

**Test Report for the
FCC and ISED Testing of an
JRD-1171 BLE Module
to FCC Rule 47CFR 15.247
and ISED RSS-247 for
JR Dynamics Ltd
(t/a Transmission Dynamics)**

Report number: C15847TR2

Project number: C9235

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| Issue | Description | | | | | | Issue by | Date |
|-------|-------------|--|--------|--|-----|---|----------|---------------------------|
| 2 | Copy 1 | | Copy 2 | | PDF | ✓ | JB | 15 th May 2025 |

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The results contained in this report are only applicable to the apparatus tested.**

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Test Report Change History

| Issue | Date | Modification Details |
|-------|-----------------------------|--|
| 1 | 25 th March 2025 | First Issue |
| 2 | 15 th May 2025 | Antenna gain added to section 3.1 and EIRP values added to section 7.2.6 |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | | |
| 10 | | |

Section 1 Test Location

All testing was performed at;

| | |
|--------------------------------|---|
| Eurofins E&E UK Ltd | Unit 5 |
| | Speedwell Road |
| | Castleford |
| | WF10 5PY |
| | |
| Tel: | 01977 731173 |
| | |
| Website | http://www.yorkemc.co.uk |
| UKAS Testing No. | 1574 |

1.1 UKAS Accreditation

Opinions and interpretations expressed herein are outside the scope of UKAS Accreditation.

Eurofins E&E UK Ltd latest accreditation schedule can be found at:

[UKAS Scope of accreditation](#)

Eurofins E&E UK Castleford Laboratory, is an Accredited facility recognised by the Federal Communications Commission (FCC) for certification testing. The appropriate FCC Designation Number is UK2013, dated 1st March 2021.

Eurofins E&E UK Castleford Laboratory is recognised by ISED for certification testing.

ISED Assigned Code: 22959

CAB Identifier: UK0004

Section 2 Customer Information

| | |
|---------------------|--|
| Company name | JR Dynamics Ltd (t/a Transmission Dynamics) |
| Address | 1 Innovation Way |
| | Northumberland Business Park |
| | Cramlington |
| | NE23 7FP |
| | United Kingdom |
| | |
| Contact | Matt Nixon |
| Email | matt@jrdltd.co.uk |

Section 3 Equipment Details

3.1 Equipment Under Test (EUT)

| | | | |
|---|---|--------------|---------------|
| Date received: | 3rd February 2025 | | |
| EUT name: | JRD-1171 BLE Module | | |
| PMN: | JRD-1171 BLE Module | | |
| HVIN: | V1.0 | | |
| FVIN: | V1.0.0 | | |
| FCC ID: | 2BNX4-JRD1171 | | |
| ISED number: | 33610-JRD1171 | | |
| Serial no: | JRD-1171-0001 | | |
| EUT description: | The EUT is a new Bluetooth Low Energy (BLE) module design, based on the Nordic Semiconductor nRF52840 system-on-chip (SoC). The module features a u.FL connector for external antenna support. The EUT is intended for use in a wide range of Transmission Dynamics products. | | |
| Antenna | External - Whip - Fanstel Corp. Ant060 (+6dBi) External - Puck - Poynting Puck-5-V1 (+5dBi) | | |
| Transmission | Digital Transmission System (DTS) Bluetooth Low Energy (BLE) | | |
| Modulation schemes | GFSK | | |
| Operating frequency band | 2400MHz to 2483.5MHz | | |
| No of units tested: | One | | |
| EUT power: | 3.0V via USB port | | |
| Highest internal frequency: | 2.480GHz | | |
| Size of EUT (m) | Width: 40 mm | Depth: 30 mm | Height: 11 mm |
| Mode/s of operation: | Continuous transmit of packetized data at top, middle and bottom channels. Channels used: 2402MHz, 2440MHz and 2480MHz. Radiated tests were performed with the whip antenna and repeated with the puck antenna. | | |
| Test software: | The EUT was placed in the required test mode by connecting it to a tablet PC via a USB-C to USB cable. The EUT settings were changed by using Python commands. The PC always remained outside of the chamber. The customer requested that power level -16 is used during all tests. | | |
| Modifications incorporated during testing: | N/A | | |

| Ports and Cables | Cable Length | Screened/unscreened | Connected to |
|------------------|--------------|---------------------|--------------|
| USB cable | 5m | Unscreened | Tablet PC |

3.2 EUT Photographs

Photographs are supplied separately.

3.3 Configuration of EUT

The apparatus was supplied in one single possible configuration.

| BLE Channel Number | Frequency | BLE Channel Number | Frequency |
|--------------------|-----------|--------------------|-----------|
| 0 | 2404 MHz | 20 | 2446 MHz |
| 1 | 2406 MHz | 21 | 2448 MHz |
| 2 | 2408 MHz | 22 | 2450 MHz |
| 3 | 2410 MHz | 23 | 2452 MHz |
| 4 | 2412 MHz | 24 | 2454 MHz |
| 5 | 2414 MHz | 25 | 2456 MHz |
| 6 | 2416 MHz | 26 | 2458 MHz |
| 7 | 2418 MHz | 27 | 2460 MHz |
| 8 | 2420 MHz | 28 | 2462 MHz |
| 9 | 2422 MHz | 29 | 2464 MHz |
| 10 | 2424 MHz | 30 | 2466 MHz |
| 11 | 2428 MHz | 31 | 2468 MHz |
| 12 | 2430 MHz | 32 | 2470 MHz |
| 13 | 2432 MHz | 33 | 2472 MHz |
| 14 | 2434 MHz | 34 | 2474 MHz |
| 15 | 2436 MHz | 35 | 2476 MHz |
| 16 | 2438 MHz | 36 | 2478 MHz |
| 17 | 2440 MHz | 37* | 2402 MHz |
| 18 | 2442 MHz | 38* | 2426 MHz |
| 19 | 2444 MHz | 39* | 2480 MHz |

*Advertising channels.

BLE Channelization

| | |
|-----------------|-----|
| Lowest channel | -16 |
| Middle channel | -16 |
| Highest channel | -16 |

Power settings table

Note: Modulation type GFSK, packet length 37 used for all tests.

3.4 EUT Monitoring/Auxiliary Equipment

| Equipment name | Type no. | Serial no |
|--------------------------|------------|--------------|
| Microsoft Surface Tablet | 1724 128GB | 000045570153 |

3.5 Monitoring Software

None. The channel required was selected via software prior to the testing.

Section 4 Test Specifications

For USA:

| | |
|-----------------------------------|--|
| Regulation / Test Standard | <p>Regulation:</p> <p>Title 47 of the Code of Federal Regulations (CFR) Part 15 (47CFR15) Subpart C – Intentional Radiators</p> <p>Measurement standard:</p> <p>ANSIC63.10-2020/Cor1-2023 American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices</p> |
|-----------------------------------|--|

| Requirement | FCC Rule Part | Comments | Result Summary |
|--|---------------------------------|----------|----------------|
| 6 dB Bandwidth | FCC § 15.247(a)(2) | Applies | Pass |
| Maximum peak conducted power | FCC § 15.247(b)(3) | Applies | Pass |
| Power spectral density | FCC § 15.247(e) | Applies | Pass |
| Band edge compliance | FCC § 15.247(d) | Applies | Pass |
| Conducted spurious emissions | FCC § 15.247(d) | Applies | Pass |
| Transmitter radiated spurious emissions – restricted bands | FCC § 15.247(d) FCC § 15.209 | Applies | Pass |

For Canada:

| | |
|-----------------------------------|--|
| Regulation / Test Standard | RSS-247 Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices Issue 3 August 2023 And, RSS-Gen — General Requirements for Compliance of Radio Apparatus Issue 5 April 2018 +A1 March 2019 +A2 February 2021 |
|-----------------------------------|--|

| Requirement | ISED Regulation | Comments | Results Summary |
|---|--|----------|-----------------|
| 99% Occupied Bandwidth | ISED RSS-Gen 6.6 | Applies | Pass |
| 6 dB Bandwidth | ISED RSS-247 § 5.2 | Applies | Pass |
| Maximum peak conducted power | ISED RSS-247 § 5.4 | Applies | Pass |
| Power spectral density | ISED RSS-247 § 5.2 | Applies | Pass |
| Band edge compliance | ISED RSS-247 § 3.3 and 5.5 ISED RSS-GEN Issue 5 Section 8.10 | Applies | Pass |
| Conducted spurious emissions | ISED RSS-247 § 5.5 | Applies | Pass |
| Transmitter radiated spurious emissions | ISED RSS-GEN § 8.9 | Applies | Pass |

4.1 Knowledge Database References

The following KDBs were referenced during the testing.

The latest knowledge database references are available via the FCC KDB website at:

<https://apps.fcc.gov/kdb>

4.1.1 Radiated Emissions (30MHz to 1000MHz)

| Publication Number | Keyword | Publication Date |
|--------------------|--|------------------|
| 913591 | Measurement of radiated emissions at the band-edge for a Part 15 RF Device | 04/05/2017 |

4.1.2 Radiated Emissions (1GHz to 40GHz)

| Publication Number | Keyword | Publication Date |
|--------------------|--|------------------|
| 414788 | Test Site Validation Requirements above 1 GHz. | 07/12/2018 |
| 414788 | Comparison Noise Emitter (CNE), reference noise source, .pdf | 07/12/2018 |
| 913591 | Measurement of radiated emissions at the band-edge for a Part 15 RF Device | 04/05/2017 |
| 414788 | Comparison Noise Emitters (CNE), test equipment, Broadband.pdf | 07/12/2018 |

4.2 Compliance Statement

The JRD-1171 BLE Module, as tested, was shown to meet requirements of the standards listed in Section 4 of this report.

4.3 Decision Rule Statement

The Decision Rule is applied on the basis of the ILAC-G8:09/2019

This guidance document has been prepared to assist laboratories in the use of decision rules when declaring statements of conformity to a specification or standard as required by ISO/IEC 17025:2017

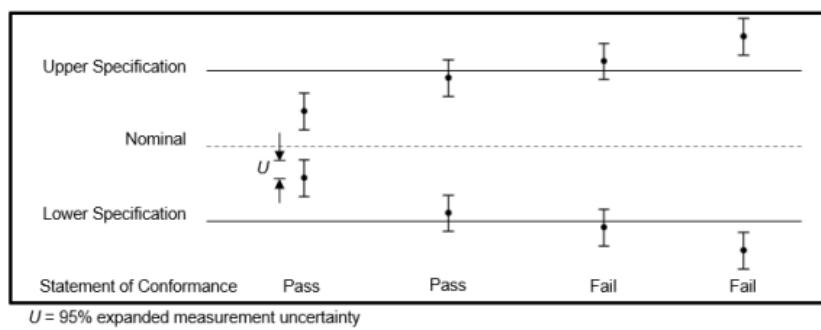
Where a result is considered marginal in respect of its proximity to the limit line, for example, the customer would be made aware of situation so that they can make an informed decision on how to proceed.

A binary decision rule exists when the result is limited to two choices (pass or fail). A non-binary decision rule exists when multiple terms may express the result (pass, conditional pass, conditional fail, fail). These are further explained below.

The laboratory recommends to use Binary Statement for Simple Acceptance Rule ($w = 0$)

Statements of conformity are reported as:

- Pass - the measured value is below the acceptance limit, $AL = TL$.
- Fail - the measured value is above the acceptance limit, $AL = TL$



Section 5 Spurious Emission Results – Radiated and Conducted

5.1 Test Specification

| | |
|--|---|
| FCC Rule Part | 47CFR 15.247 (d) |
| Standard | ANSIC63.10-2020/Cor1-2023 |
| Measurement Uncertainty Radiated tests | <p>The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95% is</p> <p>+/- 5.01dB for the frequency range from 9kHz to 30MHz +/- 6.26dB for the frequency range 30MHz to 1GHz +/- 5.14dB for the frequency range from 1GHz to 6GHz +/- 5.45dB for the frequency range from 6GHz to 18GHz</p> |
| Measurement Uncertainty Conducted tests | +/- 1.4dB |

5.2 Procedure and Test Software Version

Radiated tests:- 47CFR15.205 and 47CFR15.209

| | |
|--|-----------------------------|
| Eurofins E&E UK test procedure (30MHz to 1GHz) | CEP23 Issue 10 |
| Eurofins E&E UK test procedure (1GHz to 40GHz) | CEP64 Issue 11 |
| Test software | RadiMation Version 2023.1.6 |

Conducted Tests 47CFR 15.247(d)

| | |
|---|-------|
| ANSIC63.10-2020/Cor1-2023 Clause reference: | 11.11 |
| Test software | N/A |

5.3 Radiated Emissions (30MHz to 1GHz)

Radiated electric field emission measurements are applied as defined in 47CFR15.205 and 47CFR15.209.

5.3.1 Limits at 3m

| Frequency (MHz) | Electric Field Strength Limit (dB μ V/m) at 3m measurement distance |
|--------------------|--|
| Quasi Peak | |
| 30 - 88 | 40.0 |
| 88 -216 | 43.5 |
| 216 - 960 | 46.0 |
| 960- 1000 | 54.0 |

Note: FCC 47 CFR Part 15 Section 15.209 and 15.205 specifies test limits at 3m

Receiver Settings

| Receiver Parameters | Setting |
|----------------------|------------|
| Detector Function | Quasi Peak |
| Start Frequency | 30MHz |
| Stop Frequency | 1000MHz |
| Resolution Bandwidth | 120kHz |
| Video Bandwidth | Auto |

5.3.2 Emissions measurements**5.3.3 Date of Test**

12th February 2025

5.3.4 Test Area

LAB 1 (SAC)

5.3.5 Tested by

L Trickett

5.3.6 Test Setup

The EUT was configured in the SAC on an 80cm high polystyrene table.

The measurement was performed with an antenna to EUT separation distance of 3m. The results were maximised in orientation 0-360 degrees and height 1-4m.

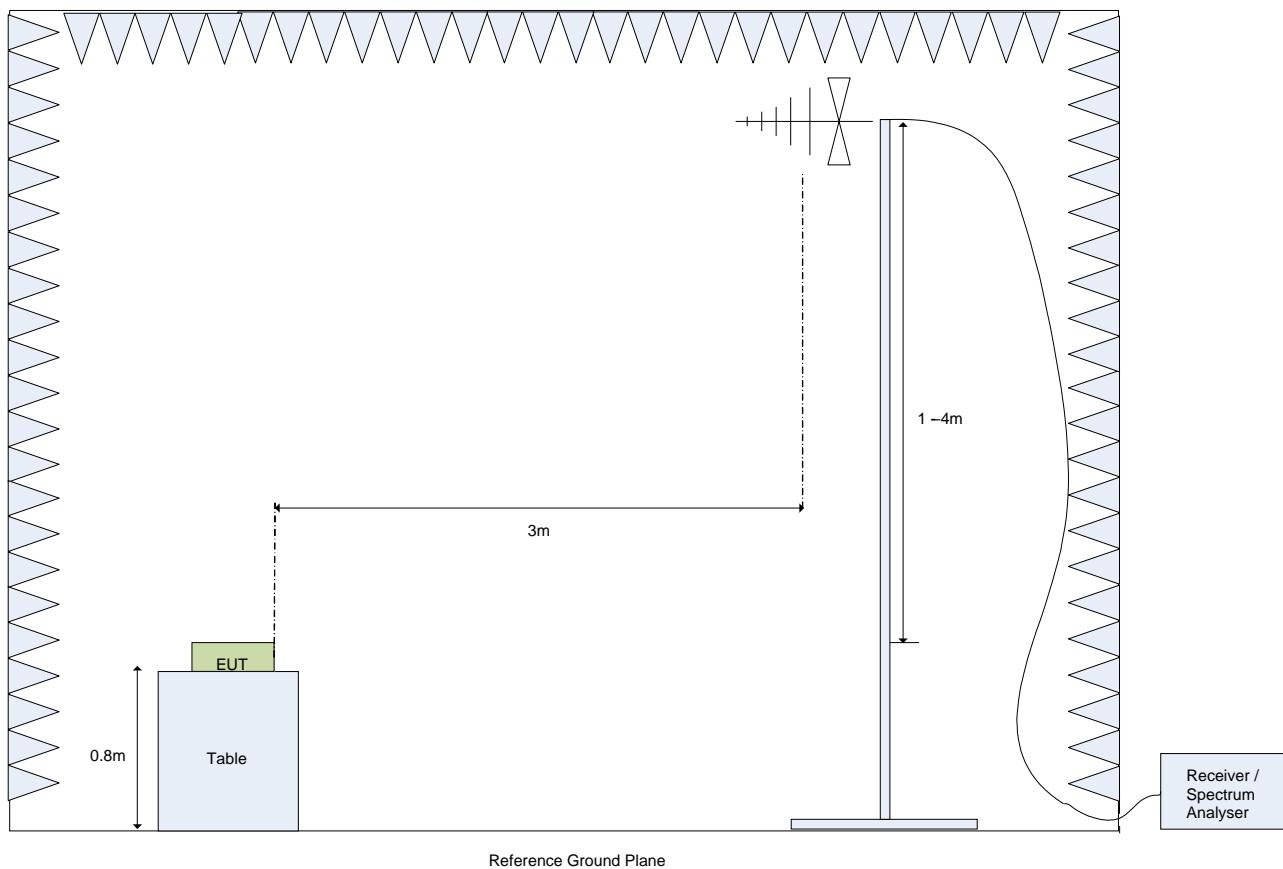


Figure 1 Test Setup for E-Field Measurements from 30MHz to 1GHz

Note 1 : With the EUT de-energized the ambient radio noise and signals met the 6dB peak detection requirement of ANSIC63.10-2020/Cor1-2023.

Note 2 : There were no significant environmental temperature changes during the test duration and hence it was not considered necessary to consider any variation in cable loss.

Operating Mode During testing

During spurious emission testing the equipment under test was set to transmit continuously on the following channels: 2402MHz, 2440MHz and 2480MHz.

The equipment under test was pre-scanned using peak detection when operating on all three channels. Final measurements were performed with the equipment under test operating on 2480MHz.

Note: The customer supplied two different antenna variants, as such radiated tests were performed for both antenna variants.

5.3.7 Electric field emissions, 30MHz to 1GHz – Whip Antenna

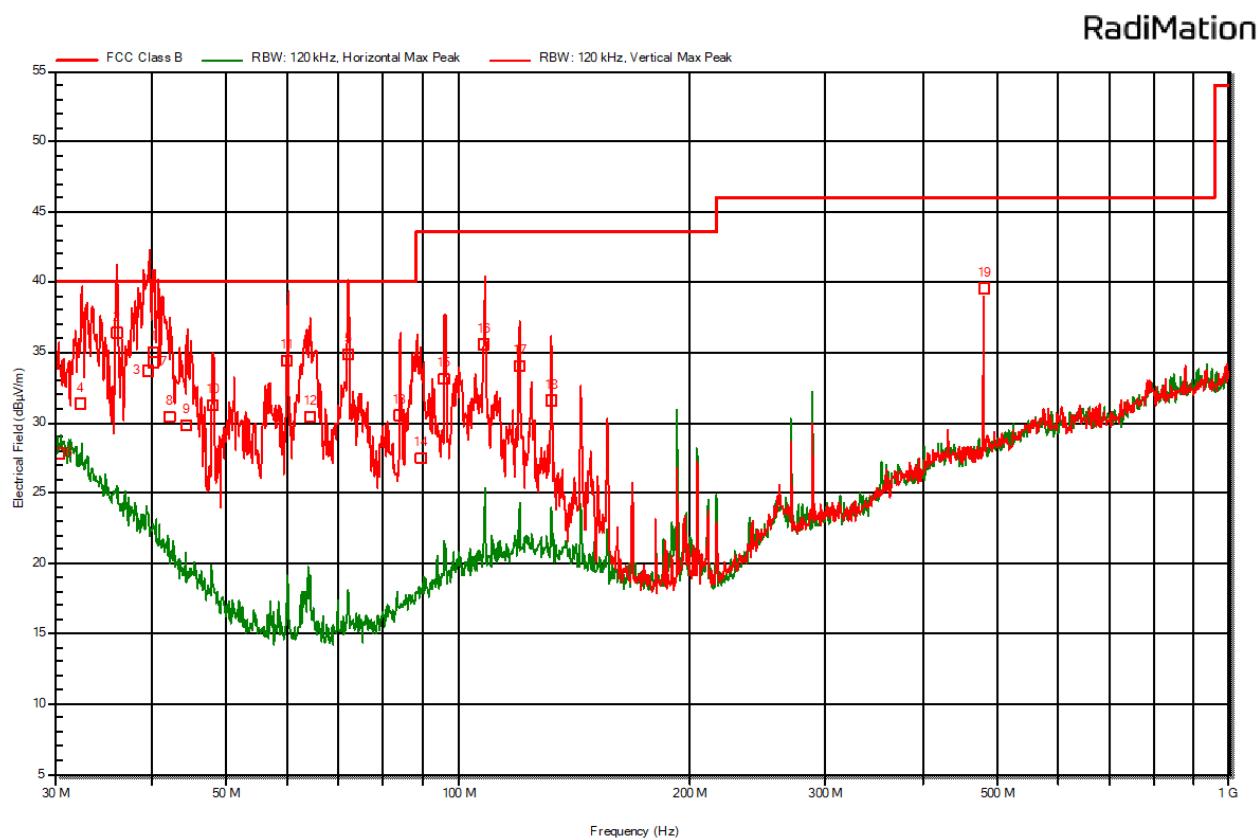


Figure 2 Electric field emissions Plot, 30MHz to 1GHz, 2480MHz Operation – Whip Antenna

| Frequency MHz | Quasi- Peak dB μ V/m | Quasi Peak Limit dB μ V/m | Quasi- Peak Difference dB | Quasi- Peak Status | Angle degrees | Height m | Polarization |
|------------------|--------------------------------|-------------------------------------|------------------------------------|--------------------------|------------------|-------------|--------------|
| 40.20 | 35.0 | 40.0 | -5.0 | Pass | 60 | 1.0 | Vertical |
| 36.06 | 36.4 | 40.0 | -3.6 | Pass | 100 | 1.0 | Vertical |
| 39.66 | 33.7 | 40.0 | -6.3 | Pass | 225 | 1.0 | Vertical |
| 32.46 | 31.3 | 40.0 | -8.7 | Pass | 330 | 1.0 | Vertical |
| 72.00 | 34.9 | 40.0 | -5.1 | Pass | 290 | 2.0 | Vertical |
| 30.30 | 27.8 | 40.0 | -12.2 | Pass | 60 | 1.0 | Vertical |
| 40.32 | 34.2 | 40.0 | -5.8 | Pass | 315 | 1.0 | Vertical |
| 42.24 | 30.4 | 40.0 | -9.6 | Pass | 335 | 1.0 | Vertical |
| 44.46 | 29.8 | 40.0 | -10.2 | Pass | 35 | 1.0 | Vertical |
| 48.00 | 31.3 | 40.0 | -8.7 | Pass | 270 | 1.0 | Vertical |
| 60.06 | 34.4 | 40.0 | -5.6 | Pass | 345 | 1.0 | Vertical |
| 64.26 | 30.4 | 40.0 | -9.6 | Pass | 70 | 1.7 | Vertical |
| 84.06 | 30.6 | 40.0 | -9.4 | Pass | 110 | 1.4 | Vertical |
| 89.34 | 27.4 | 43.5 | -16.1 | Pass | 210 | 1.1 | Vertical |
| 96.00 | 33.1 | 43.5 | -10.4 | Pass | 180 | 1.0 | Vertical |
| 108.00 | 35.6 | 43.5 | -7.9 | Pass | 55 | 1.0 | Vertical |
| 120.00 | 34.1 | 43.5 | -9.4 | Pass | 295 | 1.0 | Vertical |
| 132.00 | 31.6 | 43.5 | -11.9 | Pass | 330 | 1.0 | Vertical |
| 480.06 | 39.5 | 46.0 | -6.5 | Pass | 265 | 1.1 | Vertical |

Table 1 Electric Field Emissions Peaks, 30MHz to 1GHz. 2480MHz Operation – Whip Antenna

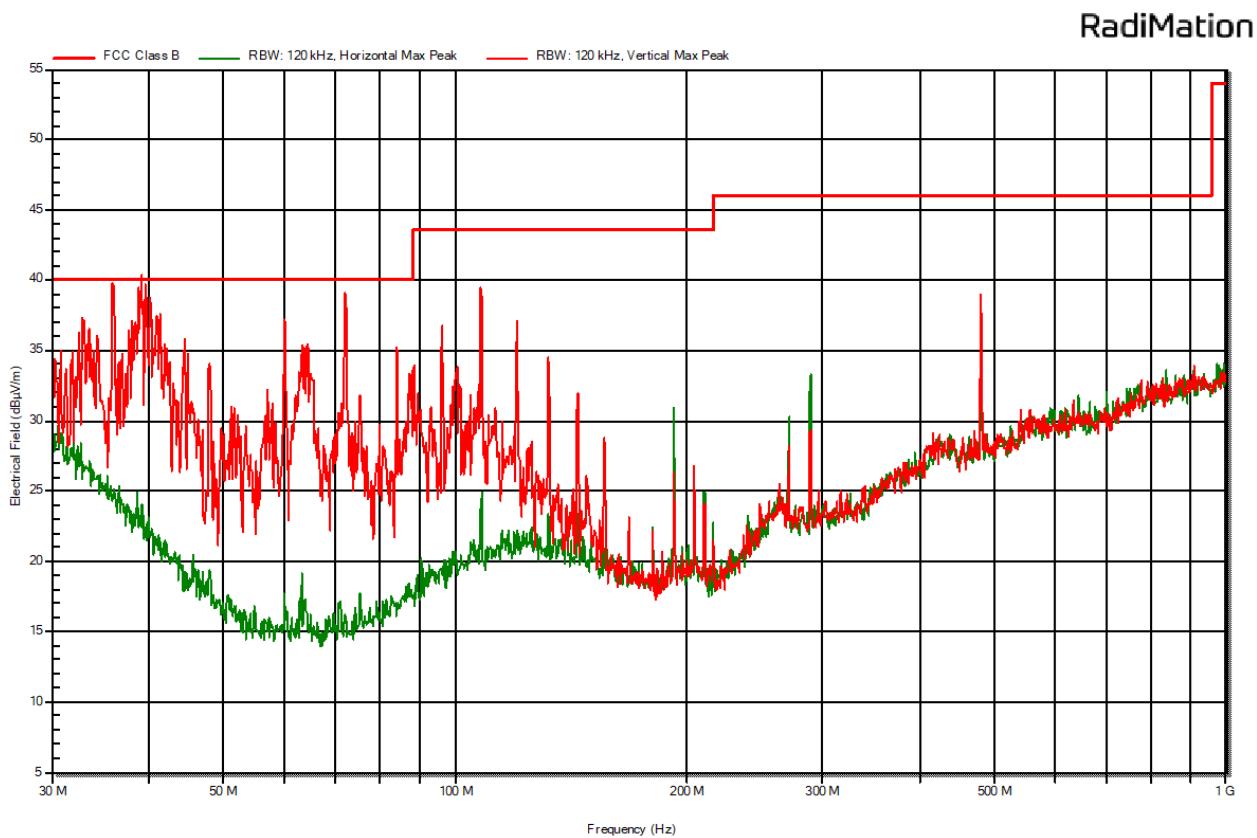


Figure 3 Electric field emissions Plot, 30MHz to 1GHz, Operation on 2402MHz - Peak detector scan – Whip Antenna

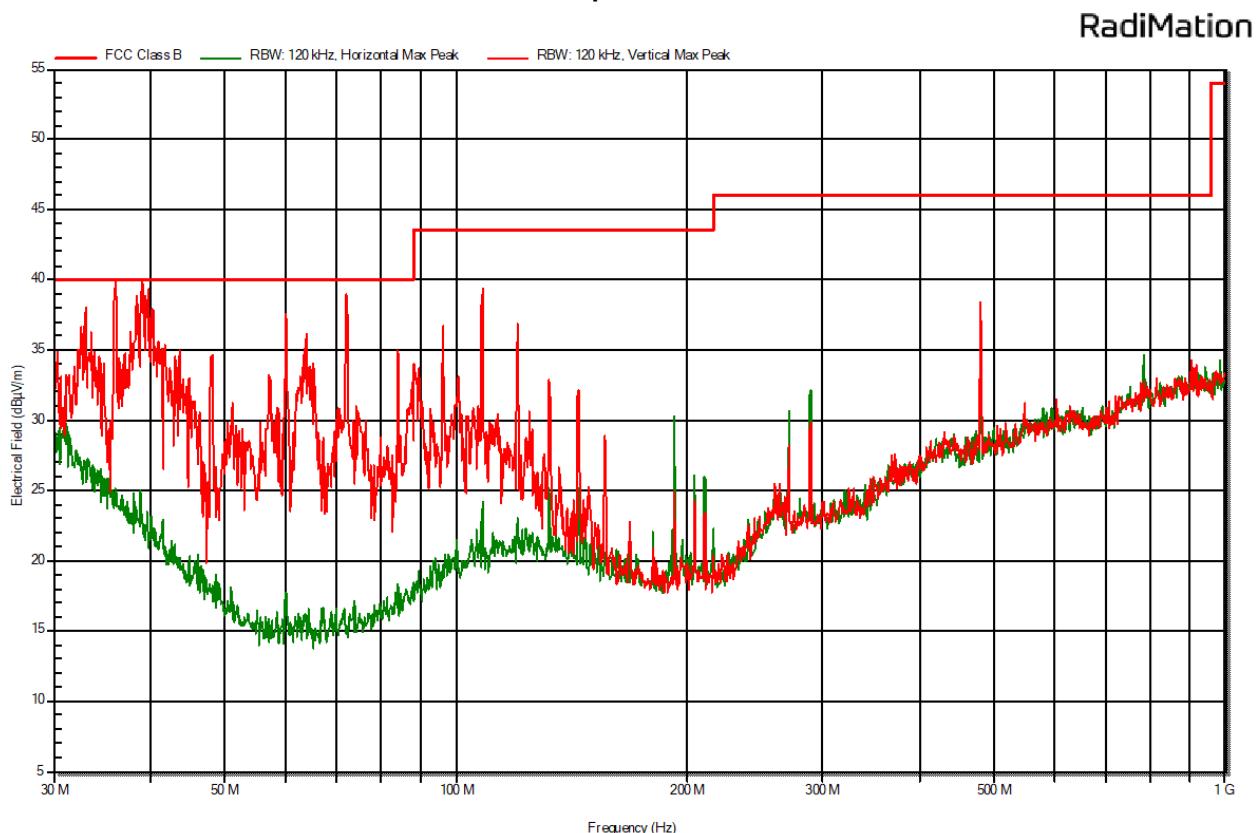


Figure 4 Electric field emissions Plot, 30MHz to 1GHz, Operation on 2440MHz - Peak detector scan – Whip Antenna

5.3.8 Electric field emissions, 30MHz to 1GHz – Puck Antenna

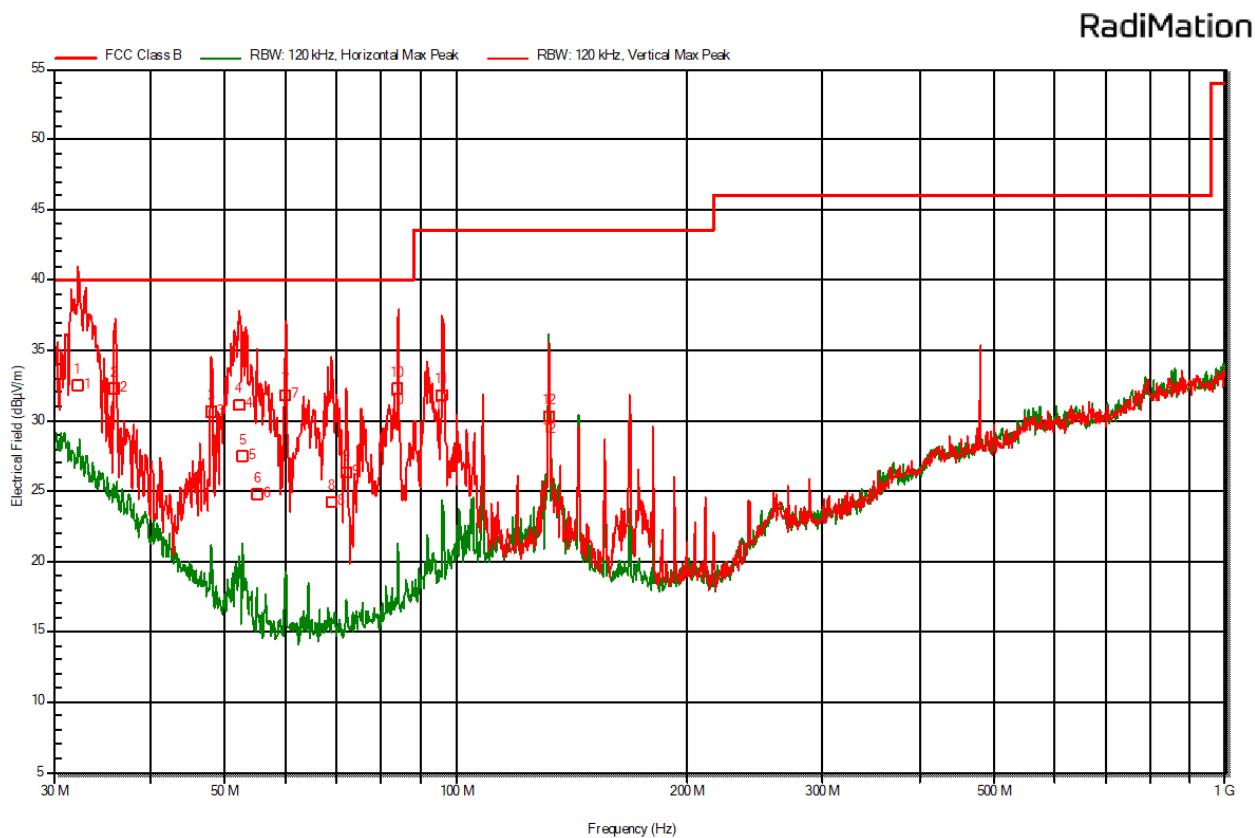


Figure 5 Electric field emissions Plot, 30MHz to 1GHz, 2480MHz Operation – Puck Antenna

| Frequency MHz | Quasi-Peak dB μ V/m | Quasi Peak Limit dB μ V/m | Quasi-Peak Difference dB | Quasi-Peak Status | Angle degrees | Height m | Polarization |
|---------------|-------------------------|-------------------------------|--------------------------|-------------------|---------------|----------|--------------|
| 32.22 | 32.6 | 40.0 | -7.4 | Pass | 79 | 1.0 | Vertical |
| 36.00 | 32.3 | 40.0 | -7.7 | Pass | 110 | 1.0 | Vertical |
| 48.06 | 30.6 | 40.0 | -9.4 | Pass | 270 | 1.0 | Vertical |
| 52.20 | 31.2 | 40.0 | -8.8 | Pass | 359 | 1.0 | Vertical |
| 52.68 | 27.5 | 40.0 | -12.5 | Pass | 215 | 1.0 | Vertical |
| 55.08 | 24.8 | 40.0 | -15.2 | Pass | 240 | 1.1 | Vertical |
| 60.00 | 31.8 | 40.0 | -8.2 | Pass | 225 | 1.0 | Vertical |
| 68.88 | 24.1 | 40.0 | -15.9 | Pass | 175 | 1.4 | Vertical |
| 72.00 | 26.4 | 40.0 | -13.6 | Pass | 315 | 1.7 | Vertical |
| 84.00 | 32.3 | 40.0 | -7.7 | Pass | 95 | 1.3 | Vertical |
| 96.00 | 31.8 | 43.5 | -11.7 | Pass | 300 | 1.0 | Vertical |
| 132.00 | 30.2 | 43.5 | -13.3 | Pass | 280 | 1.8 | Vertical |

Table 2 Electric Field Emissions Peaks, 30MHz to 1GHz. 2480MHz Operation – Puck Antenna

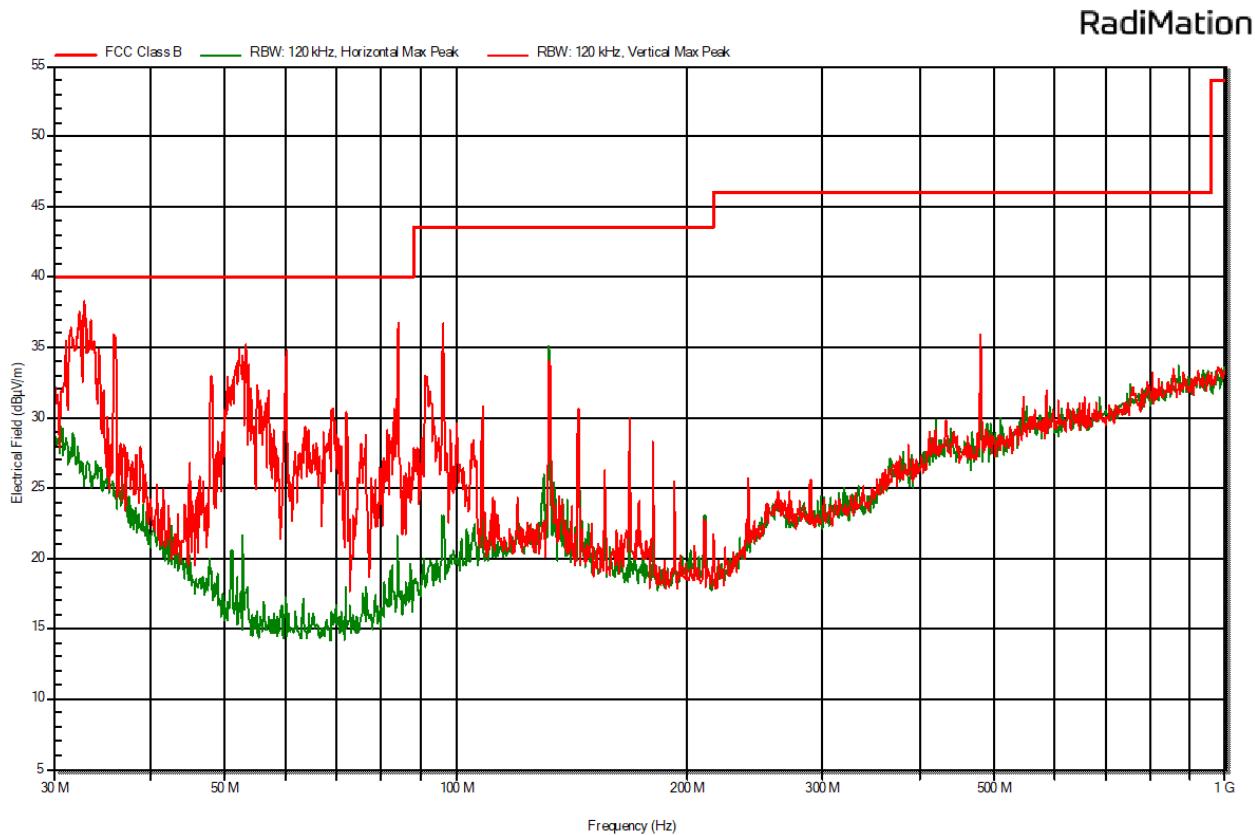


Figure 6 Electric field emissions Plot, 30MHz to 1GHz, Operation on 2402MHz - Peak detector scan – Puck Antenna

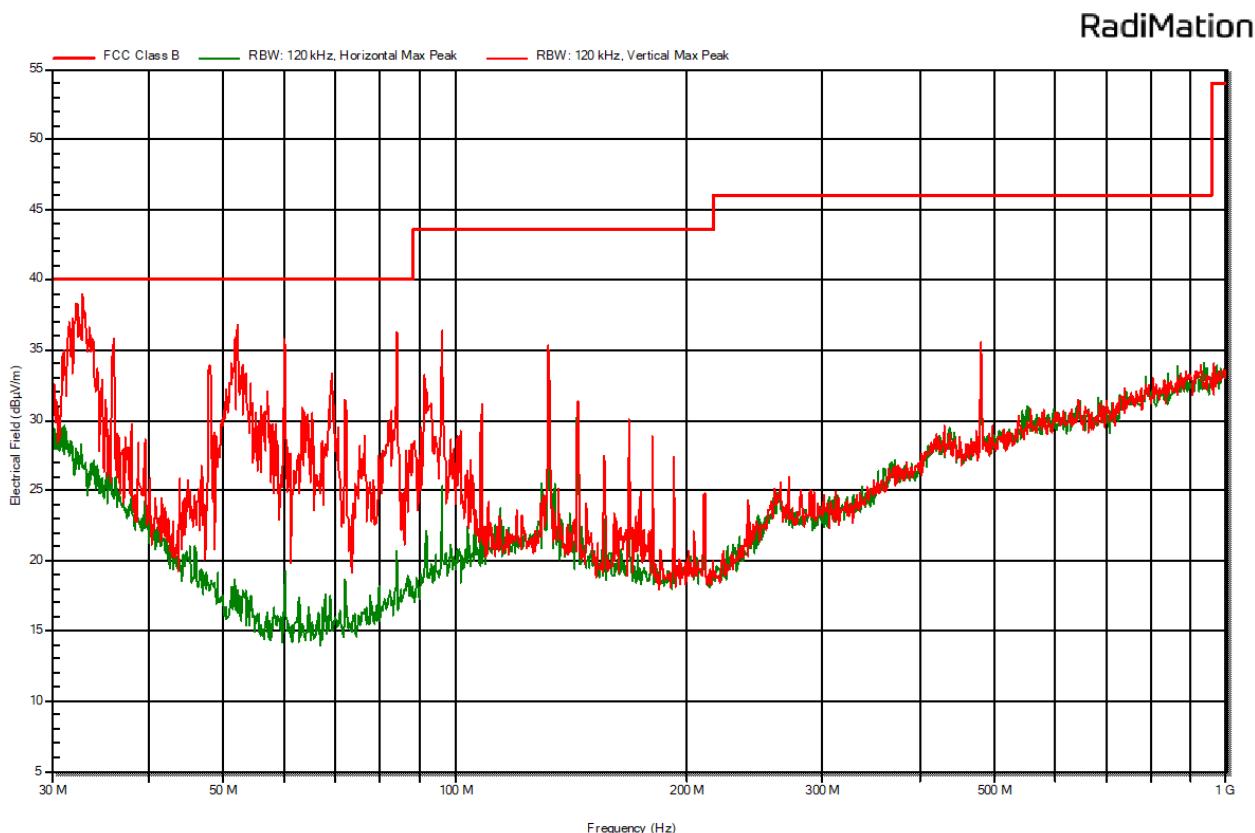


Figure 7 Electric field emissions Plot, 30MHz to 1GHz, Operation on 2440MHz - Peak detector scan – Puck Antenna

5.4 Radiated Emissions (1GHz to 18GHz)**5.4.1 Limits**

| Frequency (GHz) | Limit (dB μ V/m) | Limit (dB μ V/m) |
|--------------------|-------------------------|-------------------------|
| | Peak | Average |
| 1-18 | 74.0 | 54.0 |

5.4.2 Receiver Settings

| Receiver Parameters | Setting |
|----------------------|------------------|
| Detector Function | Average and Peak |
| Start Frequency | 1GHz |
| Stop Frequency | 18GHz |
| Resolution Bandwidth | 1MHz |
| Video Bandwidth | Auto |

5.4.3 Emissions measurements**5.4.4 Date of Test**11th February 2025**5.4.5 Test Area**

LAB 1 (SAC)

5.4.6 Tested by

L Trickett

5.4.7 Test Setup

The EUT was configured in the SAC on an 1.5m high table. Exploratory measurements on the EUT were carried out to identify suspect frequencies and worst case orientations, see Section 5.4.8.

The measurement was then performed with an antenna to EUT separation distance of 3m.

The antenna was kept in the “cone of radiation” from the EUT and pointed at the area both in azimuth and elevation using the tilt mechanism on the antenna mast.

The results were maximised in orientation 0-360 degrees and height 1-4m.

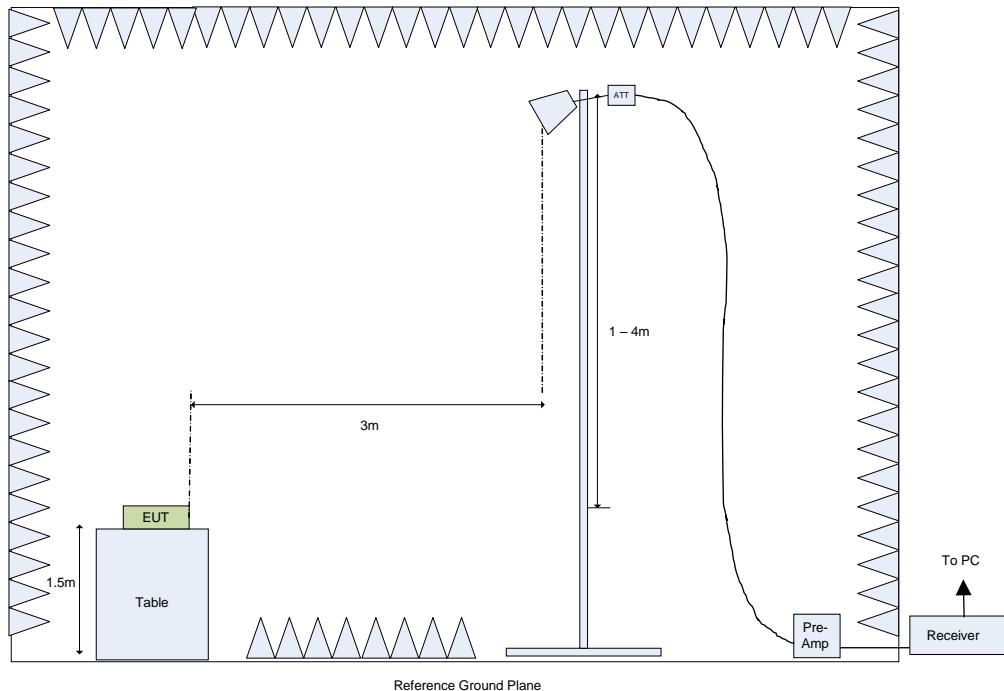


Figure 5.4.7.1: Test Setup for Final E-Field Measurements from 1GHz to 18GHz

Note 1: With the EUT de-energized the ambient radio noise and signals met the 6dB peak detection requirement of ANSIC63.10-2020/Cor1-2023.

Note 2: There were no significant environmental temperature changes during the test duration and hence it was not considered necessary to consider any variation in cable loss.

Note 3: On all swept and final measurements made between 1GHz and 18GHz a 2.4GHz Microtronics BRM50702 notch filter was placed in the measurement chain between the antenna and pre-amplifier in order to prevent the artificial generation of harmonics within the pre-amplifier.

5.4.8 Exploratory Radiated Emission Maximization – Whip Antenna

During exploratory testing, suspect emissions from the EUT were identified both in terms of the frequency and directionality. This was achieved by manually positioning the antenna close to the EUT and also by scanning it over all sides of the EUT whilst observing a spectral display. The typical distance between the surface of the EUT and the scanning antenna was circa 30cm.

| Frequency (GHz) | Mode of operation | EUT face * | Emissions Angle (w.r.t. turntable) | Height | Polarization |
|--------------------|---------------------------------|---------------|---------------------------------------|--------|--------------|
| 1.069 | Transmitting on channel 2480MHz | Front | 0 | 1.5 | V |
| 1.171 | Transmitting on channel 2440MHz | Front | 0 | 1.5 | V |
| 1.545 | Transmitting on channel 2480MHz | Front | 0 | 1.5 | V |
| 2.114 | Transmitting on channel 2402MHz | Front | 0 | 1.5 | V |
| 2.152 | Transmitting on channel 2440MHz | Front | 0 | 1.5 | V |
| 2.172 | Transmitting on channel 2440MHz | Front | 0 | 1.5 | V |
| 2.182 | Transmitting on channel 2402MHz | Front | 0 | 1.5 | V |
| 2.188 | Transmitting on channel 2440MHz | Front | 0 | 1.5 | V |
| 2.193 | Transmitting on channel 2480MHz | Front | 0 | 1.5 | V |
| 2.194 | Transmitting on channel 2402MHz | Front | 0 | 1.5 | V |
| 2.215 | Transmitting on channel 2402MHz | Front | 0 | 1.5 | V |
| 2.217 | Transmitting on channel 2440MHz | Front | 0 | 1.5 | V |
| 2.232 | Transmitting on channel 2440MHz | Front | 0 | 1.5 | V |
| 2.913 | Transmitting on channel 2440MHz | Front | 0 | 1.5 | V |
| 4.804 | Transmitting on channel 2440MHz | Front | 0 | 1.5 | V |
| 5.849 | Transmitting on channel 2440MHz | Front | 0 | 1.5 | V |
| 7.208 | Transmitting on channel 2440MHz | Front | 0 | 1.5 | V |
| 7.441 | Transmitting on channel 2480MHz | Front | 0 | 1.5 | V |

Table 3 Frequencies identified during Exploratory Radiated Emission maximization – Whip Antenna

Note 1: The front face of the EUT is deemed to be 0°, which is then turned in a clockwise direction through 360°.

Note 2: With no emissions observed above 7.5GHz during the exploratory investigation, final measurements were performed up to 10GHz only.

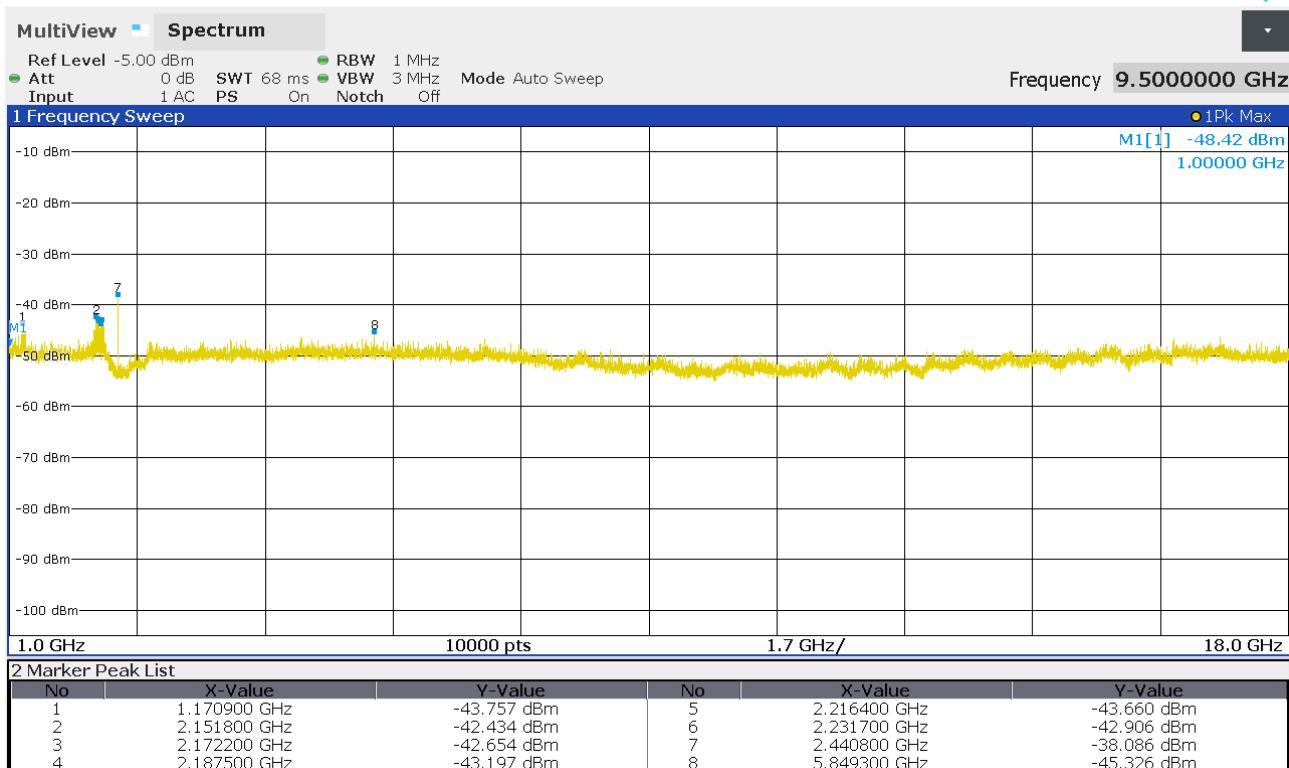


Figure 8 – Manual investigation – Operating on BLE channel 2440MHz – Whip Antenna

5.4.9 Electric field emissions, 1GHz to 18GHz – Whip Antenna

The equipment under test was pre-scanned using peak detection when operating on all three channels. Final measurements were performed with the equipment under test operating on 2480MHz

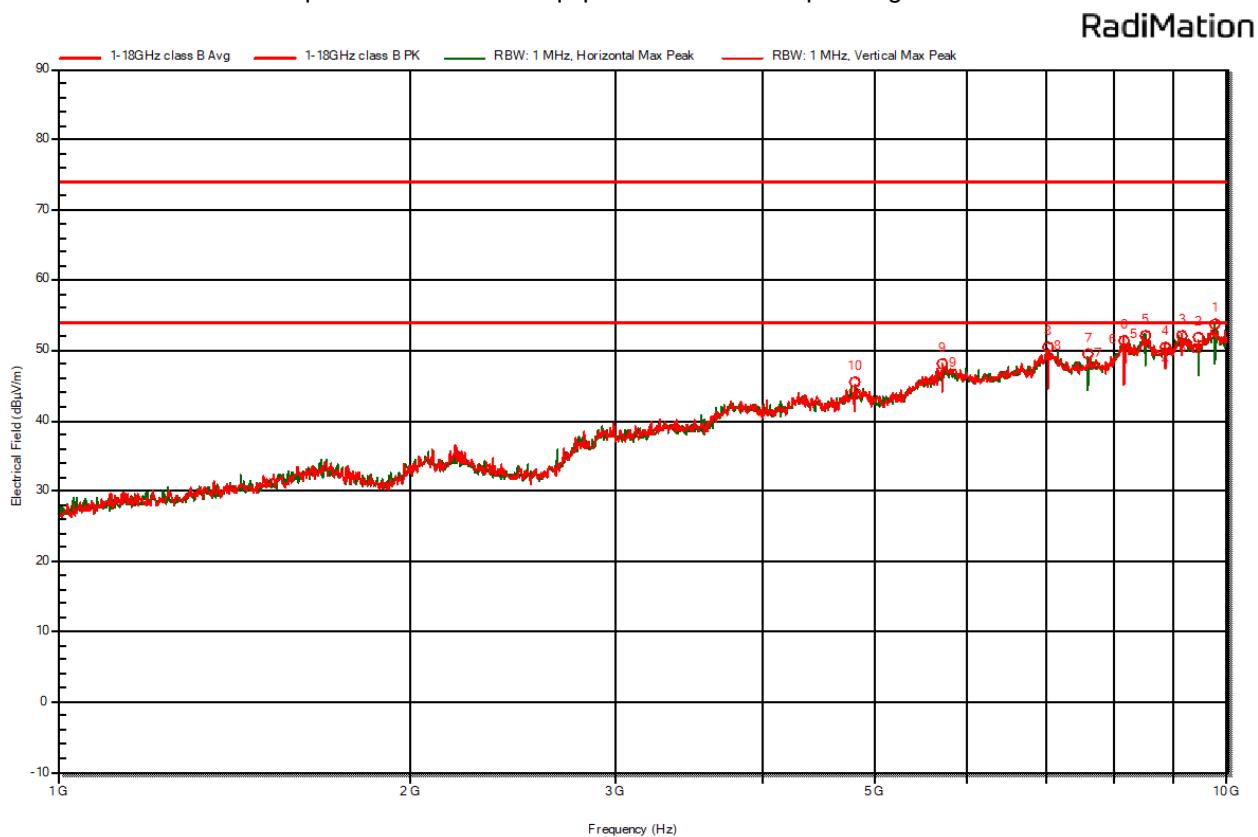


Figure 9 Electric field emissions Plot, 1GHz to 10GHz. Operation on 2480MHz – Whip Antenna

| Frequency GHz | Average dB μ V/m | Average Limit dB μ V/m | Average Difference dB | Average Status | Angle degrees | Height m | Polarization |
|------------------|-------------------------|----------------------------------|-----------------------------|-------------------|------------------|-------------|--------------|
| 9.769 | 40.4 | 54.0 | -13.6 | Pass | 335 | 3.7 | Horizontal |
| 9.440 | 38.3 | 54.0 | -15.7 | Pass | 275 | 1.2 | Horizontal |
| 9.132 | 39.2 | 54.0 | -14.8 | Pass | 10 | 1.2 | Vertical |
| 8.854 | 37.8 | 54.0 | -16.2 | Pass | 115 | 1.3 | Vertical |
| 8.500 | 39.3 | 54.0 | -14.7 | Pass | 325 | 3.6 | Horizontal |
| 8.163 | 38.3 | 54.0 | -15.7 | Pass | 105 | 2.8 | Vertical |
| 7.608 | 36.0 | 54.0 | -18.0 | Pass | 80 | 3.9 | Horizontal |
| 7.017 | 37.1 | 54.0 | -16.9 | Pass | 105 | 1.8 | Vertical |
| 5.702 | 34.9 | 54.0 | -19.1 | Pass | 25 | 2.2 | Vertical |
| 4.801 | 31.8 | 54.0 | -22.2 | Pass | 345 | 3.6 | Vertical |

Table 4 Electric Field Emissions Peaks, 1GHz to 10GHz – Operation on 2480MHz – Whip Antenna

RadiMation



Figure 10 Electric field emissions Plot, 1GHz to 10GHz, Operation on 2402MHz – Peak detector scan – Whip Antenna

RadiMation

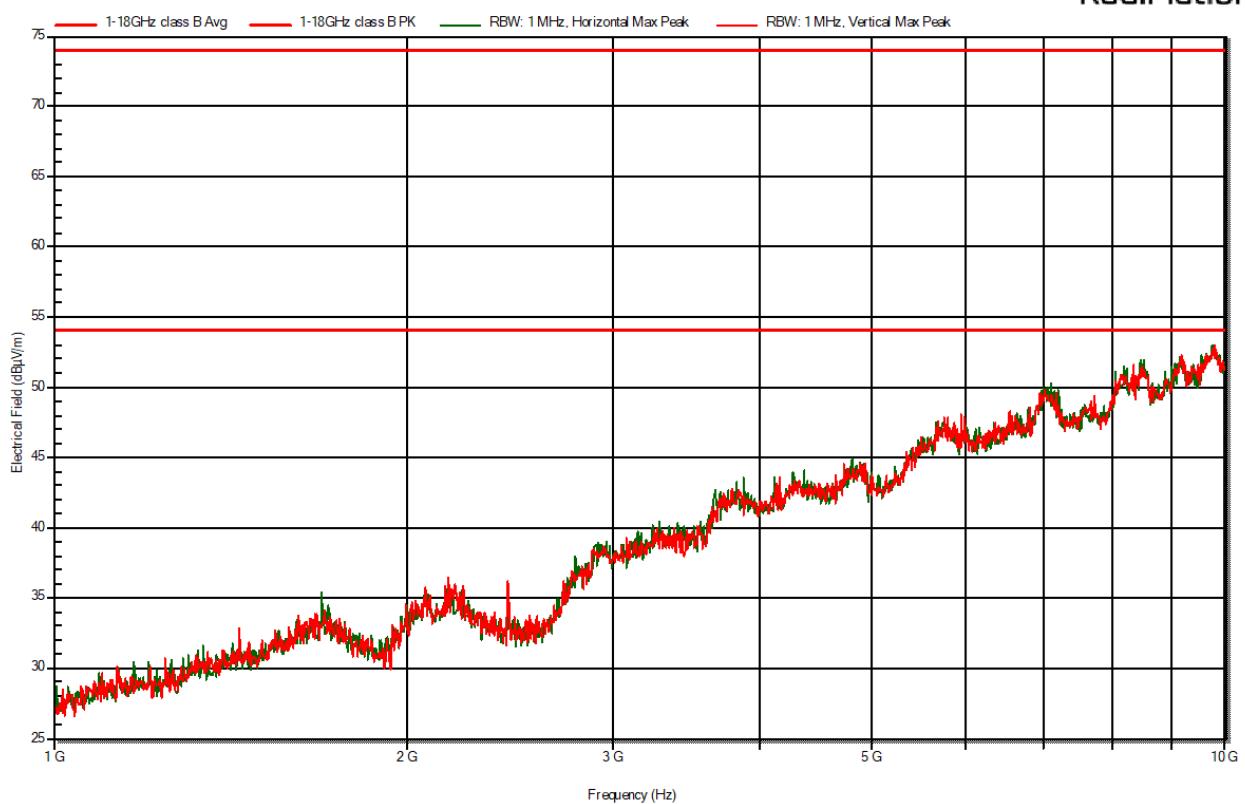


Figure 11 Electric field emissions Plot, 1GHz to 10GHz, Operation on 2440MHz – Peak detector scan – Whip Antenna

5.4.10 Exploratory Radiated Emission Maximization – Puck Antenna

During exploratory testing, suspect emissions from the EUT were identified both in terms of the frequency and directionality. This was achieved by manually positioning the antenna close to the EUT and also by scanning it over all sides of the EUT whilst observing a spectral display. The typical distance between the surface of the EUT and the scanning antenna was circa 30cm.

| Frequency (GHz) | Mode of operation | EUT face * | Emissions Angle (w.r.t. turntable) | Height | Polarization |
|--------------------|---------------------------------|---------------|---------------------------------------|--------|--------------|
| 1.008 | Transmitting on channel 2402MHz | Front | 0 | 1.5 | V |
| 1.060 | Transmitting on channel 2402MHz | Front | 0 | 1.5 | V |
| 1.088 | Transmitting on channel 2480MHz | Front | 0 | 1.5 | V |
| 1.200 | Transmitting on channel 2480MHz | Front | 0 | 1.5 | V |
| 1.365 | Transmitting on channel 2402MHz | Front | 0 | 1.5 | V |
| 2.152 | Transmitting on channel 2440MHz | Front | 0 | 1.5 | V |
| 2.160 | Transmitting on channel 2480MHz | Front | 0 | 1.5 | V |
| 2.172 | Transmitting on channel 2440MHz | Front | 0 | 1.5 | V |
| 2.176 | Transmitting on channel 2480MHz | Front | 0 | 1.5 | V |
| 2.177 | Transmitting on channel 2402MHz | Front | 0 | 1.5 | V |
| 2.188 | Transmitting on channel 2440MHz | Front | 0 | 1.5 | V |
| 2.193 | Transmitting on channel 2480MHz | Front | 0 | 1.5 | V |
| 2.194 | Transmitting on channel 2402MHz | Front | 0 | 1.5 | V |
| 2.198 | Transmitting on channel 2402MHz | Front | 0 | 1.5 | V |
| 2.201 | Transmitting on channel 2440MHz | Front | 0 | 1.5 | V |
| 2.210 | Transmitting on channel 2402MHz | Front | 0 | 1.5 | V |
| 2.216 | Transmitting on channel 2440MHz | Front | 0 | 1.5 | V |
| 2.228 | Transmitting on channel 2480MHz | Front | 0 | 1.5 | V |
| 2.232 | Transmitting on channel 2440MHz | Front | 0 | 1.5 | V |
| 2.252 | Transmitting on channel 2440MHz | Front | 0 | 1.5 | V |
| 2.256 | Transmitting on channel 2480MHz | Front | 0 | 1.5 | V |
| 7.441 | Transmitting on channel 2480MHz | Front | 0 | 1.5 | V |

Table 5 Frequencies identified during Exploratory Radiated Emission maximization – Puck Antenna

Note 1: The front face of the EUT is deemed to be 0°, which is then turned in a clockwise direction through 360°.

Note 2: With no emissions observed above 7.5GHz during the exploratory investigation, final measurements were performed up to 10GHz only.

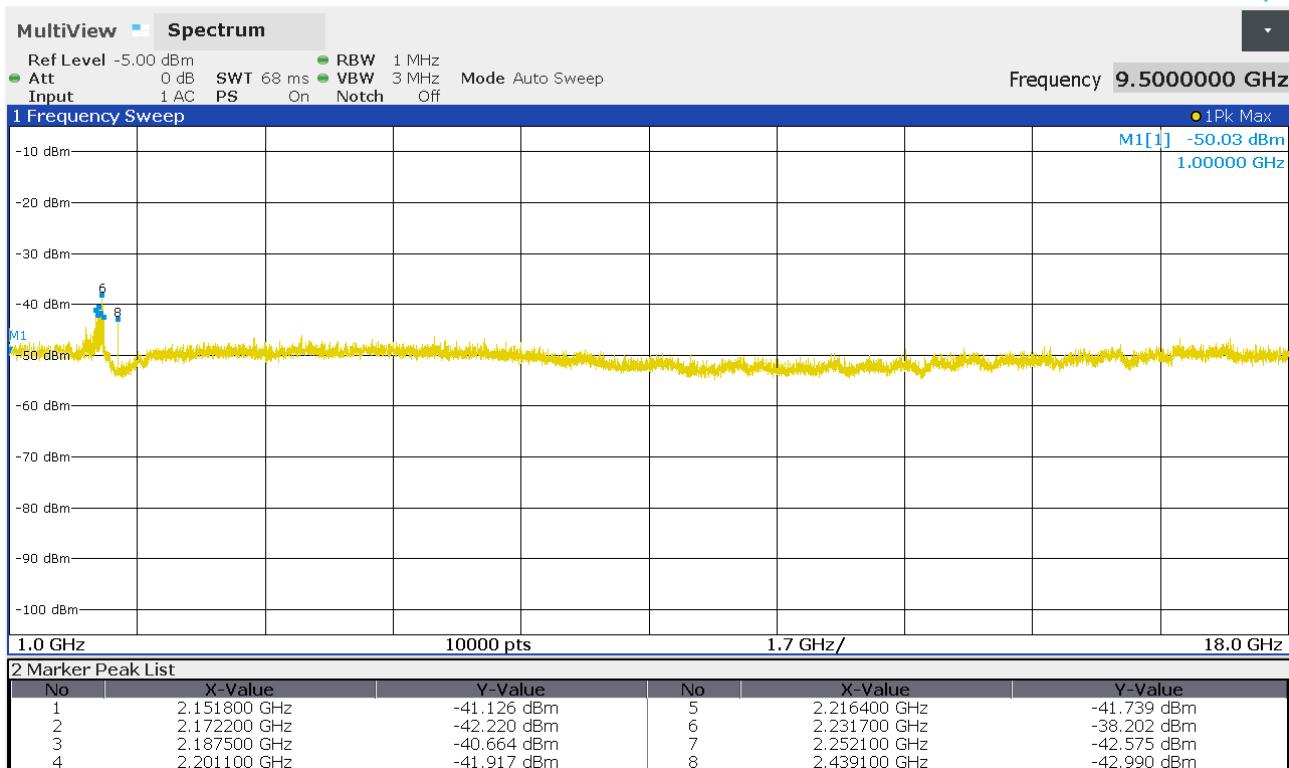


Figure 12 – Manual investigation – Operating on BLE channel 2440MHz – Puck Antenna

5.4.11 Electric field emissions, 1GHz to 18GHz – Puck Antenna

The equipment under test was pre-scanned using peak detection when operating on all three channels. Final measurements were performed with the equipment under test operating on 2480MHz

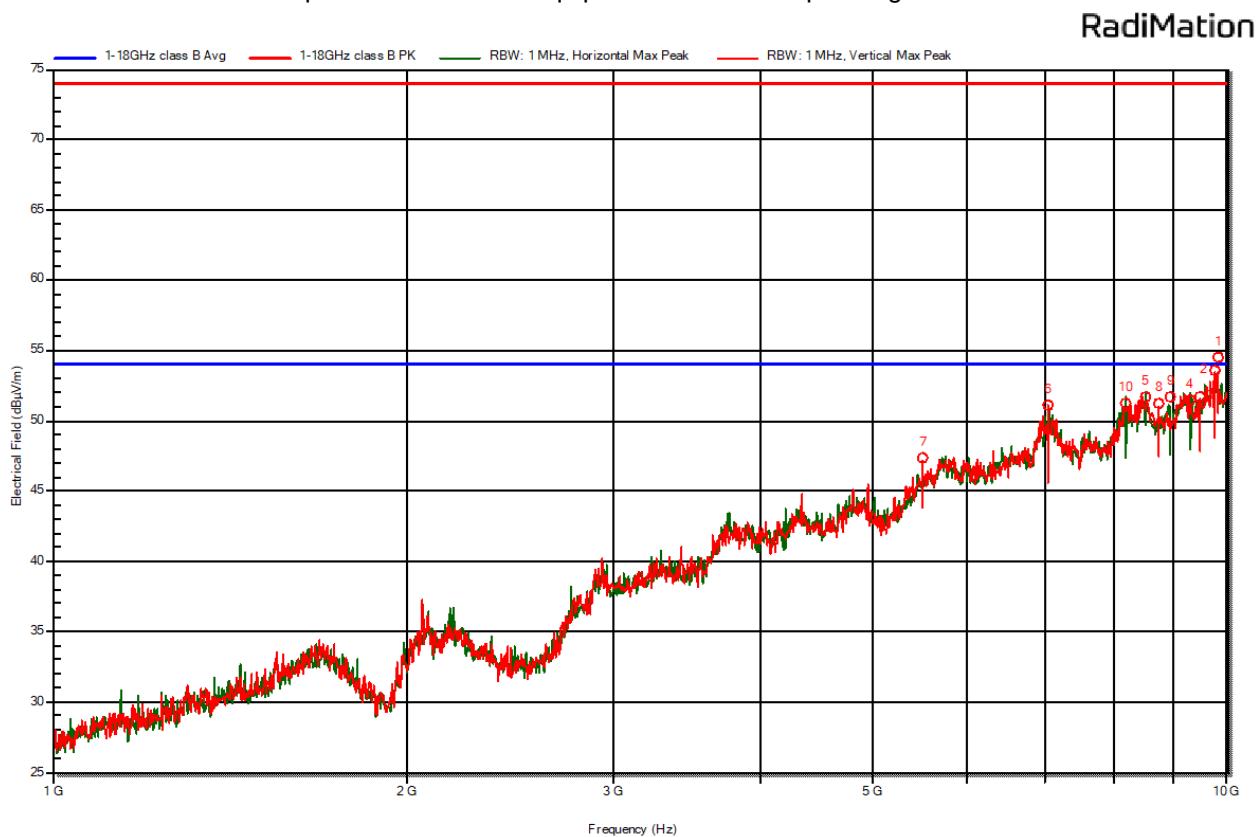


Figure 13 Electric field emissions Plot, 1GHz to 10GHz. Operation on 2480MHz – Puck Antenna

| Frequency GHz | Average dB μ V/m | Average Limit dB μ V/m | Average Difference dB | Average Status | Angle degrees | Height m | Polarization |
|------------------|-------------------------|----------------------------------|-----------------------------|-------------------|------------------|-------------|--------------|
| 9.821 | 40.7 | 54.0 | -13.3 | Pass | 55 | 1.0 | Vertical |
| 9.744 | 40.4 | 54.0 | -13.6 | Pass | 355 | 2.2 | Vertical |
| 9.465 | 38.5 | 54.0 | -15.5 | Pass | 265 | 1.0 | Vertical |
| 9.308 | 38.6 | 54.0 | -15.4 | Pass | 205 | 2.5 | Horizontal |
| 8.509 | 38.9 | 54.0 | -15.1 | Pass | 165 | 1.3 | Horizontal |
| 7.027 | 37.7 | 54.0 | -16.3 | Pass | 225 | 3.9 | Vertical |
| 5.501 | 34.0 | 54.0 | -20.0 | Pass | 55 | 1.4 | Vertical |
| 8.744 | 37.8 | 54.0 | -16.2 | Pass | 240 | 2.3 | Vertical |
| 8.930 | 38.1 | 54.0 | -15.9 | Pass | 55 | 3.9 | Horizontal |
| 8.204 | 38.6 | 54.0 | -15.5 | Pass | 250 | 1.2 | Horizontal |

Table 6 Electric Field Emissions Peaks, 1GHz to 10GHz – Operation on 2480MHz – Puck Antenna

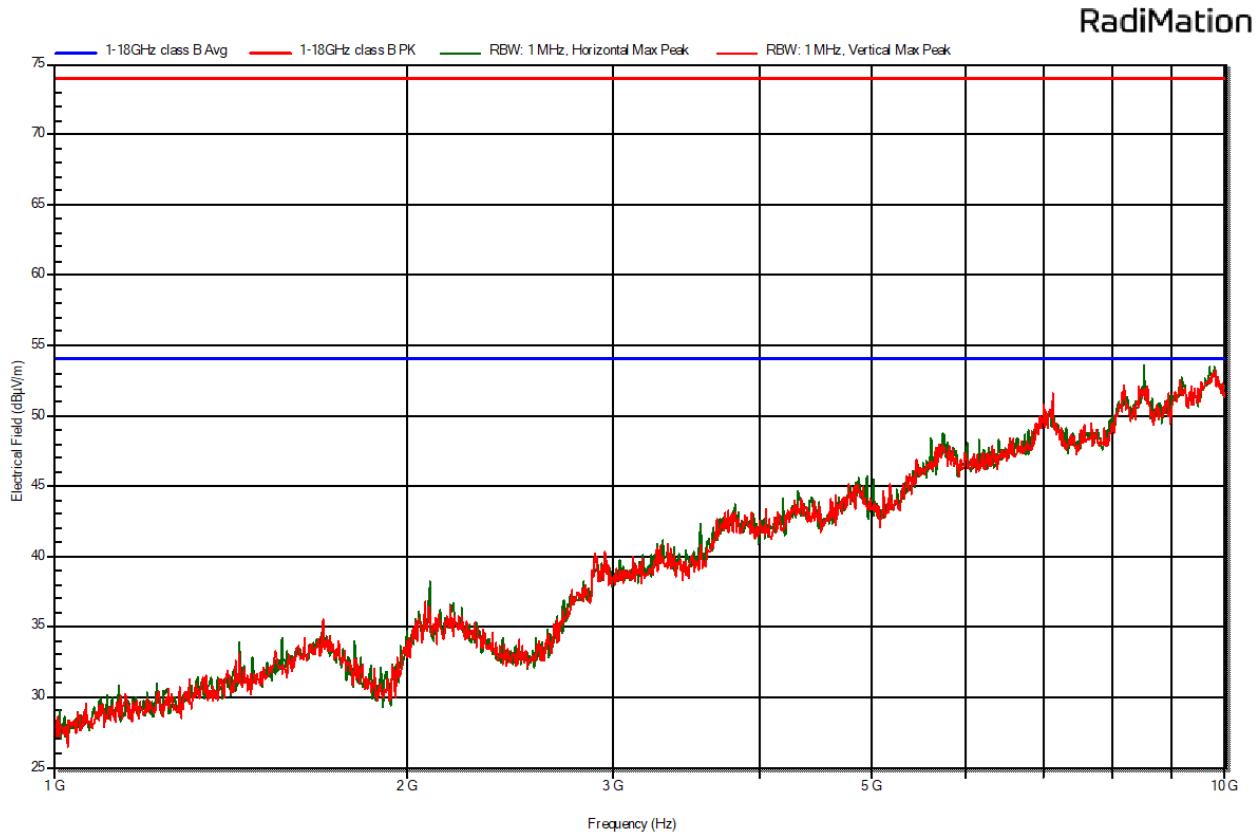


Figure 14 Electric field emissions Plot, 1GHz to 10GHz, Operation on 2402MHz - Peak detector scan – Puck Antenna

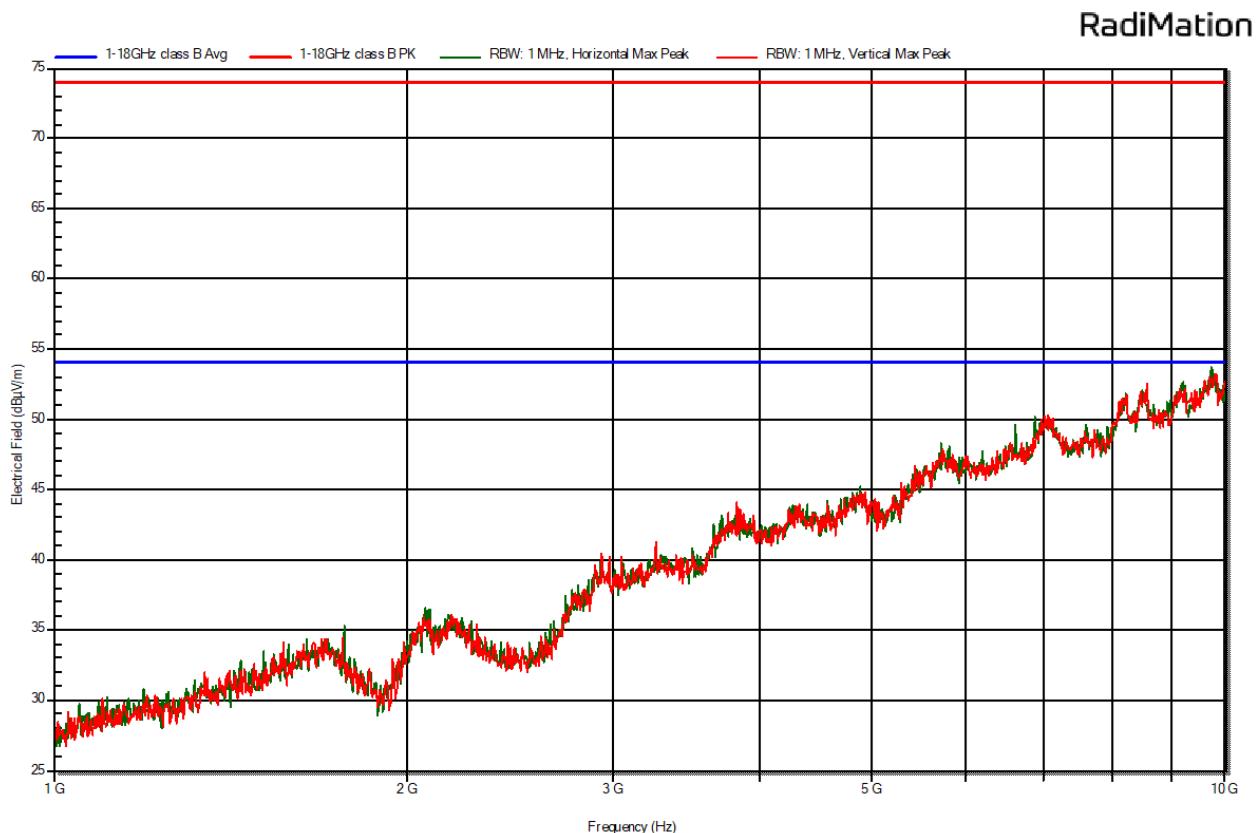


Figure 15 Electric field emissions Plot, 1GHz to 10GHz, Operation on 2440MHz – Peak detector scan – Puck Antenna

5.4.12 Example field strength calculation

The total average corrections are shown in the above table. This correction figure consists of Preamplifier gain (PG), Antenna factor (AF); and Cable loss (CL), and where necessary distance extrapolation factor (dB).

Field strength (FS) is calculated as follows:

$$FS \text{ (dB}\mu\text{V/m)} = \text{Indicated Signal Level (dB}\mu\text{V)} - PG \text{ (dB)} + AF \text{ (dB)} + CL \text{ (dB)}$$

5.4.13 Sample Data

From Figure 13 and table 6, The Average level at 8.204GHz is calculated as follows:

$$FS \text{ (dB}\mu\text{V/m)} = 44.9(\text{dB}\mu\text{V}) - 54.5(\text{dB}) + 40.4(\text{dB/m}) + 7.8(\text{dB}) = 38.6\text{dB}\mu\text{V/m}$$

5.5 Radiated Emissions (18GHz to 26GHz)**5.5.1 Limits**

| Frequency (GHz) | Limit (dB μ V/m) | Limit (dB μ V/m) |
|--------------------|-------------------------|-------------------------|
| | Peak | Average |
| 18-25 | 74.0 | 54.0 |

5.5.2 Receiver Settings

| Receiver Parameters | Setting |
|----------------------|------------------|
| Detector Function | Average and Peak |
| Start Frequency | 18GHz |
| Stop Frequency | 25GHz |
| Resolution Bandwidth | 1MHz |
| Video Bandwidth | Auto |

5.5.3 Emissions measurements**5.5.4 Date of Test**11th February 2025**5.5.5 Test Area**

LAB 1 (SAC)

5.5.6 Tested by

L Trickett

5.5.7 Test Setup

This is the same as for the 1-18GHz range for final measurements, except with a measurement distance of 1m.

5.5.8 Exploratory Radiated Emission Maximization – Whip Antenna

During exploratory testing, suspect emissions from the EUT were identified both in terms of the frequency and directionality. This was achieved by manually positioning the antenna close to the EUT and also by scanning it over all sides of the EUT whilst observing a spectral display. The typical distance between the surface of the EUT and the scanning antenna was circa 30cm.

| Frequency (GHz) | Mode of operation | EUT face * | Emissions Angle (w.r.t. turntable) | Height | Polarization |
|-----------------|--|------------|------------------------------------|--------|--------------|
| - | Tx on channels 2402MHz, 2440MHz and 2480MHz. | - | - | - | - |

Table 7 Frequencies identified during Exploratory Radiated Emission maximization – Whip Antenna

Note 1 : The front face of the EUT is deemed to be 0°, which is then turned in a clockwise direction through 360°.

No emissions were identified for further investigation above 18GHz.

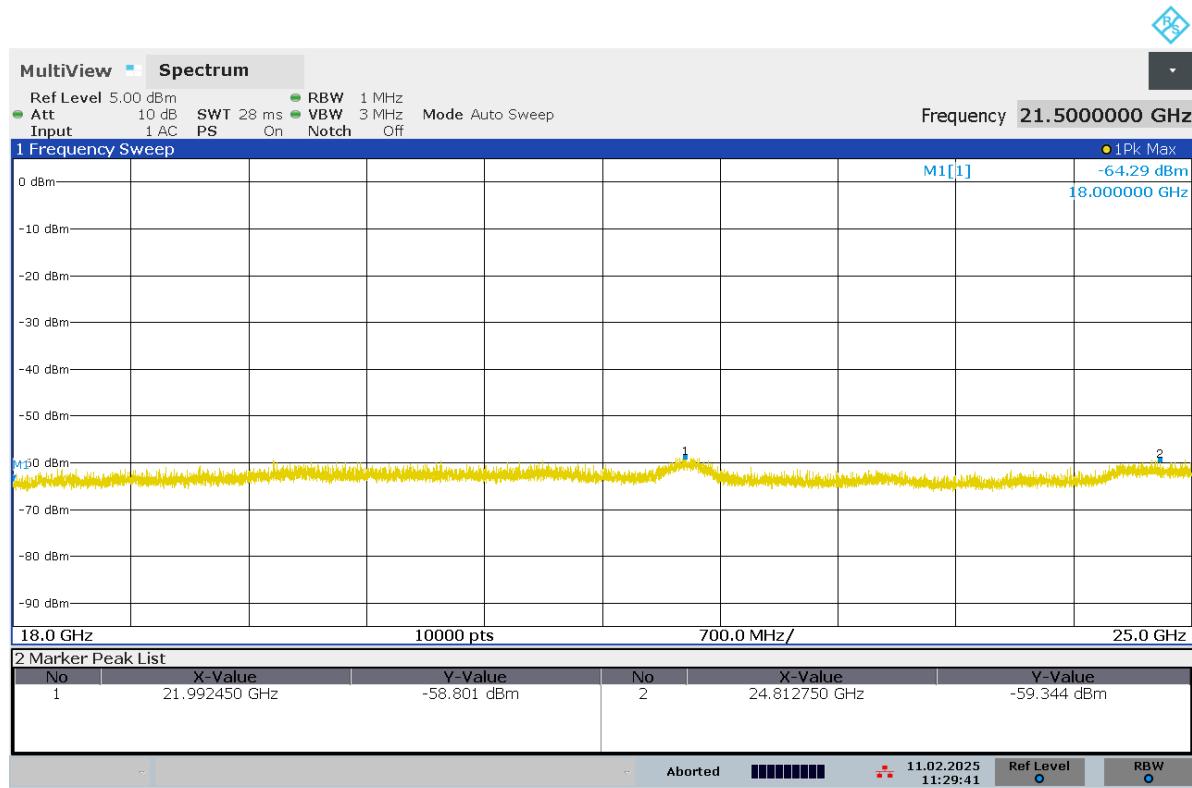
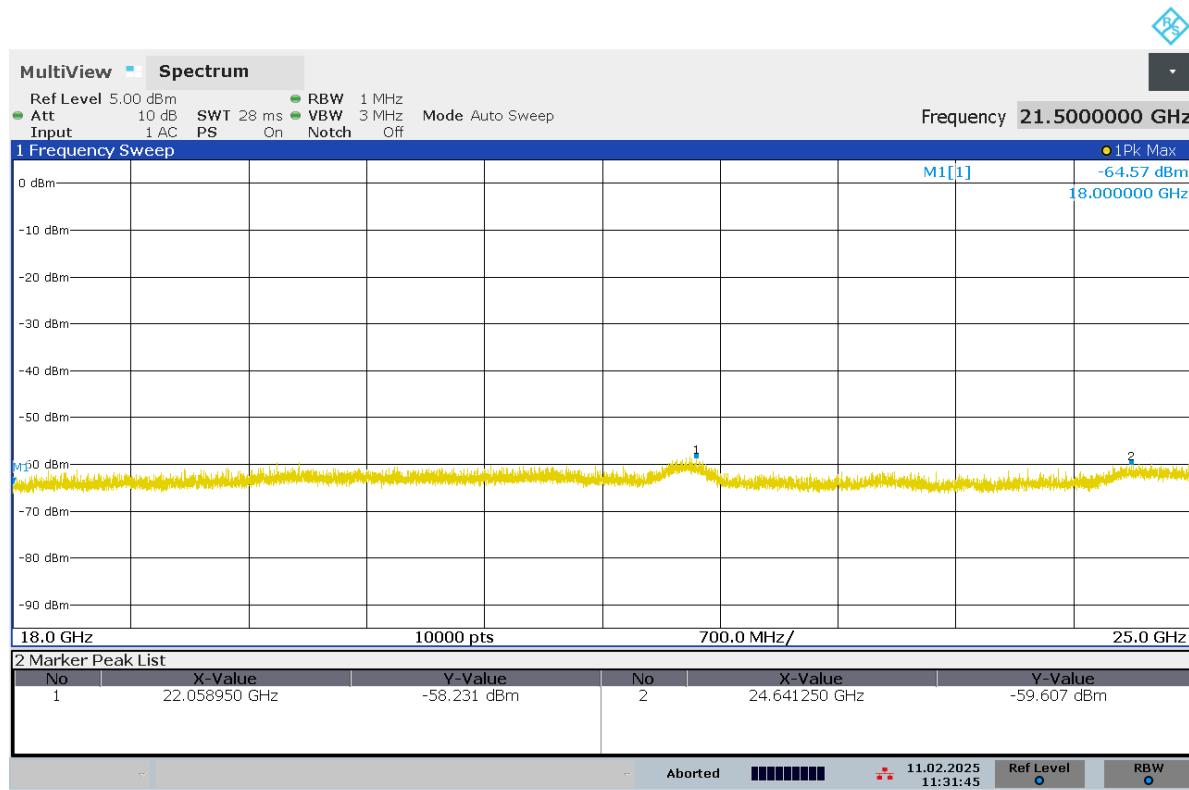
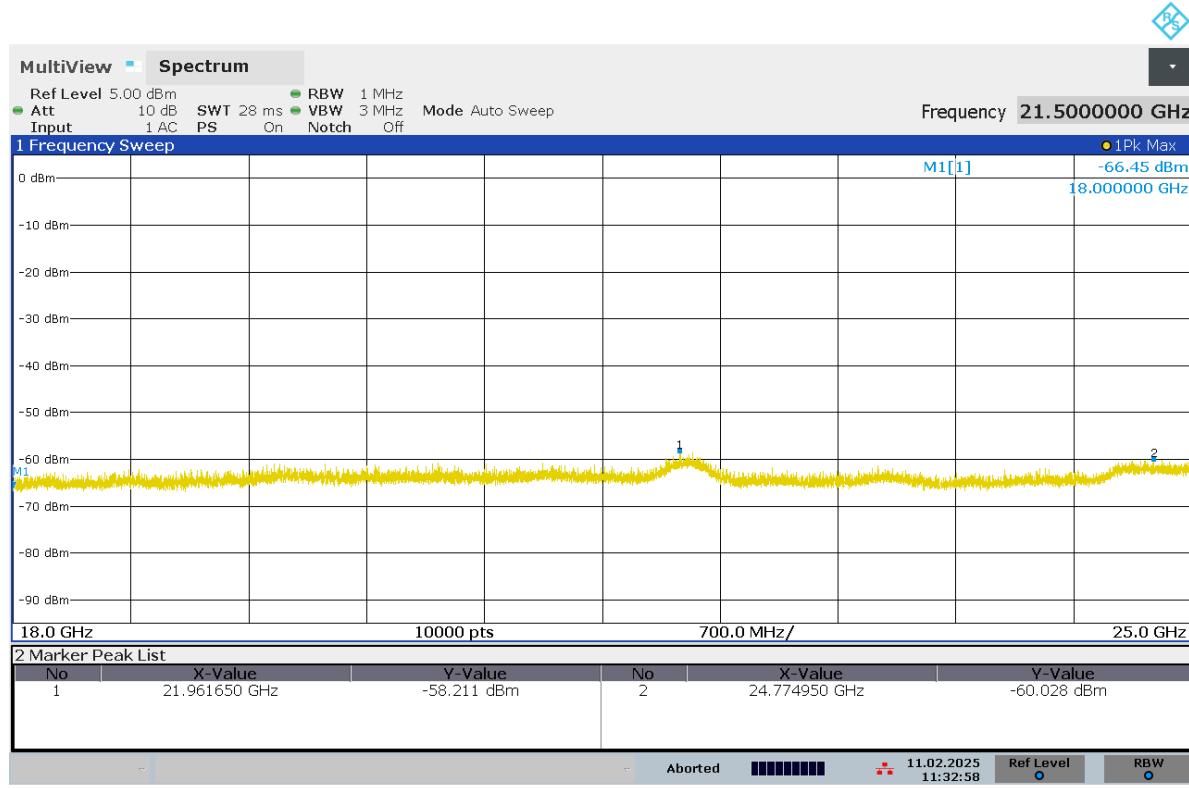


Figure 16 – Manual investigation – Operating on channel 2402MHz – Whip Antenna



11:31:45 11.02.2025

Figure 17 – Manual investigation – Operating on channel 2440MHz – Whip Antenna



11:32:58 11.02.2025

Figure 18 – Manual investigation – Operating on channel 2480MHz – Whip Antenna

5.5.9 Exploratory Radiated Emission Maximization – Puck Antenna

During exploratory testing, suspect emissions from the EUT were identified both in terms of the frequency and directionality. This was achieved by manually positioning the antenna close to the EUT and also by scanning it over all sides of the EUT whilst observing a spectral display. The typical distance between the surface of the EUT and the scanning antenna was circa 30cm.

| Frequency (GHz) | Mode of operation | EUT face * | Emissions Angle (w.r.t. turntable) | Height | Polarization |
|--------------------|--|---------------|---------------------------------------|--------|--------------|
| - | Tx on channels 2402MHz, 2440MHz and 2480MHz. | - | - | - | - |

Table 8 Frequencies identified during Exploratory Radiated Emission maximization – Puck Antenna

Note 2 : The front face of the EUT is deemed to be 0°, which is then turned in a clockwise direction through 360°.

No emissions were identified for further investigation above 18GHz.

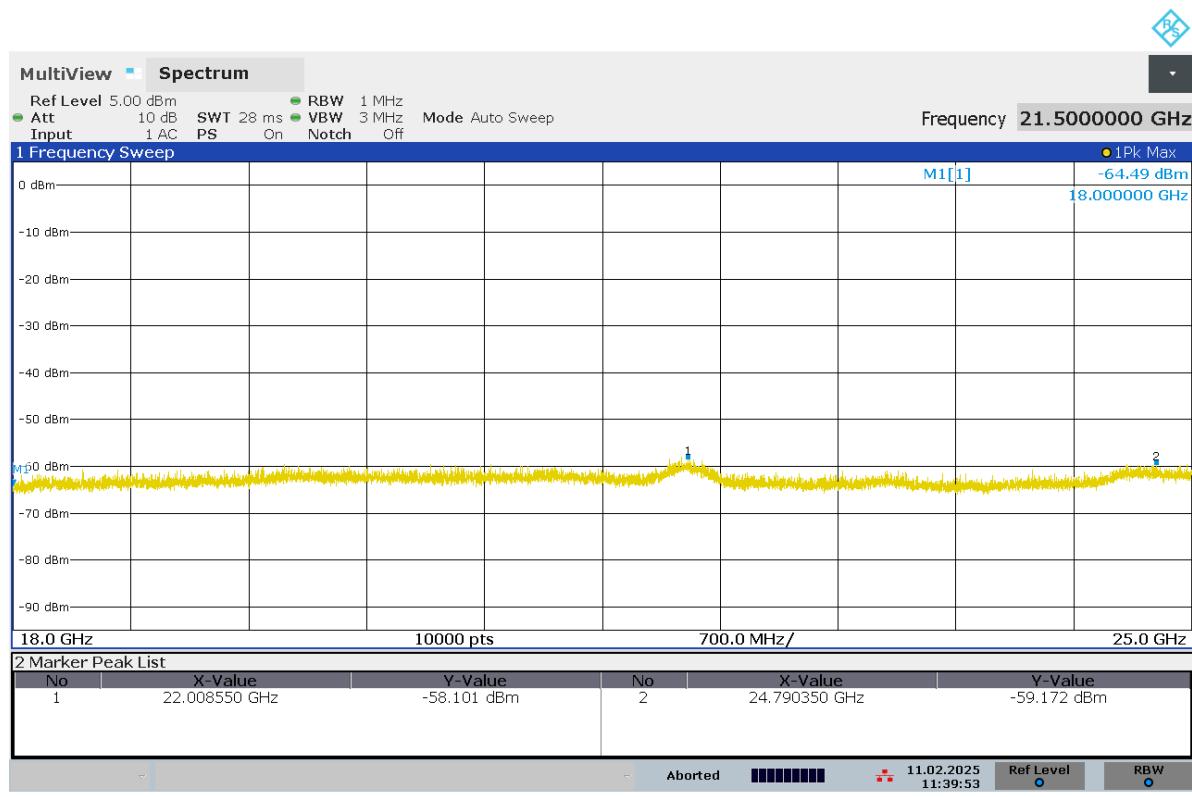


Figure 19 – Manual investigation – Operating on channel 2402MHz – Puck Antenna

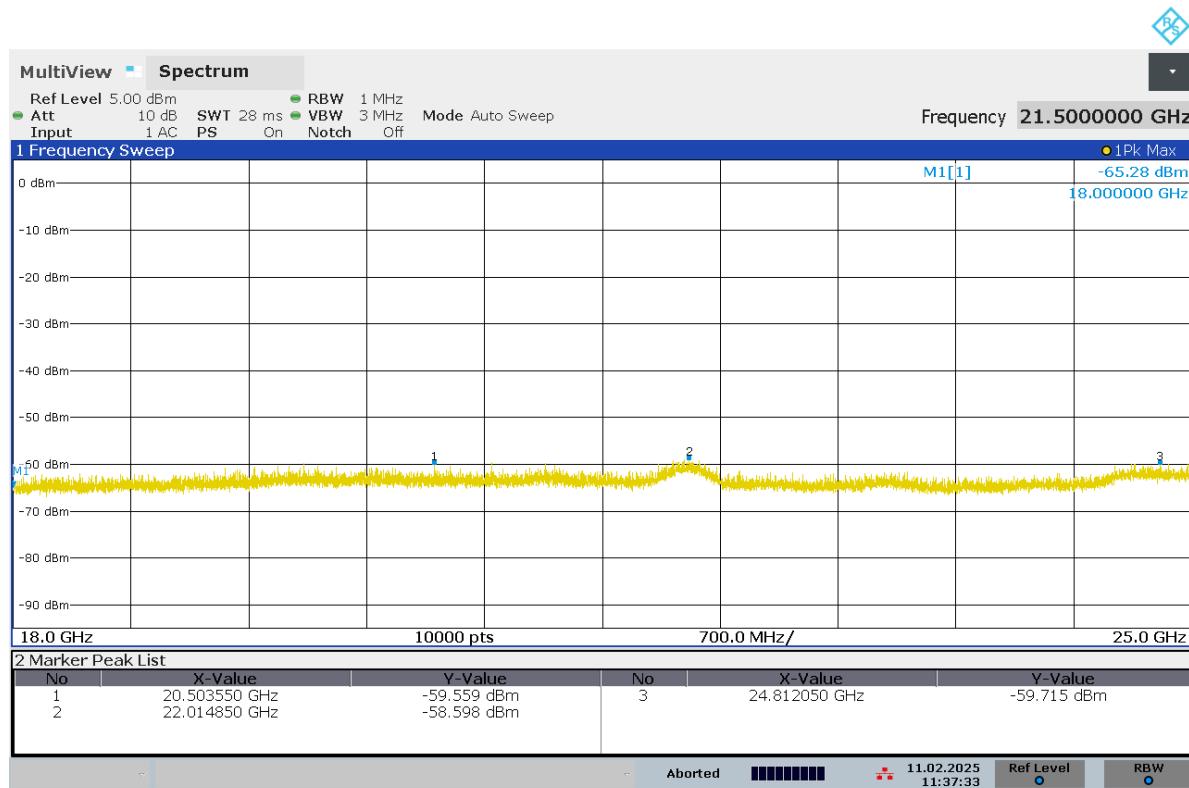


Figure 20 – Manual investigation – Operating on channel 2440MHz – Puck Antenna

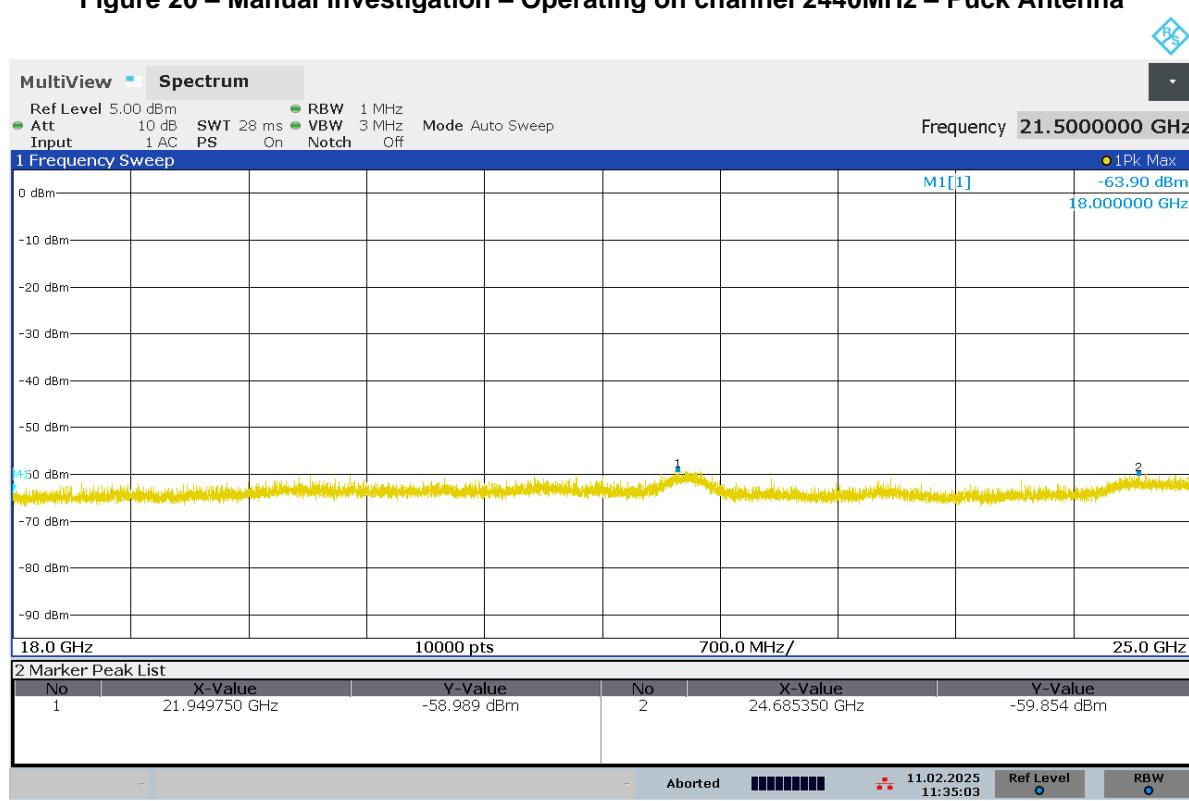


Figure 21 – Manual investigation – Operating on channel 2480MHz – Puck Antenna

5.6 Conducted Spurious Emissions 30MHz to 25GHz**5.6.1 Limits**

| Frequency (MHz) | Limit, 47CFR 15.247(d) |
|--------------------|------------------------|
| Peak | |
| 30 – 25000 | -20dBc |

Spectrum analyser settings as specified by ANSIC63.10-2020/Cor1-2023 Clause 11.11.2

| Receiver Parameters | Setting |
|----------------------|-------------|
| Detector Function | Peak |
| Start Frequency | 30MHz |
| Stop Frequency | 25000MHz |
| Resolution Bandwidth | 100kHz |
| Video Bandwidth | 300kHz |
| Sweep rate | Auto couple |
| Trace mode | Max hold |

5.6.2 Emissions measurements**5.6.3 Date of Test**

6th February 2025

5.6.4 Test Area

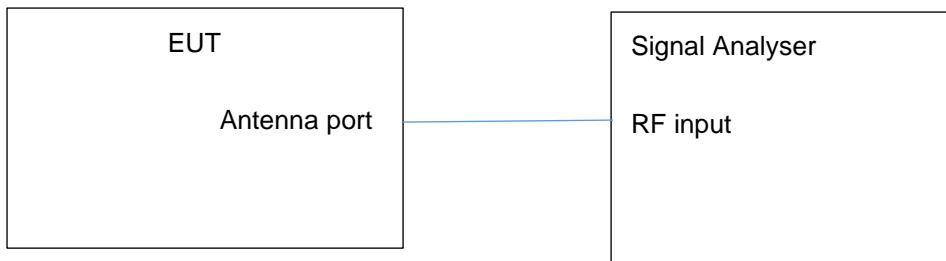
LAB 8

5.6.5 Tested by

L Trickett

5.6.6 Test Setup

The antenna port was connected directly to the signal analyser.



5.6.7 Test Results

The results of the conducted spurious emissions are stated below and by the signal analyser images.

All disturbances detected were > 20dB below the carrier.

5.6.8 Antenna port conducted emissions, 30MHz to 25GHz

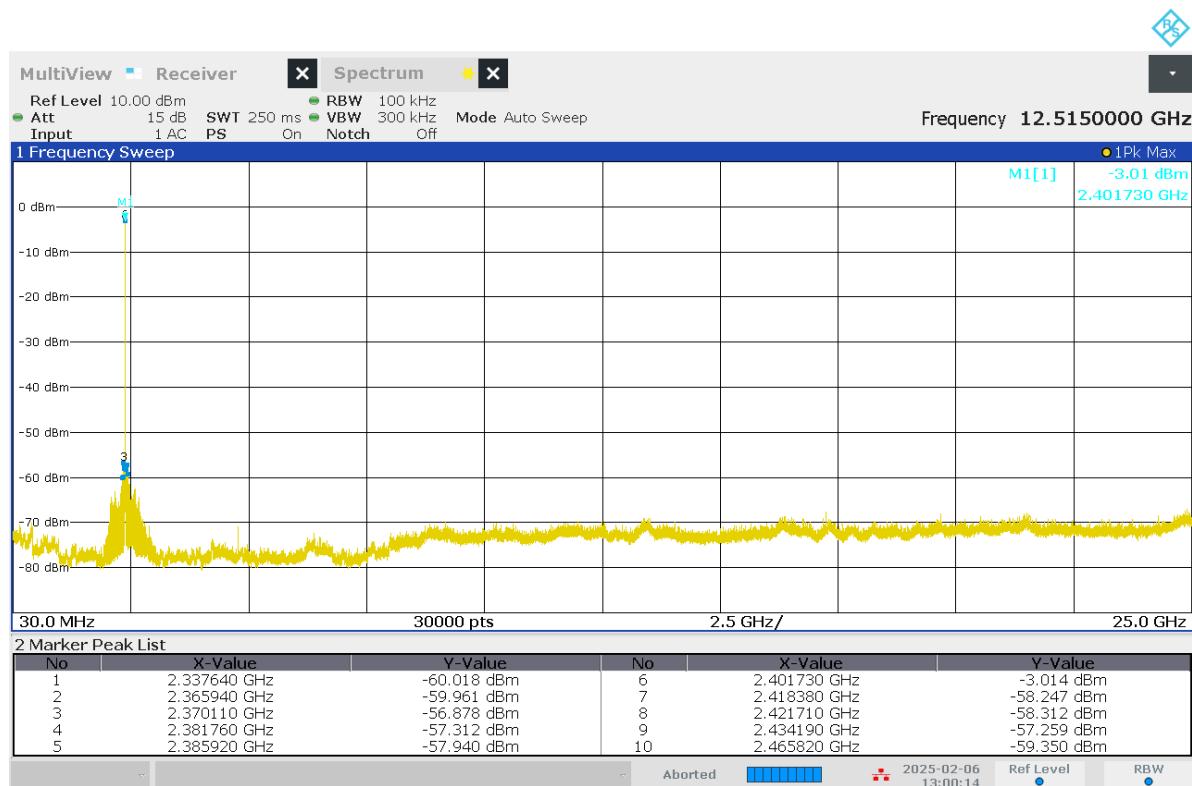


Figure 22 Conducted emissions 30MHz to 25GHz. Operation on channel 2402MHz.

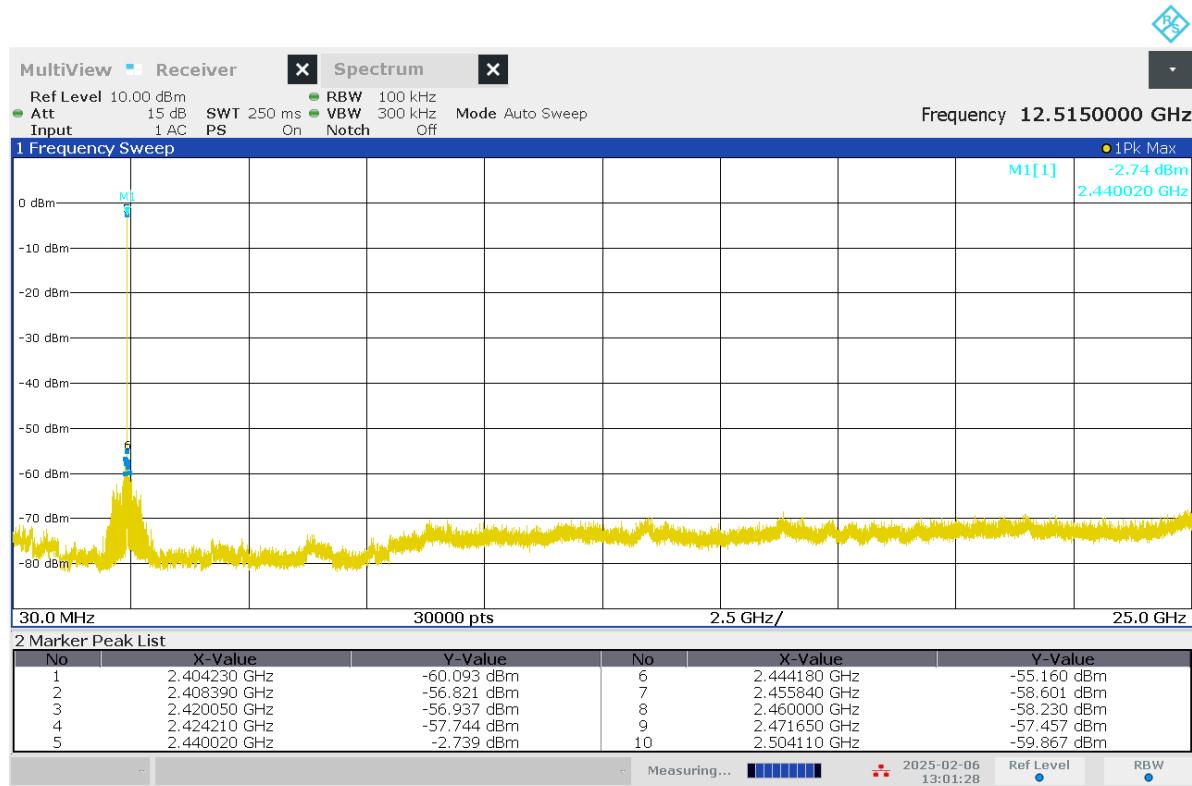


Figure 23 Conducted emissions 30MHz to 25GHz. Operation on channel 2440MHz.

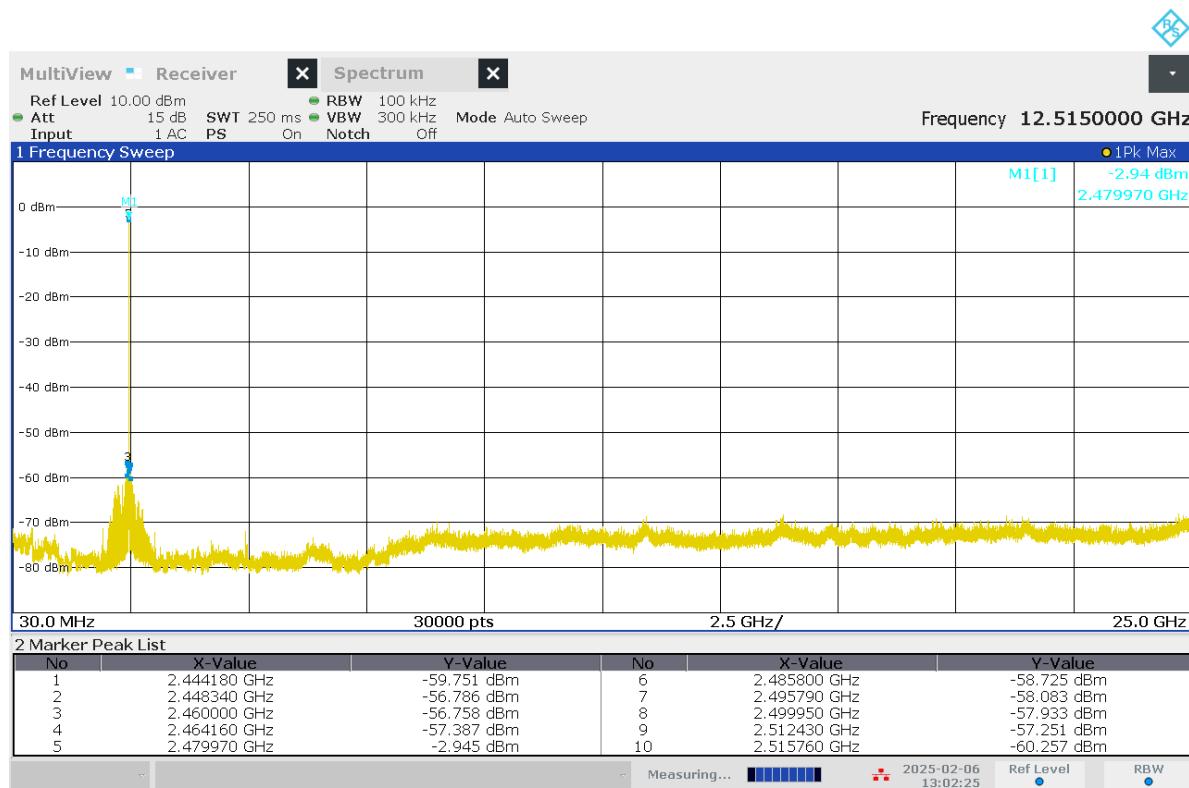


Figure 24 Conducted emissions 30MHz to 25GHz. Operation on channel 2480MHz.

Section 6 6dB Bandwidth and 99% Occupied Bandwidth

6.1 Test Specification

| | |
|--------------------------------|---|
| FCC Rule Part | 46CFR 15.247 (b)(2) |
| Standard | ANSIC63.10-2020/Cor1-2023 |
| Measurement Uncertainty | The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95% is $\pm 1.4\text{dB}$ |

6.2 Procedure and Test Software Version

Conducted Tests

| | |
|---|------|
| ANSIC63.10-2020/Cor1-2023 Clause reference: | 11.8 |
| Test software | N/A |

| Frequency (MHz) | Limit, 47CFR 15.247(a)(2) |
|----------------------|---------------------------|
| | 6dB bandwidth |
| 2400MHz to 2483.5MHz | Peak At least 500kHz |

Spectrum analyser settings as specified by ANSIC63.10-2020/Cor1-2023 Clause 11.8.1

| Receiver Parameters | Setting |
|----------------------|---------------|
| Detector Function | Peak |
| Span | 3MHz |
| Resolution Bandwidth | 100kHz/20kHz |
| Video Bandwidth | 300kHz/100kHz |
| Sweep rate | Auto couple |
| Trace mode | Max hold |

6.2.1 Emissions measurements**6.2.2 Date of Test**6th February 2025**6.2.3 Test Area**

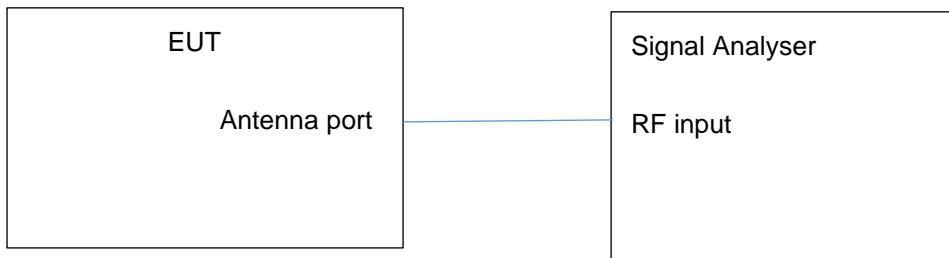
LAB 8

6.2.4 Tested by

L Trickett

6.2.5 Test Setup

The antenna port was connected directly to the signal analyser.

**6.2.6 Test Results**

The results of the 6dB bandwidth measurements are stated in the table below and by the signal analyser images.

| Channel (MHz) | 99% Occupied Bandwidth (MHz) | Measured 6dB bandwidth (kHz) | Minimum 6dB bandwidth requirement (kHz) | Figures | Result |
|---------------|------------------------------|------------------------------|---|---------|--------|
| 2402.0 | 1.053 | 673.2 | 500.0 | 25 & 28 | Pass |
| 2440.0 | 1.051 | 685.8 | 500.0 | 26 & 29 | Pass |
| 2480.0 | 1.053 | 690.9 | 500.0 | 27 & 30 | Pass |

Table 9 Bandwidth Measurements



Figure 25 Bandwidth at 6dB Point. Operation on channel 2402MHz



Figure 26 Bandwidth at 6dB Point. Operation on channel 2440MHz

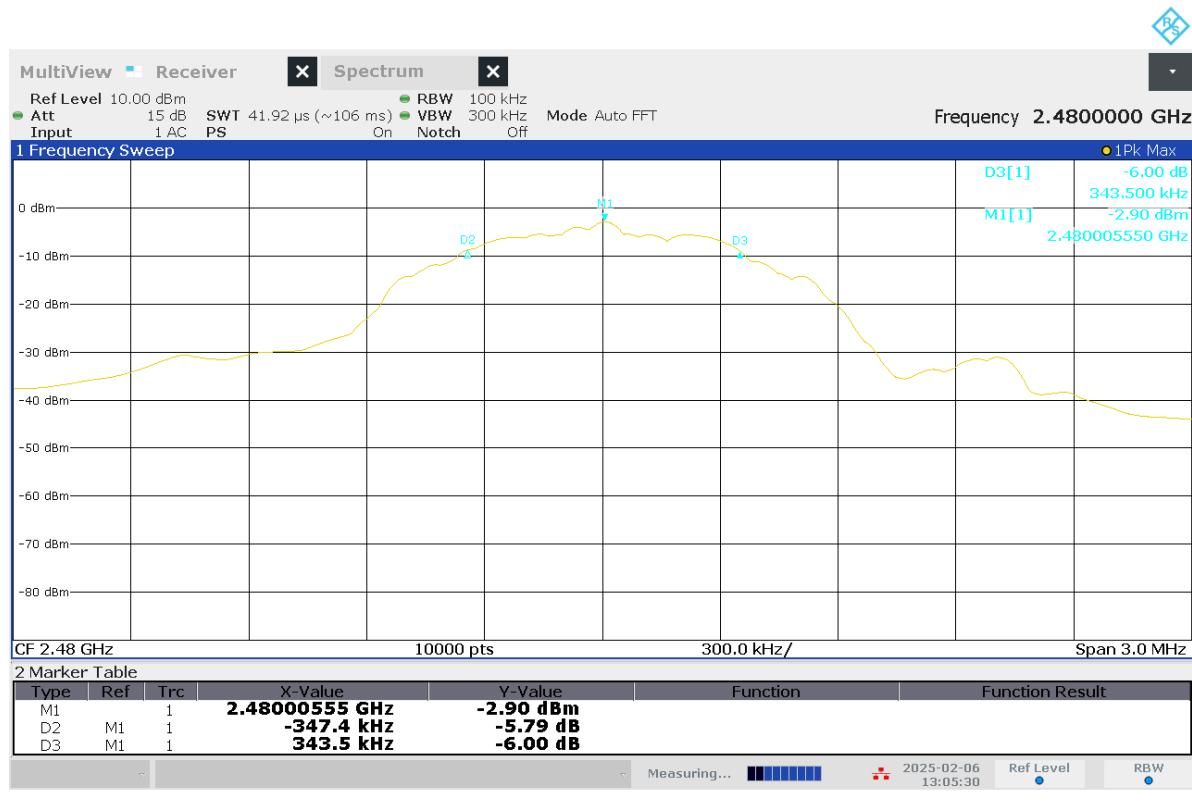


Figure 27 Bandwidth at 6dB Point. Operation on channel 2480MHz

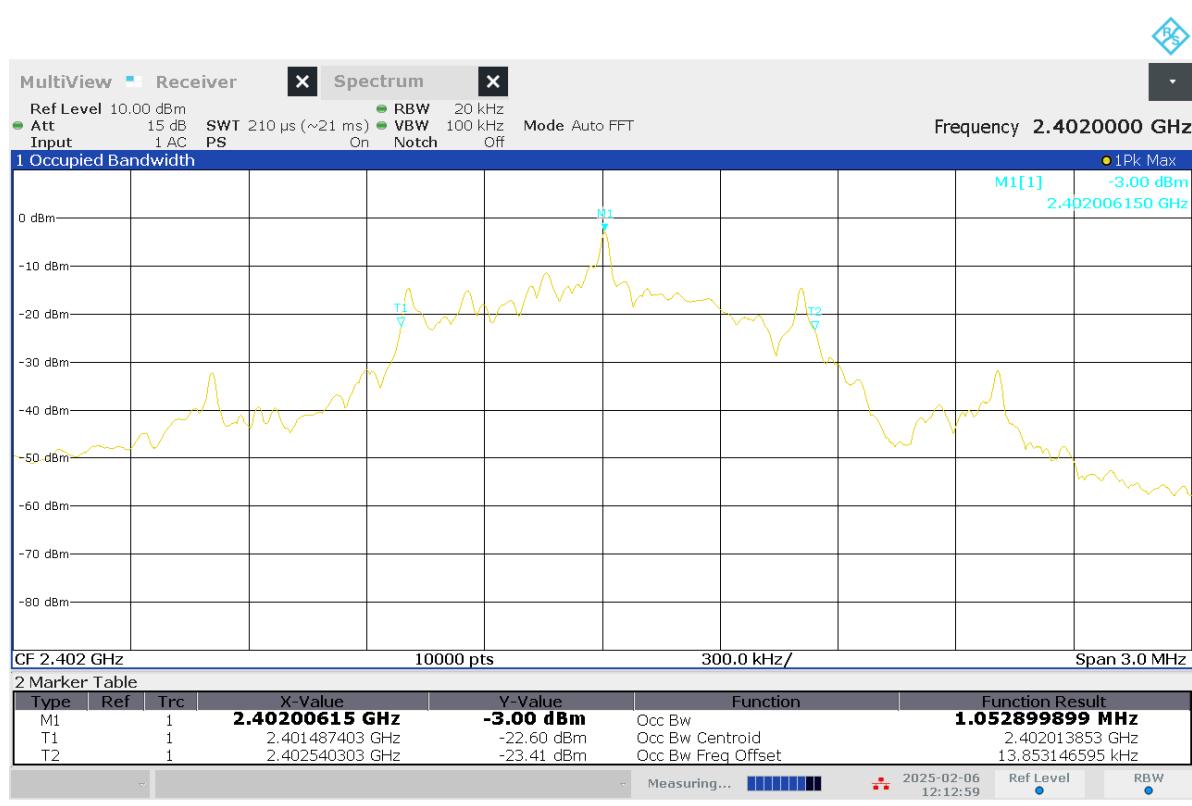


Figure 28 99% Occupied Bandwidth. Operation on channel 2402MHz

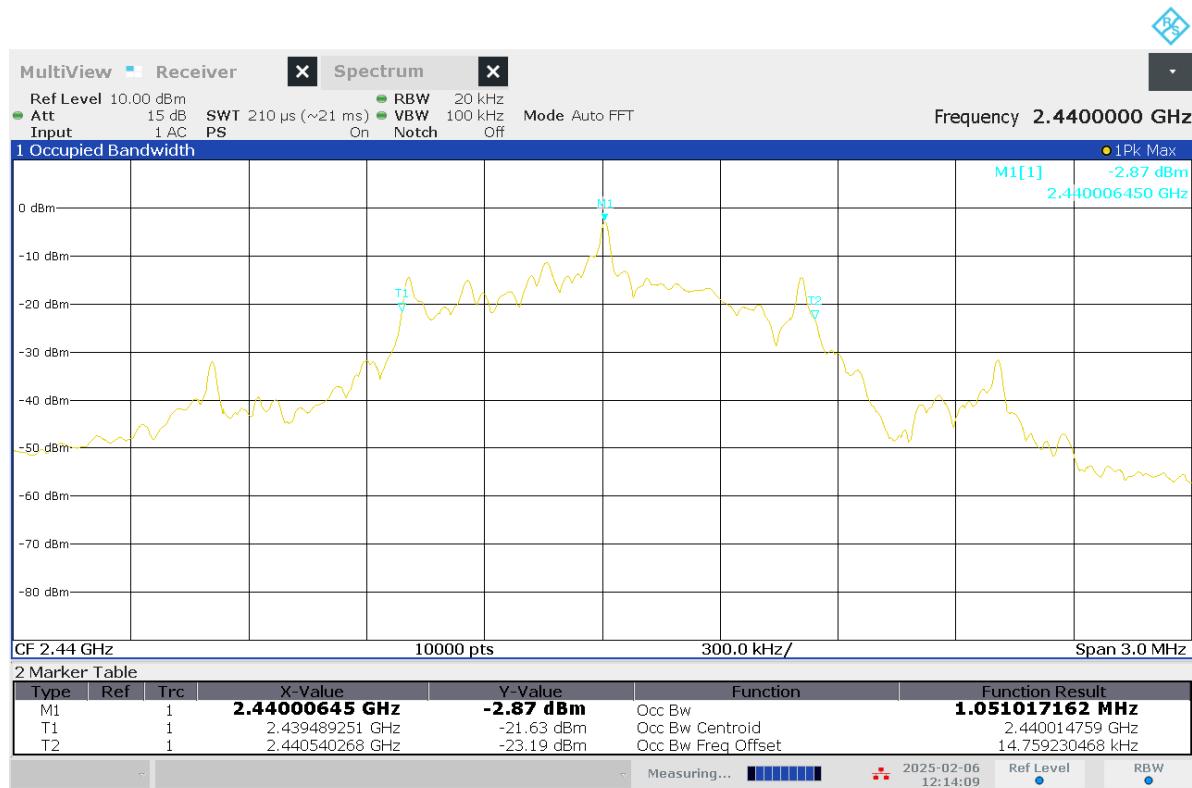


Figure 29 99% Occupied Bandwidth. Operation on channel 2440MHz



Figure 30 99% Occupied Bandwidth. Operation on channel 2480MHz

Section 7 Peak Output Power

7.1 Test Specification

| | |
|--------------------------------|---|
| FCC Rule Part | 46CFR 15.247 (b)(3) |
| Standard | ANSIC63.10-2020/Cor1-2023 |
| Measurement Uncertainty | The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95% is $\pm 1.4\text{dB}$ |

7.2 Procedure and Test Software Version

Conducted Tests

| | |
|---|------------------------------|
| ANSIC63.10-2020/Cor1-2023 Clause reference: | 11.9.1.1 (RBS>DTS bandwidth) |
| Test software | N/A |

| Frequency (MHz) | Limit, 47CFR 15.247(b)(3) |
|----------------------|---------------------------|
| | Peak |
| 2400MHz to 2483.5MHz | 1 watt |

Spectrum analyser settings as specified by ANSIC63.10-2020/Cor1-2023 Clause 11.9.1.1

| Receiver Parameters | Setting |
|----------------------|-----------------------|
| Detector Function | Peak |
| Span | 10MHz |
| Resolution Bandwidth | 2MHz (>DTS Bandwidth) |
| Video Bandwidth | 10MHz |
| Sweep rate | Auto couple |
| Trace mode | Max hold |

7.2.1 Emissions measurements**7.2.2 Date of Test**6th February 2025**7.2.3 Test Area**

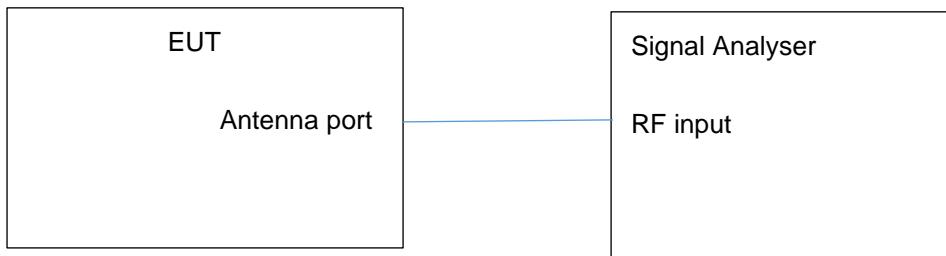
LAB 8

7.2.4 Tested by

L Trickett

7.2.5 Test Setup

The antenna port was connected directly to the signal analyser.



7.2.6 Test Result

The results of the peak output power measurements are stated in the table below and by the signal analyser images. Note: EIRP values are based on a worst case antenna gain of +6dBi.

| Channel (MHz) | Peak Power (dBm) | Peak Power (Watts) | EIRP (Watts) | Limit (Watts) | Figure |
|---------------|------------------|--------------------|--------------|---------------|--------|
| 2402 | -2.37 | 0.00058 | 0.0023 | 1 | 31 |
| 2440 | -2.26 | 0.00059 | 0.0024 | 1 | 32 |
| 2480 | -2.20 | 0.00060 | 0.0024 | 1 | 33 |

Table 10 Peak Output Power Measurements

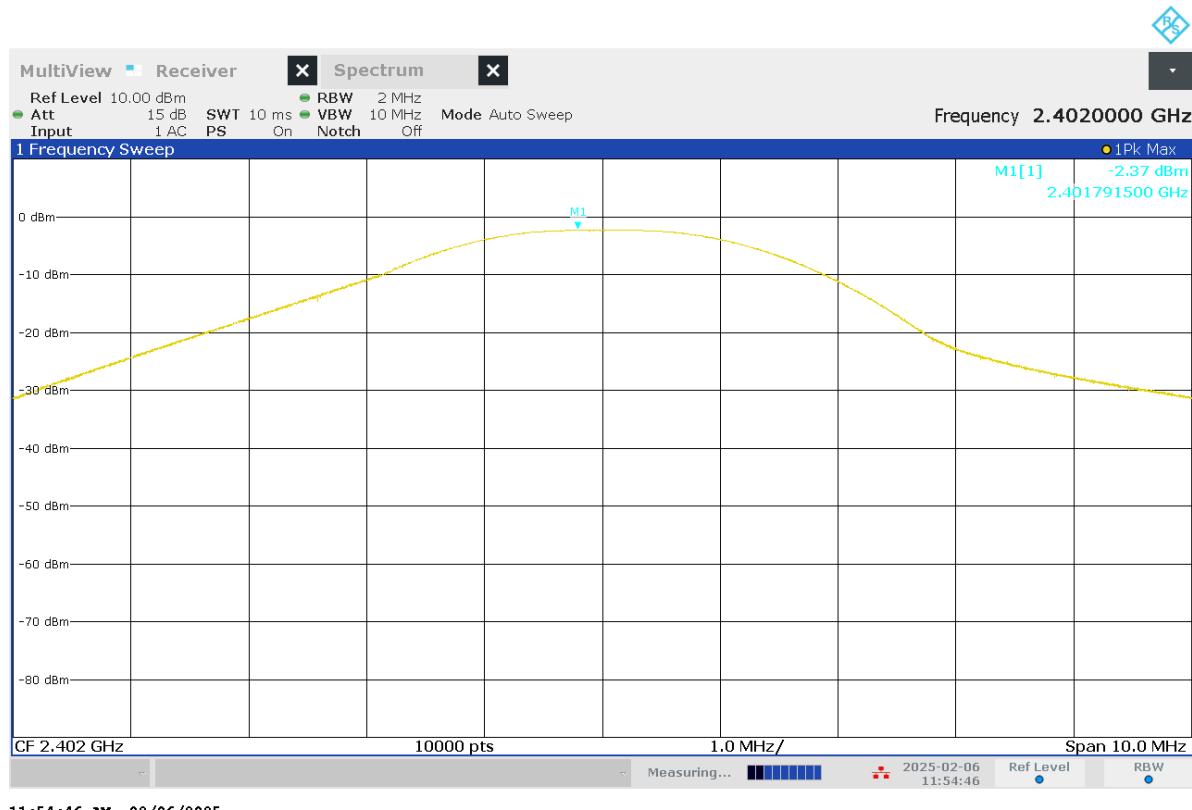


Figure 31 Peak output power, Operation on channel 2402MHz

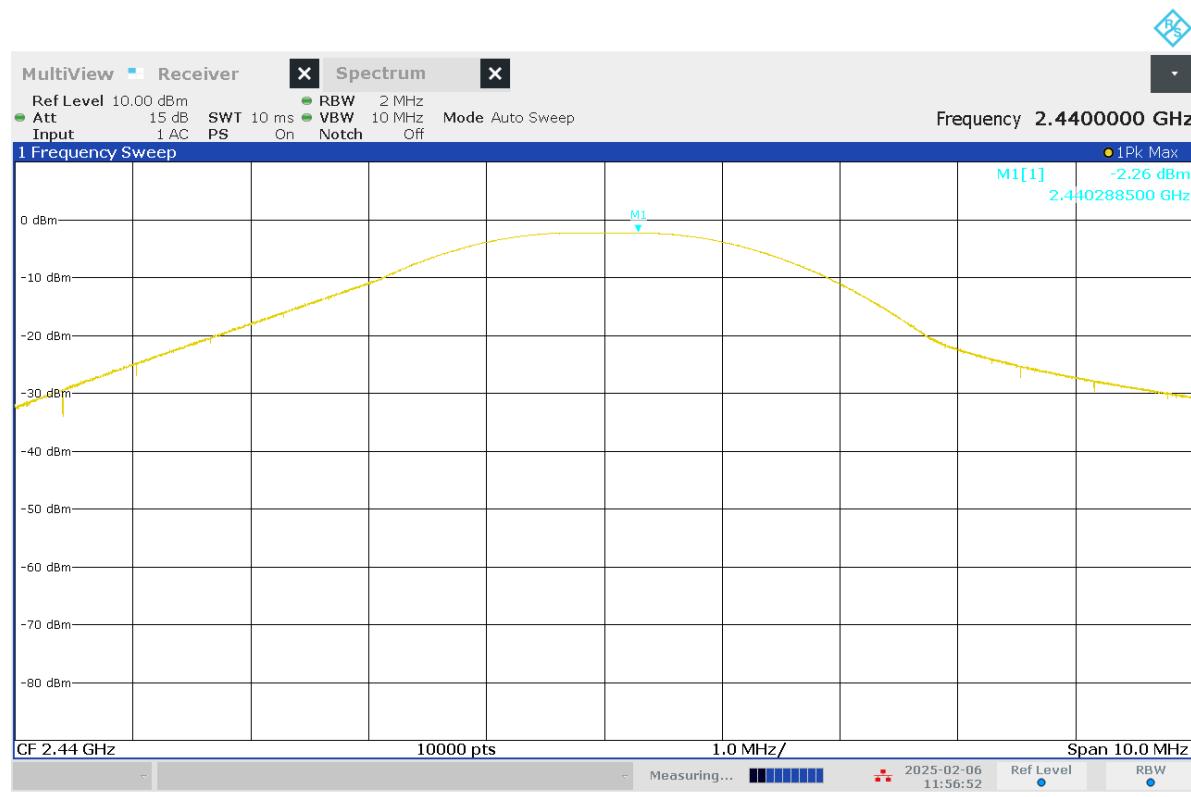


Figure 32 Peak output power, Operation on channel 2440MHz

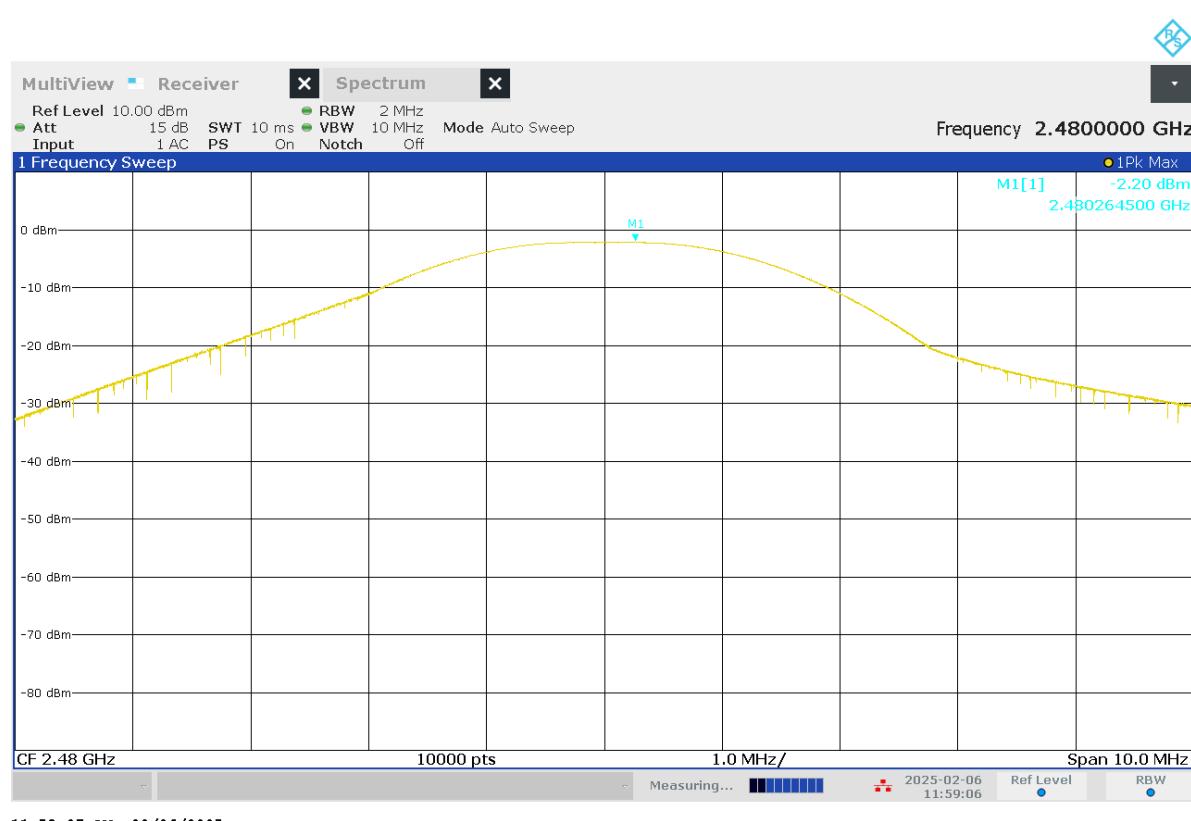


Figure 33 Peak output power, Operation on channel 2480MHz

Section 8 Power Spectral Density

8.1 Test Specification

| | |
|--------------------------------|---|
| FCC Rule Part | 46CFR 15.247 (e) |
| Standard | ANSIC63.10-2020/Cor1-2023 |
| Measurement Uncertainty | The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95% is $\pm 1.4\text{dB}$ |

8.2 Procedure and Test Software Version

Conducted Tests

| | |
|---|---------------------------|
| ANSIC63.10-2020/Cor1-2023 Clause reference: | Clause 11.10.2 (peak PSD) |
| Test software | N/A |

| Frequency (MHz) | Limit, 47CFR 15.247(e) |
|----------------------|--|
| | Peak |
| 2400MHz to 2483.5MHz | <8dBm in any 3kHz band during any time interval of complete transmission |

Spectrum analyser settings as specified by ANSIC63.10-2020/Cor1-2023 Clause 11.10.2

| Receiver Parameters | Setting |
|----------------------|-------------------------------|
| Detector Function | Peak |
| Span | 1.5xDTS bandwidth |
| Resolution Bandwidth | 3kHz \leq RBW \leq 100kHz |
| Video Bandwidth | 3 x RBW |
| Sweep rate | Auto couple |
| Trace mode | Max hold |

8.2.1 Emissions measurements

8.2.2 Date of Test

6th February 2025

8.2.3 Test Area

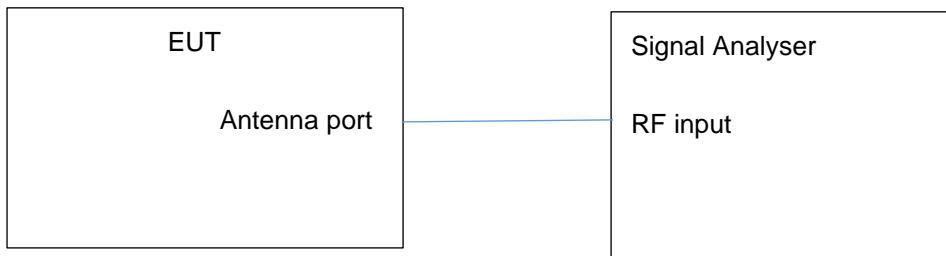
LAB 8

8.2.4 Tested by

L Trickett

8.2.5 Test Setup

The antenna port was connected directly to the signal analyser.



8.2.6 Test Results

| Channel (MHz) | Power in 3kHz RBW (dBm) | Limit (dBm) | Figure | Result |
|---------------|-------------------------|-------------|--------|--------|
| 2402 | -3.88 | 8.0 | 34 | Pass |
| 2440 | -3.79 | 8.0 | 35 | Pass |
| 2480 | -3.87 | 8.0 | 36 | Pass |

Table 11 Peak Spectral Density Measurements

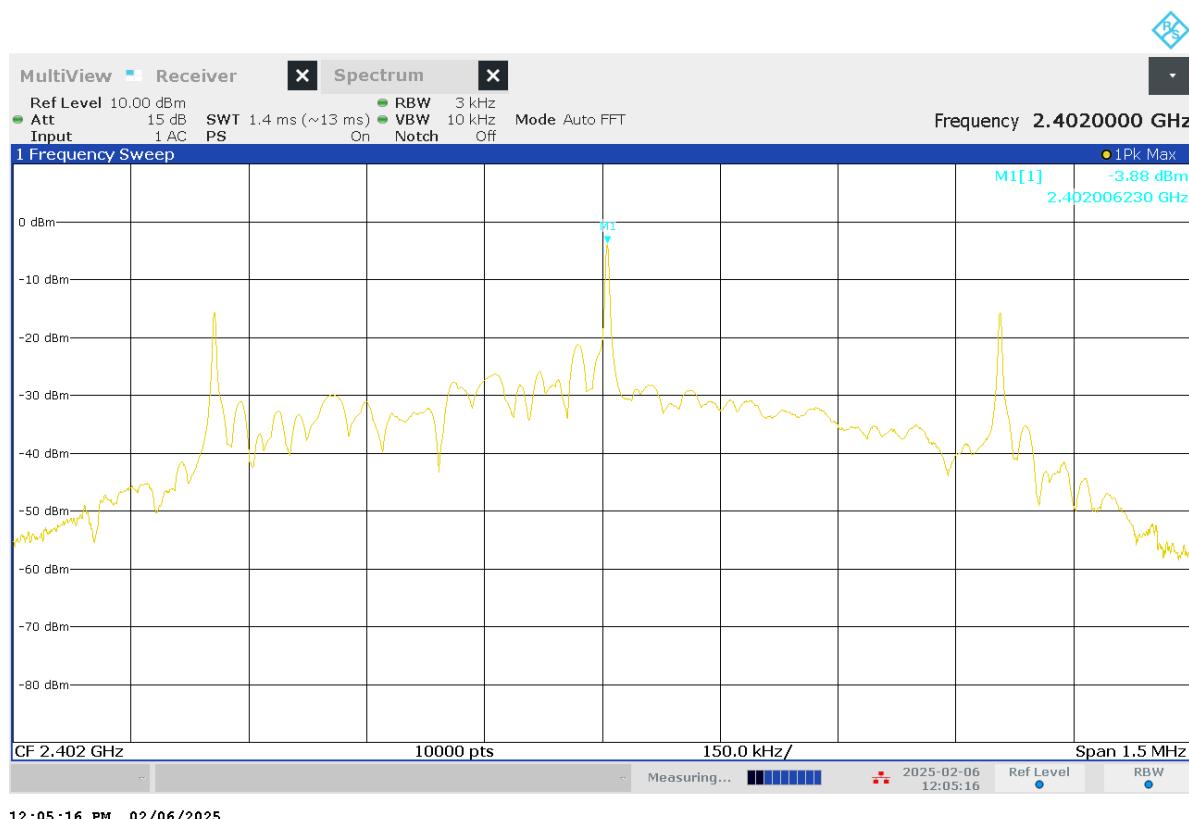


Figure 34 Power spectral density, Operation on channel 2402MHz

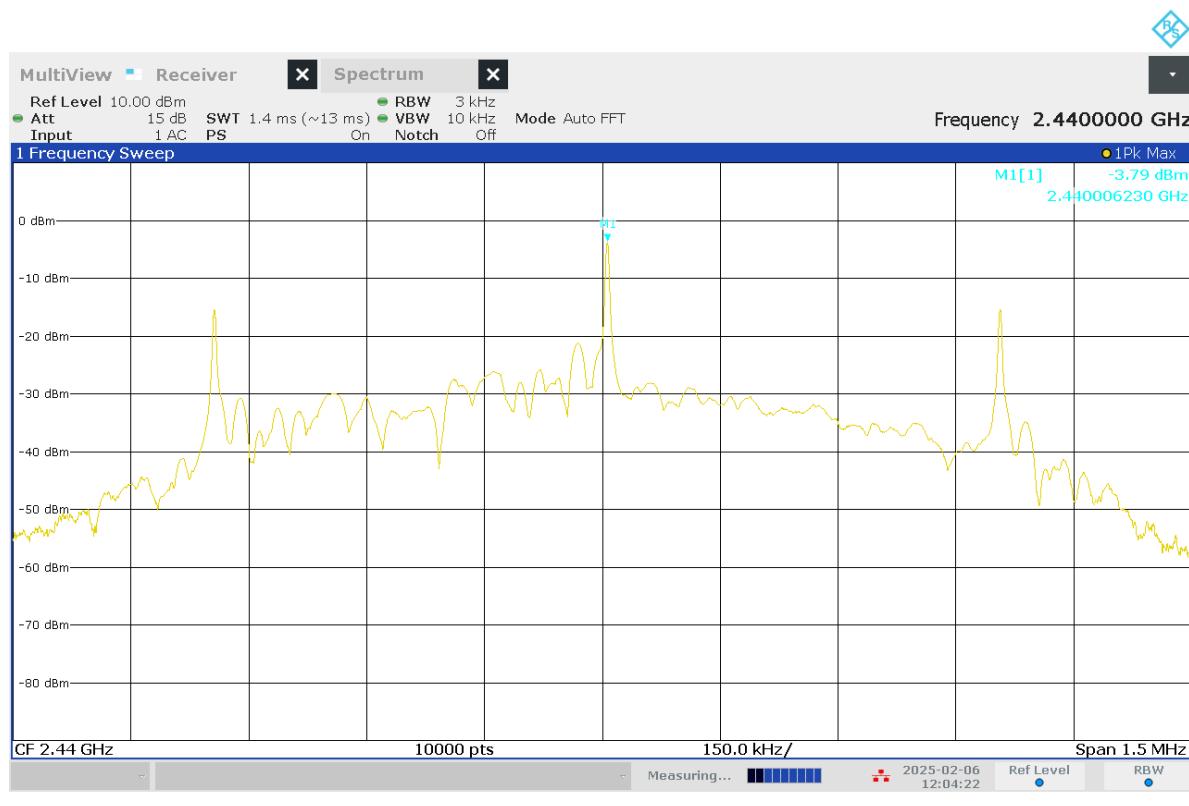


Figure 35 Power spectral density, Operation on channel 2440MHz

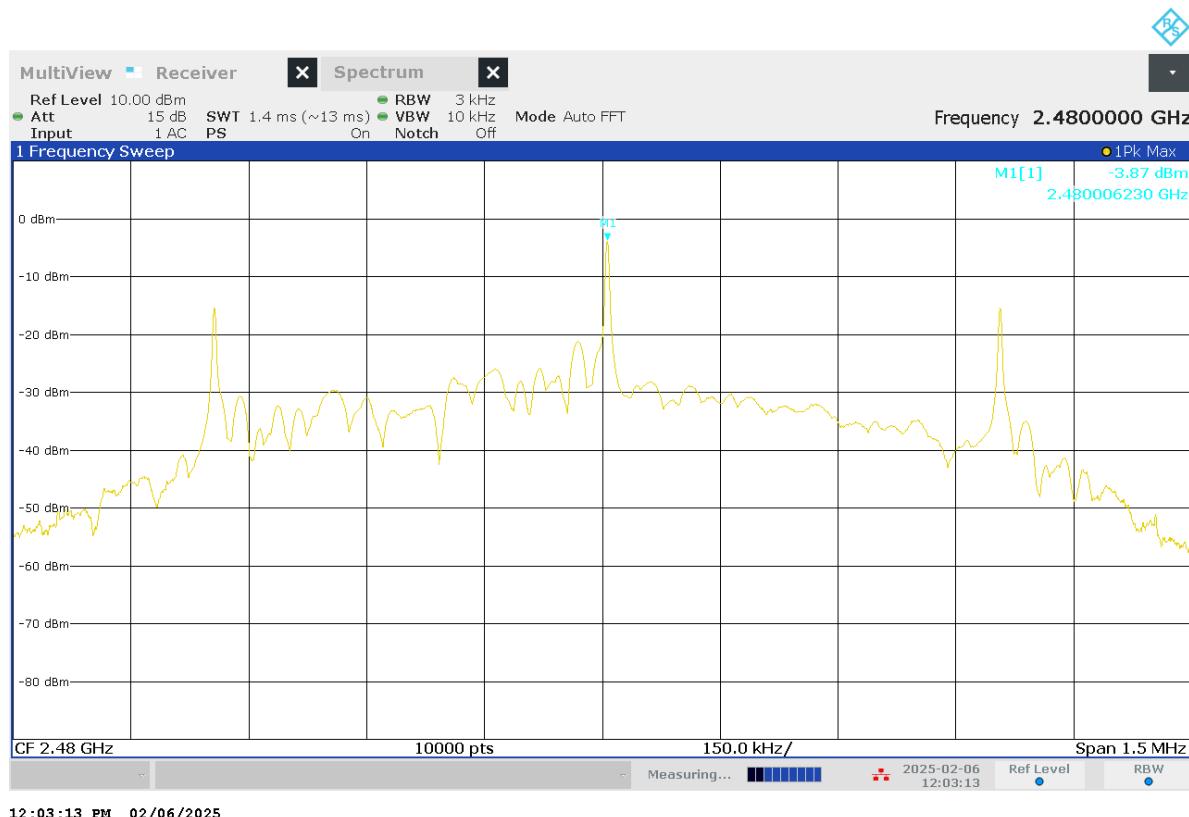


Figure 36 Power spectral density, Operation on channel 2480MHz

Section 9 Band Edge Compliance

9.1 Test Specification

| | |
|--------------------------------|--|
| FCC Rule Part | 46CFR 15.205 and 47CFR15.209 |
| Standard | ANSIC63.10-2020/Cor1-2023 |
| Measurement Uncertainty | The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95% is $\pm 5.14\text{dB}$ |

9.2 Procedure and Test Software Version

Radiated Tests

| | |
|---|---|
| ANSIC63.10-2020/Cor1-2023 Clause reference: | Clause 6.10.5 "Restricted band-edge measurements" |
| Test software | N/A |

| Frequency (MHz) | Limit, 47CFR 15.247(e) |
|----------------------|--|
| | Peak |
| 2400MHz to 2483.5MHz | Measured signal at the band edge must be below the radiated emission limits of 47CFR15.209 |

Spectrum analyser settings as specified by ANSIC63.10-2020/Cor1-2023 Clause 6.10.5 "Restricted band-edge measurements"

| Receiver Parameters | Setting |
|----------------------|--------------|
| Detector Function | Peak |
| Span | As necessary |
| Resolution Bandwidth | 1MHz |
| Video Bandwidth | 3 x RBW |
| Sweep rate | Auto couple |
| Trace mode | Max hold |

9.2.1 Emissions measurements

9.2.2 Date of Test

13th February 2025

9.2.3 Test Area

LAB 1

9.2.4 Tested by

L Trickett

9.2.5 Test Setup

The test setup was identical to radiated emissions testing 1-18GHz.

9.2.6 Test Results

Results are presented in two formats:

Tabular results of measurements at the band edges. Manual measurements were performed to measure the maximum value of signal at the band edge. The tabular data includes the following:

1. Polarity of the measurement antenna
2. Frequency at the band edge
3. Amplitude of signal at the input of the test receiver
4. Pre-amplifier gain
5. Cable loss
6. Antenna factor
7. Resultant Electric field strength = 3-4+5+6

Spectrum analyser screen displays are also included. Please note that the screen displays do not include losses or antenna factor.

Test Results – Whip Antenna**Tabular Data**

The following radiated measurements were made at the band edges:

Upper band edge

| Polarity | Frequency (MHz) | Amplitude (dBuV) | Preamp (dB) | Cable loss (dB) | AF(dB/m) | E (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|----------|-----------------|------------------|-------------|-----------------|----------|------------|----------------|-------------|
| H | 2483.5 | 70.5 | 54.3 | 3.8 | 30.6 | 50.6 | 74.0 | 23.4 |
| V | 2483.5 | 81.9 | 54.3 | 3.8 | 30.6 | 62.0 | 74.0 | 12.0 |

Table 12 Operation on Channel 2480MHz, Peak detector measurements

| Polarity | Frequency (MHz) | Amplitude (dBuV) | Preamp (dB) | Cable loss (dB) | AF(dB/m) | E (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|----------|-----------------|------------------|-------------|-----------------|----------|------------|----------------|-------------|
| H | 2483.5 | 44.5 | 54.3 | 3.8 | 30.6 | 24.6 | 54.0 | 29.4 |
| V | 2483.5 | 50.1 | 54.3 | 3.8 | 30.6 | 30.2 | 54.0 | 23.8 |

Table 13 Operation on Channel 2480MHz, Average detector measurements**Lower band edge**

| Polarity | Frequency (MHz) | Amplitude (dBuV) | Preamp (dB) | Cable loss (dB) | AF(dB/m) | E (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|----------|-----------------|------------------|-------------|-----------------|----------|------------|----------------|-------------|
| H | 2400 | 85.0 | 54.2 | 3.7 | 30.0 | 64.5 | 74.0 | 9.5 |
| V | 2400 | 94.3 | 54.2 | 3.7 | 30.0 | 73.8 | 74.0 | 0.2 |

Table 14 Operation on Channel 2402MHz Peak detector measurements

| Polarity | Frequency (MHz) | Amplitude (dBuV) | Preamp (dB) | Cable loss (dB) | AF(dB/m) | E (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|----------|-----------------|------------------|-------------|-----------------|----------|------------|----------------|-------------|
| H | 2400 | 51.1 | 54.2 | 3.7 | 30.0 | 30.6 | 54.0 | 23.4 |
| V | 2400 | 59.0 | 54.2 | 3.7 | 30.0 | 38.5 | 54.0 | 15.5 |

Table 15 Operation on Channel 2402MHz Average detector measurements

Spectrum analyser displays

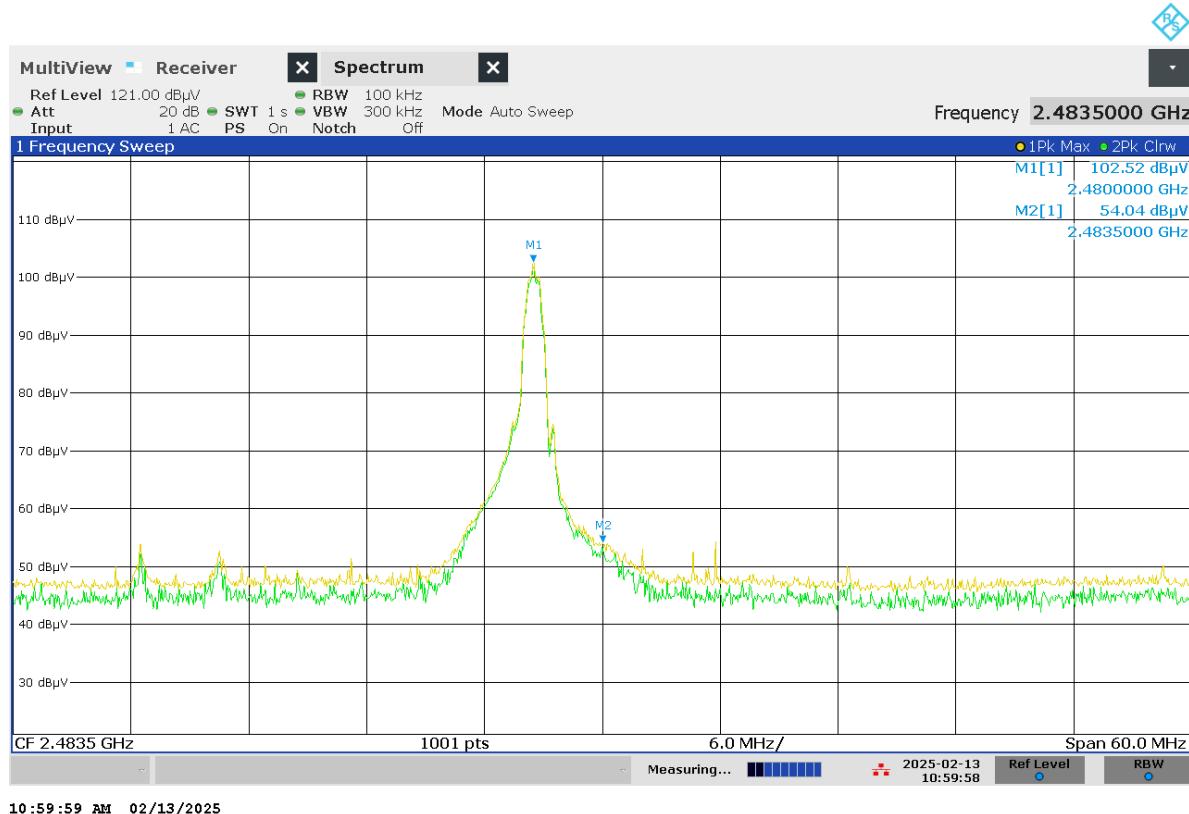


Figure 37 Band Edge Measurement – Upper band edge - Horizontal polarity

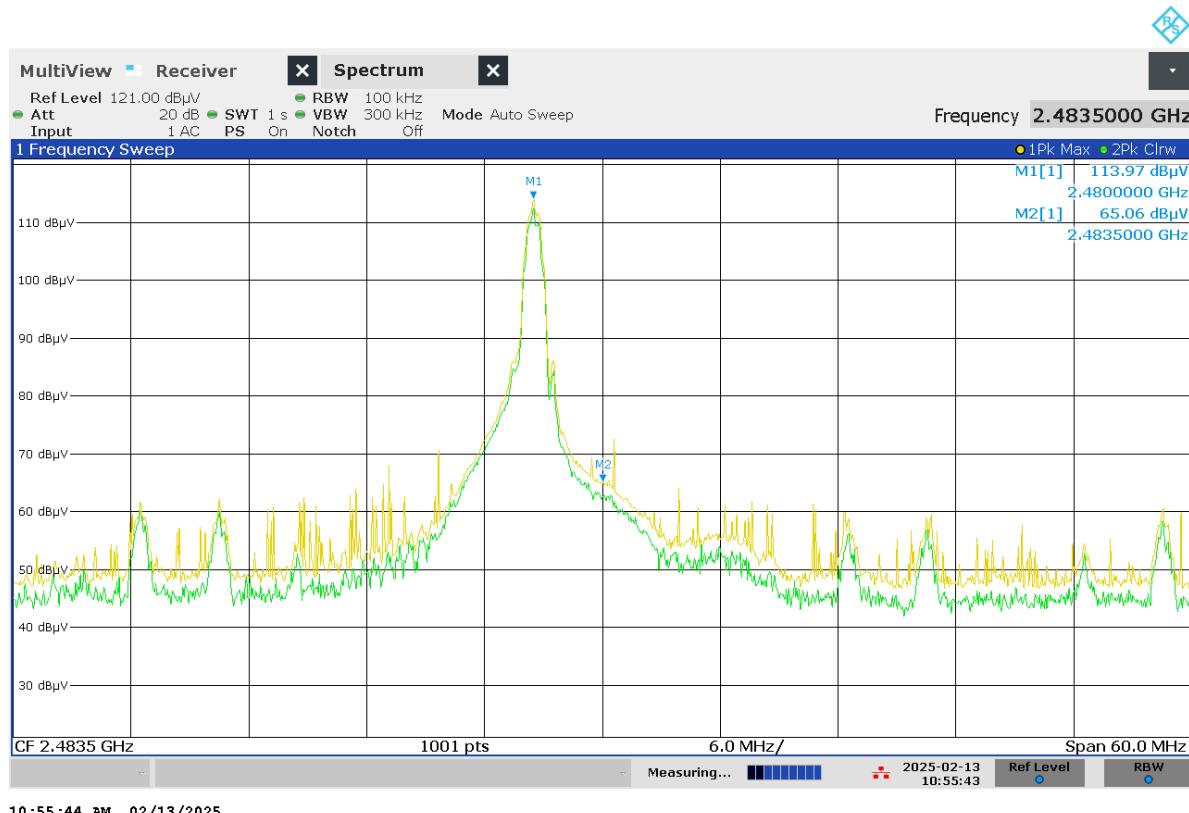


Figure 38 Band Edge Measurement – Upper band edge - Vertical polarity

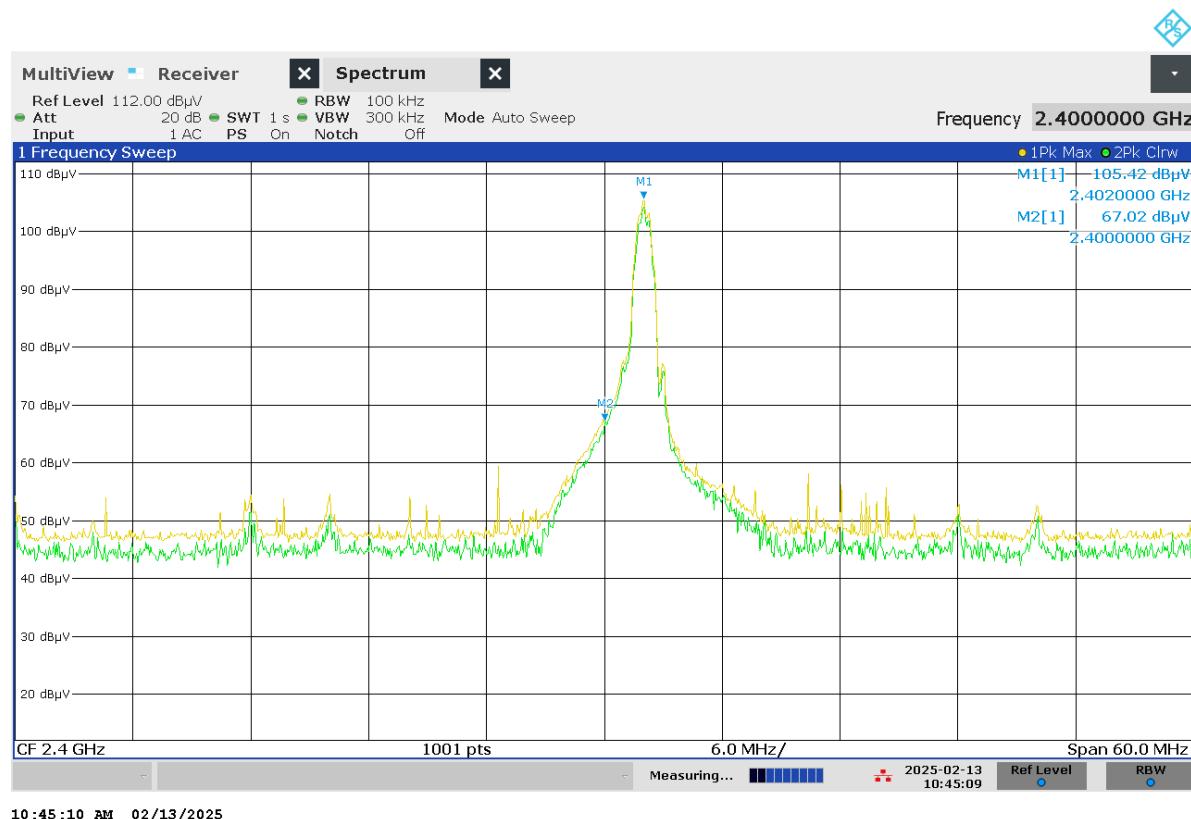


Figure 39 Band Edge Measurement – Lower band edge - Horizontal polarity

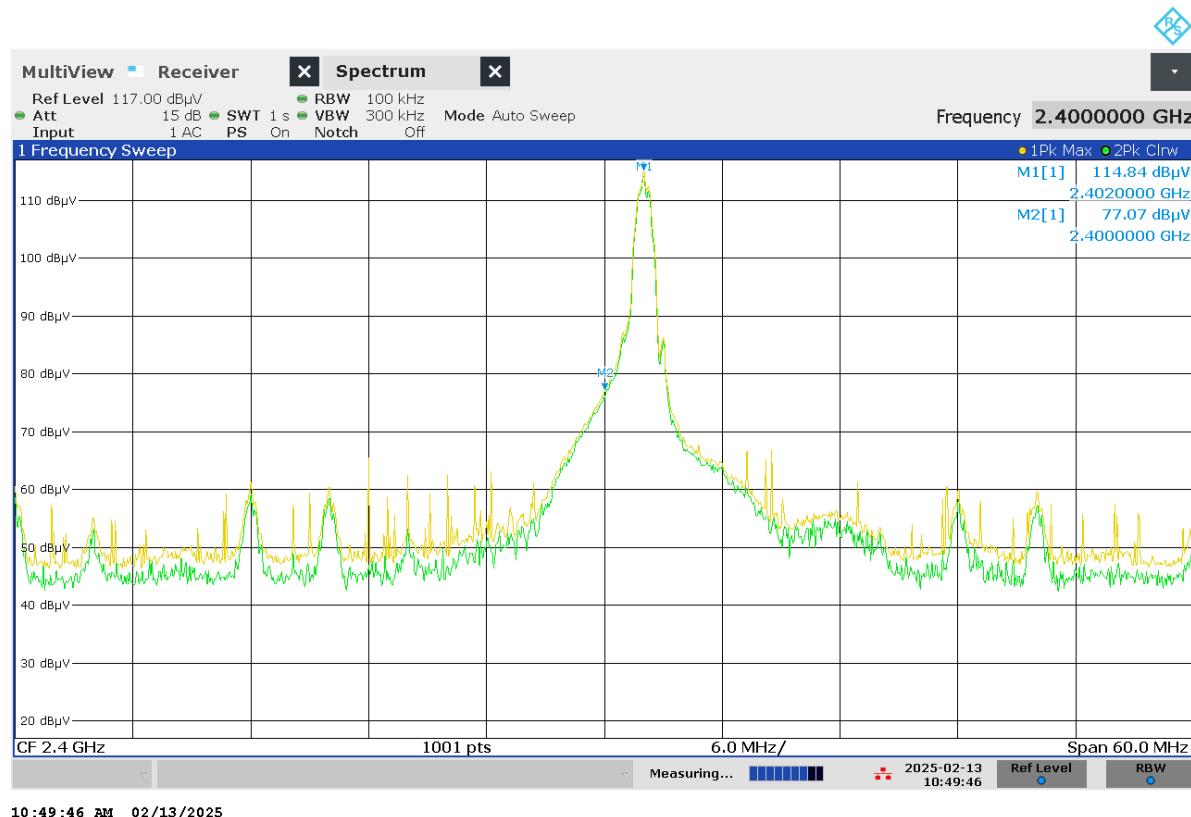


Figure 40 Band Edge Measurement – Lower band edge - Vertical polarity

Test Results – Puck Antenna**Tabular Data**

The following radiated measurements were made at the band edges:

Upper band edge

| Polarity | Frequency (MHz) | Amplitude (dBuV) | Preamp (dB) | Cable loss (dB) | AF(dB/m) | E (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|----------|-----------------|------------------|-------------|-----------------|----------|------------|----------------|-------------|
| H | 2483.5 | 71.4 | 54.3 | 3.8 | 30.6 | 51.5 | 74.0 | 22.5 |
| V | 2483.5 | 70.4 | 54.3 | 3.8 | 30.6 | 50.5 | 74.0 | 23.5 |

Table 16 Operation on Channel 2480MHz, Peak detector measurements

| Polarity | Frequency (MHz) | Amplitude (dBuV) | Preamp (dB) | Cable loss (dB) | AF(dB/m) | E (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|----------|-----------------|------------------|-------------|-----------------|----------|------------|----------------|-------------|
| H | 2483.5 | 44.7 | 54.3 | 3.8 | 30.6 | 24.8 | 54.0 | 29.2 |
| V | 2483.5 | 44.4 | 54.3 | 3.8 | 30.6 | 24.5 | 54.0 | 29.5 |

Table 17 Operation on Channel 2480MHz, Average detector measurements**Lower band edge**

| Polarity | Frequency (MHz) | Amplitude (dBuV) | Preamp (dB) | Cable loss (dB) | AF(dB/m) | E (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|----------|-----------------|------------------|-------------|-----------------|----------|------------|----------------|-------------|
| H | 2400 | 91.5 | 54.2 | 3.7 | 30.0 | 71.0 | 74.0 | 3.0 |
| V | 2400 | 88.6 | 54.2 | 3.7 | 30.0 | 68.1 | 74.0 | 5.9 |

Table 18 Operation on Channel 2402MHz Peak detector measurements

| Polarity | Frequency (MHz) | Amplitude (dBuV) | Preamp (dB) | Cable loss (dB) | AF(dB/m) | E (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|----------|-----------------|------------------|-------------|-----------------|----------|------------|----------------|-------------|
| H | 2400 | 56.5 | 54.2 | 3.7 | 30.0 | 36.0 | 54.0 | 18.0 |
| V | 2400 | 54.2 | 54.2 | 3.7 | 30.0 | 33.7 | 54.0 | 20.3 |

Table 19 Operation on Channel 2402MHz Average detector measurements

Spectrum analyser displays

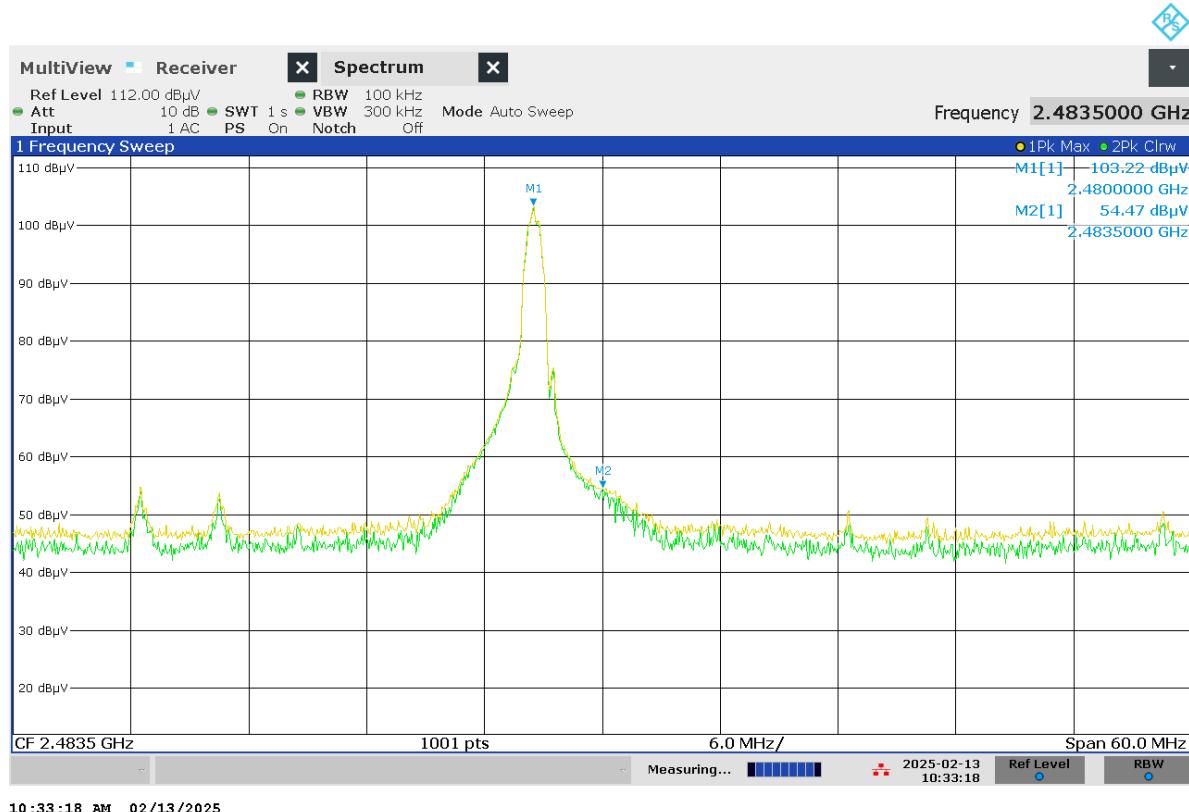


Figure 41 Band Edge Measurement – Upper band edge - Horizontal polarity

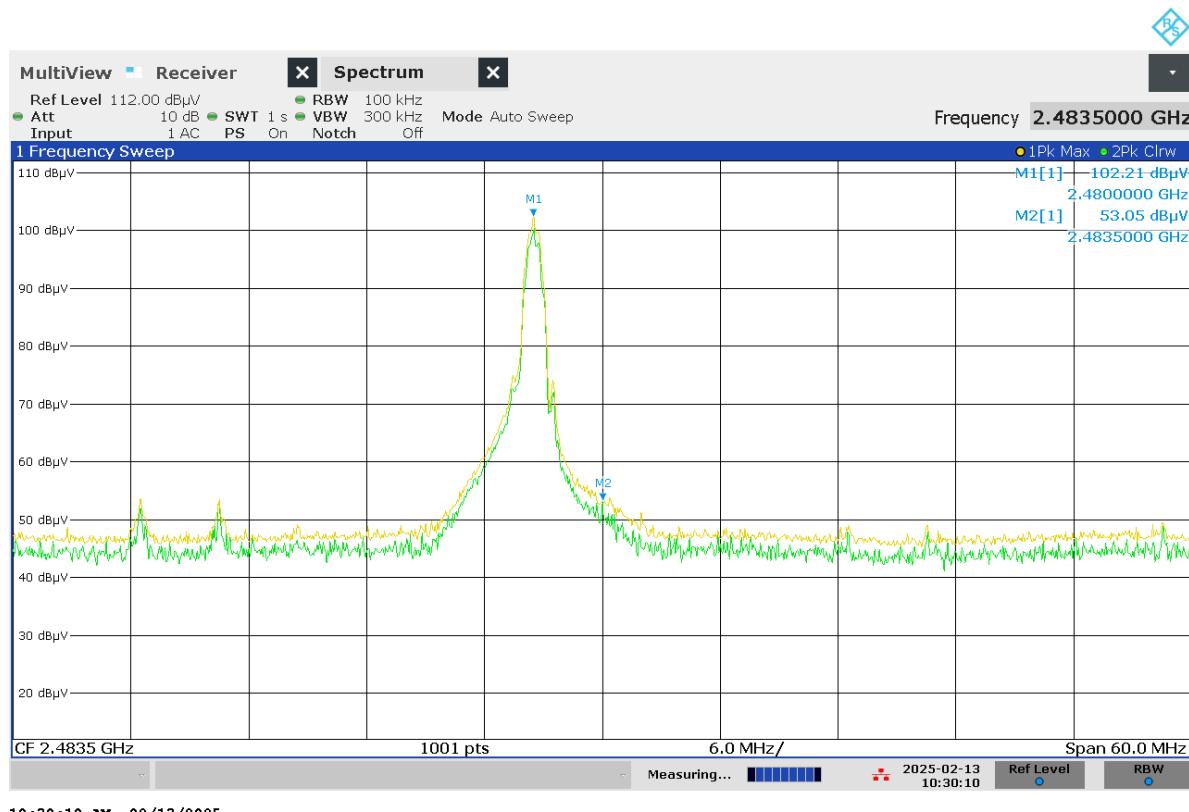


Figure 42 Band Edge Measurement – Upper band edge - Vertical polarity

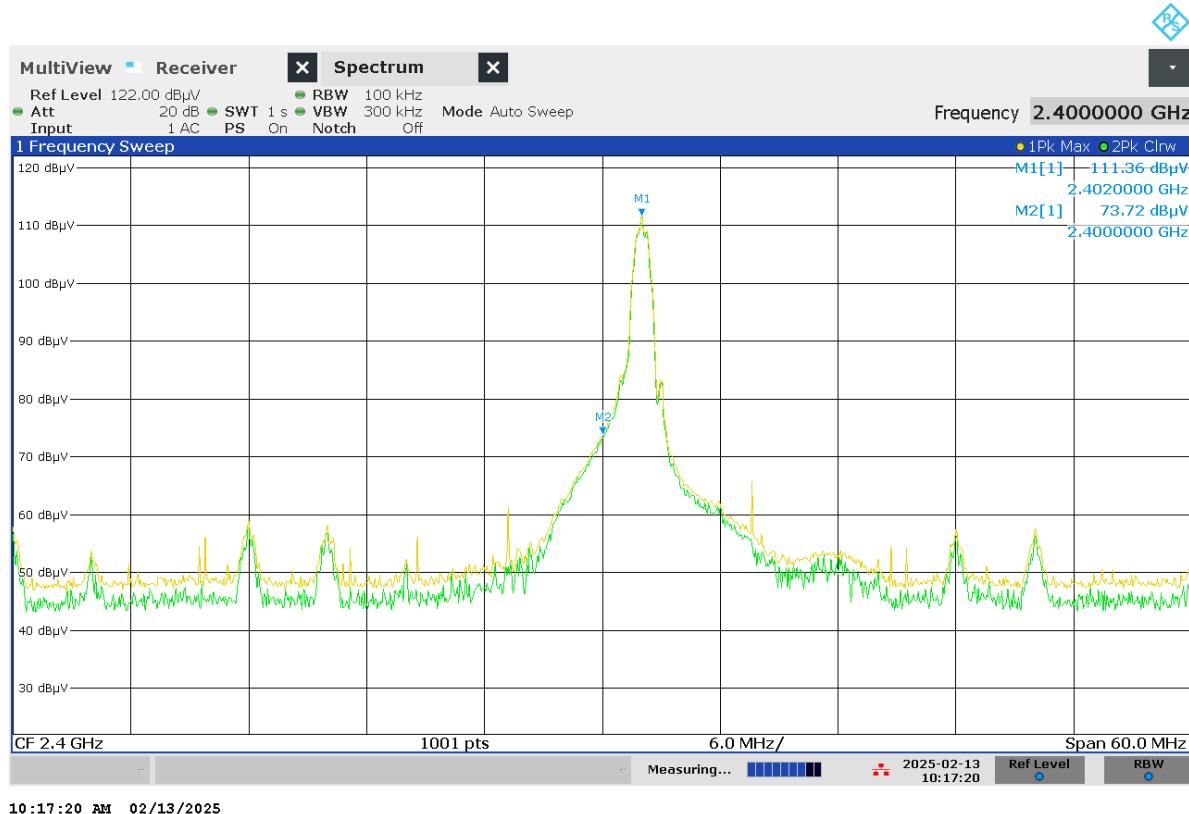


Figure 43 Band Edge Measurement – Lower band edge - Horizontal polarity

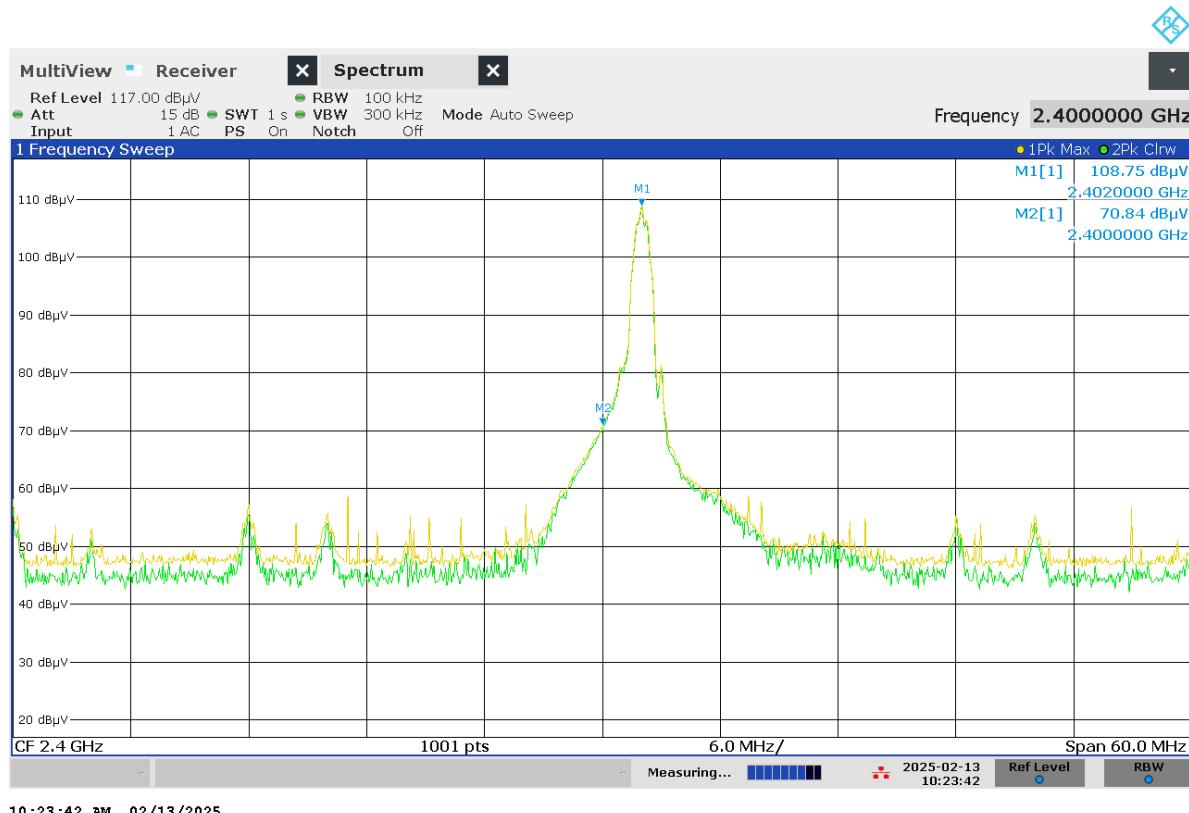


Figure 44 Band Edge Measurement – Lower band edge - Vertical polarity

Appendix A EUT Test Photos

Test set up photographs are supplied separately.

Appendix B Test Equipment List

Conducted Emissions from Antenna Port

| Item | Serial No. | Last Calibration Date | Calibration Interval |
|------------------------|------------|-----------------------------|----------------------|
| R&S ESW44 EMI Receiver | C0751 | 5 th August 2024 | 12 Months |

Radiated Emissions Equipment

| Item | Serial No. | Last Calibration Date | Calibration Interval |
|--|-----------------|---------------------------------|----------------------|
| Laboratory 1 Semi-Anechoic Chamber | C0471 | 6 th December 2022 | 36 Months |
| Lab 5 Fully-Anechoic Room | C0578 | 10 th July 2024 | 36 Months |
| ETS Lindgren 2017B Mast (1 – 4m) with tilting mechanism | -- | N/A | N/A |
| R&S ESW44 EMI Receiver | C0751 | 5 th August 2024 | 12 Months |
| R&S ESW44 EMI Receiver | C0658 | 30 th October 2023 | 18 Months |
| Teseq CBL6112D Bilog Antenna | C0506 | 22 nd August 2024 | 36 Months |
| HF27 Cable | 19149.03.13.004 | 3 rd October 2024 | 12 Months |
| HF29 Cable | 20147.01.09.001 | 3rd October 2024 | 12 Months |
| HF32 Cable | 19149.01.09.003 | 3rd October 2024 | 12 Months |
| HF35 Cable | 19149.02.13.003 | 3rd October 2024 | 12 Months |
| HF47 Cable | E44808 | 3rd October 2024 | 12 Months |
| Cable 24 | 20748.03.14.002 | 3rd October 2024 | 12 Months |
| Cable 25 | 20748.03.14.001 | 3rd October 2024 | 12 Months |
| Schwarzbeck STLP 9148 Antenna 1-18GHz | C0626 | 26 th March 2024 | 24 Months |
| 2.4GHz Microtronics BRM50702 notch filter | 79178 | 25 th October 2024 | 12 Months |
| 2.4GHz Microtronics BRM50702 notch filter | C0473 | 25th October 2024 | 12 Months |
| BONN BLMA 0118-M Preamplifier | C0702 | 1 st August 2024 | 12 Months |
| ETS Lingren 3116C-PA Horn Antenna 18-40GHz | C0433 | 29 th September 2022 | 36 Months |

-----END OF REPORT-----