



TEST REPORT Nr. R19237901

Federal Communication Commission (FCC)

Report Reference No.	R19237901
Date of issue:	11.12.19
Total number pages:	53
Applicant's name	Caen RFID S.r.l.
Address	Via Vetraia, 11 – 55049 Viareggio (LU) – Italy
Test specification:	
Standards	FCC Rules & Regulations, Title 47:2018 Part 15 paragraph(s): 107 and 109
Non-standard test method	N/A
Test Report Form No.	15-107_15-109CMC
Test Report Form(s) Originator ..	CMC Centro Misure Compatibilità S.r.l.
Master TRF	2019-10
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 CMC Centro Misure Compatibilità S.r.l.	
Test item description	R4320P PROTON – Long range RAIN RFID reader
Trademark	Caen RFID
Manufacturer	Caen RFID S.r.l.
Model / Type reference	R4320P
FCC ID	UVECAENRFID028
Rating(s)	120 V ~ 60 Hz single-phase + earth EUT supplied from PoE
Report	
Tested by (name + signature)	M. Segalla
Approved by (name + signature)	R. Beghetto



1 Summary

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2 Reference standard	
FCC Rules and Regulation Title 47 part 15:2018	--
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	
CMC Centro Misure Compatibilità S.r.l. Via della Fisica, 20 – 36016 Thiene (VI) – Italy Test site facility's FCC registration number: 182474	



Testing and sampling:	
Date of receipt of test item	21.10.19
Testing start date	14.11.19
Testing end date	27.11.19
Sampling procedure.....	Equipment used for testing was picked up by the manufacturer, at the end of the production process with random criterion. The results relate to the sample as it has been received.
General remarks:	
This report shall not be reproduced, except in full, without the written approval of CMC. 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	R4320P PROTON – Long range RAIN RFID reader					
Model Number	R4320P					
FCC ID	UVECAENRFID028					
Serial Number	WR4320PXAAAA					
Brand name	Caen RFID					
Type of device	TV Broadcast Receiver	☐				
	FM Broadcast Receiver	☐				
	CB Receiver	☐				
	Superregenerative Receiver	☐				
	Scanning Receiver	☐				
	Radar Detector	☐				
	All other receivers subject to Part 15	☐				
	TV Interface Device	☐				
	Cable System Terminal Device	☐				
	Stand-alone Cable input selector switch	☐				
	Class B personal computers and peripherals	☐				
	CPU boards and internal power supplies used with Class B personal computers	☐				
	Class B personal computers assembled using authorized CPU boards or power supplies	☐				
	Class B external switching power supplies	☐				
	Other Class B digital devices & peripherals	☒				
	Class A digital devices, peripherals & external switching power supplies	☐				
	Access Broadband over Power Line (Access BPL)	☐				
	All other devices	☐				
Ports.....	Port name and description	Cable				
		Specified length [m]	Attached during test	Shielded		
	Ethernet cable	< 30	☒	☒		
	Antenna cable	5	☒	☒		
Rated power supply	Voltage and Frequency	Reference poles				
		N	L1	L2	L3	PE
	☒ AC: 120 V, 60 Hz	☒	☒	☐	☐	☒
	☐ AC:	☐	☐	☐	☐	☐
	☒ DC: EUT supplied from PoE	☐				
Software version	1.0.0					



Mounting position..... :	☒	Table top equipment	
	☐	Wall/Ceiling mounted equipment	
	☐	Floor standing equipment	
	☐	Hand-held equipment	
	☐	Other:	
Operating modes :	No.	Operating mode of test item	
	1	Ethernet communication with auxiliary notebook	
Accessories (not part of the test item) :	Accessory	Type	Manufacturer
	PoE switch	DES-1008PA	D-Link
	Notebook	Inspiron 15	Dell



6.1 Photos of the test item

EUT supplied from 120 V ~ 60 Hz





EUT supplied from PoE







7 Verdict summary section

FCC Rules & Regulations, Title 47:2018 Part 15 paragraph(s): 107 and 109				
Clause	Requirement – Test case	Basic standard	Test sequence	Verdict
Part 15.107 Class B	Conducted emission	ANSI C63.4	2	P
Part 15.109 Class B	Radiated emission	ANSI C63.4	1	P



Normative references	
Reference no.	Description
FCC Rules and Regulation Title 47 part 15:2018	--
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





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 Emission

9.1 Conducted emission

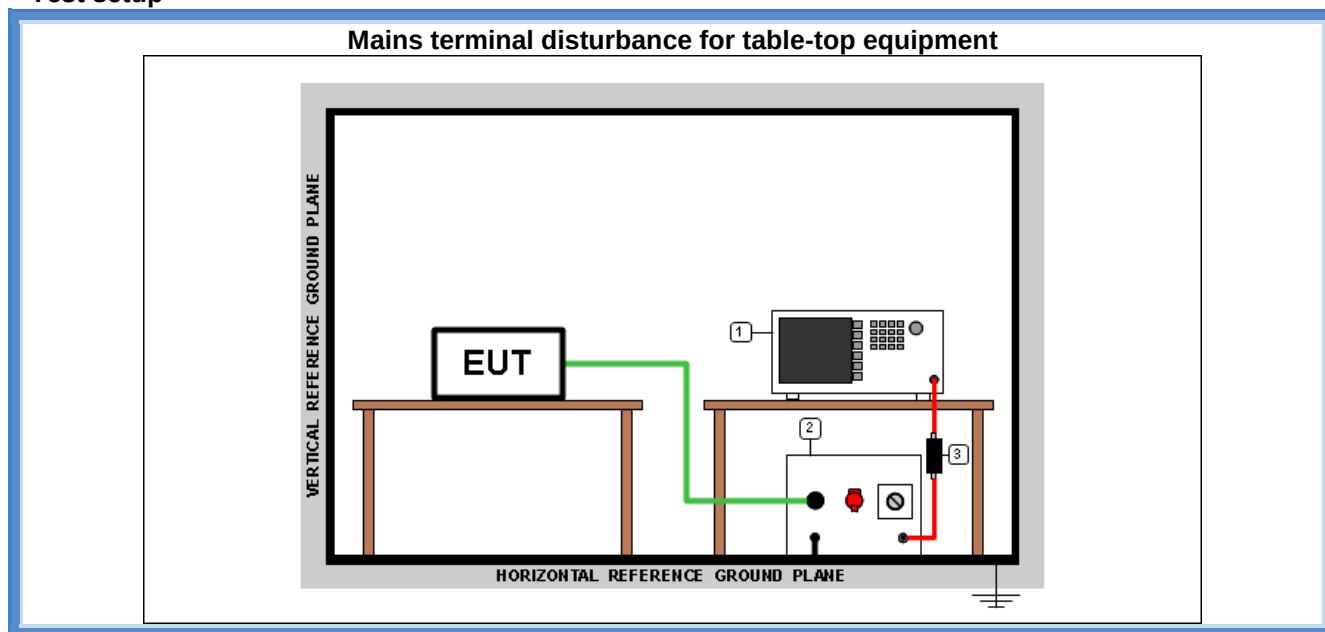
Tested by	M. Segalla	
Test date	27.11.19	
Test location (stand)	Shielded chamber (CMC A001)	
Reference standards	FCC Rules and Regulation; Titles 47 Part. 15.107 ANSI C63.4 cl. 7	
Test set-up description	☒	Table top equipment set-up (80 cm above the reference ground plane)
	☐	Floor standing equipment 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

Limits for class A equipment		
Frequency range (MHz)	$\text{dB}(\mu\text{V})$ Quasi-peak	$\text{dB}(\mu\text{V})$ Average
0,15 to 0,50	79	66
0,5 to 5	73	60
5 to 30	73	60

Limits for class B equipment		
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

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

Line	Frequency Range (MHz)	Graphs	Remarks	Result
N	0,15 – 30	G19237918	EUT supplied from 120 V ~ 60 Hz	P
L1	0,15 – 30	G19237919	EUT supplied from 120 V ~ 60 Hz	P
L1	0,15 – 30	G19237920	EUT supplied from PoE	P
N	0,15 – 30	G19237921	EUT supplied from PoE	P

Remarks: tests with EUT supplied from PoE have been performed on 120 Vac side of PoE switch

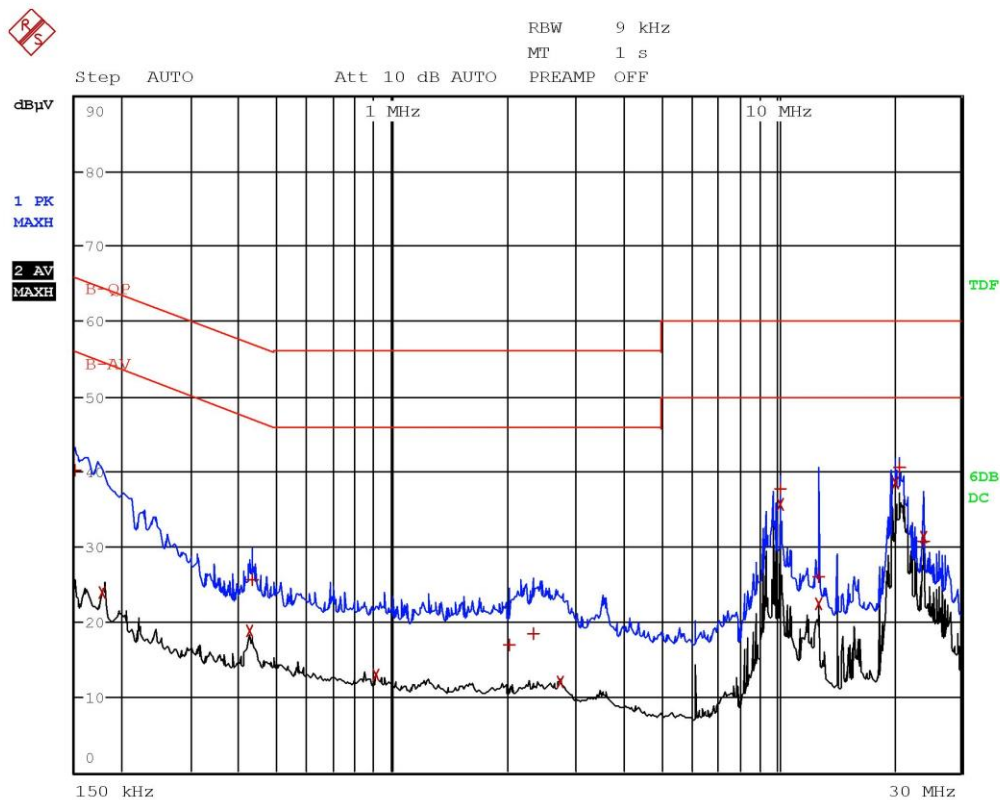
Graphs Legend

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

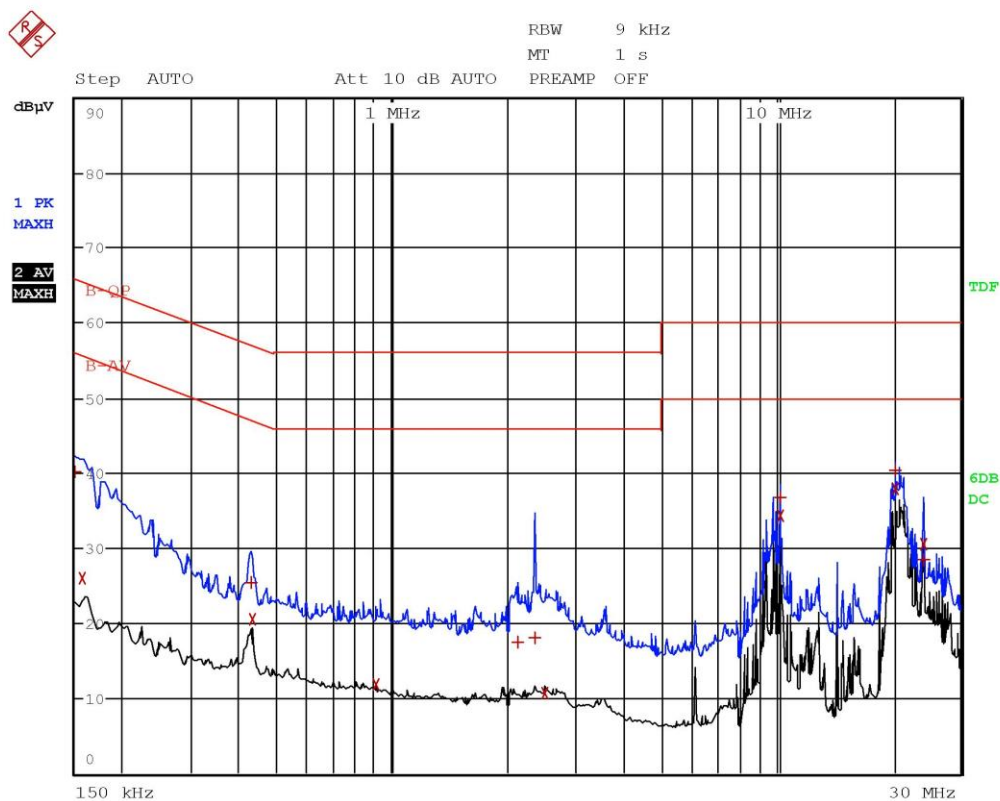


Segalla 19237918-Line N(120V-60Hz)



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	B-QP		
Trace2:	B-AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
1 Quasi Peak	150 kHz	40.23	-25.76
2 Average	178 kHz	23.90	-30.66
2 Average	422 kHz	18.78	-28.62
1 Quasi Peak	430 kHz	25.66	-31.58
2 Average	906 kHz	13.04	-32.95
1 Quasi Peak	2.006 MHz	16.84	-39.15
1 Quasi Peak	2.334 MHz	18.38	-37.61
2 Average	2.73 MHz	12.08	-33.91
1 Quasi Peak	10.238 MHz	37.77	-22.22
2 Average	10.238 MHz	35.66	-14.33
2 Average	12.878 MHz	22.41	-27.58
1 Quasi Peak	12.88 MHz	25.97	-34.02
2 Average	20.366 MHz	38.39	-11.60
1 Quasi Peak	20.806 MHz	40.48	-19.51
1 Quasi Peak	24 MHz	30.64	-29.35
2 Average	24.11 MHz	31.33	-18.66

Segalla 19237918-Line N(120V-60Hz)

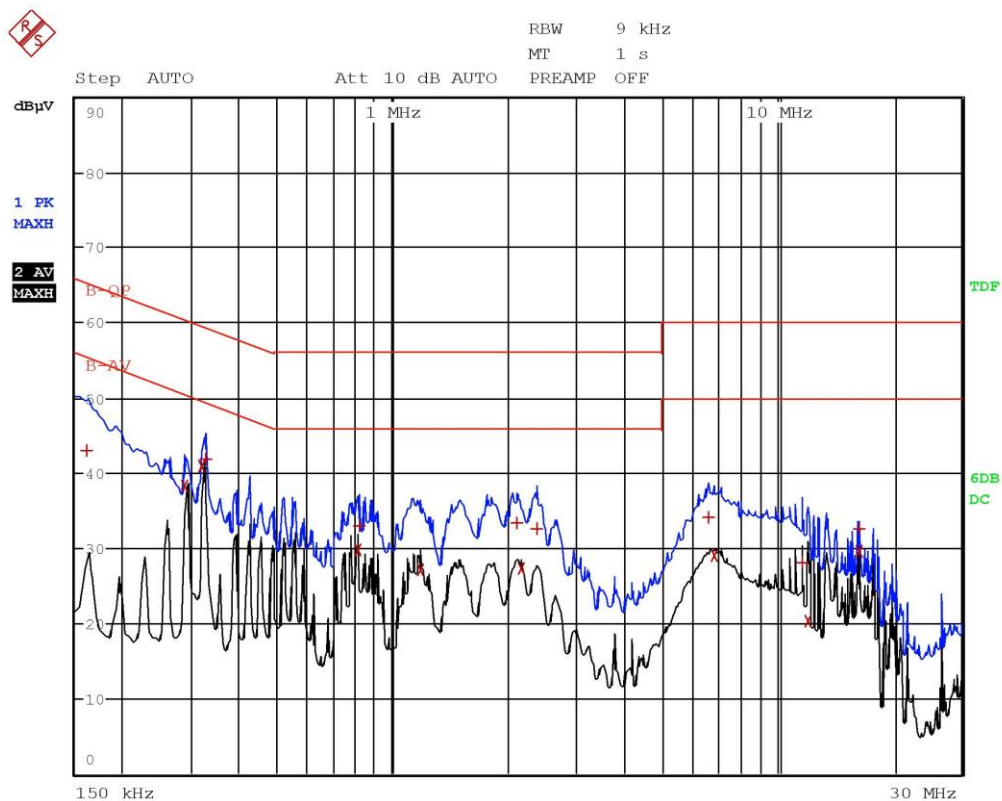


Segalla 19237919-Line L(120V-60Hz)



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	B-QP		
Trace2:	B-AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
1 Quasi Peak	150 kHz	40.16	-25.83
2 Average	158 kHz	26.07	-29.49
1 Quasi Peak	426 kHz	25.43	-31.89
2 Average	430 kHz	20.50	-26.75
2 Average	906 kHz	11.77	-34.23
1 Quasi Peak	2.11 MHz	17.54	-38.45
1 Quasi Peak	2.338 MHz	17.96	-38.03
2 Average	2.498 MHz	10.75	-35.24
1 Quasi Peak	10.238 MHz	36.82	-23.17
2 Average	10.242 MHz	34.27	-15.72
1 Quasi Peak	20.258 MHz	40.39	-19.60
2 Average	20.366 MHz	37.85	-12.14
1 Quasi Peak	24.05 MHz	28.43	-31.57
2 Average	24.11 MHz	30.57	-19.42

Segalla 19237919-Line L(120V-60Hz)

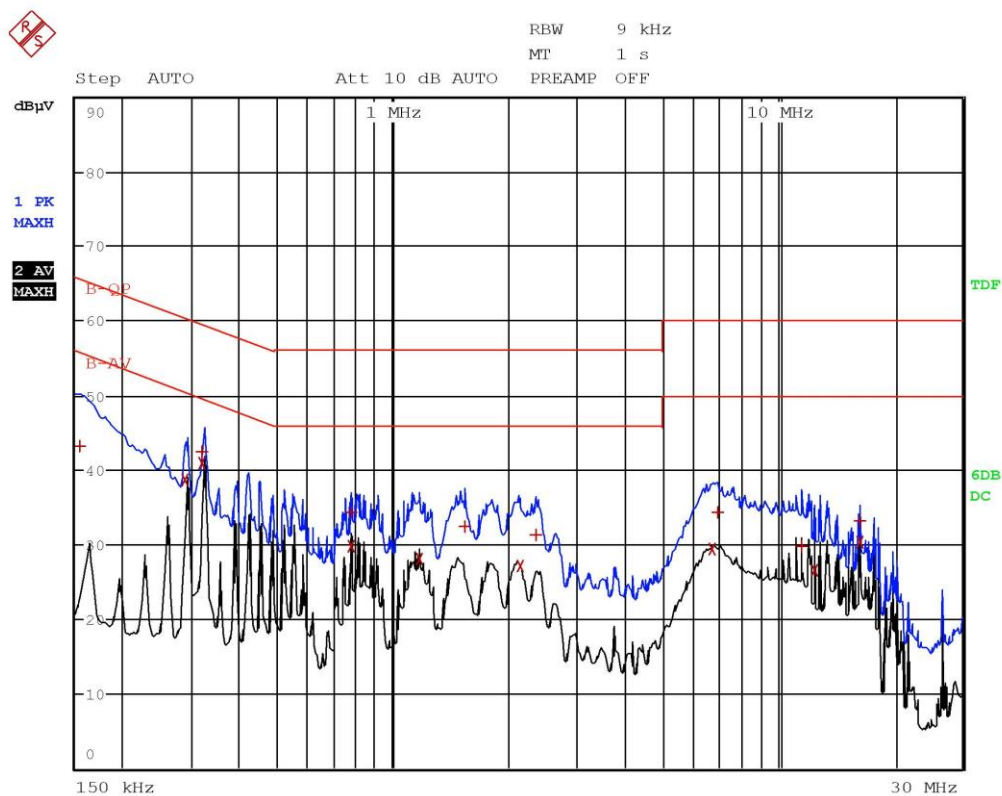


Segalla 19237920-Line L(120V-60Hz)-POE



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	B-QP		
Trace2:	B-AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
1 Quasi Peak	162 kHz	43.01	-22.34
2 Average	290 kHz	38.37	-12.14
2 Average	322 kHz	40.97	-8.67
1 Quasi Peak	326 kHz	41.87	-17.67
2 Average	810 kHz	29.86	-16.13
1 Quasi Peak	818 kHz	32.91	-23.08
2 Average	1.174 MHz	27.18	-18.81
1 Quasi Peak	2.102 MHz	33.33	-22.66
2 Average	2.15 MHz	27.24	-18.75
1 Quasi Peak	2.37 MHz	32.69	-23.30
1 Quasi Peak	6.618 MHz	34.15	-25.84
2 Average	6.838 MHz	29.11	-20.88
1 Quasi Peak	11.55 MHz	28.01	-31.98
2 Average	11.974 MHz	20.41	-29.58
1 Quasi Peak	16.23 MHz	32.61	-27.38
2 Average	16.23 MHz	29.56	-20.43

Segalla 19237920-Line L(120V-60Hz)-POE



Segalla 19237921-Line N(120V-60Hz)-POE



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	B-QP		
Trace2:	B-AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
1 Quasi Peak	154 kHz	43.23	-22.54
2 Average	290 kHz	38.59	-11.93
1 Quasi Peak	322 kHz	42.53	-17.12
2 Average	322 kHz	40.90	-8.75
1 Quasi Peak	774 kHz	34.37	-21.62
2 Average	774 kHz	29.72	-16.28
2 Average	1.17 MHz	28.01	-17.98
1 Quasi Peak	1.53 MHz	32.50	-23.49
2 Average	2.13 MHz	27.14	-18.86
1 Quasi Peak	2.35 MHz	31.22	-24.77
2 Average	6.754 MHz	29.32	-20.67
1 Quasi Peak	6.95 MHz	34.23	-25.76
1 Quasi Peak	11.534 MHz	29.82	-30.18
2 Average	12.386 MHz	26.56	-23.43
2 Average	16.226 MHz	30.40	-19.59
1 Quasi Peak	16.23 MHz	33.21	-26.78

Segalla 19237921-Line N(120V-60Hz)-POE



9.2 Radiated emission

Tested by	M. Segalla	
Test date	14.11.19	
Test location (stand)	Semi-anechoic chamber (CMC A070)	
Reference standards	FCC Rules and Regulation; Titles 47 Part. 15.109 ANSI C63.4 cl. 8	
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
Supplementary information.....	--	

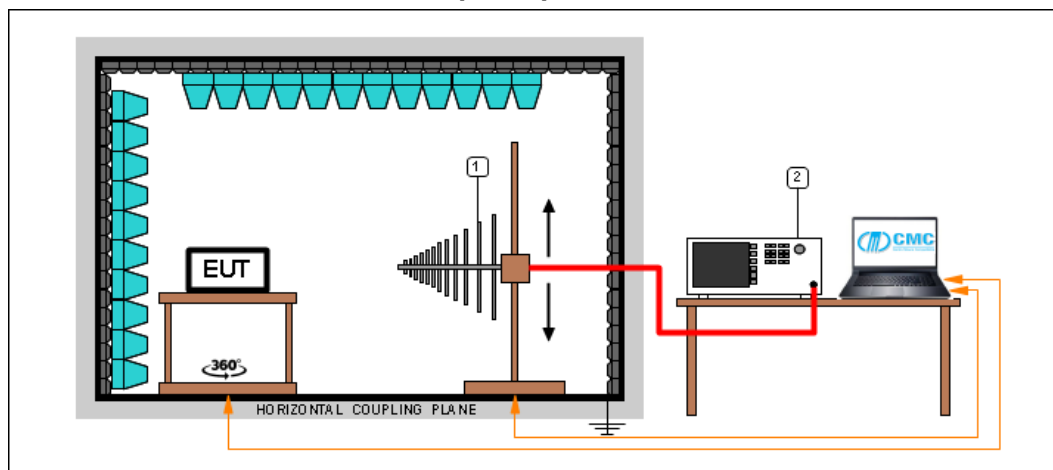
Acceptance limits

Class A radiated limits		
Frequency range (MHz)	Limits [dB(μV/m)]	Measurement distance (m)
30 to 88	39,08	10
88 to 216	43,52	10
216 to 960	46,44	10
Above 960	49,54	10

Class B radiated limits		
Frequency range (MHz)	Limits [dB(μV/m)]	Measurement distance (m)
30 to 88	40	3
88 to 216	43,52	3
216 to 960	46,02	3
Above 960	53,98	3

Test setup

Frequency ≤ 1 GHz



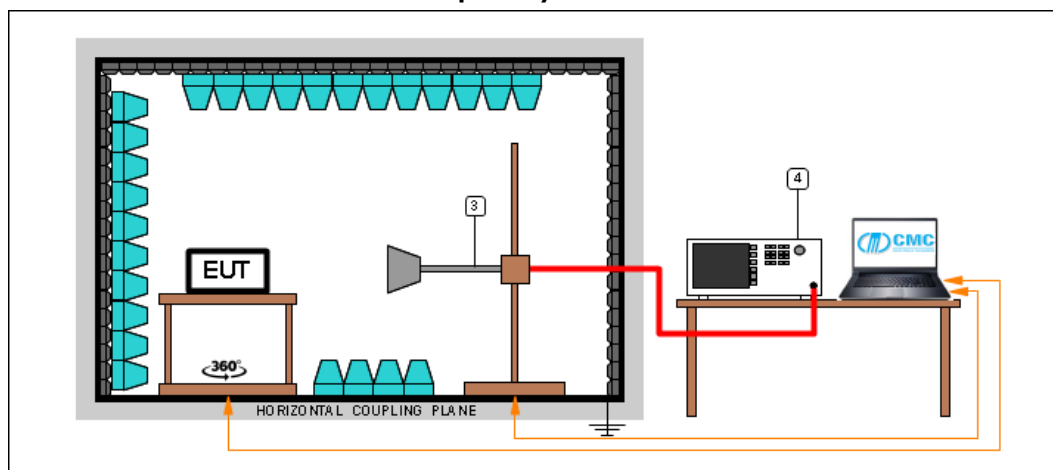
Test setup PE004_02

Nr.	Id. Number	Manufacturer	Model	Description
2	CMC S164	Rohde & Schwarz	ESU26	Receiver 20 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 S164	Rohde & Schwarz	ESU26	Receiver 20 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
2	CMC S164	Rohde & Schwarz	ESU26	Receiver 20 Hz - 26.5 GHz
1	CMC S108	Emco	3115	Waveguide antenna



Result

Polarization	Frequency Range (MHz)	Graphs	Remarks	Result
V	30 – 300	G19237906	EUT supplied from 120 V ~ 60 Hz	P
H	30 – 300	G19237907	EUT supplied from 120 V ~ 60 Hz	P
H	300 – 1000	G19237908	EUT supplied from 120 V ~ 60 Hz	P
V	300 – 1000	G19237909	EUT supplied from 120 V ~ 60 Hz	P
H	1000 – 6000	G19237910	EUT supplied from 120 V ~ 60 Hz	P
V	1000 – 6000	G19237911	EUT supplied from 120 V ~ 60 Hz	P
V	1000 – 6000	G19237912	EUT supplied from PoE	P
H	1000 – 6000	G19237913	EUT supplied from PoE	P
V	30 – 300	G19237914	EUT supplied from PoE	P
H	30 – 300	G19237915	EUT supplied from PoE	P
H	300 – 1000	G19237916	EUT supplied from PoE	P
V	300 – 1000	G19237917	EUT supplied from PoE	P

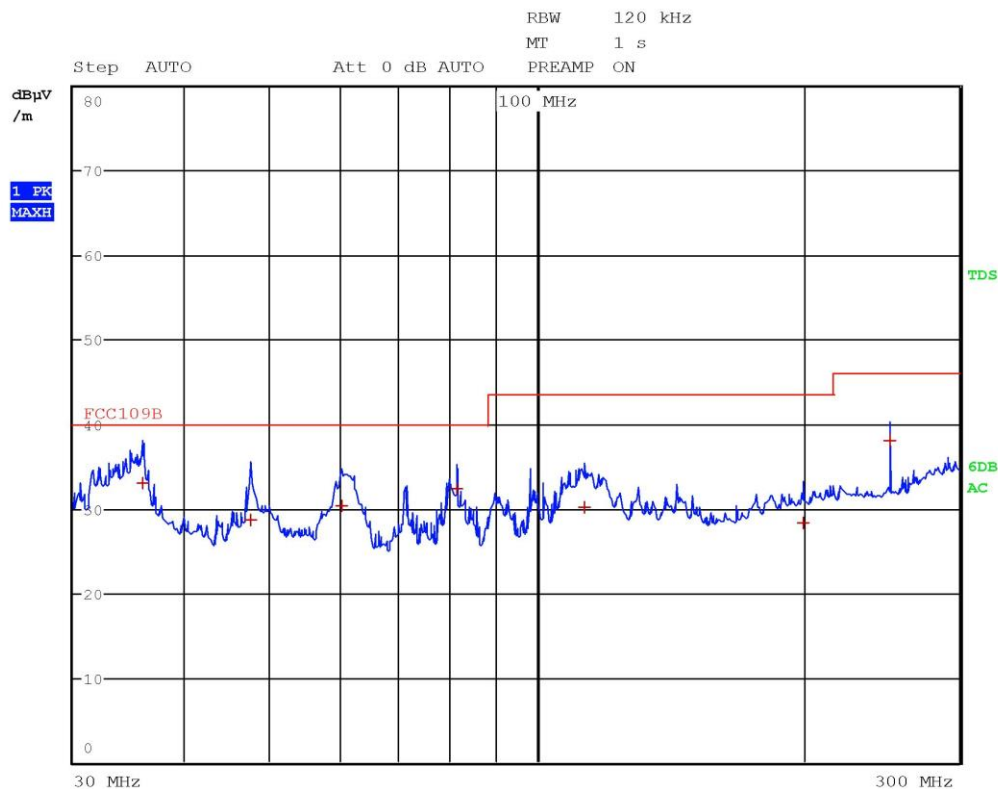
Graphs Legend

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 19237906 - 120V 60Hz