

Prüfbericht-Nr.: Test report no.:	CN25BOCB 001	Auftrags-Nr.: Order no.:	326090908	Seite 1 von 41 Page 1 of 41
Kunden-Referenz-Nr.: Client reference no.:	1288983	Auftragsdatum: Order date:	2025-01-13	
Auftraggeber: Client:	IKEA of Sweden AB Box 702, SE-343 81 Älmhult, Sweden			
Prüfgegenstand: Test item:	Self-ballasted LED lamps			
Bezeichnung / Typ-Nr.: Identification / Type no.:	LED2403R5NA			
Auftrags-Inhalt: Order content:	Test Report			
Prüfgrundlage: Test specification:	FCC CFR47 Part 15, Subpart C Section 15.247 RSS-Gen Issue 5, Amendment 2, February 2021 RSS-247 Issue 3, August 2023 ANSI C63.10: 2013			
Wareneingangsdatum: Date of sample receipt:	2025-03-21 2025-03-27	Refer to photo document.		
Prüfmuster-Nr.: Test sample no.:	A003948647-002 A003957107-008			
Prüfzeitraum: Testing period:	Refer to test report			
Ort der Prüfung: Place of testing:	TÜV Rheinland (Shanghai) Co., Ltd.			
Prüflaboratorium: Testing laboratory:	TÜV Rheinland (Shanghai) Co., Ltd.			
Prüfergebnis*: Test result*:	Pass			
geprüft von: tested by:	<input checked="" type="checkbox"/> <u>Hongfei Wu</u>	genehmigt von: authorized by:	<input checked="" type="checkbox"/> <u>Yanli Fan</u>	
Datum: Date:	2025-06-12 <small>Signed by: Hongfei Wu</small>	Datum: Date:	2025-06-12 <small>Signed by: Yanli Fan</small>	
Stellung / Position:	Sachverständige(r)/Expert	Stellung / Position:	Sachverständige(r)/Expert	
Sonstiges / Other:	FCC ID: FHO-LED2403R5NA IC: 10912A-LED2403R5NA HVIN: LED2403R5NA PMN: KAJPLATS This report is for Zigbee.			
Zustand des Prüfgegenstandes bei Anlieferung: Condition of the test item at delivery:	Prüfmuster vollständig und unbeschädigt Test item complete and undamaged			
* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n) P(ass) = passed a.m. test specification(s)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n) F(ail) = failed a.m. test specification(s)	N/A = nicht anwendbar N/A = not applicable	N/T = nicht getestet N/T = not tested
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. This test report only relates to the above mentioned test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.				

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Anmerkungen
Remarks

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3	<p>Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt.</p> <p><i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report. Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i></p>
4	<p>Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnissen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezüglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019.</p> <p><i>The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.</i></p>

TEST SUMMARY

5.1.1 ANTENNA REQUIREMENT*RESULT: Pass***5.1.2 6dB & 99% BANDWIDTH***RESULT: Pass***5.1.3 OUTPUT POWER***RESULT: Pass***5.1.4 POWER SPECTRAL DENSITY***RESULT: Pass***5.1.5 CONDUCTED BAND EDGE AND OUT-OF BAND EMISSIONS***RESULT: Pass***5.2.1 CONDUCTED EMISSION***RESULT: Pass***5.3.1 RADIATED BAND-EDGE***RESULT: Pass***5.3.2 RADIATED SPURIOUS EMISSION***RESULT: Pass*

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1. General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Photographs of the Test Set-up

2. Test Sites

2.1 Test Facilities

TÜV Rheinland (Shanghai) Co., Ltd.
Workshop14, North Half of Workshop 10 and Workshop 16, Pingqian (Taicang) Modern Industrial Park, No.525, Yuewang Lingang South Road, Shaxi, Taicang, Jiangsu, China

The used test equipment is in accordance with CISPR 16 for measurement of radio interference.

The Federal Communications Commission has reviewed the technical characteristics of the radiated and conducted emission facility, and has found these test facilities to be in compliance with the requirements of section 2.948 of the FCC rules. The description of the test facility is listed under FCC registration number 930979.

The Innovation, Science and Economic Development Canada has reviewed the technical characteristics of the radiated and conducted emission facility, and has found these test facilities to be in compliance. The description of the test facility is listed under chambers filing number 33038.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Equip.	Description	Model	Manufacturer	Due Date DD.MM.YYYY
EMC-C-196	Wireless connectivity tester	CMW270	Rohde & Schwarz	23.08.2025
EMC-C-302	Signal generator	SMB100B (6 GHz)	Rohde & Schwarz	10.12.2025
EMC-C-303	Vector Signal generator	SMW200A	Rohde & Schwarz	10.12.2025
EMC-C-304	OSP	OSP-B157W8	Rohde & Schwarz	10.12.2025
EMC-C-161	Spectrum analyser	FSV40	Rohde&Schwarz	15.07.2025
EMC-C-018	Double ridged horn antenna	BBHA 9120 D	Schwarzbeck	24.03.2026
EMC-C-066	EMI test receiver	ESCI	Rohde&Schwarz	27.10.2025
EMC-C-068	Broadband horn antenna	BBHA 9170	Schwarzbeck	18.06.2028
EMC-C-155	BiLog antenna	CBL 6112D	Teseq	24.03.2026
EMC-C-175	Preamplifier	EMC051845SE	EMCI Taiwan	24.07.2025
EMC-C-176	Preamplifier	EMC184045SE	EMCI Taiwan	24.07.2025
EMC-C-001	3 m semi-anechoic chamber	SAC3	Frankonia	03.12.2026
EMC-C-141	Shielded enclosure	10.055x3.605x3.000	Frankonia	08.11.2028
EMC-C-195	EMI test receiver	ESR3	Rohde&Schwarz	03.08.2025
EMC-C-190	Artificial mains network	ENV432	Rohde&Schwarz	11.10.2025
software				
EMC-S-036	RF measurement software	WMS32-WB (11.40.00)	Rohde&Schwarz	NA
EMC-S-032	EMI measurement software	EMC32-E+ (10.60.20)	Rohde&Schwarz	NA
EMC-S-028	EMI measurement software	EMC32-MEB (10.60.20)	Rohde&Schwarz	NA

2.3 Traceability

All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

Table 2: Measurement Uncertainty

Measurement Type	Frequency	Uncertainty
Antenna Port Conducted Emission	< 1GHz	±0.39dB
	> 1GHz	±0.68dB
Conducted Emission	150kHz - 30MHz	±2.33dB
Radiated Emission	9kHz - 30MHz	±2.93dB
	30MHz - 1GHz	±5.34dB
	> 1GHz	±5.40dB

3. General Product Information

3.1 Product Function and Intended Use

The EUT (Equipment Under Test) is a LED lamp which supports Bluetooth, Zigbee and Thread.

The aim of this report is to evaluate RF character of Zigbee of the EUT.

3.2 Ratings and System Details

Table 3: Technical Specification of EUT

General Description of EUT	
Product Name:	Self-ballasted LED lamps
Model No.:	LED2403R5NA
Operation Voltage:	AC 120V, 60Hz
Test Voltage:	DC 3.3V for RF conducted and radiated test AC 120V, 60Hz for conducted emission test
RF Technical:	1) BLE 2) Zigbee 3) Thread
Technical Specification of Zigbee	
RF IC:	SiMG301
Frequency Range:	2405~2480MHz
Modulation Type:	OQPSK
Antenna Type:	Internal slot antenna
Antenna Gain:	-1.31 dBi (declared by client)

Table 4: Operation Channel List

RF Channel	Frequency [MHz]						
11	2405	15	2425	19	2445	23	2465
12	2410	16	2430	20	2450	24	2470
13	2415	17	2435	21	2455	25	2475
14	2420	18	2440	22	2460	26	2480

3.3 Independent Operation Modes

Test frequencies are lowest channel: 2405 MHz, middle channel: 2445 MHz and highest channel: 2480 MHz

The basic operation modes are:

- A. Zigbee transmitting mode
- B. Radio operating mode

3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum power level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All testing were performed according to the procedures in ANSI C63.10: 2013.

Test Software: sscm 5.13.1

Table 5: Power parameter value

Mode	Power Parameter Setting Value
Zigbee	10

4.3 Special Accessories and Auxiliary Equipment

Table 6: Auxiliary Equipment

Equipment	Manufacturer	Model
Laptop	Lenovo	21AJ-S57N0J
Mobile phone	Apple	iPhone 15
Loudspeaker	Apple	HomePod mini
Remote control	IKEA	E2489

4.4 Countermeasures to achieve EMC Compliance

Null.

5. Test Results

5.1 Conducted Testing at Antenna Port

5.1.1 Antenna Requirement

RESULT:
Pass

According to the manufacturer declared, the EUT has one internal slot antenna, the directional gain of antenna is -1.31 dBi and the antenna is designed with permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply with the provision.

Table 7: Antenna Requirement
FCC 15.203 – Antenna Requirement 1

Requirement: No antenna other than that furnished by the responsible party shall be used with the device

Results: Antenna type: Internal slot antenna

Verdict: Pass

FCC 15.204 – Antenna Requirement 2

Requirement: An intentional radiator may be operated only with the antenna with which it is authorized. If an antenna is marketed with the intentional radiator, it shall be of a type which is authorized with the intentional radiator.

Results: Only one internal slot antenna can be used

Verdict: Pass

RSS-Gen 6.4 – External Control

Requirement: The device shall not have any external controls accessible to the user that enable it to be adjusted, selected or programmed to operate in violation of the regulatory requirements, including RSS-Gen and the applicable RSSs

Results: The device does not have any transmitter external controls accessible to the user that can be adjusted and operated in violation of the limits of this standard.

Verdict: PASS

RSS-Gen 6.8 – Antenna Requirement

Requirement: When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer.

Results:

a) Antenna Type:	Internal slot antenna
b) Manufacture:	N/A
c) Model No.:	N/A
d) Gain with reference to an isotropic radiator:	-1.31 dBi

Verdict: **PASS**

5.1.2 6dB & 99% Bandwidth**RESULT:****Pass**

Date of testing : 2025-04-29
Ambient temperature : 23.1°C
Relative humidity : 56.5%
Atmospheric pressure : 101kPa
Test requirement : FCC Part 15.247(a)(2)
RSS-247 Issue 3, August 2023, Clause 5.2(a)
RSS-Gen Issue 5, Amendment 2, February 2021, Clause
6.7
Test procedure : ANSI C63.10: 2013
Test voltage : DC 3.3V
Test modes applied : A

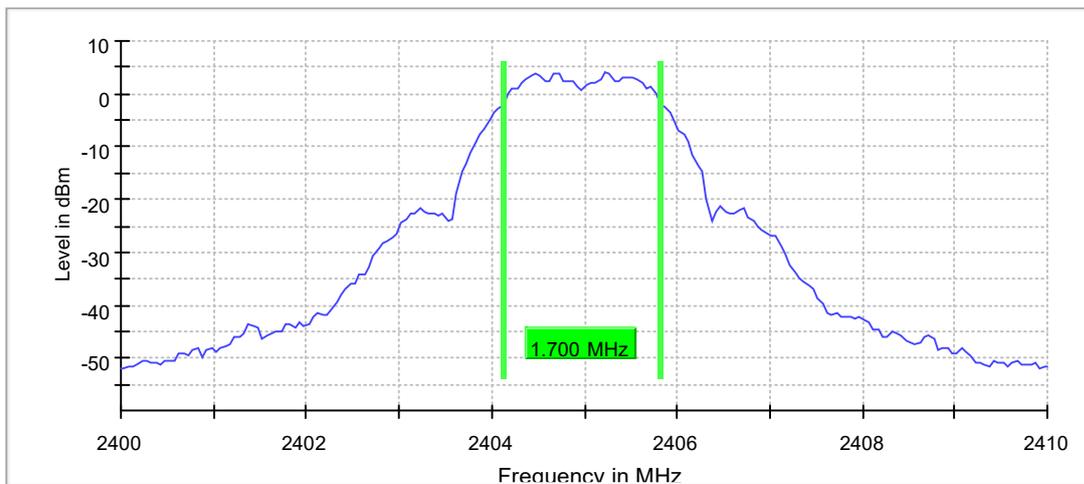
6dB Bandwidth, 2405MHz

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2405.000000	1.700000	0.500000	---	2404.125000	2405.825000

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2405.000000	4.0	PASS

6 dB Bandwidth


Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.40000 GHz	2.40000 GHz
Stop Frequency	2.41000 GHz	2.41000 GHz
Span	10.000 MHz	10.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	200	~ 200
Sweptime	37.969 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	20 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.41 dB	0.50 dB

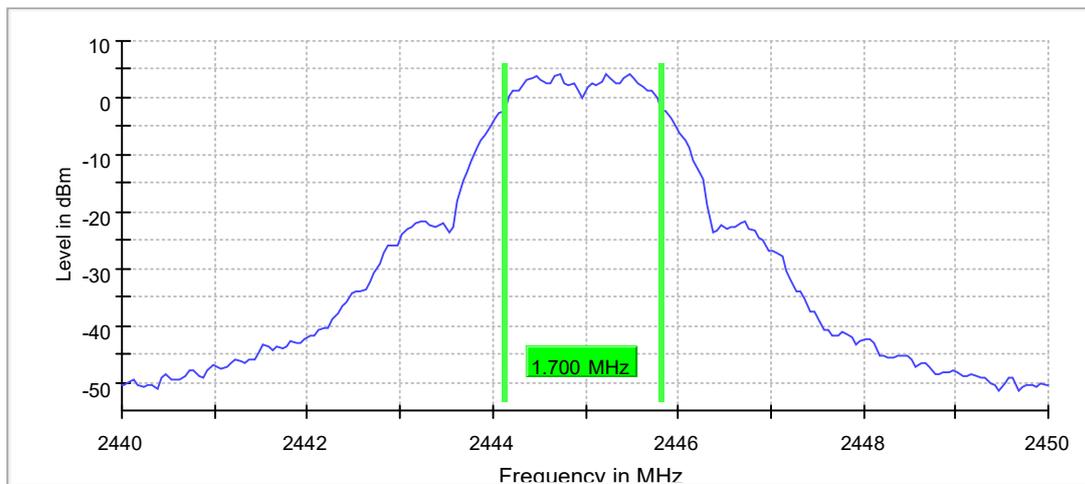
6dB Bandwidth, 2445MHz

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2445.000000	1.700000	0.500000	---	2444.125000	2445.825000

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2445.000000	4.1	PASS

6 dB Bandwidth


Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.44000 GHz	2.44000 GHz
Stop Frequency	2.45000 GHz	2.45000 GHz
Span	10.000 MHz	10.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	200	~ 200
Sweeptime	37.969 μ s	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	17 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.18 dB	0.50 dB

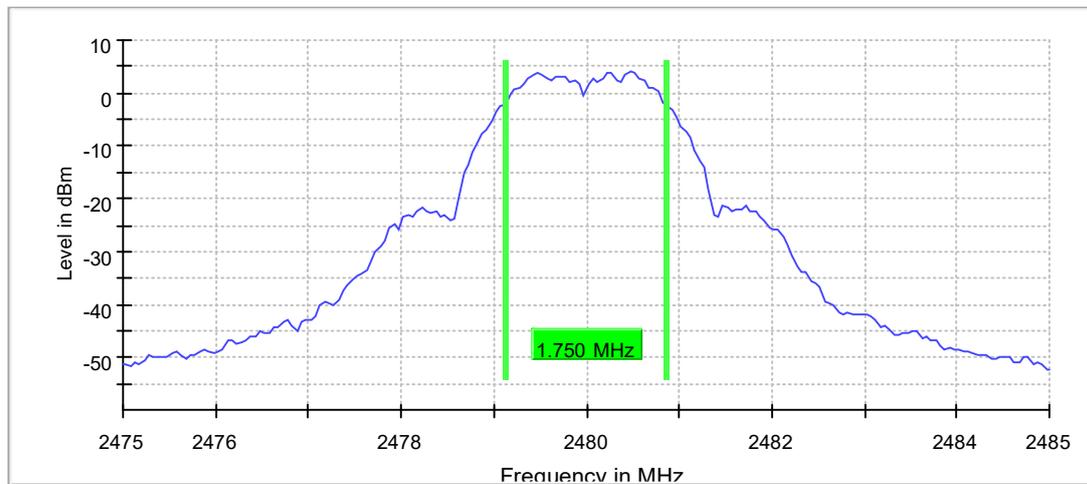
6dB Bandwidth, 2480MHz

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2480.000000	1.750000	0.500000	---	2479.125000	2480.875000

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2480.000000	4.0	PASS

6 dB Bandwidth


Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.47500 GHz	2.47500 GHz
Stop Frequency	2.48500 GHz	2.48500 GHz
Span	10.000 MHz	10.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	200	~ 200
Sweptime	37.969 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	16 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.09 dB	0.50 dB

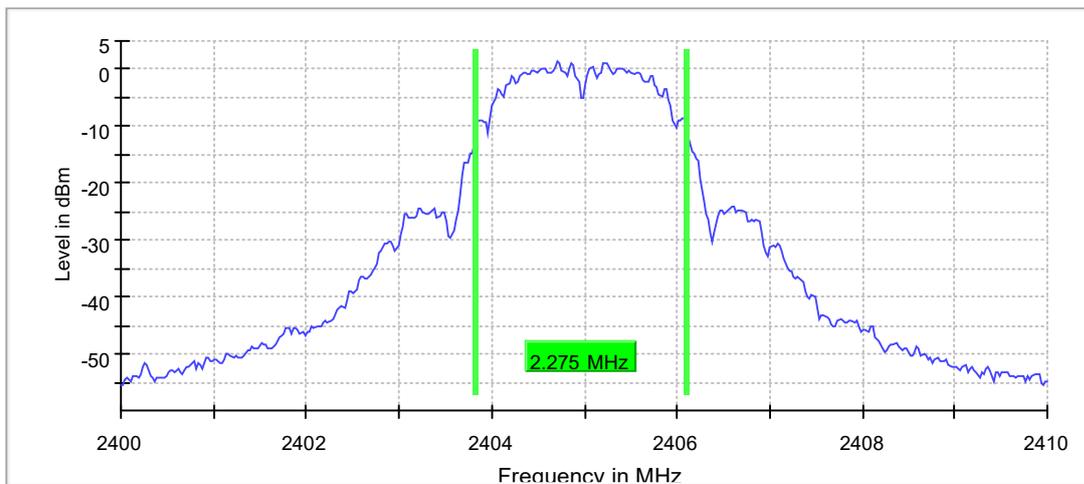
99% Occupied Channel Bandwidth, 2405MHz

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2405.000000	2.275000	---	---	2403.837500	2406.112500

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2405.000000	PASS

99 % Bandwidth


Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.40000 GHz	2.40000 GHz
Stop Frequency	2.41000 GHz	2.41000 GHz
Span	10.000 MHz	10.000 MHz
RBW	50.000 kHz	>= 50.000 kHz
VBW	200.000 kHz	>= 150.000 kHz
SweepPoints	400	~ 400
Sweeptime	75.781 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	23 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.06 dB	0.30 dB

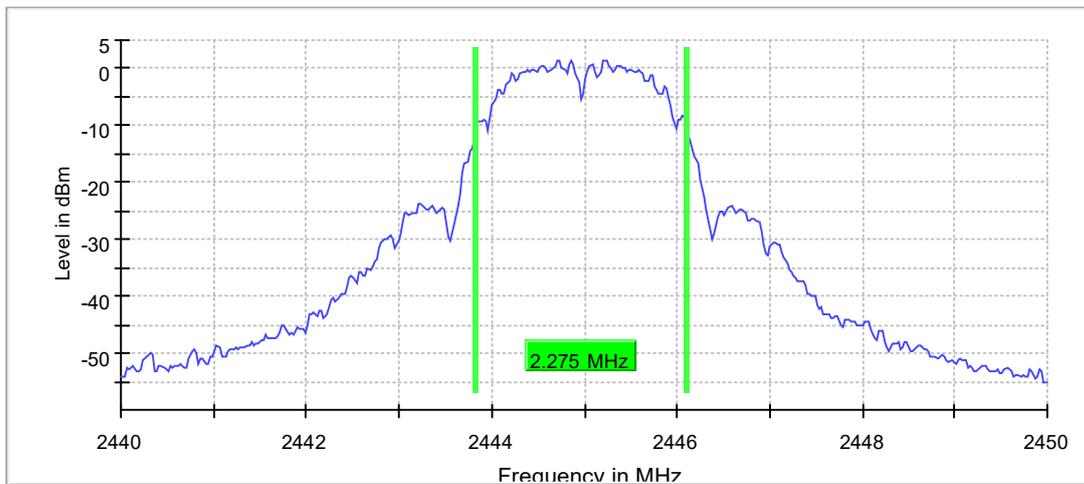
99% Occupied Channel Bandwidth, 2445MHz

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2445.000000	2.275000	---	---	2443.837500	2446.112500

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2445.000000	PASS

99 % Bandwidth


Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.44000 GHz	2.44000 GHz
Stop Frequency	2.45000 GHz	2.45000 GHz
Span	10.000 MHz	10.000 MHz
RBW	50.000 kHz	>= 50.000 kHz
VBW	200.000 kHz	>= 150.000 kHz
SweepPoints	400	~ 400
Sweeptime	75.781 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	20 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.22 dB	0.30 dB

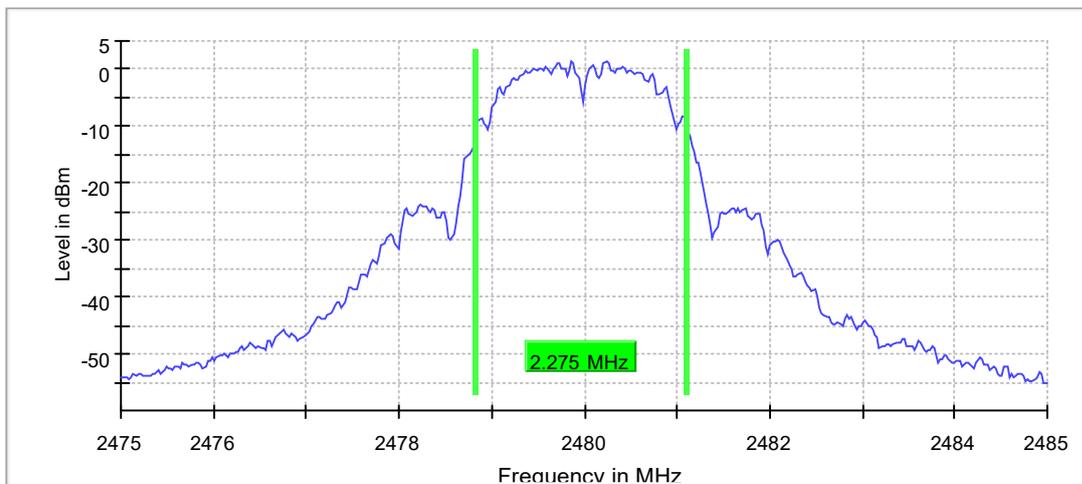
99% Occupied Channel Bandwidth, 2480MHz

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2480.000000	2.275000	---	---	2478.837500	2481.112500

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2480.000000	PASS

99 % Bandwidth


Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.47500 GHz	2.47500 GHz
Stop Frequency	2.48500 GHz	2.48500 GHz
Span	10.000 MHz	10.000 MHz
RBW	50.000 kHz	>= 50.000 kHz
VBW	200.000 kHz	>= 150.000 kHz
SweepPoints	400	~ 400
Sweeptime	75.781 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	18 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.25 dB	0.30 dB

5.1.3 Output Power

RESULT:**Pass**

Date of testing : 2025-04-29
Ambient temperature : 23.2°C
Relative humidity : 56.2%
Atmospheric pressure : 101kPa
Test requirement : FCC Part 15.247(b)(3)
RSS-247 Issue 3, August 2023, Clause 5.4(d)
Test procedure : ANSI C63.10: 2013
Test voltage : DC 3.3V
Test modes applied : A

Table 8: Peak Output Power

Frequency [MHz]	Peak Conducted Output Power [dBm]	Limit [dBm]
2405	7.6	30
2445	8.0	30
2480	8.0	30

Note:

1. The cable loss is taken into account in results.
2. EIRP=Conducted Output Power + Antenna Gain (-1.31dBi), which is far below the 4 W (36dBm).

5.1.4 Power Spectral Density

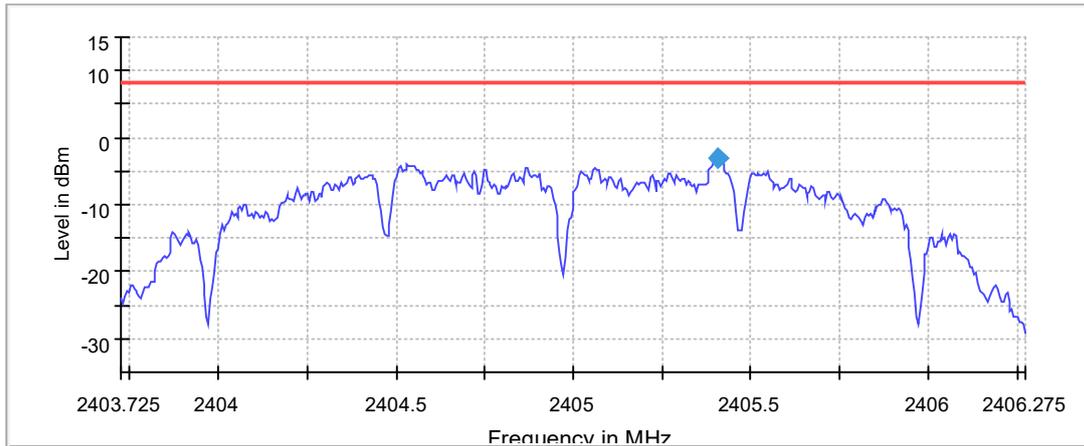
RESULT:**Pass**

Date of testing : 2025-04-29
Ambient temperature : 23.4°C
Relative humidity : 56.2%
Atmospheric pressure : 101kPa
Test requirement : FCC Part 15.247(e)
RSS-247 Issue 3, August 2023, Clause 5.2(b)
Test procedure : ANSI C63.10: 2013
Test voltage : DC 3.3V
Test modes applied : A

Power Spectral Density, 2405MHz

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2405.000000	2405.407500	-3.232	8.0	PASS

Peak Power Spectral Density



— Limit — Sum Level ◆ PSD

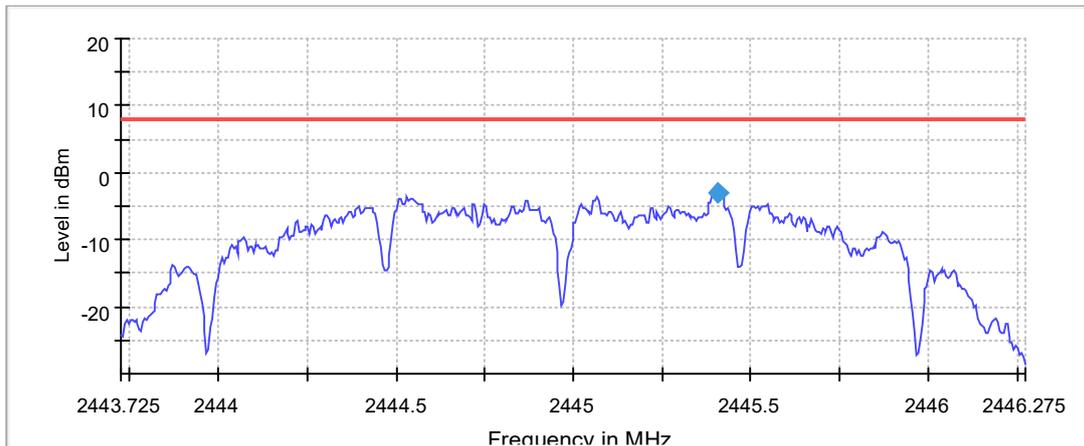
Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.40373 GHz	2.40373 GHz
Stop Frequency	2.40628 GHz	2.40628 GHz
Span	2.550 MHz	2.550 MHz
RBW	10.000 kHz	<= 10.000 kHz
VBW	30.000 kHz	>= 30.000 kHz
SweepPoints	510	~ 510
Sweeptime	2.550 ms	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	Sweep
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	9 / max. 150	max. 150
Stable	2 / 2	2
Max Stable Difference	0.31 dB	0.50 dB

Power Spectral Density, 2445MHz

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2445.000000	2445.407500	-3.024	8.0	PASS

Peak Power Spectral Density



— Limit — Sum Level ◆ PSD

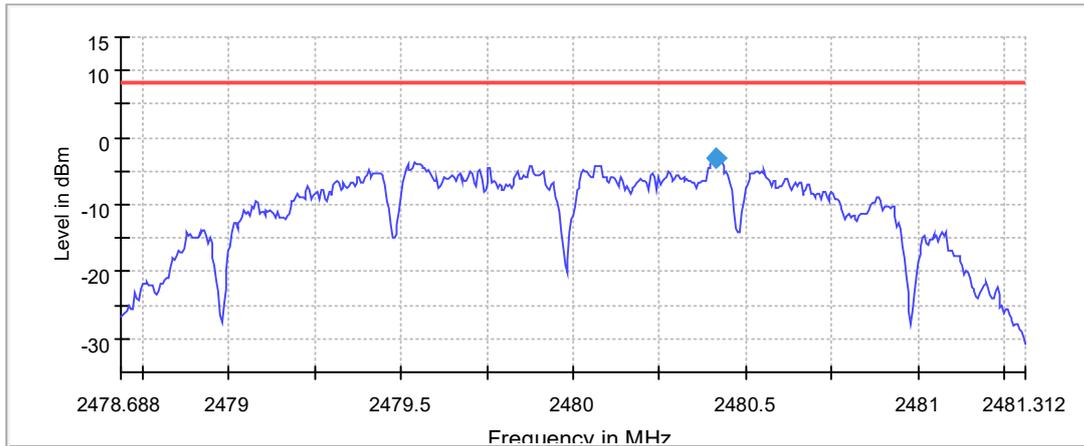
Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.44373 GHz	2.44373 GHz
Stop Frequency	2.44628 GHz	2.44628 GHz
Span	2.550 MHz	2.550 MHz
RBW	10.000 kHz	<= 10.000 kHz
VBW	30.000 kHz	>= 30.000 kHz
SweepPoints	510	~ 510
Sweeptime	2.550 ms	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	Sweep
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	11 / max. 150	max. 150
Stable	2 / 2	2
Max Stable Difference	0.35 dB	0.50 dB

Power Spectral Density, 2480MHz

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2480.000000	2480.415000	-3.058	8.0	PASS

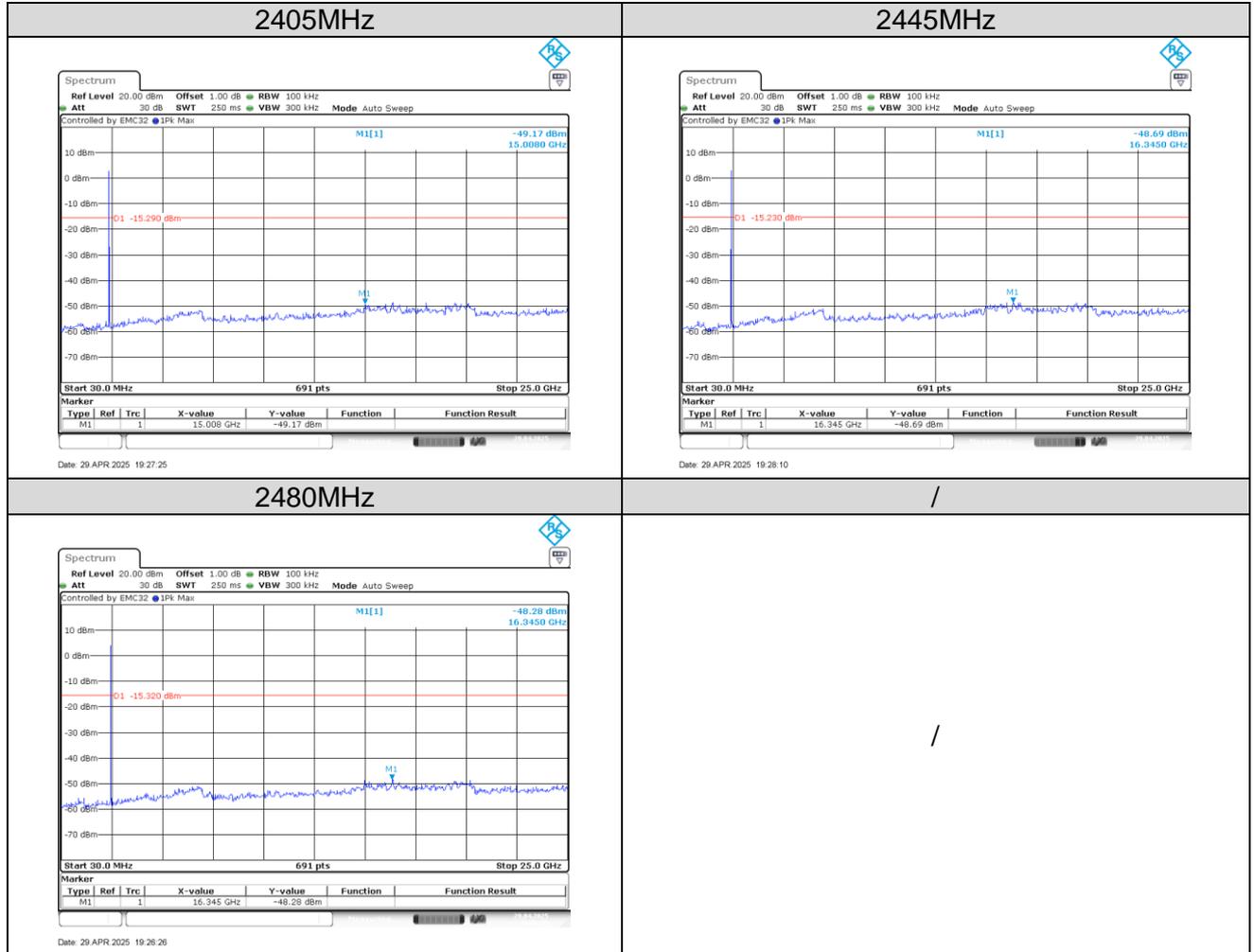
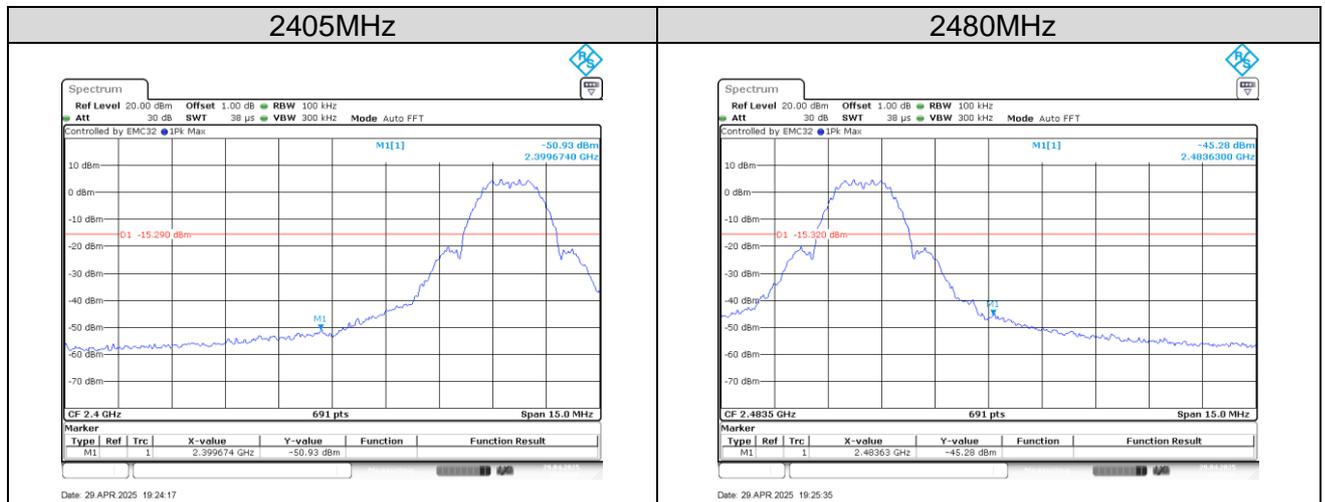
Peak Power Spectral Density



— Limit — Sum Level ◆ PSD

Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.47869 GHz	2.47869 GHz
Stop Frequency	2.48131 GHz	2.48131 GHz
Span	2.625 MHz	2.625 MHz
RBW	10.000 kHz	<= 10.000 kHz
VBW	30.000 kHz	>= 30.000 kHz
SweepPoints	525	~ 525
Sweeptime	2.630 ms	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	Sweep
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	11 / max. 150	max. 150
Stable	2 / 2	2
Max Stable Difference	0.24 dB	0.50 dB

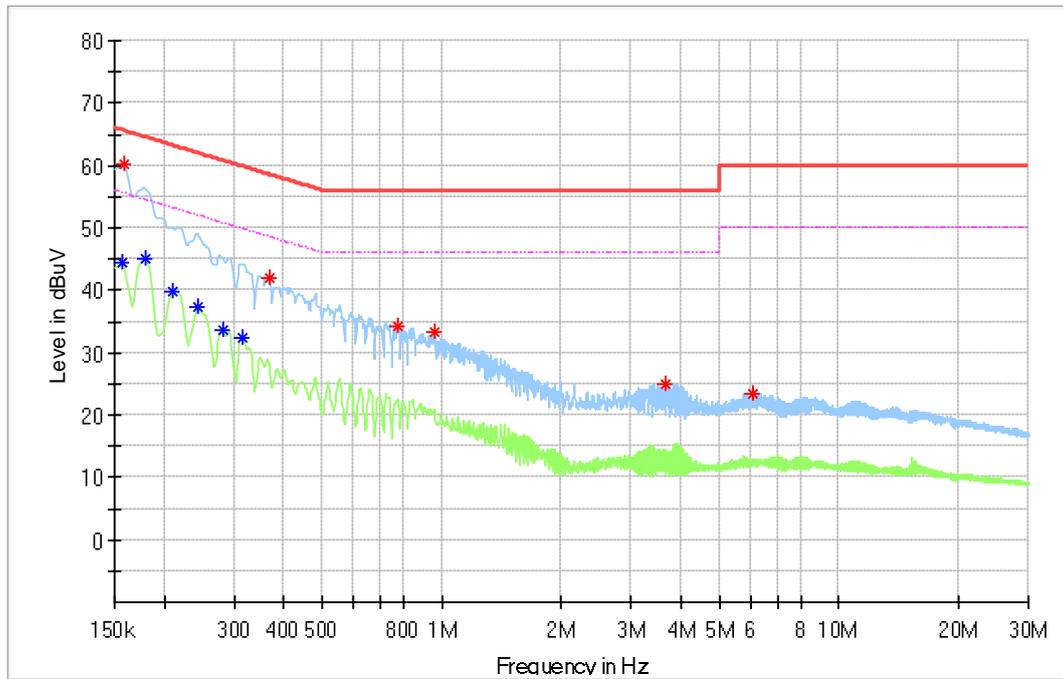
Figure 2: Conducted Spurious Emission

Figure 3: Conducted Band Edge


5.2 Emission in the Frequency Range up to 30MHz

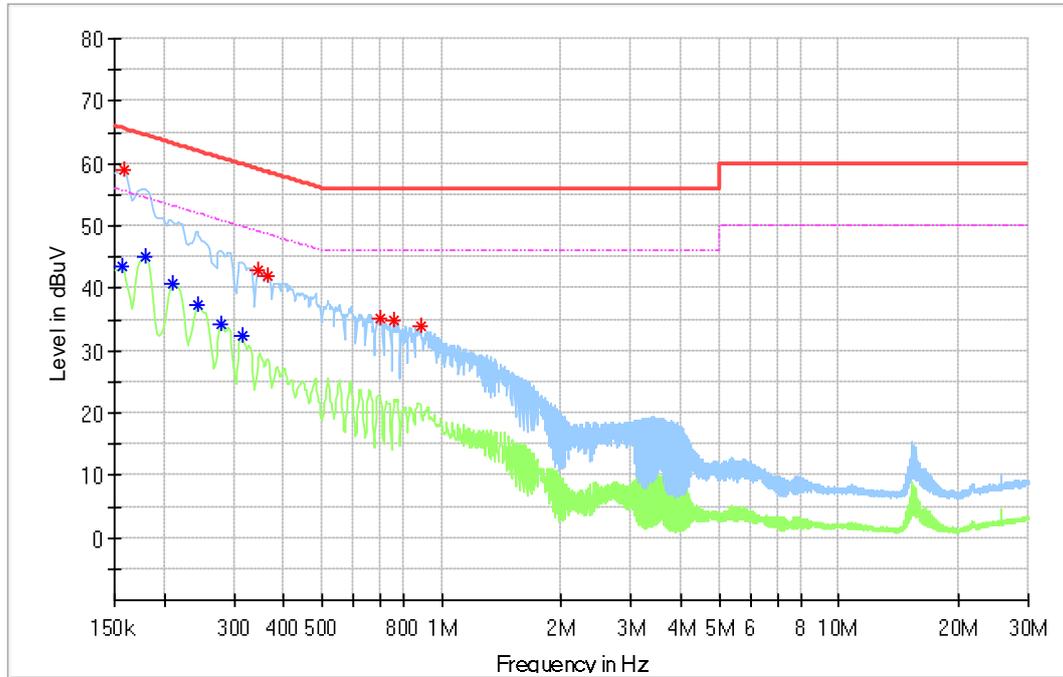
5.2.1 Conducted Emission

RESULT:**Pass**

Date of testing : 2025-03-31
Ambient temperature : 20.8°C
Relative humidity : 41.7%
Atmospheric pressure : 101kPa
Test requirement : FCC Part 15.207 (a)
RSS-Gen Issue 5, Amendment 2, February 2021, Clause
8.8
Test procedure : KDB 558074 D01v05r02
ANSI C63.10: 2013
Test voltage : AC 120V, 60Hz
Test modes applied : B

Figure 4: Conducted Emission, L

Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
0.156750	---	44.31	55.63	11.32	L1	10.3
0.159000	60.16	---	65.52	5.36	L1	10.3
0.179250	---	45.04	54.52	9.48	L1	10.3
0.210750	---	39.94	53.18	13.24	L1	10.3
0.244500	---	37.28	51.94	14.66	L1	10.3
0.280500	---	33.74	50.80	17.06	L1	10.3
0.314250	---	32.43	49.86	17.43	L1	10.3
0.368250	41.87	---	58.54	16.67	L1	10.3
0.777750	34.12	---	56.00	21.88	L1	10.4
0.962250	33.27	---	56.00	22.73	L1	10.7
3.680250	25.09	---	56.00	30.91	L1	10.2
6.085500	23.45	---	60.00	36.55	L1	10.6

Figure 5: Conducted Emission, N

Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
0.156750	---	43.37	55.63	12.27	N	10.3
0.159000	59.12	---	65.52	6.39	N	10.3
0.179250	---	45.17	54.52	9.35	N	10.6
0.210750	---	40.58	53.18	12.59	N	10.8
0.244500	---	37.46	51.94	14.48	N	10.7
0.278250	---	34.15	50.87	16.72	N	10.6
0.314250	---	32.37	49.86	17.49	N	10.5
0.343500	42.95	---	59.12	16.17	N	10.4
0.363750	42.11	---	58.64	16.53	N	10.4
0.701250	35.29	---	56.00	20.71	N	10.4
0.755250	34.83	---	56.00	21.17	N	10.4
0.888000	33.98	---	56.00	22.02	N	10.4

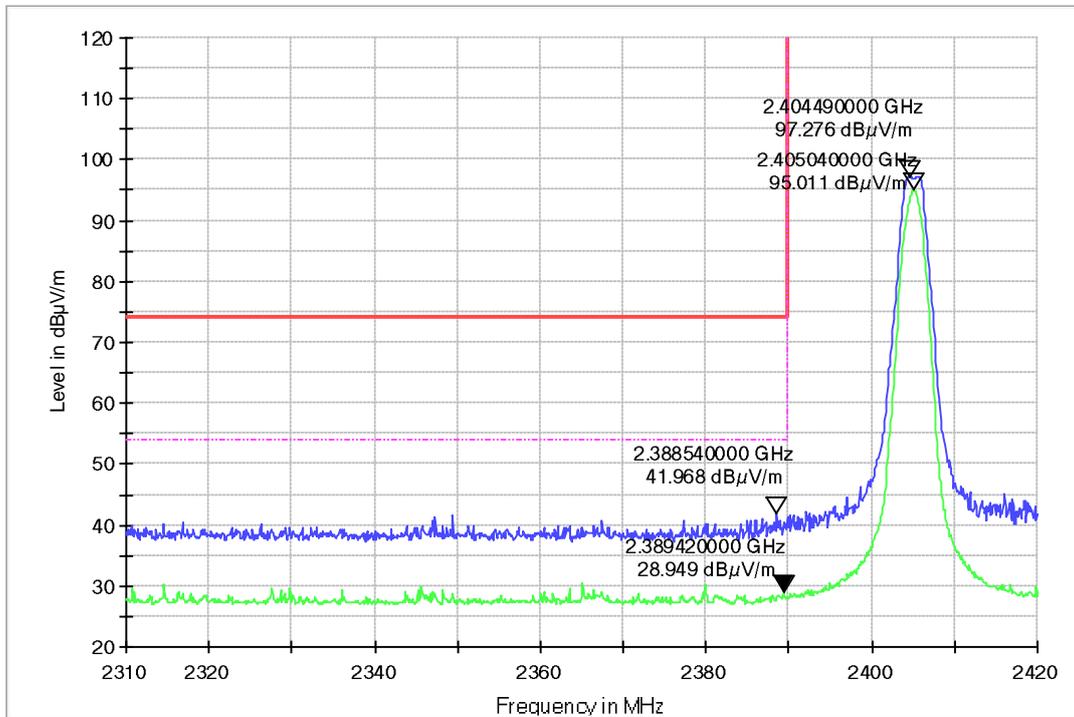
5.3 Emission in the Frequency Range above 30MHz

5.3.1 Radiated Band-Edge

RESULT:**Pass**

Date of testing	:	2025-05-12
Ambient temperature	:	24.2°C
Relative humidity	:	55.1%
Atmospheric pressure	:	101kPa
Test requirement	:	FCC Part 15.247(d) FCC Part 15.205(a) FCC Part 15.209(a) RSS-Gen Issue 5, Amendment 2, February 2021, Clause 8.9 RSS-Gen Issue 5, Amendment 2, February 2021, Clause 8.10 RSS-247 Issue 3, August 2023, Clause 5.5
Test procedure	:	ANSI C63.10: 2013
Test voltage	:	DC 3.3V
Test modes applied	:	A

Figure 6: Radiated Band-Edge, 2405MHz, H

 XXY-2310⁺ 2410 BE 1-18GHz_HL050_FSV40_Pre-10-YUNFANG

Figure 7: Radiated Band-Edge, 2405MHz, V

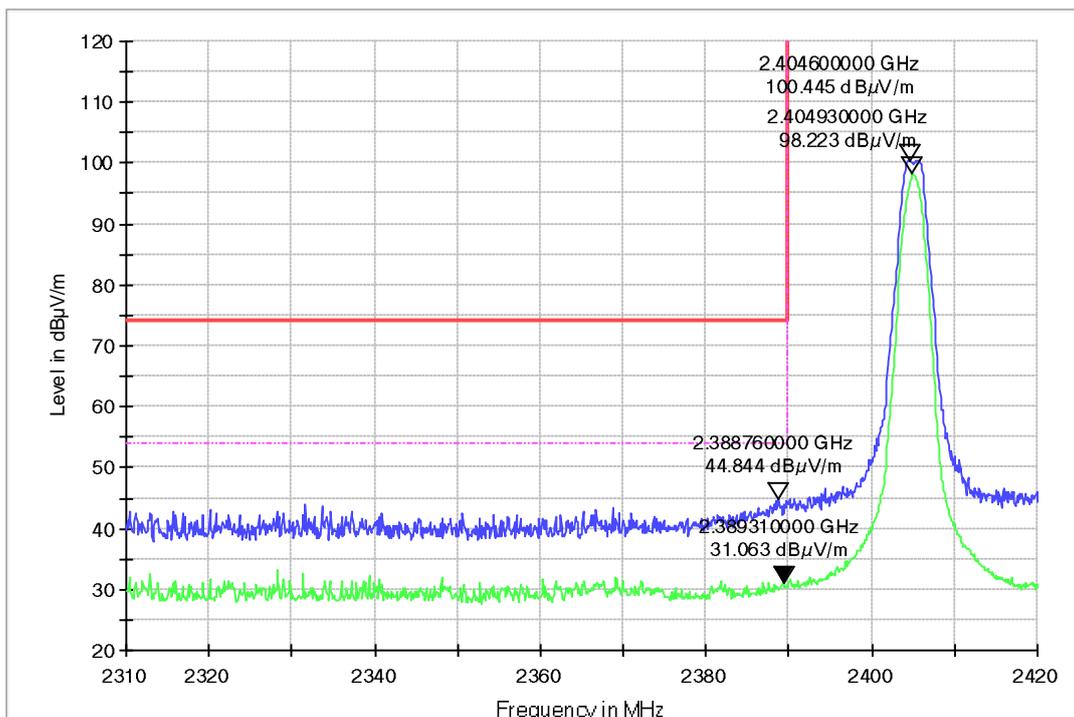
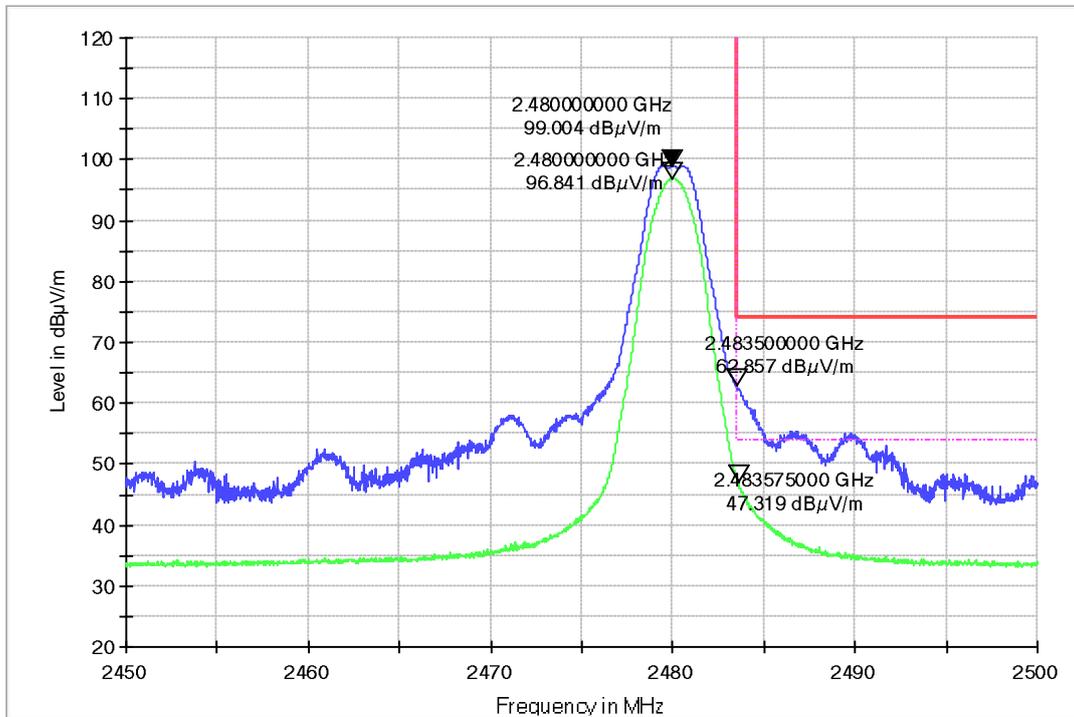
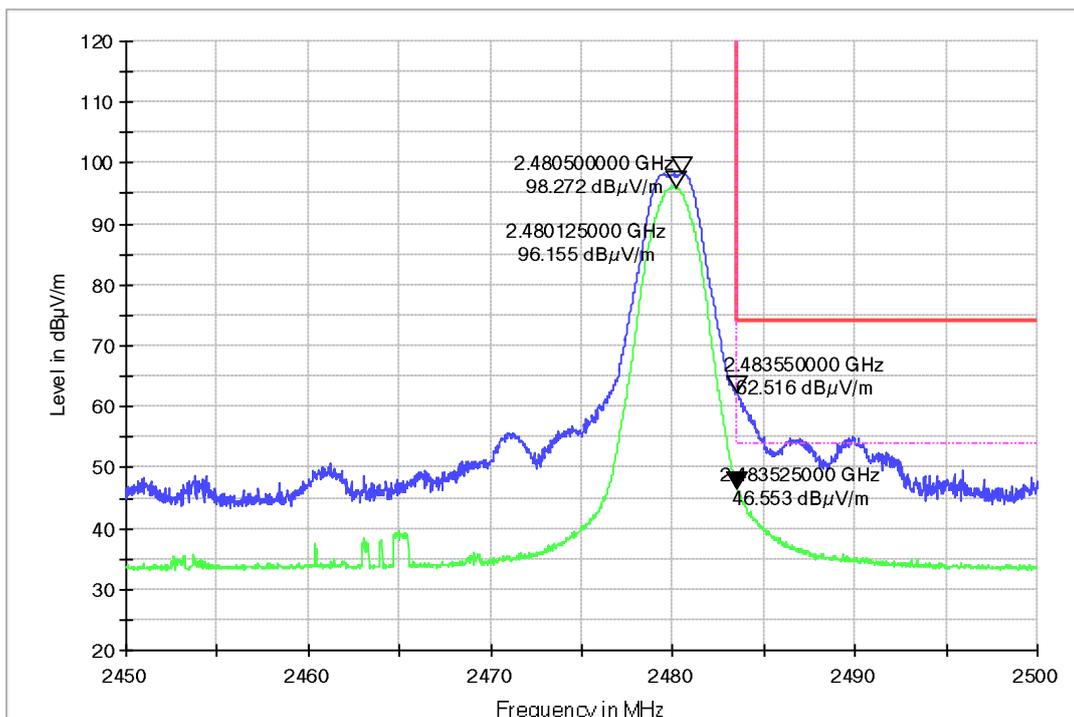
 XXY-2310⁺ 2410 BE 1-18GHz_HL050_FSV40_Pre-10-YUNFANG


Figure 8: Radiated Band-Edge, 2480MHz, H

XXY-2470° 2500 BE_1-18GHz_HL050_FSV40_Pre-10-YUNFANG


Figure 9: Radiated Band-Edge, 2480MHz, V

XXY-2470° 2500 BE_1-18GHz_HL050_FSV40_Pre-10-YUNFANG



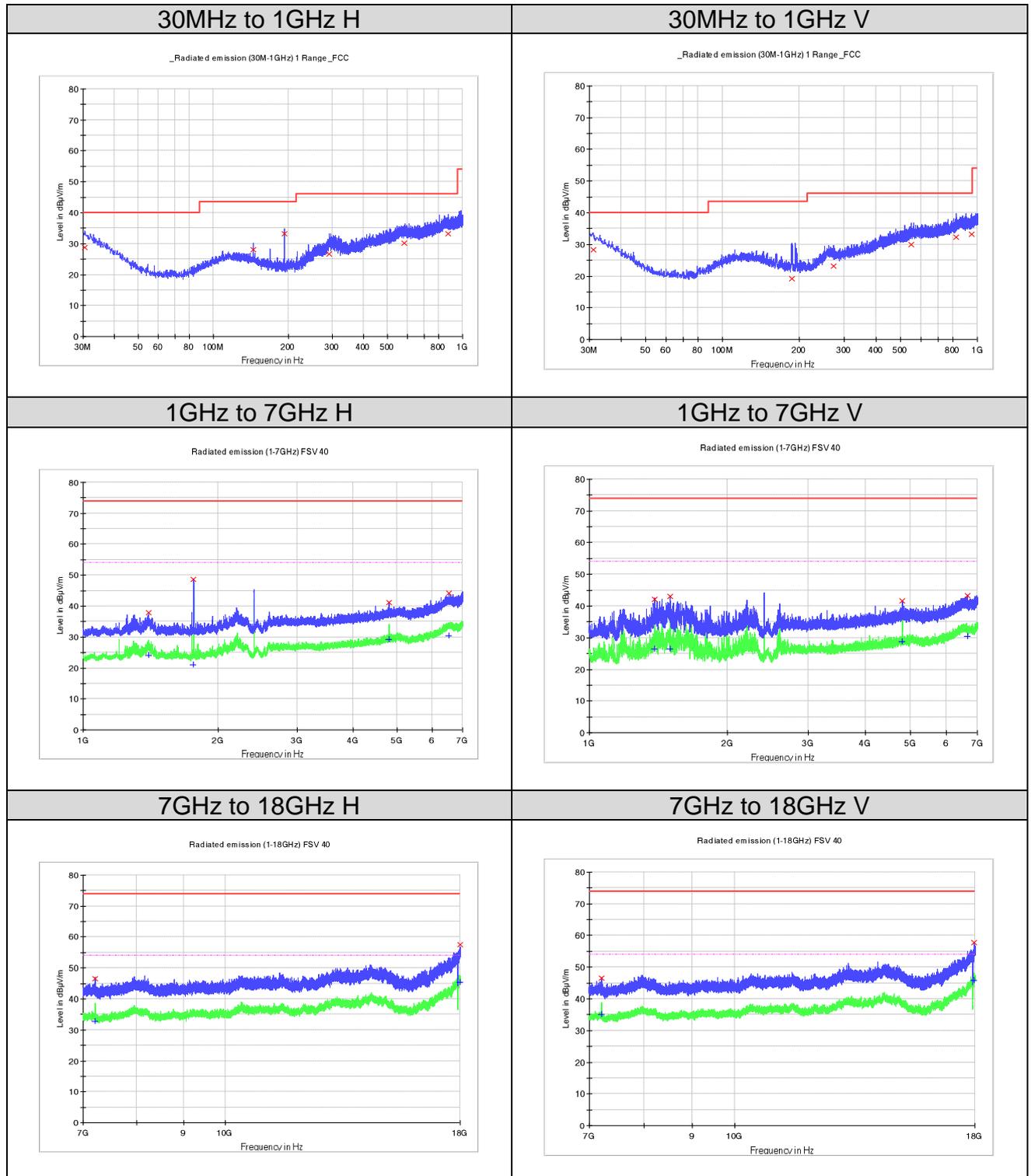
5.3.2 Radiated Spurious Emission

RESULT:**Pass**

Date of testing : 2025-04-23
Ambient temperature : 24.5°C
Relative humidity : 55.5%
Atmospheric pressure : 101kPa
Test requirement : FCC Part 15.247(d)
FCC Part 15.209(a)
RSS-Gen Issue 5, Amendment 2, February 2021, Clause 8.9
RSS-247 Issue 3, August 2023, Clause 5.5
Test procedure : ANSI C63.10: 2013
Test voltage : DC 3.3V
Test modes applied : A

Note:

For the frequency range from 18GHz to 25GHz, no emission was found.

Figure 10: Radiated Spurious Emission, 2405MHz


Limit and Margin
QP

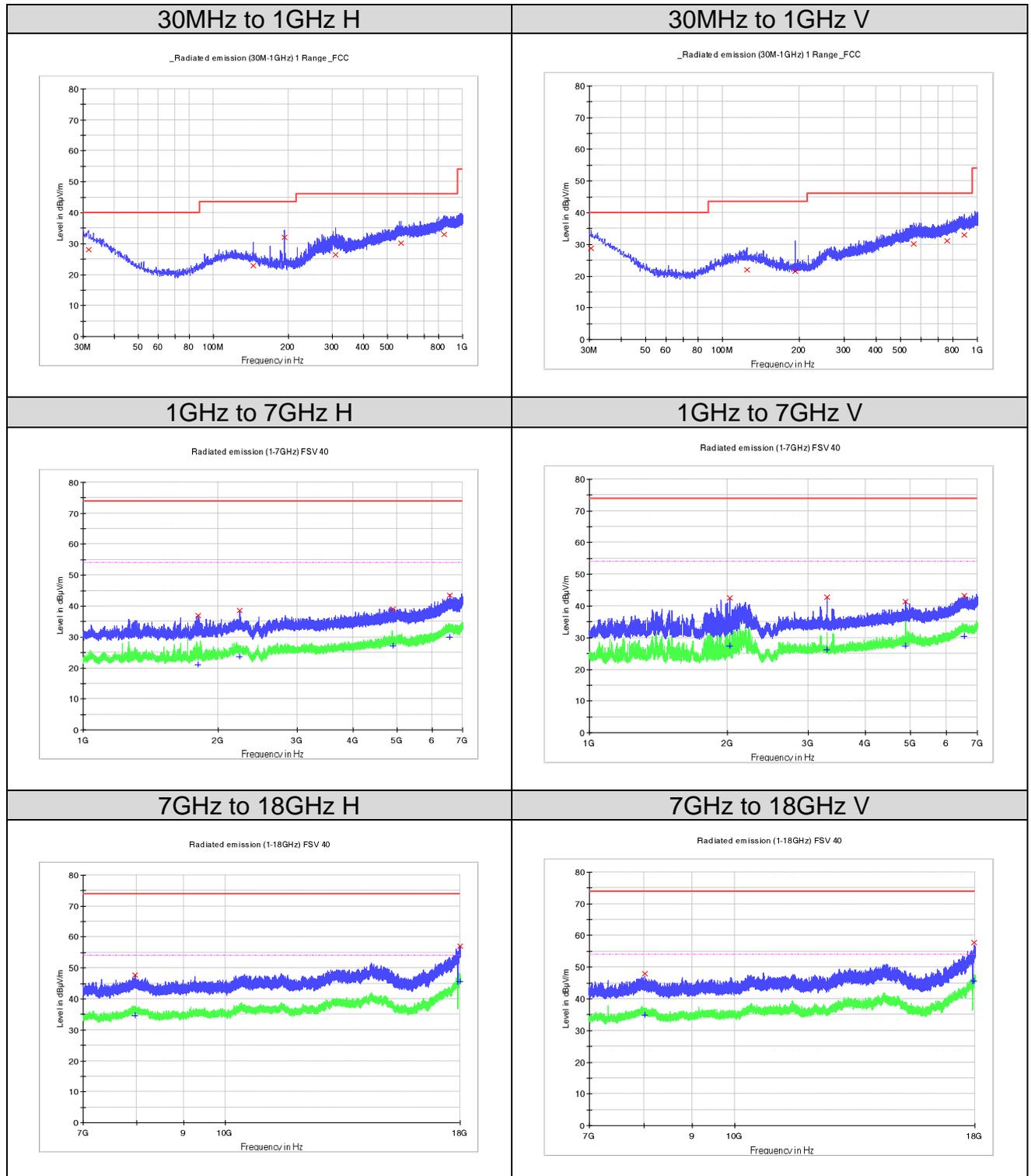
Frequency (MHz)	QuasiPeak (dBµV/m)	Pol	Corr. (dB/m)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30.485000	28.7	H	25.4	11.3	40.0
144.581250	28.1	H	17.9	15.5	43.5
192.717500	33.2	H	16.0	10.3	43.5
292.506250	26.8	H	20.0	19.3	46.0
584.476250	30.2	H	26.6	15.8	46.0
873.415000	33.2	H	28.6	12.8	46.0
31.091250	28.3	V	25.1	11.7	40.0
186.897500	19.1	V	16.0	24.4	43.5
271.893750	23.2	V	20.1	22.8	46.0
548.222500	30.0	V	26.5	16.0	46.0
827.461250	32.3	V	28.3	13.7	46.0
950.530000	33.2	V	29.0	12.8	46.0

PK

Frequency (MHz)	MaxPeak (dBµV/m)	Pol	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
1399.545455	37.8	H	-18.7	36.2	74.0
1763.636364	48.7	H	-18.8	25.3	74.0
4809.181818	41.2	H	-11.4	32.8	74.0
6535.818182	44.2	H	-7.6	29.8	74.0
7216.562500	46.6	H	-6.2	27.4	74.0
17993.125000	57.6	H	12.3	16.4	74.0
1389.727273	42.0	V	-18.7	32.0	74.0
1497.181818	43.0	V	-18.7	31.0	74.0
4810.818182	41.7	V	-11.3	32.3	74.0
6650.909091	43.2	V	-7.8	30.8	74.0
7216.218750	46.6	V	-6.2	27.4	74.0
17980.750000	57.8	V	12.0	16.2	74.0

AV

Frequency (MHz)	Average (dBµV/m)	Pol	Corr. (dB/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1399.545455	24.0	H	-18.7	30.0	54.0
1763.636364	21.0	H	-18.8	33.0	54.0
4809.181818	29.2	H	-11.4	24.8	54.0
6535.818182	30.4	H	-7.6	23.6	54.0
7216.562500	32.8	H	-6.2	21.3	54.0
17993.125000	45.4	H	12.3	8.6	54.0
1389.727273	26.5	V	-18.7	27.5	54.0
1497.181818	26.4	V	-18.7	27.6	54.0
4810.818182	28.7	V	-11.3	25.3	54.0
6650.909091	30.3	V	-7.8	23.7	54.0
7216.218750	35.2	V	-6.2	18.8	54.0
17980.750000	45.8	V	12.0	8.2	54.0

Figure 11: Radiated Spurious Emission, 2445MHz


Limit and Margin
QP

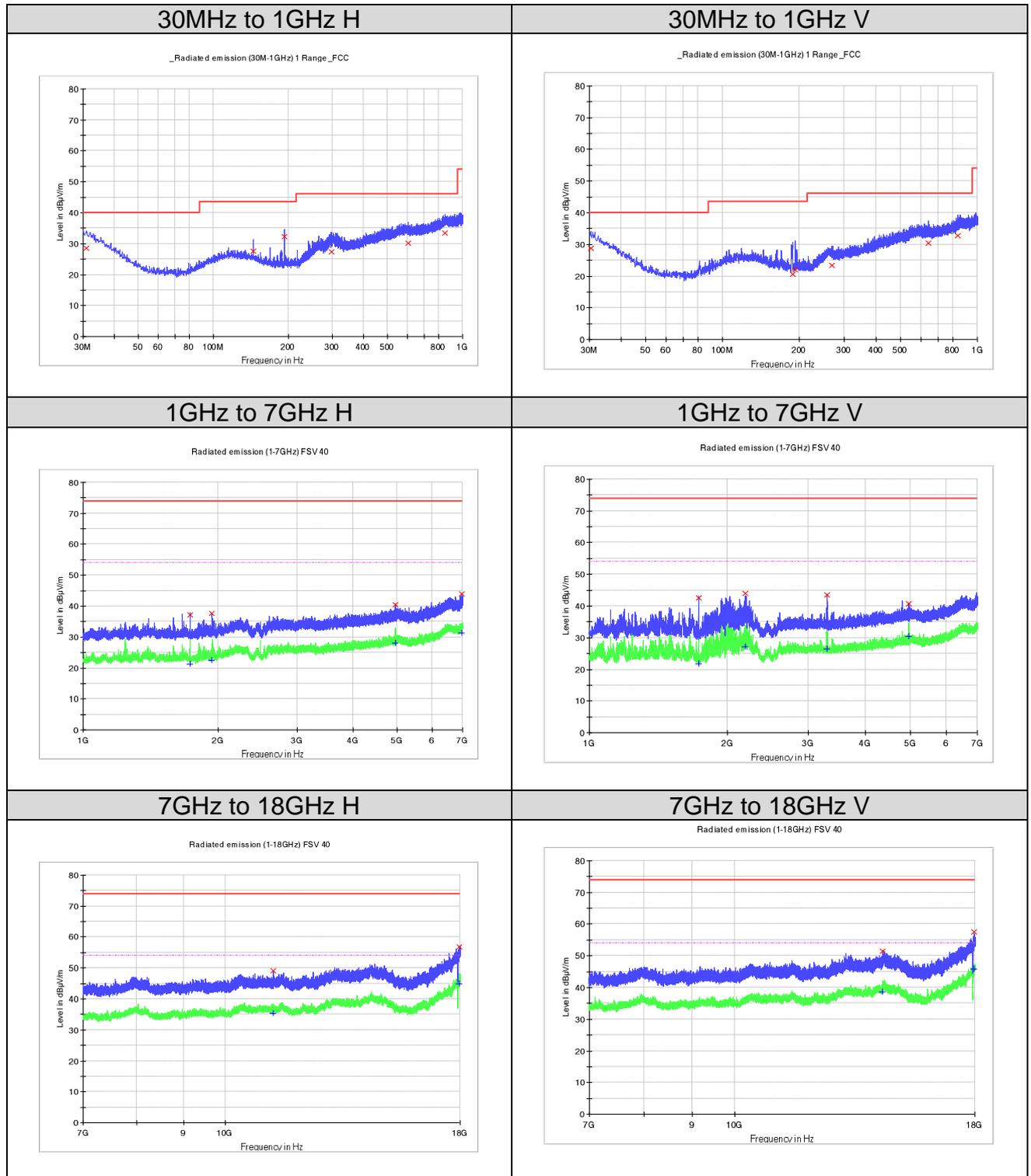
Frequency (MHz)	QuasiPeak (dBµV/m)	Pol	Corr. (dB/m)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
31.576250	28.1	H	24.8	12.0	40.0
144.338750	22.9	H	17.9	20.6	43.5
192.838750	32.1	H	16.0	11.4	43.5
309.360000	26.4	H	20.5	19.6	46.0
567.016250	30.3	H	26.6	15.8	46.0
841.647500	32.9	H	28.8	13.1	46.0
30.485000	28.7	V	25.4	11.3	40.0
124.332500	22.0	V	19.0	21.6	43.5
192.717500	21.4	V	16.0	22.1	43.5
561.923750	30.2	V	26.7	15.8	46.0
760.167500	31.1	V	27.6	14.9	46.0
891.360000	33.1	V	28.5	12.9	46.0

PK

Frequency (MHz)	MaxPeak (dBµV/m)	Pol	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
1800.181818	37.0	H	-18.8	37.0	74.0
2230.272727	38.7	H	-15.6	35.3	74.0
4891.545455	39.0	H	-11.3	35.0	74.0
6555.727273	43.6	H	-7.6	30.4	74.0
7973.843750	47.7	H	-3.6	26.3	74.0
17984.531250	57.2	H	12.1	16.8	74.0
2024.363636	42.6	V	-17.7	31.5	74.0
3287.636364	42.8	V	-14.9	31.2	74.0
4889.090909	41.5	V	-11.3	32.5	74.0
6562.000000	43.3	V	-7.6	30.7	74.0
8024.031250	47.9	V	-3.6	26.1	74.0
17968.718750	57.8	V	11.8	16.2	74.0

AV

Frequency (MHz)	Average (dBµV/m)	Pol	Corr. (dB/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1800.181818	21.1	H	-18.8	32.9	54.0
2230.272727	23.7	H	-15.6	30.3	54.0
4891.545455	27.1	H	-11.3	26.9	54.0
6555.727273	30.0	H	-7.6	24.0	54.0
7973.843750	34.7	H	-3.6	19.3	54.0
17984.531250	45.7	H	12.1	8.3	54.0
2024.363636	27.4	V	-17.7	26.6	54.0
3287.636364	26.2	V	-14.9	27.9	54.0
4889.090909	27.4	V	-11.3	26.6	54.0
6562.000000	30.4	V	-7.6	23.6	54.0
8024.031250	34.8	V	-3.6	19.2	54.0
17968.718750	45.6	V	11.8	8.5	54.0

Figure 12: Radiated Spurious Emission, 2480MHz


Limit and Margin
QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Pol	Corr. (dB/m)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30.970000	28.4	H	25.2	11.6	40.0
144.460000	27.6	H	17.9	15.9	43.5
192.596250	32.3	H	16.0	11.2	43.5
297.962500	27.4	H	20.2	18.6	46.0
603.270000	30.2	H	26.7	15.9	46.0
853.045000	33.3	H	29.0	12.7	46.0
30.363750	28.7	V	25.5	11.3	40.0
188.110000	20.6	V	16.0	22.9	43.5
192.596250	21.9	V	16.0	21.6	43.5
269.590000	23.4	V	20.4	22.6	46.0
641.585000	30.3	V	26.8	15.7	46.0
838.131250	32.8	V	28.7	13.3	46.0

PK

Frequency (MHz)	MaxPeak (dBµV/m)	Pol	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
1728.727273	37.3	H	-18.9	36.7	74.0
1937.636364	37.6	H	-18.1	36.4	74.0
4959.181818	40.4	H	-11.2	33.6	74.0
6978.727273	44.0	H	-6.7	30.0	74.0
11279.687500	49.2	H	-2.5	24.9	74.0
17947.750000	56.9	H	11.4	17.1	74.0
1729.272727	42.6	V	-18.9	31.4	74.0
2190.181818	43.9	V	-15.8	30.1	74.0
3288.181818	43.6	V	-14.9	30.4	74.0
4958.909091	40.6	V	-11.2	33.4	74.0
14368.625000	51.5	V	2.3	22.5	74.0
17971.468750	57.4	V	11.9	16.6	74.0

AV

Frequency (MHz)	Average (dBµV/m)	Pol	Corr. (dB/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1728.727273	21.2	H	-18.9	32.8	54.0
1937.636364	22.5	H	-18.1	31.5	54.0
4959.181818	28.0	H	-11.2	26.0	54.0
6978.727273	31.2	H	-6.7	22.8	54.0
11279.687500	35.3	H	-2.5	18.8	54.0
17947.750000	45.0	H	11.4	9.0	54.0
1729.272727	21.8	V	-18.9	32.2	54.0
2190.181818	27.2	V	-15.8	26.8	54.0
3288.181818	26.4	V	-14.9	27.6	54.0
4958.909091	30.3	V	-11.2	23.7	54.0
14368.625000	38.7	V	2.3	15.3	54.0
17971.468750	45.8	V	11.9	8.2	54.0

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