

FCC and ISED Test Report

Apple Inc
Model: A3113

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



Add value.
Inspire trust.

Digitally signed by
TUV SUD
Date: 2023.11.08
12:28:52 Z

FCC ID: BCGA3113

IC: 579C-A3113

COMMERCIAL-IN-CONFIDENCE

Document 75959605-11 Issue 02

SIGNATURE

NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Steve Marshall	Senior Engineer	Authorised Signatory	08 November 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	08 November 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.



DISCLAIMER AND COPYRIGHT

This non-binding report has been prepared by TÜV SÜD with all reasonable skill and care. The document is confidential to the potential Client and TÜV SÜD. No part of this document may be reproduced without the prior written approval of TÜV SÜD. © 2023 TÜV SÜD. This report relates only to the actual item/items tested.

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).

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

TÜV SÜD Ltd is a
TÜV SÜD Group Company

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

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



Contents

- 1 Report Summary.....2**
- 1.1 Report Modification Record2
- 1.2 Introduction2
- 1.3 Brief Summary of Results3
- 1.4 Product Information.....4
- 1.5 Deviations from the Standard4
- 1.6 EUT Modification Record.....4
- 1.7 Test Location5
- 2 Test Details.....6**
- 2.1 Radiated Spurious Emissions (Simultaneous Transmission).....6
- 3 Measurement Uncertainty59**



1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	03-November-2023
2	Section 1.2 updated.	08-November-2023

Table 1

1.2 Introduction

Applicant	Apple Inc
Manufacturer	Apple Inc
Model Number(s)	A3113
Serial Number(s)	KVQP772HX1 and NJFQGT4KJT
Hardware Version(s)	REV 1.0
Software Version(s)	23A32771a
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	28-September-2023
Finish of Test	26-October-2023
Name of Engineer(s)	Colin Brain, Elliot Callender, James Woods, Vineeth Nagaraj, Akhil Rajendran Bhaskaran Nair, Thomas Randall, Manohar Thota, Ioan-Alexandru Bogatu
Related Document(s)	ANSI C63.10 (2013) ANSI C63.10 (2020) ANSI C63.4 (2014) KDB 789033 D02 v02r01



1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15, ISSED RSS-247, ISSED RSS-248 and ISSED 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: 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	ANSI C63.10: 2013 ANSI C63.10: 2020
Configuration and Mode: 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	ANSI C63.10: 2013 ANSI C63.10: 2020
Configuration and Mode: 2.4 GHz WLAN and Narrowband							
2.1	15.209, 15.247(d) and 15.407(b)	5.5 and 6.2	-	6.13 and 8.9	Radiated Spurious Emissions (Simultaneous Transmission)	Pass	ANSI C63.10: 2013 ANSI C63.10: 2020
Configuration and Mode: 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	ANSI C63.10: 2013 ANSI C63.10: 2020
Configuration and Mode: 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	ANSI C63.10: 2013 ANSI C63.10: 2020

Table 2



1.4 Product Information

1.4.1 Technical Description

The equipment under test (EUT) was a portable laptop computer.

1.5 Deviations from the Standard

No deviations from the applicable test standard were made during testing.

1.6 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: A3113, Serial Number: KVQP772HX1			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A3113, Serial Number: NJFQGT4KJT			
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: 2.4 GHz Bluetooth and 5 GHz WLAN		
Radiated Spurious Emissions (Simultaneous Transmission)	Colin Brain, Elliot Callender, James Woods and Vineeth Nagaraj	UKAS
Configuration and Mode: 2.4 GHz Bluetooth and 6 GHz WLAN		
Radiated Spurious Emissions (Simultaneous Transmission)	Akhil Rajendran Bhaskaran Nair, Elliot Callender, James Woods, Thomas Randall and Vineeth Nagaraj	UKAS
Configuration and Mode: 2.4 GHz WLAN and Narrowband		
Radiated Spurious Emissions (Simultaneous Transmission)	Elliot Callender, James Woods and Manohar Thota	UKAS
Configuration and Mode: Thread and 5 GHz WLAN		
Radiated Spurious Emissions (Simultaneous Transmission)	Akhil Rajendran Bhaskaran Nair, Elliot Callender, Ioan-Alexandru Bogatu, Morsalin Hossain and Vineeth Nagaraj	UKAS
Configuration and Mode: Thread and 6 GHz WLAN		
Radiated Spurious Emissions (Simultaneous Transmission)	Akhil Rajendran Bhaskaran Nair, Ioan-Alexandru Bogatu and Morsalin Hossain	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

A3113, S/N: KVQP772HX1 - Modification State 0
A3113, S/N: NJFQGT4KJT - Modification State 0

2.1.3 Date of Test

28-September-2023 to 26-October-2023

2.1.4 Test Method

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

Ports on the EUT were terminated with loads as described in ANSI C63.4 clause 6.2.4 for each type of port on the EUT.

For frequencies > 1 GHz, plots for average measurements were taken in accordance with ANSI C63.10, clause 4.1.4.2.5 to characterize the EUT. Where emissions were detected, final average measurements were taken in accordance with ANSI C63.10, clause 4.1.4.2.2, 11.11, 11.12, 12.7.2 or 12.7.3 depending on the nature of the emission measured.

The plots shown are the characterisation of the EUT. The limits on the plots represent the most stringent case for restricted bands, (74/54 dBuV/m) when compared to non-restricted band limits. The limits shown have been used as a threshold to determine where further measurements are necessary. Where results are within 10 dB of the limits shown on the plots, further investigation was carried out and reported in results tables.

The following conversion can be applied to convert from dBµV/m to µV/m:
 $10^{(\text{Field Strength in dB}\mu\text{V/m}/20)}$

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 $20 \cdot \text{LOG}(3/1) = 9.54$ dB.

2.1.5 Example Test Setup Diagram

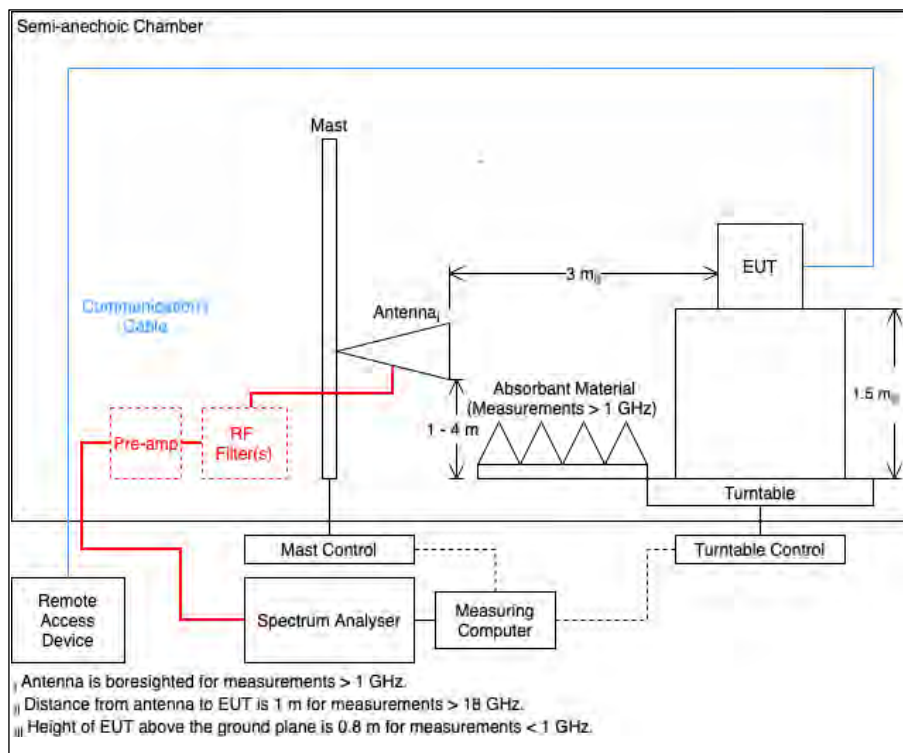


Figure 1

2.1.6 Environmental Conditions

Ambient Temperature	22.2 - 23.6 °C
Relative Humidity	44.1 - 53.6 %

2.1.7 Test Results

2.4 GHz Bluetooth and 5 GHz WLAN

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
2388.915	35.02	54.00	-18.98	RMS	352	289	Vertical
2483.706	34.29	54.00	-19.71	RMS	334	389	Vertical
4881.870	56.48	74.00	-17.52	Peak	347	270	Vertical
4881.870	44.98	54.00	-9.02	CISPR Avg	347	270	Vertical
4893.805	34.07	54.00	-19.93	CISPR Avg	232	357	Horizontal
5094.534	54.92	74.00	-19.08	Peak	341	297	Vertical
5118.563	37.68	54.00	-16.32	RMS	79	390	Horizontal
5119.851	42.81	54.00	-11.19	RMS	330	273	Vertical
5385.456	56.23	74.00	-17.77	Peak	325	290	Vertical
5385.456	43.56	54.00	-10.44	RMS	325	290	Vertical

Table 5 - 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1 and U-NII-1 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

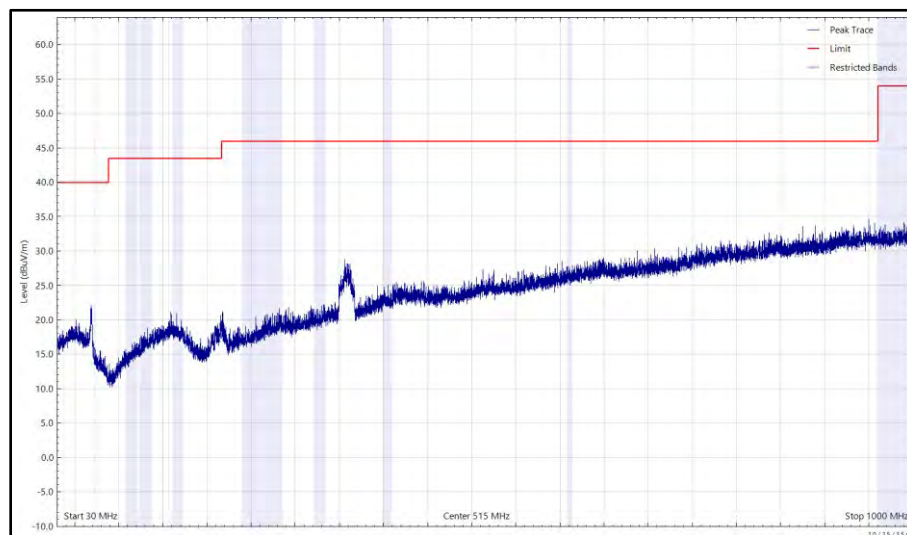


Figure 2 - 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1 and U-NII-1 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

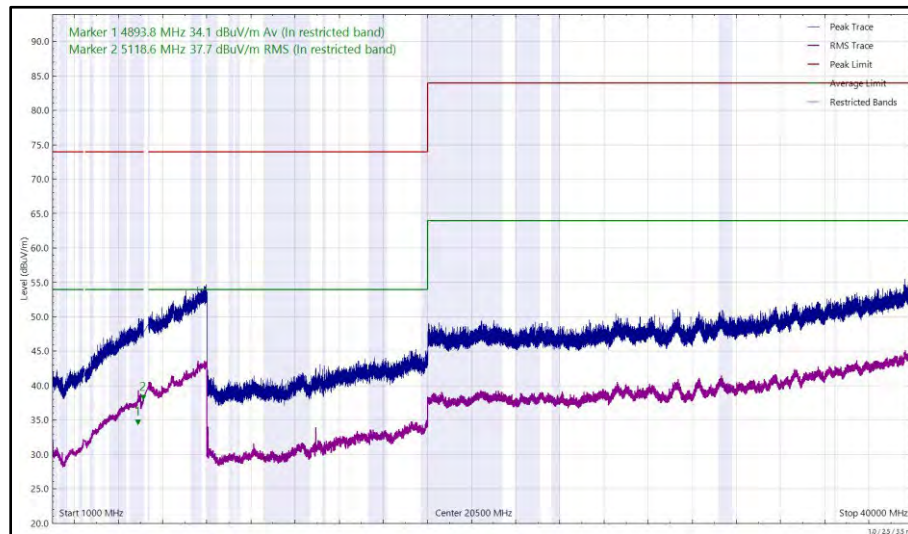


Figure 3 - 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1 and U-NII-1 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

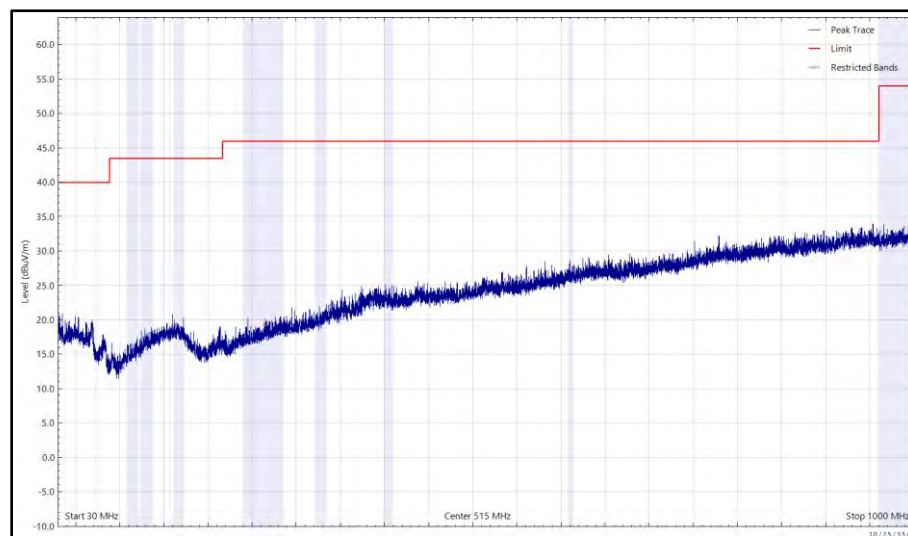


Figure 4 - 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1 and U-NII-1 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

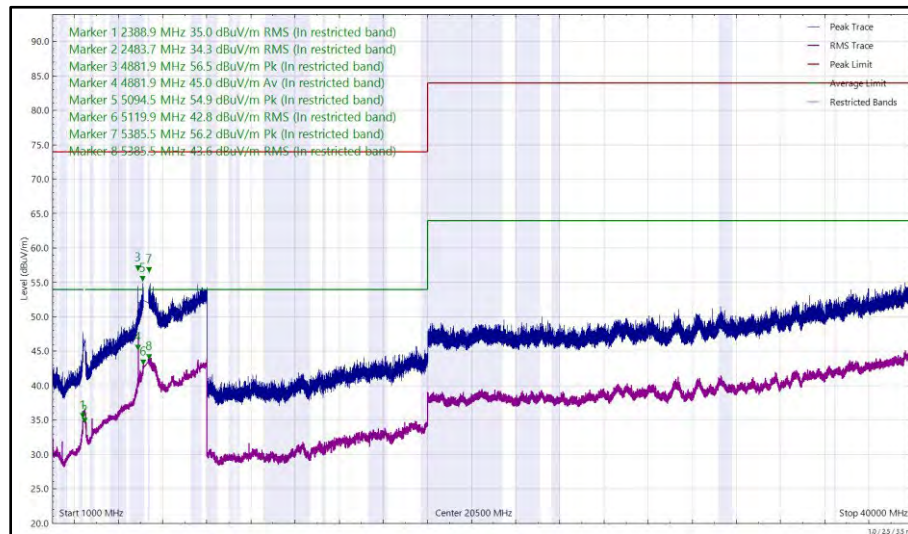


Figure 5 - 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1 and U-NII-1 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
4881.570	55.23	74.00	-18.77	Peak	348	278	Vertical
4881.570	43.38	54.00	-10.62	CISPR Avg	348	278	Vertical
5452.286	37.77	54.00	-16.23	RMS	234	383	Horizontal
5455.943	44.17	54.00	-9.83	RMS	320	291	Vertical

Table 6 - 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1 and U-NII-2C 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

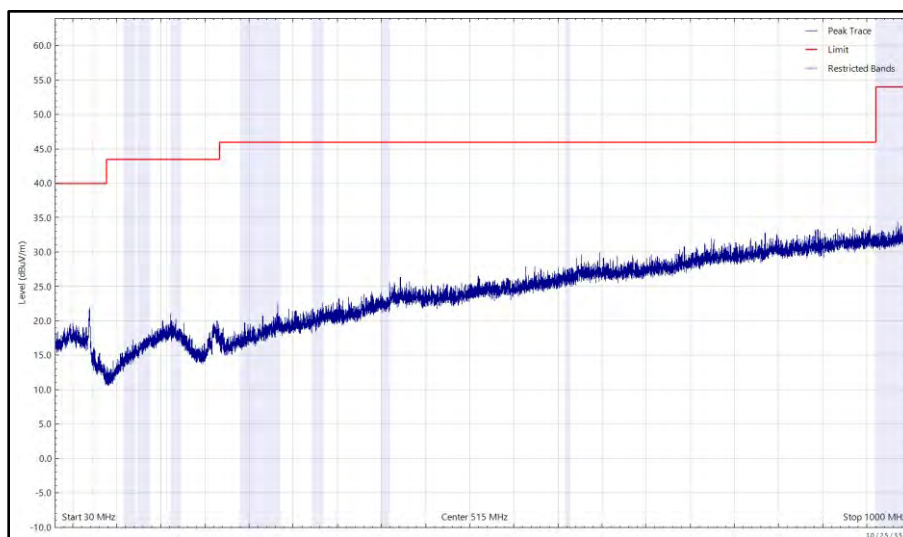


Figure 6 - 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1 and U-NII-2C 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

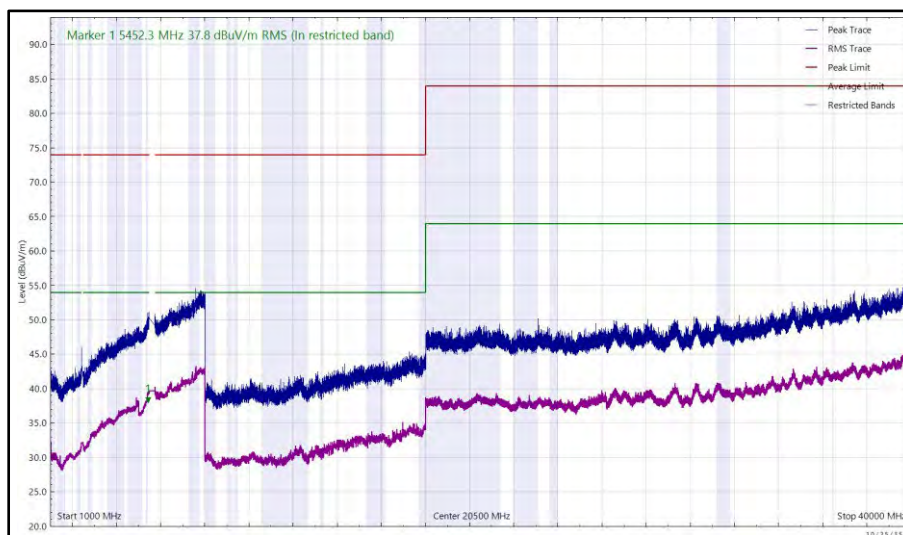


Figure 7 - 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1 and U-NII-2C 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

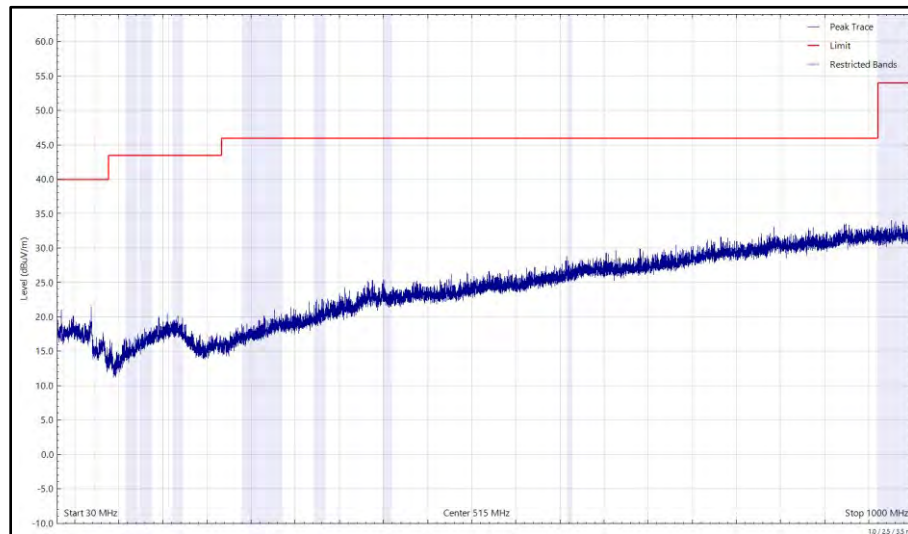


Figure 8 - 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1 and U-NII-2C 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

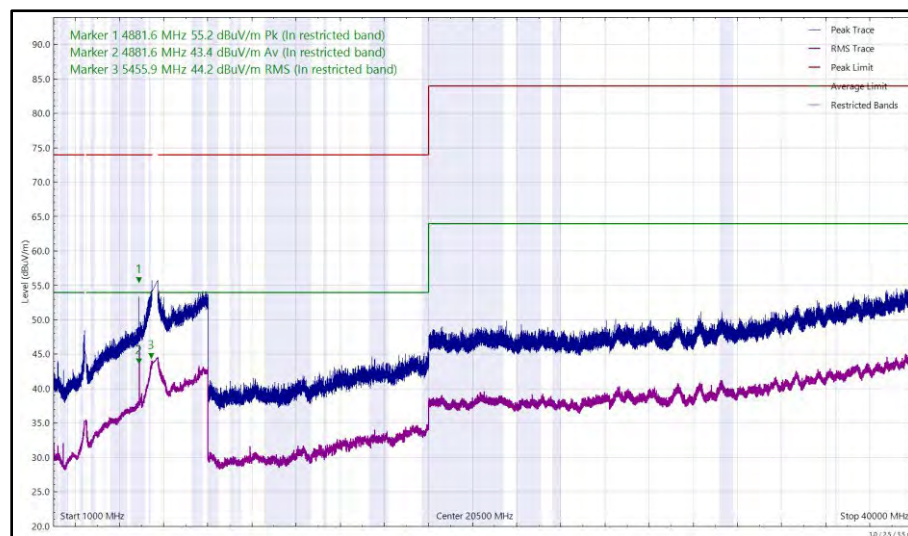


Figure 9 - 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1 and U-NII-2C 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
4882.133	43.50	54.00	-10.50	CISPR Avg	345	282	Vertical
4984.846	37.00	54.00	-17.00	RMS	246	205	Horizontal
5442.202	44.07	54.00	-9.93	RMS	320	269	Vertical
7579.341	42.21	54.00	-11.79	RMS	234	125	Horizontal
7583.285	42.22	54.00	-11.78	RMS	53	390	Vertical

Table 7 - 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1 and U-NII-3 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

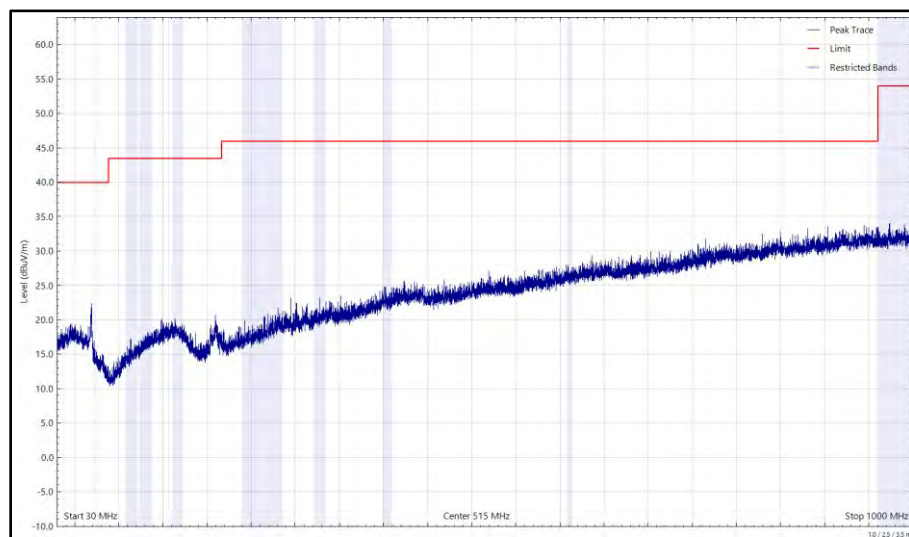


Figure 10 - 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1 and U-NII-3 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

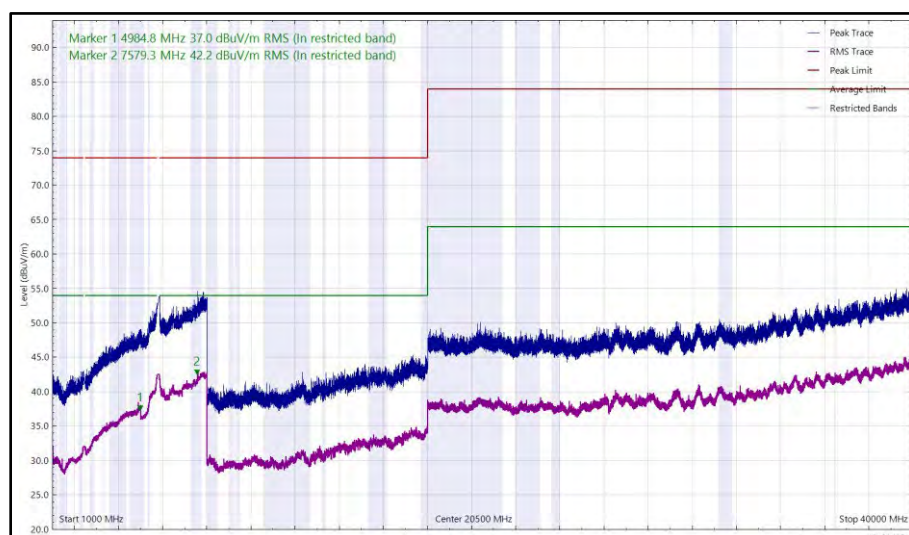


Figure 11 - 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1 and U-NII-3 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

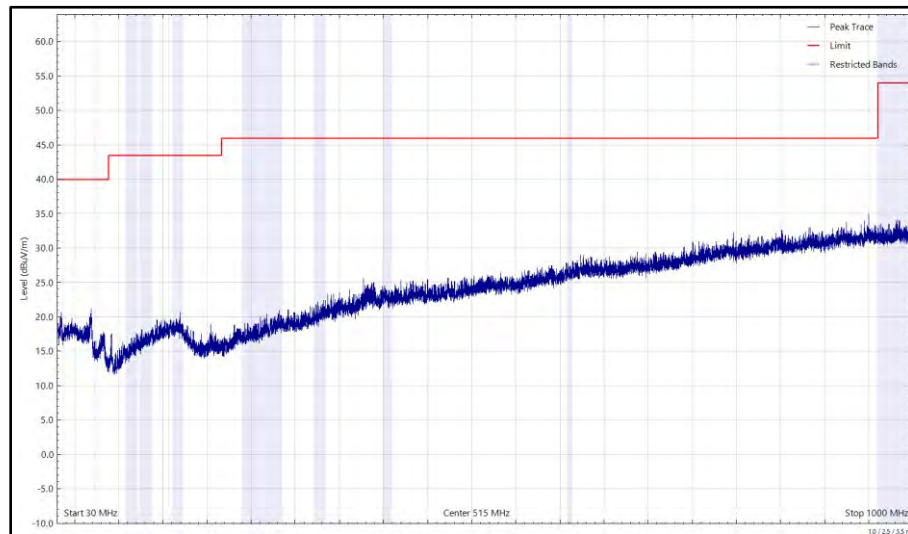


Figure 12 - 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1 and U-NII-3 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

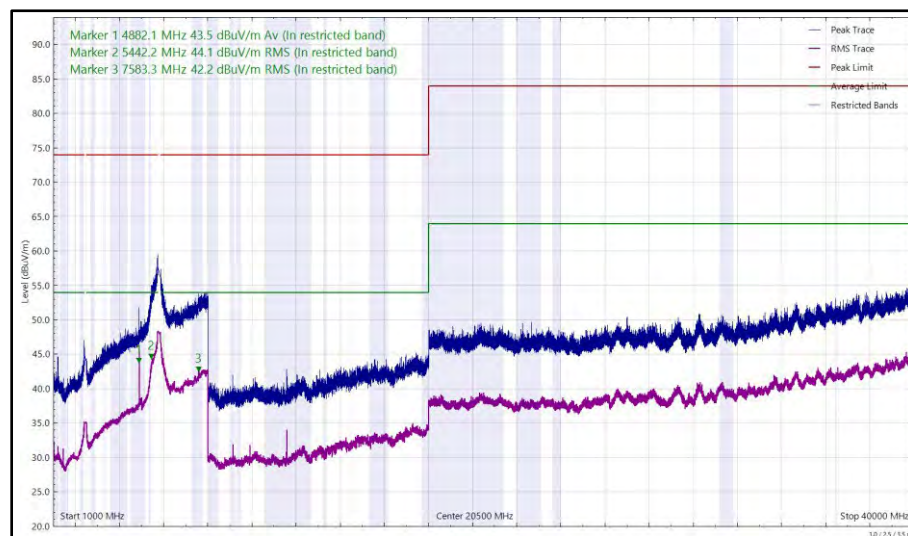


Figure 13 - 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1 and U-NII-3 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical



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

2.4 GHz Bluetooth and 6 GHz WLAN

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
4881.979	39.71	54.00	-14.29	Peak	336	300	Vertical
5899.290	63.07	74.00	-10.93	Peak	27	302	Vertical
7322.598	40.35	54.00	-13.65	Peak	48	255	Vertical
7323.656	39.34	54.00	-14.66	Peak	305	316	Vertical

Table 9 - 2441 MHz (CH39), 2-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.

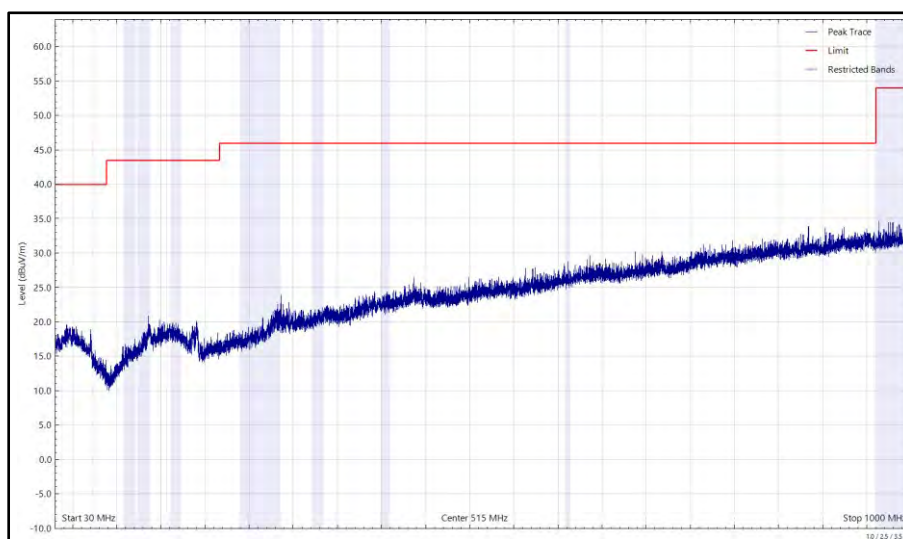


Figure 14 - 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1 and U-NII-5 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

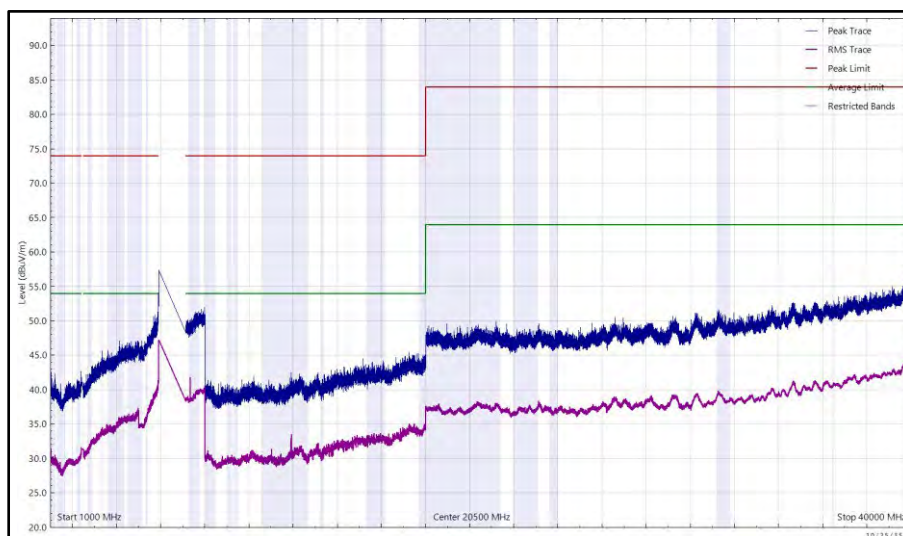


Figure 15 - 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1 and U-NII-5 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

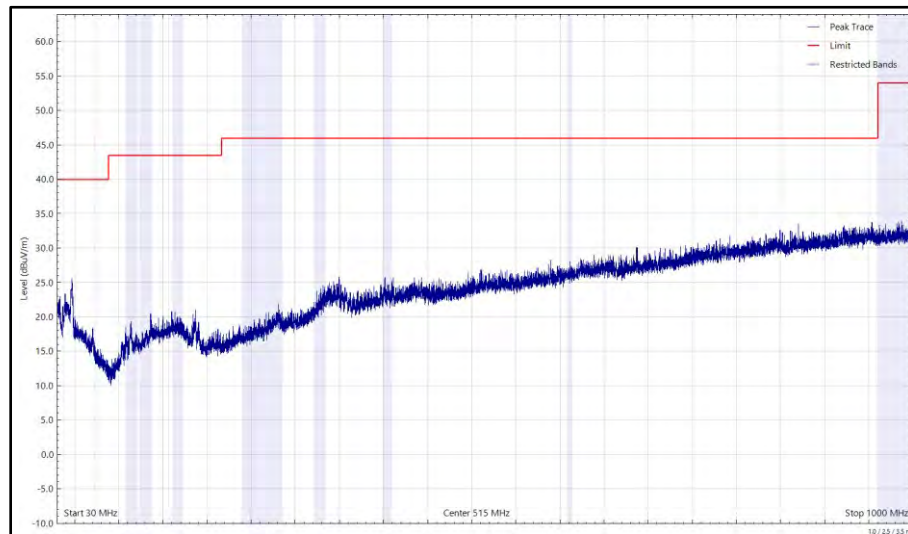


Figure 16 - 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1 and U-NII-5 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

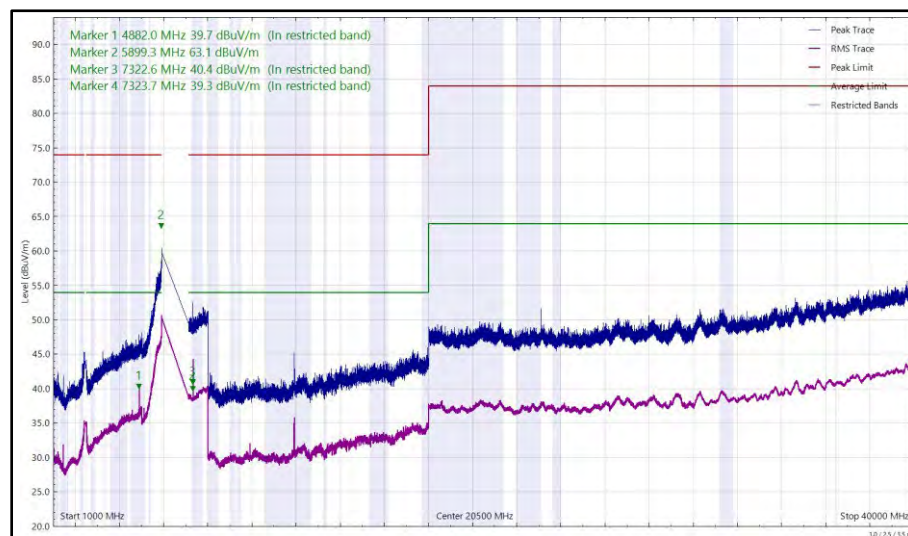


Figure 17 - 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1 and U-NII-5 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
7156.927	72.01	88.20	-16.19	Peak	305	260	Vertical

Table 10 - 2441 MHz (CH39), 2-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.

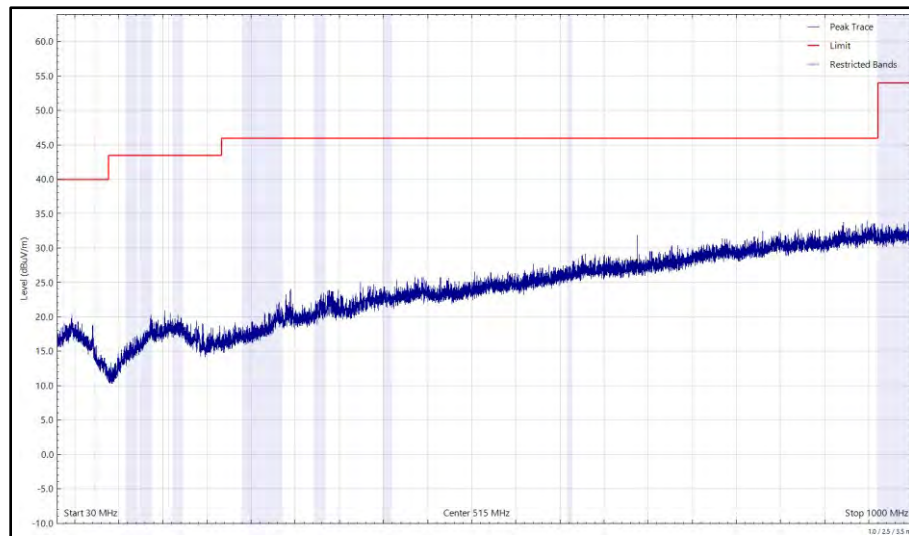


Figure 18 - 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1 and U-NII-8 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

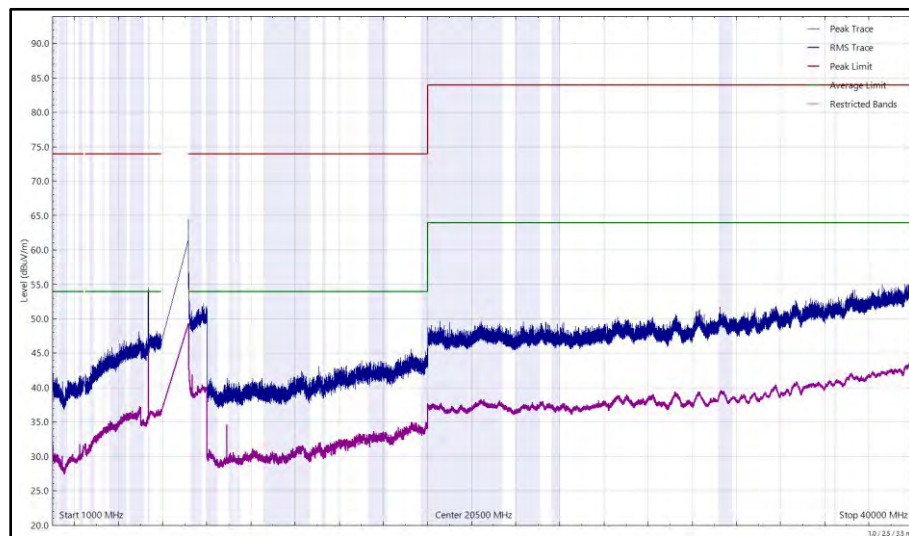


Figure 19 - 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1 and U-NII-8 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

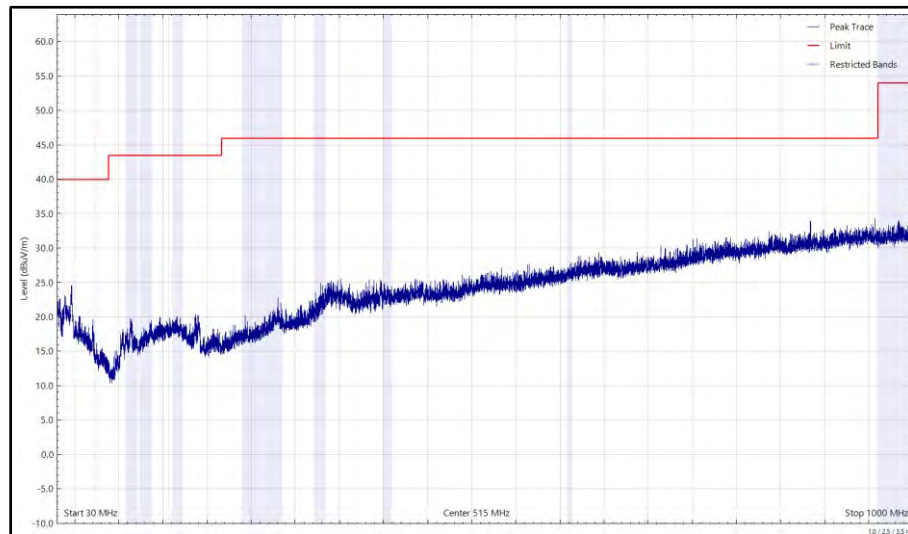


Figure 20 - 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1 and U-NII-8 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

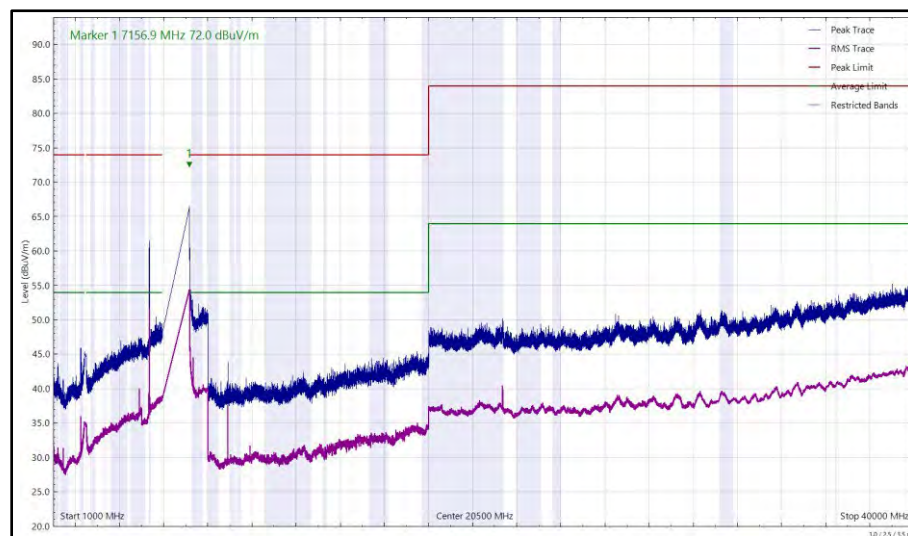


Figure 21 - 2441 MHz (CH39), 2-DH5, ePA, Core 0 + Core 1 and U-NII-8 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical



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 4.7.2	Peak: -7 dBm/MHz e.i.r.p, Average: -27 dBm/MHz e.i.r.p.
Part 15.209 / RSS-GEN Clause 8.9	Peak: 74 dBμV/m at 3m, Average 54 dBμV/m at 3m (Restricted bands > 1 GHz)

Table 11

2.4 GHz WLAN and Narrowband

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation	Orientation
2386.512	38.42	54.00	-15.58	Peak	329	367	Vertical	rms
2485.177	36.99	54.00	-17.01	Peak	304	329	Horizontal	rms
2486.529	40.67	54.00	-13.33	Peak	325	385	Vertical	rms
2489.997	56.74	74.00	-17.26	Peak	329	383	Vertical	pk

Table 12 - 2442 MHz (CH7), HT20, Core 0 and 5204 MHz, HDR8, ePA, Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

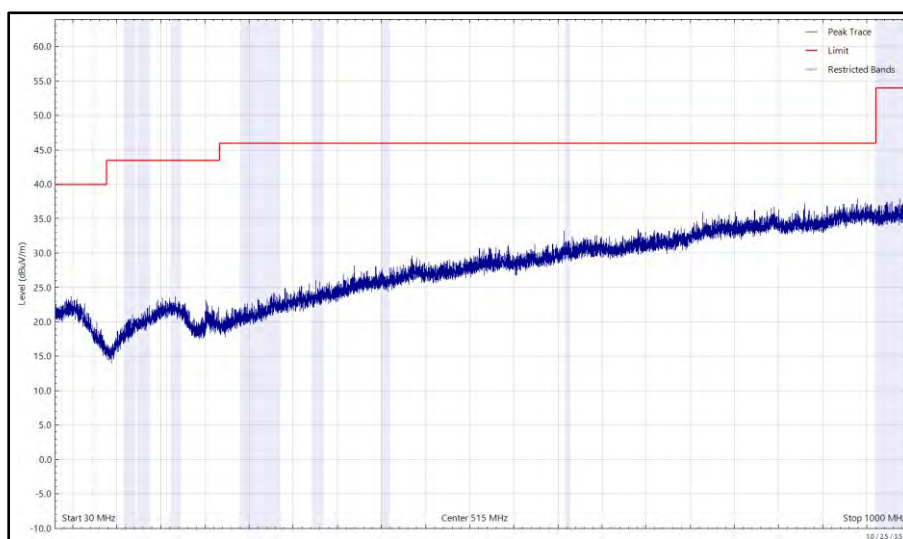


Figure 22 - 2442 MHz (CH7), HT20, Core 0 and 5204 MHz, HDR8, ePA, Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

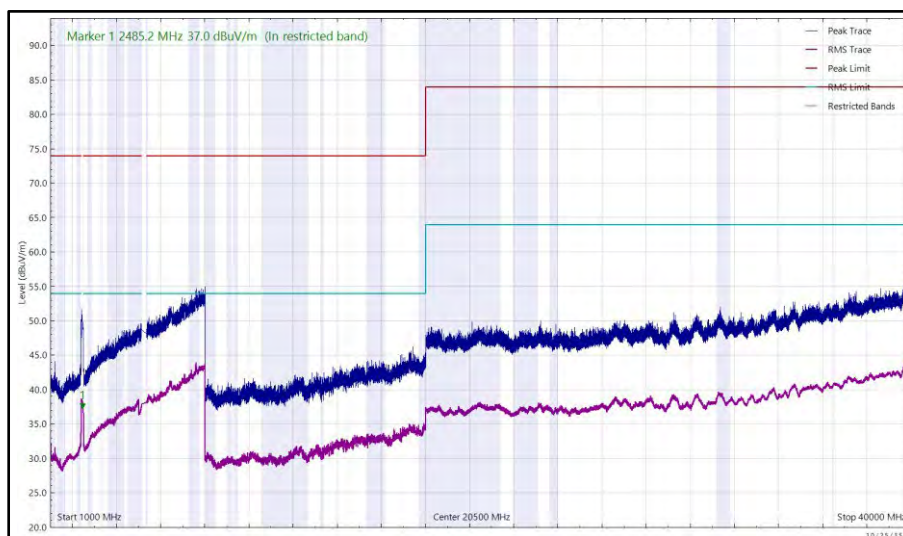


Figure 23 - 2442 MHz (CH7), HT20, Core 0 and 5204 MHz, HDR8, ePA, Core 1, 1 GHz to 40 GHz, Horizontal

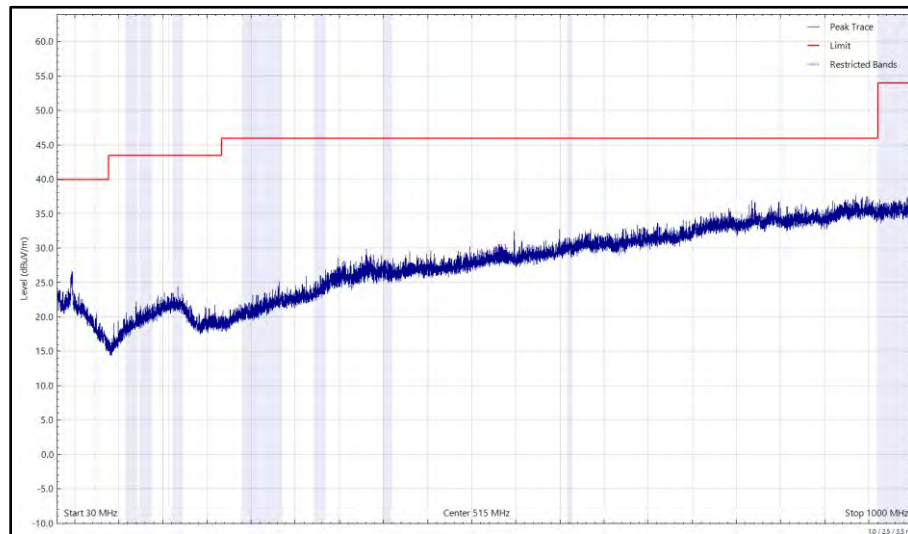


Figure 24 - 2442 MHz (CH7), HT20, Core 0 and 5204 MHz, HDR8, ePA, Core 1, 30 MHz to 1 GHz, Vertical (Peak)

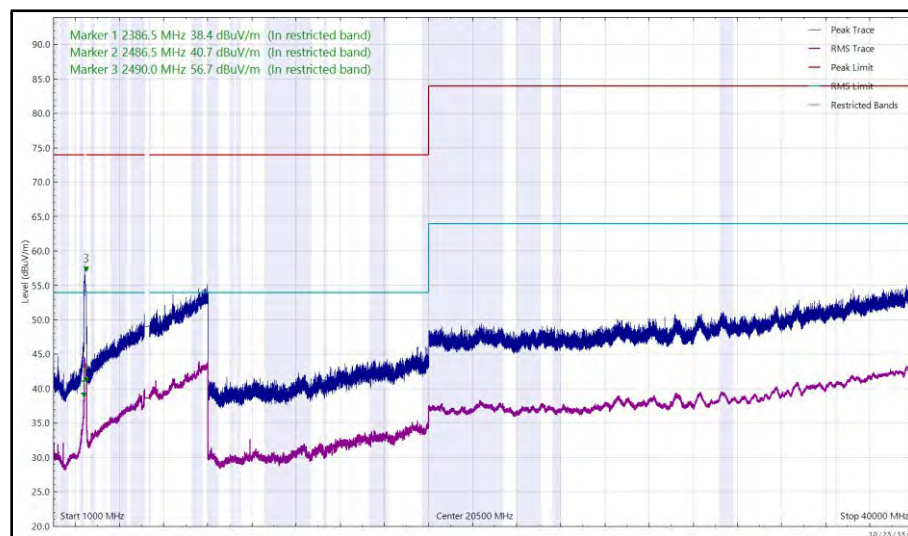


Figure 25 - 2442 MHz (CH7), HT20, Core 0 and 5204 MHz, HDR8, ePA, Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation	Orientation
2385.973	39.40	54.00	-14.60	Peak	338	329	Vertical	rms
2385.973	56.56	74.00	-17.44	Peak	338	329	Vertical	pk
2485.381	36.73	54.00	-17.27	Peak	300	247	Horizontal	rms
2488.468	57.19	74.00	-16.81	Peak	328	331	Vertical	pk
2488.468	40.11	54.00	-13.89	Peak	328	331	Vertical	rms
5374.531	41.07	54.00	-12.93	Peak	30	360	Vertical	rms
5377.146	36.88	54.00	-17.12	Peak	209	389	Horizontal	rms
7582.151	42.19	54.00	-11.81	Peak	242	260	Vertical	rms
11576.030	36.91	54.00	-17.09	Peak	162	203	Vertical	rms

Table 13 - 2442 MHz (CH7), HT20, Core 0 and 5788 MHz, HDR4, ePA, Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

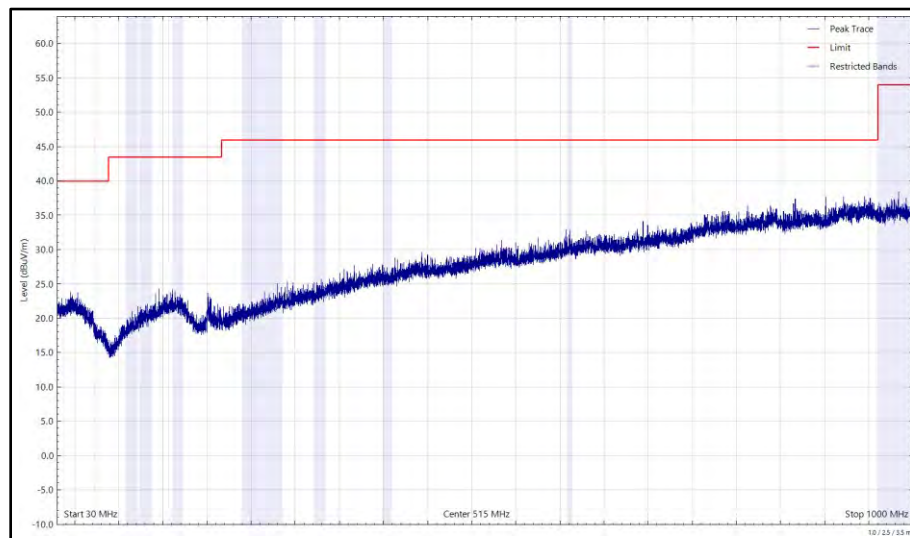


Figure 26 - 2442 MHz (CH7), HT20, Core 0 and 5788 MHz, HDR4, ePA, Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

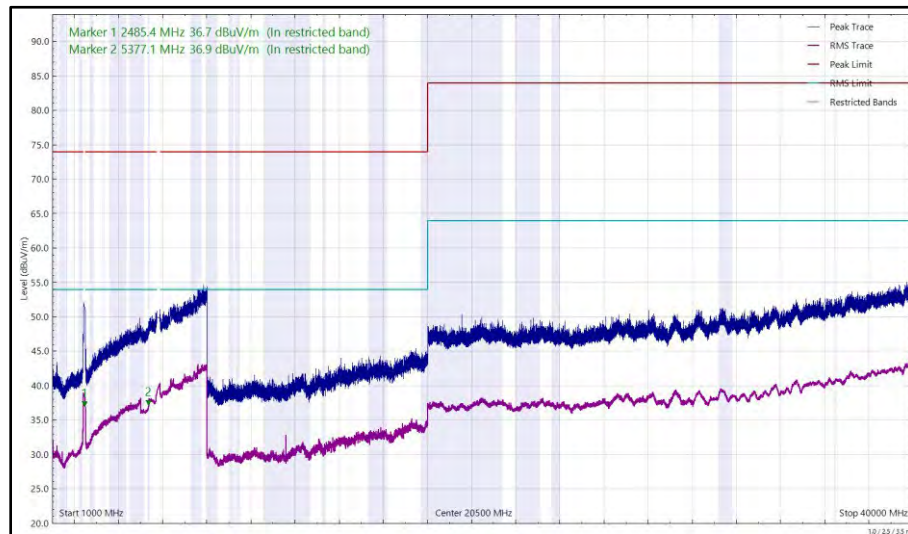


Figure 27 - 2442 MHz (CH7), HT20, Core 0 and 5788 MHz, HDR4, ePA, Core 1, 1 GHz to 40 GHz, Horizontal

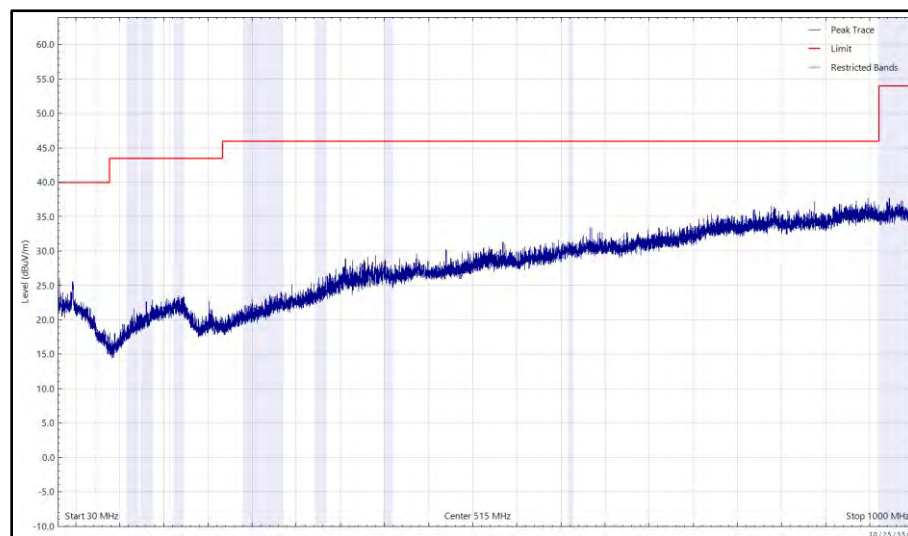


Figure 28 - 2442 MHz (CH7), HT20, Core 0 and 5788 MHz, HDR4, ePA, Core 1, 30 MHz to 1 GHz, Vertical (Peak)

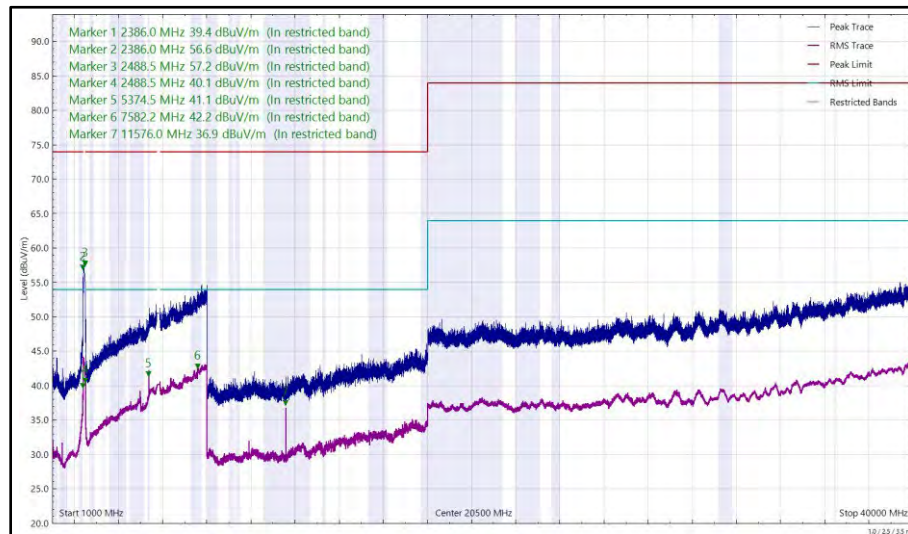


Figure 29 - 2442 MHz (CH7), HT20, Core 0 and 5788 MHz, HDR4, ePA, Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation	Orientation
2489.493	35.10	54.00	-18.90	Peak	44	380	Horizontal	rms
4882.020	56.38	74.00	-17.62	Peak	328	301	Vertical	pk
4882.020	42.35	54.00	-11.65	Peak	328	301	Vertical	rms
5043.834	37.41	54.00	-16.59	Peak	317	388	Vertical	rms
5048.285	35.99	54.00	-18.01	Peak	233	100	Horizontal	rms
7585.849	42.77	54.00	-11.23	Peak	185	214	Vertical	rms
7585.849	55.08	74.00	-18.92	Peak	185	214	Vertical	pk
7591.843	55.02	74.00	-18.98	Peak	252	322	Horizontal	pk
7591.843	42.48	54.00	-11.52	Peak	252	322	Horizontal	rms

Table 14 - 2442 MHz (CH7), HT20, Core 1 and 5204 MHz, HDR8, ePA, Core 0, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

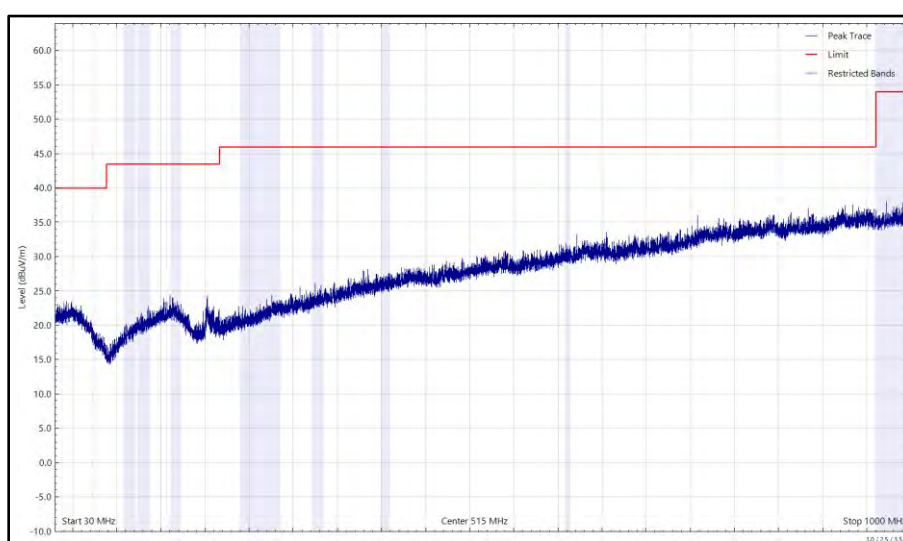


Figure 30 - 2442 MHz (CH7), HT20, Core 1 and 5204 MHz, HDR8, ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)

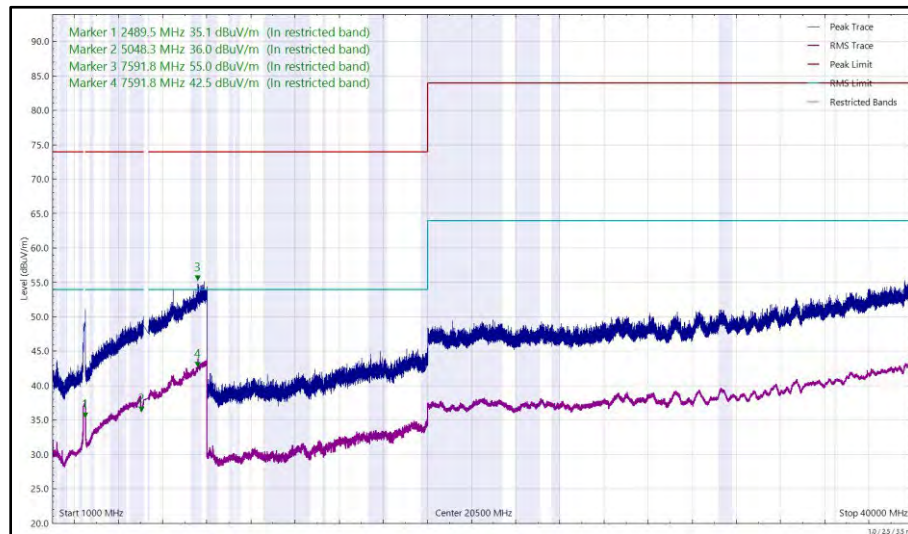


Figure 31 - 2442 MHz (CH7), HT20, Core 1 and 5204 MHz, HDR8, ePA, Core 0, 1 GHz to 40 GHz, Horizontal

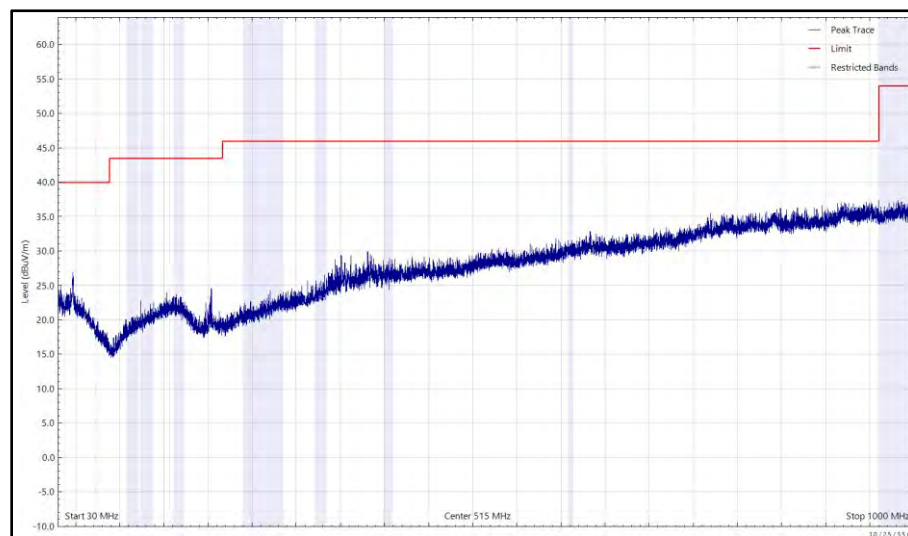
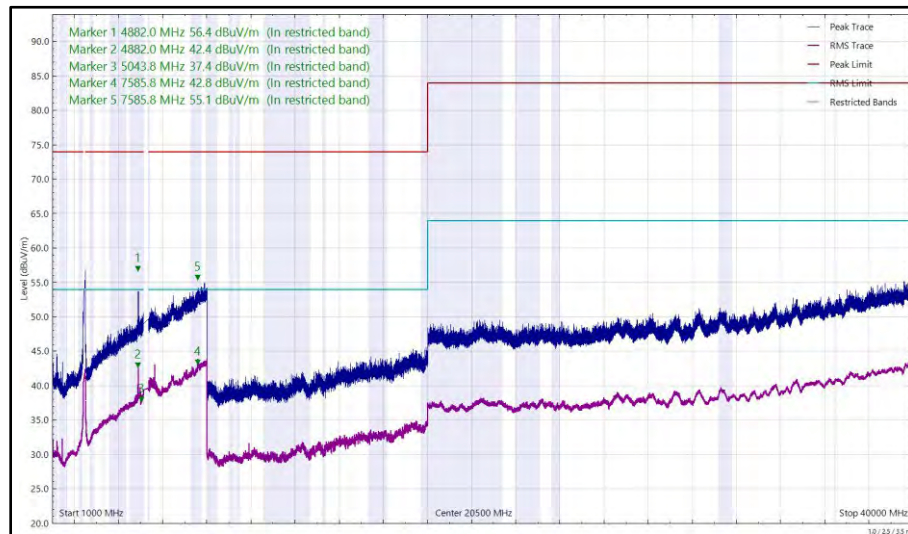


Figure 32 - 2442 MHz (CH7), HT20, Core 1 and 5204 MHz, HDR8, ePA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)



**Figure 33 - 2442 MHz (CH7), HT20, Core 1 and 5204 MHz, HDR8, ePA, Core 0,
1 GHz to 40 GHz, Vertical**



Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation	Orientation
2385.009	35.40	54.00	-18.60	Peak	326	392	Vertical	rms
2483.648	58.66	74.00	-15.34	Peak	38	382	Vertical	pk
2483.648	41.03	54.00	-12.97	Peak	38	382	Vertical	rms
2483.796	38.29	54.00	-15.71	Peak	54	339	Horizontal	rms
2483.796	55.80	74.00	-18.20	Peak	54	339	Horizontal	pk
4883.076	39.22	54.00	-14.78	Peak	337	254	Vertical	rms
5374.303	38.18	54.00	-15.82	Peak	83	392	Horizontal	rms
5374.934	43.24	54.00	-10.76	Peak	315	287	Vertical	rms
7583.074	42.18	54.00	-11.82	Peak	329	154	Vertical	rms
7583.074	54.35	74.00	-19.65	Peak	329	154	Vertical	pk
7587.437	42.10	54.00	-11.90	Peak	240	116	Horizontal	rms

Table 15 - 2442 MHz (CH7), HT20, Core 1 and 5788 MHz, HDR4, ePA, Core 0, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

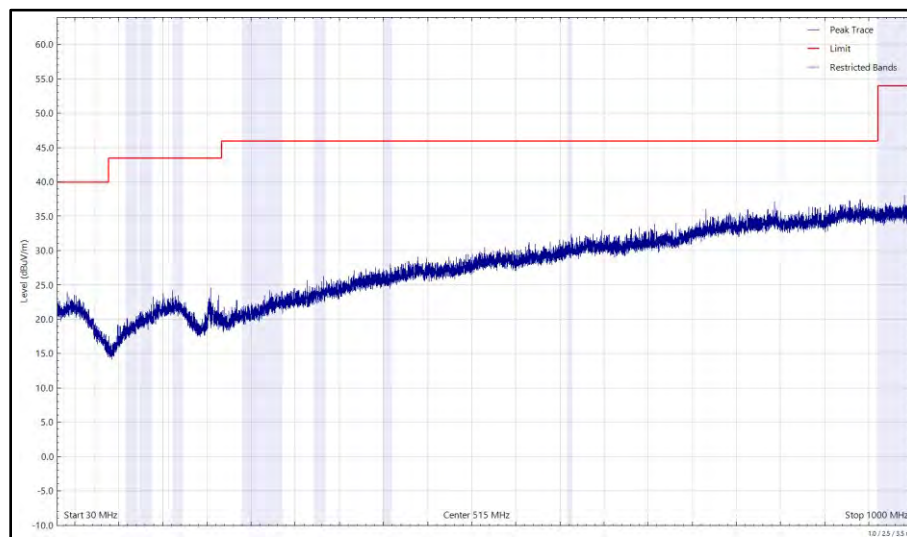


Figure 34 - 2442 MHz (CH7), HT20, Core 1 and 5788 MHz, HDR4, ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)

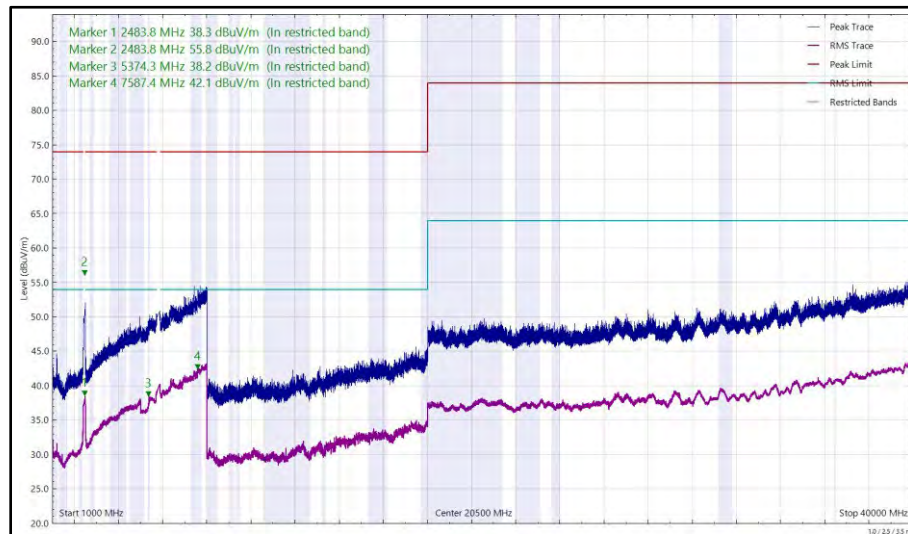


Figure 35 - 2442 MHz (CH7), HT20, Core 1 and 5788 MHz, HDR4, ePA, Core 0, 1 GHz to 40 GHz, Horizontal

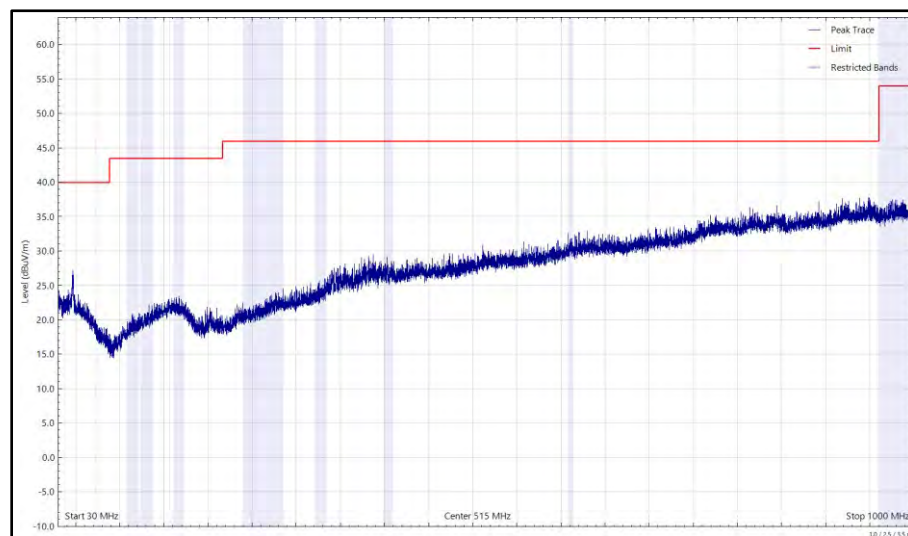


Figure 36 - 2442 MHz (CH7), HT20, Core 1 and 5788 MHz, HDR4, ePA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)

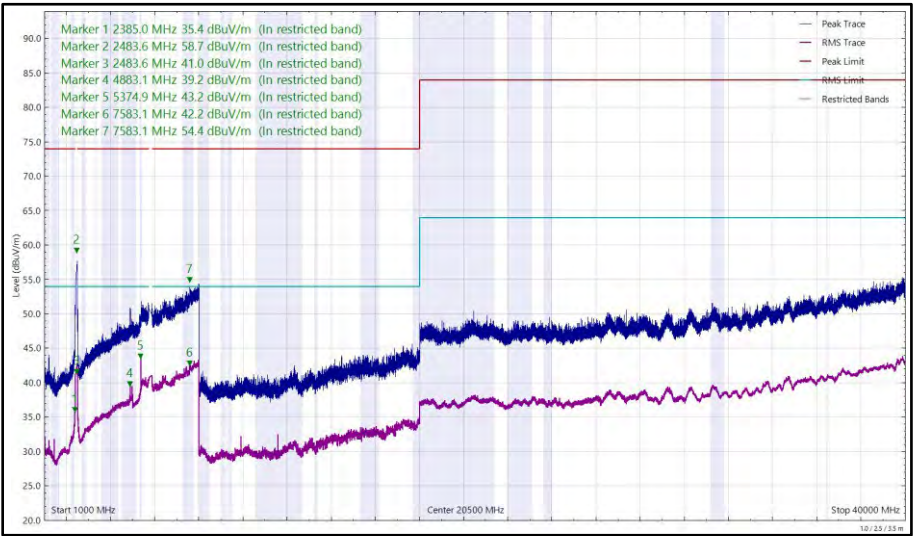


Figure 37 - 2442 MHz (CH7), HT20, Core 1 and 5788 MHz, HDR4, ePA, Core 0, 1 GHz to 40 GHz, Vertical

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 4.6.1.2	-27 dBm/MHz e.i.r.p.
Part 15.209 / RSS-GEN Clause 8.9	Peak: 74 dBμV/m at 3m, Average 54 dBμV/m at 3m (Restricted bands > 1 GHz)

Table 16

Thread and 5 GHz WLAN

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
2356.364	61.81	74.00	-12.19	Peak	243	390	Vertical
2365.655	58.69	74.00	-15.31	Peak	166	164	Horizontal
2379.874	44.47	74.00	-29.53	Peak	243	242	Vertical
2483.544	66.07	74.00	-7.93	Peak	322	399	Vertical
4878.925	47.65	54.00	-6.35	RMS	355	300	Vertical

Table 17 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

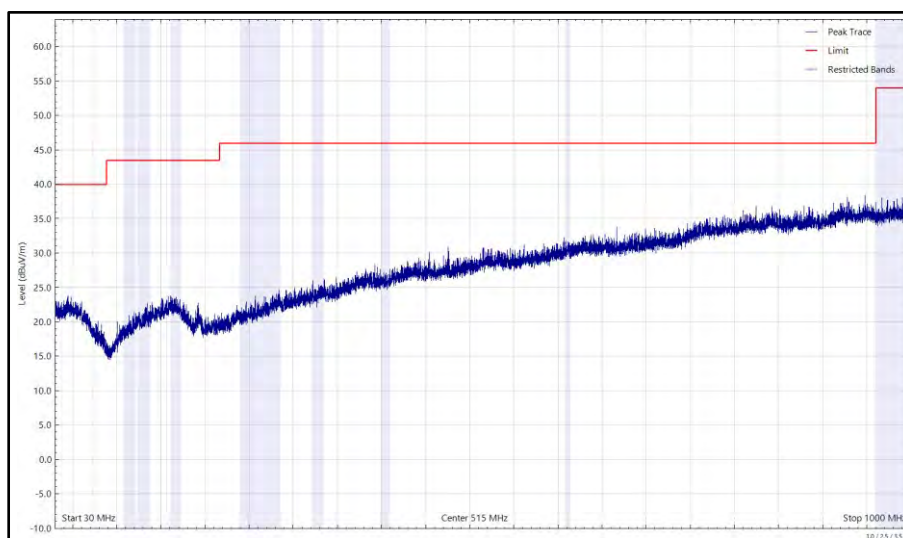


Figure 38 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

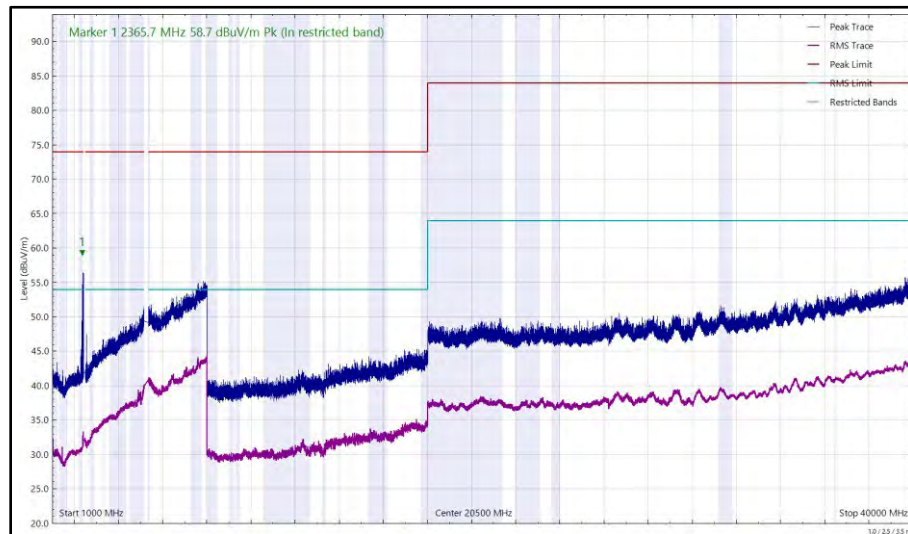


Figure 39 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

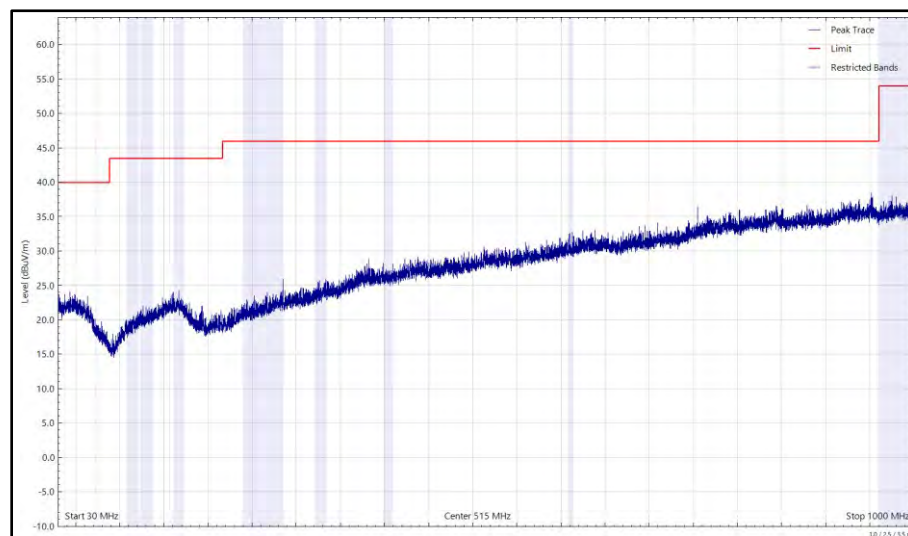


Figure 40 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

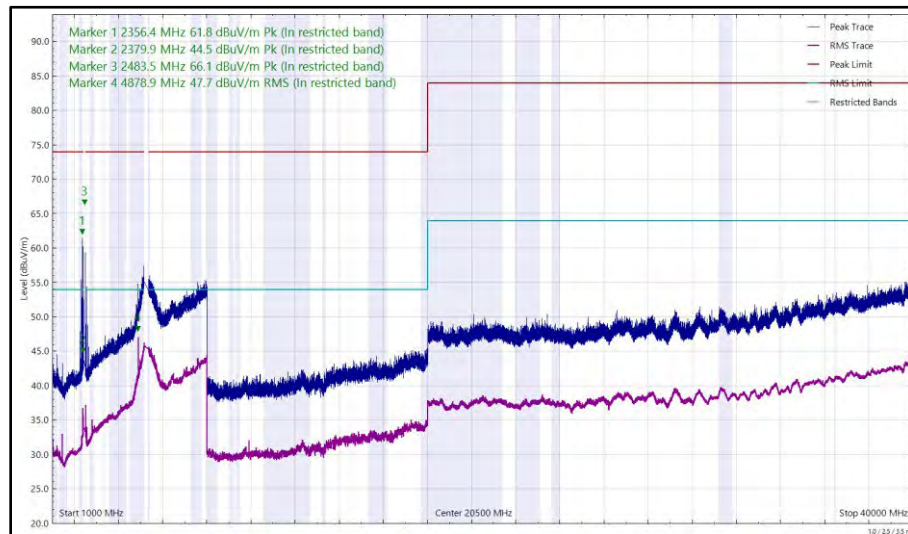


Figure 41 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
2394.092	63.40	74.00	-10.60	Peak	353	387	Vertical

Table 18 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

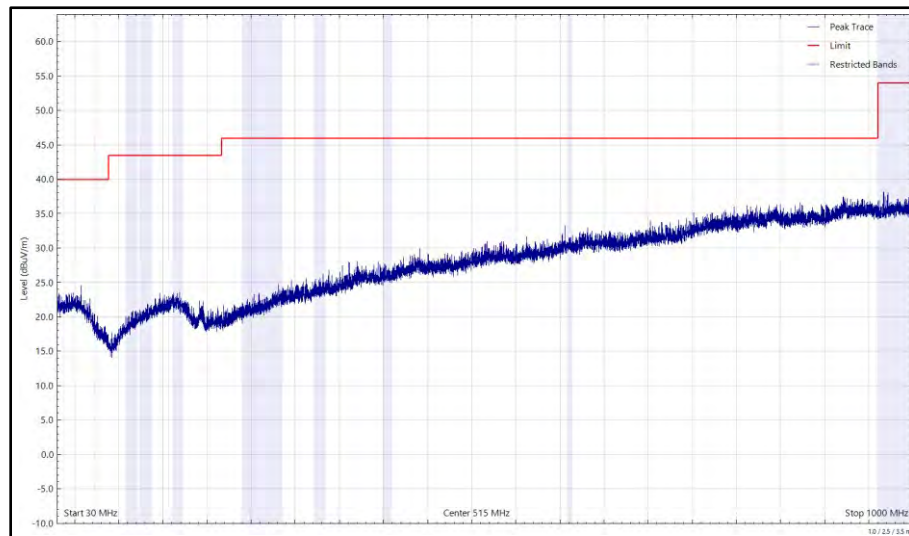


Figure 42 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

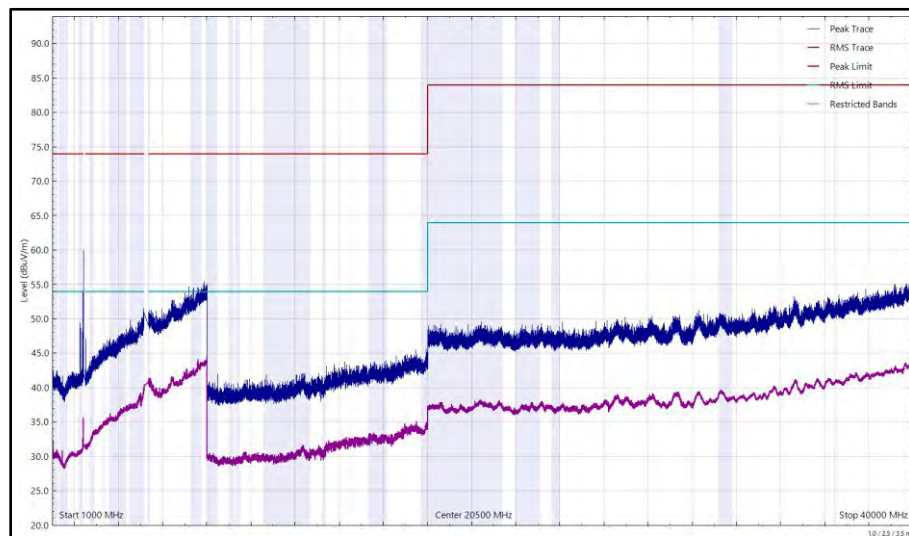


Figure 43 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

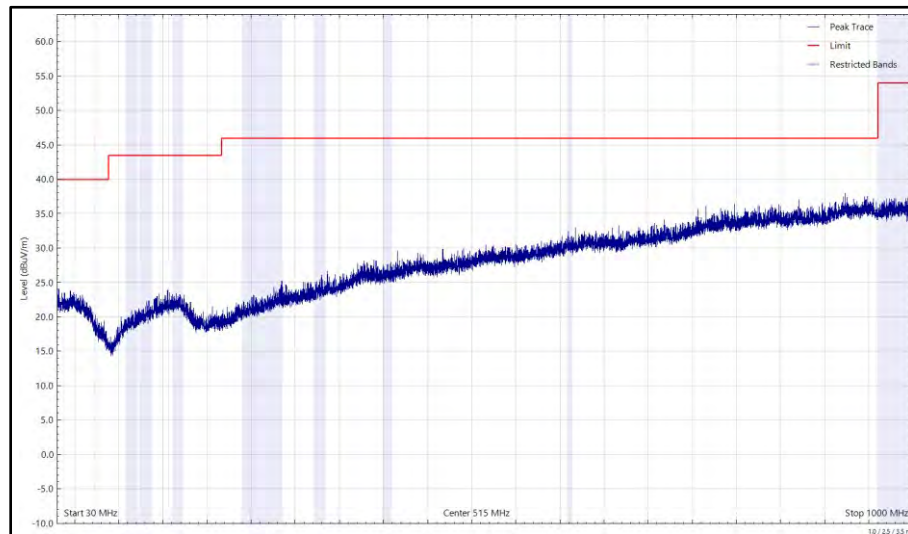


Figure 44 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

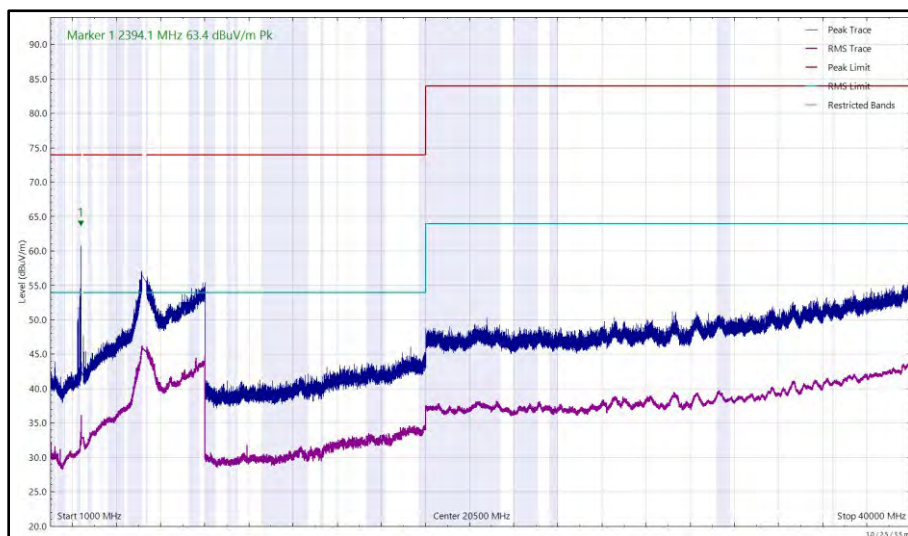


Figure 45 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-1 - 5240 MHz (CH48), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
2380.931	58.33	74.00	-15.67	Peak	182	271	Horizontal
2382.050	33.63	54.00	-20.37	RMS	207	389	Vertical
2383.910	64.26	74.00	-9.74	Peak	207	389	Vertical
4879.035	46.43	54.00	-7.57	RMS	231	284	Vertical
5457.689	45.22	54.00	-8.78	RMS	265	260	Vertical

Table 19 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

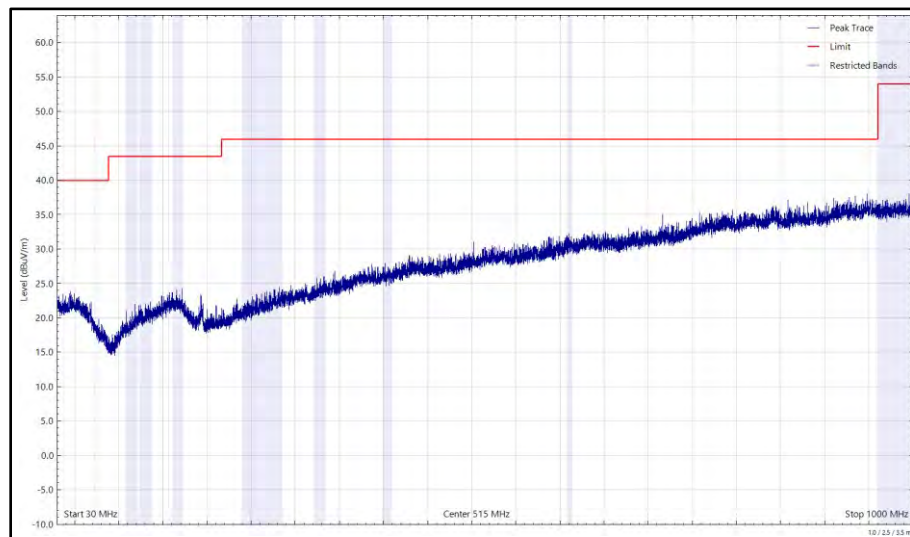


Figure 46 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

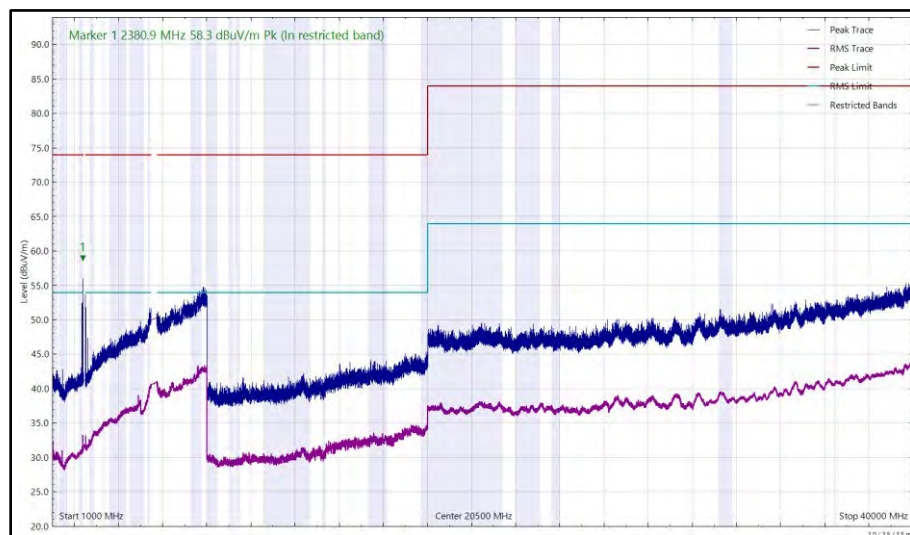


Figure 47 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

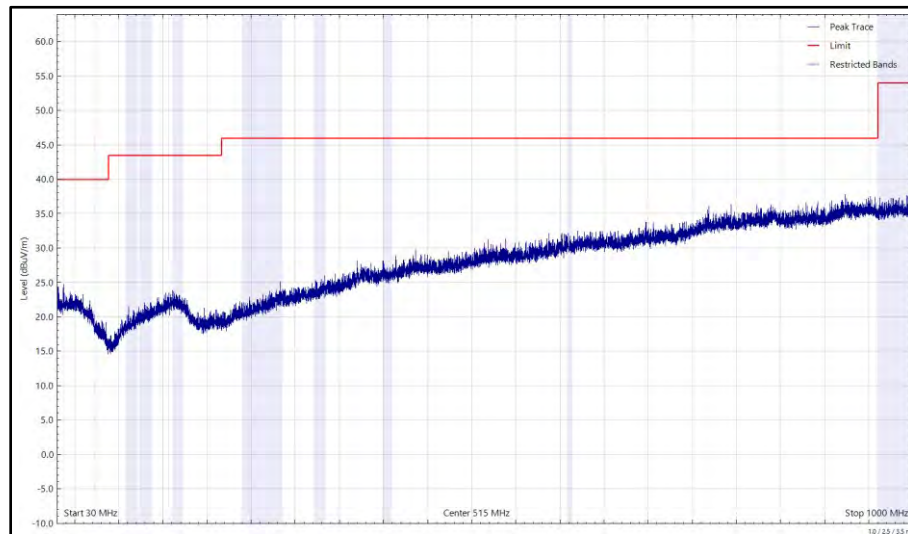


Figure 48 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

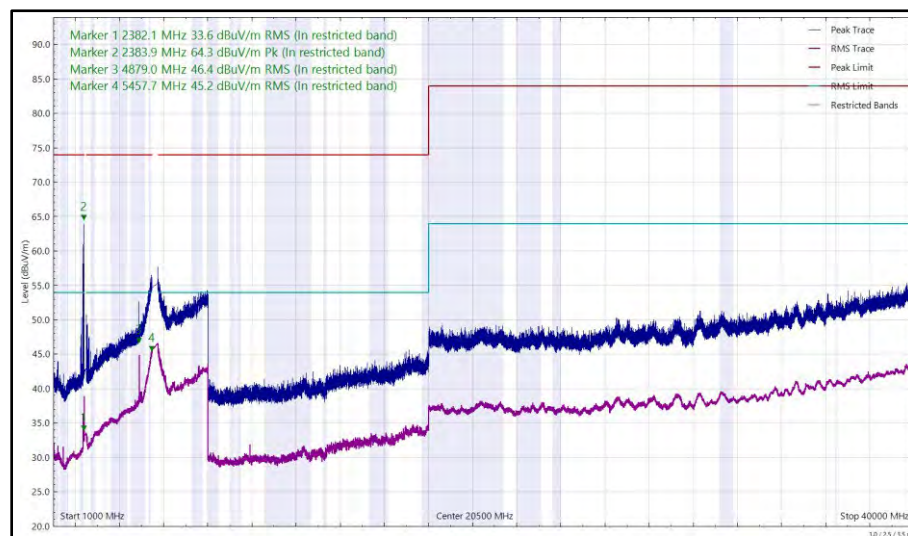


Figure 49 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
2487.844	53.98	74.00	-20.02	Peak	108	430	Horizontal
5452.460	46.25	54.00	-7.75	RMS	197	266	Vertical

Table 20 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

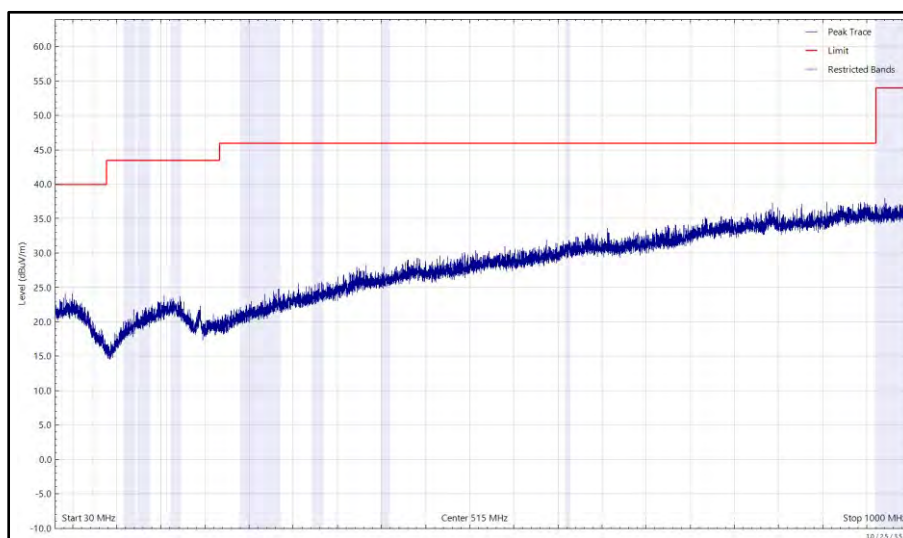


Figure 50 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

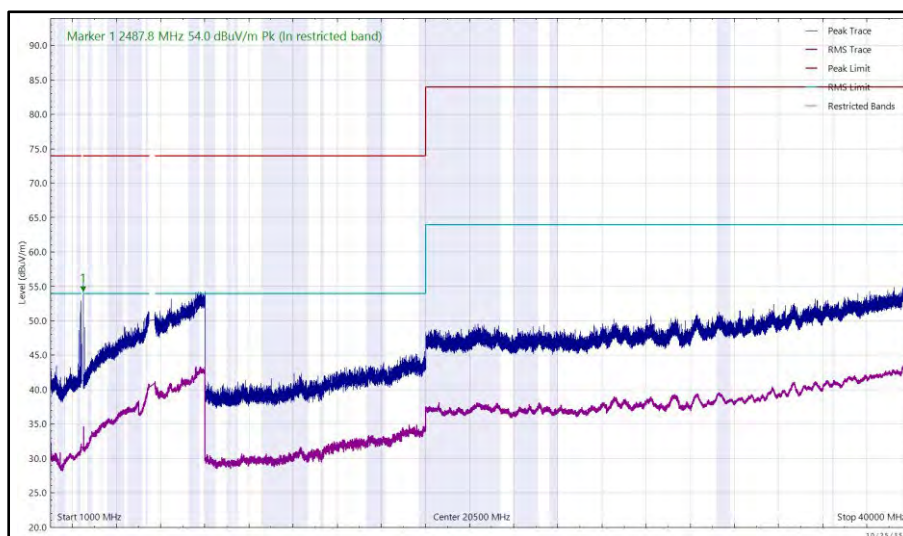


Figure 51 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

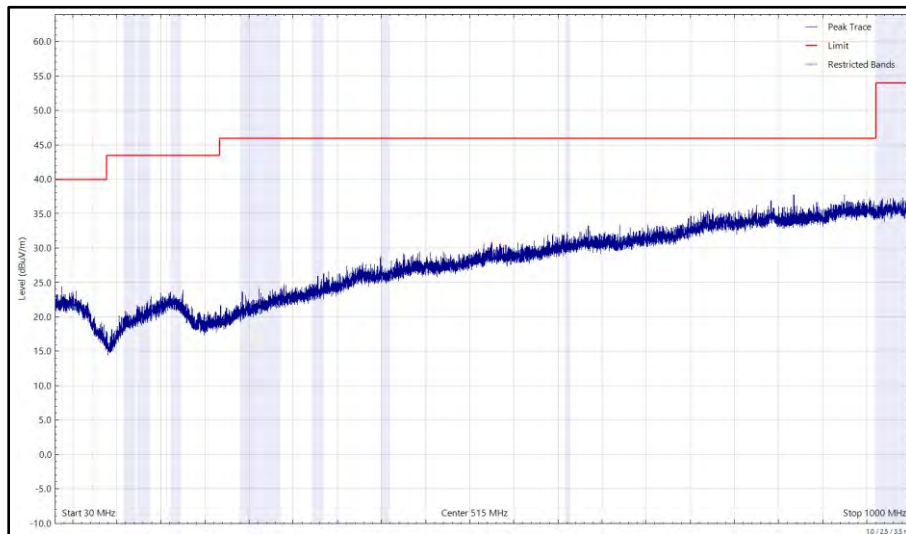


Figure 52 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

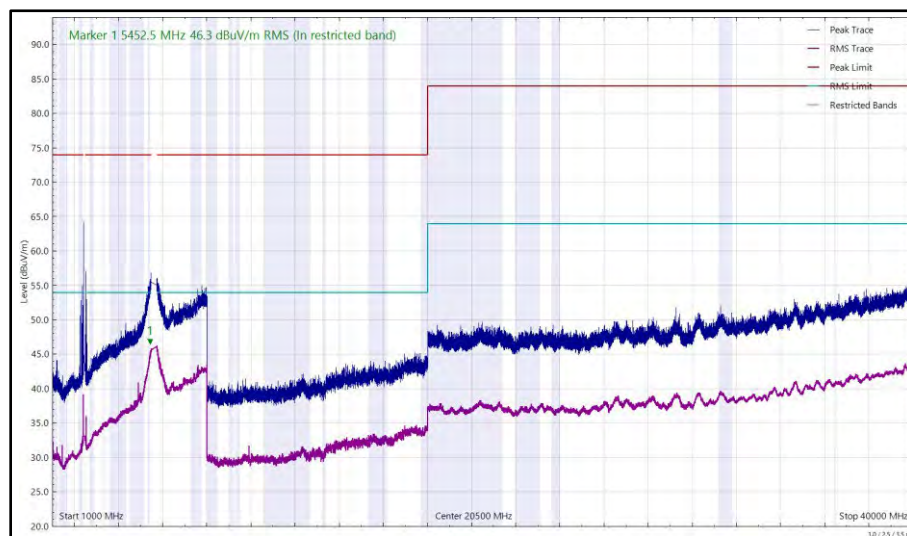


Figure 53 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-2C - 5640 MHz (CH128), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
2337.785	62.45	74.00	-11.55	Peak	241	400	Vertical
2487.550	65.58	74.00	-8.42	Peak	200	259	Vertical
4878.989	46.60	54.00	-7.40	RMS	231	280	Vertical
5458.779	44.44	54.00	-9.56	RMS	195	279	Vertical

Table 21 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

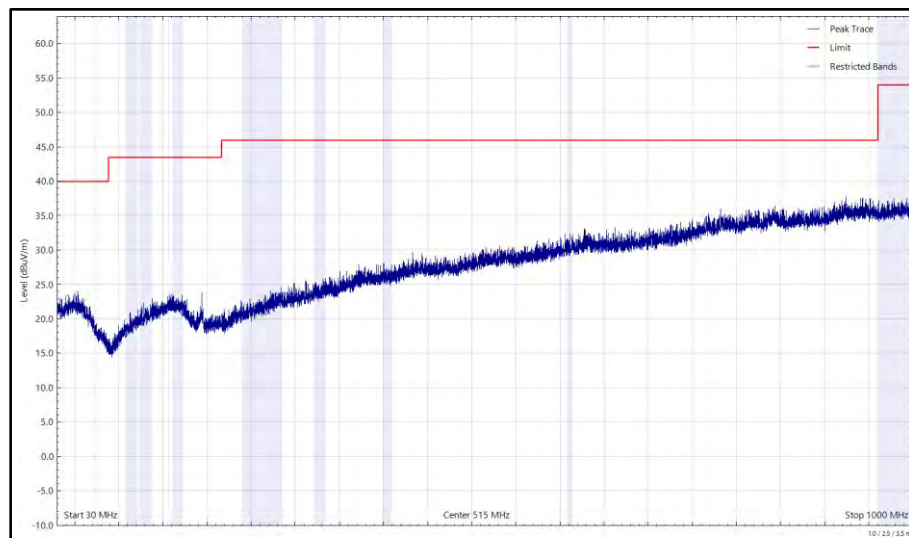


Figure 54 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

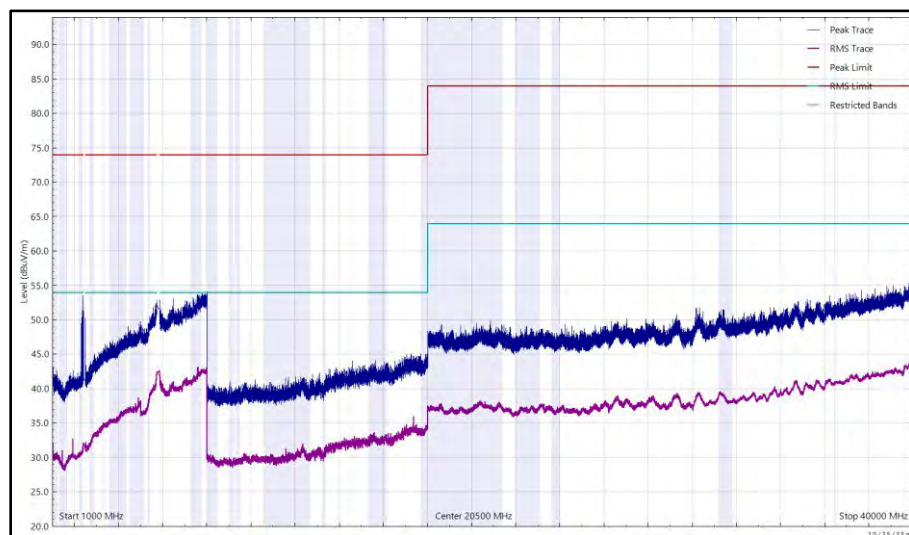


Figure 55 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

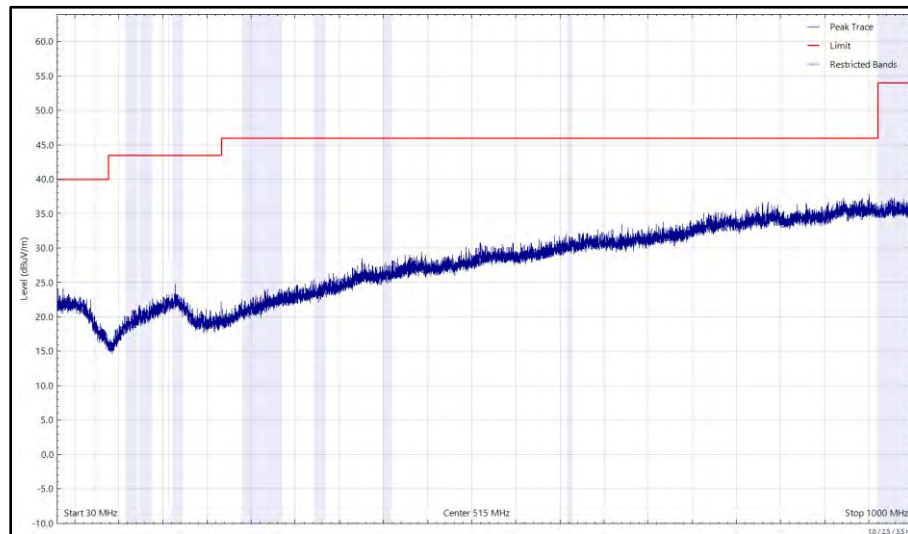


Figure 56 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

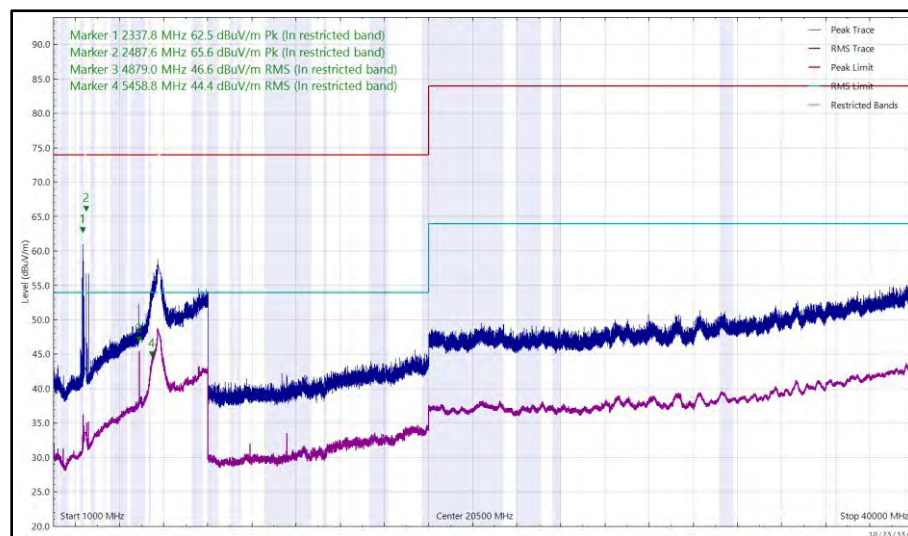


Figure 57 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
2345.811	62.24	74.00	-11.76	Peak	242	272	Vertical
2365.590	58.27	74.00	-15.73	Peak	181	293	Horizontal
2485.590	65.67	74.00	-8.33	Peak	202	317	Vertical
2488.137	32.28	54.00	-21.72	RMS	246	341	Vertical
4879.096	46.40	54.00	-7.60	RMS	229	298	Vertical
5454.332	43.91	54.00	-10.09	RMS	262	278	Vertical

Table 22 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 10 dB of the limit.

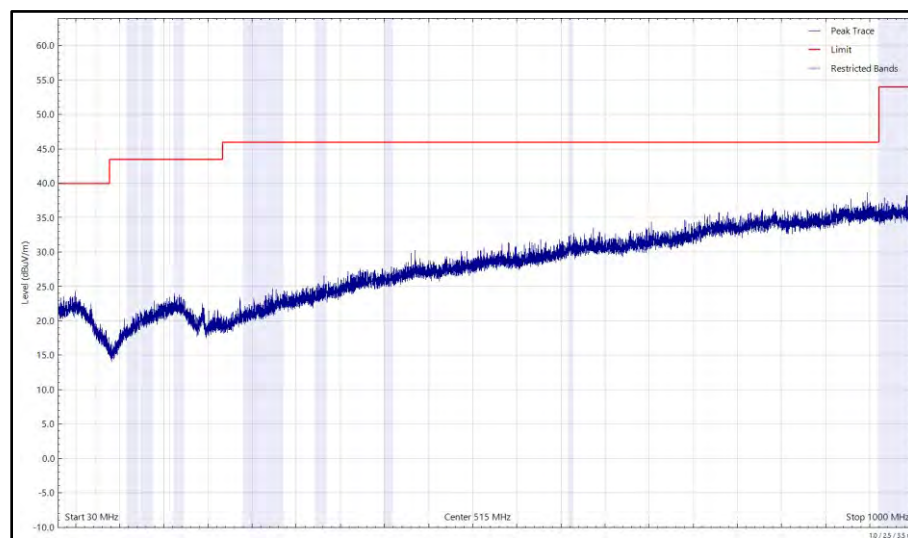


Figure 58 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

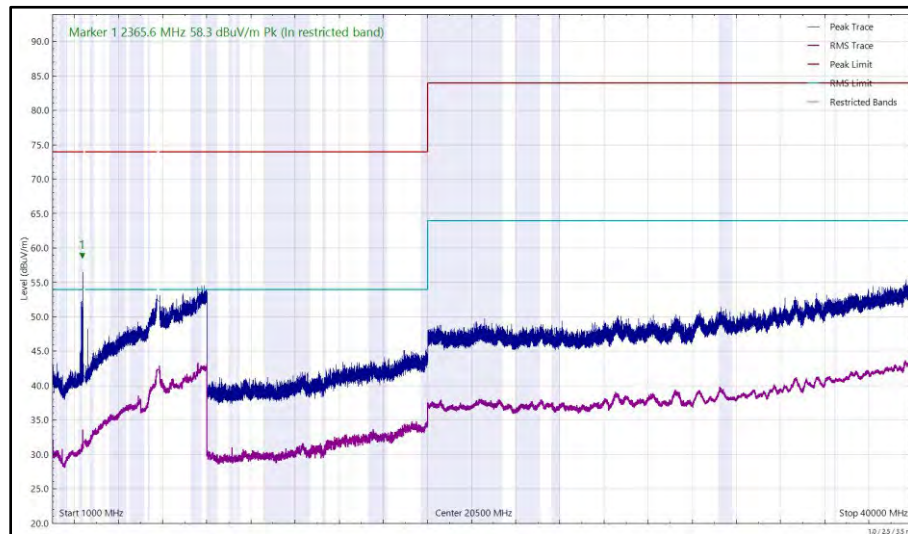


Figure 59 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

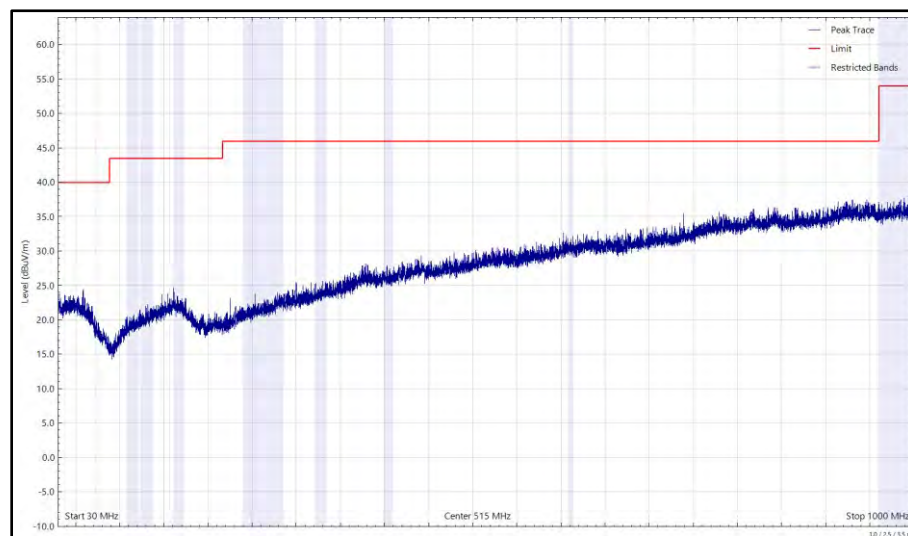


Figure 60 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

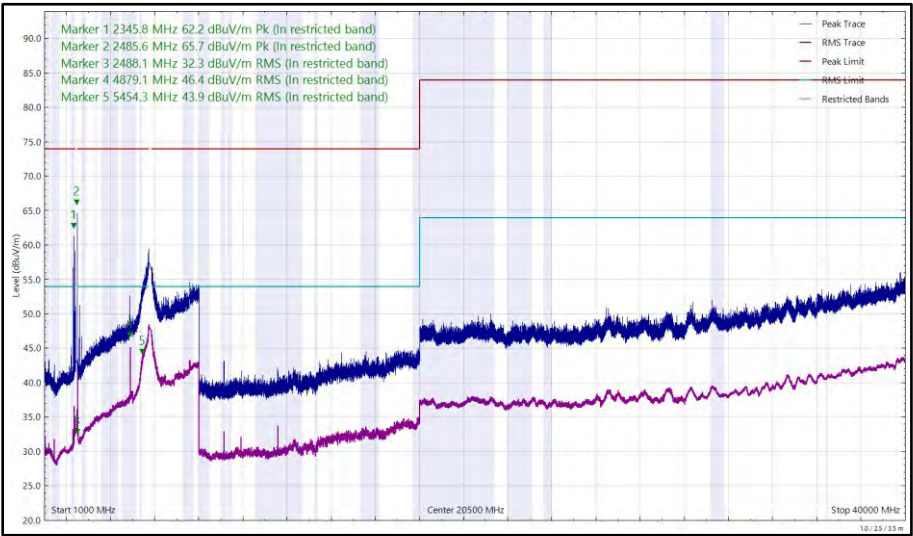


Figure 61 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-3 - 5785 MHz (CH157), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

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

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

The least stringent applicable limit was:

Clause	Limit
Part 15 247 (d) / RSS-247 Clause 5.5	-20 dBc
Part 15.407 (b) / RSS-247 Clause 6.2	-27 dBm e.i.r.p
Part 15.209 / RSS-GEN Clause 8.9	Peak: 74 dBμV/m at 3m, Average 54 dBμV/m at 3m (Restricted bands > 1 GHz)

Table 23

Thread and 6 GHz WLAN

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
2364.852	63.58	74.00	-10.42	Peak	207	255	Vertical
2383.011	61.32	74.00	-12.68	Peak	173	289	Horizontal
4878.954	38.73	54.00	-15.27	RMS	229	292	Vertical
7318.454	43.26	54.00	-10.74	RMS	197	251	Vertical
7321.485	39.35	54.00	-14.65	RMS	125	425	Horizontal
11909.410	35.52	54.00	-18.48	RMS	36	230	Vertical

Table 24 - 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 other emissions found within 10 dB of the limit.

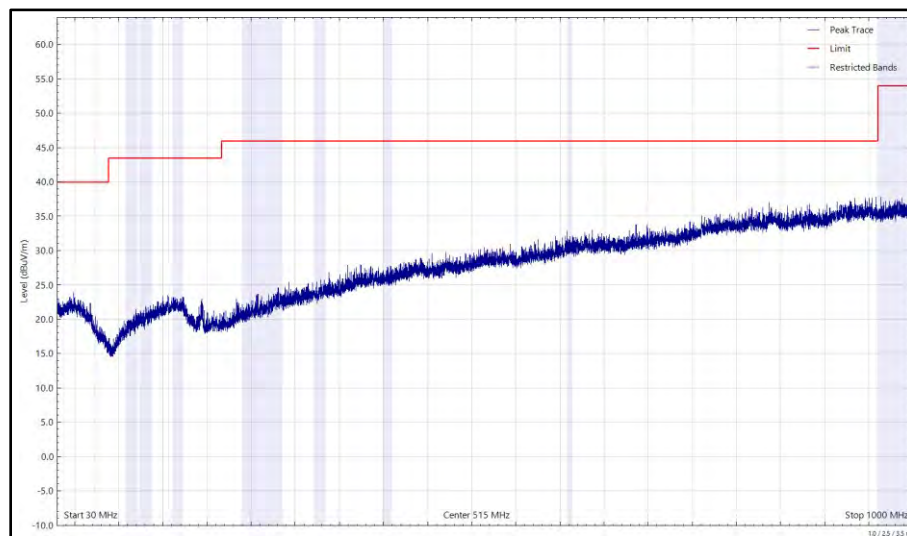


Figure 62 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

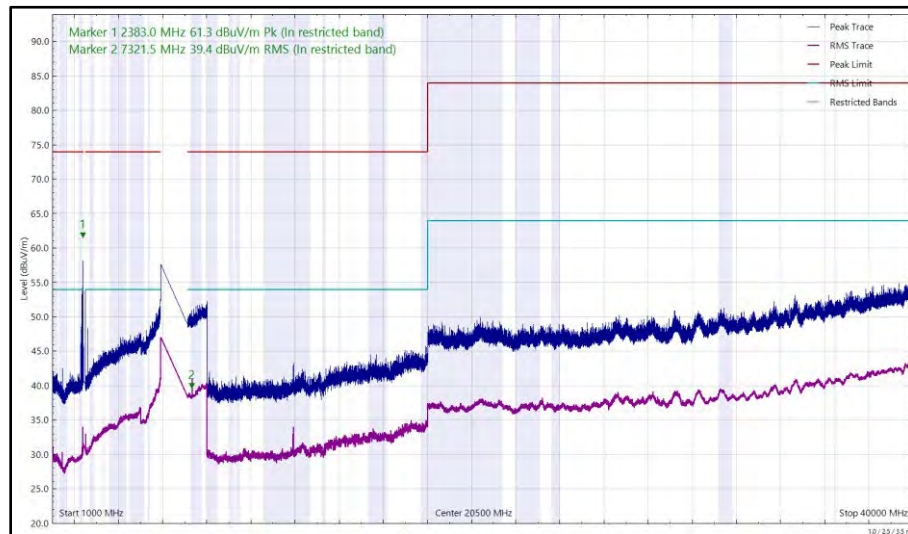


Figure 63 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

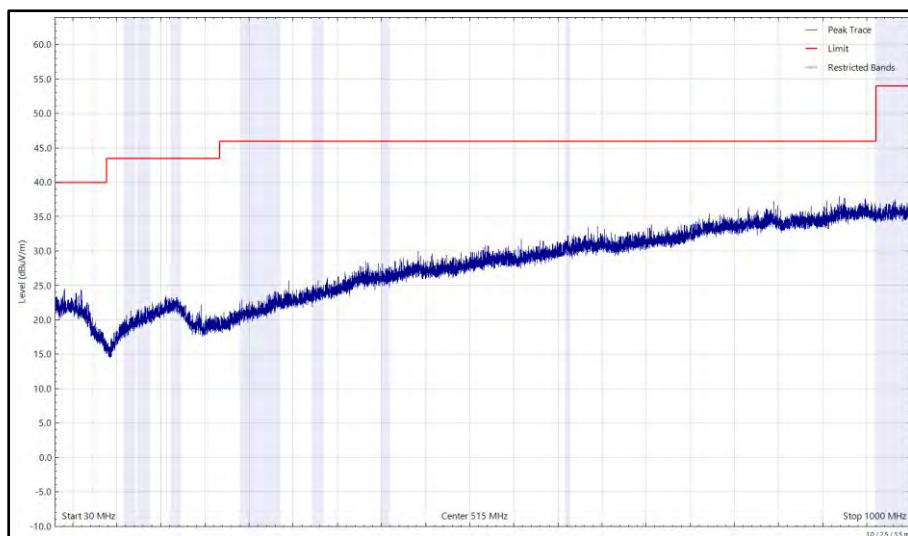


Figure 64 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

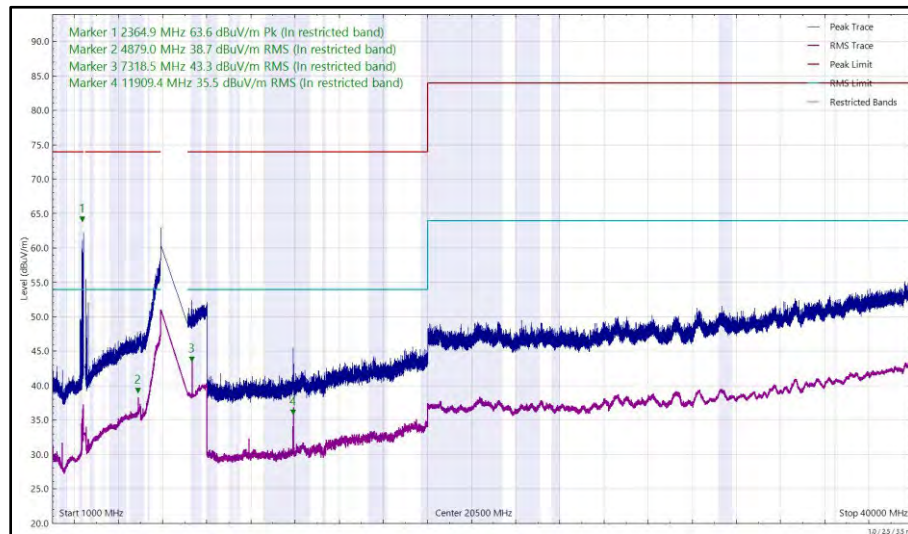


Figure 65 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
2336.230	59.73	74.00	-14.27	Peak	246	400	Vertical
2492.314	61.87	74.00	-12.13	Peak	124	397	Horizontal
7321.451	41.71	54.00	-12.29	RMS	291	275	Vertical
11909.955	33.01	54.00	-20.99	RMS	72	149	Vertical

Table 25 - 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 other emissions found within 10 dB of the limit.

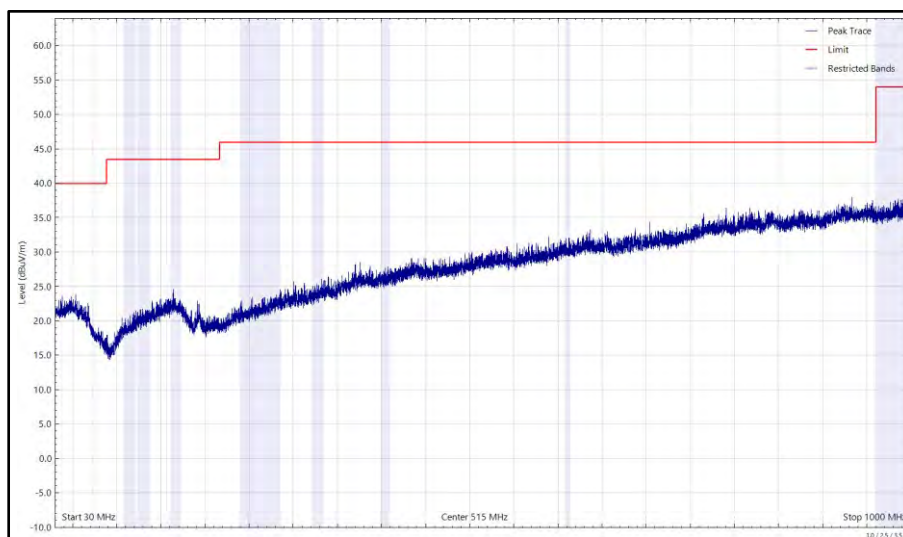


Figure 66 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

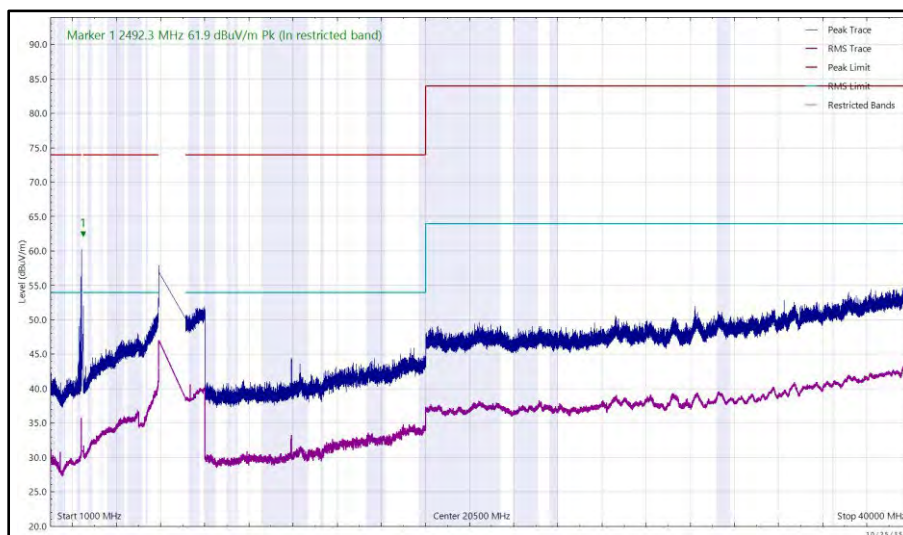


Figure 67 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

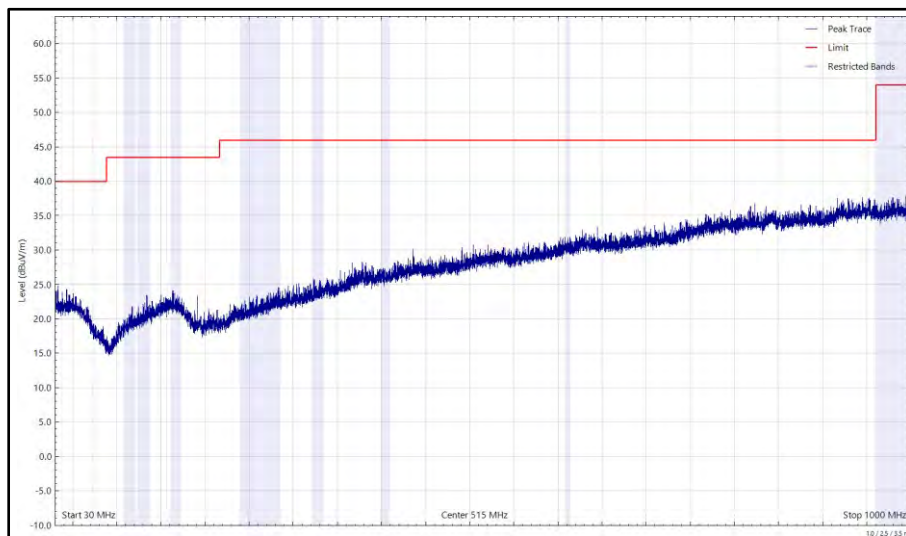


Figure 68 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

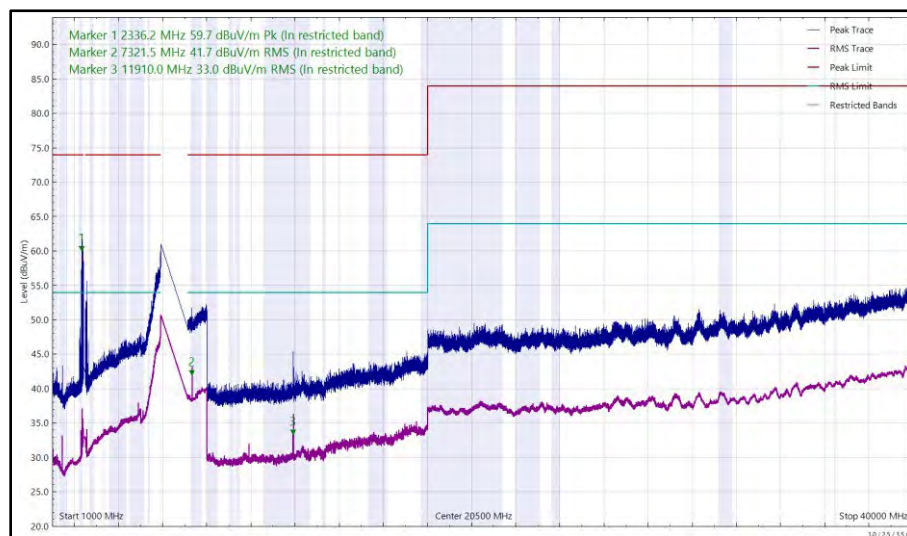


Figure 69 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-5 - 5955 MHz (CH1), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
2388.469	65.10	74.00	-8.90	Peak	237	301	Vertical
2544.757	57.22	74.00	-16.78	Peak	197	322	Vertical
5341.067	51.93	68.20	-16.27	RMS	270	275	Vertical
7155.016	53.18	68.20	-15.02	RMS	178	258	Vertical
7155.492	70.66	88.20	-17.54	Peak	178	258	Vertical
7318.476	40.38	54.00	-13.62	RMS	323	450	Horizontal
7318.500	43.54	54.00	-10.46	RMS	287	290	Vertical
21343.536	42.03	54.00	-11.97	RMS	192	100	Vertical

Table 26 - 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 other emissions found within 10 dB of the limit.

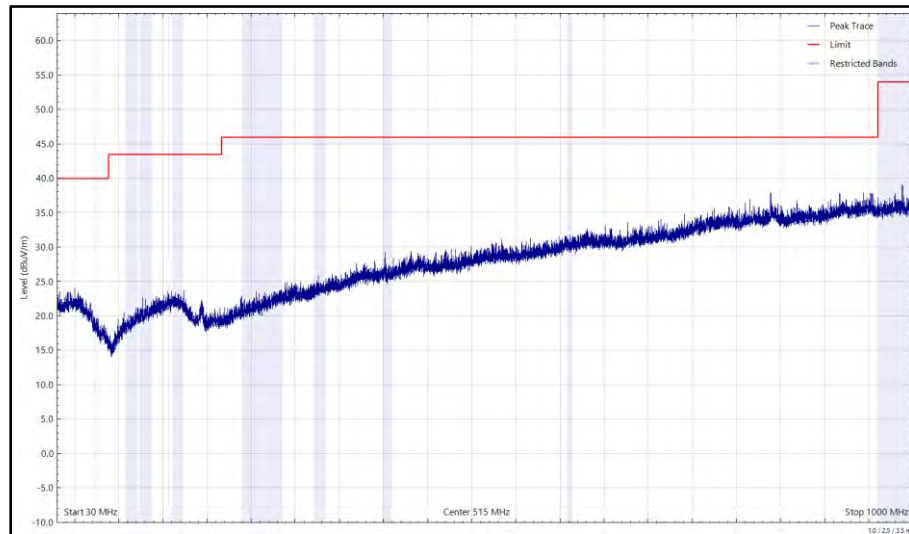


Figure 70 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

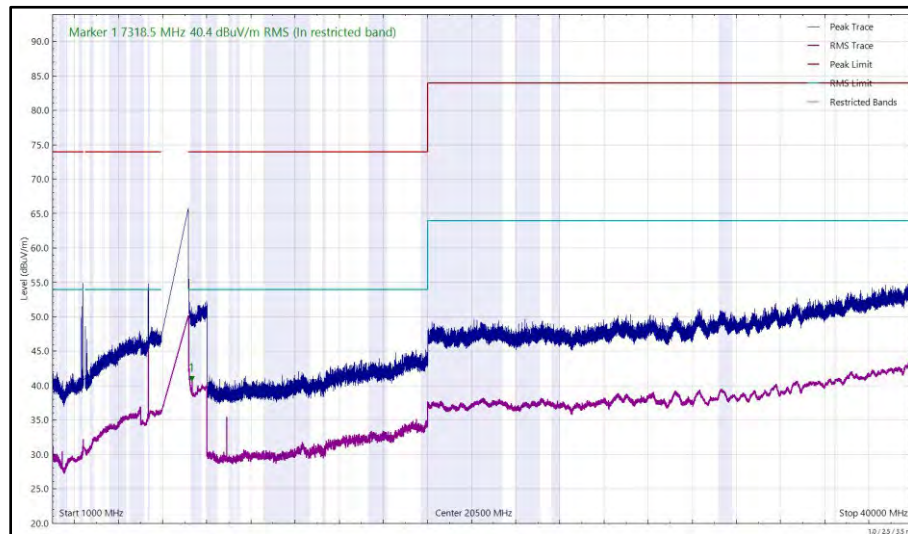


Figure 71 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

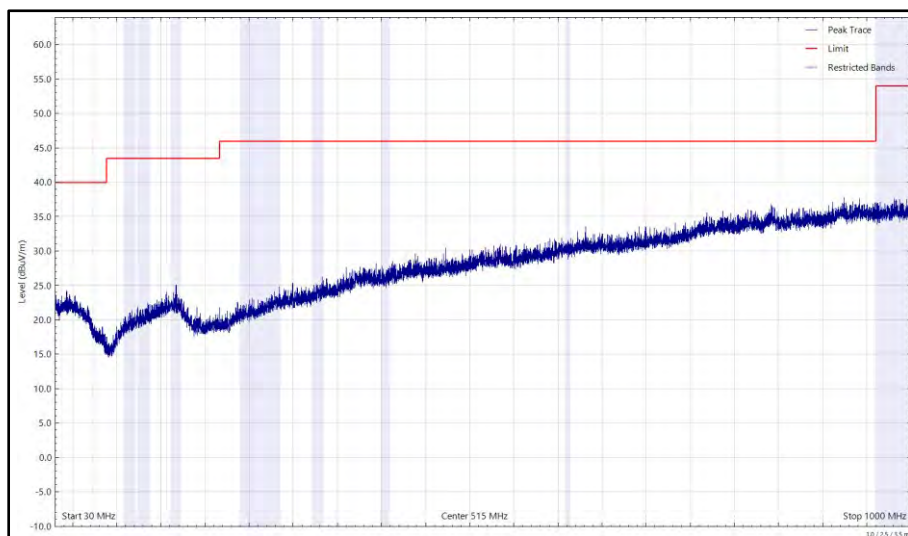


Figure 72 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

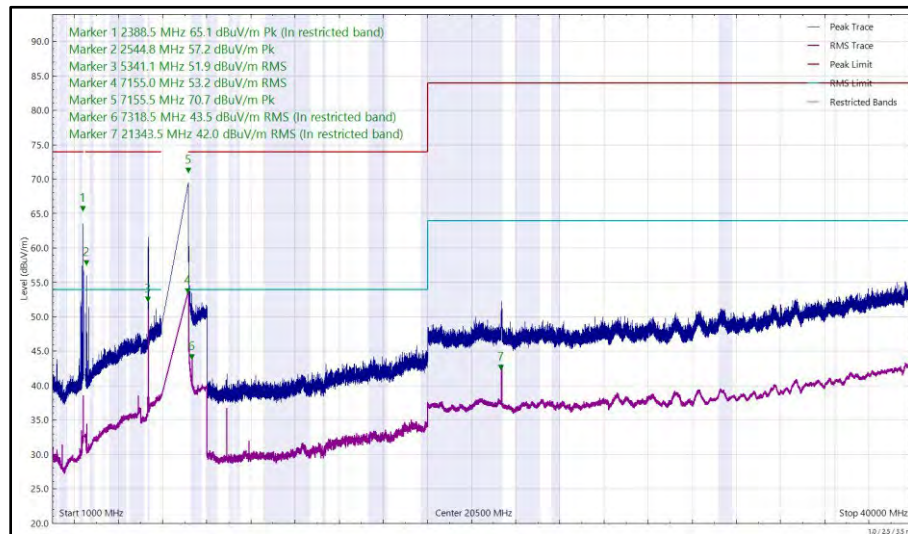


Figure 73 - 2440 MHz (CH18), Thread, ePA, Core 0 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
1440.105	33.77	54.00	-20.23	RMS	228	150	Vertical
2362.731	58.26	74.00	-15.74	Peak	172	146	Horizontal
2362.915	63.46	74.00	-10.54	Peak	239	390	Vertical
4879.092	37.46	54.00	-16.54	RMS	237	357	Vertical
5341.246	52.43	68.20	-15.77	RMS	215	292	Vertical
7155.133	71.76	88.20	-16.44	Peak	181	256	Vertical
7318.323	38.99	54.00	-15.01	RMS	115	395	Horizontal
7318.516	40.63	54.00	-13.37	RMS	273	291	Vertical
21348.849	41.88	54.00	-12.12	RMS	184	100	Vertical

Table 27 - 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 other emissions found within 10 dB of the limit.

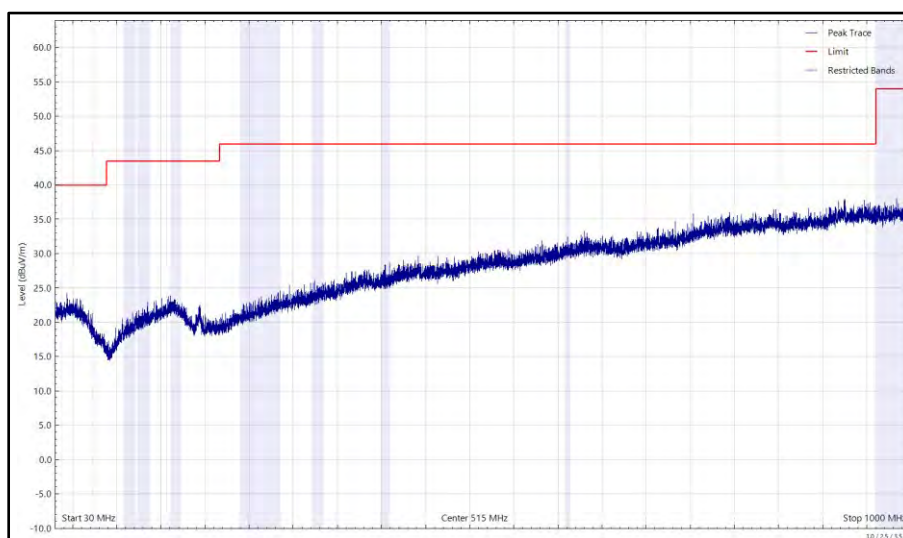


Figure 74 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

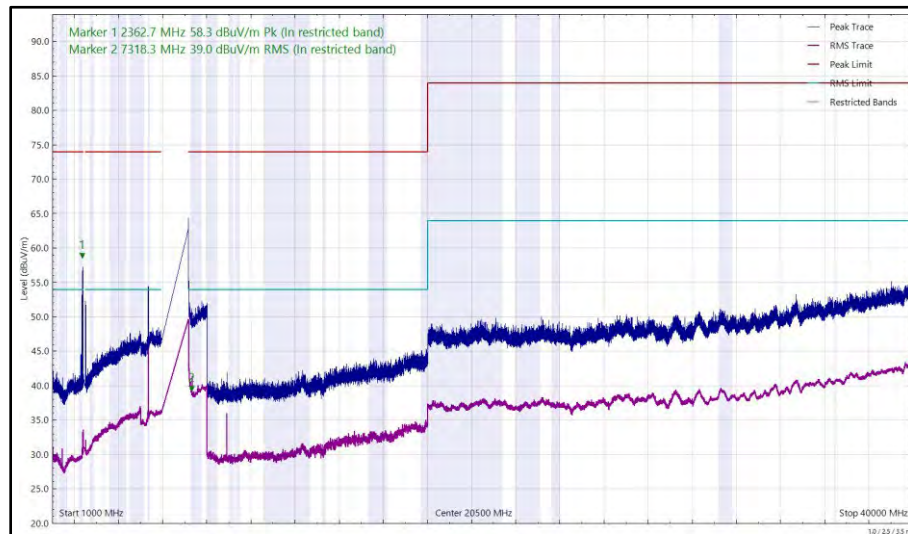


Figure 75 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal

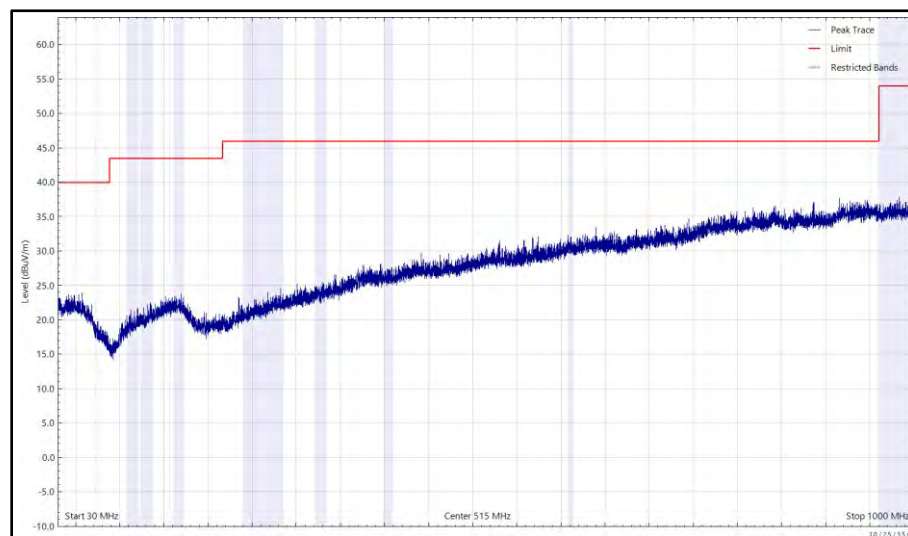


Figure 76 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

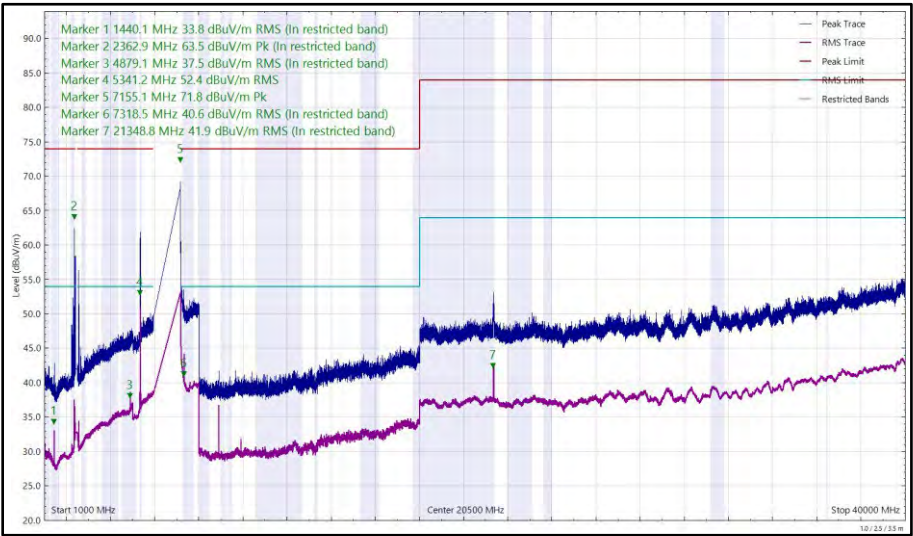


Figure 77 - 2440 MHz (CH18), Thread, ePA, Core 1 and U-NII-8 - 7115 MHz (CH233), HE20, SU, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical

FCC 47 CFR Part 15, ISSED RSS-247, ISSED RSS-248 and ISSED 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 28



2.1.8 Test Location and Test Equipment Used

This test was carried out in RF Chamber 14 and RF Chamber 15.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Expiry Date
Cable (18 GHz)	Rosenberger	LU7-071-1000	5096	12	24-Oct-2024
Emissions Software	TUV SUD	EmX V3.1.12	5125	-	Software
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	5516	12	24-Oct-2024
EMI Test Receiver	Rohde & Schwarz	ESW44	5911	12	05-May-2024
Test Receiver	Rohde & Schwarz	ESW44	5914	12	24-Feb-2024
DRG Horn Antenna (7.5-18GHz)	Schwarzbeck	HWRD750	5940	12	09-Jul-2024
TRILOG Super Broadband Test Antenna	Schwarzbeck	VULB 9168	5944	24	03-Feb-2024
1500W (300V 12A) AC Power Supply	iTech	IT7324	5955	-	O/P Mon
1500W (300V 12A) AC Power Supply	iTech	IT7324	5956	-	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
5m Semi-Anechoic Chamber (Dual-Axis), Chamber 15	Albatross Projects	RF Chamber 15	5963	36	28-Apr-2025
Compact Antenna Mast	Maturo Gmbh	CAM4.0-P	5964	-	TU
Mast & Turntable Controller	Maturo Gmbh	FCU3.0	5966	-	TU
Tilt Antenna Mast	Maturo Gmbh	BAM4.5-P	5967	-	TU
Turntable	Maturo Gmbh	TT1.5SI	5968	-	TU
Cable (N to N 1m)	Junkosha	MWX221-01000NMSNMS/B	5999	12	05-Jun-2024
Cable (SMA to SMA 6.5m)	Junkosha	MWX221-06500AMSAMS/B	6003	12	05-Jun-2024
Cable (N to N 8m)	Junkosha	MWX221-08000NMSNMS/A	6006	12	05-Jun-2024
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	6007	12	05-Jun-2024
Cable (N to N 7m)	Junkosha	MWX221-07000NMSNMS/B	6016	12	05-Jun-2024
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/B	6019	12	05-Jun-2024
Horn Antenna (1-10 GHz)	Schwarzbeck	BBHA9120B	6140	12	26-Aug-2024
Horn Antenna (1-10 GHz)	Schwarzbeck	BBHA9120B	6141	12	26-Aug-2024
Digital Multimeter	Fluke	115	6145	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	6188	24	02-Jun-2024
SAC Switch Unit	TUV SUD	TUV_SSU_001	6191	12	12-Dec-2023
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
Pre Amp 8 - 18 GHz	Wright Technologies	APS06 0061	6200	12	14-Jul-2024
Attenuator 4dB	Pasternack	PE7074-4	6203	24	16-Jul-2024
Cable (SMA to SMA 20cm)	TUV SUD	MH-FH 8-18	6220	12	24-Jul-2024
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	6315	12	04-Feb-2024
Cable (K Type 2m)	Junkosha	MWX241-02000KMSKMS/B	6323	12	04-Feb-2024
SAC Switch Unit	TUV SUD	TUV_SSU_001	6349	12	31-Mar-2024
8 GHz High Pass Filter	Wainwright	WHKX 7150 8000 18000 50SS	6427	12	24-Jul-2024
DRG Horn Antenna	Schwarzbeck	HWRD750	6458	12	09-Jul-2024
Humidity and Temperature Meter	R.S Components	1364	6486	12	18-Apr-2024
Coax cable sma to sma with N-Type adapter	TUV SUD	N/A	6637	12	24-Jul-2024

Table 29

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 30

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.