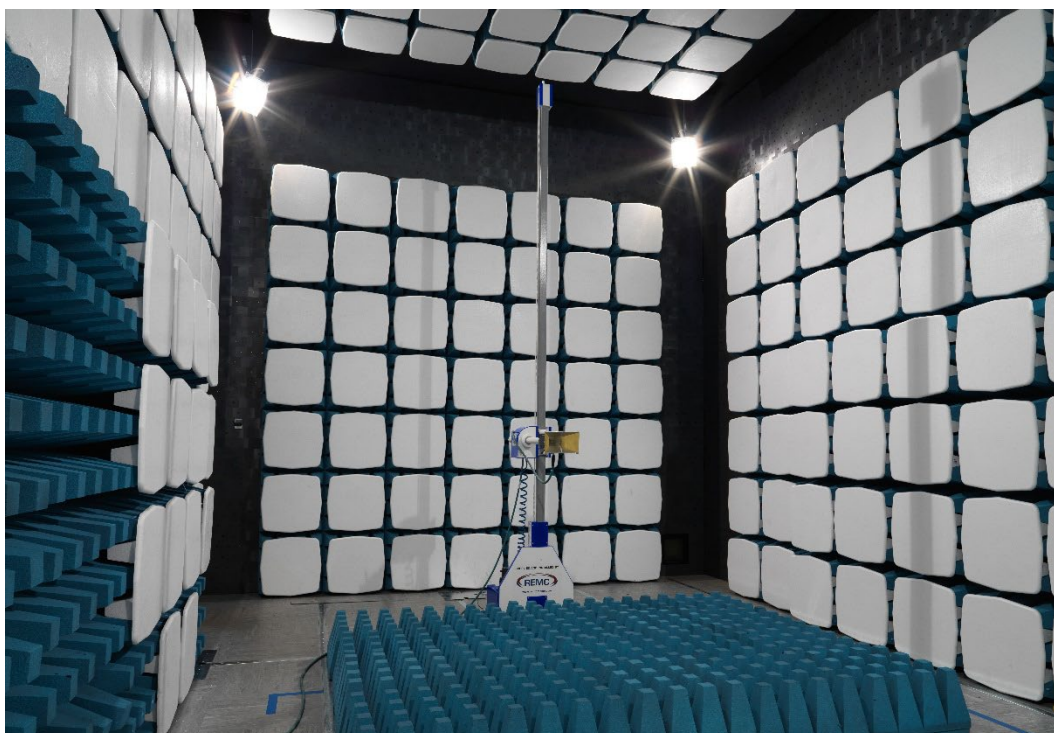


**REPORT ON THE EMC TESTING**  
**FOR**  
**INTELLIAN LTD**  
**ON A**  
**C200**  
**REPORT NUMBER: TRA-061097-44-00B**



RF759 9.0



0026

Report Number: TRA-061097-44-00B  
Copy Number: 2

**REPORT ON THE EMC TESTING OF A  
INTELLIAN LTD  
C200  
WITH RESPECT TO SPECIFICATION  
FCC CFR 47 PART 15B OCTOBER 2021**

TEST DATE: 19th June 2023

Written by:  Digitally signed by Ian Broadwell  
Date: 2023.07.07 10:56:15  
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Test Engineer (EMC)

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Date: 07/07/2023

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RF759 9.0



## 1 Revision Record

| <i>Issue Number</i> | <i>Issue Date</i> | <i>Revision History</i>                                                                                                                   |
|---------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| A                   | 27/06/2023        | Original                                                                                                                                  |
| B                   | 07/07/2023        | Highest cock frequency changed in section 9.2 from 1721.25 to 1761.25<br>Frequency range of testing increased from 8.605 GHz to 8.806 GHz |

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### 3 Introduction

This report TRA-061097-44-00B presents the results of the EMC emissions testing on a C200 to specification:

FCC CFR 47 Part 15B October 2021

FCC Code of Federal Regulations 47 Part 15B - Radio Frequency Devices 15.107 and 15.109 RF emissions from unintentional radiators

This product contains an integrated radio (or radios), the testing carried out evaluates the performance of the unintentional transmission from the non-radio part of the EUT. The radio approval for the module(s) contained within are listed with the FCC under the following FCC id(s):

FCCid: 2BAX4-INTC200M

The testing was carried out for Intellian Ltd by Element Materials Technology, an independent test house, appointed under the UK/US MRA FCC laboratory recognition programme, at their EMC test facility located at:

- |                                                                                                                                                                                     |                                                                                                                                                                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> 100 Frobisher Business Park<br>Leigh Sinton Road<br>Malvern<br>Worcestershire<br>WR14 1BX<br>UK<br><br>FCC Site Designation Number: UK2009                 | <input type="checkbox"/> Unit 1<br>Pendle Place<br>Skelmersdale<br>West Lancashire<br>WN8 9PN<br>UK<br><br>FCC Site Designation Number: UK2020                               |
| <input type="checkbox"/> 74-78 Condor Close<br>Woolsbridge Industrial Park<br>Three Legged Cross<br>Wimborne<br>Dorset<br>BH21 6SU<br>UK<br><br>FCC Site Designation Number: UK2019 | <input checked="" type="checkbox"/> Unit E<br>South Orbital Trading Park<br>Hedon Road<br>Hull<br>East Yorkshire<br>HU9 1NJ<br>UK<br><br>FCC Site Designation Number: UK2007 |

This report details the configuration of the equipment, the test methods used and any relevant modifications where appropriate.

All test and measurement equipment under the control of the laboratory and requiring calibration is subject to an established programme and procedures to control and maintain measurement standards. The quality management system meets the principles of ISO 9001, and has quality control procedures for monitoring the validity of tests undertaken. Records and sufficient detail are retained to establish an audit trail of calibration records relating to its test results for a defined period. Under control of the established calibration programme, key quantities or values of the test and measurement instrumentation are within specification and comply with the relevant traceable internationally recognised and appropriate standard specifications, which are UKAS calibrated as such where these properties have a significant effect on results. Participation in inter-laboratory comparisons and proficiency testing ensures satisfactory correlation of results conform to Element Materials Technology's own procedures, as well as statistical techniques for analysis of test data providing the appropriate confidence in measurements.

It is Element Materials Technology policy to always use the latest version of any applicable base test standards. Where a product specification calls up a superseded dated revision or an undated

basic standard, the latest version will be used. This may be a deviation to the product standard if dated references have been used.

Throughout this report EUT denotes equipment under test.

## 4 Specification References

- ANSI C63.4-2014 'American National Standard for Methods of measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz'
- ICES 003 Issue 7, October 2020 'Information Technology Equipment (Including Digital Apparatus)'

\*Indicates a specification or standard or specific amendment that is not listed on the Element Materials Technology's UKAS scope of accreditation.

## 5 Summary

|                             |                                                                                                                          |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------|
| TEST REPORT NUMBER:         | TRA-061097-44-00B                                                                                                        |
| WORKS ORDER NUMBER          | TRA-061097-02                                                                                                            |
| PURPOSE OF TEST:            | Electromagnetic Compatibility – Emissions                                                                                |
| TEST SPECIFICATION:         | FCC CFR 47 Part 15B October 2021                                                                                         |
| EQUIPMENT UNDER TEST (EUT): | C200                                                                                                                     |
| MANUFACTURER/AGENT:         | Intellian Ltd                                                                                                            |
| ADDRESS:                    | 4th Floor, The Charter Building,<br>Charter Place,<br>Uxbridge<br>UB8 1JG<br>United Kingdom                              |
| CLIENT CONTACT:             | Sophie Michel<br>☎ 07546740157<br>✉ <a href="mailto:sophie.michel@intelliantech.com">sophie.michel@intelliantech.com</a> |
| TEST DATE:                  | 19th June 2023                                                                                                           |
| TESTED BY:                  | Ian Broadwell<br>Element Materials Technology                                                                            |

### **5.1 EUT Compliance Statement**

The EUT has been tested to specification:

FCC CFR 47 Part 15B October 2021, FCC Code of Federal Regulations 47 Part 15B - Radio Frequency Devices 15.107 and 15.109 RF emissions from unintentional radiators

The EUT was found to comply. Note should be taken of any modifications given in section 6 of this report.

The results obtained within this FCC CFR 47 Part 15B report are deemed satisfactory evidence to comply with the requirements of Industry Canada Interference-Causing Equipment Standard ICES-003 issue 7.

The decision rule for compliance is inherent within the above specification and is based on recorded level by the lab, irrespective of the Measurement Uncertainty values.

### **5.2 Accreditation Statement**

The FCC standard listed is covered under the scope of Element's UKAS accreditation.

This laboratory is accredited in accordance with the recognised International Standard ISO/IEC 17025. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer joint ISO-ILAC-IAF communiqué dated April 2017).

### 5.3 Test Summary

The tests listed in the table below have been determined as applicable to the EUT:

| <i>Test Method and Description</i> | <i>Test Result</i> | <i>Test Order</i> | <i>Note</i> |
|------------------------------------|--------------------|-------------------|-------------|
| Conducted Emissions – Mains Port   | Pass               | 2                 |             |
| Radiated Emissions – Enclosure     | Pass               | 1                 |             |

## **6 EMC Modifications**

No modifications were carried out during the test programme.

## 7 Equipment Under Test (EUT) and Test Specific Information

### 7.1 EUT Identification

|                         |                                           |
|-------------------------|-------------------------------------------|
| Name:                   | Intellian C200                            |
| Model Number:           | C200M ADU;                                |
| Serial Number:          | Sample A (ADU MCB:11; RFU:8; BCX: 3W30100 |
| Build Level / Revision: | Revision B                                |
| Software Revision:      | 1.0.0 (Stable release)                    |
| Firmware Revision:      | 1.0.0 (Stable Release)                    |

### 7.2 EUT Cable / Port Identification

| Type |     | Description                                         | Part Number<br>(If applicable) | Outdoor<br>Cable Y / N | Test<br>Length | Max.<br>Installation<br>Length |
|------|-----|-----------------------------------------------------|--------------------------------|------------------------|----------------|--------------------------------|
| 1    | TNC | Power connector and data cable between ABU and BDU. | LMR200                         | Y                      | 25 m           | 75 m                           |
| 2    | SMA | Iridium BCX modem output to antenna                 | N/A                            | N/A                    | N/A            | N/A                            |

Note: SMA cable was required to connect antenna port to Ettus simulator for the purpose of testing.

### 7.3 Associated Equipment

The following equipment was not part of the system under test but needed to exercise and/or monitor the EUT during the testing.

[1]

|                          |                                                |
|--------------------------|------------------------------------------------|
| Name:                    | BDU                                            |
| Model Number:            | FB250                                          |
| Serial Number:           | PFP22121086                                    |
| Exercising / Monitoring: | Powering ADU and managing comms                |
| Brief Description:       | Second part of EUT with existing certification |

[2]

|                          |                                                                    |
|--------------------------|--------------------------------------------------------------------|
| Name:                    | Tp-link 8 port gigabit desktop switch                              |
| Model Number:            | TL-SG108S(UN)                                                      |
| Serial Number:           | 2232416003161                                                      |
| Exercising / Monitoring: | Providing switching between the laptop and Ettus box               |
| Brief Description:       | Increasing ethernet connectivity due to limited no of ports on BDU |

[3]

|                          |                                                                    |
|--------------------------|--------------------------------------------------------------------|
| Name:                    | Lenovo Laptop                                                      |
| Model Number:            | V14 G2IGL                                                          |
| Serial Number:           | PF9XB1B29172/82KA00NFUK                                            |
| Exercising / Monitoring: | Controlling data link between ADU and NI Ettus satellite simulator |
| Brief Description:       | Running propriety scripts to exercise EUT over ethernet            |

[4]

|                          |                                        |
|--------------------------|----------------------------------------|
| Name:                    | NI Ettus satellite simulator           |
| Model Number:            | USRP N210                              |
| Serial Number:           | S266FC2                                |
| Exercising / Monitoring: | L-band radio link                      |
| Brief Description:       | Simulating satellite datalink response |

#### **7.4 EUT Description**

The EUT is a maritime satellite terminal which provides three voice lines and digital data communication via the Iridium NEXT network of 66 Low-Earth Orbit satellites operating in L-band.

#### **7.5 EUT Intended Installation / Use Environment**

The ABU part of the EUT will be mounted on a support pole above the ships deck in a position to operate an over the air link with a satellite. The intended use is within a maritime environment.

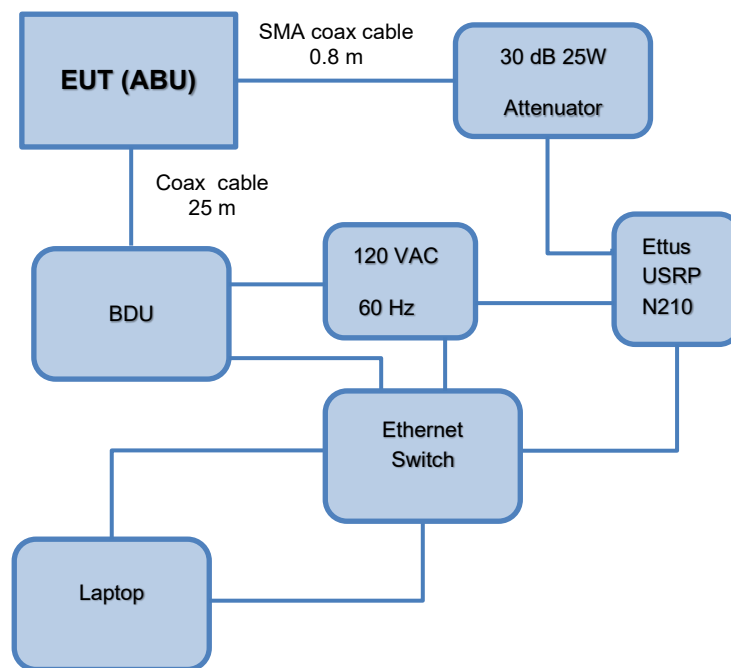
#### **7.6 EUT Operating Modes**

The manufacturer has selected the following mode of operation to provide a worst case emission profile during the test programme.

##### **7.6.1 Emissions Operating Mode**

Continuous pinging of the ADU via the BDU and connected laptop mas made possible with automated scripts provided by the manufacturer. Visual indication of the device functioning was shown in the console window with continuous scrolling of data every 6 seconds.

### 7.7 EUT Block Diagram



The BDU and ADU are connected through a single coaxial cable. The cable provides power from the BDU to the ADU and also an Ethernet data between the two units. The BDU controls all terminal management, systems monitoring, error correction and maintenance operations.

### 7.8 EUT Selection Configuration and Loading

The ADU's internal modem was continuously exercised during testing via a conducted RF path to the Ettus satellite simulator. This represented the worst case real world scenario of maximum channel data rate loading.

## 8 Conducted Emissions Mains Port FCC CFR 47 Part 15B – 15.107

### 8.1 Test Purpose

This test measures conducted noise that may be present on an EUT's power supply cable. This test ensures the protection of broadcast and telecommunication services used in the vicinity of the EUT. Specifically, but not limited to Long Wave and Medium Wave broadcast.

### 8.2 Test Parameters

|                            |                                                                                          |
|----------------------------|------------------------------------------------------------------------------------------|
| Test Chamber:              | Hull Lab 5                                                                               |
| Test Standard:             | FCC CFR 47 part 15B – 15.107<br>ANSI C63.4:2014                                          |
| Power Lines Tested:        | [1] Power port (on host device)                                                          |
| EUT Classification:        | Class A                                                                                  |
| Frequency Range:           | 150 kHz to 30 MHz                                                                        |
| Frequency Step Size:       | 5 kHz                                                                                    |
| Measurement Bandwidth:     | 10 kHz                                                                                   |
| Detectors:                 | Peak (Pre-scan)<br>Quasi-peak (Final Measurements)<br>CISPR Average (Final Measurements) |
| Quasi-peak Detector Dwell: | Minimum 2 s per frequency point                                                          |
| LISN Type:                 | CISPR 16, 50 $\Omega$ // 50 $\mu$ H                                                      |
| EUT Measurement Height:    | 0.8 m Insulated Support (Table)                                                          |
| EUT Operation Voltage:     | 120 VAC                                                                                  |
| EUT Operating Frequency:   | 60 Hz                                                                                    |
| Operating Mode:            | Emissions operating mode as defined in section 7.6                                       |
| Deviations from Standard:  | None                                                                                     |
| Test Result:               | Pass                                                                                     |

### 8.3 Environmental Conditions

|              |         |
|--------------|---------|
| Temperature: | 22 °C   |
| Humidity:    | 44 % RH |

Limits: No specific environmental conditions exist for this test.

## 8.4 Test Limits

### 8.4.1 Class A

| <b>Detector</b> | <b>Frequency Range</b> | <b>Limit</b>  |
|-----------------|------------------------|---------------|
| Quasi-Peak      | 150 kHz to 500 kHz     | 79 dB $\mu$ V |
|                 | 500 kHz to 30 MHz      | 73 dB $\mu$ V |
| Average         | 150 kHz to 500 kHz     | 66 dB $\mu$ V |
|                 | 500 kHz to 30 MHz      | 60 dB $\mu$ V |

## 8.5 Test Method

This test measures conducted noise that may be present on an EUT's power supply cable. This test ensures the protection of broadcast and telecommunication services used in the vicinity of the EUT.

The test setup used complies with all the dimension requirements set out in ANSI C63.4:2014. Reference is made to company procedure RTP1029 and RTP1002. Measurement instrumentation used meets the requirements of CISPR16-1-1:2010 or CISPR 16-1-2:2006 as appropriate, and uncertainties of CISPR 16-4-2:2011. Expanded laboratory uncertainties  $U_{lab}$  are less than or equal to CISPR 16-4-2:2011  $U_{cisp}$  Table 1. Therefore, no compensation is required to the actual measured level in determining compliance with the applied limit.

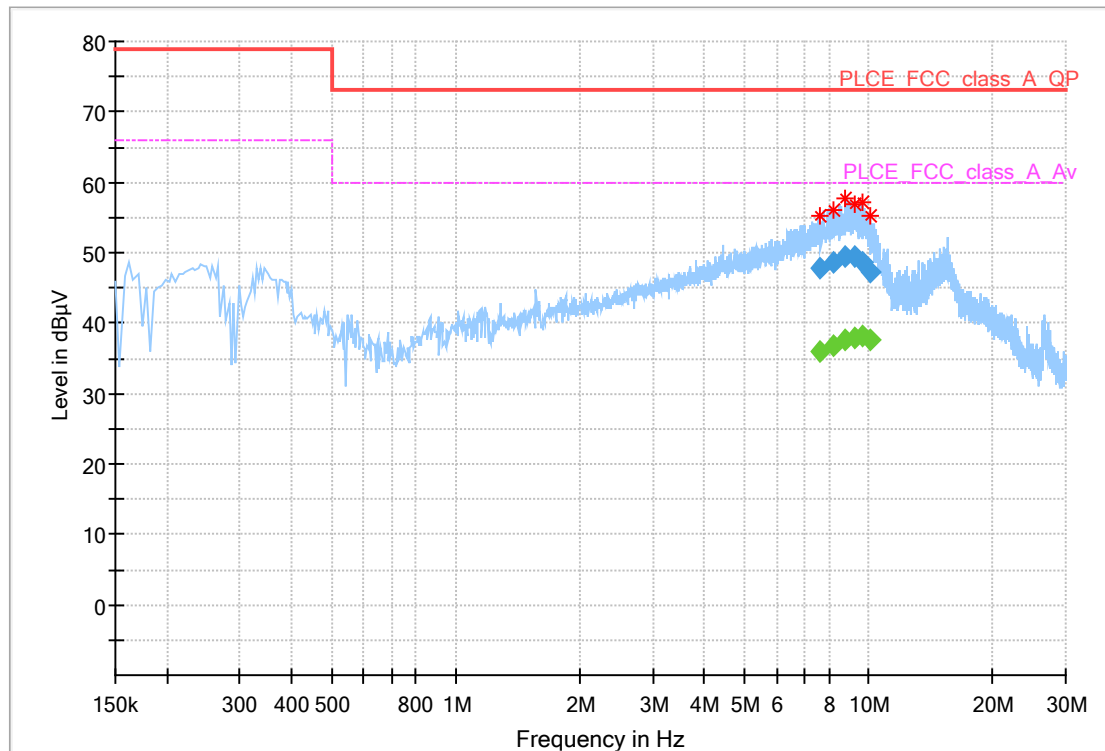
An initial scan is carried out in order to establish a frequency list that is attributable to the EUT, using automated R&S EMC32 measurement software. Receiver/analyser scan speed and bandwidth adjustments where applicable are in accordance with the reference standard, appropriate to the intercepted signal being resolved. Any emissions measurements that fall within 20 dB $\mu$ V of the Average or Quasi-Peak limit line are then re-measured using the associated CISPR detector for each frequency of interest.

## 8.6 Test Equipment

| <b>Type of Equipment</b> | <b>Maker/Supplier</b> | <b>Model Number</b> | <b>Serial Number</b> | <b>Element Number</b> | <b>Actual Equipment Used</b> |
|--------------------------|-----------------------|---------------------|----------------------|-----------------------|------------------------------|
| Receiver                 | Rohde & Schwarz       | ESHS10              | 830051/002           | H125                  | X                            |
| LISN                     | Rohde & Schwarz       | ESH3-Z5             | 838576/002           | H189                  | X                            |
| Pulse Limiter            | Rohde & Schwarz       | ESH3-Z2             | 0357.8810.54         | H680                  | X                            |

## 8.7 Test Results

### 8.7.1 Conducted Emissions Test Data

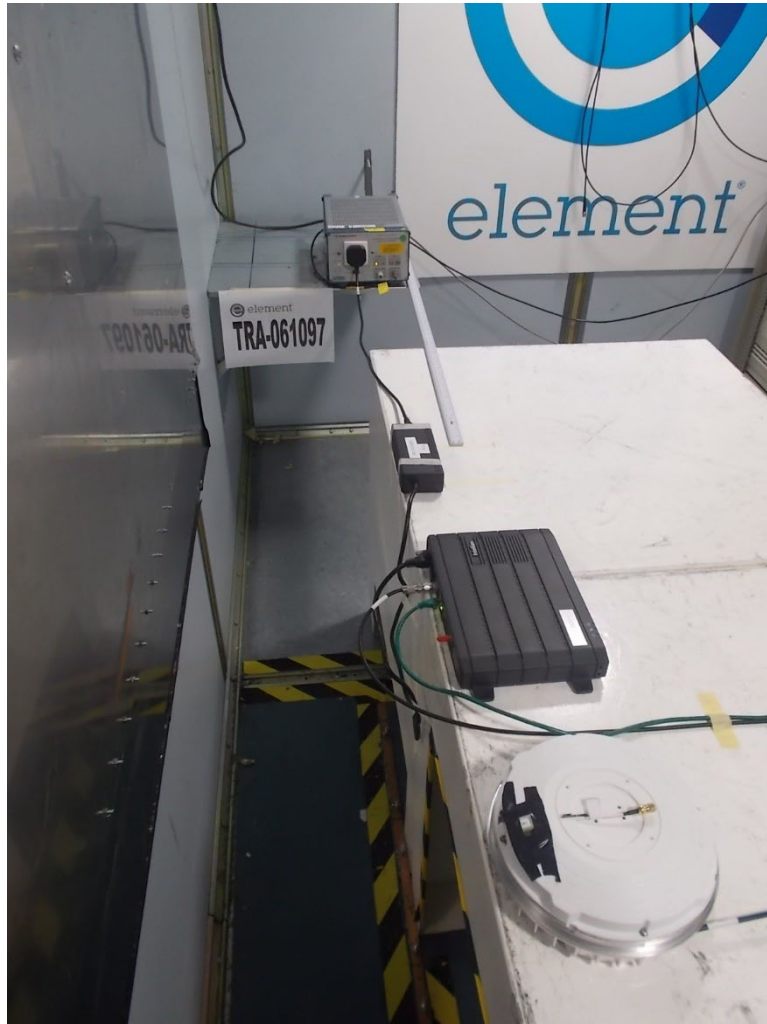


The above plot is generated from a combined horizontal and vertical Peak hold preview scan. The Blue markers above are a maximised Peak detector included for information only. The Green markers above are the maximised Quasi-Peak detector required for the formal assessment; the above emissions are listed in table format below.

| Frequency | QuasiPeak | Limit | Margin | Meas. Time | Bandwidth | Line | PE | Corr. |
|-----------|-----------|-------|--------|------------|-----------|------|----|-------|
| 7.597000  | 47.78     | 73.00 | 25.22  | 15000.0    | 10.000    | N    | GN | 10.7  |
| 8.193000  | 48.66     | 73.00 | 24.34  | 15000.0    | 10.000    | N    | GN | 10.8  |
| 8.737000  | 49.54     | 73.00 | 23.46  | 15000.0    | 10.000    | N    | GN | 10.8  |
| 9.253000  | 49.33     | 73.00 | 23.67  | 15000.0    | 10.000    | L1   | GN | 10.9  |
| 9.689000  | 48.67     | 73.00 | 24.33  | 15000.0    | 10.000    | L1   | GN | 10.9  |
| 10.061000 | 47.34     | 73.00 | 25.66  | 15000.0    | 10.000    | N    | GN | 10.8  |

| Frequency | Average | Limit | Margin | Meas. Time | Bandwidth | Line | PE | Corr. |
|-----------|---------|-------|--------|------------|-----------|------|----|-------|
| 7.597000  | 35.99   | 60.00 | 24.01  | 15000.0    | 10.000    | N    | GN | 10.7  |
| 8.193000  | 36.86   | 60.00 | 23.14  | 15000.0    | 10.000    | N    | GN | 10.8  |
| 8.737000  | 37.68   | 60.00 | 22.32  | 15000.0    | 10.000    | N    | GN | 10.8  |
| 9.253000  | 37.77   | 60.00 | 22.23  | 15000.0    | 10.000    | L1   | GN | 10.9  |
| 9.689000  | 38.28   | 60.00 | 21.72  | 15000.0    | 10.000    | L1   | GN | 10.9  |
| 10.061000 | 37.58   | 60.00 | 22.42  | 15000.0    | 10.000    | N    | GN | 10.8  |

## 8.8 Test Photograph



## 9 Radiated Emissions FCC CFR 47 Part 15(b) – 15.109

### 9.1 Test Purpose

This test measures radiated electromagnetic emissions that may emanate from EUT enclosures and cables. This test ensures the protection of broadcast and telecommunication services used in the vicinity of the EUT.

### 9.2 Test Parameters

|                                                  |                                                                                                     |
|--------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Test Chamber:                                    | Lab 10                                                                                              |
| Test Standard:                                   | FCC CFR 47 part 15(b) – 15.109<br>ANSI C63.4:2014                                                   |
| EUT Classification:                              | Class A                                                                                             |
| Highest EUT Clock Frequency Used /<br>Generated: | 1761.25 MHz                                                                                         |
| Frequency Range:                                 | 30 MHz to 8.806 GHz                                                                                 |
| Measurement Bandwidth:                           | 120 kHz ( $\leq 1$ GHz)<br>1 MHz ( $\geq 1$ GHz)                                                    |
| Video Bandwidth:                                 | 1 MHz ( $\leq 1$ GHz)<br>3 MHz ( $\geq 1$ GHz)                                                      |
| Detectors:                                       | Peak<br>Average ( $\geq 1$ GHz Final Measurements)<br>Quasi-peak ( $\leq 1$ GHz Final Measurements) |
| Quasi-peak Detector Dwell:                       | Minimum 2 s per frequency point                                                                     |
| EUT Measurement Height:                          | 0.8 m Insulated Support (Table)                                                                     |
| EUT Operation Voltage:                           | 120 VAC                                                                                             |
| EUT Operating Frequency:                         | 60 Hz                                                                                               |
| Operating Mode:                                  | Emissions operating mode as defined in section 7.6                                                  |
| Deviations from Standard:                        | None                                                                                                |
| Test Result:                                     | Pass                                                                                                |

### 9.3 Environmental Conditions

|              |         |
|--------------|---------|
| Temperature: | 22 °C   |
| Humidity:    | 44 % RH |

Limits: No specific environmental conditions exist for this test.

## 9.4 Test Limits

### 9.4.1 Class A 30 MHz to 40 GHz (3 m)

| <i>Detector</i> | <i>Frequency Range</i> | <i>Limit</i>      |
|-----------------|------------------------|-------------------|
| Quasi-peak      | 30 MHz to 88 MHz       | 49.1 dB $\mu$ V/m |
|                 | 88 MHz to 216 MHz      | 53.5 dB $\mu$ V/m |
|                 | 216 MHz to 960 MHz     | 56.4 dB $\mu$ V/m |
|                 | 960 MHz to 1 GHz       | 59.5 dB $\mu$ V/m |
| Average         | 1GHz to 40 GHz *       | 59.5 dB $\mu$ V/m |
| Peak            | 1GHz to 40 GHz *       | 79.5 dB $\mu$ V/m |

#### NOTES:

1. The exact upper frequency tested will depend on the highest clock frequency declared. The exact frequency range and highest clock frequency declared is given in the test parameters section.

## 9.5 Test Method

This test measures radiated electromagnetic emissions that may emanate from EUT enclosures and cables. This test ensures the protection of broadcast and telecommunication services used in the vicinity of the EUT.

The test set-up used complies with all the dimension requirements set out in ANSI C63.4:2014. The semi-anechoic chamber used meets the site attenuation measurements required by ANSI C63.4:2014 Clause 5.4.2 & 5.5. Reference is made to company procedure RTP1029 and RTP1005.

Measurement instrumentation used meets the requirements of CISPR 16-1-1:2010, and uncertainties of CISPR 16-4-2:2011. Expanded laboratory uncertainties  $U_{lab}$  are less than or equal to CISPR 16-4-2:2011  $U_{cisp}$  Table 1. Therefore, no compensation is required to the actual measured level in determining compliance with the applied limit.

An initial scan is carried out in order to establish a frequency list that is attributable to the EUT, using automated R&S EMC32 measurement software. Receiver/analyser scan speed and bandwidth adjustments where applicable are in accordance with the reference standard, appropriate to the intercepted signal being resolved. Any emissions measurements that fall within 20 dB $\mu$ V/m of the limit line are then maximised by rotating the equipment through 360 ° and raising/lowering the antenna through 1 to 4 m height for each frequency of interest.

## 9.6 Test Equipment

| <i>Type of Equipment</i> | <i>Maker/Supplier</i> | <i>Model Number</i> | <i>Serial Number</i> | <i>Element Number</i> | <i>Actual Equipment Used</i> |
|--------------------------|-----------------------|---------------------|----------------------|-----------------------|------------------------------|
| Receiver/Analyser        | Rohde & Schwarz       | ESU40               | 100005               | H701                  | X                            |
| Semi-Anechoic Chamber    | Panashield            | Lab 10              | -                    | H710                  | X                            |
| Bi-Log Antenna           | Teseq                 | CBL6111             | 31217                | H679                  | X                            |
| Pre-Amplifier            | Hewlett Packard       | 8449B               | 3008A00873           | H307                  | X                            |
| Pre-Amplifier            | Sonoma                | 11909A              | 186878               | H673                  | X                            |
| Lab 10 cable 1.2 m       | Teledyne Reynolds     | 106                 | -                    | H643                  | X                            |
| Lab 10 cable 7 m         | Teledyne Reynolds     | 106                 | -                    | H651                  | X                            |
| Lab 10 cable 5 m         | Teledyne Reynolds     | 106                 | -                    | H708                  |                              |
| Lab 10 cable 1 m         | Teledyne Reynolds     | 269-8006-1000       | -                    | H746                  | X                            |
| Lab 10 cable 5 m         | Teledyne Reynolds     | 269-8005-1005       | -                    | H747                  |                              |
| Antenna                  | Rohde & Schwarz       | HL050               | 100463               | H682                  | X                            |
| Cable                    | Rosenberger           | -                   | -                    | H690                  | X                            |

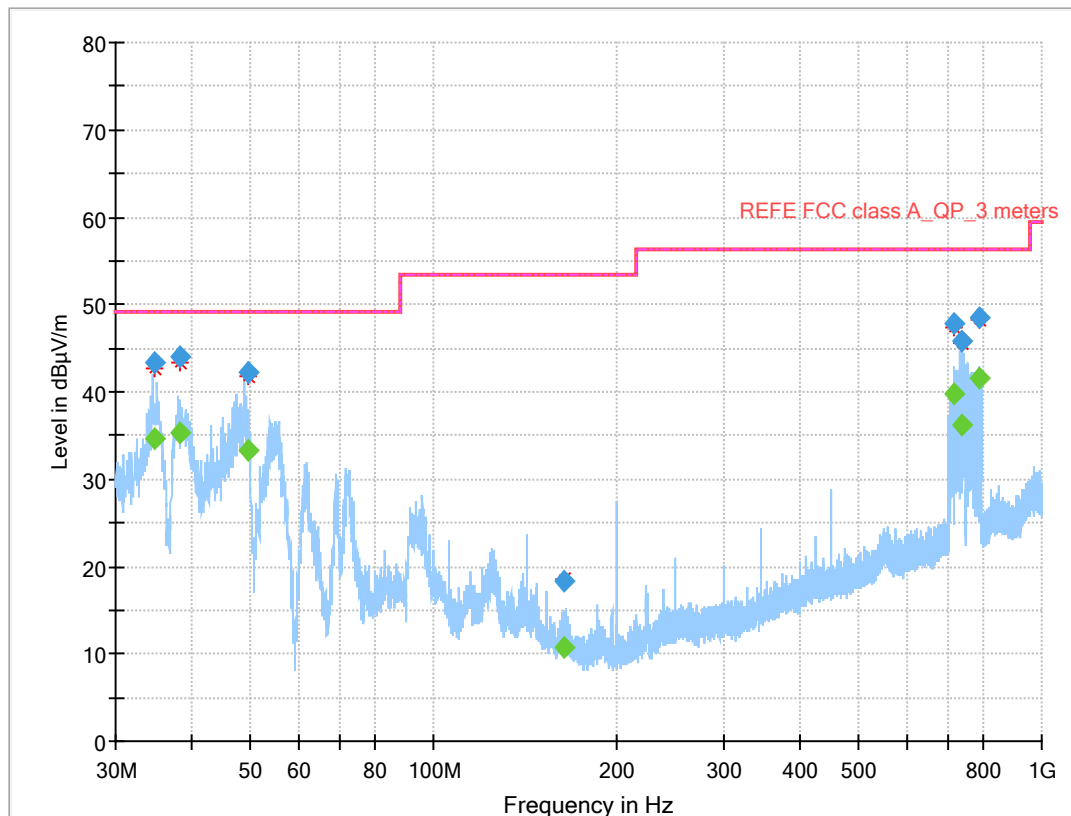
## 9.7 Test Results

### 9.7.1 Sample Calculation

The radiated emission levels used in the report are calculated thus:

| <i>Frequency (MHz)</i> | <i>Measured Value (dB<math>\mu</math>V)</i> | <i>Combined Antenna &amp; Cable Factor (dB/m)</i> | <i>Emission Level (dB<math>\mu</math>V/m)</i> |
|------------------------|---------------------------------------------|---------------------------------------------------|-----------------------------------------------|
| 38.167227              | 45.7                                        | -10.4                                             | 35.3                                          |
| 34.817653              | 43.4                                        | -8.7                                              | 34.7                                          |
| 789.87036              | 43.2                                        | -1.5                                              | 41.7                                          |
| 49.47372               | 49.5                                        | -16.3                                             | 33.2                                          |
| 717.93724              | 42.0                                        | -2.2                                              | 39.8                                          |
| 740.618813             | 37.8                                        | -1.6                                              | 36.2                                          |

### 9.7.2 Radiated Emissions E-Field Test Data – 30 MHz to 1 GHz

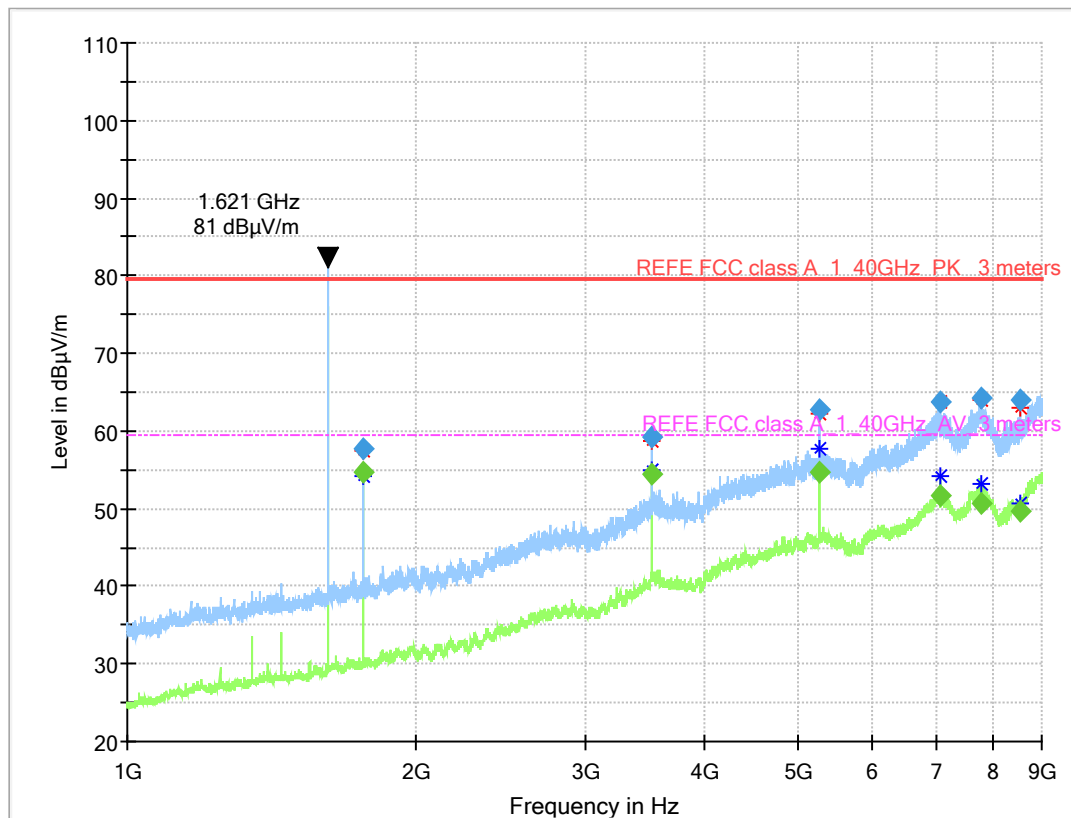


The above plot is generated from a combined horizontal and vertical Peak hold preview scan. The Blue markers above are a maximised Peak detector included for information only. The Green markers above are the maximised Quasi-Peak detector required for the formal assessment; the above emissions are listed in table format below.

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|--------------|
| 34.817653       | 43.26            | 49.10          | 5.84        | 15000.0         | 120.000         | 123.0       | V   | 124.0         | -8.7         |
| 38.167227       | 43.97            | 49.10          | 5.13        | 15000.0         | 120.000         | 102.0       | V   | 66.0          | -10.4        |
| 49.473720       | 42.25            | 49.10          | 6.85        | 15000.0         | 120.000         | 100.0       | V   | 203.0         | -16.3        |
| 163.529467      | 18.40            | 53.50          | 35.10       | 15000.0         | 120.000         | 306.0       | H   | 124.0         | -14.0        |
| 717.937240      | 47.75            | 56.40          | 8.65        | 15000.0         | 120.000         | 152.0       | V   | 168.0         | -2.2         |
| 740.618813      | 45.89            | 56.40          | 10.51       | 15000.0         | 120.000         | 306.0       | V   | 99.0          | -1.6         |
| 789.870360      | 48.56            | 56.40          | 7.84        | 15000.0         | 120.000         | 146.0       | V   | 132.0         | -1.5         |

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|--------------|
| 34.817653       | 34.65              | 49.10          | 14.45       | 15000.0         | 120.000         | 123.0       | V   | 124.0         | -8.7         |
| 38.167227       | 35.31              | 49.10          | 13.79       | 15000.0         | 120.000         | 102.0       | V   | 66.0          | -10.4        |
| 49.473720       | 33.23              | 49.10          | 15.87       | 15000.0         | 120.000         | 100.0       | V   | 203.0         | -16.3        |
| 163.529467      | 10.75              | 53.50          | 42.75       | 15000.0         | 120.000         | 306.0       | H   | 124.0         | -14.0        |
| 717.937240      | 39.79              | 56.40          | 16.61       | 15000.0         | 120.000         | 152.0       | V   | 168.0         | -2.2         |
| 740.618813      | 36.20              | 56.40          | 20.20       | 15000.0         | 120.000         | 306.0       | V   | 99.0          | -1.6         |
| 789.870360      | 41.65              | 56.40          | 14.75       | 15000.0         | 120.000         | 146.0       | V   | 132.0         | -1.5         |

### 9.7.3 Radiated Emissions E-Field Test Data – 1 GHz to 8.806 GHz



The above plot is generated from a combined horizontal and vertical Peak hold and Average hold preview scan. The Blue markers above are a maximised Peak detector. The Green markers above are the maximised Average detector; the above emissions are listed in table format below.

The above emission at 1.621 GHz has been identified as the EUT's intentional radiator and does not form part of this assessment. Technical specifications related to the antenna port of radio equipment and radiated emissions from the enclosure port of radio equipment and combinations of radio and associated ancillary equipment are not included in FCC Part 15(b).

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|--------------|
| 1761.246000     | 57.66            | 79.50          | 21.84       | 15000.0         | 1000.000        | 260.0       | H   | 112.0         | -1.7         |
| 3522.356000     | 59.30            | 79.50          | 20.20       | 15000.0         | 1000.000        | 189.0       | H   | 75.0          | 9.6          |
| 5283.794000     | 62.76            | 79.50          | 16.74       | 15000.0         | 1000.000        | 225.0       | H   | 307.0         | 15.7         |
| 7044.936000     | 63.80            | 79.50          | 15.70       | 15000.0         | 1000.000        | 357.0       | V   | 57.0          | 20.7         |
| 7772.910000     | 64.33            | 79.50          | 15.17       | 15000.0         | 1000.000        | 360.0       | H   | 12.0          | 22.5         |
| 8534.000000     | 63.89            | 79.50          | 15.61       | 15000.0         | 1000.000        | 368.0       | V   | 182.0         | 21.2         |

| Frequency (MHz) | CAverage (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|-------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|--------------|
| 1761.200000     | 54.71             | 59.50          | 4.79        | 15000.0         | 1000.000        | 200.0       | H   | 113.0         | -1.7         |
| 3522.400000     | 54.45             | 59.50          | 5.05        | 15000.0         | 1000.000        | 200.0       | H   | 60.0          | 9.6          |
| 5283.600000     | 54.68             | 59.50          | 4.82        | 15000.0         | 1000.000        | 300.0       | H   | 316.0         | 15.7         |
| 7044.800000     | 51.61             | 59.50          | 7.89        | 15000.0         | 1000.000        | 400.0       | V   | 46.0          | 20.7         |
| 7774.800000     | 50.73             | 59.50          | 8.77        | 15000.0         | 1000.000        | 300.0       | H   | 1.0           | 22.5         |
| 8532.000000     | 49.76             | 59.50          | 9.74        | 15000.0         | 1000.000        | 100.0       | H   | 262.0         | 21.2         |

## 9.8 Test Photograph

### 9.8.1 30 MHz to 1 GHz



9.8.2 1 GHz to 8.806 GHz



## 10 EMC Measurement Uncertainty

All uncertainties listed are standard uncertainties multiplied by a coverage factor K=2.00 for to give a 95% confidence level.

| <b><i>Test / Measurement</i></b>                                          | <b><i>Budget Number</i></b> | <b><i>MU</i></b> |
|---------------------------------------------------------------------------|-----------------------------|------------------|
| <b><i>Conducted Emissions Including Discontinuous Emissions:</i></b>      |                             |                  |
| Conducted Emissions 9 kHz to 150 kHz LISN Measurement                     | MU1005                      | <b>3.4 dB</b>    |
| Conducted Emissions 150 kHz to 30 MHz LISN Measurement                    | MU1006                      | <b>3.2 dB</b>    |
| Conducted Emissions 150 kHz to 30 MHz Voltage Probe Measurement           | MU1034                      | <b>2.9 dB</b>    |
| <b><i>Radiated Emissions (H-Field):</i></b>                               |                             |                  |
| Radiated Emissions 150 kHz to 30 MHz using CISPR 16-1-4 small (0.6m) Loop | MU1018                      | <b>2.5 dB</b>    |
| <b><i>Radiated Emissions (E-Field):</i></b>                               |                             |                  |
| Radiated Emissions 30 MHz to 1 GHz using CBL6111/2 Bilog Antenna          | MU1008                      | <b>5.3 dB</b>    |
| Radiated Emissions 1 GHz to 18 GHz using HL050 Log Periodic Antenna       | MU1009                      | <b>5.1 dB</b>    |
| Radiated Emissions 6 GHz to 18 GHz using Standard Gain Horn Antenna       | MU1010                      | <b>5.0 dB</b>    |
| Radiated Emissions 18 GHz to 26.5 GHz using Standard Gain Horn Antenna    | MU1011                      | <b>2.7 dB</b>    |
| Radiated Emissions 26.4 GHz to 40 GHz using Standard Gain Horn Antenna    | MU1012                      | <b>2.6 dB</b>    |