FCC and ISED Test Report

Apple Inc
Model: A3240

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)

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COMMERCIAL-IN-CONFIDENCE

Document 75962766-20 Issue 01

SIGNATURE			
NAME	**JOB TITLE**	**RESPONSIBLE FOR**	**ISSUE DATE**
Steve Marshall	Senior Engineer	Authorised Signatory	02 December 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	Rachael Watkins	02 December 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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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	02-December-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	11-October-2024
Finish of Test	13-November-2024
Name of Engineer(s)	Ahmed Al Derdiri, Elliot Callender and Ian Hart
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: A3240		
Serial Number	Hardware Version	Software Version
H2XGP4VW6W	REV1.0	24A12461c
K4L392N93P	REV1.0	24A12461c

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: A3240, Serial Number: K4L392N93P			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A3240, Serial Number: H2XGP4VW6W			
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)	Ahmed Al Derdiri	UKAS
Configuration and Mode: 6 GHz WLAN and 2.4 GHz Bluetooth		
Radiated Spurious Emissions (Simultaneous Transmission)	Ahmed Al Derdiri	UKAS
Configuration and Mode: 2.4 GHz WLAN and Narrowband		
Radiated Spurious Emissions (Simultaneous Transmission)	Elliot Callender and Ian Hart	UKAS
Configuration and Mode: 5 GHz WLAN and Thread		
Radiated Spurious Emissions (Simultaneous Transmission)	Elliot Callender and Ian Hart	UKAS
Configuration and Mode: 6 GHz WLAN and Thread		
Radiated Spurious Emissions (Simultaneous Transmission)	Elliot Callender	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

A3240, S/N: H2XGP4VW6W - Modification State 0
A3240, S/N: K4L392N93P - Modification State 0

2.1.3 Date of Test

11-October-2024 to 13-November-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 dBµV/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

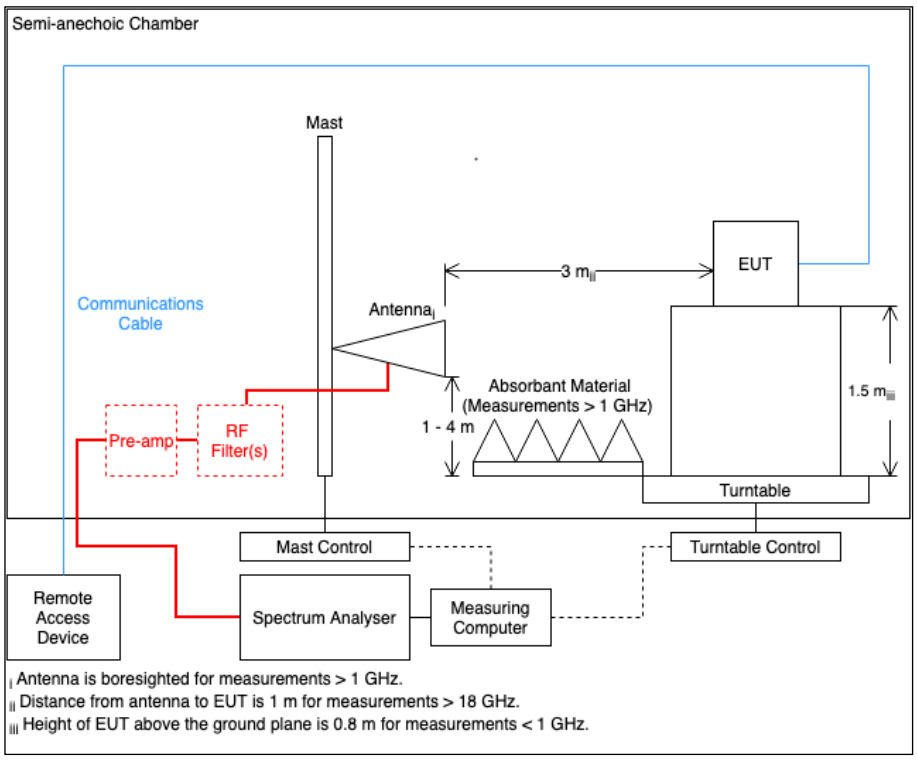

Figure 1

2.1.6 Environmental Conditions

Ambient Temperature	21.6 - 23.3 °C
Relative Humidity	42.4 - 52.3 %

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
31.896	32.27	40.00	-7.73	Q-Peak	317	113	Vertical
90.615	27.17	43.50	-16.33	Q-Peak	356	398	Horizontal
99.007	30.86	43.50	-12.64	Q-Peak	40	125	Vertical
102.715	33.98	43.50	-9.52	Q-Peak	0	341	Horizontal
108.109	31.92	43.50	-11.58	Q-Peak	350	292	Horizontal
112.093	31.93	43.50	-11.57	Q-Peak	119	100	Vertical
233.242	25.63	46.00	-20.37	Q-Peak	287	107	Vertical
253.033	24.58	46.00	-21.42	Q-Peak	279	102	Vertical
320.099	29.45	46.00	-16.55	Q-Peak	91	100	Horizontal
324.824	30.34	46.00	-15.66	Q-Peak	92	101	Horizontal
2389.606	35.17	54.00	-18.83	CISPR Avg	1	220	Vertical
4881.948	36.60	54.00	-17.40	CISPR Avg	309	376	Horizontal
4882.357	45.87	54.00	-8.13	CISPR Avg	353	270	Vertical
4882.493	58.87	74.00	-15.13	Peak	0	290	Vertical
5147.548	57.47	74.00	-16.53	Peak	336	284	Vertical
5149.850	43.41	54.00	-10.59	CISPR Avg	345	296	Vertical
5363.198	58.89	74.00	-15.11	Peak	335	287	Vertical
5368.147	42.58	54.00	-11.42	CISPR Avg	325	266	Vertical

Table 6 - 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.

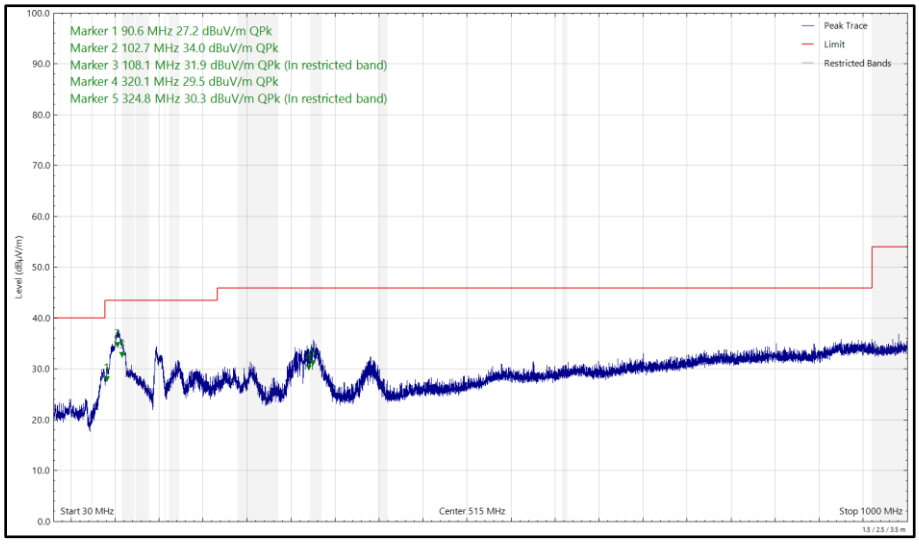

Figure 2 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

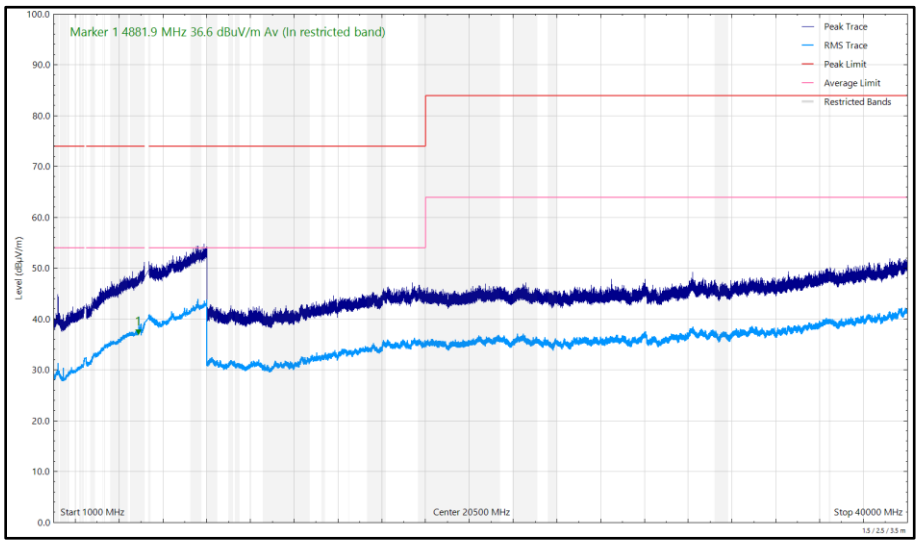

Figure 3 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

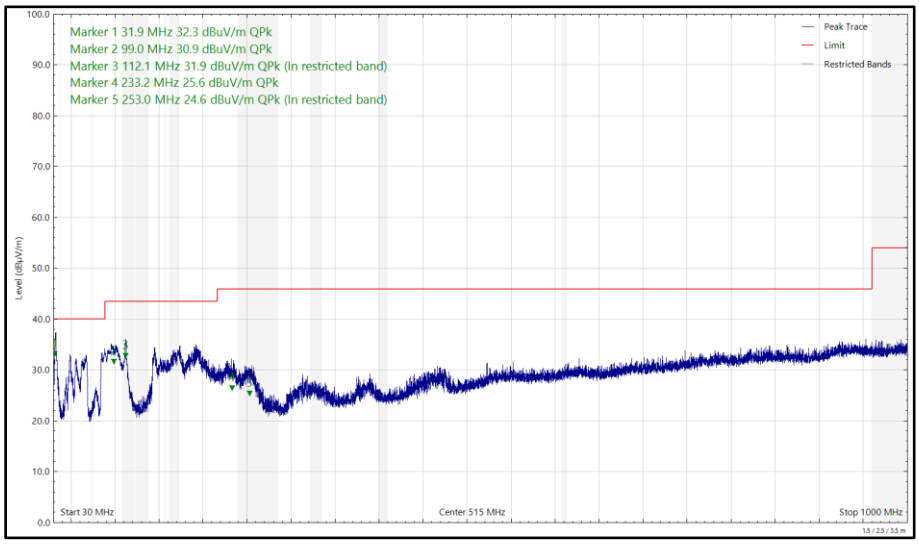

Figure 4 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

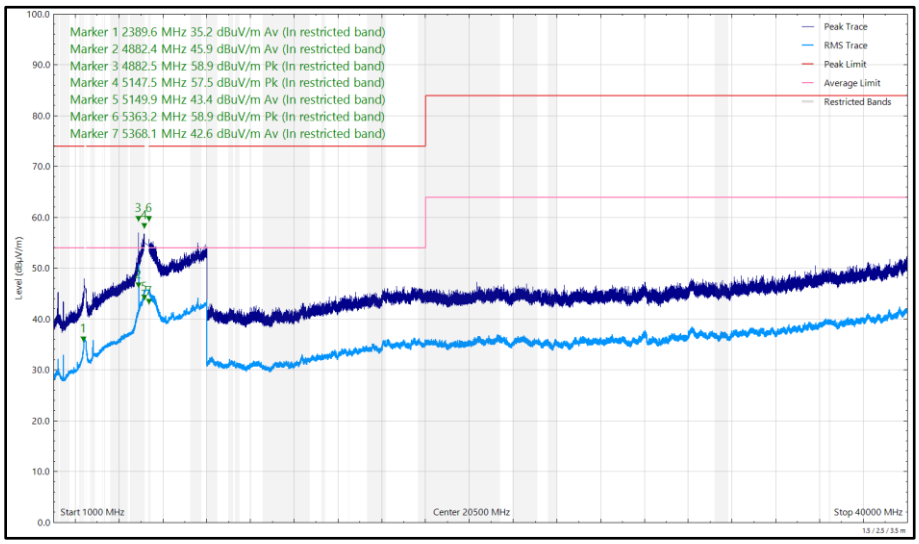

Figure 5 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
31.971	32.33	40.00	-7.67	Q-Peak	216	113	Vertical
63.522	20.18	40.00	-19.82	Q-Peak	316	356	Horizontal
100.855	31.34	43.50	-12.16	Q-Peak	36	131	Vertical
102.845	34.85	43.50	-8.65	Q-Peak	0	297	Horizontal
108.088	31.77	43.50	-11.73	Q-Peak	15	277	Horizontal
111.777	32.76	43.50	-10.74	Q-Peak	89	100	Vertical
236.273	24.58	46.00	-21.42	Q-Peak	290	121	Vertical
253.539	25.00	46.00	-21.00	Q-Peak	291	100	Vertical
320.483	29.28	46.00	-16.72	Q-Peak	89	100	Horizontal
326.133	29.94	46.00	-16.06	Q-Peak	95	100	Horizontal
4881.583	36.75	54.00	-17.25	CISPR Avg	310	390	Horizontal
4881.818	58.05	74.00	-15.95	Peak	355	266	Vertical
4882.088	45.05	54.00	-8.95	CISPR Avg	359	319	Vertical
5442.289	57.35	74.00	-16.65	Peak	323	275	Vertical
5454.909	41.02	54.00	-12.98	CISPR Avg	31	292	Vertical

Table 7 - 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.

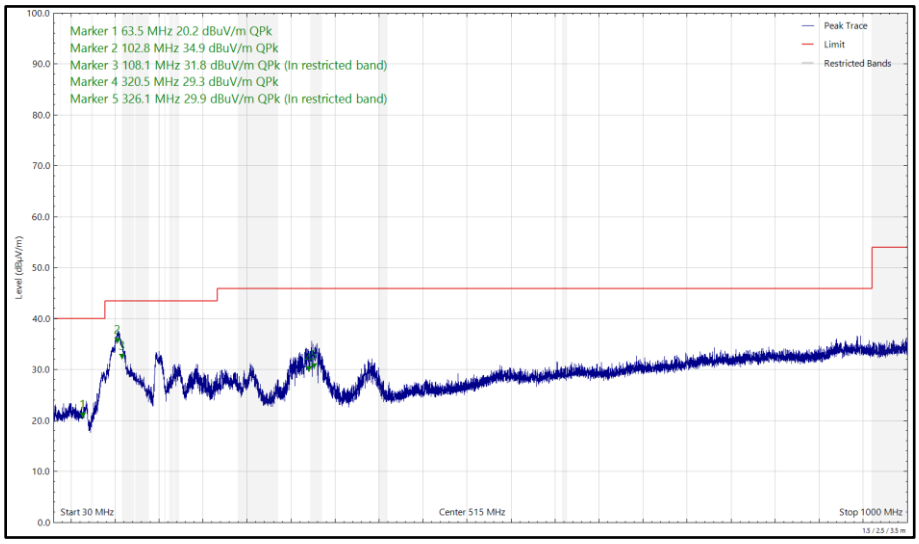

Figure 6 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

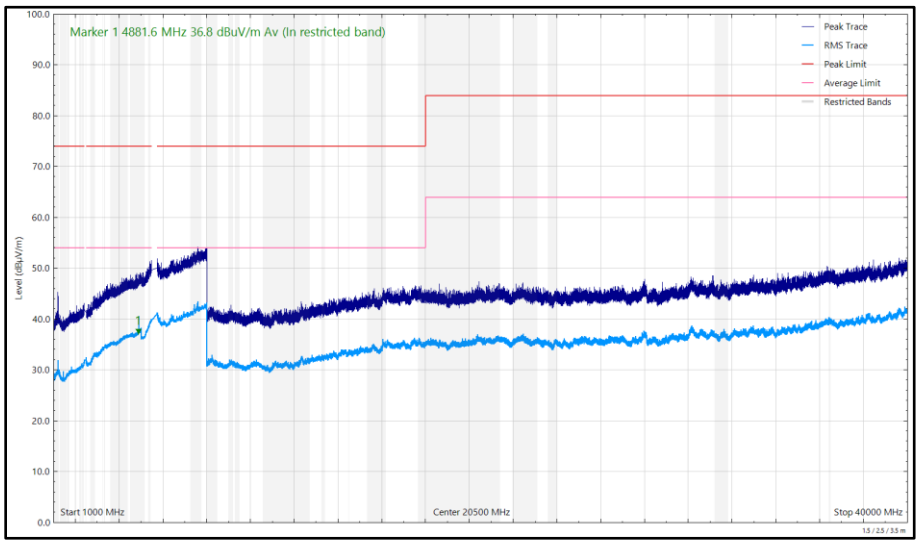

Figure 7 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

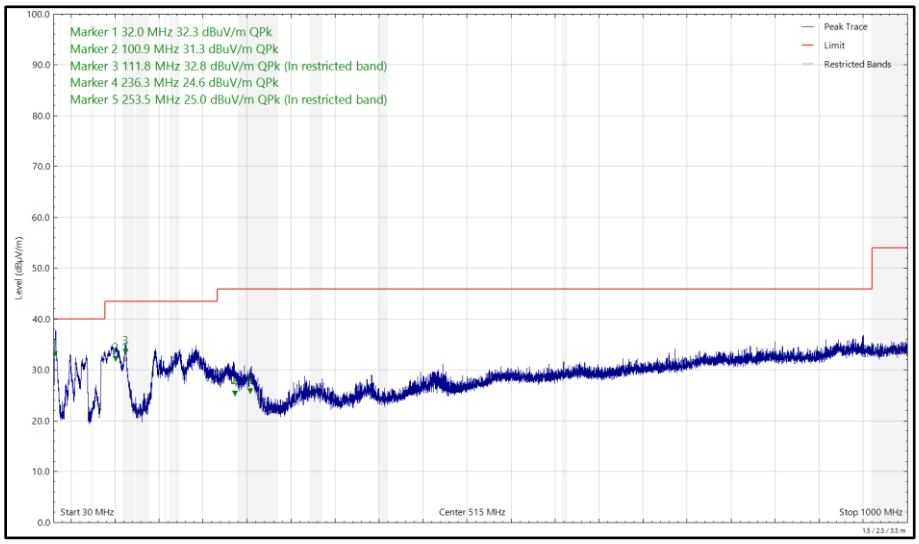

Figure 8 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

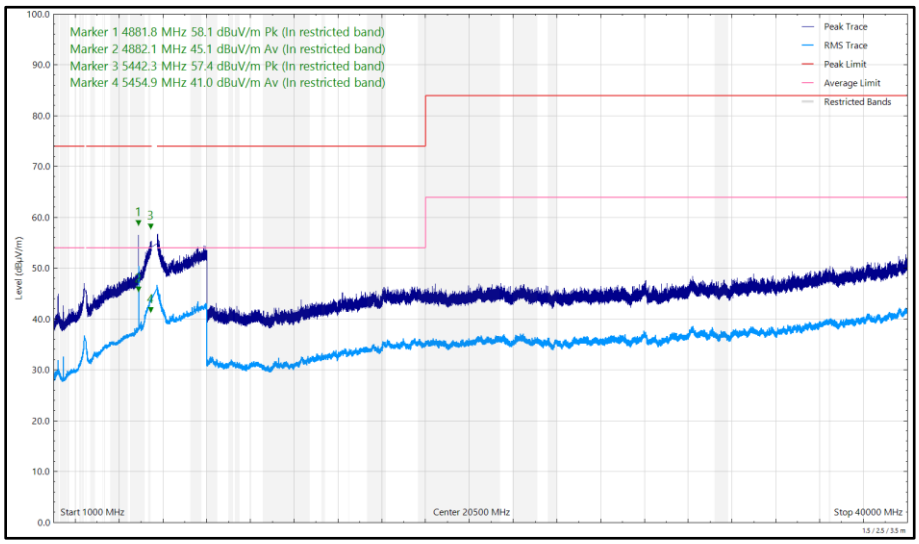

Figure 9 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
32.006	32.54	40.00	-7.46	Q-Peak	338	108	Vertical
84.481	25.80	40.00	-14.20	Q-Peak	193	247	Horizontal
95.744	30.88	43.50	-12.62	Q-Peak	132	105	Vertical
102.116	33.20	43.50	-10.30	Q-Peak	2	399	Horizontal
110.813	30.28	43.50	-13.22	Q-Peak	217	259	Horizontal
111.907	32.27	43.50	-11.23	Q-Peak	115	100	Vertical
227.172	26.50	46.00	-19.50	Q-Peak	309	110	Vertical
250.693	24.82	46.00	-21.18	Q-Peak	320	102	Vertical
319.835	28.66	46.00	-17.34	Q-Peak	81	106	Horizontal
326.574	30.01	46.00	-15.99	Q-Peak	85	106	Horizontal
4881.428	36.49	54.00	-17.51	CISPR Avg	316	395	Horizontal
4881.618	58.14	74.00	-15.86	Peak	357	293	Vertical
4882.308	45.14	54.00	-8.86	CISPR Avg	360	299	Vertical
5455.859	40.15	54.00	-13.85	CISPR Avg	328	272	Vertical
5459.203	36.21	54.00	-17.79	CISPR Avg	75	390	Horizontal
11569.990	35.91	54.00	-18.09	CISPR Avg	33	237	Vertical

Table 8 - U-NII-3 - 5785 MHz (CH157), 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.

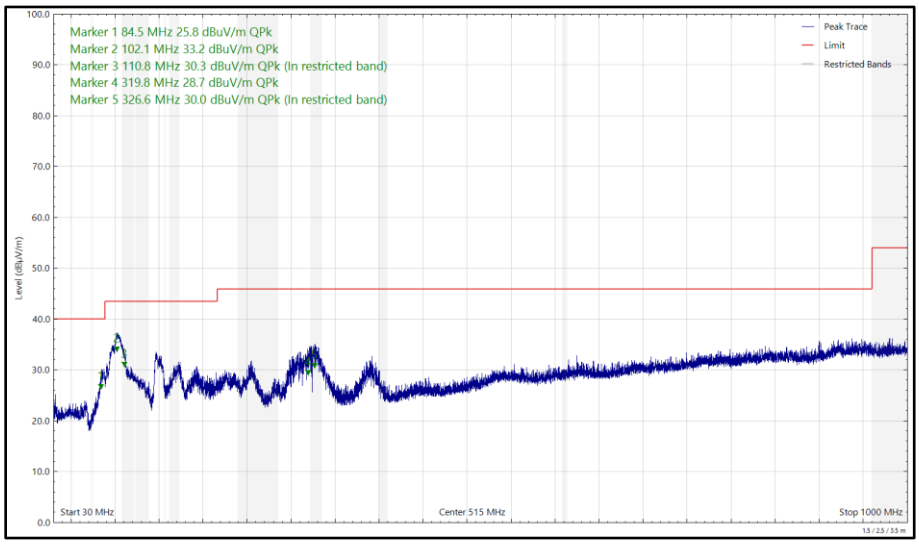

Figure 10 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

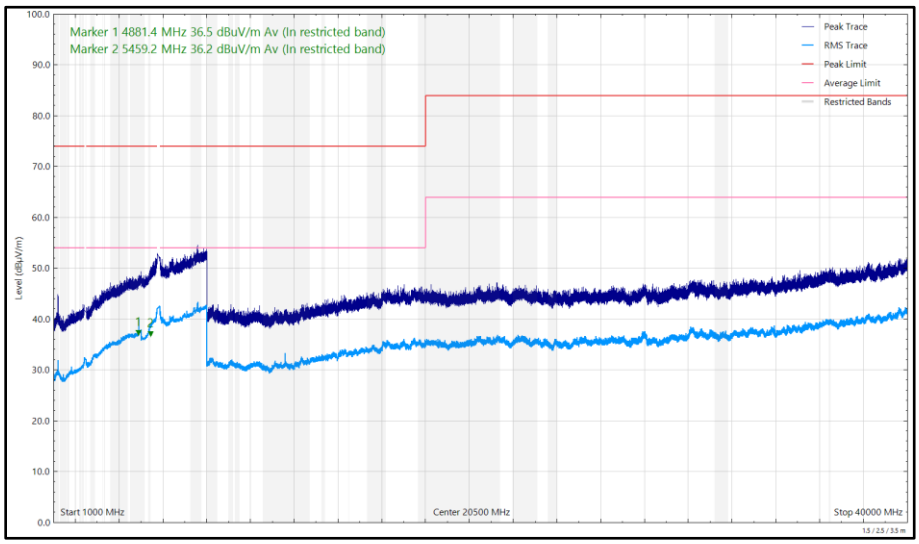

Figure 11 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

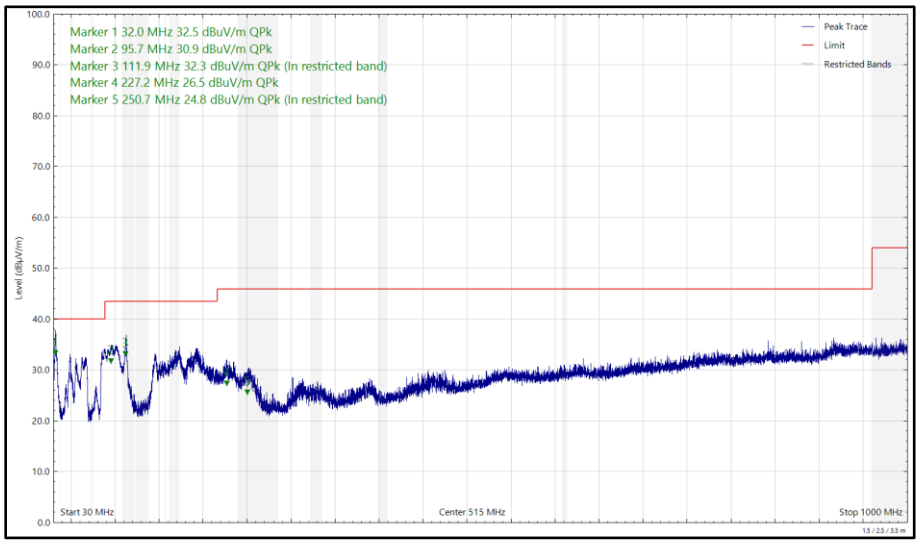

Figure 12 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

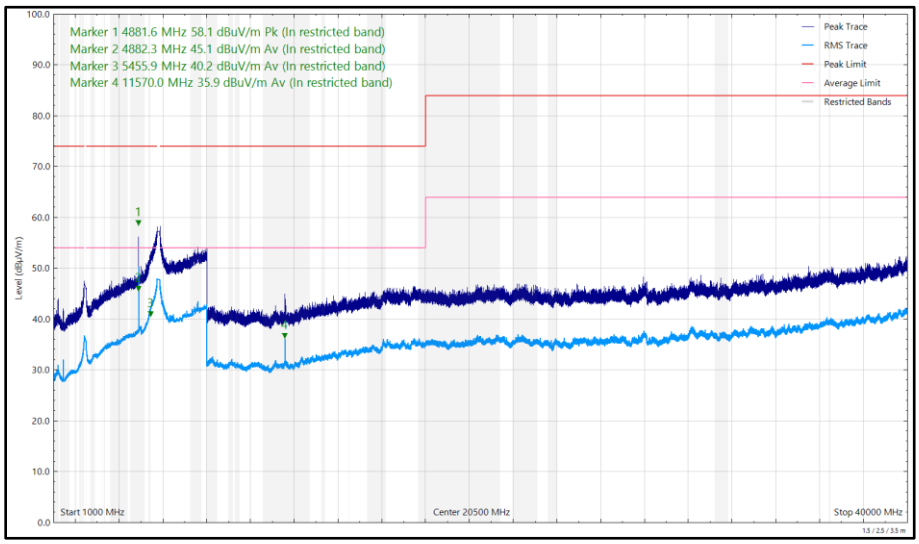

Figure 13 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

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 9

6 GHz WLAN and 2.4 GHz Bluetooth

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
32.169	32.83	40.00	-7.17	Q-Peak	311	105	Vertical
90.398	26.31	43.50	-17.19	Q-Peak	0	396	Horizontal
100.855	31.84	43.50	-11.66	Q-Peak	36	103	Vertical
103.432	34.70	43.50	-8.80	Q-Peak	3	283	Horizontal
108.037	32.15	43.50	-11.35	Q-Peak	0	289	Horizontal
112.087	32.37	43.50	-11.13	Q-Peak	100	100	Vertical
233.553	25.13	46.00	-20.87	Q-Peak	322	119	Vertical
251.552	23.97	46.00	-22.03	Q-Peak	276	110	Vertical
310.952	28.13	46.00	-17.87	Q-Peak	90	100	Horizontal
323.162	29.78	46.00	-16.22	Q-Peak	85	100	Horizontal
4881.693	36.88	54.00	-17.12	CISPR Avg	4	100	Vertical
7322.532	40.96	54.00	-13.04	CISPR Avg	328	100	Vertical
8233.130	38.29	54.00	-15.71	CISPR Avg	305	243	Vertical
8233.425	37.77	54.00	-16.23	CISPR Avg	287	399	Horizontal

Table 10 - 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.

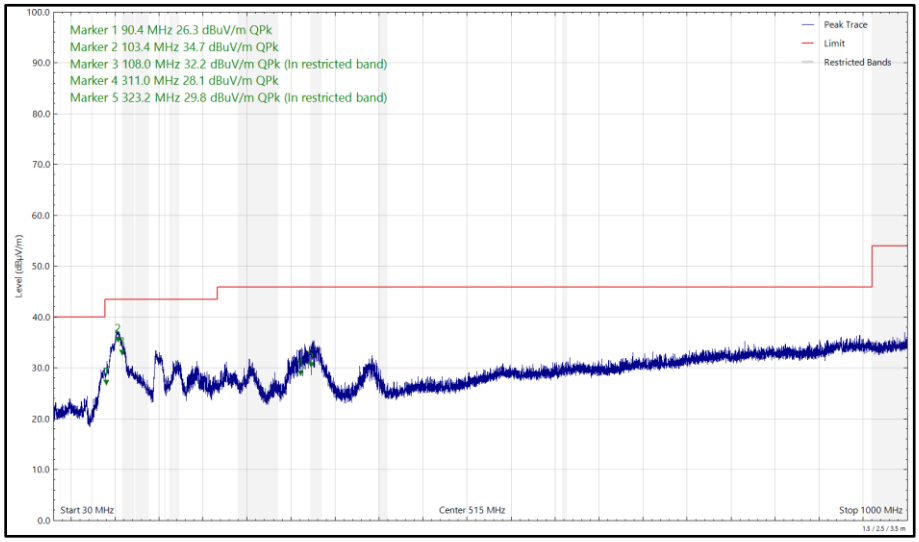

Figure 14 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

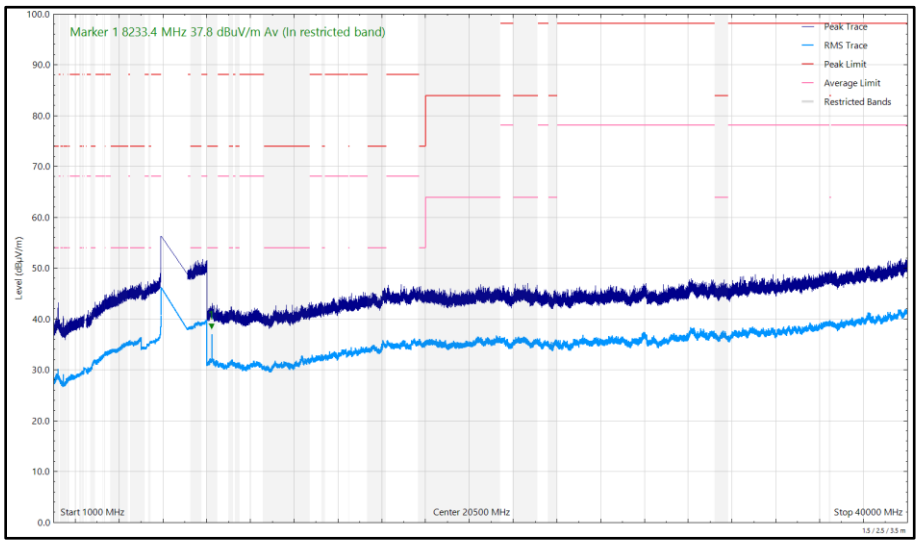

Figure 15 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

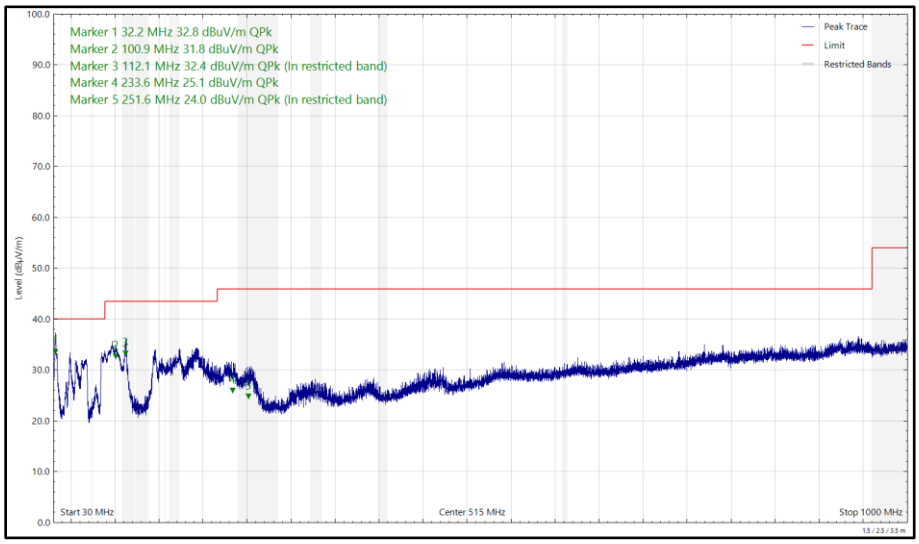

Figure 16 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

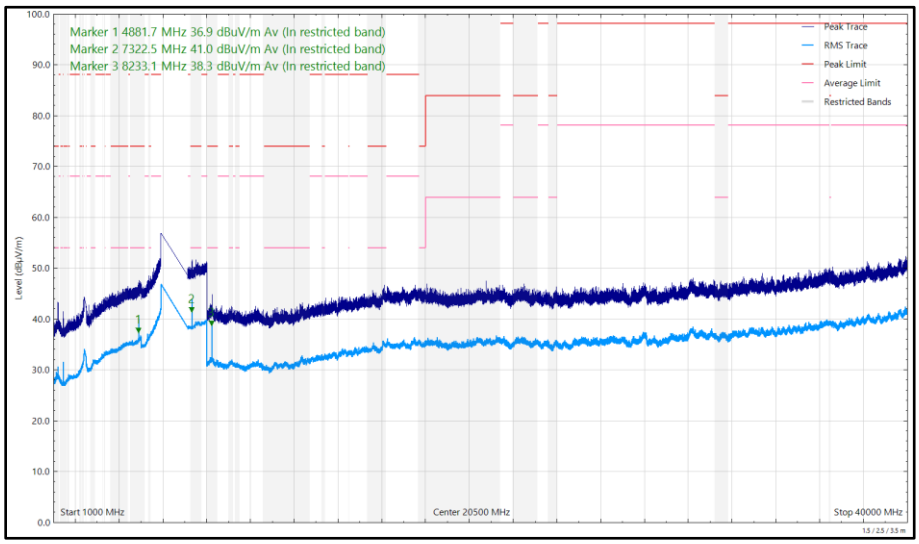

Figure 17 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
31.984	32.41	40.00	-7.59	Q-Peak	260	110	Vertical
104.839	35.04	43.50	-8.46	Q-Peak	0	289	Horizontal
112.486	32.13	43.50	-11.37	Q-Peak	6	273	Horizontal
112.547	32.35	43.50	-11.15	Q-Peak	261	110	Vertical
170.894	25.23	43.50	-18.27	Q-Peak	9	253	Horizontal
194.518	28.32	43.50	-15.18	Q-Peak	214	102	Vertical
250.592	24.52	46.00	-21.48	Q-Peak	228	108	Vertical
390.688	24.83	46.00	-21.17	Q-Peak	224	386	Horizontal
4881.828	37.18	54.00	-16.82	CISPR Avg	0	100	Vertical
7323.583	39.19	54.00	-14.81	CISPR Avg	53	100	Vertical

Table 11 - 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.

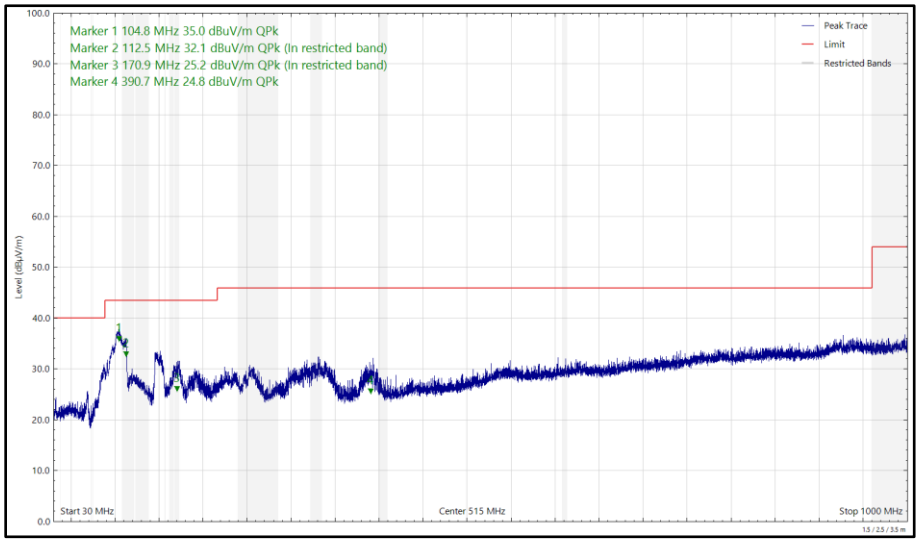

Figure 18 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

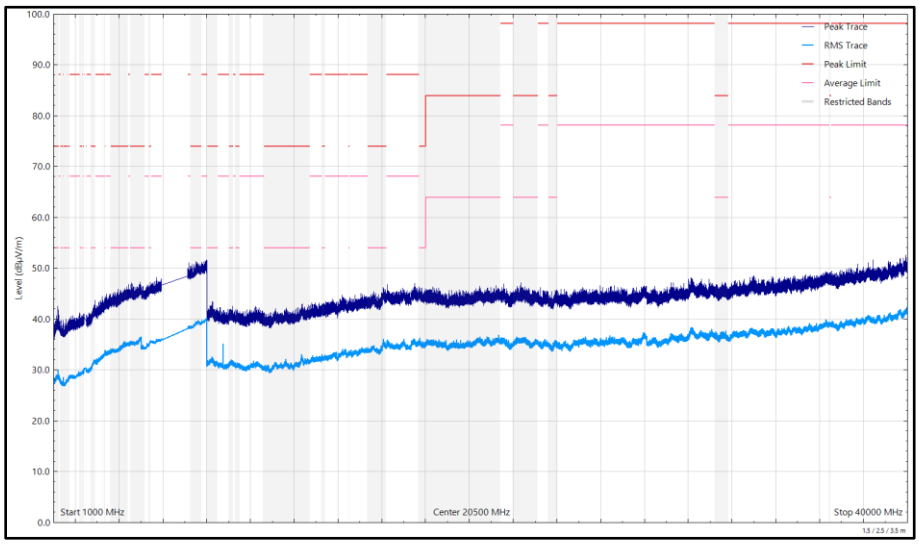

Figure 19 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

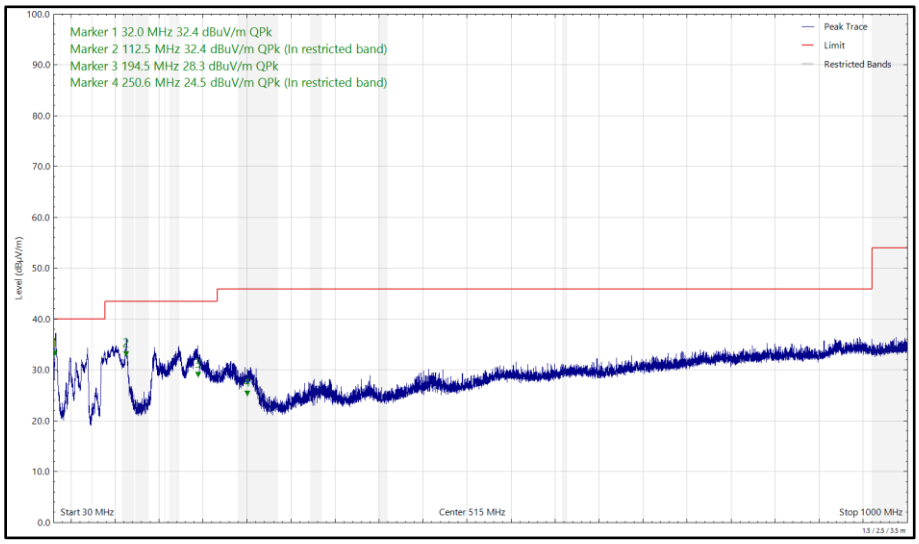

Figure 20 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

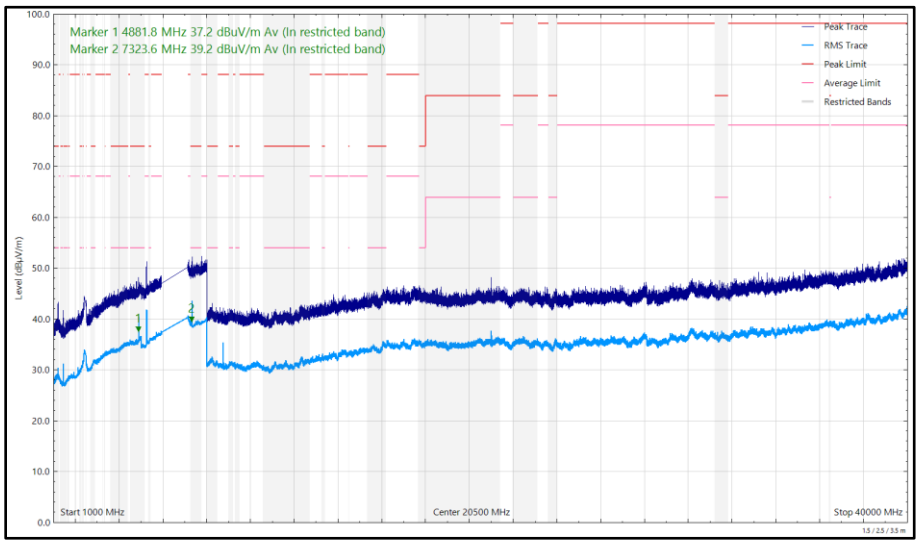

Figure 21 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

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 12

2.4 GHz WLAN and Narrowband

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
31.954	32.61	40.00	-7.39	Q-Peak	267	106	Vertical
103.856	35.24	43.50	-8.26	Q-Peak	2	305	Horizontal
111.899	32.63	43.50	-10.87	Q-Peak	350	279	Horizontal
112.361	32.93	43.50	-10.57	Q-Peak	292	248	Vertical
144.629	29.96	43.50	-13.54	Q-Peak	287	111	Vertical
146.312	28.76	43.50	-14.74	Q-Peak	213	307	Horizontal
227.884	26.30	46.00	-19.70	Q-Peak	311	115	Vertical
328.562	27.89	46.00	-18.11	Q-Peak	91	100	Horizontal
2389.841	34.92	54.00	-19.08	RMS	309	295	Horizontal
2389.889	39.24	54.00	-14.76	RMS	9	290	Vertical
2483.525	55.73	74.00	-18.27	Peak	349	346	Vertical
2483.526	39.88	54.00	-14.12	RMS	350	254	Vertical
2483.539	35.91	54.00	-18.09	RMS	305	371	Horizontal
4882.198	38.84	54.00	-15.16	RMS	360	273	Vertical

Table 13 - 2442 MHz (CH7), HT20, Core 0 and 5204 MHz, DH5, ePA, Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

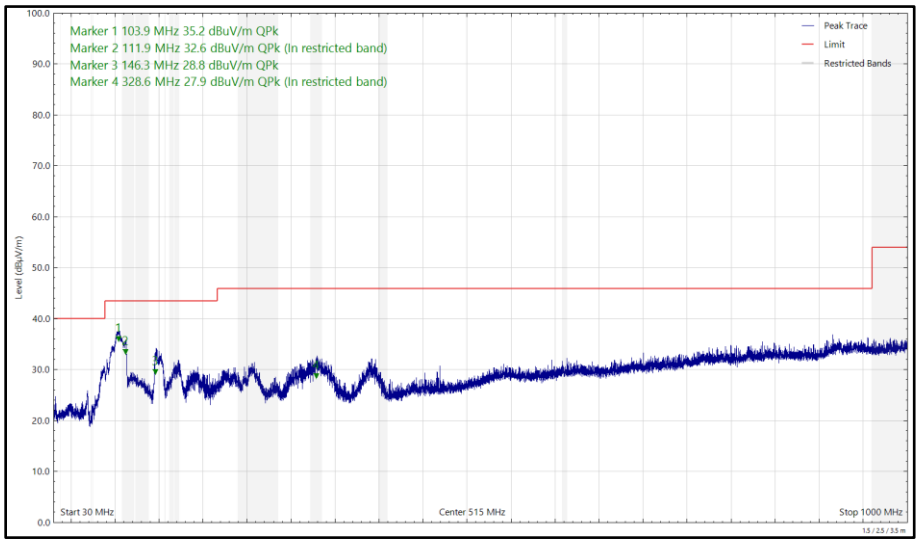

Figure 22 - 2442 MHz (CH7), HT20, Core 0 and 5204 MHz, DH5, ePA, Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

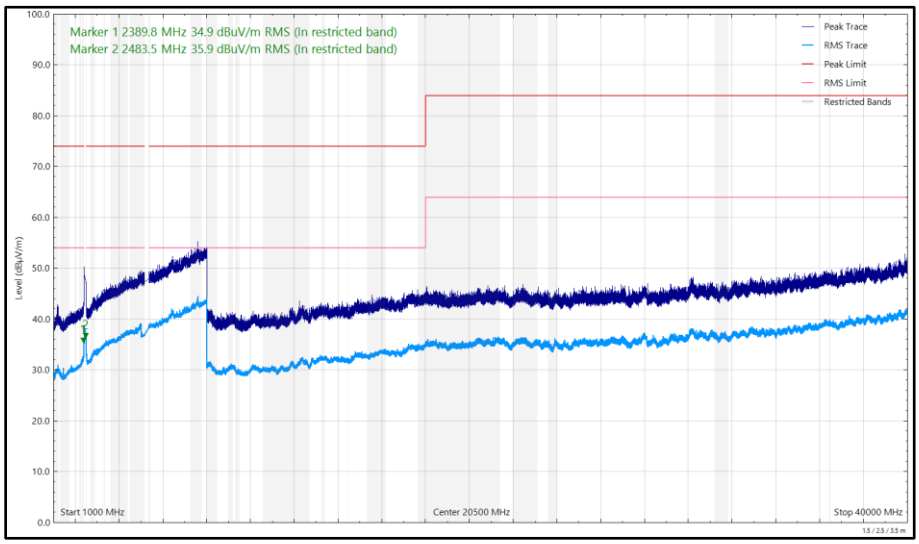

Figure 23 - 2442 MHz (CH7), HT20, Core 0 and 5204 MHz, DH5, ePA, Core 1, 1 GHz to 40 GHz, Horizontal

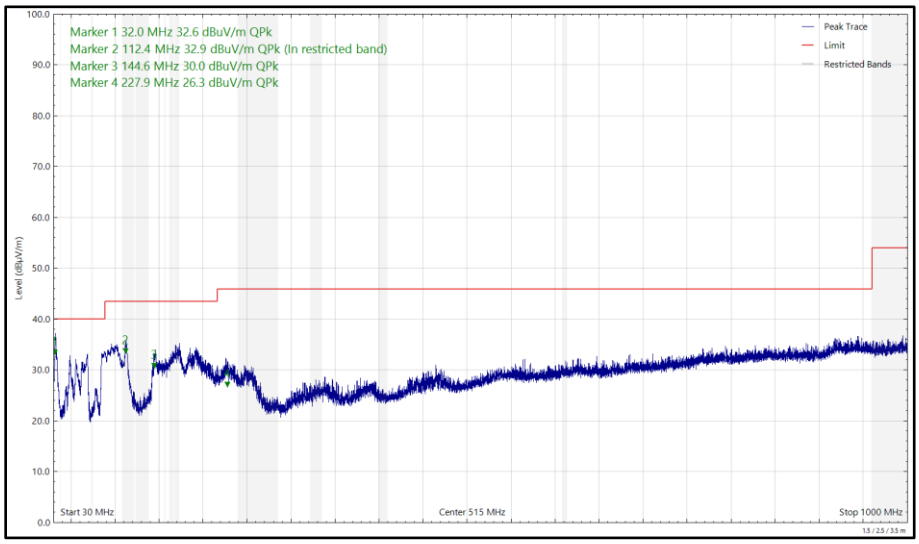

Figure 24 - 2442 MHz (CH7), HT20, Core 0 and 5204 MHz, DH5, ePA, Core 1, 30 MHz to 1 GHz, Vertical (Peak)

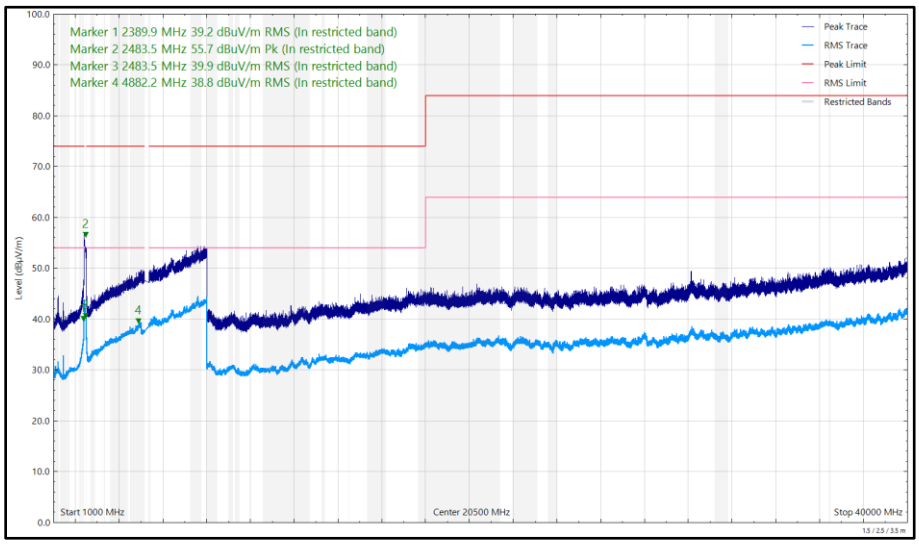

Figure 25 - 2442 MHz (CH7), HT20, Core 0 and 5204 MHz, DH5, ePA, Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
32.225	32.77	40.00	-7.23	Q-Peak	223	108	Vertical
103.727	35.09	43.50	-8.41	Q-Peak	7	313	Horizontal
110.648	32.80	43.50	-10.70	Q-Peak	0	289	Horizontal
112.304	32.59	43.50	-10.91	Q-Peak	251	100	Vertical
144.903	30.29	43.50	-13.21	Q-Peak	304	113	Vertical
148.827	27.59	43.50	-15.91	Q-Peak	8	349	Horizontal
253.394	25.85	46.00	-20.15	Q-Peak	121	103	Horizontal
255.383	24.20	46.00	-21.80	Q-Peak	262	112	Vertical
1440.207	33.45	54.00	-20.55	RMS	65	241	Vertical
2389.966	38.62	54.00	-15.38	RMS	6	272	Vertical
2389.999	34.51	54.00	-19.49	RMS	315	373	Horizontal
2483.561	36.07	54.00	-17.93	RMS	302	385	Horizontal
2483.616	40.48	54.00	-13.52	RMS	350	298	Vertical
5374.610	41.57	54.00	-12.43	RMS	19	294	Vertical

Table 14 - 2442 MHz (CH7), HT20, Core 0 and 5788 MHz, DH5, ePA, Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

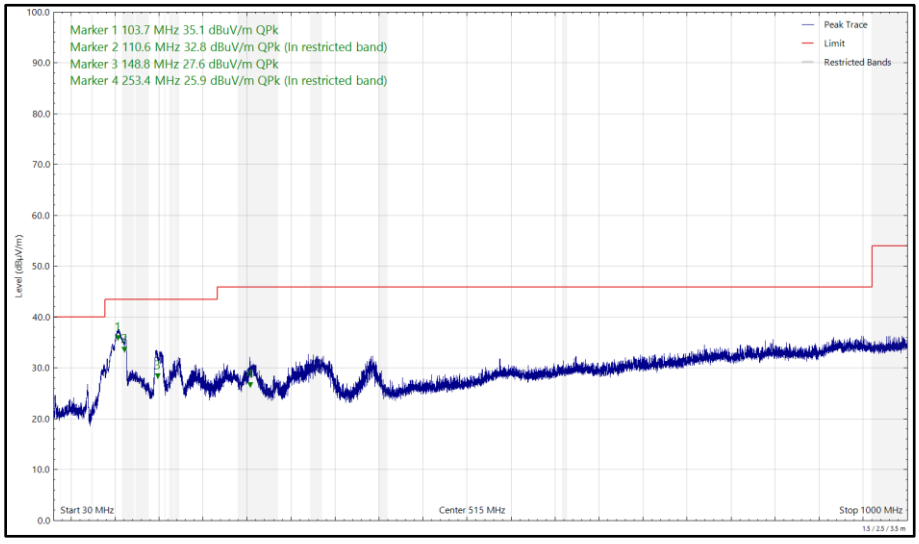

Figure 26 - 2442 MHz (CH7), HT20, Core 0 and 5788 MHz, DH5, ePA, Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

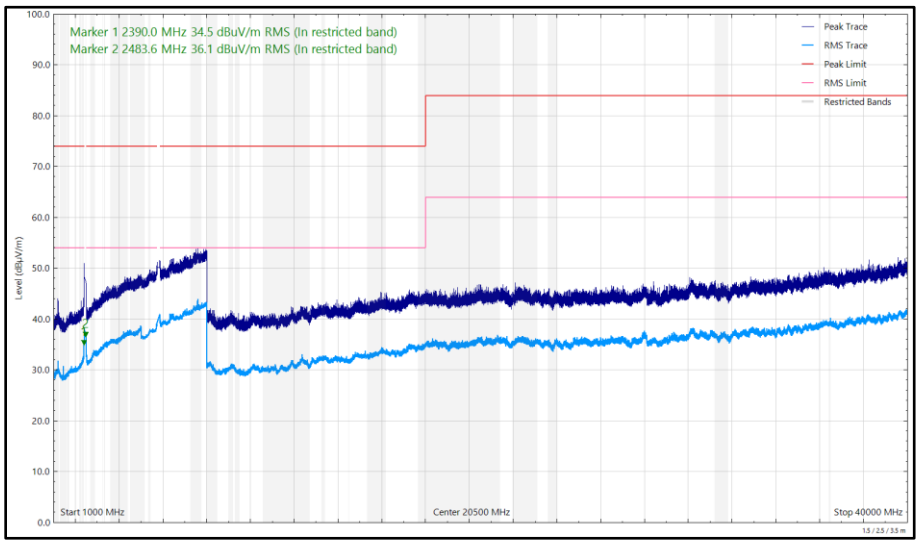

Figure 27 - 2442 MHz (CH7), HT20, Core 0 and 5788 MHz, DH5, ePA, Core 1, 1 GHz to 40 GHz, Horizontal

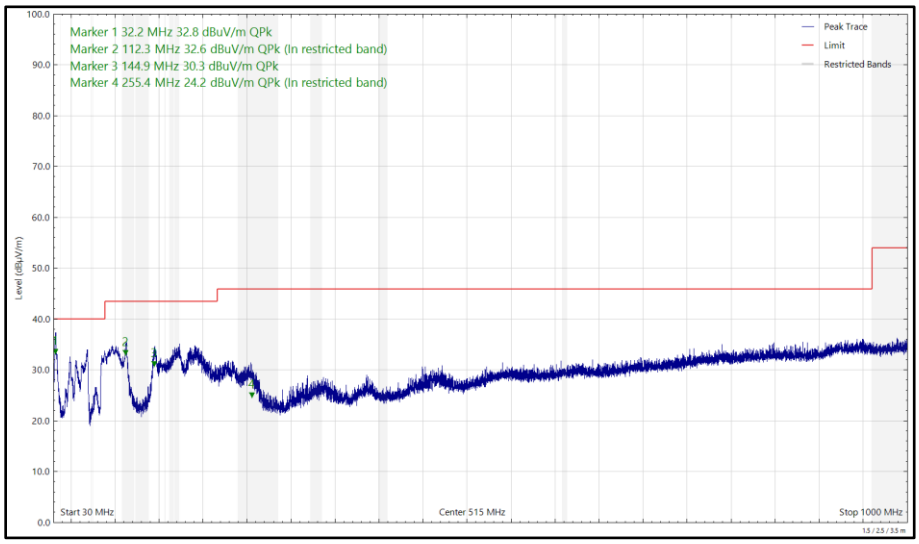

Figure 28 - 2442 MHz (CH7), HT20, Core 0 and 5788 MHz, DH5, ePA, Core 1, 30 MHz to 1 GHz, Vertical (Peak)

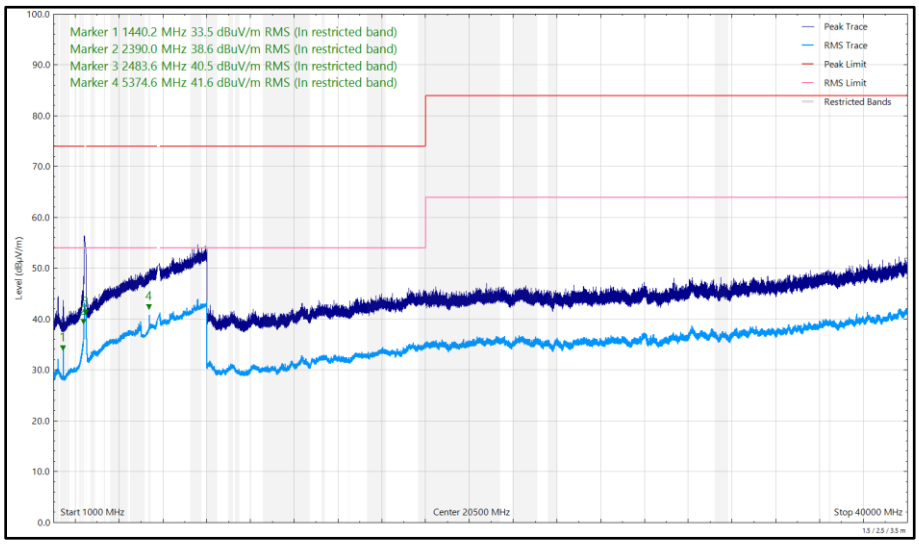

Figure 29 - 2442 MHz (CH7), HT20, Core 0 and 5788 MHz, DH5, ePA, Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
32.224	33.05	40.00	-6.95	Q-Peak	258	100	Vertical
103.343	35.05	43.50	-8.45	Q-Peak	2	273	Horizontal
110.778	32.76	43.50	-10.74	Q-Peak	0	271	Horizontal
112.079	32.41	43.50	-11.09	Q-Peak	289	279	Vertical
147.990	27.23	43.50	-16.27	Q-Peak	0	315	Horizontal
194.663	28.61	43.50	-14.89	Q-Peak	215	100	Vertical
254.173	25.11	46.00	-20.89	Q-Peak	246	101	Vertical
330.765	27.09	46.00	-18.91	Q-Peak	89	100	Horizontal
1440.165	33.72	54.00	-20.28	RMS	66	238	Vertical
2389.939	37.95	54.00	-16.05	RMS	346	389	Vertical
2483.509	40.35	54.00	-13.65	RMS	0	325	Vertical
2483.572	34.99	54.00	-19.01	RMS	56	198	Horizontal
2484.531	57.80	74.00	-16.20	Peak	360	353	Vertical
4316.266	35.85	54.00	-18.15	RMS	179	113	Horizontal
4883.053	40.16	54.00	-13.84	RMS	359	254	Vertical

Table 15 - 2442 MHz (CH7), HT20, Core 1 and 5204 MHz, DH5, ePA, Core 0, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

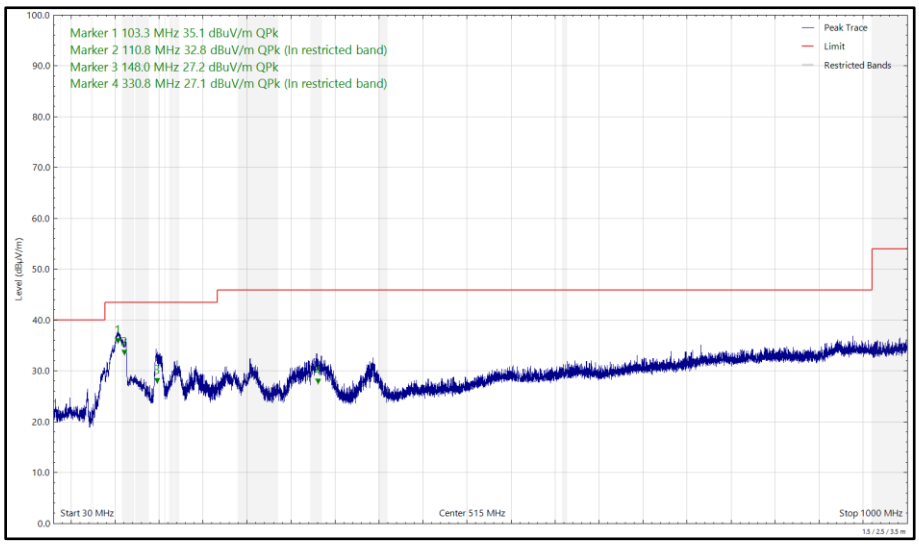

Figure 30 - 2442 MHz (CH7), HT20, Core 1 and 5204 MHz, DH5, ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)

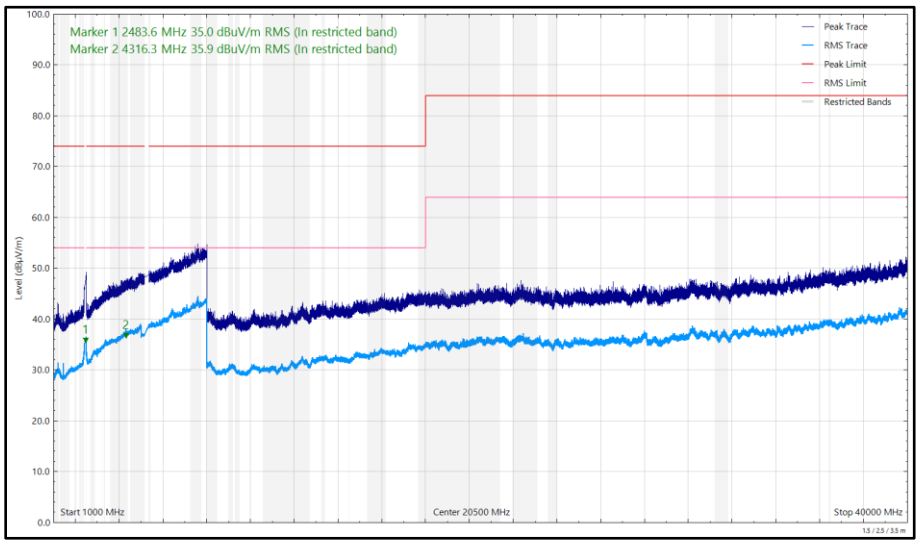

Figure 31 - 2442 MHz (CH7), HT20, Core 1 and 5204 MHz, DH5, ePA, Core 0, 1 GHz to 40 GHz, Horizontal

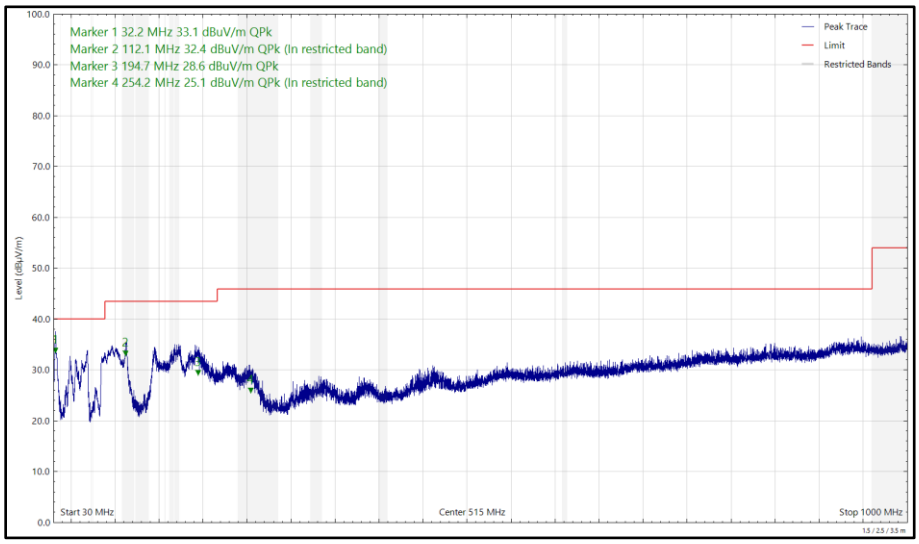

Figure 32 - 2442 MHz (CH7), HT20, Core 1 and 5204 MHz, DH5, ePA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)

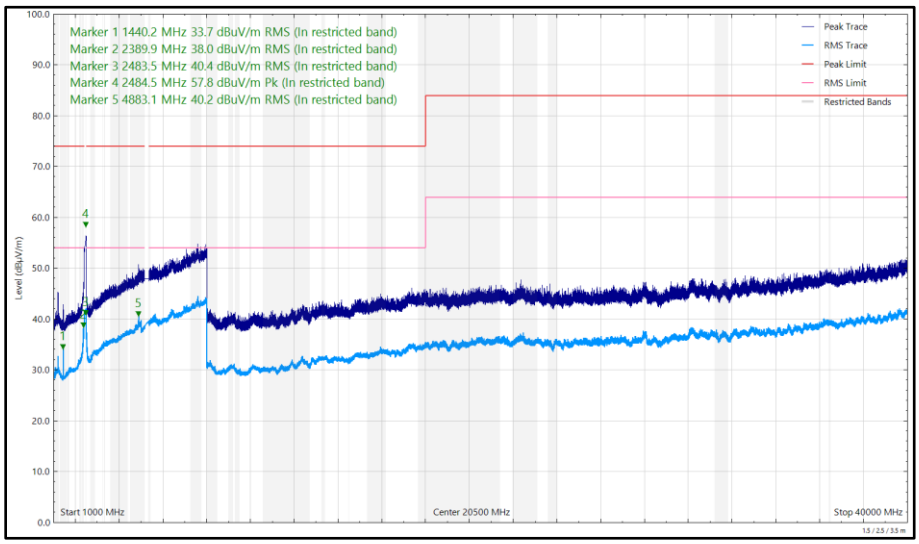

Figure 33 - 2442 MHz (CH7), HT20, Core 1 and 5204 MHz, DH5, ePA, Core 0, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
32.064	32.64	40.00	-7.36	Q-Peak	274	113	Vertical
102.317	35.16	43.50	-8.34	Q-Peak	1	312	Horizontal
111.621	33.04	43.50	-10.46	Q-Peak	360	299	Horizontal
112.482	32.54	43.50	-10.96	Q-Peak	255	100	Vertical
144.779	30.47	43.50	-13.03	Q-Peak	290	100	Vertical
147.542	28.67	43.50	-14.83	Q-Peak	28	331	Horizontal
254.215	25.11	46.00	-20.89	Q-Peak	309	100	Vertical
328.542	27.60	46.00	-18.40	Q-Peak	93	100	Horizontal
2389.608	38.85	54.00	-15.15	RMS	352	248	Vertical
2483.519	41.21	54.00	-12.79	RMS	10	310	Vertical
2483.768	36.08	54.00	-17.92	RMS	50	345	Horizontal
2485.347	58.36	74.00	-15.64	Peak	5	240	Vertical
4883.118	40.41	54.00	-13.59	RMS	360	311	Vertical
5374.545	42.08	54.00	-11.92	RMS	334	309	Vertical

Table 16 - 2442 MHz (CH7), HT20, Core 1 and 5788 MHz, DH5, ePA, Core 0, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

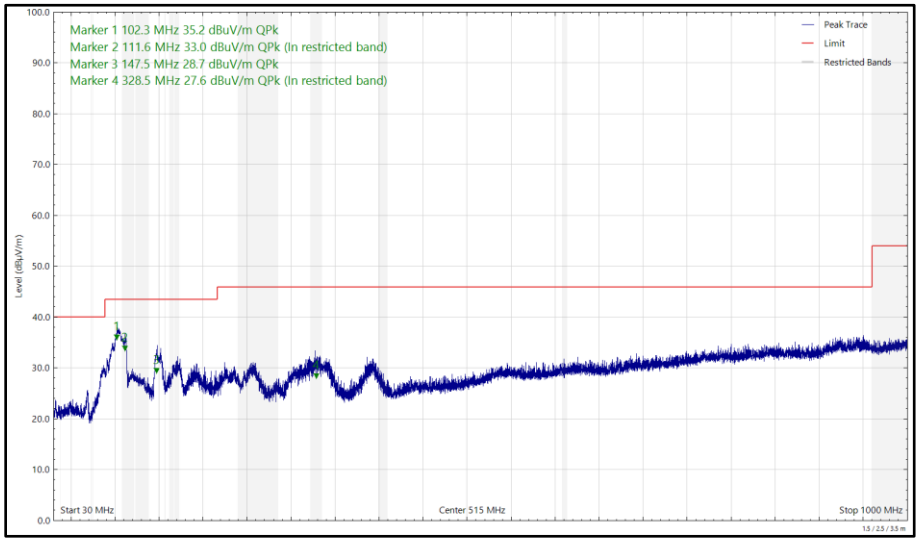

Figure 34 - 2442 MHz (CH7), HT20, Core 1 and 5788 MHz, DH5, ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)

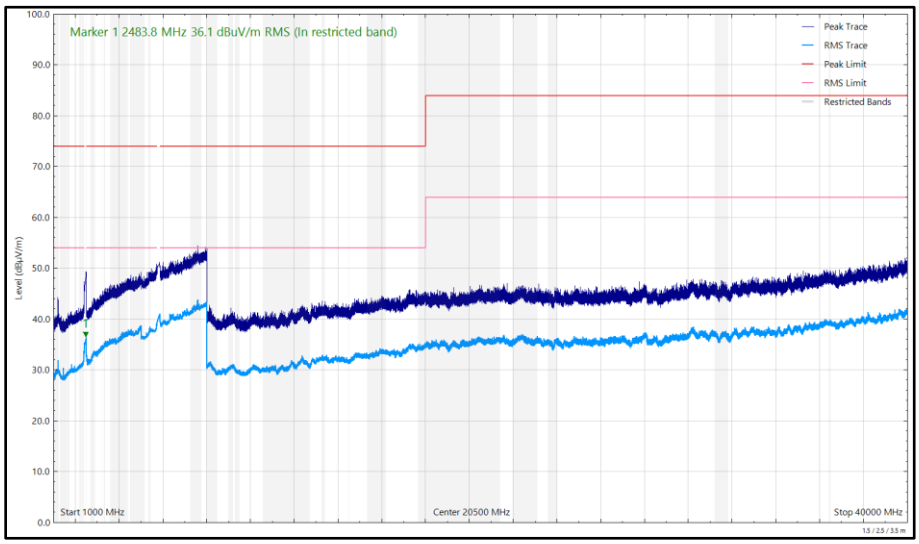

Figure 35 - 2442 MHz (CH7), HT20, Core 1 and 5788 MHz, DH5, ePA, Core 0, 1 GHz to 40 GHz, Horizontal

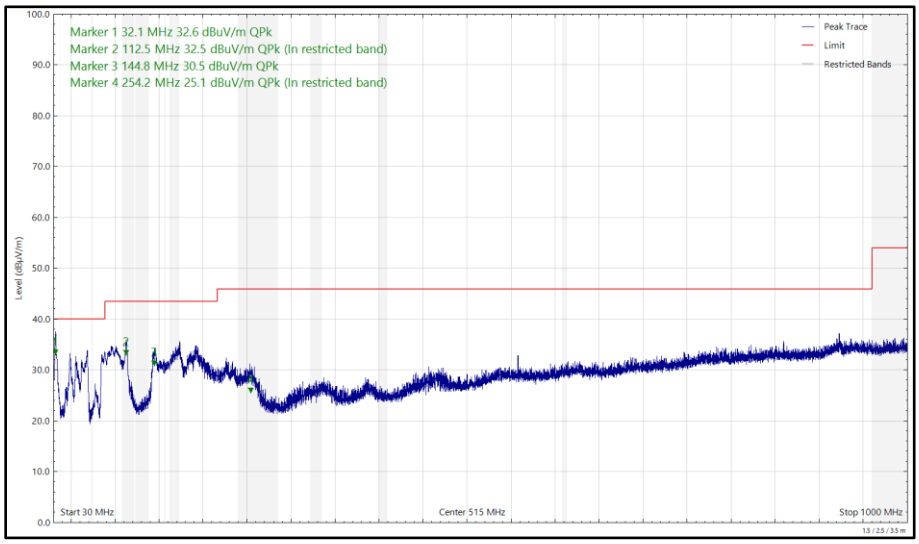

Figure 36 - 2442 MHz (CH7), HT20, Core 1 and 5788 MHz, DH5, ePA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)

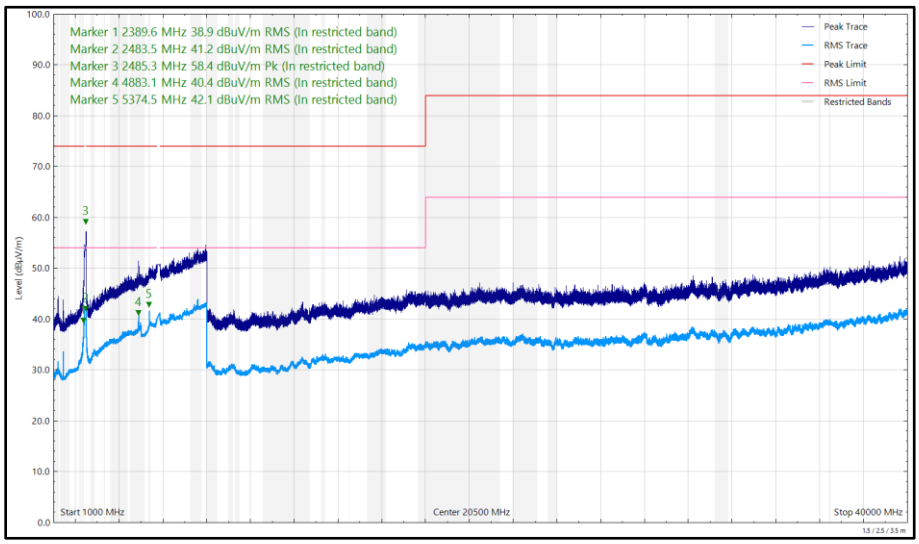

Figure 37 - 2442 MHz (CH7), HT20, Core 1 and 5788 MHz, DH5, ePA, Core 0, 1 GHz to 40 GHz, Vertical

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 17

5 GHz WLAN and Thread

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
32.244	33.24	40.00	-6.76	Q-Peak	327	103	Vertical
67.857	20.54	40.00	-19.46	Q-Peak	240	272	Horizontal
102.508	34.63	43.50	-8.87	Q-Peak	176	304	Horizontal
111.381	33.11	43.50	-10.39	Q-Peak	350	281	Horizontal
112.321	32.41	43.50	-11.09	Q-Peak	245	116	Vertical
151.199	26.44	43.50	-17.06	Q-Peak	0	339	Horizontal
191.707	29.24	43.50	-14.26	Q-Peak	200	103	Vertical
255.328	24.88	46.00	-21.12	Q-Peak	227	106	Vertical
325.111	26.61	46.00	-19.39	Q-Peak	97	104	Horizontal
4880.857	44.35	54.00	-9.65	RMS	0	272	Vertical
5109.321	57.00	74.00	-17.00	Peak	350	291	Vertical
5115.872	39.21	54.00	-14.79	RMS	62	397	Horizontal
5119.944	45.74	54.00	-8.26	RMS	343	278	Vertical
5355.547	46.20	54.00	-7.80	RMS	336	286	Vertical
5356.386	40.44	54.00	-13.56	RMS	301	397	Horizontal
5452.285	57.42	74.00	-16.58	Peak	27	279	Vertical

Table 18 - 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.

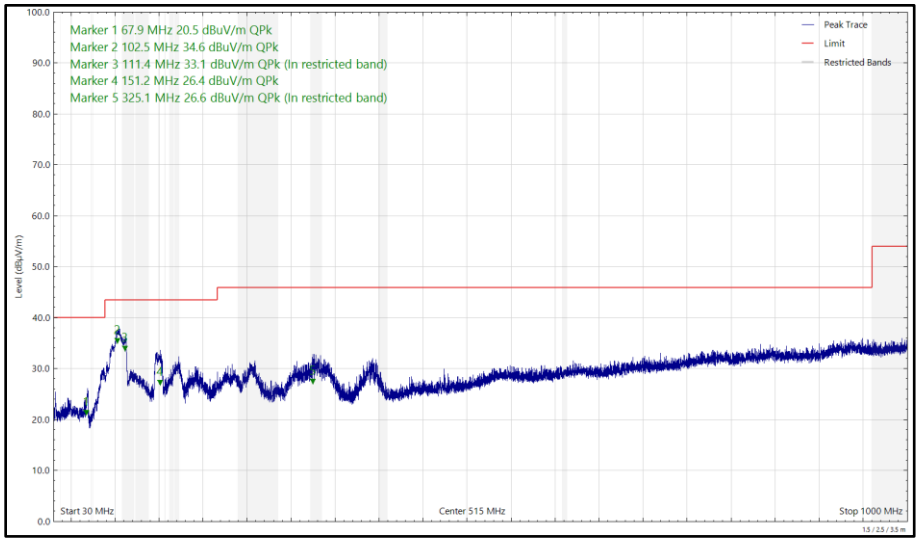

Figure 38 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)

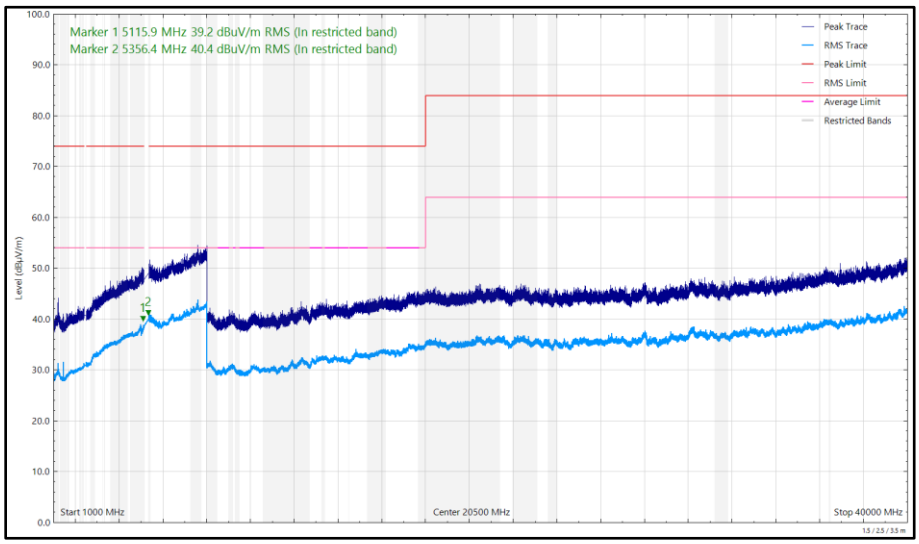

Figure 39 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 0, 1 GHz to 40 GHz, Horizontal

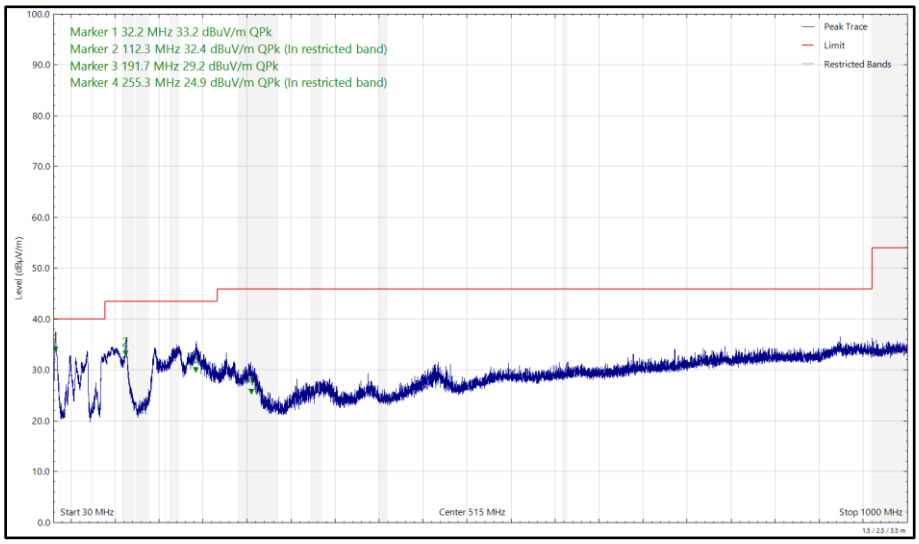

Figure 40 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)

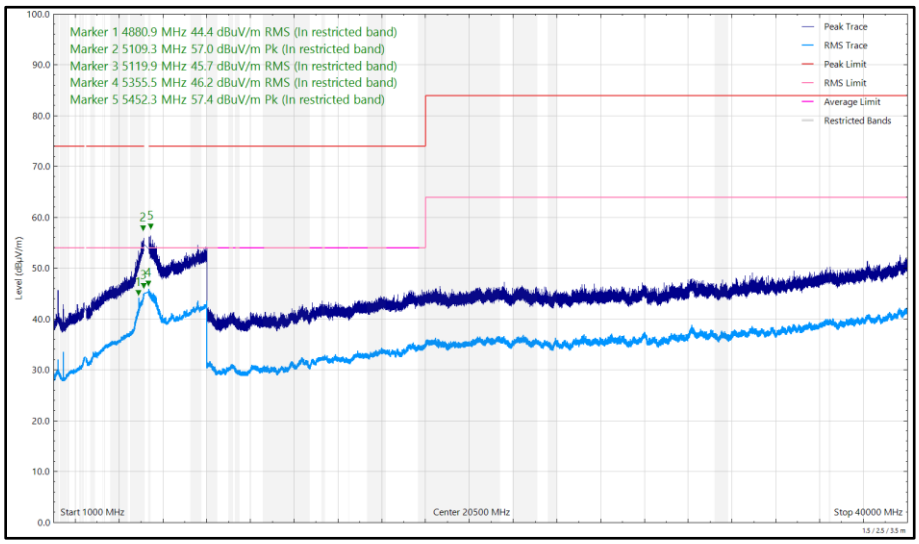

Figure 41 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 0, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
32.079	33.47	40.00	-6.53	Q-Peak	314	100	Vertical
67.592	19.74	40.00	-20.26	Q-Peak	359	390	Horizontal
103.456	35.35	43.50	-8.15	Q-Peak	0	294	Horizontal
111.434	32.98	43.50	-10.52	Q-Peak	210	261	Horizontal
113.009	30.69	43.50	-12.81	Q-Peak	290	222	Vertical
187.021	28.23	43.50	-15.27	Q-Peak	328	100	Vertical
255.862	25.09	46.00	-20.91	Q-Peak	238	100	Vertical
331.420	26.70	46.00	-19.30	Q-Peak	91	109	Horizontal
4879.093	43.47	54.00	-10.53	RMS	352	283	Vertical
4964.180	37.39	54.00	-16.61	RMS	313	185	Horizontal
4986.533	55.58	74.00	-18.42	Peak	360	280	Vertical
4998.100	43.45	54.00	-10.55	RMS	360	280	Vertical
5374.701	57.41	74.00	-16.59	Peak	333	260	Vertical
5378.535	40.34	54.00	-13.66	RMS	72	385	Horizontal
5379.285	45.43	54.00	-8.57	RMS	333	260	Vertical

Table 19 - 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.

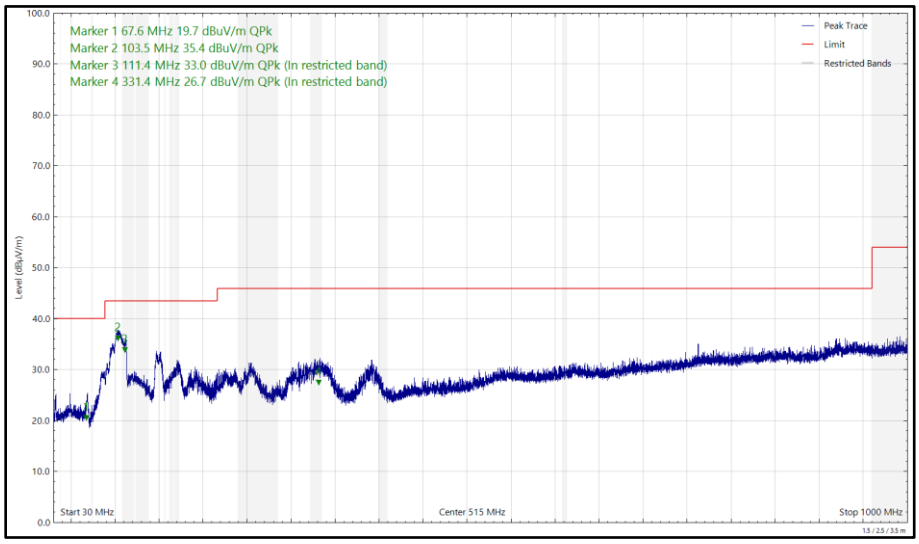

Figure 42 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

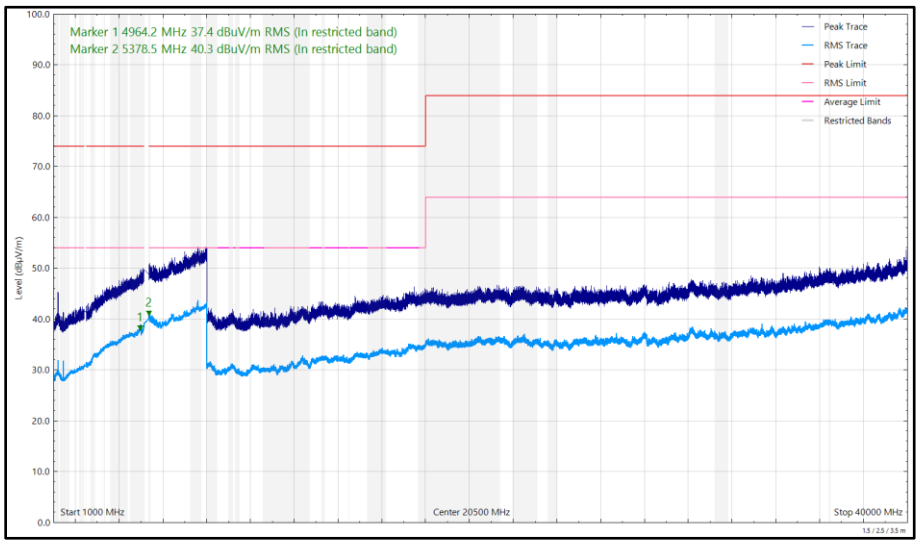

Figure 43 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 1, 1 GHz to 40 GHz, Horizontal

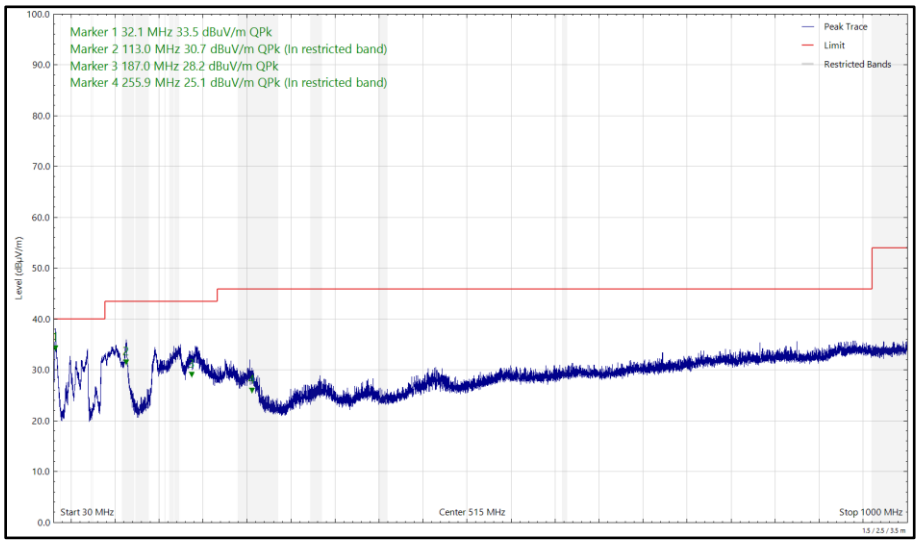

Figure 44 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 1, 30 MHz to 1 GHz, Vertical (Peak)

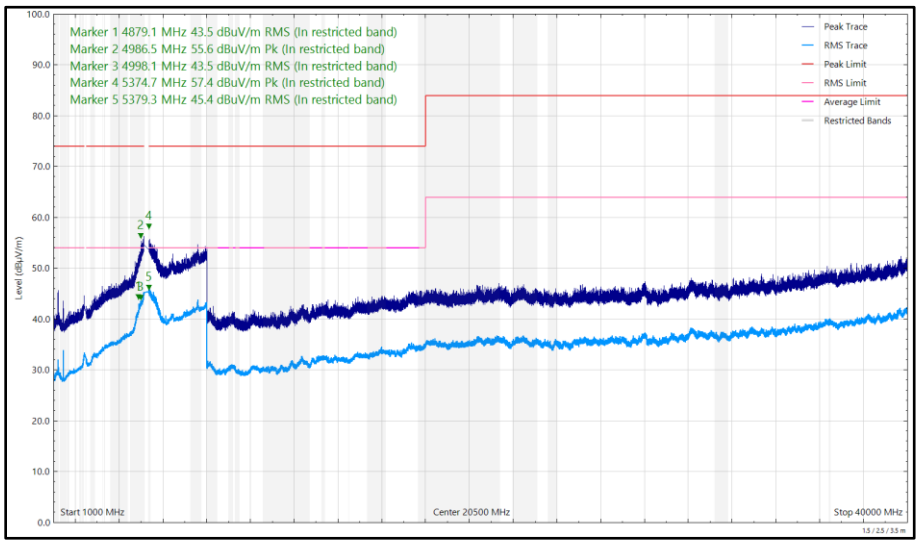

Figure 45 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
32.242	33.39	40.00	-6.61	Q-Peak	3	100	Vertical
68.611	21.46	40.00	-18.54	Q-Peak	262	355	Horizontal
103.166	34.88	43.50	-8.62	Q-Peak	352	292	Horizontal
111.892	33.10	43.50	-10.40	Q-Peak	350	283	Horizontal
112.588	31.56	43.50	-11.94	Q-Peak	247	121	Vertical
143.926	30.02	43.50	-13.48	Q-Peak	302	100	Vertical
252.019	24.70	46.00	-21.30	Q-Peak	268	102	Vertical
320.539	26.36	46.00	-19.64	Q-Peak	95	100	Horizontal
4880.803	43.31	54.00	-10.69	RMS	357	314	Vertical
5439.961	43.48	54.00	-10.52	RMS	322	323	Vertical
5444.107	55.28	74.00	-18.72	Peak	322	323	Vertical

Table 20 - U-NII-2C - 5640 MHz (CH128), 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.

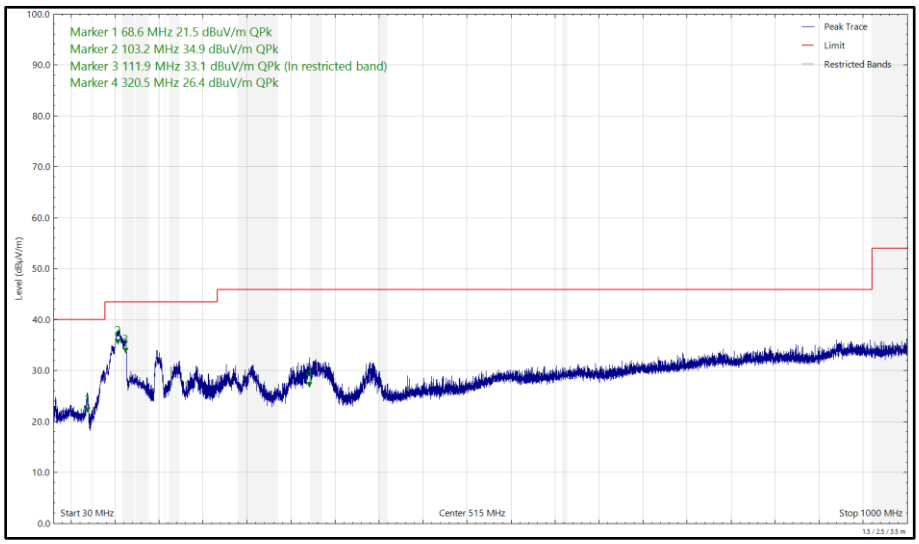

Figure 46 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)

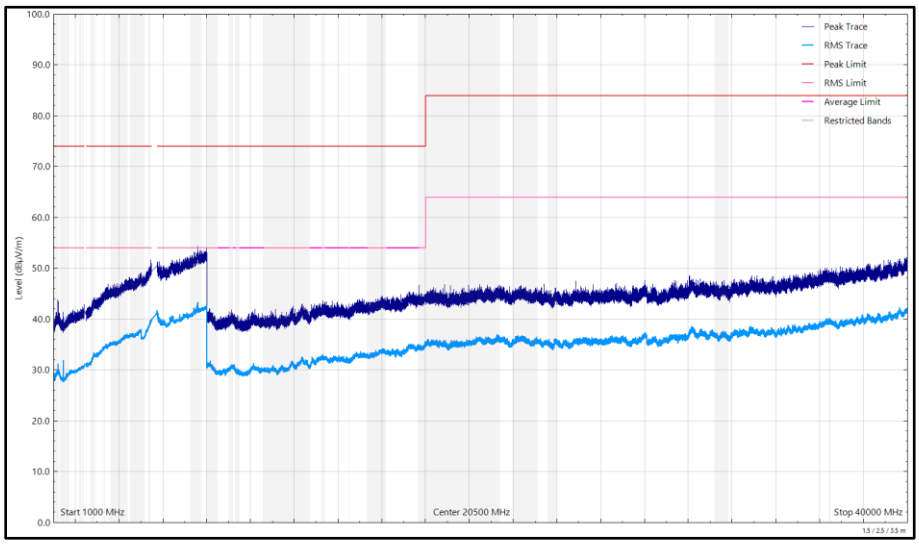

Figure 47 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 0, 1 GHz to 40 GHz, Horizontal

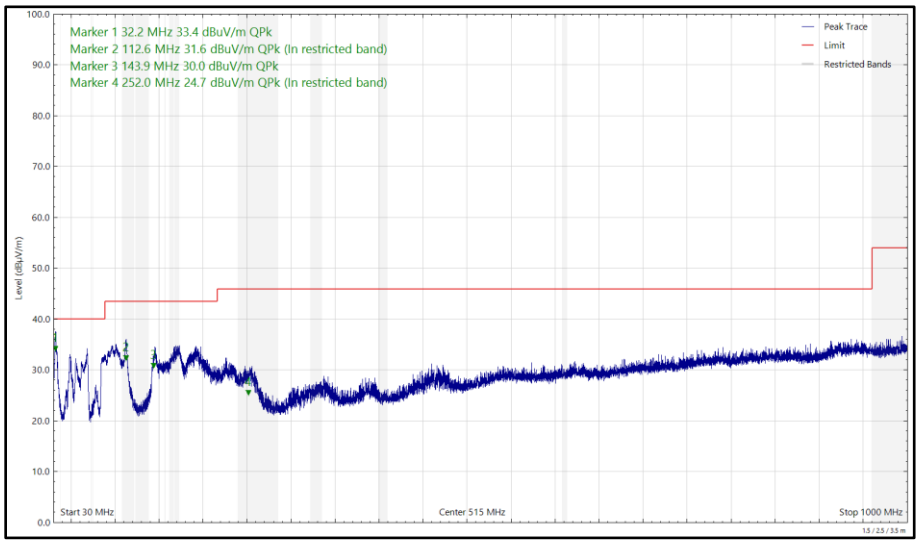

Figure 48 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)

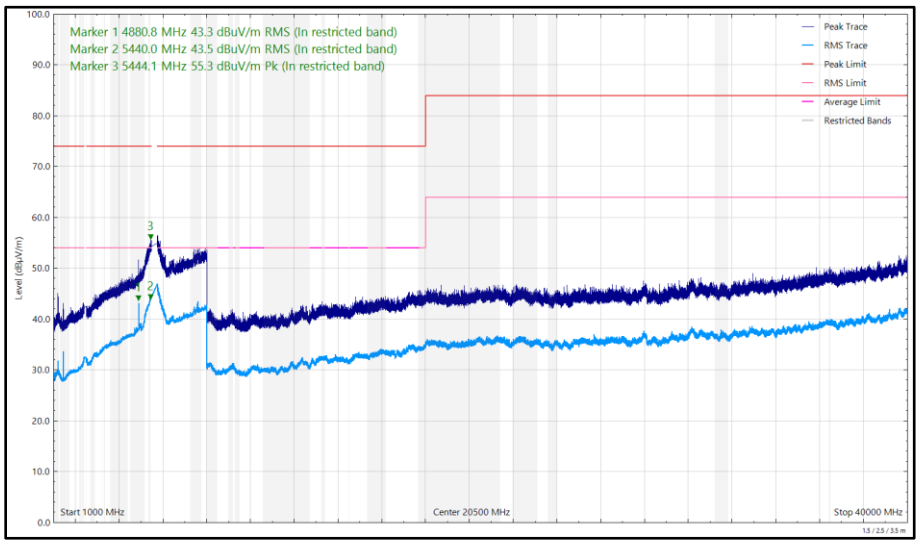

Figure 49 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 0, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
31.882	32.28	40.00	-7.72	Q-Peak	250	108	Vertical
68.278	21.35	40.00	-18.65	Q-Peak	276	379	Horizontal
104.298	35.45	43.50	-8.05	Q-Peak	0	298	Horizontal
112.088	32.70	43.50	-10.80	Q-Peak	350	276	Horizontal
112.588	32.35	43.50	-11.15	Q-Peak	297	250	Vertical
147.633	27.03	43.50	-16.47	Q-Peak	35	360	Horizontal
191.178	29.09	43.50	-14.41	Q-Peak	304	100	Vertical
256.663	24.64	46.00	-21.36	Q-Peak	251	100	Vertical
328.662	25.60	46.00	-20.40	Q-Peak	39	128	Horizontal
4879.138	41.02	54.00	-12.98	RMS	350	269	Vertical
5434.791	56.37	74.00	-17.63	Peak	326	284	Vertical
5439.507	44.45	54.00	-9.55	RMS	326	284	Vertical
5452.537	39.78	54.00	-14.22	RMS	302	366	Horizontal

Table 21 - U-NII-2C - 5640 MHz (CH128), 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.

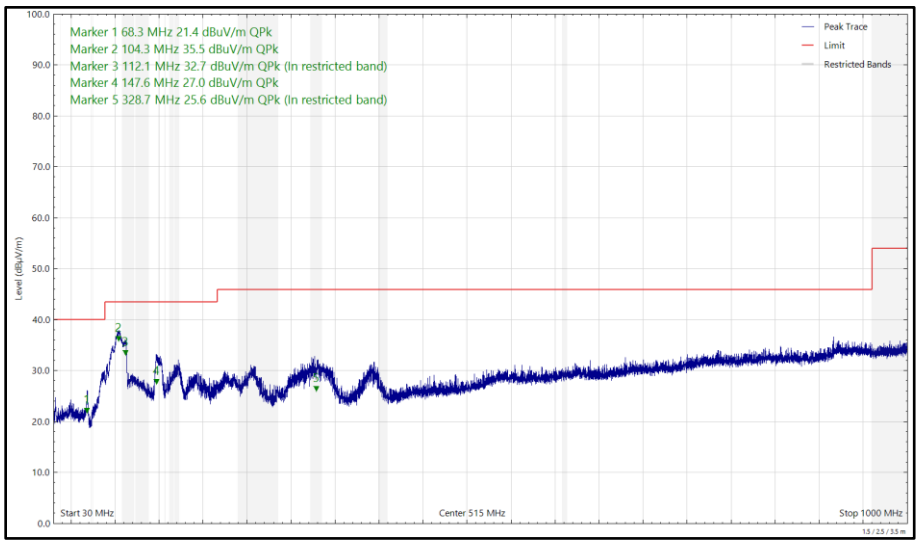

Figure 50 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

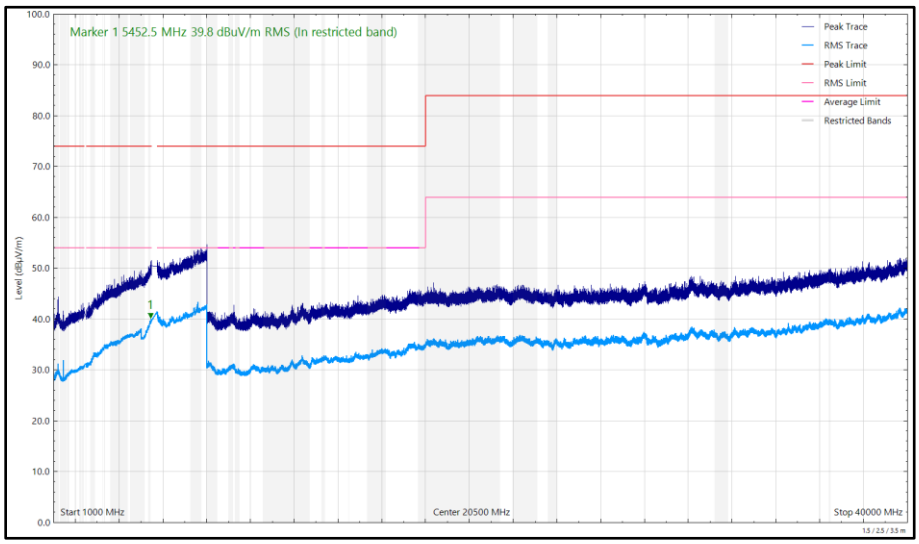

Figure 51 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 1, 1 GHz to 40 GHz, Horizontal

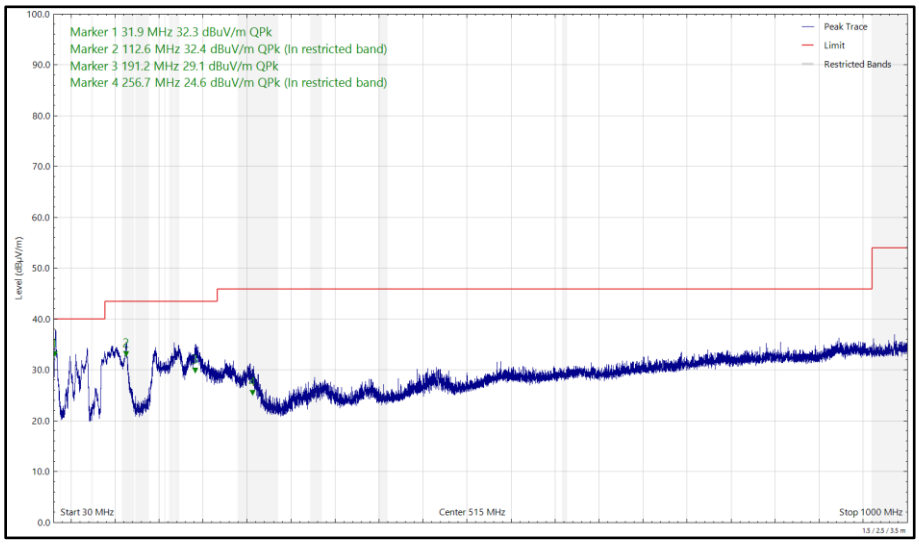

Figure 52 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 1, 30 MHz to 1 GHz, Vertical (Peak)

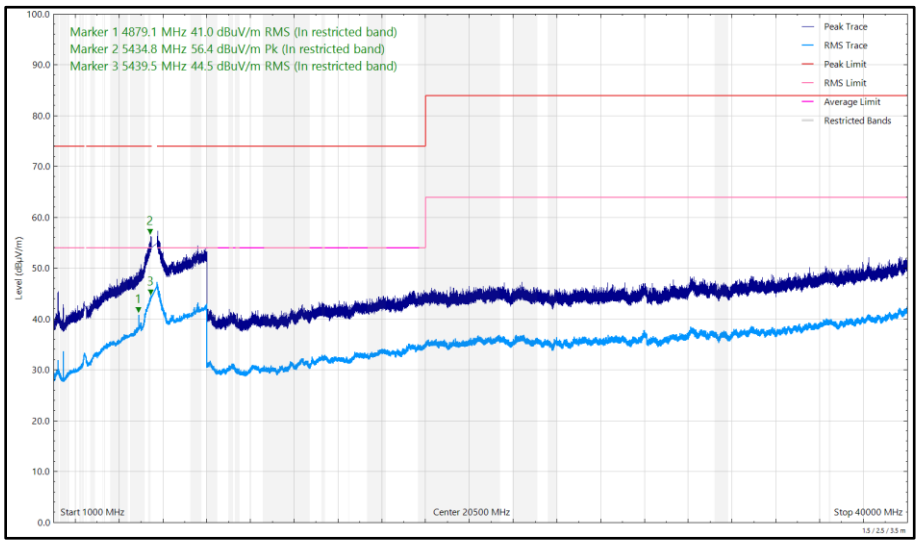

Figure 53 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
32.404	33.10	40.00	-6.90	Q-Peak	233	100	Vertical
68.314	21.16	40.00	-18.84	Q-Peak	236	346	Horizontal
102.931	34.89	43.50	-8.61	Q-Peak	0	267	Horizontal
108.082	33.54	43.50	-9.96	Q-Peak	4	296	Horizontal
112.955	31.69	43.50	-11.81	Q-Peak	238	110	Vertical
144.762	29.94	43.50	-13.56	Q-Peak	316	110	Vertical
252.493	25.11	46.00	-20.89	Q-Peak	297	100	Vertical
322.904	26.25	46.00	-19.75	Q-Peak	96	100	Horizontal
4880.808	44.39	54.00	-9.61	RMS	0	246	Vertical
5398.256	42.32	54.00	-11.68	RMS	328	303	Vertical
5399.290	54.56	74.00	-19.44	Peak	328	303	Vertical
5452.114	38.74	54.00	-15.26	RMS	307	389	Horizontal

Table 22 - U-NII-3 - 5785 MHz (CH157), 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.

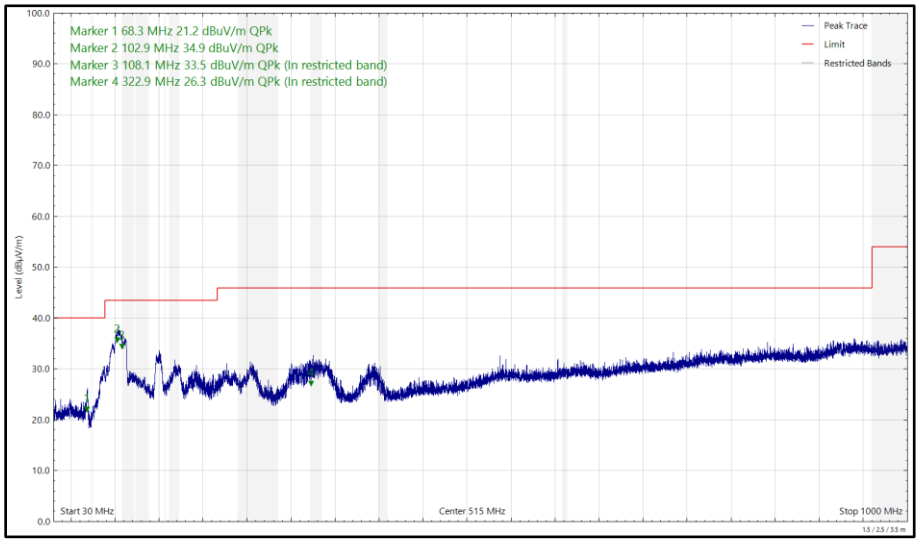

Figure 54 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)