



# H.B. Compliance Solutions

## Intentional Radiator Test Report

For the

**Wilson Electronics**

**WeBoost Dash**

Tested under

The FCC Rules contained in Title 47 of the CFR, Part 15.209

May 22, 2025

**Prepared for:**

Wilson Electronics

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**Engineering Statement:** The measurements shown in this report were made in accordance with the procedure indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurement made, the equipment tested is capable of operation in accordance with the requirements of Part 15 of the FCC Rules under normal use and maintenance. All results contained herein relate only to the sample tested.

## Report Status Sheet

| Revision # | Report Date  | Reason for Revision |
|------------|--------------|---------------------|
| Ø          | May 22, 2025 | Initial Issue       |

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## EXECUTIVE SUMMARY

### 1. Testing Summary

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15.209. All tests were conducted using measurement procedure from ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9kHz to 40GHz and ANSI C63.10-2013 Procedures for Compliance Testing of Unlicensed Wireless Devices as appropriate.

| Test Name                          | Test Method/Standard      | Result | Comments        |
|------------------------------------|---------------------------|--------|-----------------|
| Unintentional Radiated Emissions   | 15.109                    | Pass   |                 |
| A/C Power Line Conducted Emissions | 15.207(a)                 | N/A    | DC powered Only |
| Occupied Bandwidth                 | 15.215                    | Pass   |                 |
| Radiated Fundamental Emissions     | 15.209(a)                 | Pass   |                 |
| Radiated Spurious Emissions        | 15.209(a), 15.205, 15.3.3 | Pass   |                 |

## EQUIPMENT CONFIGURATION

### 1. Overview

H.B. Compliance Solutions was contracted by Wilson Electronics to perform testing on WeBoost Dash under the purchase order number PO017322.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Wilson Electronics, WeBoost Dash.

The tests were based on FCC Part 15 Rules. The tests described in this document were formal tests as described with the objective of the testing was to evaluate compliance of the Equipment Under Test (EUT) to the requirements of the aforementioned specifications. Wilson Electronics is to retain a copy of this document and it should be kept on file for at least five years after the manufacturing of the EUT has been permanently discontinued. The results obtained relate only to the item(s) tested.

|                                       |                                                                                |
|---------------------------------------|--------------------------------------------------------------------------------|
| <b>Product Name:</b>                  | WeBoost Dash                                                                   |
| <b>Model(s) Tested:</b>               | 470082                                                                         |
| <b>FCC ID:</b>                        | PWO082                                                                         |
| <b>ISED ID:</b>                       | 4726A-082                                                                      |
| <b>Supply Voltage Input:</b>          | Primary Power: 12 VDC                                                          |
| <b>Frequency Range:</b>               | 100-127kHz                                                                     |
| <b>No. of Channels:</b>               | 1                                                                              |
| <b>Type(s) of Modulation:</b>         | ASK                                                                            |
| <b>Range of Operation Power:</b>      | 0.035mW (Radiated)                                                             |
| <b>Emission Designator:</b>           | N/A                                                                            |
| <b>Channel Spacing(s)</b>             | None                                                                           |
| <b>Test Item:</b>                     | Pre-Production                                                                 |
| <b>Type of Equipment:</b>             | Fixed                                                                          |
| <b>Antenna Requirement (§15.203):</b> | Type of Antenna: Integral Loop<br>Gain of Antenna: 0dBi                        |
| <b>Environmental Test Conditions:</b> | Temperature: 15-35°C<br>Humidity: 30-60%<br>Barometric Pressure: 860-1060 mbar |
| <b>Modification to the EUT:</b>       | None                                                                           |
| <b>Evaluated By:</b>                  | Staff at H.B Compliance Solutions                                              |
| <b>Test Date(s):</b>                  | 04/25/2025 till 04/30/2025                                                     |
| <b>Firmware Number</b>                | V4.04r1.10                                                                     |
| <b>PCBA Version</b>                   | PCB2027B                                                                       |

## 2. Test Facility

All testing was performed at H.B. Compliance Solutions. This facility is located at 5005 S. Ash Avenue, Suite # A-10, Tempe AZ-85282. All equipment used in making physical determination is accurate and bears recent traceability to the National Institute of Standards and Technology.

Radiated Emissions measurements were performed in a GTEM chamber (equivalent to an Open Area Test Site). In accordance with §2.948(a)(3), a complete site description is contained at H.B. Compliance Solutions.

Test facility H.B. Compliance Solutions is an ANAB accredited test site. The ANAB certificate number is L2458. The scope of accreditation can be found on ANAB website [www.anab.org](http://www.anab.org)

FCC Registered Number: 738876

ISED Test Site Registration number is 9481A



### 3. Description of Test Sample

The Wilson WeBoost Dash is a “Contact-Coupling” bi-directional signal booster that improves RF coverage for areas in which low signal strength is a problem when using a host device inside a vehicle or building. The components are contained in a plastic enclosure.

### 4. Equipment Configuration

| Ref. ID | Name / Description | Model Number | Serial Number |
|---------|--------------------|--------------|---------------|
| # 1     | WeBoost Dash       | 470082       | N/A           |
| # 2     | Dash Cradle        |              | N/A           |

Table 1. Equipment Configuration

### 5. Support Equipment

All support equipment supplied is listed in the following Support Equipment List.

| Ref ID | Name / Description | Manufacturer | Model # | Serial # |
|--------|--------------------|--------------|---------|----------|
| # 3    | 15W Load           | EESON        | None    | None     |

Table 2. Support Equipment

### 6. Ports and Cabling Information

| Ref ID | Port name on the EUT | Cable Description | Qty. | Length (m) | Shielded? (Y/N) | Termination Box ID & Port ID |
|--------|----------------------|-------------------|------|------------|-----------------|------------------------------|
| # 4    | Power                | DC 2 Wire         | 1    | 1.5        | N               | 12VDC Power                  |

Table 3. Ports and Cabling Information

## **7. Method of Monitoring EUT Operation**

A test receiver will be used to monitor the RF transmission from the EUT.

## **8. Mode of Operation**

The EUT will be configured to transmit at maximum power level. It was set to continuous transmit. Emissions were checked in both full Wireless Power Transfer (WPT) mode and the Idle pinging mode.

## **9. Modifications**

### **9.1 Modifications to EUT**

No Modifications were made to the EUT.

### **9.2 Modifications to Test Standard**

No Modifications were made to the test standard.

## **10. Disposition of EUT**

The test sample including all support equipment submitted to H.B Compliance Solutions for testing will be returned to Wilson Electronics upon completion of testing & certification.

## Criteria for Intentional Radiators

### 1. Radiated Emissions

|                             |         |                          |            |
|-----------------------------|---------|--------------------------|------------|
| <b>Test Requirement(s):</b> | §15.109 | <b>Test Engineer(s):</b> | Sean E.    |
| <b>Test Results:</b>        | Pass    | <b>Test Date(s):</b>     | 04/29/2025 |

#### Test Procedures:

The final radiated emissions test was performed using the parameters described above as worst case. That final test was conducted at a facility that meets the ANSI C63.4 TEM waveguides requirements. The frequency range noted in the data sheets was scanned/tested at that facility. Emissions were maximized as specified, by varying table azimuth, and manipulating cables.

Using the mode of operation and configuration noted within this report, a final radiated emissions test was performed. The frequency range investigated (scanned), is also noted in this report. Radiated emissions measurements were made at the EUT azimuth such that the maximum radiated emissions level will be detected. This requires the use of a turntable.

Tests were made with the EUT rotated on X,Y,Z planes to obtain the maximum signal strength. Though specified in the report, the measurement distance shall be 3 meters.

#### Test Limits:

| Frequency Range (MHz)                                                                                                                                                                                                                       | Distance (Meters) | Field Strength |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------------|---------------|
|                                                                                                                                                                                                                                             |                   | uV/m           | dBuV/m        |
| 0.009 – 0.490                                                                                                                                                                                                                               | 300               | 2400/F(kHz)    | 67.6-20log(F) |
| 0.490 – 1.705                                                                                                                                                                                                                               | 30                | 2400/F(kHz)    | 87.6-20log(F) |
| 1.705 – 30.0                                                                                                                                                                                                                                | 30                | 30             | 29.54         |
| 30 – 88                                                                                                                                                                                                                                     | 3                 | 100            | 40.0          |
| 88 – 216                                                                                                                                                                                                                                    | 3                 | 150            | 43.5          |
| 216 – 960                                                                                                                                                                                                                                   | 3                 | 200            | 46.0          |
| 960 – 1000                                                                                                                                                                                                                                  | 3                 | 500            | 54.0          |
| Note: Emissions limits are based on measurements employing CISPR QP detector except for bands 9-90kHz, 110-490kHz and above 1000MHz. Radiated emissions limits in these three bands are based on measurements employing an average detector |                   |                |               |

**Table 4. Radiated Emissions Limit – FCC Limits from Section 15.209**

| Frequency Range (MHz)                                                                                                                                     | Peak Data (kHz) | Quasi-Peak Data (kHz) | Average Data (kHz) |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------------|--------------------|
| 30 MHz to 1 GHz                                                                                                                                           | 120 kHz         | 120 kHz               | N/A                |
| 1 GHz to 11 GHz                                                                                                                                           | 1MHz            | N/A                   | 1MHz               |
| Measurements were made using the bandwidths and detectors specified. The video filter was at least as wide as the IF bandwidth of the measuring receiver. |                 |                       |                    |

**Table 5. Radiated Emissions – Measurement Bandwidth**

## Emissions Tests Calculations

In the case of indoor measurements, radiated emissions measurements are made by the manipulation of correction factors using TILE4 software. This is done automatically by the software during the final measurement process.

In both cases, the level of the Field Strength of the interfering signal is calculated by adding the Antenna Factor, Cable Factor and by subtracting the Amplifier Gain from the measured reading. The basic equation is as follows:

$$FS = RA + AF + (CF - AG)$$

Where: FS = Field Strength

RA = Receiver (indicated) Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor

AG = Amplifier Gain

This laboratory uses an approach of combining the CF and AG using an end-to-end measurement of the entire cabling system, including the test cable, any in-line amplifiers, attenuators, or transient protection networks, all measured in-situ.

For a sample calculation, assume a receiver reading of 52.5 dBuV is obtained. With an antenna factor of 7.4 and a combined cable factor (CF + AG) of -27.9:

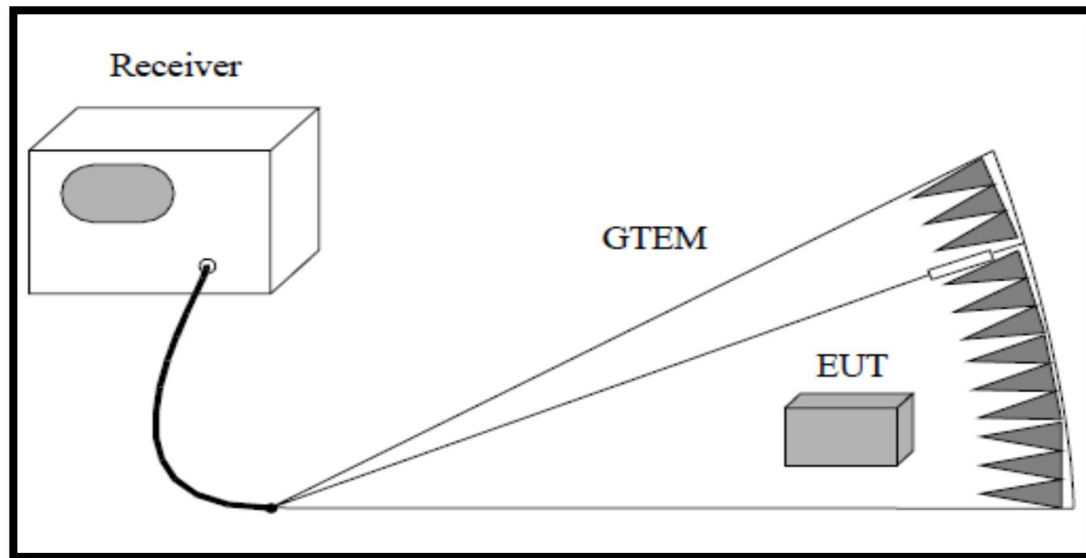
$$FS = 52.5 + 7.4 + (-27.9) = 32 \text{ dBuV/m}$$

$$FS = 32 \text{ dBuV/m}$$

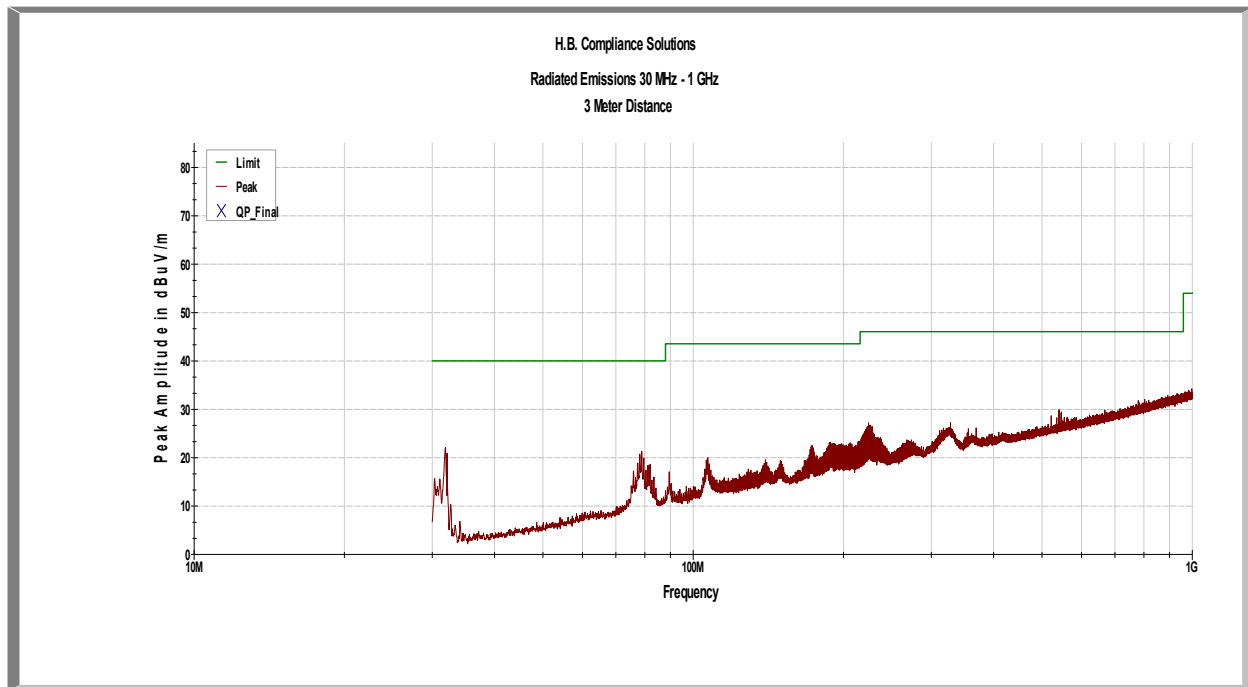
If desired, this can be converted into its corresponding level in uV/m:

$$FS = 10^{((32 \text{ dBuV/m})/20)} = 39.8 \text{ uV/m}$$

**Test Setup:**



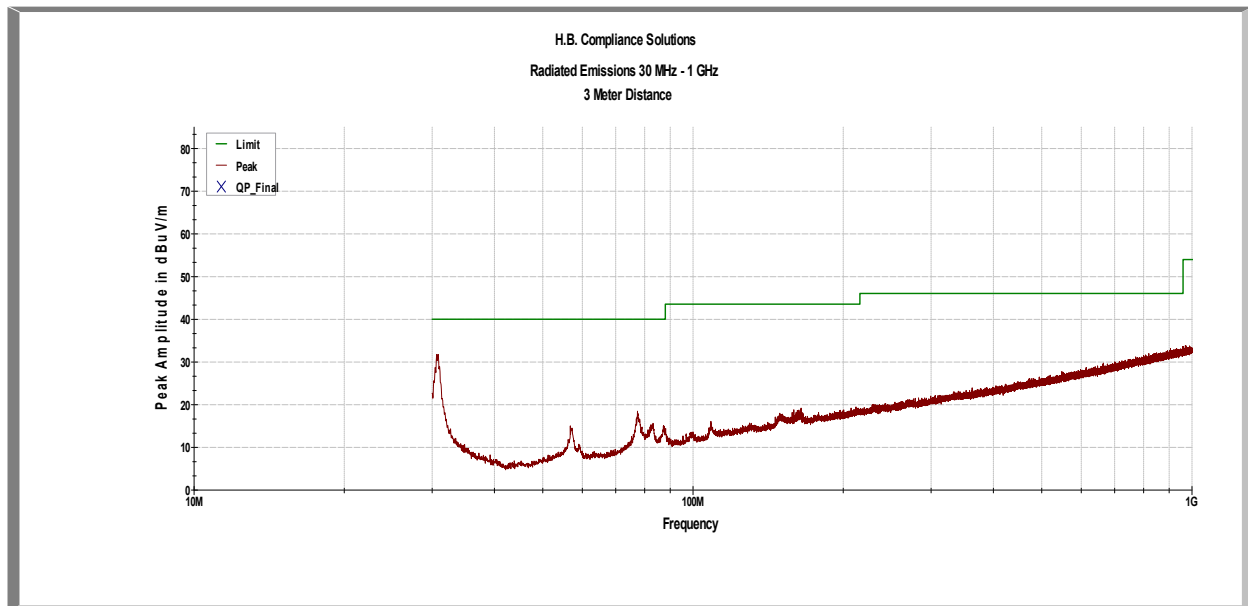
**Figure 1. Radiated Emissions Test Setup (30MHz – 1GHz)**



**Plot 1 – Radiated Emissions – 30MHz to 1GHz – Idle Mode**

| Frequency (MHz) | Measured Level (dBuV/m) | Measurement Detector | Limit (dBuV) | Margin (dB) |
|-----------------|-------------------------|----------------------|--------------|-------------|
| 31.89           | 22.12                   | Peak                 | 40.0         | -17.88      |
| 32.13           | 20.87                   | Peak                 | 40.0         | -19.13      |
| 78.89           | 21.3                    | Peak                 | 40.0         | -18.7       |
| 224.53          | 27.2                    | Peak                 | 46.02        | -18.82      |

**Table 6. Final Measurement Results for Radiated Emissions Above 30MHz**



**Plot 2 – Radiated Emissions – 30MHz to 1GHz – Charging**

| Frequency (MHz) | Measured Level (dBuV/m) | Measurement Detector | Limit (dBuV) | Margin (dB) |
|-----------------|-------------------------|----------------------|--------------|-------------|
| 31.87           | 31.75                   | Peak                 | 40.0         | -8.25       |

**Table 7. Final Measurement Results for Radiated Emissions Above 30MHz**

## 2. Occupied Bandwidth

|                             |           |                          |            |
|-----------------------------|-----------|--------------------------|------------|
| <b>Test Requirement(s):</b> | 15.215(c) | <b>Test Engineer(s):</b> | Sean E.    |
| <b>Test Results:</b>        | Pass      | <b>Test Date(s):</b>     | 04/30/2025 |

**Test Procedure:** As required by 47 CFR 15.215(c): The bandwidth of the emission shall be determined at the points 20dB down from the modulated carrier.

Customer provided a test mode internal to the EUT to control the RF modulation. The EUT antenna was attached and the waveform was received by the test antenna which was connected to the spectrum analyzer. The measured highest peak power was set relative to zero dB reference. The RBW of the Spectrum Analyzer was set to 300Hz and VBW>RBW.

| Frequency (kHz) | 20dB Bandwidth (Hz) | 99% Bandwidth (kHz) |
|-----------------|---------------------|---------------------|
| 126             | 105.37              | 91.96               |

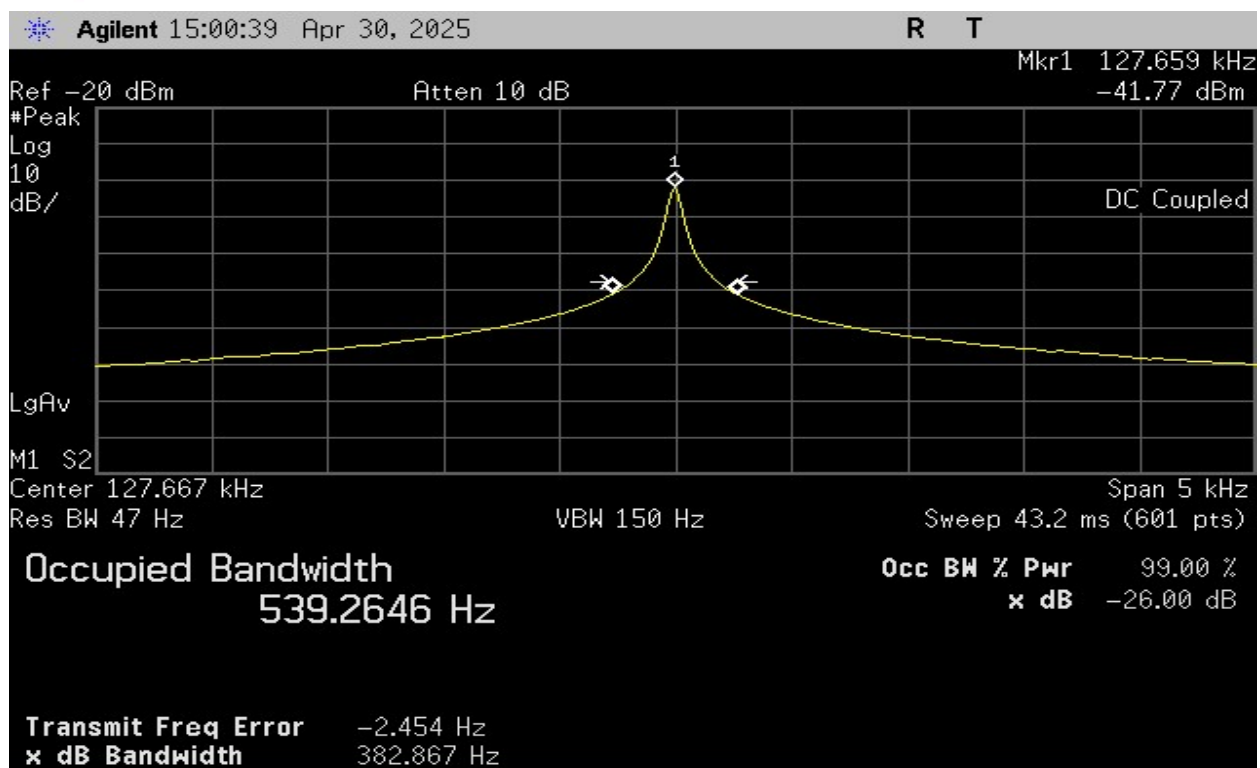
**Table 8. Occupied Bandwidth Summary, Test Results**

**Test Setup:**

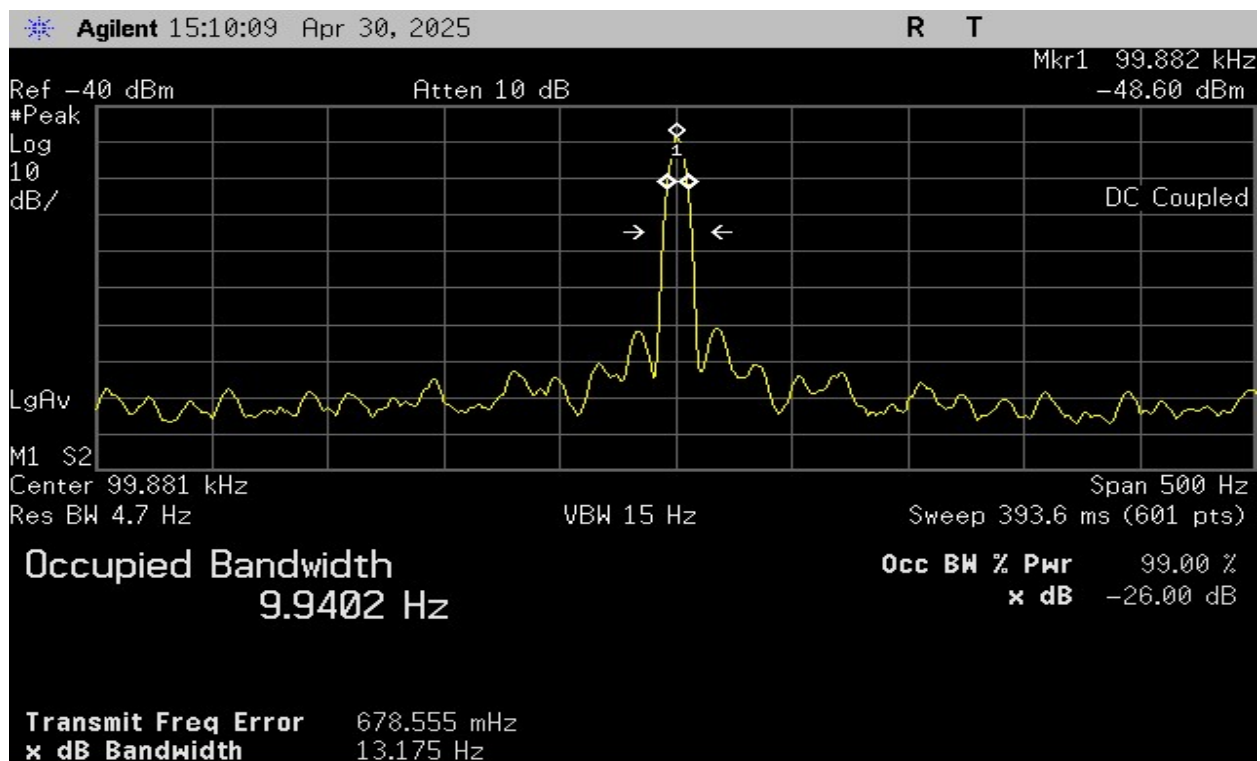


**Figure 2. Occupied Bandwidth Test Setup**

The following pages show measurements of Occupied Bandwidth plot:



Plot 3 – 20dB BW – Idle Mode Pinging



Plot 4 – 20dB BW – WPT Mode

## 5. Radiated Spurious Emissions

|                             |         |                          |            |
|-----------------------------|---------|--------------------------|------------|
| <b>Test Requirement(s):</b> | §15.209 | <b>Test Engineer(s):</b> | Sean E.    |
| <b>Test Results:</b>        | Pass    | <b>Test Date(s):</b>     | 04/17/2025 |

**Test Procedures:** As required by 47 CFR 15.209, Radiated emission measurements were made in accordance with the procedures of the ANSI C63.10 - 2013.

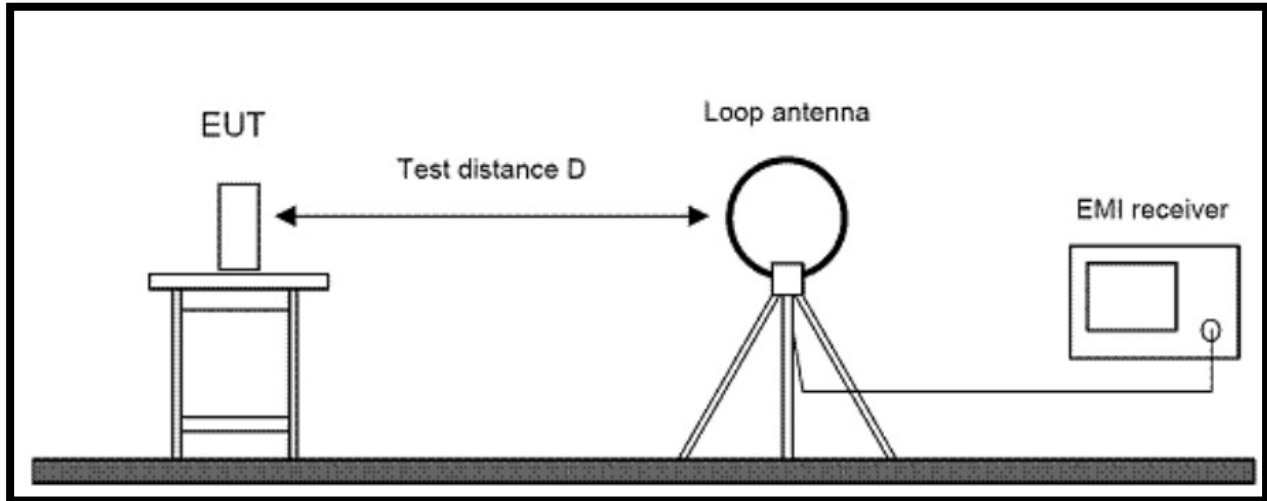
The EUT was placed on a non-reflective table inside 3 meter open area test site. The EUT was set on continuous transmit.

The measurement distance was set at 3 meters from the EUT. During the tests, EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The frequency range up to the 10<sup>th</sup> harmonic was investigated.

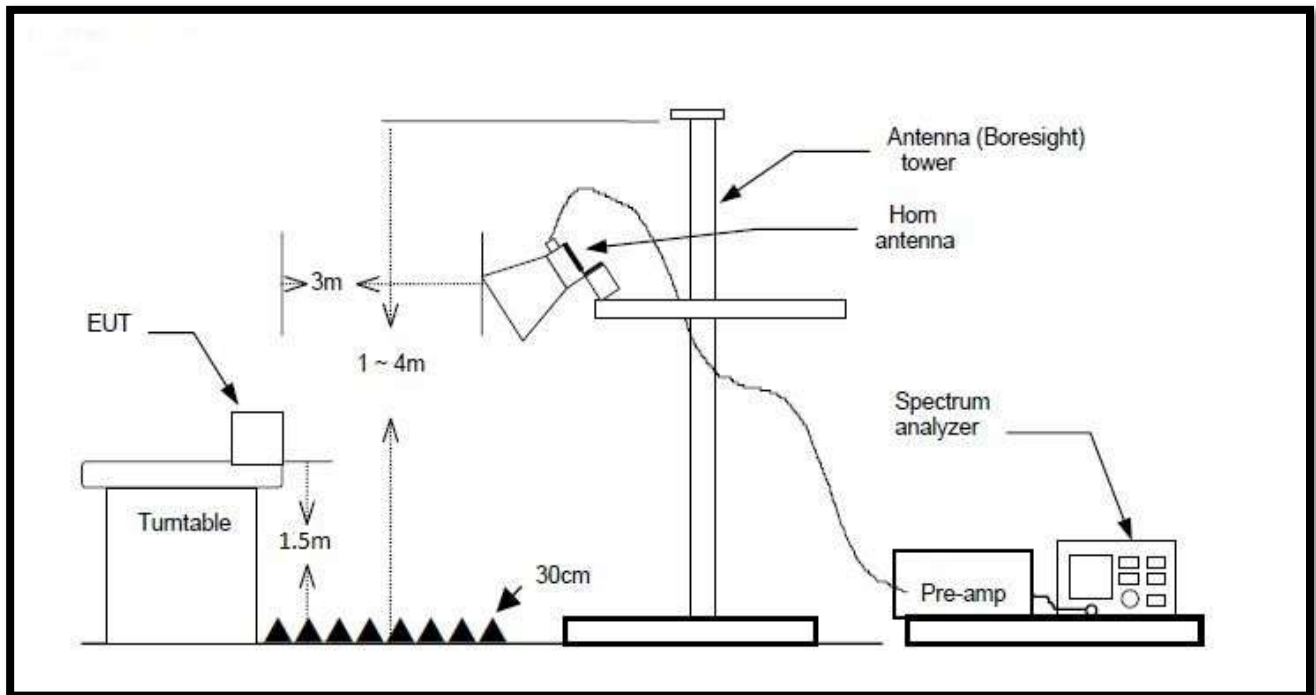
| Frequency Range  | Detector Setting        | Resolution Bandwidth | Video Bandwidth           | Span         |
|------------------|-------------------------|----------------------|---------------------------|--------------|
| 9kHz-150kHz      | As Specified in §15.209 | 200Hz                | As Specified in §15.35(c) | As necessary |
| 150kHz-30MHz     | As Specified in §15.209 | 9kHz                 | As Specified in §15.35(c) | As necessary |
| 30MHz – 1000 MHz | Quasi Peak              | 120kHz               | As Specified in §15.35(c) | Zero         |
| 1000 MHz – 5GHz  | Peak                    | 1MHz                 | 1MHz                      | As necessary |
| 1000 MHz – 5GHz  | Average                 | 1MHz                 | As Specified in §15.35(c) | As necessary |

**Table 9 - Analyzer Settings**

**Test Setup:**



**Figure 3. Radiated Emissions Test Setup (9kHz - 30MHz)**



**Figure 4. Radiated Emission Above 1GHz Test Setup**

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical

| Frequency (MHz) | Peak Measurement @ 3m (dBuV/m) | Final Measurement @ 3m (dBuV/m) | FCC Limit (dBuV/m) | FCC Peak Limit (dBuV/m) | Final Measurement Margin (dB) | Peak Margin (dB) | Detector for Final Measurement | Comment     |
|-----------------|--------------------------------|---------------------------------|--------------------|-------------------------|-------------------------------|------------------|--------------------------------|-------------|
| 0.100           | 82.40                          | 82.40                           | 107.60             | 127.60                  | -25.20                        | -45.20           | Average                        | Fundamental |

**Table 10 – Fundamental Field Strength**

| Frequency (MHz) | Final Measurement @ 3m (dBuV/m) | FCC Limit (dBuV/m) | Final Measurement Margin (dB) | Detector for Final Measurement | Comment   |
|-----------------|---------------------------------|--------------------|-------------------------------|--------------------------------|-----------|
| 0.514           | 51.74                           | 73.37              | -21.63                        | Quasi Peak                     | WPT Mode  |
| 0.879           | 54.06                           | 68.72              | -14.66                        | Quasi Peak                     | WPT Mode  |
| 1.389           | 62.34                           | 64.75              | -2.41                         | Quasi Peak                     | WPT Mode  |
| 9.979           | 51.76                           | 69.54              | -17.78                        | Quasi Peak                     | WPT Mode  |
| 0.128           | 70.57                           | 105.46             | -34.89                        | Average                        | Idle Mode |
| 0.632           | 66.75                           | 71.59              | -4.84                         | Quasi Peak                     | Idle Mode |
| 0.920           | 62.13                           | 68.33              | -6.20                         | Quasi Peak                     | Idle Mode |
| 1.596           | 52.87                           | 63.54              | -10.67                        | Peak                           | Idle Mode |

**Table 11 - Radiated Spurious Emission Data**

Remark:

To get a maximum emission level from the EUT, the EUT was moved throughout the X-axis, Y-axis and Z-Axis. Worst case is X-axis.

## Test Equipment

| Equipment                 | Manufacturer       | Model     | Serial #   | Last Cal Date | Cal Due Date |
|---------------------------|--------------------|-----------|------------|---------------|--------------|
| Two Line V-Network - LISN | Teseq              | NNB 51    | 43198      | Feb-12-25     | Feb-12-28    |
| Spectrum Analyzer (PSA)   | Agilent            | E4443A    | US41420164 | Jul-15-24     | Jul-15-25    |
| Spectrum Analyzer         | Hewlett Packard    | 8595EM    | 3801A00177 | May-08-24     | May-08-25    |
| EMI Test Receiver         | Rohde & Schwarz    | ESMI26    | 840607/005 | Jan-28-25     | Jan-28-26    |
| EMI Receiver              | Hewlett Packard    | 8566B     | 2747A05264 | Mar-25-25     | Mar-25-26    |
| Amplifier                 | Amplifier Research | LN10000A  | 27023      | Verified      |              |
| Loop Antenna              | A.H. Systems       | SAS-565H  | 150        | Apr-10-24     | Apr-10-27    |
| Antenna                   | EMCO               | GTEM 5417 | 1063       | Dec/19/22     | Dec/19/25    |
| Horn Antenna              | Com Power          | AHA-118   | 711150     | Feb-13-25     | Feb-13-28    |

**Table 12 – Test Equipment List**

**\*Statement of Traceability:** Test equipment is maintained and calibrated on a regular basis. All calibrations have been performed by a 17025 accredited test facility, traceable to National Institute of Standards and Technology (NIST)

## 6. Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. These measurements figures are calculated in accordance with ETSI TR 100 028 Parts 1 and 2. Instrumentation measurement uncertainty has **not** been taken into account to determine compliance.

The following measurement uncertainty values have been calculated as show in the table below:

| Measured Parameter             | Measurement Unit | Frequency Range | Expanded Uncertainty |
|--------------------------------|------------------|-----------------|----------------------|
| Conducted Emissions (AC Power) | dBuV or dBuA     | 150kHz – 30MHz  | ± 4.3dB              |
| Radiated Emission below 30MHz  | dBuV/m           | 9kHz-30MHz      | ± 2.96dB             |
| Radiated Emissions below 1GHz  | dBuV/m           | 30 – 1000MHz    | ± 5.6dB              |
| Radiated Emissions above 1GHz  | dBuV/m           | 1 – 26.5GHz     | ± 4.1dB              |

The reported expanded uncertainty has been estimated at a 95% confidence level (k=2)

## **END OF TEST REPORT**