RF TEST REPORT

FCC

APPLICANT

PoziTech Inc.

MODEL NAME

ILS_V2R1

FCC ID

2BFRE-ILS-V2R1

REPORT NUMBER

HA230929-POZ-001-R01-2

TEST REPORT

Date of Issue
November 12, 2024

Test Site
HCT America, Inc.
1726 Ringwood Ave, San Jose, CA 95131, USA

Applicant	PoziTech Inc.
Applicant Address	3675 Webber St Sarasota FL-34232, PoziTech Inc
FCC ID	2BFRE-ILS-V2R1
Model Name	ILS_V2R1
EUT Type	SafeRadar
RF Specification	Ultra Wideband (UWB)
Modulation Type	BPSK pulsed modulation signal
FCC Classification	Hand-held Communication Device
FCC Rule Part(s)	FCC Part Subpart F (15.519, 15.521)
Test Procedure	ANSI C63.10-2013, KDB 393764 D01

The device bearing the trade name and model specified above, has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures required. The results of testing in this report apply only to the product which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

HCT America, Inc. certifies that no party to application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C 862

Tested By

John Park

Test Engineer

Reviewed By

Yongsoo Park

Technical Manager

REVISION HISTORY

The revision history for this document is shown in table.

TEST REPORT NO.	DATE	DESCRIPTION
HA230929-POZ-001-R01	May 29, 2024	Initial Issue
HA230929-POZ-001-R01-1	September 11, 2024	Corrected typo : 10 dB bandwidth
HA230929-POZ-001-R01-2	November 12, 2024	Plot add : Below 1GHz plots are added

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HCT America, Inc., 1726 Ringwood Avenue, San Jose, CA 95131, USA TEL: +1-510-933-8848 FAX: +1-510-933-8849

1. GENERAL INFORMATION

EUT DESCRIPTION

Model	ILS_V2R1
EUT Type	SafeRadar
Serial Number	0A410356
Power Supply	12 V d.c.
RF Specification	UWB
Transmitter Chain	1
Operating Environment	Indoor and outdoor
Operating Temperature	-20 °C ~ 50 °C

RF SPECIFICATION SUBJECT TO THE REPORT

RF Specification	UWB
Transmitter Chain	1
Frequency Range	3100 MHz - 7180 MHz
Max. RF Output Power	Peak : -5.49 dBm/50MHz
Modulation Type	BPSK
Number of Channels	6 Channels
Antenna Specification [1)]	Antenna Type : Dielectric chip antenna Peak Gain : 1.31 dBi
Firmware Version [2)]	2.4.3-93509ac69
Hardware Version [2)]	V2R1
Date(s) of Tests	March 18, 2024 ~ April 22, 2024

Note(s) :
1. Antenna information is based on the document provided.
2. Firmware and Hardware Versions are provided by the client.

OPERATING FREQUENCY CHANNELS

UWB	
Channel	**Frequency (MHz)**
1	3494.4
2	3993.6
3	4492.8
4	3993.6
5	6489.6
7	6489.6

2. METHODOLOGY

The measurement procedure described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Device (ANSI C63.10-2013, KDB 393764 D01) is used in the measurement of the test device.

EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.519, 15.521 under the FCC Rules Part 15 Subpart F.

GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10. (Version :2013) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane below 1GHz. Above 1GHz with 1.5m using absorbers between the EUT and receive antenna. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. Also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. To find out the maximum emission, the relative positions of this hand-held transmitter (EUT) were rotated through three orthogonal axes according to the requirements in Section 8 of ANSI C63.10. (Version: 2013)

DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

3. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment's, which is traceable to recognized national standards. Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).

4. FACILITIES AND ACCREDITATIONS

FACILITIES

The SAC (Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at 1726 Ringwood Avenue, San Jose, California 95131, USA. (LAB CODE : US0198)
The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2014) and CISPR Publication 22.

Accredited Laboratory

A2LA has accredited

HCT AMERICA, INC.

San Jose, CA

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets the A2LA – R256 – Specific Requirements – FDA ASCA Program. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).

Presented this 17th day of July 2023.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 4201.01
Valid to July 31, 2025
Revised July 15, 2024

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

5. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203:
"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can 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."

(1) The antenna of this E.U.T is permanently attached and there is no provision for connection to an external antenna.
(2) The E.U.T Complies with the requirement of §15.203

6. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013.

All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95 % level of confidence. The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty
Occupied Bandwidth	± 120.66 kHz
Radiated Emissions (below 1 GHz)	± 5.70 dB
Radiated Emissions (Above 1 GHz)	± 5.25 dB

7. DESCRIPTION OF TESTS

7.1. Radiated Emissions

RADIATION EMISSION LIMIT

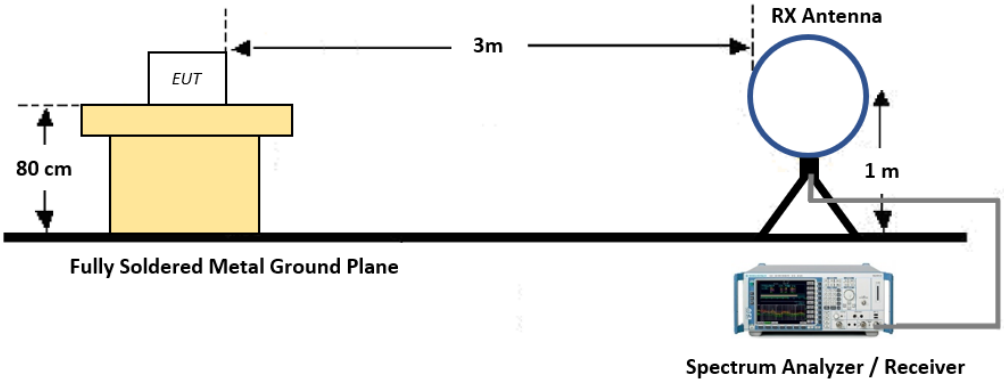
FCC : 47 CFR § 15.209		
Frequency (MHz)	**Field Strength (uV/m)**	**Measurement Distance (m)**
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

FCC : 47 CFR § 15.519	
Frequency (MHz)	**EIRP in dBm**
960 – 1610	-75.3
** 1164 – 1240	-85.3
** 1559 – 1610	-85.3
1610 – 1990	-63.3
1990 – 3100	-61.3
3100 – 10600	-41.3
Above 10600	-61.3

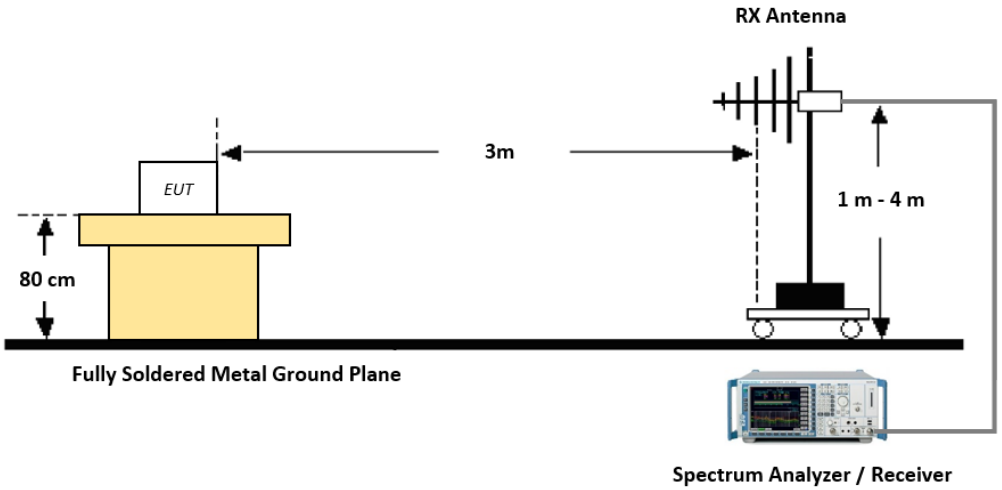
Note(s) :
** GPS Bands
1. There is a limit on the peak level of the emissions contained within a 50 MHz bandwidth centered on the frequency at which the highest radiated emission occurs, fM. That limit is 0 dBm EIRP.

TEST SETUP

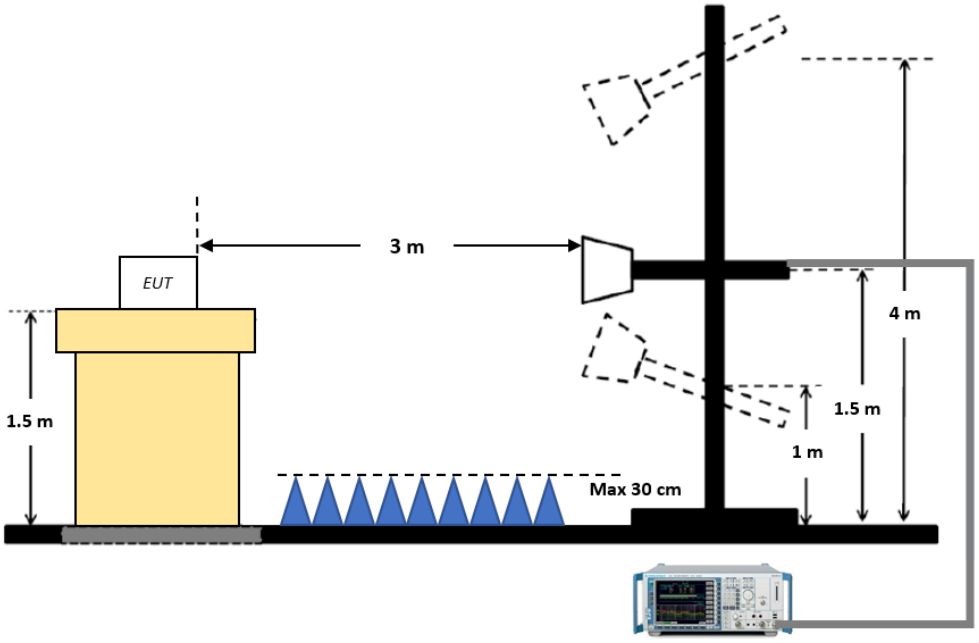
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



TEST PROCEDURE OF RADIATED SPURIOUS EMISSION (BELOW 30 MHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The loop antenna was placed at a location 3m from the EUT
3. The EUT is placed on a turntable, which is 0.8m above ground plane.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Distance Correction Factor (0.009 MHz – 0.490 MHz) = 40*log(3 m/300 m) = - 80 dB
   Measurement Distance: 3 m
7. Distance Correction Factor (0.490 MHz – 30 MHz) = 40*log(3 m/30 m) = - 40 dB
   Measurement Distance: 3 m
8. Spectrum Setting

   - Frequency Range = 9 kHz ~ 30 MHz
   - Detector = Peak
   - Trace = Max hold
   - RBW = 9 kHz
   - VBW ≥ 3*RBW

9. Total = Reading Value + Antenna Factor (A.F) + Cable Loss (C.L)
10. There is a comparison data both open-field test site and alternative test site – semi-Anechoic chamber according to 414788 D01. And the results are properly calibrated.

TEST PROCEDURE OF RADIATED SPURIOUS EMISSION (30 MHz – 1 GHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The EUT is placed on a turntable, which is 0.8 m above ground plane.
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
4. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
5. Spectrum Setting

   (1) Measurement Type (Peak):
   - Measured Frequency Range: 30 MHz – 1 GHz
   - Detector = Peak
   - Trace = Max hold
   - RBW = 100 kHz
   - VBW ≥ 3*RBW

   (2) Measurement Type(Quasi-peak):
   - Measured Frequency Range: 30 MHz – 1 GHz
   - Detector = Quasi-Peak
   - RBW = 120 kHz

6. Total = Reading Value + Antenna Factor (A.F) + Cable Loss (C.L)

TEST PROCEDURE OF RADIATED SPURIOUS EMISSION (ABOVE 1 GHz)

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
4. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. The unit was tested with its standard battery.
8. Spectrum Setting
   - RBW = 1 MHz (10kHz for emissions in the GPS bands)
   - VBW = 3 MHz (30kHz for emissions in the GPS bands)
   - Detector = Average(RMS)
   - Trace = Maxhold
   - RBW = 100 kHz
   - Trace was allowed to stabilize
   - Sweep time = No more than 1ms integration period over measurement bin
9. Above 10600 MHz

   pre-scan plots were tested at 0.55 meter respectively.

   The plots are only for the purpose of spurious emission identification.

   If no spurious emissions are measured, the test is completed in the pre-scan state.
10. Below10600 MHz and GPS band

    E (dBuv/m) = Measured Value(dBuV)
    - We apply to the offset in all range
    - The offset = Antenna Factor(A.F) + Cable Loss(C.L) – Amp Gain(A.G)

EIRP (dBm) = E (dBuv/m) – 95.3 dB

Maximum Peak Power

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
4. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
5. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. The unit was tested with its standard battery.
7. Spectrum Setting
    - RBW = 50 MHz
    - VBW = 80 MHz
    - Detector = Peak
    - Trace = Maxhold
    - Trace was allowed to stabilize
    - Sweep time = auto coupled
8. E (dBuv/m) = Measured Value(dBuV)

- We apply to the offset in all range
- The offset = Antenna Factor(A.F) + Cable Loss(C.L) – Amp Gain(A.G)

EIRP (dBm) = E (dBuv/m) – 95.3 dB

KDB 414788 OFS and Chamber Correlation Justification

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

7.2. 10 dB Bandwidth

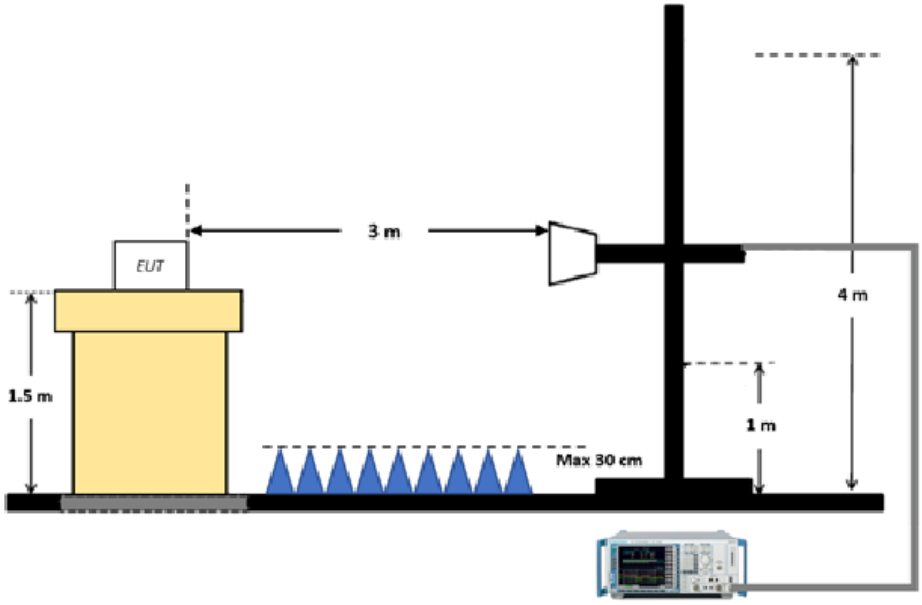
LIMIT

§15.247(d) / §15.247(b)

According to §15.503(d), fractional bandwidth is equal to or greater than 0.20, or UWB bandwidth is equal to or greater than 500 MHz.

According to §15.519(b), The UWB bandwidth of hand held UWB system must be contained between 3 100 MHz and 10 600 MHz.

TEST SETUP



TEST PROCEDURE

We tested according to the Procedure 10.1 in ANSI 63.10-2013.

The Analyzer is set to

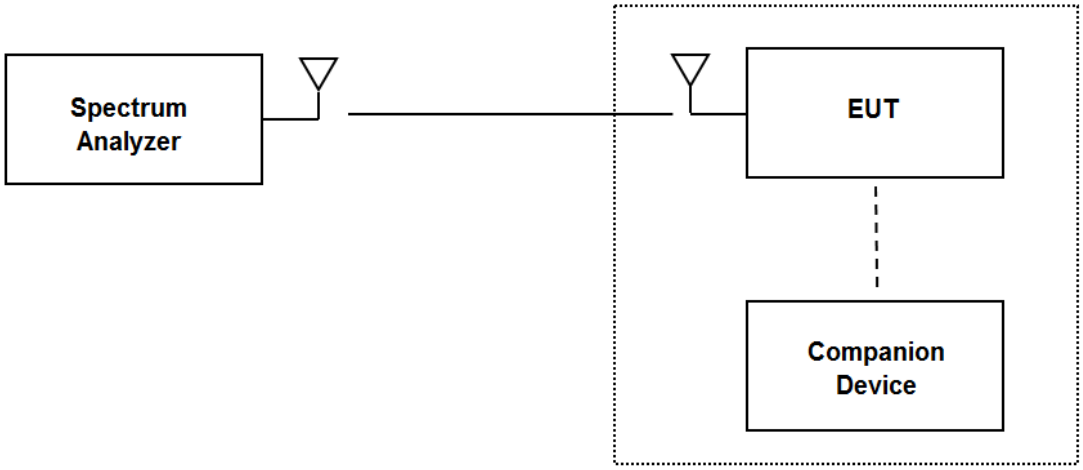
- Set the analyzer's center frequency to a supported channel.
- Trace = Max hold
- Detector = Peak
- RBW = 1 MHz
- VBW = 3 MHz
- Sweep time = 2s
- Allow the trace to stabilize
- The frequency at which the maximum power level is measured with the peak detector is designated fM and the outermost 1 MHz segments above and below fM, where the peak power falls by 10 dB relative to the level at fM, are designated as fH and fL, respectively.
- 10 dB bandwidth is defined as (fH - fL). The center frequency (fc) is mathematically determined from (fH - fL) / 2. The fractional bandwidth is defined as 2(fH - fL) / (fH + fL).

7.3. Cessation Time

LIMIT

A UWB device operating under the provisions of this section shall transmit only when it is sending information to an associated receiver. The UWB intentional radiator shall cease transmission within 10 seconds unless it receives an acknowledgement from the associated receiver that its transmission is being received. An acknowledgment of reception must continue to be received by the UWB intentional radiator at least every 10 seconds or the UWB device must cease transmitting

TEST SETUP



TEST PROCEDURE

1. SPAN = Zero Span(0 Hz)
2. RBW = 1 MHz
3. VBW = 3 MHz
4. Sweep time shall be sufficient to demonstrate EUTs compliance with the rule part.
5. Sets the marker to the points where 10 seconds after the EUT recognizes the interruption of reception.

7.4. AC POWER LINE CONDUCTED EMISSIONS

LIMIT

47 CFR § 15.207, RSS-GEN Section 8.8
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 limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN).

Frequency Range (MHz)	Limits (dBµV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

*Decreases with the logarithm of the frequency.

Compliance with this provision shall be based on the measurement of the radio frequency.
voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

TEST SETUP

See test photographs attached in Annex A for the actual connections between EUT and support equipment.

TEST PROCEDURE

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors : Quasi Peak and Average Detector.

According to FCC KDB 174176 D01 Line Conducted FAQ v01r01 :

Devices Operating Above 30 MHz

For a device with a permanent or detachable antenna operating above 30 MHz, measurements must be performed with the antenna connected as specified in clause 6.2 of ANSI C63.10-2013.

Devices Operating Below 30 MHz

For a device with a permanent or detachable antenna operating at or below 30 MHz, the FCC will accept measurements performed with a suitable dummy load in lieu of the antenna under the following conditions:
(1) Perform the AC power-line conducted tests with the antenna connected to determine compliance with Section 15.207 limits outside the transmitter's fundamental emission band;
(2) Retest with a dummy load in lieu of the antenna to determine compliance with Section 15.207 limits within the transmitter's fundamental emission band. For a detachable antenna, remove the antenna and connect a suitable dummy load to the antenna connector. For a permanent antenna, remove the antenna and terminate the RF output with a dummy load or network which simulates the antenna in the fundamental frequency band. All measurements must be performed as specified in clause 6.2 of ANSI C63.10-2013.

Note(s) :
Sample Calculation
Quasi-peak(Final Result) = Reading Value + Correction Factor

7.5. Worst case

7.5.1. 10dBc Bandwidth, Peak Power, Average Power

1. All modes of operation were investigated and the worst case configuration results are reported.
   - Mode : Stand alone
   - Worst case : Stand alone
2. The EUT was tested in three axis were investigated and the worst case axis results are reported.
   - Axis : X, Y, Z
   - Worst case : Z
3. All PRF of operation were investigated and the worst case results are reported.
   - PRF : 16 MHz, 64 MHz
   - Worst case : 16 MHz

7.5.2. Radiated Emission

1. All modes of operation were investigated and the worst case configuration results are reported.

- Mode : Stand alone
- Worst case : Stand alone

2. The EUT was tested in three axis were investigated and the worst case axis results are reported.

- Axis : X, Y, Z
- Worst case : Z

3. All PRF of operation were investigated and the worst case results are reported.

- PRF : 16, 64
- Worst case : 16

4. All position of loop antenna were investigated and the test result is a no critical peak found at all positions.

- Position : Horizontal, Vertical, Parallel to the ground plane

7.5.3. AC Power line Conducted Emissions

1. AC line conducted emission test was performed at the worst case transmission mode.

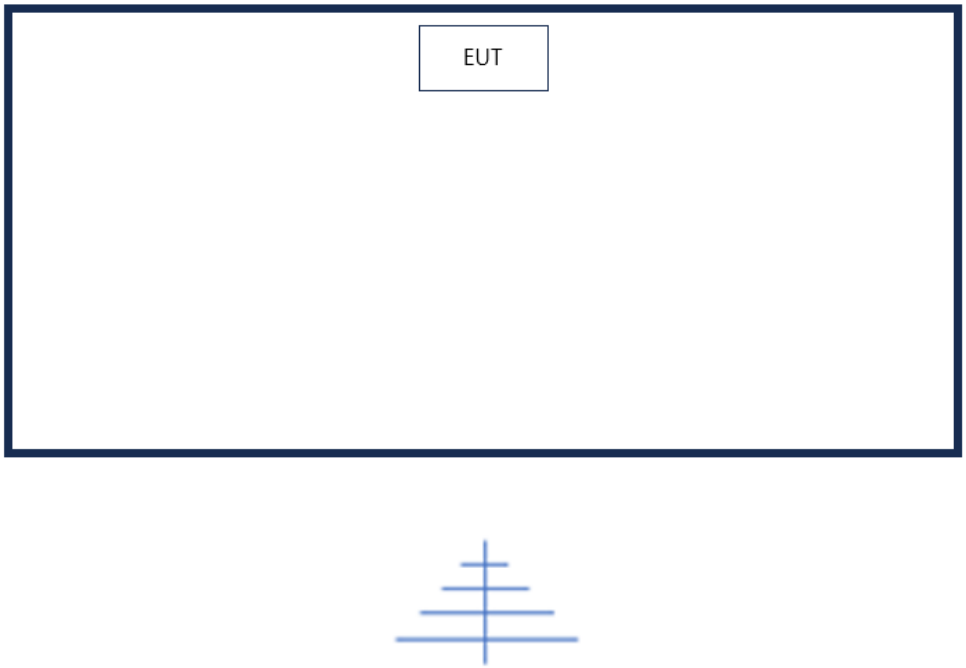
8. SUMMARY OF TEST RESULTS

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
10 dB Bandwidth	§15.503, §15.519 (b)	≥ 500 MHz	Radiated	PASS
Maximum Peak Power	§15.519(e)	< 0 dBm/50MHz EIRP		PASS
Maximum Average Power	§15.519(c)	< -41.3 dBm/MHz EIRP		PASS
Radiated Emissions Above 960MHz	§15.519(c)	cf. Section 7.1		PASS
Radiate Emissions Below 960MHz	§15.519(c), §15.519(a)	cf. Section 7.1		PASS
Radiated Emissions in the 1 164 – 1 240Mhz and 1 559 – 1 610MHz GPS Bands	§15.519(d)	cf. Section 7.1		PASS
Cessation Time	§15.519(a)(1)	Transmission shall cease in less than 10s		PASS
AC Power line Conducted Emissions	§15.207	cf. Section 7.4	Conducted	PASS

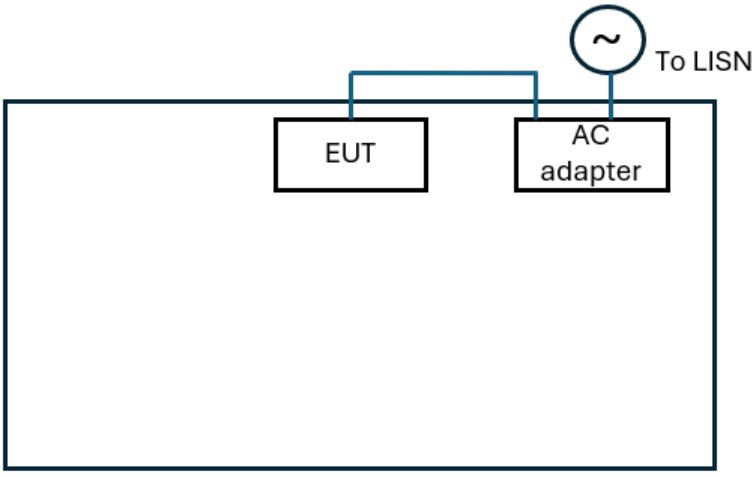
Note(s) :

TEST CONFIGURATION

Radiated Emission



Conducted Emission



LIST OF SUPPORT EQUIPMENT

Equipment Type	Model No.	Serial Number	Manufacturer	Qty	Note
-	-	-	-	-	-

9. TEST RESULT

9.1 10dB Bandwidth

Channel	PRF(MHz)	FC(MHz)	FM(MHz)	FL(MHz)	FH(MHz)	Result(MHz)
1	16	3 518.40	3 499.90	3 219.97	3 816.82	596.85
	64	3 522.90	3 495.40	3 234.97	3 810.82	575.85
2	16	3 984.77	3 963.61	3 604.52	4 365.01	760.49
	64	4 010.27	3 994.10	3 681.85	4 338.69	656.84
3	16	4 554.39	4 494.80	4 297.20	4 811.57	514.37
	64	4 552.80	4 492.80	4 301.40	4 804.20	502.80
4	16	4 057.26	3 967.11	3 450.91	4 663.61	1 212.70
	64	4 055.26	3 958.61	3 452.41	4 658.11	1 205.70
5	16	6 467.61	6 497.10	6 091.70	6 843.51	751.81
	64	6 465.86	6 489.60	6 130.69	6 801.02	670.33
7	16	6 454.86	6 487.60	5 921.24	6 988.47	1 067.23
	64	6 445.36	6 524.59	5 936.74	6 953.98	1 017.24

Note(s) :
1. Limit : ≥ 500MHz
2. f_M : The frequency at which the maximum power level is measured with the peak detector.
3. f_L : For the lowest frequency bound f_L
4. f_H : For the highest frequency bound f_H
5. f_C : $(f_H - f_L) / 2$
6. Result : $f_H - f_L$

▣ TEST PLOTS

10dB Bandwidth : PRF 64 MHz (CH 3)

Note(s) :
The worst-case plot is included in this report.

9.2. Maximum Peak Power

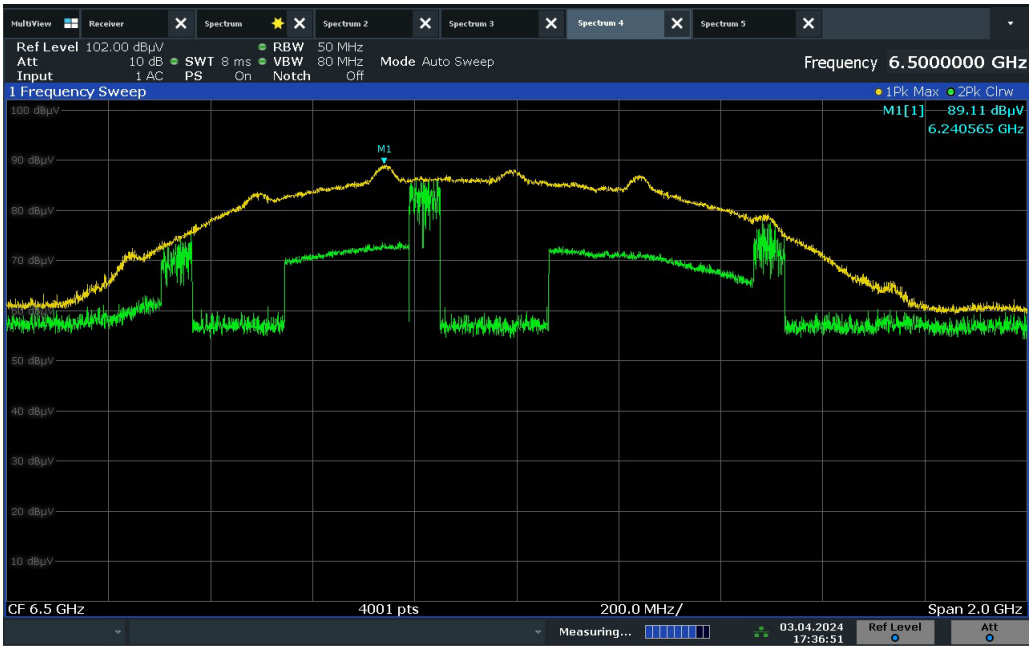
Channel	PRF (MHz)	Polarization	Reading (dBuV)	Corr. [1)] (dB)	Total (dBuV/m)	EIRP (dBm/1MHz)	Limit (dBm/1MHz)	Margin (dB)	Measurement Type
1	16	V	91.78	-6.1	85.68	-9.62	0	-9.62	Peak
	64	V	86.8	-6.1	80.7	-14.6	0	-14.6	Peak
2	16	V	91.97	-4.1	87.87	-7.43	0	-7.43	Peak
	64	V	88.48	-4.1	84.38	-10.92	0	-10.92	Peak
3	16	V	92.53	-3.9	88.63	-6.67	0	-6.67	Peak
	64	V	87.87	-3.9	83.97	-11.33	0	-11.33	Peak
4	16	V	94.46	-4.7	89.76	-5.54	0	-5.54	Peak
	64	V	88.5	-4.7	83.8	-11.5	0	-11.5	Peak
5	16	V	88.8	0.6	89.4	-5.9	0	-5.9	Peak
	64	V	82.44	0.6	83.04	-12.26	0	-12.26	Peak
7	16	V	89.11	0.7	89.81	-5.49	0	-5.49	Peak
	64	V	83.59	0.7	84.29	-11.01	0	-11.01	Peak

Note(s) :

1. E (dBuv/m) = Measured Value(dBuV) + F(dB)
   EIRP (dBm/50MHz) = E (dBuv/m) – 95.3

▣ TEST PLOTS

Peak power : PRF 16 MHz (CH 7)



Note(s) :
The worst-case plot is included in this report.

9.3. Maximum Average Power

Channel	PRF (MHz)	Polarization	Reading (dBuV)	Corr. [1)] (dB)	Total (dBuV/m)	EIRP (dBm/1MHz)	Limit (dBm/1MHz)	Margin (dB)	Measurement Type
1	16	V	49.67	-6.1	43.57	-51.73	-41.3	-10.43	Average
	64	V	48.04	-6.1	41.94	-53.36	-41.3	-12.06	Average
2	16	V	52.13	-4.1	48.03	-47.27	-41.3	-5.97	Average
	64	V	50.89	-4.1	46.79	-48.51	-41.3	-7.21	Average
3	16	V	54.36	-3.9	50.46	-44.84	-41.3	-3.54	Average
	64	V	54.27	-3.9	50.37	-44.93	-41.3	-3.63	Average
4	16	V	54.07	-4.7	49.37	-45.93	-41.3	-4.63	Average
	64	V	53.12	-4.7	48.42	-46.88	-41.3	-5.58	Average
5	16	V	52.07	0.6	52.67	-42.63	-41.3	-1.33	Average
	64	V	49.27	0.6	49.87	-45.43	-41.3	-4.13	Average
7	16	V	51.81	0.7	52.51	-42.79	-41.3	-1.49	Average
	64	V	50.23	0.7	50.93	-44.37	-41.3	-3.07	Average

Note(s) :

1. E (dBuv/m) = Measured Value(dBuV) + F(dB)

   EIRP (dBm) = E (dBuv/m) – 95.3

▣ Test Plots

Average power : PRF 16 MHz (CH 5)

Note(s) :
The plots included in this report are only at the worst-case channel

9.4. Radiated Emissions Below 960MHz

Frequency Range : 9 kHz – 30MHz

Frequency (MHz)	Polarization	Reading (dBuV)	Factor (dB)	Total (dBuV/m)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Measurement Type
No major peak found								

Note(s) :
1. The Measured of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
2. Distance extrapolation factor = 40log (specific distance / test distance) (dB)
3. Limit line = specific Limits (dBµV) + Distance extrapolation factor

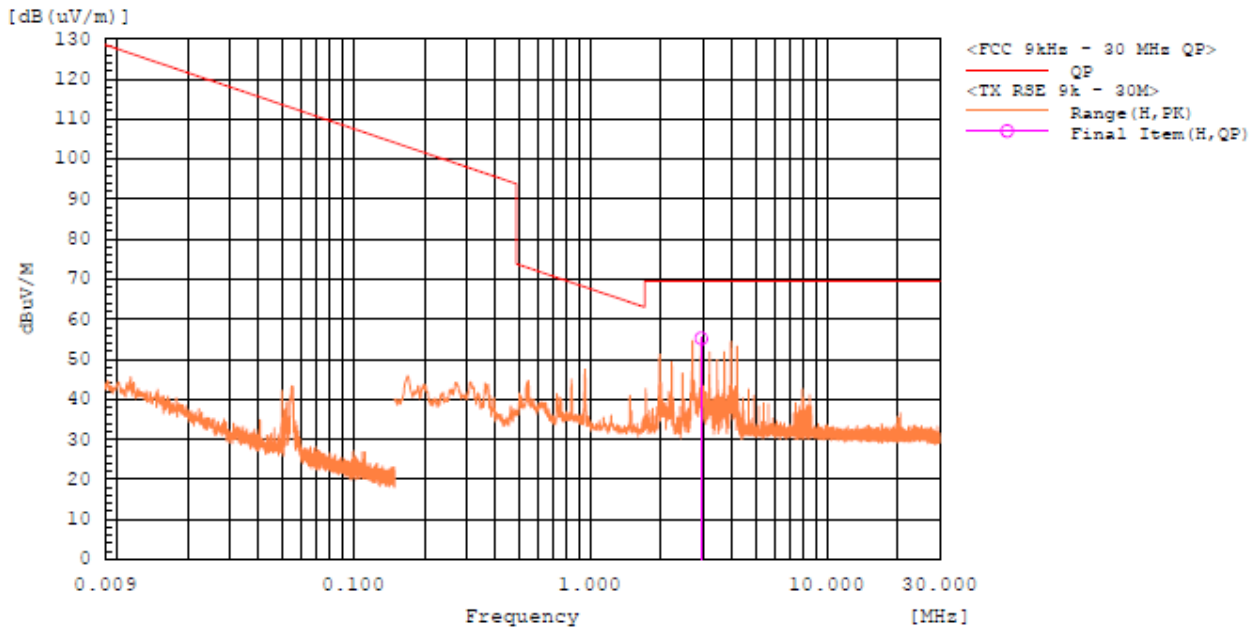
Frequency Range : Below 960 MHz

Frequency (MHz)	Polarization	Reading (dBuV)	Factor (dB)	Total (dBuV/m)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Measurement Type
No major peak found								

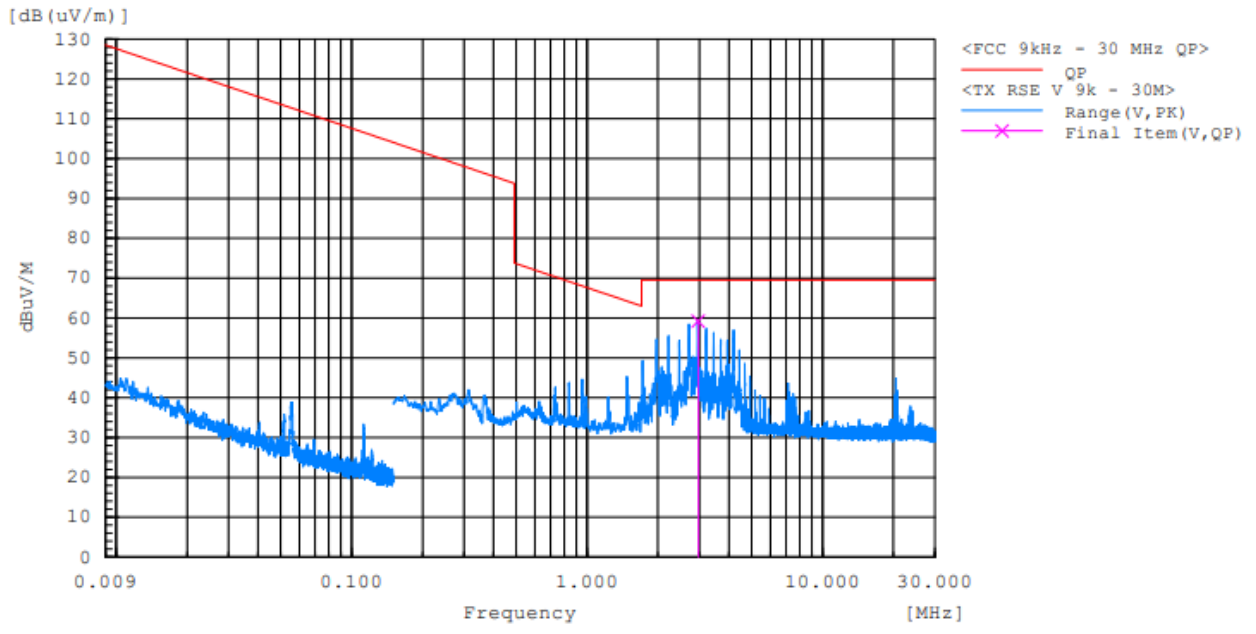
Note(s) :
1. Radiated emissions measured in frequency range from 30 MHz to 960 MHz were made with an instrument using Quasi peak detector mode.

▣ TEST PLOTS

Radiated Spurious Emission 9 kHz – 30 MHz (Antenna Position 180°) : PRF 16 MHz (CH1)



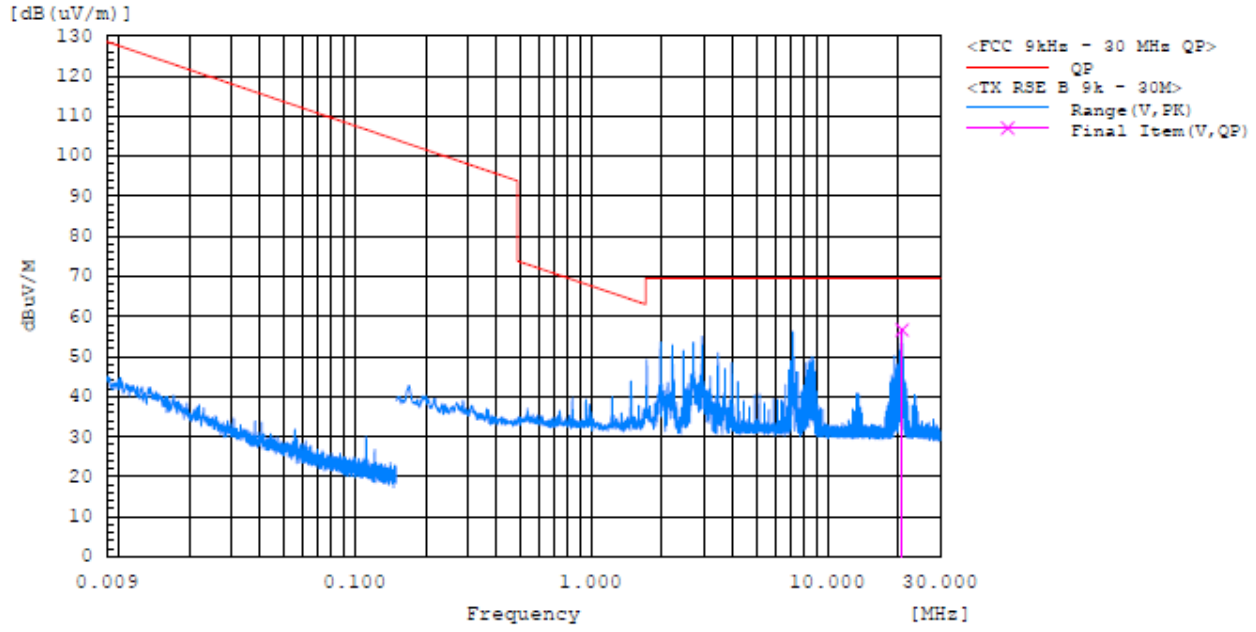
Radiated Spurious Emission 9 kHz – 30 MHz (Antenna Position 90°) : PRF 16 MHz (CH1)



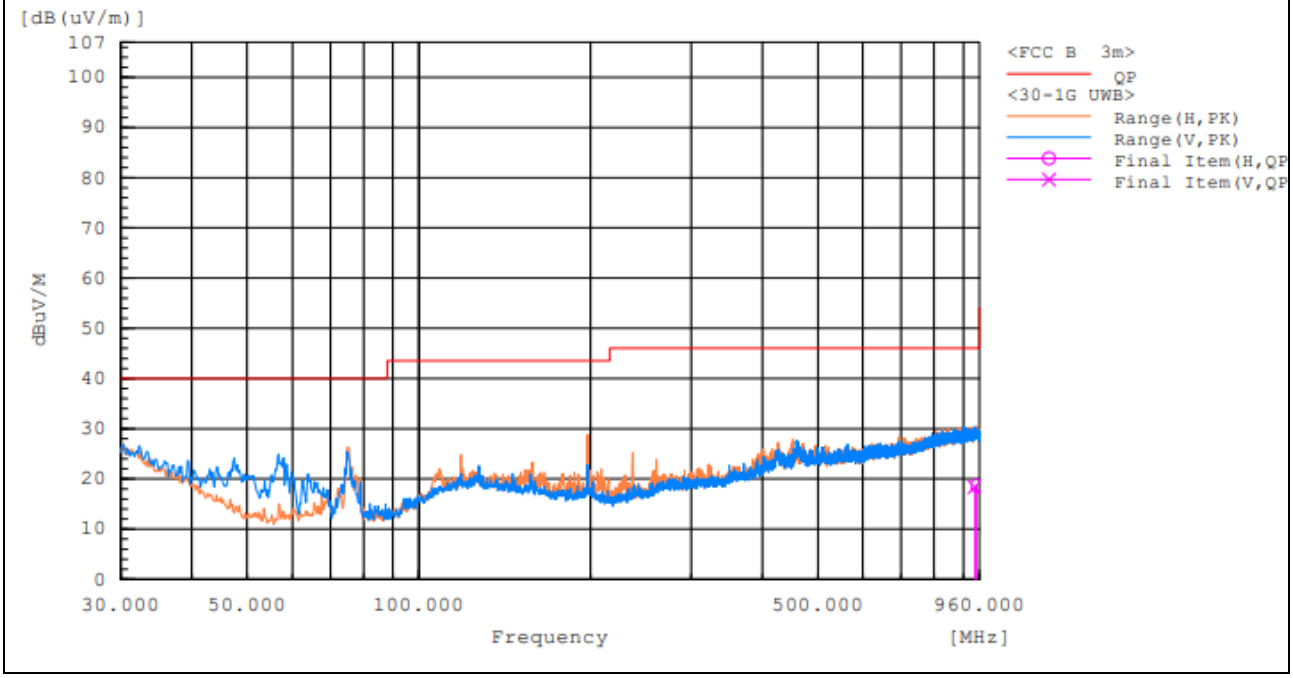
Note(s) :
The worst-case plots are included in this report.

▣ TEST PLOTS

Radiated Spurious Emission 9 kHz – 30 MHz (Antenna Position Bent Over) : PRF 16 MHz (CH1)



Radiated Spurious Emission 30 MHz – 960MHz : PRF 16 MHz (CH1)



Note(s) :
The worst-case plots are included in this report.

9.5. Radiated Emissions Above 960 MHz

Channel	1
Operating Frequency	3 494.4 MHz
Operation Mode	16 MHz

Frequency (MHz)	Polarization	Reading (dBuV)	Factor.[1] (dB)	Level (dBuV/m)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Measurement Type
6 988.93	V	48.96	-	48.96	-46.34	-41.3	5.04	RMS
14 734.04	V	43.20	14.73	28.47	-66.83	-61.3	5.53	RMS

Note(s) :

1. Distance Factor(D.F) = 14.73 dB

Channel	2
Operating Frequency	3 993.6 MHz
Operation Mode	16 MHz

Frequency (MHz)	Polarization	Reading (dBuV)	Factor.[1] (dB)	Level (dBuV/m)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Measurement Type
7 987.42	V	41.58	-	41.58	-53.72	-41.3	12.42	RMS
14 725.25	V	43.79	14.73	29.06	-66.24	-61.3	4.94	RMS

Note(s) :

1. Distance Factor(D.F) = 14.73 dB

Channel	3
Operating Frequency	4 492.8 MHz
Operation Mode	16 MHz

Frequency (MHz)	Polarization	Reading (dBuV)	Factor.[1] (dB)	Level (dBuV/m)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Measurement Type
14 724.81	V	43.8	14.73	29.07	-66.23	-61.3	4.93	RMS

Note(s) :

1. Distance Factor(D.F) = 14.73 dB

Channel 4
Operating Frequency 3 993.6 MHz
Operation Mode 16 MHz

Frequency (MHz)	Polarization	Reading (dBuV)	Factor.[1] (dB)	Level (dBuV/m)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Measurement Type
7 986.92	V	37.01	-	37.01	-58.29	-41.3	16.99	RMS
14 724.81	V	43.67	14.73	28.94	-66.36	-61.3	5.06	RMS

Note(s) :

1. Distance Factor(D.F) = 14.73 dB

Channel 5
Operating Frequency 6 489.6 MHz
Operation Mode 16 MHz

Frequency (MHz)	Polarization	Reading (dBuV)	Factor.[1] (dB)	Level (dBuV/m)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Measurement Type
14 718.21	V	43.7	14.73	28.97	-66.33	-61.3	5.03	RMS

Note(s) :

1. Distance Factor(D.F) = 14.73 dB

Channel 7
Operating Frequency 6 489.6 MHz
Operation Mode 16 MHz

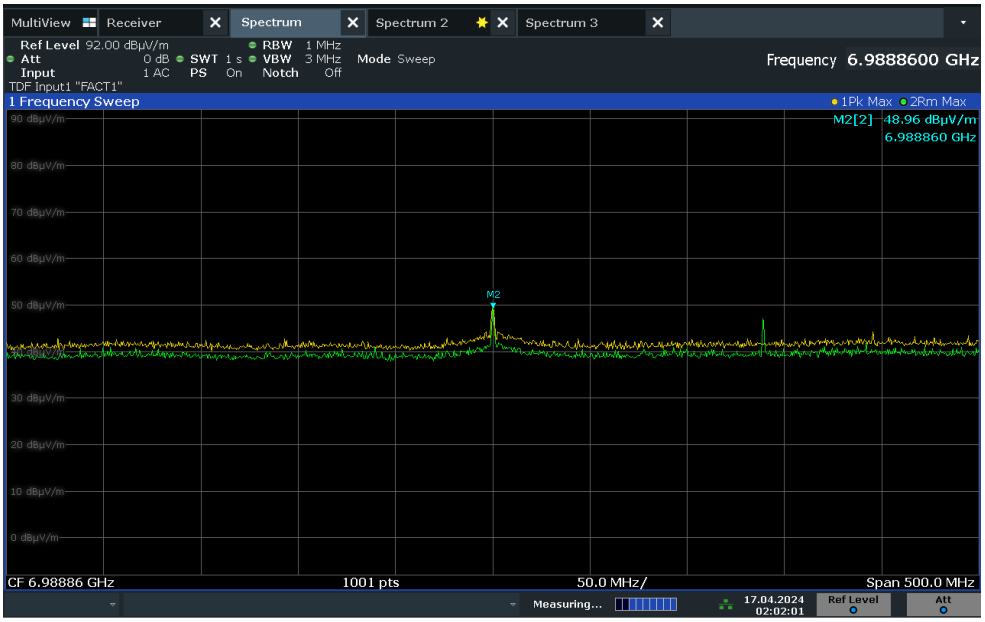
Frequency (MHz)	Polarization	Reading (dBuV)	Factor.[1] (dB)	Level (dBuV/m)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Measurement Type
14 725.25	V	43.79	14.73	29.06	-66.34	-61.3	4.94	RMS

Note(s) :

1. Distance Factor(D.F) = 14.73 dB

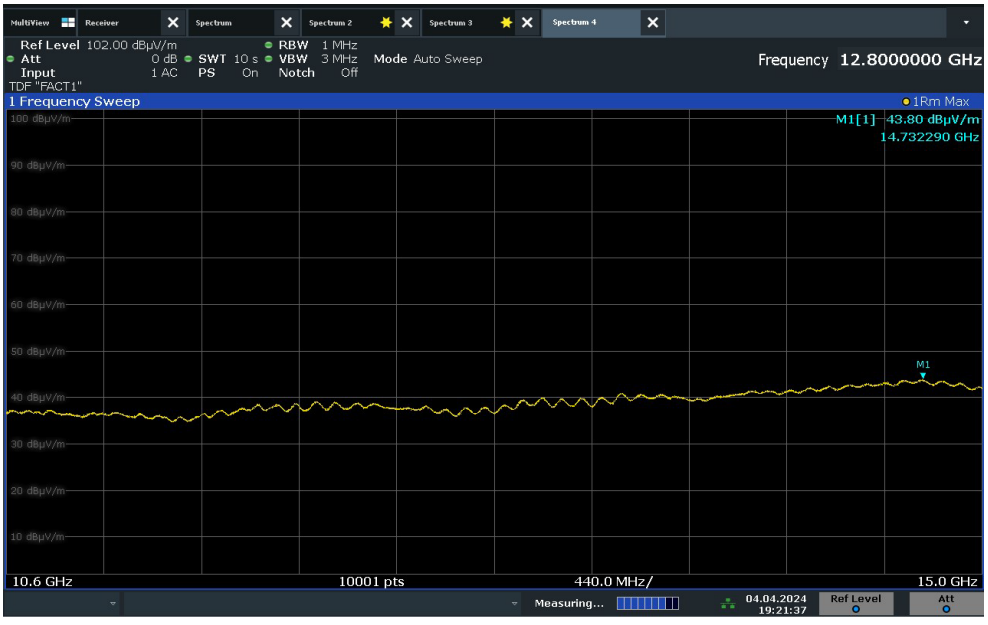
▣ TEST PLOTS

Radiated Spurious Emission below 10 600 MHz : PRF 16 MHz (CH1)



02:02:02 17.04.2024

Radiated Spurious Emission above 10 600 MHz : PRF 16 MHz (CH3)



19:21:37 04.04.2024

Note(s) :
The worst-case plots are included in this report.

9.6. Radiated Emissions in the 1164 MHz - 1240 MHz and 1559 MHz - 1610 MHz GPS Bands

Channel	1
Operating Frequency	3 494.4 MHz
Operation Mode	16 MHz

Frequency (MHz)	Polarization	Reading (dBuV)	Factor (dB)	Total (dBuV/m)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Measurement Type
No major peak found								

Note(s) :

Channel	2
Operating Frequency	3 993.6 MHz
Operation Mode	16 MHz

Frequency (MHz)	Polarization	Reading (dBuV)	Factor (dB)	Total (dBuV/m)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Measurement Type
No major peak found								

Note(s):

Channel	3
Operating Frequency	4 492.8 MHz
Operation Mode	16 MHz

Frequency (MHz)	Polarization	Reading (dBuV)	Factor (dB)	Total (dBuV/m)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Measurement Type
No major peak found								

Note(s) :

Channel 4
Operating Frequency 3 993.6 MHz
Operation Mode 16 MHz

Frequency (MHz)	Polarization	Reading (dBuV)	Factor (dB)	Total (dBuV/m)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Measurement Type
No major peak found								

Note(s) :

Channel 5
Operating Frequency 6 489.6 MHz
Operation Mode 16 MHz

Frequency (MHz)	Polarization	Reading (dBuV)	Factor (dB)	Total (dBuV/m)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Measurement Type
No major peak found								

Note(s) :

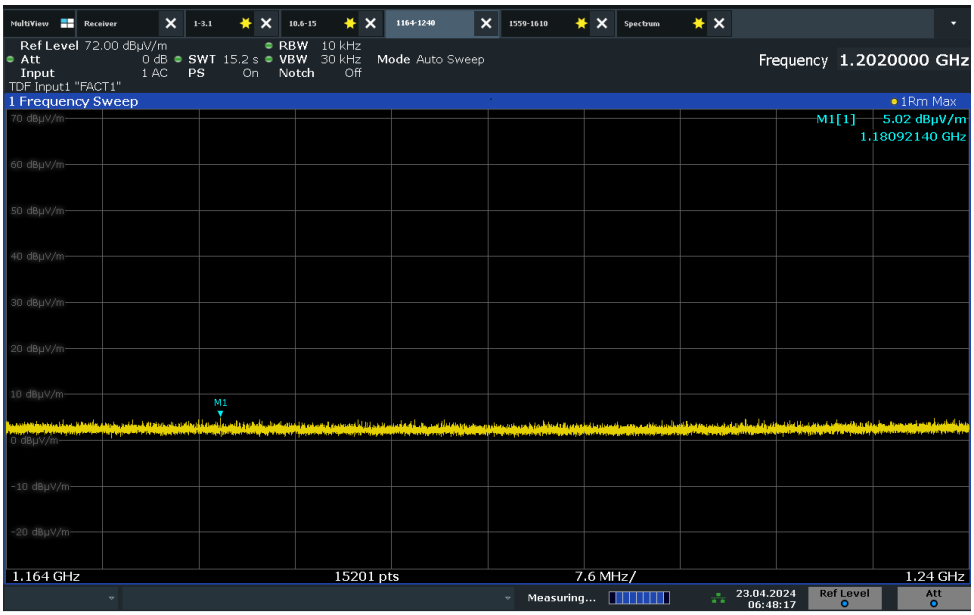
Channel 7
Operating Frequency 6 489.6 MHz
Operation Mode 16 MHz

Frequency (MHz)	Polarization	Reading (dBuV)	Factor (dB)	Total (dBuV/m)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Measurement Type
No major peak found								

Note(s) :

▣ TEST PLOTS

Radiated Spurious Emission 1 164 – 1 240 MHz : PRF 16 MHz (CH2)



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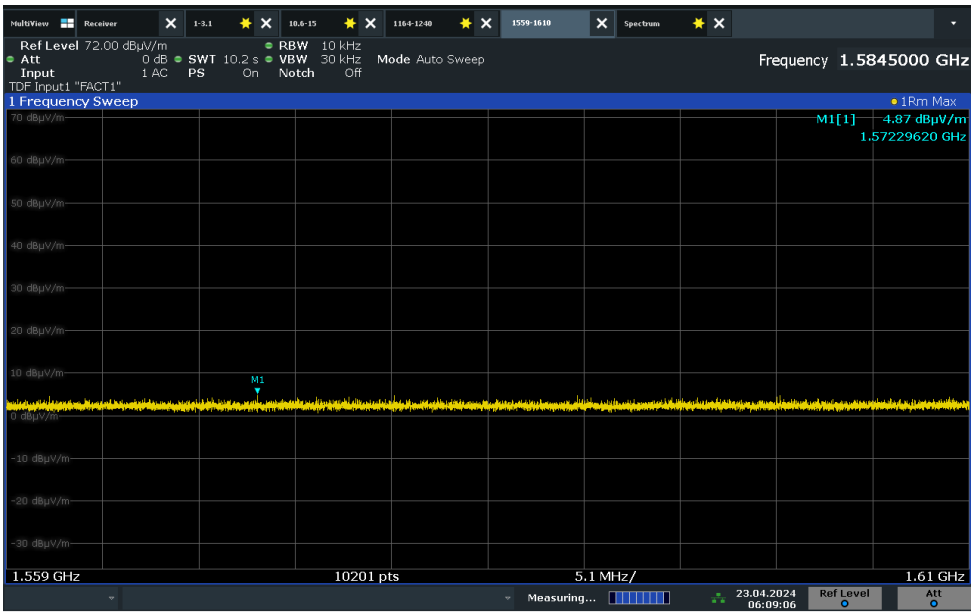
Radiated Spurious Emission 1 559 – 1 610 MHz : PRF 16 MHz (CH4)



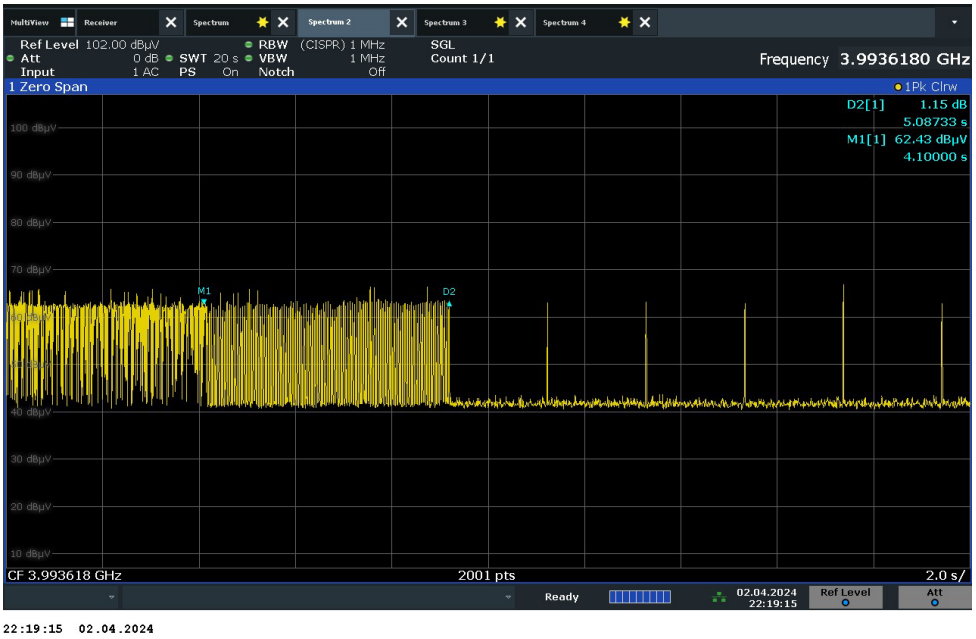
06:09:07 23.04.2024

Note(s) :
The worst-case plots are included in this report.

9.7. Cease Transmission Time

Channel	Channel Availability Check (s)	Limit (s)	Result
1	5.087	≤ 10	Compliant

Cease Transmission Time (CH 1)



Note(s) :

X2 represents the EUT for UWB stop receiving, and 1Δ2 shows the EUT for UWB cease transmitting.

9.8. Powerline Conducted Emissions

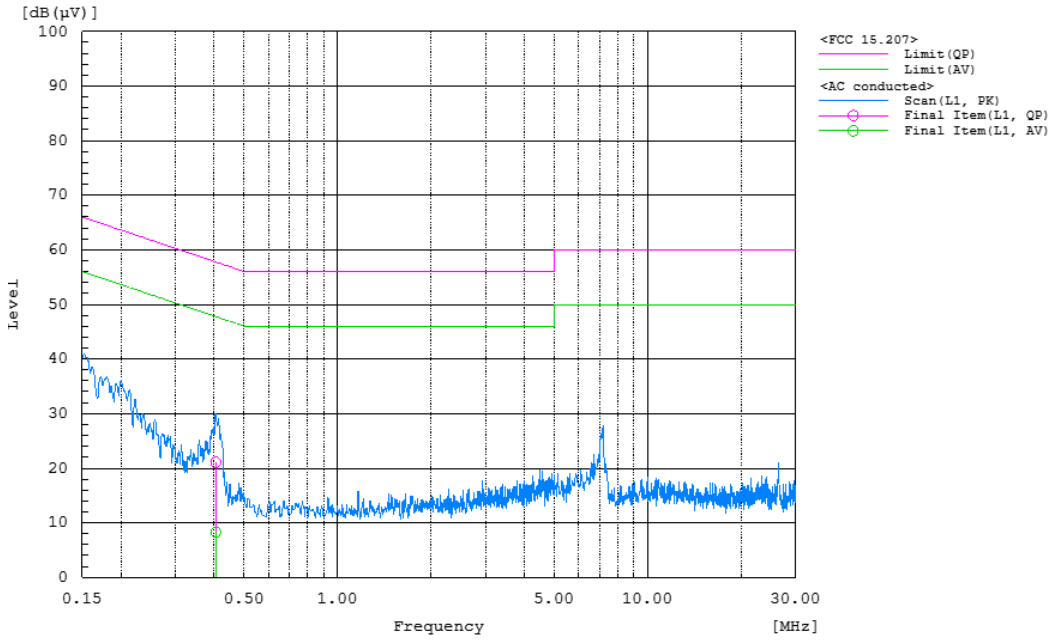
Frequency (MHz)	Line	Reading (dBµV)		Corr. [1)] (dB)	Level (dBµV)		Limit (dBµV)		Margin (dB)	
		QP	CAV		QP	CAV	QP	CAV	QP	CAV
0.404	L1	11.2	-1.6	9.9	21.1	8.3	57.8	47.8	36.7	39.5

Frequency (MHz)	Line	Reading (dBµV)		Corr. [1)] (dB)	Level (dBµV)		Limit (dBµV)		Margin (dB)	
		QP	CAV		QP	CAV	QP	CAV	QP	CAV
0.158	N	21.9	9.4	9.9	31.8	19.3	57.6	47.6	25.8	28.3

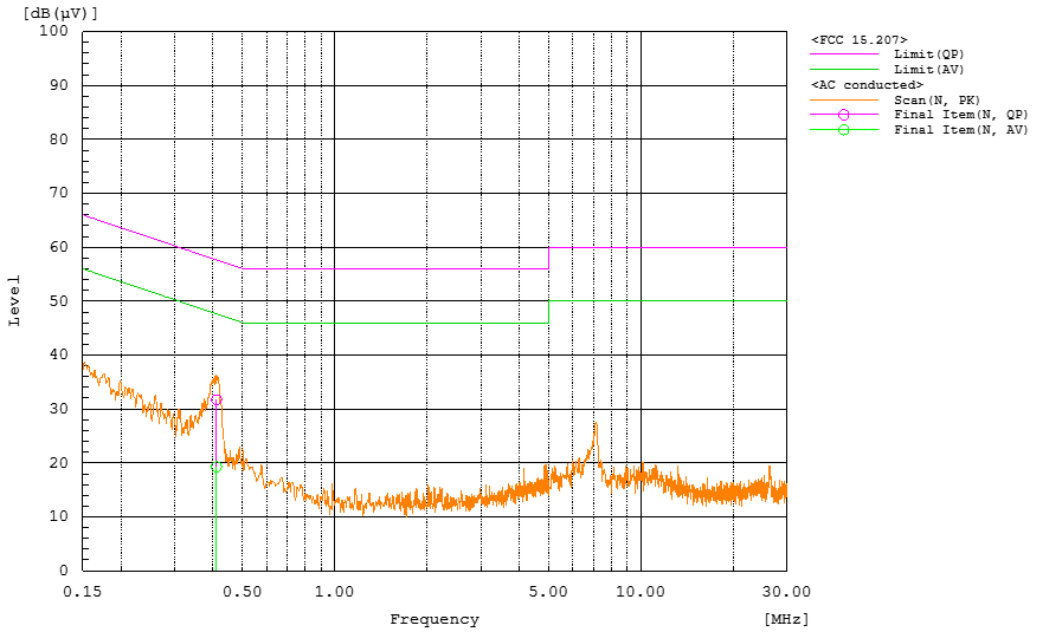
Note(s) :
1. Quasi-peak(Final Result) = Reading Value + Correction Factor

▣ TEST PLOTS

AC Line Conducted Emission (L1)



AC Line Conducted Emission (N)



10. LIST OF TEST EQUIPMENT

No.	Instrument	Model No.	Calibration Due (mm/dd/yy)	Manufacture	Serial No.
☒	Signal Analyzer (1 Hz ~ 40.0 GHz)	ESW44	10/24/2024	Rohde & Schwarz	102015
☒	Signal Analyzer (10 Hz ~ 26.5 GHz)	N9020A	06/30/2024	Keysight	MY52091291
☒	Attenuator (10 dB, DC ~ 26.5 GHz)	8493C 10 dB	09/05/2024	Keysight	89576
☒	Loop Antenna (0.009 ~ 30 MHz)	HLA 6121	09/12/2025	TESEQ	43964
☒	BI-LOG Antenna (30 MHz ~ 6 GHz)	JB6	03/06/2025	Sunol	A071116
☒	Horn Antenna (1 GHz ~ 18 GHz)	DRH-118	10/10/2024	Sunol	A070516
☒	LNA (1 GHz ~ 18 GHz)	PAM-118A	06/01/2024	Com-Power	18040074
☒	Horn Antenna (18 GHz ~ 40 GHz)	DRH-1840	01/20/2025	Sunol	17121
☒	Broadband Horn Antenna (15 GHz ~ 40 GHz)	BBHA 9170	02/01/2026	Schwarzbeck	01342
☒	LNA (18 GHz ~ 40 GHz)	CBL18405045-01	01/05/2025	CERNEX, Inc.	27973
☒	High Pass Filter	WHK10-2520-3000-18000-40EF	11/20/2024	Wainwright	9
☒	EMI Test Receiver	ESR3	12/14/2024	Rohde & Schwarz	102363
☒	LISN	ENV216	01/12/2025	Rohde & Schwarz	101349

Note(s) :

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

APPENDIX A. TEST SETUP PHOTOS

The setup photos are provided as a separate document.

APPENDIX B. PHOTOGRAPHS OF EUT

B.1. EXTERNAL PHOTOS

The external photos are provided as a separate document.

B.2. INTERNAL PHOTOS

The internal photos are provided as a separate document.

END OF TEST REPORT