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DEKRA

Test Report

FCC Part15 Subpart C

Product Name : WIRELESS CHARGER
Model No. : RB01
FCC ID : GKR-RB01
IC : 2533B-RB01

Applicant : Compal Electronics, Inc
Address : No.581 & 581-1, Ruiguang Rd., Neihu
District, Taipei city, Taiwan

Date of Receipt : Sep. 17, 2018
Test Date : Sep. 18, 2018~ Oct. 15, 2018
Issued Date : Nov. 29, 2018
Report No. : 1892106R-RF-US-P06V05
Report Version : V1.1

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

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(Suzhou) Co., Ltd.

Test Report Certification

Issued Date : Nov. 29, 2018
Report No. : 1892106R-RF-US-P06V05



Product Name : WIRELESS CHARGER
 Applicant : Compal Electronics, Inc
 Address : No.581 & 581-1, Ruiguang Rd., Neihu District, Taipei city, Taiwan
 Manufacturer : Suzhou Lineprinting Wireless Communication Co.,Ltd
 Address : 8F,Building 39,No.18,Dongchang Road,SIP,Suzhou,China
 Model No. : RB01
 FCC ID : GKR-RB01
 IC : 2533B-RB01
 EUT Voltage : DC 12V
 Test Voltage : AC 120V/60Hz
 Brand Name : LINE PRINTING
 Applicable Standard : FCC CFR Title 47 Part 15 Subpart C; ANSI C63.10: 2013
 KDB 680106 D01 RF Exposure Wireless Charging Apps v03
 Test Result : Complied
 Performed Location : DEKRA Testing and Certification (Suzhou) Co., Ltd.
 No.99 Hongye Rd., Suzhou Industrial Park, Suzhou, 215006,
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 FCC Designation Number: CN1199; IC Lab Code: 4075B

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
1892106R-RF-US-P06V05	V1.0	Initial Issued Report	Nov. 20, 2018
1892106R-RF-US-P06V05	V1.1	Added IC into report	Nov. 29, 2018

1. General Information

1.1. EUT Description

Product Name	WIRELESS CHARGER
Model No.	RB01
Working Voltage	DC 12V
Frequency Range	110kHz~145kHz
Type of Modulation	ASK

1.2. Antenna information

Model No.	N/A		
Antenna manufacturer	N/A		
Antenna Delivery	<input checked="" type="checkbox"/> 1*TX+1*RX	<input type="checkbox"/> 2*TX+2*RX	<input type="checkbox"/> 3*TX+3*RX
Antenna technology	<input checked="" type="checkbox"/> SISO		
	<input type="checkbox"/> MIMO	<input type="checkbox"/> Basic	
		<input type="checkbox"/> CDD	
		<input type="checkbox"/> Sectorized	
		<input type="checkbox"/> Beam-forming	
Antenna Type	<input type="checkbox"/> External	<input type="checkbox"/> Dipole	
		<input type="checkbox"/> Sectorized	
	<input checked="" type="checkbox"/> Internal	<input type="checkbox"/> PIFA	
		<input type="checkbox"/> PCB	
		<input type="checkbox"/> Ceramic Chip Antenna	
		<input checked="" type="checkbox"/> Loop antenna	
		<input type="checkbox"/> Type F antenna	

1.3. Mode of Operation

DEKRA has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: Transmit

Note:

1. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.
2. For portable device, radiated spurious emission was verified over X, Y, Z Axis, and shown the worst case on this report.

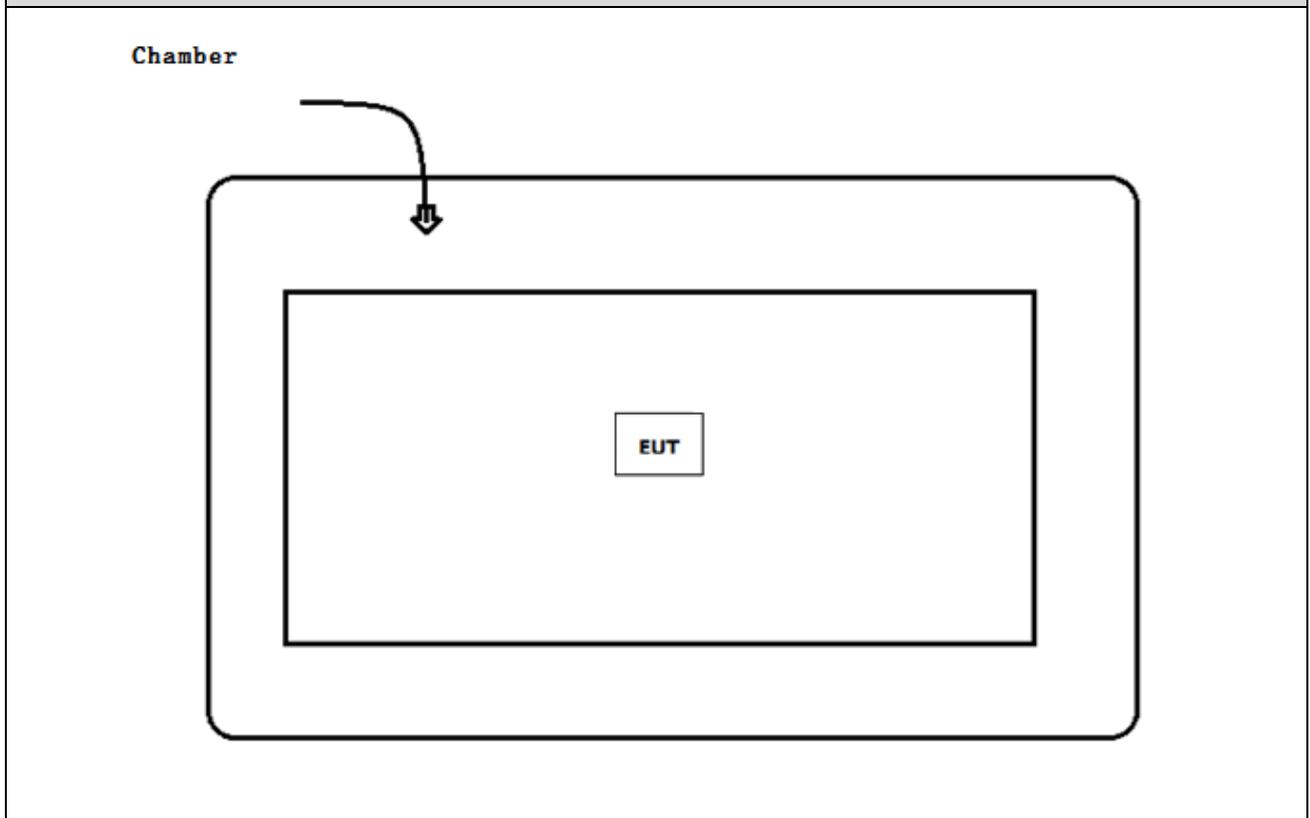
1.4. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product	Manufacturer	Model No.	Serial No.	Power Cord
1 N/A	N/A	N/A	N/A	N/A

1.5. Configuration of Tested System

Test setup Diagram- Radiated Emission



1.6. EUT Exercise Software

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of equipment.
3	Start to continue transmit.

2. Technical Test

2.1. Summary of Test Result

- No deviations from the test standards
 Deviations from the test standards as below description:

Performed Test Item	Normative References	Limit	Result
Conducted Emission	FCC CFR Title 47 Part 15 Subpart C Section 15.207	FCC 15.207	N/A
Field Strength of Spurious	FCC CFR Title 47 Part 15 Subpart C Section 15.209	FCC 15.209	PASS
Channel Bandwidth	FCC CFR Title 47 Part 15 Subpart C Section 15.215(c)	FCC 15.215	PASS
Antenna Requirement	FCC CFR Title 47 Part 15 Subpart C: Section 15.203	FCC 15.203	PASS

Performed Test Item	Normative References	Limit	Result
Conducted Emission	RSS 216: Issue 2 Clause 6.2.2.1	RSS Gen	N/A
Field Strength of Spurious	RSS 216: Issue 2 Clause 6.2.2.2	RSS Gen	PASS
Channel Bandwidth	RSS Gen: Issue 5 Clause 6.7	RSS Gen	PASS
Antenna Requirement	RSS Gen: Issue 5 Clause 6.8	RSS Gen	PASS

2.2. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	21
Humidity (%RH)	25-75	50
Barometric pressure (mbar)	860-1060	950-1000

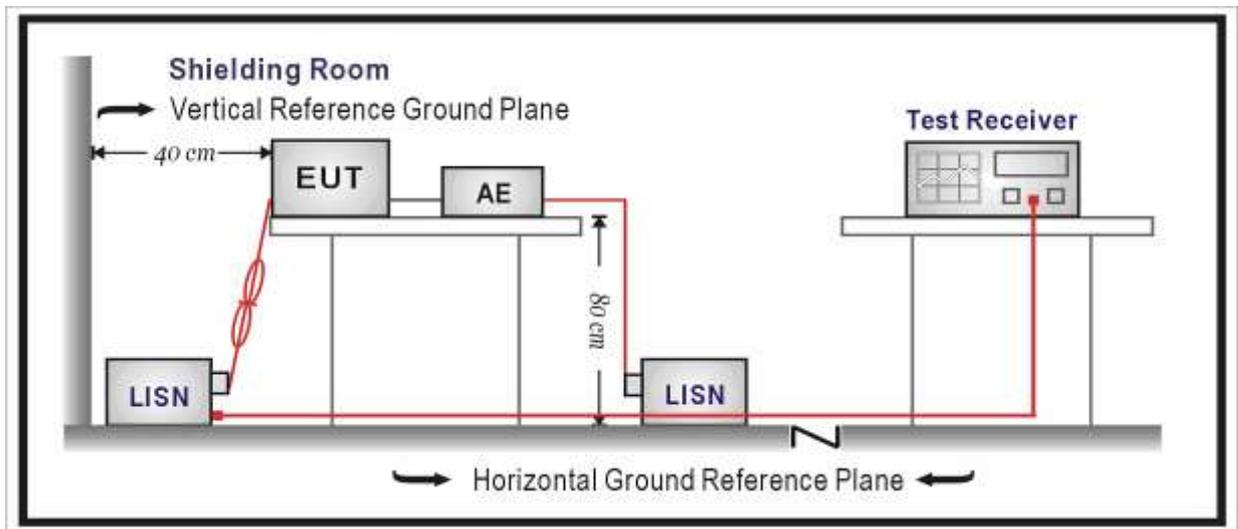
3. Conducted Emission

3.1. Test Equipment

Conducted Emission / TR-1					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100726	2018.03.29	2019.03.28
Two-Line V-Network	R&S	ENV216	100043	2018.03.29	2019.03.28
Two-Line V-Network	R&S	ENV216	100044	2018.09.17	2019.09.16
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2018.03.02	2019.03.01
50ohm Termination	SHX	TF2	07081401	2018.09.17	2019.09.16
Temperature/Humidity Meter	zhicheng	ZC1-2	TR1-TH	2018.01.04	2019.01.03

Note: All equipment are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

3.2. Test Setup



3.3. Limit

FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 – 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

3.4. Test Procedure

The EUT was setup according to ANSI C63.10 requirements. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs) Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.

3.5. Uncertainty

The measurement uncertainty is defined as ± 2.02 dB

3.6. Test Result

The device was powered by DC source, so this test was not applied.

4. Radiated Emission

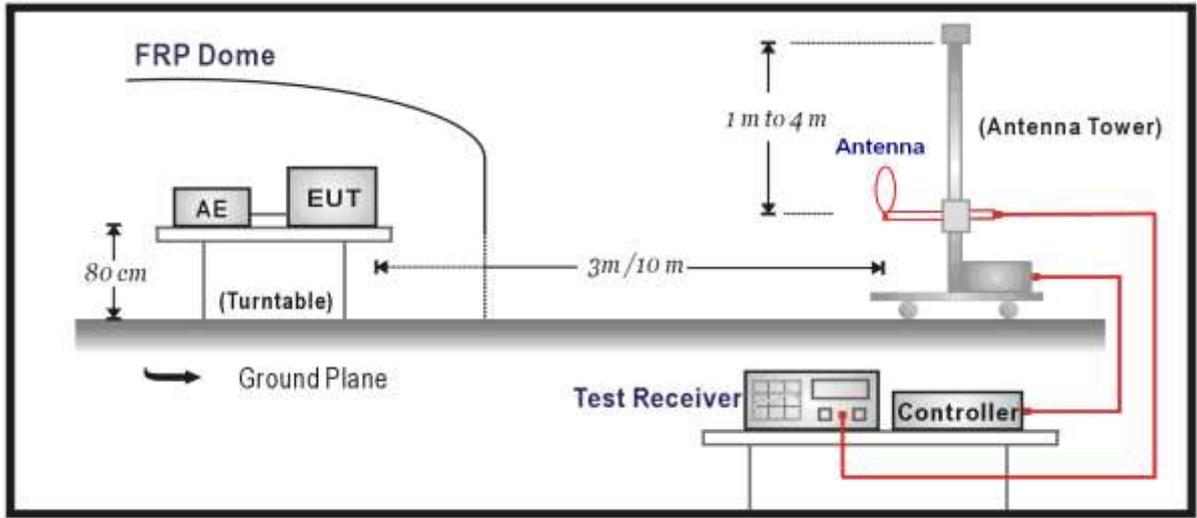
4.1. Test Equipment

Radiated Emission / AC-1					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100573	2018.03.29	2019.03.28
Loop Antenna	R&S	HFH2-Z2	833799/003	2017.11.26	2018.11.25
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2018.10.11	2019.10.10
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2018.03.02	2019.03.01
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC2-TH	2018.01.08	2019.01.07

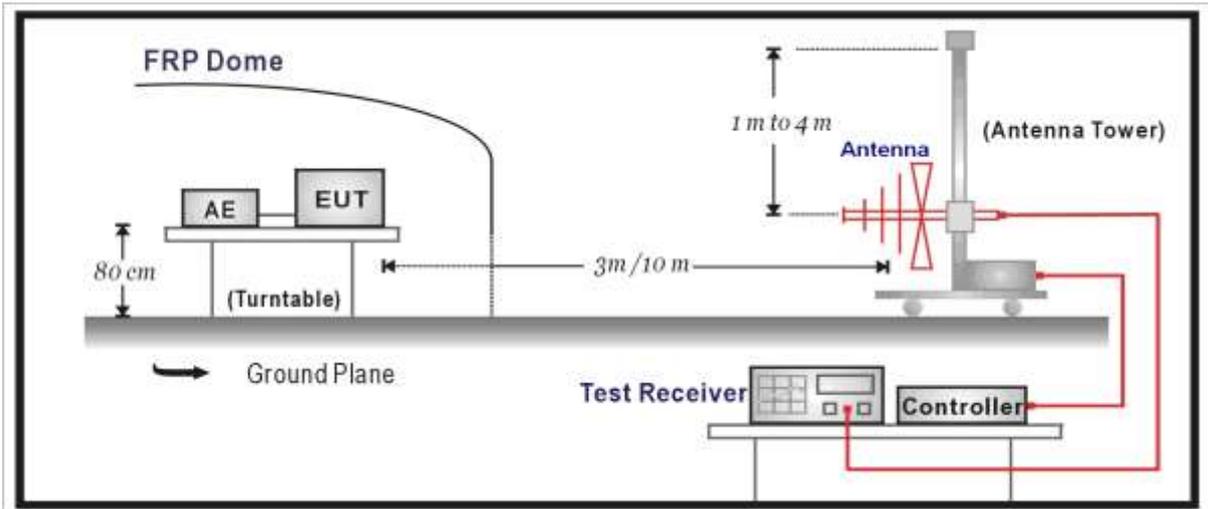
Note: All equipment are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

4.2. Test Setup

9kHz~30MHz Test Setup:



30MHz~1GHz Test Setup:



4.3. Limit

Field strength of emissions from intentional radiators operated under 15.209(a) shall not exceed the following:

FCC Part 15.209(a)		
Fundamental frequency (MHz)	Field strength of fundamental ($\mu\text{V}/\text{m}$)	Field strength of spurious emissions ($\mu\text{V}/\text{m}$)
0.009-0.490	$2400/F(\text{kHz})$	300
0.490-1.705	$24000/F(\text{kHz})$	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

(1) The tighter limits apply at the band edges.

(2) Measurements were performed at 10m and the data was extrapolated to the specified measurement distance of 300m using the square of an inverse linear distance extrapolation factor (40 dB/decade) as specified in §15.31(f)(2). Extrapolation Factor = $40 \log_{10}(300/10) = 59\text{dB}$ for example.

Measurements were performed at 10m and the data was extrapolated to the specified measurement distance of 30m using the square of an inverse linear distance extrapolation factor (40 dB/decade) as specified in §15.31(f)(2). Extrapolation Factor = $40 \log_{10}(30/10) = 19\text{dB}$ for example.

(3) All measurements were performed using a loop antenna. The antenna was positioned in three orthogonal positions (X front, Y side, Z top) and the position with the highest emission level was recorded.

4.4. Test Procedure

The EUT was setup according to ANSI C63.10 for compliance to FCC 47CFR 15.209 requirements.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 10 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This

is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10 on radiated measurement.

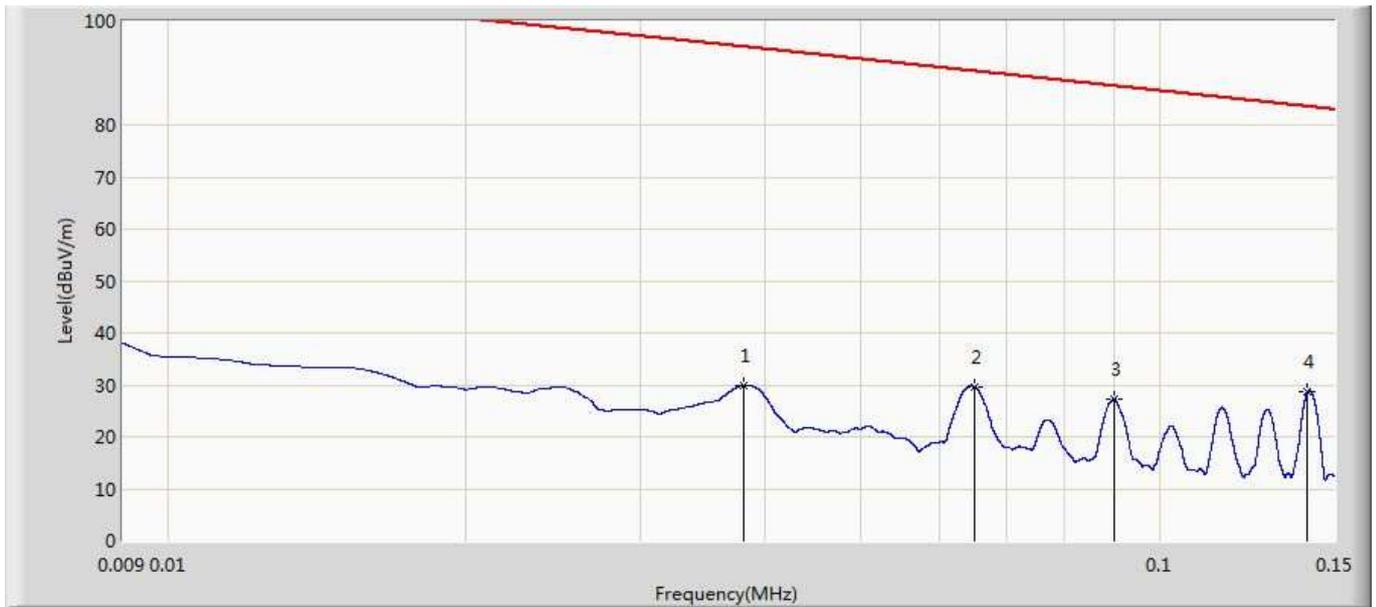
The frequency range from 9kHz to 10th harmonic is checked.

4.5. Uncertainty

The measurement uncertainty is defined as ± 3.80 dB

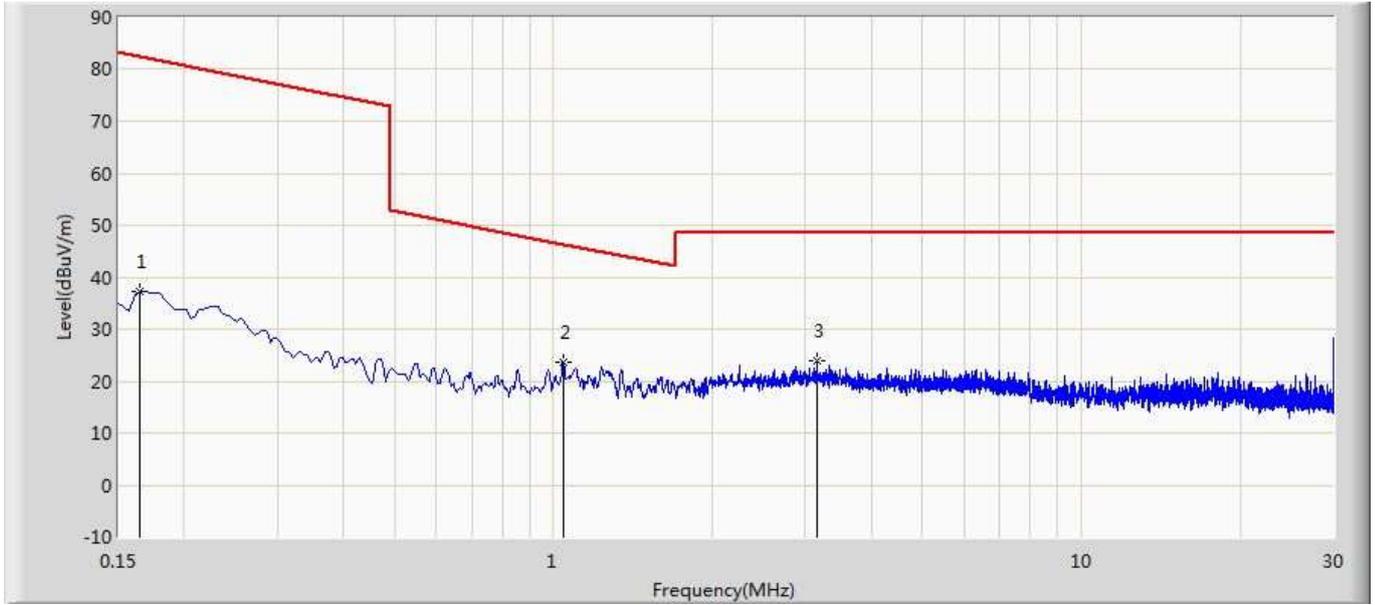
4.6. Test Result

Engineer: Eric	
Site: AC1	Time: 2018/10/15 - 13:39
Limit: FCC-Part 15.209-Below 30MHz	Margin: 0
Probe: loop antenna(0.009-30MHz)	Polarity: Vertical
EUT: WIRELESS CHARGER	Power: DC 12V
Note: Mode 1: Charging mode	



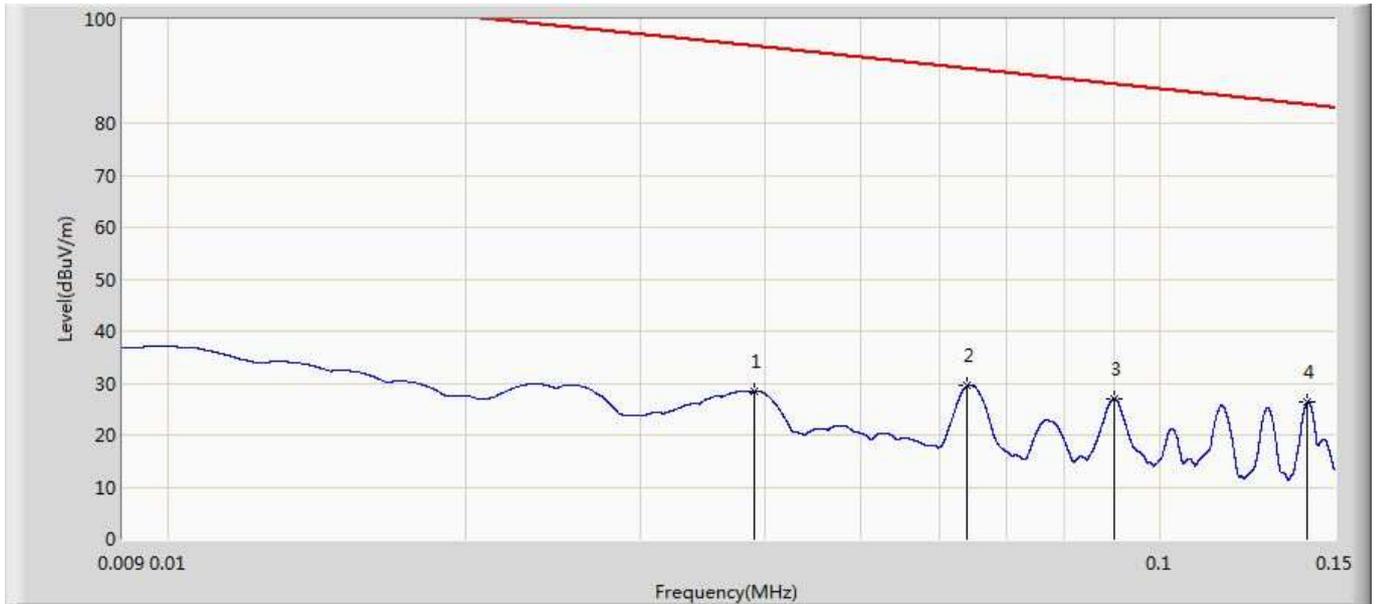
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		0.038	29.970	19.142	-65.123	95.093	10.828	QP
2		0.065	29.709	18.854	-60.722	90.431	10.855	QP
3		0.090	27.213	16.334	-60.391	87.604	10.879	QP
4	*	0.141	28.810	17.881	-54.895	83.705	10.929	QP

Engineer: Eric	
Site: AC1	Time: 2018/10/15 - 13:37
Limit: FCC-Part 15.209-Below 30MHz	Margin: 0
Probe: loop antenna(0.009-30MHz)	Polarity: Horizontal
EUT: WIRELESS CHARGER	Power: DC 12V
Note: Mode 1: Charging mode	



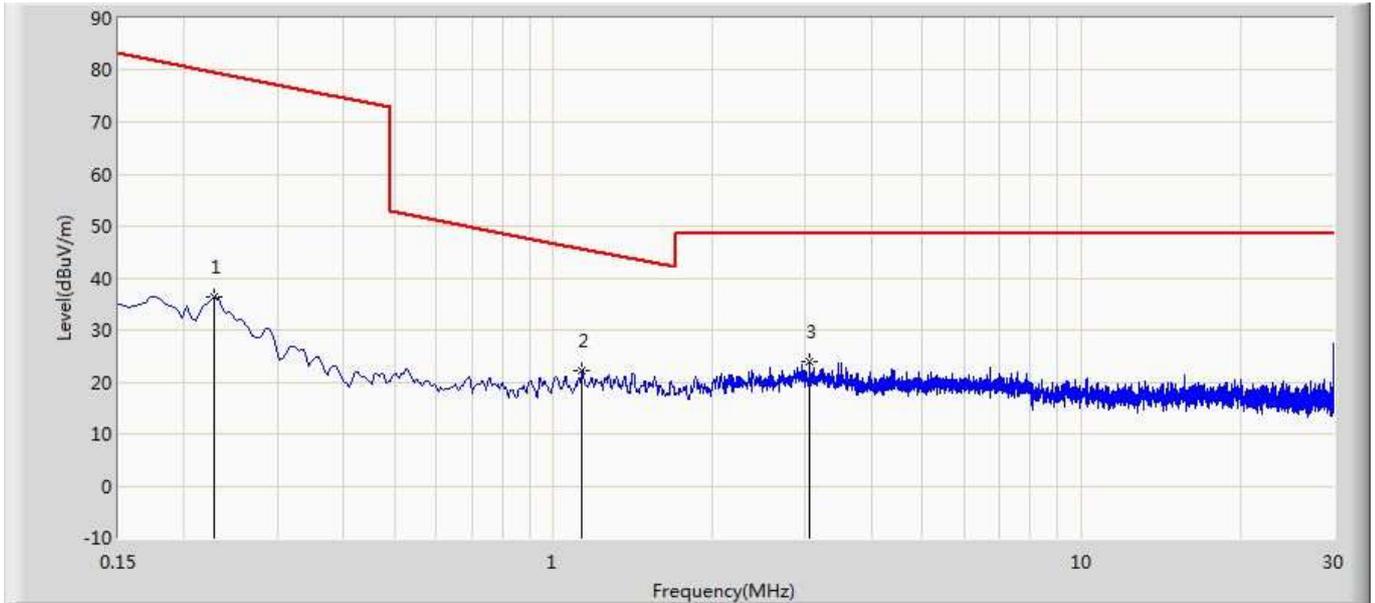
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		0.165	37.221	26.268	-45.119	82.339	10.953	QP
2	*	1.042	23.754	12.176	-22.577	46.332	11.578	QP
3		3.146	24.020	12.410	-24.607	48.627	11.610	QP

Engineer: Eric	
Site: AC1	Time: 2018/10/15 - 13:44
Limit: FCC-Part 15.209-Below 30MHz	Margin: 0
Probe: loop antenna(0.009-30MHz)	Polarity: Horizontal
EUT: WIRELESS CHARGER	Power: DC 12V
Note: Mode 1: Charging mode	



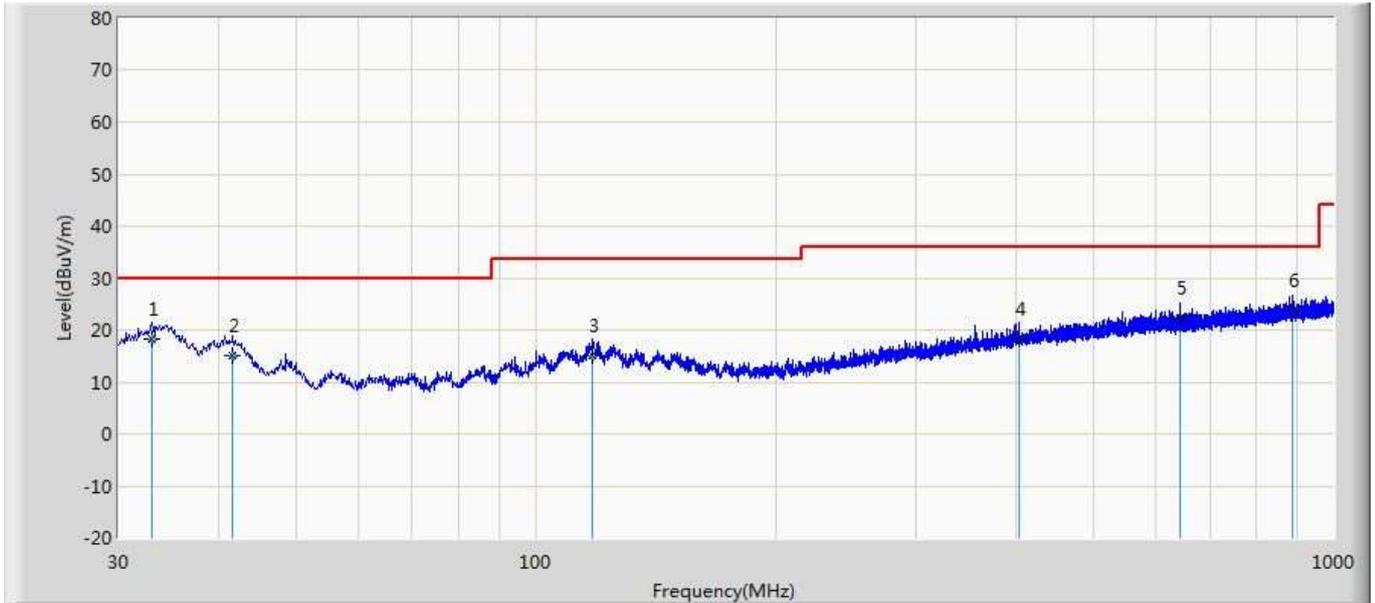
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		0.039	28.452	17.623	-66.415	94.868	10.829	QP
2		0.064	29.534	18.680	-61.032	90.565	10.854	QP
3		0.090	26.871	15.992	-60.733	87.604	10.879	QP
4	*	0.141	26.390	15.461	-57.315	83.705	10.929	QP

Engineer: Eric	
Site: AC1	Time: 2018/10/15 - 13:42
Limit: FCC-Part 15.209-Below 30MHz	Margin: 0
Probe: loop antenna(0.009-30MHz)	Polarity: Vertical
EUT: WIRELESS CHARGER	Power: DC 12V
Note: Mode 1: Charging mode	



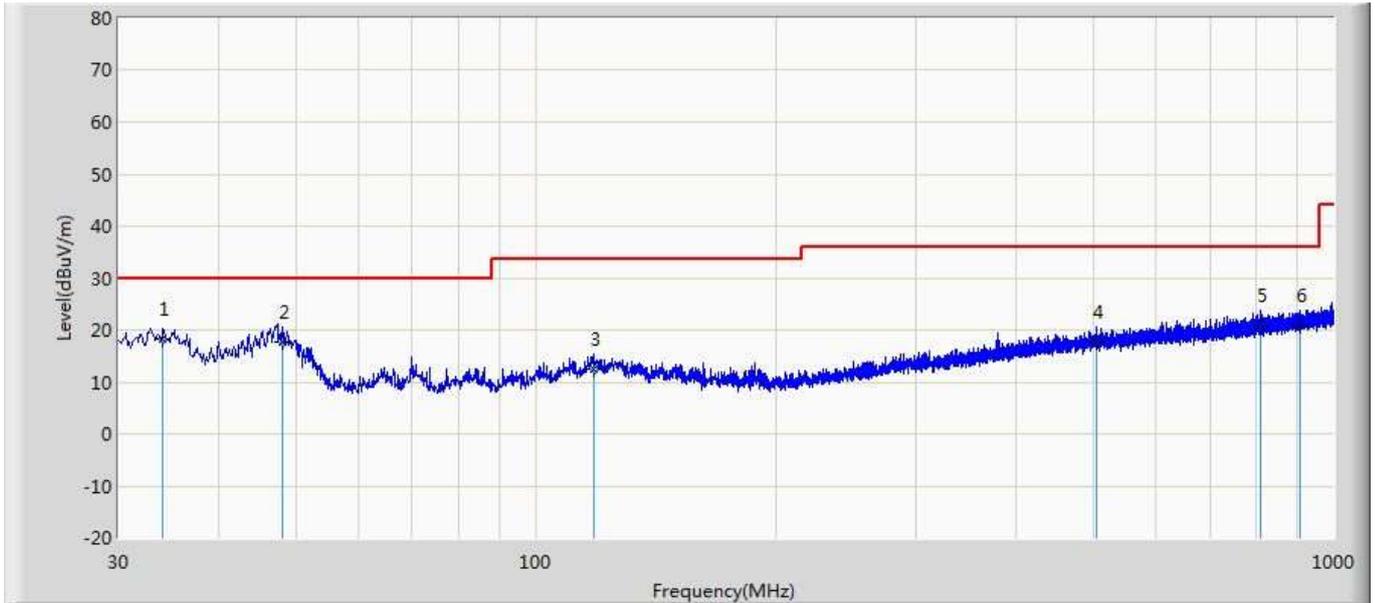
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		0.228	36.234	25.220	-43.296	79.530	11.014	QP
2	*	1.131	22.045	10.465	-23.575	45.620	11.580	QP
3		3.053	23.829	12.220	-24.799	48.627	11.609	QP

Engineer: Eric	
Site: AC1	Time: 2018/10/09 - 17:44
Limit: FCC_Part15.109_RE(10m)_ClassB	Margin: 0
Probe: CBL6112B_2931(30-1000MHz)	Polarity: Horizontal
EUT: WIRELESS CHARGER	Power: DC 12V
Note: Mode 1: Charging mode	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	33.031	18.256	23.800	-11.744	30.000	-5.545	QP
2		41.761	14.987	23.100	-15.013	30.000	-8.113	QP
3		118.027	15.118	22.100	-18.382	33.500	-6.982	QP
4		402.844	18.360	19.700	-17.640	36.000	-1.339	QP
5		641.343	22.215	18.900	-13.785	36.000	3.315	QP
6		888.450	23.698	17.200	-12.302	36.000	6.498	QP

Engineer: Eric	
Site: AC1	Time: 2018/10/09 - 17:44
Limit: FCC_Part15.109_RE(10m)_ClassB	Margin: 0
Probe: CBL6112B_2933(30-1000MHz)	Polarity: Vertical
EUT: WIRELESS CHARGER	Power: DC 12V
Note: Mode 1: Charging mode	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	34.123	18.260	25.200	-11.740	30.000	-6.940	QP
2		48.066	17.611	30.700	-12.389	30.000	-13.090	QP
3		118.270	12.400	20.500	-21.100	33.500	-8.100	QP
4		505.664	17.617	17.600	-18.383	36.000	0.017	QP
5		810.729	20.791	16.300	-15.209	36.000	4.491	QP
6		908.699	20.767	15.100	-15.233	36.000	5.667	QP

Note:

1. " * ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

Test Result	Pass
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5. 20dB Occupied Bandwidth

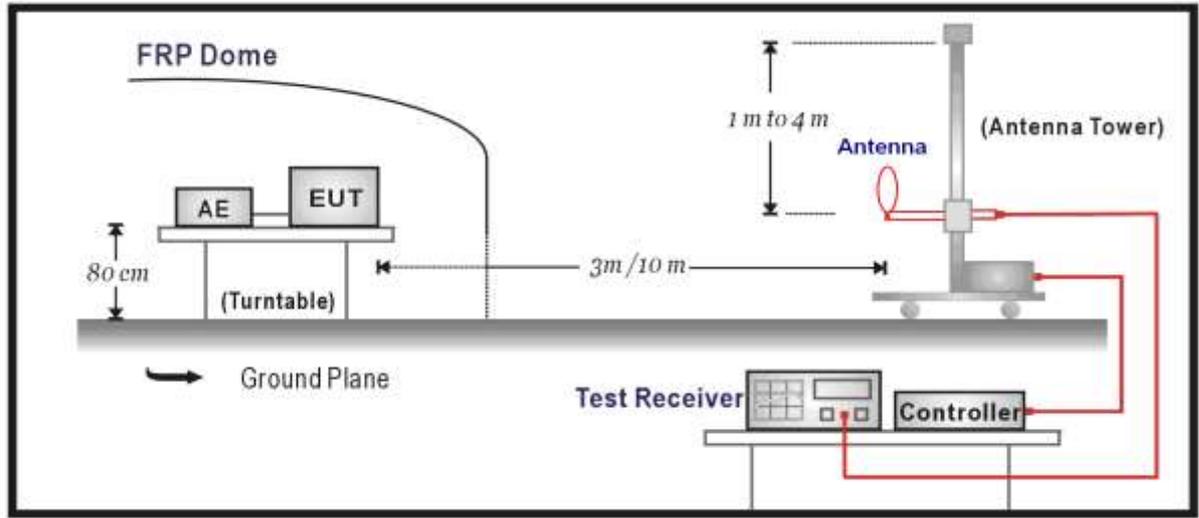
5.1. Test Equipment

20dBc Occupied Bandwidth / AC-1					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100573	2018.03.29	2019.03.28
Loop Antenna	R&S	HFH2-Z2	833799/003	2017.11.26	2018.11.25
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2018.10.11	2019.10.10
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2018.03.02	2019.03.01
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC2-TH	2018.01.08	2019.01.07

Note: All equipment are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

5.2. Test Setup

9kHz~30MHz Test Setup:



5.3. Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.215(c), must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

5.4. Test Procedure

The bandwidth of the fundamental frequency was measured by spectrum analyzer with the RBW 1%~5% of 20dBc bandwidth and the VBW three times of the RBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

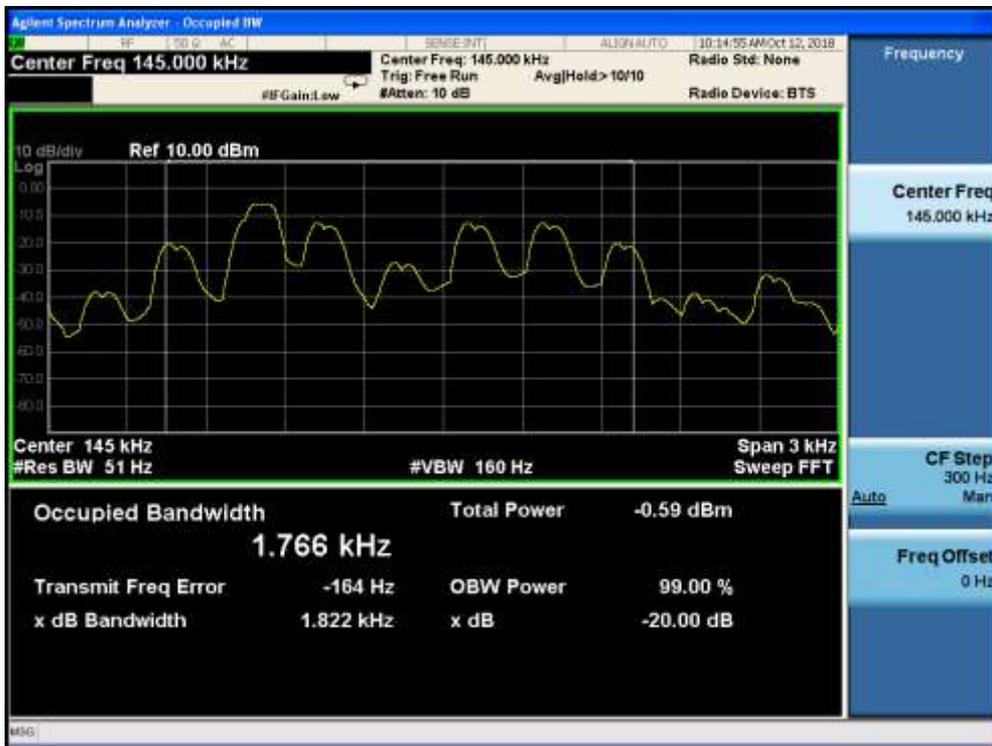
5.5. Uncertainty

The measurement uncertainty is defined as ± 10 Hz

5.6. Test Result

Product	WIRELESS CHARGER		
Test Item	20dB Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2018/09/30	Test Site	AC-1

Frequency (kHz)	20dB Bandwidth (kHz)	99% Bandwidth (kHz)
110~145	1.822	1.766



Test Result	Pass
-------------	------

6. Antenna Requirement

6.1. Requirement

Antenna Requirement Limit
<p>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 shall be considered sufficient to comply with the provisions of this section. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.</p>

6.2. Result

Antenna Connector Construction	
<input checked="" type="checkbox"/>	The use of a permanently attached antenna
<input type="checkbox"/>	The antenna use of a unique coupling to the intentional radiator
<input type="checkbox"/>	The use of a nonstandard antenna jack or electrical connector
Please refer to the attached document "Internal Photograph" to show the antenna connector.	

————— The End —————