FCC Test Report

Apple Inc
Model: A3403

In accordance with FCC 47 CFR Part 15 (2.4 GHz Bluetooth, 2.4 GHz WLAN, 5 GHz WLAN, 6 GHz WLAN, Narrowband and Thread)

TUV SUD Limited
Digitally signed by TUV SUD Limited
Date: 2024.10.16 10:38:32 +01'00'

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

FCC ID: BCGA3403

COMMERCIAL-IN-CONFIDENCE

Document 75961394-93 Issue 01

SIGNATURE			
NAME	**JOB TITLE**	**RESPONSIBLE FOR**	**ISSUE DATE**
Steve Marshall	Senior Engineer	Authorised Signatory	03 October 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. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Report Generation	Rachael Watkins	03 October 2024	

FCC Accreditation
553713/UK2026 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 for the tests detailed in section 1.3.

TÜV SÜD
is a trading name of TUV SUD Ltd
Registered in Scotland at East Kilbride,
Glasgow G75 0QF, United Kingdom
Registered number: SC215164

TUV SUD Ltd is a
TÜV SÜD Group Company

Phone: +44 (0) 1489 558100
Fax: +44 (0) 1489 558101
www.tuvsud.com/en

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

Contents

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	03-Oct-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
Start of Test	26-August-2024
Finish of Test	18-September-2024
Name of Engineer(s)	Ioan-Alexandru Bogatu, Ian Hart, Morsalin Hossain, Elliot Callender, Ahmed Al Derdiri and James Woods
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 is shown below.

Section	Specification Clause	Test Description	Result	Comments/Base Standard
Configuration and Mode: 5 GHz WLAN and 2.4 GHz Bluetooth				
2.1	15.209, 15.247(d) and 15.407(b)	Radiated Spurious Emissions (Simultaneous Transmission)	Pass	ANSI C63.4 (2014) ANSI C63.10 (2020)
Configuration and Mode: 6 GHz WLAN and 2.4 GHz Bluetooth				
2.1	15.209, 15.247(d) and 15.407(b)	Radiated Spurious Emissions (Simultaneous Transmission)	Pass	ANSI C63.4 (2014) ANSI C63.10 (2020)
Configuration and Mode: 2.4 GHz WLAN and Narrowband				
2.1	15.209, 15.247(d) and 15.407(b)	Radiated Spurious Emissions (Simultaneous Transmission)	Pass	ANSI C63.4 (2014) ANSI C63.10 (2020)
Configuration and Mode: 5 GHz WLAN and Thread				
2.1	15.209, 15.247(d) and 15.407(b)	Radiated Spurious Emissions (Simultaneous Transmission)	Pass	ANSI C63.4 (2014) ANSI C63.10 (2020)
Configuration and Mode: 6 GHz WLAN and Thread				
2.1	15.209, 15.247(d) and 15.407(b)	Radiated Spurious Emissions (Simultaneous Transmission)	Pass	ANSI C63.4 (2014) ANSI C63.10 (2020)

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: A3403			
Serial Number	Hardware Version	Software Version	Firmware
JF4T7PYJ66	REV1.0	24A32191s	WLAN: 23.30.16 BT: 22.1.65.459
LJHNW3N9XQ	REV1.0	24A32190v	WLAN: 23.30.16 BT: 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: A3403, Serial Number: LJHNW3N9XQ			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A3403, Serial Number: JF4T7PYJ66			
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)	Elliot Callender, Ian Hart, Ioan-Alexandru Bogatu and Morsalin Hossain	UKAS
Configuration and Mode: 6 GHz WLAN and 2.4 GHz Bluetooth		
Radiated Spurious Emissions (Simultaneous Transmission)	Ahmed Al Derdiri, Ian Hart, Ioan-Alexandru Bogatu and Morsalin Hossain	UKAS
Configuration and Mode: 5 GHz WLAN and Thread		
Radiated Spurious Emissions (Simultaneous Transmission)	Ahmed Al Derdiri, Elliot Callender, Ian Hart and Morsalin Hossain	UKAS
Configuration and Mode: 6 GHz WLAN and Thread		
Radiated Spurious Emissions (Simultaneous Transmission)	Ahmed Al Derdiri, James Woods, Manohar Thota and Morsalin Hossain	UKAS
Configuration and Mode: 2.4 GHz WLAN and Narrowband		
Radiated Spurious Emissions (Simultaneous Transmission)	Ahmed Al Derdiri, Elliot Callender, Ioan-Alexandru Bogatu and Morsalin Hossain	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)

2.1.2 Equipment Under Test and Modification State

A3403, S/N: JF4T7PYJ66 - Modification State 0
A3403, S/N: LJHNW3N9XQ - Modification State 0

2.1.3 Date of Test

26-August-2024 to 18-September-2024

2.1.4 Test Method

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

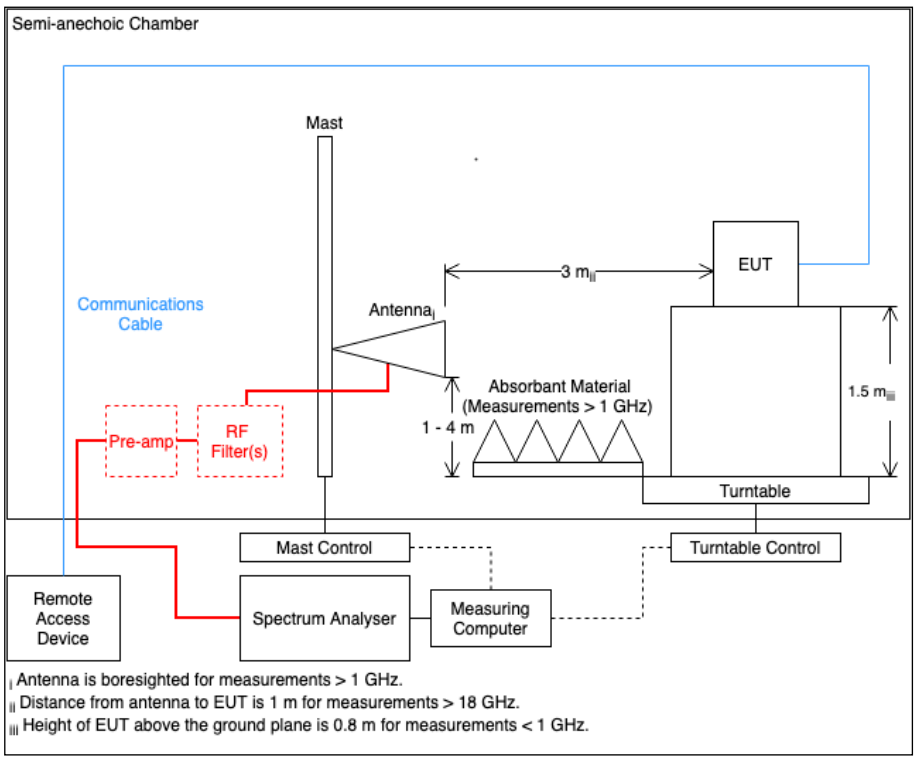

Figure 1

2.1.6 Environmental Conditions

Ambient Temperature	21.9 - 24.3 °C
Relative Humidity	43.6 - 58.0 %

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
4881.863	55.37	74.00	-18.63	Peak	360	319	Vertical
4881.863	43.79	54.00	-10.21	CISPR Avg	360	319	Vertical
4882.608	35.51	54.00	-18.49	CISPR Avg	56	329	Horizontal
5110.784	56.81	74.00	-17.19	Peak	360	348	Vertical
5145.640	45.07	54.00	-8.93	RMS	360	262	Vertical
5149.478	40.98	54.00	-13.02	RMS	68	369	Horizontal
5356.682	46.72	54.00	-7.28	RMS	0	276	Vertical
5385.595	42.42	54.00	-11.58	RMS	74	395	Horizontal
5387.243	58.42	74.00	-15.58	Peak	358	282	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.

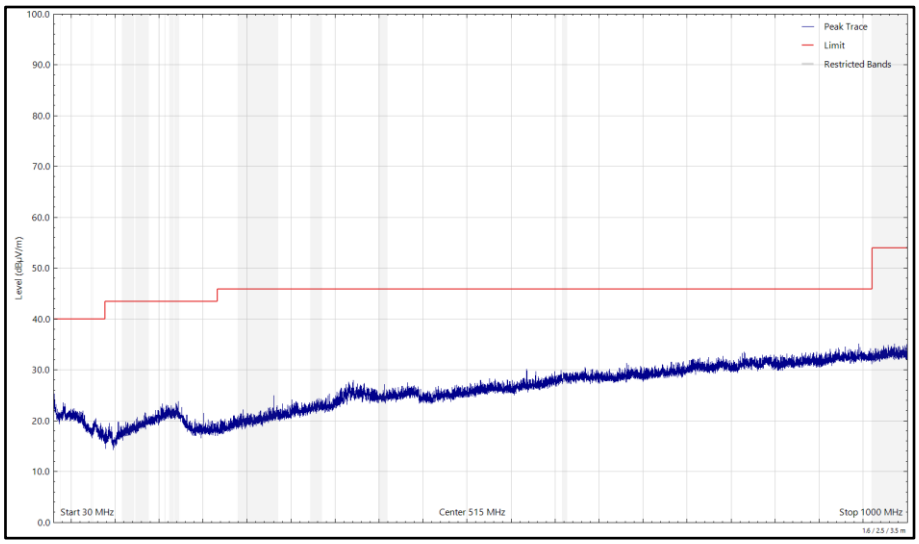

Figure 2 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Horizontal (Peak)

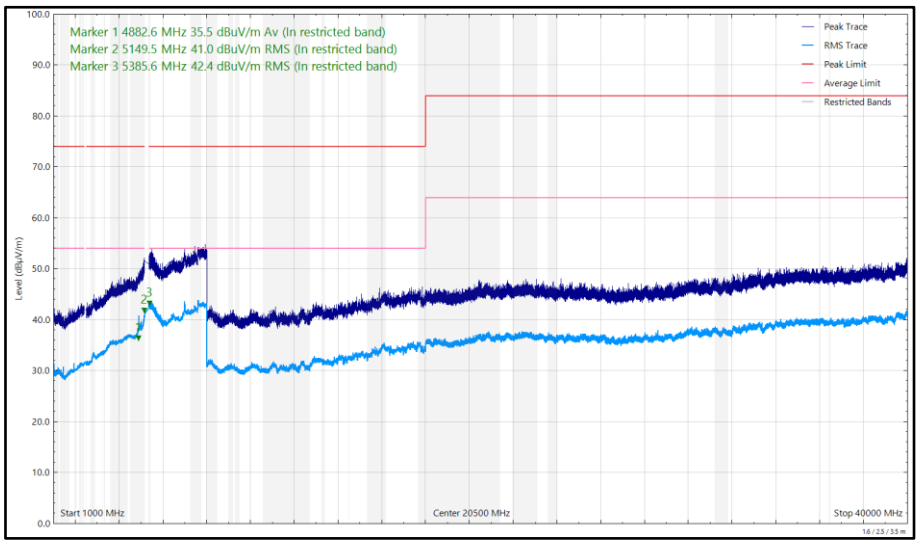

Figure 3 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Horizontal

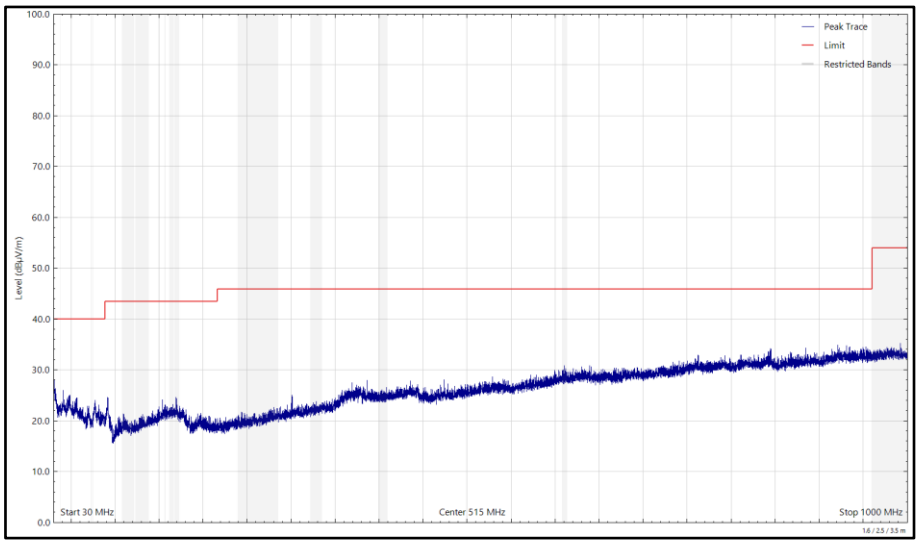

Figure 4 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Vertical (Peak)

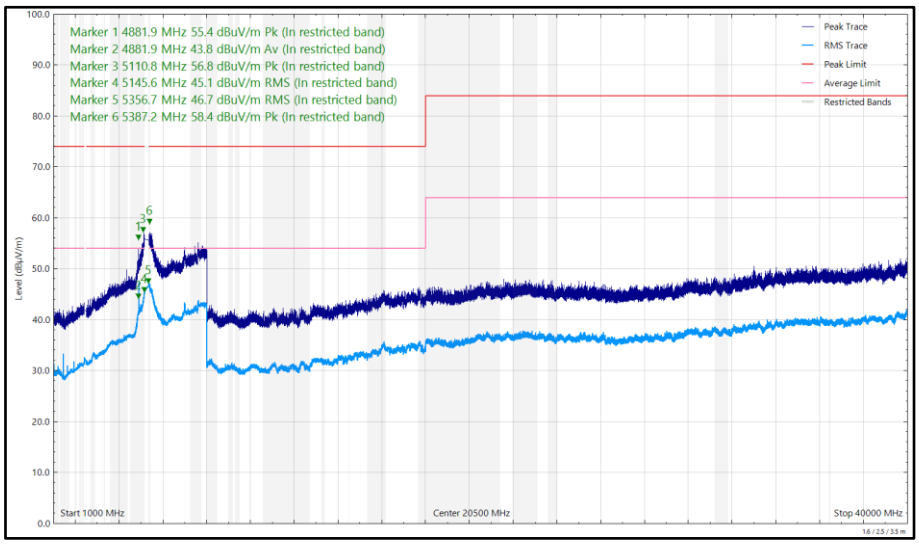

Figure 5 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
4882.148	42.93	54.00	-11.07	CISPR Avg	360	341	Vertical
4888.276	33.37	54.00	-20.63	CISPR Avg	233	331	Horizontal
5447.900	56.96	74.00	-17.04	Peak	360	262	Vertical
5458.349	42.54	54.00	-11.46	RMS	66	360	Horizontal
5459.996	45.73	54.00	-8.27	RMS	356	268	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.

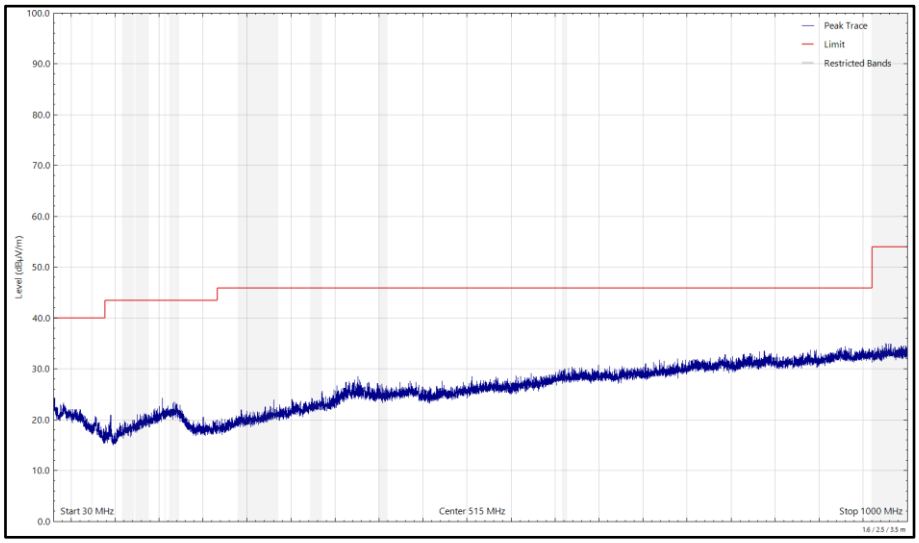

Figure 6 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Horizontal (Peak)

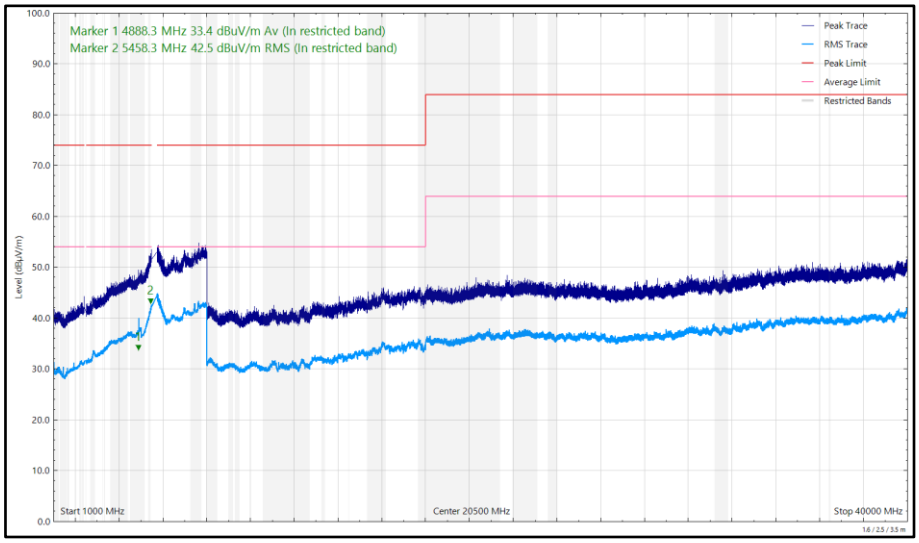

Figure 7 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Horizontal

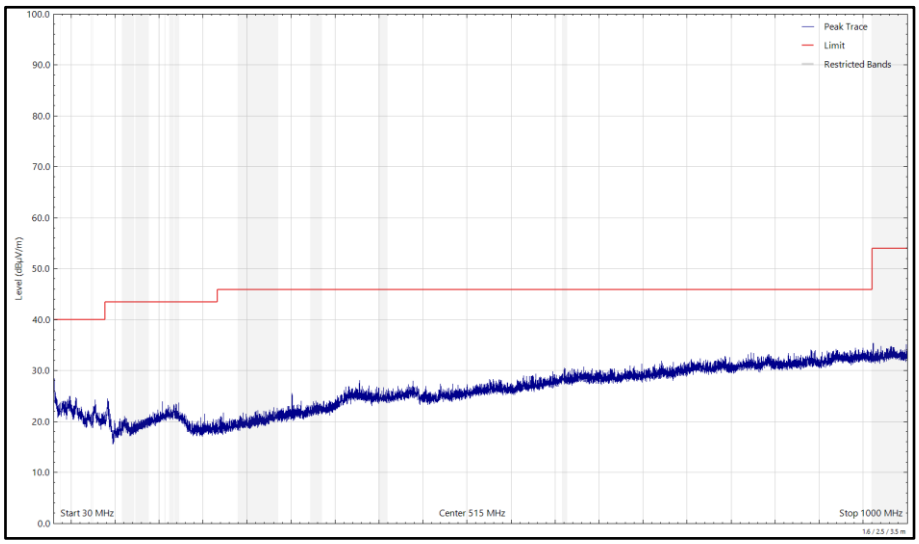

Figure 8 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Vertical (Peak)

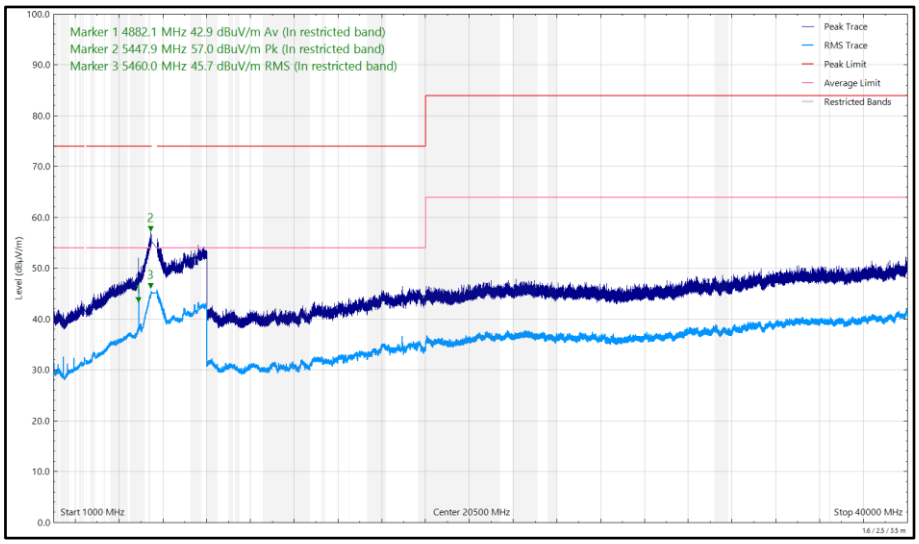

Figure 9 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
4881.383	33.78	54.00	-20.22	CISPR Avg	116	391	Horizontal
4881.718	42.27	54.00	-11.73	CISPR Avg	0	328	Vertical
5413.510	56.07	74.00	-17.93	Peak	357	271	Vertical
5458.592	40.93	54.00	-13.07	RMS	68	390	Horizontal
5459.132	44.33	54.00	-9.67	RMS	360	273	Vertical

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.

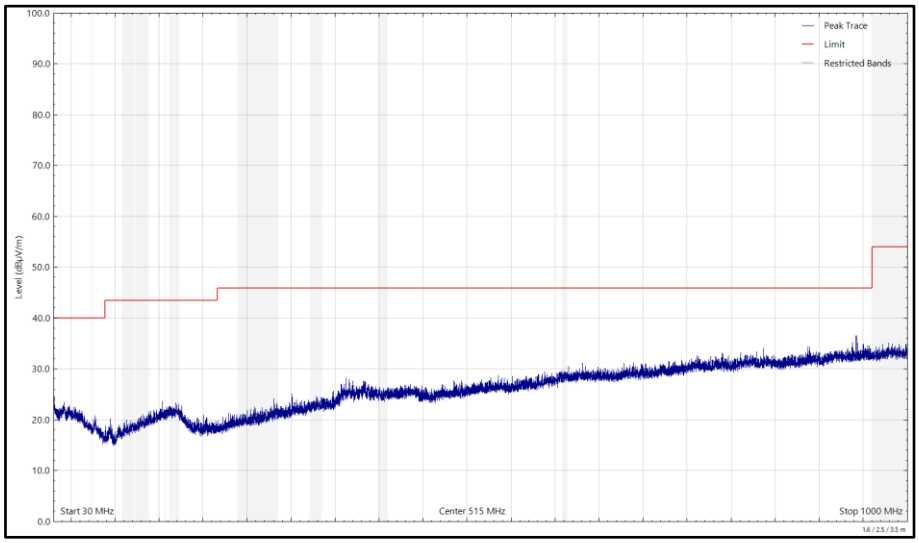

Figure 10 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Horizontal (Peak)

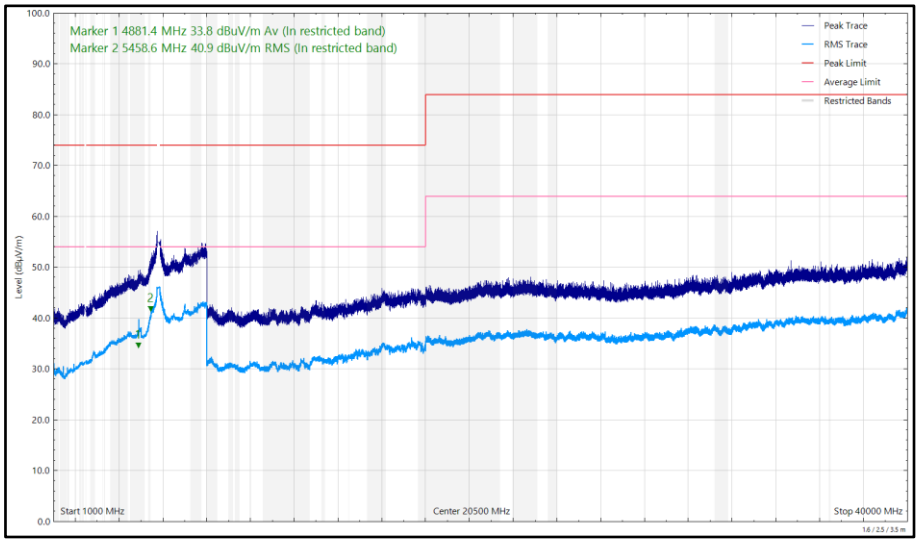

Figure 11 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Horizontal

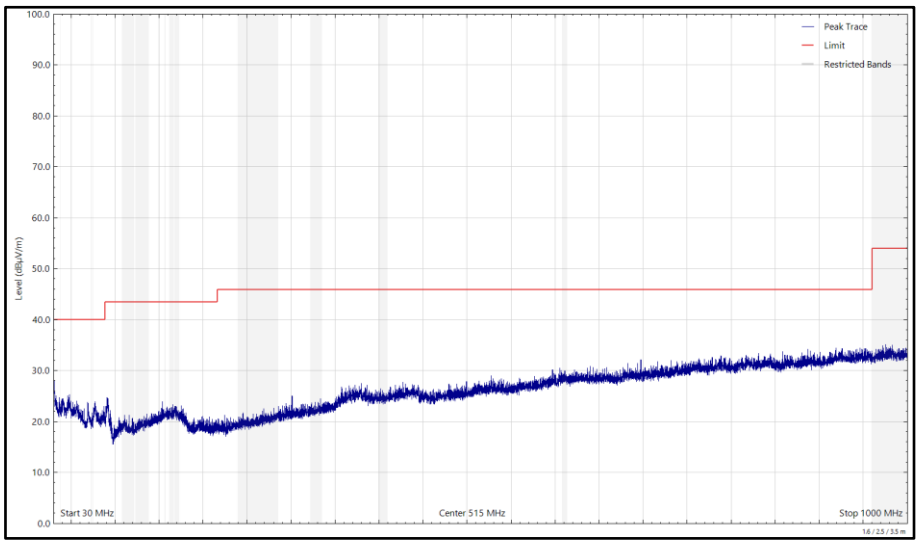

Figure 12 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Vertical (Peak)

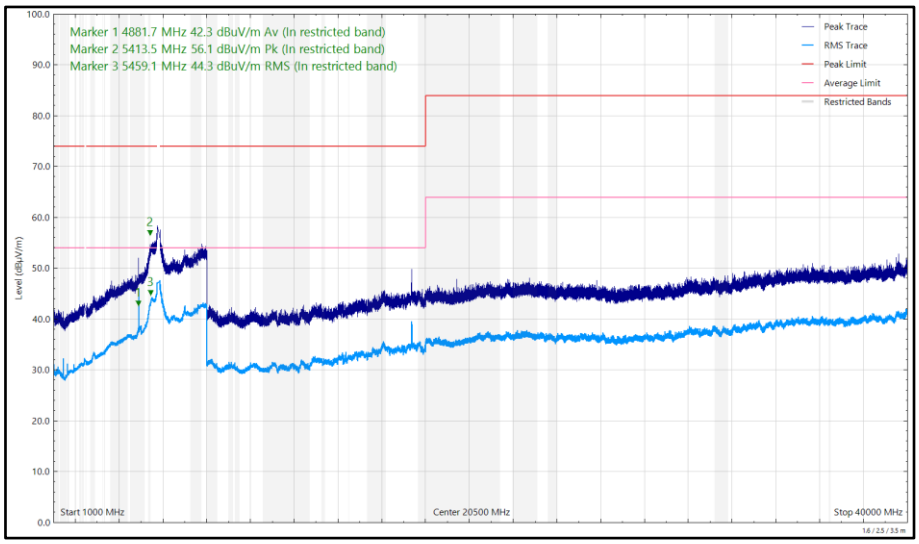

Figure 13 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
38.478	24.32	40.00	-15.68	Q-Peak	350	117	Vertical
2381.577	31.81	54.00	-22.19	CISPR Avg	356	312	Vertical
2484.286	30.95	54.00	-23.05	CISPR Avg	35	290	Vertical
4881.603	55.87	74.00	-18.13	Peak	356	344	Vertical
4881.603	43.91	54.00	-10.09	CISPR Avg	356	344	Vertical
4882.317	38.25	54.00	-15.75	CISPR Avg	53	400	Horizontal
5148.919	40.73	54.00	-13.27	RMS	68	393	Horizontal
5149.123	57.09	74.00	-16.91	Peak	360	322	Vertical
5149.973	45.31	54.00	-8.69	RMS	360	343	Vertical
5354.047	46.45	54.00	-7.55	RMS	0	276	Vertical
5360.179	42.29	54.00	-11.71	RMS	75	370	Horizontal
5380.886	58.27	74.00	-15.73	Peak	353	255	Vertical

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, 1 GHz to 40 GHz

No other emissions found within 10 dB of the limit.

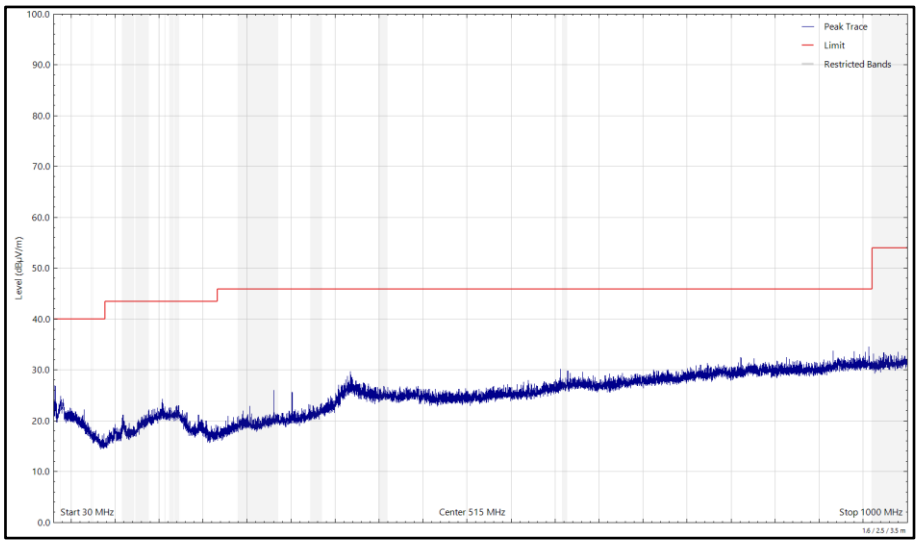

Figure 14 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

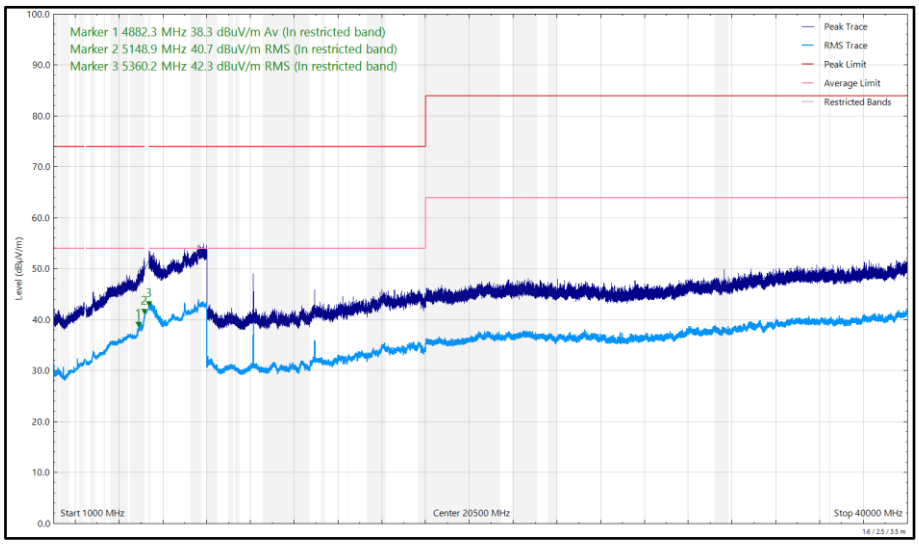

Figure 15 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

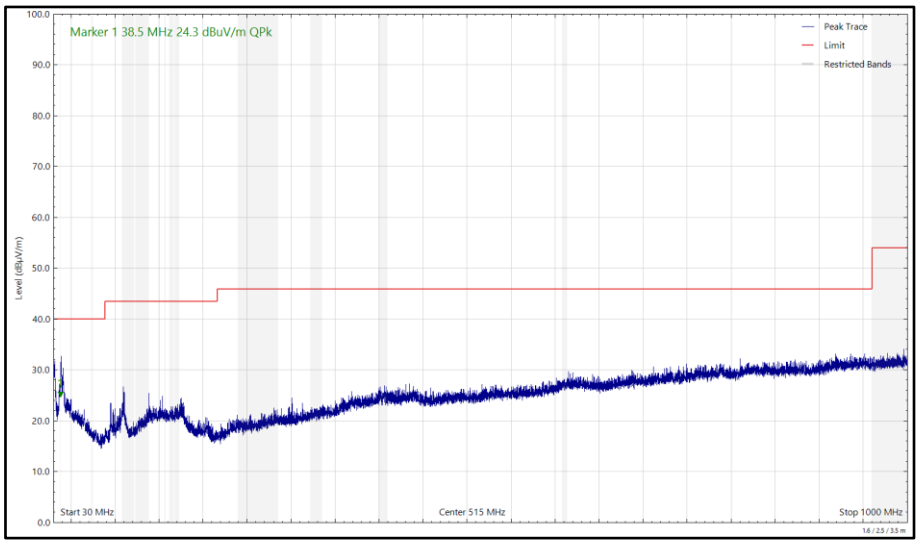

Figure 16 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

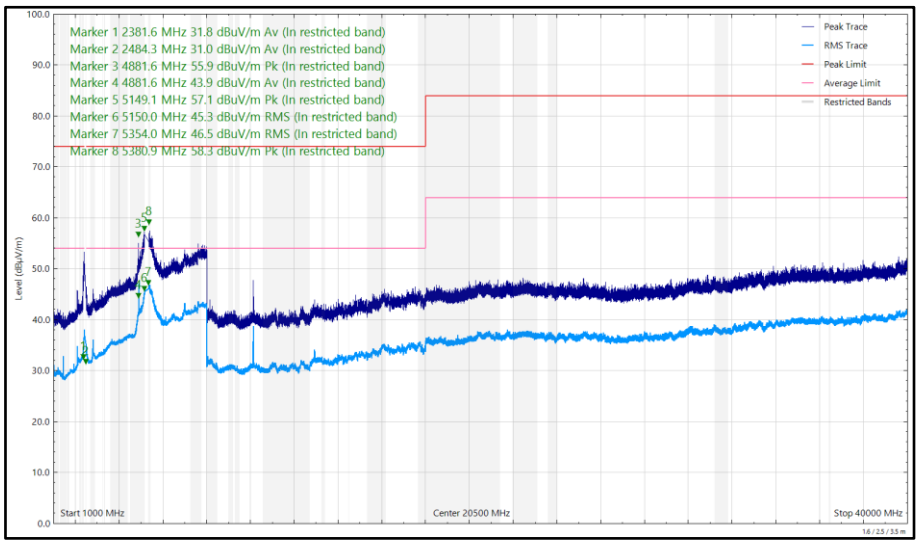

Figure 17 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
31.255	27.59	40.00	-12.41	Q-Peak	359	100	Vertical
2387.803	32.80	54.00	-21.20	CISPR Avg	9	369	Vertical
2485.511	31.47	54.00	-22.53	CISPR Avg	23	386	Vertical
4881.628	43.88	54.00	-10.12	CISPR Avg	360	317	Vertical
4881.773	39.05	54.00	-14.95	CISPR Avg	68	386	Horizontal
5454.791	45.75	54.00	-8.25	RMS	359	276	Vertical
5456.563	41.84	54.00	-12.16	RMS	74	327	Horizontal
5456.997	57.15	74.00	-16.85	Peak	350	272	Vertical

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, 1 GHz to 40 GHz

No other emissions found within 10 dB of the limit.

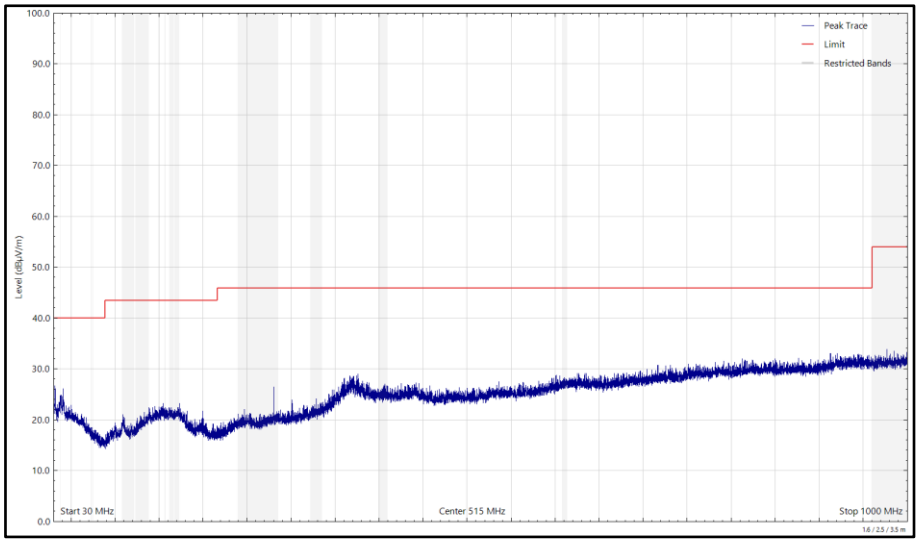

Figure 18 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

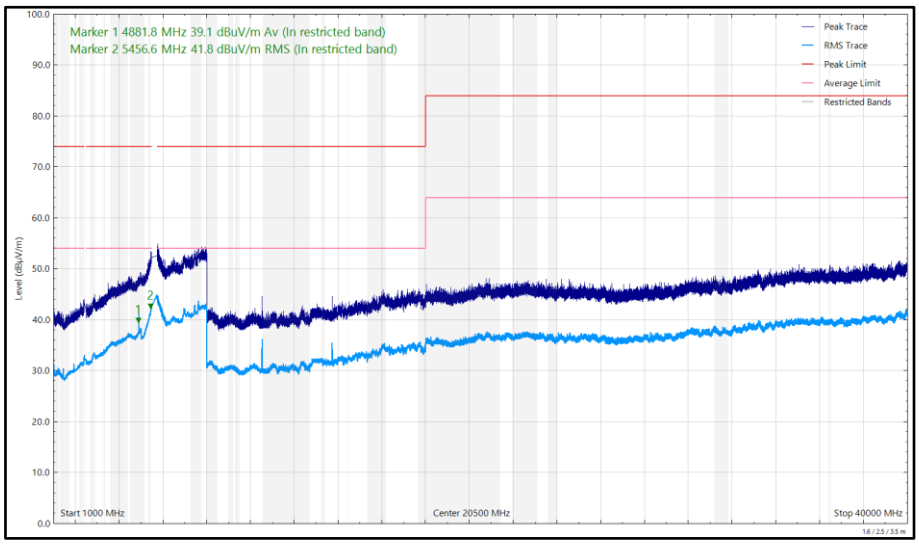

Figure 19 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

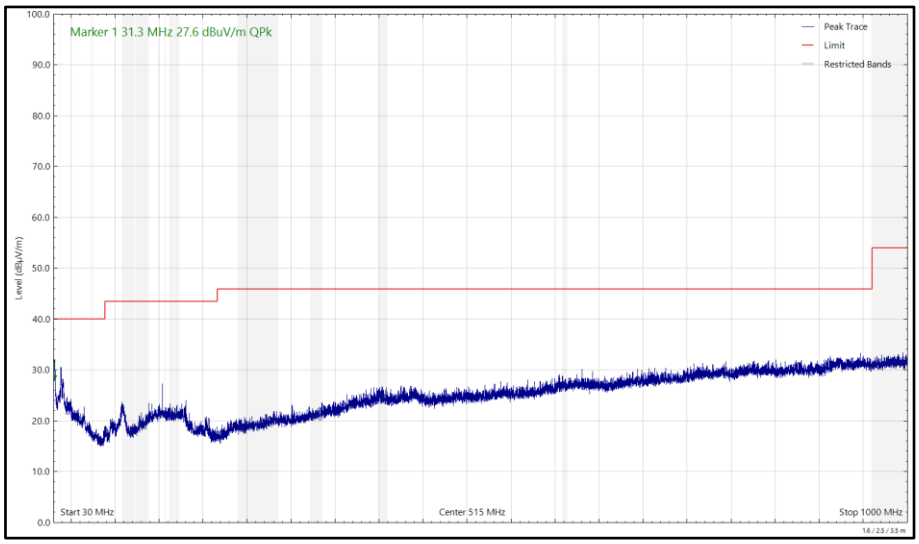

Figure 20 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

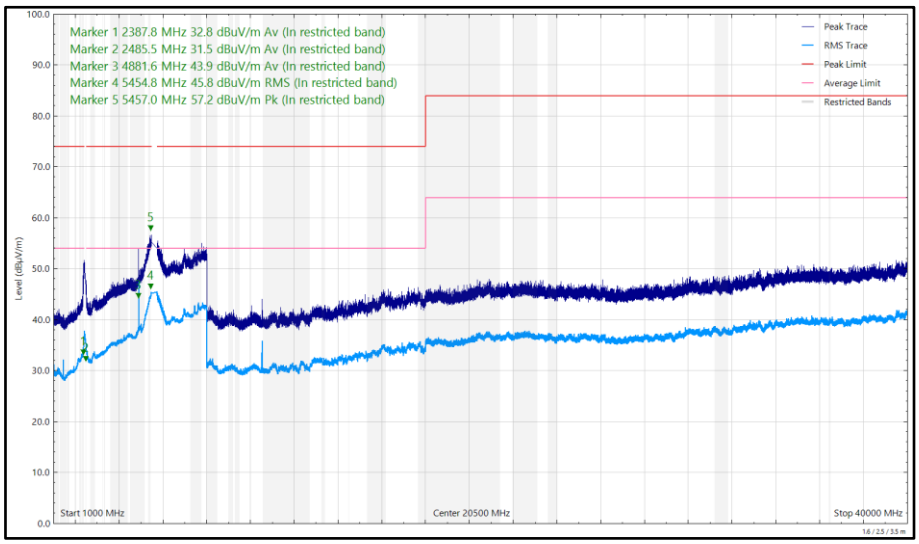

Figure 21 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
31.137	27.23	40.00	-12.77	Q-Peak	235	107	Vertical
2378.415	30.66	54.00	-23.34	CISPR Avg	348	329	Vertical
2484.846	30.77	54.00	-23.23	CISPR Avg	25	348	Vertical
4881.748	36.23	54.00	-17.77	CISPR Avg	51	287	Horizontal
4882.083	40.68	54.00	-13.32	CISPR Avg	0	377	Vertical
5446.746	55.79	74.00	-18.21	Peak	360	270	Vertical
5456.723	40.95	54.00	-13.05	RMS	71	360	Horizontal
5457.777	43.30	54.00	-10.70	RMS	350	280	Vertical
9126.350	31.77	54.00	-22.23	CISPR Avg	74	383	Horizontal
9129.410	29.64	54.00	-24.36	CISPR Avg	56	284	Vertical
10669.415	35.39	54.00	-18.61	CISPR Avg	303	273	Vertical
10669.610	35.97	54.00	-18.03	CISPR Avg	78	321	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.

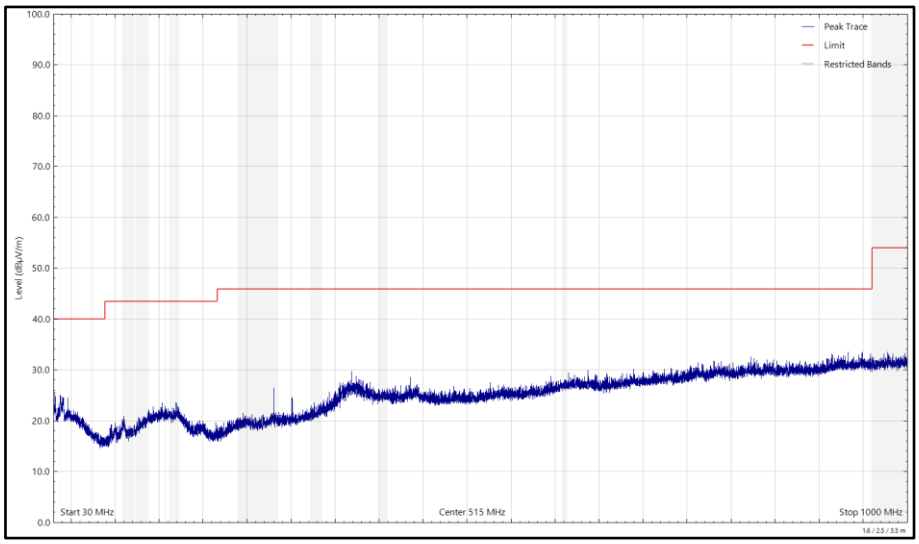

Figure 22 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

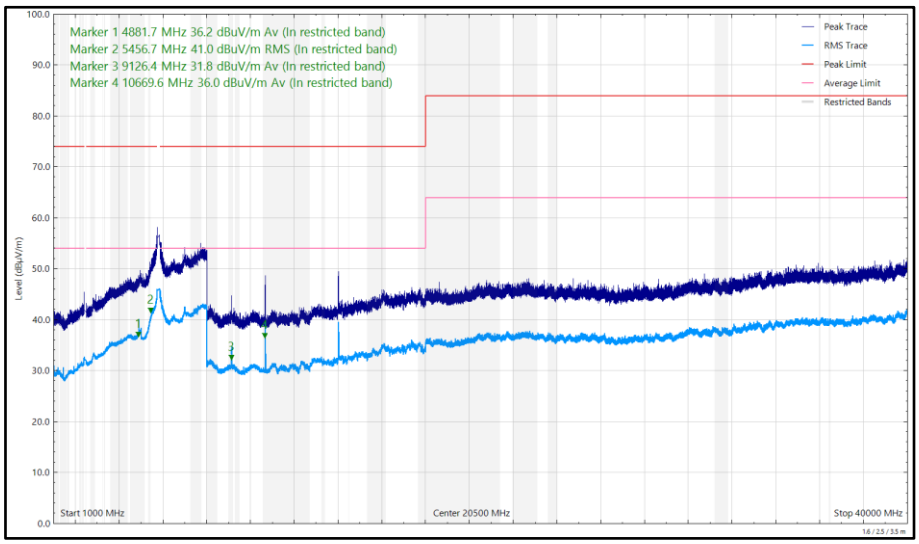

Figure 23 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

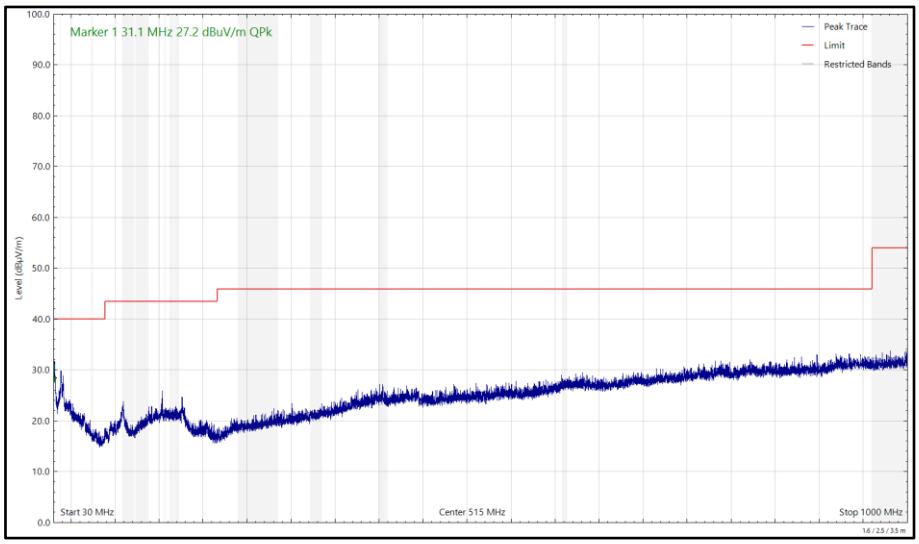

Figure 24 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

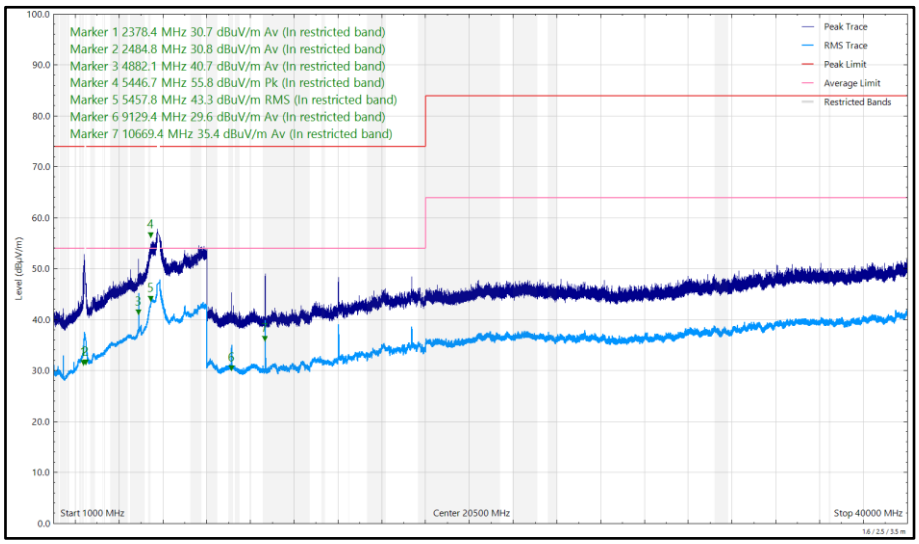

Figure 25 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

FCC 47 CFR Part 15

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)	-20 dBc
Part 15.407 (b)	-27 dBm e.i.r.p
Part 15.209	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
37.864	14.59	40.00	-25.41	Q-Peak	351	123	Horizontal
109.109	16.98	43.50	-26.52	Q-Peak	0	110	Vertical
279.997	24.46	46.00	-21.54	Q-Peak	104	106	Horizontal
4881.653	34.20	54.00	-19.80	CISPR Avg	0	255	Vertical
5435.323	35.10	54.00	-18.90	RMS	356	152	Horizontal
5454.807	36.40	54.00	-17.60	RMS	7	265	Vertical
7322.083	39.12	54.00	-14.88	CISPR Avg	336	266	Vertical
7322.572	38.86	54.00	-15.14	CISPR Avg	62	387	Horizontal
8233.270	37.20	54.00	-16.80	RMS	26	249	Vertical
11052.870	35.75	54.00	-18.25	CISPR Avg	291	316	Horizontal
11062.790	33.71	54.00	-20.29	CISPR Avg	294	264	Vertical

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.

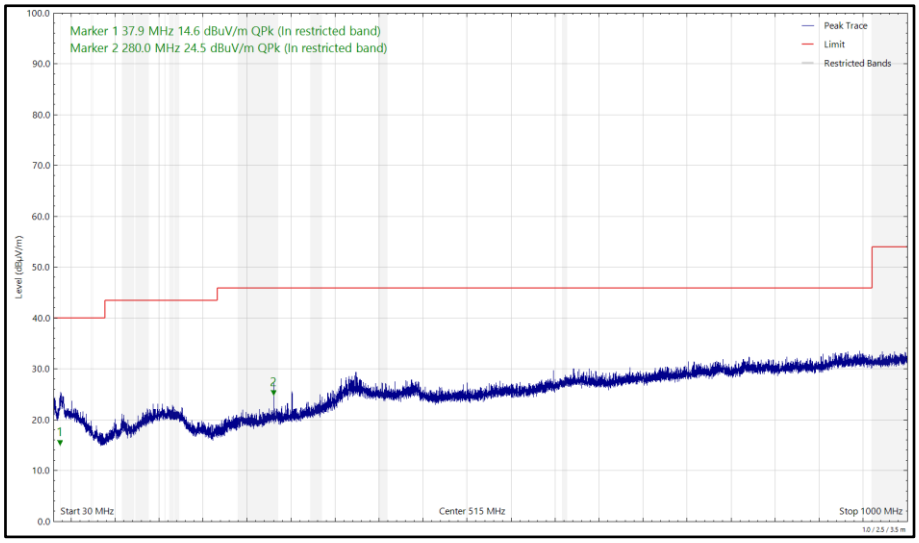

Figure 26 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

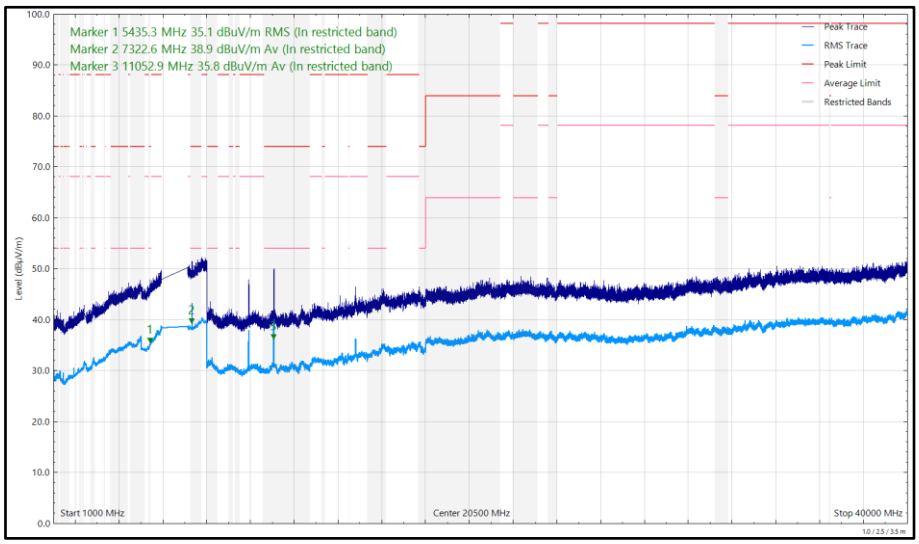

Figure 27 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

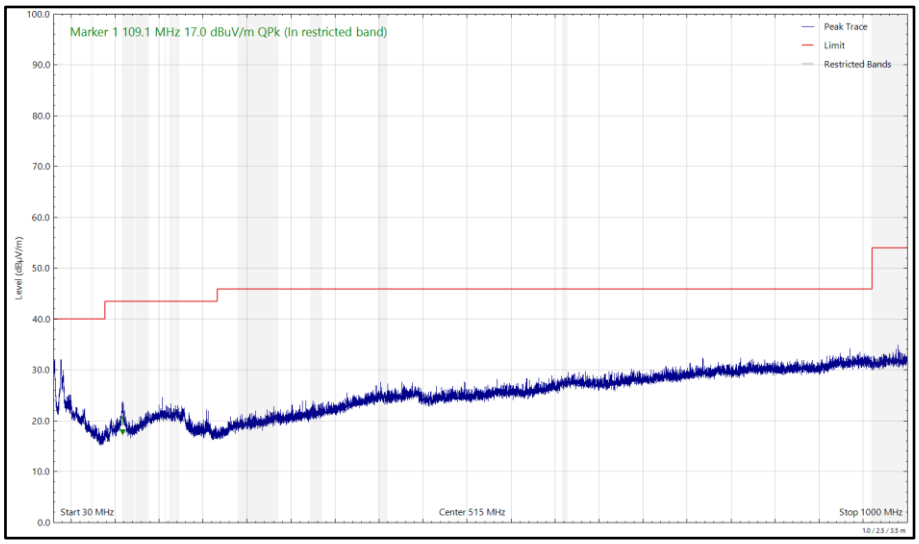

Figure 28 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

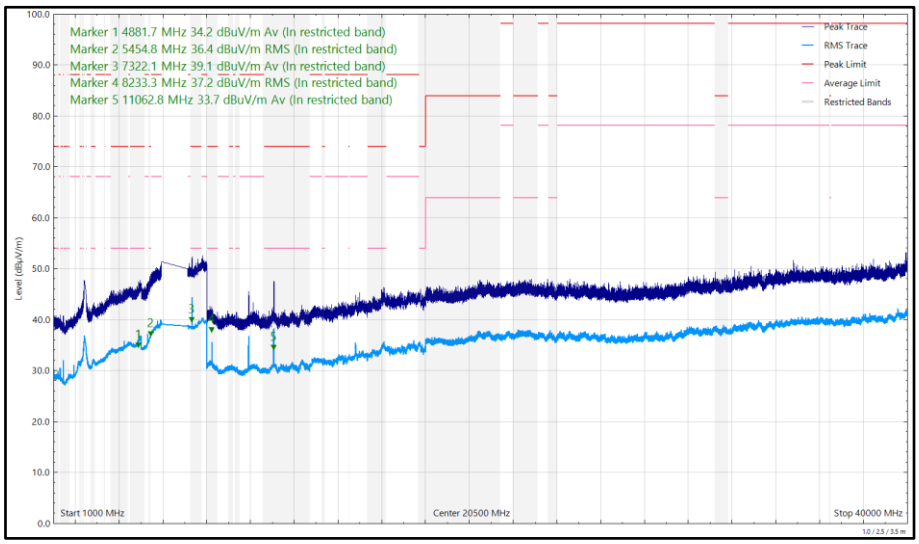

Figure 29 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
279.987	24.27	46.00	-21.73	Q-Peak	109	102	Horizontal
4881.888	34.62	54.00	-19.38	CISPR Avg	360	362	Vertical
5250.528	48.13	68.20	-20.07	RMS	3	258	Vertical
5442.749	36.35	54.00	-17.65	RMS	2	278	Vertical
5452.995	35.01	54.00	-18.99	RMS	198	390	Horizontal
7323.177	41.26	54.00	-12.74	CISPR Avg	56	110	Vertical
7323.543	40.11	54.00	-13.89	CISPR Avg	68	364	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.

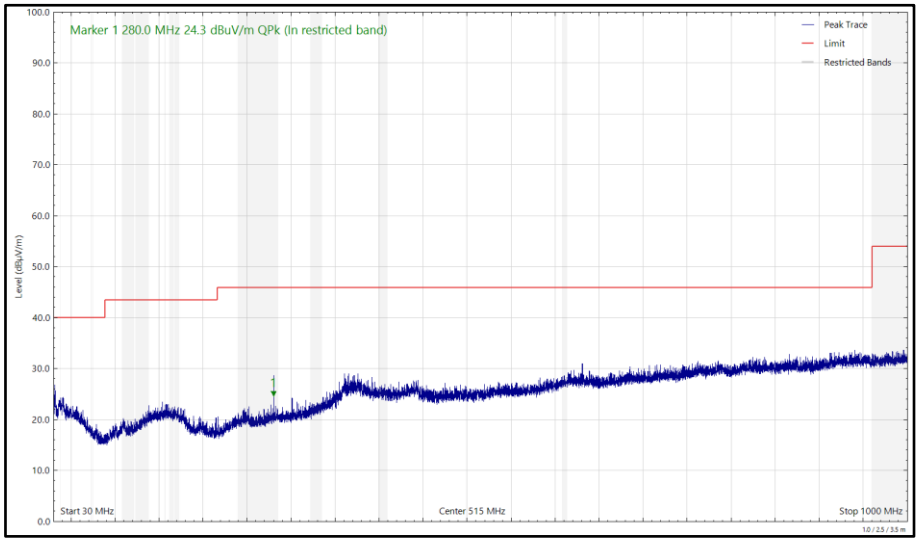

Figure 30 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

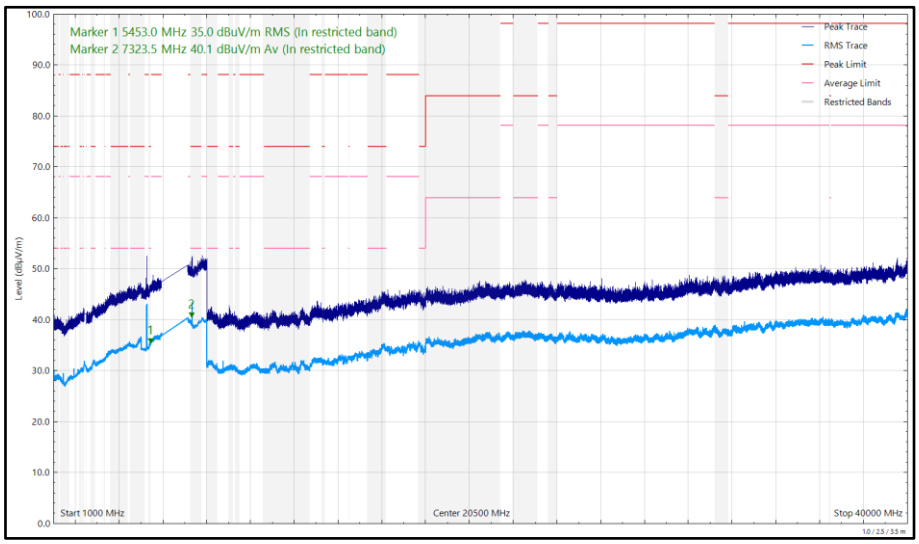

Figure 31 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

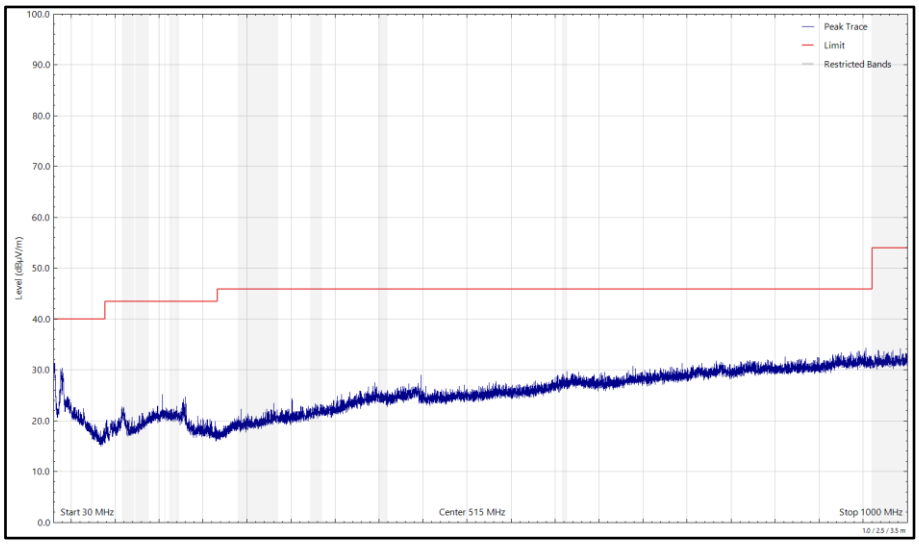

Figure 32 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

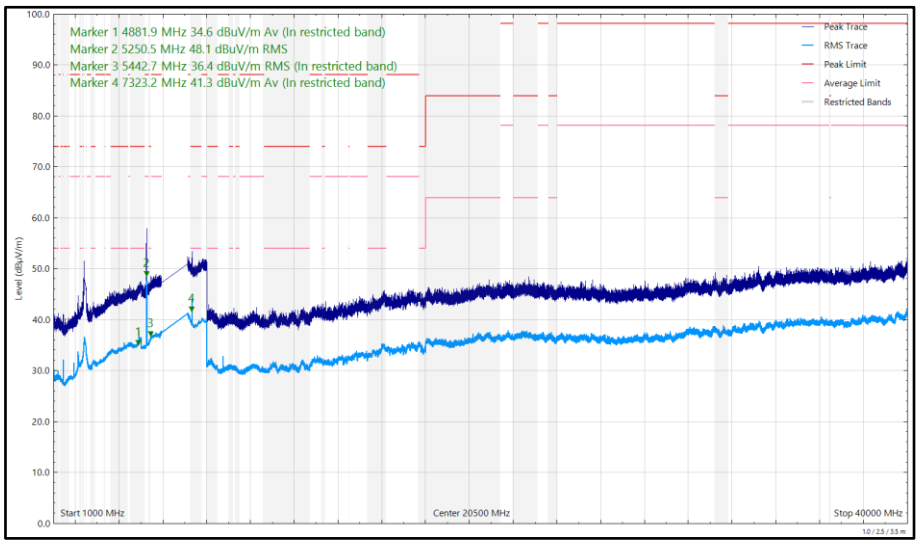

Figure 33 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
4212.023	33.90	54.00	-20.10	RMS	0	255	Vertical
4882.322	36.65	54.00	-17.35	CISPR Avg	8	338	Vertical
5434.463	37.02	54.00	-16.98	RMS	357	275	Vertical
5456.538	35.06	54.00	-18.94	RMS	16	390	Horizontal
7322.286	37.42	54.00	-16.58	CISPR Avg	72	358	Horizontal
7322.829	38.64	54.00	-15.36	CISPR Avg	59	100	Vertical
8233.250	33.96	54.00	-20.04	RMS	17	364	Vertical

Table 15 - U-NII-5 - 6175 MHz (CH45), 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.

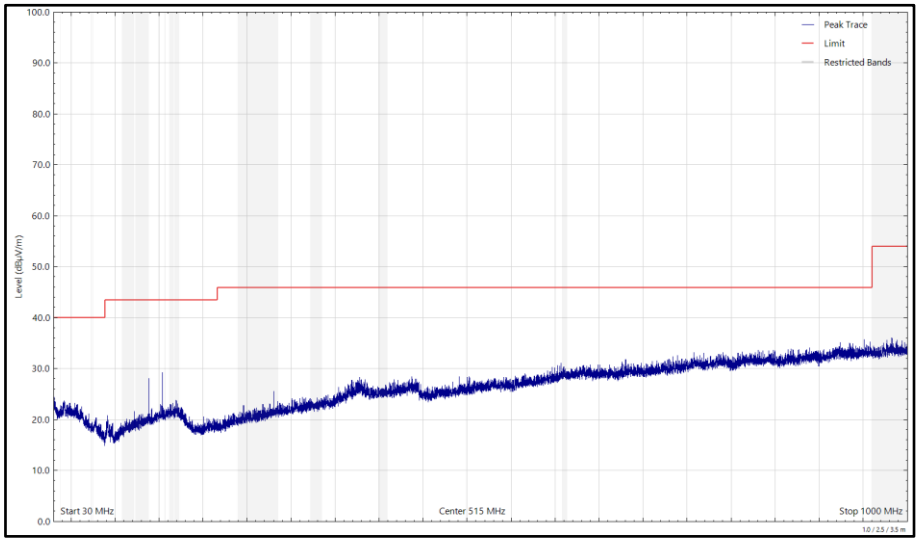

Figure 34 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Horizontal (Peak)

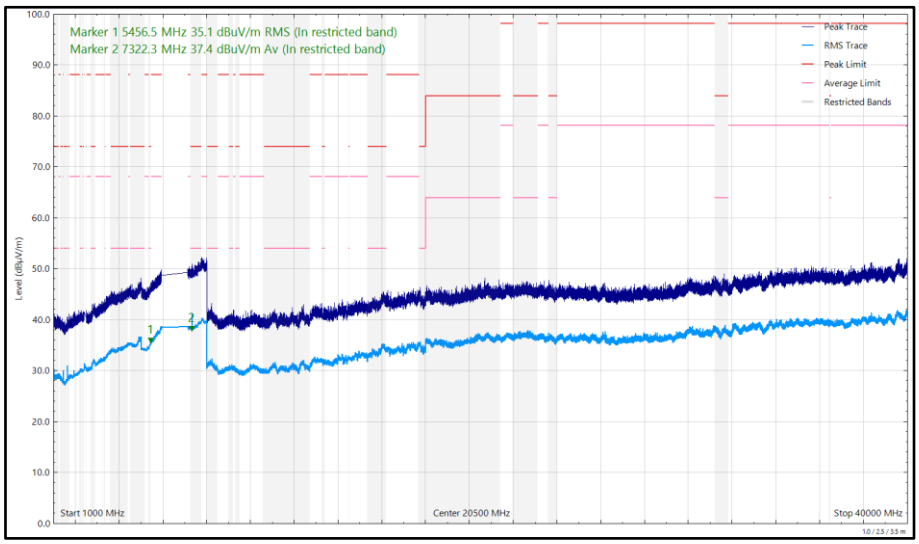

Figure 35 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Horizontal

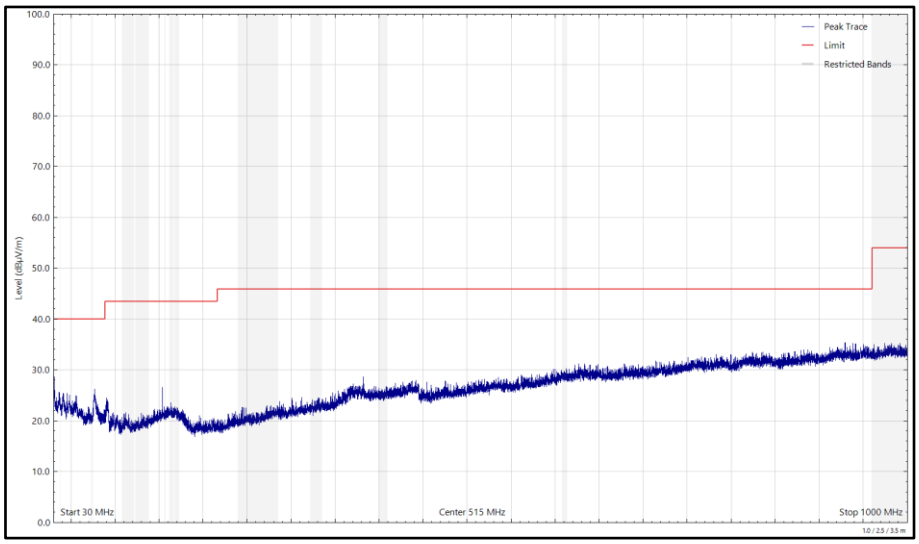

Figure 36 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Vertical (Peak)

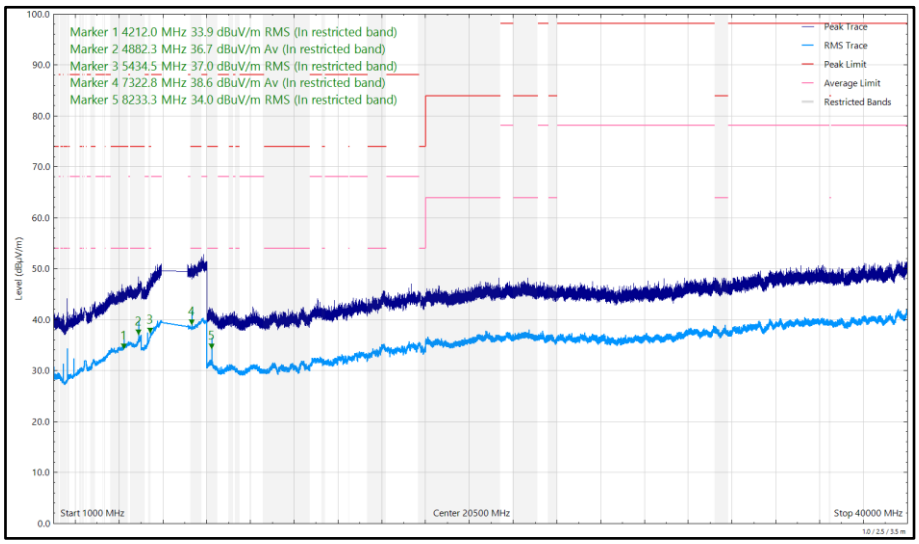

Figure 37 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
4881.738	37.30	54.00	-16.70	CISPR Avg	6	335	Vertical
5441.855	35.94	54.00	-18.06	RMS	355	391	Vertical
5446.409	35.63	54.00	-18.37	RMS	82	348	Horizontal
7322.649	37.33	54.00	-16.67	CISPR Avg	29	100	Vertical
7326.472	35.33	54.00	-18.67	CISPR Avg	251	337	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.

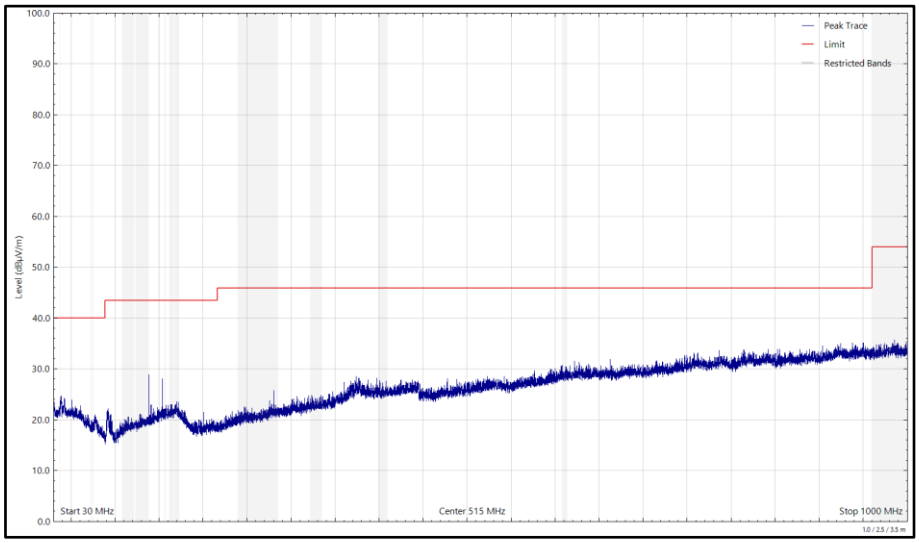

Figure 38 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Horizontal (Peak)

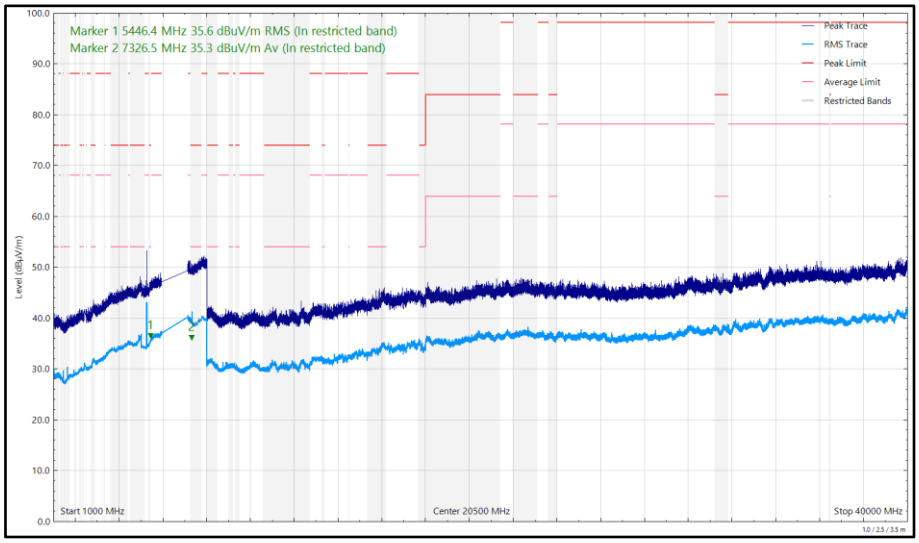

Figure 39 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Horizontal

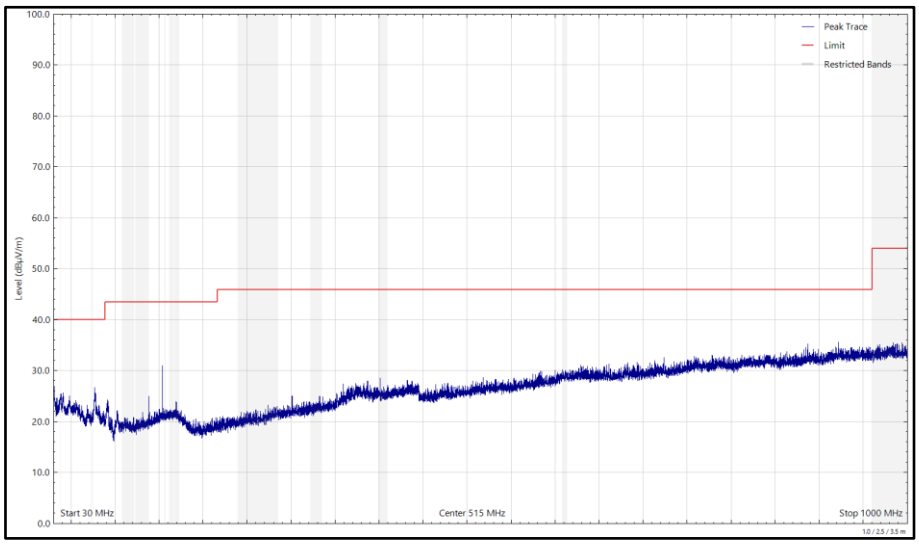

Figure 40 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Vertical (Peak)

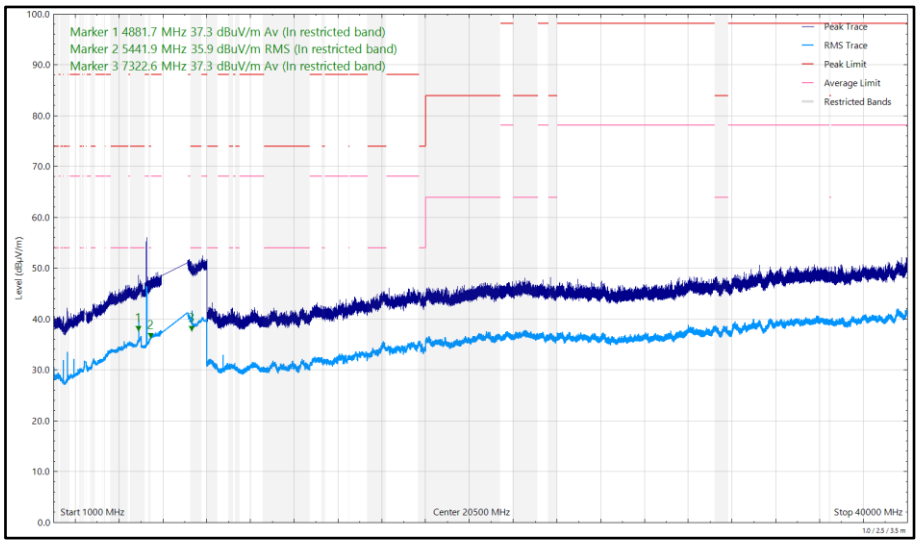

Figure 41 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Vertical

FCC 47 CFR Part 15

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)	-20 dBc
Part 15.407 (b)	Peak: -7 dBm/MHz e.i.r.p, Average: -27 dBm/MHz e.i.r.p.
Part 15.209	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
108.028	15.73	43.50	-27.77	Q-Peak	9	100	Vertical
280.015	23.12	46.00	-22.88	Q-Peak	64	106	Horizontal
2389.692	41.21	54.00	-12.79	RMS	18	361	Vertical
2389.817	35.51	54.00	-18.49	RMS	316	368	Horizontal
2483.548	43.20	54.00	-10.80	RMS	10	396	Vertical
2483.550	37.83	54.00	-16.17	RMS	39	399	Horizontal
2485.156	59.47	74.00	-14.53	Peak	10	396	Vertical
4883.558	40.29	54.00	-13.71	RMS	5	391	Vertical
5146.774	36.69	54.00	-17.31	RMS	265	384	Horizontal
5149.997	38.41	54.00	-15.59	RMS	17	349	Vertical
5381.253	38.38	54.00	-15.62	RMS	357	323	Vertical
5393.787	38.63	54.00	-15.37	RMS	83	384	Horizontal

Table 18 - 2442 MHz (CH7), HT20, Core 0 and 5204 MHz, HDR4, ePA, Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

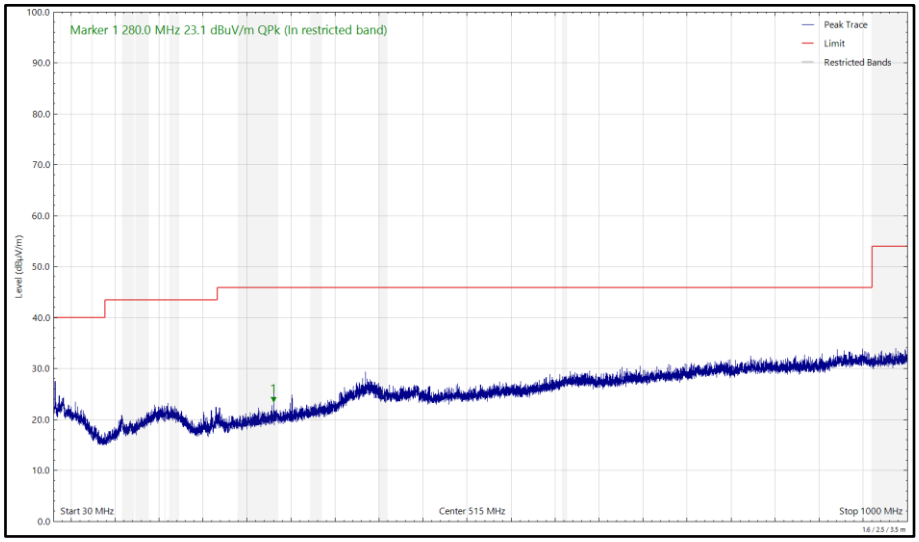

Figure 42 - 2442 MHz (CH7), HT20, Core 0 and 5204 MHz, HDR4, ePA, Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

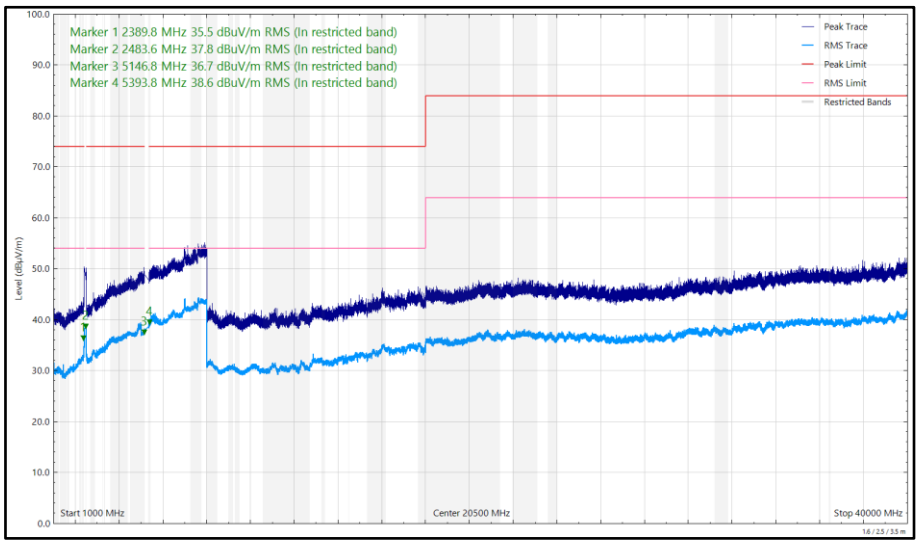

Figure 43 - 2442 MHz (CH7), HT20, Core 0 and 5204 MHz, HDR4, ePA, Core 1, 1 GHz to 40 GHz, Horizontal

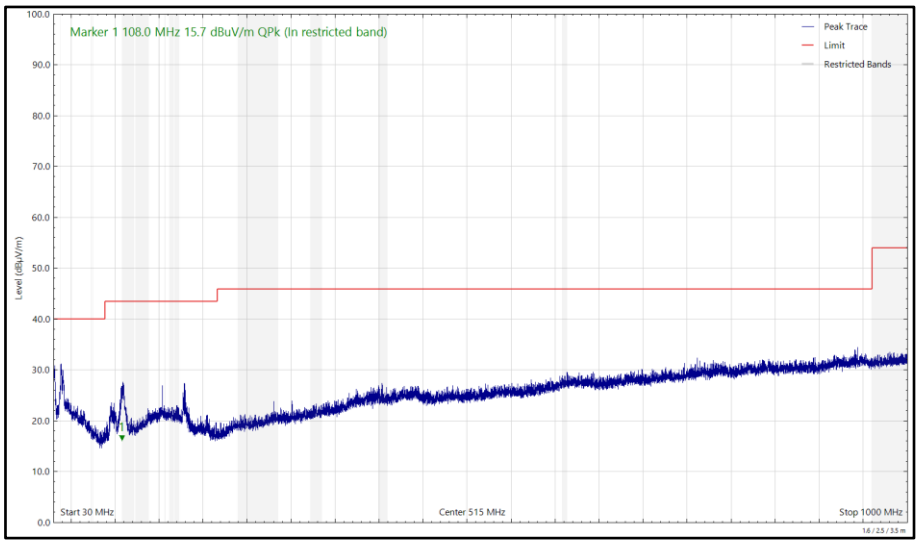

Figure 44 - 2442 MHz (CH7), HT20, Core 0 and 5204 MHz, HDR4, ePA, Core 1, 30 MHz to 1 GHz, Vertical (Peak)

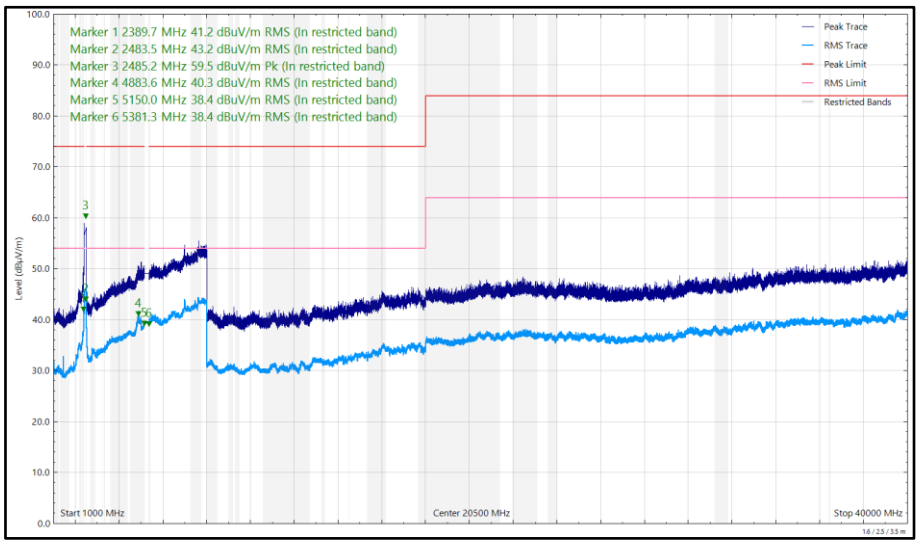

Figure 45 - 2442 MHz (CH7), HT20, Core 0 and 5204 MHz, HDR4, ePA, Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
124.804	14.86	43.50	-28.64	Q-Peak	262	100	Vertical
279.992	22.85	46.00	-23.15	Q-Peak	85	138	Horizontal
2389.635	41.64	54.00	-12.36	RMS	344	325	Vertical
2389.735	35.09	54.00	-18.91	RMS	312	361	Horizontal
2483.507	44.43	54.00	-9.57	RMS	350	396	Vertical
2483.515	38.79	54.00	-15.21	RMS	46	389	Horizontal
2483.603	60.64	74.00	-13.36	Peak	350	396	Vertical
4961.153	40.63	54.00	-13.37	RMS	9	269	Vertical
5374.507	44.47	54.00	-9.53	RMS	63	284	Vertical
5374.541	44.03	54.00	-9.97	RMS	75	320	Horizontal

Table 19 - 2442 MHz (CH7), 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.

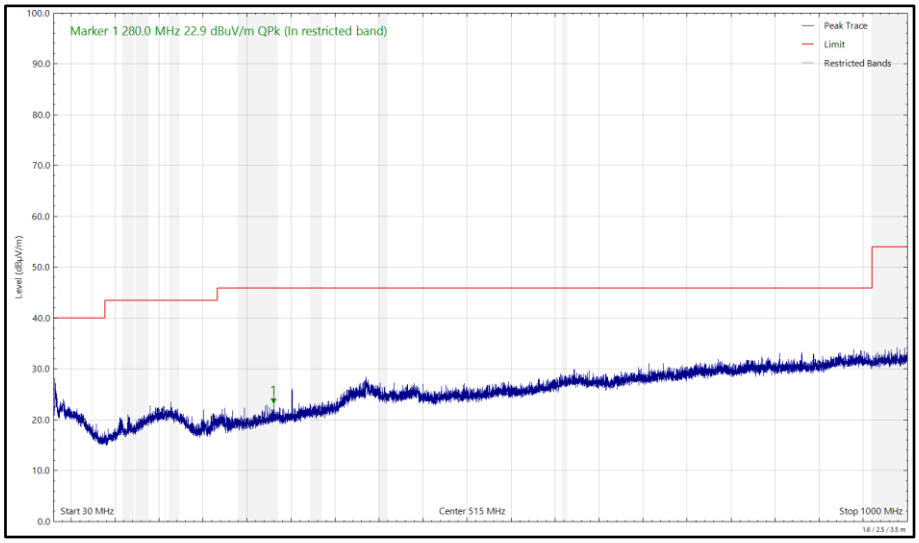

Figure 46 - 2442 MHz (CH7), HT20, Core 0 and 5788 MHz, HDR4, ePA, Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

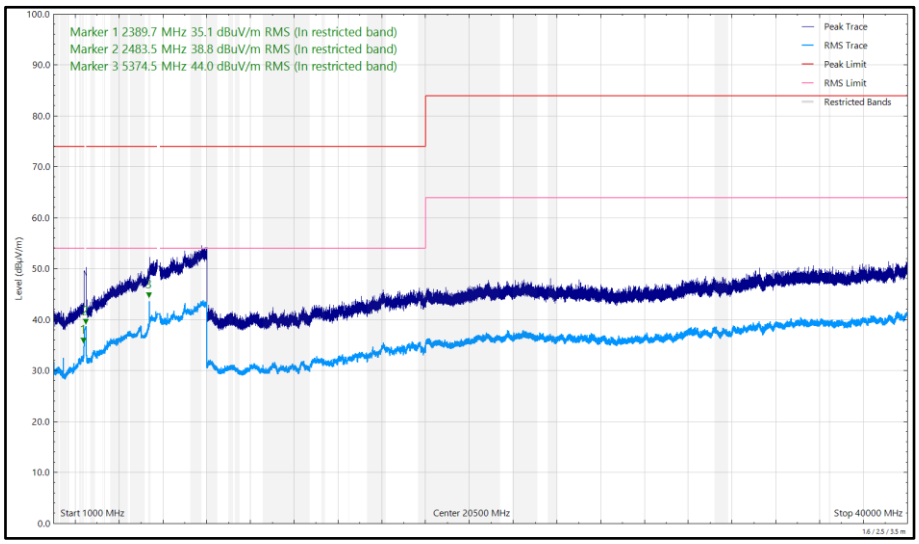

Figure 47 - 2442 MHz (CH7), HT20, Core 0 and 5788 MHz, HDR4, ePA, Core 1, 1 GHz to 40 GHz, Horizontal

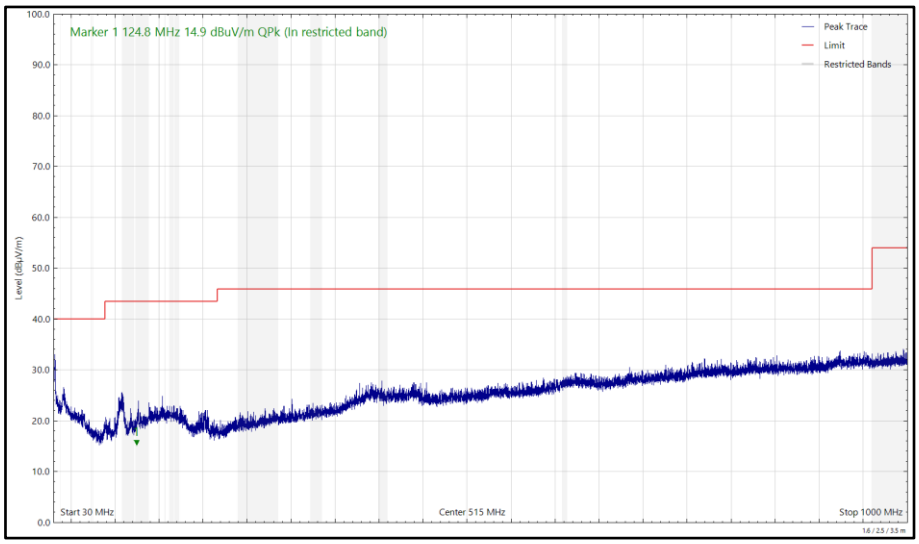

Figure 48 - 2442 MHz (CH7), HT20, Core 0 and 5788 MHz, HDR4, ePA, Core 1, 30 MHz to 1 GHz, Vertical (Peak)

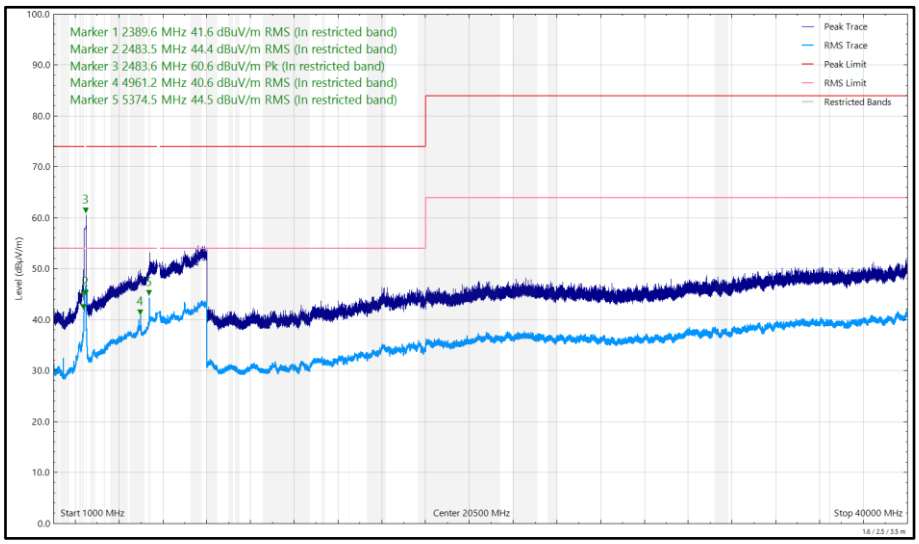

Figure 49 - 2442 MHz (CH7), HT20, Core 0 and 5788 MHz, HDR4, ePA, Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
2389.669	37.05	54.00	-16.95	RMS	63	387	Horizontal
2389.923	57.43	74.00	-16.57	Peak	350	370	Vertical
2389.954	42.10	54.00	-11.90	RMS	37	290	Vertical
2399.154	63.21	80.00	-16.79	Peak	10	367	Vertical
2483.516	42.09	54.00	-11.91	RMS	52	398	Horizontal
2483.566	47.03	54.00	-6.97	RMS	10	392	Vertical
2483.863	59.35	74.00	-14.65	Peak	59	397	Horizontal
2484.135	63.85	74.00	-10.15	Peak	6	386	Vertical
4883.552	39.66	54.00	-14.34	RMS	360	360	Vertical
5148.685	39.50	54.00	-14.50	RMS	10	286	Vertical
5149.075	37.30	54.00	-16.70	RMS	58	400	Horizontal
5443.540	41.19	54.00	-12.81	RMS	0	311	Vertical
5443.748	38.26	54.00	-15.74	RMS	69	315	Horizontal

Table 20 - 2442 MHz (CH7), HT20, Core 1 and 5204 MHz, HDR4, ePA, Core 0, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

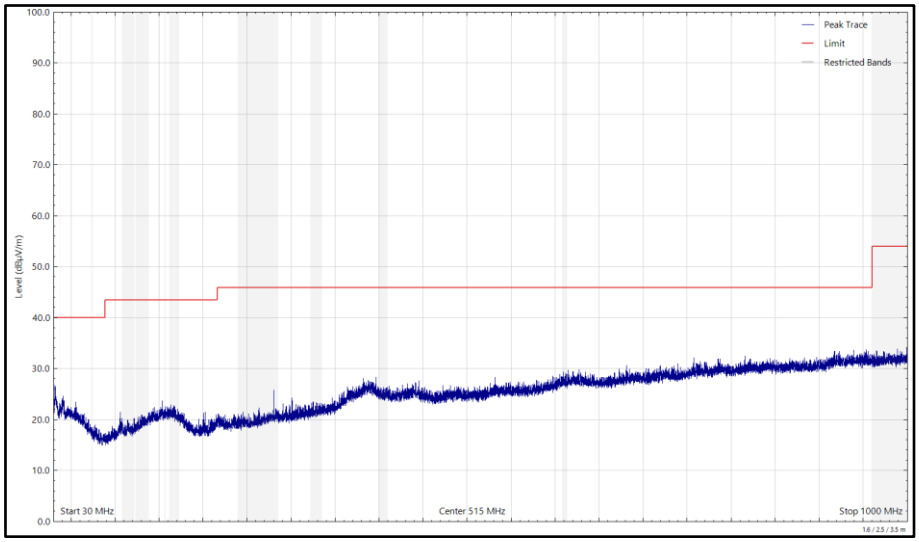

Figure 50 - 2442 MHz (CH7), HT20, Core 1 and 5204 MHz, HDR4, ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)

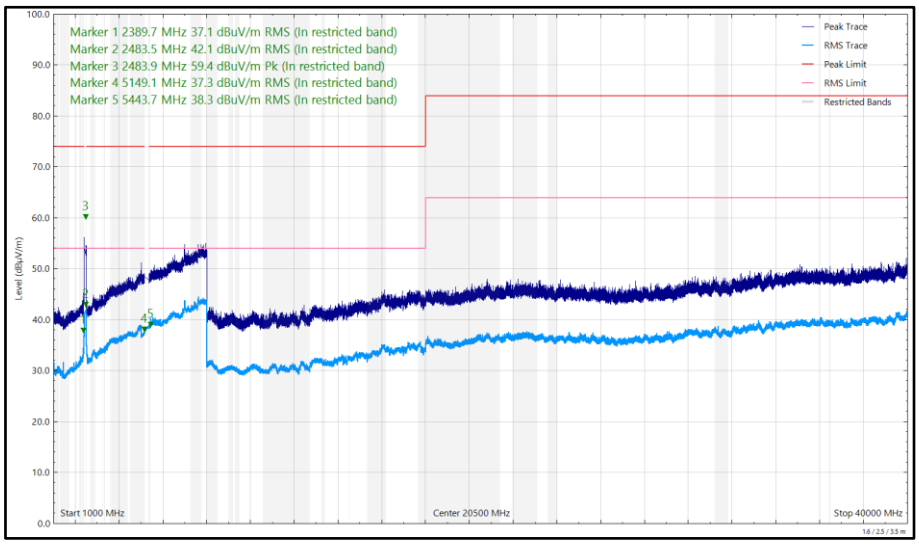

Figure 51 - 2442 MHz (CH7), HT20, Core 1 and 5204 MHz, HDR4, ePA, Core 0, 1 GHz to 40 GHz, Horizontal

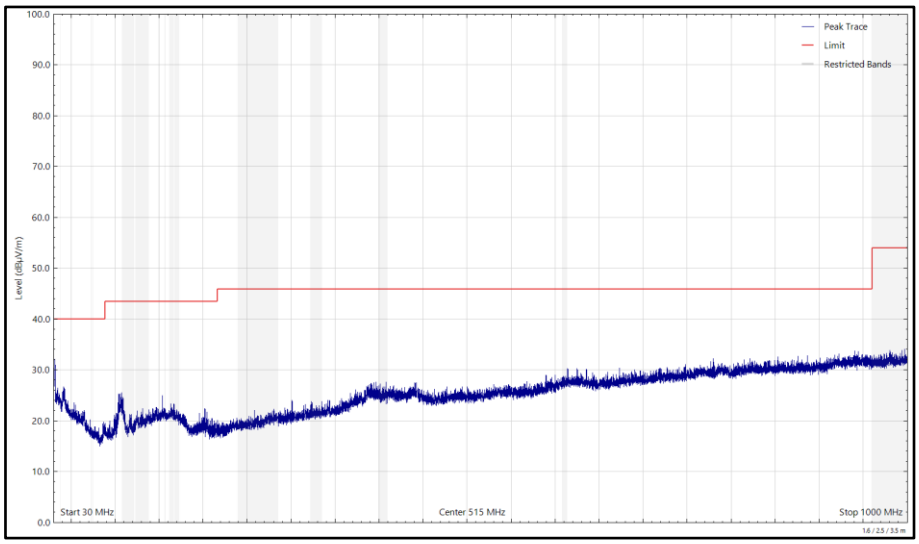

Figure 52 - 2442 MHz (CH7), HT20, Core 1 and 5204 MHz, HDR4, ePA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)

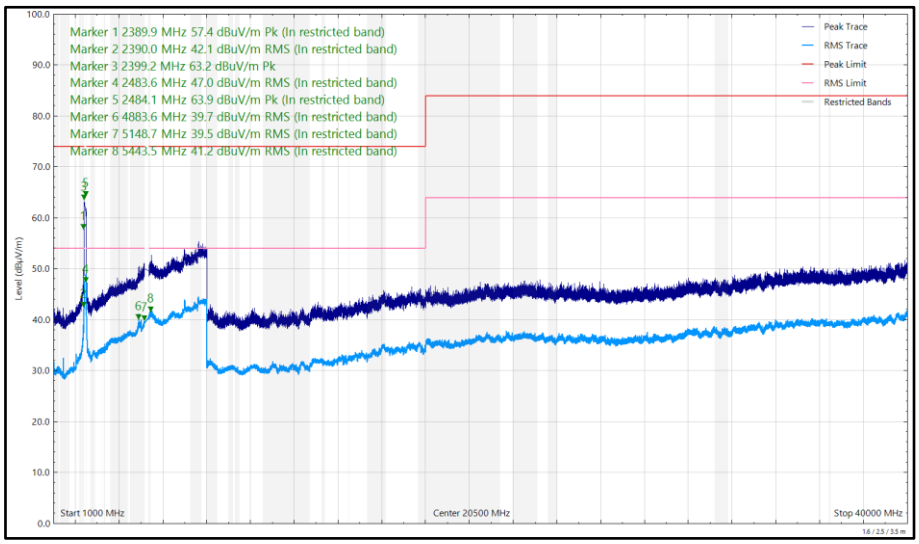

Figure 53 - 2442 MHz (CH7), HT20, Core 1 and 5204 MHz, HDR4, ePA, Core 0, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
2386.915	58.87	74.00	-15.13	Peak	31	329	Vertical
2389.792	36.89	54.00	-17.11	RMS	52	400	Horizontal
2389.897	41.88	54.00	-12.12	RMS	40	375	Vertical
2398.355	63.33	80.00	-16.67	Peak	32	303	Vertical
2483.504	47.51	54.00	-6.49	RMS	17	334	Vertical
2483.681	41.86	54.00	-12.14	RMS	52	382	Horizontal
2483.711	64.14	74.00	-9.86	Peak	16	375	Vertical
5374.472	42.87	54.00	-11.13	RMS	0	326	Vertical
5374.538	38.21	54.00	-15.79	RMS	293	372	Horizontal

Table 21 - 2442 MHz (CH7), 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.

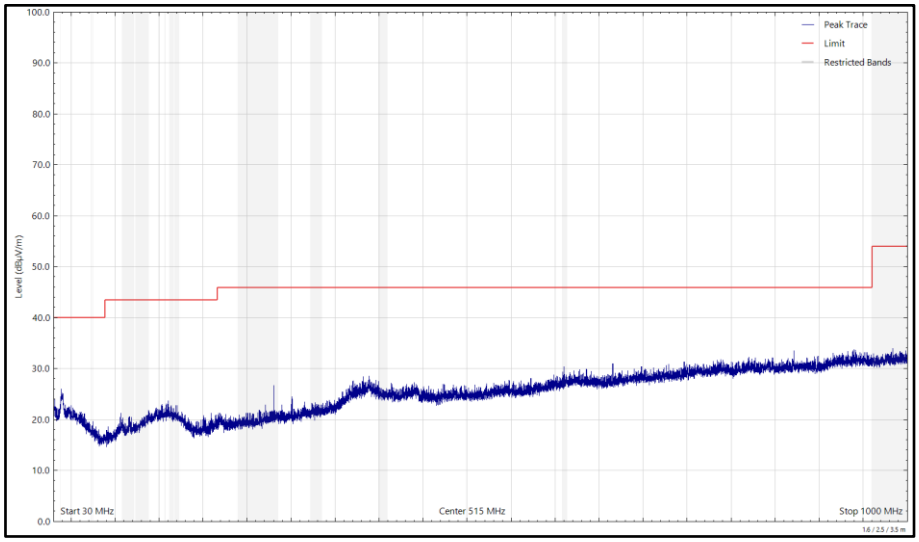

Figure 54 - 2442 MHz (CH7), HT20, Core 1 and 5788 MHz, HDR4, ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)

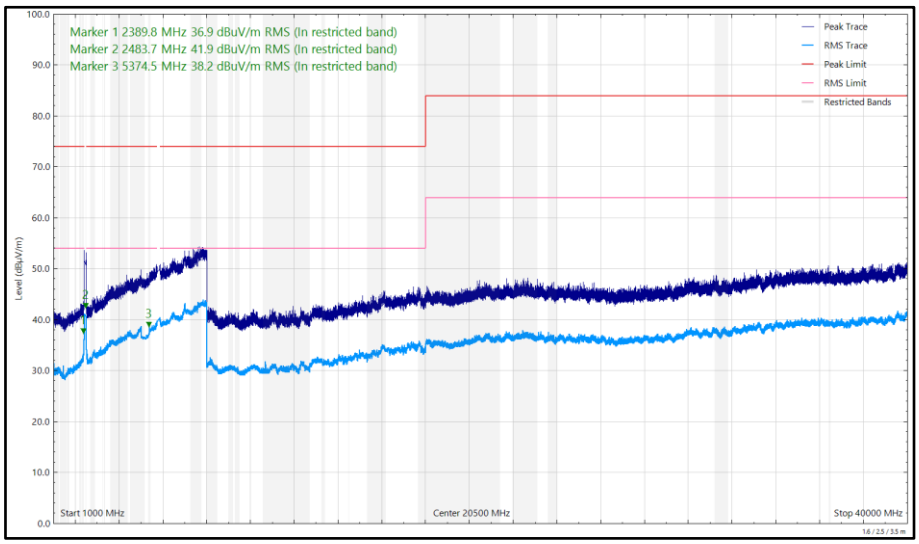

Figure 55 - 2442 MHz (CH7), HT20, Core 1 and 5788 MHz, HDR4, ePA, Core 0, 1 GHz to 40 GHz, Horizontal

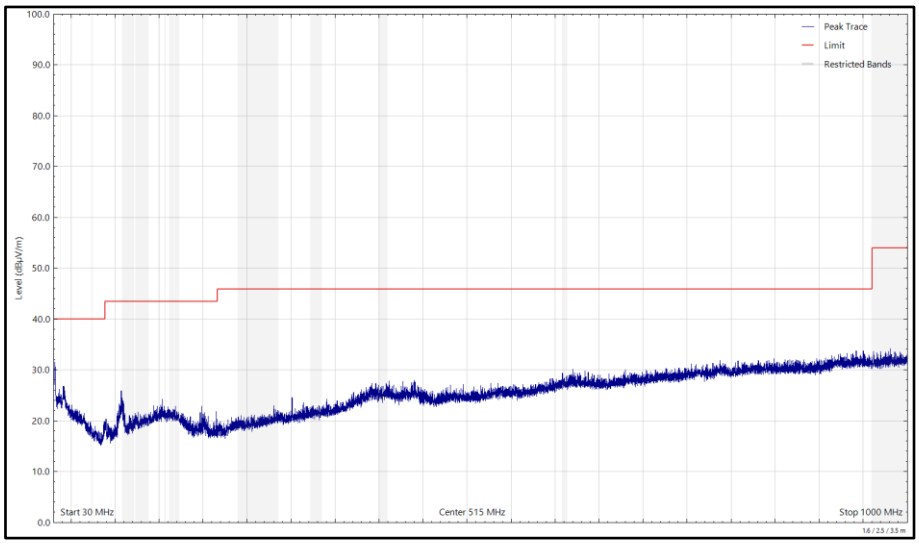

Figure 56 - 2442 MHz (CH7), HT20, Core 1 and 5788 MHz, HDR4, ePA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)

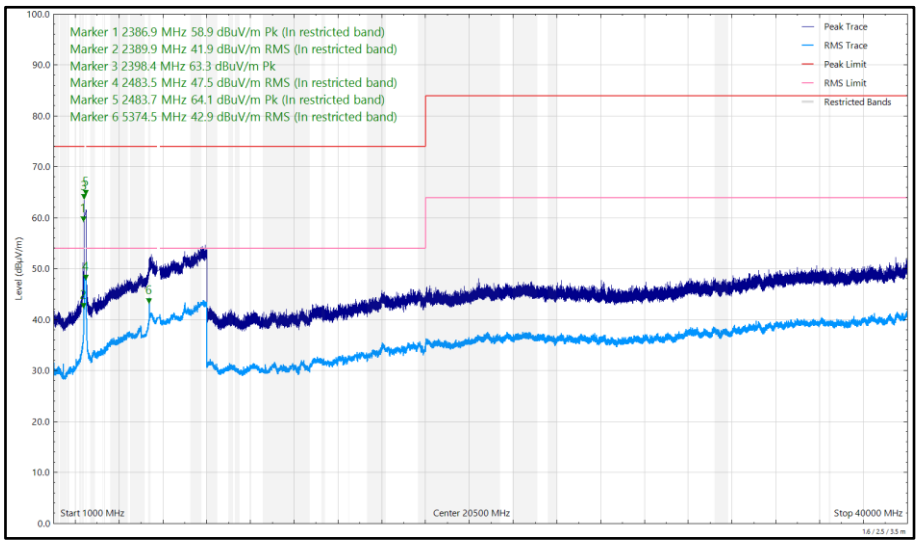

Figure 57 - 2442 MHz (CH7), HT20, Core 1 and 5788 MHz, HDR4, ePA, Core 0, 1 GHz to 40 GHz, Vertical

FCC 47 CFR Part 15

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)	30 dBc
Part 15.407 (b)	-27 dBm/MHz e.i.r.p.
Part 15.209	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
2389.814	35.94	54.00	-18.06	RMS	340	333	Vertical
2483.624	36.91	54.00	-17.09	RMS	349	366	Vertical
2802.158	36.10	54.00	-17.90	RMS	349	350	Vertical
4877.968	42.06	54.00	-11.94	RMS	65	380	Horizontal
4878.223	46.18	54.00	-7.82	RMS	7	368	Vertical
4880.663	55.00	74.00	-19.00	Peak	360	287	Vertical
5117.348	55.96	74.00	-18.04	Peak	9	340	Vertical
5119.143	43.61	54.00	-10.39	RMS	10	296	Vertical
5119.985	39.72	54.00	-14.28	RMS	71	282	Horizontal
5356.241	59.22	74.00	-14.78	Peak	360	268	Vertical
5357.457	43.13	54.00	-10.87	RMS	76	332	Horizontal
5359.251	46.66	54.00	-7.34	RMS	1	271	Vertical

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.

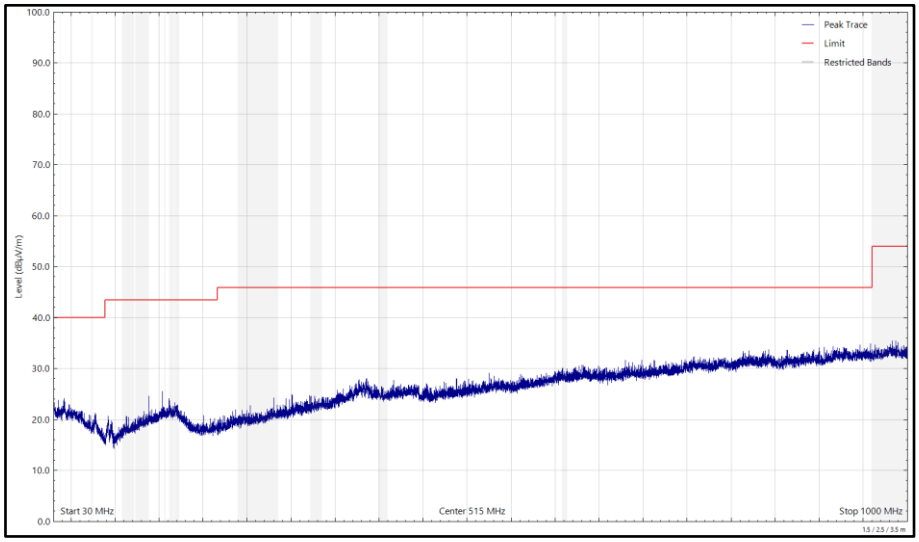

Figure 58 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)

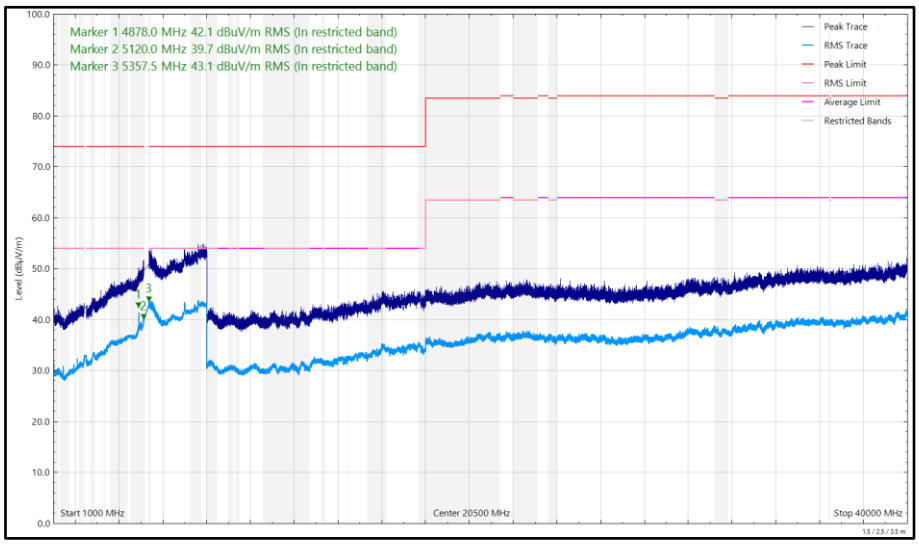

Figure 59 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 0, 1 GHz to 40 GHz, Horizontal

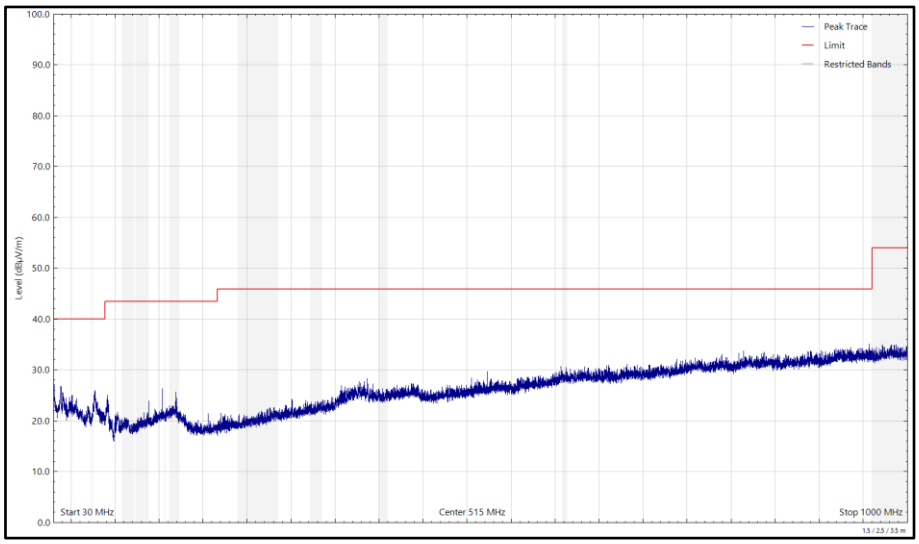

Figure 60 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)