DEKRA Testing and Certification, S.A.U.
Parque Tecnológico de Andalucía,
c/ Severo Ochoa nº 2 · 29590 Campanillas · Málaga · España
C.I.F. A29507456

ISED CABid: ES1909
Lab. Company Number: 4621A

Test Report No:
77595RRF.001

Partial Test Report

USA FCC Part 22, Part 24, Part 27
CANADA RSS-132, RSS-133, RSS-139, RSS-199

(*) Identification of item tested	CPAP Device
(*) Trademark	ResMed
(*) Model and/or type reference	28330
(*) Derived model not tested	28541, 28542, 28405
Other identification of the product	FCC ID: 2ACHL-AIR104GU IC: 9103A-AIR104GU
(*) Features	4G, 3G, 2G HW version: R379-7135 SW version: SX558
Applicant	ResMed Pty Ltd 1 Elizabeth Macarthur Drive, Bella Vista, NSW, 2153, Australia
Test method requested, standard	USA FCC Part 22 (10-1-21 Edition). USA FCC Part 24 (10-1-21 Edition). USA FCC Part 27 (10-1-21 Edition). CANADA RSS-132 Issue 4, January 2023. CANADA RSS-133 Issue 6, January 2018 Amendment 1. CANADA RSS-139 Issue 4 September 2022, Amendment October 2022. CANADA RSS-199 Issue 3, December 2016. ANSI C63.26-2015. KDB 971168 D01 Power Meas License Digital Systems v03r01, April. 2018.
Approved by (name / position & signature)	José Manuel Gómez Galván EMC Consumer & RF Lab. Manager Firmado digitalmente por 53680346W JOSE MANUEL GOMEZ (C:A29507456)
Date of issue	2024-02-22
Report template No	FDT08_24 (*) "Data provided by the client"

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Competences and guarantees

DEKRA Testing and Certification S.A.U. is a testing laboratory accredited by the National Accreditation Body (ENAC - Entidad Nacional de Acreditación) to perform the tests indicated in the Certificate No. 51/LE 147.

DEKRA Testing and Certification is an FCC-recognized accredited testing laboratory with appropriate scope of accreditation that covers the performed tests in this report.

DEKRA Testing and Certification is an ISED-recognized accredited testing laboratory, CABid: ES1909, Company Number: 4621A, with the appropriate scope of accreditation that covers the performed tests in this report.

In order to assure the traceability to other national and international laboratories, DEKRA Testing and Certification S.A.U. has a calibration and maintenance program for its measurement equipment.

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The results presented in this Test Report apply only to the particular item under test established in this document.

General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
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Uncertainty

Uncertainty (factor k=2) was calculated according to the DEKRA Testing and Certification S.A.U. internal document PODT000.

Data provided by the client

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested").
2. The sample of the model 28330 is a CPAP device with integrated cellular connectivity.
3. Derived models not tested. These models have been declared by the supplier of the sample as being the same as the model under test.

ResMed
Changing lives with every breath

Date: 05-Feb-2024

DECLARATION OF EQUIVALENCE

This document declares that the following designated products are equivalent to the u under test **28330.**

Model Name / Product Code	Marketing Name
28541	AirCurve 10 ST-A
28542	AirCurve 10 ST-A
28405	AirCurve 10 ST-A

All the above stated products have the same cellular hardware and firmware.

Applicant:
Company Name: ResMed Pty Ltd
Address: 1 Elizabeth Macarthur Drive,
Bella Vista NSW 2153
Australia

By,

Christopher Jenkins
Title: Manager – Systems Engineering
Company: ResMed Pty Ltd
Telephone: +61 2 8884 1517
e-mail: Christopher.jenkins@resmed.com.au

Usage of samples

Samples undergoing test have been selected by: The client.

- Sample S/01 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
77595B/007	CPAP Device	28330	22232884595	13-12-2023
77595B/010	AC/DC Adapter	370006	-	13-12-2023
77595B/011	Power Cord AC/DC (USA)	-	-	13-12-2023

Sample S/01 has undergone the following test(s): The radiated tests indicated in Appendix A.

Test sample description

Ports……:	Port name and description		Cable: Specified max length [m]	Cable: Attached during test	Cable: Shielded	Cable: Coupled to patient(3)	
	Power (PSU 370006)			☒	☐	☐	
Supplementary information to the ports……:	-						
Rated power supply ..... :	Voltage and Frequency		Reference poles: L1	L2	L3	N	PE
	☒	AC: 100–240V, 50–60Hz 1.0–1.5A	☐	☐	☐	☐	☐
	☒	AC: 115V, 400Hz 1.5A, (aircraft)	☐	☐	☐	☐	☐
	☒	DC: 24V, 90W (DC-DC Converter)					
Rated Power..... :	53W (57VA) - Typical, 104W (108VA) – Peak						
Clock frequencies..... :	N/A						
Other parameters ..... :	-						
Software version..... :	SX558						
Hardware version ..... :	R379-7135						
Dimensions in cm (W x H x D) ... :	255 mm X 116 mm X 150 mm						
Mounting position ..... :	☒	Table top equipment					
	☐	Wall/Ceiling mounted equipment					
	☐	Floor standing equipment					
	☐	Hand-held equipment					
	☐	Other:					
Modules/parts..... :	Module/parts of test item		Type	Manufacturer			
	Cellular Module (4G, 3G, 2G)		LARA-R6001	u-blox			
Accessories (not part of the test item) ..... :	Description		Type	Manufacturer			
	-		-	-			
Documents as provided by the applicant..... :	Description		File name	Issue date			
	-		-	-			

(3) Only for Medical Equipment

Identification of the client

ResMed Pty Ltd

1 Elizabeth Macarthur Drive, Bella Vista, NSW, 2153, Australia

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2023-12-19
Date (finish)	2024-02-08

Document history

Report number	Date	Description
77595RRF.001	2024-02-22	First release.

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 20 % Max. = 75 %

In the semianechoic chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 20 % Max. = 75 %

Remarks and comments

The tests have been performed by the technical personnel: Sergio Carrasco and Pablo Redondo.

Used instrumentation:

Control No.	Equipment	Next Calibration
06496	Horn Antenna 1-18 GHz SCHWARZBECK MESS-ELEKTRONIK BBHA 9120 D	2026-12
03541	Hybrid Bilog Antenna 30MHz-6GHz SUNOL SCIENCES CORPORATION JB6	2024-11
03783	RF Preamplifier G>30dB, 1-18GHz BONN ELEKTRONIK BLMA 0118-3A	2025-02
06144	RF Preamplifier 40 dB, 10 MHz - 6 GHz BONN ELEKTRONIK BLNA 0160-01N	2024-07
04716	Signal and Spectrum Analyzer 2 Hz - 50 GHz ROHDE AND SCHWARZ FSW50	2024-08
06791	Semianechoic Absorber Lined Chamber ETS LINDGREN FACT 3 200 STP	N/A
06792	Shielded Room ETS LINDGREN S101	N/A
04804	Wideband Radio Communication Tester ROHDE AND SCHWARZ CMW500	2024-03
07760	Digital Multimeter FLUKE 175	2024-11
04609	AC Power Supply CHROMA 6490	N/A
04657	Horn Antenna 18-40 GHz SCHWARZBECK MESS-ELEKTRONIK BBHA 9170	2026-06
08856	Pre-Amplifier G>30dB 17-40GHz BONN ELEKTRONIK BLMA 1840-4A	2025-01
09227	Wideband Radio Communication Tester ROHDE AND SCHWARZ CMW500	2024-07
04848	EMC/RF Testing SW ROHDE AND SCHWARZ EMC32	N/A

Testing verdicts

Not applicable:	N/A
Pass:	P
Fail:	F
Not measured:	N/M

Summary

FCC 22 / RSS-132 PARAGRAPH		
Requirement – Test case	**Verdict**	**Remark**
Clause 22.913/RSS-132 Clause 5.4: RF Output Power	N/M	(1)
Clause 2.1047/RSS-132 Clause 5.2: Modulation Characteristics	N/M	(1)
Clause 22.355/RSS-132 Clause 5.3: Frequency Stability	N/M	(1)
Clause 2.1049: Occupied Bandwidth	N/M	(1)
Clause 22.917/RSS-132 Clause 5.5: Spurious Emissions at Antenna Terminals	N/M	(1)
Clause 22.917/RSS-132 Clause 5.5: Radiated Emissions	P*	(2)
Supplementary information and remarks: (1) Test not requested. (2) Tests performed only in the worst channel		

FCC 24 / RSS-133 PARAGRAPH		
Requirement – Test case	**Verdict**	**Remark**
Clause 24.232/RSS-133 Clause 6.4: RF output power	N/M	(1)
Clause 2.1047/RSS-133 Clause 6.2: Modulation characteristics	N/M	(1)
Clause 24.235/RSS-133 Clause 6.3: Frequency stability	N/M	(1)
Clause 2.1049: Occupied Bandwidth	N/M	(1)
Clause 24.238/RSS-133 Clause 6.5: Spurious emissions at antenna terminals	N/M	(1)
Clause 24.238/RSS-133 Clause 6.5: Radiated emissions	P*	(2)
Supplementary information and remarks: (1) Test not requested. (2) Tests performed only in the worst channel		

FCC 27 / RSS-199 PARAGRAPH			
Requirement – Test case		**Verdict**	**Remark**
FCC 27.50 / RSS-199 4.4.	RF Output Power	N/M	(1)
FCC 2.1047 / RSS-199 4.1.	Modulation Characteristics	N/M	(1)
FCC 27.54 / RSS-199 4.3.	Frequency Stability	N/M	(1)
FCC 2.1049	Occupied Bandwidth	N/M	(1)
FCC 27.53 / RSS-199 4.5	Spurious Emissions at Antenna Terminals	N/M	(1)
FCC 27.53 / RSS-199 4.5	Radiated Emissions	P*	(2)

Supplementary information and remarks:

(1) Test not requested.

(2) Tests performed only in the worst channel

Appendix A: Test results for FCC 22, 24, 27 / RSS-132, RSS-133, RSS-199

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TEST CONDITIONS

(*): Declared by the Applicant.

POWER SUPPLY (*):

Vnormal: 24 Vdc
Type of Power Supply: AC-DC Adapter

ANTENNA GAIN (*):

Bands	Gain (dBi)	Type
2G 850	1.71	Taoglas (Ceramic SMT) antenna integrated onto the PCBA
2G 1900	3.03	Taoglas (Ceramic SMT) antenna integrated onto the PCBA
LTE 41	2.69	Taoglas (Ceramic SMT) antenna integrated onto the PCBA

TEST FREQUENCIES (*):

The device supports bands for 2G, 3G and LTE. The testing was requested only for the worst case accordingly to a preliminary test of the RF Output power.

The worst case in the range <1GHz is:

2G Band 850 MHz:

GPRS and EDGE modulations:

Low Channel (128): 824.2 MHz
Middle Channel (190): 836.6 MHz
High Channel (251): 848.8 MHz

The worst in the range between 1GHz and 2GHz is:

2G Band 1900 MHz:

GPRS and EDGE modulations:

Low Channel (512): 1850.2 MHz
Middle Channel (662): 1880.2 MHz
High Channel (810): 1909.8 MHz

The worst in the range > 2GHz is:

LTE Band 41. QPSK and 16QAM modulations:

	Channel (Frequency)			
	BW = 5 MHz	BW = 10 MHz	BW = 15 MHz	BW = 20 MHz
Low	39675 (2498.50 MHz)	39700 (2501.00 MHz)	39725 (2503.50 MHz)	39750 (2506.00 MHz)
Middle	40620 (2593.00 MHz)	40620 (2593.00 MHz)	40620 (2593.00 MHz)	40620 (2593.00 MHz)
High	41565 (2687.50 MHz)	41540 (2685.00 MHz)	41515 (2682.50 MHz)	41490 (2680.00 MHz)

Radiated emissions

Limits

1. 2G 850. FCC § 2.1051 and § 22.917 / RSS-132 5.5.

FCC § 2.1051 and § 22.917:

> The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.
>
> Compliance with these rules is based on the use of measurement instrumentation employing a reference bandwidth as follows:
>
> In the spectrum below 1 GHz, instrumentation should employ a reference bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

RSS-132. 5.5:

Mobile and base station equipment shall comply with the limits in (i) and (ii) below.

i. In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10 P (watts).
ii. After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10 P (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

2. 2G 1900. FCC § 2.1051 and § 24.238 / RSS-133 6.5.

FCC §2.1051 and §24.238 / RSS-133 6.5.

> The power of emissions shall be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. P in watts.
>
> Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater.

At Po transmitting power, the specified minimum attenuation becomes 43+10 log (Po), and the level in dBm relative to Po becomes:

Po (dBm) - [43 + 10 log (Po in mW) - 30] = -13 dBm

3. LTE Band 41. FCC §2.1053 & §27.53 (m) (4) / RSS-199 Clause 4.5 (b).

FCC §27.53 (m) (4):

> For BRS and EBS stations, the power of any emissions outside the licensee's frequency bands of operation shall be attenuated below the transmitter power (P) measured in watts in accordance with the standards below. If a licensee has multiple contiguous channels, out-of-band emissions shall be measured from the upper and lower edges of the contiguous channels.
>
> > (4) For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service

licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

RSS-199 Clause 4.5 (b):

In the 1 MHz band immediately outside and adjacent to the channel edge, the unwanted emission power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth for base station and fixed subscriber equipment, and 2% for mobile subscriber equipment. Beyond the 1 MHz band, a resolution bandwidth of 1 MHz shall be used. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz, or 1% or 2% of the occupied bandwidth, as applicable.

Equipment shall comply with the following unwanted emission limits:

(b) for mobile subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least:

i. 40 + 10 log10 p from the channel edges to 5 MHz away
ii. 43 + 10 log10 p between 5 MHz and X MHz from the channel edges, and
iii. 55 + 10 log10 p at X MHz and beyond from the channel edges

In addition, the attenuation shall not be less than 43 + 10 log10 p on all frequencies between 2490.5 MHz and 2496 MHz, and 55 + 10 log10 p at or below 2490.5 MHz.
In (b), p is the transmitter power measured in watts and X is 6 MHz or the equipment occupied bandwidth, whichever is greater.

LTE Band 41 MEASUREMENT LIMIT:

On all frequencies between the channel edge and 5 megahertz from the channel edge:
At Po transmitting power, the specified minimum attenuation becomes 40+10 log (Po), and the level in dBm relative Po becomes:

Po (dBm) – [40 + 10 log (Po in mwatts) - 30] = -10 dBm

On all frequencies between 5 megahertz and X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section; and between 2490.5 MHz and 2496 MHz:
At Po transmitting power, the specified minimum attenuation becomes 43+10 log (Po), and the level in dBm relative Po becomes:

Po (dBm) – [43 + 10 log (Po in mwatts) - 30] = -13 dBm

On all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section; and below 2490.5 MHz:
At Po transmitting power, the specified minimum attenuation becomes 55+10 log (Po), and the level in dBm relative Po becomes:

Po (dBm) – [55 + 10 log (Po in mwatts) - 30] = -25 dBm

Method

The measurement was performed with the EUT inside an anechoic chamber. The spectrum was scanned from 30 MHz to at least the 10th harmonic of the highest frequency generated within the equipment.

The EUT was placed on a 1 meter high non-conductive stand at a 3 meter distance from the measuring antenna. Detected emissions were maximized at each frequency by rotating the EUT and adjusting the height and polarization of the measuring antenna. The maximum meter reading was recorded.

Measurement Limit:

According to specification, the power of emissions shall be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB, P in watts.

At Po transmitting power, the specified minimum attenuation becomes 43+10log (Po), and the level in dBm relative Po becomes:

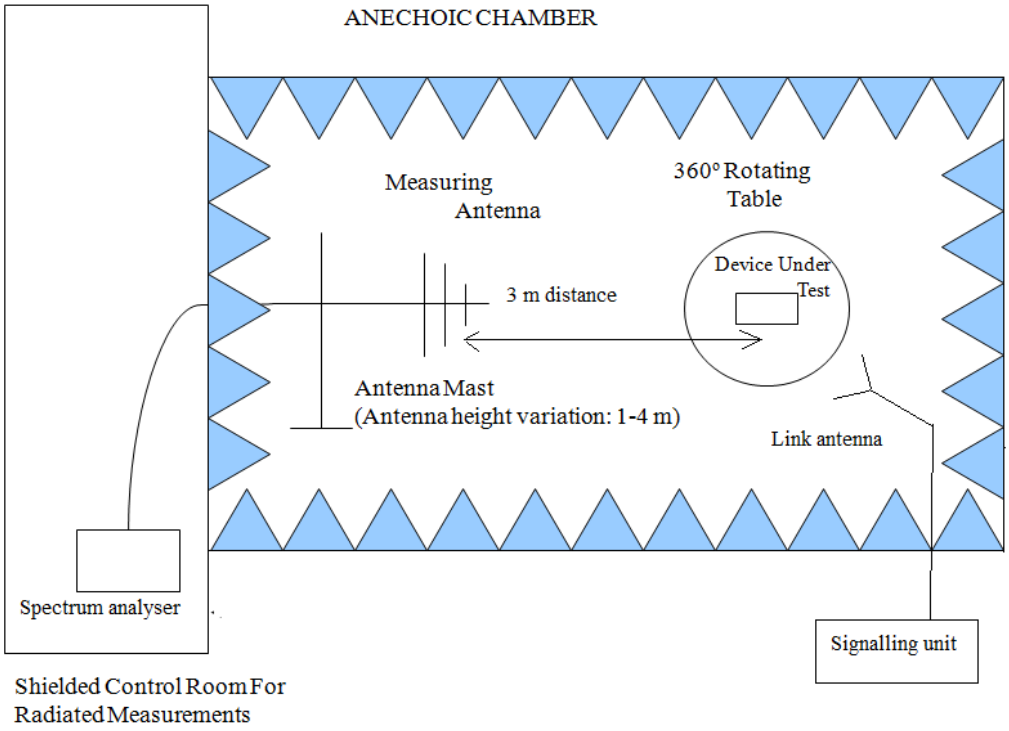
$$Po\ (dBm) – [43 + 10\ log\ (Po\ in\ mwatts) - 30] = - 13\ dBm$$

The maximum field strength (dBµV/m) of each detected emission at less than 20 dB respect to the limit is converted to an equivalent EIRP level (dBm) according to ANSI C63.26 with the formula:

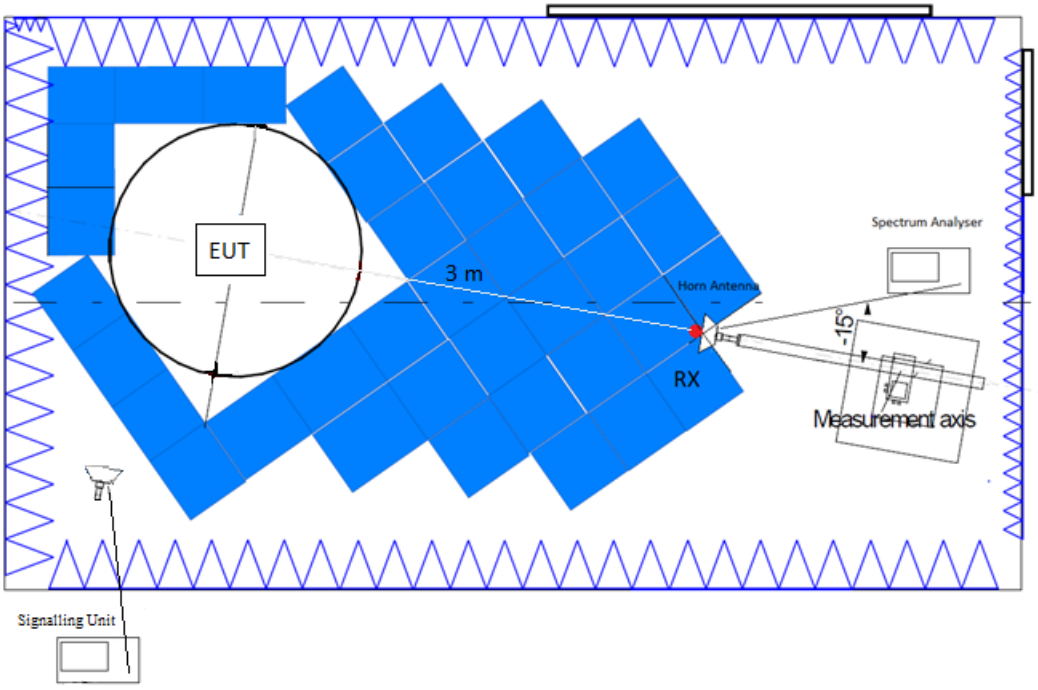
EIRP (dBm) = E (dBµV/m) + 20 log(D) - 104.8; where D is the measurement distance (in the far field region) in m. D = 3 m

Test Setup

Radiated measurements below 1 GHz:



Radiated measurements above 1 GHz:



Results

2G Band 850 MHz:

GPRS and EDGE modulations:
A preliminary scan determined the GPRS modulation as the worst case. The following tables and plots show the results for the worst case modulation.

- LOW CHANNEL:

Frequency range 30 MHz - 1 GHz

Spurious frequencies at less than 20 dB below the limit:

Spurious frequency (MHz)	E.I.R.P (dBm)	Polarization	Detector
551.547	-31.59	V	Peak
718.954	-29.92	V	Peak
868.916	-25.45	V	Peak
672.338	-30.68	H	Peak
985.481	-26.7	H	Peak

Frequency range 1 - 8.5 GHz

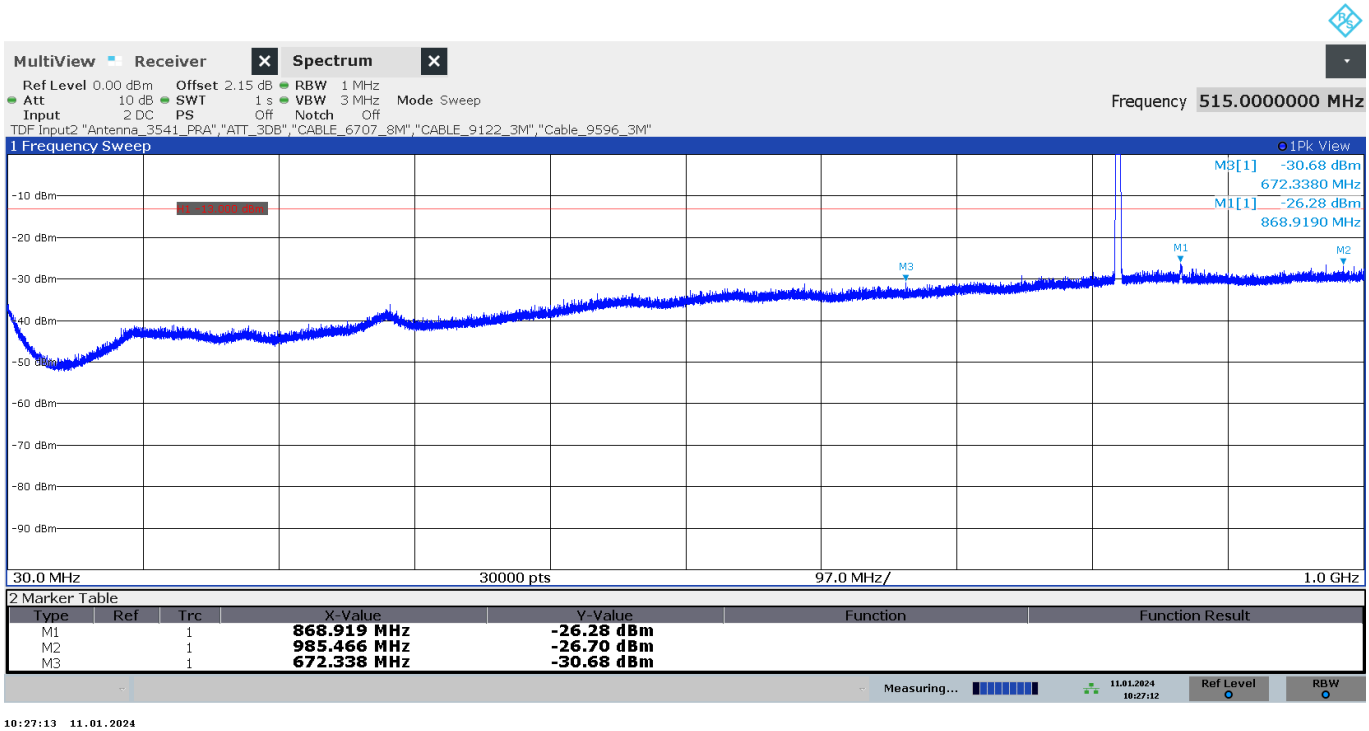
No spurious frequencies at less than 20 dB below the limit.

Measurement uncertainty (dB): <± 5.03 for f ≥ 30 MHz up to 1 GHz
<± 4.32 for f ≥ 1 GHz up to 8.5 GHz

Verdict: PASS

FREQUENCY RANGE 30 MHz - 1 GHz:

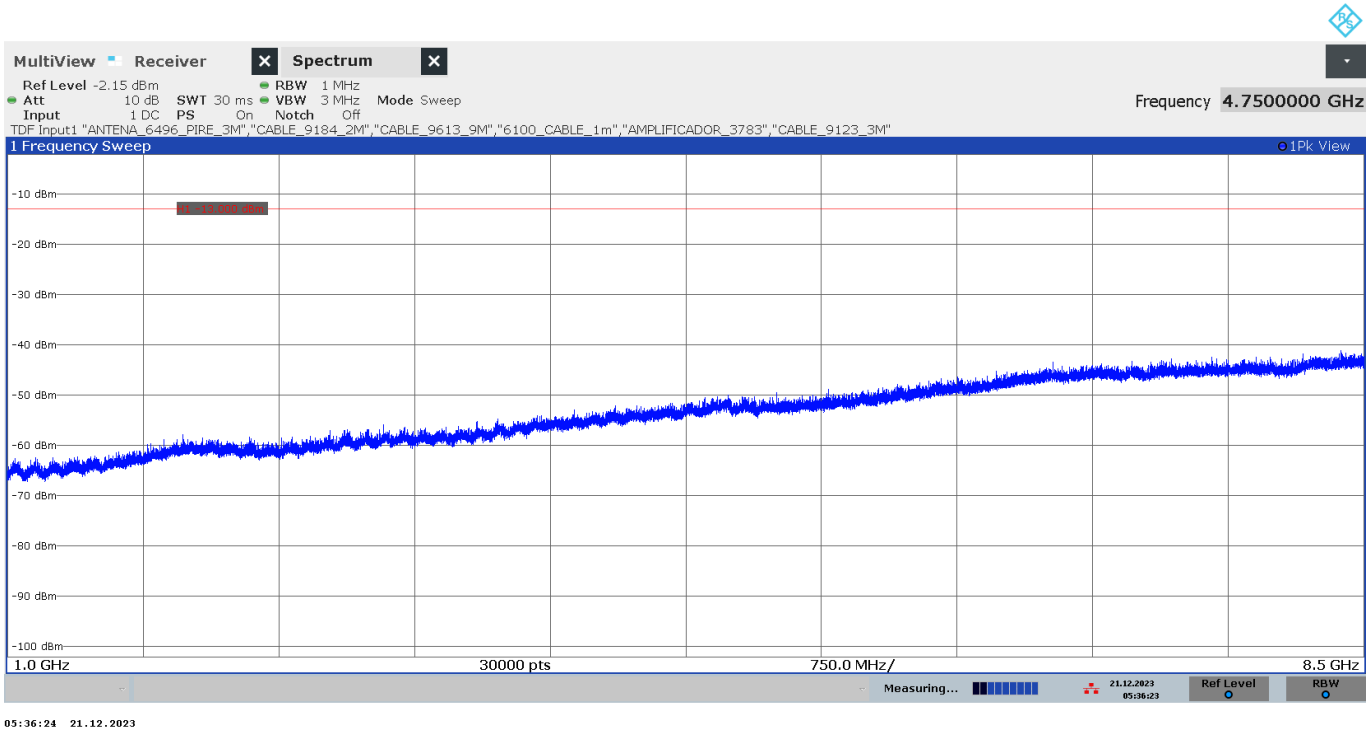
- LOW CHANNEL:



The peak above the limit is the carrier frequency.

FREQUENCY RANGE 1 - 8.5 GHz:

- LOW CHANNEL:



2G Band 1900 MHz:

GPRS and EDGE modulations:
A preliminary scan determined the GPRS modulation as the worst case. The following tables and plots show the results for GPRS modulation.

- MIDDLE CHANNEL:

Frequency range 30 MHz - 1 GHz:

No spurious signals were found at less than 20 dB below the limit.

Frequency range 1 - 18 GHz:

No spurious signals were found at less than 20 dB below the limit.

Frequency range 18 - 20 GHz:

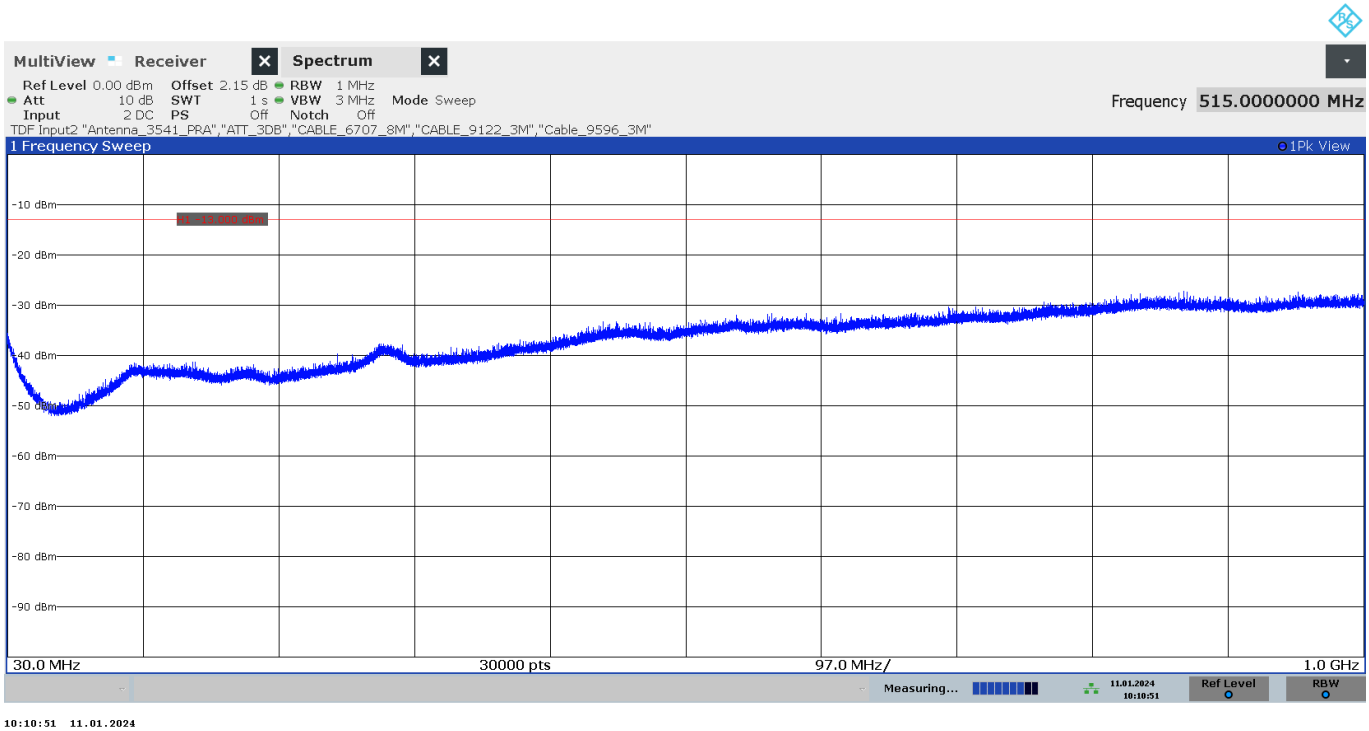
No spurious signals were found at less than 20 dB below the limit.

Measurement uncertainty (dB)	<±5.03 for f < 1GHz <±4.32 for f ≥ 1 GHz up to 17 GHz <±4.58 for f ≥ 17 GHz up to 20 GHz

Verdict: PASS

FREQUENCY RANGE 30 MHz - 1 GHz:

- MIDDLE CHANNEL:



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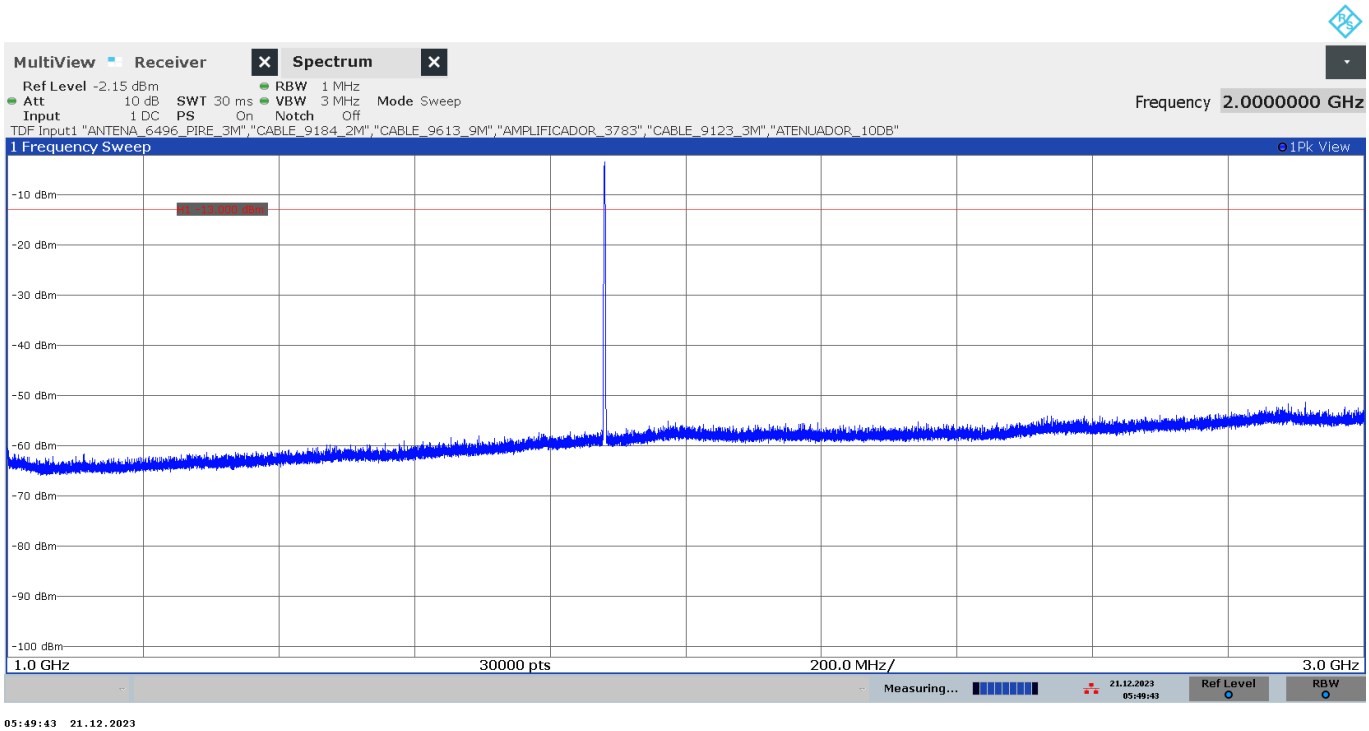
FREQUENCY RANGE 1 - 3 GHz:

- MIDDLE CHANNEL:



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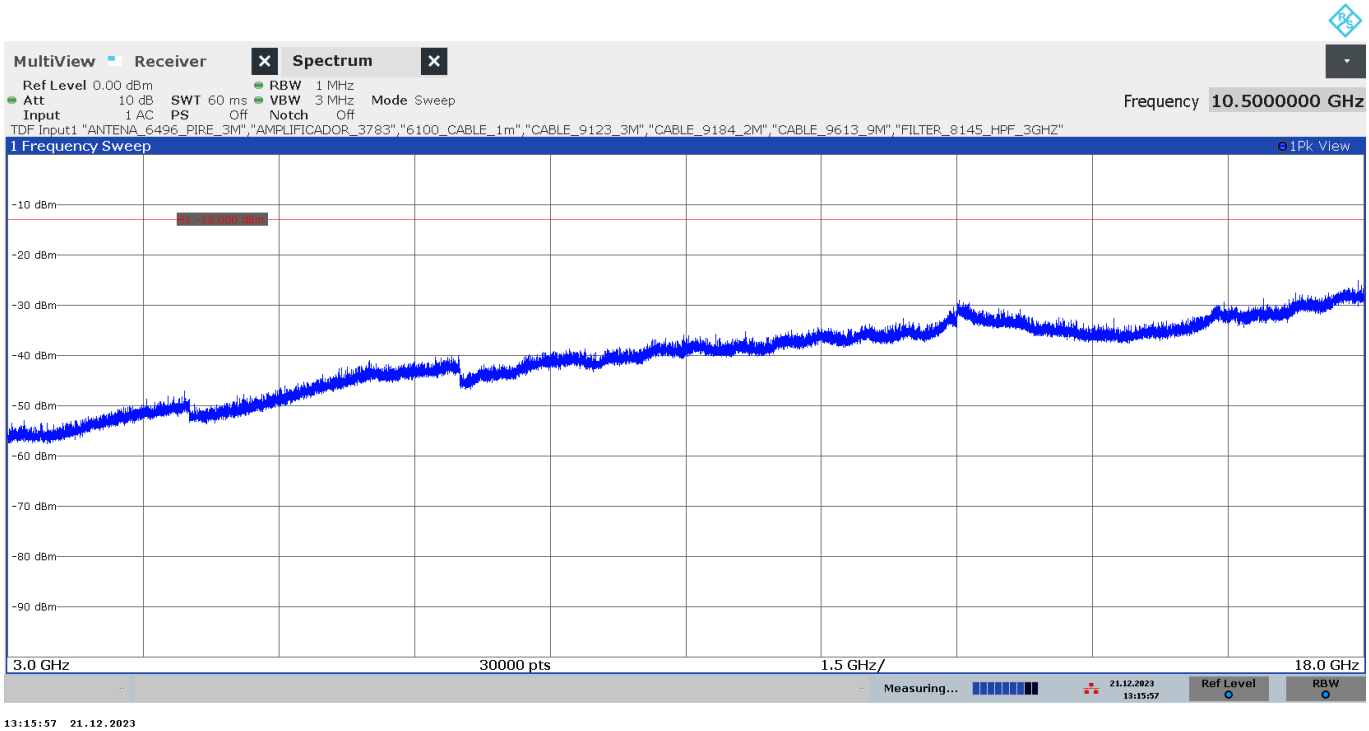
The peak above the limit is the carrier frequency.

FREQUENCY RANGE 3 - 18 GHz:

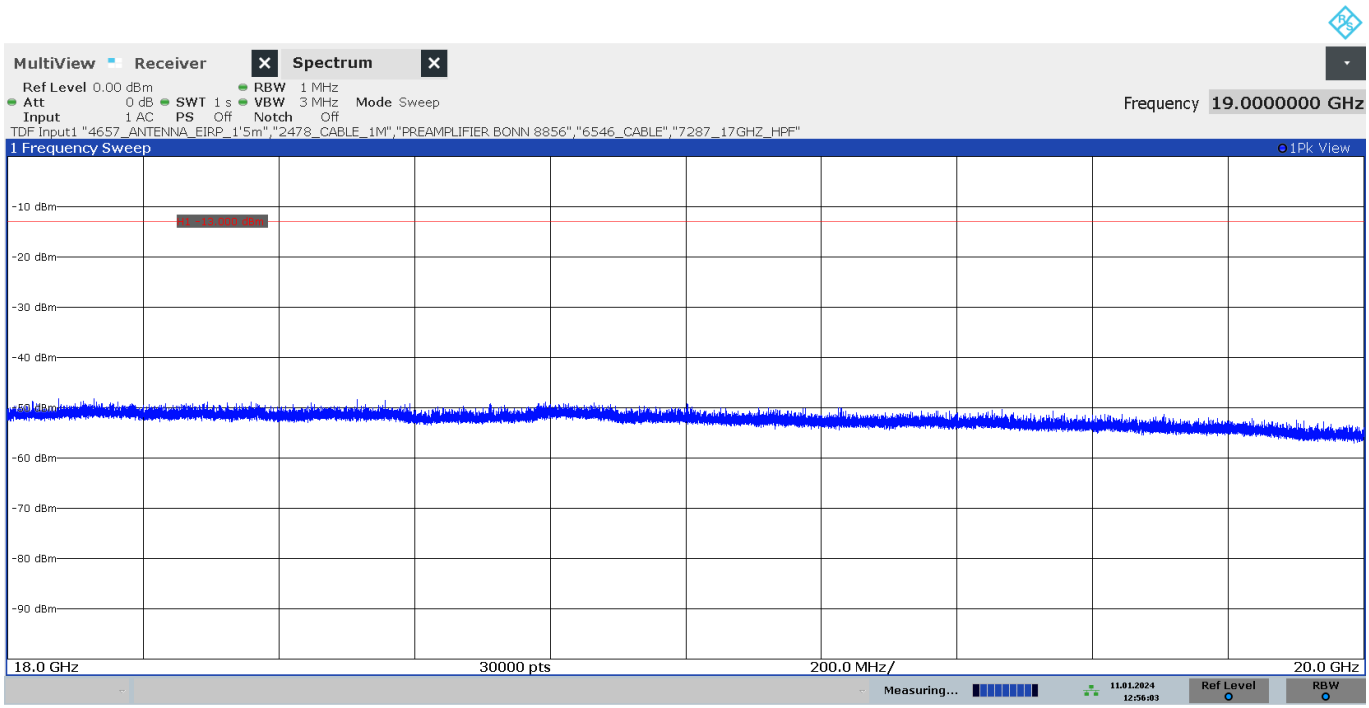
- MIDDLE CHANNEL:



13:15:57 21.12.2023

FREQUENCY RANGE 18 - 20 GHz:

- MIDDLE CHANNEL:



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LTE Band 41:

QPSK and 16QAM modulations:
A preliminary scan determined the QPSK modulation, BW=10 MHz, RB=1, Offset=24 as the worst-case.

- LOW CHANNEL:

Frequency range 30 MHz - 1 GHz:

No spurious frequencies at less than 20 dB below the limit.

Frequency range 1 - 26 GHz:

Spurious frequencies at less than 20 dB below the limit:

Spurious frequency (MHz)	E.I.R.P (dBm)	Polarization	Detector
7.77843	-41.9	V	Peak
16.79817	-41.08	H	Peak

Frequency range 2490.5 - 2496 MHz:

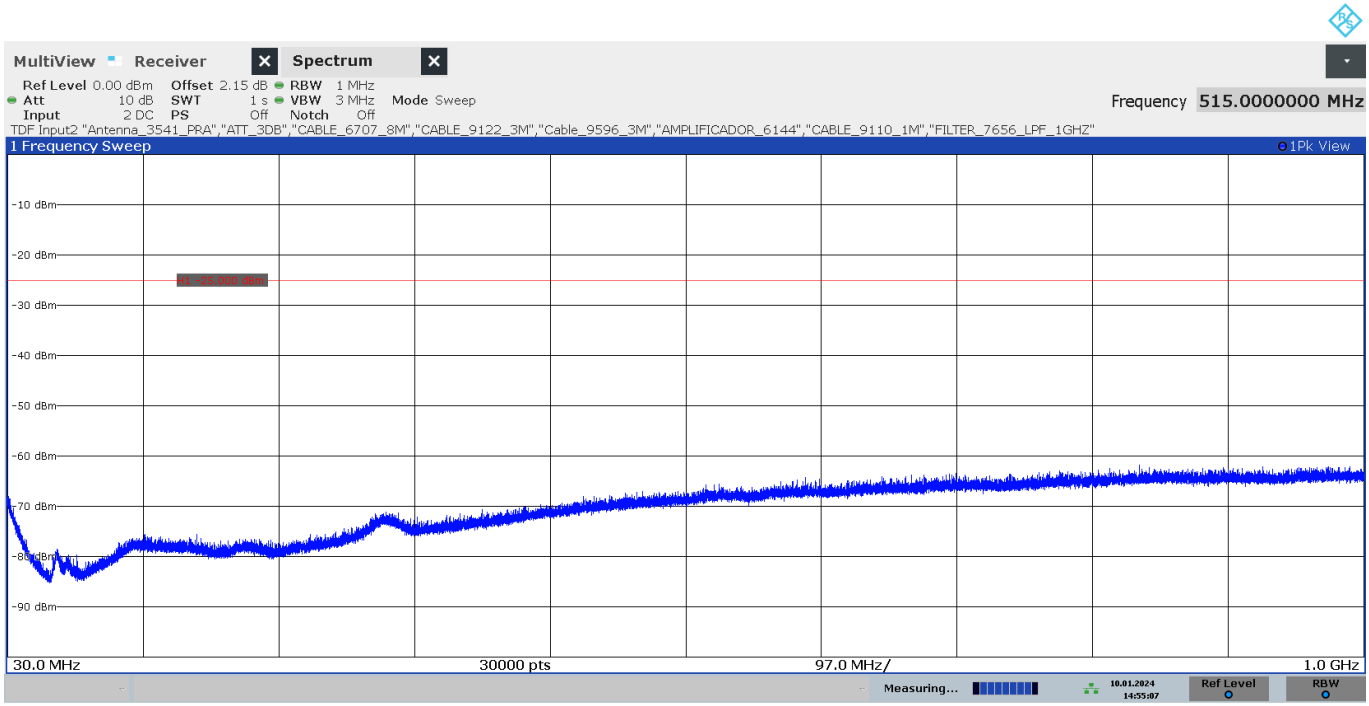
No spurious frequencies at less than 20 dB below the limit.

Measurement uncertainty (dB)	<±503 for f < 1GHz <±4.32 for f ≥ 1 GHz up to 18 GHz <±5.51 for f ≥ 18 GHz up to 27 GHz

Verdict: PASS

FREQUENCY RANGE 30 MHz - 1 GHz:

- LOW CHANNEL:



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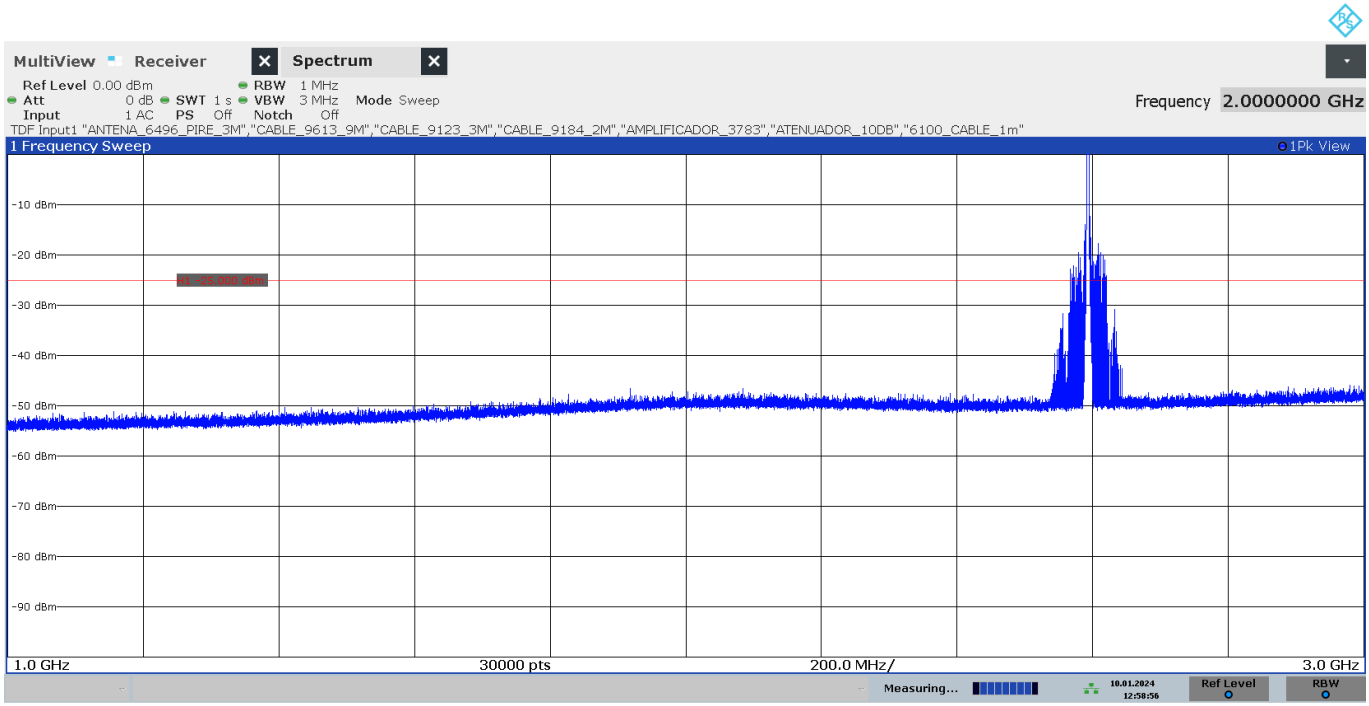
FREQUENCY RANGE 1 - 3 GHz:

- LOW CHANNEL:



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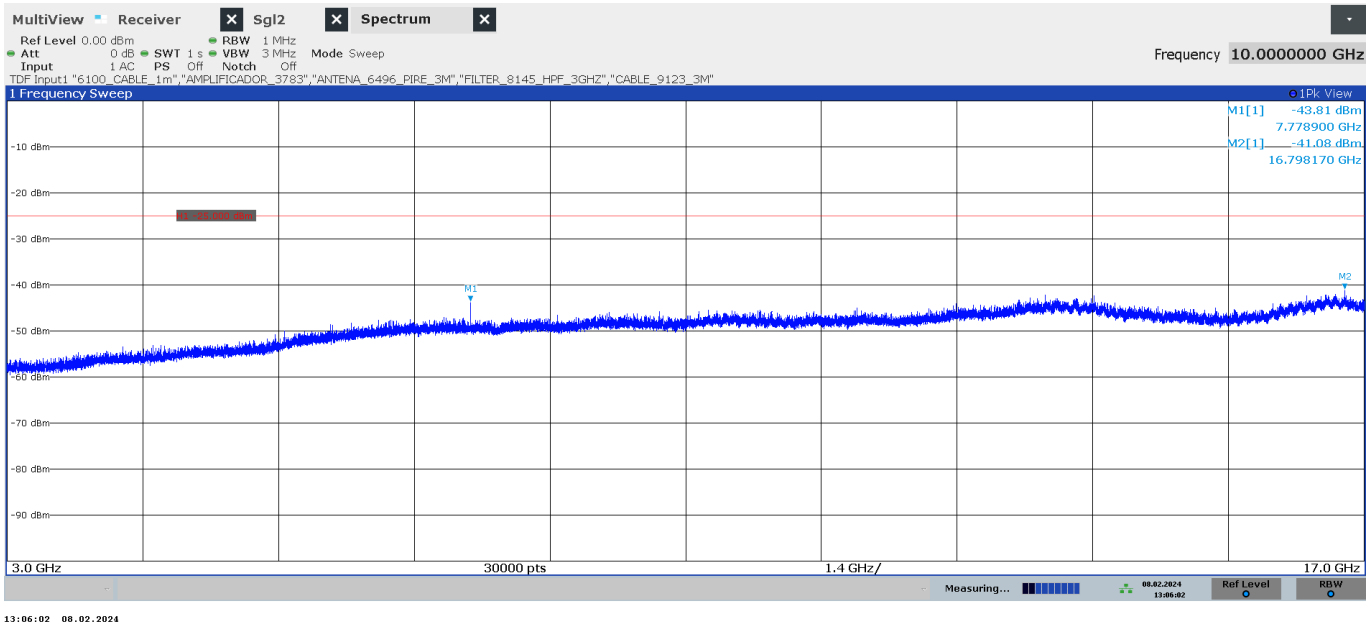
The peaks above the limit is the carrier frequency.

FREQUENCY RANGE 3 - 17 GHz:

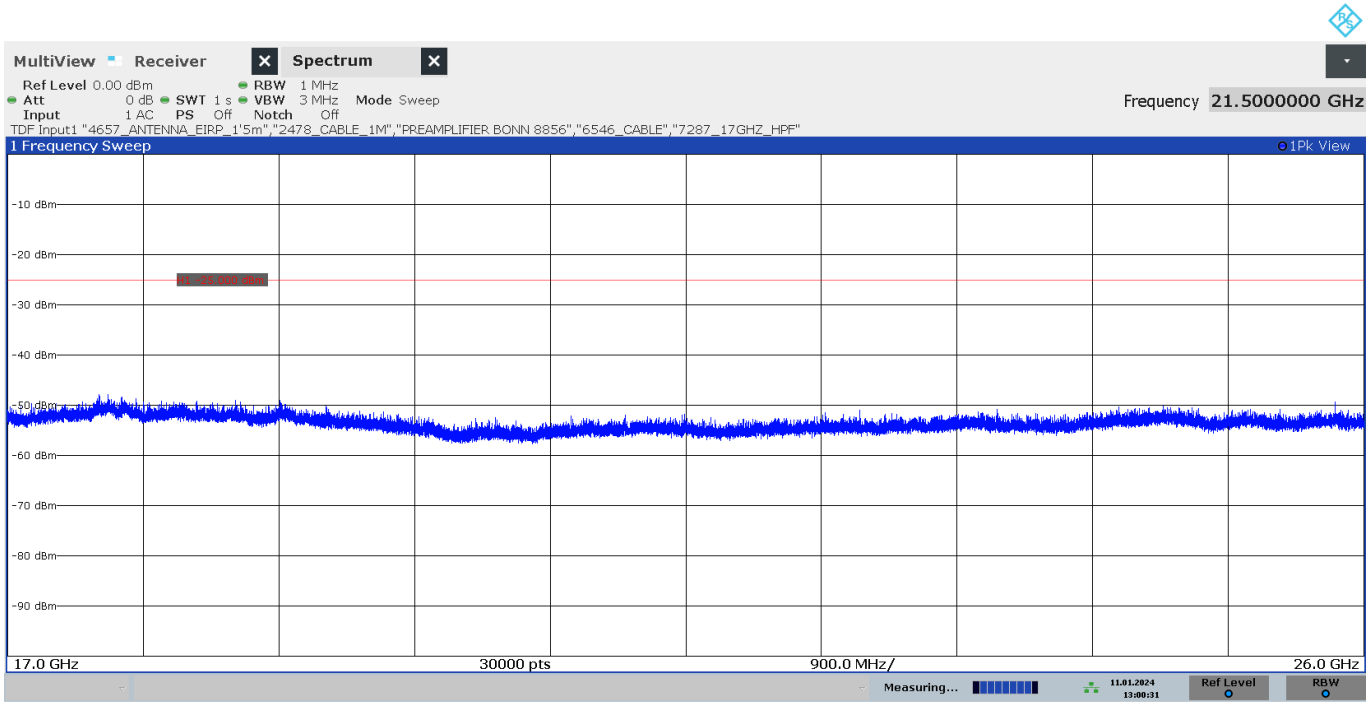
- LOW CHANNEL:



13:06:02 08.02.2024

FREQUENCY RANGE 17 - 26 GHz:

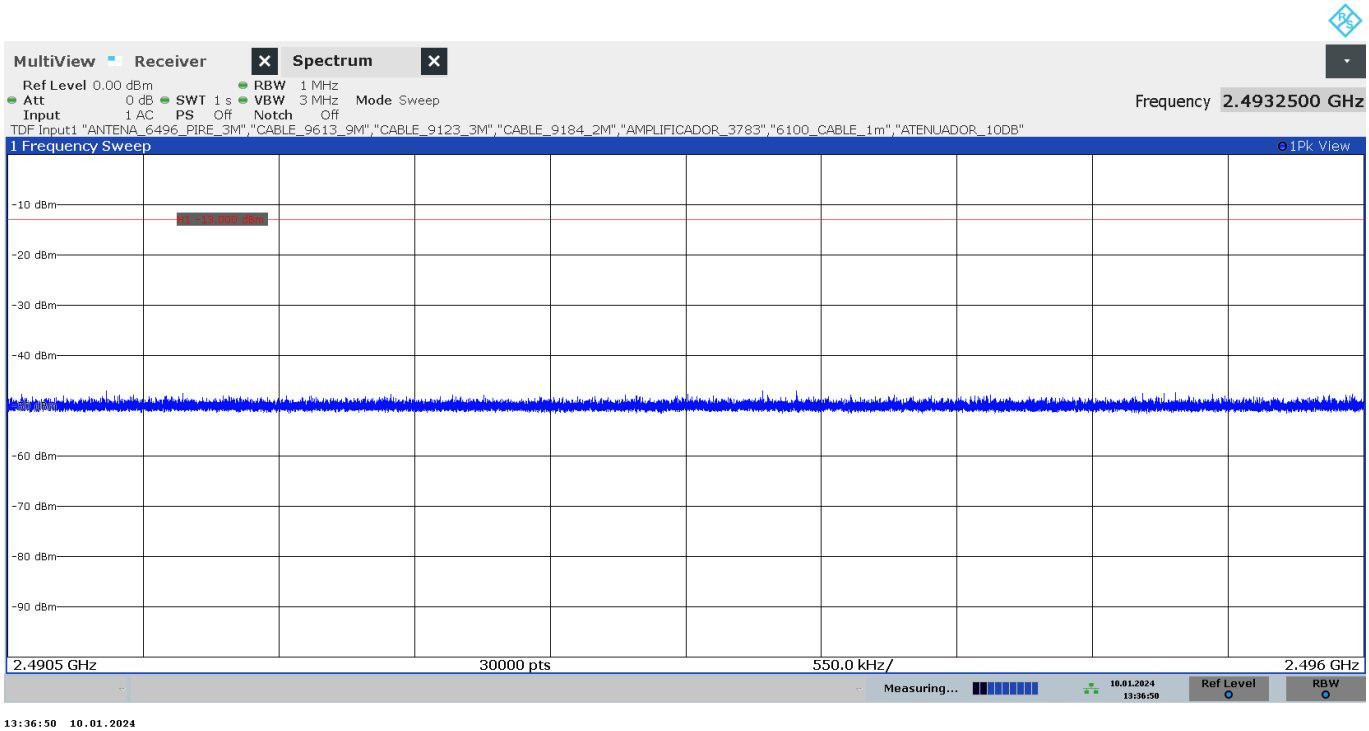
- LOW CHANNEL:



13:00:32 11.01.2024

FREQUENCY RANGE 2490.5 - 2496 MHz:

- LOW CHANNEL:



13:36:50 10.01.2024