



FCC TEST REPORT
For
Ugreen Group Limited
2-in-1 Magnetic Wireless Charger
Test Model: W526

Additional Model No.: Please Refer to Page 6

Prepared for : Ugreen Group Limited
Address : Ugreen Building, Longcheng Industrial Park, Longguanxi Road, Longhua, ShenZhen, China
Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
Address : 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park
Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China
Tel : (+86)755-82591330
Fax : (+86)755-82591332
Web : www.LCS-cert.com
Mail : webmaster@LCS-cert.com
Date of receipt of test sample : March 08, 2024
Number of tested samples : 2
Serial number : A240306015-1, A240306015-2
Serial number : Prototype
Date of Test : March 08, 2024 ~ April 07, 2024
Date of Report : April 07, 2024





FCC TEST REPORT
FCC CFR 47 PART 15C

Report Reference No. : LCSA03074058EA

Date Of Issue : April 07, 2024

Testing Laboratory Name : Shenzhen LCS Compliance Testing Laboratory Ltd.

Address : 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park
Yabianxueziwei, Shajing Street, Baoan District, Shenzhen,
518000, China

Testing Location/ Procedure : Full application of Harmonised standards
Partial application of Harmonised standards
Other standard testing method

Applicant's Name : Ugreen Group Limited

Address : Ugreen Building, Longcheng Industrial Park, Longguanxi Road,
Longhua, ShenZhen, 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

Shenzhen LCS Compliance Testing Laboratory Ltd. All rights reserved.

This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen LCS Compliance Testing Laboratory Ltd. is acknowledged as copyright owner and source of the material. Shenzhen LCS Compliance Testing Laboratory Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

Test Item Description : 2-in-1 Magnetic Wireless Charger

Trade Mark : UGREEN

Test Model : W526

Power Supply : USB-C1(IN) Input: 5.0V=3.0A/ 9.0V=3A/ 12.0V=2.5A
Wireless Charging Output:20.0W Max
(iPhone: 7.5W, AirPods:5.0W)
USB-C2(OUT) Output:5.0V=1.0A, 5.0W Max
Total Output Power:25.0W Max

Result : Positive

Compiled by:

Li Huan

Li Huan/Administrator

Supervised by:

Cary Luo

Cary Luo/ Technique principal

Approved by:

Gavin Liang

Gavin Liang/ Manager



Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



FCC TEST REPORT

| | |
|---|---------------------------------|
| Test Report No. : LCSA03074058EA | April 07, 2024 Date of issue |
|---|---------------------------------|

| | |
|--------------------------|--|
| Test Model..... | : W526 |
| EUT..... | : 2-in-1 Magnetic Wireless Charger |
| Applicant..... | : Ugreen Group Limited |
| Address..... | : Ugreen Building, Longcheng Industrial Park, Longguanxi Road, Longhua, ShenZhen, China |
| Telephone..... | : / |
| Fax..... | : / |
| Manufacturer..... | : Ugreen Group Limited |
| Address..... | : Ugreen Building, Longcheng Industrial Park, Longguanxi Road, Longhua, ShenZhen, China |
| Telephone..... | : / |
| Fax..... | : / |
| Factory..... | : Shenzhen Powerqi Technology Co., Ltd. |
| Address..... | : 2th Floor, A4 Building, A4 Block, Fangxin Science & Tech. Park, Longgang District, Shenzhen, China |
| Telephone..... | : / |
| Fax..... | : / |

| | |
|--------------------|-----------------|
| Test Result | Positive |
|--------------------|-----------------|

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 | Revision Content | Revised By |
|----------------|----------------|------------------|------------|
| 000 | April 07, 2024 | Initial Issue | --- |
| | | | |
| | | | |





TABLE OF CONTENTS

- 1. GENERAL INFORMATION 6**
 - 1.1 Description of Device (EUT) 6
 - 1.2 Support equipment List 6
 - 1.3 External I/O Cable 6
 - 1.4 Description of Test Facility 7
 - 1.5 Statement of the Measurement Uncertainty 7
 - 1.6 Measurement Uncertainty 7
 - 1.7 Description of Test Modes 8
- 2. TEST METHODOLOGY 9**
 - 2.1 EUT Configuration 9
 - 2.2 EUT Exercise 9
 - 2.3 General Test Procedures 9
 - 2.3.1 Conducted Emissions 9
 - 2.3.2 Radiated Emissions 9
- 3. SYSTEM TEST CONFIGURATION 10**
 - 3.1 Justification 10
 - 3.2 EUT Exercise Software 10
 - 3.3 Special Accessories 10
 - 3.4 Block Diagram/Schematics 10
 - 3.5 Equipment Modifications 10
 - 3.6 Test Setup 10
- 4. SUMMARY OF TEST EQUIPMENT 11**
- 5. SUMMARY OF TEST RESULT 12**
- 6. POWER LINE CONDUCTED MEASUREMENT 13**
- 7. RADIATED EMISSION MEASUREMENT 17**
 - 7.1. Block Diagram of Test Setup 17
 - 7.2. Radiated Emission Limit 18
 - 7.3. EUT Configuration on Measurement 18
 - 7.4. Field Strength Calculation 19
 - 7.5. Operating Condition of EUT 19
 - 7.6. Measuring Setting 19
 - 7.7. Test Procedure 19
 - 7.8. Test Results 21
- 8. 20 DB BANDWIDTH MEASUREMENT 26**
 - 8.1. Block Diagram of Test Setup 26
 - 8.2. Test Procedure 26
 - 8.3. Test Results 27
- 9. PHOTOGRAPHS OF TEST SETUP 28**
- 10. EXTERNAL PHOTOGRAPHS OF THE EUT 28**
- 11. INTERNAL PHOTOGRAPHS OF THE EUT 28**





1. GENERAL INFORMATION

1.1 Description of Device (EUT)

- EUT : 2-in-1 Magnetic Wireless Charger
- Test Model : W526
- Additional Model No. : 35278, 35278P, 35278X, 35278A, 35278B, 35278U, 35278JP, 35278ZD
- Model Declaration : PCB board, structure and internal of these model(s) are the same, So no additional models were tested
- Power Supply : USB-C1(IN) Input: 5.0V \Rightarrow 3.0A/ 9.0V \Rightarrow 3A/ 12.0V \Rightarrow 2.5A
Wireless Charging Output:20.0W Max (iPhone: 7.5W, AirPods:5.0W)
USB-C2(OUT) Output:5.0V \Rightarrow 1.0A, 5.0W Max
Total Output Power:25.0W Max
- Hardware Version : W526-35278-A-V2、 W526-35278-B-V1
- Software Version : W526-35278-A; W526-35278-B
- Wireless Charging :
- Operating Frequency : 110.1~205.0KHz
- Modulation Type : ASK
- Antenna Type : Coil Antenna

1.2 Support equipment List

| Manufacturer | Description | Model | Serial Number | Certificate |
|---------------------------------------|---------------|-----------------|-----------------|-------------|
| SHENZHEN TIANYIN ELECTRONICS CO., LTD | Power Adapter | TPA-4605020 0UU | -- | FCC |
| Huawei | Mobile phone | FRD-AL10 | FRD-AL10C00B373 | FCC |
| Huawei | TWS Earphone | -- | -- | FCC |

Note: Auxiliary equipment is provided by the laboratory.

1.3 External I/O Cable

| I/O Port Description | Quantity | Cable |
|----------------------|----------|-----------------------------|
| Power Port | 1 | USB Cable: 0.5m, 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 |
|----------------------------|-----------------|-------------|------|
| Radiation Uncertainty | 9KHz~30MHz | 3.10dB | (1) |
| | 30MHz~200MHz | 2.96dB | (1) |
| | 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) |
| Occupied Channel Bandwidth | 1GHz-40GHz | ±5% | (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: ASK

| Test Modes | | |
|---|--|------------|
| Mode 1 | AC/DC Adapter(12V/2.5A) + EUT + Phone + TWS Earphone (Battery Status: <1%) | Record |
| Mode 2 | AC/DC Adapter (12V/2.5A)+ EUT + Phone + TWS Earphone (Battery Status: <50%) | Record |
| Mode 3 | AC/DC Adapter (12V/2.5A) + EUT + Phone + TWS Earphone (Battery Status: 100%) | Record |
| Mode 4 | AC/DC Adapter (9V/3A) + EUT + Phone + TWS Earphone (Battery Status: <1%) | Pre-tested |
| Mode 5 | AC/DC Adapter (9V/3A) + EUT + Phone + TWS Earphone (Battery Status: <50%) | Pre-tested |
| Mode 6 | AC/DC Adapter (9V/3A) + EUT + Phone + TWS Earphone (Battery Status: 100%) | Pre-tested |
| Mode 7 | AC/DC Adapter (5V/3A) + EUT + Phone + TWS Earphone (Battery Status: <1%) | Pre-tested |
| Mode 8 | AC/DC Adapter (5V/3A) + EUT + Phone + TWS Earphone (Battery Status: <50%) | Pre-tested |
| Mode 9 | AC/DC Adapter (5V/3A) + EUT + Phone + TWS Earphone (Battery Status: 100%) | Pre-tested |
| Mode 10 | AC/DC Adapter (5V/3A) + EUT + Phone (Battery Status: <1%) | Pre-tested |
| Mode 11 | AC/DC Adapter (5V/3A) + EUT + Phone (Battery Status: <50%) | Pre-tested |
| Mode 12 | AC/DC Adapter (5V/3A) + EUT + Phone (Battery Status: 100%) | Pre-tested |
| Mode 13 | AC/DC Adapter (5V/3A) + TWS Earphone (Battery Status: <1%) | Pre-tested |
| Mode 14 | AC/DC Adapter (5V/3A) + TWS Earphone (Battery Status: <50%) | Pre-tested |
| Mode 15 | AC/DC Adapter (5V/3A) + TWS Earphone (Battery Status: 100%) | Pre-tested |
| Mode 16 | AC/DC Adapter (9V/3A) + EUT + Phone (Battery Status: <1%) | Pre-tested |
| Mode 17 | AC/DC Adapter (9V/3A) + EUT + Phone (Battery Status: <50%) | Pre-tested |
| Mode 18 | AC/DC Adapter (9V/3A) + EUT + Phone (Battery Status: 100%) | Pre-tested |
| Mode 19 | AC/DC Adapter (9V/3A) + EUT + TWS Earphone (Battery Status: <1%) | Pre-tested |
| Mode 20 | AC/DC Adapter (9V/3A) + EUT + TWS Earphone (Battery Status: <50%) | Pre-tested |
| Mode 21 | AC/DC Adapter (9V/3A) + EUT + TWS Earphone (Battery Status: 100%) | Pre-tested |
| Mode 22 | AC/DC Adapter (12V/2.5A) + EUT + Phone (Battery Status: <1%) | Pre-tested |
| Mode 23 | AC/DC Adapter (12V/2.5A) + EUT + Phone (Battery Status: <50%) | Pre-tested |
| Mode 24 | AC/DC Adapter (12V/2.5A) + EUT + Phon (Battery Status: 100%) | Pre-tested |
| Mode 25 | AC/DC Adapter (12V/2.5A) + EUT + TWS Earphone (Battery Status: <1%) | Pre-tested |
| Mode 26 | AC/DC Adapter (12V/2.5A) + EUT + TWS Earphone (Battery Status: <50%) | Pre-tested |
| Mode 27 | AC/DC Adapter (12V/2.5A) + EUT + TWS Earphone (Battery Status: 100%) | Pre-tested |
| Note: All test modes were pre-tested, but we only recorded the worst case in this report. | | |





2. TEST METHODOLOGY

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

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

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



Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



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.





4. SUMMARY OF TEST EQUIPMENT

| Item | Equipment | Manufacturer | Model No. | Serial No. | Cal Date | Due Date |
|------|--------------------------------|-------------------|-------------|-----------------|------------|------------|
| 1 | MXA Signal Analyzer | Agilent | N9020A | MY49100060 | 2023-10-18 | 2024-10-17 |
| 2 | DC Power Supply | Agilent | E3642A | N/A | 2023-10-18 | 2024-10-17 |
| 3 | Temperature & Humidity Chamber | GUANGZHOU GOGNWEN | GDS-100 | 70932 | 2023-10-05 | 2024-10-04 |
| 4 | EMI Test Software | AUDIX | E3 | / | N/A | N/A |
| 5 | 3m Semi Anechoic Chamber | SIDT FRANKONIA | SAC-3M | 03CH03-HY | 2023-06-09 | 2024-06-08 |
| 6 | Positioning Controller | Max-Full | MF7802BS | MF780208586 | N/A | N/A |
| 7 | Active Loop Antenna | SCHWARZBECK | FMZB 1519B | 00005 | 2021-08-29 | 2024-08-28 |
| 8 | By-log Antenna | SCHWARZBECK | VULB9163 | 9163-470 | 2021-09-12 | 2024-09-11 |
| 9 | Horn Antenna | SCHWARZBECK | BBHA 9120D | 9120D-1925 | 2021-09-05 | 2024-09-04 |
| 10 | EMI Test Receiver | R&S | ESR 7 | 101181 | 2023-08-15 | 2024-08-14 |
| 11 | RS SPECTRUM ANALYZER | R&S | FSP40 | 100503 | 2023-07-17 | 2024-07-16 |
| 12 | Low-frequency amplifier | SchwarzZBECK | BBV9745 | 00253 | 2023-10-18 | 2024-10-17 |
| 13 | High-frequency amplifier | JS Denki Pte | PA0118-43 | JSPA21009 | 2023-10-18 | 2024-10-17 |
| 14 | EMI Test Receiver | R&S | ESPI | 101940 | 2023-08-15 | 2024-08-14 |
| 15 | Artificial Mains | R&S | ENV216 | 101288 | 2023-06-09 | 2024-06-08 |
| 16 | 10dB Attenuator | SCHWARZBECK | MTS-IMP-136 | 261115-001-0032 | 2023-06-09 | 2024-06-08 |
| 17 | EMI Test Software | Farad | EZ | / | N/A | N/A |
| 18 | Pulse Limiter | R&S | ESH3-Z2 | 102750-NB | 2023-08-15 | 2024-08-14 |



Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



5. SUMMARY OF TEST RESULT

| 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 |
| §15.215 | 20 dB Bandwidth | Sample 1 | Compliant |

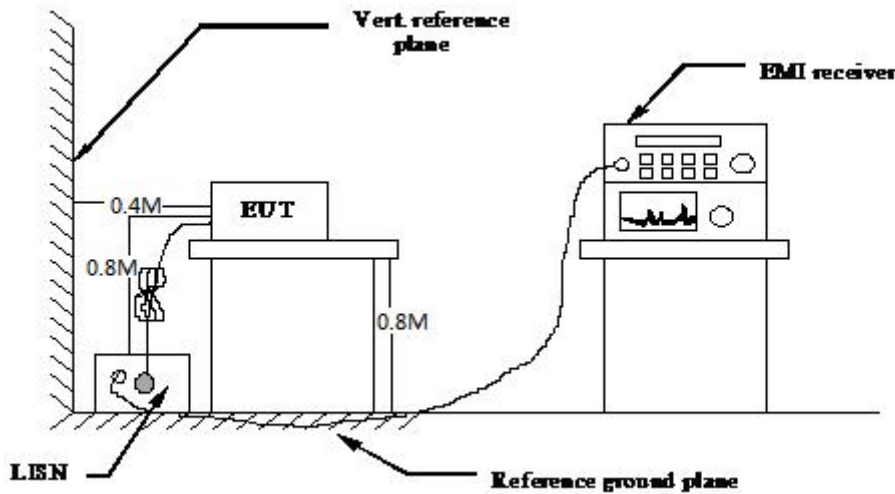
*Remark: The measurement uncertainty is not included in the test result.
N/A – Not Applicable!!!*





6. POWER LINE CONDUCTED MEASUREMENT

6.1. Block Diagram of Test Setup



6.2. Disturbance Calculation

The AC mains conducted disturbance is calculated by adding the 10dB Pulse Limiter and Cable Factor and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

Correct Factor=Lisn Factor+Cable Factor+Insertion loss of Pulse Limitter

$$CD \text{ (dBuV)} = RA \text{ (dBuV)} + PL \text{ (dB)} + CL \text{ (dB)}$$

| | |
|----------------------------------|--|
| Where CD = Conducted Disturbance | CL = Cable Attenuation Factor (Cable Loss) |
| RA = Reading Amplitude | PL = 10 dB Pulse Limiter Factor |

6.3. 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 (MHz) | Limits (dBµV) | |
|-----------------------|---------------|----------|
| | 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 |

* Decreasing linearly with the logarithm of the frequency

6.4 Test Results

PASS

The test data please refer to following page.

| | | | |
|---------------|------------|----------------|----------|
| Temperature | 24.4°C | Humidity | 53.0% |
| Test Engineer | Paddi Chen | Configurations | Transmit |





Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

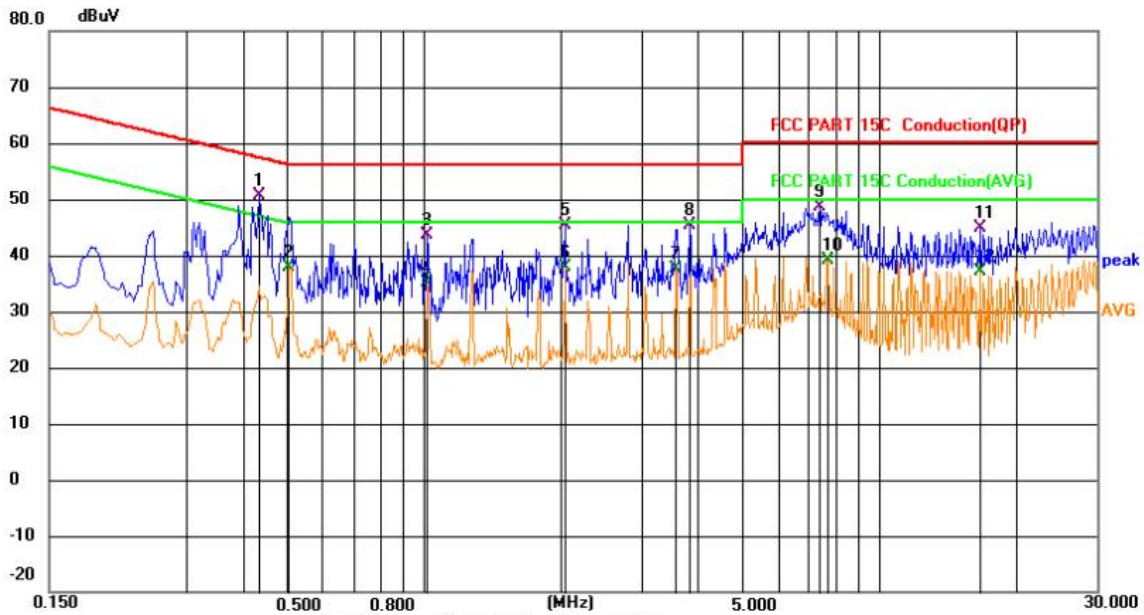
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



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

Line

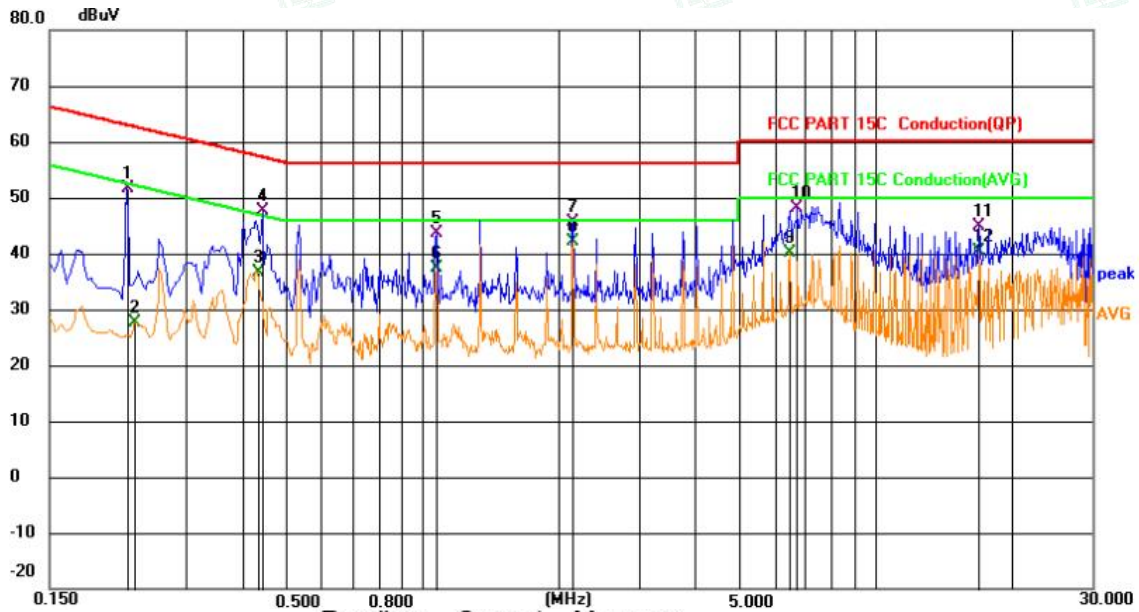


| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measurement dBuV | Limit dBuV | Margin dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|---------------------|---------------|--------------|----------|---------|
| 1 | * | 0.4336 | 30.96 | 19.64 | 50.60 | 57.18 | -6.58 | QP | |
| 2 | | 0.5056 | 18.18 | 19.65 | 37.83 | 46.00 | -8.17 | AVG | |
| 3 | | 1.0184 | 23.98 | 19.65 | 43.63 | 56.00 | -12.37 | QP | |
| 4 | | 1.0184 | 15.58 | 19.65 | 35.23 | 46.00 | -10.77 | AVG | |
| 5 | | 2.0400 | 25.71 | 19.68 | 45.39 | 56.00 | -10.61 | QP | |
| 6 | | 2.0400 | 18.25 | 19.68 | 37.93 | 46.00 | -8.07 | AVG | |
| 7 | | 3.5701 | 18.02 | 19.70 | 37.72 | 46.00 | -8.28 | AVG | |
| 8 | | 3.8266 | 25.61 | 19.70 | 45.31 | 56.00 | -10.69 | QP | |
| 9 | | 7.3996 | 28.82 | 19.74 | 48.56 | 60.00 | -11.44 | QP | |
| 10 | | 7.6966 | 19.48 | 19.76 | 39.24 | 50.00 | -10.76 | AVG | |
| 11 | | 16.6111 | 24.92 | 19.99 | 44.91 | 60.00 | -15.09 | QP | |
| 12 | | 16.6111 | 17.19 | 19.99 | 37.18 | 50.00 | -12.82 | AVG | |





Neutral



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measurement dBuV | Limit dBuV | Margin dB | Detector | Comment |
|-----|-----|-----------|--------------------|-------------------|------------------|------------|-----------|----------|---------|
| 1 | | 0.2221 | 31.93 | 19.63 | 51.56 | 62.74 | -11.18 | QP | |
| 2 | | 0.2311 | 8.01 | 19.63 | 27.64 | 52.41 | -24.77 | AVG | |
| 3 | | 0.4305 | 16.98 | 19.63 | 36.61 | 47.24 | -10.63 | AVG | |
| 4 | | 0.4426 | 28.07 | 19.64 | 47.71 | 57.01 | -9.30 | QP | |
| 5 | | 1.0725 | 24.10 | 19.65 | 43.75 | 56.00 | -12.25 | QP | |
| 6 | | 1.0725 | 17.70 | 19.65 | 37.35 | 46.00 | -8.65 | AVG | |
| 7 | | 2.1480 | 25.94 | 19.69 | 45.63 | 56.00 | -10.37 | QP | |
| 8 | * | 2.1480 | 22.38 | 19.69 | 42.07 | 46.00 | -3.93 | AVG | |
| 9 | | 6.4546 | 20.26 | 19.82 | 40.08 | 50.00 | -9.92 | AVG | |
| 10 | | 6.7111 | 28.34 | 19.82 | 48.16 | 60.00 | -11.84 | QP | |
| 11 | | 16.9216 | 24.89 | 20.02 | 44.91 | 60.00 | -15.09 | QP | |
| 12 | | 16.9216 | 20.38 | 20.02 | 40.40 | 50.00 | -9.60 | AVG | |

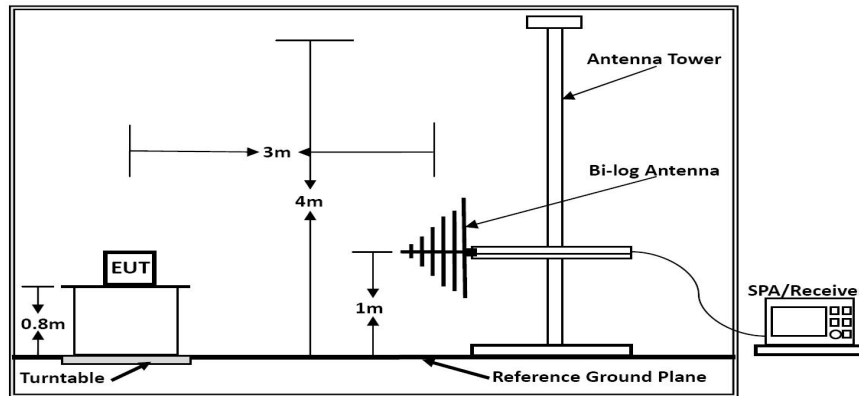
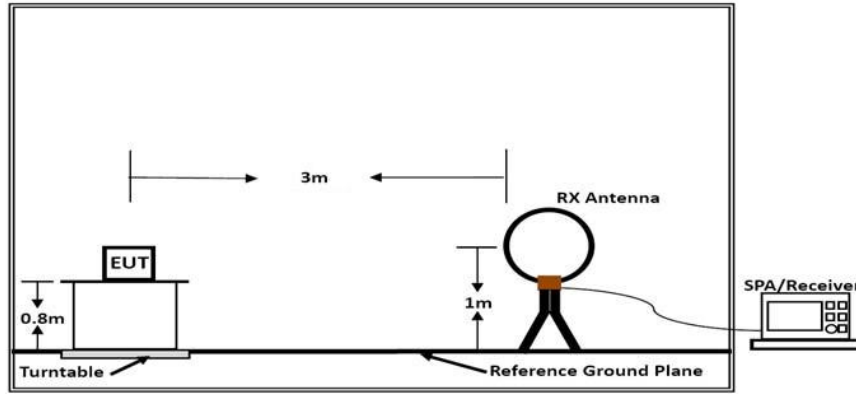
***Note: Pre-scan all modes and recorded the worst case results in this report.
 Margin=Reading level + Correct - Limit





7. RADIATED EMISSION MEASUREMENT

7.1. Block Diagram of Test Setup





7.2. Radiated Emission Limit

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 | | | |

\1\ 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. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS \text{ (dBuV/m)} = RA \text{ (dBuV)} + AF \text{ (dB/m)} + CL \text{ (dB)} - AG \text{ (dB)}$$

| | |
|---------------------------|--|
| Where FS = Field Strength | CL = Cable Attenuation Factor (Cable Loss) |
| RA = Reading Amplitude | AG = Amplifier Gain |
| AF = Antenna Factor | |

7.5. Operating Condition of EUT

- (1) Setup the EUT as shown in Section 7.1.
- (2) Let the EUT work in worst test mode1 and measure it.

7.6. 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 |

7.7. 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 ($\pm 45^\circ$) 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.

7.8. Test Results

PASS.

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

The test data please refer to following page:

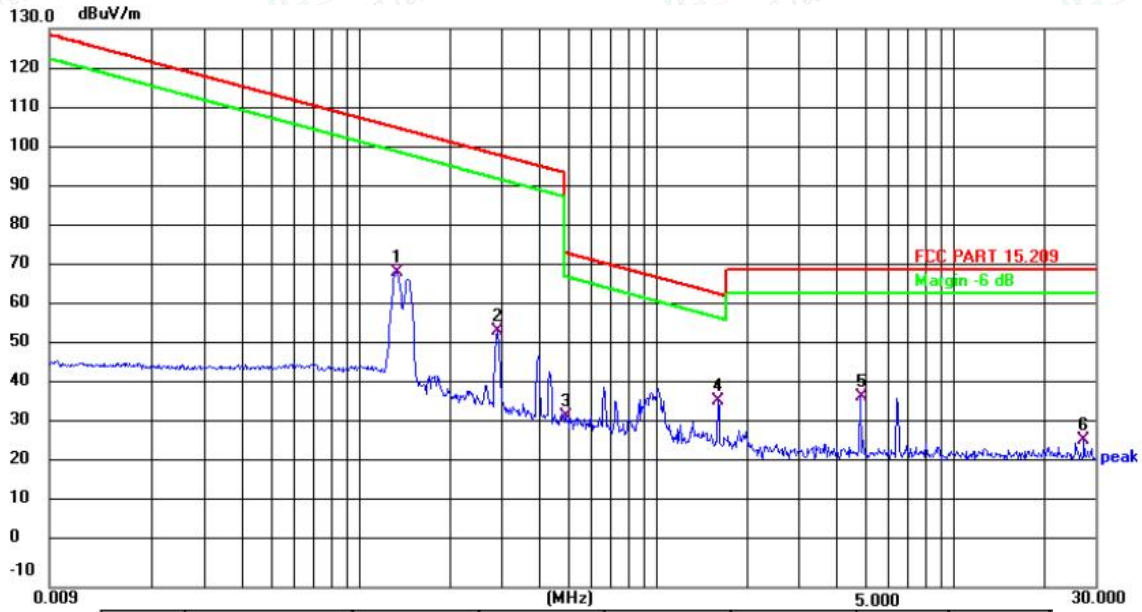
| | | | |
|---------------|------------|----------------|----------|
| Temperature | 23.6°C | Humidity | 52.2% |
| Test Engineer | Paddi Chen | Configurations | Transmit |

0.009 MHz – 30 MHz





0 degree

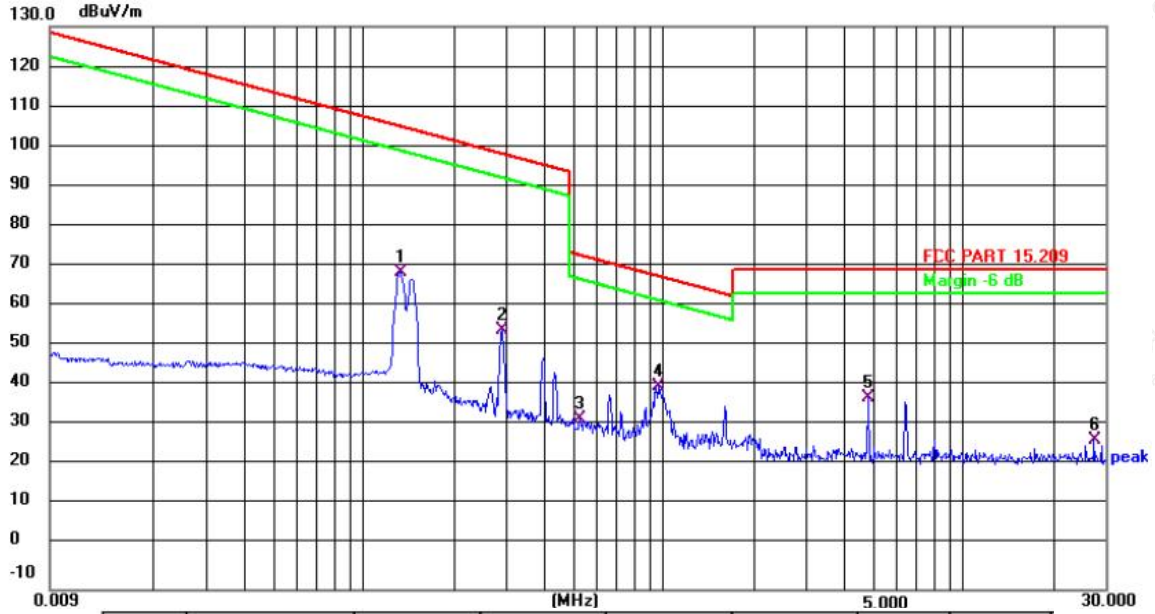


| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|
| 1 | 0.1329 | 78.74 | -9.79 | 68.95 | 105.07 | -36.12 | QP |
| 2 | 0.2897 | 64.08 | -9.75 | 54.33 | 98.34 | -44.01 | QP |
| 3 | 0.4949 | 42.60 | -9.71 | 32.89 | 73.71 | -40.82 | QP |
| 4 | 1.6045 | 45.94 | -9.32 | 36.62 | 63.50 | -26.88 | QP |
| 5 | 4.8358 | 47.30 | -9.40 | 37.90 | 69.54 | -31.64 | QP |
| 6 | 27.4390 | 37.28 | -10.26 | 27.02 | 69.54 | -42.52 | QP |





90 degree



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|
| 1 | 0.1330 | 78.72 | -9.79 | 68.93 | 105.10 | -36.17 | QP |
| 2 | 0.2898 | 64.16 | -9.75 | 54.41 | 98.35 | -43.94 | QP |
| 3 | 0.5281 | 42.03 | -9.67 | 32.36 | 73.15 | -40.79 | QP |
| 4 | 0.9625 | 49.99 | -9.27 | 40.72 | 67.94 | -27.22 | QP |
| 5 | 4.8358 | 47.30 | -9.40 | 37.90 | 69.54 | -31.64 | QP |
| 6 | 27.4391 | 37.48 | -10.26 | 27.22 | 69.54 | -42.32 | QP |

Remark: 1). Measured at antenna position 0 degree and 90 degree.
 2). Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

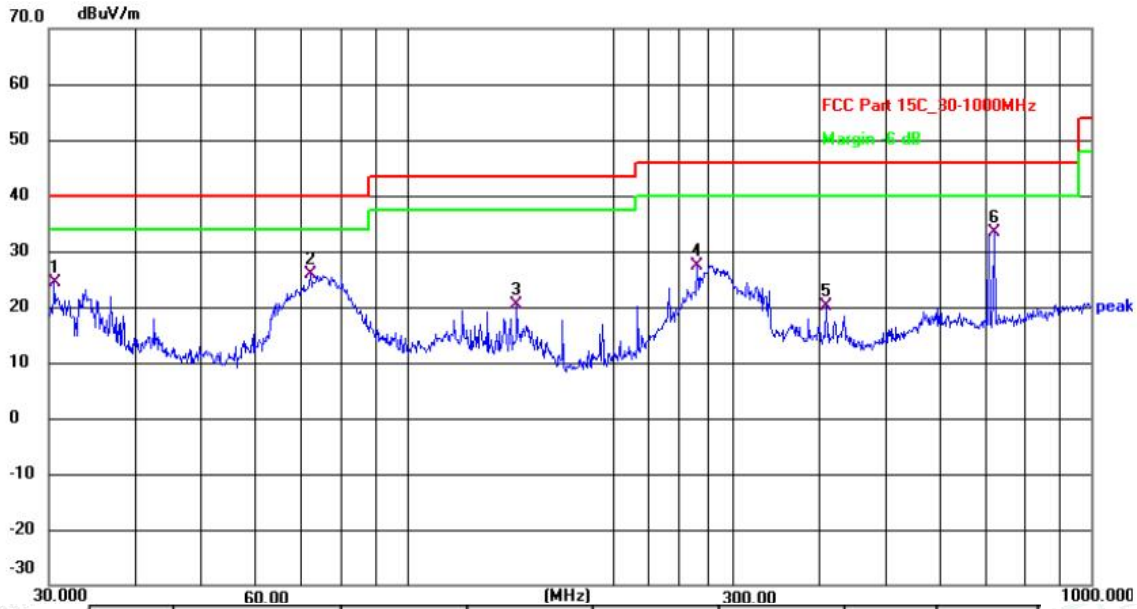




Below 1GHz

| | | | |
|---------------|------------|----------------|----------|
| Temperature | 23.8°C | Humidity | 52.1% |
| Test Engineer | Paddi Chen | Configurations | Transmit |

Horizontal



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|
| 1 | 30.5305 | 42.73 | -18.39 | 24.34 | 40.00 | -15.66 | QP |
| 2 | 72.3375 | 45.44 | -19.56 | 25.88 | 40.00 | -14.12 | QP |
| 3 | 144.8417 | 40.84 | -20.38 | 20.46 | 43.50 | -23.04 | QP |
| 4 | 265.6757 | 42.94 | -15.45 | 27.49 | 46.00 | -18.51 | QP |
| 5 | 410.3824 | 34.21 | -14.08 | 20.13 | 46.00 | -25.87 | QP |
| 6 | 721.7258 | 44.06 | -10.58 | 33.48 | 46.00 | -12.52 | QP |



Shenzhen LCS Compliance Testing Laboratory Ltd.

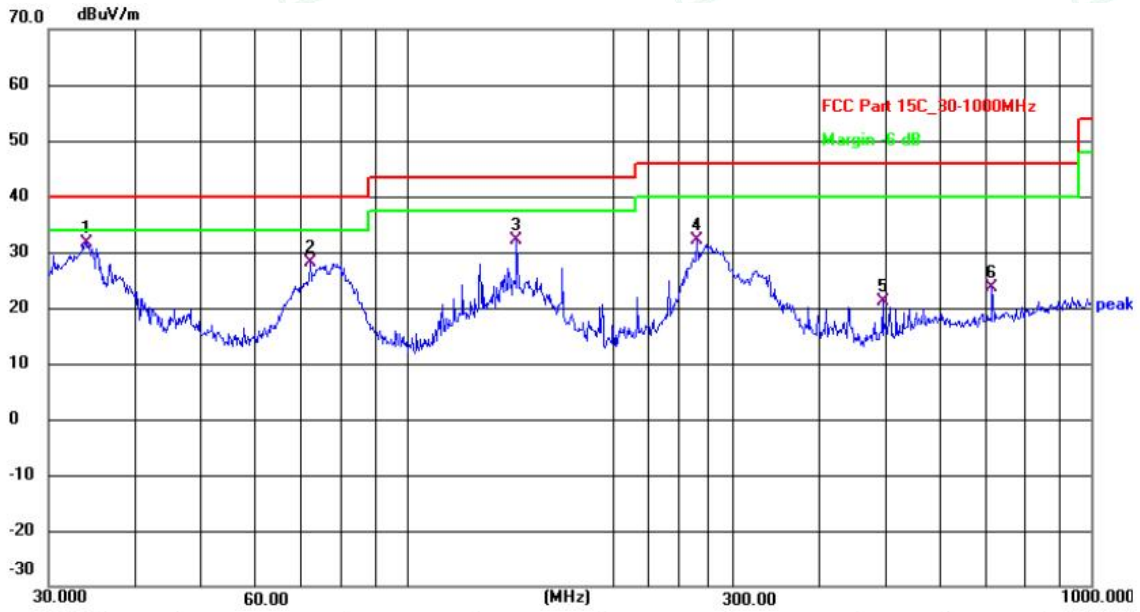
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



Vertical



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|
| 1 | 34.1559 | 49.57 | -17.91 | 31.66 | 40.00 | -8.34 | QP |
| 2 | 72.3375 | 47.72 | -19.56 | 28.16 | 40.00 | -11.84 | QP |
| 3 | 144.8417 | 52.53 | -20.38 | 32.15 | 43.50 | -11.35 | QP |
| 4 | 265.6757 | 47.65 | -15.45 | 32.20 | 46.00 | -13.80 | QP |
| 5 | 495.9343 | 34.56 | -13.37 | 21.19 | 46.00 | -24.81 | QP |
| 6 | 716.6820 | 34.26 | -10.66 | 23.60 | 46.00 | -22.40 | QP |

1). Emission level (dBuV/m) = 20 log Emission level (uV/m).

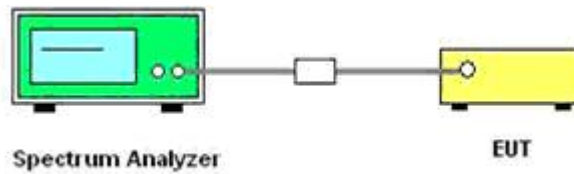
2). Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.





8. 20 DB BANDWIDTH MEASUREMENT

8.1. Block Diagram of Test Setup



8.2. Test Procedure

Use the following spectrum analyzer settings:

Span = 1KHz

RBW = 10Hz

VBW = 30Hz

Sweep = auto

Detector function = peak

Trace = max hold

The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).



Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity

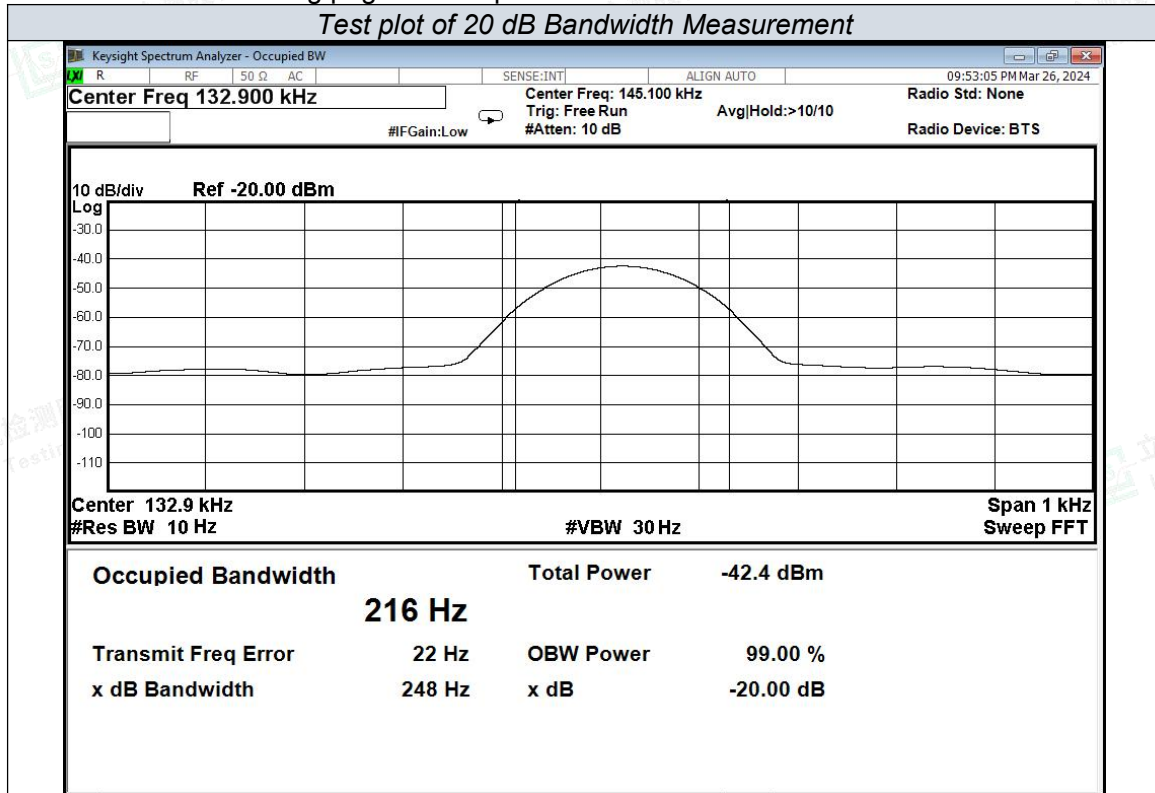


8.3. Test Results

| Test Result Of 20dB Bandwidth Measurement | | |
|---|----------------------|---------------|
| Test Frequency (MHz) | 20dB Bandwidth (kHz) | Limit (KHz) |
| 0.1329 | 0.248 | Non-Specified |

Result: Pass

Please refer to the following page for test plot.



Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



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-----



Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity