

# TEST REPORT

**Test Report No. : UL-RPT-RP15051752-116A**

**Manufacturer** : Inxpect S.p.a  
**Model No.** : S203A  
**FCC ID** : 2ANOS-S203A  
**Test Standard(s)** : FCC Parts 15.207, 15.209, 15.215 & 15.255

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2. The results in this report apply only to the sample(s) tested.
3. The sample tested is in compliance with the above standard(s).
4. The test results in this report are traceable to the national or international standards.
5. Version 1.0.

**Date of Issue:** 30 January 2024

**Checked by:**



Sarah Williams  
RF Operations Leader, Radio Laboratory

**Company Signatory:**



Ben Mercer  
Lead Project Engineer, Radio Laboratory



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**1. Customer Information**










|                      |   |
|----------------------|---|
| <b>Company Name:</b> | Inxpect S.p.A                                   |
| <b>Address:</b>      | Via Serpente 91,<br>25131 Brescia (BS)<br>Italy |

## 2. Summary of Testing

### 2.1. General Information

|                                  |   |
|----------------------------------|---|
| <b>Specification Reference:</b>  | 47CFR15.255   |
| <b>Specification Title:</b>      | Code of Federal Regulations Volume 47 (Telecommunications):<br>Part 15 Subpart C (Radio Frequency Devices) – Section 15.255         |
| <b>Specification Reference:</b>  | 47CFR15.207 and 47CFR15.209   |
| <b>Specification Title:</b>      | Code of Federal Regulations Volume 47 (Telecommunications):<br>Part 15 Subpart C (Intentional Radiators) - Sections 15.207 & 15.209 |
| <b>Specification Reference:</b>  | 47CFR15.215   |
| <b>Specification Title:</b>      | Code of Federal Regulations Volume 47 (Telecommunications):<br>Part 15 Subpart C (Intentional Radiators) - Section 15.215           |
| <b>Site Registration:</b>        | 685609  |
| <b>FCC Lab. Designation No.:</b> | UK2011  |
| <b>Location of Testing:</b>      | Unit 3 Horizon, Wade Road, Kingsland Business Park, Basingstoke,<br>Hampshire, RG24 8AH, United Kingdom                             |
| <b>Test Dates:</b>               | 05 December 2023 to 23 January 2024   |

### 2.2. Summary of Test Results

| FCC Reference (47CFR)  | Measurement  | Result  |
|--|--|---|
| Part 15.255(c)(2)  | Transmitter Duty Cycle   |  |
| Part 15.255(c)(2)  | Transmitter EIRP   |  |
| Part 15.255(e)(1)  | Transmitter 6 dB Bandwidth   |  |
| Part 15.215(c)   | Transmitter 20 dB Bandwidth  |  |
| Part 15.255(d) /<br>15.209   | Transmitter Spurious Emissions                                       |  |
| Part 15.255(f)   | Transmitter Frequency Stability<br>(Temperature & Voltage Variation) |  |
| Part 15.207  | AC Conducted Emissions   |  |
| <b>Key to Results</b><br> = Complied  = Did not comply |  |   |

**2.3. Methods and Procedures**

|                   |  |
|-------------------|--|
| <b>Reference:</b> | ANSI C63.10-2013   |
| <b>Title:</b>     | American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices |
| <b>Reference:</b> | FCC KDB 174176 D01 Line Conducted FAQ v01r01 June 3, 2015                                      |
| <b>Title:</b>     | AC Power-Line Conducted Emissions Frequently Asked Questions                                   |

**2.4. Deviations from the Test Specification**

For the measurements contained within this test report, there were no deviations from, additions to, or exclusions from the test specification identified above.

### **3. Equipment Under Test (EUT)**

#### **3.1. Identification of Equipment Under Test (EUT)**

|                            |   |
|----------------------------|---|
| Brand Name:                | Inxpect   |
| Model Name or Number:      | S203A   |
| Test Sample Serial Number: | PR013 (Profile 2)   |
| Hardware Version:          | 1.0   |
| Software Version:          | N/A   |
| Firmware Version:          | RADAR 6.3.2.6 + RadioConfig.h v1.0 + RadioConfig-WW.h v1.0 + RadioConfig-S203A.h v1.0 |
| FCC ID:                    | 2ANOS-S203A   |
| Date of Receipt:           | 04 December 2023  |

|                            |   |
|----------------------------|---|
| Brand Name:                | Inxpect   |
| Model Name or Number:      | S203A   |
| Test Sample Serial Number: | PR020 (Profile 3)   |
| Hardware Version:          | 1.0   |
| Software Version:          | N/A   |
| Firmware Version:          | RADAR 6.3.2.6 + RadioConfig.h v1.0 + RadioConfig-WW.h v1.0 + RadioConfig-S203A.h v1.0 |
| FCC ID:                    | 2ANOS-S203A   |
| Date of Receipt:           | 04 December 2023  |

#### **3.2. Description of EUT**

The equipment under test was a 60GHz radar sensor using FMCW.

#### **3.3. Modifications Incorporated in the EUT**

No modifications were applied to the EUT during testing.

#### **3.4. Additional Information Related to Testing**

|                           |                      |                         |
|---------------------------|----------------------|-------------------------|
| Category of Equipment:    | Transceiver          |                         |
| Modulation Type:          | FMCW                 |                         |
| Power Supply Requirement: | Nominal              | 12 VDC                  |
| Antenna Type:             | Integrated Patch     |                         |
| Antenna Gain:             | 11.0 dBi             |                         |
| Transmit Frequency Range: | 61.2 GHz to 63.4 GHz |                         |
| Transmit Channels Tested: | Channel ID           | Channel Frequency (GHz) |
|                           | Single               | 62.3                    |

### **3.5. Support Equipment**

The following support equipment was used to exercise the EUT during testing:

|                              |                          |
|------------------------------|--------------------------|
| <b>Description:</b>          | Control Unit (Profile 2) |
| <b>Brand Name:</b>           | Inxpect                  |
| <b>Model Name or Number:</b> | ISC-B01                  |
| <b>Serial Number:</b>        | ZZ055                    |

|                              |                          |
|------------------------------|--------------------------|
| <b>Description:</b>          | Control Unit (Profile 3) |
| <b>Brand Name:</b>           | Inxpect                  |
| <b>Model Name or Number:</b> | C201B                    |
| <b>Serial Number:</b>        | ZZ999                    |

|                              |                         |
|------------------------------|-------------------------|
| <b>Description:</b>          | CAN Cable. Length 10 m. |
| <b>Brand Name:</b>           | Not marked or stated    |
| <b>Model Name or Number:</b> | Not marked or stated    |
| <b>Serial Number:</b>        | Not marked or stated    |

|                              |                      |
|------------------------------|----------------------|
| <b>Description:</b>          | CAN Termination      |
| <b>Brand Name:</b>           | Not marked or stated |
| <b>Model Name or Number:</b> | Not marked or stated |
| <b>Serial Number:</b>        | Not marked or stated |



## **4. Operation and Monitoring of the EUT during Testing**

### **4.1. Operating Modes**

- Transmit Mode: transmitting at maximum power with a FMCW modulated signal.

### **4.2. Configuration and Peripherals**

The EUT was tested in the following configuration(s):

- Transmit tests: The EUT powered up in transmit mode. No configuration was required.
- The EUT was connected to either an ISC-B01 or C201B control unit via a 10m CAN cable. The control units supplied 12 VDC to the EUT via the CAN cable. The control units were powered by a 24 VDC bench DC power supply. The DC power supply was connected to a 120 VAC 60 Hz single phase main supply.
- Transmitter radiated spurious emission tests were performed with the EUT in the position/orientation that produced the worst case with respect to emissions. The unused CAN port was fitted with a CAN termination.

## **5. Measurements, Examinations and Derived Results**

### **5.1. General Comments**

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%. Please refer to *Section 6: Measurement Uncertainties* for details.

In accordance with UKAS requirements all the measurement equipment is on a calibration schedule. All equipment was within the calibration period on the date of testing.

## 5.2. Test Results

### 5.2.1 Transmitter Duty Cycle

#### Test Summary:

|                             |                             |            |                 |
|-----------------------------|-----------------------------|------------|-----------------|
| Test Engineers:             | Shamraiz Ashiq & Ben Mercer | Test Date: | 17 January 2024 |
| Test Sample Serial Numbers: | PR013 & PR020               |            |                 |

|                   |   |
|-------------------|---|
| FCC Reference:    | Part 15.255(c)(2)(iii)                  |
| Test Method Used: | ANSI C63.10 Section 7.5 and notes below |

#### Environmental Conditions:

|                        |    |
|------------------------|----|
| Temperature (°C):      | 24 |
| Relative Humidity (%): | 21 |

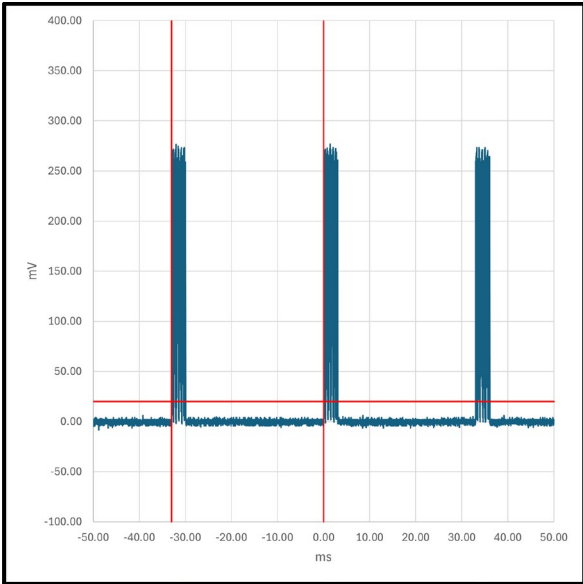
#### Note(s):

- Transmitter duty cycle was measured using an RF detector connected to a digital storage oscilloscope. The raw data was captured and analysed to calculate the duty cycle.  
*On Time / [Period or 100 ms whichever is the lesser].*  
*Profile 2 duty cycle: 3.07 ms / 33.00 ms = 0.0930*  
*Profile 3 duty cycle: 4.74 ms / 16.00 ms = 0.2944*
- Transmitter off times exceeding 2 ms were summed over a rolling 33 ms period. The minimum combined off time in any 33 ms period was recorded below.

Transmitter Duty Cycle (continued)

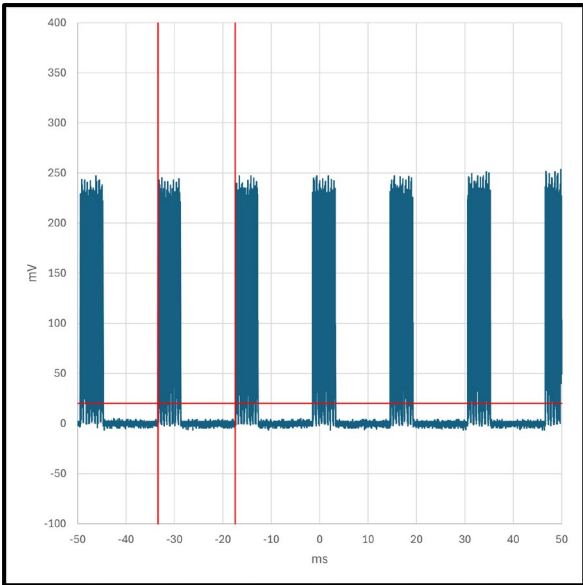
Results: Profile 2

| Tx On Duration (ms) | Period (ms) | Duty Cycle (%) | Minimum Tx Off Duration (ms) | Tx Off Limit (ms) | Result   |
|---------------------|-------------|----------------|------------------------------|-------------------|----------|
| 3.07                | 33.00       | 9.30           | 29.93                        | >25.5             | Complied |



Results: Profile 3

| Tx On Duration (ms) | Period (ms) | Duty Cycle (%) | Minimum Tx Off Duration (ms) | Tx Off Limit (ms) | Result   |
|---------------------|-------------|----------------|------------------------------|-------------------|----------|
| 4.71                | 16.00       | 29.44          | 22.58                        | >16.5             | Complied |



5.2.2. Transmitter Peak EIRP

Test Summary:

|                             |                             |            |                 |
|-----------------------------|-----------------------------|------------|-----------------|
| Test Engineers:             | Shamraiz Ashiq & Ben Mercer | Test Date: | 23 January 2024 |
| Test Sample Serial Numbers: | PR013 & PR020               |            |                 |

|                   |                          |
|-------------------|--------------------------|
| FCC Reference:    | Part 15.255(c)(2)(iii)   |
| Test Method Used: | ANSI C63.10 Section 9.11 |

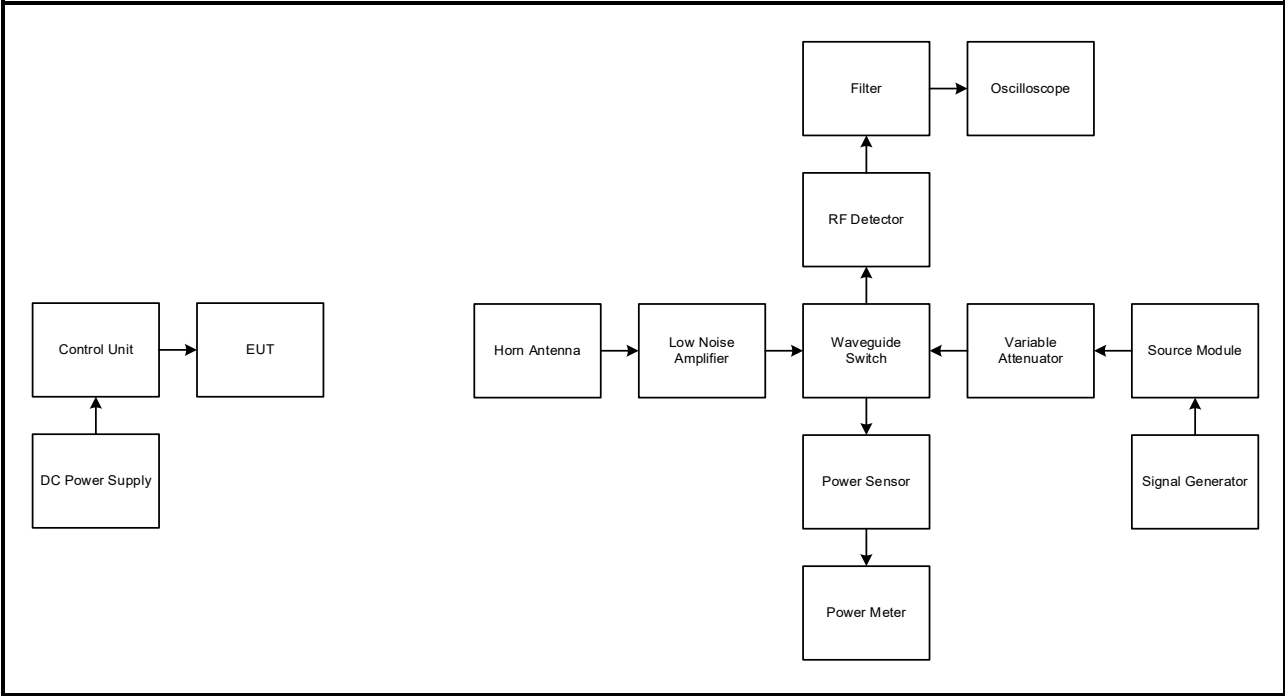
Environmental Conditions:

|                        |    |
|------------------------|----|
| Temperature (°C):      | 19 |
| Relative Humidity (%): | 46 |

Note(s):

1. The measurement antenna was connected to an RF detector via a low noise amplifier and 4-way waveguide switch. A CW signal generator and wideband thermocouple power sensor were connected to the remaining two ports.
2. The RF detector was connected to the 50 Ω input of a digital storage oscilloscope via a 10 MHz low pass filter.
3. The EUT peak voltage was measured on the oscilloscope. The waveguide switch was then rotated to connect the signal generator to the RF detector, and the signal generator output was adjusted to match the previously measured voltage. The waveguide switch was then rotated to connect the signal generator output to the thermocouple power sensor, and the signal generator output power was measured.
4. The substituted level recorded below includes the calibrated path loss of the waveguide switch.

Test setup:



**Transmitter Peak EIRP (continued)****Results: Profile 2**

| Frequency (GHz) | Level (V) | Substituted EIRP Level (dBm) | Limit (dBm) | Margin (dB) | Result   |
|-----------------|-----------|------------------------------|-------------|-------------|----------|
| 62.300          | 2.8       | 13.1                         | 14.0        | 0.9         | Complied |

**Results: Profile 3**

| Frequency (GHz) | Level (V) | Substituted EIRP Level (dBm) | Limit (dBm) | Margin (dB) | Result   |
|-----------------|-----------|------------------------------|-------------|-------------|----------|
| 62.300          | 5.7       | 19.9                         | 20.0        | 0.1         | Complied |

**Test Equipment Used:**

| Asset No. | Instrument       | Manufacturer       | Type No.               | Serial No.    | Date Calibration Due  | Cal. Interval (Months) |
|-----------|------------------|--------------------|------------------------|---------------|-----------------------|------------------------|
| K0010     | 3m RSE chamber   | Rainford Solutions | N/A                    | N/A           | 11 Oct 2024           | 12                     |
| M2041     | Thermohygrometer | Testo              | 608-H1                 | 45119912      | 27 Dec 2024           | 12                     |
| A3236     | Amplifier        | Sage Millimeter    | SBL-5037533550-1515-E1 | 18199-01      | Calibrated before Use | -                      |
| A2964     | Horn Antenna     | Link Microtek      | AM15HA-ULV1            | 14930         | 24 Jun 2025           | 36                     |
| G0640     | Signal Generator | Keysight           | E8257D                 | US000000055   | 10 Jan 2025           | 24                     |
| M2070     | Oscilloscope     | Keysight           | DSOX2024A              | MY59125508    | 22 Feb 2024           | 24                     |
| M281      | Power Meter      | Hewlett Packard    | E4418A                 | GB37170210-01 | 18 May 2024           | 12                     |
| M291      | Power Sensor     | Hewlett Packard    | V8486A                 | US39010039    | 01 Feb 2025           | 24                     |
| M1255     | Source Module    | Hewlett Packard    | 83557A                 | 2948A00169    | Calibrated before use | -                      |
| A3252     | Low Pass Filter  | Mini-Circuits      | BLP-10.7+              | YUU54901833   | Calibrated before use | -                      |
| A3232     | Attenuator       | Sage Millimeter    | STA-30-15-M2           | 18199-01      | Calibrated before use | -                      |
| A3233     | RF Detector      | Sage Millimeter    | SFD-503753-15SF-P1     | 18199-01      | Calibrated before use | -                      |

5.2.3. Transmitter 6 dB Bandwidth

Test Summary:

|                             |                             |             |                                     |
|-----------------------------|-----------------------------|-------------|-------------------------------------|
| Test Engineers:             | Shamraiz Ashiq & Ben Mercer | Test Dates: | 05 December 2023 to 22 January 2024 |
| Test Sample Serial Numbers: | PR013 & PR020               |             |                                     |

|                   |                         |
|-------------------|-------------------------|
| FCC Reference:    | Part 15.255(e)(1)       |
| Test Method Used: | ANSI C63.10 Section 9.3 |

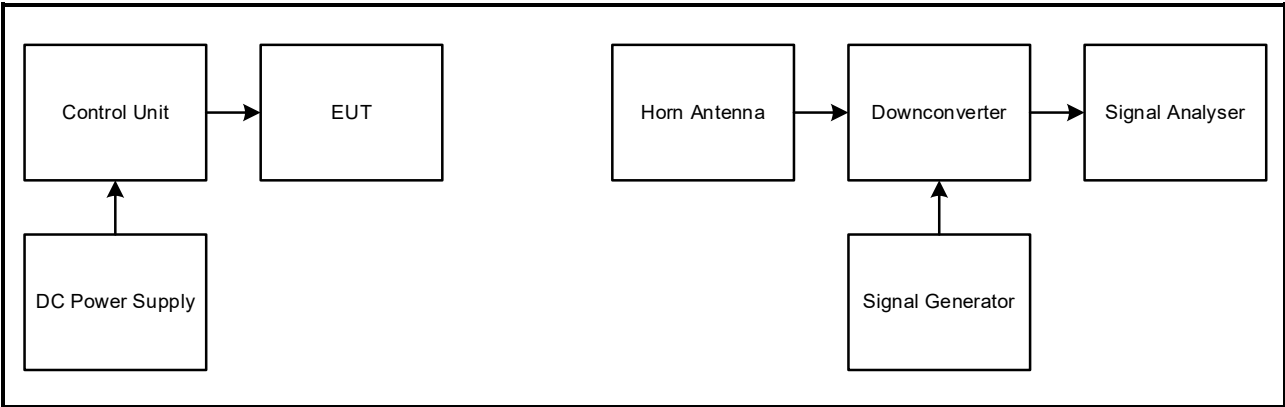
Environmental Conditions:

|                        |          |
|------------------------|----------|
| Temperature (°C):      | 18 to 21 |
| Relative Humidity (%): | 45 to 50 |

Note(s):

1. The analyser span was set to between two and three times the emission bandwidth. The RBW was set to 100 kHz, and the VBW was set to three times the RBW. The marker delta function was used to measure 6 dB down from the peak on both sides of the emission. The resulting frequency delta between the two markers was recorded as the emission bandwidth.

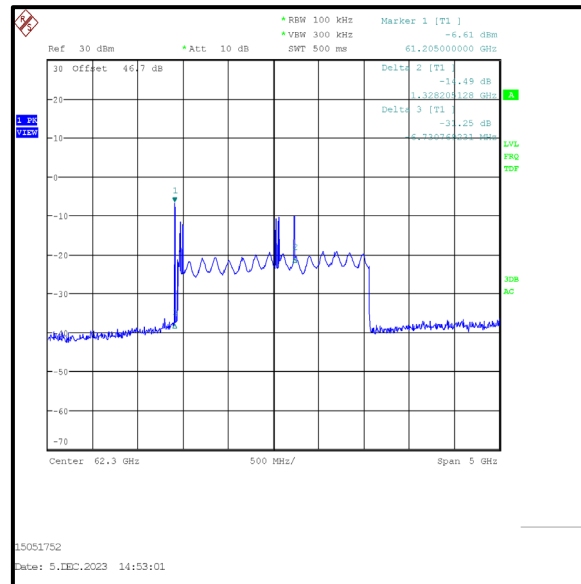
Test setup:



### Transmitter 6 dB Bandwidth (continued)

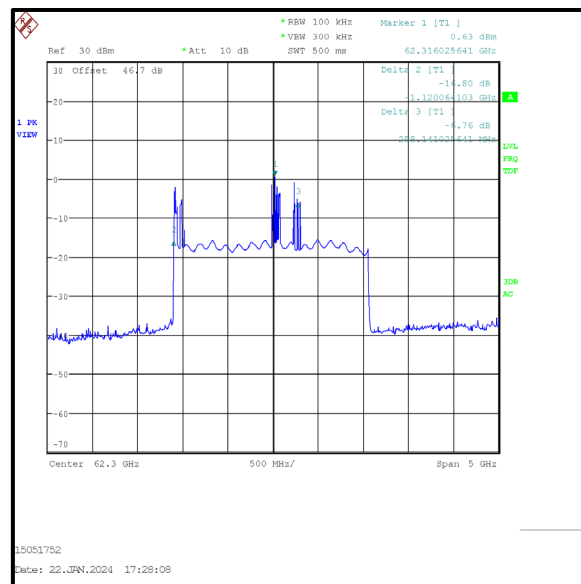
## Results: Profile 2

| Channel | RBW (kHz) | VBW (kHz) | Emission Bandwidth (MHz) |
|---------|-----------|-----------|--------------------------|
| Single  | 100       | 300       | 1334.936                 |



### Results: Profile 3

| Channel | RBW (kHz) | VBW (kHz) | Emission Bandwidth (MHz) |
|---------|-----------|-----------|--------------------------|
| Single  | 100       | 300       | 1378.205                 |



### Single Channel



**Transmitter 6 dB Bandwidth (continued)**

**Test Equipment Used:**

| Asset No. | Instrument       | Manufacturer       | Type No.    | Serial No. | Date Calibration Due | Cal. Interval (Months) |
|-----------|------------------|--------------------|-------------|------------|----------------------|------------------------|
| K0010     | 3m RSE chamber   | Rainford Solutions | N/A         | N/A        | 11 Oct 2024          | 12                     |
| M2041     | Thermohygrometer | Testo              | 608-H1      | 45119912   | 27 Dec 2024          | 12                     |
| G0640     | Signal Generator | Keysight           | E8257D      | US00000055 | 10 Jan 2025          | 24                     |
| M2069     | Downconverter    | Virginia Diodes    | WR15.0 SAX  | SAX 394    | 16 Oct 2025          | 24                     |
| A2964     | Horn Antenna     | Link Microtek      | AM15HA-ULV1 | 14930      | 24 Jun 2025          | 36                     |
| M1886     | Test Receiver    | Rohde & Schwarz    | ESU26       | 100554     | 02 Aug 2024          | 12                     |

5.2.4 Transmitter 20 dB Bandwidth

Test Summary:

|                             |                             |            |                  |
|-----------------------------|-----------------------------|------------|------------------|
| Test Engineers:             | Shamraiz Ashiq & Ben Mercer | Test Date: | 05 December 2023 |
| Test Sample Serial Numbers: | PR013 & PR020               |            |                  |

|                   |                           |
|-------------------|---------------------------|
| FCC Reference:    | Part 15.215(c)            |
| Test Method Used: | ANSI C63.10 Section 6.9.2 |

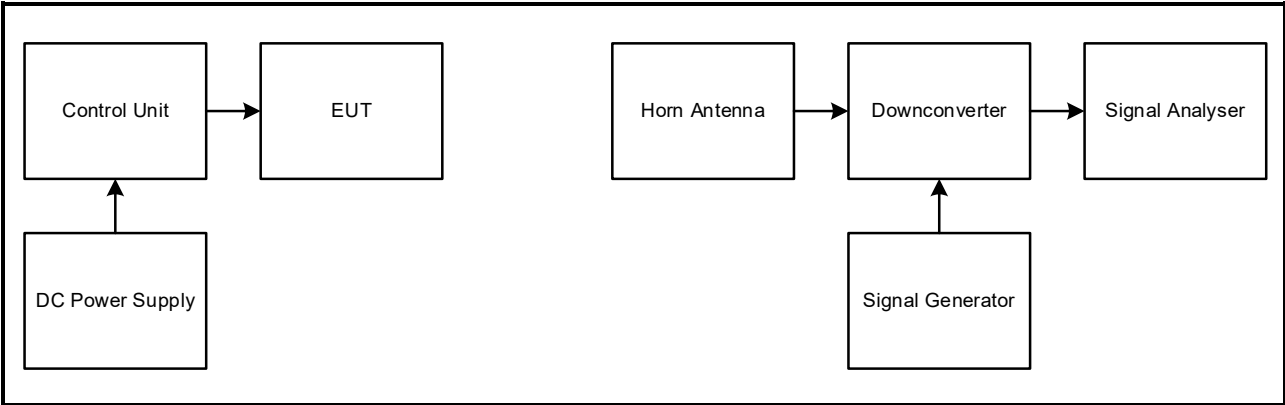
Environmental Conditions:

|                        |    |
|------------------------|----|
| Temperature (°C):      | 18 |
| Relative Humidity (%): | 50 |

Note(s):

- Due to instrument limitations, it was not possible to set the RBW in the range 1% to 5% of OBW as required by ANSI C63.10 Section 6.9.2. An enquiry was submitted to the FCC OET and it was deemed acceptable to use a minimum RBW of 1 MHz.
- The signal analyser resolution bandwidth was set to 1 MHz and the video bandwidth to 3 MHz. A peak detector was used, sweep time was set to auto and the trace mode was Max Hold. The span was set to 5 GHz. The marker delta function was used to measure 20 dB down from the peak on both sides of the emission. The resulting frequency delta between the two markers was recorded as the 20 dB bandwidth.

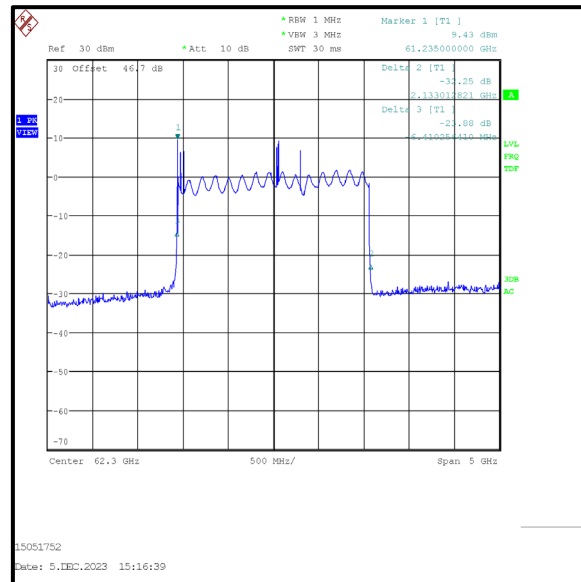
Test setup:



### Transmitter 20 dB Bandwidth (continued)

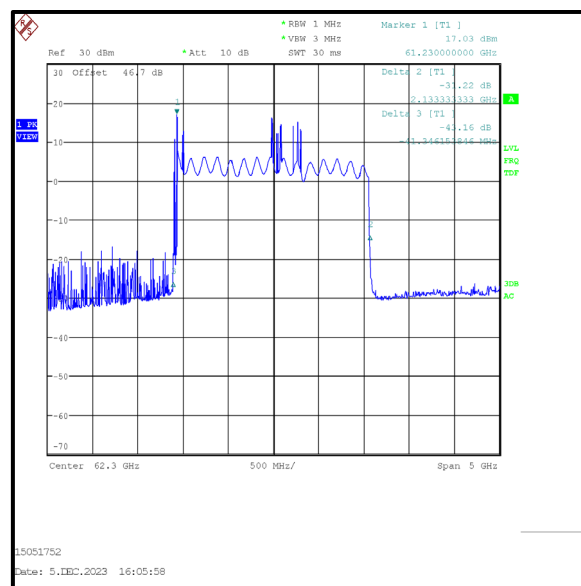
## Results: Profile 2

| Channel | 20 dB Bandwidth (MHz) |
|---------|-----------------------|
| Single  | 2139.423              |



### Results: Profile 3

| Channel | 20 dB Bandwidth (MHz) |
|---------|-----------------------|
| Single  | 2174.679              |



**Transmitter 20 dB Bandwidth (continued)**

**Test Equipment Used**

| Asset No. | Instrument       | Manufacturer       | Type No.    | Serial No. | Date Calibration Due | Cal. Interval (Months) |
|-----------|------------------|--------------------|-------------|------------|----------------------|------------------------|
| K0010     | 3m RSE chamber   | Rainford Solutions | N/A         | N/A        | 11 Oct 2024          | 12                     |
| M2041     | Thermohygrometer | Testo              | 608-H1      | 45119912   | 27 Dec 2024          | 12                     |
| G0640     | Signal Generator | Keysight           | E8257D      | US00000055 | 10 Jan 2025          | 24                     |
| M2069     | Downconverter    | Virginia Diodes    | WR15.0 SAX  | SAX 394    | 16 Oct 2025          | 24                     |
| A2964     | Horn Antenna     | Link Microtek      | AM15HA-ULV1 | 14930      | 24 Jun 2025          | 36                     |
| M1886     | Test Receiver    | Rohde & Schwarz    | ESU26       | 100554     | 02 Aug 2024          | 12                     |

### 5.2.5. Transmitter Radiated Spurious Emissions

#### Test Summary:

|                                    |   |                    |  |
|------------------------------------|---|--------------------|--|
| <b>Test Engineers:</b>             | Shamraiz Ashiq,<br>Ben Mercer &<br>Andrew Edwards | <b>Test Dates:</b> | 18 December 2023 to<br>04 January 2024 |
| <b>Test Sample Serial Numbers:</b> | PR013 & PR020                                     |                    |  |

|                          |                                       |
|--------------------------|---------------------------------------|
| <b>FCC Reference:</b>    | Part 15.255(d) / 15.209               |
| <b>Test Method Used:</b> | ANSI C63.10 Sections 6.3, 6.4 and 6.5 |
| <b>Frequency Range</b>   | 9 kHz to 1000 MHz                     |

#### Environmental Conditions:

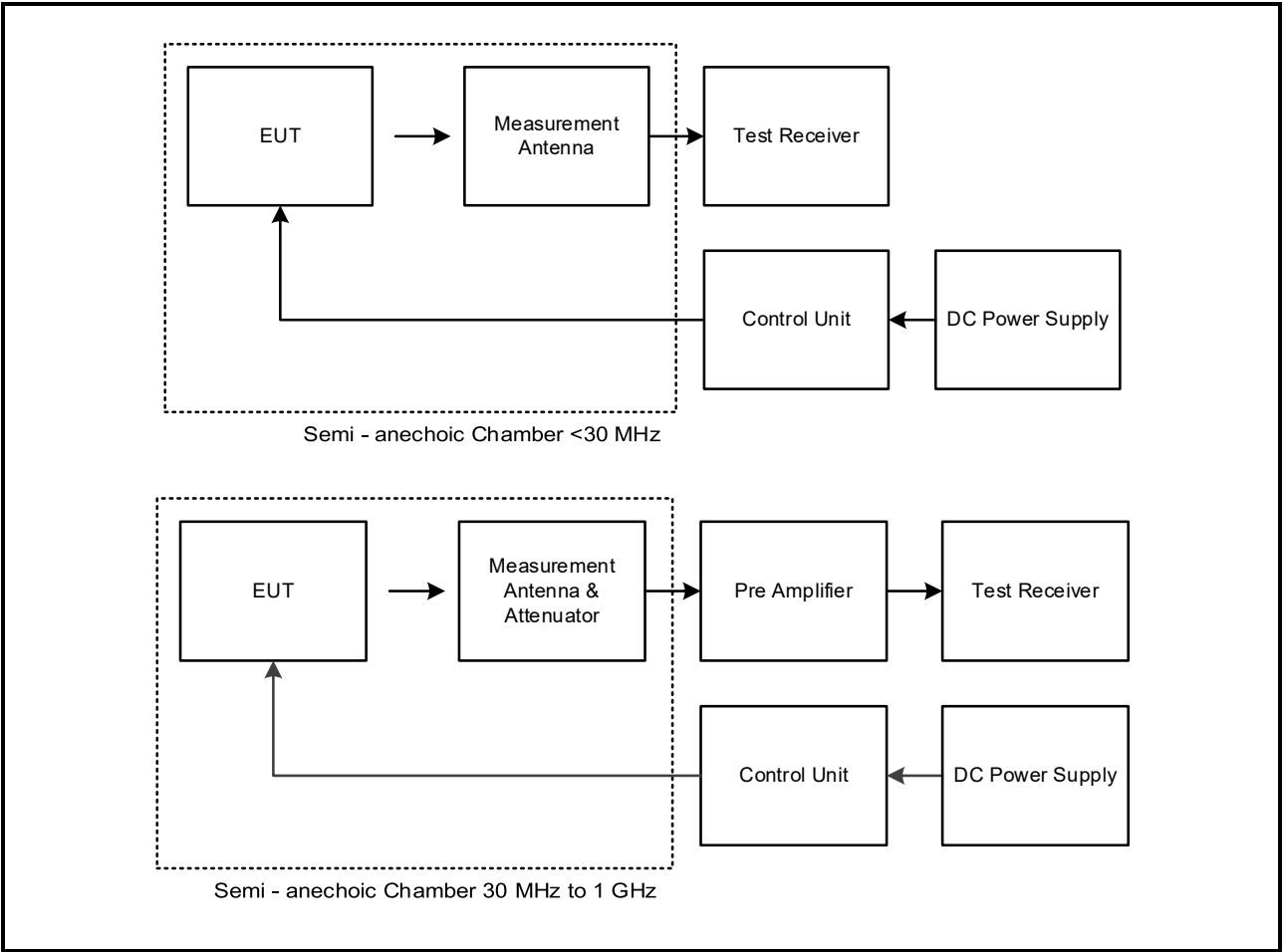
|                               |          |
|-------------------------------|----------|
| <b>Temperature (°C):</b>      | 17 to 20 |
| <b>Relative Humidity (%):</b> | 44 to 52 |

#### Note(s):

1. The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.
2. All other emissions shown on the pre-scan plot were investigated and found to be ambient, >20 dB below the applicable limit or below the measurement system noise floor.
3. Measurements below 30 MHz were performed in a semi-anechoic chamber (Asset Number K0001) at 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. The limit was extrapolated to 3 metres in accordance with ANSI C63.10 clause 6.4.3 using the method described in clause 6.4.4.2. ANSI C63.10 clause 5.2 states an alternative test site that can demonstrate equivalence to an open area test site may be used for measurements below 30 MHz. Therefore, measurements were performed in a semi-anechoic chamber. The correlation data between semi-anechoic chamber and an open field test site is available upon request.
4. Measurements from 30 MHz to 1 GHz were performed in a semi-anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
5. Pre-scans were performed and markers placed on the highest measured levels. The test receiver was configured as follows: For 9 kHz to 150 kHz, the resolution bandwidth was set to 300 Hz and video bandwidth 1 kHz. A peak detector was used and trace mode was Max Hold. For 150 kHz to 30 MHz, the resolution bandwidth was set to 10 kHz and video bandwidth 30 kHz, trace mode was Max Hold. For 30 MHz to 1 GHz, the resolution bandwidth was set to 120 kHz and video bandwidth 500 kHz. A peak detector was used, sweep time was set to auto and trace mode was Max Hold.

**Transmitter Radiated Spurious Emissions (continued)**

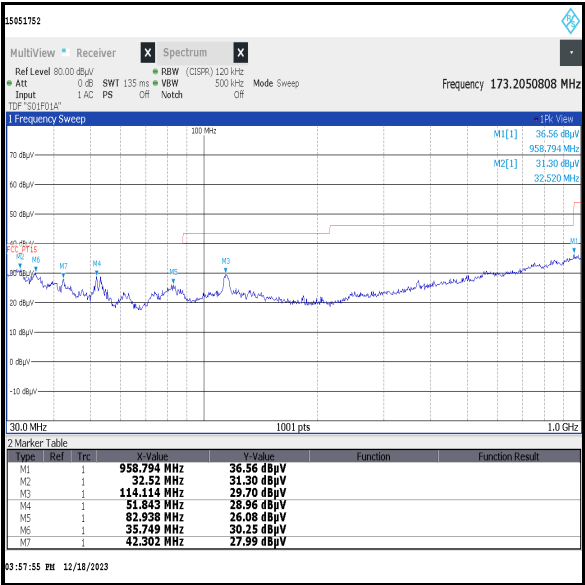
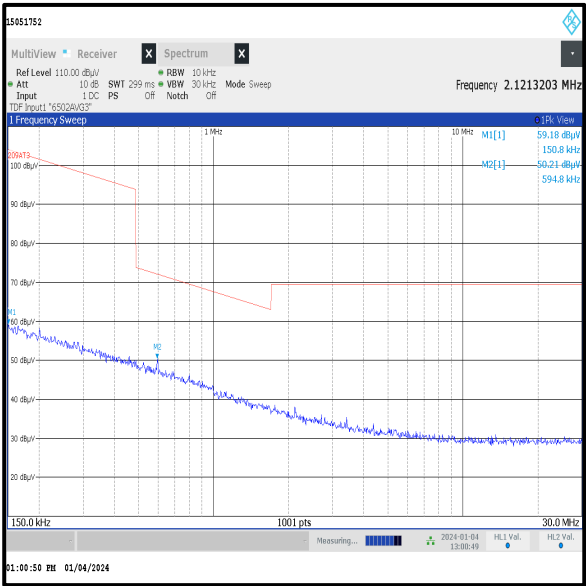
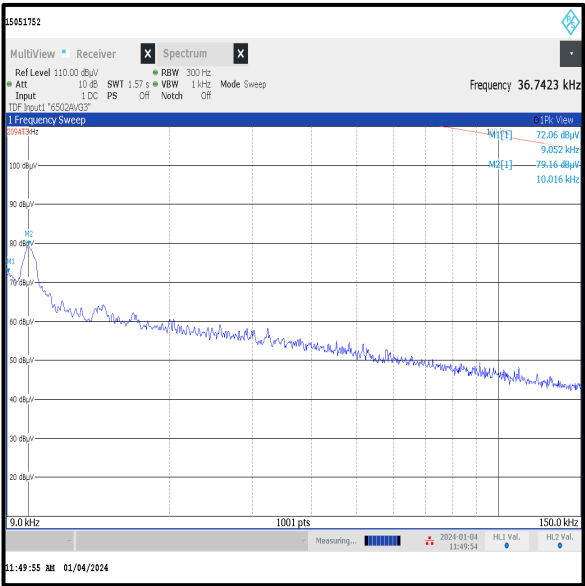
**Test setup:**



Transmitter Radiated Spurious Emissions (continued)

Results: Profile 2

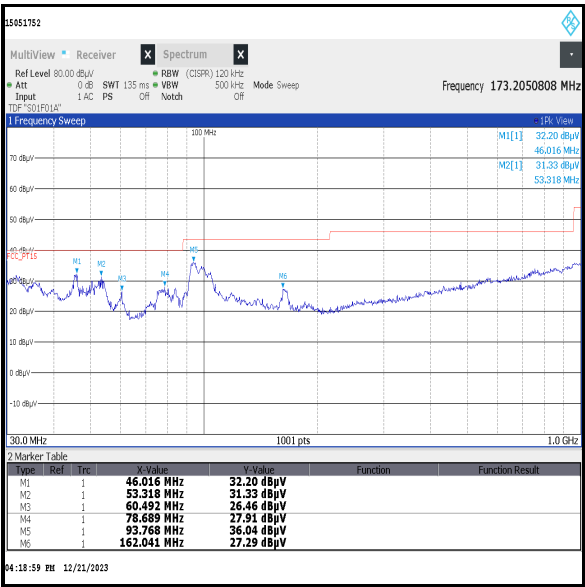
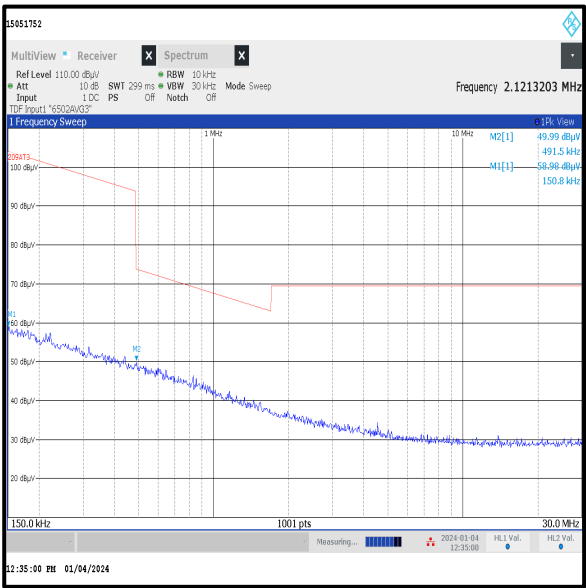
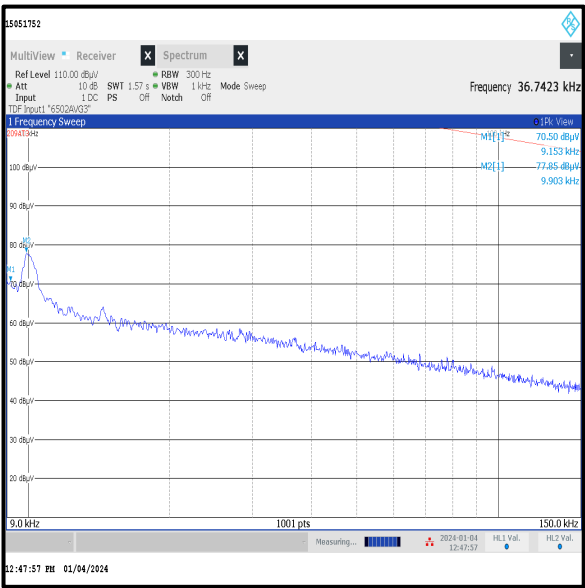
| Frequency (MHz) | Antenna Polarity | Quasi-Peak Level (dBμV/m) | Quasi-Peak Limit (dBμV/m) | Margin (dB) | Result   |
|-----------------|------------------|---------------------------|---------------------------|-------------|----------|
| 37.766          | Vertical         | 26.9                      | 40.0                      | 13.1        | Complied |
| 51.943          | Vertical         | 27.8                      | 40.0                      | 12.2        | Complied |
| 82.124          | Vertical         | 24.6                      | 40.0                      | 15.4        | Complied |
| 114.214         | Vertical         | 26.9                      | 43.5                      | 16.6        | Complied |



Transmitter Radiated Spurious Emissions (continued)

Results: Profile 3

| Frequency (MHz) | Antenna Polarity | Quasi-Peak Level (dBμV/m) | Quasi-Peak Limit (dBμV/m) | Margin (dB) | Result   |
|-----------------|------------------|---------------------------|---------------------------|-------------|----------|
| 45.706          | Vertical         | 30.3                      | 40.0                      | 9.7         | Complied |
| 52.530          | Vertical         | 29.2                      | 40.0                      | 10.8        | Complied |
| 80.010          | Vertical         | 31.4                      | 40.0                      | 8.6         | Complied |
| 93.418          | Vertical         | 35.3                      | 43.5                      | 8.2         | Complied |
| 162.041         | Vertical         | 23.2                      | 43.5                      | 20.3        | Complied |





**Transmitter Radiated Spurious Emissions (continued)****Test Summary:**

|                                    |                             |                    |                                      |
|------------------------------------|-----------------------------|--------------------|--------------------------------------|
| <b>Test Engineers:</b>             | Shamraiz Ashiq & Ben Mercer | <b>Test Dates:</b> | 11 December 2023 to 20 December 2023 |
| <b>Test Sample Serial Numbers:</b> | PR013 & PR020               |                    |                                      |

|                          |  |
|--------------------------|--|
| <b>FCC Reference:</b>    | Part 15.255(d) / 15.209                              |
| <b>Test Method Used:</b> | ANSI C63.10 Sections 6.3, 6.6, 9.8, 9.9, 9.12 & 9.13 |
| <b>Frequency Range:</b>  | 1 GHz to 200 GHz                                     |

**Environmental Conditions:**

|                               |          |
|-------------------------------|----------|
| <b>Temperature (°C):</b>      | 17 to 20 |
| <b>Relative Humidity (%):</b> | 45 to 52 |

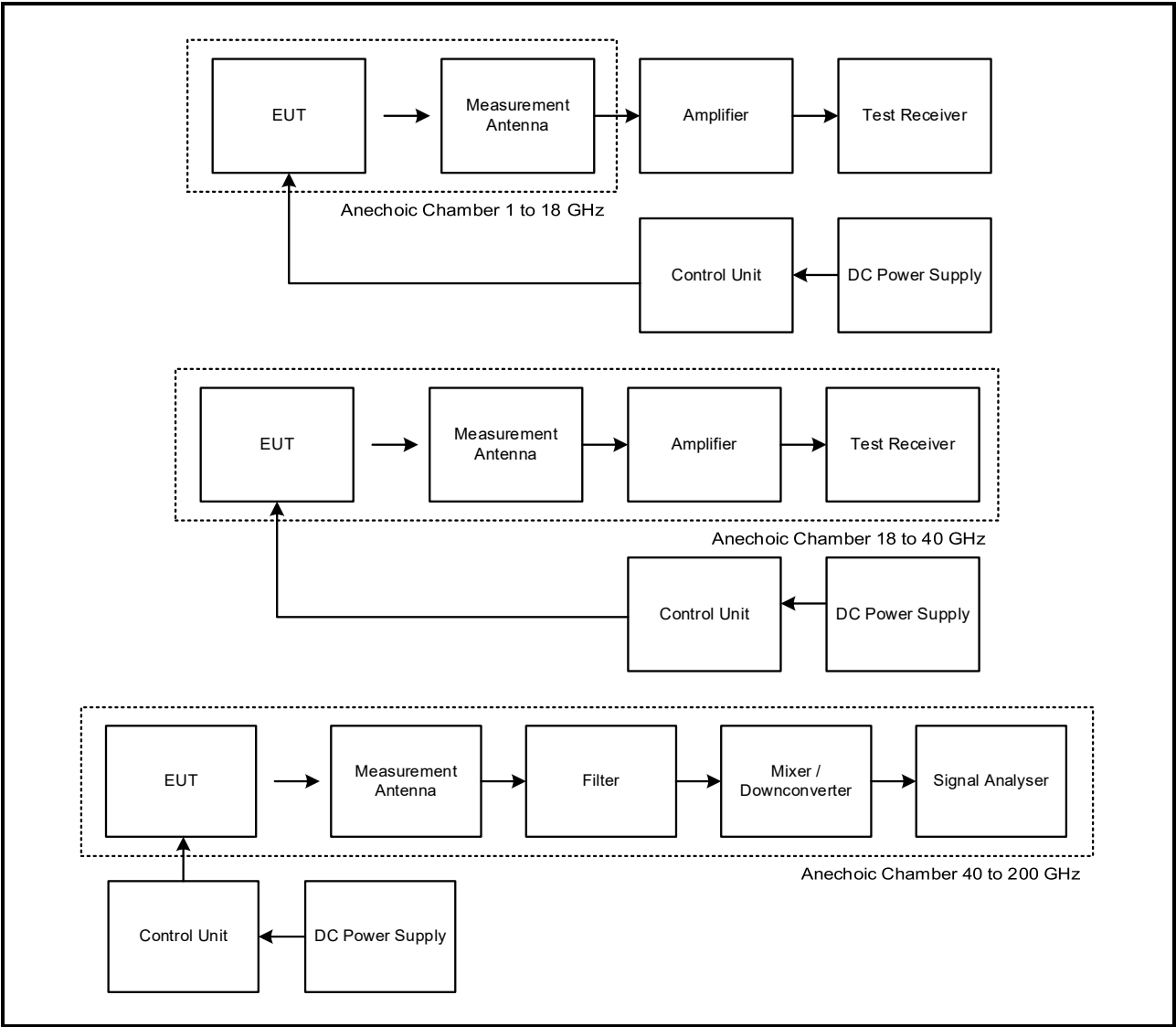
**Note(s):**

1. The final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
2. The emission at approximately 62.3 GHz is the EUT fundamental.
3. All other emissions were >20 dB below the applicable limit, below the noise floor of the measurement system, or mixing products.
4. Measurements from 1 GHz to 18 GHz were performed in a semi-anechoic chamber (Asset Number K226202) at 3 metres. The EUT was placed at a height of 1.5 m above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
5. Measurements from 18 GHz to 40 GHz were performed in a semi-anechoic chamber (Asset Number K226202) at 1 metre. The EUT was placed at a height of 1.5 m above the reference ground plane in the centre of the chamber turntable
6. Part 15.255(d)(3) defines a power density limit of 90 pW/cm<sup>2</sup> at 3 metres for spurious emissions between 40 GHz and 200 GHz. This was converted to a field strength limit of 85.31 dBuV/m using the equations provided in section 9.6 of ANSI C63.10.
7. Measurements distances above 40 GHz were determined using the procedure defined in section 9.8 of ANSI C63.10. Measurements were made at the following distances:  

40 GHz to 200 GHz – 1 metre
8. Where measurements were performed at a distance other than that specified by the limit, a correction factor was calculated using the equation provided in section 9.4 of ANSI C63.10. This correction factor was included in the transducer factor entered on the signal analyser.
9. \*In accordance with ANSI C63.10 Section 6.6.4.3 Note 1, if the maximized peak measured value complies with the average limit, then it is unnecessary to perform an average measurement.

**Transmitter Radiated Spurious Emissions (continued)**

**Test setup:**

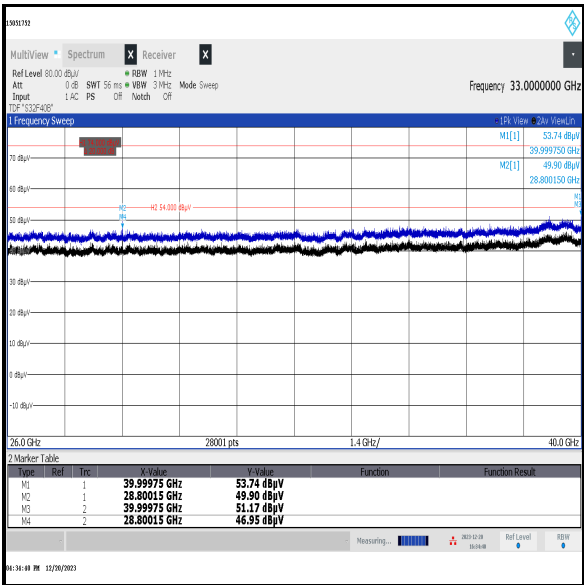
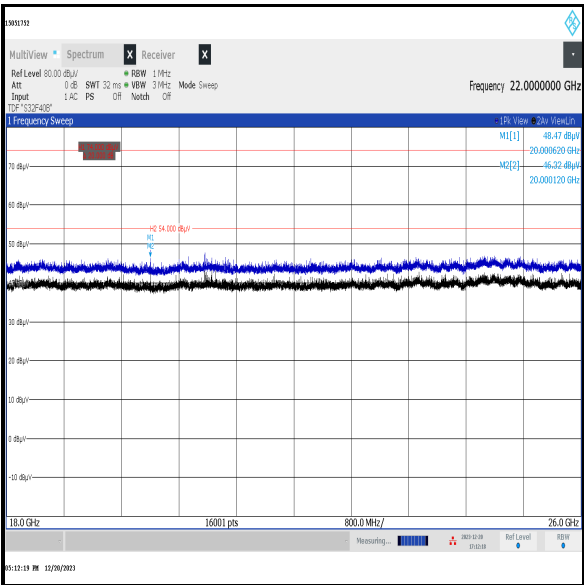
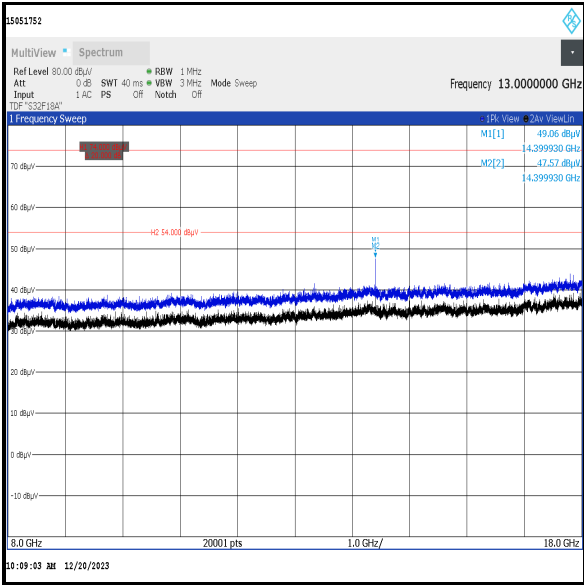
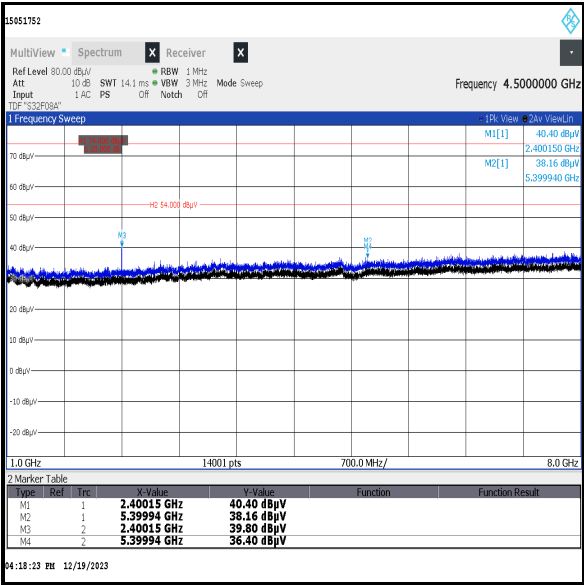


**Transmitter Radiated Spurious Emissions (continued)**

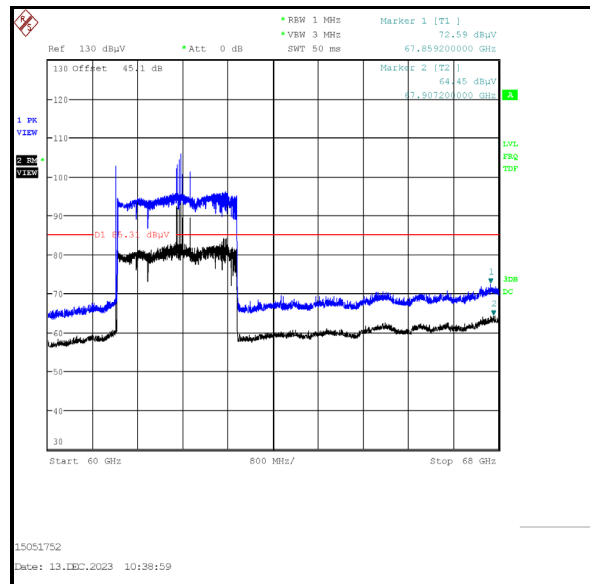
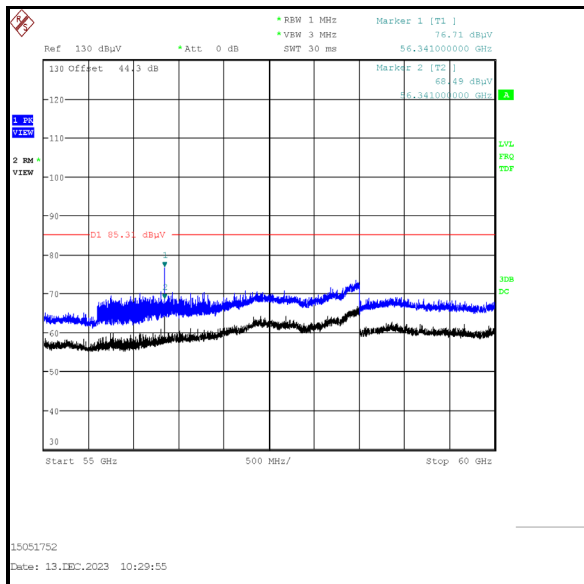
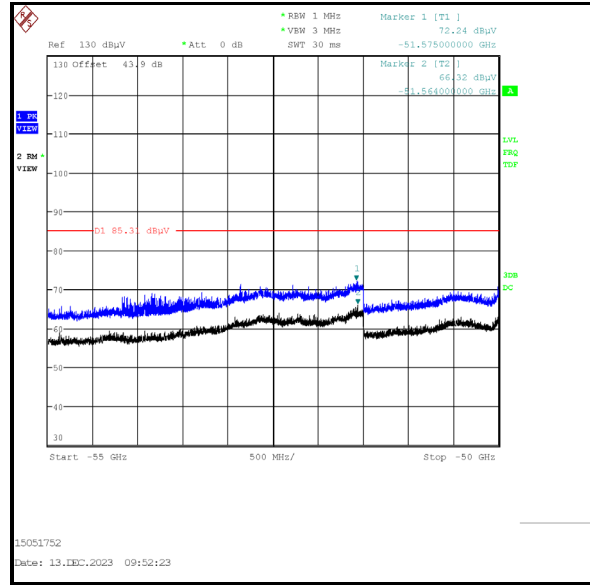
**Results: Profile 2**

| Frequency<br>(MHz) | Antenna<br>Polarity | Peak Level<br>(dBμV/m) | Average Limit<br>(dBμV/m) | Margin<br>(dB) | Result   |
|--------------------|---------------------|------------------------|---------------------------|----------------|----------|
| 2400.030           | Horizontal          | 42.2                   | 54.0*                     | 11.8           | Compiled |
| 5399.811           | Horizontal          | 40.8                   | 54.0*                     | 13.2           | Compiled |
| 14400.071          | Horizontal          | 51.3                   | 54.0*                     | 2.7            | Compiled |
| 20000.020          | Horizontal          | 50.2                   | 54.0*                     | 3.8            | Compiled |
| 20759.520          | Horizontal          | 49.9                   | 54.0*                     | 4.1            | Complied |
| 28799.861          | Horizontal          | 51.1                   | 54.0*                     | 2.9            | Compiled |
| 39999.768          | Horizontal          | 53.8                   | 54.0*                     | 0.2            | Compiled |

Transmitter Radiated Spurious Emissions (continued)

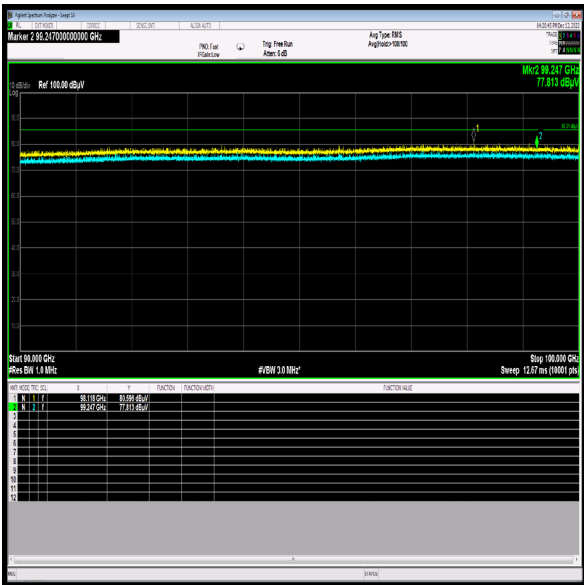
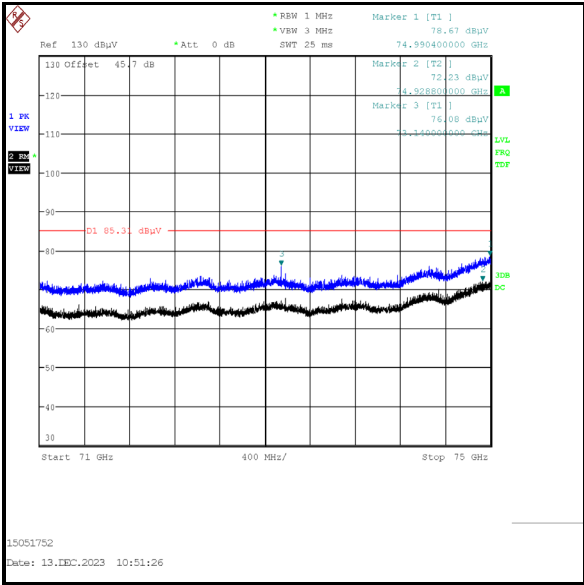
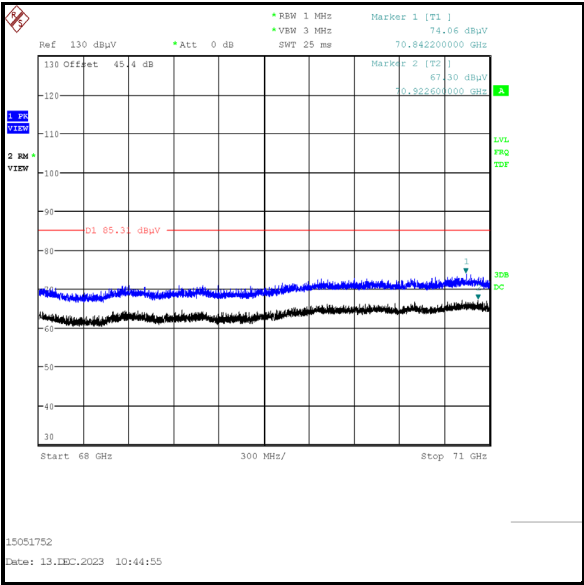


Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

**Transmitter Radiated Spurious Emissions (continued)**

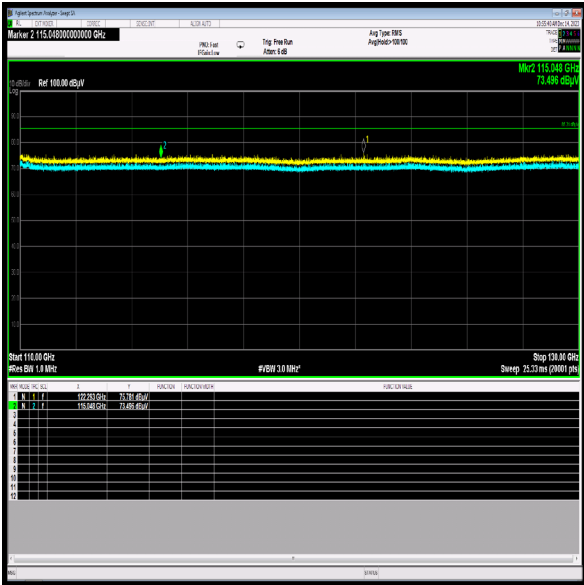
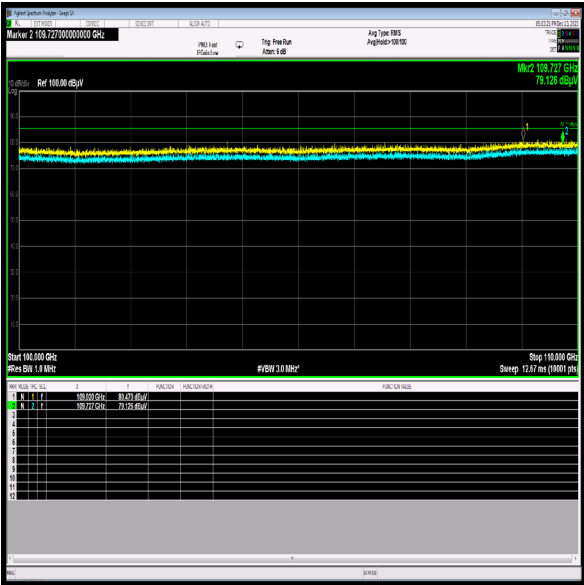
Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Transmitter Radiated Spurious Emissions (continued)



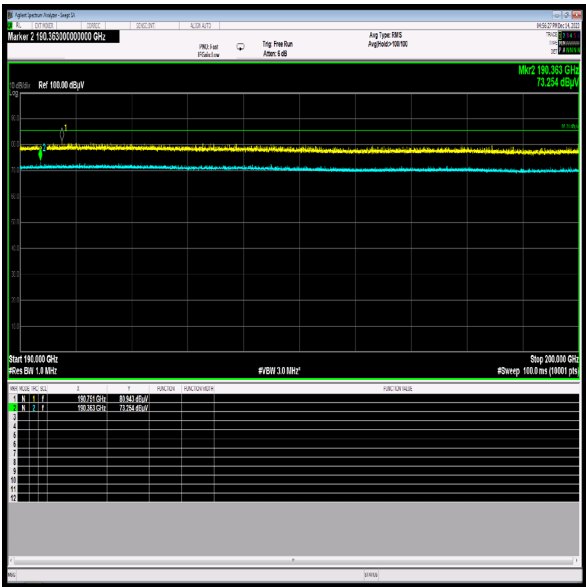
Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Transmitter Radiated Spurious Emissions (continued)



Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Transmitter Radiated Spurious Emissions (continued)



Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

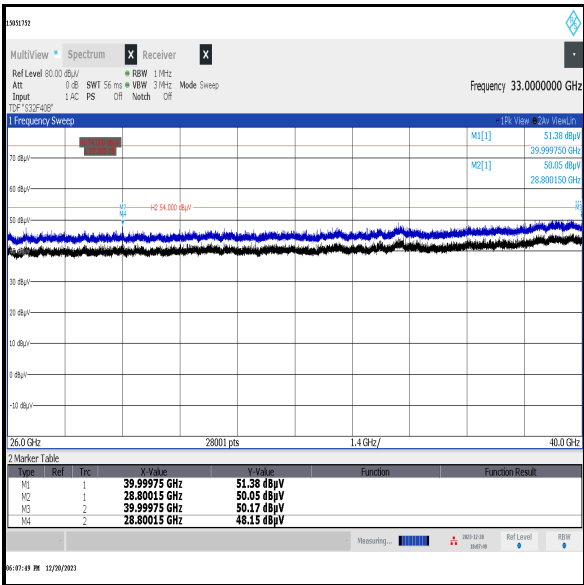
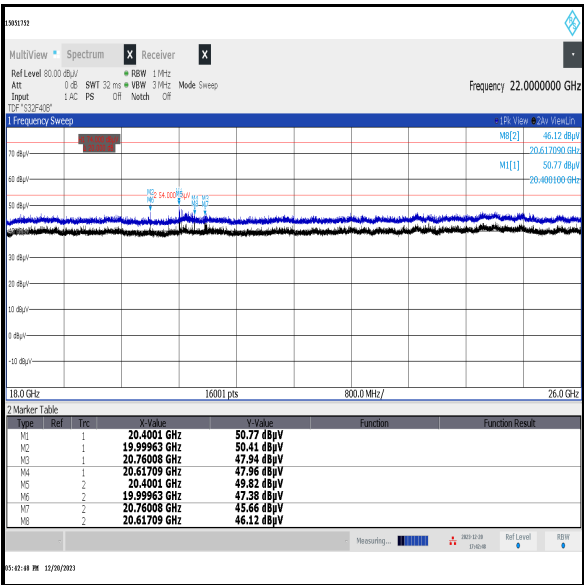
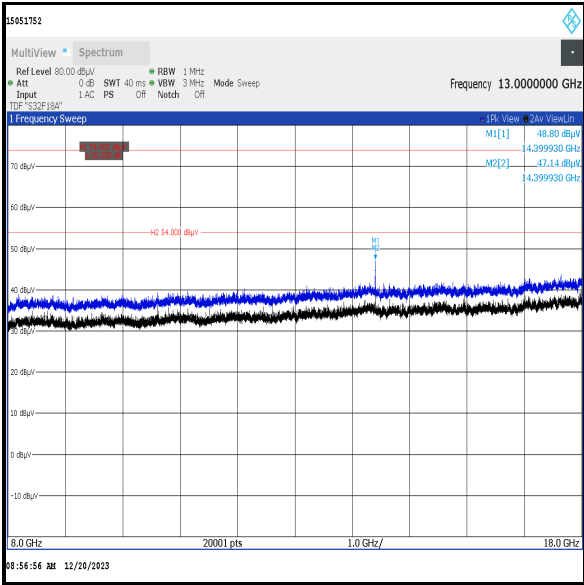
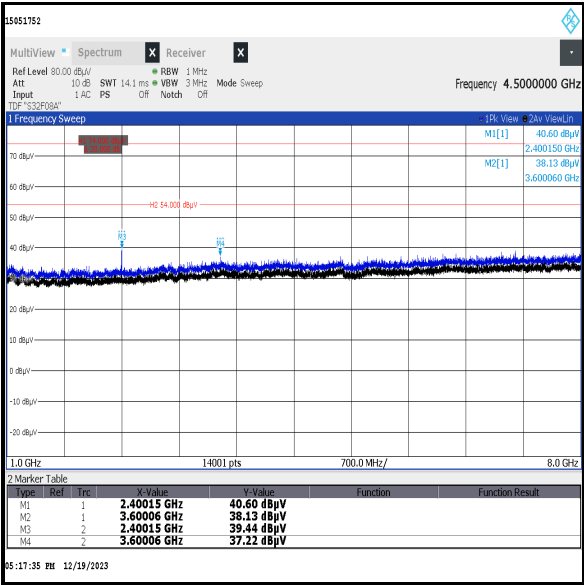


**Transmitter Radiated Spurious Emissions (continued)**

**Results: Profile 3**

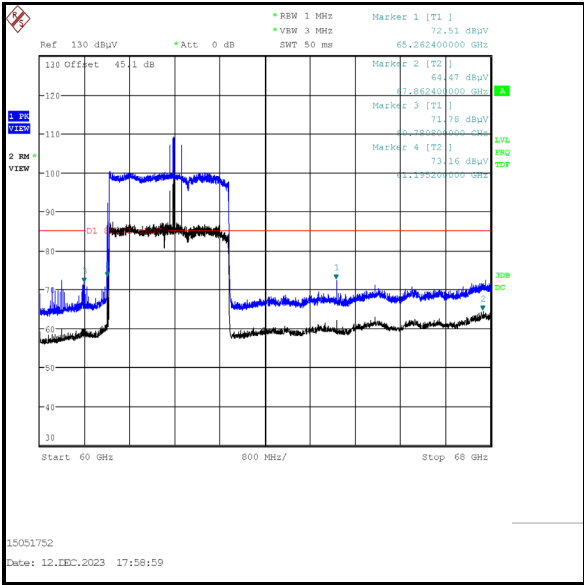
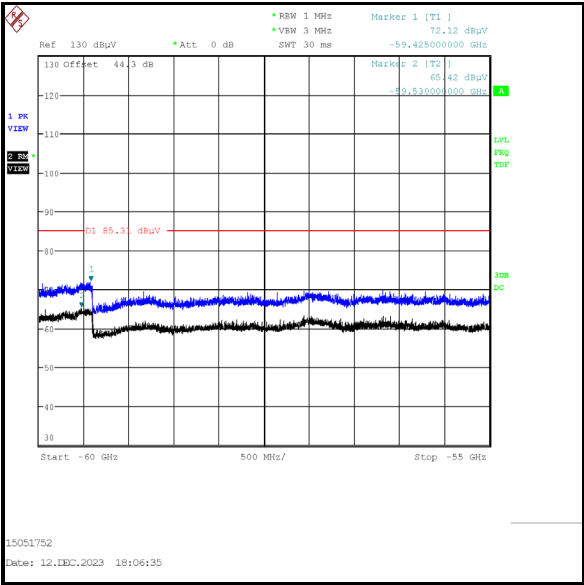
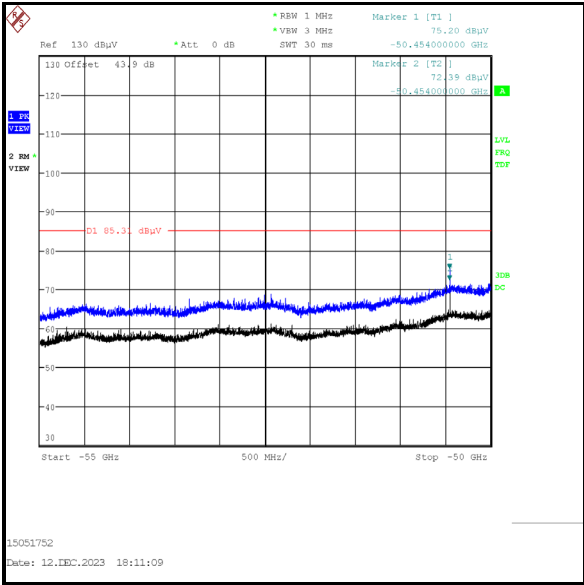
| Frequency<br>(MHz) | Antenna<br>Polarity | Peak Level<br>(dBμV/m) | Average Limit<br>(dBμV/m) | Margin<br>(dB) | Result   |
|--------------------|---------------------|------------------------|---------------------------|----------------|----------|
| 2400.048           | Horizontal          | 43.0                   | 54.0*                     | 11.0           | Compiled |
| 3600.014           | Horizontal          | 40.0                   | 54.0*                     | 14.0           | Compiled |
| 14400.291          | Horizontal          | 50.9                   | 54.0*                     | 3.1            | Compiled |
| 19999.894          | Horizontal          | 51.1                   | 54.0*                     | 2.9            | Compiled |
| 20399.969          | Horizontal          | 52.0                   | 54.0*                     | 2.0            | Compiled |
| 20616.738          | Horizontal          | 50.8                   | 54.0*                     | 3.2            | Compiled |
| 20758.313          | Horizontal          | 49.1                   | 54.0*                     | 4.9            | Compiled |
| 28799.868          | Horizontal          | 50.8                   | 54.0*                     | 3.2            | Compiled |
| 40000.021          | Horizontal          | 50.2                   | 54.0*                     | 3.8            | Compiled |

Transmitter Radiated Spurious Emissions (continued)



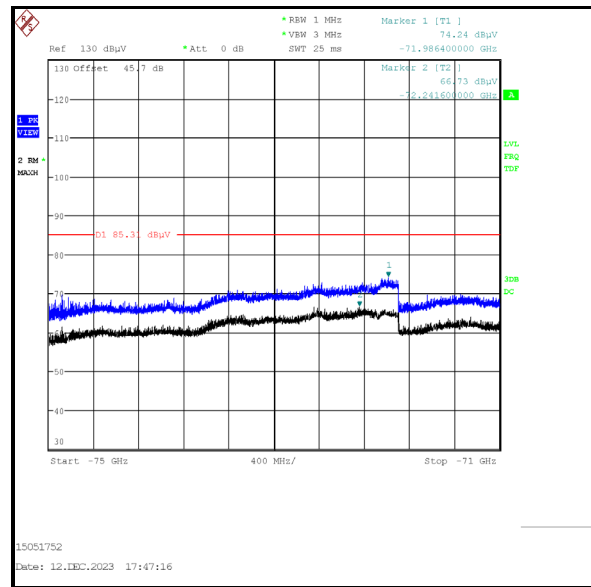
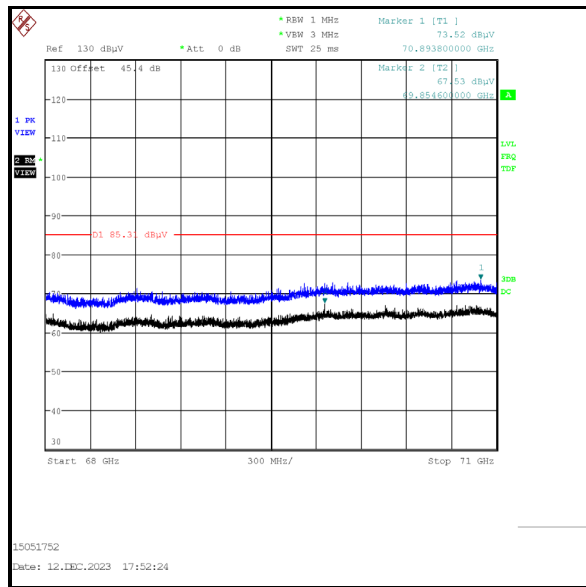
Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Transmitter Radiated Spurious Emissions (continued)



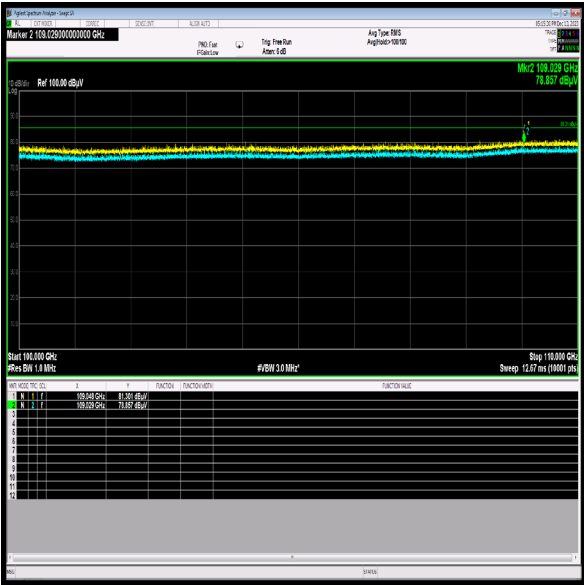
Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

### Transmitter Radiated Spurious Emissions (continued)



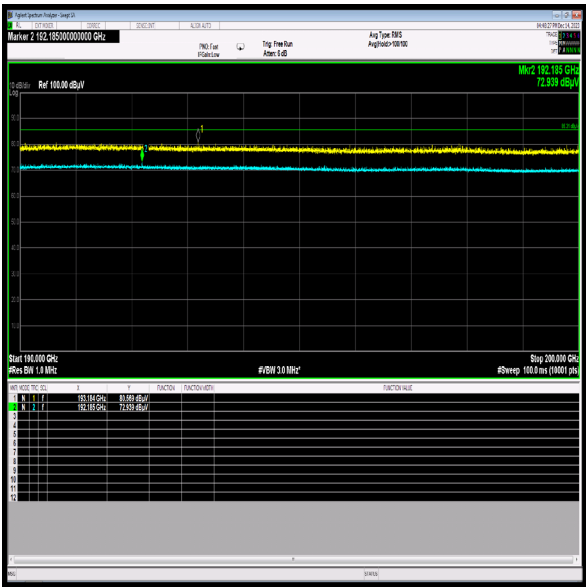
*Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.*

Transmitter Radiated Spurious Emissions (continued)



Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Transmitter Radiated Spurious Emissions (continued)



Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

**Transmitter Radiated Spurious Emissions (continued)****Test Equipment Used:**

| Asset No. | Instrument       | Manufacturer       | Type No.            | Serial No.  | Date Calibration Due | Cal. Interval (Months) |
|-----------|------------------|--------------------|---------------------|-------------|----------------------|------------------------|
| M2041     | Thermohygrometer | Testo              | 608-H1              | 45119912    | 27 Dec 2024          | 12                     |
| M226553   | Thermohygrometer | Testo              | 608-H1              | 83800731    | 28 Dec 2024          | 12                     |
| M2040     | Thermohygrometer | Testo              | 608-H1              | 45124934    | 27 Dec 2024          | 12                     |
| K0010     | 3m RSE Chamber   | MVG Industries     | N/A                 | N/A         | 11 Oct 2024          | 12                     |
| K0001     | 3m RSE Chamber   | MVG Industries     | N/A                 | N/A         | 06 Sep 2024          | 12                     |
| K226202   | 3m RSE Chamber   | Albatross Projects | N/A                 | N/A         | 21 Apr 2024          | 12                     |
| M1886     | Test Receiver    | Rohde & Schwarz    | ESU26               | 100554      | 02 Aug 2024          | 12                     |
| M236226   | Test Receiver    | Rohde & Schwarz    | ESW26               | 103134      | 21 Apr 2024          | 12                     |
| M1832     | Signal Analyser  | Keysight           | N9010A              | MY53470303  | 18 May 2024          | 24                     |
| M227312   | Test Receiver    | Rohde & Schwarz    | ESW44               | 103203      | 11 May 2024          | 12                     |
| A2963     | Antenna          | Link Microtek      | AM19HA-ULV1         | 14929       | 20 Jun 2025          | 36                     |
| A2964     | Antenna          | Link Microtek      | AM15HA-ULV1         | 14930       | 24 Jun 2025          | 36                     |
| A2967     | Antenna          | Link Microtek      | AM10HA-ULV1         | 14933       | 13 Jul 2025          | 36                     |
| A2968     | Antenna          | Link Microtek      | AM7HA-ULV1          | 14934       | 06 Mar 2024          | 12                     |
| A2969     | Antenna          | Link Microtek      | AM4HA-ULV1          | 14935       | 06 Mar 2024          | 12                     |
| A231045   | Antenna          | Schwarzbeck        | HWRD 750            | 00064       | 25 Mar 2025          | 12                     |
| A231043   | Antenna          | Schwarzbeck        | BBHA 9120 B         | 00834       | 25 Mar 2025          | 12                     |
| A231050   | Antenna          | Schwarzbeck        | BBHA 9170           | 01280       | 25 Mar 2024          | 12                     |
| A231925   | Antenna          | Teseq, Inc         | CBL6111D            | 63584       | 27 Apr 2024          | 12                     |
| A3165     | Antenna          | ETS-Lindgren       | 6502                | 00224383    | 13 Apr 2024          | 12                     |
| A219915   | Downconverter    | Virginia Diodes    | WR19SAX             | SAX 897     | 14 Apr 2024          | 24                     |
| M2069     | Downconverter    | Virginia Diodes    | WR15SAX             | SAX 394     | 16 Oct 2025          | 24                     |
| M2065     | Downconverter    | Virginia Diodes    | WR10SAX             | SAX 393     | 30 July 2025         | 24                     |
| M2066     | Downconverter    | Virginia Diodes    | WR6.5SAX            | SAX 392     | 31 May 2024          | 24                     |
| M2067     | Downconverter    | Virginia Diodes    | WR4.3SAX            | SAX 391     | 31 May 2024          | 24                     |
| G0640     | Signal Generator | Keysight           | E8257D              | US000000055 | 10 Jan 2025          | 24                     |
| A3213     | High Pass Filter | Sage Millimeter    | SWF-75370340-10-H1  | 18199-01    | 25 Aug 2024          | 24                     |
| A3212     | Low Pass Filter  | Sage Millimeter    | SWF-50354340-22-L1  | B10754-01   | 25 Aug 2024          | 24                     |
| A3010     | Attenuator       | AtlanTecRF         | AN18-06             | 208801#5    | 27 Apr 2024          | 12                     |
| A3154     | Pre-Amplifier    | Com-Power          | PAM-103             | 18020012    | 21 Aug 2024          | 12                     |
| A231863   | Amplifier        | Atlantic Microwave | A-LNAKX-380116-S5S5 | 221044001   | 25 Mar 2024          | 12                     |
| A230567   | Amplifier        | Atlantic Microwave | A-HPAKX-380143-K5K5 | VJ3601001   | 25 Mar 2024          | 12                     |

5.2.6. Transmitter Frequency Stability (Temperature Variation)

Test Summary:

|                             |                             |            |                  |
|-----------------------------|-----------------------------|------------|------------------|
| Test Engineers:             | Shamraiz Ashiq & Ben Mercer | Test Date: | 28 December 2023 |
| Test Sample Serial Numbers: | PR013 & PR020               |            |                  |

|                   |                          |
|-------------------|--------------------------|
| FCC Reference:    | Part 15.255(f)           |
| Test Method Used: | ANSI C63.10 Section 9.14 |

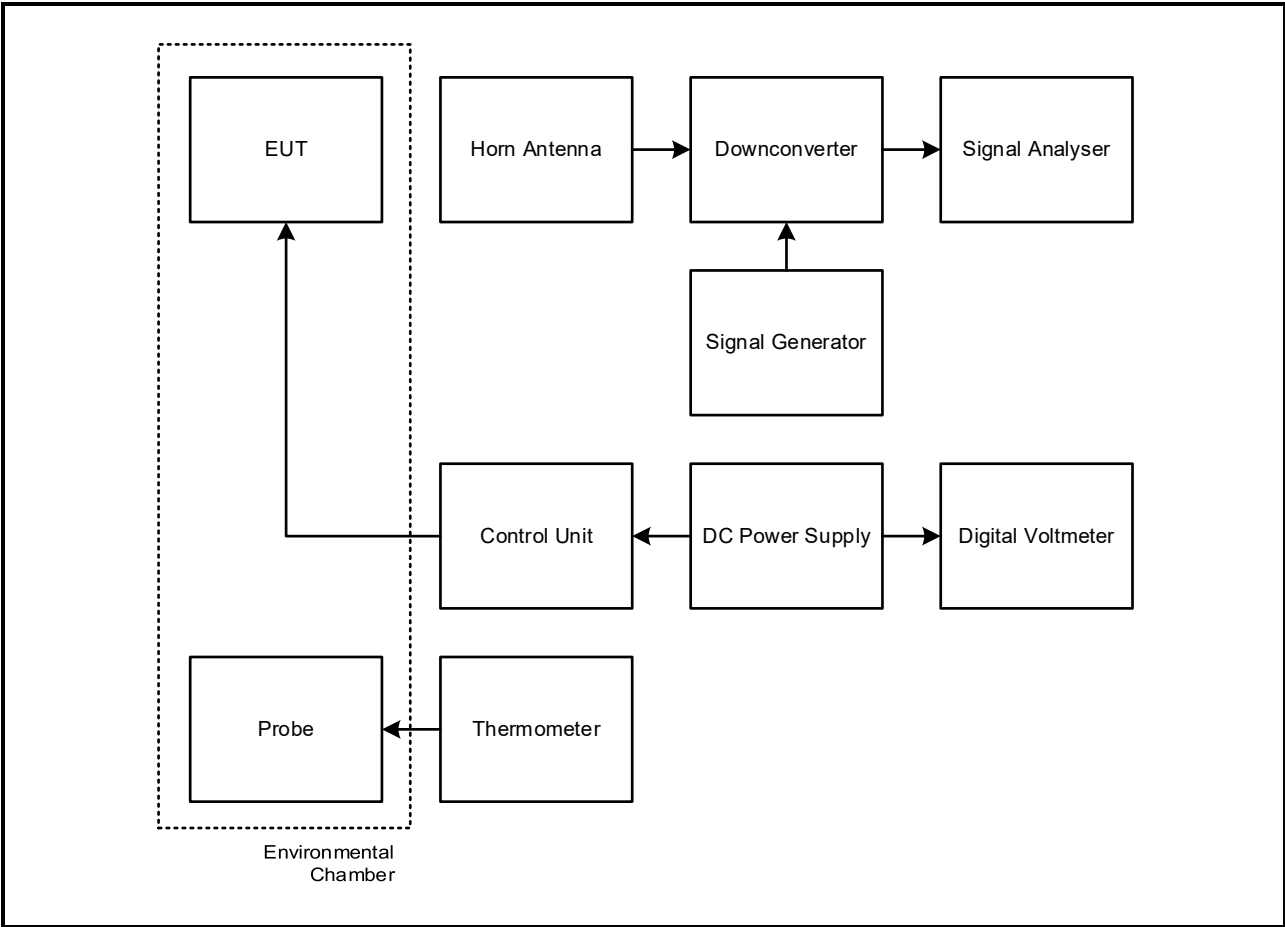
Environmental Conditions:

|                                |    |
|--------------------------------|----|
| Ambient Temperature (°C):      | 19 |
| Ambient Relative Humidity (%): | 50 |

Note(s):

- 1. The 20 dB emission bandwidth was recorded on a signal analyser and compared to the lower and upper emission edges.
- 2. Temperature was monitored throughout the test with a calibrated digital thermometer.

Test setup:





**Transmitter Frequency Stability (Temperature Variation) (continued)****Results: Profile 2 / Lower Band Edge**

| Temperature (°C)        | Lower Band Edge Frequency (MHz) | Lower 20 dB Emission Bandwidth Frequency (MHz) | Result   |
|-------------------------|---------------------------------|--|----------|
| -20                     | 57000.000                       | 61200.000                                      | Complied |
| -10                     | 57000.000                       | 61195.000                                      | Complied |
| 0                       | 57000.000                       | 61205.000                                      | Complied |
| 10                      | 57000.000                       | 61230.000                                      | Complied |
| 20                      | 57000.000                       | 61190.000                                      | Complied |
| 30                      | 57000.000                       | 61230.000                                      | Complied |
| 40                      | 57000.000                       | 61225.000                                      | Complied |
| 50                      | 57000.000                       | 61205.000                                      | Complied |
| Worst-case Margin (MHz) |                                 | 4190.000                                       |          |

**Results: Profile 2 / Upper Band Edge**

| Temperature (°C)        | Upper Band Edge Frequency (MHz) | Upper 20 dB Emission Bandwidth Frequency (MHz) | Result   |
|-------------------------|---------------------------------|--|----------|
| -20                     | 64000.000                       | 63365.000                                      | Complied |
| -10                     | 64000.000                       | 63365.000                                      | Complied |
| 0                       | 64000.000                       | 63365.000                                      | Complied |
| 10                      | 64000.000                       | 63365.000                                      | Complied |
| 20                      | 64000.000                       | 63365.000                                      | Complied |
| 30                      | 64000.000                       | 63365.000                                      | Complied |
| 40                      | 64000.000                       | 63365.000                                      | Complied |
| 50                      | 64000.000                       | 63365.000                                      | Complied |
| Worst-case Margin (MHz) |                                 | 635.000  |          |

**Transmitter Frequency Stability (Temperature Variation) (continued)**

**Results: Profile 3 / Lower Band Edge**

| Temperature (°C)        | Lower Band Edge Frequency (MHz) | Lower 20 dB Emission Bandwidth Frequency (MHz) | Result   |
|-------------------------|---------------------------------|--|----------|
| -20                     | 57000.000                       | 61230.000                                      | Complied |
| -10                     | 57000.000                       | 61229.872                                      | Complied |
| 0                       | 57000.000                       | 61205.000                                      | Complied |
| 10                      | 57000.000                       | 61225.000                                      | Complied |
| 20                      | 57000.000                       | 61210.000                                      | Complied |
| 30                      | 57000.000                       | 61205.000                                      | Complied |
| 40                      | 57000.000                       | 61210.000                                      | Complied |
| 50                      | 57000.000                       | 61195.000                                      | Complied |
| Worst-case Margin (MHz) |                                 | 4195.000                                       |          |

**Results: Profile 3 / Upper Band Edge**

| Temperature (°C)        | Upper Band Edge Frequency (MHz) | Upper 20 dB Emission Bandwidth Frequency (MHz) | Result   |
|-------------------------|---------------------------------|--|----------|
| -20                     | 64000.000                       | 63360.000                                      | Complied |
| -10                     | 64000.000                       | 63365.000                                      | Complied |
| 0                       | 64000.000                       | 63360.000                                      | Complied |
| 10                      | 64000.000                       | 63360.000                                      | Complied |
| 20                      | 64000.000                       | 63365.000                                      | Complied |
| 30                      | 64000.000                       | 63360.000                                      | Complied |
| 40                      | 64000.000                       | 63360.000                                      | Complied |
| 50                      | 64000.000                       | 63360.000                                      | Complied |
| Worst-case Margin (MHz) |                                 | 635.000  |          |

**Transmitter Frequency Stability (Temperature Variation) (continued)**

**Test Equipment Used:**

| Asset No. | Instrument            | Manufacturer          | Type No.    | Serial No. | Date Calibration Due  | Cal. Interval (Months) |
|-----------|-----------------------|-----------------------|-------------|------------|-----------------------|------------------------|
| M2004     | Thermohygrometer      | Testo                 | 608-H1      | 45046425   | 27 Dec 2024           | 12                     |
| M1886     | Test Receiver         | Rohde & Schwarz       | ESU26       | 100554     | 02 Aug 2024           | 12                     |
| M2069     | Downconverter         | Virginia Diodes       | WR15SAX     | SAX 394    | 16 Oct 2025           | 24                     |
| M2053     | Thermomter            | Fluke Corporation     | 52II        | 4232071WS  | 13 Mar 2024           | 12                     |
| M1251     | Multimeter            | Fluke Corporation     | 175         | 89170179   | 08 Jun 2024           | 12                     |
| G0640     | Signal Generator      | Keysight Technologies | E8257D      | US00000055 | 10 Jan 2025           | 24                     |
| E235136   | Environmental Chamber | Espec                 | PU-3J       | 15021355   | Calibrated before use | -                      |
| A2964     | Antenna               | Link Microtek.        | AM15HA-ULV1 | 14930      | 24 Jun 2025           | 36                     |

**5.2.7. Transmitter Frequency Stability (Voltage Variation)****Test Summary:**

|                                    |                             |                   |                  |
|------------------------------------|-----------------------------|-------------------|------------------|
| <b>Test Engineers:</b>             | Shamraiz Ashiq & Ben Mercer | <b>Test Date:</b> | 28 December 2023 |
| <b>Test Sample Serial Numbers:</b> | PR013 & PR020               |                   |                  |

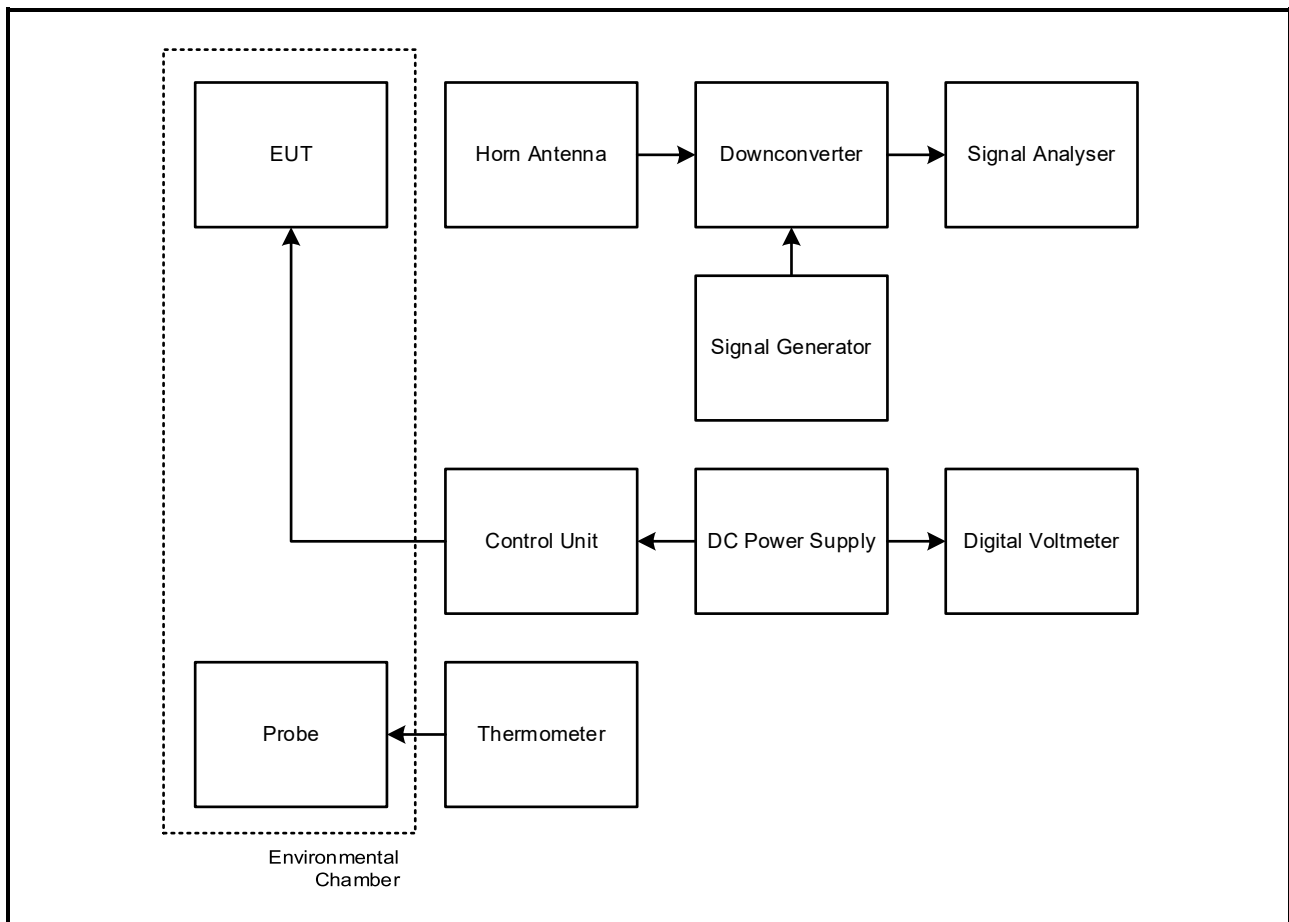
|                          |                          |
|--------------------------|--------------------------|
| <b>FCC Reference:</b>    | Part 15.255(f)           |
| <b>Test Method Used:</b> | ANSI C63.10 Section 9.14 |

**Environmental Conditions:**

|                                       |    |
|---------------------------------------|----|
| <b>Ambient Temperature (°C):</b>      | 19 |
| <b>Ambient Relative Humidity (%):</b> | 50 |

**Note(s):**

1. The 20 dB emission bandwidth was recorded on a signal analyser and compared to the lower and upper emission edges.
2. The DC power supply voltage was set to 85% and 115% of the stated Control Unit input voltage of 24 VDC.
3. Voltage was monitored throughout the test with a calibrated digital voltmeter.

**Test setup:**

**Transmitter Frequency Stability (Voltage Variation) (continued)****Results: Profile 2 / Lower Band Edge**

| Supply Voltage (VDC)    | Lower Band Edge Frequency (MHz) | Lower 20 dB Emission Bandwidth Frequency (MHz) | Result   |
|-------------------------|---------------------------------|--|----------|
| 20.4                    | 57000.000                       | 61190.000                                      | Complied |
| 24.0                    | 57000.000                       | 61190.000                                      | Complied |
| 27.6                    | 57000.000                       | 61230.000                                      | Complied |
| Worst-case Margin (MHz) |                                 | 4190.000                                       |          |

**Results: Profile 2 / Upper Band Edge**

| Supply Voltage (VDC)    | Upper Band Edge Frequency (MHz) | Upper 20 dB Emission Bandwidth Frequency (MHz) | Result   |
|-------------------------|---------------------------------|--|----------|
| 20.4                    | 64000.000                       | 63365.000                                      | Complied |
| 24.0                    | 64000.000                       | 63365.000                                      | Complied |
| 27.6                    | 64000.000                       | 63365.000                                      | Complied |
| Worst-case Margin (MHz) |                                 | 635.000  |          |

**Results: Profile 3 / Lower Band Edge**

| Supply Voltage (VDC)    | Lower Band Edge Frequency (MHz) | Lower 20 dB Emission Bandwidth Frequency (MHz) | Result   |
|-------------------------|---------------------------------|--|----------|
| 20.4                    | 57000.000                       | 61230.000                                      | Complied |
| 24.0                    | 57000.000                       | 61210.000                                      | Complied |
| 27.6                    | 57000.000                       | 61230.000                                      | Complied |
| Worst-case Margin (MHz) |                                 | 4210.000                                       |          |

**Results: Profile 3 / Upper Band Edge**

| Supply Voltage (VDC)    | Upper Band Edge Frequency (MHz) | Upper 20 dB Emission Bandwidth Frequency (MHz) | Result   |
|-------------------------|---------------------------------|--|----------|
| 20.4                    | 64000.000                       | 63360.000                                      | Complied |
| 24.0                    | 64000.000                       | 63365.000                                      | Complied |
| 27.6                    | 64000.000                       | 63360.000                                      | Complied |
| Worst-case Margin (MHz) |                                 | 635.000  |          |

**Transmitter Frequency Stability (Voltage Variation) (continued)**

**Test Equipment Used:**

| Asset No. | Instrument            | Manufacturer          | Type No.    | Serial No. | Date Calibration Due  | Cal. Interval (Months) |
|-----------|-----------------------|-----------------------|-------------|------------|-----------------------|------------------------|
| M2004     | Thermohygrometer      | Testo                 | 608-H1      | 45046425   | 27 Dec 2024           | 12                     |
| M1886     | Test Receiver         | Rohde & Schwarz       | ESU26       | 100554     | 02 Aug 2024           | 12                     |
| M2069     | Downconverter         | Virginia Diodes       | WR15SAX     | SAX 394    | 16 Oct 2025           | 24                     |
| M2053     | Thermomter            | Fluke Corporation     | 52II        | 4232071WS  | 13 Mar 2024           | 12                     |
| M1251     | Multimeter            | Fluke Corporation     | 175         | 89170179   | 08 Jun 2024           | 12                     |
| G0640     | Signal Generator      | Keysight Technologies | E8257D      | US00000055 | 10 Jan 2025           | 24                     |
| E235136   | Environmental Chamber | Espec                 | PU-3J       | 15021355   | Calibrated before use | -                      |
| A2964     | Antenna               | Link Microtek.        | AM15HA-ULV1 | 14930      | 24 Jun 2025           | 36                     |
| S0557     | DC Power supply       | Thurlby Thandar       | EL303R      | 395819     | Calibrated before use | -                      |

5.2.8. Transmitter AC Conducted Spurious Emissions

Test Summary:

|                             |                 |             |                                       |
|-----------------------------|-----------------|-------------|---------------------------------------|
| Test Engineer:              | Alison Johnston | Test Dates: | 09 January 2024 to<br>16 January 2024 |
| Test Sample Serial Numbers: | PR013 & PR020   |             |                                       |

|                   |   |
|-------------------|---|
| FCC Reference:    | Part 15.207   |
| Test Method Used: | ANSI C63.10 Section 6.2, FCC KDB 174176 and notes below |

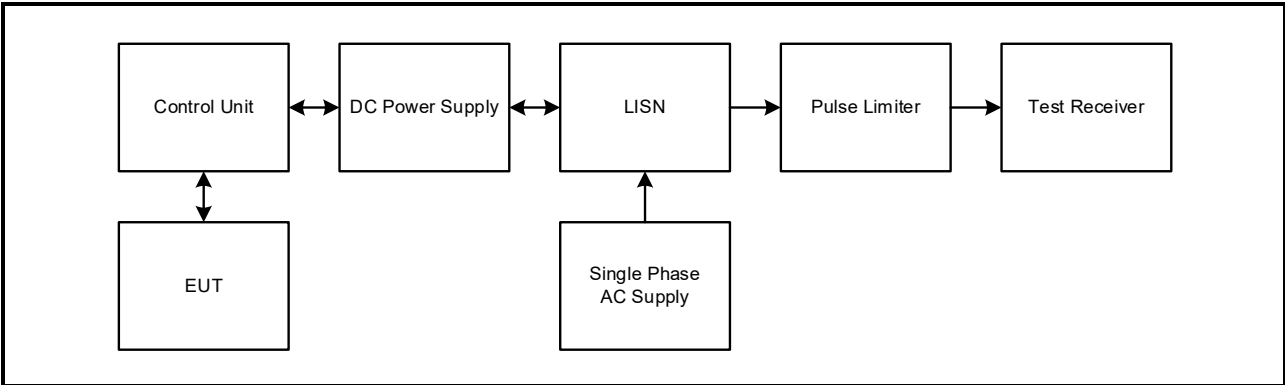
Environmental Conditions:

|                        |    |
|------------------------|----|
| Temperature (°C):      | 22 |
| Relative Humidity (%): | 40 |

Note(s):

1. The EUT was connected to the Control Unit via CAN cable. The Control Unit supplied 12 VDC to the EUT. The Control Unit was powered from a 24 VDC bench power supply. The bench power supply was connected to a 120 VAC 60 Hz single phase supply via a LISN.
2. In accordance with FCC KDB 174176 Q4, all tests above were also performed with a 240 VAC 60 Hz single phase supply.
3. Pre-scans were performed and markers placed on the highest live and neutral measured levels. Final measurements were performed on the marker frequencies and the results entered into the tables below.
4. A pulse limiter was fitted between the LISN and the test receiver.

Test Setup Diagrams



**Transmitter AC Conducted Spurious Emissions (continued)****Results: Profile 2 / Live / Quasi Peak / 120 VAC 60 Hz**

| Frequency (MHz) | Line | Level (dB $\mu$ V) | Limit (dB $\mu$ V) | Margin (dB) | Result   |
|-----------------|------|--------------------|--------------------|-------------|----------|
| 13.560000       | Live | 29.8               | 60.0               | 30.2        | Complied |
| 14.365500       | Live | 21.0               | 60.0               | 39.0        | Complied |
| 14.896500       | Live | 25.7               | 60.0               | 34.3        | Complied |
| 15.198000       | Live | 20.1               | 60.0               | 39.9        | Complied |
| 19.113000       | Live | 18.2               | 60.0               | 41.8        | Complied |
| 24.895500       | Live | 14.4               | 60.0               | 45.6        | Complied |

**Results: Profile 2 / Live / Average / 120 VAC 60 Hz**

| Frequency (MHz) | Line | Level (dB $\mu$ V) | Limit (dB $\mu$ V) | Margin (dB) | Result   |
|-----------------|------|--------------------|--------------------|-------------|----------|
| 13.560000       | Live | 27.8               | 50.0               | 22.2        | Complied |
| 14.329500       | Live | 14.6               | 50.0               | 35.4        | Complied |
| 14.941500       | Live | 15.6               | 50.0               | 34.4        | Complied |
| 15.360000       | Live | 19.3               | 50.0               | 30.7        | Complied |
| 16.521000       | Live | 21.3               | 50.0               | 28.7        | Complied |
| 18.024000       | Live | 21.2               | 50.0               | 28.8        | Complied |

**Results: Profile 2 / Neutral / Quasi Peak / 120 VAC 60 Hz**

| Frequency (MHz) | Line    | Level (dB $\mu$ V) | Limit (dB $\mu$ V) | Margin (dB) | Result   |
|-----------------|---------|--------------------|--------------------|-------------|----------|
| 12.916500       | Neutral | 23.9               | 60.0               | 36.1        | Complied |
| 14.361000       | Neutral | 21.8               | 60.0               | 38.2        | Complied |
| 14.820000       | Neutral | 21.1               | 60.0               | 38.9        | Complied |
| 15.463500       | Neutral | 20.9               | 60.0               | 39.1        | Complied |
| 19.387500       | Neutral | 27.3               | 60.0               | 32.7        | Complied |
| 24.000000       | Neutral | 22.8               | 60.0               | 37.2        | Complied |

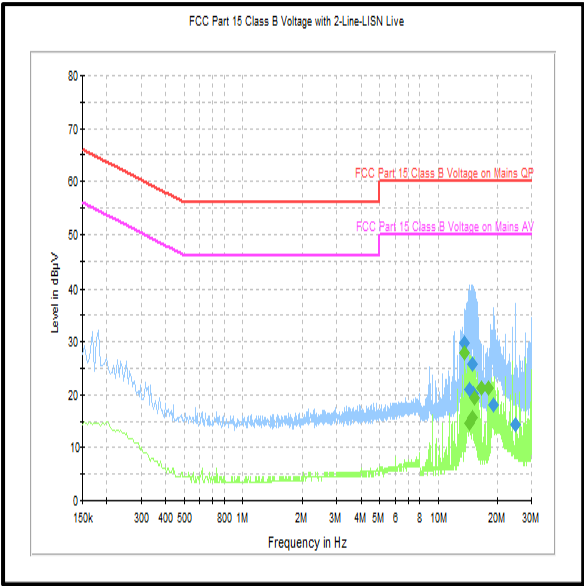
**Results: Profile 2 / Neutral / Average / 120 VAC 60 Hz**

| Frequency (MHz) | Line    | Level (dB $\mu$ V) | Limit (dB $\mu$ V) | Margin (dB) | Result   |
|-----------------|---------|--------------------|--------------------|-------------|----------|
| 13.560000       | Neutral | 27.5               | 50.0               | 22.5        | Complied |
| 15.198000       | Neutral | 12.4               | 50.0               | 37.6        | Complied |
| 16.516500       | Neutral | 20.1               | 50.0               | 29.9        | Complied |
| 19.392000       | Neutral | 20.6               | 50.0               | 29.4        | Complied |
| 22.002000       | Neutral | 21.6               | 50.0               | 28.4        | Complied |
| 26.002500       | Neutral | 22.5               | 50.0               | 27.5        | Complied |

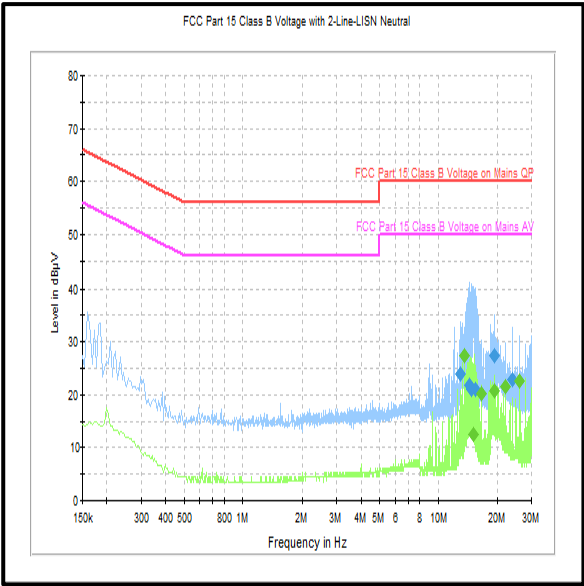


**Transmitter AC Conducted Spurious Emissions (continued)**

**Results: Profile 2 / 120 VAC 60 Hz**



**Live**



**Neutral**

*Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying tables.*

**Transmitter AC Conducted Spurious Emissions (continued)****Results: Profile 2 / Live / Quasi Peak / 240 VAC 60 Hz**

| Frequency (MHz) | Line | Level (dB $\mu$ V) | Limit (dB $\mu$ V) | Margin (dB) | Result   |
|-----------------|------|--------------------|--------------------|-------------|----------|
| 13.330500       | Live | 28.3               | 60.0               | 31.7        | Complied |
| 14.284500       | Live | 23.8               | 60.0               | 36.2        | Complied |
| 14.892000       | Live | 26.9               | 60.0               | 33.1        | Complied |
| 15.351000       | Live | 24.1               | 60.0               | 35.9        | Complied |
| 19.392000       | Live | 26.7               | 60.0               | 33.3        | Complied |
| 24.000000       | Live | 28.0               | 60.0               | 32.0        | Complied |

**Results: Profile 2 / Live / Average / 240 VAC 60 Hz**

| Frequency (MHz) | Line | Level (dB $\mu$ V) | Limit (dB $\mu$ V) | Margin (dB) | Result   |
|-----------------|------|--------------------|--------------------|-------------|----------|
| 13.560000       | Live | 25.8               | 50.0               | 24.2        | Complied |
| 14.280000       | Live | 16.7               | 50.0               | 33.3        | Complied |
| 15.153000       | Live | 13.9               | 50.0               | 36.1        | Complied |
| 16.512000       | Live | 20.7               | 50.0               | 29.3        | Complied |
| 18.573000       | Live | 22.3               | 50.0               | 27.7        | Complied |
| 24.000000       | Live | 23.0               | 50.0               | 27.0        | Complied |

**Results: Profile 2 / Neutral / Quasi Peak / 240 VAC 60 Hz**

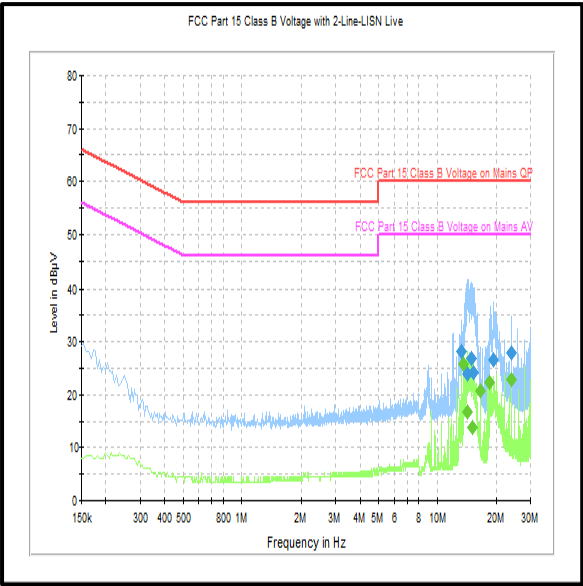
| Frequency (MHz) | Line    | Level (dB $\mu$ V) | Limit (dB $\mu$ V) | Margin (dB) | Result   |
|-----------------|---------|--------------------|--------------------|-------------|----------|
| 12.916500       | Neutral | 23.2               | 60.0               | 36.8        | Complied |
| 14.370000       | Neutral | 23.0               | 60.0               | 37.0        | Complied |
| 15.162000       | Neutral | 21.7               | 60.0               | 38.3        | Complied |
| 15.499500       | Neutral | 27.3               | 60.0               | 32.7        | Complied |
| 19.392000       | Neutral | 25.8               | 60.0               | 34.2        | Complied |
| 24.000000       | Neutral | 21.7               | 60.0               | 38.3        | Complied |

**Results: Profile 2 / Neutral / Average / 240 VAC 60 Hz**

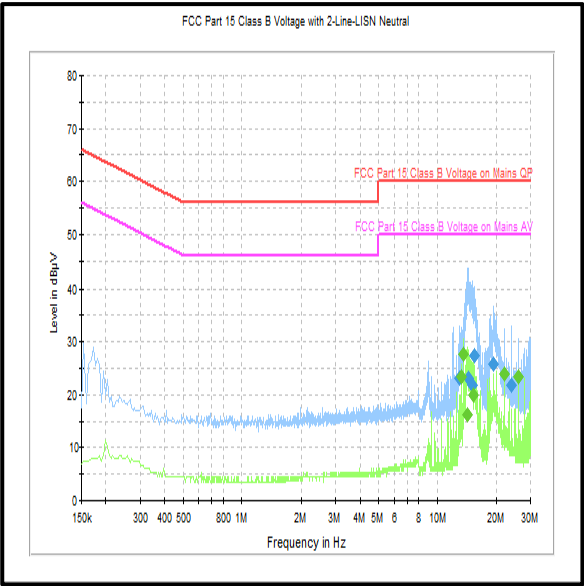
| Frequency (MHz) | Line    | Level (dB $\mu$ V) | Limit (dB $\mu$ V) | Margin (dB) | Result   |
|-----------------|---------|--------------------|--------------------|-------------|----------|
| 13.330500       | Neutral | 23.4               | 50.0               | 26.6        | Complied |
| 13.560000       | Neutral | 27.6               | 50.0               | 22.4        | Complied |
| 14.275500       | Neutral | 16.3               | 50.0               | 33.7        | Complied |
| 15.342000       | Neutral | 20.0               | 50.0               | 30.0        | Complied |
| 22.002000       | Neutral | 23.9               | 50.0               | 26.1        | Complied |
| 26.002500       | Neutral | 23.3               | 50.0               | 26.7        | Complied |

**Transmitter AC Conducted Spurious Emissions (continued)**

**Results: Profile 2 / 240 VAC 60 Hz**



**Live**



**Neutral**

*Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying tables.*

**Transmitter AC Conducted Spurious Emissions (continued)****Results: Profile 3 / Live / Quasi Peak / 120 VAC 60 Hz**

| Frequency (MHz) | Line | Level (dBμV) | Limit (dBμV) | Margin (dB) | Result   |
|-----------------|------|--------------|--------------|-------------|----------|
| 13.753500       | Live | 29.0         | 60.0         | 31.0        | Complied |
| 14.361000       | Live | 22.3         | 60.0         | 37.7        | Complied |
| 14.937000       | Live | 22.1         | 60.0         | 37.9        | Complied |
| 15.391500       | Live | 21.1         | 60.0         | 38.9        | Complied |
| 18.609000       | Live | 33.5         | 60.0         | 26.5        | Complied |
| 24.000000       | Live | 30.0         | 60.0         | 30.0        | Complied |

**Results: Profile 3 / Live / Average / 120 VAC 60 Hz**

| Frequency (MHz) | Line | Level (dBμV) | Limit (dBμV) | Margin (dB) | Result   |
|-----------------|------|--------------|--------------|-------------|----------|
| 13.560000       | Live | 27.7         | 50.0         | 22.3        | Complied |
| 14.199000       | Live | 27.3         | 50.0         | 22.7        | Complied |
| 18.609000       | Live | 23.4         | 50.0         | 26.6        | Complied |
| 19.068000       | Live | 22.7         | 50.0         | 27.3        | Complied |
| 19.468500       | Live | 20.5         | 50.0         | 29.5        | Complied |
| 22.002000       | Live | 22.0         | 50.0         | 28.0        | Complied |

**Results: Profile 3 / Neutral / Quasi Peak / 120 VAC 60 Hz**

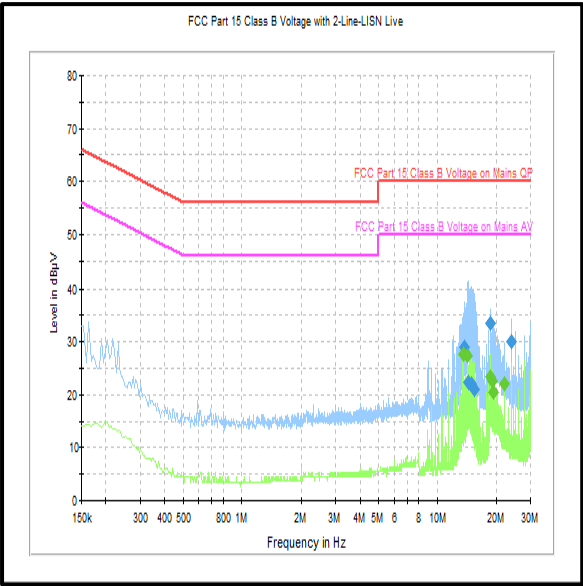
| Frequency (MHz) | Line    | Level (dBμV) | Limit (dBμV) | Margin (dB) | Result   |
|-----------------|---------|--------------|--------------|-------------|----------|
| 14.208000       | Neutral | 31.0         | 60.0         | 29.0        | Complied |
| 14.820000       | Neutral | 21.3         | 60.0         | 38.7        | Complied |
| 15.468000       | Neutral | 20.8         | 60.0         | 39.2        | Complied |
| 18.604500       | Neutral | 33.3         | 60.0         | 26.7        | Complied |
| 21.907500       | Neutral | 19.3         | 60.0         | 40.7        | Complied |
| 23.995500       | Neutral | 17.1         | 60.0         | 42.9        | Complied |

**Results: Profile 3 / Neutral / Average / 120 VAC 60 Hz**

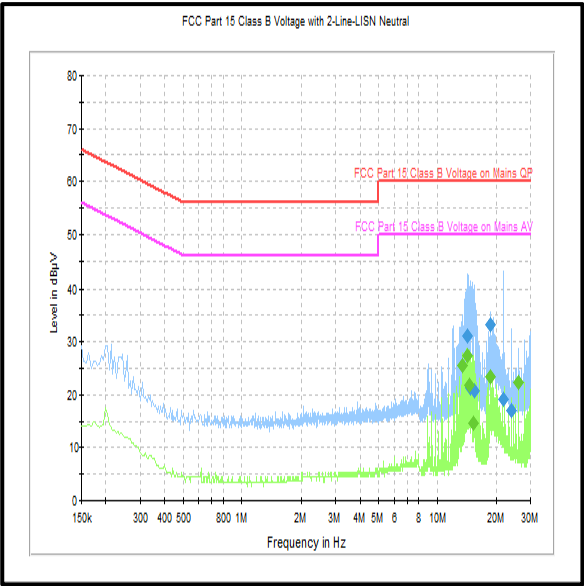
| Frequency (MHz) | Line    | Level (dBμV) | Limit (dBμV) | Margin (dB) | Result   |
|-----------------|---------|--------------|--------------|-------------|----------|
| 13.384500       | Neutral | 25.6         | 50.0         | 24.4        | Complied |
| 14.190000       | Neutral | 27.5         | 50.0         | 22.5        | Complied |
| 14.608500       | Neutral | 21.8         | 50.0         | 28.2        | Complied |
| 15.360000       | Neutral | 14.7         | 50.0         | 35.3        | Complied |
| 18.604500       | Neutral | 23.5         | 50.0         | 26.5        | Complied |
| 26.002500       | Neutral | 22.2         | 50.0         | 27.8        | Complied |

**Transmitter AC Conducted Spurious Emissions (continued)**

**Results: Profile 3 / 120 VAC 60 Hz**



**Live**



**Neutral**

*Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying tables.*

**Transmitter AC Conducted Spurious Emissions (continued)****Results: Profile 3 / Live / Quasi Peak / 240 VAC 60 Hz**

| Frequency (MHz) | Line | Level (dB $\mu$ V) | Limit (dB $\mu$ V) | Margin (dB) | Result   |
|-----------------|------|--------------------|--------------------|-------------|----------|
| 13.384500       | Live | 31.5               | 60.0               | 28.6        | Complied |
| 14.361000       | Live | 22.2               | 60.0               | 37.8        | Complied |
| 14.829000       | Live | 21.0               | 60.0               | 39.0        | Complied |
| 15.468000       | Live | 20.2               | 60.0               | 39.8        | Complied |
| 18.591000       | Live | 33.2               | 60.0               | 26.8        | Complied |
| 24.000000       | Live | 28.0               | 60.0               | 32.0        | Complied |

**Results: Profile 3 / Live / Average / 240 VAC 60 Hz**

| Frequency (MHz) | Line | Level (dB $\mu$ V) | Limit (dB $\mu$ V) | Margin (dB) | Result   |
|-----------------|------|--------------------|--------------------|-------------|----------|
| 13.384500       | Live | 24.4               | 50.0               | 25.6        | Complied |
| 13.560000       | Live | 25.1               | 50.0               | 24.9        | Complied |
| 14.149500       | Live | 26.0               | 50.0               | 24.0        | Complied |
| 18.600000       | Live | 23.6               | 50.0               | 26.4        | Complied |
| 24.000000       | Live | 23.0               | 50.0               | 27.0        | Complied |
| 24.000000       | Live | 23.0               | 50.0               | 27.0        | Complied |

**Results: Profile 3 / Neutral / Quasi Peak / 240 VAC 60 Hz**

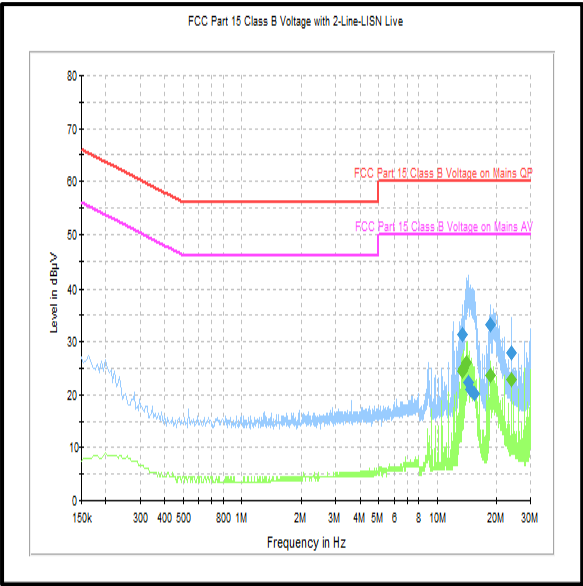
| Frequency (MHz) | Line    | Level (dB $\mu$ V) | Limit (dB $\mu$ V) | Margin (dB) | Result   |
|-----------------|---------|--------------------|--------------------|-------------|----------|
| 13.380000       | Neutral | 31.7               | 60.0               | 28.3        | Complied |
| 14.149500       | Neutral | 35.3               | 60.0               | 24.7        | Complied |
| 14.932500       | Neutral | 24.7               | 60.0               | 35.3        | Complied |
| 15.427500       | Neutral | 20.6               | 60.0               | 39.4        | Complied |
| 18.604500       | Neutral | 29.1               | 60.0               | 30.9        | Complied |
| 24.000000       | Neutral | 20.7               | 60.0               | 39.3        | Complied |

**Results: Profile 3 / Neutral / Average / 240 VAC 60 Hz**

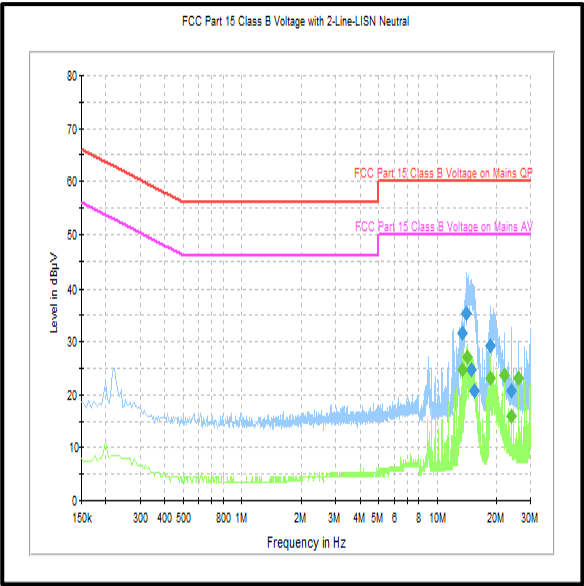
| Frequency (MHz) | Line    | Level (dB $\mu$ V) | Limit (dB $\mu$ V) | Margin (dB) | Result   |
|-----------------|---------|--------------------|--------------------|-------------|----------|
| 13.375500       | Neutral | 24.6               | 50.0               | 25.4        | Complied |
| 14.185500       | Neutral | 27.0               | 50.0               | 23.0        | Complied |
| 18.595500       | Neutral | 23.2               | 50.0               | 26.8        | Complied |
| 22.002000       | Neutral | 23.7               | 50.0               | 26.3        | Complied |
| 24.000000       | Neutral | 15.9               | 50.0               | 34.1        | Complied |
| 26.002500       | Neutral | 23.2               | 50.0               | 26.8        | Complied |

Transmitter AC Conducted Spurious Emissions (continued)

Results: Profile 3 / 240 VAC 60 Hz



Live



Neutral

Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying tables.

Test Equipment Used for Transmitter AC Conducted Spurious Emissions:

| Asset No. | Instrument       | Manufacturer    | Type No. | Serial No. | Date Calibration Due | Cal. Interval (Months) |
|-----------|------------------|-----------------|----------|------------|----------------------|------------------------|
| M2037     | Thermohygrometer | Testo           | 608-H1   | 45124925   | 27 Dec 2024          | 12                     |
| A649      | LISN             | Rohde & Schwarz | ESH3-Z5  | 825562/008 | 23 Aug 2024          | 12                     |
| A1830     | Pulse Limiter    | Rohde & Schwarz | ESH3-Z2  | 100668     | 01 Jun 2024          | 12                     |
| M1124     | Test Receiver    | Rohde & Schwarz | ESIB 26  | 100046     | 02 Oct 2024          | 12                     |

Test Measurement Software/Firmware Used:

| Name                  | Version | Release Date |
|-----------------------|---------|--------------|
| Rohde & Schwarz EMC32 | 6.30.0  | 2018         |

## **6 Measurement Uncertainty & Decision Rule**

### **Overview**

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

### **Decision Rule**

Measurement system instrumentation shall be used with an accuracy specification meeting the accuracy specification limits according to IEC/IECEE OD-5014.

As applicable, unless specified otherwise in this report, the compliance "Decision Rule" is based on Simple Acceptance. If the measured value is on the limit, the result is defined as a pass. In this case the risk of a false positive is 50%. For further information regarding risk assessment refer to ILAC G8:09/2019.

### **Measurement Uncertainty**

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor such that a confidence level of approximately 95% is maintained. For the purposes of this document "approximately" is interpreted as meaning "effectively" or "for most practical purposes".

| Measurement Type                   | Range              | Confidence Level (%) | Calculated Uncertainty |
|------------------------------------|--------------------|----------------------|------------------------|
| Transmitter EIRP                   | 57 to 71 GHz       | 95%                  | ±2.70 dB               |
| Transmitter Peak Output Power      | 57 to 71 GHz       | 95%                  | ±2.70 dB               |
| Transmitter 6 dB Bandwidth         | 57 to 71 GHz       | 95%                  | ±4.59 %                |
| Transmitter 20 dB Bandwidth        | 57 to 71 GHz       | 95%                  | ±4.59 %                |
| Transmitter 99% Occupied Bandwidth | 57 to 71 GHz       | 95%                  | ±3.92 %                |
| Transmitter Radiated Emissions     | 30 MHz to 1 GHz    | 95%                  | ±3.30 dB               |
| Transmitter Radiated Emissions     | 1 GHz to 40 GHz    | 95%                  | ±3.13 dB               |
| Transmitter Radiated Emissions     | 40 GHz to 200 GHz  | 95%                  | ±5.12 dB               |
| AC Conducted Spurious Emissions    | 0.15 MHz to 30 MHz | 95%                  | ±2.42 dB               |

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty the published guidance of the appropriate accreditation body is followed.



7. Report Revision History

| Version Number | Revision Details |        |                 |
|----------------|------------------|--------|-----------------|
|                | Page No(s)       | Clause | Details         |
| 1.0            | -                | -      | Initial Version |

--- END OF REPORT ---