

# FCC and ISED Test Report

Apple Inc  
Model: A2338

In accordance with FCC 47 CFR Part 15,  
ISED RSS-247 and ISED RSS-GEN (2.4 GHz  
WLAN, 5 GHz WLAN and 2.4 GHz Bluetooth)

Prepared for: Apple Inc  
One Apple Park Way  
Cupertino  
California  
95014  
USA



Add value.  
Inspire trust.

FCC ID: BGCA2338

IC: 579C-A2338

## COMMERCIAL-IN-CONFIDENCE

Document 75948987-14 Issue 01

### SIGNATURE

| NAME           | JOB TITLE       | RESPONSIBLE FOR      | ISSUE DATE      |
|----------------|-----------------|----------------------|-----------------|
| Steve Marshall | Senior Engineer | Authorised Signatory | 06 October 2020 |

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD 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 Parts 15, ISED RSS-247 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         | Cristian Onaca | 06 October 2020 |           |

FCC Accreditation

90987 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 Parts 15: 2019, ISED RSS-247: Issue 2 (2017-02) and ISED RSS-GEN: Issue 5 (04-2018) + A1 (03-2019) 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           | 06-October-2020 |

**Table 1**

## 1.2 Introduction

|                               |                                                                                                               |
|-------------------------------|---------------------------------------------------------------------------------------------------------------|
| Applicant                     | Apple Inc                                                                                                     |
| Manufacturer                  | Apple Inc                                                                                                     |
| Model Number(s)               | A2338                                                                                                         |
| Serial Number(s)              | C02CX02PQC36                                                                                                  |
| Hardware Version(s)           | REV 1.0                                                                                                       |
| Software Version(s)           | 20W112771j                                                                                                    |
| Number of Samples Tested      | 1                                                                                                             |
| Test Specification/Issue/Date | FCC 47 CFR Part 15: 2019<br>ISED RSS-247: Issue 2 (2017-02)<br>ISED RSS-GEN: Issue 5 (04-2018) + A1 (03-2019) |
| Order Number                  | 0540201117                                                                                                    |
| Date                          | 05-May-2020                                                                                                   |
| Date of Receipt of EUT        | 30-August-2020                                                                                                |
| Start of Test                 | 30-August-2020                                                                                                |
| Finish of Test                | 09-September-2020                                                                                             |
| Name of Engineer(s)           | Cristian Onaca                                                                                                |
| Related Document(s)           | ANSI C63.10: 2013                                                                                             |



### 1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Parts 15, ISED RSS-247 and ISED RSS-GEN is shown below.

| Section                                                                       | Specification Clause              |             |              | Test Description                                        | Result | Comments/Base Standard |
|-------------------------------------------------------------------------------|-----------------------------------|-------------|--------------|---------------------------------------------------------|--------|------------------------|
|                                                                               | FCC Part 15                       | RSS-247     | RSS-GEN      |                                                         |        |                        |
| Configuration and Mode: SDB - 2.4 GHz WLAN and 5 GHz WLAN                     |                                   |             |              |                                                         |        |                        |
| 2.1                                                                           | 15.247 (d), 15.407 (b) and 15.209 | 5.5 and 6.2 | 8.9 and 8.10 | Radiated Spurious Emissions (Simultaneous Transmission) | Pass   | ANSI C63.10: 2013      |
| Configuration and Mode: CoTX - 2.4 GHz WLAN, 5 GHz WLAN and 2.4 GHz Bluetooth |                                   |             |              |                                                         |        |                        |
| 2.1                                                                           | 15.247 (d), 15.407 (b) and 15.209 | 5.5 and 6.2 | 8.9 and 8.10 | Radiated Spurious Emissions (Simultaneous Transmission) | Pass   | ANSI C63.10: 2013      |

**Table 2**



## 1.4 Product Information

### 1.4.1 Technical Description

The Equipment Under Test (EUT) was a Laptop Computer with Bluetooth, Bluetooth Low Energy and 802.11 a/b/g/n/ac/ax capabilities in the 2.4 GHz and 5 GHz bands.

### 1.5 Deviations from the Standard

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

### 1.6 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: A2338, Serial Number: C02CX02PQC36 |                                                 |                        |                          |
| 0                                         | As supplied by the customer                     | Not Applicable         | Not Applicable           |

**Table 3**

### 1.7 Test Location

TÜV SÜD conducted the following tests at our Fareham Test Laboratory.

| Test Name                                                                      | Name of Engineer(s) | Accreditation |
|--------------------------------------------------------------------------------|---------------------|---------------|
| Configuration and Mode: SDB - 2.4 GHz WLAN and 5 GHz WLAN                      |                     |               |
| Radiated Spurious Emissions (Simultaneous Transmission)                        | Cristian Onaca      | UKAS          |
| Configuration and Mode: CoTX - 2.4 GHz WLAN , 5 GHz WLAN and 2.4 GHz Bluetooth |                     |               |
| Radiated Spurious Emissions (Simultaneous Transmission)                        | Cristian Onaca      | UKAS          |

**Table 4**

Office Address:

Octagon House  
Concorde Way  
Segensworth North  
Fareham  
Hampshire  
PO15 5RL  
United Kingdom



## 2 Test Details

### 2.1 Radiated Spurious Emissions (Simultaneous Transmission)

#### 2.1.1 Specification Reference

FCC 47 CFR Parts 15, Clause 15.247 (d), 15.407 (b) and 15.209  
ISED RSS 247, Clause 5.5 and 6.2  
ISED RSS GEN, Clause 8.9 and 8.10

#### 2.1.2 Equipment Under Test and Modification State

A2338, S/N: C02CX02PQC36 - Modification State 0

#### 2.1.3 Date of Test

30-August-2020 to 09-September-2020

#### 2.1.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 6.3, 6.4 and 6.6.

The EUT was placed on the non-conducting platform in a manner typical of a normal installation.

Ports on the EUT were terminated with loads as described in ANSI C63.4 clause 6.2.4 for each type of port on the EUT.

For frequencies > 1 GHz, plots for average measurements were taken in accordance with ANSI C63.10, clause 4.1.4.2.5 to characterize the EUT. Where emissions were detected, final average measurements were taken in accordance with ANSI C63.10, clause 4.1.4.2.2, 11.11, 11.12, 12.7.2 or 12.7.3 depending on the nature of the emission measured.

The plots shown are the characterisation of the EUT. The limits on the plots represent the most stringent case for restricted bands, (74/54 dBuV/m) when compared to non-restricted band limits. The limits shown have been used as a threshold to determine where further measurements are necessary. Where results are within 10 dB of the limits shown on the plots, further investigation was carried out and reported in results tables.

The following conversion can be applied to convert from dBµV/m to µV/m:  
 $10^{(\text{Field Strength in dB}\mu\text{V/m}/20)}$

To determine the emission characteristic of the EUT above 18 GHz, the test antenna was swept over all faces of the EUT whilst observing a spectral display. The frequency of any emissions of interest was noted for formal measurement at the correct measurement distance of 1m. This procedure was repeated for all relevant transmit operating channels.

At a measurement distance of 1 meter the limit line was increased by  $20 \cdot \text{LOG}(3/1) = 9.54$  dB.

## 2.1.5 Example Test Setup Diagram

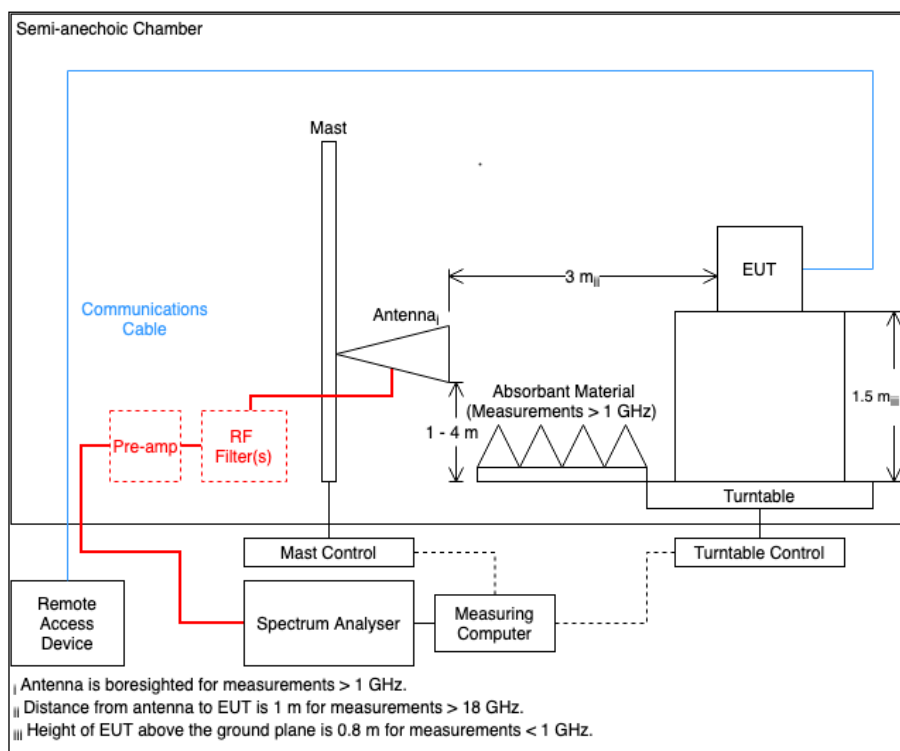


Figure 1

## 2.1.6 Environmental Conditions

Ambient Temperature 20.8 - 24.9 °C  
Relative Humidity 37.3 - 55.3 %

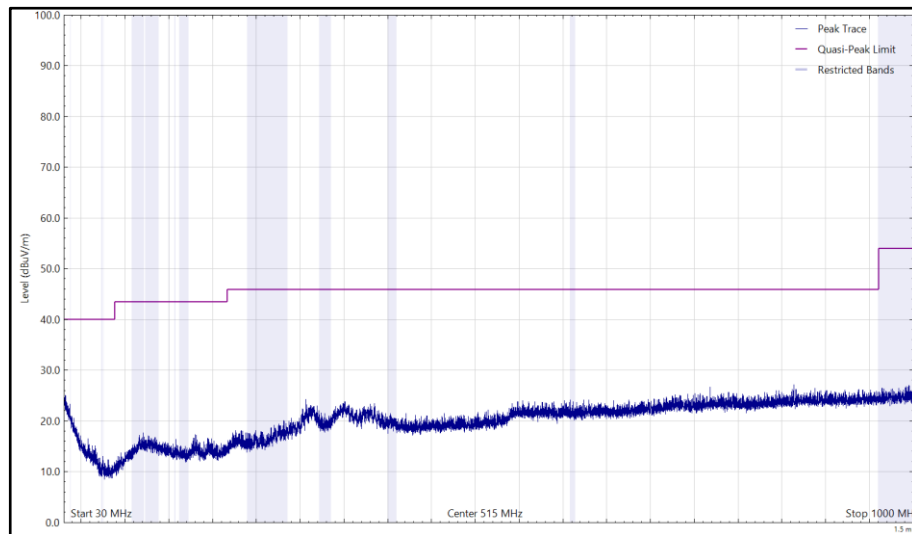
## 2.1.7 Test Results

SDB - 2.4 GHz WLAN and 5 GHz WLAN

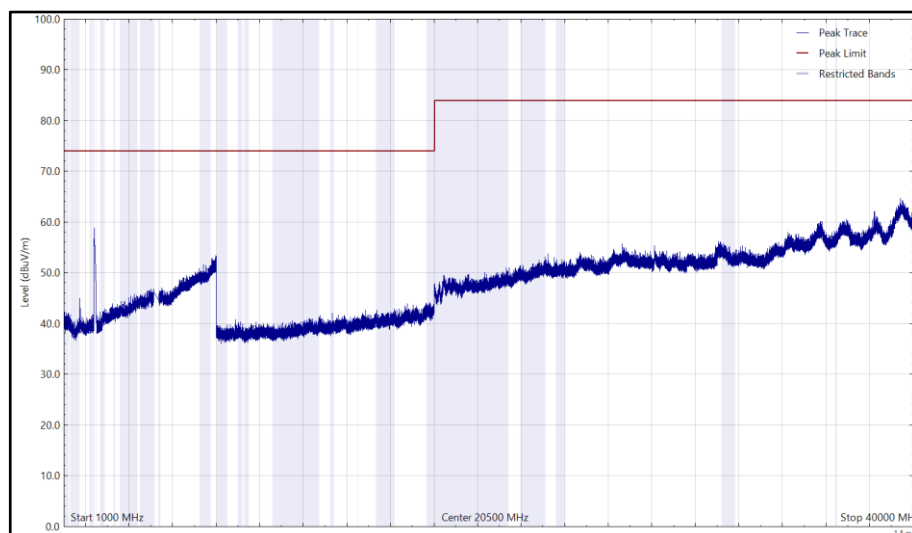
| Frequency (MHz) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation |
|-----------------|----------------|----------------|-------------|----------|-----------|-------------|--------------|
| 4832.926        | 42.7           | 54.0           | -11.3       | rms      | 348       | 276         | Vertical     |
| 4835.295        | 44.1           | 54.0           | -9.9        | rms      | 8         | 293         | Vertical     |

**Table 5 - 2417 MHz (CH2), HT20, CDD, Core 0 + Core 1 and U-NII-1 - 5200 MHz (CH40), HT20, CDD, Core 0 + Core 1, 30 MHz to 40 GHz**

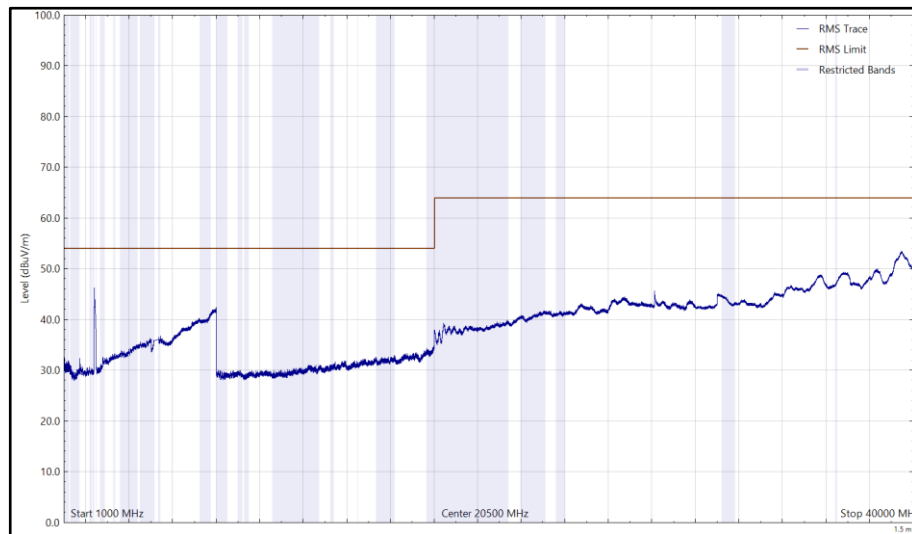
No other emissions found within 10 dB of the limit.



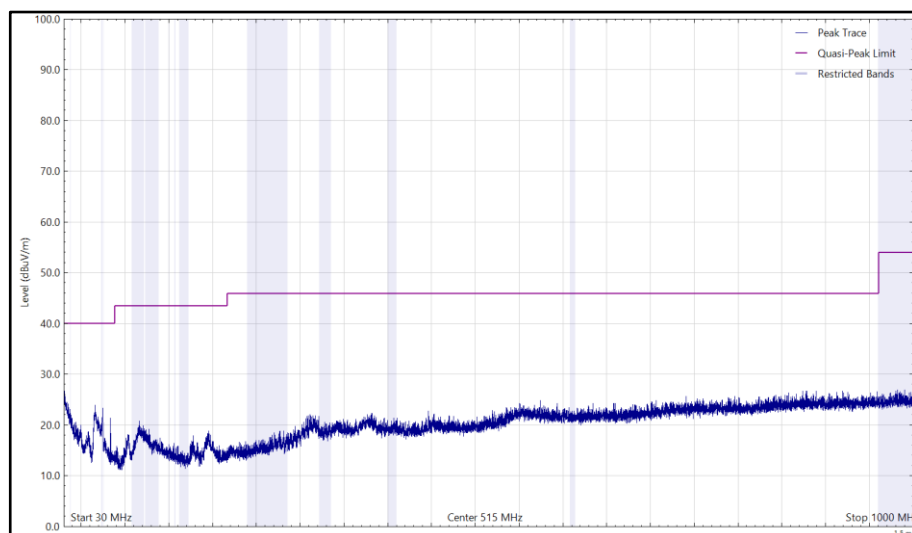
**Figure 2 - 2417 MHz (CH2), HT20, CDD, Core 0 + Core 1 and U-NII-1 - 5200 MHz (CH40), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)**



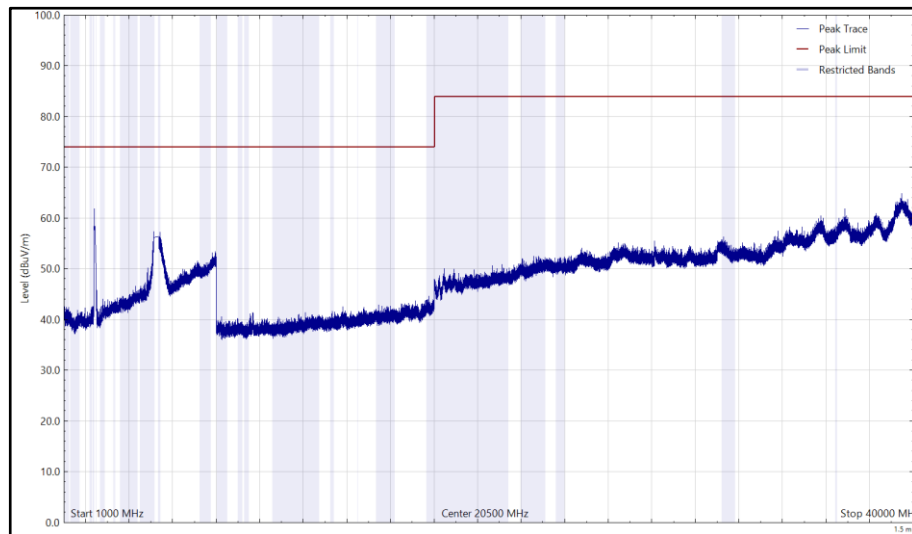
**Figure 3 - 2417 MHz (CH2), HT20, CDD, Core 0 + Core 1 and U-NII-1 - 5200 MHz (CH40), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (Peak)**



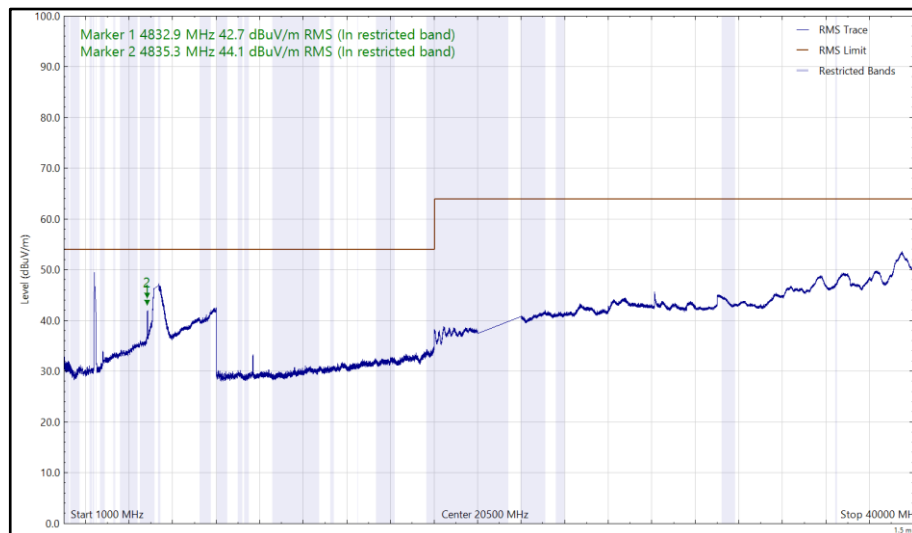
**Figure 4 - 2417 MHz (CH2), HT20, CDD, Core 0 + Core 1 and U-NII-1 - 5200 MHz (CH40), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (rms)**



**Figure 5 - 2417 MHz (CH2), HT20, CDD, Core 0 + Core 1 and U-NII-1 - 5200 MHz (CH40), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)**



**Figure 6 - 2417 MHz (CH2), HT20, CDD, Core 0 + Core 1 and U-NII-1 - 5200 MHz (CH40), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (Peak)**

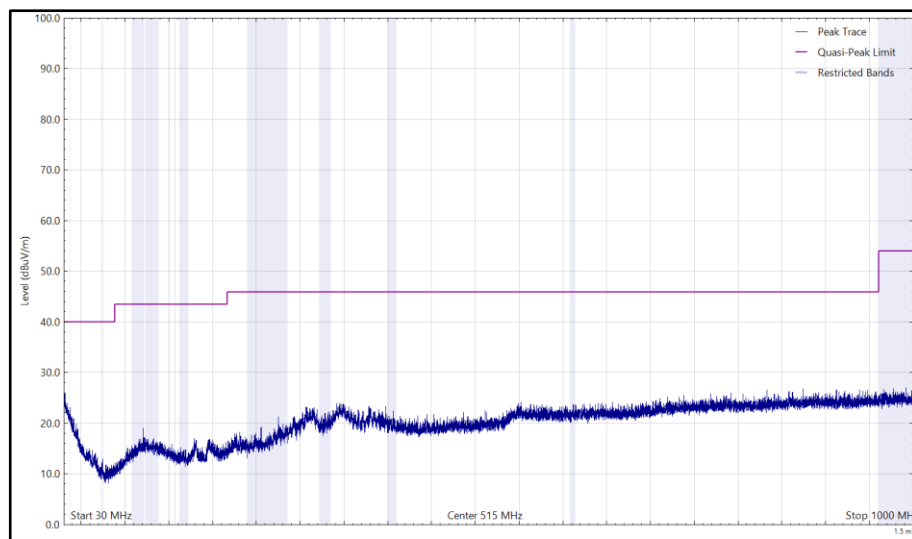


**Figure 7 - 2417 MHz (CH2), HT20, CDD, Core 0 + Core 1 and U-NII-1 - 5200 MHz (CH40), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (rms)**

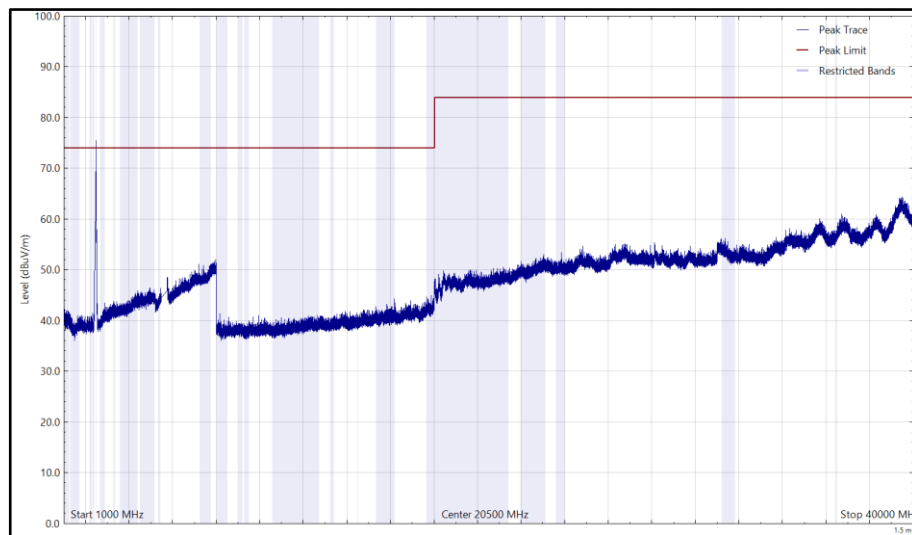
| Frequency (MHz) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation |
|-----------------|----------------|----------------|-------------|----------|-----------|-------------|--------------|
| 4900.047        | 56.7           | 74.0           | -17.4       | Peak     | 11        | 322         | Vertical     |
| 4902.753        | 43.5           | 54.0           | -10.5       | rms      | 351       | 304         | Vertical     |

**Table 6 - 2452 MHz (CH9), HT20, CDD, Core 0 + Core 1 and U-NII-2C - 5680 MHz (CH136), HT20, CDD, Core 0 + Core 1, 30 MHz to 40 GHz**

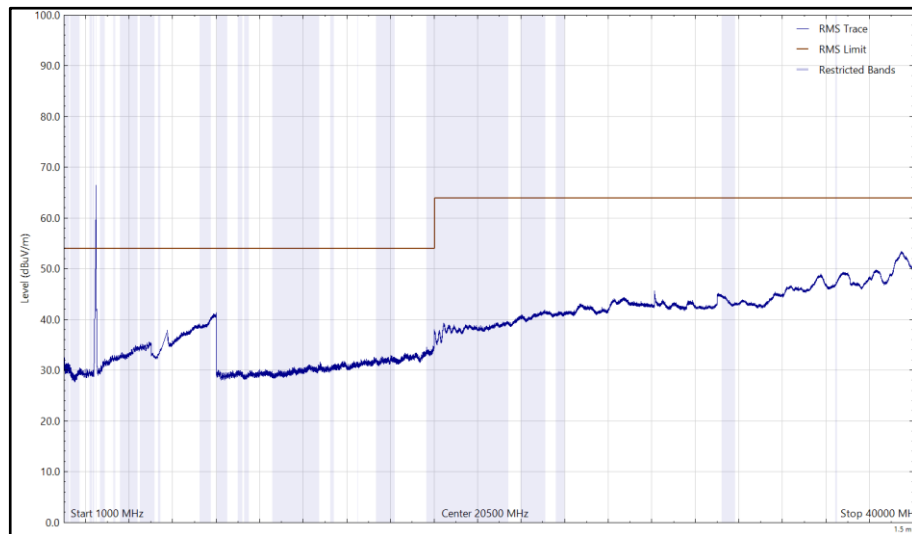
No other emissions found within 10 dB of the limit.



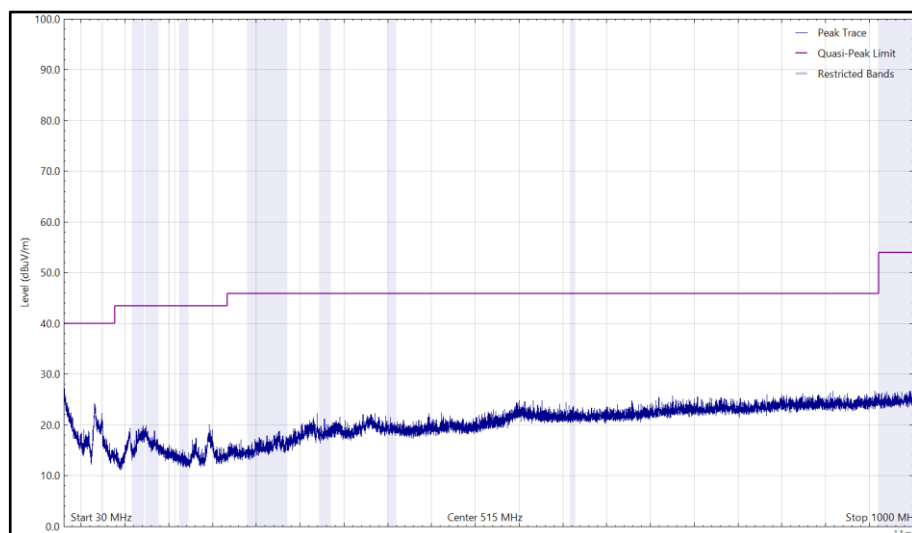
**Figure 8 - 2452 MHz (CH9), HT20, CDD, Core 0 + Core 1 and U-NII-2C - 5680 MHz (CH136), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)**



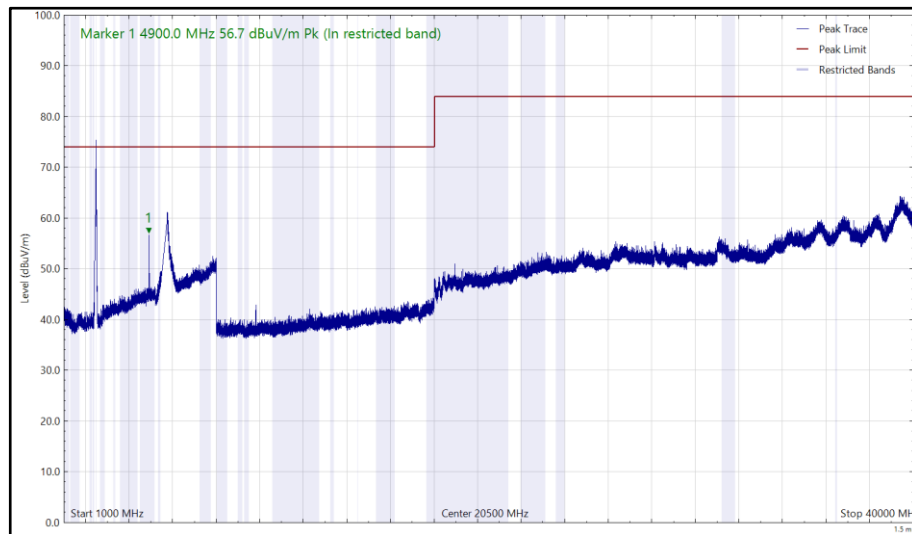
**Figure 9 - 2452 MHz (CH9), HT20, CDD, Core 0 + Core 1 and U-NII-2C - 5680 MHz (CH136), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (Peak)**



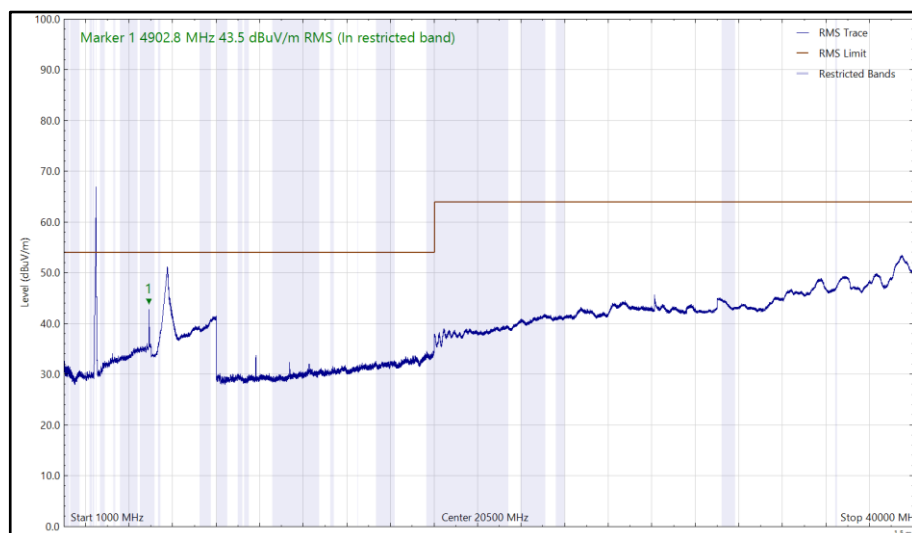
**Figure 10 - 2452 MHz (CH9), HT20, CDD, Core 0 + Core 1 and U-NII-2C - 5680 MHz (CH136), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (rms)**



**Figure 11 - 2452 MHz (CH9), HT20, CDD, Core 0 + Core 1 and U-NII-2C - 5680 MHz (CH136), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)**



**Figure 12 - 2452 MHz (CH9), HT20, CDD, Core 0 + Core 1 and U-NII-2C - 5680 MHz (CH136), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (Peak)**



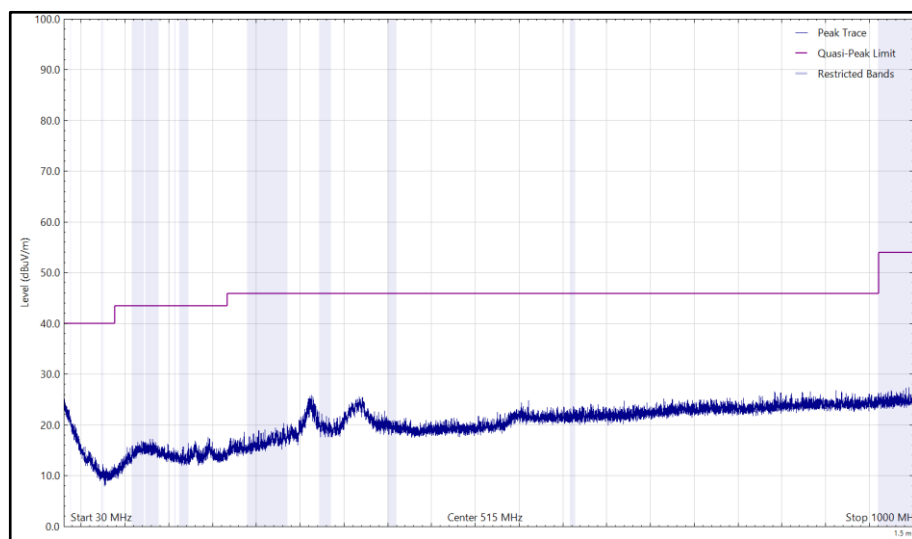
**Figure 13 - 2452 MHz (CH9), HT20, CDD, Core 0 + Core 1 and U-NII-2C - 5680 MHz (CH136), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (rms)**

CoTX - 2.4 GHz WLAN and 5 GHz WLAN and 2.4 GHz Bluetooth

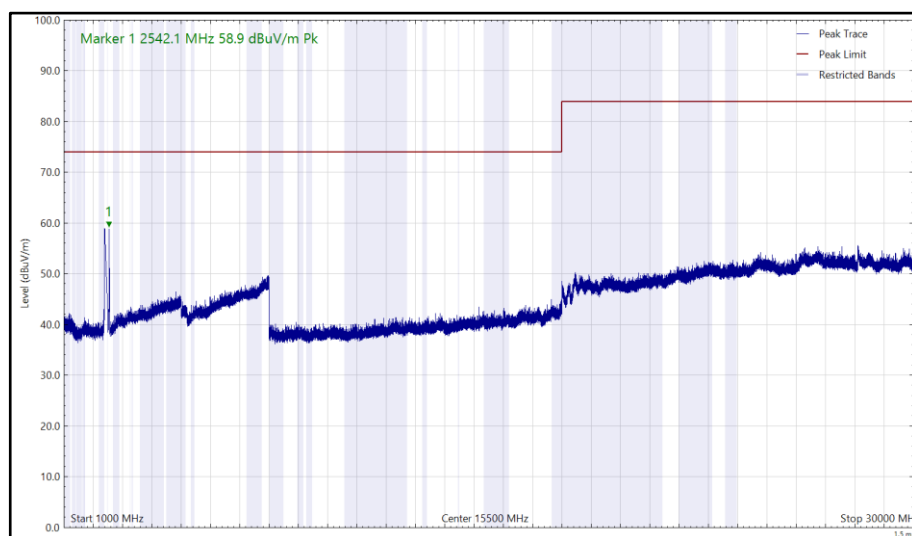
| Frequency (MHz) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector  | Angle (°) | Height (cm) | Polarisation |
|-----------------|----------------|----------------|-------------|-----------|-----------|-------------|--------------|
| 2539.503        | 66.6           | 74.0           | -7.4        | Peak      | 20        | 324         | Vertical     |
| 2542.097        | 58.9           | 74.0           | -15.1       | Peak      | 303       | 400         | Horizontal   |
| 4959.567        | 35.1           | 54.0           | -18.9       | CISPR Avg | 359       | 100         | Vertical     |

**Table 7 - 2417 MHz (CH2), HT20, CDD, Core 0 + Core 1 and 2480 MHz (CH78), DH5, ePA, Core 0, 30 MHz to 30 GHz**

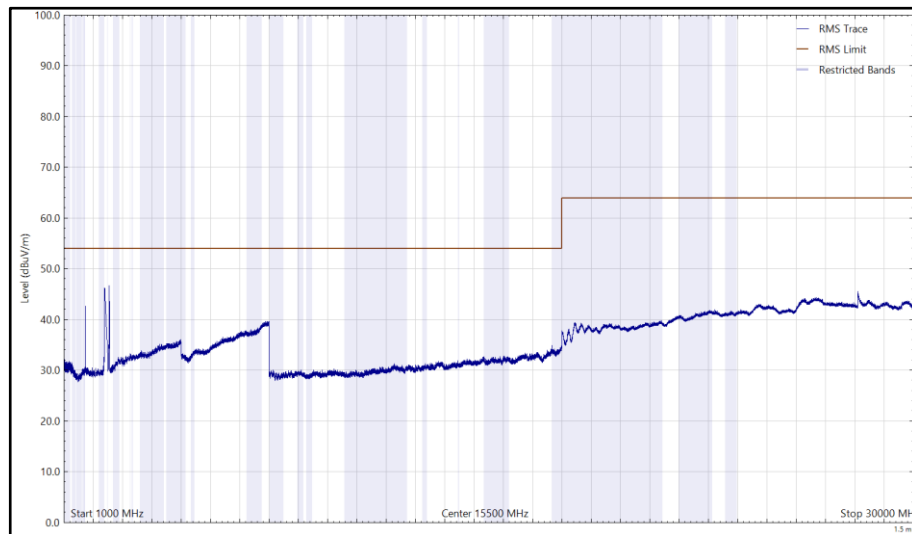
No other emissions found within 10 dB of the limit.



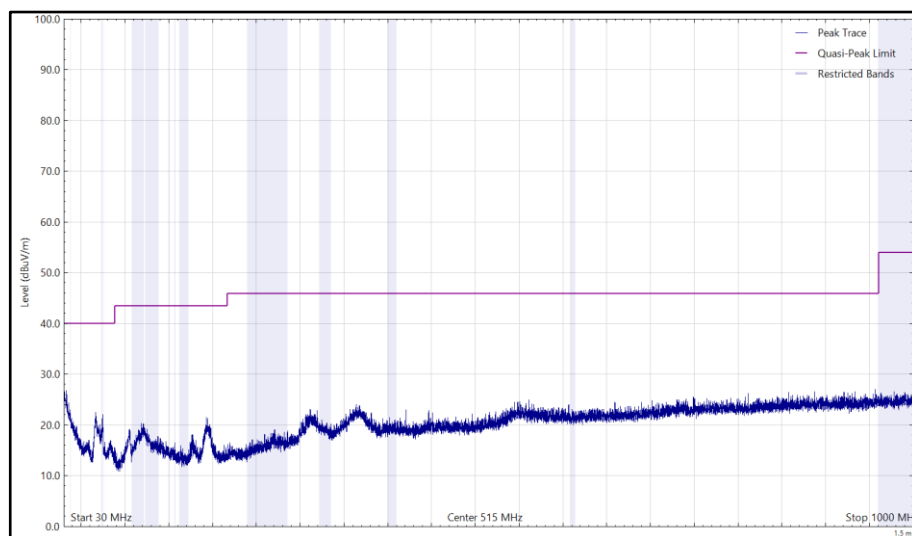
**Figure 14 - 2417 MHz (CH2), HT20, CDD, Core 0 + Core 1 and 2480 MHz (CH78), DH5, ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)**



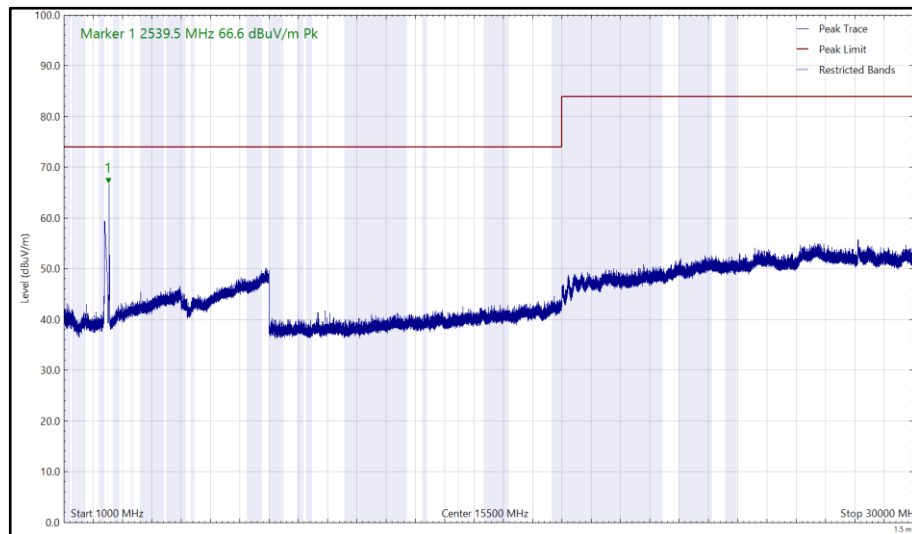
**Figure 15 - 2417 MHz (CH2), HT20, CDD, Core 0 + Core 1 and 2480 MHz (CH78), DH5, ePA, Core 0, 1 GHz to 30 GHz, Horizontal (Peak)**



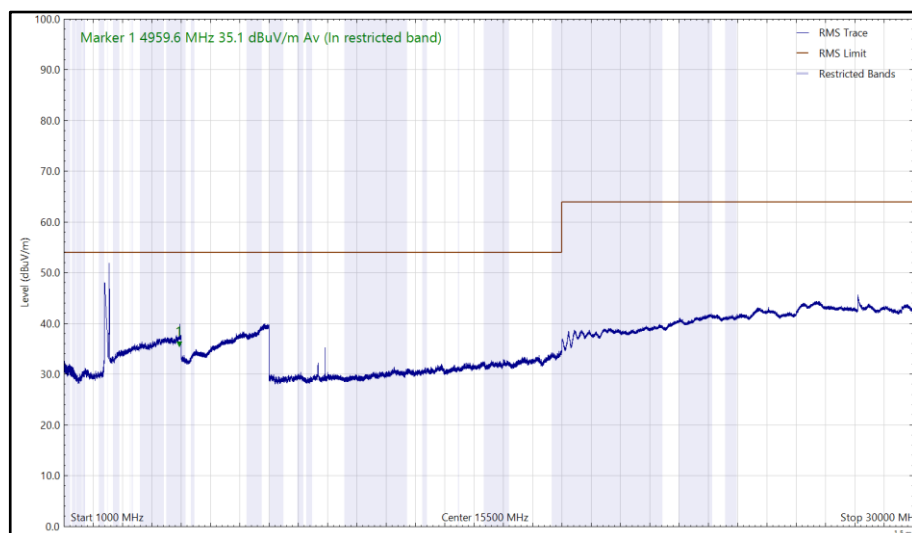
**Figure 16 - 2417 MHz (CH2), HT20, CDD, Core 0 + Core 1 and 2480 MHz (CH78), DH5, ePA, Core 0, 1 GHz to 30 GHz, Horizontal (rms)**



**Figure 17 - 2417 MHz (CH2), HT20, CDD, Core 0 + Core 1 and 2480 MHz (CH78), DH5, ePA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)**



**Figure 18 - 2417 MHz (CH2), HT20, CDD, Core 0 + Core 1 and 2480 MHz (CH78), DH5, ePA, Core 0, 1 GHz to 30 GHz, Vertical (Peak)**

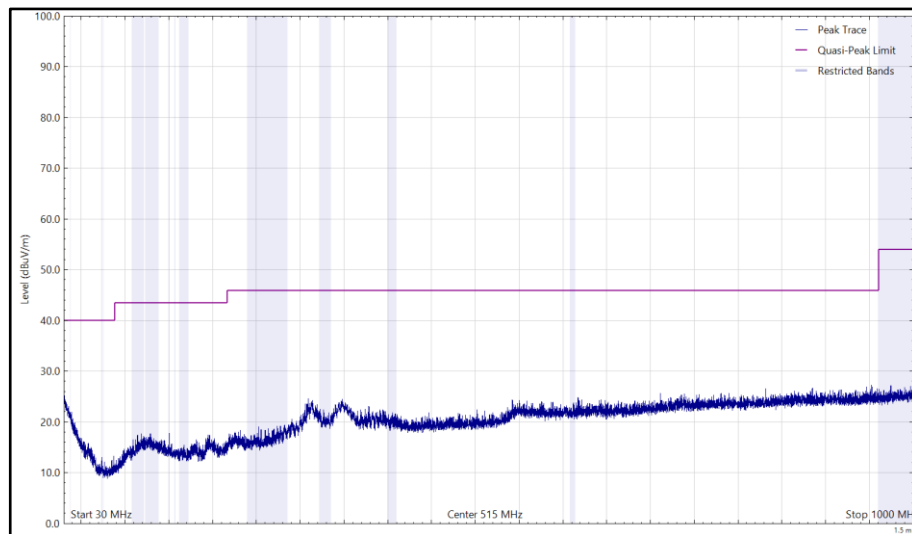


**Figure 19 - 2417 MHz (CH2), HT20, CDD, Core 0 + Core 1 and 2480 MHz (CH78), DH5, ePA, Core 0, 1 GHz to 30 GHz, Vertical (rms)**

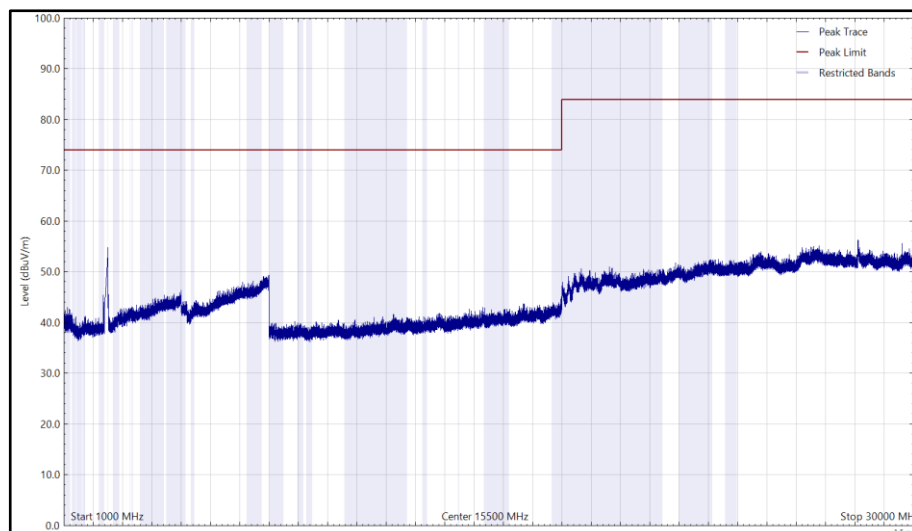
| Frequency (MHz) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector  | Angle (°) | Height (cm) | Polarisation |
|-----------------|----------------|----------------|-------------|-----------|-----------|-------------|--------------|
| 2352.471        | 38.4           | 54.0           | -15.6       | CISPR Avg | 327       | 379         | Horizontal   |
| 2354.726        | 65.3           | 74.0           | -8.7        | Peak      | 42        | 395         | Vertical     |
| 4803.926        | 38.2           | 54.0           | -15.8       | CISPR Avg | 346       | 106         | Vertical     |

**Table 8 - 2452 MHz (CH9), HT20, CDD, Core 0 + Core 1 and 2402 MHz (CH0), DH5, ePA, Core 0, 30 MHz to 30 GHz**

No other emissions found within 10 dB of the limit.



**Figure 20 - 2452 MHz (CH9), HT20, CDD, Core 0 + Core 1 and 2402 MHz (CH0), DH5, ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)**



**Figure 21 - 2452 MHz (CH9), HT20, CDD, Core 0 + Core 1 and 2402 MHz (CH0), DH5, ePA, Core 0, 1 GHz to 30 GHz, Horizontal (Peak)**

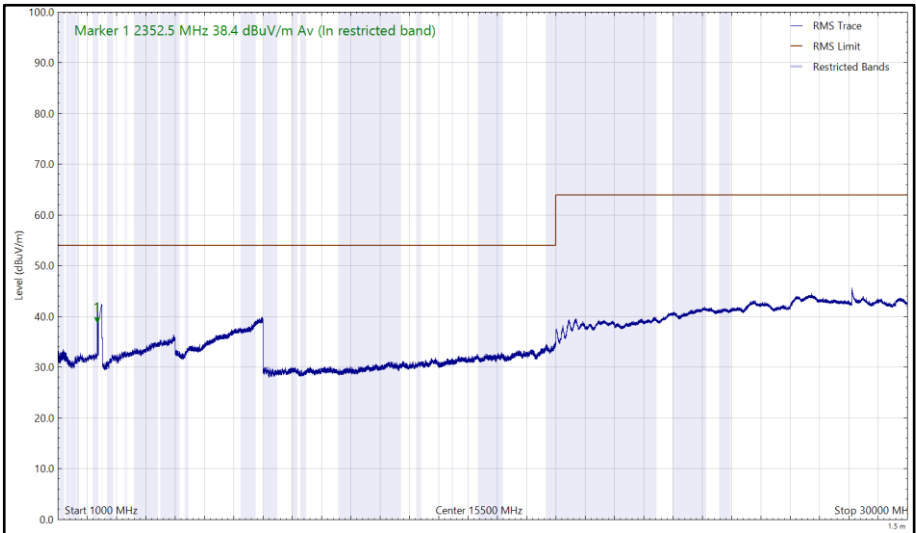


Figure 22 - 2452 MHz (CH9), HT20, CDD, Core 0 + Core 1 and 2402 MHz (CH0), DH5, ePA, Core 0, 1 GHz to 30 GHz, Horizontal (rms)

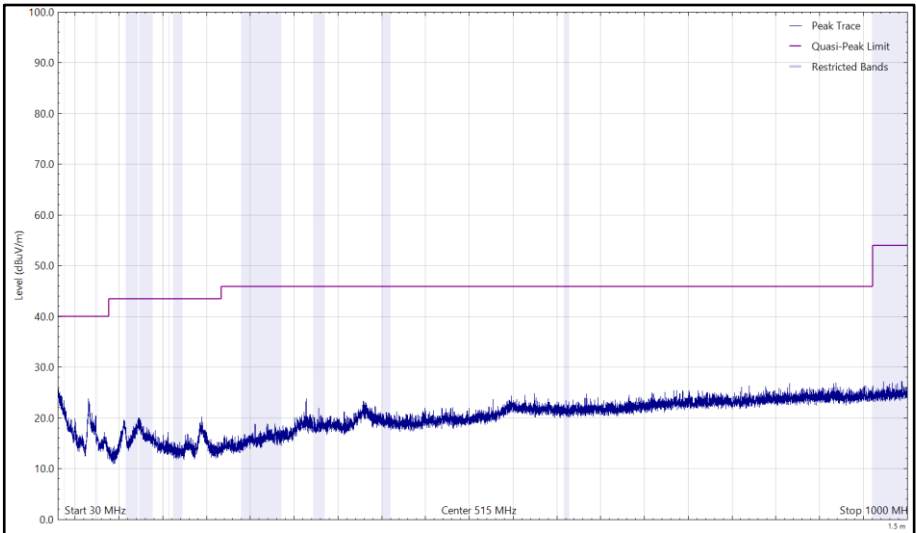


Figure 23 - 2452 MHz (CH9), HT20, CDD, Core 0 + Core 1 and 2402 MHz (CH0), DH5, ePA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)

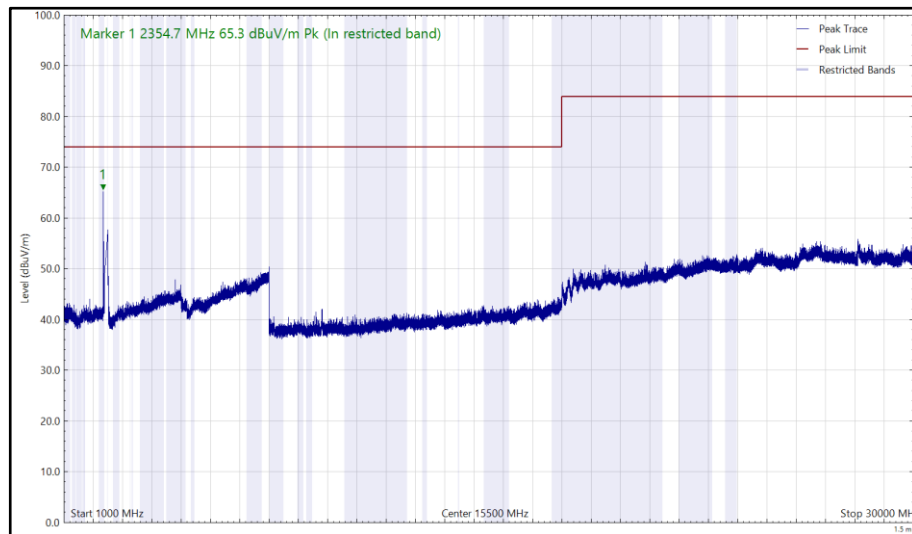


Figure 24 - 2452 MHz (CH9), HT20, CDD, Core 0 + Core 1 and 2402 MHz (CH0), DH5, ePA, Core 0, 1 GHz to 30 GHz, Vertical (Peak)

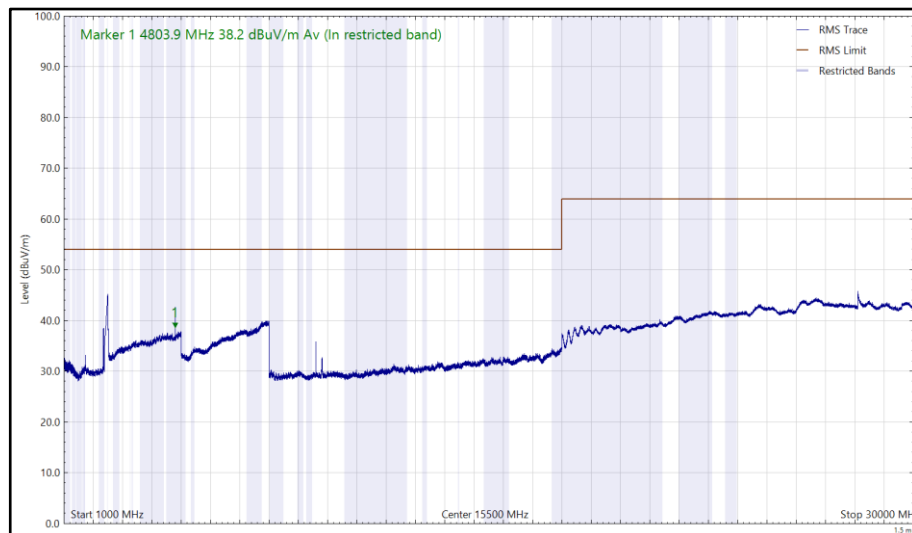
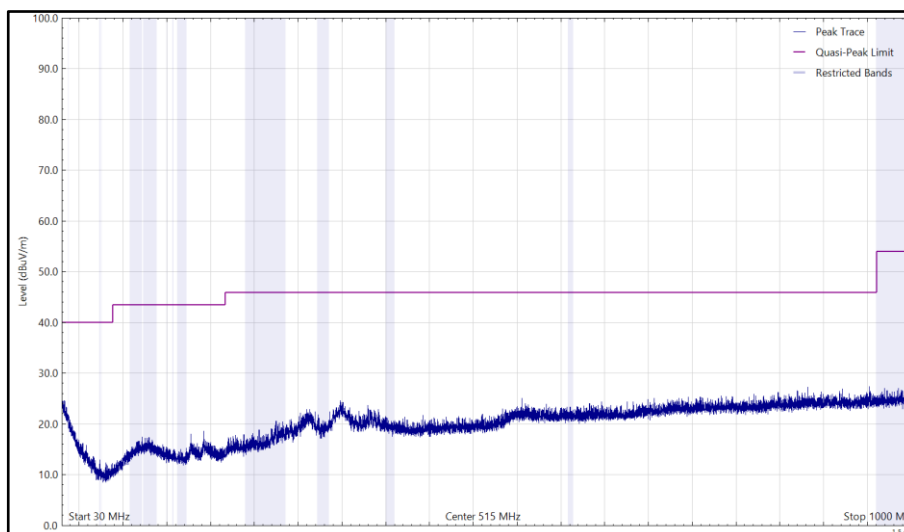


Figure 25 - 2452 MHz (CH9), HT20, CDD, Core 0 + Core 1 and 2402 MHz (CH0), DH5, ePA, Core 0, 1 GHz to 30 GHz, Vertical (rms)

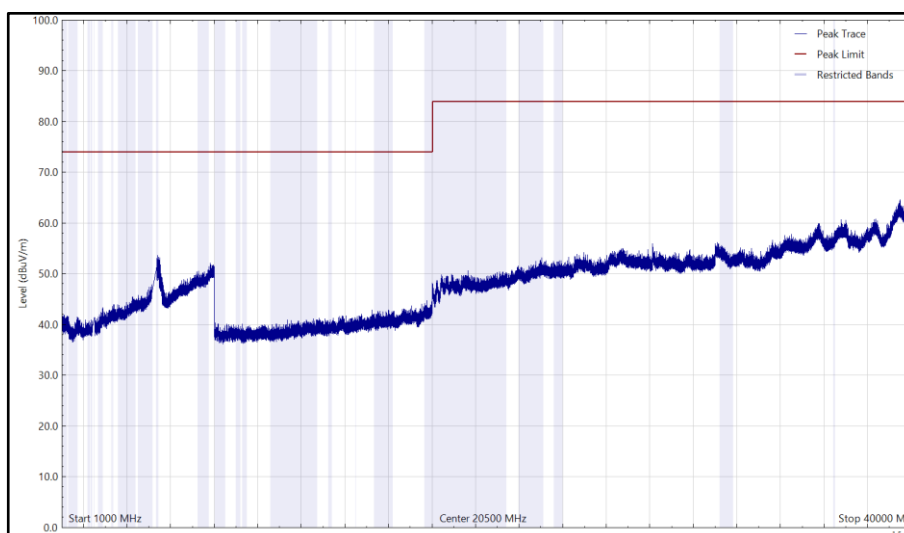
| Frequency (MHz) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector  | Angle (°) | Height (cm) | Polarisation |
|-----------------|----------------|----------------|-------------|-----------|-----------|-------------|--------------|
| 4959.717        | 45.5           | 54.0           | -8.5        | CISPR Avg | 350       | 286         | Vertical     |

**Table 9 - U-NII-1 - 5200 MHz (CH40), HT20, CDD, Core 0 + Core 1 and 2480 MHz (CH78), DH5, ePA, Core 0, 30 MHz to 40 GHz**

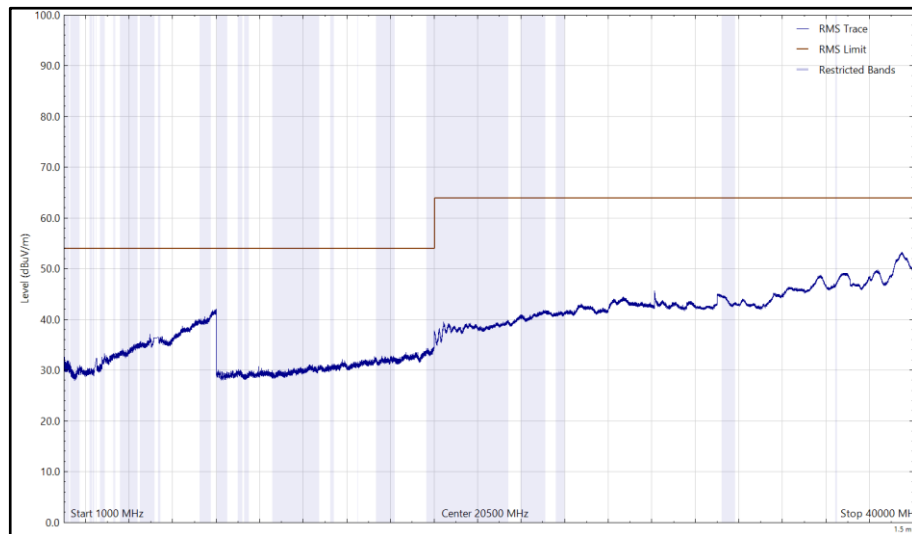
No other emissions found within 10 dB of the limit.



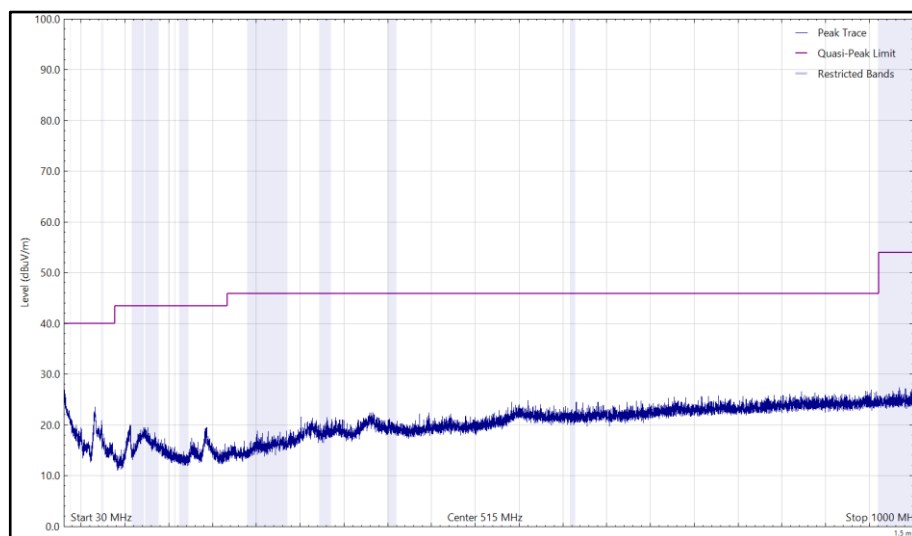
**Figure 26 - U-NII-1 - 5200 MHz (CH40), HT20, CDD, Core 0 + Core 1 and 2480 MHz (CH78), DH5, ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)**



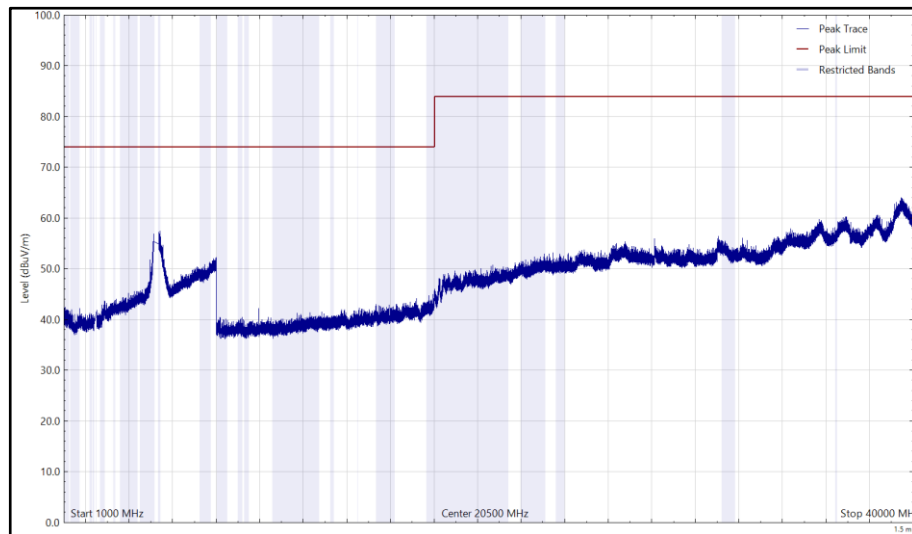
**Figure 27 - U-NII-1 - 5200 MHz (CH40), HT20, CDD, Core 0 + Core 1 and 2480 MHz (CH78), DH5, ePA, Core 0, 1 GHz to 40 GHz, Horizontal (Peak)**



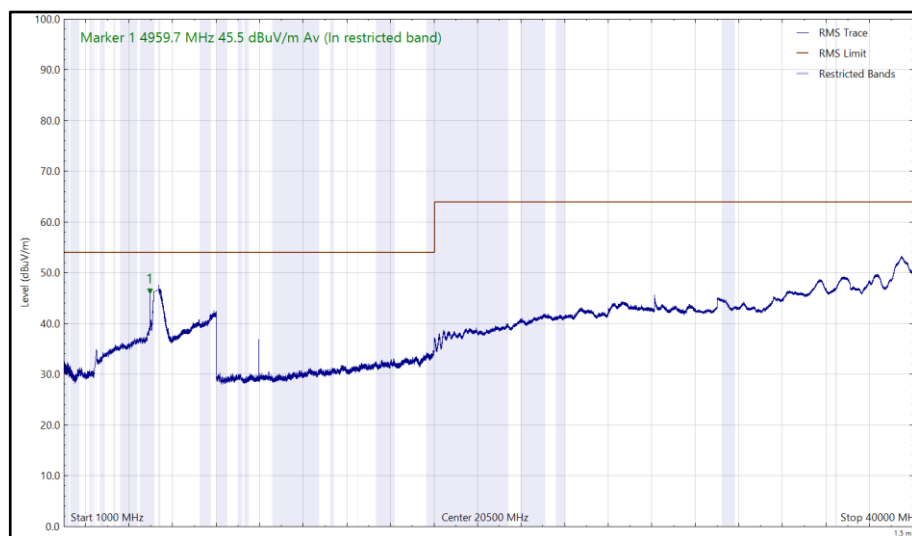
**Figure 28 - U-NII-1 - 5200 MHz (CH40), HT20, CDD, Core 0 + Core 1 and 2480 MHz (CH78), DH5, ePA, Core 0, 1 GHz to 40 GHz, Horizontal (rms)**



**Figure 29 - U-NII-1 - 5200 MHz (CH40), HT20, CDD, Core 0 + Core 1 and 2480 MHz (CH78), DH5, ePA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)**



**Figure 30 - U-NII-1 - 5200 MHz (CH40), HT20, CDD, Core 0 + Core 1 and 2480 MHz (CH78), DH5, ePA, Core 0, 1 GHz to 40 GHz, Vertical (Peak)**

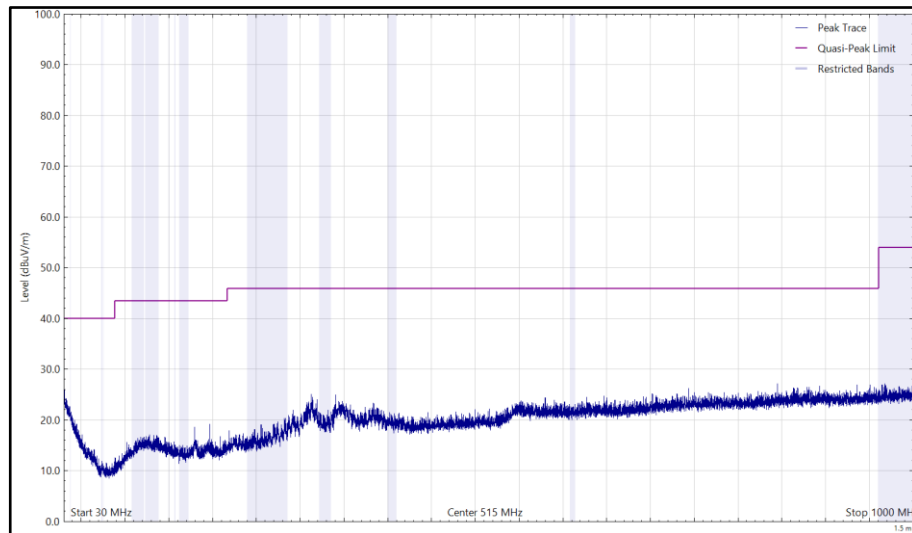


**Figure 31 - U-NII-1 - 5200 MHz (CH40), HT20, CDD, Core 0 + Core 1 and 2480 MHz (CH78), DH5, ePA, Core 0, 1 GHz to 40 GHz, Vertical (rms)**

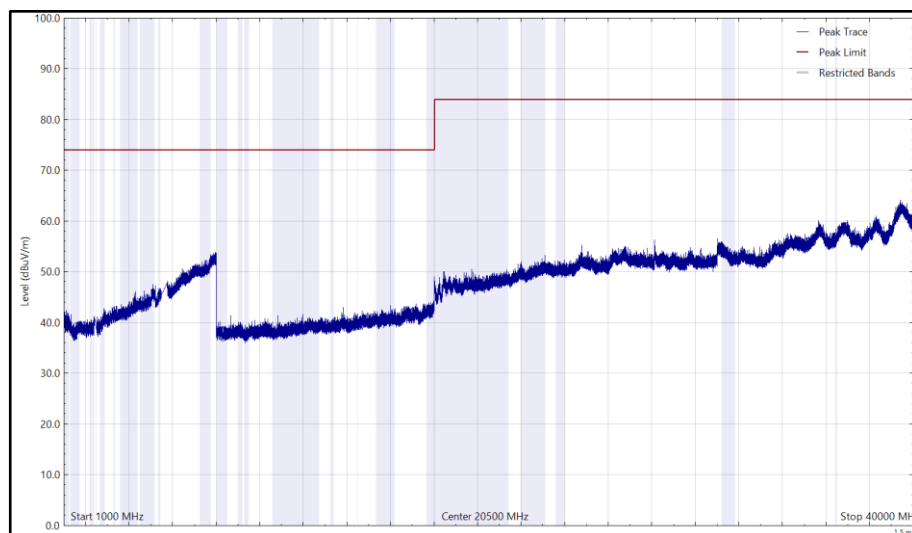
| Frequency (MHz) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector  | Angle (°) | Height (cm) | Polarisation |
|-----------------|----------------|----------------|-------------|-----------|-----------|-------------|--------------|
| 4803.636        | 43.9           | 54.0           | -10.1       | CISPR Avg | 347       | 290         | Vertical     |

**Table 10 - U-NII-2C - 5680 MHz (CH136), HT20, CDD, Core 0 + Core 1 and 2402 MHz (CH0), DH5, ePA, Core 0, 30 MHz to 40 GHz**

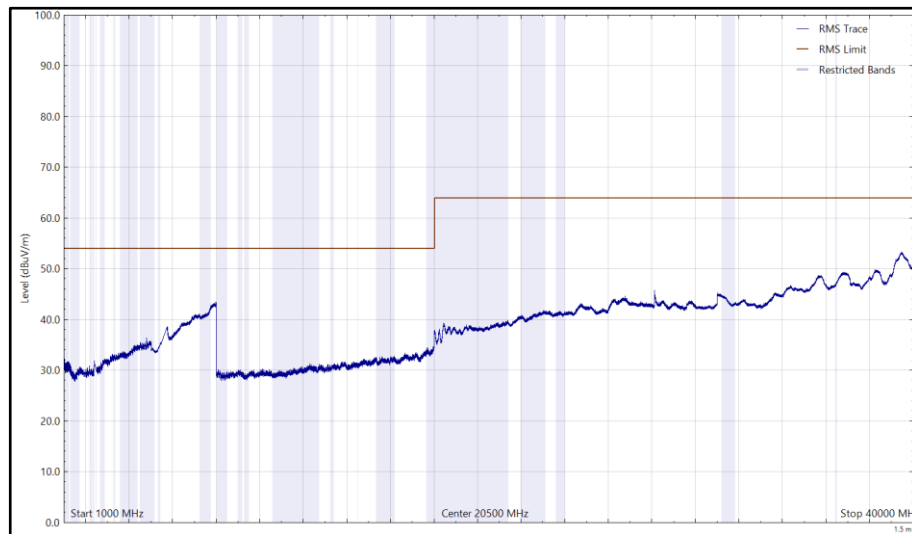
No other emissions found within 10 dB of the limit.



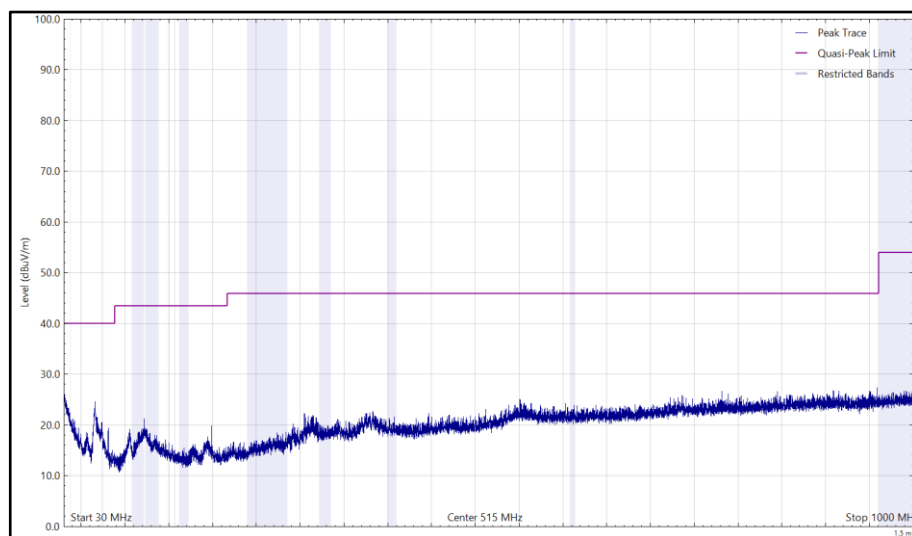
**Figure 32 - U-NII-2C - 5680 MHz (CH136), HT20, CDD, Core 0 + Core 1 and 2402 MHz (CH0), DH5, ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)**



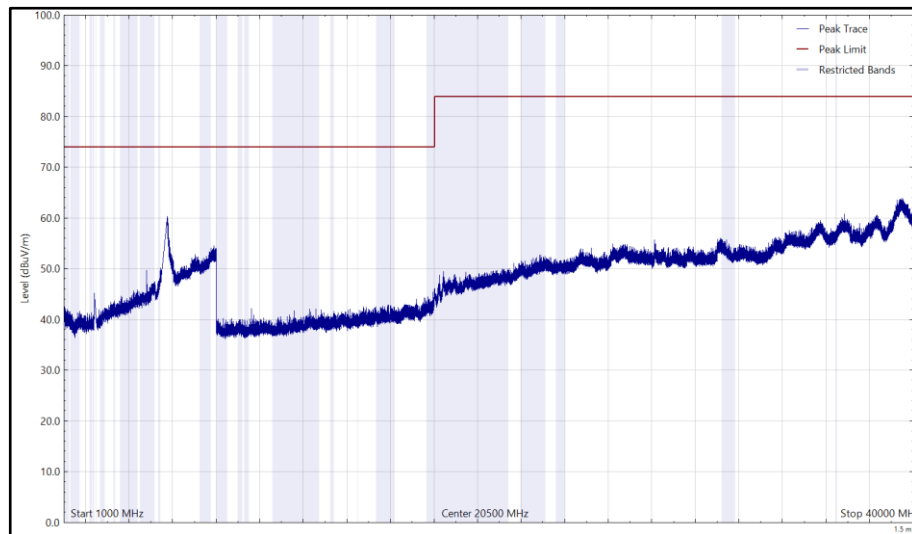
**Figure 33 - U-NII-2C - 5680 MHz (CH136), HT20, CDD, Core 0 + Core 1 and 2402 MHz (CH0), DH5, ePA, Core 0, 1 GHz to 40 GHz, Horizontal (Peak)**



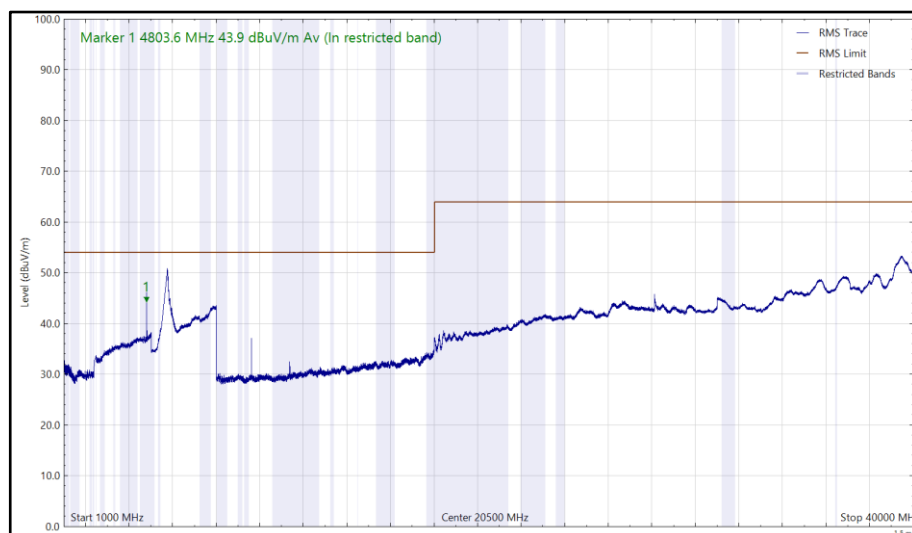
**Figure 34 - U-NII-2C - 5680 MHz (CH136), HT20, CDD, Core 0 + Core 1 and 2402 MHz (CH0), DH5, ePA, Core 0, 1 GHz to 40 GHz, Horizontal (rms)**



**Figure 35 - U-NII-2C - 5680 MHz (CH136), HT20, CDD, Core 0 + Core 1 and 2402 MHz (CH0), DH5, ePA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)**



**Figure 36 - U-NII-2C - 5680 MHz (CH136), HT20, CDD, Core 0 + Core 1 and 2402 MHz (CH0), DH5, ePA, Core 0, 1 GHz to 40 GHz, Vertical (Peak)**



**Figure 37 - U-NII-2C - 5680 MHz (CH136), HT20, CDD, Core 0 + Core 1 and 2402 MHz (CH0), DH5, ePA, Core 0, 1 GHz to 40 GHz, Vertical (rms)**



### Limit Clause

The least stringent limit from the applicable rule parts was used to determine compliance for Radiated Emissions testing of multiple transmission sources.

| Specification and Clause                                                   | Limit                                              |
|----------------------------------------------------------------------------|----------------------------------------------------|
| FCC Part 15.247 (d)                                                        | -20 dBc                                            |
| FCC Part 15.407 (b)                                                        | -27 dBm (EIRP) / 68.2 dBμV/m at 3 m                |
| FCC Part 15.209 (Within restricted bands listed in 15.205)                 | Peak: 74 dBμV/m at 3 m<br>Average 54 dBμV/m at 3 m |
| ISED RSS-247, Clause 5.5                                                   | -20 dBc                                            |
| ISED RSS-247, Clause 6.2                                                   | -27 dBm (EIRP) / 68.2 dBμV/m at 3 m                |
| ISED RSS-GEN, Clause 8.9<br>(Within restricted bands listed in clause 8.8) | Peak: 74 dBμV/m at 3 m<br>Average 54 dBμV/m at 3 m |

**Table 11 - Limit Table**



## 2.1.8 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 5.

| Instrument                                | Manufacturer        | Type No                                  | TE No | Calibration Period (months) | Calibration Due |
|-------------------------------------------|---------------------|------------------------------------------|-------|-----------------------------|-----------------|
| Screened Room (5)                         | Rainford            | Rainford                                 | 1545  | 36                          | 23-Jan-2021     |
| Turntable Controller                      | Inn-Co GmbH         | CO 1000                                  | 1606  | -                           | TU              |
| Multimeter                                | Iso-tech            | IDM101                                   | 2417  | 12                          | 11-Nov-2020     |
| Antenna with permanent attenuator (Bilog) | Chase               | CBL6143                                  | 2904  | 24                          | 30-Sep-2021     |
| Tilt Antenna Mast                         | Maturo GmbH         | TAM 4.0-P                                | 4811  | -                           | TU              |
| Double Ridge Broadband Horn Antenna       | Schwarzbeck         | BBHA 9120 B                              | 4848  | 12                          | 10-Mar-2021     |
| Band Reject Filter - 2.425 GHz            | Wainwright          | WRCGV14-2390-2400-2450-2460-50SS         | 5067  | 12                          | 01-Oct-2020     |
| Band Reject Filter - 2.4585 GHz           | Wainwright          | WRCGV14-2423.5-2433.5-2483.5-2493.5-50SS | 5069  | 12                          | 01-Oct-2020     |
| Band Reject Filter - 5.22 GHz             | Wainwright          | WRCJV12-5120-5150-5290-5320-50SS         | 5072  | 12                          | 24-Sep-2020     |
| Band Reject Filter - 5.690 GHz            | Wainwright          | WRCJV8-5635-5670-5710-5745-50SS          | 5080  | 12                          | 25-Sep-2020     |
| EmX Emissions Software                    | TUV SUD             | EmX                                      | 5125  | -                           | Software        |
| DRG Horn Antenna (7.5-18GHz)              | Schwarzbeck         | HWRD750                                  | 5216  | 12                          | 10-Mar-2021     |
| Horn Antenna (15-40GHz)                   | Schwarzbeck         | BBHA 9170                                | 5217  | 12                          | 12-Oct-2020     |
| Preamplifier (30dB 1GHz to 18GHz)         | Schwarzbeck         | BBV 9718 C                               | 5261  | 12                          | 07-Apr-2021     |
| 1m -SMA Cable                             | Junkosha            | MWX221-01000AMSAMS/A                     | 5513  | 12                          | 01-Apr-2021     |
| 1m -SMA Cable                             | Junkosha            | MWX221-01000AMSAMS/A                     | 5515  | 12                          | 01-Apr-2021     |
| 2m SMA Cable                              | Junkosha            | MWX221-02000AMSAMS/A                     | 5517  | 12                          | 01-Apr-2021     |
| 8m N-Type Cable                           | Junkosha            | MWX221-08000NMSNMS/B                     | 5520  | 12                          | 24-Mar-2021     |
| 2 m K Type Cable                          | Junkosha            | MWX241-02000KMSKMS/A                     | 5523  | 12                          | 03-Apr-2021     |
| EMI Test Receiver                         | Rohde & Schwarz     | ESW44                                    | 5527  | 12                          | 06-Feb-2021     |
| 3 GHz High pass Filter                    | Wainwright          | WHKX12-2580-3000-18000-80SS              | 5548  | 12                          | 05-May-2021     |
| 7 GHz High Pass Filter                    | Wainwright          | WHKX12-5850-6800-18000-80SS              | 5549  | 12                          | 23-May-2021     |
| 8 - 18 GHz Amplifier                      | Wright Technologies | APS06-0061                               | 5596  | 12                          | 25-Aug-2021     |

Table 12

TU – Traceability ~Unscheduled



### 3 Measurement Uncertainty

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

| Test Name                                               | Measurement Uncertainty                                        |
|---------------------------------------------------------|----------------------------------------------------------------|
| Radiated Spurious Emissions (Simultaneous Transmission) | 30 MHz to 1 GHz: $\pm 5.2$ dB<br>1 GHz to 40 GHz: $\pm 6.3$ dB |

**Table 13**

#### Measurement Uncertainty Decision Rule

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115: 2007, clause 4.4.3 and 4.5.1.