

#### FCC TEST REPORT

#### For

## Dongguan Boxinda Electronic Technology Co., LTD

### 3 in 1 Wireless Charger

Test Model: B-12

Prepared for : Dongguan Boxinda Electronic Technology Co., LTD

Address Room 302, Building 1, 160 Luyuan Road, Tangxia Town, Dongguan

City, Guangdong Province China

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.

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Date of receipt of test sample : February 18, 2022

Number of tested samples : 2

Serial number : 220214097A-1(Engineer sample), 220214097A-2(Normal sample)

Date of Test : February 18, 2022 ~ February 26, 2022

Date of Report : February 28, 2022



Scan code to check authenticity



# FCC TEST REPORT FCC CFR 47 PART 15C

Report Reference No. .....: LCS220214097AEA

Date Of Issue ..... : February 28, 2022

Testing Laboratory Name.....: Shenzhen LCS Compliance Testing Laboratory Ltd.

101, 201 Bldg A & 301 Bldg C, Juji Industrial Park

Address ...... : Yabianxueziwei, Shajing Street, Baoan District, Shenzhen,

518000, China

Testing Location/ Procedure ........ Partial application of Harmonised standards

Other standard testing method  $\square$ 

Applicant's Name .....: : Dongguan Boxinda Electronic Technology Co., LTD

Room 302, Building 1, 160 Luyuan Road, Tangxia Town,

Dongguan City, Guangdong Province China

**Test Specification** 

Standard.....: FCC CFR 47 PART 15C

Test Report Form No. .....: LCSEMC-1.0

TRF Originator.....: Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF .....: Dated 2011-03

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Test Item Description.....: 3 in 1 Wireless Charger

Trade Mark .....: N/A

Test Model.....: B-12

Power Supply ...... : Input: DC 9V, 2A; DC 12V, 2A

Output for Phone: 5W/7.5W/10W/15W Max

Output for Earphone:5W Max

Output for Smart Watch: 2W Max

Result .....: Positive

Compiled by: Supervised by:

Cherry Chen/ Administrator

Jin Wang/ Technique principal

Gavin Liang/ Manager

Approved by:



#### **FCC TEST REPORT**

Test Report No. : LCS220214097AEA February 28, 2022

Date of issue

Test Model..... : B-12 EUT..... : 3 in 1 Wireless Charger Applicant..... : Dongguan Boxinda Electronic Technology Co., LTD Room 302, Building 1, 160 Luyuan Road, Tangxia Town,
Donaguan City Guanadana Daniel Address..... Dongguan City, Guangdong Province China Telephone..... : / Fax..... Manufacturer..... : Dongguan Boxinda Electronic Technology Co., LTD Address..... : Room 302, Building 1, 160 Luyuan Road, Tangxia Town, Dongguan City, Guangdong Province China Telephone..... Fax..... : / : Dongguan Boxinda Electronic Technology Co., LTD Factory..... : Room 302, Building 1, 160 Luyuan Road, Tangxia Town, Address..... Dongguan City, Guangdong Province China Telephone.....:: : / Fax.....: : /

Test Re	esult	Positi	ve

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.



## **Revision History**

Report Version	Issue Date	<b>Revision Content</b>	Revised By
000	February 28, 2022	Initial Issue	



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#### 1. GENERAL INFORMATION

#### 1.1 Description of Device (EUT)

EUT : 3 in 1 Wireless Charger

Test Model : B-12

Power Supply : Input: DC 9V, 2A; DC 12V, 2A

Output for Phone: 5W/7.5W/10W/15W Max

Output for Earphone:5W Max

Output for Smart Watch: 2W Max

Hardware Version : /

Software Version : /

Wireless Charging :

Operating : 110.3~205.0KHz

Frequency

Modulation Type : CW (Continuous Wave)

Antenna Type : Coil Antenna

#### 1.2 Support equipment List

	Manufacturer	Description	Model	Serial Number	Certificate
Ī	OPPO	Adapter	OP52KAUH		FCC
Ī	Apple	Phone	ipone 11		FCC
Ī	Apple	TWS Earphone			FCC
Ī	Apple	Watch			FCC

Note: Auxiliary equipment is provided by the laboratory.

#### 1.3 External I/O Cable

I/O Port Description	Quantity	Cable
Type-C USB Port	1	USB Cable: 1.1m, unshielded

#### 1.4 Description of Test Facility

NVLAP Accreditation Code is 600167-0.

FCC Designation Number is CN5024

CAB identifier is CN0071.

CNAS Registration Number is L4595. Test Firm Registration Number: 254912

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4:2014 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.



#### 1.5 Statement of the Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

#### 1.6 Measurement Uncertainty

Test Item		Frequency Range	Uncertainty	Note
		9KHz~30MHz	3.10dB	(1)
		30MHz~200MHz	2.96dB	(1)
Radiation Uncertainty :	: [	200MHz~1000MHz	3.10dB	(1)
		1GHz~26.5GHz	3.80dB	(1)
		26.5GHz~40GHz	3.90dB	(1)
Conduction Uncertainty :	:	150kHz~30MHz	1.63dB	(1)
Power disturbance :	:	30MHz~300MHz	1.60dB	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

#### 1.7 Description of Test Modes

Equipment under test was operated during the measurement under the following conditions:

Charging and communication mode

Modulation Type: CW (Continuous Wave)

Test Mo	des	
Mode 1	AC/DC Adapter (9V/2A) + EUT + Mobile Phone (Battery Status: <1%)+ Earphone+ Watch	Record
Mode 2	AC/DC Adapter (9V/2A) + EUT + Mobile Phone (Battery Status: <50%)+ Earphone+ Watch	Pre-tested
Mode 3	AC/DC Adapter (9V/2A) + EUT + Mobile Phone (Battery Status: 100%)+ Earphone+ Watch	Pre-tested
Note: All	test modes were pre-tested, but we only recorded the worst case in this report.	

For AC conducted emission, pre-test at both AC 120V/60Hz and AC 240V/50Hz, recorded worst case; For AC conducted emission, pre-test at both AC charge from power adapter modes, recorded worst case.

#### 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, FCC CFR PART 15C 15.207 and DA 00-705.

#### 2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

#### 2.2 EUT Exercise

The EUT was operated in the normal operating mode for Hopping Numbers and Dwell Time test and a continuous transmits mode for other tests.

According to its specifications, the EUT must comply with the requirements of the Section 15.207 under the FCC Rules Part 15 Subpart C.

#### 2.3 General Test Procedures

#### 2.3.1 Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

#### 2.3.2 Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane below 1GHz and 1.5 m above ground plane above 1GHz. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.3 of ANSI C63.10-2013



### 3. SYSTEM TEST CONFIGURATION

#### 3.1 Justification

The system was configured for testing in a normal condition.

#### 3.2 EUT Exercise Software

N/A.

#### 3.3 Special Accessories

N/A.

### 3.4 Block Diagram/Schematics

Please refer to the related document.

#### 3.5 Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

### 3.6 Test Setup

Please refer to the test setup photo.

#### Item Equipment Manufacturer Model No. Serial No. Cal Date Due Date N9020A MY49100040 2021-06-17 2022-06-16 1 MXA Signal Analyzer Agilent 2 SPECTRUM ANALYZER R&S FSP40 100503 2021-11-16 2022-11-15 SIDT 3 SAC-3M 03CH03-HY 2021-09-25 2022-09-24 3m Semi Anechoic Chamber **FRANKONIA** 4 MF-7082 2021-06-21 2022-06-20 **Positioning Controller** MF 5 **EMI Test Software** EZ-EMC / N/A N/A ΕZ 6 **EMI Test Receiver** ESR 7 101181 2021-06-21 2022-06-20 R&S 7 **SCHWARZBECK** FMZB 1519B 2021-06-30 2024-07-01 Active Loop Antenna 00005 8 By-log Antenna SCHWARZBECK VULB9163 9163-470 2021-06-30 2024-07-01 9 Horn Antenna SCHWARZBECK **BBHA 9120D** 9120D-1925 2021-06-30 2024-07-01 10 RF Cable-R03m Jye Bao RG142 CB021 2021-06-21 2022-06-20 11 RF Cable-HIGH SUHNER SUCOFLEX 106 03CH03-HY 2021-06-21 2022-06-20 12 **EMI Test Receiver** R&S **ESPI** 101840 2021-06-21 2022-06-20 13 Artificial Mains ENV216 101288 2021-06-21 2022-06-20 R&S 14 10dB Attenuator SCHWARZBECK MTS-IMP-136 261115-001-0032 2021-06-21 2022-06-20 15 **Broadband Preamplifier** SCHWARZBECK BBV9745 9719-025 2021-06-21 2022-06-20

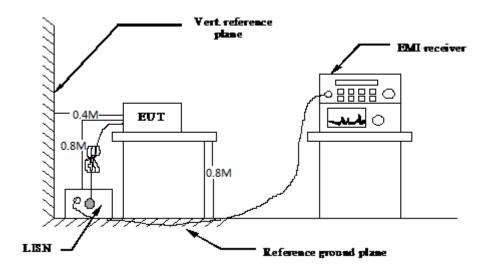
#### FCC Rules Description of Test Test Sample Result §15.207(a) AC Conducted Emissions Sample 1 Compliant §15.209 Radiated Spurious Emissions Sample 1 Compliant

Remark: The measurement uncertainty is not included in the test result. N/A - Not Applicable!!!



### 6. POWER LINE CONDUCTED MEASUREMENT

#### 6.1. Block Diagram of Test Setup



#### 6.2. Standard Applicable

According to §15.207: For all the consumer devices which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range are listed as follows:

Frequency Range	Limits (d	lBμV)
(MHz)	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

<sup>\*</sup> Decreasing linearly with the logarithm of the frequency

#### 6.3 Test Results

#### **PASS**

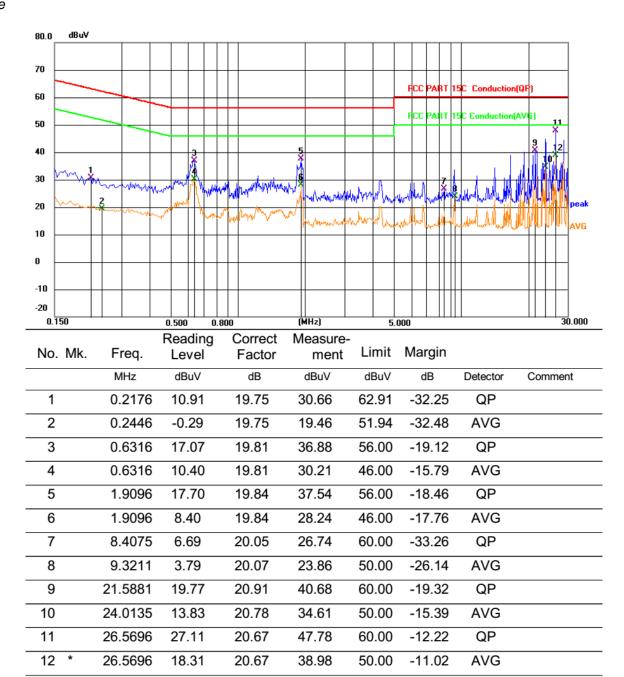
The test data please refer to following page.

Temperature	<b>22.5</b> ℃	Humidity	53.7%
Test Engineer	Kay Hu	Configurations	Transmit



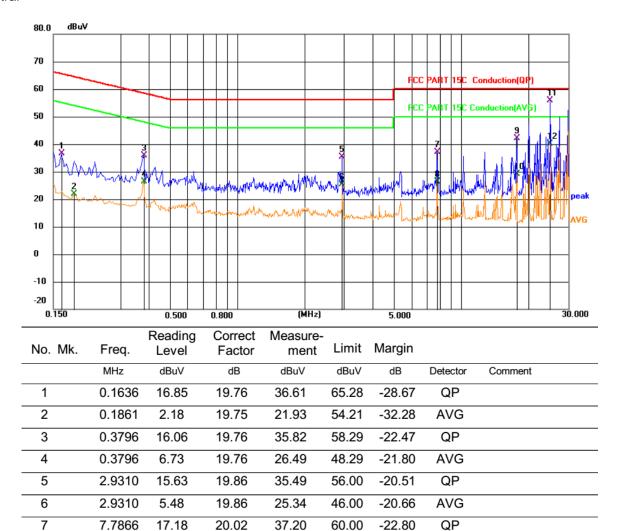
#### AC Power Line Conducted Emission (Power input to adapter @ AC 120V/60Hz (Worst Case))

Line





#### Neutral



26.47

42.19

29.17

55.94

40.07

-23.53

-17.81

-20.83

-4.06

-9.93

50.00

60.00

50.00

60.00

50.00

**AVG** 

QP

AVG

QP

**AVG** 

20.02

20.75

20.75

20.62

20.62

7.7866

17.6236

17.6236

25.0350

25.0350

8

9

10

11

12

6.45

21.44

8.42

35.32

19.45

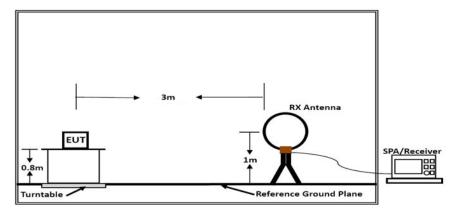
<sup>\*\*\*</sup>Note: Pre-scan all modes and recorded the worst case results in this report.

Margin=Reading level + Correct - Limit

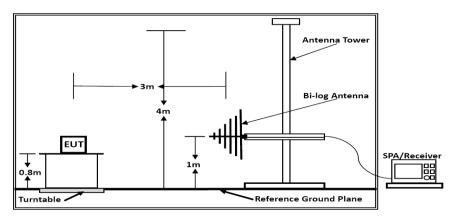


## 7. RADIATED EMISSION MEASUREMENT

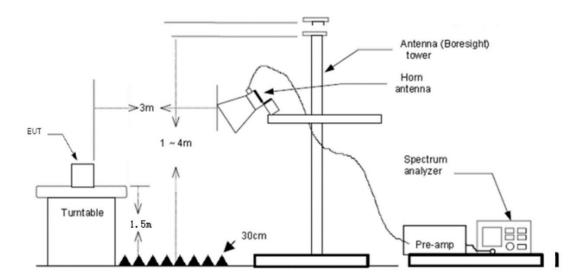
### 7.1. Block Diagram of Test Setup



Below 30MHz



Below 1GHz



15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
\1\ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293.	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(\2\)
13.36-13.41			

<sup>\1\</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

\2\ Above 38.6

According to §15.247 (d): 20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (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

## 7.3. EUT Configuration on Measurement

The following equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

#### 7.4. Operating Condition of EUT

Setup the EUT as shown in Section 7.1.



#### 7.5. Measuring Setting

The following table is the setting of spectrum analyzer and receiver.

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP/Average
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP/Average
Start ~ Stop Frequency	30MHz~1000MHz / RB 100kHz for QP

#### 7.6. Test Procedure

#### 1) Sequence of testing 9 kHz to 30 MHz

#### Setup:

- --- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- --- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.
- --- If the EUT is a floor standing device, it is placed on the ground.
- --- Auxiliary equipment and cables were positioned to simulate normal operation conditions.
- --- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- --- The measurement distance is 3 meter.
- --- The EUT was set into operation.

#### **Premeasurement:**

- --- The turntable rotates from 0° to 315° using 45° steps.
- --- The antenna height is 1 meter.
- --- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

#### Final measurement:

- --- Identified emissions during the premeasurement the software maximizes by rotating the turntable position (0° to 360°) and by rotating the elevation axes (0° to 360°).
- --- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QPK detector.
- --- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.



#### 2) Sequence of testing 30 MHz to 1 GHz

#### Setup:

- --- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- --- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.
- --- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- --- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- --- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- --- The measurement distance is 3 meter.
- --- The EUT was set into operation.

#### Premeasurement:

- --- The turntable rotates from 0° to 315° using 45° steps.
- --- The antenna is polarized vertical and horizontal.
- --- The antenna height changes from 1 to 3 meter.
- --- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

#### Final measurement:

- --- The final measurement will be performed with minimum the six highest peaks.
- --- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (± 45°) and antenna movement between 1 and 4 meter.
- --- The final measurement will be done with QP detector with an EMI receiver.
- --- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

#### 7.7. Test Results

PASS.

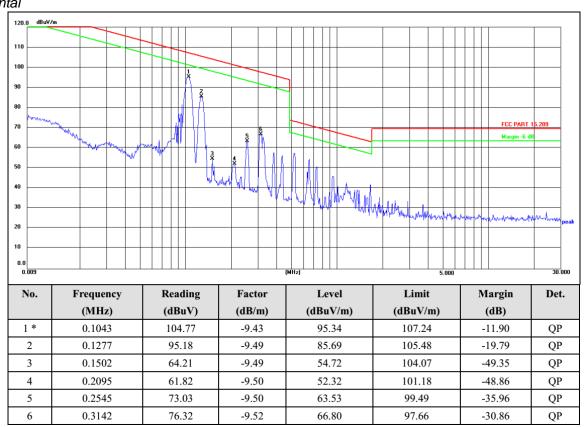
Only report the worst test data mode 1 in test report;

The test data please refer to following page:

Temperature	23.6℃	Humidity	52.2%
Test Engineer	Kay Hu	Configurations	Transmit



#### 0.009 MHz – 30 MHz Horizontal



Remark: 1). Measured at antenna position 0 degree and 90 degree, recorded worst case at 0 degree.

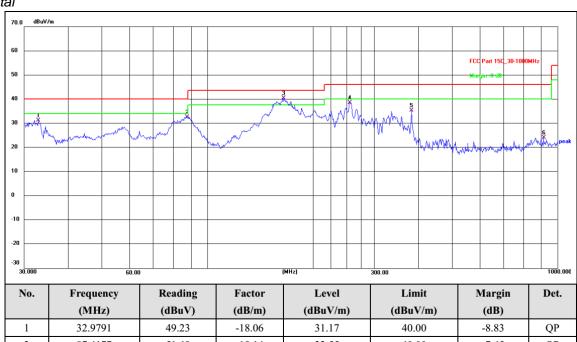
2). Margin=Reading level + Factor- Limit



Temperature	Temperature 23.5°C		52.2%	
Test Engineer	Kay Hu	Configurations	Transmit	

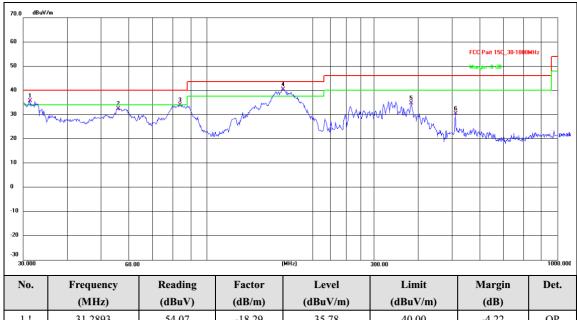
#### Below 1GHz

#### Horizontal





#### Vertical



No.	Frequency	Reading	Factor	Level	Limit	Margin	Det.
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1!	31.2893	54.07	-18.29	35.78	40.00	-4.22	QP
2	56.0007	50.70	-18.13	32.57	40.00	-7.43	QP
3	84.1100	53.42	-19.47	33.95	40.00	-6.05	QP
4 *	164.9075	59.96	-19.61	40.35	43.50	-3.15	QP
5	383.9318	49.46	-14.63	34.83	46.00	-11.17	QP
6	511.8352	43.39	-12.96	30.43	46.00	-15.57	QP

- 1). Emission level (dBuV/m) = 20 log Emission level (uV/m).
- 2). Corrected Reading: Antenna Factor + Cable Loss + Read Level Preamp Factor = Level.



#### 9. PHOTOGRAPHS OF TEST SETUP

Please refer to separated files for Test Setup Photos of the EUT.

### 10. EXTERNAL PHOTOGRAPHS OF THE EUT

Please refer to separated files for External Photos of the EUT.

#### 11. INTERNAL PHOTOGRAPHS OF THE EUT

Please refer to separated files for Internal Photos of the EUT.

-----THE END OF REPORT-----