

TEST REPORT

Nr. R22008401

Federal Communication Commission (FCC)

Report Reference No.	R22008401
Date of issue:	08.03.2023
Total number pages:	67
Customer name	Microgate S.r.l.
Address	Via Waltraud Gebert Deeg, 3e – 39100 Bolzano (BZ) – Italy
Test specification:	
Standards	FCC Rules & Regulations, Title 47:2021 Part 15 paragraph(s): 203, 204, 207, 209 and 231
Non-standard test method	N/A
Test Report Form No.	15-231_DEKRA
Test Report Form(s) Originator ...	DEKRA Testing and Certification S.r.l.
Master TRF	2022-12
General disclaimer:	
The test results 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	WITTYPRO TAB – Display Board
(*) Trademark	Microgate
(*) Manufacturer	Microgate S.r.l.
(*) Model / Type reference	WIT204
(*) FCC ID	2ADEOWIT204
(*) Rating(s)	12 Vdc from battery
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	
FCC Rules and Regulation Title 47 part 15:2021	--
3 List of attachments	
Attachment 1: Instruments list, 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	

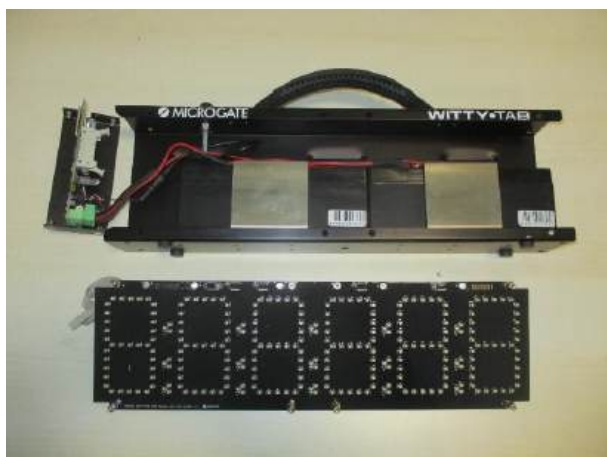
Revision index	Date	Change history
1.0	08.03.2023	--

Testing and sampling:	
Date of receipt of test item	12.01.2022
Testing start date	01.03.2023
Testing end date	02.03.2023
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 P220030
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 results 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 does meet the requirement:	P (Pass)
Test object does not meet the requirement:	F (Fail)
Test object does not performed:	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 test item(s)

Description	WITTYPRO TAB – Display Board											
Model Number	WIT204											
FCC ID	2ADEOWIT204											
Serial Number	000003											
Brand name	Microgate											
Nominal frequency	F _L : 433,3125 MHz				F _H : 434,7125 MHz							
Rated power supply	Voltage and Frequency			Reference poles								
				N	L1	L2	L3	PE				
	☐	AC:			☐	☐	☐	☐				
	☐	AC:			☐	☐	☐	☐				
	☒	DC: 12 V from battery						☐				
Type of equipment	☒ Transmitter unit ☒ Receiver unit											
Type of station	☐ Portable station ☒ Mobile station											
Software version	Bootloader version 2.0.2 Application version 2.0.22											
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 these 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 47:2021 Part 15 paragraph(s): 203, 204, 207, 209 and 231			
Clause	Requirement – Test case	Basic standard	Verdict
Part 15.203	Antenna requirements	ANSI C63.10	P
Part 15.207	Conducted emissions	ANSI C63.10	P
Part 15.209	Radiated emissions	ANSI C63.10	P
Part 15.209 and 15.231(b) (e)	Field strength of fundamental	ANSI C63.10	P
Part 15.209 and 15.231	Spurious emissions (> 1 GHz)	ANSI C63.10	P
Part 15.231(c)	Occupied channel bandwidth	ANSI C63.10	P
Part 15.231(a) (e)	Periodic operation characteristics	ANSI C63.10	P

Normative references	
Reference no.	Description
FCC Rules and Regulation Title 47 part 15:2021	--
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 C63.10:2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

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.		
Measurement uncertainties :	Attachment 1		

9 Test results

9.1 Antenna requirements

Tested by	M. Segalla	
Test date	01.03.2023	
Reference standards.....	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	-4,7 dBi	
External R.F. power amplifier.....	Not Present	

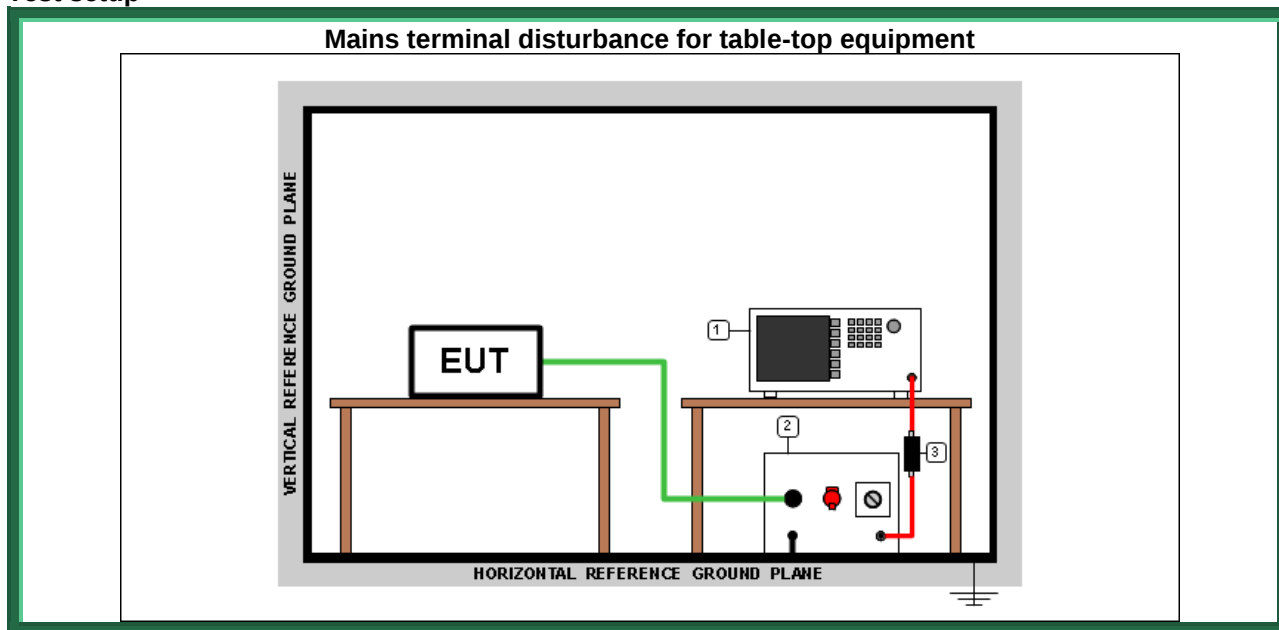
9.2 Conducted emissions

Tested by	M. Segalla	
Test date	02.03.2023	
Test location (stand).....	Shielded chamber (CMC A001)	
Reference standards.....	FCC Rules and Regulation; Titles 47 Part. 15.207 ANSI C63.10 cl. 6.2	
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.....	☒	Artificial mains network, 50 μ H/50 Ω LISN
	☐	Other:

Acceptance limits

Frequency range (MHz)	$\text{dB}(\mu\text{V})$ Quasi-peak	$\text{dB}(\mu\text{V})$ Average
0,15 to 0,50	66 to 56	56 to 46
0,5 to 5	56	46
5 to 30	60	50

Test setup



Test setup PE001_01

Nr.	Id. Number	Manufacturer	Model	Description
3	CMC S010	Rohde & Schwarz	ESH3-Z2	Pulse limiter
2	CMC S200	Schwarzbeck	NSLK 8128	V-LISN
1	CMC S206	Rohde & Schwarz	ESCI 7	EMC Receiver 9KHz-7GHz

Result

Transmission channel (MHz)	Line	Frequency Range (MHz)	Graphs	Result
433,3125	N	0,15 – 30	G22008417	P
433,3125	L1	0,15 – 30	G22008418	P
434,7125	L1	0,15 – 30	G22008436	P
434,7125	N	0,15 – 30	G22008437	P

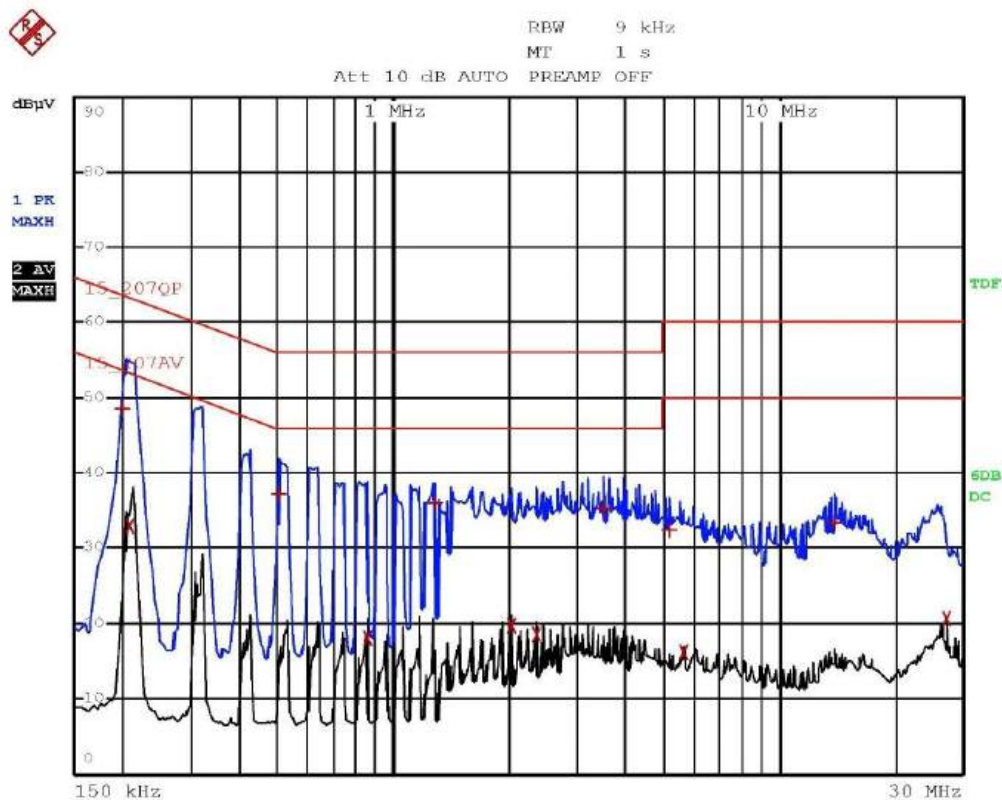
Remarks: tests performed on 120 V ~ 60 Hz side of power unit

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

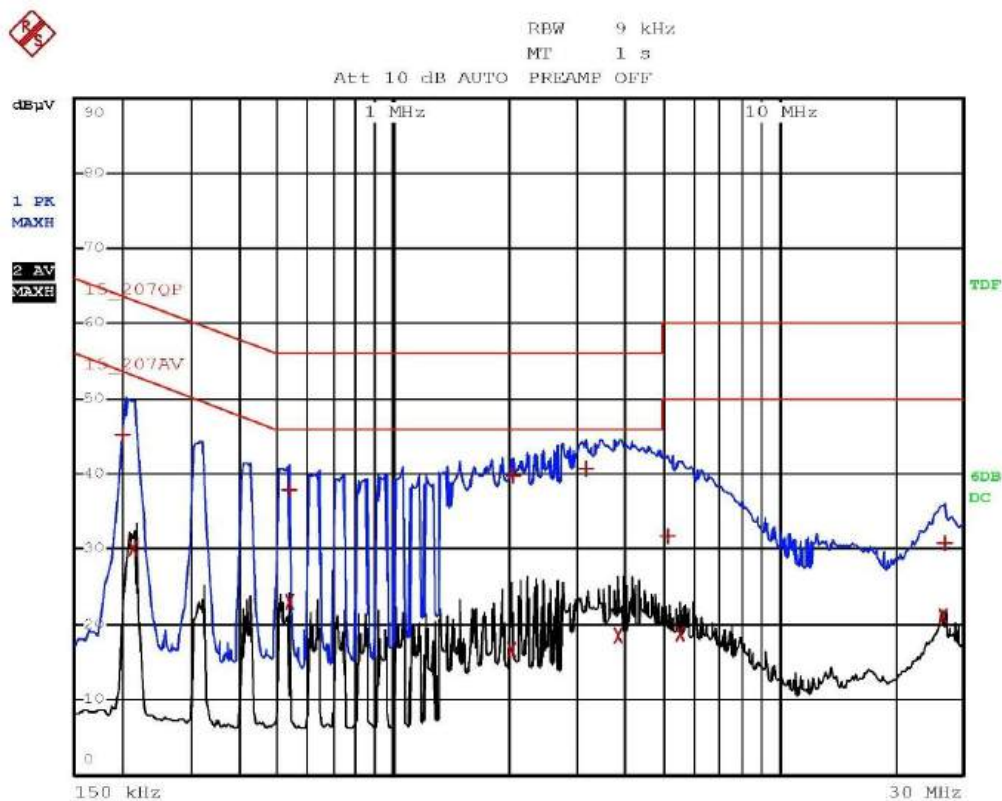
Graphs



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EDIT PEAK LIST (Final Measurement Results)				
Trace1:	15_207QP			
Trace2:	15_207AV			
Trace3:	---			
TRACE	FREQUENCY	LEVEL dBpV	DELTA LIMIT dB	
1 Quasi Peak	202 kHz	48.46	-15.05	
2 Average	210 kHz	32.96	-20.23	
1 Quasi Peak	506 kHz	37.15	-18.84	
2 Average	854 kHz	18.11	-27.88	
1 Quasi Peak	1.282 MHz	35.95	-20.04	
2 Average	2.026 MHz	19.76	-26.23	
2 Average	2.346 MHz	18.44	-27.55	
1 Quasi Peak	3.518 MHz	35.31	-20.68	
1 Quasi Peak	5.226 MHz	32.54	-27.45	
2 Average	5.654 MHz	16.12	-33.87	
1 Quasi Peak	13.99 MHz	33.39	-26.60	
2 Average	27.158 MHz	20.55	-29.44	

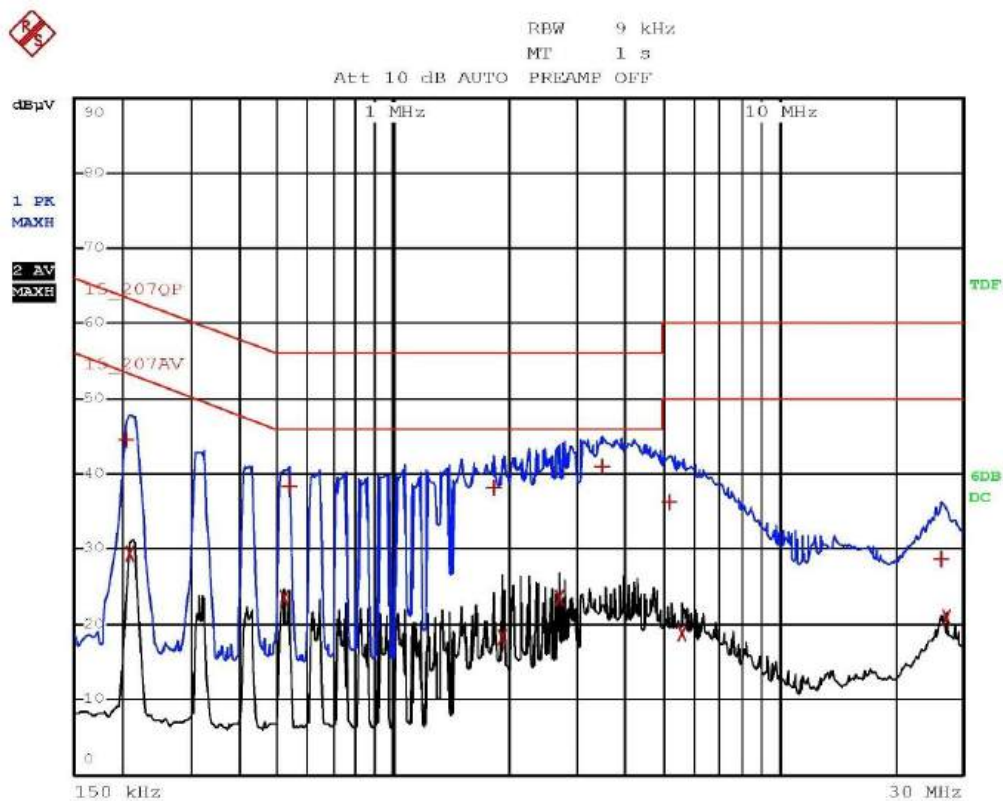
Segalla 22008417



Segalla 22008418

EDIT PEAK LIST (Final Measurement Results)			
Trace1:	15_207QP		
Trace2:	15_207AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBpV	DELTA LIMIT dB
1 Quasi Peak	202 kHz	45.20	-18.23
2 Average	214 kHz	30.07	-22.97
1 Quasi Peak	534 kHz	37.89	-18.10
2 Average	534 kHz	23.02	-22.97
2 Average	2.026 MHz	16.71	-29.28
1 Quasi Peak	2.042 MHz	39.76	-16.23
1 Quasi Peak	3.178 MHz	40.72	-15.27
2 Average	3.846 MHz	18.63	-27.36
1 Quasi Peak	5.178 MHz	31.80	-28.19
2 Average	5.558 MHz	18.67	-31.32
2 Average	26.61 MHz	21.20	-28.80
1 Quasi Peak	26.986 MHz	30.79	-29.20

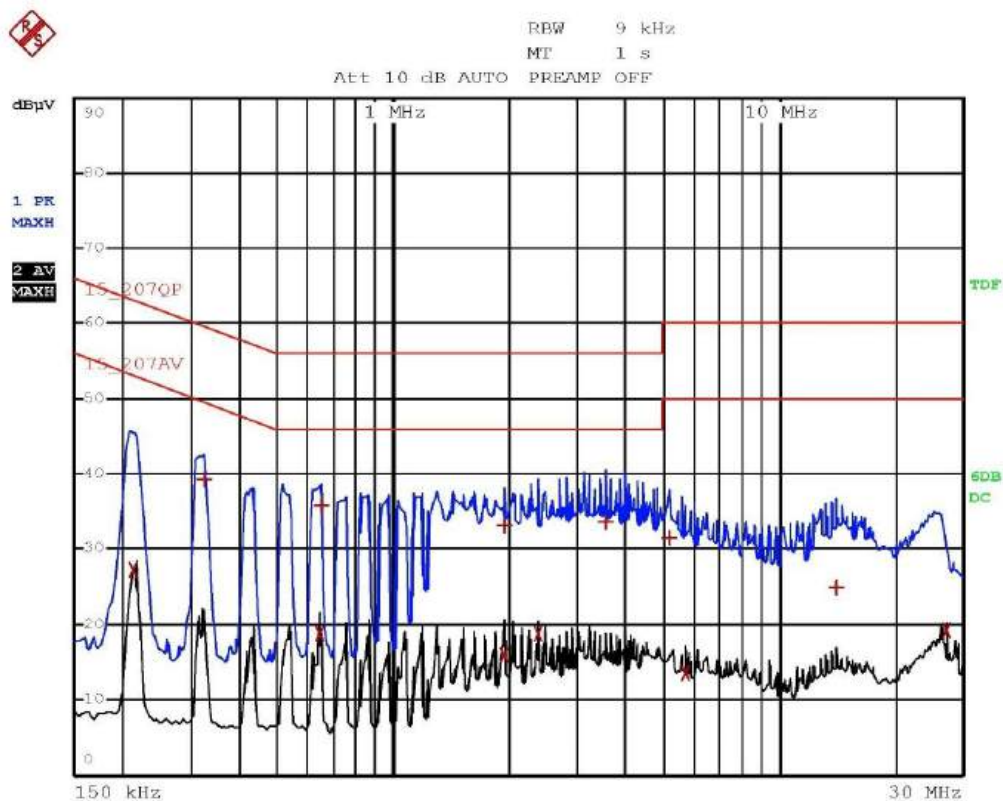
Segalla 22008418



Segalla 22008436

EDIT PEAK LIST (Final Measurement Results)			
Trace1:	15_207QP		
Trace2:	15_207AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBpV	DELTA LIMIT dB
1 Quasi Peak	206 kHz	44.57	-18.79
2 Average	210 kHz	29.45	-23.74
2 Average	518 kHz	23.50	-22.49
1 Quasi Peak	538 kHz	38.46	-17.53
1 Quasi Peak	1.83 MHz	38.26	-17.73
2 Average	1.934 MHz	18.35	-27.64
2 Average	2.69 MHz	23.54	-22.45
1 Quasi Peak	3.502 MHz	41.07	-14.92
1 Quasi Peak	5.218 MHz	36.17	-23.82
2 Average	5.598 MHz	19.83	-31.16
1 Quasi Peak	26.45 MHz	28.64	-31.35
2 Average	27.158 MHz	20.87	-29.12

Segalla 22008436



Segalla 22008437

EDIT PEAK LIST (Final Measurement Results)			
Trace1:	15_207QP		
Trace2:	15_207AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBpV	DELTA LIMIT dB
2 Average	214 kHz	27.26	-25.70
1 Quasi Peak	322 kHz	39.21	-20.43
2 Average	646 kHz	18.88	-27.11
1 Quasi Peak	650 kHz	35.82	-20.17
2 Average	1.942 MHz	15.85	-30.14
1 Quasi Peak	1.95 MHz	33.11	-22.89
2 Average	2.386 MHz	18.76	-27.24
1 Quasi Peak	3.566 MHz	33.68	-22.31
1 Quasi Peak	5.19 MHz	31.53	-28.46
2 Average	5.738 MHz	13.61	-36.38
1 Quasi Peak	14.194 MHz	25.00	-34.99
2 Average	27.158 MHz	19.36	-30.63

Segalla 22008437

9.3 Radiated emissions and spurious emissions

Tested by	M. Segalla
Test date	02.03.2023
Test location (stand)	Semi-anechoic chamber (CMC A070)
Reference standards.....	FCC Rules and Regulation; Titles 47 Part 15.209 and 15.231 ANSI C63.10 cl. 6.3, 6.4, 6.5 and 6.6
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 results 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

FCC Part 15.231 (b)	
<i>Fundamental frequency (MHz)</i>	<i>Field strength of spurious emissions [dB(μV/m)]</i>
40,66 to 40,70	47,04
70 to 130	41,94
130 to 174	41,94 to 51,48
174 to 260	51,48
260 to 470	51,48 to 61,94
Above 470	61,94

The restricted frequency bands are listed in the following table

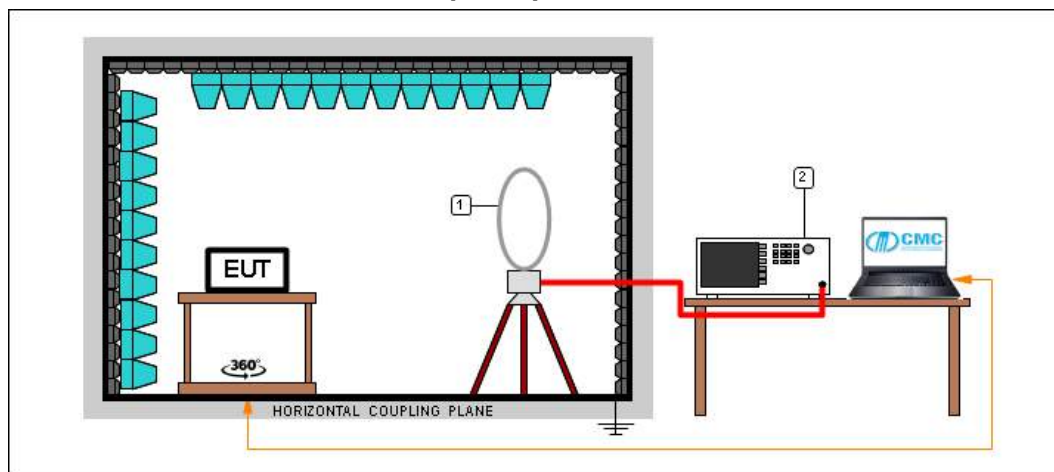
MHz	MHz	MHz	GHz
0,090 – 0,110	16,42 – 16,423	399,9 – 410	4,5 – 5,15
0,495 – 0,505	16,69475 – 16,69525	608 – 614	5,35 – 5,46
2,1735 – 2,1905	16,80425 – 16,80475	960 – 1240	7,25 – 7,75
4,125 – 4,128	25,5 – 25,67	1300 – 1427	8,025 – 8,5
4,17725 – 4,17775	37,5 – 38,25	1435 – 1626,5	9,0 – 9,2
4,20725 – 4,20775	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

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

Test setup

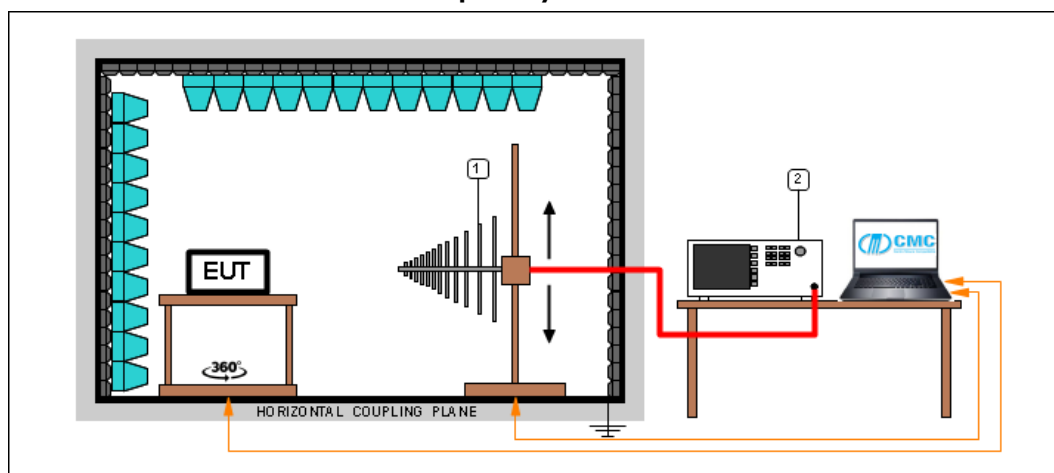
Frequency ≤ 30 MHz



Test setup PE004_01

Nr.	Id. Number	Manufacturer	Model	Description
2	CMC S353	Rohde & Schwarz	ESW26	EMI Test Receiver 1 Hz - 26.5 GHz
1	CMC S127	Schaffner	HLA6120	Loop Antenna 9kHz - 30MHz

Frequency ≤ 1 GHz



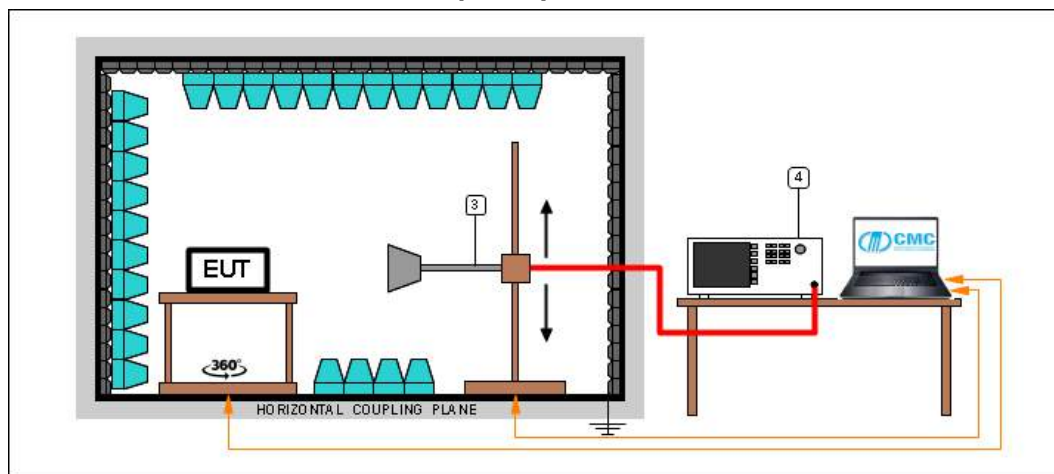
Test setup PE004_02

Nr.	Id. Number	Manufacturer	Model	Description
2	CMC S353	Rohde & Schwarz	ESW26	EMI Test Receiver 1 Hz - 26.5 GHz
1	CMC S271	Schwarzbeck	BBA 9106 + VHBB 9124	Broadband Antenna

Test setup PE004_03

Nr.	Id. Number	Manufacturer	Model	Description
2	CMC S353	Rohde & Schwarz	ESW26	EMI Test Receiver 1 Hz - 26.5 GHz
1	CMC S287	Schwarzbeck	VUSLP 9111B	Broadband Antenna

Frequency > 1 GHz



Test setup PE004_04

Nr.	Id. Number	Manufacturer	Model	Description
4	CMC S353	Rohde & Schwarz	ESW26	EMI Test Receiver 1 Hz - 26.5 GHz
3	CMC S108	Emco	3115	Waveguide antenna

Test setup PE004_05

Nr.	Id. Number	Manufacturer	Model	Description
4	CMC S353	Rohde & Schwarz	ESW26	EMI Test Receiver 1 Hz - 26.5 GHz
3	CMC S290	Schwarzbeck	BBHA 9170	Horn Antenna (15-40 GHz)

Result

Transmission channel (MHz)	Polarization	Frequency Range (MHz)	Graphs	Result
433,3125	H	300 – 1000	G22008406	P
433,3125	V	300 – 1000	G22008407	P
433,3125	V	30 – 300	G22008408	P
433,3125	H	30 – 300	G22008409	P
433,3125	Loop	0,009 – 30	G22008410	P
433,3125	V	1000 – 3000	G22008411	P
433,3125	H	1000 – 3000	G22008412	P
433,3125	H	3000 – 18000	G22008413	P
433,3125	V	3000 – 18000	G22008414	P
433,3125	V	18000 – 26000	G22008415	P
433,3125	H	18000 – 26000	G22008416	P
434,7125	H	300 – 1000	G22008425	P
434,7125	V	300 – 1000	G22008426	P
434,7125	V	30 – 300	G22008427	P
434,7125	H	30 – 300	G22008428	P
434,7125	Loop	0,009 – 30	G22008429	P
434,7125	H	1000 – 3000	G22008430	P
434,7125	V	1000 – 3000	G22008431	P
434,7125	V	3000 – 18000	G22008432	P
434,7125	H	3000 – 18000	G22008433	P
434,7125	V	18000 – 26000	G22008434	P
434,7125	H	18000 – 26000	G22008435	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, peaks above the limits at ~ 2,4 GHz are due to the BLE advertising frequencies

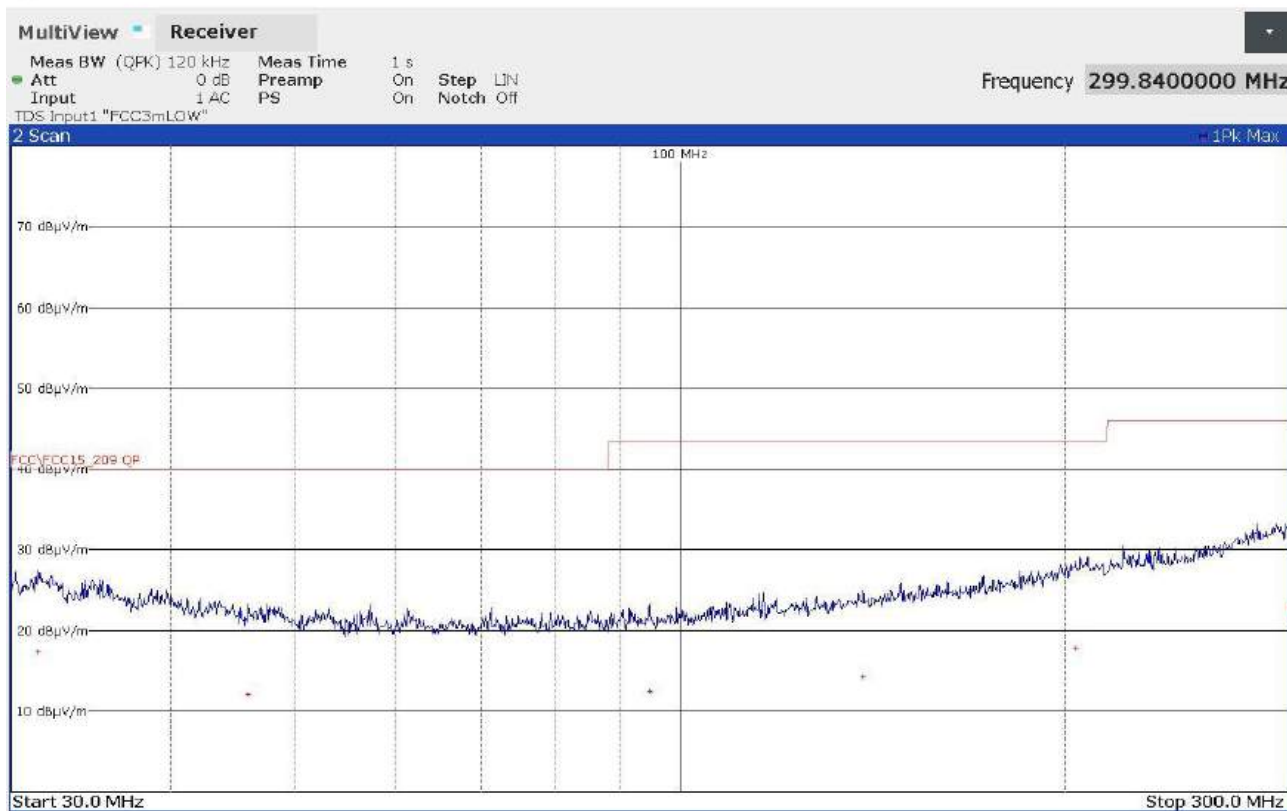
Graphs Legend

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 22008406



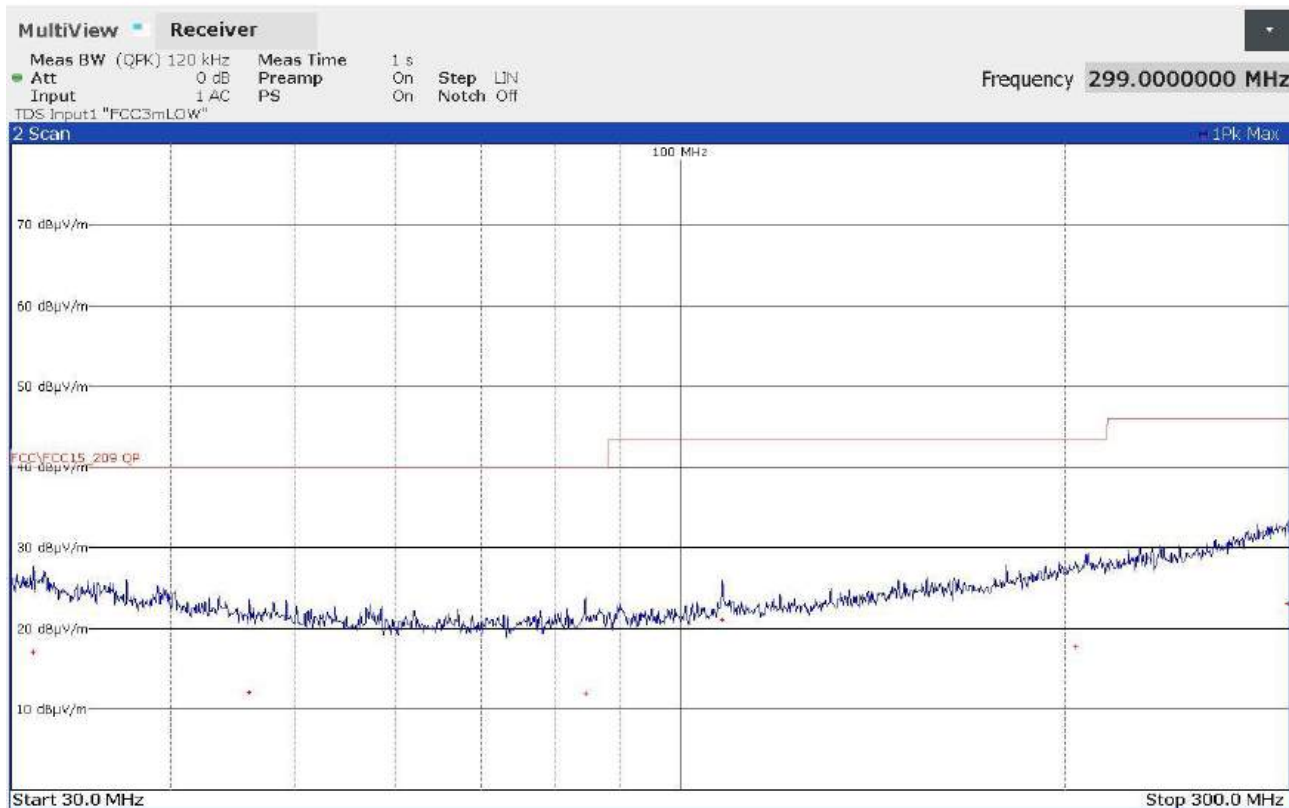
FINAL RESULT TABLE

QUASI PEAK

Freq Hz	Lev dBuV/m	Margin dB
31520000	+17,35	-22,65
45960000	+12,04	-27,96
94720000	+12,46	-31,06
139160000	+14,21	-29,31
204040000	+17,77	-25,75
299840000	+22,90	-23,12

22008406_2

Segalla 22008407



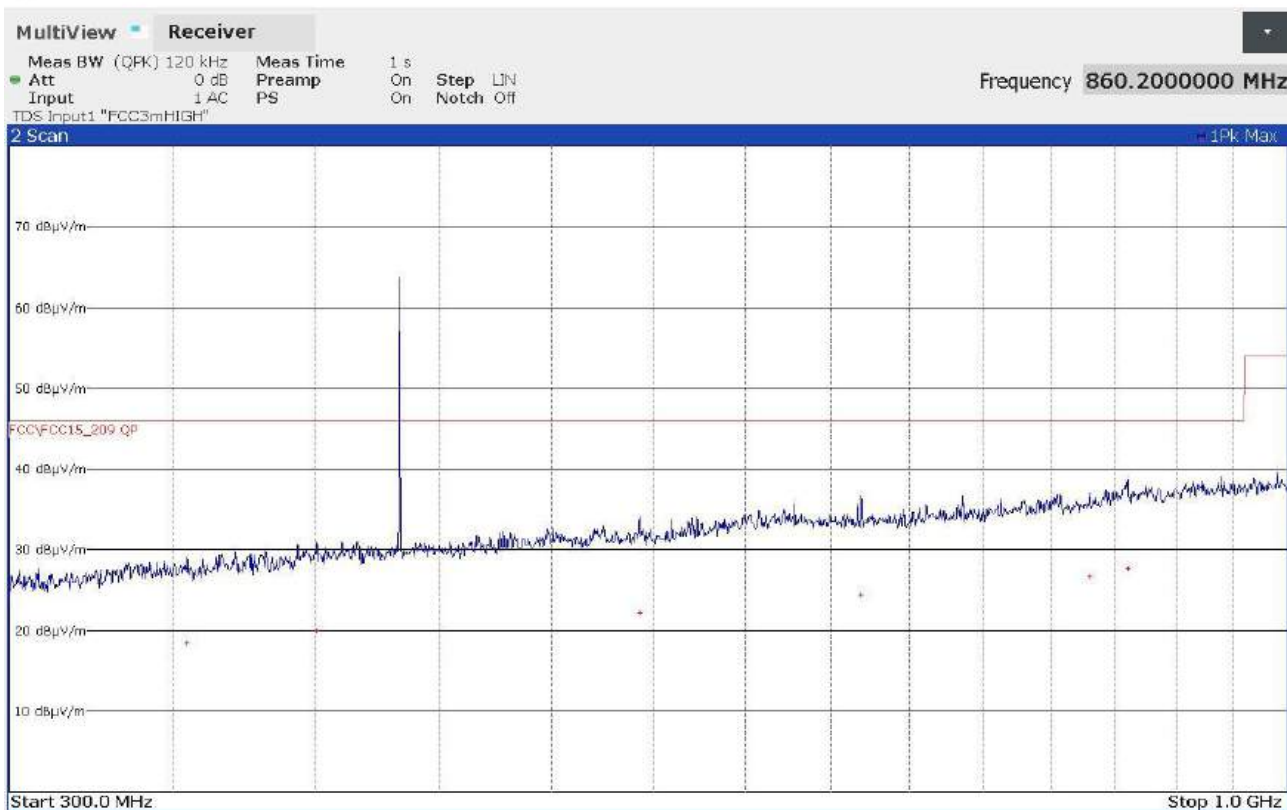
FINAL RESULT TABLE

QUASI PEAK

Freq Hz	Lev dBuV/m	Margin dB
31240000	+17,12	-22,88
46080000	+12,12	-27,88
84360000	+11,97	-28,03
108000000	+21,09	-22,43
204080000	+17,72	-25,80
299000000	+23,06	-22,96

22008407_2

Segalla 22008408



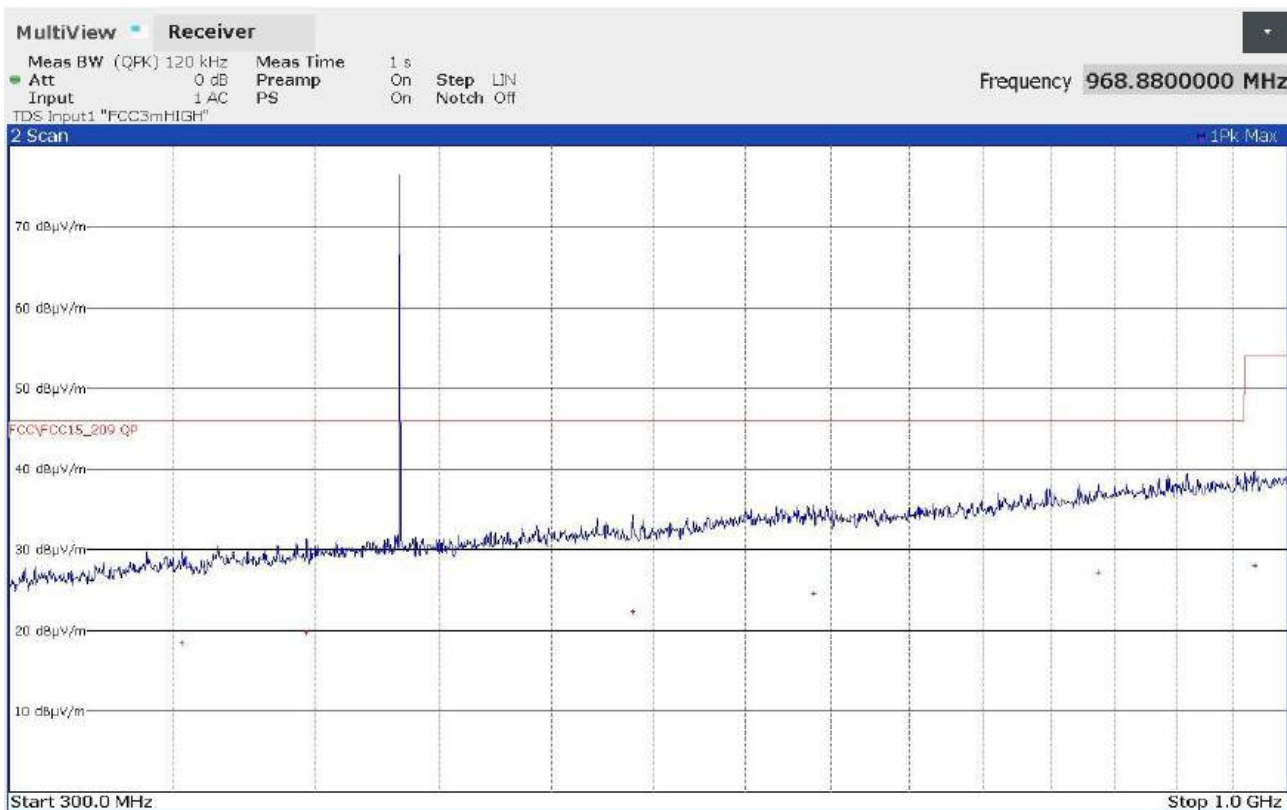
FINAL RESULT TABLE

QUASI PEAK

Freq Hz	Lev dBuV/m	Margin dB
354800000	+18,44	-27,58
400840000	+19,90	-26,12
543160000	+22,23	-23,79
669280000	+24,44	-21,58
829840000	+26,70	-19,32
860200000	+27,72	-18,30

22008408_2

Segalla 22008409



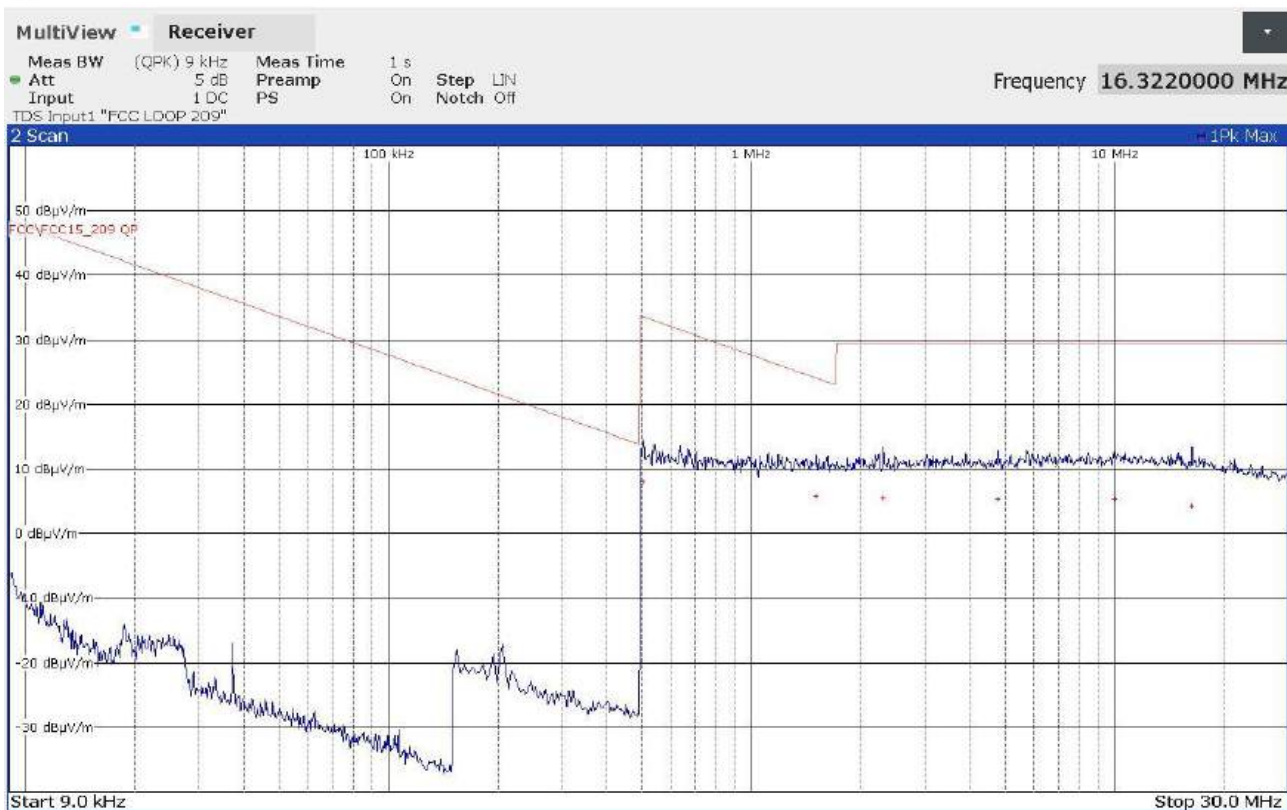
FINAL RESULT TABLE

QUASI PEAK

Freq Hz	Lev dBuV/m	Margin dB
353120000	+18,50	-27,52
397080000	+19,72	-26,30
539800000	+22,25	-23,77
640040000	+24,57	-21,45
836560000	+27,13	-18,89
968880000	+28,09	-25,89

22008409_2

Segalla 22008410



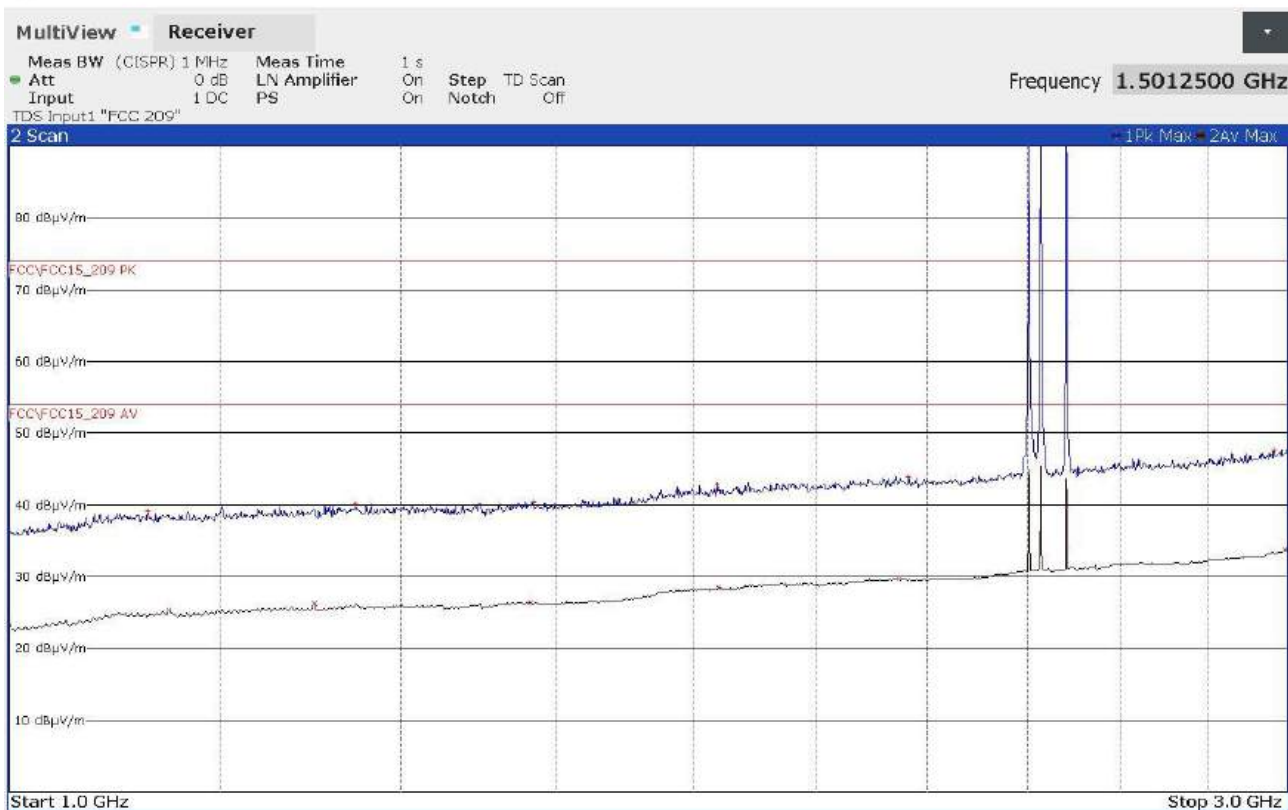
FINAL RESULT TABLE

QUASI PEAK

Freq Hz	Lev dBuV/m	Margin dB
502000	+8,00	-25,59
1506000	+5,77	-18,28
2306000	+5,44	-24,10
4770000	+5,36	-24,18
9950000	+5,36	-24,18
16322000	+4,30	-25,24

22008410_2

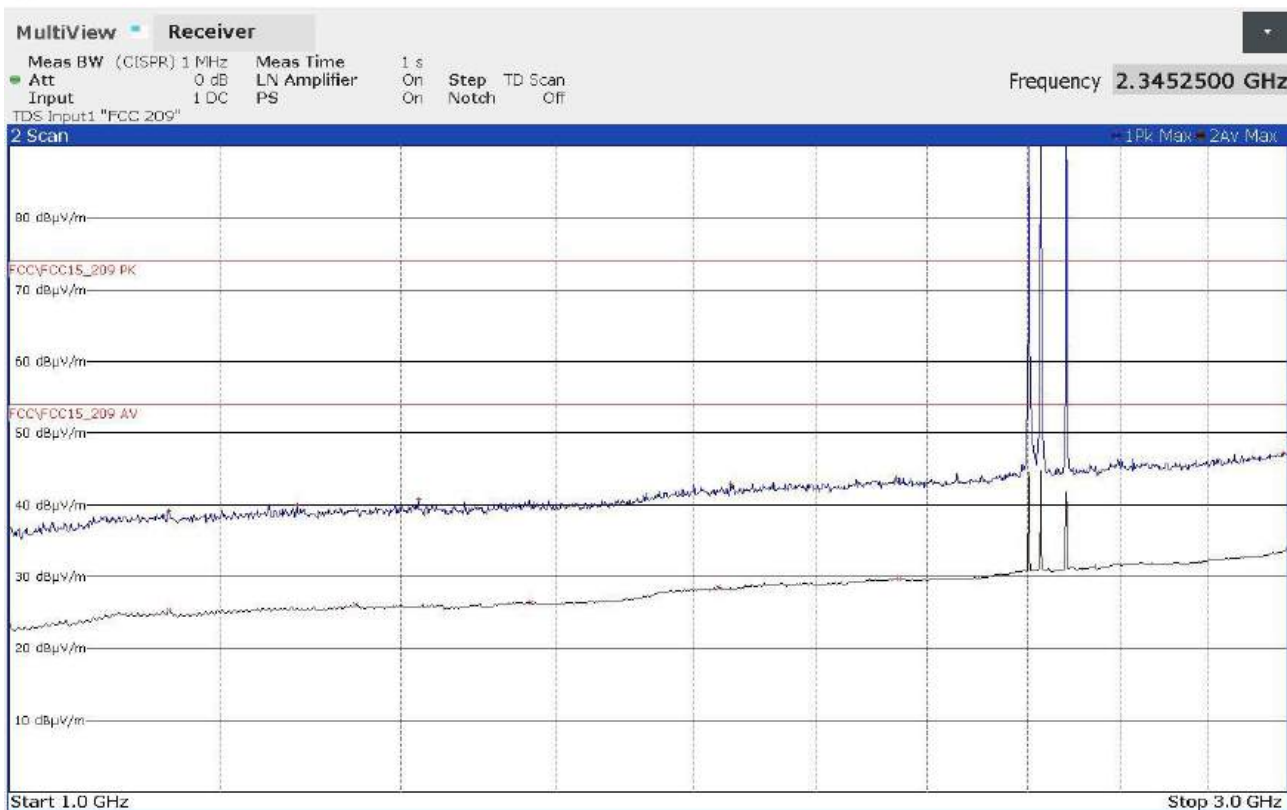
Segalla 22008411


FINAL RESULT TABLE

MAX PEAK			AVERAGE		
Freq Hz	Lev dBuV/m	Margin dB	Freq Hz	Lev dBuV/m	Margin dB
1126500000	+39,10	-34,88	1147250000	+25,26	-28,72
1347000000	+40,09	-33,89	1300000000	+26,21	-27,77
1568500000	+40,36	-33,62	1564500000	+26,42	-27,56
1838000000	+42,72	-31,26	1839500000	+28,52	-25,46
2165500000	+43,83	-30,15	2147750000	+29,72	-24,26
2963000000	+47,71	-26,27	2993250000	+33,75	-20,23

22008411_2

Segalla 22008412

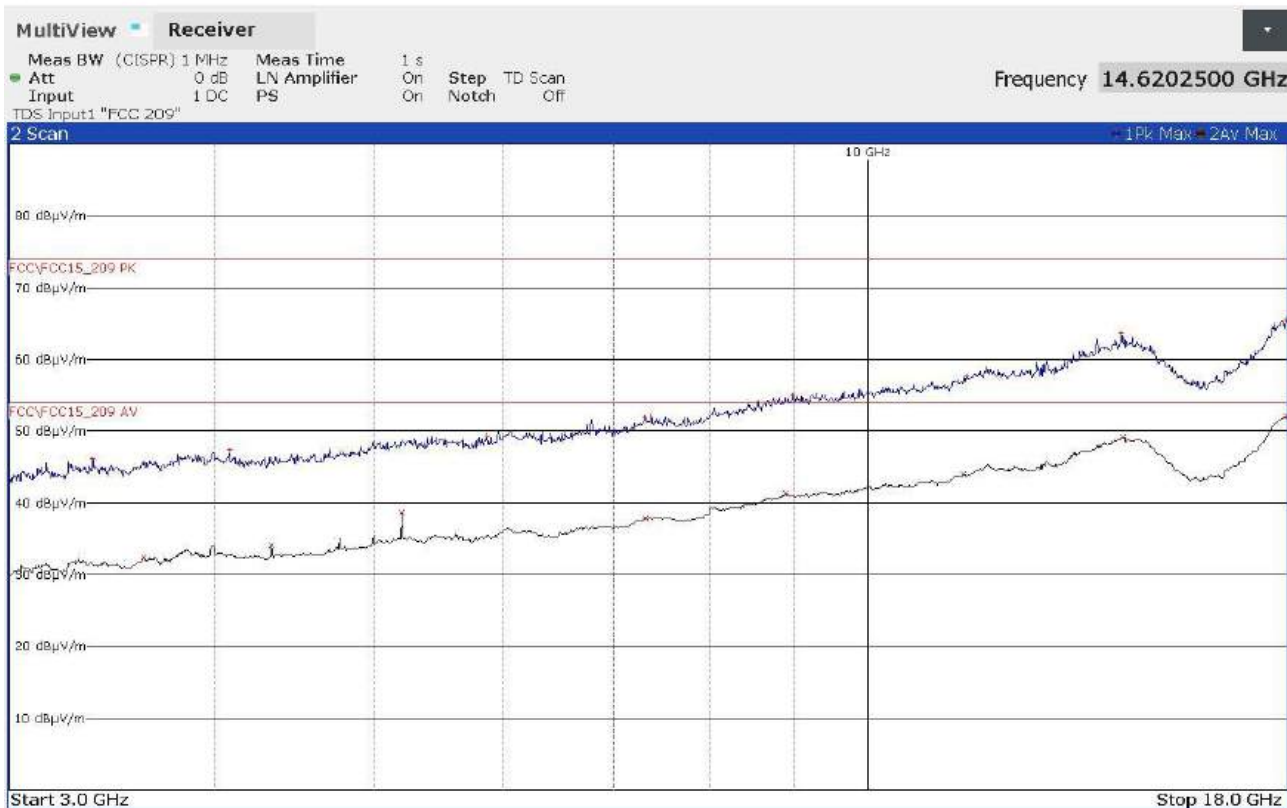


FINAL RESULT TABLE

MAX PEAK			AVERAGE		
Freq Hz	Lev dBuV/m	Margin dB	Freq Hz	Lev dBuV/m	Margin dB
1146750000	+39,18	-34,80	1147250000	+25,26	-28,72
1281250000	+39,94	-34,04	1347000000	+26,14	-27,84
1421750000	+40,83	-33,15	1564750000	+26,42	-27,56
1858750000	+42,86	-31,12	1839250000	+28,52	-25,46
2142250000	+43,77	-30,21	2147750000	+29,73	-24,25
2986750000	+47,25	-26,73	2999750000	+33,76	-20,22

22008412_2

Segalla 22008413

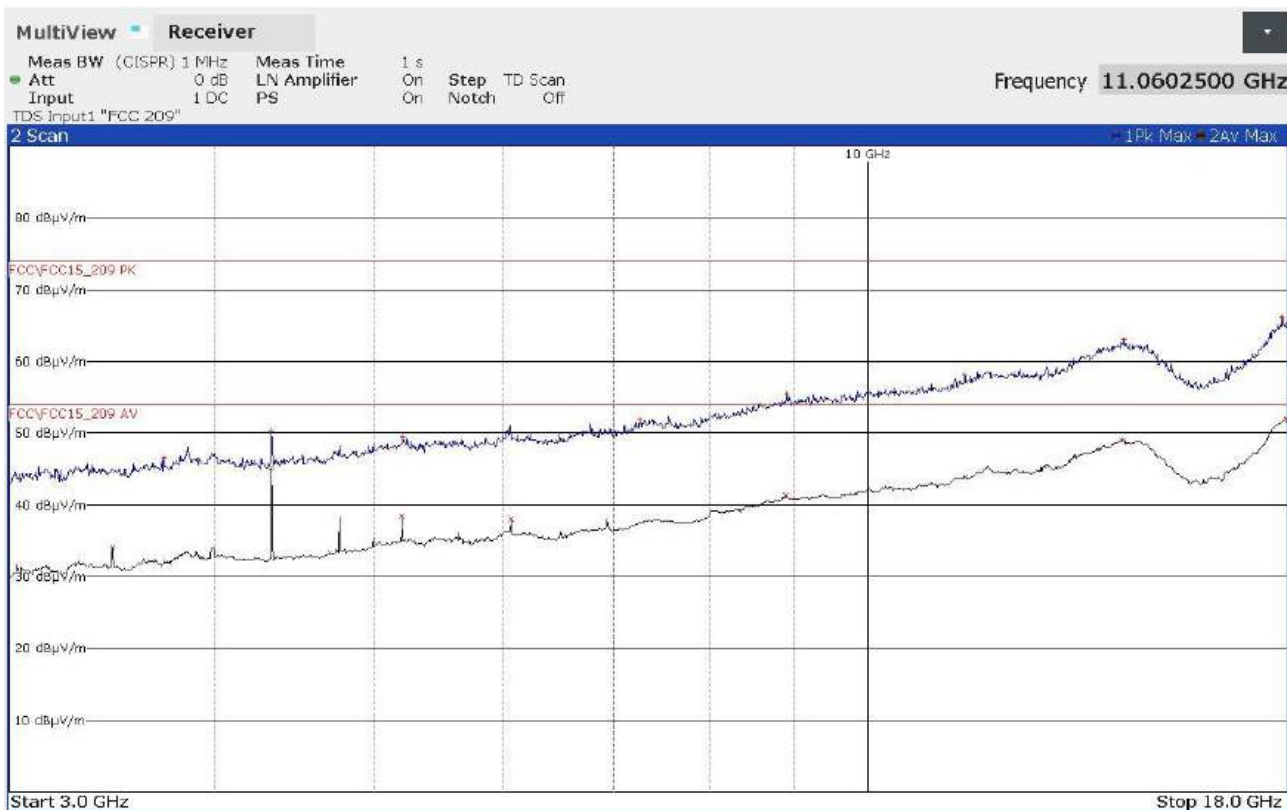


FINAL RESULT TABLE

MAX PEAK			AVERAGE		
Freq Hz	Lev dBuV/m	Margin dB	Freq Hz	Lev dBuV/m	Margin dB
3373750000	+46,18	-27,80	3623000000	+32,40	-21,58
4089500000	+47,32	-26,66	4333250000	+34,05	-19,93
5859500000	+49,28	-24,70	5199750000	+38,72	-15,26
7317000000	+51,80	-22,18	7318250000	+37,91	-16,07
8998750000	+54,90	-19,08	8900000000	+41,32	-12,66
11470750000	+57,64	-16,34	11420000000	+43,96	-10,02
14255000000	+63,67	-10,31	14280000000	+49,18	-4,80
17976750000	+65,60	-8,38	17940000000	+52,19	-1,79

22008413_2

Segalla 22008414

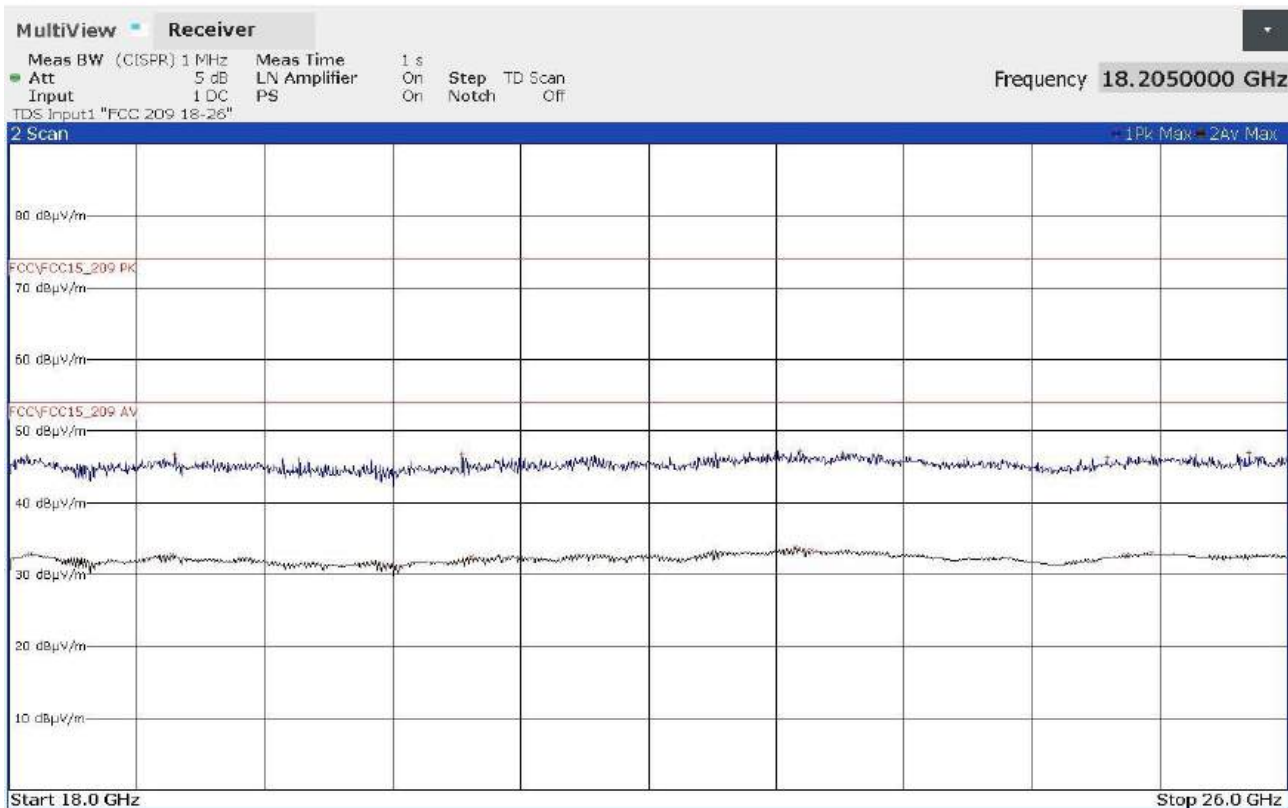


FINAL RESULT TABLE

MAX PEAK			AVERAGE		
Freq Hz	Lev dBuV/m	Margin dB	Freq Hz	Lev dBuV/m	Margin dB
3724000000	+46,56	-27,42	3466500000	+34,01	-19,97
4333250000	+50,33	-23,65	4333250000	+45,08	-8,90
5206500000	+49,49	-24,49	5199750000	+38,37	-15,61
7259250000	+51,80	-22,18	6066500000	+38,00	-15,98
8919250000	+55,53	-18,45	8900000000	+41,29	-12,69
11448250000	+58,03	-15,95	11460000000	+43,92	-10,06
14300000000	+63,09	-10,89	14280000000	+49,11	-4,87
17857250000	+66,17	-7,81	17940000000	+52,07	-1,91

22008414_2

Segalla 22008415

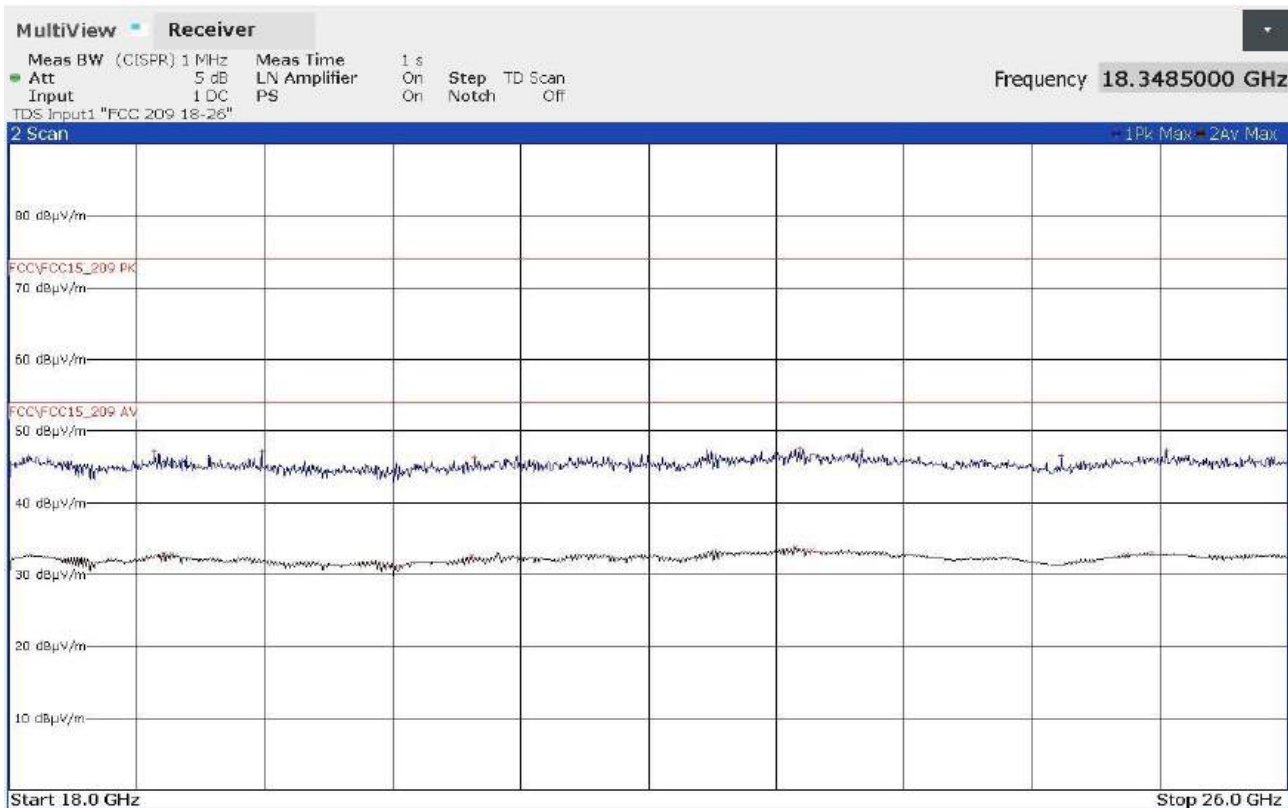


FINAL RESULT TABLE

MAX PEAK			AVERAGE		
Freq Hz	Lev dBuV/m	Margin dB	Freq Hz	Lev dBuV/m	Margin dB
18114000000	+46,46	-27,52	18132750000	+32,80	-21,18
19039000000	+46,64	-27,34	19018250000	+32,66	-21,32
20835750000	+46,83	-27,15	20890250000	+32,43	-21,55
22944500000	+47,28	-26,70	22919250000	+33,73	-20,25
23215000000	+46,87	-27,11	23022750000	+33,42	-20,56
24868500000	+46,33	-27,65	24990750000	+32,67	-21,31
25756000000	+46,91	-27,07	25146000000	+32,89	-21,09

22008415_2

Segalla 22008416

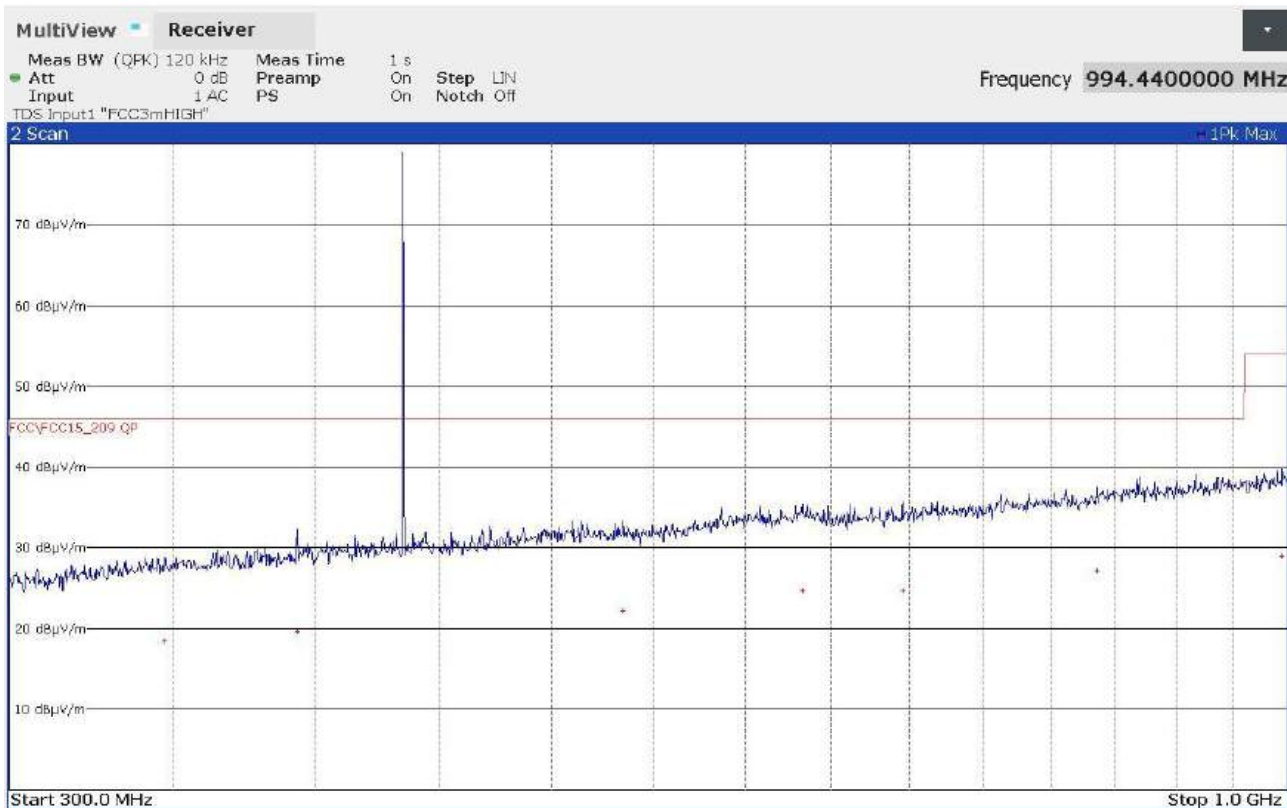


FINAL RESULT TABLE

MAX PEAK			AVERAGE		
Freq Hz	Lev dBuV/m	Margin dB	Freq Hz	Lev dBuV/m	Margin dB
18911750000	+47,04	-26,94	18966750000	+32,87	-21,11
19583000000	+47,09	-26,89	19018250000	+32,77	-21,21
20912750000	+46,28	-27,70	20891250000	+32,46	-21,52
22945000000	+47,55	-26,43	22919750000	+33,75	-20,23
23334000000	+47,27	-26,71	23021250000	+33,41	-20,57
24581750000	+46,49	-27,49	24990500000	+32,70	-21,28
25237250000	+47,27	-26,71	25146750000	+32,92	-21,06

22008416_2

Segalla 22008425



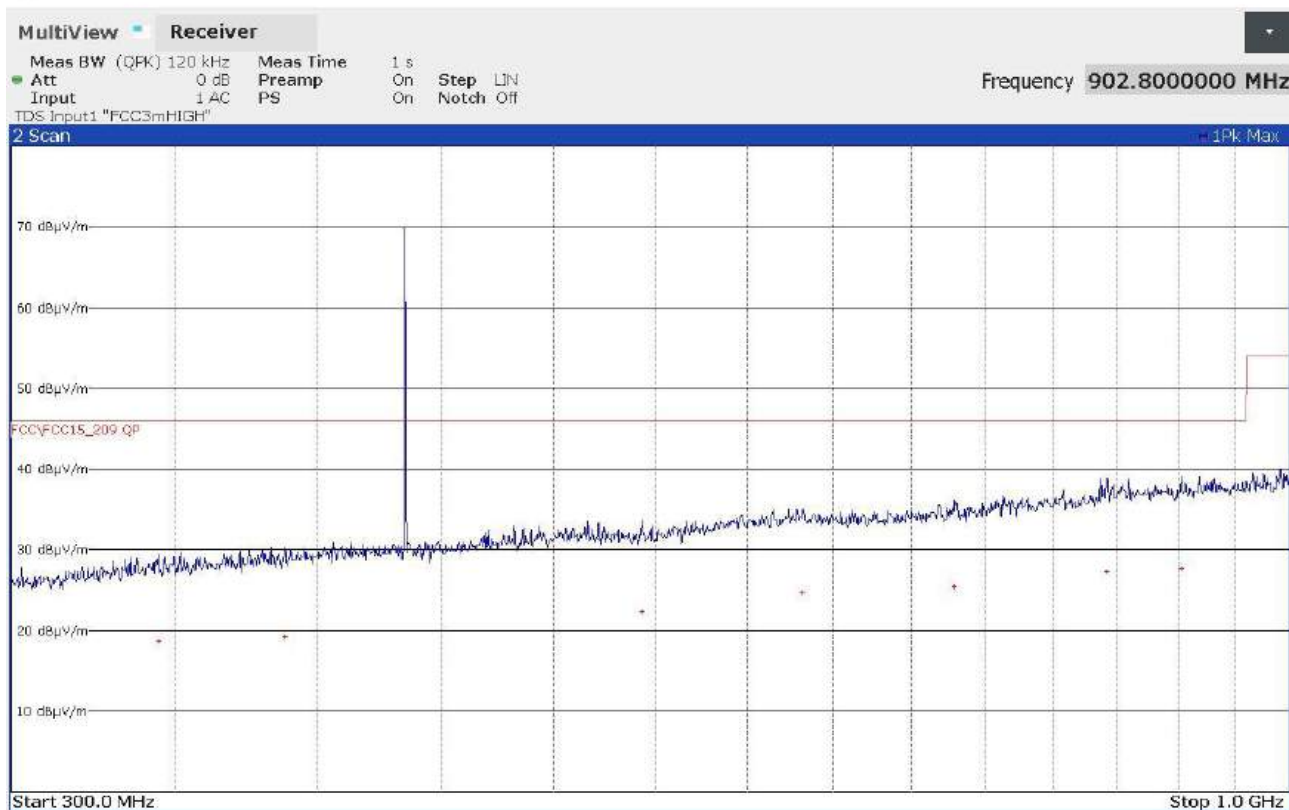
FINAL RESULT TABLE

QUASI PEAK

Freq Hz	Lev dBuV/m	Margin dB
347520000	+18,46	-27,56
393560000	+19,56	-26,46
534720000	+22,18	-23,84
633200000	+24,69	-21,33
695880000	+24,70	-21,32
835720000	+27,11	-18,91
994440000	+28,94	-25,04

22008425_2

Segalla 22008426



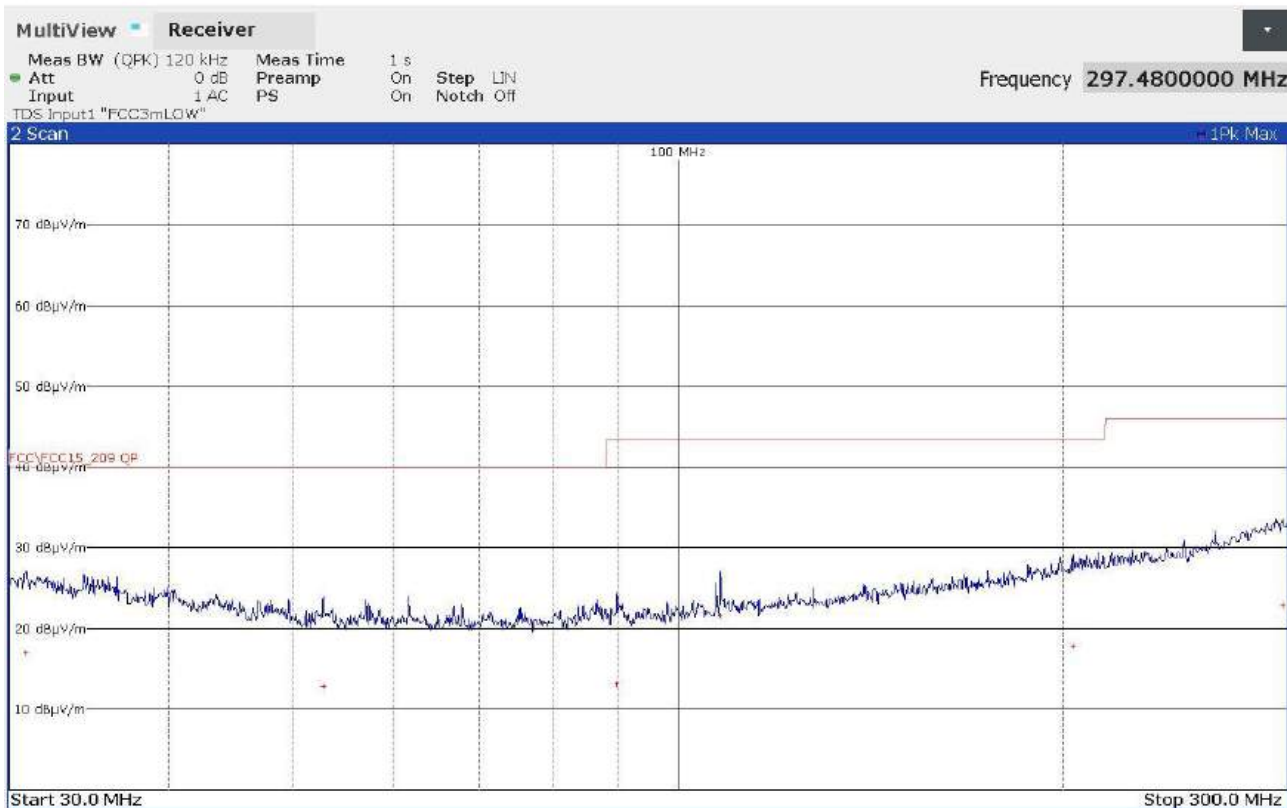
FINAL RESULT TABLE

QUASI PEAK

Freq Hz	Lev dBuV/m	Margin dB
344840000	+18,65	-27,37
388440000	+19,22	-26,80
543280000	+22,34	-23,68
632360000	+24,69	-21,33
729160000	+25,46	-20,56
842240000	+27,25	-18,77
902800000	+27,72	-18,30

22008426_2

Segalla 22008427



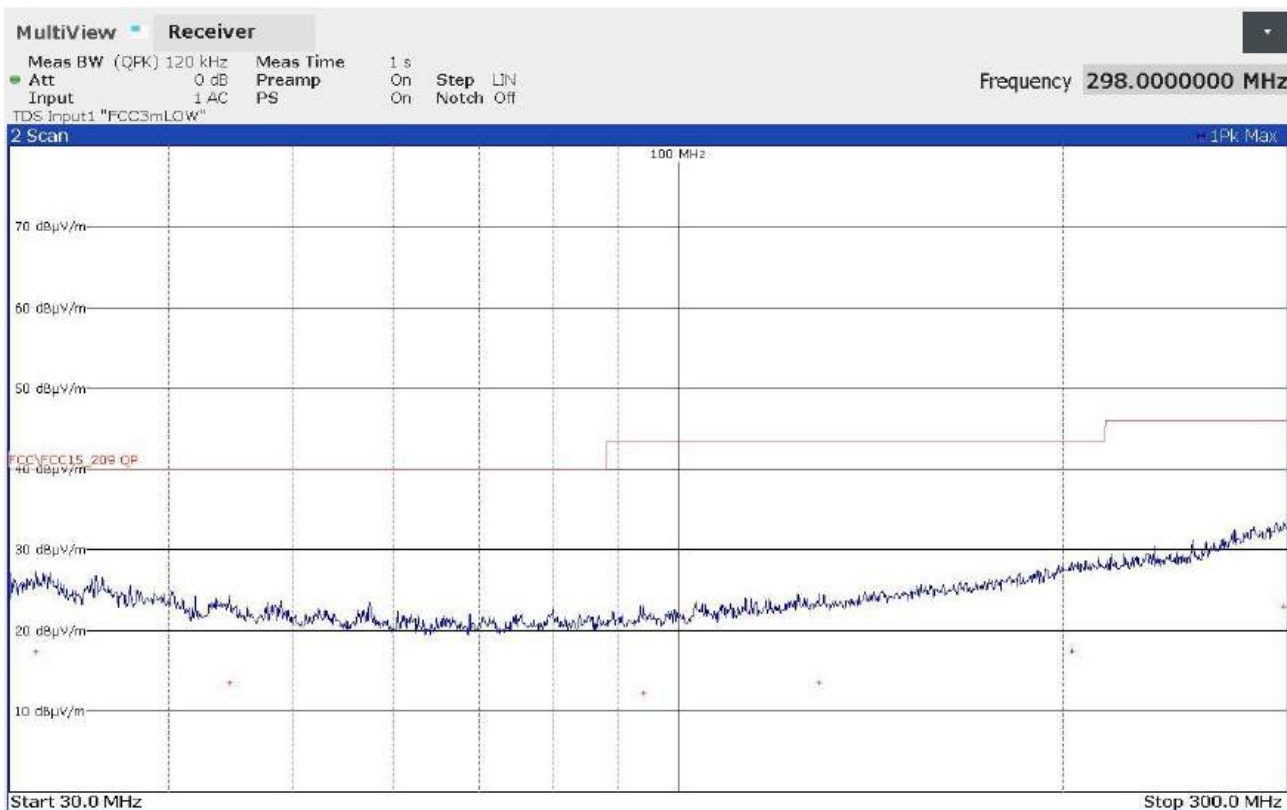
FINAL RESULT TABLE

QUASI PEAK

Freq Hz	Lev dBuV/m	Margin dB
30960000	+16,94	-23,06
52800000	+12,82	-27,18
89680000	+13,05	-30,47
108000000	+21,53	-21,99
203880000	+17,79	-25,73
297480000	+22,79	-23,23

22008427_2

Segalla 22008428



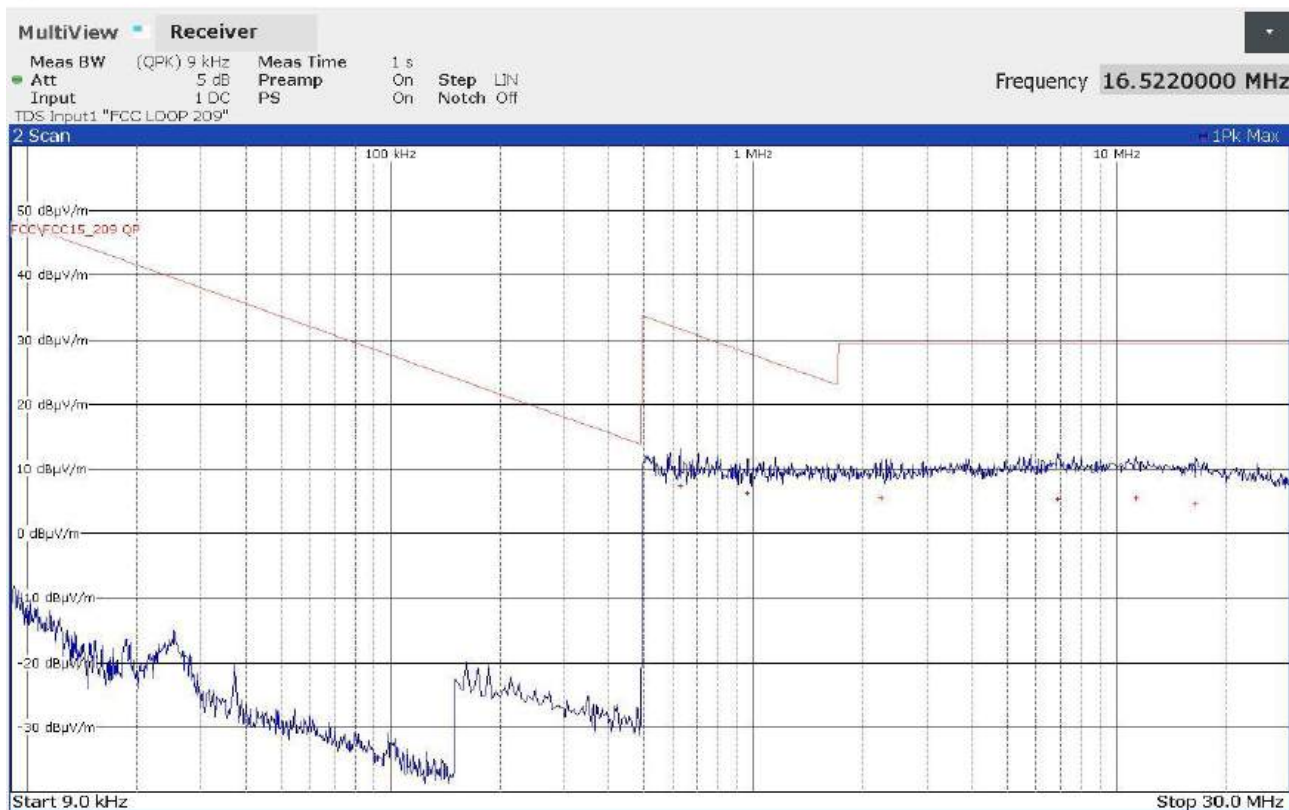
FINAL RESULT TABLE

QUASI PEAK

Freq Hz	Lev dBuV/m	Margin dB
31480000	+17,34	-22,66
44680000	+13,51	-26,49
94040000	+12,22	-31,30
128920000	+13,49	-30,03
203240000	+17,49	-26,03
298000000	+22,92	-23,10

22008428_2

Segalla 22008429



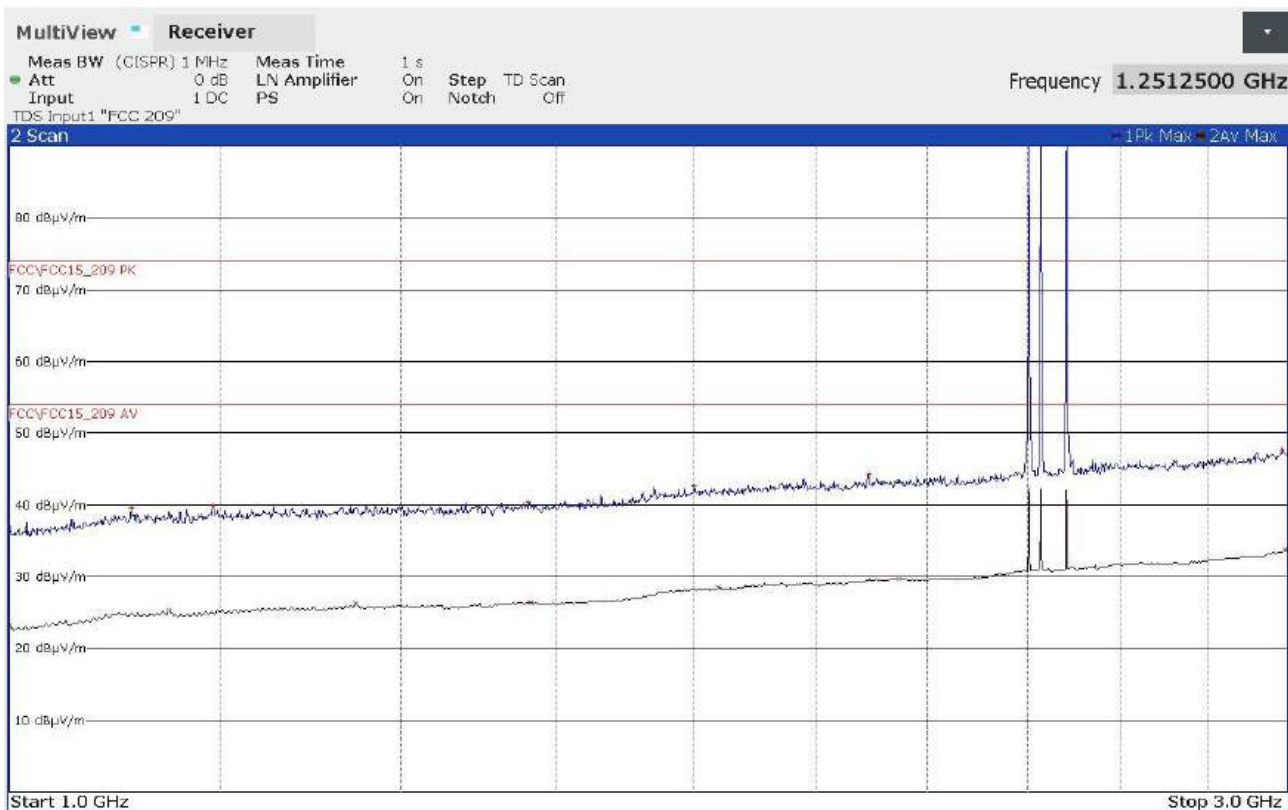
FINAL RESULT TABLE

QUASI PEAK

Freq Hz	Lev dBuV/m	Margin dB
626000	+7,28	-24,39
962000	+6,21	-21,73
2238000	+5,47	-24,07
6902000	+5,36	-24,18
11290000	+5,46	-24,08
16522000	+4,50	-25,04

22008429_2

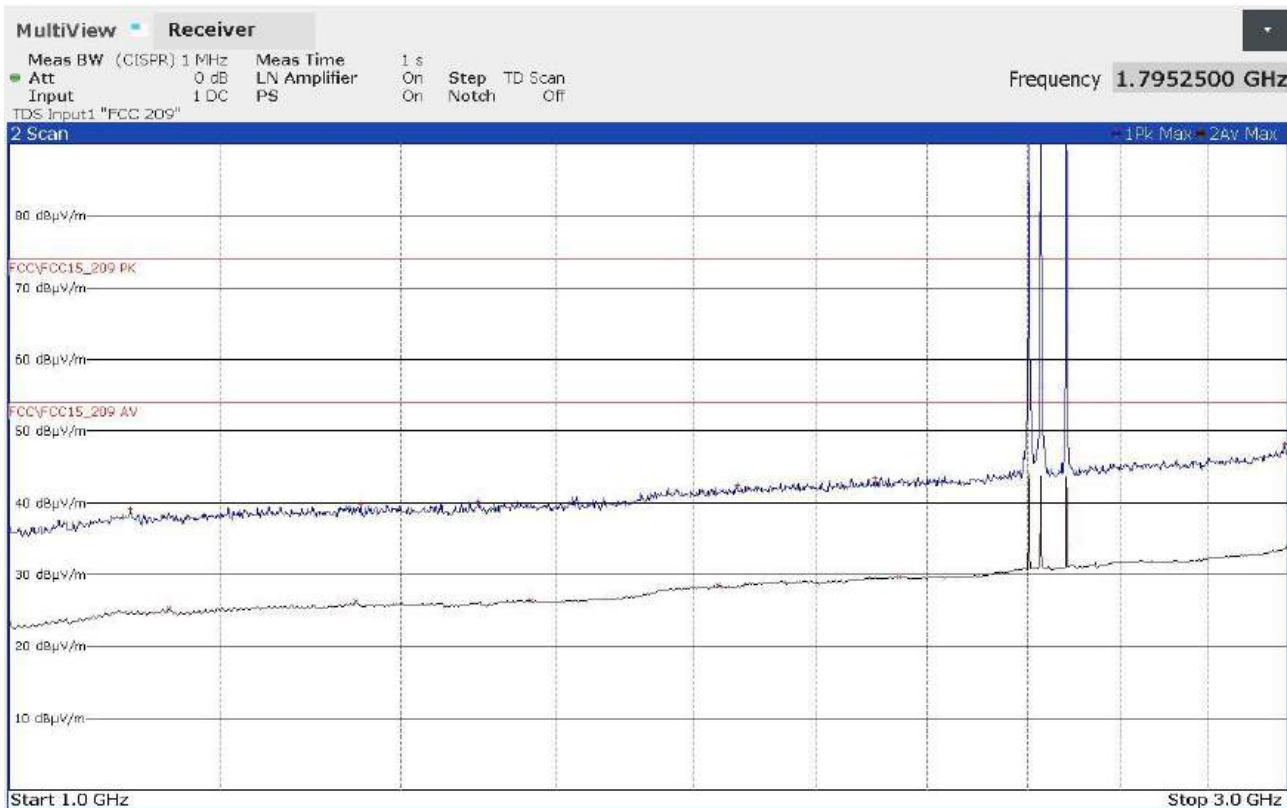
Segalla 22008430


FINAL RESULT TABLE

MAX PEAK			AVERAGE		
Freq Hz	Lev dBuV/m	Margin dB	Freq Hz	Lev dBuV/m	Margin dB
1111000000	+39,58	-34,40	1147500000	+25,28	-28,70
1191500000	+39,85	-34,13	1347250000	+26,17	-27,81
1562750000	+40,39	-33,59	1565000000	+26,42	-27,56
1802000000	+42,59	-31,39	1839750000	+28,51	-25,47
2092500000	+44,31	-29,67	2147500000	+29,72	-24,26
2985250000	+47,60	-26,38	2992750000	+33,76	-20,22

22008430_2

Segalla 22008431



FINAL RESULT TABLE

MAX PEAK

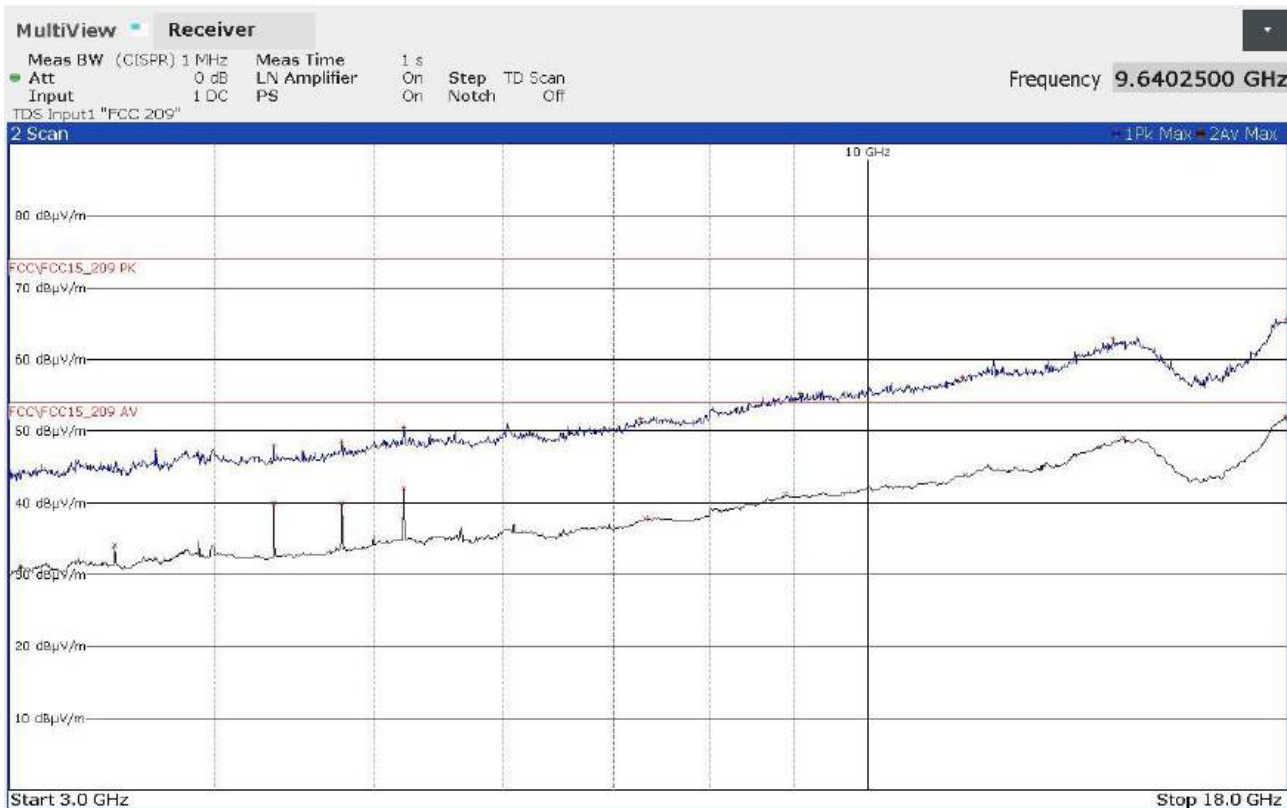
Freq Hz	Lev dBuV/m	Margin dB
1110250000	+39,18	-34,80
1353000000	+39,83	-34,15
1495750000	+40,27	-33,71
1869750000	+42,52	-31,46
2104250000	+43,51	-30,47
2991250000	+48,26	-25,72

AVERAGE

Freq Hz	Lev dBuV/m	Margin dB
1147500000	+25,25	-28,73
1347250000	+26,16	-27,82
1564750000	+26,42	-27,56
1839750000	+28,52	-25,46
2147500000	+29,71	-24,27
2999750000	+33,75	-20,23

22008431_2

Segalla 22008432

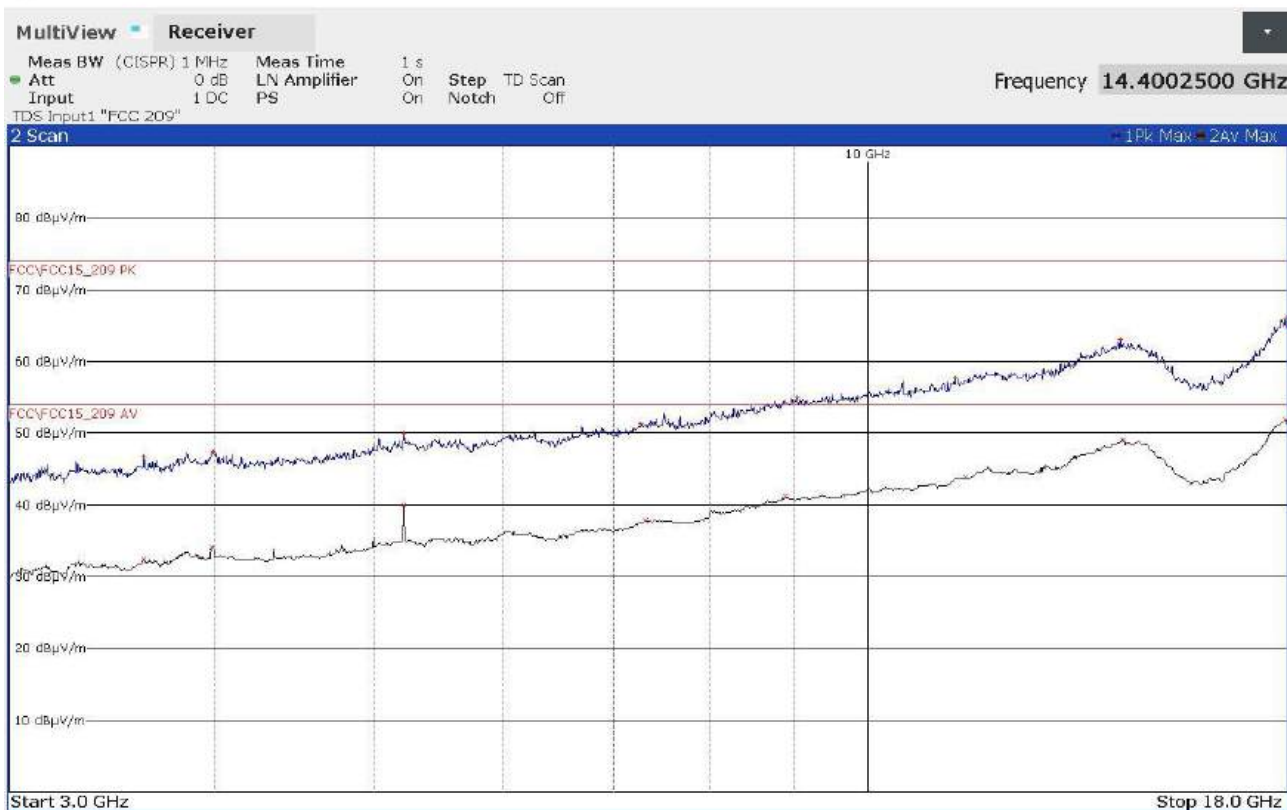


FINAL RESULT TABLE

MAX PEAK			AVERAGE		
Freq Hz	Lev dBuV/m	Margin dB	Freq Hz	Lev dBuV/m	Margin dB
3686000000	+47,25	-26,73	3477750000	+34,00	-19,98
4347250000	+47,99	-25,99	4347250000	+39,93	-14,05
4781750000	+48,53	-25,45	4781750000	+39,96	-14,02
5216500000	+50,50	-23,48	5216500000	+42,07	-11,91
7272750000	+51,67	-22,31	7318000000	+37,82	-16,16
9092000000	+55,24	-18,74	8900000000	+41,25	-12,73
11415750000	+57,51	-16,47	11460000000	+43,86	-10,12
14091250000	+62,78	-11,20	14280000000	+49,06	-4,92
17978750000	+65,61	-8,37	17939250000	+51,96	-2,02

22008432_2

Segalla 22008433

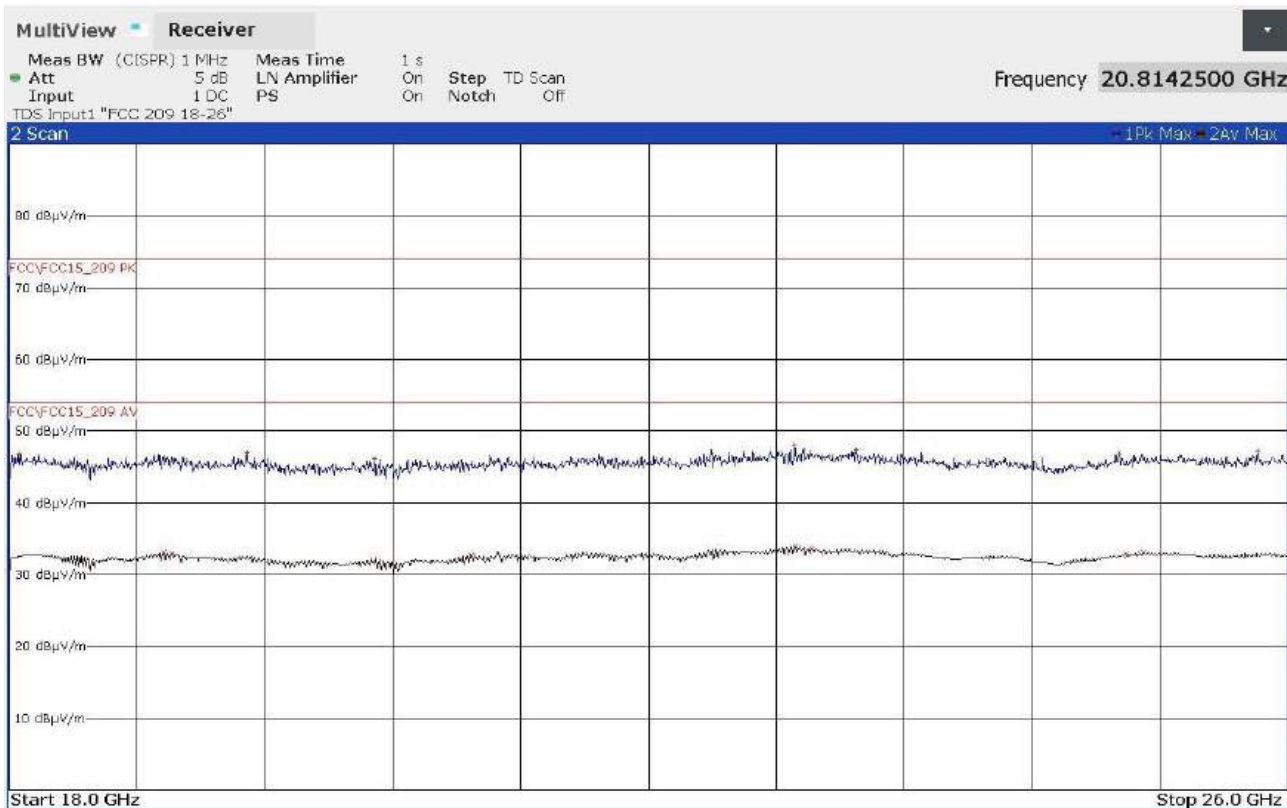


FINAL RESULT TABLE

MAX PEAK			AVERAGE		
Freq Hz	Lev dBuV/m	Margin dB	Freq Hz	Lev dBuV/m	Margin dB
3623000000	+46,68	-27,30	3622500000	+32,38	-21,60
3989500000	+47,36	-26,62	3988250000	+34,01	-19,97
5216500000	+49,94	-24,04	5216500000	+40,01	-13,97
7274500000	+51,35	-22,63	7324750000	+37,80	-16,18
9051750000	+54,92	-19,06	8900000000	+41,25	-12,73
11297500000	+57,68	-16,30	11460000000	+43,82	-10,16
14238250000	+63,08	-10,90	14280000000	+49,04	-4,94
17939500000	+66,03	-7,95	17939750000	+51,92	-2,06

22008433_2

Segalla 22008434

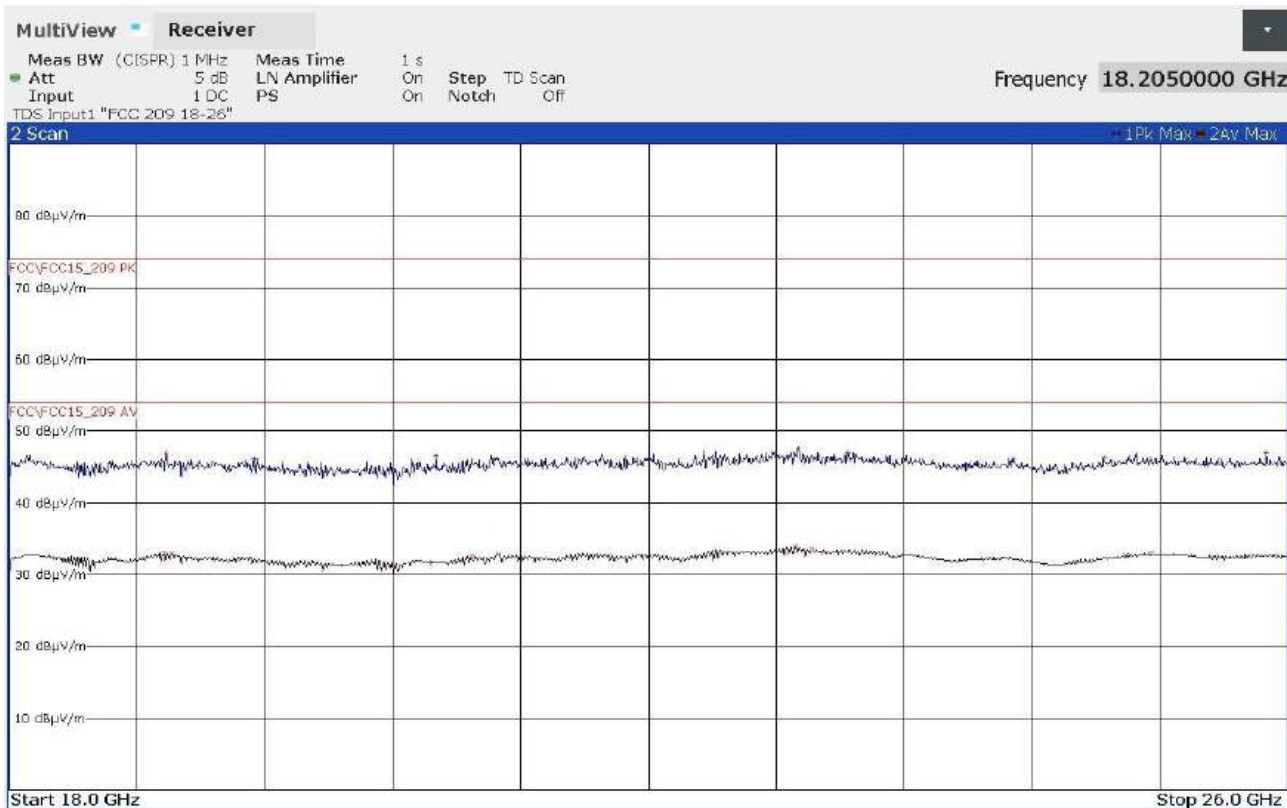


FINAL RESULT TABLE

MAX PEAK			AVERAGE		
Freq Hz	Lev dBuV/m	Margin dB	Freq Hz	Lev dBuV/m	Margin dB
18059750000	+46,87	-27,11	18966250000	+33,06	-20,92
19487000000	+46,90	-27,08	19017000000	+32,95	-21,03
20288250000	+46,12	-27,86	20890500000	+32,65	-21,33
22916500000	+48,06	-25,92	22919750000	+33,94	-20,04
23295000000	+47,41	-26,57	23020500000	+33,60	-20,38
24944250000	+46,78	-27,20	24990750000	+32,80	-21,18
25811500000	+47,20	-26,78	25094250000	+33,06	-20,92

22008434_2

Segalla 22008435



FINAL RESULT TABLE

MAX PEAK			AVERAGE		
Freq Hz	Lev dBuV/m	Margin dB	Freq Hz	Lev dBuV/m	Margin dB
18981000000	+46,77	-27,21	18967500000	+32,97	-21,01
19535750000	+46,17	-27,81	19017500000	+32,89	-21,09
20671750000	+46,61	-27,37	20891750000	+32,54	-21,44
22936500000	+47,48	-26,50	22919250000	+33,86	-20,12
23245750000	+47,03	-26,95	23019500000	+33,51	-20,47
24847000000	+46,33	-27,65	24991000000	+32,67	-21,31
25863000000	+47,02	-26,96	25145750000	+32,92	-21,06

22008435_2

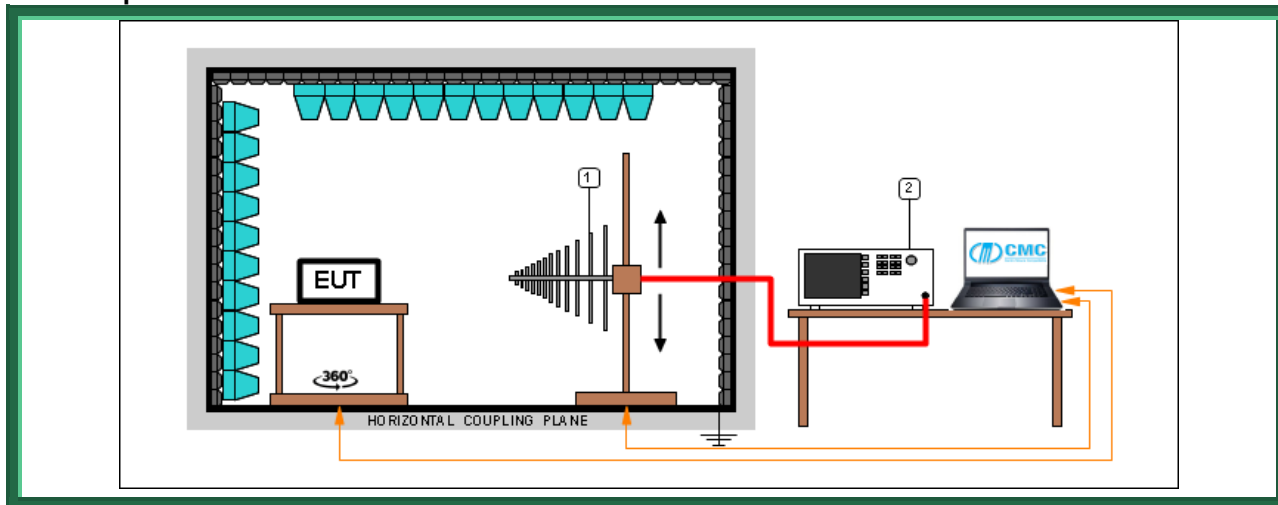
9.4 Field strength of fundamental

Tested by	M. Segalla
Test date	01.03.2023
Test location (stand)	Semi-anechoic chamber (CMC A070)
Reference standards.....	FCC Rules and Regulation; Titles 47 Part 15.209 and 15.231 (b)
Supplementary test set-up description.....	EUT – antenna distance: 10 m
Supplementary information	--

Acceptance limits

FCC Part 15.231 (b)	
Fundamental frequency (MHz)	Field strength of fundamental [dB(μV/m)]
40,66 to 40,70	67,04
70 to 130	61,94
130 to 174	61,94 to 71,48
174 to 260	71,48
260 to 470	71,48 to 81,94
Above 470	81,94

Test setup



Test setup PE004_03

Nr.	Id. Number	Manufacturer	Model	Description
2	CMC S353	Rohde & Schwarz	ESW26	EMI Test Receiver 1 Hz - 26.5 GHz
1	CMC S287	Schwarzbeck	VUSLP 9111B	Broadband Antenna

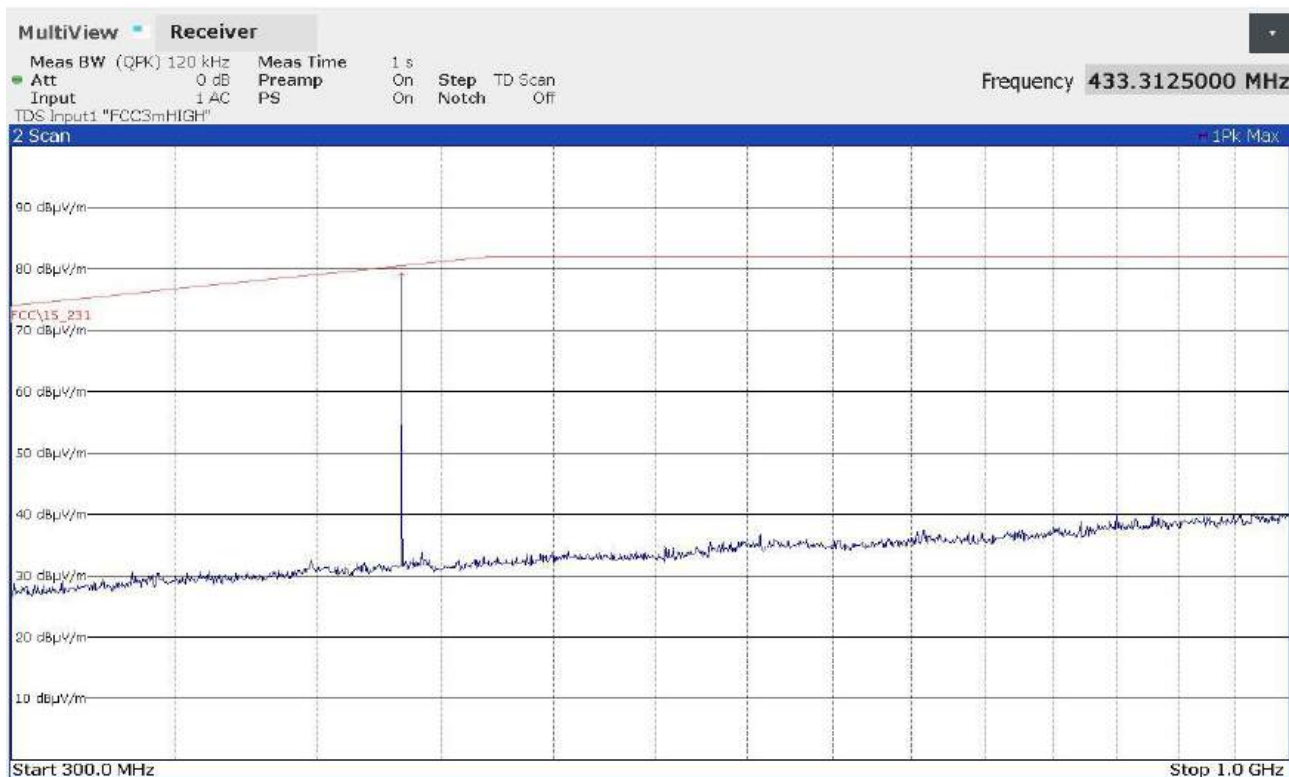
Result

Frequency (MHz)	Graph(s)	Peak level (dB μ V/m)	Limits (dB μ V/m)
433,3125	G22008402	79,03	80,11
434,7125	G22008424	79,19	80,18

Remarks: EUT was tested in 3 orthogonal planes. The results in this table show the highest value

Graphs

Segalla 22008402



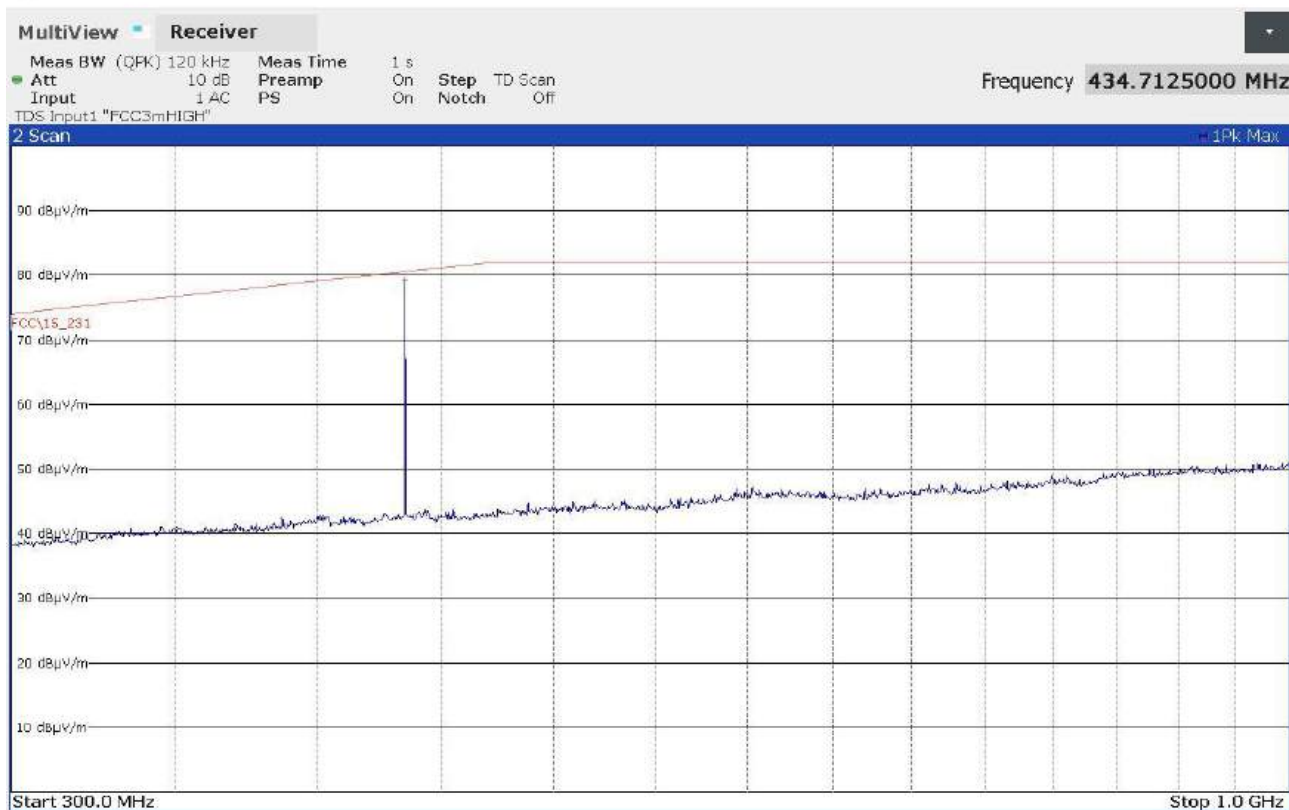
FINAL RESULT TABLE

QUASI PEAK

Freq Hz	Lev dBuV/m	Margin dB
433312500	+79,03	-1,47

22008402_2

Segalla 22008424



FINAL RESULT TABLE

QUASI PEAK

Freq Hz	Lev dBuV/m	Margin dB
434712500	+79,19	-1,37

22008424_2

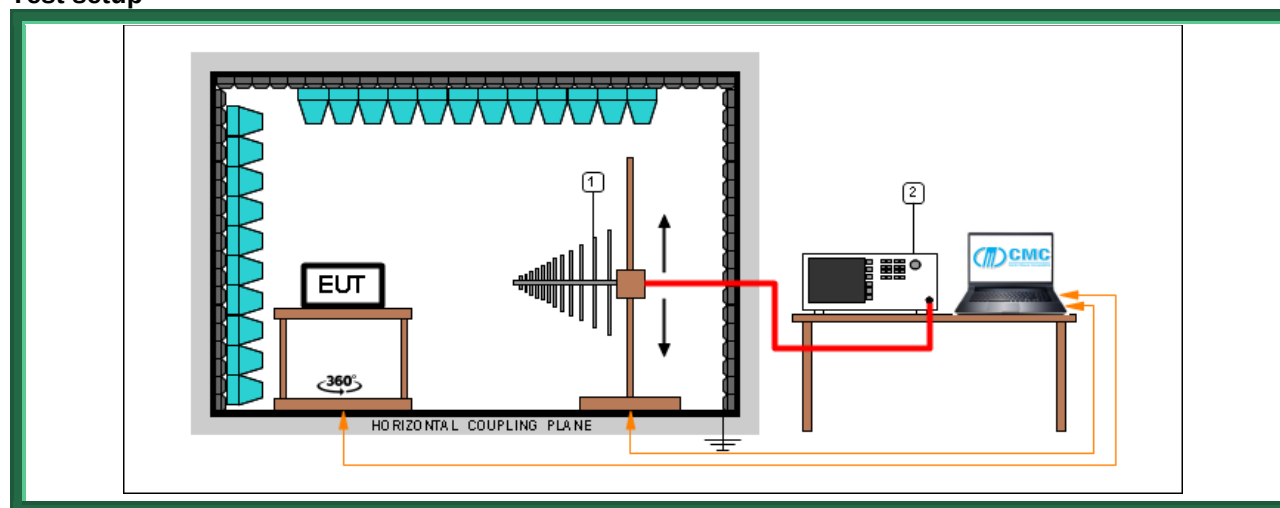
9.5 Occupied channel bandwidth

Tested by	M. Segalla
Test date	01.03.2023
Test location (stand)	Semi-anechoic chamber (CMC A070)
Reference standards.....	FCC Rules and Regulation; Titles 47 Part. 15.231 (c)
Supplementary test set-up description.....	--
Supplementary information	--

Acceptance limits

Limits	
Devices operating above 70 MHz and below 900 MHz	Devices operating above 900 MHz
0,25% of the center frequency	0,5% of the center frequency

Test setup



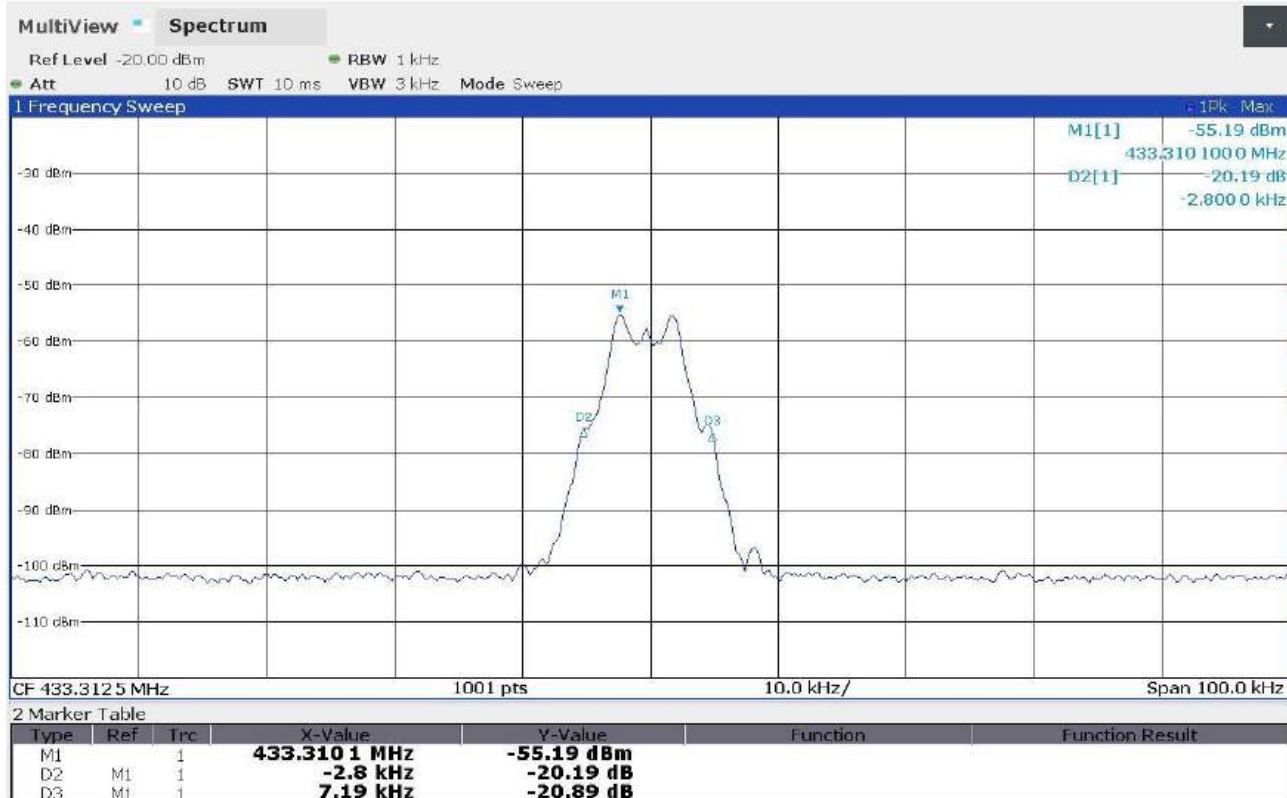
Test setup PE004_03				
Nr.	Id. Number	Manufacturer	Model	Description
2	CMC S353	Rohde & Schwarz	ESW26	EMI Test Receiver 1 Hz - 26.5 GHz
1	CMC S287	Schwarzbeck	VUSLP 9111B	Broadband Antenna

Result

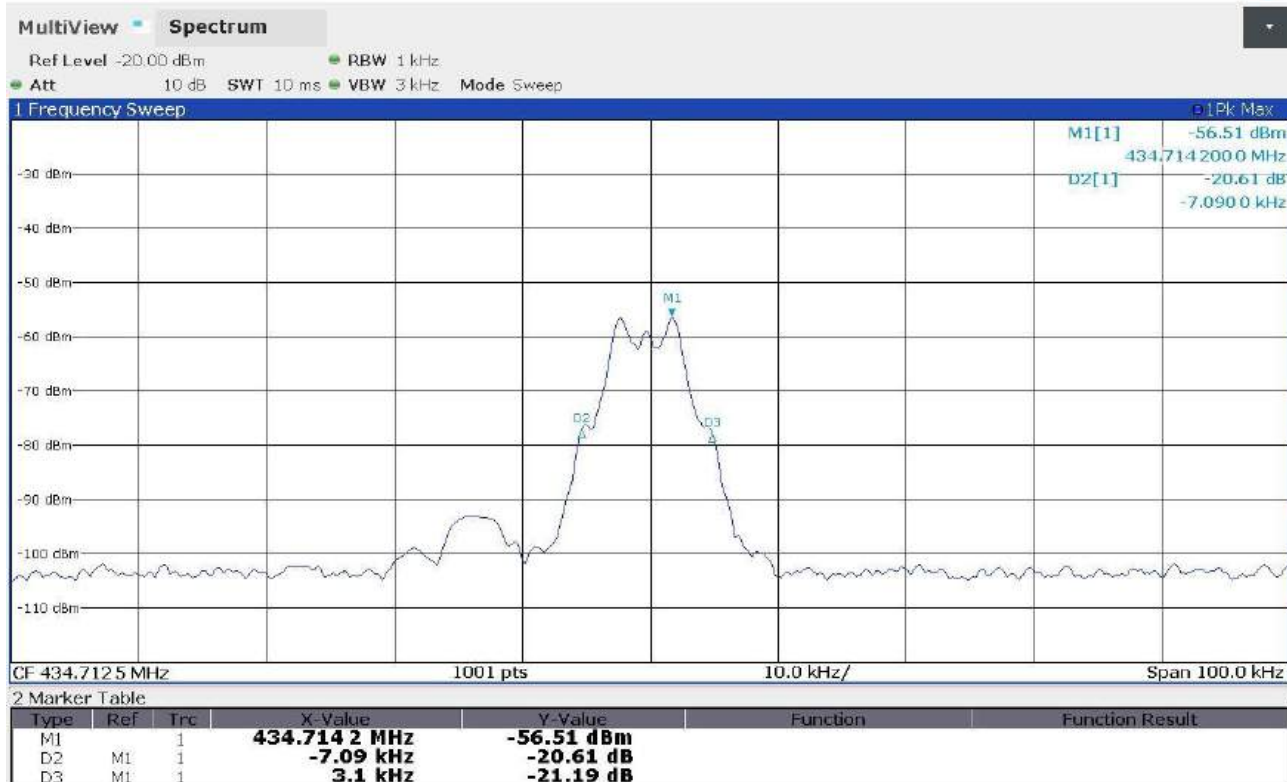
Frequency (MHz)	Graphs	20 dB bandwidth (kHz)	Limit (kHz)
433,3125	G22008403	9,99	1083,28
434,7125	G22008420	10,19	1086,78

Graphs

Segalla 22008403



Segalla 22008420



9.6 Periodic operation characteristics

Tested by	M. Segalla	
Test date	01.03.2023	
Test location (stand)	Laboratory	
Reference standards.....	FCC Rules and Regulation; Titles 47 Part. 15.231 (a) (e)	
Type of transmission.....	☒	Manually operated transmitter
	☐	Transmitter activated automatically

Acceptance limits

The provisions of this section are restricted to periodic operation within the band 40,66 – 40,70 MHz and above 70 MHz. Except as shown in paragraph (e) of this section, the intentional radiator is restricted to the transmission of a control signal such as those used with alarm systems, door openers, remote switches, etc. Continuous transmissions, voice, video and the radio control of toys are not permitted. Data is permitted to be sent with a control signal. The following conditions shall be met to comply with the provisions for this periodic operation

15.231(a1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

<i>Transmission channel (MHz)</i>	<i>Graphs</i>	<i>Transmitter deactivation time</i>	<i>Limits</i>
433,3125	G22008405	1,205 s	5 s
434,7125	G22008422	1,205 s	5 s

15.231(a2) A transmitter activated automatically shall cease transmission within 5 seconds after activation

Result: N.A.

15.231(a3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour

Result: The EUT does not employ periodic transmission.

15.231(a4) Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition.

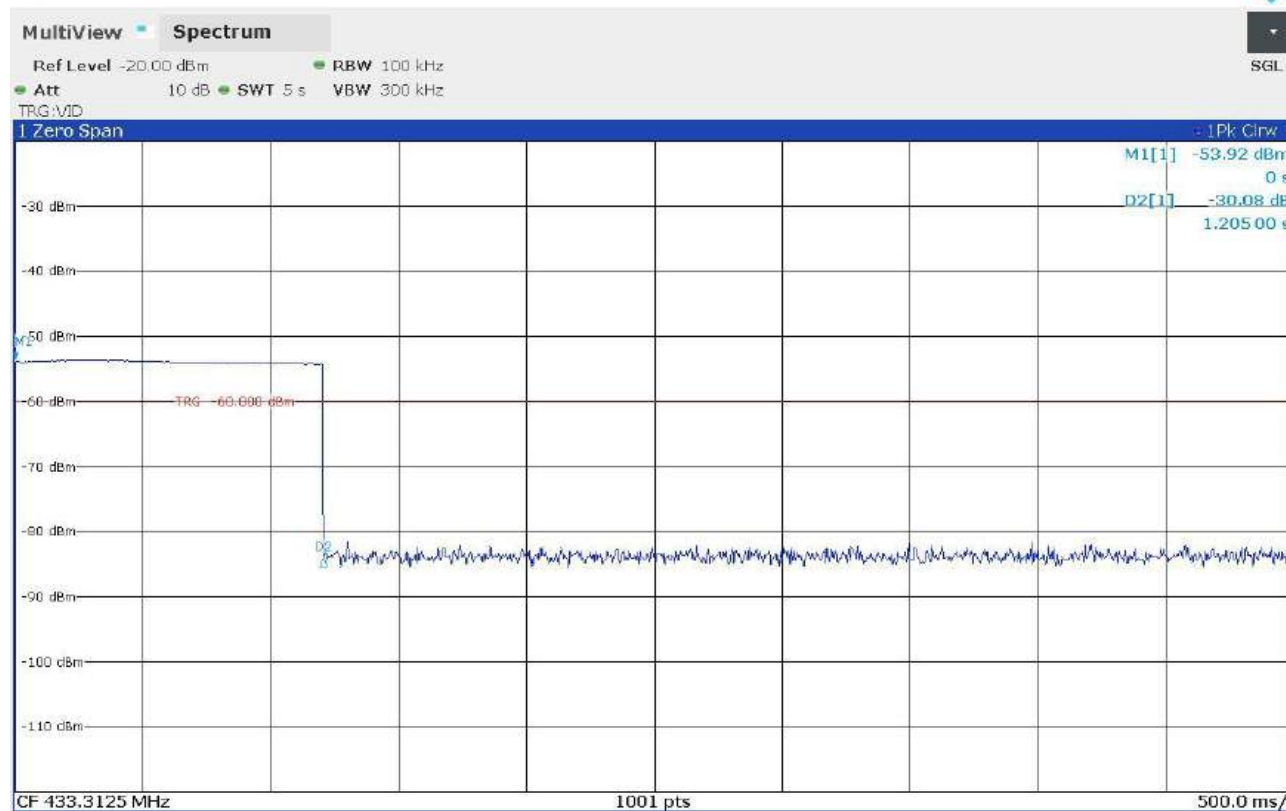
Result: N.A.

15.231(a5) Transmission of set-up information for security systems may exceed the transmission duration limits in paragraphs (a)(1) and (a)(2) of this section, provided such transmissions are under the control of a professional installer and do not exceed ten seconds after a manually operated switch is released or a transmitter is activated automatically. Such set-up information may include data

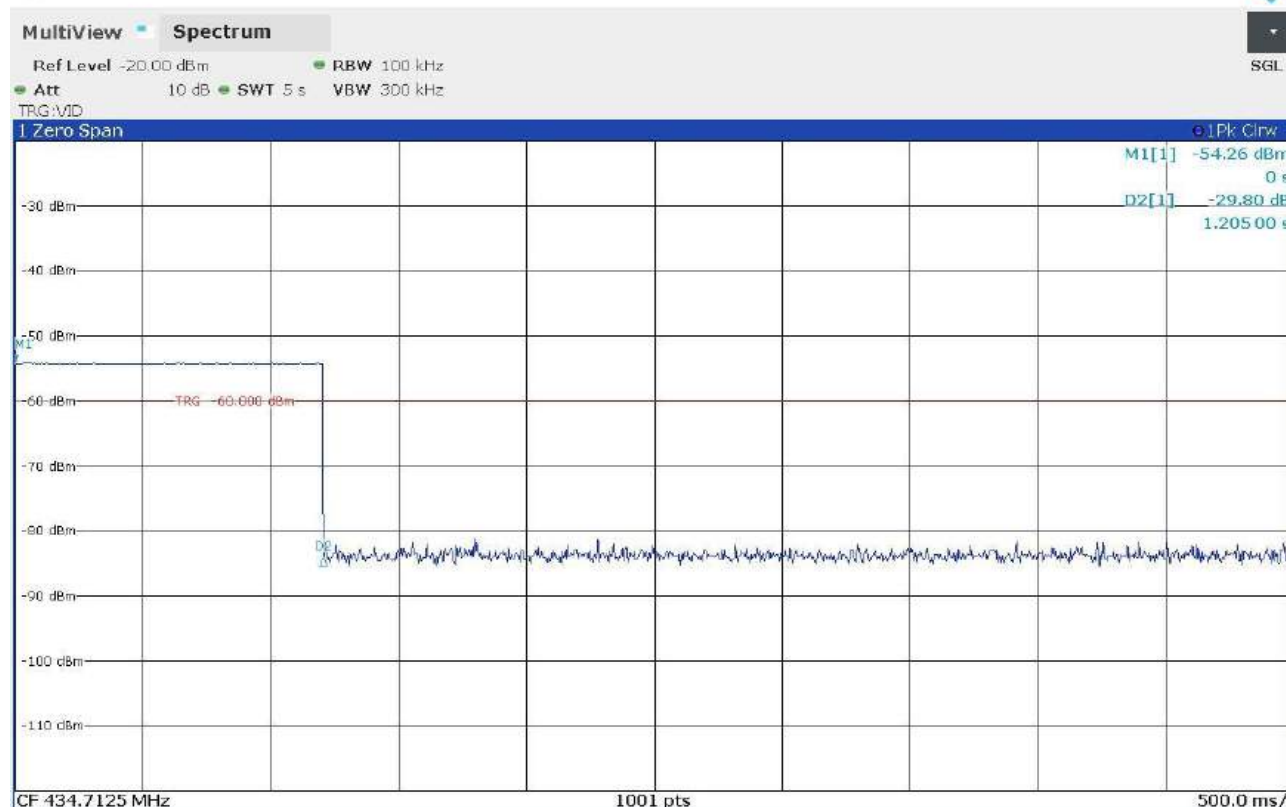
Result: N.A.

Graphs

Segalla 22008405



Segalla 22008422



Attachment 1

Instruments list

<i>Id. number</i>	<i>Manufacturer</i>	<i>Model</i>	<i>Description</i>	<i>Serial number</i>
CMC S003	SCHAFFNER	NSG 2025-4	Burst Source with CDN	1010
CMC S006	Chauvin Arnoux	CA43	Field Meter	218541RLV
CMC S009	Rohde & Schwarz	ESH2-Z5	Artificial Network	839497/007
CMC S010	Rohde & Schwarz	ESH3-Z2	Impulses Limiting Device	- - -
CMC S013	Rohde & Schwarz	EZ-17	Current Probe	840411/009
CMC S014	Rohde & Schwarz	ESH2-Z3	Passive Probe	- - -
CMC S016	Rohde & Schwarz	HK116	Broadband Antenna	839472/001
CMC S017	Rohde & Schwarz	HL223	Broadband Antenna	825584/009
CMC S018	SCHAFFNER	CDN 126	Coupling Clamp	128
CMC S019	FCC	FCC 801-M5-25	CDN Power Line	06
CMC S022	Teseo	LAS 1	Loop Antenna	3971
CMC S027	Amplifier Research	75A250	RF Amplifier	19349
CMC S028	FCC	FCC-203I	Injection Clamp	209
CMC S029	Keytek	Cemaster	Surge/Dip/Burst Generator	9609258
CMC S031	Tektronix	TDS 210	Digital Oscilloscope	B010552
CMC S032	SCHAFFNER	NSG 2050	Surge Source with CDN	200111-253AR
CMC S034	Schwarzbeck	UHA 9105	Dipole	UHA 91052234
CMC S035	Eutron	BVR 1800 30-50	DC Power Source	3004
CMC S037	Rohde & Schwarz	NRVS	Power Meter	845127/023
CMC S039	CMC	BI 01	Induction Coil	- - -
CMC S040	Walker Scientific	ELF 50-D	Magnetic Field Meter	K71484-290
CMC S042	Fluke	Fluke 73	Multimeter	67771510
CMC S076	Altitude	25438	Barometer	- - -
CMC S078	Amplifier Research	100W1000M1	RF Amplifier	21849
CMC S079	AH System, Inc	SAS-200/542	Broadband Antenna	504
CMC S080	AH System; Inc	SAS-200/510	Broadband Antenna	807
CMC S082	AH System; Inc	SAS-200/560	Loop Antenna	635
CMC S083	AH System; Inc	BCP-200/510	Current Probe	564
CMC S084	AH System; Inc	BCP-200/511	Current Probe	579
CMC S085	AH System; Inc	SAS-200/530	Broadband Dipole	504
CMC S086	CMC	RVCP01	Resistance 470kOhm	- - -
CMC S087	CMC	RHCP01	Resistance 470kOhm	- - -
CMC S091	CMC	DIPLP	Dipole for Loop Antenna control	- - -
CMC S093	LeCroy	9370	Digital oscilloscope	937001338
CMC S094	Schwarzbeck	NNBM 8126-A	LISN 5μH	8126A161
CMC S095	FCC	FCC 801-M3-16	CDN power line	9821
CMC S106	Gigatronix	900	RF Signal Generator	323001
CMC S107	Hewlett Packard	HP8563E	Spectrum Analyser	3846A09658
CMC S108	Emco	3115	Horn Antenna	9811-5622
CMC S109	Farnell	LFM4	LF Signal Generator	531
CMC S111	LEM HEME	PR 1001	Current Probes	- - -
CMC S112	Amplifier Research	DC3010	Directional Coupler	15238
CMC S114	Schwarzbeck	VHA 9103	Dipole	VHA 91031801
CMC S116	CMC	BCIP01	Calibration BCI-JIG	--
CMC S117	MARCONI	2019A	RF Signal Generator	118453/014
CMC S118	Hewlett Packard	E3632A	Programmable Power Supply	KR75301881

Attachment 1

<i>Id. number</i>	<i>Manufacturer</i>	<i>Model</i>	<i>Description</i>	<i>Serial number</i>
CMC S119	Hewlett Packard	HP8903B	Audio Analyzer	3011A09055
CMC S120	FCC	FC130-A	Current Injection Probe	118
CMC S121	Wavetek	LCR55	Bridge LCR	20104738
CMC S122	Fluke	336	Amperometric Clamp Meter	81754972
CMC S124	Spin	AMTP42-20	Horn Antenna	103
CMC S127	SCHAFFNER	HLA6120	Loop Antenna	1191
CMC S128	SCHAFFNER	CBA9428	RF Amplifier	1006
CMC S129	Rohde & Schwarz	ESPI7	Receiver	836.914/004
CMC S130	SCHAFFNER	NSG 5000	Automotive Impulse Generator	02032579-1
CMC S131	SCHAFFNER	CDN 500	Capacitive Clamp	400-151/0128
CMC S132	CMC	OPS150	Open Strip Line 150mm	- - -
CMC S135	LEM HEME	PR 30	Current Probe	P04217832830
CMC S136	Schwarzbeck	VULB 9136	Broadband Antenna	9136-205
CMC S138	Agilent	33220A	Function/Arbitrary Waveform Gener.	MY44003979
CMC S142	Narda	ELT-400+B-sensor	Exposure level tester	D-0034+D-0032
CMC S144	Rohde & Schwarz	URV5	Power Meter	881375/004
CMC S145	Hewlett Packard	778D	Directional Coupler	17237
CMC S146	Amplifier Research	10W1000B	RF Amplifier	18451
CMC S150	RKB	LOG3080	Broadband Antenna	- - -
CMC S151	CMC	CI 02	Induction Multi Coil	- - -
CMC S152	CMC	CDN100	Direct injection device	001
CMC S155	Chroma	61705	Power supply source	000000088
CMC S156	Yokogawa	DL9040	Digital Oscilloscope	91F643771
CMC S161	EM TEST	EFT 500 M4 S1	Burst source with CDN	V0739102946
CMC S162	FCC	FCC 801-M2-16	CDN power line	07047
CMC S163	NOISEKEN	ESS-2002+TC-815R	ESD simulator	ESS0787336
CMC S164	Rohde & Schwarz	ESU26	EMC receiver	100052
CMC S170	Amplifier Research	FL7006	Field meter	0327425
CMC S171	Schwarzbeck	BBHA 9120 LF(A)	Broadband Antenna	284
CMC S172	Schwarzbeck	VHBD9134+BBAL9136	Broadband Antenna	9134-037
CMC S173	Luthi	CDN L-801 AF4	CDN I/O line	2481
CMC S174	Luthi	CDN L-801 AF8	CDN I/O line	2482
CMC S175	Luthi	CDN L-801 T2	CDN I/O line	2473
CMC S176	Luthi	CDN L-801 T4	CDN I/O line	2475
CMC S177	Luthi	CDN L-801 T8	CDN I/O line	2476
CMC S178	Schwarzbeck	STLP 9128 C	Broadband Antenna	086
CMC S179	Frankonia	FLL-250A	RF Amplifier	1023
CMC S181	Milmega	AS0822-200	RF Amplifier	1031424
CMC S182	Milmega	AS0206-50	RF Amplifier	1031425
CMC S183	Minicircuits	PWR-SEN-6G+	USB Power Sensor	0809070042
CMC S184	ARRAY	3400A	Arbitrary Waveform Generation	TW00009164
CMC S185	EM TEST	OCS 500 M6 S4	Oscilatory compact simulator	V0915104789
CMC S186	Schwarzbeck	SBA 9119	Broadband Antenna	009
CMC S187	Rohde & Schwarz	SMB100A	RF signal generator	102572
CMC S189	Eutron	BVR 1800 300V5A	DC Power Source	9100
CMC S190	Spin	AMDR-10180	Horn Antenna	01-309-09
CMC S191	EM TEST	UCS 500 N5	Burst/Surge/PFQ compact simulator	V0947105547
CMC S193	Solar	6552-1A	BF Amplifier	- - -

Attachment 1

<i>Id. number</i>	<i>Manufacturer</i>	<i>Model</i>	<i>Description</i>	<i>Serial number</i>
CMC S194	CMC	CDN 16 PL	CDN Power line	- - -
CMC S195	Schwarzbeck	VULB 9118 E sp.	Broadband Antenna	827
CMC S196	EM TEST	BS 200N	Electronic switch	V100510506
CMC S197	EM TEST	UCS 200N	Pulse generator	V0825103901
CMC S198	FCC	F - 55	RF Current Probe	100999
CMC S199	EM TEST	CNI 503	CDN for Burst and Surge	V1026106843
CMC S200	Schwarzbeck	NSLK 8128	V-LISN	8128-273
CMC S201	S.M. ELECTRONICS	SA3N150-06F	Attenuator	- - -
CMC S202	Rohde & Schwarz	CMU200	Universal radio communication tester	104099
CMC S203	CMC	VH	Van der Hoofden test-head	- - -
CMC S205	Schwarzbeck	NNBM 8124	LISN 5µH	065
CMC S206	Rohde & Schwarz	ESCI 7	EMC Receiver	100781
CMC S207	AlphaLab	ASMGM	Milligauss meter	584
CMC S209	Elettrotest	TPS40K 30K60S	AC Source	002.11
CMC S210	EM TEST	PFS 200N30	Power Fail simulator	V1130110311
CMC S211	Luthi	CDN L-801 M1	CDN M line	2811
CMC S212	Luthi	CDN L-801 M2	CDN M line	2812
CMC S213	Luthi	CDN L-801 M3	CDN M line	2813
CMC S214	EM TEST	VDS200N10	Voltage drope simulator	V1150111222
CMC S215	FCC	F-130A-1	BCI Probe	112166
CMC S216	Luthi	MDS21	Absorbing Clamp	4101
CMC S217	Schwarzbeck	TK9420	Voltage Probe	458
CMC S218	RS	50WCW	50 ohm Load	- - -
CMC S219	EM TEST	CNV 504 N1.2	Box Surge	V1210112161
CMC S221	Minicircuits	BW-N20W5+	Attenuator	0612
CMC S222	A-INFOMW	ACB06-100SN	Attenuator	J3081111111003
CMC S223	Minicircuits	BW-N20W20+	Attenuator	1217
CMC S224	Fairview microwave	SMC4037-20	Directional Coupler	J5DF568-081
CMC S225	Fairview microwave	SA3550N	Step Attenuator	201237026
CMC S226	Werlatone	C6021-10	Dual Directional Coupler	99019
CMC S227	Rohde & Schwarz	ESR7	EMI Test Receiver 7GHz	101121
CMC S228	Agilent	U3401A	Digital Multimeter	MY52270047
CMC S229	Schwarzbeck	CAT5 8158	ISN 8-Wire	CAT5-8158-0074
CMC S230	Werlatone	C1795-10	Dual Directional Coupler	100140
CMC S234	Schwarzbeck	VTSD 9561-F	Pulse Limiter/Attenuator	9561-F023
CMC S235	Schwarzbeck	VUSLP 9111B	Broadband Antenna	9111B-118
CMC S236	Schwarzbeck	BBA 9106 + VHBB 9124	Broadband Antenna	9124-672
CMC S237	EM TEST	DPA 503N	Harmonic & Flicker analyser	P1338124620
CMC S238	Minicircuits	PWR-SEN-6GHS	USB Power Sensor	11302250023
CMC S239	Schwarzbeck	UAH 9105	Dipole	9105-2599
CMC S240	CMC	ITF2	Three-phase Impedances cabinet	- - -
CMC S241	Schwarzbeck	BBV 9718	Broadband Preamplifier	9718-126
CMC S242	CMC	W-IM1	Shielded Cable	- - -
CMC S243	Minicircuits	ZX60-33LN-S+	Low Noise Amplifier	S F558500921
CMC S244	EM TEST	AutoWave	Automotive Waveforms Gen.	P1303110740
CMC S245	CMC	AEP1	Automotive ESD Plane	- - -
CMC S246	Minicircuits	ZFBT-6GW	Bias Tee	RF405100521

Attachment 1

<i>Id. number</i>	<i>Manufacturer</i>	<i>Model</i>	<i>Description</i>	<i>Serial number</i>
CMC S247	Minicircuits	ZFBT-6GW+	Bias Tee	RF476100846
CMC S249	Schwarzbeck	NNBM 8124	LISN 5μH	685
CMC S250	Pico Technology	PicoLog1216	USB Data Logger	CO117/017
CMC S251	Schwarzbeck	BBV 9745	Broadband Preamplifier	9745-0019
CMC S252	Agilent	34972A	Data Acquisition	MY49018010
CMC S253	Minicircuits	PWR-SEN-6GHS	USB Power Sensor	11405260039
CMC S254	Prana	DR220	RF Amplifier	1610
CMC S255	S.M.ELECTRONICS	SA3N100-03F	Attenuator	- - -
CMC S256	HAMEG	HM8135	RF signal generator	014759546
CMC S257	Schwarzbeck	VAMP 9243	Active Monopole Antenna	9243-468
CMC S259	Schwarzbeck	SBA 9113 B	Broadband Antenna	247
CMC S260	CMC	Wfr_N_white	Shielded Cable	Wfr_ant10-1
CMC S261	CMC	Wfr_N	Shielded Cable	Wfr_ant20-1
CMC S262	CMC	Wfr_N_fix	Shielded Cable	Wfr_fix32-1
CMC S263	CMC	Wfr_N_fix	Shielded Cable	Wfr_fix31-1
CMC S264	CMC	Wfr_N	Shielded Cable	Wfr_ext03-1
CMC S265	CMC	Wfr_N_fix	Shielded Cable	Wfr_fix22-1
CMC S266	CMC	Wfr_N	Shielded Cable	Wfr_ext02-1
CMC S267	CMC	Wfr_N	Shielded Cable	Wfr_ant20-2
CMC S268	Schwarzbeck	HLC 27	Compact Dipole Antenna	005
CMC S269	Fairview microwave	FMCP1005	Dual Directional Coupler	1520
CMC S270	Schwarzbeck	SBA 9112	Broadband Antenna	295
CMC S271	Schwarzbeck	BBA 9106 + VHBB 9124	Broadband Antenna	831
CMC S272	Minicircuits	PWR-SEN-6GHS	USB Power Sensor	11408040322
CMC S273	Minicircuits	PWR-SEN-6GHS	USB Power Sensor	11408040304
CMC S274	Minicircuits	PWR-SEN-6GHS	USB Power Sensor	11408040326
CMC S275	Schwarzbeck	NNHV 8123	LISN 5μH	8123-200#76
CMC S276	Schwarzbeck	NNHV 8123	LISN 5μH	8123-200#77
CMC S277	CMC	Wsac03_N_fix	Shielded Cable	Wsac03_fix21-1
CMC S278	CMC	Wsac03_N_fix	Shielded Cable	Wsac03_fix12-1
CMC S279	CMC	Wsac03_N_fix	Shielded Cable	Wsac03_fix12-2
CMC S280	CMC	Wsac03_N_white	Shielded Cable	Wsac03_ant10-1
CMC S281	CMC	Wsac03_N	Shielded Cable	Wsac03_ext02-1
CMC S282	CMC	Wsac03_N	Shielded Cable	Wsac03_int20-1
CMC S283	CMC	Wsac03_N_white	Shielded Cable	Wsac03_bci20-1
CMC S284	Rohde & Schwarz	SMB100A	RF signal generator	3.20.390.24
CMC S287	Schwarzbeck	VUSLP 9111B	Broadband Antenna	9111B-203
CMC S288	CMC	W_sma_white	Joint Shielded Cable	W_001
CMC S290	Schwarzbeck	BBHA 9170	Horn Antenna	733
CMC S291	Milmega	AS0860-40/25	RF Amplifier	1076710
CMC S292	BONN	BLWA 0310-300	RF Amplifier	1610818
CMC S293	Schwarzbeck	422NJ	Antenna Flat Elements	422NJ-051
CMC S294	TESEQ	NSG 437	ESD Simulator	899
CMC S295	Rohde & Schwarz	FSW43	Spectrum Analyzer	104059
CMC S296	Milmega	80RF1000-300	RF Amplifier	1078225
CMC S298	RIGOL	DSG3060	RF signal generator	DSG3A183600076
CMC S299	CMC	Wfr_sma	Shielded Cable	Wfr_ant20-2

Attachment 1

<i>Id. number</i>	<i>Manufacturer</i>	<i>Model</i>	<i>Description</i>	<i>Serial number</i>
CMC S300	CMC	Wfr_sma_fix	Shielded Cable	Wfr_fix32-3
CMC S301	CMC	Wfr_sma	Shielded Cable	Wfr_ext03-2
CMC S302	Testo	175H1	Data Logger	40370182 610
CMC S303	Schwarzbeck	VHBD 9134 + BBAE 9179	Broadband Antenna	9134-037 + 00020
CMC S304	Rohde & Schwarz	CMW290	Functional radio communication tester	101637
CMC S308	CMC	CDN100	Direct injection device	002
CMC S309	EM TEST	compact NX5	Burst/Surge/PFQ compact simulator	P1640185047
CMC S310	TESEQ	CDN M432	CDN M line	48108
CMC S311	Rohde & Schwarz	BBA150	RF Amplifier	103021
CMC S312	EM TEST	coupling NX5	CDN for Burst and Surge	P1737203098
CMC S313	EM TEST	NetWave 30-400	AC Source	P1751211689
CMC S318	RIGOL	DSG815	RF signal generator	DSG8A202600203
CMC S319	TESEQ	KEMZ 801A	Injection Clamp	51292
CMC S322	Werlatone	C5960-10	Dual Directional Coupler	117666
CMC S323	Vectawave	VBA250-800	RF Amplifier	123091
CMC S324	CMC	CCC01	Coupling Clamp	001
CMC S326	RIGOL	DSG3060	RF signal generator	DSG3A204600091
CMC S327	Minicircuits	PWR-SEN-6GHS	USB Power Sensor	11901020110
CMC S328	Minicircuits	PWR-SEN-6GHS	USB Power Sensor	11901020127
CMC S329	Schwarzbeck	BBHA 9120 J	Horn Antenna	9120J-0167
CMC S331	Bruel & Kjaer	2260 + 4231	Phonometer	1847463 + 2095024
CMC S332	Schwarzbeck	STLP 9128 D	Double Log-periodic Antenna	91028 D 049
CMC S333	CMC	Wfr_sma_fix	Shielded Cable	Wfr_fix32-4
CMC S334	Wainwright Instruments	WHKX12-935-1000-15000-40SS	High Pass Filter	46
CMC S335	Wainwright Instruments	WHKX12-2487.1-2660-18000-40SS	High Pass Filter	01
CMC S336	Narda	EP601	Field Meter	711WX90802
CMC S337	Milmega	AS0860A-100/50	RF Amplifier	1087595
CMC S338	RIGOL	DSG815	RF signal generator	DSG8A212700221
CMC S339	Minicircuits	ZHSS-8G-S+	High Pass Filter	32002
CMC S340	Schwarzbeck	NNBM 8124 200A	LISN 5μH	8124-200 00629
CMC S341	Schwarzbeck	NNBM 8124 200A	LISN 5μH	8124-200 00630
CMC S342	Micsig	CP2100B	Current Probe	310000980
CMC S344	Fairview microwave	SCE18110101-800CM	Shielded Cable	---
CMC S345	Fairview microwave	SCE18110101-250CM	Shielded Cable	---
CMC S346	Fairview microwave	FMC2929085-500CM	Shielded Cable	---
CMC S347	Fairview microwave	FMAM3260	Broadband Preamplifier	V000669F02152016H045
CMC S348	Rohde & Schwarz	RTM3004	Digital Oscilloscope	1335.8794K04-104249-KF
CMC S349	EM TEST	AutoWave	Automotive Waveforms Generator	P2012239934
CMC S350	EM TEST	VDS 200Q50.2	Voltage Drop Simulator	P2012239962
CMC S351	EM TEST	UCS 200N	Pulse Generator	P2026241998
CMC S352	Schwarzbeck	CDN S8 RJ45	CDN I/O line	00023
CMC S353	Rohde & Schwarz	ESW26	Emi Test Receiver	101492
CMC S354	CMC	Wfr_sma_white	Shielded Cable	Wfr_ant20-1
CMC S355	CMC	Wfar03_N_white	Shielded Cable	Wfar03_blkng
CMC S356	Minicircuits	ZAPD-2-252-N+	Power Splitter	NFG23501720

Attachment 1

<i>Id. number</i>	<i>Manufacturer</i>	<i>Model</i>	<i>Description</i>	<i>Serial number</i>
CMC S357	Minicircuits	ZAPD-30-S+	Power Splitter	SFG24201721
CMC S358	CMC	Wsac03_N	Shielded Cable	Wsac03_ant10-2
CMC S359	Wainwright Instruments GmbH	WRCJV8-2350-2400-2483.5-2533.5-40SS	Band Reject Filter	12
CMC S360	TESEQ	CIP 9136A	Bulk Current Injection Probe	61394
CMC S361	CMC	Tnet01	T Network	T001
CMC A001	Sispe	F5123	Shield chamber	---
CMC A002	SIDT	951130	Anechoic chamber	---
CMC A007	CMC	10707	Semi-anechoic chamber	---
CMC A008	CMC	BPA	Track for absorbing clamp	---
CMC A013	CMC	TR01	Rotary motorized table	---
CMC A014	CMC	PM01	Antenna positionning Mast	---
CMC A070	Frankonia	SAC10	Semi-anechoic chamber	F159003
CMC A071	Frankonia	FC06	Controller Turntable & Antennamast	FC06-2014-015
CMC A072	Frankonia	FAM2-4	Antenna mast	---
CMC A073	Frankonia	FTM 3-3	Turntable	FC062015029
CMC A075	Schwarzbeck	AM9144	Modular Antenna Mast	---
CMC A076	Frankonia	SAC03	Semi-anechoic chamber	F159002
CMC B026	Angelantoni	UY 245 IU	Climatic chamber	1059.78
CMC B069	Angelantoni	CH 600C	Climatic Chamber	41973
CMC B087	Yokogawa	WT3000	Precision Power analyzer	91JB15155

Attachment 1

Measurement uncertainty

Test	Test Setup	Expanded uncertainty	Note
Conducted emission CISPR 16 LISN 50uH 0,009-0,0150 MHz	PE001_01	3,4 dB	1
Conducted emission CISPR 16 LISN 50uH 0,150-30,0 MHz	PE001_01	3,0 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	2,6 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_01	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_01	4,1 dB	1
Radiated Emission CISPR 16 Bicon. Ant. 30-300 MHz	PE004_02	4,7 dB	1
Radiated Emission CISPR 16 LogP. Ant. 300-1000 MHz	PE004_03	4,6 dB	1
Radiated Emission CISPR 16 Horn Ant. 1-18 GHz	PE004_04	4,7 dB	1
Human Exposure to electromagnetic fields	PE005_01	16,7 %	1
Harmonics	PE006_01	10 mA + 2,9 %	1
Flicker	PE007_01	4,15 %	1
Radiated Immunity 80 MHz - 6 GHz	PE102_XX	2,20 dB 0,86 V/m a 3V/m	1
Conducted Immunity 0,15 - 230 MHz	PE105_XX	1,20 dB 0,44 V a 3V	1
AC Magnetic field	PE106_01	1,55 % 0,15 A/m a 10A/m	1
Pulse Magnetic field	PE107_01	6,23 % 18,7 A/m a 300A/m	1
Dumped Magnetic field	PE108_01	6,23 % 1,87 A/m a 30A/m	1
Common mode conducted immunity	PE112_01	2,16 % 0,22 V a 10V	1

Attachment 1

Test	Test Setup	Expanded uncertainty	Note
Power/Spurious 9kHz-30MHz	PR001_01	4,1 dB	1
Power/Spurious ERP 30-1000MHz d=10m	PR001_02+03	4,7 dB	1
Misura della potenza EIRP 1-18GHz d=3m	PR001_04+05	4,7 dB	1
Misura della potenza EIRP 18-40GHz d=3m	PR001_06	5,4 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_22_01 date 31/01/2022

Note 1:

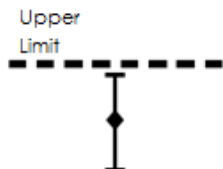
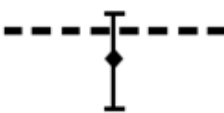
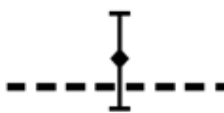
The expanded uncertainty reported according to the document EA-4-02 is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of $p = 95\%$

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