FCC Test Report

Brand:
Amphenol Tecvox

Model:
WC15ALa

Marketing Name
Qi 1.3.3 15W Wireless Charger

Product Description:
Qi 1.3.3 15W Wireless Charger

FCC ID: 2AWLR-15WCS13

Applied Rules and Standards:
47 CFR Parts: 18

REPORT #: EMC_AMPHT_006_24001_FCC_18

DATE: 2024-10-21

A2LA Accredited

IC recognized # 3462B

***CETECOM* Inc.**
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CETECOM Inc. is a Delaware Corporation with Corporation number: 2905571

TABLE OF CONTENTS

1 Assessment

The following device as further described in section 3 of this report was evaluated against the applicable criteria specified in the Code of Federal Regulations Title 47 parts 18.

No deficiencies were ascertained.

Company	Description	Model #
Amphenol Tecvox	Qi 1.3.3 15W Wireless Charger	WC15ALa

Responsible for the Report:

Date	Section	Name	Signature
2024-10-21	Compliance	Cheng Song (EMC Engineer)	Cheng Song CN = Cheng Song email = cheng.song@cetecom.com C = AD 2024.10.21 17:17:47 -07'00'

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the EMC Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Street Address:	411 Dixon Landing Road
City/Zip Code	Milpitas, CA 95035
Country	USA
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
EMC Engineer:	Cheng Song
Responsible Project Leader:	Shane Hao

2.2 Identification of the Client

Client's Name:	Amphenol Tecvox
Street Address:	25270 Will McComb Dr
City/Zip Code	Tanner, AL 35671
Country	USA

2.3 Identification of the Manufacturer

Manufacturer's Name:	Same as Client
Manufacturers Address:	
City/Zip Code	
Country	

3 Equipment Under Test (EUT)

3.1 EUT Specifications

Brand	Amphenol Tecvox
FCC ID	2AWLR-15WCS13
Model Number	WC15ALa
Marketing Name	Qi 1.3.3 15W Wireless Charger
HW Version	5
SW Version	6882
Product Description	Qi 1.3.3 15W Wireless Charger
Radio Information as declared	Qi v1.3 EPP + BPP
Antenna Information as declared	N/A
Max. declared Output Power:	15W
Modulation:	FSK
Frequency Range / number of channels (All Radios)	115-205 kHz Fixed 127.7 kHz
Power Supply/ Rated Operating Voltage Range	9 VDC – 16 VDC
Operating Temperature Range	Charging temp: -40°C – 55°C, Operating temp: -40°C – 85°C
Sample Revision	☐Production ■Pre-production
EUT Diameter	n < 60cm
Note: Details about the Equipment Under Test (EUT) are provided by the client or applicant.	

3.2 EUT details

EUT #	Serial Number	HW Version	SW Version	Comments
1	0000000070	5	6882	

3.3 Accessory Equipment (AE) details

AE #	Type	Model	Manufacturer	Serial Number
1	LIN System	NA	Amphenol Tecvox	NA

3.4 Test Setup Configurations

EUT Set-up #	Combination of AE used for test set up	Comments
1	EUT#1 + AE#1	

3.5 Mode of Operation details

Operating Mode	Description of Operating modes	Additional Information
Op. 1	Operating	The EUT was configured to wireless power transfer mode.

3.6 Justification for Mode of Operation

During testing, the EUT was configured to operate in maximum power transfer mode, as described in section 3.5 of this document, representing the worst-case operating condition.

For radiated measurements, the data in this report reflects the worst-case scenario across both horizontal and vertical antenna polarizations, as well as all EUT orientations.

4 Subject of Investigation

The objective of the measurements done by CETECOM Inc. was to evaluate the compliance of the EUT against the relevant requirements specified in section 1.

4.1 Date of Testing:

2024-10-02

4.2 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus, with 95% confidence interval (in dB delta to result), based on a coverage factor k=2.

Measurement System		EMC 1	EMC 2
Conducted emissions (mains port)	150 kHz – 30 MHz	2.47 dB	N/A
Radiated emissions	9 kHz – 30 MHz	2.68 dB	2.53 dB
	30 – 100 MHz	4.39 dB	3.85 dB
	100 MHz – 1 GHz	5.65 dB	5.24 dB
	1 – 6 GHz	5.0 dB	4.88 dB
	6 – 18 GHz	4.76 dB	4.58 dB
	18 – 40 GHz	4.65 dB	4.61 dB

4.3 Environmental Conditions during Testing:

The following environmental conditions were maintained during the course of testing:

- Ambient Temperature: 20-25°C
- Relative humidity: 40-60%

Deviating test conditions are indicated at individual test description where applicable.

4.4 Decision Rule:

Cetecom advanced follows ILAC G8:2019 chapter 4.2.1 (Simple Acceptance Rule).

Only the measured values related to their corresponding limits will be used to decide whether the equipment under test meets the requirements of the test standards listed in chapter 3. The measurement uncertainty is mentioned in this test report, See chapter 9, but is not taken into account – neither to the limits nor to the measurement results. Measurement results with a smaller margin to the corresponding limits than the measurement uncertainty have a potential risk of more than 5% that the decision might be wrong.

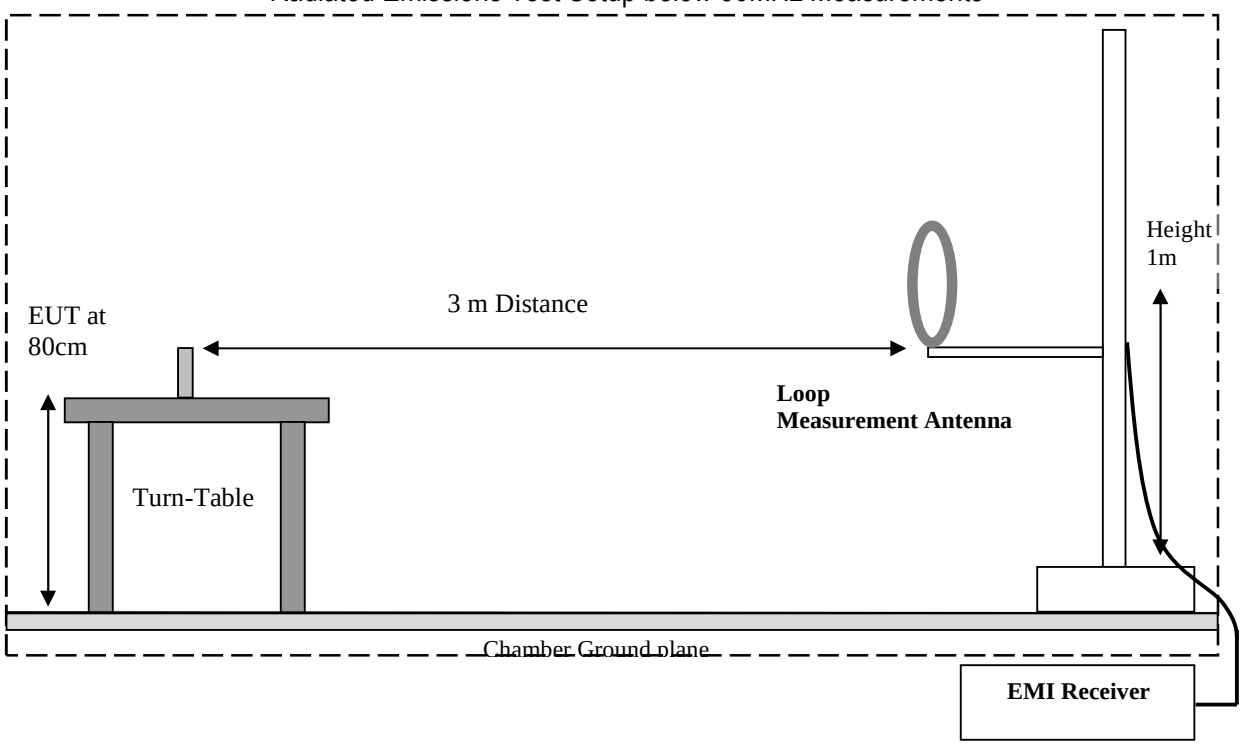
5 Measurement Procedures

5.1 Radiated Measurement

The radiated measurement is performed according to FCC/OET MP–5, FCC Methods of Measurements of Radio Noise Emissions from ISM Equipment.

- The exploratory measurement is accomplished by running a matrix of 16 sweeps over the required frequency range with R&S Test-SW EMC32 for 4 positions of the turntable, two orthogonal positions of the EUT and both antenna polarizations. This procedure exceeds the requirement of the above standards to cover the 3 orthogonal axis of the EUT. A max peak detector is utilized during the exploratory measurement. The Test-SW creates an overall maximum trace for all 12 sweeps and saves the settings for each point of this trace. The maximum trace is part of the test report.
- The 10 highest emissions are selected with an automatic algorithm of EMC32 searching for peaks in the noise floor and ensuring that broadband signals are not selected multiple times.
- The maxima are then put through the final measurement and again maximized in a 90deg range of the turntable, fine search in frequency domain and height scan between 1m and 4m.
- The above procedure is repeated for all possible ways of power supply to EUT and for all supported modulations.
- In case there are no emissions above noise floor level only the maximum trace is reported as described above.

Radiated Emissions Test Setup below 30MHz Measurements



5.2 Sample Calculations for Field Strength Measurements

Field Strength is calculated from the Spectrum Analyzer/ Receiver readings, taking into account the following parameters:

1. Measured reading in dBµV
2. Cable Loss between the receiving antenna and SA in dB and
3. Antenna Factor in dB/m

All radiated measurement plots in this report are taken from a test SW that calculates the Field Strength based on the following equation:

FS (dBµV/m) = Measured Value on SA (dBµV) + Cable Loss (dB) + Antenna Factor (dB/m)

Example:

Frequency (MHz)	Measured SA (dBµV)	Cable Loss (dB)	Antenna Factor Correction (dB)	Field Strength Result (dBµV/m)
1000	80.5	3.5	14	98.0

5.3 Field Strength Correction based on Distance

To correct for distance when measuring at a distance other than the specification distance;
For measurements below 30 MHz – 40log(SpecDistance/TestDistance) = Distance Factor
For measurements above 30 MHz – 20log(SpecDistance/TestDistance) = Distance Factor

6 Measurement Results Summary

Test Specification	Test Case	Temperature and Voltage Conditions	Mode	Pass	Fail	NA	NP	Result
FCC §18.305	Radiated Emissions	Nominal	Op. 1	■	☐	☐	☐	Complies
FCC §18.307	Conducted Emissions	Nominal	Op. 1	☐	☐	■	☐	Note 1 Note 2

Note 1: NA= Not Applicable; NP= Not Performed.
Note 2: The EUT is not designed to be connected to the public utility (AC) power line.

7 Test Result Data

7.1 Radiated Emissions Measurement according to CFR 47 Part 18.305.

7.1.1 Measurement Procedure

Spectrum Analyzer Settings:

- Frequency = 9 KHz – 30 MHz
- RBW = 9 KHz
- Detector: Peak

7.1.2 Limits:

FCC §18.305 (b)

The field strength levels of emissions which lie outside the bands specified in § 18.301, unless otherwise indicated, shall not exceed the following:

Equipment	Operating frequency	RF Power generated by equipment (watts)	Field strength limit (uV/m)	Distance (meters)
Any type unless otherwise specified (miscellaneous)	Any ISM frequency	Below 500 500 or more	25 25 × SQRT(power/500)	300 [1]300
	Any non-ISM frequency	Below 500 500 or more	15 15 × SQRT(power/500)	300 [1]300
Industrial heaters and RF stabilized arc welders	On or below 5,725 MHz Above 5,725 MHz	Any Any	10 ([2])	1,600 ([2])
Medical diathermy	Any ISM frequency Any non-ISM frequency	Any Any	25 15	300 300
Ultrasonic	Below 490 kHz	Below 500 500 or more	2,400/F(kHz) 2,400/F(kHz) × SQRT(power/500)	300 [3]300
	490 to 1,600 kHz Above 1,600 kHz	Any Any	24,000/F(kHz) 15	30 30
Induction cooking ranges	Below 90 kHz On or above 90 kHz	Any Any	1,500 300	[4]30 [4]30

1 Field strength may not exceed 10 µV/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.

2 Reduced to the greatest extent possible.

3 Field strength may not exceed 10 µV/m at 1600 meters. Consumer equipment is not permitted the increase in field strength otherwise permitted here for over 500 watts.

4 Induction cooking ranges manufactured prior to February 1, 1980, shall be subject to the field strength limits for miscellaneous ISM equipment.

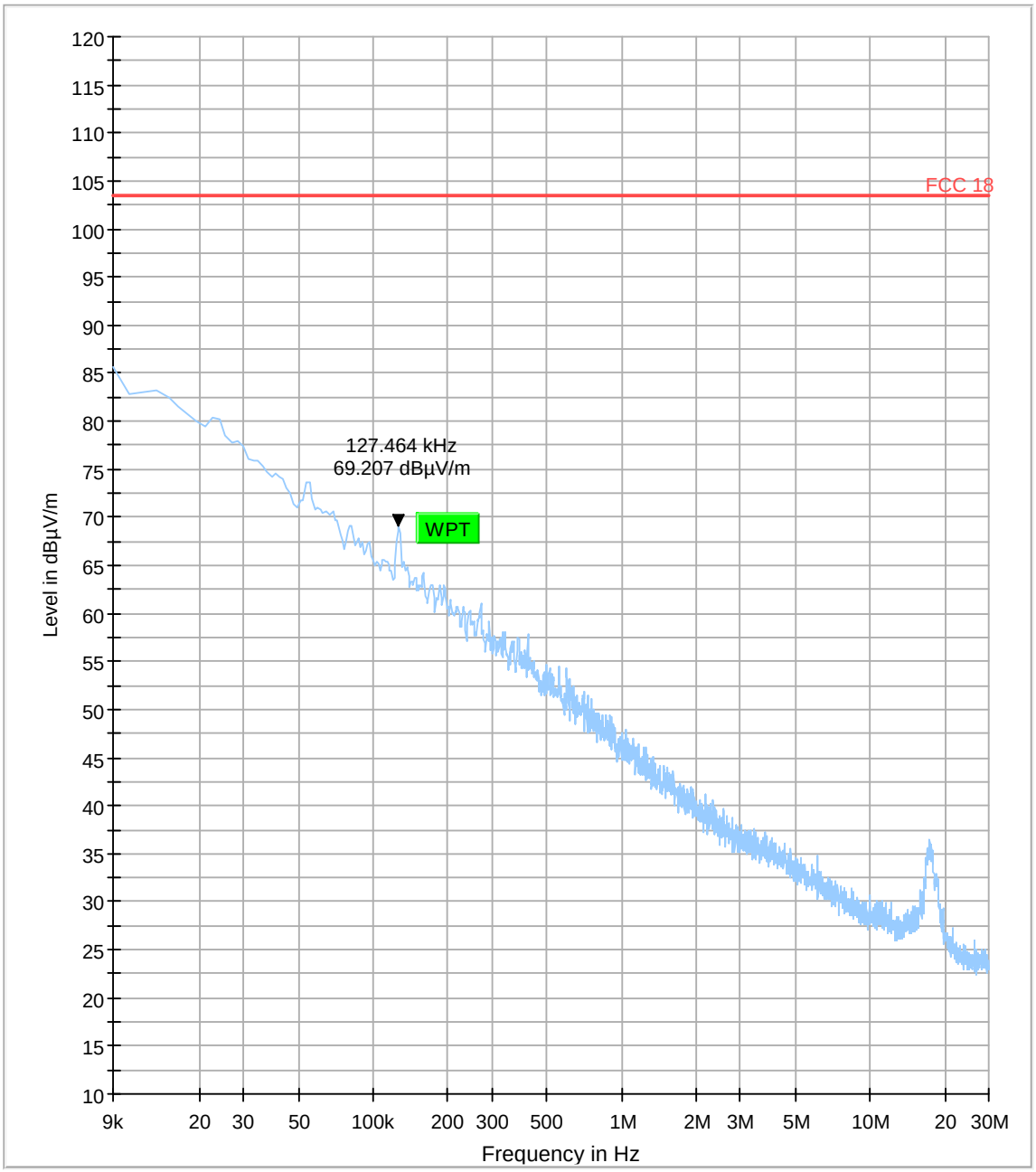
7.1.3 Test Summary:

Environmental Conditions	
Ambient Temperature:	20.9°C
Relative Humidity:	32 %
Atmospheric Pressure:	1022 mbar

Test Results						
Plot #	**EUT Set-Up #**	**EUT operating mode**	**Scan Frequency**	**Power Supply Input**	**Comments**	**Result**
1	1	Op. 1	9 kHz – 30 MHz	13.5 VDC	-	Pass

7.1.4 Measurement Plots:

Plot # 1



8 Test setup photos

Setup photos are included in supporting file name: “EMC_AMPHT_006_24001_FCC_18_Setup_Photos”

9 Test Equipment and Ancillaries Used For Testing

Equipment Type	Manufacturer	Model	Serial #	Calibration Cycle	Last Calibration Date
ACTIVE LOOP ANTENNA	ETS LINDGREN	6507	00161344	3 YEARS	08/13/2024
TEST RECEIVER	R&S	ESW44	103143	3 YEARS	09/12/2024
DIGITAL THRMOMETER	CONTROL COMPANY	4410,90080-03	230713059	3 YEARS	10/18/2023

Note: Equipment used meets the measurement uncertainty requirements as required per applicable standards for 95% confidence levels. Calibration due dates, unless defined specifically, falls on the last day of the month. Items indicated “N/A” for cal status either do not specifically require calibration or is internally characterized before use.

10 Revision History

Date	Report Name	Changes to report	Prepared by
2024-10-21	EMC_AMPHT_006_24001_FCC_18	Initial Version	Cheng Song

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