FCC Test Report

Apple Inc
Model: A3186

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 08:51:46 +01'00'

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

FCC ID: BCGA3186

COMMERCIAL-IN-CONFIDENCE

Document 75961394-109 Issue 01

SIGNATURE			
NAME	**JOB TITLE**	**RESPONSIBLE FOR**	**ISSUE DATE**
Steve Marshall	Senior Engineer	Authorised Signatory	16 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	Lauren Walters	16 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.

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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

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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	16-October-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	05-August-2024
Finish of Test	18-September-2024
Name of Engineer(s)	Ahmed Al Derdiri, Akhil Rajendran Bhaskaran Nair, Ian Hart, Ioan-Alexandru Bogatu, Thomas Randall, Colin Brain, James Woods 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 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: A3186			
Serial Number	Hardware Version	Software Version	Firmware
GQFXQXKN7J	REV1.0	24A32191n	WLAN: 23.30.16 Bluetooth: 22.1.65.459 Narrowband: 22.1.65.459 Thread: 22.1.65.459
FW299237X1	REV1.0	24A32191i	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: A3186, Serial Number: GQFXQXKN7J			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A3186, Serial Number: FW299237X1			
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, Akhil Rajendran Bhaskaran Nair, Ian Hart, Ioan-Alexandru Bogatu and Thomas Randall	UKAS
Configuration and Mode: 6 GHz WLAN and 2.4 GHz Bluetooth		
Radiated Spurious Emissions (Simultaneous Transmission)	Akhil Rajendran Bhaskaran Nair, Colin Brain, Ioan-Alexandru Bogatu, James Woods and Thomas Randall	UKAS
Configuration and Mode: 2.4 GHz WLAN and Narrowband		
Radiated Spurious Emissions (Simultaneous Transmission)	Colin Brain, Ian Hart, Ioan-Alexandru Bogatu and Thomas Randall	UKAS
Configuration and Mode: 5 GHz WLAN and Thread		
Radiated Spurious Emissions (Simultaneous Transmission)	Ahmed Al Derdiri, Akhil Rajendran Bhaskaran Nair, Ian Hart, Ioan-Alexandru Bogatu, Thomas Randall and Vineeth Nagaraj	UKAS
Configuration and Mode: 6 GHz WLAN and Thread		
Radiated Spurious Emissions (Simultaneous Transmission)	Akhil Rajendran Bhaskaran Nair, Ian Hart, Ioan-Alexandru Bogatu, James Woods, Thomas Randall and Vineeth Nagaraj	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

A3186, S/N: GQFXQXKN7J - Modification State 0
A3186, S/N: FW299237X1 - Modification State 0

2.1.3 Date of Test

05-August-2024 to 18-September-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

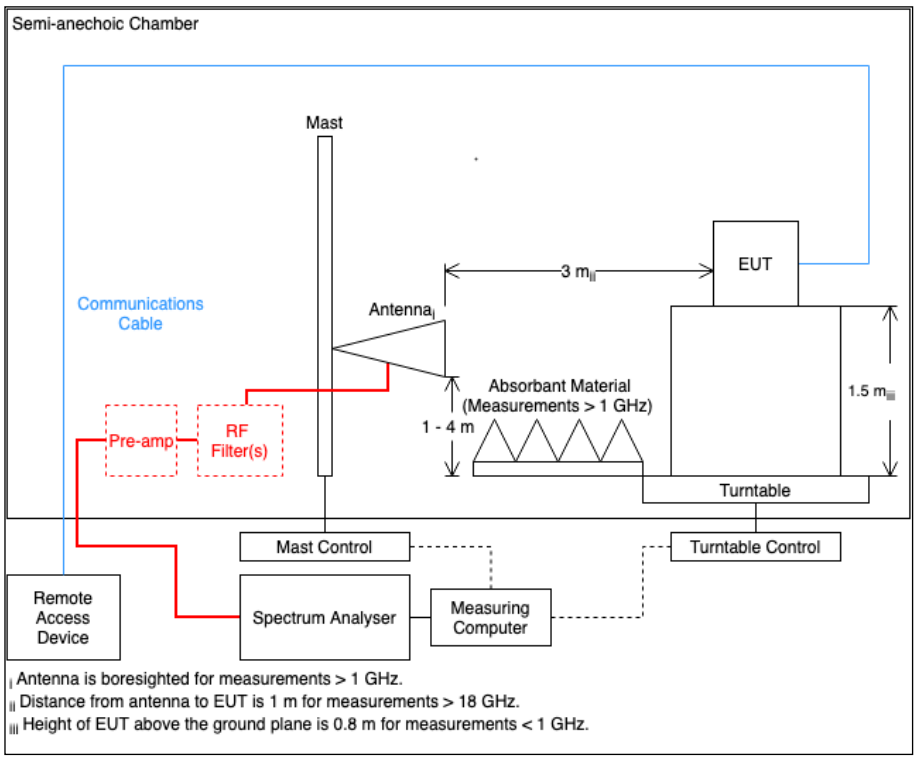

Figure 1

2.1.6 Environmental Conditions

Ambient Temperature	20.3 - 24.5 °C
Relative Humidity	39.2 - 53.5 %

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
4881.628	40.45	54.00	-13.55	CISPR Avg	360	327	Vertical
5141.780	56.07	74.00	-17.93	Peak	1	314	Vertical
5146.216	44.36	54.00	-9.64	RMS	1	314	Vertical
5374.371	58.64	74.00	-15.36	Peak	357	287	Vertical
5381.714	46.26	54.00	-7.74	RMS	357	287	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.

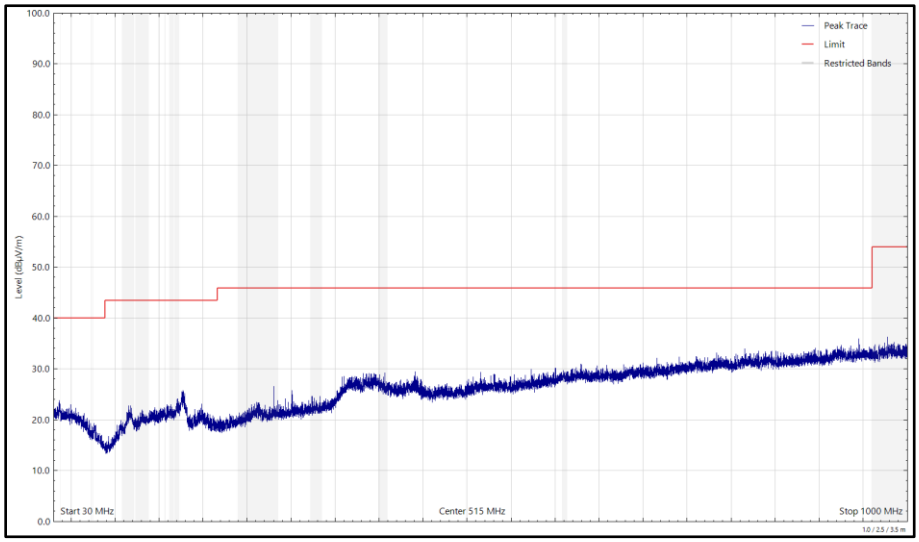

Figure 2 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Horizontal (Peak)

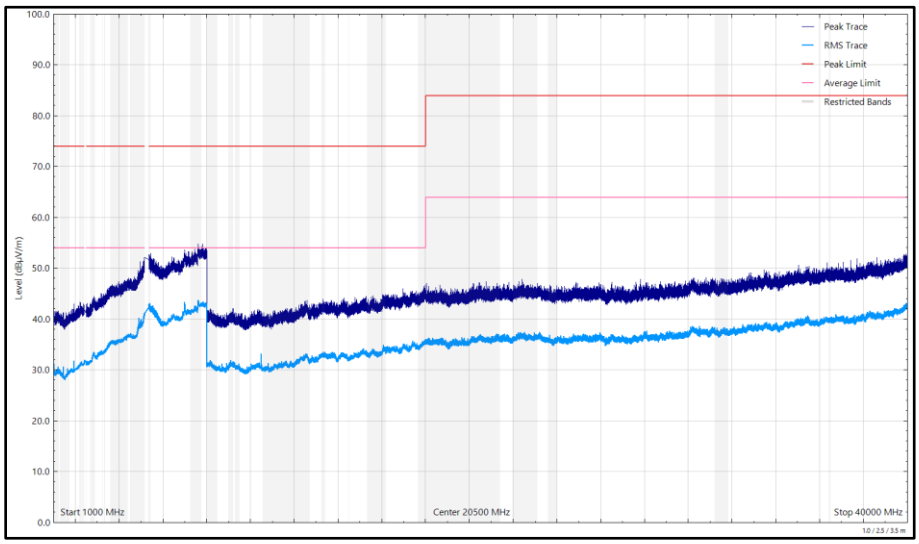

Figure 3 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Horizontal

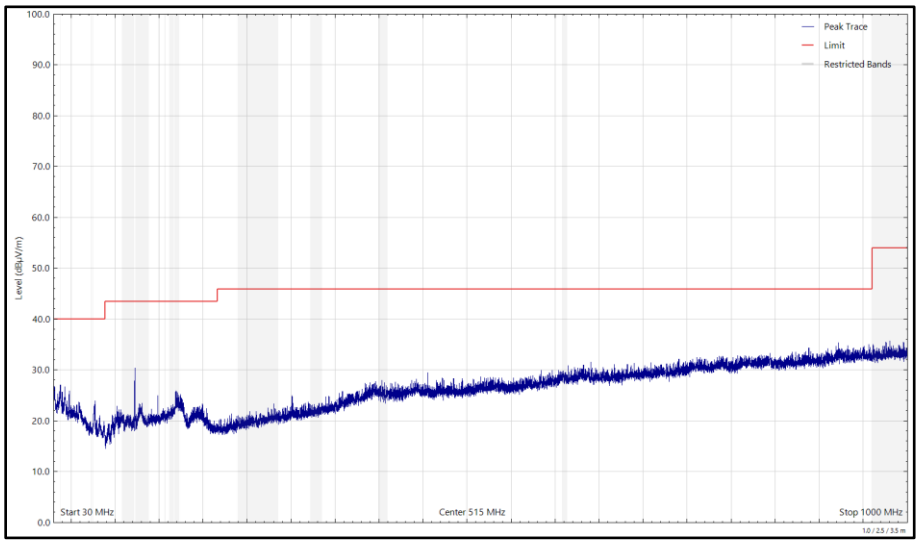

Figure 4 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Vertical (Peak)

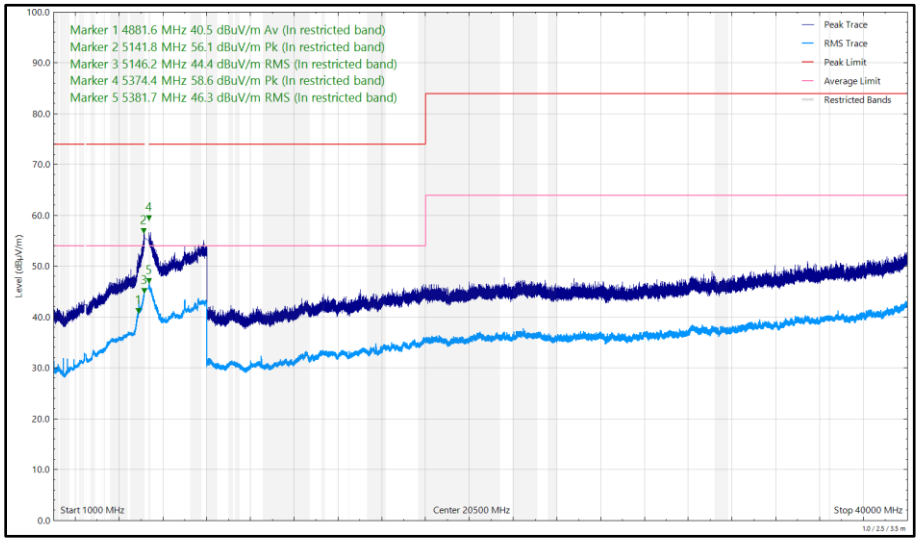

Figure 5 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
409.766	25.54	46.00	-20.46	Q-Peak	63	170	Horizontal
4882.133	38.93	54.00	-15.07	CISPR Avg	0	329	Vertical
5456.387	46.09	54.00	-7.91	RMS	360	275	Vertical
5456.764	58.05	74.00	-15.95	Peak	360	275	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.

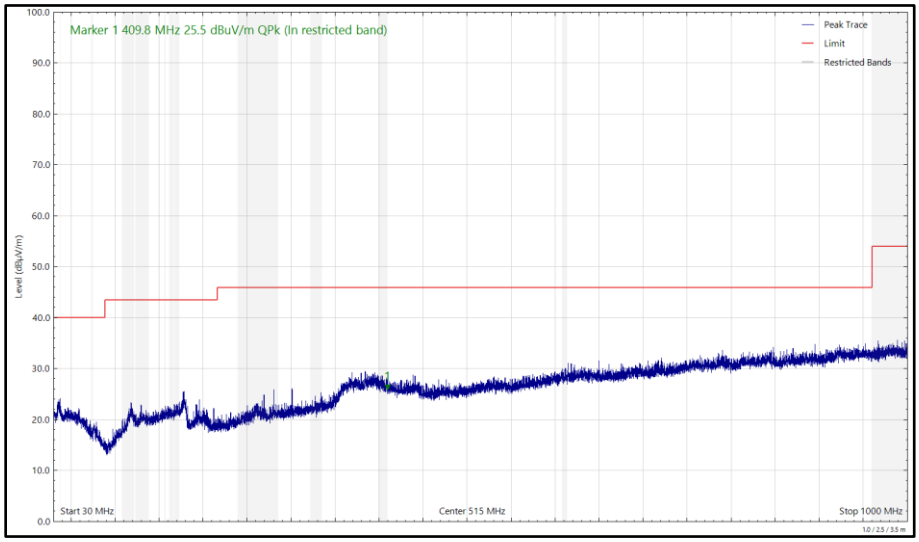

Figure 6 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Horizontal (Peak)

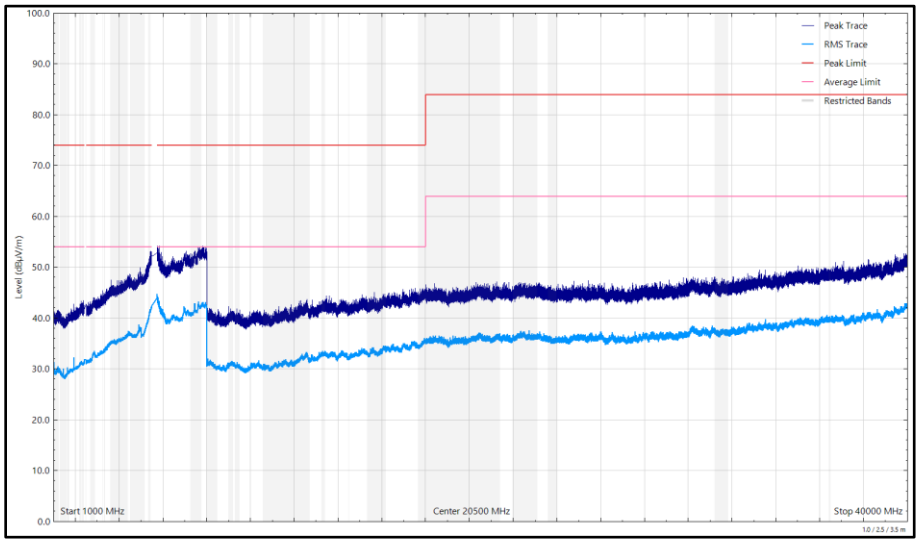

Figure 7 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Horizontal

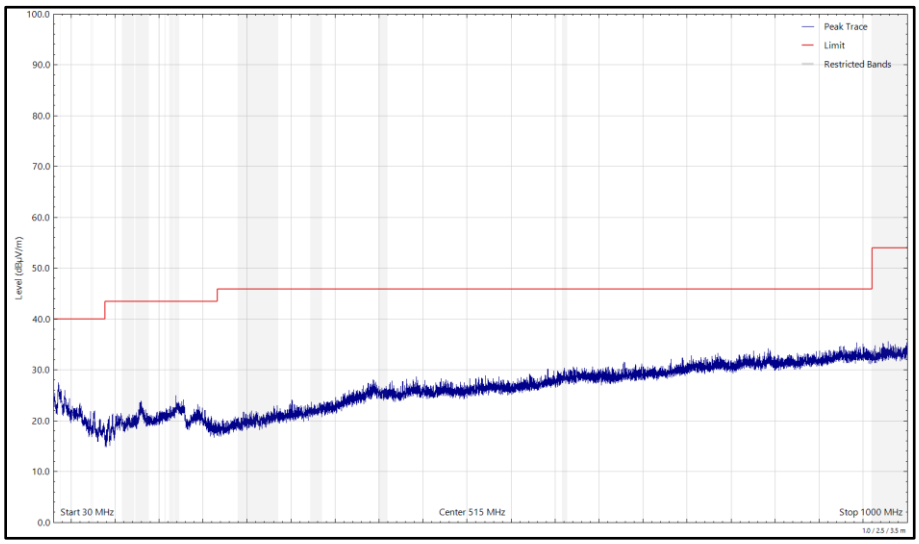

Figure 8 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Vertical (Peak)

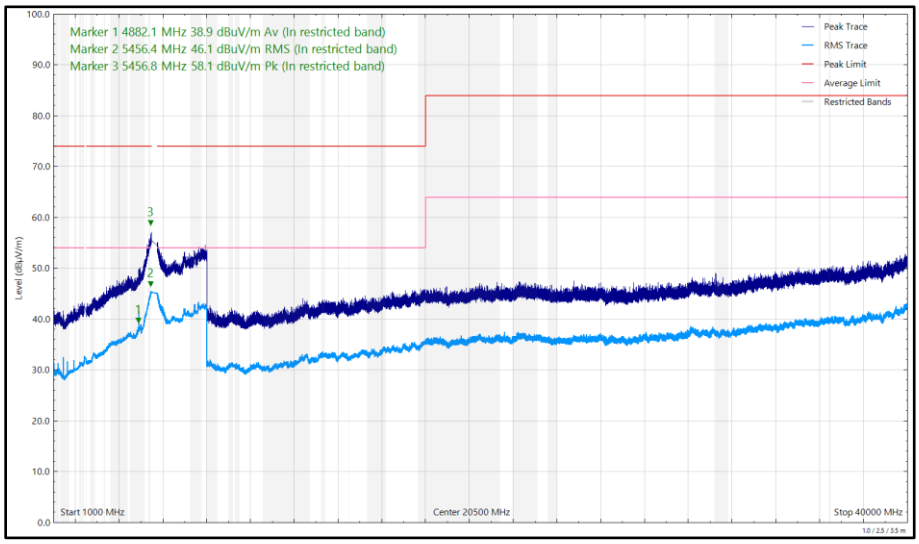

Figure 9 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
404.728	25.25	46.00	-20.75	Q-Peak	79	191	Vertical
409.730	25.65	46.00	-20.35	Q-Peak	218	240	Horizontal
4881.903	37.76	54.00	-16.24	CISPR Avg	0	225	Vertical
5445.461	55.80	74.00	-18.20	Peak	3	270	Vertical
5457.041	44.54	54.00	-9.46	RMS	358	275	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.

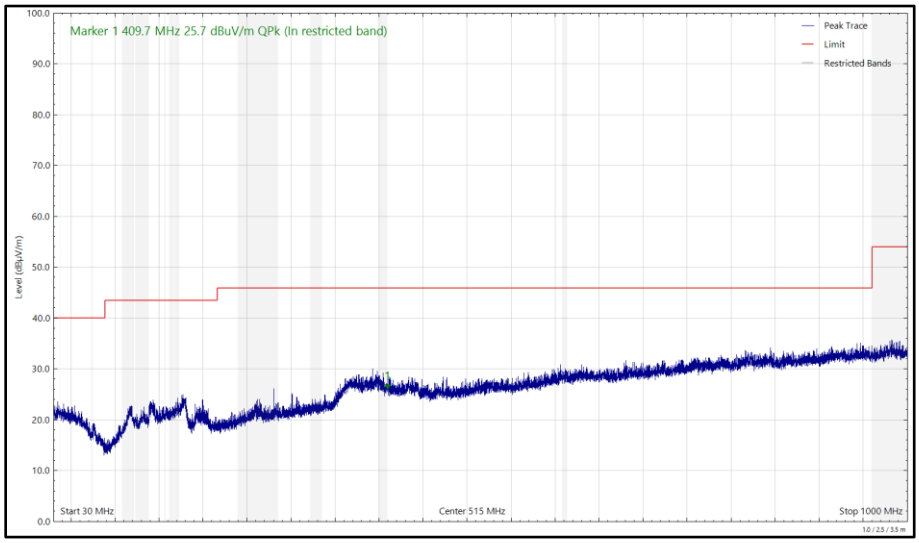

Figure 10 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Horizontal (Peak)

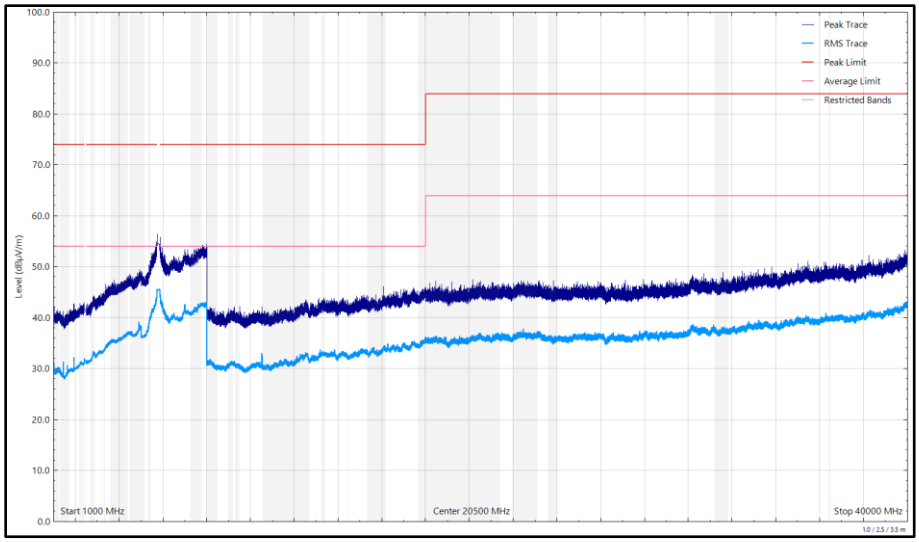

Figure 11 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Horizontal

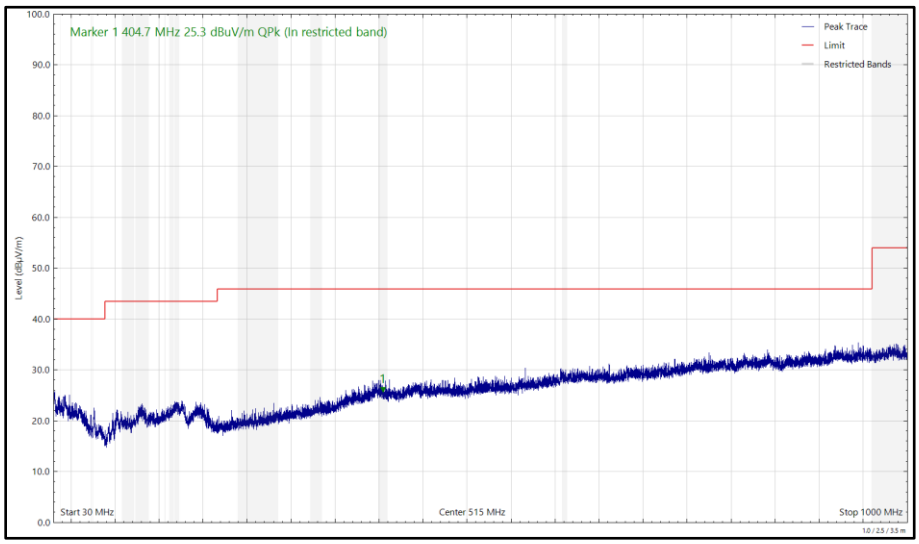

Figure 12 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Vertical (Peak)

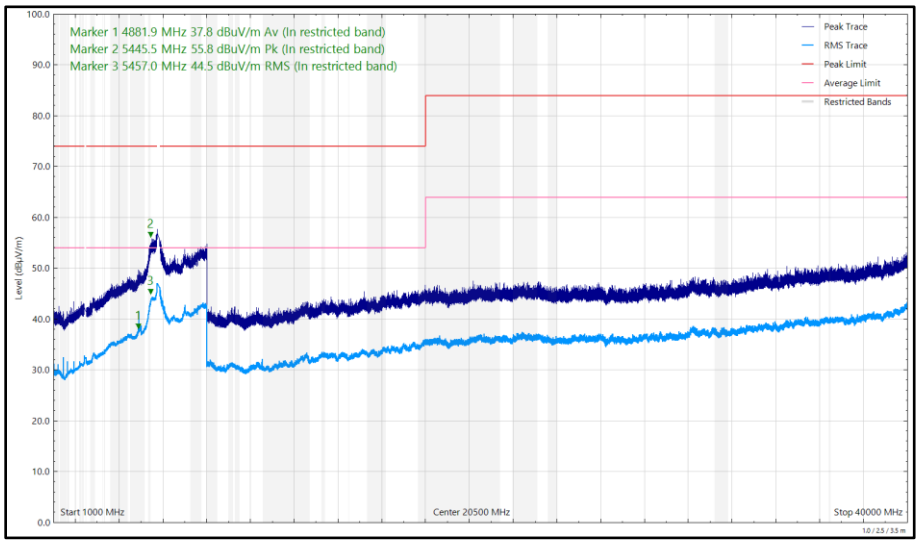

Figure 13 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
2389.659	32.31	54.00	-21.69	CISPR Avg	15	383	Vertical
2484.075	33.33	54.00	-20.67	CISPR Avg	33	302	Vertical
2800.932	34.35	54.00	-19.65	RMS	4	373	Vertical
4881.478	38.52	54.00	-15.48	CISPR Avg	66	400	Horizontal
4881.518	41.76	54.00	-12.24	CISPR Avg	6	331	Vertical
5141.919	58.53	74.00	-15.47	Peak	9	272	Vertical
5149.590	45.80	54.00	-8.20	RMS	10	282	Vertical
5149.849	41.26	54.00	-12.74	RMS	73	306	Horizontal
5352.316	47.72	54.00	-6.28	RMS	358	285	Vertical
5365.847	43.38	54.00	-10.62	RMS	74	342	Horizontal
5369.428	59.78	74.00	-14.22	Peak	3	282	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, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

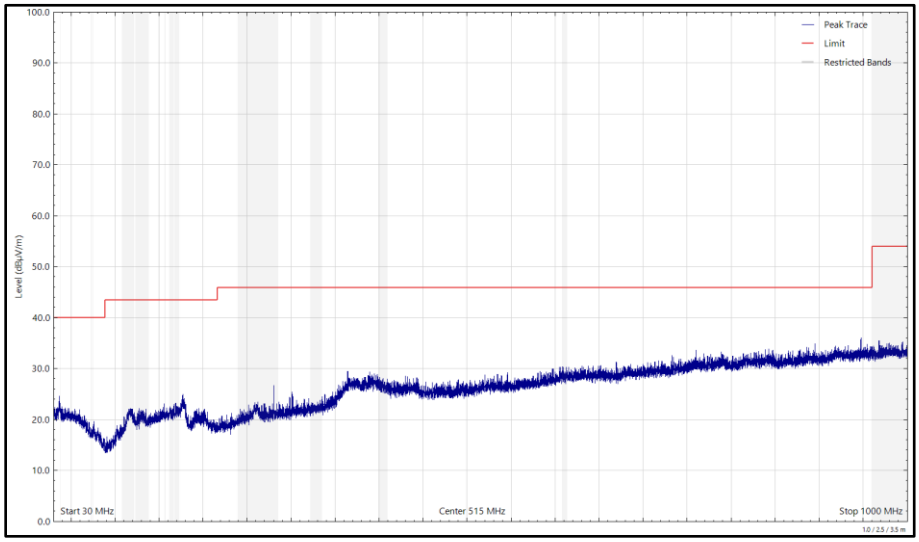

Figure 14 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

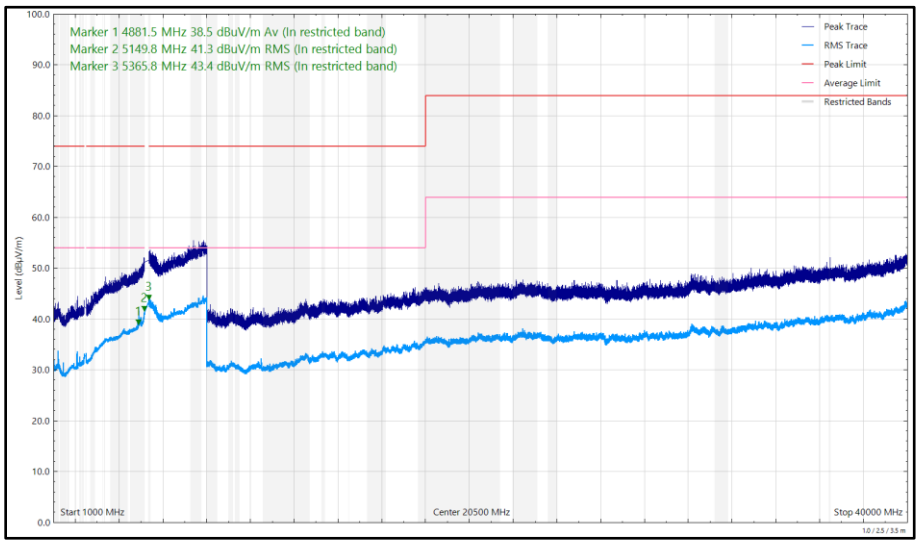

Figure 15 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

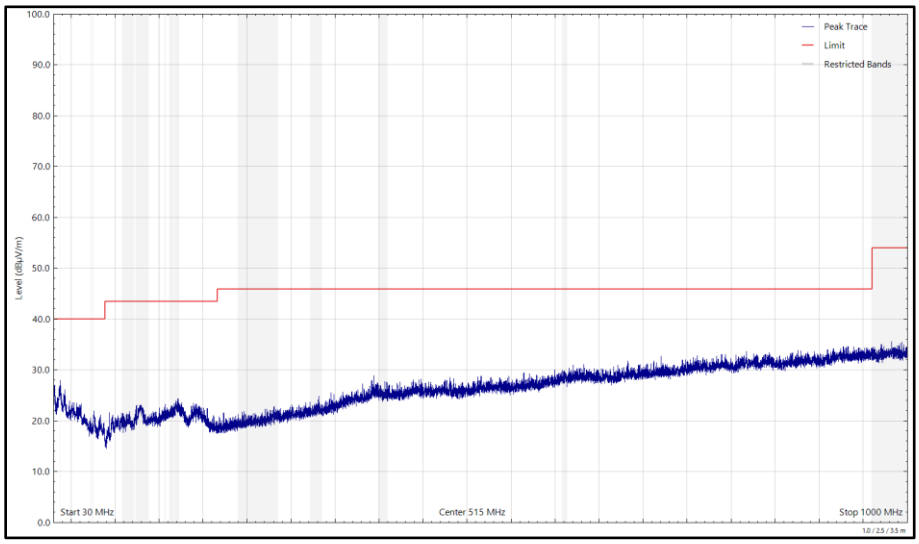

Figure 16 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

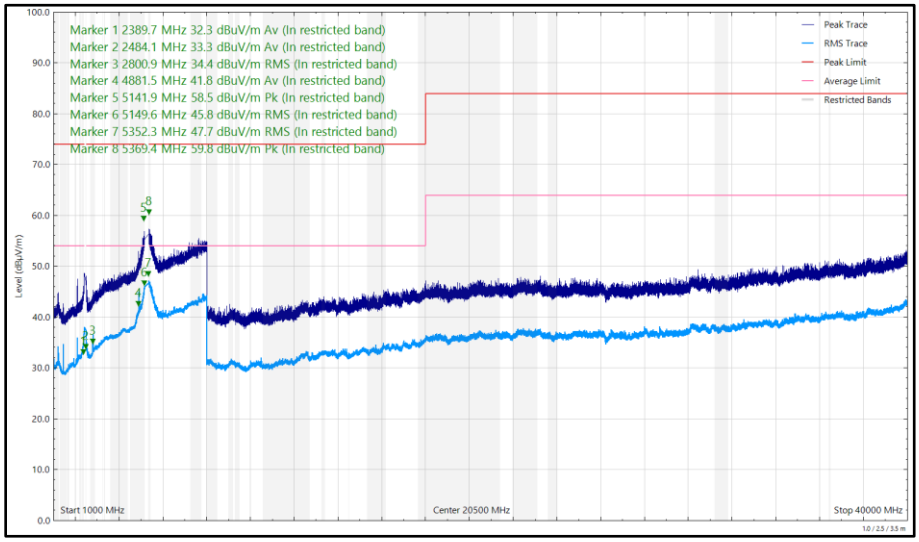

Figure 17 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
130.175	19.35	43.50	-24.15	Q-Peak	360	300	Vertical
2386.737	32.56	54.00	-21.44	CISPR Avg	10	328	Vertical
2485.855	31.47	54.00	-22.53	CISPR Avg	1	381	Vertical
4881.778	40.50	54.00	-13.50	CISPR Avg	13	319	Vertical
4882.518	37.38	54.00	-16.62	CISPR Avg	75	390	Horizontal
5436.675	46.43	54.00	-7.57	RMS	4	280	Vertical
5443.146	58.60	74.00	-15.40	Peak	357	286	Vertical
5443.655	54.37	74.00	-19.63	Peak	75	376	Horizontal
5446.761	43.14	54.00	-10.86	RMS	74	350	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.

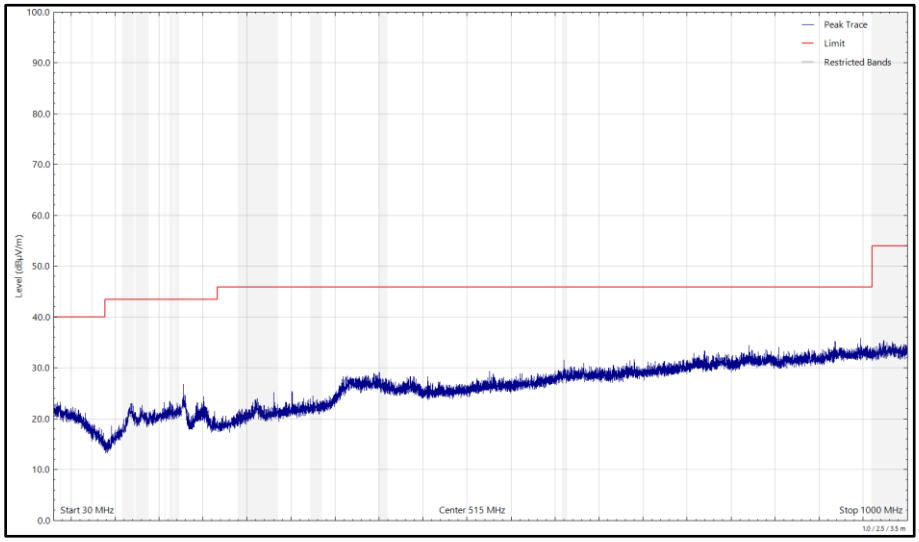

Figure 18 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

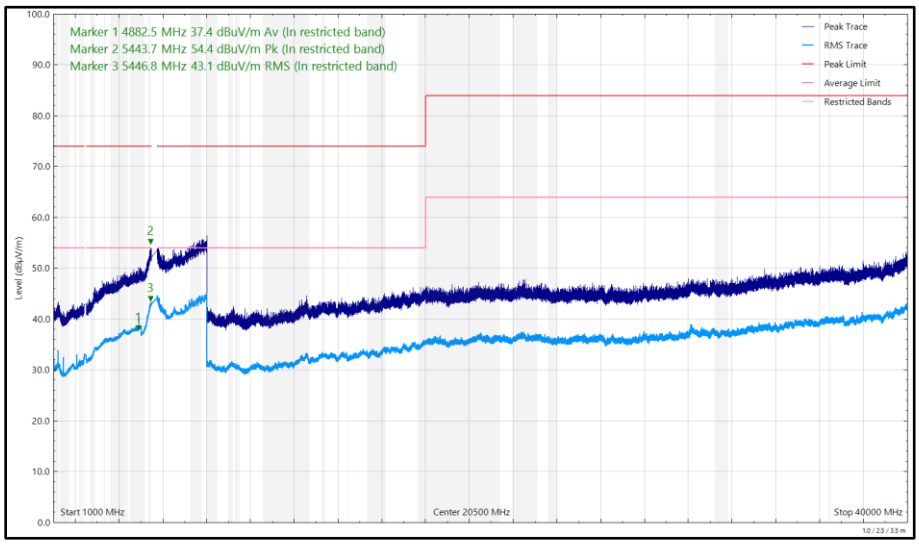

Figure 19 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

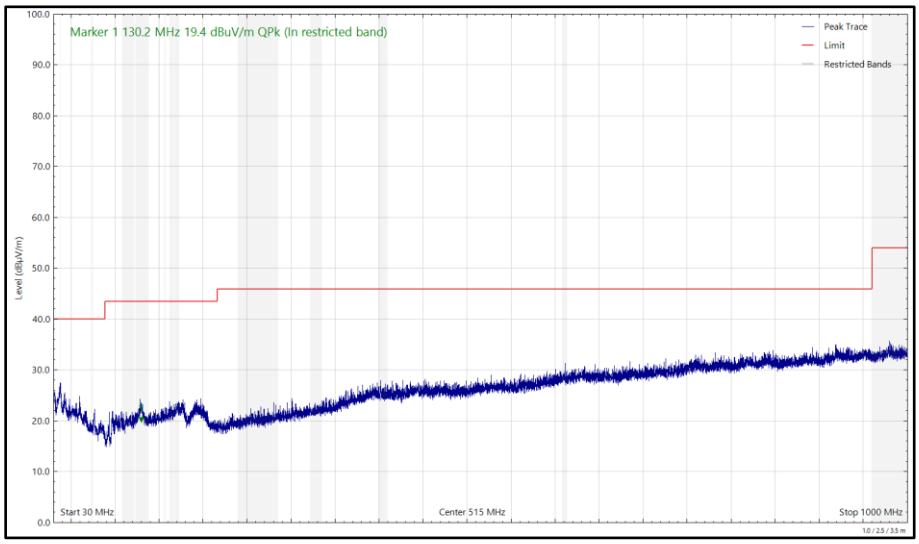

Figure 20 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

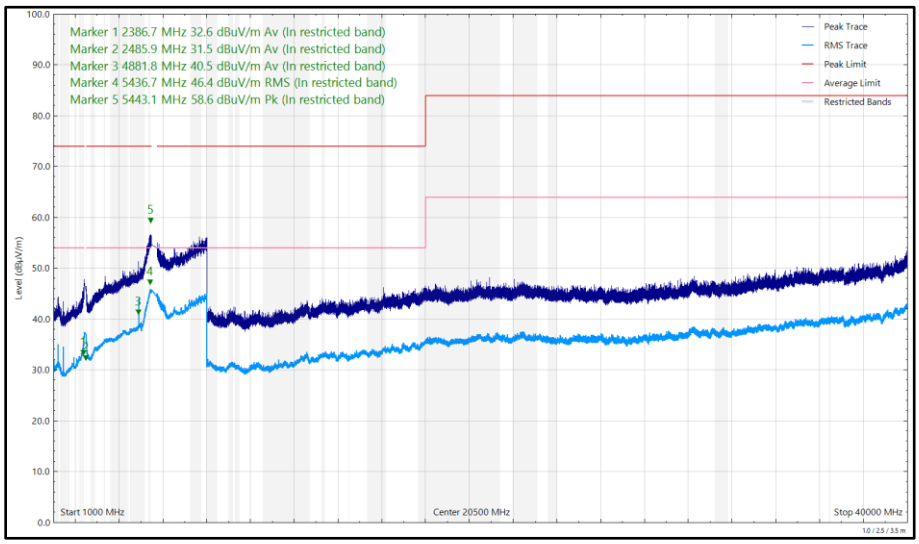

Figure 21 - U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
2381.541	32.31	54.00	-21.69	CISPR Avg	18	331	Vertical
2486.163	32.20	54.00	-21.80	CISPR Avg	39	349	Vertical
4881.533	37.19	54.00	-16.81	CISPR Avg	66	400	Horizontal
4882.068	40.76	54.00	-13.24	CISPR Avg	10	346	Vertical
5399.142	55.79	74.00	-18.21	Peak	358	270	Vertical
5450.859	41.84	54.00	-12.16	RMS	73	388	Horizontal
5453.601	45.24	54.00	-8.76	RMS	358	277	Vertical

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, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

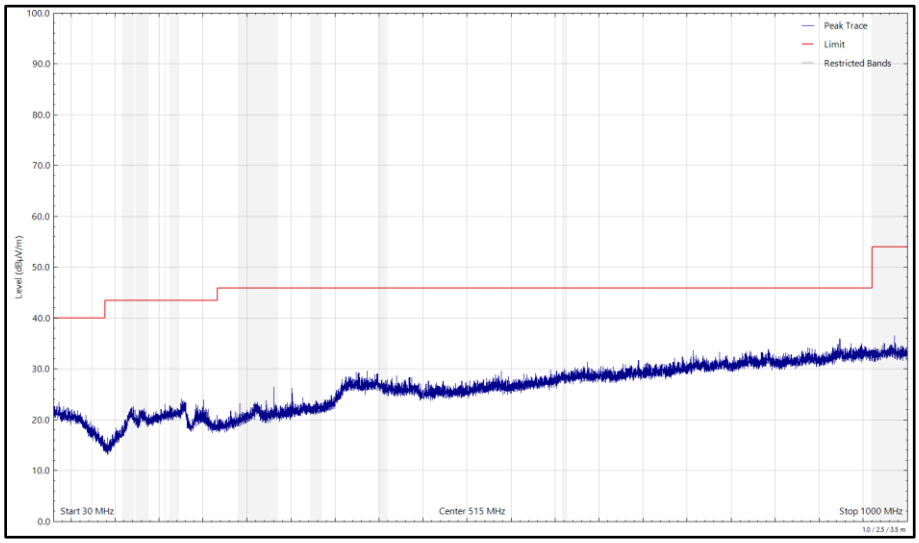

Figure 22 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

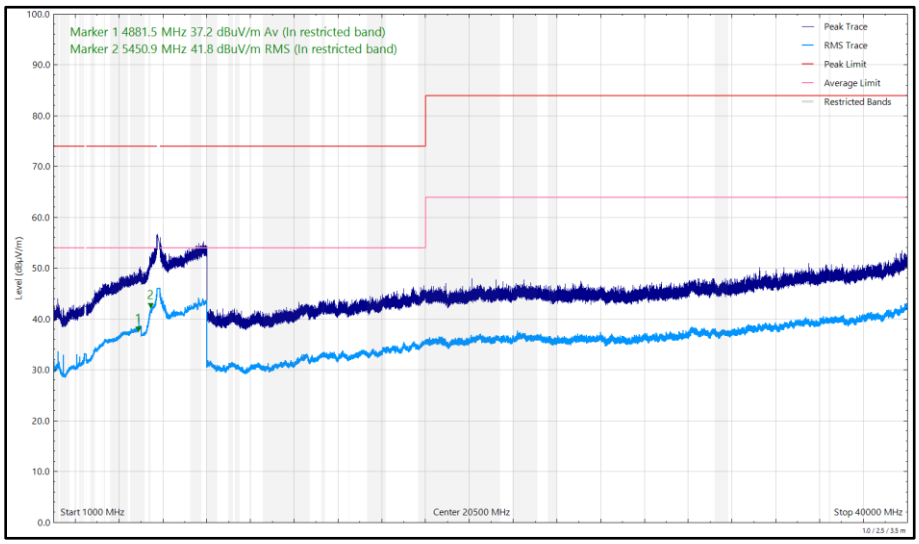

Figure 23 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

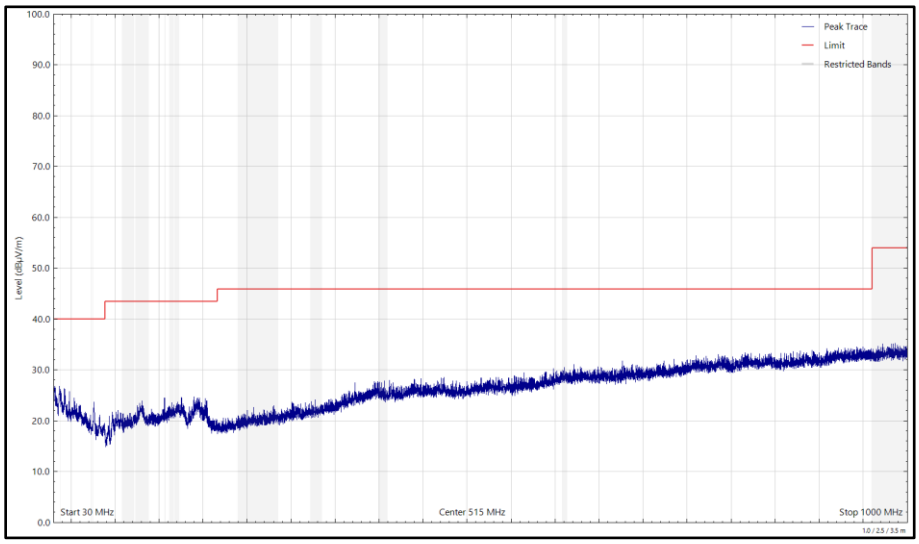

Figure 24 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

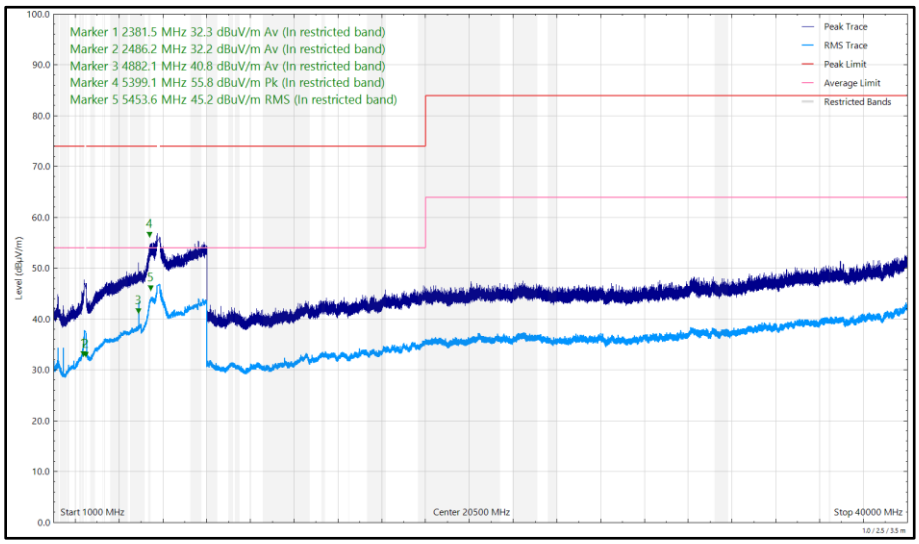

Figure 25 - U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

FCC 47 CFR Part 15, 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
281.377	21.21	46.00	-24.79	Q-Peak	219	100	Horizontal
2388.382	32.19	54.00	-21.81	CISPR Avg	24	307	Vertical
2484.141	32.43	54.00	-21.57	CISPR Avg	19	347	Vertical
7323.366	40.52	54.00	-13.48	CISPR Avg	69	345	Horizontal
7323.440	42.10	54.00	-11.90	CISPR Avg	29	239	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.

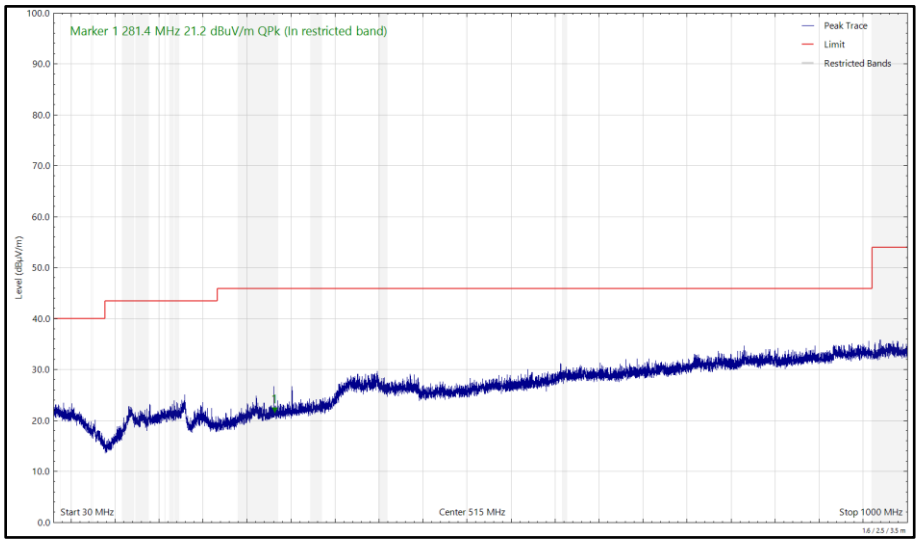

Figure 26 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

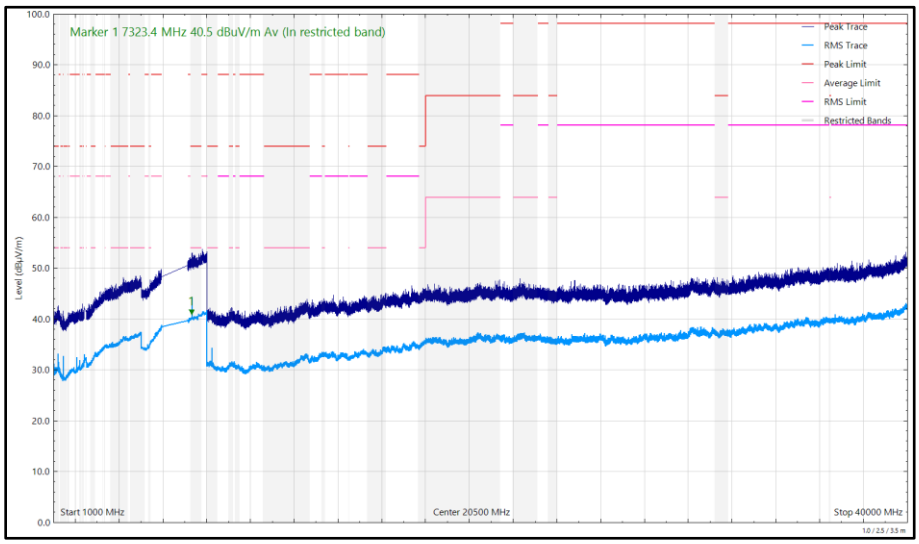

Figure 27 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

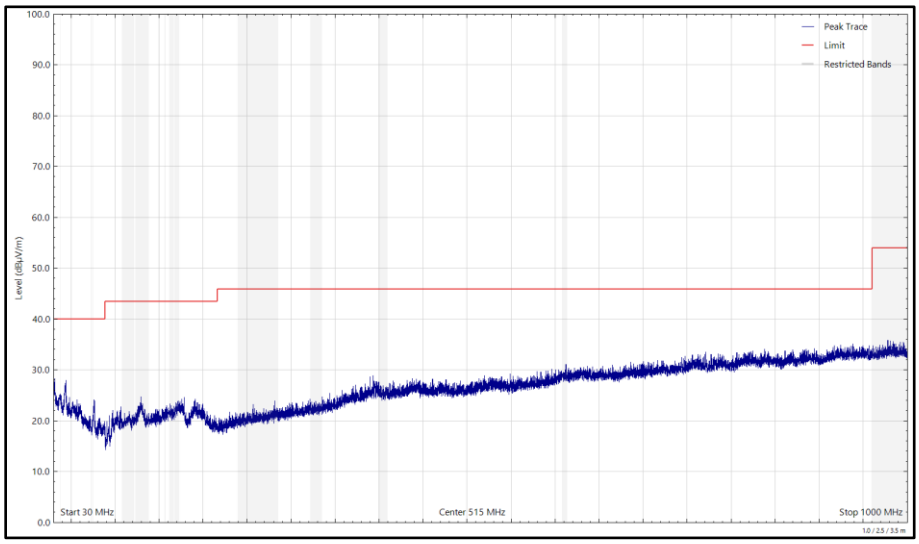

Figure 28 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

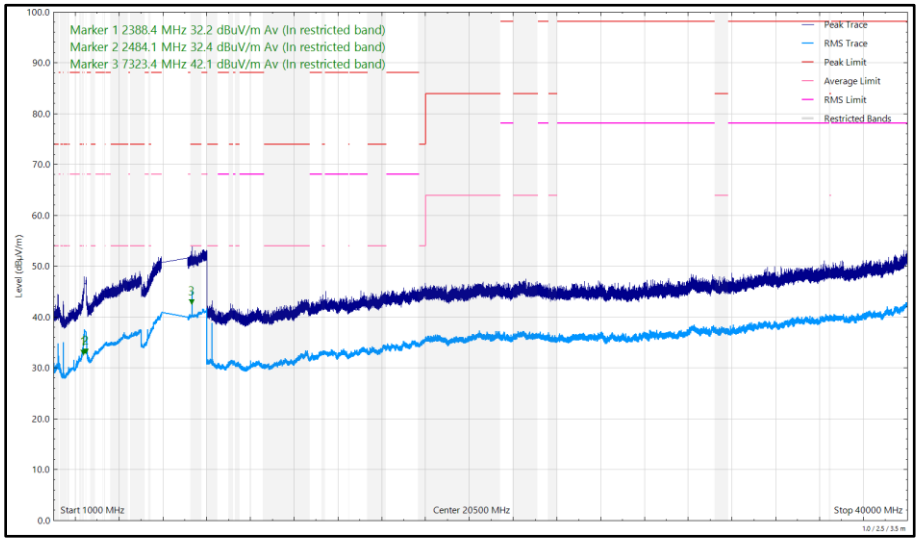

Figure 29 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
277.728	20.92	46.00	-25.08	Q-Peak	26	158	Horizontal
2385.408	32.44	54.00	-21.56	CISPR Avg	12	363	Vertical
2485.297	32.71	54.00	-21.29	CISPR Avg	12	302	Vertical
7322.617	40.51	54.00	-13.49	CISPR Avg	82	378	Horizontal
7323.342	55.89	74.00	-18.11	Peak	343	275	Vertical
7323.731	40.76	54.00	-13.24	CISPR Avg	30	236	Vertical

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.

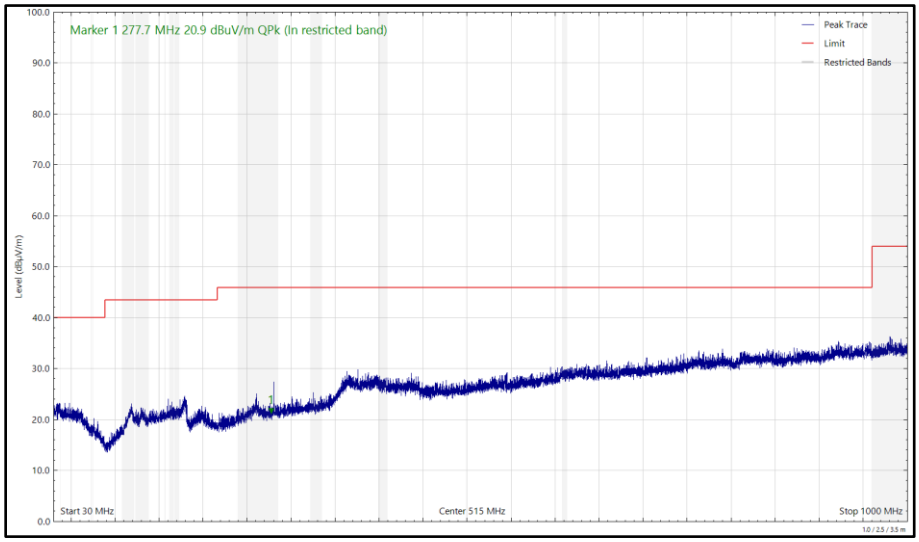

Figure 30 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

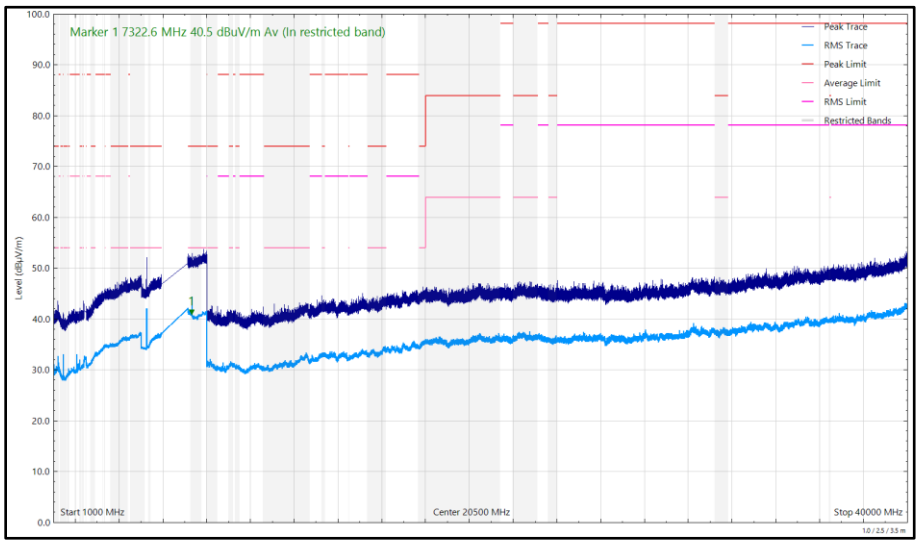

Figure 31 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

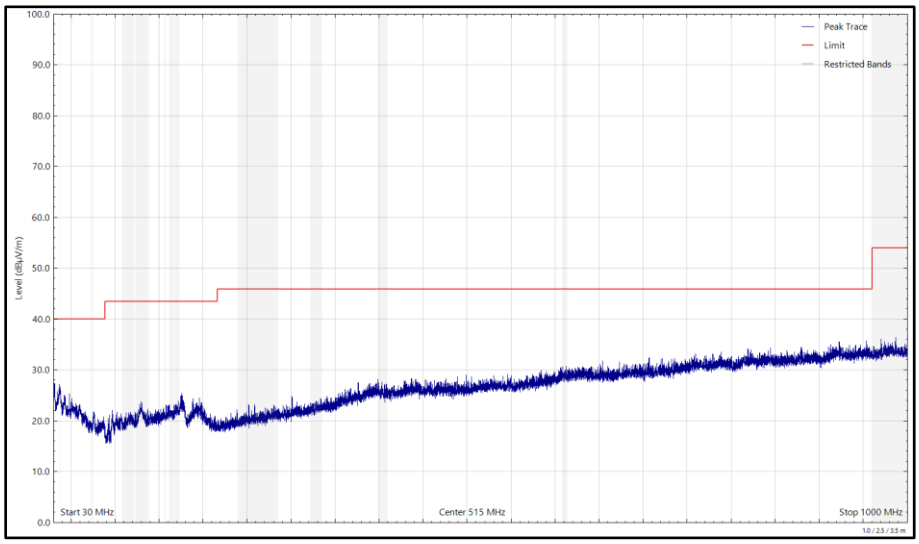

Figure 32 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

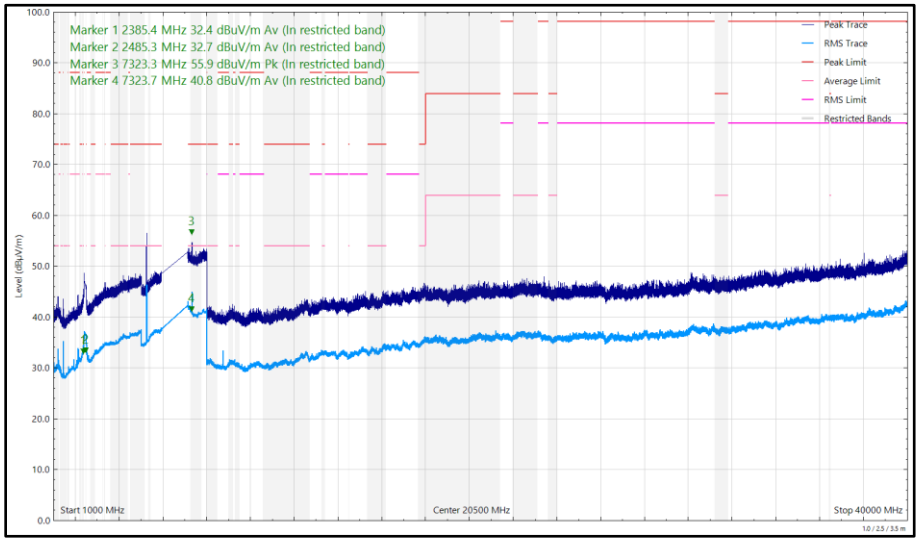

Figure 33 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
33.684	21.13	40.00	-18.87	Q-Peak	16	100	Vertical
278.033	20.97	46.00	-25.03	Q-Peak	3	154	Horizontal
4881.613	35.07	54.00	-18.93	CISPR Avg	64	368	Horizontal
4882.063	40.49	54.00	-13.51	CISPR Avg	360	327	Vertical
7322.629	37.73	54.00	-16.27	CISPR Avg	79	390	Horizontal
7323.071	37.71	54.00	-16.29	CISPR Avg	9	215	Vertical
8233.280	39.47	54.00	-14.53	RMS	27	208	Vertical
8233.330	34.14	54.00	-19.86	RMS	81	290	Horizontal

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.

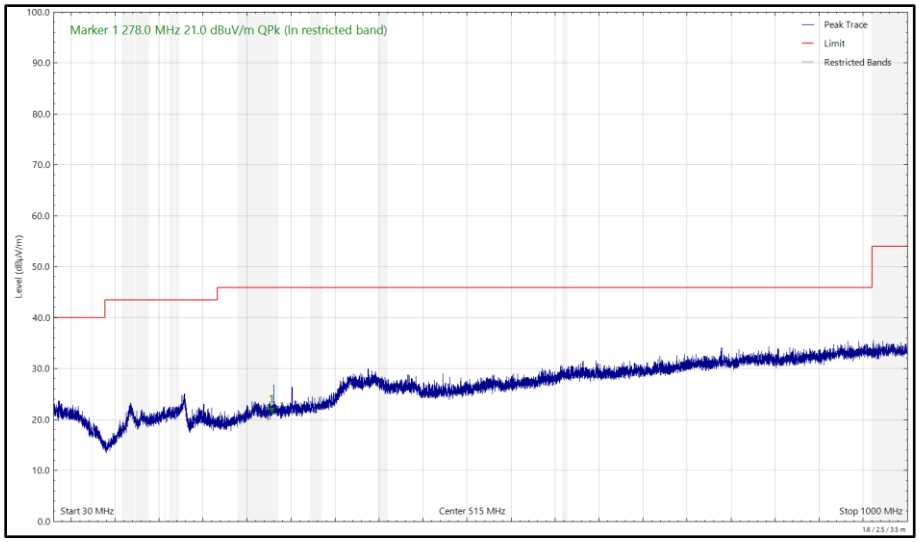

Figure 34 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Horizontal (Peak)

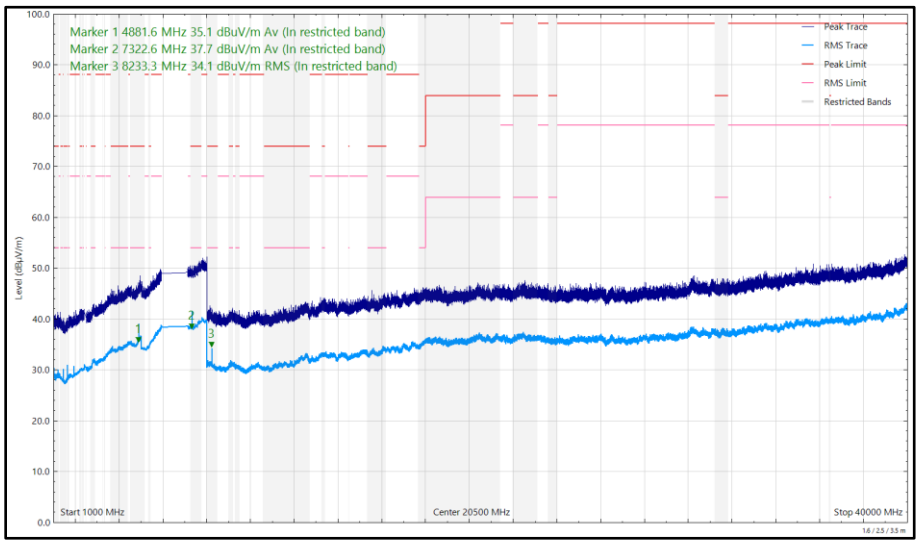

Figure 35 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Horizontal

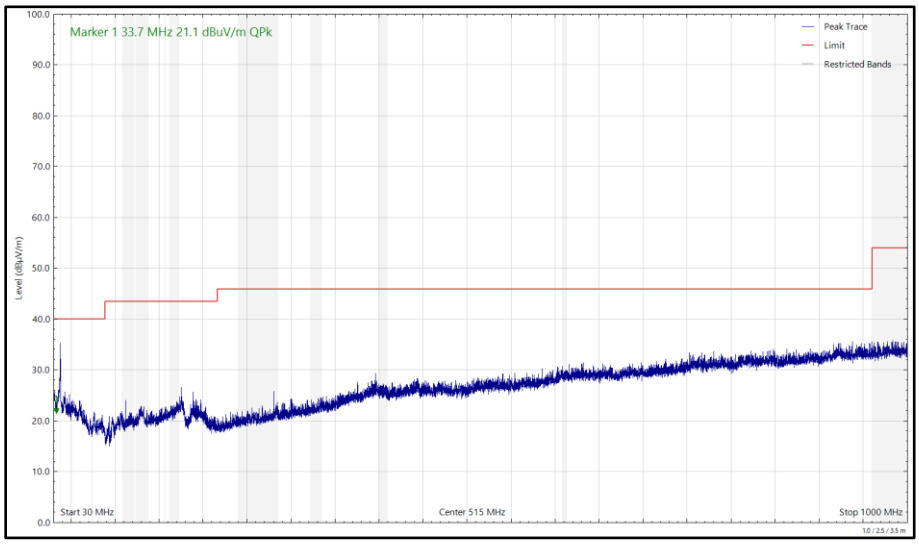

Figure 36 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Vertical (Peak)

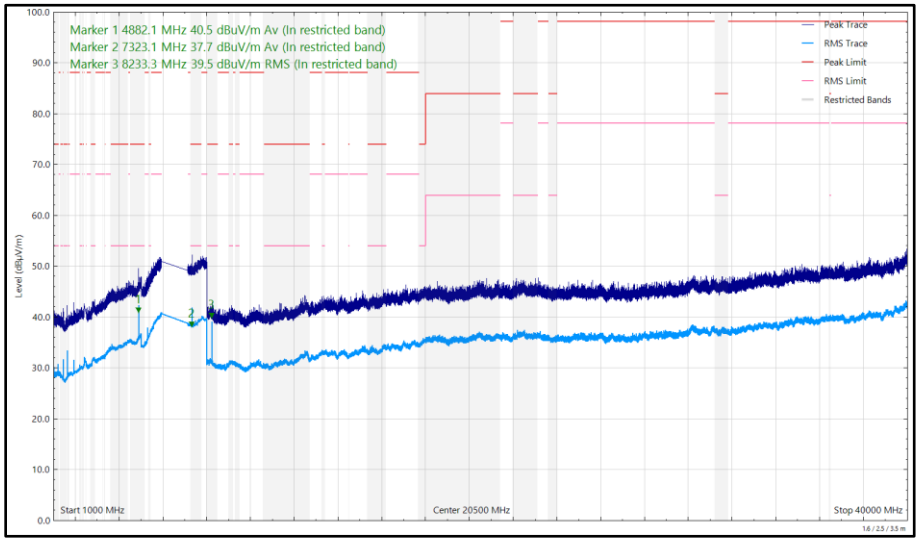

Figure 37 - U-NII-5 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
4881.658	38.64	54.00	-15.36	CISPR Avg	360	319	Vertical
4881.833	35.96	54.00	-18.04	CISPR Avg	72	378	Horizontal
5446.563	34.96	54.00	-19.04	RMS	74	100	Horizontal
5452.223	36.30	54.00	-17.70	RMS	0	250	Vertical
7322.692	38.31	54.00	-15.69	CISPR Avg	78	381	Horizontal
7322.974	37.88	54.00	-16.12	CISPR Avg	344	245	Vertical

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.

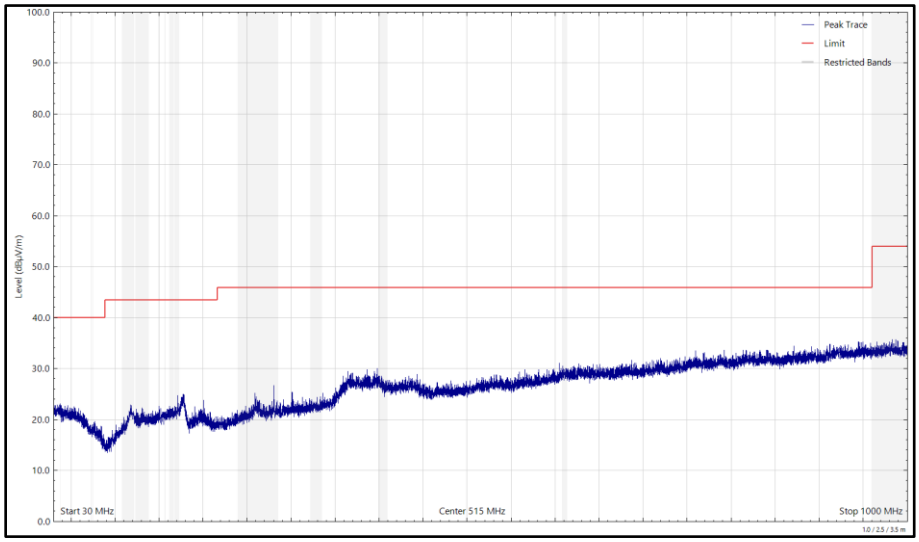

Figure 38 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Horizontal (Peak)

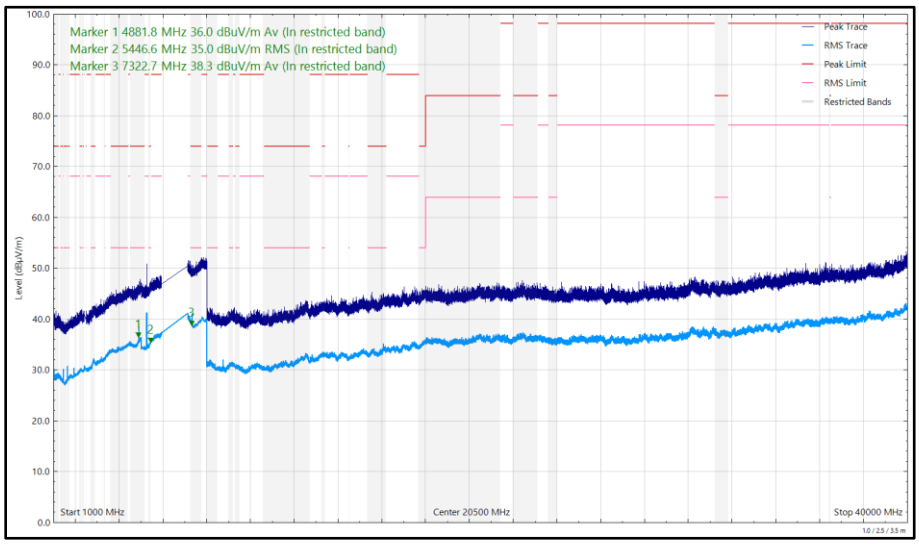

Figure 39 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Horizontal

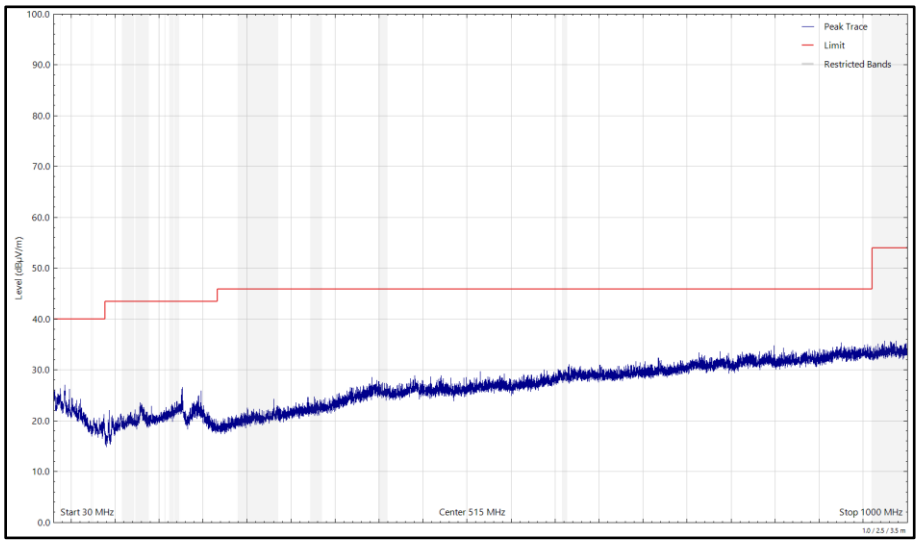

Figure 40 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Vertical (Peak)

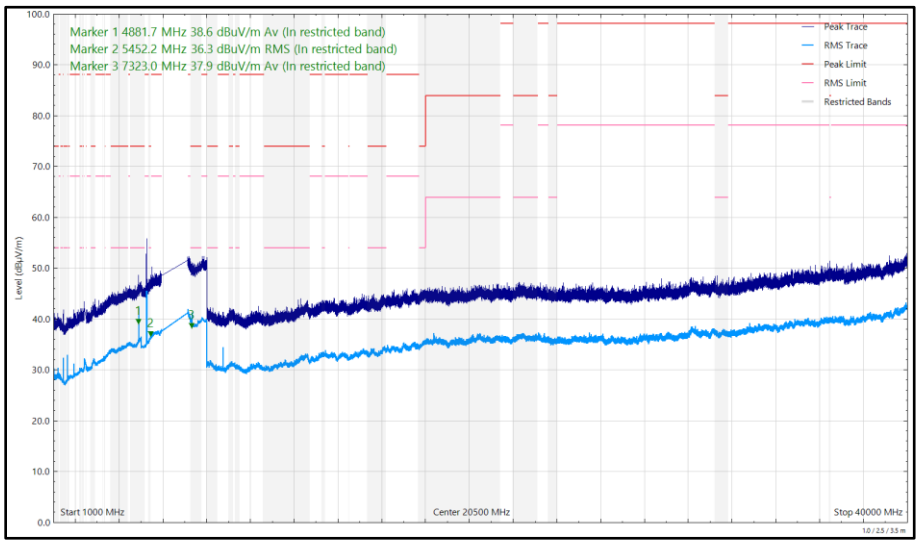

Figure 41 - U-NII-8 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Vertical

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
127.518	19.28	43.50	-24.22	Q-Peak	217	106	Vertical
2386.483	56.92	74.00	-17.08	Peak	346	346	Vertical
2389.830	41.24	54.00	-12.76	RMS	335	367	Vertical
2389.937	35.88	54.00	-18.12	RMS	47	373	Horizontal
2483.521	45.60	54.00	-8.40	RMS	339	384	Vertical
2483.521	38.78	54.00	-15.22	RMS	35	390	Horizontal
2484.192	60.94	74.00	-13.06	Peak	351	386	Vertical
4883.438	42.10	54.00	-11.90	RMS	4	362	Vertical
4885.182	38.71	54.00	-15.29	RMS	74	359	Horizontal

Table 18 - 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.

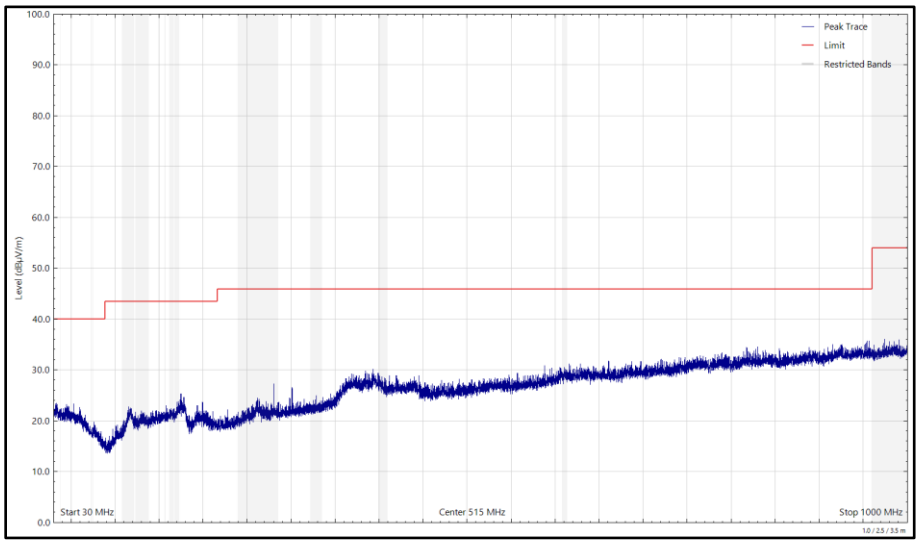

Figure 42 - 2442 MHz (CH7), HT20, Core 0 and 5204 MHz, DH5, ePA, Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

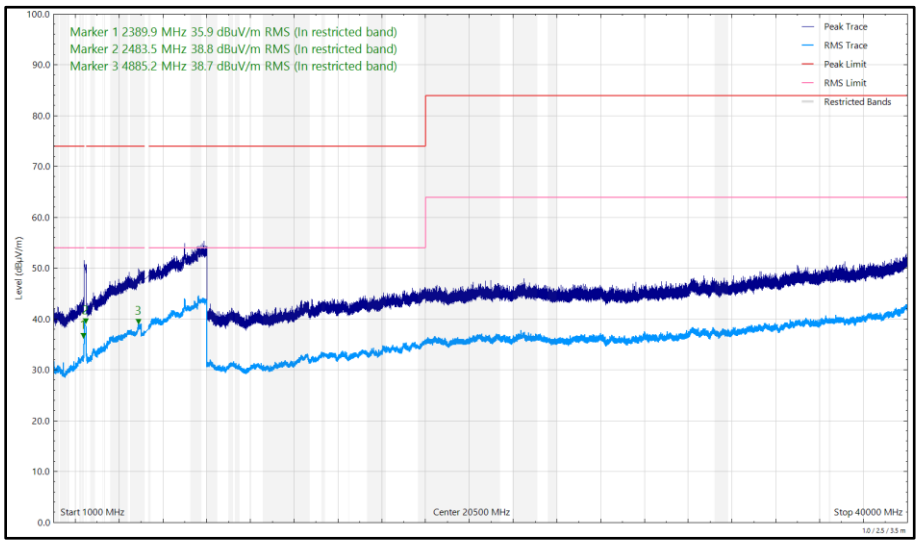

Figure 43 - 2442 MHz (CH7), HT20, Core 0 and 5204 MHz, DH5, ePA, Core 1, 1 GHz to 40 GHz, Horizontal

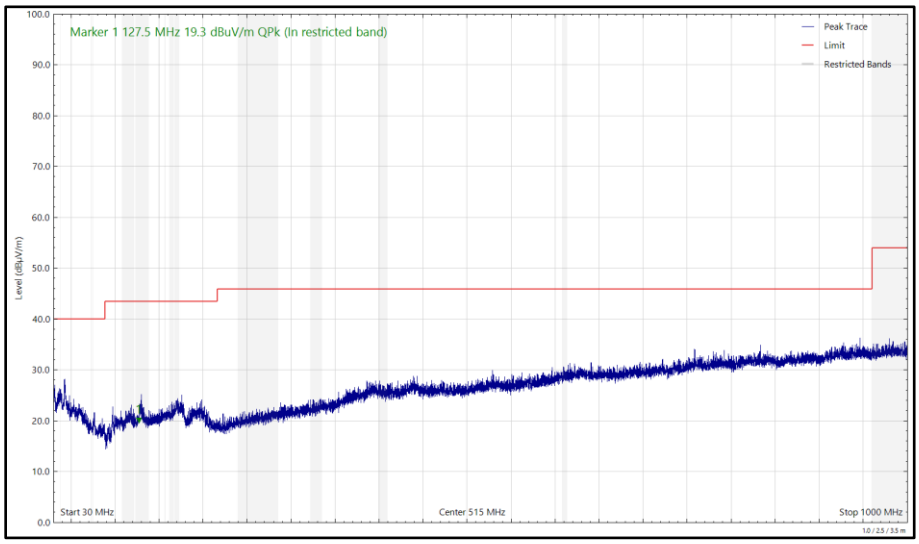

Figure 44 - 2442 MHz (CH7), HT20, Core 0 and 5204 MHz, DH5, ePA, Core 1, 30 MHz to 1 GHz, Vertical (Peak)

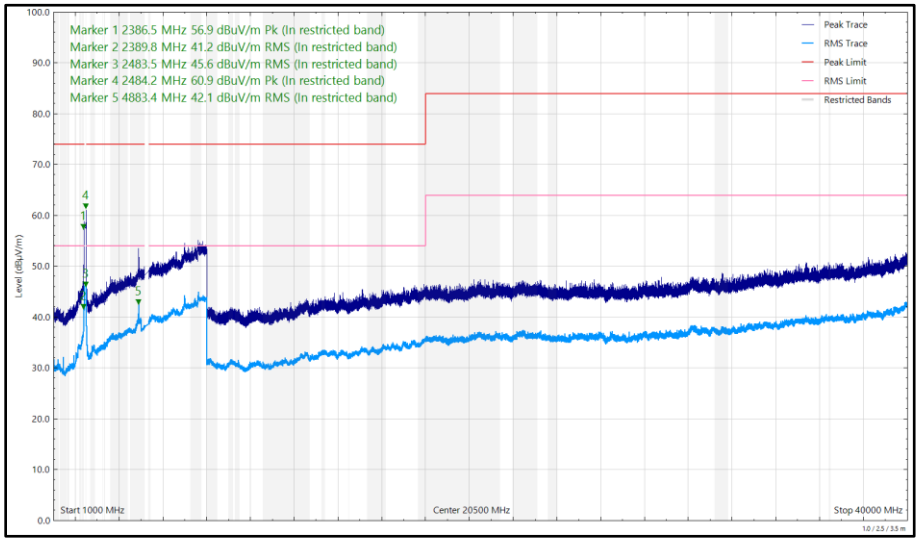

Figure 45 - 2442 MHz (CH7), HT20, Core 0 and 5204 MHz, DH5, ePA, Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
2389.444	57.64	74.00	-16.36	Peak	337	314	Vertical
2389.444	40.33	54.00	-13.67	RMS	337	314	Vertical
2389.983	35.00	54.00	-19.00	RMS	45	394	Horizontal
2483.566	39.24	54.00	-14.76	RMS	39	381	Horizontal
2483.574	45.64	54.00	-8.36	RMS	351	347	Vertical
2485.425	60.76	74.00	-13.24	Peak	337	352	Vertical
4884.402	39.26	54.00	-14.74	RMS	360	344	Vertical
5374.590	41.60	54.00	-12.40	RMS	71	345	Horizontal
5374.617	42.08	54.00	-11.92	RMS	6	386	Vertical

Table 19 - 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.

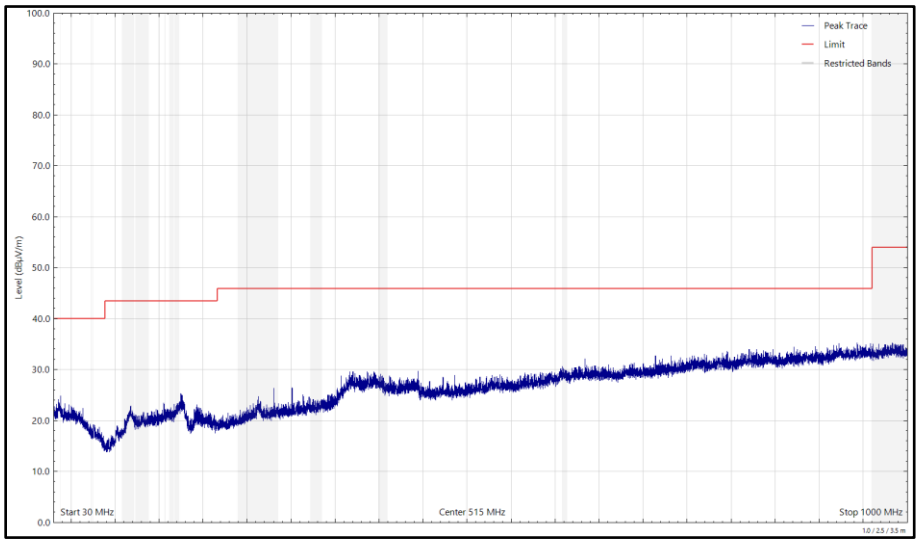

Figure 46 - 2442 MHz (CH7), HT20, Core 0 and 5788 MHz, DH5, ePA, Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

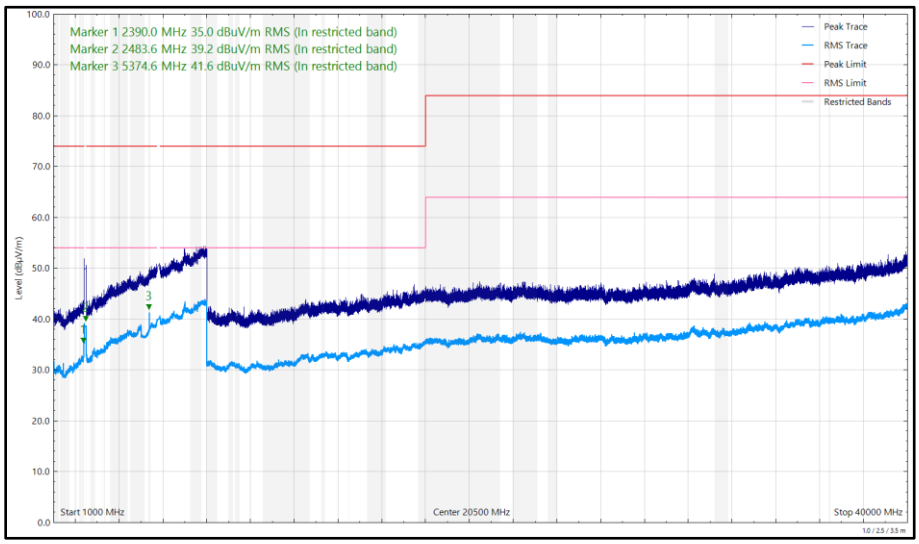

Figure 47 - 2442 MHz (CH7), HT20, Core 0 and 5788 MHz, DH5, ePA, Core 1, 1 GHz to 40 GHz, Horizontal

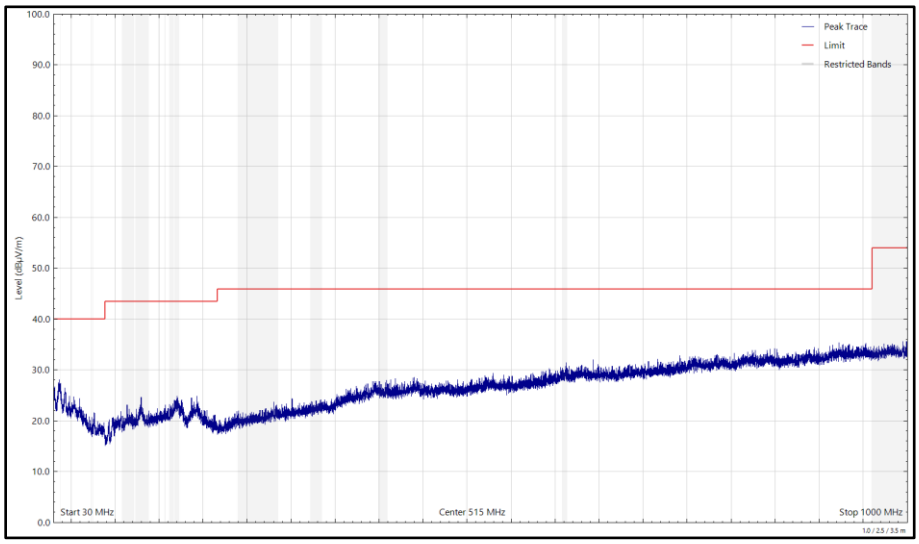

Figure 48 - 2442 MHz (CH7), HT20, Core 0 and 5788 MHz, DH5, ePA, Core 1, 30 MHz to 1 GHz, Vertical (Peak)

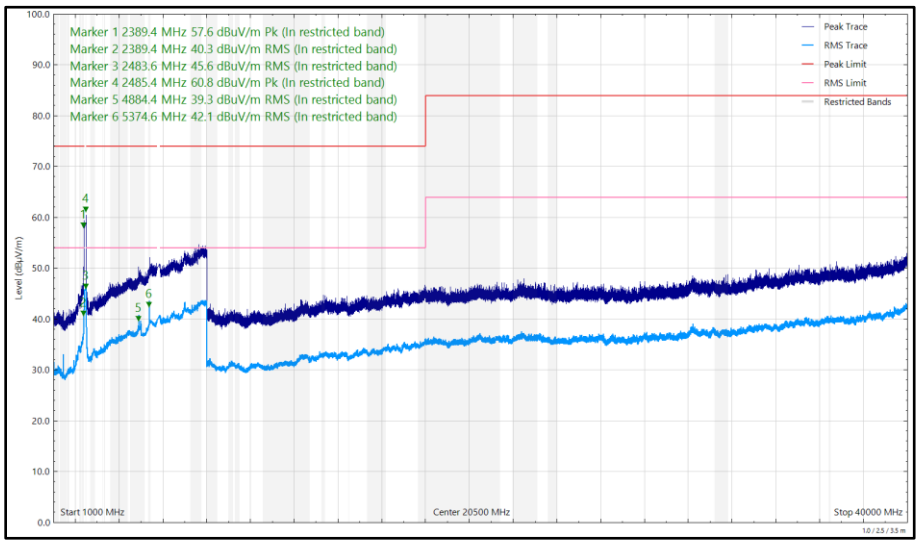

Figure 49 - 2442 MHz (CH7), HT20, Core 0 and 5788 MHz, DH5, ePA, Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
37.727	22.94	40.00	-17.06	Q-Peak	354	110	Vertical
2389.484	58.09	74.00	-15.91	Peak	9	340	Vertical
2389.641	40.70	54.00	-13.30	RMS	9	371	Vertical
2389.959	37.57	54.00	-16.43	RMS	57	376	Horizontal
2483.521	41.40	54.00	-12.60	RMS	57	400	Horizontal
2483.621	45.17	54.00	-8.83	RMS	33	400	Vertical
2484.801	61.82	74.00	-12.18	Peak	43	400	Vertical
4882.333	40.71	54.00	-13.29	RMS	66	352	Horizontal
4885.027	41.51	54.00	-12.49	RMS	325	272	Vertical

Table 20 - 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.

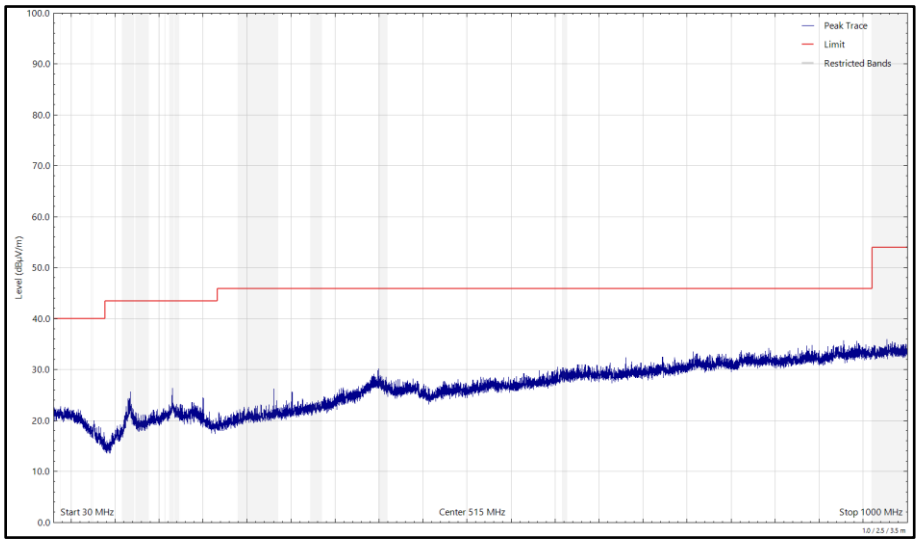

Figure 50 - 2442 MHz (CH7), HT20, Core 1 and 5204 MHz, DH5, ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)

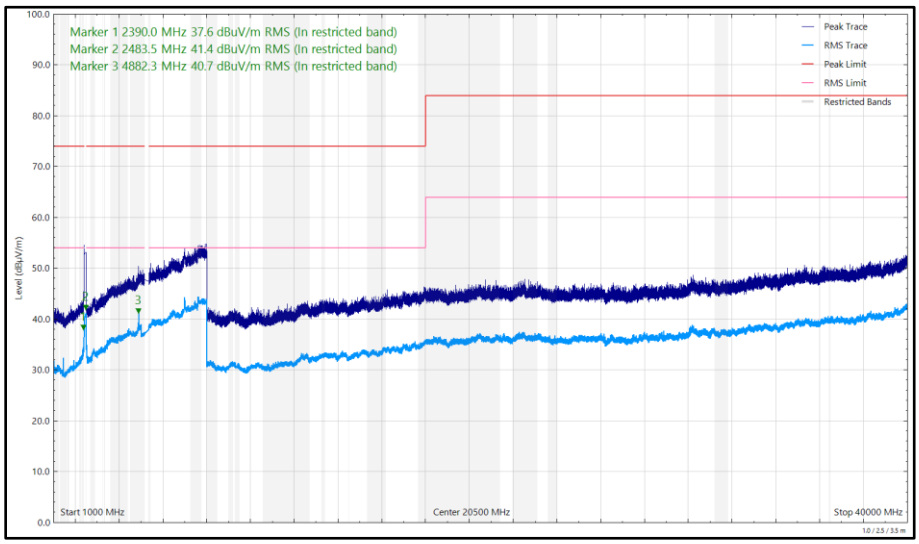

Figure 51 - 2442 MHz (CH7), HT20, Core 1 and 5204 MHz, DH5, ePA, Core 0, 1 GHz to 40 GHz, Horizontal

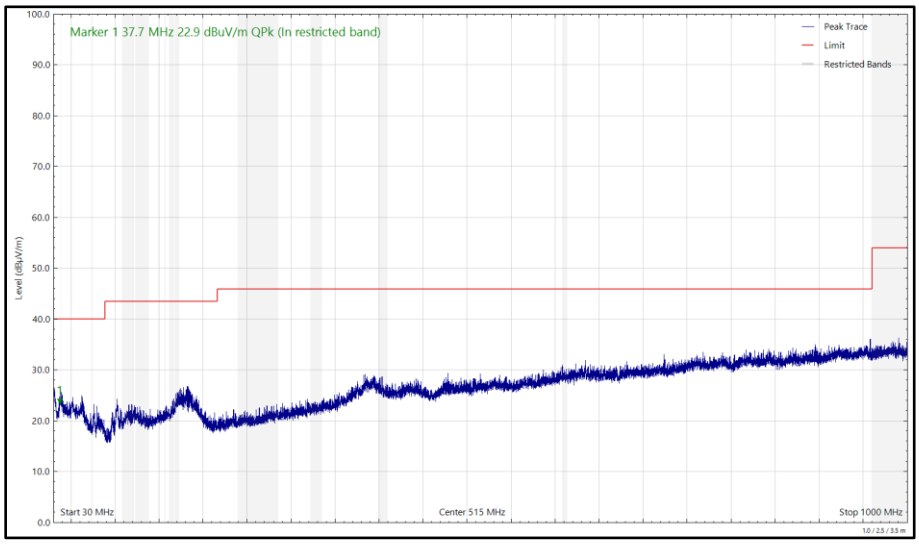

Figure 52 - 2442 MHz (CH7), HT20, Core 1 and 5204 MHz, DH5, ePA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)

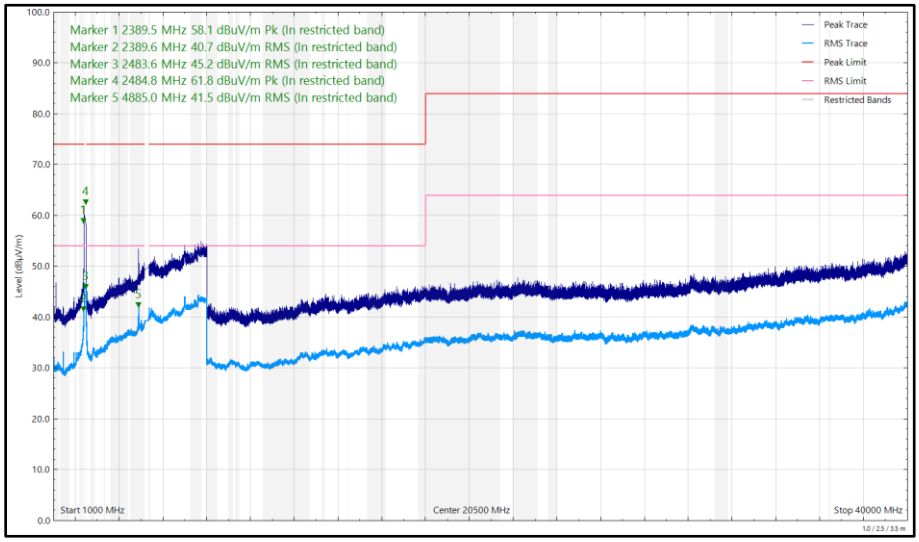

Figure 53 - 2442 MHz (CH7), HT20, Core 1 and 5204 MHz, DH5, ePA, Core 0, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
38.035	20.55	40.00	-19.45	Q-Peak	266	250	Vertical
2389.546	38.69	54.00	-15.31	RMS	31	344	Vertical
2389.546	56.69	74.00	-17.31	Peak	31	344	Vertical
2389.822	37.17	54.00	-16.83	RMS	57	386	Horizontal
2483.536	39.78	54.00	-14.22	RMS	59	400	Horizontal
2483.539	45.30	54.00	-8.70	RMS	37	264	Vertical
2484.923	62.55	74.00	-11.45	Peak	30	301	Vertical
4883.847	41.12	54.00	-12.88	RMS	10	315	Vertical
5374.590	43.46	54.00	-10.54	RMS	0	278	Vertical
5374.590	38.09	54.00	-15.91	RMS	63	390	Horizontal

Table 21 - 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.

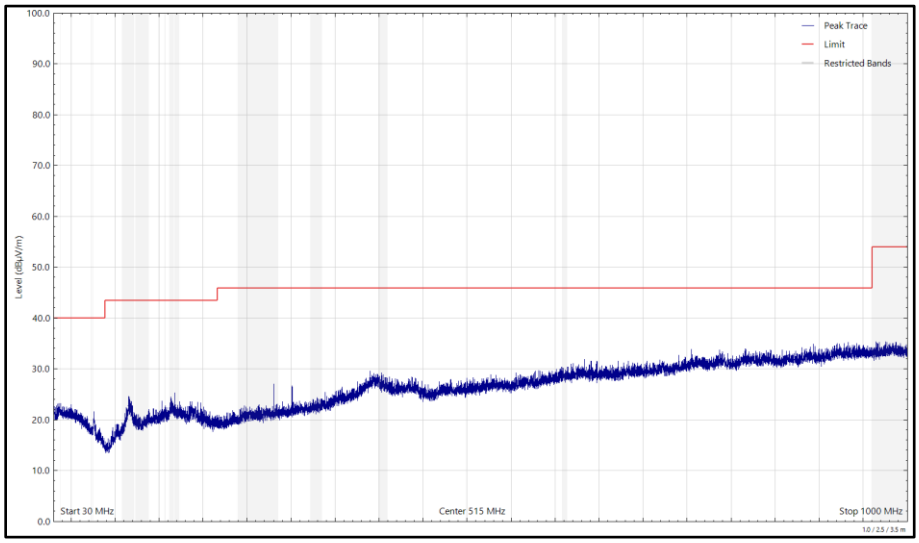

Figure 54 - 2442 MHz (CH7), HT20, Core 1 and 5788 MHz, DH5, ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)

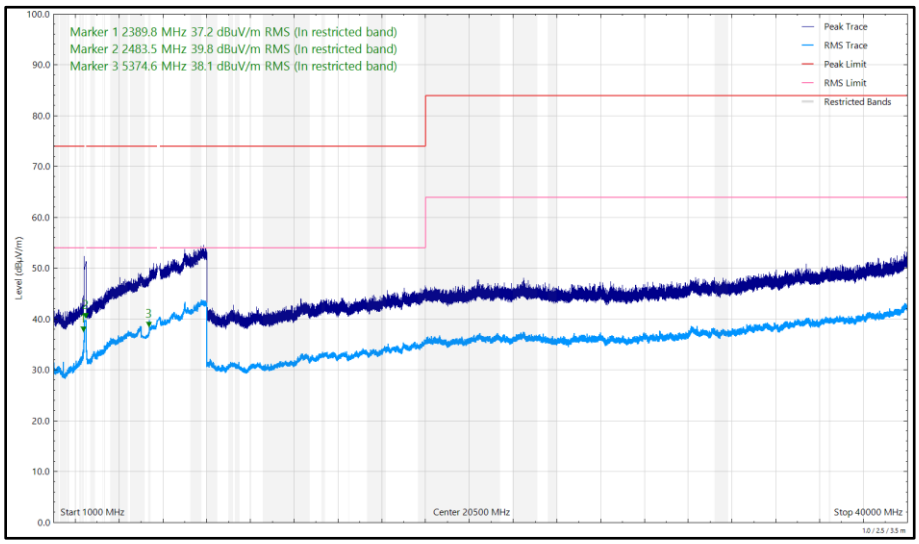

Figure 55 - 2442 MHz (CH7), HT20, Core 1 and 5788 MHz, DH5, ePA, Core 0, 1 GHz to 40 GHz, Horizontal

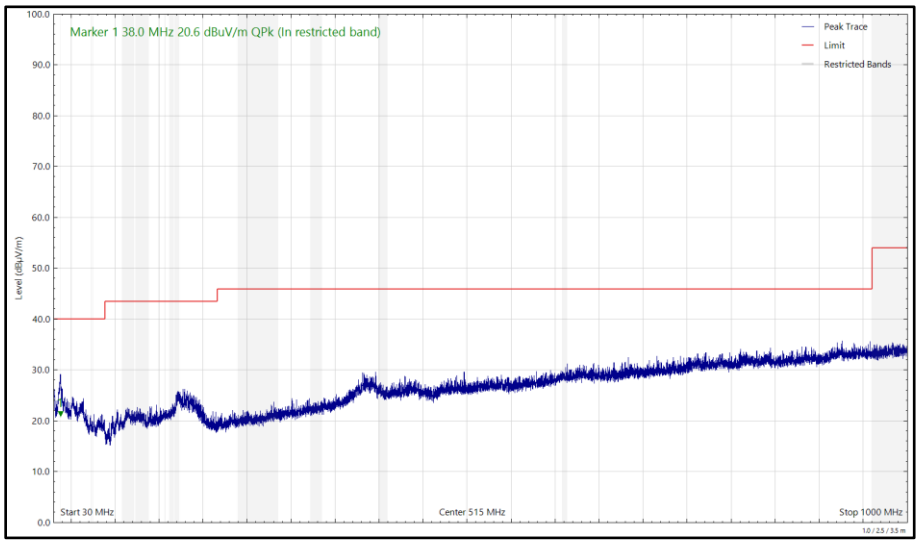

Figure 56 - 2442 MHz (CH7), HT20, Core 1 and 5788 MHz, DH5, ePA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)

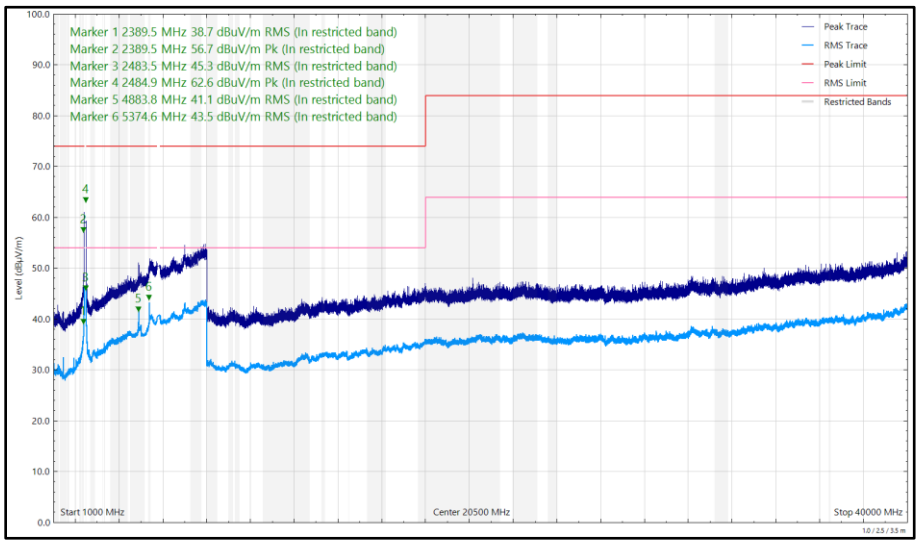

Figure 57 - 2442 MHz (CH7), HT20, Core 1 and 5788 MHz, DH5, ePA, Core 0, 1 GHz to 40 GHz, Vertical

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 22

5 GHz WLAN and Thread

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
37.516	22.37	40.00	-17.63	Q-Peak	109	100	Vertical
4880.883	42.52	54.00	-11.48	RMS	4	219	Vertical
5352.224	45.52	54.00	-8.48	RMS	1	281	Vertical
5385.037	57.41	74.00	-16.59	Peak	357	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 6 dB of the limit.

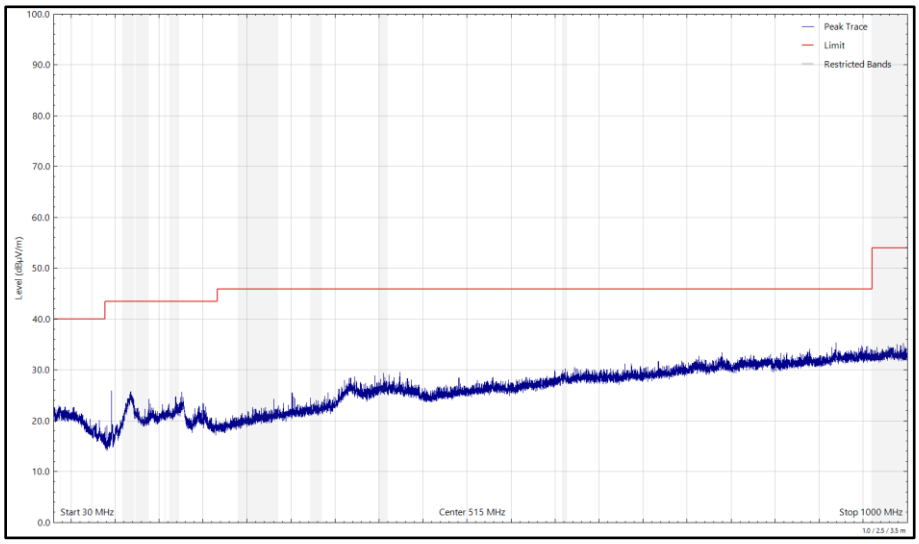

Figure 58 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)

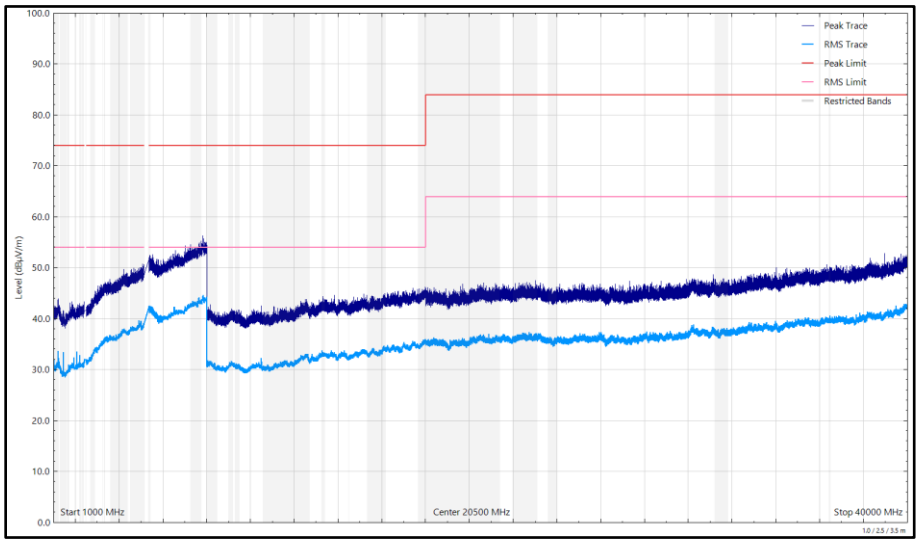

Figure 59 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 0, 1 GHz to 40 GHz, Horizontal

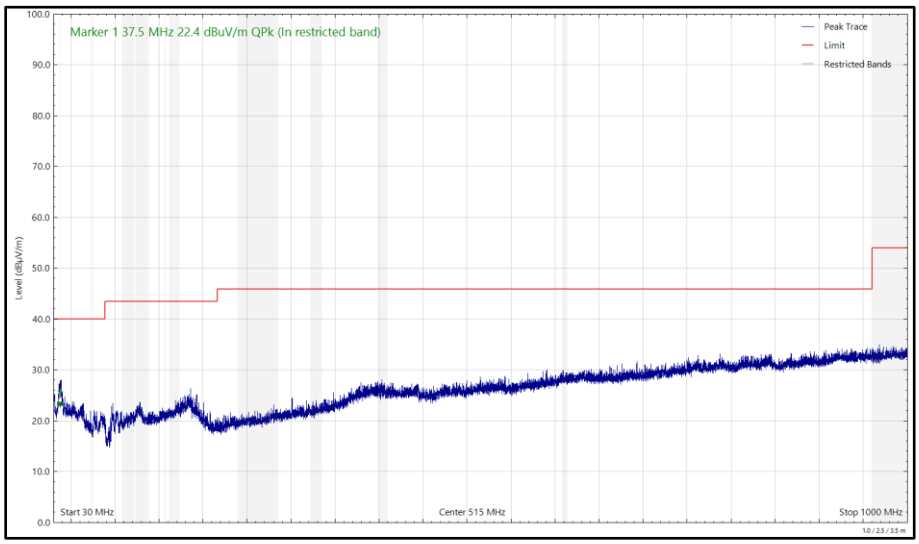

Figure 60 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)

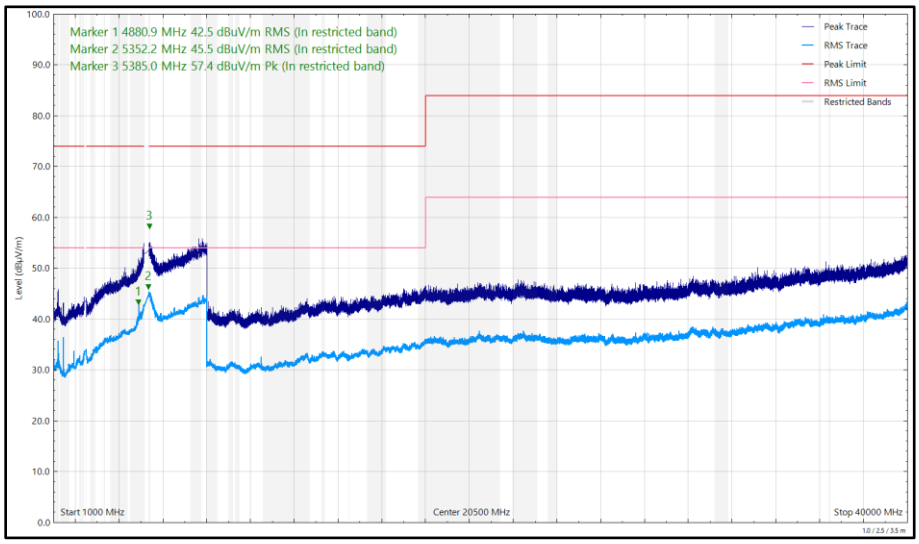

Figure 61 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), ePA, Core 0, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
37.963	20.97	40.00	-19.03	Q-Peak	20	107	Vertical
118.597	19.86	43.50	-23.64	Q-Peak	8	260	Horizontal
2384.279	34.87	54.00	-19.13	RMS	41	384	Vertical
2483.630	34.25	54.00	-19.75	RMS	28	289	Vertical
4880.827	43.00	54.00	-11.00	RMS	3	338	Vertical
5351.810	45.12	54.00	-8.88	RMS	359	291	Vertical
5368.496	57.92	74.00	-16.08	Peak	2	264	Vertical

Table 24 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), Core1, ePA, Core 1, 30 MHz to 40 GHz

No other emissions found within 6 dB of the limit.

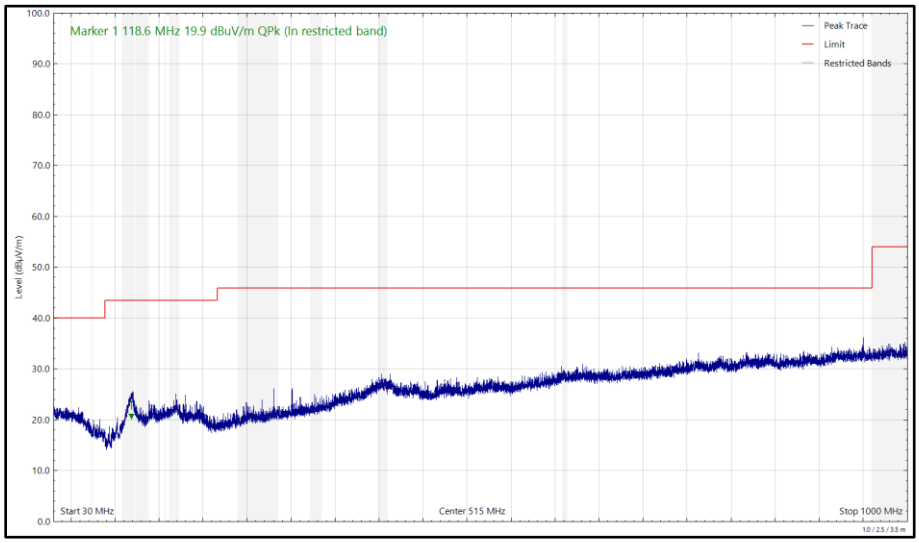

Figure 62 - U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), Core1, ePA, Core 1, 30 MHz to 1 GHz, Horizontal (Peak)