ETSI Test Report for

EN 300 330 v2.1.1

The RvA is signatory to ILAC - MRA

Product name : Apollo Max with 4G modem

Applicant : Payter B.V.

Test report No. : P000405718 003 Ver 1.00

Laboratory information

Accreditation

Kiwa Nederland B.V. complies with the accreditation criteria for test laboratories as laid down in ISO/IEC 17025:2017. The accreditation covers the quality system of the laboratory as well as the specific activities as described in the authorized annex bearing the accreditation number L248 and is granted by the Dutch Council For Accreditation (RvA: Raad voor Accreditatie).

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The Industry Canada company number for Kiwa Nederland B.V. is: 4173A. The CABID is NL0001.

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Documentation

The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The documentation of the testing performed on the tested devices is archived for 10 years at Kiwa Nederland B.V.

Testing Location

Test Site	Kiwa Nederland B.V.
Test Site location	Wilmersdorf 50 7327 AC Apeldoorn The Netherlands Tel. +31 88998 3393
Test Site FCC	NL0001
CABID	NL0001

Revision History

Version	Date	Remarks	By
v0.50	20-09-2024	First draft	AWM/MHK
v1.00	21-10-2024	Final release	MHK

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Summary of Test results

EN 300 330 v2.1.1	Description	Paragraph	Verdict
Clause 4.3.2	Operating frequency ranges	3.2	Pass
Clause 4.3.3	Modulation bandwidth	3.3	Pass
Clause 4.3.4	Transmitter H-field requirements	3.1	Pass
Clause 4.3.8	Transmitter spurious emissions (9 kHz – 30 MHz)	3.4	Pass
Clause 4.3.9	Transmitter spurious emissions (30 – 1000 MHz)	3.4	Pass

1 General Description

1.1 Applicant

Client name:	Payter B.V.
Address	Rozenlaan 115
Zip code:	3051LP
Country:	Netherlands
Telephone:	+31854012380
E-mail:	l.degelder@payter.nl
Contact name:	Eric van Diggele

1.2 Manufacturer

Manufacturer name:	Payter B.V.
Address:	Rozenlaan 115
Zip code:	3051LP
Country:	Netherlands
Telephone:	+31854012380
E-mail:	m.noordermeer@payter.nl
Contact name:	Marcus Noordermeer

1.3 Tested Equipment Under Test (EUT)

Product name:	Apollo Max with 4G modem
Brand name:	Payter
Product description:	Payment terminal with PIN entry
Batch and/or serial No.	APM.BL.ENG V1-0
Software version:	--
Hardware version:	--
Date of receipt	01-07-2024
Tests started:	21-08-2024
Testing ended:	04-09-2024

1.4 Product specifications of Equipment under test

Tx Frequency:	13.56 MHz
Rx frequency:	13.56 MHz
Antenna type:	--
Type of modulation:	--

1.5 Modification of the Equipment Under Test (EUT)

None.

1.6 Environmental conditions

Test date	21-08-2024	04-09-2024
Ambient temperature	24.5 °C	23.4 %
Humidity	54.6 °C	75.9 %

1.7 Applicable standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- EN 300 330 v2.1.1 (2017)

1.8 Observation and remarks

The manufacturer provided test mode firmware to set the EUT to transmit or receive continuously. The EUT contains a pre-certified NFC module.

1.9 Conclusions

The sample of the product showed **NO NON-COMPLIANCES** to the specifications stated in paragraph 1.7 of this report.

The results of the test as stated in this report, are exclusively applicable to the product items as identified in this report. Kiwa Netherland B.V. accepts no responsibility for any properties of product items in this test report, which are not supported by the tests as specified in paragraph 1.7 *"Applicable standards".*

All tests are performed by:

Name : ing. Maaz H. Khan.
: ing. A. Mostert

Review of test report by:

Name : ing R. van Barneveld

Review of test methods by:

Date : 22-10-2024

Name : P. van Wanrooij

Function : Test Engineer

Signature :

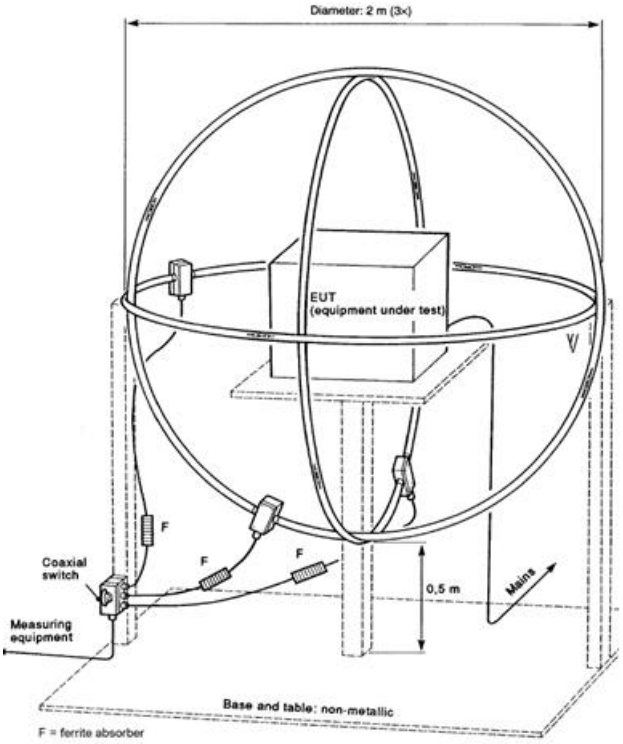
2 Test configuration of the Equipment Under Test

2.1 Test mode

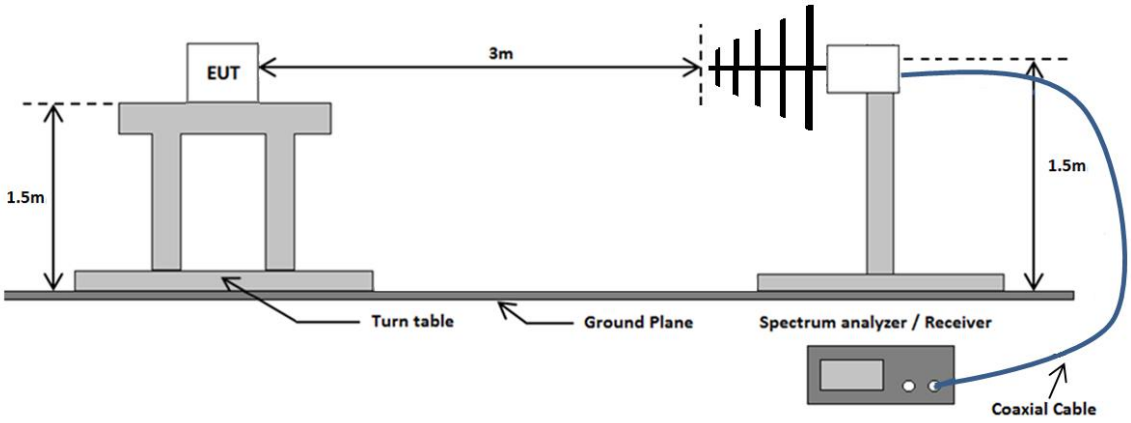
The applicant provided test mode firmware for the EUT, in which it was possible to configure the EUT to transmit continuously.

2.2 Radiated Test setup

Radiated emissions test setup below 30 MHz



Radiated emissions test setup 30 MHz - 1 GHz



2.3 Equipment used in the test configuration

Description	Manufacturer	Model	ID	Used at Par.
Spectrum Analyzer	Rohde & Schwarz	ESR7	114534	3.1 to 3.3
Triple loop antenna	Schwarzbeck	HXYZ 9170	114366	3.1 to 3.3

Nyquist

Description	Manufacturer	Model	ID	Used at Par.
Anechoic room	ETS Lindgren	FRIIS	114872	3.4
Spectrum analyzer	Rohde & Schwarz	FSV3044	114871	3.4
Preamplifier 25 - 1000 MHz	Schwarzbeck	BBV 9745	114138	3.4
Antenna 25 - 1000 MHz	Chase	CBL 6111	114763	3.4
Armored blue cable inside room	Huber+Suhner	Sucoflex 118	--	3.4
Blue cable outside room	Huber+Suhner	Sucoflex 101	--	3.4

3 Test results

3.1 Transmitter carrier output levels (H-field)

3.1.1 Limit

Frequency (MHz)	Limit (dBuA/m) at 10m
13.553≤ f ≤ 13.567	60

3.1.2 Measurement instruments

The measurement instruments are listed in chapter 2.3 of this report.

3.1.3 Test setup

The test setup is as shown in chapter 2.2 of this report.

3.1.4 Test procedure

According to EN 300 330 v2.1.1, clause 6.2.4, extreme conditions according to Clause 5.6
IRN 410 Radiated magnetic disturbance – Method 2 LAS meetopstelling

3.1.5 Test results

Temperature	Voltage	Max Field strength at 10m (dBµA/m)
25°C	230 VAC	7.85
Uncertainty		+3.0 / -2.5 dB

3.2 Occupied Frequency Range

3.2.1 Limit

According to EN 300 330 v2.1.1, Clause 4.3.4

3.2.2 Measurement instruments

The measurement instruments are listed in chapter 2.3 of this report.

3.2.3 Test setup

The test setup is as shown in chapter 2.2 of this report.

3.2.4 Test procedure

According to EN 300 330 v2.1.1, Clause 6.2.2.2
IRN 404 Occupied bandwidth – Method 1 99% power bandwidth

3.2.5 Test results

Permitted range of frequencies:
The operating frequencies must fall within the limit: 13.553 ≤ f ≤ 13.567 MHz

Occupied frequency ranges:

Temperature	Voltage	Lower frequency (MHz)	Upper frequency (MHz)
25°C	230 VAC	13.5595	13.5634
Uncertainty		±1 kHz	

3.3 Modulation bandwidth

3.3.1 Limit

Spectrum mask limit I-4 according to EN 300-330 v2.1.1, Annex I.

3.3.2 Measurement instruments

The measurement instruments are listed in chapter 2.3 of this report.

3.3.3 Test setup

The test setup is as shown in chapter 2.2 of this report.

3.3.4 Test procedure

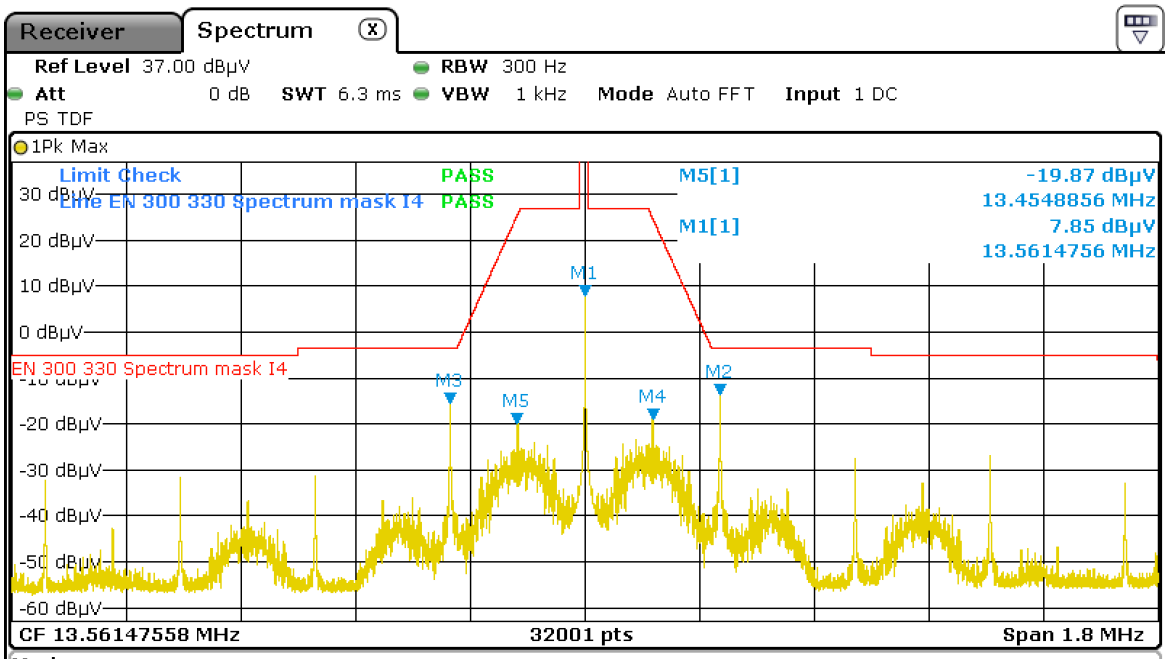
According to EN 300 330 v2.1.1, clause 6.2.3
IRN 409 – Method 1

3.3.5 Measurement uncertainty

The reported uncertainty is: +3.0/-2.5 dB

3.3.6 Plots

Under normal conditions (25°C and 230 VAC)



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	13.5614756 MHz	7.85 dBµV		
M2		1	13.7733626 MHz	-13.72 dBµV		
M3		1	13.3495886 MHz	-15.42 dBµV		
M4		1	13.6680098 MHz	-18.97 dBµV		
M5		1	13.4548856 MHz	-19.87 dBµV		

Notes:

- dBµV reads as dBµA/m

3.4 Transmitter Radiated Spurious Emissions

3.4.1 Limit

Frequency (MHz)	Limit (dBuA/m)
0.009 to 10	27 at 9 kHz descending 3 dB/oct
10 to 30	-3.5

Frequency (MHz)	Limit (nW)
47 to 74	4 (-54 dBm)
87,5 to 118	
174 to 230	
470 to 790	
Other frequencies between 30 – 1000 MHz	250 (-36 dBm)

3.4.2 Measurement instruments

The measurement instruments are listed in chapter 2.3 of this report.

3.4.3 Test setup

The test setup is as shown in chapter 2.2 of this report.

3.4.4 Test procedure

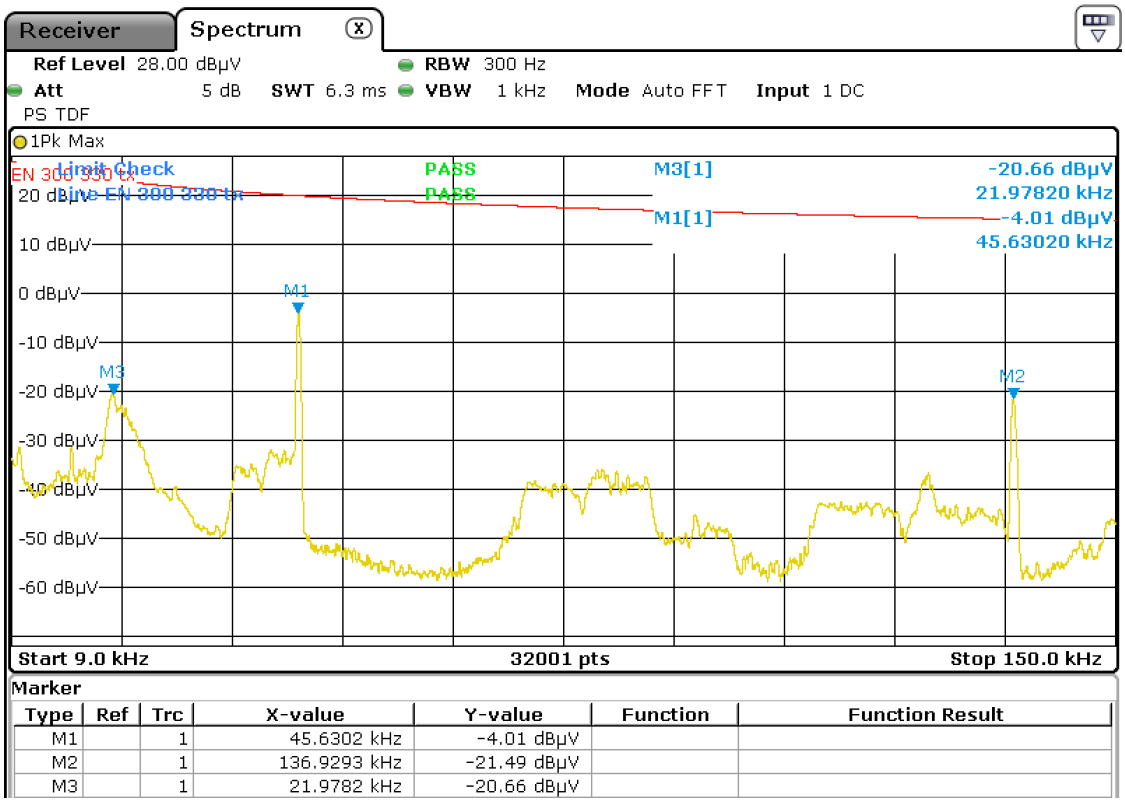
According to EN 300 330 v2.1.1, clause 6.2.8 and 6.2.9.

3.4.5 Measurement Uncertainty

Frequency	Uncertainty
0.150 – 30 MHz	+3.0 / -2.5 dB
30 – 1000 MHz	+3.6 / -3.6 dB

3.4.6 Plots of the Transmitter Spurious Emissions Measurement, transmitter powered on

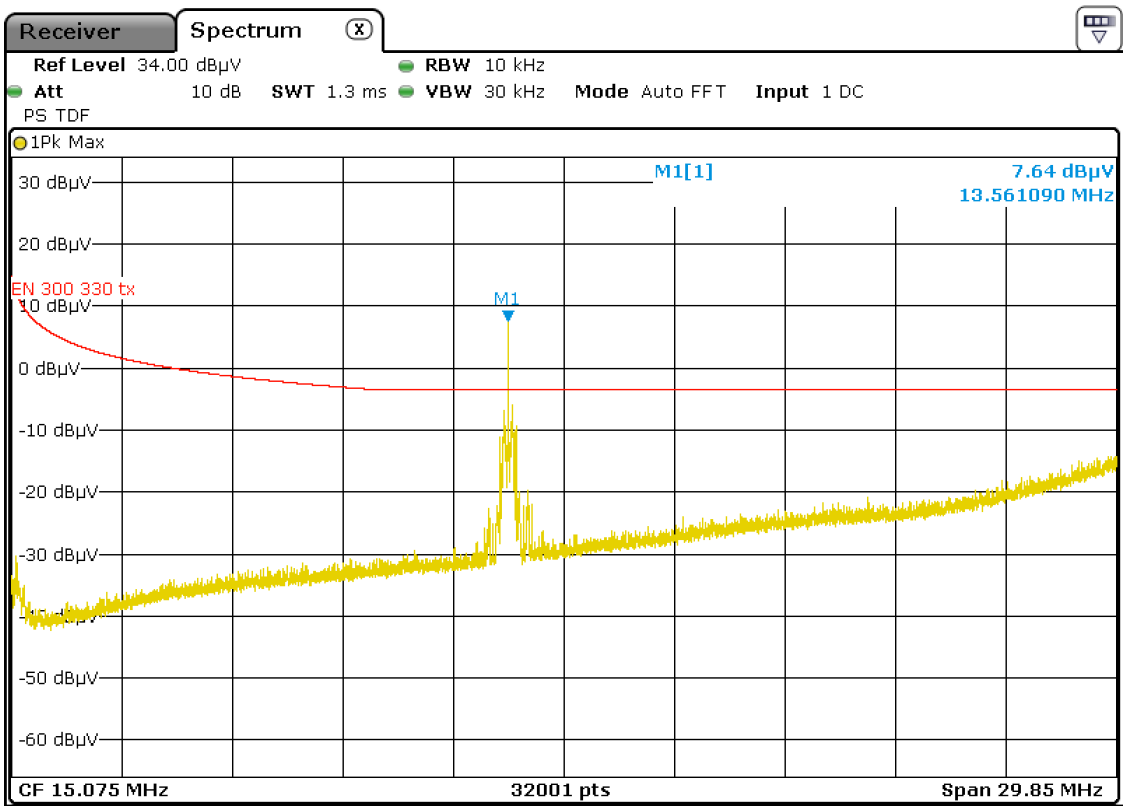
9 – 150 kHz



Marker

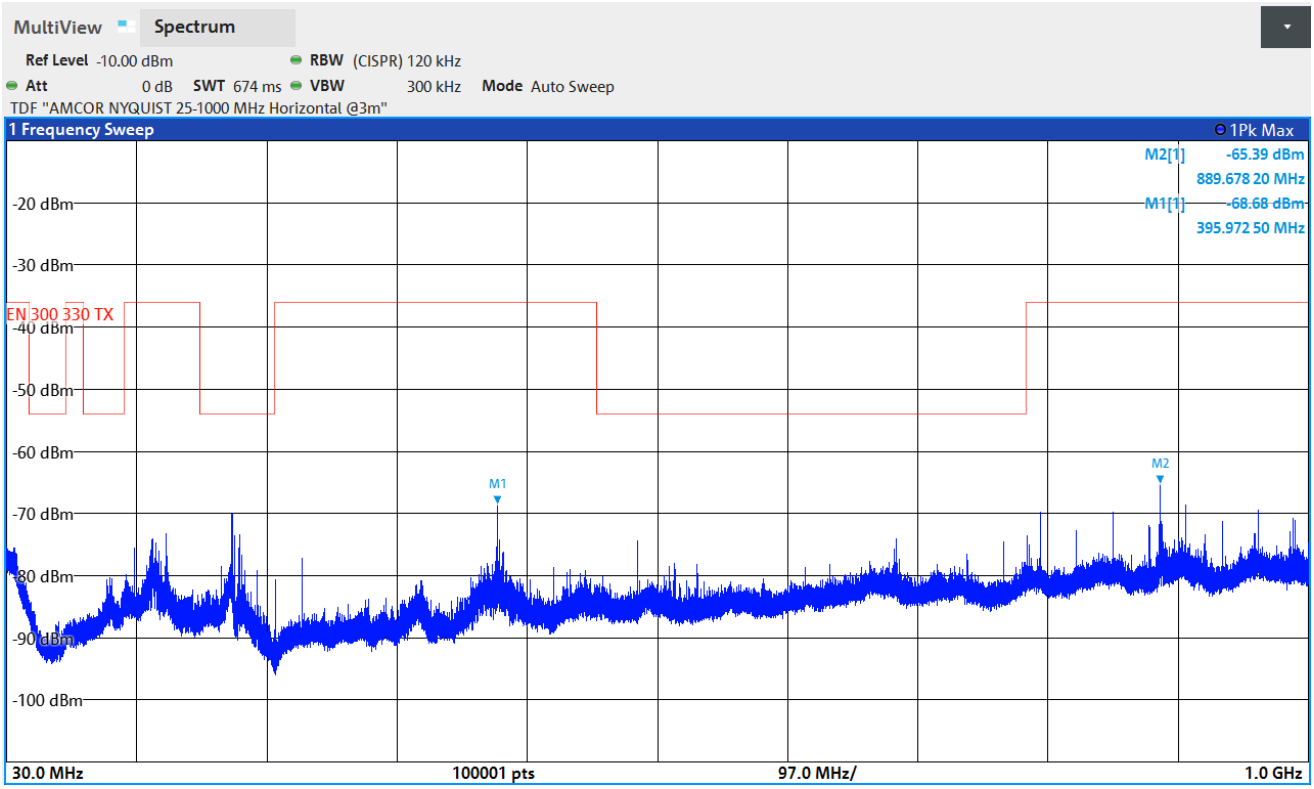
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	45.6302 kHz	-4.01 dBµV		
M2		1	136.9293 kHz	-21.49 dBµV		
M3		1	21.9782 kHz	-20.66 dBµV		

150 kHz – 30 MHz

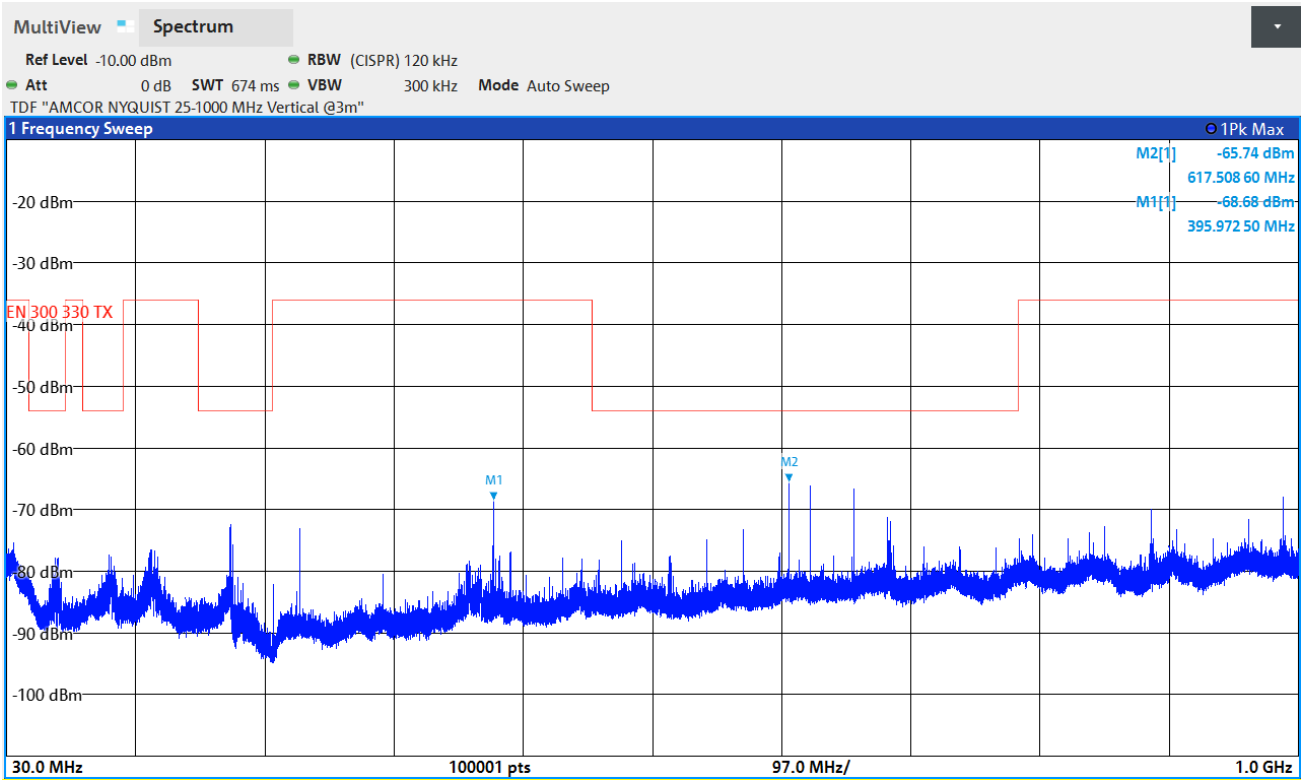


Note: The peak at 13,56 MHz is the carrier frequency and is not subject to the spurious emissions limit.

30-1000 MHz, Horizontal



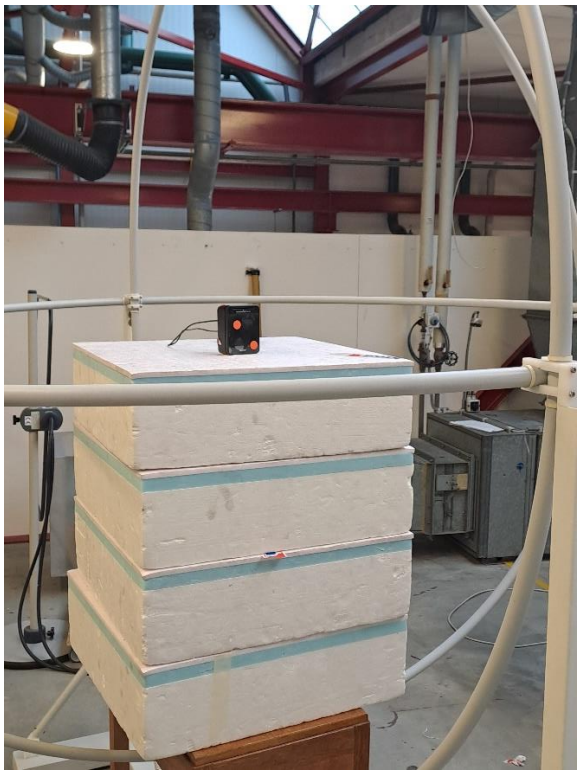
30-1000 MHz, Vertical



4 Photo module

4.1 Test setups

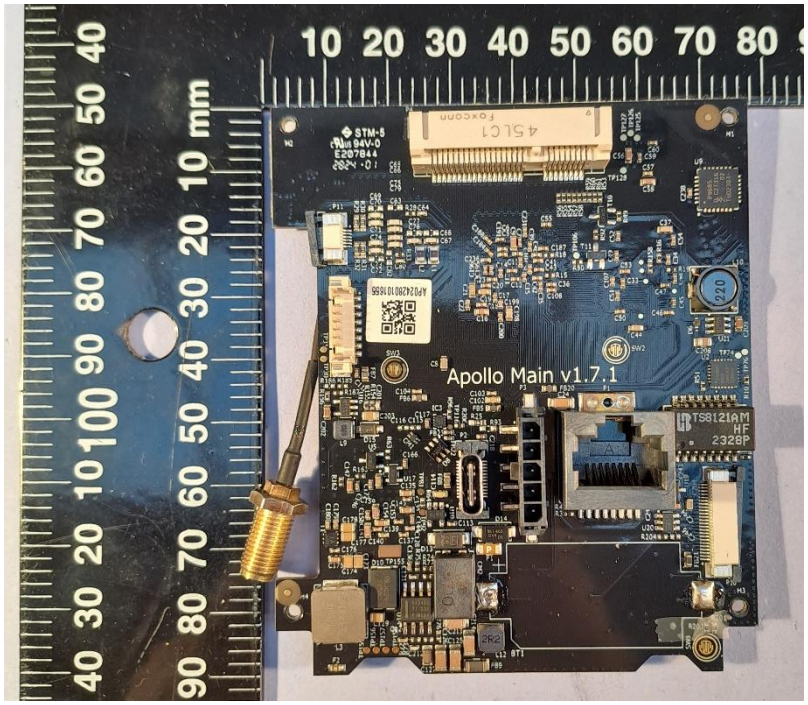
9 kHz – 30 MHz



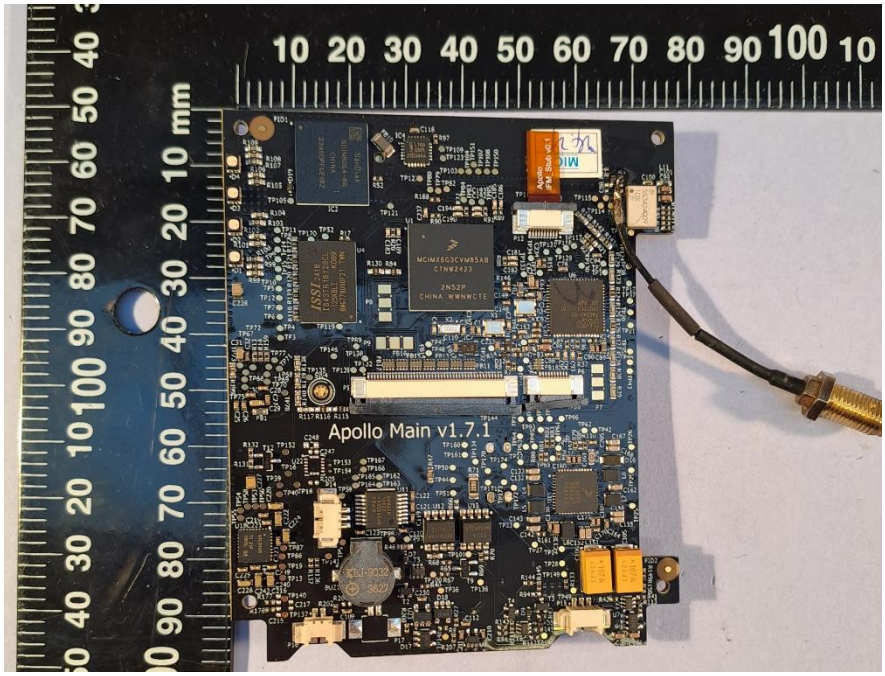
30 – 1000 MHz

4.2 EUT photos

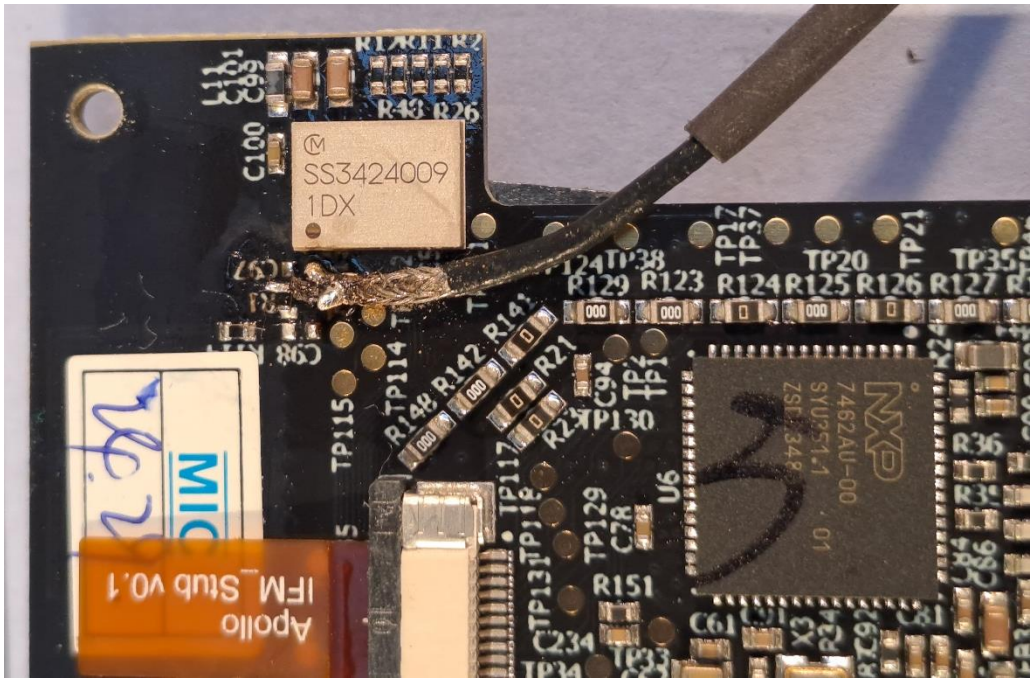
Board top



Board bottom

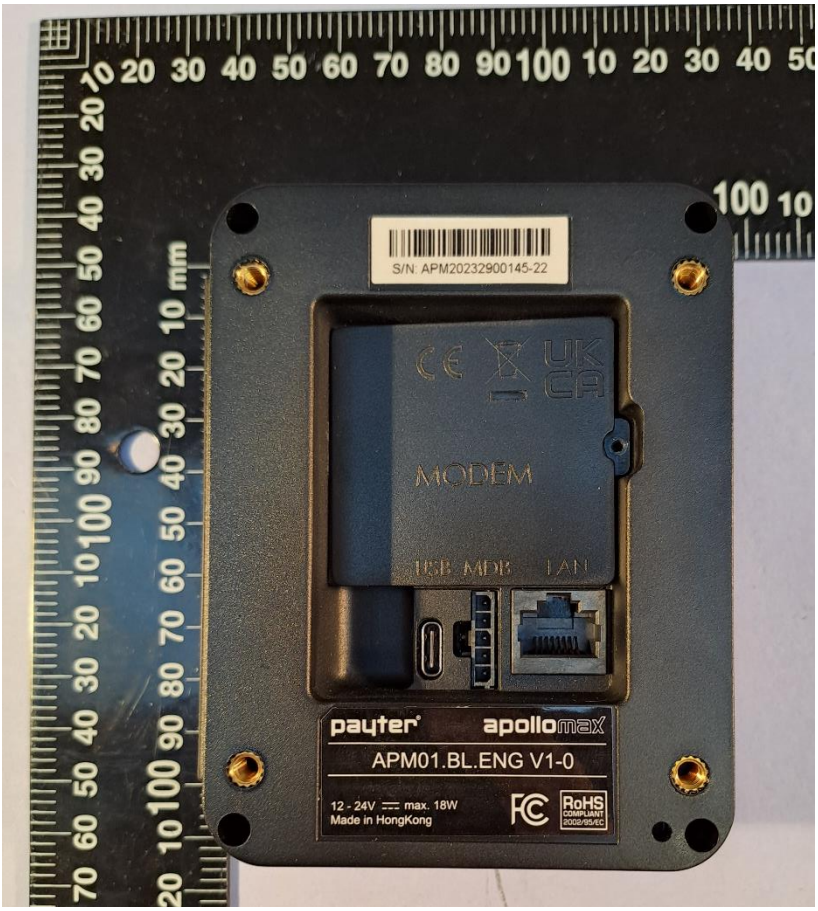


802.11b Rransceiver



EUT Top

EUT Back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