



Solutions

TEST REPORT

Test Report No.: UL-RPT-RP-14647518-1316-FCC

Applicant * : Eseye Design Limited
Model No. * : Hera604v6
FCC ID * : 2AASBHERAQ4029
Technology * : WLAN 2.4 GHz (802.11 b, g, n)
Test Standard(s) : **FCC Parts 15.207, 15.209(a) & 15.247**
For details of applied tests refer to test result summary

1. This test report shall not be reproduced in full or partial, without the written approval of UL International Germany GmbH.
2. The results in this report apply only to the sample tested.
3. The test results in this report are traceable to the national or international standards.
4. Test Report Version 1.1 supersede Version 1.0 with immediate effect
Test Report UL-RPT-RP-14647518-1316-FCC Version 1.1 issue date 20 February 2026
Replaces
Test Report UL-RPT-RP-14647518-1316-FCC Version 1.0 issue date 22 May 2024
which is no longer valid.
5. Result of the tested sample: **Pass**
6. All information marked with a (*) were provided by customer / applicant or authorized representative

Prepared by: Rachid Acharkaoui
Title: Operation Manager
Date: 20 Feb 2026

Approved by Bernd Woerl
Title: Staff Laboratory Engineer
Date: 20 Feb 2026



Deutsche
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D-PL-19381-02-00

This laboratory is accredited by DAkkS.
The tests reported herein have been performed in
accordance with its' terms of accreditation.

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1. Customer Information *

1.1. Applicant Information

Company Name:	Eseye Design Limited
Company Address:	20 Nugent Road, Guildford, GU2 7AF
Contact Person:	Jon Darley
Contact E-Mail Address:	jdarley@eseye.com
Contact Phone No.:	+44 1483 802 503

1.2. Manufacturer Information

Company Name:	Eseye Design Limited
Company Address:	20 Nugent Road, Guildford, GU2 7AF
Contact Person:	Jon Darley
Contact E-Mail Address:	jdarley@eseye.com
Contact Phone No.:	+44 1483 802 503

2. Summary of Testing

2.1. General Information

Applied Standards

Specification Reference:	47CFR15.247
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications): Part 15 Subpart C (Intentional Radiators) - Section 15.247
Specification Reference:	47CFR15.207 and 47CFR15.209
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications): Part 15 Subpart C (Intentional Radiators) - Sections 15.207 and 15.209

Location

Location of Testing:	UL International Germany GmbH; Admiral-Rosendahl-Strasse 9 63263 Neu-Isenburg, GERMANY
Registration Number:	399704

Date Information

Order Date:	10 January 2023
EUT arrived:	20 November 2023
Test Dates:	21 February 2024 to 04 March 2024, 09 Feb 2026 (for V1.1 retesting)
EUT returned:	-/-

2.2. Summary of Test Results

DIGITAL TRANSMISSION SYSTEMS (DTS): 2400-2483.5 MHz					
FCC Part 15 Clause	Compliance Test Description	Test Result			
		C	N.C.	N.P.	N.A.
15.207	Transmitter AC Power Line Conducted Emissions	☒	☐	☐	☐
Part 15.247(a)(2)	Transmitter Minimum 6 dB Bandwidth	☒	☐	☐	☐
Part 15.35(c)	Transmitter Duty Cycle ^(Note 1)	☒	☐	☐	☐
Part 15.247(e)	Transmitter Power Spectral Density	☒	☐	☐	☐
Part 15.247(b)(3)	Transmitter Maximum (Peak) Output Power	☒	☐	☐	☐
15.247(d) & 15.209(a)	Transmitter Radiated Emissions	☒	☐	☐	☐
15.247(d) & 15.209(a)	Transmitter Band Edge Radiated Emissions	☒	☐	☐	☐
C: COMPLIED N.C.: NOT COMPLIED N.P.: NOT PERFORMED N.A.: NOT APPLICABLE					
Decision rule: Where not otherwise specified or communicated in writing, statements of conformity (e.g. Pass/Fail) are established according to the following decision rule: considering the ILAC G8:2019 chapter 4.2.1 (simple acceptance rule). This leads to a maximum 50% of false accept or false reject when the measured value equals the tolerance limit. See ILAC-G8:09/2019 for further details.					

Note(s):

1. The measurement was performed to assist in the calculation of the level of emissions.

2.3. Methods and Procedures

Reference:	ANSI C63.10-2020 + Cor. 1-2023
Title:	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
Reference:	FCC KDB 558074 D01 DTS Meas. Guidance v05r02 April 2, 2019
Title:	Guidance for compliance measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid System Devices Operating Under Section 15.247 of the FCC rules
Reference:	FCC KDB 174176 D01 Line Conducted FAQ v01r02 August 7, 2025
Title:	AC Power-Line Conducted Emissions Frequently Asked Questions

2.4. Deviations from the Test Specification

For the measurements contained within this test report, there were no deviations from, additions to, or exclusions from the test specification identified above.

3. Equipment Under Test (EUT)

3.1. Identification of Equipment Under Test (EUT) *

Brand Name:	Eseye
Model Name or Number:	Hera604v6
Serial Number:	04425600823330100049
Hardware Version Number:	EPCB256003
Software Version Number:	0.9.2
FCC ID:	2AASBHERAQ4029

3.2. Description of EUT *

The equipment under test was a MIMO Cellular Router supporting WLAN 2.4 GHz operations in 2400-2483.5 MHz ISM band.

3.3. Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing.

3.4. Additional Information Related to Testing *

Category of Equipment:	WLAN 2.4 GHz (IEEE 802.11b, g, n)		
Type of Radio Device:	Transceiver		
Power Supply Requirement(s):	Nominal	120 VAC 50Hz	
Tested Data rate:	802.11b	1/2/5.5/11 Mbps	
	802.11g	6/9/12/18/24/36/48/54 Mbps	
	802.11n20	MCS1 to MCS7 (MIMO)	
	802.11n40	MCS1 to MCS7 (MIMO)	
Modulation Type:	DSSS, OFDM		
Nominal Channel Bandwidth:	20 MHz, 40 MHz		
Maximum RF Output Power:	20.432 dBm		
Declared Antenna Gain:	2400 MHz	2450 MHz	2500 MHz
	2.27 dBi	2.67 dBi	2.89 dBi
Antenna Type:	External Antenna		
Antenna Details:	AN2450-5505BRS		
Number of Antenna:	2		
Transmit Frequency Range:	2400 MHz to 2483.5 MHz		
Transmit Channels Tested: BW 20MHz	Channel ID	Channel Number	Frequency (MHz)
	Bottom	1	2412
	Middle	6	2437
	Top	11	2462
Transmit Channels Tested: BW 40MHz	Channel ID	Channel Number	Frequency (MHz)
	Bottom	3	2422
	Middle	6	2437
	Top	9	2452

3.5. Support Equipment

The following support equipment was used to exercise the EUT during testing:

A. Support Equipment (In-house)

Item	Description	Brand Name	Model Name or Number	Serial Number
1	-/-	-/-	-/-	-/-

B. Support Equipment (Manufacturer supplied) *

Item	Description	Brand Name	Model Name or Number	Serial Number
1	Laptop with Qualcomm Radio Control Tool QRCT Ver 4.0.00192.0	DELL	P97F	FNZ3BG3
2	AC/DC adapter	Power	FJ-SW1201250N	-/-

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

The EUT was tested in the following operating mode(s):

☒ Transmitter / Modulated Carrier Continuous Transmissions Mode WLAN 2.4 GHz:

- 802.11b | 20 MHz | No-HT | 1/2/5.5/11 Mbps | Bottom/Middle/Top Channel | Power 12
- 802.11g | 20 MHz | No-HT | 6/9/12/18/24/36/48/54 Mbps | Bottom/Middle/Top Channel | Power 12
- 802.11n | 20 MHz | HT20 | MCS1 to MCS7 | Bottom/Middle/Top Channel | Power 12
- 802.11n | 40 MHz | HT40 | MCS1 to MCS7 | Bottom/Middle/Top Channel | Power 11

According to the RF output power following data rates were determined to be the worst cases per mode and therefore, all further measurements were performed only with these worst-case modes.

- b-mode 2 Mbps | PWR 12 dBm
- g-mode 6 Mbps | PWR 12 dBm
- n-mode HT20 MCS4 | PWR 12 dBm
- n-mode HT40 MCS5 | PWR 11 dBm

4.2. Configuration and Peripherals

- The customer supplied document containing the setup instructions "Configuration Notes for Hera 600 v6 Regulatory testing.docx" was used for configuration.
- The product supports MIMO in IEEE 802.11n modes on antenna port 0 and port 1. Preliminary tests have shown that the output power on port 1 is higher and represents the worst case. Therefore, conducted measurements were performed on port 1 and a conservative factor of 3.01 dB has been added to n-mode HT20 & n-mode HT40.

EUT Power Supply:

- The EUT was powered with 120 V AC 60 Hz.
- For AC conducted line emissions measurement the EUT was powered via AC/DC power adapter. The measurements were carried out with 120 VAC /60 Hz & 240 VAC/60 Hz.

Test Mode Activation:

- The EUT can be connected with the Test laptop via USB cable and ethernet cable supplied by the customer.
- The test modes were activated by Qualcomm Radio Control Tool.

Radiated Measurements:

- Before starting final radiated spurious emission measurements "worst case verification" with the EUT in Standing-position & Laying-position was performed by Lab.
- The EUT in Standing-position was found to be the worst case, with vertical antennas orientation.
- The radiated measurements below 30 MHz were performed with the EUT positioned on the turn table and rotating 360 degrees while the loop antenna height was set to 80 cm.
- The radiated measurements above 30 MHz were performed with the EUT positioned on the turn table and rotating 360 degrees while the antenna height varies from 1 to 4 m over the measurement frequency range.

Configuration and Peripherals (continued)

- R&S® EMC32 V11.30.00 Software was used for the Radiated spurious emission measurements.
- The continuous transmission of the EUT ($D \geq 98\%$) cannot be achieved and EUT was transmitting with different duty cycles w.r.t to different modes. Duty Cycle Correction Factors (as mentioned below) were added to all average measurements respectively according to the modes used to compensate as if it was transmitting with 100% duty cycle.

5. Measurements, Examinations and Derived Results

5.1. General Comments

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%. Please refer to Section 6 *Measurement Uncertainty* for details.

In accordance with DAkkS requirements all the measurement equipment is on a calibration schedule. All equipment was within the calibration period on the date of testing.

5.2. Test Results

5.2.1. Transmitter AC Conducted Spurious Emissions

Test Summary:

Test Engineer:	Abbas Al-Hussainy	Test Date:	04 March 2024
Test Sample Serial Number:	0442560082333010049		
Test Site Identification	SR 7/8		

FCC Reference:	Part 15.207
Test Method Used:	ANSI C63.10 Section 6.2 / FCC KDB 174176 and notes below

Environmental Conditions:

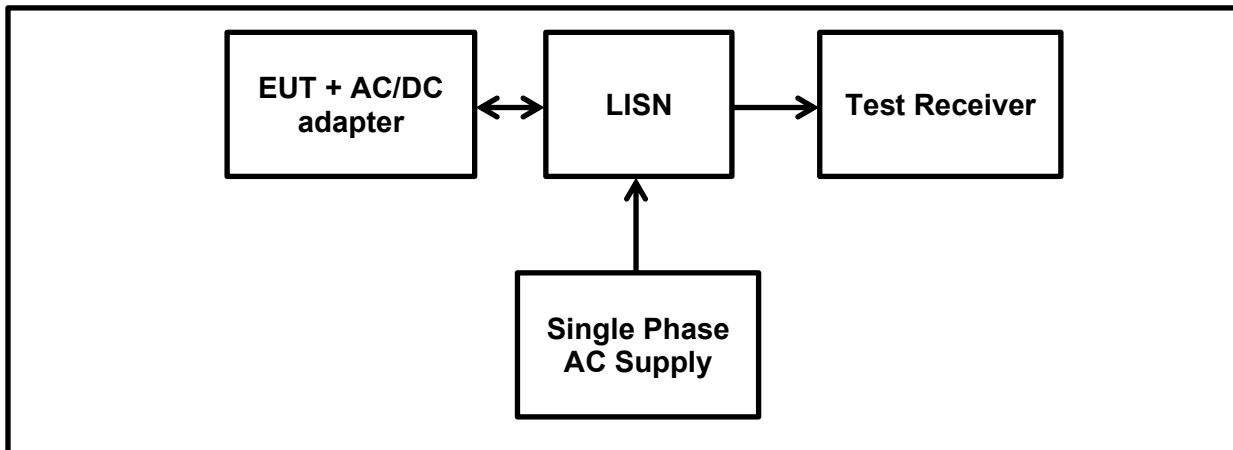
Temperature (°C):	22.4
Relative Humidity (%):	45.6

Settings of the Instrument

Detector	Quasi Peak/ Average
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Note(s):

1. The EUT was plugged into an AC/DC switching adaptor. The switching Adaptor was connected to 120 VAC / 60 Hz single phase supply via a LISN.
2. Preliminary measurements were performed at both 50 Hz and 60 Hz supply frequencies. There was no change to the observed emissions.
3. In accordance with FCC KDB 174176 Q4, tests were performed with a 240 VAC 60 Hz single phase supply as this was within the voltage range marked on the 100-240 VAC~50/60 Hz power supply.
4. The EUT was configured with the following worst-case mode w.r.t output power:
 - WLAN 2.4 GHz | n-Mode | 20 MHz | MCS4 | Bottom channel | PWR 12 dBm | MIMO
5. Pre-scans were performed, and markers placed on the highest live and neutral measured levels. Final measurements were performed on the marker frequencies and the results entered into the tables below.
6. The final measured value, for the given emission, in the table below incorporates the cable loss.
7. All other emissions shown on the pre-scan plot were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
8. Measurements were performed in shielded room (SR7/ 8 Asset Number 1603671). The EUT was placed at a height of 80 cm above the reference ground plane and in a distance of 40 cm from the vertical ground plane at the edge of the table.
9. Measurement software used: Toyo EMI Software; CE measurement software EP5/CE Ver 4.0.1.

Transmitter AC Conducted Spurious Emissions (continued)**Test Setup:**

Transmitter AC Conducted Spurious Emissions (continued)**Results: WLAN 2.4 GHz | n-Mode | 20 MHz | MCS4 | Bottom channel | PWR 12 dBm****Results: Live / Quasi Peak / 120 VAC 60 Hz**

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.15034	Live	46.4	66.0	19.6	Complied
0.44800	Live	33.0	56.9	23.9	Complied
1.03895	Live	22.9	56.0	33.1	Complied
1.50508	Live	21.4	56.0	34.6	Complied
3.64864	Live	20.7	56.0	35.3	Complied
14.21849	Live	29.3	60.0	30.7	Complied

Results: Live / Average / 120 VAC 60 Hz

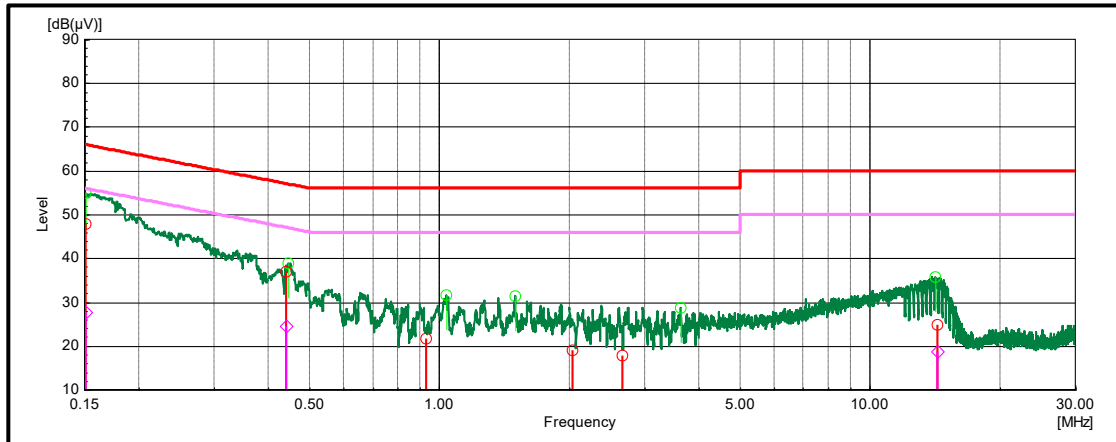
Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.15034	Live	27.3	56.0	28.7	Complied
0.44800	Live	22.5	46.9	24.4	Complied
1.03895	Live	11.1	46.0	34.9	Complied
1.50508	Live	10.4	46.0	35.6	Complied
3.64864	Live	10.5	46.0	35.5	Complied
14.21849	Live	20.5	50.0	29.5	Complied

Transmitter AC Conducted Spurious Emissions (continued)**Results: WLAN 2.4 GHz | n-Mode | 20 MHz | MCS4 | Bottom channel | PWR 12 dBm****Results: Neutral / Quasi Peak / 120 VAC 60 Hz**

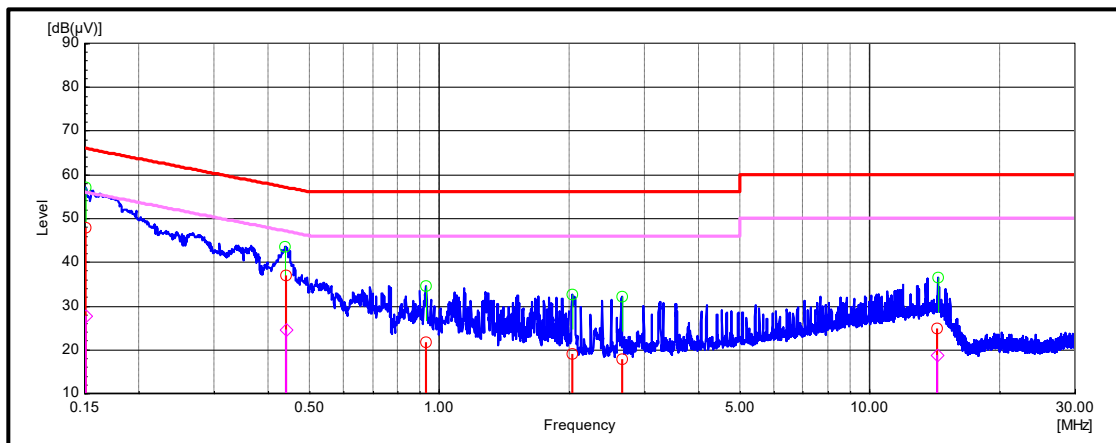
Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.15109	Neutral	47.9	65.9	18.0	Complied
0.44064	Neutral	36.9	57.0	20.1	Complied
0.93352	Neutral	21.6	56.0	34.4	Complied
2.03525	Neutral	19.1	56.0	36.9	Complied
2.65629	Neutral	17.8	56.0	38.2	Complied
14.38091	Neutral	24.7	60.0	35.3	Complied

Results: Neutral / Average / 120 VAC 60 Hz

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.15109	Neutral	27.7	55.9	28.2	Complied
0.44064	Neutral	24.5	47.0	22.5	Complied
0.93352	Neutral	8.0	46.0	38.0	Complied
2.03525	Neutral	8.0	46.0	38.0	Complied
2.65629	Neutral	7.5	46.0	38.5	Complied
14.38091	Neutral	18.8	50.0	31.2	Complied

Transmitter AC Conducted Spurious Emissions (continued)**Results: WLAN 2.4 GHz | n-Mode | 20 MHz | MCS4 | Bottom channel | PWR 12 dBm****Plot: Live Line / 120 VAC 60 Hz**

Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Plot: Neutral Line / 120 VAC 60 Hz

Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Result: Pass

Transmitter AC Conducted Spurious Emissions (continued)**Results: WLAN 2.4 GHz | n-Mode | 20 MHz | MCS4 | Bottom channel | PWR 12 dBm****Results: Live / Quasi Peak / 240 VAC 60 Hz**

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.16921	Live	47.2	65.0	17.8	Complied
0.18253	Live	45.6	64.4	18.8	Complied
0.21404	Live	43.3	63.0	19.7	Complied
0.22442	Live	45.2	62.7	17.5	Complied
0.25713	Live	40.5	61.5	21.0	Complied
0.27955	Live	36.8	60.8	24.0	Complied
0.29719	Live	38.8	60.3	21.5	Complied
0.35402	Live	32.1	58.9	26.8	Complied
0.44220	Live	35.8	57.0	21.2	Complied
0.87462	Live	30.8	56.0	25.2	Complied
0.91919	Live	29.7	56.0	26.3	Complied
1.26691	Live	29.8	56.0	26.2	Complied
1.61012	Live	29.1	56.0	26.9	Complied
2.05321	Live	28.5	56.0	27.5	Complied

Results: Live / Average / 240 VAC 60 Hz

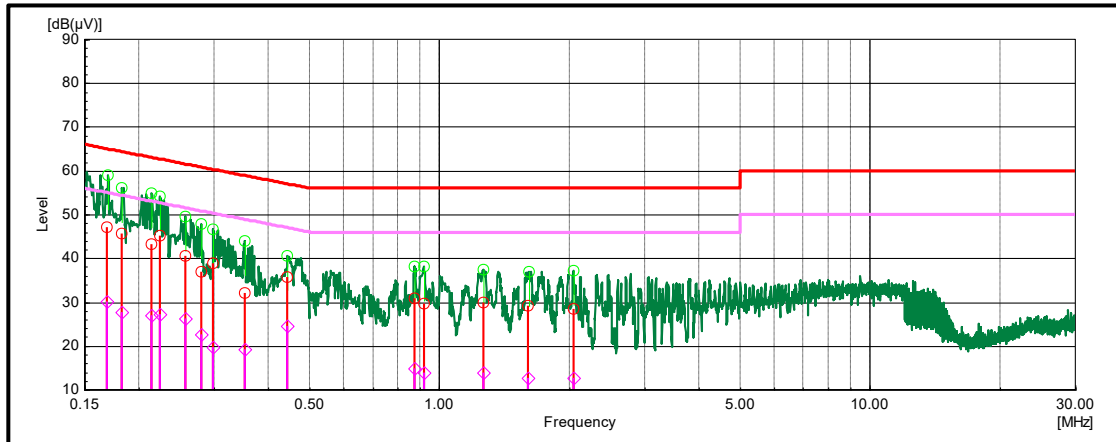
Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.16921	Live	30.1	55.0	24.9	Complied
0.18253	Live	27.6	54.4	26.8	Complied
0.21404	Live	27.0	53.0	26.0	Complied
0.22442	Live	27.3	52.7	25.4	Complied
0.25713	Live	26.3	51.5	25.2	Complied
0.27955	Live	22.6	50.8	28.2	Complied
0.29719	Live	19.6	50.3	30.7	Complied
0.35402	Live	19.3	48.9	29.6	Complied
0.44220	Live	24.5	47.0	22.5	Complied
0.87462	Live	14.9	46.0	31.1	Complied
0.91919	Live	13.9	46.0	32.1	Complied
1.26691	Live	13.9	46.0	32.1	Complied
1.61012	Live	12.6	46.0	33.4	Complied
2.05321	Live	12.6	46.0	33.4	Complied

Transmitter AC Conducted Spurious Emissions (continued)**Results: WLAN 2.4 GHz | n-Mode | 20 MHz | MCS4 | Bottom channel | PWR 12 dBm****Results: Neutral / Quasi Peak / 240 VAC 60 Hz**

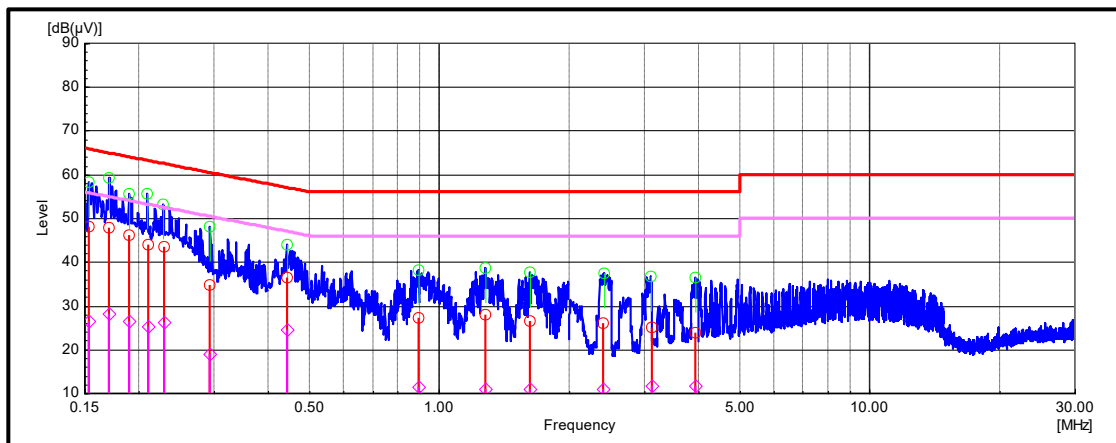
Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.15378	Neutral	48.1	65.8	17.7	Complied
0.17139	Neutral	47.9	64.9	17.0	Complied
0.19014	Neutral	46.0	64.0	18.0	Complied
0.21062	Neutral	44.0	63.2	19.2	Complied
0.22895	Neutral	43.6	62.5	18.9	Complied
0.29337	Neutral	34.7	60.4	25.7	Complied
0.44297	Neutral	36.3	57.0	20.7	Complied
0.89482	Neutral	27.3	56.0	28.7	Complied
1.27884	Neutral	27.8	56.0	28.2	Complied
1.62184	Neutral	26.6	56.0	29.4	Complied
2.40735	Neutral	26.1	56.0	29.9	Complied
3.11345	Neutral	25.0	56.0	31.0	Complied
3.94014	Neutral	23.9	56.0	32.1	Complied

Results: Neutral / Average / 240 VAC 60 Hz

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.15378	Neutral	26.5	55.8	29.3	Complied
0.17139	Neutral	28.2	54.9	26.7	Complied
0.19014	Neutral	26.5	54.0	27.5	Complied
0.21062	Neutral	25.3	53.2	27.9	Complied
0.22895	Neutral	26.2	52.5	26.3	Complied
0.29337	Neutral	18.9	50.4	31.5	Complied
0.44297	Neutral	24.5	47.0	22.5	Complied
0.89482	Neutral	11.6	46.0	34.4	Complied
1.27884	Neutral	10.9	46.0	35.1	Complied
1.62184	Neutral	10.9	46.0	35.1	Complied
2.40735	Neutral	11.0	46.0	35.0	Complied
3.11345	Neutral	11.8	46.0	34.2	Complied
3.94014	Neutral	11.8	46.0	34.2	Complied

Transmitter AC Conducted Spurious Emissions (continued)**Results: WLAN 2.4 GHz | n-Mode | 20 MHz | MCS4 | Bottom channel | PWR 12 dBm****Plot: Live Line / 240VAC 60 Hz**

Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Plot: Neutral Line / 240 VAC 60 Hz

Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Result: Pass

5.2.2. Transmitter Minimum 6 dB Bandwidth**Test Summary:**

Test Engineer:	Omar El Moghrabi	Test Date:	09 February 2026
Test Sample Serial Number:	0442560082333010049		
Test Site Identification	N-I TS8997 Test has been done on Neu-Isenburg lab due to relocation of Stuttgart office under the DAKKS accreditation number: D-PL-19381-01-02		

FCC Reference:	Part 15.247(a)(2)
Test Method Used:	FCC KDB 558074 Section 8.2 referencing ANSI C63.10:2020 Section 11.8.1 Option 1

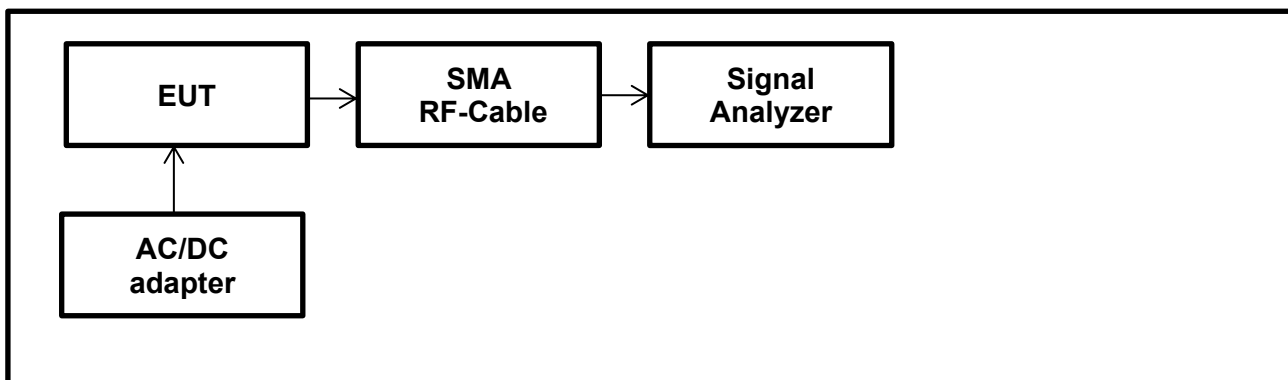
Environmental Conditions:

Temperature (°C):	22.6
Relative Humidity (%):	40.4

Notes:

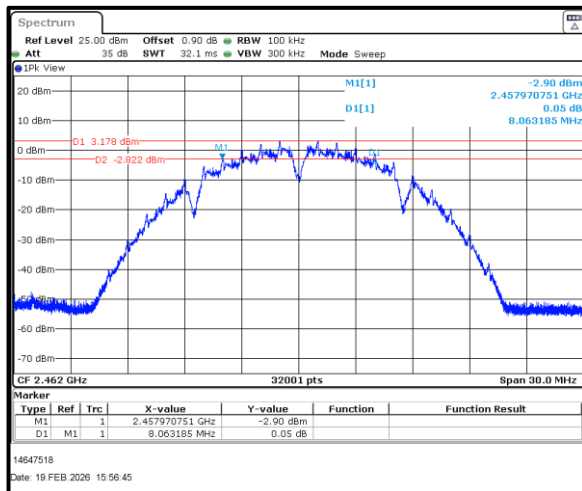
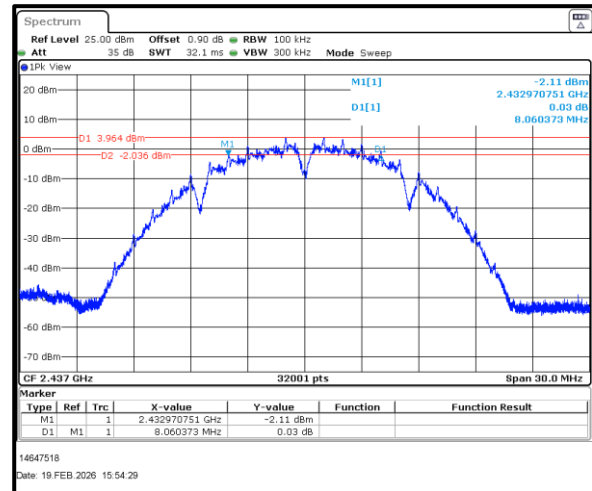
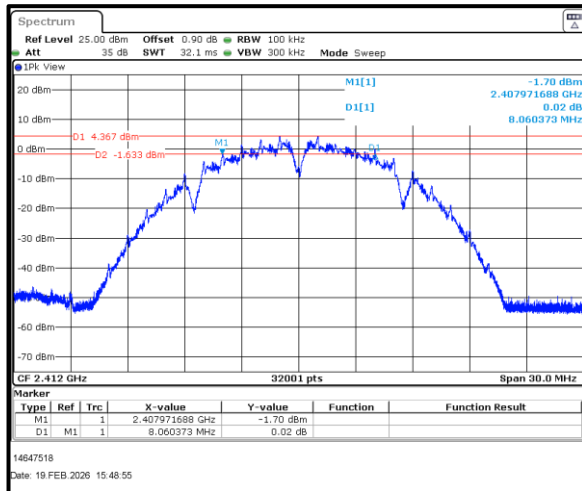
1. The measurements were performed using the below configurations on the bottom, middle and top channels in accordance FCC KDB 558074 Section 8.2 referencing ANSI C63.10 Section 11.8 (11.8.1 Option 1 measurement procedure).
2. The spectrum analyser resolution bandwidth was set to the range of 1% to 5% of the OBW but not less than 100 kHz and video bandwidth set to be VBW $\geq$ [3 × RBW]. A peak detector was used, sweep time was set to auto and the trace mode was Max Hold. The DTS bandwidth was measured at 6 dB down from the peak of the signal.
3. The measurement was performed at the worst-case data rates for each mode as follows.
 - b-mode 2 Mbps | PWR 12 dBm
 - g-mode 6 Mbps | PWR 12 dBm
 - n-mode HT20 MCS4 | PWR 12 dBm
 - n-mode HT40 MCS5 | PWR 11 dBm
4. The RF port on the EUT was connected to the spectrum analyser using suitable attenuation and RF cable. The measured values take into consideration the external attenuation correction factors.
 - The RF cable attenuation maximum 0.9 dB@2.4GHz from the EUT to Analyzer.
 - Measurement was performed on one antenna port. A factor of 3.01 dB was added to compensate 2 port measurement for n-mode HT20 and n-mode HT40.

Therefore, total the reference level offset of 3.91 dB was added to the n-mode HT20 and n-mode HT40 at the tested frequencies conducted plots, while 0.9 dB was added to b-mode and g-mode, respectively.

Test Setup:

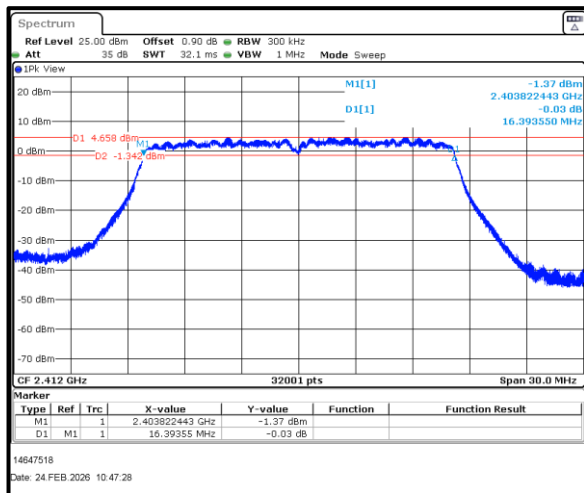
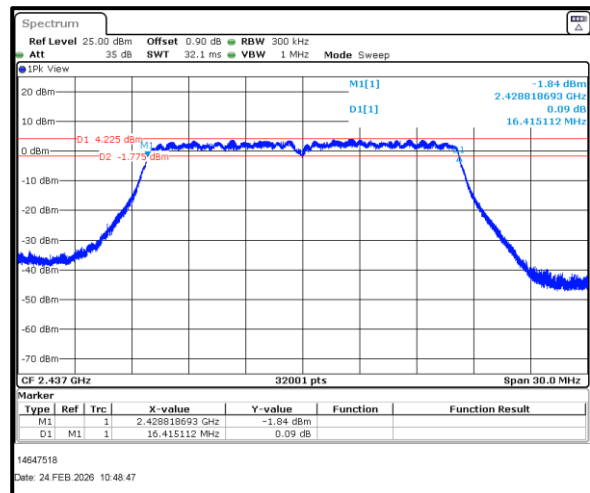
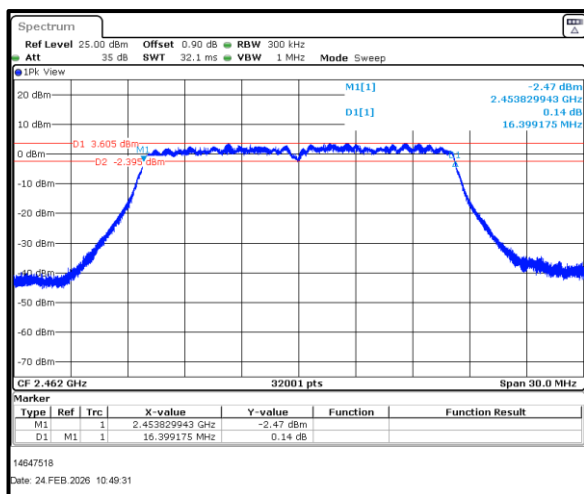
Transmitter Minimum 6 dB Bandwidth (continued)**Results: AC-DC Power Supply / 802.11b / 20 MHz / 2 Mbps / PWR 12**

Channel	6 dB Bandwidth (kHz)	Limit (kHz)	Margin (kHz)	Result
Bottom	8060.373	≥ 500	7560.373	Complied
Middle	8060.373	≥ 500	7560.373	Complied
Top	8063.185	≥ 500	7563.185	Complied

**Result: Pass**

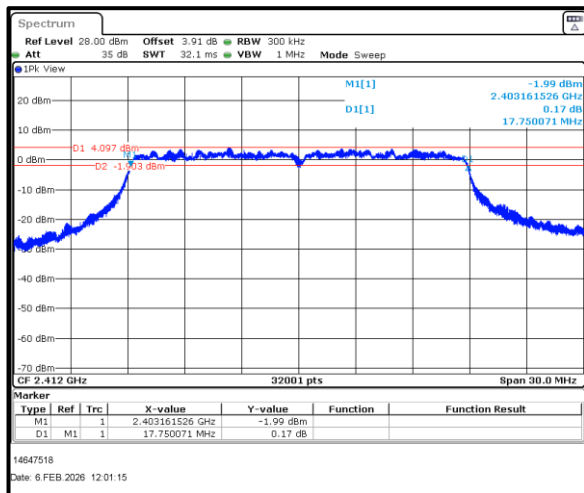
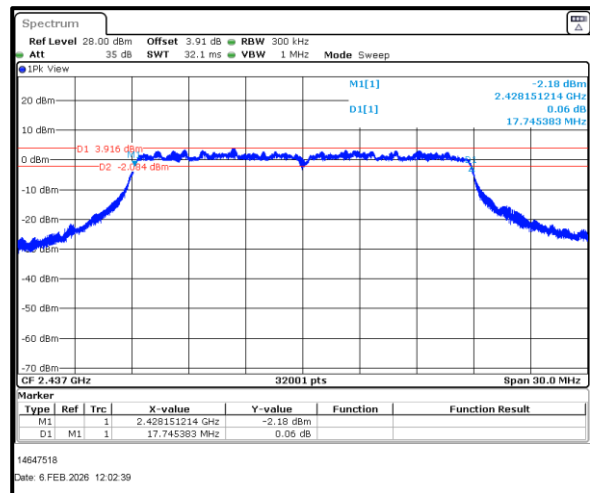
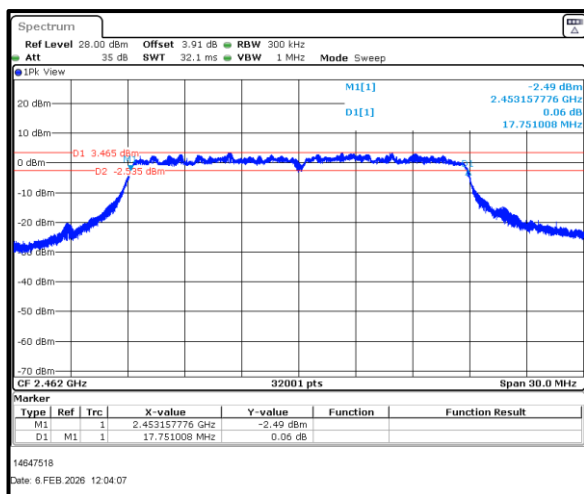
Transmitter Minimum 6 dB Bandwidth (continued)**Results: AC-DC Power Supply / 802.11g / 20 MHz / 6 Mbps / PWR 12**

Channel	6 dB Bandwidth (kHz)	Limit (kHz)	Margin (kHz)	Result
Bottom	16393.550	≥ 500	15893.550	Complied
Middle	16415.112	≥ 500	15915.112	Complied
Top	16399.175	≥ 500	15899.175	Complied

**Bottom Channel****Middle Channel****Top Channel****Result: Pass**

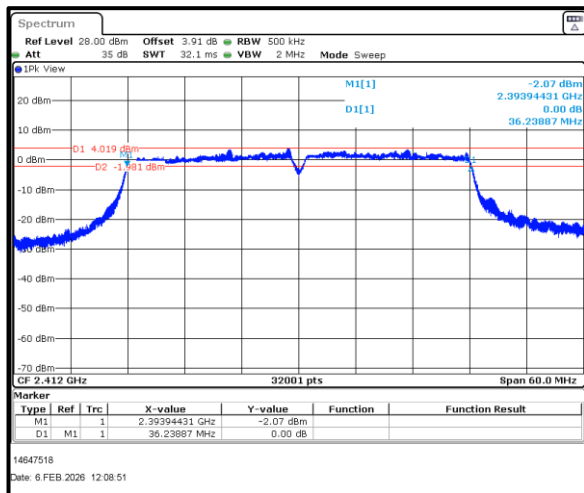
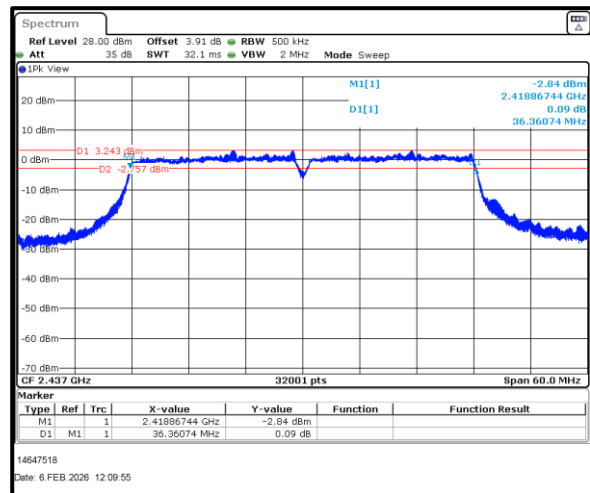
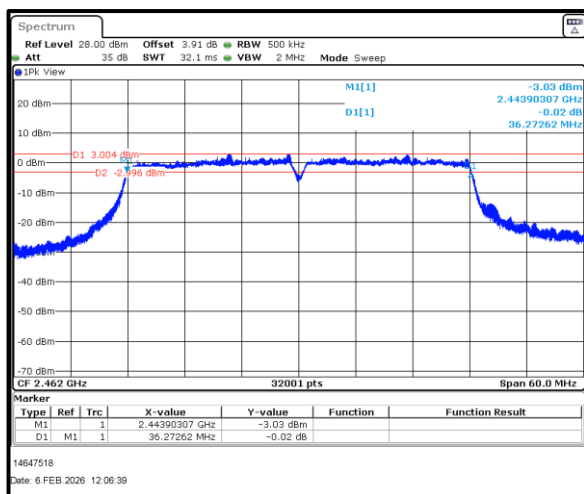
Transmitter Minimum 6 dB Bandwidth (continued)**Results: AC-DC Power Supply / 802.11n / 20 MHz / MCS4 / PWR 12**

Channel	6 dB Bandwidth (kHz)	Limit (kHz)	Margin (kHz)	Result
Bottom	17750.071	≥ 500	17250.071	Complied
Middle	17745.383	≥ 500	17245.383	Complied
Top	17751.008	≥ 500	17251.008	Complied

**Bottom Channel****Middle Channel****Top Channel****Result: Pass**

Transmitter Minimum 6 dB Bandwidth (continued)**Results: AC-DC Power Supply / 802.11n / 40 MHz / MCS5 / PWR 11**

Channel	6 dB Bandwidth (kHz)	Limit (kHz)	Margin (kHz)	Result
Bottom	36238.87	≥ 500	35738.870	Complied
Middle	36360.74	≥ 500	35860.740	Complied
Top	36272.62	≥ 500	35772.620	Complied

**Bottom Channel****Middle Channel****Top Channel****Result: Pass**

5.2.3. Transmitter Duty Cycle**Test Summary:**

Test Engineer:	Abbas Al-Hussainy	Test Date:	01 March 2024
Test Sample Serial Number:	0442560082333010049		
Test Site Identification	SR 9 / NI-TS8779		

FCC Reference:	Part 15.35(c)
Test Method Used:	FCC KDB 558074 Section 6 referencing ANSI C63.10 Section 11.6

Environmental Conditions:

Temperature (°C):	22.1
Relative Humidity (%):	41.9

Notes:

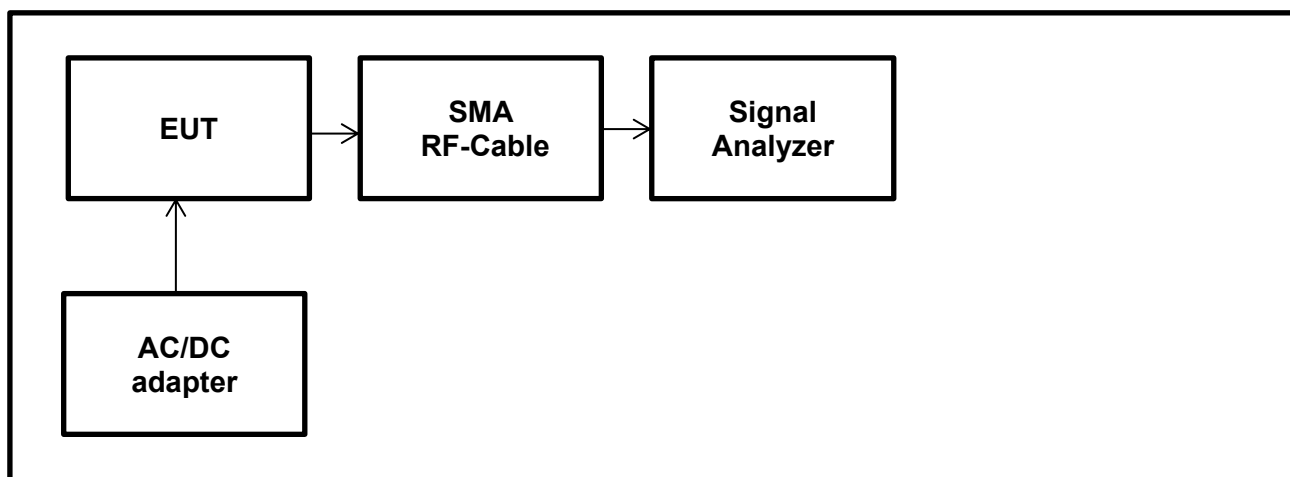
- The transmitter duty cycle was measured using a spectrum analyser in the time domain and calculated by using the following calculation:

$$\text{Duty Cycle (\%)} = 100 \times [\text{On Time (T}_{\text{ON}})] / [\text{Period(T}_{\text{ON}} + \text{T}_{\text{OFF}}) \text{ or } 100\text{ms whichever is the lesser}]$$

$$\text{Duty Cycle Correction Factor} = 10 \log 1 / [\text{On Time (T}_{\text{ON}})] / [\text{Period(T}_{\text{ON}} + \text{T}_{\text{OFF}}) \text{ or } 100\text{ms whichever is the lesser}]$$

- Duty Cycle Correction Factor for b-mode 2 Mbps: Duty cycle more than 98%
- Duty Cycle Correction Factor for g-mode 6 Mbps: 0.18 dB
- Duty Cycle Correction Factor for n-mode HT20 MCS4: 0.14 dB
- Duty Cycle Correction Factor for n-mode HT40 MCS5: 0.29 dB
- The RF port on the EUT was connected to the spectrum analyser using suitable attenuation and RF cable. The measured values takes into consideration the external attenuation correction factors.
- The RF cable attenuation maximum 0.9 dB@2.4GHz from the EUT to Analyzer.
- Measurements were performed on one antenna port. A factor of 3.01 dB was added to compensate 2 port measurement for n-mode HT20 and n-mode HT40.

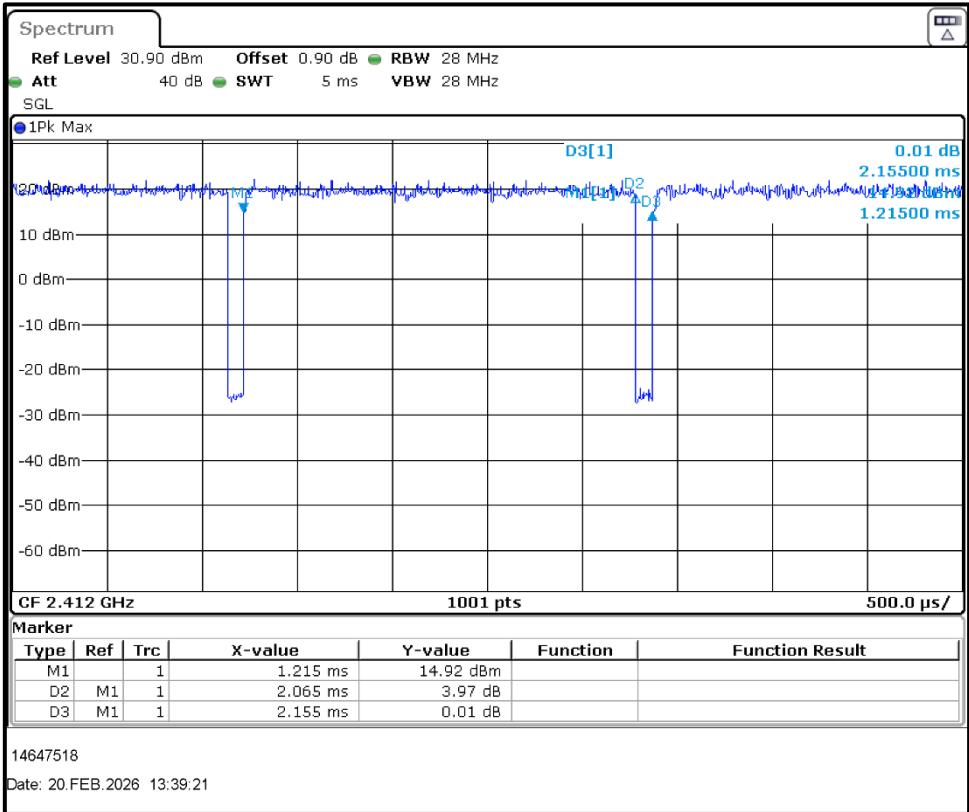
Therefore, total the reference level offset of 3.91 dB was added to the n-mode HT20 and n-mode HT40 at the tested frequencies conducted plots, while 0.9 dB was added to b-mode and g-mode, respectively.

Test Setup:

Transmitter Duty Cycle (continued)

Results: AC-DC Power Supply / 802.11g / 20 MHz / 6 Mbps / PWR 12

Pulse On Time (T _{ON}) (ms)	Pulse Period (T _{ON} +T _{OFF}) (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
2.065	2.155	95.82	0.18

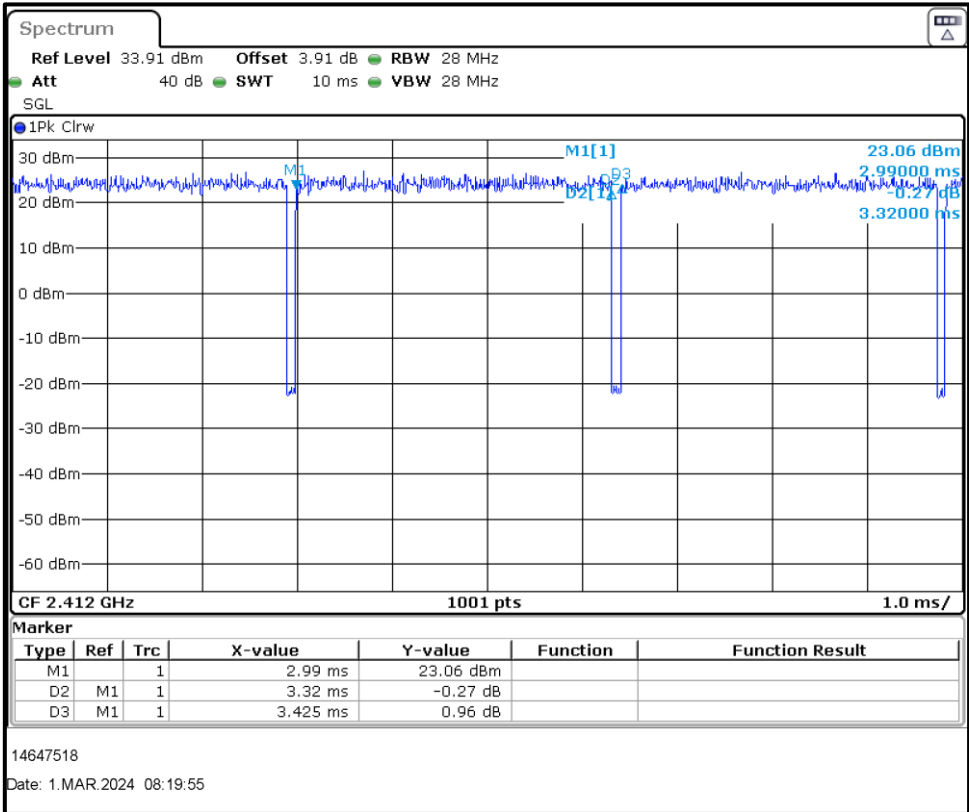


Result: Pass

Transmitter Duty Cycle (continued)

Results: AC-DC Power Supply / 802.11n / 20 MHz / MCS4 / PWR 12

Pulse On Time (T _{ON}) (ms)	Pulse Period (T _{ON} +T _{OFF}) (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
3.320	3.425	96.93	0.14

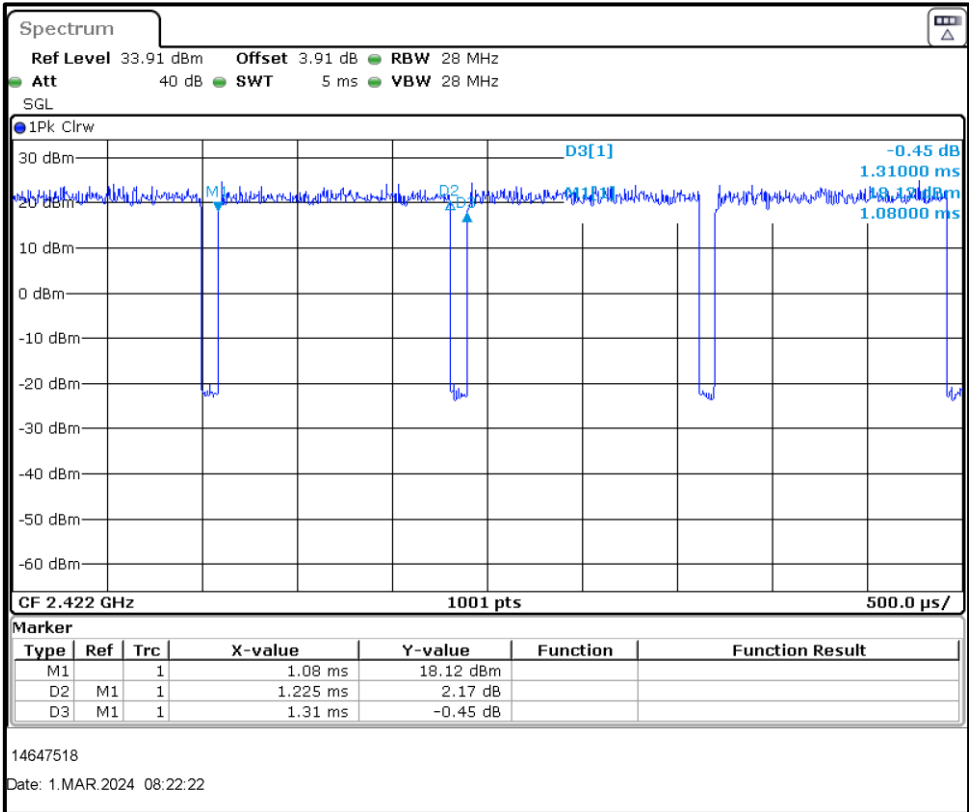


Result: Pass

Transmitter Duty Cycle (continued)

Results: AC-DC Power Supply / 802.11n / 40 MHz / MCS5 / PWR 11

Pulse On Time (T _{ON}) (ms)	Pulse Period (T _{ON} +T _{OFF}) (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
1.225	1.31	93.51	0.29



Result: Pass

5.2.4. Transmitter Power Spectral Density**Test Summary:**

Test Engineer:	Abbas Al-Hussainy	Test Date:	29 February 2024
Test Sample Serial Number:	0442560082333010049		
Test Site Identification	SR 9/ N-I TS8997		

FCC Reference:	Part 15.247(e)
Test Method Used:	FCC KDB 558074 Section 8.4 referencing ANSI C63.10 Sections 11.10.2

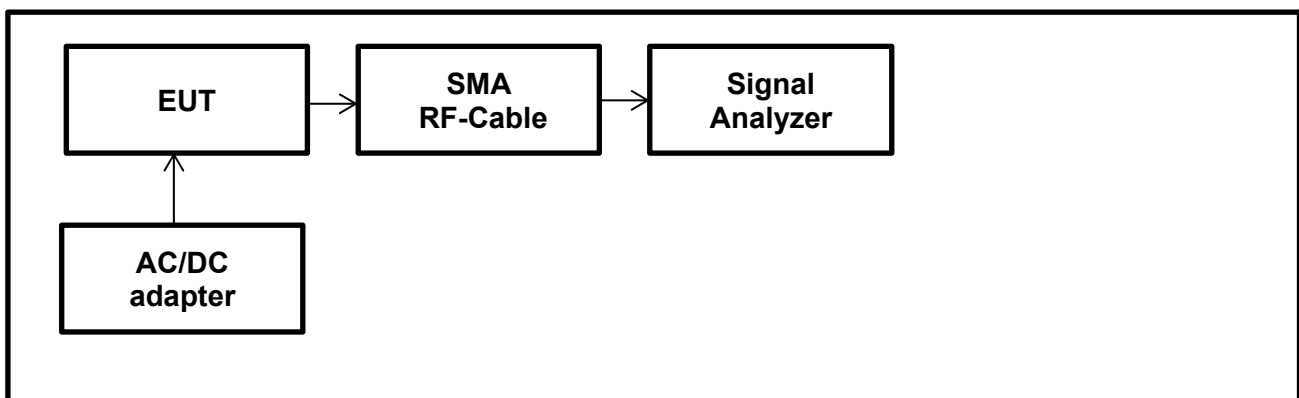
Environmental Conditions:

Temperature (°C):	22.6
Relative Humidity (%):	40.4

Notes:

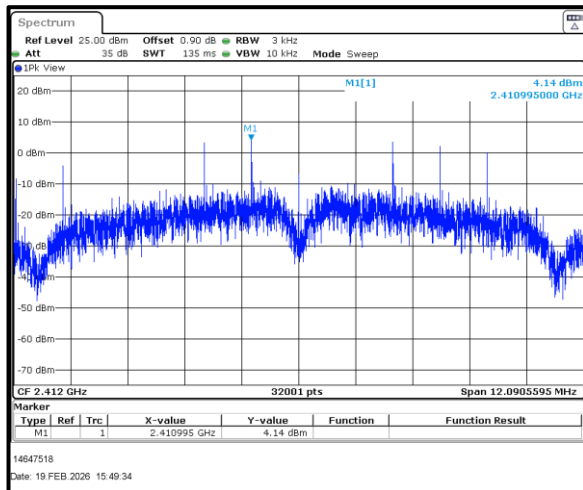
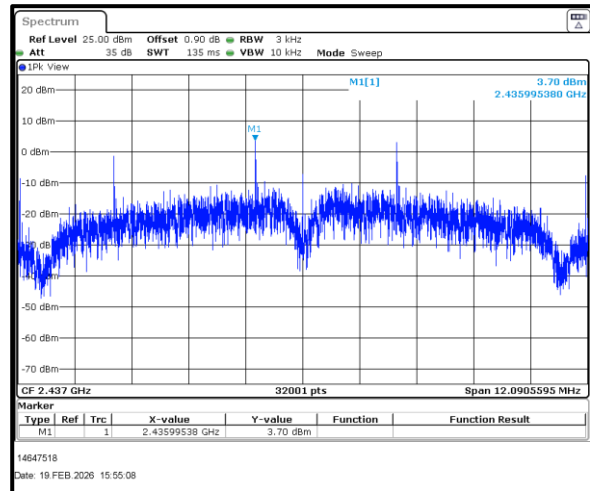
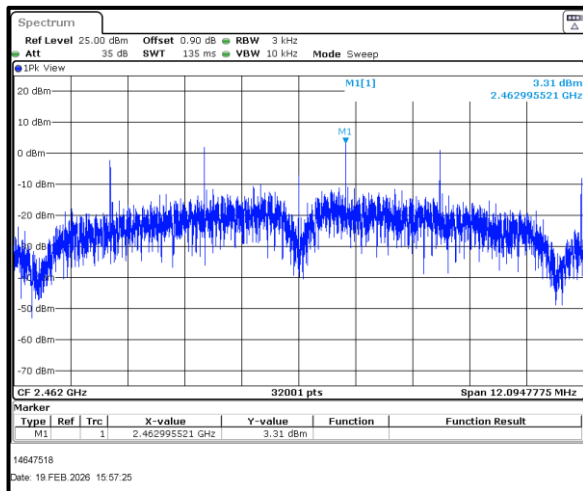
- Final measurements were performed using the below configurations on the bottom, middle and top channels.
- The EUT was transmitting at < 98% duty cycle and testing was performed in accordance with ANSI C63.10 Section 11.10.2 Method PKPSD.
- The signal analyser resolution bandwidth was set to 3 kHz and video bandwidth 10 kHz. A Peak detector was used and sweep time was set to Auto. The span was set to 1.5 times the DTS bandwidth. The highest peak of the measured signal was recorded.
- The measurement was performed only at the worst-case data rates for each mode as follows.
 - b-mode 2 Mbps | PWR 12 dBm
 - g-mode 6 Mbps | PWR 12 dBm
 - n-mode HT20 MCS4 | PWR 12 dBm
 - n-mode HT40 MCS5 | PWR 11 dBm
- The RF port on the EUT was connected to the spectrum analyser using suitable attenuation and RF cable. The measured values take into consideration the external attenuation correction factors.
 - The RF cable attenuation maximum 0.9 dB@2.4GHz from the EUT to Analyzer.
 - Measurements were performed on one antenna port. A factor of 3.01 dB was added to compensate 2 port measurement for n-mode HT20 and n-mode HT40.

Therefore, total the reference level offset of 3.91 dB was added to the n-mode HT20 and n-mode HT40 at the tested frequencies conducted plots, while 0.9 dB was added to b-mode and g-mode, respectively.

Test Setup:

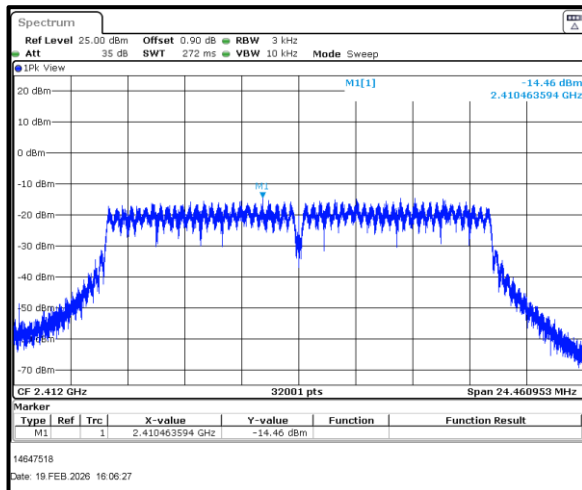
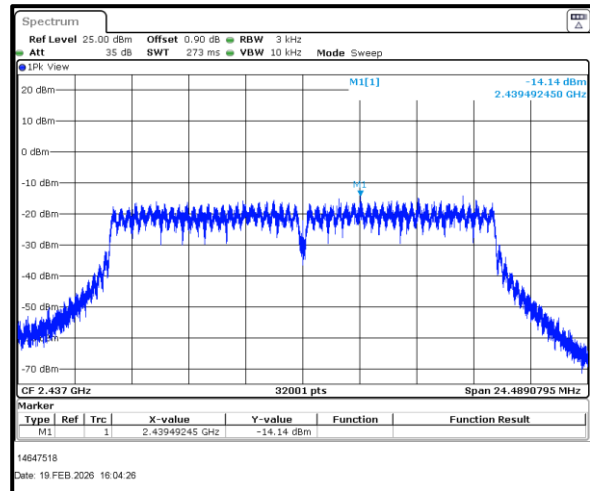
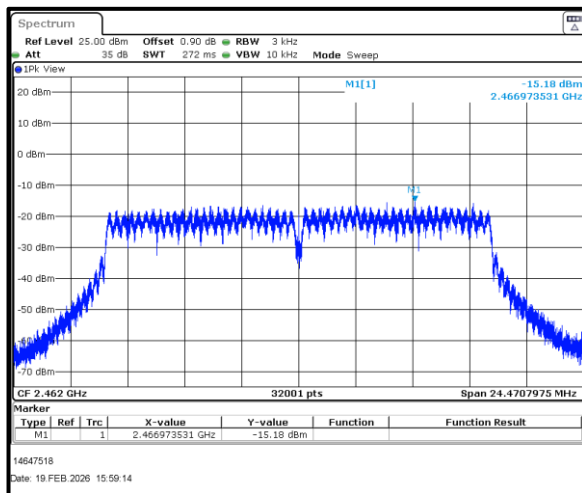
Transmitter Power Spectral Density (continued)**Results: AC-DC Power Supply / 802.11b / 20 MHz / 2 Mbps / PWR 12**

Channel	PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Margin (dB)	Result
Bottom	4.14	8.0	3.86	Complied
Middle	3.70	8.0	4.30	Complied
Top	3.31	8.0	4.69	Complied

**Bottom Channel****Middle Channel****Top Channel****Result: Pass**

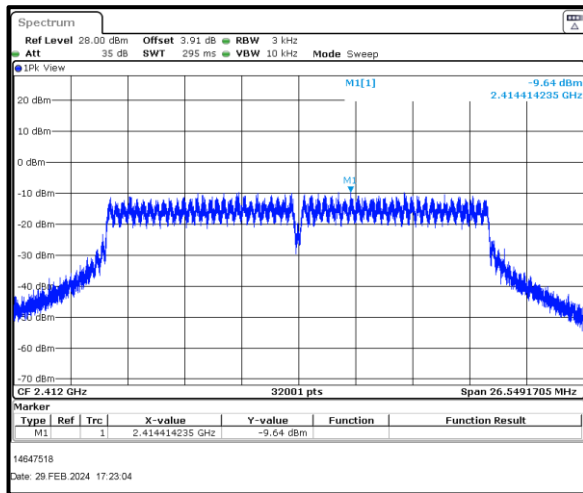
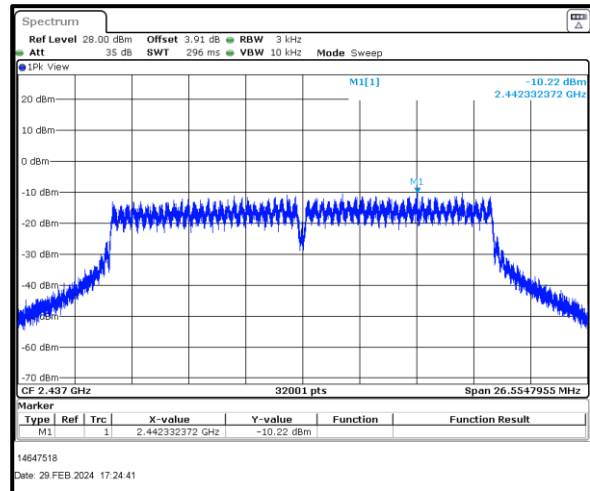
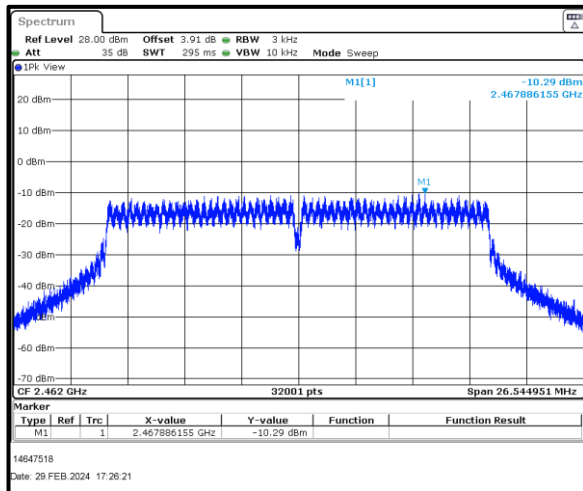
Transmitter Power Spectral Density (continued)**Results: AC-DC Power Supply / 802.11g / 20 MHz / 6 Mbps / PWR 12**

Channel	PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Margin (dB)	Result
Bottom	-14.46	8.0	22.46	Complied
Middle	-14.14	8.0	22.14	Complied
Top	-15.18	8.0	23.18	Complied

**Bottom Channel****Middle Channel****Top Channel****Result: Pass**

Transmitter Power Spectral Density (continued)**Results: AC-DC Power Supply / 802.11n / 20 MHz / MCS4 / PWR 12**

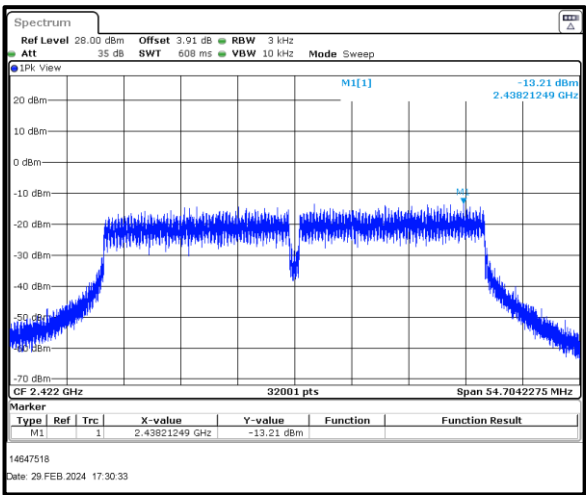
Channel	PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Margin (dB)	Result
Bottom	-9.64	8.0	17.64	Complied
Middle	-10.22	8.0	18.22	Complied
Top	-10.29	8.0	18.29	Complied

**Bottom Channel****Middle Channel****Top Channel****Result: Pass**

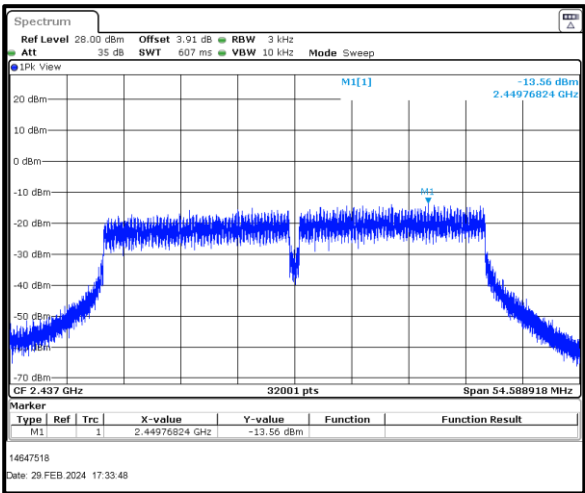
Transmitter Power Spectral Density (continued)

Results: AC-DC Power Supply / 802.11n / 40 MHz / MCS5 / PWR 11

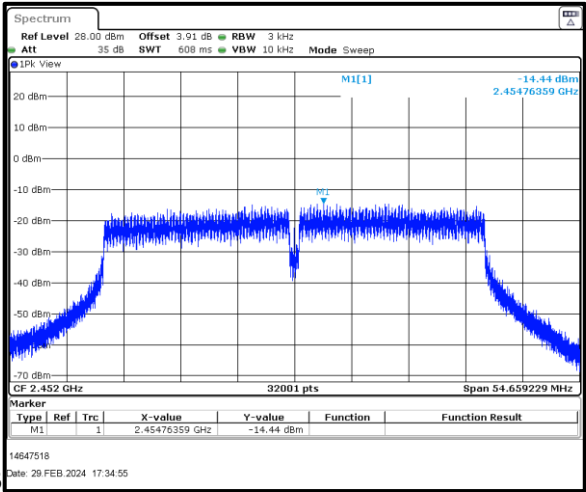
Channel	PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Margin (dB)	Result
Bottom	-13.21	8.0	21.21	Complied
Middle	-13.56	8.0	21.56	Complied
Top	-14.44	8.0	22.44	Complied



Bottom Channel



Middle Channel



Top Channel

Result: Pass

5.2.5. Transmitter Maximum (Peak) Output Power**Test Summary:**

Test Engineer:	Abbas Al-Hussainy	Test Date:	27 February 2024
Test Sample Serial Number:	0442560082333010049		
Test Site Identification	SR 9		

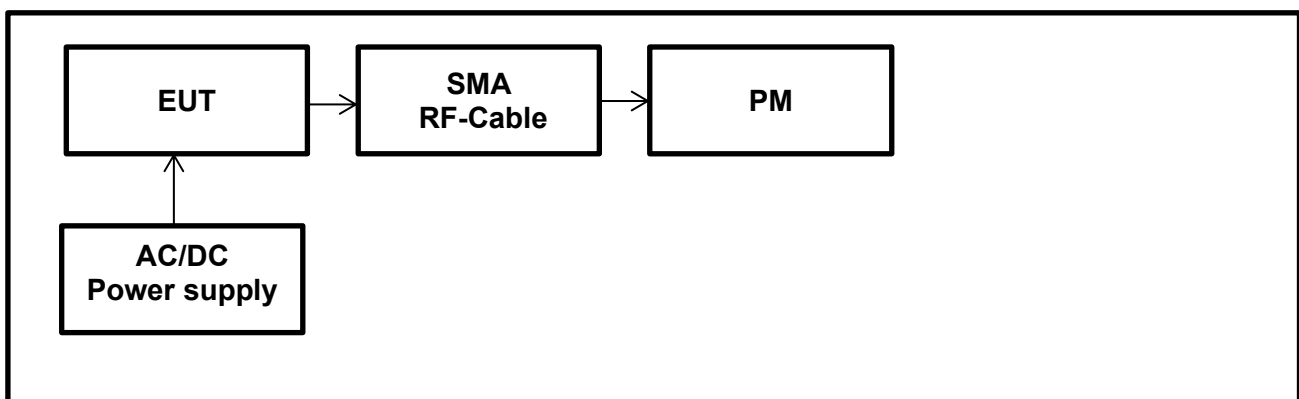
FCC Reference:	Part 15.247(b)(3)
Test Method Used:	FCC KDB 558074 Section 8.3.1.3 referencing ANSI C63.10 Sections 11.9.1.2

Environmental Conditions:

Temperature (°C):	22.6
Relative Humidity (%):	41.3

Notes:

- The EUT was transmitting at <98% duty cycle and testing was performed in accordance with ANSI C63.10 Section 11.9.1.2 Method PKPM1. The broadband peak RF power meter (VBW ≥ EUT's DTS Bandwidth) was used to measure the signal power.
- The RF port on the EUT was connected to the spectrum analyser using suitable connectors and RF cable and the readings as the output power including proper path loss.
- The product supports MIMO in IEEE 802.11n modes on antenna port 0 and port 1. Preliminary tests have shown that the output power on port 1 is higher and represents the worst case.
- Measurements were performed on one antenna port. A factor of 3.01 dB was added to compensate two ports measurement for n-mode HT20 and n-mode HT40.

Test Setup :

Transmitter Maximum (Peak) Output Power (continued)**Results: AC-DC Power Supply / 802.11b / 20 MHz / PWR 12**

Port 1			
Operational bands:	b-mode		
Channel no.:	1	6	11
b-mode			
2MBit	13.018	11.704	11.922
Operational bands:	b-mode		
FCC-Limits [dBm]	30.00		
FCC-Limits EIRP [dBm]	36.00		
Limit Check:	Limit Check:		
Highest conducted power value over channels and modulations:	13.02		
Declared antenna Gain max:	2.89		
EIRP	15.91		
Margin to Limit EIRP:	20.09		
Verdict:	Pass		

Transmitter Maximum (Peak) Output Power (continued)**Results: AC-DC Power Supply / 802.11g / 20 MHz / PWR 12**

Port 1			
Operational bands:	g-mode		
Channel no.:	1	6	11
g-mode			
6Mbit	16.405	15.173	15.171
Operational bands:	g-mode		
FCC-Limits [dBm]	30.00		
FCC-Limits EIRP [dBm]	36.00		
Limit Check:	Limit Check:		
Highest conducted power value over channels and modulations:	16.40		
Declared antenna Gain max:	2.89		
EIRP	19.29		
Margin to Limit EIRP:	16.71		
Verdict:	Pass		

Transmitter Maximum (Peak) Output Power (continued)**Results: AC-DC Power Supply / 802.11n / 20 MHz / PWR 12**

Port 1			
Operational bands:	n-mode (20 MHz)		
Channel no.:	1	6	11
n-mode			
MCS4	16.522	15.347	15.083
Operational bands:	n-mode		
FCC-Limits [dBm]	30.00		
FCC-Limits EIRP [dBm]	36.00		
Limit Check:	Limit Check:		
Correction factor	3.01		
Highest conducted power value over channels and modulations:	19.53		
Declared antenna Gain max:	2.89		
EIRP	22.42		
Margin to Limit EIRP:	13.58		
Verdict:	Pass		

Transmitter Maximum (Peak) Output Power (continued)**Results: AC-DC Power Supply / 802.11n / 40 MHz / PWR 11**

Port 1			
Operational bands:	n-mode (40 MHz)		
Channel no.:	3	6	9
n-mode			
MCS5	14.040	13.569	13.439
Operational bands:	n-mode		
FCC-Limits [dBm]	30.00		
FCC-Limits EIRP [dBm]	36.00		
Limit Check:	Limit Check:		
Correction factor	3.01		
Highest conducted power value over channels and modulations:	17.05		
Declared antenna Gain max:	2.89		
EIRP	19.94		
Margin to Limit EIRP:	16.06		
Verdict:	Pass		

5.2.6. Transmitter Radiated Emissions**Test Summary:**

Test Engineer:	Abbas Al-Hussainy	Test Date:	27 February 2024
Test Sample Serial Number:	0442560082333010049		
Test Site Identification	SR 1/2		

FCC Reference:	Parts 15.247(d) & 15.209(a)
Test Method Used:	FCC KDB 558074 Sections 8.5 & 8.6 referencing ANSI C63.10 Sections 11.11 and 11.12 ANSI C63.10:2020 Sections 6.3 and 6.4
Frequency Range	9 kHz to 30 MHz

Environmental Conditions:

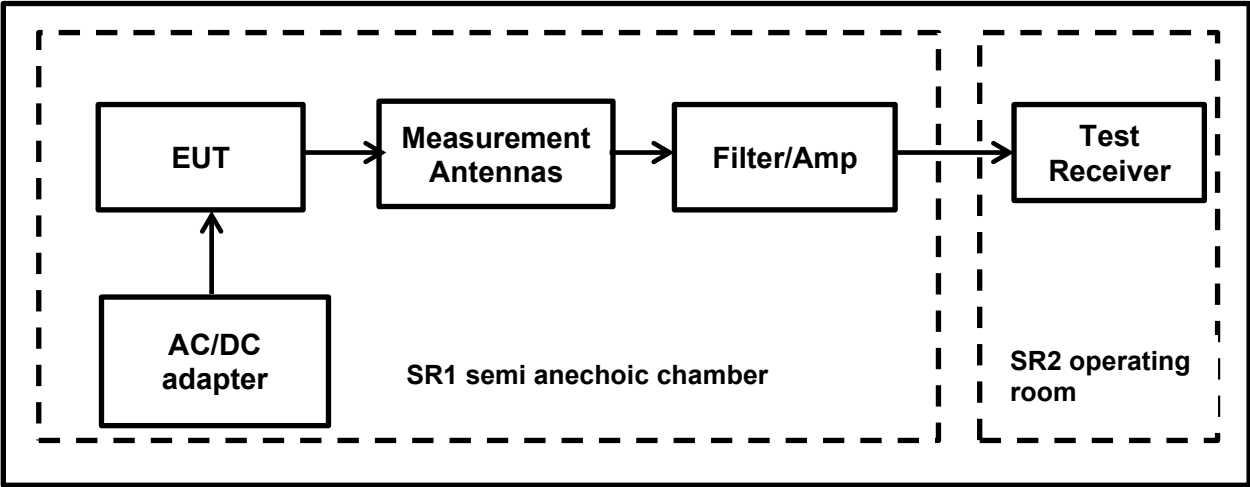
Temperature (°C):	23.4
Relative Humidity (%):	44.1

Notes:

- In accordance with FCC KDB 414788 D01 Radiated Test Site & ANSI C63.10 clause 5.2 an alternative test site that can demonstrate equivalence to an open area test site may be used. Therefore, the measurement was performed in a Semi Anechoic Chamber. (The OATS / SAC comparison data is available upon request).
- The limits are specified at a test distances of 30 and 300 metres. However, as specified in FCC Section 15.31 (f)(2) & ANSI C63.10 clause 6.4.3, measurements may be performed at a closer distance and the measured level extrapolated to the specified measurement distance using the method described in clauses 6.4.4, specifically sub-clause 6.4.4.1 which specifies that the measured level shall be extrapolated to the specified distance by conservatively presuming that the field strength decays at 40 dB/decade.
Therefore, measurements were performed at a measurement distance of 3 m.
- Therefore, the limit values are extrapolated to a measurement distance of 3 m.
 - 9 kHz- 490 kHz: limits extrapolated from 300 m to 3 m by adding 80 dB at 40 dB /decade.
 - 490 kHz-1705 kHz: limits extrapolated from 30 m to 3 m by adding 40 dB at 40 dB /decade.
- Measurements below 30 MHz were performed in a semi-anechoic chamber SR1/ 2 (Asset Number 1603665) at a distance of 3 m. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. The measurement loop antenna height was 100 cm.
- The radiated emissions measurements were performed with the EUT set to the following worst-case mode.
 - WLAN 2.4 GHz | n-Mode | 20 MHz | MCS4 | Bottom channel | PWR 12 dBm | MIMO
- The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.
- Pre-scans were performed, and markers placed on the highest measured levels. The test receiver was set to:
 - Frequency range: 9 kHz-150 kHz: RBW: 300 Hz / VBW: 1 kHz
 - Frequency range: 150 kHz – 30 MHz: RBW: 10 kHz /VBW: 30 kHz
 - Detector: Max-Peak detector
 - Trace Mode: Max Hold

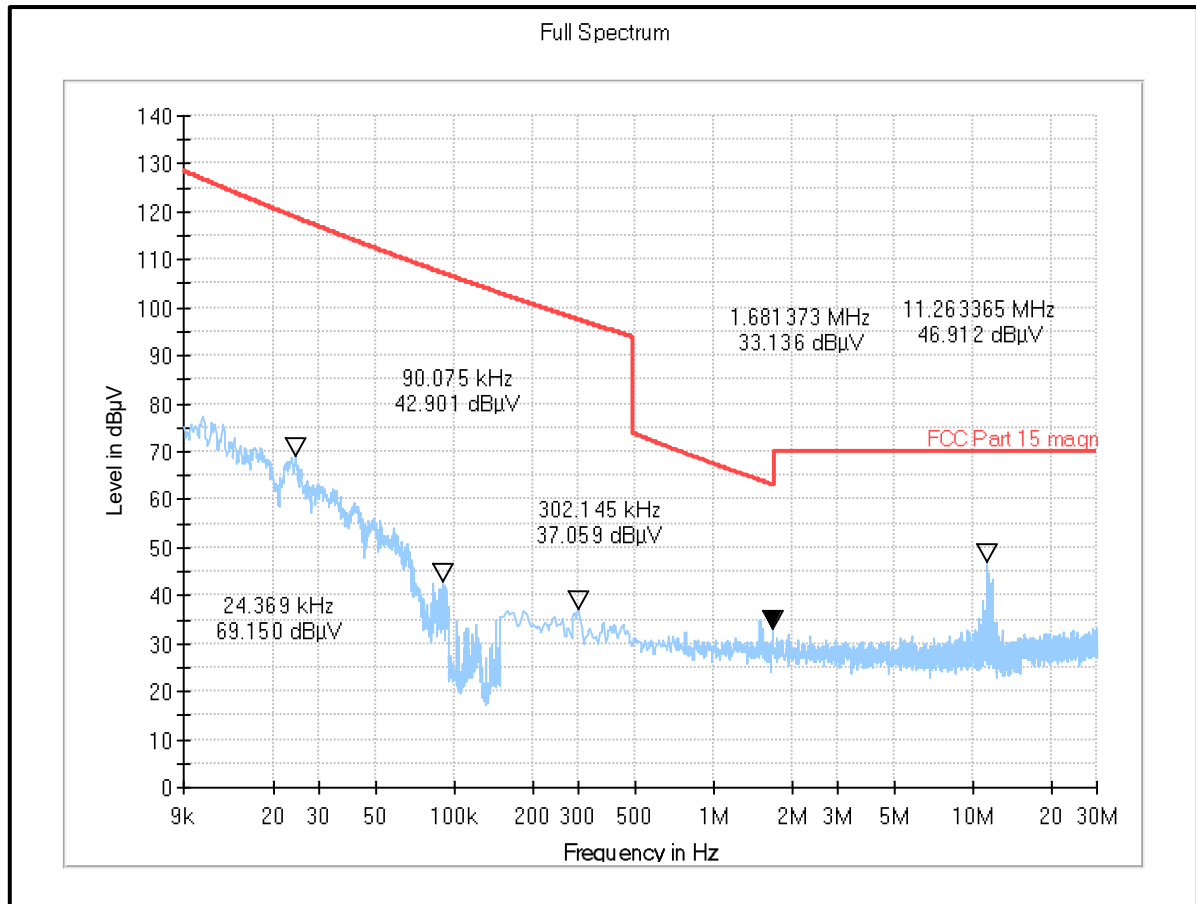
Transmitter Radiated Emissions (continued)

Test Setup:



Transmitter Radiated Emissions (continued)**Results: 802.11n / 20 MHz / MCS4 / Bottom Channel / PWR 12 dBm | MIMO**

Frequency (MHz)	Loop Antenna Orientation	Peak Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
All emissions below more than 20 dB from Margin					

Plot: 9 kHz – 30 MHz: Results: 802.11n / 20 MHz / MCS4 / Bottom Channel / PWR 12 dBm | MIMO**Result: Pass**

Transmitter Radiated Emissions (continued)**Test Summary:**

Test Engineer:	Abbas Al-Hussainy	Test Date:	27 February 2024
Test Sample Serial Number:	04425600823330100049		
Test Site Identification	SR 1/2		

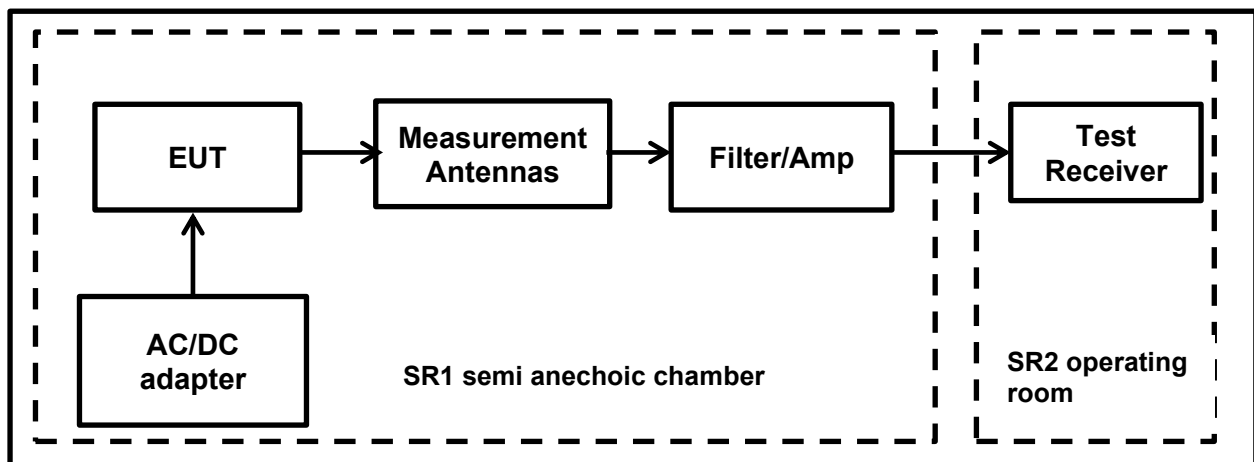
FCC Reference:	Parts 15.247(d) & 15.209(a)
Test Method Used:	FCC KDB 558074 Sections 8.5 & 8.6 referencing ANSI C63.10 Sections 11.11 and 11.12 ANSI C63.10:2020 Sections 6.3 and 6.5
Frequency Range:	30 MHz to 1000 MHz

Environmental Conditions:

Temperature (°C):	23.4
Relative Humidity (%):	44.1

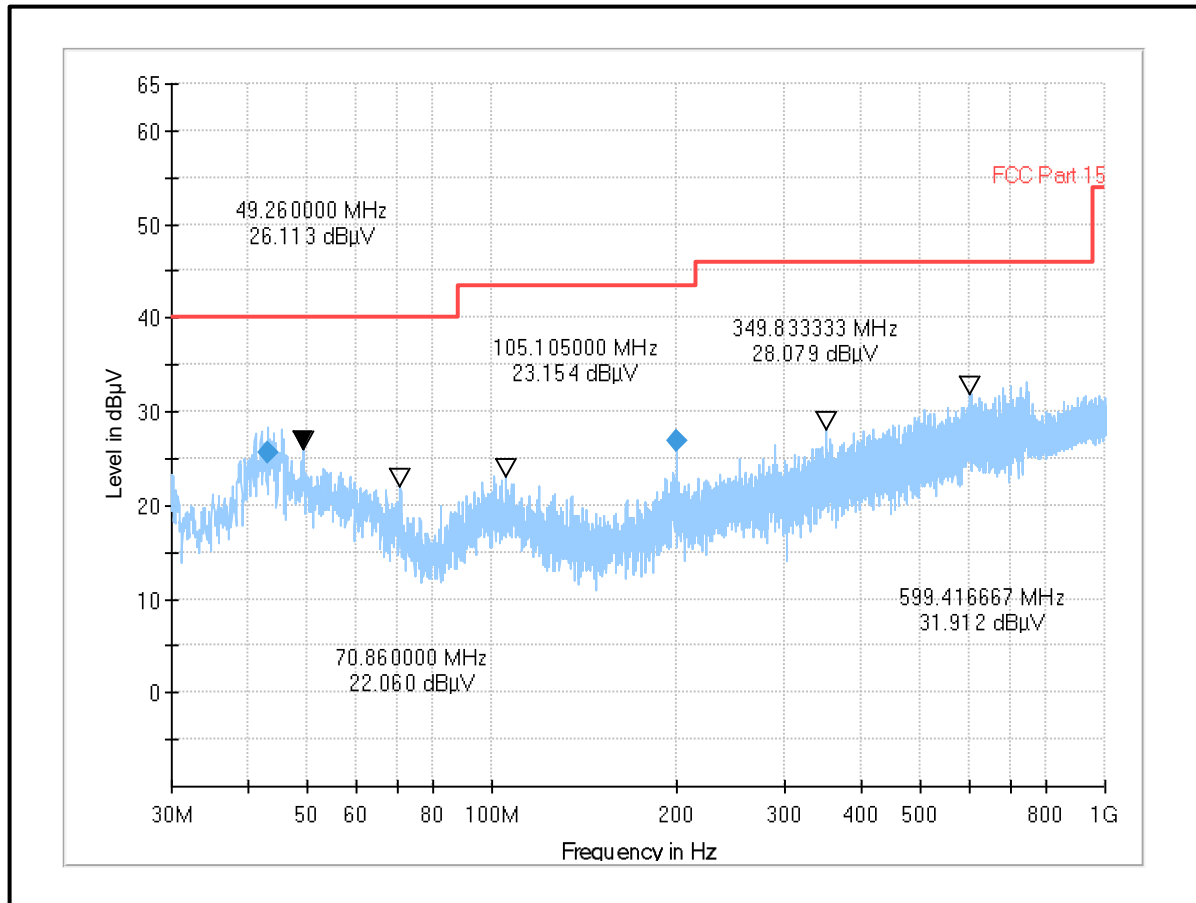
Note(s):

- Measurements below 1 GHz were performed in a semi-anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
- The radiated emissions measurements were performed with the EUT set to the following worst-case mode.
 - WLAN 2.4 GHz | n-Mode | 20 MHz | MCS4 | Bottom channel | PWR 12 dBm | MIMO
- Pre-scans were performed, and markers placed on the highest measured levels. The test receiver resolution bandwidth was set to 100 kHz and video bandwidth 300 kHz. A peak detector was used, sweep time was set to auto and trace mode was Max Hold.
- Final measurements were performed on the marker frequencies. The results entered in the table below incorporates the calibrated antenna factor and cable loss. The test receiver resolution bandwidth was set to 120 kHz, using a CISPR quasi-peak detector and span big enough to see the whole emission.
- The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.

Test Setup:

Transmitter Radiated Emissions (continued)**Results: 802.11n / 20 MHz / MCS4 / Bottom Channel / PWR 12 dBm | MIMO**

Frequency (MHz)	Antenna Polarization	MaxPeak Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
43.095000	Vertical	25.65	40.00	14.35	Complied
200.010000	Vertical	26.79	43.50	16.71	Complied

Plot: 30 MHz – 1GHz: 802.11n / 20 MHz / MCS4 / Bottom Channel / PWR 12 dBm | MIMO**Result: Pass**

Transmitter Radiated Emissions (continued)**Test Summary:**

Test Engineer:	Abbas Al-Hussainy	Test Date:	27 February 2024 to 28 February 2024
Test Sample Serial Number:	04425600823330100049		
Test Site Identification	SR 1/2		

FCC Reference:	Parts 15.247(d) & 15.209(a)
Test Method Used:	FCC KDB 558074 Sections 8.5 & 8.6 referencing ANSI C63.10 Sections 11.11 and 11.12 ANSI C63.10:2020 Sections 6.3 and 6.6
Frequency Range:	1 GHz to 26.5 GHz

Environmental Conditions:

Temperature (°C):	21.6 to 23.4
Relative Humidity (%):	44.1 to 47.6

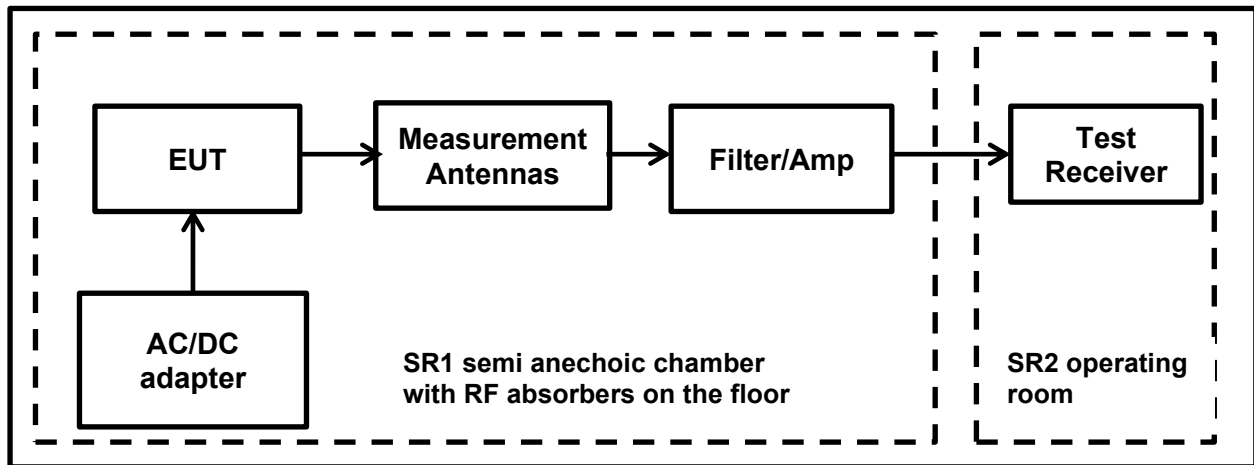
Notes:

- Pre-scans above 1 GHz were performed in a semi-anechoic chamber SR1/ 2 (Asset Number 1603665) with RF absorbers on the floor at a distance of 3 m. The EUT was placed at a height of 1.5 m above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 m above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber SR1/ 2 (Asset Number 1603665) with absorber on the floor at a distance of 3 m. The EUT was placed at a height of 1.5 m above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 m to 4 m.
- The radiated measurements were performed with the EUT set to the following worst-case mode w.r.t output power.
 - WLAN 2.4 GHz | n-Mode | 20 MHz | MCS4 | PWR 12 dBm | MIMO
- Measurements performed on bottom, Middle and top channels and only the worst-case emission plot is reported.
- Pre-scans were performed, and a marker placed on the highest measured level of the appropriate plot. The test receiver resolution bandwidth was set to 1 MHz and video bandwidth 3 MHz the sweep time was set to auto.
- The emissions shown at frequencies approximately 2.4 GHz to 2.4835 GHz on the 1 GHz to 18 GHz plots are the EUT fundamental for the tested channel.
- The Non-Restricted Band Emissions were performed in accordance with ANSI C63.10 Section 11.11 As the maximum peak conducted output power was previously measured, in accordance with ANSI C63.10 Section 11.11.1(a) measurements were performed with peak detector and -20 dBc limit applied.
- The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.
- For frequency range between 1 GHz and 18 GHz, the final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.

9. In accordance with ANSI C63.10-2013 Section 5.3.3 & 6.5.3 measurements above 18 GHz were performed at closer distance (1 m); because at specified measurement distance (3m) for compliance the instrumentation noise floor was typically close to the radiated emission limit.

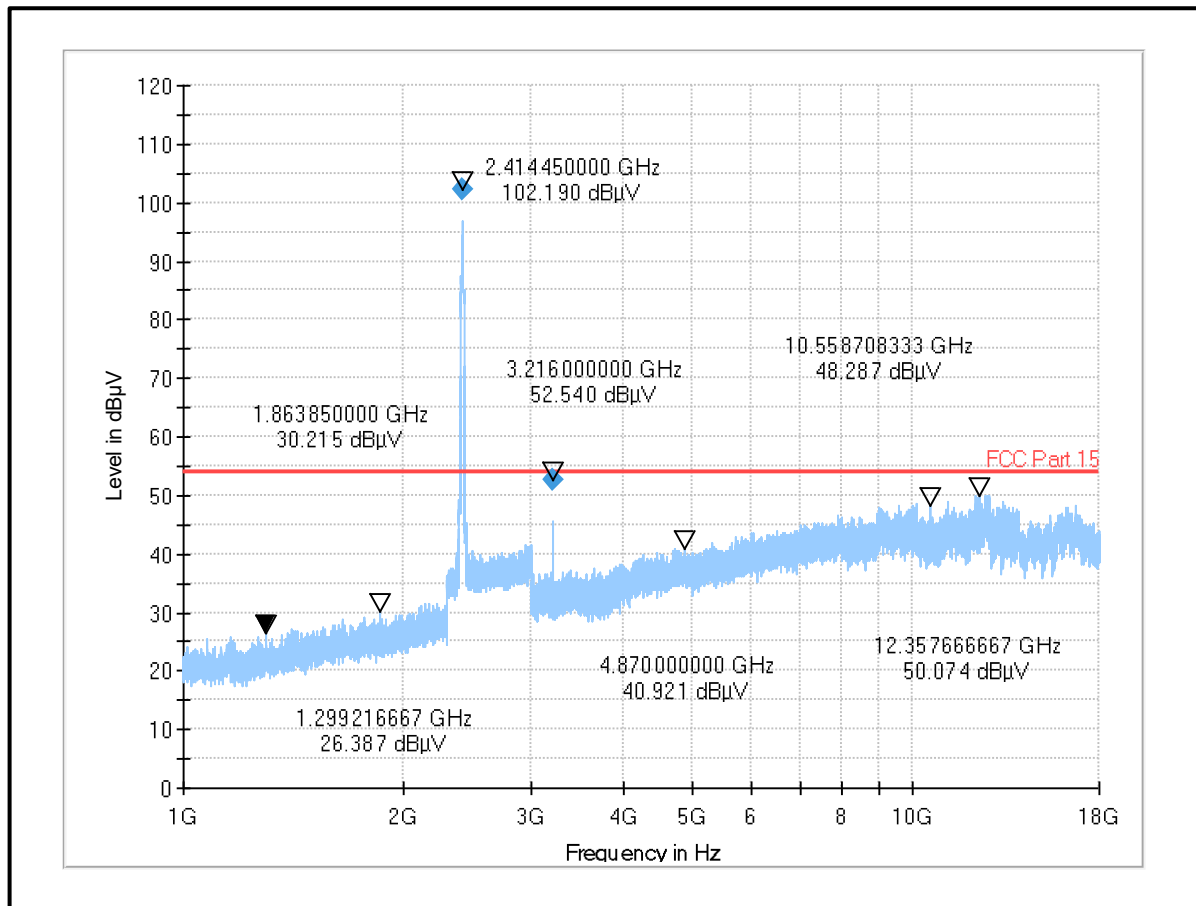
Transmitter Radiated Emissions (continued)

Test Setup:



Transmitter Radiated Emissions (continued)**Results: 802.11n / 20 MHz / MCS4 / Bottom Channel / PWR 12 dBm | MIMO****Non-Restricted band**

Frequency (MHz)	Antenna Polarization	Peak Level (dB μ V/m)	-20 dBc Limit (dB μ V/m)	Margin (dB)	Result
3216.000000	Vertical	52.54	80.14	27.6	Complied

Plot: 1 GHz – 18 GHz: 802.11n / 20 MHz / MCS4 / Bottom Channel / PWR 12 dBm | MIMO**Result: Pass**

Transmitter Radiated Emissions (continued)**Results: 802.11n / 20 MHz / MCS4 / Middle Channel / PWR 12 dBm | MIMO**

Frequency (MHz)	Antenna Polarization	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
No critical emissions were detected					

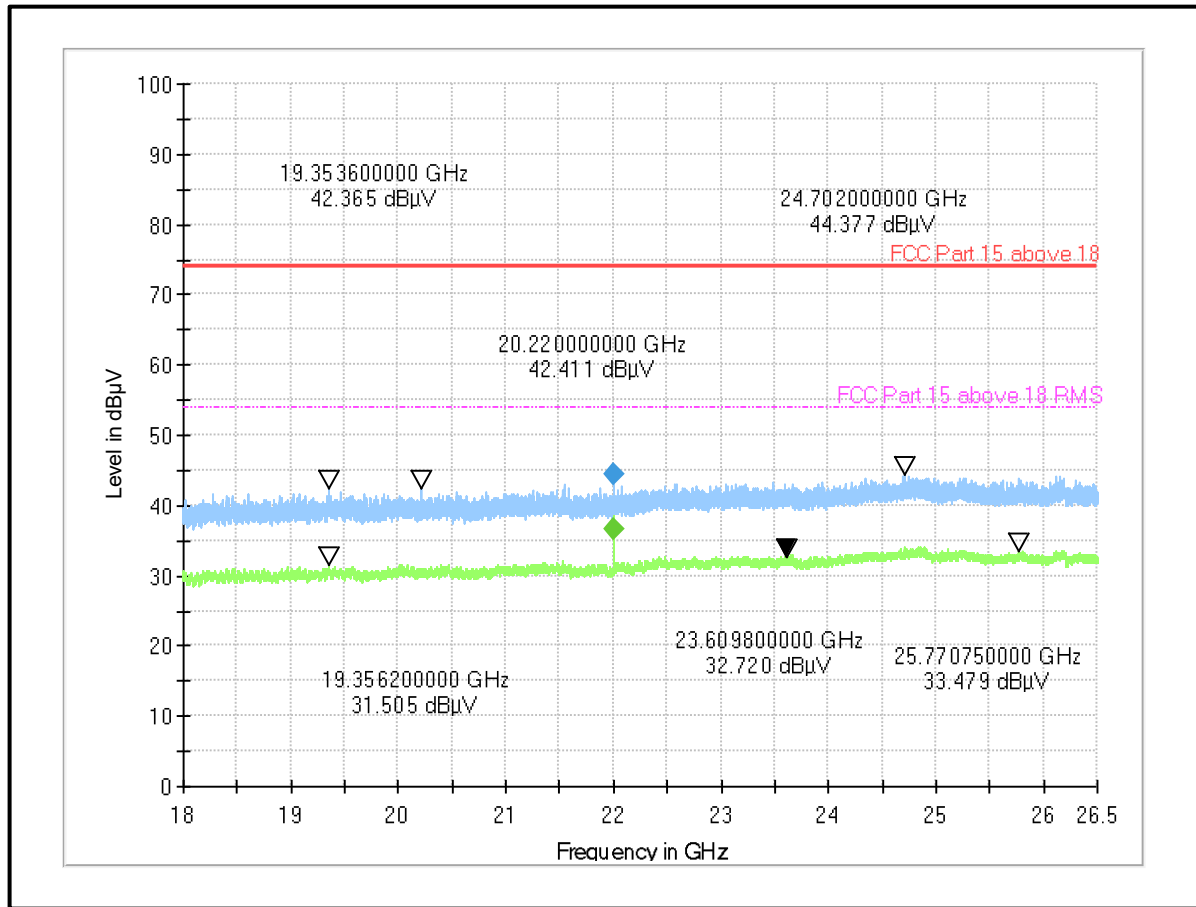
Result: Pass**Results: 802.11n / 20 MHz / MCS4 / Top Channel / PWR 12 dBm | MIMO**

Frequency (MHz)	Antenna Polarization	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
No critical emissions were detected					

Result: Pass**Results: 802.11n / 20 MHz / MCS4 / Bottom Channel / PWR 12 dBm | MIMO**

Frequency (MHz)	Antenna Polarization	Peak Level (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)	Result
22000.000000	Vertical	44.55	74.00	29.45	Complied

Frequency (MHz)	Antenna Polarization	Average Level (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)	Result
22000.000000	Vertical	36.61	54.00	17.39	Complied

Transmitter Radiated Emissions (continued)**Plot: 18 GHz – 26.5 GHz: 802.11n / 20 MHz / MCS4 / Bottom Channel / PWR 12 dBm | MIMO****Result: Pass****Results: 802.11n / 20 MHz / MCS4 / Middle Channel / PWR 12 dBm | MIMO**

Frequency (MHz)	Antenna Polarization	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
No critical emissions were detected					

Result: Pass**Results: 802.11n / 20 MHz / MCS4 / Top Channel / PWR 12 dBm | MIMO**

Frequency (MHz)	Antenna Polarization	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
No critical emissions were detected					

Result: Pass

5.2.7. Transmitter Band Edge Radiated Emissions**Test Summary:**

Test Engineer:	Abbas Al-Hussainy	Test Date:	21 February 2024 to 28 February 2024
Test Sample Serial Number:	0442560082333010049		
Test Site Identification	SR 1/2		

FCC Reference:	Parts 15.247(d), 15.209(a) & 15.205(a)
Test Method Used:	DTS emissions in non-restricted frequency bands: FCC KDB 558074 Section 8.5 referencing ANSI C63.10:2020 Sections 11.11
	DTS emissions in restricted frequency bands: FCC KDB 558074 Section 8.6 referencing ANSI C63.10:2020 Sections 11.12
	ANSI C63.10:2020 Sections 6.10.4, 6.10.5

Environmental Conditions:

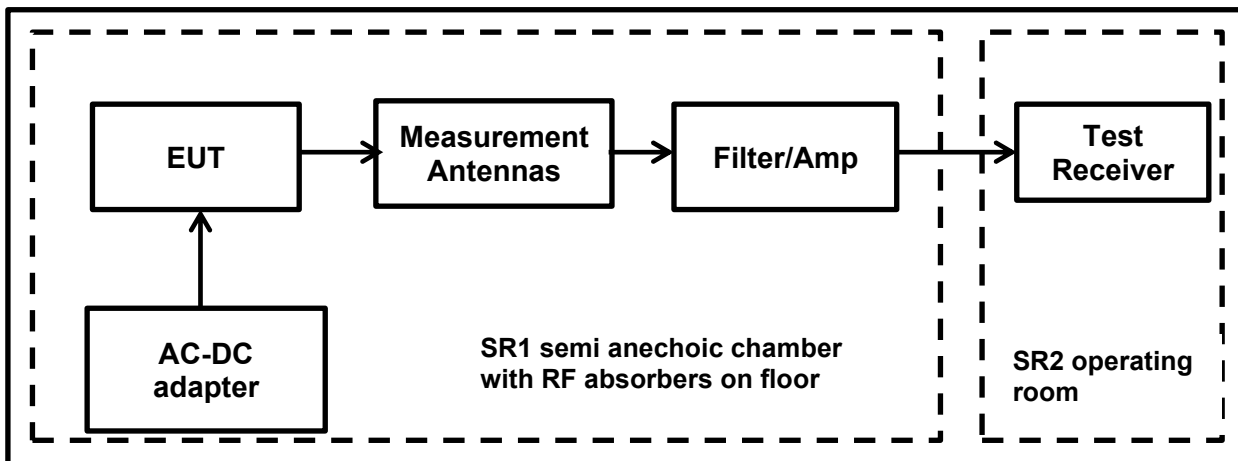
Temperature (°C):	21.6 to 22.4
Relative Humidity (%):	44.3 to 47.6

Note(s):

1. The measurements were in a semi-anechoic chamber SR1/ 2 (Asset Number 1603665) with RF absorbers on the floor at a distance of 3 m. The EUT was placed at a height of 1.5 m above the test chamber floor in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 m to 4 m
2. As the lower band edge falls within a non-restricted band, measurements were performed in accordance with FCC KDB 558074 Section 8.5 referencing ANSI C63.10 Section 11.11. Since maximum conducted (Peak) output power was previously measured in accordance with ANSI C63.10 Section 11.11.1(a) lower band edge measurement was performed with a peak detector and the -20 dBc limit applied.
3. As the lower band edge falls within a non-restricted band, only peak measurements are required. The test receiver resolution bandwidth was set to 100 kHz and video bandwidth 300 kHz. A peak detector was used, sweep time was set to auto and trace mode was Max Hold. The test receiver was left to sweep for 300 sweeps in order to maximise the carrier level and out-of-band emissions. A marker and corresponding reference level line were placed on the peak of the carrier. Marker frequencies and levels were recorded.
4. The restricted band peak measurements were performed in accordance with ANSI C63.10 Section 11.12.2.4.
5. As the EUT continuous transmission of the EUT ($D \geq 98\%$) cannot be achieved and the duty cycle is constant (duty cycle variations are less than $\pm 2\%$), the restricted band average measurements were performed in accordance with ANSI C63.10 Section 11.12.2.5.2.
6. As the upper band edge falls within a restricted band both peak and average measurements were recorded by placing a marker at the edge of the band. For peak measurements the test receiver resolution bandwidth was set to 1 MHz and the video bandwidth 3 MHz. A peak detector was used, sweep time was set to auto and trace mode was Max Hold. For average measurements the test receiver resolution bandwidth was set to 1 MHz and the video bandwidth 3 MHz. A RMS detector in power averaging mode was used. The test receiver was left to sweep for a sufficient length of time in order to maximise the carrier level and out-of-band emissions. A marker was placed on the band edge spot frequencies and a second marker placed on the highest emission level in the adjacent restricted band of operation (where a higher level emission was present). Marker frequencies and levels were recorded.

Transmitter Band Edge Radiated Emissions (continued)**Note(s): (continued)**

7. There is a restricted band 10 MHz below the lower band edge. The test receiver was set up as follows: the RBW set to 1 MHz, the VBW set to 3 MHz, with the sweep time set to auto couple. Peak and average measurements were performed with their respective detectors. Markers were placed on the highest point on each trace.
8. The measurement was performed only at the worst-case data rates for each mode as follows.
 - b-mode 2 Mbps | PWR 12 dBm
 - g-mode 6 Mbps | PWR 12 dBm
 - n-mode HT20 MCS4 | PWR 12 dBm
 - n-mode HT40 MCS5 | PWR 11 dBm
9. The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.
10. ** As the continuous transmission of the EUT ($D \geq 98\%$) cannot be achieved and EUT was transmitting with different duty cycles w.r.t to different modes. Duty Cycle Correction Factors (as mentioned below) were added to all average measurements respectively according to the modes used to compensate as if it was transmitting with 100% duty cycle.
 - Duty Cycle Correction Factor for b-mode 2 Mbps: Duty cycle more than 98%
 - Duty Cycle Correction Factor for g-mode 6 Mbps: 0.18 dB
 - Duty Cycle Correction Factor for n-mode HT20 MCS4: 0.14 dB
 - Duty Cycle Correction Factor for n-mode HT40 MCS5: 0.29 dB

Test Setup:

Transmitter Band Edge Radiated Emissions (Continued)**Results: AC-DC Power Supply / 802.11b / 20 MHz / 2 Mbps / PWR 12****Results: Lower Band Edge / Peak**

Frequency (MHz)	Peak Level (dBμV/m)	-20 dBc Limit (dBμV/m)	Margin (dB)	Result
2397.20	55.51	83.37	27.86	Complied
2400.00	52.07	83.37	31.30	Complied

Results: Lower Band Edge / 2310 to 2390 MHz Restricted Band / Peak

Frequency (MHz)	Peak Level (dBμV/m)	Peak Limit (dBμV/m)	Margin (dB)	Result
2364.15	55.39	74.00	18.61	Complied

Results: Lower Band Edge / 2310 to 2390 MHz Restricted Band / Average

Frequency (MHz)	Average Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
2374.46	43.63	54.00	10.37	Complied

Results: Upper Band Edge / Peak

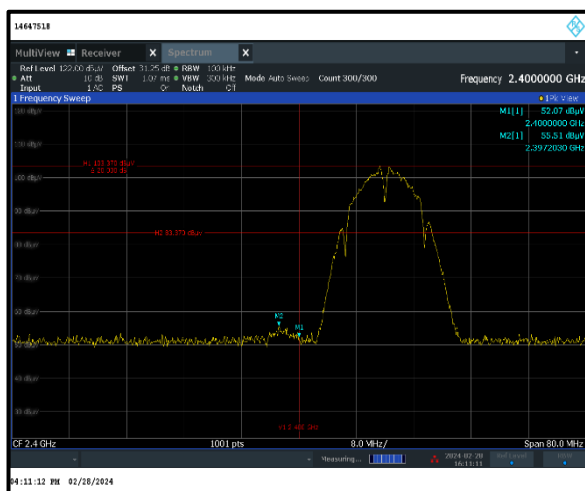
Frequency (MHz)	Peak Level (dBμV/m)	Peak Limit (dBμV/m)	Margin (dB)	Result
2483.50	56.39	74.00	17.61	Complied
2497.97	57.62	74.00	16.38	Complied

Results: Upper Band Edge / Average

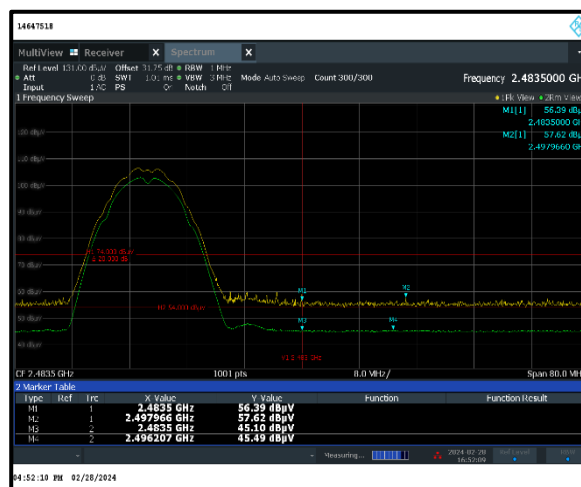
Frequency (MHz)	Peak Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
2483.50	45.10	54.00	8.90	Complied
246.21	45.49	54.00	8.51	Complied

Transmitter Band Edge Radiated Emissions (Continued)

Results: AC-DC Power Supply / 802.11b / 20 MHz / 2 Mbps / PWR 12



Lower Band Edge Peak Measurement



Upper Band Edge Measurement



Restricted Band Edge Measurement

Result: Pass

Transmitter Band Edge Radiated Emissions (Continued)**Results: AC-DC Power Supply / 802.11g / 20 MHz / 6 Mbps / PWR 12****Results: Lower Band Edge / Peak**

Frequency (MHz)	Peak Level (dBμV/m)	-20 dBc Limit (dBμV/m)	Margin (dB)	Result
2399.84	64.49	80.42	15.93	Complied
2400.00	62.21	80.42	18.21	Complied

Results: Lower Band Edge / 2310 to 2390 MHz Restricted Band / Peak

Frequency (MHz)	Peak Level (dBμV/m)	Peak Limit (dBμV/m)	Margin (dB)	Result
2388.12	63.90	74.00	10.10	Complied

Results: Lower Band Edge / 2310 to 2390 MHz Restricted Band / Average

Frequency (MHz)	Average Level (dBμV/m)	Duty Cycle Correction Factor (dB)	Corrected Average Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
2387.96	49.40	0.18	49.58**	54.00	4.42	Complied

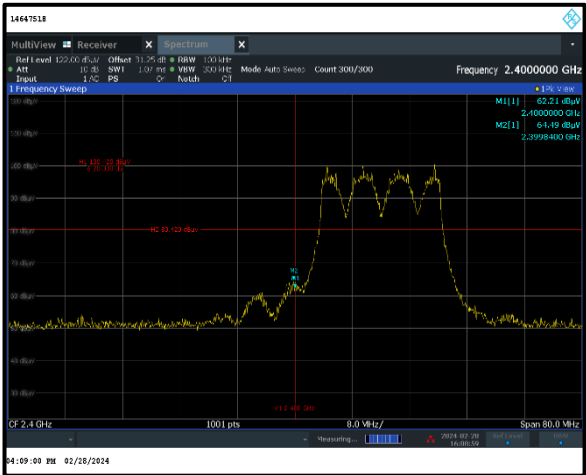
Results: Upper Band Edge / Peak

Frequency (MHz)	Peak Level (dBμV/m)	Peak Limit (dBμV/m)	Margin (dB)	Result
2483.50	63.56	74.00	10.44	Complied
2483.9	65.22	74.00	8.78	Complied

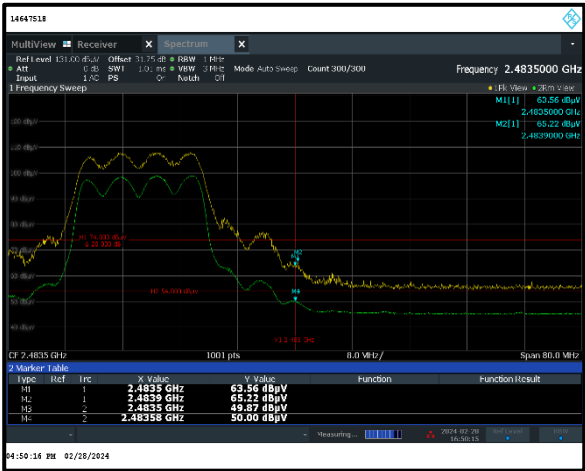
Results: Upper Band Edge / Average

Frequency (MHz)	Peak Level (dBμV/m)	Duty Cycle Correction Factor (dB)	Corrected Average Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
2483.50	49.87	0.18	50.05**	54.00	3.95	Complied
2483.58	50.00	0.18	50.18**	54.00	3.82	Complied

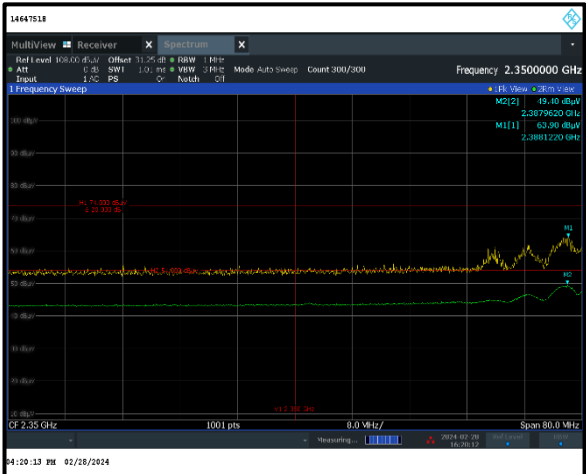
Transmitter Band Edge Radiated Emissions (Continued)
Results: AC-DC Power Supply / 802.11g / 20 MHz / 6 Mbps / PWR 12



Lower Band Edge Peak Measurement



Upper Band Edge Measurement



Restricted Band Edge Measurement

Result: **Pass**

Transmitter Band Edge Radiated Emissions (Continued)**Results: AC-DC Power Supply / 802.11n / 20 MHz / MCS4 / PWR 12****Results: Lower Band Edge / Peak**

Frequency (MHz)	Peak Level (dBμV/m)	-20 dBc Limit (dBμV/m)	Margin (dB)	Result
2399.76	69.88	80.14	10.26	Complied
2400.00	68.72	80.14	11.42	Complied

Results: Lower Band Edge / 2310 to 2390 MHz Restricted Band / Peak

Frequency (MHz)	Peak Level (dBμV/m)	Peak Limit (dBμV/m)	Margin (dB)	Result
2389.72	67.91	74.00	6.09	Complied

Results: Lower Band Edge / 2310 to 2390 MHz Restricted Band / Average

Frequency (MHz)	Average Level (dBμV/m)	Duty Cycle Correction Factor (dB)	Corrected Average Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
2386.52	48.25	0.14	48.39**	54.00	5.61	Complied

Results: Upper Band Edge / Peak

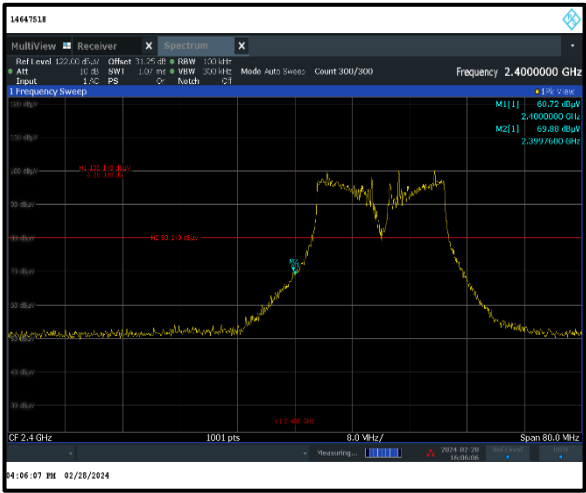
Frequency (MHz)	Peak Level (dBμV/m)	Peak Limit (dBμV/m)	Margin (dB)	Result
2483.50	64.57	74.00	9.43	Complied
2483.82	64.93	74.00	9.07	Complied

Results: Upper Band Edge / Average

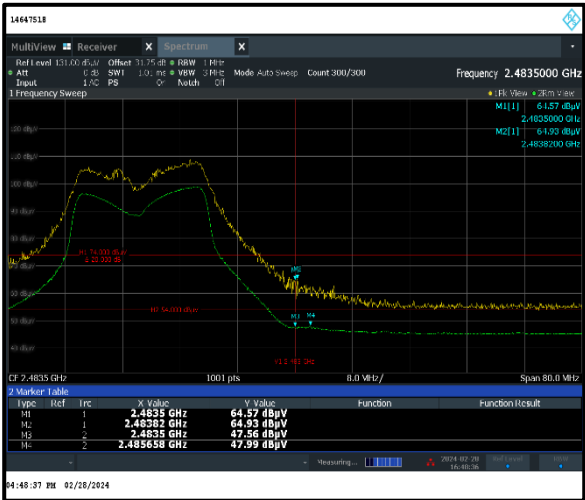
Frequency (MHz)	Peak Level (dBμV/m)	Duty Cycle Correction Factor (dB)	Corrected Average Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
2483.50	47.56	0.14	47.70**	54.00	6.30	Complied
2485.66	47.99	0.14	48.13**	54.00	5.87	Complied

Transmitter Band Edge Radiated Emissions (Continued)

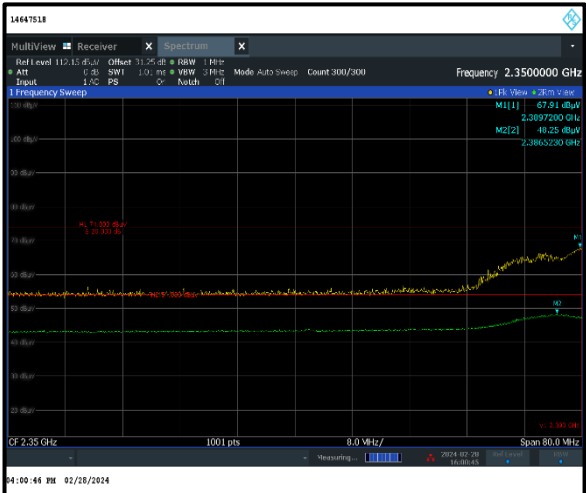
Results: AC-DC Power Supply / 802.11n / 20 MHz / MCS4 / PWR 12



Lower Band Edge Peak Measurement



Upper Band Edge Measurement



Restricted Band Edge Measurement

Result: Pass

Transmitter Band Edge Radiated Emissions (Continued)**Results: AC-DC Power Supply / 802.11n / 40 MHz / MCS5 / PWR 11****Results: Lower Band Edge / Peak**

Frequency (MHz)	Peak Level (dBμV/m)	-20 dBc Limit (dBμV/m)	Margin (dB)	Result
2399.90	65.97	77.13	11.16	Complied
2400.00	66.46	77.13	10.67	Complied

Results: Lower Band Edge / 2310 to 2390 MHz Restricted Band / Peak

Frequency (MHz)	Peak Level (dBμV/m)	Peak Limit (dBμV/m)	Margin (dB)	Result
2384.13	65.33	74.00	8.67	Complied

Results: Lower Band Edge / 2310 to 2390 MHz Restricted Band / Average

Frequency (MHz)	Average Level (dBμV/m)	Duty Cycle Correction Factor (dB)	Corrected Average Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
2386.84	52.20	0.29	52.49**	54.00	1.51	Complied

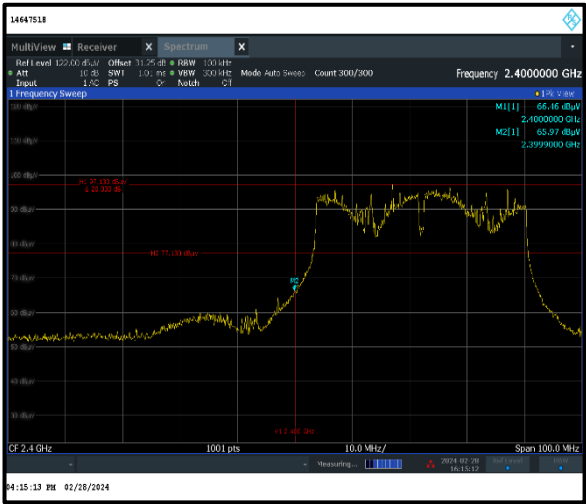
Results: Upper Band Edge / Peak

Frequency (MHz)	Peak Level (dBμV/m)	Peak Limit (dBμV/m)	Margin (dB)	Result
2483.50	68.16	74.00	5.84	Complied
2483.80	68.74	74.00	5.26	Complied

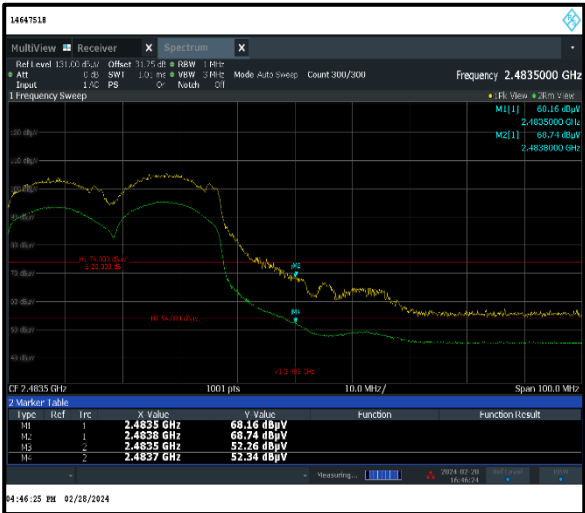
Results: Upper Band Edge / Average

Frequency (MHz)	Peak Level (dBμV/m)	Duty Cycle Correction Factor (dB)	Corrected Average Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
2483.50	52.26	0.29	52.55**	54.00	1.45	Complied
2483.70	52.34	0.29	52.63**	54.00	1.37	Complied

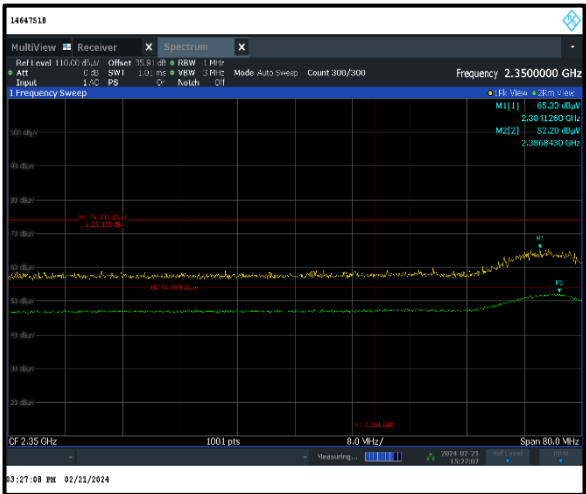
Transmitter Band Edge Radiated Emissions (Continued)
Results: AC-DC Power Supply / 802.11n / 40 MHz / MCS5 / PWR 11



Lower Band Edge Peak Measurement



Upper Band Edge Measurement



Restricted Band Edge Measurement

Result: **Pass**

6. Measurement Uncertainty

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor such that a confidence level of approximately 95% is maintained. For the purposes of this document “approximately” is interpreted as meaning “effectively” or “for most practical purposes”.

Measurement Type	Confidence Level (%)	Calculated Uncertainty
AC Conducted Spurious Emissions	95%	±2.49 dB
Conducted Maximum Peak Output Power	95%	±0.59 dB
Radiated Spurious Emissions	95%	±3.10 dB
Band Edge Radiated Emissions	95%	±3.10 dB
Transmitter Duty Cycle	95%	±3.4%
Minimum 6 dB Bandwidth	95%	±0.87 %
Spectral Power Density	95%	±0.59 dB

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty the published guidance of the appropriate accreditation body is followed.

7. Used equipment

Test site: Stuttgart lab Chamber SR 1/2 (UL International Germany GmbH, Hedelfinger Str. 61, Stuttgart)

ID	Manufacturer	Type	Model	Serial	Calibration Date	Cal. Cycle (months)
1	Rohde & Schwarz	Antenna, Loop	HFH2-Z2	831247/012	18/07/2023	36
377	BONN Elektronik	Amplifier, Low Noise Pre	BLMA 0118-1A	025294B	18/07/2023	12
423	Bonn Elektronik	Amplifier, Low Noise Pre	BLMA 1840-1A	55929	18/07/2023	12
460	Deisel	Turntable	DT 4250 S	n/a	n/a	n/a
495	Schwarzbeck	Antenna, Trilog Broadband	VULB 9163	01691	30/11/2023	36
496	Rohde & Schwarz	Antenna, log. - periodical	HL050	100297	22/08/2022	24
588	Maturo	Controller	NCD	029/7180311	n/a	n/a
591	Rohde & Schwarz	Receiver	ESU 40	100244/040	13/07/2023	12
669	Rohde & Schwarz	EMI Test Receiver	ESW 44	103087	13/07/2023	18
607	Schwarzbeck	Antenna broadband horn antenna	BBHA 9170	9170-561	12/01/2024	36
608	Rohde & Schwarz	Switch Matrix	OSP 120	101227	lab verification	n/a
628	Maturo	Antenna mast	CAM 4.0-P	224/19590716	n/a	n/a
629	Maturo	Kippeinrichtung	KE 2.5-R-M	MAT002	n/a	n/a
-/-	Testo	Thermo-Hygrometer	608-H1	01	lab verification	n/a
328	SPS	AC/DC power distribution system	PAS 5000	A2464 00/2 0200	lab verification	n/a
1603665	Siemens Matsushita Components	semi-anechoic chamber SR1/ 2	-/-	B83117-A1421-T161	n/a	n/a
681	Maturo	Antenna mast, tilting	BAM4.5-P	402/0718.1	n/a	n/a

Test site: Stuttgart lab Chamber SR 7/8 (UL International Germany GmbH, Hedelfinger Str. 61, Stuttgart)

ID	Manufacturer	Type	Model	Serial No.	Calibration Date	Cal. Cycle
22	Rohde & Schwarz	Artificial Mains	ESH3-Z5	831767/014	18.07.2023	12
23	Rohde & Schwarz	Artificial Mains	ESH3-Z5	831767/013	18.07.2023	12
215	Rohde & Schwarz	Artificial Mains Network	ESH2-Z5	879675/002	18.07.2023	24
349	Rohde & Schwarz	Receiver, EMI Test	ESIB7	836697/009	18.07.2023	12
351	Rohde & Schwarz	network, Artificial Mains	ESH3-Z5	862770/018	18.07.2023	12

Test site: Stuttgart lab Chamber SR 9 (UL International Germany GmbH, Hedelfinger Str. 61, Stuttgart)

ID	Manufacturer	Type	Model	Serial	Calibration Date	Cal. Cycle (months)
625	Schwarzbeck	Antenna, H-field	HFSL 7101	109	lab verification only relative measurements	n/a
637	Rohde & Schwarz	Spectrum Analyser	FSV40	101587	12/07/2023	12
327	SPS	AC/DC power distribution system	PAS 5000	A2464 00/1 0200	lab verification	n/a
-/-	Testo	Thermo-Hygrometer	608-H1	07	lab verification	n/a
645	Weiss Umwelttechnik	Climatic Chamber	LabEvent T/110/70/3	5822619794 0010	lab verification	n/a
239408	Cable SR9 CPM	Cable SR9 CPM 01	SMA/N/TNC/BN C	N/A	lab verification	n/a

Used Equipment (continued)**Test site: N-I TS8997** (UL International Germany GmbH, Admiral-Rosendahl-Strasse 9 Neu-Isenburg)

ID	Manufacturer	Type	Model	Serial	Calibration Date	Cal. Cycle (months)
637	Rohde & Schwarz	Spectrum Analyser	FSV40	101587	12/07/2023	36
327	SPS	AC/DC power distribution system	PAS 5000	A2464 00/1 0200	lab verification	n/a
-/-	Testo	Thermo-Hygrometer	608-H1	07	lab verification	n/a
239408	Cable NI-TS8997 CPM	Cable NI TS8997 CPM 01	SMA/N/TNC/BNC	N/A	lab verification	n/a

8. Report Revision History

Version Number	Revision Details		
	Page No(s)	Clause	Details
1.0	-	-	Initial Version
1.1	20-24, 39, 50	5.2.2 5.2.6 5.2.7	Update the report according to ANSI C63.10:2020, with the corresponding retesting required for Transmitter Minimum 6 dB Bandwidth.

--- END OF REPORT ---