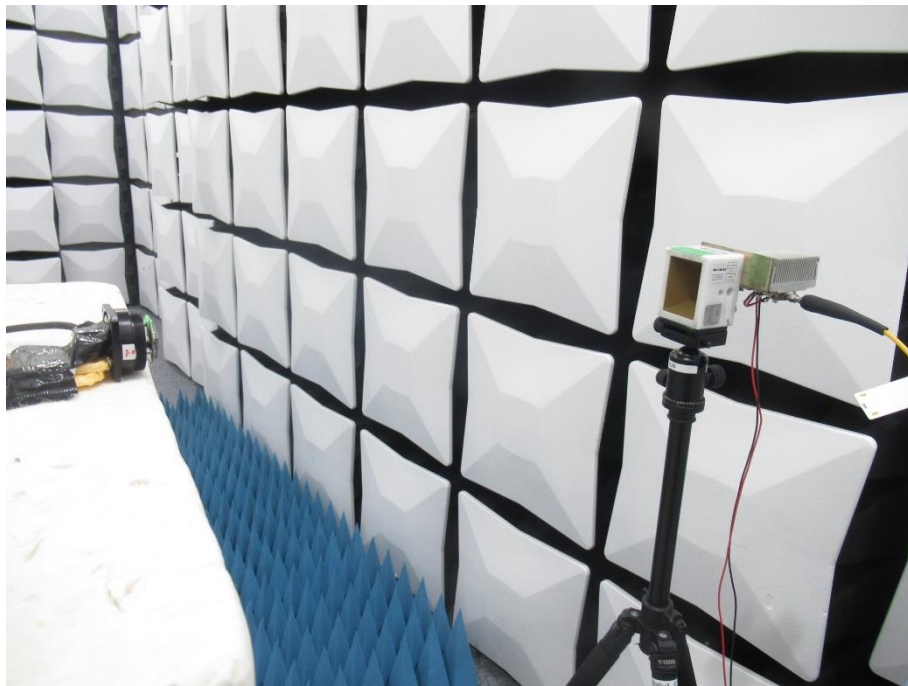
5.3.2 Photo documentation of the test set-up



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.

FCC ID: NXIMUPS

IC: 3066A-MUPS



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.

FCC ID: NXIMUPS
IC: 3066A-MUPS

5.3.3 Applicable standard

According to FCC Part 15, Section 15.517(c):

The radiated emissions at or below 960 MHz from a device operating under the provisions of this section shall not exceed the emission levels in §15.209. The radiated emissions above 960 MHz from a device operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz.

According to FCC Part 15, Section 15.521(c):

Emissions from digital circuitry used to enable the operation of the UWB transmitter shall comply with the limits in § 15.209, rather than the limits specified in this subpart, provided it can be clearly demonstrated that those emissions from the UWB device are due solely to emissions from digital circuitry contained within the transmitter and that the emissions are not intended to be radiated from the transmitter's antenna. Emissions from associated digital devices, as defined in § 15.3(k), e.g., emissions from digital circuitry used to control additional functions or capabilities other than the UWB transmission, are subject to the limits contained in Subpart B of this part.

5.3.4 Description of Measurement

The maximum emission is measured following the procedure set out in ANSI C63-10, item 10.2. The EUT is set in TX continuous mode while measuring.

Analyser settings:

9 kHz – 150 kHz	RBW: 200 Hz			
150 kHz - 30 MHz	RBW: 9 kHz			
30 MHz – 960 MHz	RBW: 120 kHz	Detector: QP		
960 MHz – 40 GHz	RBW: 1 MHz	VBW: 3 MHz	Detector: RMS	Sweep time: 1ms per MHz

for § 15.521(c) additionally:

960 MHz – 40 GHz	RBW: 1 MHz	VBW: 3 MHz	Detector: Peak/Av	Sweep time: 100 ms
------------------	------------	------------	-------------------	--------------------

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.

FCC ID: NXIMUPS
IC: 3066A-MUPS
5.3.5 Test result
5.3.5.1 Measurement 9 kHz to 30 MHz

f (MHz)	Level AV@3m (dBμV)	Ant. factor (dB/m)	Field strength AV@3m dB(μV/m)	Distance corr. 3m to 30m (dB)	Corrected level AV@30m dB(μV/m)	Limit AV@30m dB(μV/m)	Delta (dB)
0.900	-14.4	20.0	5.6	-40.0	-31.4	28.5	-59.9
2.110	-4.5	20.0	15.5	-40.0	-24.5	29.5	-54.0
5.170	-11.0	20.0	9.0	-40.0	-31.0	29.5	-60.5
7.400	-11.9	20.0	8.1	-40.0	-31.9	29.5	-61.8
16.000	-16.7	20.0	3.3	-40.0	-36.7	29.5	-66.2
28.800	-2.7	20.0	17.3	-40.0	-22.7	29.5	-52.2

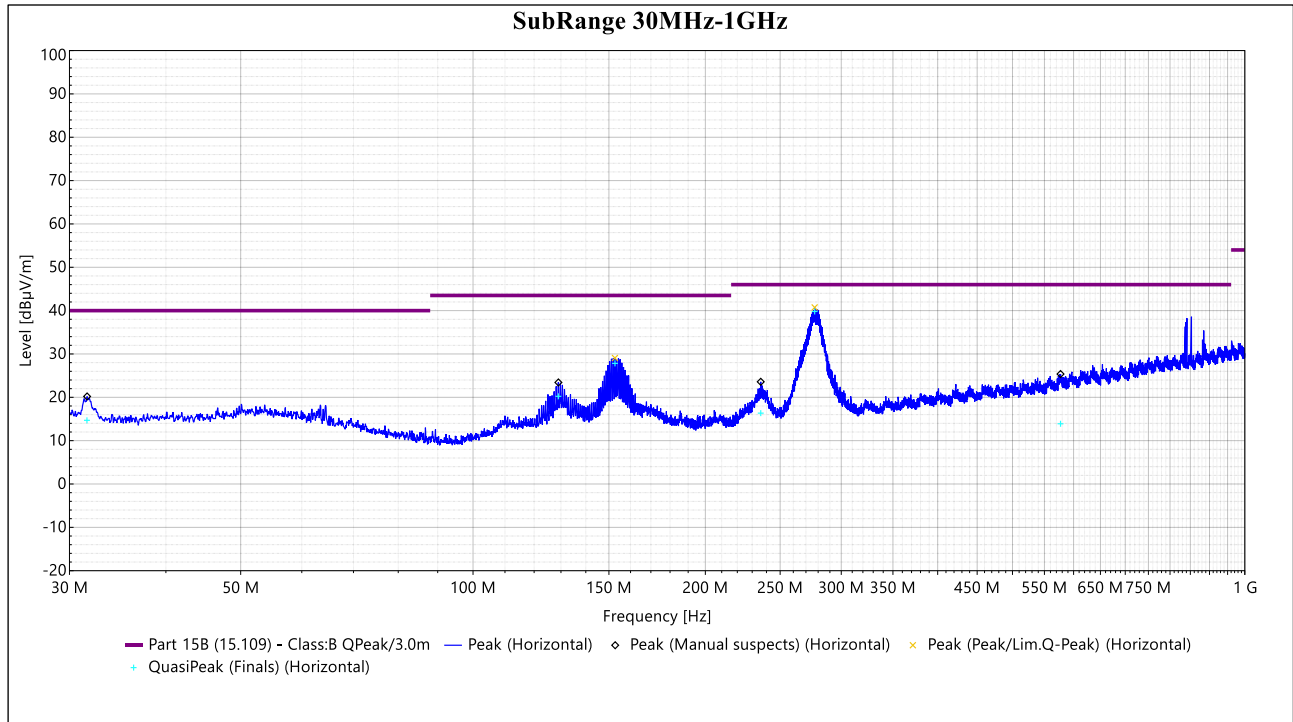
f (MHz)	Level AV@3m (dBμV)	Ant. factor (dB/m)	Field strength AV@3m dB(μA/m)	Distance corr. 3m to 30m (dB)	Corrected level AV@30m dB(μA/m)	Limit AV@30m dB(μA/m)	Delta (dB)
0.900	-14.4	20.0	-45.9	-40.0	-85.9	-23.0	-62.9
2.110	-4.5	20.0	-36.0	-40.0	-76.0	-21.9	-54.1
5.170	-11.0	20.0	-42.5	-40.0	-82.5	-21.9	-60.6
7.400	-11.9	20.0	-43.4	-40.0	-83.4	-21.9	-61.5
16.000	-16.7	20.0	-48.2	-40.0	-88.2	-21.9	-66.3
28.800	-2.7	20.0	-34.2	-40.0	-74.2	-21.9	-52.3

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.

FCC ID: NXIMUPS
IC: 3066A-MUPS

5.3.5.2 Measurement 30 MHz to 960 MHz

horizontal

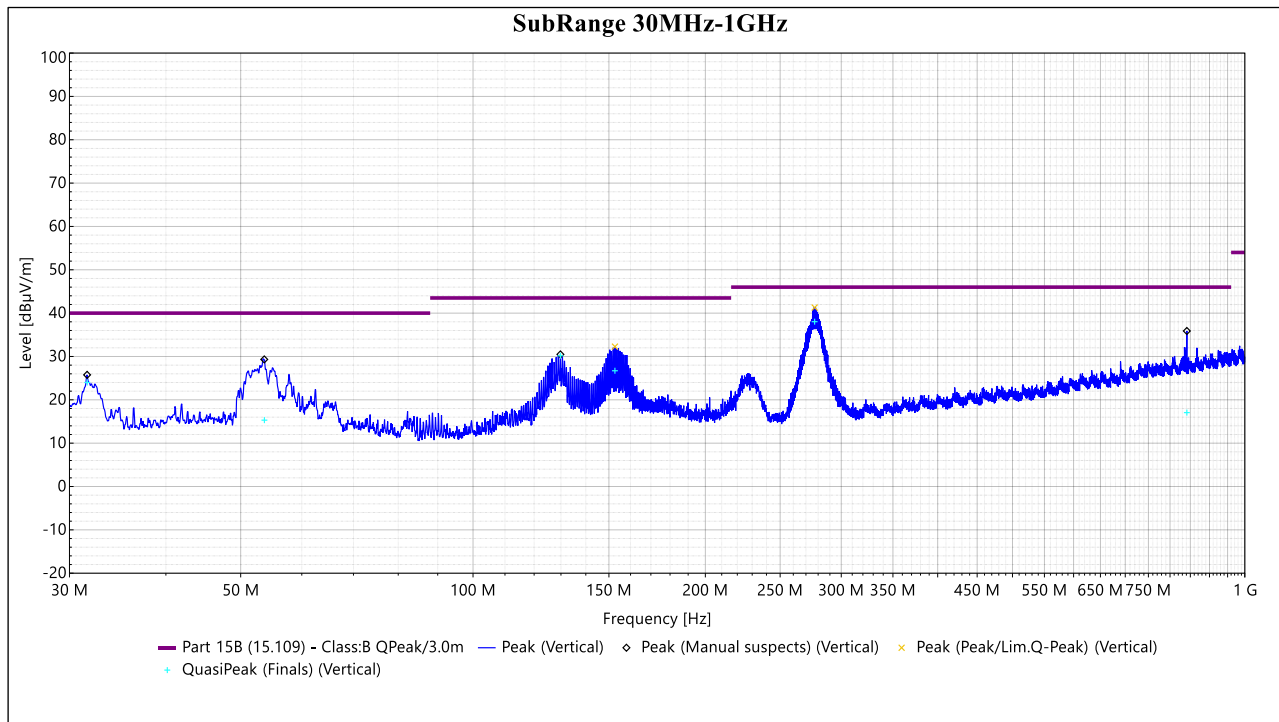


Frequency (Hz)	QuasiPeak (dBμV/m)	QP Margin	QP Limit (dBμV/m)	angle	height	polarization	RBW (Hz)	Meas.Time (s)	Correction (dB)
31.6064577 M	14.687	-25.313	40	2	1.26	Horizontal	120000	0.01	-11.139
129.0004132 M	20.227	-23.273	43.5	158	1.55	Horizontal	120000	0.01	-11.443
152.7376423 M	27.825	-15.675	43.5	92	2.15	Horizontal	120000	0.01	-9.864
235.9505257 M	16.354	-29.646	46	82	2.02	Horizontal	120000	0.01	-11.274
277.118437 M	39.807	-6.193	46	284	1.17	Horizontal	120000	0.01	-9.853
577.0813038 M	13.897	-32.103	46	115	1.5	Horizontal	120000	0.01	-2.281

FCC ID: NXIMUPS

IC: 3066A-MUPS

horizontal

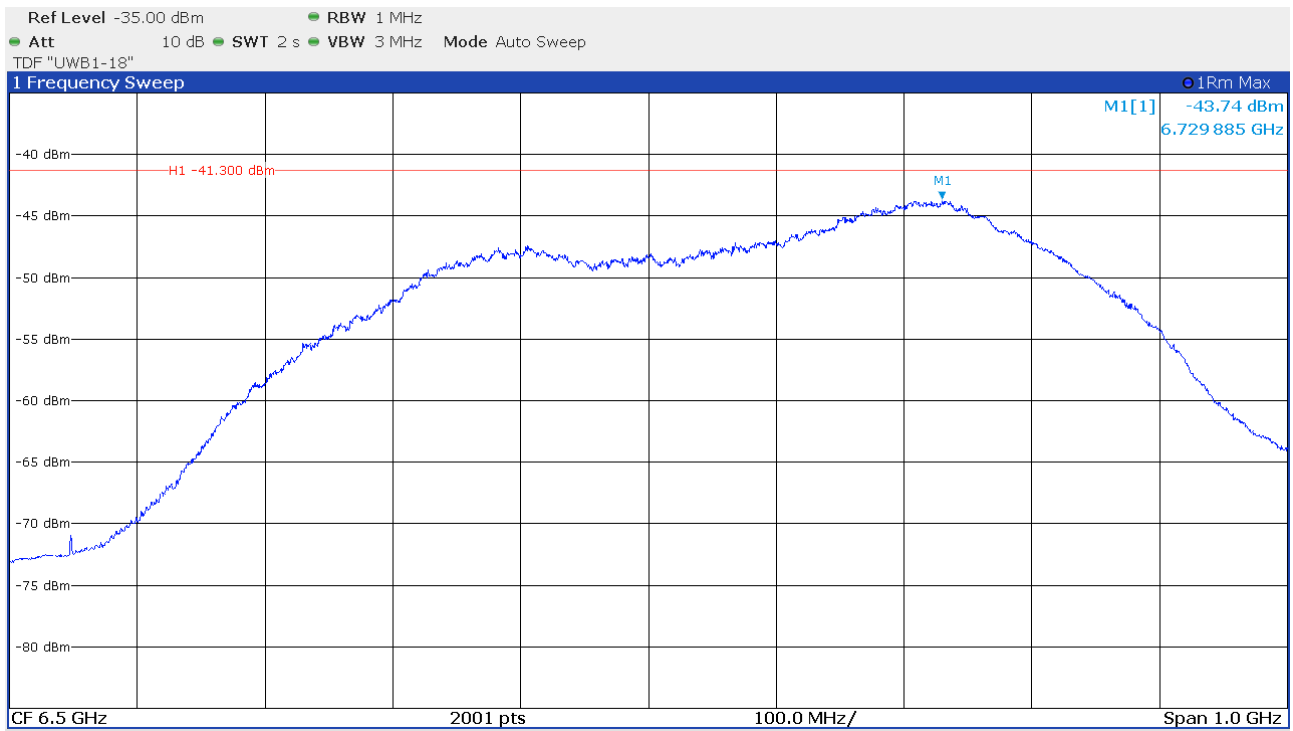
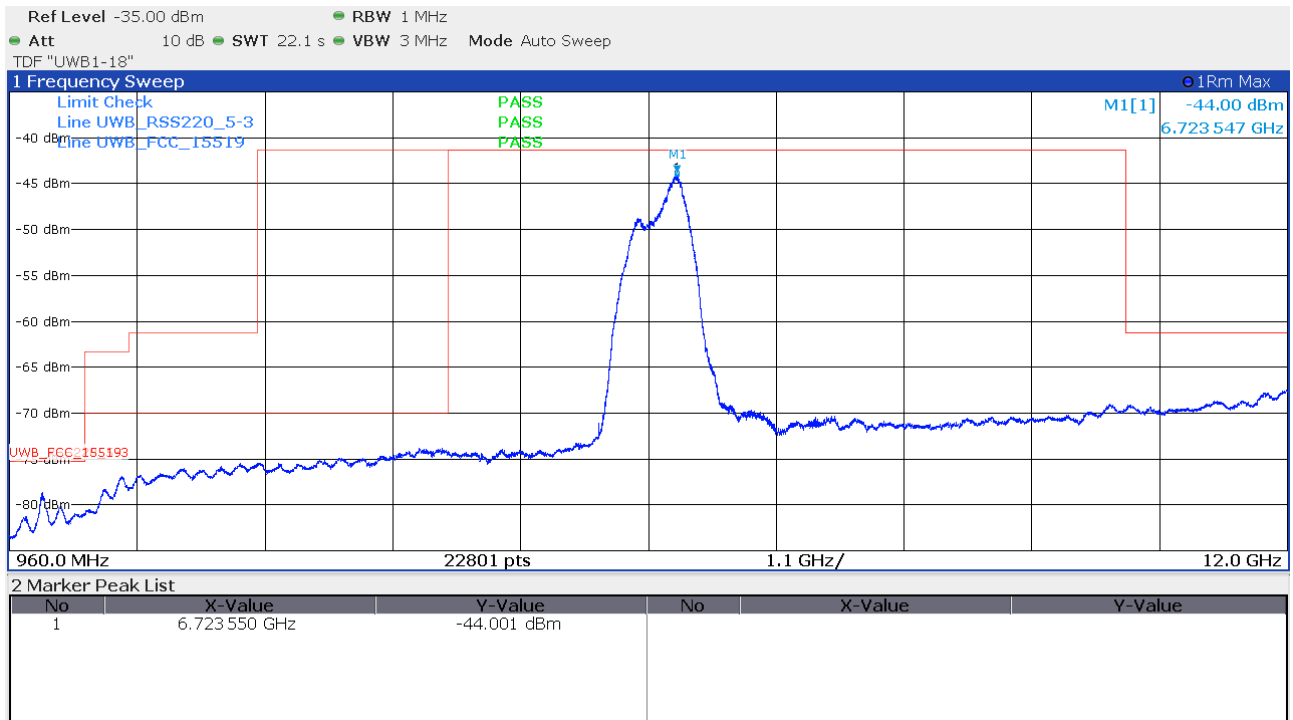


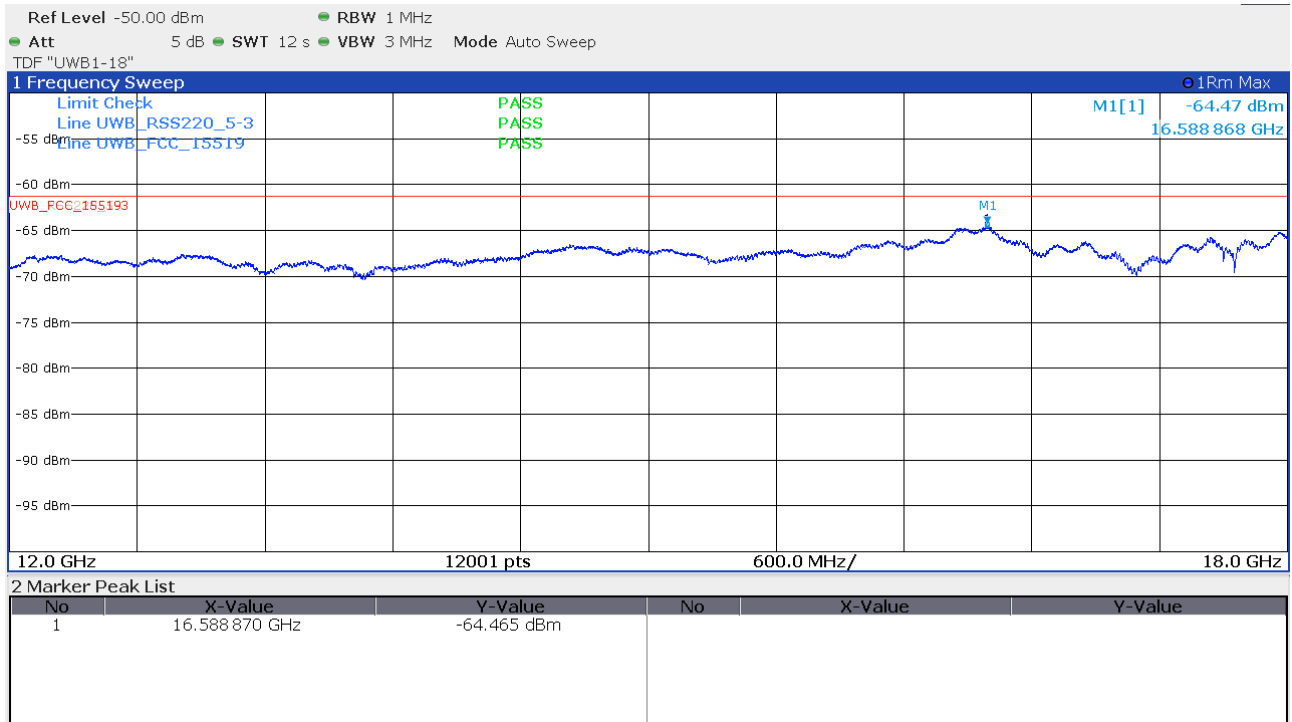
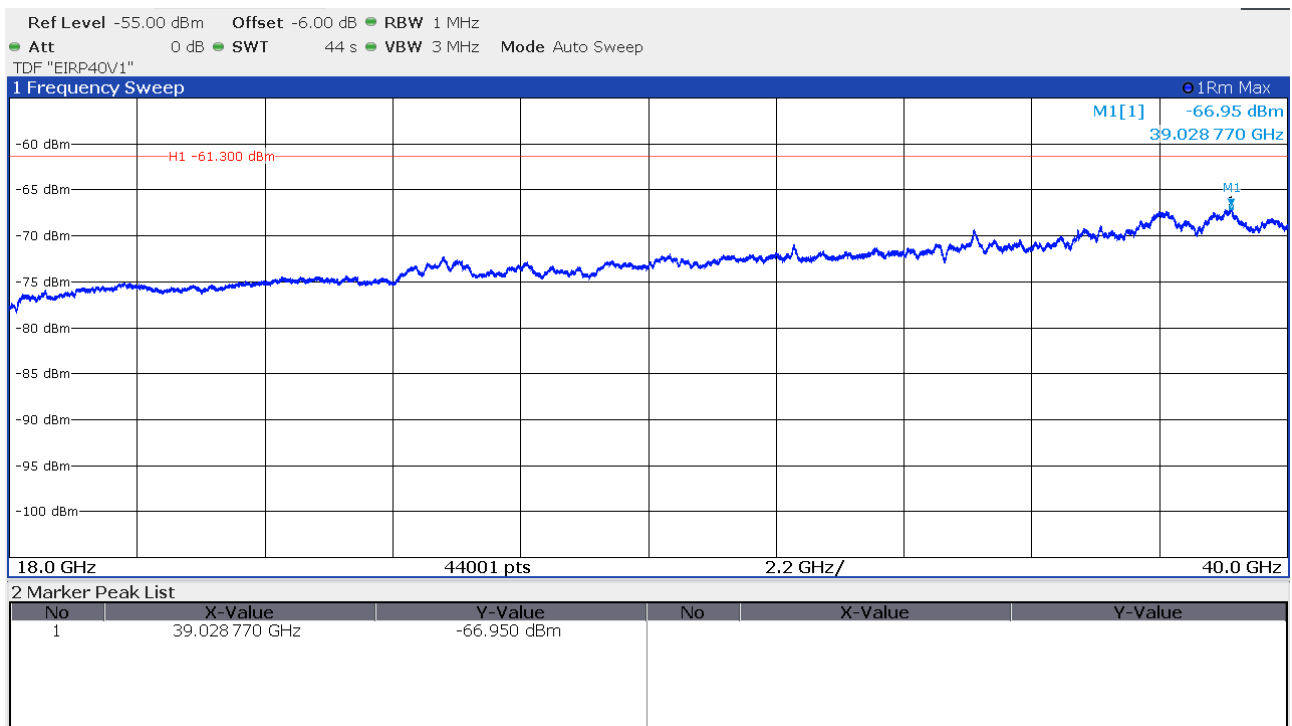
Frequency (Hz)	QuasiPeak (dBμV/m)	QP Margin	QP Limit (dBμV/m)	angle	height	polarization	RBW (Hz)	Meas.Time (s)	Correction (dB)
31.6318876 M	24.004	-15.996	40	126	1.31	Vertical	120000	0.01	-13.074
53.6674293 M	15.307	-24.693	40	357	1.4	Vertical	120000	0.01	-11.002
129.7995146 M	30.166	-13.334	43.5	194	1.02	Vertical	120000	0.01	-10.85
152.7037285 M	26.715	-16.785	43.5	24	1.02	Vertical	120000	0.01	-9.046
277.0855934 M	38.026	-7.974	46	13	1.02	Vertical	120000	0.01	-10.052
841.245452 M	17.05	-28.95	46	270	1.88	Vertical	120000	0.01	1.421

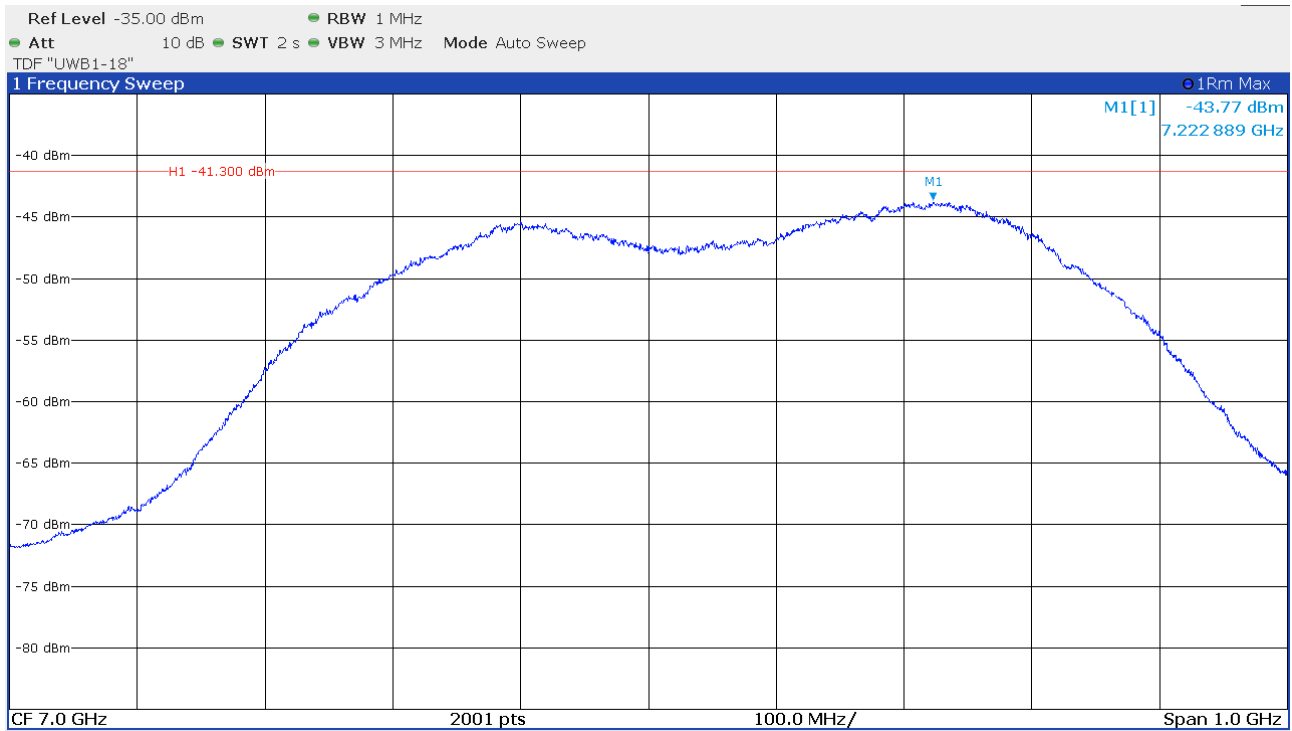
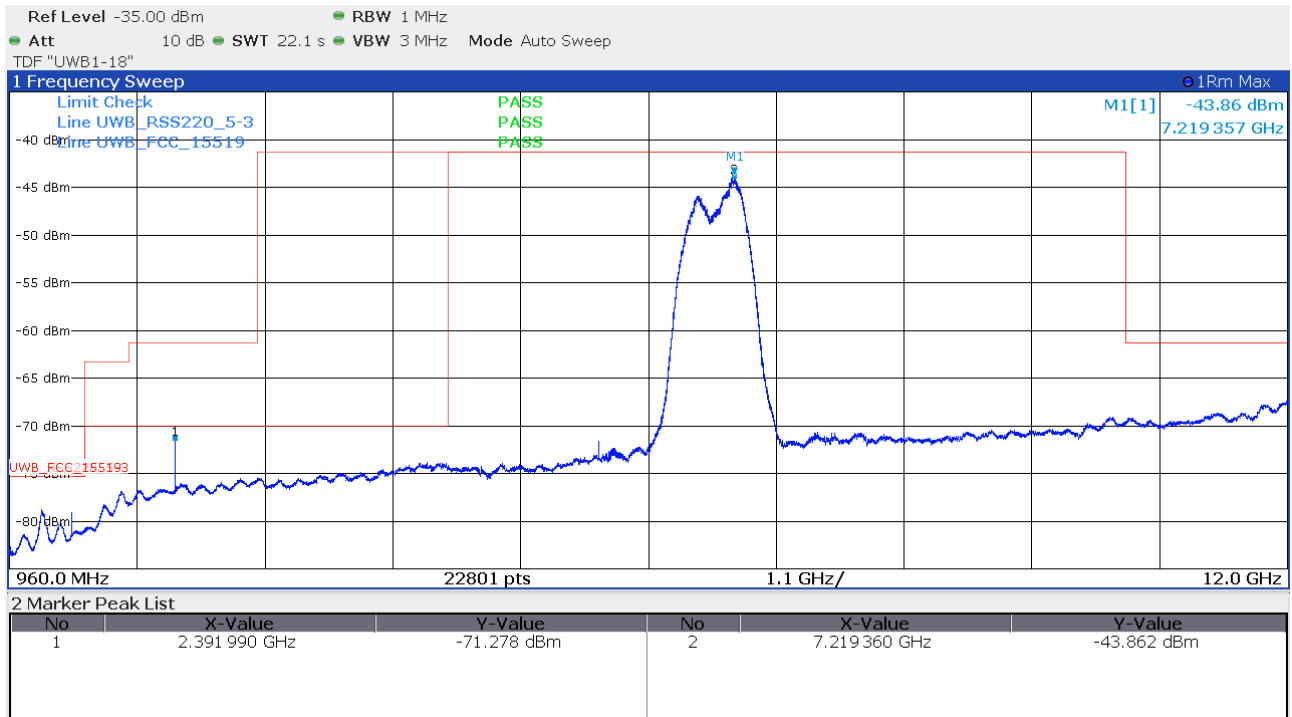
5.3.5.3 Measurement 960 MHz to 40 GHz

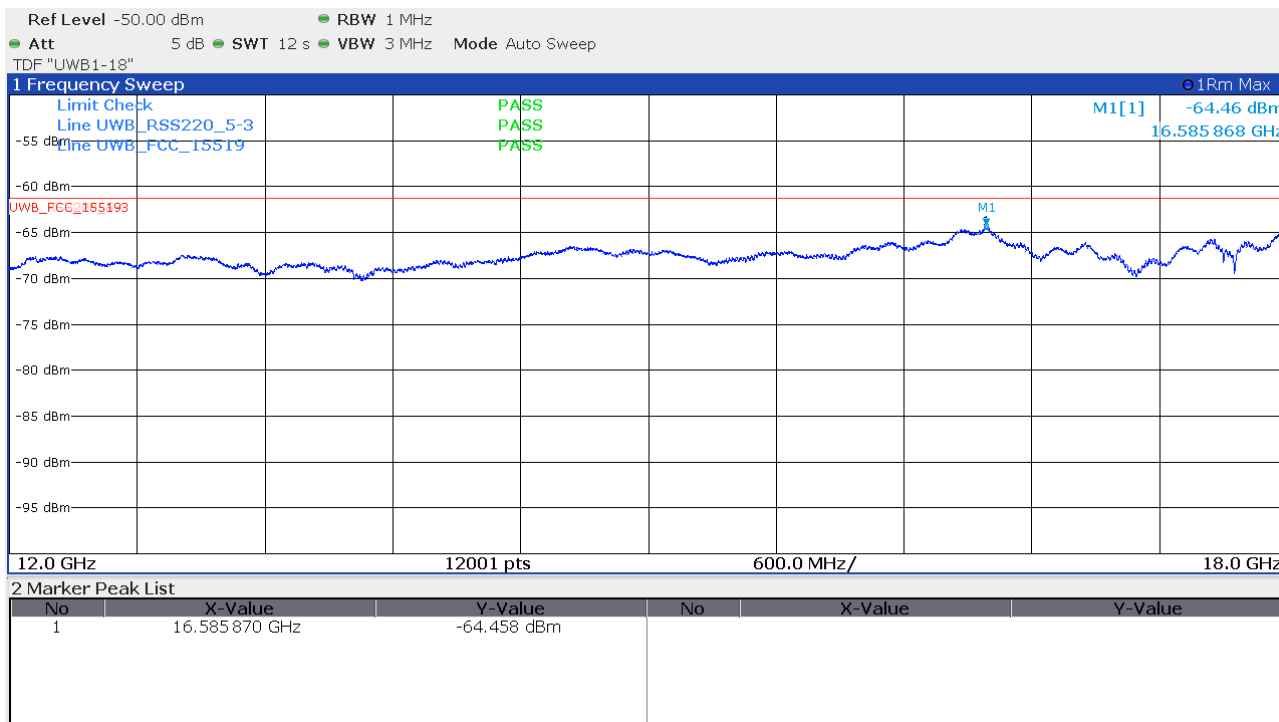
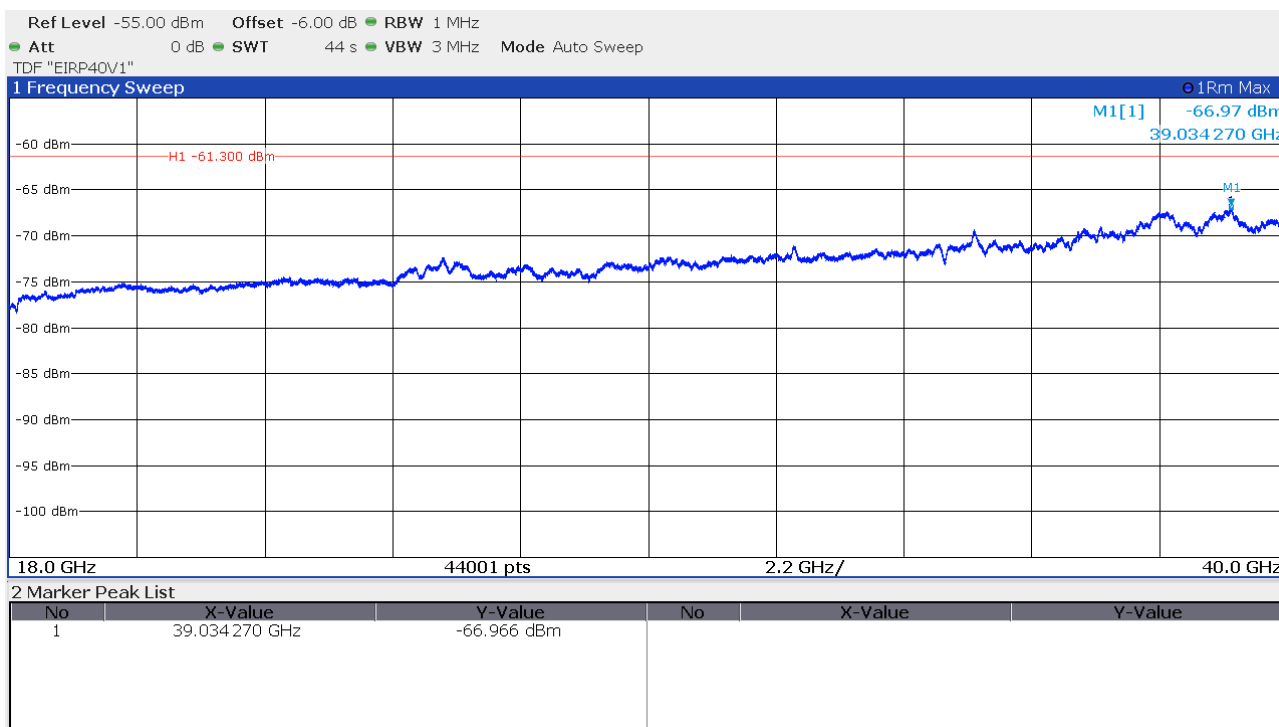
According to § 15.521(c), missions from digital circuitry used to enable the operation of the UWB transmitter shall comply with the limits in § 15.209. The average limit is given by 54 dBμV/m at 3 meter distance, which corresponds to an EIRP of -41.3 dBm according to ANSI C63.10 2013 clause 10.3.9.

As proven in the following measurements, no emissions outside the UWB transmission can be detected in the frequency range 960 MHz and 40 GHz and the highest emissions occurs by the UWB emission itself, which lies under the UWB limit of -41.3 dBm. Therefore, the requirements according to § 15.209 can be regarded as fulfilled.

FCC ID: NXIMUPS
IC: 3066A-MUPS
Channel 5
Mean Power

960 MHz to 18 GHz


FCC ID: NXIMUPS
IC: 3066A-MUPS

18 GHz to 40 GHz


FCC ID: NXIMUPS
IC: 3066A-MUPS
Channel 6
Mean Power

960 MHz to 18 GHz


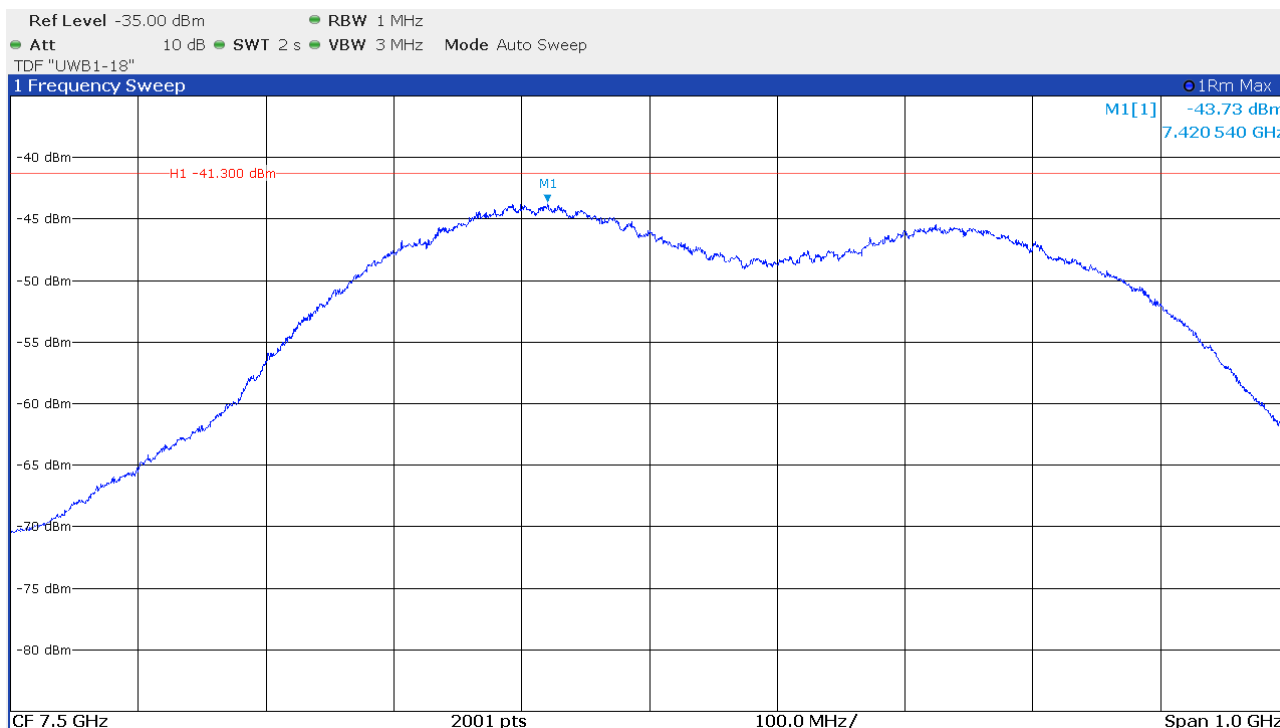
FCC ID: NXIMUPS
IC: 3066A-MUPS

18 GHz to 40 GHz


FCC ID: NXIMUPS

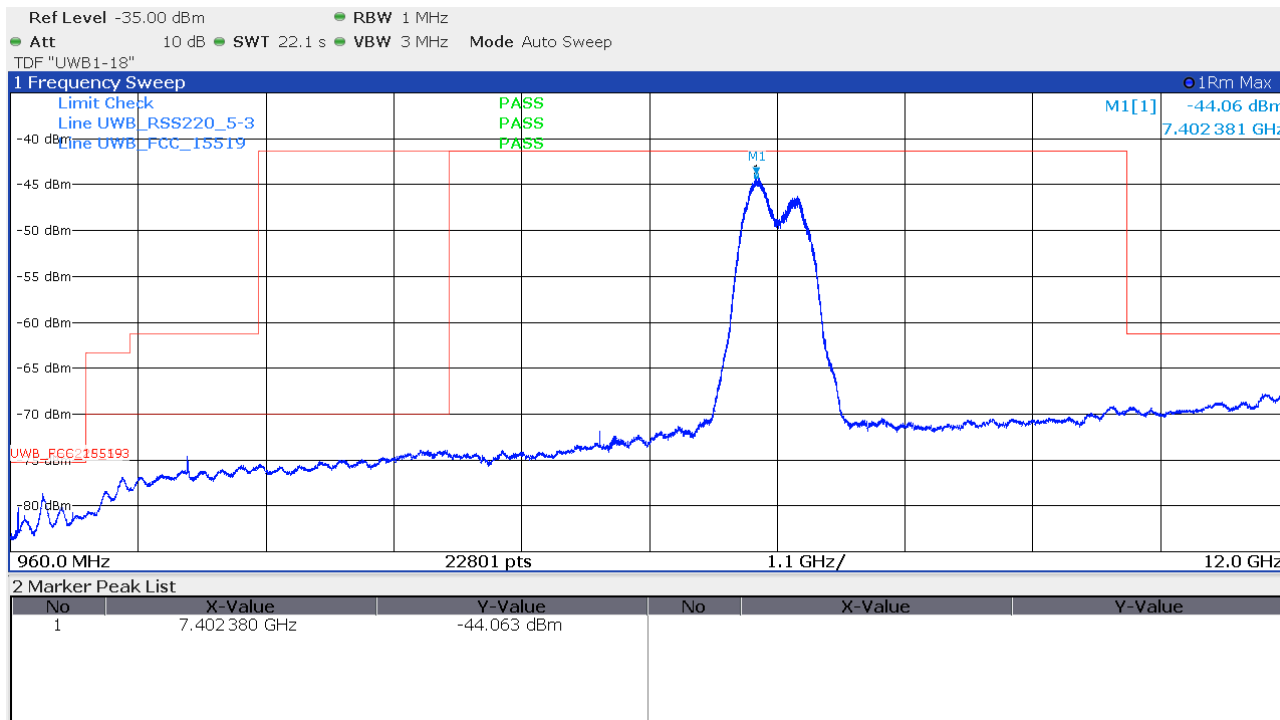
IC: 3066A-MUPS

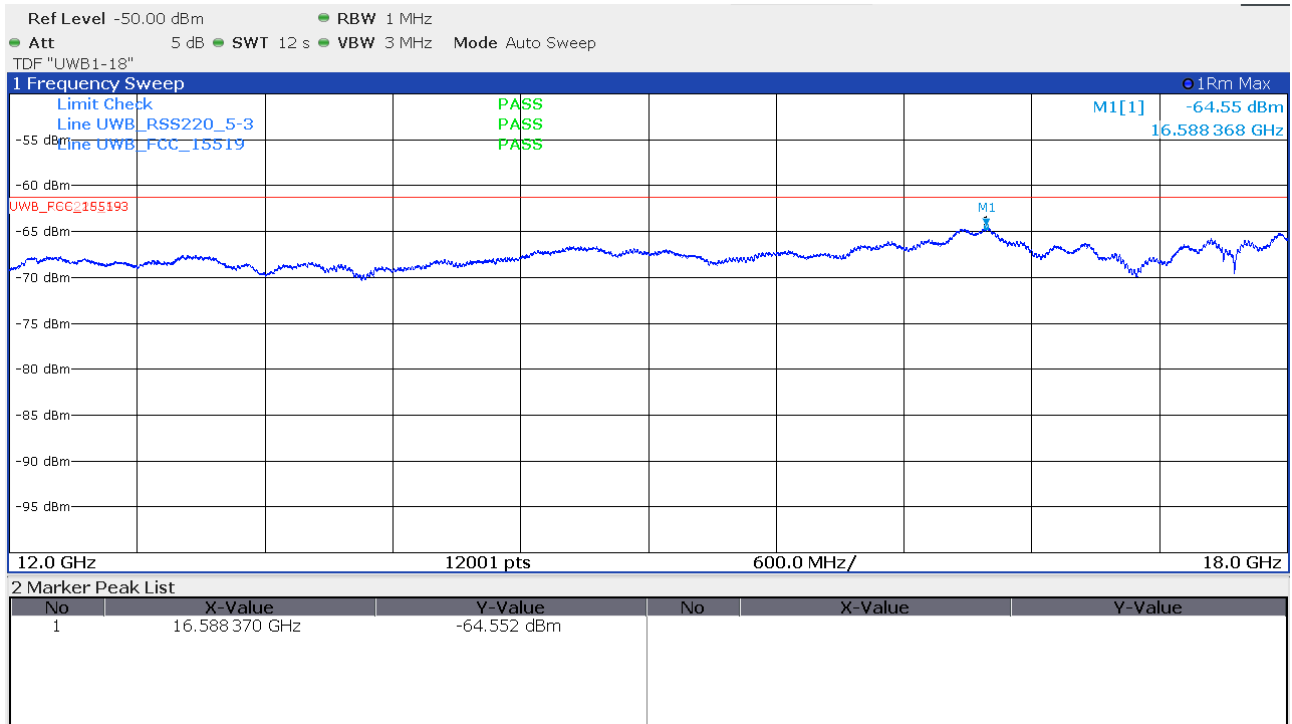
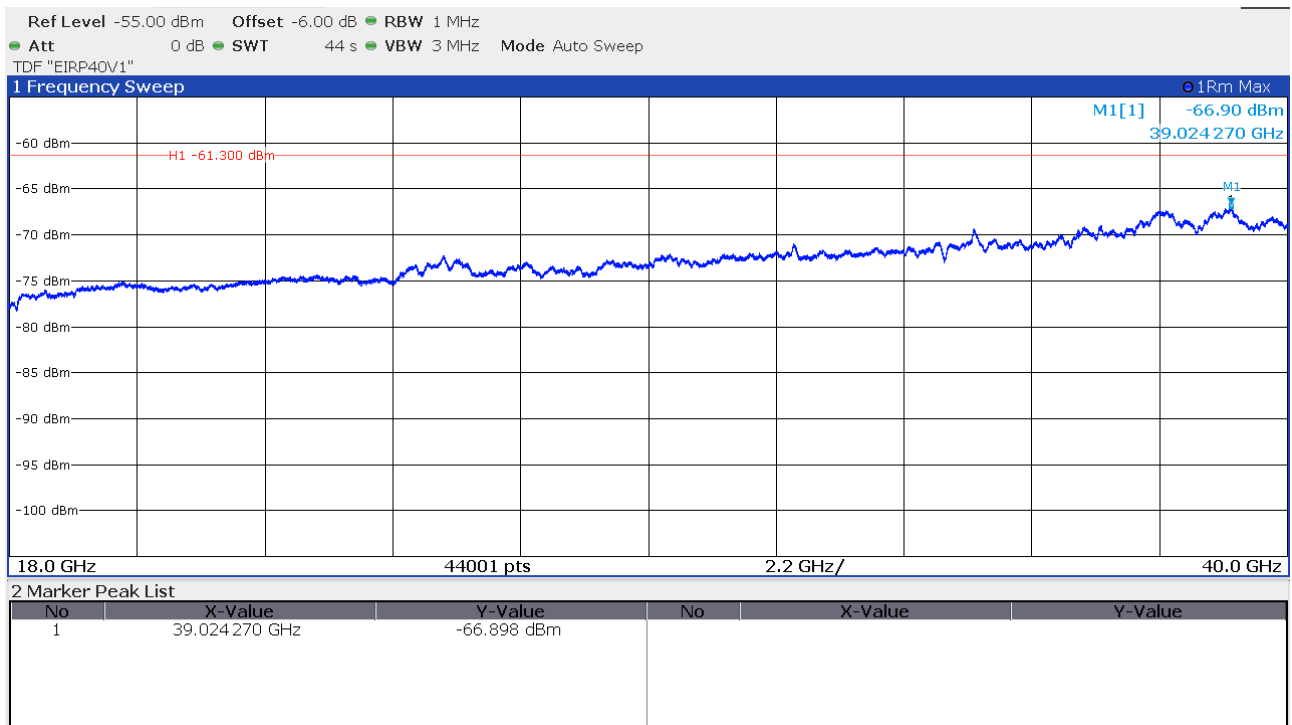
Channel 8

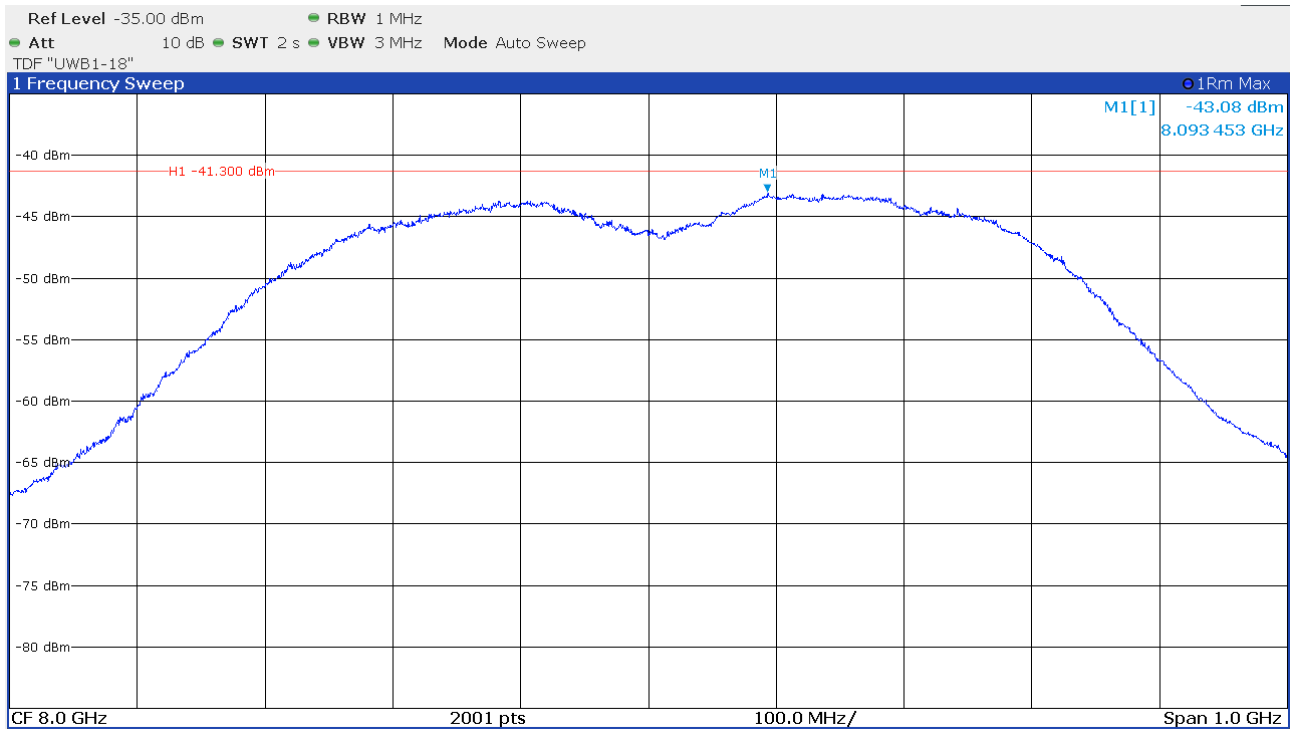
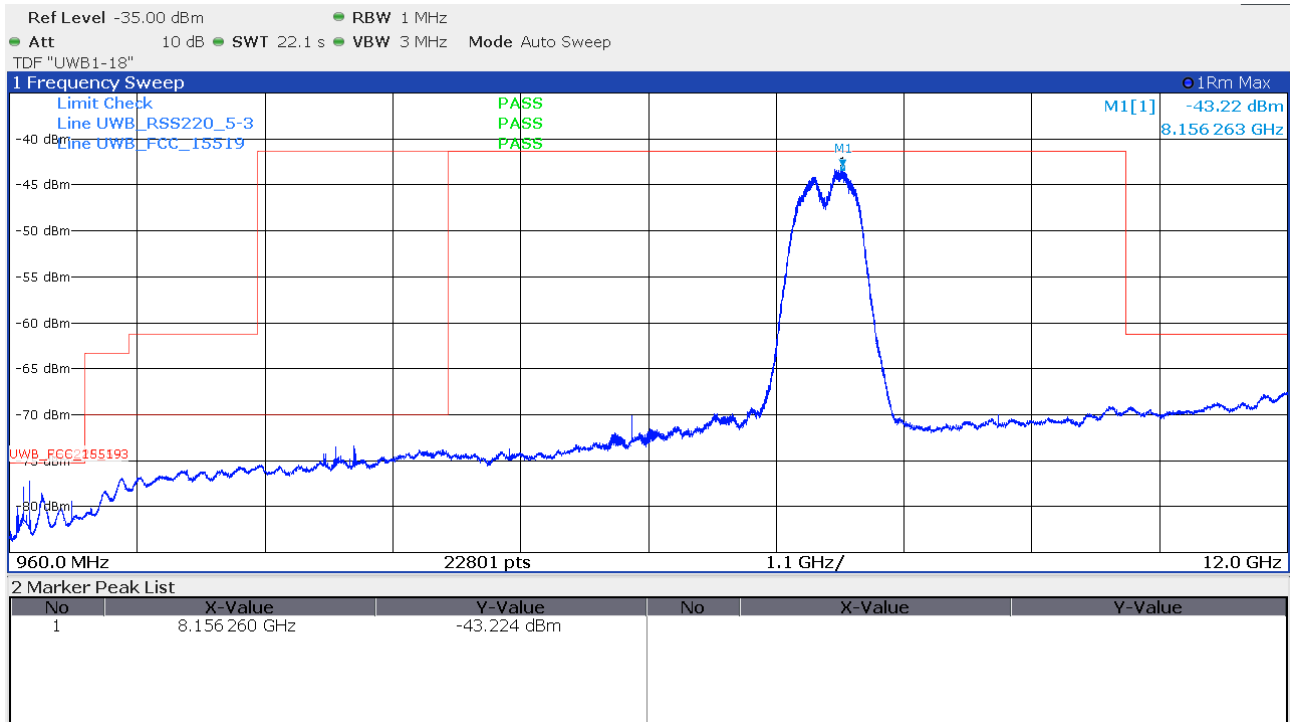
Mean Power

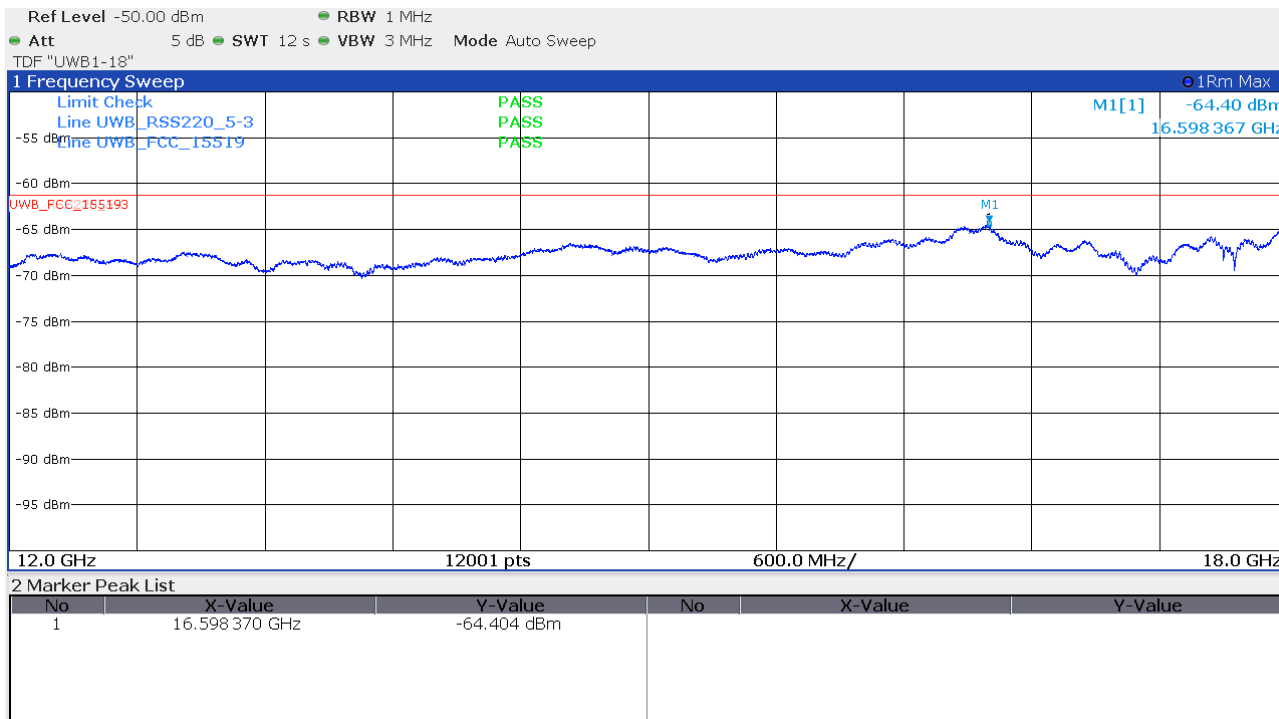


960 MHz to 18 GHz

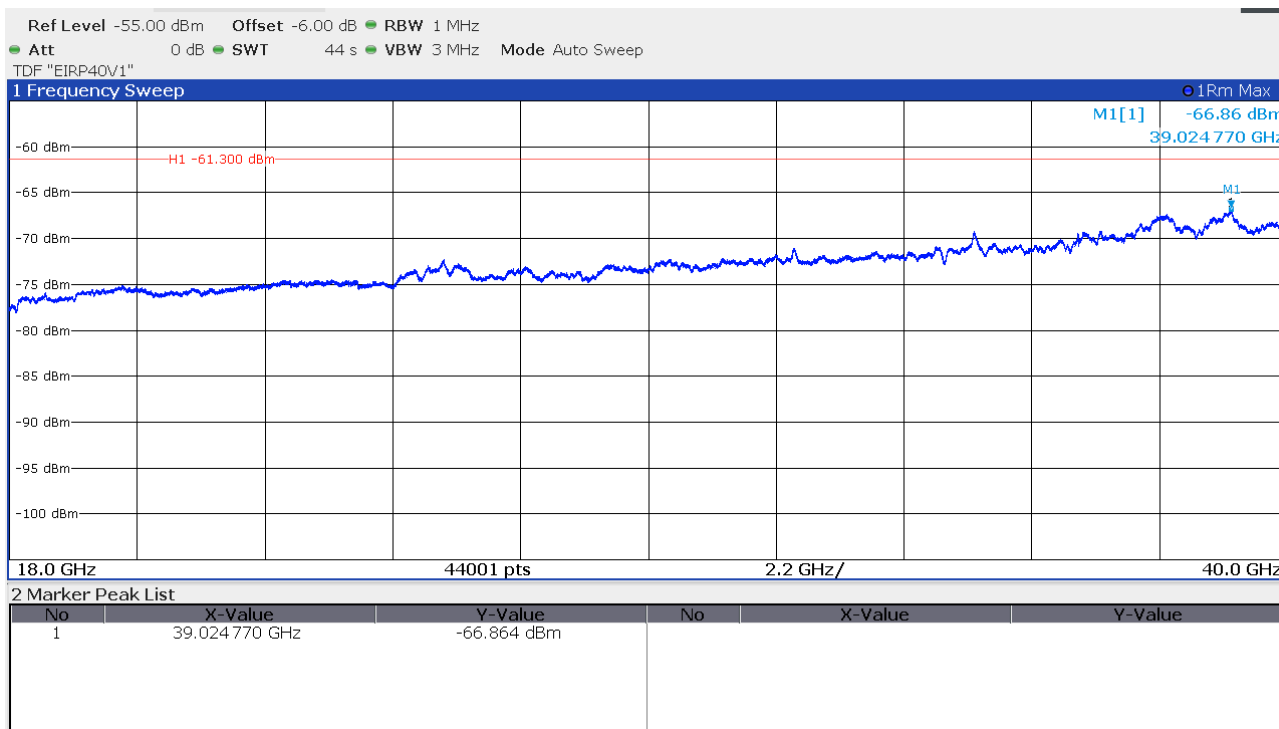


FCC ID: NXIMUPS
IC: 3066A-MUPS

18 GHz to 40 GHz


FCC ID: NXIMUPS
IC: 3066A-MUPS
Channel 9
Mean Power

960 MHz to 18 GHz


FCC ID: NXIMUPS
IC: 3066A-MUPS


18 GHz to 40 GHz



FCC ID: NXIMUPS
IC: 3066A-MUPS
Limits:

Limit according §15.209(a) in the frequency range 9 kHz 960 MHz:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

Limit according §15.517(c) in the frequency range 960 MHz to 40 GHz:

Frequency in MHz	EIRP in dBm
960-1610	-75.3
1610-1990	-53.3
1990-3100	-51.3
3100-10600	-41.3
Above 10600	-51.3

Limit according RSS-220 5.2.1 (d) in the frequency range 960 MHz to 40 GHz:

Frequency in MHz	EIRP in dBm
960-1610	-75.3
1610-4750	-70.0
4750-10600	-41.3
Above 10600	-51.3

The requirements are **FULFILLED**.

Remarks: The tighter limits of the ruleparts FCC 15.519 and RSS-220 5.3 for hand-held devices are visible
in the plots. The device also complies for indoor regulations 15.517 and RSS-220 5.2.

FCC ID: NXIMUPS

IC: 3066A-MUPS

5.4 Radiated Emissions at 1164-1240 MHz and 1559-1610 MHz

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

5.4.1 Description of the test location

Test location: Fully anechoic room FAR1

5.4.2 Photo documentation of the test set-up



5.4.3 Applicable standard

According to FCC Part 15, Section 15.517(d):

In addition to the radiated emission limits specified in the table in paragraph (c) of this section, UWB transmitters operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of no less than 1 kHz.

5.4.4 Description of Measurement

The spectral line is measured following the procedure set out in ANSI C63-10, item 10.3.10. The EUT is set in TX continuous mode while measuring.

Analyser settings:

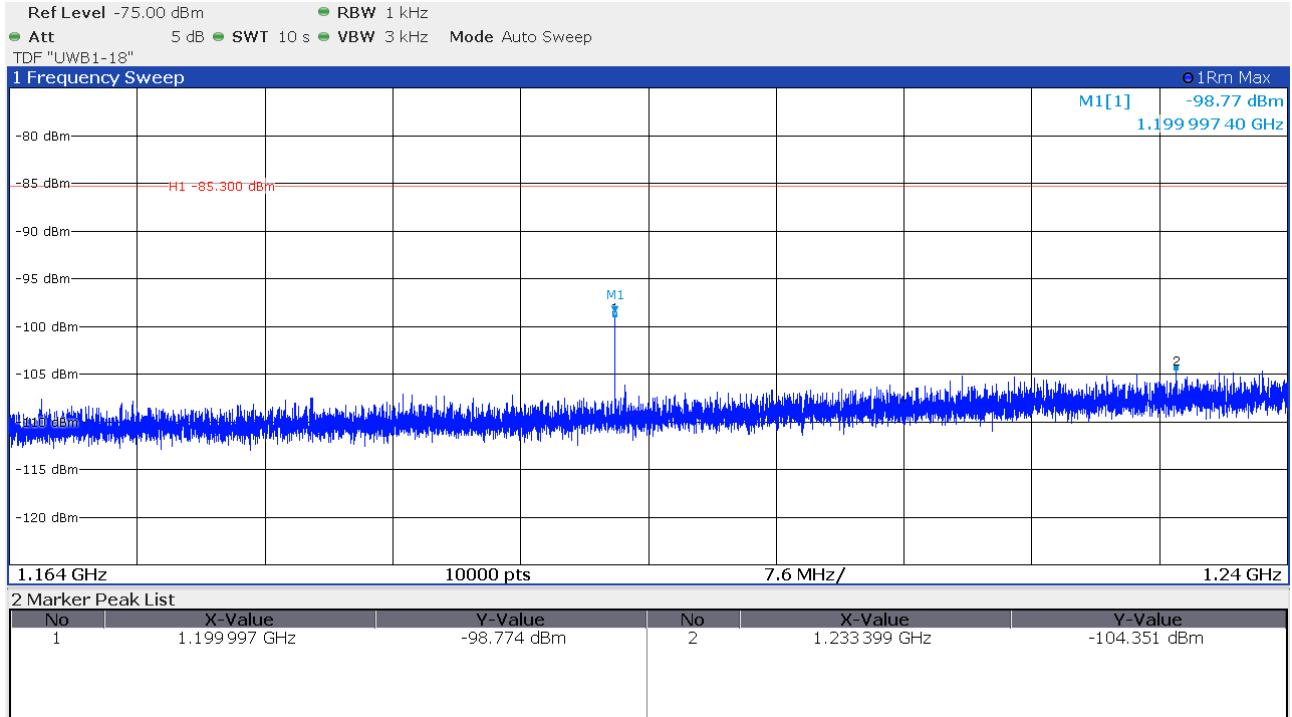
RBW: 1 kHz, VBW: 3 kHz, Detector: RMS, Sweep time: 1 ms/1kHz,

FCC ID: NXIMUPS
IC: 3066A-MUPS

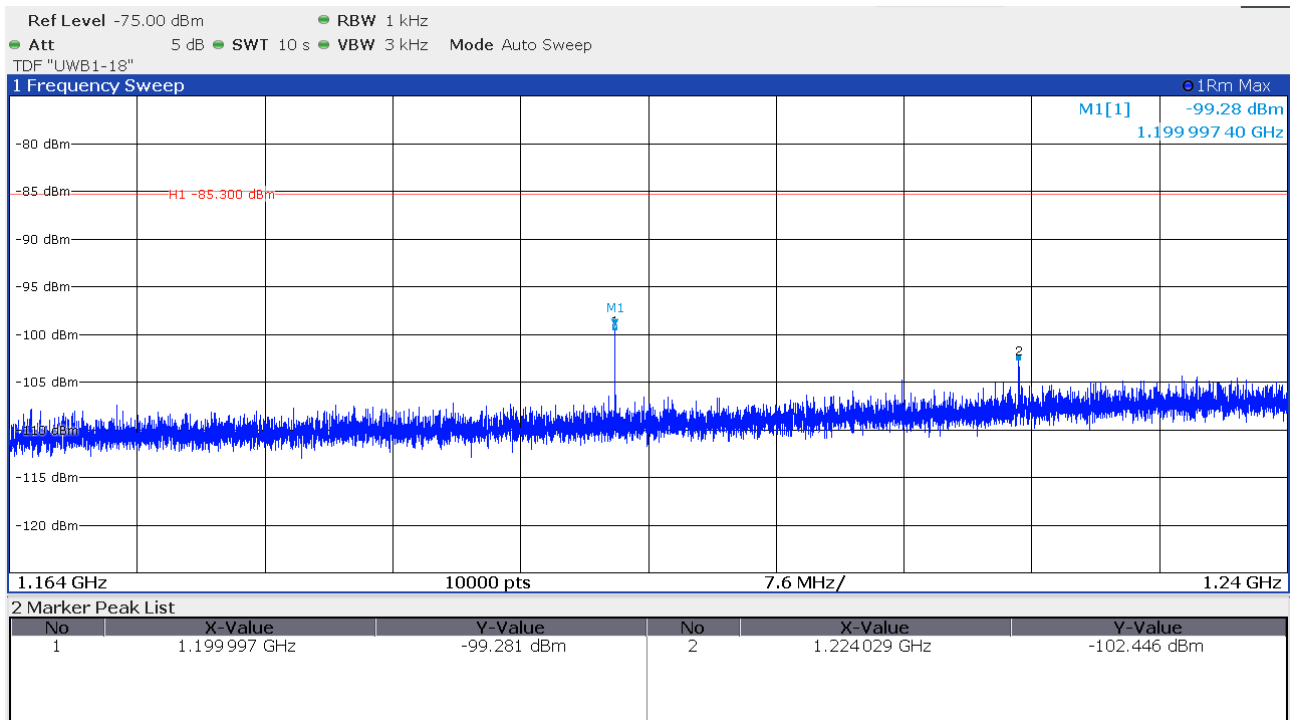
5.4.5 Test result

Channel 5

1164 MHz to 1240 MHz horizontal

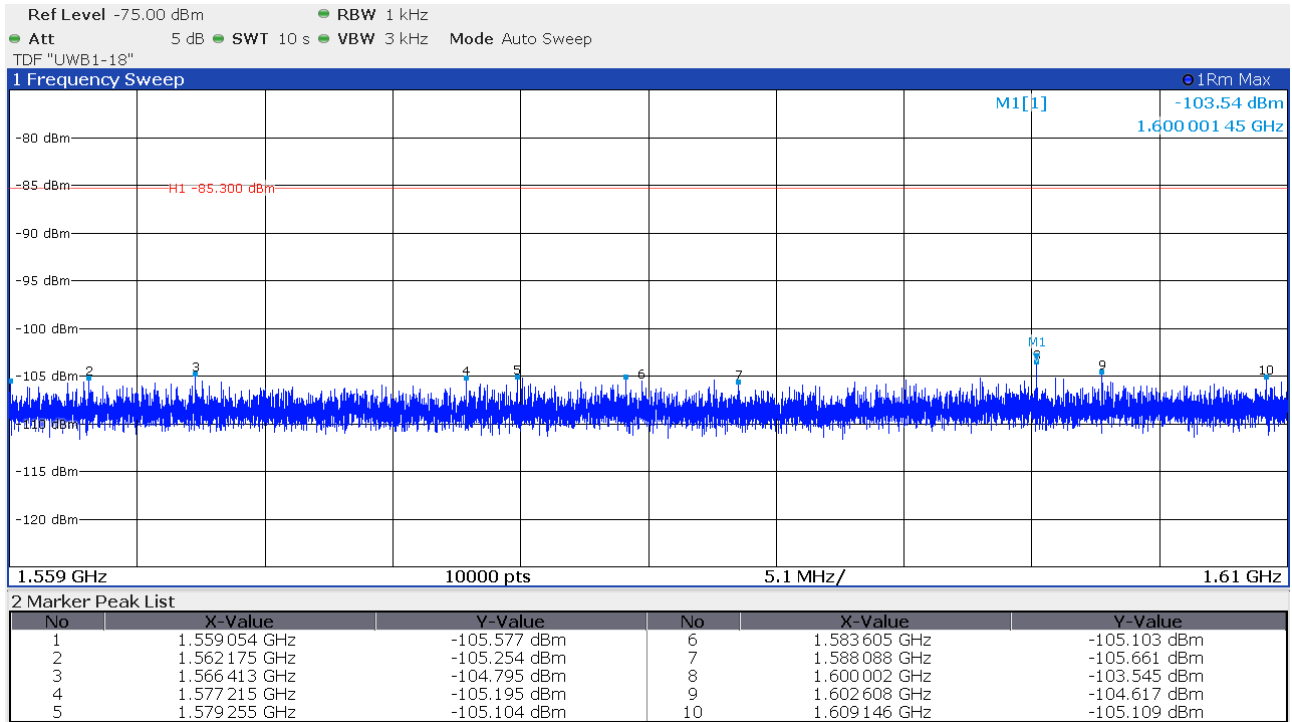


1164 MHz to 1240 MHz vertical

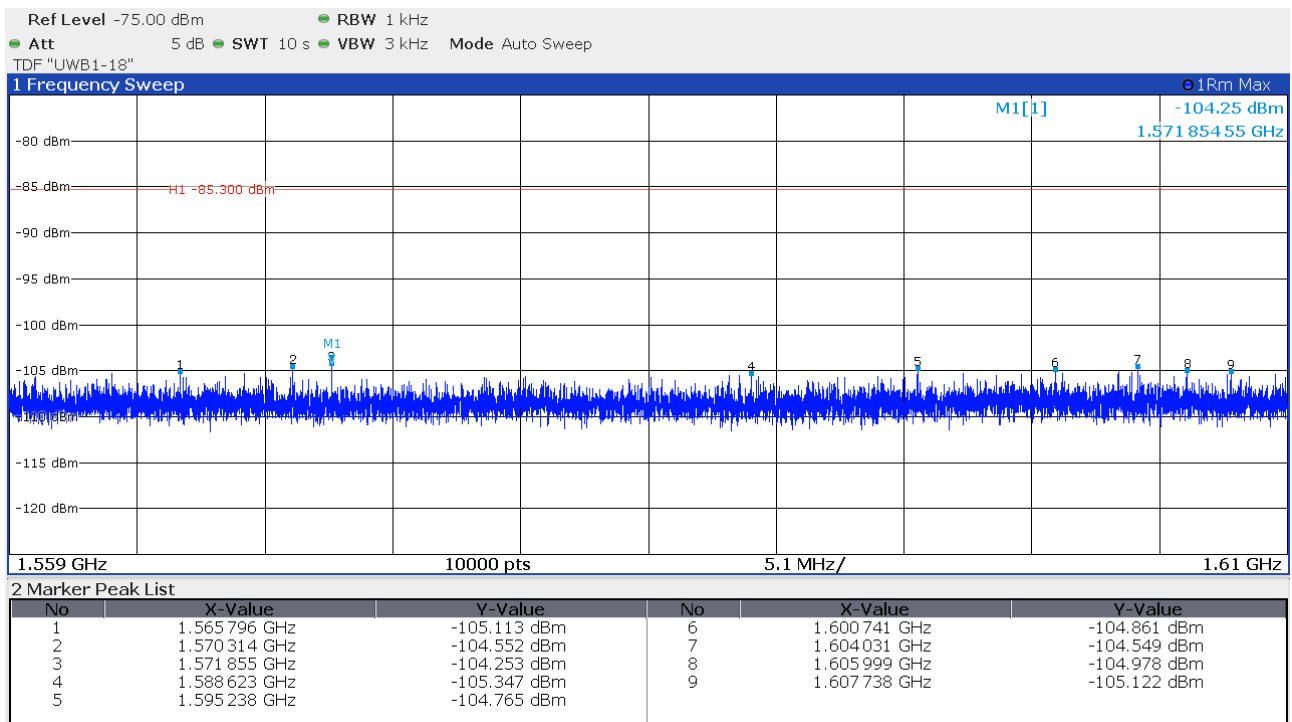


FCC ID: NXIMUPS
IC: 3066A-MUPS

1559 MHz to 1610 MHz horizontal

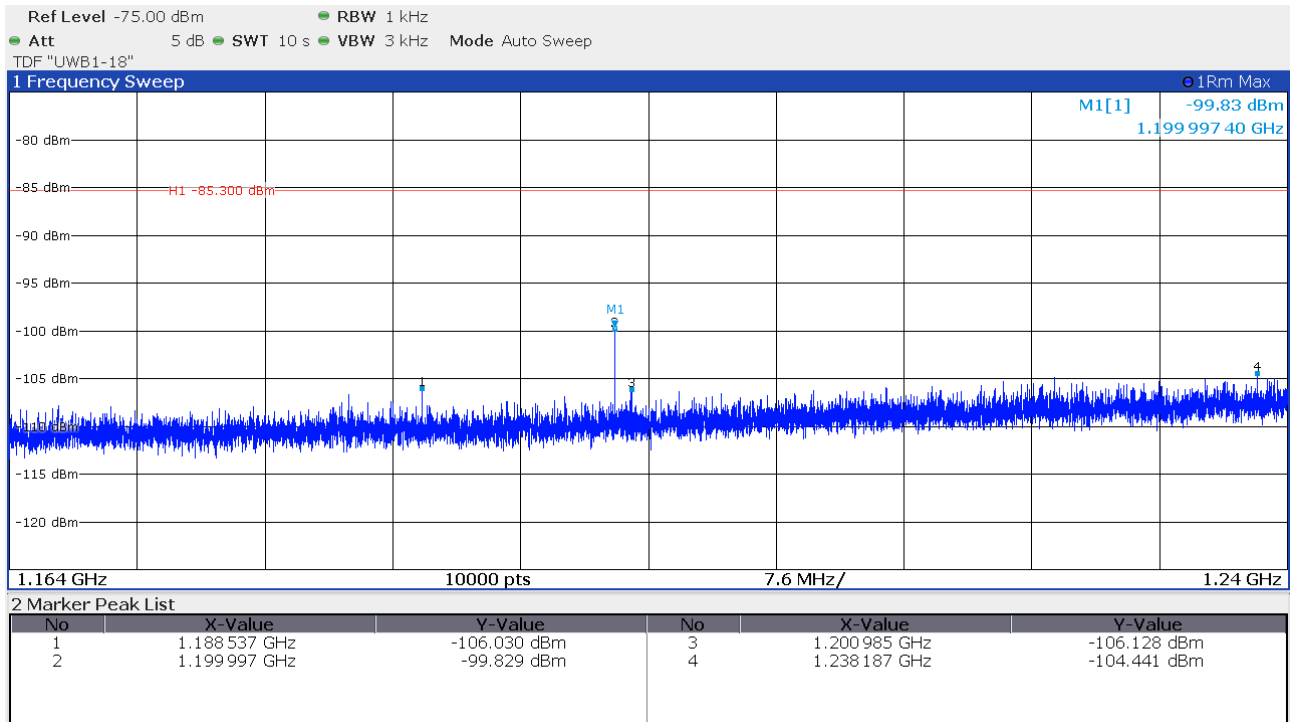


1559 MHz to 1610 MHz vertical

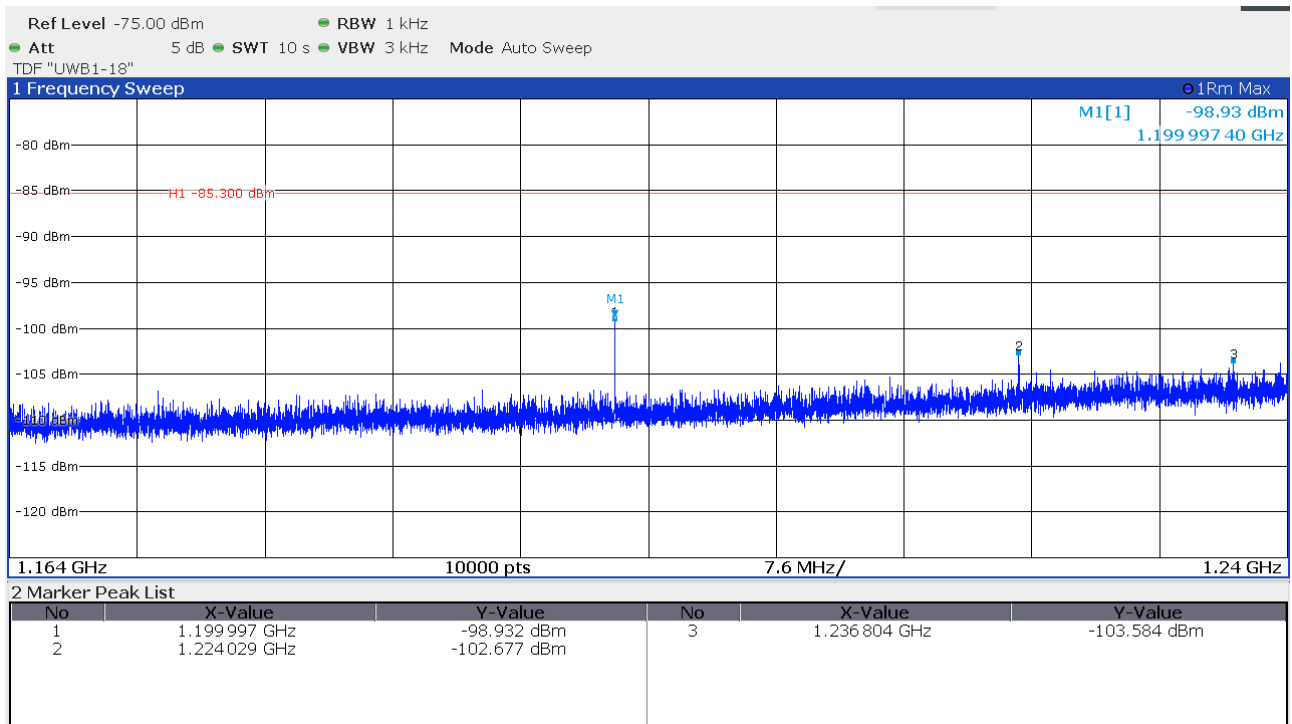


FCC ID: NXIMUPS
IC: 3066A-MUPS
Channel 6

1164 MHz to 1240 MHz horizontal

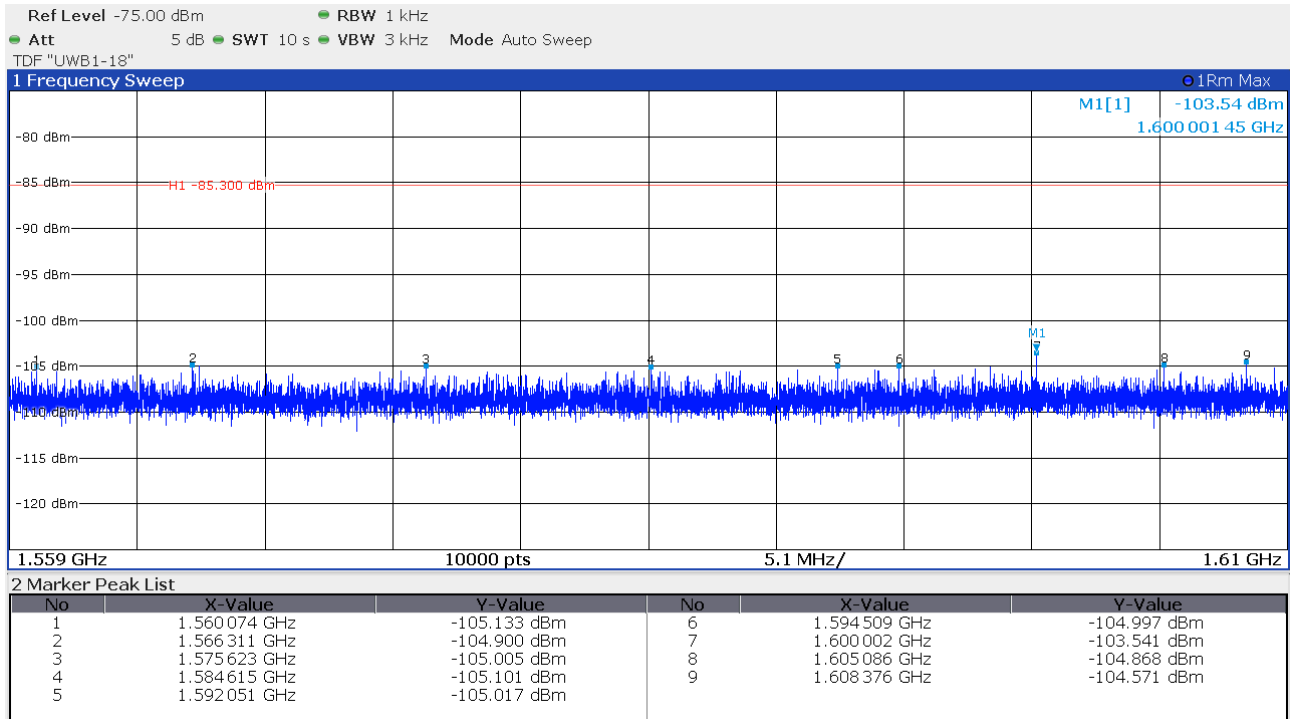


1164 MHz to 1240 MHz vertical

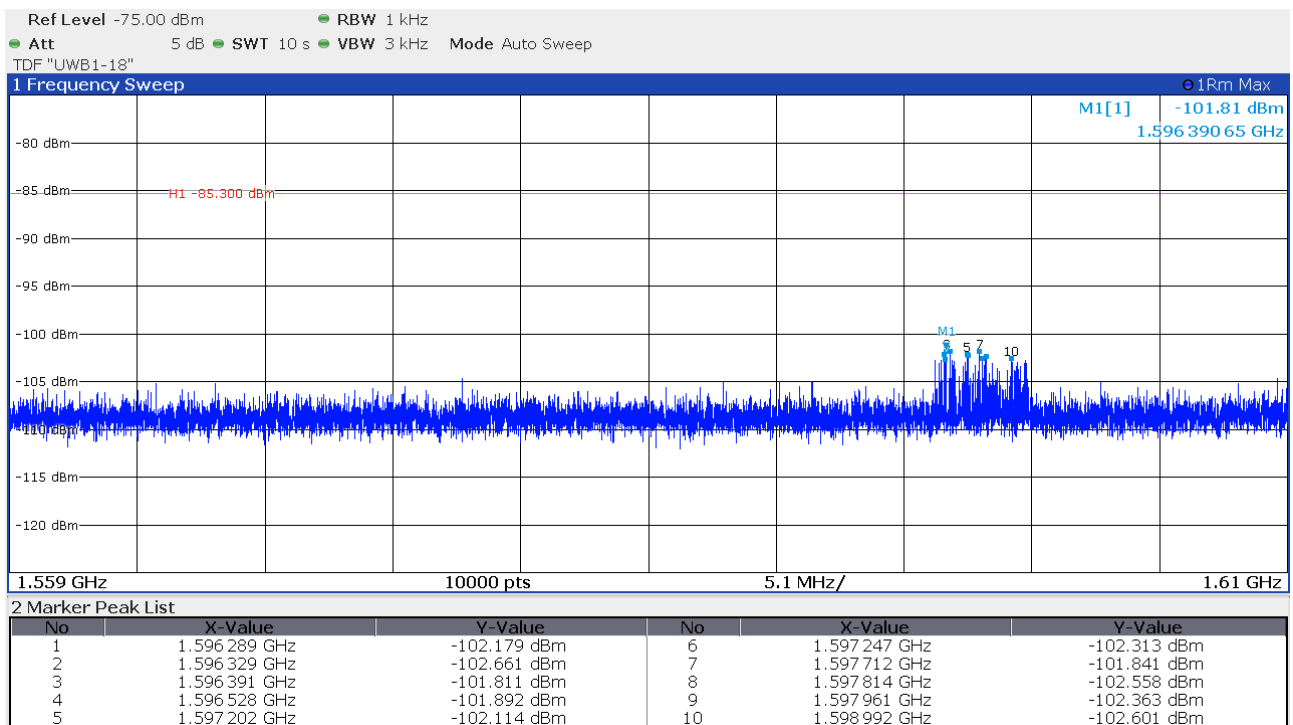


FCC ID: NXIMUPS
IC: 3066A-MUPS

1559 MHz to 1610 MHz horizontal

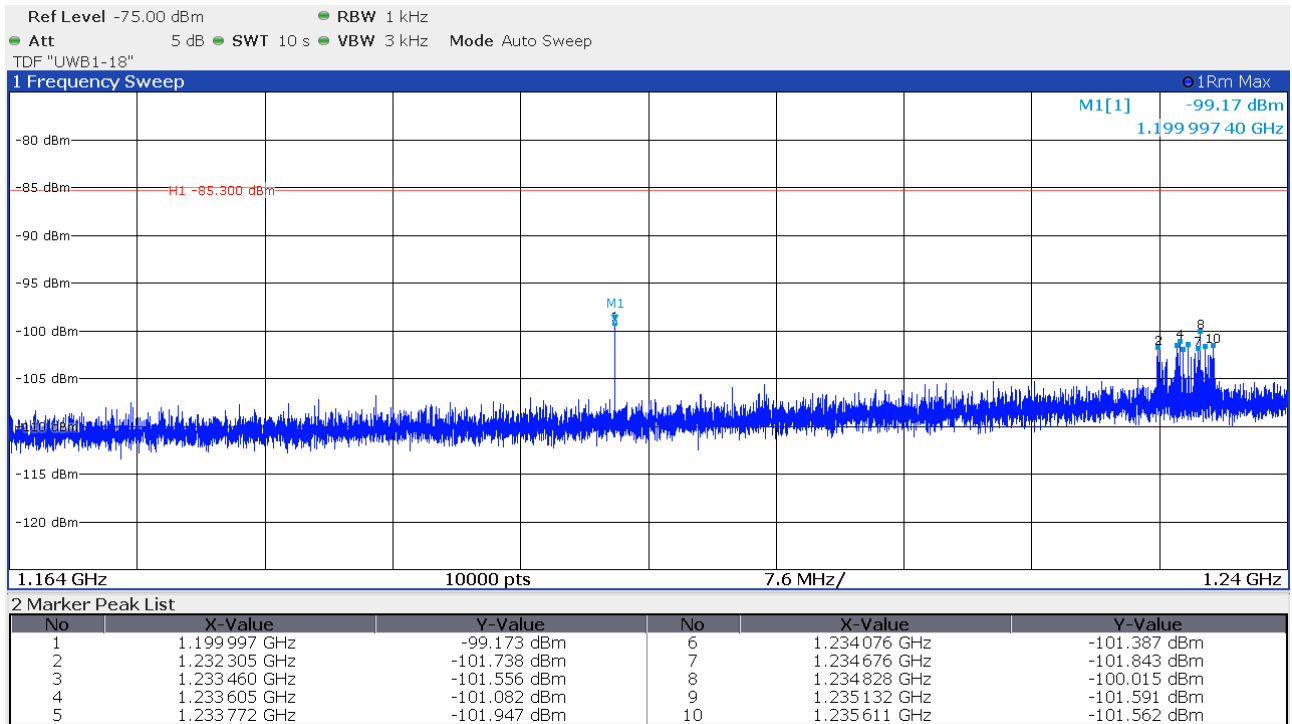


1559 MHz to 1610 MHz vertical

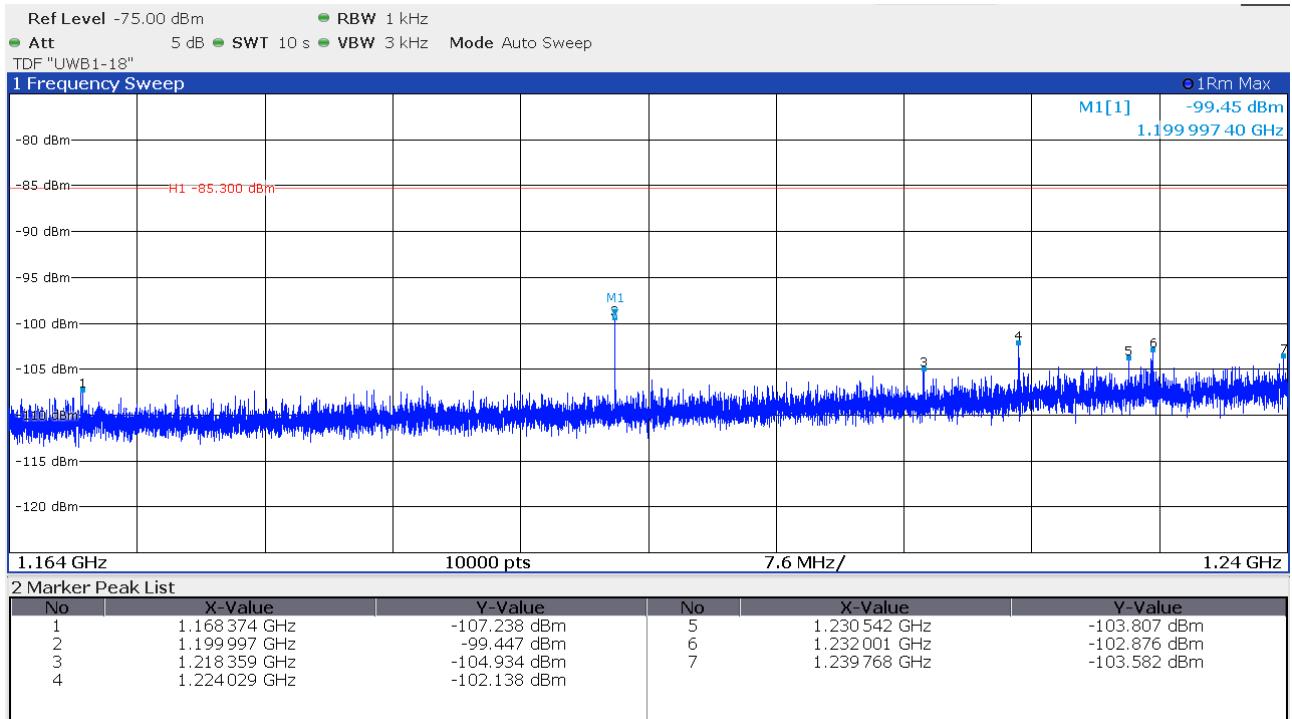


FCC ID: NXIMUPS
IC: 3066A-MUPS
Channel 8

1164 MHz to 1240 MHz horizontal

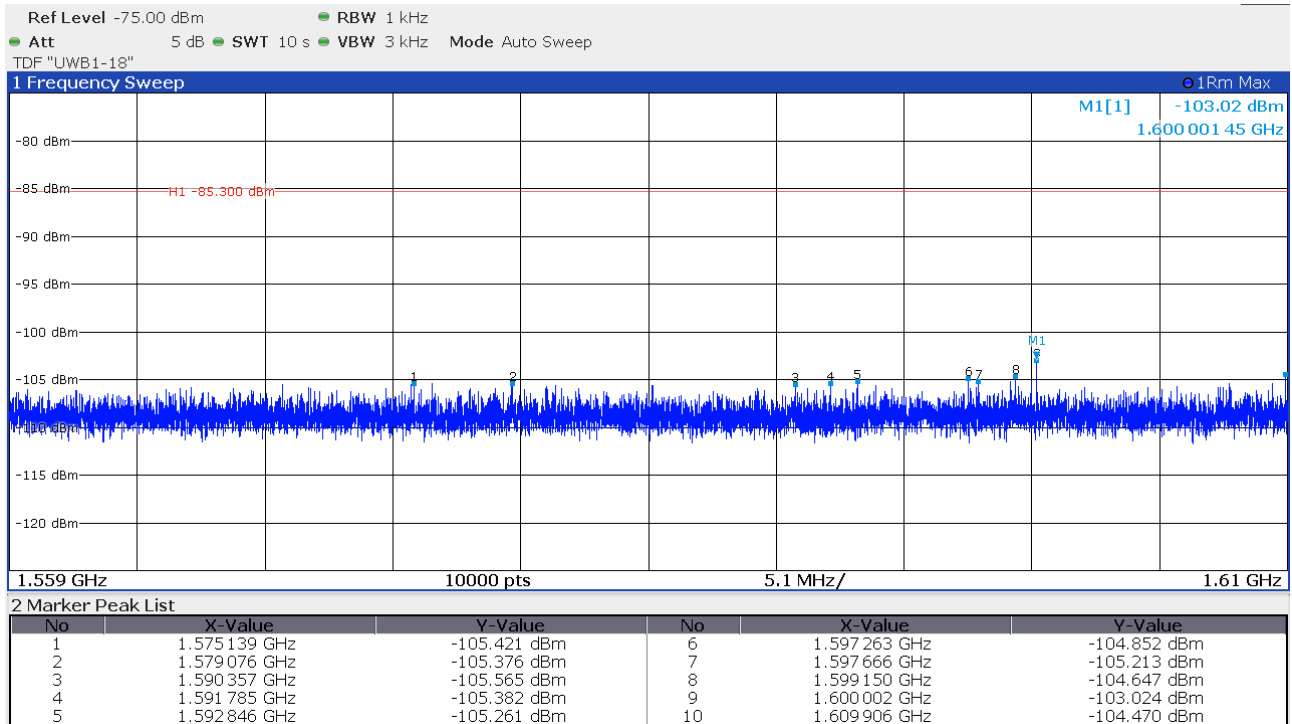


1164 MHz to 1240 MHz vertical

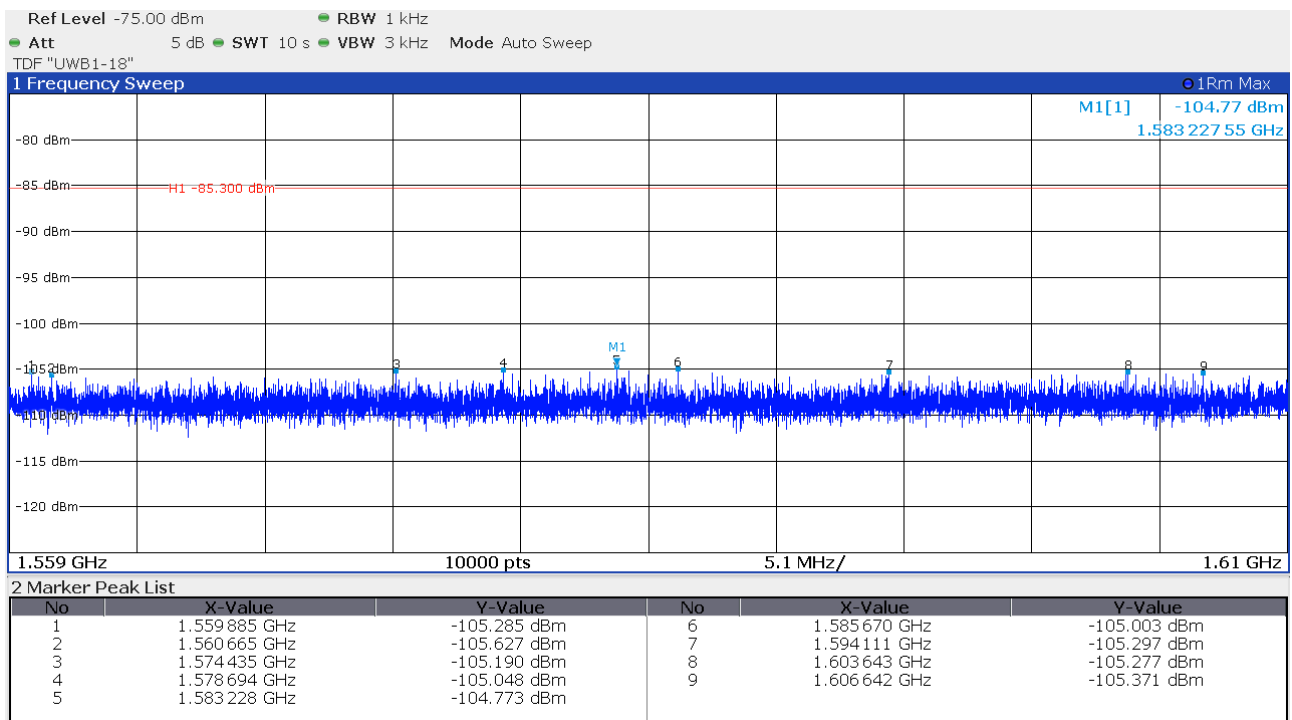


FCC ID: NXIMUPS
IC: 3066A-MUPS

1559 MHz to 1610 MHz horizontal

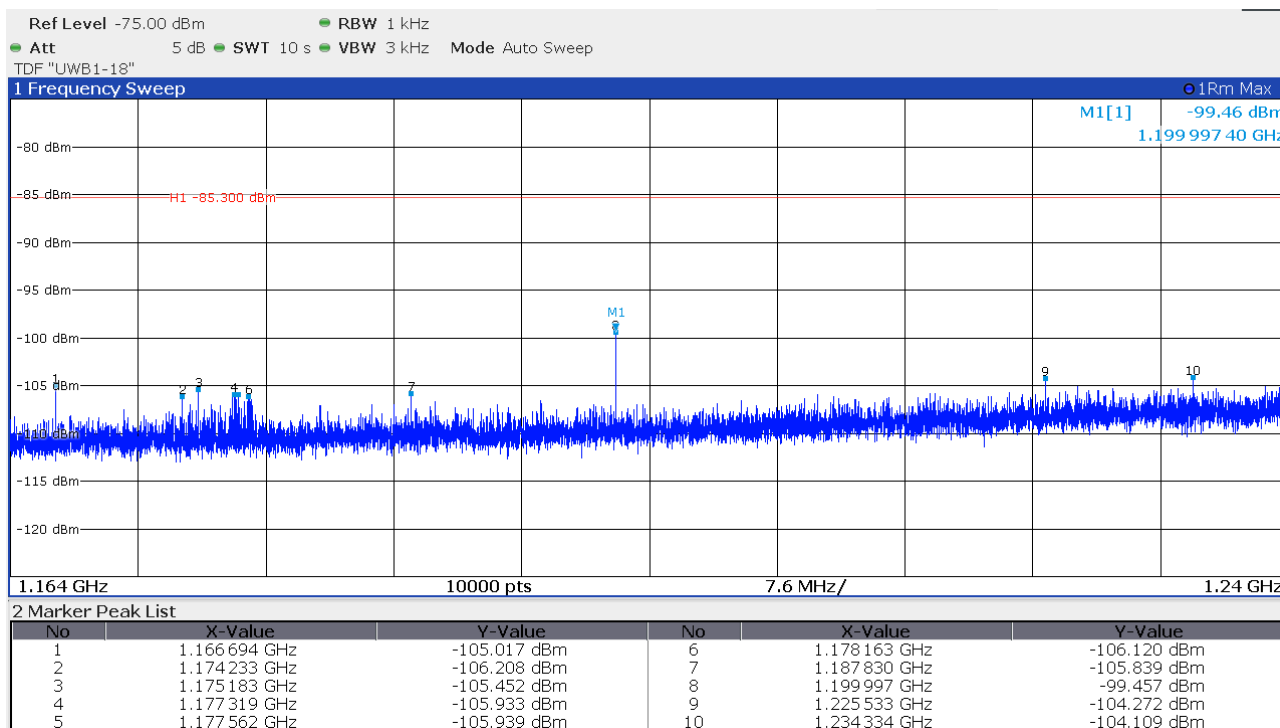


1559 MHz to 1610 MHz vertical

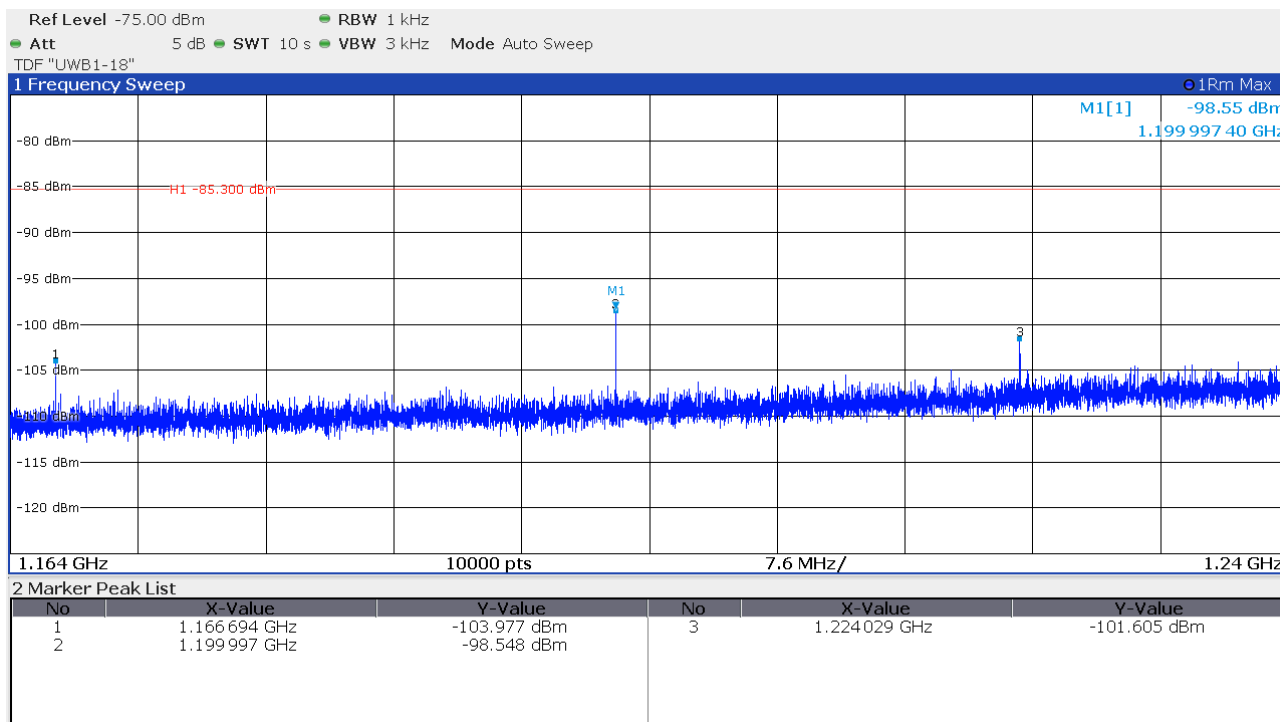


FCC ID: NXIMUPS
IC: 3066A-MUPS
Channel 9

1164 MHz to 1240 MHz horizontal

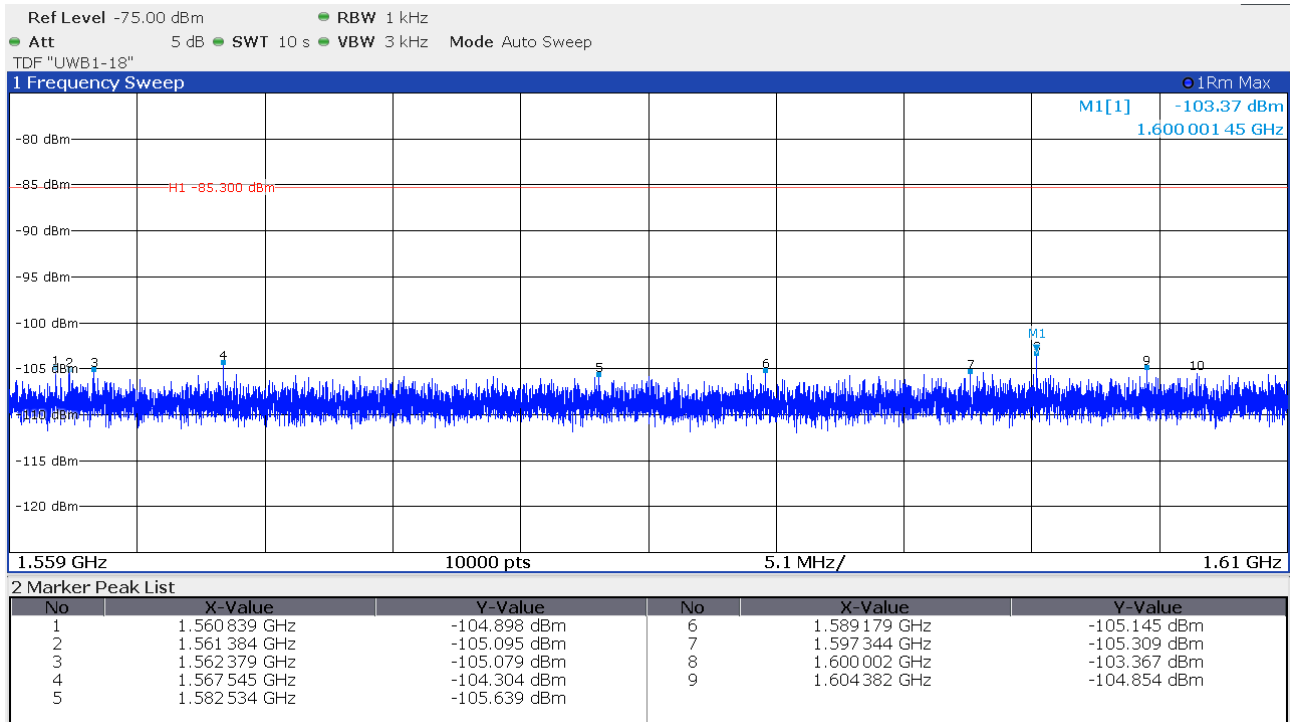


1164 MHz to 1240 MHz vertical

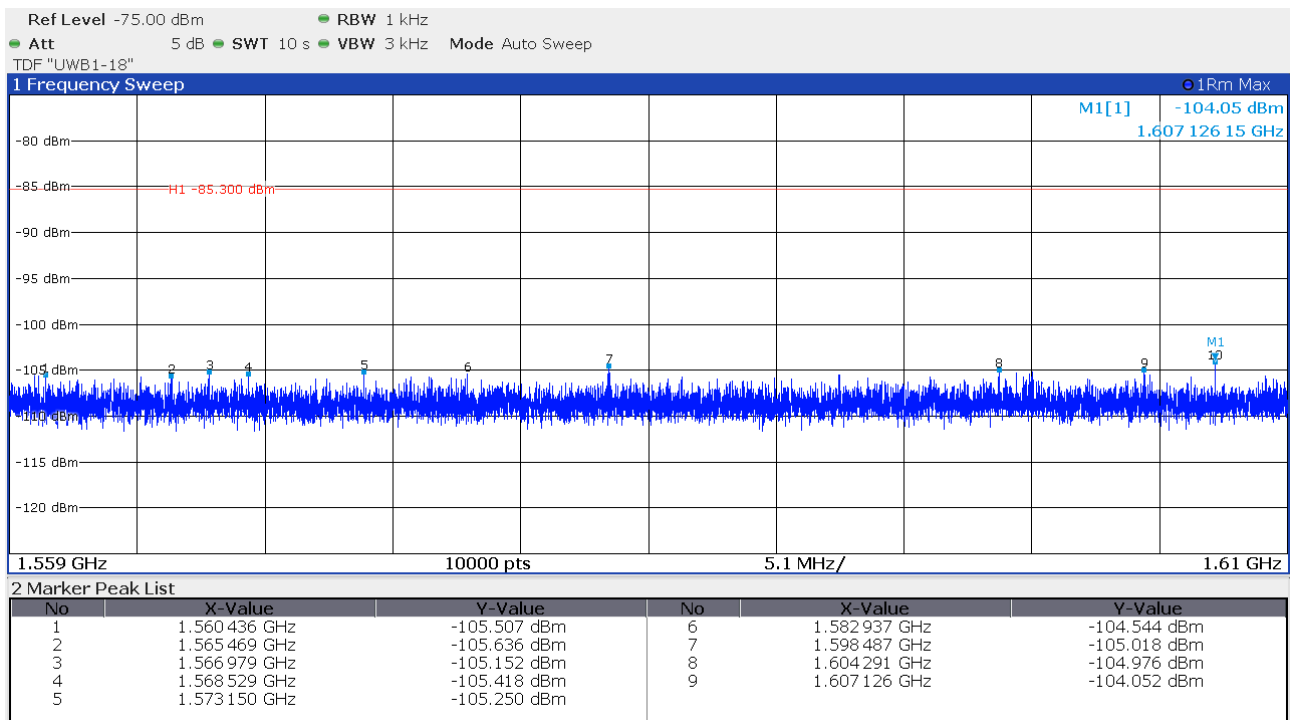


FCC ID: NXIMUPS
IC: 3066A-MUPS

1559 MHz to 1610 MHz horizontal



1559 MHz to 1610 MHz vertical



FCC ID: NXIMUPS**IC: 3066A-MUPS**

Limit according §15.517(d) in the frequency

Frequency in MHz	EIRP in dBm
1164-1240	-85.3
1559-1610	-85.3

The requirements are **FULFILLED**.

Remarks: None.

FCC ID: NXIMUPS
IC: 3066A-MUPS

5.5 Peak Power radiated

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

5.5.1 Description of the test location

Test location: Fully anechoic room FAR1

5.5.2 Photo documentation of the test set-up



5.5.3 Applicable standard

According to FCC Part 15, Section 15.517(e):

There is a limit on the peak level of the emissions contained within a 50 MHz bandwidth centered on the frequency at which the highest radiated emission occurs, f_m . That limit is 0 dBm EIRP. It is acceptable to employ a different resolution bandwidth, and a correspondingly different peak emission limit, following the procedures described in §15.521.

5.5.4 Description of Measurement

The peak power is measured following the procedure set out in ANSI C63-10, item 10.3.5. The EUT is set in TX continuous mode while measuring.

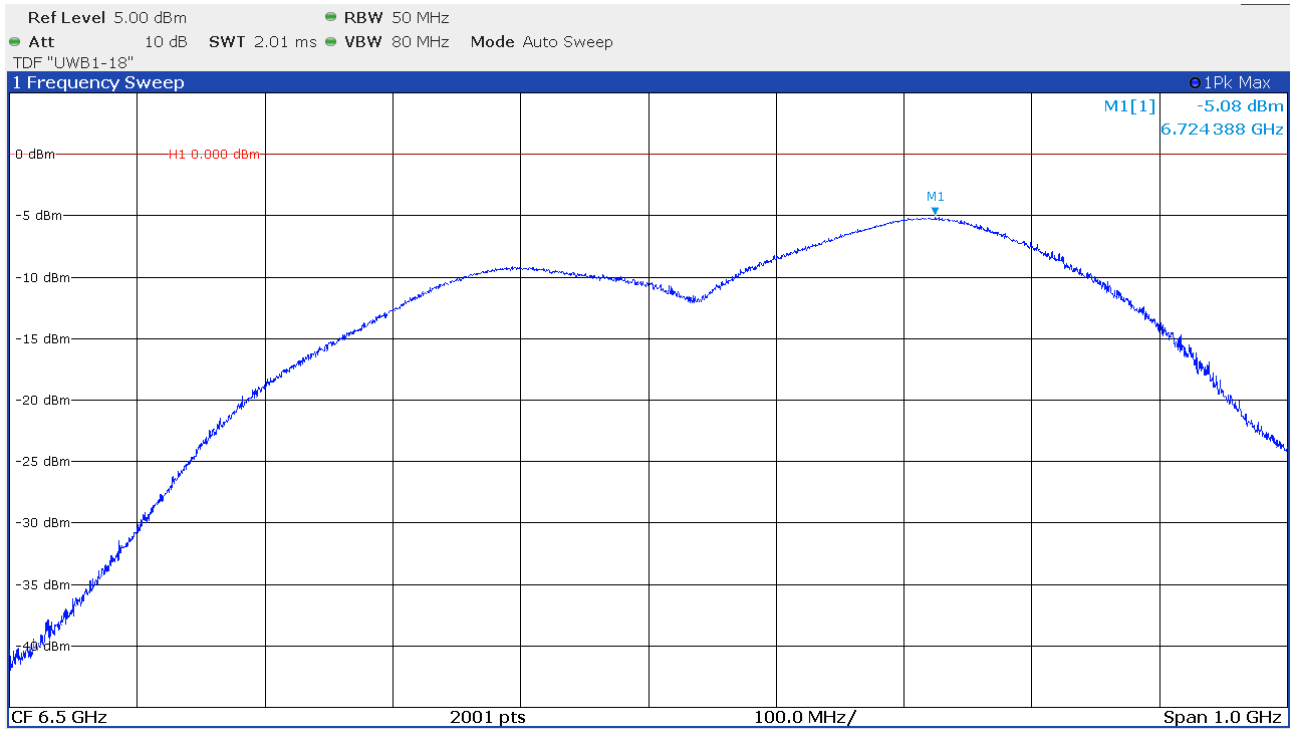
Analyser settings:

RBW: 50 MHz, VBW: 80 MHz, Detector: Peak, Trace Mode: Max hold

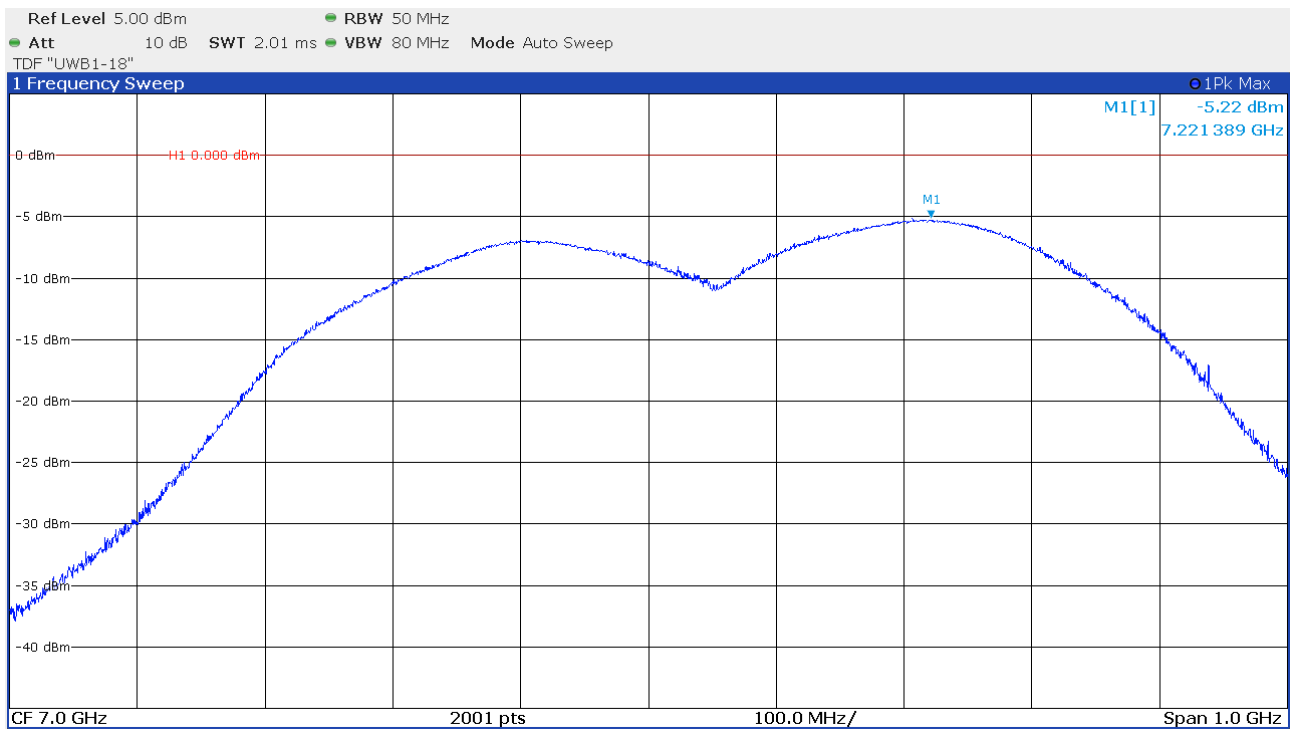
FCC ID: NXIMUPS
IC: 3066A-MUPS

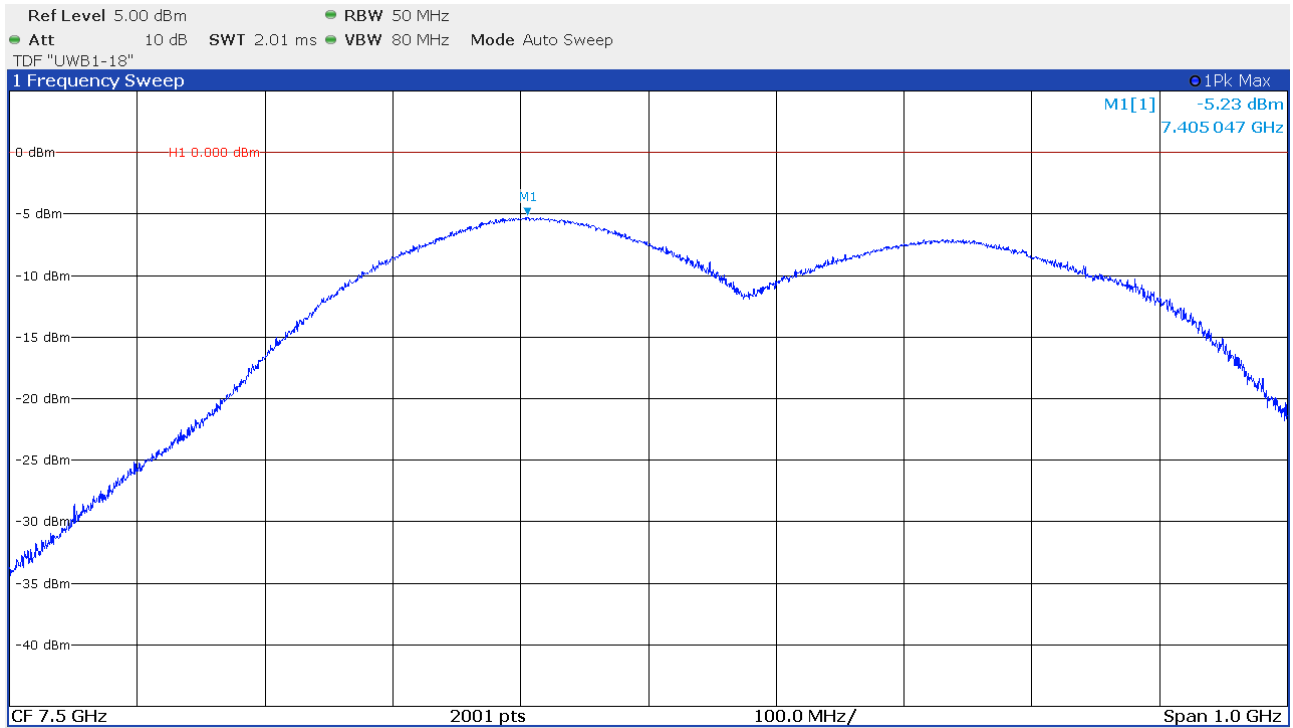
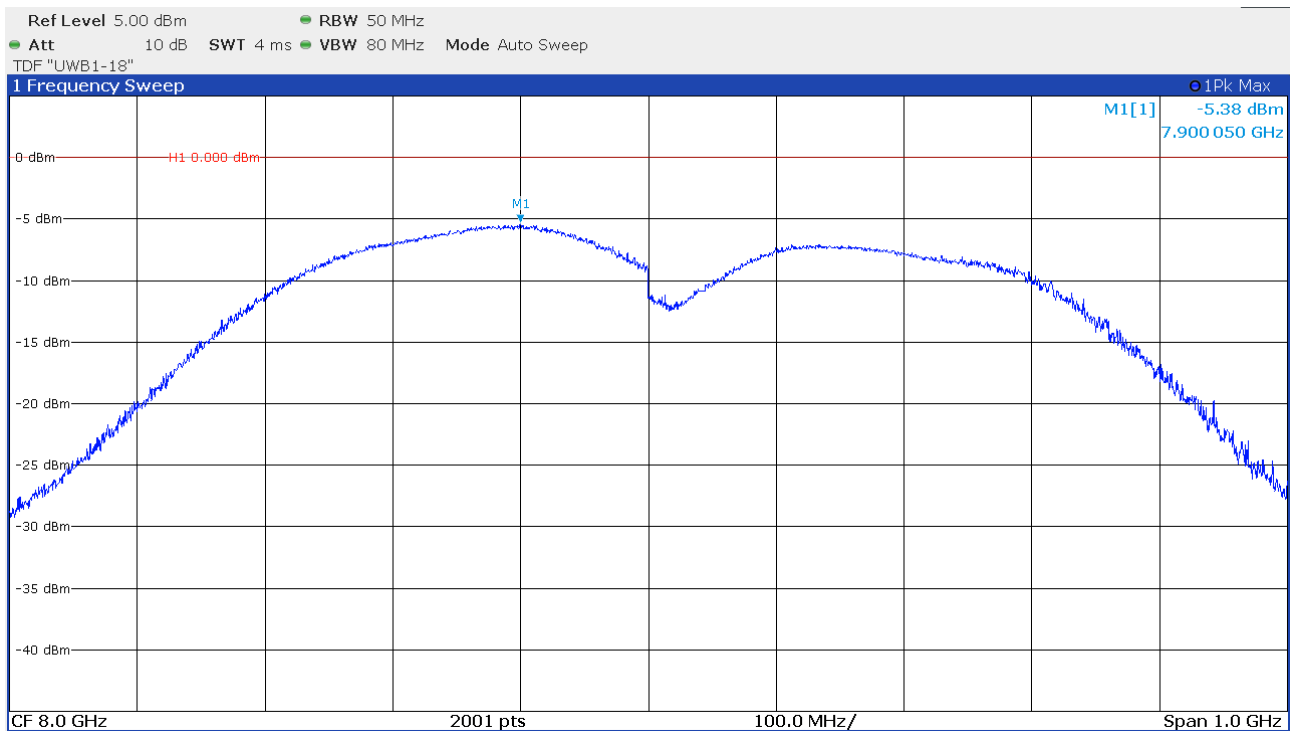
5.5.5 Test result

Channel 5



Channel 6



FCC ID: NXIMUPS
IC: 3066A-MUPS
Channel 8

Channel 9


FCC ID: NXIMUPS**IC: 3066A-MUPS**

Min. limit margin: -5.1 dB at 6.724 GHz

The requirements are **FULFILLED**.**Remarks:** None.

FCC ID: NXIMUPS
IC: 3066A-MUPS

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	ESR3	09-02/03-21-001	03/07/2025	03/07/2024		
	ENV432	09-02/20-21-001	02/09/2026	02/09/2024	02/09/2025	02/09/2024
	KK-SPU195FR01-2X11N-3,	09-02/50-21-037				
	KK-SPU195FR01-2X11N-2M	09-02/50-21-040				
	CDB-10K-18-50V-NMF-I	09-02/50-22-033	17/07/2025	17/07/2024		
	BAT-EMC 2023.0.8.0	09-02/68-21-002				
	61605	09-07/20-21-011	21/03/2025	21/03/2022		
CPR 3	ESW26	02-02/03-17-002	16/04/2025	16/04/2024		
	AMF-6D-01002000-22-10P	02-02/17-15-004				
	3117	02-02/24-20-007	20/11/2025	20/11/2024		
	BAM 4.5-P	02-02/50-17-024				
	KK-SF106-2X11N-6,5M	02-02/50-18-016				
	0_5 Meter DC-18GHz	09-16/50-23-003				
SER 2	ESR7	09-02/03-21-004	05/08/2025	05/08/2024		
	BBV 9743 B	09-02/17-21-002	19/12/2024	19/12/2023		
	VULB9168	09-02/24-22-003	06/08/2025	06/08/2024	12/08/2025	12/08/2024
	KK-7.8F-2XNM_4.0M	09-02/50-21-018				
	KK-7.8F-2XNM-10.0M	09-02/50-21-019				
	KK-7.8F-2XNM_4.5M	09-02/50-21-023				
	KK-7.8F-2XNM_9.5M	09-02/50-21-025				
	50F-003 N 3dB	09-02/50-22-002				
	CDB-10K-18-50V-NMF-I	09-02/50-22-031	17/07/2025	17/07/2024		
	BAT-EMC 2023.0.8.0	09-02/68-21-002				
SER 3	ESW26	02-02/03-17-002	16/04/2025	16/04/2024		
	FSW43	02-02/11-21-001	26/08/2025	26/08/2024		
	AMF-6D-01002000-22-10P	02-02/17-15-004				
	LNA-40-18004000-33-5P	02-02/17-20-002				
	BBHA 9170	02-02/24-05-013	21/03/2026	21/03/2023		
	3117	02-02/24-20-007	20/11/2025	20/11/2024		
	BAM 4.5-P	02-02/50-17-024				
	KK-SF106-2X11N-6,5M	02-02/50-18-016				
	ZHSS-11G-S+	02-02/50-20-025				
	KMS116-GL140SE-KMS116-	02-02/50-20-026				
	0_5 Meter DC-18GHz	09-16/50-23-003				

SER 2 measurments are performed before 19/12/2024.

FCC ID: NXIMUPS

IC: 3066A-MUPS

7 DETAILED MEASUREMENT UNCERTAINTY

Note: The following table provides an overview of all uncertainties for CSA Group Bayern GmbH

Measurement	Ucisp [dB]	Ulab comb. + [dB]	Ulab comb. - [dB]	Ulab exp. + [dB]	Ulab exp. - [dB]
EMISSION					
Conducted disturbance at AC mains and other port power using a V-AMN (150 kHz to 30 MHz)	3.4 dB	1.48 dB	1.58 dB	2.96 dB	3.16 dB
Radiated disturbance (disturbance current in a Loop antenna 9 kHz to 30 MHz)	na	1.36 dB	1.39 dB	2.73 dB	2.78 dB
Radiated disturbance (electrical field strength at an OATS / SAC; 30 MHz – 1000 MHz; Hybrid antenna; 3 m or 10 m)	6.3 dB	2.08 dB	2.07 dB	4.17 dB	4.13 dB
Radiated disturbance (electrical field strength in a SAC / FAR; 1 GHz – 6 GHz)	5.2 dB	2.54 dB	1.87 dB	5.07 dB	3.73 dB
Radiated disturbance (electrical field strength in a SAC / FAR; 6 GHz – 18 GHz)	5.5 dB	2.70 dB	2.15 dB	5.40 dB	4.30 dB
Radiated disturbance (electrical field strength in a SAC / FAR ; 18 GHz – 40 GHz)	na	2.95 dB	2.78 dB	5.91 dB	5.55 dB
6 dB / 20 dB / 26 dB / 99% bandwidth	na	$2.5 \cdot 10^{-7} \%$	$2.5 \cdot 10^{-7} \%$	$4.9 \cdot 10^{-6} \%$	$4.9 \cdot 10^{-6} \%$
Frequency stability	na	$2.5 \cdot 10^{-7} \%$	$2.5 \cdot 10^{-7} \%$	$4.9 \cdot 10^{-6} \%$	$4.9 \cdot 10^{-6} \%$

- End of test report -

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.