

FCC and ISED Test Report

Sepura Ltd

TETRA Mobile Radio, Model: SC2024

In accordance with FCC 47 CFR Part 15C,
ISED RSS-247 and ISED RSS-GEN

Prepared for: Sepura Ltd
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Add value.
Inspire trust.

FCC ID: XX6SC2024

IC: 8739A-SC2024

COMMERCIAL-IN-CONFIDENCE

Document 75950098-01 Issue 01

SIGNATURE

NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Steve Marshall	Senior engineer	Authorised Signatory	15 January 2021

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 15C and ISED RSS-247 and ISED RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Graeme Lawler	15 January 2021	
Testing	Mehadi Choudhury	15 January 2021	

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

ISED Accreditation
12669A Octagon House, Fareham Test Laboratory

EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15C: 2019, ISED RSS-247: Issue 2 (02-2017) and ISED RSS-GEN: Issue 5 (04-2018) + A1 (03-2019) for the tests detailed in section 1.3.



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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	15 January 2021

Table 1

1.2 Introduction

Applicant	Sepura Ltd
Manufacturer	Sepura Ltd
Model Number(s)	SC2024
Manufacturer Declared Variant(s)	SC2020 and SC2028
Serial Number(s)	SC2024: 1PR002039GKP2KB and 1PR001847GK01HF SC2020: 1PR001905GK12RP
Hardware Version(s)	Production
Software Version(s)	2001 797 07367
Number of Samples Tested	3
Test Specification/Issue/Date	FCC 47 CFR Part 15C: 2019 ISED RSS-247: Issue 2 (02-2017) ISED RSS-GEN: Issue 5 (04-2018) + A1 (03-2019)
Order Number	PLC-PO017051-1
Date	23-September-2020
Date of Receipt of EUT	30-October-2020 and 17-November-2020
Start of Test	09-November-2020
Finish of Test	01-December-2020
Name of Engineer(s)	Graeme Lawler and Mehadi Choudhury
Related Document(s)	ANSI C63.10 (2013)



1.3 Brief Summary of Results

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

Section	Specification Clause			Test Description	Result	Comments/Base Standard
Configuration and Mode: 2.4 GHz WLAN						
-	15.203	-	0	Antenna Requirement	N/T	The EUT has an integral antenna therefore the requirement is met. See application form for details.
2.1	15.205	-	8.10	Restricted Band Edges	Pass	
2.2	15.207	-	8.8	AC Power Line Conducted Emissions	Pass	
2.3	15.247 (a)(2)	5.2	6.7	Emission Bandwidth	Pass	
2.4	15.247 (b)	5.4	6.12	Maximum Conducted Output Power	Pass	
2.5	15.247 (d)	5.5	-	Authorised Band Edges	Pass	
2.6	15.247 (d) and 15.205	5.5	6.13	Spurious Radiated Emissions	Pass	
2.7	15.247 (e)	5.2	6.12	Power Spectral Density	Pass	

Table 2



1.4 Manufacturer Declared Variant(s)

The conducted sample tested was the SC2020.

The only difference between SC2020, SC2024 and SC2028 is the operating frequency of the TETRA band.

The SC20 all share the same Bluetooth/Wi-Fi module.

This is on a separate PCB which can be plugged in to any SC20 radio.

Therefore, all conducted Bluetooth/Wi-Fi tests will be the same for all SC20 radios.

Radiated emissions and intermodulation products could be different because of the different TETRA bands, but as the same Bluetooth/Wi-Fi PCB is used for all SC20s, the radiated emissions from the Wi-Fi module should be the same.

The smaller SC21 series radios use the same Bluetooth/Wi-Fi module but for cost and space saving the module has been integrated onto the main PCB. Conducted results will therefore remain the same and can be read across from the SC20 module results, but radiated emissions will need to be verified for each radio



1.5 Application Form

Equipment Description

Technical Description: <i>(Please provide a brief description of the intended use of the equipment)</i>	The SC20 hand-portable terminal is a TETRA enabled radio with Bluetooth and Wi-Fi capability
Manufacturer:	Sepura
Model:	SC2024
Part Number:	N/A
Hardware Version:	Production
Software Version:	2001 797 07367
FCC ID (if applicable)	XX6SC2024
IC ID (if applicable)	8739A-SC2024

Table 3

Intentional Radiators

Technology	TETRA	BT Classic / EDR	BLE	Wi-Fi 802.11b, g	Wi-Fi 802.11n 20	Wi-Fi 802.11n 40
Frequency Band (MHz)	403 – 470	2400 – 2483.5	2400 – 2483.5	2400 – 2483.5	2400 – 2483.5	2400 – 2483.5
Conducted Declared Output Power (dBm)	34	7.382	7.4	16.5	16.5	16.5
Antenna Gain (dBi)	> 0	2.5	2.5	2.5	2.5	2.5
Supported Bandwidth(s) (MHz)	25 kHz	1	2	16.5	19.7	36.8
Modulation Scheme(s)	$\pi/4$ DQPSK	GFSK $\pi/4$ DQPSK 8DPSK	GFSK	802.11b: CCK, DBPSK, DQPSK 802.11g: BPSK, QPSK, 16QAM, 64QAM	BPSK, QPSK, 16QAM, 64QAM	BPSK, QPSK, 16QAM, 64QAM
ITU Emission Designator	22K0DXW	1M01F1D 1M01G1D	1M81F1D	16M5G1D	19M7G1D	36M8G1D
Bottom Frequency (MHz)	403	2402	2402	2412	2412	2422
Middle Frequency (MHz)	436.5	2441	2441	2437	2437	2437
Top Frequency (MHz)	470	2480	2480	2462	2462	2452

Table 4



Un-intentional Radiators

Highest frequency generated or used in the device or on which the device operates or tunes	2480 MHz
Lowest frequency generated or used in the device or on which the device operates or tunes	32.768 kHz
Class A Digital Device (Use in commercial, industrial or business environment) ☒	
Class B Digital Device (Use in residential environment only) ☐	

Table 5

DC Power Source

Nominal voltage:	7.4	V
Extreme upper voltage:	7.4	V
Extreme lower voltage:	6.2	V
Max current:	2	A

Table 6

Battery Power Source

Voltage:	7.4	V
End-point voltage:	6.2	V (Point at which the battery will terminate)
Alkaline ☐ Leclanche ☐ Lithium ☒ Nickel Cadmium ☐ Lead Acid* ☐ *(Vehicle regulated)		
Other ☐	Please detail:	

Table 7

Charging

Can the EUT transmit whilst being charged	Yes ☒ No ☐
---	---

Table 8

Temperature

Minimum temperature:	-20	°C
Maximum temperature:	+60	°C

Table 9

Antenna Characteristics

Antenna connector ☒ TETRA			State impedance	50	Ohm
Temporary antenna connector ☐			State impedance		Ohm
Integral antenna ☒	Type:	PCB	State impedance	50	Ohm
External antenna ☐	Type:		State impedance		dBI

Table 10



Ancillaries (if applicable)

Manufacturer:		Part Number:	
Model:		Country of Origin:	

Table 11

The SC2024 may be used with standard SC20 accessories, batteries, chargers, belt clips, holsters, remote speaker and microphones, earpieces etc

I hereby declare that the information supplied is correct and complete.

Name: Chris Beecham

Position held: Conformance Engineer

Date: 30 October 2020



1.6 Product Information

1.6.1 Technical Description

The SC20 hand-portable terminal is a TETRA enabled radio with Bluetooth and Wi-Fi capability.

1.6.2 Test Modes

For conducted tests the EUT antenna was disconnected and the EUT directly connected to the test equipment via a cable and attenuator.

For all tests, the EUT was put into a continuous transmit test mode with the chipset manufacturer's test commands via a script running in the EUTs terminal application. The EUT then transmitted the required type of packeted 802.11 data frames of fixed length, containing the standard headers and with pseudo-random data content, ensuring the measured signals were representative and contained all the symbols at the highest power control level.

After preliminary investigations were performed, the EUT was therefore tested in the following worst-case modes:

- 802.11b 1 Mbps
- 802.11g 6 Mbps
- 802.11n HT20 MCS0
- 802.11n HT40 MCS0

1.7 Deviations from the Standard

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

1.8 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: SC2024, Serial Number: 1PR002039GKP2KB			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: SC2020, Serial Number: 1PR001905GK12RP			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: SC2024, Serial Number: 1PR001847GK01HF			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 12

1.9 Test Location

TÜV SÜD conducted the following tests at our Fareham Test Laboratory.

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: 2.4 GHz WLAN		
Restricted Band Edges	Graeme Lawler	UKAS
AC Power Line Conducted Emissions	Graeme Lawler	UKAS
Emission Bandwidth	Mehadi Choudhury	UKAS



Test Name	Name of Engineer(s)	Accreditation
Maximum Conducted Output Power	Mehadi Choudhury	UKAS
Authorised Band Edges	Graeme Lawler	UKAS
Spurious Radiated Emissions	Graeme Lawler	UKAS
Power Spectral Density	Mehadi Choudhury	UKAS

Table 13

Office Address:

Octagon House, Concorde Way
Segensworth North, Fareham
Hampshire, PO15 5RL
United Kingdom



2 Test Details

2.1 Restricted Band Edges

2.1.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.205
ISED RSS-GEN, Clause 8.10

2.1.2 Equipment Under Test and Modification State

SC2024, S/N: 1PR002039GKP2KB - Modification State 0

2.1.3 Date of Test

11-November-2020

2.1.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 6.10.5.

Peak measurements were taken in accordance with ANSI C63.10, clause 11.12.2.4.

Plots for average measurements were taken in accordance with ANSI C63.10, clause 4.1.4.2.5.

These are shown for information purposes and were used to determine the worst-case measurement point. Final average measurements were then taken in accordance with ANSI C63.10, clause 4.1.4.2.2 to obtain the measurement result recorded in the test results tables.

The following conversion can be applied to convert from dBμV/m to μV/m:

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

2.1.5 Environmental Conditions

Ambient Temperature 20.2 °C
Relative Humidity 53.7 %

2.1.6 Test Results

2.4 GHz WLAN

Mode	Data Rate/Modulation Coding Scheme	Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
802.11b	1 Mbps	2412	2390.0	60.16	48.47
802.11b	1 Mbps	2462	2483.5	60.62	48.54
802.11g	6 Mbps	2412	2390.0	64.27	48.41
802.11g	6 Mbps	2462	2483.5	60.68	48.69
802.11n HT20	MCS0	2412	2390.0	64.74	48.46
802.11n HT20	MCS0	2462	2483.5	61.23	48.49
802.11n HT40	MCS0	2422	2390.0	65.47	48.16
802.11n HT40	MCS0	2452	2483.5	62.30	48.52

Table 14 - SISO

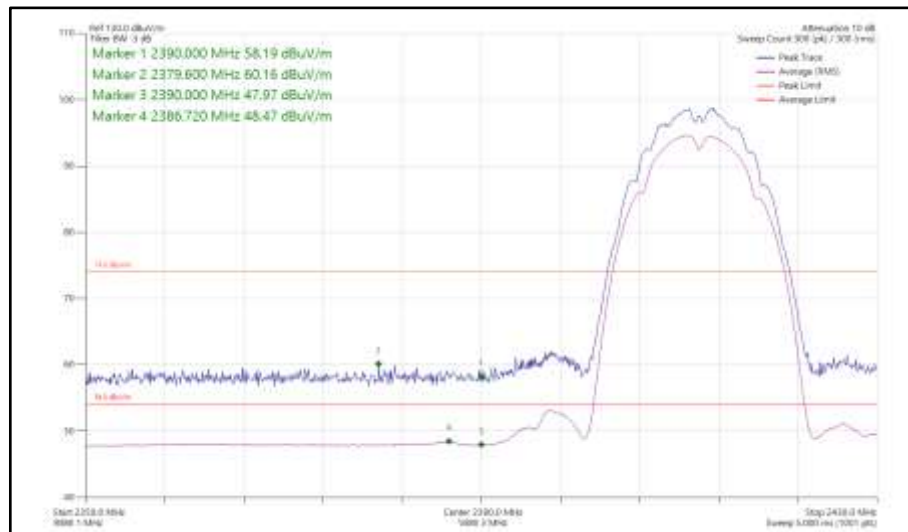


Figure 1 - 802.11b, 2412 MHz, Band Edge Frequency 2390.0 MHz

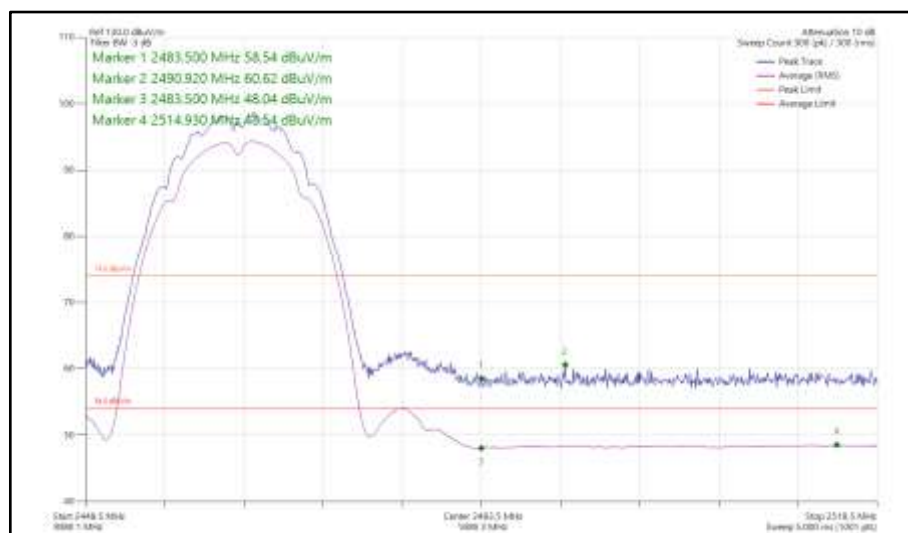


Figure 2 - 802.11b, 2462 MHz, Band Edge Frequency 2483.5 MHz

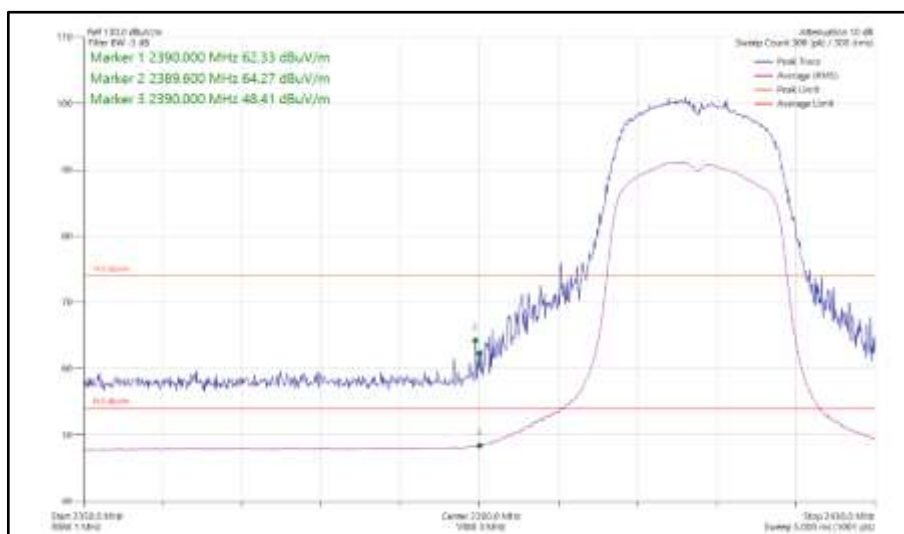


Figure 3 - 802.11g, 2412 MHz, Band Edge Frequency 2390.0 MHz

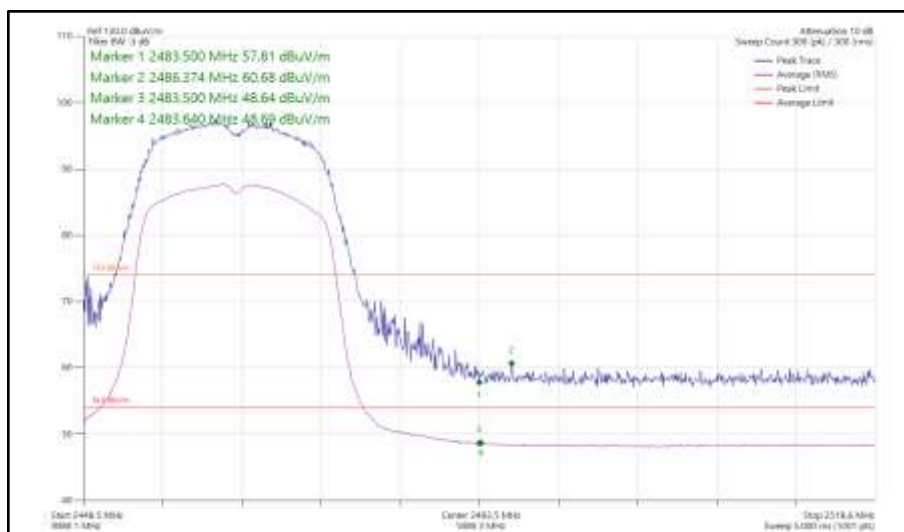


Figure 4 - 802.11g, 2462 MHz, Band Edge Frequency 2483.5 MHz

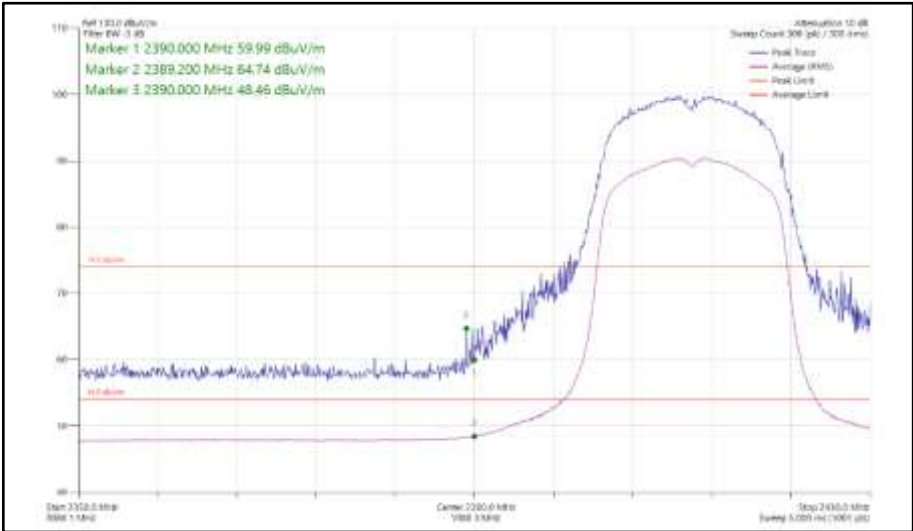


Figure 5 - 802.11n HT20 2412 MHz, Band Edge Frequency 2390 MHz

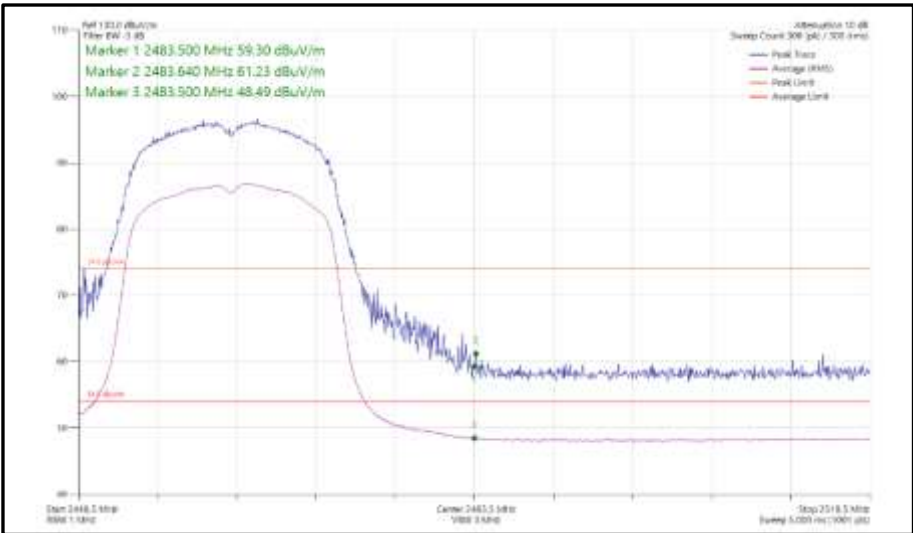


Figure 6 - 802.11n HT20 2462 MHz, Band Edge Frequency 2483.5 MHz

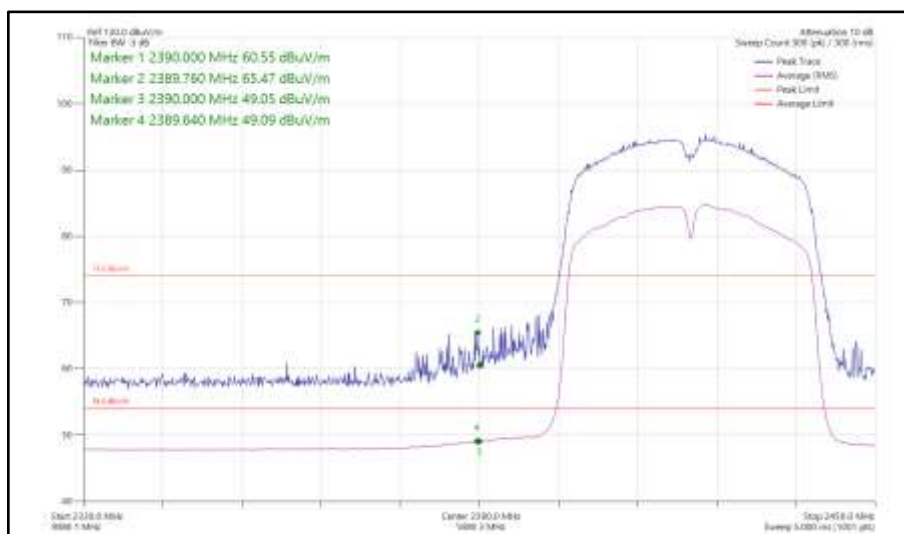


Figure 7 - 802.11n HT40 2412 MHz, Band Edge Frequency 2390 MHz

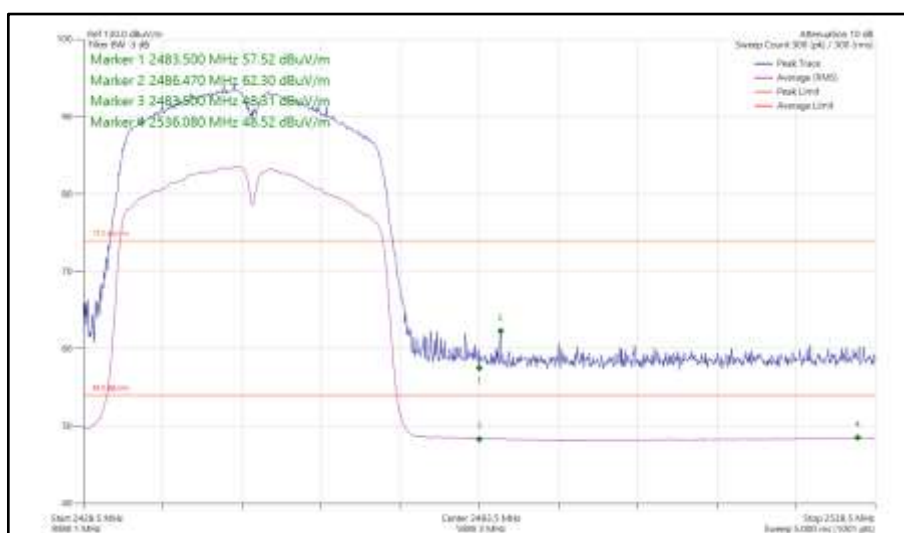


Figure 8 - 802.11n HT40 2452 MHz, Band Edge Frequency 2483.5 MHz



FCC 47 CFR Part 15, Limit Clause 15.209

Frequency (MHz)	Field Strength ($\mu\text{V}/\text{m}$ at 3 m)
30 to 88	100
88 to 216	150
216 to 960	200
Above 960	500

Table 15

ISED RSS-GEN, Limit Clause 8.9

Frequency (MHz)	Field Strength ($\mu\text{V}/\text{m}$ at 3 m)
30 to 88	100
88 to 216	150
216 to 960	200
Above 960*	500

Table 16

*Unless otherwise specified, for all frequencies greater than 1 GHz, the radiated emission limits for licence-exempt radio apparatus stated in applicable RSSs (including RSS-Gen) are based on measurements using a linear average detector function having a minimum resolution bandwidth of 1 MHz. If an average limit is specified for the EUT, then the peak emission shall also be measured with instrumentation properly adjusted for such factors as pulse desensitization to ensure the peak emission is less than 20 dB above the average limit.



2.1.7 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 12.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	03-Jan-2021
Cable (18 GHz)	Rosenberger	LU7-071-2000	5106	12	09-Dec-2020
EmX Emissions Software	TUV SUD	V2.0.1	5125	-	Software
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5481	12	18-Mar-2021
2m SMA Cable	Junkosha	MWX221-02000AMSAMS/A	5517	12	01-Apr-2021
8m N-Type Cable	Junkosha	MWX221-08000NMSNMS/B	5520	12	24-Mar-2021
2 m K Type Cable	Junkosha	MWX241-02000KMSKMS/A	5523	12	3-Apr-2021
Broadband Horn Antenna (1-10 GHz)	Schwarzbeck	BBHA 9120 B	5611	12	22-Sep-2021
Turntable & Mast Controller	Maturo Gmbh	NCD/498/2799.01	5612	-	TU
Tilt Antenna Mast TAM 4.0-P	Maturo Gmbh	TAM 4.0-P	5613	-	TU
3m Semi Anechoic Chamber	MVG	EMC-3	5621	36	11-Aug-2023

Table 17

TU - Traceability Unscheduled

2.2 AC Power Line Conducted Emissions

2.2.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.207
ISED RSS-GEN, Clause 8.8

2.2.2 Equipment Under Test and Modification State

SC2024, S/N: 1PR001847GK01HF - Modification State 0

2.2.3 Date of Test

01-December-2020

2.2.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 6.2.

The EUT was placed on a non-conductive table 0.8m above a reference ground plane and 0.4m away from a vertical coupling plane

All power was connected to the EUT through an Artificial Mains Network (AMN).

Conducted disturbance voltage measurements on mains lines were made at the output of the AMN.

2.2.5 Example Calculation

Quasi-Peak level (dBμV) = Receiver level (dBμV) + Correction Factor (dB)
Margin (dB) = Quasi-Peak level (dBμV) – Limit (dBμV)

CISPR Average level (dBμV) = Receiver level (dBμV) + Correction Factor (dB)
Margin (dB) = CISPR Average level (dBμV) – Limit (dBμV)

2.2.6 Example Test Setup Diagram

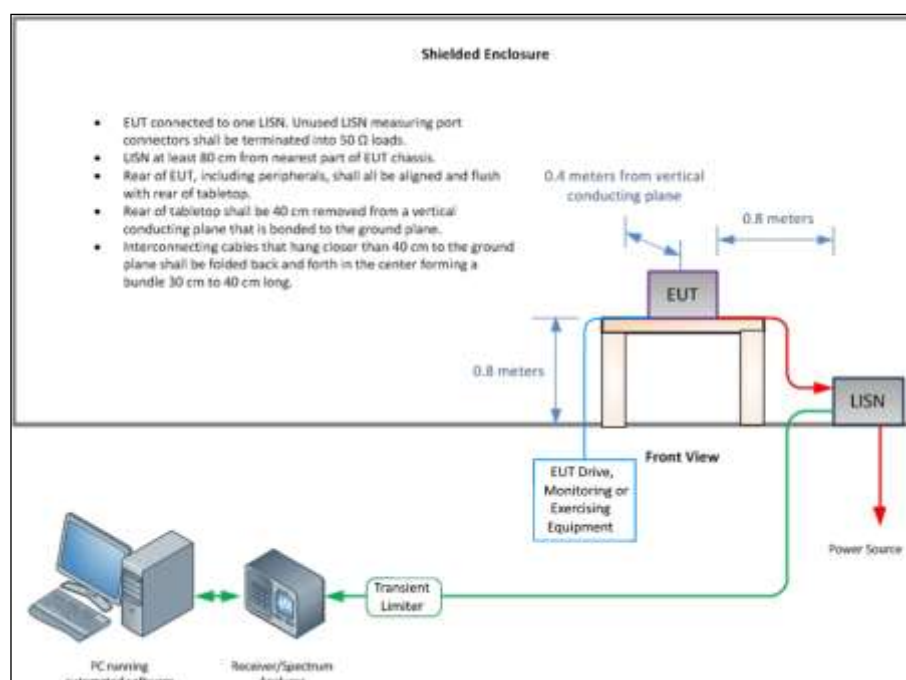


Figure 9 – Test Setup Diagram

2.2.7 Environmental Conditions

Ambient Temperature 19.9 °C
Relative Humidity 35.4 %

2.2.8 Test Results

2.4 GHz WLAN

Applied supply voltage: 118.2 V AC
Applied supply frequency: 60 Hz

Frequency (MHz)	Level (dBμV)	Limit (dBμV)	Margin (dB)	Detector
0.156	48.7	65.7	-17.0	Q-Peak
0.156	30.2	55.7	-25.5	CISPR Average
0.209	47.8	63.2	-15.4	Q-Peak
0.209	29.0	53.2	-24.3	CISPR Average
0.277	42.7	60.9	-18.2	Q-Peak
0.277	28.4	50.9	-22.5	CISPR Average
0.372	35.5	58.4	-22.9	Q-Peak
0.372	23.3	48.4	-25.1	CISPR Average

Table 18 - Neutral Line Emissions Results

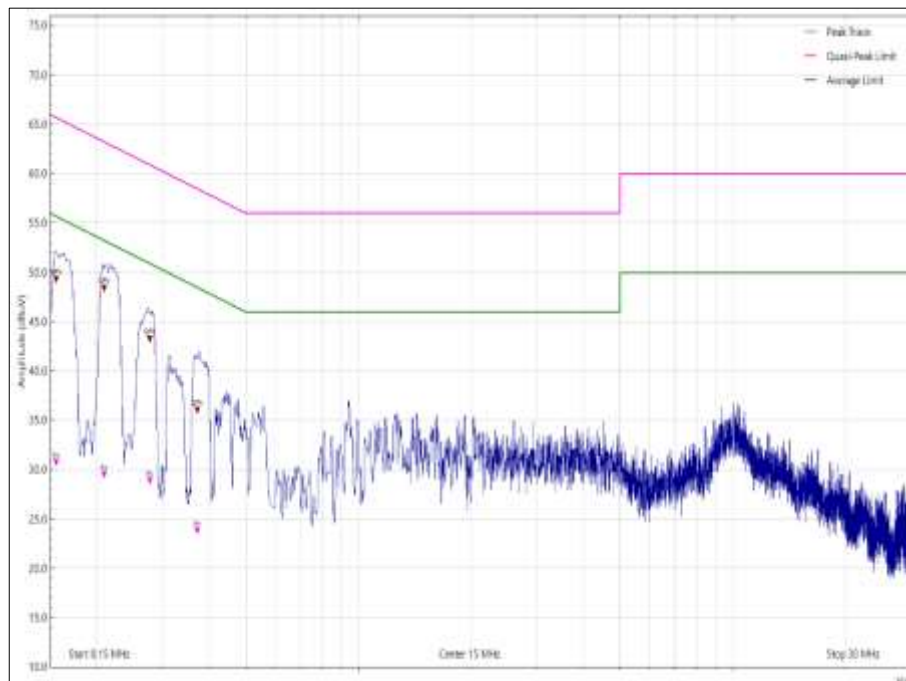


Figure 10 - Neutral Line - 150 kHz to 30 MHz

Frequency (MHz)	Level (dBμV)	Limit (dBμV)	Margin (dB)	Detector
0.158	47.2	65.6	-18.5	Q-Peak
0.158	30.8	55.6	-24.8	CISPR Average
0.209	46.4	63.2	-16.8	Q-Peak
0.209	31.0	53.2	-22.2	CISPR Average
0.280	40.9	60.8	-19.9	Q-Peak
0.280	28.8	50.8	-22.0	CISPR Average
0.378	36.0	58.3	-22.3	Q-Peak
0.378	24.7	48.3	-23.6	CISPR Average

Table 19 - Live Line Emissions Results

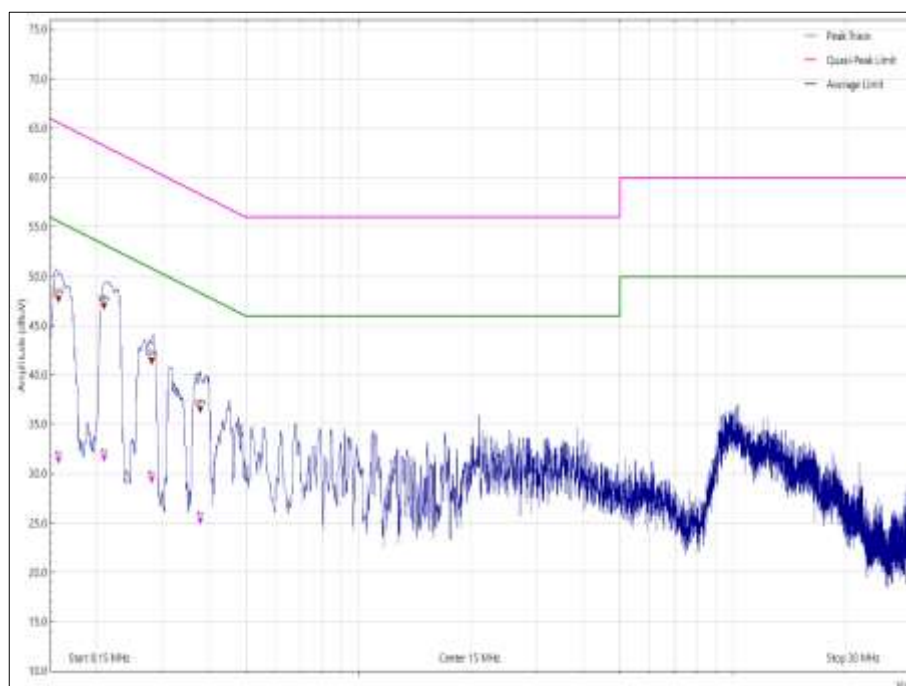


Figure 11 - Live Line - 150 kHz to 30 MHz



Table 20 – Test Setup Photo

FCC 47 CFR Part 15, Limit Clause 15.207 and ISED RSS-GEN, Limit Clause 8.8

Frequency of Emission (MHz)	Conducted Limit (dB μ V)	
	Quasi-Peak	CISPR Average
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5	56	46
5 to 30	60	50

Table 21

*Decreases with the logarithm of the frequency.



2.2.9 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 12.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
LISN	Rohde & Schwarz	ESH3-Z5	1390	12	27-Jan-2021
Transient Limiter	Hewlett Packard	11947A	2377	12	26-Feb-2021
Multimeter	Iso-tech	IDM101	2424	12	12-Dec-2020
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	03-Jan-2021
Cable (18 GHz)	Rosenberger	LU7-071-2000	5106	12	09-Dec-2020
EmX Emissions Software	TUV SUD	V2.0.1	5125	-	Software
Termination (50ohm)	Diamond Antenna	DL-30N	5465	12	27-Feb-2021
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5481	12	18-Mar-2021
8m N Type Cable	Junkosha	MWX221-08000NMSNMS/B	5519	12	24-Mar-2021
3m Semi Anechoic Chamber	MVG	EMC-3	5621	36	11-Aug-2023

Table 22



2.3 Emission Bandwidth

2.3.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (a)(2)
ISED RSS-247, Clause 5.2
ISED RSS-GEN, Clause 6.7

2.3.2 Equipment Under Test and Modification State

SC2020, S/N: 1PR001905GK12RP - Modification State 0

2.3.3 Date of Test

09-November-2020

2.3.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 11.8.1.

2.3.5 Environmental Conditions

Ambient Temperature 24.3 °C
Relative Humidity 48.9 %

2.3.6 Test Results

2.4 GHz WLAN

Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Mode:	802.11b	Duty Cycle (%):	N/A
Data Rate:	1 Mbps	Antenna Gain (dBi):	N/A
Antenna Configuration:	SISO	Beamforming Gain (dBi):	N/A
Active Port(s):	A (Core 0)	Active ChainId(s):	-

Table 23

Test Frequency (MHz)	6 dB Bandwidth (MHz)					Limit (kHz)	Margin (MHz)
	A	B	C	D	Minimum		
2412	10.120	-	-	-	10.120	≥500.0	-9.620
2437	10.120	-	-	-	10.120	≥500.0	-9.620
2462	10.120	-	-	-	10.120	≥500.0	-9.620

Table 24 - 6 dB Bandwidth Results



Test Frequency (MHz)	99% Bandwidth (MHz)					Limit (kHz)	Margin (MHz)
	A	B	C	D	Maximum		
2412	14.680	-	-	-	14.680	-	-
2437	14.640	-	-	-	14.640	-	-
2462	14.760	-	-	-	14.760	-	-

Table 25 - 99% Bandwidth Results



Figure 12 - Core 0 (A) 2412 MHz (CH1) 99% Bandwidth



Figure 13 - Core 0 (A) 2412 MHz (CH1) 6 dB Bandwidth





Figure 16 - Core 0 (A) 2462 MHz (CH11) 99% Bandwidth



Figure 17 - Core 0 (A) 2462 MHz (CH11) 6 dB Bandwidth



Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Mode:	802.11g	Duty Cycle (%):	N/A
Data Rate:	6 Mbps	Antenna Gain (dBi):	N/A
Antenna Configuration:	SISO	Beamforming Gain (dBi):	N/A
Active Port(s):	A (Core 0)	Active ChainId(s):	-

Table 26

Test Frequency (MHz)	6 dB Bandwidth (MHz)					Limit (kHz)	Margin (MHz)
	A	B	C	D	Minimum		
2412	15.160	-	-	-	15.160	≥500.0	-14.660
2437	15.180	-	-	-	15.180	≥500.0	-14.680
2462	15.160	-	-	-	15.160	≥500.0	-14.660

Table 27 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)					Limit (kHz)	Margin (MHz)
	A	B	C	D	Maximum		
2412	16.280	-	-	-	16.280	-	-
2437	19.920	-	-	-	19.920	-	-
2462	16.320	-	-	-	16.320	-	-

Table 28 - 99% Bandwidth Results



Figure 18 - Core 0 (A) 2412 MHz (CH1) 99% Bandwidth

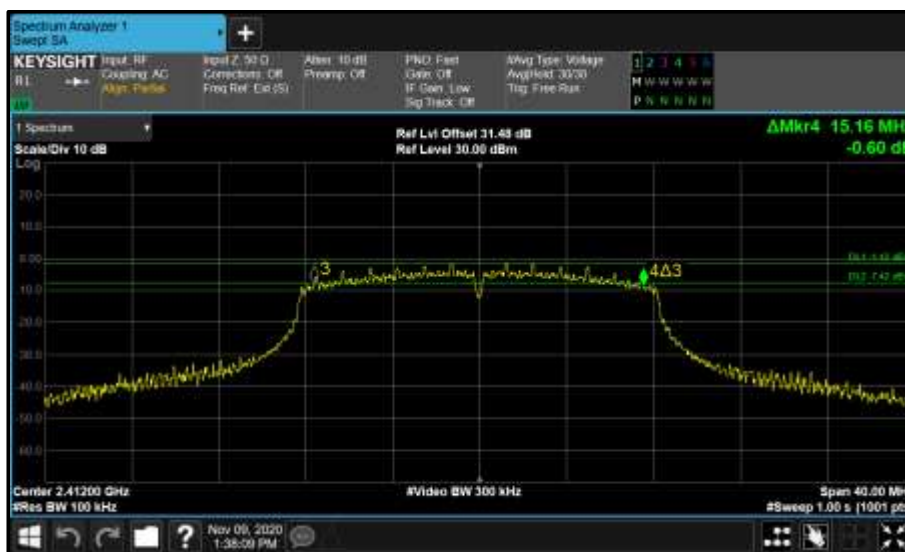


Figure 19 - Core 0 (A) 2412 MHz (CH1) 6 dB Bandwidth



Figure 20 - Core 0 (A) 2437 MHz (CH6) 99% Bandwidth

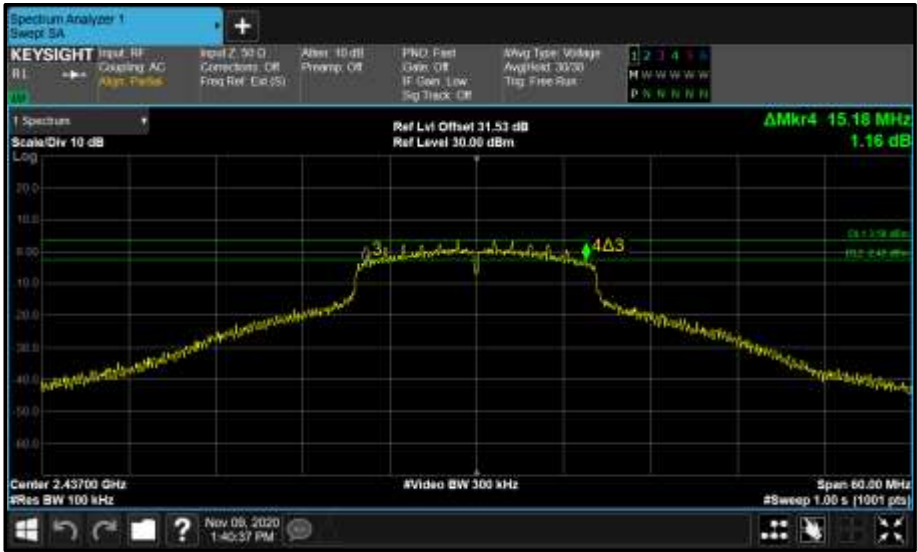


Figure 21 - Core 0 (A) 2437 MHz (CH6) 6 dB Bandwidth

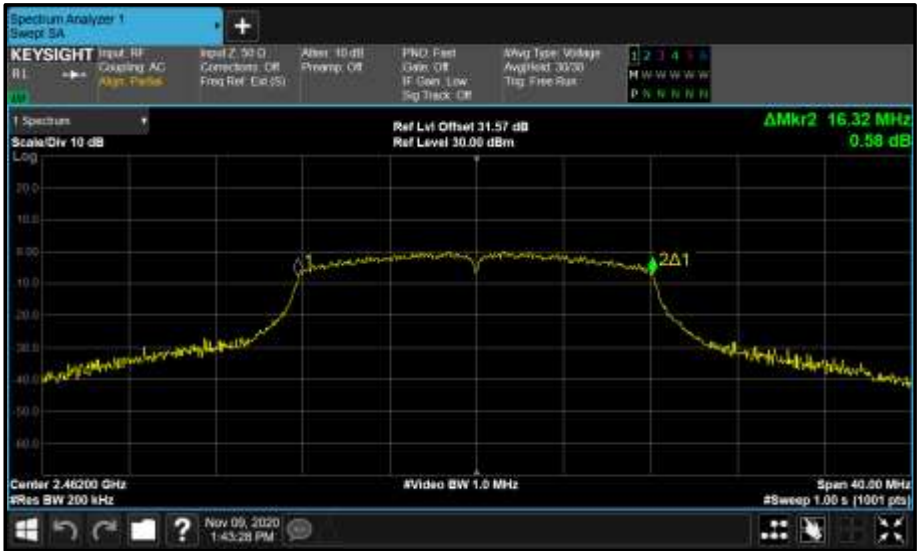


Figure 22 - Core 0 (A) 2462 MHz (CH11) 99% Bandwidth

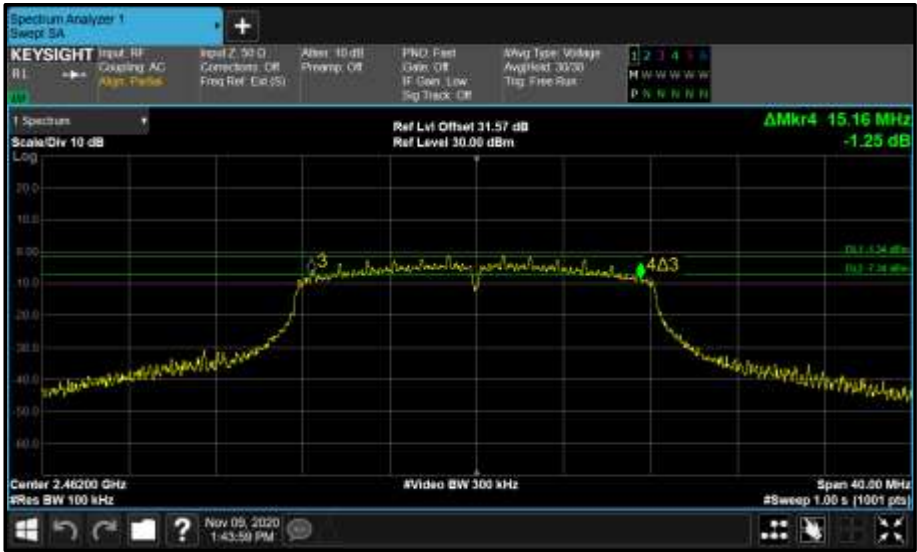


Figure 23 - Core 0 (A) 2462 MHz (CH11) 6 dB Bandwidth



Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Mode:	802.11n 20 MHz Bandwidth	Duty Cycle (%):	N/A
Modulation Coding Scheme:	MCS0	Antenna Gain (dBi):	N/A
Antenna Configuration:	SISO	Beamforming Gain (dBi):	N/A
Active Port(s):	A (Core 0)	Active ChainId(s):	-

Table 29

Test Frequency (MHz)	6 dB Bandwidth (MHz)					Limit (kHz)	Margin (MHz)
	A	B	C	D	Minimum		
2412	15.160	-	-	-	15.160	≥500.0	-14.660
2437	15.180	-	-	-	15.180	≥500.0	-14.680
2462	15.160	-	-	-	15.160	≥500.0	-14.660

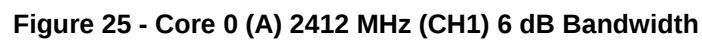
Table 30 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)					Limit (kHz)	Margin (MHz)
	A	B	C	D	Maximum		
2412	17.440	-	-	-	17.440	-	-
2437	18.720	-	-	-	18.720	-	-
2462	17.480	-	-	-	17.480	-	-

Table 31 - 99% Bandwidth Results



Figure 24 - Core 0 (A) 2412 MHz (CH1) 99% Bandwidth



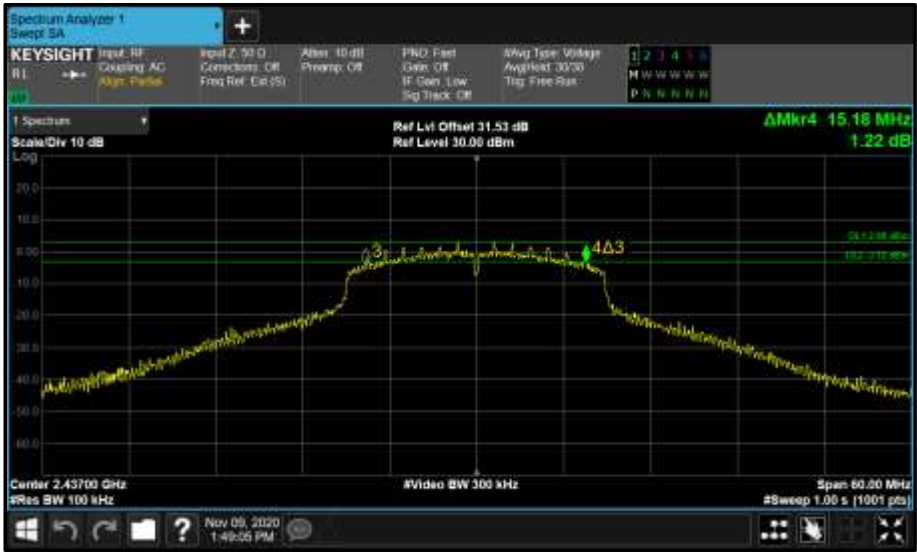


Figure 27 - Core 0 (A) 2437 MHz (CH6) 6 dB Bandwidth



Figure 28 - Core 0 (A) 2462 MHz (CH11) 99% Bandwidth

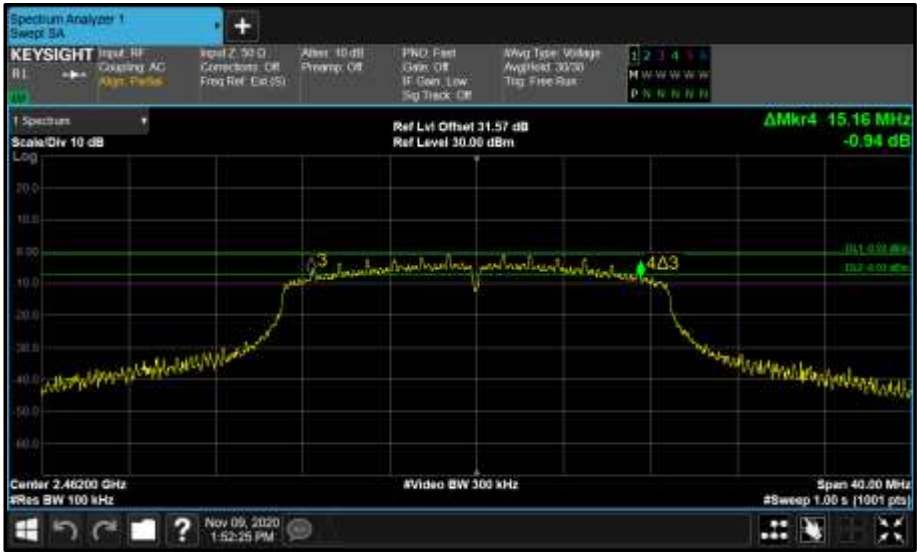


Figure 29 - Core 0 (A) 2462 MHz (CH11) 6 dB Bandwidth



Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Mode:	802.11n 40 MHz Bandwidth	Duty Cycle (%):	N/A
Modulation Coding Scheme:	MCS0	Antenna Gain (dBi):	N/A
Antenna Configuration:	SISO	Beamforming Gain (dBi):	N/A
Active Port(s):	A (Core 0)	Active ChainId(s):	-

Table 32

Test Frequency (MHz)	6 dB Bandwidth (MHz)					Limit (kHz)	Margin (MHz)
	A	B	C	D	Minimum		
2422	34.000	-	-	-	34.000	≥500.0	-33.500
2437	34.000	-	-	-	34.000	≥500.0	-33.500
2452	34.000	-	-	-	34.000	≥500.0	-33.500

Table 33 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)					Limit (kHz)	Margin (MHz)
	A	B	C	D	Maximum		
2422	35.680	-	-	-	35.680	-	-
2437	36.320	-	-	-	36.320	-	-
2452	35.760	-	-	-	35.760	-	-

Table 34 - 99% Bandwidth Results



Figure 30 - Core 0 (A) 2422 MHz (CH3) 99% Bandwidth



Figure 31 - Core 0 (A) 2422 MHz (CH3) 6 dB Bandwidth



Figure 32 - Core 0 (A) 2437 MHz (CH6) 99% Bandwidth

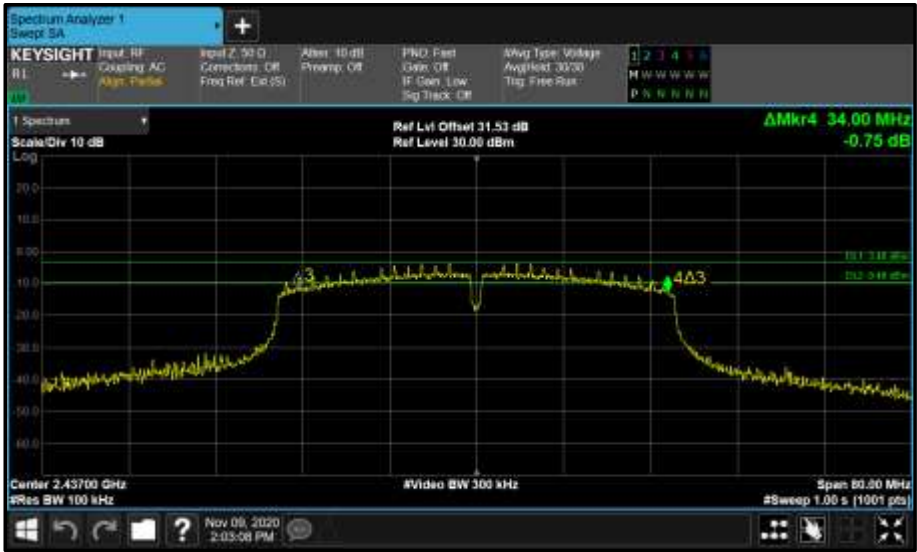


Figure 33 - Core 0 (A) 2437 MHz (CH6) 6 dB Bandwidth

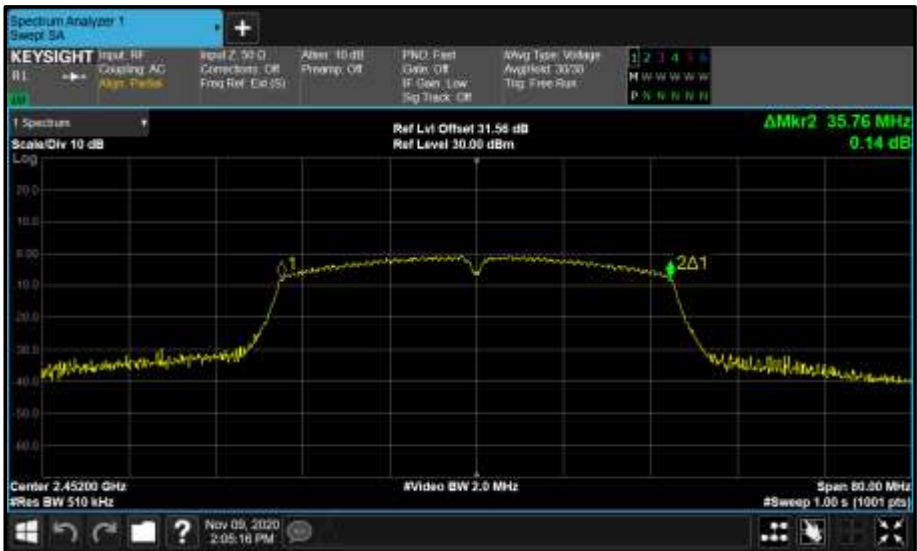


Figure 34 - Core 0 (A) 2452 MHz (CH9) 99% Bandwidth



Figure 35 - Core 0 (A) 2452 MHz (CH9) 6 dB Bandwidth

FCC 47 CFR Part 15, Limit Clause 15.247(a)(2) and ISED RSS-247, Clause 5.2(a)

The minimum 6 dB Bandwidth shall be at least 500 kHz.



2.3.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	17-May-2021
Multimeter	Iso-tech	IDM101	2424	12	12-Dec-2020
Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	17-May-2021
MXA Signal Analyser	Keysight Technologies	N9020B	5528	24	04-Mar-2022
Signal Commissioning Unit	TUV SUD	SCU001	5546	12	15-Apr-2021
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB 40	5605	12	08-Sep-2021

Table 35



2.4 Maximum Conducted Output Power

2.4.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (b)
ISED RSS-247, Clause 5.4
ISED RSS-GEN, Clause 6.12

2.4.2 Equipment Under Test and Modification State

SC2020, S/N: 1PR001905GK12RP - Modification State 0

2.4.3 Date of Test

09-November-2020

2.4.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 11.9.2.3.2 Method AVGPM-G..

2.4.5 Environmental Conditions

Ambient Temperature 24.3 °C
Relative Humidity 48.9 %

2.4.6 Test Results

2.4 GHz WLAN

Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Mode:	802.11b	Duty Cycle (%):	N/A
Data Rate:	1 Mbps	Antenna Gain (dBi):	2.50
Antenna Configuration:	SISO	Beamforming Gain (dBi):	N/A
Active Port(s):	A (Core 0)	Active ChainId(s):	-

Table 36

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	Σ		
2412	14.5	-	-	-	-	30.00	-15.53
2437	14.3	-	-	-	-	30.00	-15.69
2462	14.2	-	-	-	-	30.00	-15.78

Table 37 - Maximum Conducted (average) Output Power Results



Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Mode:	802.11g	Duty Cycle (%):	N/A
Data Rate:	6 Mbps	Antenna Gain (dBi):	2.50
Antenna Configuration:	SISO	Beamforming Gain (dBi):	N/A
Active Port(s):	A (Core 0)	Active ChainId(s):	-

Table 38

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	Σ		
2412	9.6	-	-	-	-	30.00	-20.35
2437	14.1	-	-	-	-	30.00	-15.89
2462	9.5	-	-	-	-	30.00	-20.51

Table 39 - Maximum Conducted (average) Output Power Results

Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Mode:	802.11n 20 MHz Bandwidth	Duty Cycle (%):	N/A
Modulation Coding Scheme:	MCS0	Antenna Gain (dBi):	2.50
Antenna Configuration:	SISO	Beamforming Gain (dBi):	N/A
Active Port(s):	A (Core 0)	Active ChainId(s):	-

Table 40

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	Σ		
2412	9.7	-	-	-	-	30.00	-20.33
2437	13.4	-	-	-	-	30.00	-16.63
2462	9.6	-	-	-	-	30.00	-20.37

Table 41 - Maximum Conducted (average) Output Power Results



Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Mode:	802.11n 40 MHz Bandwidth	Duty Cycle (%):	N/A
Modulation Coding Scheme:	MCS0	Antenna Gain (dBi):	2.50
Antenna Configuration:	SISO	Beamforming Gain (dBi):	N/A
Active Port(s):	A (Core 0)	Active ChainId(s):	-

Table 42

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	Σ		
2422	7.7	-	-	-	-	30.00	-22.30
2437	9.8	-	-	-	-	30.00	-20.15
2452	7.6	-	-	-	-	30.00	-22.39

Table 43 - Maximum Conducted (average) Output Power Results

FCC 47 CFR Part 15, Limit Clause 15.247 (b)(3)

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

ISED RSS-247, Limit Clause 5.4 (b)

For DTSS employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1 W. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e) of the specification.

2.4.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Multimeter	Iso-tech	IDM101	2424	12	12-Dec-2020
USB Power Sensor	Boonton	RTP5006	5184	12	09-Jan-2021
Signal Commissioning Unit	TUV SUD	SCU001	5546	12	15-Apr-2021
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB 40	5605	12	08-Sep-2021

Table 44

2.5 Authorised Band Edges

2.5.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (d)
ISED RSS-247, Clause 5.5

2.5.2 Equipment Under Test and Modification State

SC2024, S/N: 1PR002039GKP2KB - Modification State 0

2.5.3 Date of Test

11-November-2020

2.5.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 6.10.4.

2.5.5 Environmental Conditions

Ambient Temperature 20.2 °C
Relative Humidity 53.7 %

2.5.6 Test Results

2.4 GHz WLAN

Mode	Data Rate/Modulation Coding Scheme	Frequency (MHz)	Band Edge Frequency (MHz)	Level (dBc)
802.11b	1 Mbps	2412	2400	-41.17
802.11g	6 Mbps	2412	2400	-31.81
802.11n HT20	MCS0	2412	2400	-32.65
802.11n HT40	MCS0	2422	2400	-33.63

Table 45 - SISO

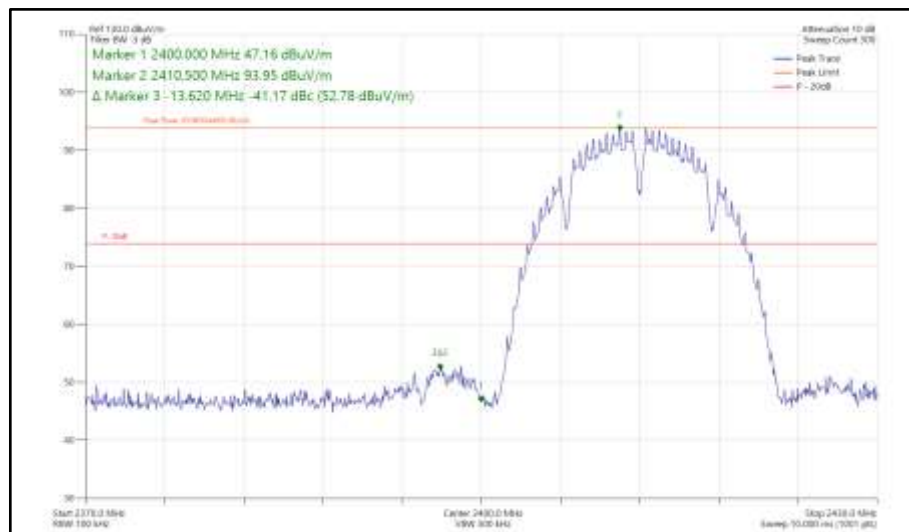
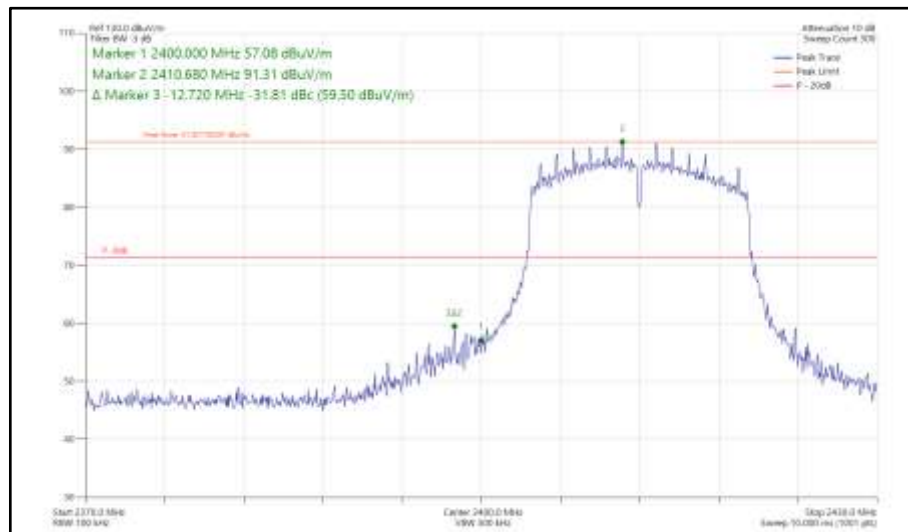
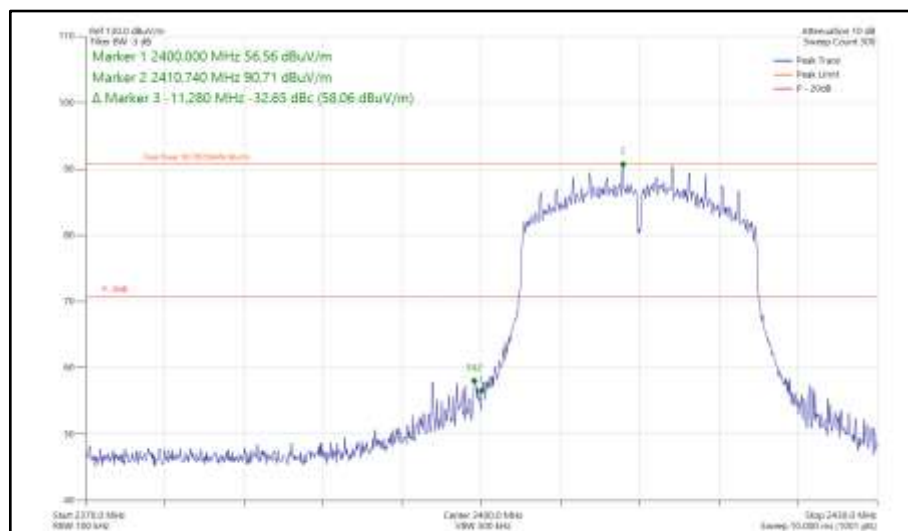


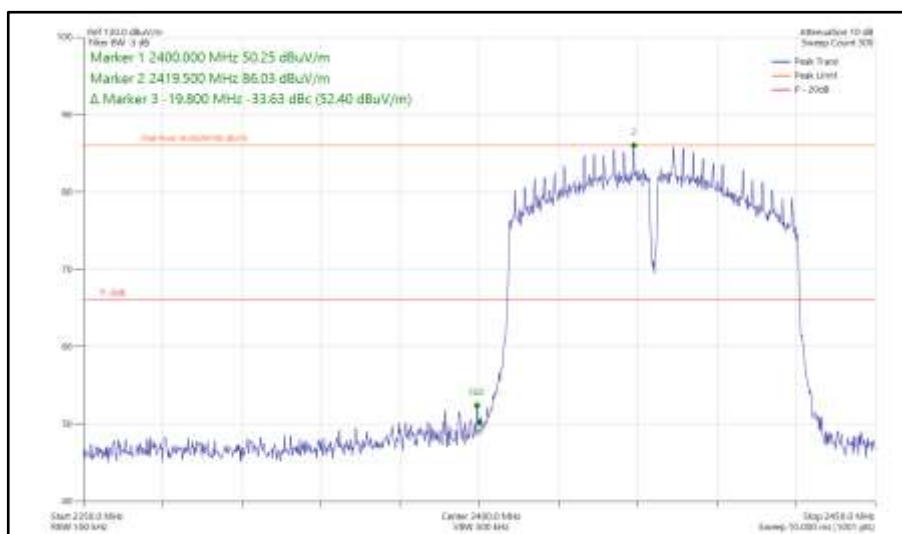
Figure 36 - 802.11b, Core 0 - 2412 MHz
Band Edge Frequency 2400 MHz



**Figure 37 - 802.11g, Core 0 - 2412 MHz
Band Edge Frequency 2400 MHz**



**Figure 38 - 802.11n HT20 Core 0 - 2412 MHz
Band Edge Frequency 2400 MHz**



**Figure 39 - 802.11n HT40 Core 0 - 2422 MHz
Band Edge Frequency 2400 MHz**

Remarks

Compliance was assessed for conducted power, using average methods, therefore the limit at the authorised band edge shall be based on 30 dB below the fundamental instead of 20 dB. The limit line on the above plots show the 20 dBc point, however it can be confirmed that compliance with the 30 dBc limit is met.

FCC 47 CFR Part 15, Limit Clause 15.247 (d)

20 dB below the fundamental measured in a 100 kHz bandwidth using a peak detector. If the transmitter complies with the conducted power limits, based on the use of RMS averaging over a time interval, the attenuation required shall be 30 dB below the fundamental instead of 20 dB.

ISED RSS-247, Limit Clause 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.



2.5.7 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 12.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	03-Jan-2021
Cable (18 GHz)	Rosenberger	LU7-071-2000	5106	12	09-Dec-2020
EmX Emissions Software	TUV SUD	V2.0.1	5125	-	Software
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5481	12	18-Mar-2021
2m SMA Cable	Junkosha	MWX221-02000AMSAMS/A	5517	12	01-Apr-2021
8m N-Type Cable	Junkosha	MWX221-08000NMSNMS/B	5520	12	24-Mar-2021
2 m K Type Cable	Junkosha	MWX241-02000KMSKMS/A	5523	12	3-Apr-2021
Broadband Horn Antenna (1-10 GHz)	Schwarzbeck	BBHA 9120 B	5611	12	22-Sep-2021
Turntable & Mast Controller	Maturo Gmbh	NCD/498/2799.01	5612	-	TU
Tilt Antenna Mast TAM 4.0-P	Maturo Gmbh	TAM 4.0-P	5613	-	TU
3m Semi Anechoic Chamber	MVG	EMC-3	5621	36	11-Aug-2023

Table 46

TU - Traceability Unscheduled



2.6 Spurious Radiated Emissions

2.6.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (d) and 15.205
ISED RSS-247, Clause 5.5
ISED RSS-GEN, Clause 6.13

2.6.2 Equipment Under Test and Modification State

SC2024, S/N: 1PR002039GKP2KB - Modification State 0

2.6.3 Date of Test

11-November-2020 to 18-November-2020

2.6.4 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.

For an EUT which could reasonable be used in multiple planes, pre-scans were performed with the EUT orientated in X, Y and Z planes with reference to the ground plane.

Ports on the EUT were terminated with loads as described in ANSI C63.4 clause 6.2.4. For EUT's with multiple connectors of the same type, additional interconnecting cables were connected, and pre-scans performed to determine whether the level of the emissions were increased by >2 dB.

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.

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 20 dBc outside restricted bands. 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.

Where formal measurements have been necessary, the results have been presented in the emissions table.

2.6.5 Example Test Setup Diagram

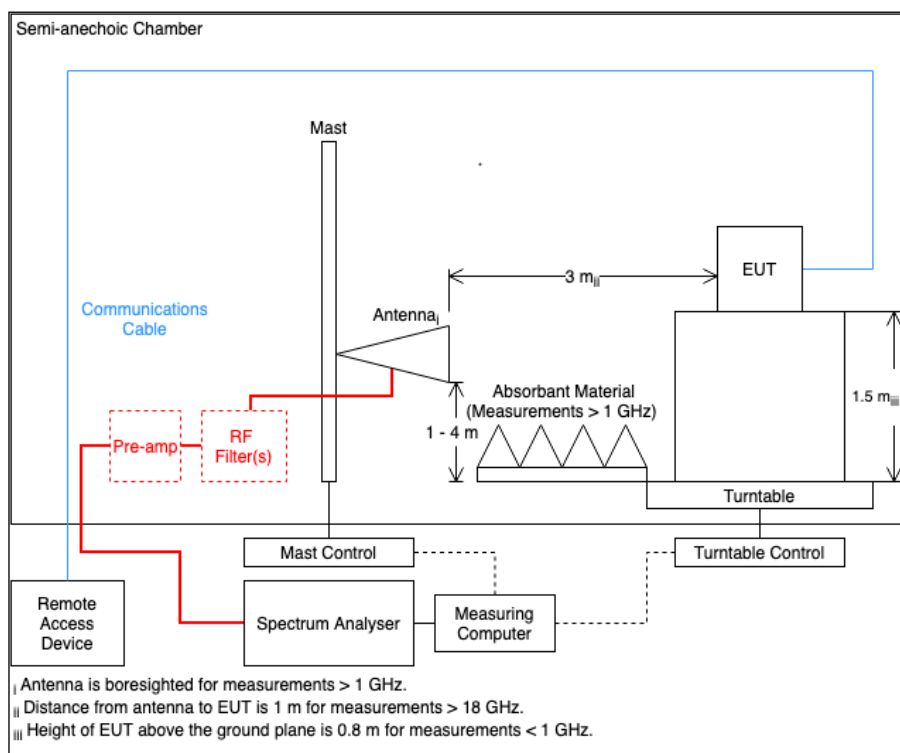


Figure 40

2.6.6 Environmental Conditions

Ambient Temperature 19.8 - 20.2 °C
Relative Humidity 50.0 - 57.6 %

2.6.7 Test Results

2.4 GHz WLAN

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation	Orientation
4823.902	51.0	54.0	-3.0	CISPR Avg	165	156	Vertical	X
4823.962	47.7	54.0	-6.3	CISPR Avg	231	100	Horizontal	X

Table 47 - 802.11b - X, 2412 MHz, 30 MHz to 25 GHz

No other emissions found within 6 dB of the limit.

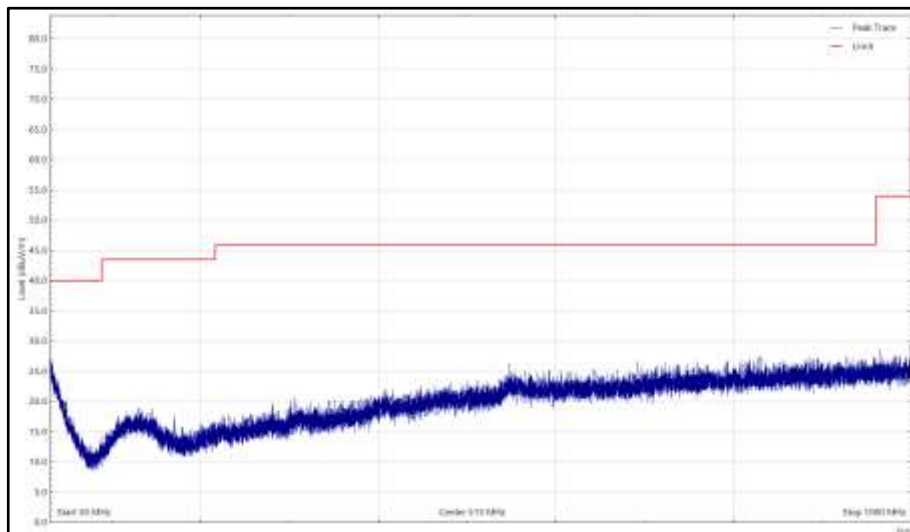


Figure 41 - 802.11b - X, 2412 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

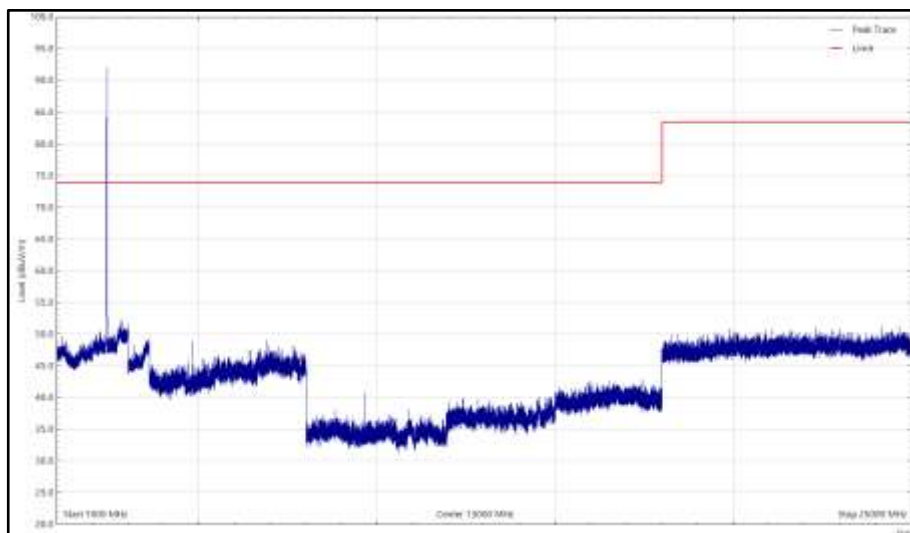


Figure 42 - 802.11b - X, 2412 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

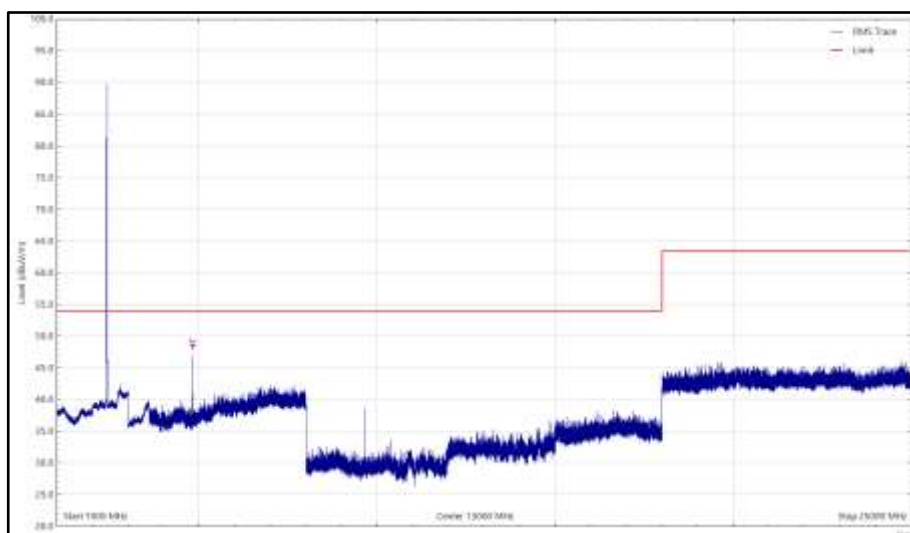


Figure 43 - 802.11b - X, 2412 MHz, 1 GHz to 25 GHz, Horizontal (rms)

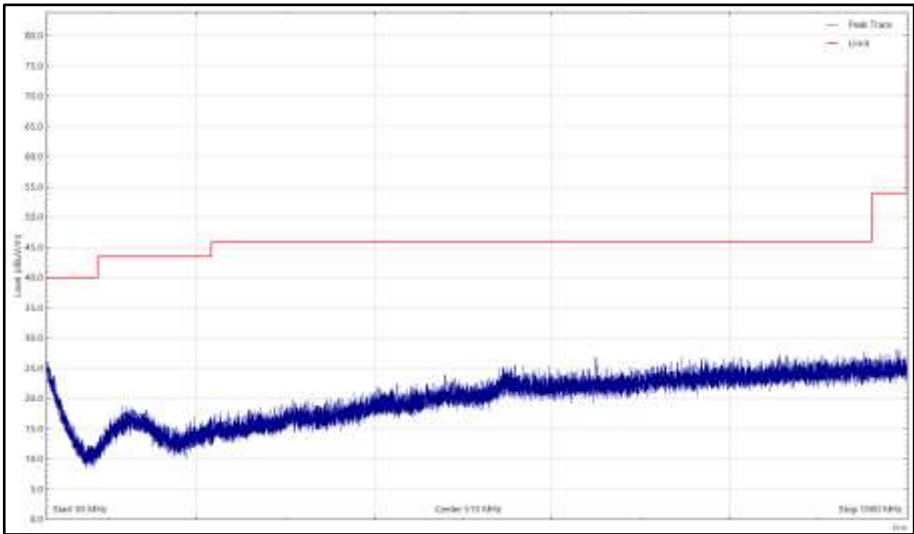


Figure 44 - 802.11b - X, 2412 MHz, 30 MHz to 1 GHz, Vertical (Peak)

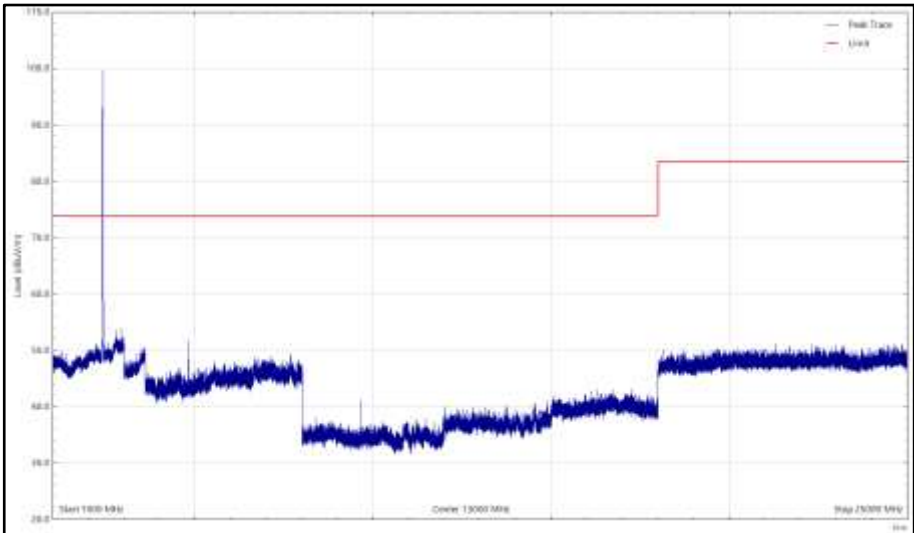


Figure 45 - 802.11b - X, 2412 MHz, 1 GHz to 25 GHz, Vertical (Peak)

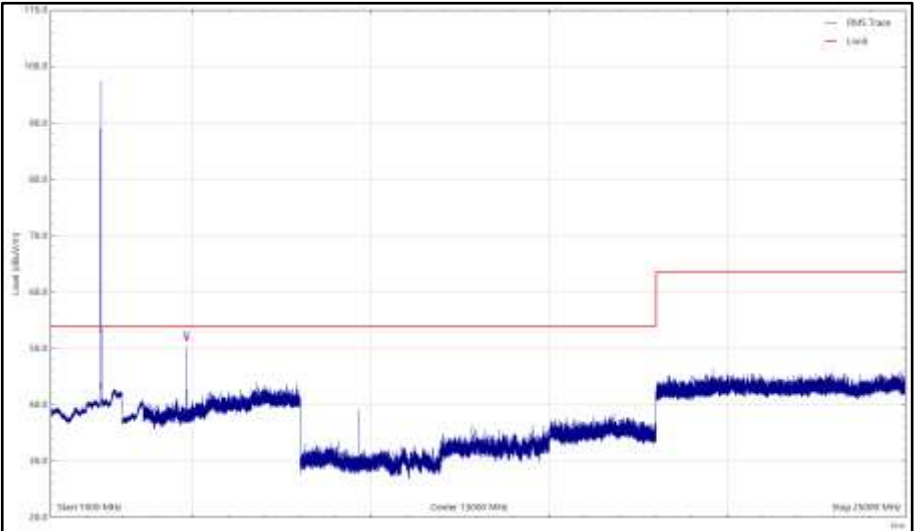


Figure 46 - 802.11b - X, 2412 MHz, 1 GHz to 25 GHz, Vertical (rms)

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation	Orientation
4873.824	50.5	54.0	-3.4	CISPR Avg	177	100	Vertical	X
4873.909	47.6	54.0	-6.4	CISPR Avg	223	133	Horizontal	X

Table 48 - 802.11b - X, 2437 MHz, 30 MHz to 25 GHz

No other emissions found within 6 dB of the limit.

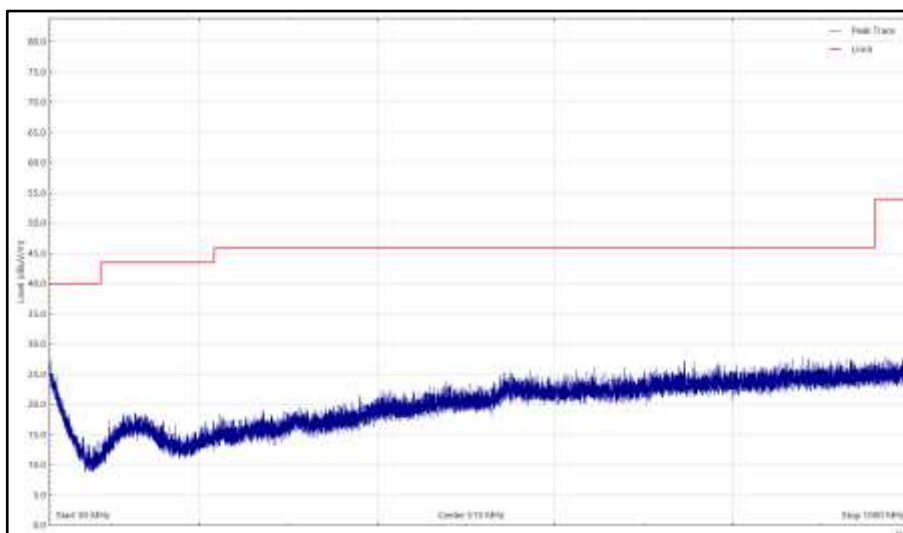


Figure 47 - 802.11b - X, 2437 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

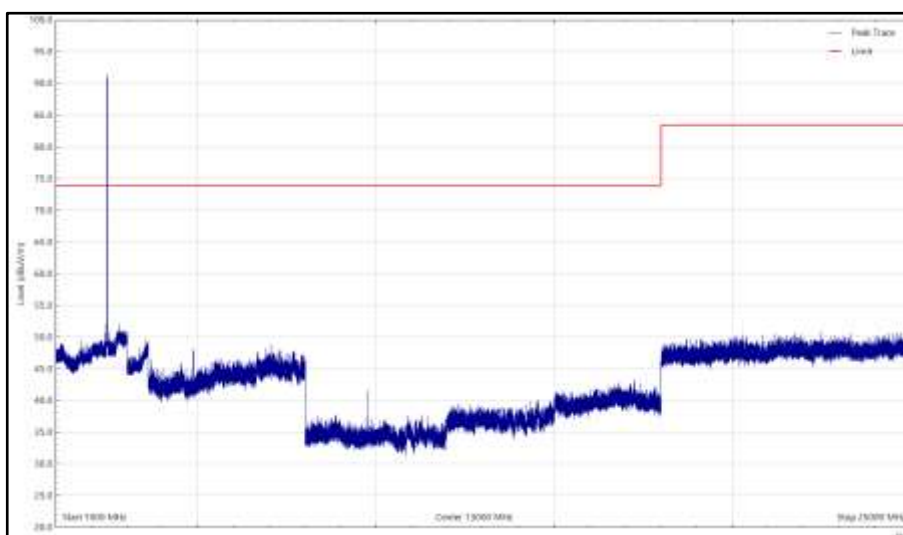


Figure 48 - 802.11b - X, 2437 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

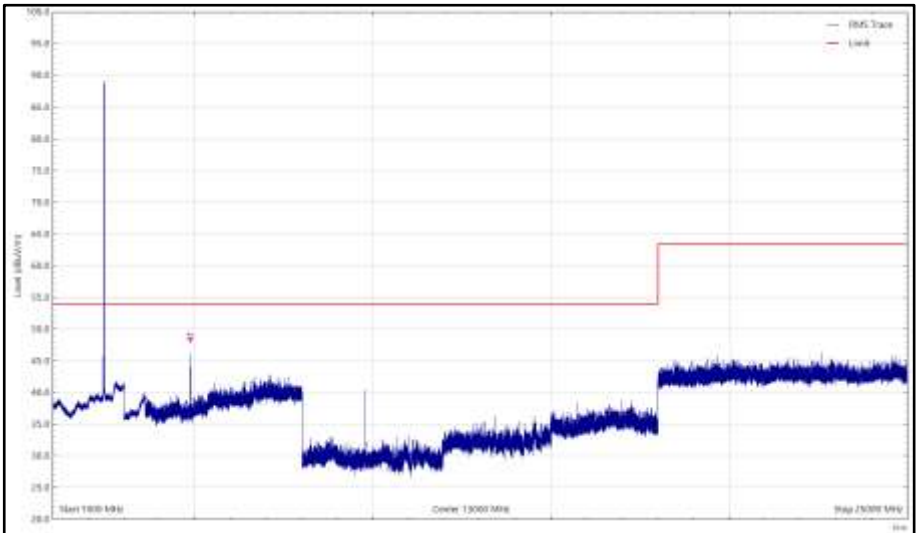


Figure 49 - 802.11b - X, 2437 MHz, 1 GHz to 25 GHz, Horizontal (rms)

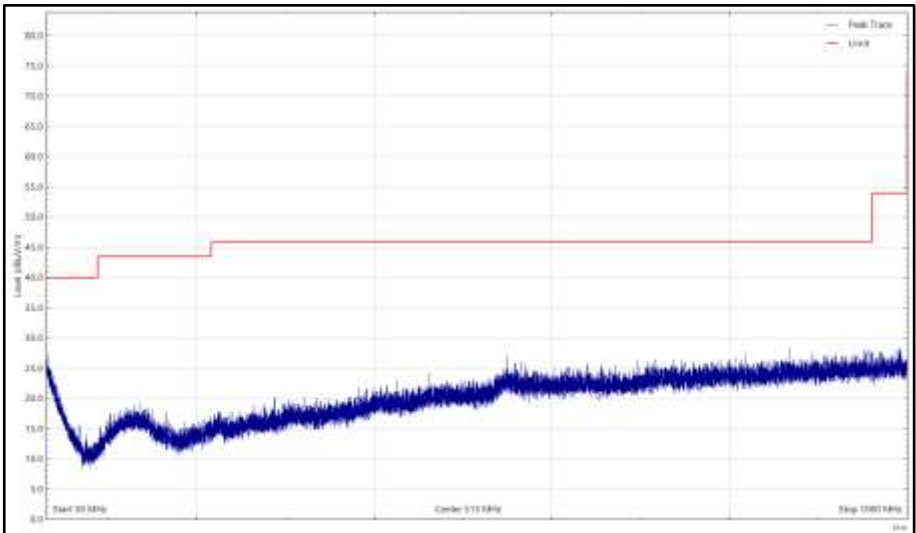


Figure 50 - 802.11b - X, 2437 MHz, 30 MHz to 1 GHz, Vertical (Peak)

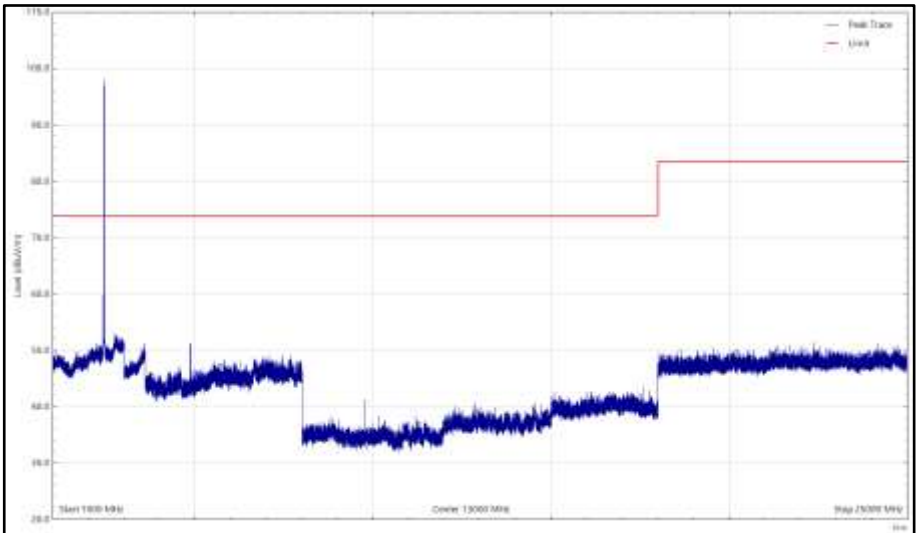


Figure 51 - 802.11b - X, 2437 MHz, 1 GHz to 25 GHz, Vertical (Peak)

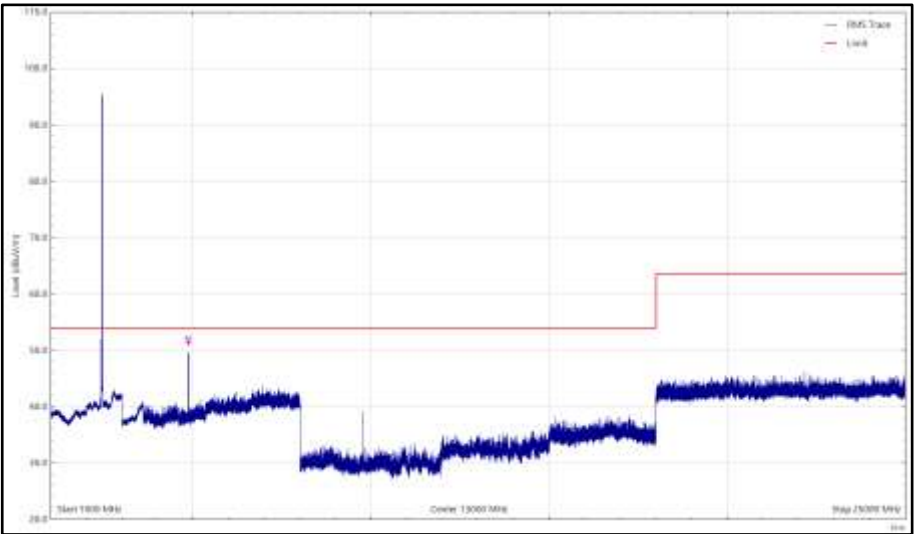


Figure 52 - 802.11b - X, 2437 MHz, 1 GHz to 25 GHz, Vertical (rms)

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation	Orientation
4923.976	50.4	54.0	-3.6	CISPR Avg	173	102	Vertical	X
4923.980	47.2	54.0	-6.8	CISPR Avg	222	100	Horizontal	X

Table 49 - 802.11b - X, 2462 MHz, 30 MHz to 25 GHz

No other emissions found within 6 dB of the limit.

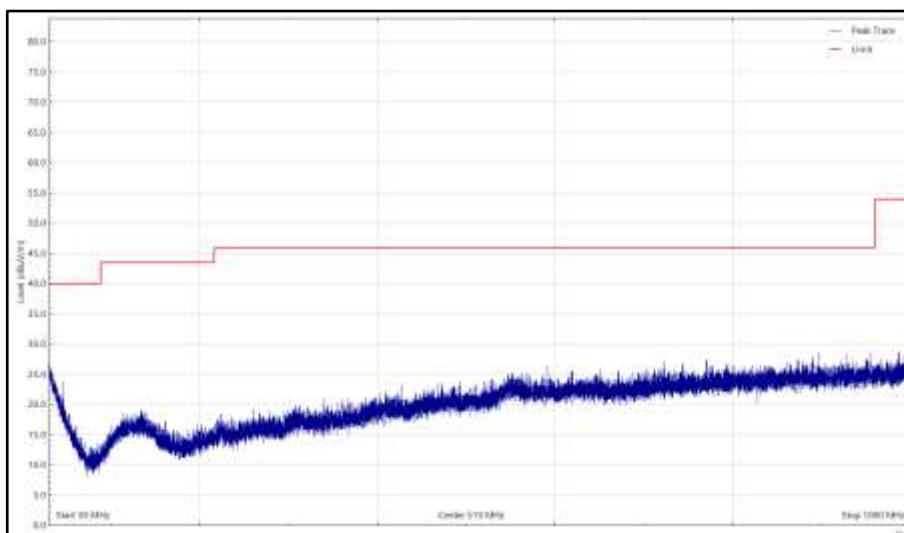


Figure 53 - 802.11b - X, 2462 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

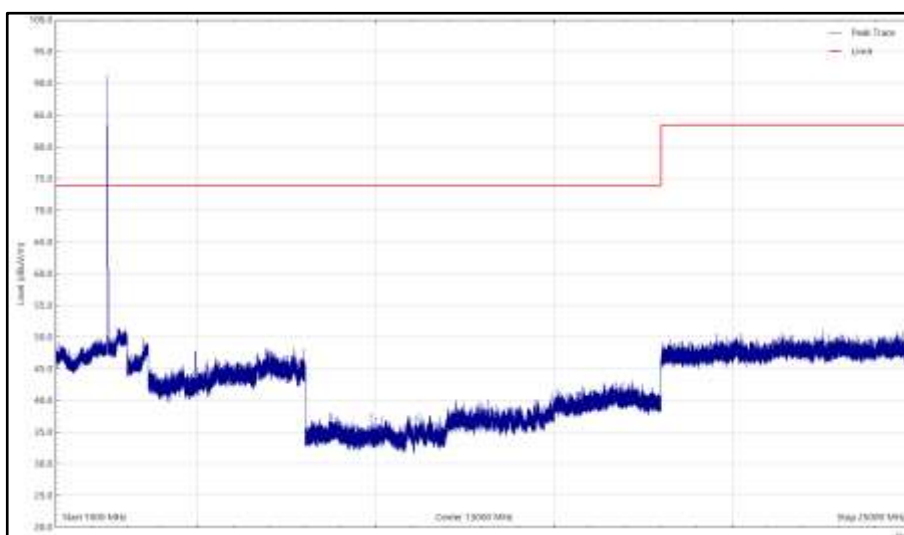


Figure 54 - 802.11b - X, 2462 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

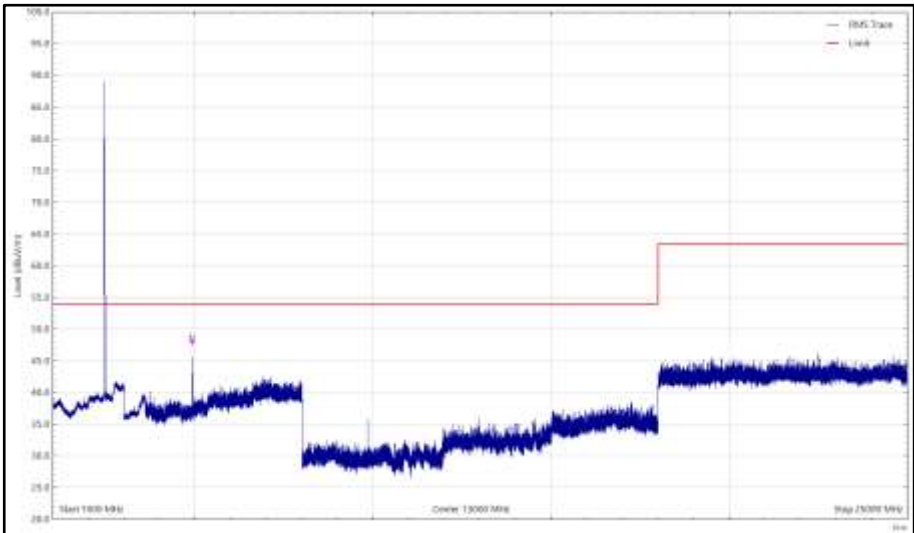


Figure 55 - 802.11b - X, 2462 MHz, 1 GHz to 25 GHz, Horizontal (rms)

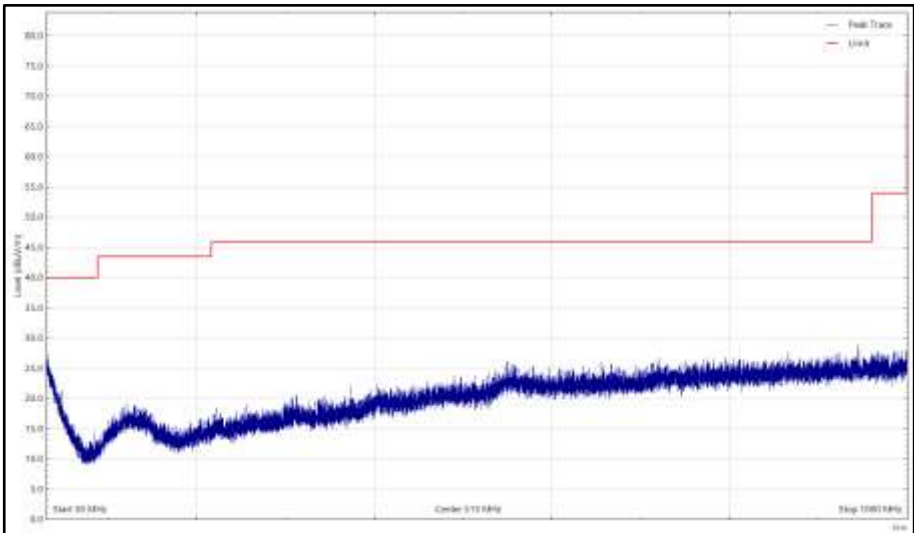


Figure 56 - 802.11b - X, 2462 MHz, 30 MHz to 1 GHz, Vertical (Peak)

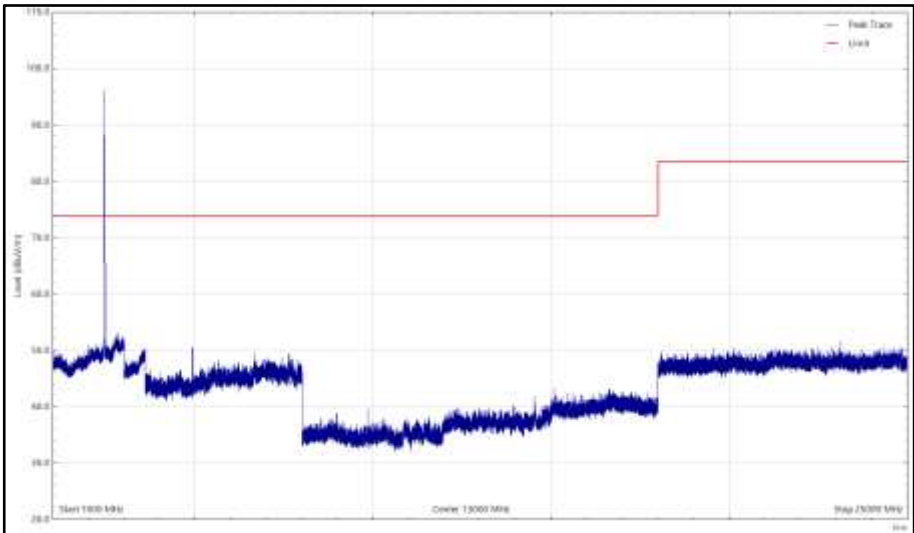


Figure 57 - 802.11b - X, 2462 MHz, 1 GHz to 25 GHz, Vertical (Peak)

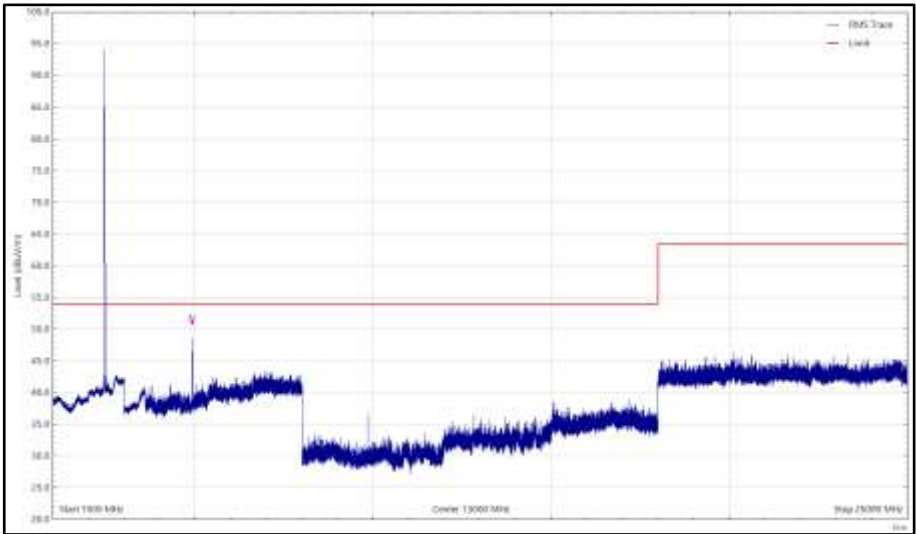


Figure 58 - 802.11b - X, 2462 MHz, 1 GHz to 25 GHz, Vertical (rms)



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

Table 50 - 802.11g - X, 2412 MHz, 30 MHz to 25 GHz

*No emissions found within 6 dB of the limit.

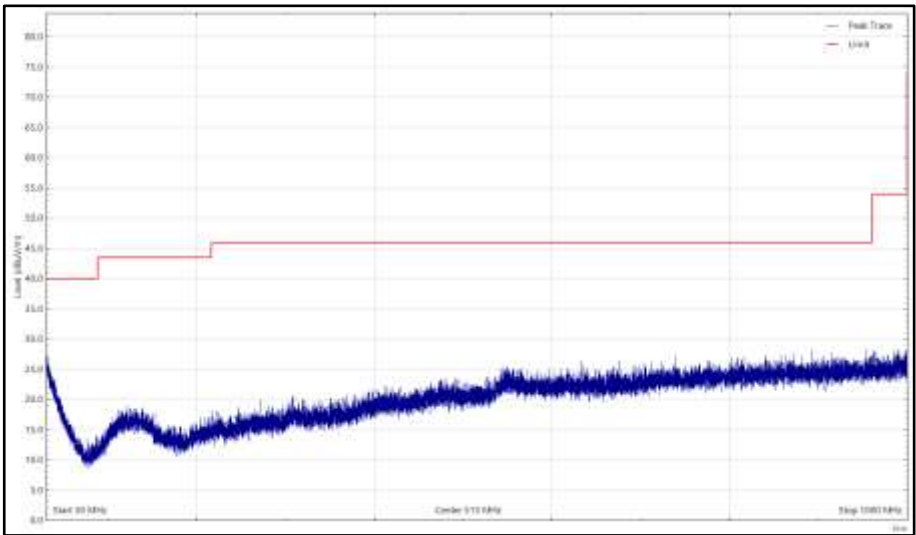


Figure 59 - 802.11g - X, 2412 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

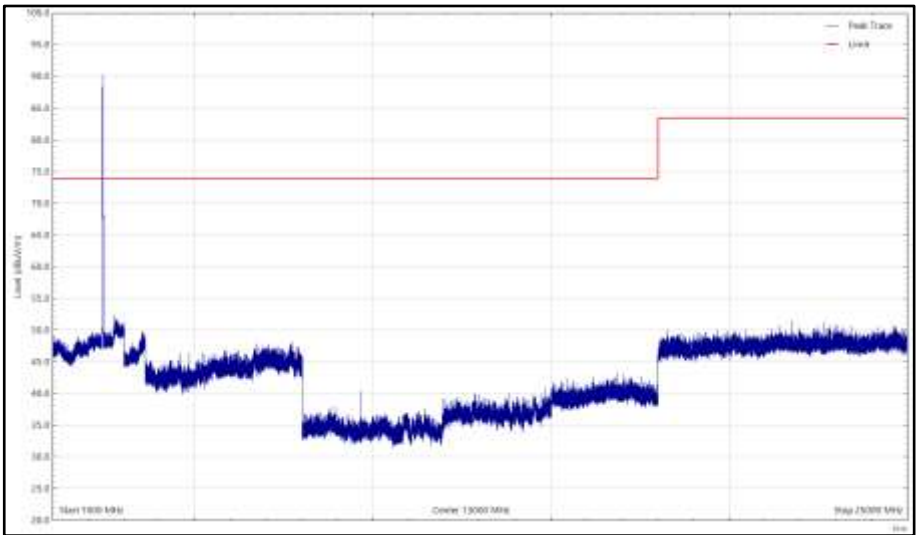


Figure 60 - 802.11g - X, 2412 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

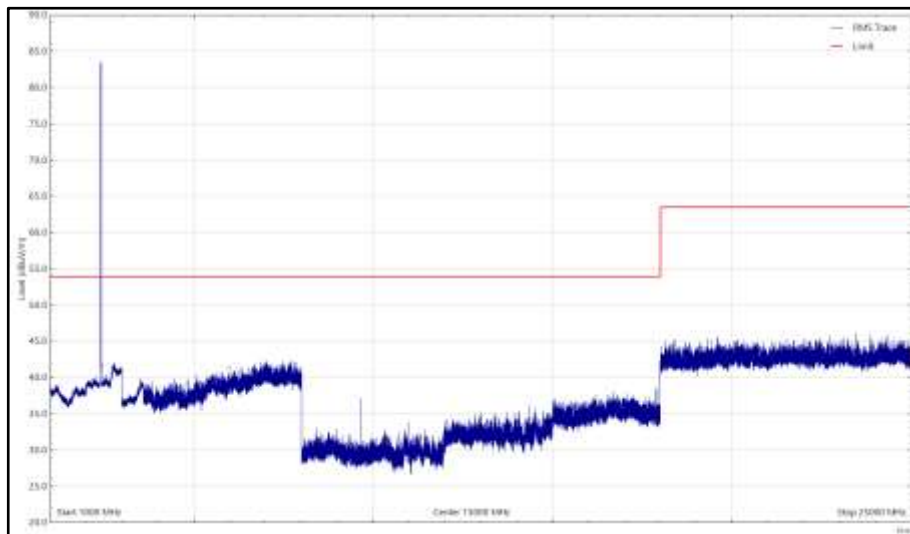


Figure 61 - 802.11g - X, 2412 MHz, 1 GHz to 25 GHz, Horizontal (rms)

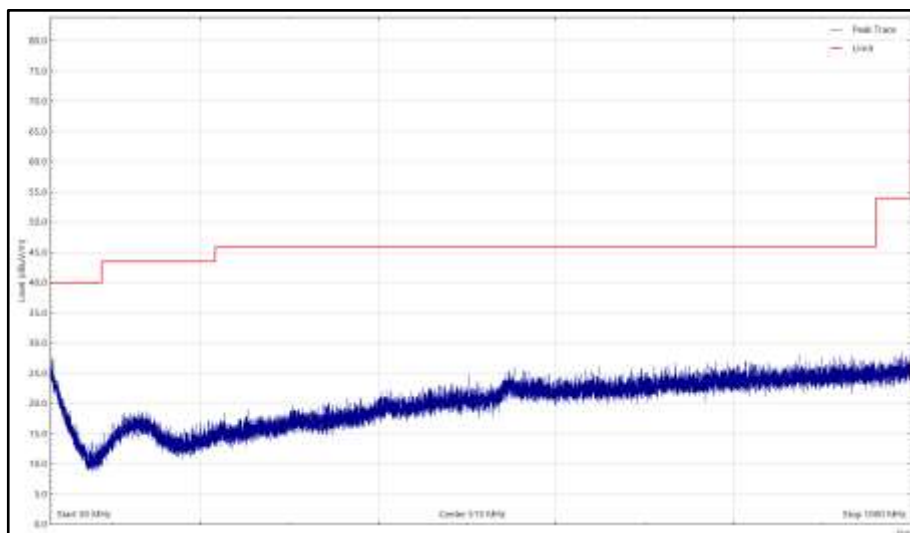


Figure 62 - 802.11g - X, 2412 MHz, 30 MHz to 1 GHz, Vertical (Peak)

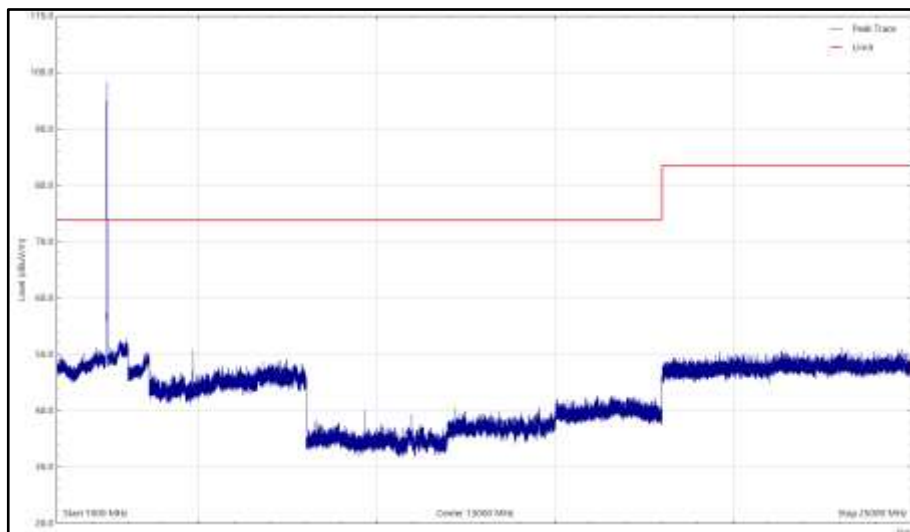


Figure 63 - 802.11g - X, 2412 MHz, 1 GHz to 25 GHz, Vertical (Peak)

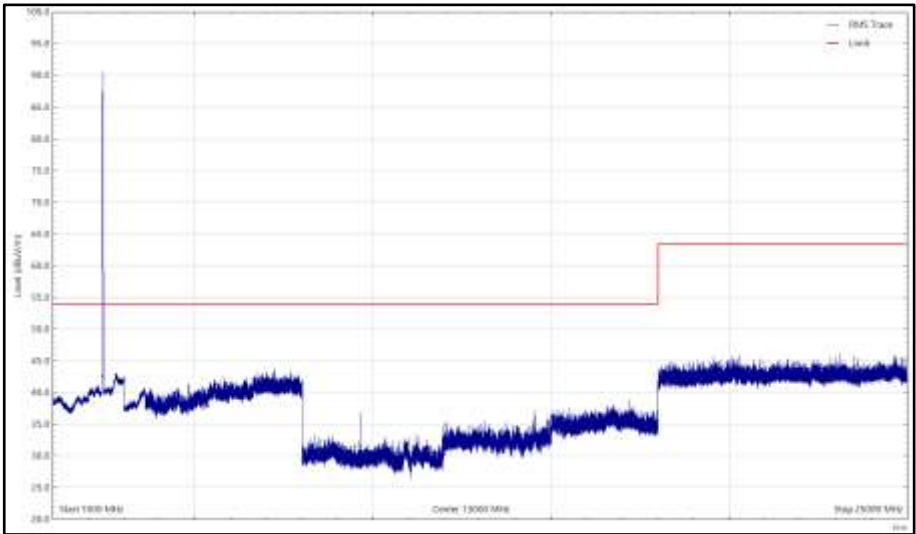


Figure 64 - 802.11g - X, 2412 MHz, 1 GHz to 25 GHz, Vertical (rms)

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

Table 51 - 802.11g - X, 2437 MHz, 30 MHz to 25 GHz

*No emissions found within 6 dB of the limit.

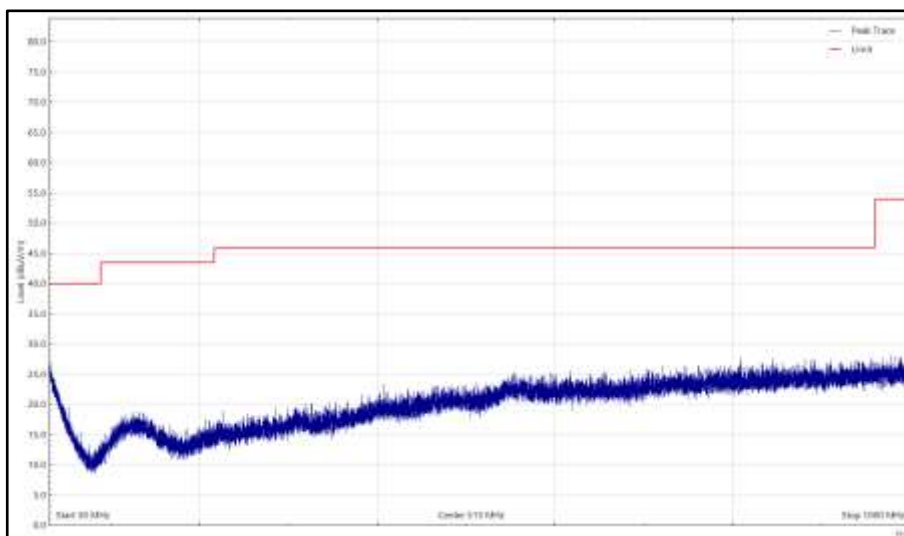


Figure 65 - 802.11g - X, 2437 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

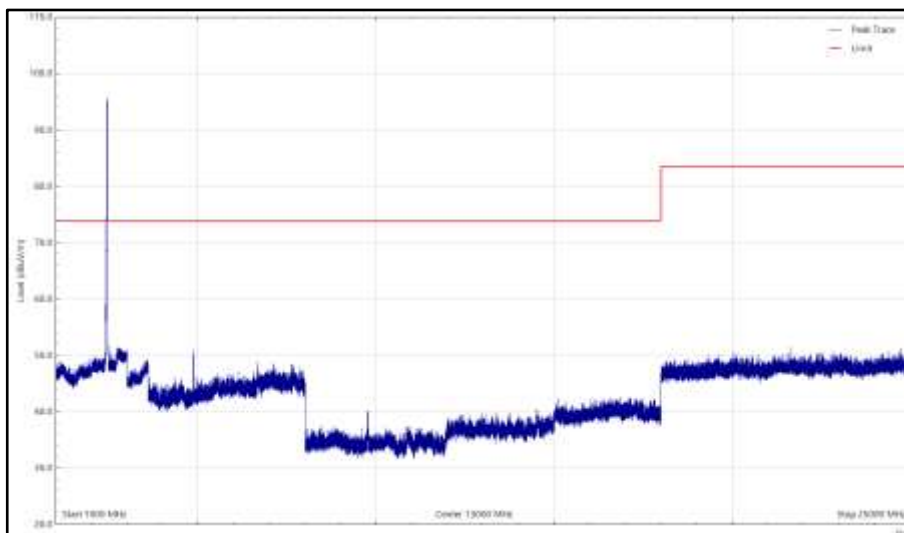


Figure 66 - 802.11g - X, 2437 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

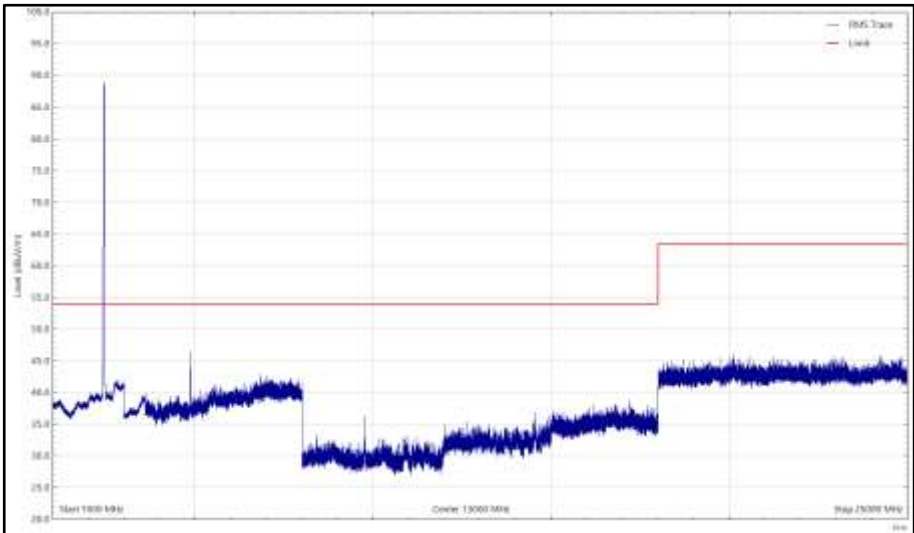


Figure 67 - 802.11g - X, 2437 MHz, 1 GHz to 25 GHz, Horizontal (rms)

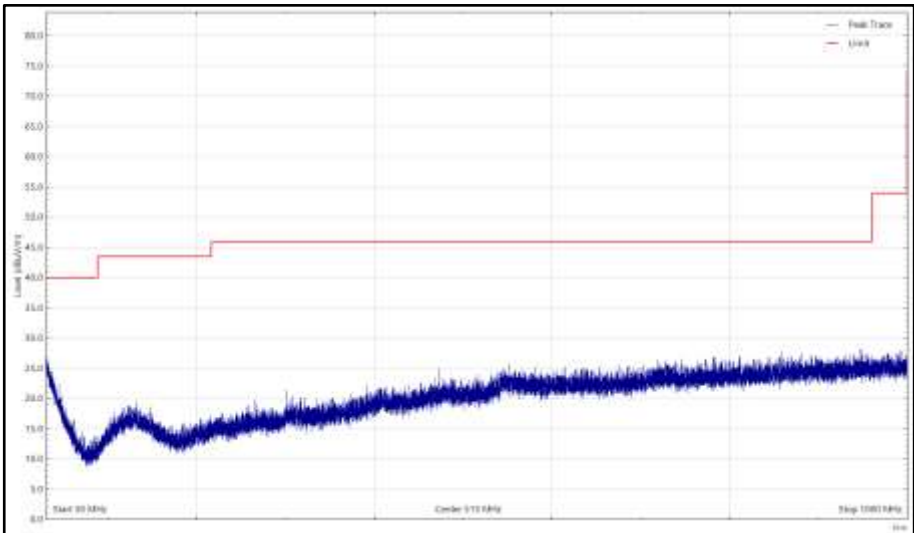


Figure 68 - 802.11g - X, 2437 MHz, 30 MHz to 1 GHz, Vertical (Peak)

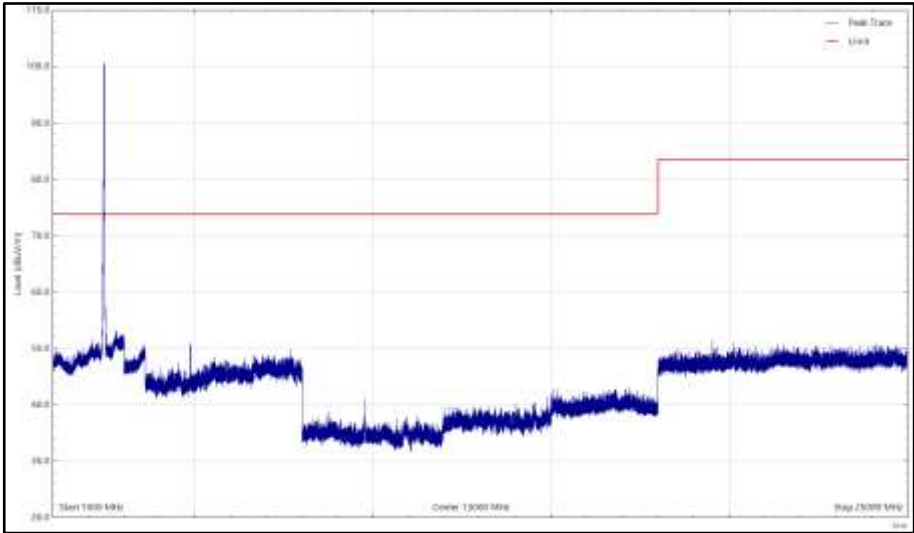


Figure 69 - 802.11g - X, 2437 MHz, 1 GHz to 25 GHz, Vertical (Peak)

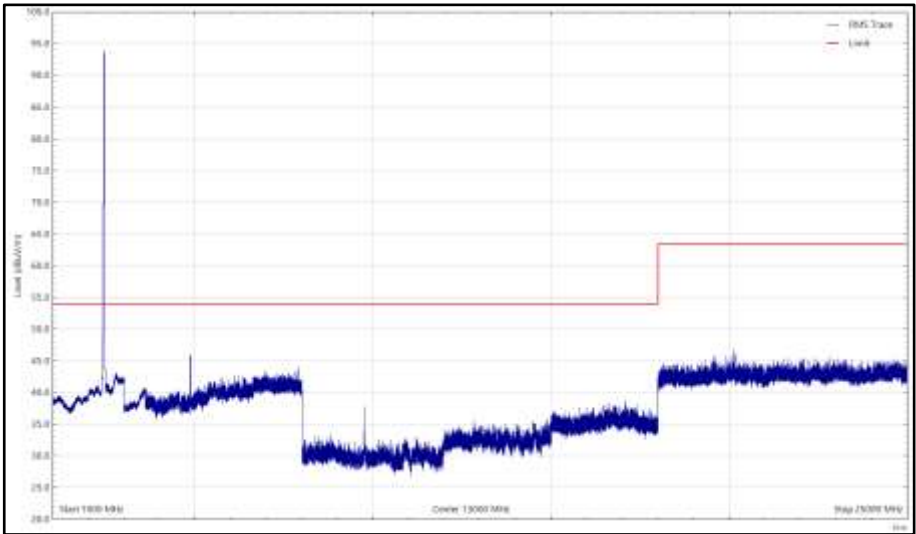


Figure 70 - 802.11g - X, 2437 MHz, 1 GHz to 25 GHz, Vertical (rms)



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

Table 52 - 802.11g - X, 2462 MHz, 30 MHz to 25 GHz

*No emissions found within 6 dB of the limit.

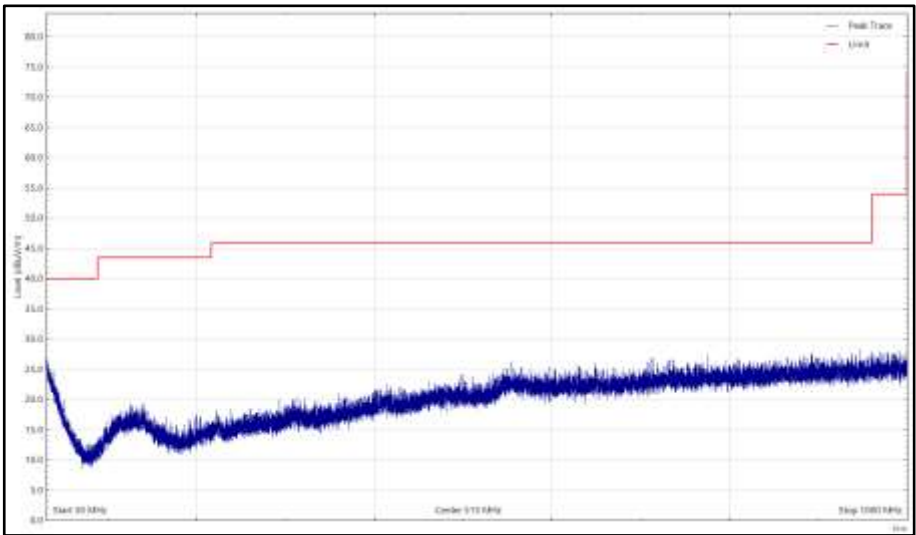


Figure 71 - 802.11g - X, 2462 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

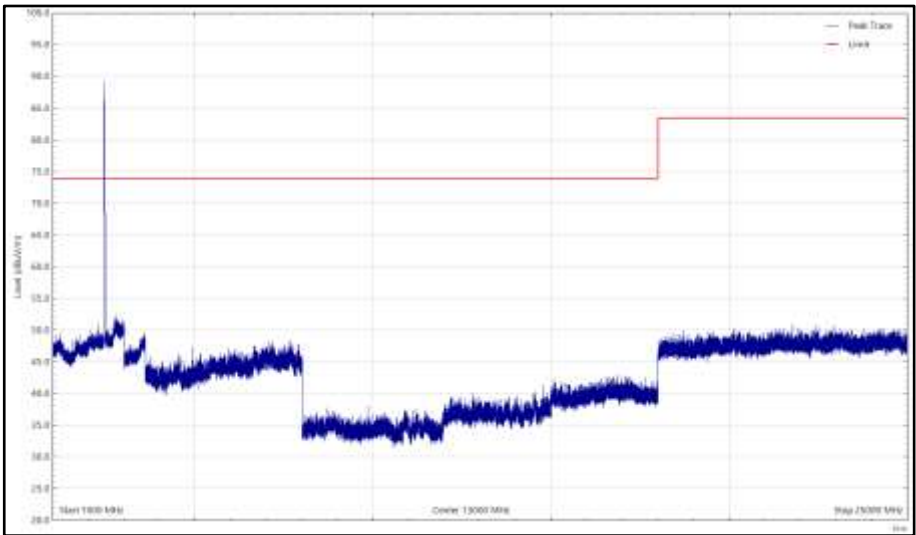


Figure 72 - 802.11g - X, 2462 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

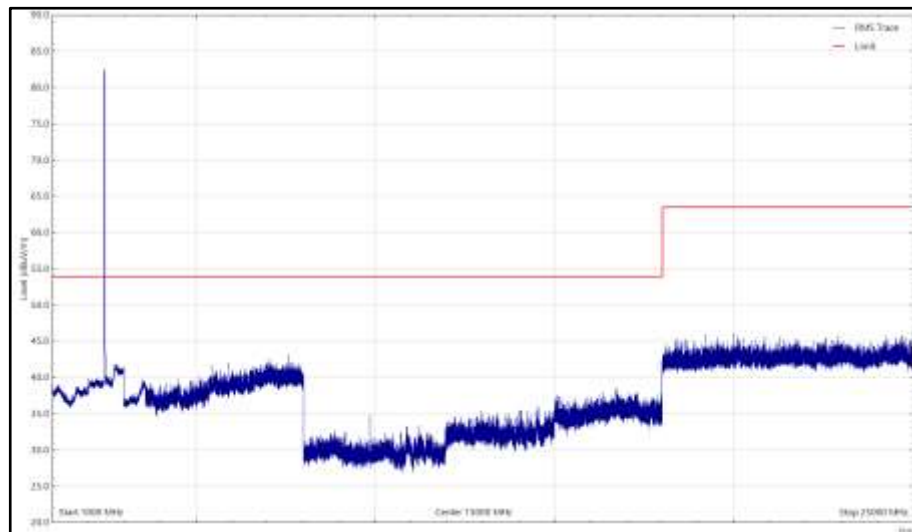


Figure 73 - 802.11g - X, 2462 MHz, 1 GHz to 25 GHz, Horizontal (rms)

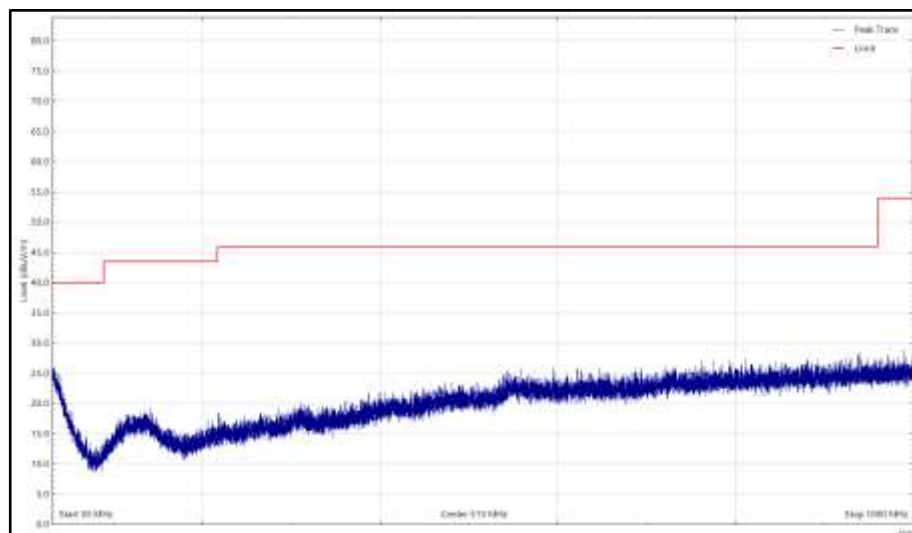


Figure 74 - 802.11g - X, 2462 MHz, 30 MHz to 1 GHz, Vertical (Peak)

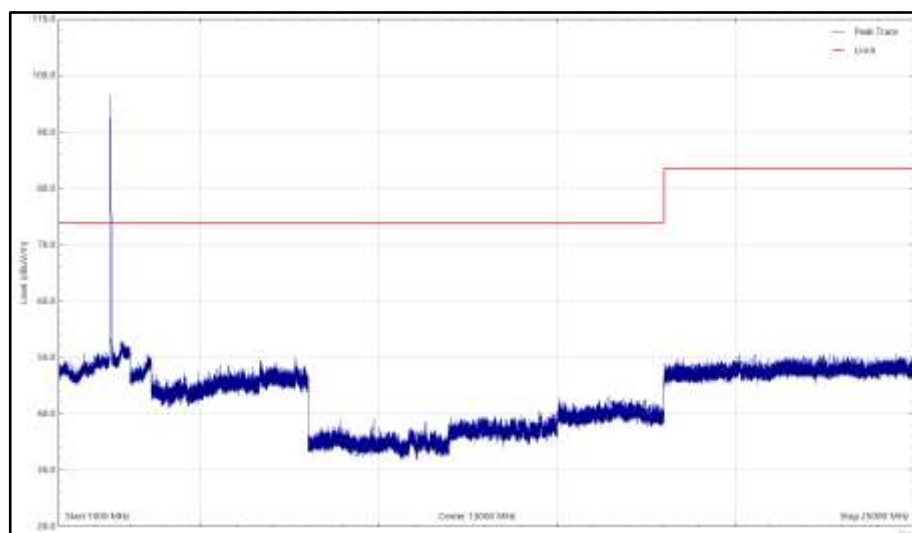


Figure 75 - 802.11g - X, 2462 MHz, 1 GHz to 25 GHz, Vertical (Peak)

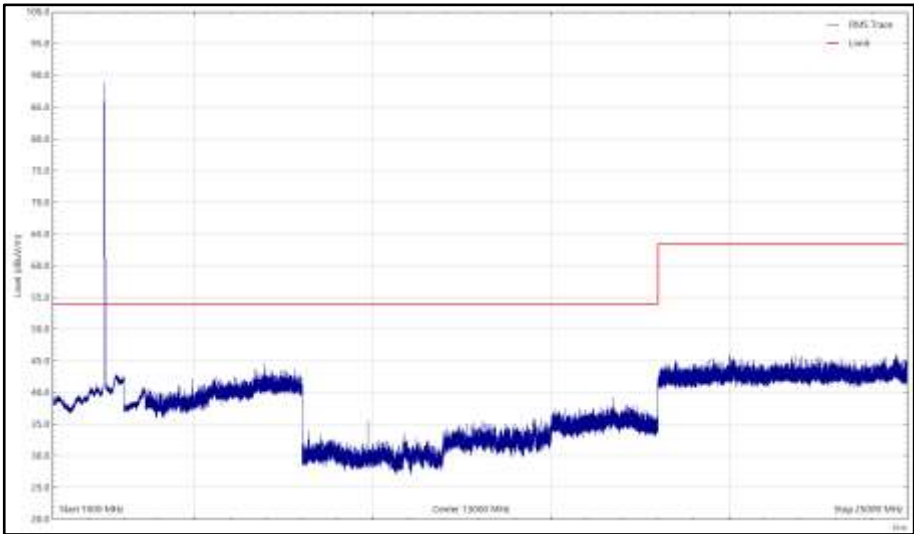


Figure 76 - 802.11g - X, 2462 MHz, 1 GHz to 25 GHz, Vertical (rms)



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

Table 53 - 802.11n20 - X, 2412 MHz, 30 MHz to 25 GHz

*No emissions found within 6 dB of the limit.

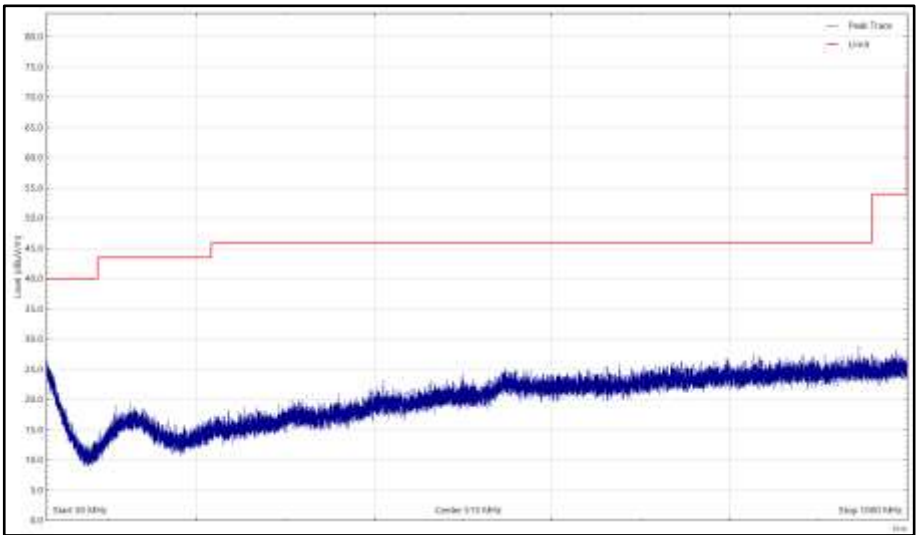


Figure 77 - 802.11n20 - X, 2412 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

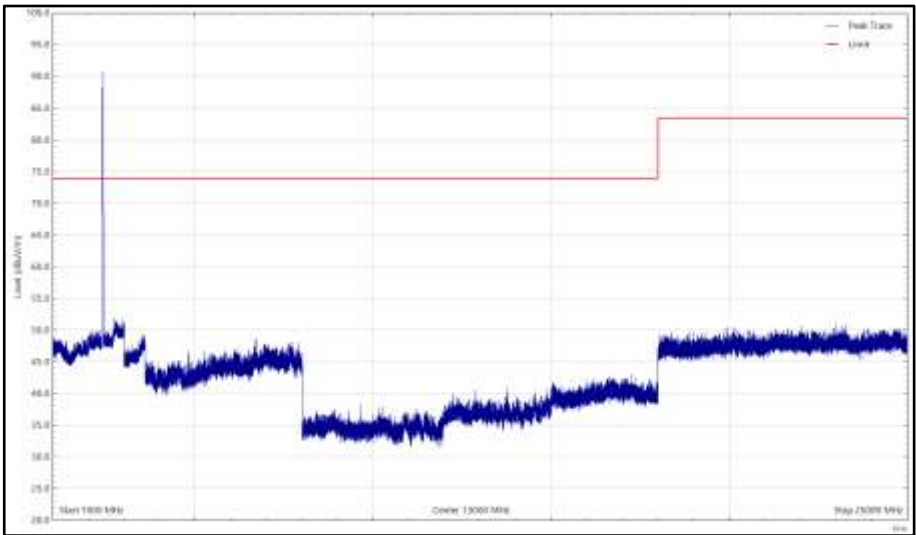


Figure 78 - 802.11n20 - X, 2412 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

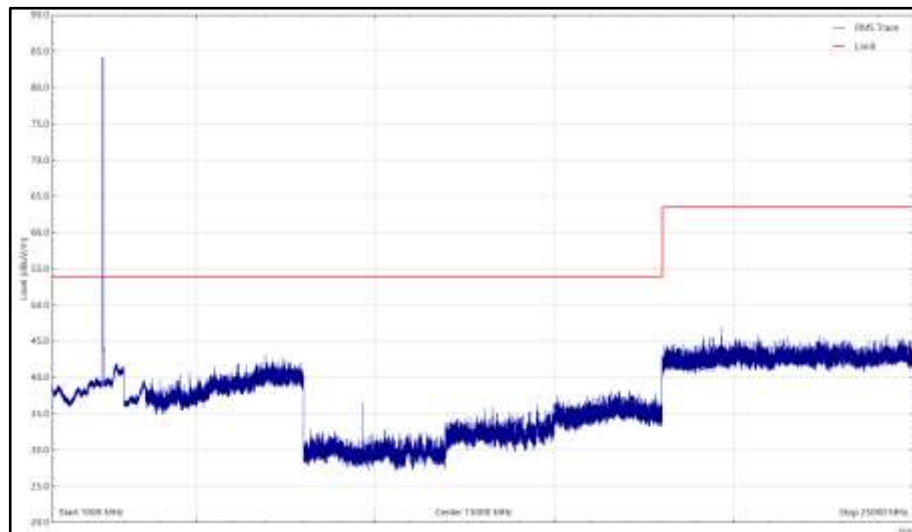


Figure 79 - 802.11n20 - X, 2412 MHz, 1 GHz to 25 GHz, Horizontal (rms)

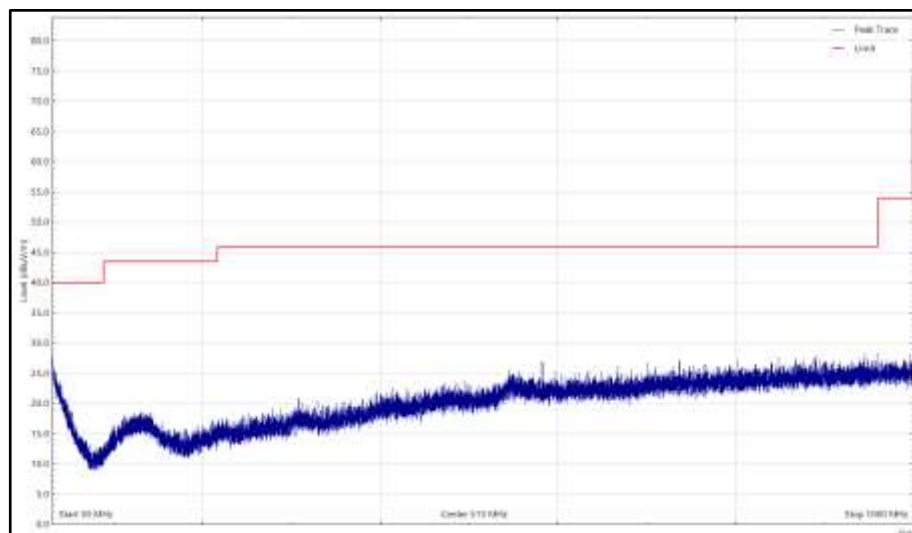


Figure 80 - 802.11n20 - X, 2412 MHz, 30 MHz to 1 GHz, Vertical (Peak)

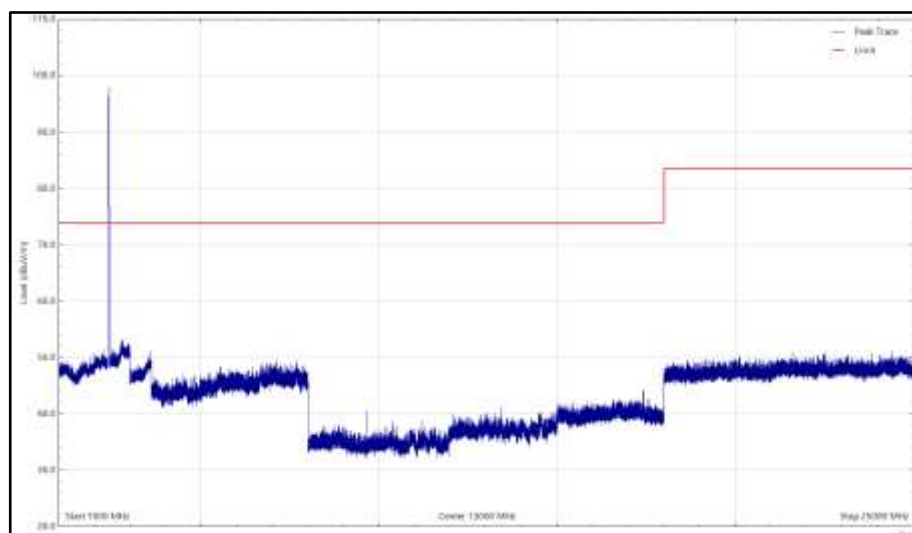


Figure 81 - 802.11n20 - X, 2412 MHz, 1 GHz to 25 GHz, Vertical (Peak)

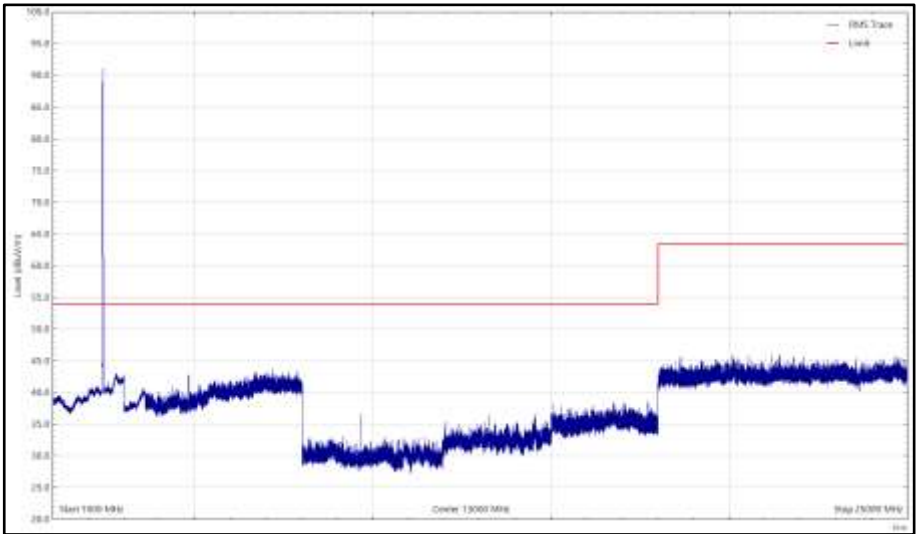


Figure 82 - 802.11n20 - X, 2412 MHz, 1 GHz to 25 GHz, Vertical (rms)



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

Table 54 - 802.11n20 - X, 2437 MHz, 30 MHz to 25 GHz

*No emissions found within 6 dB of the limit.

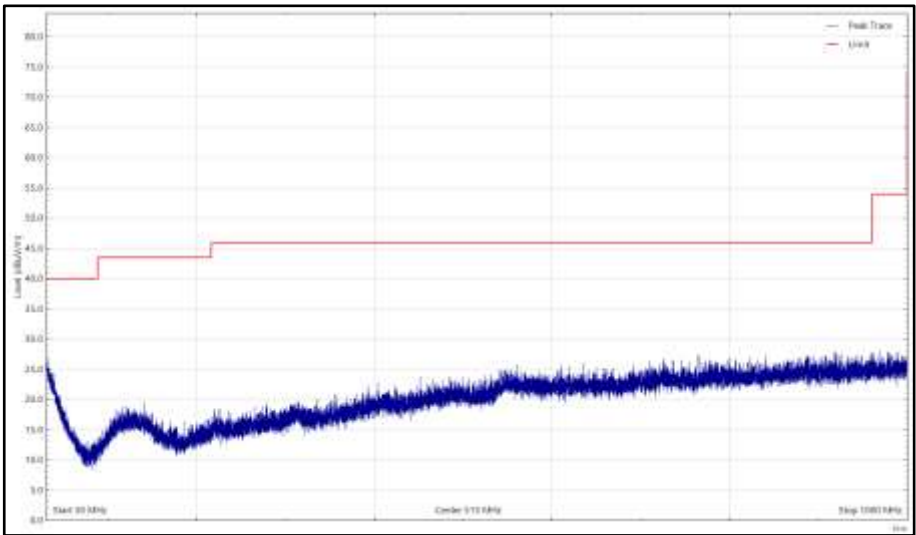


Figure 83 - 802.11n20 - X, 2437 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

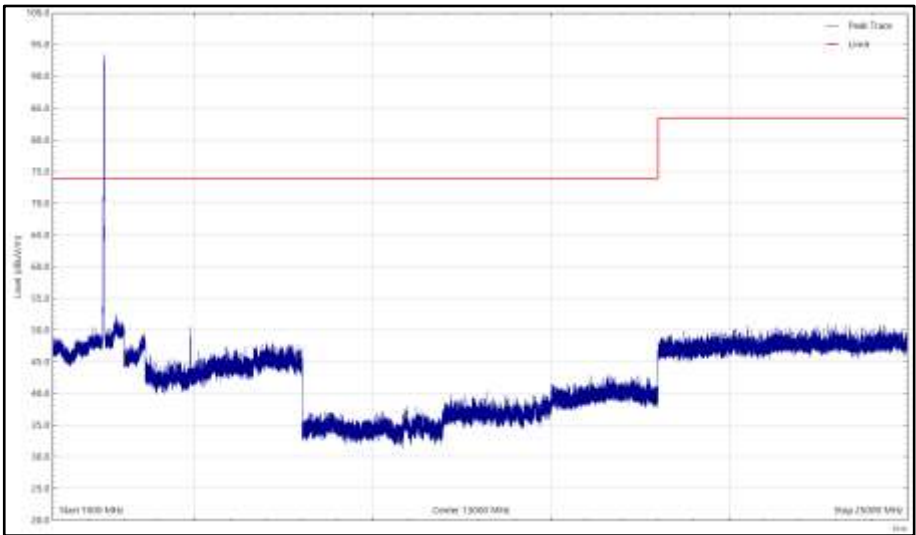


Figure 84 - 802.11n20 - X, 2437 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

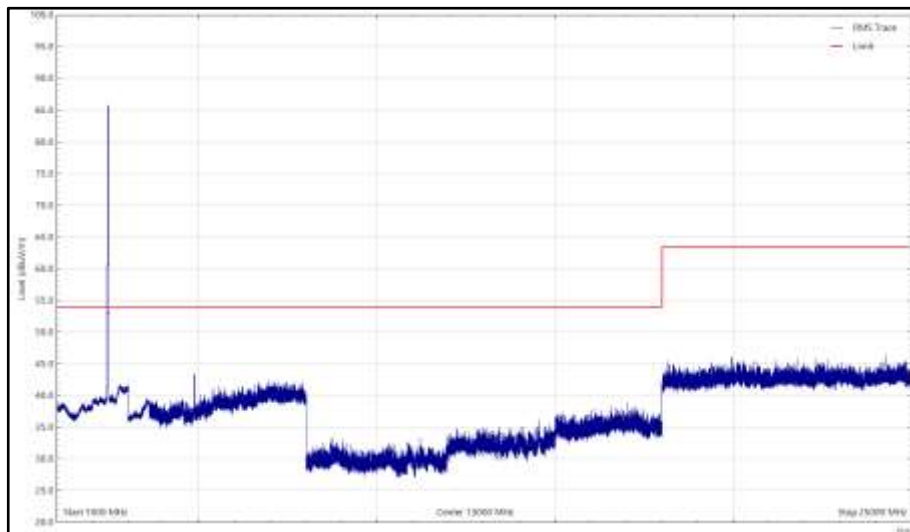


Figure 85 - 802.11n20 - X, 2437 MHz, 1 GHz to 25 GHz, Horizontal (rms)

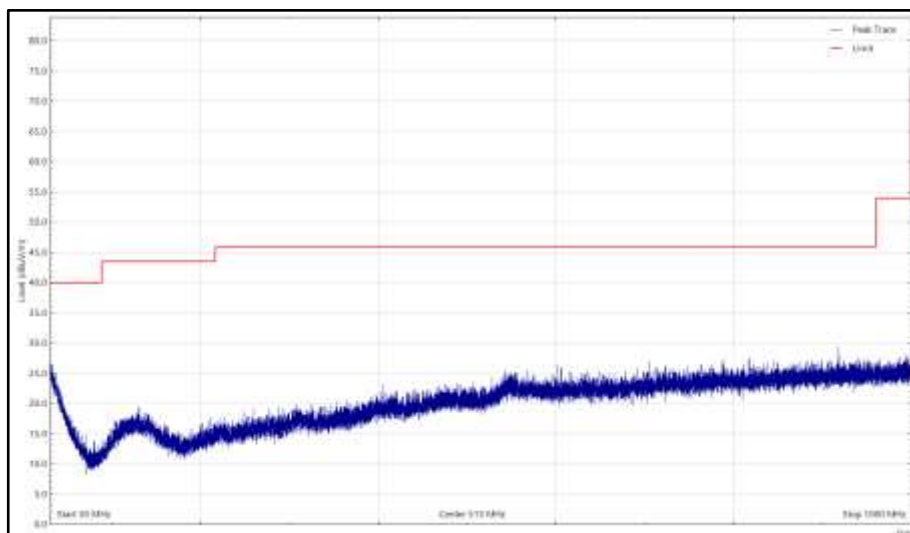


Figure 86 - 802.11n20 - X, 2437 MHz, 30 MHz to 1 GHz, Vertical (Peak)

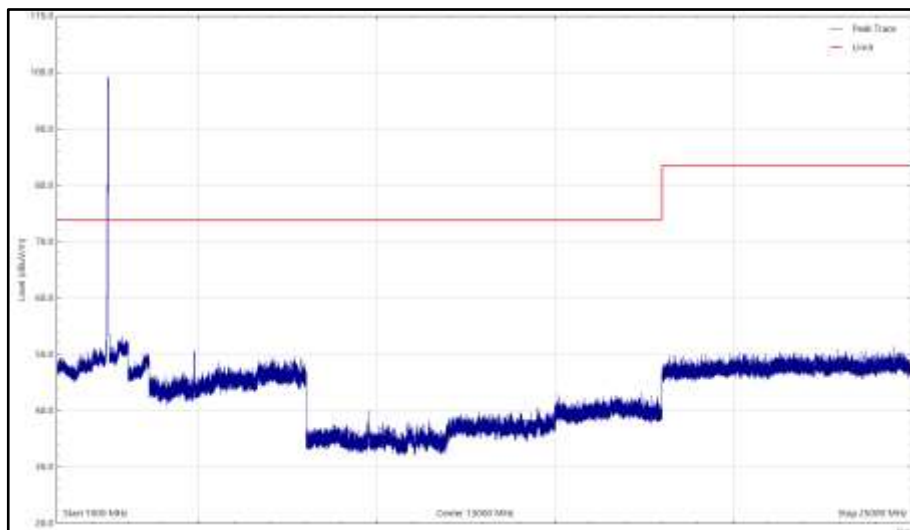


Figure 87 - 802.11n20 - X, 2437 MHz, 1 GHz to 25 GHz, Vertical (Peak)

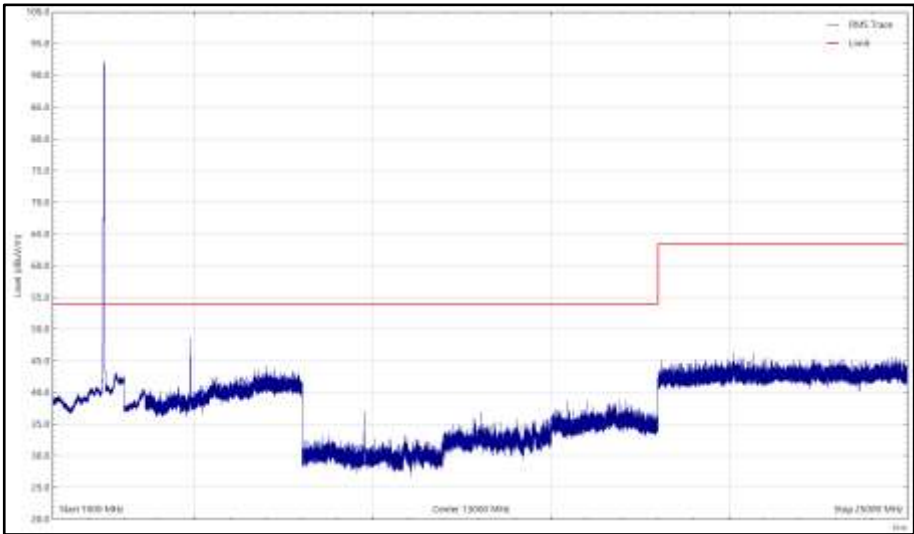


Figure 88 - 802.11n20 - X, 2437 MHz, 1 GHz to 25 GHz, Vertical (rms)



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

Table 55 - 802.11n20 - X, 2462 MHz, 30 MHz to 25 GHz

*No emissions found within 6 dB of the limit.

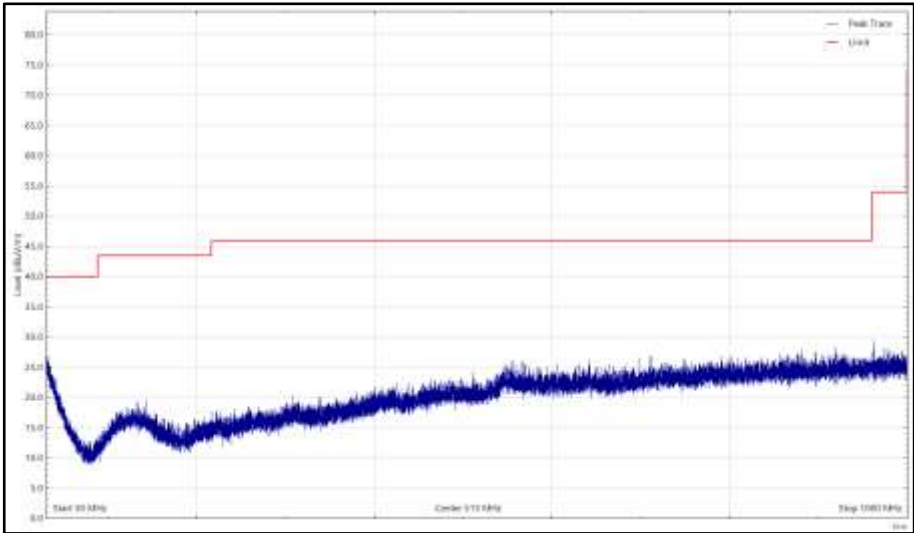


Figure 89 - 802.11n20 - X, 2462 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

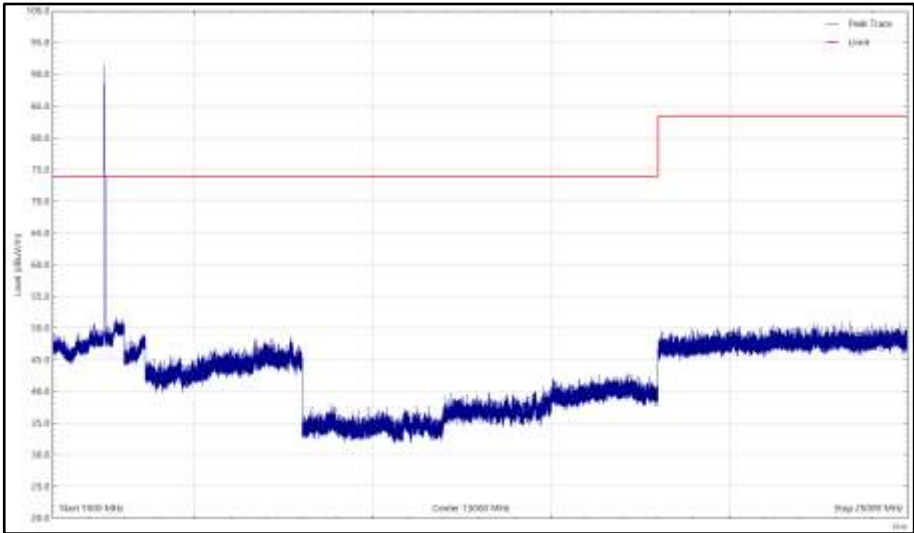


Figure 90 - 802.11n20 - X, 2462 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

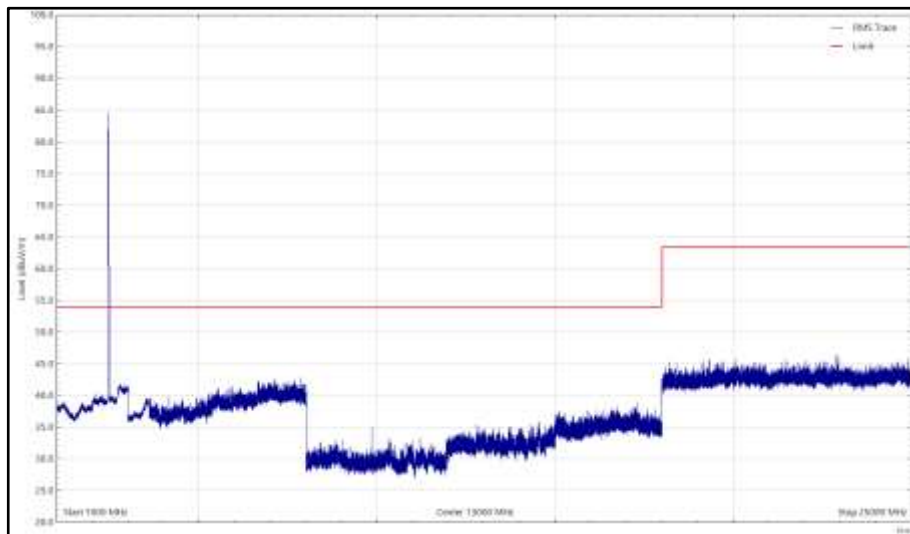


Figure 91 - 802.11n20 - X, 2462 MHz, 1 GHz to 25 GHz, Horizontal (rms)

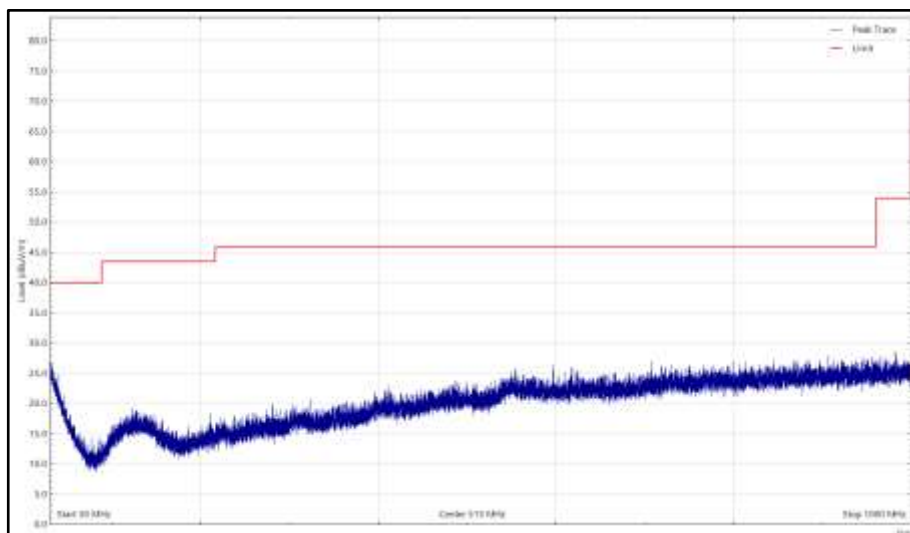


Figure 92 - 802.11n20 - X, 2462 MHz, 30 MHz to 1 GHz, Vertical (Peak)

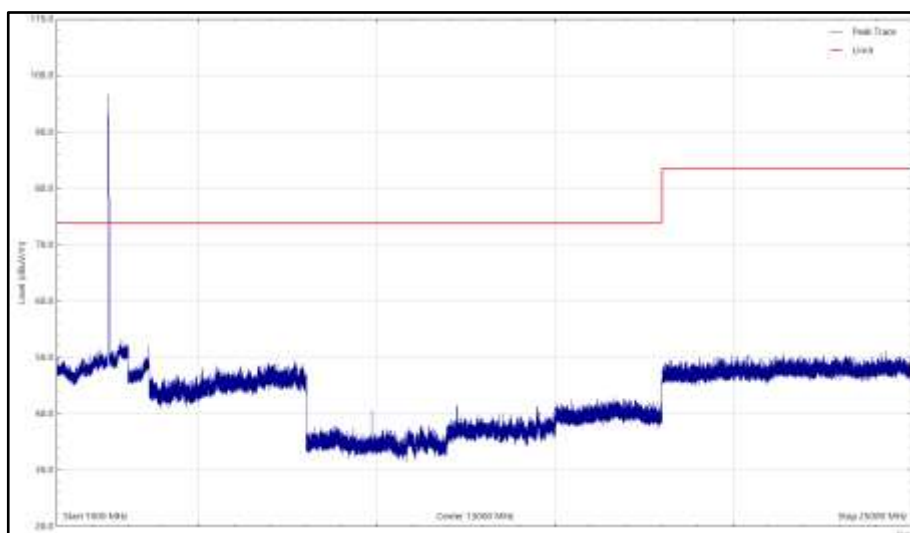


Figure 93 - 802.11n20 - X, 2462 MHz, 1 GHz to 25 GHz, Vertical (Peak)

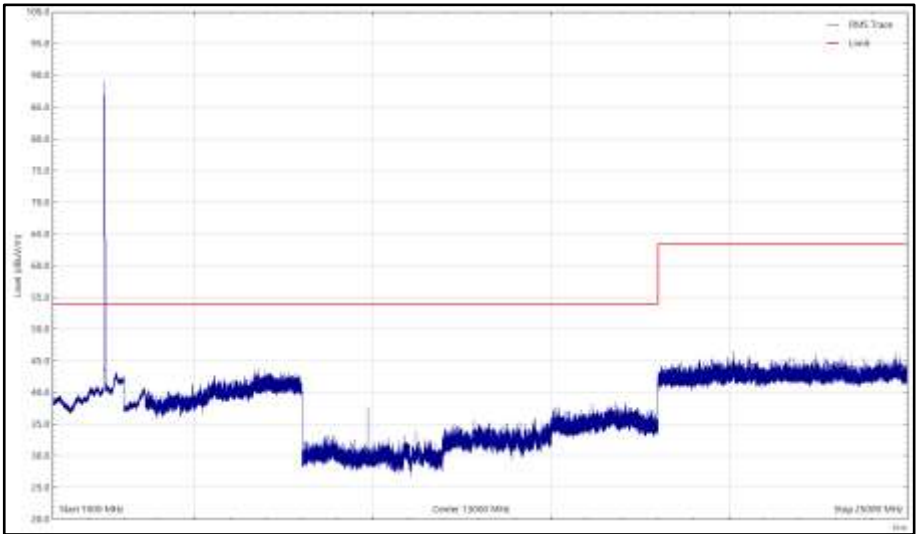


Figure 94 - 802.11n20 - X, 2462 MHz, 1 GHz to 25 GHz, Vertical (rms)

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation	Orientation
4823.891	49.2	54.0	-4.8	CISPR Avg	213	390	Vertical	Y
4823.923	48.4	54.0	-5.6	CISPR Avg	73	254	Horizontal	Y

Table 56 - 802.11b - Y, 2412 MHz, 30 MHz to 25 GHz

No other emissions found within 6 dB of the limit.

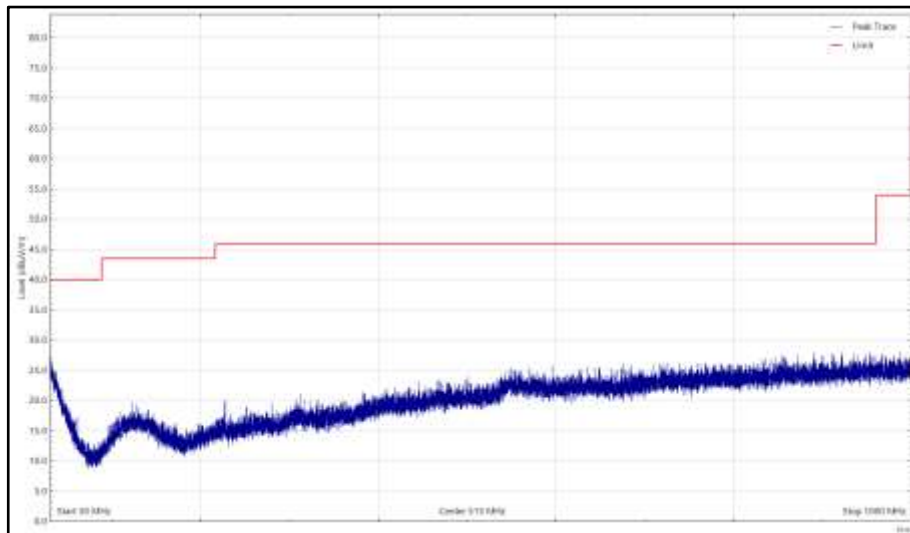


Figure 95 - 802.11b - Y, 2412 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

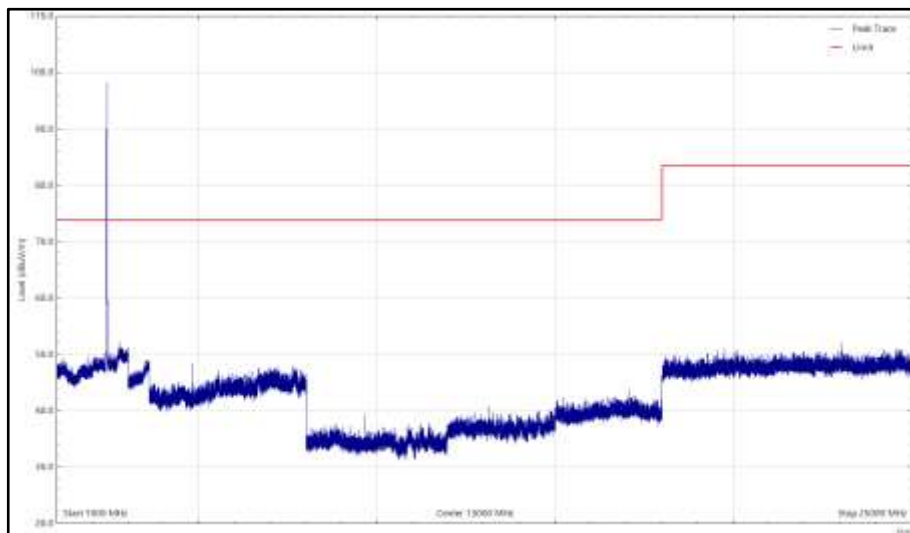


Figure 96 - 802.11b - Y, 2412 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

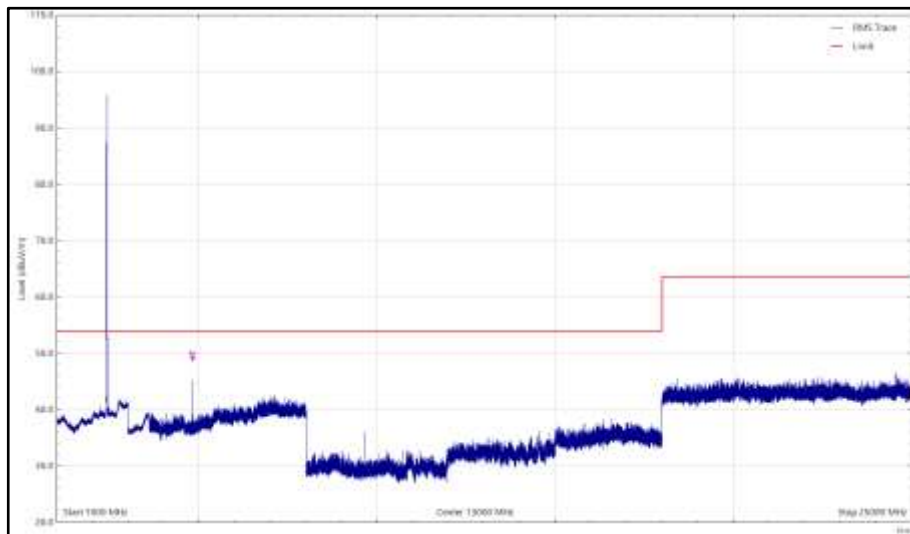


Figure 97 - 802.11b - Y, 2412 MHz, 1 GHz to 25 GHz, Horizontal (rms)

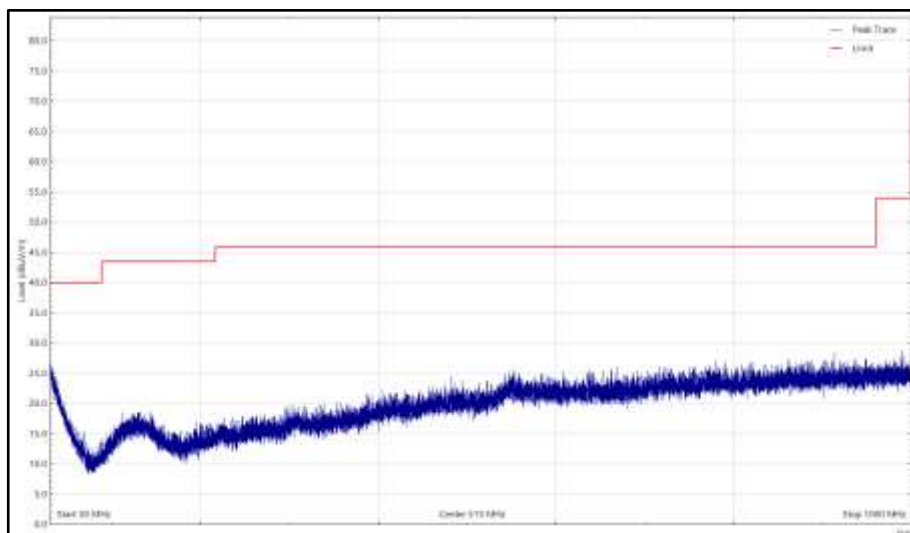


Figure 98 - 802.11b - Y, 2412 MHz, 30 MHz to 1 GHz, Vertical (Peak)

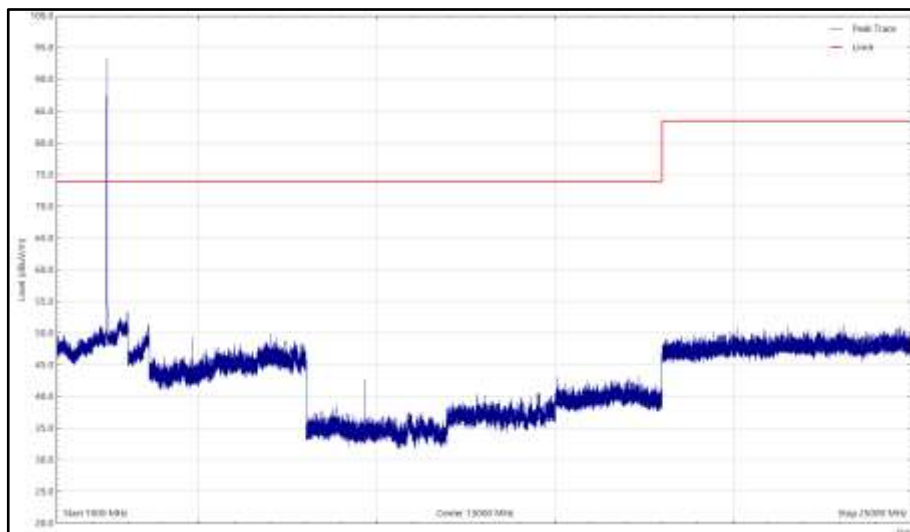


Figure 99 - 802.11b - Y, 2412 MHz, 1 GHz to 25 GHz, Vertical (Peak)

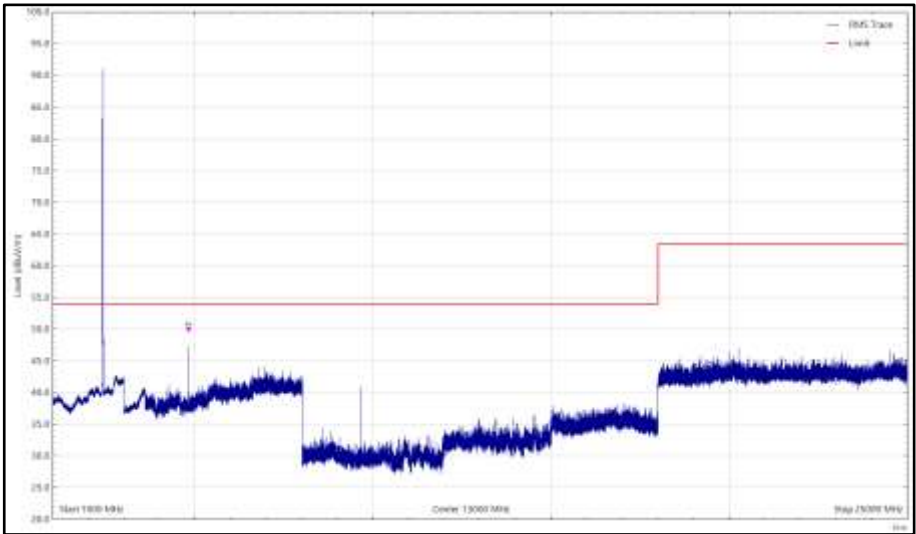


Figure 100 - 802.11b - Y, 2412 MHz, 1 GHz to 25 GHz, Vertical (rms)

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation	Orientation
4874.013	46.5	54.0	-7.5	CISPR Avg	215	107	Vertical	Y
4874.050	44.8	54.0	-9.2	CISPR Avg	112	259	Horizontal	Y

Table 57 - 802.11b - Y, 2437 MHz, 30 MHz to 25 GHz

No other emissions found within 6 dB of the limit.

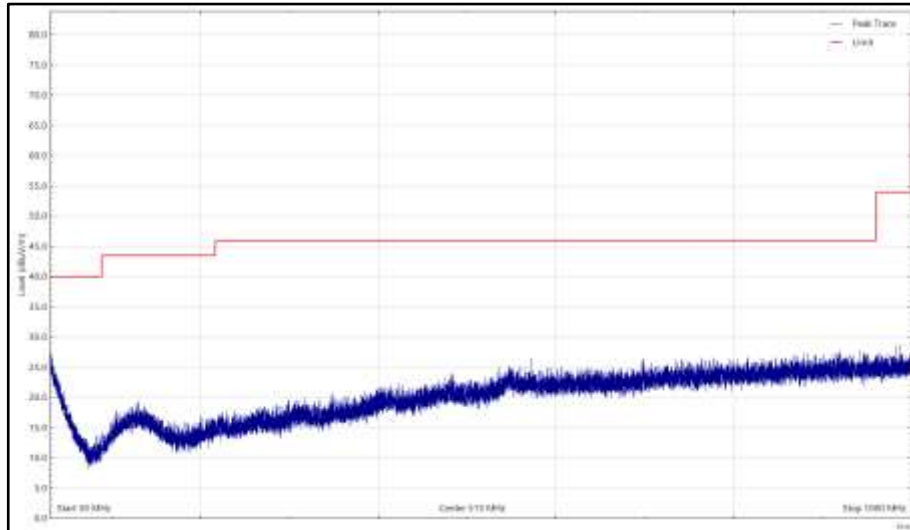


Figure 101 - 802.11b - Y, 2437 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

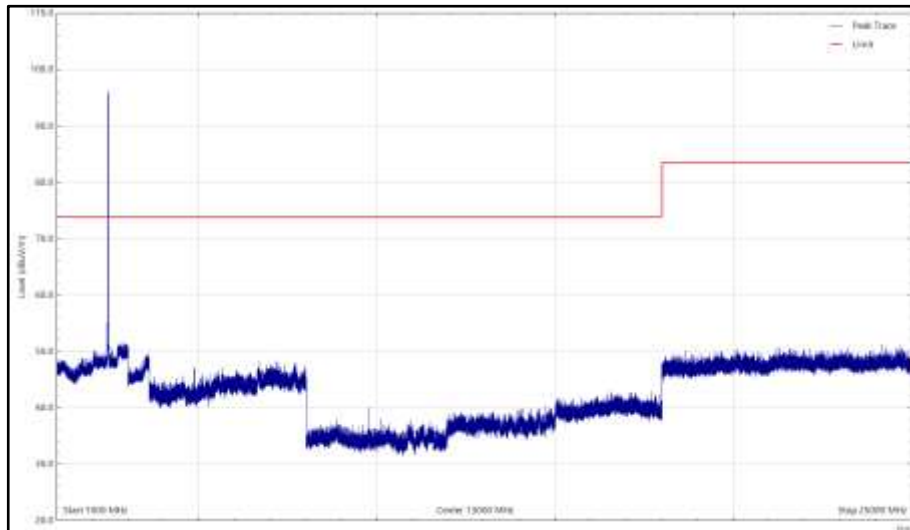


Figure 102 - 802.11b - Y, 2437 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

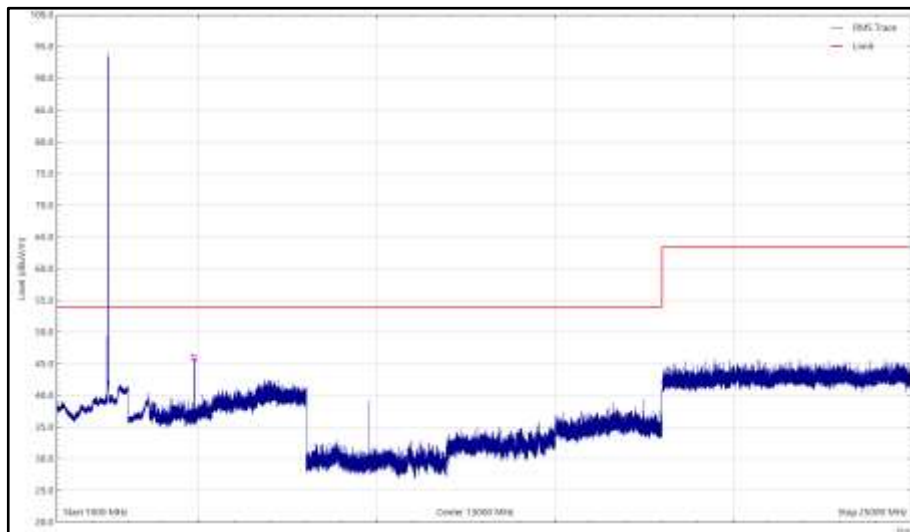


Figure 103 - 802.11b - Y, 2437 MHz, 1 GHz to 25 GHz, Horizontal (rms)

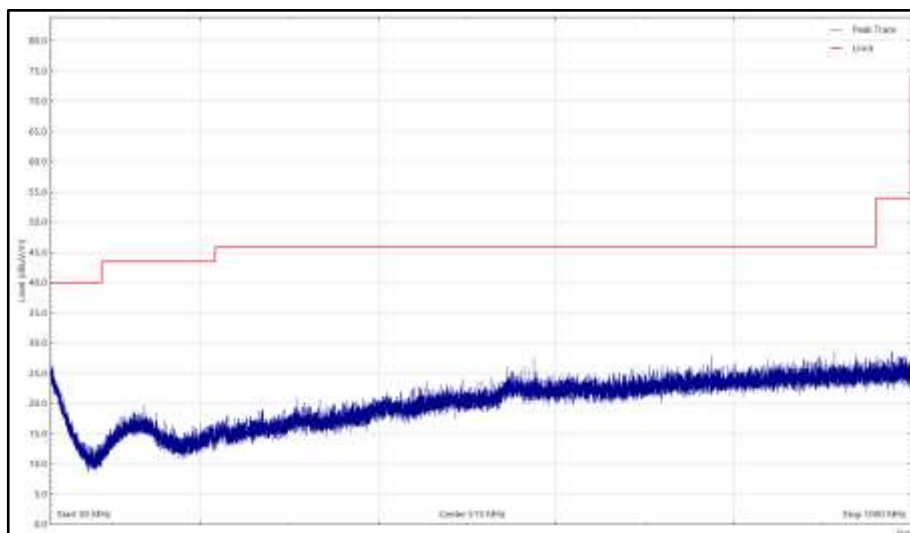


Figure 104 - 802.11b - Y, 2437 MHz, 30 MHz to 1 GHz, Vertical (Peak)

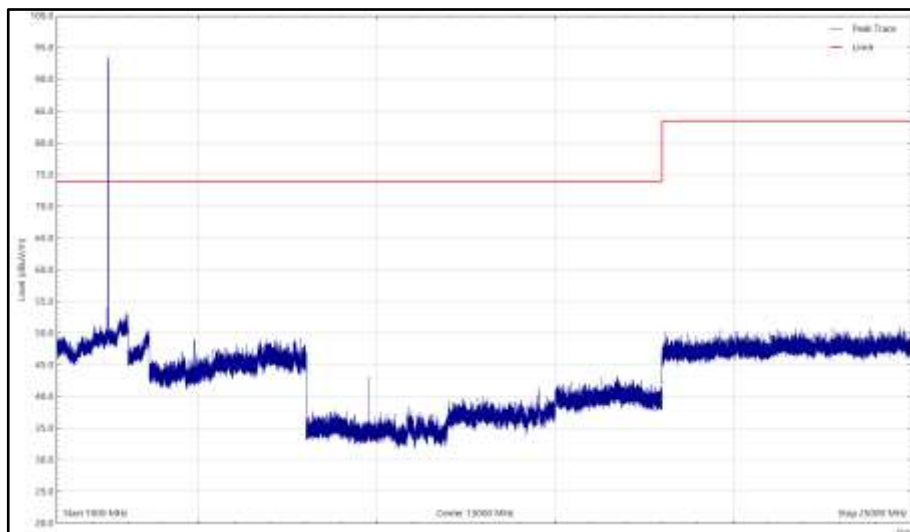


Figure 105 - 802.11b - Y, 2437 MHz, 1 GHz to 25 GHz, Vertical (Peak)

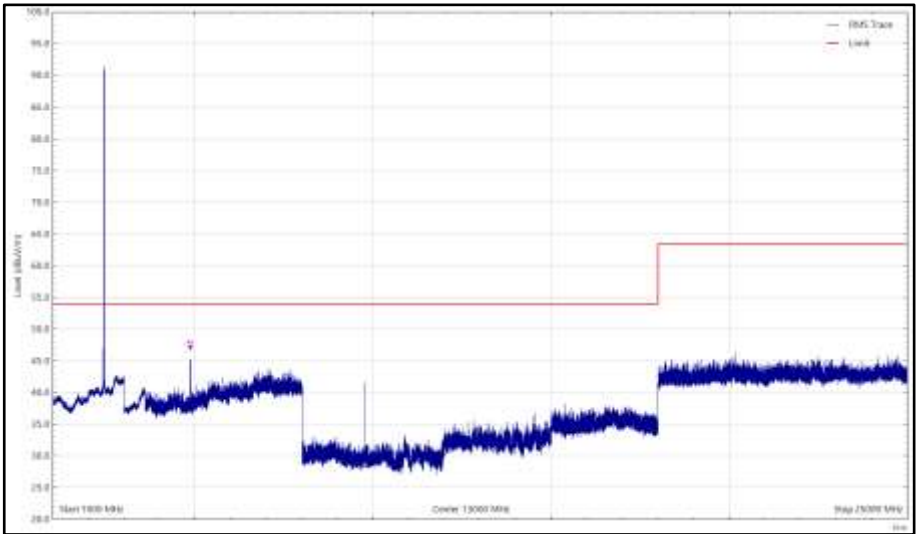


Figure 106 - 802.11b - Y, 2437 MHz, 1 GHz to 25 GHz, Vertical (rms)

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation	Orientation
4923.960	46.4	54.0	-7.6	CISPR Avg	212	104	Vertical	Y
4923.983	47.0	54.0	-7.0	CISPR Avg	95	273	Horizontal	Y

Table 58 - 802.11b - Y, 2462 MHz, 30 MHz to 25 GHz

No other emissions found within 6 dB of the limit.

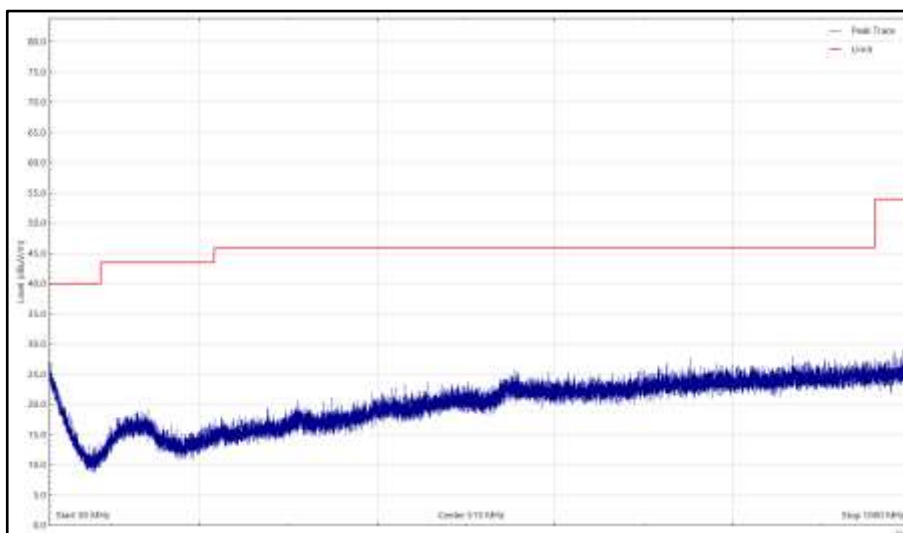


Figure 107 - 802.11b - Y, 2462 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

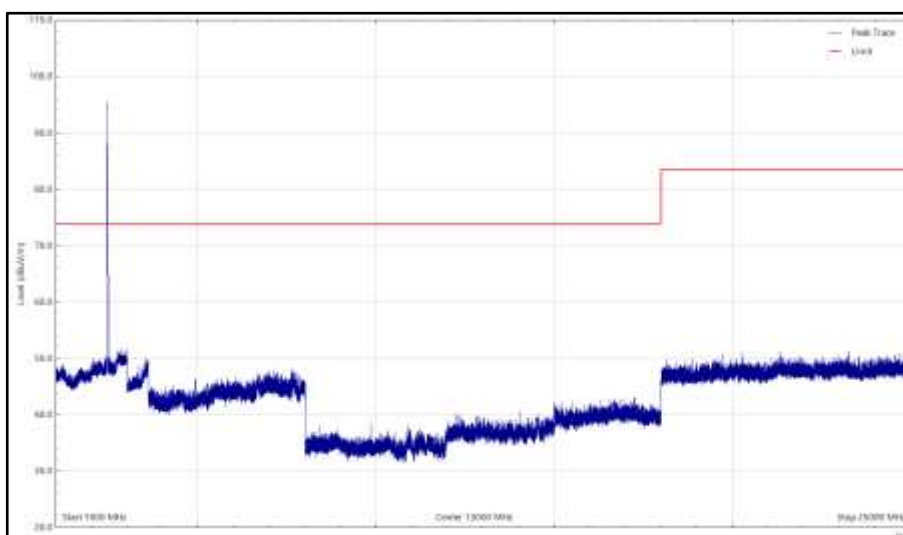


Figure 108 - 802.11b - Y, 2462 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

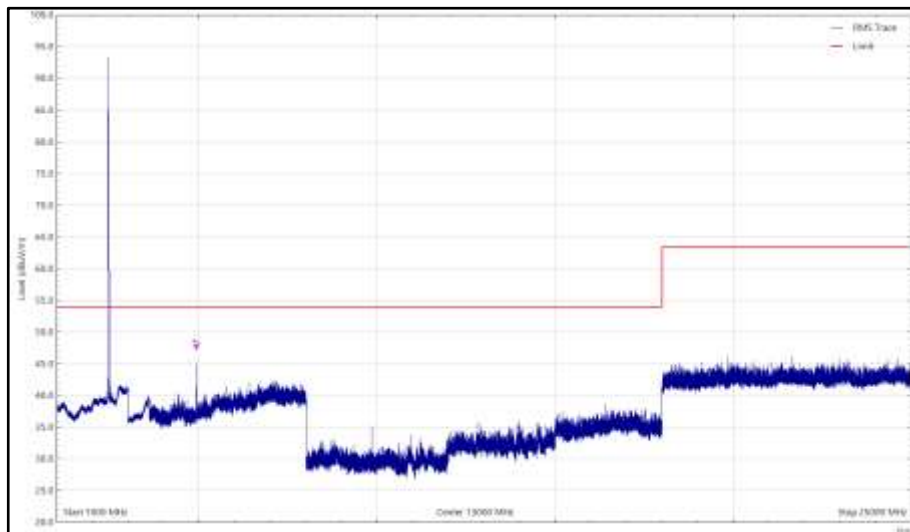


Figure 109 - 802.11b - Y, 2462 MHz, 1 GHz to 25 GHz, Horizontal (rms)

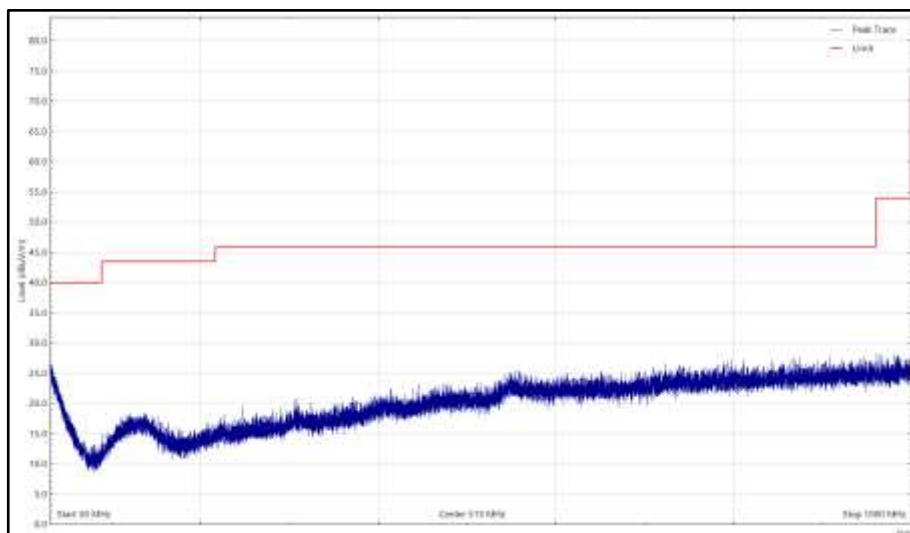


Figure 110 - 802.11b - Y, 2462 MHz, 30 MHz to 1 GHz, Vertical (Peak)

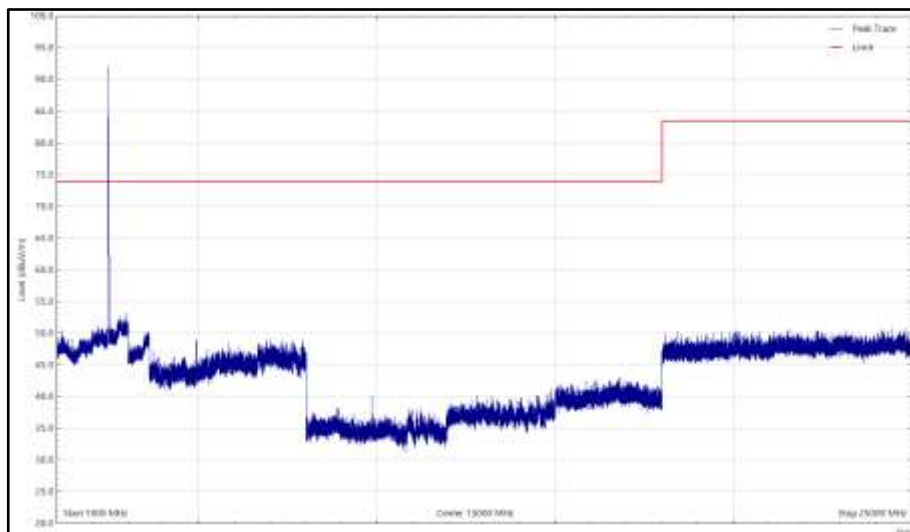


Figure 111 - 802.11b - Y, 2462 MHz, 1 GHz to 25 GHz, Vertical (Peak)

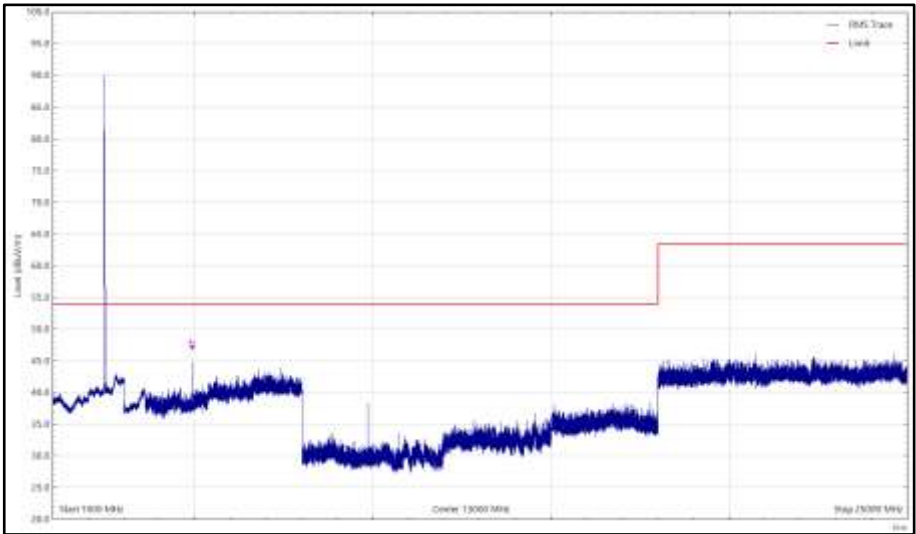


Figure 112 - 802.11b - Y, 2462 MHz, 1 GHz to 25 GHz, Vertical (rms)



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

Table 59 - 802.11g - Y, 2412 MHz, 30 MHz to 25 GHz

*No emissions found within 6 dB of the limit.

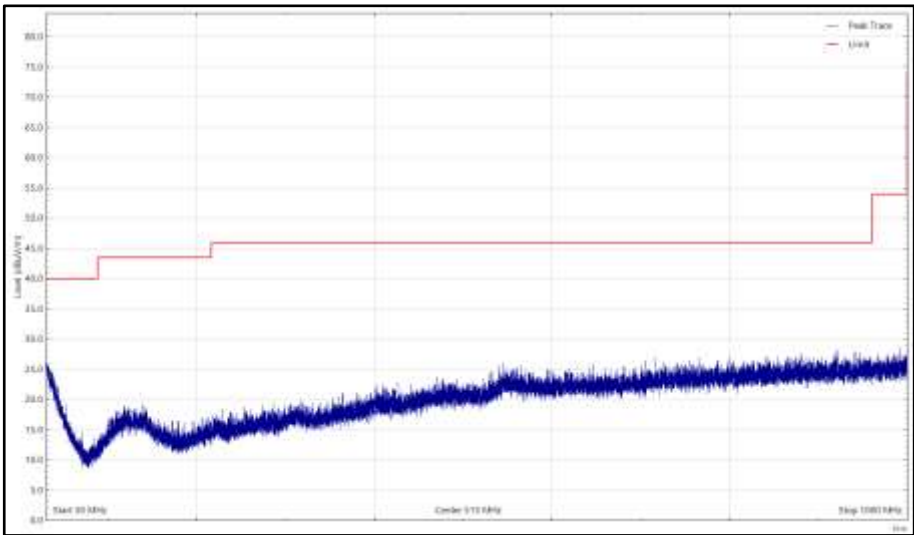


Figure 113 - 802.11g - Y, 2412 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

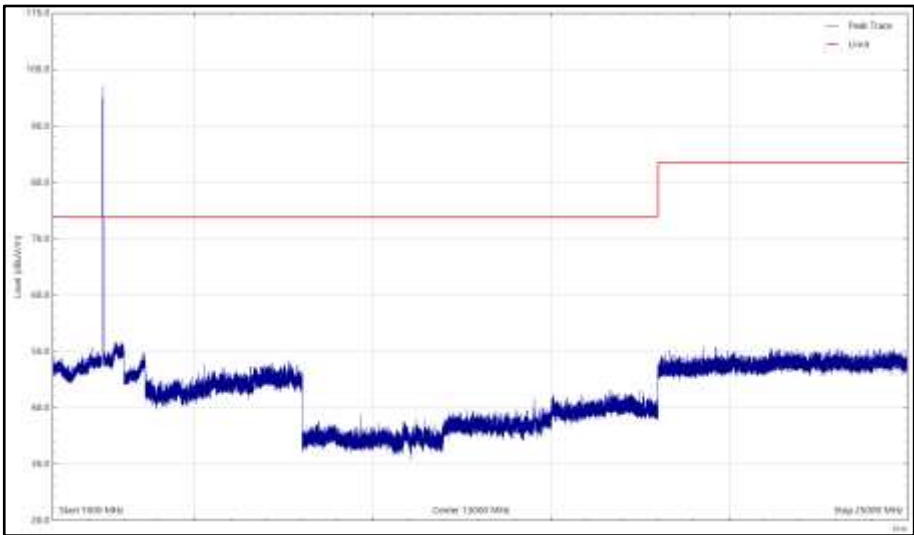


Figure 114 - 802.11g - Y, 2412 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

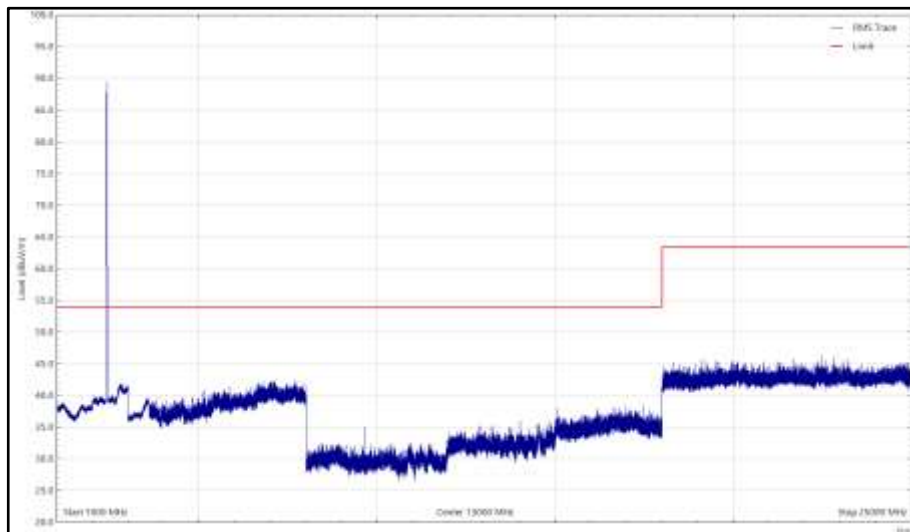


Figure 115 - 802.11g - Y, 2412 MHz, 1 GHz to 25 GHz, Horizontal (rms)

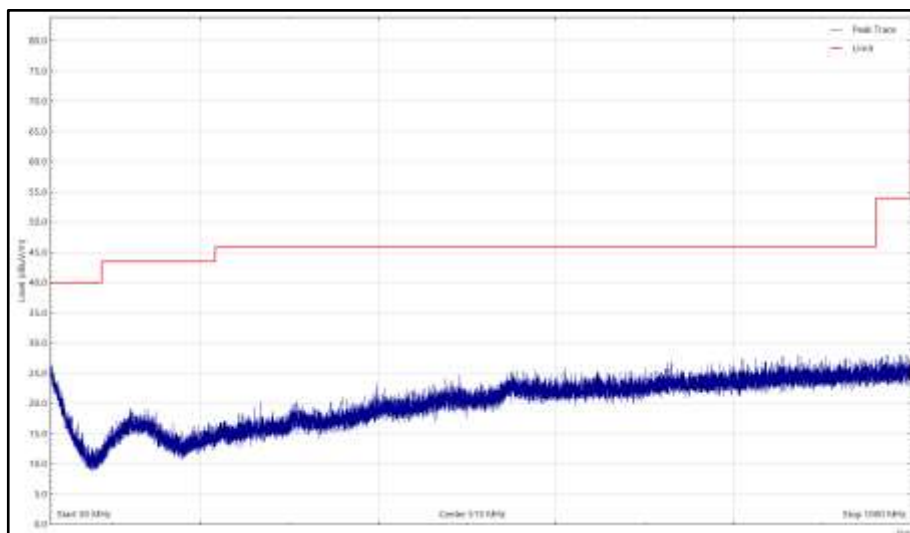


Figure 116 - 802.11g - Y, 2412 MHz, 30 MHz to 1 GHz, Vertical (Peak)

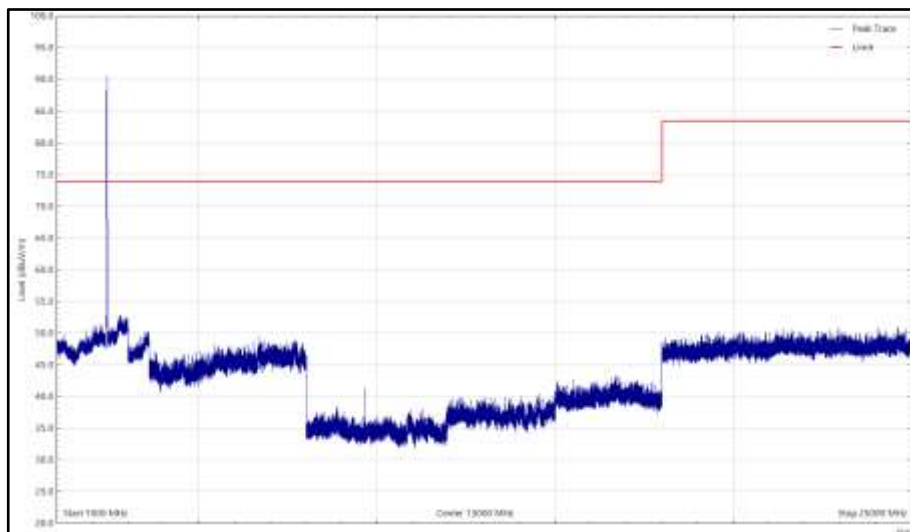


Figure 117 - 802.11g - Y, 2412 MHz, 1 GHz to 25 GHz, Vertical (Peak)

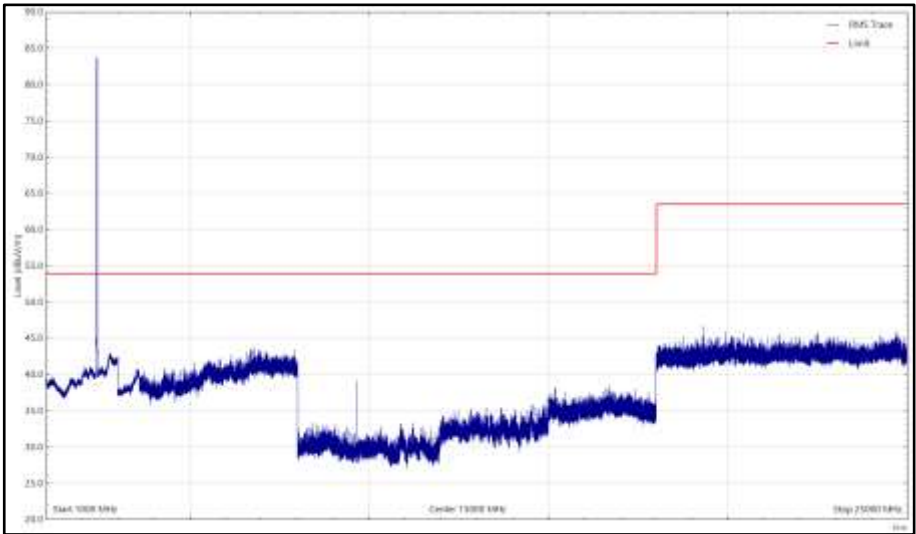


Figure 118 - 802.11g - Y, 2412 MHz, 1 GHz to 25 GHz, Vertical (rms)

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

Table 60 - 802.11g - Y, 2437 MHz, 30 MHz to 25 GHz

*No emissions found within 6 dB of the limit.

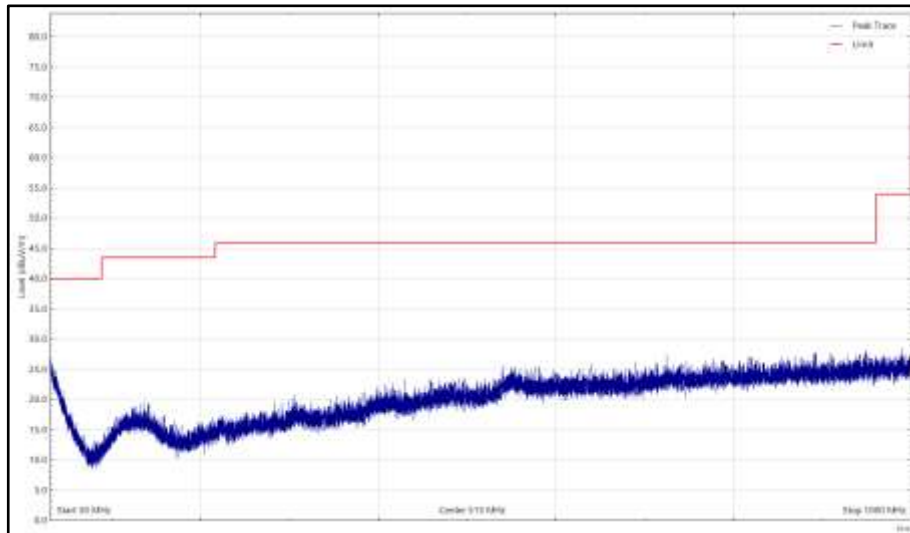


Figure 119 - 802.11g - Y, 2437 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

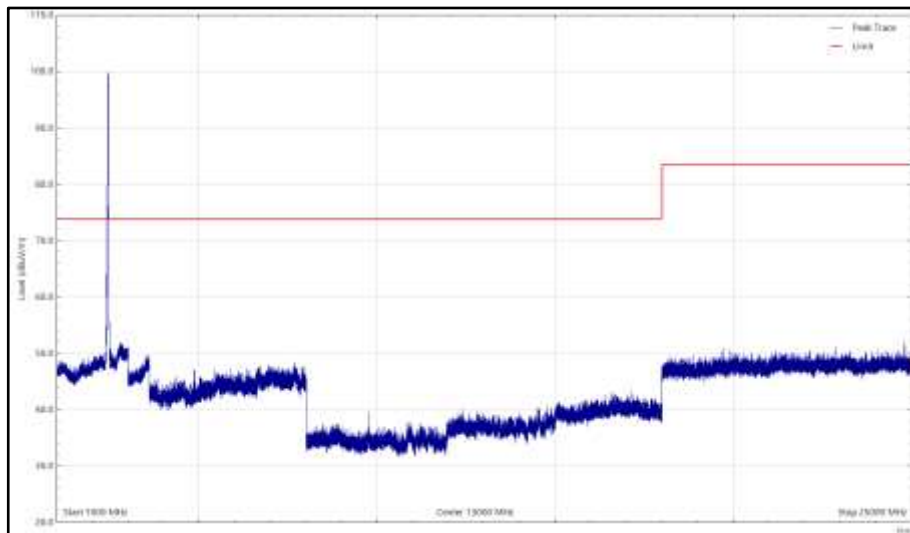


Figure 120 - 802.11g - Y, 2437 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

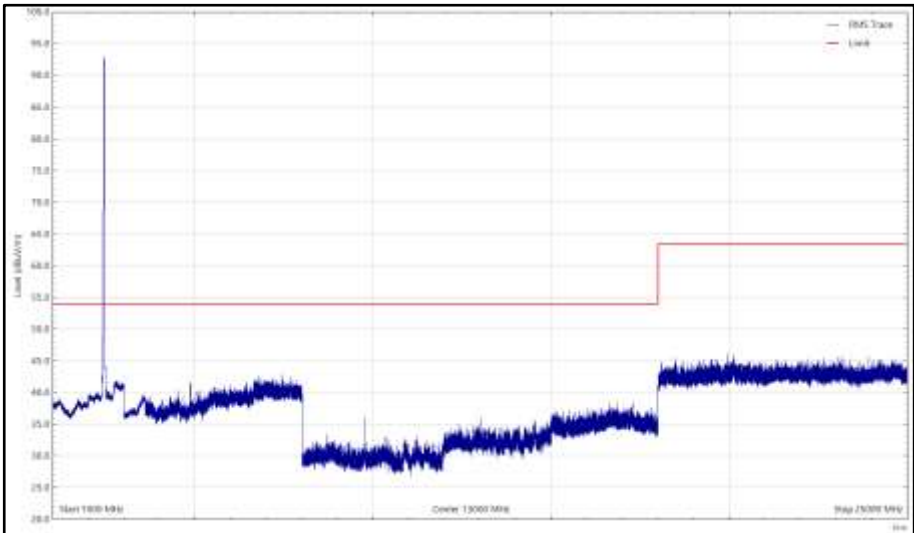


Figure 121 - 802.11g - Y, 2437 MHz, 1 GHz to 25 GHz, Horizontal (rms)

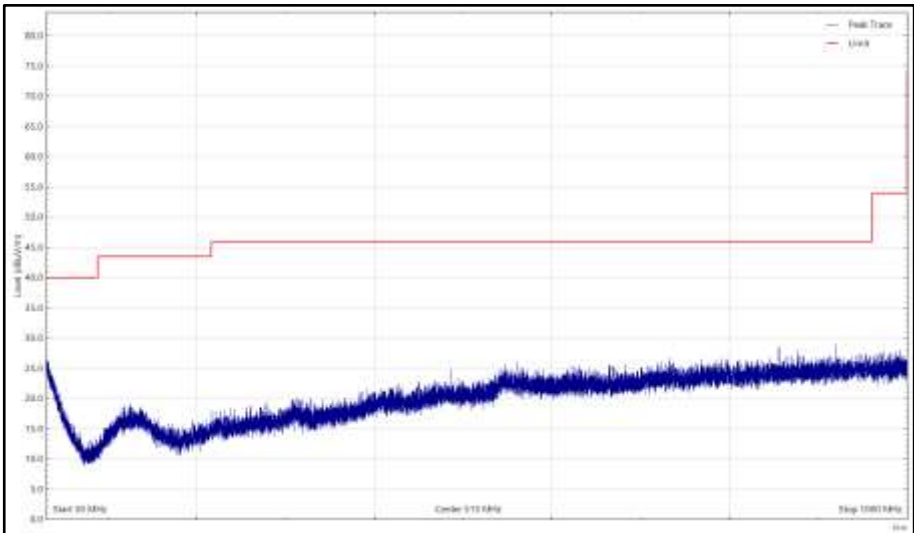


Figure 122 - 802.11g - Y, 2437 MHz, 30 MHz to 1 GHz, Vertical (Peak)

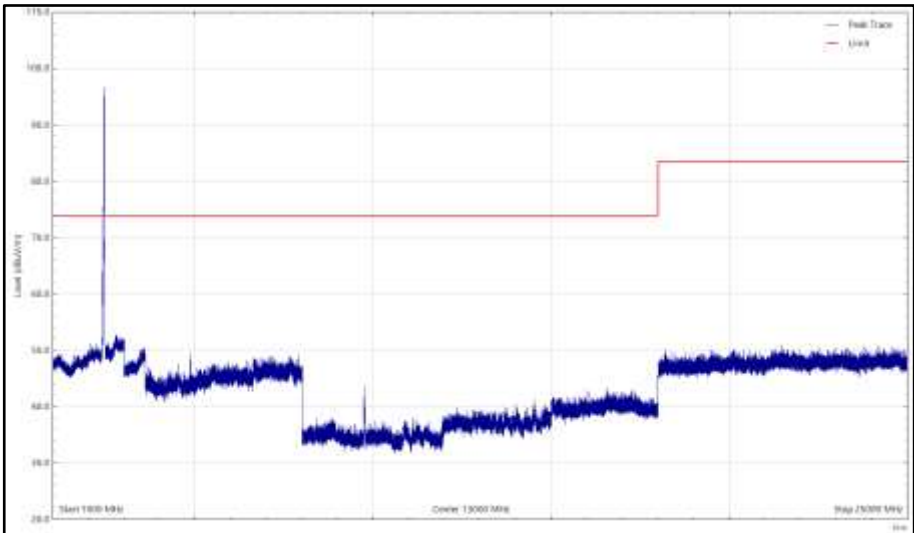


Figure 123 - 802.11g - Y, 2437 MHz, 1 GHz to 25 GHz, Vertical (Peak)

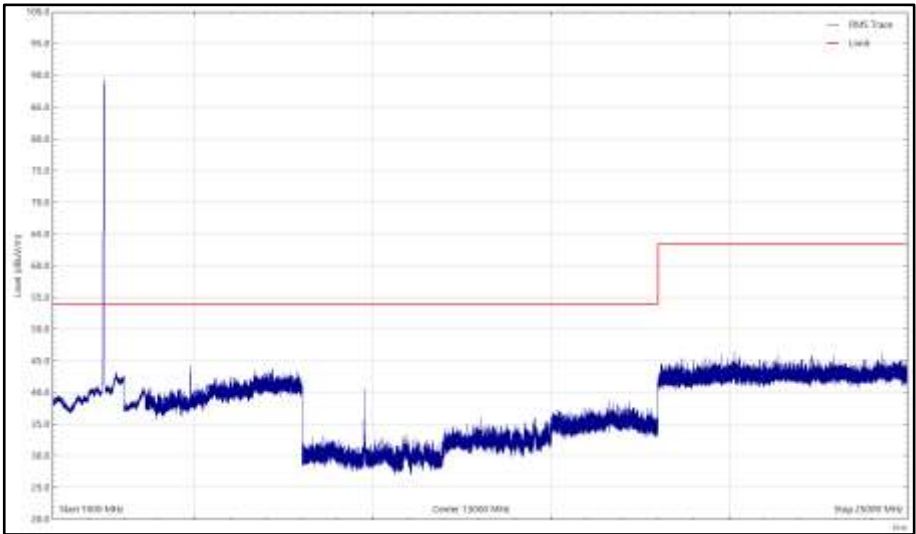


Figure 124 - 802.11g - Y, 2437 MHz, 1 GHz to 25 GHz, Vertical (rms)

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

Table 61 - 802.11g - Y, 2462 MHz, 30 MHz to 25 GHz

*No emissions found within 6 dB of the limit.

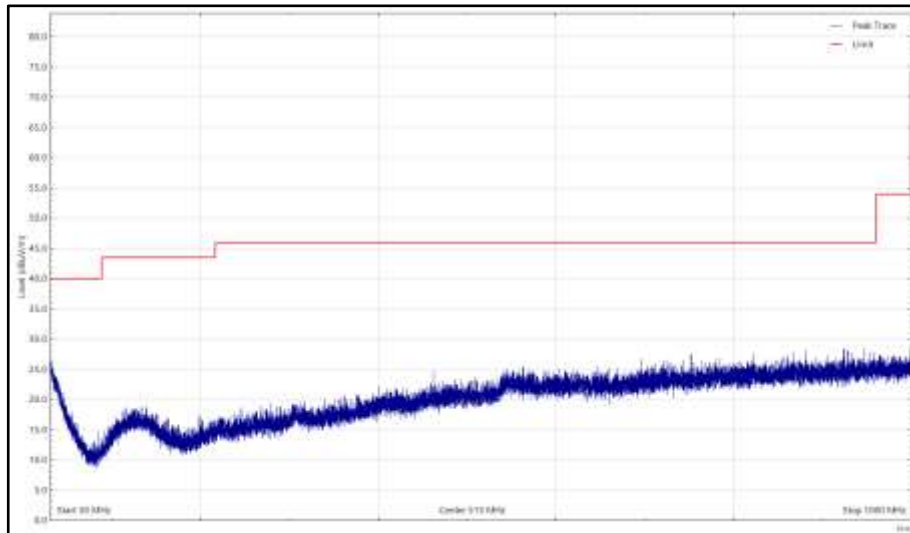


Figure 125 - 802.11g - Y, 2462 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

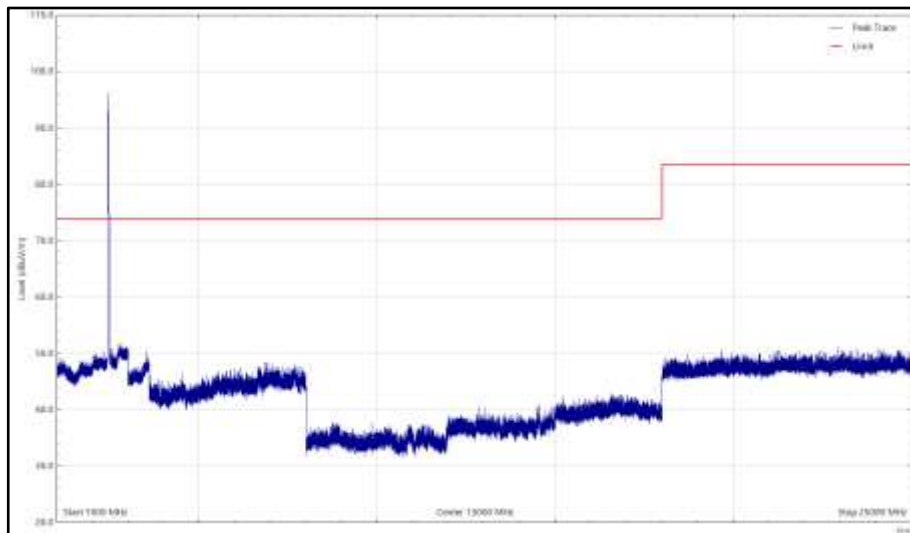


Figure 126 - 802.11g - Y, 2462 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

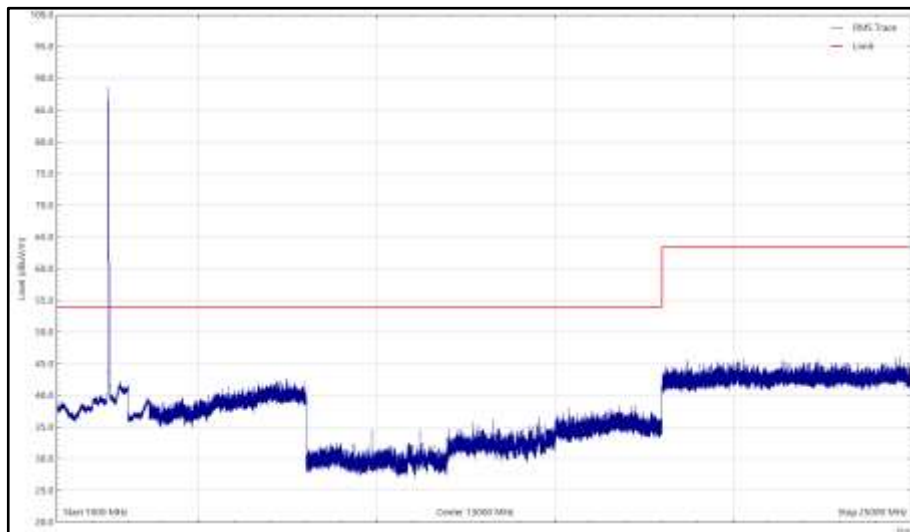


Figure 127 - 802.11g - Y, 2462 MHz, 1 GHz to 25 GHz, Horizontal (rms)

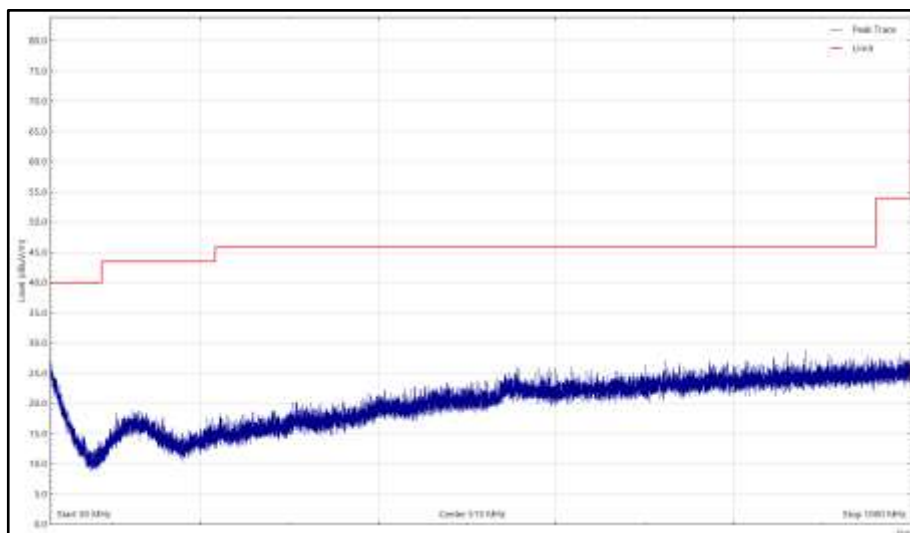


Figure 128 - 802.11g - Y, 2462 MHz, 30 MHz to 1 GHz, Vertical (Peak)

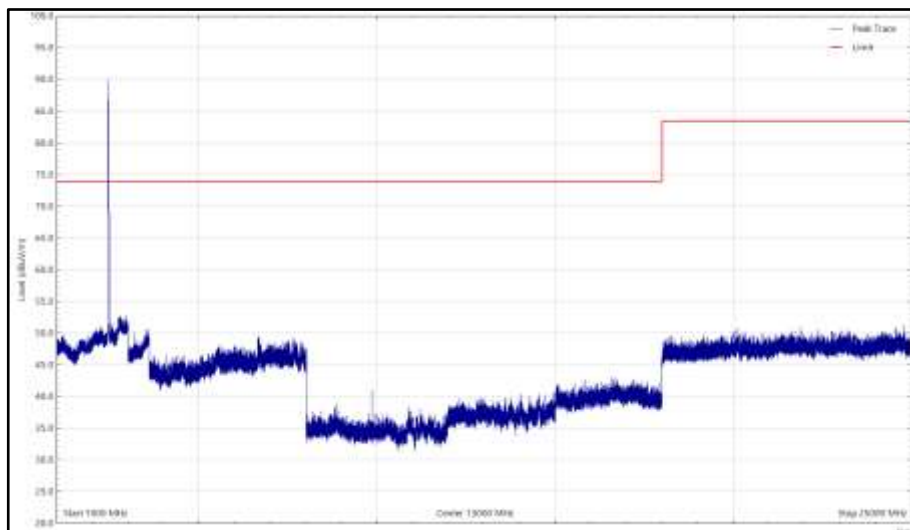


Figure 129 - 802.11g - Y, 2462 MHz, 1 GHz to 25 GHz, Vertical (Peak)

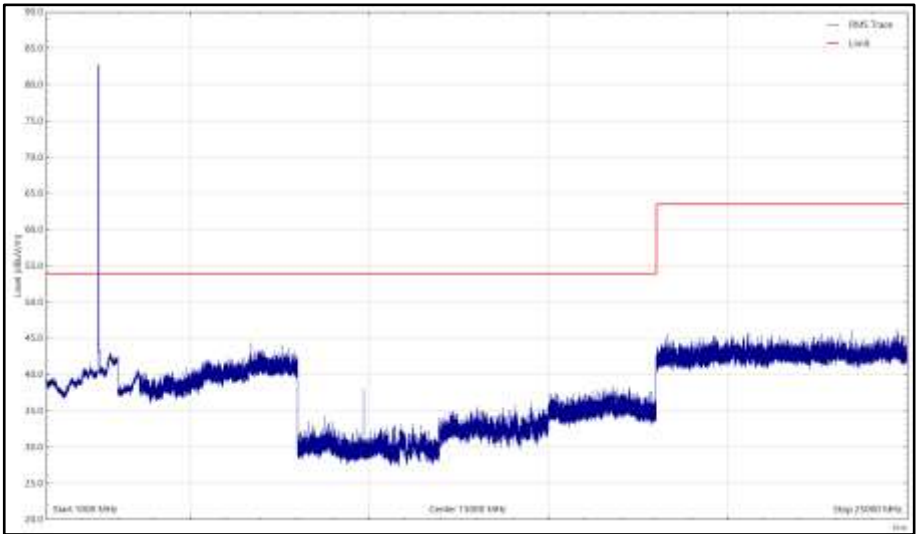


Figure 130 - 802.11g - Y, 2462 MHz, 1 GHz to 25 GHz, Vertical (rms)

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

Table 62 - 802.11n20 - Y, 2412 MHz, 30 MHz to 25 GHz

*No emissions found within 6 dB of the limit.

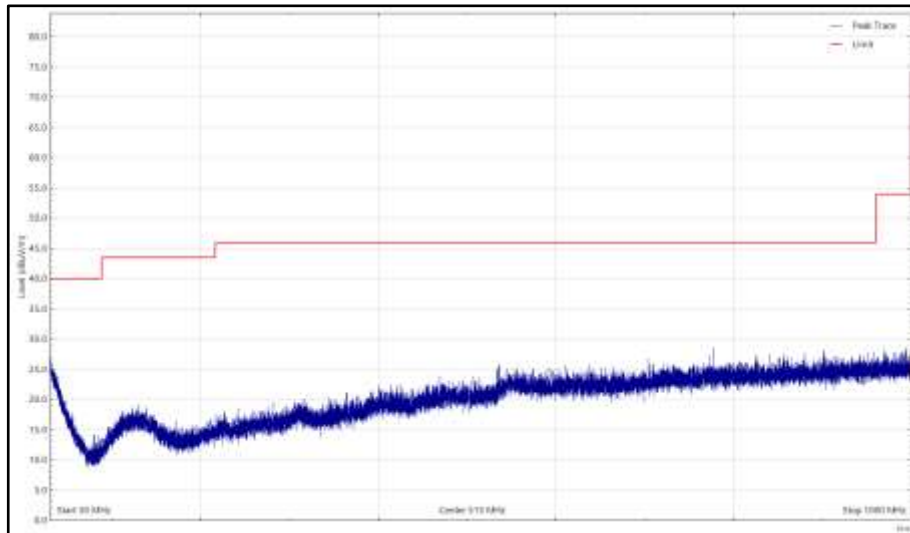


Figure 131 - 802.11n20 - Y, 2412 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

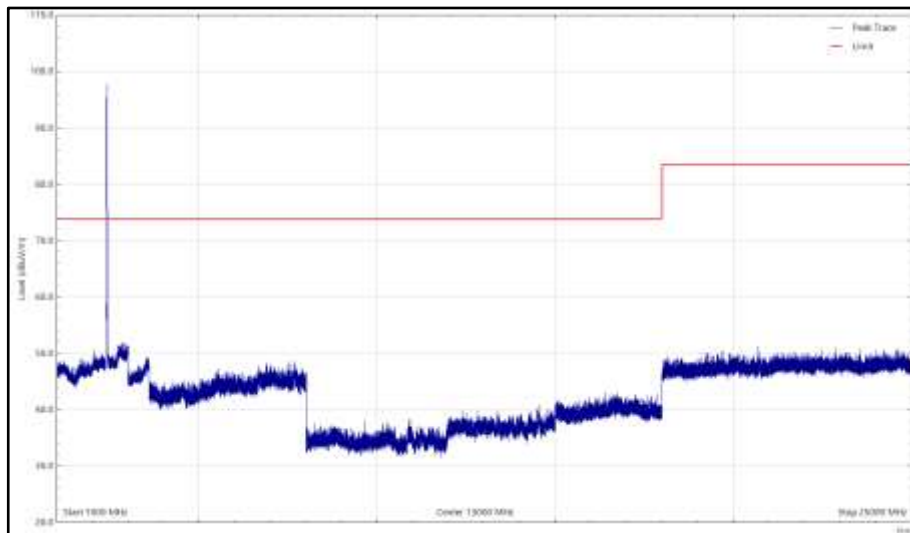


Figure 132 - 802.11n20 - Y, 2412 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

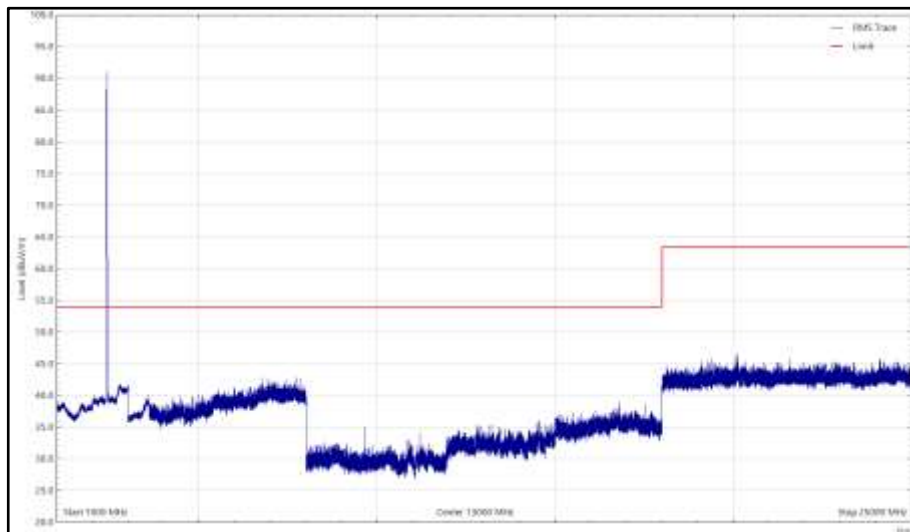


Figure 133 - 802.11n20 - Y, 2412 MHz, 1 GHz to 25 GHz, Horizontal (rms)

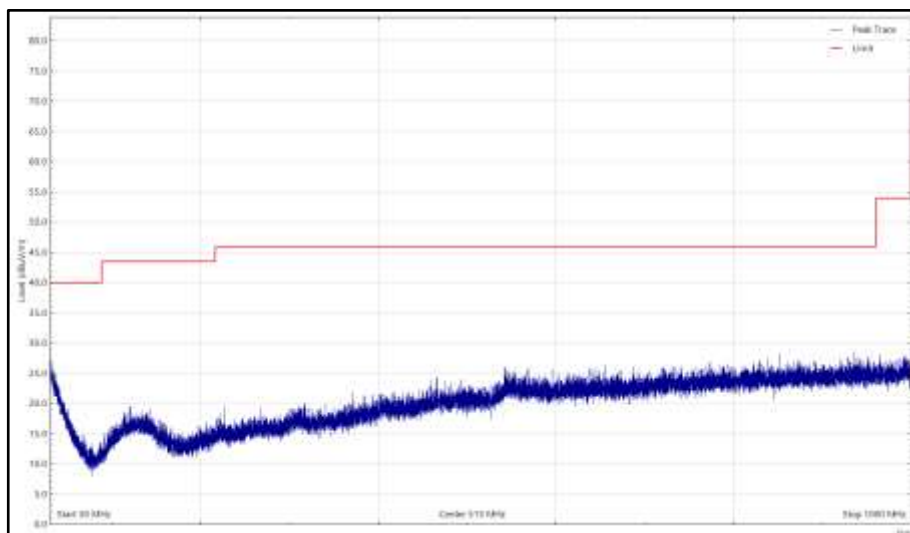


Figure 134 - 802.11n20 - Y, 2412 MHz, 30 MHz to 1 GHz, Vertical (Peak)

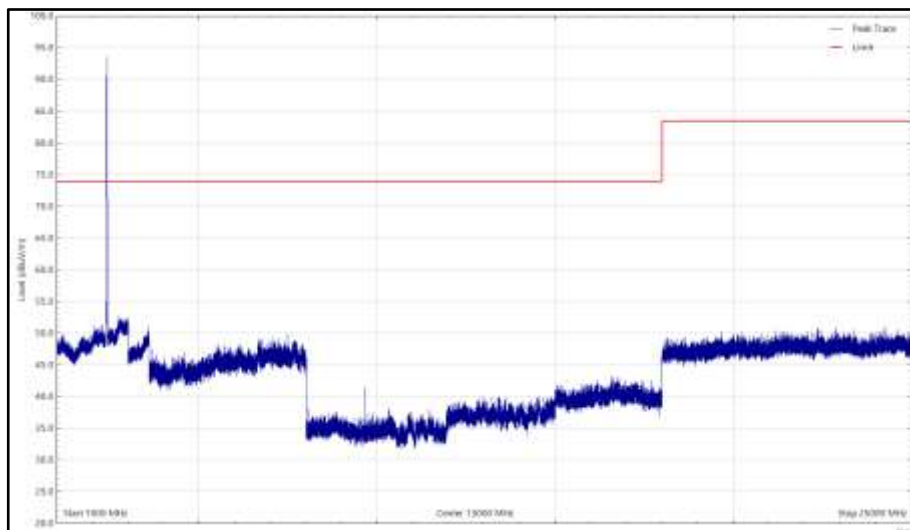


Figure 135 - 802.11n20 - Y, 2412 MHz, 1 GHz to 25 GHz, Vertical (Peak)

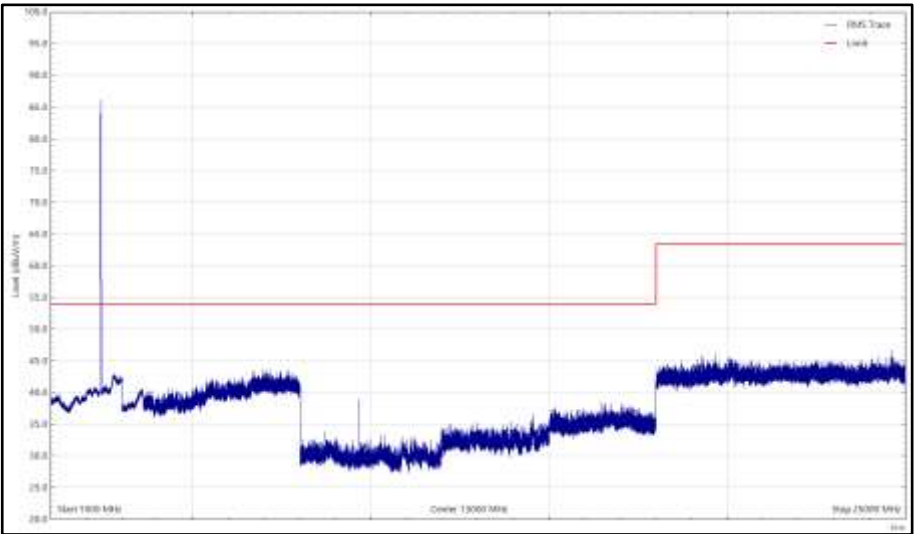


Figure 136 - 802.11n20 - Y, 2412 MHz, 1 GHz to 25 GHz, Vertical (rms)



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

Table 63 - 802.11n20 - Y, 2437 MHz, 30 MHz to 25 GHz

*No emissions found within 6 dB of the limit.

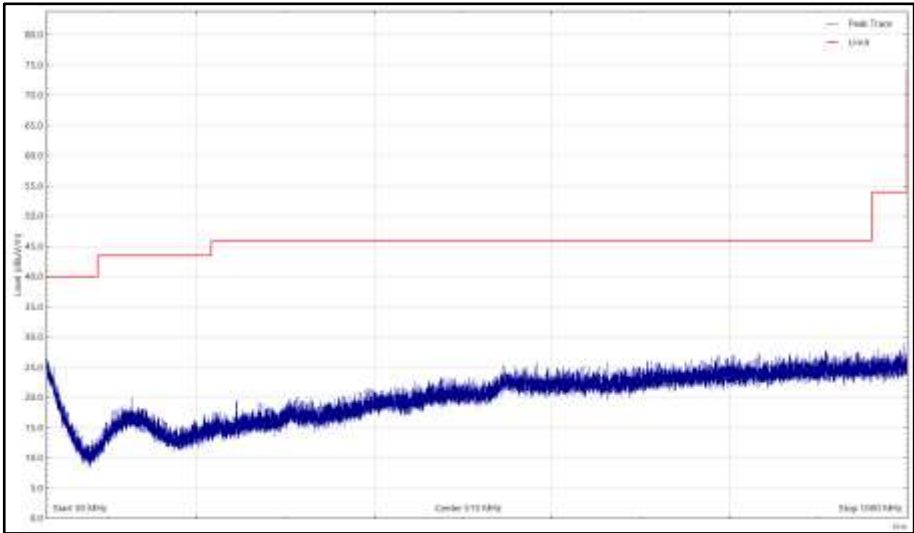


Figure 137 - 802.11n20 - Y, 2437 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

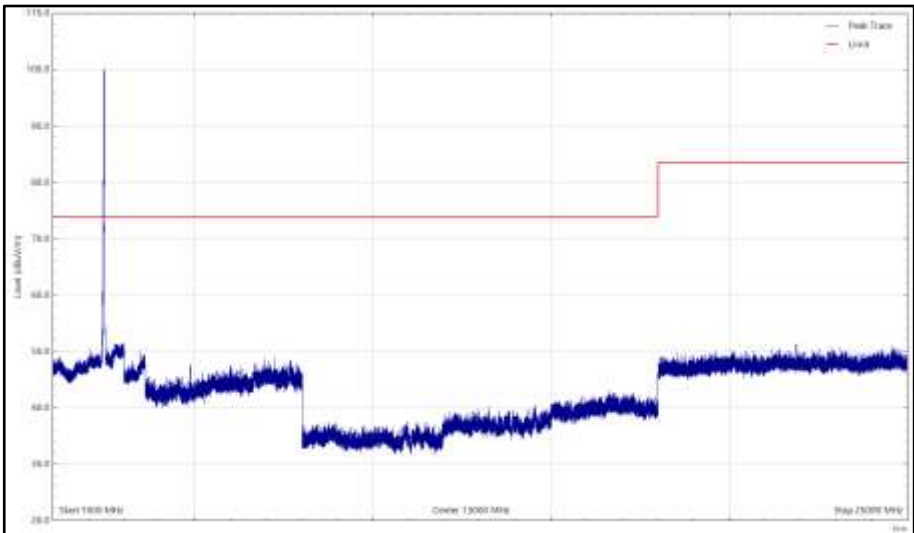


Figure 138 - 802.11n20 - Y, 2437 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

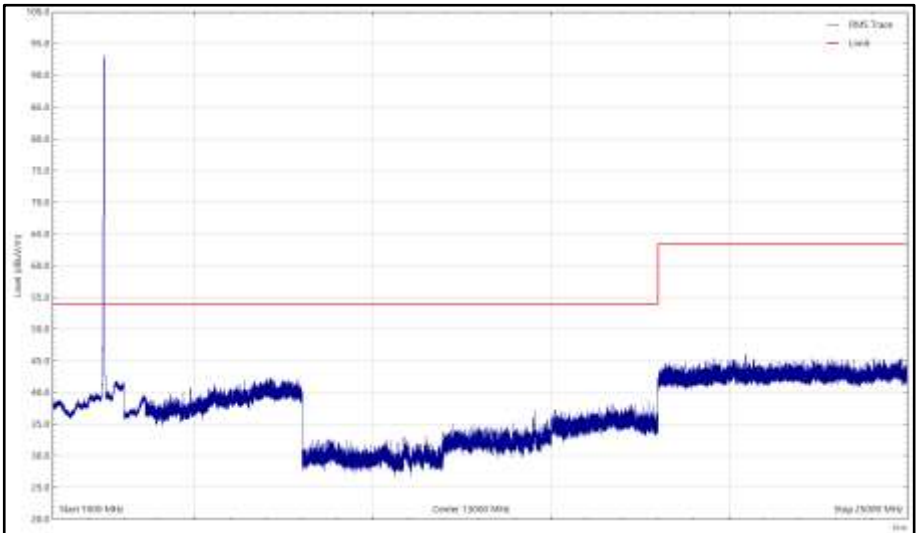


Figure 139 - 802.11n20 - Y, 2437 MHz, 1 GHz to 25 GHz, Horizontal (rms)

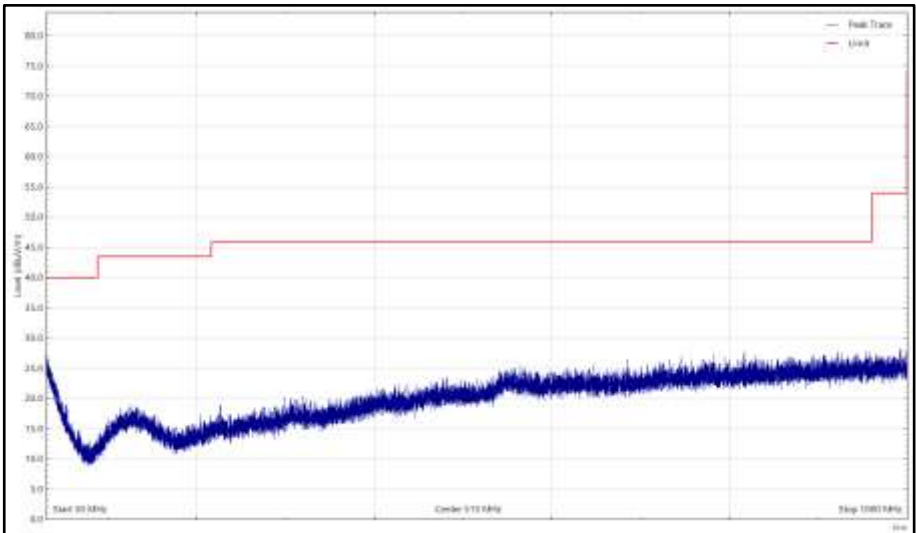


Figure 140 - 802.11n20 - Y, 2437 MHz, 30 MHz to 1 GHz, Vertical (Peak)

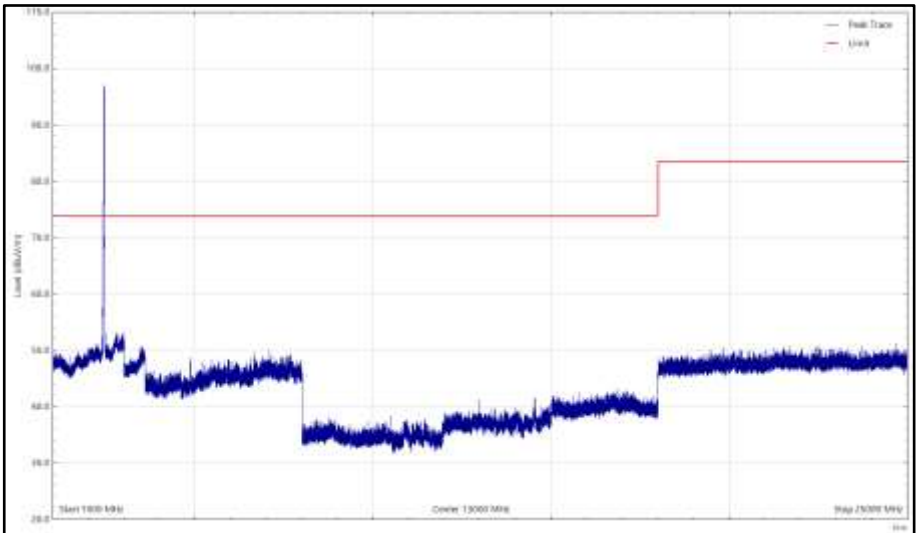


Figure 141 - 802.11n20 - Y, 2437 MHz, 1 GHz to 25 GHz, Vertical (Peak)

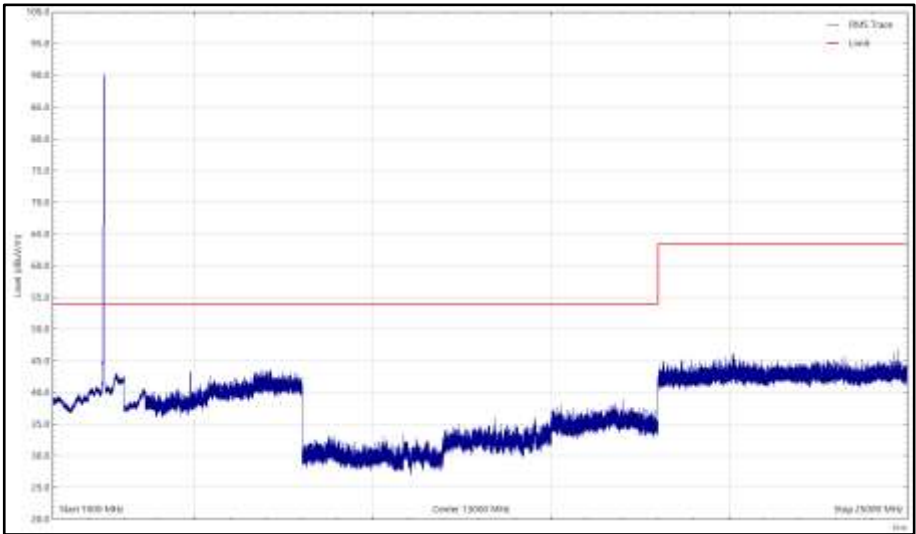


Figure 142 - 802.11n20 - Y, 2437 MHz, 1 GHz to 25 GHz, Vertical (rms)



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

Table 64 - 802.11n20 - Y, 2462 MHz, 30 MHz to 25 GHz

*No emissions found within 6 dB of the limit.

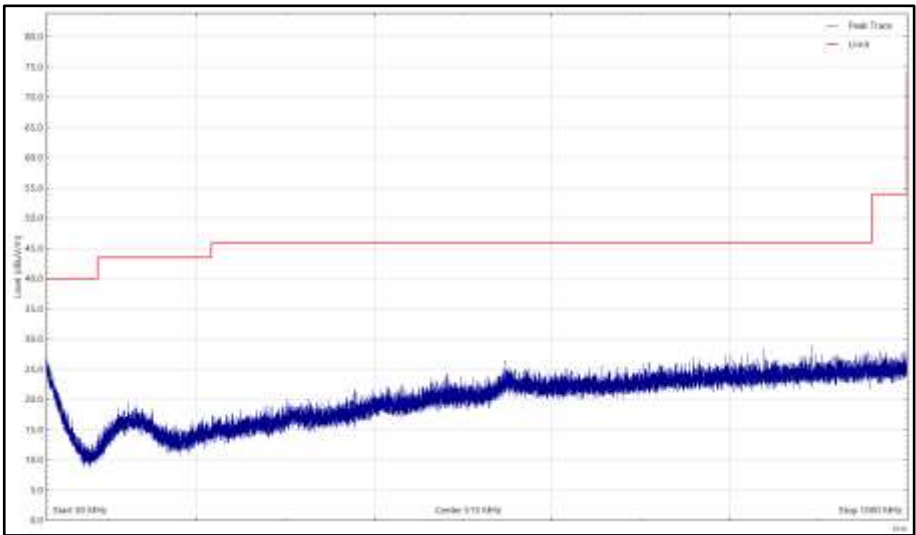


Figure 143 - 802.11n20 - Y, 2462 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

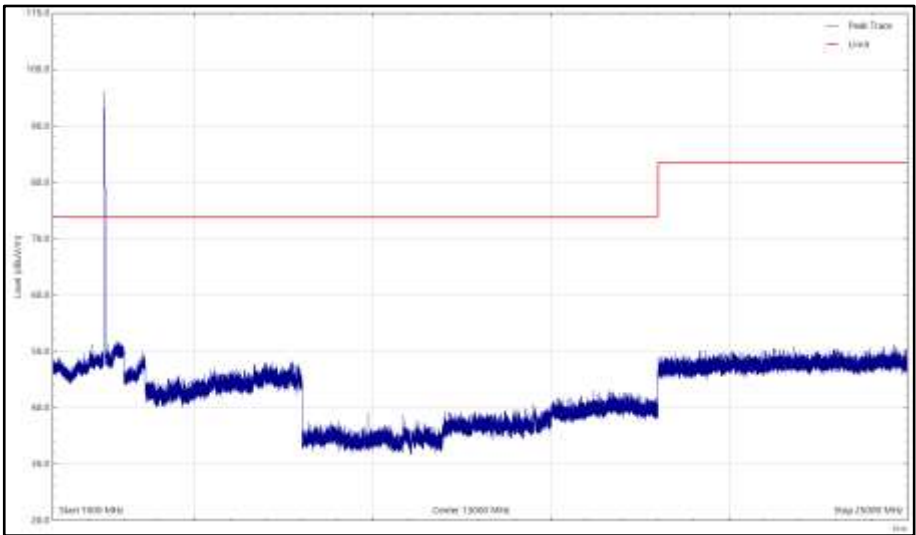


Figure 144 - 802.11n20 - Y, 2462 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

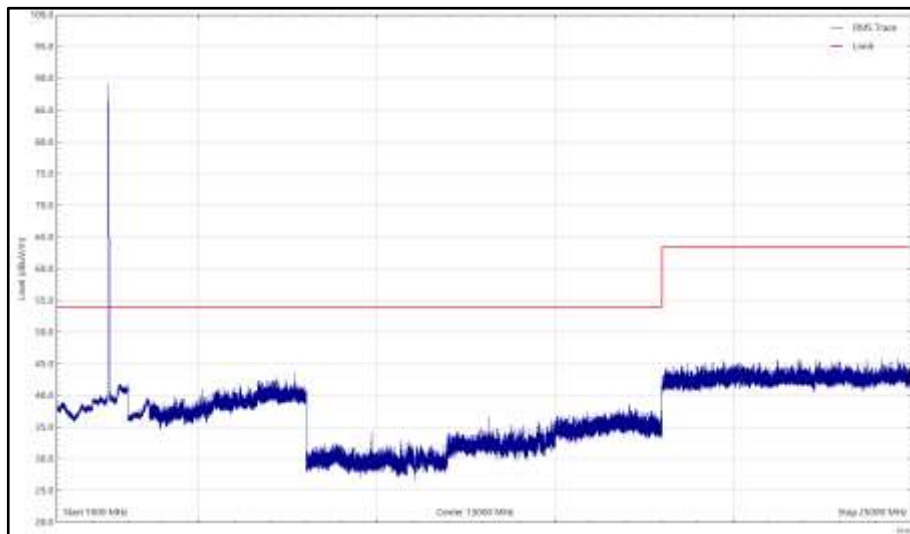


Figure 145 - 802.11n20 - Y, 2462 MHz, 1 GHz to 25 GHz, Horizontal (rms)

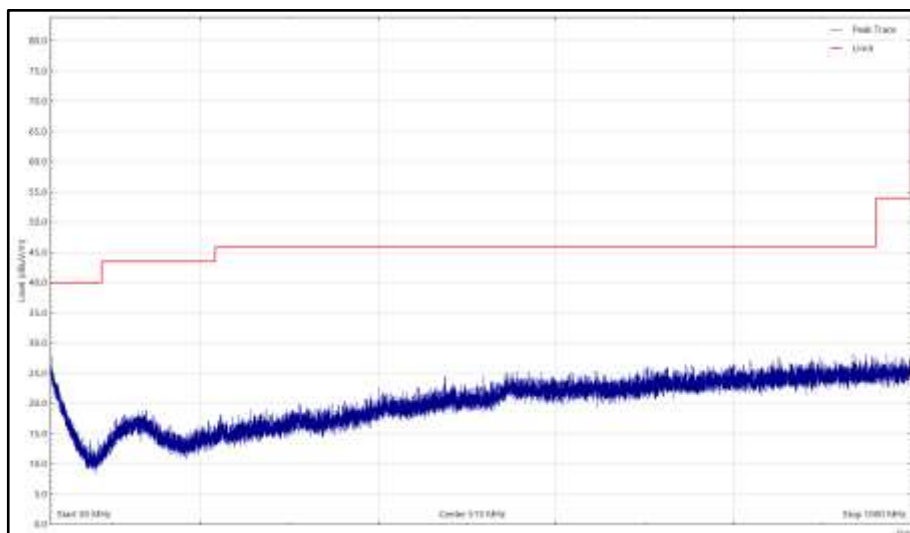


Figure 146 - 802.11n20 - Y, 2462 MHz, 30 MHz to 1 GHz, Vertical (Peak)

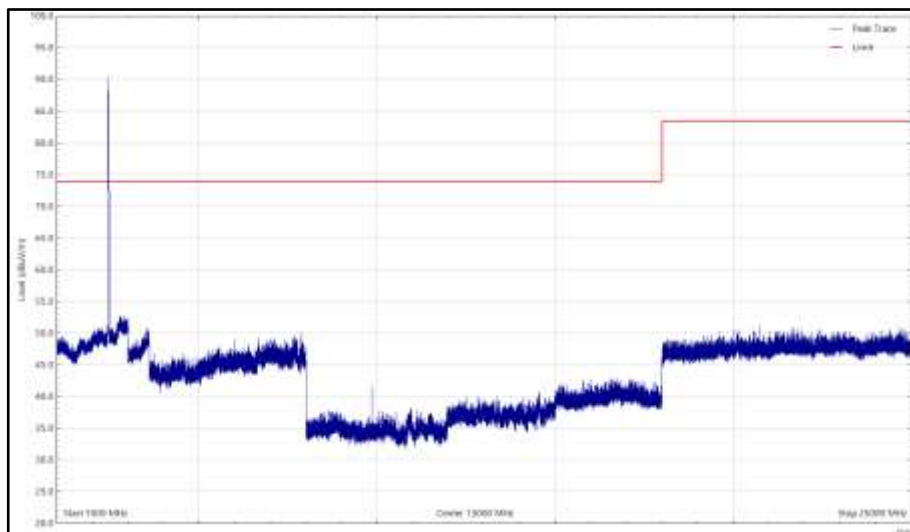


Figure 147 - 802.11n20 - Y, 2462 MHz, 1 GHz to 25 GHz, Vertical (Peak)

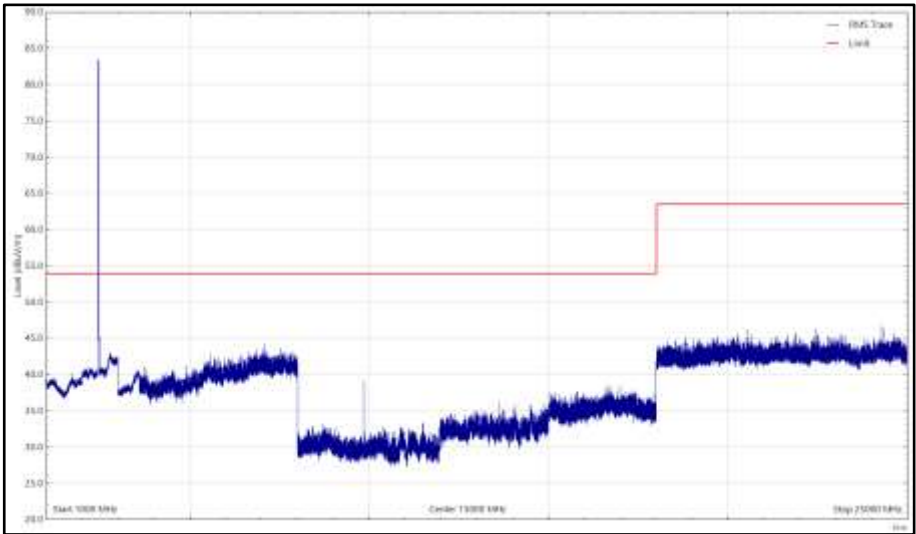


Figure 148 - 802.11n20 - Y, 2462 MHz, 1 GHz to 25 GHz, Vertical (rms)

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation	Orientation
4823.888	51.1	54.0	-2.9	CISPR Avg	132	100	Vertical	Z
4823.985	50.1	54.0	-3.9	CISPR Avg	145	161	Horizontal	Z

Table 65 - 802.11b - Z, 2412 MHz, 30 MHz to 25 GHz

No other emissions found within 6 dB of the limit.

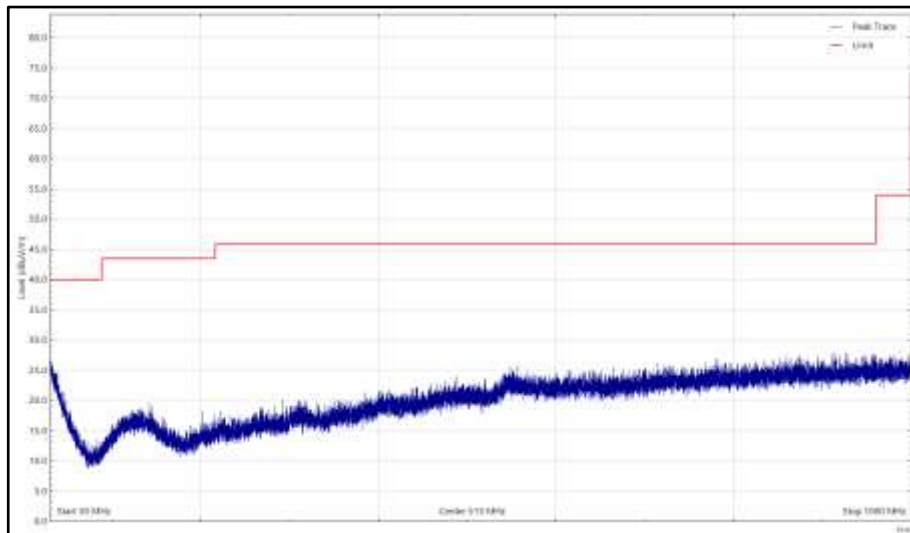


Figure 149 - 802.11b - Z, 2412 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

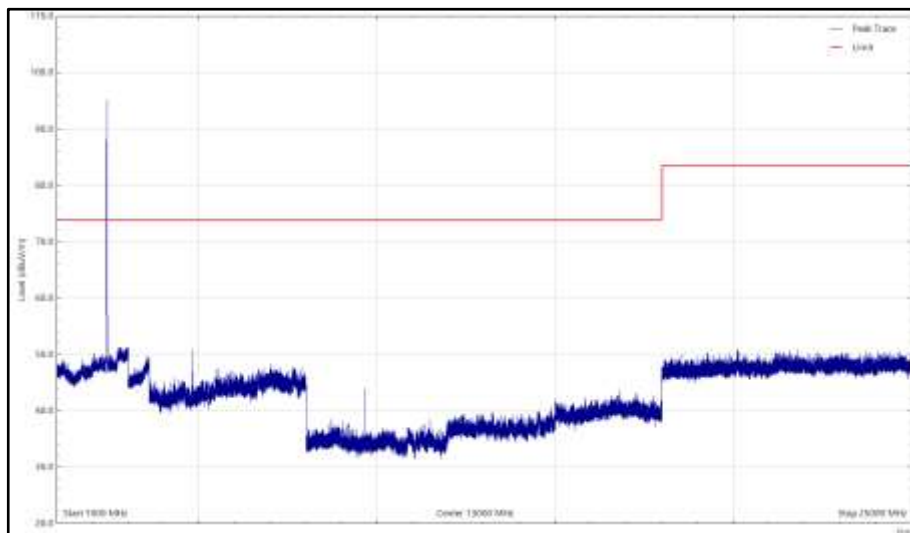


Figure 150 - 802.11b - Z, 2412 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

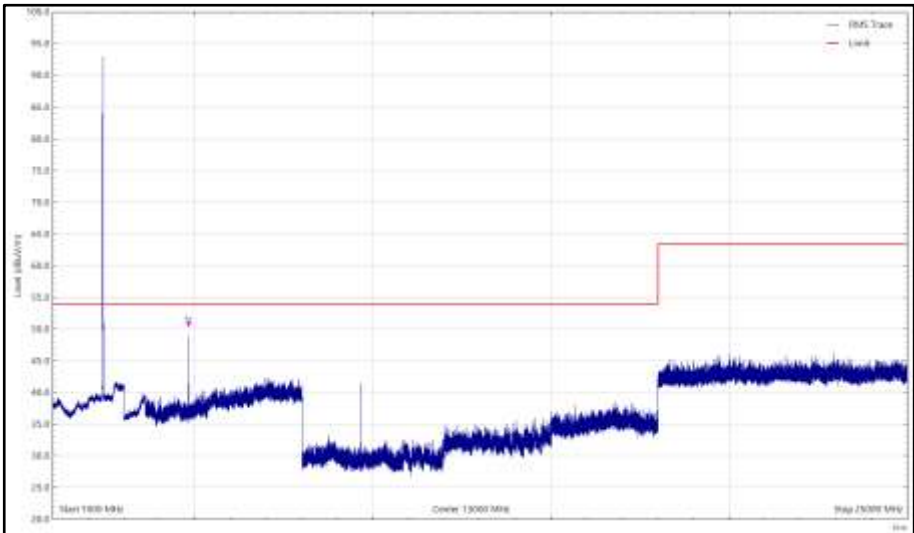


Figure 151 - 802.11b - Z, 2412 MHz, 1 GHz to 25 GHz, Horizontal (rms)

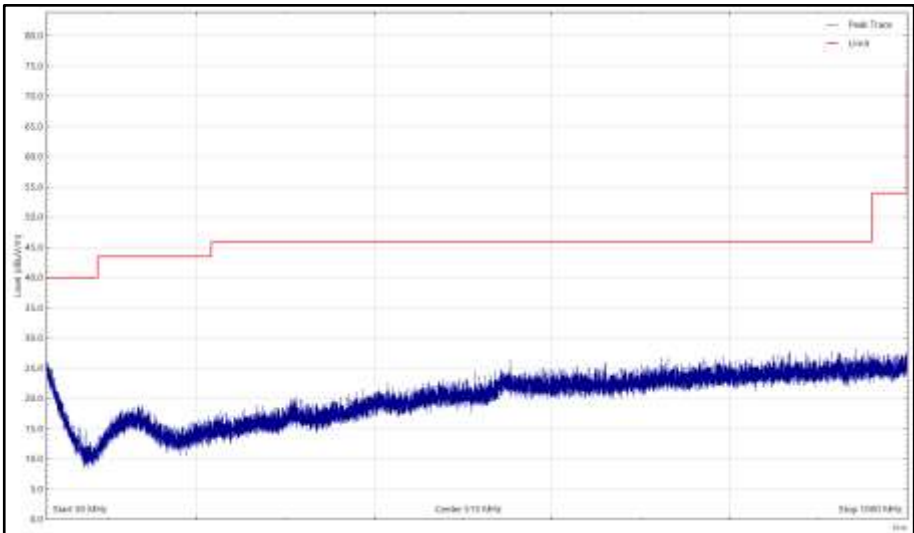


Figure 152 - 802.11b - Z, 2412 MHz, 30 MHz to 1 GHz, Vertical (Peak)

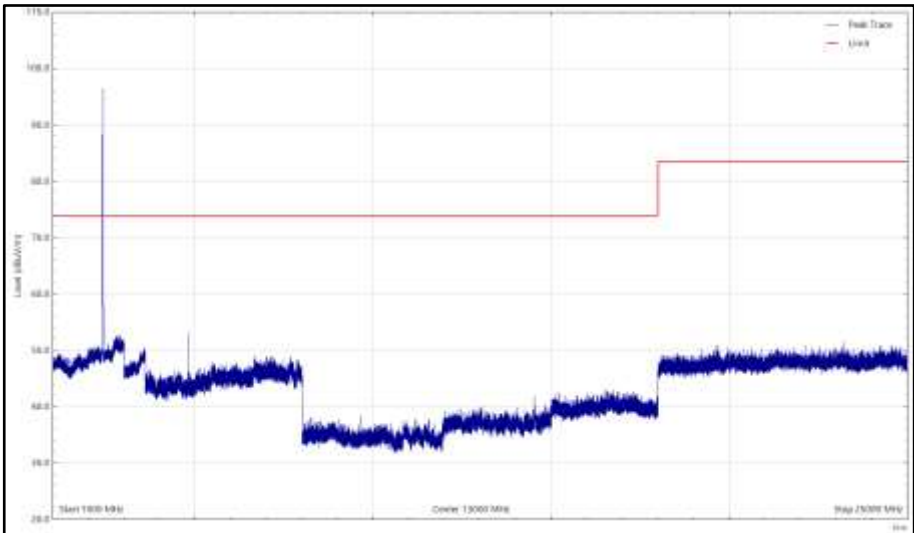


Figure 153 - 802.11b - Z, 2412 MHz, 1 GHz to 25 GHz, Vertical (Peak)

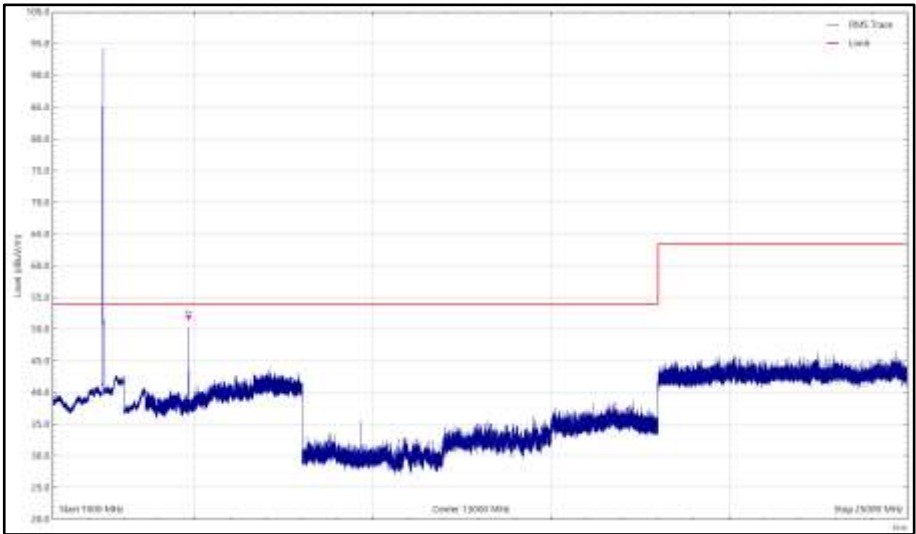


Figure 154 - 802.11b - Z, 2412 MHz, 1 GHz to 25 GHz, Vertical (rms)

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation	Orientation
4873.802	48.1	54.0	-5.9	CISPR Avg	51	104	Horizontal	Z
4873.987	48.5	54.0	-5.5	CISPR Avg	128	100	Vertical	Z

Table 66 - 802.11b - Z, 2437 MHz, 30 MHz to 25 GHz

No other emissions found within 6 dB of the limit.

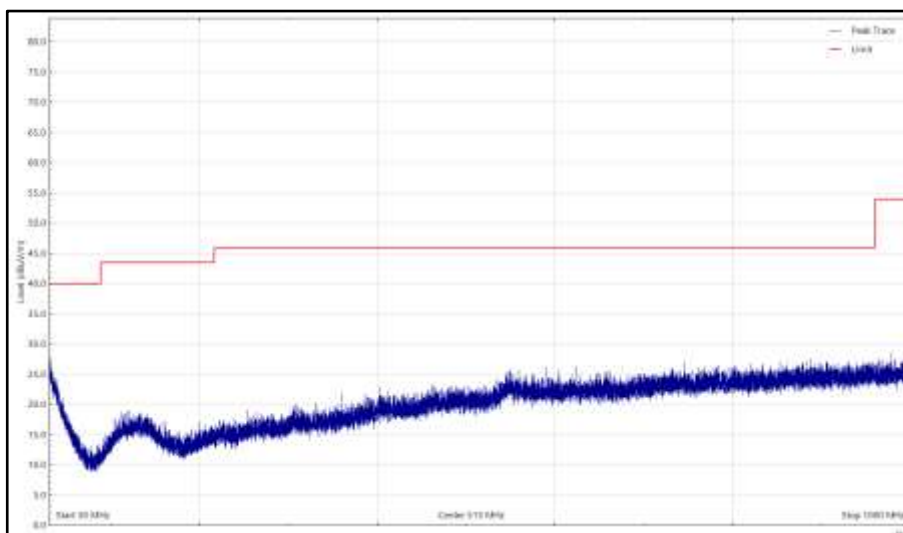


Figure 155 - 802.11b - Z, 2437 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

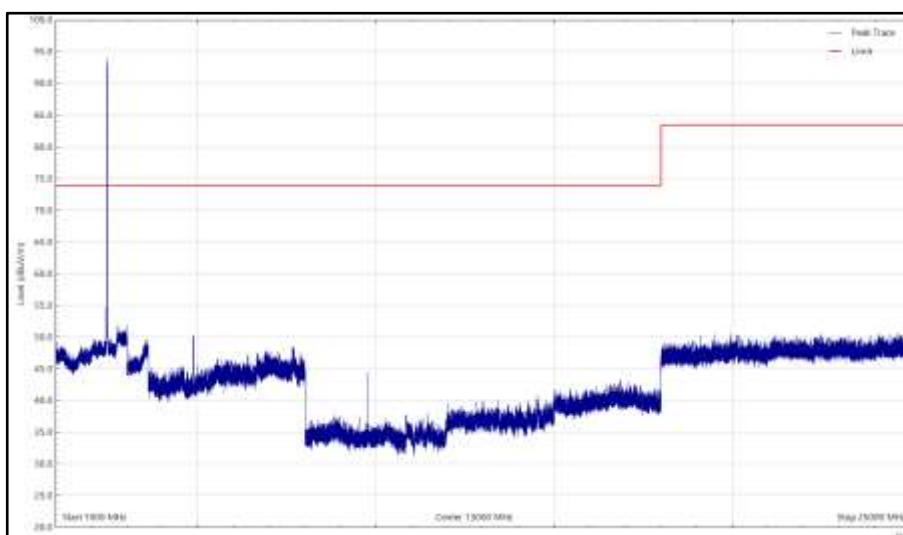


Figure 156 - 802.11b - Z, 2437 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

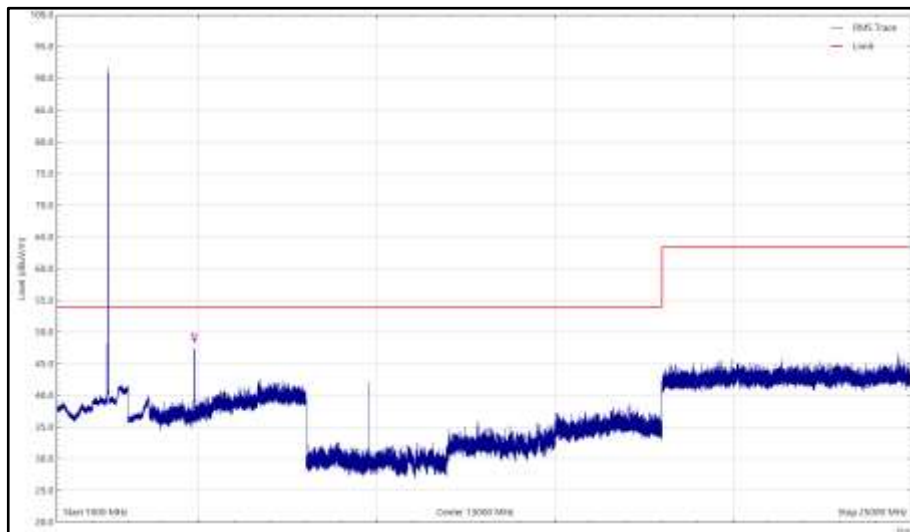


Figure 157 - 802.11b - Z, 2437 MHz, 1 GHz to 25 GHz, Horizontal (rms)

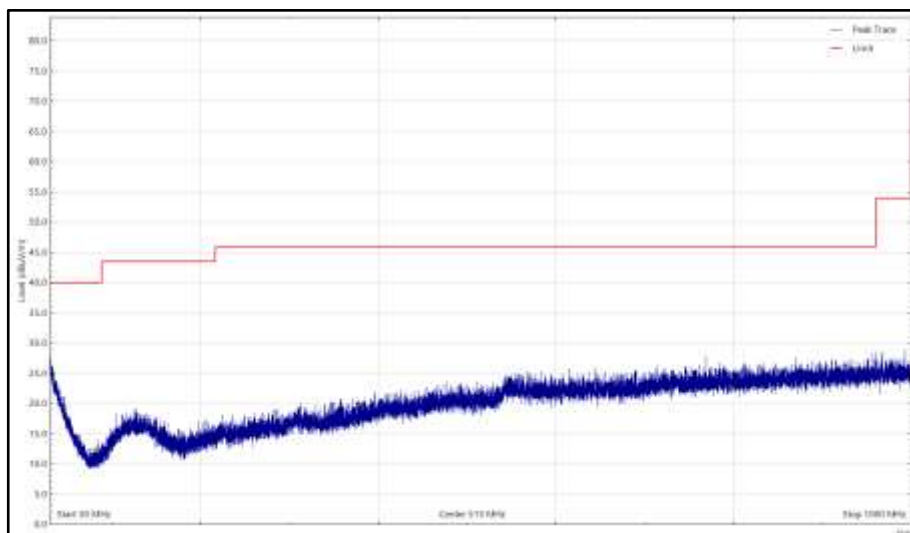


Figure 158 - 802.11b - Z, 2437 MHz, 30 MHz to 1 GHz, Vertical (Peak)

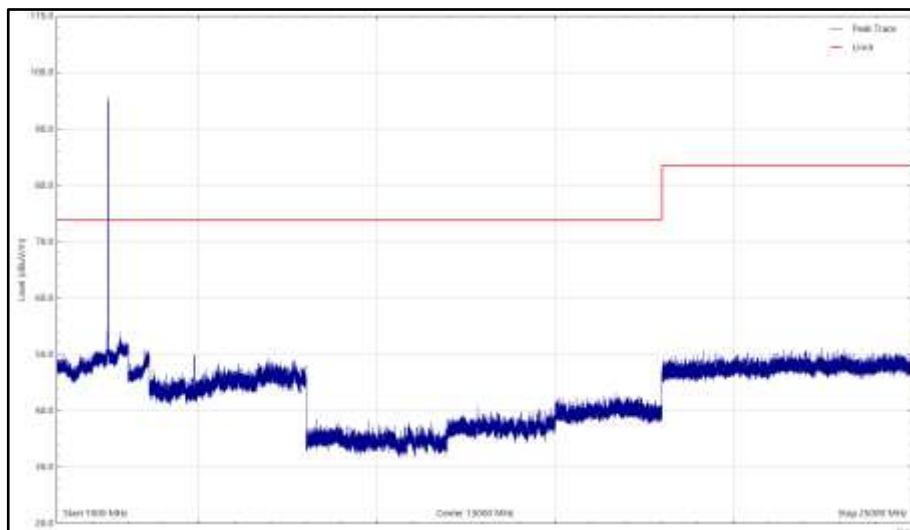


Figure 159 - 802.11b - Z, 2437 MHz, 1 GHz to 25 GHz, Vertical (Peak)

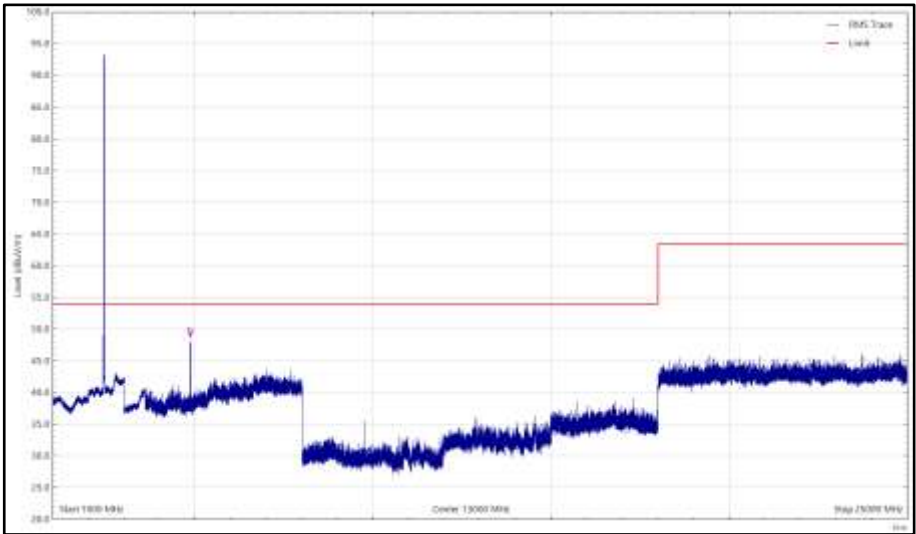


Figure 160 - 802.11b - Z, 2437 MHz, 1 GHz to 25 GHz, Vertical (rms)

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation	Orientation
4923.835	48.3	54.0	-5.7	CISPR Avg	121	121	Vertical	Z
4923.919	46.7	54.0	-7.3	CISPR Avg	0	129	Horizontal	Z

Table 67 - 802.11b - Z, 2462 MHz, 30 MHz to 25 GHz

No other emissions found within 6 dB of the limit.

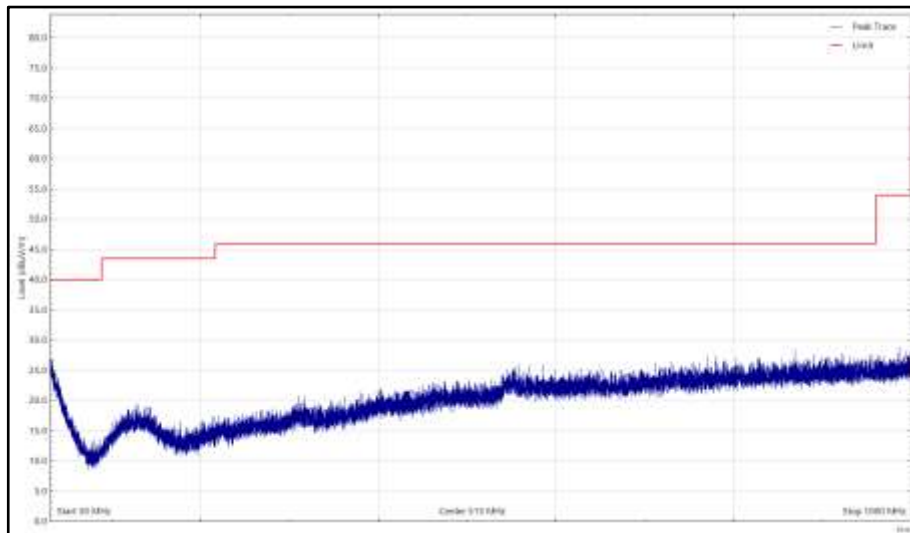


Figure 161 - 802.11b - Z, 2462 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

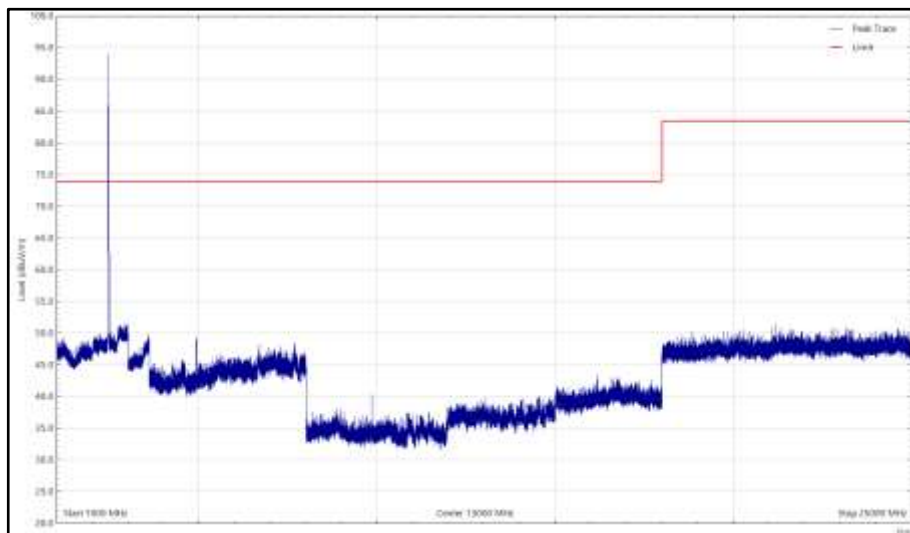


Figure 162 - 802.11b - Z, 2462 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

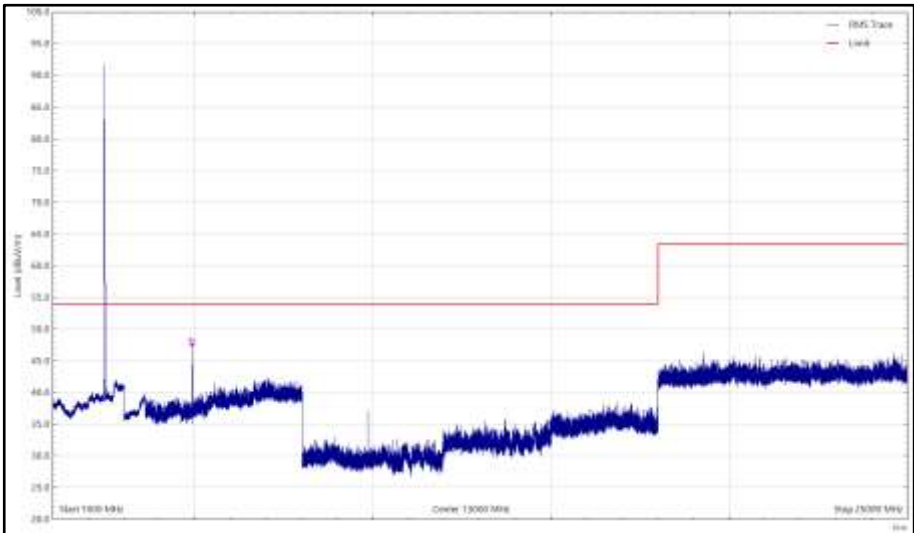


Figure 163 - 802.11b - Z, 2462 MHz, 1 GHz to 25 GHz, Horizontal (rms)

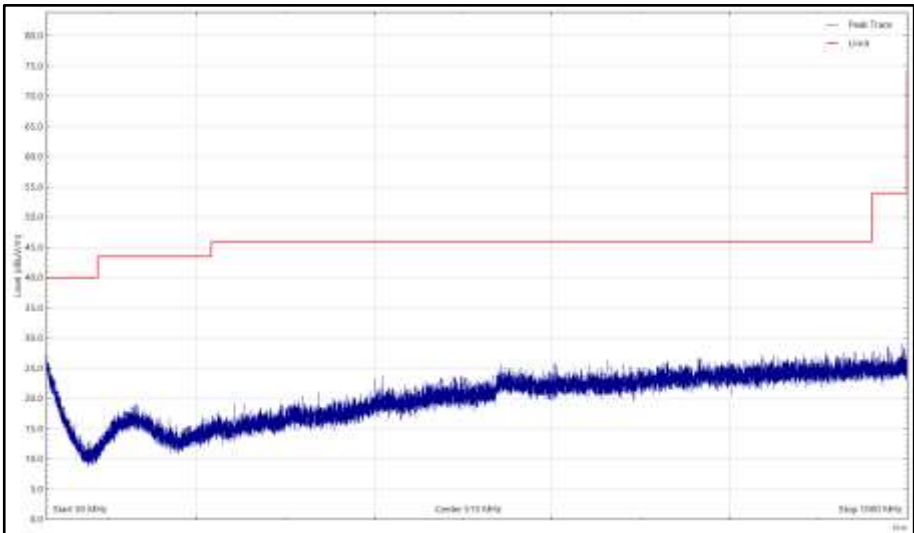


Figure 164 - 802.11b - Z, 2462 MHz, 30 MHz to 1 GHz, Vertical (Peak)

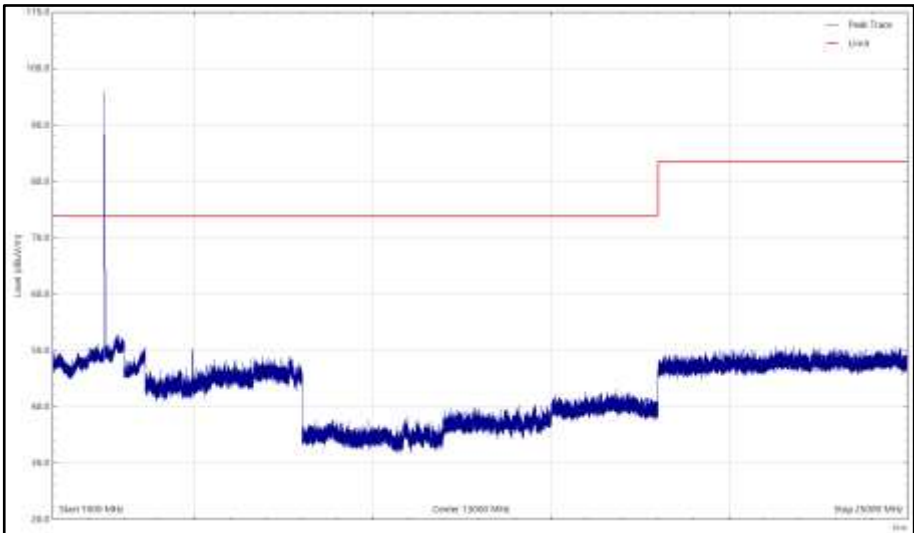


Figure 165 - 802.11b - Z, 2462 MHz, 1 GHz to 25 GHz, Vertical (Peak)

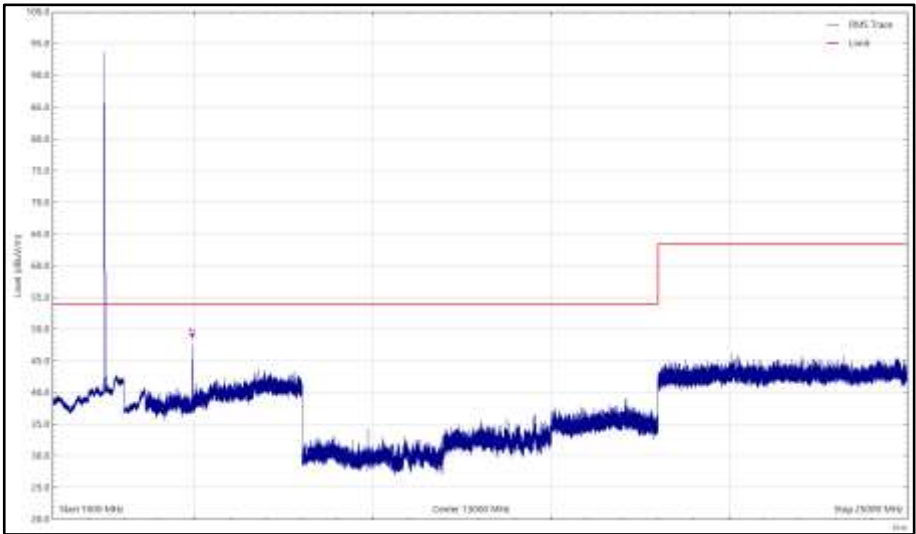


Figure 166 - 802.11b - Z, 2462 MHz, 1 GHz to 25 GHz, Vertical (rms)

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

Table 68 - 802.11g - Z, 2412 MHz, 30 MHz to 25 GHz

*No emissions found within 6 dB of the limit.

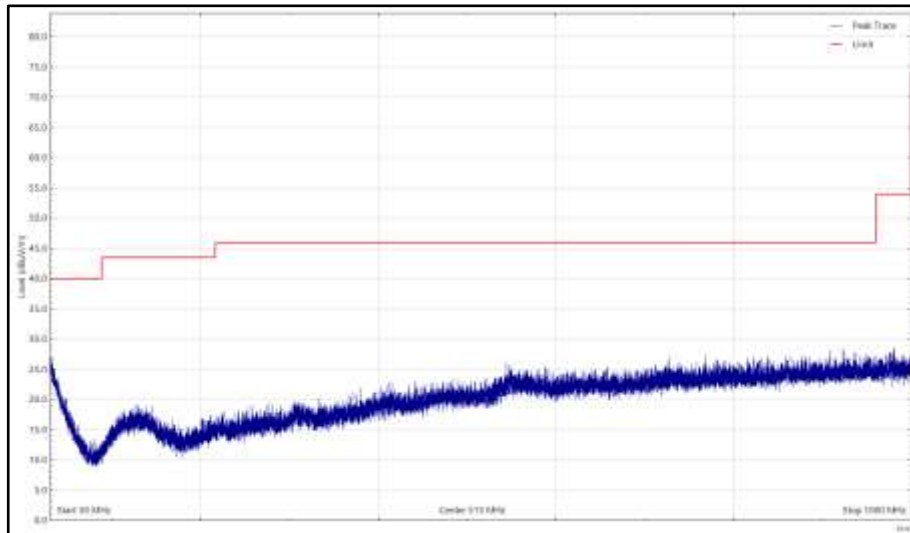


Figure 167 - 802.11g - Z, 2412 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

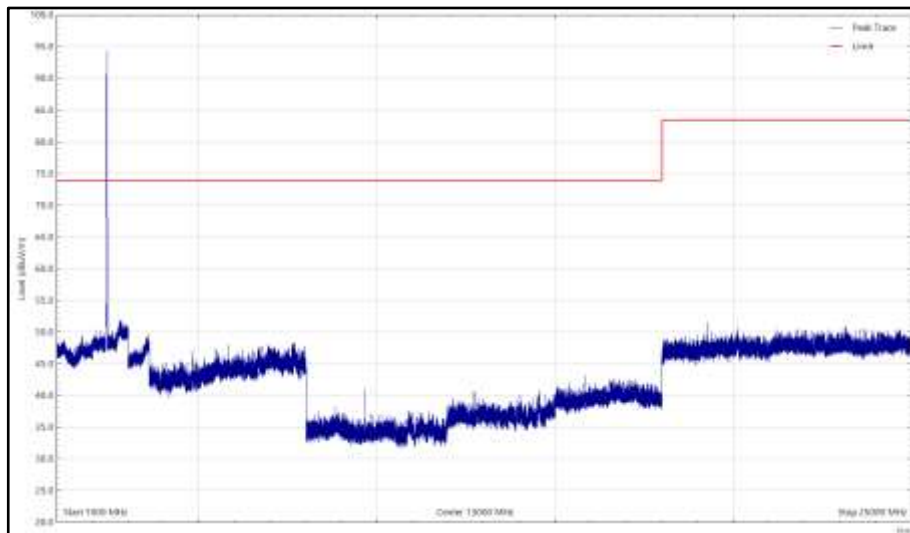


Figure 168 - 802.11g - Z, 2412 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

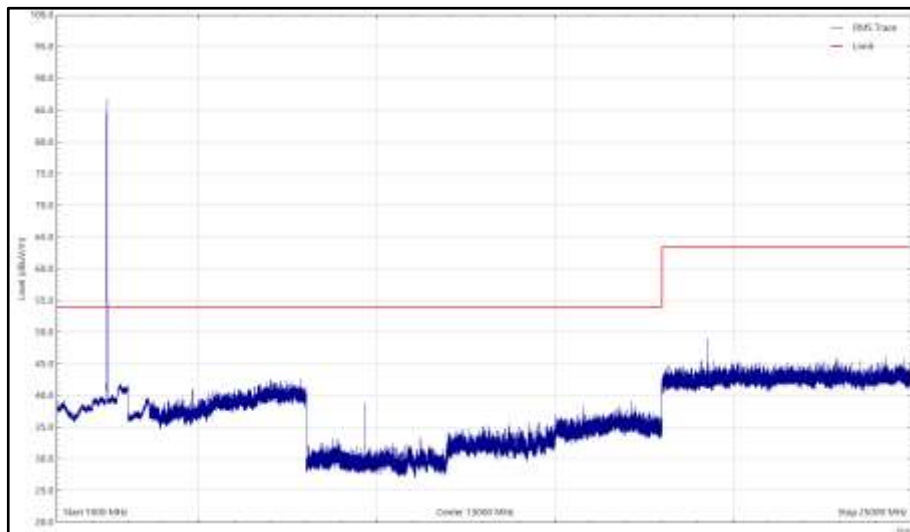


Figure 169 - 802.11g - Z, 2412 MHz, 1 GHz to 25 GHz, Horizontal (rms)

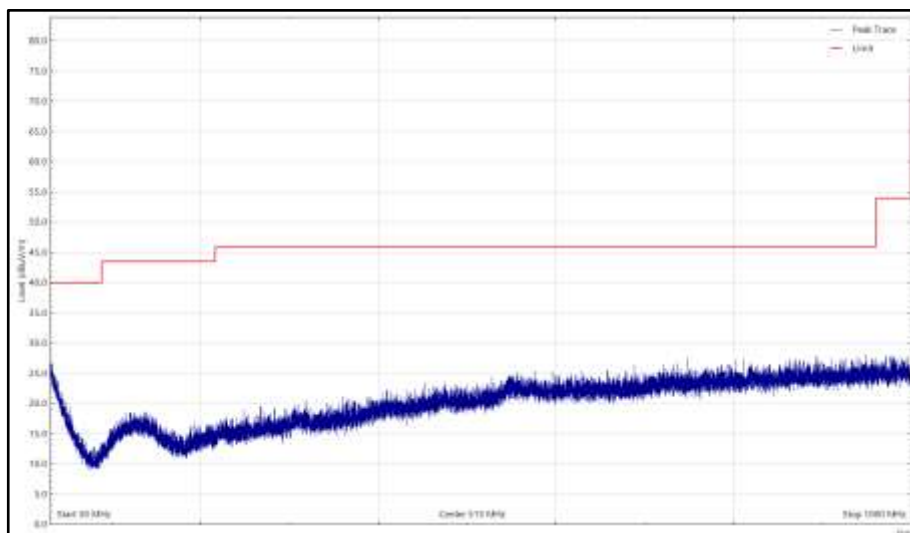


Figure 170 - 802.11g - Z, 2412 MHz, 30 MHz to 1 GHz, Vertical (Peak)

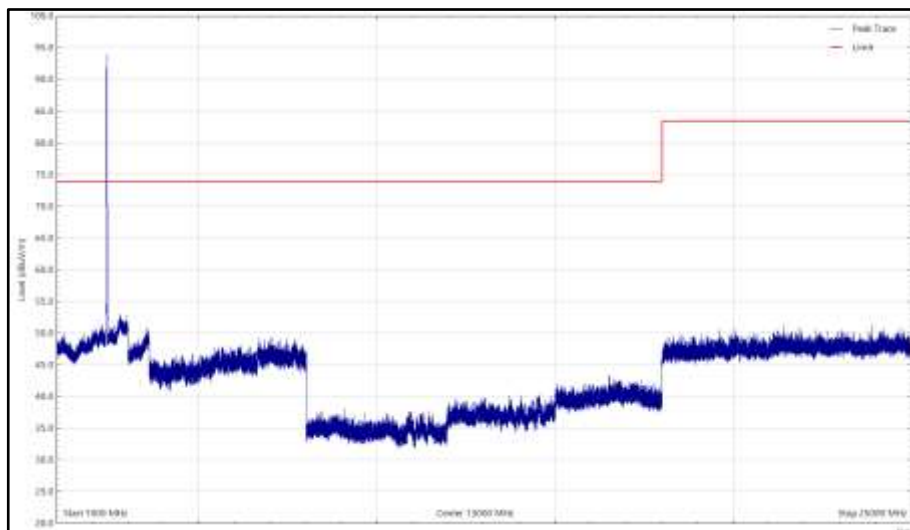


Figure 171 - 802.11g - Z, 2412 MHz, 1 GHz to 25 GHz, Vertical (Peak)

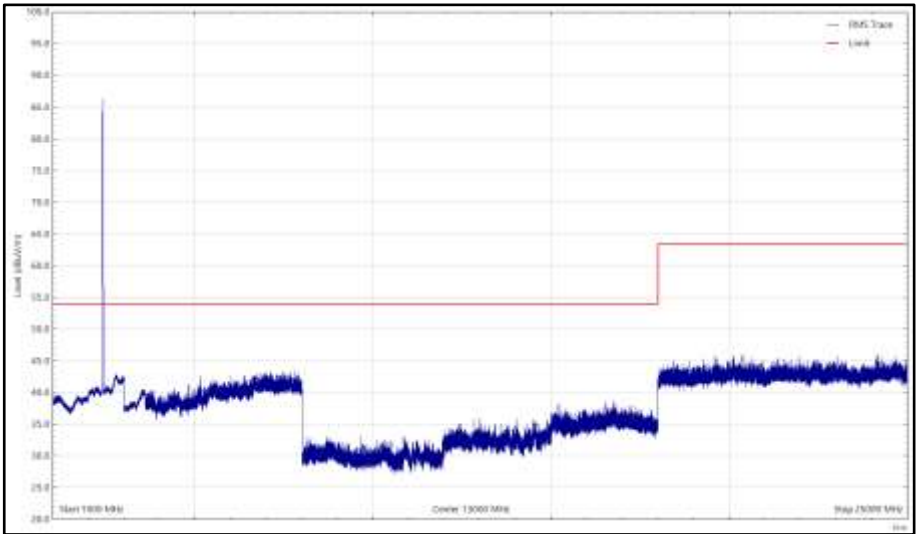


Figure 172 - 802.11g - Z, 2412 MHz, 1 GHz to 25 GHz, Vertical (rms)

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

Table 69 - 802.11g - Z, 2437 MHz, 30 MHz to 25 GHz

*No emissions found within 6 dB of the limit.

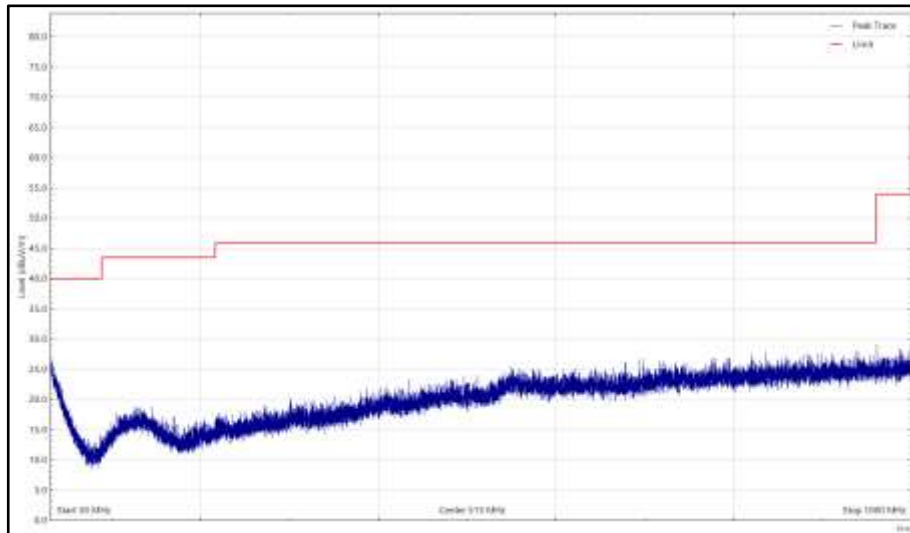


Figure 173 - 802.11g - Z, 2437 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

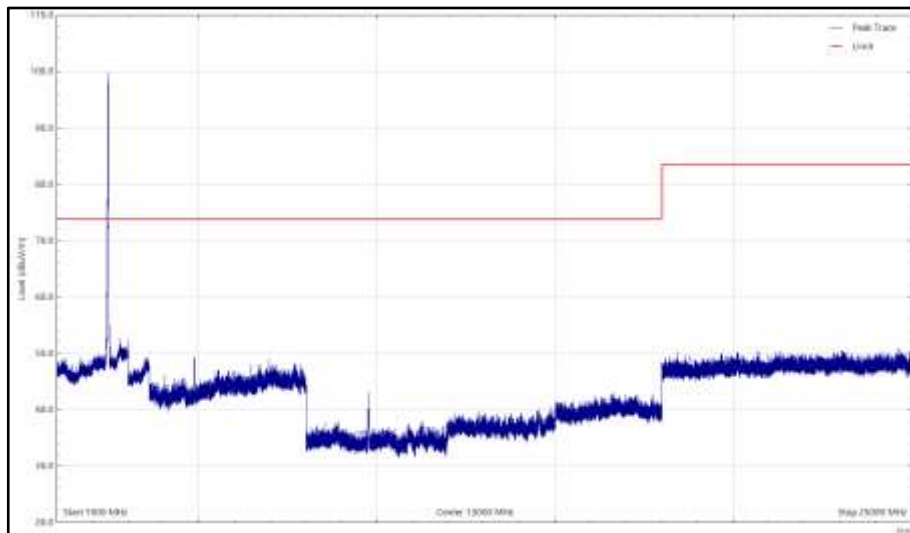


Figure 174 - 802.11g - Z, 2437 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

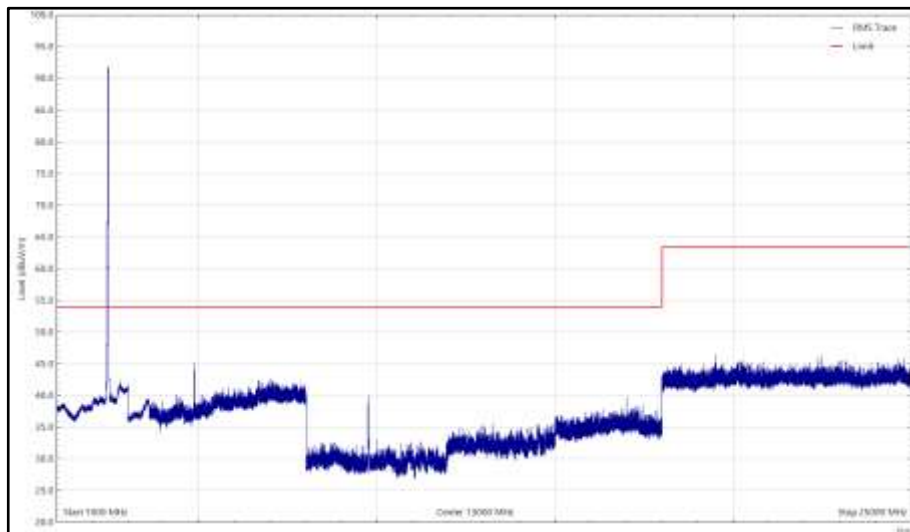


Figure 175 - 802.11g - Z, 2437 MHz, 1 GHz to 25 GHz, Horizontal (rms)

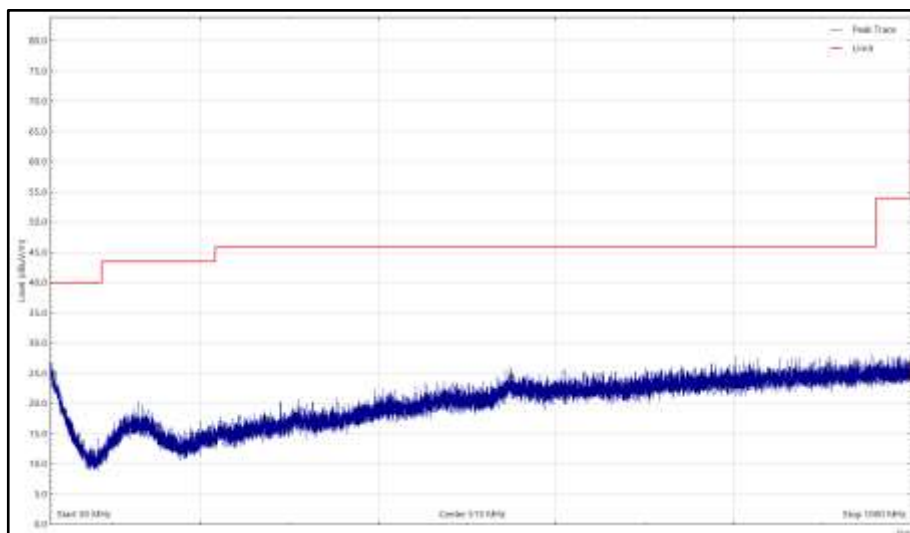


Figure 176 - 802.11g - Z, 2437 MHz, 30 MHz to 1 GHz, Vertical (Peak)

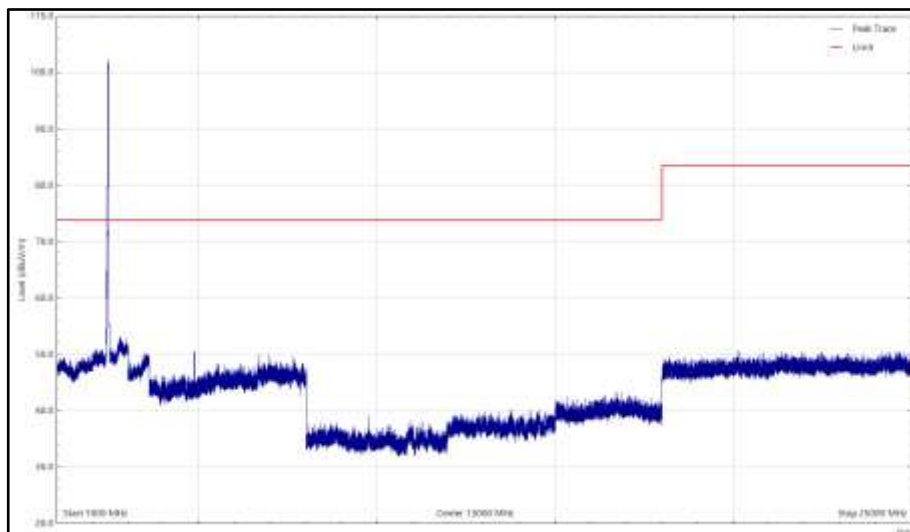


Figure 177 - 802.11g - Z, 2437 MHz, 1 GHz to 25 GHz, Vertical (Peak)

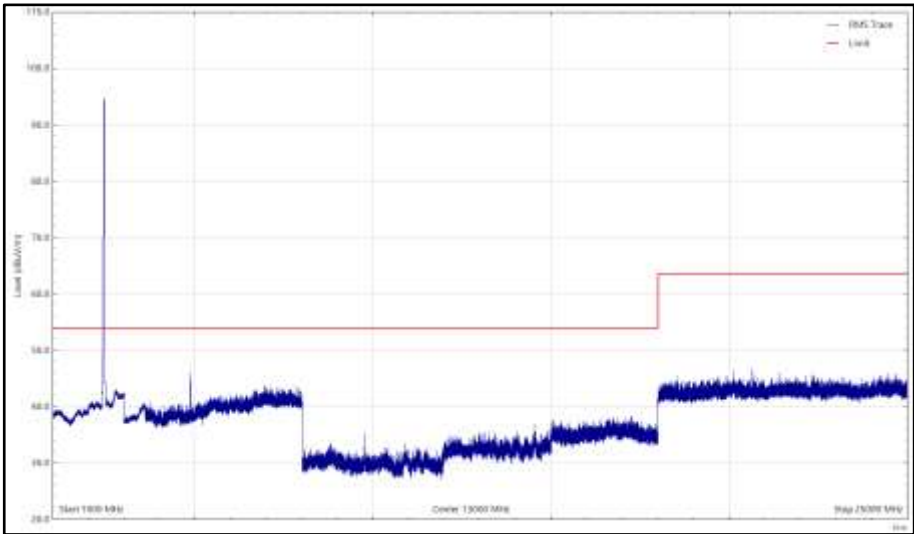


Figure 178 - 802.11g - Z, 2437 MHz, 1 GHz to 25 GHz, Vertical (rms)

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

Table 70 - 802.11g - Z, 2462 MHz, 30 MHz to 25 GHz

*No emissions found within 6 dB of the limit.

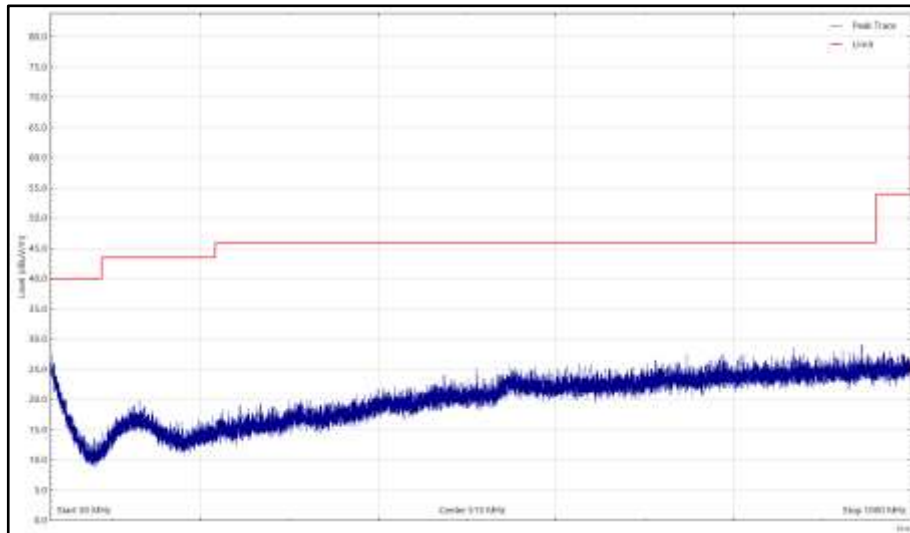


Figure 179 - 802.11g - Z, 2462 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

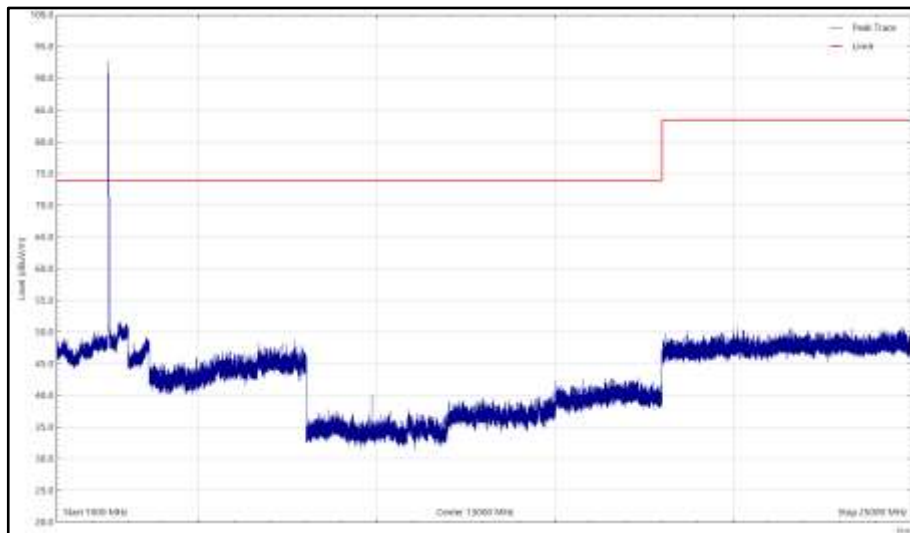


Figure 180 - 802.11g - Z, 2462 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

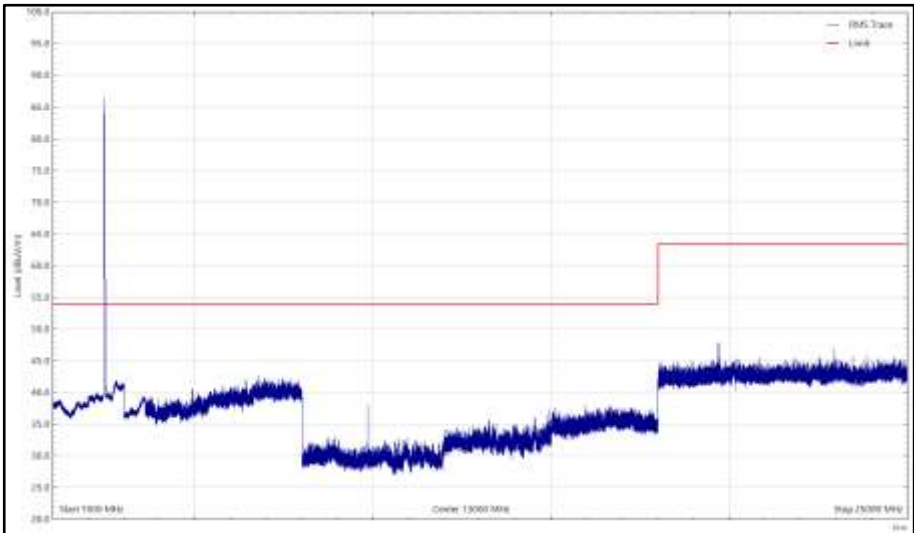


Figure 181 - 802.11g - Z, 2462 MHz, 1 GHz to 25 GHz, Horizontal (rms)

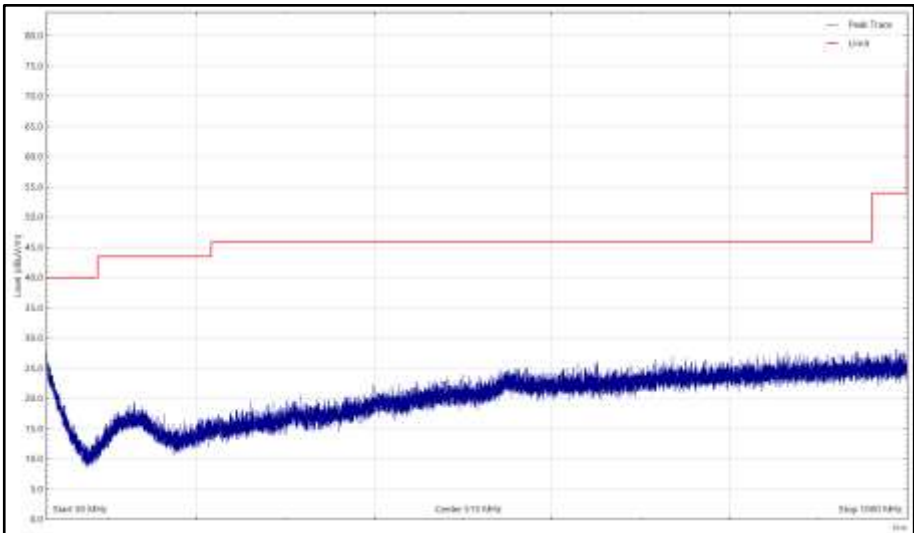


Figure 182 - 802.11g - Z, 2462 MHz, 30 MHz to 1 GHz, Vertical (Peak)

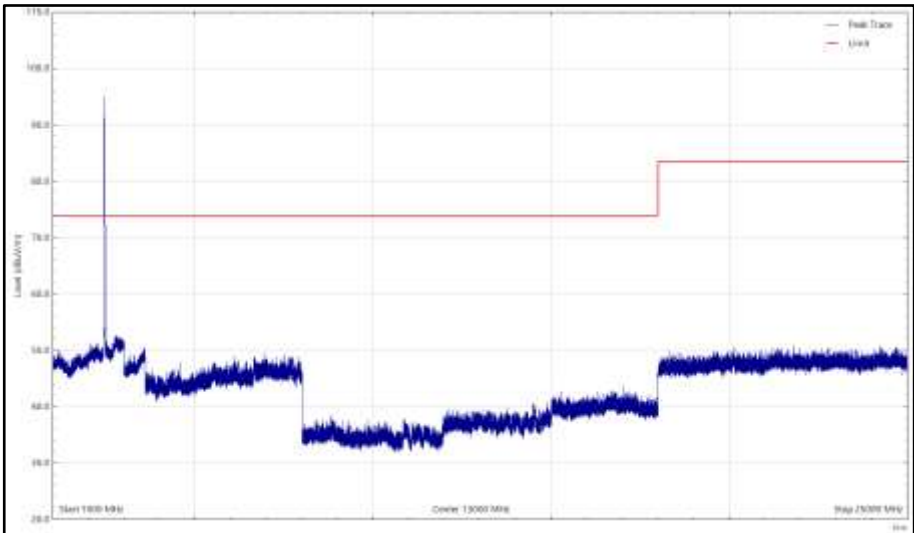


Figure 183 - 802.11g - Z, 2462 MHz, 1 GHz to 25 GHz, Vertical (Peak)

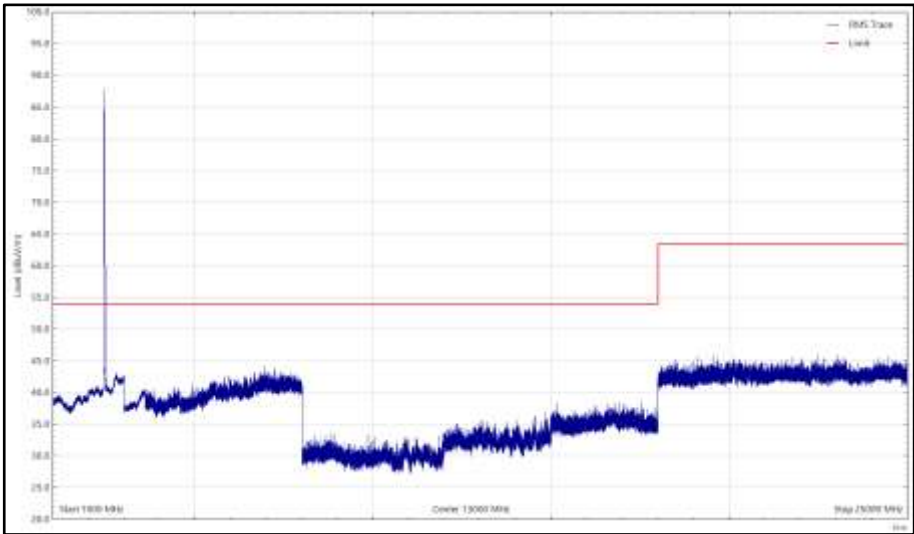


Figure 184 - 802.11g - Z, 2462 MHz, 1 GHz to 25 GHz, Vertical (rms)

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

Table 71 - 802.11n20 - Z, 2412 MHz, 30 MHz to 25 GHz

*No emissions found within 6 dB of the limit.

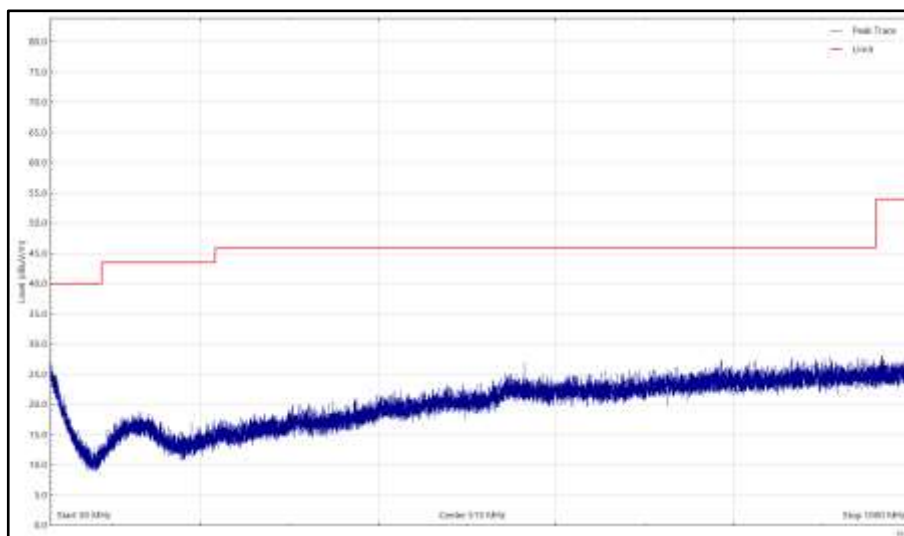


Figure 185 - 802.11n20 - Z, 2412 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

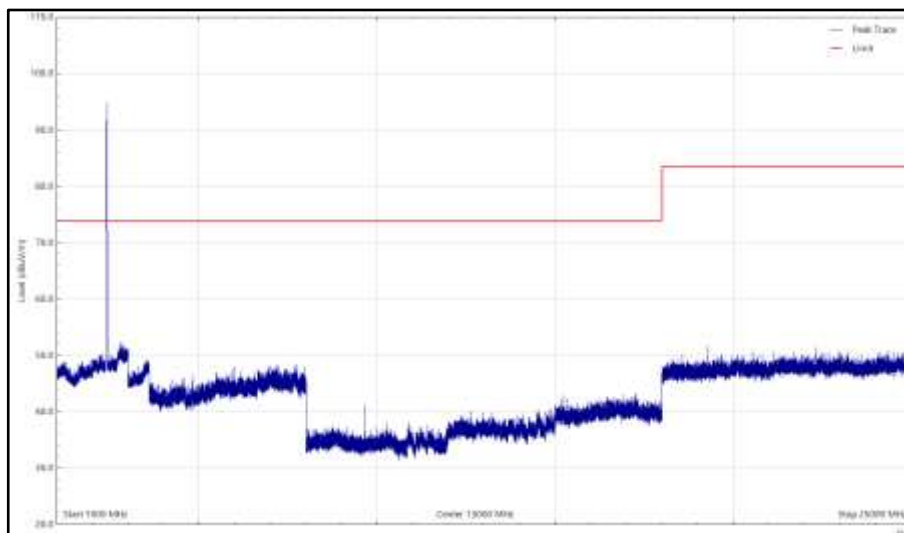


Figure 186 - 802.11n20 - Z, 2412 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

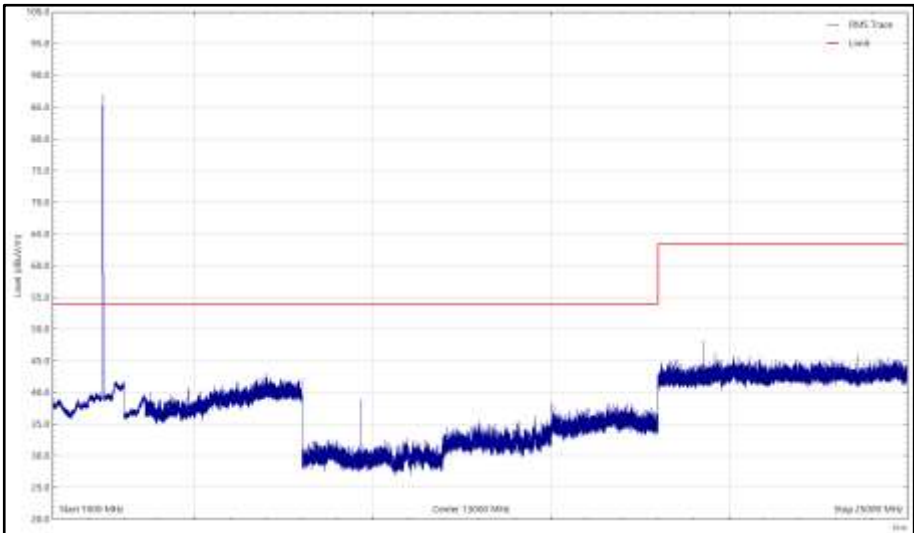


Figure 187 - 802.11n20 - Z, 2412 MHz, 1 GHz to 25 GHz, Horizontal (rms)

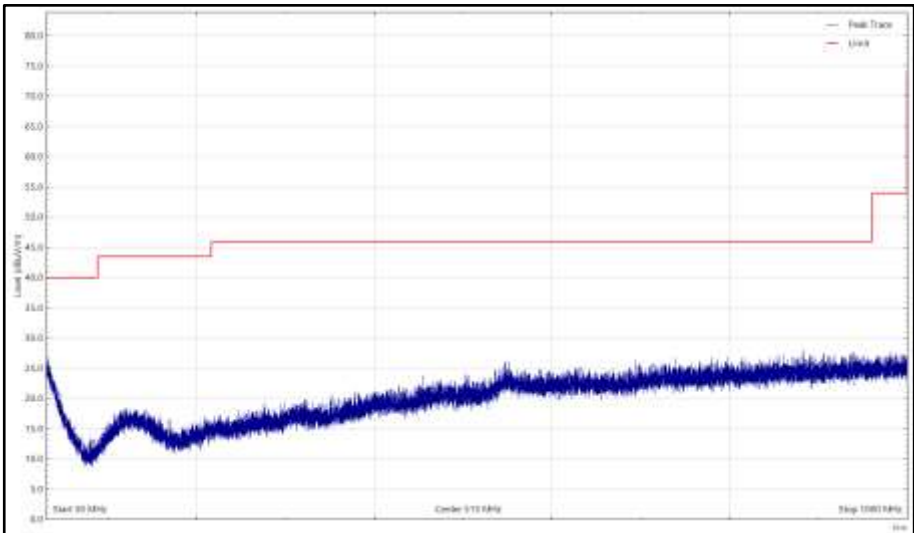


Figure 188 - 802.11n20 - Z, 2412 MHz, 30 MHz to 1 GHz, Vertical (Peak)

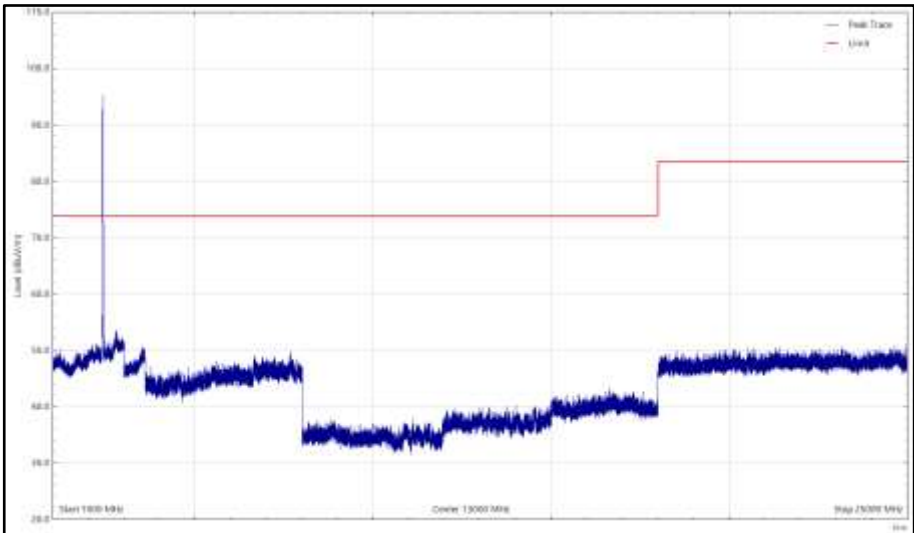


Figure 189 - 802.11n20 - Z, 2412 MHz, 1 GHz to 25 GHz, Vertical (Peak)

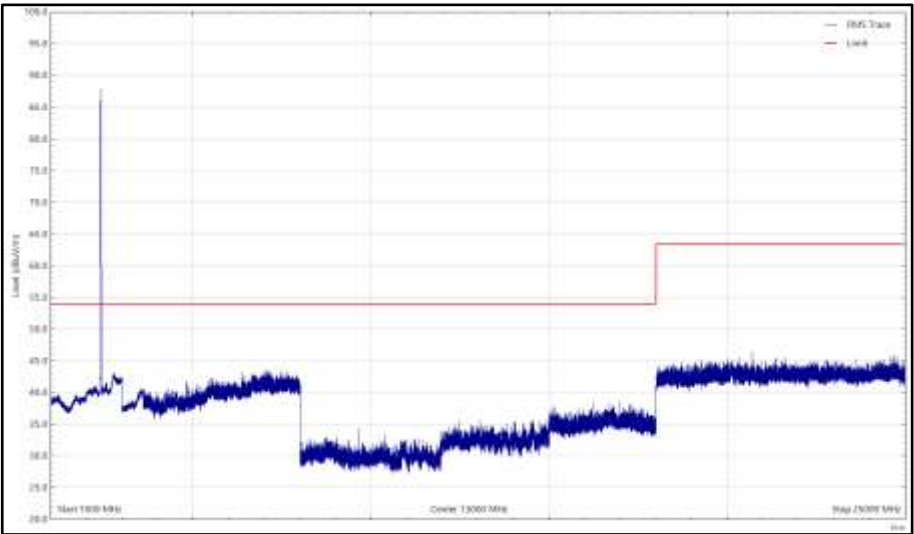


Figure 190 - 802.11n20 - Z, 2412 MHz, 1 GHz to 25 GHz, Vertical (rms)



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

Table 72 - 802.11n20 - Z, 2437 MHz, 30 MHz to 25 GHz

*No emissions found within 6 dB of the limit.

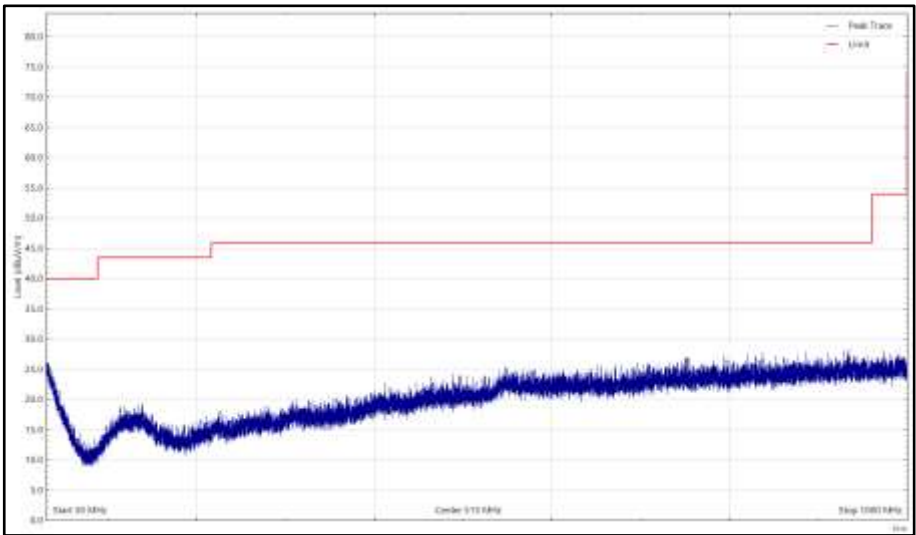


Figure 191 - 802.11n20 - Z, 2437 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

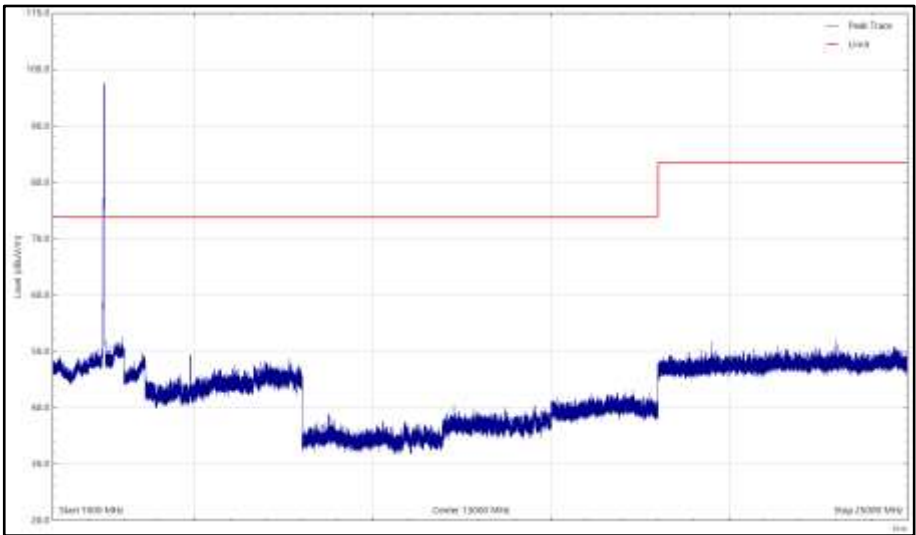


Figure 192 - 802.11n20 - Z, 2437 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

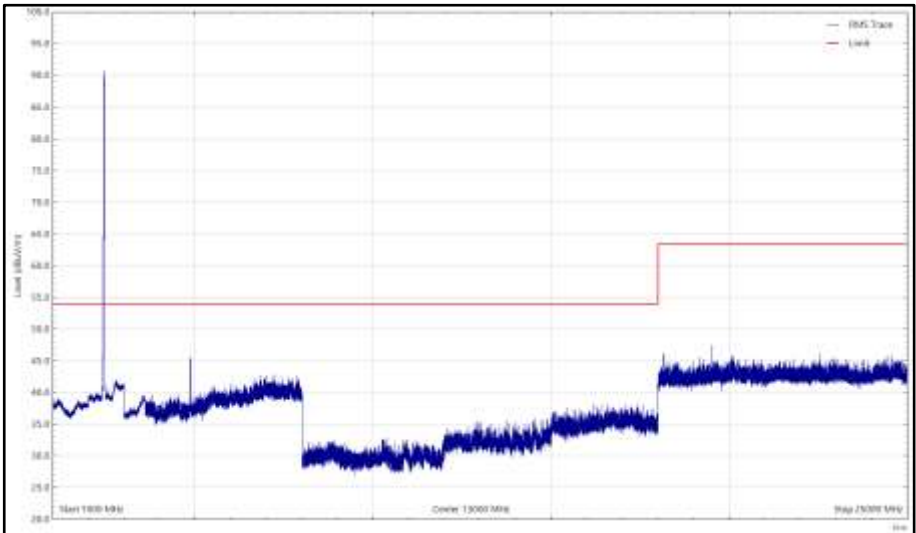


Figure 193 - 802.11n20 - Z, 2437 MHz, 1 GHz to 25 GHz, Horizontal (rms)

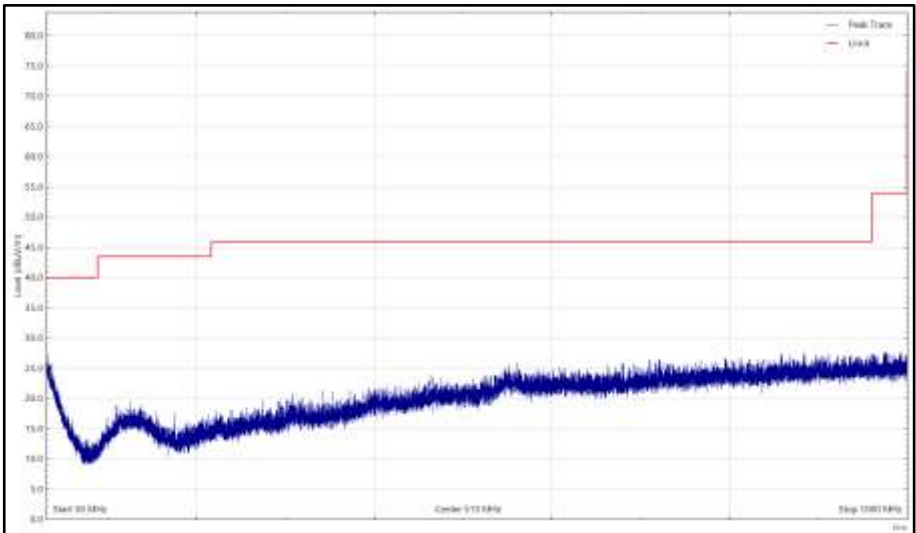


Figure 194 - 802.11n20 - Z, 2437 MHz, 30 MHz to 1 GHz, Vertical (Peak)

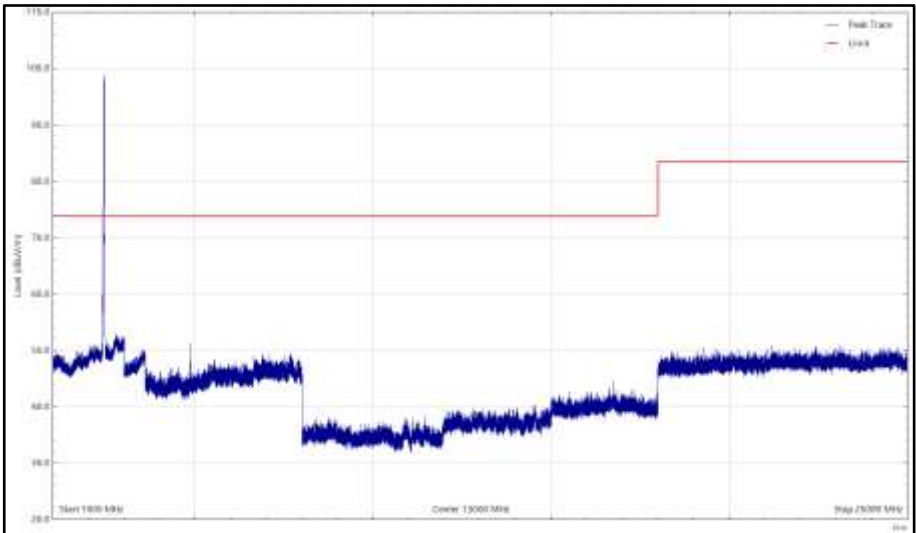


Figure 195 - 802.11n20 - Z, 2437 MHz, 1 GHz to 25 GHz, Vertical (Peak)

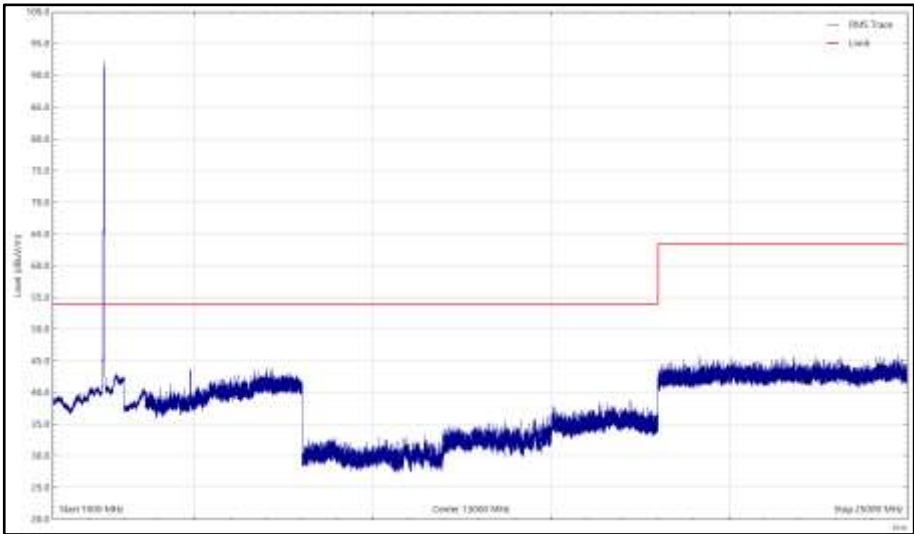


Figure 196 - 802.11n20 - Z, 2437 MHz, 1 GHz to 25 GHz, Vertical (rms)



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

Table 73 - 802.11n20 - Z, 2462 MHz, 30 MHz to 25 GHz

*No emissions found within 6 dB of the limit.

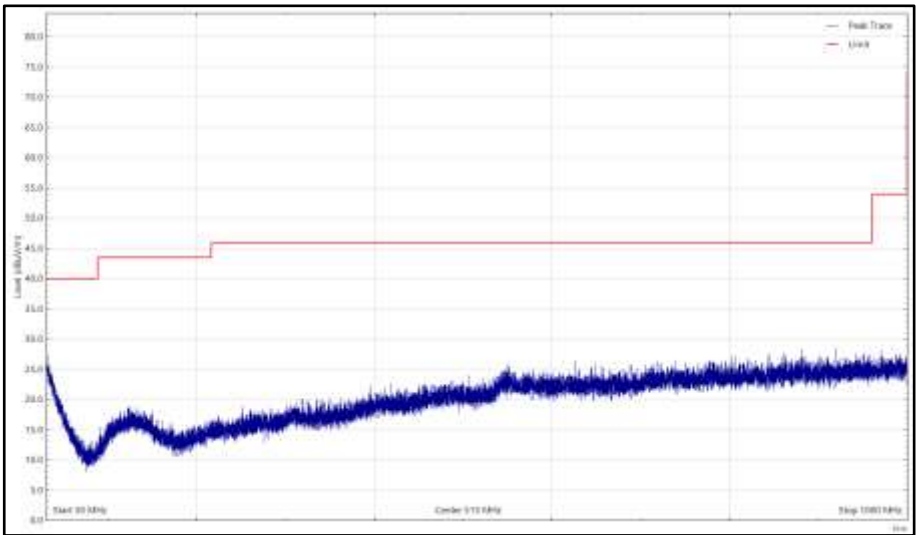


Figure 197 - 802.11n20 - Z, 2462 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

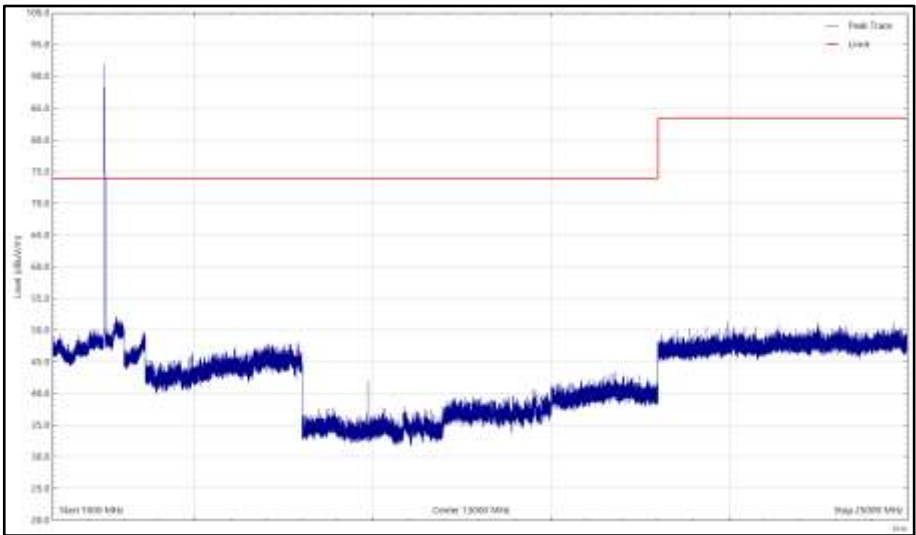


Figure 198 - 802.11n20 - Z, 2462 MHz, 1 GHz to 25 GHz, Horizontal (Peak)

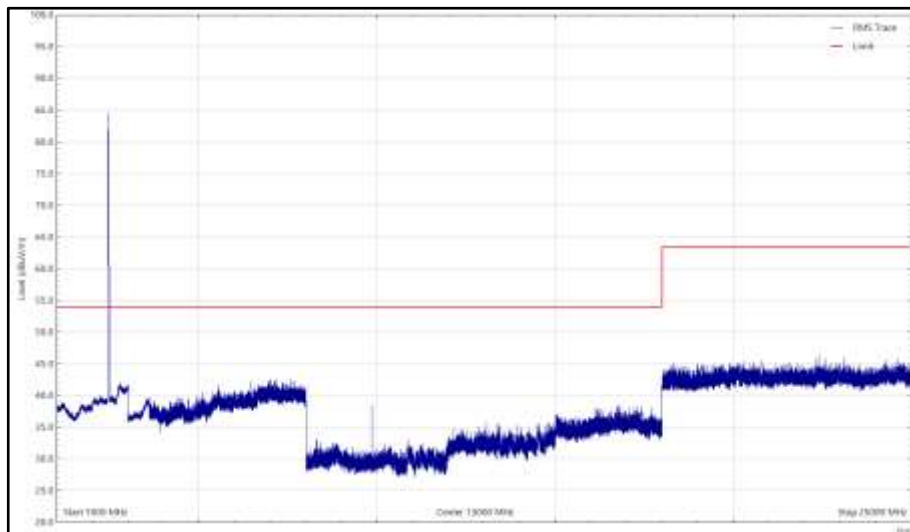


Figure 199 - 802.11n20 - Z, 2462 MHz, 1 GHz to 25 GHz, Horizontal (rms)

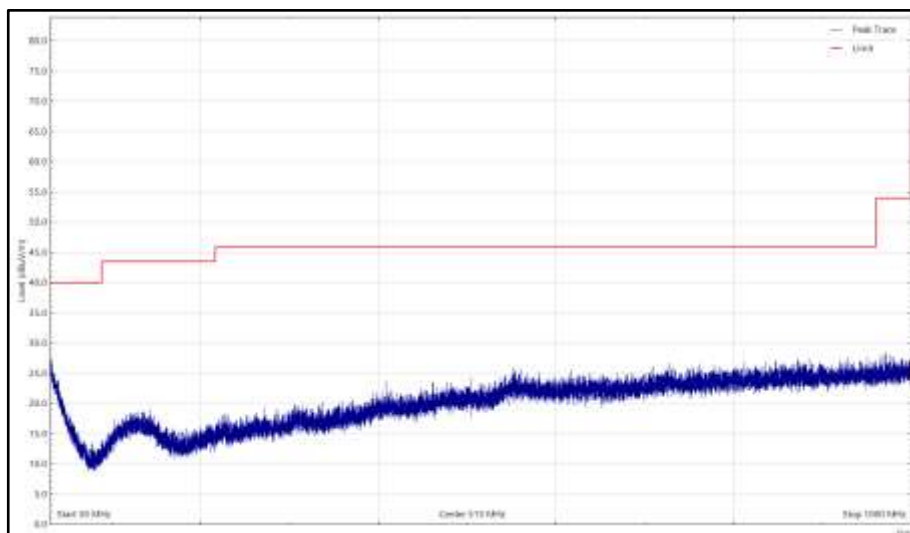


Figure 200 - 802.11n20 - Z, 2462 MHz, 30 MHz to 1 GHz, Vertical (Peak)

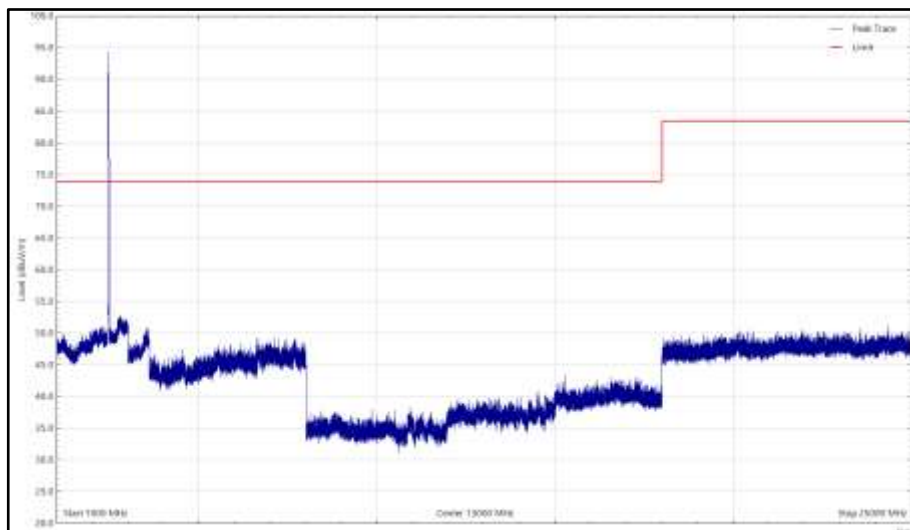


Figure 201 - 802.11n20 - Z, 2462 MHz, 1 GHz to 25 GHz, Vertical (Peak)

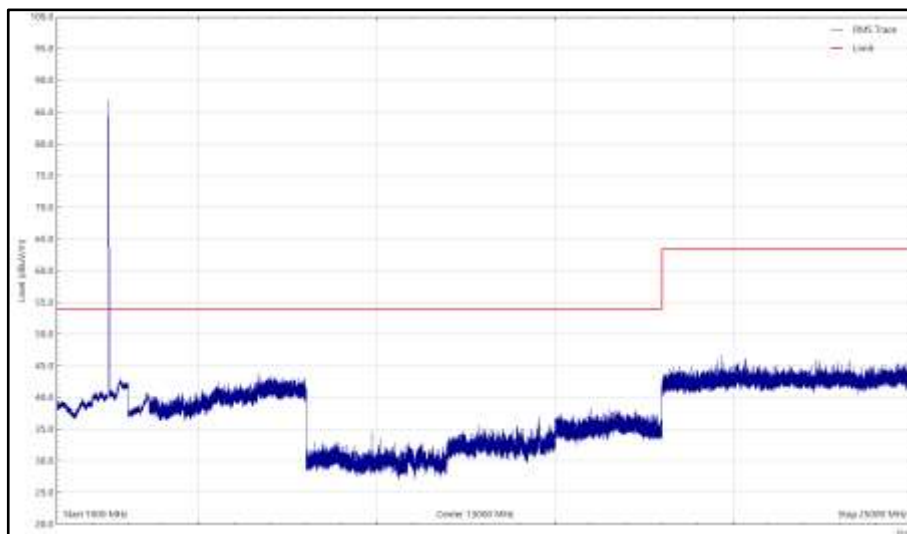


Figure 202 - 802.11n20 - Z, 2462 MHz, 1 GHz to 25 GHz, Vertical (rms)

FCC 47 CFR Part 15, Limit Clause 15.247 (d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in 15.209(a)

ISED RSS-247, Limit Clause 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.



Figure 203 - Test Setup – 30 MHz to 1 GHz – X Orientation



Figure 204 - Test Setup – 30 MHz to 1 GHz – Y Orientation



Figure 205 - Test Setup – 30 MHz to 1 GHz – Z Orientation

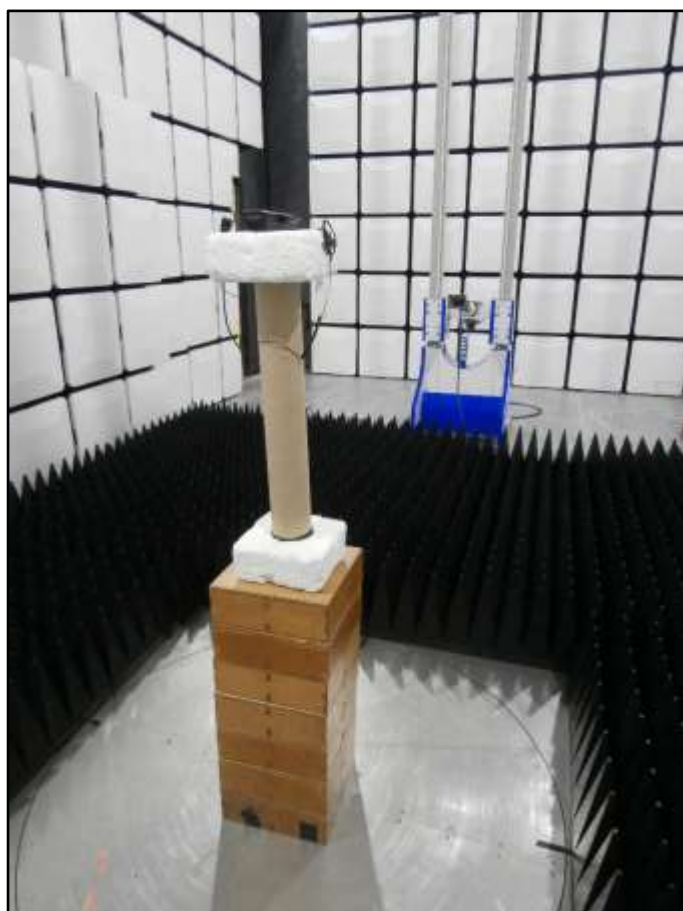


Figure 206 - Test Setup – 1 GHz to 18 GHz – X Orientation

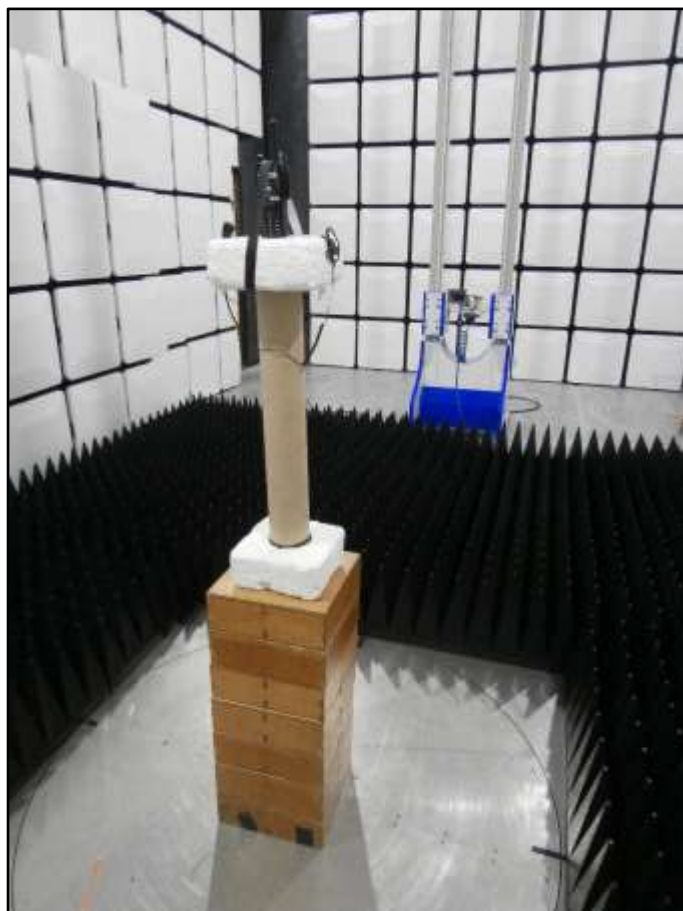


Figure 207 - Test Setup – 1 GHz to 18 GHz – Y Orientation

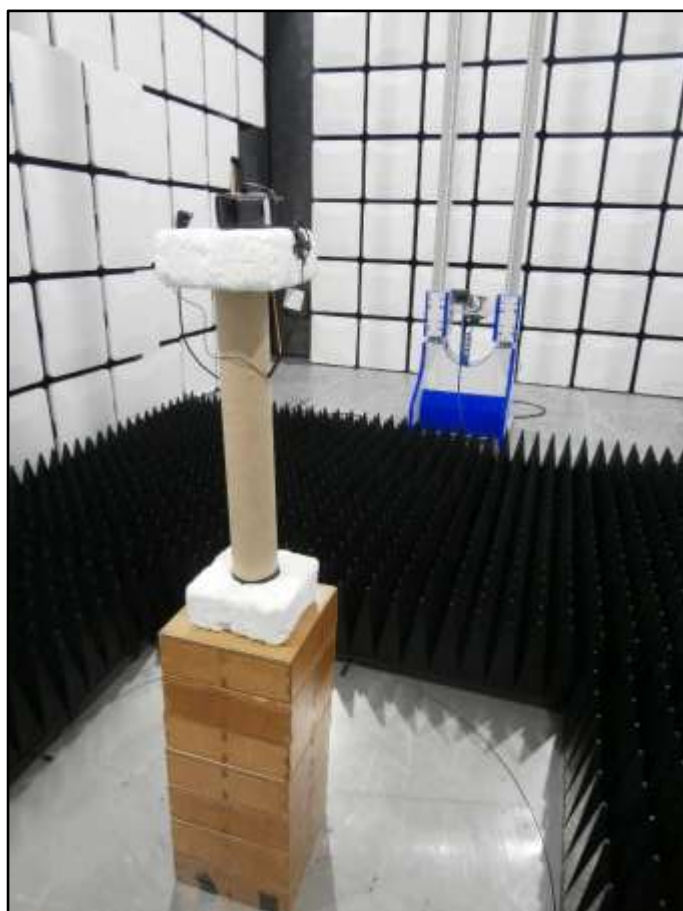


Figure 208 - Test Setup – 1 GHz to 18 GHz – Z Orientation



Figure 209 - Test Setup – 18 GHz to 25 GHz – X Orientation



Figure 210 - Test Setup – 18 GHz to 25 GHz – Y Orientation



Figure 211 - Test Setup – 18 GHz to 25 GHz – Z Orientation



2.6.8 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 12.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Antenna 18-40GHz (Double Ridge Guide)	Link Microtek Ltd	AM180HA-K-TU2	230	24	27-Jul-2022
Antenna with permanent attenuator (Bilog)	Schaffner	CBL6143	287	24	14-Oct-2022
8GHz - 18GHz Pre-Amplifier	Phase One	PSO4-0087	1533	12	04-Feb-2021
18GHz - 40GHz Pre-Amplifier	Phase One	PSO4-0087	1534	12	18-Feb-2021
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	03-Jan-2021
Cable (18 GHz)	Rosenberger	LU7-071-2000	5106	12	09-Dec-2020
EmX Emissions Software	TUV SUD	V2.0.1	5125	-	Software
3.5 mm 1m Cable	Junkosha	MWX221-01000DMS	5420	12	22-Jun-2021
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5481	12	18-Mar-2021
2m SMA Cable	Junkosha	MWX221-02000AMSAMS/A	5517	12	01-Apr-2021
8m N-Type Cable	Junkosha	MWX221-08000NMSNMS/B	5520	12	24-Mar-2021
2 m K Type Cable	Junkosha	MWX241-02000KMSKMS/A	5523	12	3-Apr-2021
3 GHz High pass Filter	Wainwright	WHKX12-2580-3000-18000-80SS	5548	12	5-May-2021
Broadband Horn Antenna (1-10 GHz)	Schwarzbeck	BBHA 9120 B	5611	12	22-Sep-2021
DRG Horn Antenna (7.5-18GHz)	Schwarzbeck	HWRD750	5610	12	22-Sep-2021
Turntable & Mast Controller	Maturo Gmbh	NCD/498/2799.01	5612	-	TU
Tilt Antenna Mast TAM 4.0-P	Maturo Gmbh	TAM 4.0-P	5613	-	TU
3m Semi Anechoic Chamber	MVG	EMC-3	5621	36	11-Aug-2023

Table 74

TU - Traceability Unscheduled



2.7 Power Spectral Density

2.7.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (e)
ISED RSS-247, Clause 5.2
ISED RSS-GEN, Clause 6.12

2.7.2 Equipment Under Test and Modification State

SC2020, S/N: 1PR001905GK12RP - Modification State 0

2.7.3 Date of Test

09-November-2020

2.7.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 11.10.3.

2.7.5 Environmental Conditions

Ambient Temperature 24.3 °C
Relative Humidity 48.9 %

2.7.6 Test Results

2.4 GHz WLAN

Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Mode:	802.11b	Duty Cycle (%):	97.2
Data Rate:	1 Mbps	Antenna Gain (dBi):	N/A
Antenna Configuration:	SISO	Beamforming Gain (dBi):	N/A
Active Port(s):	A (Core 0)	Active ChainId(s):	-

Table 75

Test Frequency (MHz)	RBW (kHz)	PSD (dBm/3 kHz)					Limit (dBm / 3kHz)	Margin (dB)
		A	B	C	D	Σ		
2412	30.0	-8.21	-	-	-	-	8.0	-16.21
2437	30.0	-7.93	-	-	-	-	8.0	-15.93
2462	30.0	-8.53	-	-	-	-	8.0	-16.53

Table 76 - Maximum Power Spectral Density Results



Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Mode:	802.11g	Duty Cycle (%):	86.5
Data Rate:	6 Mbps	Antenna Gain (dBi):	N/A
Antenna Configuration:	SISO	Beamforming Gain (dBi):	N/A
Active Port(s):	A (Core 0)	Active ChainId(s):	-

Table 77

Test Frequency (MHz)	RBW (kHz)	PSD (dBm/3 kHz)					Limit (dBm / 3kHz)	Margin (dB)
		A	B	C	D	Σ		
2412	30.0	-13.97	-	-	-	-	8.0	-21.97
2437	30.0	-9.59	-	-	-	-	8.0	-17.59
2462	30.0	-14.04	-	-	-	-	8.0	-22.04

Table 78 - Maximum Power Spectral Density Results

Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Mode:	802.11n 20 MHz Bandwidth	Duty Cycle (%):	85.9
Modulation Coding Scheme:	MCS0	Antenna Gain (dBi):	N/A
Antenna Configuration:	SISO	Beamforming Gain (dBi):	N/A
Active Port(s):	A (Core 0)	Active ChainId(s):	-

Table 79

Test Frequency (MHz)	RBW (kHz)	PSD (dBm/3 kHz)					Limit (dBm / 3kHz)	Margin (dB)
		A	B	C	D	Σ		
2412	30.0	-13.88	-	-	-	-	8.0	-21.88
2437	30.0	-10.43	-	-	-	-	8.0	-18.43
2462	30.0	-13.95	-	-	-	-	8.0	-21.95

Table 80 - Maximum Power Spectral Density Results



Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Mode:	802.11n 40 MHz Bandwidth	Duty Cycle (%):	74.9
Modulation Coding Scheme:	MCS0	Antenna Gain (dBi):	N/A
Antenna Configuration:	SISO	Beamforming Gain (dBi):	N/A
Active Port(s):	A (Core 0)	Active ChainId(s):	-

Table 81

Test Frequency (MHz)	RBW (kHz)	PSD (dBm/3 kHz)					Limit (dBm / 3kHz)	Margin (dB)
		A	B	C	D	Σ		
2422	30.0	-18.03	-	-	-	-	8.0	-26.03
2437	30.0	-16.94	-	-	-	-	8.0	-24.94
2452	30.0	-18.85	-	-	-	-	8.0	-26.85

Table 82 - Maximum Power Spectral Density Results

FCC 47 CFR Part 15, Limit Clause 15.247 (e)

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

ISED RSS-247, Limit Clause 5.2(b)

The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission



2.7.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	17-May-2021
Multimeter	Iso-tech	IDM101	2424	12	12-Dec-2020
Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	17-May-2021
MXA Signal Analyser	Keysight Technologies	N9020B	5528	24	04-Mar-2022
Signal Commissioning Unit	TUV SUD	SCU001	5546	12	15-Apr-2021
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB 40	5605	12	08-Sep-2021

Table 83



3 Measurement Uncertainty

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

Test Name	Measurement Uncertainty
Restricted Band Edges	30 MHz to 1 GHz: ± 5.2 dB 1 GHz to 40 GHz: ± 6.3 dB
AC Power Line Conducted Emissions	150 kHz to 30 MHz, LISN, ± 3.7 dB
Emission Bandwidth	± 191.14 kHz
Maximum Conducted Output Power	± 3.2 dB
Authorised Band Edges	30 MHz to 1 GHz: ± 5.2 dB 1 GHz to 40 GHz: ± 6.3 dB
Spurious Radiated Emissions	30 MHz to 1 GHz: ± 5.2 dB 1 GHz to 40 GHz: ± 6.3 dB
Power Spectral Density	± 3.2 dB

Table 84

Measurement Uncertainty Decision Rule

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115: 2007, clause 4.4.3 and 4.5.1.