



TEST REPORT Nr. R20096901

Federal Communication Commission (FCC)

Report Reference No.	R20096901
Date of issue:	31.08.2020
Total number pages:	52
Applicant's name	D-Air Lab S.r.l.
Address	Via dell'Economia, 64/C – 36100 Vicenza (VI) – Italy
Test specification:	
Standards	FCC Rules & Regulations, Title 47:2019 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	2020-05
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	Device to be integrated on clothing
Trademark	D-Air Lab
Manufacturer	D-Air Lab S.r.l.
Model / Type reference	301_N
FCC ID	2AWM3-301N
Rating(s)	3,7 Vdc from battery
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	9
8	Test conditions	11
8.1	General	11
9	Emission	12
9.1	Conducted emission	12
9.2	Radiated emission	22



2 Reference standard	
FCC Rules and Regulation Title 47 part 15:2019	--
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	

Revision index	Date	Change history
1.0	06.07.2020	--



Testing and sampling:	
Date of receipt of test item.....	22.05.2020
Testing start date	04.06.2020
Testing end date	08.06.2020
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 P200477
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	Device to be integrated on clothing						
Model Number	301_N						
FCC ID	2AWM3-301N						
Serial Number	--						
Brand name	D-Air Lab						
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	☐					
Rated power supply		Voltage and Frequency	Reference poles				
			N	L1	L2	L3	PE
	☐	AC:	☐	☐	☐	☐	☐
	☐	AC:	☐	☐	☐	☐	☐
	☒	DC: 3,7 V from battery					☐
Emission class	Class B						
Certified radio module	Sierra Wireless model BC127, FCC ID SSSBC127-X						
Mounting position	☐	Table top equipment					
	☐	Wall/Ceiling mounted equipment					
	☐	Floor standing equipment					
	☐	Hand-held equipment					
	☒	Other: wearable equipment					



Operating modes	No.	Operating mode of test item	
	1	Battery mode, BLE link with smartphone, led at the highest brightness	
	2	Recharging mode, Bluetooth and BLE link with smartphone	
Accessories (not part of the test item)	Accessory	Type	Manufacturer
	Smartphone	NEXUS 5X	LG
	Charger USB(100-240V 50-60Hz)	A1400	APPLE
Declination of responsibility	Components list and software/hardware version (if reported) are provided by the manufacturer. CMC Centro Misure Compatibilità S.r.l. cannot be considered responsible for these information, for any other document sent by the manufacturer 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 47:2019 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 15:2019	--
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	05.06.2020	
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:

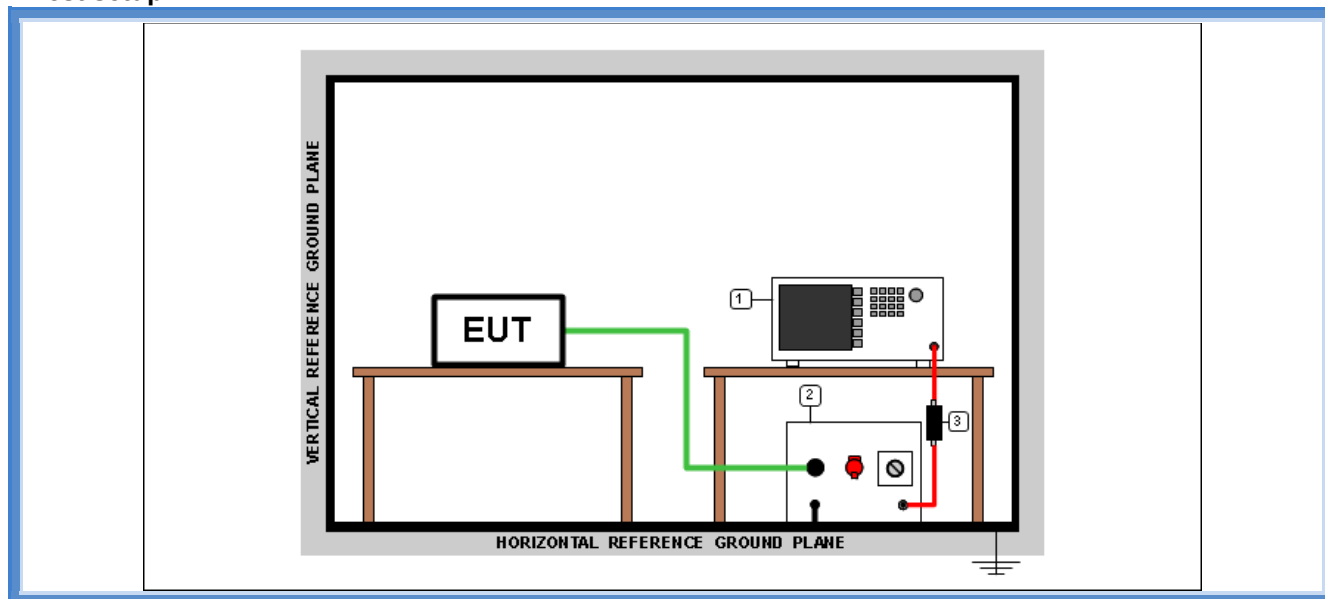
Acceptance limits

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

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

Operating mode	Power supply	Line	Frequency Range (MHz)	Graphs	Result
Recharging mode	120 V ~ 60 Hz	L1	0,15 – 30	G20096913	P
Recharging mode	120 V ~ 60 Hz	N	0,15 – 30	G20096914	P
Recharging mode	240 V ~ 60 Hz	N	0,15 – 30	G20096915	P
Recharging mode	240 V ~ 60 Hz	L1	0,15 – 30	G20096916	P

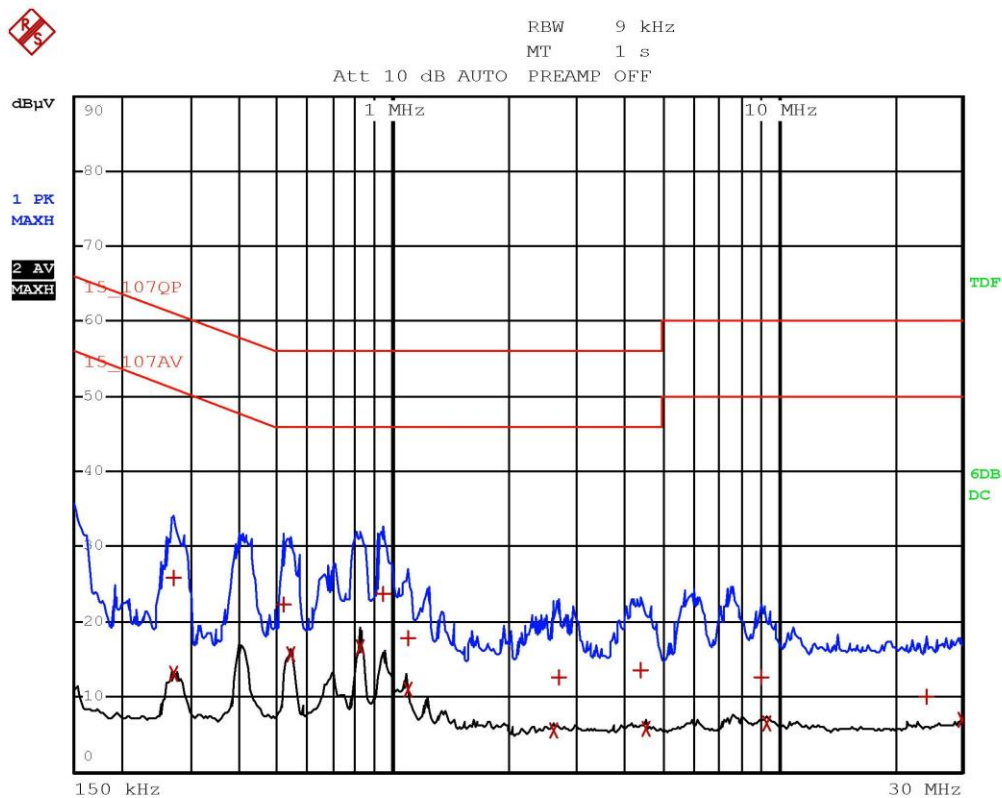
Remarks: tests performed on AC side of auxiliary USB charger

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

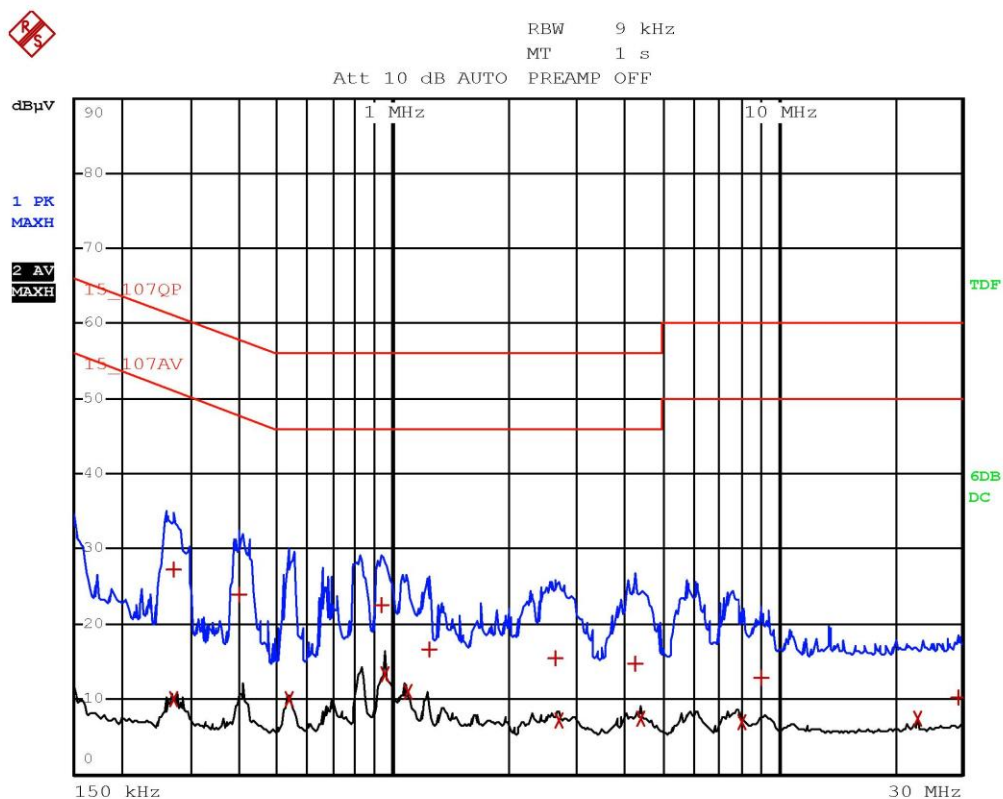


Segalla 20096913-Line L(120V 60Hz)-Recharge mode with BT and
BLE on



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	15_107QP		
Trace2:	15_107AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
1 Quasi Peak	270 kHz	25.78	-35.33
2 Average	274 kHz	13.10	-37.89
1 Quasi Peak	522 kHz	22.38	-33.61
2 Average	542 kHz	15.67	-30.32
2 Average	818 kHz	16.54	-29.45
1 Quasi Peak	942 kHz	23.80	-32.19
1 Quasi Peak	1.094 MHz	17.73	-38.26
2 Average	1.094 MHz	10.95	-35.04
2 Average	2.614 MHz	5.50	-40.49
1 Quasi Peak	2.69 MHz	12.52	-43.47
1 Quasi Peak	4.382 MHz	13.49	-42.50
2 Average	4.526 MHz	5.80	-40.20
1 Quasi Peak	9.046 MHz	12.74	-47.25
2 Average	9.354 MHz	6.45	-43.54
1 Quasi Peak	24.262 MHz	9.98	-50.01
2 Average	29.902 MHz	6.88	-43.11

Segalla 20096913-Line L(120V 60Hz)-Recharge mode with BT and
BLE on

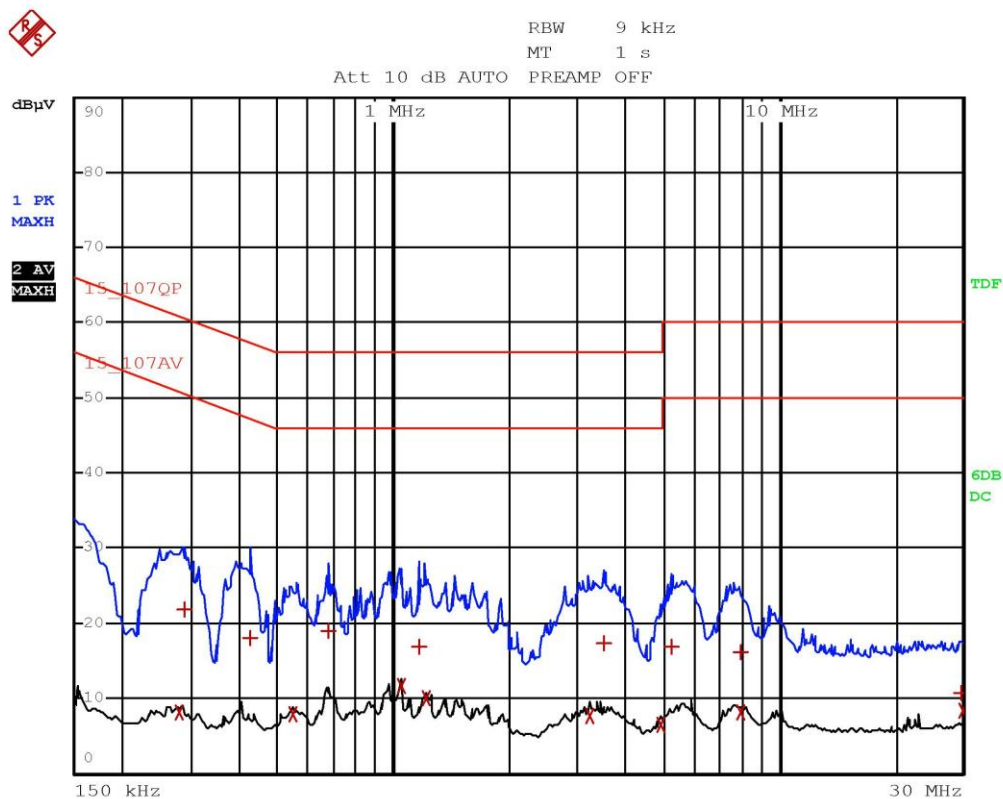


Segalla 20096914-Line N(120V 60Hz)-Recharge mode with BT and
BLE on



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	15_107QP		
Trace2:	15_107AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
1 Quasi Peak	270 kHz	27.22	-33.89
2 Average	274 kHz	10.04	-40.94
1 Quasi Peak	398 kHz	23.99	-33.89
2 Average	538 kHz	10.13	-35.86
1 Quasi Peak	938 kHz	22.54	-33.45
2 Average	954 kHz	13.39	-32.60
2 Average	1.094 MHz	11.09	-34.90
1 Quasi Peak	1.246 MHz	16.57	-39.42
1 Quasi Peak	2.642 MHz	15.46	-40.53
2 Average	2.69 MHz	7.16	-38.83
1 Quasi Peak	4.286 MHz	14.70	-41.29
2 Average	4.394 MHz	7.39	-38.60
2 Average	8.094 MHz	6.99	-43.00
1 Quasi Peak	9.07 MHz	12.79	-47.20
2 Average	23.13 MHz	7.42	-42.57
1 Quasi Peak	29.254 MHz	10.35	-49.64

Segalla 20096914-Line N(120V 60Hz)-Recharge mode with BT and
BLE on

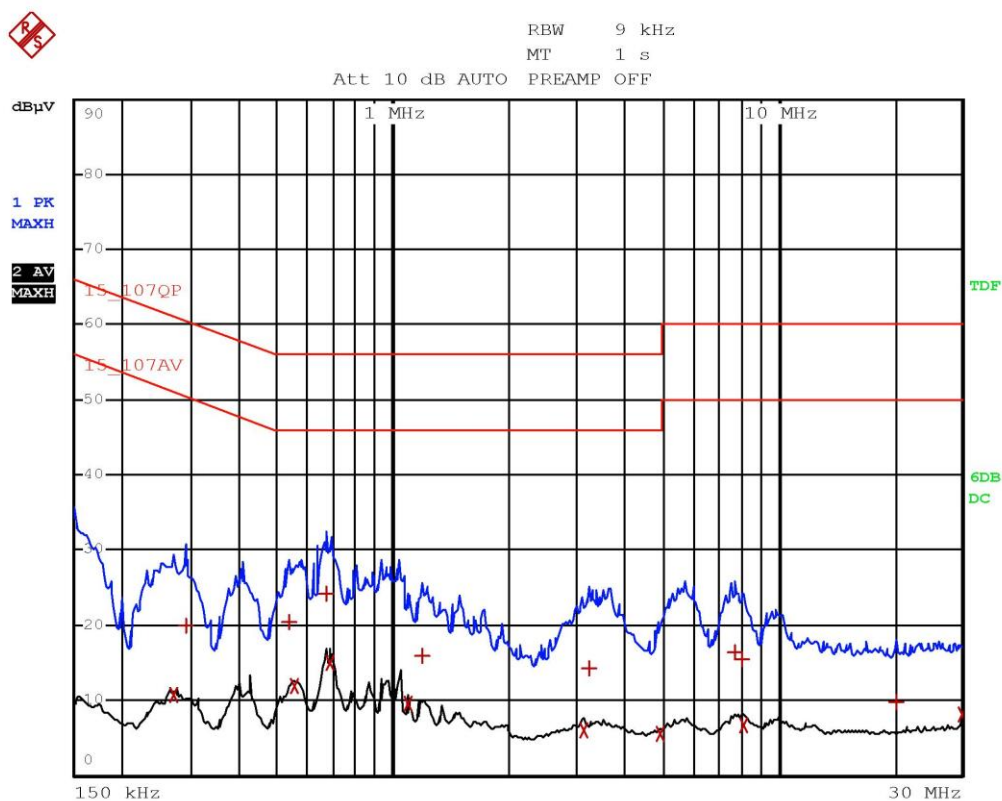


Segalla 20096915-Line N(240V 60Hz)-Recharge mode with BT and
BLE on



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	15_107QP		
Trace2:	15_107AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
2 Average	282 kHz	8.08	-42.67
1 Quasi Peak	286 kHz	21.79	-38.84
1 Quasi Peak	426 kHz	18.03	-39.29
2 Average	550 kHz	7.97	-38.02
1 Quasi Peak	678 kHz	18.92	-37.07
2 Average	1.054 MHz	11.69	-34.30
1 Quasi Peak	1.174 MHz	16.94	-39.05
2 Average	1.214 MHz	10.12	-35.87
2 Average	3.222 MHz	7.73	-38.26
1 Quasi Peak	3.53 MHz	17.45	-38.54
2 Average	4.946 MHz	6.47	-39.52
1 Quasi Peak	5.27 MHz	16.91	-43.08
1 Quasi Peak	8.006 MHz	16.22	-43.77
2 Average	8.006 MHz	8.09	-41.90
1 Quasi Peak	29.554 MHz	10.72	-49.27
2 Average	29.898 MHz	8.29	-41.70

Segalla 20096915-Line N(240V 60Hz)-Recharge mode with BT and
BLE on



Segalla 20096916-Line L(240V 60Hz)-Recharge mode with BT and
BLE on



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	15_107QP		
Trace2:	15_107AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBpV	DELTA LIMIT dB
2 Average	274 kHz	10.65	-40.34
1 Quasi Peak	290 kHz	20.03	-40.48
1 Quasi Peak	538 kHz	20.38	-35.62
2 Average	554 kHz	11.90	-34.09
1 Quasi Peak	670 kHz	24.33	-31.67
2 Average	686 kHz	14.91	-31.08
2 Average	1.094 MHz	9.50	-36.49
1 Quasi Peak	1.198 MHz	16.00	-39.99
2 Average	3.13 MHz	5.96	-40.03
1 Quasi Peak	3.226 MHz	14.32	-41.67
2 Average	4.966 MHz	5.48	-40.51
1 Quasi Peak	7.722 MHz	16.37	-43.62
1 Quasi Peak	8.094 MHz	15.57	-44.42
2 Average	8.162 MHz	6.82	-43.17
1 Quasi Peak	20.262 MHz	9.89	-50.10
2 Average	29.898 MHz	8.12	-41.87

Segalla 20096916-Line L(240V 60Hz)-Recharge mode with BT and
BLE on



9.2 Radiated emission

Tested by	M. Segalla	
Test date	04.06.2020	
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	--	

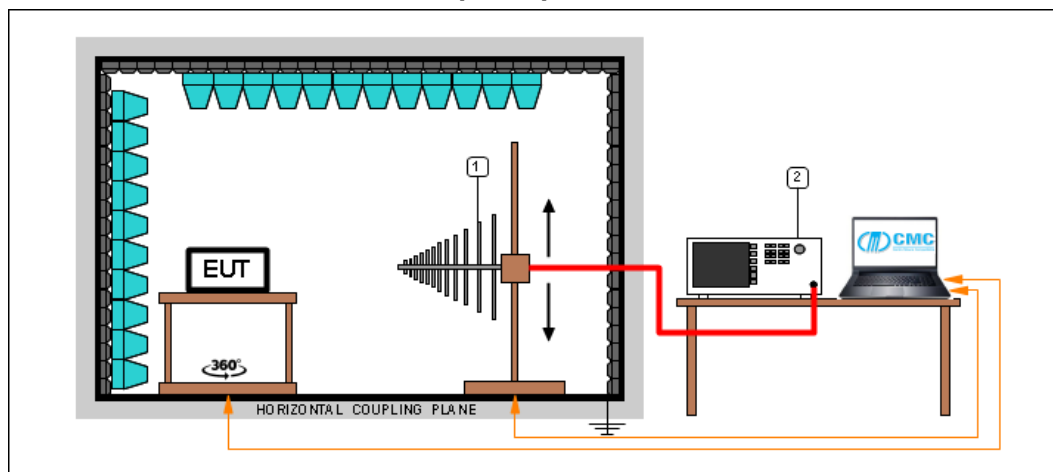
Acceptance limits

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



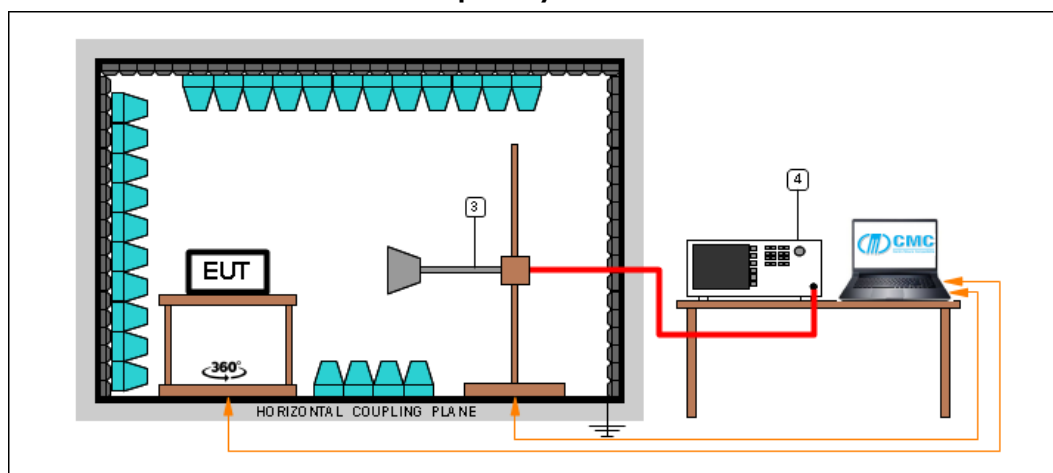
Test setup PE004_02

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

Operating mode	Polarization	Frequency Range (MHz)	Graphs	Result
Battery mode	H	30 – 300	G20096901	P
Battery mode	V	30 – 300	G20096902	P
Battery mode	V	300 – 1000	G20096903	P
Battery mode	H	300 – 1000	G20096904	P
Battery mode	V	1000 – 6000	G20096905	P
Battery mode	H	1000 – 6000	G20096906	P
Recharging mode	H	1000 – 6000	G20096907	P
Recharging mode	V	1000 – 6000	G20096908	P
Recharging mode	V	300 – 1000	G20096909	P
Recharging mode	H	300 – 1000	G20096910	P
Recharging mode	H	30 – 300	G20096911	P
Recharging mode	V	30 – 300	G20096912	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, using the transducer factor of the test receiver

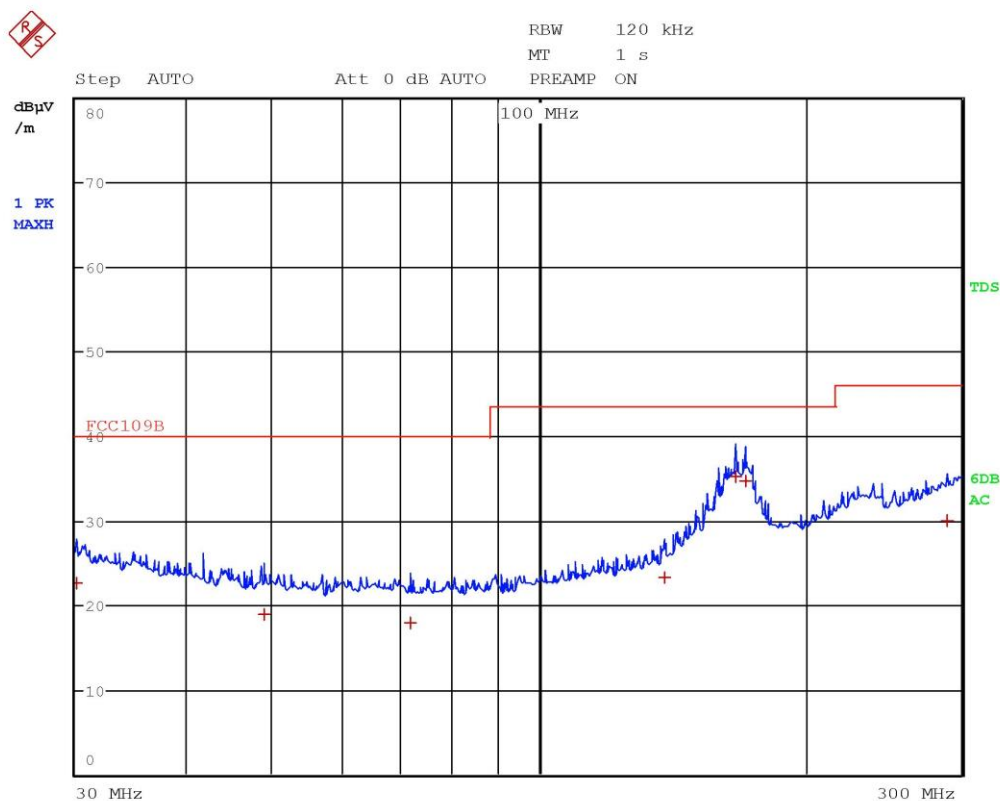
Graphs Legend

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 20096901-Horiz(30-300MHz - 10m)-Battery mode with maximum brightness-BLE communication with smartphone



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	FCC109B		
Trace2:	---		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
1 Quasi Peak	30.08 MHz	22.59	-17.40
1 Quasi Peak	49 MHz	18.84	-21.15
1 Quasi Peak	71.64 MHz	17.85	-22.14
1 Quasi Peak	138.76 MHz	23.35	-20.16
1 Quasi Peak	166.8 MHz	35.15	-8.36
1 Quasi Peak	171.04 MHz	34.69	-8.82
1 Quasi Peak	288.6 MHz	29.92	-16.10

Segalla 20096901-Horiz(30-300MHz - 10m)-Battery mode with maximum brightness-BLE communication with smartphone