



TEST REPORT Nr. R20020701

Federal Communication Commission (FCC)

Report Reference No.	R20020701
Date of issue:	05.03.2020
Total number pages:	54
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	2020-03
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	R4321P Quattro - Smart 4-port Long Range RAIN RFID reader
Trademark	Caen RFID
Manufacturer	Caen RFID S.r.l.
Model / Type reference	R4321P
FCC ID	UVECAENRFID030
Rating(s)	120 V ~ 60 Hz single-phase 48 Vdc from PoE
Report	
Tested by (name + signature)	M. Segalla
Approved by (name + signature)	R. Beghetto



1 Summary

1	Summary.....	2
2	Reference standard	3
3	List of attachments.....	3
4	Deviation(s) from test specification.....	3
5	Testing location.....	3
6	General description of test item(s).....	5
6.1	Photos of the test item	7
7	Verdict summary section	11
8	Test conditions	13
8.1	General	13
9	Emission	14
9.1	Conducted emission	14
9.2	Radiated emission	24



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 Attachment 2: Components list	
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	

Revision index	Date	Change history
1.0	05.03.2020	--



Testing and sampling:	
Date of receipt of test item	23.01.2020
Testing start date	04.03.2020
Testing end date	04.03.2020
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.
Internal identification	Adhesive label with the product number P200112
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	R4321P Quattro - Smart 4-port Long Range RAIN RFID reader					
Model Number	R4321P					
FCC ID	UVECAENRFID030					
Serial Number	0001000125190001					
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		
	USB cable	< 3	☒	☐		
	PoE Ethernet cable	< 10	☒	☒		
	Antenna cable	< 10	☒	☐		
Rated power supply	Voltage and Frequency	Reference poles				
		N	L1	L2	L3	PE
	☒ AC: 120 V, 60 Hz	☒	☒	☐	☐	☐
	☐ AC:	☐	☐	☐	☐	☐
	☒ DC: 48 V from PoE	☐				



Emission class	Class B		
Software version	1.0.0		
Mounting position.....	☐	Table top equipment	
	☐	Wall/Ceiling mounted equipment	
	☒	Floor standing equipment	
	☐	Hand-held equipment	
	☐	Other:	
Components list	Attachment 2 Components list is provided by the manufacturer, CMC Centro Misure Compatibilità S.r.l. is not responsible for the contents of the component list and any other document sent by the manufacturer.		
Operating modes	No.	Operating mode of test item	
	1	EUT supplied from 120 Vac, USB communication with auxiliary PC	
	2	EUT supplied from PoE, Ethernet link with auxiliary PC	
Accessories (not part of the test item)	Accessory	Type	Manufacturer
	PoE switch	DES-1008PA	D-link
	Notebook	ASPIRE 3 - N19C1	ACER



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	Conducted emission	ANSI C63.4	2	P
Part 15.109	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

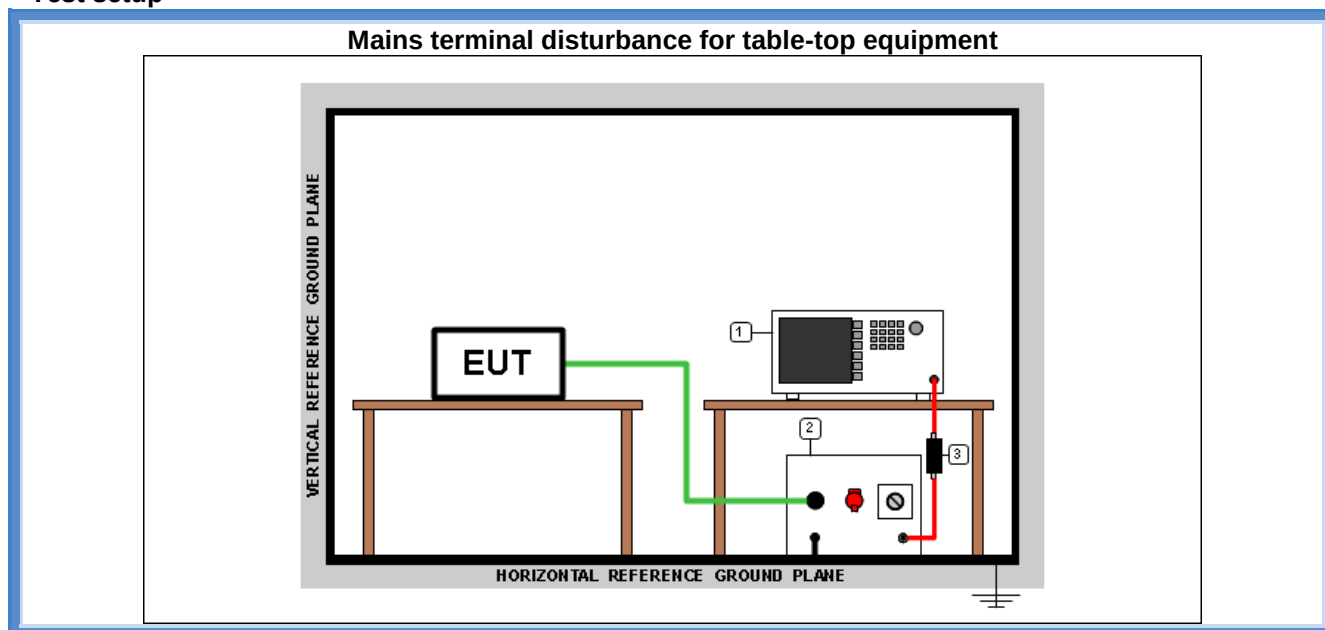
Tested by	M. Segalla	
Test date	04.03.2020	
Test location (stand)	Shielded chamber (CMC A001)	
Reference standards	FCC Rules and Regulation; Titles 47 Part. 15.107 ANSI C63.4 cl. 7	
Test set-up description	☒	Table top equipment set-up (80 cm above the reference ground plane)
	☐	Floor standing equipment 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	G20020713	EUT supplied from 120 V ~ 60 Hz	P
L1	0,15 – 30	G20020714	EUT supplied from 120 V ~ 60 Hz	P
L1	0,15 – 30	G20020715	EUT supplied from PoE	P
N	0,15 – 30	G20020716	EUT supplied from PoE	P

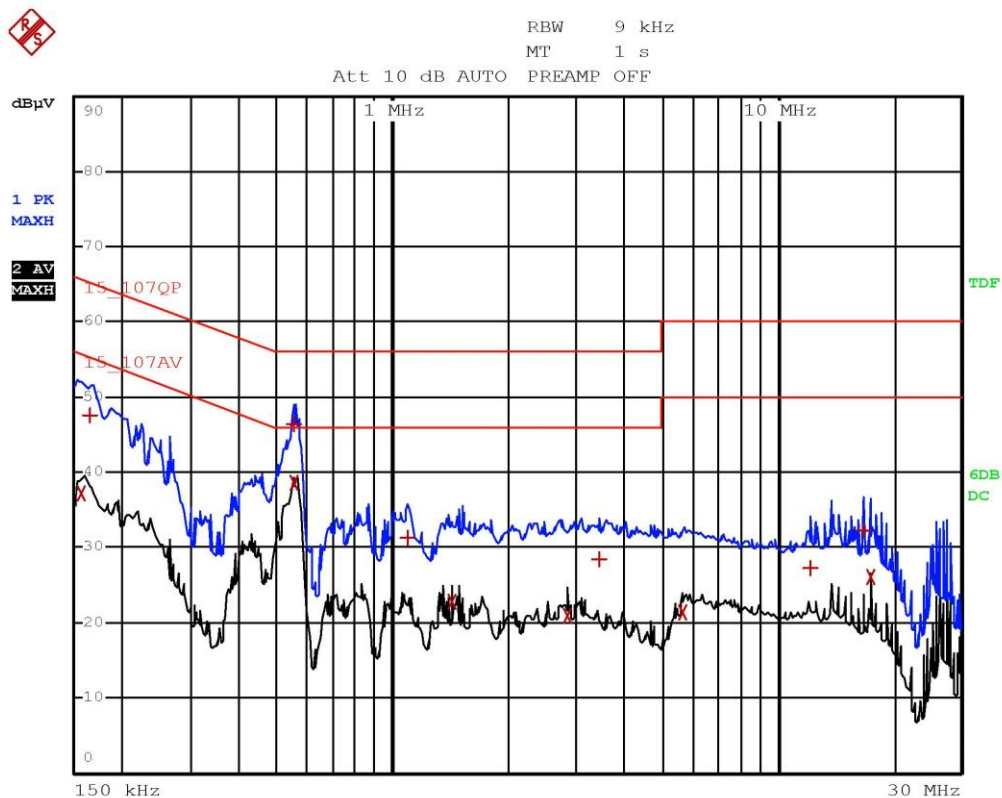
Graphs Legend

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

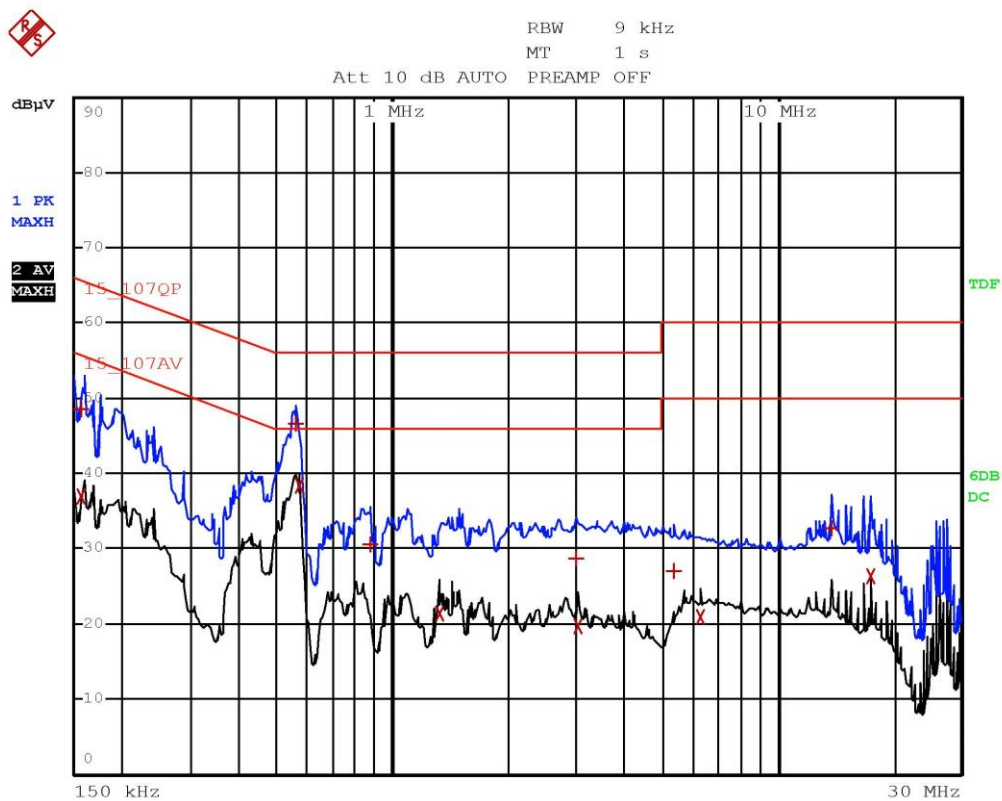


Segalla 20020713-Line N-AC/DC supply + USB link



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	15_107QP		
Trace2:	15_107AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
2 Average	158 kHz	37.16	-18.40
1 Quasi Peak	166 kHz	47.68	-17.47
1 Quasi Peak	554 kHz	46.53	-9.46
2 Average	554 kHz	38.70	-7.29
1 Quasi Peak	1.098 MHz	31.27	-24.73
2 Average	1.422 MHz	22.89	-23.10
2 Average	2.862 MHz	20.86	-25.13
1 Quasi Peak	3.438 MHz	28.40	-27.59
2 Average	5.702 MHz	21.41	-28.58
1 Quasi Peak	12.206 MHz	27.19	-32.80
1 Quasi Peak	16.798 MHz	32.35	-27.64
2 Average	17.398 MHz	26.01	-23.98

Segalla 20020713-Line N-AC/DC supply + USB link

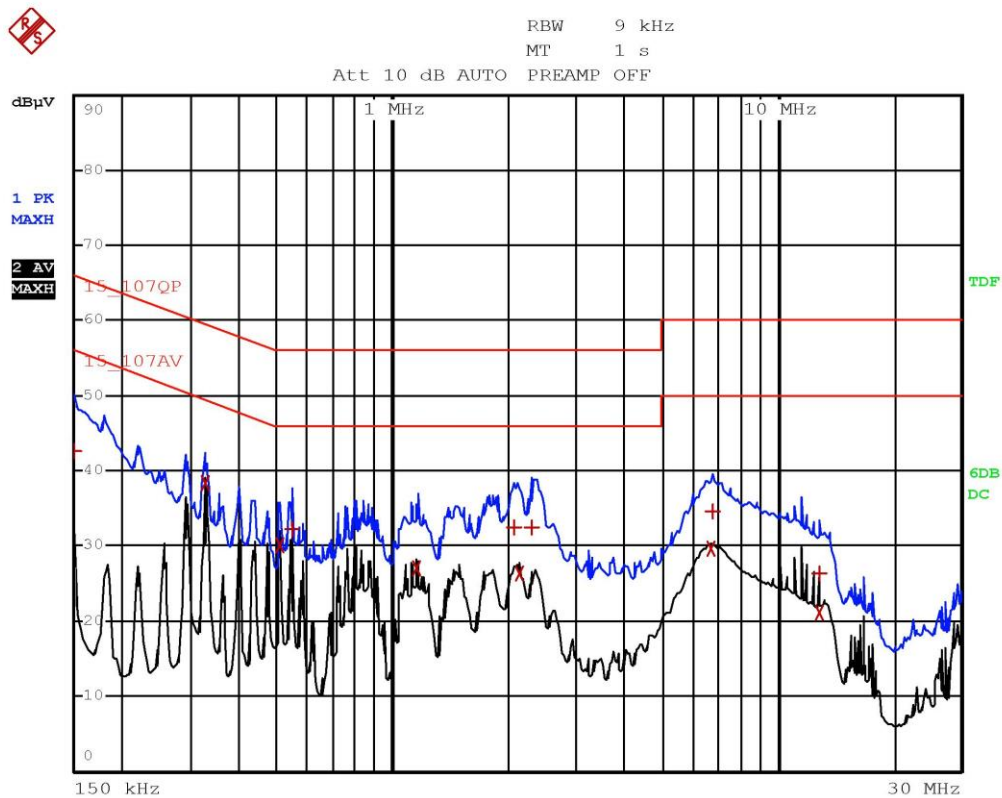


Segalla 20020714-Line L-AC/DC supply + USB link



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	15_107QP		
Trace2:	15_107AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
1 Quasi Peak	158 kHz	48.43	-17.13
2 Average	158 kHz	37.06	-18.50
1 Quasi Peak	562 kHz	46.53	-9.46
2 Average	570 kHz	38.38	-7.61
1 Quasi Peak	878 kHz	30.58	-25.41
2 Average	1.322 MHz	21.41	-24.58
1 Quasi Peak	3.002 MHz	28.74	-27.25
2 Average	3.026 MHz	19.80	-26.19
1 Quasi Peak	5.406 MHz	26.93	-33.06
2 Average	6.342 MHz	20.97	-29.02
1 Quasi Peak	13.802 MHz	32.64	-27.35
2 Average	17.402 MHz	26.29	-23.71

Segalla 20020714-Line L-AC/DC supply + USB link

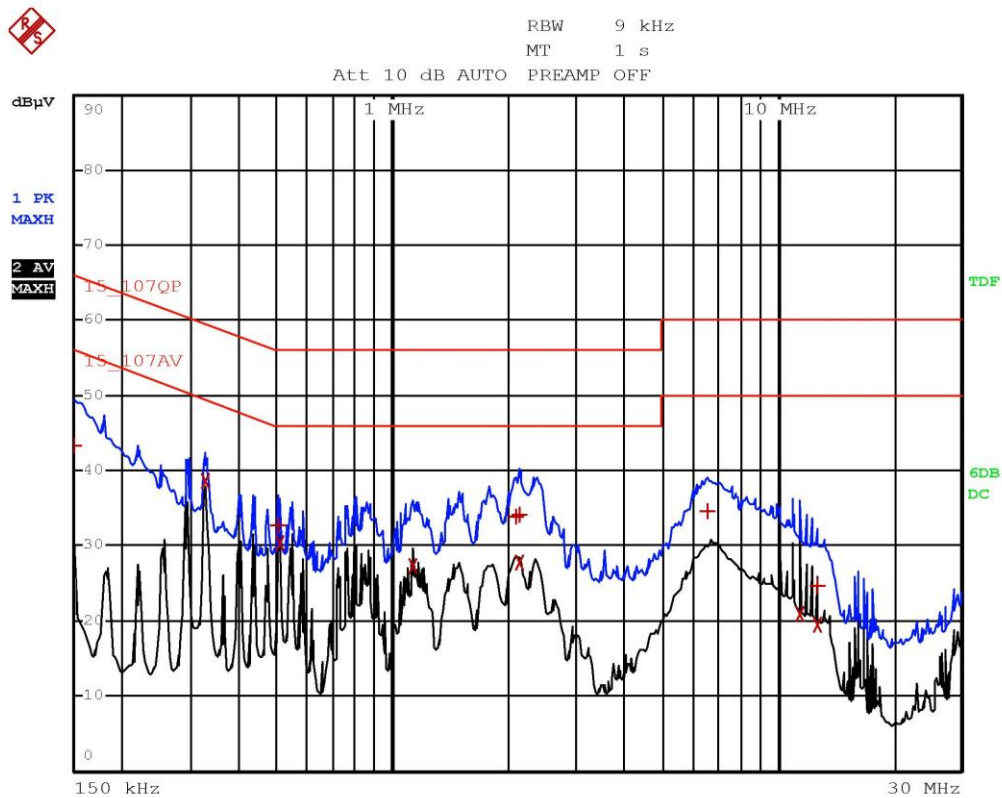


Segalla 20020715-Line L-POE supply + ETH link



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	15_107QP		
Trace2:	15_107AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
1 Quasi Peak	150 kHz	42.70	-23.29
2 Average	326 kHz	38.45	-11.09
2 Average	510 kHz	30.15	-15.84
1 Quasi Peak	550 kHz	32.26	-23.73
2 Average	1.158 MHz	26.94	-19.06
1 Quasi Peak	2.066 MHz	32.59	-23.40
2 Average	2.146 MHz	26.31	-19.68
1 Quasi Peak	2.314 MHz	32.59	-23.40
2 Average	6.706 MHz	29.70	-20.29
1 Quasi Peak	6.822 MHz	34.69	-25.31
1 Quasi Peak	12.83 MHz	26.35	-33.64
2 Average	12.83 MHz	21.14	-28.85

Segalla 20020715-Line L-POE supply + ETH link



Segalla 20020716-Line N-POE supply + ETH link



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	15_107QP		
Trace2:	15_107AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dB μ V	DELTA LIMIT dB
1 Quasi Peak	150 kHz	43.42	-22.57
2 Average	326 kHz	38.67	-10.88
1 Quasi Peak	506 kHz	32.64	-23.35
2 Average	510 kHz	30.27	-15.72
2 Average	1.126 MHz	27.28	-18.71
1 Quasi Peak	2.086 MHz	33.96	-22.03
1 Quasi Peak	2.134 MHz	34.10	-21.89
2 Average	2.138 MHz	27.73	-18.26
1 Quasi Peak	6.582 MHz	34.65	-25.34
2 Average	11.454 MHz	20.92	-29.07
1 Quasi Peak	12.774 MHz	24.57	-35.42
2 Average	12.774 MHz	19.40	-30.59

Segalla 20020716-Line N-POE supply + ETH link



9.2 Radiated emission

Tested by	M. Segalla	
Test date	04.03.2020	
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 m for frequencies below 1 GHz 3 m for frequencies above 1 GHz
Supplementary information	--	

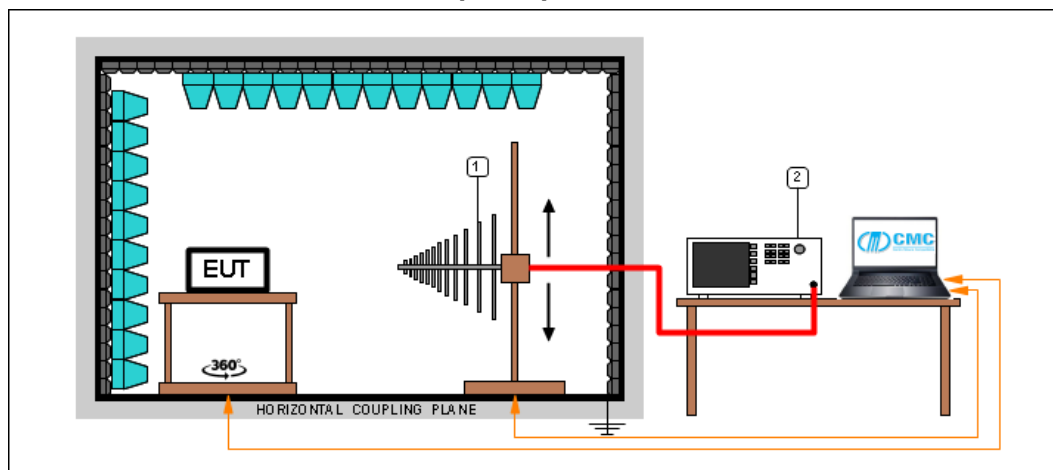
Acceptance limits

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



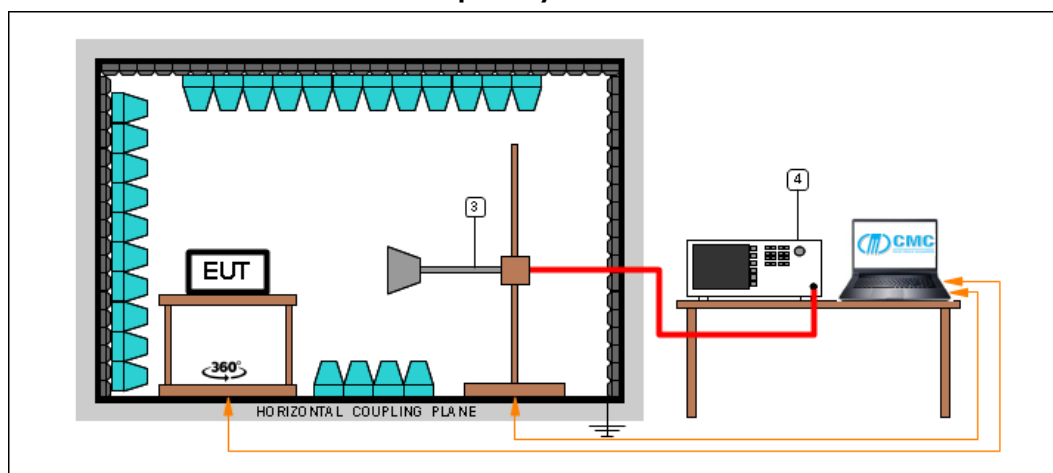
Test setup PE004_02

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
4	CMC S164	Rohde & Schwarz	ESU26	Receiver 20 Hz - 26.5 GHz
3	CMC S108	Emco	3115	Waveguide antenna



Result

Polarization	Frequency Range (MHz)	Graphs	Remarks	Result
V	1000 – 6000	G20020701	EUT supplied from 120 V ~ 60 Hz	P
H	1000 – 6000	G20020702	EUT supplied from 120 V ~ 60 Hz	P
H	30 – 300	G20020703	EUT supplied from 120 V ~ 60 Hz	P
V	30 – 300	G20020704	EUT supplied from 120 V ~ 60 Hz	P
V	300 – 1000	G20020705	EUT supplied from 120 V ~ 60 Hz	P
H	300 – 1000	G20020706	EUT supplied from 120 V ~ 60 Hz	P
V	30 – 300	G20020707	EUT supplied from PoE	P
H	30 – 300	G20020708	EUT supplied from PoE	P
H	300 – 1000	G20020709	EUT supplied from PoE	P
V	300 – 1000	G20020710	EUT supplied from PoE	P
V	1000 – 6000	G20020711	EUT supplied from PoE	P
H	1000 – 6000	G20020712	EUT supplied from PoE	P

Remarks: measurements at frequencies 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

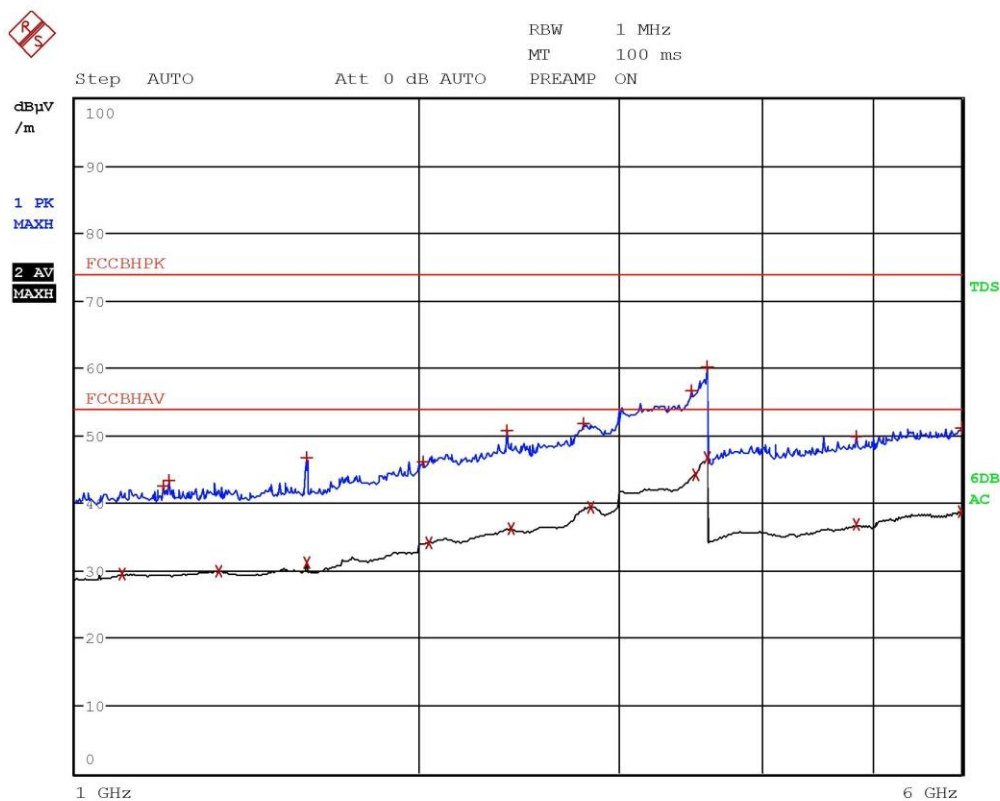
Graphs Legend

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 20020701-Vert(1000-6000MHz)-AC/DC supply + USB link