

RAPPORTO DI PROVA

TEST REPORT

Rif. / Ref. n.	FCCTR_180878-0	Data Emissione /Issue Date:	01/03/2022	Pagine / Pages:	21
Scopo delle prove Test object	Prove di tipo in accordo alla Norma Type test according to standard FCC Cfr 47 part 15 - Subpart C - §15.207, §15.209				
Richiedente Applicant	DATALOGIC S.r.l. Via S. Vitalino 13 - 40012 Lippo Di Calderara Di Reno - Bologna - Italy Phone. +39 051 3147196 Fax +39 051 3147561				
Marchio commerciale Trade mark					
Fabbricante Manufacturer	DATALOGIC S.r.l.				
Prodotto Product	Base charger station				
Modello testato Testing model	BC9600-910				
Tipo Type	CM9631				
Identificativo FCC FCC ID	U4FBC9600				
Data ricevimento campioni Date of test samples receipt	25/11/2021				
Campioni verificati No. of tested samples	1 – Sampled by the manufacturer				
Data verifiche Testing date	09/12/2021				
Sito di prova Testing site	PRSLAB S.r.l. Unipersonale - Via Campagna 92 - 22020 Faloppio - Como - Italy				
Identificativo FCC del sito di prova FCC designation number	IT0012				
Esito delle valutazioni Assessment results	CONFORME / COMPLIANT				
Verifiche effettuate da Verifications carried out by	Daniele AOSANI Tecnico Laboratorio Laboratory Engineer				
Approvato Approved by	Riccardo PFEIFFER Responsabile Laboratorio Laboratory Manager				

I risultati delle prove riportati nel presente rapporto di prova si riferiscono solo ai campioni esaminati. The test results reported in this test report shall refer only to the samples tested. Il campione è stato fornito dal cliente ed i risultati si riferiscono al campione così come ricevuto The sample has been provided by the customer and the results apply to the sample as received Questo Report non può essere riprodotto in modo parziale, salvo espressa autorizzazione scritta da parte del Laboratorio This report may not be partially reproduced, except with the prior written permission of the issuing Laboratory

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0. RELEASE CONTROL RECORD

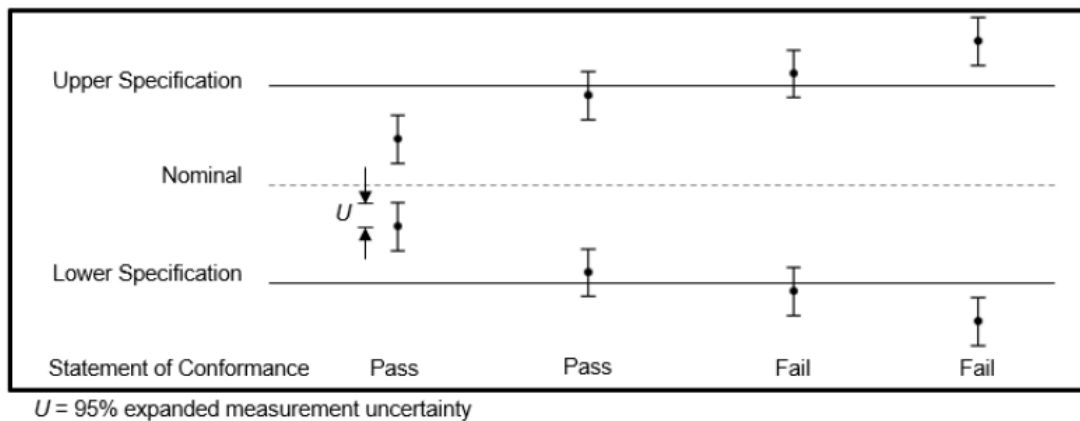
TEST REPORT NUMBER	REASON OF CHANGE	DATE OF ISSUE
FCCTR_180878-0	Original release	01/03/2022

This document is valid in last revision that deletes and replaces the previous one

1. DECISION RULE

PRSLAB specifies that, if the decision rules of conformity of the test results are not indicated in detail in the standard/s object of tests, it takes as a decision rule for the declaration of conformity the simple binary system ($w = 0$) stated in the ILAC-G8-09:2019 document.

The decision rule is applicable for all parts of standard



Statements of conformity are reported as:

- Pass: the measured value is below the acceptance limit, $AL=TL$.
- Fail: the measured value is above the acceptance limit, $AL=TL$.

Definitions

- Guard Band (w): interval between a tolerance limit and a corresponding acceptance limit where length $w=|TL-AL|$.
- Tolerance Limit (TL) (Specification Limit): specified upper or lower bound of permissible values of a property.
- Acceptance Limit (AL): specified upper or lower bound of permissible measured quantity values.

2. INFORMATION PROVIDED BY CUSTOMER

The Equipment Under Test (EUT) was a Wireless Power Transfer (WPT) base station that has a module (FCC ID: U4F0022) incorporated within it. The EUT incorporates a WPT module to wirelessly charge the battery within the reader. The EUT is marketed as a WPT system. This system works on a frequency range 134-141 kHz. The working frequency of the device is not fixed; it changes relating to battery charge level.

Differences between versions declared by manufacturer		
MODEL NAME		BC9600-910
TESTED TYPE	CM9631	<p>The difference between the connection modules variants is related to the external interface offered (example: RJ45 connection for type CM9631 or RJ45 connection + connector for the AC / DC adapter for CM9630).</p> <p>These differences do not affect neither the radio not the WPT component.</p>
VARIANTS	CM9630	
	CM9680	
	CM9681	


According to Manufacturer declaration, the tested model is the most representative and the most complex. The differences between the tested one and his variants are described in the table below and are declared by Manufacturer.

3. GENERAL REMARKS

- None

4. TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

4.1 EUT Identification

DESCRIPTION	Base charger station
MODEL NAME	BC9600-910
TYPE	CM9631
AUXILIARY EQUIPMENT	Type: HP910RB (Wireless reader), CONTAINS FCC ID: U4F0022
SERIAL NUMBER	B21P18133 (base charger station) B21P08656 (wireless reader)
FCC ID	U4FBC9600
PRS LAB INTERNAL REFERENCE	BC 390/2021 3/10
TRADEMARK	
MANUFACTURER	DATALOGIC S.r.l.
COUNTRY OF MANUFACTURER	Italy
SINGLE UNIT OR SYSTEM	Single
POWER SOURCE	AC/DC adapter powered at 100-240V ~ 50-60Hz USB
AC/DC ADAPTER MODEL	PSAA18U-120 with DC output 12V (manufactured by Phihong Technology CO., LTD.) EA10681V-240 with DC output 24V (manufactured by EDACPOWER ELEC.)
SUPPLY VOLTAGE	10-30Vdc from AC/DC adapter 5Vdc from USB
MAX POWER or MAX ABSORBED CURRENT	Max 1.5A from AC/DC adapter Max 500mA from USB
OPERATING TEMPERATURE	0°C ÷ +50°C
DIMENSIONS	See photographic documentation
WORKING FREQUENCY	135kHz (for wireless power transmission)
EUT STANDING	<input type="checkbox"/> WALL; <input type="checkbox"/> CEILING; <input checked="" type="checkbox"/> TABLE; <input type="checkbox"/> FLOOR; <input type="checkbox"/> RACK MOUNTED; <input type="checkbox"/> BODY WORN; <input type="checkbox"/> HANDELD; <input type="checkbox"/> PORTABLE; <input type="checkbox"/> MOBILE

4.2 WPT module technical data

CHIP MANUFACTURER	
CHIP MODEL	P9235A-RBNDG18
ETS CATEGORY	Wireless Power Transmission (WPT)
FREQUENCY RANGE	134-141 kHz f. band
TRANSMITTER MAX POWER	5W
TYPE OF MODULATION	FSK/ASK
ANTENNA TYPE	Internal
ANTENNA SPECS	WPC A11a RX Coil : Ls = 14,5 uH, Rs = 0,26 Ohm TX Coil: Ls = 6,3 uH, Rdc = 0,06 Ohm
MEASURED 99% BW	<p>99%BW = 6.44kHz</p>

4.3 Ports identification

PORT	DESCRIPTION	CONNECTION	NOTES
<input checked="" type="checkbox"/> Enclosure	Plastic	Screw	---
<input checked="" type="checkbox"/> AC mains power port	230V ~ 50Hz with AC/DC adapter	---	---
<input checked="" type="checkbox"/> DC network power port	5Vdc from USB type C	RJ45	---
<input type="checkbox"/> Wired network port	Port not present	---	---
<input checked="" type="checkbox"/> Signal / Control port	Cable RS232 USB port (type A or type C)	RJ45	<3mt
<input type="checkbox"/> Antenna port	<input checked="" type="checkbox"/> Internal; <input type="checkbox"/> External		

Note:

During the tests all cables must be what provided the manufacturer or the same that used in the real employment of the EUT.

4.4 Modifications incorporated in E.U.T.

The following items are the modifications introduced in the equipment under test:

- None

4.5 Auxiliary equipment

- None

5. OPERATING MODES AND TEST CONDITIONS

In the following table there are the operating conditions adopted during tests identified by an indicator (#) at which has been referred the item "Operating condition of the equipment under test"

OPERATING CONDITION	DESCRIPTION
#1	EUT in Wireless Power Transfer mode, WPT battery initially discharged Radiated measurements were performed with the reader placed above the base; it produced worst case emissions and output power, therefore this alignment was used for all measurements.

Special Test Software: None

Special Hardware Used: None

Transmitter Test Antenna: The EUT has been tested with the antenna fitted in a manner typical of normal intended use as integral antenna equipment as described with the test results.

6. REFERENCE STANDARDS

CODE OF FEDERAL REGULATIONS	DESCRIPTION
Title 47 Part 15 Subpart C	Radio frequency devices – Intentional Radiators
Title 47 Part 15 Subpart C § 15.205	Radio frequency devices – Intentional Radiators Restricted bands of operation
Title 47 Part 15 Subpart C § 15.207	Radio frequency devices – Intentional Radiators Conducted Limits
Title 47 Part 15 Subpart C § 15.209	Radio frequency devices – Intentional Radiators Radiated Emissions Limits
ANSI C63.10:2013	American National Standard for Testing Unlicensed Wireless Devices

7. UNITS OF MEASUREMENTS

Conducted EMI Data is in dB μ V; dB referenced to one microvolt

Radiated EMI Data is in dB μ V/m; dB/m referenced to one microvolt per meter

Sample Calculation:

RFS = Radiated Field Strength,
FSM = Field Strength Measured,
A.F. = Receive antenna factor,
Gain = amplification gains and/or cable losses.

$RFS (dB\mu V/m @ 3m) = FSM (dB\mu V) + A.F. (dB/m) - Gain (dB)$

8. SUMMARY OF TEST RESULTS

SUMMARY OF TEST RESULTS				
Port	Test	Reference Standard	Operating Condition ¹	Results
Enclosure	Radiated Emissions 9kHz – 30MHz	Title 47 Part 15 Subpart C § 15.209	#1	Within the limits
	Radiated Emissions 30MHz – 1GHz		#1	Within the limits
AC main	Conducted Emissions	Title 47 Part 15 Subpart C § 15.207	#1	Within the limits

¹ Ref. Tab. Of Section 5

9. TESTS RESULTS

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TEST 1.

RADIATED EMISSIONS – 9kHz to 30MHz

REFERENCE DOCUMENT

FCC Cfr 47 part 15 – Subpart C - §15.209

• TEST SETUP	Acc. To ref. Std.					
• TEST LOCATION	Semi-Anechoic Chamber					
• DISTANCE OF MEASUREMENT	3m					
• TEST EQUIPMENT USED FOR TEST	Instrument	Manufacturer	Model	Serial n°	Calibrated On	Due to
	Network simulator	Spitzenberger+ Spies	PAS 5000	A6762 00/0 0521	03/2020	03/2022
	MXE Emi Receiver	Keysight	N9038A	MY57290150	07/2021	07/2022
	Semi-Anechoic Chamber	Siemens	B83117-D6019-T232	003-005-134/94C	02/2021	02/2022
	Loop antenna	Rohde & Schwarz	HFH 2-Z2	841801/012	05/2020	05/2023
	Software EMC	Rohde & Schwarz	EMC32-E	V 8.40.0	N.A.	
• TESTED PORT	Enclosure port					
• FREQUENCY RANGE	9kHz – 30MHz					
• LIMITS	Acc. To ref. Std.					
• UNCERTAINTY OF MEASURE	Level of confidence = 95% (k=2) Expanded uncertainty 9kHz – 30MHz = 4,18 dB					
• TEST PERFORMED BY	Daniele Aosani					

TEST CONDITIONS	REQUIRED	MEASURED
Ambient temperature	23°C ± 5°C	22.6 °C
Ambient humidity	25 – 75%Rh	39%
Pressure	85 – 106kPa (860mbar – 1060mbar)	960 mbar
Voltage		115V ~ 60Hz

OPERATING CONDITION: #1

RESULT: **WITHIN THE LIMITS**

MEASUREMENT PARAMETER – 9kHz – 150kHz

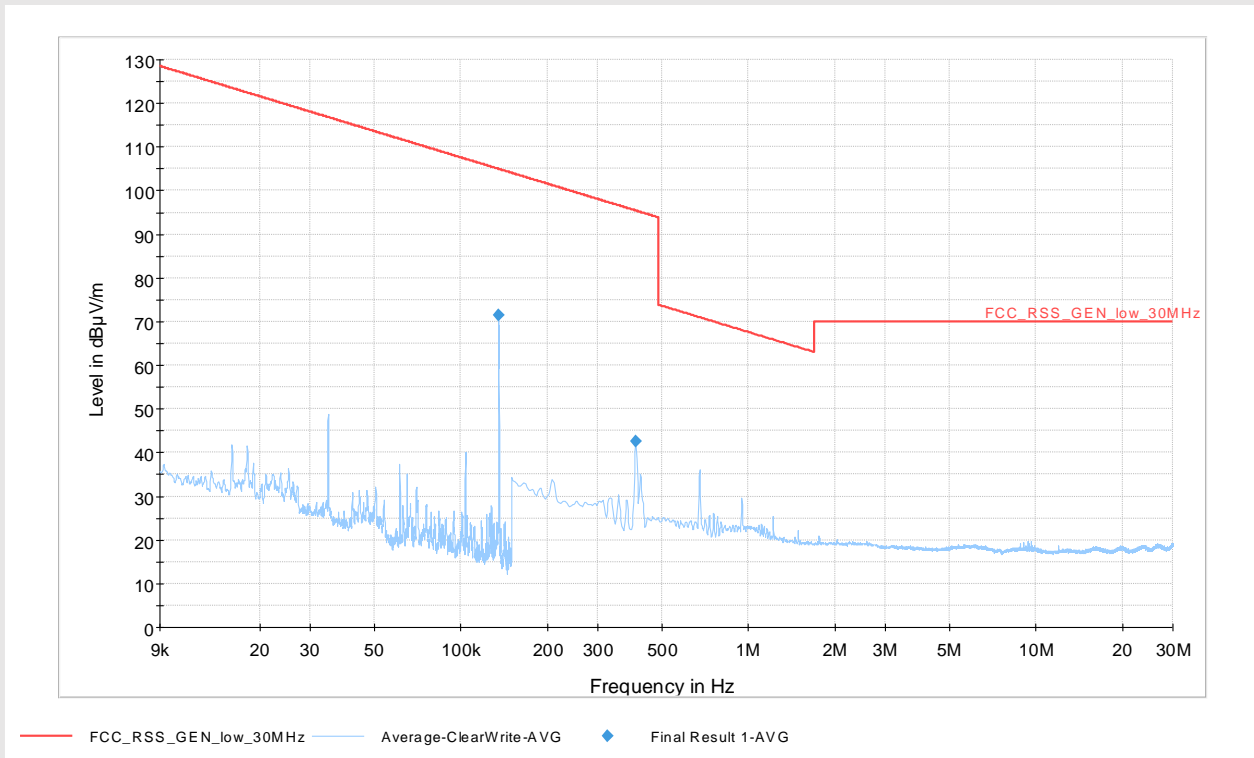
Resolution bandwidth	300Hz
Video bandwidth	1kHz
Span	141kHz
Sweep time	Auto couple
Detector	Peak
Trace-Mode	Max. hold

MEASUREMENT PARAMETER – 150kHz – 30MHz

Resolution bandwidth	10kHz
Video bandwidth	30kHz
Span	29.850MHz
Sweep time	Auto couple
Detector	Peak
Trace-Mode	Max. hold

TEST RESULT

FREQUENCY RANGE	9kHz – 30MHz
OPERATING CONDITION	EUT in Wireless Power Transfer mode



Final Results:

Frequency (MHz)	MaxPeak (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
0.136050	71.4	255.0	270.0	33.5	104.9
0.406500	42.5	255.0	270.0	52.9	95.4

Limits Calculation:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

9kHz – 490kHz 2400(uV/m)/F(kHz)

9kHz --- 2400/9=266,67uV/m=48,5dBuV/m @30m

Using (40dB/decade) factor according to 15.31

9kHz --- 48,5dBuV/m+40db+40db=128,5dBuV/m @3m

490kHz --- 93,8dBuV/m @3m

1705kHz --- 63dBuV/m @3m

30000kHz --- 69,5dBuV/m @3m

TEST 2.

RADIATED EMISSIONS – 30MHz to 1GHz

REFERENCE DOCUMENT

FCC Cfr 47 part 15 – Subpart C - §15.209

• TEST SETUP	Acc. To ref. Std.					
• TEST LOCATION	Semi-Anechoic Chamber					
• DISTANCE OF MEASUREMENT	3m					
• TEST EQUIPMENT USED FOR TEST	Instrument	Manufacturer	Model	Serial n°	Calibrated On	Due to
	Network simulator	Spitzenberger+ Spies	PAS 5000	A6762 00/0 0521	03/2020	03/2022
	MXE Emi Receiver	Keysight	N9038A	MY57290150	07/2021	07/2022
	Semi-Anechoic Chamber	Siemens	B83117-D6019-T232	003-005-134/94C	02/2021	02/2022
	Bi-log antenna	Chase	CBL6111C	2717	03/2019	03/2022
	Software EMC	Rohde & Schwarz	EMC32-E	V 8.40.0	N.A.	
• TESTED PORT	Enclosure port					
• FREQUENCY RANGE	30MHz – 1GHz					
• LIMITS	Acc. To ref. Std.					
• UNCERTAINTY OF MEASURE	Level of confidence = 95% (k=2) Expanded uncertainty 30MHz – 1GHz = 5,72 dB					
• TEST PERFORMED BY	Daniele Aosani					

TEST CONDITIONS	REQUIRED	MEASURED
Ambient temperature	23°C ± 5°C	22.4 °C
Ambient humidity	25 - 75%rH	41%
Pressure	85 - 106kPa (860mbar - 1060mbar)	960 mbar
Voltage		115V ~ 60Hz

OPERATING CONDITION: #1

RESULT: **WITHIN THE LIMITS**

MEASUREMENT PARAMETER – 30MHz – 1GHz

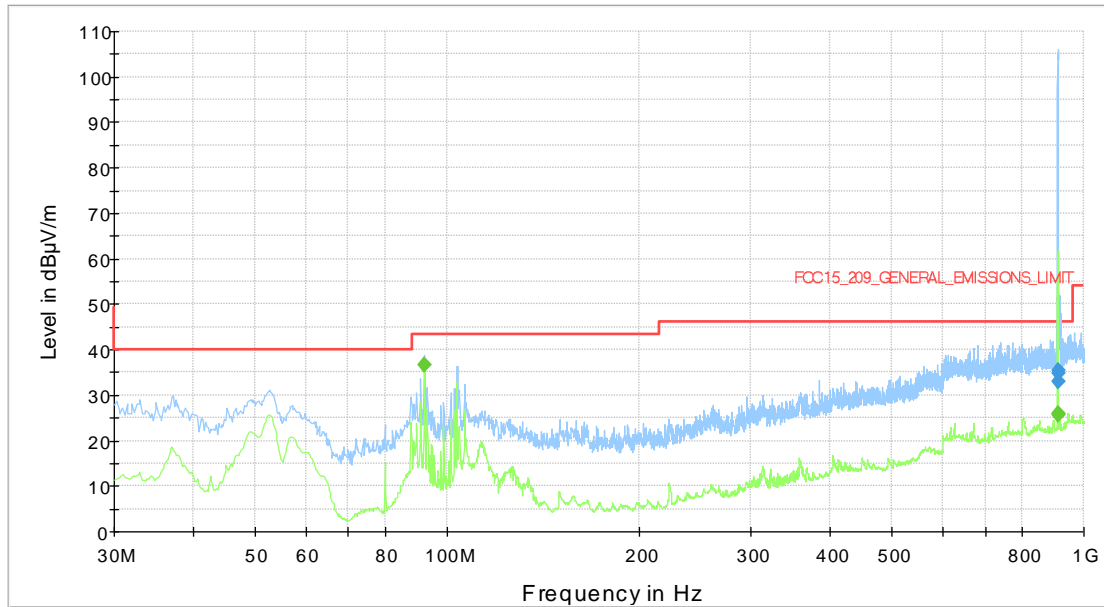
Resolution bandwidth	120kHz
Video bandwidth	300kHz
Span	970MHz
Sweep time	Auto couple
Detector	Peak
Trace-Mode	Max. hold

TEST RESULTS

Operating condition: EUT in Wireless Power Transfer mode

Frequency Range: 30MHz – 1GHz

Vertical polarization



— FCC 15_209_GENERAL_EMISSIONS_LIMIT-CAR
— Average-ClearWrite-AVG
— MaxPeak-ClearWrite-PK+
◆ Final Result1-PK+
◆ Final Result2-AVG

Final Results:

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
909.750000	32.9	179.7	85.0	13.10	46.00
909.990000	35.3	179.8	84.0	10.70	46.00
910.230000	34.9	179.9	92.0	11.10	46.00

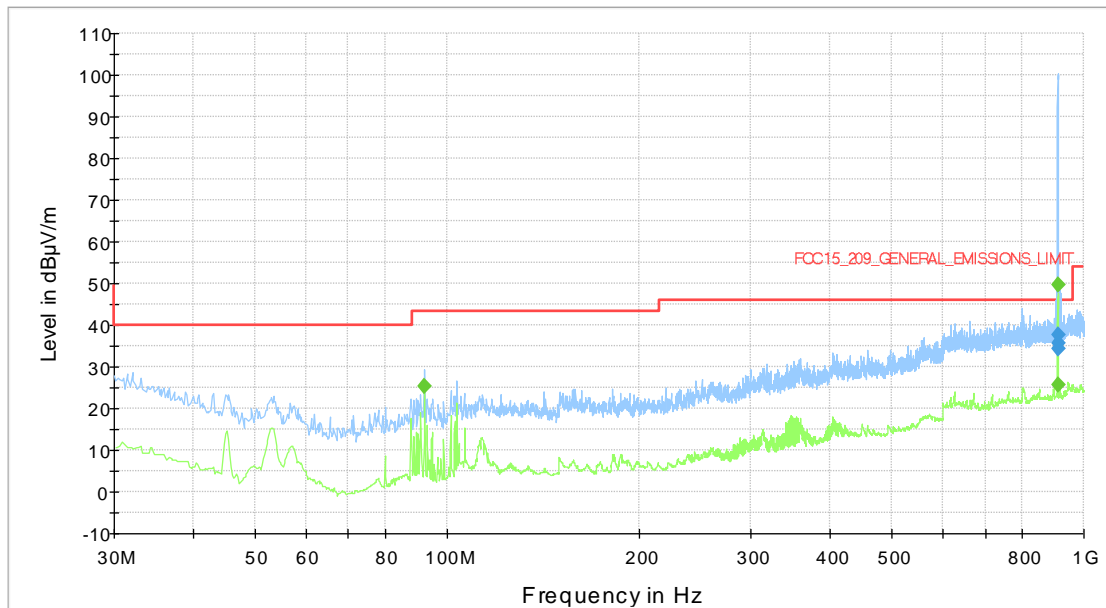
Frequency (MHz)	Average (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
92.190000	36.5	151.8	82.0	7.00	43.50
909.750000	25.9	261.8	97.0	20.10	46.00
910.230000	25.8	179.7	82.0	20.20	46.00

Notes:

The carrier is due to BLE radio communication which the manufacturer was unable to stop.

Frequency Range: 30MHz – 1GHz

Horizontal polarization



— FCC15_209_GENERAL_EMISSIONS_LIMIT-CAR
— Average-ClearWrite-AVG
— MaxPeak-ClearWrite-PK+
◆ Final Result1-PK+
◆ Final Result2-AVG

Final Results:

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
909.780000	37.7	232.8	86.0	8.30	46.00
909.990000	35.7	235.7	97.0	10.30	46.00
910.230000	34.3	255.8	97.0	11.70	46.00

Frequency (MHz)	Average (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
92.190000	25.4	231.8	-8.0	18.10	43.50
909.750000	25.8	179.8	97.0	20.20	46.00
910.230000	49.7	230.8	82.0	-3.70	46.00

Notes:

The carrier is due to BLE radio communication which the manufacturer was unable to stop.

TEST 3.

CONDUCTED EMISSION

REFERENCE DOCUMENT

Title 47 Part 15 Subpart C - §15.207

• TEST SETUP	Acc. To ref. Std.					
• TEST LOCATION	Semi-Anechoic Chamber					
• TEST EQUIPMENT USED FOR TEST	Instrument	Manufacturer	Model	Serial n°	Calibrated On	Due to
	Network simulator	Spitzenberger+ Spies	PAS 5000	A6762 00/0 0521	03/2020	03/2022
	MXE Emi Receiver	Keysight	N9038A	MY57290150	07/2021	07/2022
	LISN	NARDA	PMM L3-32	243ZT00202	07/2020	07/2022
	Software EMC	Rohde & Schwarz	EMC32-E	V 8.40.0	N.A.	
	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100837	07/2021	07/2023
• TESTED PORT	AC mains power port					
• FREQUENCY RANGE	150kHz - 30MHz					
• LIMITS	Acc. To ref. Std.					
• UNCERTAINTY OF MEASURE	Level of confidence = 95% (k=2) Expanded uncertainty 150kHz – 30 MHz = 2,81 dB					
• TEST PERFORMED BY	Daniele Aosani					

TEST CONDITIONS	REQUIRED	MEASURED
Ambient temperature	23°C ± 5°C	24°C
Ambient humidity	25 - 75%rH	45%
Pressure	85 - 106kPa (860mbar - 1060mbar)	960mbar
Voltage		115V ~ 60Hz

OPERATING CONDITION: #1

RESULT: **Within the Limits**

MEASUREMENT PARAMETER – 150kHz – 30MHz

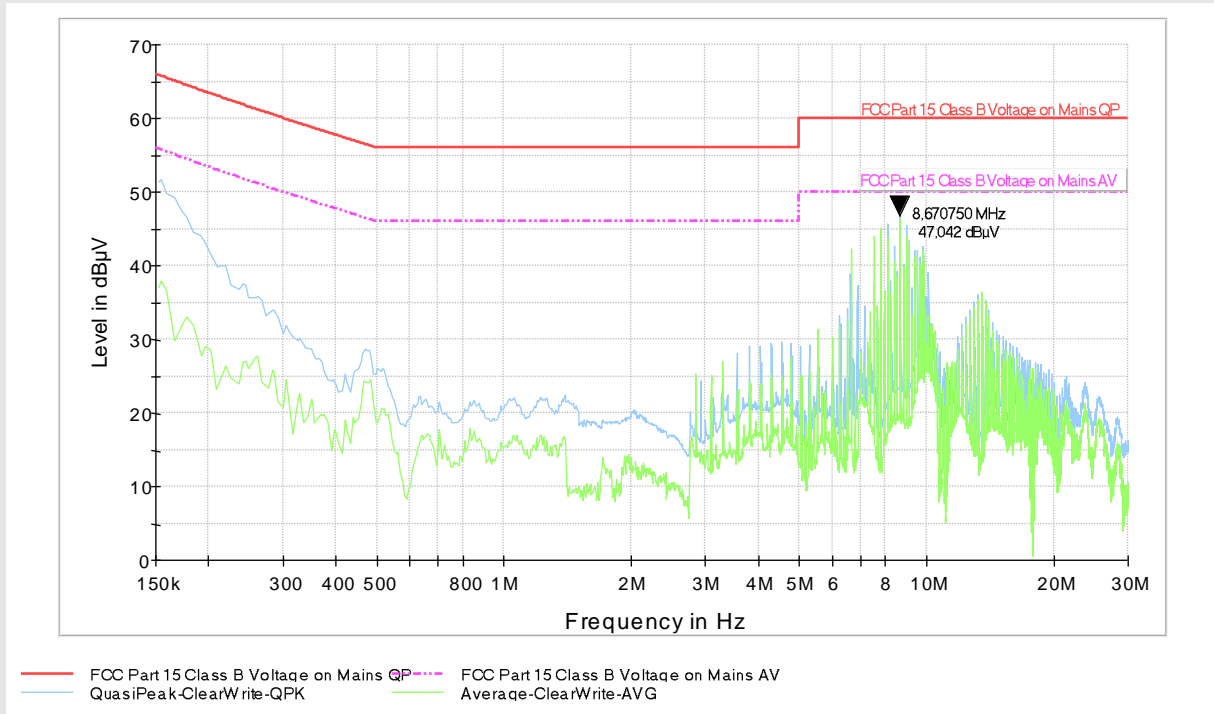
Resolution bandwidth	9kHz
Video bandwidth	30kHz
Span	29.850MHz
Sweep time	Auto couple
Detector	Quasi Peak - Average
Trace-Mode	Max. hold

TEST RESULTS

Operating condition: EUT in Wireless Power Transfer mode

Line: L

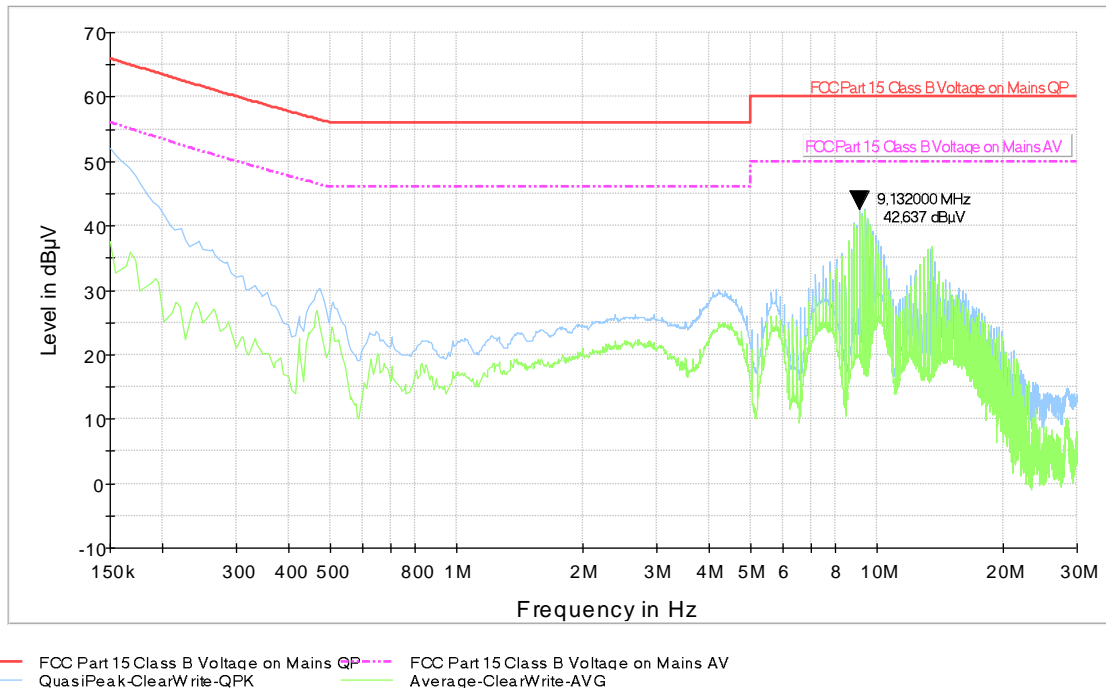
Frequency Range: 150MHz – 30MHz



Notes:

Line: N

Frequency Range: 150MHz – 30MHz



Note:

END OF TEST REPORT