

# FCC and ISED Test Report

Sepura Limited Model: SCG2228

In accordance with FCC 47 CFR Part 2, FCC 47 CFR Part 90, ISED RSS-119 and ISED RSS-GEN (TETRA)



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FCC ID: XX6SCG2228X

IC: 8739A-SCG2228X

## COMMERCIAL-IN-CONFIDENCE

Document 75958868-04 Issue 01

### SIGNATURE

| NAME           | JOB TITLE       | RESPONSIBLE FOR      | ISSUE DATE       |
|----------------|-----------------|----------------------|------------------|
| Steve Marshall | Senior Engineer | Authorised Signatory | 23 February 2024 |

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 2, FCC 47 CFR Part 90, ISED RSS-119 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         | Thomas Biddlecombe | 23 February 2024 |           |
|                 | George Williams    | 23 February 2024 |           |

FCC Accreditation

492497/UK2010 Octagon House, Fareham Test Laboratory

ISED Accreditation

12669A Octagon House, Fareham Test Laboratory

### EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 22: 2021, FCC 47 CFR Part 90: 2022, ISED RSS-119: Issue 12 (05-2015) and ISED RSS-GEN: Issue 5 (04-2018) + A2 (02-2021) for the tests detailed in section 1.3.



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#### ACCREDITATION

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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           | 23-February-2024 |

**Table 1**

## 1.2 Introduction

|                               |                                                                                                                                           |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Applicant                     | Sepura Limited                                                                                                                            |
| Manufacturer                  | Sepura Limited                                                                                                                            |
| Model Number(s)               | SCG2228                                                                                                                                   |
| Serial Number(s)              | 1PR002401GPT84X                                                                                                                           |
| Hardware Version(s)           | PLX-85015500                                                                                                                              |
| Software Version(s)           | Development                                                                                                                               |
| Number of Samples Tested      | 1                                                                                                                                         |
| Test Specification/Issue/Date | FCC 47 CFR Part 2: 2021<br>FCC 47 CFR Part 90: 2022<br>ISED RSS-119: Issue 12 (05-2015)<br>ISED RSS-GEN: Issue 5 (04-2018) + A2 (02-2021) |
| Order Number                  | PLC-PO026141-1                                                                                                                            |
| Date                          | 27-June-2023                                                                                                                              |
| Date of Receipt of EUT        | 19-January-2024                                                                                                                           |
| Start of Test                 | 29-January-2024                                                                                                                           |
| Finish of Test                | 15-February-2024                                                                                                                          |
| Name of Engineer(s)           | Thomas Biddlecombe and George Williams                                                                                                    |
| Related Document(s)           | ANCI C63.26: 2015                                                                                                                         |



### 1.3 Brief Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 2, FCC 47 CFR Part 90, ISED RSS-119 and ISED RSS-GEN is shown below. These tests have been performed as spot-check measurements as per KDB 484596 D01. All other compliance is to be shown as per the report for the "Premium" variant.

| Section                                                                     | Specification Clause |         |         |         | Test Description               | Result | Comments/Base Standard |
|-----------------------------------------------------------------------------|----------------------|---------|---------|---------|--------------------------------|--------|------------------------|
|                                                                             | Part 2               | Part 90 | RSS-119 | RSS-GEN |                                |        |                        |
| Configuration and Mode: Tetra Basic Variant Spot Check - 806 MHz to 825 MHz |                      |         |         |         |                                |        |                        |
| 2.1                                                                         | 2.1046               | 90.205  | 5.4     | 6.12    | Maximum Conducted Output Power | Pass   | ANCI C63.26: 2015      |
| 2.2                                                                         | 2.1053               | 90.210  | 5.8     | 6.13    | Radiated Spurious Emissions    | Pass   | ANSI C63.26: 2015      |
| Configuration and Mode: Tetra Basic Variant Spot Check - 851 MHz to 870 MHz |                      |         |         |         |                                |        |                        |
| 2.1                                                                         | 2.1046               | 90.205  | 5.4     | 6.12    | Maximum Conducted Output Power | Pass   | ANCI C63.26: 2015      |
| 2.2                                                                         | 2.1053               | 90.210  | 5.8     | 6.13    | Radiated Spurious Emissions    | Pass   | ANSI C63.26: 2015      |

**Table 2**

A brief  
carried out  
75958868-  
variant) is



summary of the tests  
in document  
01 ("Premium"  
shown below.

| Section                                            | Specification Clause |         |         |         | Test Description                        | Result | Comments/Base Standard |
|----------------------------------------------------|----------------------|---------|---------|---------|-----------------------------------------|--------|------------------------|
|                                                    | Part 2               | Part 90 | RSS-119 | RSS-GEN |                                         |        |                        |
| Configuration and Mode: Tetra - 806 MHz to 825 MHz |                      |         |         |         |                                         |        |                        |
| 2.1                                                | 2.1046               | 90.205  | 5.4     | 6.12    | Maximum Conducted Output Power          | Pass   | ANCI C63.26: 2015      |
| 2.2                                                | 2.1047               | 90.207  | 5.2     | -       | Types of Emissions                      | Pass   |                        |
| 2.3                                                | 2.1049               | 90.209  | 5.5     | 6.7     | Bandwidth Limitations                   | Pass   | ANSI C63.26: 2015      |
| 2.4                                                | 2.1051               | 90.210  | 5.8     | 6.13    | Spurious Emissions at Antenna Terminals | Pass   |                        |
| 2.5                                                | 2.1053               | 90.210  | 5.8     | 6.13    | Radiated Spurious Emissions             | Pass   | ANSI C63.26: 2015      |
| 2.6                                                | 2.1055               | 90.213  | 5.3     | 6.11    | Frequency Stability                     | Pass   | ANSI C63.26: 2015      |
| 2.7                                                | -                    | 90.221  | 5.8.9.1 | -       | Adjacent Channel Power                  | Pass   |                        |
| Configuration and Mode: Tetra - 851 MHz to 870 MHz |                      |         |         |         |                                         |        |                        |
| 2.1                                                | 2.1046               | 90.205  | 5.4     | 6.12    | Maximum Conducted Output Power          | Pass   | ANCI C63.26: 2015      |
| 2.2                                                | 2.1047               | 90.207  | 5.2     | -       | Types of Emissions                      | Pass   |                        |
| 2.3                                                | 2.1049               | 90.209  | 5.5     | 6.7     | Bandwidth Limitations                   | Pass   | ANSI C63.26: 2015      |
| 2.4                                                | 2.1051               | 90.210  | 5.8     | 6.13    | Spurious Emissions at Antenna Terminals | Pass   |                        |
| 2.5                                                | 2.1053               | 90.210  | 5.8     | 6.13    | Radiated Spurious Emissions             | Pass   | ANSI C63.26: 2015      |
| 2.6                                                | 2.1055               | 90.213  | 5.3     | 6.11    | Frequency Stability                     | Pass   | ANSI C63.26: 2015      |
| 2.7                                                | -                    | 90.221  | 5.8.9.1 | -       | Adjacent Channel Power                  | Pass   |                        |

**Table 3**



## 1.4 Application Form

### Equipment Description

|                                                                                                                                                            |                                            |                                                                |                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|----------------------------------------------------------------|--------------------------------|
| Technical Description:<br><i>(Please provide a brief description of the intended use of the equipment including the technologies the product supports)</i> |                                            | The SCG2228 mobile terminal is a TETRA enabled radio with GNSS |                                |
| Manufacturer:                                                                                                                                              |                                            | Sepura Limited                                                 |                                |
| Model:                                                                                                                                                     |                                            | SCG2228                                                        |                                |
| Part Number:                                                                                                                                               |                                            | SCG2228                                                        |                                |
| Hardware Version:                                                                                                                                          |                                            | PLX-85015500                                                   |                                |
| Software Version:                                                                                                                                          |                                            | Development                                                    |                                |
| FCC ID of the product under test – <a href="#">see guidance here</a>                                                                                       |                                            | XX6SCG2228X                                                    |                                |
| IC ID of the product under test – <a href="#">see guidance here</a>                                                                                        |                                            | 8739A-SCG2228X                                                 |                                |
| Device Category                                                                                                                                            | Mobile <input checked="" type="checkbox"/> | Portable <input type="checkbox"/>                              | Fixed <input type="checkbox"/> |
| Equipment is fitted with an Audio Low Pass Filter                                                                                                          |                                            | Yes <input type="checkbox"/>                                   | No <input type="checkbox"/>    |

**Table 4**

### Intentional Radiators

| Technology                                                                                        | TETRA / TMO | TETRA / DMO |  |  |  |  |
|---------------------------------------------------------------------------------------------------|-------------|-------------|--|--|--|--|
| Frequency Range (MHz to MHz)                                                                      | 806 to 824  | 851 to 870  |  |  |  |  |
| Conducted Declared Output Power (dBm)                                                             | 40          | 40          |  |  |  |  |
| Antenna Gain (dBi)                                                                                | 5           | 5           |  |  |  |  |
| Supported Bandwidth(s) (MHz) (e.g. 1 MHz, 20 MHz, 40 MHz)                                         | 25 kHz      | 25 kHz      |  |  |  |  |
| Modulation Scheme(s) (e.g. GFSK, QPSK etc)                                                        | DQPSK       | DQPSK       |  |  |  |  |
| ITU Emission Designator ( <a href="#">see guidance here</a> ) (not mandatory for Part 15 devices) | 22K0DXW     | 22K0DXW     |  |  |  |  |
| Bottom Frequency (MHz)                                                                            | 806         | 851.0125    |  |  |  |  |
| Middle Frequency (MHz)                                                                            | 815.00      | 860.00      |  |  |  |  |
| Top Frequency (MHz)                                                                               | 824         | 868.9875    |  |  |  |  |

**Table 5**



### Un-intentional Radiators

|                                                                                                                    |            |
|--------------------------------------------------------------------------------------------------------------------|------------|
| Highest frequency generated or used in the device or on which the device operates or tunes                         | 2480 MHz   |
| Lowest frequency generated or used in the device or on which the device operates or tunes                          | 32.768 kHz |
| 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"/>                              |            |

**Table 6**

### AC Power Source

|                                                                                       |     |    |
|---------------------------------------------------------------------------------------|-----|----|
| AC supply frequency:                                                                  | 50  | Hz |
| Voltage                                                                               | 240 | V  |
| Max current:                                                                          | 90W | A  |
| Single Phase <input checked="" type="checkbox"/> Three Phase <input type="checkbox"/> |     |    |

**Table 7**

### DC Power Source

|                        |      |   |
|------------------------|------|---|
| Nominal voltage:       | 12   | V |
| Extreme upper voltage: | 15.6 | V |
| Extreme lower voltage: | 10.8 | V |
| Max current:           | 90W  | A |

**Table 8**

### Battery Power Source

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

**Table 9**

### Charging

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

**Table 10**

### Temperature

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

**Table 11**



Cable Loss

|                                          |  |    |
|------------------------------------------|--|----|
| Adapter Cable Loss<br>(Conducted sample) |  | dB |
|------------------------------------------|--|----|

**Table 12**

Antenna Characteristics

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |                  |                 |    |     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------|-----------------|----|-----|
| Antenna connector <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                  | State impedance | 50 | Ohm |
| Temporary antenna connector <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                  | State impedance |    | Ohm |
| Integral antenna <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Type: |                  | Gain            |    | dBi |
| External antenna <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Type: | Panorama AFGB-S5 | Gain            | 5  | dBi |
| <p>For external antenna only:</p> <p>Standard Antenna Jack <input checked="" type="checkbox"/> If yes, describe how user is prohibited from changing antenna (if not professional installed):</p> <p>Equipment is only ever professionally installed <input type="checkbox"/></p> <p>Non-standard Antenna Jack <input type="checkbox"/></p> <p>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> |       |                  |                 |    |     |

**Table 13**

Ancillaries (if applicable)

|               |  |                    |  |
|---------------|--|--------------------|--|
| Manufacturer: |  | Part Number:       |  |
| Model:        |  | Country of Origin: |  |

**Table 14**

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

*Prakriti Gupta*

Name:Prakriti Gupta  
Position held: Conformance team leader  
Date: 23/02/2024



## 1.5 Product Information

### 1.5.1 Technical Description

The SCG2228 mobile terminal is a TETRA enabled radio with GNSS.

### 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: SCG2228, Serial Number: 1PR002401GPT84X |                                                 |                        |                          |
| 0                                              | As supplied by the customer                     | Not Applicable         | Not Applicable           |

**Table 15**

### 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: Tetra Basic Variant Spot Check - 806 MHz to 825 MHz |                     |               |
| Maximum Conducted Output Power                                              | Thomas Biddlecombe  | UKAS          |
| Radiated Spurious Emissions                                                 | George Williams     | UKAS          |
| Configuration and Mode: Tetra Basic Variant Spot Check - 851 MHz to 870 MHz |                     |               |
| Maximum Conducted Output Power                                              | Thomas Biddlecombe  | UKAS          |
| Radiated Spurious Emissions                                                 | George Williams     | UKAS          |

**Table 16**

Office Address:

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



## 2 Test Details

### 2.1 Maximum Conducted Output Power

#### 2.1.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1046  
FCC 47 CFR Part 90, Clause 90.205  
ISED RSS-119, Clause 5.4  
ISED RSS-GEN, Clause 6.12

#### 2.1.2 Equipment Under Test and Modification State

SCG2228, S/N: 1PR002401GPT84X - Modification State 0

#### 2.1.3 Date of Test

15-February-2024

#### 2.1.4 Test Method

The test was applied in accordance with the test method requirements of FCC 47 CFR Part 90, Industry Canada RSS-119, and ISED RSS-GEN with reference to ANSI C63.26, clause 5.2.4.3.

The EUT was configured to transmit on maximum power on only one channel per band in burst mode. The EUT was connected to a spectrum analyser via a cable and 20 dB of attenuation. The path loss was measured using a network analyser and entered as a reference level offset in the spectrum analyser. The RBW of the spectrum analyser was set to 30 kHz and the video bandwidth to 91 kHz with the trace set to average using an RMS detector and the result was recorded.

#### 2.1.5 Environmental Conditions

|                     |         |
|---------------------|---------|
| Ambient Temperature | 21.2 °C |
| Relative Humidity   | 52.5 %  |



2.1.6 Test Results

Tetra Basic Variant Spot Check - 806 MHz to 825 MHz

| Parameter                             | 823.9875 MHz |
|---------------------------------------|--------------|
| Conducted Output Power (dBm)          | 39.002       |
| Manufacturer Declared Power (dBm)     | 40.0         |
| $\Delta$ from manufacturer Power (dB) | 0.998        |
| Antenna Gain (dBi)                    | 5.0          |
| ERP (dBm)                             | 44.002       |

Table 17 - ERP

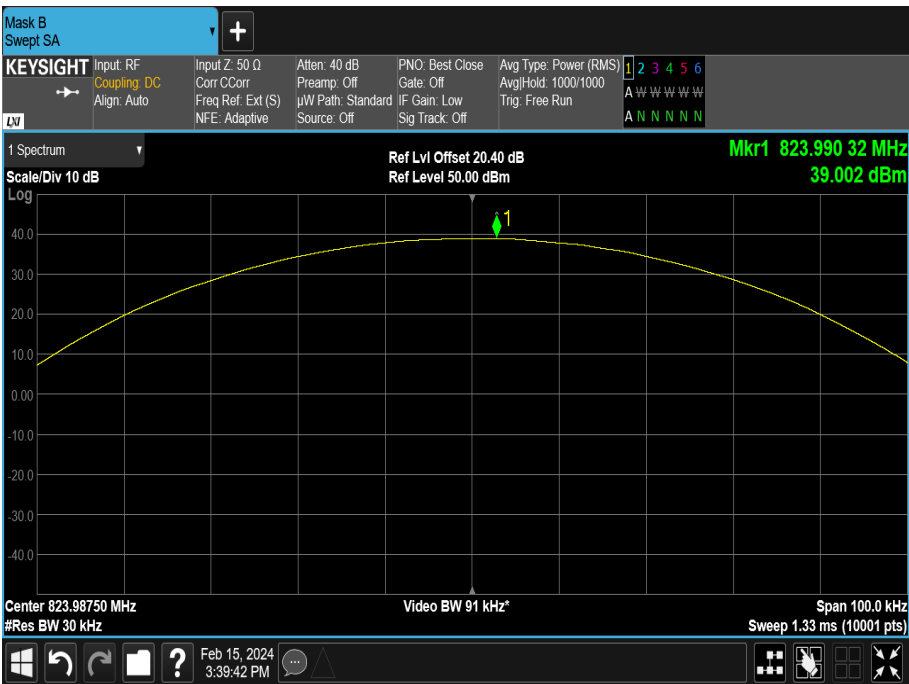


Figure 1 – 823.9875 MHz



Tetra Basic Variant Spot Check - 851 MHz to 870 MHz

| Parameter                             | N/A MHz |
|---------------------------------------|---------|
| Conducted Output Power (dBm)          | 39.052  |
| Manufacturer Declared Power (dBm)     | 40.0    |
| $\Delta$ from manufacturer Power (dB) | 0.948   |
| Antenna Gain (dBi)                    | 5       |
| ERP (dBm)                             | 44.052  |

Table 18 - ERP

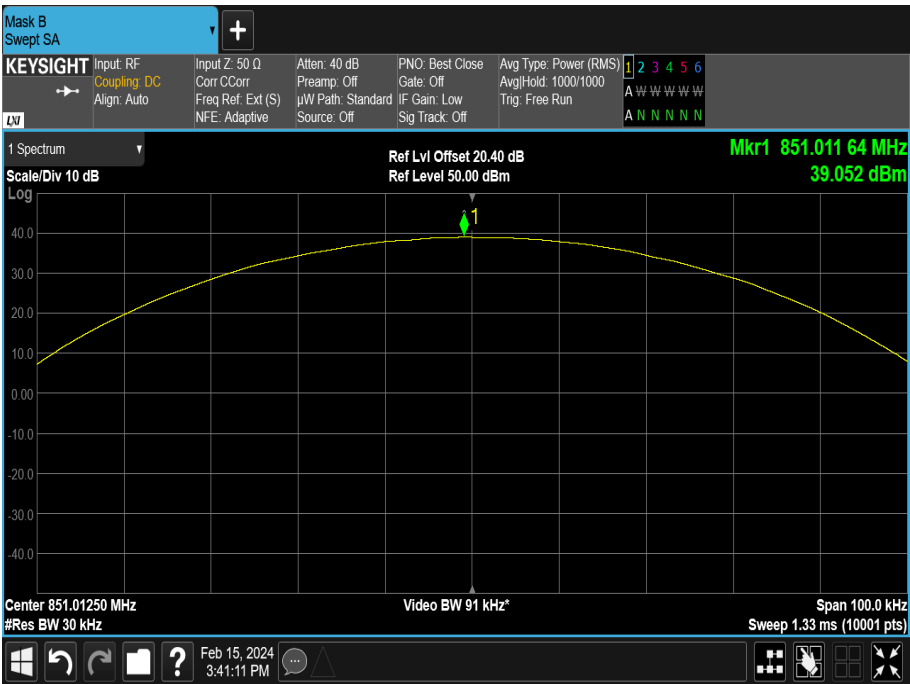


Figure 2 – 851.0125 MHz



FCC 47 CFR Part 90, Limit Clause 90.205

| Frequency (MHz)                                   | Limit                                                                   |
|---------------------------------------------------|-------------------------------------------------------------------------|
| < 25                                              | 1000 W                                                                  |
| 25 to 50                                          | 300 W                                                                   |
| 72 to 76                                          | 300 W                                                                   |
| 150 to 174                                        | Refer to 90.205 (d) of the specification                                |
| 217 to 220                                        | Refer to 90.259 of the specification                                    |
| 220 to 222                                        | Refer to 90.729 of the specification                                    |
| 421 to 430                                        | Refer to 90.279 of the specification                                    |
| 450 to 470                                        | Refer to 90.205 (h) of the specification                                |
| 470 to 512                                        | Refer to 90.307 and 90.309 of the specification                         |
| 758 to 775 and 788 to 805                         | Refer to 90.541 and 90.542 of the specification                         |
| 806 to 824, 851 to 869, 869 to 901 and 935 to 940 | Refer to 90.635 of the specification                                    |
| 902 to 927.25                                     | LMS systems operating pursuant to subpart M of the specification : 30 W |
| 927.25 to 928                                     | LMS equipment: 300 W                                                    |
| 929 to 930                                        | Refer to 90.494 of the specification                                    |
| 1427 to 1429.5 and 1429.5 to 1432                 | Refer to 90.259 of the specification                                    |
| 2450 to 2483.5                                    | 5 W                                                                     |
| 4940 to 4990                                      | Refer to 90.1215 of the specification                                   |
| 5850 to 5925                                      | Refer to subpart M of the specification                                 |
| All other frequency bands                         | On a case by case basis                                                 |

**Table 19 - FCC Limits for Maximum ERP**



Industry Canada RSS-119, Limit Clause 5.4

The output power shall be within  $\pm 1$  dB of the manufacturer's rated power listed in the equipment specifications.

| Frequency (MHz)                                                                         | Transmitter Output Power (W) |                                      |
|-----------------------------------------------------------------------------------------|------------------------------|--------------------------------------|
|                                                                                         | Base/Fixed Equipment         | Mobile Equipment                     |
| 27.41 to 28 and 29.7 to 50                                                              | 300                          | 30                                   |
| 72 to 76                                                                                | No Limit                     | 1                                    |
| 138 to 174                                                                              | 111100                       | 60                                   |
| 217 to 217 and 219 to 220                                                               | See SRSP-512 for ERP limit   | 30*                                  |
| 220 to 222                                                                              | 110                          | 50                                   |
| 406.1 to 430 and 450 to 470                                                             | See SRSP-511 for ERP limit   | 60                                   |
| 768 to 776 and 798 to 806                                                               | 110                          | 30<br>3 W ERP for portable equipment |
| 806 to 821, 851 to 866, 821 to 824 and 866 to 869                                       | 110                          | 30                                   |
| 896 to 901 and 935 to 940                                                               | 110                          | 60                                   |
| 929 to 930 and 931 to 932                                                               | 110                          | 30                                   |
| 928 to 929, 952 to 953, 932 to 932.5 and 941 to 941.5                                   | 110                          | 30                                   |
| 932.5 to 935 and 941.5 to 944                                                           | 110                          | 30                                   |
| *Equipment is generally authorised for effective radiated power (ERP) of less than 5 W. |                              |                                      |

**Table 20 - Industry Canada Limits for Transmitter Output Power**



### 2.1.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

| Instrument                     | Manufacturer          | Type No             | TE No | Calibration Period (months) | Calibration Expires |
|--------------------------------|-----------------------|---------------------|-------|-----------------------------|---------------------|
| Multimeter                     | Fluke                 | 79 Series III       | 611   | 12                          | 15-Dec-2024         |
| Hygrometer                     | Rotronic              | I-1000              | 3220  | 12                          | 28-Nov-2024         |
| Network Analyser               | Rohde & Schwarz       | ZVA 40              | 3548  | 12                          | 06-Mar-2024         |
| Calibration Unit               | Rohde & Schwarz       | ZV-Z54              | 4368  | 12                          | 06-Mar-2024         |
| Signal Analyzer                | Keysight Technologies | PXA N9030B          | 5432  | 12                          | 08-Jun-2024         |
| Attenuator 5W 20dB DC-18GHz    | Aaren                 | AT40A-4041-D18-20   | 5500  | 12                          | 21-May-2024         |
| Modular Power System Mainframe | Keysight Technologies | N6701C              | 5835  | -                           | TU                  |
| DC Power Module 60V 20A 300W   | Keysight Technologies | N6754A              | 5836  | -                           | O/P Mon             |
| 1m K-Type Cable                | Junkosha              | MWX221/B            | 5908  | 12                          | 21-May-2024         |
| Frequency Standard             | Orolia                | SecureSync 2402-053 | 6339  | 6                           | 12-Mar-2024         |

**Table 21**

TU - Traceability Unscheduled

O/P Mon – Output Monitored using calibrated equipment



## **2.2 Radiated Spurious Emissions**

### **2.2.1 Specification Reference**

FCC 47 CFR Part 2, Clause 2.1053  
FCC 47 CFR Part 90, Clause 90.210  
ISED RSS-119, Clause 5.8  
ISED RSS-GEN, Clause 6.13

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

SCG2228, S/N: 1PR002401GPT84X - Modification State 0

### **2.2.3 Date of Test**

08-February-2024

### **2.2.4 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. The profiling produced a list of the worst-case emissions together with the EUT azimuth and antenna polarisation.

Testing was performed in accordance with ANSI C63.26, Clause 5.5.

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.

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

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

The Emissions were tested against RSS-119 Clause 5.8.10, as opposed to FCC Part 90.210(b), since the limit in RSS-119 is -17dBm, compliance with the limits provided also prove compliance with FCC Part 90.210(b).

### 2.2.5 Example Test Setup Diagram

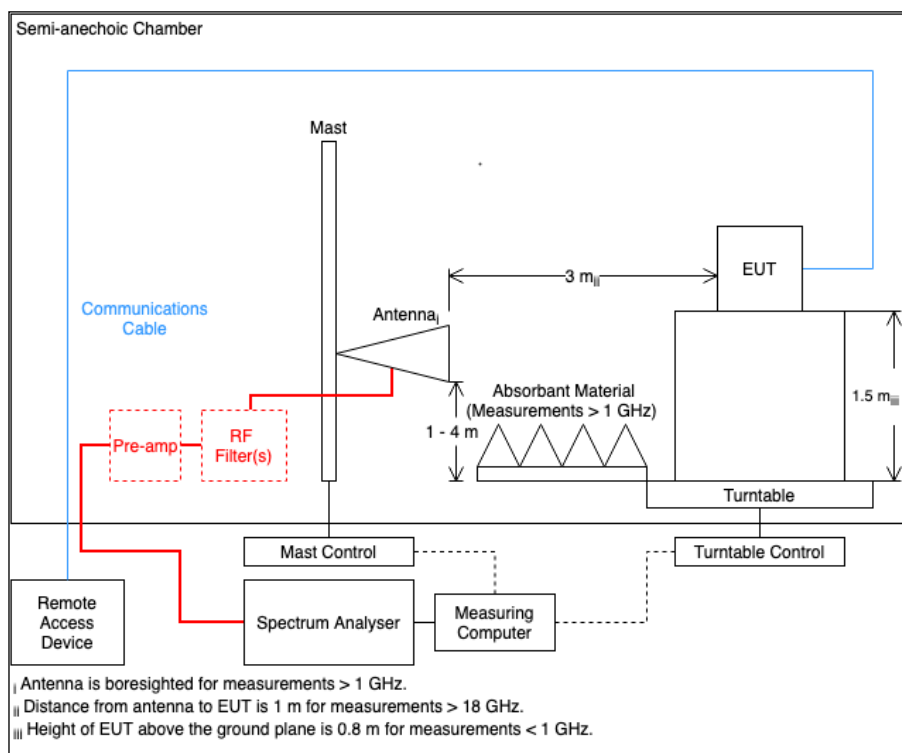


Figure 3

### 2.2.6 Environmental Conditions

|                     |         |
|---------------------|---------|
| Ambient Temperature | 21.5 °C |
| Relative Humidity   | 45.0 %  |



2.2.7 Test Results

Tetra Basic Variant Spot Check - 806 MHz to 825 MHz

| Frequency (MHz) | Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation | Orientation |
|-----------------|----------------|----------------|-------------|----------|-----------|-------------|--------------|-------------|
|                 |                |                |             |          |           |             |              |             |

Table 22

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

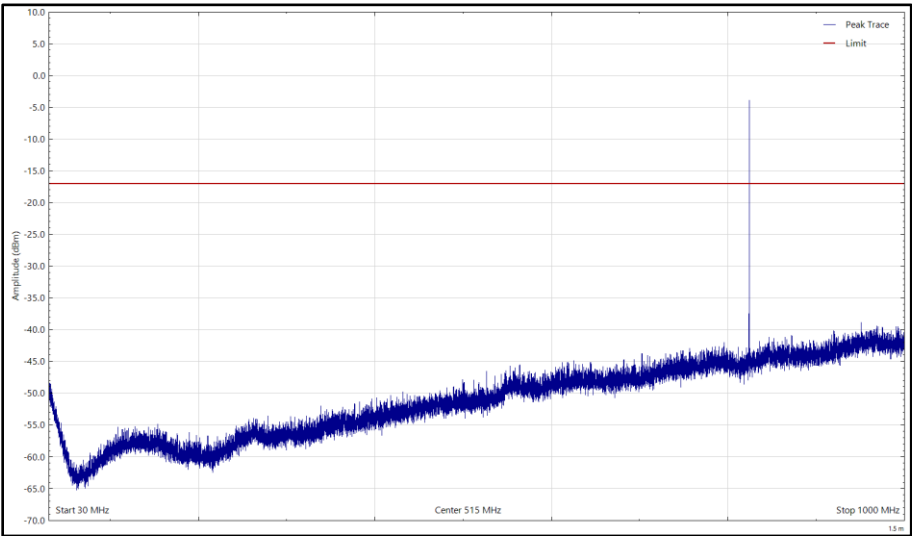


Figure 4 - 30 MHz to 1 GHz, Horizontal Polarisation

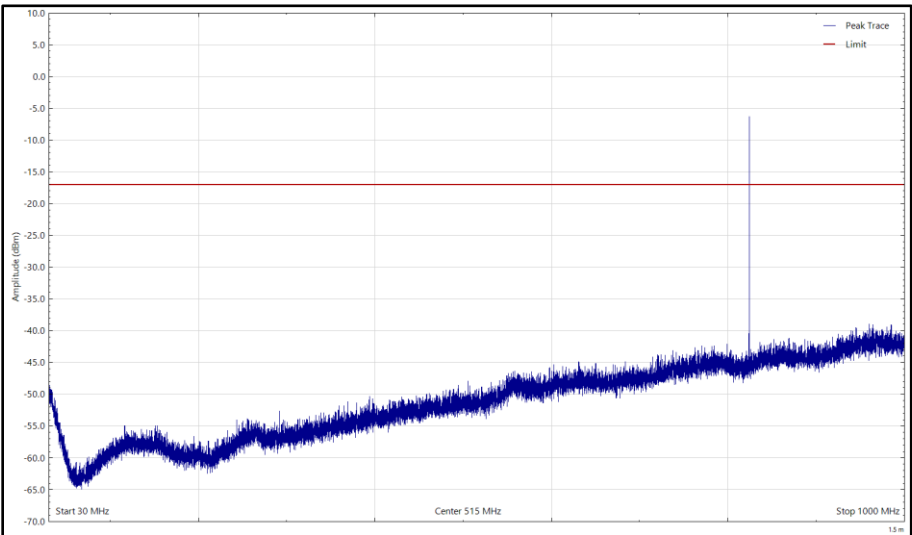


Figure 5 - 30 MHz to 1 GHz, Vertical Polarisation

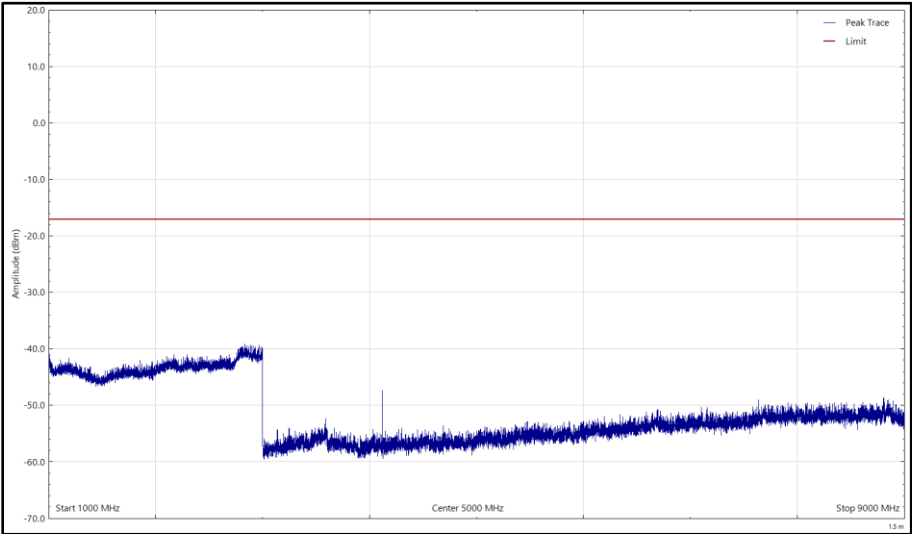


Figure 6 - 1 GHz to 9 GHz, Horizontal Polarisation

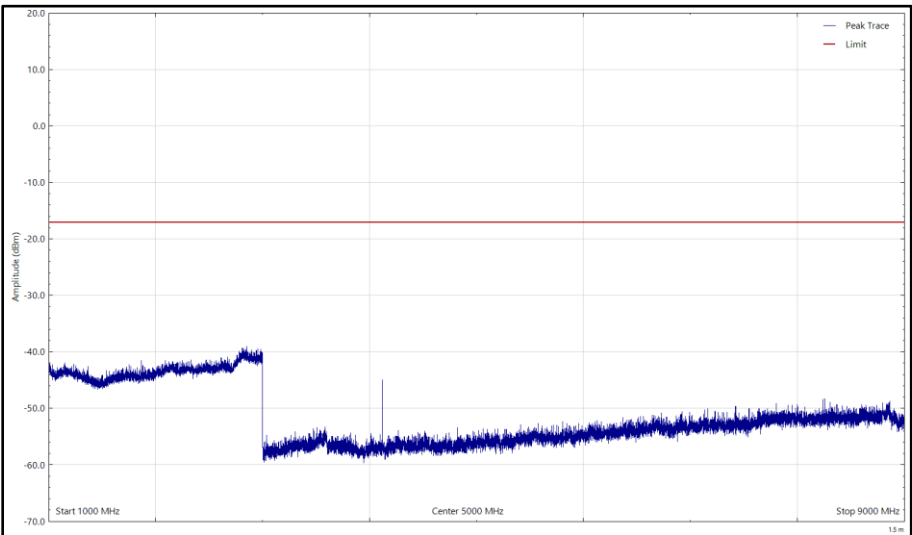


Figure 7 - 1 GHz to 9 GHz, Vertical Polarisation

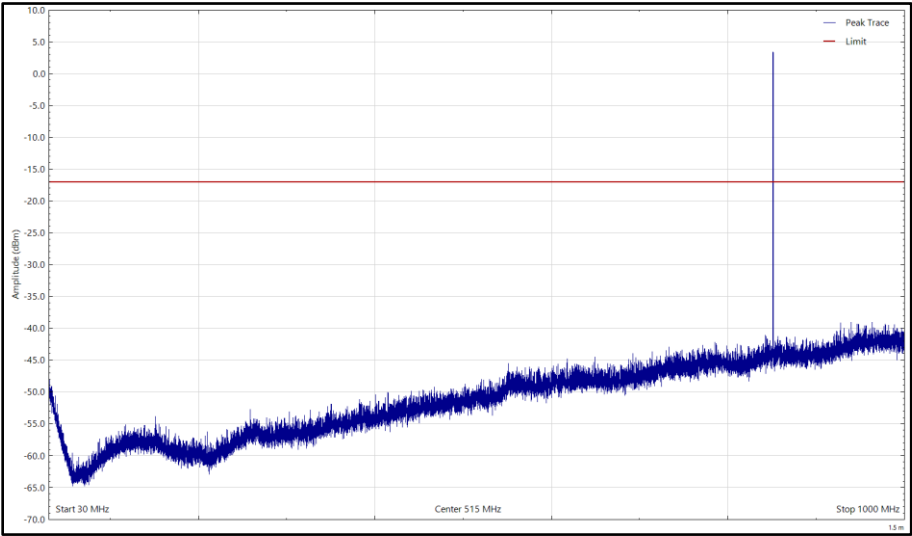


Tetra Basic Variant Spot Check - 851 MHz to 870 MHz

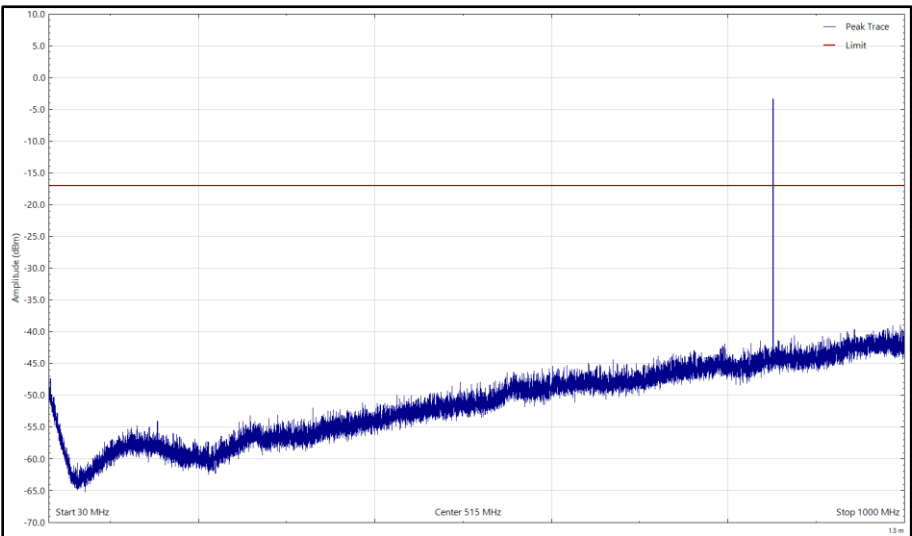
| Frequency (MHz) | Level (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation | Orientation |
|-----------------|----------------|----------------|-------------|----------|-----------|-------------|--------------|-------------|
|                 |                |                |             |          |           |             |              |             |

**Table 23**

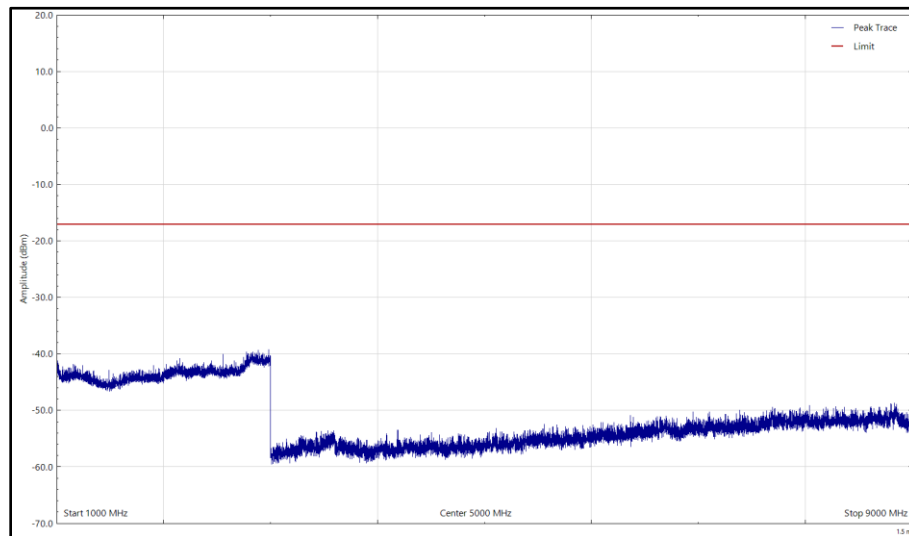
\*No emissions were detected within 10 dB of the limit.



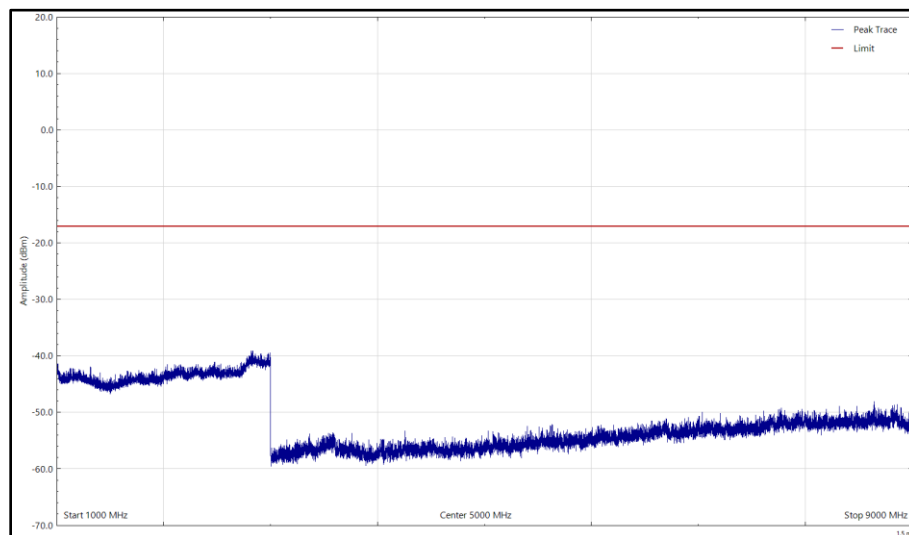
**Figure 8 - 30 MHz to 1 GHz, Horizontal Polarisation**



**Figure 9 - 30 MHz to 1 GHz, Vertical Polarisation**



**Figure 10 - 1 GHz to 9 GHz, Horizontal Polarisation**



**Figure 11 - 1 GHz to 9 GHz, Vertical Polarisation**

FCC 47 CFR Part 90, Limit Clause 90.210

The EUT shall comply with emission mask B as per FCC 47 CFR Part 90, clause 90.210.

Industry Canada RSS-119, Limit Clause 5.8

The EUT shall comply with emission mask Y as per Industry Canada RSS-119. clause 5.8.



## 2.2.8 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 12.

| Instrument                          | Manufacturer    | Type No              | TE No | Calibration Period (months) | Calibration Expires |
|-------------------------------------|-----------------|----------------------|-------|-----------------------------|---------------------|
| Power Supply Unit                   | Hewlett Packard | 6267B                | 21    | -                           | TU                  |
| Termination (50ohm)                 | Meca            | 405-1                | 550   | 12                          | 23-Nov-2024         |
| Test Receiver                       | Rohde & Schwarz | ESU40                | 3506  | 12                          | 30-Mar-2024         |
| Antenna (DRG 1-10.5GHz)             | Schwarzbeck     | BBHA9120B            | 4848  | 12                          | 09-Jul-2024         |
| Emissions Software                  | TUV SUD         | EmX V3.1.12          | 5125  | -                           | Software            |
| 1 Meter Cable                       | Teledyne        | PR90-088-1MTR        | 5194  | 12                          | 10-Aug-2024         |
| Pre-Amplifier (1 GHz to 18 GHz)     | Schwarzbeck     | BBV 9718 C           | 5350  | 12                          | 01-Dec-2024         |
| Cable (K Type 2m)                   | Junkosha        | MWX241-02000KMS      | 5421  | 12                          | 08-Mar-2024         |
| Thermo-Hygro-Barometer              | PCE Instruments | PCE-THB-40           | 5471  | 12                          | 28-Apr-2024         |
| Turntable & Mast Controller         | Maturo Gmbh     | NCD/498/2799.01      | 5612  | -                           | TU                  |
| Tilt Antenna Mast                   | Maturo Gmbh     | TAM 4.0-P            | 5613  | -                           | TU                  |
| Turntable                           | Maturo Gmbh     | Turntable 1.5 SI-2t  | 5614  | -                           | TU                  |
| Antenna (Bi-Log, 30 MHz to 1 GHz)   | Teseq           | CBL6111D             | 5615  | 24                          | 15-Mar-2025         |
| 3m Semi-Anechoic Chamber            | MVG             | EMC Chamber 12       | 5621  | 36                          | 07-Aug-2026         |
| Cable (N to N 8m)                   | Junkosha        | MWX221-08000NMSNMS/B | 6330  | 12                          | 16-Feb-2024         |
| Termination, N-Type(M) 10W, DC-3GHz | Aaren           | AT40T-10E03          | 6565  | 12                          | 18-Jun-2024         |

**Table 24**

TU - Traceability Unscheduled



### 3 Measurement Uncertainty

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

| Test Name                      | Measurement Uncertainty                                        |
|--------------------------------|----------------------------------------------------------------|
| Maximum Conducted Output Power | $\pm 3.2$ dB                                                   |
| Radiated Spurious Emissions    | 30 MHz to 1 GHz: $\pm 5.2$ dB<br>1 GHz to 18 GHz: $\pm 6.3$ dB |

**Table 25**

#### 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.