

# FCC REPORT

**Applicant:** TWELVE SOUTH, LLC

**Address of Applicant:** 1503 KING ST STE201 Charleston, SC29405, USA

**Equipment Under Test (EUT)**

Product Name: PowerPic Wireless charging picture frame

Model No.: 12-1809, 12-1810, 12-1829

Trade mark: Twelve South

FCC ID: 2AREBFM18XX

**Applicable standards:** FCC CFR Title 47 Part 15 Subpart C Section 15.209

**Date of sample receipt:** 18 Sep., 2018

**Date of Test:** 19 Sep., to 13 Oct., 2018

**Date of report issue:** 17 Oct., 2018

**Test Result:** PASS\*

\* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Bruce Zhang  
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

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## 2 Version

Version No.	Date	Description
00	17 Oct., 2018	Original

**Prepared By:**

*YT Yang*

**Date:**

17 Oct., 2018

**Report Clerk**

**Check By:**

*Wimer Zhang*

**Date:**

17 Oct., 2018

**Project Engineer**

## 3 Contents

Page

1	COVER PAGE.....	1
2	VERSION .....	2
3	CONTENTS .....	3
4	TEST SUMMARY.....	4
5	GENERAL INFORMATION.....	5
5.1	CLIENT INFORMATION.....	5
5.2	GENERAL DESCRIPTION OF E.U.T.....	5
5.3	TEST MODE .....	5
5.4	DESCRIPTION OF SUPPORT UNITS.....	5
5.5	MEASUREMENT UNCERTAINTY.....	5
5.6	DESCRIPTION OF CABLE USED .....	6
5.7	LABORATORY FACILITY.....	6
5.8	LABORATORY LOCATION .....	6
5.9	TEST INSTRUMENTSLIST.....	7
6	TEST RESULTS ANDMEASUREMENT DATA .....	8
6.1	ANTENNA REQUIREMENT .....	8
6.2	RADIATED EMISSION .....	9
6.3	CONDUCTED EMISSION .....	16
6.4	20DB BANDWIDTH.....	19
7	TEST SETUP PHOTOS.....	21
8	EUT CONSTRUCTIONAL PHOTOS.....	23

## 4 Test Summary

Test Item	Section in CFR 47	Result
Spurious emissions	15.209	Pass
20dB Bandwidth	15.215(c)	Pass
Conducted Emission	15.207	Pass
<i>Remark:</i> <i>Pass: The EUT complies with the essential requirements in the standard.</i>		

## 5 General Information

### 5.1 Client Information

Applicant:	TWELVE SOUTH, LLC
Address:	1503 KING ST STE201 Charleston, SC29405, USA
Manufacturer/Factory:	Dongguan Union Electric Co., LTD
Address:	3/F,9 YINYUAN ST JIAOYITANG VILLAGE TANGXIA TOWN DONGGUAN CITY, GUANGDONG PROVINCE. CHINA

### 5.2 General Description of E.U.T.

Product Name:	PowerPic Wireless charging picture frame
Model No.:	12-1809, 12-1810, 12-1829
Operation Frequency:	110.5kHz ~ 205kHz
Modulation type:	ASK
Antenna Type:	Coil Antenna
Power supply (Wireless Charger):	Model: 12-1810 Input: 5V, 2A / 9V, 1.67A Output: 5V, 1A / 6V, 1.25A / 9V, 1.1A
Test Sample Condition:	The test samples were provided in good working order with no visible defects.
Remark:	Model No.: 12-1809, 12-1810, 12-1829 were identical inside, the electrical circuit design, layout, components used and internal wiring, with only difference being model name.

### 5.3 Test mode

Transmitting mode:	Keep the EUT in transmitting mode with modulation
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### 5.4 Description of Support Units

Manufacturer	Description	Model	S/N	FCC ID/DoC
Skytek	Wireless charging match load	N/A	N/A	N/A
DEE VAN ENTERPRISECO., LTE	Adapter	DSA-18QFBFUSA	N/A	N/A

### 5.5 Measurement Uncertainty

Parameter	Expanded Uncertainty (Confidence of 95%)
Conducted Emission (9kHz ~ 30MHz)	±2.22 dB
Radiated Emission (9kHz ~ 30MHz)	±2.76 dB
Radiated Emission (30MHz ~ 1000MHz)	±4.28 dB
Radiated Emission (1GHz ~ 18GHz)	±5.72 dB
Radiated Emission (18GHz ~ 26.5GHz)	±2.88 dB

## 5.6 Description of Cable Used

Cable Type	Description	Length	From	To
USB Cable	Detachable, Unshielded	1.5m	EUT	Adapter

## 5.7 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC - Registration No.: 727551**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC (Federal Communications Commission). The Registration No. is 727551.

- **IC - Registration No.: 10106A-1**

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

- **CNAS - Registration No.: CNAS L6048**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

- **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <https://portal.a2la.org/scopepdf/4346-01.pdf>

## 5.8 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.  
 Address: No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,  
 Bao'an District, Shenzhen, Guangdong, China  
 Tel: +86-755-23118282, Fax: +86-755-23116366  
 Email: info@ccis-cb.com, Website: http://www.ccis-cb.com

## 5.9 Test Instrumentslist

Radiated Emission:					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
3m SAC	SAEMC	9m*6m*6m	966	07-22-2017	07-21-2020
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-16-2018	03-15-2019
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-16-2018	03-15-2019
Horn Antenna	SCHWARZBECK	BBHA9120D	1805	06-22-2017	06-21-2020
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170582	11-21-2017	11-20-2018
Loop Antenna	SCHWARZBECK	FMZB 1519 B	00044	04-28-2018	04-27-2019
EMI Test Software	AUDIX	E3	Version: 6.110919b		
Pre-amplifier	HP	8447D	2944A09358	03-07-2018	03-06-2019
Pre-amplifier	CD	PAP-1G18	11804	03-07-2018	03-06-2019
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-07-2018	03-06-2019
Spectrum analyzer	Rohde & Schwarz	FSP40	100363	11-21-2017	11-20-2018
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-07-2018	03-06-2019
Simulated Station	Anritsu	MT8820C	6201026545	03-07-2018	03-06-2019
Cable	ZDECL	Z108-NJ-NJ-81	1608458	03-07-2018	03-06-2019
Cable	MICRO-COAX	MFR64639	K10742-5	03-07-2018	03-06-2019
Cable	SUHNER	SUCOFLEX100	58193/4PE	03-07-2018	03-06-2019

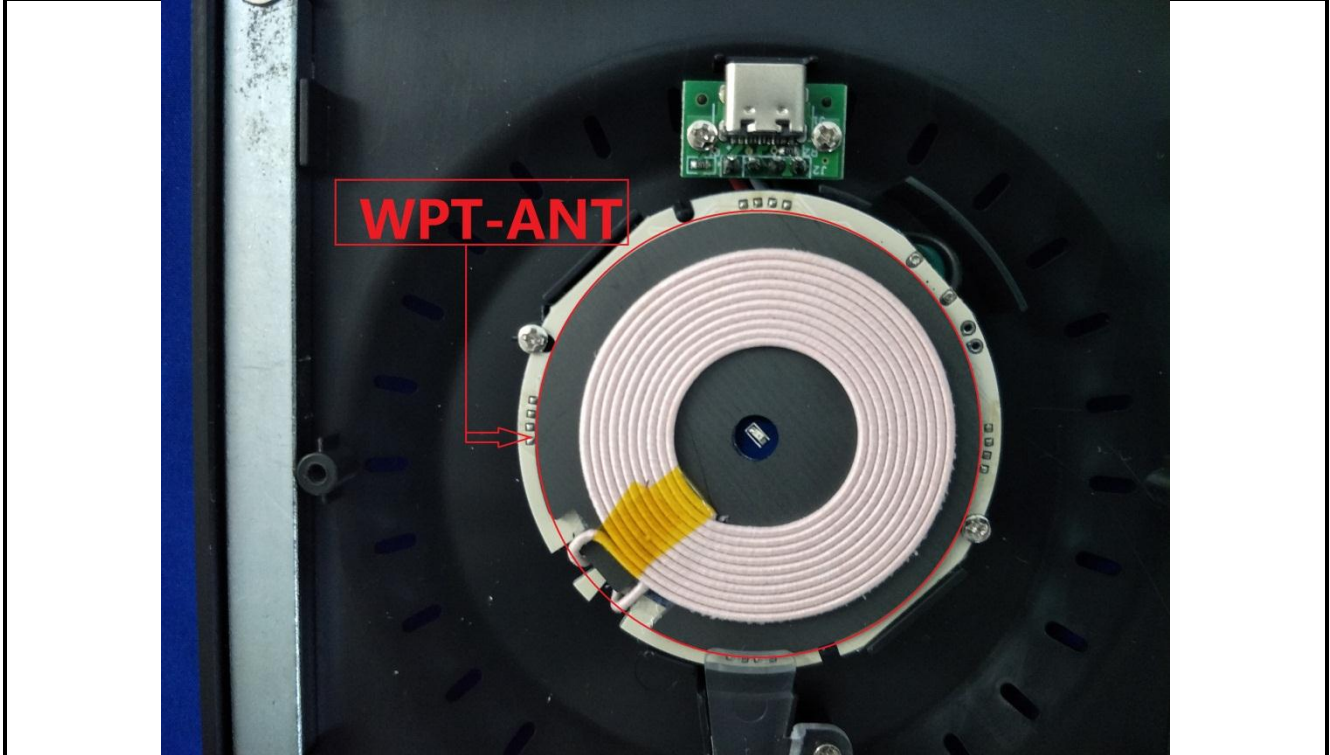
Conducted Emission:					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
EMI Test Receiver	Rohde & Schwarz	ESCI	101189	03-07-2018	03-06-2019
Pulse Limiter	SCHWARZBECK	OSRAM 2306	9731	03-07-2018	03-06-2019
LISN	CHASE	MN2050D	1447	03-19-2018	03-18-2019
LISN	Rohde & Schwarz	ESH3-Z5	8438621/010	07-21-2018	07-20-2019
Cable	HP	10503A	N/A	03-07-2018	03-06-2019
EMI Test Software	AUDIX	E3	Version: 6.110919b		

## 6 Test results and Measurement Data

### 6.1 Antenna requirement

<b>Standard requirement:</b>	FCC Part15 C Section 15.203
<p>15.203 requirement:          An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.</p>	

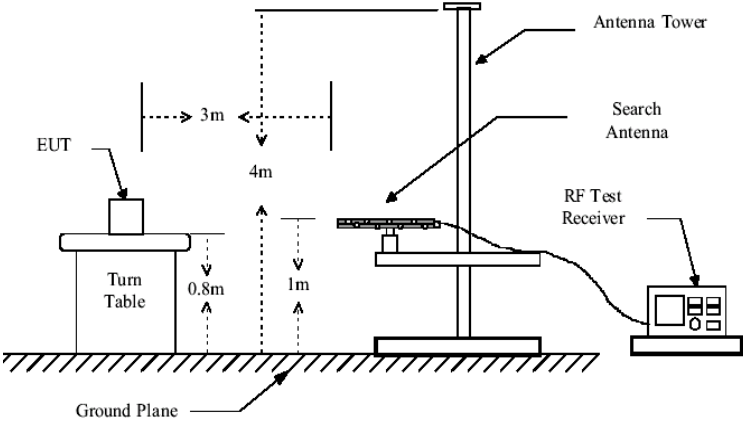
<b>E.U.T Antenna:</b>	
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## 6.2 Radiated Emission

Test Requirement:	FCC Part15 C Section 15.209				
Test Method:	ANSI C63.4:2014				
Test Frequency Range:	9kHz to 1000MHz				
Test site:	Measurement Distance: 3m(Semi-Anechoic Chamber)				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	9kHz-150kHz	Quasi-peak	200Hz	600Hz	Quasi-peak Value
	150kHz-30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
Limit:	Frequency (MHz)	Limit (uV/m @3m)		Distance (m)	
	0.009-0.490	2400/F(kHz)		300	
	0.490-1.705	24000/F(kHz)		30	
	1.705-30	30		30	
	30-88	100		3	
	88-216	150		3	
	216-960	200		3	
	Above 1GHz	500		3	
Test Procedure:	<p>a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</p> <p>b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</p> <p>c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</p> <p>d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotating table was turned from 0 degrees to 360 degrees to find the maximum reading.</p> <p>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>f. If the emission level of the EUT in peak mode was 10dB lower than the limits specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</p>				
Test setup:	<p>9kHz-30MHz</p> <p>30MHz-1GHz</p>				

	
<p>Test Instruments:</p>	<p>Refer to section 5.9 for details</p>
<p>Test mode:</p>	<p>Refer to section 5.3 for details</p>
<p>Test results:</p>	<p>Pass</p>
<p>Remark:</p>	<p>The emission levels of above 1 GHz are very lower than the limit and not show in test report.</p>

**Measurement Data:**

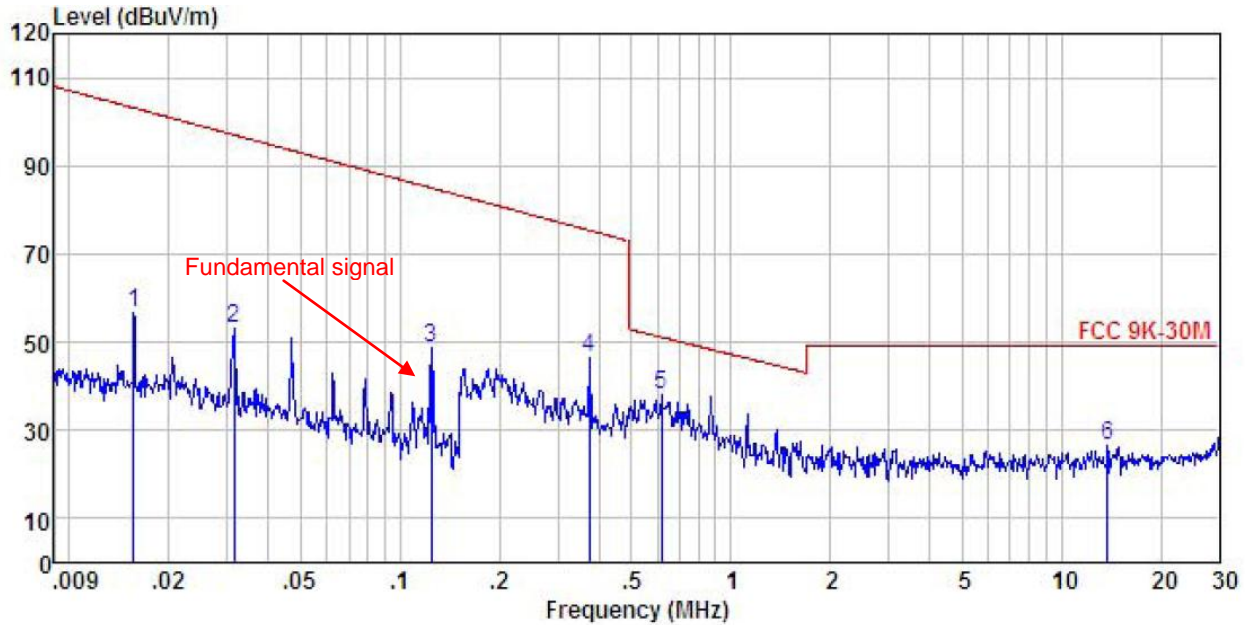
**a) Fundamental field strength**

Peak value				
Test Polarization	Frequency (kHz)	H-field@3m (dBμV)	Limit@3m (dBμV)	Result
Horizontal	159.19	78.96	83.57	Pass
Vertical	159.19	77.86	83.57	Pass
Average value				
Test Polarization	Frequency (kHz)	H-field@3m (dBμV)	Limit@3m (dBμV)	Result
Horizontal	159.19	62.48	63.57	Pass
Vertical	159.19	61.59	63.57	Pass

**b) Radiated spurious:**

**9kHz~30MHz**

Test Polarization: Horizontal



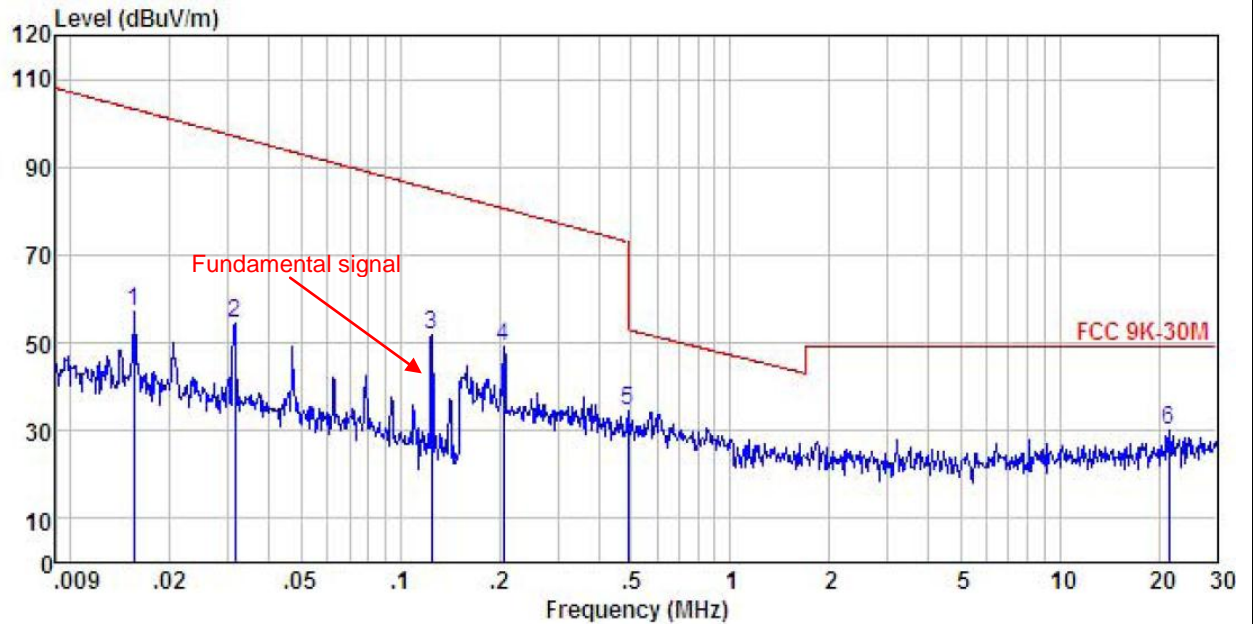
Site : 3m chamber  
 Condition : FCC 9K-30M 3m LOOP-FMZB 1519B HORIZONTAL  
 EUT : PowerPic Wireless charging picture frame  
 Model : 12-1809  
 Test mode : Charging mode  
 Power Rating : AC 120V/60Hz  
 Environment : Temp:25.5°C Humi:55% 101KPa  
 Test Engineer: YI  
 REMARK :

	Read	Antenna	Cable	Preamp	Level	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	30.77	-25.86	0.05	0.00	56.46	103.17	-46.71	Peak
2	27.52	-25.95	0.12	0.00	53.19	97.06	-43.87	Peak
3	23.16	-26.13	0.23	0.00	48.76	84.99	-36.23	Peak
4	20.78	-26.27	0.37	0.00	46.38	75.40	-29.02	Peak
5	12.51	-26.30	0.53	0.00	38.24	51.16	-12.92	Peak
6	0.70	-26.48	0.64	0.00	26.36	49.00	-22.64	Peak

**Remark:**

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.
3. The test data of the 9kHz - 150kHz is noise floor, so not show in this report.

Test Polarization: Vertical



Site : 3m chamber  
 Condition : FCC 9K-30M 3m LOOP-FMZB 1519B VERTICAL  
 EUT : PowerPic Wireless charging picture frame  
 Model : 12-1809  
 Test mode : Charging mode  
 Power Rating : AC 120V/60Hz  
 Environment : Temp:25.5°C Humi:55% 101KPa  
 Test Engineer: YT  
 REMARK :

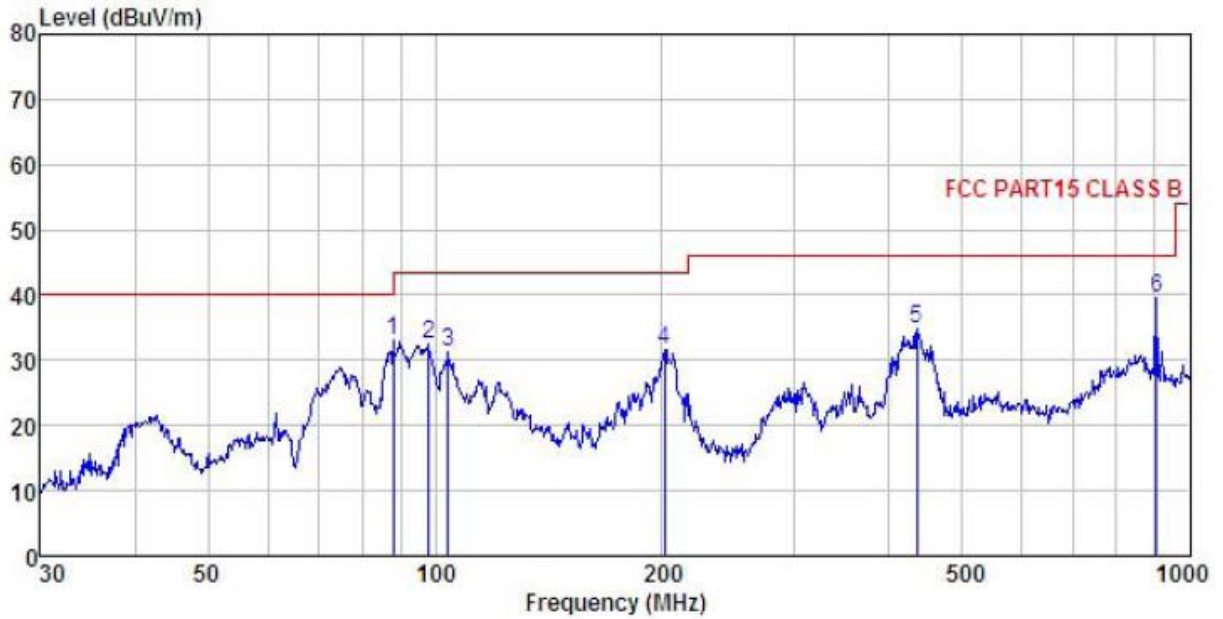
	Read	Antenna	Cable	Preamp	Level	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	0.015	31.51	-25.86	0.05	0.00	57.20	103.24	-46.04 Peak
2	0.031	28.86	-25.95	0.12	0.00	54.53	97.06	-42.53 Peak
3	0.125	26.21	-26.13	0.23	0.00	51.81	84.99	-33.18 Peak
4	0.206	23.37	-26.20	0.33	0.00	49.00	80.58	-31.58 Peak
5	0.491	8.87	-26.30	0.44	0.00	34.51	52.98	-18.47 Peak
6	21.512	4.05	-26.21	0.68	0.00	30.02	49.00	-18.98 Peak

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.
3. The test data of the 9kHz - 150kHz is noise floor, so not show in this report.

**30MHz~1000MHz**

Test Polarization: Horizontal



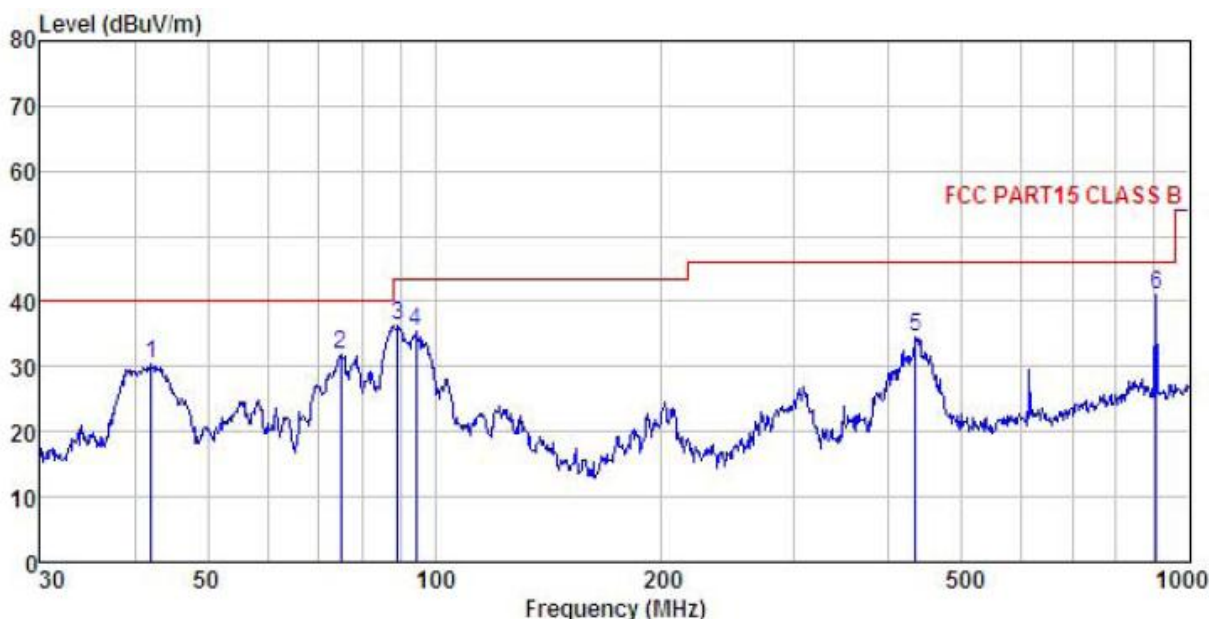
Site : 3m chamber  
 Condition : FCC PART15 CLASS B 3m VULB9163(30M2G) HORIZONTAL  
 EUT : Wireless Charger  
 Model : V10  
 Test mode : Charging mode  
 Power Rating : AC 120V/60Hz  
 Environment : Temp:25.5°C Humi:55% 101KPa  
 Test Engineer: Zora  
 REMARK :

	Read	Antenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	88.033	50.54	10.18	1.96	29.58	33.10	43.50 -10.40 QP
2	98.142	48.21	11.93	1.97	29.54	32.57	43.50 -10.93 QP
3	104.170	46.75	12.12	1.99	29.50	31.36	43.50 -12.14 QP
4	201.393	46.34	11.30	2.87	28.82	31.69	43.50 -11.81 QP
5	436.590	44.80	15.60	3.16	28.85	34.71	46.00 -11.29 QP
6	903.309	42.79	21.00	3.74	27.87	39.66	46.00 -6.34 QP

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Test Polarization: Vertical



Site : 3m chamber  
 Condition : FCC PART15 CLASS B 3m VULB9163(30M2G) VERTICAL  
 EUT : Wireless Charger  
 Model : V10  
 Test mode : Charing mode  
 Power Rating : AC 120V/60Hz  
 Environment : Temp:25.5°C Humi:55% 101KPa  
 Test Engineer: Zora  
 REMARK :

Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	42.154	45.24	13.73	1.25	29.88	30.34	40.00	-9.66 QP
2	75.182	50.70	9.18	1.63	29.68	31.83	40.00	-8.17 QP
3	89.276	53.28	10.60	2.04	29.57	36.35	43.50	-7.15 QP
4	94.428	51.48	11.40	2.01	29.55	35.34	43.50	-8.16 QP
5	434.065	44.66	15.60	3.16	28.84	34.58	46.00	-11.42 QP
6	903.309	44.11	21.00	3.74	27.87	40.98	46.00	-5.02 QP

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamp Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

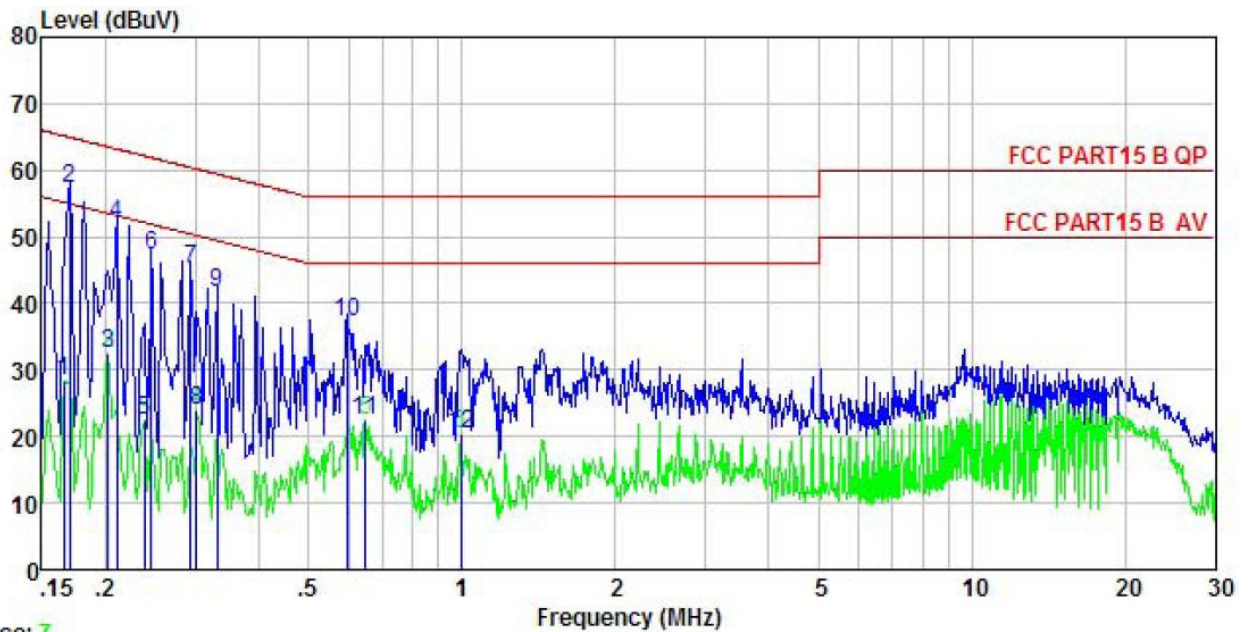
## 6.3 Conducted Emission

Test Requirement:	FCC Part 15 B Section 15.107		
Test Method:	ANSI C63.4:2014		
Test Frequency Range:	150kHz to 30MHz		
Class / Severity:	Class B		
Receiver setup:	RBW=9kHz, VBW=30kHz		
Limit:	Frequency range (MHz)	Limit (dB $\mu$ V)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	0.5-30	60	50
* Decreases with the logarithm of the frequency.			
Test setup:	<p>Remark  E.U.T: Equipment Under Test  LISN: Line Impedance Stabilization Network  Test table height=0.8m</p>		
Test procedure	<ol style="list-style-type: none"> <li>1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network(L.I.S.N.). The provide a 50ohm/50uH coupling impedance for the measuring equipment.</li> <li>2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs).</li> <li>3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.</li> </ol>		
Test environment:	Temp.:	23 °C	Humid.: 56% Press.: 101kPa
Test Instruments:	Refer to section 5.9 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Pass		



**Measurement data:**

Test Phase: Line



Trace: 7

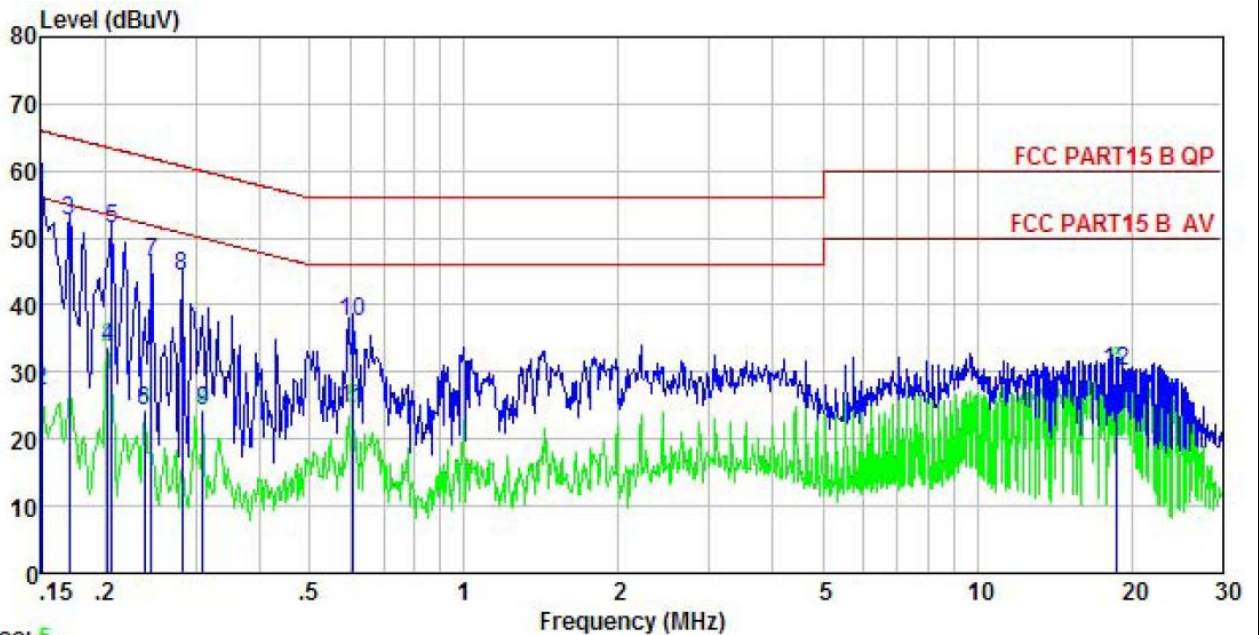
Site : CCIS Shielding Room  
 Condition : FCC PART15 B QP LISN LINE  
 EUT : PowerPic Wireless Charging Picture Frame  
 Model : 12-1809  
 Test mode : Charging Mode  
 Power Rating : AC 120V/60Hz  
 Environment : Temp:25.5°C Humi:55%  
 Test Engineer: YT  
 Remark :

	Read	LISN	Cable	Limit	Over		
Freq	Level	Factor	Loss	Line	Limit	Remark	
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.166	17.35	0.17	10.77	28.29	55.16	-26.87 Average
2	0.170	46.32	0.17	10.77	57.26	64.94	-7.68 QP
3	0.202	21.51	0.15	10.76	32.42	53.54	-21.12 Average
4	0.211	41.13	0.15	10.76	52.04	63.18	-11.14 QP
5	0.238	11.69	0.14	10.75	22.58	52.17	-29.59 Average
6	0.246	36.37	0.14	10.75	47.26	61.91	-14.65 QP
7	0.294	34.38	0.13	10.74	45.25	60.41	-15.16 QP
8	0.302	13.04	0.13	10.74	23.91	50.19	-26.28 Average
9	0.330	30.62	0.13	10.73	41.48	59.44	-17.96 QP
10	0.595	26.37	0.13	10.77	37.27	56.00	-18.73 QP
11	0.647	11.43	0.13	10.77	22.33	46.00	-23.67 Average
12	0.994	9.41	0.13	10.87	20.41	46.00	-25.59 Average

**Notes:**

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

Test Phase: Neutral



Trace: 5

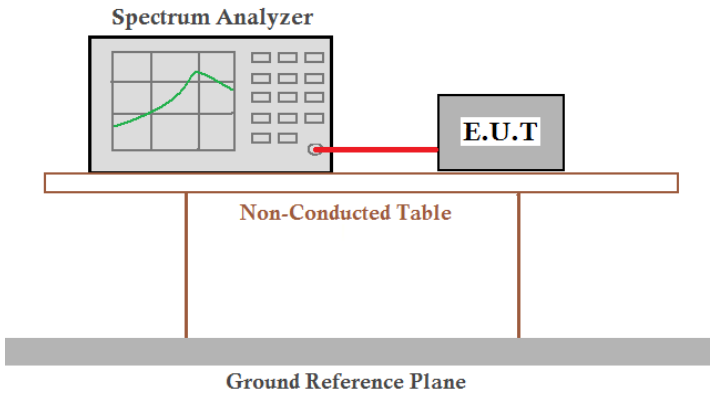
Site : CCIS Shielding Room  
 Condition : FCC PART15 B QP LISN NEUTRAL  
 EUT : PowerPic Wireless Charging Picture Frame  
 Model : 12-1809  
 Test mode : Charging Mode  
 Power Rating : AC 120V/60Hz  
 Environment : Temp:25.5°C Humi:55%  
 Test Engineer: YT  
 Remark :

	Read	LISN	Cable	Limit	Over		
Freq	Level	Factor	Loss	Line	Limit	Remark	
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.150	45.82	0.99	10.78	57.59	66.00	-8.41 QP
2	0.150	15.31	0.99	10.78	27.08	56.00	-28.92 Average
3	0.170	40.93	0.96	10.77	52.66	64.94	-12.28 QP
4	0.202	21.84	0.92	10.76	33.52	53.54	-20.02 Average
5	0.206	39.71	0.92	10.76	51.39	63.36	-11.97 QP
6	0.238	12.62	0.94	10.75	24.31	52.17	-27.86 Average
7	0.246	34.78	0.95	10.75	46.48	61.91	-15.43 QP
8	0.282	32.66	0.96	10.74	44.36	60.76	-16.40 QP
9	0.310	12.39	0.97	10.74	24.10	49.97	-25.87 Average
10	0.608	25.90	0.97	10.77	37.64	56.00	-18.36 QP
11	0.608	12.75	0.97	10.77	24.49	46.00	-21.51 Average
12	18.721	18.38	0.74	10.92	30.04	50.00	-19.96 Average

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

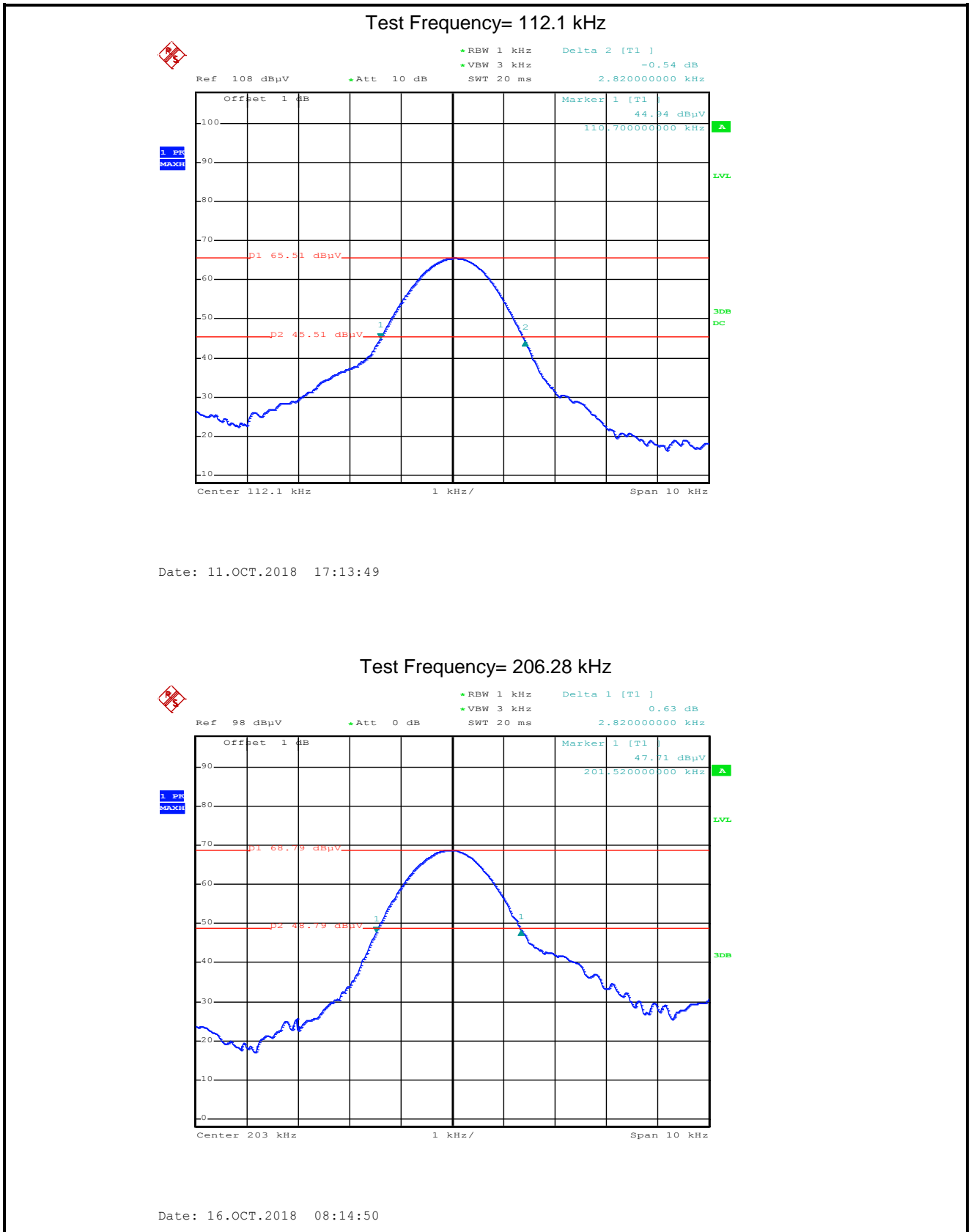
## 6.4 20dB Bandwidth

Test Requirement:	FCC Part15 C Section 15.215 (c)
Test Method:	ANSI C63.4:2009
Receiver setup:	RBW=1 kHz, VBW=3 kHz, detector: Peak
Limit:	The fundamentelemission be kept within atleast the central 80% of the permittedband
Test Procedure:	<ol style="list-style-type: none"> <li>1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT.</li> <li>2. Set the EUT to proper test channel.</li> <li>3. Max hold the radiated emissions, mark the peak power frequency point and the -20dB upper and lower frequency points.</li> <li>4. Read 20dB bandwidth.</li> </ol>
Test setup:	 <p>The diagram shows a Spectrum Analyzer on the left, connected to an E.U.T. on the right by a red cable. Both are positioned on a table labeled 'Non-Conducted Table'. Below the table is a thick grey bar labeled 'Ground Reference Plane'.</p>
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

### Measurement Data

20dB bandwidth (kHz)	Limits
2.82	N/A
2.82	
<i>Remark: For report purpose only.</i>	

Test plot as follows:



### Test Frequency= 206.28 kHz