FCC and ISED Test Report

Apple Inc
Model: A3112

In accordance with FCC 47 CFR Part 15, ISED RSS-247, ISED RSS-248 and ISED RSS-GEN (2.4 GHz Bluetooth, 2.4 GHz WLAN, 5 GHz WLAN, 6 GHz WLAN, Narrowband and Thread)

TUV SUD Digitally signed by TUV SUD Date: 2024.08.21 16:47:26 +01'00'

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FCC ID: BCGA3112 IC: 579C-A3112

COMMERCIAL-IN-CONFIDENCE

Document 75959702-20 Issue 01

SIGNATURE			
NAME	**JOB TITLE**	**RESPONSIBLE FOR**	**ISSUE DATE**
Steve Marshall	Senior Engineer	Authorised Signatory	21 August 2024

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 Part 15, ISED RSS-247, ISED RSS-248 and ISED RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Report Generation	Lauren Walters	21 August 2024	

FCC Accreditation
553713/UK2026 Concorde Park, Fareham Test Laboratory

ISED Accreditation
28798/UK0003 Concorde Park, Fareham Test Laboratory

EXECUTIVE SUMMARY
A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15: 2023, ISED RSS-247: Issue 3 (2023-08), ISED RSS-248: Issue 2 (2022-12) and ISED RSS-GEN: Issue 5 (2018-04) + A2 (2021-02) for the tests detailed in section 1.3.

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ACCREDITATION
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Contents

1 Report Summary 2

1.1 Report Modification Record 2
1.2 Introduction 2
1.3 Brief Summary of Results 3
1.4 Product Information 4
1.5 Deviations from the Standard 4
1.6 Identification of the EUT 4
1.7 EUT Modification Record 4
1.8 Test Location 5

2 Test Details 6

2.1 Radiated Spurious Emissions (Simultaneous Transmission) 6

3 Measurement Uncertainty 95

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	21-August-2024

Table 1

1.2 Introduction

Applicant	Apple Inc
Manufacturer	Apple Inc
EUT/Sample Identification	Refer to section 1.6
Test Specification/Issue/Date	FCC 47 CFR Part 15: 2023 ISED RSS-247: Issue 3 (2023-08) ISED RSS-248: Issue 2 (2022-12) ISED RSS-GEN: Issue 5 (2018-04) + A2 (2021-02)
Start of Test	22-June-2024
Finish of Test	05-July-2024
Name of Engineer(s)	Akhil Rajendran Bhaskaran Nair, Colin Brain, Elliot Callender, Ioan-Alexandru Bogatu, James Woods, Manohar Thota, Thomas Randall, Tony Baby and Vineeth Nagaraj
Related Document(s)	ANSI C63.4 (2014) ANSI C63.10 (2020) KDB 789033 D02 v02r01 KDB 987594 D02 v01r01

1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15, ISED RSS-247, ISED RSS-248 and ISED RSS-GEN is shown below.

Section	Specification Clause				Test Description	Result	Comments/Base Standard
	Part 15	RSS-247	RSS-248	RSS-GEN			
Configuration and Mode: 5 GHz WLAN and 2.4 GHz Bluetooth							
2.1	15.209, 15.247(d) and 15.407(b)	5.5 and 6.2	-	6.13 and 8.9	Radiated Spurious Emissions (Simultaneous Transmission)	Pass	ANSI C63.4 (2014) ANSI C63.10 (2020) KDB 789033 D02 v02r01 KDB 987594 D02 v01r01
Configuration and Mode: 6 GHz WLAN and 2.4 GHz Bluetooth							
2.1	15.209, 15.247(d) and 15.407(b)	5.5	4.6	6.13 and 8.9	Radiated Spurious Emissions (Simultaneous Transmission)	Pass	ANSI C63.4 (2014) ANSI C63.10 (2020) KDB 789033 D02 v02r01 KDB 987594 D02 v01r01
Configuration and Mode: 2.4 GHz WLAN and Narrowband							
2.1	15.209, 15.247(d) and 15.407(b)	5.5 and 6.2	-	6.13 and 8.9	Radiated Spurious Emissions (Simultaneous Transmission)	Pass	ANSI C63.4 (2014) ANSI C63.10 (2020) KDB 789033 D02 v02r01 KDB 987594 D02 v01r01
Configuration and Mode: 5 GHz WLAN and Thread							
2.1	15.209, 15.247(d) and 15.407(b)	5.5 and 6.2	-	6.13 and 8.9	Radiated Spurious Emissions (Simultaneous Transmission)	Pass	ANSI C63.4 (2014) ANSI C63.10 (2020) KDB 789033 D02 v02r01 KDB 987594 D02 v01r01
Configuration and Mode: 6 GHz WLAN and Thread							
2.1	15.209, 15.247(d) and 15.407(b)	5.5	4.6	6.13 and 8.9	Radiated Spurious Emissions (Simultaneous Transmission)	Pass	ANSI C63.4 (2014) ANSI C63.10 (2020) KDB 789033 D02 v02r01 KDB 987594 D02 v01r01

Table 2

1.4 Product Information

1.4.1 Technical Description

The equipment under test (EUT) was a portable laptop computer.

1.5 Deviations from the Standard

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

1.6 Identification of the EUT

The table below details identification of the EUT(s) that have been used to carry out the testing within this report.

Model: A3112			
Serial Number	Hardware Version	Software Version	Firmware
D2XW4JQFNK	REV1.0	24A21940x	WLAN: 23.30.16 Bluetooth: 22.1.65.459 Narrowband: 22.1.65.459 Thread: 22.1.65.459
MNV254CLPF	REV1.0	24A21940x	WLAN: 23.30.16 Bluetooth: 22.1.65.459 Narrowband: 22.1.65.459 Thread: 22.1.65.459

Table 3

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: A3112, Serial Number: D2XW4JQFNK			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A3112, Serial Number: MNV254CLPF			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 4

1.8 Test Location

TÜV SÜD conducted the following tests at our Concorde Park Test Laboratory.

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: 5 GHz WLAN and 2.4 GHz Bluetooth		
Radiated Spurious Emissions (Simultaneous Transmission)	Akhil Rajendran Bhaskaran Nair, Elliot Callender, James Woods and Vineeth Nagaraj	UKAS
Configuration and Mode: 6 GHz WLAN and 2.4 GHz Bluetooth		
Radiated Spurious Emissions (Simultaneous Transmission)	Akhil Rajendran Bhaskaran Nair, Elliot Callender and Thomas Randall	UKAS
Configuration and Mode: 2.4 GHz WLAN and Narrowband		
Radiated Spurious Emissions (Simultaneous Transmission)	Elliot Callender, Tony Baby, Thomas Randall and Vineeth Nagaraj	UKAS
Configuration and Mode: 5 GHz WLAN and Thread		
Radiated Spurious Emissions (Simultaneous Transmission)	Akhil Rajendran Bhaskaran Nair, Elliot Callender, Ioan-Alexandru Bogatu, Thomas Randall, Tony Baby and Vineeth Nagaraj	UKAS
Configuration and Mode: 6 GHz WLAN and Thread		
Radiated Spurious Emissions (Simultaneous Transmission)	Colin Brain, Ioan-Alexandru Bogatu, Manohar Thota and Thomas Randall	UKAS

Table 5

Office Address:

TÜV SÜD
Concorde Park
Concorde Way
Fareham
Hampshire
PO15 5FG
United Kingdom

2 Test Details

2.1 Radiated Spurious Emissions (Simultaneous Transmission)

2.1.1 Specification Reference

FCC 47 CFR Part 15, Clause 15.209, 15.247(d) and 15.407(b)
ISED RSS-247, Clause 5.5 and 6.2
ISED RSS-248, Clause 4.6
ISED RSS-GEN, Clause 6.13 and 8.9

2.1.2 Equipment Under Test and Modification State

A3112, S/N: D2XW4JQFNK - Modification State 0
A3112, S/N: MNV254CLPF - Modification State 0

2.1.3 Date of Test

22-June-2024 to 05-July-2024

2.1.4 Test Method

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.

This test was performed in accordance with ANSI C63.10, clause 6.3, 6.5 and 6.6.

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^(Field Strength in dBµV/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*LOG(3/1) = 9.54 dB.

2.1.5 Example Test Setup Diagram

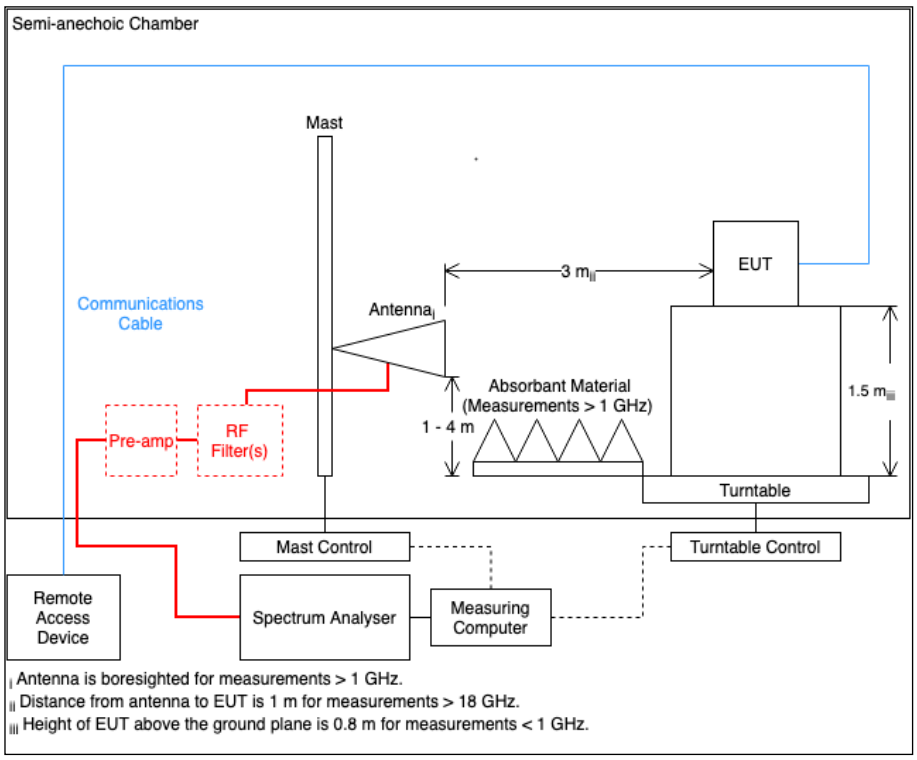

Figure 1

2.1.6 Environmental Conditions

Ambient Temperature	20.4 - 24.2 °C
Relative Humidity	39.2 - 55.5 %

2.1.7 Test Results

5 GHz WLAN and 2.4 GHz Bluetooth

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
279.989	26.99	46.00	-19.01	Q-Peak	102	104	Horizontal
4210.703	36.41	54.00	-17.59	RMS	7	390	Vertical
4881.928	39.68	54.00	-14.32	CISPR Avg	268	100	Vertical
5146.646	58.02	74.00	-15.98	Peak	360	319	Vertical
5149.673	38.00	54.00	-16.00	RMS	52	286	Horizontal
5149.930	45.56	54.00	-8.44	RMS	359	313	Vertical
5354.117	41.05	54.00	-12.95	RMS	285	345	Horizontal
5360.970	46.58	54.00	-7.42	RMS	360	319	Vertical
5367.761	58.64	74.00	-15.36	Peak	360	318	Vertical
7323.455	38.60	54.00	-15.40	CISPR Avg	55	100	Vertical

Table 6 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

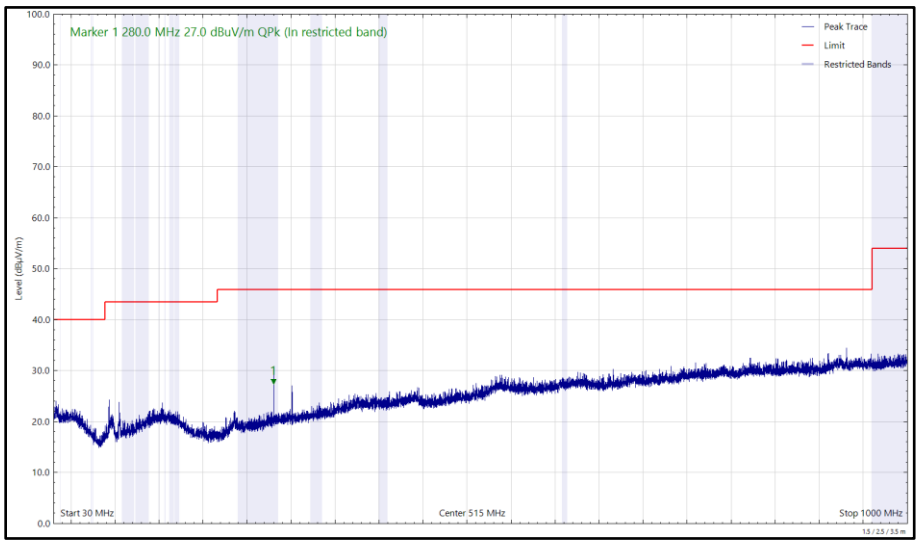

Figure 2 - U-NII-1 – 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Horizontal (Peak)

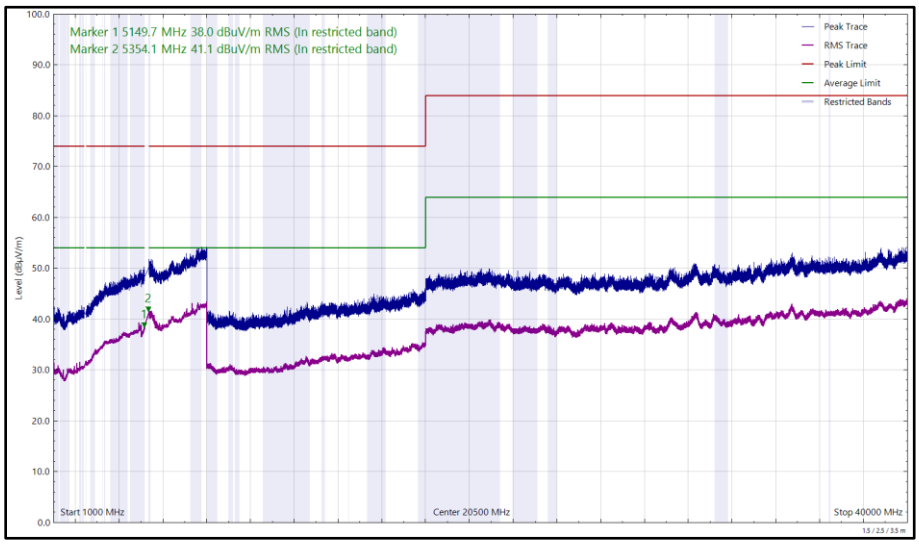

Figure 3 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Horizontal

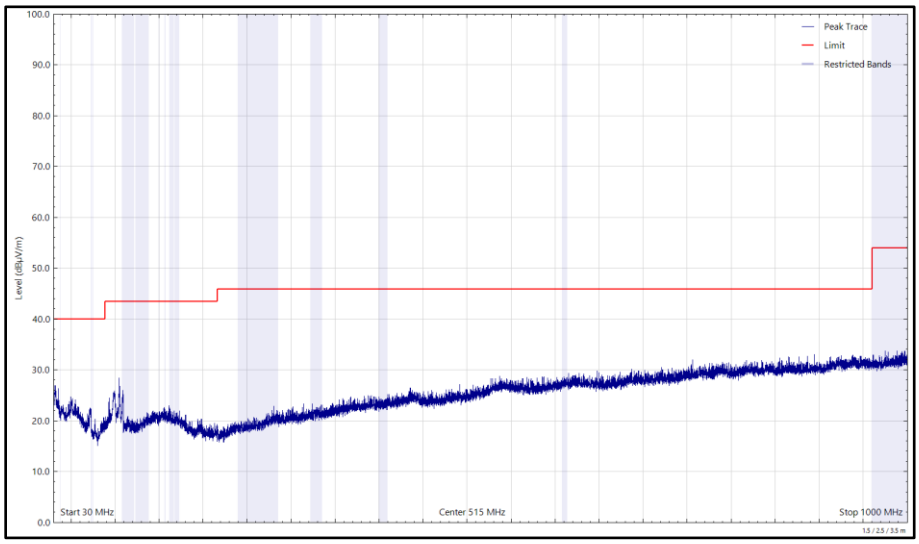

Figure 4 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Vertical (Peak)

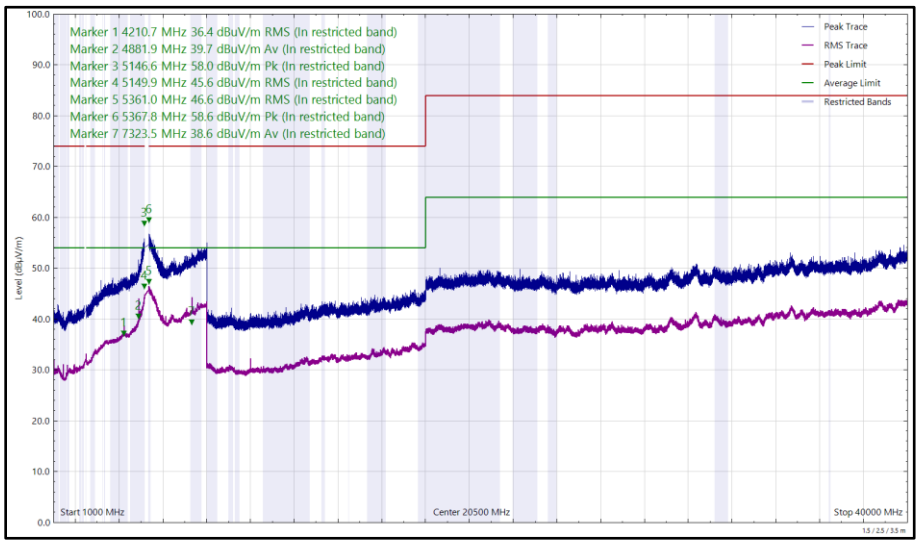

Figure 5 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
4202.589	36.24	54.00	-17.76	RMS	128	102	Vertical
4881.828	38.19	54.00	-15.81	CISPR Avg	255	100	Vertical
5454.681	56.89	74.00	-17.11	Peak	357	315	Vertical
5455.624	44.03	54.00	-9.97	RMS	355	223	Vertical
5459.947	40.55	54.00	-13.45	RMS	288	390	Horizontal
7320.690	36.97	54.00	-17.03	CISPR Avg	350	111	Horizontal
7322.885	39.57	54.00	-14.43	CISPR Avg	309	129	Vertical

Table 7 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

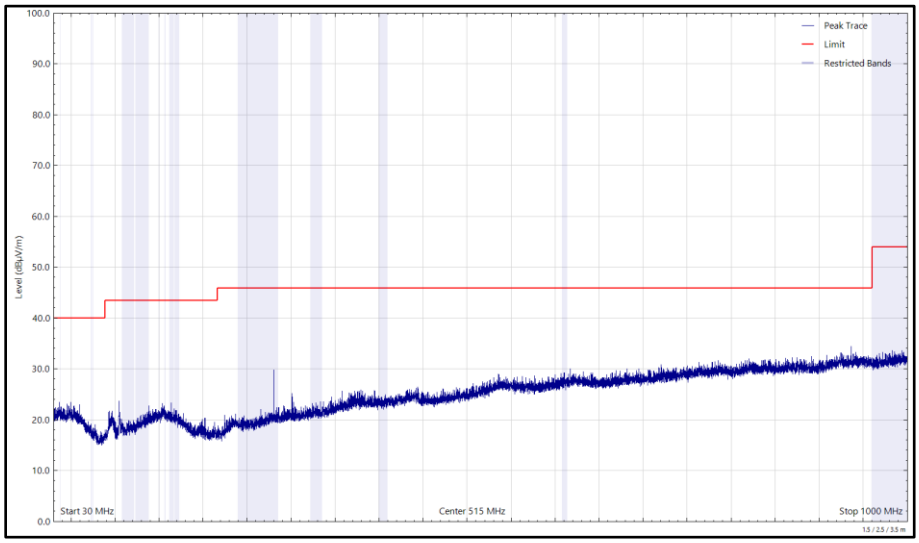

Figure 6 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Horizontal (Peak)

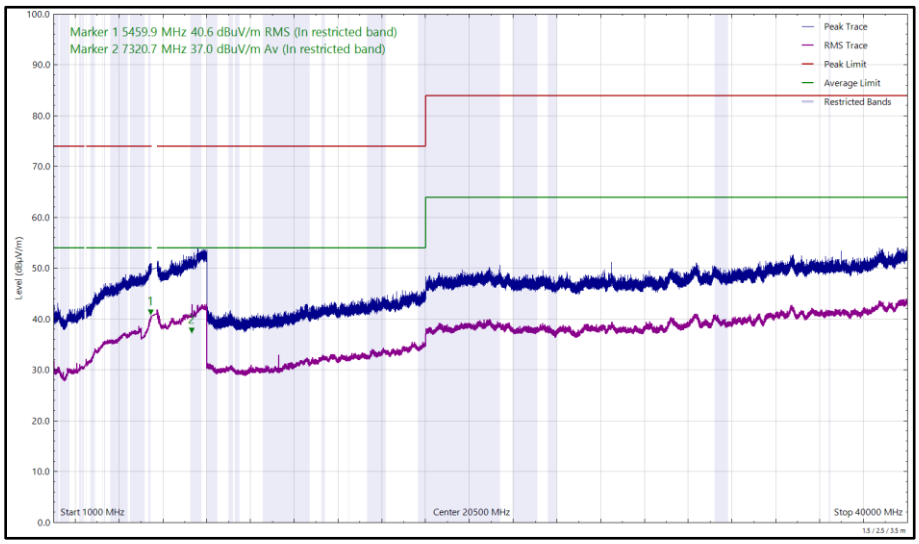

Figure 7 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Horizontal

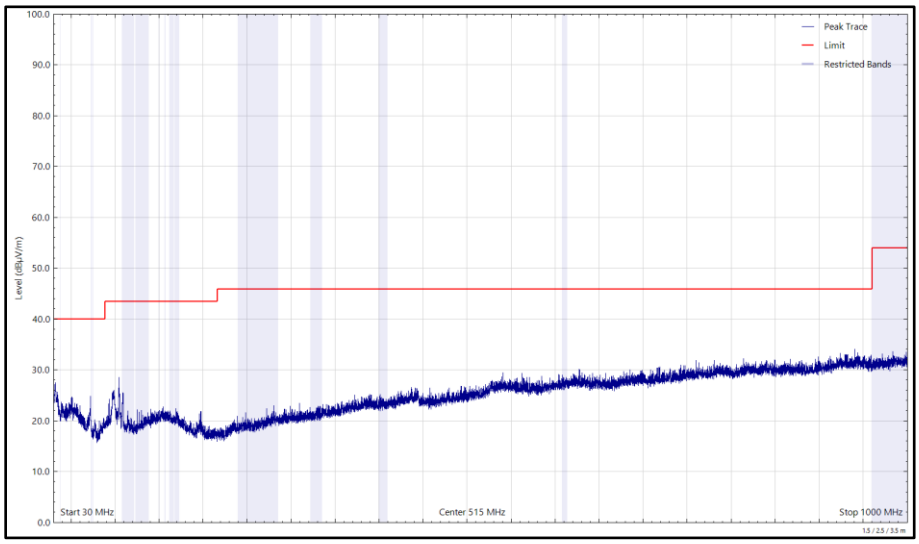

Figure 8 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Vertical (Peak)

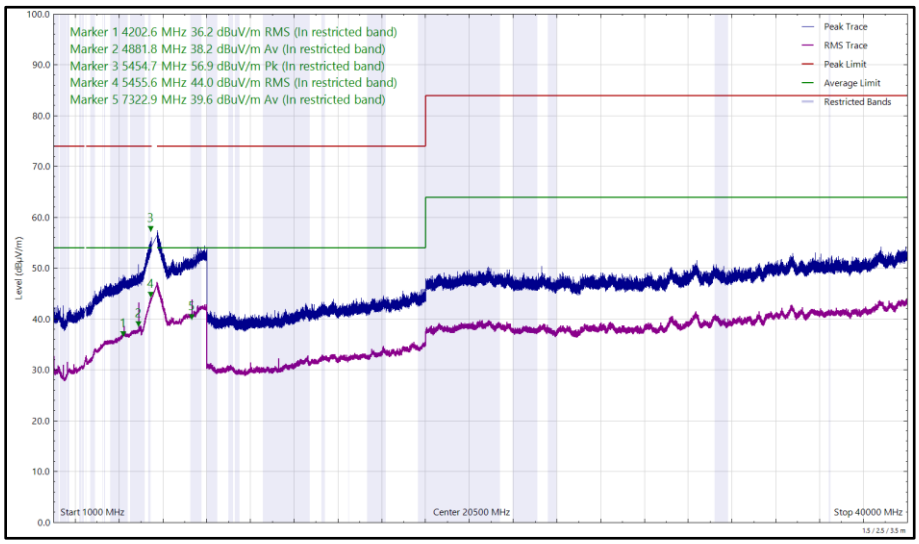

Figure 9 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
279.998	22.25	46.00	-23.75	Q-Peak	96	201	Horizontal
4881.738	40.41	54.00	-13.59	CISPR Avg	259	288	Vertical
5450.644	38.80	54.00	-15.20	RMS	277	369	Horizontal
5455.191	42.93	54.00	-11.07	RMS	1	313	Vertical
7323.170	40.74	54.00	-13.26	CISPR Avg	337	285	Vertical
7332.163	36.71	54.00	-17.29	CISPR Avg	332	109	Horizontal

Table 8 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

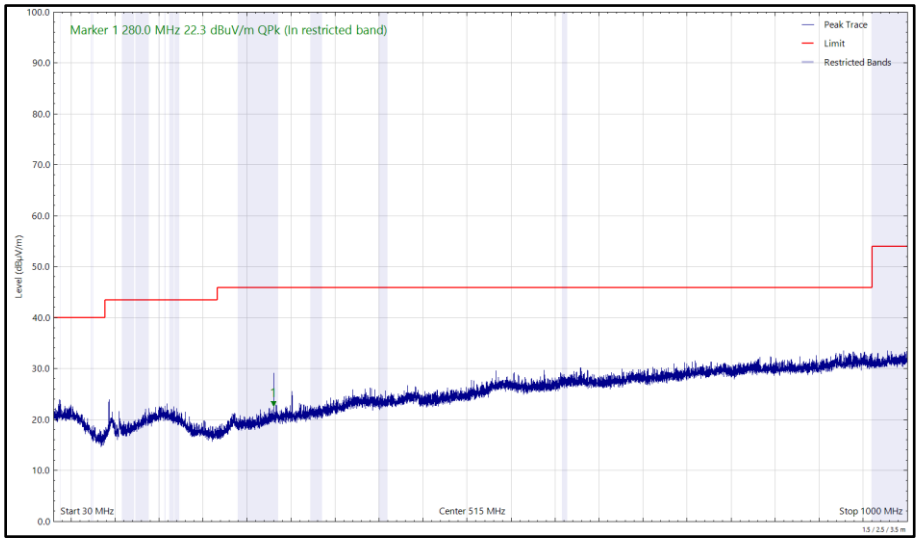

Figure 10 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Horizontal (Peak)

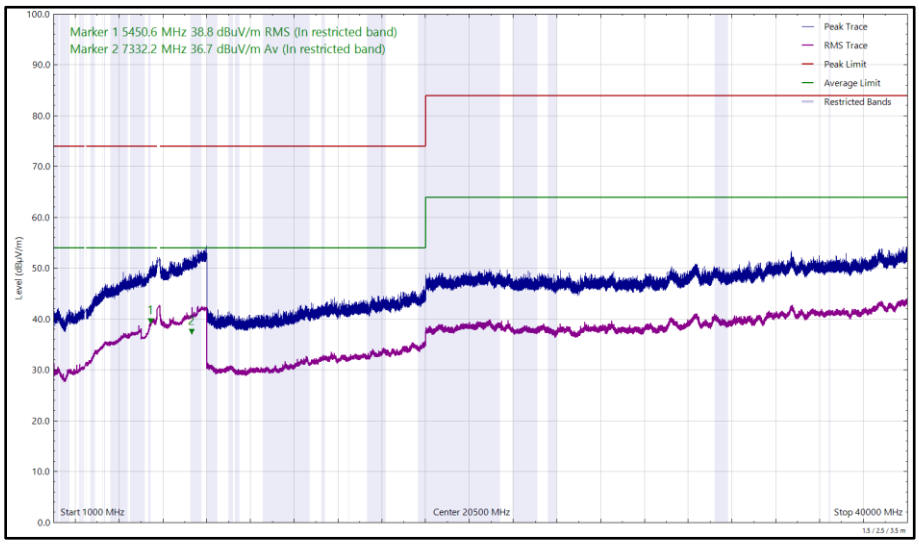

Figure 11 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Horizontal

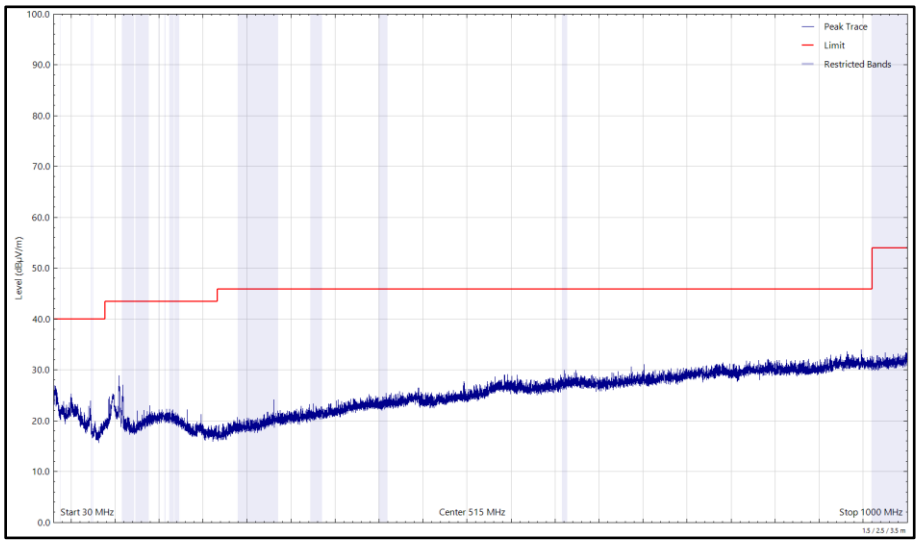

Figure 12 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Vertical (Peak)

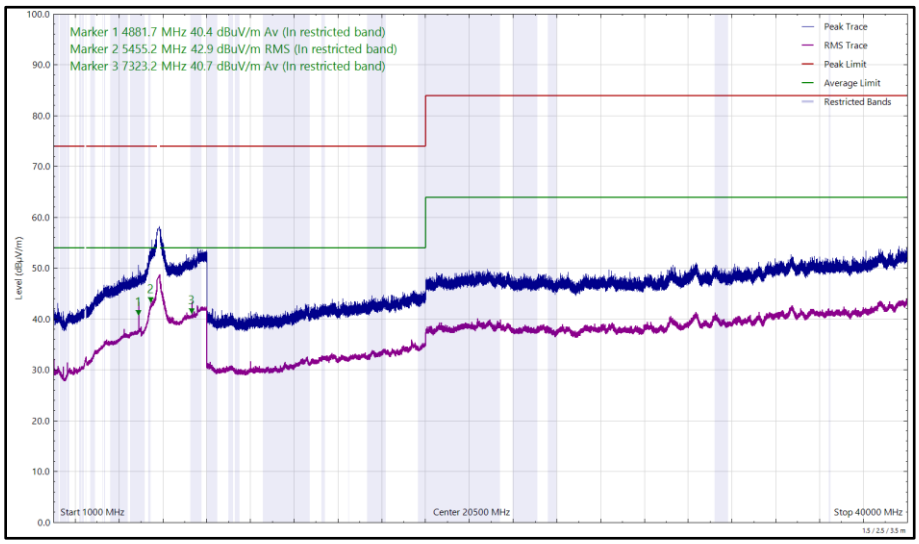

Figure 13 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
283.733	20.54	46.00	-25.46	Peak	22	318	Horizontal
2483.519	34.75	54.00	-19.25	RMS	255	234	Vertical
2800.377	32.58	54.00	-21.42	RMS	232	100	Vertical
4881.678	38.34	54.00	-15.66	CISPR Avg	254	100	Vertical
4882.723	33.46	54.00	-20.54	Peak	35	100	Horizontal
5140.512	57.63	74.00	-16.37	Peak	0	299	Vertical
5149.889	45.28	54.00	-8.72	RMS	0	322	Vertical
5359.602	46.05	54.00	-7.95	RMS	359	292	Vertical
5359.602	58.05	74.00	-15.95	Peak	359	292	Vertical
5411.302	40.92	54.00	-13.08	Peak	289	388	Horizontal

Table 9 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

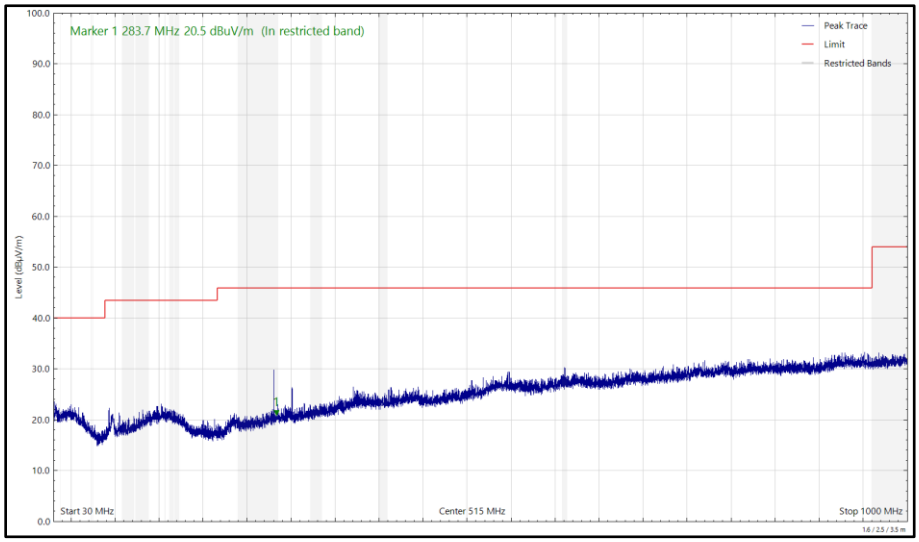

Figure 14 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

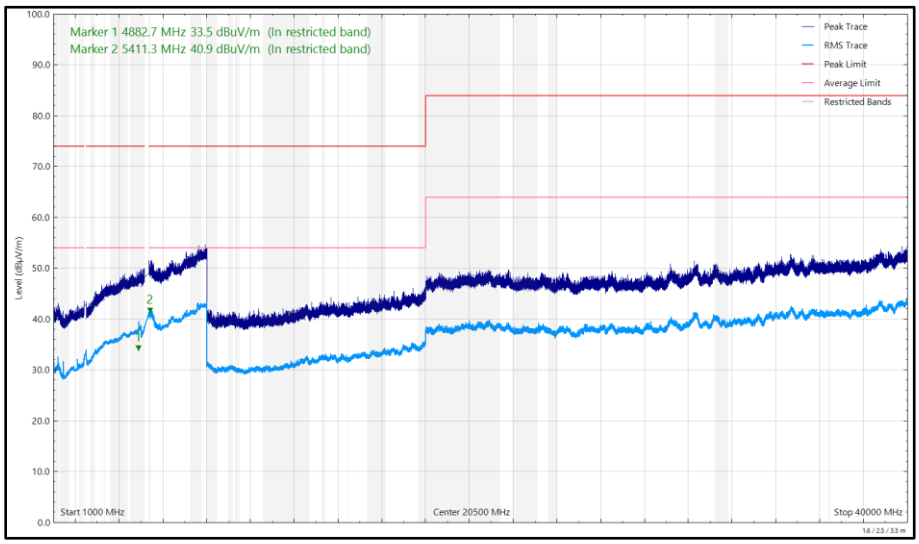

Figure 15 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

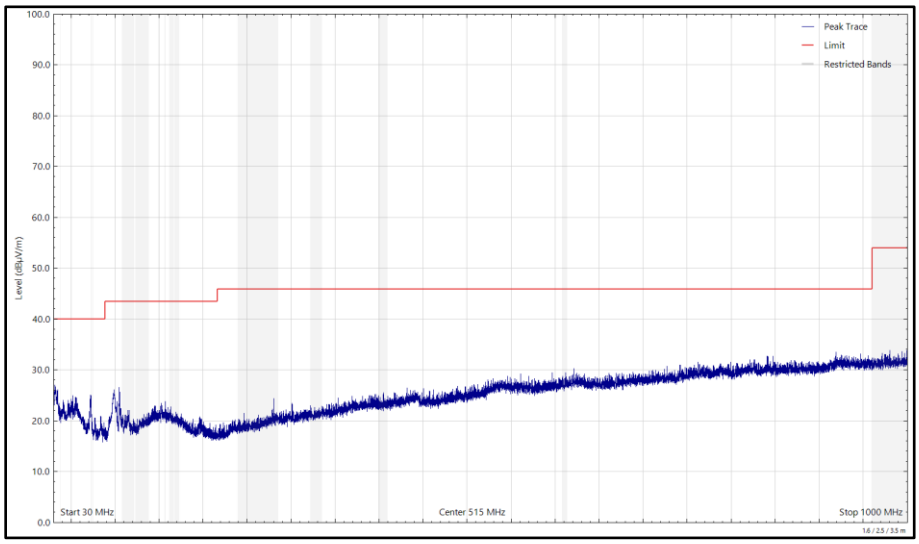

Figure 16 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

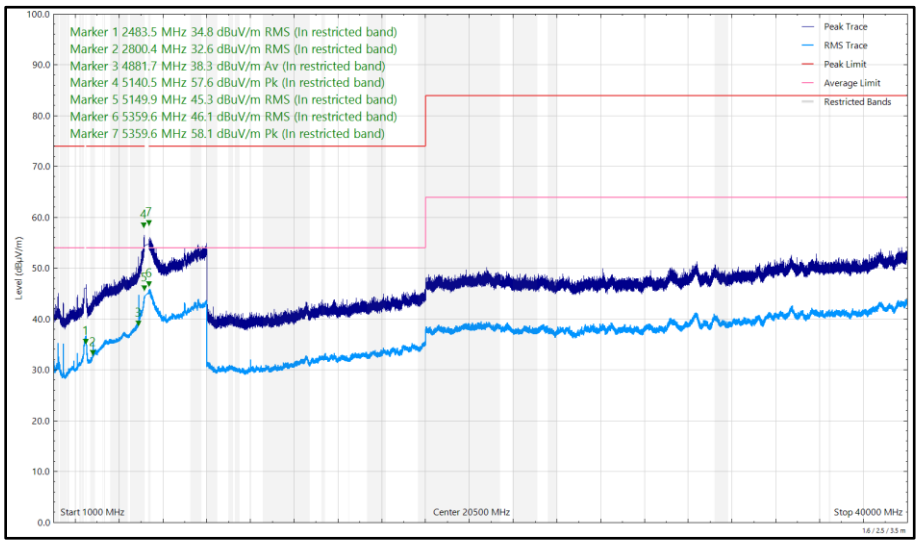

Figure 17 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
279.992	24.60	46.00	-21.40	Peak	136	100	Horizontal
1200.626	35.33	54.00	-18.67	RMS	214	159	Vertical
1440.100	30.90	54.00	-23.10	RMS	292	100	Vertical
2483.580	36.53	54.00	-17.47	RMS	279	394	Vertical
4882.403	36.51	54.00	-17.49	CISPR Avg	252	100	Vertical
5434.180	56.57	74.00	-17.43	Peak	0	317	Vertical
5434.180	44.20	54.00	-9.80	RMS	0	317	Vertical
5459.858	40.61	54.00	-13.39	Peak	288	389	Horizontal

Table 10 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

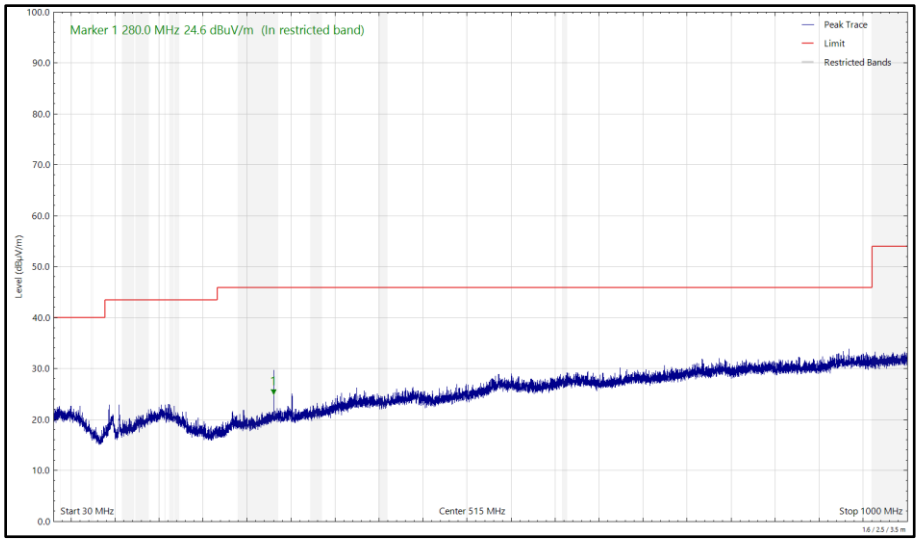

Figure 18 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

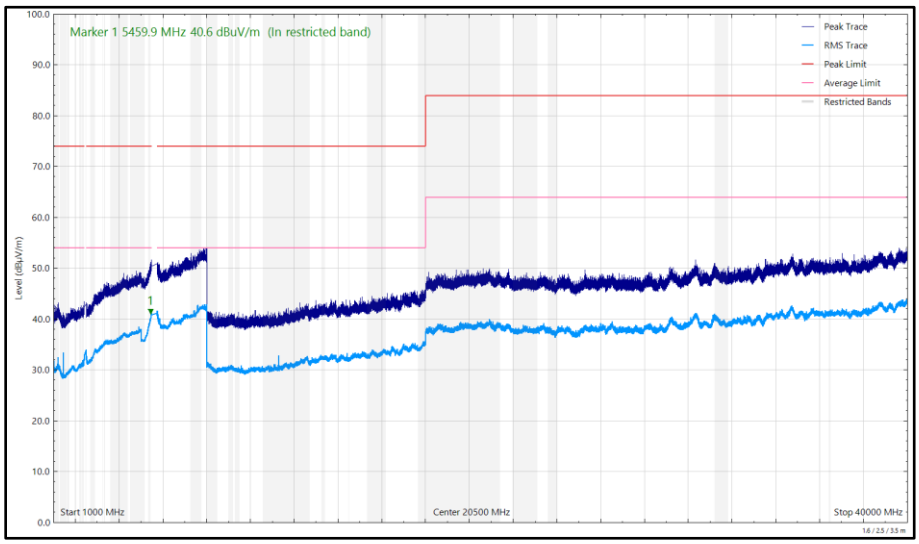

Figure 19 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

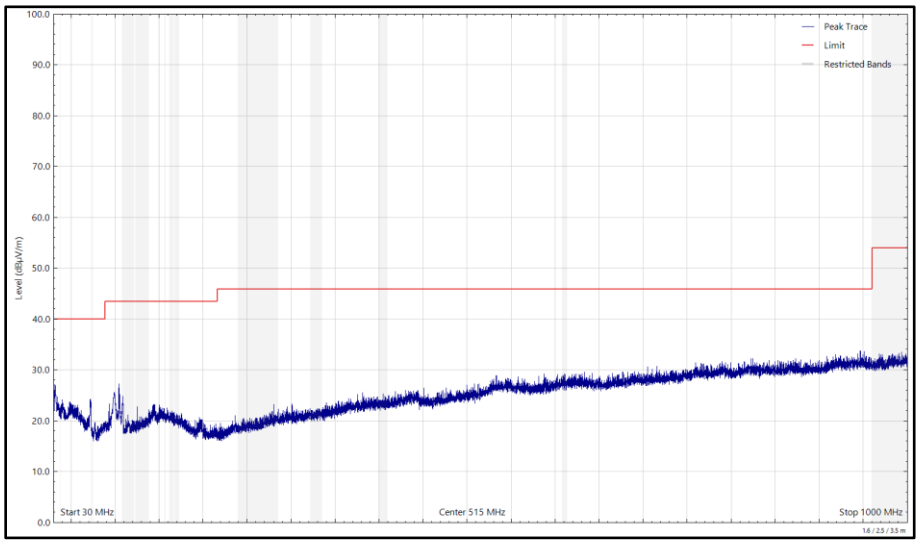

Figure 20 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

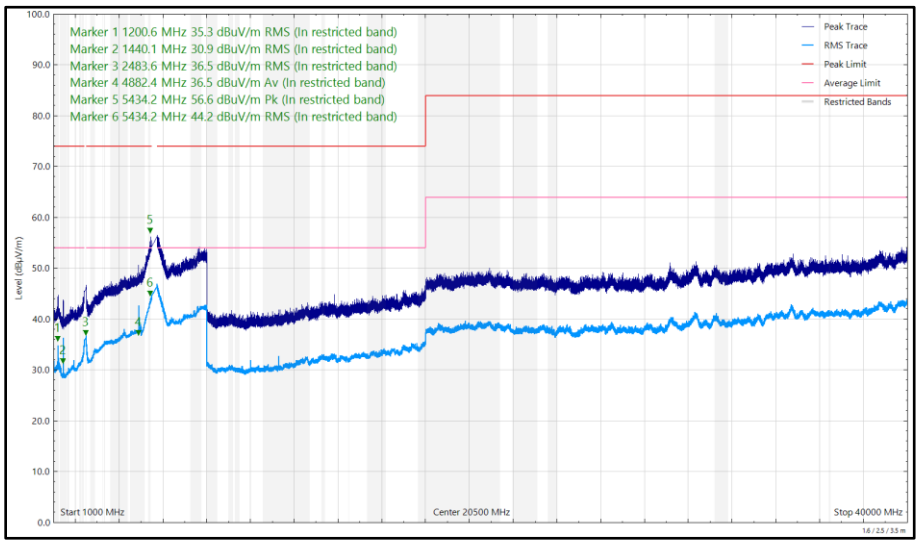

Figure 21 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
281.714	20.32	46.00	-25.68	Peak	302	360	Horizontal
1200.215	34.41	54.00	-19.59	RMS	31	322	Vertical
1440.045	31.06	54.00	-22.94	RMS	338	100	Vertical
2483.601	36.01	54.00	-17.99	RMS	273	399	Vertical
4882.728	34.63	54.00	-19.37	CISPR Avg	237	186	Vertical
5451.013	40.81	54.00	-13.19	Peak	2	100	Vertical
5458.838	36.94	54.00	-17.06	Peak	290	100	Horizontal

Table 11 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz

No other emissions found within 10 dB of the limit.

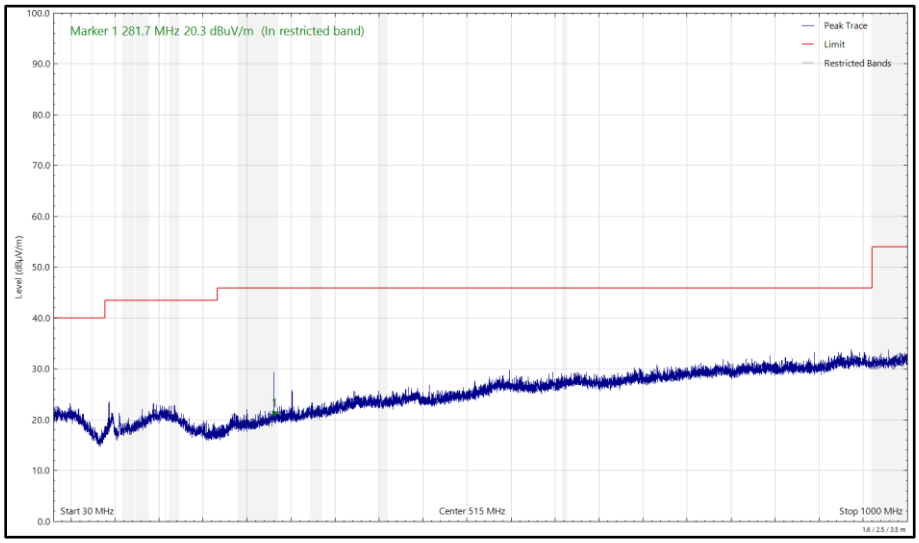

Figure 22 - U-NII-3 - 5785 GHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 GHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

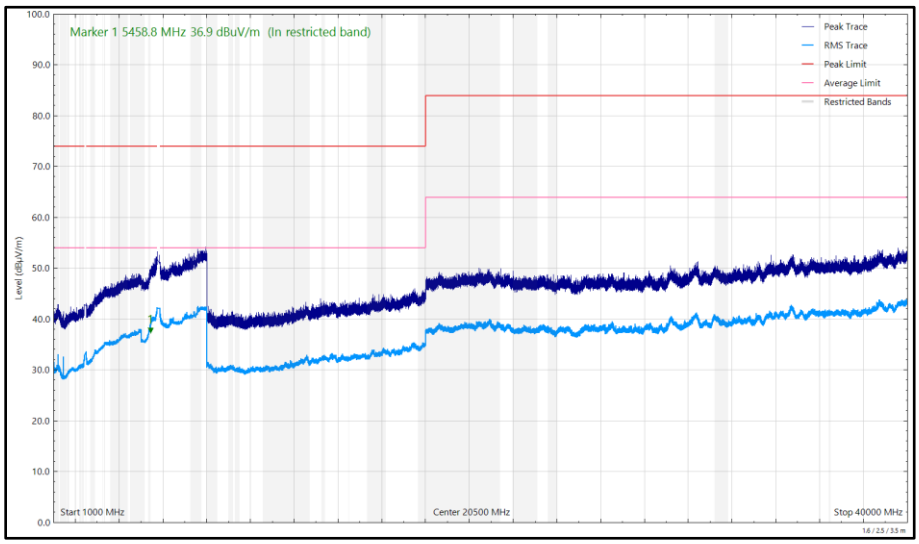

Figure 23 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

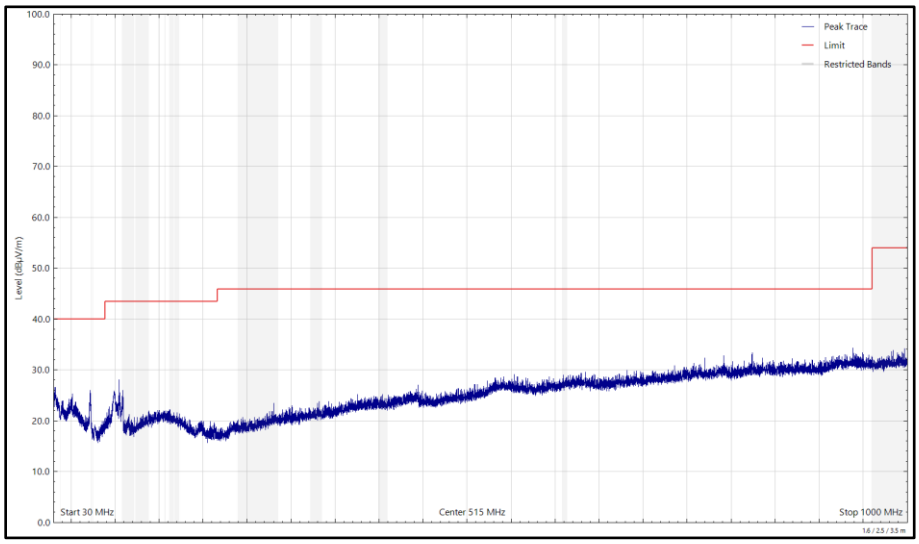

Figure 24 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 GHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

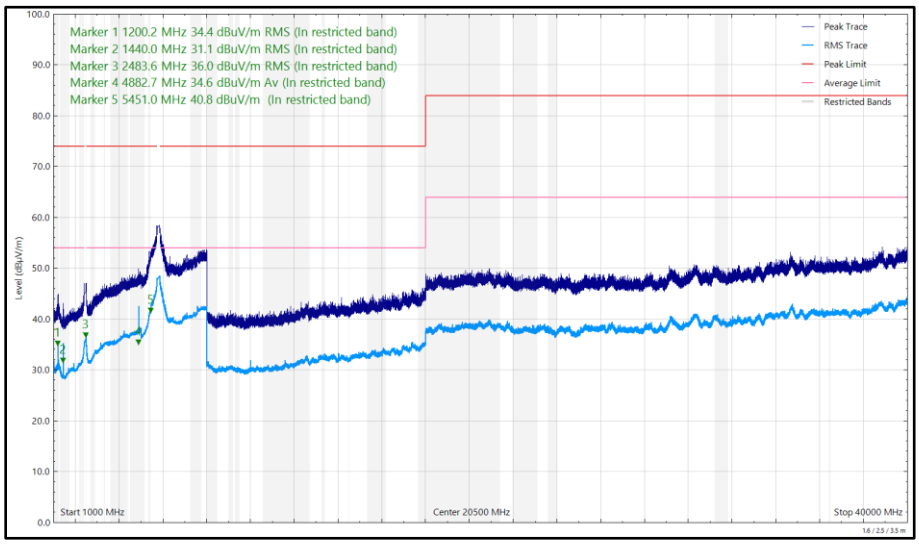

Figure 25 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

FCC 47 CFR Part 15, ISED RSS-247 and ISED RSS-GEN

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

The least stringent applicable limit was:

Clause	Limit
Part 15 247 (d) / RSS-247 Clause 5.5	-20 dBc
Part 15.407 (b) / RSS-247 Clause 6.2	-27 dBm e.i.r.p
Part 15.209 / RSS-GEN Clause 8.9	Peak: 74 dBµV/m at 3m, Average 54 dBµV/m at 3m (Restricted bands > 1 GHz)

Table 12

6 GHz WLAN and 2.4 GHz Bluetooth

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
1440.182	35.30	54.00	-18.70	RMS	326	229	Vertical
2488.410	32.83	54.00	-21.17	RMS	59	383	Horizontal
2488.884	34.87	54.00	-19.13	RMS	44	341	Vertical
4211.916	35.76	54.00	-18.24	RMS	339	395	Vertical
4882.085	36.77	54.00	-17.23	RMS	42	101	Vertical
5396.429	38.41	54.00	-15.59	RMS	3	349	Vertical
5449.294	36.31	54.00	-17.69	RMS	186	362	Horizontal
7322.903	40.95	54.00	-13.05	RMS	12	178	Vertical
7322.963	42.09	54.00	-11.91	RMS	74	393	Horizontal
8233.345	36.05	54.00	-17.95	RMS	46	231	Vertical
8233.370	34.98	54.00	-19.02	RMS	74	346	Horizontal

Table 13 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

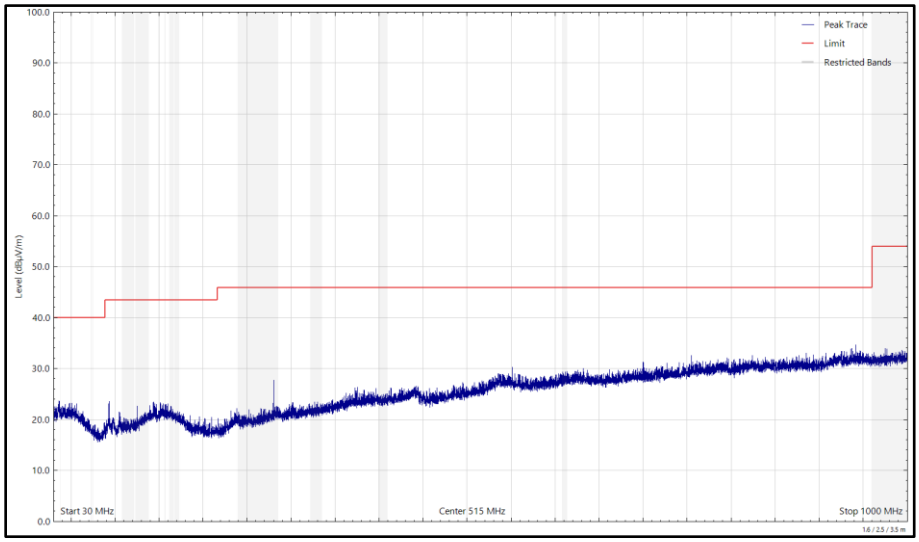

Figure 26 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

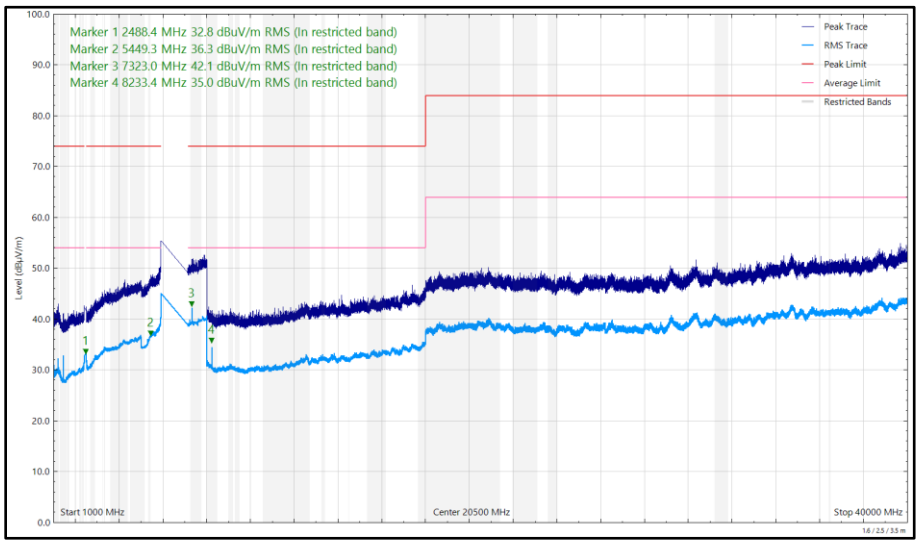

Figure 27 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

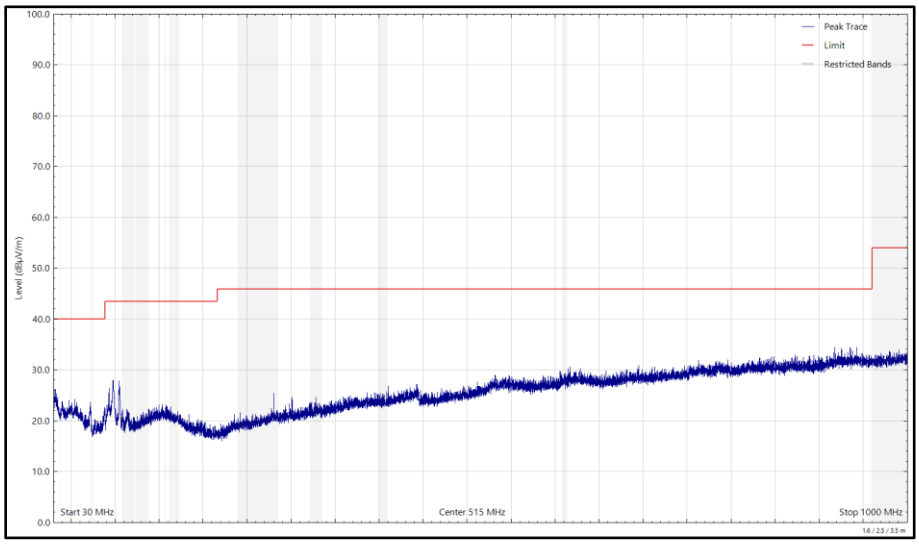

Figure 28 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

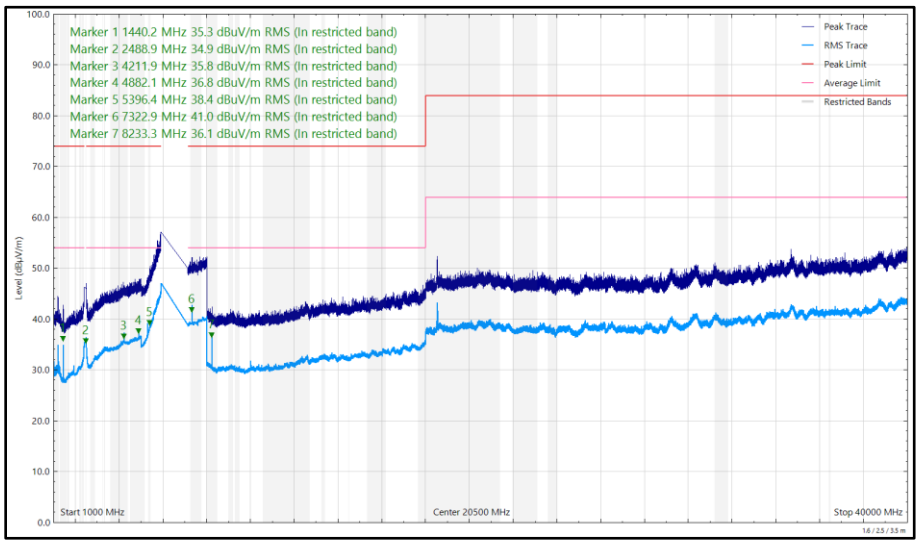

Figure 29 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
279.998	20.87	46.00	-25.13	Q-Peak	88	400	Horizontal
1206.270	34.98	54.00	-19.02	RMS	340	159	Vertical
1440.090	35.03	54.00	-18.97	RMS	63	148	Vertical
2489.512	34.04	54.00	-19.96	RMS	25	388	Vertical
4882.053	37.65	54.00	-16.35	RMS	352	313	Vertical
7473.521	39.11	54.00	-14.89	RMS	321	228	Vertical
7476.342	50.55	74.00	-23.45	Peak	321	228	Vertical
7477.166	39.14	54.00	-14.86	RMS	103	352	Horizontal
7480.810	51.16	74.00	-22.84	Peak	341	100	Horizontal

Table 14 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

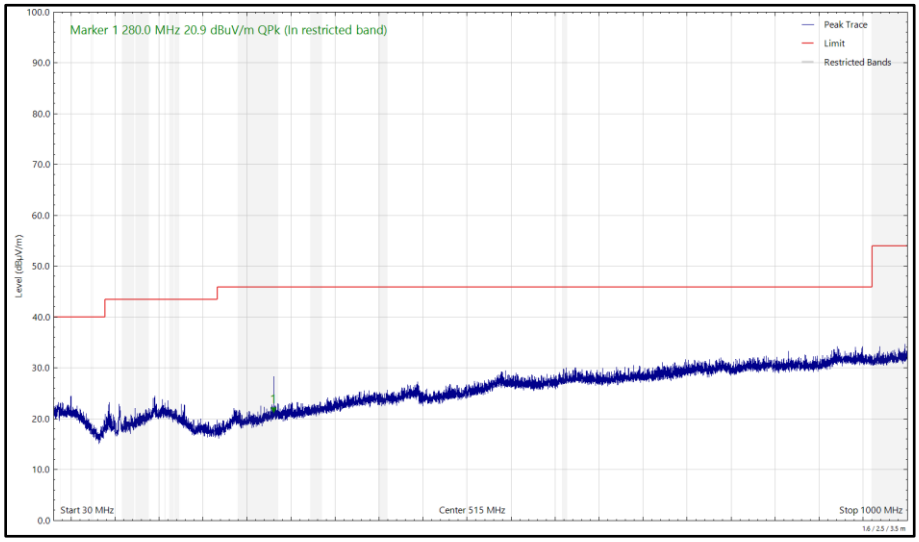

Figure 30 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

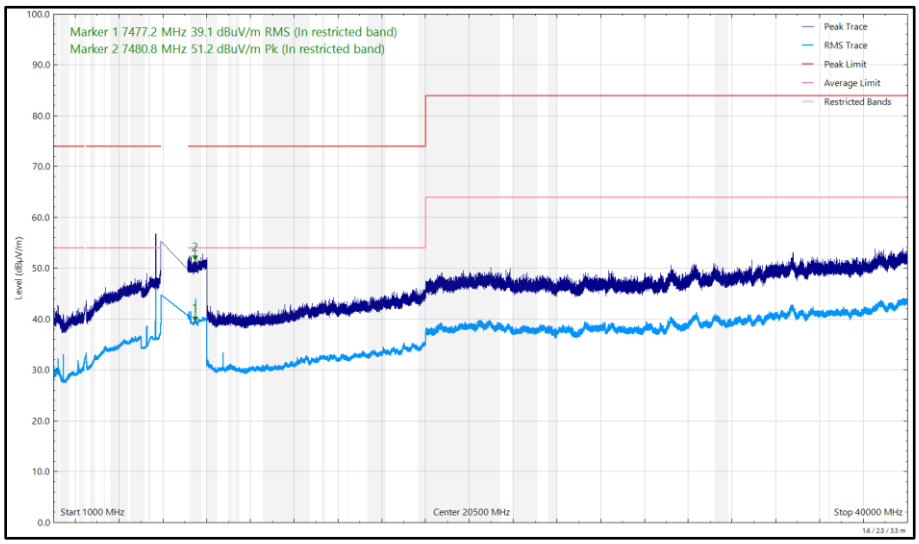

Figure 31 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

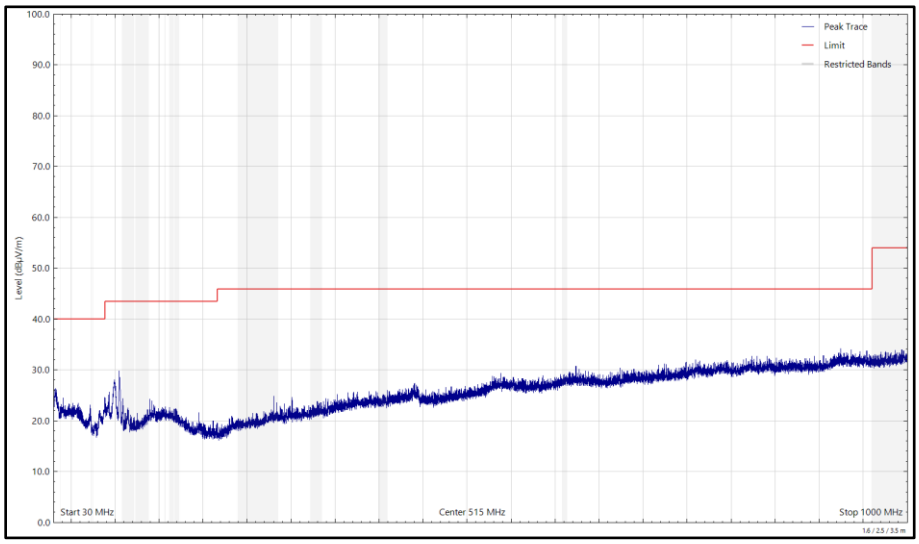

Figure 32 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

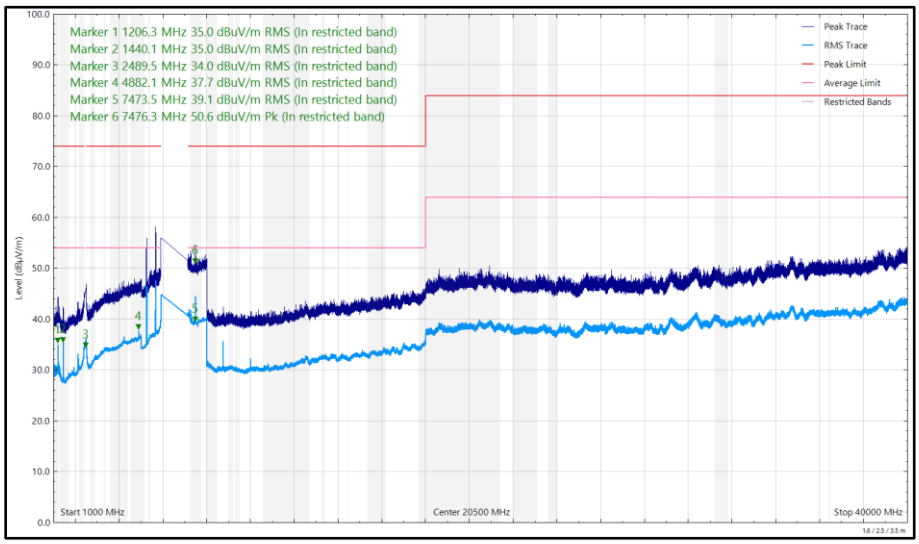

Figure 33 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
279.988	22.89	46.00	-23.11	Q-Peak	264	107	Horizontal
279.998	21.41	46.00	-24.59	Q-Peak	22	143	Vertical
4882.000	34.22	54.00	-19.78	RMS	356	279	Vertical
7322.914	41.64	54.00	-12.36	RMS	48	280	Vertical
7323.006	38.20	54.00	-15.80	RMS	251	353	Horizontal
8233.380	35.19	54.00	-18.81	RMS	34	295	Vertical
8233.385	35.07	54.00	-18.93	RMS	77	392	Horizontal

Table 15 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30MHz to 40 GHz

No other emissions found within 10 dB of the limit.

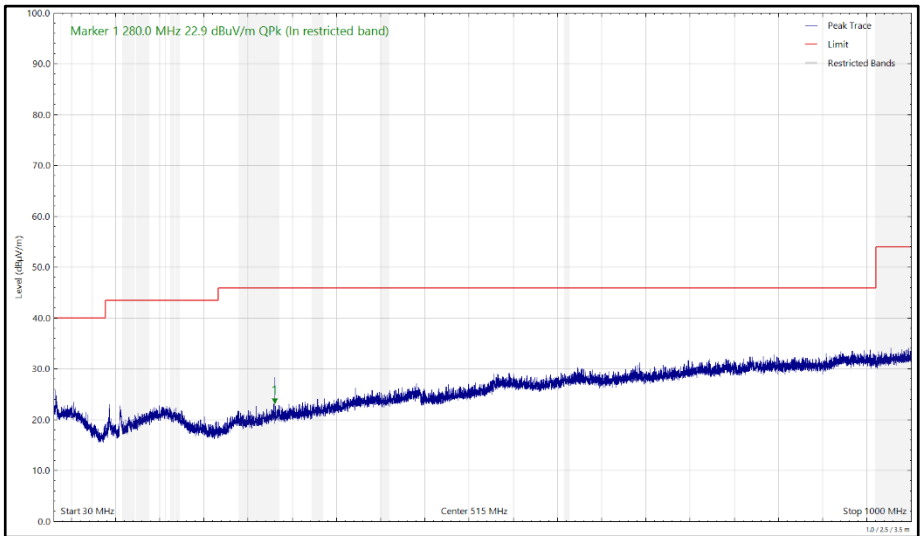

Figure 34 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 GHz to 1 GHz, Horizontal

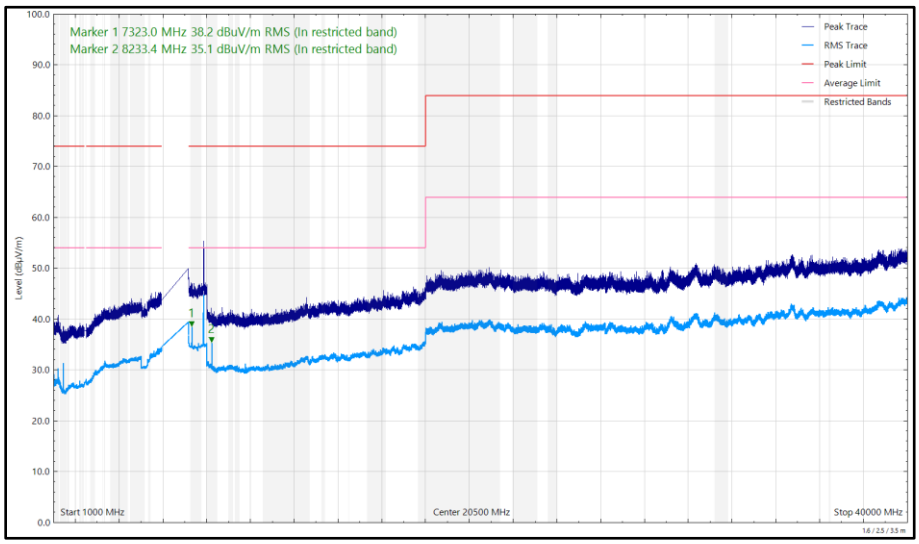

Figure 35 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Horizontal

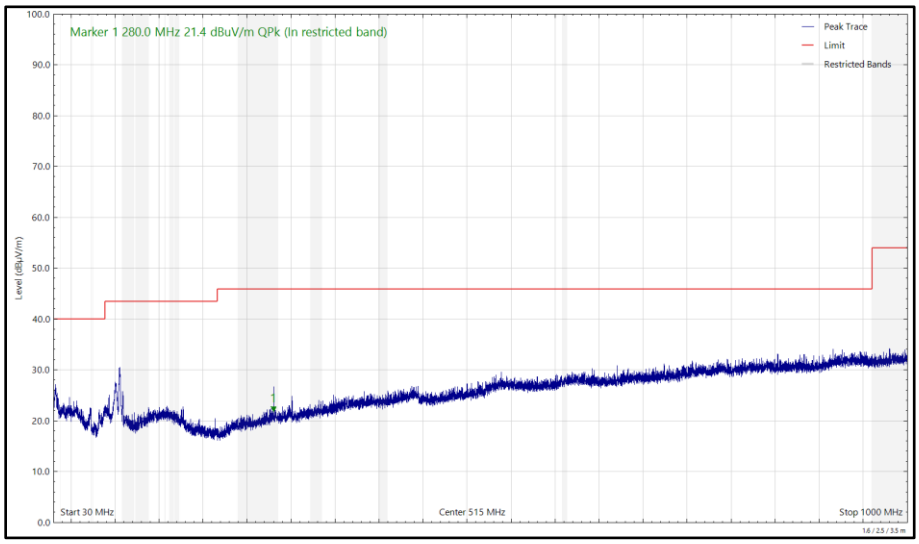

Figure 36 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Vertical (Peak)

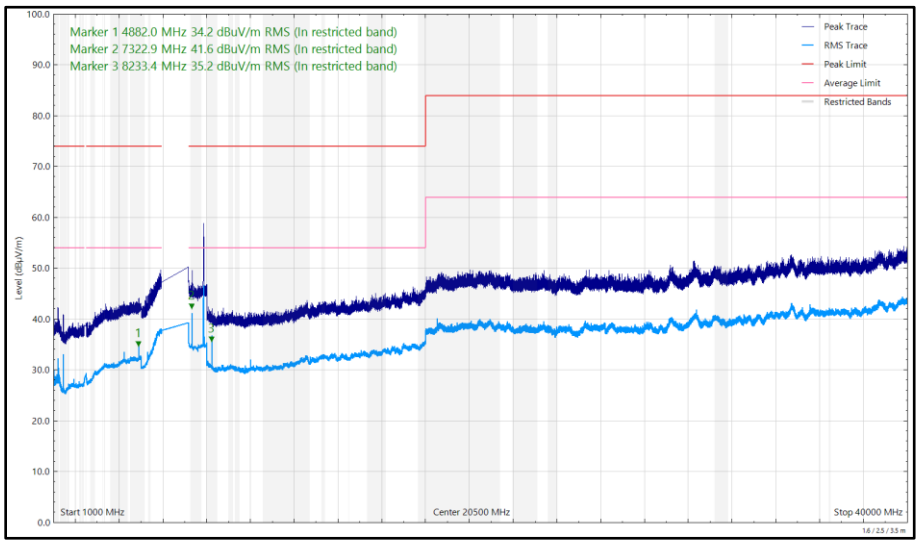

Figure 37 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
279.993	28.02	46.00	-17.98	Q-Peak	97	110	Horizontal
4882.080	33.63	54.00	-20.37	RMS	358	196	Vertical
7323.050	42.09	54.00	-11.91	RMS	48	282	Vertical
7323.068	37.41	54.00	-16.59	RMS	77	398	Horizontal

Table 16 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

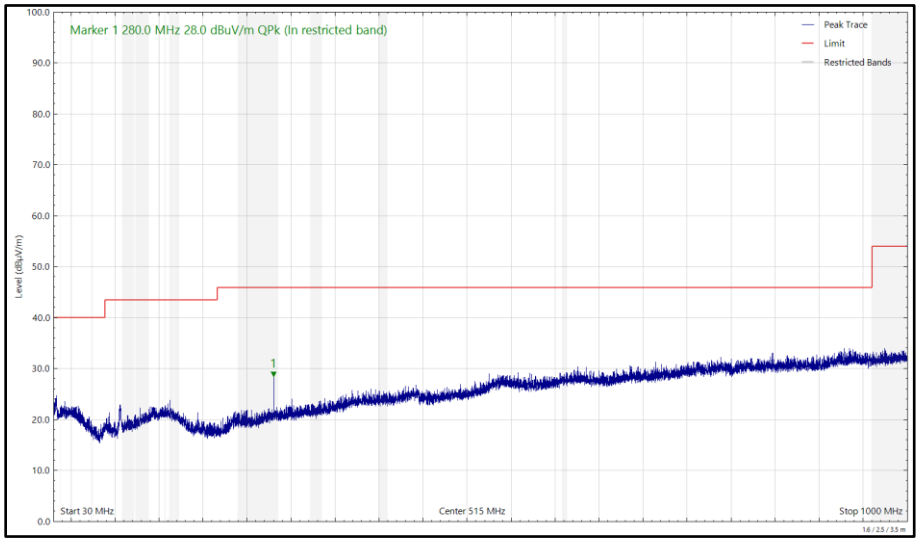

Figure 38 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Horizontal (Peak)

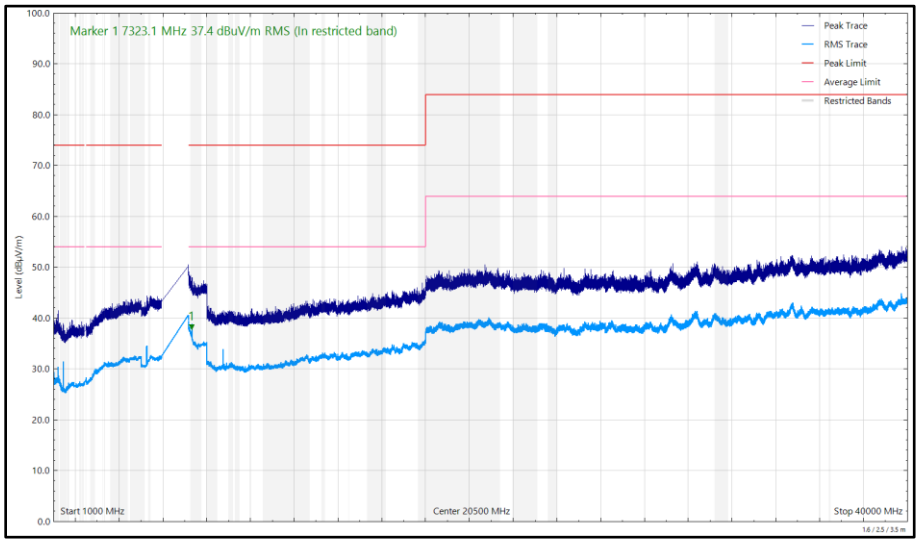

Figure 39 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Horizontal

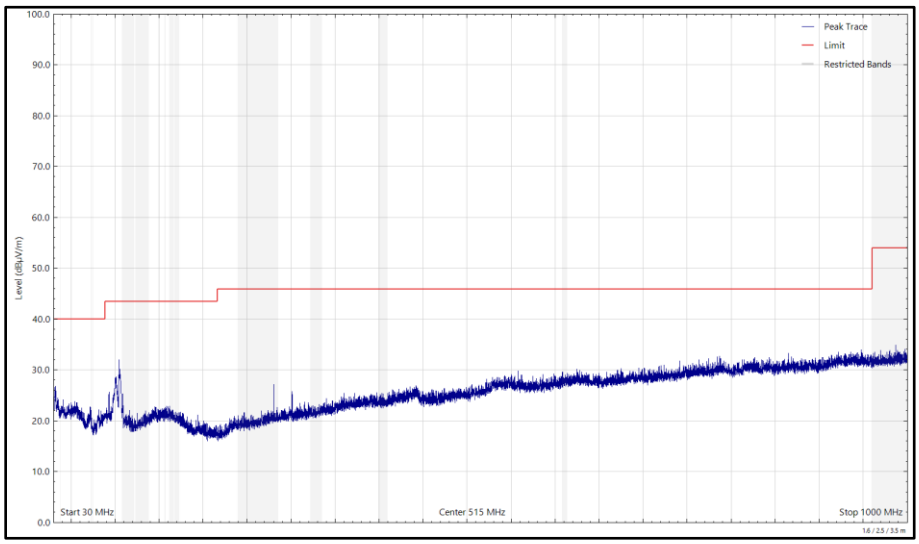

Figure 40 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Vertical (Peak)

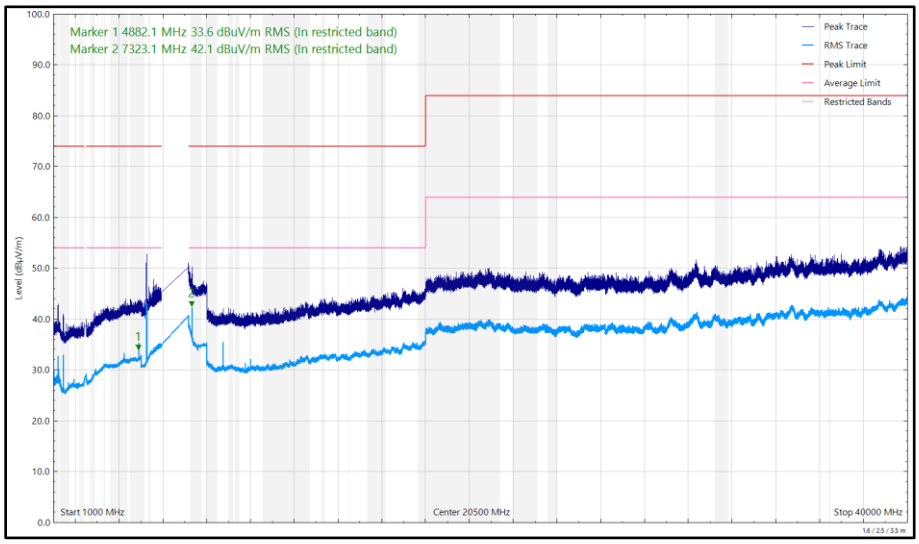

Figure 41 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Vertical

FCC 47 CFR Part 15, ISED RSS-247, ISED RSS-248 and ISED RSS-GEN

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

The least stringent applicable limit was:

Clause	Limit
Part 15 247 (d) / RSS-247 Clause 5.5	-20 dBc
Part 15.407 (b) / RSS-248 Clause 4.7.2	Peak: -7 dBm/MHz e.i.r.p, Average: -27 dBm/MHz e.i.r.p.
Part 15.209 / RSS-GEN Clause 8.9	Peak: 74 dBµV/m at 3m, Average 54 dBµV/m at 3m (Restricted bands > 1 GHz)

Table 17

2.4 GHz WLAN and Narrowband

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
1440.161	36.58	54.00	-17.42	RMS	311	150	Vertical
2389.476	60.53	74.00	-13.47	Peak	228	308	Vertical
2483.555	40.48	54.00	-13.52	RMS	248	390	Vertical
2483.670	36.28	54.00	-17.72	RMS	179	346	Horizontal
4873.478	39.93	54.00	-14.07	RMS	268	288	Vertical

Table 18 - 2437 MHz (CH6), HT20, Core 0 and 5204 MHz, HDR8, ePA, Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

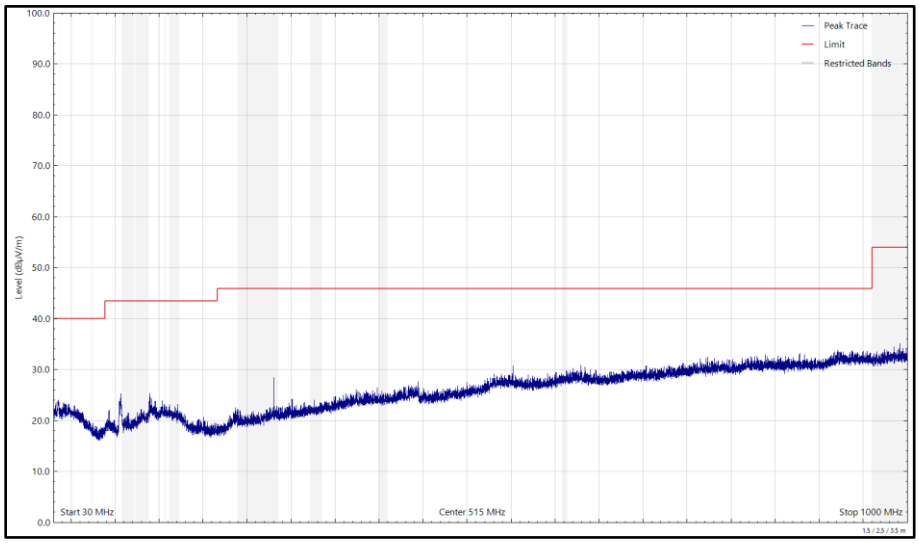

Figure 42 - 2437 MHz (CH6), HT20, Core 0 and 5204 MHz, HDR8, ePA, Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

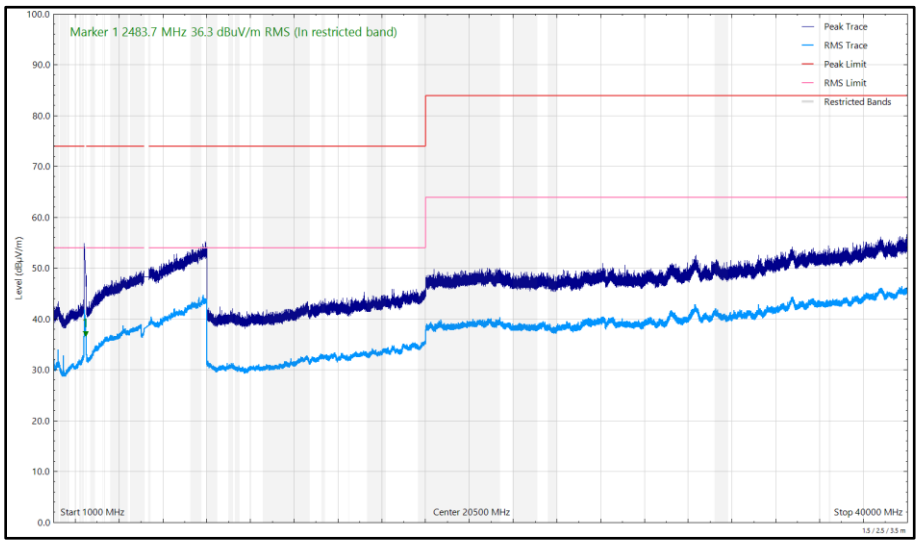

Figure 43 - 2437 MHz (CH6), HT20, Core 0 and 5204 MHz, HDR8, ePA, Core 1, 1 GHz to 40 GHz, Horizontal

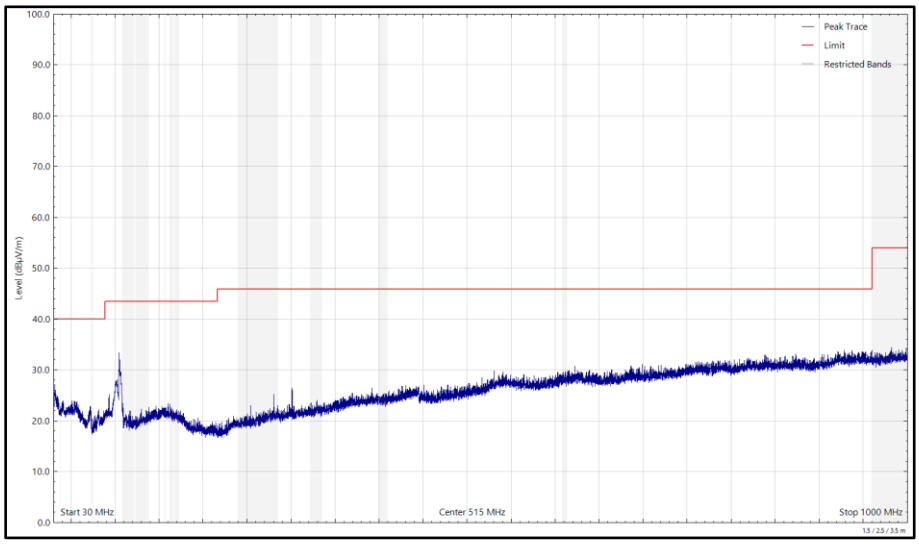

Figure 44 - 2437 MHz (CH6), HT20, Core 0 and 5204 MHz, HDR8, ePA, Core 1, 30 MHz to 1 GHz, Vertical (Peak)

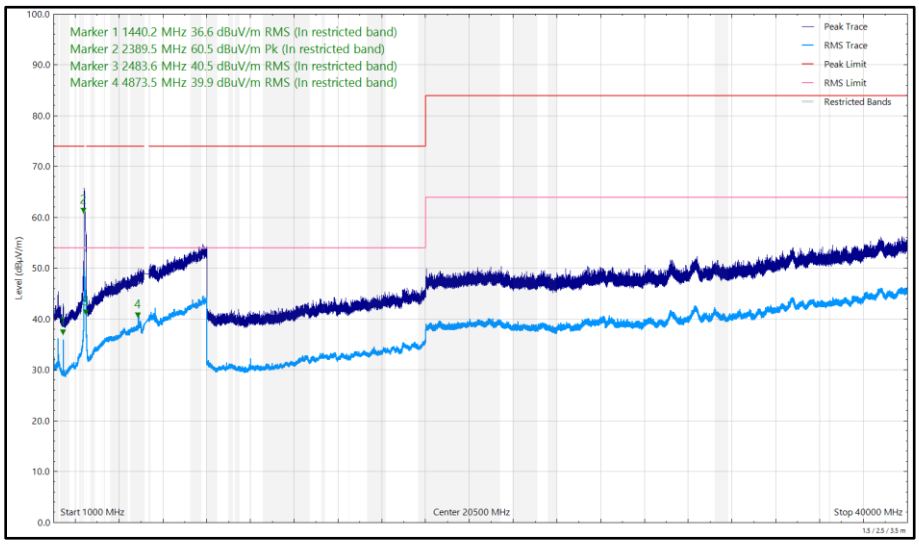

Figure 45 - 2437 MHz (CH6), HT20, Core 0 and 5204 MHz, HDR8, ePA, Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
2389.929	35.90	54.00	-18.10	RMS	299	334	Horizontal
2389.949	39.24	54.00	-14.76	RMS	239	340	Vertical
2483.555	37.68	54.00	-16.32	RMS	296	399	Horizontal
2483.589	41.33	54.00	-12.67	RMS	287	388	Vertical
2484.551	60.67	74.00	-13.33	Peak	287	388	Vertical
4871.294	60.86	74.00	-13.14	Peak	204	286	Vertical
4873.283	44.50	54.00	-9.50	RMS	203	379	Vertical
4875.007	39.32	54.00	-14.68	RMS	281	320	Horizontal
5369.020	40.54	54.00	-13.46	RMS	216	326	Vertical

Table 19 - 2437 MHz (CH6), HT20, Core 1 and 5204 MHz, HDR8, ePA, Core 0, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

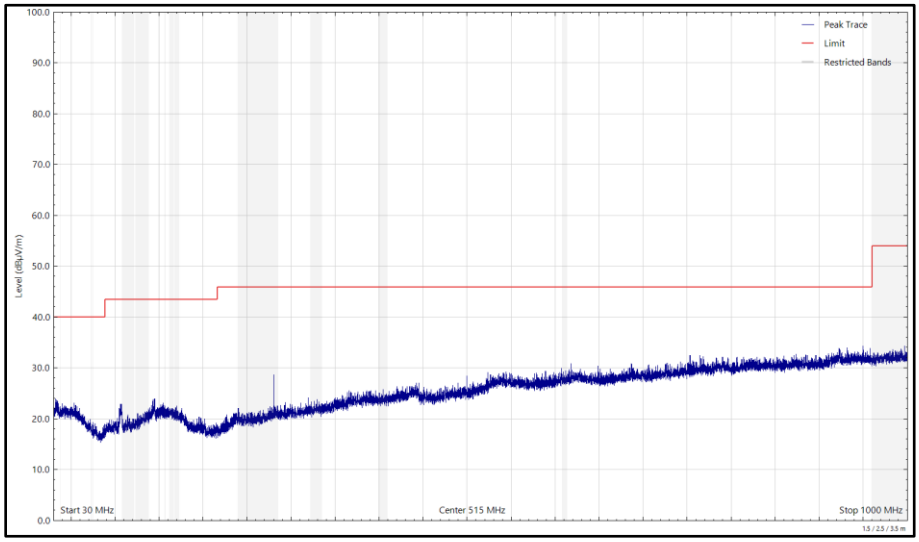

Figure 46 - 2437 MHz (CH6), HT20, Core 1 and 5204 MHz, HDR8, ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)

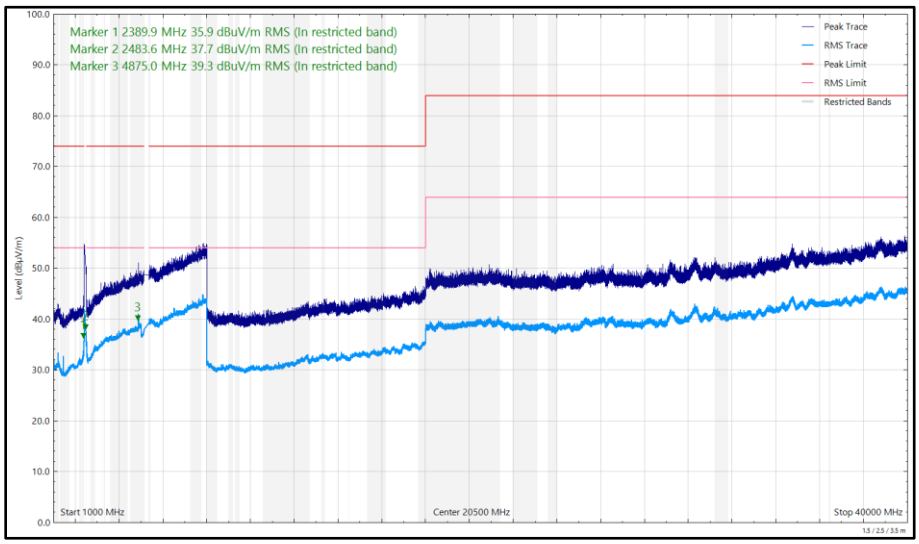

Figure 47 - 2437 MHz (CH6), HT20, Core 1 and 5204 MHz, HDR8, ePA, Core 0, 1 GHz to 40 GHz, Horizontal

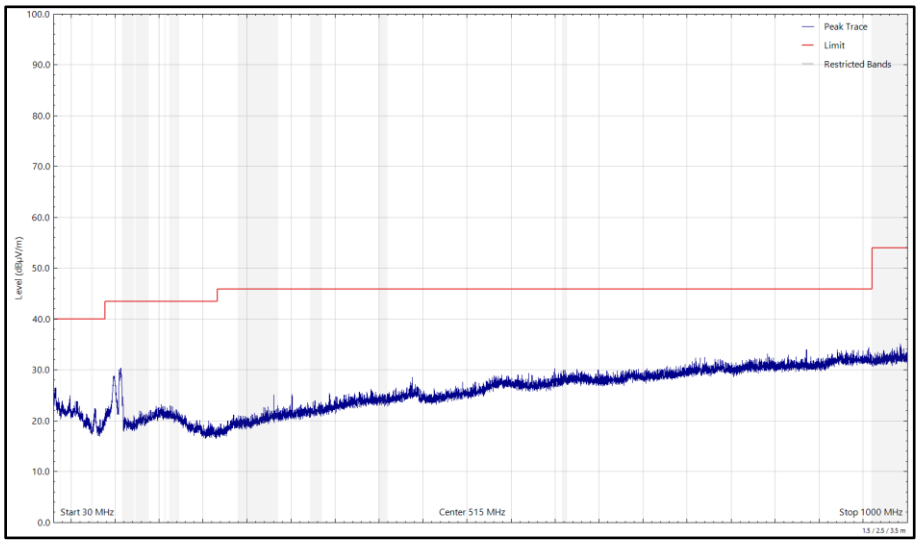

Figure 48 - 2437 MHz (CH6), HT20, Core 1 and 5204 MHz, HDR8, ePA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)

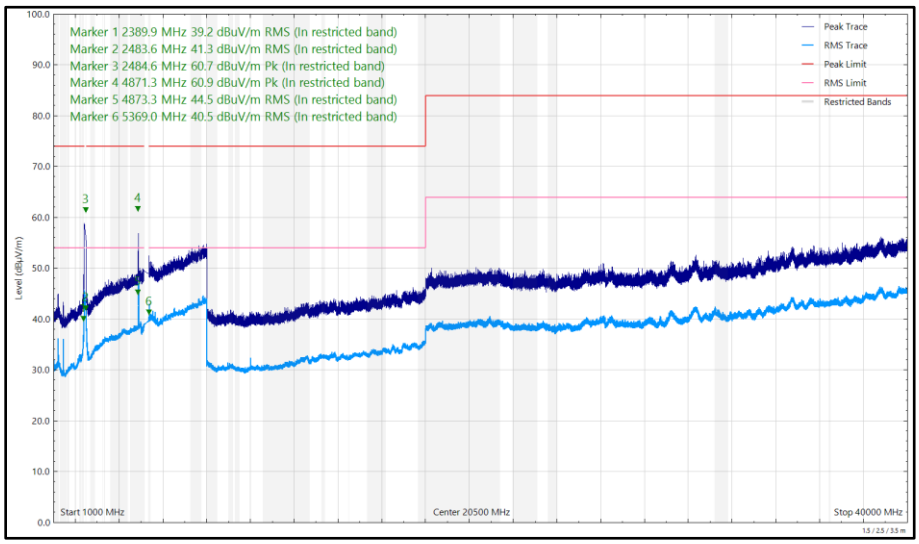

Figure 49 - 2437 MHz (CH6), HT20, Core 1 and 5204 MHz, HDR8, ePA, Core 0, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
2389.624	57.91	74.00	-16.09	Peak	242	333	Vertical
2389.975	35.03	54.00	-18.97	RMS	182	363	Horizontal
2483.629	37.16	54.00	-16.84	RMS	230	379	Vertical
5374.590	45.17	54.00	-8.83	RMS	243	320	Vertical

Table 20 - 2437 MHz (CH6), HT20, Core 0 and 5788 MHz, HDR4, ePA, Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

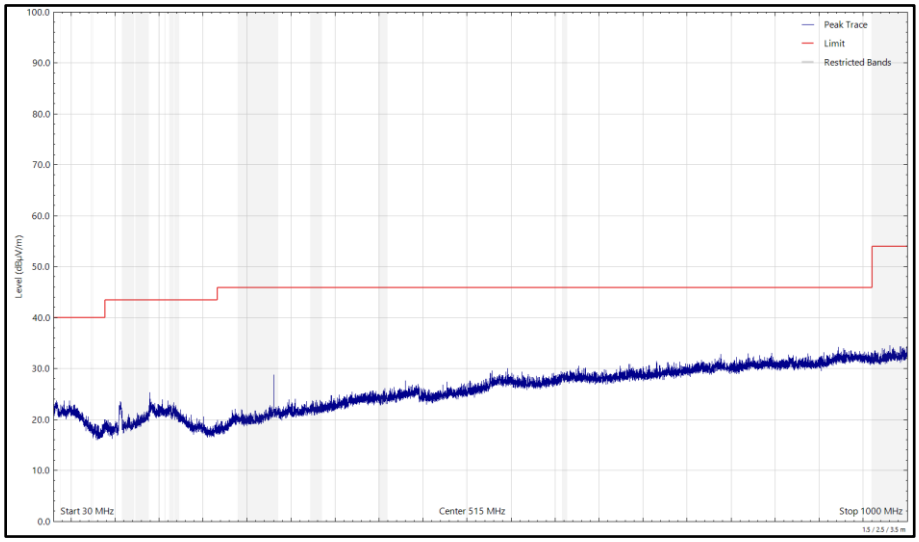

Figure 50 - 2437 MHz (CH6), HT20, Core 0 and 5788 MHz, HDR4, ePA, Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

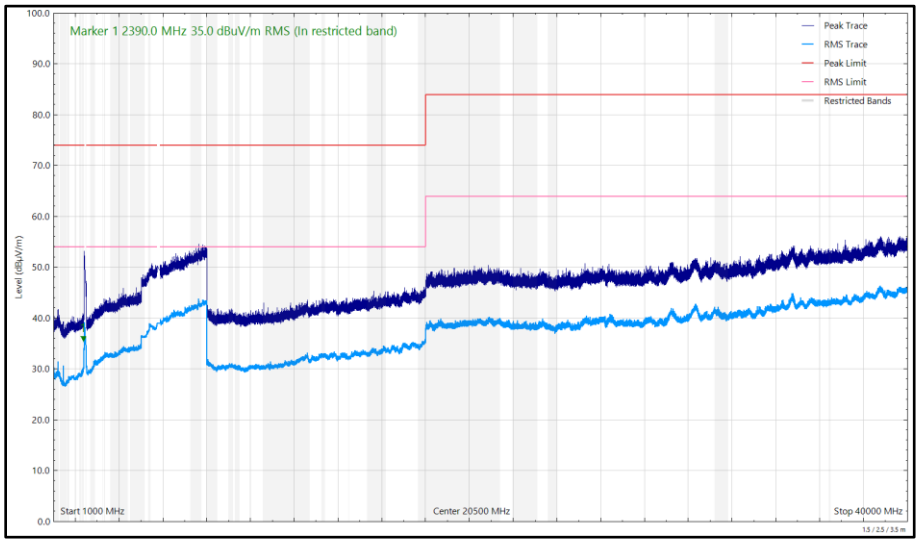

Figure 51 - 2437 MHz (CH6), HT20, Core 0 and 5788 MHz, HDR4, ePA, Core 1, 1 GHz to 40 GHz, Horizontal

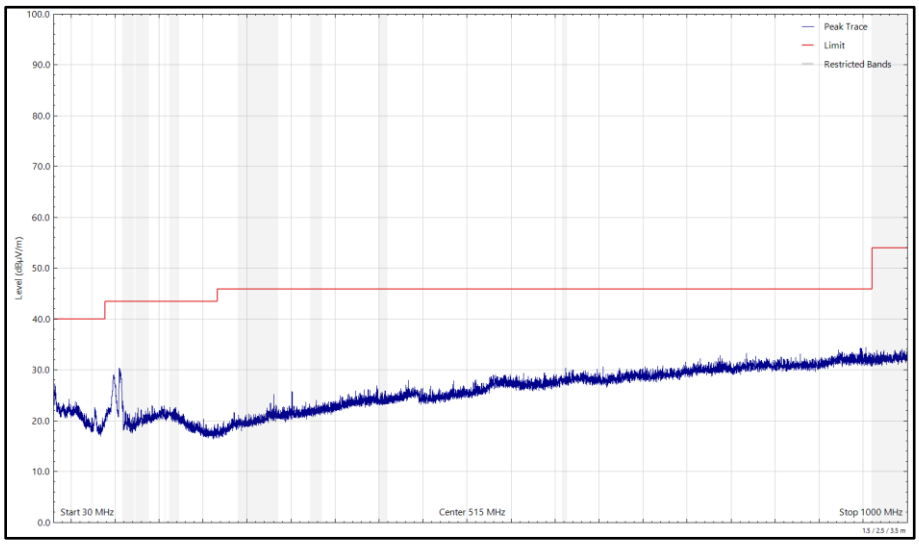

Figure 52 - 2437 MHz (CH6), HT20, Core 0 and 5788 MHz, HDR4, ePA, Core 1, 30 MHz to 1 GHz, Vertical (Peak)

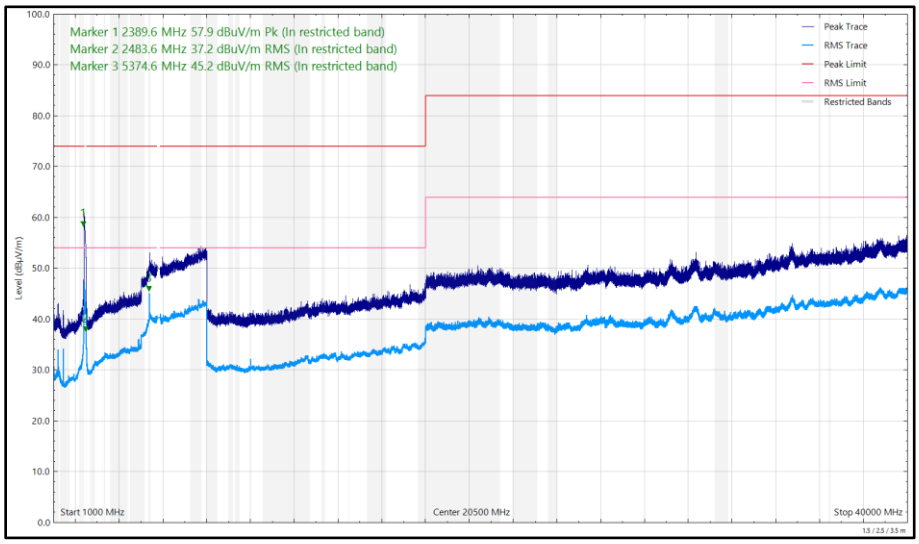

Figure 53 - 2437 MHz (CH6), HT20, Core 0 and 5788 MHz, HDR4, ePA, Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
1203.616	34.47	54.00	-19.53	RMS	214	160	Vertical
2483.514	38.91	54.00	-15.09	RMS	286	392	Vertical
4874.093	35.85	54.00	-18.15	RMS	207	390	Vertical
5374.535	42.06	54.00	-11.94	RMS	191	305	Vertical
5374.631	39.73	54.00	-14.27	RMS	173	373	Horizontal

Table 21 - 2437 MHz (CH6), HT20, Core 1 and 5788 MHz, HDR4, ePA, Core 0, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

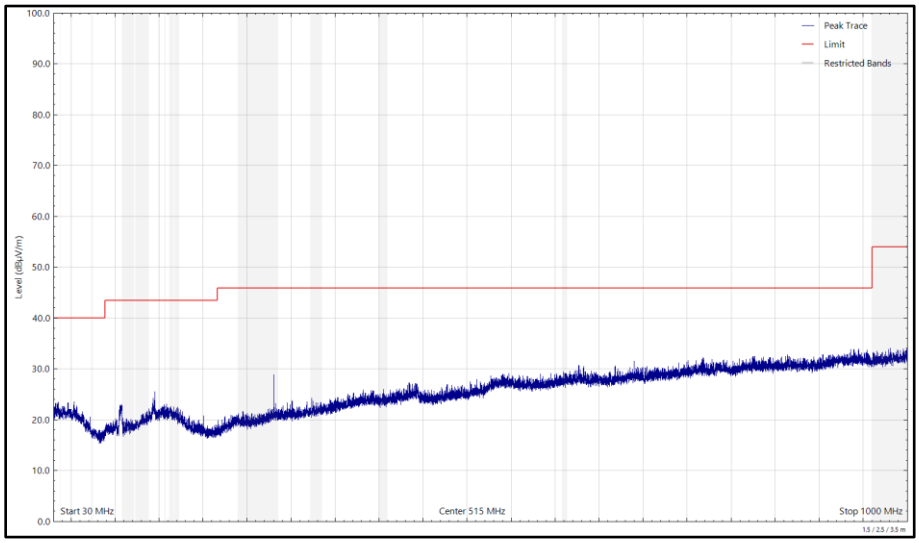

Figure 54 - 2437 MHz (CH6), HT20, Core 1 and 5788 MHz, HDR4, ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)

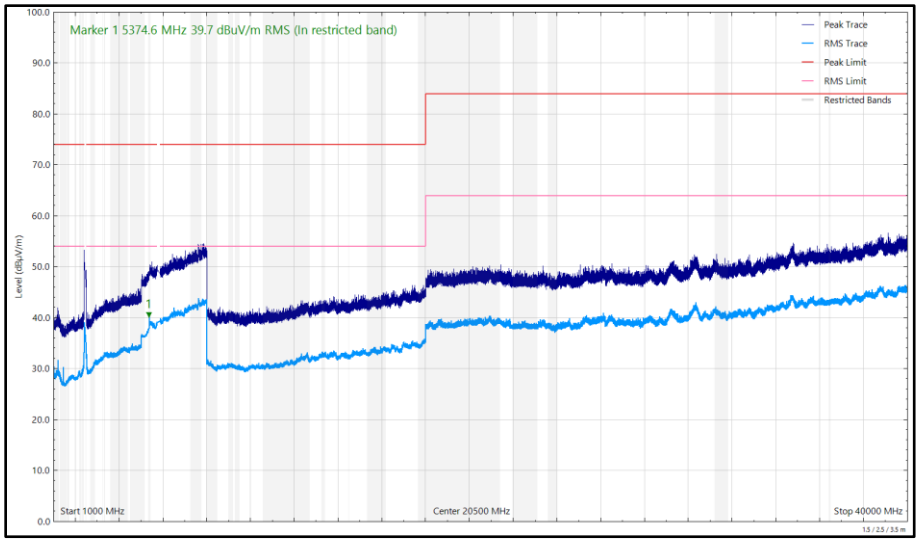

Figure 55 - 2437 MHz (CH6), HT20, Core 1 and 5788 MHz, HDR4, ePA, Core 0, 1 GHz to 40 GHz, Horizontal

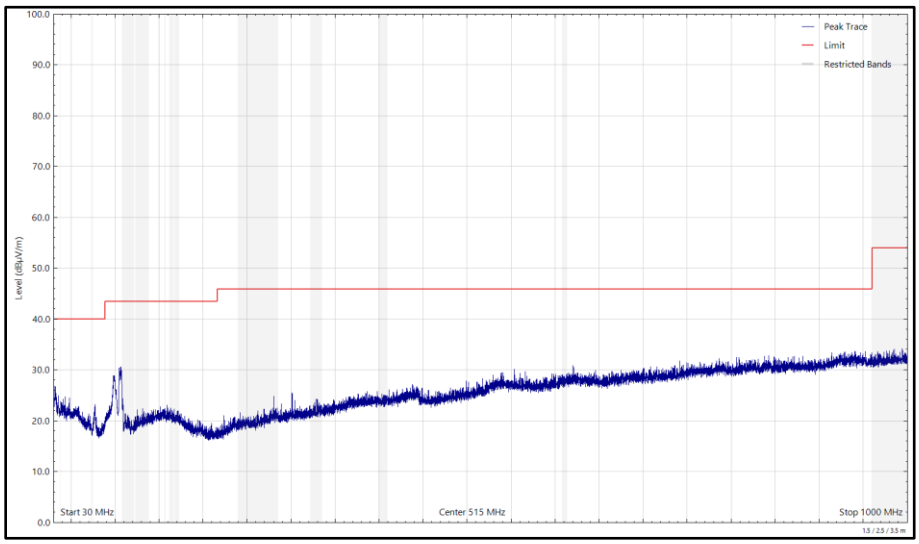

Figure 56 - 2437 MHz (CH6), HT20, Core 1 and 5788 MHz, HDR4, ePA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)

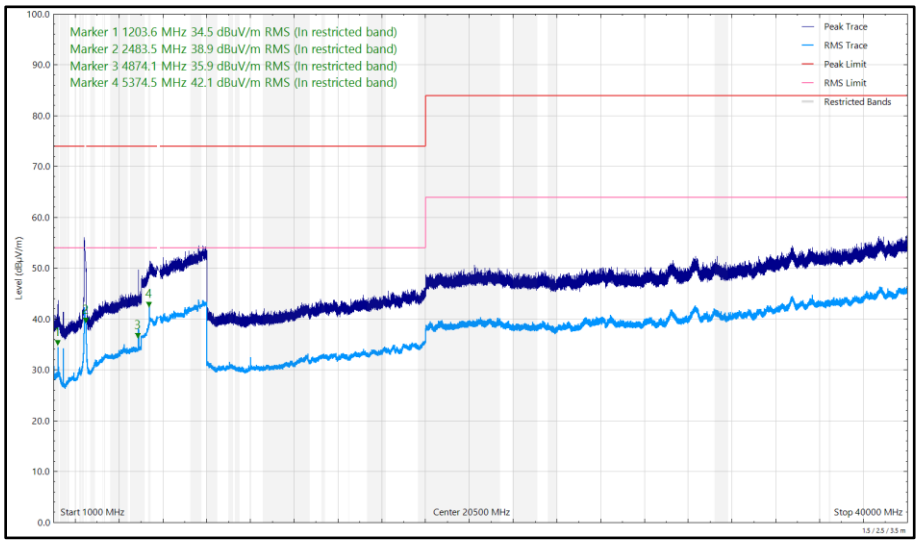

Figure 57 - 2437 MHz (CH6), HT20, Core 1 and 5788 MHz, HDR4, ePA, Core 0, 1 GHz to 40 GHz, Vertical

FCC 47 CFR Part 15, ISED RSS-247 and ISED RSS-GEN

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

The least stringent applicable limit was:

Clause	Limit
Part 15 247 (d) / RSS-247 Clause 5.5	30 dBc
Part 15.407 (b) / RSS-247 Clause 4.6.1.2	-27 dBm/MHz e.i.r.p.
Part 15.209 / RSS-GEN Clause 8.9	Peak: 74 dBµV/m at 3m, Average 54 dBµV/m at 3m (Restricted bands > 1 GHz)

Table 22

5 GHz WLAN and Thread

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
2365.674	35.20	54.00	-18.80	RMS	358	259	Vertical
2367.339	66.95	74.00	-7.05	Peak	351	394	Vertical
2487.593	38.38	54.00	-15.62	RMS	350	384	Vertical
4222.191	35.47	54.00	-18.53	RMS	350	241	Vertical
4388.491	35.88	54.00	-18.12	RMS	3	110	Horizontal
4879.053	44.69	54.00	-9.31	RMS	21	280	Vertical
4880.898	37.49	54.00	-16.51	RMS	122	322	Horizontal

Table 23 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 0, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

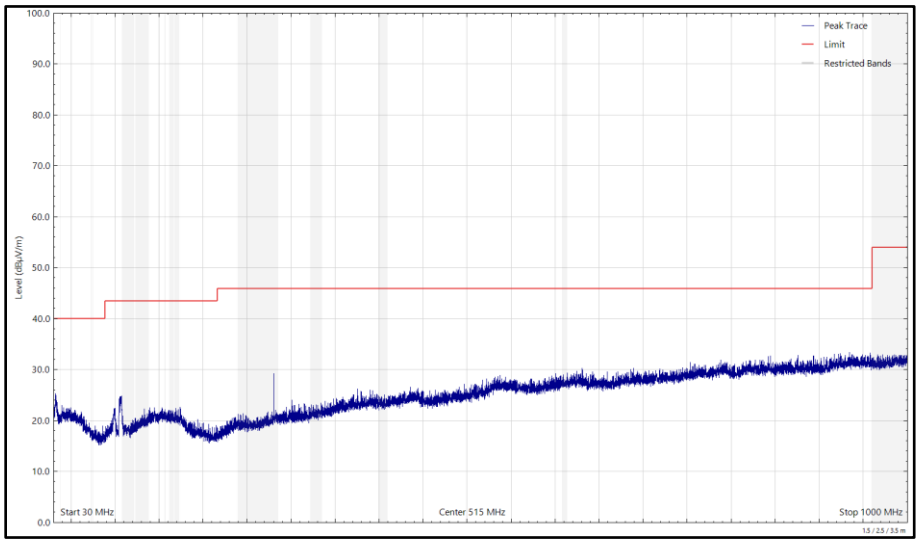

Figure 58 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)

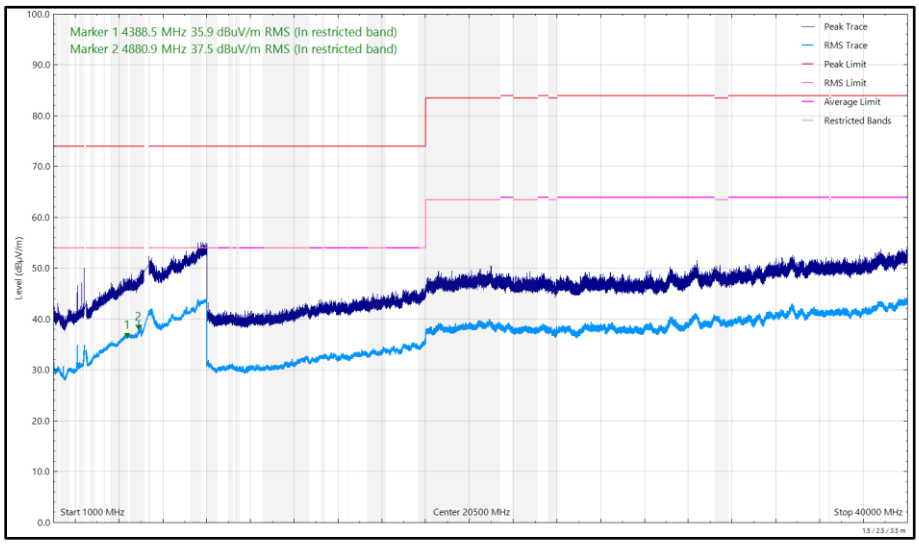

Figure 59 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 0, 1 GHz to 40 GHz, Horizontal

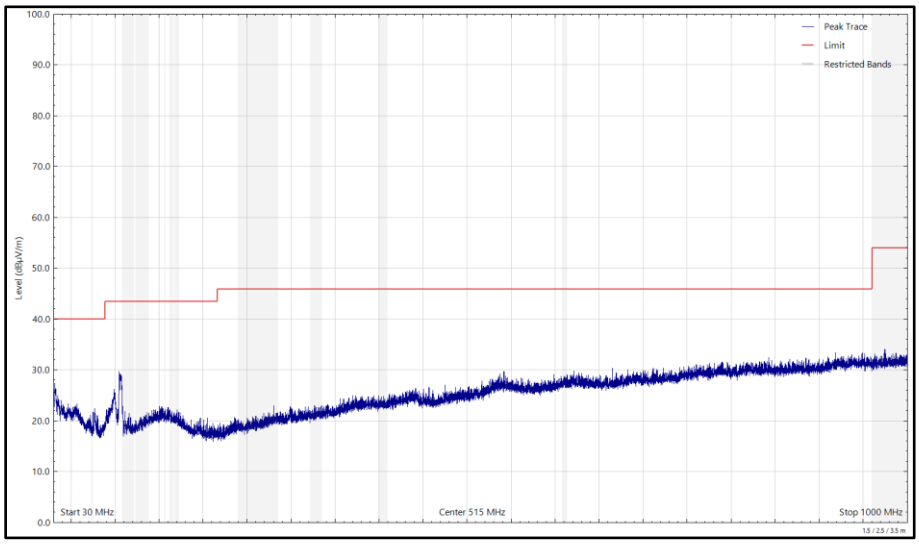

Figure 60 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)

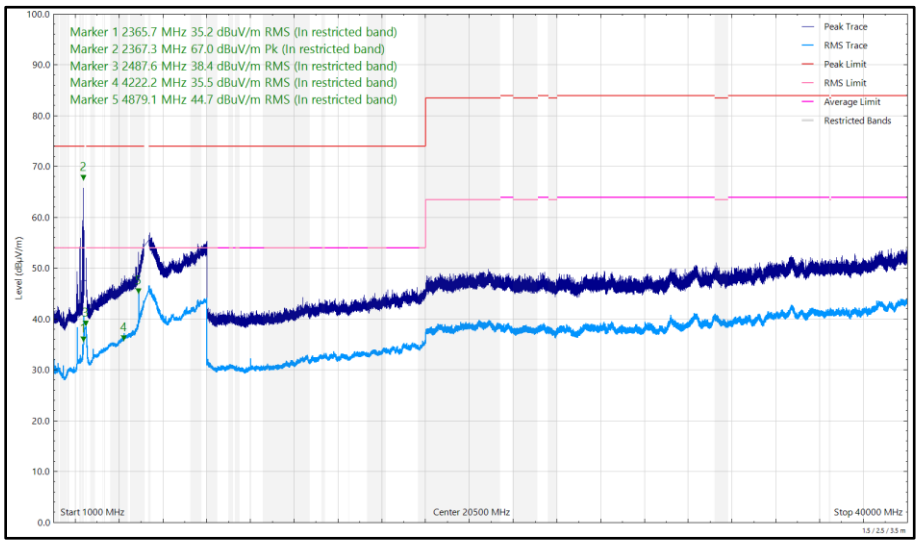

Figure 61 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 0, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
2399.613	71.47	80.00	-8.53	Peak	33	393	Vertical
2483.577	37.47	54.00	-16.53	RMS	0	331	Vertical
2496.619	69.73	74.00	-4.27	Peak	41	382	Vertical
2518.258	62.43	80.00	-17.57	Peak	22	311	Vertical
4300.327	35.71	54.00	-18.29	RMS	82	393	Horizontal
4344.211	35.83	54.00	-18.17	RMS	139	111	Vertical
4879.173	37.35	54.00	-16.65	RMS	44	264	Horizontal
4880.997	44.16	54.00	-9.84	RMS	20	280	Vertical

Table 24 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

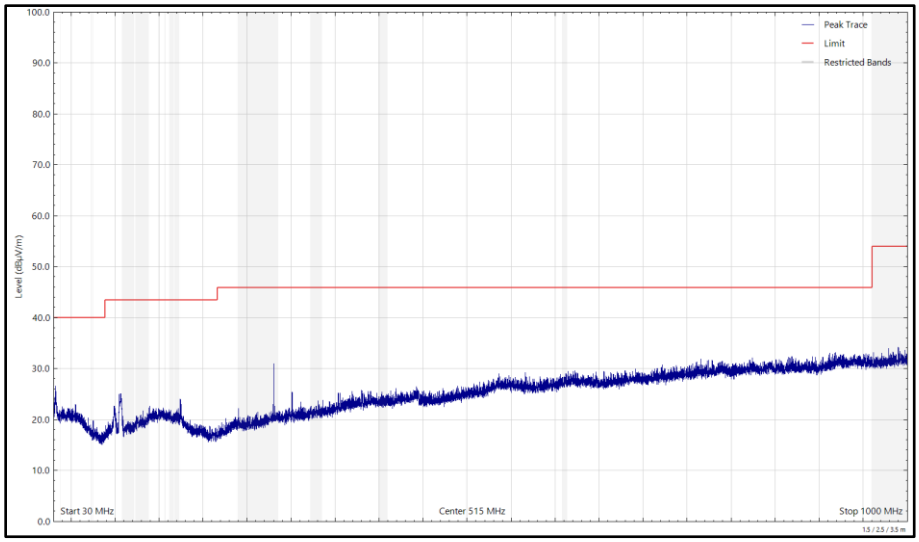

Figure 62 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

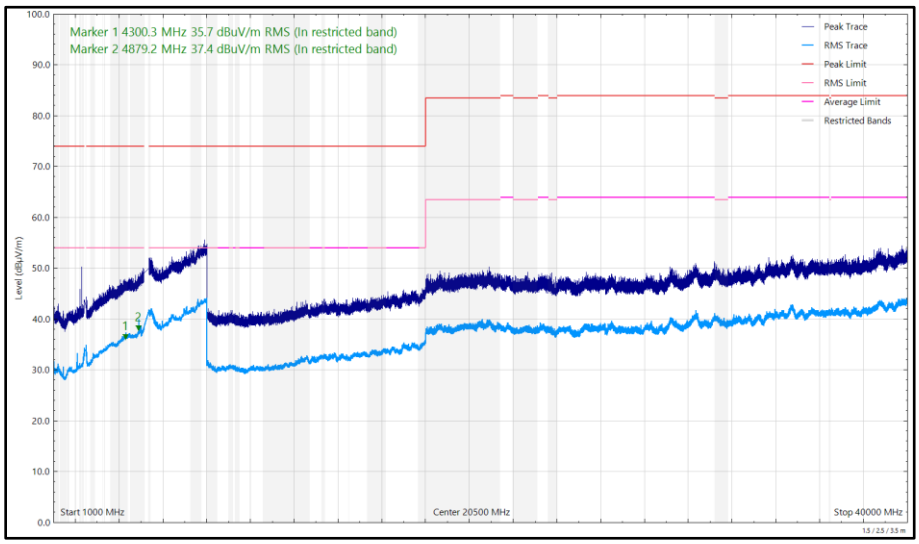

Figure 63 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 1, 1 GHz to 40 GHz, Horizontal

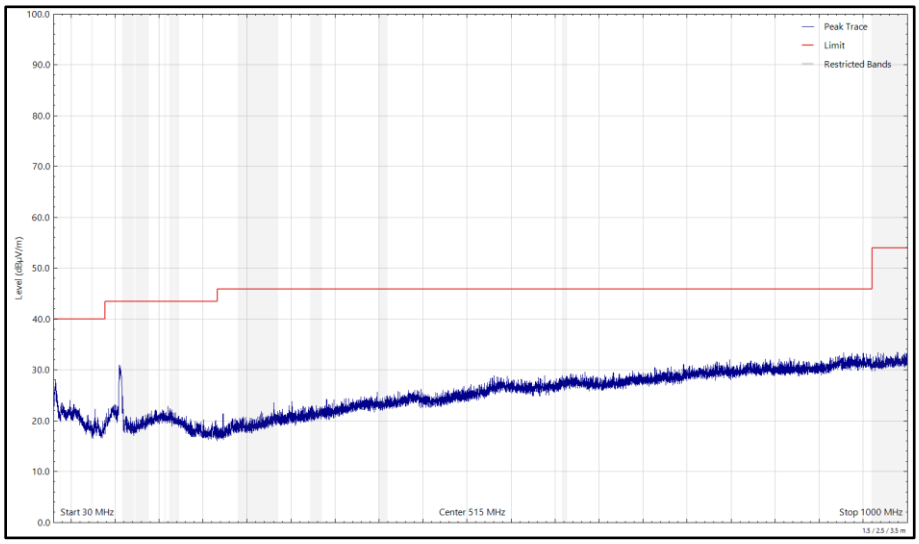

Figure 64 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 1, 30 MHz to 1 GHz, Vertical (Peak)

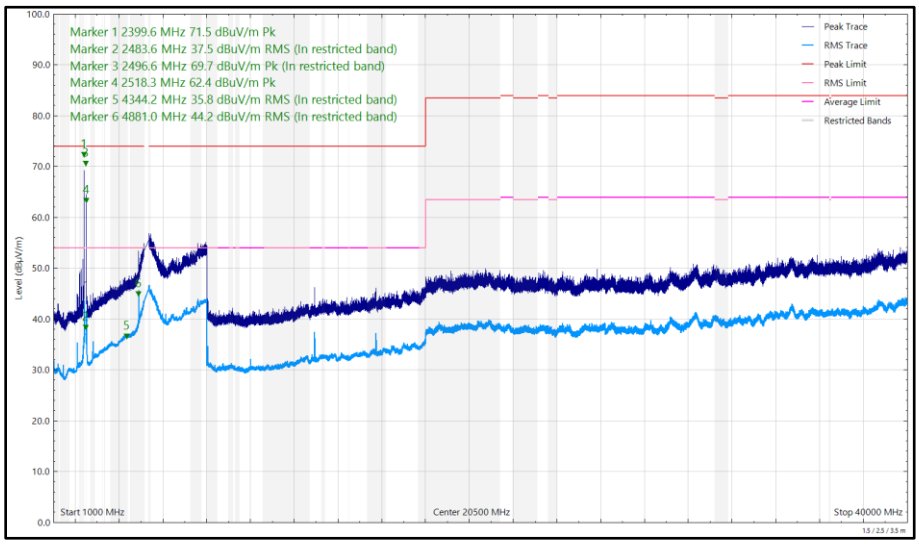

Figure 65 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
4880.828	37.69	54.00	-16.31	RMS	109	370	Horizontal
4880.833	46.53	54.00	-7.47	RMS	358	300	Vertical
5113.724	42.31	54.00	-11.69	RMS	27	110	Vertical
5115.739	56.49	74.00	-17.51	Peak	360	294	Vertical
5390.123	59.37	74.00	-14.63	Peak	0	323	Vertical
5411.277	46.07	54.00	-7.93	RMS	4	318	Vertical
5427.822	41.65	54.00	-12.35	RMS	289	371	Horizontal
7581.975	42.52	54.00	-11.48	RMS	99	323	Horizontal

Table 25 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), iPA, Core 2, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

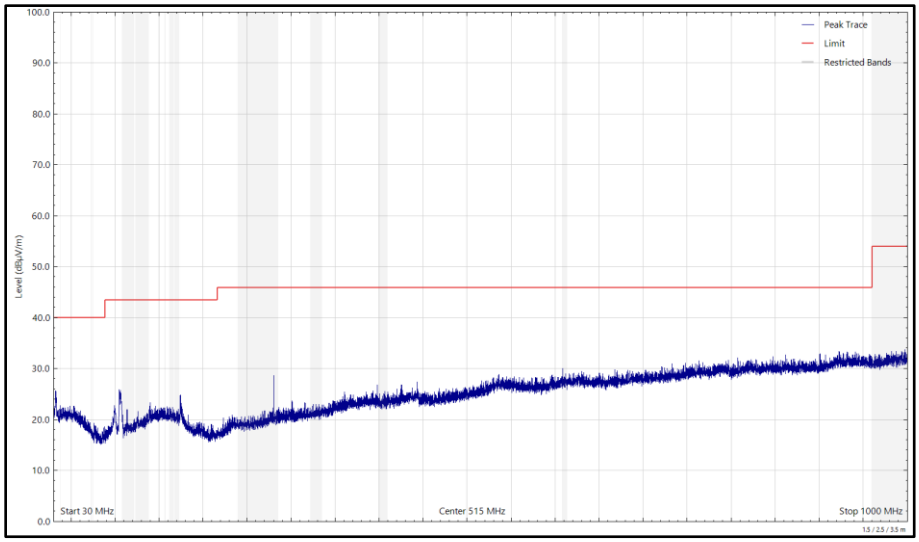

Figure 66 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), iPA, Core 2, 30 MHz to 1 GHz, Horizontal (Peak)

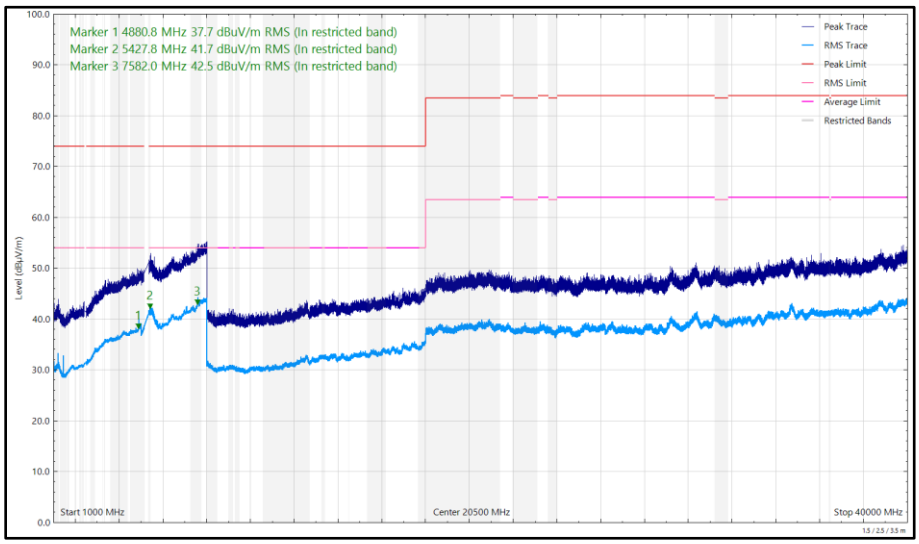

Figure 67 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), iPA, Core 2, 1 GHz to 40 GHz, Horizontal

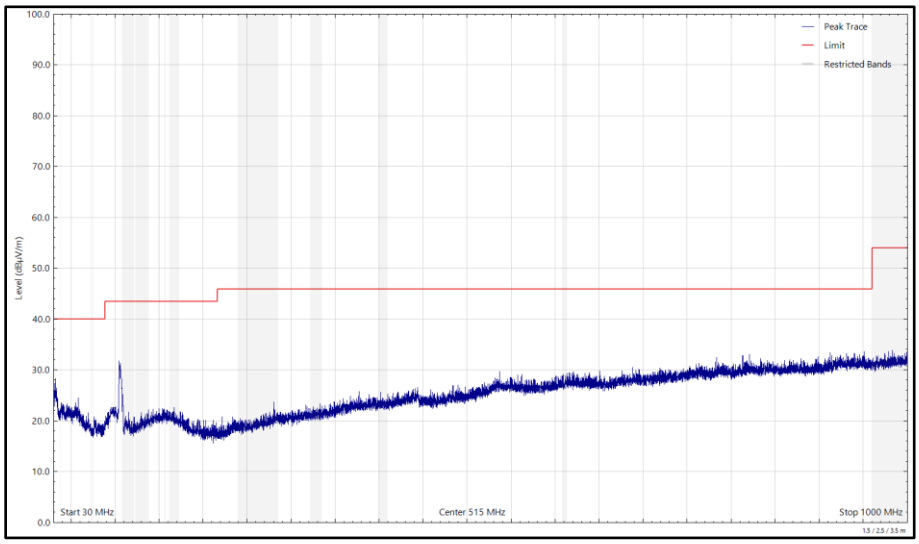

Figure 68 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), iPA, Core 2, 30 MHz to 1 GHz, Vertical (Peak)