DEKRA Testing and Certification, S.A.U.
Parque Tecnológico de Andalucía,
c/ Severo Ochoa nº 2 · 29590 Campanillas · Málaga · España
C.I.F. A29 507 456

Test report No:
NIE: 66340REM.001

Test report

FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-19 Edition) & ICES-003 Issue 7 (October 2020)

(*) Identification of item tested	Long-range wireless gateway: master concentrator
(*) Trademark	Carlo Gavazzi
(*) Model and /or type reference	UWPMM1UL2X
Other identification of the product	HW Version: 1 SW Version: 1 FCC ID: SNJWLM IC: 7118D-WLM
(*) Features	USB, RS485, LoRa (both EU868 and US915 frequencies)
Manufacturer	Carlo Gavazzi Controls SpA Via Safforze, 8 32100 Belluno (BL) ITALY
Test method requested, standard	FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-19 Edition) & ICES-003 Issue 7 (October 2020)
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Rafael López EMC Consumer & RF Lab. Manager RAFAEL LÓPEZ MARTÍN 2021.02.16 13:50:37 +01'00'
Date of issue	2021-01-19
Report template No	FDT08_23 (*) “Data provided by the client”

Index

ACRONYMS 3
COMPETENCES AND GUARANTEES 3
GENERAL CONDITIONS 4
UNCERTAINTY 4
DATA PROVIDED BY THE CLIENT 4
USAGE OF SAMPLES 5
TEST SAMPLE DESCRIPTION 6
IDENTIFICATION OF THE CLIENT 7
TESTING PERIOD AND PLACE 7
DOCUMENT HISTORY 7
ENVIRONMENTAL CONDITIONS 8
REMARKS AND COMMENTS 9
TESTING VERDICTS 9
LIST OF EQUIPMENT USED DURING THE TEST 9
SUMMARY 10
APPENDIX A: TEST RESULTS 11

Acronyms

Acronym ID	Acronym Description
Avg	Radiated Average Level
Avg	Conducted Average Level
Az	Azimuth
CPL	Zones / Coupling Cables
Code	EMC Test Code
Freq	Frequency
Freq Rng	Frequency Range
H	Height
Line	Conducted Emissions - Tested Line
MP	Measurement Point
Max	Conducted Maximum Level
MaxPeak	Radiated Maximum Peak Level
OM	Operation Mode
Pol	Polarization
QuasiPeak	Conducted Quasi Peak Level
QuasiPeak	Radiated Quasi Peak Level
S/	Sample
V	Verdict
Volt Immunity Lvl	Voltage Immunity Severity Level
Volt Immunity Type	Voltage Immunity Type

Competences and guarantees

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

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

DEKRA Testing and Certification S.A.U. guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Testing and Certification S.A.U. at the time of performance of the test.

DEKRA Testing and Certification S.A.U. is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

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

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General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Testing and Certification S.A.U.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Testing and Certification S.A.U. and the Accreditation Bodies.

Uncertainty

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

The total uncertainty of the measurement system for the measured radio disturbance characteristics of EUT from 30 MHz to 1000 MHz is I = ± 4,9 dB for quasi-peak measurements, I = ± 4,6 dB for peak measurements (k= 2).

The total uncertainty of the measurement system for the measured radio disturbance characteristics of EUT from 1000 MHz to 12.75 GHz is I = ± 2,6 dB for peaks and average measurements (k = 2).

Data provided by the client

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested"
2. The sample consists of an electric-cabinet equipment that receives data from Carlo Gavazzi UWPAM1US1L2X via LoRa frequencies and send them to the UWP Master controller.

DEKRA Testing and Certification S.A.U. declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Usage of samples

Samples undergoing test have been selected by: The client.

Id	Control Number	Description	Model	Serial Nº	Date of Reception	Application
S/01	66340_05	Wireless Master Gateway	UWPMM1UL2X	BU2860014011X	2020-11-04	Element under test
S/01	66340_06	Antenna	---	---	2020-11-04	Element under test
S/01	66340_13	USB Cable	---	---	2020-11-04	Auxiliary element

Notes referenced to samples during the project.

Id	Note
S/01	N/A

Test sample description

Ports…….. :	Port name and description	Cable			
		Specified max length [m]	Attached during test	Shielded	Coupled to patient[3]
	USB Micro B (shielded to internal mass)			X	
	RS485				
	Antenna connector (shielded to internal mass)		X	X	
	Lateral Bus				
Supplementary information to the ports…….. :	N/A				

Rated power supply ..... :	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	X	AC: 115-240 V ac 50/60 Hz +/-10%	X			X	
	X	DC: 24 Vdc +/- 20%					

Rated Power ..... :	DC: 1.3 W max. AC: 5.5 VA max.
Clock frequencies..... :	Integrated micro :32MHz clock. Transceiver 32.768KHz clock
Other parameters..... :	Not provided data
Software version ..... :	1
Hardware version..... :	1
Dimensions in cm (W x H x D)..... :	Not provided data

Mounting position..... :		Table top equipment
		Wall/Ceiling mounted equipment
		Floor standing equipment
		Hand-held equipment
	X	Other: Electrical cabinet

Modules/parts ..... :	Module/parts of test item	Type	Manufacturer
	Main module		Carlo Gavazzi
	Dipole antenna		
	Power cable		
	Auxiliary module for testing		Carlo Gavazzi
Accessories (not part of the test item) ..... :	Description	Type	Manufacturer
	N/A		
Documents as provided by the applicant . :	Description	File name	Issue date
	UWPA-UWPM Datasheet	uwpa-uwpm_ds	4/12/2019

[3] Only for Medical Equipment

Identification of the client

Carlo Gavazzi Controls SpA
Via Safforze, 8
32100 Belluno (BL) ITALY.

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2020-11-23
Date (finish)	2020-11-24

Document history

Report number	Date	Description
66340REM.001	2021-01-19	First release

Environmental conditions

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

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

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

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

In the chamber for conducted measurements, the following limits were not exceeded during the test:

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

Remarks and comments

The tests have been performed by the technical personnel: Daniel Mejías, Jaime Barranquero & Antonio Sánchez.

Testing verdicts

Fail	F
Inconclusive	I
Not applicable	N/A
Not measured	N/M
Pass	P

List of equipment used during the test

Control Number	Description	Model	Manufacturer	Next Calibration
3258	SONDA DE TEMPERATURA Y HUMEDAD RELATIVA	HUMIDIPROBE	PICO TECHNOLOGY	2021-04-22
3545	USB TEMPERATURE AND HUMIDITY SENSOR	HUMIDIPROBE	PICO TECHNOLOGY	2021-04-22
4575	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	TR-702W	T&D	2021-04-22
7684	ABSORBING CLAMP 30MHz-1GHz	CLA-150	COM-POWER CORPORATION	---
7769	PREAMPLIFIER 30dB 500MHz-18GHz	BBV 9718 C	SCHWARZBECK	2021-01-09
7817	EMI TEST RECEIVER 2Hz-44GHz	ESW44	ROHDE AND SCHWARZ	2021-10-29
7826	ULTRALOG ANTENNA 30MHz-6GHz	HL562E_UPG	ROHDE AND SCHWARZ	2022-10-15
7853	EMI RECEIVER 10Hz-30MHz	PMM 9010F	NARDA	2021-10-30
7859	THREE-PHASE ARTIFICIAL NETWORK 32A	PMM L3-32	NARDA	2021-11-20
8130	SEMIANECHOIC ABSORBER LINED CHAMBER VI	P29419	ALBATROSS	---
8134	SHIELDED ROOM	P29419	ALBATROSS PROJECTS GMBH	---

Summary

Test Specification.	Requirement – Test case	Verdict	Remark
FCC CFR 47, Part 15, Subpart B (10-1-19 Edition) & ICES-003 Issue 7 (October 2020). ANSI C63.4 (2014)	Radiated emission	Pass	---
FCC CFR 47, Part 15, Subpart B (10-1-19 Edition) & ICES-003 Issue 7 (October 2020) ANSI C63.4 (2014)	Conducted emission	Pass	---

Appendix A: Test results

Appendix A context

DESCRIPTION OF THE OPERATION MODES 13
TEST STANDARDS VERSION APPLIED 13
TEST CASES DETAILS 14
FCC CFR 47, PART 15, SUBPART B (10-1-19 EDITION) & ICES-003 ISSUE 7 (OCTOBER 2020)
RE RADIATED EMISSION 14
FCC CFR 47, PART 15, SUBPART B (10-1-19 EDITION) & ICES-003 ISSUE 7 (OCTOBER 2020)
CE CONDUCTED EMISSION 20

Description of the operation modes

The operation modes described in this paragraph constitute a functionality of the sample under test for itself. Every operation mode takes a failure criteria for the immunity test that they were applying to it and a monitoring to guarantee performance of the same ones.

The operation modes used by the samples to which the present report refers, are shown in the following table:

Id	Description
OM_01	EUT ON. LORA OFF. Equipment transferring data to an auxiliary laptop via RS485 and front USB. Power Supply (DUT):115 Vac, 60 Hz. Power supply (Laptop): 115 Vac, 60Hz.
OM_02	EUT ON. LORA ON. Equipment transferring data to an auxiliary laptop via RS485 and front USB. Power Supply (DUT):115 Vac, 60 Hz. Power supply (Laptop): 115 Vac, 60Hz.
OM_03	EUT ON. LORA OFF. Equipment transferring data to an auxiliary laptop via RS485 and front USB. Power Supply (DUT):115 Vac, 60 Hz..
OM_04	EUT ON. LORA ON. Equipment transferring data to an auxiliary laptop via RS485 and front USB. Power Supply (DUT):115 Vac, 60 Hz.
OM_05	EUT ON. LORA OFF. Equipment transferring data to an auxiliary laptop via RS485 and front USB. Power Supply (DUT):24 Vdc. Power supply (Laptop): 115 Vac, 60Hz.
OM_06	EUT ON. LORA ON. Equipment transferring data to an auxiliary laptop via RS485 and front USB. Power Supply (DUT):24 Vdc. Power supply (Laptop): 115 Vac, 60Hz.

Test standards version applied

The product standards and test standards applied for each test cases are shown in the following table:

Product Test Standard	Test standard	Requirement – Test case
FCC CFR 47, Part 15, Subpart B & ICES-003 Issue 7 (October 2020).	ANSI C63.4 (2014)	Radiated emission
FCC CFR 47, Part 15, Subpart B & ICES-003 Issue 7 (October 2020).	ANSI C63.4 (2014)	Conducted emission

Test Cases Details

FCC CFR 47, Part 15, Subpart B (10-1-19 Edition), Sec. 15.109 & ICES-003 Issue 7 (October 2020)

RE Radiated emission

Limits of interference Class B

The applied limit for radiated emissions, 3 m distance, according with the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B (10-1-19 Edition), Secs. 15.109 & ICES-003 Issue 7 (Updated October 2020)

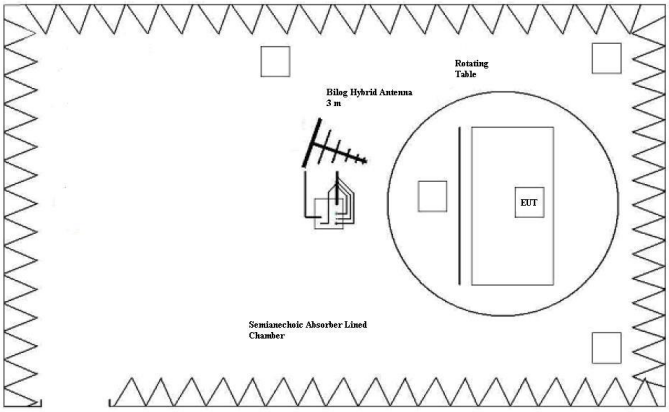
Table 2: Radiated emission limits

Frequency range (MHz)	FCC Part 15B Class B (3 m) Quasi-Peak (dBµV/m)	ICES-003 Issue 7 Limit for 3 m Quasi-Peak (dBµV/m)	FCC Part 15B & ICES-003 Issue 7	
			PK Limit for 3m (dBµV/m)	AVG Limit for 3m (dBµV/m)
30-88	40.0	40.0	---	---
88-216	43.5	43.5	---	---
216-230	46.0	46.0	---	---
230-960	46.0	47.0	---	---
960-1000	54.0	54.0	---	---
1 GHz – F_M	---	---	74	54

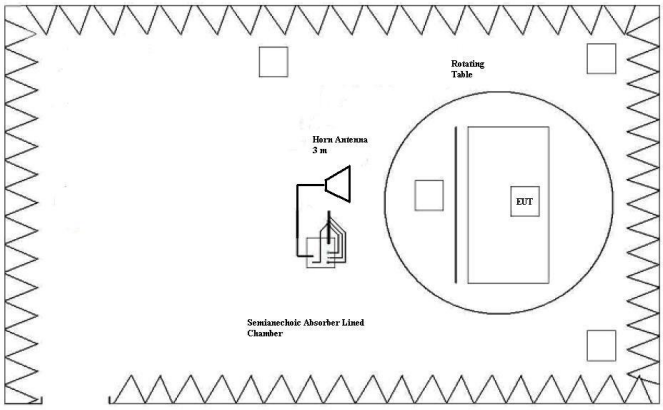
Above 1 GHz, except for outdoor units of home satellite receiving systems, the ITE or digital apparatus shall comply with the limits specified in table 2 up to the frequency F_M, which shall be determined as per table 3.

Table 3: Required highest measurement frequency for radiated emission

Highest internal Frequency (F_x)	Highest measurement Frequency (F_M)
$F_X \leq 108$ MHz	1 GHz
108 MHz < $F_X \leq 500$ MHz	2 GHz
500 MHz < $F_X \leq 1$ GHz	5 GHz
$F_X > 1$ GHz	5 x F_X up to a maximum of 40 GH
*F_x is the highest fundamental frequency generated and/or used in the ITE or digital apparatus under test.	



Setup for measurements < 1GHz.



Setup for measurements > 1GHz.

RESULTS

CRmmnnRR	Description	Result
CR0101LR	Range: 30 MHz - 1000 MHz.	P
CR0101HR	Range: 1 GHz – 6 GHz.	P
CR0105LR	Range: 30 MHz - 1000 MHz.	P
CR0105HR	Range: 1 GHz – 6 GHz.	P
CR0101HR2	Range: 6 GHz – 40 GHz.	N/A*
CR0105HR2	Range: 6 GHz – 40 GHz.	N/A*

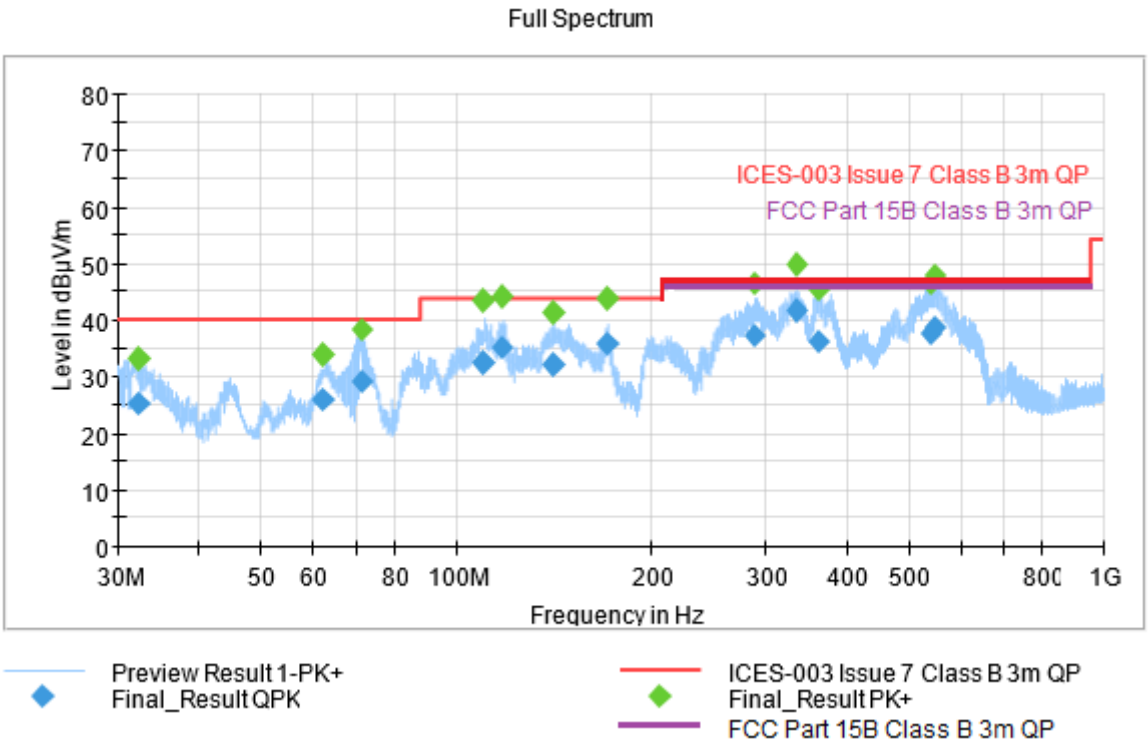
mm: Sample number; nn: Operation mode; RR: Measurement range.

*According to FCC 47 CFR Part 15B / ICES-003 Issue 7, test is only required up to the 5th harmonics of the maximum internal work frequency.

VERDICT

Pass

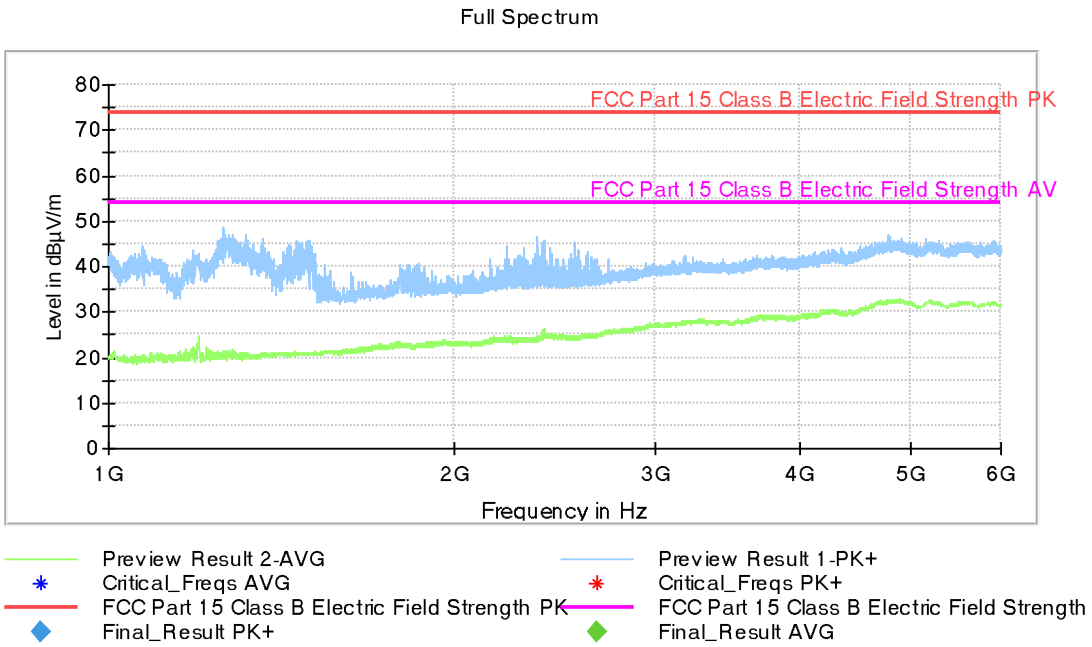
Project:	66340REM.001
Company:	CARLO GAVAZZI CONTROLLS SPA
Sample:	S/01
Operation mode:	01
Graphical code:	RE0101LR
Description:	EUT ON. LORA OFF. Equipment transferring data to an auxiliary laptop via RS485 and front USB. Power Supply (DUT):115 Vac, 60 Hz. Power supply (Laptop): 115 Vac, 60Hz.
Verdict:	Passed



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
32.215000	---	33.13	---	---	210.0	V	332.0
32.215000	25.04	---	40.00	14.96	210.0	V	332.0
62.441000	---	33.77	---	---	185.0	V	162.0
62.441000	25.52	---	40.00	14.48	185.0	V	162.0
71.625000	28.83	---	40.00	11.17	119.0	V	226.0
71.625000	---	38.22	---	---	119.0	V	226.0
110.295000	---	43.25	---	---	144.0	V	14.0
110.295000	32.26	---	43.52	11.26	144.0	V	14.0
117.714000	34.88	---	43.52	8.64	112.0	V	257.0
117.714000	---	44.20	---	---	112.0	V	257.0
141.500000	32.11	---	43.52	11.41	232.0	H	15.0
141.500000	---	41.14	---	---	232.0	H	15.0
170.919000	---	43.50	---	---	171.0	H	204.0
170.919000	35.72	---	43.52	7.80	171.0	H	204.0
289.515000	36.97	---	46.00	9.03	125.0	H	68.0
289.515000	---	46.22	---	---	125.0	H	68.0
335.355000	---	49.72	---	---	100.0	V	205.0
335.355000	41.43	---	46.00	4.57	100.0	V	205.0
362.919000	---	45.10	---	---	167.0	V	13.0
362.919000	36.09	---	46.00	9.91	167.0	V	13.0
542.071000	37.46	---	46.00	8.54	150.0	H	91.0
542.071000	---	46.35	---	---	150.0	H	91.0
547.932000	38.41	---	46.00	7.59	149.0	H	82.0
547.932000	---	47.71	---	---	149.0	H	82.0

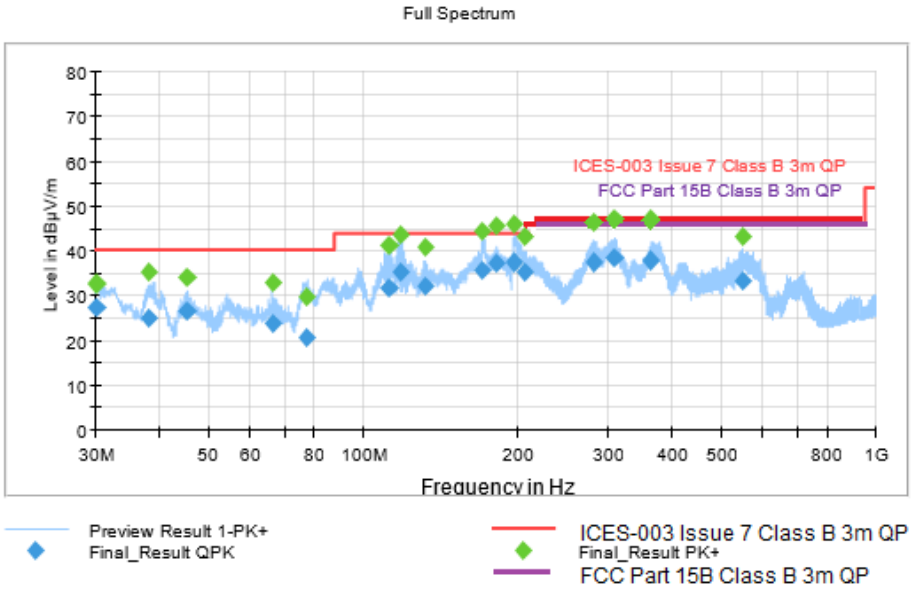
Project:	66340REM.001
Company:	CARLO GAVAZZI CONTROLLS SPA
Sample:	S/01
Operation mode:	01
Graphical code:	RE0101HR
Description:	EUT ON. LORA OFF. Equipment transferring data to an auxiliary laptop via RS485 and front USB. Power Supply (DUT):115 Vac, 60 Hz. Power supply (Laptop): 115 Vac, 60Hz.
Verdict:	Passed



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
---	---	---	---	---	---		---

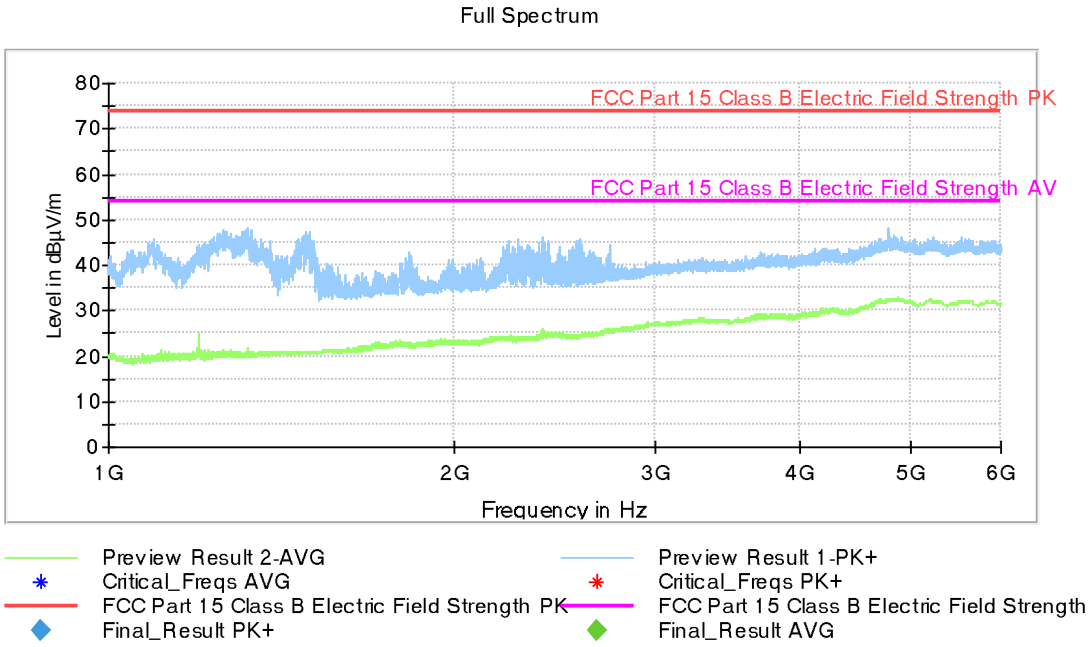
Project:	66340REM.001
Company:	CARLO GAVAZZI CONTROLLS SPA
Sample:	S/01
Operation mode:	05
Graphical code:	RE0105LR
Description:	EUT ON. LORA OFF. Equipment transferring data to an auxiliary laptop via RS485 and front USB. Power Supply (DUT):24 Vdc. Power supply (Laptop): 115 Vac. 60Hz.
Verdict:	Passed



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
30.235200	---	32.78	---	---	218.0	V	84.0
30.235200	26.99	---	40.00	13.01	218.0	V	84.0
38.348000	---	35.08	---	---	106.0	V	281.0
38.348000	25.00	---	40.00	15.00	106.0	V	281.0
45.213000	---	34.16	---	---	108.0	V	48.0
45.213000	26.25	---	40.00	13.75	108.0	V	48.0
66.523000	23.79	---	40.00	16.21	151.0	V	142.0
66.523000	---	32.99	---	---	151.0	V	142.0
77.883000	20.49	---	40.00	19.51	119.0	V	122.0
77.883000	---	29.75	---	---	119.0	V	122.0
112.115000	---	41.26	---	---	248.0	V	244.0
112.115000	31.66	---	43.52	11.86	248.0	V	244.0
118.084000	---	43.75	---	---	100.0	V	251.0
118.084000	35.30	---	43.52	8.22	100.0	V	251.0
132.357000	---	40.76	---	---	100.0	V	346.0
132.357000	31.81	---	43.52	11.71	100.0	V	346.0
171.495000	35.65	---	43.52	7.87	100.0	V	12.0
171.495000	---	44.46	---	---	100.0	V	12.0
181.729000	36.98	---	43.52	6.54	105.0	V	6.0
181.729000	---	45.34	---	---	105.0	V	6.0
196.807000	---	45.70	---	---	181.0	H	8.0
196.807000	37.54	---	43.52	5.98	181.0	H	8.0
206.810000	35.16	---	43.52	8.36	155.0	H	48.0
206.810000	---	43.34	---	---	155.0	H	48.0
282.410000	37.40	---	46.00	8.60	100.0	H	173.0
282.410000	---	46.10	---	---	100.0	H	173.0
308.162000	38.49	---	46.00	7.51	112.0	H	60.0
308.162000	---	47.08	---	---	112.0	H	60.0
363.279000	---	46.86	---	---	163.0	V	352.0
363.279000	37.92	---	46.00	8.08	163.0	V	352.0
551.017000	---	43.47	---	---	168.0	H	89.0
551.017000	33.28	---	46.00	12.72	168.0	H	89.0

Project:	66340REM.001
Company:	CARLO GAVAZZI CONTROLLS SPA
Sample:	S/01
Operation mode:	05
Graphical code:	RE0105HR
Description:	EUT ON. LORA OFF. Equipment transferring data to an auxiliary laptop via RS485 and front USB. Power Supply (DUT):24 Vdc. Power supply (Laptop): 115 Vac, 60Hz.
Verdict:	Pass



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
---	---	---	---	---	---		---

FCC CFR 47, Part 15, Subpart B (10-1-19 Edition), Sec. 15.107 & Subpart C (10-01-19 Edition), Sec 15.207 & ICES-003 Issue 7 (October 2020)
CE Conducted emission

Limits of interference Class B

The applied limit for continuous conducted emissions in power leads, according with the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B (10-1-19 Edition), Secs. 15.107 & Subpart C (10-1-19 Edition), Secs. 15.207 & ICES-003 Issue 7 (October 2020), in the frequency range 0,15 to 30 MHz, for Class B equipment was:

Frequency range	Limit (dBµV)	
(MHz)	Quasi-Peak	Average
0,15 to 0,5	66 - 56	56 - 46
0,5 to 5	56	46
5 to 30	60	50

RESULTS

CCmmnnhh	Description	Result
CC01010N	Range: 150kHz – 30MHz. Neutral AC wire noise. ANSI setup.	P
CC0101L1	Range: 150kHz – 30MHz. Phase AC wire noise. ANSI setup.	P
CC01020N	Range: 150kHz – 30MHz. Neutral AC wire noise. ANSI setup.	P
CC0102L1	Range: 150kHz – 30MHz. Phase AC wire noise. ANSI setup.	P
CC01030N	Range: 150kHz – 30MHz. Neutral AC wire noise.	P
CC0103L1	Range: 150kHz – 30MHz. Phase AC wire noise.	P
CC01040N	Range: 150kHz – 30MHz. Neutral AC wire noise.	P
CC0104L1	Range: 150kHz – 30MHz. Phase AC wire noise.	P
CC01050N	Range: 150kHz – 30MHz. Neutral AC wire noise. ANSI setup.	P
CC0105L1	Range: 150kHz – 30MHz. Phase AC wire noise. ANSI setup.	P
CC01060N	Range: 150kHz – 30MHz. Neutral AC wire noise. ANSI setup.	P
CC0106L1	Range: 150kHz – 30MHz. Phase AC wire noise. ANSI setup.	P

mm: Sample number; nn: Operation mode; hh: Wire

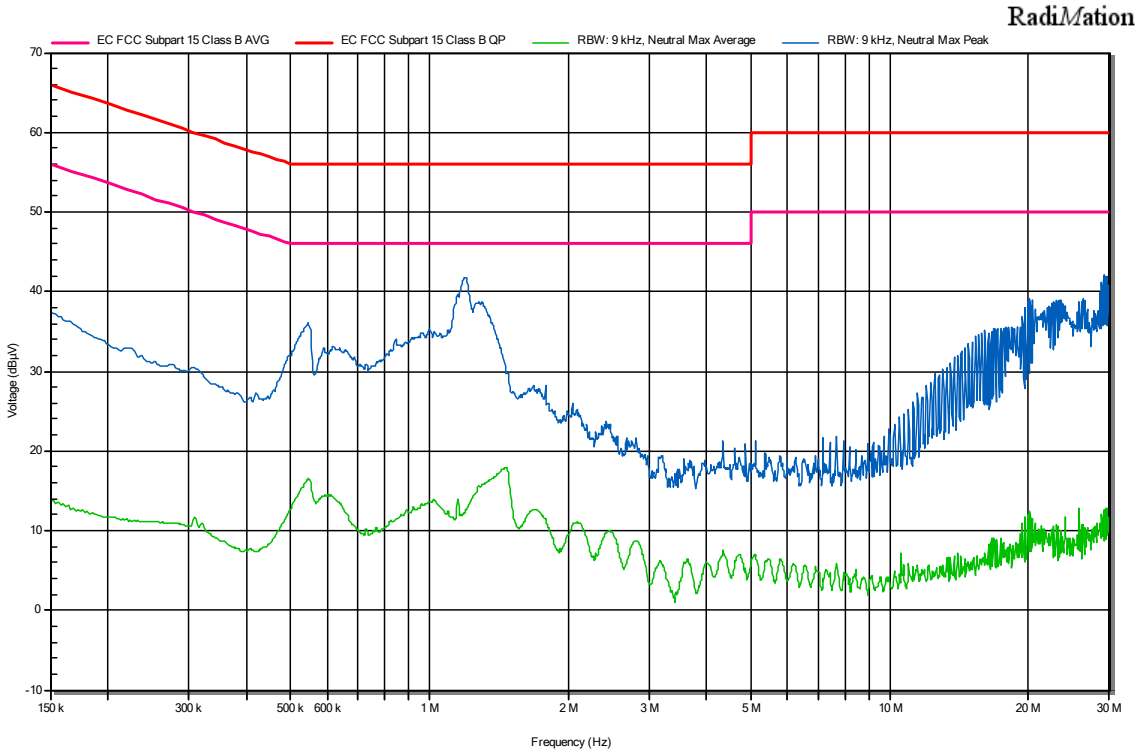
VERDICT

Pass

Images:

Project:	66340REM.001
Company:	CARLO GAVAZZI CONTROLLS SPA
Sample:	S/01
Operation mode:	01
Graphical code:	CE0101N
Description:	EUT ON. LORA OFF. Equipment transferring data to an auxiliary laptop via RS485 and front USB. Power Supply (DUT):115 Vac, 60 Hz. Power supply (Laptop): 115 Vac, 60Hz. Neutral wire noise

Full Spectrum

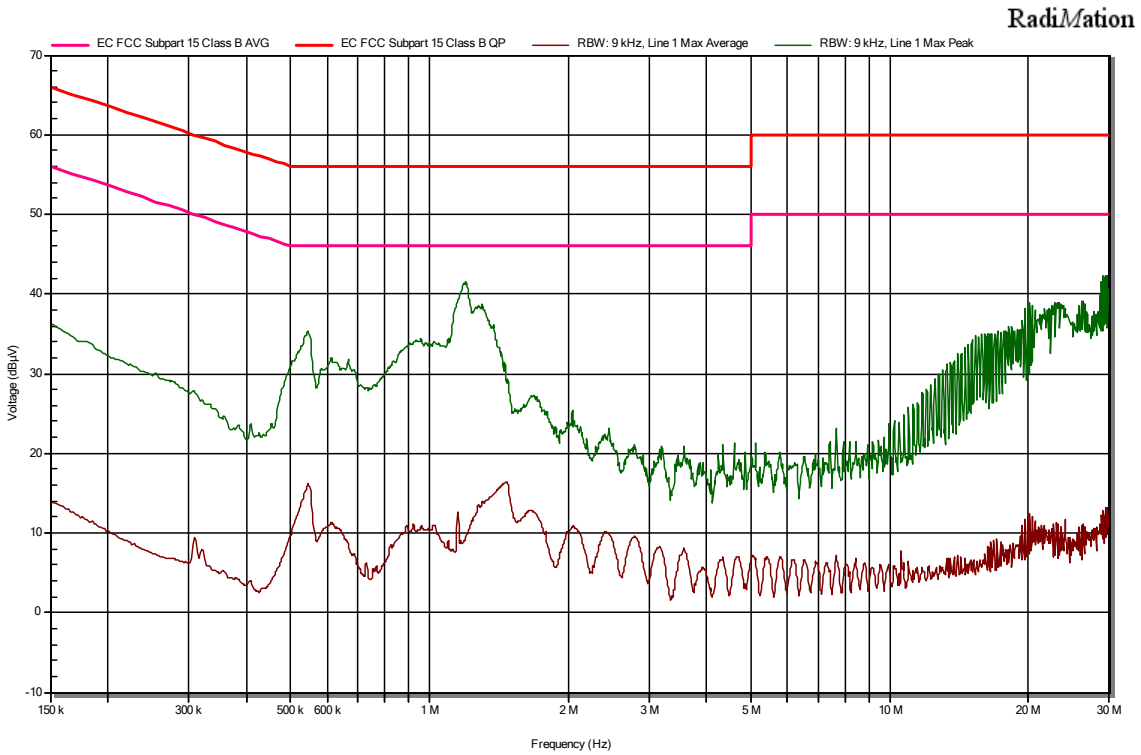


Final_Result

Frequency	Peak	Average
544,623 kHz	36,1 dBµV	16,5 dBµV
618,231 kHz	33,1 dBµV	14,2 dBµV
1,021 MHz	34,7 dBµV	13,8 dBµV
1,193 MHz	41,8 dBµV	12,3 dBµV
16,851 MHz	35,4 dBµV	6,3 dBµV
19,388 MHz	36,6 dBµV	10,9 dBµV
20,151 MHz	39 dBµV	12,1 dBµV
22,697 MHz	38,7 dBµV	10,5 dBµV
26,275 MHz	39,1 dBµV	10,8 dBµV
29,082 MHz	41,8 dBµV	12,4 dBµV

Project:	66340REM.001
Company:	CARLO GAVAZZI CONTROLLS SPA
Sample:	S/01
Operation mode:	01
Graphical code:	CE0101L1
Description:	EUT ON. LORA OFF. Equipment transferring data to an auxiliary laptop via RS485 and front USB. Power Supply (DUT):115 Vac, 60 Hz. Power supply (Laptop): 115 Vac, 60Hz. Phase wire noise.

Full Spectrum

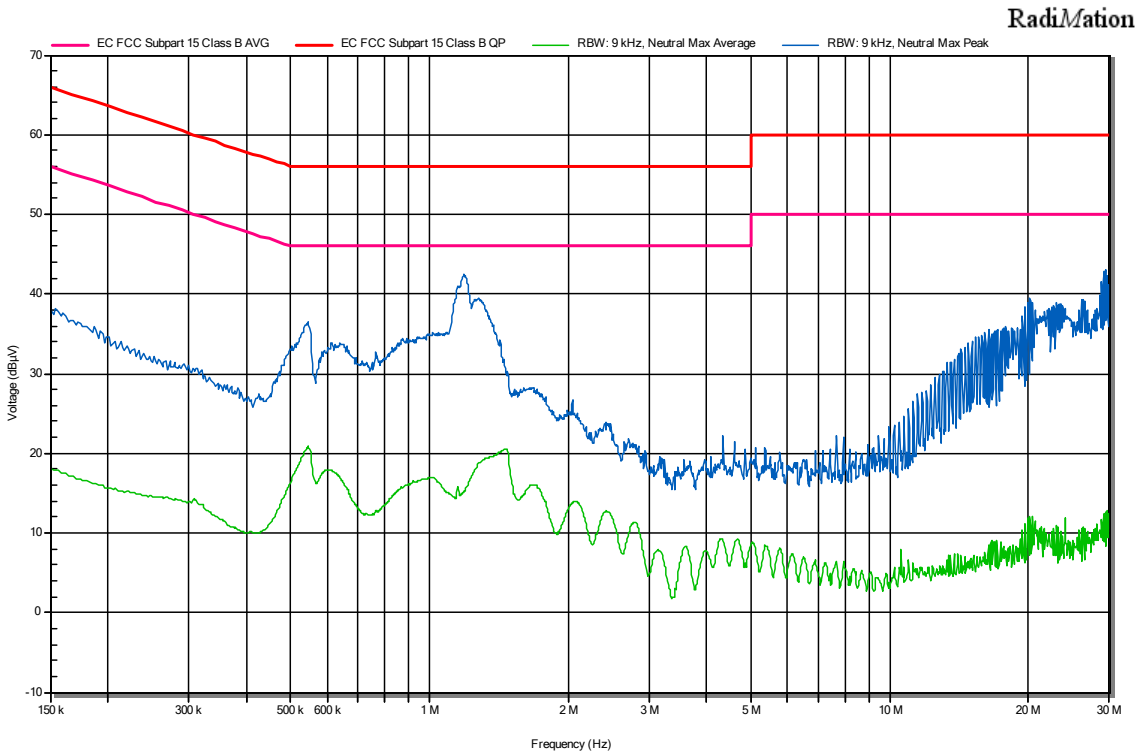


Final_Result

Frequency	Peak	Average
544,623 kHz	35,3 dBµV	16,1 dBµV
612,097 kHz	32 dBµV	11,2 dBµV
920,844 kHz	33,9 dBµV	11,2 dBµV
1,195 MHz	41,5 dBµV	9,3 dBµV
16,859 MHz	35,1 dBµV	5,9 dBµV
19,628 MHz	37,5 dBµV	11,3 dBµV
20,139 MHz	38,9 dBµV	12,2 dBµV
23,239 MHz	38,9 dBµV	7,7 dBµV
26,009 MHz	39,1 dBµV	10,9 dBµV
29,573 MHz	42,4 dBµV	13,1 dBµV

Project:	66340REM.001
Company:	CARLO GAVAZZI CONTROLLS SPA
Sample:	S/01
Operation mode:	02
Graphical code:	CE0102N
Description:	EUT ON. LORA ON. Equipment transferring data to an auxiliary laptop via RS485 and front USB. Power Supply (DUT):115 Vac, 60 Hz. Power supply (Laptop): 115 Vac, 60Hz. Neutral wire noise

Full Spectrum

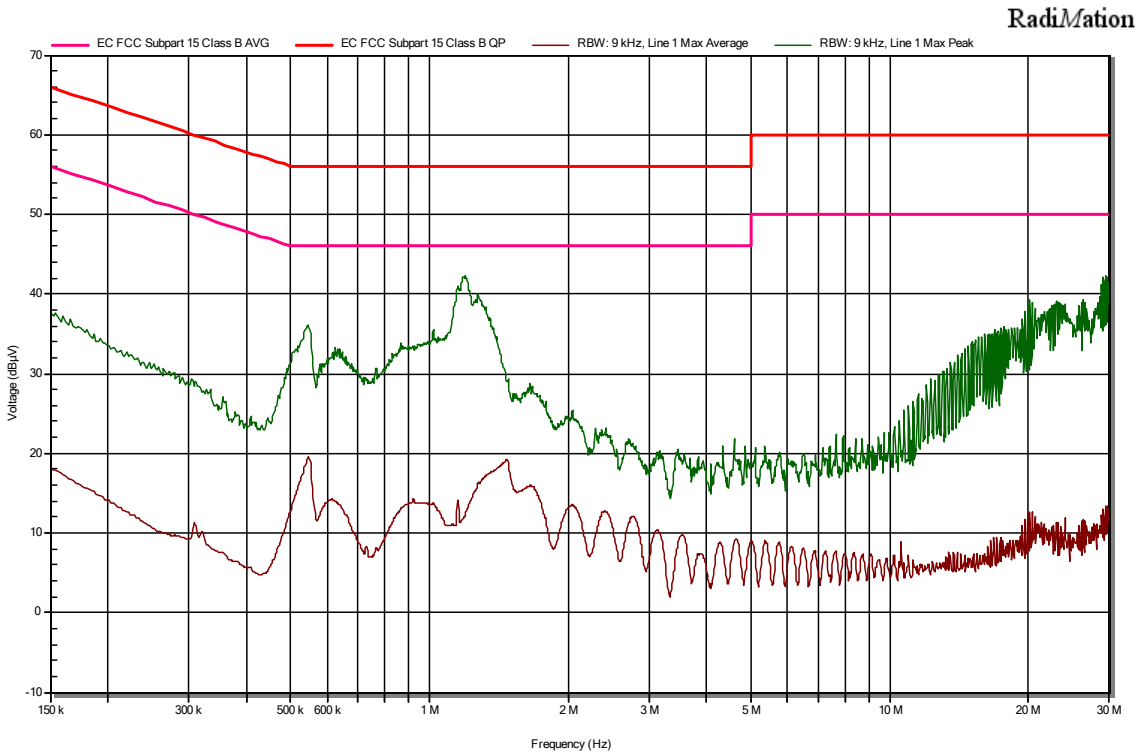


Final_Result

Frequency	Peak	Average
542,578 kHz	36,3 dBµV	20,8 dBµV
640,723 kHz	33,6 dBµV	16,8 dBµV
1,017 MHz	35,1 dBµV	17 dBµV
1,187 MHz	42,5 dBµV	15,2 dBµV
17,109 MHz	35,4 dBµV	7 dBµV
19,386 MHz	36,2 dBµV	10,4 dBµV
20,143 MHz	39,4 dBµV	11,1 dBµV
23,733 MHz	38,5 dBµV	8,9 dBµV
26,021 MHz	39,3 dBµV	10,4 dBµV
29,332 MHz	43,1 dBµV	12,5 dBµV

Project:	66340REM.001
Company:	CARLO GAVAZZI CONTROLLS SPA
Sample:	S/01
Operation mode:	02
Graphical code:	CE0102L1
Description:	EUT ON. LORA ON. Equipment transferring data to an auxiliary laptop via RS485 and front USB. Power Supply (DUT):115 Vac, 60 Hz. Power supply (Laptop): 115 Vac, 60Hz. Phase wire noise.

Full Spectrum

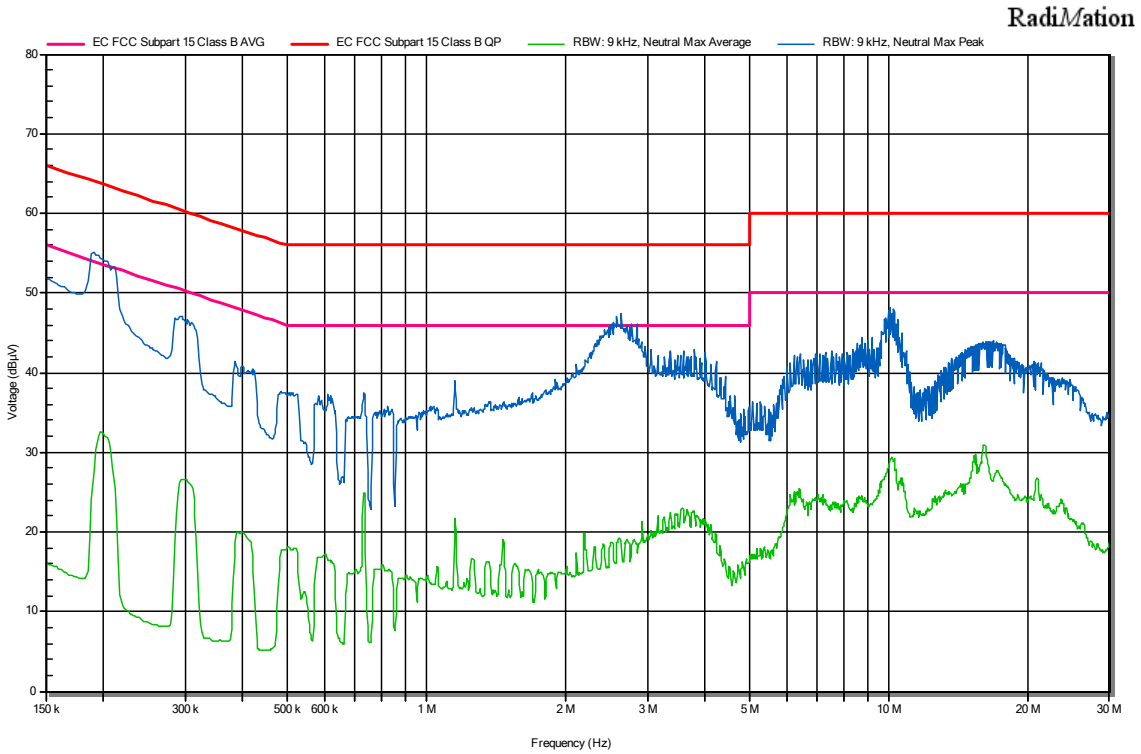


Final_Result

Frequency	Peak	Average
544,623 kHz	36,1 dBµV	19,5 dBµV
630,499 kHz	33 dBµV	13,7 dBµV
920,844 kHz	33,5 dBµV	14,3 dBµV
1,195 MHz	42,3 dBµV	12,3 dBµV
17,62 MHz	35,8 dBµV	6,5 dBµV
19,626 MHz	37,8 dBµV	11,7 dBµV
20,135 MHz	39,1 dBµV	12,6 dBµV
22,94 MHz	39 dBµV	10,9 dBµV
26,261 MHz	38,7 dBµV	11,5 dBµV
29,309 MHz	42,2 dBµV	13 dBµV

Project:	66340REM.001
Company:	CARLO GAVAZZI CONTROLLS SPA
Sample:	S/01
Operation mode:	OM#03
Description:	EUT ON. LORA OFF. Equipment transferring data to an auxiliary laptop via RS485 and front USB. Power Supply (DUT):115 Vac, 60 Hz. Neutral wire noise.

Full Spectrum

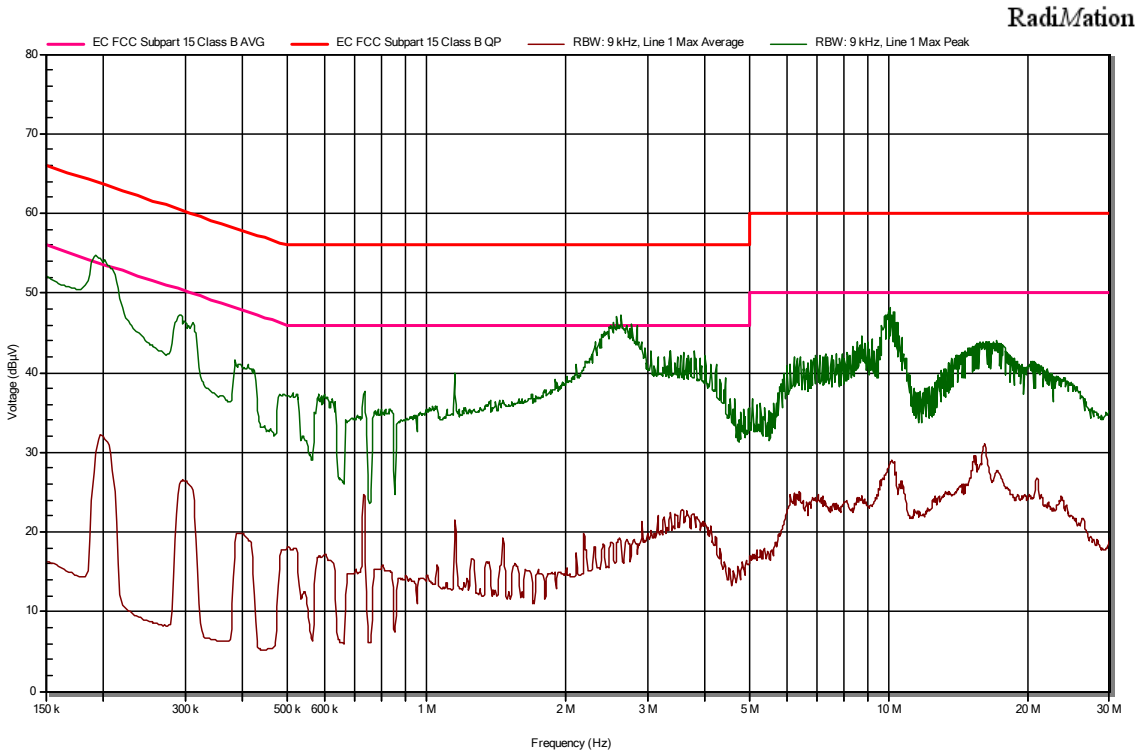


Final_Result

Frequency	Peak	Average
194,983 kHz	54,7 dBµV	32 dBµV
293,127 kHz	47 dBµV	26,5 dBµV
2,307 MHz	43,6 dBµV	18,1 dBµV
2,508 MHz	45,8 dBµV	18,8 dBµV
2,634 MHz	47,2 dBµV	18,6 dBµV
2,925 MHz	42,3 dBµV	21,4 dBµV
3,796 MHz	42,9 dBµV	21,5 dBµV
4,006 MHz	42,5 dBµV	20 dBµV
10,016 MHz	48,2 dBµV	25,8 dBµV
10,437 MHz	46,7 dBµV	25,8 dBµV

Project:	66340REM.001
Company:	CARLO GAVAZZI CONTROLLS SPA
Sample:	S/01
Operation mode:	OM#03
Description:	EUT ON. LORA OFF. Equipment transferring data to an auxiliary laptop via RS485 and front USB. Power Supply (DUT):115 Vac, 60 Hz. Phase wire noise

Full Spectrum

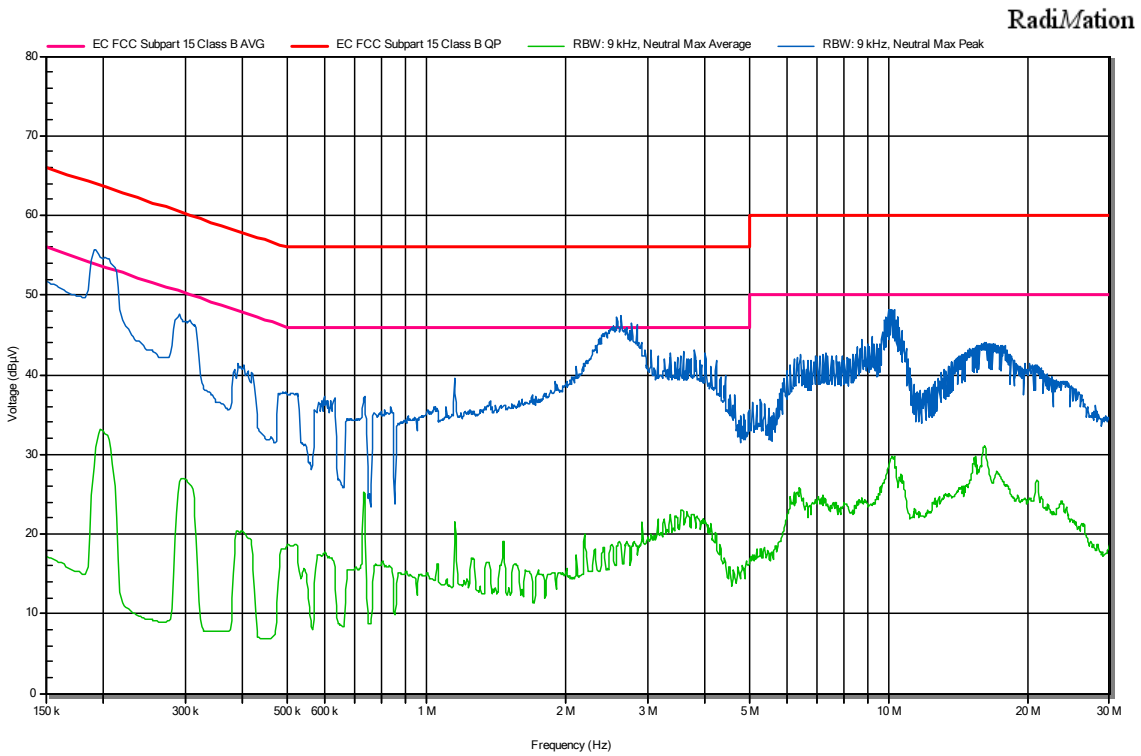


Final_Result

Frequency	Peak	Average
194,983 kHz	54,3 dBµV	31,6 dBµV
293,127 kHz	47,1 dBµV	26,4 dBµV
2,307 MHz	42,2 dBµV	18,1 dBµV
2,583 MHz	47 dBµV	18,6 dBµV
2,706 MHz	45,2 dBµV	18,9 dBµV
2,923 MHz	42,3 dBµV	21,3 dBµV
4,006 MHz	42,2 dBµV	19,6 dBµV
8,752 MHz	44,7 dBµV	23,4 dBµV
10,016 MHz	48,2 dBµV	25,6 dBµV
10,437 MHz	46,2 dBµV	25,2 dBµV

Project:	66340REM.001
Company:	CARLO GAVAZZI CONTROLLS SPA
Sample:	S/01
Operation mode:	OM#04
Description:	EUT ON. LORA ON. Equipment transferring data to an auxiliary laptop via RS485 and front USB. Power Supply (DUT):115 Vac, 60 Hz. Neutral wire noise

Full Spectrum

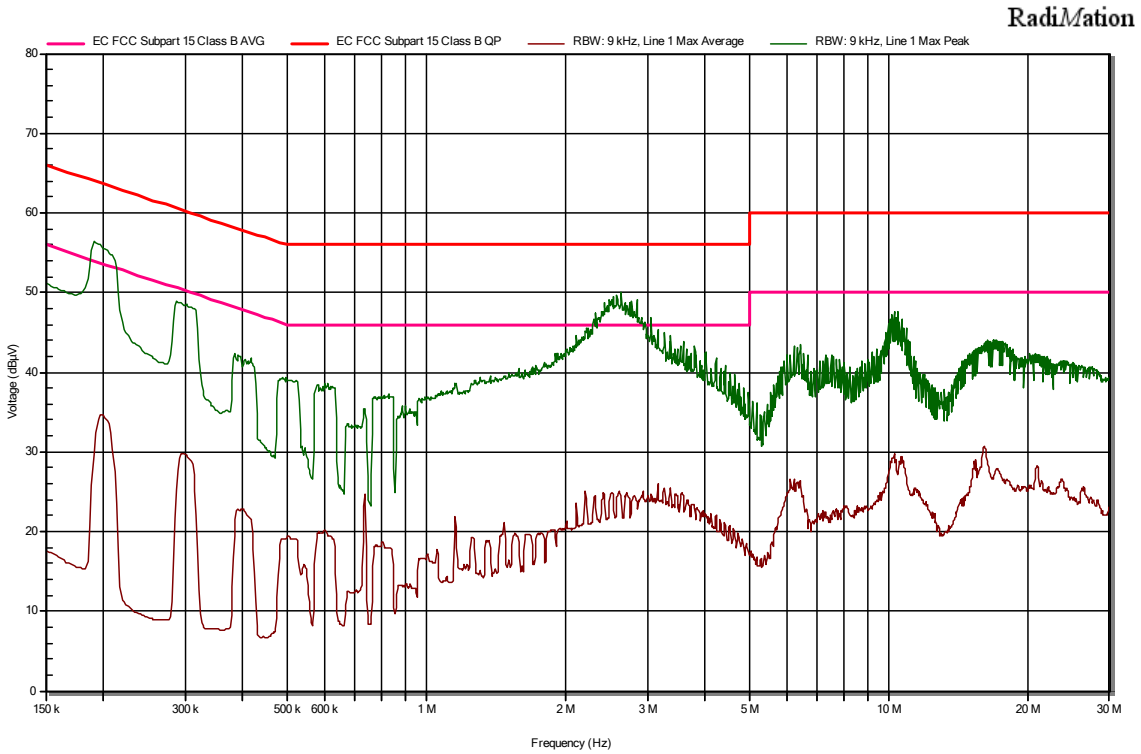


Final_Result

Frequency	Peak	Average
194,983 kHz	55,2 dBµV	32,6 dBµV
291,083 kHz	47,7 dBµV	26,5 dBµV
2,307 MHz	42 dBµV	18,1 dBµV
2,585 MHz	46,6 dBµV	18,5 dBµV
2,706 MHz	45,4 dBµV	19 dBµV
2,927 MHz	42,1 dBµV	21,5 dBµV
3,796 MHz	43,2 dBµV	21,8 dBµV
4,006 MHz	42,8 dBµV	20,2 dBµV
10,018 MHz	48,1 dBµV	26 dBµV
10,439 MHz	47,2 dBµV	26,4 dBµV

Project:	66340REM.001
Company:	CARLO GAVAZZI CONTROLLS SPA
Sample:	S/01
Operation mode:	OM#04
Description:	EUT ON. LORA ON . Equipment transferring data to an auxiliary laptop via RS485 and front USB. Power Supply (DUT):115 Vac, 60 Hz. Phase wire noise

Full Spectrum

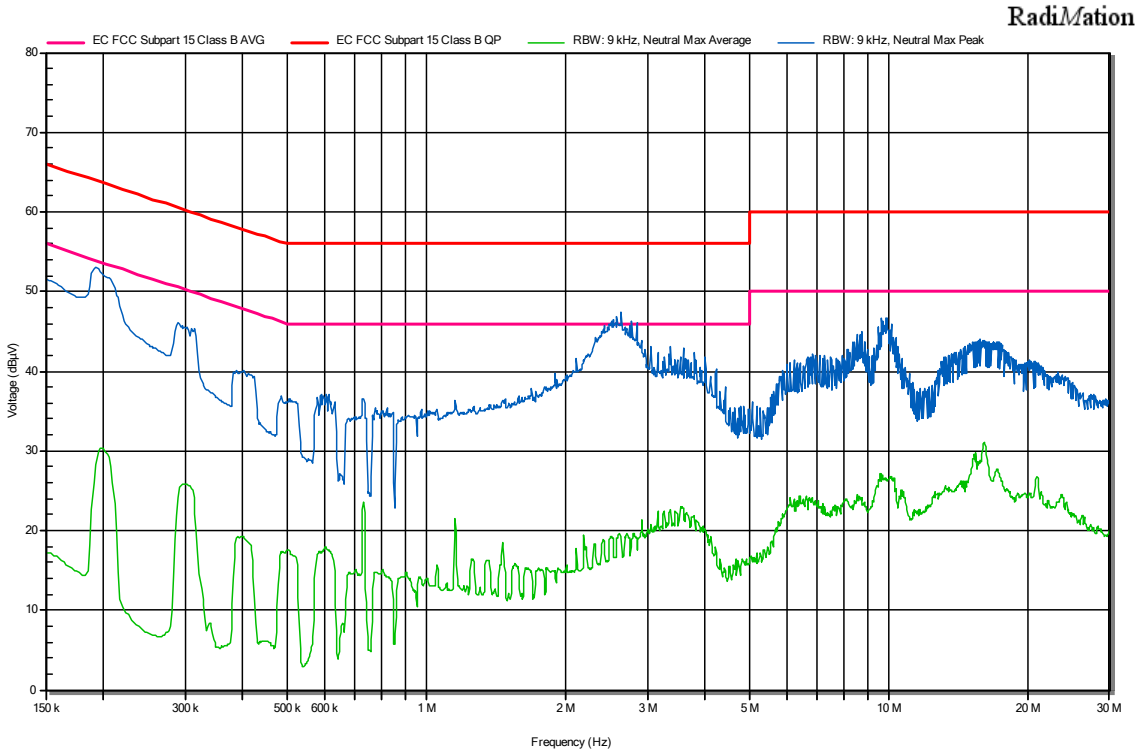


Final_Result

Frequency	Peak	Average
194,983 kHz	56,1 dBµV	34,1 dBµV
293,127 kHz	48,7 dBµV	29,7 dBµV
2,107 MHz	43,7 dBµV	23,6 dBµV
2,309 MHz	45,5 dBµV	24,5 dBµV
2,508 MHz	49,1 dBµV	24,9 dBµV
2,636 MHz	50 dBµV	24,2 dBµV
3,16 MHz	44,1 dBµV	26 dBµV
4,008 MHz	42,5 dBµV	20,8 dBµV
10,23 MHz	47,7 dBµV	29 dBµV
10,439 MHz	47,2 dBµV	27,3 dBµV

Project:	66340REM.001
Company:	CARLO GAVAZZI CONTROLLS SPA
Sample:	S/01
Operation mode:	OM#05
Description:	EUT ON. LORA OFF. Equipment transferring data to an auxiliary laptop via RS485 and front USB. Power Supply (DUT):24 Vdc. Power supply (Laptop): 115 Vac, 60Hz.Neutral wire noise

Full Spectrum

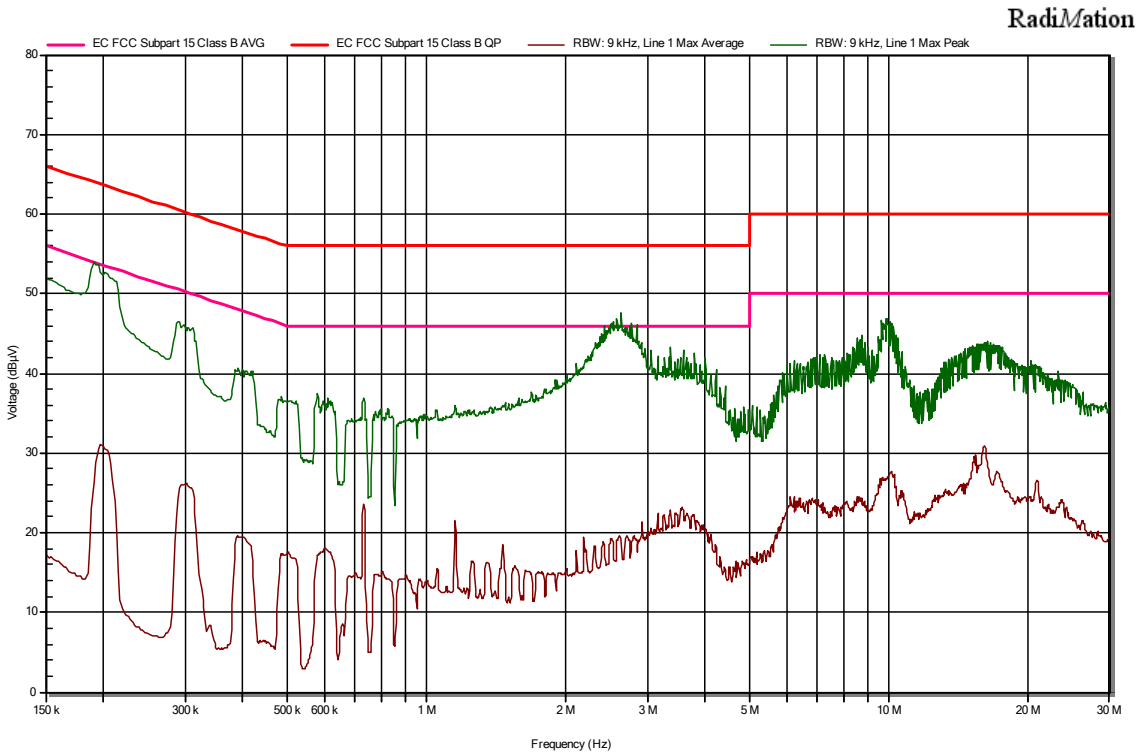


Final_Result

Frequency	Peak	Average
150 kHz	51,5 dBµV	17,3 dBµV
194,983 kHz	52,9 dBµV	29,9 dBµV
299,261 kHz	45,6 dBµV	25,9 dBµV
2,307 MHz	43,9 dBµV	18,3 dBµV
2,508 MHz	46 dBµV	19,3 dBµV
2,632 MHz	47 dBµV	19,2 dBµV
3,16 MHz	42,3 dBµV	22,1 dBµV
3,37 MHz	42,9 dBµV	22,5 dBµV
3,794 MHz	42,4 dBµV	20,8 dBµV
9,658 MHz	46,7 dBµV	26,6 dBµV

Project:	66340REM.001
Company:	CARLO GAVAZZI CONTROLLS SPA
Sample:	S/01
Operation mode:	OM#05
Description:	EUT ON. LORA OFF. Equipment transferring data to an auxiliary laptop via RS485 and front USB. Power Supply (DUT):24 Vdc. Power supply (Laptop): 115 Vac, 60Hz.Phase wire noise

Full Spectrum

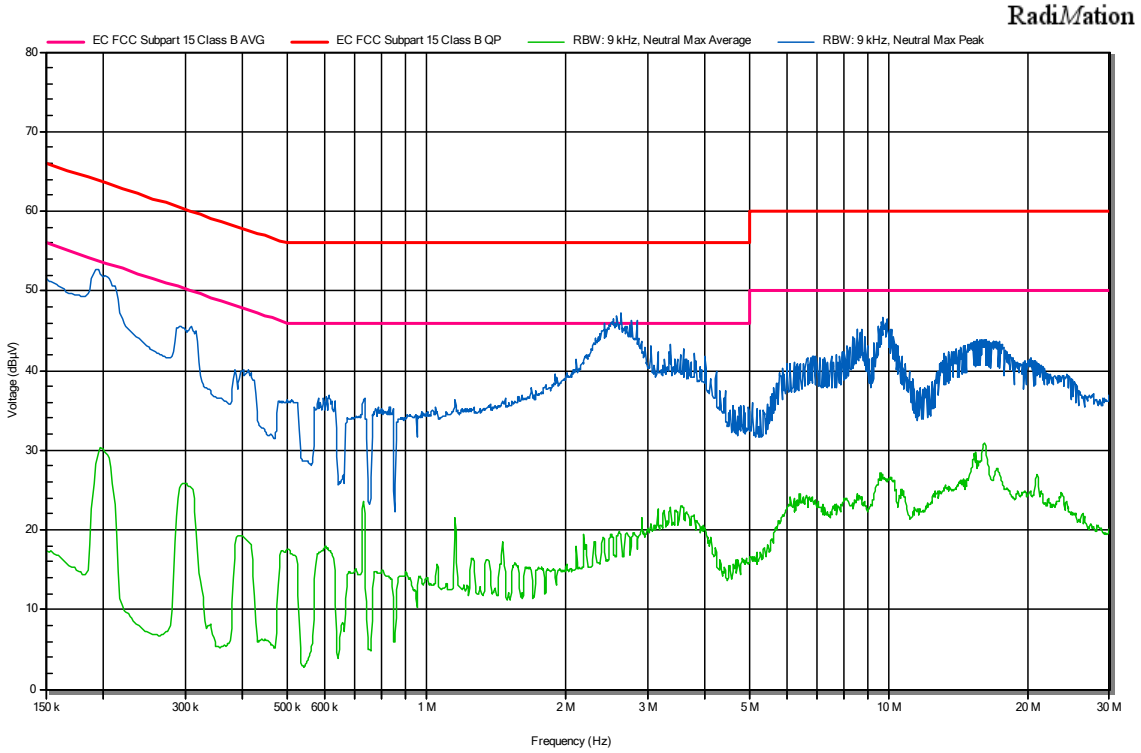


Final_Result

Frequency	Peak	Average
150 kHz	52 dBµV	17,1 dBµV
192,938 kHz	53,7 dBµV	28,8 dBµV
291,083 kHz	46,5 dBµV	25,6 dBµV
2,307 MHz	42,7 dBµV	18,2 dBµV
2,508 MHz	46,2 dBµV	19,2 dBµV
2,634 MHz	47,6 dBµV	19 dBµV
2,918 MHz	43 dBµV	21,3 dBµV
3,372 MHz	43,3 dBµV	22,2 dBµV
3,794 MHz	42,5 dBµV	21,4 dBµV
9,909 MHz	46,9 dBµV	26 dBµV

Project:	66340REM.001
Company:	CARLO GAVAZZI CONTROLLS SPA
Sample:	S/01
Operation mode:	OM#06
Description:	EUT ON. LORA ON. Equipment transferring data to an auxiliary laptop via RS485 and front USB. Power Supply (DUT):24 Vdc. Power supply (Laptop): 115 Vac, 60Hz. Neutral wire noise.

Full Spectrum

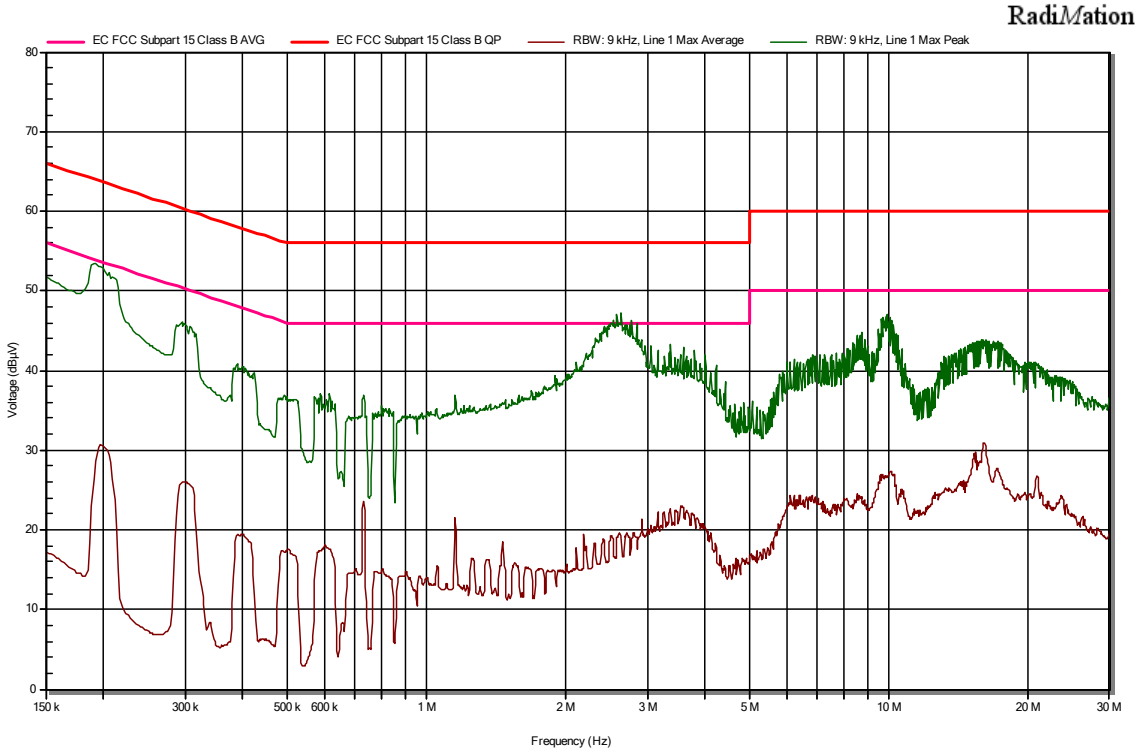


Final_Result

Frequency	Peak	Average
150 kHz	51,5 dBµV	17,4 dBµV
194,983 kHz	52,8 dBµV	29,7 dBµV
2,107 MHz	41,4 dBµV	17,9 dBµV
2,305 MHz	43,1 dBµV	18,5 dBµV
2,508 MHz	46,1 dBµV	19,4 dBµV
2,632 MHz	46,7 dBµV	19,3 dBµV
3,16 MHz	42 dBµV	22,2 dBµV
3,37 MHz	43,1 dBµV	22,5 dBµV
4,004 MHz	41,7 dBµV	18,6 dBµV
9,697 MHz	46,7 dBµV	26,2 dBµV

Project:	66340REM.001
Company:	CARLO GAVAZZI CONTROLLS SPA
Sample:	S/01
Operation mode:	OM#06
Description:	EUT ON. LORA ON. Equipment transferring data to an auxiliary laptop via RS485 and front USB. Power Supply (DUT):24 Vdc. Power supply (Laptop): 115 Vac, 60Hz.Phase wire noise

Full Spectrum



Final_Result

Frequency	Peak	Average
150 kHz	51,7 dBµV	17,1 dBµV
192,938 kHz	53,4 dBµV	28,7 dBµV
299,261 kHz	46 dBµV	26 dBµV
2,307 MHz	43,6 dBµV	18,3 dBµV
2,508 MHz	46 dBµV	19,3 dBµV
2,634 MHz	47,3 dBµV	19 dBµV
2,918 MHz	42,3 dBµV	21,4 dBµV
3,372 MHz	43,3 dBµV	22 dBµV
4,004 MHz	42 dBµV	18,9 dBµV
9,909 MHz	47 dBµV	25,7 dBµV