Report on the FCC and ISED Testing of the

Attenti US, Inc.
14024VL

In accordance with FCC 47 CFR Part 15B, ISED ICES-003 Class B

Prepared for: Attenti US, Inc.
1838 Gunn Highway
Odessa, FL 33556

America

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Document Number: TP72145757.101 | Issue: 02

SIGNATURE			
NAME	**JOB TITLE**	**RESPONSIBLE FOR**	**ISSUE DATE**
Pete Walsh	**Service Line Manager**	**Authorized Signatory**	2019-February-05

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD America, Inc. document control rules.

FCC Accreditation Designation Number US1063 Tampa, FL Test Laboratory	Innovation, Science, and Economic Development Canada Accreditation Site Number 2087A-2 Tampa, FL Test Laboratory

EXECUTIVE SUMMARY
A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15B :2017, ISED ICES-003: Issue 06 (2016).

A2LA Cert. No. 2955.15

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Additional signatures required by FCC 47 CFR Part 2, § 2.938 (b) (10)

Signatures of the individuals responsible for testing the product

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15B and ISED ICES-003. The sample tested was found to comply with the requirements defined in the applied rules.

NAME	RESPONSIBLE FOR	SIGNATURE
David 'Chip' Foerstner	Testing	

If this report is issued in support of the Supplier's Declaration of Conformity type of FCC authorization the following signature block need to be included for the responsible party to sign at a later date.

Signature of an official of the responsible party, as designated in § 2.909

SIGNATURE		
NAME	**COMPANY**	**DATE**

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1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Table 1.1-1 – Modification Record

Issue	Description of Change	Date of Issue
1	First Issue	2019-January-31
2	Added text to 1.5.2	2019-February-05

1.2 Introduction

Applicant	Attenti US, Inc.
Manufacturer	Attenti US, Inc.
Applicant's Email Address	SDupont@Attentigroup.com
Model Number(s)	14024VL
Serial Number(s)	Unit # 4
Hardware Version(s)	3
Software Version(s)	V4.5.0.1G4
Number of Samples Tested	1
Test Specification/Issue/Date	FCC 47 CFR Part 15B: 2017 ISED ICES-003: Issue 06 (2016)
Order Number	72145757
Date	2019-January-23
Date of Receipt of EUT	2019-January-28
Start of Test	2019-January-28
Finish of Test	2019-January-28
Name of Engineer(s)	David 'Chip' Foerstner
Related Document(s)	ANSI C63.4: 2014

1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with the specifications shown below.

Table 1.3-1 – Summary of Results

Section	Specification Clause		Test Description	Result	Comments/Base Standard
	Part 15B	ICES-003			
Configuration and Mode: 120 VAC / 60 Hz and charging product					
2.1	15.107	6.1	Conducted Disturbance at Mains Terminals	Pass	ANSI C63.4: 2014
2.2	15.109	6.2	Radiated Disturbance	Pass	ANSI C63.4: 2014

1.4 Declaration of Build Status

EQUIPMENT DESCRIPTION	
Model Name/Number	**AT1 1-Piece GPS Tracking Device Model 14024VL**
Part Number	**14024VL**
Hardware Version	3
Software Version	V4.5.0.1G4
FCC ID (if applicable)	**NC3-14024VL**
ISED ID (if applicable)	**23669-14024VL**
Technical Description (Please provide a brief description of the intended use of the equipment)	**This is an Offender Tracking Device that used GPS, LTE, and Wi-Fi to determine geographical position.**

UN-INTENTIONAL RADIATOR	
Highest frequency generated or used in the device or on which the device operates or tunes	**During Normal Operation: 2.480 GHz (Wi-Fi ISM Band)** **During Idle (Non-Activated) 48 MHz (MCU)**
Lowest frequency generated or used in the device or on which the device operates or tunes	**32.768KHz (Y2 Crystal)**
Class A Digital Device (Use in commercial, industrial or business environment) ☐ Class B Digital Device (Use in residential environment only) ☒	

Power Source			
AC	Single Phase	Three Phase	Nominal Voltage
	☒	☐	120VAC
External DC	Nominal Voltage		Maximum Current
	12VDC		2 Amps
Battery	Nominal Voltage		Battery Operating End Point Voltage
	3.7V		3.4 to 4.2V

EXTREME CONDITIONS					
(Storage) Maximum temperature	+50	°C	(Storage) Minimum temperature	-20	°C

Ancillaries
Please list all ancillaries which will be used with the device.
1) Wall Adapter (for Battery Charging Purposes) **2) Freedom Charger (External Battery Pack & Charger) – Not Yet Released** 3) **Copper-Reinforced Ankle Strap**

I hereby declare that the information supplied is correct and complete.

Name: **Stan DuPont**

Position held: **Electronics Engineer** Date: **1/30/19**

1.5 Product Information

1.5.1 Technical Description

The Equipment Under Test (EUT) was a 1 Piece GPS Offender Tracking Device with charger.

A full description and detailed product specification details are available from the manufacturer.

Figure 1.5.1-1 - Front View of the EUT

Table 1.5-1-1 - Cable Descriptions

Cable/Port	Description
DC input of EUT	Custom magnetic to barrel connector
Charger output	Dedicated to barrel connector
Adapter cable	Barrel to barrel connector

Table 1.5-1-2 – Support Equipment Descriptions

Make/Model	Description
Model JF024WR-1200200UH	Power supply charger

1.5.2 Modes of Operation

The tested mode of operation was charging. During the conducted emissions test, the (433.92) MHz radio was powered on and set to maximum output power.

1.6 Deviations from the Standard

No deviations from the applicable test standard were made during testing.

1.7 EUT Modification Record

The table below details modifications made to the EUT during the test program. The modifications incorporated during each test are recorded on the appropriate test pages.

Table 1.7-1 – Modification Record

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
None			

1.8 Test Location

TÜV SÜD conducted the following tests at our Tampa, FL Test Laboratory.

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: 120 VAC / 60 Hz and charging		
Conducted Emissions	David 'Chip' Foerstner	A2LA
Radiated Emissions	David 'Chip' Foerstner	A2LA

Office address: 5610 West Sligh Avenue, Suite 100,
Tampa, FL 33634 USA

2 Test Details

2.1 Conducted Emissions

2.1.1 Specification Reference

FCC 47 CFR Part 15B, Clause 15.107
ICES-003, Clause 6.1

2.1.2 Equipment Under Test and Modification State

As shown in §1.2 with modifications if any as shown in §1.7.

2.1.3 Date of Test

2019-January-28

2.1.4 Test Method

The EUT was placed on a non-conductive table 0.8m above a reference ground plane and 0.4m away from a vertical coupling plane.

All power was connected to the EUT through an Artificial Mains Network (AMN). Conducted emissions measurements on mains lines were made at the output of the AMN. The AMN was placed 0.8m from the boundary of the EUT and bonded to the reference ground plane.

The EUT was assessed against the class B limits specified in FCC 47 CFR Part 15.107 and ISED ICES-003, clause 6.1.

2.1.5 Environmental Conditions

The EUT was evaluated within the temperature and humidity range of the EUT as specified by the manufacturer. When the manufacturer does not specify climatic parameters for the EUT, all tests are performed within the ambient temperature range of 20°C to 40°C and humidity range of 30% to 80%.

2.1.6 Additional Observations

Measurements were performed using EMC32 v8.54 automated software. The reported level is the actual level with all the correction factors factored in. Correction Factor column is for informational purposes only. See Section 2.1.7 for a sample computation.

2.1.7 Sample Computation (Conducted Emission)

Measuring equipment raw measurement (dBµV) @ 150kHz			30.0
Correction Factor (dB)	TEMC00002 - LISN	0.03	10.53
	Cable 1	10.50	
Reported Quasi-peak Final Measurement (dBµV) @ 150kHz			40.53

2.1.8 Test Results

Results for Configuration and Mode: 120 VAC / 60 Hz - charging

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown in Figure 2.1.8-1 and Tables 2.1.8-1 through 2.1.8.2.

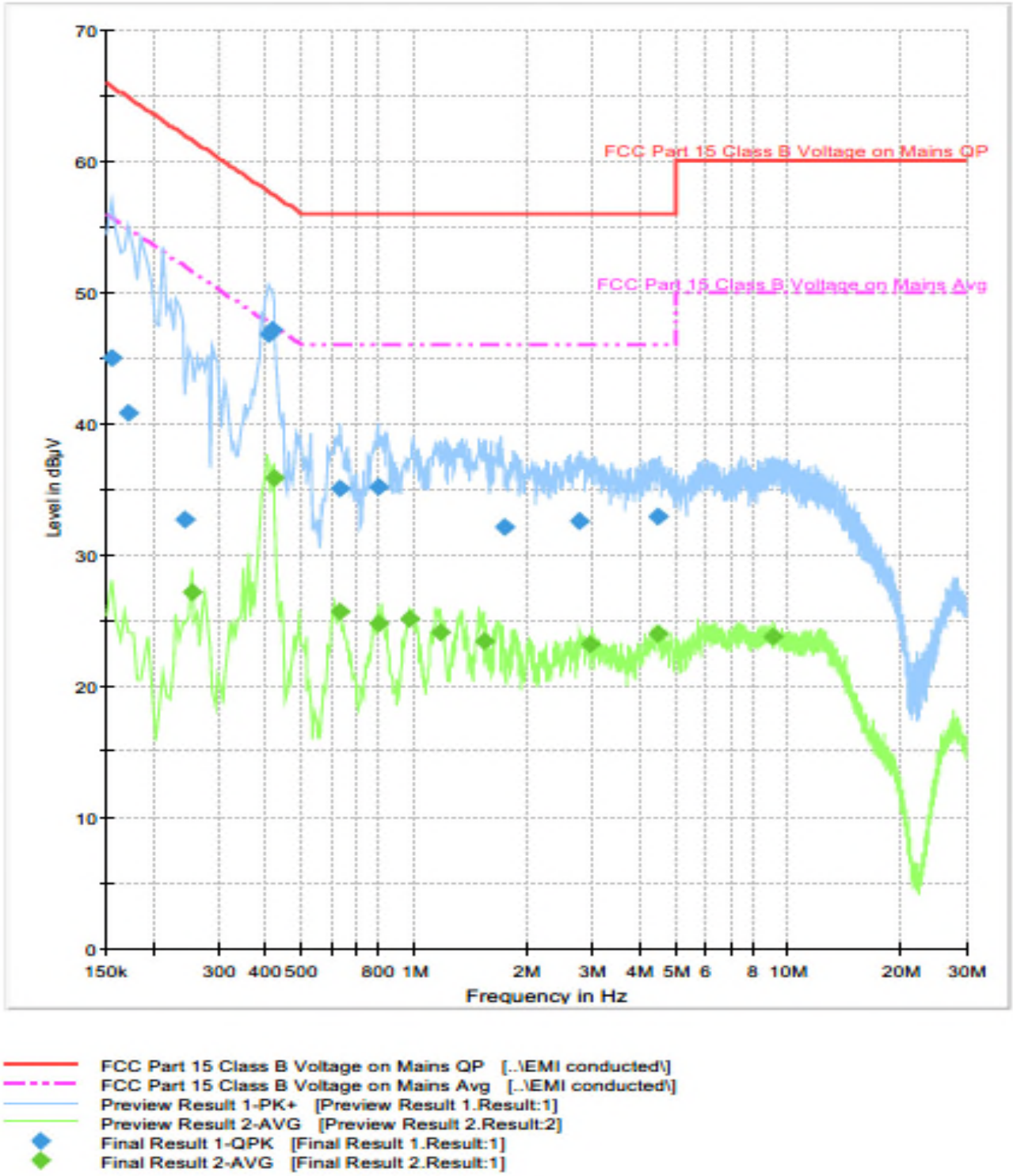

Figure 2.1.8-1 - Graphical Results - AC Mains Composite Line and Neutral Plot

Table 2.1.8-1 – Quasi-peak Detector Results on the AC Power Port

Frequency (MHz)	Quasi-peak (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	45.0	N	10.0	20.8	65.8
0.172500	40.8	N	10.0	24.0	64.8
0.244500	32.7	N	10.0	29.3	61.9
0.406500	46.9	L1	10.0	10.8	57.7
0.415500	47.1	L1	10.0	10.4	57.5
0.636000	35.1	L1	10.0	20.9	56.0
0.798000	35.2	L1	10.1	20.8	56.0
1.743000	32.2	L1	10.2	23.8	56.0
2.773500	32.6	L1	10.3	23.4	56.0
4.506000	32.9	L1	10.4	23.1	56.0

Table 2.1.8-2 - Average Detector Results on the AC Power Port

Frequency (MHz)	Average (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.253500	27.2	L1	10.0	24.5	51.6
0.420000	35.8	L1	10.0	11.6	47.4
0.631500	25.7	L1	10.0	20.3	46.0
0.798000	24.8	L1	10.1	21.2	46.0
0.969000	25.1	L1	10.1	20.9	46.0
1.176000	24.1	L1	10.1	21.9	46.0
1.531500	23.4	L1	10.2	22.6	46.0
2.971500	23.2	L1	10.3	22.8	46.0
4.501500	23.9	L1	10.4	22.1	46.0
9.078000	23.8	L1	10.9	26.2	50.0

2.1.9 Conducted Emissions Test Set-up Photos

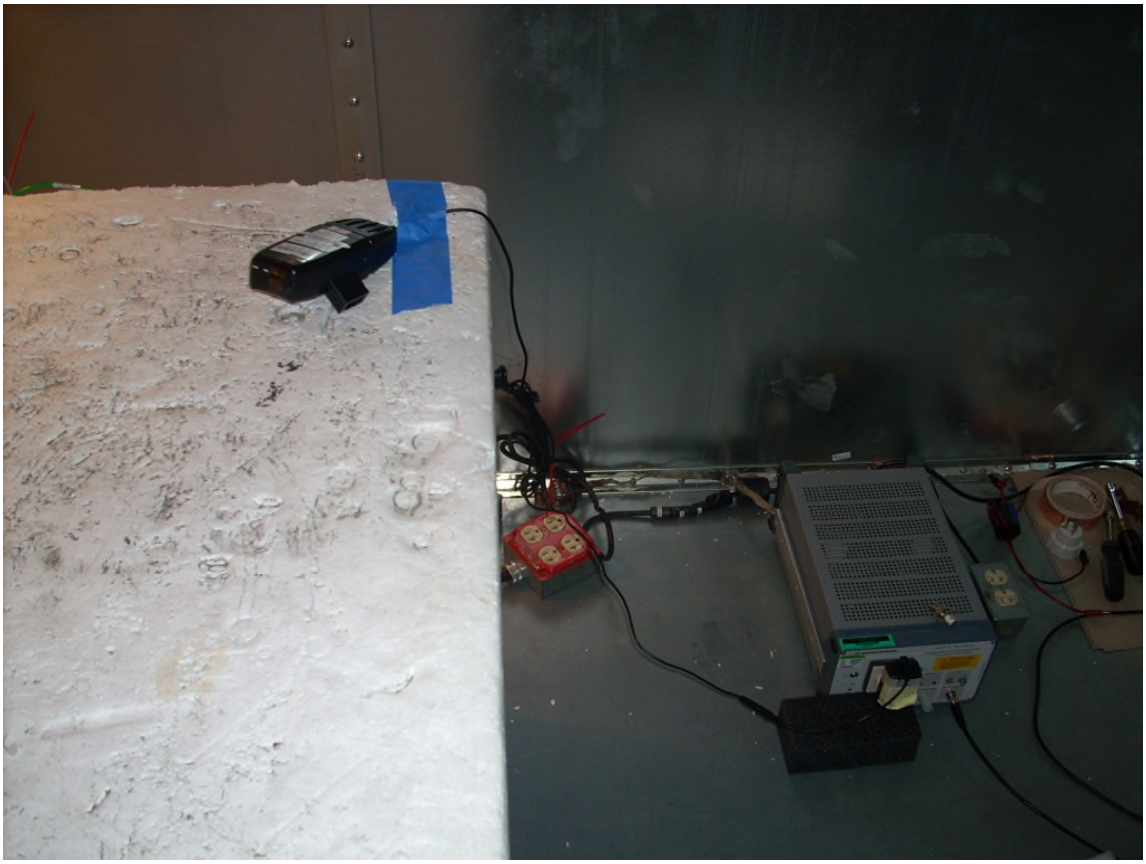

Photo 2.1.9-1 – Front View of the Test Setup

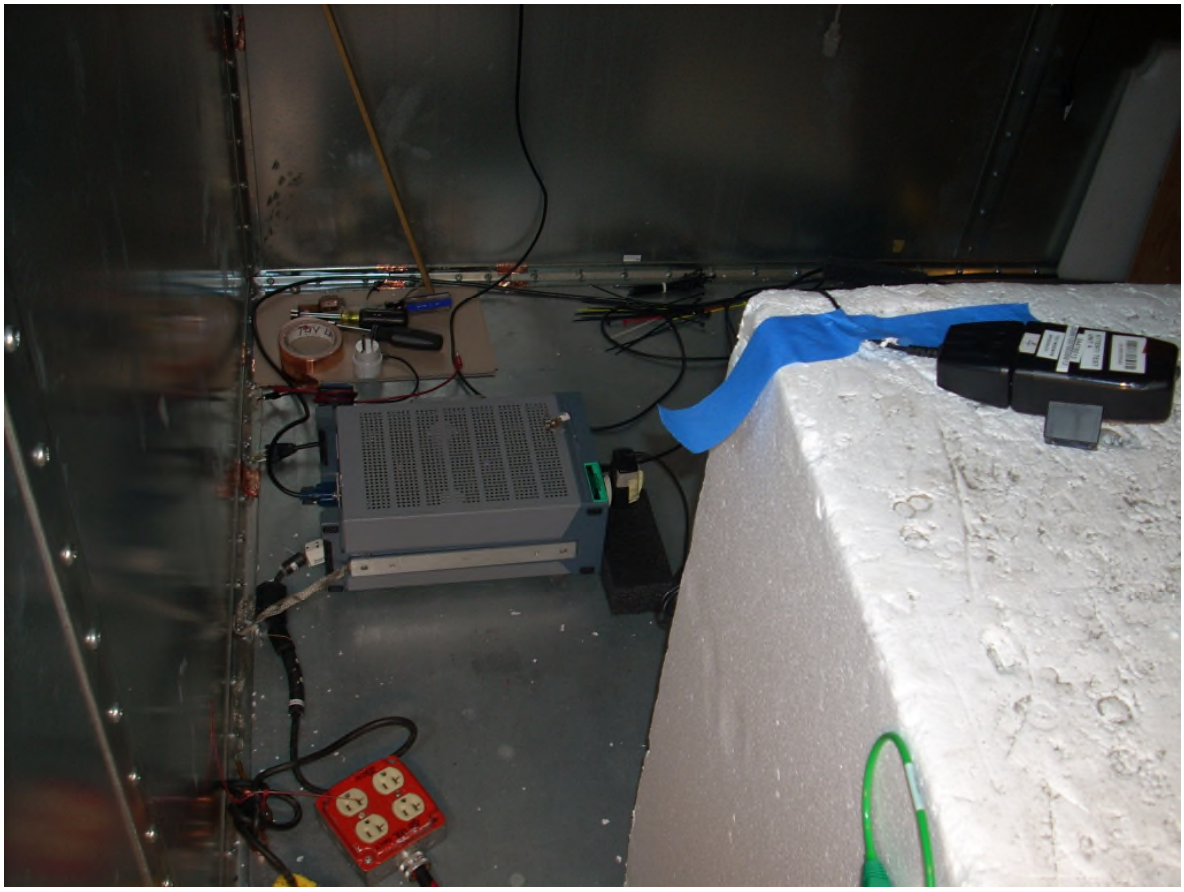

Photo 2.1.9-2 – Rear View of the Test Setup

2.1.10 Test Location and Test Equipment Used

The tests were carried out in Tampa, FL using equipment listed below in Table 2.1.10-1.

Table 2.1.10-1 – Conducted Emissions Test Equipment List

Instrument	Manufacturer	Type No	TE No	Software/Firmware	Calibration Period (months)	Calibration Due
EMI Test Receiver	Rhode & Schwarz	ESCS30	TEMC00011	2.3002.0102.36	24	2019-11-17
LISN	Rhode & Schwarz	ESH3-Z5	TEMC00002	N/A	12	2019-09-27
Test Software	Rhode & Schwarz	EMC32	N/A	8.54	N/A	N/A
Shield Room	Universal Shielding		TEMC00100	N/A	N/A	N/A

TU - Traceability Unscheduled
O/P MON - Traceability Unscheduled
N/A - Not Applicable

2.2 Radiated Emissions

2.2.1 Specification Reference

FCC 47 CFR Part 15B, Clause 15.109
ISED ICES-003, Clause 6.2

2.2.2 Equipment Under Test and Modification State

As shown in §1.2 with modifications if any as shown in §1.7.

2.2.3 Date of Test

2019-January-28

2.2.4 Test Method

The EUT was set up in a semi-anechoic chamber on a remotely controlled turntable and placed on a non-conductive table 0.8m above a reference ground plane.

A pre-scan of the EUT emissions profile was made while varying the antenna-to-EUT azimuth and antenna-to-EUT polarization using a peak detector; measurements were taken at a 3m distance. Using the pre-scan list of the highest emissions detected, their bearing and associated antenna polarization, the EUT was then formally measured using a Quasi-peak, Peak, Average detector as appropriate. The readings were maximized by adjusting the antenna height, polarization and turntable azimuth, in accordance with the specification.

The EUT was assessed against the class B limits specified in FCC 47 CFR Part 15.109 and ISED ICES-003, clause 7.1.

2.2.5 Environmental Conditions

The EUT was evaluated within the temperature and humidity range of the EUT as specified by the manufacturer. When the manufacturer does not specify climatic parameters for the EUT, all tests are performed within the ambient temperature range of 20°C to 40°C and humidity range of 30% to 80%.

2.2.6 Additional Observations

The frequency range investigated was 30 MHz to 1 GHz. The highest frequency to which the DUT was measured was determined in accordance with either Table 5.1-1 below or for devices generating frequencies in excess of 1000 MHz, five times the highest frequency generated by the device. A minimum of the six highest emissions within 20 dB of the limit were recorded.

Table 2.2.6-1 – FCC Part 15 § 15.33 Frequency Range of Radiated Measurements

Highest Frequency Generated or Used in the Device or On Which the Device Operates or Tunes (MHz)	Upper Frequency of Measurement (MHz)
Below 1.705 MHz	30
1.705 - 108	1000
108 - 500	2000
500 - 1000	5000

Measurements up to 1 GHz were done using EMC32 V10.20 automated software. Reported level is the actual level with all the correction factors factored in. Correction Factor column is for informational purposes only. See Section 2.2.9 for sample computation.

2.2.7 Sample Computation (Radiated Emissions)

Measuring equipment raw measurement (dBµV) @ 30 MHz			20.0
Correction Factor (dB)	Cable 2	0.24	18.94
	TEMC00011 (antenna)	18.70	
Reported Quasi-peak Final Measurement (dBµV/m) @ 30MHz			38.94

2.2.8 Test Results

Results for Configuration and Mode: 120 VAC / 60 Hz - charging

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

Highest frequency generated or used within the EUT: 33 MHz
Which necessitates an upper frequency test limit of: 1 GHz

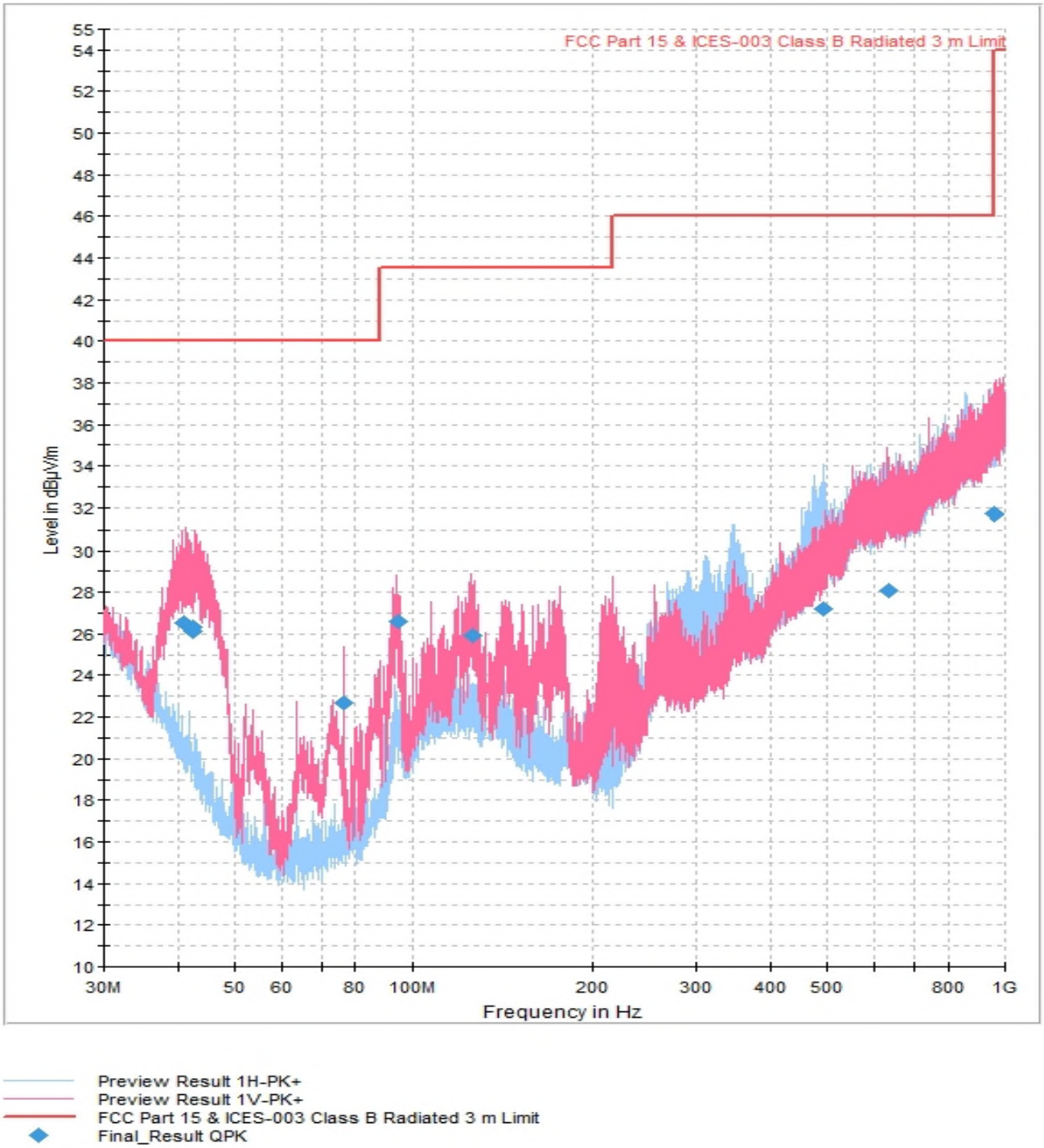

Figure 2.2.8-1 - Graphical Results 30 MHz to 1 GHz - Horizontal and Vertical Polarity

Table 2.2.8-1 - Quasi-peak Radiated Emissions Data

Frequency (MHz)	Quasi-peak (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
40.840	26.5	114.0	V	244.0	19.3	13.5	40.0
42.400	26.1	135.0	V	242.0	18.4	13.9	40.0
42.560	26.3	124.0	V	244.0	18.4	13.7	40.0
76.280	22.7	266.0	V	288.0	13.7	17.3	40.0
94.240	26.6	109.0	V	88.0	17.0	16.9	43.5
126.160	25.9	154.0	H	164.0	19.9	17.6	43.5
491.960	27.2	400.0	V	201.0	26.3	18.8	46.0
633.720	28.1	343.0	H	87.0	28.6	17.9	46.0
959.000	31.7	195.0	H	112.0	31.1	14.3	46.0

2.2.9 Radiated Emissions Test Set-up Photos

Photo 2.2.9-1 – Front View of the Test Setup up to 1 GHz

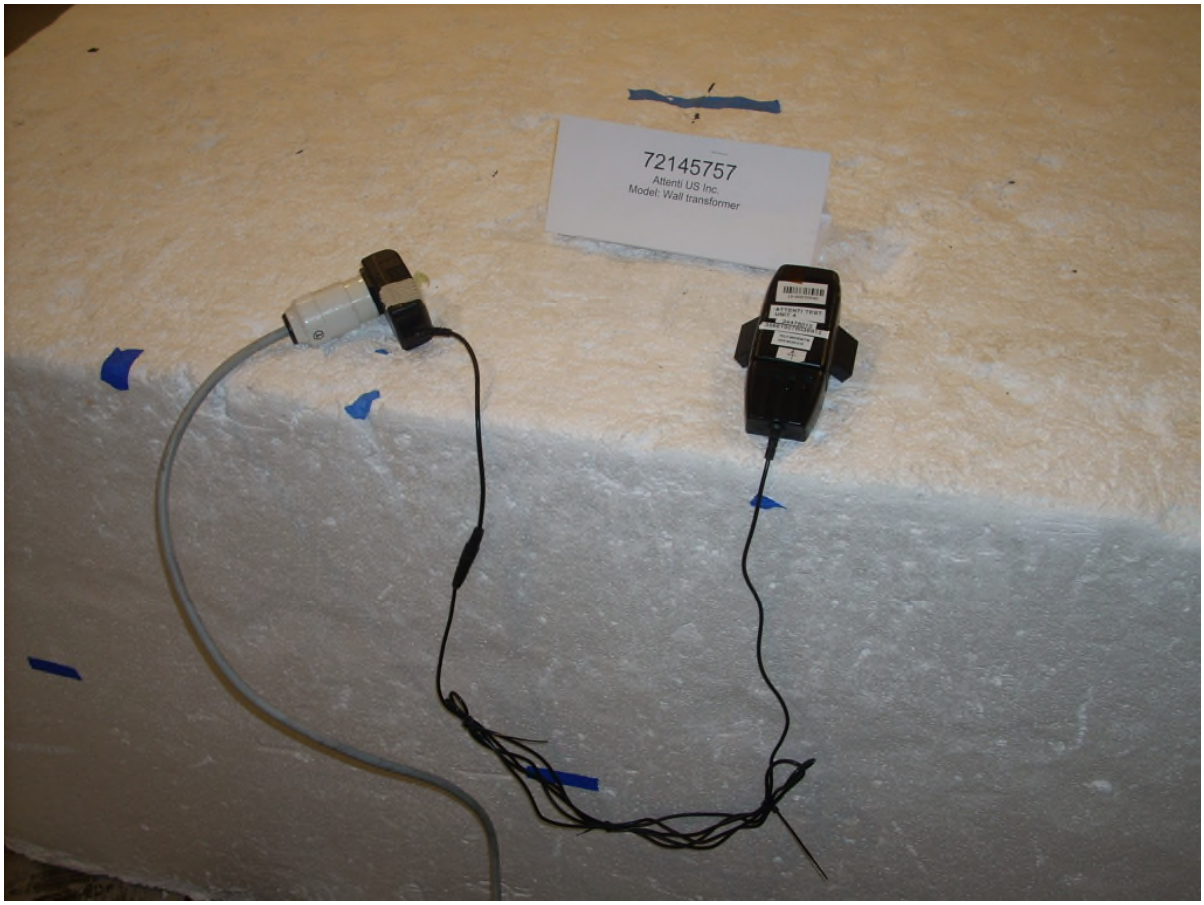

Photo 2.2.9-2 – Rear View of the Test Setup up to 1 GHz

2.2.10 Test Location and Test Equipment Used

The tests were carried out in Tampa, FL using equipment listed below in Table 2.1.8-1.

Table 2.2.10-1

Instrument	Manufacturer	Type No	TE No	Software /Firmware Revision	Calibration Period (months)	Calibration Due
Bilog Antenna	Chase EMC	6112B	TEMC00005	N/A	24	2019-12-19
Double-ridged waveguide horn antenna	ETS Lindgren	3117	TEMC00061	N/A	24	2020-2-13
EMI Test Receiver	Rhode & Schwarz	ESIB 40	TEMC00128	4.35	24	2019-11-16
Pre-amplifier	Compower	PAM-118A	TEMC00160	N/A	24	2020-2-7
Spectrum Analyzer	Agilent	E7405A	TEMC00012	A.09.02	24	2020-3-28
Test Software	Rhode & Schwarz	EMC32		10.35.10	N/A	N/A
Semi-anechoic Room	Panashield	3m	TEMC00031	N/A	24	2020-1-26

TU - Traceability Unscheduled
O/P MON - Traceability Unscheduled
N/A - Not Applicable

3 Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

Table 3-1 - Values of U_{cispr} and U_{Lab}

Measurement	U_{cispr}	U_{Lab}
Conducted disturbance (mains port) (9 kHz – 150 kHz) (150 kHz – 30 MHz)	 3.8 dB 3.4 dB	 3.71 dB 3.31 dB
Conducted disturbance (telecom port) (150 kHz – 30 MHz 55 dB LCL) (150 kHz – 30 MHz 65 dB LCL) (150 kHz – 30 MHz 75 dB LCL)	5.0 dB 5.0 dB 5.0 dB	4.11 dB 4.50 dB 4.94 dB
Radiated disturbance (electric field strength on an open area test site or alternative test site) (30 MHz – 1 000 MHz) (1 – 6 GHz) (6-18 GHz)	 6.3 dB 5.2 dB 5.5 dB	 5.85 dB 4.48 dB 4.48 dB

Notes:

U_{cispr} resembles a value of measurement uncertainty for a specific test, which was determined by considering uncertainties associated with the quantities listed in CISPR 16-4-2:2011.

Compliance or non-compliance with a disturbance limit shall be determined in the following manner.

If U_{Lab} is less than or equal to U_{cispr} in Table 5.0-1, then:
- compliance is deemed to occur if no measured disturbance exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance exceeds the disturbance limit.

If U_{Lab} is greater than U_{cispr}, then:
- compliance is deemed to occur if no measured disturbance, increased by (U_{Lab} – U_{cispr}), exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance, increased by (U_{Lab} – U_{cispr}), exceeds the disturbance limit.

The TÜV SÜD AMERICA, Inc. calculated MU is less than the internationally accepted MU, therefore an adjustment to the measured result as mentioned above is not necessary.

4 Diagram of Test Set-ups

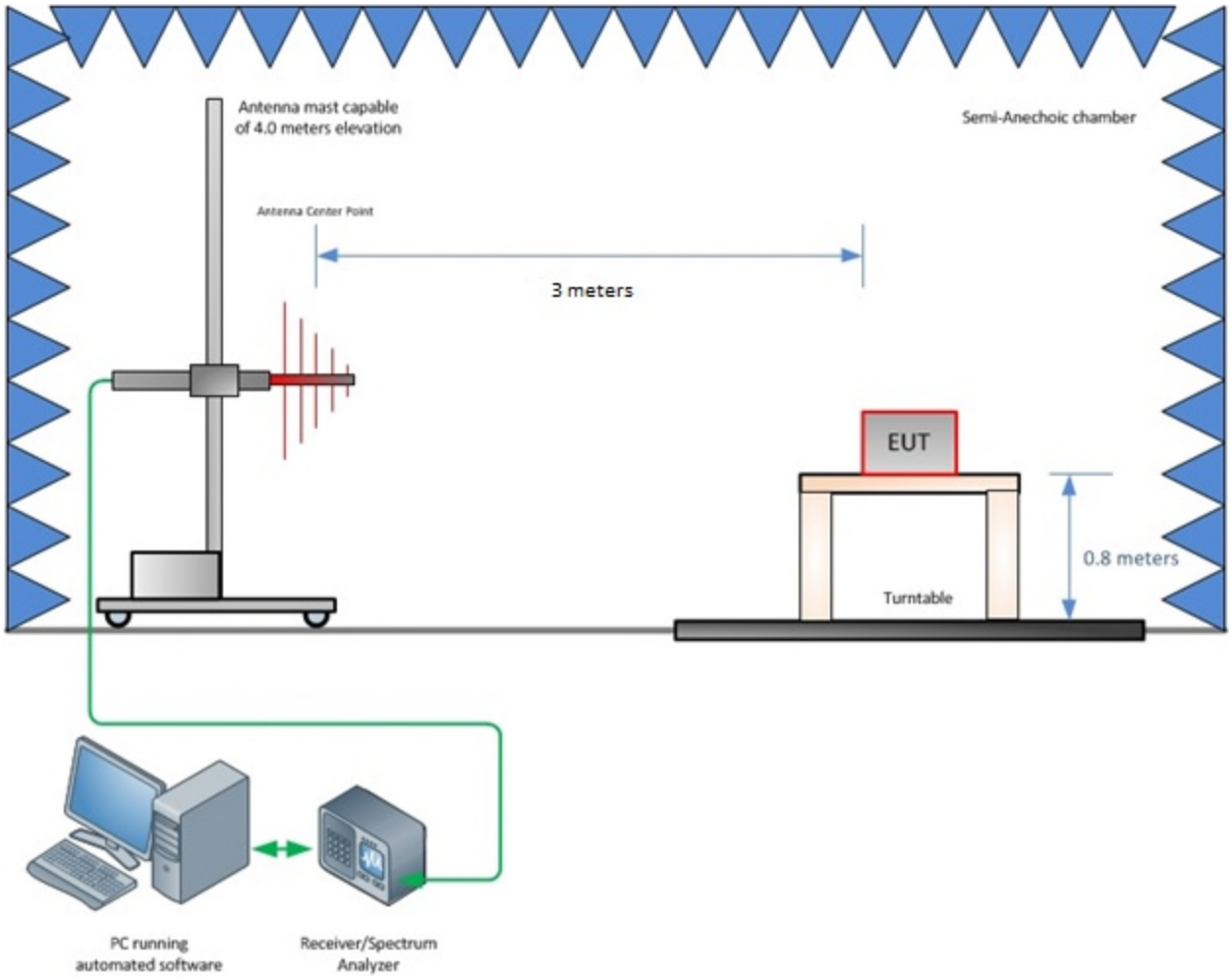

Figure 4-1 - Radiated Emissions Test Setup up to 1 GHz

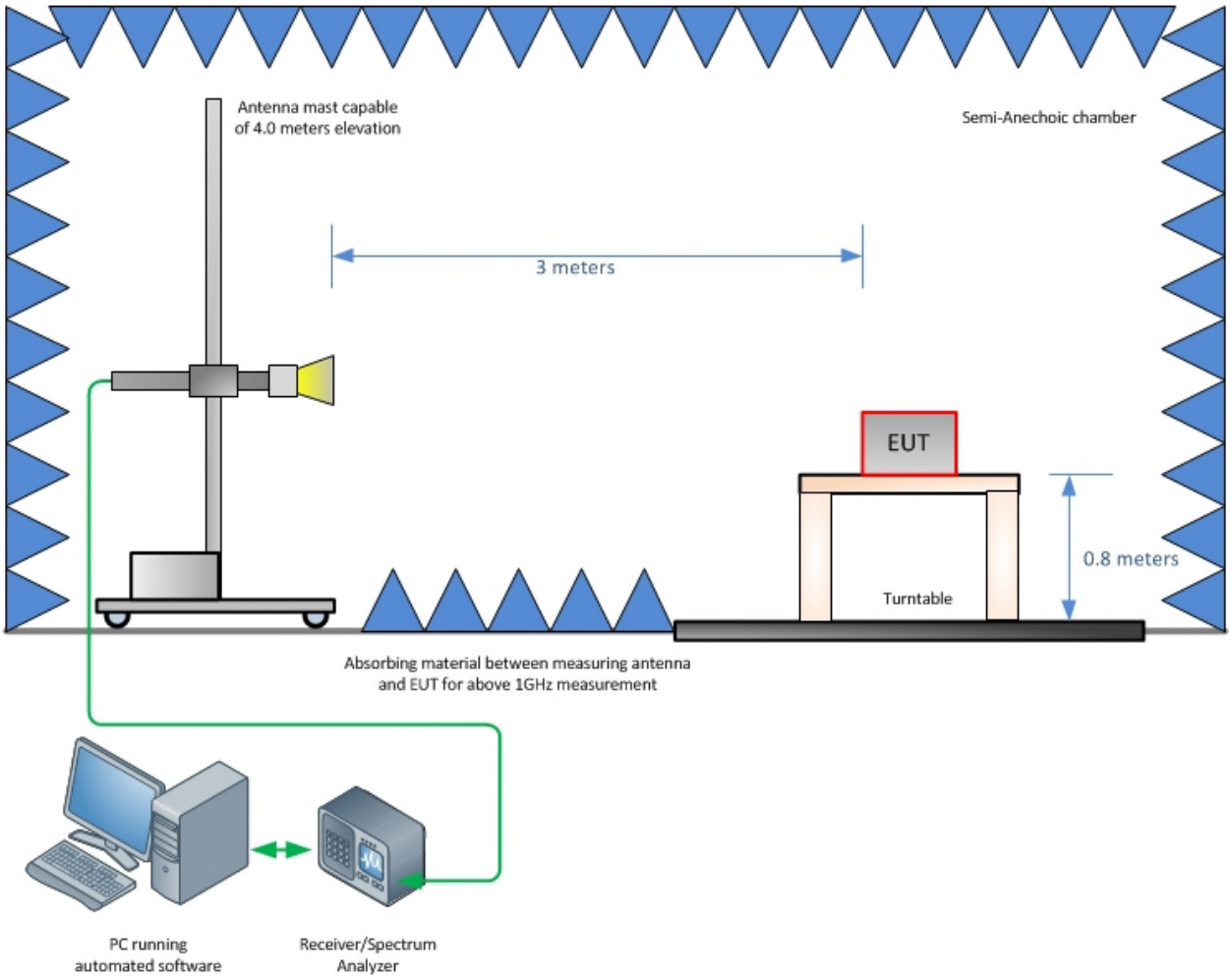

Figure 4-2 - Radiated Emissions Test Setup above 1 GHz

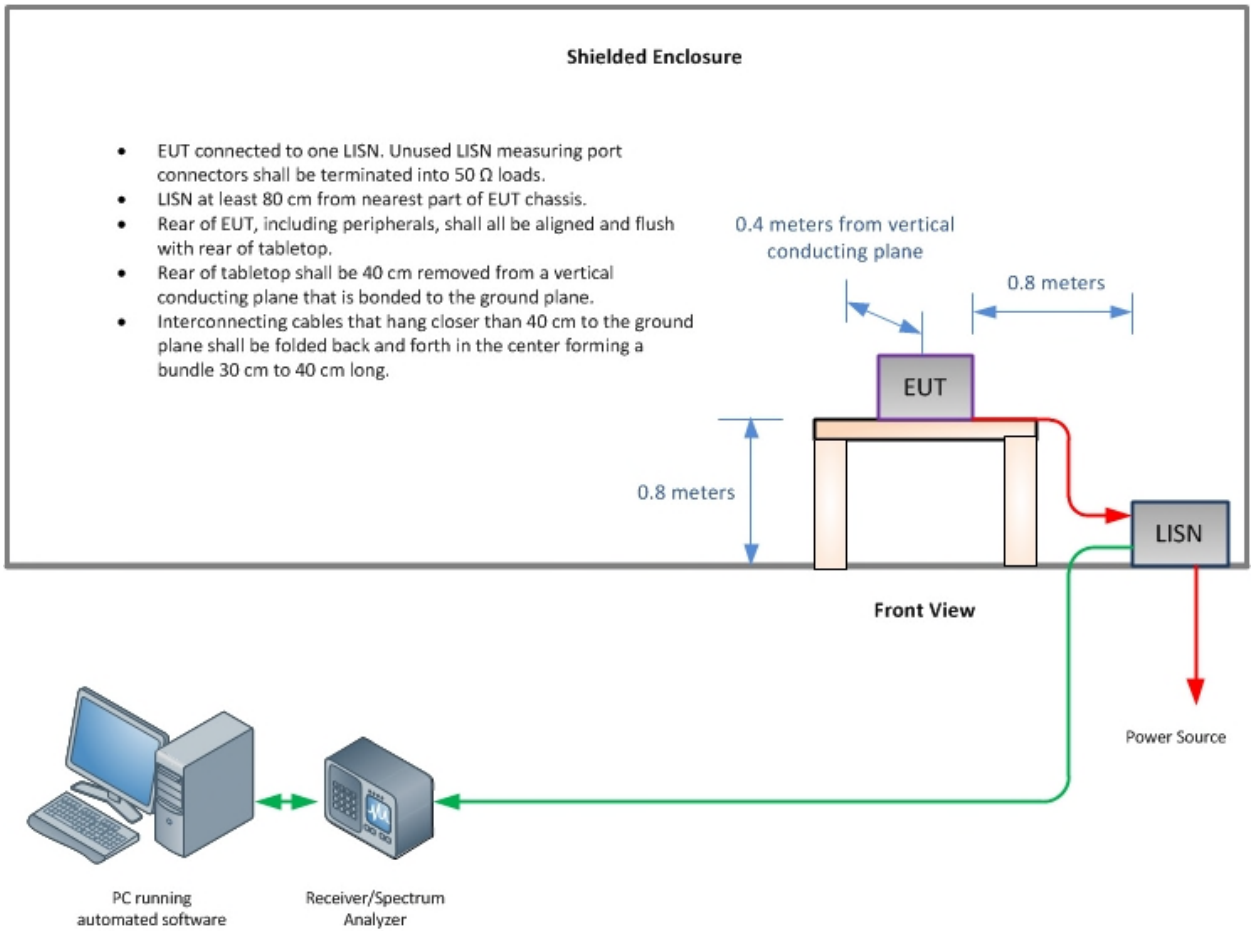

Figure 4-3 - Conducted Emissions Test Setup

5 Accreditation, Disclaimers and Copyright

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