

TEST REPORT

Application No.: SHEM2104003314CR
FCC ID: 2A2EZVW30ACAP
Applicant: Delta Electronics, Inc.
Address of Applicant: No. 256, Yangguang Street, Neihu District, Taipei 114067, Taiwan
Manufacturer: Delta Electronics, Inc.
Address of Manufacturer: No. 256, Yangguang Street, Neihu District, Taipei 114067, Taiwan
Factory: Delta Electronics, Inc.
Address of Factory: 252, Shangying Road, Guishan District, Taoyuan City 333425, Taiwan
Equipment Under Test (EUT):
EUT Name: Wireless Charger Module
Model No.: PT00062426-B
Standard(s) : 47 CFR Part 18
Date of Receipt: 2021-04-23
Date of Test: 2021-04-26 to 2021-05-28
Date of Issue: 2021-08-10

| | |
|---------------------|--------------|
| Test Result: | Pass* |
|---------------------|--------------|

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

Parlan Zhan

Parlan Zhan
E&E Section Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. 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. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.
Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com



| Revision Record | | | |
|-----------------|-------------|------------|-------------------|
| Version | Description | Date | Remark |
| 00 | Original | 2021-06-30 | / |
| 01 | Update | 2021-08-10 | Revise test mode. |
| | | | |

| Authorized for issue by: | | | |
|--------------------------|--|--|--|
| | |  | |
| | | <hr/> | |
| | | Micheal Niu / Project Engineer | |
| | |  | |
| | | <hr/> | |
| | | Parlam Zhan / Reviewer | |

2 Test Summary

| Emission Part | | | | |
|---|----------------|-------------------|-------------|--------|
| Item | Standard | Method | Requirement | Result |
| Conducted Emissions at Mains Terminals (150kHz-30MHz) | 47 CFR Part 18 | FCC OST/MP-5:1986 | Class B | Pass |
| Radiated Emissions (Magnetic field Strength) (9kHz-30MHz) | 47 CFR Part 18 | FCC OST/MP-5:1986 | Class B | Pass |



3 Contents

| | Page |
|--|------|
| 1 COVER PAGE..... | 1 |
| 2 TEST SUMMARY | 3 |
| 3 CONTENTS..... | 4 |
| 4 GENERAL INFORMATION..... | 5 |
| 4.1 DETAILS OF E.U.T. | 5 |
| 4.2 DESCRIPTION OF SUPPORT UNITS | 5 |
| 4.3 MEASUREMENT UNCERTAINTY..... | 5 |
| 4.4 TEST LOCATION..... | 6 |
| 4.5 TEST FACILITY..... | 6 |
| 4.6 DEVIATION FROM STANDARDS..... | 6 |
| 4.7 ABNORMALITIES FROM STANDARD CONDITIONS..... | 6 |
| 5 EQUIPMENT LIST..... | 7 |
| 6 EMISSION TEST RESULTS | 9 |
| 6.1 CONDUCTED EMISSIONS AT MAINS TERMINALS (150kHz-30MHz) | 9 |
| 6.2 RADIATED EMISSIONS (MAGNETIC FIELD STRENGTH) (9kHz-30MHz)..... | 12 |
| 7 TEST SETUP PHOTOGRAPHS | 14 |
| 8 EUT CONSTRUCTIONAL DETAILS..... | 14 |

4 General Information

4.1 Details of E.U.T.

Power supply: Input: DC 13.5V,2.4A by DC power supply
 Output: DC 5V,6A
 Wireless charging (Single):15W
 Wireless charging (Dual):15W*2

Test voltage: AC 120V/60Hz

Operation frequency: 126.7KHz-128.7KHz

Antenna type: Inductive Loop Coil Antenna

4.2 Description of Support Units

| Description | Manufacturer | Model No. |
|-----------------|--------------|-----------|
| DC power supply | Agilent | E3632A |
| Load | / | / |
| Mobilephone | Apple | Iphone 12 |
| Mobilephone | Huawei | P40 |

4.3 Measurement Uncertainty

| No. | Item | Measurement Uncertainty |
|-----|---------------------------------|-------------------------|
| 1 | Radio Frequency | 8.4 x 10 ⁻⁸ |
| 2 | Timeout | 2s |
| 3 | Duty Cycle | 0.37% |
| 4 | Occupied Bandwidth | 3% |
| 5 | RF Conducted Power | 0.6dB |
| 6 | RF Power Density | 2.9dB |
| 7 | Conducted Spurious Emissions | 0.75dB |
| 8 | RF Radiated Power | 5.1dB (Below 1GHz) |
| | | 4.9dB (Above 1GHz) |
| 9 | Radiated Spurious Emission Test | 4.2dB (Below 30MHz) |
| | | 4.5dB (30MHz-1GHz) |
| | | 5.1dB (1GHz-18GHz) |
| | | 5.4dB (Above 18GHz) |
| 10 | Temperature Test | 1°C |
| 11 | Humidity Test | 3% |
| 12 | Supply Voltages | 1.5% |
| 13 | Time | 3% |

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

4.4 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

No tests were sub-contracted.

4.5 Test Facility

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

- **CNAS (No. CNAS L4354)**

CNAS has accredited Compliance Certification Services (Kunshan) Inc. to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 2541.01)**

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

- **FCC (Designation Number: CN1172)**

Compliance Certification Services Inc. has been recognized as an accredited testing laboratory. Designation Number: CN1172.

- **ISED (CAB identifier: CN0072)**

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.

CAB Identifier: CN0072.

- **VCCI (Member No.: 1938)**

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-1600, C-1707, T-1499, G-10216 respectively.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

5 Equipment List

Conducted Emission at Mains Terminals (150kHz-30MHz)

| Item | Equipment | Manufacturer | Model | Serial Number | Cal Date | Cal. Due Date |
|------|------------------|--------------|-----------|---------------|------------|---------------|
| 1 | Test Software | Farad | EZ-EMC | CCS-03A1 | N.C.R | N.C.R |
| 2 | EMI Test Receive | R&S | ESCI | 100781 | 02/01/2021 | 01/31/2022 |
| 3 | LISN | R&S | ENV216 | 101604 | 10/19/2020 | 10/18/2021 |
| 4 | LISN | Schwarzbeck | NNLK 8129 | 8129-143 | 10/19/2020 | 10/18/2021 |
| 5 | Pulse Limiter | R&S | ESH3-Z2 | 100609 | 02/01/2021 | 01/31/2022 |
| 6 | CE test Cable | Thermax | | 14 | 10/17/2020 | 10/16/2021 |

RF Conducted Test

| Item | Equipment | Manufacturer | Model | Serial Number | Cal Date | Cal. Due Date |
|------|--------------------------------------|---------------|------------|---------------|------------|---------------|
| 1 | Test Software | BST | TST PASS | V 1.1.0 | N.C.R | N.C.R |
| 2 | Spectrum Analyzer | Agilent | E4446A | MY44020154 | 04/22/2021 | 04/21/2022 |
| 3 | Spectrum Analyzer | Keysight | N9020A | MY53420174 | 09/25/2020 | 09/24/2021 |
| 4 | Spectrum Analyzer | Keysight | N9020A | MY55370209 | 10/19/2020 | 10/18/2021 |
| 5 | Signal Generator | Agilent | E8257C | MY43321570 | 10/18/2020 | 10/18/2021 |
| 6 | MXG Vector Signal Generator | Agilent | N5182A | MY50142015 | 09/25/2020 | 09/24/2021 |
| 7 | Universal Radio Communication Tester | R&S | CMU200 | 109525 | 10/19/2020 | 10/18/2021 |
| 8 | Universal Radio Communication Tester | R&S | CMW500 | 159275 | 10/19/2020 | 10/18/2021 |
| 9 | Power Meter | Anritsu | ML2495A | 1445010 | 04/21/2021 | 04/20/2022 |
| 10 | Switcher | CCSRF | FY562 | KS301219 | 10/19/2020 | 10/18/2021 |
| 11 | AC Power Source | EXTECH | 6605 | 1570106 | N.C.R | N.C.R |
| 12 | DC Power Supply | Aglient | E3632A | MY50340053 | N.C.R | N.C.R |
| 13 | 6dB Attenuator | Mini-Circuits | NAT-6-2W | 15542-1 | N.C.R | N.C.R |
| 14 | Power Divider | AISI | IOWOPE2068 | PE2068 | N.C.R | N.C.R |
| 15 | Filter | MICRO-TRONICS | BRM50701 | 5 | N.C.R | N.C.R |
| 16 | Conducted test cable | / | RF01-RF04 | / | 04/21/2020 | 04/22/2021 |
| 17 | Temp. / Humidity Chamber | TERCHY | MHK-120AK | X30109 | 04/21/2020 | 04/20/2021 |

RF Radiated Test

| Item | Equipment | Manufacturer | Model | Serial Number | Cal Date | Cal. Due Date |
|------|----------------------------|--------------|-----------|---------------|------------|---------------|
| 1 | Test Software | Farad | EZ-EMC | CCS-03A1 | N/A | N/A |
| 2 | Spectrum Analyzer | R&S | FSV40 | 101493 | 10/19/2020 | 10/18/2021 |
| 3 | Signal Generator | Agilent | E8257C | MY43321570 | 10/10/2020 | 10/18/2021 |
| 4 | Loop Antenna | COM-POWER | AL-130R | 10160008 | 04/29/2019 | 04/28/2021 |
| 5 | Loop Antenna | COM-POWER | AL-130R | 10160008 | 04/29/2021 | 04/28/2023 |
| 6 | Bilog Antenna | TESEQ | CBL 6112D | 35403 | 06/22/2019 | 06/21/2021 |
| 7 | Bilog Antenna | SCHWARZBECK | VULB9160 | 9160-3342 | 04/29/2019 | 04/28/2021 |
| 8 | Bilog Antenna | SCHWARZBECK | VULB9160 | 9160-3342 | 04/29/2021 | 04/28/2023 |
| 9 | Horn-antenna(1-18GHz) | Schwarzbeck | BBHA9120D | 267 | 10/26/2020 | 10/25/2022 |
| 10 | Horn-antenna(1-18GHz) | ETS-LINDGREN | 3117 | 00143290 | 02/22/2021 | 02/21/2023 |
| 11 | Horn Antenna(18-40GHz) | Schwarzbeck | BBHA9170 | BBHA9170171 | 02/22/2021 | 02/21/2024 |
| 12 | Pre-Amplifier(30MHz~18GHz) | CCSRF | AMP1277 | 1 | 10/19/2020 | 10/18/2021 |
| 13 | Pre-Amplifier(0.1~26.5GHz) | EMCI | EMC012645 | 980060 | 04/21/2020 | 04/20/2021 |
| 14 | Pre-Amplifier(0.1~26.5GHz) | EMCI | EMC012645 | 980060 | 04/21/2021 | 04/20/2022 |



| | | | | | | |
|----|----------------------------|-------------------------|-------------|-------------|------------|------------|
| 15 | Low Pass Filter | MICRO-TRONICS | VLFX-950 | RV142900829 | N.C.R | N.C.R |
| 16 | High Pass Filter | Mini-Circuits | VHF-1200 | 15542 | N.C.R | N.C.R |
| 17 | Filter (5450MHz~5770 MHz) | MICRO-TRONICS | BRC50704-01 | 2 | N.C.R | N.C.R |
| 18 | Filter (5690 MHz~5930 MHz) | MICRO-TRONICS | BRC50705-01 | 4 | N.C.R | N.C.R |
| 19 | Filter (5150 MHz~5350 MHz) | MICRO-TRONICS | BRC50703-01 | 2 | N.C.R | N.C.R |
| 20 | Filter (885 MHz~915 MHz) | MICRO-TRONICS | BRM14698 | 1 | N.C.R | N.C.R |
| 21 | Filter (815 MHz~860 MHz) | MICRO-TRONICS | BRM14697 | 1 | N.C.R | N.C.R |
| 22 | Filter (1745 MHz~1910 MHz) | MICRO-TRONICS | BRM14700 | 1 | N.C.R | N.C.R |
| 23 | Filter (1922 MHz~1977 MHz) | MICRO-TRONICS | BRM50715 | 1 | N.C.R | N.C.R |
| 24 | Filter (2550 MHz) | MICRO-TRONICS | HPM13362 | 5 | N.C.R | N.C.R |
| 25 | Filter (1532 MHz~1845 MHz) | MICRO-TRONICS | BRM50713 | 1 | N.C.R | N.C.R |
| 26 | Filter (2.4GHz) | MICRO-TRONICS | BRM50701 | 5 | N.C.R | N.C.R |
| 27 | RE test cable | / | RE01-RE04 | / | 04/21/2020 | 04/22/2021 |
| 28 | RE test cable | / | RE01-RE04 | / | 04/21/2021 | 04/22/2022 |
| 29 | Software | Fard technology co.,ltd | EZ-EMC | 1.1.1.2 | N/A | N/A |

6 Emission Test Results

6.1 Conducted Emissions at Mains Terminals (150kHz-30MHz)

| | |
|-------------------|--|
| Test Requirement: | 47 CFR Part 18 |
| Test Method: | FCC OST/MP-5:1986 |
| Frequency Range: | 150kHz to 30MHz |
| Limit: | |
| 0.15M-0.5MHz | 66dB(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) average |
| 0.5M-5MHz | 56dB(μV) quasi-peak, 46dB(μV) average |
| 5M-30MHz | 60dB(μV) quasi-peak, 50dB(μV) average |
| Detector: | Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz |

6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 48 % RH Atmospheric Pressure: 1010 mbar

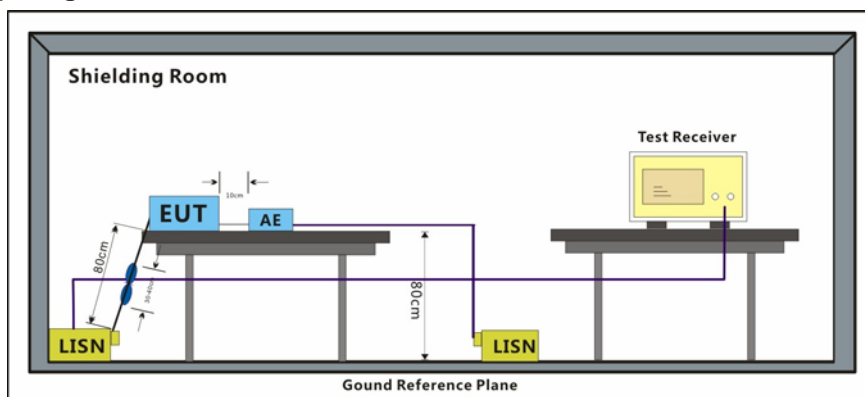
Pre-test these modes to find the worst case: a: Left Transfer Zone Charging_The load shall be set at full/half/empty load (15W/7.5W/0W) respectively.

b: Right Transfer Zone Charging_The load shall be set at full/half/empty load (15W/7.5W/0W) respectively.

c: Dual Transfer Zones Charging_The load of each side shall be set at full/half/empty load (15W*2/7.5W*2/0W) respectively and simultaneous charging at same time.

The worst case for final test: c: Dual Transfer Zones Charging_The load of each side shall be set at full load (15W*2) respectively and simultaneous charging at same time.

6.1.2 Test Setup Diagram



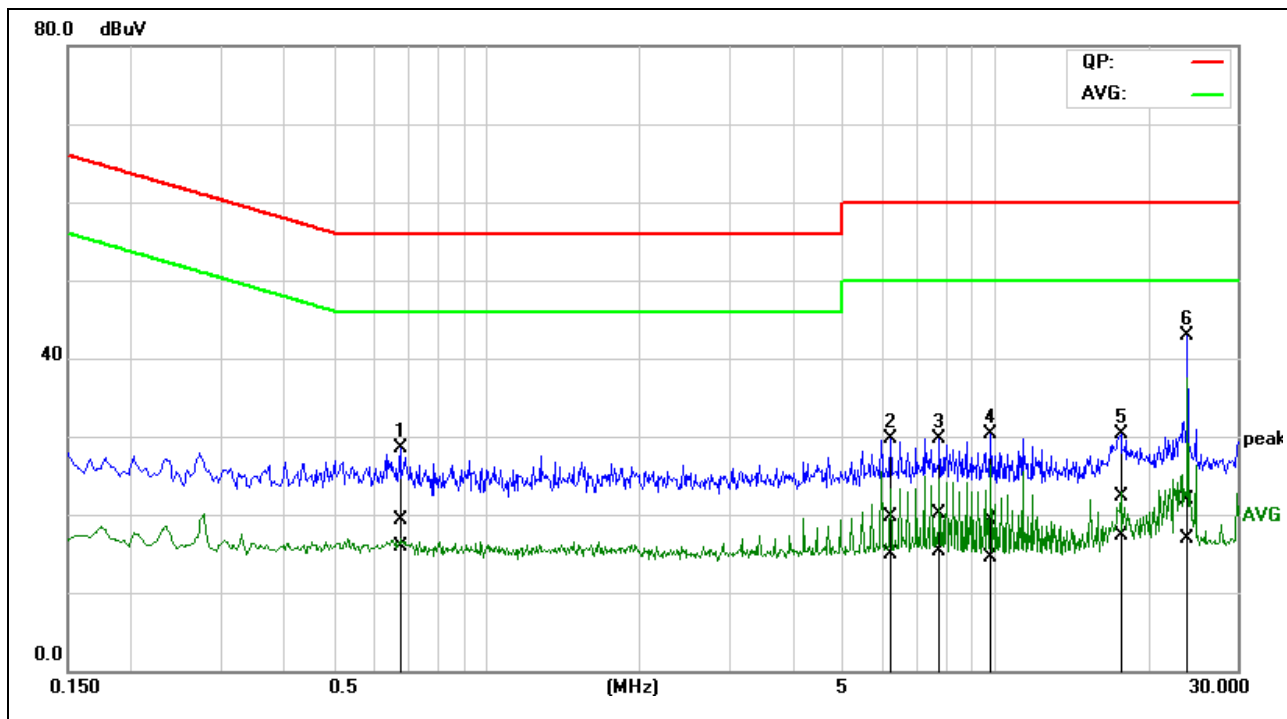
6.1.3 Measurement Data

An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

1. Result (dBuV) = Reading (dBuV) + Correction Factor (dB)

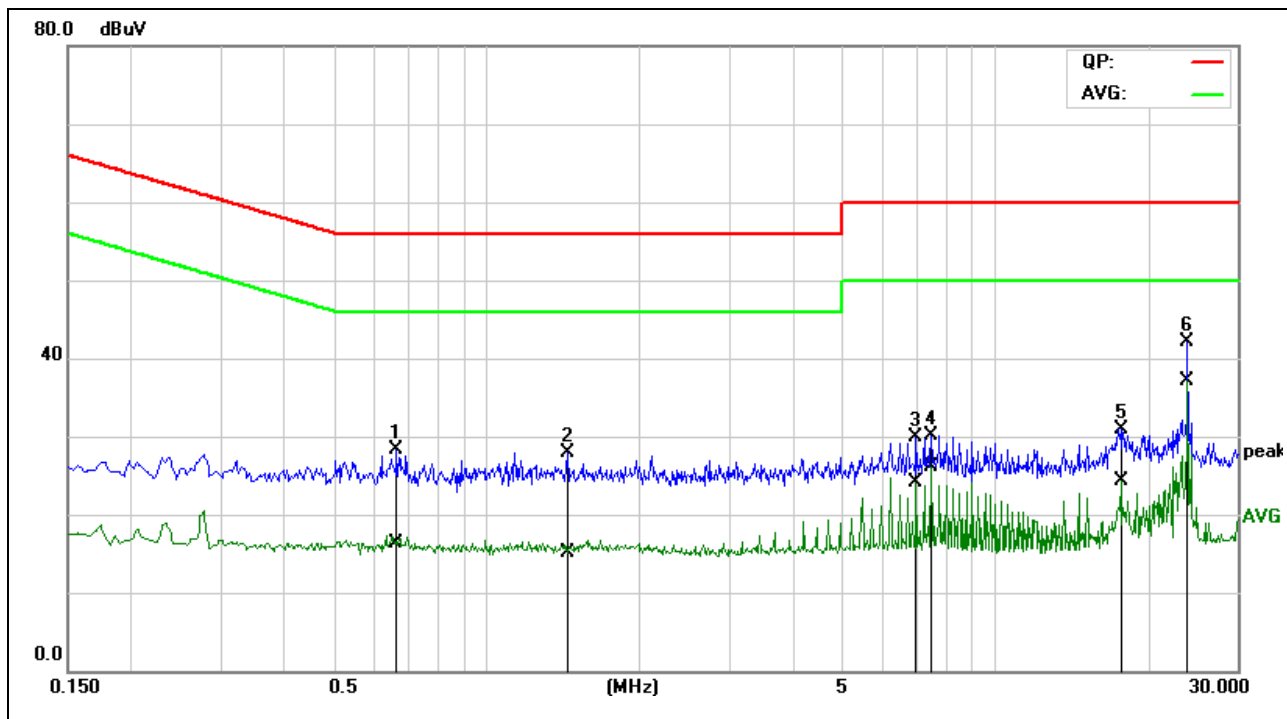
2. Correction Factor (dB) = LISN Factor (dB) + Cable Loss (dB)

Mode:c; Line:Live Line



| No. | Frequency | QuasiPeak reading | Average reading | Corre ction factor | QuasiPeak result | Average result | QuasiPeak limit | Average limit | QuasiPeak margin | Average margin |
|-----|-----------|-------------------|-----------------|--------------------|------------------|----------------|-----------------|---------------|------------------|----------------|
| | (MHz) | (dBuV) | (dBuV) | (dB) | (dBuV) | (dBuV) | (dBuV) | (dBuV) | (dB) | (dB) |
| 1* | 0.6820 | -0.27 | -3.61 | 19.53 | 19.26 | 15.92 | 56.00 | 46.00 | -36.74 | -30.08 |
| 2 | 6.2668 | -0.17 | -4.85 | 19.82 | 19.65 | 14.97 | 60.00 | 50.00 | -40.35 | -35.03 |
| 3 | 7.7948 | 0.21 | -4.53 | 19.89 | 20.10 | 15.36 | 60.00 | 50.00 | -39.90 | -34.64 |
| 4 | 9.8348 | -0.76 | -5.42 | 19.97 | 19.21 | 14.55 | 60.00 | 50.00 | -40.79 | -35.45 |
| 5 | 17.7184 | 2.17 | -2.94 | 20.19 | 22.36 | 17.25 | 60.00 | 50.00 | -37.64 | -32.75 |
| 6 | 24.0266 | 1.50 | -3.35 | 20.34 | 21.84 | 16.99 | 60.00 | 50.00 | -38.16 | -33.01 |

Mode:c; Line:Neutral Line



| No. | Frequency | QuasiPeak reading | Average reading | Corre ction factor | QuasiPeak result | Average result | QuasiPeak limit | Average limit | QuasiPeak margin | Average margin |
|-----|-----------|-------------------|-----------------|--------------------|------------------|----------------|-----------------|---------------|------------------|----------------|
| | (MHz) | (dBuV) | (dBuV) | (dB) | (dBuV) | (dBuV) | (dBuV) | (dBuV) | (dB) | (dB) |
| 1 | 0.6708 | -0.66 | -3.59 | 19.52 | 18.86 | 15.93 | 56.00 | 46.00 | -37.14 | -30.07 |
| 2 | 1.4668 | -1.49 | -4.34 | 19.55 | 18.06 | 15.21 | 56.00 | 46.00 | -37.94 | -30.79 |
| 3 | 7.0308 | -0.22 | -4.85 | 19.84 | 19.62 | 14.99 | 60.00 | 50.00 | -40.38 | -35.01 |
| 4 | 7.5426 | 0.16 | -4.59 | 19.86 | 20.02 | 15.27 | 60.00 | 50.00 | -39.98 | -34.73 |
| 5 | 17.7184 | 2.48 | -2.60 | 20.18 | 22.66 | 17.58 | 60.00 | 50.00 | -37.34 | -32.42 |
| 6 | 24.0268 | 1.59 | -3.35 | 20.34 | 21.93 | 16.99 | 60.00 | 50.00 | -38.07 | -33.01 |

6.2 Radiated Emissions (Magnetic field Strength) (9kHz-30MHz)

Test Requirement: 47 CFR Part 18
 Test Method: FCC OST/MP-5:1986
 Frequency Range: 9kHz to 30MHz
 Measurement Distance: 3m
 Limit:

| Equipment | Operating frequency | RF Power generated by equipment (watts) | Field strength limit (uV/m) | Distance (meters) |
|---|-----------------------|---|---|-------------------|
| Any type unless otherwise specified (miscellaneous) | Any frequency non-ISM | Below 500 500 or more | 15 $15 \times \text{SQRT}(\text{power}/500)$ | 300 300 |

¹Field strength may not exceed 10 uV/m at 1600 meters. Consumer equipment operating below 1000 MHz is not permitted the increase in field strength otherwise permitted here for power over 500 watts.

| Frequency band in which device operates (MHz) | Range of frequency measurements | |
|---|---|---|
| | Lowest frequency | Highest frequency |
| Below 1.705 | Lowest frequency generated in the device, but not lower than 9 kHz | 30 MHz. |
| 1.705 to 30 | Lowest frequency generated in the device, but not lower than 9 kHz | 400 MHz. |
| 30 to 500 | Lowest frequency generated in the device or 25 MHz, whichever is lower | Tenth harmonic or 1,000 MHz, whichever is higher. |
| 500 to 1,000 | Lowest frequency generated in the device or 100 MHz, whichever is lower | Tenth harmonic. |

6.2.1 E.U.T. Operation

Operating Environment:

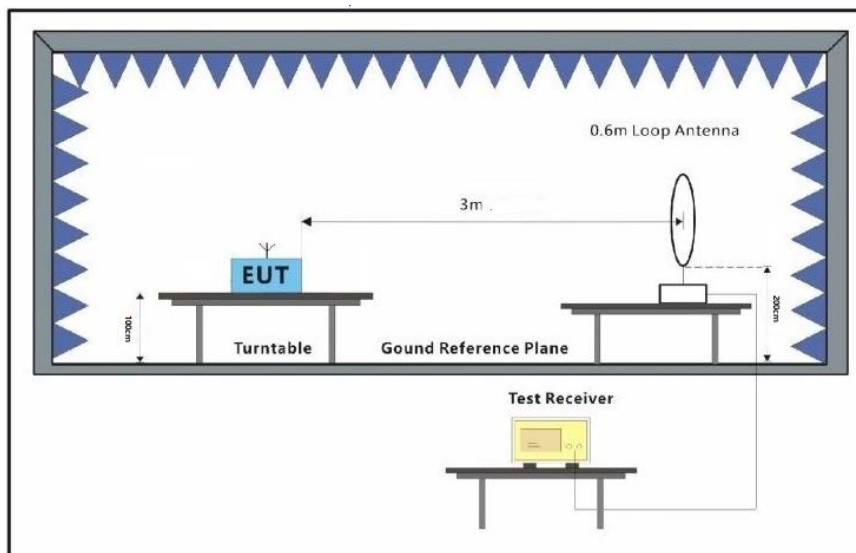
Temperature: 24 °C Humidity: 48 % RH Atmospheric Pressure: 1010 mbar

Pre-test these modes to find the worst case:

- a: Left Transfer Zone Charging_The load shall be set at full/half/empty load (15W/7.5W/0W) respectively.
- b: Right Transfer Zone Charging_The load shall be set at full/half/empty load (15W/7.5W/0W) respectively.
- c: Dual Transfer Zones Charging_The load of each side shall be set at full/half/empty load (15W*2/7.5W*2/0W) respectively and simultaneous charging at same time.

The worst case for final test: c: Dual Transfer Zones Charging_The load of each side shall be set at full load (15W*2) respectively and simultaneous charging at same time.

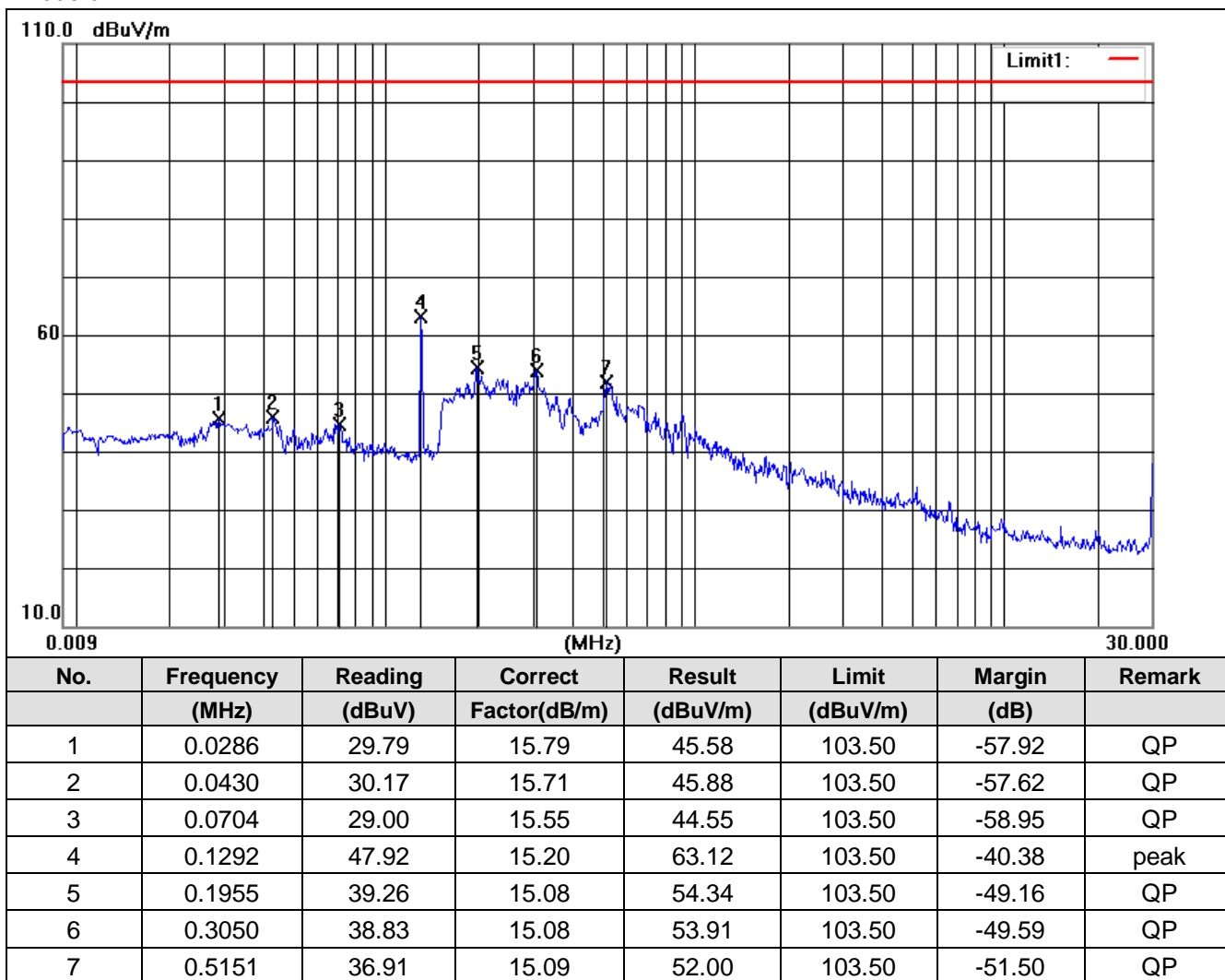
6.2.2 Test Setup Diagram



6.2.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.

Mode c





7 Test Setup Photographs

Refer to the < Test Setup photos-FCC>.

8 EUT Constructional Details

Refer to the < External Photos > & < Internal Photos >.

- End of the Report -