

TEST REPORT

Nr. R24187401

Federal Communication Commission (FCC)

Report Reference No.	R24187401
Date of issue:	13.11.2024
Total number pages:	41
Customer name	Xylem Service Italia S.r.l.
Address	Via Lombardi, 14 – 36075 Montecchio Maggiore (VI) – Italy
Test specification:	
Standard(s)	FCC Rules & Regulations, Title 47:2023 Part 15 paragraph(s): 203, 204, 205, 207, 209, 215 and 247 Tests details at page 7
Non-standard test method	N/A
Test Report Form No.	15-247_DTS_DEKRA
Test Report Form(s) Originator ...	DEKRA Testing and Certification S.r.l.
Master TRF	2024-10
General disclaimer:	
The test Verdict presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of DEKRA Testing and Certification S.r.l.	
(*) Test item description	Circulator with Bluetooth wireless technology
(*) Trademark	Xylem
(*) Manufacturer	Xylem Service Italia S.r.l.
(*) Model / Type reference	ECOCIRC+ 20-18F
(*) FCC ID	2AYCGXSI01
(*) Rating(s)	120 V ~ 60 Hz single-phase
Report	
Tested by (name + signature)	M. Segalla
Approved by (name + signature)	F. Marenda

(*) information provided by the customer

1 Summary

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2 Reference standard(s)	
FCC Rules and Regulation Title 47 part 15:2023 KDB 558074 D01 15.247 Meas Guidance v05r02	-- Guidance for compliance measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid System Devices operating under section 15.247 of the FCC rules
ANSI C63.4:2014	American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz – 40 GHz
ANSI C63.10:2020 + COR1:2023	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
3 List of attachments	
Attachment 1: Measurement uncertainty, judgement of compliance and quality manual references	
4 Deviation(s) from test specification	
None	
5 Testing location	
DEKRA Testing and Certification S.r.l. Via della Fisica, 20 – 36016 Thiene (VI) – Italy Test site facility's FCC registration number: 182474	

Revision index	Date	Change history
1.0	13.11.2024	--

Testing and sampling:	
Date of receipt of test item	08.10.2024
Testing start date	12.11.2024
Testing end date	12.11.2024
Sampling procedure	Sample used for testing chosen by the customer; DEKRA Testing and Certification S.r.l. cannot be considered responsible for the selection of the sample
Internal identification	Adhesive label with the product number P240981
General remarks:	
This report shall not be reproduced, except in full, without the written approval of DEKRA Testing and Certification S.r.l. The test Verdict presented in this report relate only to the object tested. “(see appended table)”: refers to a table appended to the report. Throughout this report a comma is used as the decimal separator. Tests reported in this test report marked by wording: “Test not accredited by ACCREDIA” are not part of the ACCREDIA accreditation of this laboratory.	
Possible test case verdicts:	
Test case does not apply to the test object:	N/A (Not Applicable)
Test object meets the requirement:	P (Pass)
Test object does not meet the requirement:	F (Fail)
Test object was not evaluated for the requirement:	N/E (Not Executed)
Definition of symbols used in this test report:	
☒ Indicates that the listed condition, standard or equipment is applicable for this report. ☐ Indicates that the listed condition, standard or equipment is not applicable for this report.	

6 General description of tested item and testing condition(s)

Description	Circulator with Bluetooth wireless technology						
Model Number	ECOCIRC+ 20-18F						
FCC ID	2AYCGXSI01						
Serial Number	202409050006						
Brand name	Xylem						
Frequency band	2400 – 2483,5 MHz						
Nominal frequencies	F _L : 2402 MHz		F _M : 2440 MHz		F _H : 2480 MHz		
Test power supply.....		Voltage and Frequency	Reference poles				
			N	L1	L2	L3	PE
	☒	AC: 120 V, 60 Hz	☒	☒	☐	☐	☐
	☐	AC:	☐	☐	☐	☐	☐
	☐	DC:					☐
Type of equipment	☒ Transmitter unit ☐ Receiver unit						
Type of station	☐ Portable station ☒ Mobile station						
Test arrangements of EUT	<i>Intended operational arrangement(s) of EUT</i>			<i>Test arrangement (see basic standard)</i>			
	☐ Table-top only			Table-top			
	☒ Floor-standing only			Floor-standing			
	☐ Can be floor-standing or table-top			Table-top			
	☐ Rack mounted			In rack or table-top			
	☐ Other, for example wall mounted, ceiling mounted, handheld, body worn			Table-top			
Operating modes	No.	Operating mode of test item					
	1	EUT in continuous transmission at maximum power					
Declination of responsibility	Information relating to the description of the sample, components list, and software/hardware version (if reported) are provided by the customer. DEKRA Testing and Certification S.r.l. cannot be considered responsible for this information, for any other document sent by the customer and for any difference between the software version present in the tested sample and that present in the object intended for final sale. In some cases, the software in the tested sample is in a version dedicated exclusively to the test, and therefore does not represent the software installed in the final version of the product.						

6.1 Photos of the test item



7 Verdict summary section

FCC Rules & Regulations, Title 47:2023 Part 15 paragraph(s): 203, 204, 205, 207, 209, 215 and 247			
Clause	Requirement – Test case	Basic standard	Verdict
Part 15.203	Antenna requirements	--	P
Part 15.207	Conducted emissions	ANSI C63.10	N/E
Part 15.209	Emissions in restricted frequency bands and in unrestricted frequency bands	ANSI C63.10	P
Part 15.247 (a) (2)	DTS bandwidth	ANSI C63.10	N/E
Part 15.215 (c)	20 dB bandwidth	ANSI C63.10	N/E
Part 15.247 (d)	Band edge	ANSI C63.10	N/E
Part 15.209 and 15.247	Fundamental emission output power	ANSI C63.10	P
Part 15.209 and 15.247	Maximum power spectral density level in the fundamental emission	ANSI C63.10	N/E

8 Test conditions

8.1 General

Environmental reference conditions..... :	The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment.						
	The climatic conditions during the tests were within the following limits:						
	Temperature		Humidity		Atmospheric pressure		
	15 °C – 35 °C		30 % - 60 %		800 hPa – 1060 hPa		
	If explicitly required in the basic standard or applied product standard the climatic values are recorded and documented separately in this test report.						
	Environmental conditions have been monitored with the following instrument.						
	<i>Id. Number</i>	<i>Manufacturer</i>	<i>Model</i>	<i>Serial number</i>	<i>Description</i>	<i>Last calibration date</i>	<i>Calibration expiration</i>
	CMC S302	Testo	175H1	40370182 610	Data Logger	May 2024	May 2025
Measurement uncertainties :	Attachment 1						

9 Test results

9.1 Antenna requirements

Tested by	M. Segalla	
Test date	12.11.2024	
Basic standard(s)	FCC Rules and Regulation; Titles 47 Part. 15.203 and 15.204	
Test specification	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§ 15.211, 15.213, 15.217, 15.219, 15.221, or § 15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded	
Antenna type	☒	Integral antenna
	☐	External antenna
Antenna gain	-0,40 dBi	
External R.F. power amplifier	Not Present	

9.2 Emissions in restricted frequency bands and in unrestricted frequency bands

Tested by	M. Segalla
Test date	12.11.2024
Test location (stand)	Semi-anechoic chamber (CMC A070)
Basic standard(s)	ANSI C63.10 cl. 6.3, 6.4, 6.5 and 6.6
Product standard(s)	FCC Rules and Regulation; Titles 47 Part. 15.209
Test set-up description	☒ Table top equipment set-up (80 cm above the reference ground plane) ☐ Floor standing equipment set-up (insulating material up to 12 mm thick) ☐ False floor installation equipment set-up (insulating material up to 34 cm above the reference ground plane)
Supplementary test set-up description	--
Test method applied	OATS or SAC with measurement distance [m]: 10 m for frequencies below 1 GHz 3 m for frequencies above 1 GHz
Supplementary information	--

Acceptance limits

Acceptance limits for emissions in restricted frequency bands ($f < 1000$ MHz)		
Frequency range (MHz)	Test distance (m)	Limits [dB(μ V/m)]
0,009 to 0,490	300	$20\log(2400/F(\text{kHz}))$
0,490 to 1,705	30	$20\log(24000/F(\text{kHz}))$
1,705 to 30	30	$20\log(30)$
30 to 88	3	$20\log(100)^{**}$
88 to 216	3	$20\log(150)^{**}$
216 to 960	3	$20\log(200)^{**}$
Above 960	3	$20\log(500)$

****:** except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54 – 72 MHz, 76 – 88 MHz, 174 – 216 MHz or 470 – 806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.

Perimeter protection systems may operate in the 54 – 72 MHz and 76 – 88 MHz bands under the provisions of this section. The use of such perimeter protection systems is limited to industrial, business and commercial applications.

Remarks: the emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9 – 90 kHz and 110 – 490 kHz. Radiated emission limits in these two bands are based on measurements employing an average detector. The Verdict have been extrapolated to the specified distance using an extrapolation factor.

Acceptance limits for emissions in restricted frequency bands ($f \geq 1000$ MHz)			
Frequency (MHz)	Test distance (m)	AV limits [dB(μ V/m)]	Peak limits [dB(μ V/m)]
> 1000	3	54	74

The restricted frequency bands are listed in the following table:

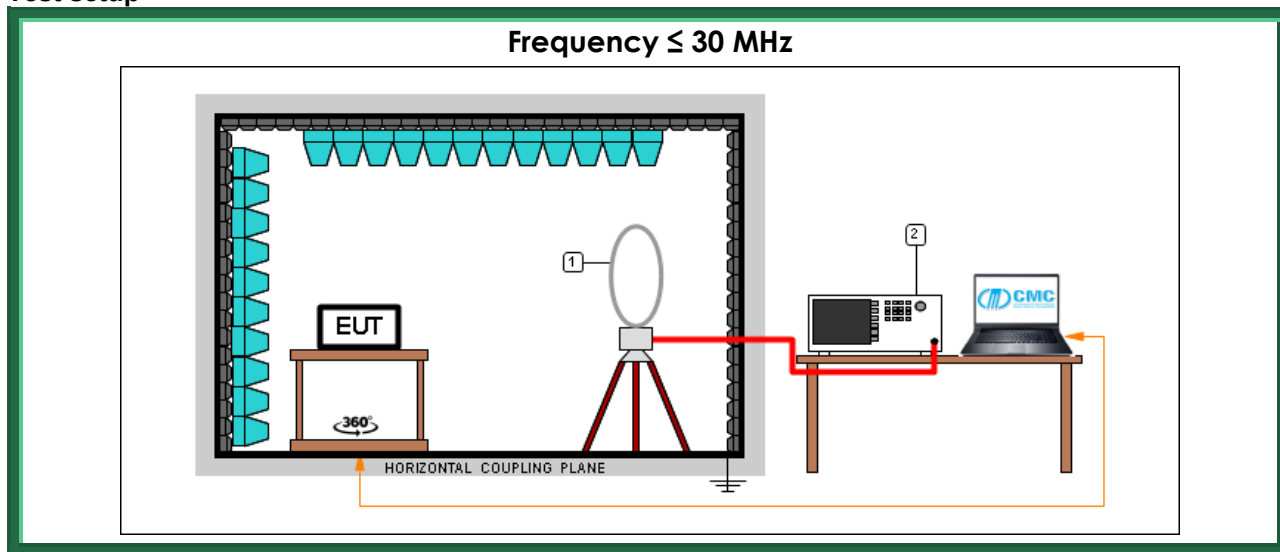
MHz	MHz	MHz	GHz
0,090 – 0,110	16,42 – 16,423	399,9 – 410	4,5 – 5,15
0,495 – 0,505	16,69475 – 16,69525	608 – 614	5,35 – 5,46
2,1735 – 2,1905	16,80425 – 16,80475	960 – 1240	7,25 – 7,75
4,125 – 4,128	25,5 – 25,67	1300 – 1427	8,025 – 8,5
4,17725 – 4,17775	37,5 – 38,25	1435 – 1626,5	9,0 – 9,2
4,20725 – 4,20775	73 – 74,6	1645,5 – 1646,5	9,3 – 9,5
6,215 – 6,218	74,8 – 75,2	1660 – 1710	10,6 – 12,7
6,26775 – 6,26825	108 – 121,94	1718,8 – 1722,2	13,25 – 13,4
6,31175 – 6,31225	123 – 138	2200 – 2300	14,47 – 14,5
8,291 – 8,294	149,9 – 150,05	2310 – 2390	15,35 – 16,2
8,362 – 8,366	156,52475 – 156,52525	2483,5 – 2500	17,7 – 21,4
8,37625 – 8,38675	156,7 – 156,9	2690 – 2900	22,01 – 23,12
8,41425 – 8,41475	162,0125 – 167,17	3260 – 3267	23,6 – 24,0
12,29 – 12,293	167,72 – 173,2	3332 – 3339	31,2 – 31,8
12,51975 – 12,52025	240 – 285	3345,8 – 3358	36,43 – 36,5
12,57675 – 12,57725	322 – 335,4	3600 – 4400	Above 38,6
13,36 – 13,41			

Acceptance limits for emissions in non-restricted frequency bands (according to ANSI C63.10 cl. 11.11.1)

The DTS rules specify that in any 100 kHz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions:

- If the maximum peak conducted output power procedure was used to demonstrate compliance as described in 9.1, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz.
- If maximum conducted (average) output power was used to demonstrate compliance as described in 9.2, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz.
- In either case, attenuation to levels below the 15.209 general radiated emissions limits is not required

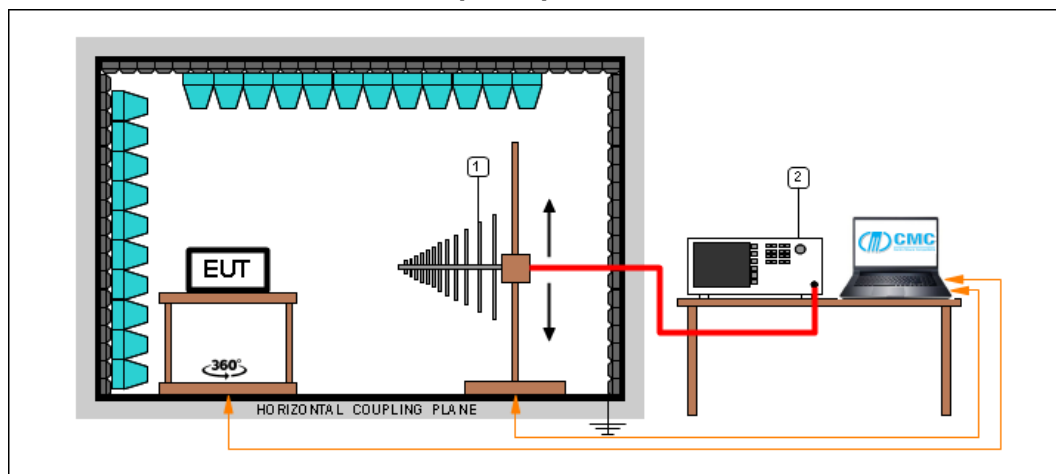
Test setup



Test setup PE004_21

Nr.	<i><i>Id. Number</i></i>	<i><i>Manufacturer</i></i>	<i><i>Model</i></i>	<i><i>Serial number</i></i>	<i><i>Description</i></i>	<i><i>Last calibration date</i></i>	<i><i>Calibration expiration</i></i>
2	CMC S402	Rohde & Schwarz	ESW44	103433	Emi Test Receiver	December 2023	December 2024
1	CMC S127	Schaffner	HLA6120	1191	Loop Antenna 9kHz - 30MHz	May 2024	May 2025
--	CMC A105	Frankonia	FC06	FC06.1-2017-073	Turntable & Antenna mast controller (Software V02.05.013)	No calibration required	No calibration required

Frequency ≤ 1 GHz

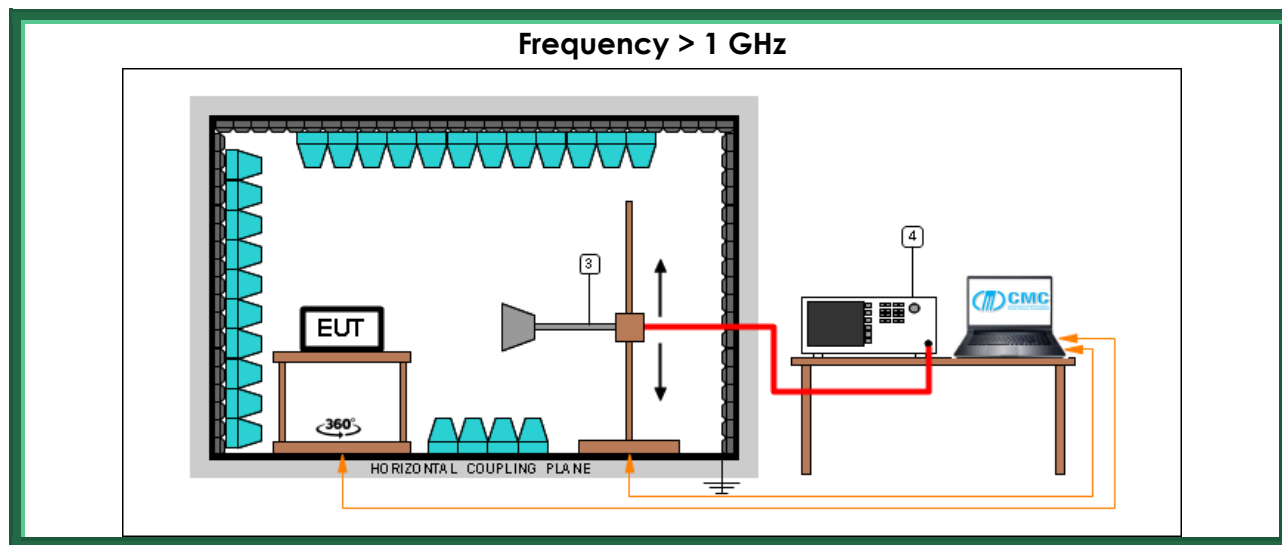


Test setup PE004_22

Nr.	Id. Number	Manufacturer	Model	Serial number	Description	Last calibration date	Calibration expiration
2	CMC S402	Rohde & Schwarz	ESW44	103433	Emi Test Receiver	December 2023	December 2024
1	CMC S271	Schwarzbeck	BBA 9106 + VHBB 9124	831	Broadband Antenna	August 2022	August 2025
--	CMC A105	Frankonia	FC06	FC06.1-2017-073	Turntable & Antenna mast controller (Software V02.05.013)	No calibration required	No calibration required

Test setup PE004_23

Nr.	Id. Number	Manufacturer	Model	Serial number	Description	Last calibration date	Calibration expiration
2	CMC S402	Rohde & Schwarz	ESW44	103433	Emi Test Receiver	December 2023	December 2024
1	CMC S287	Schwarzbeck	VUSLP 9111B	9111B-203	Broadband Antenna	August 2022	August 2025
--	CMC A105	Frankonia	FC06	FC06.1-2017-073	Turntable & Antenna mast controller (Software V02.05.013)	No calibration required	No calibration required



Test setup PE004_24

Nr.	Id. Number	Manufacturer	Model	Serial number	Description	Last calibration date	Calibration expiration
4	CMC S402	Rohde & Schwarz	ESW44	103433	Emi Test Receiver	December 2023	December 2024
3	CMC S108	Emco	3115	9811-5622	Waveguide antenna	August 2022	August 2025
--	CMC A105	Frankonia	FC06	FC06.1-2017-073	Turntable & Antenna mast controller (Software V02.05.013)	No calibration required	No calibration required

Test setup PE004_25

Nr.	Id. Number	Manufacturer	Model	Serial number	Description	Last calibration date	Calibration expiration
4	CMC S402	Rohde & Schwarz	ESW44	103433	Emi Test Receiver	December 2023	December 2024
3	CMC S290	Schwarzbeck	BBHA 9170	733	Horn Antenna	October 2021	October 2026
--	CMC A105	Frankonia	FC06	FC06.1-2017-073	Turntable & Antenna mast controller (Software V02.05.013)	No calibration required	No calibration required

Result

Transmission frequency (MHz)	Polarization	Frequency Range (MHz)	Graphs	Verdict
2402	V	1000 – 3000	G24187402	P
2402	H	1000 – 3000	G24187403	P
2402	H	3000 – 18000	G24187404	P
2402	V	3000 – 18000	G24187405	P
2440	V	3000 – 18000	G24187406	P
2440	H	3000 – 18000	G24187407	P
2440	H	1000 – 3000	G24187408	P
2440	V	1000 – 3000	G24187409	P
2480	V	1000 – 3000	G24187412	P
2480	H	1000 – 3000	G24187413	P
2480	H	3000 – 18000	G24187414	P
2480	V	3000 – 18000	G24187415	P
Worst case	V	18000 – 26000	G24187416	P
Worst case	H	18000 – 26000	G24187417	P
Worst case	H	300 – 1000	G24187418	P
Worst case	V	300 – 1000	G24187419	P
Worst case	V	30 – 300	G24187420	P
Worst case	H	30 – 300	G24187421	P
Worst case	Loop	0,009 – 30	G24187422	P

Remarks: EUT was tested in 3 orthogonal planes, graphs are related to the highest detected levels.

Measurements at frequencies lower than 30 MHz have been performed with an EUT – antenna distance of 10 m. Measured values have been corrected with conversion factor $40\log(\text{test distance}/10)$ based on the measuring distance provided by the standard.

Measurements at frequencies higher than 30 MHz and lower than 1000 MHz have been performed with an EUT – antenna distance of 10 m. Measured values have been corrected with conversion factor $20\log(\text{test distance}/10)$ based on the measuring distance provided by the standard.

Peaks above the limits are caused by the nominal transmitting frequencies.

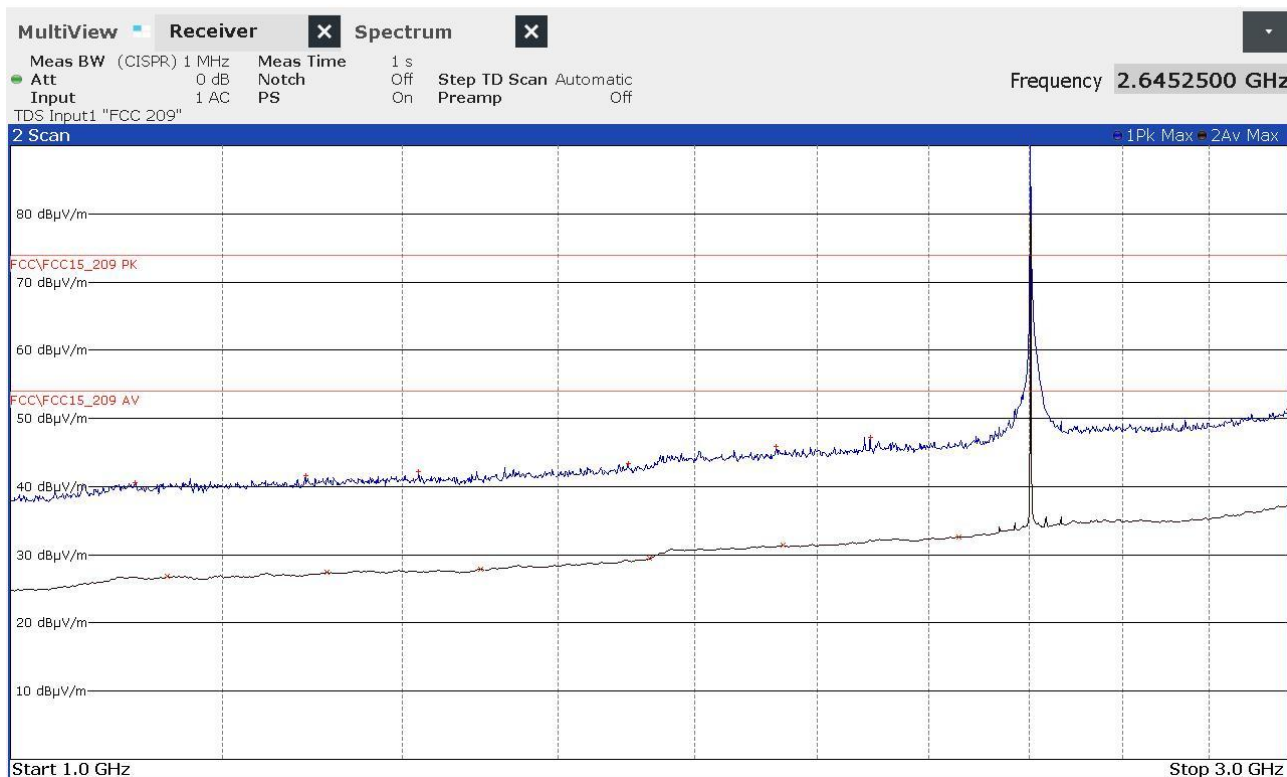
Graphs Legend

PK: Peak; QP [1s] (quasi-peak at 1 second) values are marked with a +

AV: Average; AV [1s] (average at 1 second) values are marked with a X

Graphs

Segalla 24187402

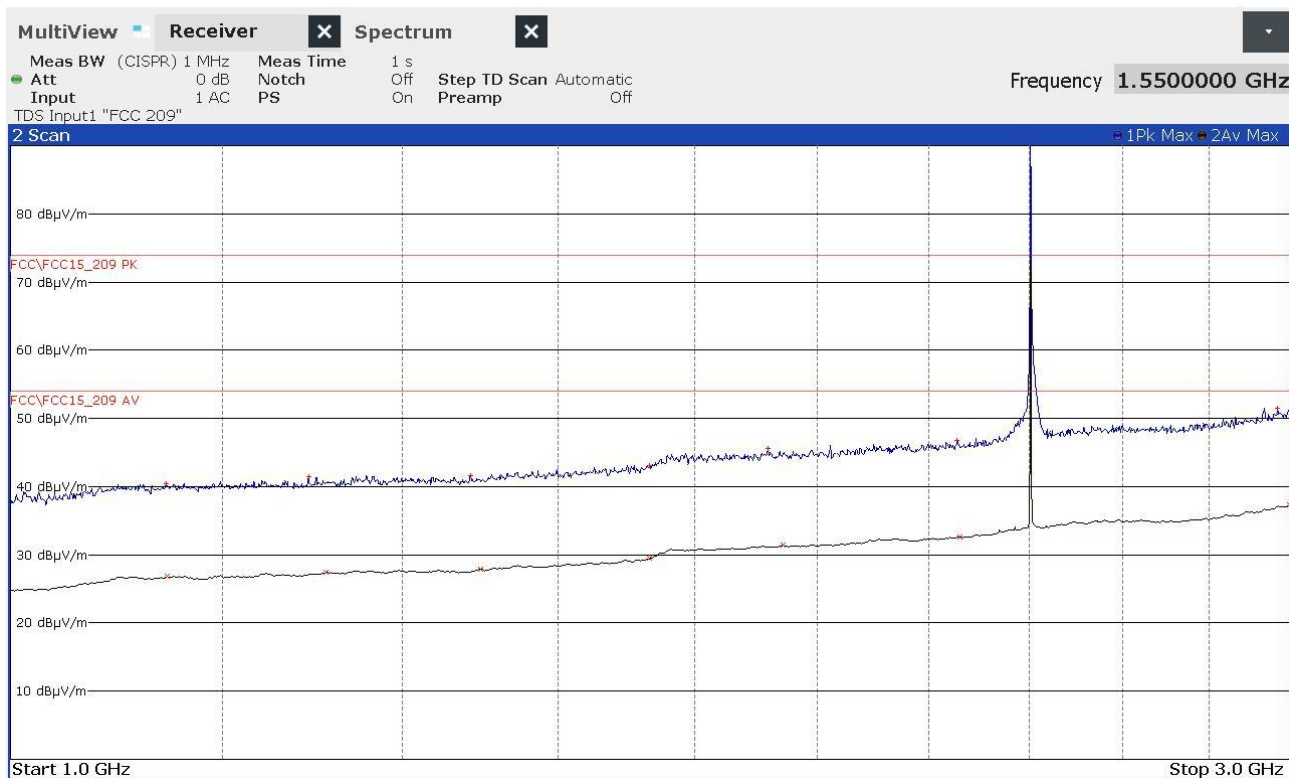


FINAL RESULT TABLE

MAX PEAK			AVERAGE		
Freq Hz	Lev dBuV/m	Margin dB	Freq Hz	Lev dBuV/m	Margin dB
1113000000	+40,64	-33,34	1144250000	+26,83	-27,15
1288500000	+41,64	-32,34	1312250000	+27,45	-26,53
1419500000	+42,18	-31,80	1498000000	+27,95	-26,03
1699500000	+43,32	-30,66	1732000000	+29,44	-24,54
1930250000	+45,89	-28,09	1941500000	+31,46	-22,52
2092500000	+47,22	-26,76	2259250000	+32,68	-21,30
2998000000	+51,29	-22,69	2999750000	+37,31	-16,67

24187402_2

Segalla 24187403

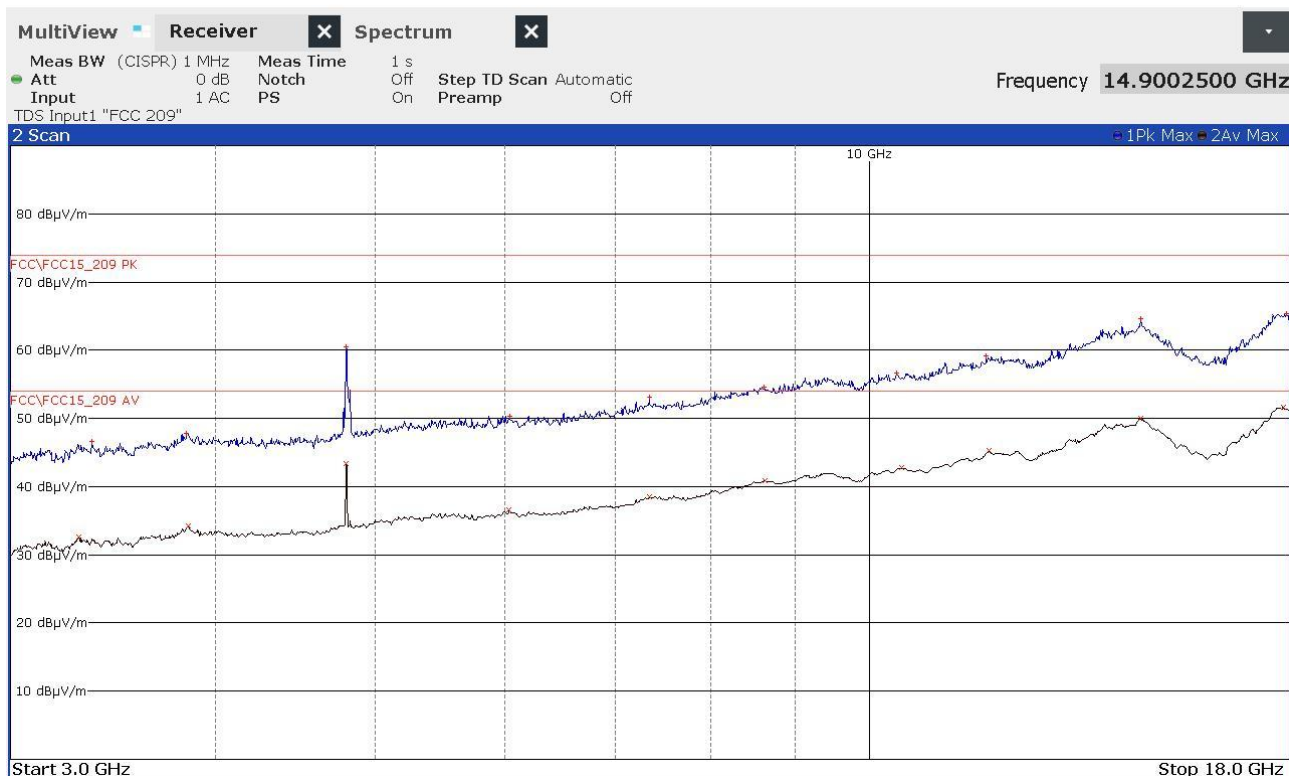


FINAL RESULT TABLE

MAX PEAK			AVERAGE		
Freq Hz	Lev dBuV/m	Margin dB	Freq Hz	Lev dBuV/m	Margin dB
1142750000	+40,38	-33,60	1144250000	+26,81	-27,17
1291750000	+41,47	-32,51	1311750000	+27,43	-26,55
1484250000	+41,62	-32,36	1497500000	+27,93	-26,05
1731750000	+43,15	-30,83	1732000000	+29,44	-24,54
1916500000	+45,55	-28,43	1941500000	+31,46	-22,52
2254500000	+46,83	-27,15	2260500000	+32,66	-21,32
2969500000	+51,56	-22,42	2999750000	+37,31	-16,67

24187403_2

Segalla 24187404

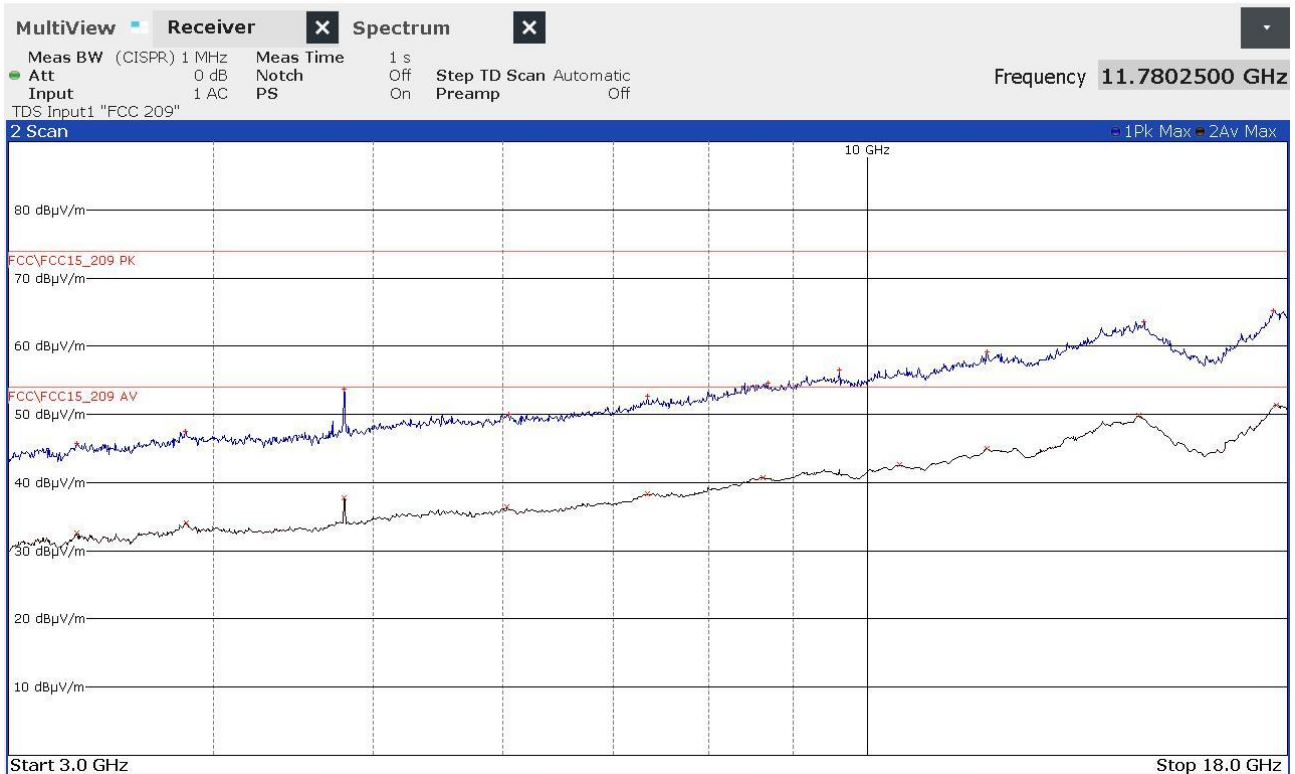


FINAL RESULT TABLE

MAX PEAK			AVERAGE		
Freq Hz	Lev dBuV/m	Margin dB	Freq Hz	Lev dBuV/m	Margin dB
3361750000	+46,66	-27,32	3299750000	+32,65	-21,33
3840250000	+47,82	-26,16	3849750000	+34,20	-19,78
4803500000	+60,47	-13,51	4803750000	+43,34	-10,64
6036500000	+50,35	-23,63	6032750000	+36,52	-17,46
7348250000	+53,06	-20,92	7347000000	+38,46	-15,52
8619750000	+54,60	-19,38	8637250000	+40,86	-13,12
10377250000	+56,61	-17,37	10457750000	+42,76	-11,22
11771750000	+59,18	-14,80	11816000000	+45,29	-8,69
14614750000	+64,57	-9,41	14617750000	+49,98	-4,00
17912250000	+65,30	-8,68	17837500000	+51,57	-2,41

24187404_2

Segalla 24187405

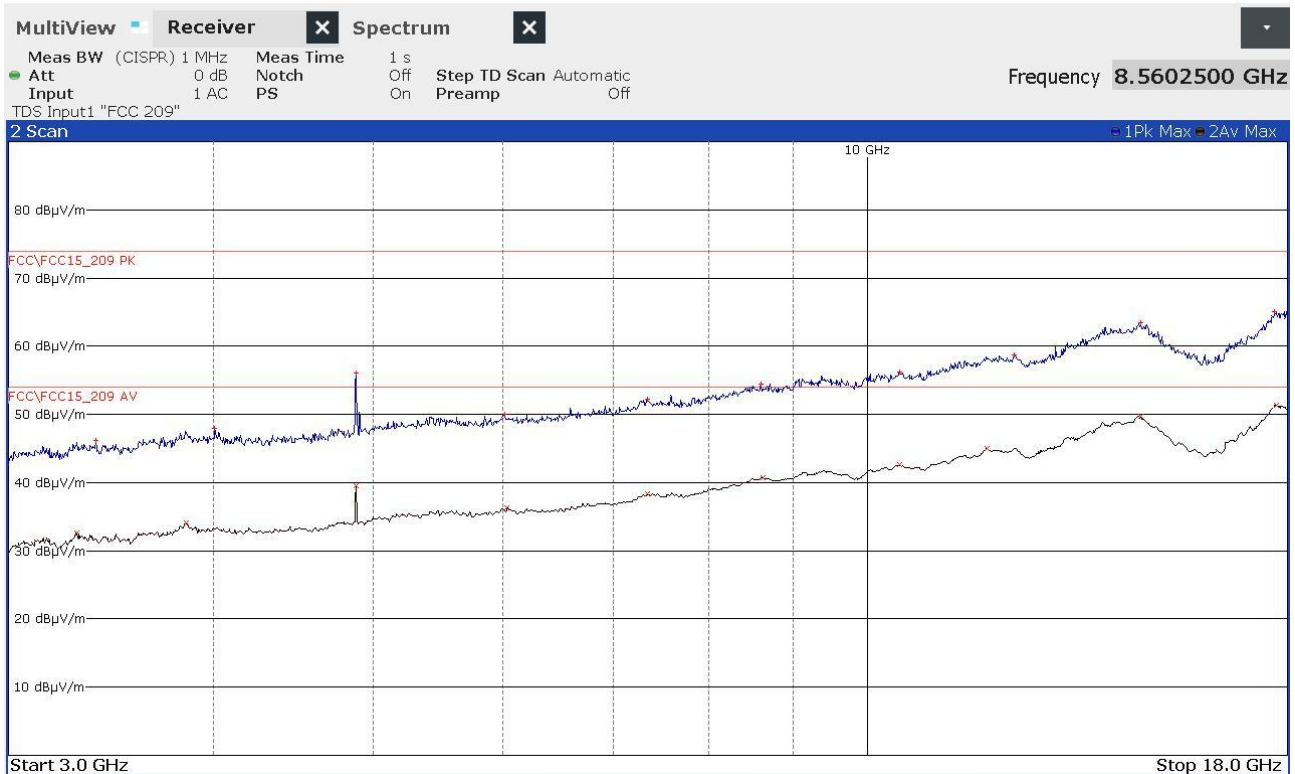


FINAL RESULT TABLE

MAX PEAK			AVERAGE		
Freq Hz	Lev dBuV/m	Margin dB	Freq Hz	Lev dBuV/m	Margin dB
3299500000	+45,76	-28,22	3299500000	+32,62	-21,36
3843250000	+47,58	-26,40	3849750000	+34,12	-19,86
4803500000	+53,68	-20,30	4803750000	+37,79	-16,19
6045500000	+49,98	-24,00	6032750000	+36,41	-17,57
7347500000	+52,73	-21,25	7347500000	+38,32	-15,66
8695750000	+54,57	-19,41	8637500000	+40,74	-13,24
9607000000	+56,58	-17,40	10458750000	+42,61	-11,37
11816250000	+59,12	-14,86	11817750000	+45,07	-8,91
14728500000	+63,64	-10,34	14616500000	+49,80	-4,18
17651500000	+65,22	-8,76	17726250000	+51,37	-2,61

24187405_2

Segalla 24187406

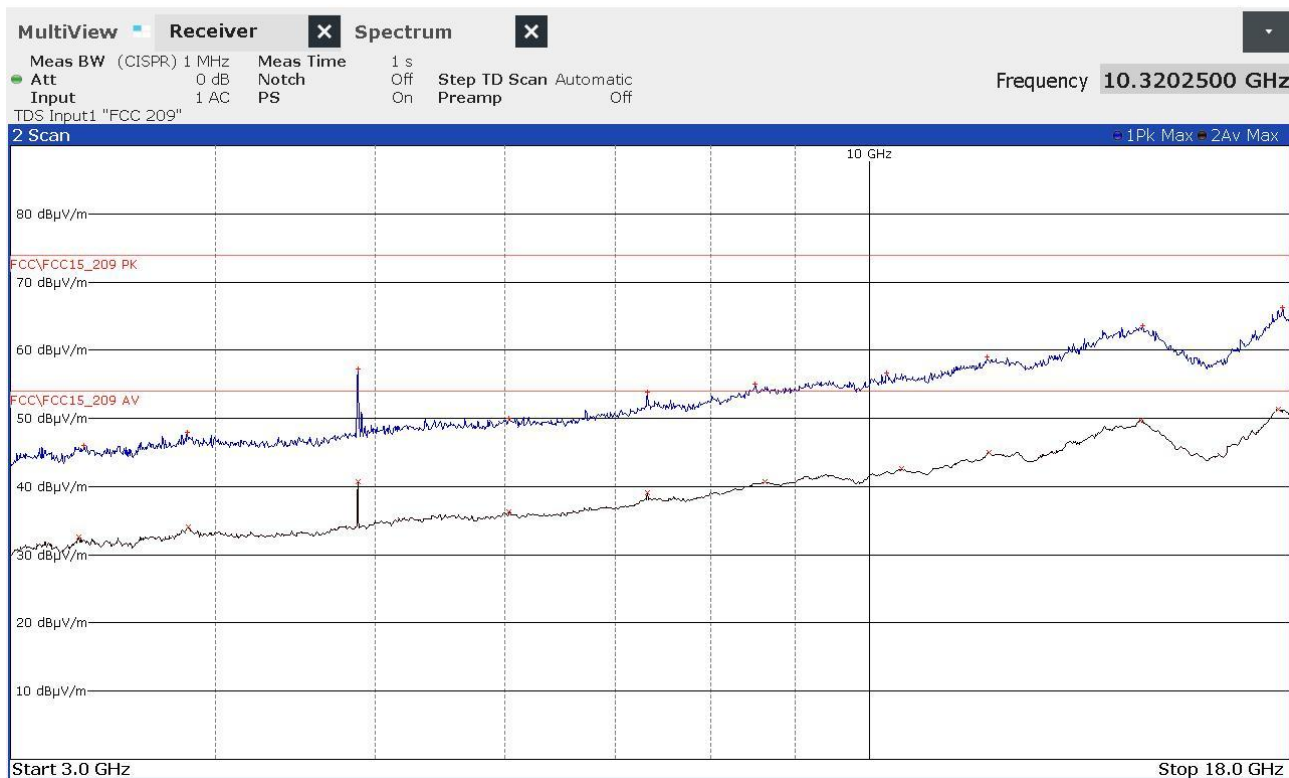


FINAL RESULT TABLE

MAX PEAK			AVERAGE		
Freq Hz	Lev dBuV/m	Margin dB	Freq Hz	Lev dBuV/m	Margin dB
3391750000	+46,19	-27,79	3299500000	+32,60	-21,38
4004500000	+47,90	-26,08	3849750000	+34,13	-19,85
4879500000	+56,01	-17,97	4879750000	+39,61	-14,37
6009000000	+50,07	-23,91	6032750000	+36,35	-17,63
7339750000	+52,27	-21,71	7348000000	+38,29	-15,69
8607750000	+54,51	-19,47	8637250000	+40,70	-13,28
10450250000	+56,24	-17,74	10458750000	+42,57	-11,41
12275000000	+58,76	-15,22	11817000000	+45,06	-8,92
14657000000	+63,39	-10,59	14658250000	+49,76	-4,22
17682750000	+65,11	-8,87	17726000000	+51,35	-2,63

24187406_2

Segalla 24187407

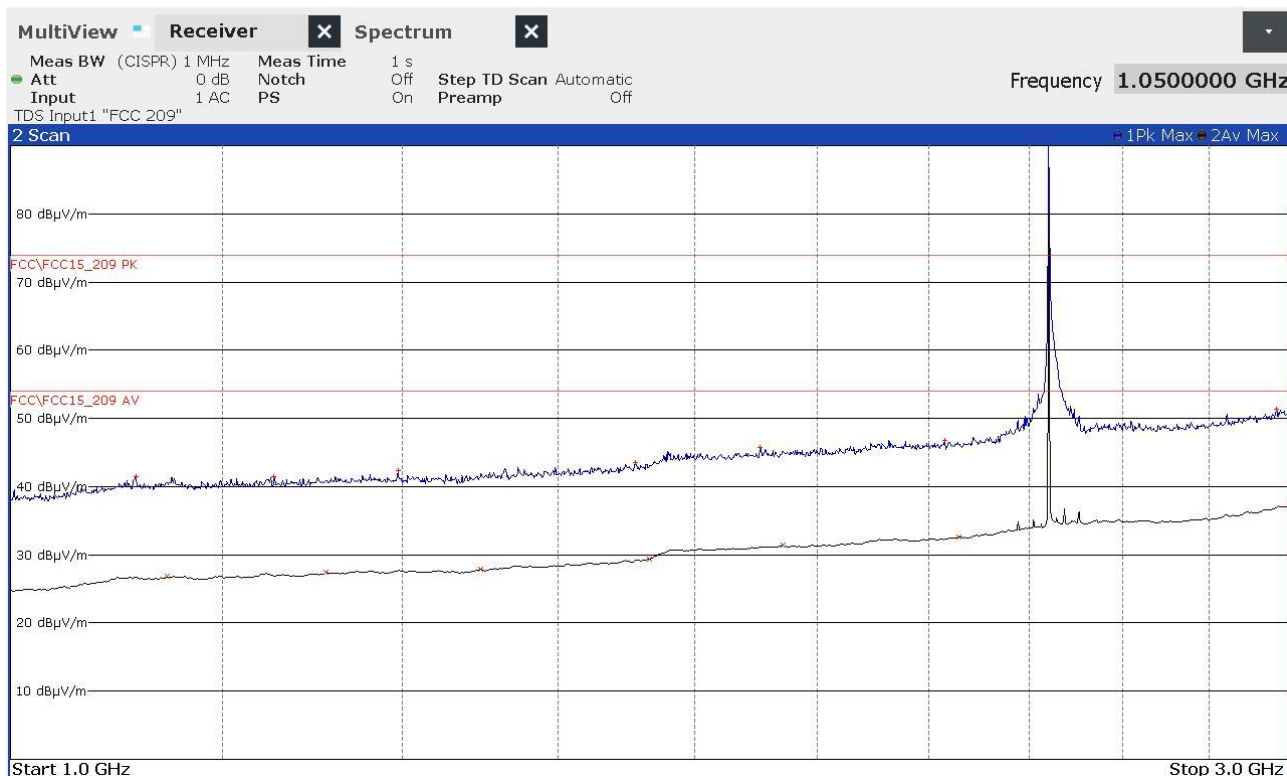


FINAL RESULT TABLE

MAX PEAK			AVERAGE		
Freq Hz	Lev dBuV/m	Margin dB	Freq Hz	Lev dBuV/m	Margin dB
3325000000	+46,01	-27,97	3299750000	+32,59	-21,39
3841000000	+47,99	-25,99	3849750000	+34,14	-19,84
4879500000	+57,22	-16,76	4879750000	+40,69	-13,29
6031750000	+50,02	-23,96	6032250000	+36,33	-17,65
7319250000	+53,88	-20,10	7319250000	+39,15	-14,83
8514250000	+54,99	-18,99	8636250000	+40,68	-13,30
10232250000	+56,68	-17,30	10459000000	+42,58	-11,40
11778000000	+58,97	-15,01	11817000000	+45,05	-8,93
14659750000	+63,61	-10,37	14617000000	+49,77	-4,21
17827500000	+66,30	-7,68	17726500000	+51,34	-2,64

24187407_2

Segalla 24187408

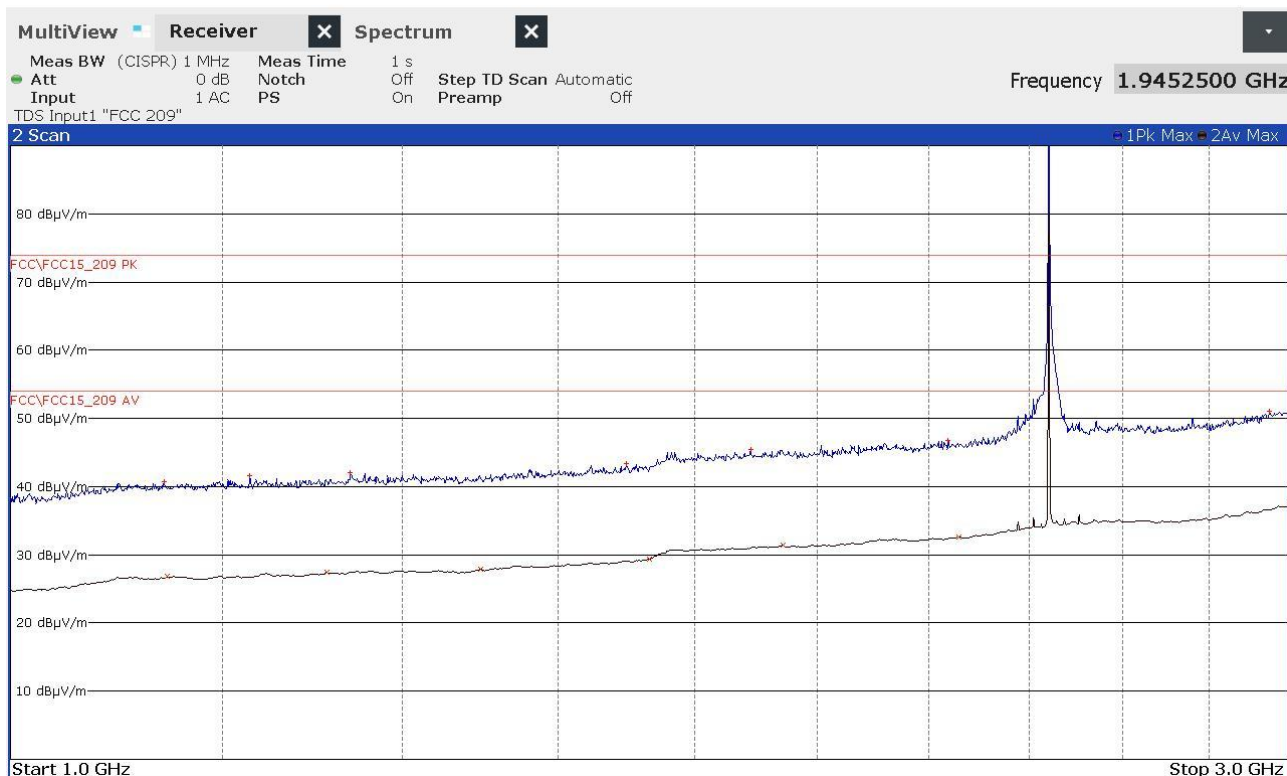


FINAL RESULT TABLE

MAX PEAK			AVERAGE		
Freq Hz	Lev dBuV/m	Margin dB	Freq Hz	Lev dBuV/m	Margin dB
1113750000	+41,53	-32,45	1144000000	+26,78	-27,20
1254250000	+41,53	-32,45	1311750000	+27,41	-26,57
1395250000	+42,36	-31,62	1497500000	+27,91	-26,07
1710000000	+43,47	-30,51	1732000000	+29,41	-24,57
1904500000	+45,77	-28,21	1941500000	+31,42	-22,56
2230750000	+46,71	-27,27	2258500000	+32,65	-21,33
2967250000	+51,35	-22,63	2999750000	+37,28	-16,70

24187408_2

Segalla 24187409

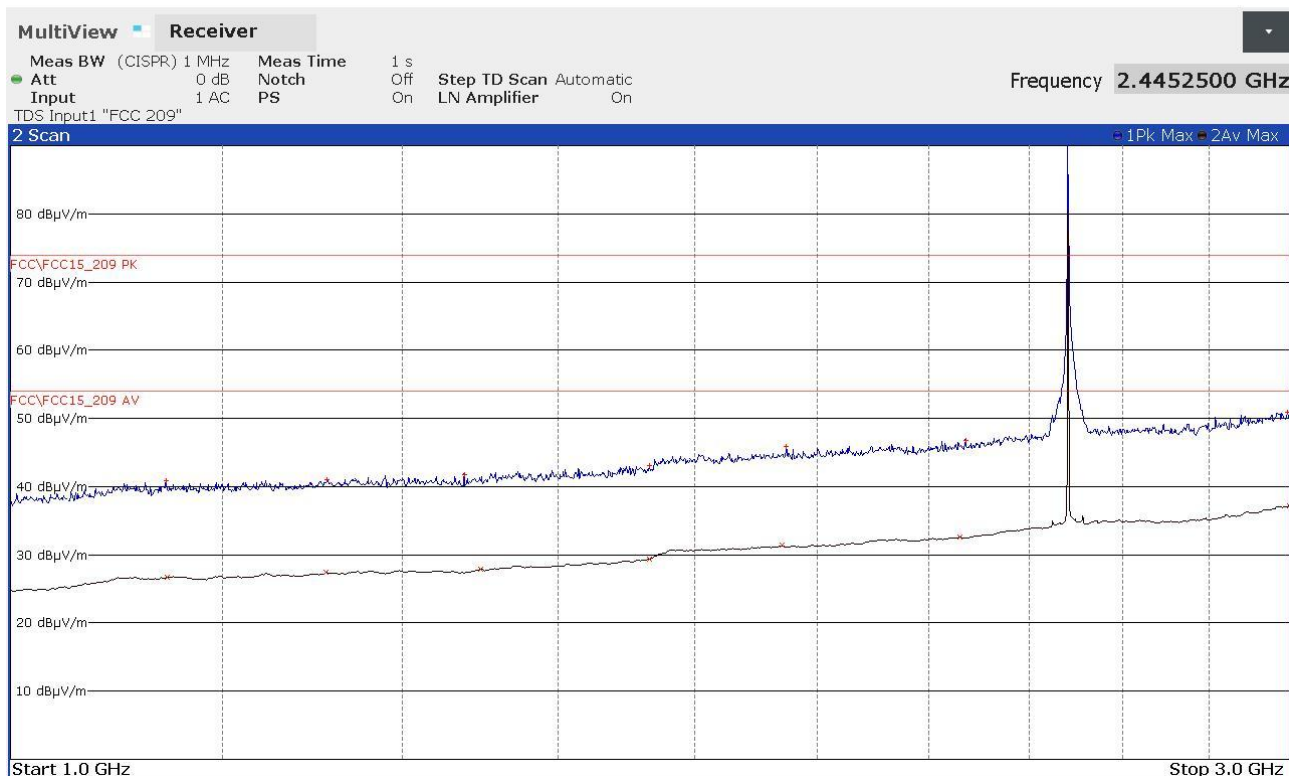


FINAL RESULT TABLE

MAX PEAK			AVERAGE		
Freq Hz	Lev dBuV/m	Margin dB	Freq Hz	Lev dBuV/m	Margin dB
1140750000	+40,69	-33,29	1144000000	+26,78	-27,20
1228250000	+41,54	-32,44	1312500000	+27,41	-26,57
1338500000	+41,98	-32,00	1498000000	+27,92	-26,06
1696750000	+43,32	-30,66	1732000000	+29,43	-24,55
1888250000	+45,43	-28,55	1941500000	+31,42	-22,56
2237750000	+46,82	-27,16	2258250000	+32,64	-21,34
2948500000	+51,05	-22,93	2999750000	+37,27	-16,71

24187409_2

Segalla 24187412

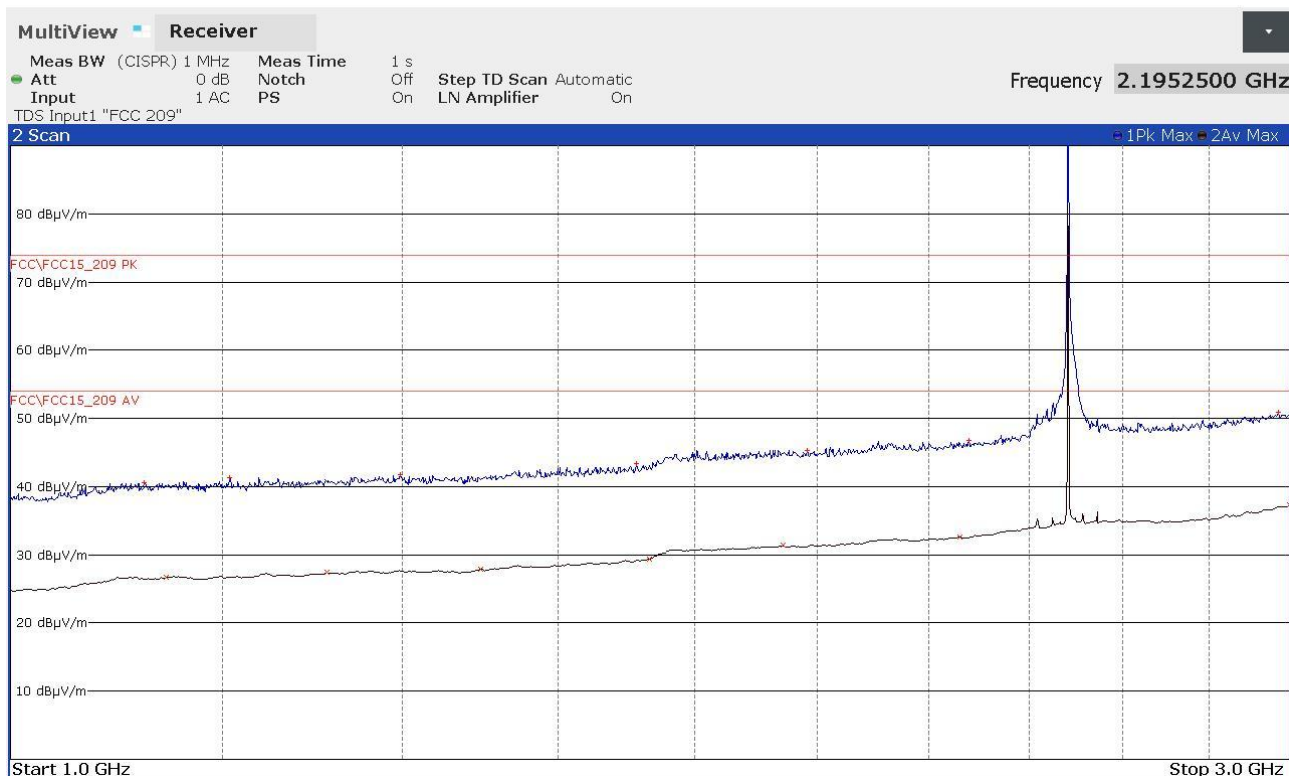


FINAL RESULT TABLE

MAX PEAK			AVERAGE		
Freq Hz	Lev dBuV/m	Margin dB	Freq Hz	Lev dBuV/m	Margin dB
1142750000	+40,90	-33,08	1143750000	+26,77	-27,21
1312250000	+41,05	-32,93	1311500000	+27,41	-26,57
1476500000	+41,69	-32,29	1498000000	+27,92	-26,06
1730750000	+43,01	-30,97	1732000000	+29,40	-24,58
1947000000	+45,86	-28,12	1941000000	+31,40	-22,58
2271250000	+46,71	-27,27	2259500000	+32,62	-21,36
2994750000	+50,83	-23,15	2999750000	+37,25	-16,73

24187412_2

Segalla 24187413

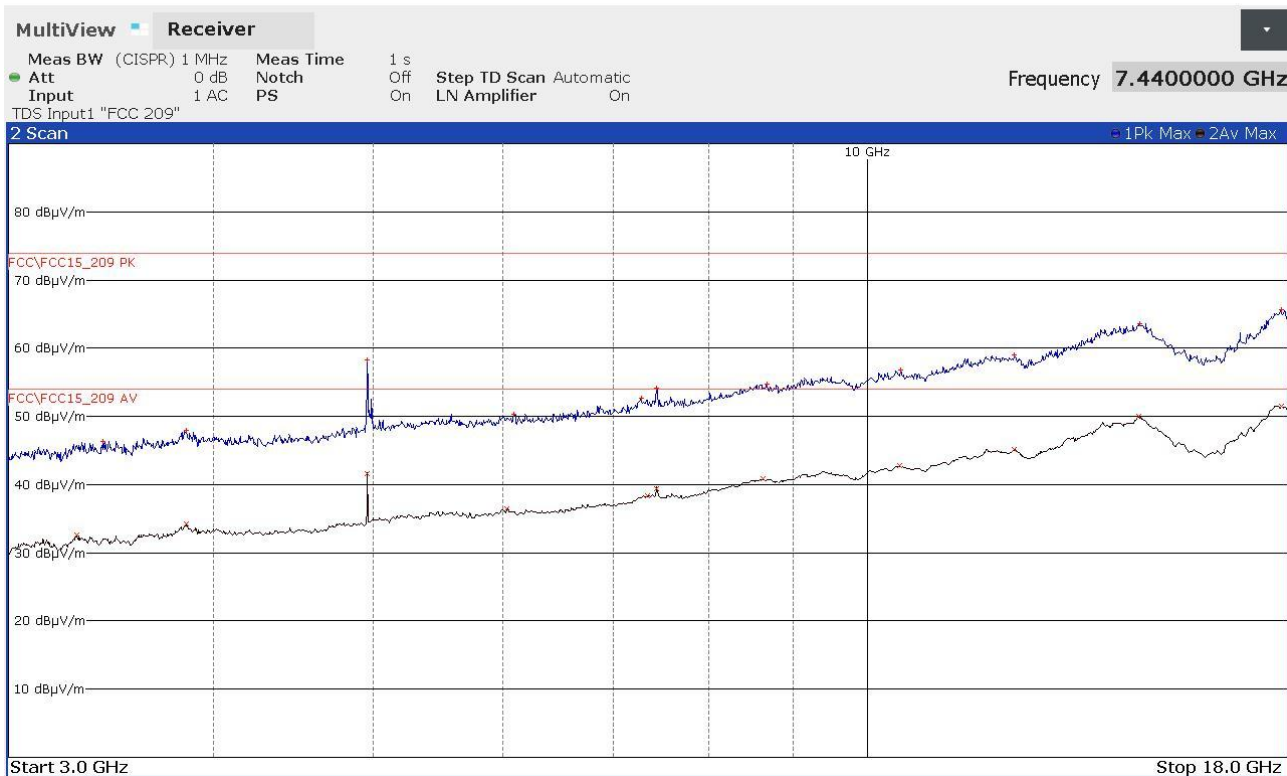


FINAL RESULT TABLE

MAX PEAK			AVERAGE		
Freq Hz	Lev dBuV/m	Margin dB	Freq Hz	Lev dBuV/m	Margin dB
1121250000	+40,62	-33,36	1143500000	+26,77	-27,21
1207250000	+41,34	-32,64	1312250000	+27,41	-26,57
1397500000	+41,74	-32,24	1497750000	+27,94	-26,04
1711750000	+43,33	-30,65	1732000000	+29,40	-24,58
1983000000	+45,34	-28,64	1941250000	+31,42	-22,56
2277250000	+46,74	-27,24	2259500000	+32,63	-21,35
2972000000	+50,94	-23,04	2999750000	+37,29	-16,69

24187413_2

Segalla 24187414

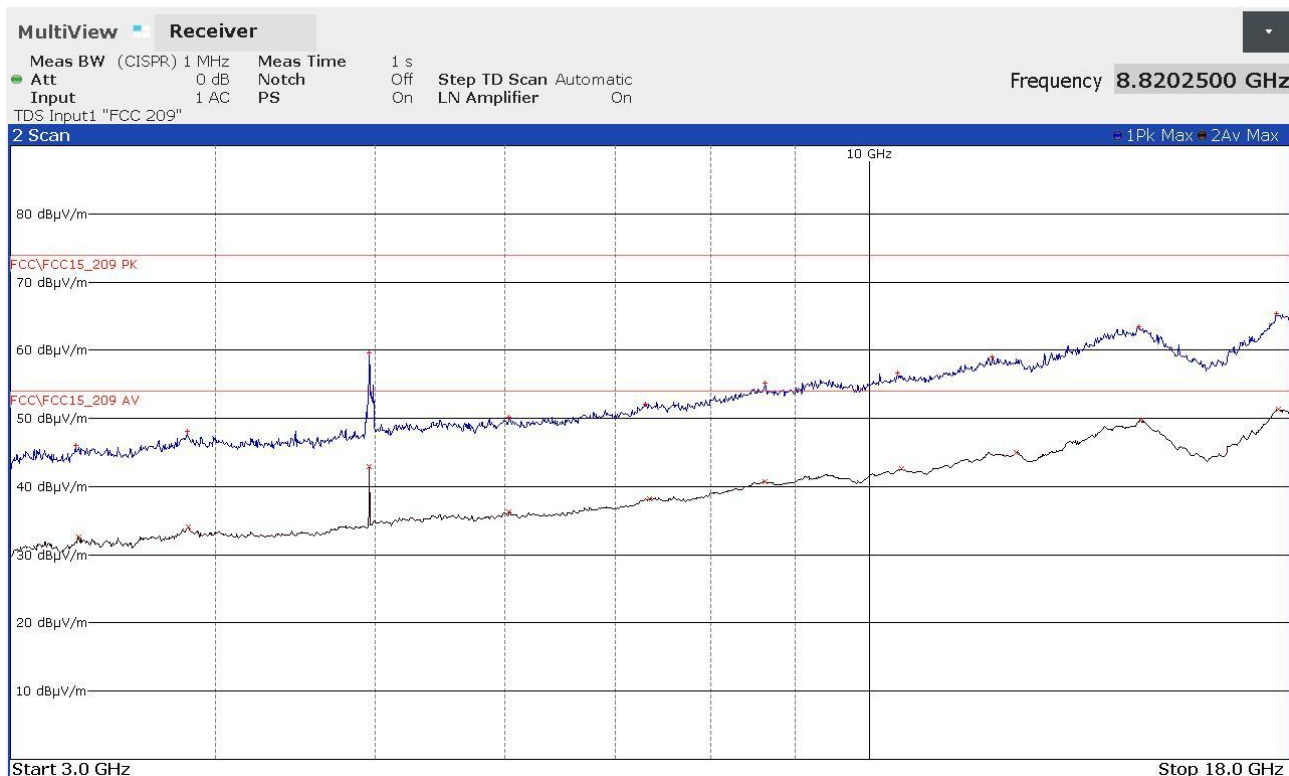


FINAL RESULT TABLE

MAX PEAK			AVERAGE		
Freq Hz	Lev dBuV/m	Margin dB	Freq Hz	Lev dBuV/m	Margin dB
3425500000	+46,30	-27,68	3299750000	+32,63	-21,35
3849750000	+47,94	-26,04	3849750000	+34,19	-19,79
4959500000	+58,29	-15,69	4959750000	+41,68	-12,30
6087250000	+50,31	-23,67	6031250000	+36,49	-17,49
7276500000	+52,65	-21,33	7348250000	+38,41	-15,57
7440750000	+54,22	-19,76	7440000000	+39,32	-14,66
8677750000	+54,81	-19,17	8637750000	+40,83	-13,15
10470750000	+56,84	-17,14	10459750000	+42,80	-11,18
12277750000	+58,95	-15,03	12279500000	+45,17	-8,81
14632000000	+63,61	-10,37	14618000000	+49,98	-4,00
17847250000	+65,71	-8,27	17837750000	+51,50	-2,48

24187414_2

Segalla 24187415

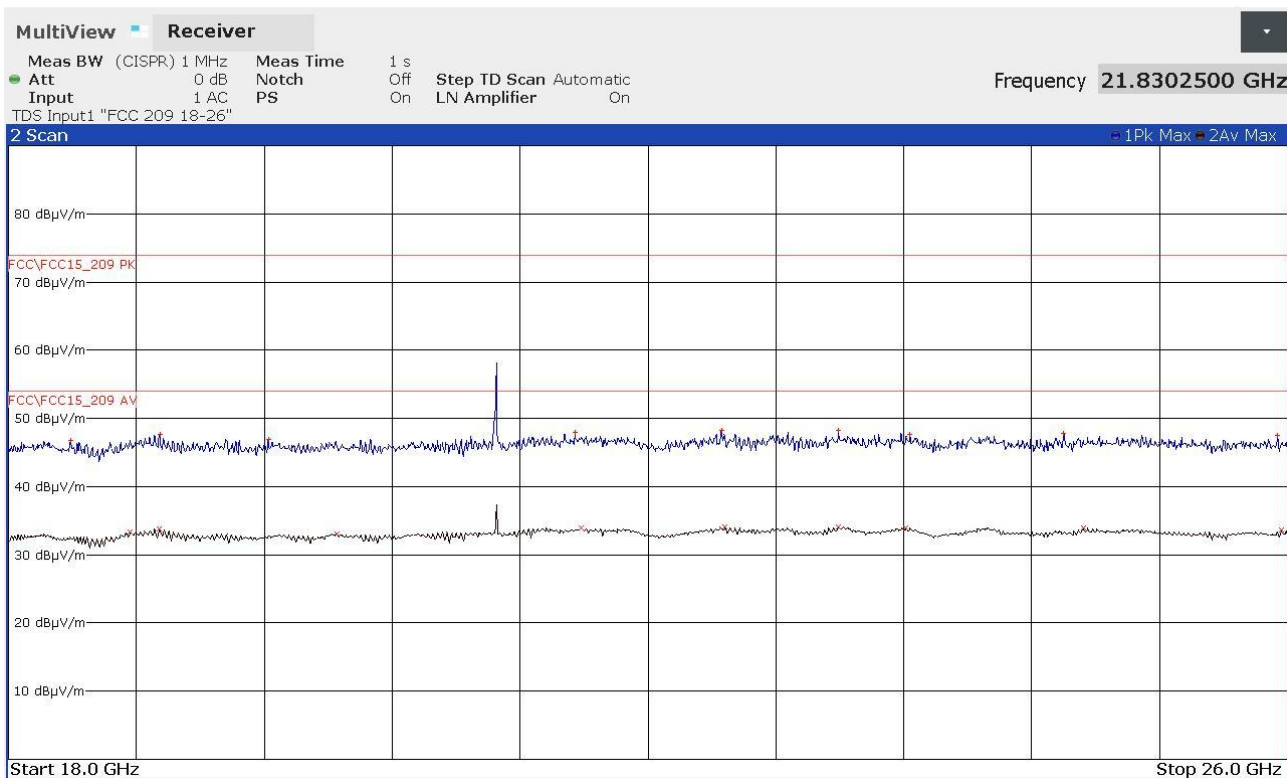


FINAL RESULT TABLE

MAX PEAK			AVERAGE		
Freq Hz	Lev dBuV/m	Margin dB	Freq Hz	Lev dBuV/m	Margin dB
3288250000	+46,07	-27,91	3299500000	+32,58	-21,40
3843500000	+48,13	-25,85	3849750000	+34,11	-19,87
4959500000	+59,57	-14,41	4959750000	+42,90	-11,08
6032750000	+50,11	-23,87	6032000000	+36,35	-17,63
7305750000	+52,09	-21,89	7348250000	+38,27	-15,71
8632750000	+55,18	-18,80	8637750000	+40,71	-13,27
10399000000	+56,65	-17,33	10458750000	+42,62	-11,36
11874250000	+58,97	-15,01	12278750000	+45,06	-8,92
14572750000	+63,47	-10,51	14617750000	+49,79	-4,19
17664750000	+65,38	-8,60	17726750000	+51,32	-2,66

24187415_2

Segalla 24187416

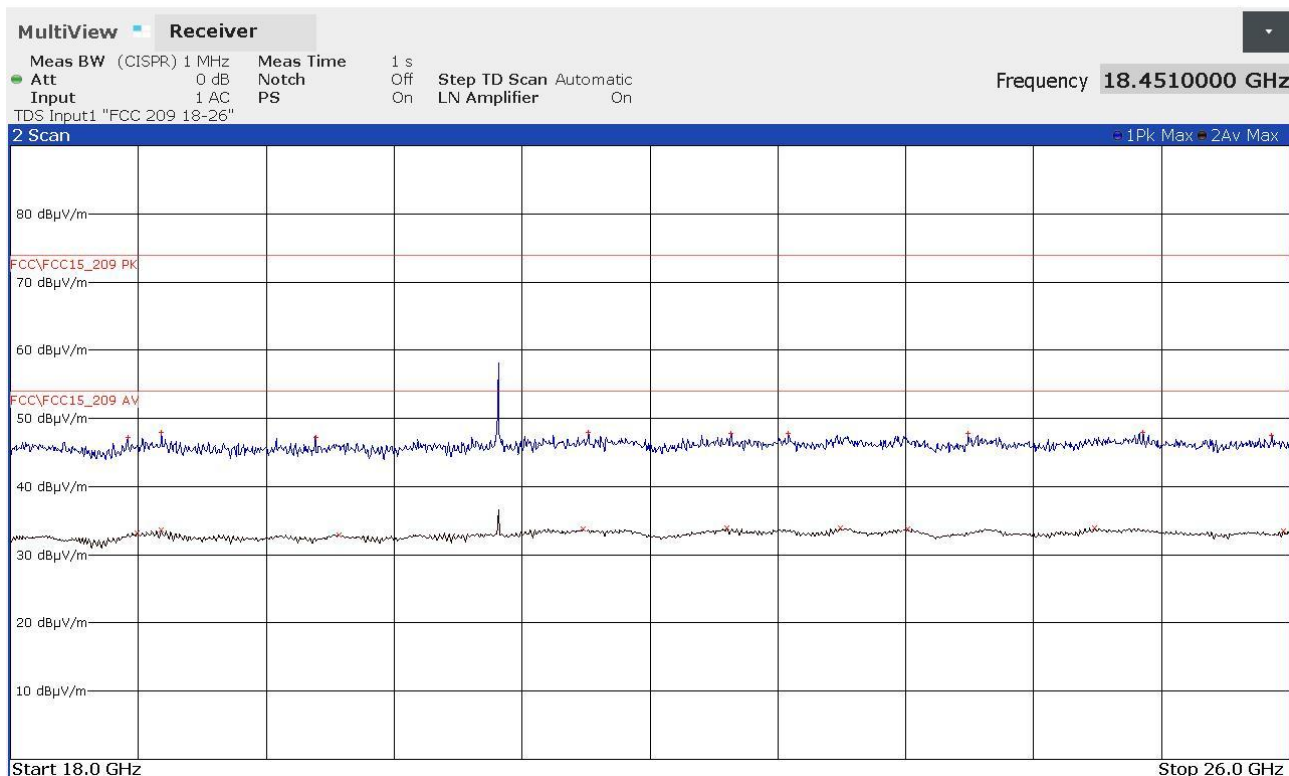


FINAL RESULT TABLE

MAX PEAK			AVERAGE		
Freq Hz	Lev dBuV/m	Margin dB	Freq Hz	Lev dBuV/m	Margin dB
18388000000	+46,83	-27,15	18763500000	+33,32	-20,66
18946500000	+47,68	-26,30	18943500000	+33,75	-20,23
19624750000	+46,96	-27,02	20054000000	+33,11	-20,87
21544250000	+47,96	-26,02	21584000000	+33,93	-20,05
22459000000	+48,30	-25,68	22482500000	+34,04	-19,94
23190000000	+48,23	-25,75	23191500000	+34,15	-19,83
23639000000	+47,63	-26,35	23612250000	+33,94	-20,04
24601000000	+47,82	-26,16	24721250000	+33,94	-20,04
25938000000	+47,54	-26,44	25963000000	+33,58	-20,40

24187416_2

Segalla 24187417

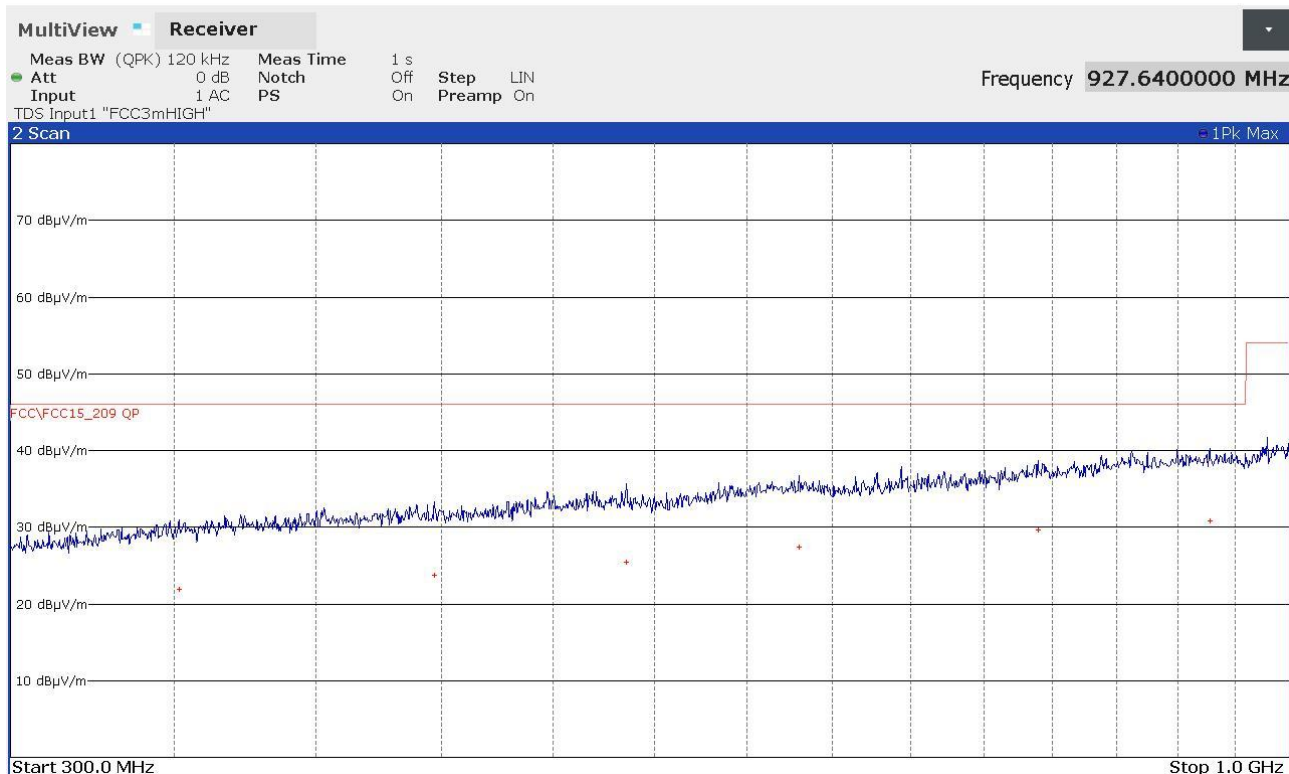


FINAL RESULT TABLE

MAX PEAK			AVERAGE		
Freq Hz	Lev dBuV/m	Margin dB	Freq Hz	Lev dBuV/m	Margin dB
18734500000	+47,27	-26,71	18792750000	+33,19	-20,79
18944500000	+47,89	-26,09	18943500000	+33,60	-20,38
19907500000	+47,17	-26,81	20053250000	+32,95	-21,03
21615750000	+47,94	-26,04	21583250000	+33,78	-20,20
22509000000	+47,87	-26,11	22481750000	+33,87	-20,11
22864500000	+47,77	-26,21	23190500000	+33,97	-20,01
23989500000	+47,82	-26,16	23610500000	+33,81	-20,17
25084750000	+47,89	-26,09	24778250000	+33,93	-20,05
25889750000	+47,54	-26,44	25963000000	+33,53	-20,45

24187417_2

Segalla 24187418



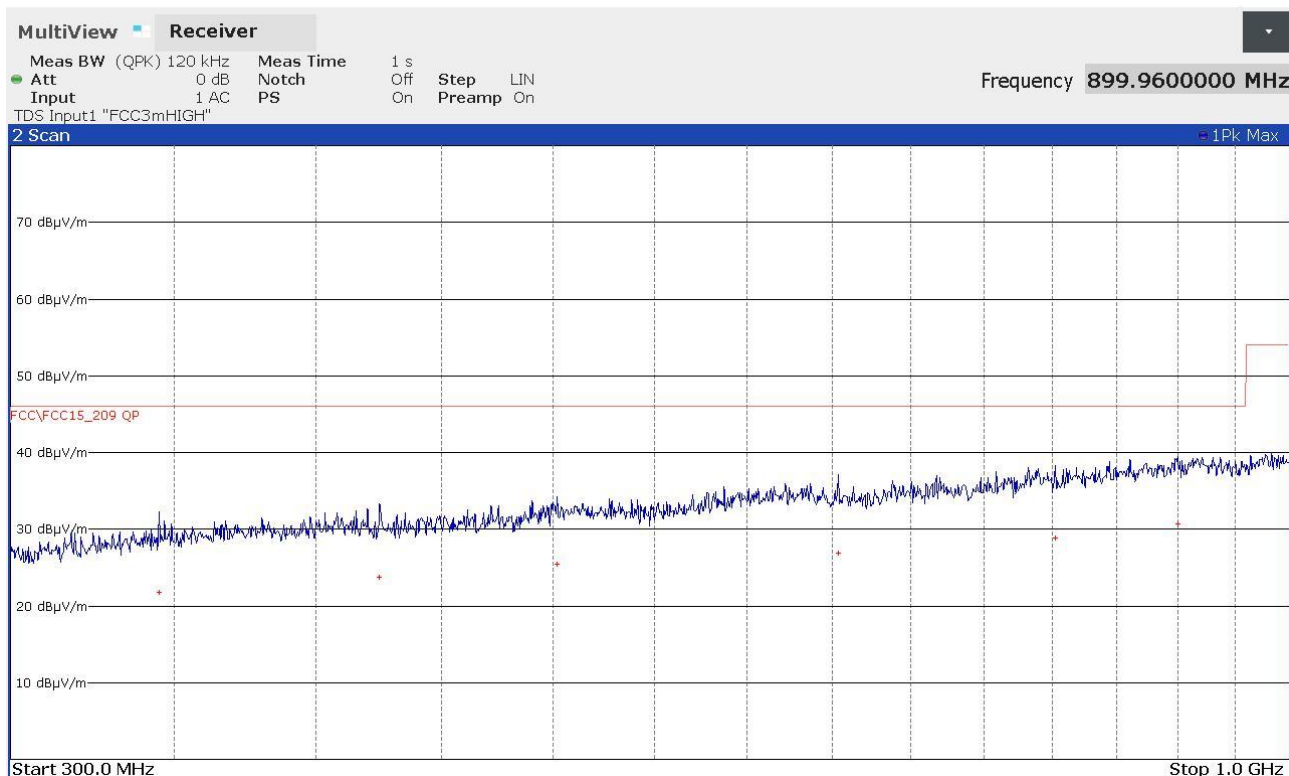
FINAL RESULT TABLE

QUASI PEAK

Freq Hz	Lev dBuV/m	Margin dB
351520000	+21,95	-24,07
447000000	+23,80	-22,22
535800000	+25,46	-20,56
630400000	+27,47	-18,55
789280000	+29,66	-16,36
927640000	+30,87	-15,15

24187418_2

Segalla 24187419



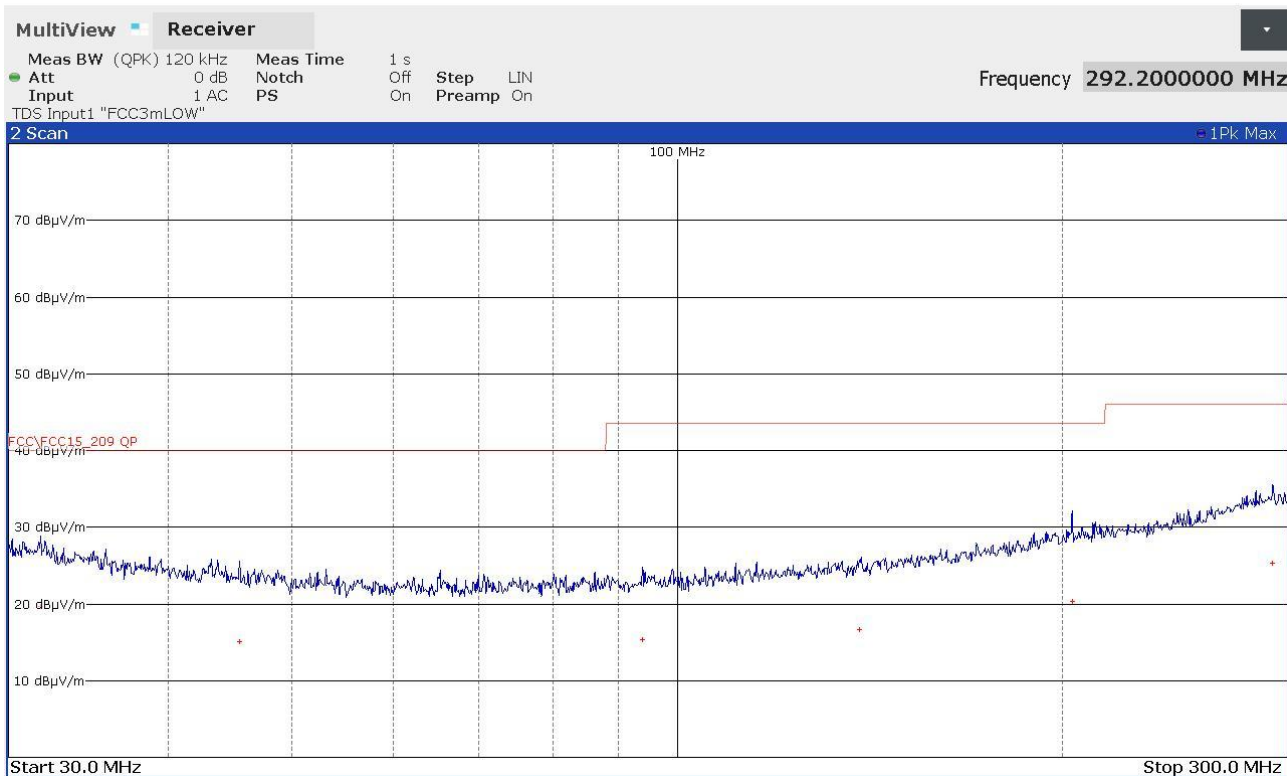
FINAL RESULT TABLE

QUASI PEAK

Freq Hz	Lev dBuV/m	Margin dB
345080000	+21,77	-24,25
424680000	+23,72	-22,30
501920000	+25,48	-20,54
654080000	+26,83	-19,19
802000000	+28,88	-17,14
899960000	+30,71	-15,31

24187419_2

Segalla 24187420



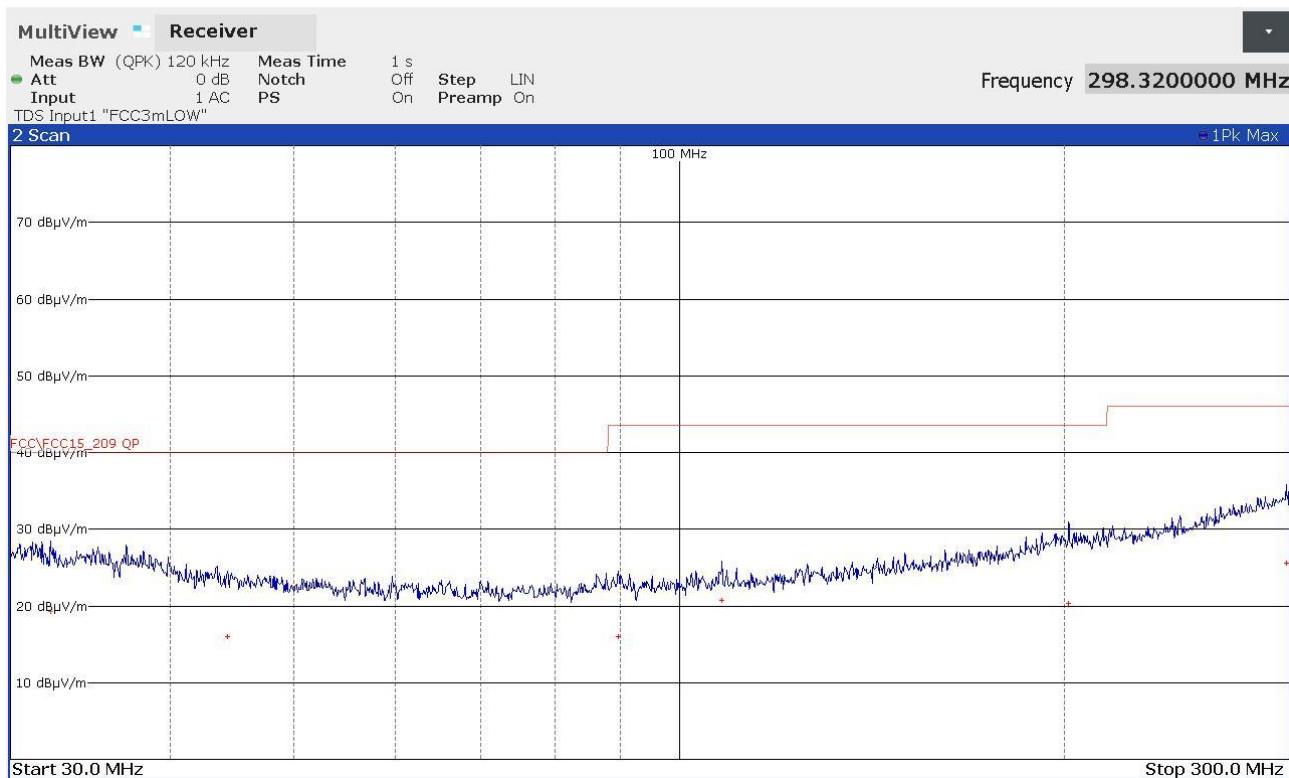
FINAL RESULT TABLE

QUASI PEAK

Freq Hz	Lev dBuV/m	Margin dB
31800000	+19,73	-20,27
45480000	+15,14	-24,86
94000000	+15,40	-28,12
138760000	+16,69	-26,83
203560000	+20,34	-23,18
292200000	+25,33	-20,69

24187420_2

Segalla 24187421



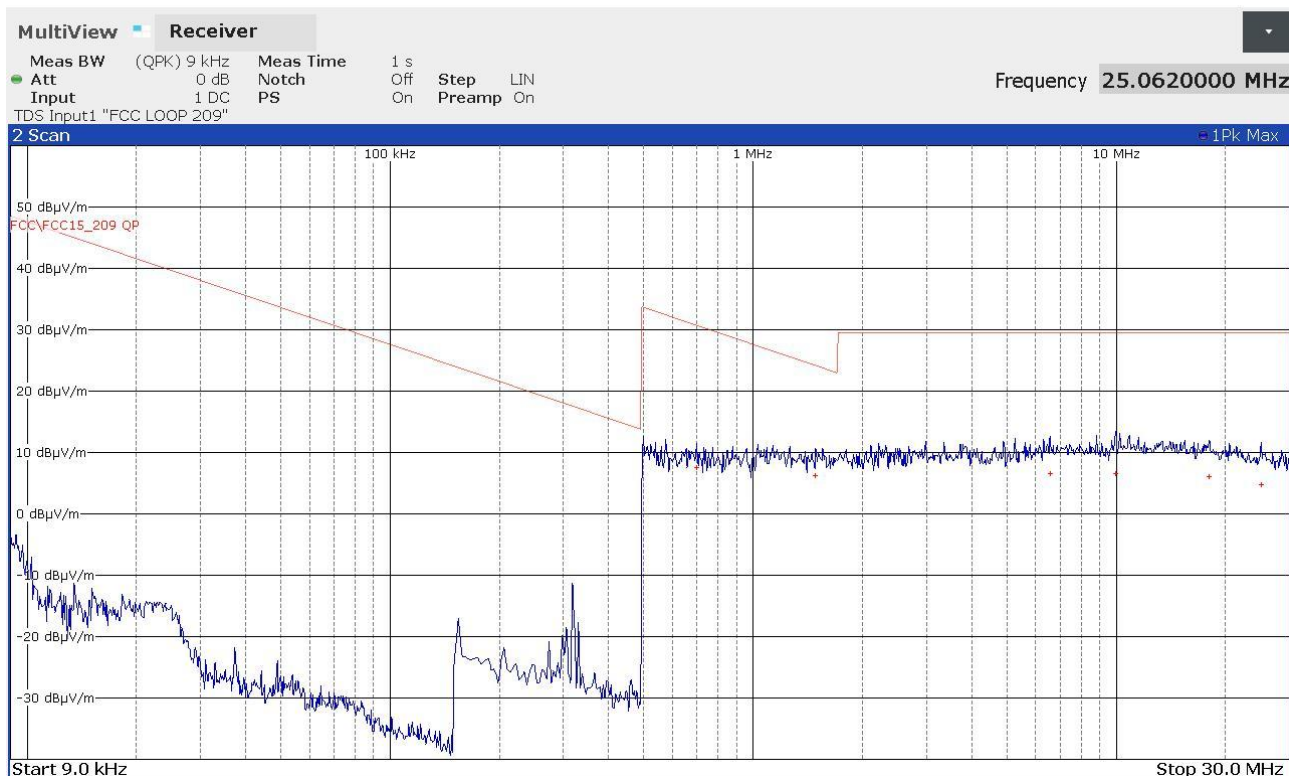
FINAL RESULT TABLE

QUASI PEAK

Freq Hz	Lev dBuV/m	Margin dB
32240000	+19,23	-20,77
44360000	+16,04	-23,96
89600000	+15,94	-27,58
108000000	+20,68	-22,84
201680000	+20,34	-23,18
298320000	+25,53	-20,49

24187421_2

Segalla 24187422



FINAL RESULT TABLE

QUASI PEAK

Freq Hz	Lev dBuV/m	Margin dB
698000	+7,47	-23,26
1486000	+6,27	-17,89
6566000	+6,57	-22,97
9962000	+6,58	-22,96
18042000	+6,02	-23,52
25062000	+4,79	-24,75

24187422_2

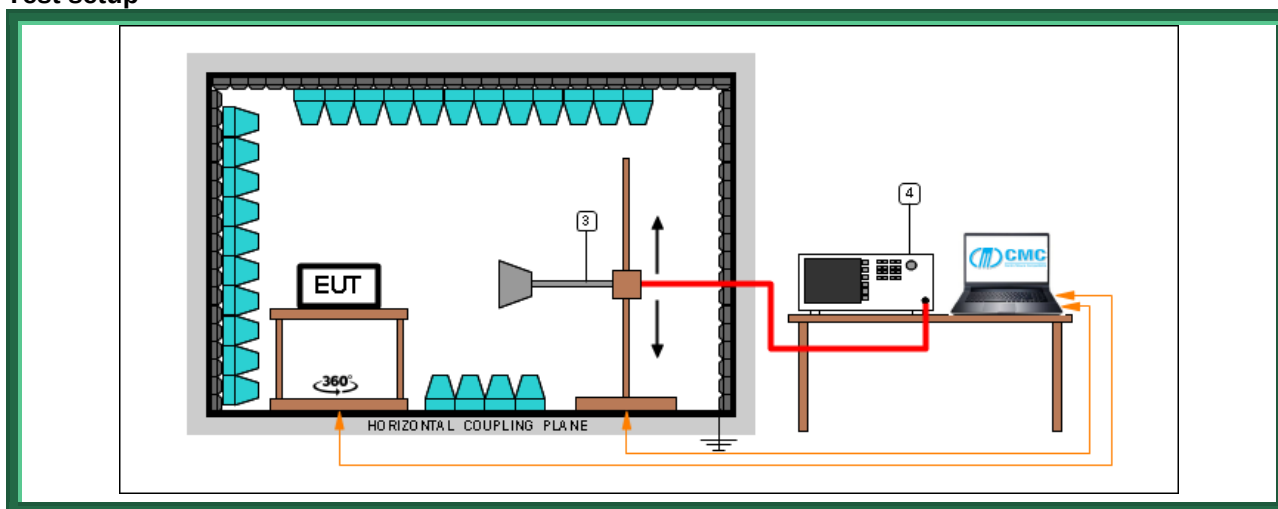
9.3 Fundamental emission output power

Tested by	M. Segalla
Test date	12.11.2024
Test location (stand)	Semi-anechoic chamber (CMC A070)
Basic standard(s)	ANSI C63.10 cl. 11.9.1.1 KDB 558074 D01 DTS Meas Guidance v05r02 cl. 8.3.1.1
Product standard(s)	FCC Rules and Regulation; Titles 47 Part 15.247 (b) (3)
Supplementary test set-up description	EUT – antenna distance: 3 m
Supplementary information	--

Acceptance limits

For systems using digital modulation in the 902 – 928 MHz, 2400 – 2483,5 MHz, and 5725 – 5850 MHz bands: 1 W.

Test setup



Test setup PE004_24

Nr.	Id. Number	Manufacturer	Model	Serial number	Description	Last calibration date	Calibration expiration
4	CMC S402	Rohde & Schwarz	ESW44	103433	Emi Test Receiver	December 2023	December 2024
3	CMC S108	Emco	3115	9811-5622	Waveguide antenna	August 2022	August 2025

Result

Transmission frequency (MHz)	Polarization	Graphs	Measured level (dBμV/m)	Peak Output Power (mW)	Limit (mW)	Verdict
2402	Worst case	G24187401	101,01	4,15	1000	P
2440	Worst case	G24187410	100,92	4,07	1000	P
2480	Worst case	G24187411	100,97	4,11	1000	P

Remarks

$P = (E \times d)^2 / (30 \times G)$

Where:

E = the measured maximum fundamental field strength in V/m

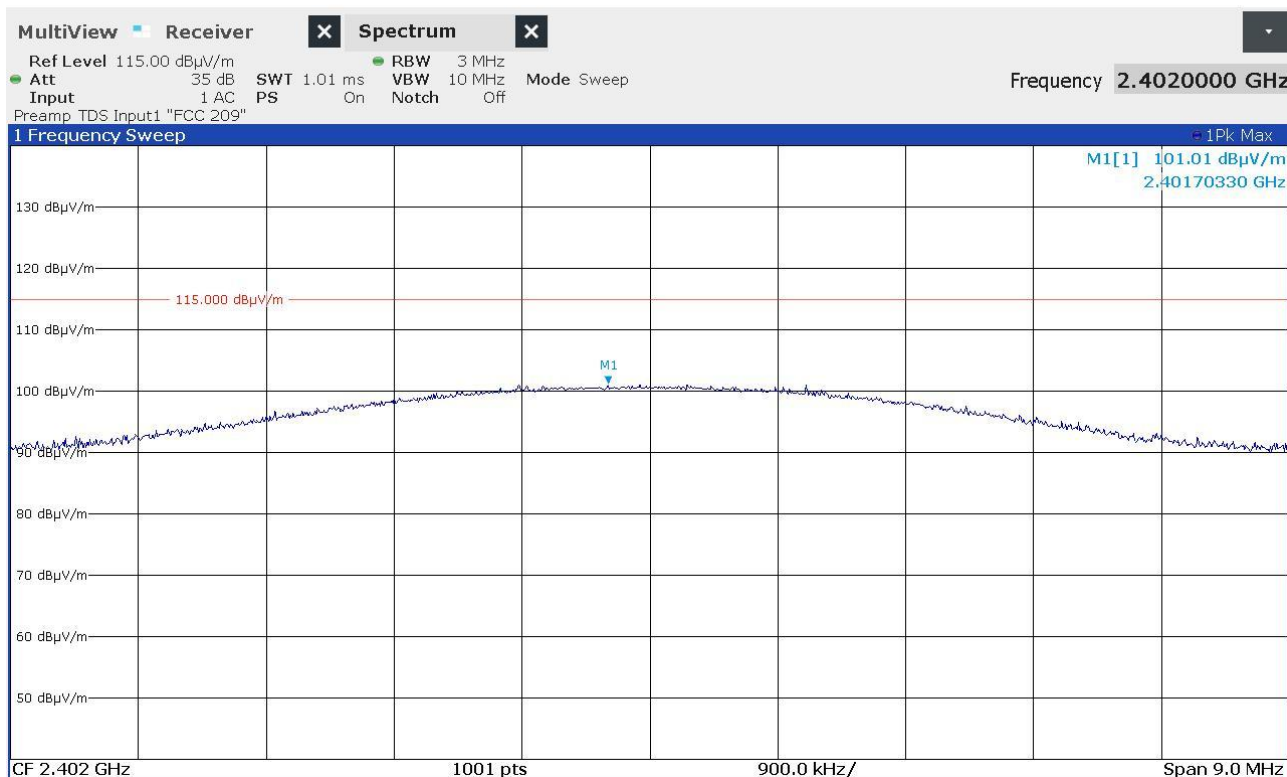
G = the numeric gain of the transmitting antenna: 0,902 (-0,40 dBi)

d = the distance in meters from which the field strength was measured (3 m)

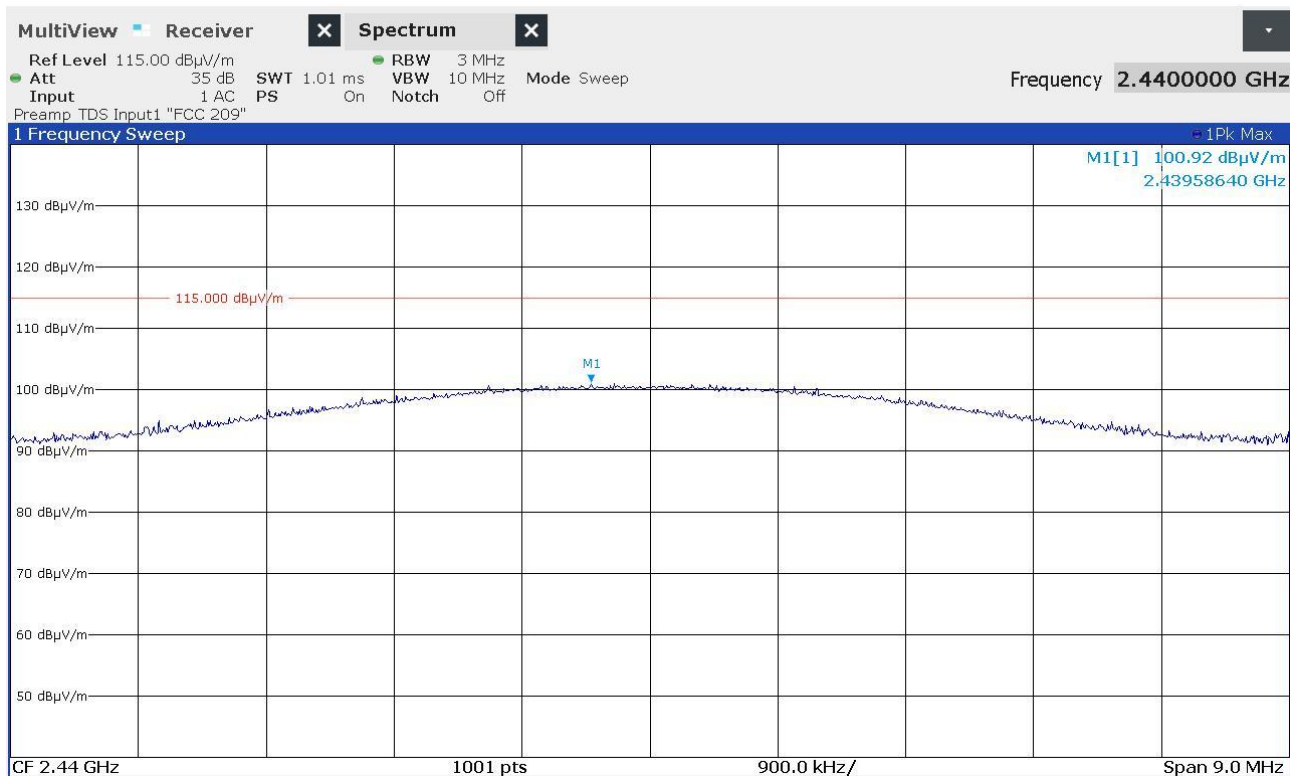
P = the power in watts

Graphs

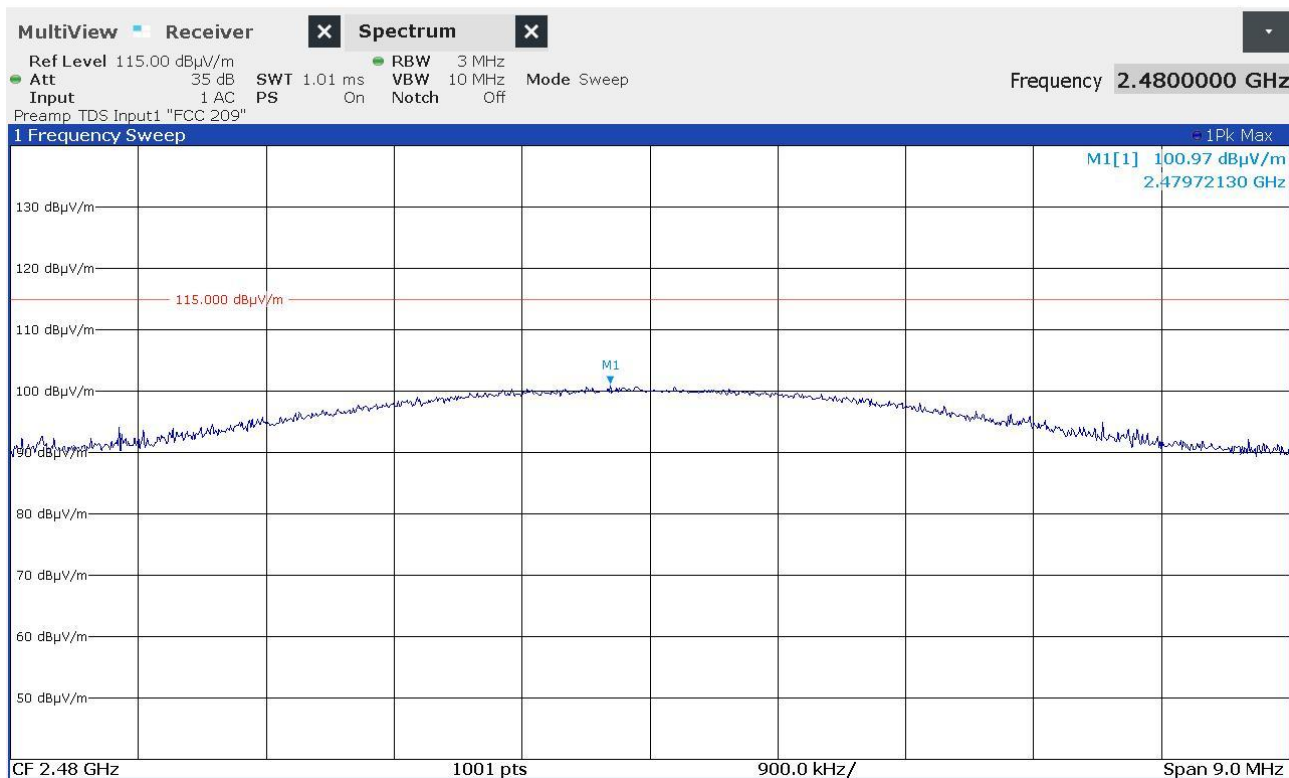
Segalla 24187401



Segalla 24187410



Segalla 24187411



Attachment 1

Measurement uncertainty

Test	Test Setup	Expanded uncertainty			Note
Conducted emission CISPR 16 LISN 50uH 0,009-0,0150 MHz	PE001_01			3,6 dB	1
Conducted emission CISPR 16 LISN 50uH 0,150-30,0 MHz	PE001_01			2,9 dB	1
Conducted emission CISPR 16 Voltage Probe 0,15-30 MHz	PE001_02			2,3 dB	1
Conducted emission CISPR 16 Current Probe 0,15-30 MHz	PE001_03			2,5 dB	1
Conducted emission CISPR 16 ISN 0,15-30 MHz	PE001_04			4,7 dB	1
Clic CISPR 16 LISN 50uH 0,150-30,0 MHz	PE001_05			2,9 dB	1
Radiated Emission CDNE 30-300 MHz	PE001_06			3,3 dB	1
Disturbance Power 30-300 MHz	PE002_X1			3,8 dB	1
Radiated Emission LAS 0,15-30 MHz	PE003_01			2,0 dB	1
Radiated Emission CISPR 16 Loop Ant. 0,15-30 MHz	PE004_X1			4,1 dB	1
Radiated Emission CISPR 16 Bicon. Ant. 30-300 MHz	PE004_X2			4,7 dB	1
Radiated Emission CISPR 16 LogP. Ant. 300-1000 MHz	PE004_X3			4,6 dB	1
Radiated Emission CISPR 16 Horn Ant. 1-18 GHz	PE004_X4			4,7 dB	1
Human Exposure to electromagnetic fields	PE005_01			14,2 %	1
Harmonics	PE006_01	10 mA	+	2,9 %	1
Flicker	PE007_01			3,40 %	1
Radiated Immunity 80 MHz - 6 GHz	PE102_XX	2,26 dB		0,89 V/m a 3V/m	1
Conducted Immunity 0,15 - 230 MHz	PE105_XX	1,26 dB		0,47 V a 3V	1
AC Magnetic field	PE106_01	1,55 %		0,15 A/m a 10A/m	1
Pulse Magnetic field	PE107_01	6,21 %		18,6 A/m a 300A/m	1
Dumped Magnetic field	PE108_01	6,21 %		1,86 A/m a 30A/m	1
Common mode conducted immunity	PE112_01	2,11 %		0,21 V a 10V	1

Attachment 1

Test	Test Setup	Expanded uncertainty	Note
Power/Spurious 9kHz-30MHz	PR001_X1	4,1 dB	1
Power/Spurious ERP 30-1000MHz d=10m/3m	PR001_X2+X3	4,8 dB	1
Misura della potenza EIRP 1-18GHz d=3m	PR001_X4+X5	4,7 dB	1
Misura della potenza EIRP 18-40GHz d=3m	PR001_X6	5,1 dB	1
Frequency error	PR002_01+02	$< 1 \times 10^{-7}$	1
Timing zero span (1001pts.)	PR002_01+02	0,2 % SWT	1
Modulation bandwidth	PR002_01+02	$< 1 \times 10^{-7}$	1
Conducted RF power and spurious emission	PR002_01+02	1,1 dB	1
Adjacent channel power	PR002_01+02	1,1 dB	1
Blocking	PR002_01+02	1,1 dB	1

Test	Test Setup	Expanded uncertainty	Note
Electrostatic discharge immunity test	PE101_0X		2
Electrical fast transients / burst immunity test	PE103_0X		2
Surge immunity test	PE104_0X		2
Short interruption immunity test	PE109_01		2
Ring Wave immunity test	PE110_01		2
Low frequency immunity test	PE111_01		2
Dumped Oscillatory immunity test	PE113_01		2
Rev_24_01 date 03/02/2024			

Note 1:

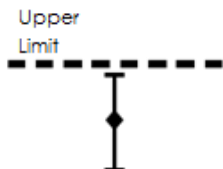
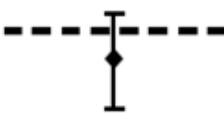
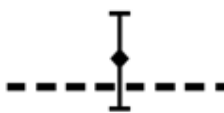
The expanded uncertainty reported according to the document EA-4-02 is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of $p = 95\%$

Note 2:

It has been demonstrated that the used test equipment meets the specified requirements in the standard with at least a 95% confidence, covering factor $k=2$

Attachment 1

Judgement of compliance

Case 1	Case 2	Case 3	Case 4
 The sample complies with the requirements. The measurement results is within the specification limit when the measurement uncertainty is taken into account.	 The sample complies with the requirements. It is not possible to state compliance using a 95% coverage probability for the expanded uncertainty although the measurement result is below the limit.	 The sample does not comply with the requirements. It is not possible to state compliance using a 95% coverage probability for the expanded uncertainty also the measurement result is upper the limit.	 The sample does not comply with the requirements. The measurement results is outside the specification limit when the measurement uncertainty is taken into account.

In agreement with ILAC-G8:09/2019 cl.4.2.1 Guidelines on Decision Rules and Statements of Conformity

Quality manual references – Internal procedure

Internal Procedure PM001 rev. 4.0 (Quality Manual)	Measure procedure
Internal Procedure INC_M rev. 10.0 (Quality Manual)	Measurement uncertainty calculation