

# FCC and ISED Test Report

Manufacturer: Ocean Signal Limited  
GMDSS Radio (Green Radio), Model: V200



In accordance with FCC 47 CFR Part 80, FCC 47 CFR Part 2 and ISED RSS-182 and ISED RSS-GEN (GMDSS VHF)

Prepared for: Ocean Signal Limited  
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Margate  
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United Kingdom

FCC ID: XYEV200

IC: 9296A-V200

## COMMERCIAL-IN-CONFIDENCE

Document 75961609-04 Issue 01

### SIGNATURE

| NAME           | JOB TITLE       | RESPONSIBLE FOR      | ISSUE DATE   |
|----------------|-----------------|----------------------|--------------|
| Steve Marshall | Senior Engineer | Authorised Signatory | 05 June 2025 |

Signatures in this approval box have checked this document in line with the requirements of TUV SUD document control rules.

### ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 80, FCC 47 CFR Part 2 and ISED RSS-182 and ISED RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

| RESPONSIBLE FOR | NAME                | DATE         | SIGNATURE |
|-----------------|---------------------|--------------|-----------|
| Testing         | Neil Rousell        | 05 June 2025 |           |
| Testing         | Pier-Angelo Lorusso | 05 June 2025 |           |

FCC Accreditation

492497/UK2010 Octagon House, Fareham Test Laboratory

ISED Accreditation

12669A/UK0003 Octagon House, Fareham Test Laboratory

### EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 80: 2023, FCC 47 CFR Part 2: 2023, ISED RSS-182: Issue 6 (2021-06) and ISED RSS-GEN: Issue 5 (04-2018) + A2 (02-2021) for the tests detailed in section 1.3.



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#### ACCREDITATION

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation. Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited). Results of tests covered by our Flexible UKAS Accreditation Schedule are marked FS (Flexible Scope).

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# 1 Report Summary

## 1.1 Report Modification Record

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

| Issue | Description of Change | Date of Issue |
|-------|-----------------------|---------------|
| 1     | First Issue           | 05 June 2025  |

Table 1

## 1.2 Introduction

|                               |                                                                                                                                          |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Applicant                     | Ocean Signal Limited                                                                                                                     |
| Manufacturer                  | Ocean Signal Limited                                                                                                                     |
| Model Number(s)               | V200                                                                                                                                     |
| Serial Number(s)              | S24070003                                                                                                                                |
| Hardware Version(s)           | 11                                                                                                                                       |
| Software Version(s)           | 13.00.00                                                                                                                                 |
| Number of Samples Tested      | 1                                                                                                                                        |
| Test Specification/Issue/Date | FCC 47 CFR Part 80: 2023<br>FCC 47 CFR Part 2: 2023<br>ISED RSS-182: Issue 6 (2021-06)<br>ISED RSS-GEN: Issue 5 (04-2018) + A2 (02-2021) |
| Order Number                  | P9755 - QAF                                                                                                                              |
| Date                          | 27-May-2024                                                                                                                              |
| Date of Receipt of EUT        | 05-August-2024                                                                                                                           |
| Start of Test                 | 12-March-2025                                                                                                                            |
| Finish of Test                | 24-March-2025                                                                                                                            |
| Name of Engineer(s)           | Neil Rousell and Pier-Angelo Lorusso                                                                                                     |
| Related Document(s)           | ANSI C63.26 (2015)<br>KDB 971168 D01 v03r01                                                                                              |



### 1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 80, FCC 47 CFR Part 2 and ISED RSS-182 and ISED RSS-GEN is shown below.

| Section                                              | Specification Clause |        |         |         | Test Description                        | Result | Comments/Base Standard |
|------------------------------------------------------|----------------------|--------|---------|---------|-----------------------------------------|--------|------------------------|
|                                                      | Part 80              | Part 2 | RSS-182 | RSS-GEN |                                         |        |                        |
| Configuration and Mode: DC Powered – Radio GMDSS VHF |                      |        |         |         |                                         |        |                        |
| 2.1                                                  | 80.205               | 2.1049 | 5.4     | 6.7     | Bandwidths                              | Pass   | ANSI C63.26 (2015)     |
| 2.2                                                  | 80.209               | 2.1055 | 5.5     | 6.11    | Transmitter Frequency Tolerances        | Pass   | ANSI C63.26 (2015)     |
| 2.3                                                  | 80.211               | 2.1051 | 5.9     | 6.13.   | Spurious Emissions at Antenna Terminals | Pass   | ANSI C63.26 (2015)     |
| 2.4                                                  | 80.211               | 2.1053 | 5.9     | 6.13.   | Radiated Spurious Emissions             | Pass   | ANSI C63.26 (2015)     |
| 2.5                                                  | 80.213               | 2.1047 | 5.4     | N/A.    | Modulation Requirements                 | Pass   |                        |
| 2.6                                                  | 80.215               | 2.1046 | 5.6     | 6.12    | Transmitter Power                       | Pass   | ANSI C63.26 (2015)     |

**Table 2**



## 1.4 Application Form

### Equipment Description

|                                                                                                                                                     |                                    |                                              |                                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|----------------------------------------------|----------------------------------------|
| Technical Description:<br>(Please provide a brief description of the intended use of the equipment including the technologies the product supports) | GMDSS Handheld VHF Transceiver     |                                              |                                        |
| Manufacturer:                                                                                                                                       | Ocean Signal                       |                                              |                                        |
| Model:                                                                                                                                              | Ocean Signal Branded SafeSEA V200, | ACR Branded ACR SR303                        |                                        |
| Part Number:                                                                                                                                        | 722S-04675 battery only            | 4586                                         | supplied with primary                  |
|                                                                                                                                                     | 722S-04676 rechargeable battery    | 4587                                         | supplied with                          |
| Hardware Version:                                                                                                                                   | 11                                 |                                              |                                        |
| Software Version:                                                                                                                                   | 13.00.00                           |                                              |                                        |
| FCC ID of the product under test – <a href="#">see guidance here</a>                                                                                | XYEV200                            |                                              |                                        |
| IC ID of the product under test – <a href="#">see guidance here</a>                                                                                 | 9296A-V200                         |                                              |                                        |
| Device Category                                                                                                                                     | Mobile <input type="checkbox"/>    | Portable <input checked="" type="checkbox"/> | Fixed <input type="checkbox"/>         |
| Equipment is fitted with an Audio Low Pass Filter                                                                                                   | Yes <input type="checkbox"/>       |                                              | No <input checked="" type="checkbox"/> |

### Intentional Radiators

| Technology                                                                                        | PLL                                   | PLL                                                                  |  |  |  |  |
|---------------------------------------------------------------------------------------------------|---------------------------------------|----------------------------------------------------------------------|--|--|--|--|
| Frequency Range (MHz to MHz)                                                                      | <b>GMDSS TX,RX: 156.300 - 157.425</b> | VHF<br>TX:156.025 -161.775<br>RX:156.050 -162<br>WX:162.40 0-162.550 |  |  |  |  |
| Conducted Declared Output Power (dBm)                                                             | 34                                    | 37                                                                   |  |  |  |  |
| Antenna Gain (dBi)                                                                                | 1.2                                   | 1.2                                                                  |  |  |  |  |
| Supported Bandwidth(s) (MHz) (e.g. 1 MHz, 20 MHz, 40 MHz)                                         | 25K                                   | 25K                                                                  |  |  |  |  |
| Modulation Scheme(s) (e.g. GFSK, QPSK etc)                                                        | 16K0G3E                               | 16K0G3E                                                              |  |  |  |  |
| ITU Emission Designator ( <a href="#">see guidance here</a> ) (not mandatory for Part 15 devices) | 16K0G3E                               | 16K0G3E                                                              |  |  |  |  |
| Bottom Frequency (MHz)                                                                            |                                       |                                                                      |  |  |  |  |



|                        |  |  |  |  |  |  |
|------------------------|--|--|--|--|--|--|
| Middle Frequency (MHz) |  |  |  |  |  |  |
| Top Frequency (MHz)    |  |  |  |  |  |  |

#### Un-intentional Radiators

|                                                                                                                    |  |
|--------------------------------------------------------------------------------------------------------------------|--|
| Highest frequency generated or used in the device or on which the device operates or tunes                         |  |
| Lowest frequency generated or used in the device or on which the device operates or tunes                          |  |
| Class A Digital Device (Use in commercial, industrial or business environment) <input checked="" type="checkbox"/> |  |
| Class B Digital Device (Use in residential environment only) <input type="checkbox"/>                              |  |

#### AC Power Source

|                                                                            |     |    |
|----------------------------------------------------------------------------|-----|----|
| AC supply frequency:                                                       | N/A | Hz |
| Voltage                                                                    | N/A | V  |
| Max current:                                                               | N/A | A  |
| Single Phase <input type="checkbox"/> Three Phase <input type="checkbox"/> |     |    |

#### DC Power Source

|                        |     |   |
|------------------------|-----|---|
| Nominal voltage:       | N/A | V |
| Extreme upper voltage: | N/A | V |
| Extreme lower voltage: | N/A | V |
| Max current:           | N/A | A |

#### Battery Power Source

|                                                                                                                                                                                                                   |     |                                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----------------------------------------------|
| Voltage:                                                                                                                                                                                                          | 6.0 | V                                             |
| End-point voltage:                                                                                                                                                                                                | 3.0 | V (Point at which the battery will terminate) |
| Alkaline <input type="checkbox"/> Leclanche <input type="checkbox"/> Lithium <input checked="" type="checkbox"/> Nickel Cadmium <input type="checkbox"/> Lead Acid* <input type="checkbox"/> *(Vehicle regulated) |     |                                               |
| Other <input type="checkbox"/> Please detail:                                                                                                                                                                     |     |                                               |

#### Charging

|                                           |                                                                     |
|-------------------------------------------|---------------------------------------------------------------------|
| Can the EUT transmit whilst being charged | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
|-------------------------------------------|---------------------------------------------------------------------|

#### Temperature

|                      |     |    |
|----------------------|-----|----|
| Minimum temperature: | -20 | °C |
| Maximum temperature: | 55  | °C |

#### Cable Loss

|                                       |     |    |
|---------------------------------------|-----|----|
| Adapter Cable Loss (Conducted sample) | N/A | dB |
|---------------------------------------|-----|----|



### Antenna Characteristics

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |                 |                 |     |     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----------------|-----------------|-----|-----|
| Antenna connector <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |                 | State impedance | 50  | Ohm |
| Temporary antenna connector <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |                 | State impedance | 50  | Ohm |
| Integral antenna <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Type: | N/A             | Gain            |     | dBi |
| External antenna <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Type: | Helical antenna | Gain            | 1.2 | dBi |
| <p>For external antenna only:<br/>Standard Antenna Jack <input checked="" type="checkbox"/> If yes, describe how user is prohibited from changing antenna (if not professional installed):<br/>Equipment is only ever professionally installed <input checked="" type="checkbox"/><br/>Non-standard Antenna Jack <input type="checkbox"/><br/>All part 15 applications will need to show how the antenna gain was derived either from a manufacturer data sheet or a measurement. Where the gain of the antenna is inherently accounted for as a result of the measurement, such as field strength measurements on a part 15.249 or 15.231 device, so the gain does not necessarily need to be verified. However, enough information regarding the construction of the antenna shall be provided. Such information maybe photographs, length of wire antenna etc.</p> |       |                 |                 |     |     |

### Ancillaries (if applicable)

|                        |              |                    |       |
|------------------------|--------------|--------------------|-------|
| Contract Manufacturer: | HIMUNICATION | Part Number:       |       |
| Model:                 | V200/V200    | Country of Origin: | CHINA |

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

Steve Moore

Product Manager

Ocean Signal Ltd.



## 1.5 Product Information

### 1.5.1 Technical Description

Marine GMDSS Handheld VHF

## 1.6 Deviations from the Standard

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

## 1.7 EUT Modification Record

The table below details modifications made to the EUT during the test programme.

The modifications incorporated during each test are recorded on the appropriate test pages.

| Modification State                    | Description of Modification still fitted to EUT | Modification Fitted By | Date Modification Fitted |
|---------------------------------------|-------------------------------------------------|------------------------|--------------------------|
| Model: V200, Serial Number: S24070003 |                                                 |                        |                          |
| 0                                     | As supplied by the customer                     | Not Applicable         | Not Applicable           |
| 1                                     | Fix for IEC 61097-12, 5.4.10 CSE fail           | Ocean Signal           | 28-February-2025         |

**Table 3**

## 1.8 Test Location

TÜV SÜD conducted the following tests at our Octagon House Test Laboratory.

| Test Name                                  | Name of Engineer(s) | Accreditation |
|--------------------------------------------|---------------------|---------------|
| Configuration and Mode: DC Powered - Radio |                     |               |
| Bandwidths                                 | Neil Rousell        | UKAS          |
| Transmitter Frequency Tolerances           | Neil Rousell        | UKAS          |
| Spurious Emissions at Antenna Terminals    | Neil Rousell        | UKAS          |
| Radiated Spurious Emissions                | Pier-Angelo Lorusso | UKAS          |
| Modulation Requirements                    | Neil Rousell        | UKAS          |
| Transmitter Power                          | Neil Rousell        | UKAS          |

**Table 4**

Office Address:

TÜV SÜD  
Octagon House  
Concorde Way  
Fareham  
Hampshire  
PO15 5RL  
United Kingdom



2 Test Details

2.1 Bandwidths

2.1.1 Specification Reference

FCC 47 CFR Part 80, Clause 80.205  
FCC 47 CFR Part 2, Clause 2.1049  
ISED RSS-182, Clause 5.4  
ISED RSS-GEN, Clause 6.7

2.1.2 Equipment Under Test and Modification State

V200, S/N: S24070003 - Modification State 1

2.1.3 Date of Test

12-March-2025

2.1.4 Test Method

The test was applied in accordance with KDB 971168 D01, clause 4.3 and ANSI C63.26, clause 5.4.4.

2.1.5 Environmental Conditions

Ambient Temperature 19.9 °C  
Relative Humidity 33.6 %

2.1.6 Test Results

DC Powered - Radio

| 99% Occupied Bandwidth (kHz) |             |             |
|------------------------------|-------------|-------------|
| 156.300 MHz                  | 156.800 MHz | 157.425 MHz |
| 8.1                          | 8.1         | 8.1         |

Table 5

Table 6 - Occupied Bandwidth Results

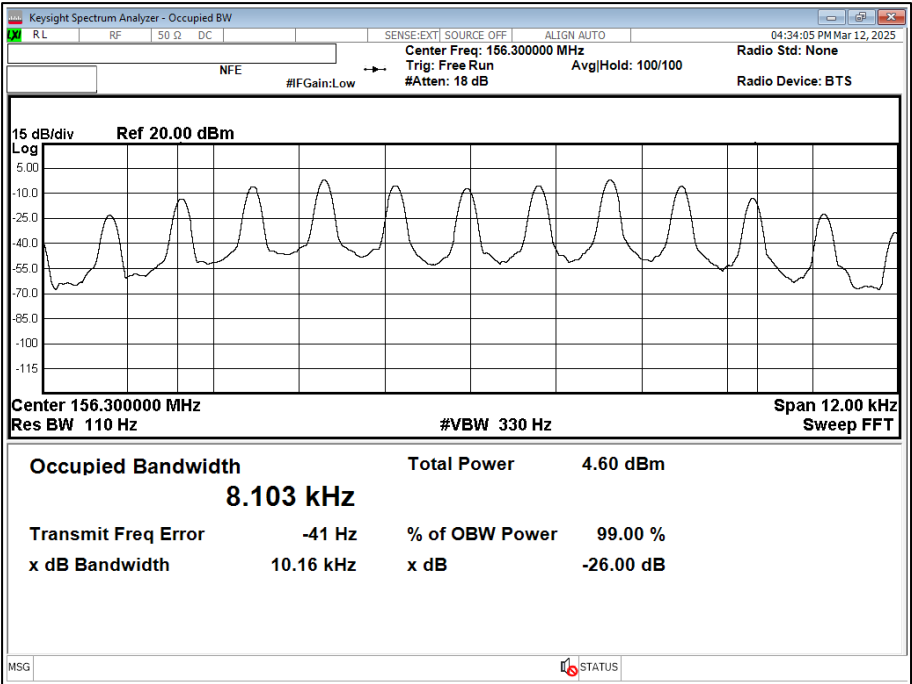


Figure 1 - 156.300 MHz Occupied Bandwidth

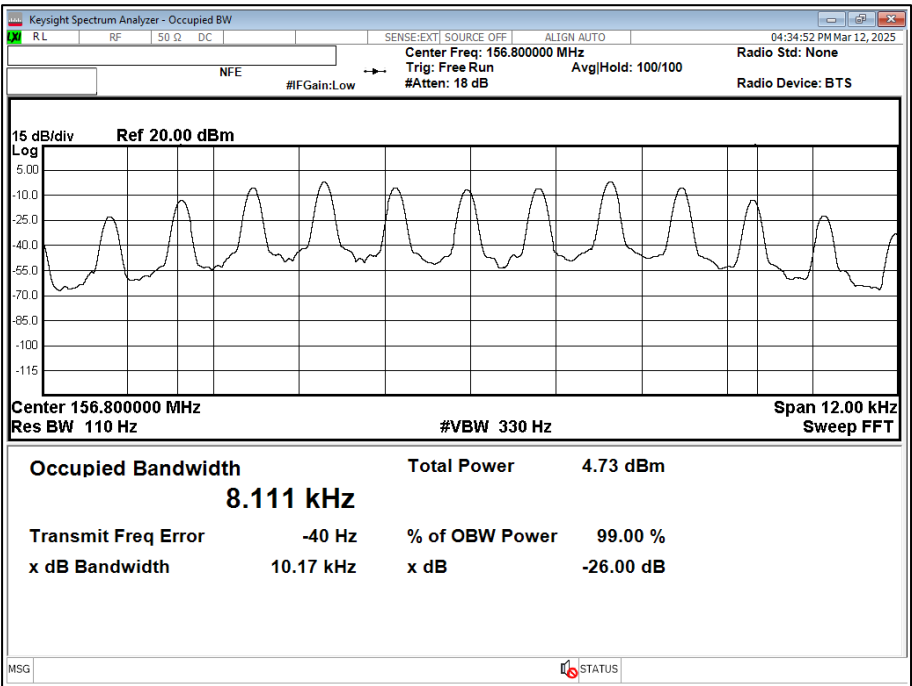


Figure 2 - 156.800 MHz Occupied Bandwidth

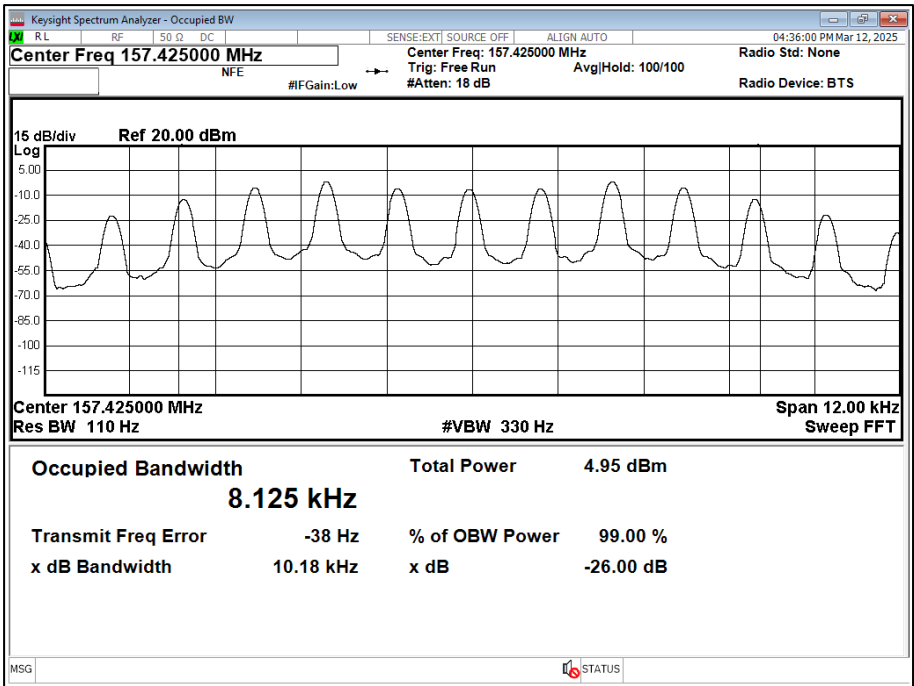


Figure 3 - 157.425 MHz Occupied Bandwidth

2.1.7 Specification Limits

FCC 47 CFR Part 80, Limit Clause 80.205

20 kHz

ISED RSS-182, Limit Clause 5.4

The authorized channel bandwidth for voice shall be 16 kHz.



### 2.1.8 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 2.

| Instrument                | Manufacturer          | Type No             | TE No | Calibration Period (months) | Calibration Expires |
|---------------------------|-----------------------|---------------------|-------|-----------------------------|---------------------|
| Power Supply Unit         | Farnell               | LB30-4              | 158   | 12                          | O/P Mon             |
| Audio Analyser            | Hewlett Packard       | 8903B               | 576   | 12                          | 04-Feb-2026         |
| Attenuator (20 dB, 150 W) | Narda                 | 769-20              | 3367  | 12                          | 02-Sep-2025         |
| Attenuator (10dB, 150W)   | Narda                 | 769-10              | 3368  | 12                          | 21-Mar-2025         |
| PXA Signal Analyser       | Keysight Technologies | N9030A              | 4654  | 12                          | 24-Feb-2026         |
| Thermo-Hygro-Barometer    | PCE Instruments       | PCE-THB 40          | 5604  | 12                          | 26-Nov-2025         |
| GPSDR Frequency standard  | Orolia                | SecureSync 2402-053 | 6339  | 6                           | 23-Mar-2025         |
| Multimeter                | Fluke                 | 115                 | 6343  | 12                          | 27-Feb-2026         |

**Table 7**

O/P Mon – Output Monitored using calibrated equipment



## **2.2 Transmitter Frequency Tolerances**

### **2.2.1 Specification Reference**

FCC 47 CFR Part 80, Clause 80.209 (a)  
FCC 47 CFR Part 2, Clause 2.1055 (a) (2), (d) (2)  
ISED RSS-182, Clause 5.5  
ISED RSS-GEN, Clause 6.11.

### **2.2.2 Equipment Under Test and Modification State**

V200, S/N: S24070003 - Modification State 0

### **2.2.3 Date of Test**

20-March-2025

### **2.2.4 Test Method**

The test was applied in accordance with ANSI C63.26, clause 5.6.

The EUT was connected to a frequency counter using an external 10 MHz frequency reference and was set to transmit on maximum power with an unmodulated carrier on channel 16 (156.8 MHz).

The difference between the frequency of the fundamental and the frequency of the assigned channel in accordance with the manufacture's documentation was recorded.

In accordance with 2.1055, the temperature was varied from -20°C to +50° in 10° steps at the nominal battery voltage (6.0 VDC) and at the battery endpoint voltage at 20°C.

### **2.2.5 Environmental Conditions**

|                     |         |
|---------------------|---------|
| Ambient Temperature | 21.7 °C |
| Relative Humidity   | 37.0 %  |



## 2.2.6 Test Results

### DC Powered - Radio

| Voltage            | Frequency Error (ppm) |
|--------------------|-----------------------|
| 3.0 VDC (Endpoint) | -1.44                 |

**Table 8 Frequency Stability Under Voltage Variations**

| Temperature | Frequency Error (ppm) |
|-------------|-----------------------|
| -20 °C      | -0.68                 |
| -10 °C      | -0.46                 |
| 0 °C        | -0.40                 |
| 10 °C       | -0.31                 |
| 20 °C       | -0.26                 |
| 30 °C       | -0.20                 |
| 40 °C       | -0.16                 |
| 50 °C       | -0.17                 |

**Table 9 Frequency Stability Under Temperature Variations**

## 2.2.7 Specification Limits

### FCC 47 CFR Part 80, Limit Clause 80.209

± 10 ppm.

### ISED RSS-182, Limit Clause 5.5

Coast Station: ±10.0 ppm for transmitter power less than 3 W.  
±5.0 ppm for transmitter power between 3 W and 50 W.

Ship Station: ±10 ppm.



### 2.2.8 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 2.

| Instrument                  | Manufacturer    | Type No             | TE No | Calibration Period (months) | Calibration Expires |
|-----------------------------|-----------------|---------------------|-------|-----------------------------|---------------------|
| Counter                     | Hewlett Packard | 53181A              | 159   | 12                          | 05-Sep-2025         |
| Climatic Chamber            | Votsch          | VT4002              | 161   | -                           | O/P Mon             |
| Thermocouple Thermometer    | Fluke           | 51                  | 3173  | 12                          | 31-May-2025         |
| Quad Power Supply           | Rohde & Schwarz | HMP4040             | 4954  | -                           | O/P Mon             |
| Attenuator 5W 30dB DC-18GHz | Aaren           | AT40A-4041-D18-30   | 5504  | 12                          | 16-Jul-2025         |
| Thermo-Hygro-Barometer      | PCE Instruments | PCE-THB 40          | 5604  | 12                          | 26-Nov-2025         |
| GPSDR Frequency standard    | Orolia          | SecureSync 2402-053 | 6339  | 6                           | 18-Sep-2025         |
| Multimeter                  | Fluke           | 115                 | 6343  | 12                          | 27-Feb-2026         |

**Table 10**

O/P Mon – Output Monitored using calibrated equipment



## **2.3 Spurious Emissions at Antenna Terminals**

### **2.3.1 Specification Reference**

FCC 47 CFR Part 80, Clause 80.211  
FCC 47 CFR Part 2, Clause 2.1051  
SED RSS-182, Clause 5.9  
ISED RSS-GEN, Clause 6.13

### **2.3.2 Equipment Under Test and Modification State**

V200, S/N: S24070003 - Modification State 1

### **2.3.3 Date of Test**

13-March-2025

### **2.3.4 Test Method**

For emissions where the frequency is removed less than 250% of the authorized bandwidth measurements were performed conducted as follows:

The EUT was connected to a spectrum analyzer via a cable and attenuator.

The path loss between the EUT and analyzer was calibrated using a network analyzer and entered into the spectrum analyzer as a reference level offset.

The reference level for the mask was established with an RBW approximately 2 or 3 times the emission bandwidth.

The mask as per ISED RSS 182, Clause 5.9. Mask B for voice was applied as a worst case.

For emissions where the frequency is removed more than 250% of the authorized bandwidth measurements were performed both conducted and radiated as follows:

The EUT was connected to a spectrum analyzer via an attenuator and cable. A high pass filter was added for measurements between 300 MHz and 2 GHz.

The spectrum analyzer was configured with an RBW of 100 kHz below 1 GHz and 1 MHz for frequencies greater than 1 GHz with the trace set to max hold using a peak detector.

### **2.3.5 Environmental Conditions**

|                     |         |
|---------------------|---------|
| Ambient Temperature | 21.6 °C |
| Relative Humidity   | 31.2 %  |



2.3.6 Test Results

DC Powered - Radio

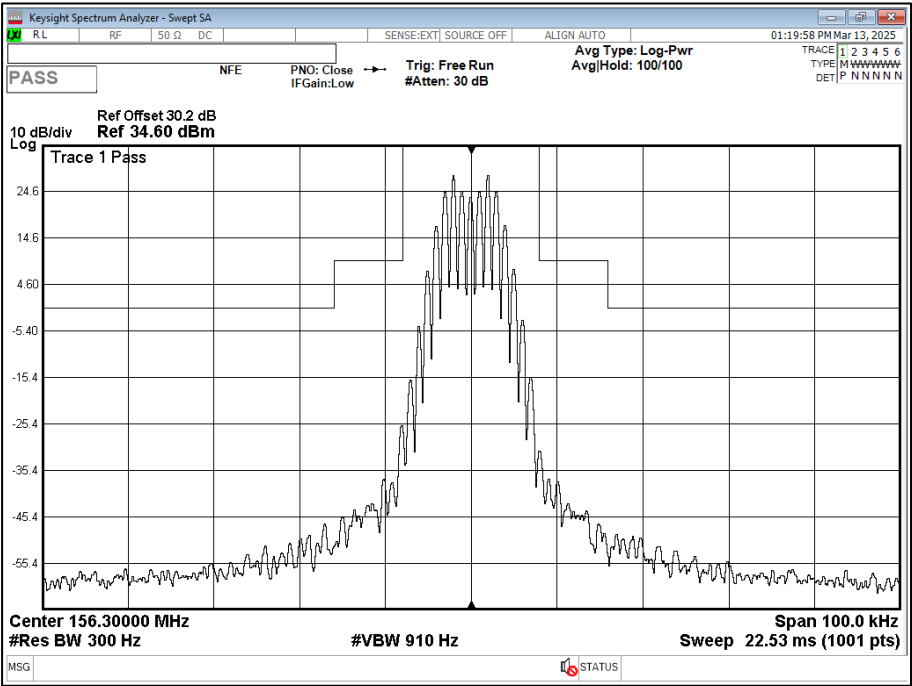


Figure 4 - 156.300 MHz - Transmitter Spectrum Mask

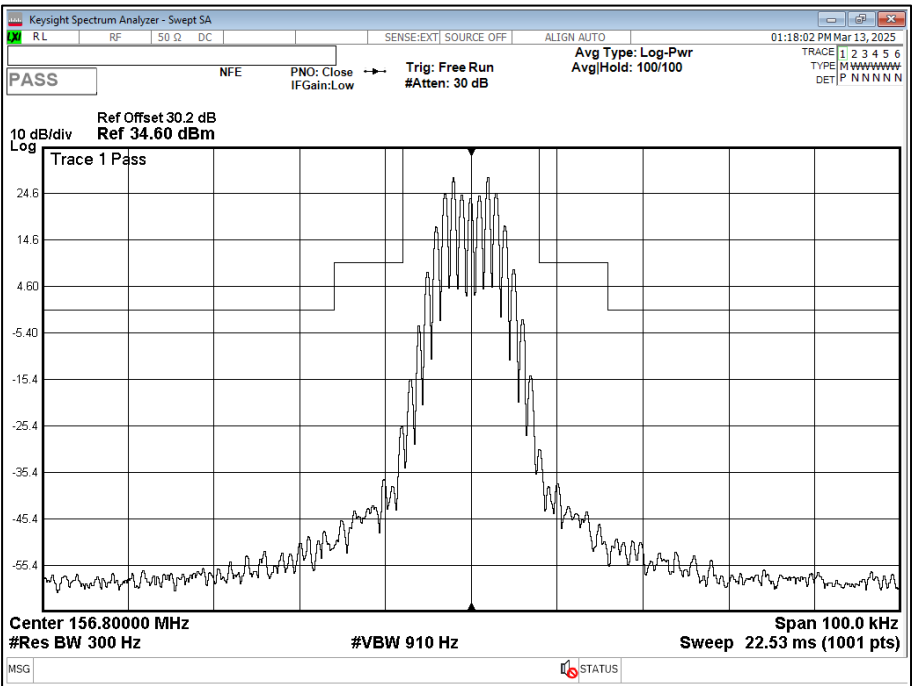


Figure 5 - 156.800 MHz - Transmitter Spectrum Mask

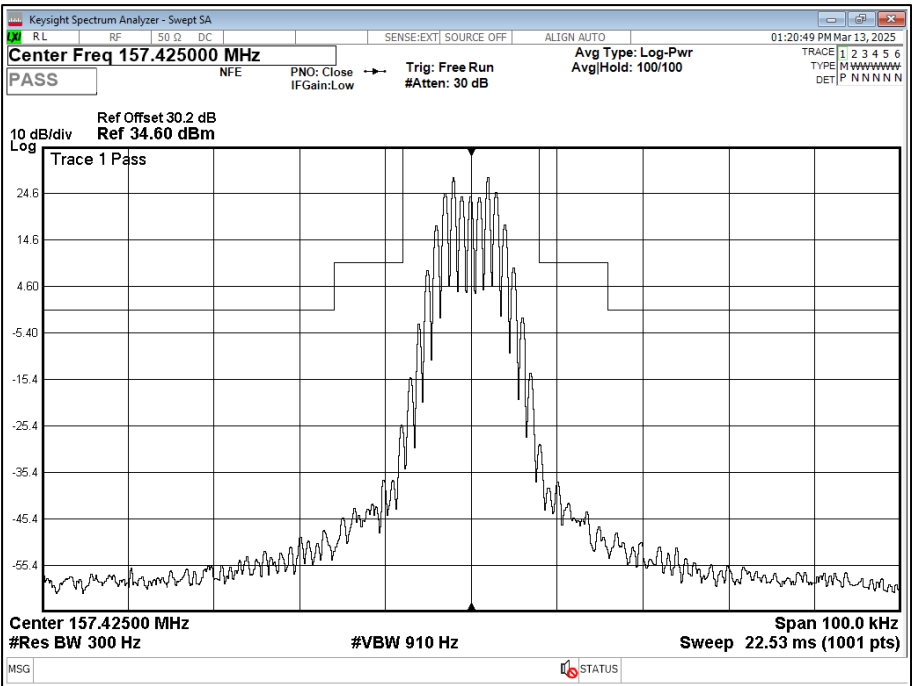


Figure 6 - 157.425 MHz - Transmitter Spectrum Mask

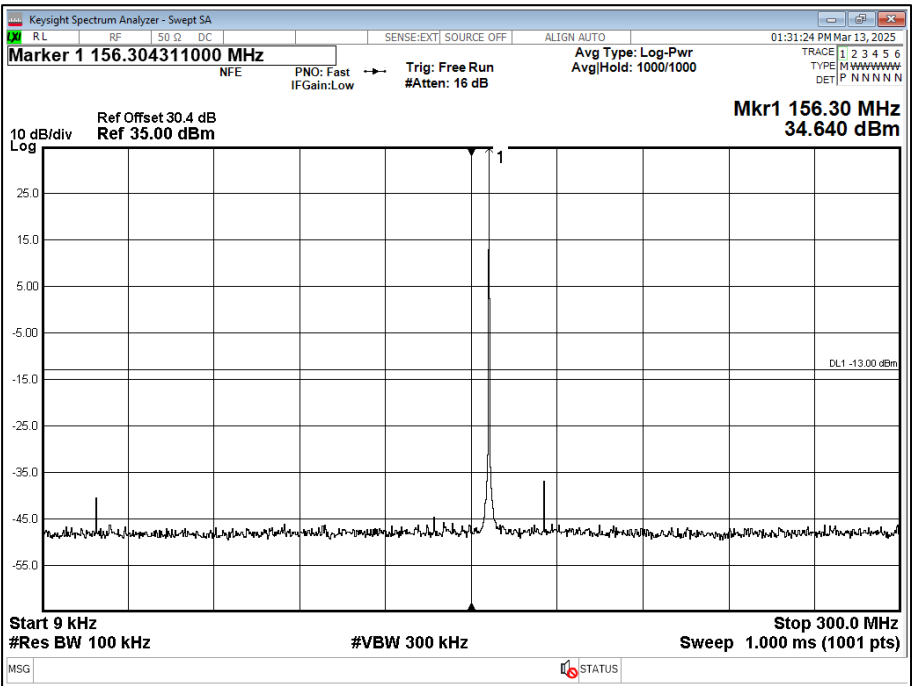


Figure 7 - 156.300 MHz - 9 kHz to 300 MHz

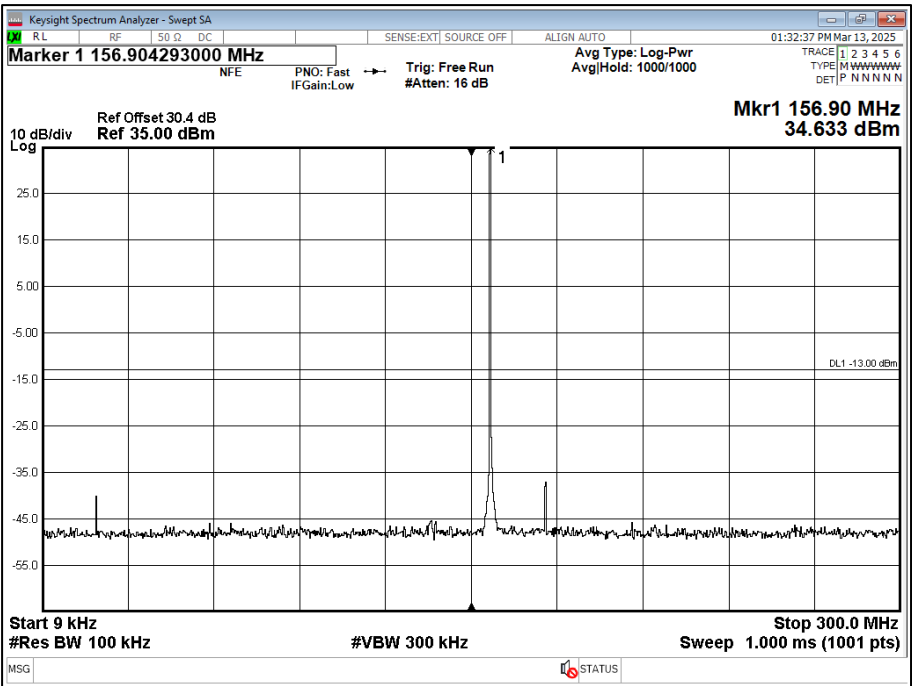


Figure 8 - 156.800 MHz - 9 kHz to 300 MHz

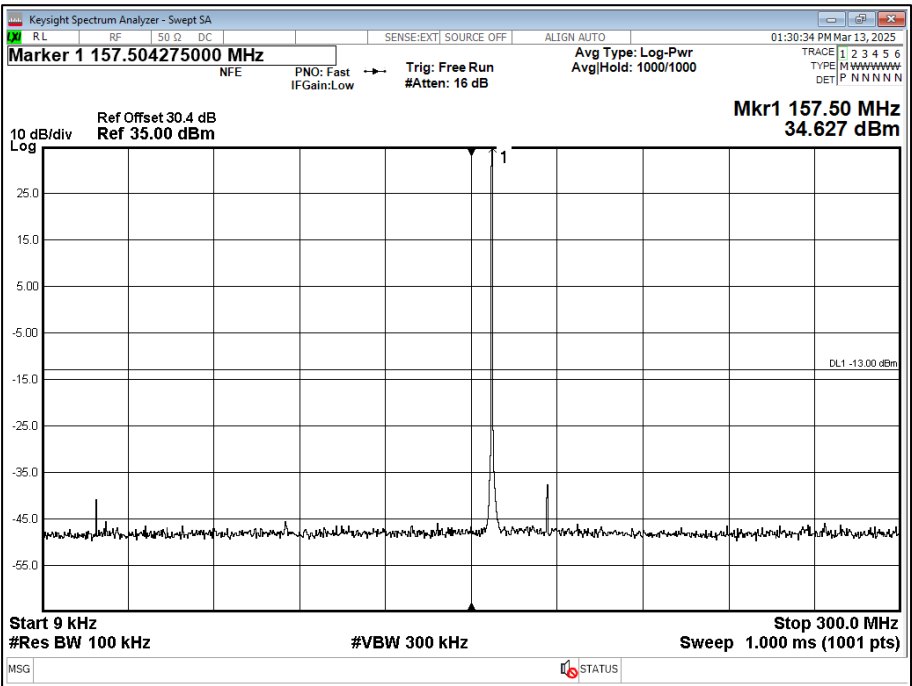


Figure 9 - 157.425 MHz - 9 kHz to 300 MHz

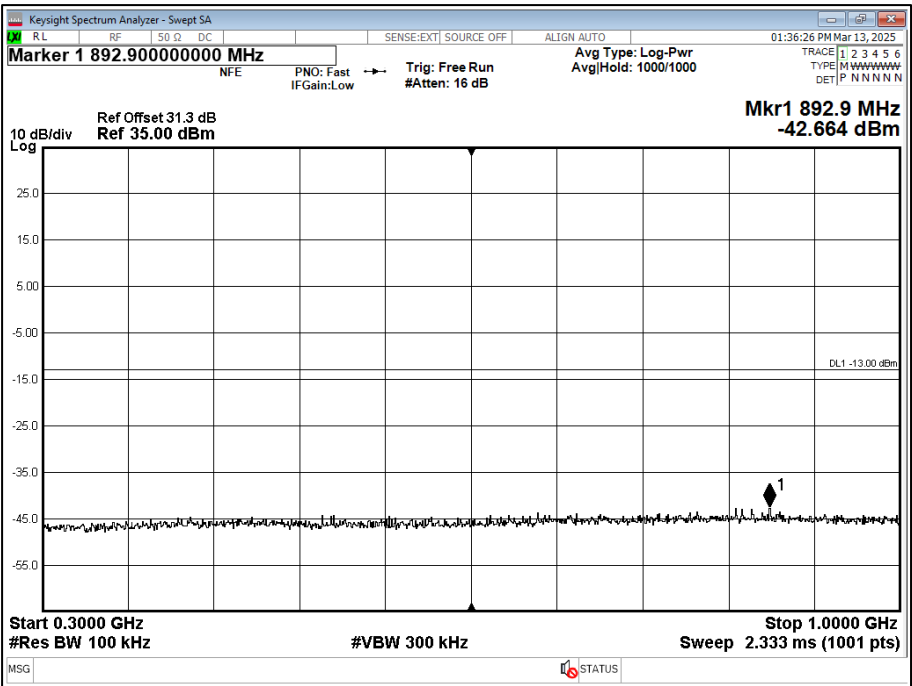


Figure 10 - 156.300 MHz - 300 MHz to 1 GHz

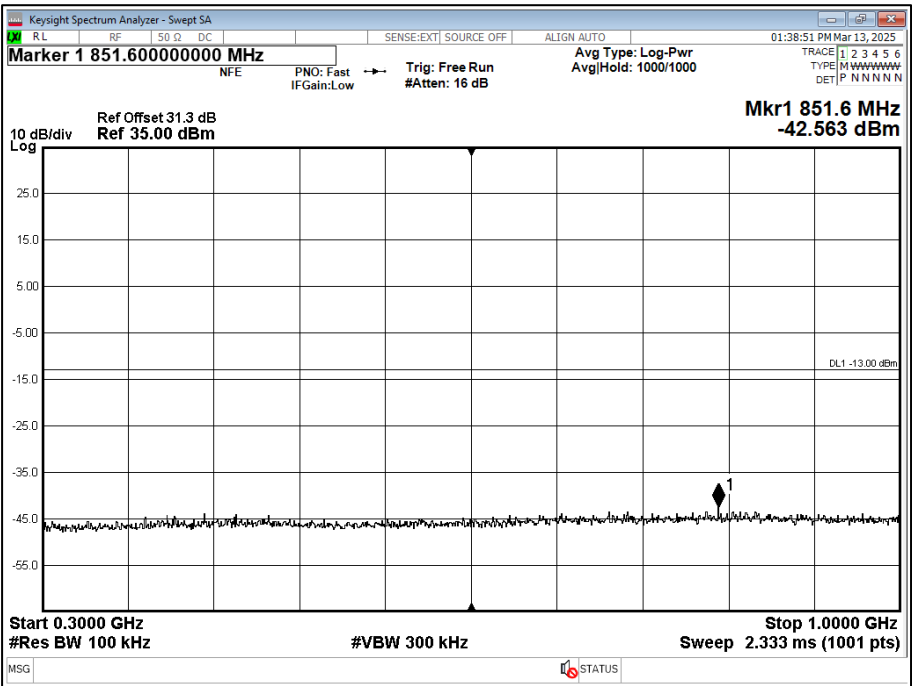


Figure 11 - 156.800 MHz - 300 MHz to 1 GHz

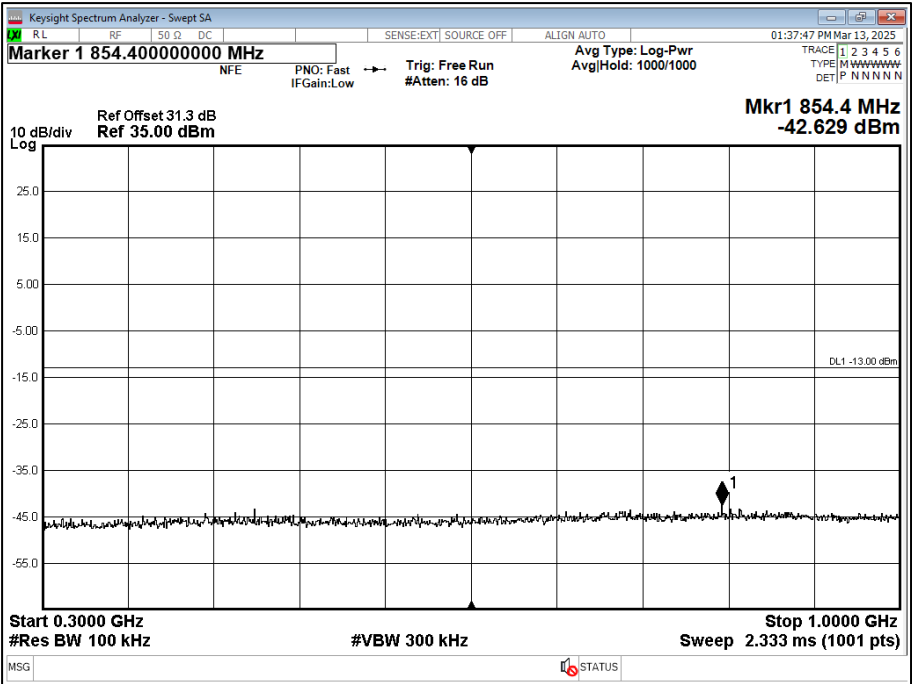


Figure 12 - 157.425 MHz - 300 MHz to 1 GHz

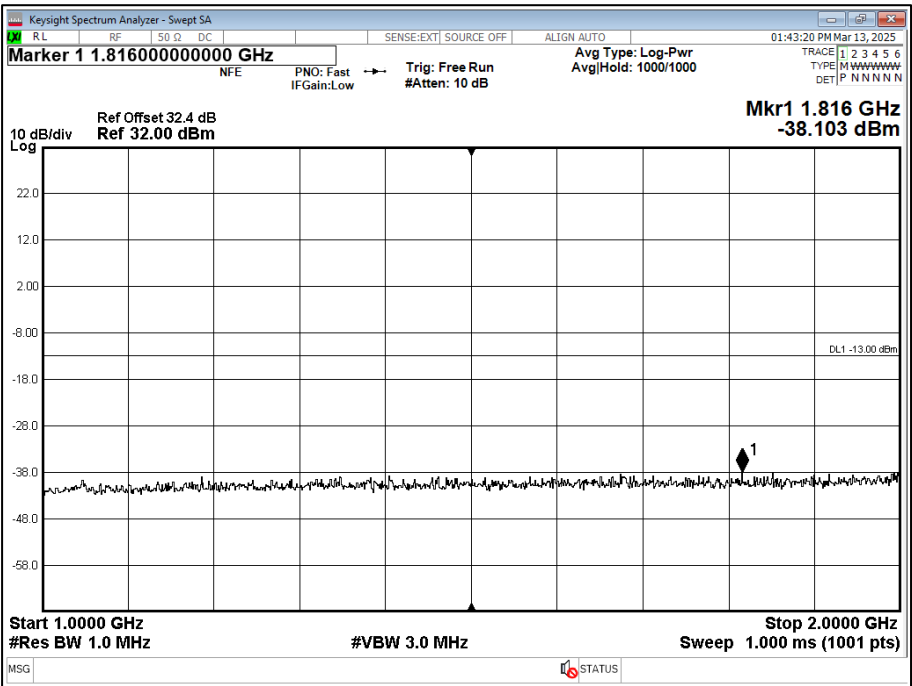


Figure 13 - 156.300 MHz - 1 GHz to 2 GHz

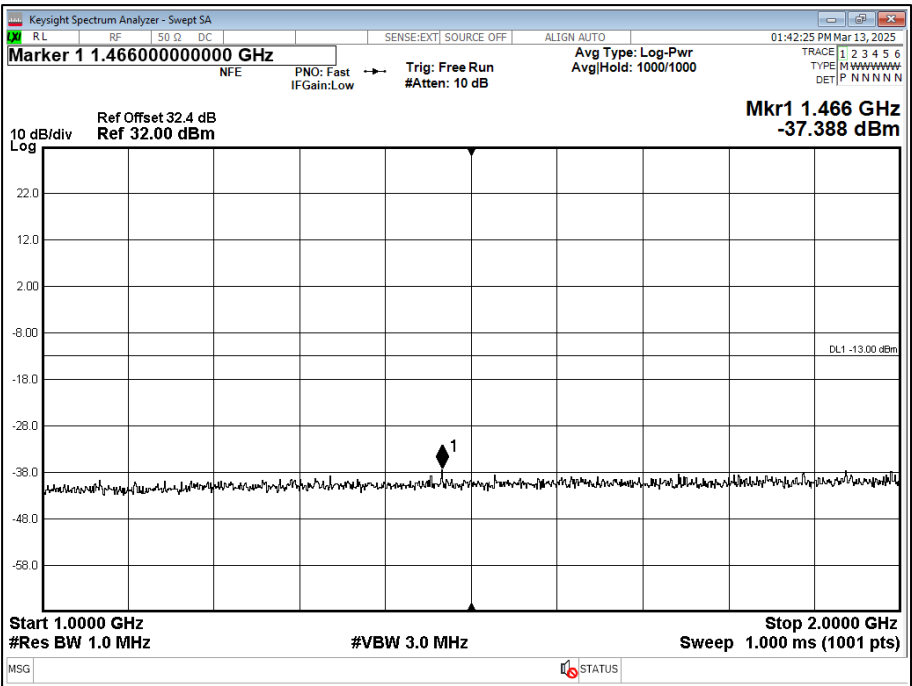


Figure 14 - 156.800 MHz - 1 GHz to 2 GHz

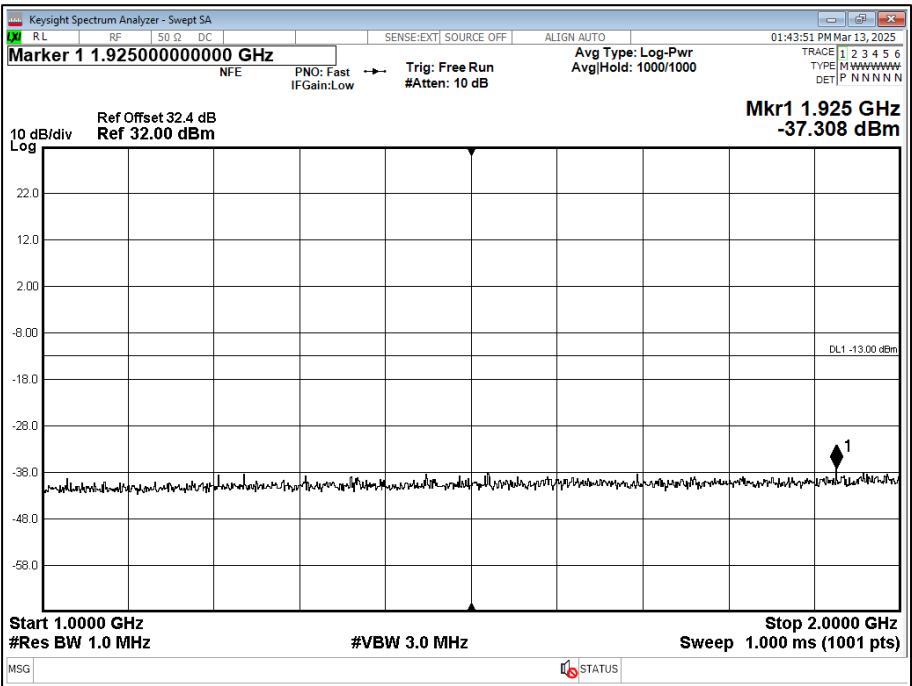


Figure 15 - 157.425 MHz - 1 GHz to 2 GHz



### **2.3.7 Specification Limits**

#### FCC 47 CFR Part 80, Limit Clause 80.211

Within 250% of the Authorised Bandwidth:

On any frequency removed from the assigned frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: At least 25 dB;

On any frequency removed from the assigned frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: At least 35 dB

More than 250% of the Authorised Bandwidth:

On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 plus  $10\log_{10}$  (mean power in watts) dB.

#### ISED RSS-182, Limit Clause 5.9.1

On any frequency removed from the carrier frequency by more than 50%, but not more than 100% of the authorized bandwidth: at least 25 dB, measured with a bandwidth of 300 Hz.

On any frequency removed from the carrier frequency by more than 100%, but not more than 250% of the authorized bandwidth: at least 35 dB, measured with a bandwidth of 300 Hz.

On any frequency removed from the carrier frequency by more than 250% of the authorized bandwidth: at least  $43 + 10 \log_{10} p(\text{watts})$  dB, measured with a bandwidth of 30 kHz.



### 2.3.8 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 2.

| Instrument                    | Manufacturer          | Type No             | TE No | Calibration Period (months) | Calibration Expires |
|-------------------------------|-----------------------|---------------------|-------|-----------------------------|---------------------|
| Power Supply Unit             | Farnell               | LB30-4              | 158   | 12                          | O/P Mon             |
| Audio Analyser                | Hewlett Packard       | 8903B               | 576   | 12                          | 04-Feb-2026         |
| Attenuator (20 dB, 150 W)     | Narda                 | 769-20              | 3367  | 12                          | 02-Sep-2025         |
| Attenuator (10dB, 150W)       | Narda                 | 769-10              | 3368  | 12                          | 21-Mar-2025         |
| PXA Signal Analyser           | Keysight Technologies | N9030A              | 4654  | 12                          | 24-Feb-2026         |
| Network Analyser              | Keysight Technologies | E5063A              | 5018  | 12                          | 23-Oct-2025         |
| Electronic Calibration Module | Keysight Technologies | 85093C              | 5188  | 12                          | 07-Feb-2026         |
| 300 MHz High Pass Filter      | Mini-Circuits         | NHP-300             | 5532  | 12                          | 28-May-2025         |
| Thermo-Hygro-Barometer        | PCE Instruments       | PCE-THB 40          | 5604  | 12                          | 26-Nov-2025         |
| GPSDR Frequency standard      | Orolia                | SecureSync 2402-053 | 6339  | 6                           | 23-Mar-2025         |
| Multimeter                    | Fluke                 | 115                 | 6343  | 12                          | 27-Feb-2026         |

**Table 11**

O/P Mon – Output Monitored using calibrated equipment



## **2.4 Radiated Spurious Emissions**

### **2.4.1 Specification Reference**

FCC 47 CFR Part 80, Clause 80.211  
FCC 47 CFR Part 2, Clause 2.1051  
ISED RSS-182 Clause 5.9.1  
ISED RSS-GEN, Clause 6.13

### **2.4.2 Equipment Under Test and Modification State**

V200, S/N: S24070003 - Modification State 0

### **2.4.3 Date of Test**

24-March-2025

### **2.4.4 Test Method**

A preliminary profile of the Radiated Spurious Emissions was obtained up to the 10th harmonic by operating the EUT on a remotely controlled turntable within a semi-anechoic chamber.

Measurements of emissions from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations.

As the EUT was considered mobile/portable and therefore reasonable to be used in multiple planes, pre-scans were performed with the EUT orientated in X, Y and Z planes with reference to the ground plane. Testing was performed in accordance with ANSI C63.26, Clause 5.5.

The EUT was powered by customer supplied internal Lithium Battery with Nominal voltage of 6 VDC.

Prescans and final measurements were performed using the direct field strength method. Field strength measurements were performed and then converted to Equivalent Power Measurements in accordance with ANSI C63.26, Clause 5.2.7 equation c)

Example calculation:

$E \text{ (dBuV/m)} + 20\log(d) - 104.8 = \text{EIRP (dBm)}$  where (d) is the measurement distance.

$82.2 \text{ (dBuV/m)} + 20\log(3) - 104.8 = \text{EIRP (dBm)}$

$-13.0 = \text{EIRP (dBm)}$

## 2.4.5 Example Test Setup Diagram

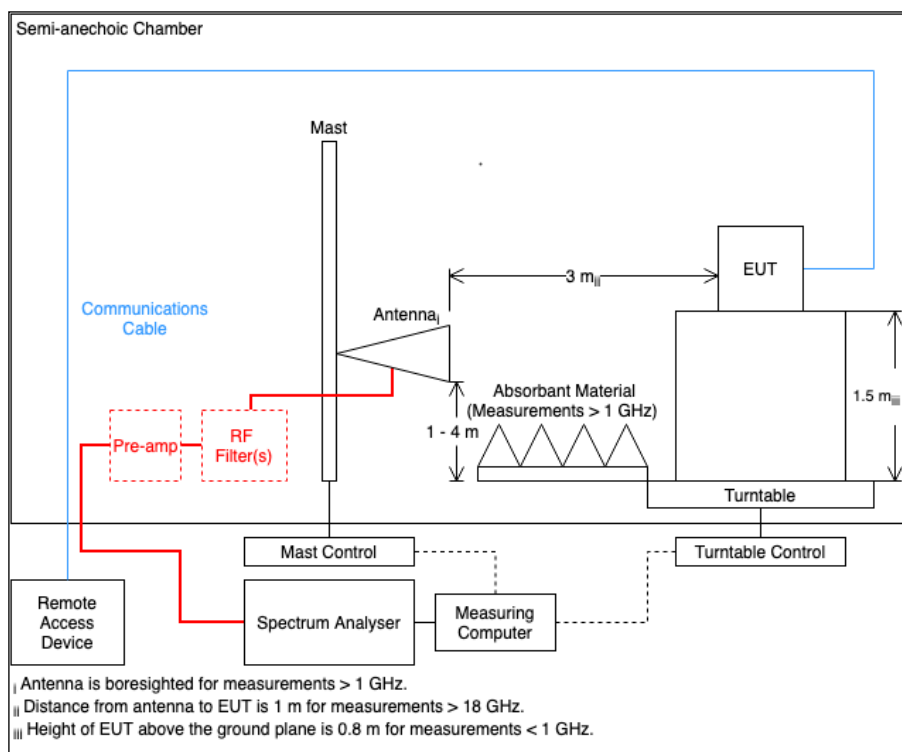


Figure 16

## 2.4.6 Environmental Conditions

|                     |         |
|---------------------|---------|
| Ambient Temperature | 22.3 °C |
| Relative Humidity   | 36.7 %  |



2.4.7 Test Results

DC Powered – Radio (Bottom Channel 156.3MHz)

| Frequency (MHz) | Level (dBm) |
|-----------------|-------------|
| *               |             |

Table 12 Emissions Results

\*No emissions were detected within 10 dB of the limit.

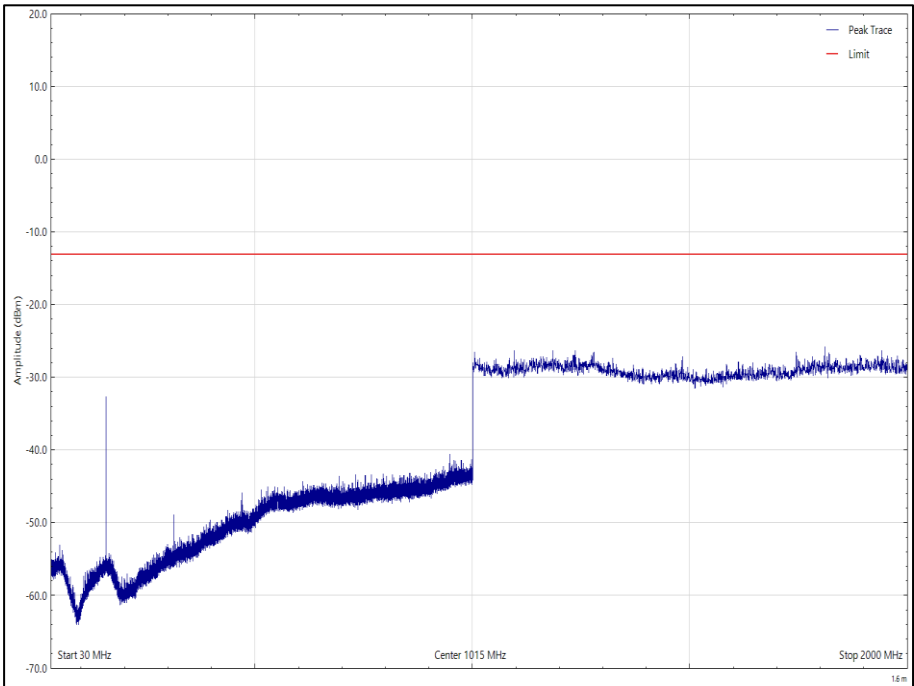


Figure 17 - 30 MHz to 2 GHz Horizontal X Plane (Bottom Channel 156.3MHz)

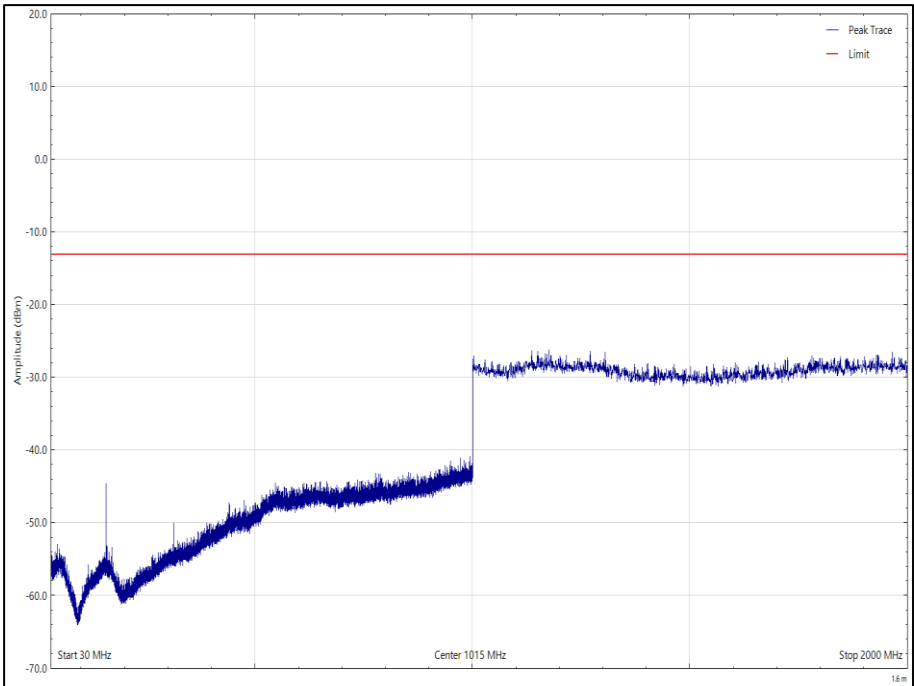


Figure 18 - 30 MHz to 2 GHz Vertical X Plane (Bottom Channel 156.3MHz)

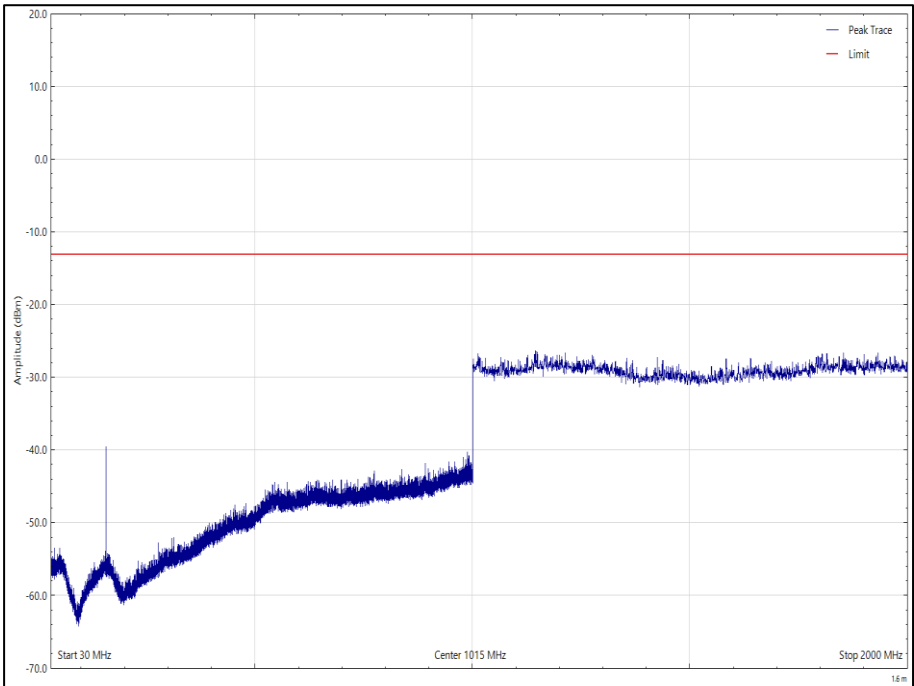


Figure 19 - 30 MHz to 2 GHz Horizontal Y Plane (Bottom Channel 156.3MHz)

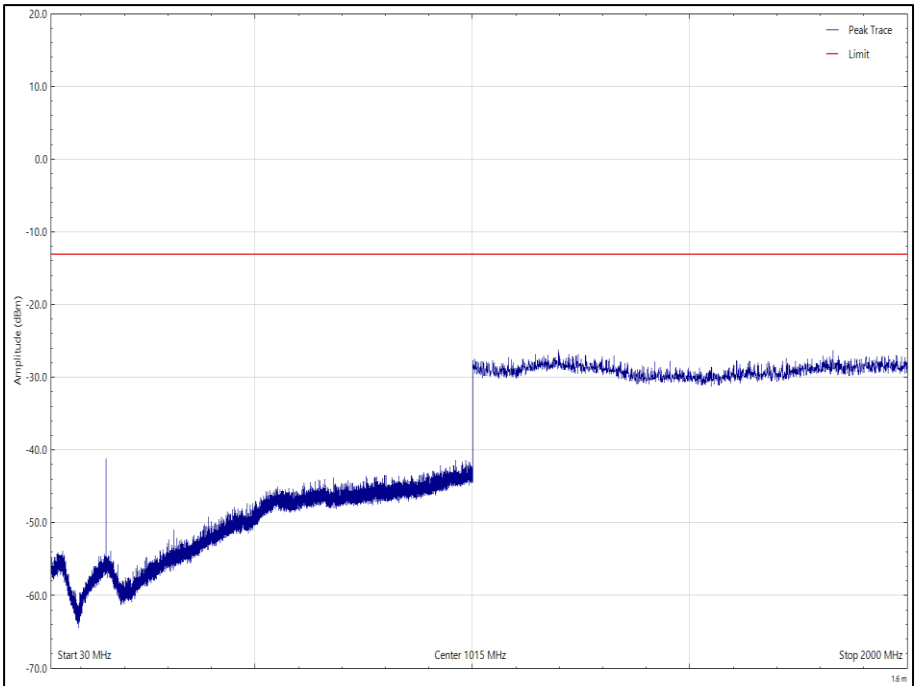


Figure 20 - 30 MHz to 2 GHz Vertical Y Plane (Bottom Channel 156.3MHz)

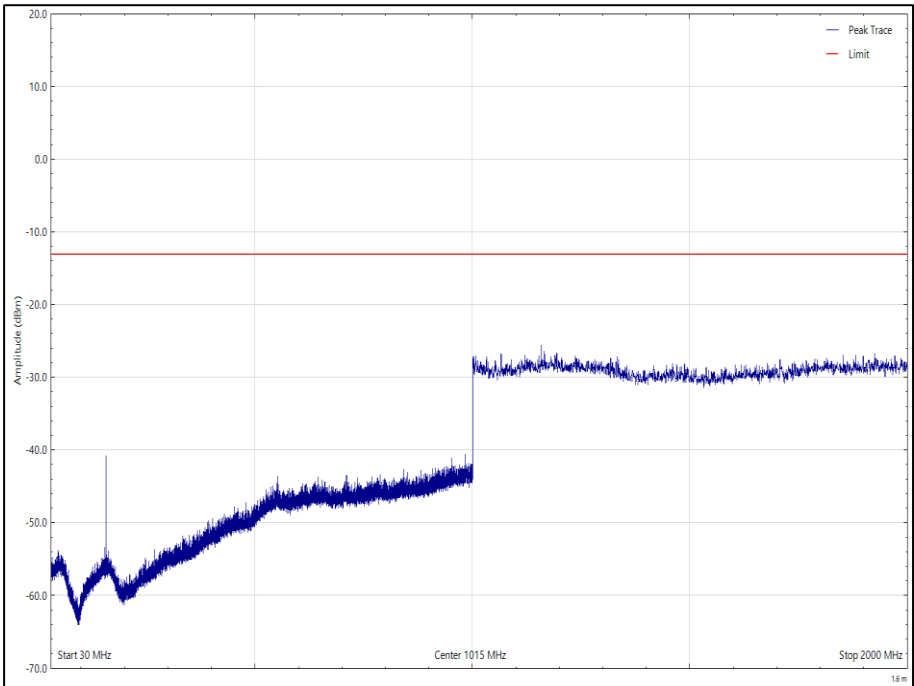


Figure 21 - 30 MHz to 2 GHz Horizontal Z Plane (Bottom Channel 156.3MHz)

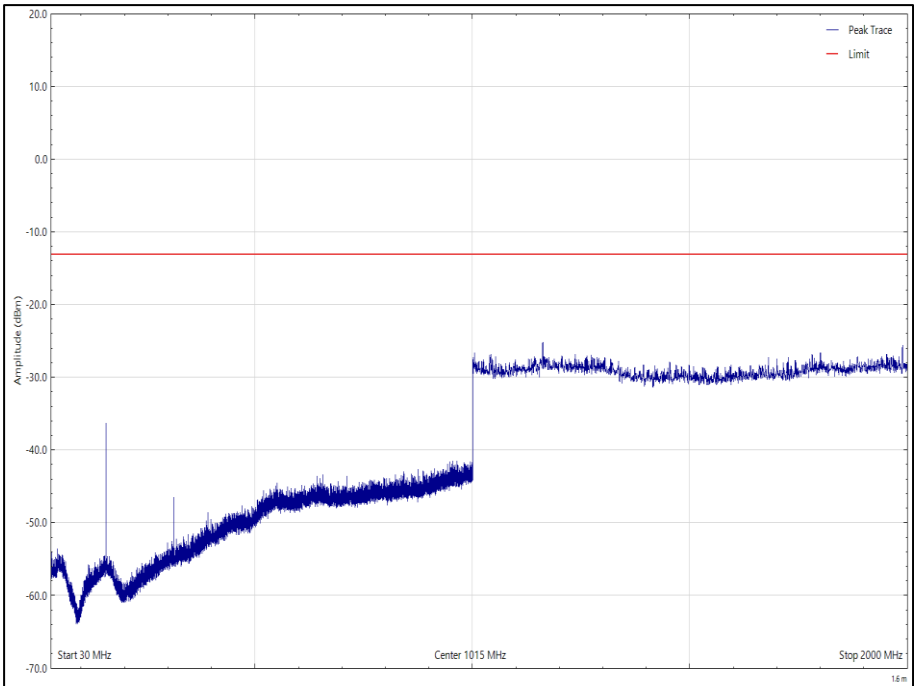


Figure 22 - 30 MHz to 2 GHz Vertical Z Plane (Bottom Channel 156.3MHz)



DC Powered – Radio (Top Channel 157.425MHz)

| Frequency (MHz) | Level (dBm) |
|-----------------|-------------|
| *               |             |

Table 13 Emissions Results

\*No emissions were detected within 10 dB of the limit.

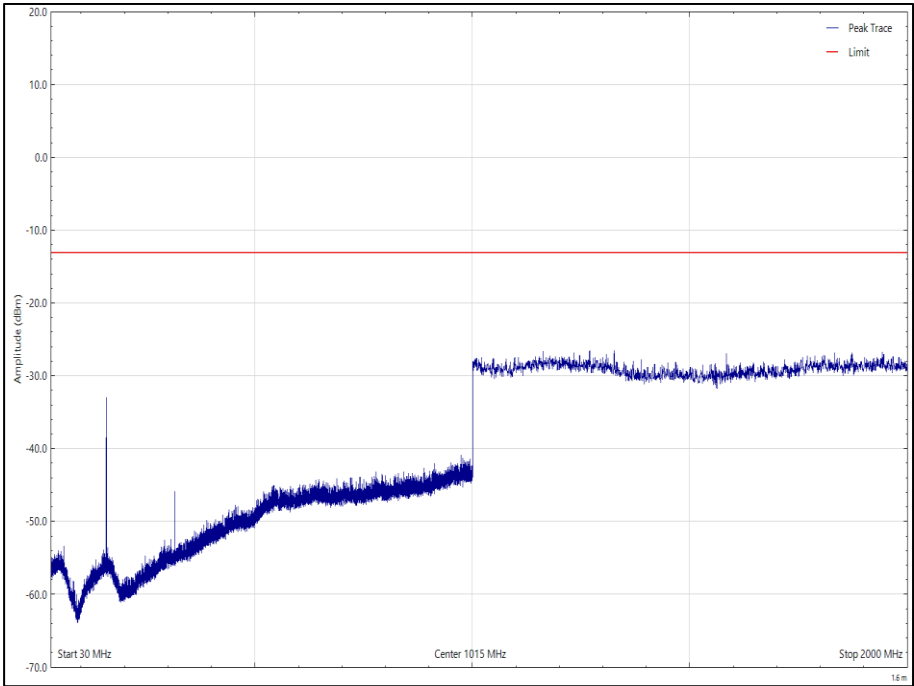


Figure 23 - 30 MHz to 2 GHz Horizontal X Plane (Top Channel 157.425MHz)

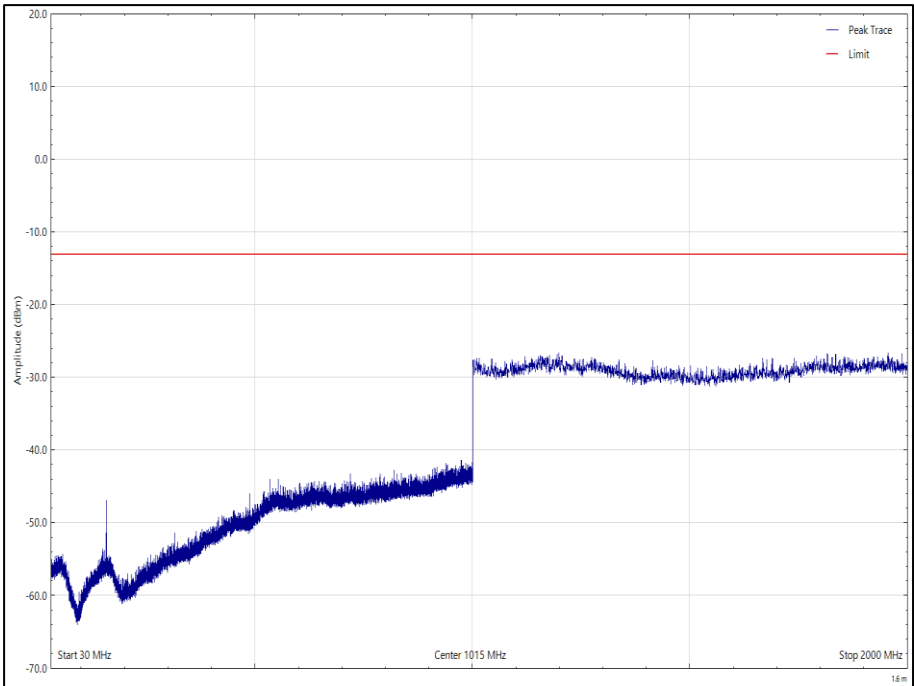


Figure 24 - 30 MHz to 2 GHz Vertical X Plane (Top Channel 157.425MHz)

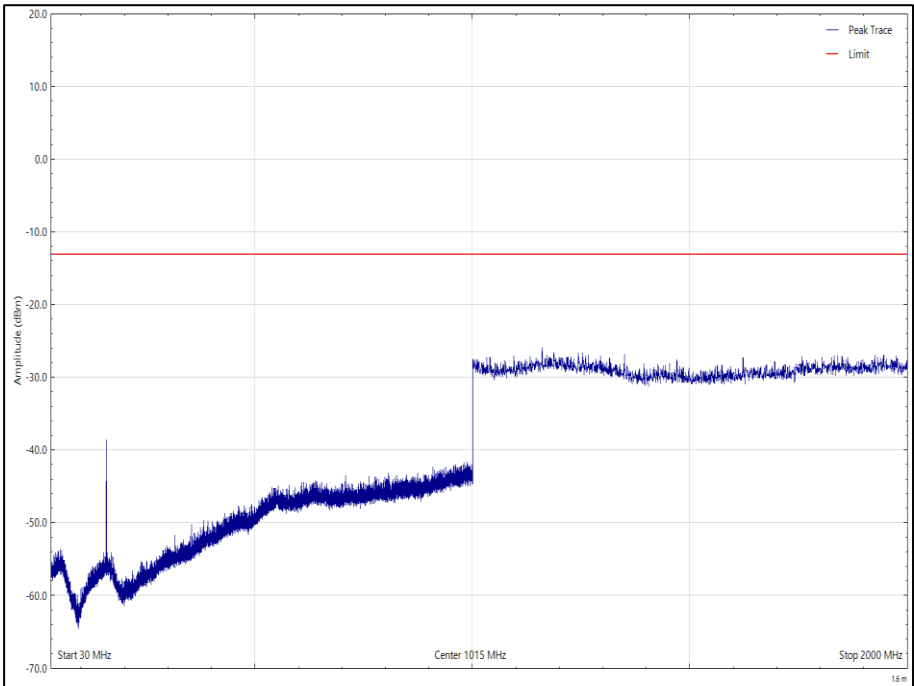


Figure 25 - 30 MHz to 2 GHz Horizontal Y Plane (Top Channel 157.425MHz)

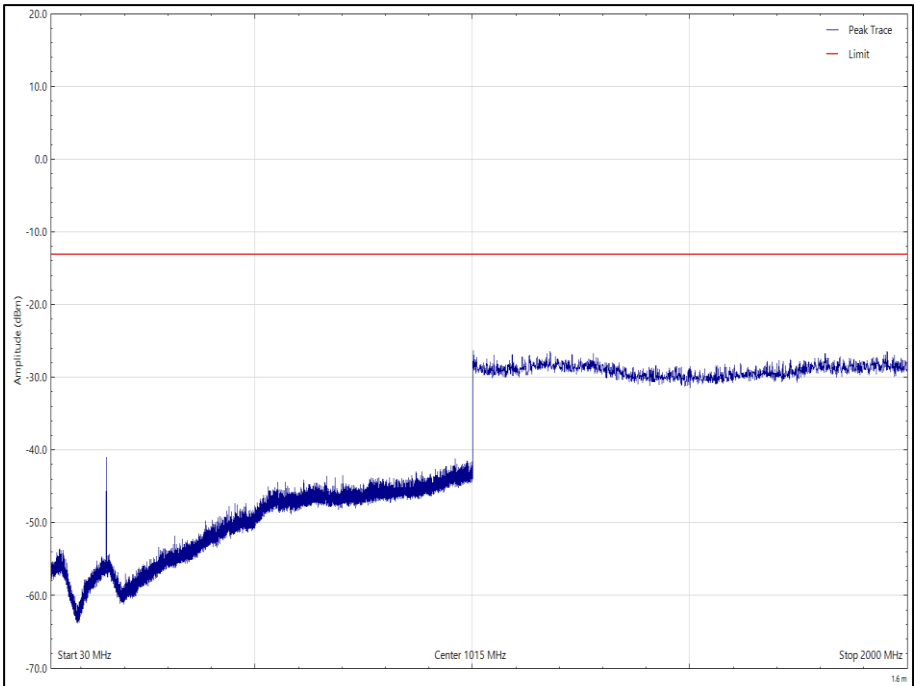


Figure 26 - 30 MHz to 2 GHz Vertical Y Plane (Top Channel 157.425MHz)

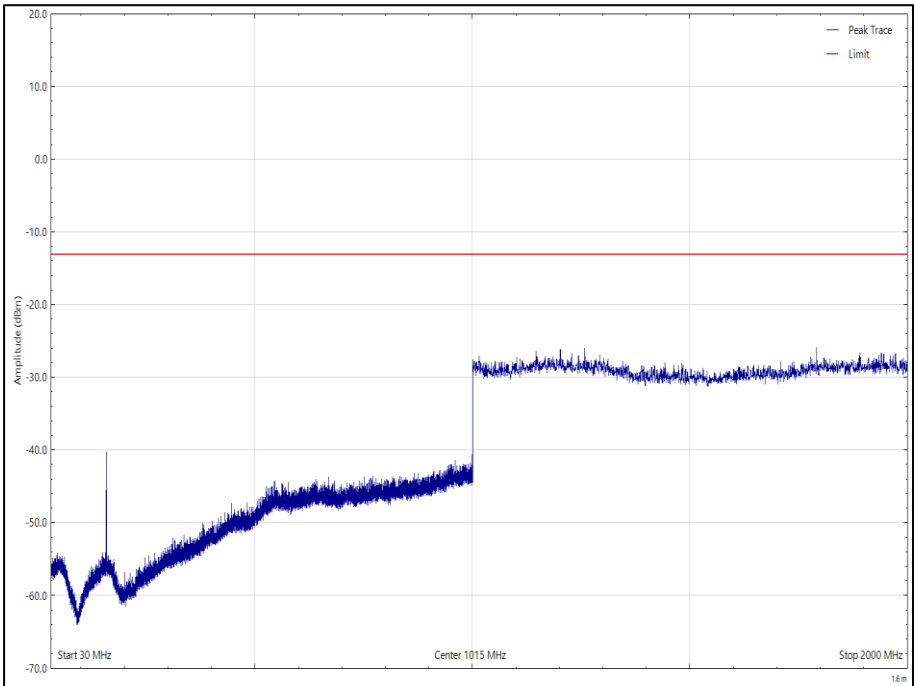
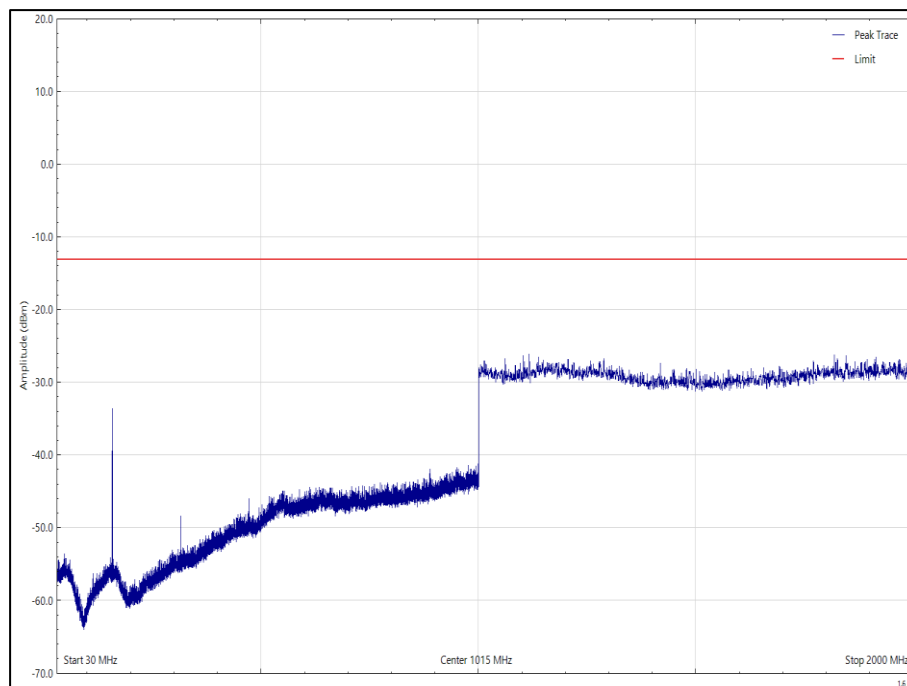


Figure 27 - 30 MHz to 2 GHz Horizontal Z Plane (Top Channel 157.425MHz)



**Figure 28 - 30 MHz to 2 GHz Vertical Z Plane (Top Channel 157.425MHz)**

#### **2.4.8 Specification Limits**

FCC 47 CFR Part 80, Limit Clause 80.211

More than 250% of the Authorised Bandwidth:

On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 plus  $10\log_{10}$  (mean power in watts) dB.

ISED RSS-182, Limit Clause 5.9.1

On any frequency removed from the carrier frequency by more than 250% of the authorized bandwidth: at least  $43 + 10 \log_{10} p(\text{watts})$  dB, measured with a bandwidth of 30 kHz.



#### 2.4.9 Test Location and Test Equipment Used

This test was carried out in RF Chamber 11.

| Instrument                          | Manufacturer    | Type No              | TE No | Calibration Period (months) | Calibration Expires |
|-------------------------------------|-----------------|----------------------|-------|-----------------------------|---------------------|
| Hygrometer                          | Rotronic        | I-1000               | 3220  | 12                          | 02-Dec-2025         |
| Emissions Software                  | TUV SUD         | EmX V3.4.2           | 5125  | -                           | Software            |
| 3m Semi-Anechoic Chamber            | Rainford        | RF Chamber 11        | 5136  | 36                          | 14-Nov-2027         |
| Mast                                | Maturo          | TAM 4.0-P            | 5158  | -                           | TU                  |
| Mast and Turntable Controller       | Maturo          | Maturo NCD           | 5159  | -                           | TU                  |
| Turntable                           | Maturo          | TT 15WF              | 5160  | -                           | TU                  |
| Antenna (DRG, 1 GHz to 10.5 GHz)    | Schwarzbeck     | BBHA9120B            | 5215  | 12                          | 14-Jul-2025         |
| Test Receiver                       | Rohde & Schwarz | ESW44                | 5382  | 12                          | 09-Sep-2025         |
| Cable (SMA to SMA, 2 m)             | Junkosha        | MWX221-02000AMSAMS/A | 5518  | 12                          | 18-Apr-2025         |
| Termination, N-Type(M) 25W, DC-3GHz | Aaren           | AT40T-10H03          | 6568  | 12                          | 19-Jun-2025         |
| Trilog Super Broadband Test Antenna | Schwarzbeck     | VULB 9168            | 6635  | 24                          | 13-Jun-2025         |
| 8m Cable                            | Scott Cables    | SCB800-A-NMNM-08.00M | 6714  | 6                           | 06-Jun-2025         |

**Table 14**

TU - Traceability Unscheduled



## **2.5 Modulation Requirements**

### **2.5.1 Specification Reference**

FCC 47 CFR Part 80, Clause 80.213  
FCC 47 CFR Part 2, Clause 2.1047  
ISED RSS-182, Clause 5.4  
ISED RSS-GEN, Clause N/A

### **2.5.2 Equipment Under Test and Modification State**

V200, S/N: S24070003 - Modification State 0

### **2.5.3 Date of Test**

21-March-2025

### **2.5.4 Test Method**

#### DC Powered – Radio

This test was carried out in accordance with FCC CFR 47 Part 80.213 and Part 2.1047 (a), (b) & (c).

The EUT was connected to a spectrum analyser in FM demod mode via a cable and attenuator and was configured to transmit at maximum power on the channel 16 (156.8 MHz).

#### Audio frequency response

A modulation signal, at a frequency of 1 kHz adjusted in level to produce a frequency deviation of  $\pm 1$  kHz, was applied to the EUT. The modulation frequency was then be varied between 100 Hz and 3 kHz, keeping the audio input level constant.

#### Maximum frequency deviation

The modulation frequency was varied between 100 Hz and 3 kHz. The level of this test signal was 20 dB above the level which produced a modulation signal, at a frequency of 1 kHz with a frequency deviation of  $\pm 3$  kHz.

#### Reduction of frequency deviation at modulation frequencies above 3 kHz

A modulation signal, at a frequency of 1 kHz with a frequency deviation of  $\pm 3$  kHz, was applied to the EUT. The frequency was varied from 3 kHz to 25 kHz.

### **2.5.5 Environmental Conditions**

|                     |         |
|---------------------|---------|
| Ambient Temperature | 22.5 °C |
| Relative Humidity   | 38.5 %  |



2.5.6 Test Results

DC Powered - Radio

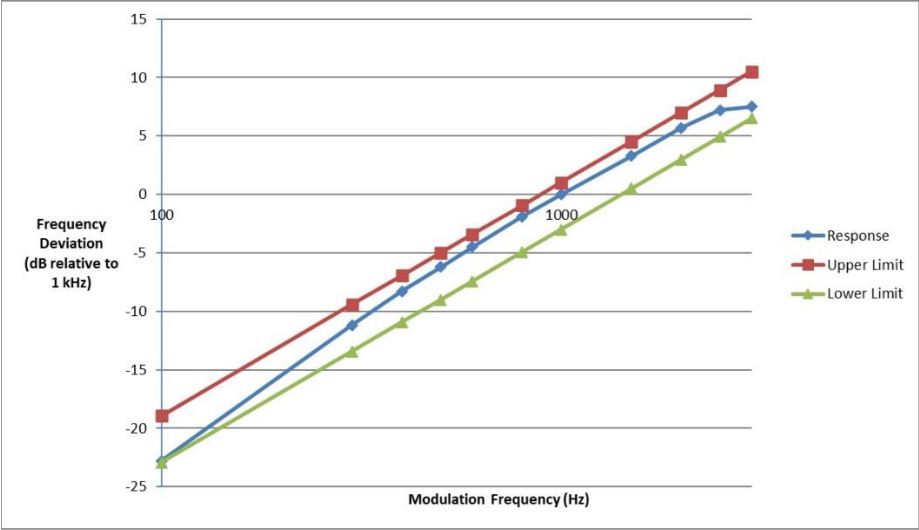


Figure 29 Audio frequency response

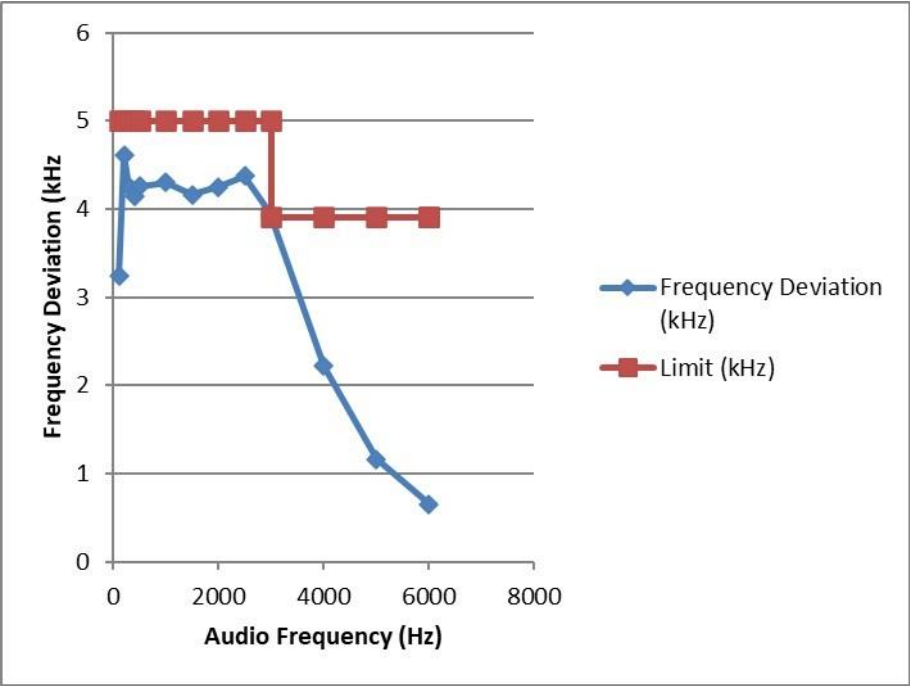
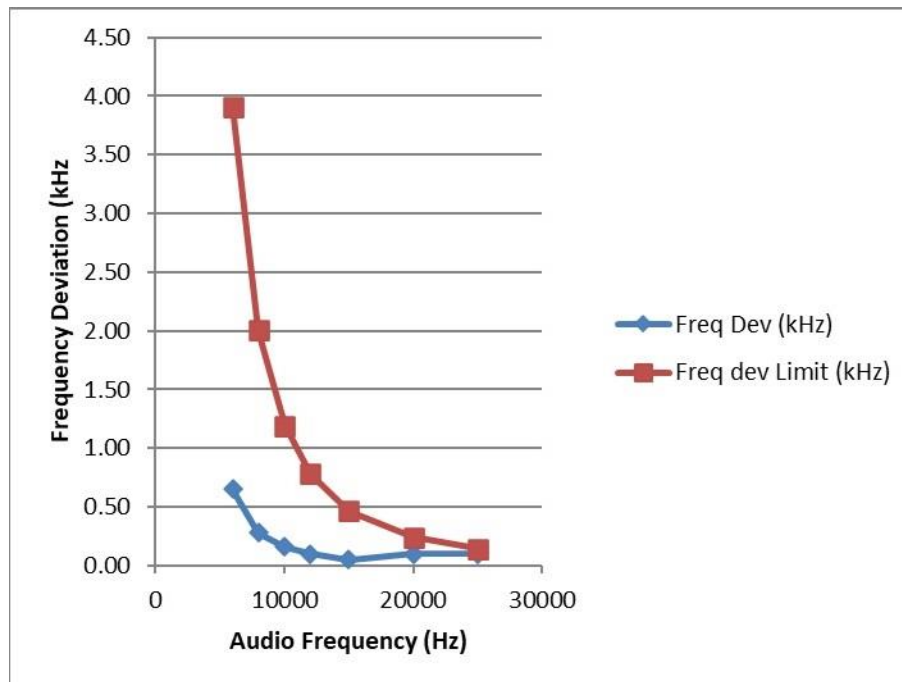


Figure 30 Maximum frequency deviation



**Figure 31 Reduction of frequency deviation at modulation frequencies above 3kHz**

## 2.5.7 Specification Limits

### FCC 47 CFR Part 80, Limit Clause 80.213

Radiotelephone transmitters using A3E, F3E and G3E emission must have a modulation limiter to prevent any modulation over 100 percent.

### FCC 47 CFR Part 2, Limit Clause 2.1047

Voice modulated communication equipment. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted. For equipment required to have an audio low-pass filter, a curve showing the frequency response of the filter, or of all circuitry installed between the modulation limiter and the modulated stage shall be submitted.

Equipment which employs modulation limiting. A curve or family of curves showing the percentage of modulation versus the modulation input voltage shall be supplied. The information submitted shall be sufficient to show modulation limiting capability throughout the range of modulating frequencies and input modulating signal levels employed.

### ISED RSS-182, Limit Clause 5.4 iii

The frequency deviation corresponding to 100% modulation shall approach 5 kHz as nearly as practicable and the frequency deviation shall not exceed  $\pm 5$  kHz



### 2.5.8 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 2.

| Instrument                  | Manufacturer          | Type No             | TE No | Calibration Period (months) | Calibration Expires |
|-----------------------------|-----------------------|---------------------|-------|-----------------------------|---------------------|
| Audio Analyser              | Hewlett Packard       | 8903B               | 576   | 12                          | 04-Feb-2026         |
| PXA Signal Analyser         | Keysight Technologies | N9030A              | 4654  | 12                          | 24-Feb-2026         |
| Quad Power Supply           | Rohde & Schwarz       | HMP4040             | 4954  | -                           | O/P Mon             |
| Attenuator 5W 30dB DC-18GHz | Aaren                 | AT40A-4041-D18-30   | 5504  | 12                          | 16-Jul-2025         |
| Thermo-Hygro-Barometer      | PCE Instruments       | PCE-THB 40          | 5604  | 12                          | 26-Nov-2025         |
| GPSDR Frequency standard    | Orolia                | SecureSync 2402-053 | 6339  | 6                           | 18-Sep-2025         |
| Multimeter                  | Fluke                 | 115                 | 6343  | 12                          | 27-Feb-2026         |

**Table 15**

O/P Mon – Output Monitored using calibrated equipment



## 2.6 Transmitter Power

### 2.6.1 Specification Reference

FCC 47 CFR Part 80, Clause 80.215  
FCC 47 CFR Part 2, Clause 2.1046  
ISED RSS-182, Clause 5.6  
ISED RSS-GEN, Clause 6.12

### 2.6.2 Equipment Under Test and Modification State

V200, S/N: S24070003 - Modification State 1

### 2.6.3 Date of Test

12-March-2025

### 2.6.4 Test Method

This test was performed in accordance with ANSI C63.26, clause 5.2.3.2.

### 2.6.5 Environmental Conditions

Ambient Temperature 19.9 °C  
Relative Humidity 33.6 %

### 2.6.6 Test Results

DC Powered - Radio

| 156.300 MHz  |            | 156.800 MHz  |            | 157.425 MHz  |            |
|--------------|------------|--------------|------------|--------------|------------|
| Result (dBm) | Result (W) | Result (dBm) | Result (W) | Result (dBm) | Result (W) |
| 34.6         | 2.9        | 34.6         | 2.9        | 34.6         | 2.9        |

**Table 16 - Transmitter Power**

### 2.6.7 Specification Limits

FCC 47 CFR Part 80, Limit Clause 80.215 (c) and (e)

Ship station frequencies above 27500 kHz. The maximum power must not exceed the values listed below:

- Marine Utility Stations and Handheld Portable Transmitters: 156 to 162 MHz - 10 W
- Ships Stations: 156 to 162 MHz - 25 W



#### ISED RSS-182, Limit Clause 5.6

The output power for equipment certified under RSS-182 shall not exceed the limits specified in the table below:

| Radio Equipment Type                     | Maximum Power |
|------------------------------------------|---------------|
| Coast Station                            | 50 W          |
| Ship Stations                            | 25 W          |
| Shipborne hand-held portable transmitter | 6 W           |

**Table 17 - Power Limits Table (RSS-182)**

Ship station transmitters shall have power control features implemented to reduce the carrier power to 1 W or less for use at short ranges, except for DSC equipment operating on the 156.525 MHz (channel 70) frequency, for which the power reduction facility is optional.

Survival two-way radiotelephones should have a minimum equivalent isotropically radiated power (e.i.r.p.) of 0.25 W.

#### **2.6.8 Test Location and Test Equipment Used**

This test was carried out in RF Laboratory 2.

| Instrument                          | Manufacturer          | Type No    | TE No | Calibration Period (months) | Calibration Expires |
|-------------------------------------|-----------------------|------------|-------|-----------------------------|---------------------|
| Power Supply Unit                   | Farnell               | LB30-4     | 158   | 12                          | O/P Mon             |
| Attenuator (20 dB, 150 W)           | Narda                 | 769-20     | 3367  | 12                          | 02-Sep-2025         |
| Attenuator (10dB, 150W)             | Narda                 | 769-10     | 3368  | 12                          | 21-Mar-2025         |
| P-Series Power Meter                | Agilent Technologies  | N1911A     | 3980  | 12                          | 18-Nov-2025         |
| 50 MHz-18 GHz Wideband Power Sensor | Agilent Technologies  | N1921A     | 3982  | 12                          | 18-Nov-2025         |
| Network Analyser                    | Keysight Technologies | E5063A     | 5018  | 12                          | 23-Oct-2025         |
| Electronic Calibration Module       | Keysight Technologies | 85093C     | 5188  | 12                          | 07-Feb-2026         |
| Thermo-Hygro-Barometer              | PCE Instruments       | PCE-THB 40 | 5604  | 12                          | 26-Nov-2025         |
| Multimeter                          | Fluke                 | 115        | 6343  | 12                          | 27-Feb-2026         |

**Table 18**

O/P Mon – Output Monitored using calibrated equipment

### 3 Photographs

#### 3.1 Test Setup Photographs

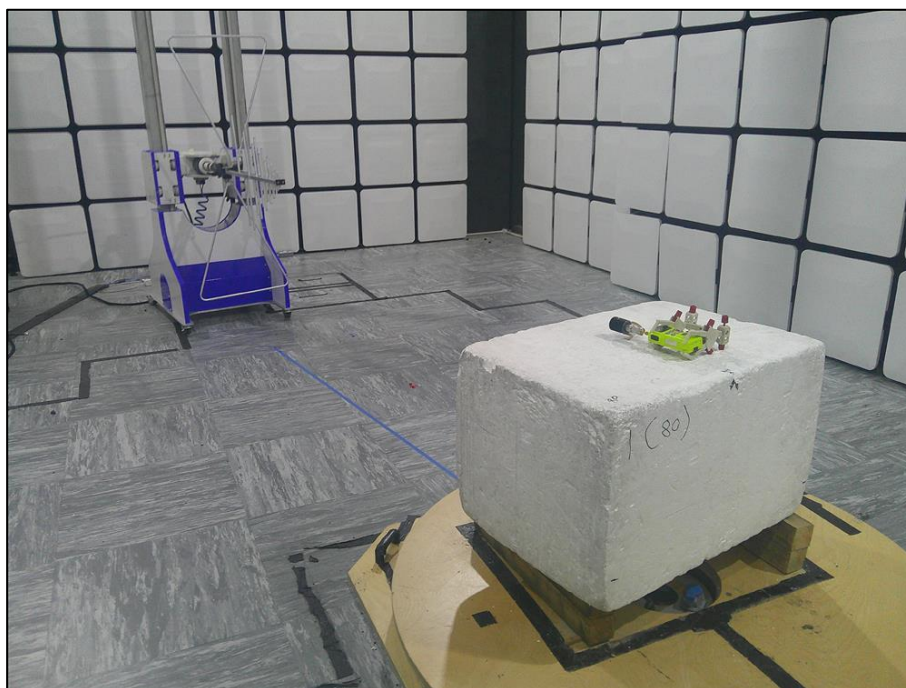


Figure 32 - 30 to 1000MHz X Plane

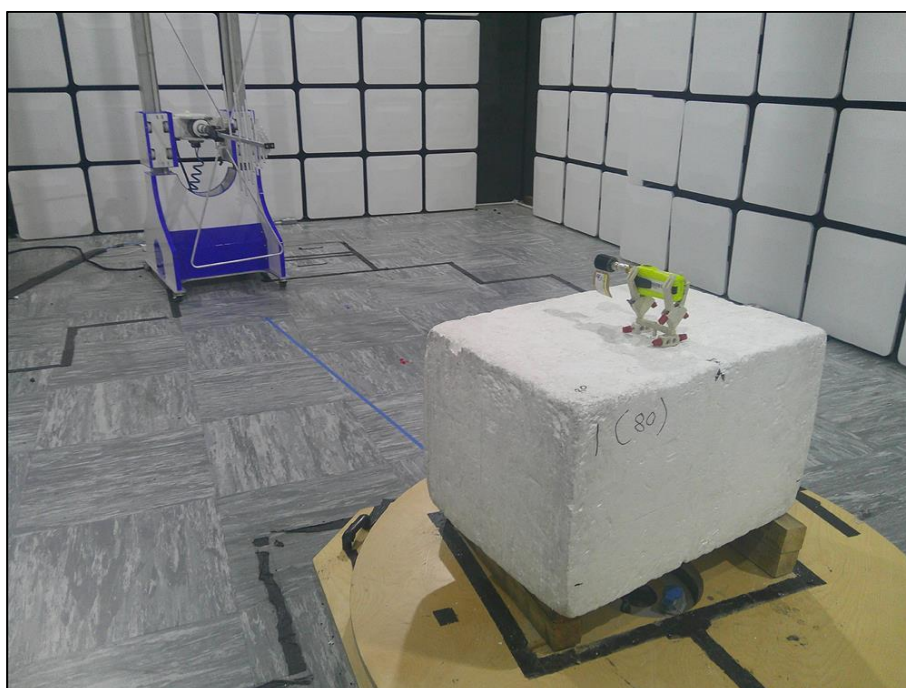


Figure 33 - 30 to 1000MHz Y Plane



Figure 34 - 30 to 1000MHz Z Plane



Figure 35 - 1 to 2GHz X Plane

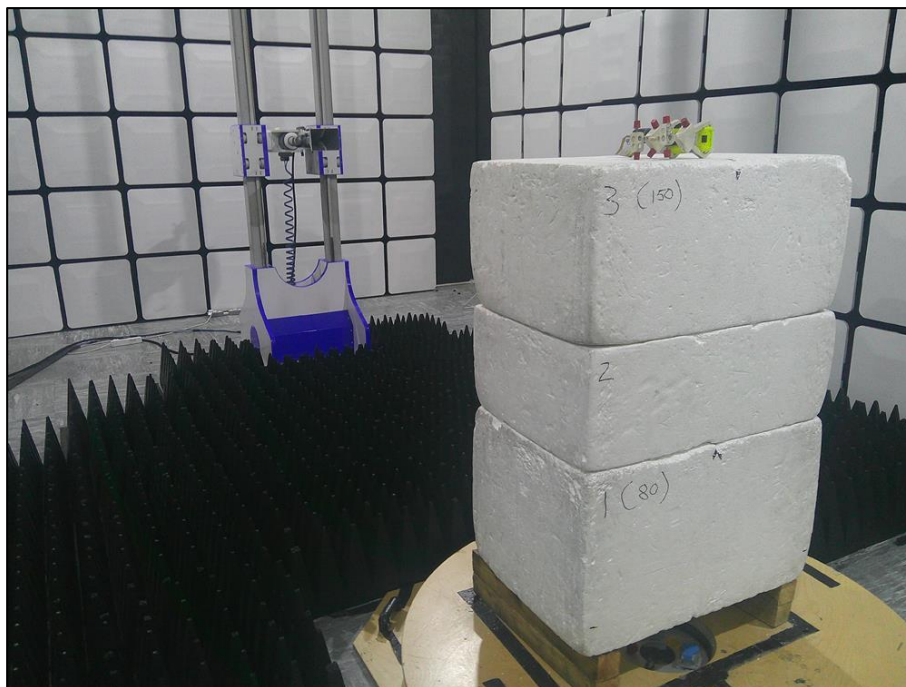


Figure 36 - 1 to 2GHz Y Plane

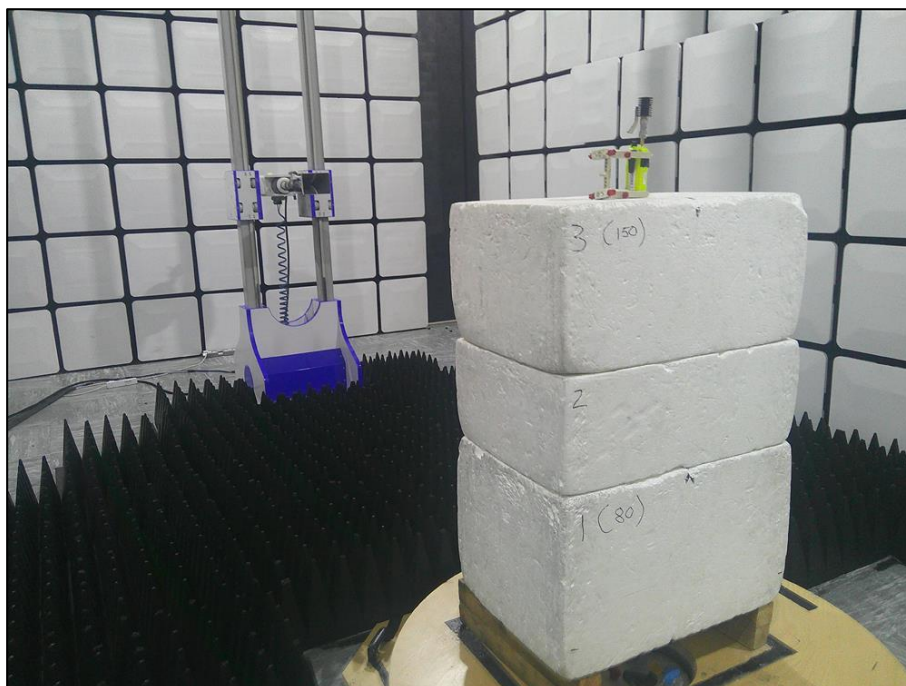


Figure 37 - 1 to 2GHz Z Plane



## 4 Measurement Uncertainty

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

| Test Name                                          | Measurement Uncertainty                                                       |
|----------------------------------------------------|-------------------------------------------------------------------------------|
| Bandwidths                                         | $\pm 58.05$ Hz                                                                |
| Transmitter Frequency Tolerances                   | $\pm 11$ Hz                                                                   |
| Spurious Emissions at Antenna Terminals            | $\pm 3.45$ dB                                                                 |
| Radiated Spurious Emissions                        | 30 MHz to 1 GHz: $\pm 5.2$ dB<br>1 GHz to 18 GHz: $\pm 6.3$ dB                |
| Modulation Requirements - Audio Frequency Response | $\pm 1.5$ dB (Audio Frequency Response)<br>$\pm 1.73\%$ (Frequency Deviation) |
| Transmitter Power                                  | $\pm 3.2$ dB                                                                  |

**Table 19**

### Measurement Uncertainty Decision Rule – Accuracy Method

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115:2021, Clause 4.4.3 (Procedure 2). The measurement results are directly compared with the test limit to determine conformance with the requirements of the standard.

Risk: The uncertainty of measurement about the measured result is negligible with regard to the final pass/fail decision. The measurement result can be directly compared with the test limit to determine conformance with the requirement (compare IEC Guide 115). The level of risk to falsely accept and falsely reject items is further described in ILAC-G8.