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Test Report for the FCC and ISED Testing of a IH-303 Sensor Hub to FCC Rule 47CFR 15.247 and ISED RSS-247 for WattIQ Inc

Report number: C15805TR3
Project number: C8930

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Issue	Description						Issue by	Date
3	Copy 1		Copy 2		PDF	√	JB	4th March 2025

1574

Registered Address
Eurofins Electrical and Electronic UK Ltd
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Registered in England and Wales
Company Reg. No. 6048589
VAT Reg. No. GB 887 1276 83

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Test Report Change History

Issue	Date	Modification Details
1	21st January 2025	First Issue
2	19th February 2025	Product name amended
3	4th March 2025	Sample numbers added and section 7.2.6 amended
4		
5		
6		
7		
8		
9		
10		

Section 1 Test Location

All testing was performed at;

Eurofins E&E UK	Unit 5
	Speedwell Road
	Castleford
	WF10 5PY
Tel:	01977 731173
Website	http://www.yorkemc.co.uk
UKAS Testing No.	1574

1.1 UKAS Accreditation

Opinions and interpretations expressed herein are outside the scope of UKAS Accreditation.

Eurofins E&E UK latest accreditation schedule can be found at:
http://www.ukas.org/testing/lab_detail.asp?lab_id=989&location_id=&vMenuOption=3

Eurofins E&E UK Castleford Laboratory, is an Accredited facility recognised by the Federal Communications Commission (FCC) for certification testing. The appropriate FCC Designation Number is UK2013, dated 1st March 2021.

Eurofins E&E UK Castleford Laboratory is recognised by ISED for certification testing.
ISED Assigned Code: 22959
CAB Identifier: UK0004

Section 2 Customer Information

Company name	WattIQ Inc
Address	400 Oyster Point Blvd
	Suite 414
	South San Francisco
	California
	94080
	United States of America
Contact	Priya Vijayakumar
Email	hardware@wattiq.io

Section 3 Equipment Details

3.1 Equipment Under Test (EUT)

Date received:	26th November 2024		
EUT name:	IH-303 Sensor Hub		
PMN:	IH-303 Sensor Hub		
HVIN:	T1a		
FVIN:	0x20		
FCC ID:	2AECNIH-303		
ISED number:	26911-IH303		
EUT description:	Used for various cold storage applications, this device operates as part of a controlled temperature monitoring system that communicates via ZigBee to an external internet gateway to provide remote logging and alarms		
Antenna	Integral IFA PCB trace		
Transmission	Digital Transmission System (DTS) Zigbee		
Modulation scheme	OQPSK		
Operating frequency band	2400MHz to 2483.5MHz		
No of units tested:	Two Radiated sample number: 2C8E5402 Conducted sample number: 2C7E3E85		
EUT power:	5Vdc via plug top PSU		
Highest internal frequency:	2.480GHz		
Size of EUT (m)	Width: 85 mm	Depth: 140 mm	Height: 35 mm
Mode/s of operation:	Continuous transmit of packetized data at bottom, middle and top channels. Channels used: Ch 11 2405MHz, Ch18 2440MHz and Ch26 2480MHz. Test software installed with control of Zigbee channel and power levels achieved by a button on the EUT front panel. Short press to change the channel and long press (>3s) to change the power level. The samples sent for testing were capable of 6 power levels. Testing showed that to keep the EUT compliant, the power level with 1 LED flash was the maximum that could be used on the bottom and middle channels. The power level with 4 flashes was the maximum that could be used on the top channel. Therefore, these power levels were set prior to all tests being carried out.		
Test software:	RfTest.hex Test Firmware installed		
Modifications incorporated during testing:	The samples sent for testing were capable of 6 power levels. Testing showed that to keep the EUT compliant, the power level with 1 LED flash was the maximum that could be used on the bottom and middle channels. The power level with 4 flashes was the maximum that could be used on the top channel.		

Ports and Cables	Cable Length	Screened / Unscreened	Connected to
EUT power Jack	1m	Unscreened	Plug top PSU

EUT Monitoring/Auxiliary Equipment

Equipment name	Type no.	Serial no
ACER Laptop	Aspire 5	NXK5BEK005325141433400
USB Zigbee Dongle	InteliGateway	2262CB59
CUI INC 100-240VAC to 5Vdc plug top PSU	SMI5-5-V-I38	-

3.2 EUT Photographs

Photographs are supplied separately.

3.3 Configuration of EUT

The apparatus was supplied in one single possible configuration.

3.4 EUT Monitoring/Auxiliary Equipment

None.

3.5 Monitoring Software

None. The channel required was selected via software prior to the testing.

Section 4 Test Specifications

For USA:

Regulation / Test Standard	Regulation: Title 47 of the Code of Federal Regulations (CFR) Part 15 (47CFR15) Subpart C – Intentional Radiators Measurement standard: ANSI C63.10-2013 American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

Requirement	FCC Rule Part	Comments	Result Summary
6 dB Bandwidth	FCC § 15.247(a)(2)	Applies	Pass
Maximum peak conducted power	FCC § 15.247(b)(3)	Applies	Pass
Power spectral density	FCC § 15.247(e)	Applies	Pass
Band edge compliance	FCC § 15.247(d)	Applies	Pass
Conducted spurious emissions	FCC § 15.247(d)	Applies	Pass
Transmitter radiated spurious emissions – restricted bands	FCC § 15.247(d) FCC § 15.209	Applies	Pass
AC power line conducted emissions	FCC § 15.207	Applies	Pass

For Canada:

Regulation / Test Standard	RSS-247 Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices Issue 3 August 2023 And, RSS-Gen — General Requirements for Compliance of Radio Apparatus Issue 5 April 2018 +A1 March 2019 +A2 February 2021

Requirement	ISED Ragulation	Comments	Results Summary
99% Occupied Bandwidth	RSS-Gen 6.6	Applies	Pass
6 dB Bandwidth	ISED RSS-247 § 5.2	Applies	Pass
Maximum peak conducted power	ISED RSS-247 § 5.4	Applies	Pass
Power spectral density	ISED RSS-247 § 5.2	Applies	Pass
Band edge compliance	ISED RSS-247 § 3.3 and 5.5 RSS-GEN Issue 5 Section 8.10	Applies	Pass
Conducted spurious emissions	ISED RSS-247 § 5.5	Applies	Pass
Transmitter radiated spurious emissions	ISED RSS-GEN § 8.9	Applies	Pass
AC power line conducted emissions	ISED RSS-247 § 3.1	Applies	Pass

4.1 Knowledge Database References

The following KDBs were referenced during the testing.
The latest knowledge database references are available via the FCC KDB website at:

https://apps.fcc.gov/kdb

4.1.1 Radiated Emissions (30MHz to 1000MHz)

Publication Number	Keyword	Publication Date
913591	Measurement of radiated emissions at the band-edge for a Part 15 RF Device	04/05/2017

4.1.2 Radiated Emissions (1GHz to 40GHz)

Publication Number	Keyword	Publication Date
414788	Test Site Validation Requirements above 1 GHz.	07/12/2018
414788	Comparison Noise Emitter (CNE), reference noise source, .pdf	07/12/2018
913591	Measurement of radiated emissions at the band-edge for a Part 15 RF Device	04/05/2017
414788	Comparison Noise Emitters (CNE), test equipment, Broadband.pdf	07/12/2018

4.2 Compliance Statement

The IH-303 Sensor Hub, as tested, was shown to meet requirements of the standards listed in Section 4 of this report.

4.3 Decision Rule Statement

The Decision Rule is applied on the basis of the ILAC-G8:09/2019

This guidance document has been prepared to assist laboratories in the use of decision rules when declaring statements of conformity to a specification or standard as required by ISO/IEC 17025:2017

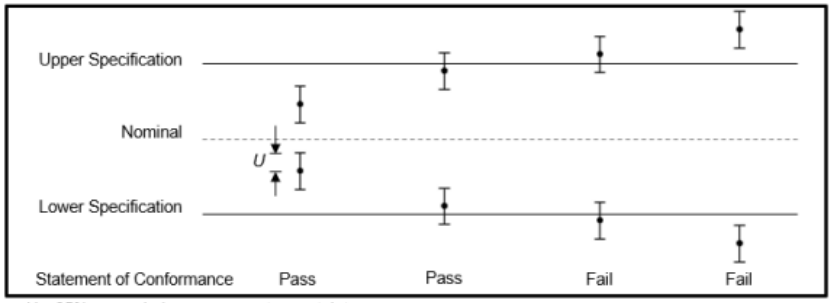
Where a result is considered marginal in respect of its proximity to the limit line, for example, the customer would be made aware of situation so that they can make an informed decision on how to proceed.

A binary decision rule exists when the result is limited to two choices (pass or fail). A non-binary decision rule exists when multiple terms may express the result (pass, conditional pass, conditional fail, fail). These are further explained below.

The laboratory recommends to use Binary Statement for Simple Acceptance Rule (w = 0)

Statements of conformity are reported as:

- Pass - the measured value is below the acceptance limit, AL = TL.
- Fail - the measured value is above the acceptance limit, $AL = TL$



U = 95% expanded measurement uncertainty

Section 5 Spurious Emission Results – Radiated and Conducted

5.1 Test Specification

FCC Rule Part	47CFR 15.247 (d)
Standard	ANSI C63.10:2013
Measurement Uncertainty Radiated tests	The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95% is +/- 6.26dB for the frequency range 30MHz to 1GHz +/- 5.14dB for the frequency range from 1GHz to 6GHz +/- 5.45dB for the frequency range from 6GHz to 18GHz +/- 5.25dB for the frequency range from 18GHz to 40GHz
Measurement Uncertainty Conducted tests	±1.4dB

5.2 Procedure and Test Software Version

Radiated tests:- 47CFR15.205 and 47CFR15.209

Eurofins E&E UK test procedure (30MHz to 1GHz)	CEP23 Issue 10
Eurofins E&E UK test procedure (1GHz to 40GHz)	CEP64 Issue 11
Test software	RadiMation Version 2023.1.6

Conducted Tests 47CFR 15.247(d)

ANSi C63.10-2013 Clause reference:	11.11.2 and 11.11.3
Test software	N/A

5.3 Radiated Emissions (30MHz to 1GHz)

Radiated electric field emission measurements are applied as defined in 47CFR15.205 and 47CFR15.209.

5.3.1 Limits at 3m

Frequency (MHz)	Electric Field Strength Limit (dBµV/m) at 3m measurement distance
	Quasi Peak
30 - 88	40.0
88 -216	43.5
216 - 960	46.0
960- 1000	54.0

Note: FCC 47 CFR Part 15 Section 15.209 and 15.205 specifies test limits at 3m

Receiver Settings

Receiver Parameters	Setting
Detector Function	Quasi Peak
Start Frequency	30MHz
Stop Frequency	1000MHz
Resolution Bandwidth	120kHz
Video Bandwidth	Auto

5.3.2 Emissions measurements

5.3.3 Date of Test

4th December 2024

5.3.4 Test Area

LAB 1 (SAC)

5.3.5 Tested by

L Trickett

5.3.6 Test Setup

The EUT was configured in the SAC on an 80cm high polystyrene table.

The measurement was performed with an antenna to EUT separation distance of 3m. The results were maximised in orientation 0-360 degrees and height 1-4m.

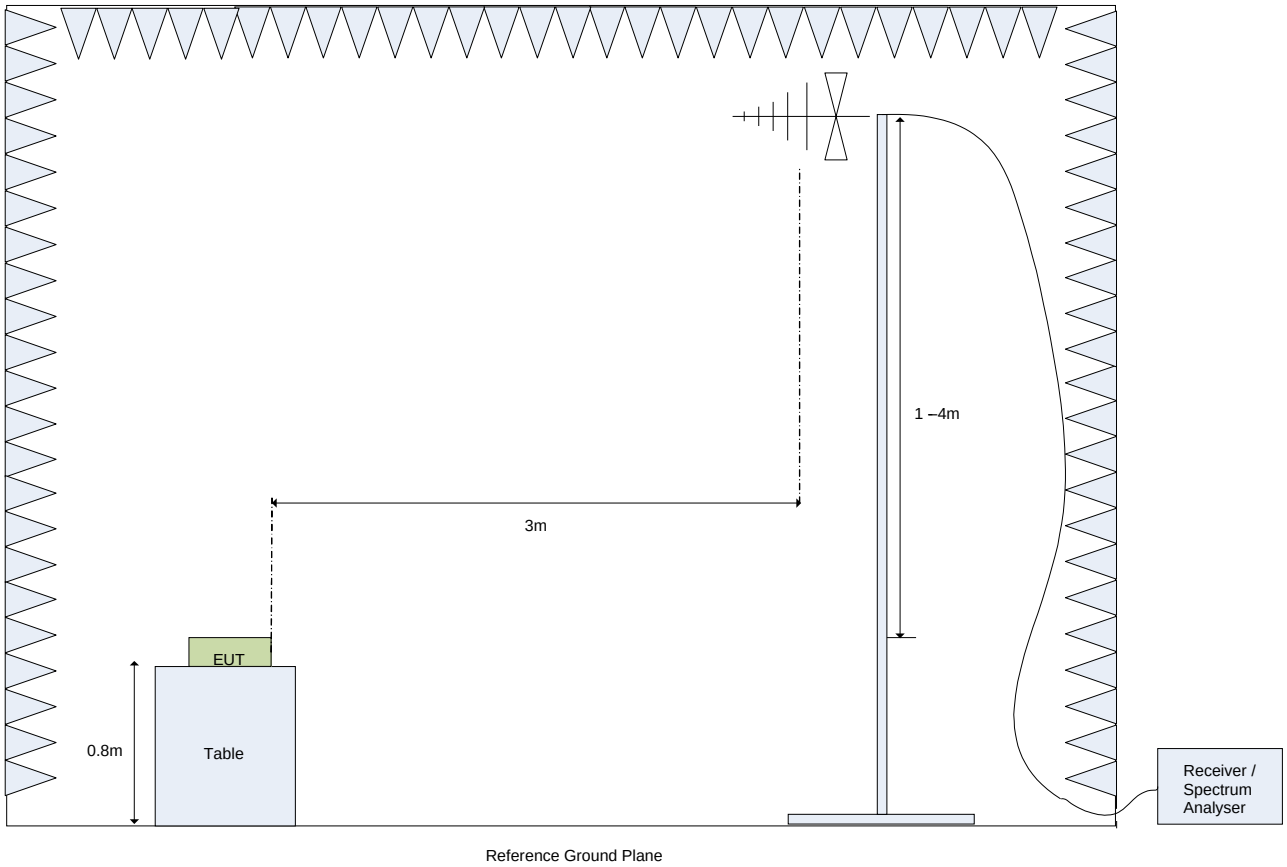


Figure 1 Test Setup for E-Field Measurements from 30MHz to 1GHz

Note 1 : With the EUT de-energized the ambient radio noise and signals met the 6dB peak detection requirement of ANSI C63.10-2013.

Note 2 : There were no significant environmental temperature changes during the test duration and hence it was not considered necessary to consider any variation in cable loss.

Operating Mode During testing

During spurious emission testing the equipment under test was set to transmit on the following channels: Ch11 2405MHz, Ch18 2440MHz and Ch26 2480MHz.

The equipment under test was pre-scanned using peak detection when operating on all three channels. Final measurements were performed with the equipment under test operating on 2440MHz.

5.3.7 Electric field emissions, 30MHz to 1GHz

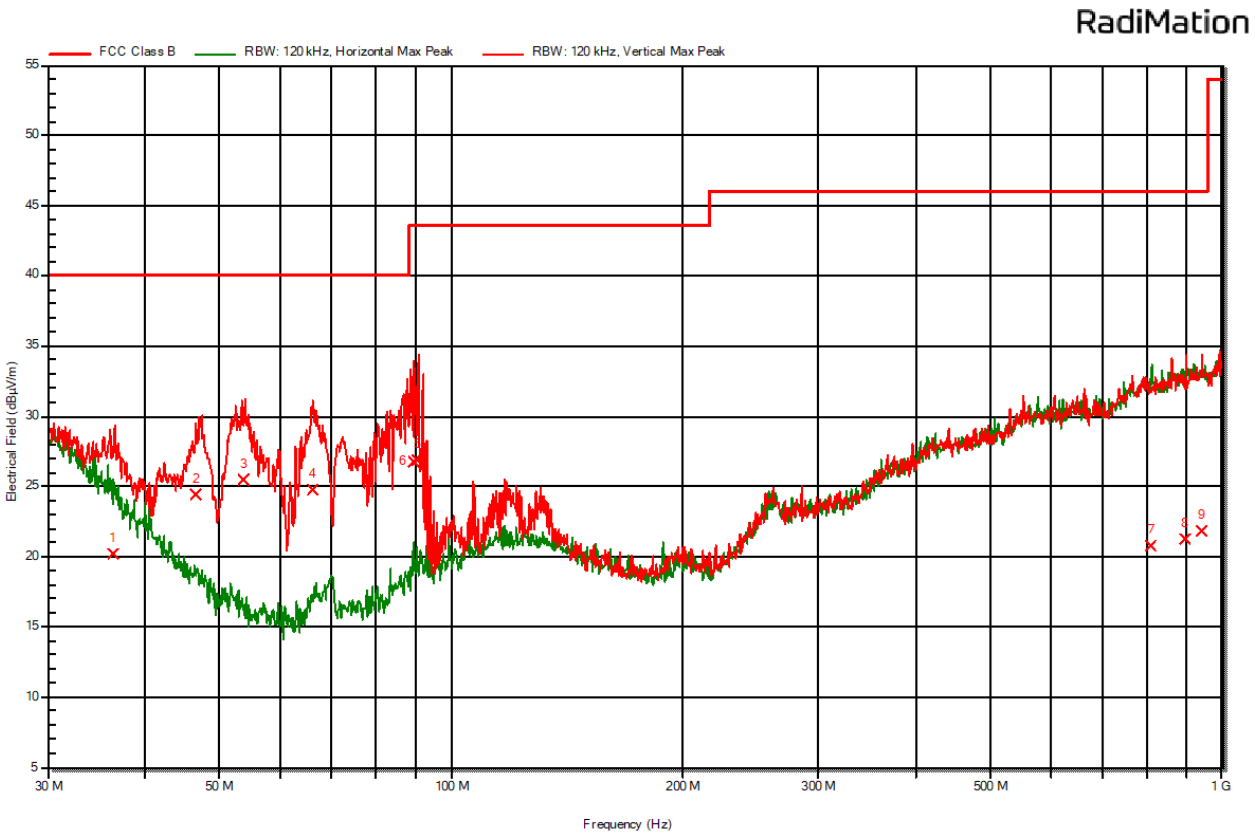


Figure 2 Electric field emissions Plot, 30MHz to 1GHz, 2440MHz Operation

Frequency MHz	Quasi-Peak dBµV/m	Quasi Peak Limit dBµV/m	Quasi-Peak Difference dB	Quasi-Peak Status	Angle degrees	Height m	Polarization
36.54	20.2	40.0	-19.8	Pass	330	1.0	Vertical
46.68	24.4	40.0	-15.6	Pass	350	1.0	Vertical
53.94	25.5	40.0	-14.5	Pass	270	1.0	Vertical
66.18	24.8	40.0	-15.2	Pass	355	1.4	Vertical
90.284	26.9	43.5	-16.6	Pass	40	1.0	Vertical
89.58	26.8	43.5	-16.7	Pass	80	1.0	Vertical
808.26	20.8	46.0	-25.2	Pass	215	2.1	Horizontal
895.26	21.3	46.0	-24.7	Pass	305	3.4	Vertical
941.52	21.9	46.0	-24.1	Pass	54	1.9	Vertical

Table 1 Electric Field Emissions Peaks, 30MHz to 1GHz. 2440MHz Operation

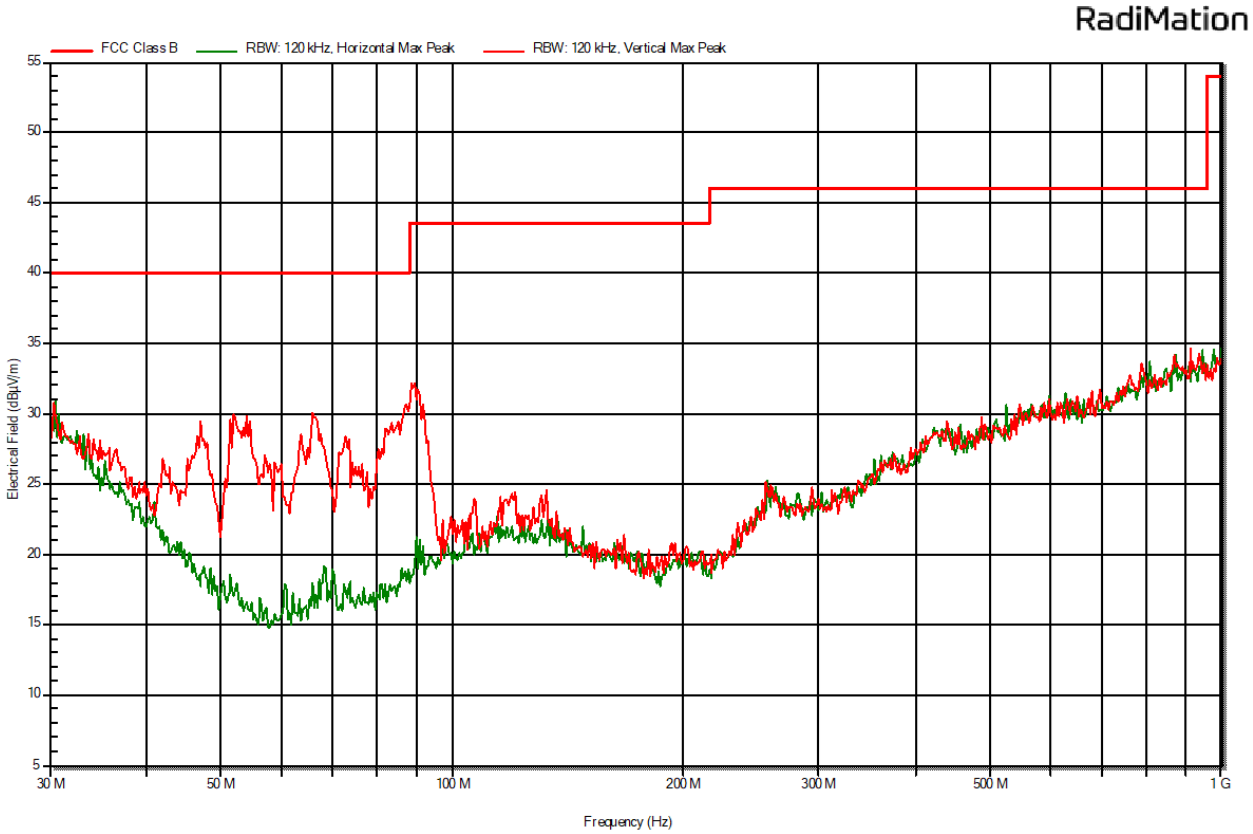


Figure 3 Electric field emissions Plot, 30MHz to 1GHz, Operation on 2405MHz - Peak detector scan

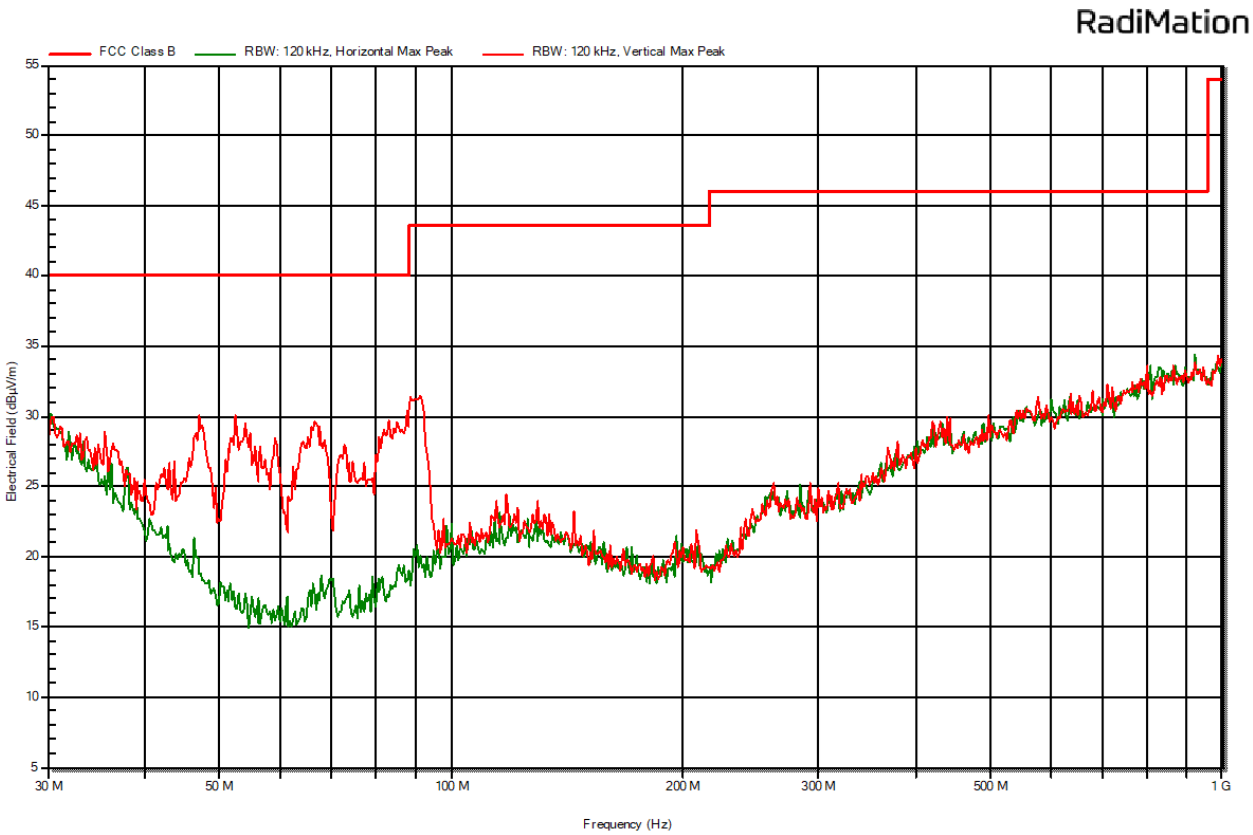


Figure 4 Electric field emissions Plot, 30MHz to 1GHz, Operation on 2480MHz - Peak detector scan

5.4 Radiated Emissions (1GHz to 18GHz)

5.4.1 Limits

Frequency (GHz)	Limit (dBµV/m)	Limit (dBµV/m)
	Peak	Average
1-18	74.0	54.0

5.4.2 Receiver Settings

Receiver Parameters	Setting
Detector Function	Average and Peak
Start Frequency	1GHz
Stop Frequency	18GHz
Resolution Bandwidth	1MHz
Video Bandwidth	Auto

5.4.3 Emissions measurements

5.4.4 Date of Test

6th December 2024

5.4.5 Test Area

LAB 1 (SAC)

5.4.6 Tested by

L Trickett

5.4.7 Test Setup

The EUT was configured in the SAC on an 1.5m high table Exploratory measurements on the EUT were carried out to identify suspect frequencies and worst case orientations, see Section 5.4.8.

The measurement was then performed with an antenna to EUT separation distance of 3m.

The antenna was kept in the “cone of radiation” from the EUT and pointed at the area both in azimuth and elevation using the tilt mechanism on the antenna mast.

The results were maximised in orientation 0-360 degrees and height 1-4m.

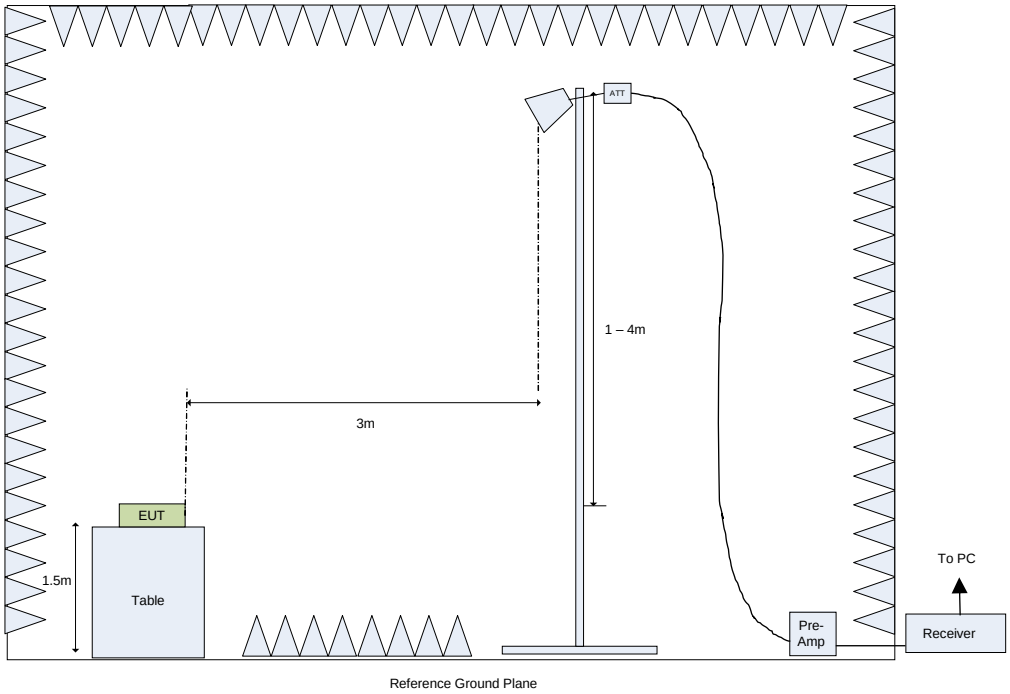


Figure 5.4.7.1: Test Setup for Final E-Field Measurements from 1GHz to 18GHz

Note 1 : With the EUT de-energized the ambient radio noise and signals met the 6dB peak detection requirement of ANSI C63.4-2010.

Note 2 : There were no significant environmental temperature changes during the test duration and hence it was not considered necessary to consider any variation in cable loss.

Note 3: On all swept and final measurements made between 1GHz and 18GHz a 2.4GHz Microtronics BRM50702 notch filter was placed in the measurement chain between the antenna and pre-amplifier in order to prevent the artificial generation of harmonics within the pre-amplifier.

5.4.8 Exploratory Radiated Emission Maximization

During exploratory testing, suspect emissions from the EUT were identified both in terms of the frequency and directionality. This was achieved by manually positioning the antenna close to the EUT and also by scanning it over all sides of the EUT whilst observing a spectral display. The typical distance between the surface of the EUT and the scanning antenna was circa 30cm.

Frequency (GHz)	Mode of operation	EUT face *	Emissions Angle (w.r.t. turntable)	Height	Polarization
1.4279	Transmitting on 2480MHz	Front face	90	1.5	V
1.6290	Transmitting on 2480MHz	Front face	90	1.5	V
1.6355	Transmitting on 2480MHz	Front face	90	1.5	V
1.6572	Transmitting on 2480MHz	Front face	90	1.5	V
1.6651	Transmitting on 2480MHz	Front face	90	1.5	V
1.6840	Transmitting on 2480MHz	Front face	90	1.5	V
1.7816	Transmitting on 2405MHz	Front face	90	1.5	V
1.8431	Transmitting on 2440MHz	Front face	90	1.5	V
1.8518	Transmitting on 2440MHz	Front face	90	1.5	V
1.8757	Transmitting on 2440MHz	Front face	90	1.5	V
1.8880	Transmitting on 2440MHz	Front face	90	1.5	V
1.9350	Transmitting on 2440MHz	Front face	90	1.5	V
1.9444	Transmitting on 2405 & 2440MHz	Front face	90	1.5	V
1.9502	Transmitting on 2405MHz	Front face	90	1.5	V
1.9516	Transmitting on 2480MHz	Front face	90	1.5	V
1.9524	Transmitting on 2440MHz	Front face	90	1.5	V
1.9878	Transmitting on 2440MHz	Front face	90	1.5	V
2.0008	Transmitting on 2480MHz	Front face	90	1.5	V
2.0073	Transmitting on 2480MHz	Front face	90	1.5	V
2.0016	Transmitting on 2440MHz	Front face	90	1.5	V
2.0139	Transmitting on 2405MHz	Front face	90	1.5	V
2.0175	Transmitting on 2480MHz	Front face	90	1.5	V
2.0312	Transmitting on 2440MHz	Front face	90	1.5	V
2.0370	Transmitting on 2440MHz	Front face	90	1.5	V

2.0399	Transmitting on 2480MHz	Front face	90	1.5	V
2.0420	Transmitting on 2440MHz	Front face	90	1.5	V
2.0630	Transmitting on 2440MHz	Front face	90	1.5	V
2.0725	Transmitting on 2440MHz	Front face	90	1.5	V
2.0739	Transmitting on 2480MHz	Front face	90	1.5	V
2.0876	Transmitting on 2440MHz	Front face	90	1.5	V
2.0934	Transmitting on 2440MHz	Front face	90	1.5	V
2.1072	Transmitting on 2440 & 2408MHz	Front face	90	1.5	V
2.1210	Transmitting on 2440MHz	Front face	90	1.5	V
2.2164	Transmitting on 2480MHz	Front face	90	1.5	V
2.8226	Transmitting on 2480MHz	Front face	90	1.5	V
4.8113	Transmitting on 2440MHz	Front face	90	1.5	V
4.8793	Transmitting on 2440MHz	Front face	90	1.5	V
4.9610	Transmitting on 2480MHz	Front face	90	1.5	V
7.2137	Transmitting on 2440MHz	Front face	90	1.5	V
7.2166	Transmitting on 2440MHz	Front face	90	1.5	V
7.3186	Transmitting on 2440MHz	Front face	90	1.5	V
7.3215	Transmitting on 2440MHz	Front face	90	1.5	V
7.4386	Transmitting on 2480MHz	Front face	90	1.5	V
7.4416	Transmitting on 2480MHz	Front face	90	1.5	V
9.7579	Transmitting on 2440MHz	Front face	90	1.5	V
9.9221	Transmitting on 2480MHz	Front face	90	1.5	V

Table 2 Frequencies identified during Exploratory Radiated Emission maximization

Note 1 : The front face of the EUT is deemed to be 0°, which is then turned in a clockwise direction through 360°.

Note 2 : With no emissions seen above 9.92GHz, further testing was limited to 10GHz.

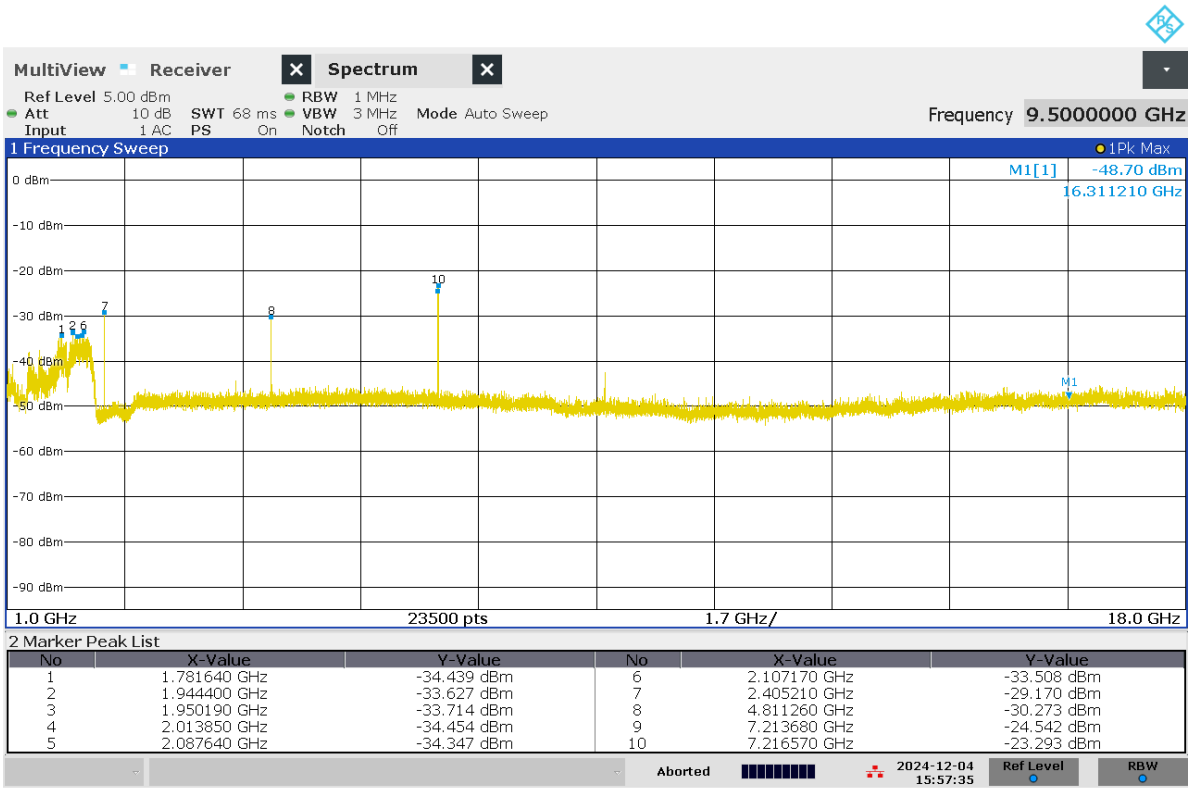


Figure 5 – Manual investigation 1-18GHz – Operating on channel 2405MHz

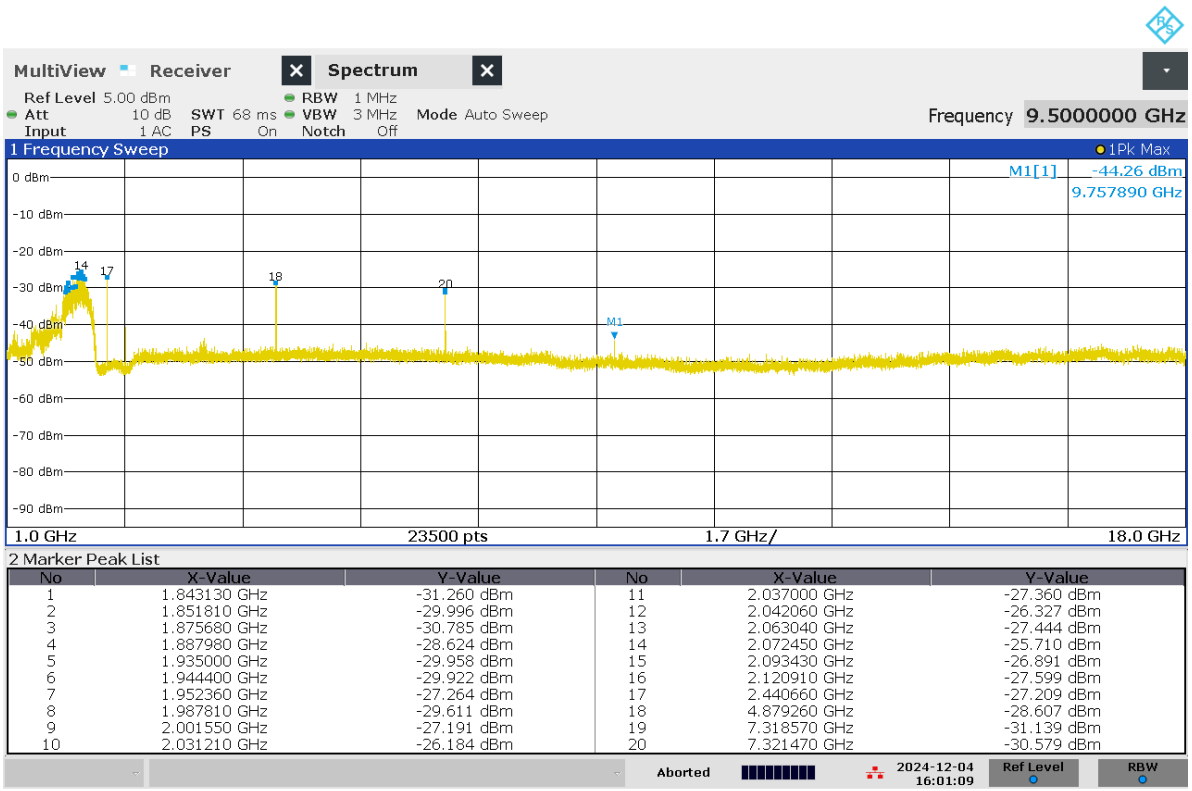
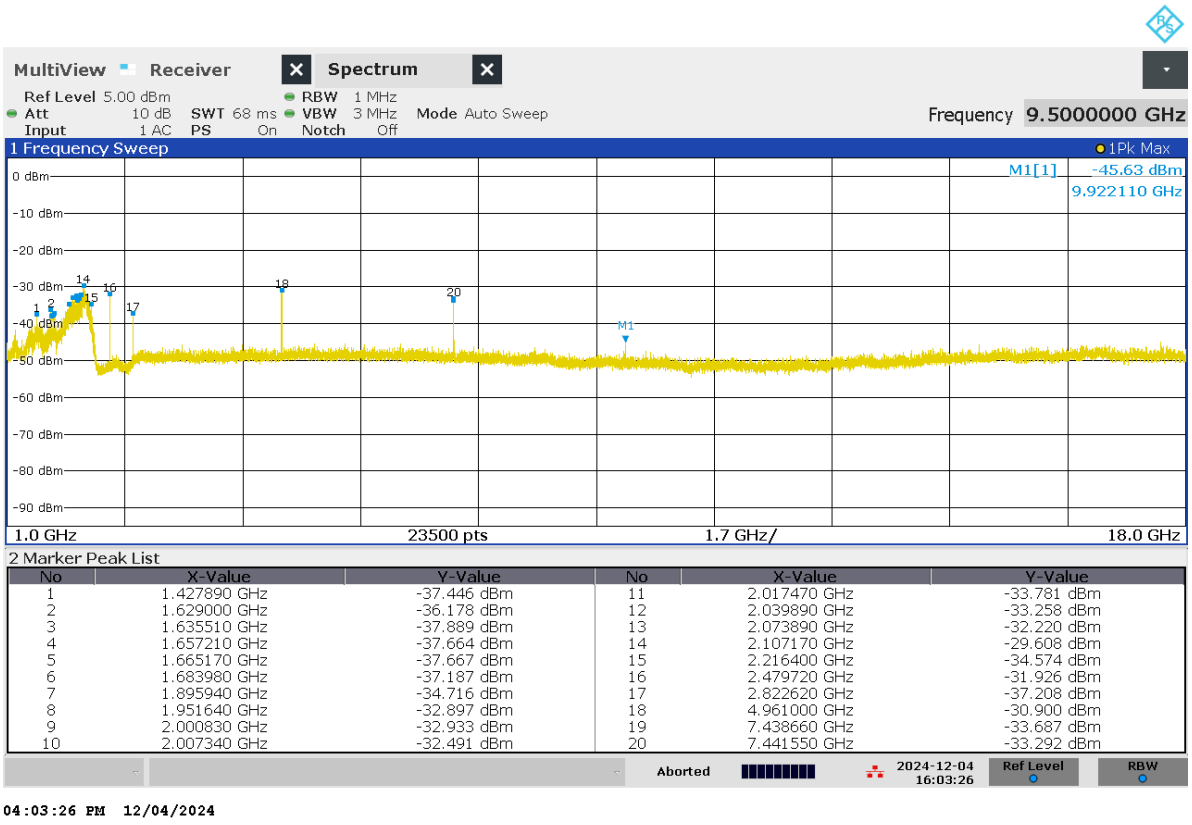


Figure 6 – Manual investigation 1-18GHz – Operating on channel 2440MHz



No	X-Value	Y-Value	No	X-Value	Y-Value
1	1.427890 GHz	-37.446 dBm	11	2.017470 GHz	-33.781 dBm
2	1.629000 GHz	-36.178 dBm	12	2.039890 GHz	-33.258 dBm
3	1.635510 GHz	-37.889 dBm	13	2.073890 GHz	-32.220 dBm
4	1.657210 GHz	-37.664 dBm	14	2.107170 GHz	-29.608 dBm
5	1.665170 GHz	-37.667 dBm	15	2.216400 GHz	-34.574 dBm
6	1.683980 GHz	-37.187 dBm	16	2.479720 GHz	-31.926 dBm
7	1.895940 GHz	-34.716 dBm	17	2.822620 GHz	-37.208 dBm
8	1.951640 GHz	-32.897 dBm	18	4.961000 GHz	-30.900 dBm
9	2.000830 GHz	-32.933 dBm	19	7.438660 GHz	-33.687 dBm
10	2.007340 GHz	-32.491 dBm	20	7.441550 GHz	-33.292 dBm

Figure 7 – Manual investigation 1-18GHz – Operating on channel 2480MHz

5.4.9 Electric field emissions, 1GHz to 10GHz

The equipment under test was pre-scanned using peak detection when operating on all three channels. Final measurements were performed with the equipment under test operating on 2440MHz.

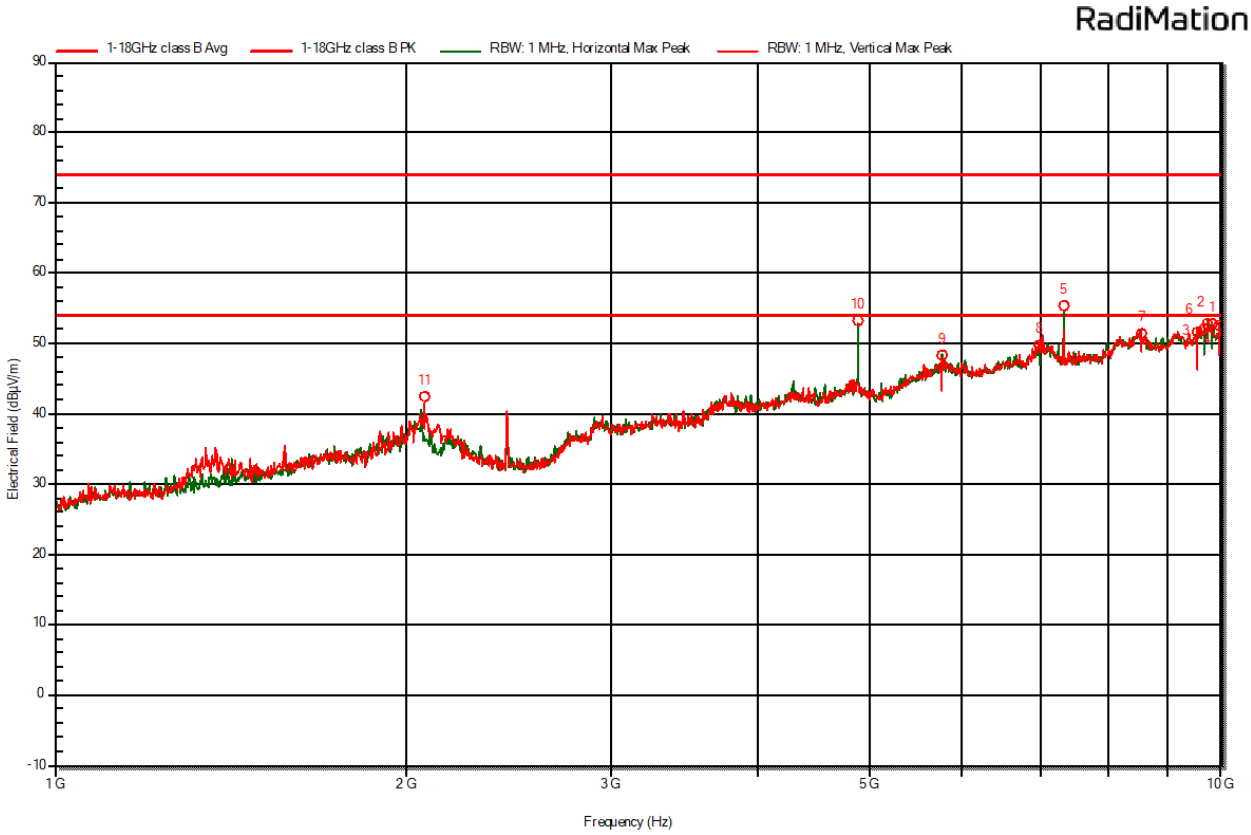


Figure 8 Electric field emissions Plot, 1GHz to 10GHz. Operation on 2440MHz

Frequency GHz	Average dBµV/m	Average Limit dBµV/m	Average Difference dB	Average Status	Angle degrees	Height m	Polarization
9.821	39.77	54.0	-14.23	Pass	65	2.1	Horizontal
9.962	39.44	54.0	-14.56	Pass	115	1.4	Vertical
9.551	38.60	54.0	-15.40	Pass	160	2.5	Vertical
9.739	39.78	54.0	-14.22	Pass	305	2.2	Horizontal
7.322	37.42	54.0	-16.58	Pass	310	1.0	Horizontal
9.667	39.15	54.0	-14.85	Pass	345	2.2	Horizontal
8.533	38.66	54.0	-15.34	Pass	205	1.2	Vertical
6.984	37.02	54.0	-16.98	Pass	265	1.9	Horizontal
5.761	34.96	54.0	-19.04	Pass	225	2.0	Vertical
4.879	34.43	54.0	-19.57	Pass	140	1.6	Horizontal
2.076	25.34	54.0	-28.66	Pass	255	3.4	Vertical

Table 3 Electric Field Emissions Peaks, 1GHz to 10GHz – Operation on 2440MHz

Figure 9 Electric field emissions Plot, 1GHz to 10GHz, Operation on 2402MHz - Peak detector scan

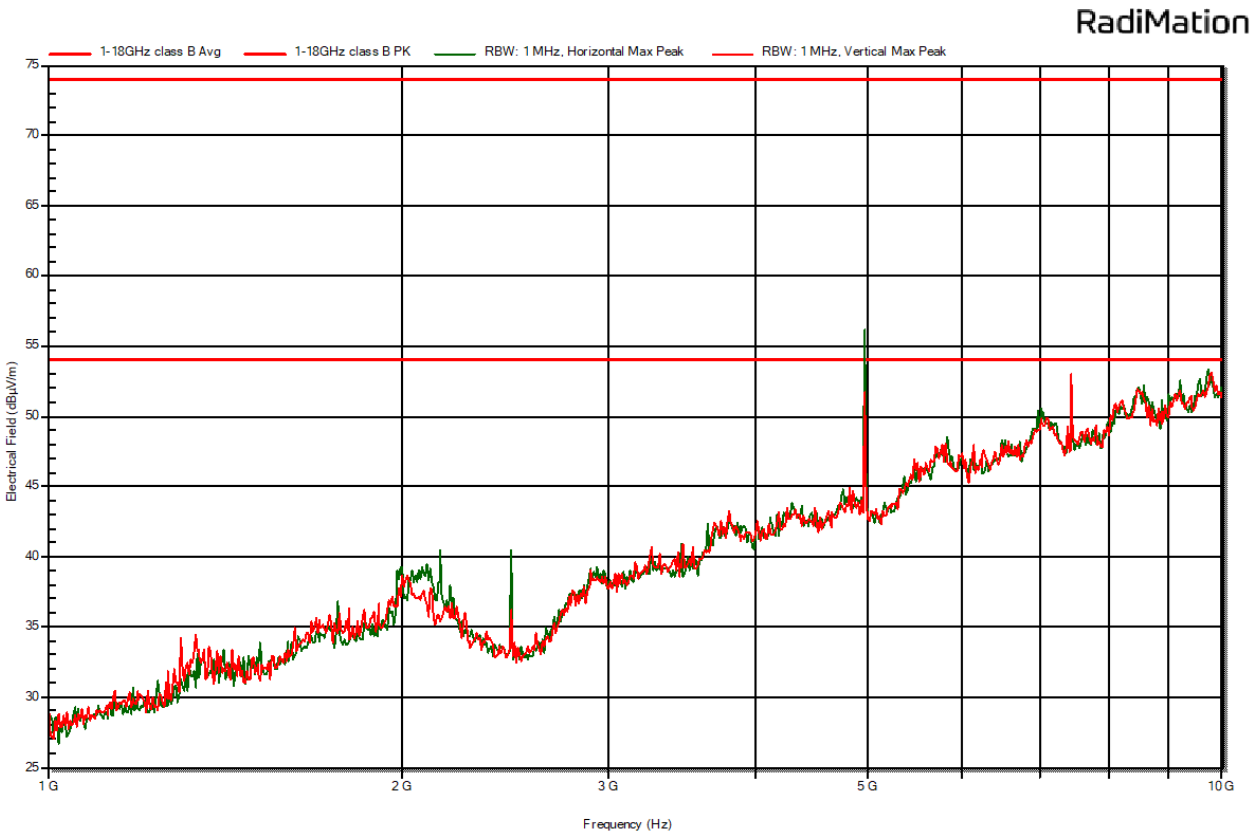


Figure 10 Electric field emissions Plot, 1GHz to 18GHz, Operation on 2480MHz – Peak detector scan

5.4.10 Example field strength calculation

The total average corrections are shown in the above table. This correction figure consists of Preamplifier gain (PG), Antenna factor (AF); and Cable loss (CL), and where necessary distance extrapolation factor (dB).

Field strength (FS) is calculated as follows:

FS (dBµV/m) = Indicated Signal Level (dBµV) - PG (dB) + AF (dB) + CL (dB)

5.4.11 Sample Data

From Figure 5 and Table 3, The Average level at 2.076GHz is calculated as follows:

FS (dBµV/m) = 47.42(dBµV) – 54.03(dB) + 29.18(dB/m) + 2.77(dB) = 25.34BµV/m

5.5 Radiated Emissions (18GHz to 26GHz)

5.5.1 Limits

Frequency (GHz)	Limit (dBµV/m)	Limit (dBµV/m)
	Peak	Average
18-25	74.0	54.0

5.5.2 Receiver Settings

Receiver Parameters	Setting
Detector Function	Average and Peak
Start Frequency	18GHz
Stop Frequency	25GHz
Resolution Bandwidth	1MHz
Video Bandwidth	Auto

5.5.3 Emissions measurements

5.5.4 Date of Test

4th December 2024

5.5.5 Test Area

LAB 1 (SAC)

5.5.6 Tested by

L Trickett

5.5.7 Test Setup

This is the same as for the 1-18GHz range for final measurements, except with a measurement distance of 1m.

5.5.8 Exploratory Radiated Emission Maximization

During exploratory testing, suspect emissions from the EUT were identified both in terms of the frequency and directionality. This was achieved by manually positioning the antenna close to the EUT and also by scanning it over all sides of the EUT whilst observing a spectral display. The typical distance between the surface of the EUT and the scanning antenna was circa 30cm.

Frequency (GHz)	Mode of operation	EUT face *	Emissions Angle (w.r.t. turntable)	Height	Polarization
-	Tx on channels 2405MHz, 2440MHz and 2480MHz.	-	-	-	-

Table 4: Frequencies identified during Exploratory Radiated Emission maximization

Note 2 : The front face of the EUT is deemed to be 0°, which is then turned in a clockwise direction through 360°.

No emissions were identified for further investigation above 18GHz.

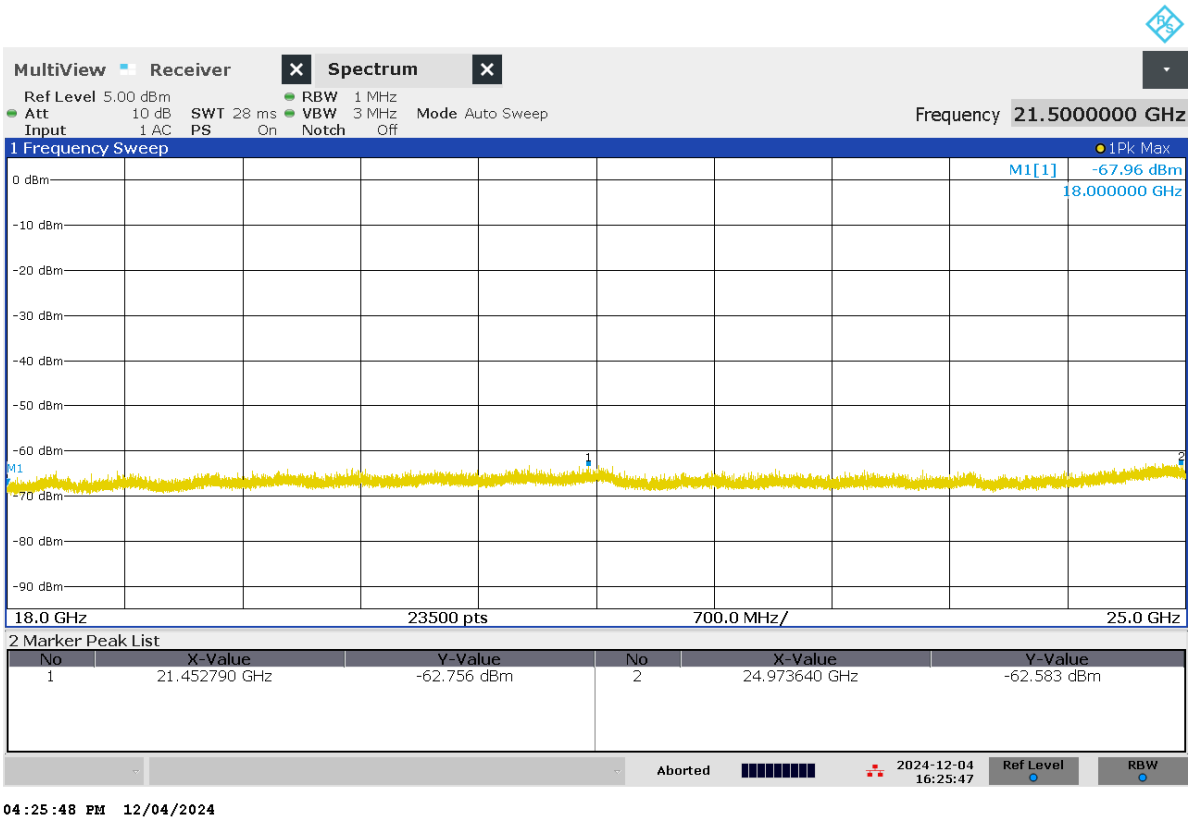


Figure 11 – manual investigation – Operating on channel 2405MHz

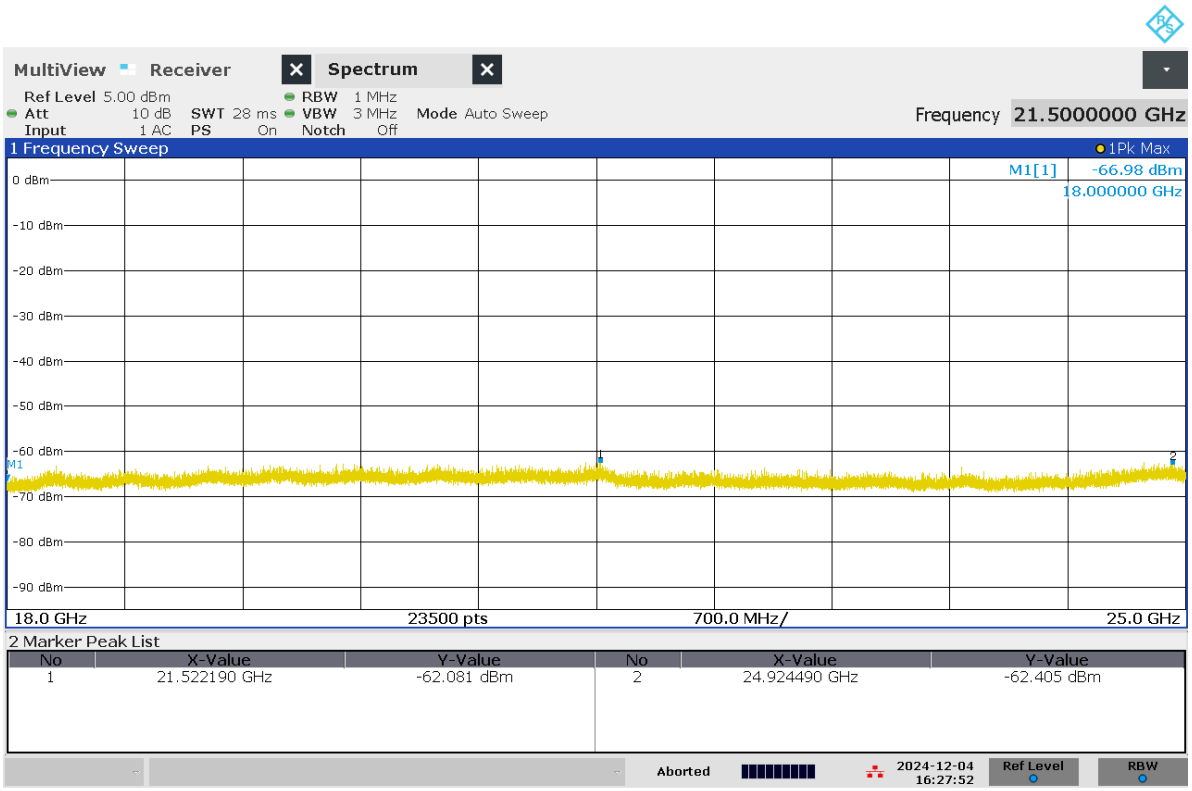


Figure 12 – manual investigation – Operating on channel 2440MHz

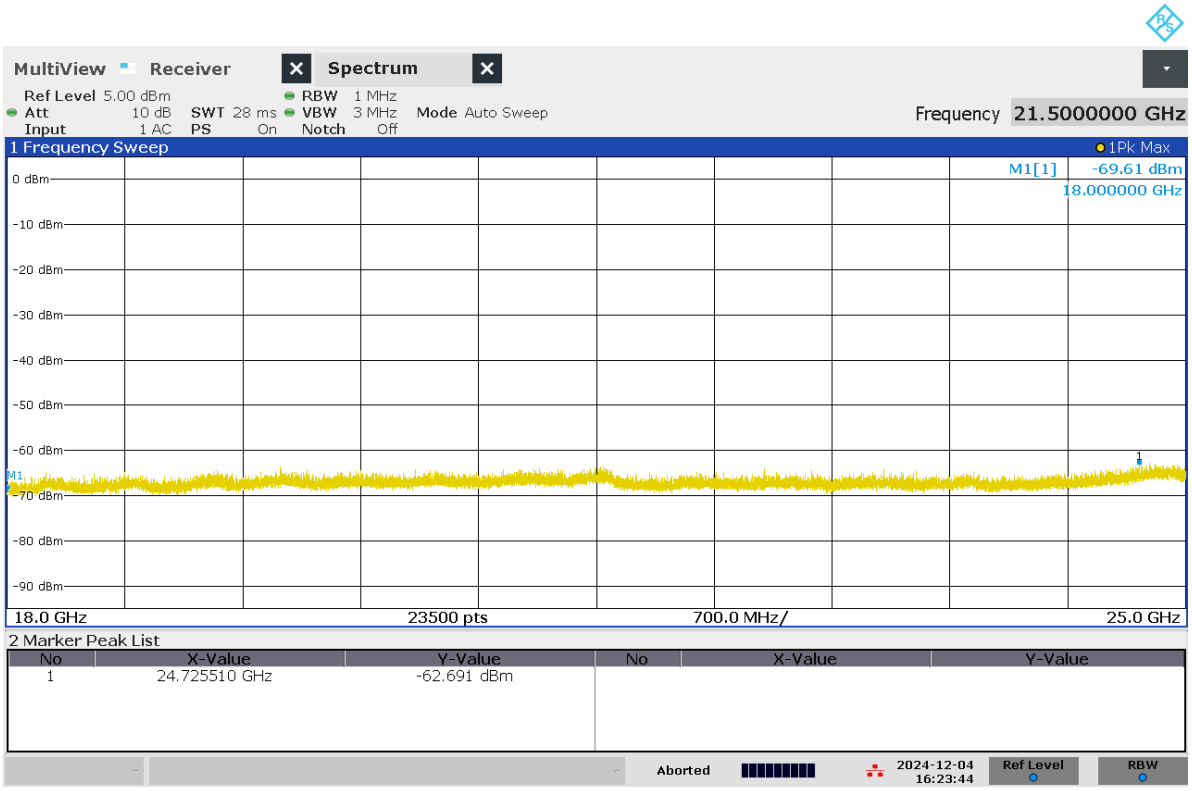


Figure 13 – manual investigation – Operating on channel 2480MHz

5.6 Conducted Spurious Emissions 30MHz to 25GHz

5.6.1 Limits

Frequency (MHz)	Limit, 47CFR 15.247(d)
	Peak
30 – 25000	-20dBc

Spectrum analyser settings as specified by ANSI C63.10-2013 Clause 11.11.2

Receiver Parameters	Setting
Detector Function	Peak
Start Frequency	30MHz
Stop Frequency	1000MHz
Start Frequency	1000MHz
Stop Frequency	25000MHz
Resolution Bandwidth	100kHz
Video Bandwidth	300kHz
Sweep rate	Auto couple
Trace mode	Max hold

5.6.2 Emissions measurements

5.6.3 Date of Test

2nd December2024

5.6.4 Test Area

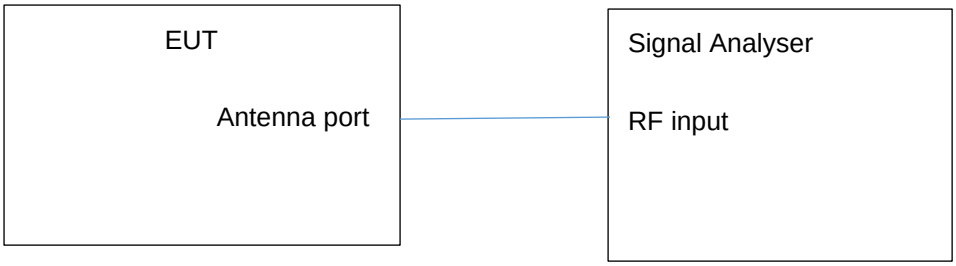
LAB 8

5.6.5 Tested by

J Beevers

5.6.6 Test Setup

The antenna port was connected directly to the signal analyser.

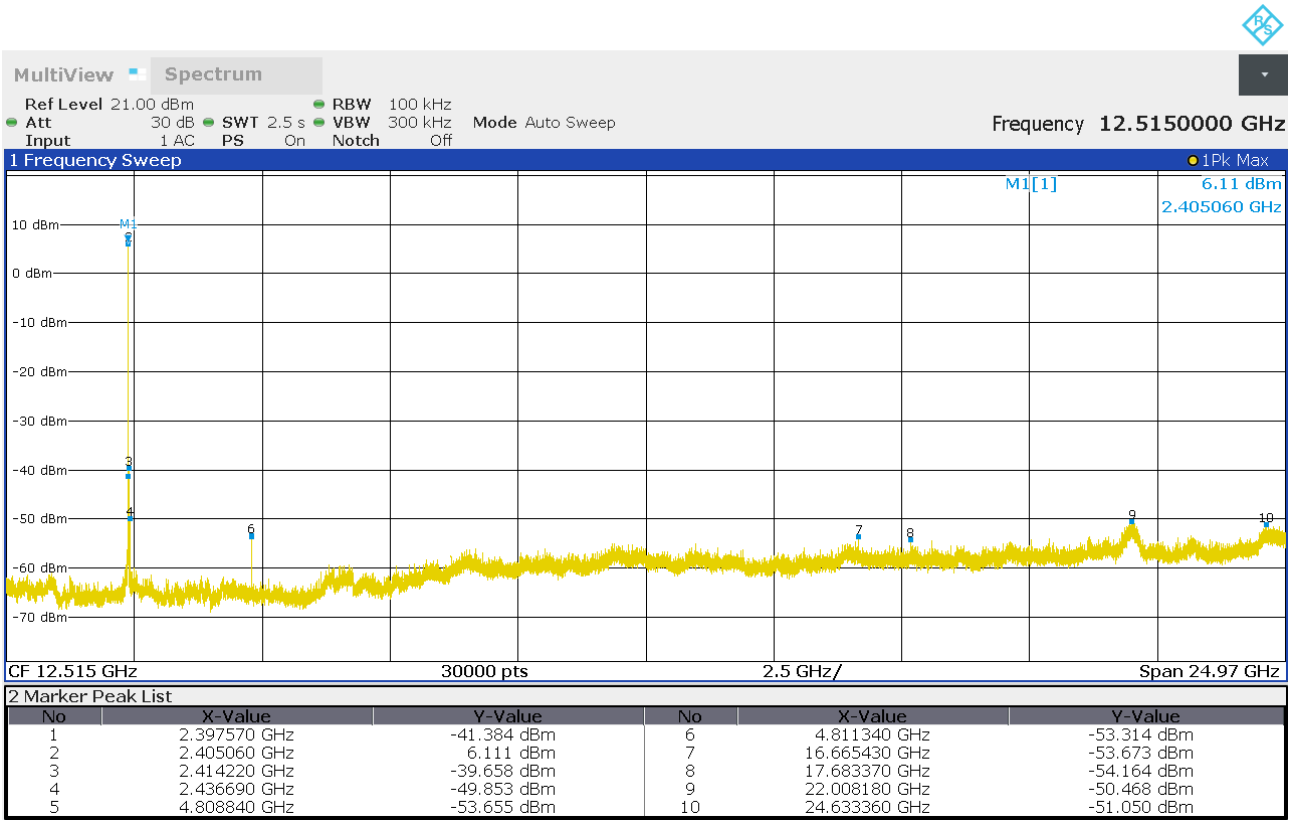


5.6.7 Test Results

The results of the conducted spurious emissions are stated below and by the signal analyser images.

All disturbances detected were > 20dB below the carrier.

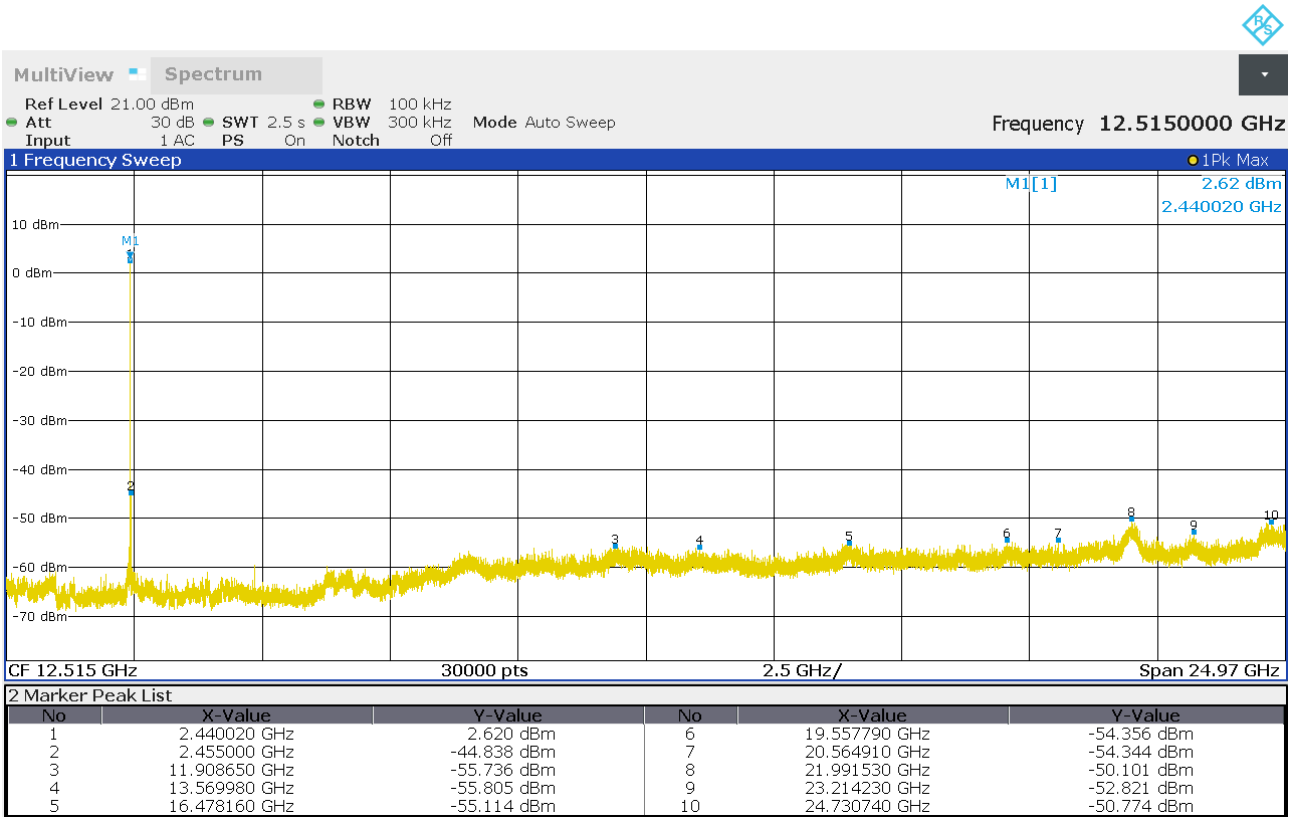
5.6.8 Antenna port conducted emissions, 30MHz to 25GHz



2 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	2.397570 GHz	-41.384 dBm	6	4.811340 GHz	-53.314 dBm
2	2.405060 GHz	6.111 dBm	7	16.665430 GHz	-53.673 dBm
3	2.414220 GHz	-39.658 dBm	8	17.683370 GHz	-54.164 dBm
4	2.436690 GHz	-49.853 dBm	9	22.008180 GHz	-50.468 dBm
5	4.808840 GHz	-53.655 dBm	10	24.633360 GHz	-51.050 dBm

Figure 14 Conducted emissions 30MHz to 25GHz. Operation on channel 2405MHz.



2 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	2.440020 GHz	2.620 dBm	6	19.557790 GHz	-54.356 dBm
2	2.455000 GHz	-44.838 dBm	7	20.564910 GHz	-54.344 dBm
3	11.908650 GHz	-55.736 dBm	8	21.991530 GHz	-50.101 dBm
4	13.569980 GHz	-55.805 dBm	9	23.214230 GHz	-52.821 dBm
5	16.478160 GHz	-55.114 dBm	10	24.730740 GHz	-50.774 dBm

Figure 15 Conducted emissions 30MHz to 25GHz. Operation on channel 2440MHz.

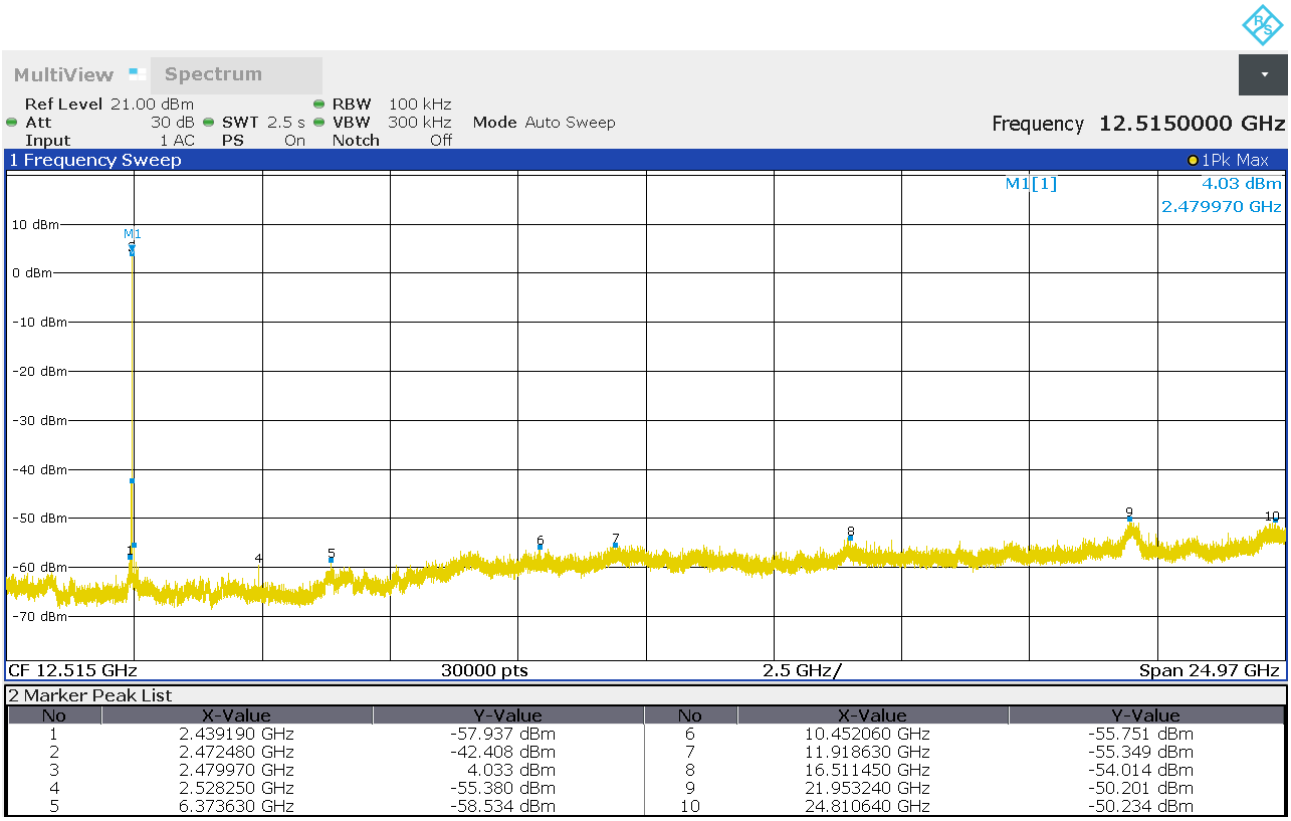


Figure 16 Conducted emissions 30MHz to 25GHz. Operation on channel 2480MHz.

Section 6 6dB Bandwidth and 99% Occupied Bandwidth

6.1 Test Specification

FCC Rule	46CFR 15.247 (b)(2)
Standard	ANSI C63.10:2013
Measurement Uncertainty	The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95% is ±1.4dB

6.2 Procedure and Test Software Version

Conducted Tests

ANSi C63.10-2013 Clause reference:	11.9.1.1 (RBW>DTS bandwidth)
Test software	N/A

Frequency (MHz)	**Limit, 47CFR 15.247(a)(2) 6dB bandwidth**
	Peak
2400MHz to 2483.5MHz	At least 500kHz

Spectrum analyser settings as specified by ANSI C63.10-2013 Clause 11.8.1

Receiver Parameters	**Setting**
Detector Function	Peak
Span	3MHz
Resolution Bandwidth	50kHz
Video Bandwidth	150kHz
Sweep rate	Auto couple
Trace mode	Max hold

6.2.1 Emissions measurements

6.2.2 Date of Test

2nd December 2024

6.2.3 Test Area

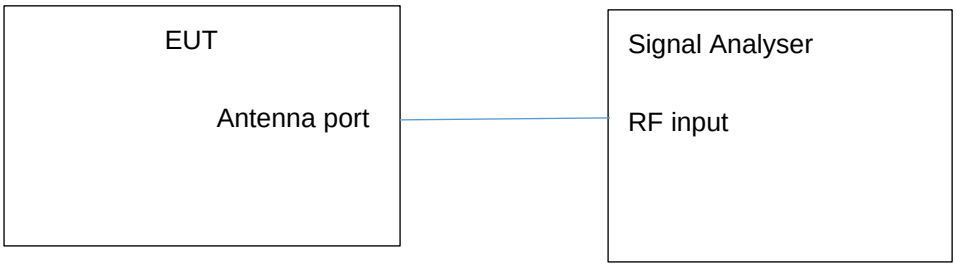
LAB 8

6.2.4 Tested by

J Beevers

6.2.5 Test Setup

The antenna port was connected directly to the signal analyser.



6.2.6 Test Results

The results of the 6dB bandwidth measurements are stated in the table below and by the signal analyser images.

Channel (MHz)	99% Occupied Bandwidth (MHz)	Measured 6dB bandwidth (kHz)	Minimum requirement (kHz)	Figures	Result
2405	2.6136	1630	500.0	17 & 20	Pass
2440	2.6004	1600	500.0	18 & 21	Pass
2480	2.6014	1640	500.0	19 & 22	Pass

Table 4 Bandwidth Measurements

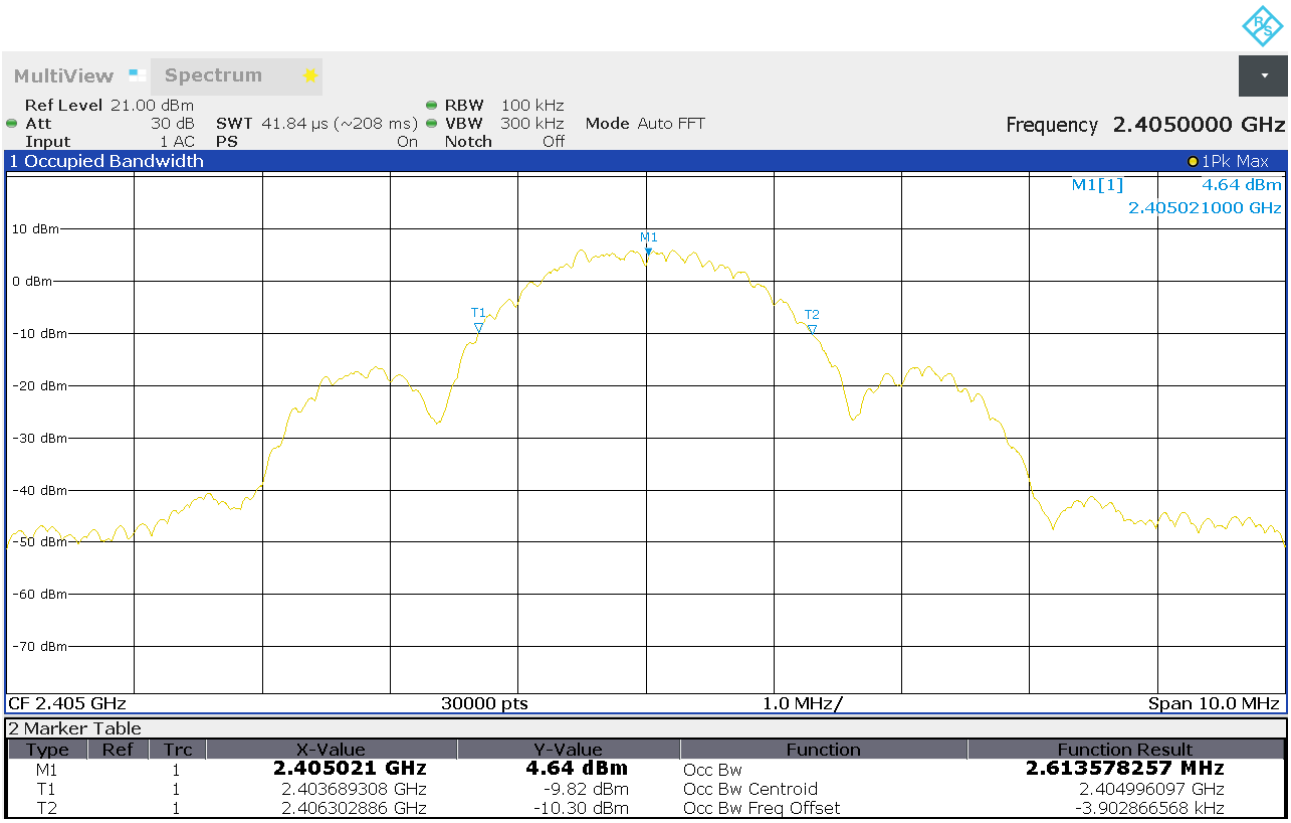


Figure 17 99% Occupied Bandwidth. Operation on channel 2402MHz

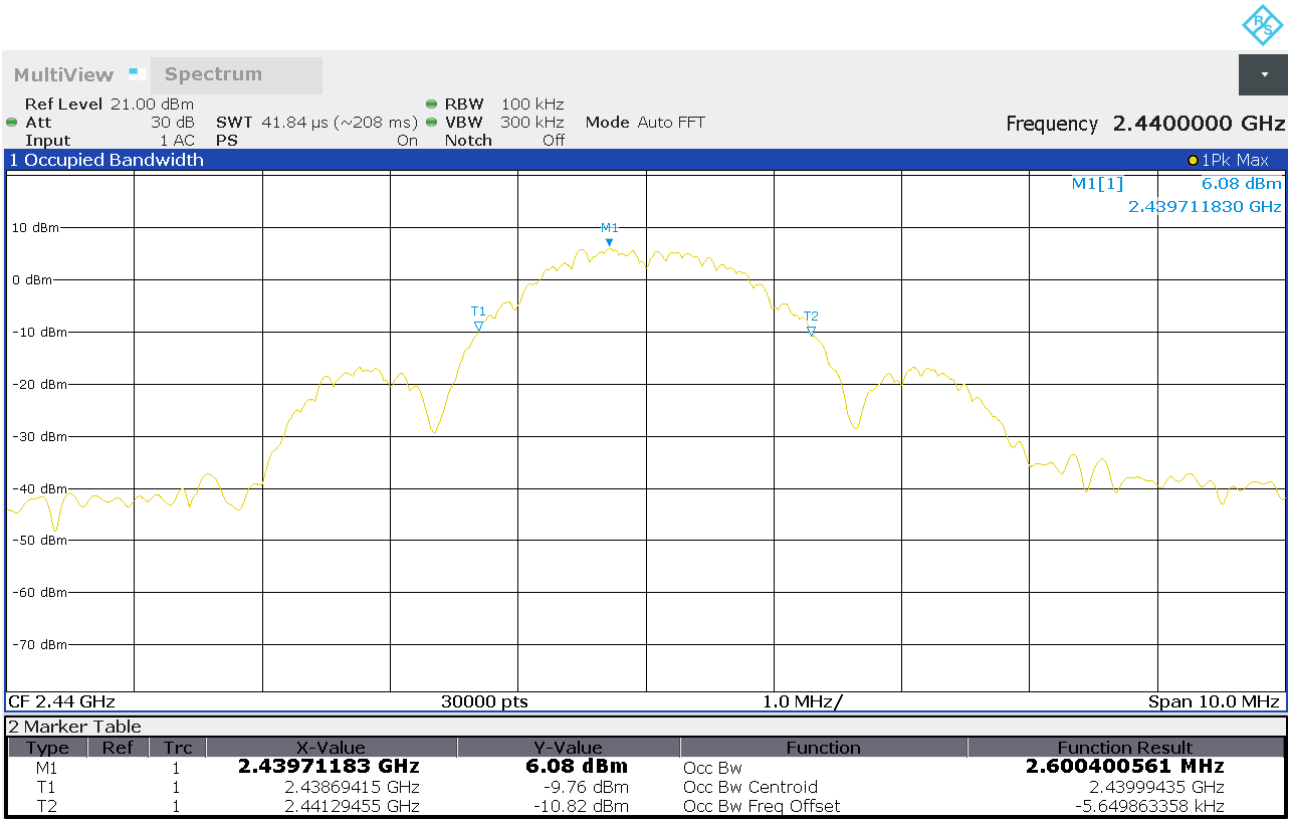


Figure 18 99% Occupied Bandwidth. Operation on channel 2440MHz

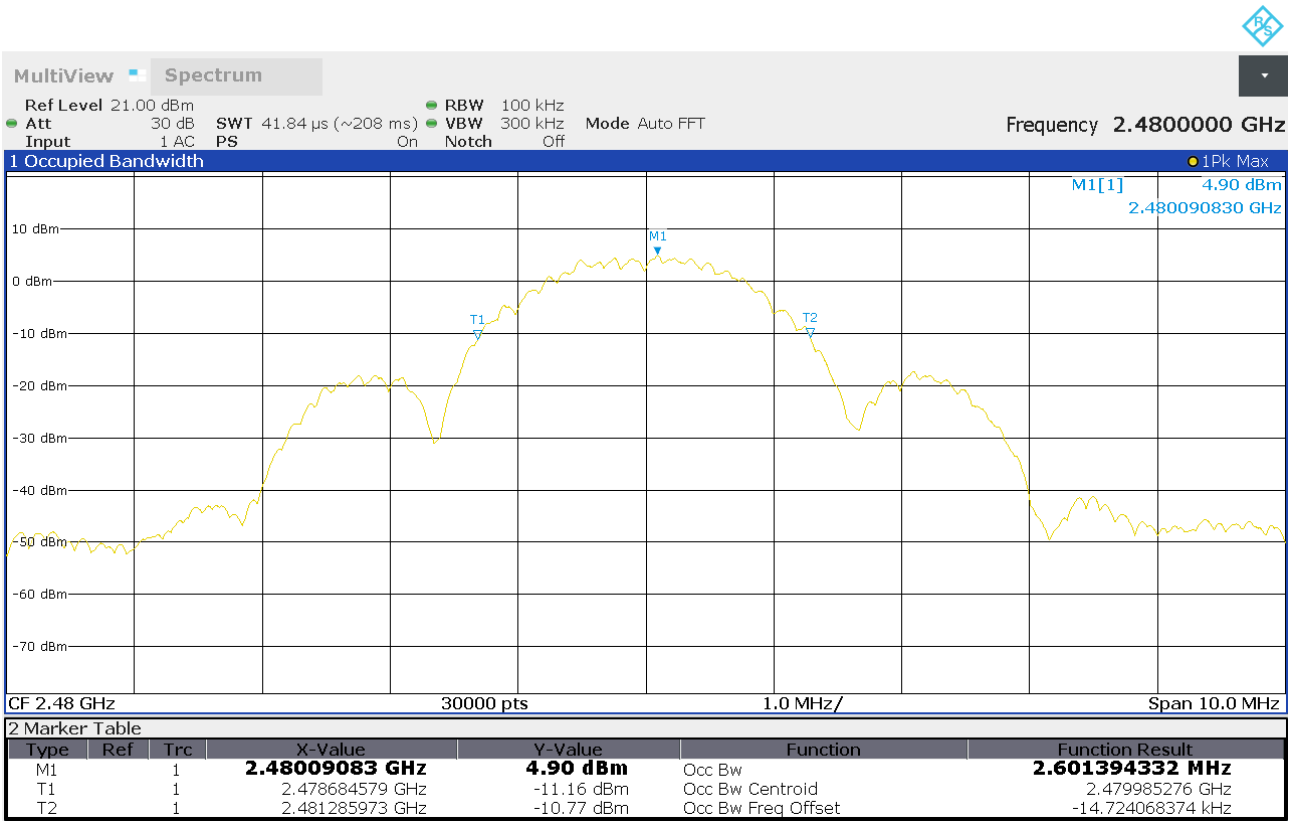


Figure 19 Bandwidth at 6dB Point and 99% Occupied Bandwidth. Operation on channel 2480MHz

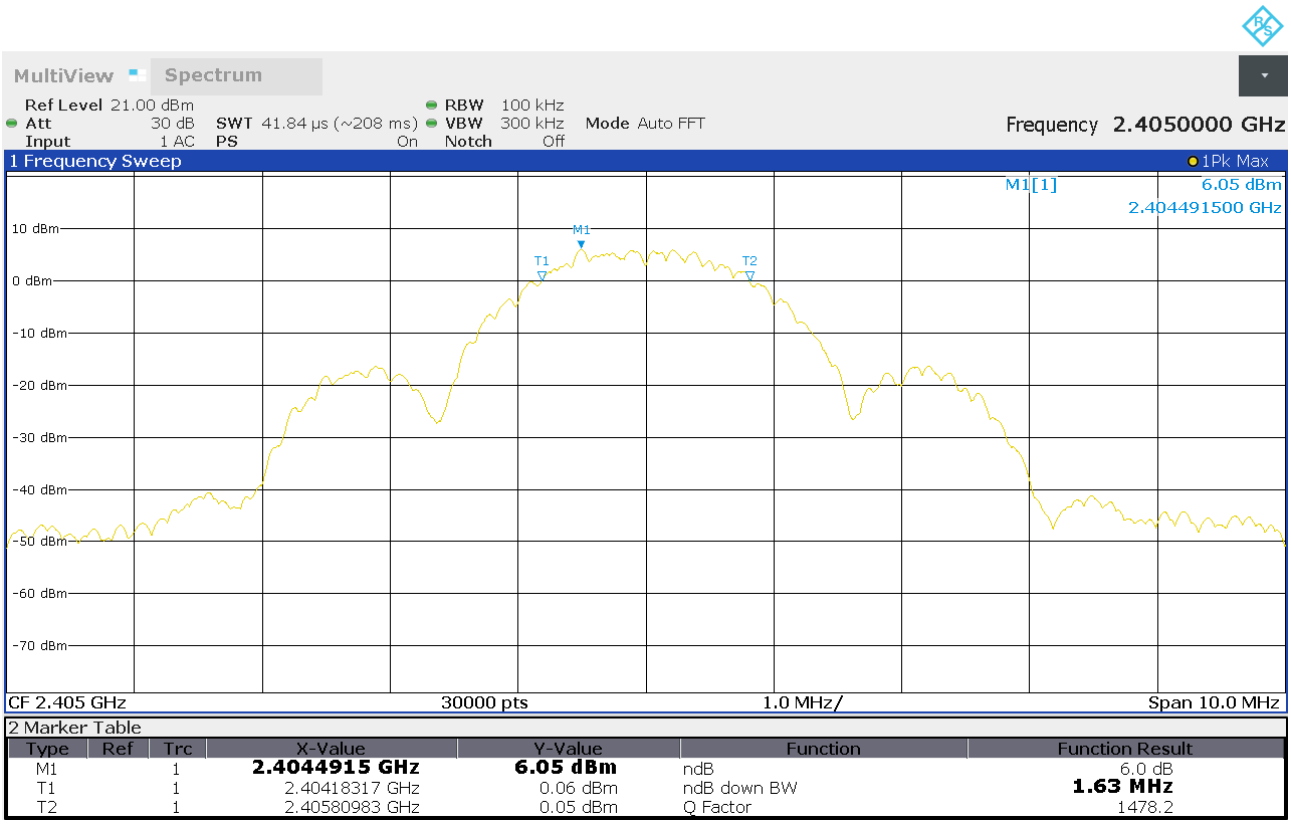


Figure 20 Bandwidth at 6dB Point. Operation on channel 2405MHz

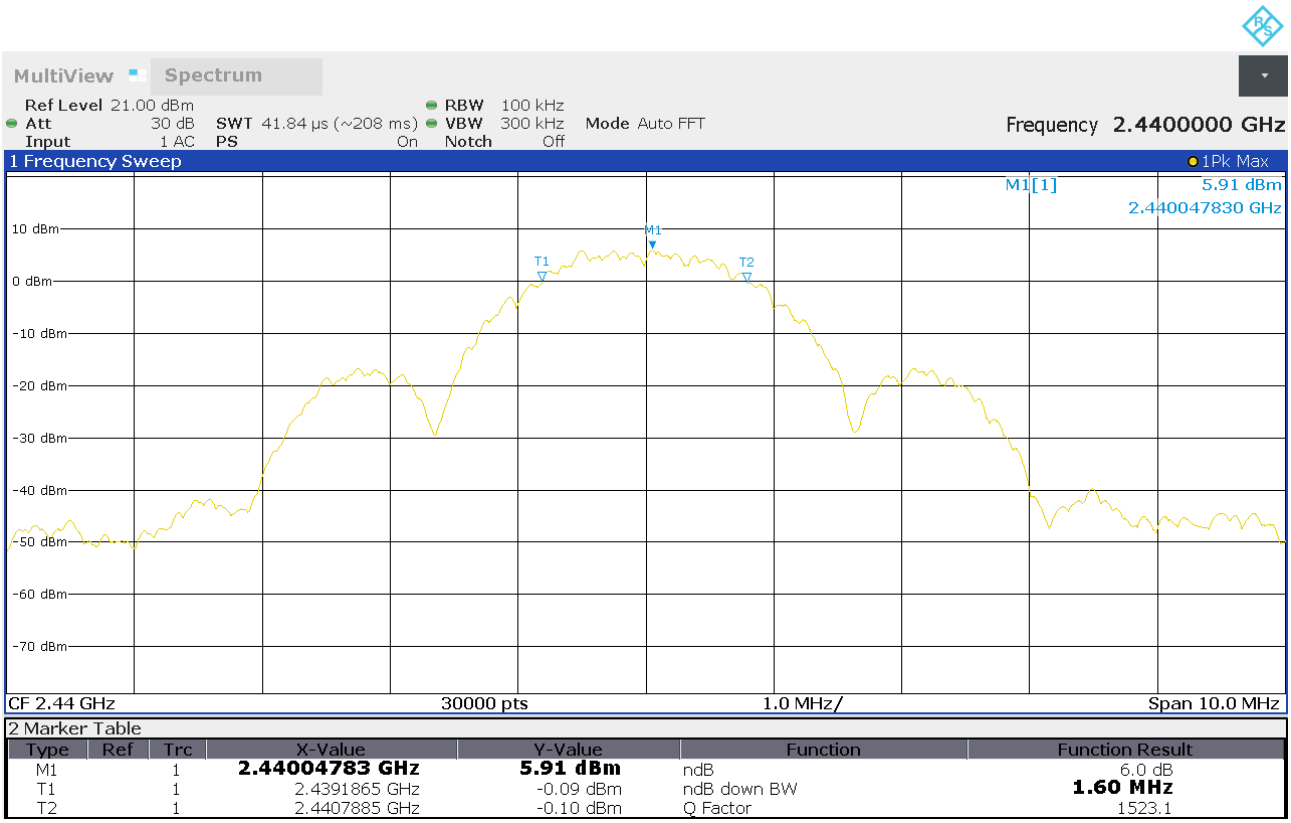


Figure 21 Bandwidth at 6dB Point. Operation on channel 2440MHz

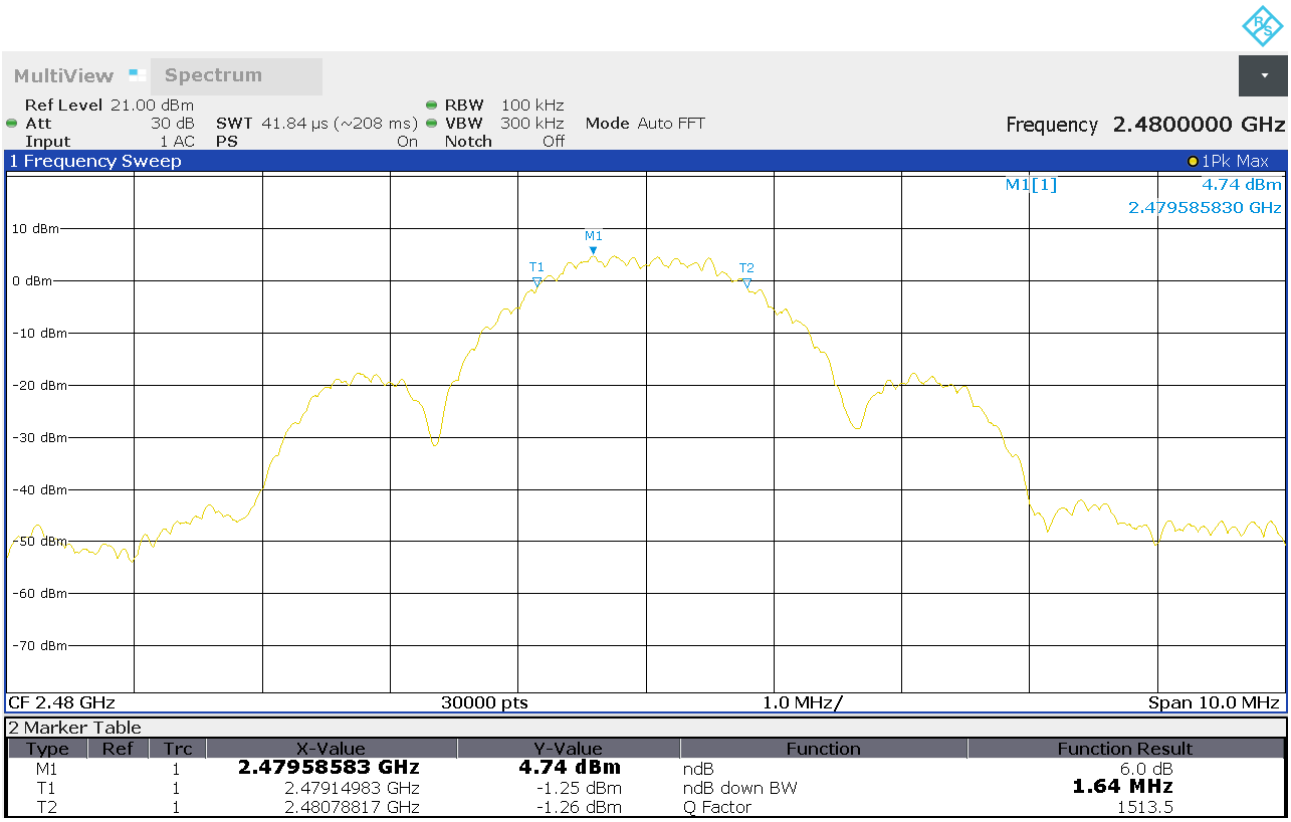


Figure 22 Bandwidth at 6dB Point. Operation on channel 2480MHz

Section 7 Peak Output Power

7.1 Test Specification

FCC Rule	46CFR 15.247 (b)(3)
Standard	ANSI C63.10:2013
Measurement Uncertainty	The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95% is ±1.4dB

7.2 Procedure and Test Software Version

Conducted Tests

ANSi C63.10-2013 Clause reference:	11.9.1.1 (RBS>DTS bandwidth)
Test software	N/A

Frequency (MHz)	**Limit, 47CFR 15.247(b)(2)**
	Peak
2400MHz to 2483.5MHz	1 watt

Spectrum analyser settings as specified by ANSI C63.10-2013 Clause 11.11.2

Receiver Parameters	**Setting**
Detector Function	Peak
Span	10MHz
Resolution Bandwidth	2MHz (>DTS Bandwidth)
Video Bandwidth	6MHz
Sweep rate	Auto couple
Trace mode	Max hold

7.2.1 Emissions measurements

7.2.2 Date of Test

6th December 2024

7.2.3 Test Area

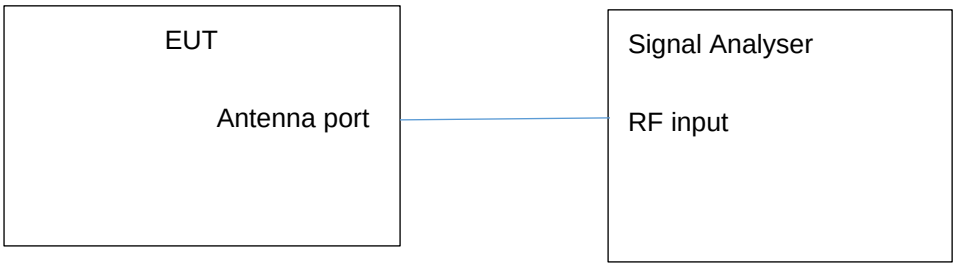
LAB 8

7.2.4 Tested by

J Beevers

7.2.5 Test Setup

The antenna port was connected directly to the signal analyser.



7.2.6 Test Result

The results of the peak output power measurements are stated in the table below and by the signal analyser images.

Channel (MHz)	Conducted Power* (dBm)	Conducted Power* (Watts)	Conducted Power Limit (Watts)	e.i.r.p (Watts)**	RSS-247 e.i.r.p Limit (Watts)	Figure
2405	14.14	0.026	1	0.055	4	23
2440	13.78	0.024	1	0.051	4	24
2480	2.16	0.002	1	0.004	4	25

Table 5 Peak Output Power Measurements

* Including cable loss of 0.4dB.

** Including cable loss of 0.4dB & antenna gain declared by the manufacturer of 3.3dB.

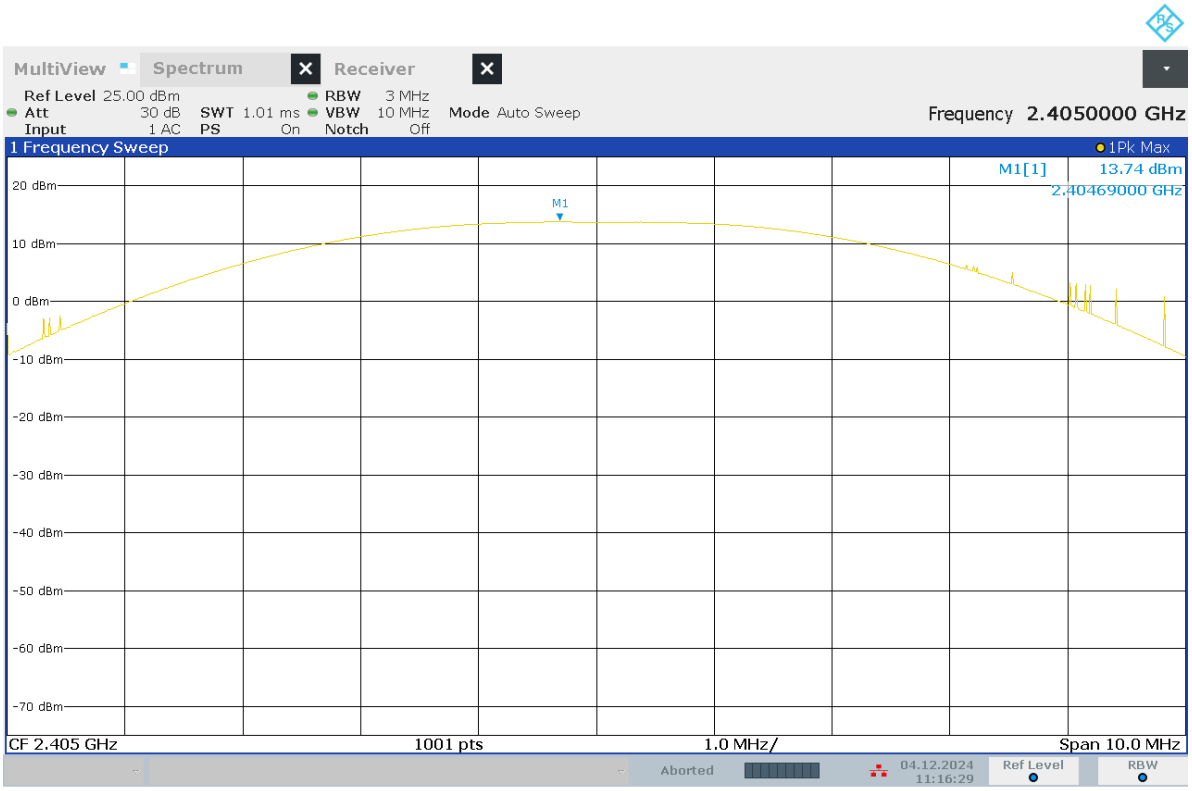


Figure 23 Peak output power, Operation on channel 2405MHz

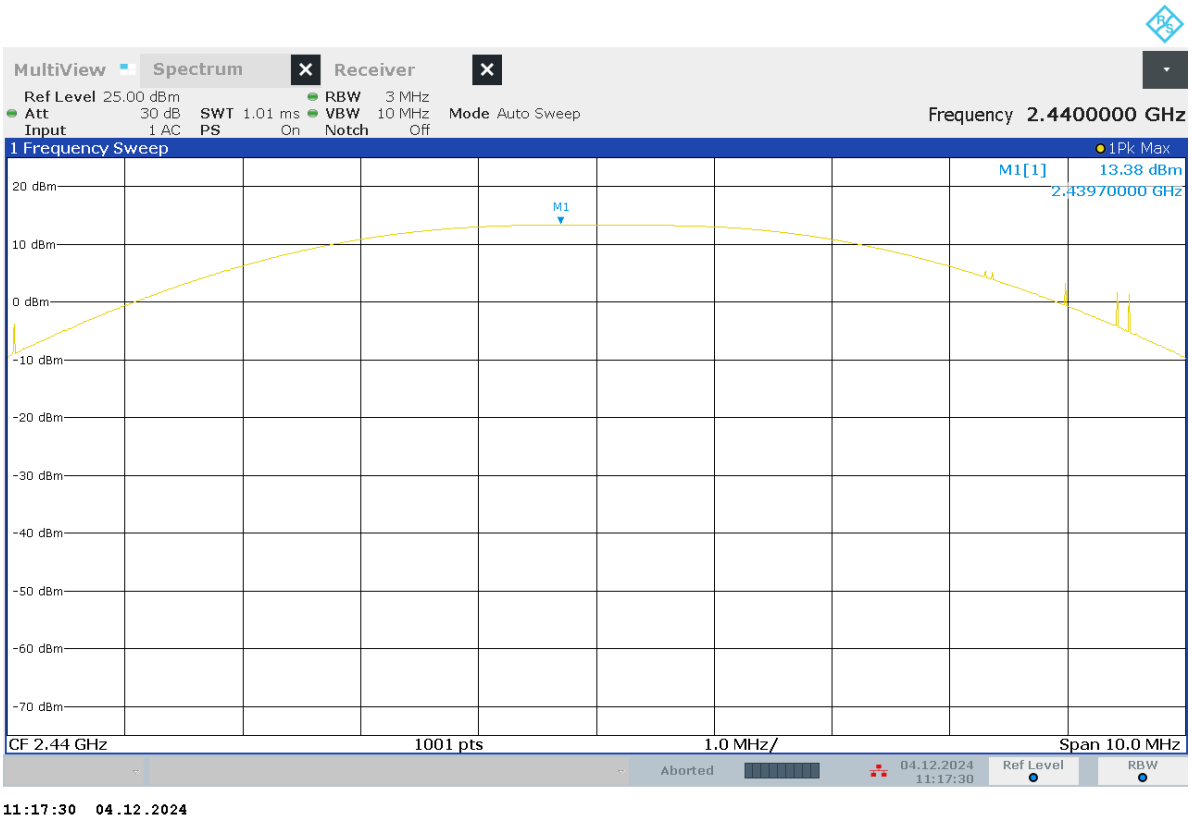


Figure 24 Peak output power, Operation on channel 2440MHz

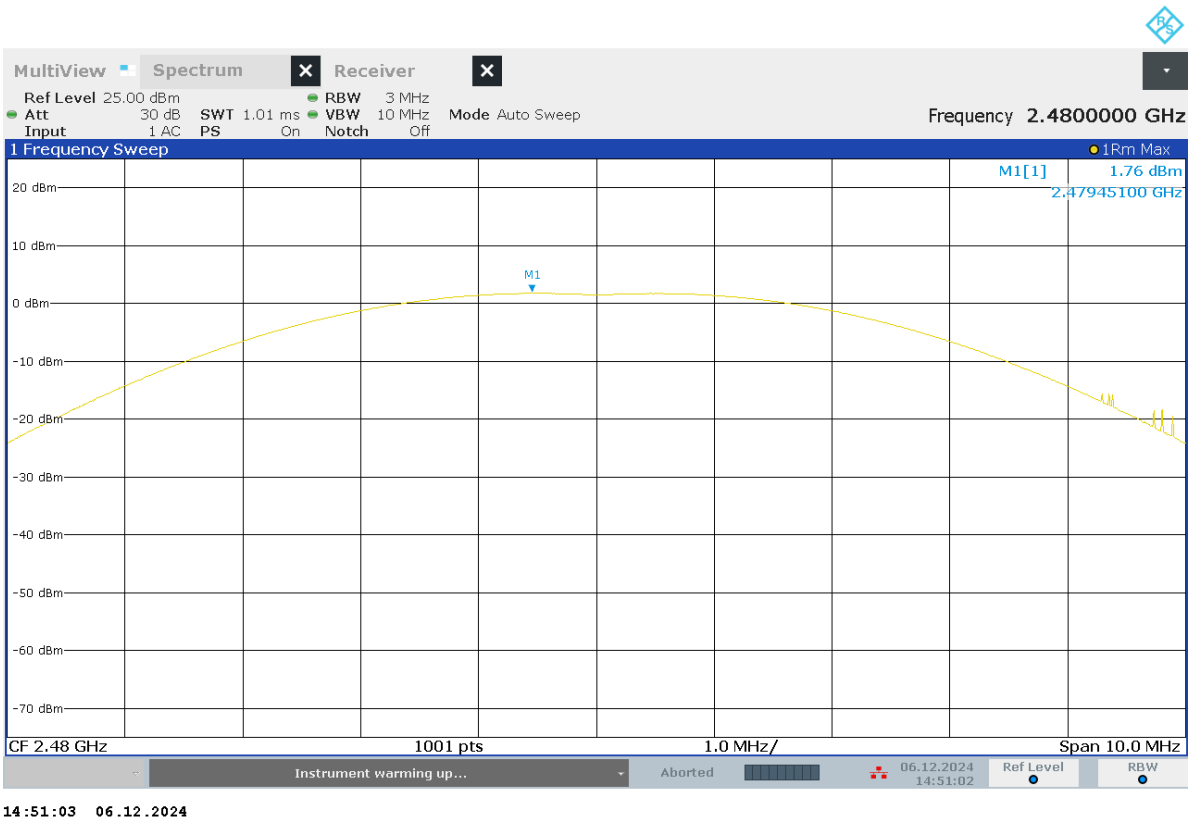


Figure 25 Peak output power, Operation on channel 2480MHz

Section 8 Power Spectral Density

8.1 Test Specification

FCC Rule	46CFR 15.247 (e)
Standard	ANSI C63.10:2013
Measurement Uncertainty	The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95% is ±1.4dB

8.2 Procedure and Test Software Version

Conducted Tests

ANSi C63.10-2013 Clause reference:	Clause 11.10.2
Test software	N/A

Frequency (MHz)	**Limit, 47CFR 15.247(e)**
	Peak
2400MHz to 2483.5MHz	<8dBm in any 3kHz band during any time interval of complete transmission

Spectrum analyser settings as specified by ANSI C63.10-2013 Clause 11.10.2

Receiver Parameters	**Setting**
Detector Function	Peak
Span	1.5xDTS bandwidth
Resolution Bandwidth	3kHz ≤RBW ≤100kHz
Video Bandwidth	3 x RBW
Sweep rate	Auto couple
Trace mode	Max hold

8.2.1 Emissions measurements

8.2.2 Date of Test

4th December 2024

8.2.3 Test Area

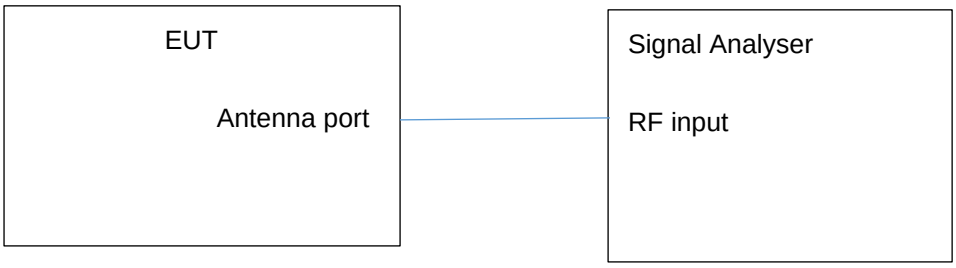
LAB 8

8.2.4 Tested by

J Beevers

8.2.5 Test Setup

The antenna port was connected directly to the signal analyser.



8.2.6 Test Results

Channel (MHz)	Power in 3kHz* RBW (dBm)	Limit (dBm)	Figure	Result
2405	1.75	8.0	26	Pass
2440	0.91	8.0	27	Pass
2480	-11.15	8.0	28	Pass

Table 6 Peak Spectral Density Measurements

* Including cable loss of 0.4dB & antenna gain declared by the manufacturer of 3.3dB.

Figure 26 Power spectral density, Operation on channel 2405MHz

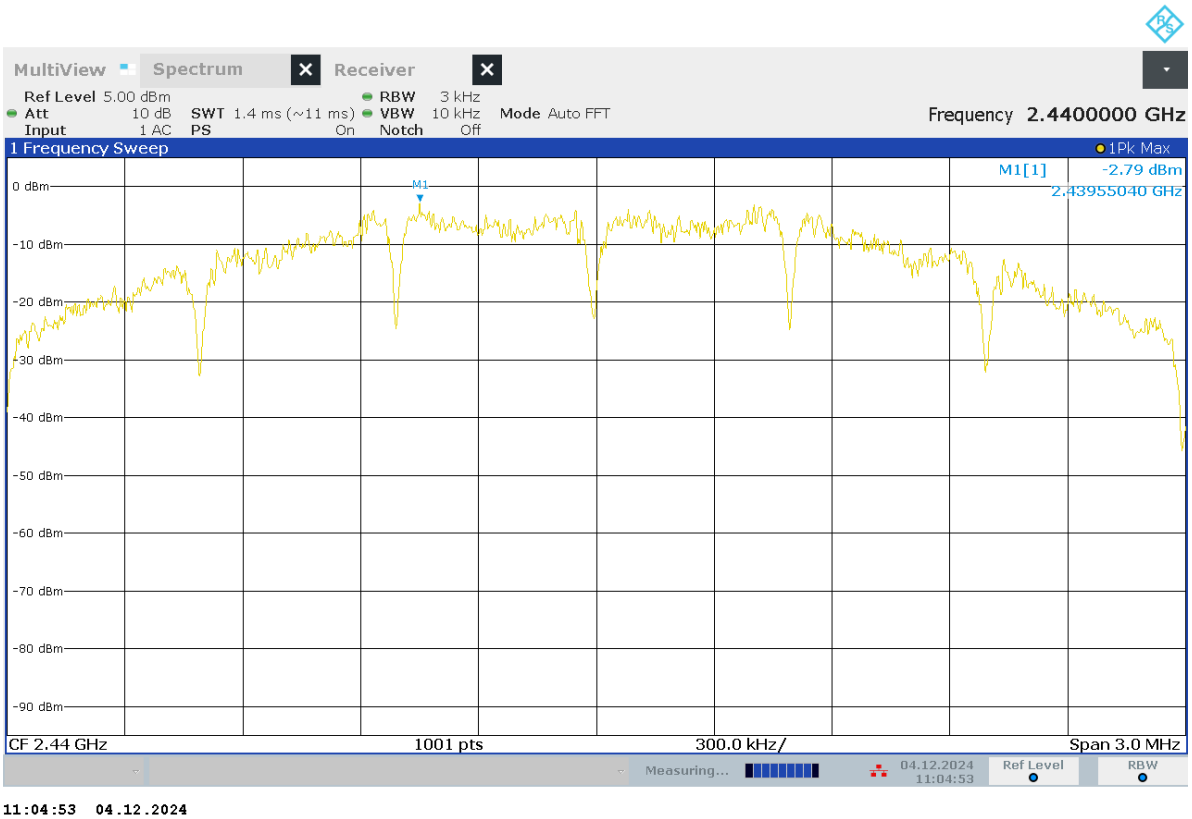


Figure 27 Power spectral density, Operation on channel 2440MHz

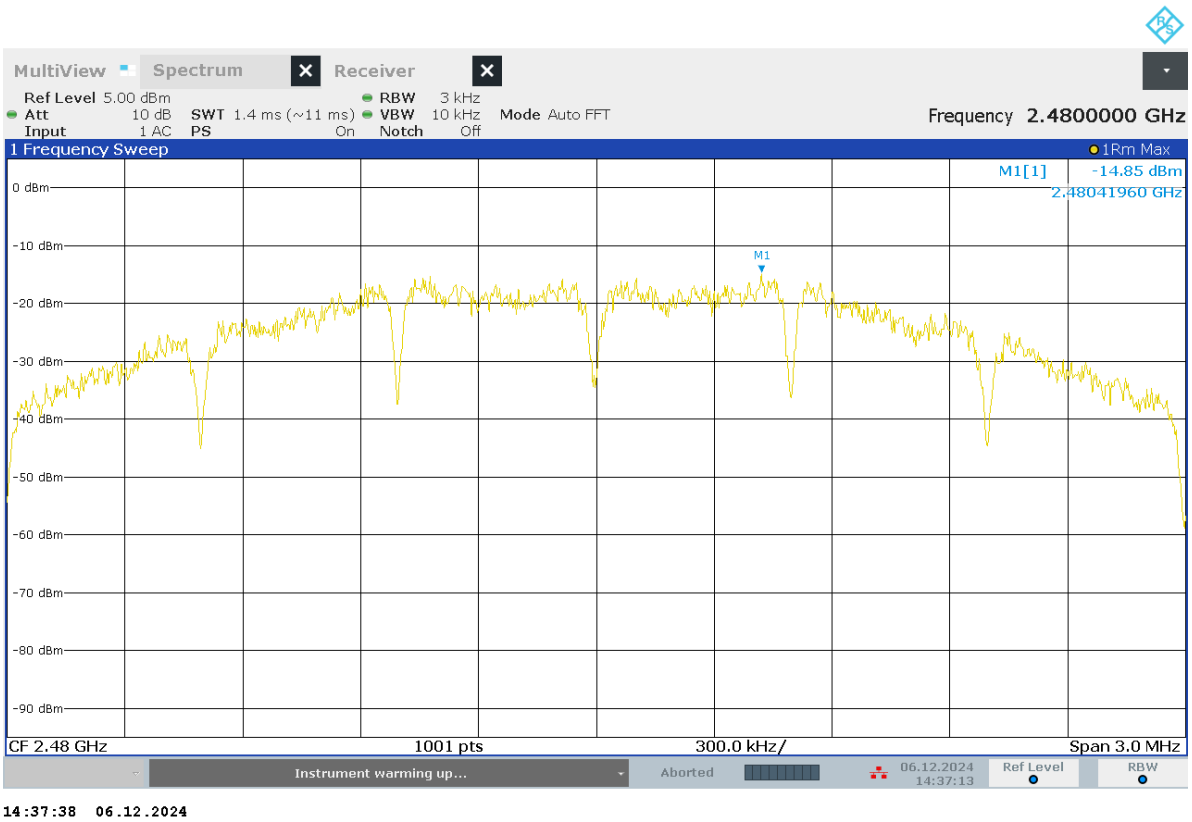


Figure 28 Power spectral density, Operation on channel 2480MHz

Section 9 Band Edge Compliance

9.1 Test Specification

FCC Rule	46CFR 15.205 and 47CFR15.209
Standard	ANSI C63.10:2013
Measurement Uncertainty	The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95% is ± 5.14dB

9.2 Procedure and Test Software Version

Conducted Tests

ANSi C63.10-2013 Clause reference:	Clause 6.10.4 Authorised band-edge measurements
Test software	N/A

Frequency (MHz)	**Limit, 47CFR 15.247(e)**
	Peak
2400MHz to 2483.5MHz	Measured signal at the band edge must be below the radiated emission limits of 47CFR15.209

Spectrum analyser settings as specified by ANSI C63.10-2013 Clause 6.10.5 “Restricted band-edge measurements”

Receiver Parameters	**Setting**
Detector Function	Peak
Span	As necessary
Resolution Bandwidth	1MHz
Video Bandwidth	3 x RBW
Sweep rate	Auto couple
Trace mode	Max hold

9.2.1 Emissions measurements

9.2.2 Date of Test

6th December 2024

9.2.3 Test Area

LAB 1

9.2.4 Tested by

L Trickett

9.2.5 Test Setup

The test setup was identical to radiated emissions testing 1-18GHz.

9.2.6 Test Results

Results are presented in two formats:

Tabular results of measurements at the band edges. Manual measurements were performed to measure the maximum value of signal at the band edge. The tabular data includes the following:

1. Polarity of the measurement antenna
2. Frequency at the band edge
3. Amplitude of signal at the input of the test receiver
4. Pre-amplifier gain
5. Cable loss
6. Antenna factor
7. Resultant Electric field strength = 3-4+5+6

Spectrum analyser screen displays are also included. Please note that the screen displays do not include losses or antenna factor.

Tabular Data

The following radiated measurements were made at the band edges:

Upper band edge

Polarity	Frequency (MHz)	Amplitude (dBuV)	Preamp (dB)	Cable loss (dB)	AF(dB/m)	E (dBuV/m)	Limit (dBuV/m)	Margin (dB)
H	2483.5	91.6	54.3	3.8	30.6	71.7	74.0	2.3
V	2483.5	87.9	54.3	3.8	30.6	68.0	74.0	6.0

Table 7 Operation on 2480MHz. Peak detector measurements

Polarity	Frequency (MHz)	Amplitude (dBuV)	Preamp (dB)	Cable loss (dB)	AF(dB/m)	E (dBuV/m)	Limit (dBuV/m)	Margin (dB)
H	2483.5	50.0	54.3	3.8	30.6	30.1	54.0	23.9
V	2483.5	48.2	54.3	3.8	30.6	28.3	54.0	25.7

Table 8 Operation on 2480MHz. Average detector measurements

Lower band edge

Polarity	Frequency (MHz)	Amplitude (dBuV)	Preamp (dB)	Cable loss (dB)	AF(dB/m)	E (dBuV/m)	Limit (dBuV/m)	Margin (dB)
H	2400	92.2	54.2	3.7	30.0	71.7	74.0	2.3
V	2400	91.9	54.2	3.7	30.0	71.4	74.0	2.6

Table 9 Operation on 2405MHz. Peak detector measurements

Polarity	Frequency (MHz)	Amplitude (dBuV)	Preamp (dB)	Cable loss (dB)	AF(dB/m)	E (dBuV/m)	Limit (dBuV/m)	Margin (dB)
H	2400	48.0	54.2	3.7	30.0	27.5	54.0	26.5
V	2400	47.9	54.2	3.7	30.0	27.4	54.0	26.6

Table 10 Operation on 2405MHz. Average detector measurements

Spectrum analyser displays

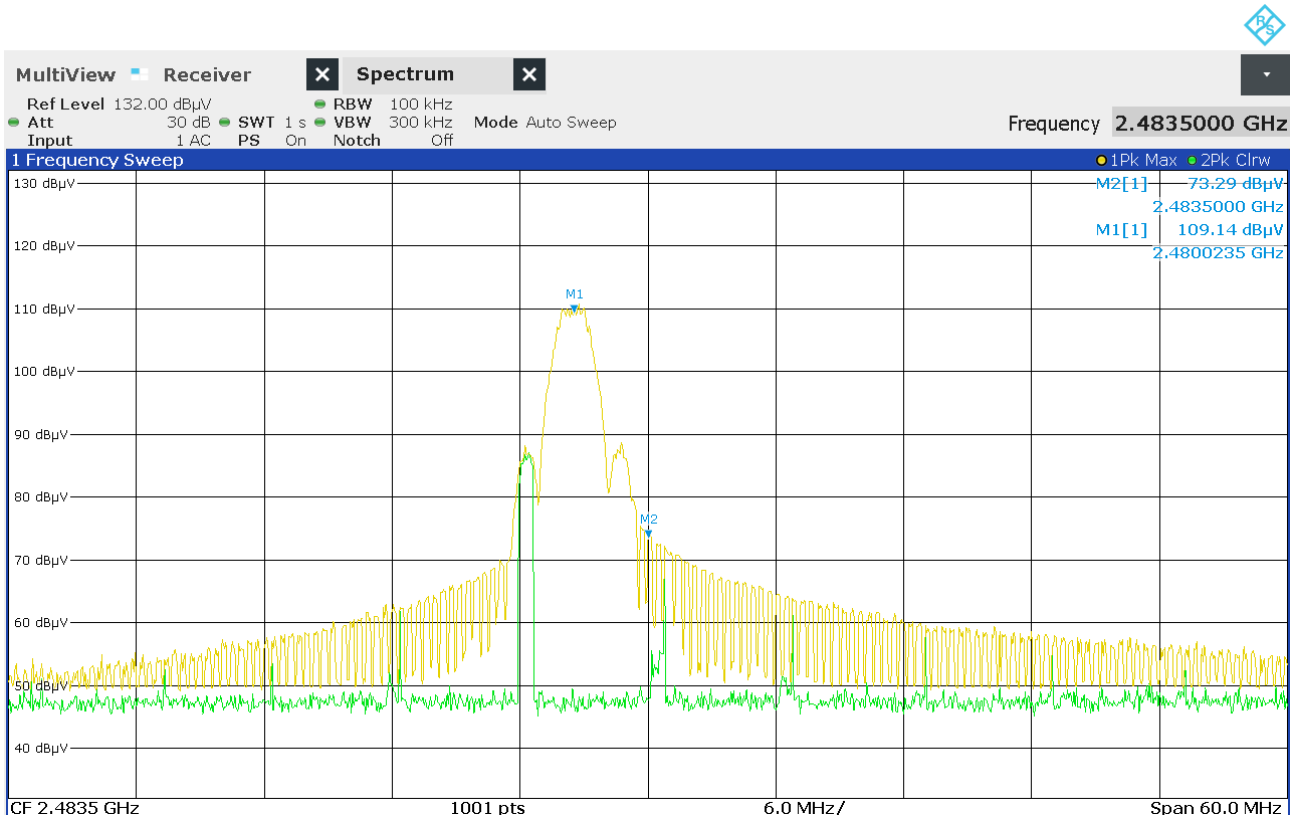


Figure 29 Band Edge Measurement – Upper band edge - Horizontal polarity

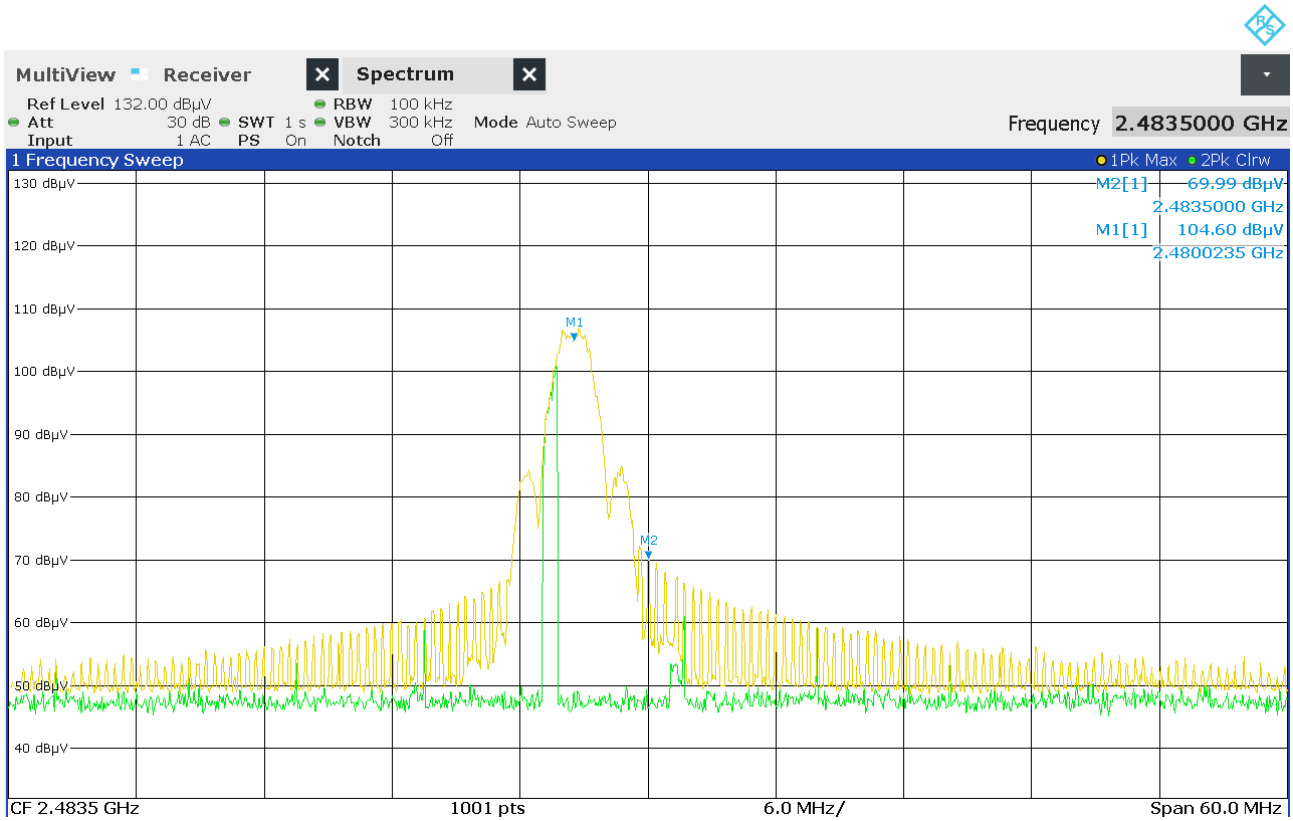


Figure 30 Band Edge Measurement – Upper band edge - Vertical polarity

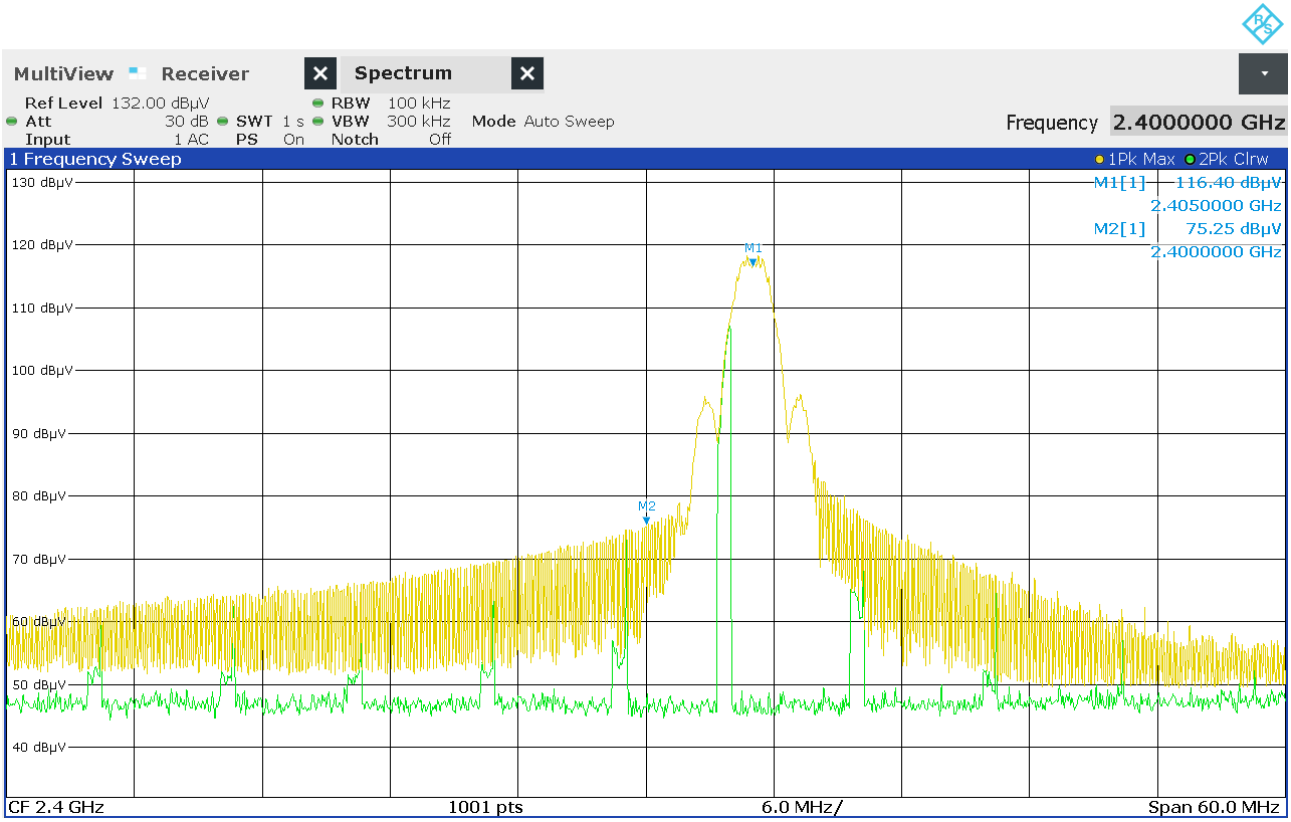


Figure 31 Band Edge Measurement – Lower band edge - Horizontal polarity

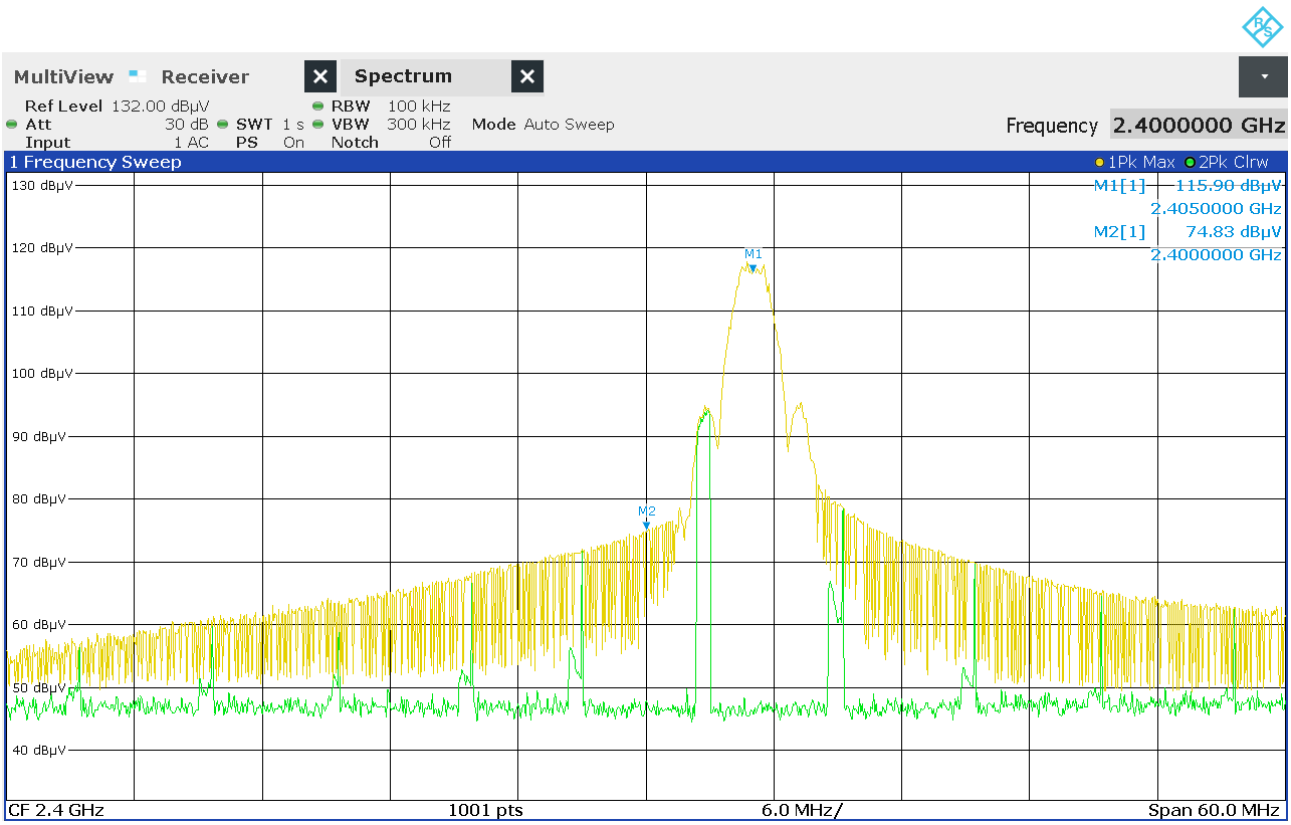


Figure 32 Band Edge Measurement – Lower band edge - Vertical polarity

Section 10 AC Mains Conducted Emissions

10.1 Test Specification

Regulation (USA)	47CFR15.207
Standard	ANSI C63.10:2013
Measurement Uncertainty	The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 % is +/- 3.44dB

10.2 Power Line Emission Limits

Frequency (MHz)	Limits (dBµV)	
	Quasi Peak	Average
0.15 – 0.5	66 – 56*	56 – 46*
0.5 – 5.0	56.0	46.0
5.0 - 30	60.0	50.0

Note: * The limit decreases linearly with the logarithm of the frequency in the range

10.3 Receiver Settings

Receiver Parameters	Setting
Detector Function	Quasi Peak and Average
Start Frequency	150kHz
Stop Frequency	30MHz
Resolution Bandwidth	10kHz
Video Bandwidth	Auto

10.4 Procedure and Test Software Version

Eurofins E&E UK test procedure	CEP19 Issue 10
Test software	RadiMation Version 2023.1.6

10.4.1 Date of Test

19th December 2024

10.4.2 Test Area

LAB 2

10.4.3 Tested by

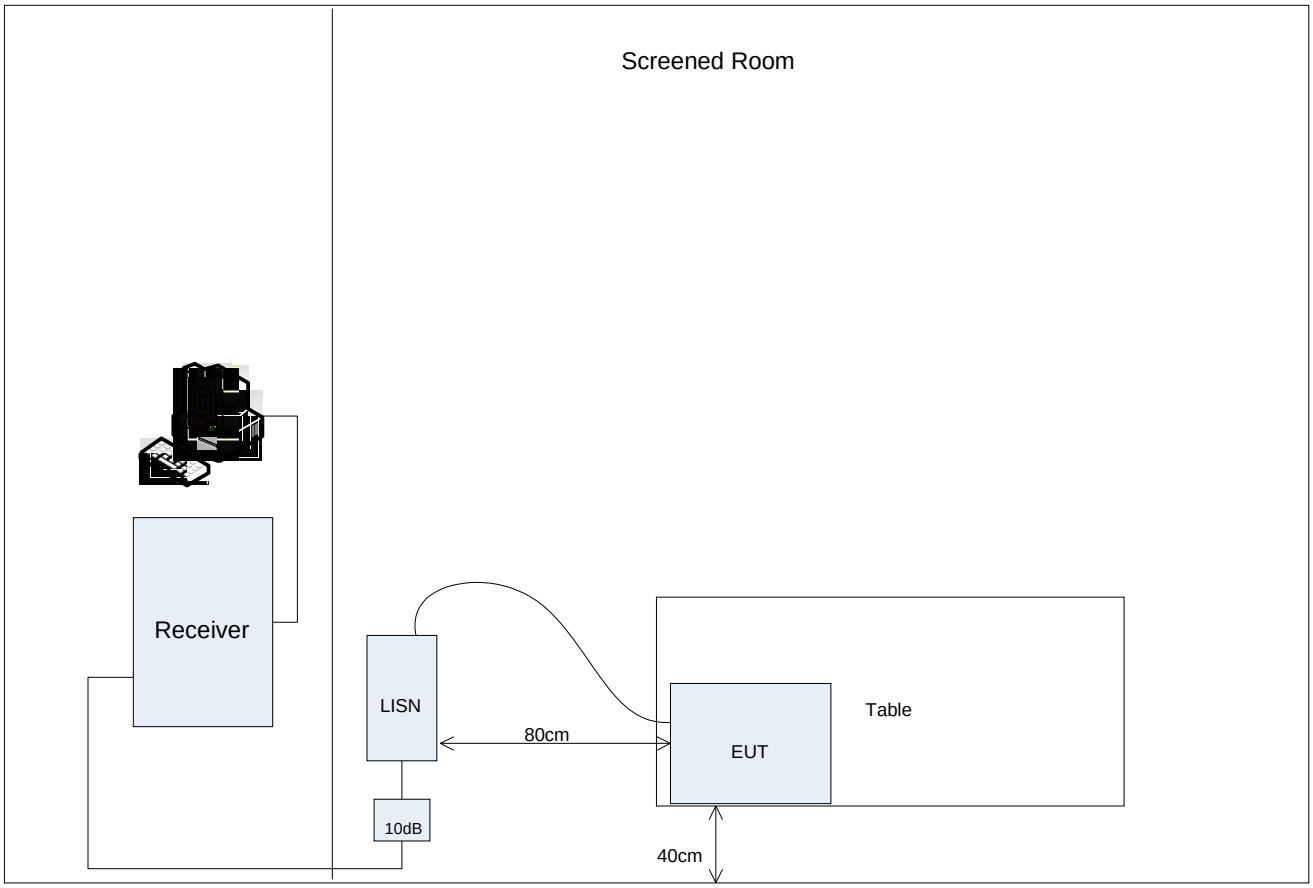
L Trickett

10.4.4 Test Setup

This test was applied to the EUT's Live and Neutral lines. The EUT was configured in the screened room on an 80cm high table was positioned 40cm from the room wall.

A calibrated mains extension lead was used to ensure a known impedance was presented to the EUT

The EUT was then powered from the mains supply via a Line Impedance Stabilisation Network (LISN).



10.5 Test Results

This section contains graphical and tabulated data. The following data is presented.

Mode of Operation	Conductor	Result summary
Operating at 2405MHz	Live	Pass
Operating at 2405MHz	Neutral	Pass
Operating at 2440MHz	Live	Pass
Operating at 2440MHz	Neutral	Pass
Operating at 2480MHz	Live	Pass
Operating at 2480MHz	Neutral	Pass

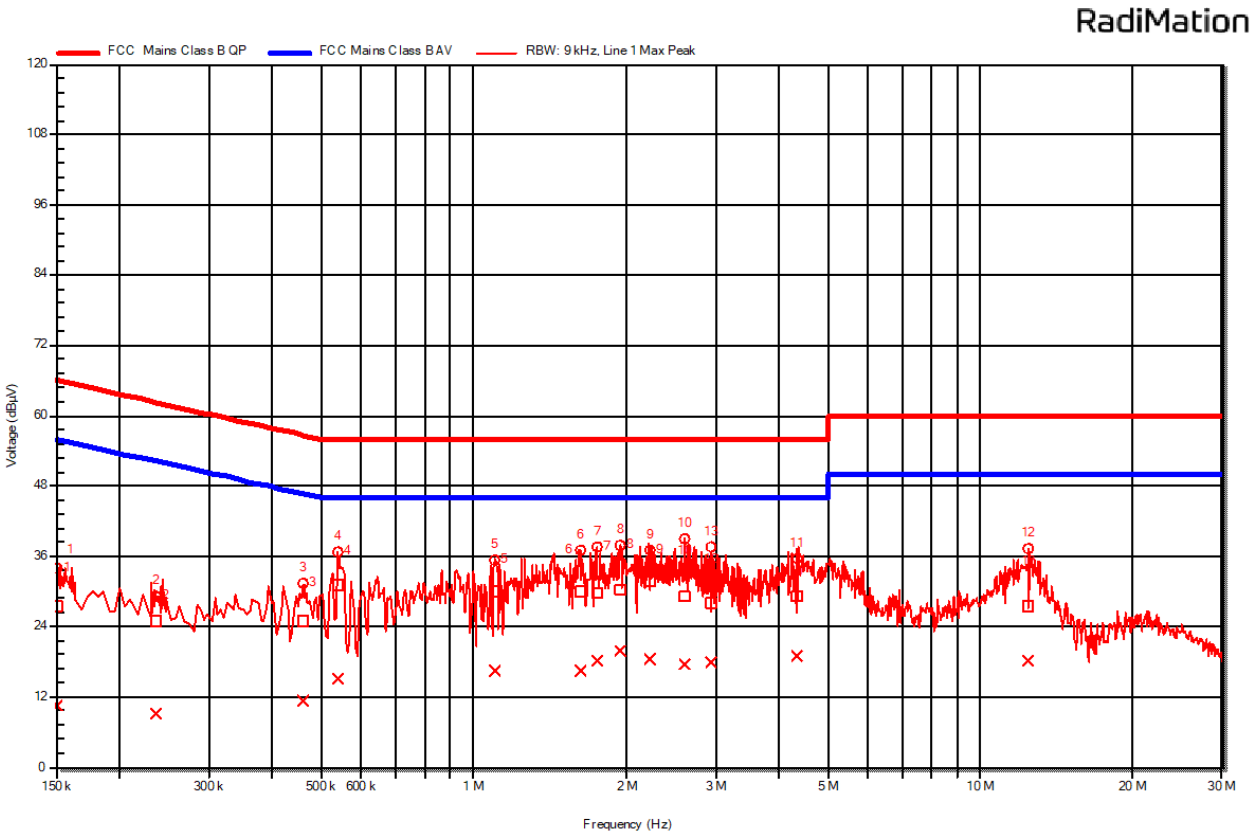


Figure 33: AC mains conducted emissions 2405MHz – Live

Frequency (MHz)	Average (dBµV)	Average Limit (dBµV)	Average Difference (dB)	Average Status	Quasi-Peak (dBµV)	Quasi-Peak Limit (dBµV)	Quasi-Peak Difference (dB)	Quasi-Peak Status
0.151	10.5	56.0	-45.4	Pass	27.5	66.0	-38.5	Pass
0.236	9.2	52.2	-43.0	Pass	25.0	62.2	-37.3	Pass
0.461	11.4	46.7	-35.3	Pass	24.8	56.7	-31.9	Pass
0.538	15.2	46.0	-30.8	Pass	31.1	56.0	-24.9	Pass
1.102	16.6	46.0	-29.4	Pass	30.1	56.0	-25.9	Pass
1.620	16.4	46.0	-29.7	Pass	30.1	56.0	-25.9	Pass
1.747	18.0	46.0	-28.0	Pass	29.8	56.0	-26.2	Pass
1.943	19.9	46.0	-26.1	Pass	30.3	56.0	-25.7	Pass
2.227	18.6	46.0	-27.4	Pass	31.6	56.0	-24.4	Pass
2.605	17.6	46.0	-28.4	Pass	29.3	56.0	-26.7	Pass
4.349	19.1	46.0	-26.9	Pass	29.0	56.0	-27.0	Pass
12.451	18.0	50.0	-32.0	Pass	27.6	60.0	-32.4	Pass
2.945	17.9	46.0	-28.1	Pass	28.0	56.0	-28.0	Pass

Table 11: Electric Field Emissions Peaks, 150kHz to 30MHz – Live - 2405MHz

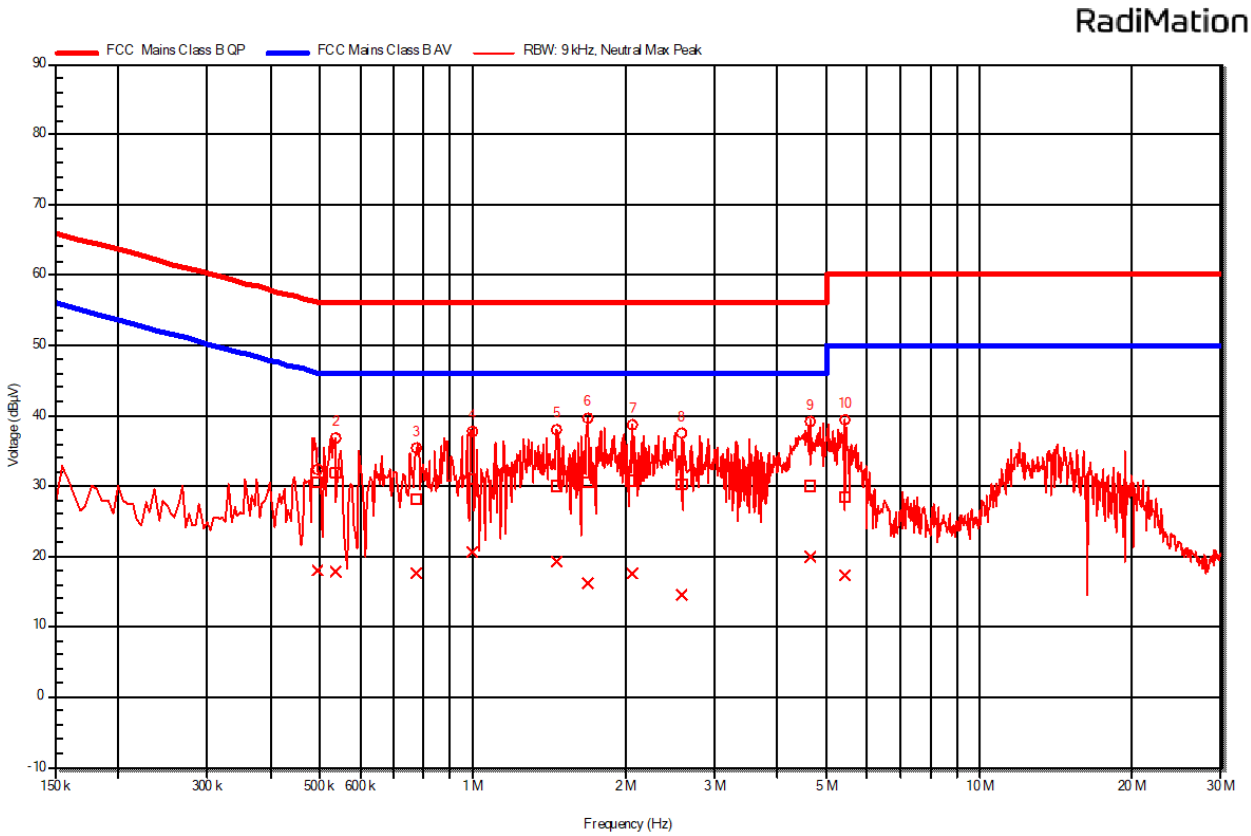


Figure 34: AC mains conducted emissions 2405MHz – Neutral

Frequency (MHz)	Average (dBµV)	Average Limit (dBµV)	Average Difference (dB)	Average Status	Quasi-Peak (dBµV)	Quasi-Peak Limit (dBµV)	Quasi-Peak Difference (dB)	Quasi-Peak Status
0.497	18.1	46.1	-28.0	Pass	30.5	56.1	-25.5	Pass
0.536	17.8	46.0	-28.2	Pass	32.0	56.0	-24.0	Pass
0.776	17.7	46.0	-28.3	Pass	28.1	56.0	-27.9	Pass
0.997	20.7	46.0	-25.3	Pass	31.0	56.0	-25.0	Pass
1.461	19.1	46.0	-26.9	Pass	30.0	56.0	-26.0	Pass
1.692	16.3	46.0	-29.7	Pass	30.4	56.0	-25.6	Pass
2.067	17.7	46.0	-28.3	Pass	30.6	56.0	-25.4	Pass
2.594	14.5	46.0	-31.5	Pass	30.3	56.0	-25.7	Pass
4.632	19.9	46.0	-26.1	Pass	30.0	56.0	-26.0	Pass
5.437	17.3	50.0	-32.7	Pass	28.3	60.0	-31.7	Pass

Table 12: Electric Field Emissions Peaks, 150kHz to 30MHz – Neutral - 2405MHz

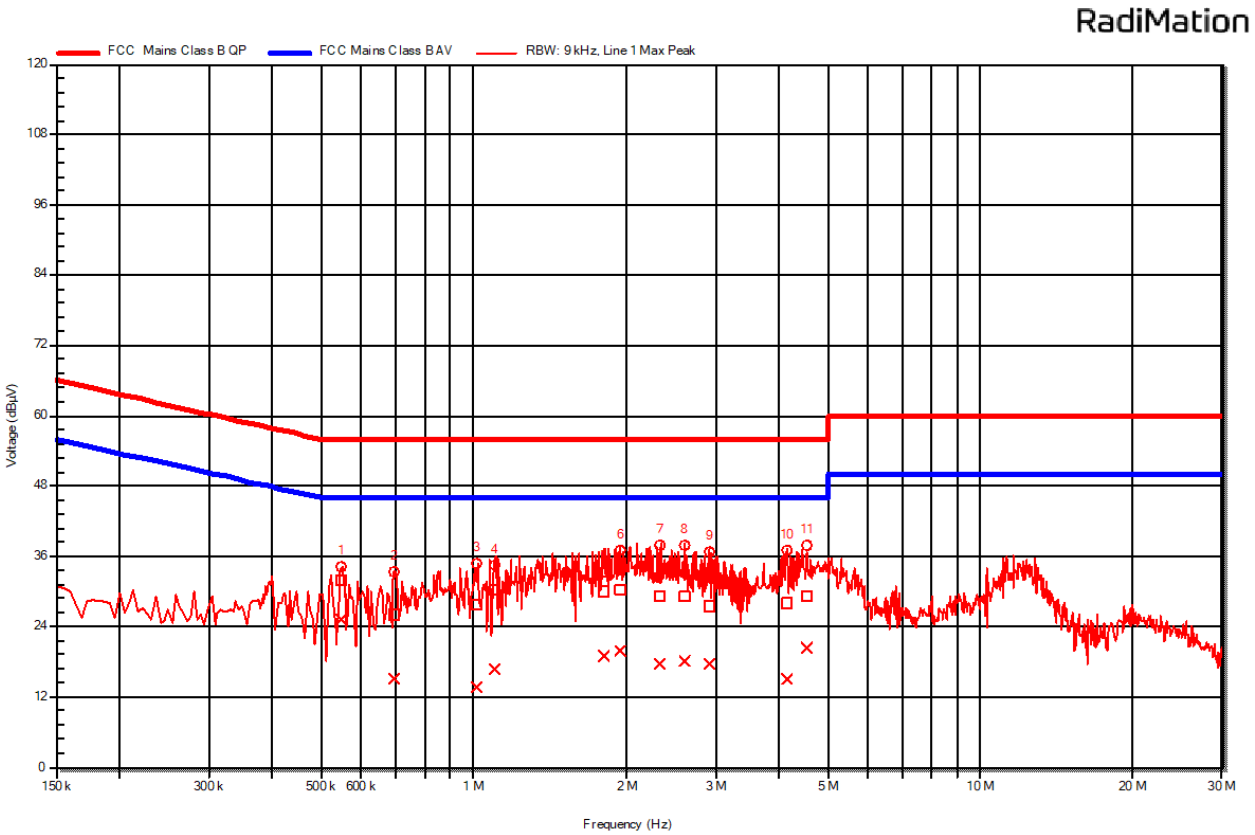


Figure 35: AC mains conducted emissions 2440MHz – Live

Frequency (MHz)	Average (dBµV)	Average Limit (dBµV)	Average Difference (dB)	Average Status	Quasi-Peak (dBµV)	Quasi-Peak Limit (dBµV)	Quasi-Peak Difference (dB)	Quasi-Peak Status
0.549	25.2	46.0	-20.8	Pass	32.1	46.0	-23.9	Pass
0.699	15.2	46.0	-30.8	Pass	26.1	46.0	-29.9	Pass
1.016	13.5	46.0	-32.5	Pass	27.8	46.0	-28.2	Pass
1.100	16.8	46.0	-29.2	Pass	30.3	46.0	-25.7	Pass
1.805	18.9	46.0	-27.1	Pass	30.0	46.0	-26.0	Pass
1.941	19.9	46.0	-26.1	Pass	30.3	46.0	-25.7	Pass
2.337	17.5	46.0	-28.5	Pass	29.1	46.0	-26.9	Pass
2.601	18.1	46.0	-27.9	Pass	29.2	46.0	-26.8	Pass
2.909	17.7	46.0	-28.3	Pass	27.6	46.0	-28.4	Pass
4.155	15.2	46.0	-30.8	Pass	28.0	46.0	-28.0	Pass
4.533	20.4	46.0	-25.7	Pass	29.1	46.0	-26.9	Pass

Table 13: Electric Field Emissions Peaks, 150kHz to 30MHz – Live - 2440MHz

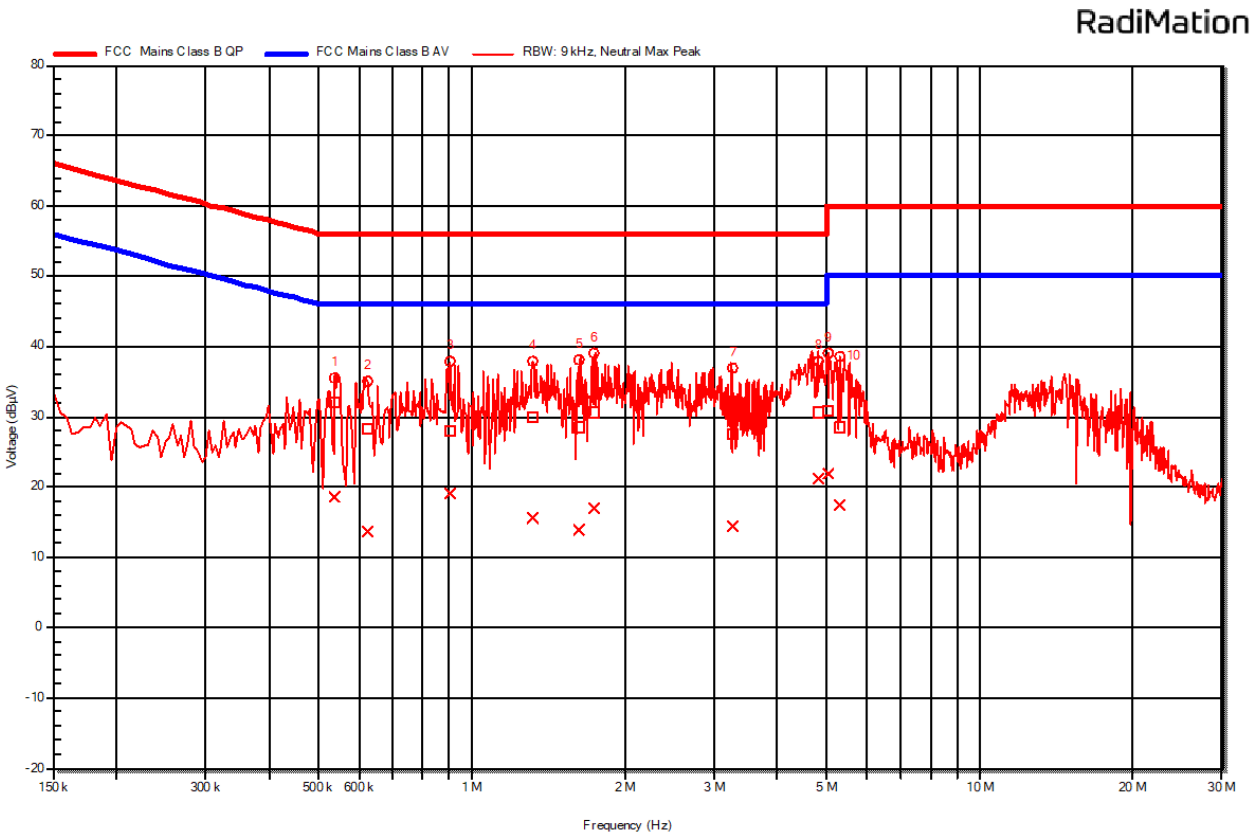


Figure 36: AC mains conducted emissions 2440MHz – Neutral

Frequency (MHz)	Average (dBµV)	Average Limit (dBµV)	Average Difference (dB)	Average Status	Quasi-Peak (dBµV)	Quasi-Peak Limit (dBµV)	Quasi-Peak Difference (dB)	Quasi-Peak Status
0.538	18.7	46.0	-27.3	Pass	32.0	56.0	-24.0	Pass
0.622	13.6	46.0	-32.4	Pass	28.2	56.0	-27.8	Pass
0.910	19.1	46.0	-26.9	Pass	28.1	56.0	-27.9	Pass
1.320	15.6	46.0	-30.4	Pass	30.0	56.0	-26.0	Pass
1.632	13.8	46.0	-32.2	Pass	28.4	56.0	-27.6	Pass
1.746	16.9	46.0	-29.1	Pass	30.5	56.0	-25.5	Pass
3.251	14.4	46.0	-31.6	Pass	27.6	56.0	-28.4	Pass
4.804	21.2	46.0	-24.8	Pass	30.5	56.0	-25.5	Pass
5.019	21.8	50.0	-28.2	Pass	30.8	60.0	-29.2	Pass
5.287	17.4	50.0	-32.6	Pass	28.5	60.0	-31.5	Pass

Table 14: Electric Field Emissions Peaks, 150kHz to 30MHz – Neutral - 2440MHz

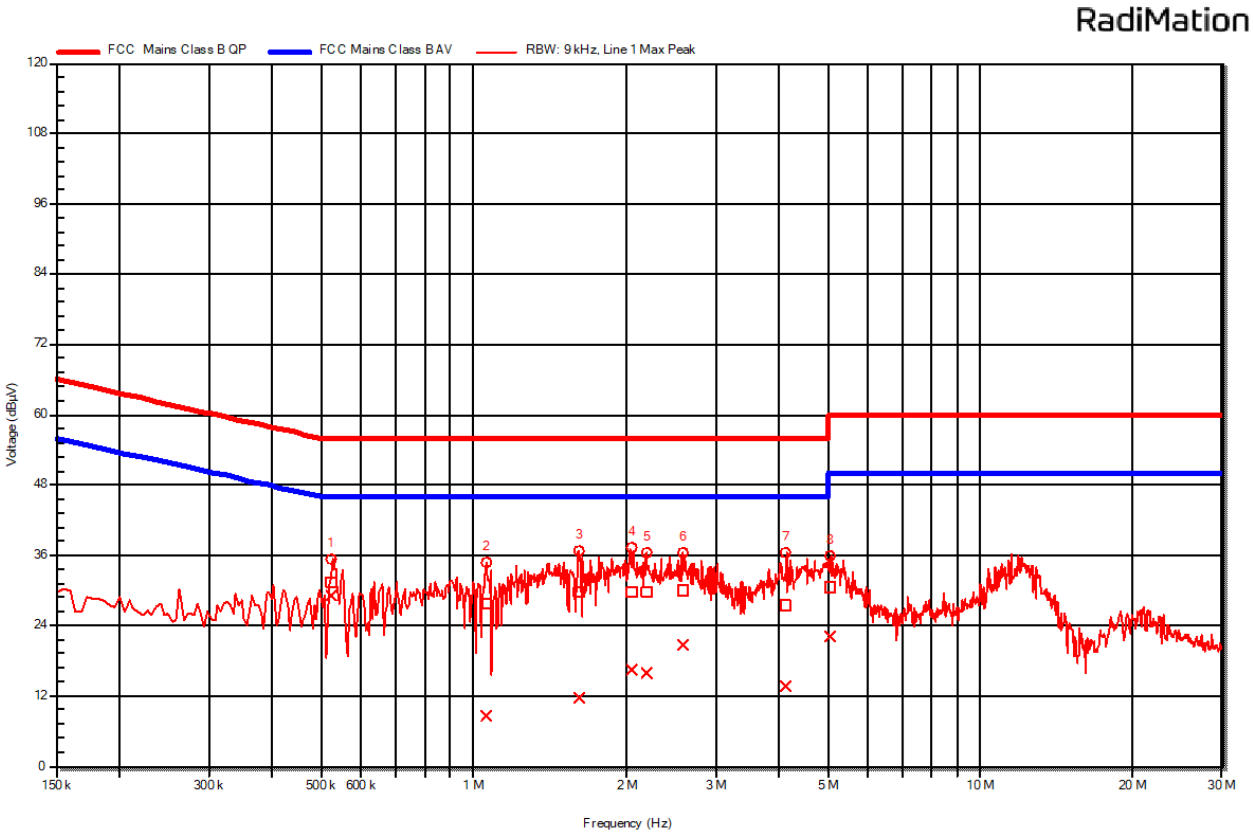


Figure 37: AC mains conducted emissions 2480MHz – Live

Frequency (MHz)	Average (dBµV)	Average Limit (dBµV)	Average Difference (dB)	Average Status	Quasi-Peak (dBµV)	Quasi-Peak Limit (dBµV)	Quasi-Peak Difference (dB)	Quasi-Peak Status
0.525	29.2	46.0	-16.8	Pass	31.5	56.0	-24.5	Pass
1.057	8.5	46.0	-37.5	Pass	27.8	56.0	-28.2	Pass
1.608	11.8	46.0	-34.2	Pass	29.7	56.0	-26.3	Pass
2.053	16.6	46.0	-29.4	Pass	29.8	56.0	-26.2	Pass
2.193	16.0	46.0	-30.0	Pass	29.7	56.0	-26.3	Pass
2.591	20.7	46.0	-25.3	Pass	29.9	56.0	-26.1	Pass
4.130	13.6	46.0	-32.4	Pass	27.5	56.0	-28.5	Pass
5.059	22.1	50.0	-27.9	Pass	30.6	60.0	-29.4	Pass

Table 15: Electric Field Emissions Peaks, 150kHz to 30MHz – Live - 2480MHz

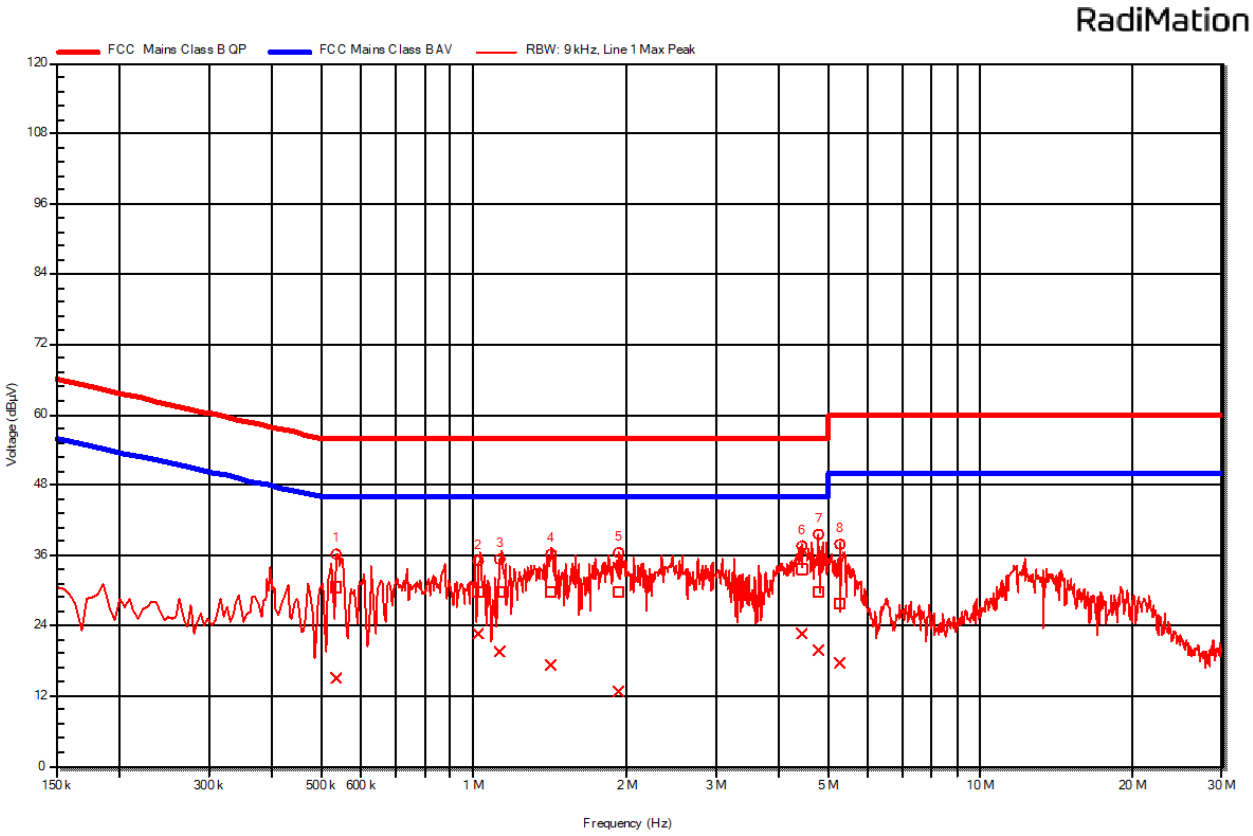


Figure 38: AC mains conducted emissions 2480MHz – Neutral

Frequency (MHz)	Average (dBµV)	Average Limit (dBµV)	Average Difference (dB)	Average Status	Quasi-Peak (dBµV)	Quasi-Peak Limit (dBµV)	Quasi-Peak Difference (dB)	Quasi-Peak Status
0.534	15.2	46.0	-30.8	Pass	30.6	56.0	-25.4	Pass
1.022	22.8	46.0	-23.2	Pass	29.6	56.0	-26.4	Pass
1.128	19.5	46.0	-26.5	Pass	29.8	56.0	-26.2	Pass
1.423	17.3	46.0	-28.7	Pass	29.8	56.0	-26.2	Pass
1.930	12.8	46.0	-33.2	Pass	29.6	56.0	-26.4	Pass
4.430	22.6	46.0	-23.4	Pass	33.7	56.0	-22.3	Pass
4.790	20.0	46.0	-26.0	Pass	29.8	56.0	-26.2	Pass
5.280	17.6	50.0	-32.4	Pass	27.7	60.0	-32.3	Pass

Table 16: Electric Field Emissions Peaks, 150kHz to 30MHz – Neutral - 2440MHz

10.5.1 Example calculation

This correction factors required consists of LISN Insertion loss (IL), Cable loss (CL) and Transient Limiter Loss (TL)

The Actual Signal Level (ASL) is calculated as follows:

ASL (dBµV) = Indicated Signal Level (dBµV) + IL (dB) + CL (dB) + TL (dB)

10.5.2 Sample Data

The Quasi-Peak level at 5.280MHz

ASL (dBµV) = 17.6dBµV = 7.1dBµV + 0.5db + 0.0dB + 10.0dB

Appendix A EUT Test Photos

Test set up photographs are supplied separately.

Appendix B Test Equipment List

Conducted Emissions from Antenna Port

Item	Serial No.	Last Calibration Date	Calibration Interval
RF Cable	Cable 20	3rd October 2024	12 Months
R & S ESW44 Spectrum Analyser	C0658	30th October 2023	18 Months

Radiated Emissions Equipment

Item	Serial No.	Last Calibration Date	Calibration Interval
Laboratory 1 Semi-Anechoic Chamber	C0471	6th December 2022	36 Months
ETS Lindgren 2017B Mast (1 – 4m) with tilting mechanism	--	N/A	N/A
R&S ESW44 EMI Receiver	C0751	5th August 2024	12 Months
Teseq CBL6112D Bilog Antenna	C0506	22nd August 2024	36 Months
HF27 Cable	19149.03.13.004	3rd October 2024	12 Months
HF41 Cable	21068.04.12.002	3rd October 2024	12 Months
HF32 Cable	19149.01.09.003	3rd October 2024	12 Months
HF35 Cable	19149.02.13.003	3rd October 2024	12 Months
HF47 Cable	E44808	3rd October 2024	12 Months
HF29 Cable	20147.01.09.001	3rd October 2024	12 Months
Schwarzbeck STLP 9148 Antenna 1-18GHz	C0626	26th March 2024	24 Months
BONN BLMA 0118-M Preamplifier	C0702	1st August 2024	12 Months
ETS Lindgren 3116C Active Horn Antenna	C0433	28th September 2022	36 Months
2.4GHz Microtronics notch filter	79178	25th October 2024	12 Months
Kikusui PCR2000M AC Power Supply	C0198	-	-

AC Mains Conducted Emissions Equipment

Item	Serial No.	Last Calibration Date	Calibration Interval
Rohde & Schwarz ESR7 Test receiver	C0449	13th February 2024	12 Months
Cables J7A, J9A	-	17th September 2024	12 Months
Cable LF3	-	7th October 2024	12 Months
Rohde & Schwarz ESH3-Z5 LISN	78119	8th January 2024	12 Months
Teseq CFL 9206A transient limiter 10dB 9kHz - 30MHz	C0282	5th January 2024	12 Months
Kikusui PCR2000M AC Power Supply	C0198	-	-

----------END OF REPORT----------