Test Report

HELEM2301000023-1 v1.2

FINAS
Finnish Accreditation Service
T004 (EN ISO/IEC 17025)

INTENTIONAL RADIATOR TESTS ACCORDING TO FCC PART 15 C AND ISED CANADA REQUIREMENTS

Equipment Under Test:	Electronic Pipette
Model:	Picus® 2
Manufacturer/Customer:	Sartorius Liquid Handling oy Tulppatie 1 FI-00880 Helsinki Finland
FCC Rule Part:	15.247
IC Rule Part:	RSS-247, Issue 2, 2017 RSS-GEN Issue 5 Amendment 2, 2021
KDB:	558074 D01 15.247 Meas Guidance v05r02 Guidance for Compliance Measurements on Digital Transmission Systems, Frequency Hopping Spread Spectrum System, and Hybrid System Devices Operating Under §15.247 of the FCC rules (April 2, 2019)

Date: 2 July 2026
Issued by:
Lauri Sippola
Testing Engineer

Date: 2 July 2026
Checked by:
Rauno Repo
Senior EMC Specialist

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GENERAL REMARKS

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

RELEASE HISTORY

Version	Changes	Issued
1.0	Initial release	15 March 2023
1.1	Manufacturer's company information was updated	31 October 2024
1.2	Picus® 2 Dispenser LH-747601 added to parallel models	2 July 2026

PRODUCT DESCRIPTION

Equipment Under Test

Equipment Under Test:	Electronic Pipette
Model:	Picus® 2
Type:	-
Trademark:	Sartorius
Serial no:	Sample 1: Prototype 1 Sample 2: VER1 0053 Sample 3: Prototype 1
Parallel models	Picus® 2 has multiple variants, see differences in the section “General description”
Contains FCC ID:	2AA9B05
Contains IC:	12208A-05
Radio module or chip:	u-blox BMD-350

General Description

The equipment under test is a battery-powered portable electronic pipette. The pipette can be charged via USB port while using the device, or via proprietary charging pins in a charging stand when not in use.

The Picus® 2 model has multiple variants with different number of channels and volume range:

Variant	Model	Channels	Volume range [µl]
LH-747021	Picus® 2	1	0.2 – 10
LH-747041	Picus® 2	1	5 – 120
LH-747061	Picus® 2	1	10 – 300
LH-747081	Picus® 2	1	50 – 1 000
LH-747101	Picus® 2	1	100 – 5 000
LH-747111	Picus® 2	1	500 – 10 000
LH-747321	Picus® 2	8	0.2 – 10
LH-747341	Picus® 2	8	5 – 120
LH-747361	Picus® 2	8	10 – 300
LH-747391	Picus® 2	8	50 – 1 200
LH-747421	Picus® 2	12	0.2 – 10
LH-747441	Picus® 2	12	5 – 120
LH-747461	Picus® 2	12	10 – 300
LH-747491	Picus® 2	12	50 – 1 200
LH-747601	Picus® 2 Dispenser	-	-

Classification

Fixed device	☐
Mobile Device (Human body distance > 20cm)	☐
Portable Device (Human body distance < 20cm)	☒

Ratings and declarations

Operating Frequency Range (OFR):	2402 - 2480 MHz
Channels:	40
Channel separation:	1 MHz
Transmission technique:	DSSS
Modulation:	GFSK
Antenna type:	Internal
Antenna gain:	1 dBi

Power Supply

Power input port type	Electronic pipette: DC (battery operated) USB charger: AC (L/N) Charging stand: DC (two-wire) Power supply: AC (L/N)
Rated voltage	Electronic pipette: 2.5-7.5 V USB charger: input 100-240 V, output 5.2 V Charging stand: input 8.0 V Power supply: input 100-240 V, output 7.5 V
Rated current	Electronic pipette: - USB charger: input 0.2 A, output 1.4 A Charging stand: input 0.3 A Power supply: input 0.5 A, output 2.0 A
Rated frequency	Electronic pipette: DC USB charger: input 50-60 Hz, output DC Charging stand: input DC, output DC Power supply: input 50-60 Hz, output DC
Rated power	Electronic pipette: - USB charger: output 7.0 W Charging stand: - Power supply: -

Samples and Modifications

No.	Name	Description
1	Sample 1	Configured to transmit at the lowest channel
2	Sample 2	Configured to transmit at the middle channel
3	Sample 3	Configured to transmit at the highest channel

Mechanical Size of the EUT

Height: 215 mm Width: 115 mm Length: 65 mm

SUMMARY OF TESTING

Test Specification	Description of Test	Result
§15.203	Antenna requirement	PASS
§15.209(a), §15.247(d) / RSS-247 5.5	Radiated Emissions Within the Restricted Bands	PASS

The decision rule applied for the tests results stated in this test report is according to the requirements of section 1.3 of ANSI C63.10-2013.

EUT Test Conditions during Testing

Configuration of the EUT was made to correspond to the actual assembling conditions as far as possible. The EUT was set into continuous pipetting mode and was charged in charging stand. The AC mains input voltage was 120 V, 60 Hz.

The test conditions were proposed by the customer.

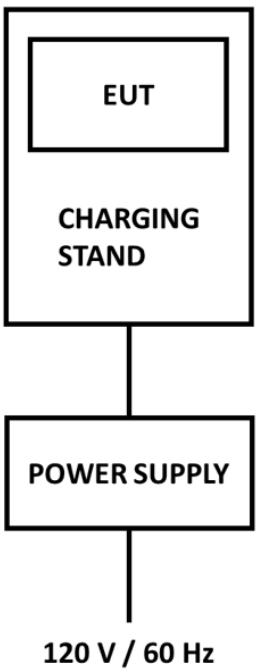


Figure 1: Test setup block diagram

Table 1: Test frequencies and settings

Channel	Frequency (MHz)
0	2402
22	2446
39	2480

Test Facility

Testing Laboratory / address: FCC designation number: **FI0002** ISED CAB identifier: **T004**	SGS Fimko Ltd Takomotie 8 FI-00380, HELSINKI FINLAND
Test Site:	☐ K10LAB, ISED Canada registration number: **8708A-1** ☒ K5LAB, ISED Canada registration number: **8708A-2** ☐ T10LAB

TEST RESULTS

Antenna Requirement

Standard: FCC Rule §15.203
Tested by: LAS
Date: 14 February 2023

FCC Rule: 15.203

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.

Specification	Requirement (at least one of the following shall be applied)	Conclusion
§15.203	1. Permanently attached antenna 2. Unique coupling to the intentional radiator 3. Professionally installed radio. The installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.	**PASS**
Note	Option 1 is used	

Transmitter Radiated Spurious Emissions 9 kHz – 26.5 GHz

Standard:	ANSI C63.10 (2013)			
Tested by:	PKA	LAS, PKA	PKA	HAM
Date:	13 February 2023	14 February 2023	15 February 2023	2 March 2023
Temperature:	22.9 °C	23.1 °C	22.8 °C	23 °C
Humidity:	37 % RH	35 % RH	33 % RH	30 % RH
Measurement uncertainty:	± 4.51 dB Level of confidence 95 % (k = 2)			

FCC Rule: 15.247(d), 15.209(a)

RSS-247 5.5

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. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a)**.**

The correction factor in the final result table contains the sum of the transducers (antenna + amplifier + cables).
Peak values of emissions below 1000 MHz measured for reference as well as transmitter fundamental.

Frequency range [MHz]	Limit [µV/m]	Limit [dBµV/m]	Detector
0.009-0.490	2400/F(kHz)	48.5-13.8	Quasi-peak
0.490-1.705	24000/F(kHz)	33.8-22.97	Quasi-peak
1.705-30.0	30	29.54	Quasi-peak
30 - 80	100	40.0	Quasi-peak
88 - 216	150	43.5	Quasi-peak
216 - 960	200	46.0	Quasi-peak
960 - 1000	500	53.9	Quasi-peak
Above 1000	500	53.9	Average
Above 1000	5000	73.9	Peak

Results LOW channel

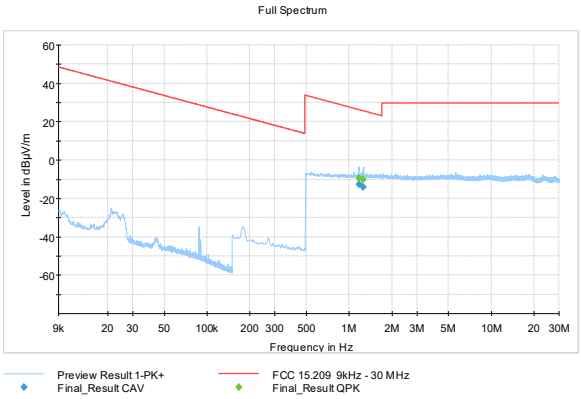


Figure 2: LOW channel **(**9 kHz – 30 MHz)

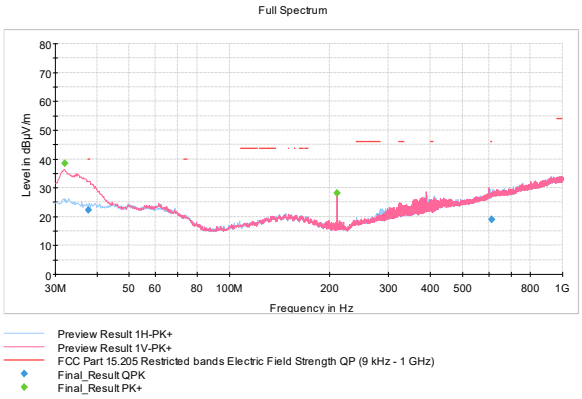


Figure 3: LOW channel (30 MHz – 1000 MHz)

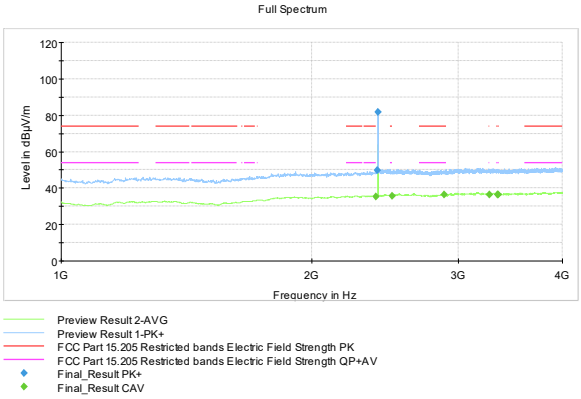


Figure 4: LOW channel (1 GHz – 4 GHz)

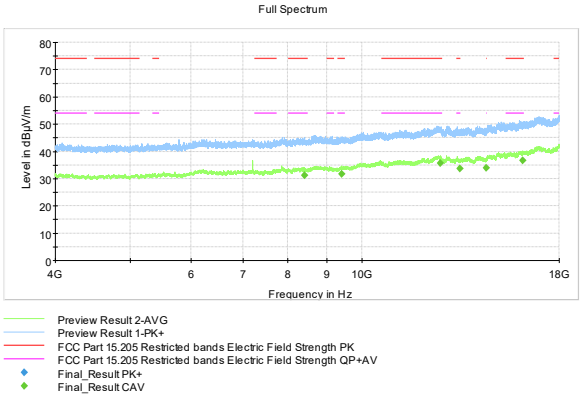


Figure 5: LOW channel (4 GHz – 18 GHz)

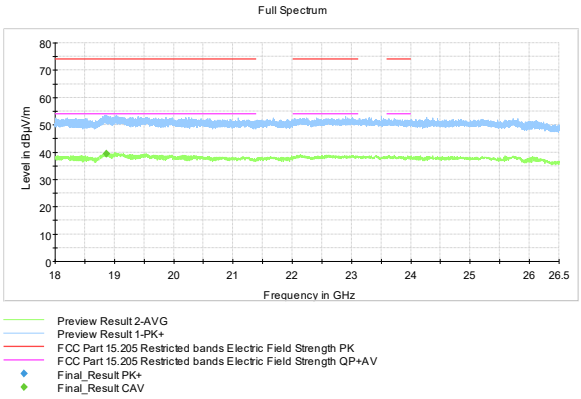


Figure 6: LOW channel (18 GHz – 26.5 GHz)

Table 2: Average results LOW channel

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1.170500	-12.57	1000.0	9.000	100.0	V	126.0	-20.5	38.83	26.26
1.260500	-13.88	1000.0	9.000	100.0	V	341.0	-20.5	39.50	25.62
2389.800000	35.47	1000.0	1000.000	367.0	H	188.0	13.6	18.53	54.00
2495.750000	35.77	1000.0	1000.000	129.0	V	321.0	13.7	18.23	54.00
2881.850000	36.43	1000.0	1000.000	112.0	H	243.0	14.4	17.57	54.00
3266.250000	36.37	1000.0	1000.000	116.0	H	221.0	14.3	17.63	54.00
3350.000000	36.41	1000.0	1000.000	400.0	H	139.0	14.4	17.59	54.00
8413.200000	31.20	1000.0	1000.000	314.0	H	320.0	12.4	22.80	54.00
9395.600000	31.69	1000.0	1000.000	100.0	V	348.0	14.1	22.31	54.00
12630.400000	35.55	1000.0	1000.000	138.0	V	233.0	18.3	18.45	54.00
13372.700000	33.74	1000.0	1000.000	100.0	V	290.0	17.3	20.26	54.00
14473.500000	34.00	1000.0	1000.000	107.0	H	0.0	18.9	20.00	54.00
16145.600000	36.77	1000.0	1000.000	107.0	V	0.0	21.9	17.23	54.00
18864.250000	39.48	1000.0	1000.000	116.0	V	142.0	8.0	14.52	54.00

Table 3: Quasi-peak results LOW channel

Frequency (MHz)	QuasiP (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1.170500	-9.46	1000.0	9.000	100.0	V	126.0	-20.5	35.72	26.26
1.260500	-10.23	1000.0	9.000	100.0	V	341.0	-20.5	35.85	25.62
37.675000	22.37	1000.0	120.000	166.0	V	24.0	16.6	17.63	40.00
612.655000	19.12	1000.0	120.000	325.0	V	342.0	27.1	26.90	46.02

Results MID channel

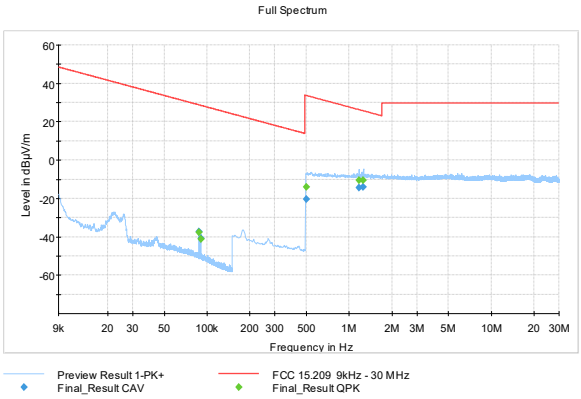


Figure 7: MID channel **(**9 kHz – 30 MHz)

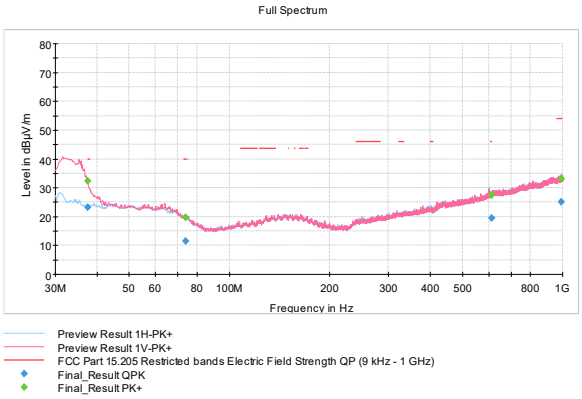


Figure 8: MID channel (30 MHz – 1000 MHz)

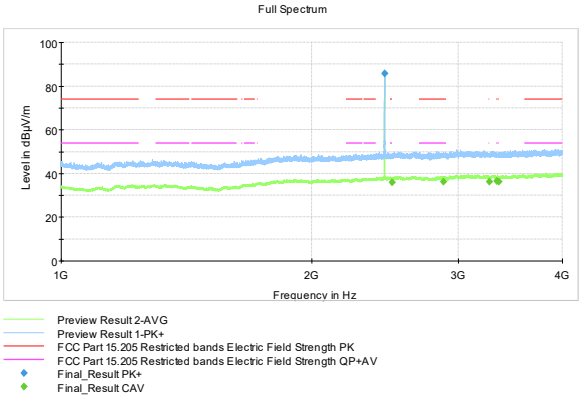


Figure 9: MID channel (1 GHz – 4 GHz)

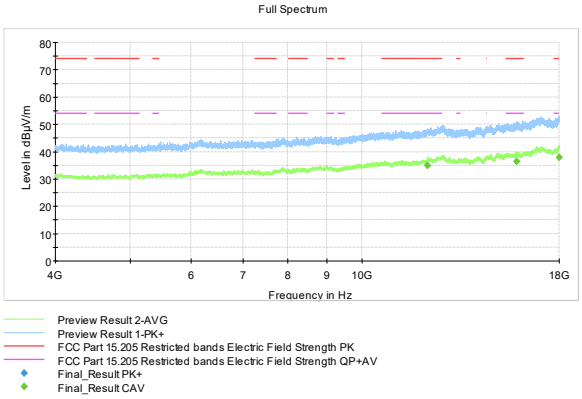


Figure 10: MID channel (4 GHz – 18 GHz)

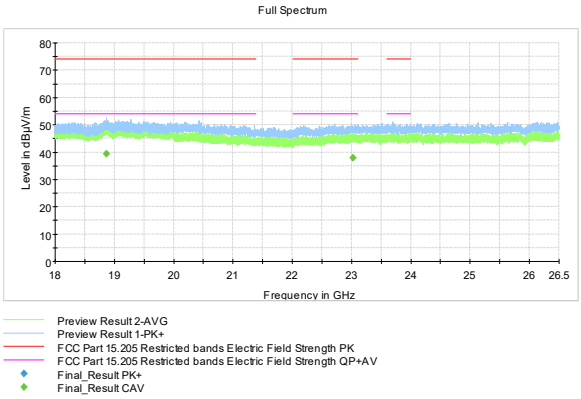


Figure 11: MID channel (18 GHz – 26.5 GHz)

Table 4: Peak results MID channel

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
37.575000	32.36	1000.0	120.000	105.0	V	120.0	16.6	7.64	40.00
73.925000	19.69	1000.0	120.000	151.0	H	19.0	15.1	20.31	40.00
613.115000	27.54	1000.0	120.000	123.0	H	180.0	27.1	18.48	46.02
990.625000	33.19	1000.0	120.000	400.0	V	225.0	32.3	20.79	53.98

Table 5: Average results MID channel

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
0.087560	-37.30	1000.0	0.200	190.0	V	114.0	-60.3	66.05	28.75
0.090210	-40.94	1000.0	0.200	190.0	V	109.0	-60.3	69.43	28.49
0.499000	-20.25	1000.0	9.000	190.0	V	92.0	-20.4	53.89	33.64
1.172750	-14.57	1000.0	9.000	100.0	V	240.0	-20.5	40.81	26.24
1.260500	-13.97	1000.0	9.000	190.0	V	98.0	-20.5	39.59	25.62
2496.250000	35.79	1000.0	1000.000	100.0	V	29.0	13.7	18.21	54.00
2881.450000	36.36	1000.0	1000.000	107.0	H	288.0	14.4	17.64	54.00
3266.250000	36.37	1000.0	1000.000	107.0	V	94.0	14.3	17.63	54.00
3356.400000	36.30	1000.0	1000.000	100.0	V	204.0	14.3	17.70	54.00
12160.000000	34.82	1000.0	1000.000	107.0	H	253.0	17.9	19.18	54.00
15852.400000	36.40	1000.0	1000.000	100.0	H	0.0	21.6	17.60	54.00
17985.500000	37.86	1000.0	1000.000	100.0	H	224.0	26.0	16.14	54.00
18864.000000	39.50	1000.0	1000.000	100.0	V	261.0	8.0	14.50	54.00
23028.400000	37.96	1000.0	1000.000	107.0	V	349.0	7.2	16.04	54.00

Table 6: Quasi-peak results MID channel

Frequency (MHz)	QuasiP (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
0.087560	-37.83	1000.0	0.200	190.0	V	114.0	-60.3	66.58	28.75
0.090210	-41.34	1000.0	0.200	190.0	V	109.0	-60.3	69.83	28.49
0.499000	-14.17	1000.0	9.000	190.0	V	92.0	-20.4	47.81	33.64
1.172750	-10.67	1000.0	9.000	100.0	V	240.0	-20.5	36.91	26.24
1.260500	-10.41	1000.0	9.000	190.0	V	98.0	-20.5	36.03	25.62
37.575000	23.23	1000.0	120.000	105.0	V	120.0	16.6	16.77	40.00
73.925000	11.50	1000.0	120.000	151.0	H	19.0	15.1	28.50	40.00
613.115000	19.52	1000.0	120.000	123.0	H	180.0	27.1	26.50	46.02
990.625000	25.15	1000.0	120.000	400.0	V	225.0	32.3	28.83	53.98

Results HIGH channel



Figure 12: HIGH channel **(**9 kHz – 30 MHz)

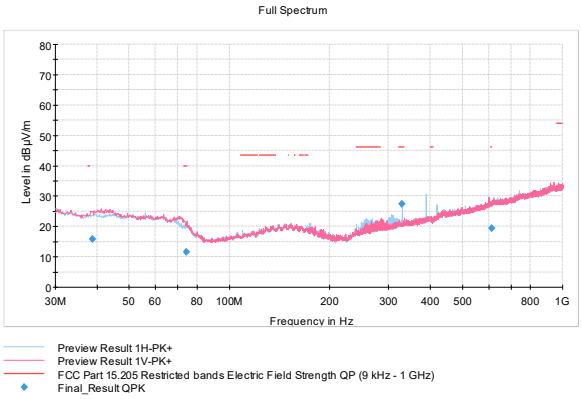


Figure 13: HIGH channel (30 MHz – 1000 MHz)

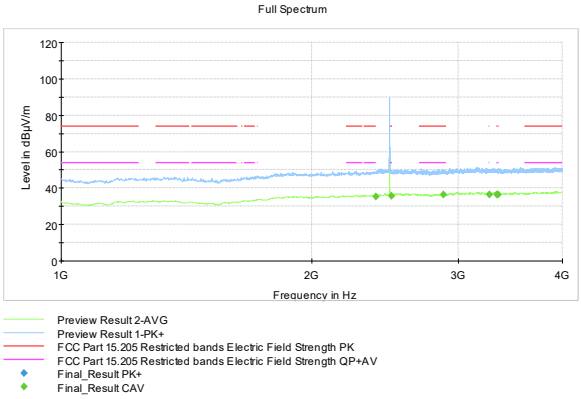


Figure 14: HIGH channel (1 GHz – 4 GHz)

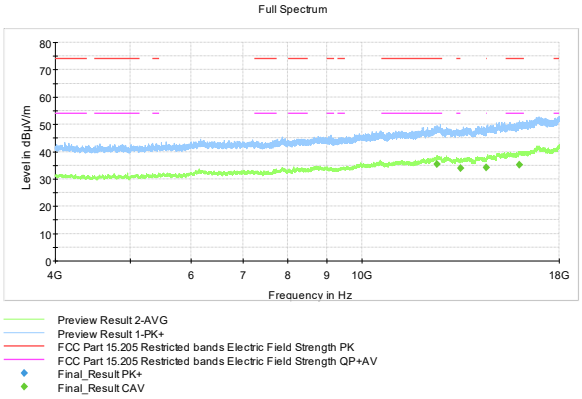


Figure 15: HIGH channel (4 GHz – 18 GHz)

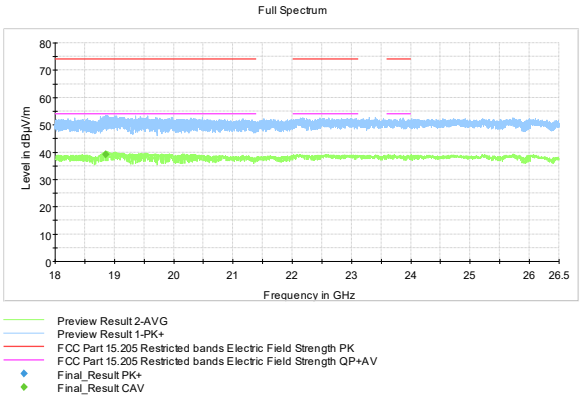


Figure 16: HIGH channel (18 GHz – 26.5 GHz)

Table 7: Peak results HIGH channel

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
74.135000	19.39	1000.0	120.000	147.0	V	268.0	15.0	20.61	40.00
329.900000	35.90	1000.0	120.000	349.0	H	165.0	20.4	10.12	46.02
613.775000	27.53	1000.0	120.000	175.0	V	135.0	27.2	18.49	46.02

Table 8: Average results HIGH channel

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1.170500	-12.88	1000.0	9.000	100.0	V	295.0	-20.5	39.14	26.26
1.260500	-14.62	1000.0	9.000	100.0	V	149.0	-20.5	40.24	25.62
2495.400000	35.77	1000.0	1000.000	139.0	V	79.0	13.7	18.23	54.00
2881.450000	36.42	1000.0	1000.000	116.0	V	39.0	14.4	17.58	54.00
3266.150000	36.36	1000.0	1000.000	116.0	H	240.0	14.3	17.64	54.00
3337.150000	36.39	1000.0	1000.000	184.0	V	135.0	14.4	17.61	54.00
3347.750000	36.38	1000.0	1000.000	100.0	V	263.0	14.4	17.62	54.00
12505.700000	35.41	1000.0	1000.000	116.0	V	314.0	17.8	18.59	54.00
13397.500000	33.91	1000.0	1000.000	383.0	H	267.0	17.6	20.09	54.00
14477.500000	34.06	1000.0	1000.000	100.0	V	316.0	18.8	19.94	54.00
15992.700000	35.27	1000.0	1000.000	100.0	V	324.0	22.0	18.73	54.00
18857.000000	39.10	1000.0	1000.000	166.0	V	30.0	8.0	14.90	54.00

Table 9: Quasi-peak results HIGH channel

Frequency (MHz)	QuasiP (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1.170500	-9.57	1000.0	9.000	100.0	V	295.0	-20.5	35.83	26.26
1.260500	-10.73	1000.0	9.000	100.0	V	149.0	-20.5	36.35	25.62
74.135000	11.49	1000.0	120.000	147.0	V	268.0	15.0	28.51	40.00
329.900000	27.50	1000.0	120.000	349.0	H	165.0	20.4	18.52	46.02
613.775000	19.29	1000.0	120.000	175.0	V	135.0	27.2	26.73	46.02

Radiated lower and upper band edge results

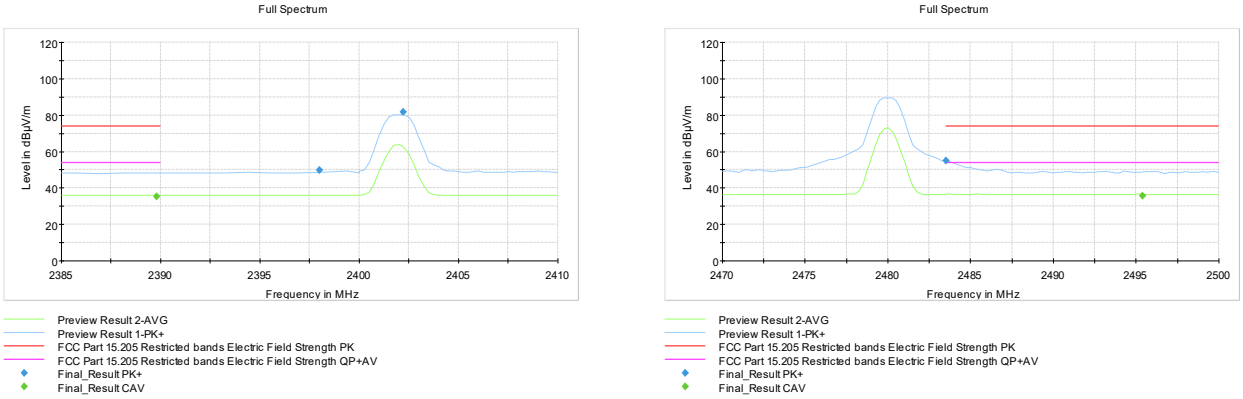


Figure 17: Radiated lower and upper band edge results

Table 10: Peak results Radiated lower and upper band edge results

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2398.000000	49.80	1000.0	1000.000	211.0	H	228.0	13.7	---	---
2402.200000	81.74	1000.0	1000.000	370.0	H	175.0	13.7	---	---
2483.500000	54.89	1000.0	1000.000	250.0	V	147.0	13.7	19.11	74.00

Table 11: Average results Radiated lower and upper band edge results

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2389.800000	35.47	1000.0	1000.000	367.0	H	188.0	13.6	18.53	54.00
2495.400000	35.77	1000.0	1000.000	139.0	V	79.0	13.7	18.23	54.00

TEST EQUIPMENT

RF-Test Equipment

Equipment	Manufacturer	Type	Inv or serial	Prev Calib	Next Calib
POWER SUPPLY	CALIFORNIA INSTR.	5001 iX Series II	inv:7826	NCR	NCR
RF PREAMPLIFIER	CIAO	CA118-3123	inv:10278	2022-09-21	2023-09-21
RF PREAMPLIFIER	CIAO	CA1840-5019	inv:10593	2022-09-21	2023-09-21
TEMPERATURE/ HUMIDITY SENSOR	EDS	OW-ENV-TH, K5 SAC	inv:10517	2022-10-27	2023-10-27
ANTENNA	EMCO	3117, emi 1-18GHz	inv:7293	2022-06-16	2024-06-16
ANTENNA	EMCO	3160-09, emi 18-26.5GHz	inv:7294	2023-02-23	2024-02-23
TURNTABLE	MATURO	DS430 UPGRADED	inv:10182	NCR	NCR
MAST & TURNTABLE CONTROLLER	MATURO	NCD	inv:10183	NCR	NCR
ANTENNA MAST	MATURO	TAM 4.0E	inv:10181	NCR	NCR
ATTENUATOR	PASTERNACK	PE 7004-4 (4dB)	inv:10126	2023-03-13	2024-03-13
TEST SOFTWARE	ROHDE & SCHWARZ	EMC-32	-	NCR	NCR
EMI TEST RECEIVER	ROHDE & SCHWARZ	ESW26	inv:10679	2022-06-20	2023-06-20
ANTENNA	ROHDE & SCHWARZ	HFH2-Z2 , 335.4711.52	inv:8013	2022-10-25	2024-10-25
ANTENNA	SCHWARZBECK	VULB 9168	inv:8911	2022-11-29	2024-11-29
FILTER	WAINWRIGHT	HP, WHKX4.0/18G-10SS	inv:10403	2023-01-09	2025-01-09
ATTENUATOR	PASTERNACK	10 dB, DC-40 GHz	sn:A1	2021-04-20	2023-04-20

NCR = No calibration required

END OF REPORT