

FCC and ISED Test Report

Apple Inc
Model: A2991

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

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



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SIGNATURE

NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Steve Marshall	Senior Engineer	Authorised Signatory	11 October 2023

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD document control rules.

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15, ISED RSS-247, ISED RSS-248 and ISED RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Report Generation	Lauren Walters	11 October 2023	

FCC Accreditation

553713/UK2026 Concorde Park, Fareham Test Laboratory

ISED Accreditation

28798 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: 2021, ISED RSS-247: Issue 2 (2017-02), ISED RSS-248: Issue 2 (2022-12) and ISED RSS-GEN: Issue 5 (2018-04) + A2 (2021-02) for the tests detailed in section 1.3.



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ACCREDITATION

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation. Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited). Results of tests covered by our Flexible UKAS Accreditation Schedule are marked FS (Flexible Scope).

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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	11-October-2023

Table 1

1.2 Introduction

Applicant	Apple Inc
Manufacturer	Apple Inc
Model Number(s)	A2991
Serial Number(s)	N7RTH0WPW3 and XNJWHY732L
Hardware Version(s)	REV 1.0
Software Version(s)	23A32390z
Number of Samples Tested	2
Test Specification/Issue/Date	FCC 47 CFR Part 15: 2021 ISED RSS-247: Issue 2 (2017-02) ISED RSS-248: Issue 2 (2022-12) ISED RSS-GEN: Issue 5 (2018-04) + A2 (2021-02)
Start of Test	02-August-2023
Finish of Test	17-September-2023
Name of Engineer(s)	Akhil Rajendran Bhaskaran Nair, Colin Brain, Dale Hills, Ian Hart, James Woods, Michael Evans, Morsalin Hossain and Tom Randall
Related Document(s)	ANSI C63.10: 2013 ANSI C63.10: 2020 ANSI C63.4: 2014 KDB 789033



1.3 Brief Summary of Results

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

Section	Specification Clause				Test Description	Result	Comments/Base Standard
	Part 15	RSS-247	RSS-248	RSS-GEN			
Configuration and Mode: CoTx - 2.4 GHz Bluetooth and 5 GHz WLAN							
2.1	15.209, 15.247(d) and 15.407(b)	5.5 and 6.2	-	6.13 and 8.9	Radiated Spurious Emissions (Simultaneous Transmission)	Pass	
Configuration and Mode: CoTx - 2.4 GHz Bluetooth and 6 GHz WLAN							
2.1	15.209, 15.247(d) and 15.407(b)	5.5	4.6	6.13 and 8.9	Radiated Spurious Emissions (Simultaneous Transmission)	Pass	
Configuration and Mode: CoTx - 2.4 GHz WLAN and Narrowband							
2.1	15.209, 15.247(d) and 15.407(b)	5.5 and 6.2	-	6.13 and 8.9	Radiated Spurious Emissions (Simultaneous Transmission)	Pass	
Configuration and Mode: CoTx - Thread and 5 GHz WLAN							
2.1	15.209, 15.247(d) and 15.407(b)	5.5 and 6.2	-	6.13 and 8.9	Radiated Spurious Emissions (Simultaneous Transmission)	Pass	
Configuration and Mode: CoTx - Thread and 6 GHz WLAN							
2.1	15.209, 15.247(d) and 15.407(b)	5.5	4.6	6.13 and 8.9	Radiated Spurious Emissions (Simultaneous Transmission)	Pass	

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 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: A2991, Serial Number: N7RTH0WPW3			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A2991, Serial Number: XNJWHY732L			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 3



1.7 Test Location

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

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: CoTx - 2.4 GHz WLAN and Narrowband		
Radiated Spurious Emissions (Simultaneous Transmission)	Colin Brain, Ian Hart, James Woods, Michael Evans, Morsalin Hossain and Tom Randall	UKAS
Configuration and Mode: CoTx - 2.4 GHz Bluetooth and 5 GHz WLAN		
Radiated Spurious Emissions (Simultaneous Transmission)	Colin Brain and Thomas Randall	UKAS
Configuration and Mode: CoTx - 2.4 GHz Bluetooth and 6 GHz WLAN		
Radiated Spurious Emissions (Simultaneous Transmission)	Colin Brain and Thomas Randall	UKAS
Configuration and Mode: CoTx - Thread and 5 GHz WLAN		
Radiated Spurious Emissions (Simultaneous Transmission)	Akhil Rajendran Bhaskaran Nair, Dale Hills and Ian Hart	UKAS
Configuration and Mode: CoTx - Thread and 6 GHz WLAN		
Radiated Spurious Emissions (Simultaneous Transmission)	Dale Hills, Ian Hart and Thomas Randall	UKAS

Table 4

Office Address:

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



2 Test Details

2.1 Radiated Spurious Emissions (Simultaneous Transmission)

2.1.1 Specification Reference

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

2.1.2 Equipment Under Test and Modification State

A2991, S/N: N7RTH0WPW3 - Modification State 0
A2991, S/N: XNJWHY732L - Modification State 0

2.1.3 Date of Test

02-August-2023 to 17-September-2023

2.1.4 Test Method

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

The EUT was placed on the non-conducting platform in a manner typical of a normal installation.

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:
 $10^{(\text{Field Strength in dB}\mu\text{V/m}/20)}$

At a measurement distance of 1 meter the limit line was increased by $20 \cdot \text{LOG}(3/1) = 9.54$ dB.

2.1.5 Example Test Setup Diagram

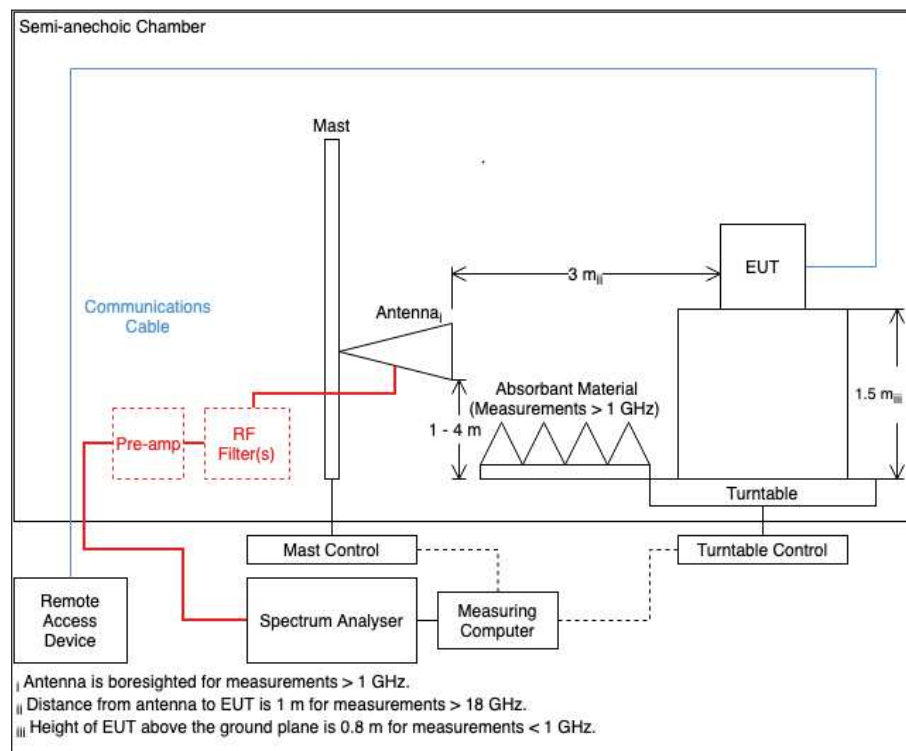


Figure 1

2.1.6 Environmental Conditions

Ambient Temperature	22.1 - 24.3 °C
Relative Humidity	35.2 - 51.0 %

2.1.7 Test Results

CoTx - 2.4 GHz Bluetooth and 5 GHz WLAN

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
4882.284	49.62	54.00	-4.38	CISPR Avg	241	313	Vertical
5360.658	46.29	54.00	-7.71	RMS	238	273	Vertical

Table 5 - 2441 MHz (CH39), DH5, ePA, Core 0 + Core 1 and U-NII-1 - 5240 MHz (CH48), VHT20, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

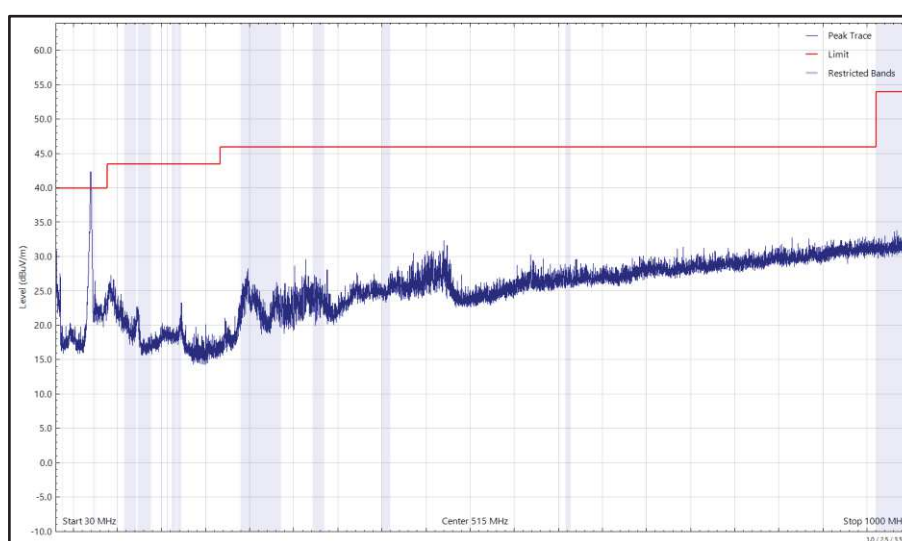


Figure 2 - 2441 MHz (CH39), DH5, ePA, Core 0 + Core 1 and U-NII-1 - 5240 MHz (CH48), VHT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

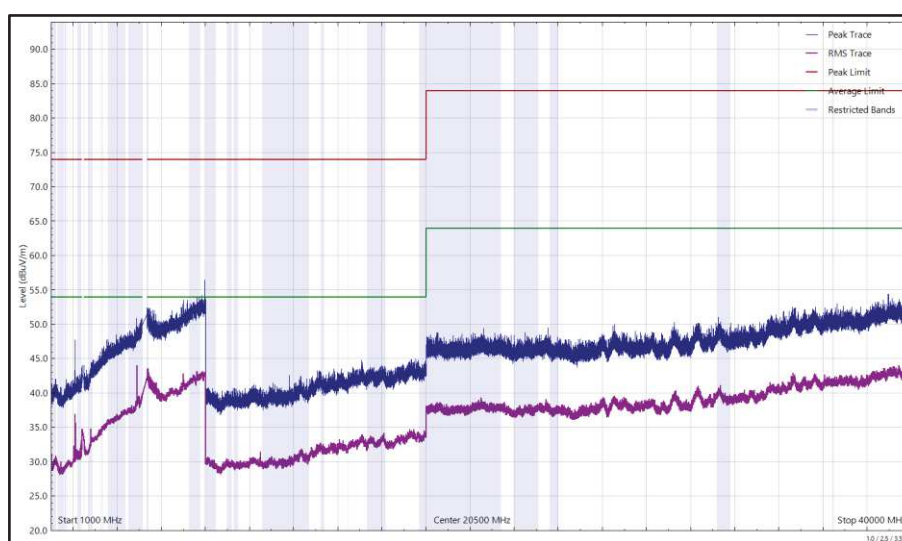


Figure 3 - 2441 MHz (CH39), DH5, ePA, Core 0 + Core 1 and U-NII-1 - 5240 MHz (CH48), VHT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

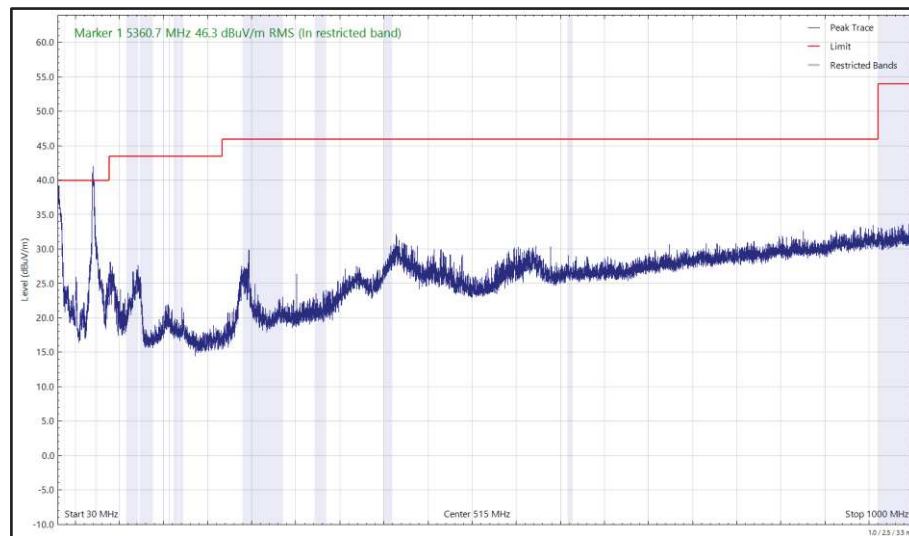


Figure 4 - 2441 MHz (CH39), DH5, ePA, Core 0 + Core 1 and U-NII-1 - 5240 MHz (CH48), VHT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

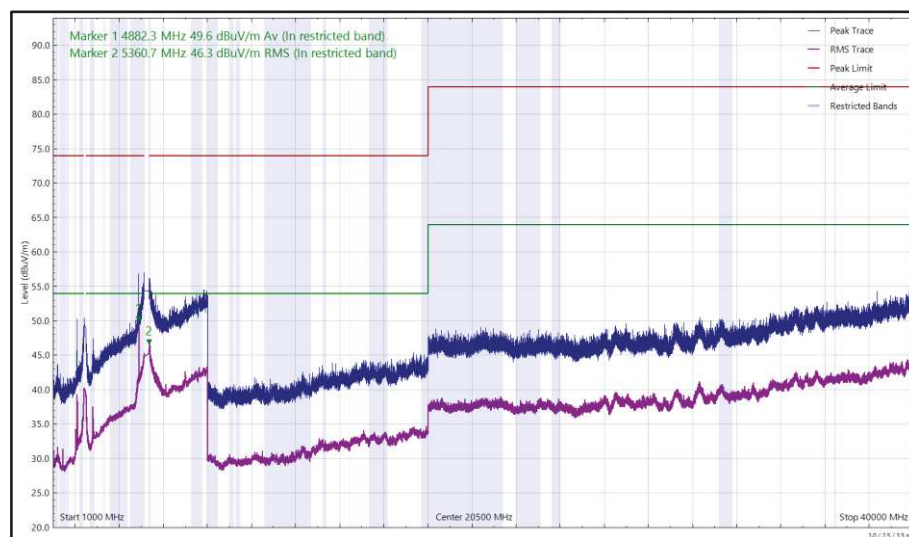


Figure 5 - 2441 MHz (CH39), DH5, ePA, Core 0 + Core 1 and U-NII-1 - 5240 MHz (CH48), VHT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
4882.320	47.26	54.00	-6.74	CISPR Avg	234	325	Vertical

Table 6 - 2441 MHz (CH39), DH5, ePA, Core 0 + Core 1 and U-NII-2C - 5640 MHz (CH128), VHT20, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

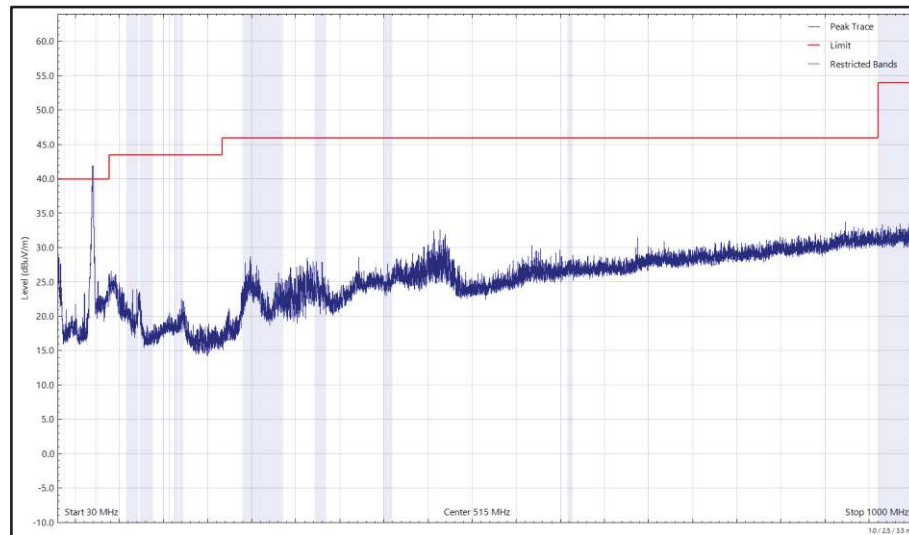


Figure 6 - 2441 MHz (CH39), DH5, ePA, Core 0 + Core 1 and U-NII-2C - 5640 MHz (CH128), VHT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

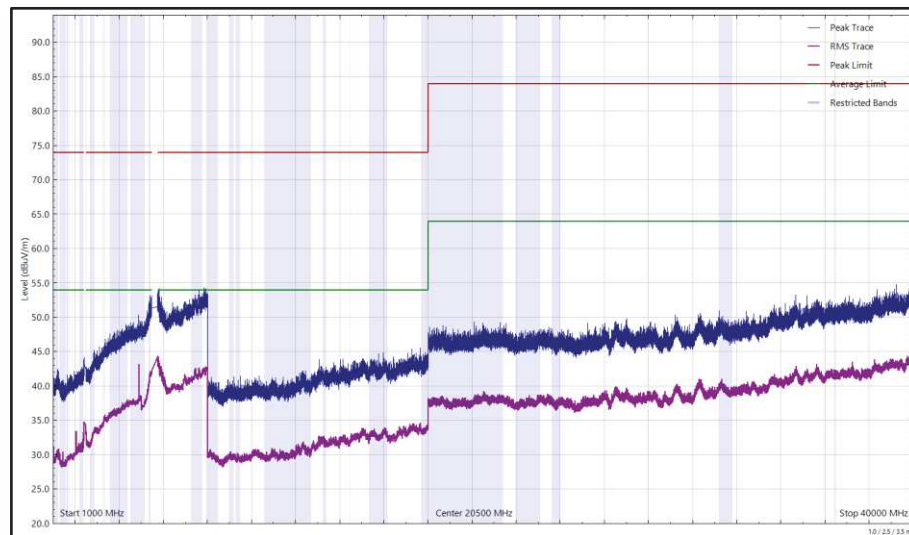


Figure 7 - 2441 MHz (CH39), DH5, ePA, Core 0 + Core 1 and U-NII-2C - 5640 MHz (CH128), VHT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

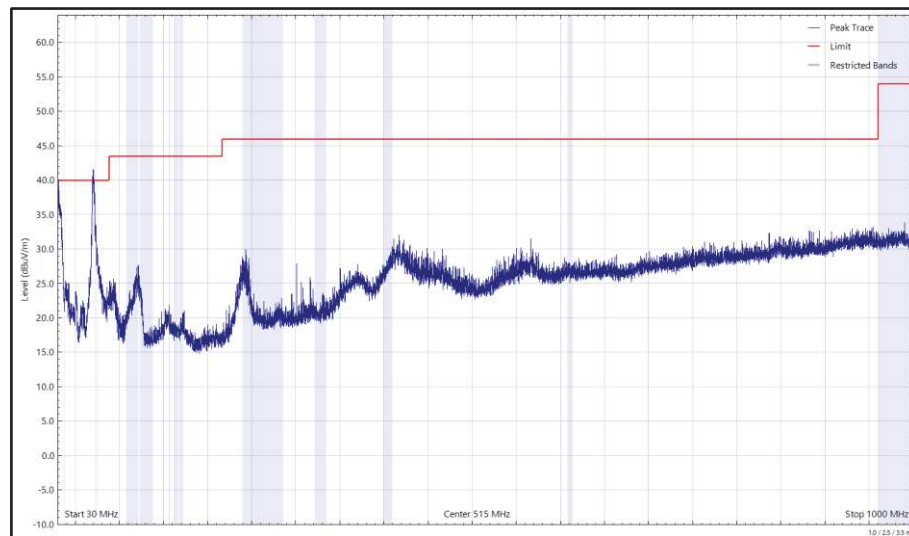


Figure 8 - 2441 MHz (CH39), DH5, ePA, Core 0 + Core 1 and U-NII-2C - 5640 MHz (CH128), VHT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

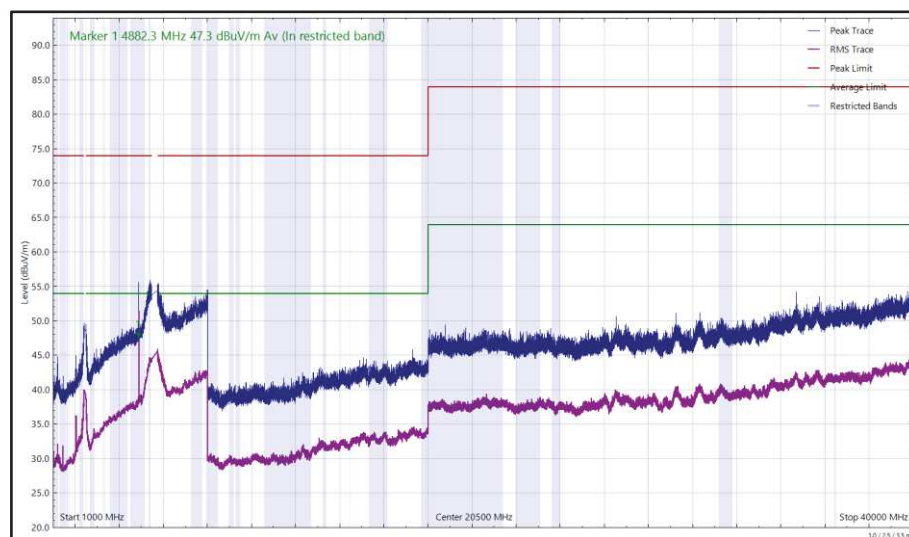


Figure 9 - 2441 MHz (CH39), DH5, ePA, Core 0 + Core 1 and U-NII-2C - 5640 MHz (CH128), VHT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 7 - 2441 MHz (CH39), DH5, ePA, Core 0 + Core 1 and U-NII-3 - 5785 MHz (CH157), VHT20, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

*No emissions found within 10 dB of the limit.

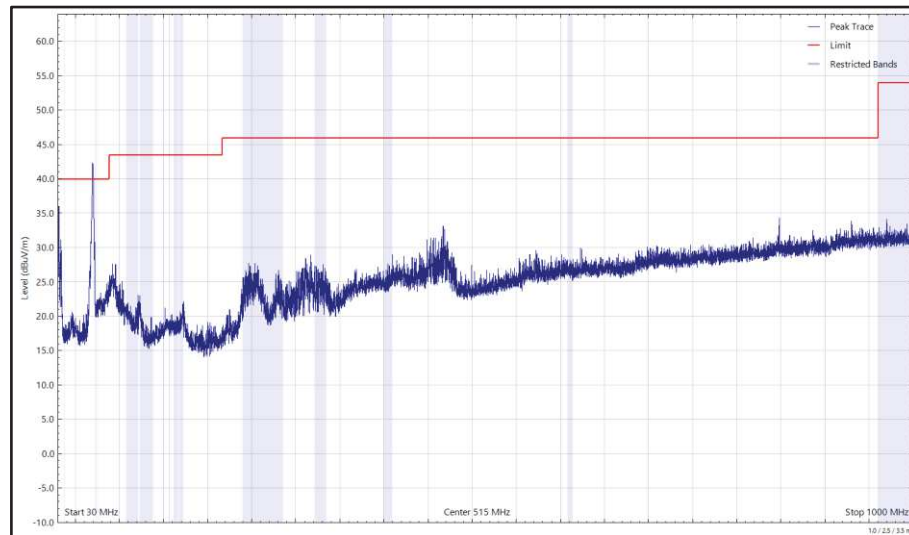


Figure 10 - 2441 MHz (CH39), DH5, ePA, Core 0 + Core 1 and U-NII-3 - 5785 MHz (CH157), VHT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

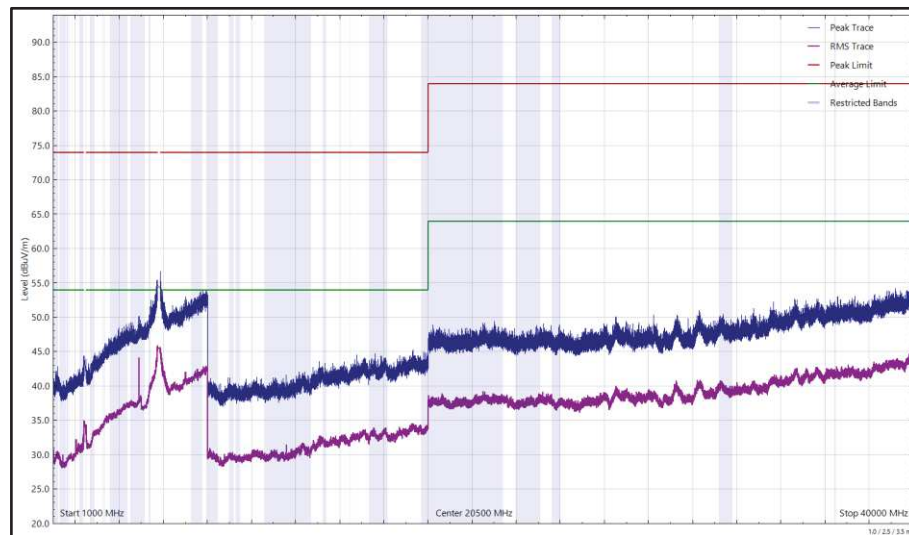


Figure 11 - 2441 MHz (CH39), DH5, ePA, Core 0 + Core 1 and U-NII-3 - 5785 MHz (CH157), VHT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

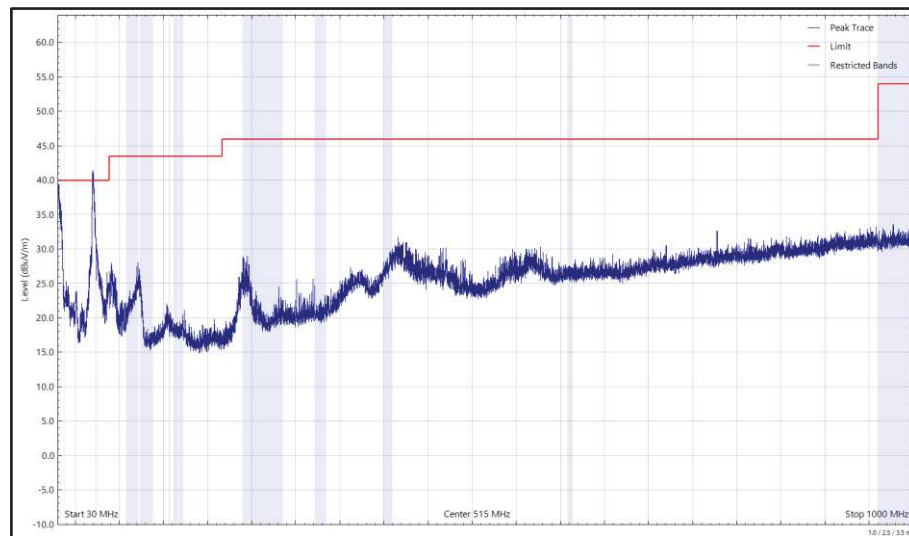


Figure 12 - 2441 MHz (CH39), DH5, ePA, Core 0 + Core 1 and U-NII-3 - 5785 MHz (CH157), VHT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

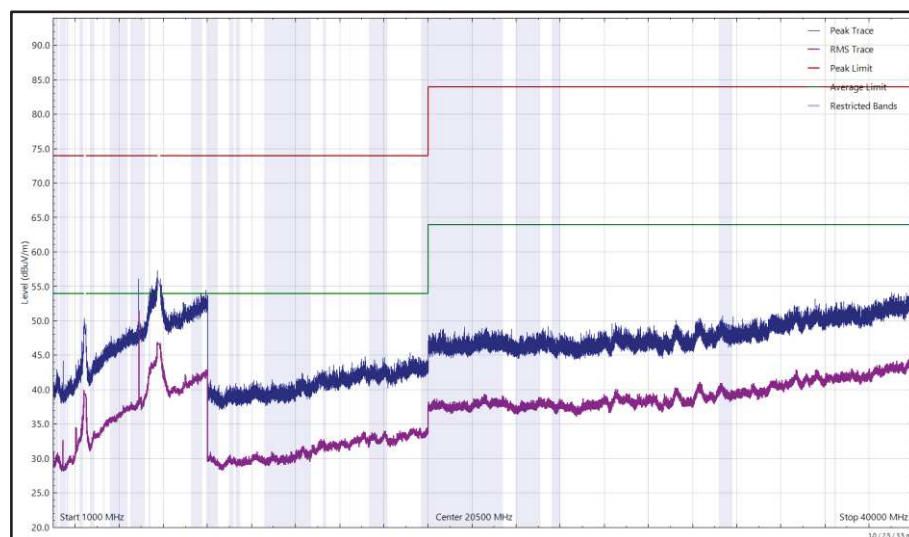


Figure 13 - 2441 MHz (CH39), DH5, ePA, Core 0 + Core 1 and U-NII-3 - 5785 MHz (CH157), VHT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical



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 dB μ V/m at 3m, Average 54 dB μ V/m at 3m (Restricted bands > 1 GHz)

Table 8

CoTx - 2.4 GHz Bluetooth and 6 GHz WLAN

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
7323.442	46.73	54.00	-7.27	CISPR Avg	266	278	Vertical

Table 9 - 2441 MHz (CH39), DH5, ePA, Core 0 + Core 1 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

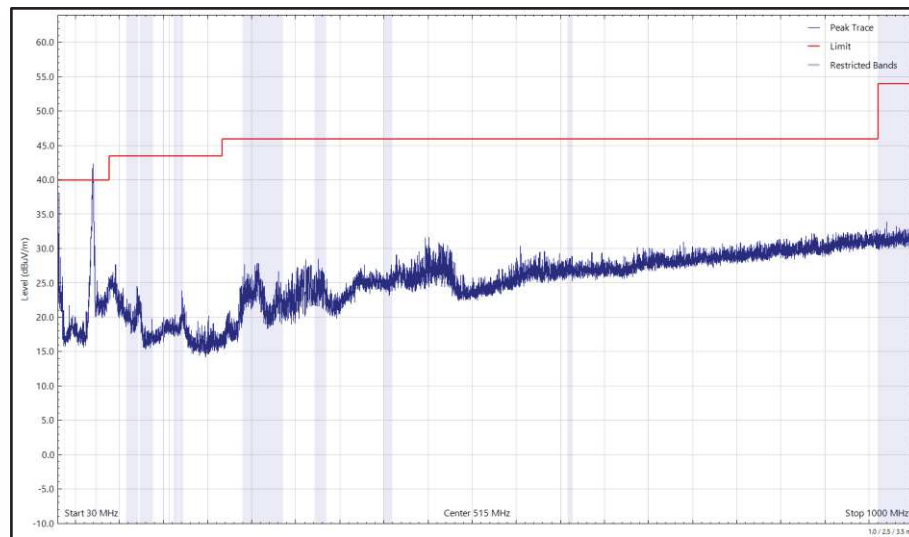


Figure 14 - 2441 MHz (CH39), DH5, ePA, Core 0 + Core 1 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

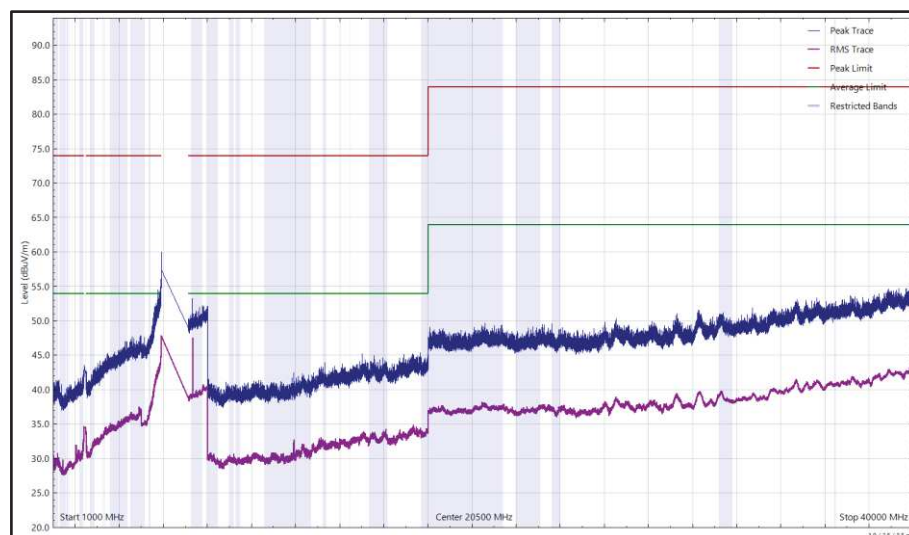


Figure 15 - 2441 MHz (CH39), DH5, ePA, Core 0 + Core 1 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

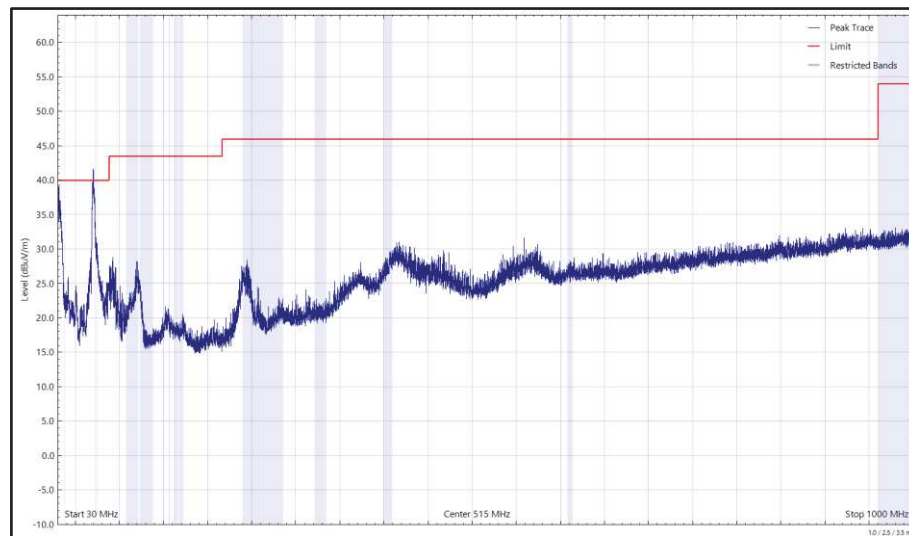


Figure 16 - 2441 MHz (CH39), DH5, ePA, Core 0 + Core 1 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

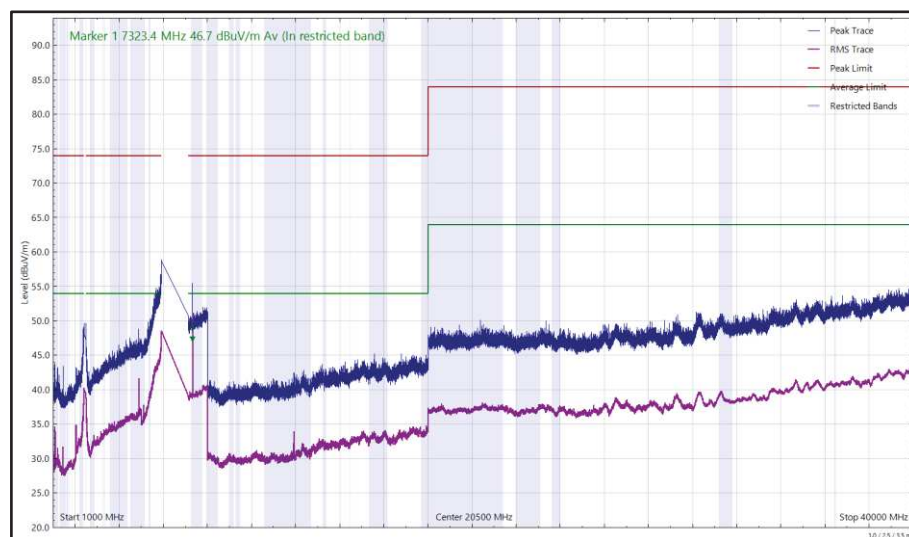


Figure 17 - 2441 MHz (CH39), DH5, ePA, Core 0 + Core 1 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
7323.183	48.32	54.00	-5.68	CISPR Avg	265	294	Vertical

Table 10 - 2441 MHz (CH39), DH5, ePA, Core 0 + Core 1 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

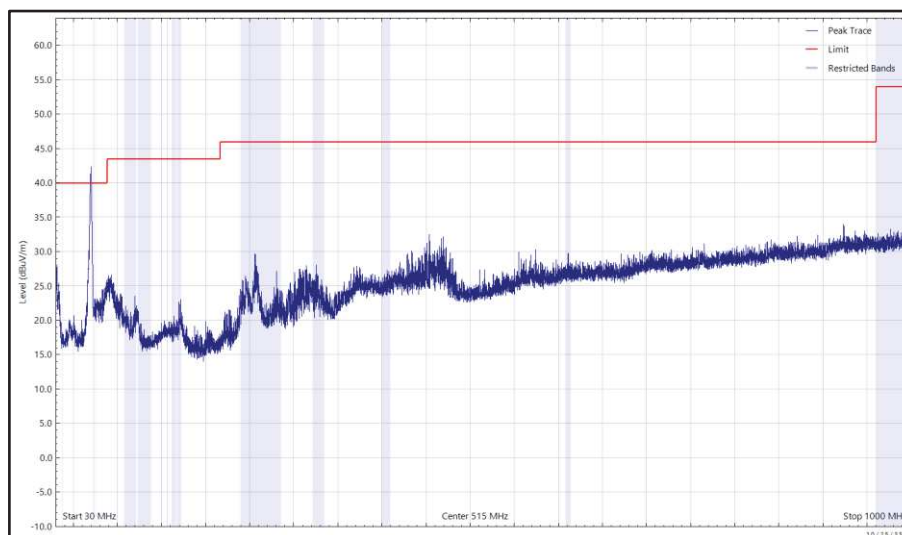


Figure 18 - 2441 MHz (CH39), DH5, ePA, Core 0 + Core 1 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

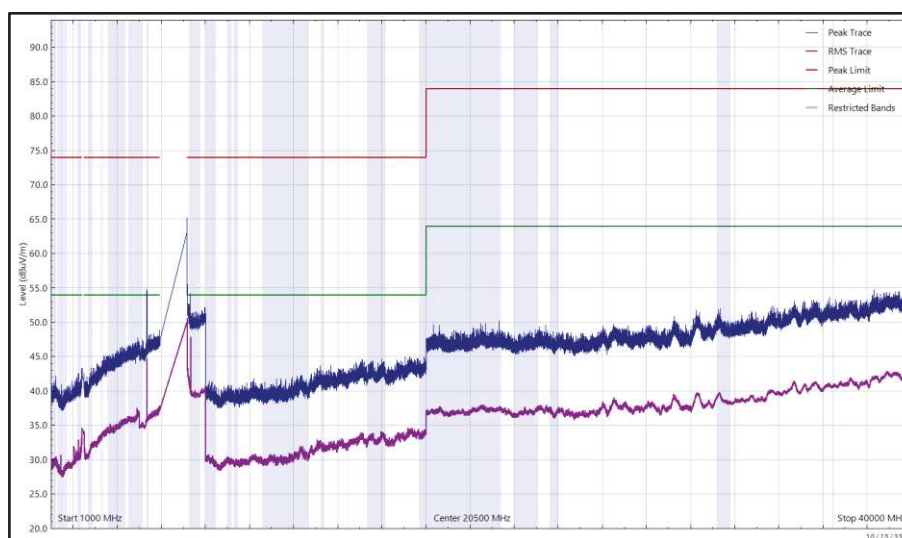


Figure 19 - 2441 MHz (CH39), DH5, ePA, Core 0 + Core 1 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

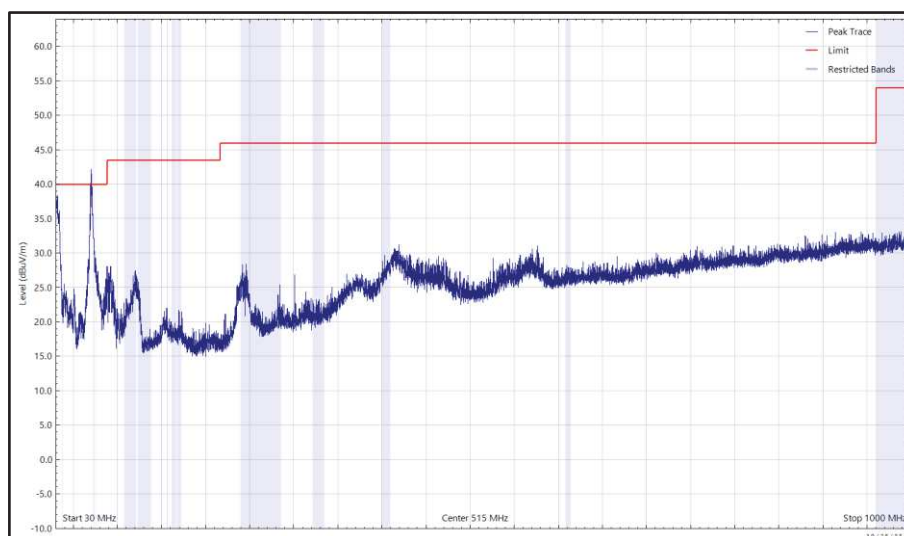


Figure 20 - 2441 MHz (CH39), DH5, ePA, Core 0 + Core 1 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

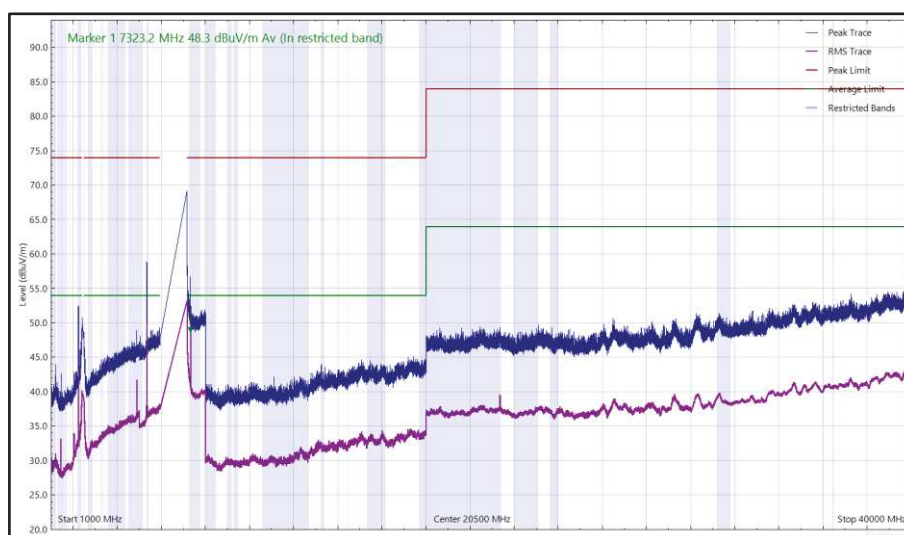


Figure 21 - 2441 MHz (CH39), DH5, ePA, Core 0 + Core 1 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical



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

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

The least stringent applicable limit was:

Clause	Limit
Part 15 247 (d) / RSS-247 Clause 5.5	-20 dBc
Part 15.407 (b) / RSS-248 Clause 4.6.2	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 11

CoTx - 2.4 GHz WLAN and Narrowband

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 12 - 2437 MHz (CH6), HT20, Core 0 and 5204 MHz, HDR4, ePA, Core 1, 30 MHz to 40 GHz

*No emissions found within 10 dB of the limit.

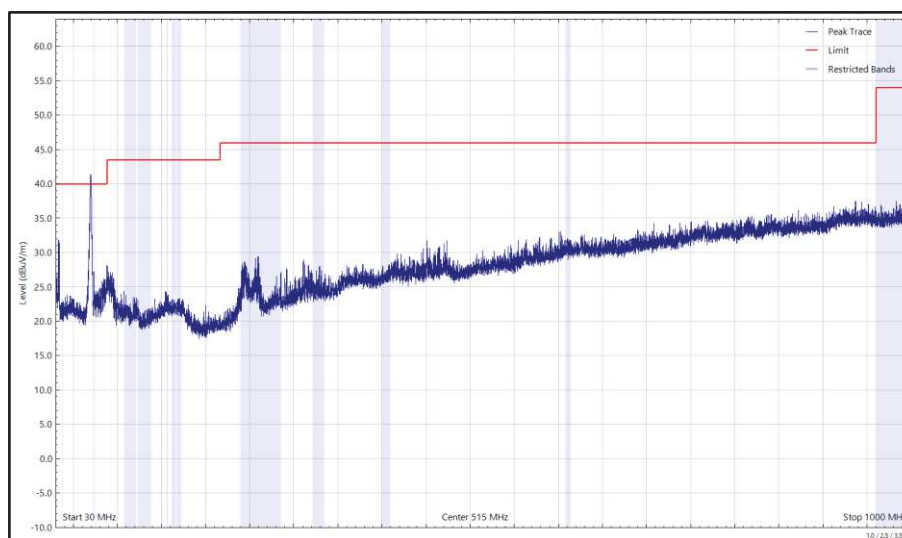


Figure 22 - 2437 MHz (CH6), HT20, Core 0 and 5204 MHz, HDR4, ePA, Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

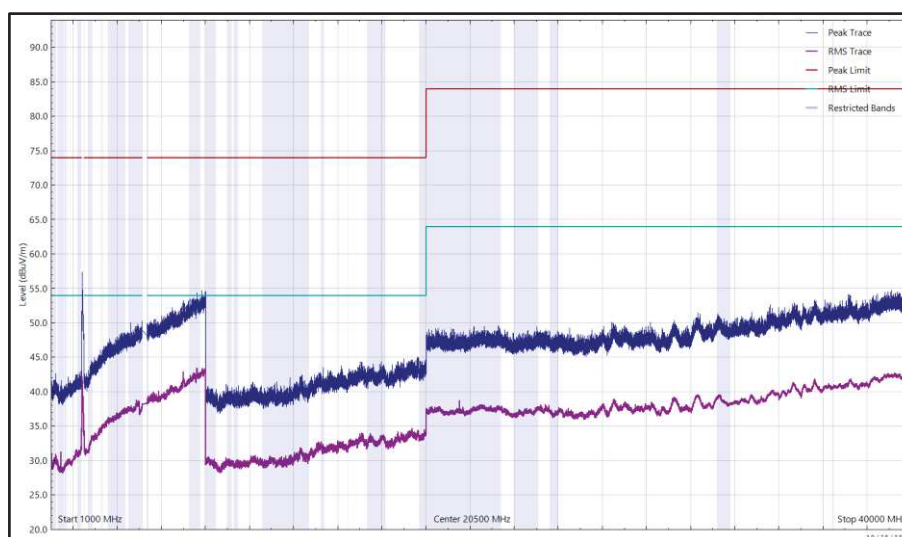


Figure 23 - 2437 MHz (CH6), HT20, Core 0 and 5204 MHz, HDR4, ePA, Core 1, 1 GHz to 40 GHz, Horizontal

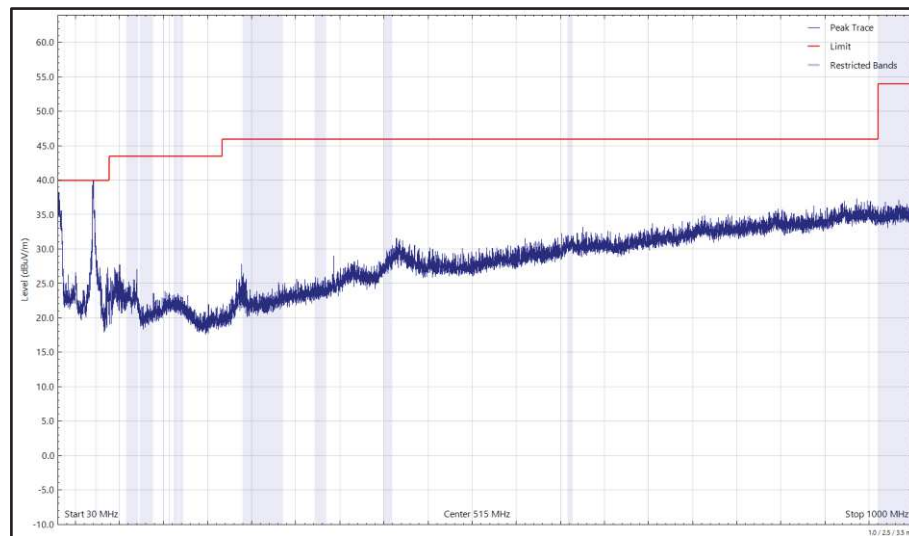


Figure 24 - 2437 MHz (CH6), HT20, Core 0 and 5204 MHz, HDR4, ePA, Core 1, 30 MHz to 1 GHz, Vertical (Peak)

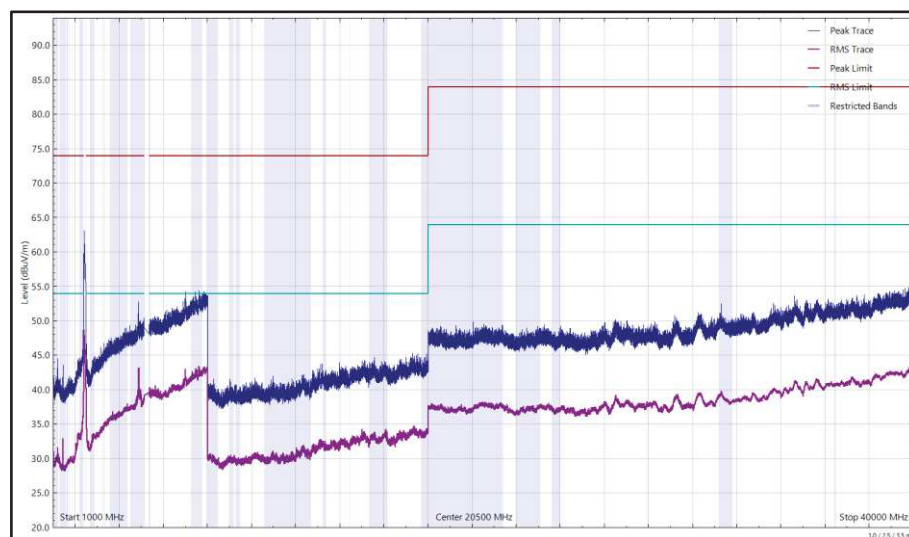


Figure 25 - 2437 MHz (CH6), HT20, Core 0 and 5204 MHz, HDR4, ePA, Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
5374.907	53.99	74.00	-20.01	Peak	247	313	Vertical

Table 13 - 2437 MHz (CH6), HT20, Core 0 and 5788 MHz, HDR4, ePA, Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

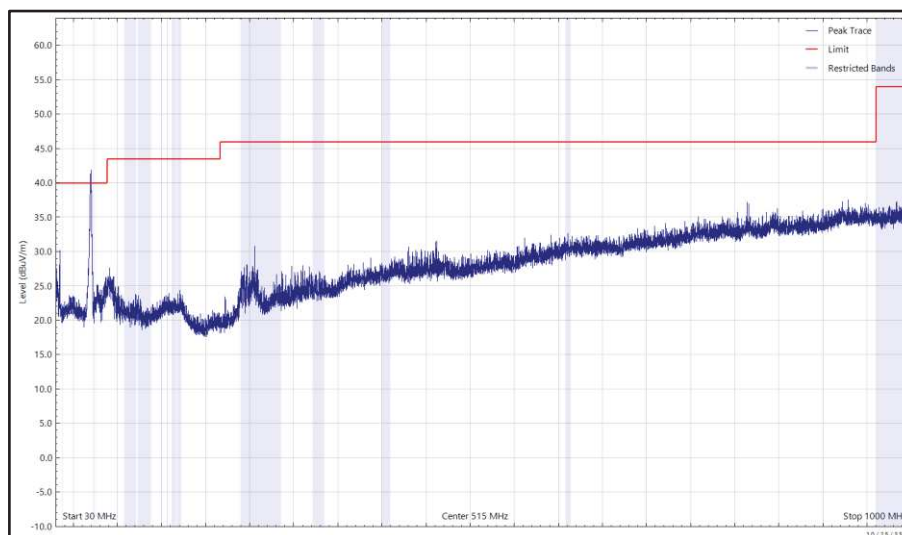


Figure 26 - 2437 MHz (CH6), HT20, Core 0 and 5788 MHz, HDR4, ePA, Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

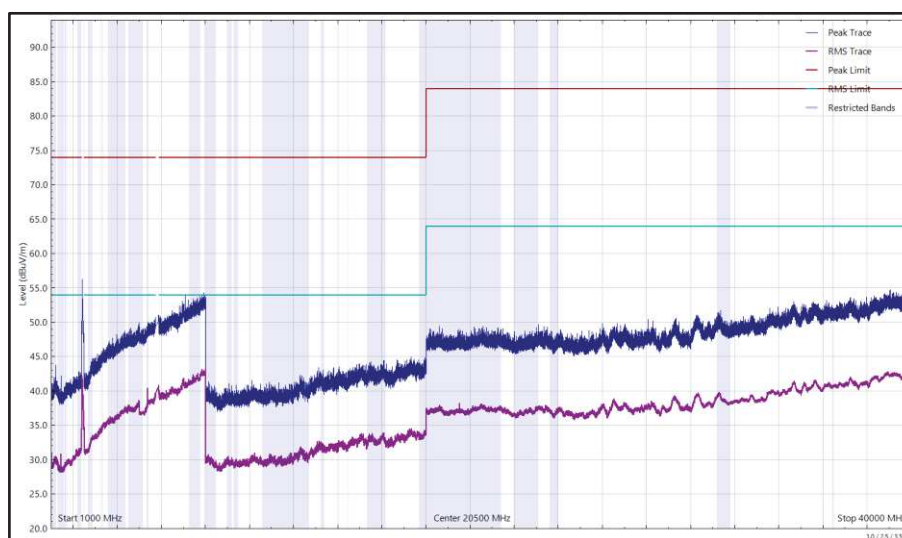


Figure 27 - 2437 MHz (CH6), HT20, Core 0 and 5788 MHz, HDR4, ePA, Core 1, 1 GHz to 40 GHz, Horizontal

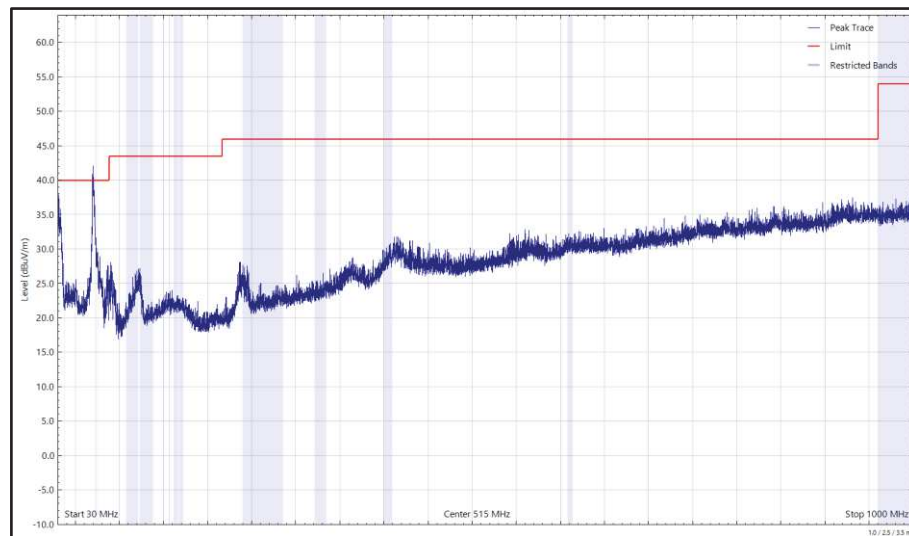


Figure 28 - 2437 MHz (CH6), HT20, Core 0 and 5788 MHz, HDR4, ePA, Core 1, 30 MHz to 1 GHz, Vertical (Peak)

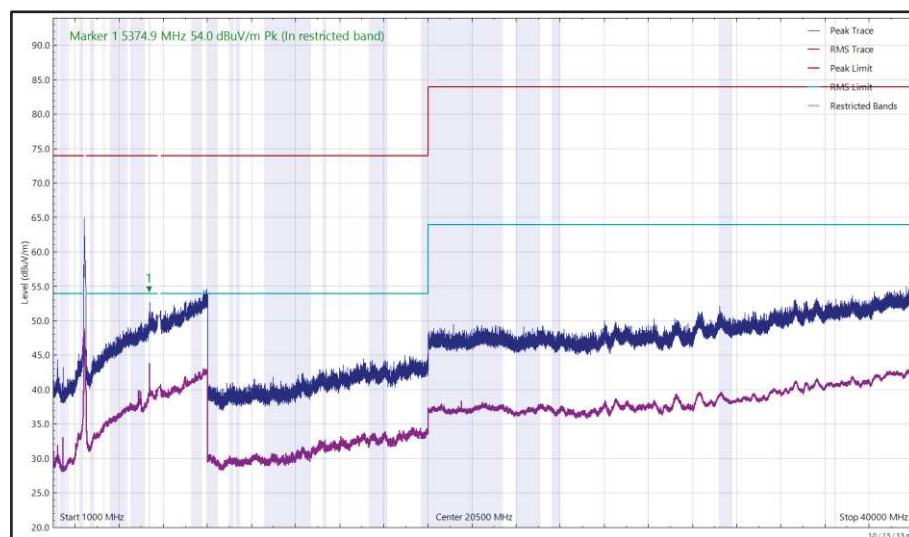


Figure 29 - 2437 MHz (CH6), HT20, Core 0 and 5788 MHz, HDR4, ePA, Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
4873.685	58.49	74.00	-15.51	Peak	278	310	Vertical
4873.685	45.86	54.00	-8.14	RMS	278	310	Vertical

Table 14 - 2437 MHz (CH6), 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.

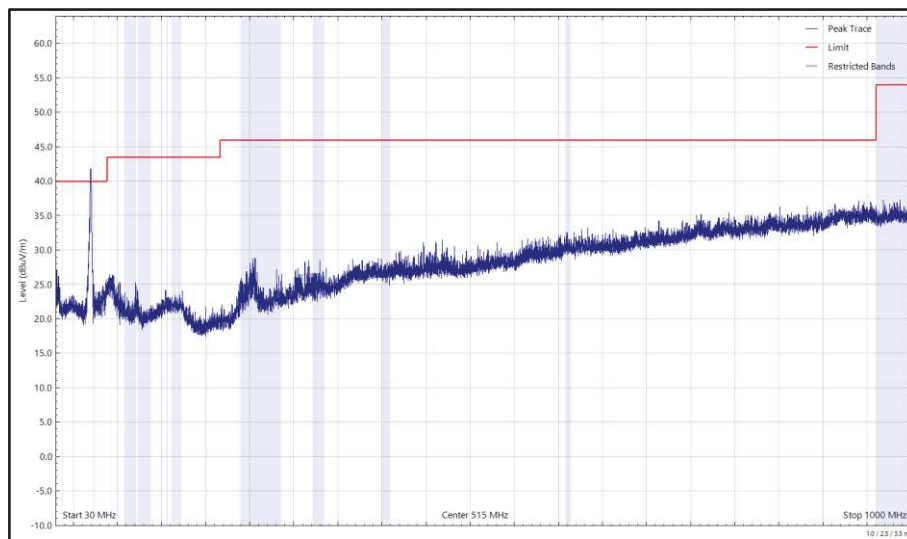


Figure 30 - 2437 MHz (CH6), HT20, Core 1 and 5204 MHz, HDR4, ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)

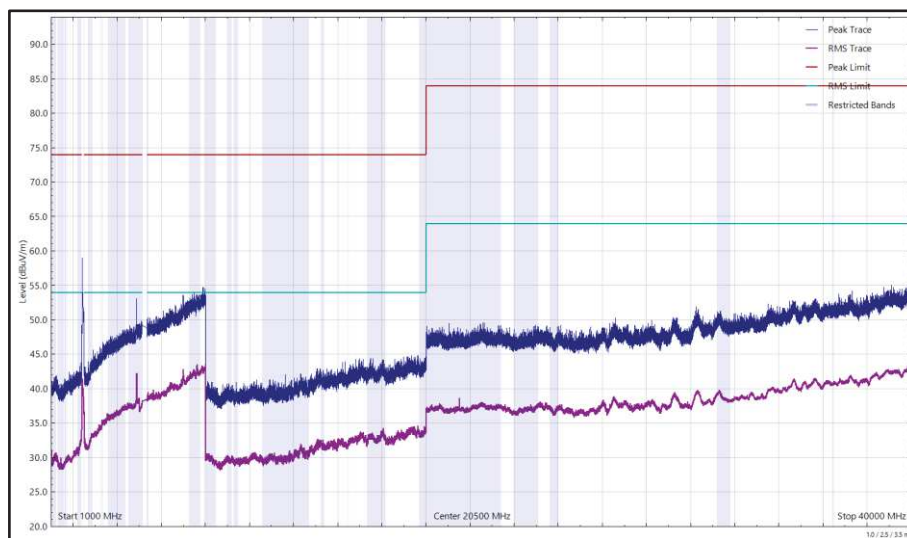


Figure 31 - 2437 MHz (CH6), HT20, Core 1 and 5204 MHz, HDR4, ePA, Core 0, 1 GHz to 40 GHz, Horizontal

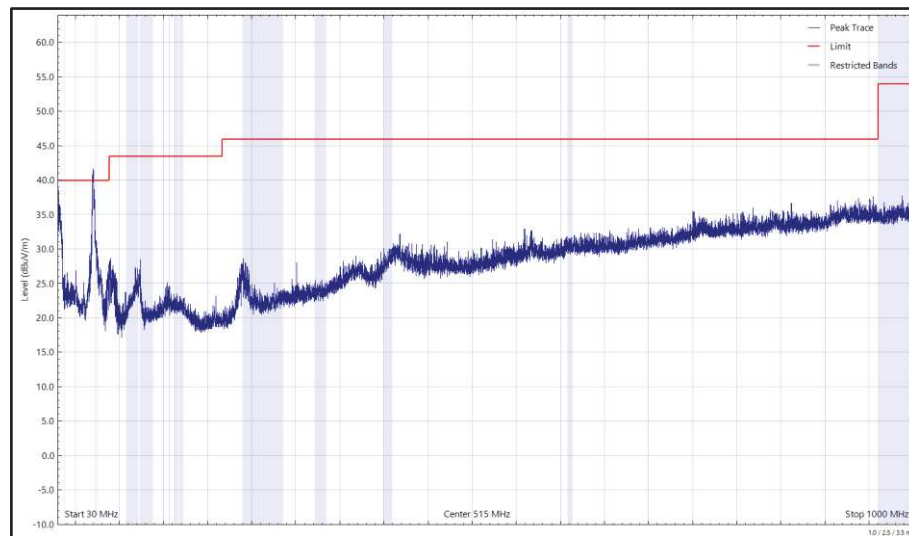


Figure 32 - 2437 MHz (CH6), HT20, Core 1 and 5204 MHz, HDR4, ePA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)

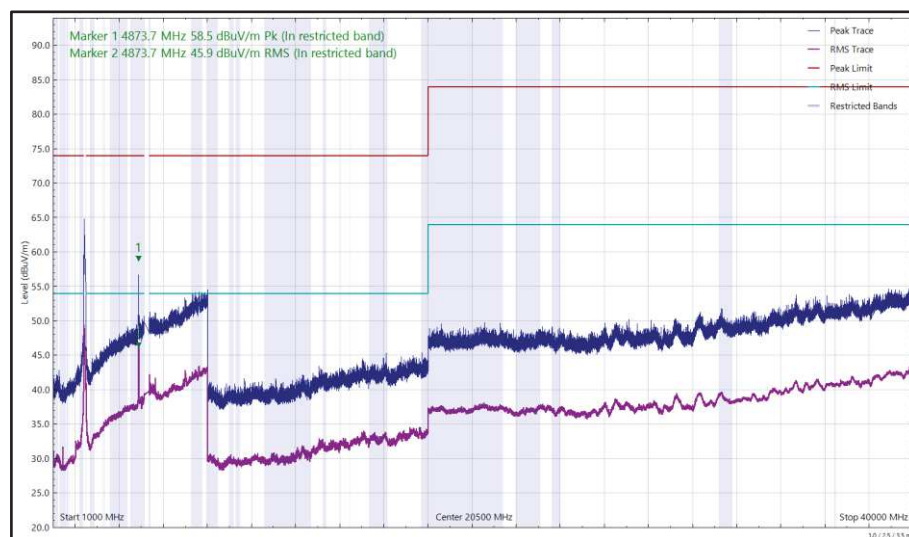


Figure 33 - 2437 MHz (CH6), HT20, Core 1 and 5204 MHz, HDR4, ePA, Core 0, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 15 - 2437 MHz (CH6), HT20, Core 1 and 5788 MHz, HDR4, ePA, Core 0, 30 MHz to 40 GHz

*No emissions found within 10 dB of the limit.

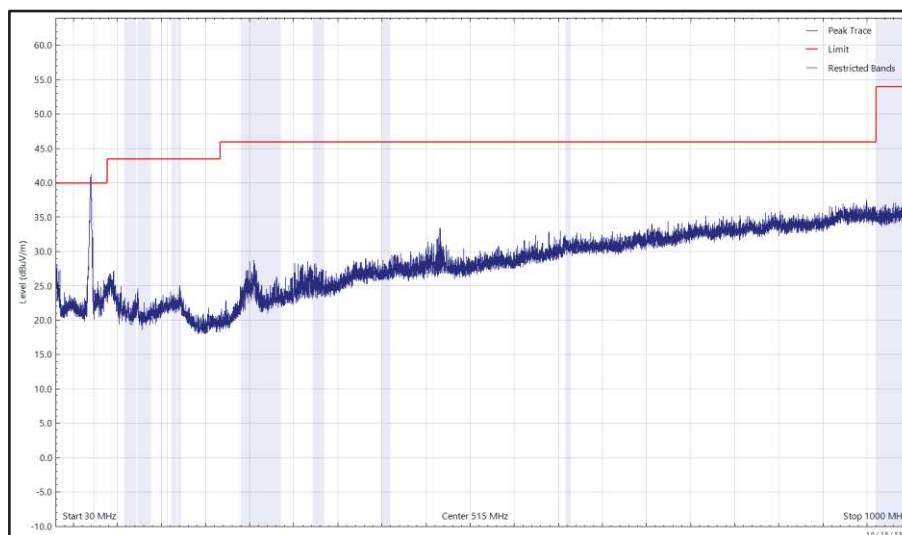


Figure 34 - 2437 MHz (CH6), HT20, Core 1 and 5788 MHz, HDR4, ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)

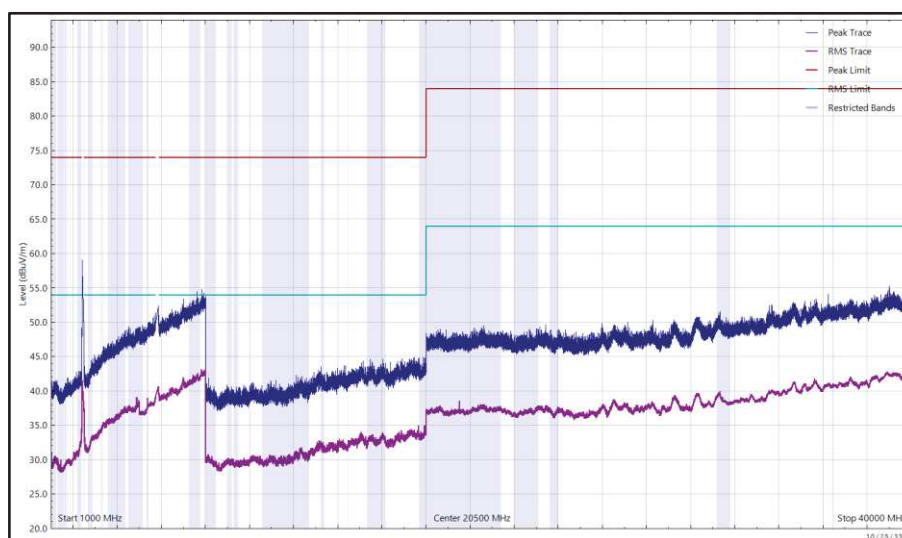


Figure 35 - 2437 MHz (CH6), HT20, Core 1 and 5788 MHz, HDR4, ePA, Core 0, 1 GHz to 40 GHz, Horizontal

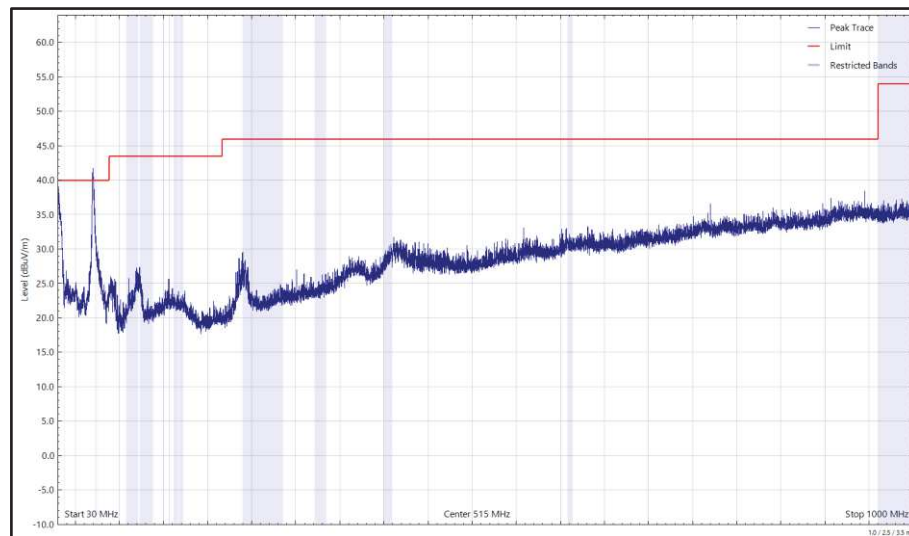


Figure 36 - 2437 MHz (CH6), HT20, Core 1 and 5788 MHz, HDR4, ePA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)

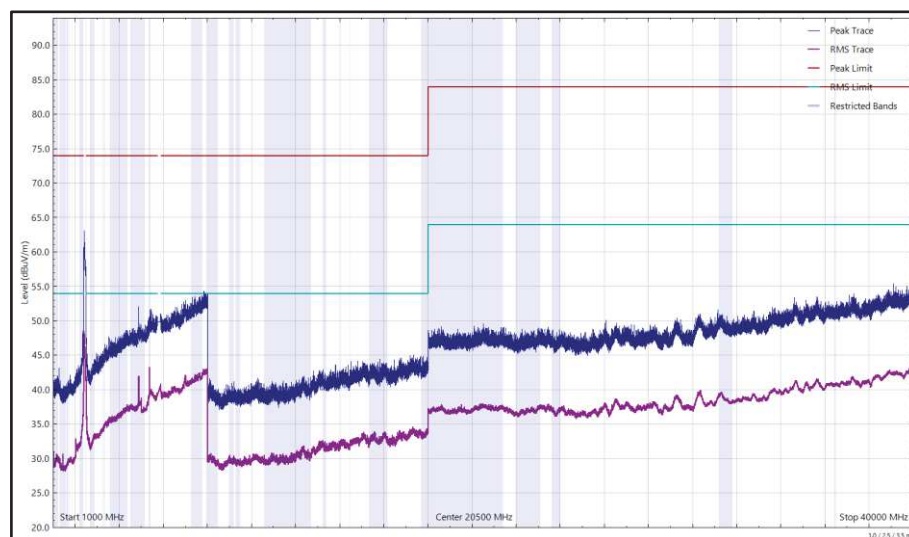


Figure 37 - 2437 MHz (CH6), HT20, Core 1 and 5788 MHz, HDR4, ePA, Core 0, 1 GHz to 40 GHz, Vertical



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

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

The least stringent applicable limit was:

Clause	Limit
Part 15.247 (d) / RSS-247 Clause 5.5	-30 dBc
Part 15.407 (b) / RSS-247 Clause 6.2	-27 dBm e.i.r.p
Part 15.209 / RSS-GEN Clause 8.9	Peak: 74 dB μ V/m at 3m, Average 54 dB μ V/m at 3m (Restricted bands > 1 GHz)

Table 16

CoTx - Thread and 5 GHz WLAN

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
4880.902	48.76	54.00	-5.24	RMS	122	347	Vertical

Table 17 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-1 - 5240 MHz (CH48), VHT20, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

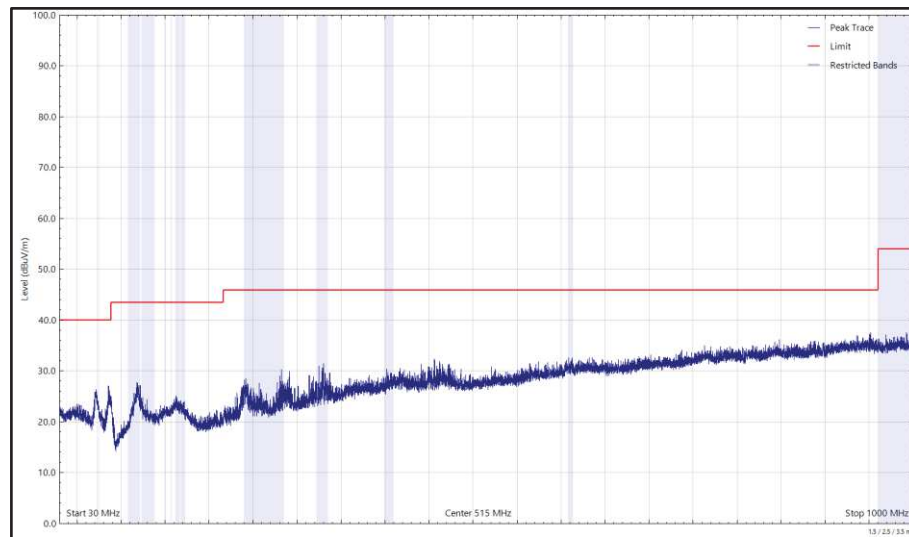


Figure 38 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-1 - 5240 MHz (CH48), VHT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

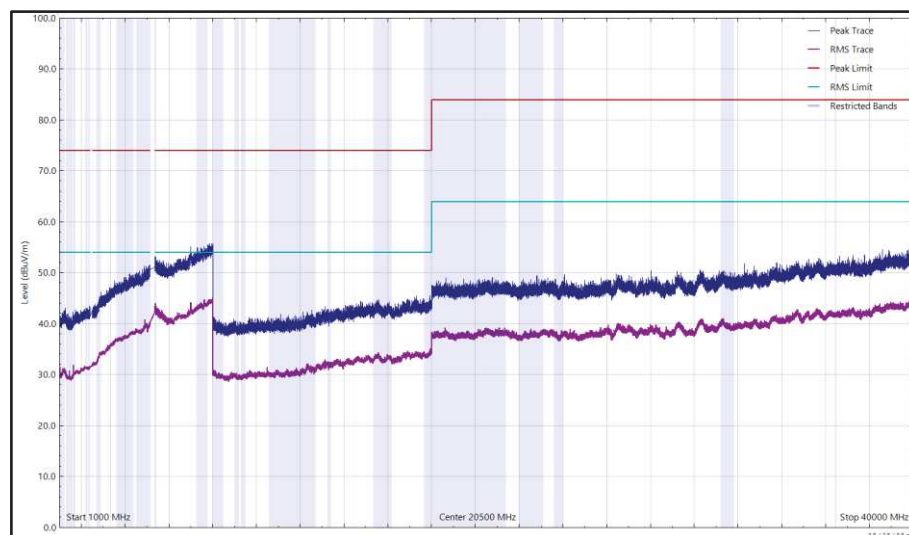


Figure 39 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-1 - 5240 MHz (CH48), VHT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

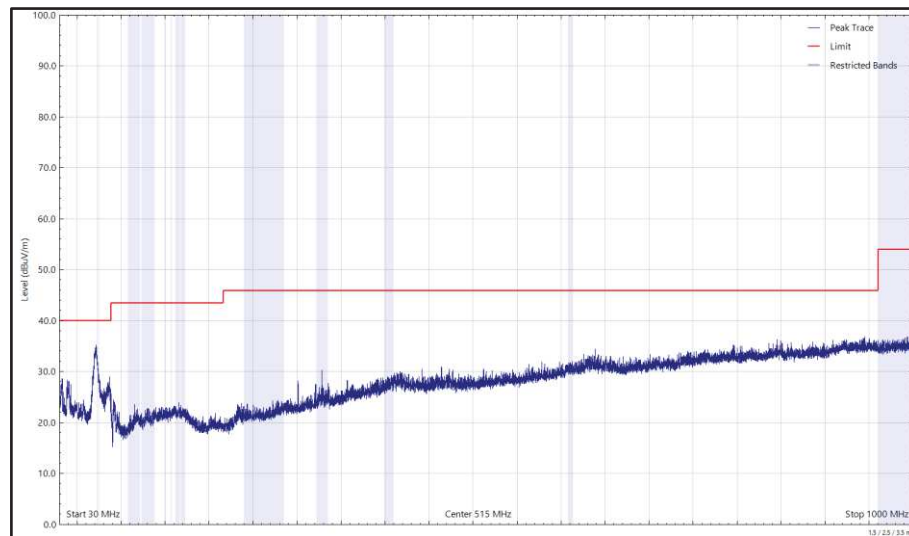


Figure 40 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-1 - 5240 MHz (CH48), VHT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

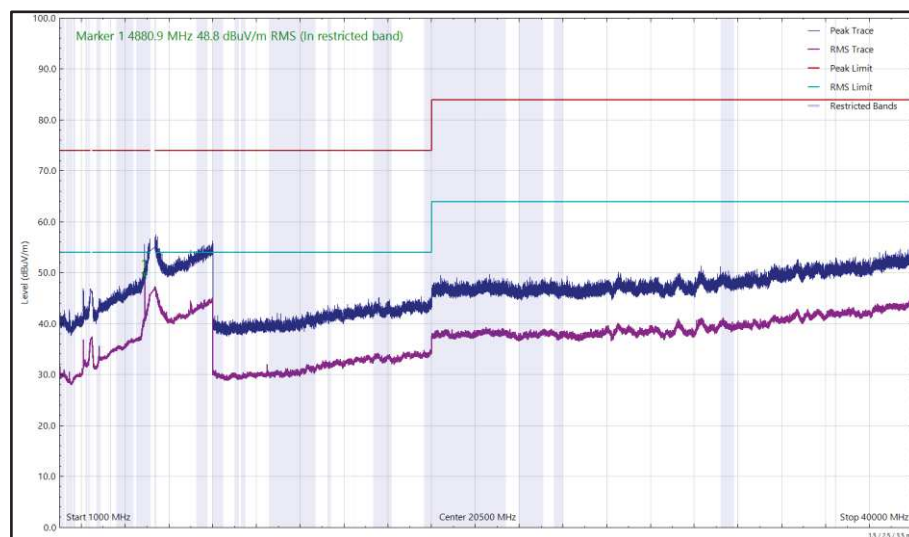


Figure 41 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-1 - 5240 MHz (CH48), VHT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 18 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-1 - 5240 MHz (CH48), VHT20, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

*No emissions found within 10 dB of the limit.

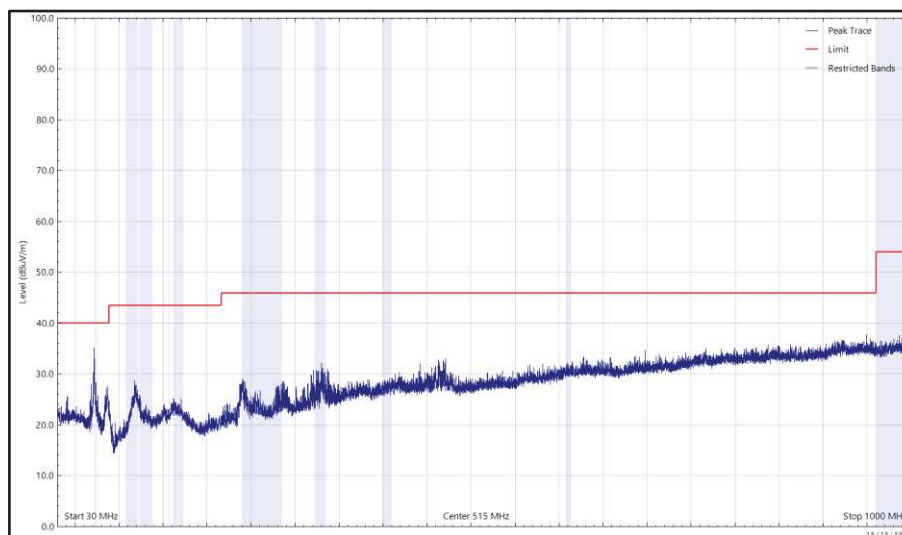


Figure 42 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-1 - 5240 MHz (CH48), VHT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

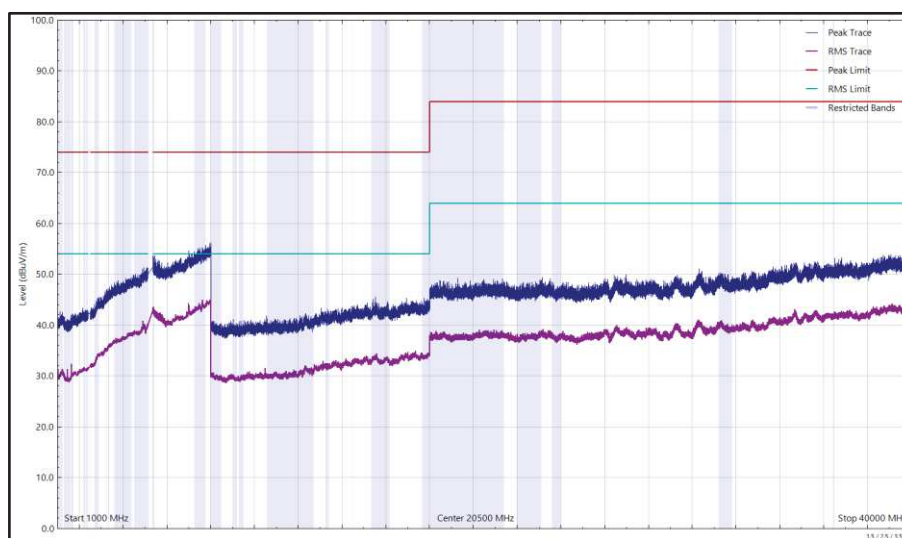


Figure 43 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-1 - 5240 MHz (CH48), VHT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

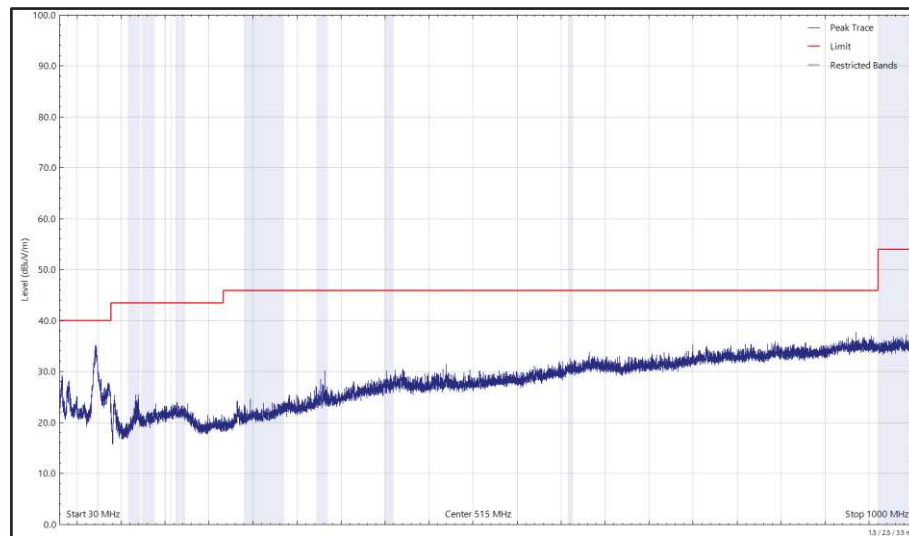


Figure 44 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-1 - 5240 MHz (CH48), VHT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

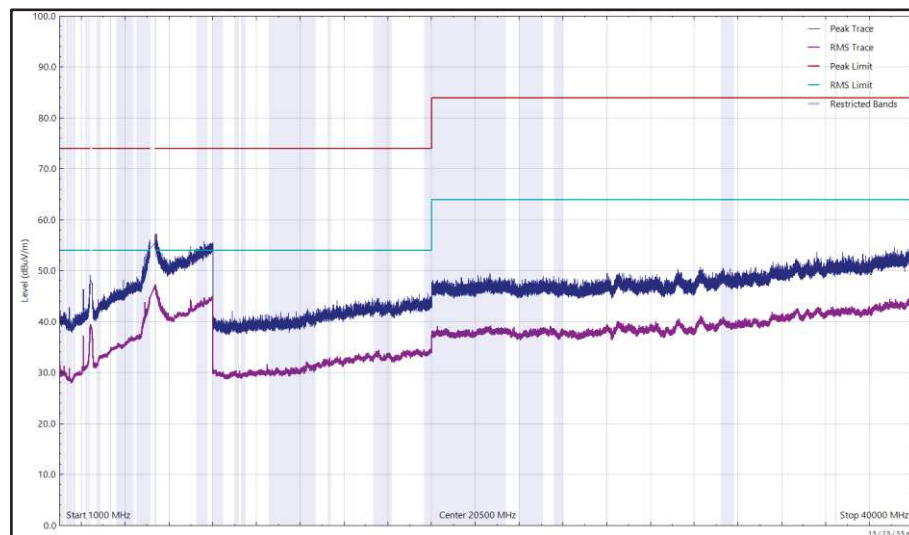


Figure 45 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-1 - 5240 MHz (CH48), VHT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
4879.025	48.12	54.00	-5.88	RMS	233	317	Vertical

Table 19 - 2440 MHz (CH18), Thread, iPA, Core 2 and U-NII-1 - 5240 MHz (CH48), VHT20, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

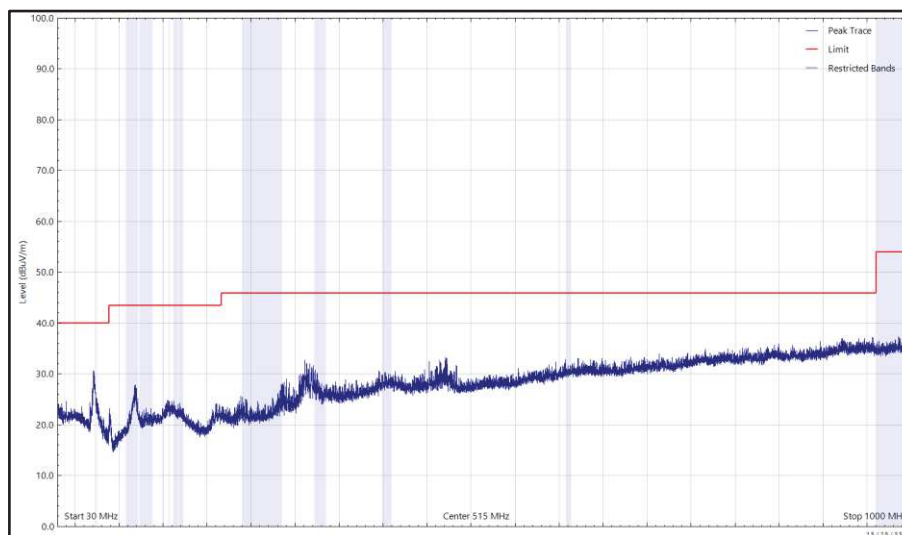


Figure 46 - 2440 MHz (CH18), Thread, iPA, Core 2 and U-NII-1 - 5240 MHz (CH48), VHT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

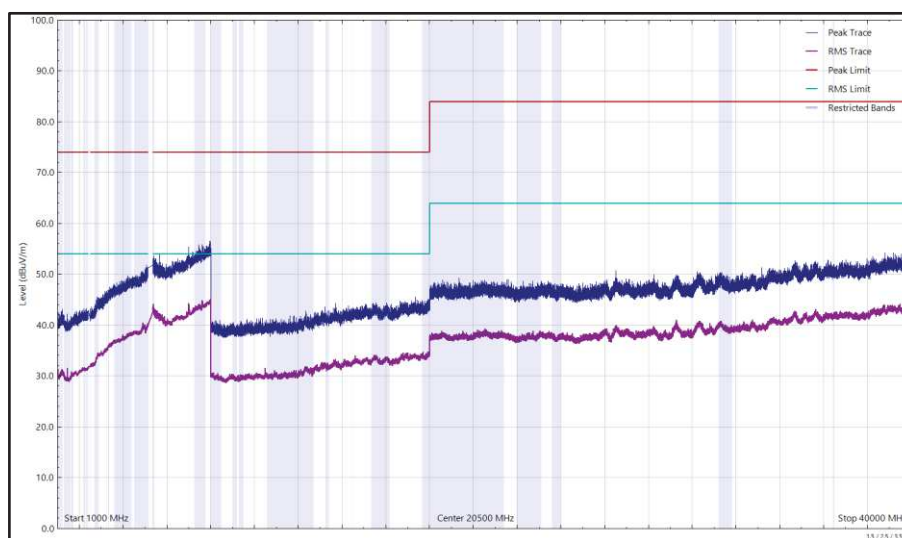


Figure 47 - 2440 MHz (CH18), Thread, iPA, Core 2 and U-NII-1 - 5240 MHz (CH48), VHT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

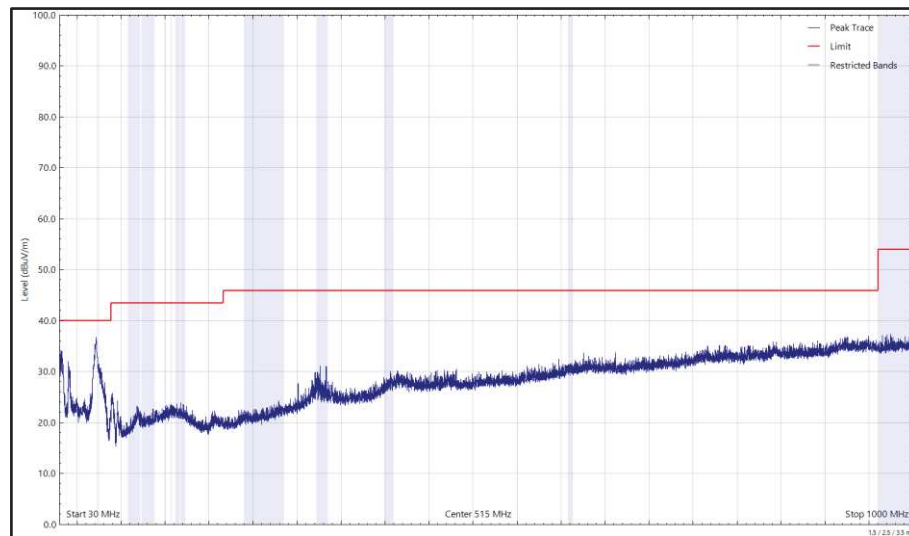


Figure 48 - 2440 MHz (CH18), Thread, iPA, Core 2 and U-NII-1 - 5240 MHz (CH48), VHT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

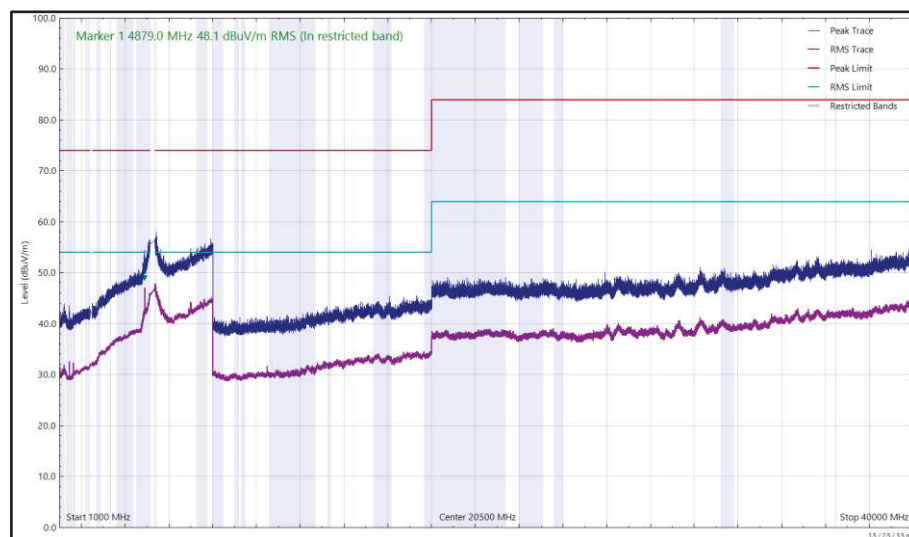


Figure 49 - 2440 MHz (CH18), Thread, iPA, Core 2 and U-NII-1 - 5240 MHz (CH48), VHT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
4879.070	46.48	54.00	-7.52	RMS	230	315	Vertical

Table 20 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-2C - 5640 MHz (CH128), VHT20, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

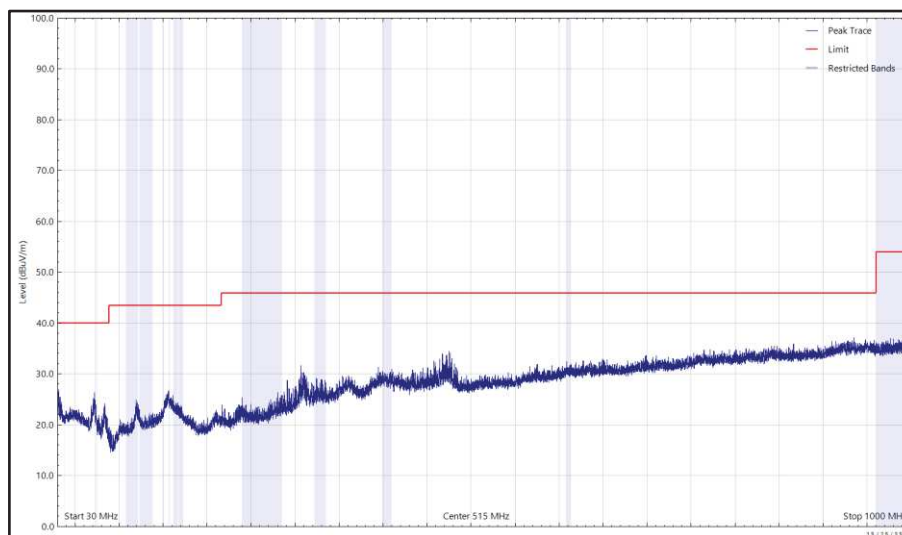


Figure 50 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-2C - 5640 MHz (CH128), VHT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

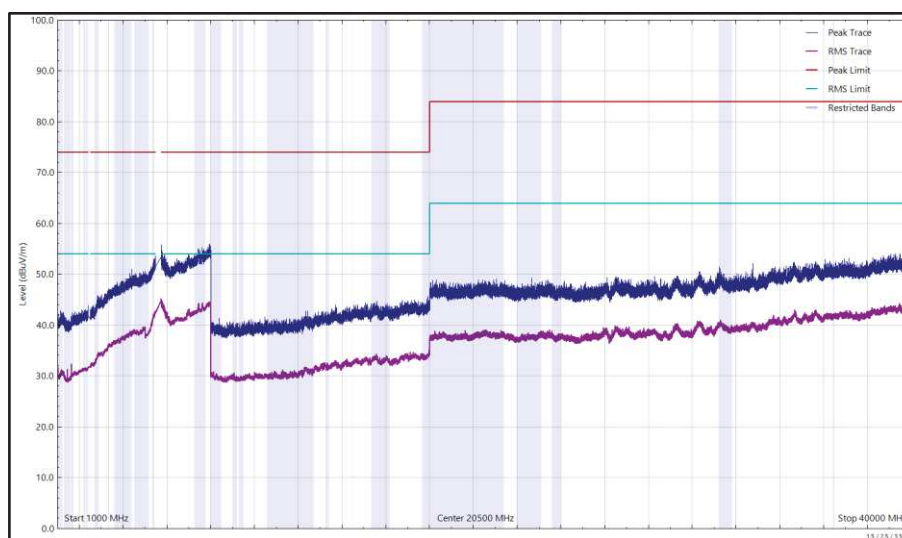


Figure 51 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-2C - 5640 MHz (CH128), VHT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

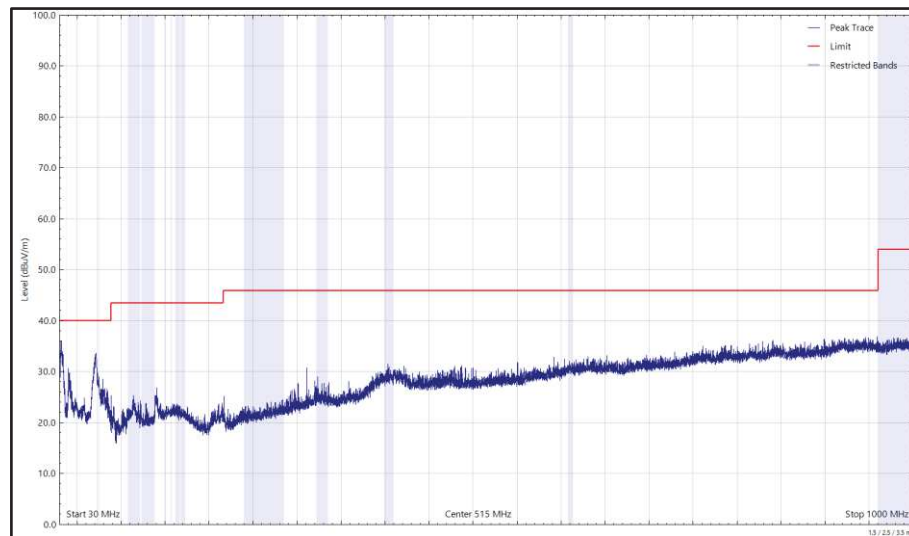


Figure 52 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-2C - 5640 MHz (CH128), VHT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

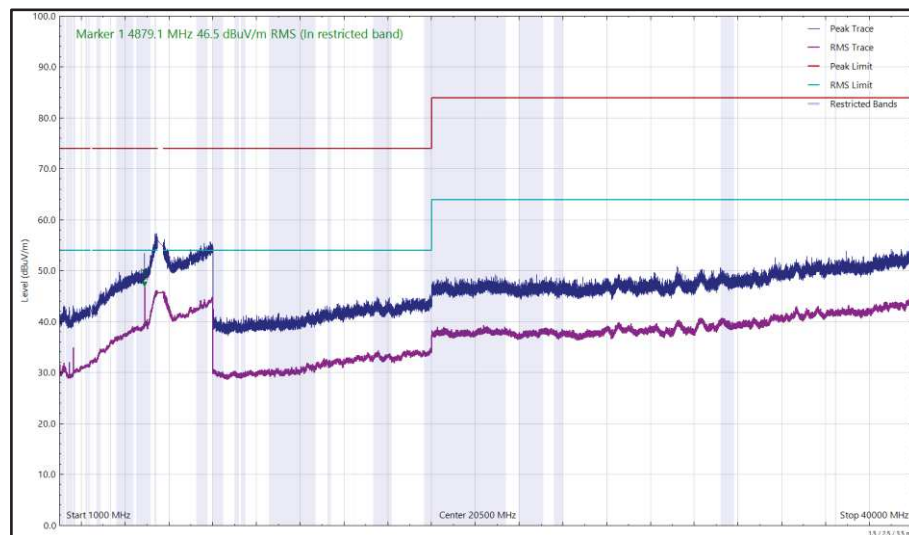


Figure 53 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-2C - 5640 MHz (CH128), VHT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
4879.055	46.38	54.00	-7.62	RMS	237	306	Vertical

Table 21 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-2C - 5640 MHz (CH128), VHT20, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

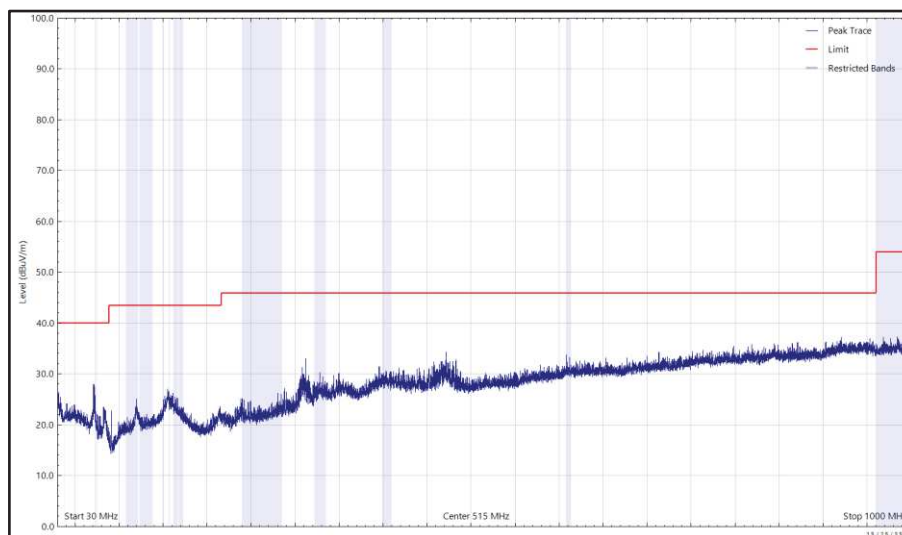


Figure 54 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-2C - 5640 MHz (CH128), VHT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

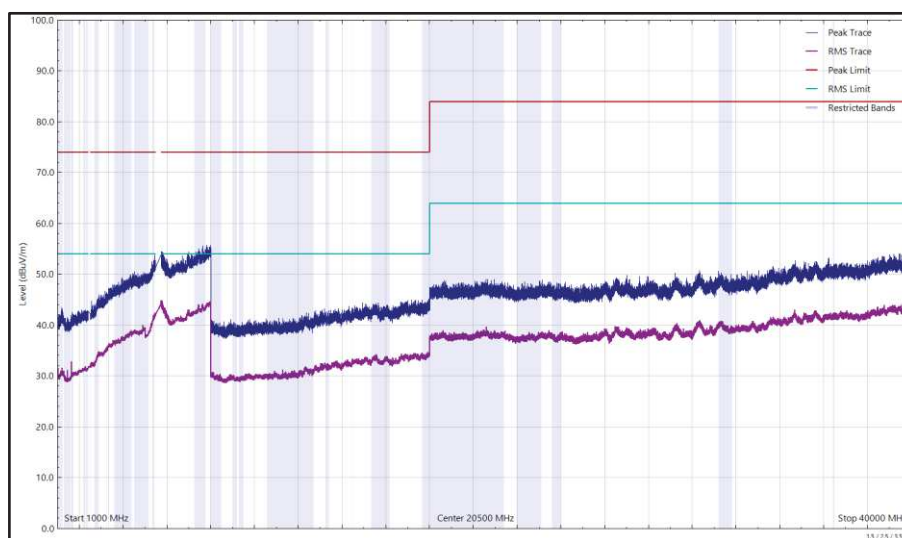


Figure 55 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-2C - 5640 MHz (CH128), VHT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

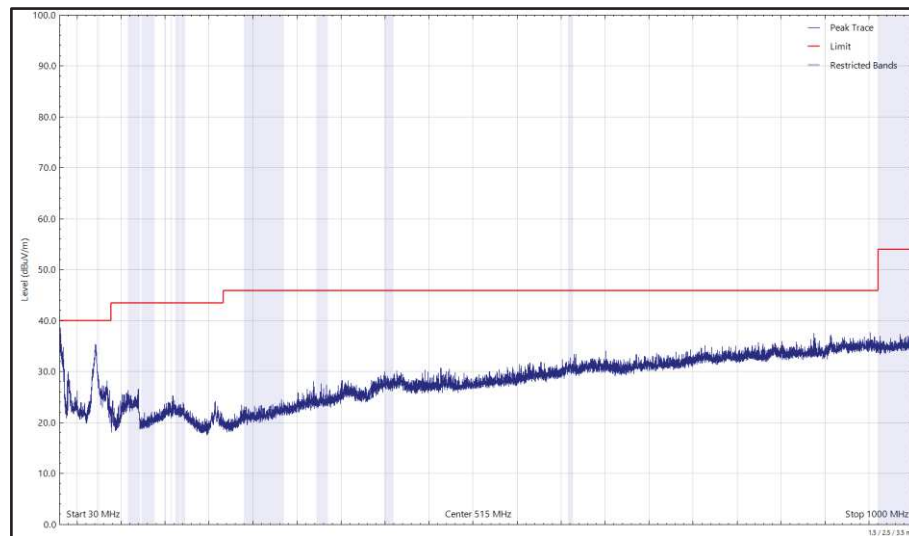


Figure 56 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-2C - 5640 MHz (CH128), VHT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

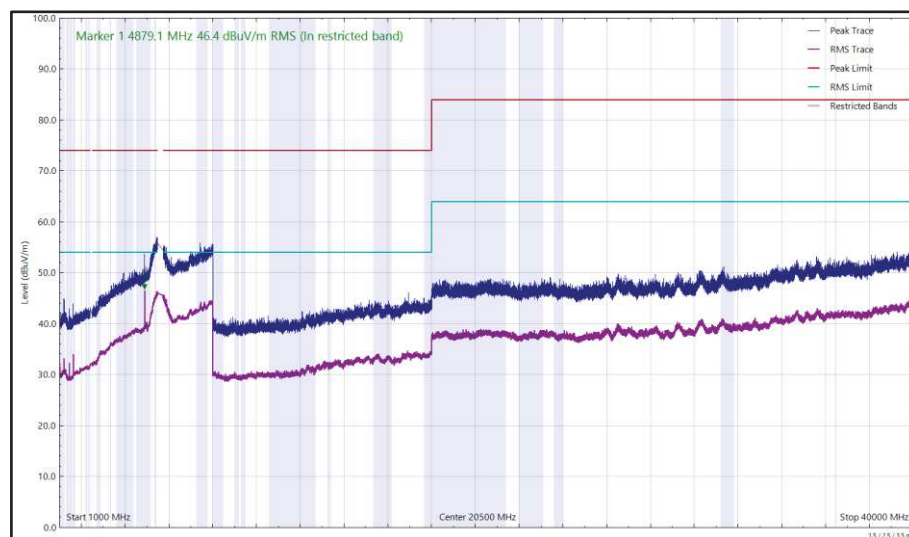


Figure 57 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-2C - 5640 MHz (CH128), VHT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
4880.903	46.42	54.00	-7.58	RMS	235	329	Vertical

Table 22 - 2440 MHz (CH18), Thread, iPA, Core 2 and U-NII-2C - 5640 MHz (CH128), VHT20, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

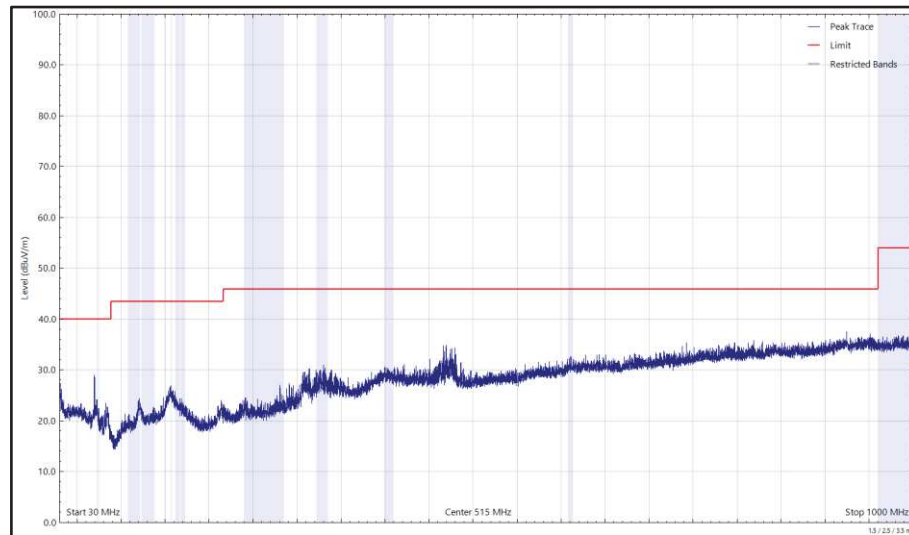


Figure 58 - 2440 MHz (CH18), Thread, iPA, Core 2 and U-NII-2C - 5640 MHz (CH128), VHT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

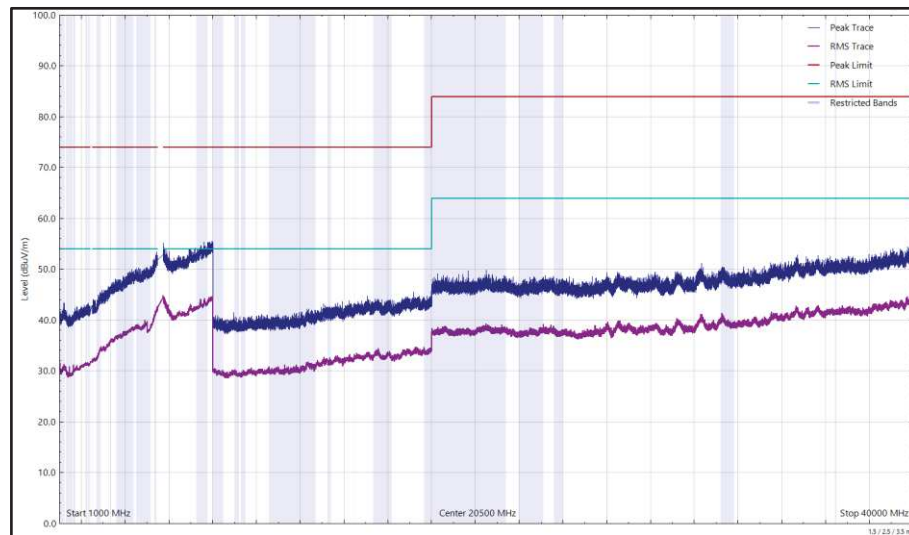


Figure 59 - 2440 MHz (CH18), Thread, iPA, Core 2 and U-NII-2C - 5640 MHz (CH128), VHT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

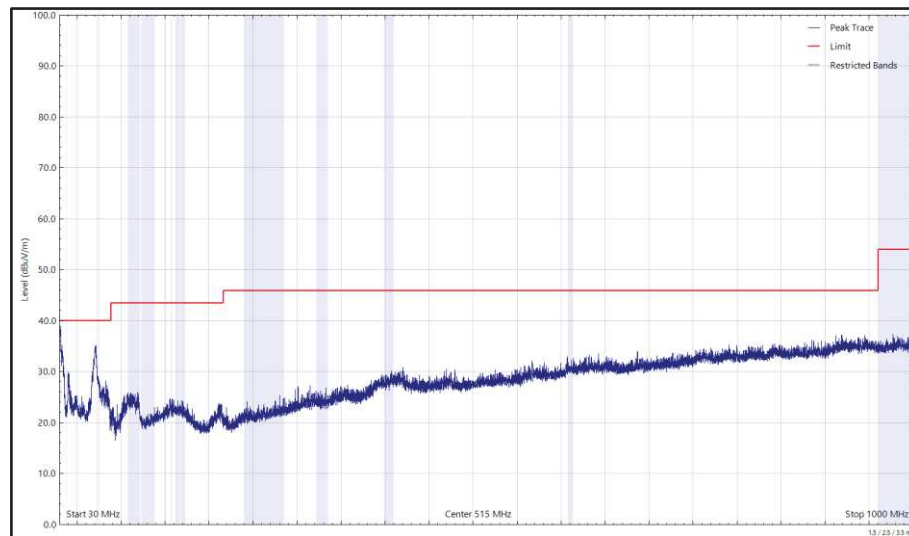


Figure 60 - 2440 MHz (CH18), Thread, iPA, Core 2 and U-NII-2C - 5640 MHz (CH128), VHT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

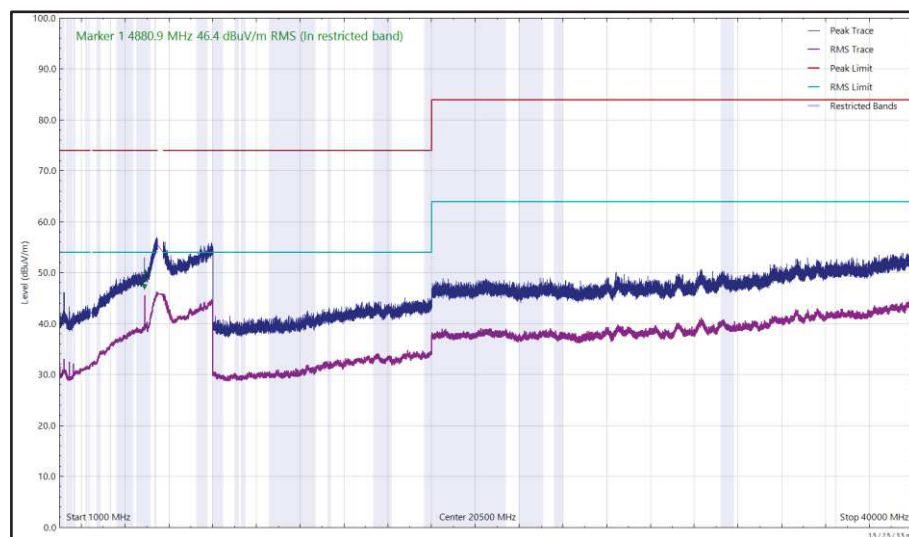


Figure 61 - 2440 MHz (CH18), Thread, iPA, Core 2 and U-NII-2C - 5640 MHz (CH128), VHT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
4880.962	47.90	54.00	-6.10	RMS	122	327	Vertical

Table 23 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-3 - 5785 MHz (CH157), VHT20, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

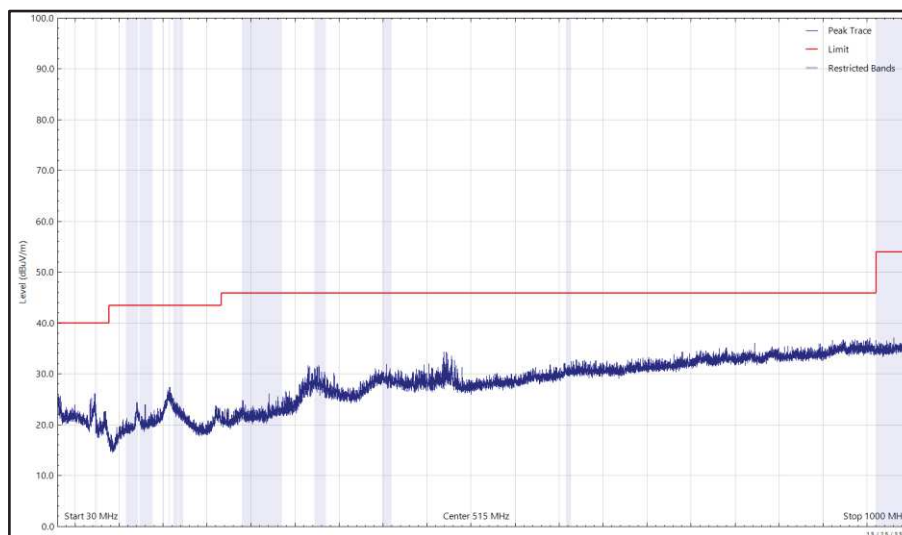


Figure 62 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-3 - 5785 MHz (CH157), VHT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

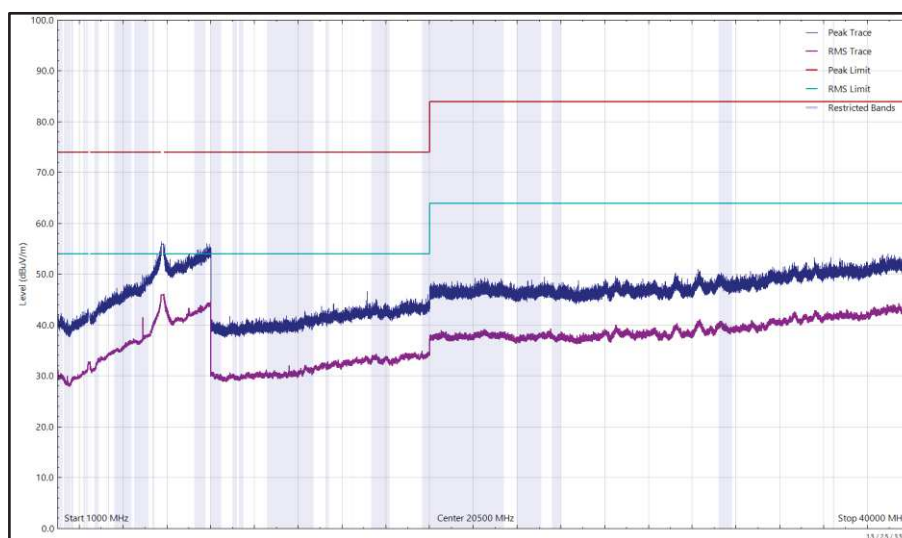


Figure 63 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-3 - 5785 MHz (CH157), VHT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

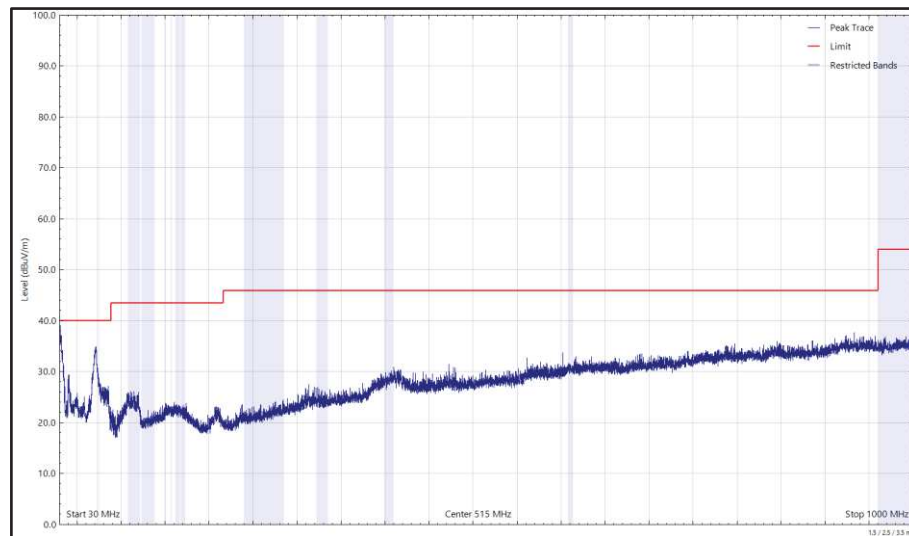


Figure 64 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-3 - 5785 MHz (CH157), VHT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

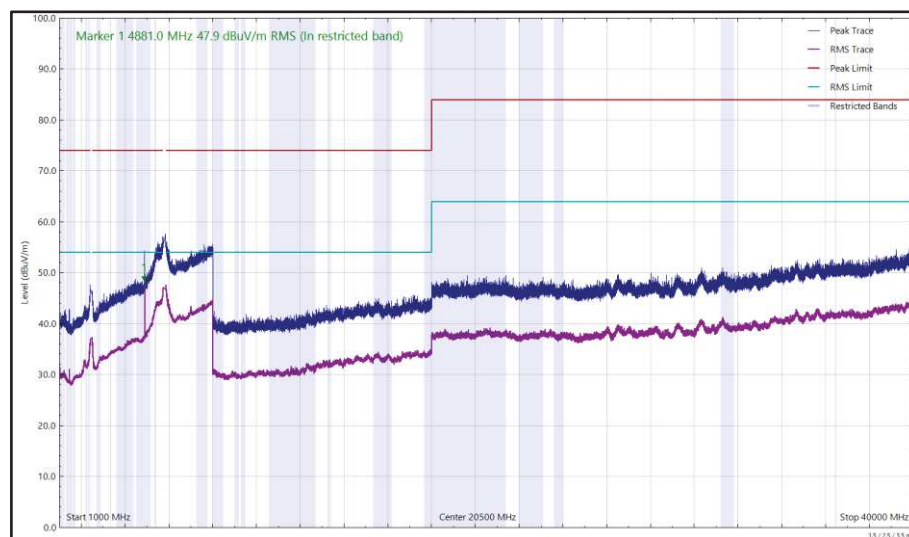


Figure 65 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-3 - 5785 MHz (CH157), VHT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical



Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 24 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-3 - 5785 MHz (CH157), VHT20, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

*No emissions found within 10 dB of the limit.

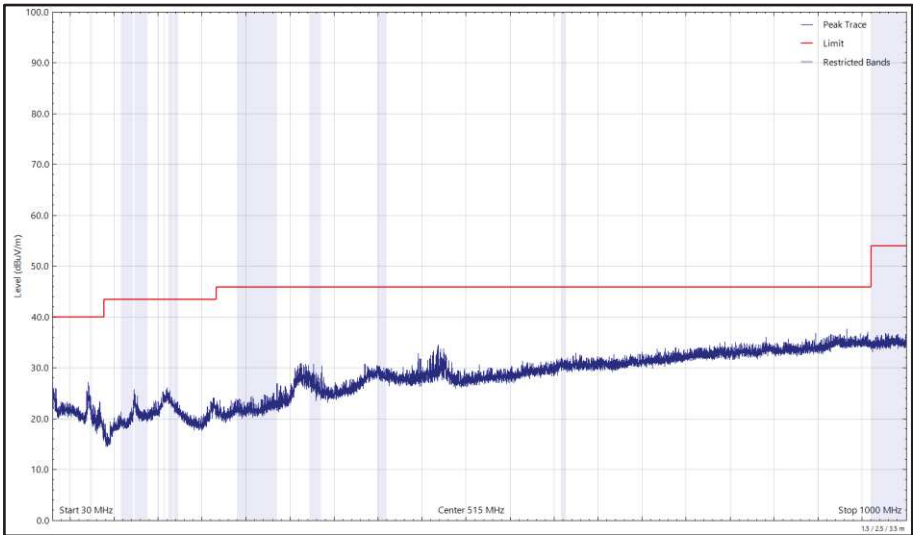


Figure 66 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-3 - 5785 MHz (CH157), VHT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

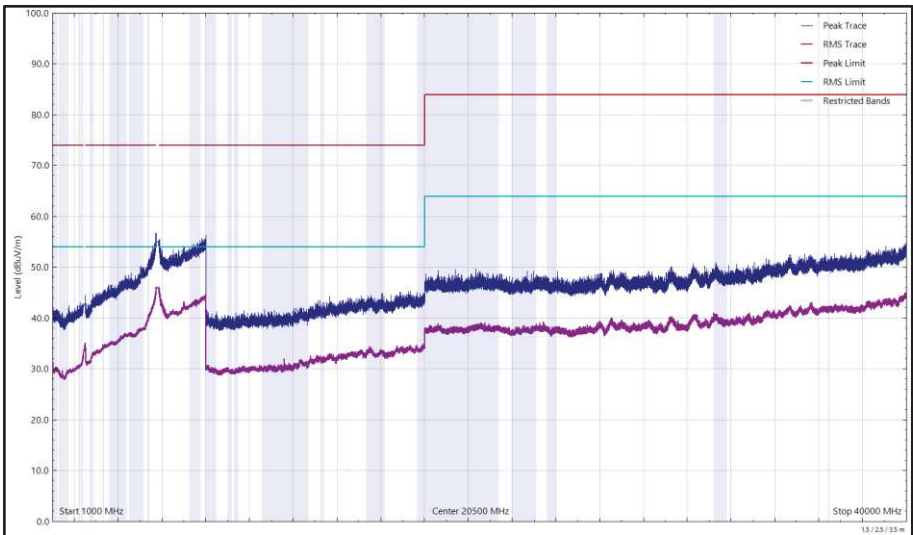


Figure 67 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-3 - 5785 MHz (CH157), VHT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

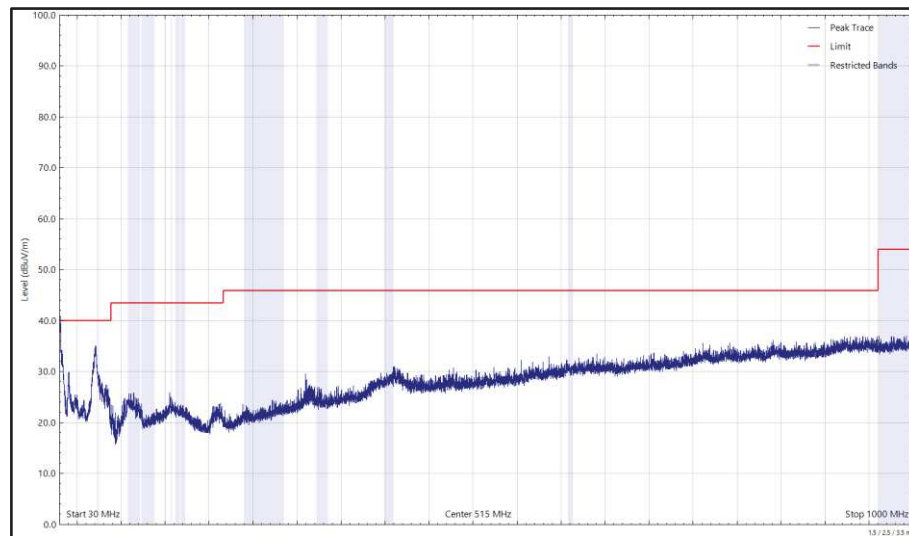


Figure 68 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-3 - 5785 MHz (CH157), VHT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

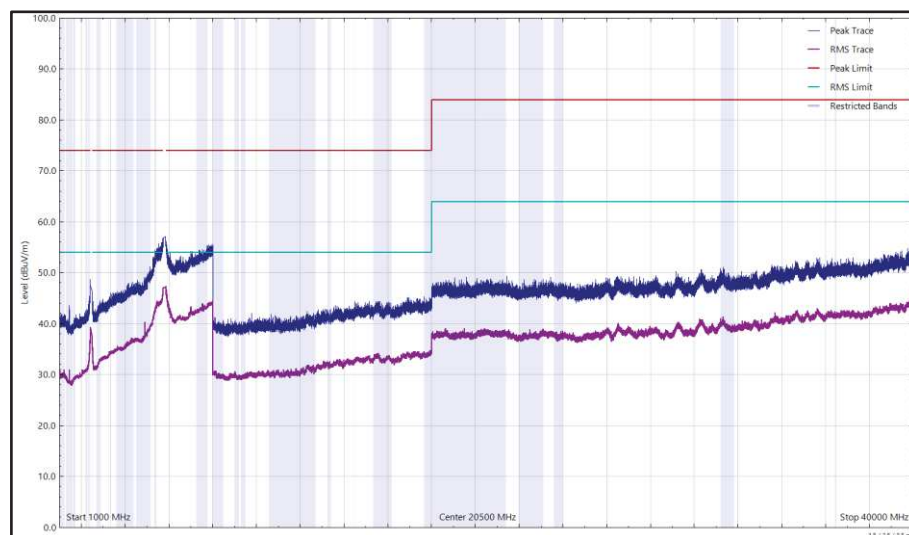


Figure 69 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-3 - 5785 MHz (CH157), VHT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
4879.105	45.18	54.00	-8.82	RMS	127	337	Vertical

Table 25 - 2440 MHz (CH18), Thread, iPA, Core 2 and U-NII-3 - 5785 MHz (CH157), VHT20, CDD, Core 0 + Core 1, 1 to 40 GHz

No other emissions found within 10 dB of the limit.

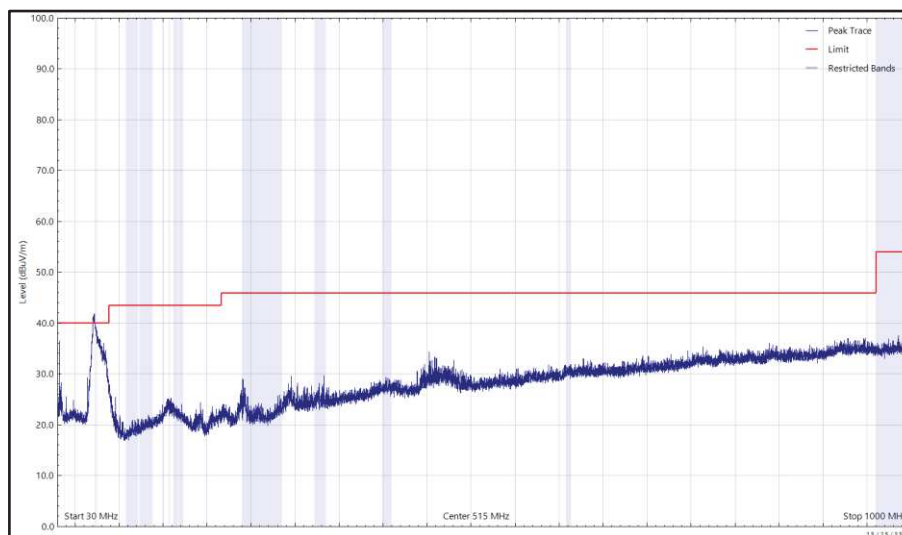


Figure 70 - 2440 MHz (CH18), Thread, iPA, Core 2 and U-NII-3 - 5785 MHz (CH157), VHT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

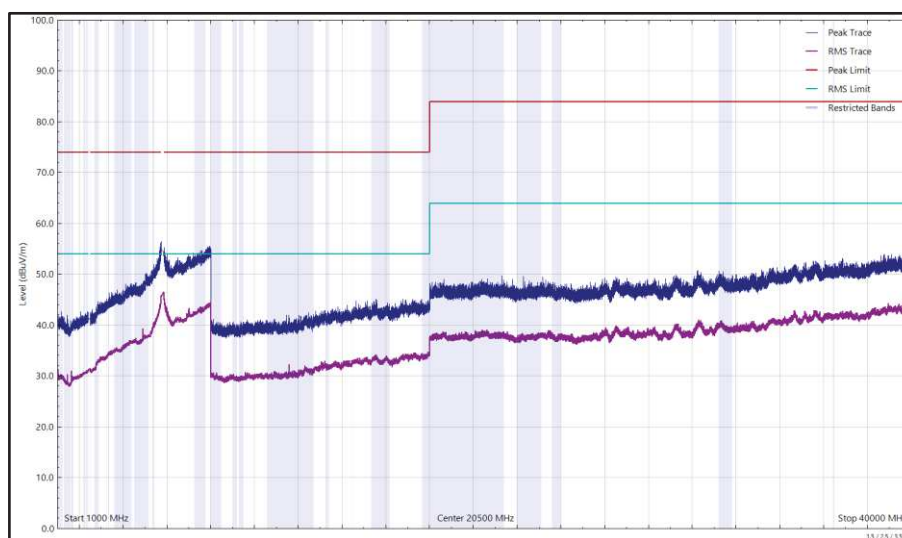


Figure 71 - 2440 MHz (CH18), Thread, iPA, Core 2 and U-NII-3 - 5785 MHz (CH157), VHT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

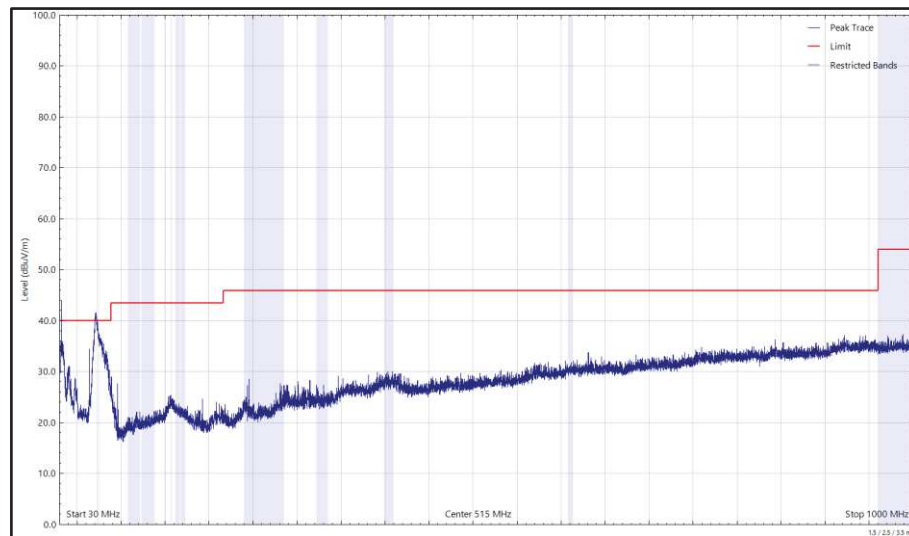


Figure 72 - 2440 MHz (CH18), Thread, iPA, Core 2 and U-NII-3 - 5785 MHz (CH157), VHT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

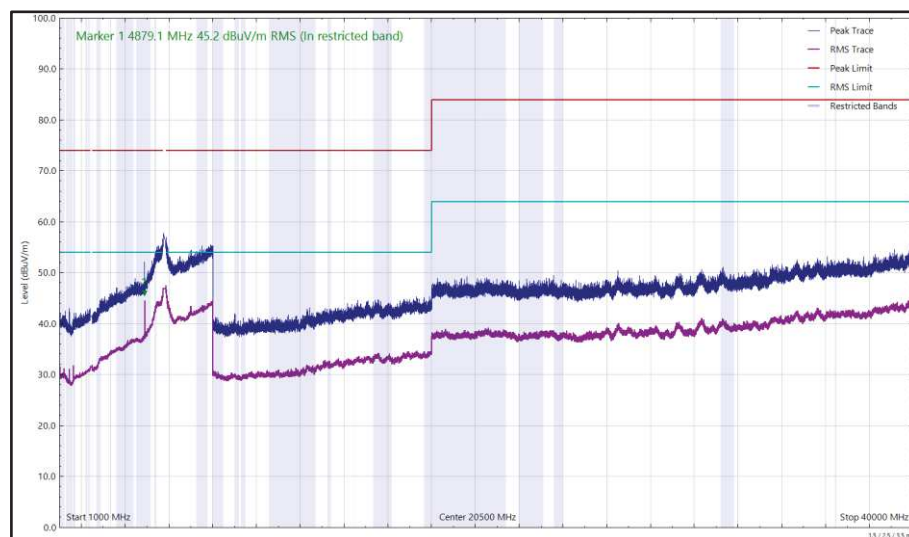


Figure 73 - 2440 MHz (CH18), Thread, iPA, Core 2 and U-NII-3 - 5785 MHz (CH157), VHT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical



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 dB μ V/m at 3m, Average 54 dB μ V/m at 3m (Restricted bands > 1 GHz)

Table 26

CoTx - Thread and 6 GHz WLAN

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 27 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

*No emissions found within 10 dB of the limit.

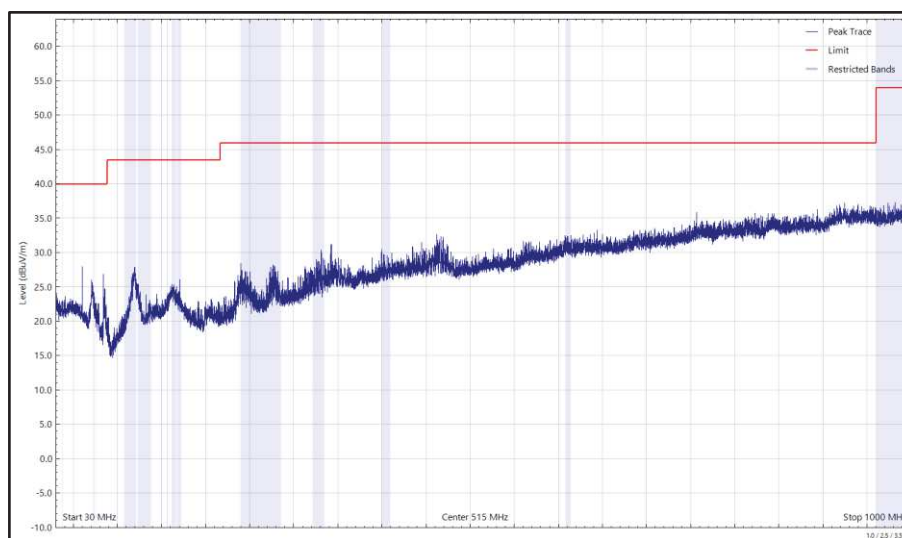


Figure 74 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

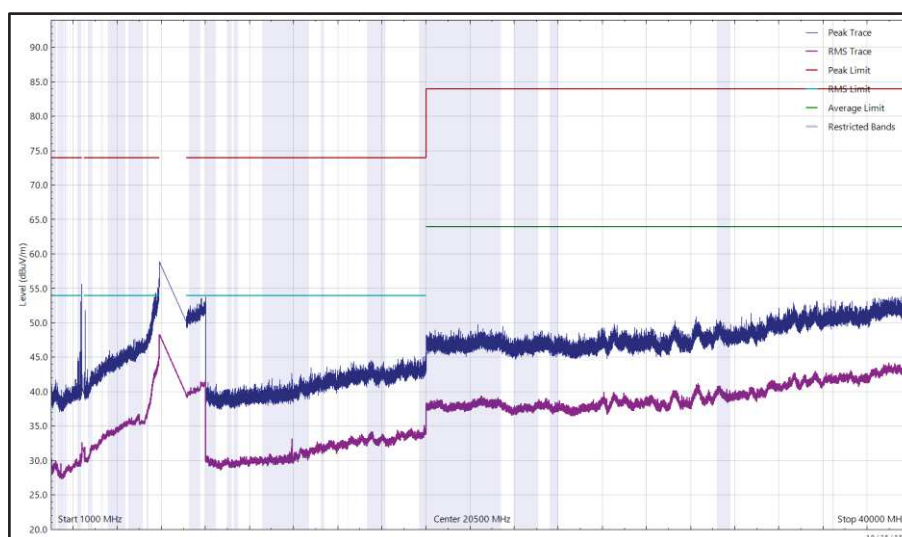


Figure 75 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

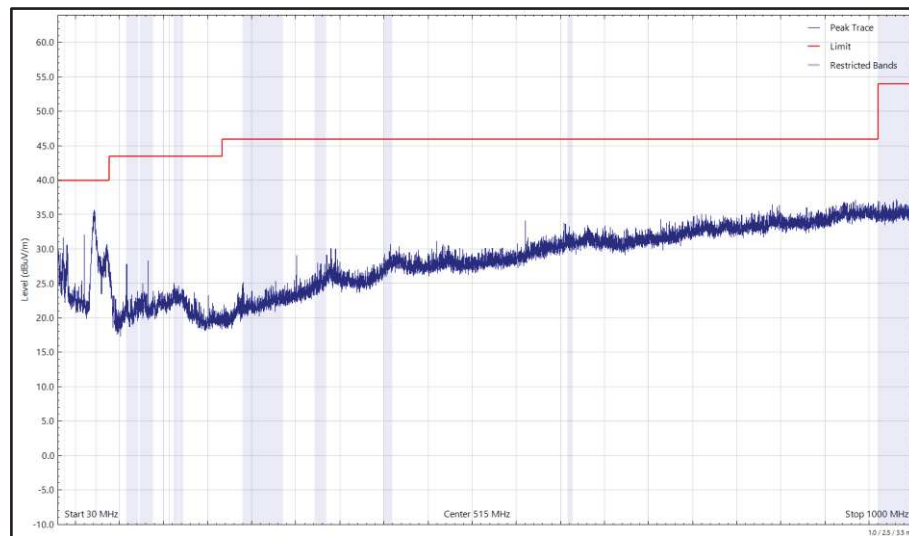


Figure 76 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

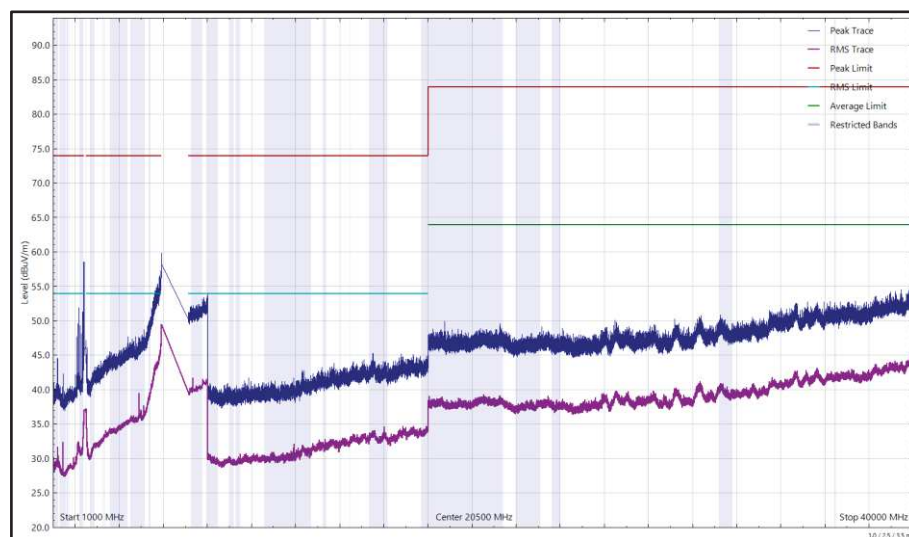


Figure 77 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical



Frequency (MHz)	Level (dBuv/m)	Limit (dBuv/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 28 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

*No emissions found within 10 dB of the limit.

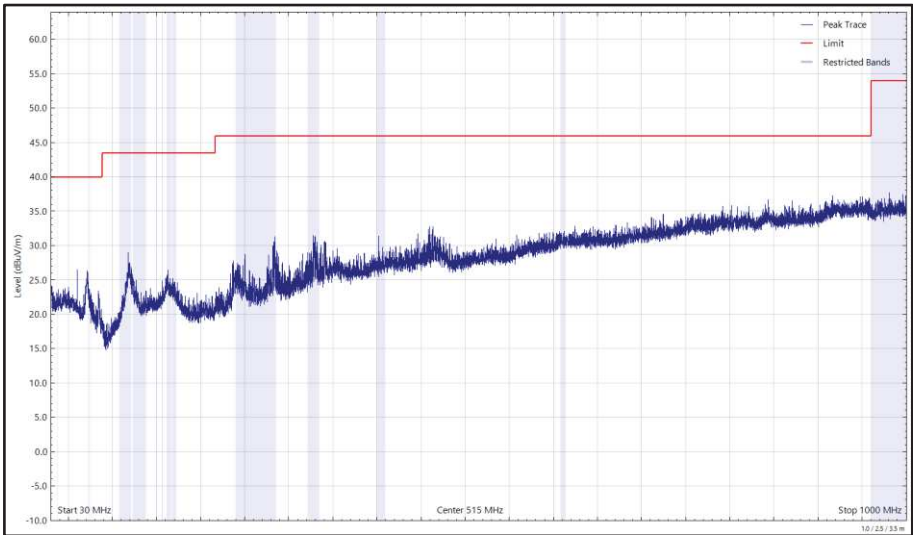


Figure 78 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

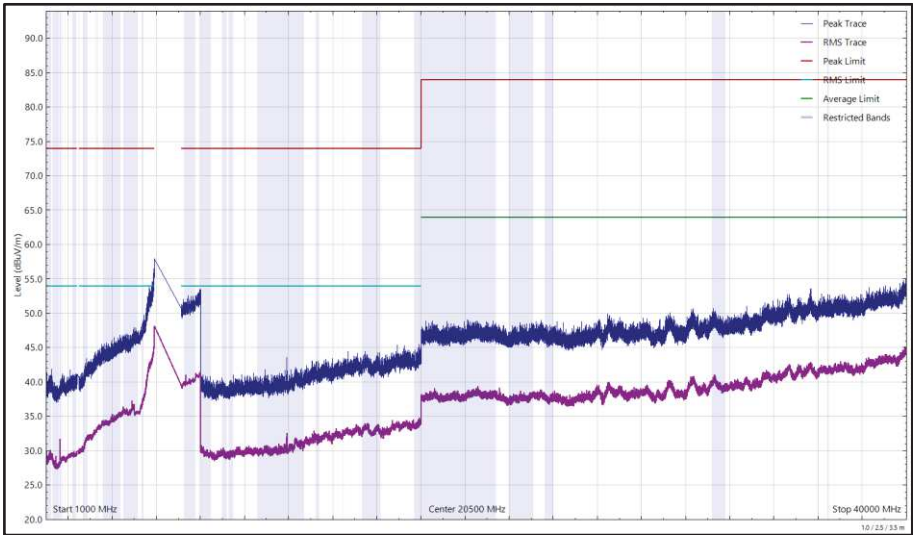


Figure 79 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

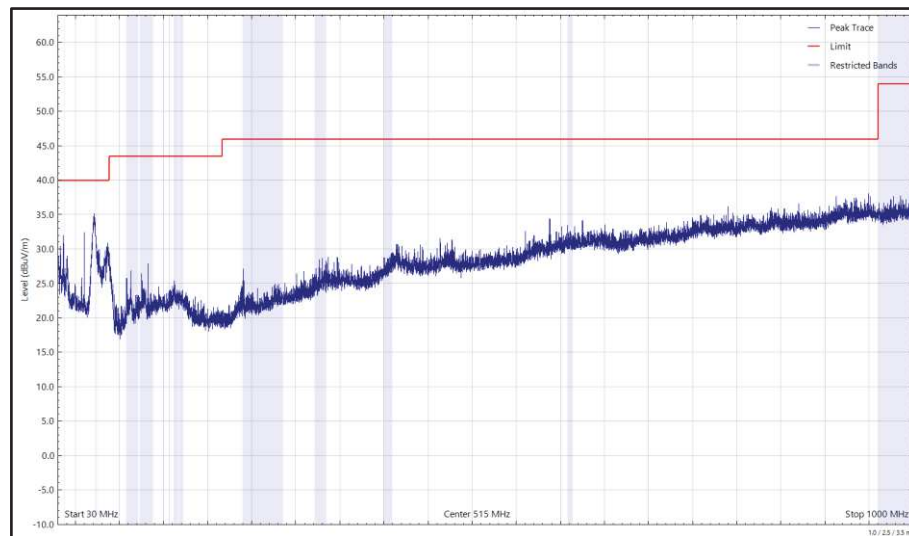


Figure 80 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

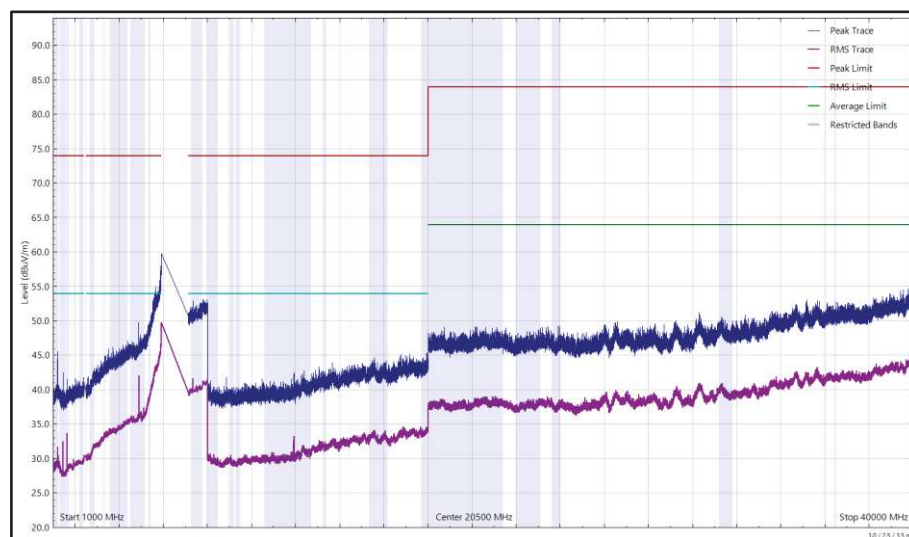


Figure 81 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical



Frequency (MHz)	Level (dBuv/m)	Limit (dBuv/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 29 - 2440 MHz (CH18), Thread, iPA, Core 2 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

*No emissions found within 10 dB of the limit.

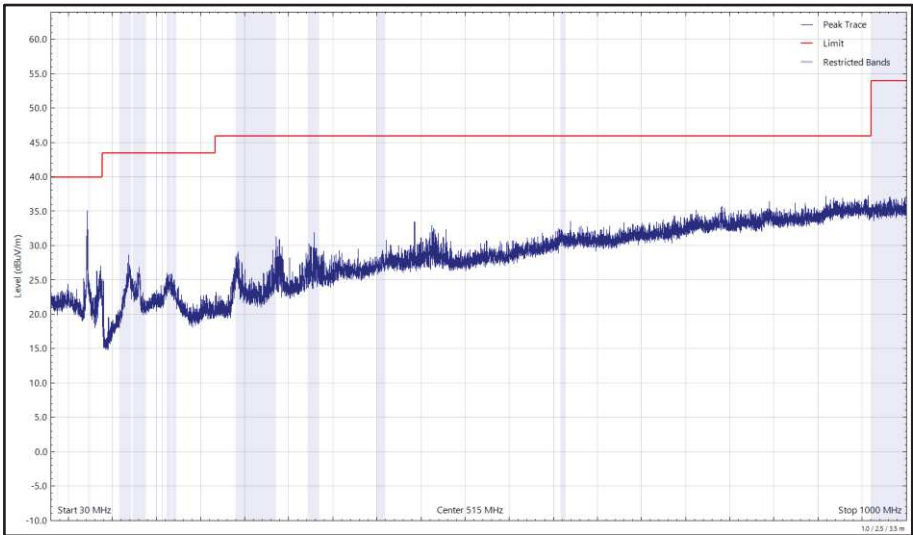


Figure 82 - 2440 MHz (CH18), Thread, iPA, Core 2 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

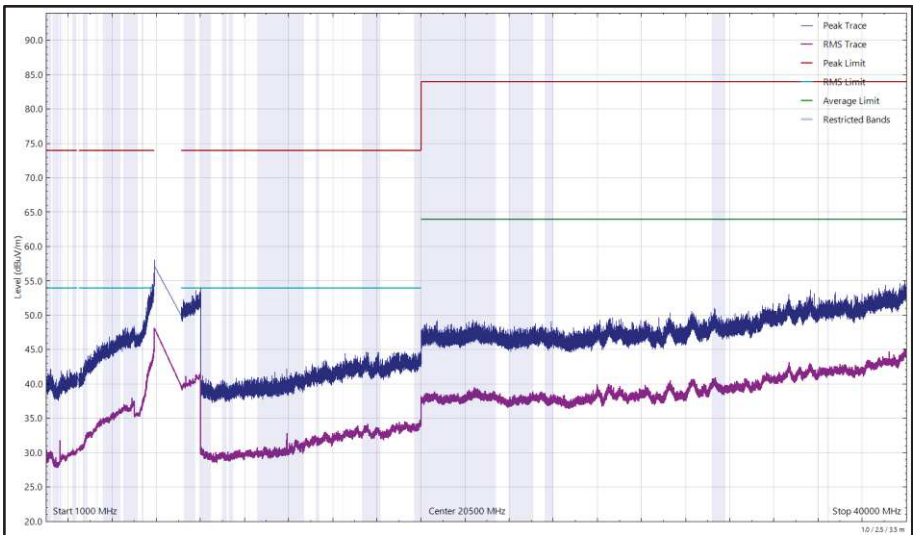


Figure 83 - 2440 MHz (CH18), Thread, iPA, Core 2 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

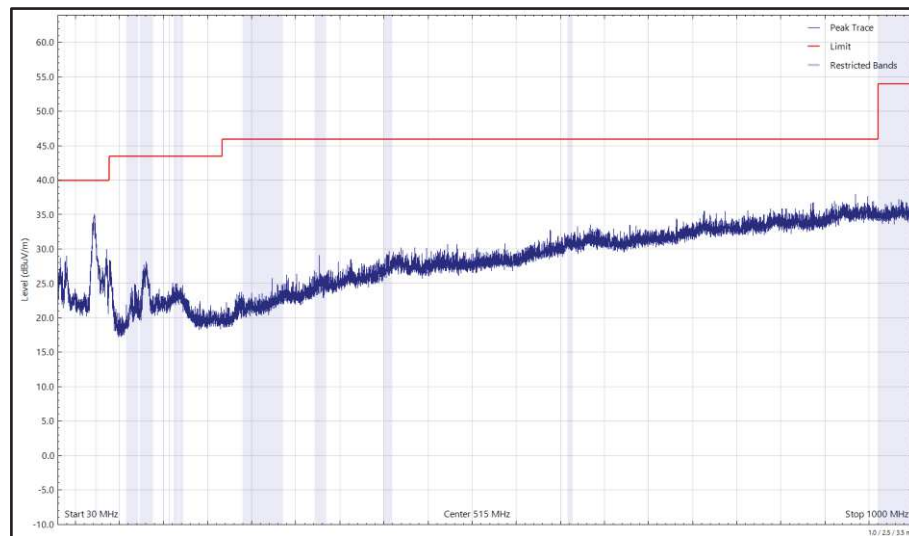


Figure 84 - 2440 MHz (CH18), Thread, iPA, Core 2 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

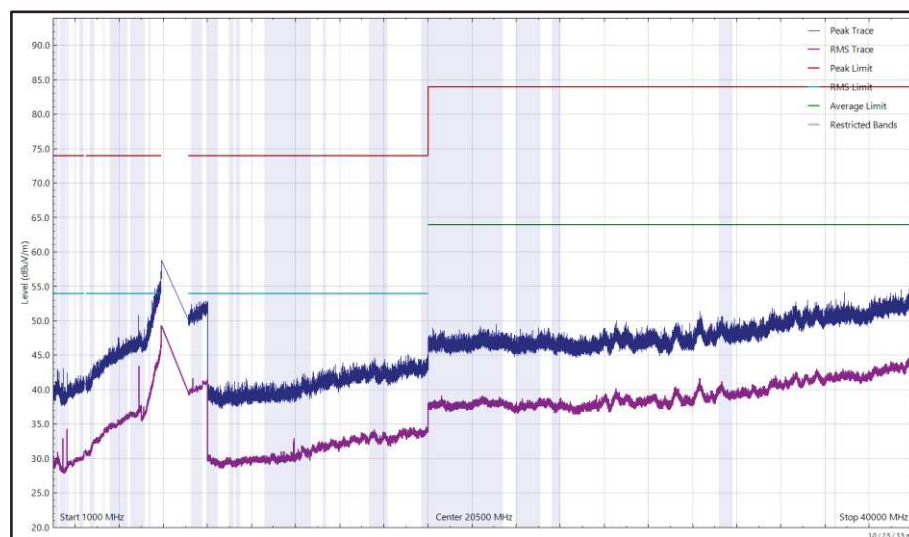


Figure 85 - 2440 MHz (CH18), Thread, iPA, Core 2 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 30 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

*No emissions found within 10 dB of the limit.

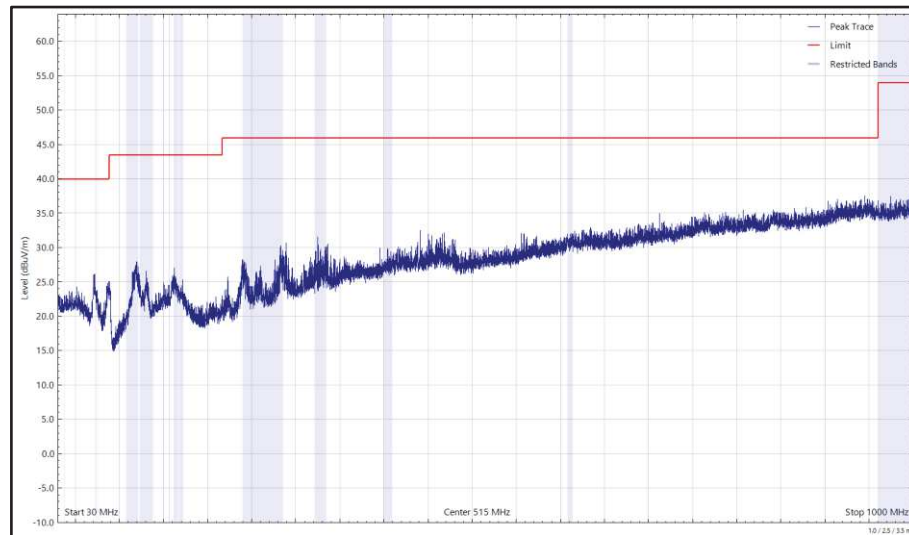


Figure 86 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

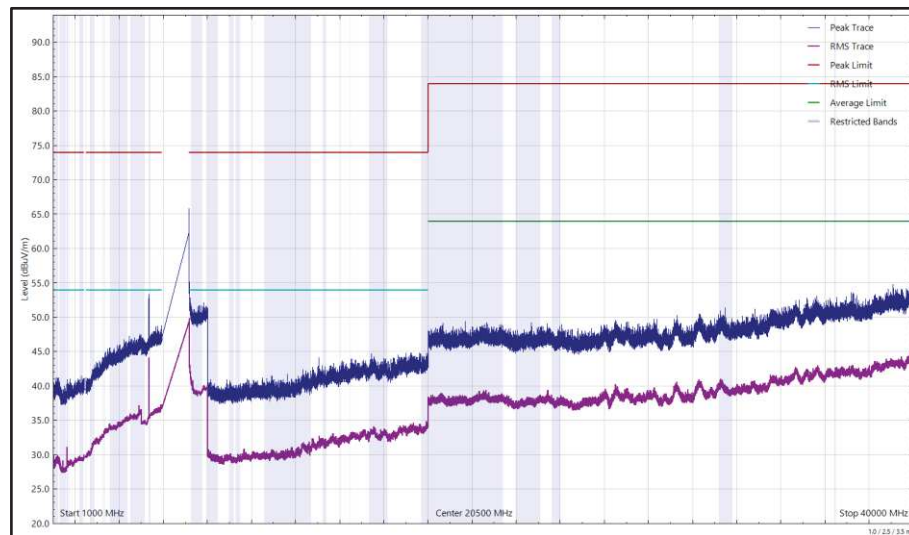


Figure 87 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

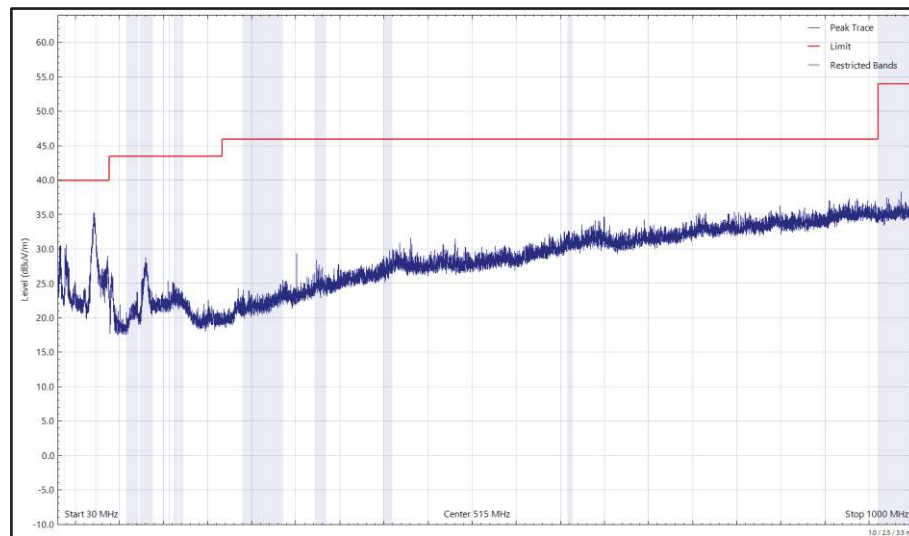


Figure 88 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

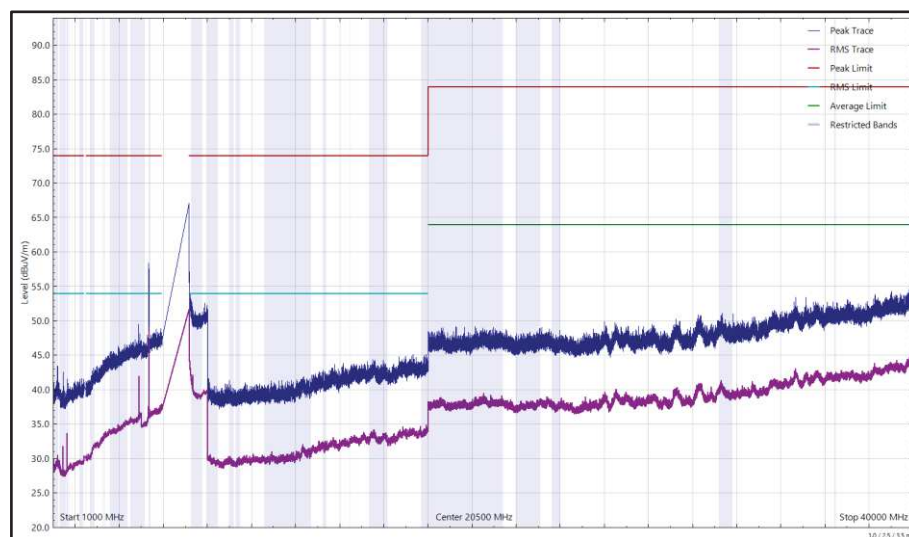


Figure 89 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical



Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 31 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

*No emissions found within 10 dB of the limit.

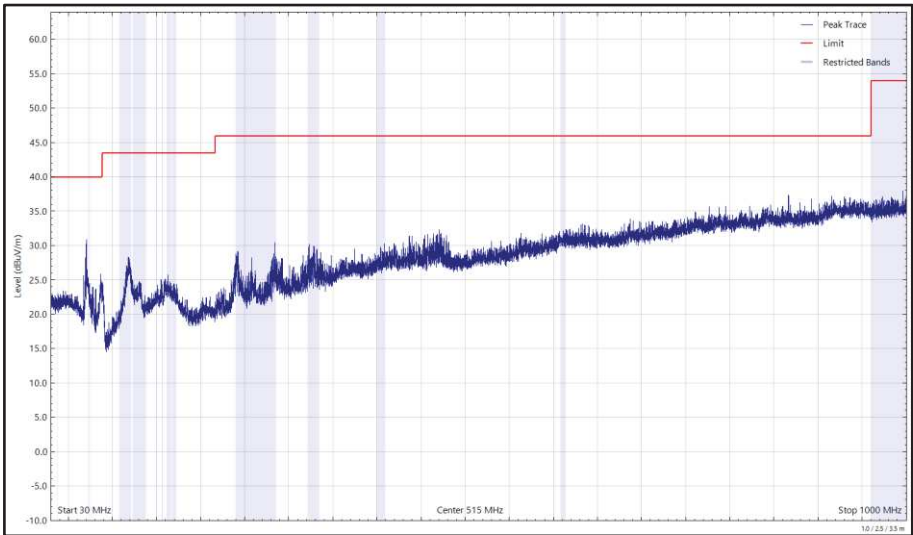


Figure 90 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

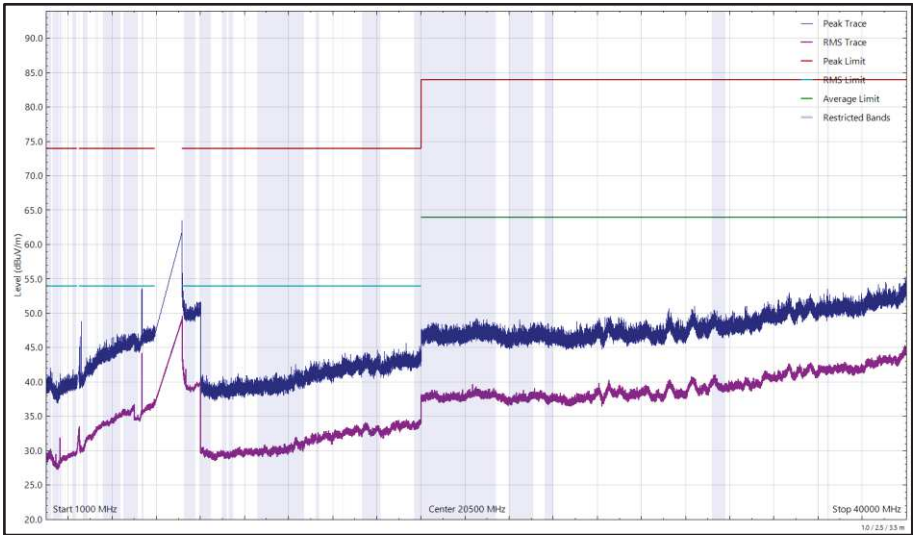


Figure 91 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

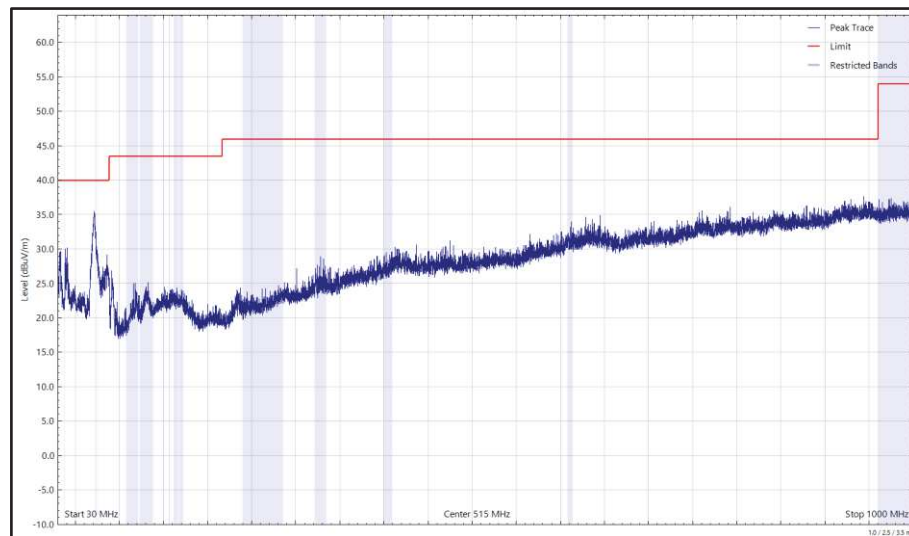


Figure 92 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

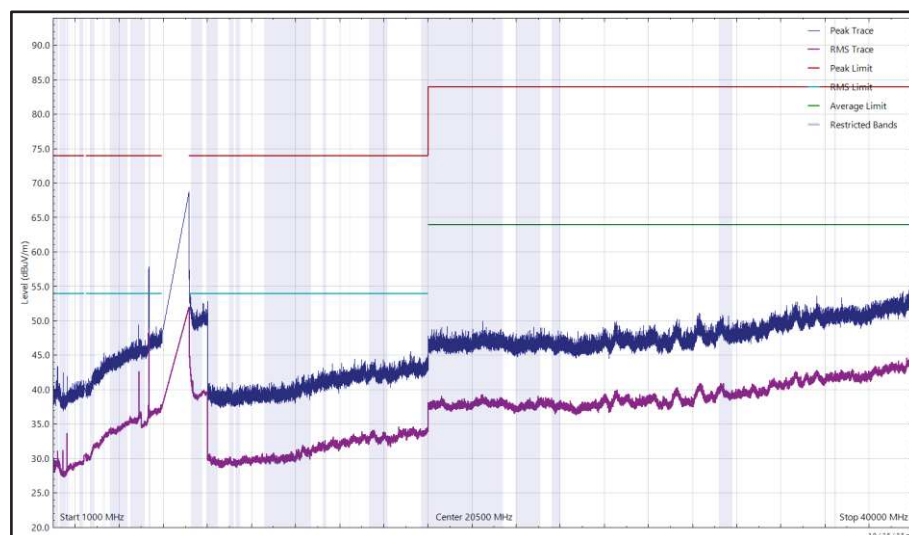


Figure 93 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical



Frequency (MHz)	Level (dBuv/m)	Limit (dBuv/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 32 - 2440 MHz (CH18), Thread, iPA, Core 2 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

*No emissions found within 10 dB of the limit.

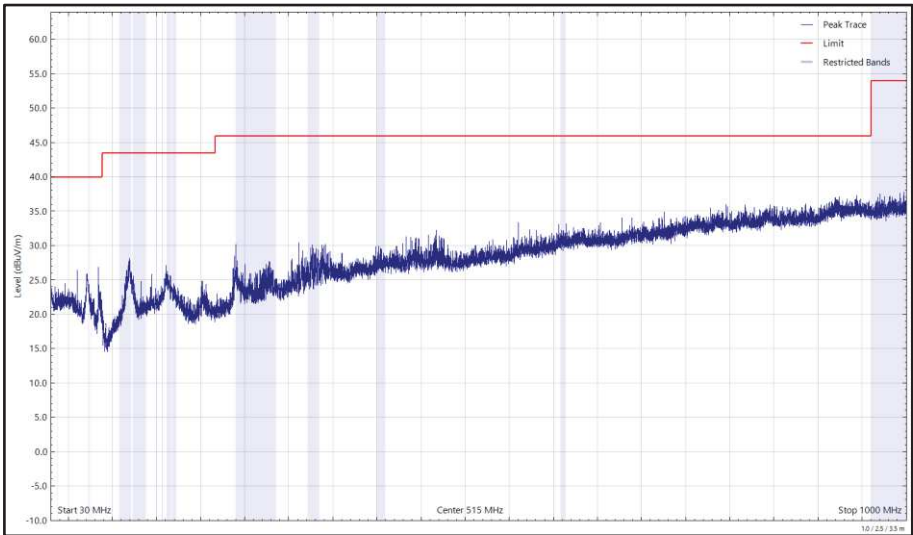


Figure 94 - 2440 MHz (CH18), Thread, iPA, Core 2 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

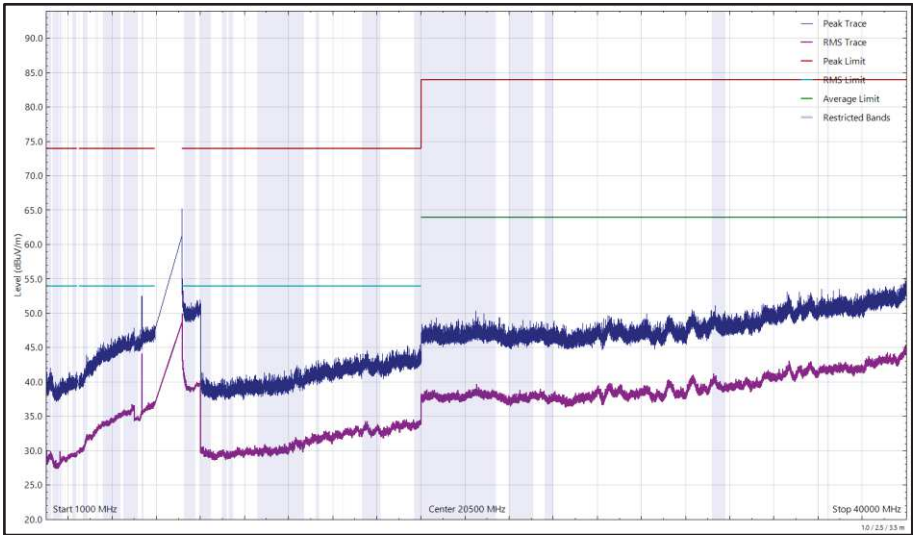


Figure 95 - 2440 MHz (CH18), Thread, iPA, Core 2 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

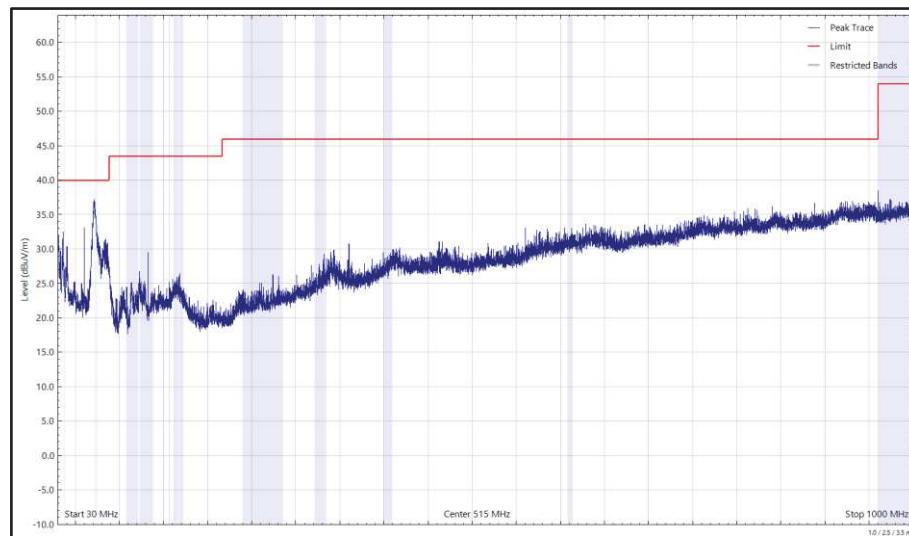


Figure 96 - 2440 MHz (CH18), Thread, iPA, Core 2 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

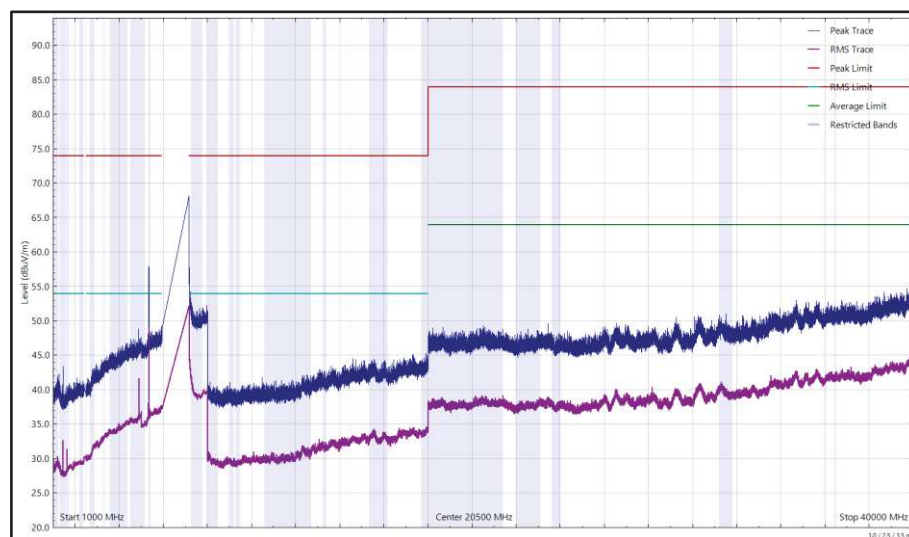


Figure 97 - 2440 MHz (CH18), Thread, iPA, Core 2 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical



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

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

The least stringent applicable limit was:

Clause	Limit
Part 15 247 (d) / RSS-247 Clause 5.5	-20 dBc
Part 15.407 (b) / RSS-248 Clause 4.6.2	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 33



2.1.8 Test Location and Test Equipment Used

This test was carried out in RF Chamber 14.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Expiry Date
Emissions Software	TUV SUD	EmX V3.1.12	5125	-	Software
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	5516	12	23-Oct-2023
EMI Test Receiver	Rohde & Schwarz	ESW44	5912	12	17-Apr-2024
Test Receiver	Rohde & Schwarz	ESW44	5914	12	24-Feb-2024
Cable (K Type 2m)	Junkosha	MWX241-02000KMSKMS/B	5933	12	05-Jun-2024
DRG Horn Antenna (7.5-18GHz)	Schwarzbeck	HWRD750	5940	12	09-Jul-2024
TRILOG Super Broadband Test Antenna	Schwarzbeck	VULB 9168	5943	24	03-Feb-2024
1500W (300V 12A) AC Power Supply	iTech	IT7324	5955	-	O/P Mon
5m Semi-Anechoic Chamber (Dual-Axis)	Albatross Projects	RF Chamber 14	5958	36	26-Apr-2025
Compact Antenna Mast	Maturo Gmbh	CAM4.0-P	5959	-	TU
Mast & Turntable Controller	Maturo Gmbh	FCU3.0	5960	-	TU
Tilt Antenna Mast	Maturo Gmbh	BAM4.5-P	5961	-	TU
Turntable	Maturo Gmbh	TT1.5SI	5962	-	TU
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	5996	12	05-Jun-2024
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	5997	12	14-Sep-2023
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	5997	12	14-Sep-2024
Cable (SMA to SMA 6.5m)	Junkosha	MWX221-06500AMSAMS/B	6003	12	05-Jun-2024
Cable (N to N 7m)	Junkosha	MWX221-07000NMSNMS/B	6005	12	05-Jun-2024
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	6007	12	05-Jun-2024
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	6008	12	05-Jun-2024
Cable (N to N 8m)	Junkosha	MWX221-08000NMSNMS/A	6017	12	14-Sep-2023
Cable (N to N 8m)	Junkosha	MWX221-08000NMSNMS/A	6017	12	14-Sep-2024
Horn Antenna (1-10 GHz)	Schwarzbeck	BBHA9120B	6141	12	28-Aug-2023
Horn Antenna (1-10 GHz)	Schwarzbeck	BBHA9120B	6141	12	26-Aug-2028
SAC Switch Unit	TUV SUD	TUV_SSU_001	6144	12	05-Dec-2023
Digital Multimeter	Fluke	115	6146	12	15-Jun-2024
Digital Multimeter	Fluke	115	6147	12	16-Jun-2024



Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Expiry Date
Humidity & Temperature meter	R.S Components	1364	6149	12	07-Jul-2024
Double Ridge Active Horn Antenna (18-40 GHz)	Com-Power	AHA-840	6187	24	02-Jun-2024
Double Ridge Active Horn Antenna (18-40 GHz)	Com-Power	AHA-840	6188	24	02-Jun-2024
8 GHz Highpass Filter	Wainwright	WHKX 7150 8000 18000 50SS	6196	12	24-Jul-2024
Pre Amp 8 - 18 GHz	Wright Technologies	APS06 0061	6198	12	14-Jul-2024
Attenuator (4 dB)	Pasternack	PE7074-4	6202	24	16-Jul-2024
Cable (SMA to SMA 20cm)	TUV SUD	MH-FH 8-18	6220	12	24-Jul-2024
Cable (SMA to SMA 8m)	Junkosha	MWX221-08000AMSAMS/B	6319	12	04-Feb-2024
Cable (K Type 2m)	Junkosha	MWX241-02000KMSKMS/B	6324	12	04-Feb-2024
Humidity and Temperature Meter	R.S Components	1364	6346	12	28-Feb-2024

Table 34

TU - Traceability Unscheduled
O/P Mon - Output Monitored using calibrated equipment



3 Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

Test Name	Measurement Uncertainty
Radiated Spurious Emissions (Simultaneous Transmission)	30 MHz to 1 GHz: ± 5.2 dB 1 GHz to 40 GHz: ± 6.3 dB

Table 35

Measurement Uncertainty Decision Rule – Accuracy Method

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115:2021, Clause 4.4.3 (Procedure 2). The measurement results are directly compared with the test limit to determine conformance with the requirements of the standard.

Risk: The uncertainty of measurement about the measured result is negligible with regard to the final pass/fail decision. The measurement result can be directly compared with the test limit to determine conformance with the requirement (compare IEC Guide 115). The level of risk to falsely accept and falsely reject items is further described in ILAC-G8.