

## RAPPORTO DI PROVA

### TEST REPORT

Rif. / Ref. n.	<b>FCCTR_178033-3</b>	Data Emissione /Issue Date:	<b>02/12/2020</b>	Pagine / Pages:	<b>21</b>
Scopo delle prove Test object	Prove di tipo in accordo alla Norma Type test according to standard <b>FCC Cfr 47 part 15 - Subpart C - §15.207, §15.209</b>				
Richiedente Applicant	<b>DATALOGIC S.r.l.</b> 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	<b>WLC4190</b>				
Tipo Type	<b>BK-BT</b>				
Identificativo FCC FCC ID	<b>U4FWRLCHRP</b>				
Data ricevimento campioni Date of test samples receipt	12/06/2020				
Campioni verificati No. of tested samples	1 – Sampled by the manufacturer				
Data verifiche Testing date	From 13/07/2020 to 24/09/2020				
Sito di prova Testing site	<b>PRSLAB S.r.l. Unipersonale</b> - Via Campagna 92 - 22020 Faloppio - Como - Italy				
Identificativo FCC del sito di prova FCC designation number	IT0012				
Esito delle valutazioni Assessment results	<b>CONFORME / COMPLIANT</b>				
Verifiche effettuate da Verifications carried out by	<b>Daniele AOSANI</b> Tecnico laboratorio EMC & RADIO EMC & RADIO Test Engineer				
Approvato Approved by	<b>Riccardo PFEIFFER</b> Responsabile laboratori EMC & RADIO EMC & RADIO 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. Questo Report non può essere riprodotto in modo parziale, salvo 1spreso 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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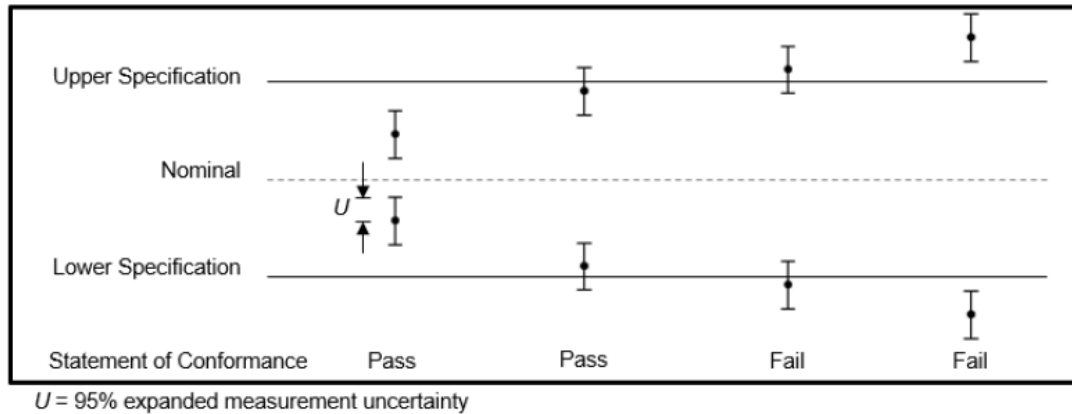
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## 0. RELEASE CONTROL RECORD

TEST REPORT NUMBER	REASON OF CHANGE	DATE OF ISSUE
FCCTR_178033-0	Original release	07/08/2020
FCCTR_178033-1	Editorial changes at pag. 1, 3, 4, 8 Update "Reference Standard" section at pag. 7 Update "List of Instruments" section at pag. 9 Added Measurement parameters at pag. 11 Added new plots at pag. 15-16-19-20 Removed "photographic documentation" section	25/09/2020
FCCTR_178033-2	Added at pag. 5 99% BW measurement	16/11/2020
FCCTR_178033-3	Added at pag. 5 99% BW plot	02/12/2020

## 1. DECISION RULE

PRS LAB, for declaration of conformity related to measurement result, use a simple binary statement ( $w=0$ ), as indicated in the document ILAC-G8-09:2019



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,  $AL=TL$ .

## 2. INFORMATION PROVIDED BY CUSTOMER


The Equipment Under Test (EUT) was a Wireless Power Transfer (WPT) base station that has a module (FCC ID: U4FBT-VRG-STD) 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.

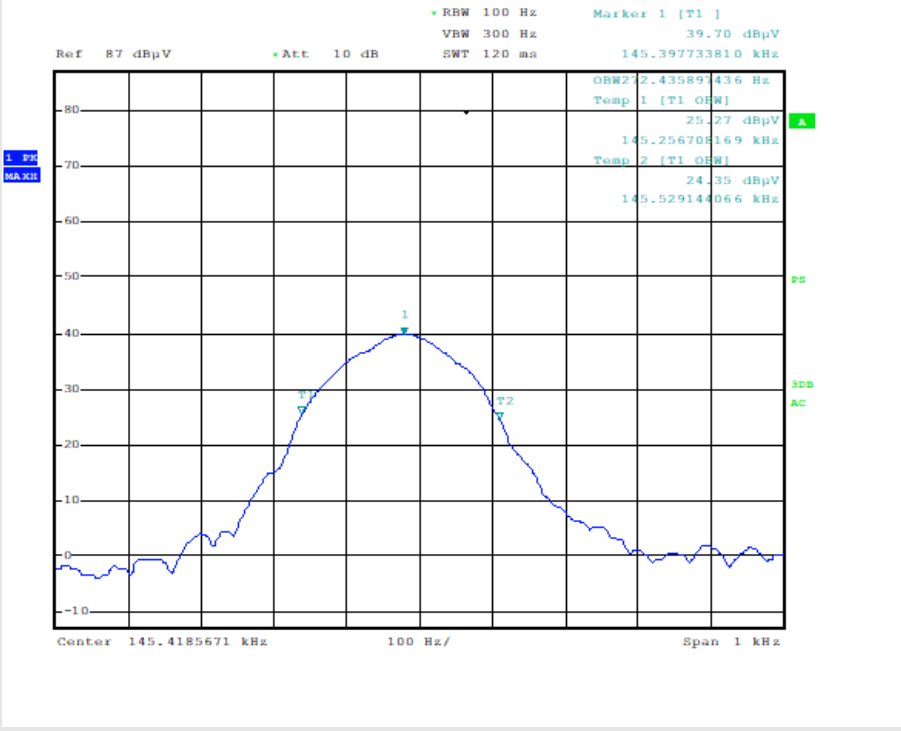
This system works on a frequency range 134-146 kHz. The working frequency of the device is not fixed; it changes relating to battery charge level.

### 3. TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

#### 3.1 EUT Identification

DESCRIPTION	Base charger station
MODEL NAME	WLC4190
TYPE	BK-BT
AUXILIARY EQUIPMENT	Type: GBT-4200-BK-WLC (Wireless reader), CONTAINS FCC ID: U4FBT-VRG-STD
SERIAL NO.	B20P10466 (Wireless reader) B20P08912 (Base charger station)
FCC ID	U4FWRLCHRP
PRSLAB INTERNAL REFERENCE	BC 157/2020 1/22 (Base charger station – model WLC4190 type BK-BT) BC 149/2020 3/9 (Wireless reader – model GBT4200 type BK-WLC) BC 159/2020 ½(USB external powered) BC 157/2020 22/22 (AC/DC Adapter model PSAA18U-120)
TRADEMARK	
MANUFACTURER	DATALOGIC S.r.l.
COUNTRY OF MANUFACTURER	Vietnam
POWER SUPPLY	AC/DC adaptor (model <b>PSAA18U-120</b> , manufactured <b>Phihong Technology Co., Ltd.</b> )
SUPPLY VOLTAGE	12Vdc from AC/DC adaptor powered at 115V ~ 60Hz
MAX ABSORBED CURRENT	1,2A
WORKING FREQUENCY	135kHz (for wireless power transmission)
EUT STANDING	Table
<p>There are two model variants of the EUT but there is no difference within the WPT circuitry between the Bluetooth and SRD variants. WPT initial testing was performed on both variants and the BT variant was deemed the worst case and used for all final measurements.</p> <p>This device: Model: WLC4190 Type: BK-910</p> <p>Is the alternate variant to Model:WLC4190 Type: BK-BT</p>	

### 3.2 WPT module technical data

<b>CHIP MANUFACTURER</b>	Renesas	
<b>CHIP MODEL</b>	P9225-4	
<b>ETS CATEGORY</b>	Wireless Power Transmission (WPT)	
<b>FREQUENCY RANGE</b>	100-148 kHz f. band	
<b>TRANSMITTER MAX POWER</b>	5W	
<b>TYPE OF MODULATION</b>	FSK/ASK	
<b>ANTENNA TYPE</b>	Internal	
<b>ANTENNA SPECS</b>	WPC A11 TX: Induct. 6,3 Uh DC Res. 40 mOhm	
<b>MEASURED 99% BW</b>	 <p>99%BW = 272,43Hz</p>	

### 3.3 Ports identification

PORT	DESCRIPTION	CONNECTION	NOTES
<input checked="" type="checkbox"/> Enclosure	Plastic	Screws/Pressure	---
<input checked="" type="checkbox"/> AC Power input	115V ~ 60Hz	AC/DC adaptor	<3mt
<input type="checkbox"/> DC Power input	Port not present	---	---
<input checked="" type="checkbox"/> Signal / Control port	USB cable	RJ45	<3mt
<input type="checkbox"/> Telecomm. Port	Port not present	---	---
<input type="checkbox"/> Antenna port	Internal	---	---

**Note:**

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

### 3.4 Modifications incorporated in E.U.T.

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

- None

### 3.5 Auxiliary equipment

- Personal computer model **PP17L**, manufactured by **DELL**, to communicate with WPT source.

## 4. 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 <sup>1</sup> 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.

<sup>1</sup> There are two model variants of the EUT but there is no difference within the WPT circuitry between the Bluetooth and SRD 910MHz variants. WPT initial testing was performed on both variants and the Bluetooth variant was deemed the worst case and used for all final 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.

## 5. REFERENCE STANDARDS

REFERENCE STANDARD	
Title 47 Part 15 Subpart C § 15.205	Radio frequency devices – 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

## 6. SUMMARY OF TEST RESULTS

EUT PORT	DESCRIPTION OF PHENOMENA	BASIC STANDARD	OPERATING CONDITION <sup>1</sup>	RESULTS
Enclosure	Radiated Emissions 9kHz – 30MHz	Title 47 Part 15 Subpart C § 15.209	#1	Within the limits
	Radiated Emissions 30MHz – 1GHz			
AC mains	Conducted Emissions	Title 47 Part 15 Subpart C § 15.207	#1	Within the limits

Note: ---

<sup>1</sup>Ref. Tab. Of Section 4

## 7. UNITS OF MEASUREMENTS

Conducted EMI Data is in dB $\mu$ V; dB referenced to one microvolt

Radiated EMI Data is in dB $\mu$ 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.

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



## 8. LIST OF INSTRUMENTS USED

Instrument	Manufacturer	Model	Serial n°	Calibrated on	Due to
MXE Emi Receiver	Keysight	N9038A	MY57290150	12/2019	12/2020
Loop antenna	Rohde & Schwarz	HFH 2-Z2	841801/012	05/2020	05/2023
Bi-Log antenna	Chase	CBL6111C	2717	03/2019	03/2022
LISN	Rohde & Schwarz	ESH3-Z5	838576/009	11/2019	05/2021
Semi-Anechoic Chamber	Siemens	B83117-D6019-T232	003-005-134/94C	02/2020	02/2021
Stabilized Power Supply	Spitzenberger+Spies	PAS5000	A154201/00595	03/2020	03/2021

## 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

• <b>TEST SETUP</b>	Acc. To ref. Std.
• <b>TEST LOCATION</b>	Semi-anechoic chamber (ANSI C63.4:2014) Siemens+Matsushita type B84117-D6019-T232 Measure distance 3 meters
• <b>TYPE OF MEASUREMENT</b>	Radiated
• <b>MEASUREMENT DISTANCE</b>	3m
• <b>TEST EQUIPMENT USED FOR TEST</b>	MXE Emi Receiver Keysight mod. N9038A Loop Antenna Rohde & Schwarz mod. HFH 2-Z2 Stabilized Power Supply Spitzenberger+Spies mod. PAS5000
• <b>TEST LIMITS</b>	Acc. To ref. Std.
• <b>UNCERTAINTY OF MEASURE</b>	Level of confidence = 95% (k=2) Expanded uncertainty 9kHz – 30MHz = 4,20 dB
• <b>TEST PERFORMED BY</b>	Daniele Aosani

TEST CONDITIONS	REQUIRED	MEASURED
<b>Ambient temperature</b>	<b>23°C ± 5°C</b>	23.6 °C
<b>Ambient humidity</b>	<b>25 – 75%Rh</b>	38%
<b>Pressure</b>	<b>85 – 106kPa (860mbar – 1060mbar)</b>	960 mbar
<b>Voltage</b>		115V ~ 60Hz

OPERATING CONDITION: #1

RESULT: **WITHIN THE LIMITS**

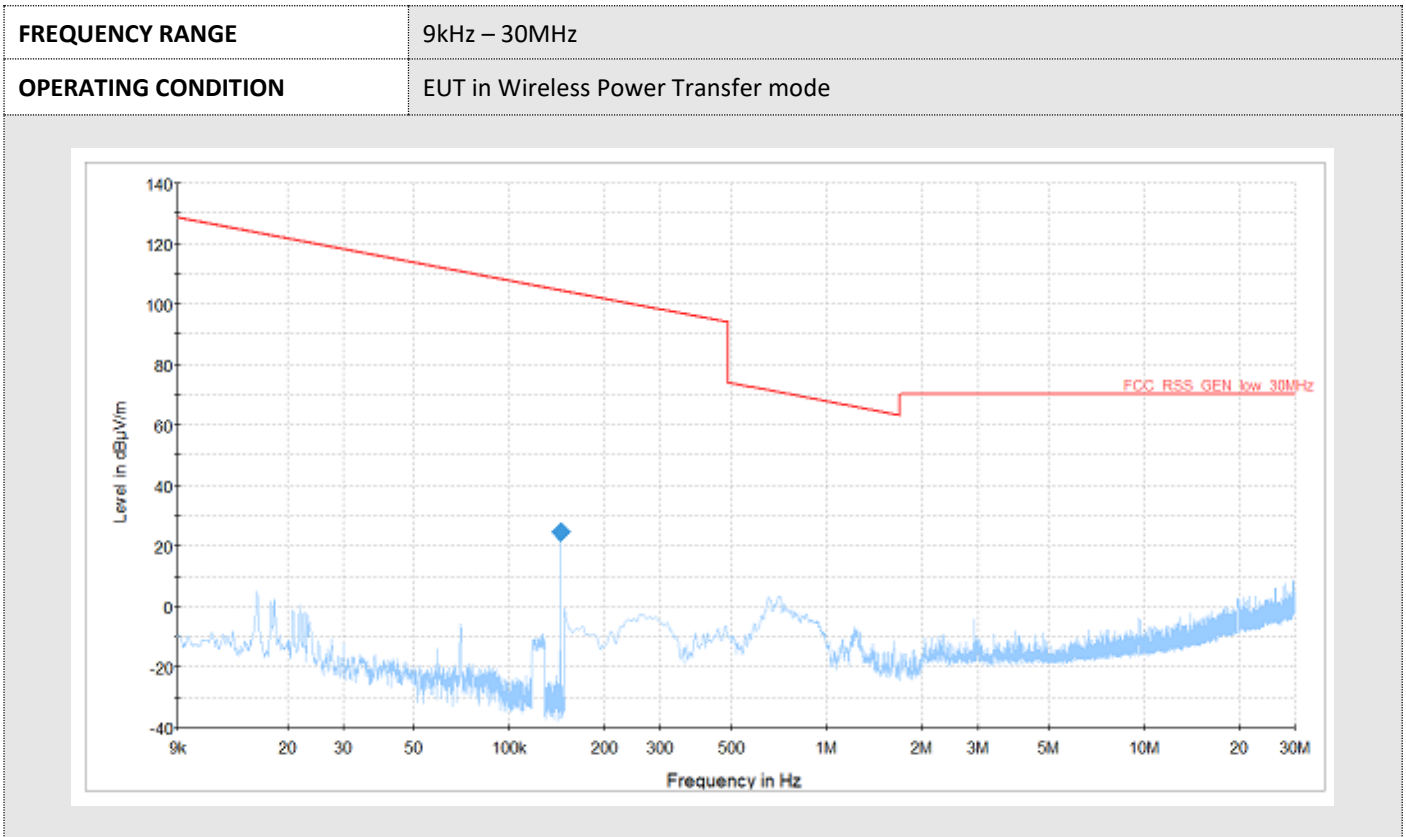
**MEASUREMENT PARAMETER – 9kHz – 150kHz**

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

**MEASUREMENT PARAMETER – 150kHz – 30MHz**

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

**TEST RESULT**



**Final Result**

Frequency (MHz)	MaxPeak (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
0.13500	21.7	130.2	H	180.0	82.66	104.361

**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

• <b>TEST SETUP</b>	Acc. To ref. Std.
• <b>TEST LOCATION</b>	Semi-anechoic chamber (ANSI C63.4:2014) Siemens+Matsushita type B84117-D6019-T232 Measure distance 3 meters
• <b>TYPE OF MEASUREMENT</b>	Radiated
• <b>MEASUREMENT DISTANCE</b>	3m
• <b>TEST EQUIPMENT USED FOR TEST</b>	MXE Emi Receiver Keysight mod. N9038A Bi-Log antenna Chase mod. CBL6111A Stabilized Power Supply Spitzenberger+Spies mod. PAS5000
• <b>TEST LIMITS</b>	Acc. To ref. Std.
• <b>UNCERTAINTY OF MEASURE</b>	Level of confidence = 95% (k=2) Expanded uncertainty 30MHz – 1GHz = 4,85 dB
• <b>TEST PERFORMED BY</b>	Daniele Aosani

TEST CONDITIONS	REQUIRED	MEASURED
<b>Ambient temperature</b>	<b>23°C ± 5°C</b>	23.6 °C
<b>Ambient humidity</b>	<b>25 - 75%rH</b>	38%
<b>Pressure</b>	<b>85 - 106kPa (860mbar - 1060mbar)</b>	960 mbar
<b>Voltage</b>		115V ~ 60Hz

OPERATING CONDITION: #1

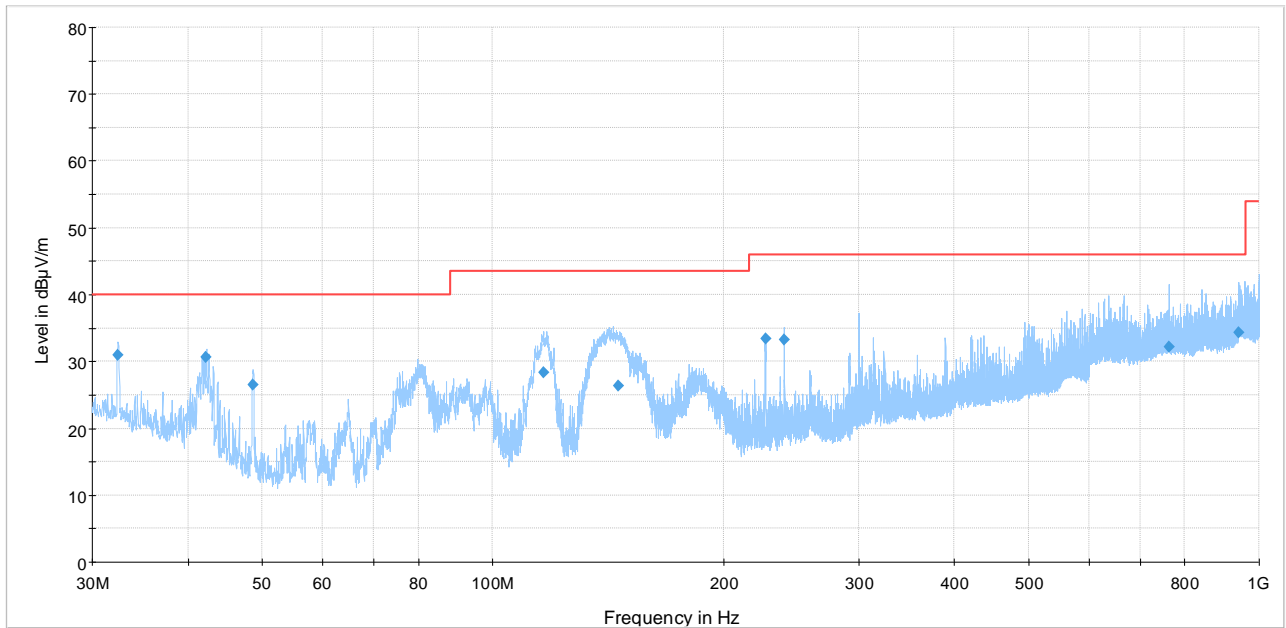
RESULT: **WITHIN THE LIMITS**

**MEASUREMENT PARAMETER – 30MHz – 1GHz**

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

**TEST RESULT**

<b>FREQUENCY RANGE</b>	30MHz – 1GHz
<b>OPERATING CONDITION</b>	EUT in Wireless Power Transfer mode
<b>POLARIZATION</b>	V

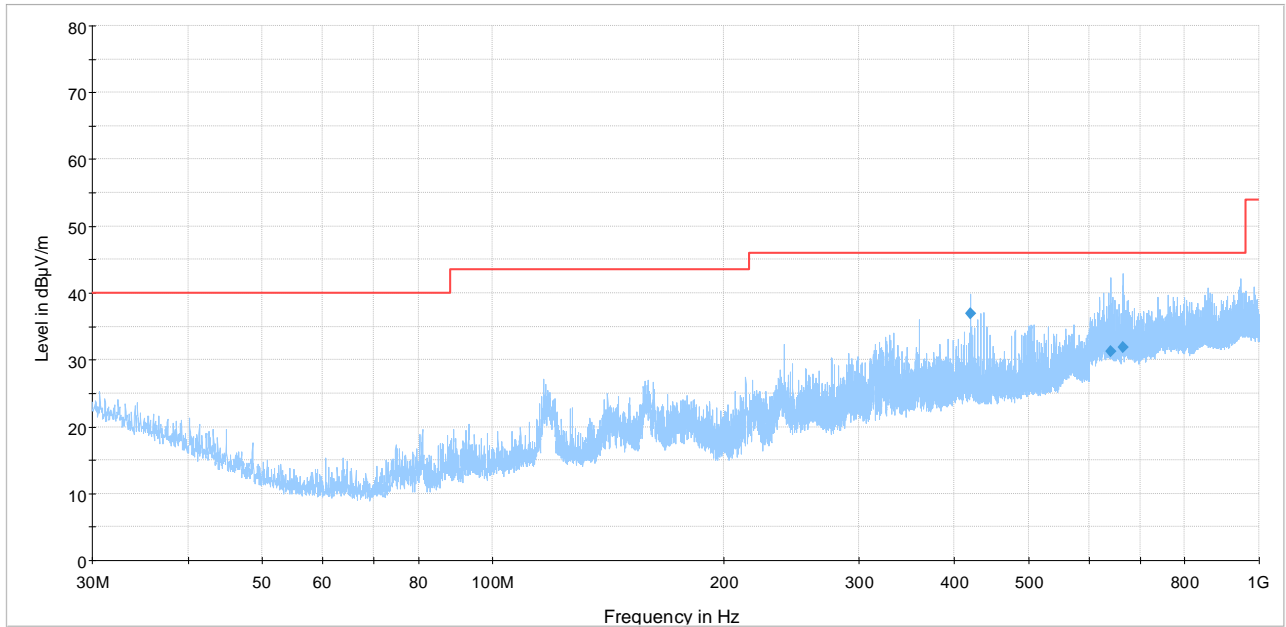


— FCC Part 15 Class B Electric Field Strength QP+AV — MaxPeak-ClearWrite-PK+ ◆ Final Result 1-QPK

**Final Result**

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
32.430000	30.9	120.000	104.7	V	-8.0	9.1	40.0
42.270000	30.7	120.000	99.7	V	-8.0	9.3	40.0
48.690000	26.5	120.000	99.8	V	7.0	13.5	40.0
116.610000	28.4	120.000	99.7	V	7.0	15.1	43.5
145.770000	26.3	120.000	99.7	V	-8.0	17.2	43.5
227.220000	33.5	120.000	180.3	V	-6.0	12.5	46.0
240.150000	33.2	120.000	99.8	V	-8.0	12.8	46.0
762.630000	32.3	120.000	99.8	V	1.0	13.8	46.0
938.940000	34.4	120.000	99.7	V	7.0	11.6	46.0

<b>FREQUENCY RANGE</b>	30MHz – 1GHz
<b>OPERATING CONDITION</b>	EUT in Wireless Power Transfer mode
<b>POLARIZATION</b>	H



— FCC Part 15 Class B Electric Field Strength QP+AV — MaxPeak-ClearWrite-PK+ ◆ Final Result 1-QPK

**Final Result**

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
420.120000	37.0	120.000	99.9	H	7.0	9.0	46.0
640.050000	31.2	120.000	180.1	H	-4.0	14.8	46.0
664.800000	31.9	120.000	124.7	H	7.0	14.1	46.0



## TEST 3.

### CONDUCTED EMISSIONS

REFERENCE DOCUMENT

FCC Cfr 47 part 15 - Subpart C - §15.207

• <b>TEST SETUP</b>	Acc. To ref. Std
• <b>TEST LOCATION</b>	Shielded Room
• <b>TYPE OF MEASUREMENT</b>	Conducted
• <b>TEST EQUIPMENT USED FOR TEST</b>	MXE Emi Receiver Keysight mod. N9038A LISN Rohde & Schwarz mod. ESH3-Z5 Stabilized Power Supply Spitzenberger+Spies mod. PAS5000
• <b>TEST LIMITS</b>	Acc. To ref. Std
• <b>UNCERTAINTY OF MEASURE</b>	Level of confidence = 95% (k=2) Expanded uncertainty 9KHz – 30MHz = 3,28 dB
• <b>TEST PERFORMED BY</b>	Daniele Aosani

TEST CONDITIONS	REQUIRED	MEASURED
<b>Ambient temperature</b>	23°C ± 5°C	23.6 °C
<b>Ambient humidity</b>	25 - 75%rH	38%
<b>Pressure</b>	85 - 106kPa (860mbar - 1060mbar)	960 mbar
<b>Voltage</b>		115V ~ 60Hz

OPERATING CONDITION: #1

RESULT: **WITHIN THE LIMITS**

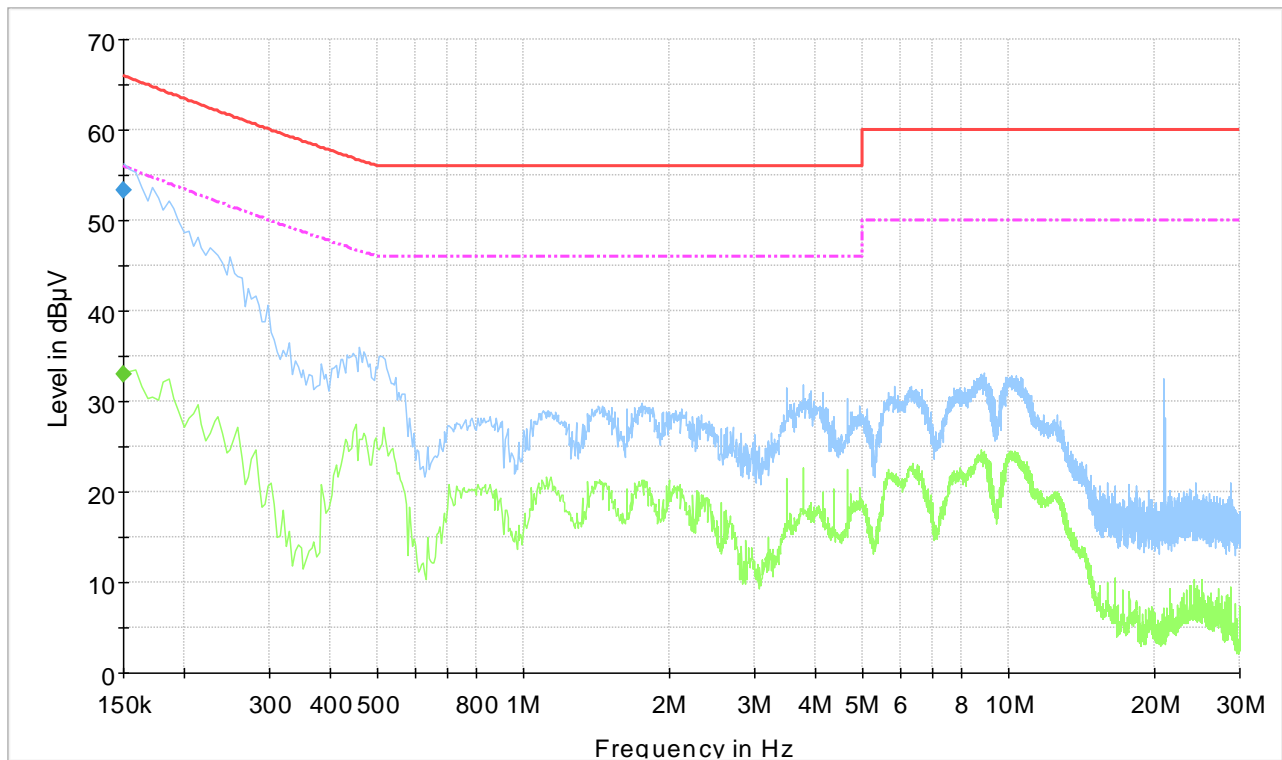
**MEASUREMENT PARAMETER – 150kHz – 30MHz**

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

**TEST RESULT**

<b>FREQUENCY RANGE</b>	150kHz – 30MHz
<b>OPERATING CONDITION</b>	EUT in Wireless Power Transfer mode
<b>LINE</b>	Neutral

**EMI\_COND**



**Final Result Quasi Peak**

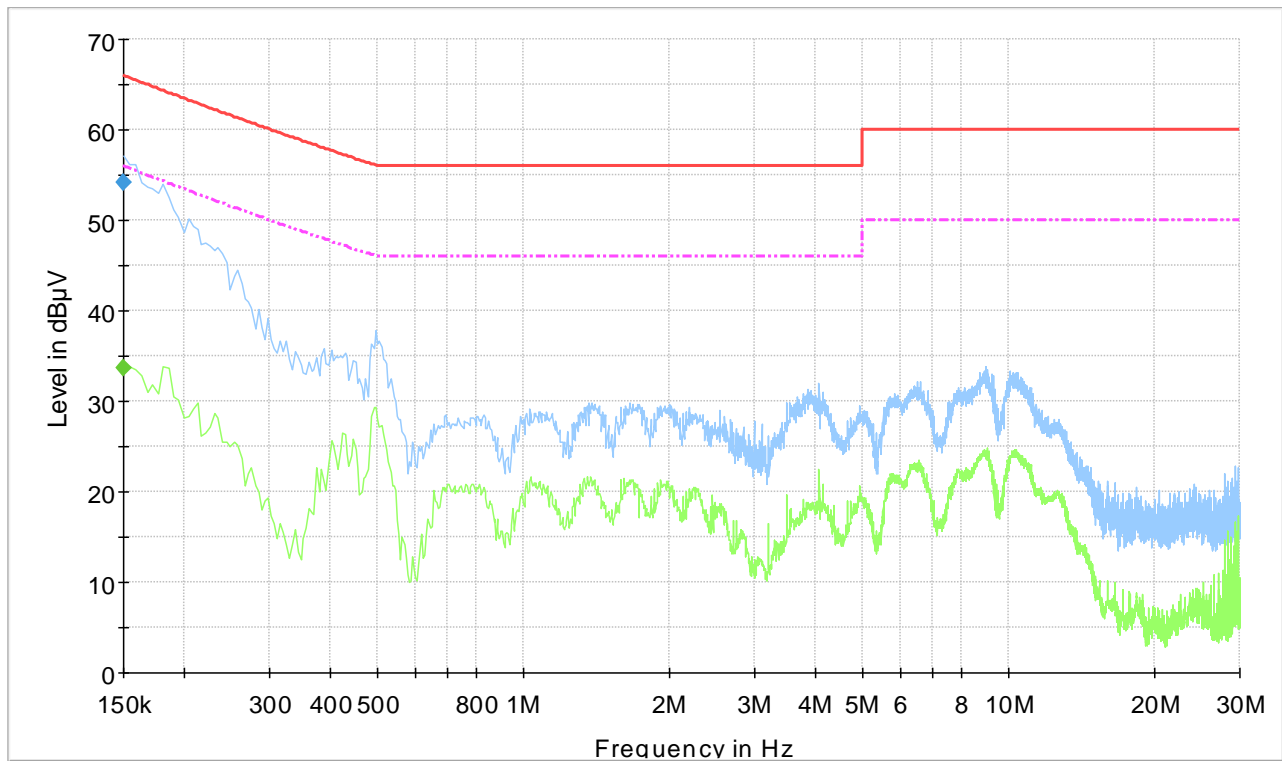
Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	PE	Line	Margin (dB)	Limit (dBµV)
0.150000	53.4	9.00	GND	N	12.6	66.0

**Final Result Average**

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	PE	Line	Margin (dB)	Limit (dBµV)
0.150000	33.0	9.00	GND	N	23.0	56.0

<b>FREQUENCY RANGE</b>	150kHz – 30MHz
<b>OPERATING CONDITION</b>	EUT in Wireless Power Transfer mode
<b>LINE</b>	Line

EMI\_COND



Final Result Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	PE	Line	Margin (dB)	Limit (dBµV)
0.150000	54.2	9.00	GND	L1	11.8	66.0

Final Result Average

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	PE	Line	Margin (dB)	Limit (dBµV)
0.150000	33.6	9.00	GND	L1	22.4	56.0

**END OF TEST REPORT**