FCC Test Report

Apple Inc
Model: A3185

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 08:37:50 +01'00'

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FCC ID: BCGA3185

COMMERCIAL-IN-CONFIDENCE

Document 75961394-101 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	Rachael Watkins	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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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	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	15-August-2024
Finish of Test	18-September-2024
Name of Engineer(s)	Vineeth Nagaraj, Colin Brain, Thomas Randall, Morsalin Hossain, Thomas Randall, Manohar Thota, Akhil Rajendran Bhaskaran Nair, Vineeth Nagaraj, James Woods and Ian Hart
Related Document(s)	ANSI C63.4 (2014) ANSI C63.10 (2020) KDB 789033 D0245 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) KDB 789033 D02 v02r01
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) KDB 987594 D02 v01r01
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) KDB 789033 D02 v02r01
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) 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: A3185			
Serial Number	Hardware Version	Software Version	Firmware
GX224MWRCX	REV1.0	24A32191s	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: A3185, Serial Number: GX224MWRCX			
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: 2.4 GHz WLAN and Narrowband		
Radiated Spurious Emissions (Simultaneous Transmission)	Colin Brain, Morsalin Hossain, Thomas Randall and Vineeth Nagaraj	UKAS
Configuration and Mode: 5 GHz WLAN and 2.4 GHz Bluetooth		
Radiated Spurious Emissions (Simultaneous Transmission)	Akhil Rajendran Bhaskaran Nair, James Woods, Manohar Thota, Thomas Randall and Vineeth Nagaraj	UKAS
Configuration and Mode: 6 GHz WLAN and 2.4 GHz Bluetooth		
Radiated Spurious Emissions (Simultaneous Transmission)	Akhil Rajendran Bhaskaran Nair, Ian Hart, Manohar Thota, Thomas Randall and Vineeth Nagaraj	UKAS
Configuration and Mode: 5 GHz WLAN and Thread		
Radiated Spurious Emissions (Simultaneous Transmission)	Akhil Rajendran Bhaskaran Nair, Colin Brain, Morsalin Hossain, 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, Morsalin Hossain, 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

A3185, S/N: GX224MWRCX - Modification State 0

2.1.3 Date of Test

15-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

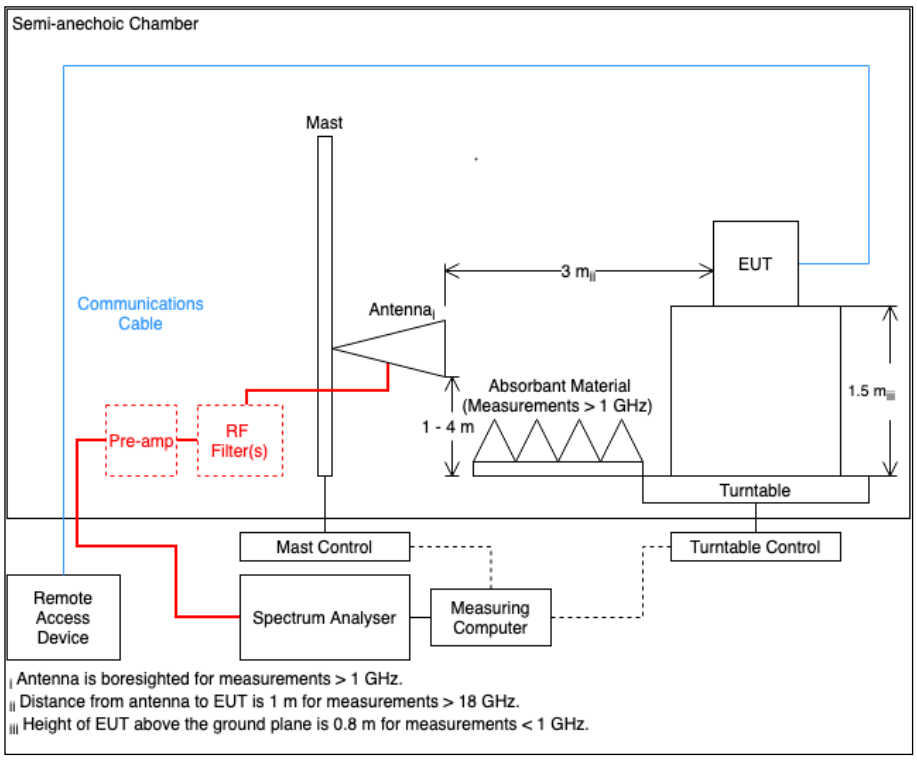

Figure 1

2.1.6 Environmental Conditions

Ambient Temperature	21.4 - 24.3 °C
Relative Humidity	39.1 - 54.3 %

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
121.806	14.71	43.50	-28.79	Q-Peak	0	340	Horizontal
4881.963	42.68	54.00	-11.32	CISPR Avg	25	245	Vertical
4891.041	33.73	54.00	-20.27	CISPR Avg	18	179	Horizontal
5139.200	56.42	74.00	-17.58	Peak	9	324	Vertical
5148.165	45.20	54.00	-8.80	RMS	10	329	Vertical
5149.876	38.99	54.00	-15.01	RMS	63	400	Horizontal
5366.557	41.03	54.00	-12.97	RMS	296	318	Horizontal
5373.265	58.17	74.00	-15.83	Peak	353	300	Vertical
5386.470	46.69	54.00	-7.31	RMS	350	328	Vertical

Table 6 - 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.

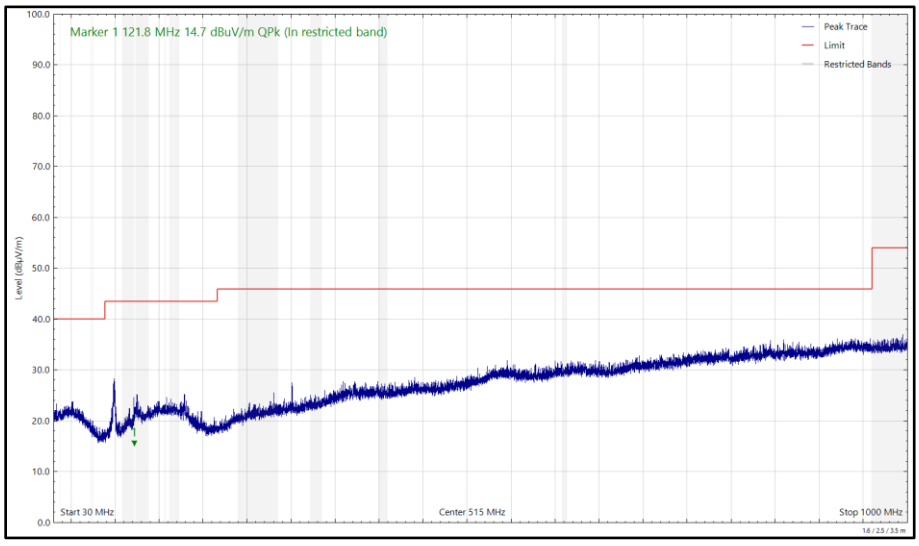

Figure 2 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Horizontal (Peak)

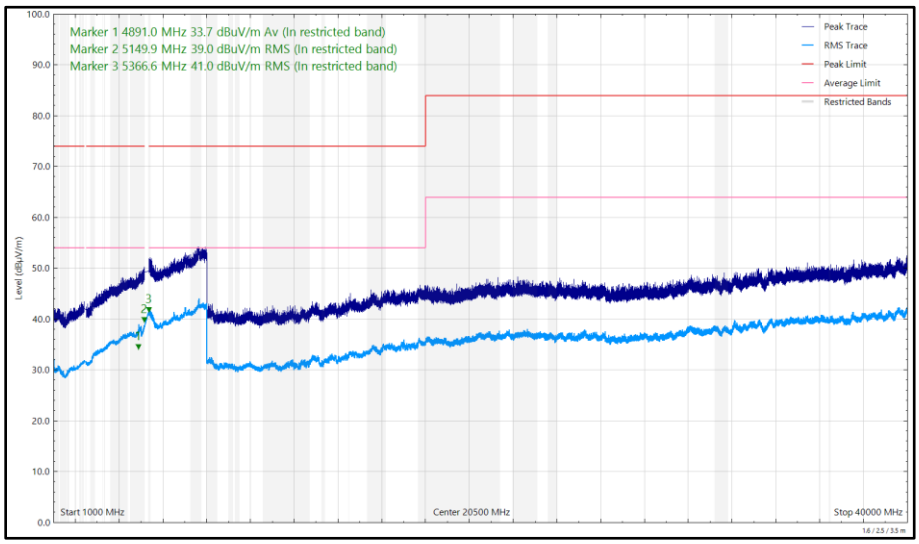

Figure 3 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Horizontal

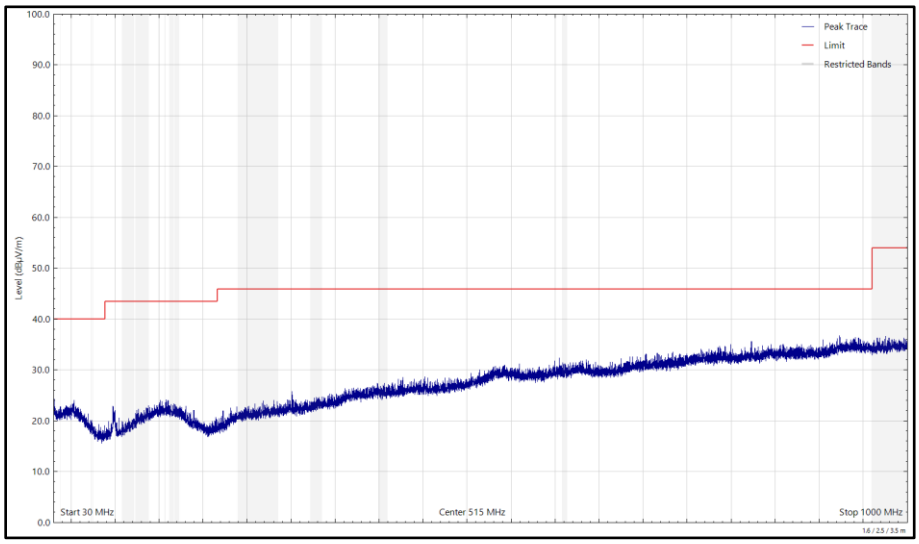

Figure 4 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Vertical (Peak)

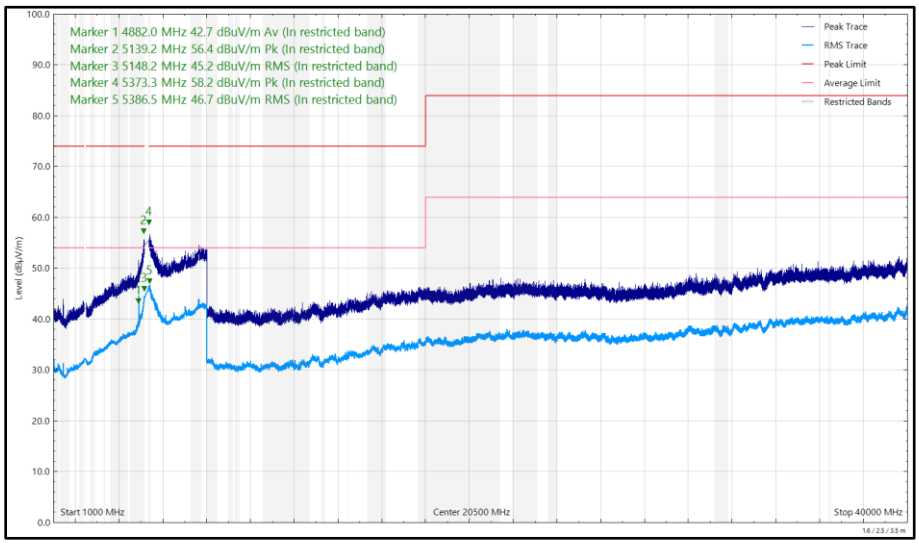

Figure 5 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
124.021	16.44	43.50	-27.06	Q-Peak	10	251	Horizontal
280.025	18.21	46.00	-27.79	Q-Peak	99	376	Horizontal
4881.813	43.59	54.00	-10.41	CISPR Avg	6	308	Vertical
5412.749	57.55	74.00	-16.45	Peak	351	331	Vertical
5440.046	45.44	54.00	-8.56	RMS	353	307	Vertical
5449.641	40.73	54.00	-13.27	RMS	300	370	Horizontal
11280.400	33.82	54.00	-20.18	RMS	77	377	Horizontal
11280.420	33.80	54.00	-20.20	RMS	55	246	Vertical

Table 7 - 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.

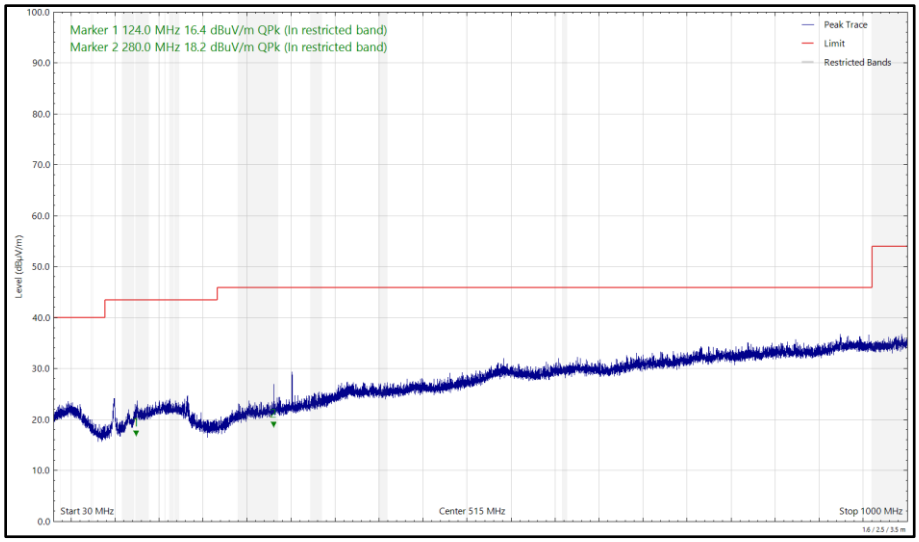

Figure 6 - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Horizontal (Peak)

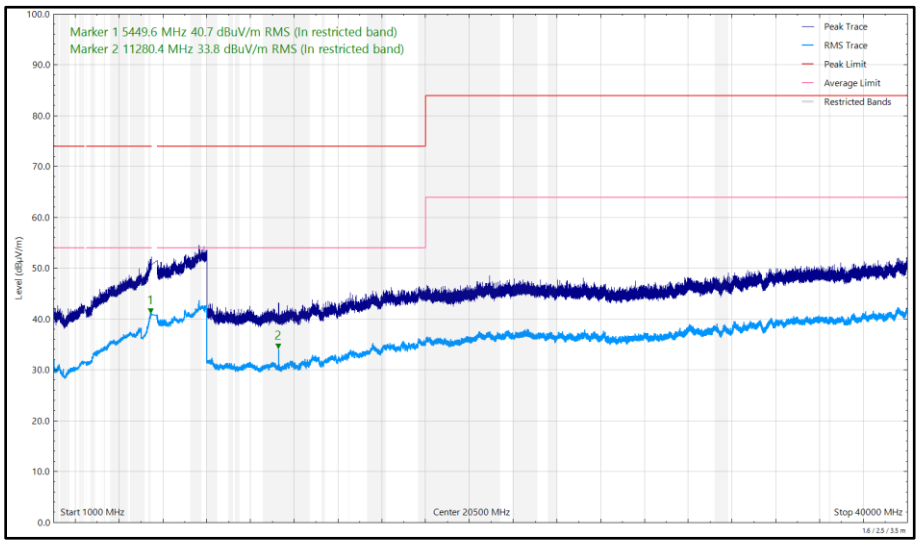

Figure 7 - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Horizontal

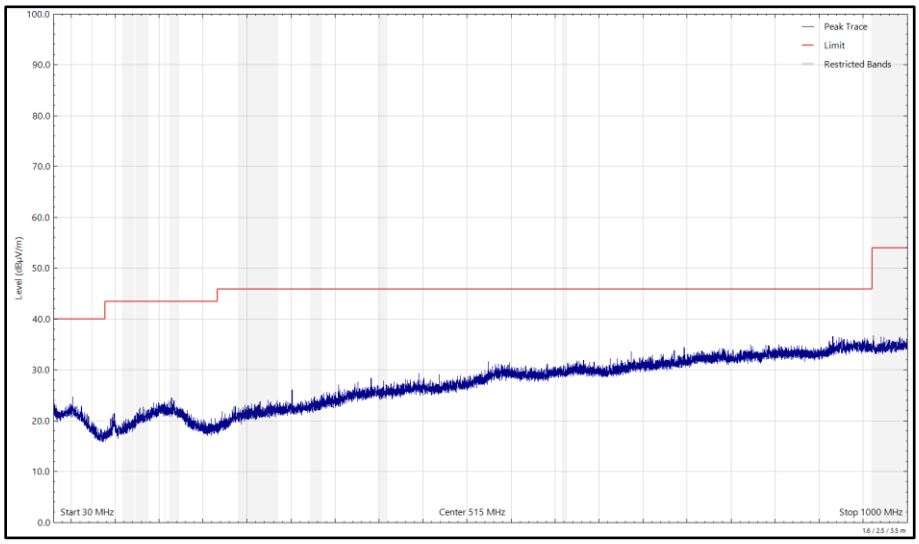

Figure 8 - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Vertical (Peak)

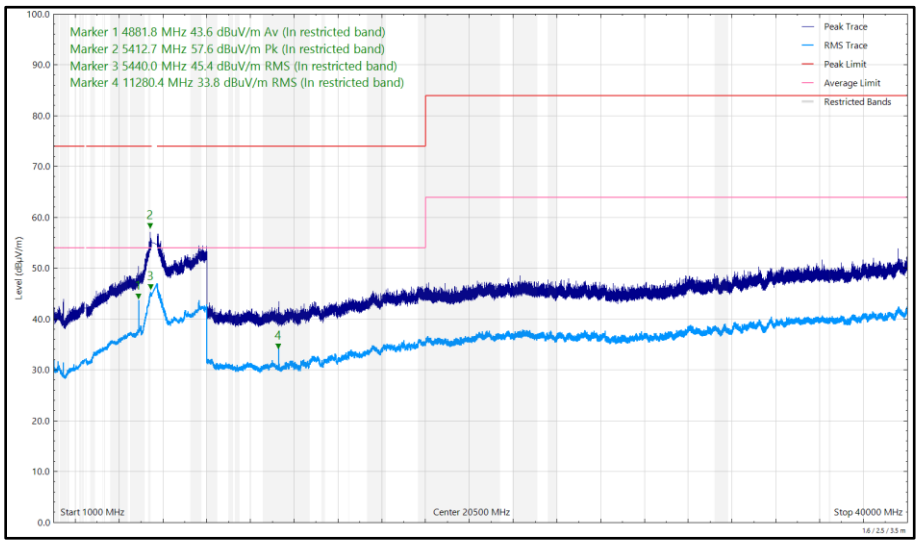

Figure 9 - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
4882.362	41.97	54.00	-12.03	CISPR Avg	7	286	Vertical
4892.795	33.47	54.00	-20.53	CISPR Avg	98	156	Horizontal
5415.239	42.53	54.00	-11.47	RMS	1	351	Vertical
5449.248	39.68	54.00	-14.32	RMS	297	347	Horizontal
5457.682	54.83	74.00	-19.17	Peak	0	321	Vertical

Table 8 - 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.

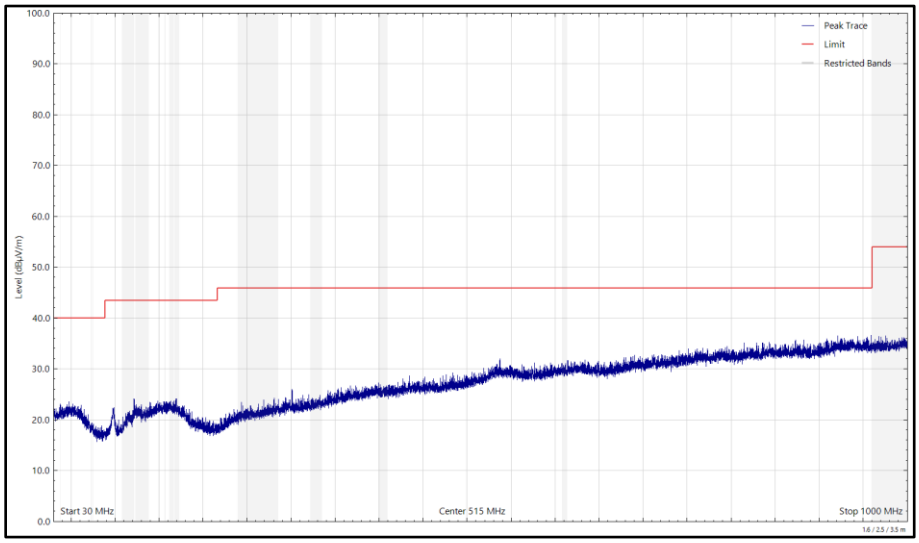

Figure 10 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Horizontal (Peak)

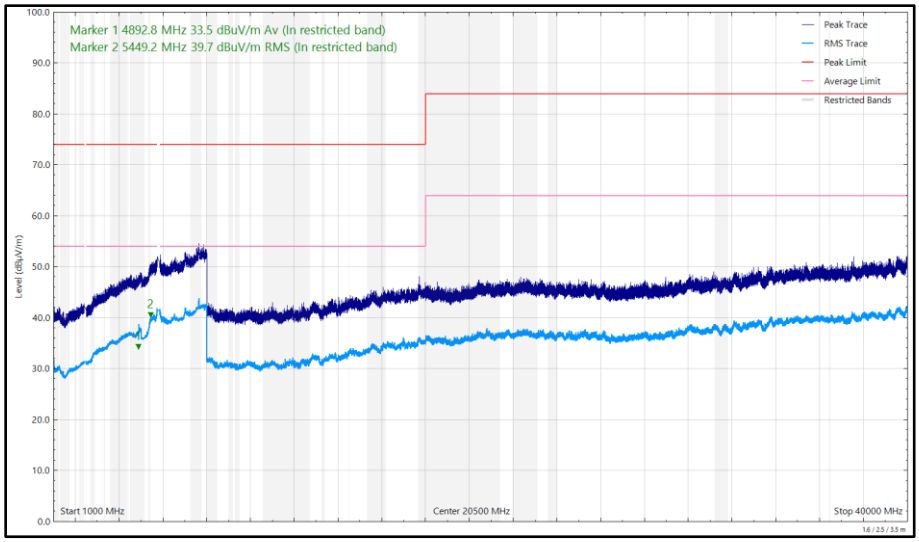

Figure 11 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Horizontal

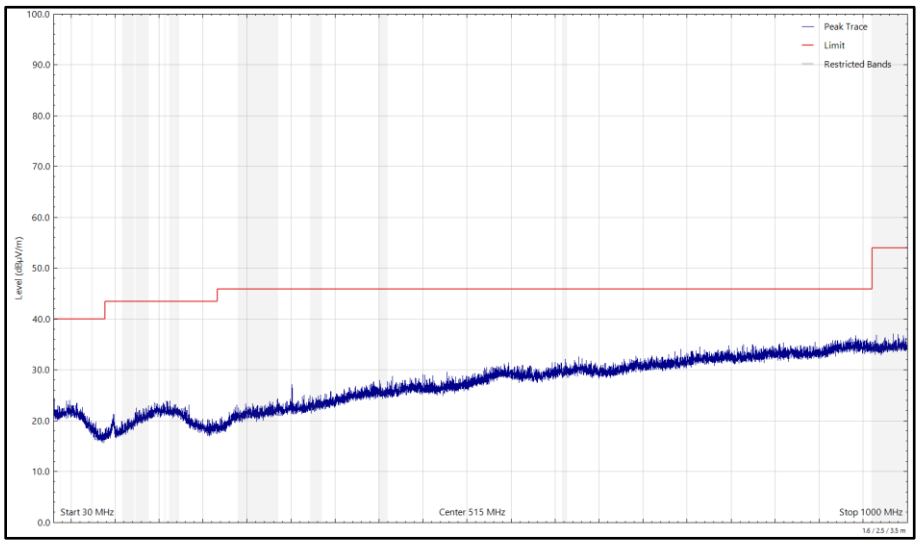

Figure 12 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Vertical (Peak)

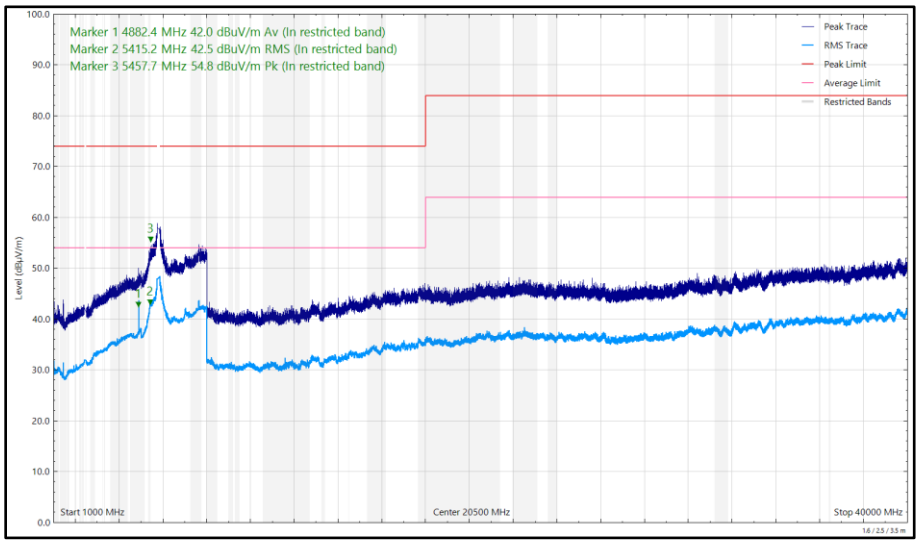

Figure 13 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
124.867	13.78	43.50	-29.72	Q-Peak	201	340	Horizontal
280.006	18.87	46.00	-27.13	Q-Peak	100	352	Horizontal
1200.855	34.32	54.00	-19.68	RMS	303	400	Vertical
1439.496	32.63	54.00	-21.37	RMS	1	358	Horizontal
1440.746	33.02	54.00	-20.98	RMS	47	154	Vertical
2384.382	29.96	54.00	-24.04	CISPR Avg	54	380	Horizontal
2485.480	32.44	54.00	-21.56	CISPR Avg	17	294	Vertical
2487.645	30.36	54.00	-23.64	CISPR Avg	56	383	Horizontal
4882.198	40.89	54.00	-13.11	CISPR Avg	28	258	Vertical
5146.667	45.91	54.00	-8.09	RMS	339	305	Vertical
5149.057	56.88	74.00	-17.12	Peak	10	311	Vertical
5149.916	39.30	54.00	-14.70	RMS	52	323	Horizontal
5352.372	46.09	54.00	-7.91	RMS	354	323	Vertical
5357.536	41.69	54.00	-12.31	RMS	297	392	Horizontal
5377.253	59.53	74.00	-14.47	Peak	349	338	Vertical

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

No other emissions found within 10 dB of the limit.

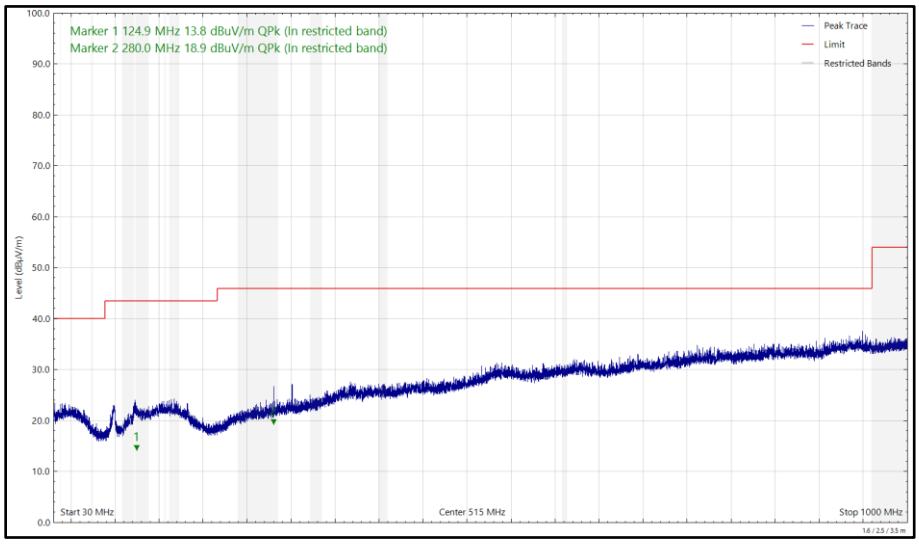

Figure 14 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

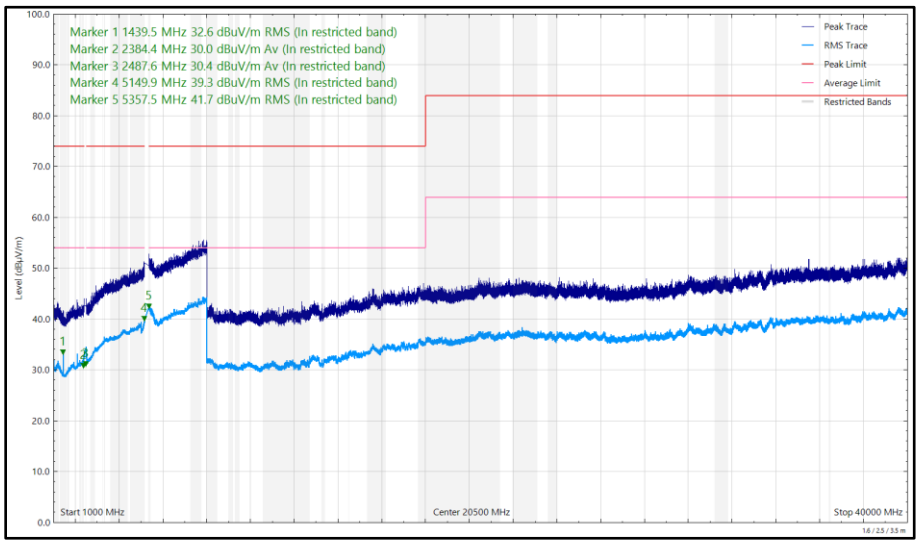

Figure 15 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

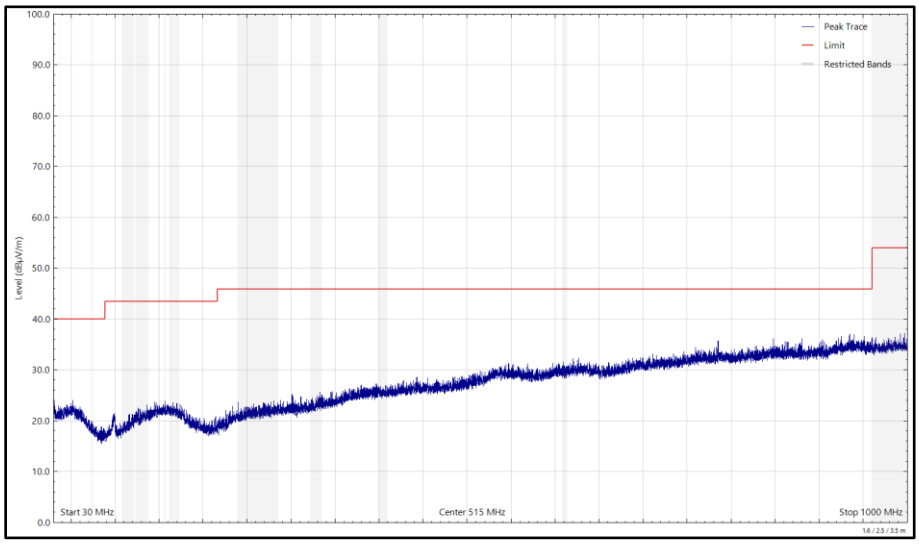

Figure 16 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

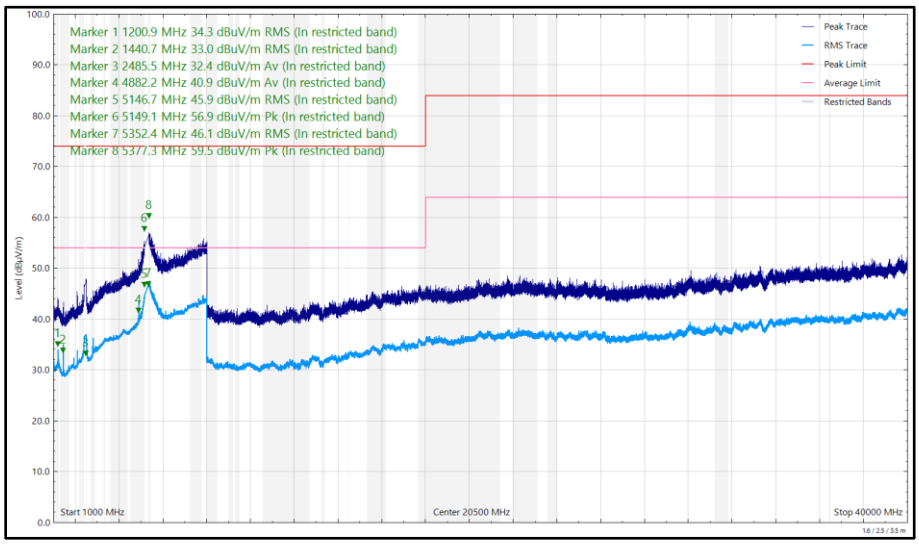

Figure 17 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
123.465	18.91	43.50	-24.59	Q-Peak	0	258	Horizontal
280.004	23.47	46.00	-22.53	Q-Peak	102	100	Horizontal
1200.190	35.02	54.00	-18.98	RMS	319	248	Vertical
2389.209	31.32	54.00	-22.68	CISPR Avg	37	378	Vertical
2484.220	30.84	54.00	-23.16	CISPR Avg	51	388	Horizontal
2488.652	32.10	54.00	-21.90	CISPR Avg	41	389	Vertical
4881.638	39.63	54.00	-14.37	CISPR Avg	27	264	Vertical
5397.721	45.63	54.00	-8.37	RMS	349	332	Vertical
5444.387	57.35	74.00	-16.65	Peak	354	318	Vertical
5452.965	42.08	54.00	-11.92	RMS	291	400	Horizontal
11280.325	32.84	54.00	-21.16	RMS	300	211	Vertical

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

No other emissions found within 10 dB of the limit.

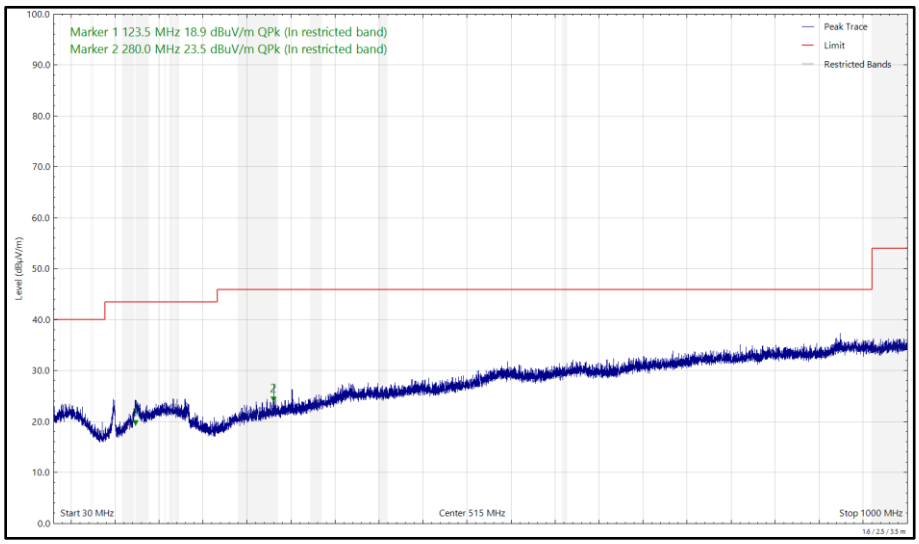

Figure 18 - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

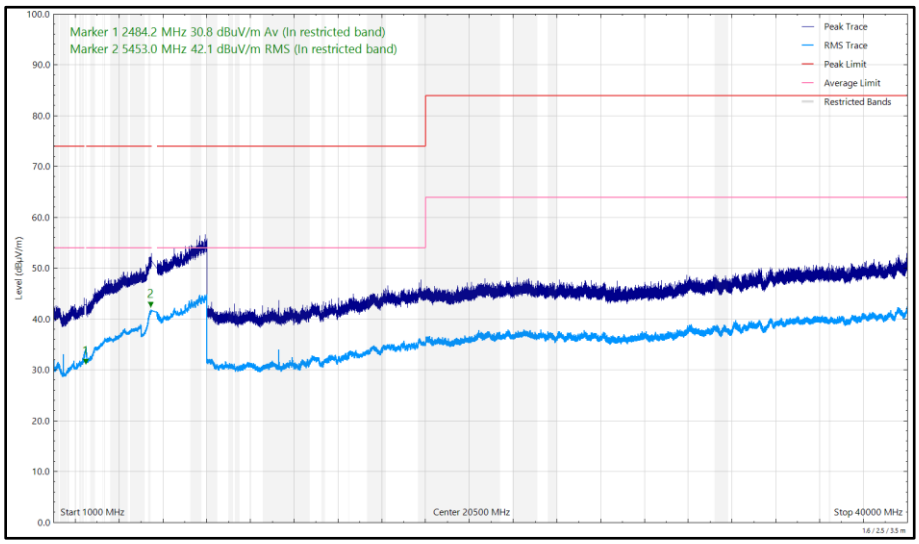

Figure 19 - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

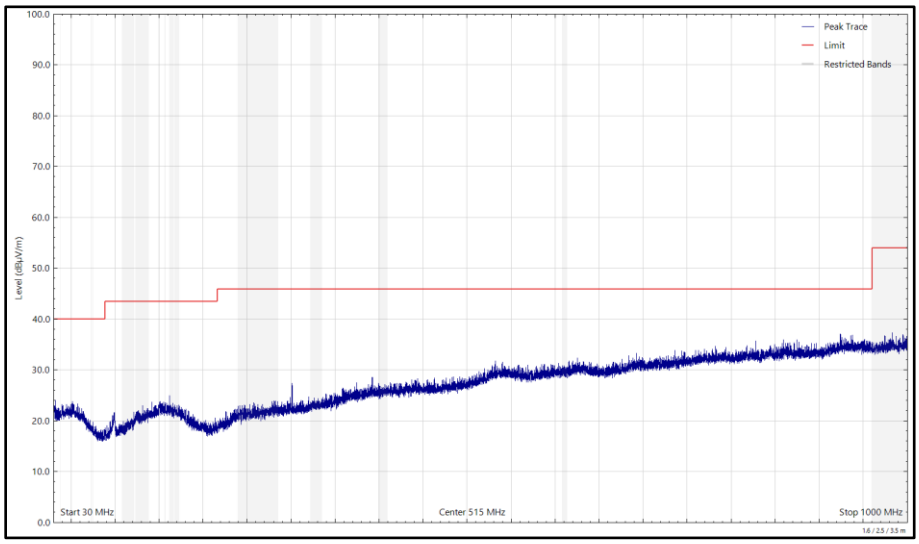

Figure 20 - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

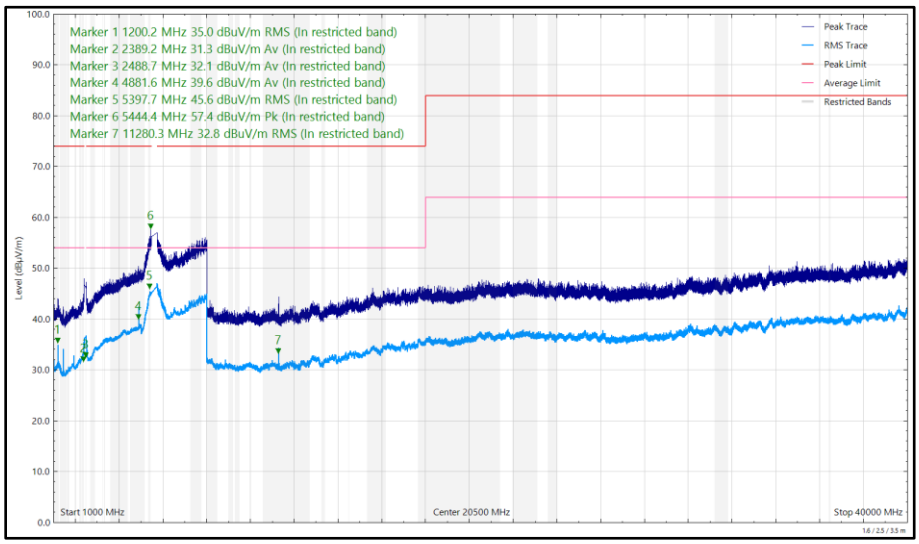

Figure 21 - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
123.181	18.93	43.50	-24.57	Q-Peak	14	260	Horizontal
1200.105	33.21	54.00	-20.79	RMS	320	255	Vertical
1440.469	32.76	54.00	-21.24	RMS	323	126	Vertical
2386.409	29.88	54.00	-24.12	CISPR Avg	54	382	Horizontal
2389.417	31.23	54.00	-22.77	CISPR Avg	0	368	Vertical
2484.910	30.18	54.00	-23.82	CISPR Avg	55	343	Horizontal
2486.861	31.29	54.00	-22.71	CISPR Avg	350	386	Vertical
4882.018	40.67	54.00	-13.33	CISPR Avg	25	264	Vertical
5409.215	55.49	74.00	-18.51	Peak	353	313	Vertical
5452.304	43.49	54.00	-10.51	RMS	2	332	Vertical
5454.786	40.66	54.00	-13.34	RMS	289	398	Horizontal

Table 11 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2DH5, ePA, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

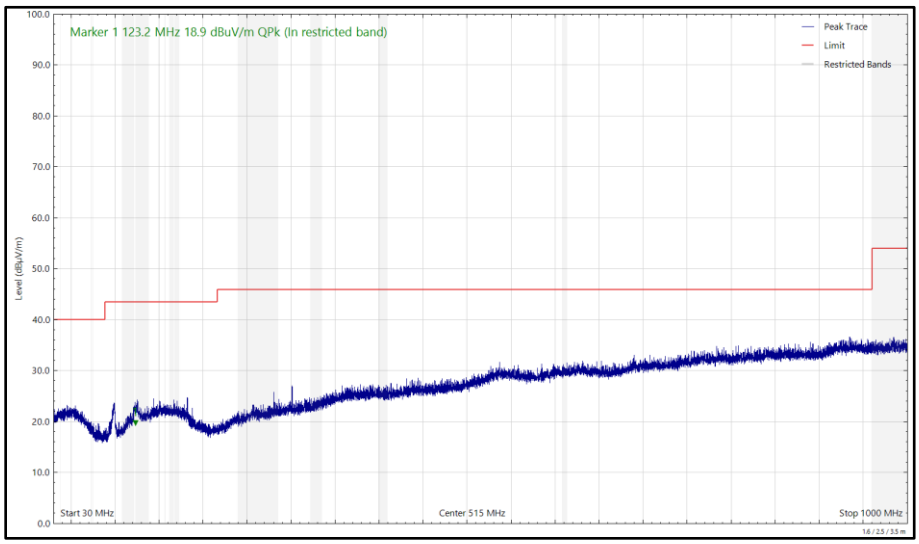

Figure 22 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

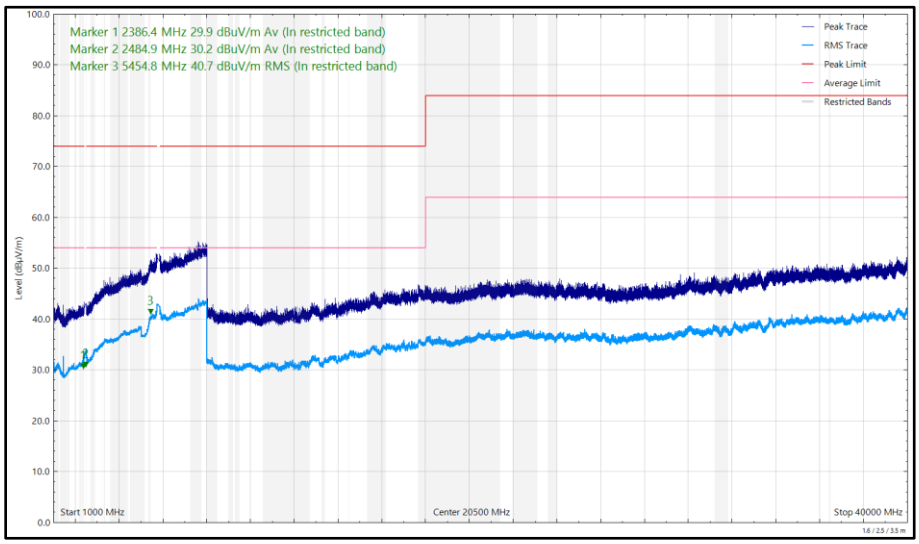

Figure 23 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

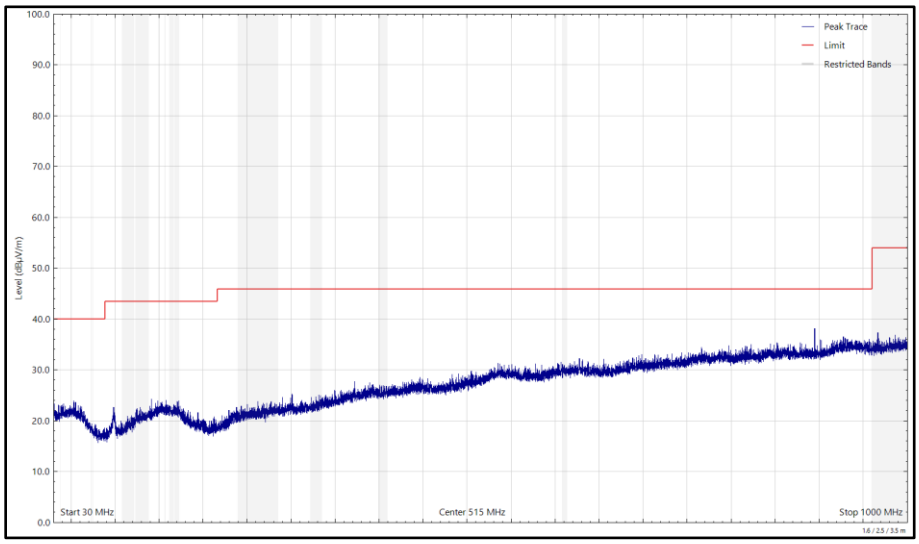

Figure 24 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

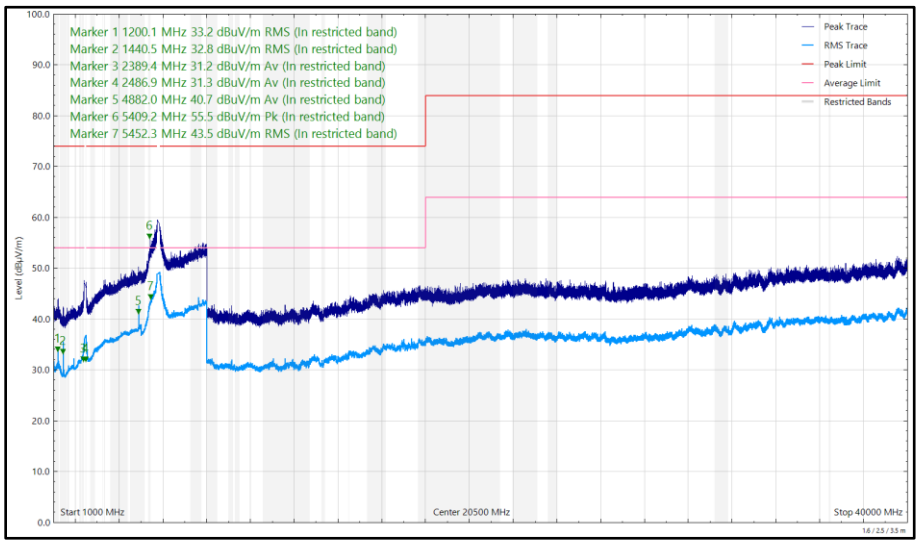

Figure 25 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

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 15.407 (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 12

6 GHz WLAN and 2.4 GHz Bluetooth

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
4882.018	38.85	54.00	-15.15	CISPR Avg	32	272	Vertical
5452.716	37.12	54.00	-16.88	RMS	316	289	Vertical
5453.374	35.70	54.00	-18.30	RMS	178	108	Horizontal
7322.666	38.00	54.00	-16.00	CISPR Avg	76	360	Horizontal
7323.086	38.89	54.00	-15.11	CISPR Avg	60	238	Vertical
8233.250	37.54	54.00	-16.46	RMS	77	318	Horizontal
8233.305	40.10	54.00	-13.90	RMS	66	135	Vertical

Table 13 - 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.

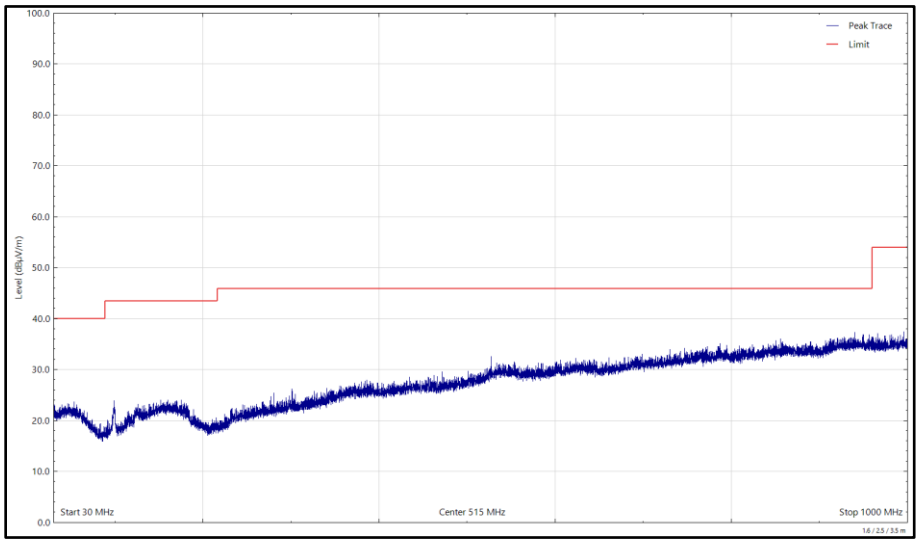

Figure 26 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Horizontal (Peak)

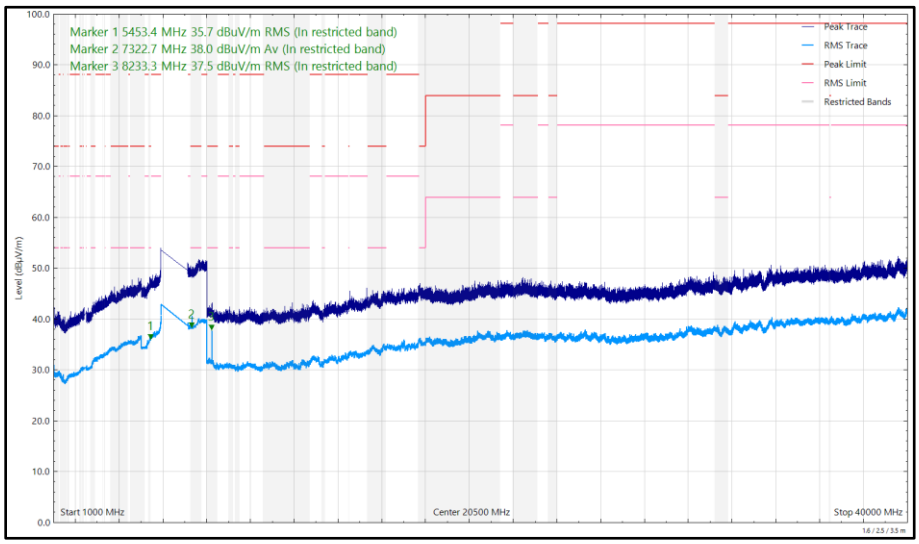

Figure 27 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Horizontal

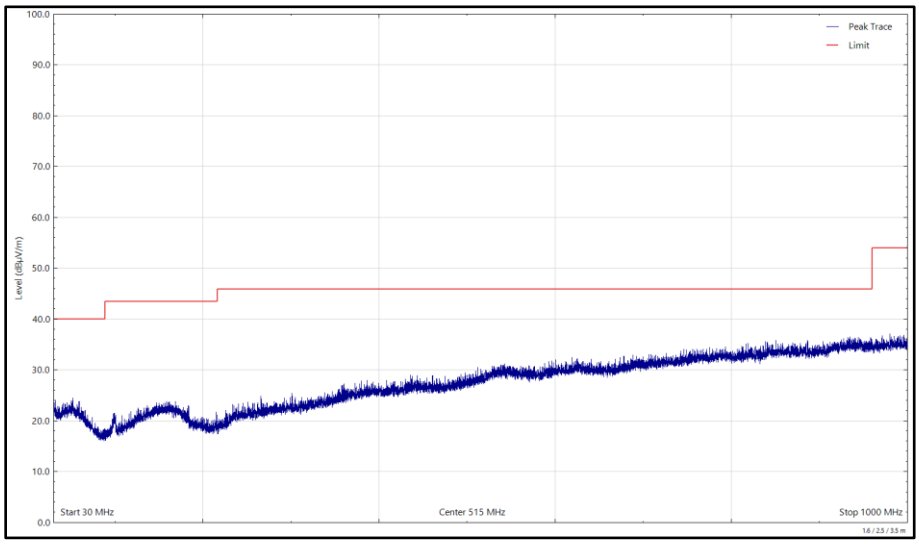

Figure 28 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Vertical (Peak)

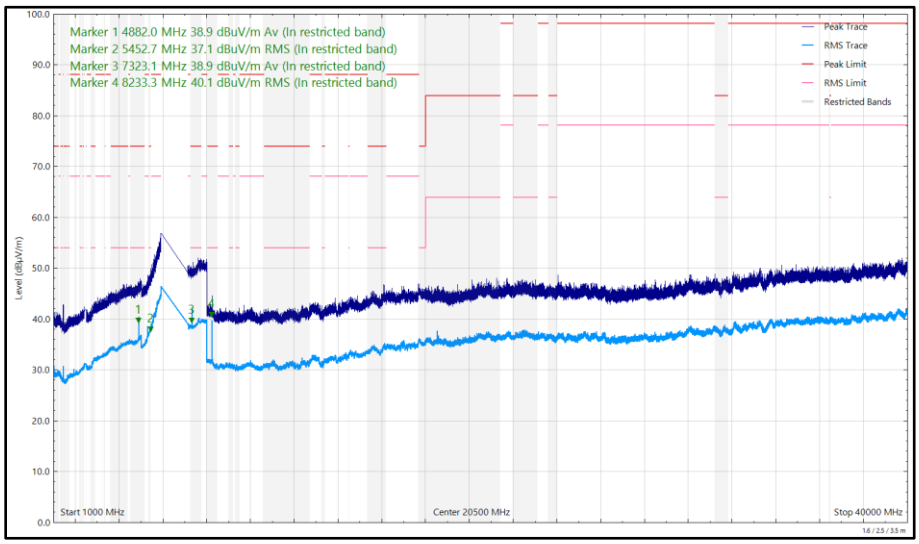

Figure 29 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
4881.833	39.46	54.00	-14.54	CISPR Avg	28	280	Vertical
5446.981	36.66	54.00	-17.34	RMS	0	360	Vertical
5453.090	35.51	54.00	-18.49	RMS	23	237	Horizontal
7257.406	40.31	54.00	-13.69	RMS	81	371	Horizontal
7322.606	38.91	54.00	-15.09	CISPR Avg	55	273	Vertical

Table 14 - 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.

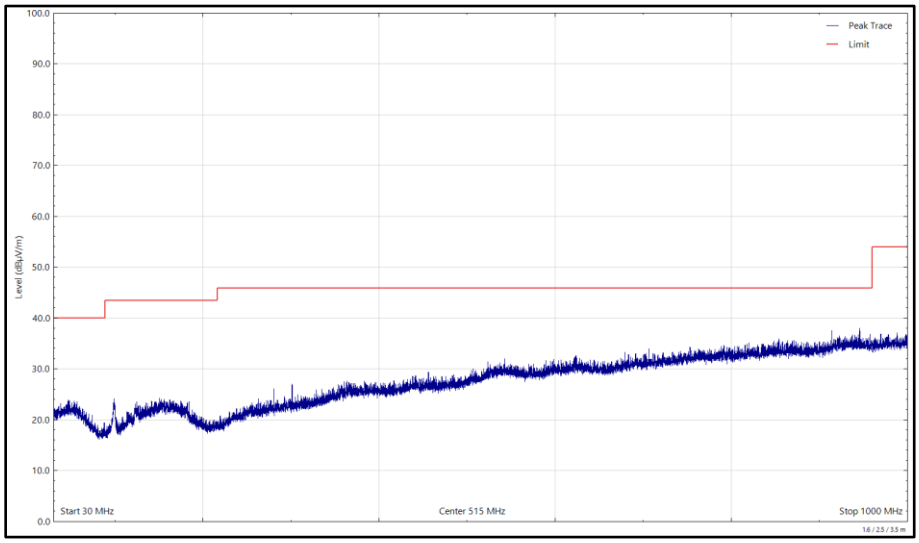

Figure 30 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Horizontal (Peak)

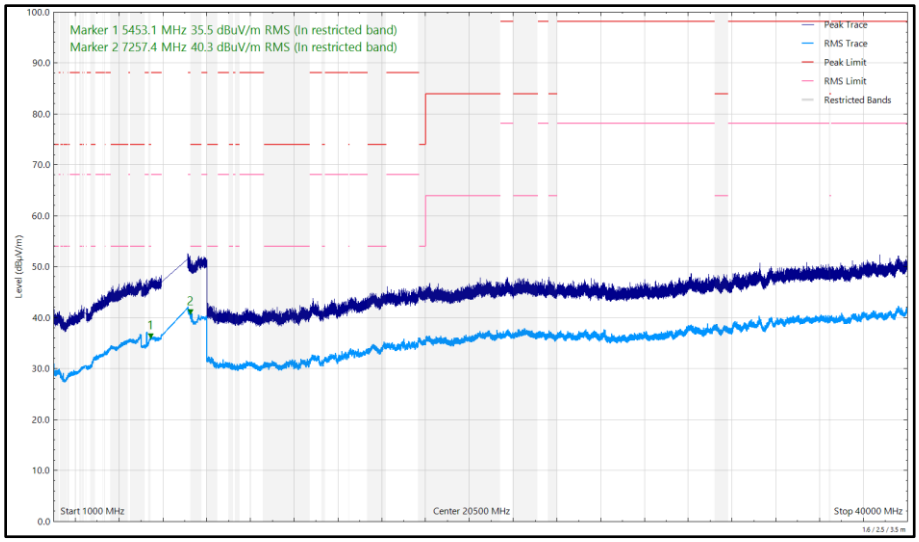

Figure 31 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Horizontal

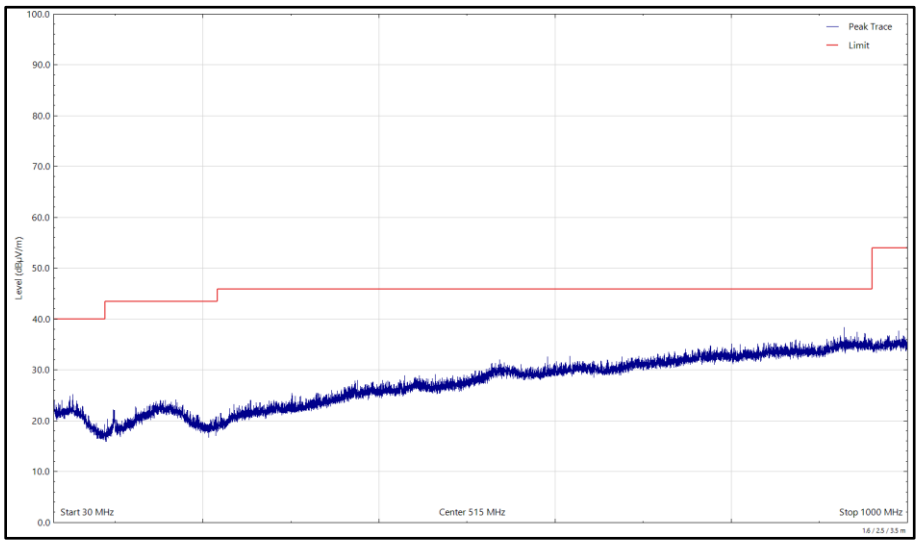

Figure 32 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 30 MHz to 1 GHz, Vertical (Peak)

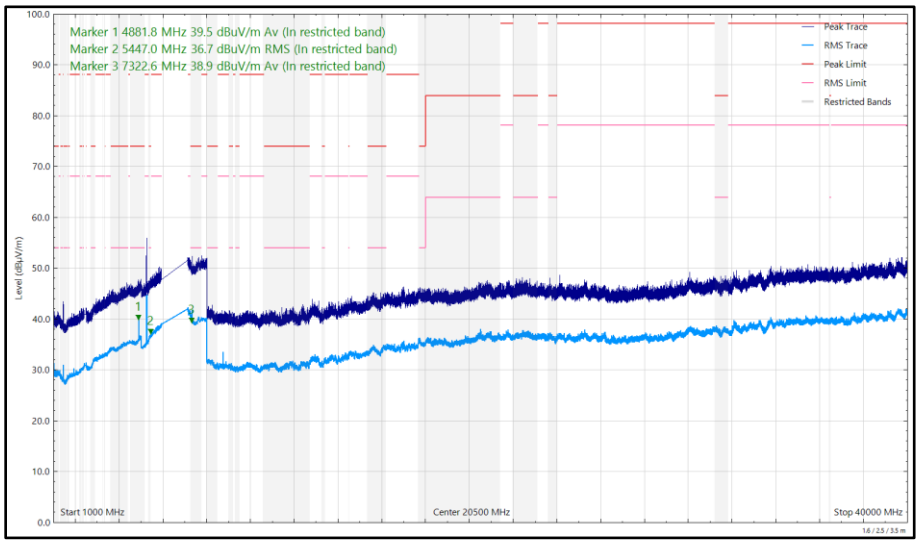

Figure 33 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), DH5, iPA, Core 2, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
1440.246	30.48	54.00	-23.52	RMS	247	100	Vertical
2389.025	31.08	54.00	-22.92	CISPR Avg	9	343	Vertical
2484.357	32.23	54.00	-21.77	CISPR Avg	31	300	Vertical
4882.238	34.57	54.00	-19.43	CISPR Avg	25	100	Vertical
5447.287	35.51	54.00	-18.49	RMS	118	343	Horizontal
5452.918	36.20	54.00	-17.80	RMS	354	228	Vertical
7323.474	39.71	54.00	-14.29	CISPR Avg	346	139	Vertical
7323.577	37.03	54.00	-16.97	CISPR Avg	262	118	Horizontal
8233.275	36.10	54.00	-17.90	RMS	83	361	Horizontal
8233.290	38.95	54.00	-15.05	RMS	61	264	Vertical

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

No other emissions found within 10 dB of the limit.

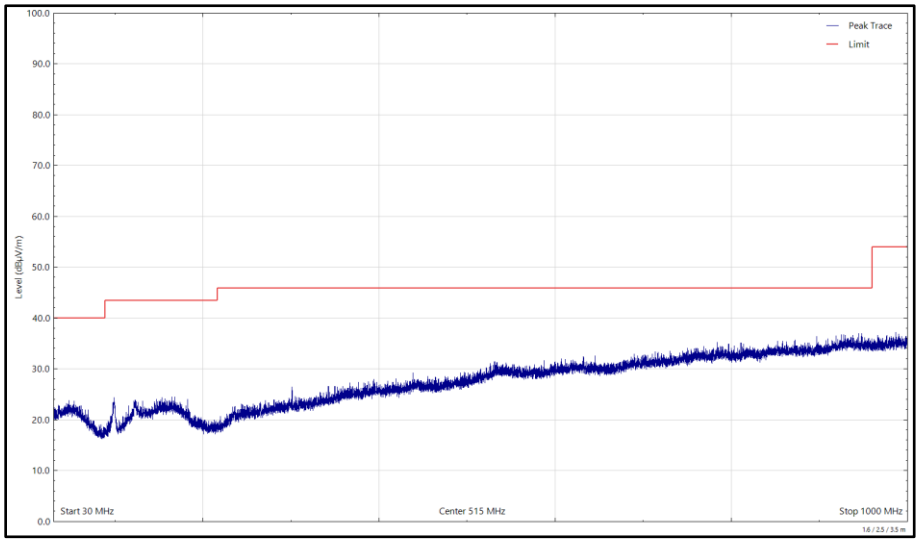

Figure 34 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

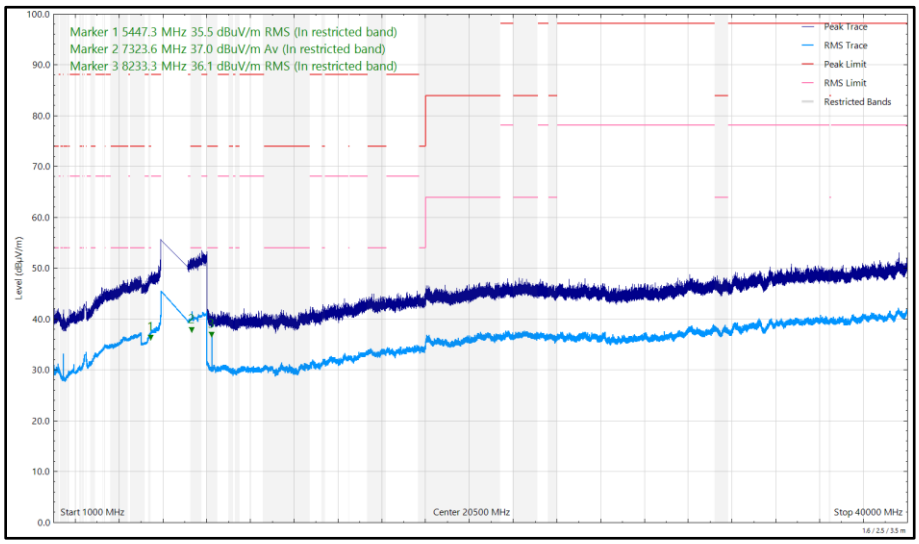

Figure 35 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

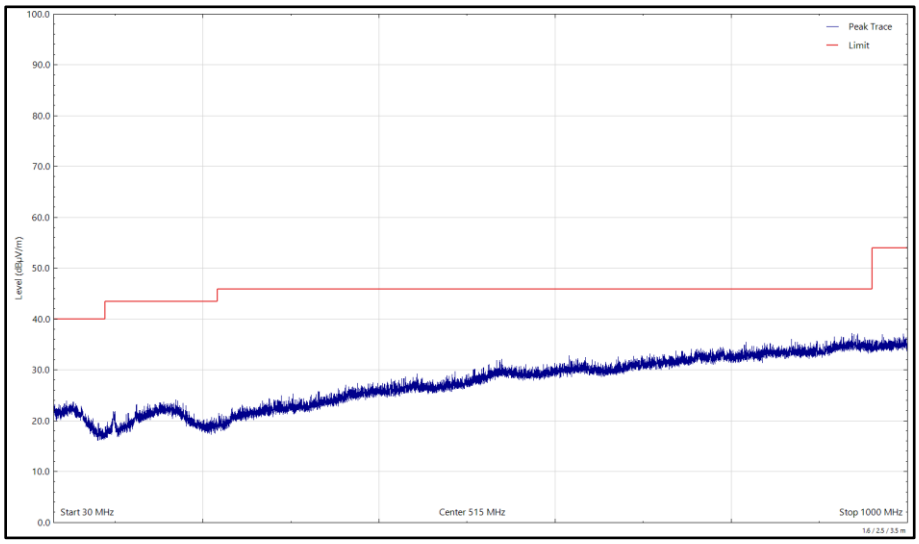

Figure 36 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

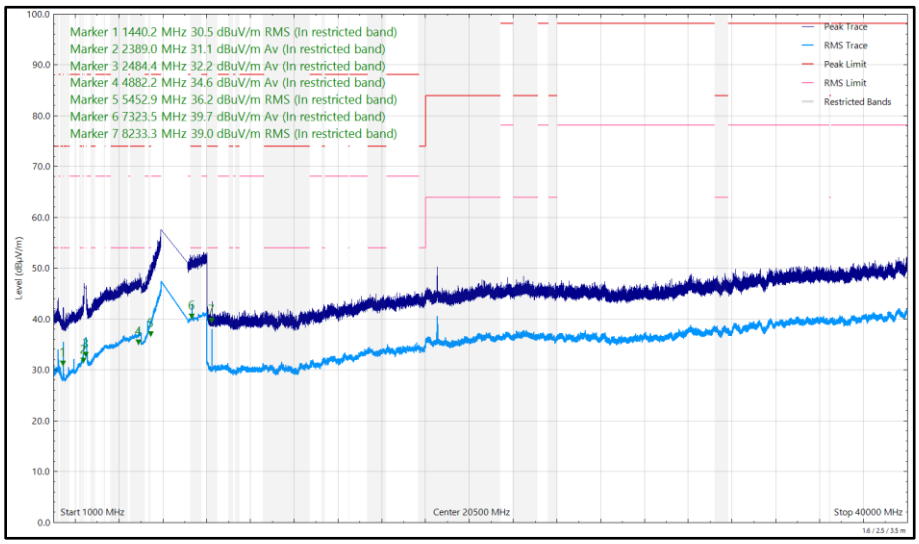

Figure 37 - 6175 MHz (CH45), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
1440.050	36.74	54.00	-17.26	RMS	243	244	Vertical
2389.232	31.11	54.00	-22.89	CISPR Avg	41	390	Vertical
2484.332	31.75	54.00	-22.25	CISPR Avg	28	380	Vertical
4886.802	32.97	54.00	-21.03	CISPR Avg	242	134	Vertical
5441.384	35.87	54.00	-18.13	RMS	33	156	Vertical
7322.617	39.64	54.00	-14.36	CISPR Avg	55	274	Vertical

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

No other emissions found within 10 dB of the limit.

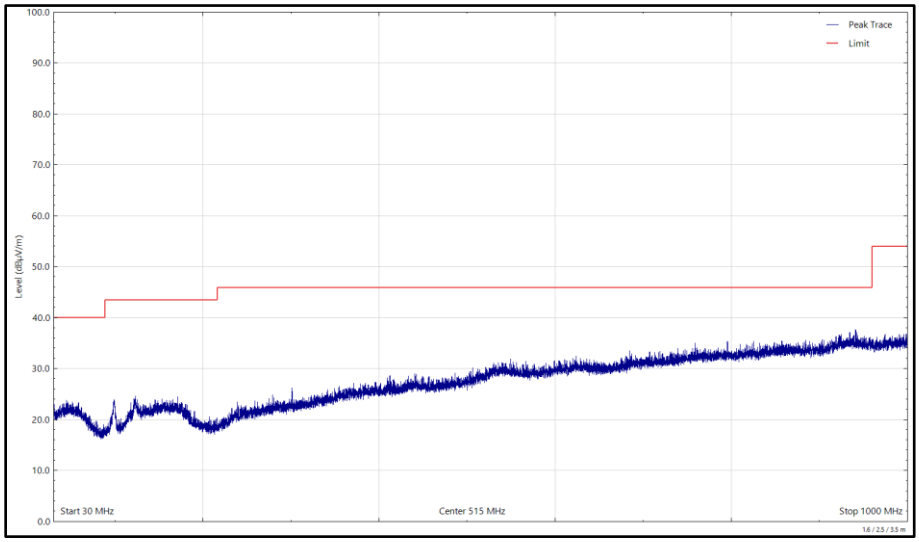

Figure 38 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

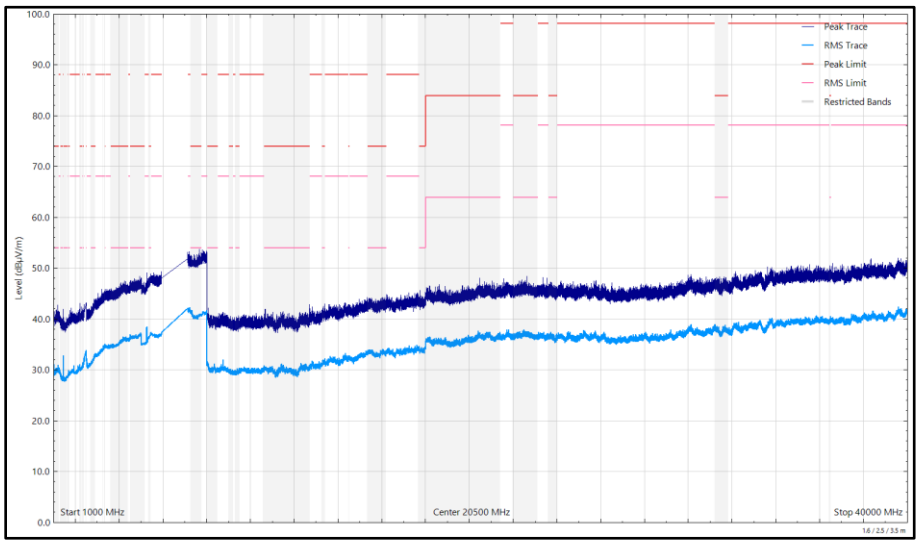

Figure 39 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

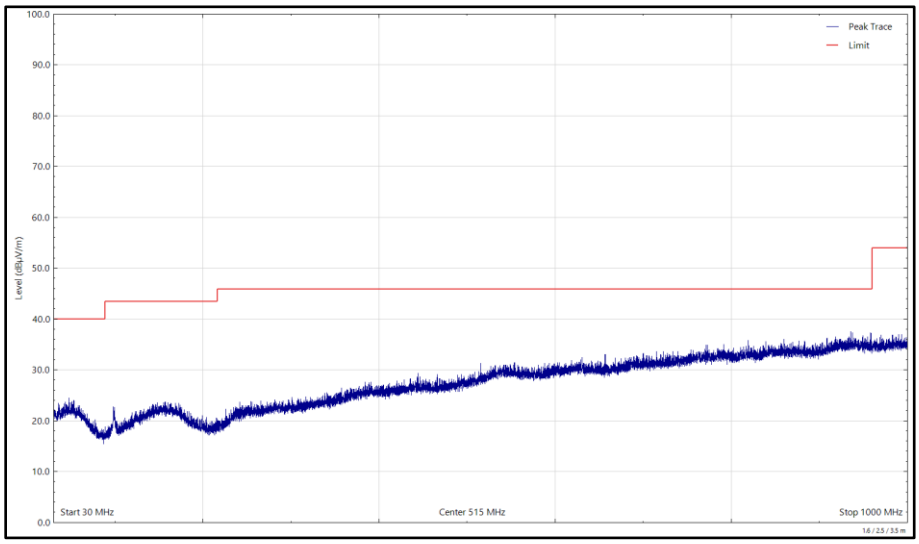

Figure 40 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2DH5, ePA, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

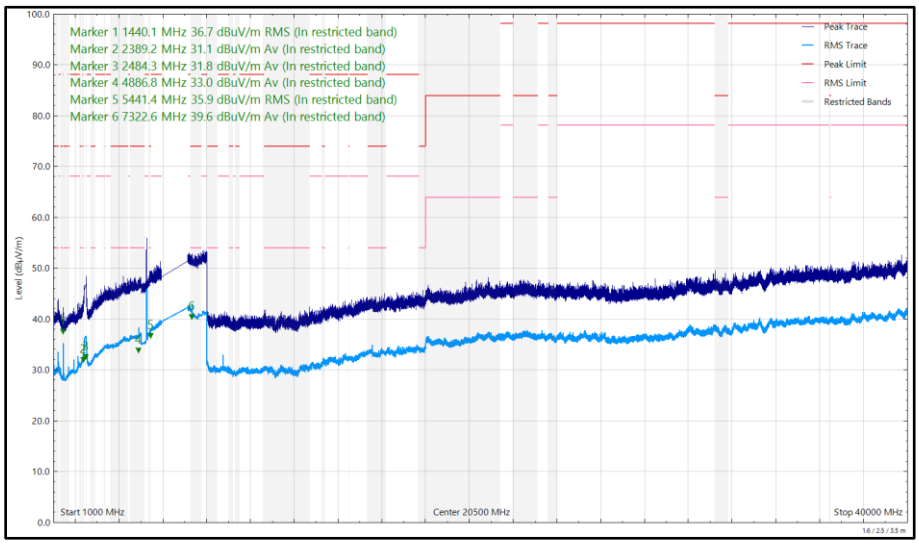

Figure 41 - 6995 MHz (CH209), HE20, SU, CDD, Core 0 + Core 1 and 2441 MHz (CH39), 2DH5, ePA, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

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)	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
2389.931	35.81	54.00	-18.19	RMS	304	390	Horizontal
2389.971	40.43	54.00	-13.57	RMS	358	281	Vertical
2483.514	40.42	54.00	-13.58	RMS	45	395	Horizontal
2483.534	44.00	54.00	-10.00	RMS	25	290	Vertical
2484.966	59.55	74.00	-14.45	Peak	336	390	Vertical
4091.206	35.58	54.00	-18.42	RMS	203	132	Horizontal
5140.871	37.56	54.00	-16.44	RMS	28	298	Vertical
5145.465	36.27	54.00	-17.73	RMS	126	110	Horizontal
5406.783	37.89	54.00	-16.11	RMS	299	336	Horizontal
5448.784	37.80	54.00	-16.20	RMS	108	373	Vertical

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.

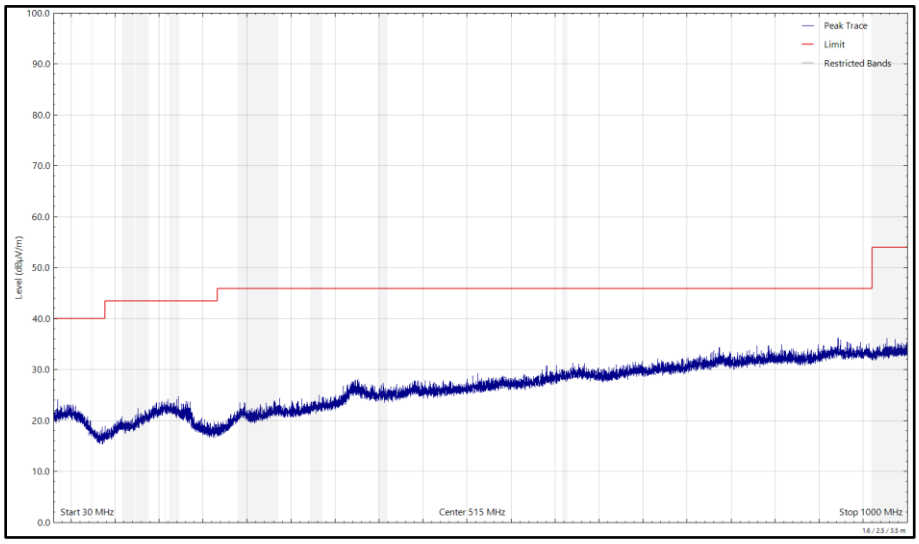

Figure 42 - 2442 MHz (CH7), HT20, Core 0 and 5204 MHz, DH5, ePA, Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

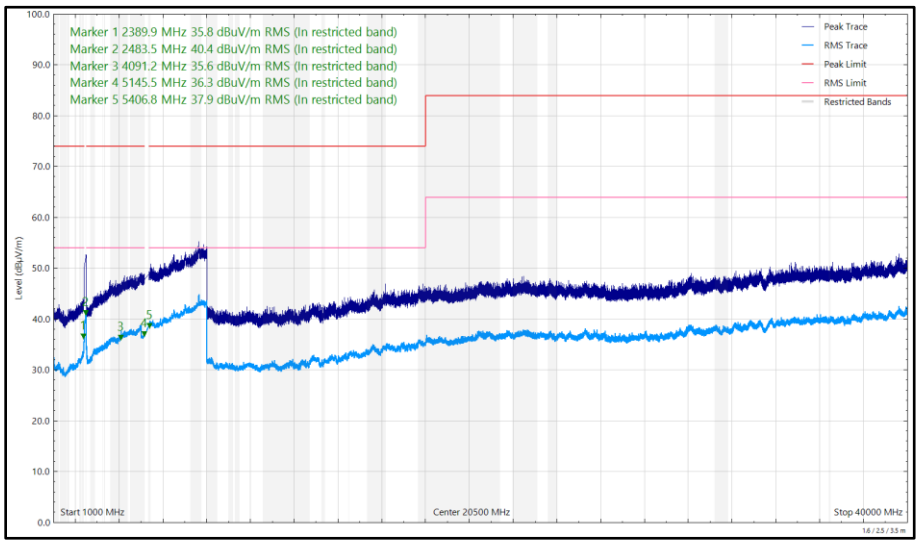

Figure 43 - 2442 MHz (CH7), HT20, Core 0 and 5204 MHz, DH5, ePA, Core 1, 1 GHz to 40 GHz, Horizontal

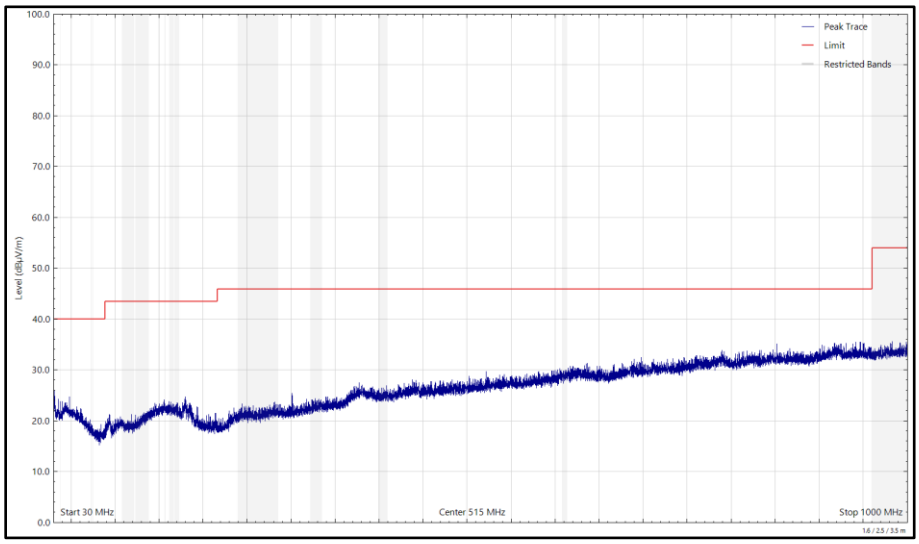

Figure 44 - 2442 MHz (CH7), HT20, Core 0 and 5204 MHz, DH5, ePA, Core 1, 30 MHz to 1 GHz, Vertical (Peak)

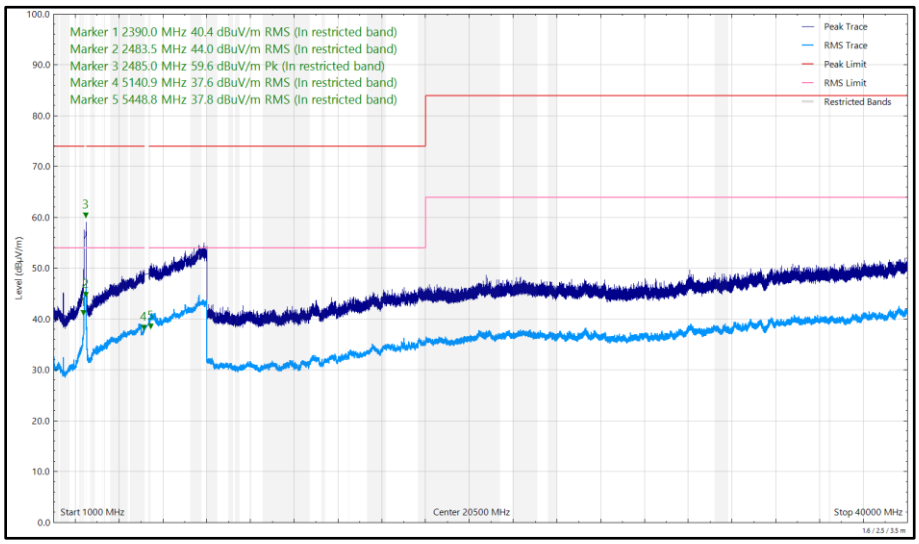

Figure 45 - 2442 MHz (CH7), HT20, Core 0 and 5204 MHz, DH5, ePA, Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
2385.042	55.96	74.00	-18.04	Peak	352	326	Vertical
2389.936	36.47	54.00	-17.53	RMS	315	377	Horizontal
2389.981	39.58	54.00	-14.42	RMS	1	393	Vertical
2483.516	44.58	54.00	-9.42	RMS	8	306	Vertical
2483.619	39.29	54.00	-14.71	RMS	307	354	Horizontal
2483.781	60.18	74.00	-13.82	Peak	0	354	Vertical
5374.576	44.46	54.00	-9.54	RMS	359	311	Vertical
5426.766	37.75	54.00	-16.25	RMS	305	263	Horizontal

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.

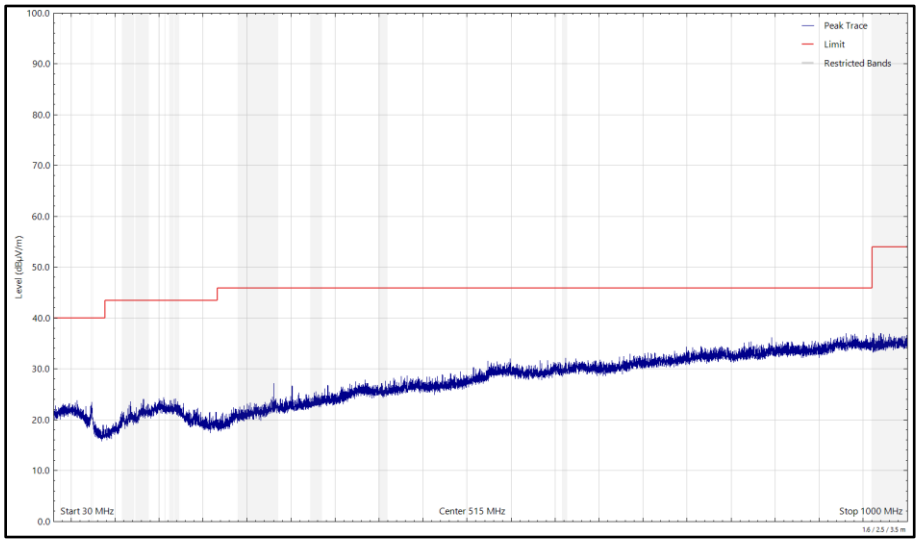

Figure 46 - 2442 MHz (CH7), HT20, Core 0 and 5788 MHz, DH5, ePA, Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

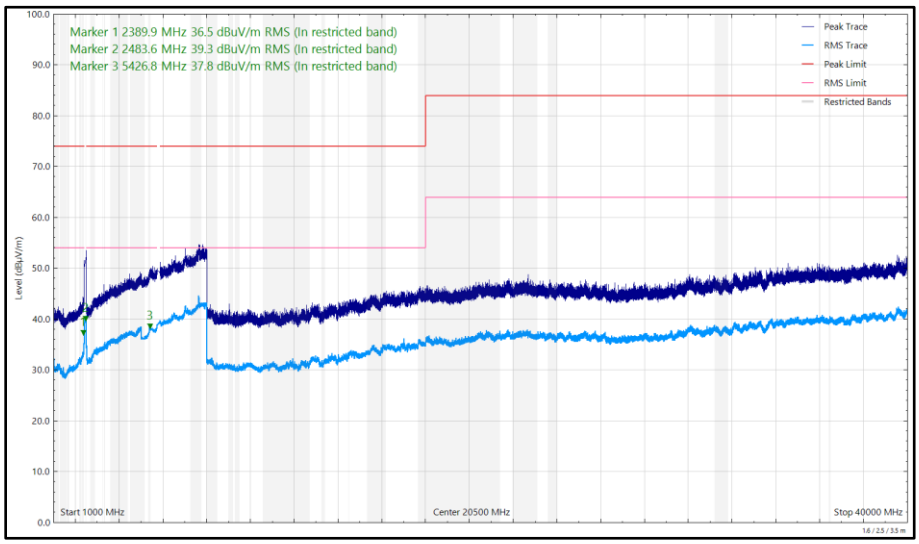

Figure 47 - 2442 MHz (CH7), HT20, Core 0 and 5788 MHz, DH5, ePA, Core 1, 1 GHz to 40 GHz, Horizontal

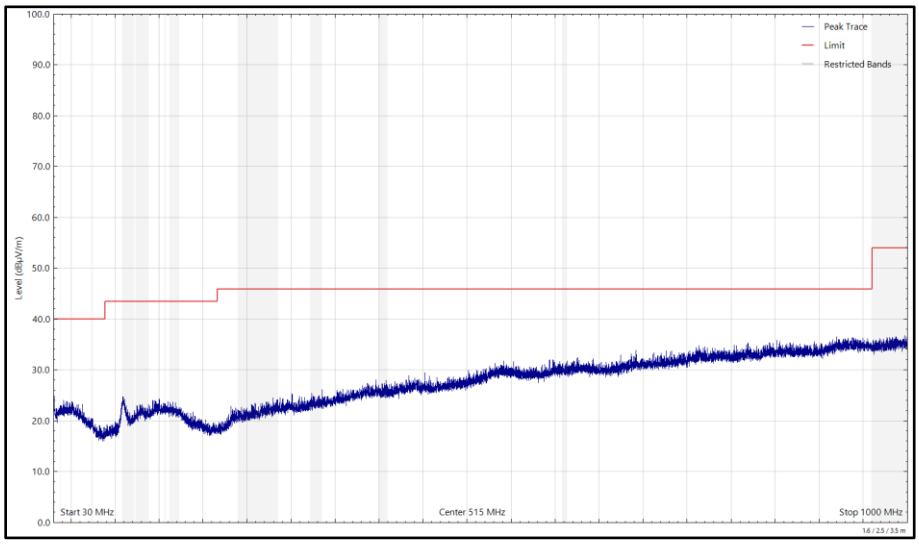

Figure 48 - 2442 MHz (CH7), HT20, Core 0 and 5788 MHz, DH5, ePA, Core 1, 30 MHz to 1 GHz, Vertical (Peak)

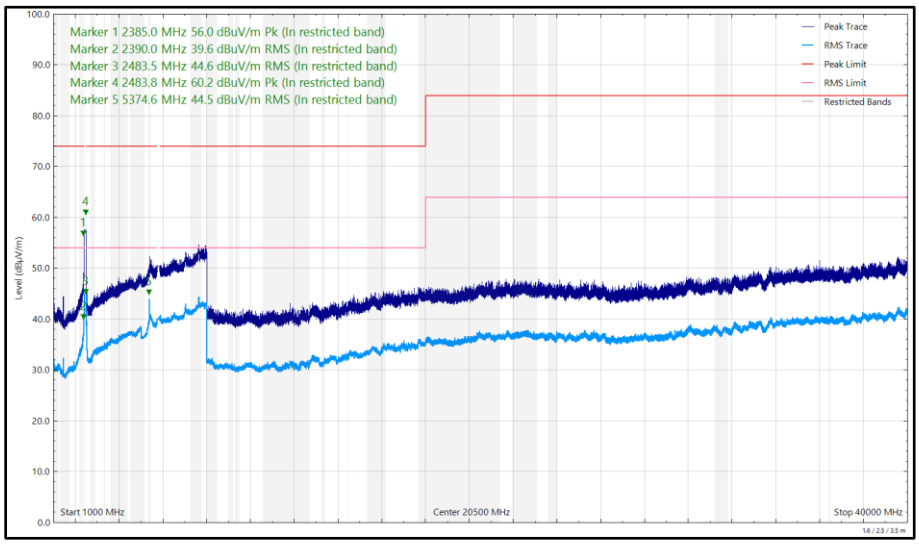

Figure 49 - 2442 MHz (CH7), HT20, Core 0 and 5788 MHz, DH5, ePA, Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
2389.493	38.25	54.00	-15.75	RMS	59	385	Horizontal
2389.891	40.46	54.00	-13.54	RMS	50	400	Vertical
2483.536	45.95	54.00	-8.05	RMS	42	395	Vertical
2483.580	42.44	54.00	-11.56	RMS	51	400	Horizontal
2485.324	63.16	74.00	-10.84	Peak	51	400	Vertical
2485.515	59.36	74.00	-14.64	Peak	52	389	Horizontal
3349.979	33.77	54.00	-20.23	RMS	14	393	Horizontal
4882.453	37.93	54.00	-16.07	RMS	31	280	Vertical
5131.934	36.23	54.00	-17.77	RMS	186	349	Horizontal
5145.383	38.08	54.00	-15.92	RMS	328	380	Vertical
5413.679	38.02	54.00	-15.98	RMS	99	397	Horizontal
5447.426	37.87	54.00	-16.13	RMS	122	100	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.

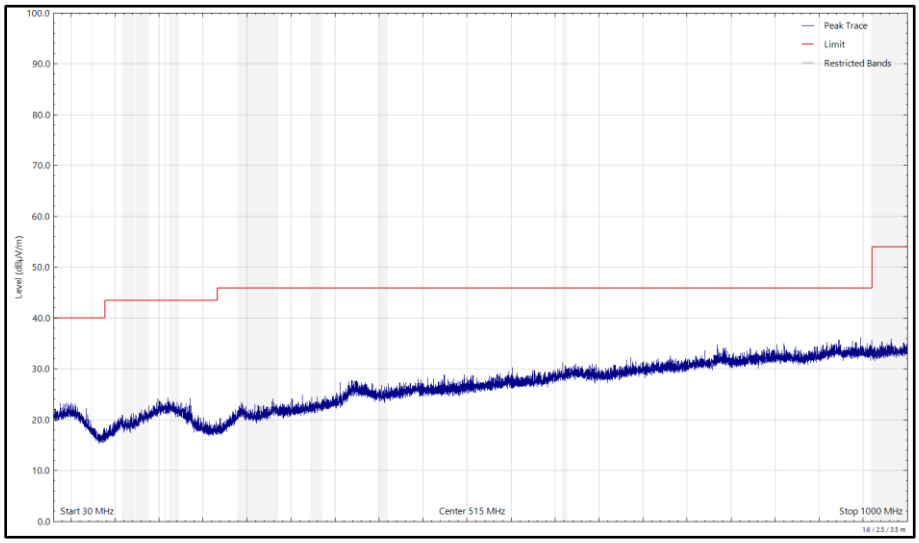

Figure 50 - 2442 MHz (CH7), HT20, Core 1 and 5204 MHz, DH5, ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)

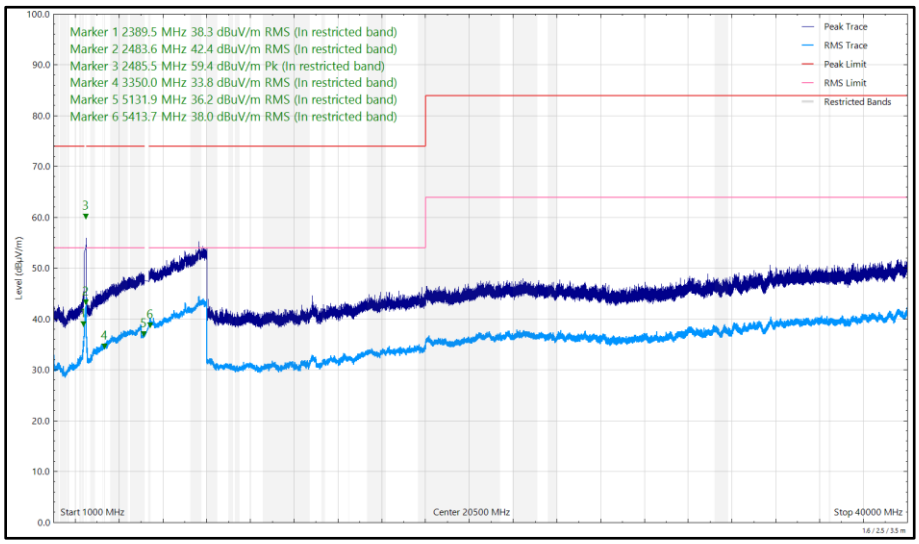

Figure 51 - 2442 MHz (CH7), HT20, Core 1 and 5204 MHz, DH5, ePA, Core 0, 1 GHz to 40 GHz, Horizontal

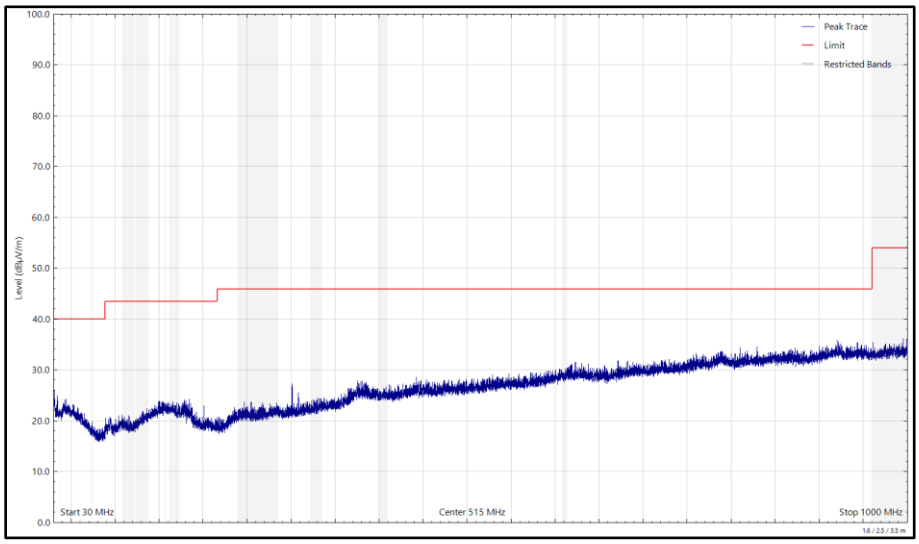

Figure 52 - 2442 MHz (CH7), HT20, Core 1 and 5204 MHz, DH5, ePA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)

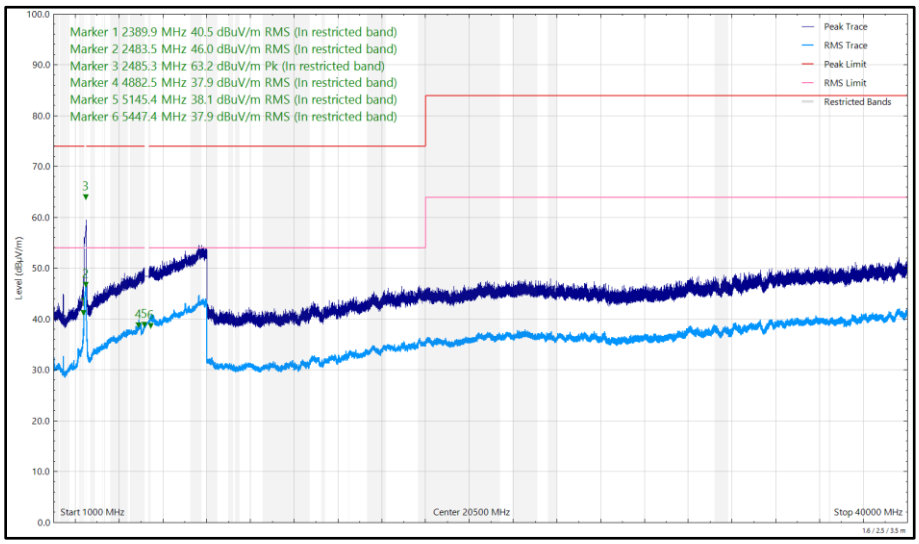

Figure 53 - 2442 MHz (CH7), HT20, Core 1 and 5204 MHz, DH5, ePA, Core 0, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
2389.893	38.16	54.00	-15.84	RMS	53	388	Horizontal
2389.906	37.85	54.00	-16.15	RMS	10	377	Vertical
2483.519	46.55	54.00	-7.45	RMS	44	400	Vertical
2483.559	42.28	54.00	-11.72	RMS	54	390	Horizontal
2485.175	58.98	74.00	-15.02	Peak	52	360	Horizontal
2485.341	63.16	74.00	-10.84	Peak	48	354	Vertical
5374.459	44.80	54.00	-9.20	RMS	348	298	Vertical
5374.479	39.53	54.00	-14.47	RMS	298	398	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.

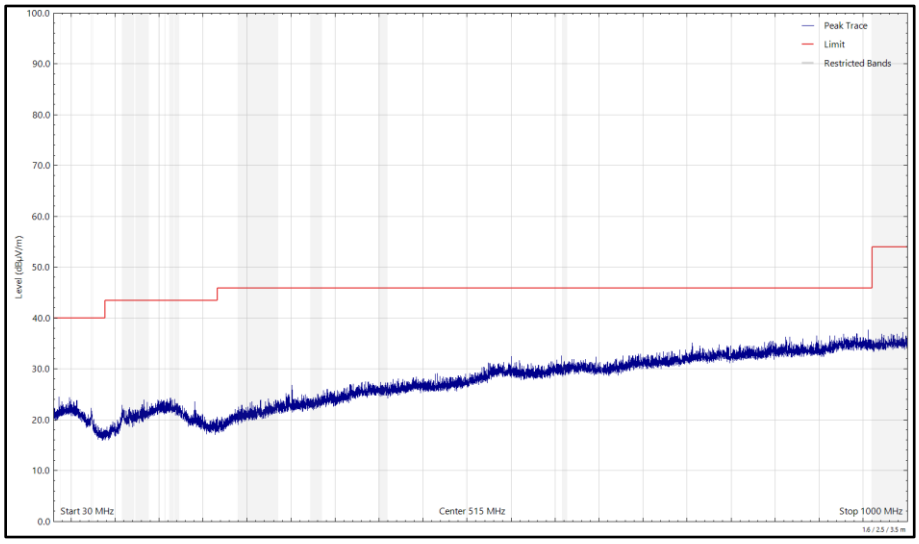

Figure 54 - 2442 MHz (CH7), HT20, Core 1 and 5788 MHz, DH5, ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)

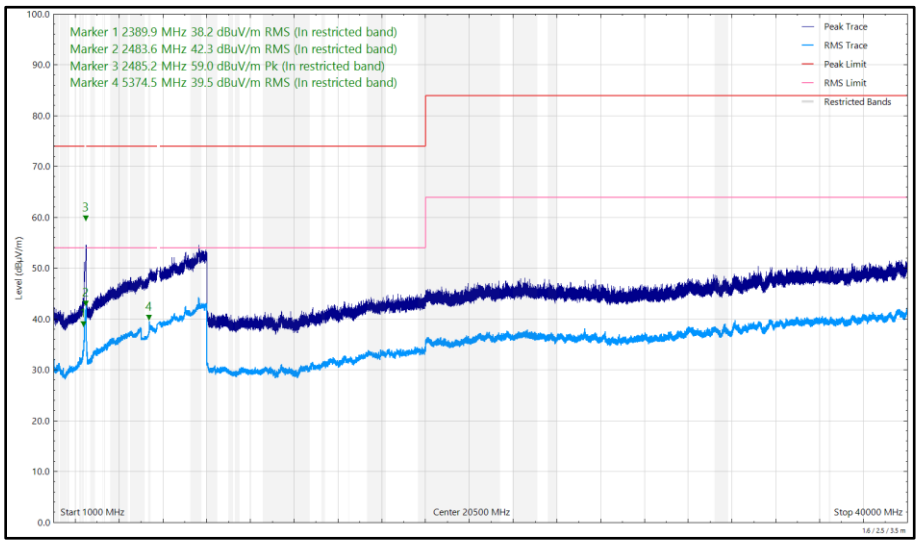

Figure 55 - 2442 MHz (CH7), HT20, Core 1 and 5788 MHz, DH5, ePA, Core 0, 1 GHz to 40 GHz, Horizontal

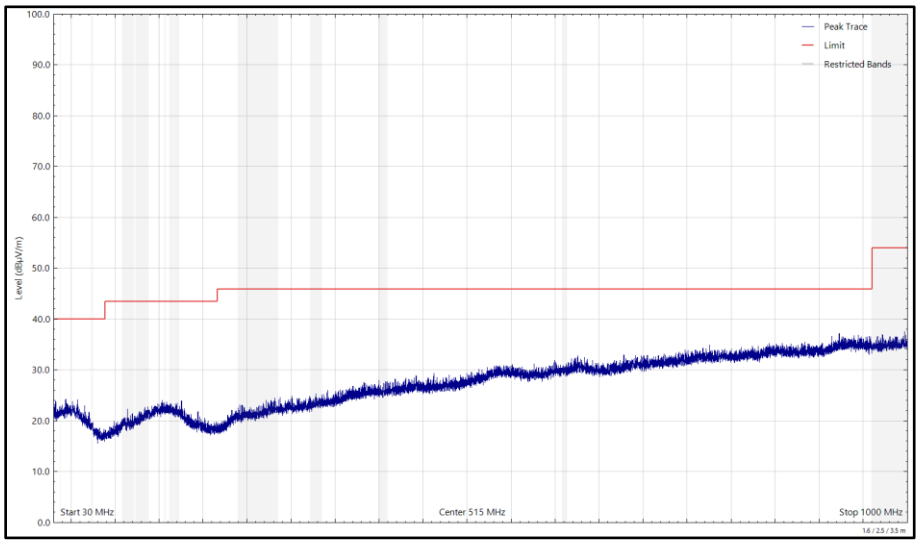

Figure 56 - 2442 MHz (CH7), HT20, Core 1 and 5788 MHz, DH5, ePA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)

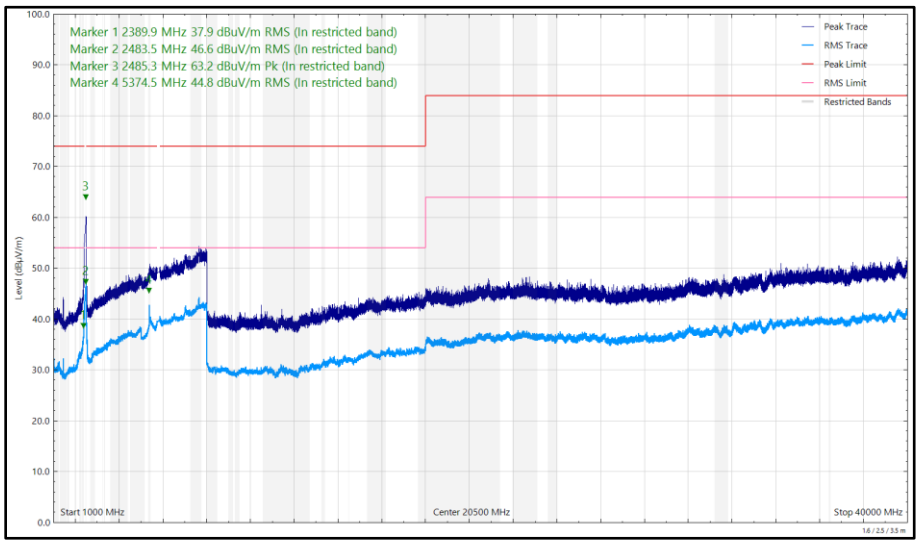

Figure 57 - 2442 MHz (CH7), HT20, Core 1 and 5788 MHz, DH5, ePA, Core 0, 1 GHz to 40 GHz, Vertical

FCC 47 CFR Part 15

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
125.902	22.26	43.50	-21.24	Q-Peak	141	100	Vertical
1205.425	32.45	54.00	-21.55	RMS	185	400	Vertical
2380.056	36.85	54.00	-17.15	RMS	351	381	Vertical
2483.535	35.04	54.00	-18.96	RMS	314	389	Horizontal
2484.666	38.48	54.00	-15.52	RMS	351	306	Vertical
4879.098	39.29	54.00	-14.71	RMS	309	395	Horizontal
4879.193	55.89	74.00	-18.11	Peak	330	269	Vertical
4880.913	46.97	54.00	-7.03	RMS	334	274	Vertical
5078.706	54.43	74.00	-19.57	Peak	6	348	Vertical
5118.727	43.95	54.00	-10.05	RMS	338	272	Vertical
5119.961	39.32	54.00	-14.68	RMS	57	396	Horizontal
5351.722	47.46	54.00	-6.54	RMS	348	332	Vertical
5354.131	58.70	74.00	-15.30	Peak	6	330	Vertical
5366.671	42.19	54.00	-11.81	RMS	292	339	Horizontal
5498.930	57.02	74.00	-16.98	Peak	4	244	Vertical

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

No other emissions found within 10 dB of the limit.

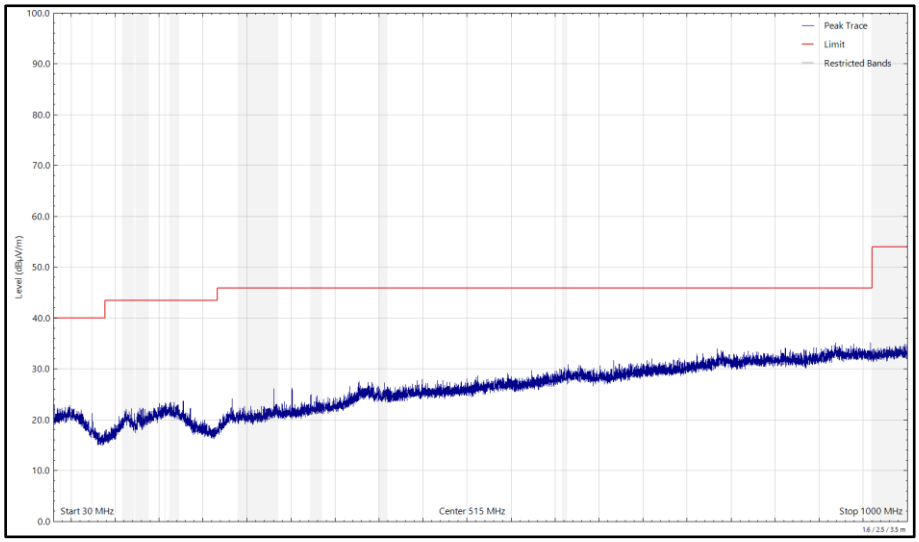

Figure 58 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), Core 0, ePA, 30 MHz to 1 GHz, Horizontal (Peak)

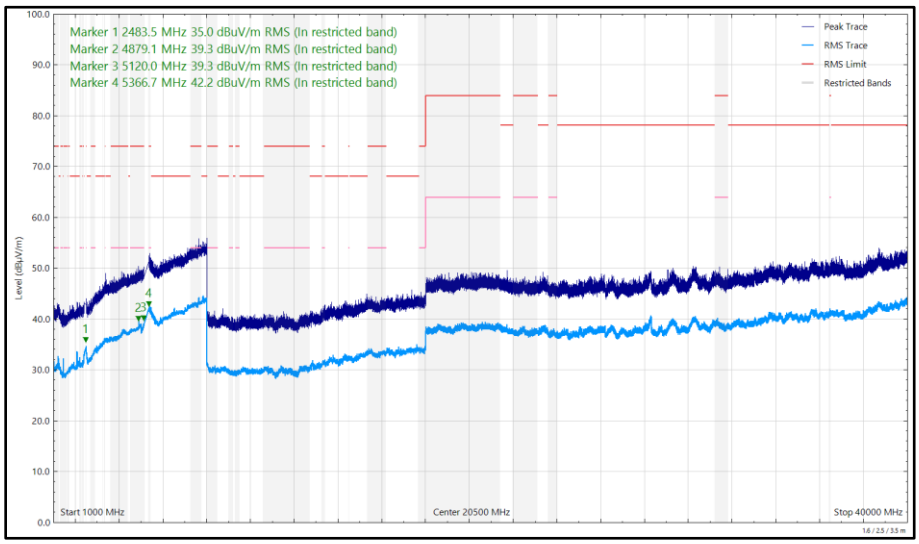

Figure 59 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), Core 0, ePA, 1 GHz to 40 GHz, Horizontal

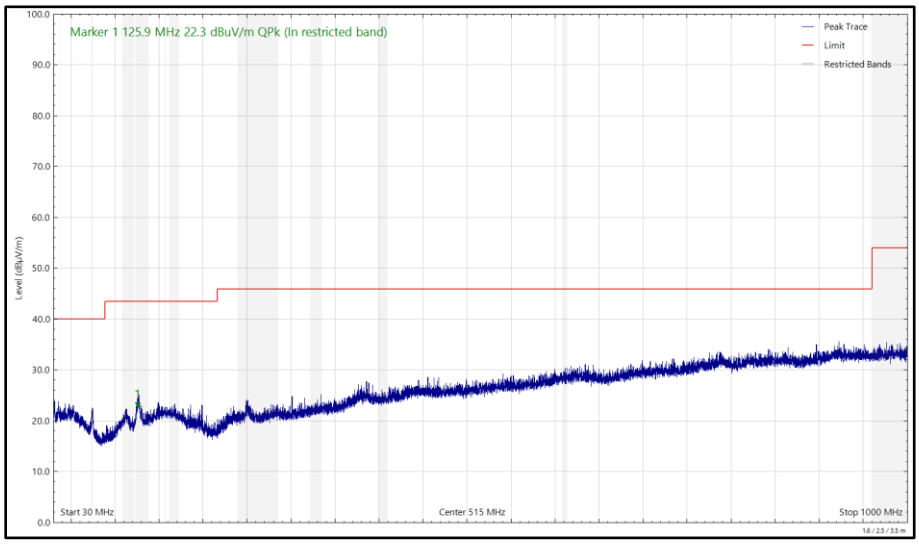

Figure 60 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1 and 2440 MHz (CH18), Core 0, ePA, 30 MHz to 1 GHz, Vertical (Peak)