

Prüfbericht-Nr.: <i>Test report no.:</i>	CN253F07 001	Auftrags-Nr.: <i>Order no.:</i>	326063162	Seite 1 von 39 <i>Page 1 of 39</i>
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	1288983	Auftragsdatum: <i>Order date:</i>	2024-11-15	
Auftraggeber: <i>Client:</i>	IKEA of Sweden AB Box 702, SE-343 81 Älmhult, Sweden			
Prüfgegenstand: <i>Test item:</i>	Water Leakage Sensor			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	E2493			
Auftrags-Inhalt: <i>Order content:</i>	Test Report			
Prüfgrundlage: <i>Test specification:</i>	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: <i>Date of sample receipt:</i>	2024-11-14	Refer to photo document.		
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003864150-007~008			
Prüfzeitraum: <i>Testing period:</i>	2024-12-09 ~ 2025-02-10			
Ort der Prüfung: <i>Place of testing:</i>	TÜV Rheinland (Shanghai) Co., Ltd.			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shanghai) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	<input checked="" type="checkbox"/> <u>Hongfei Wu</u>	genehmigt von: <i>authorized by:</i>	<input checked="" type="checkbox"/> <u>Yanli Fan</u>	
Datum: <i>Date:</i>	2025-07-15 <small>Signed by: Hongfei Wu</small>	Datum: <i>Date:</i>	2025-07-15 <small>Signed by: Yanli Fan</small>	
Stellung / Position:	Sachverständige(r)/Expert	Stellung / Position:	Sachverständige(r)/Expert	
Sonstiges / Other:	FCC ID: FHO-E2493 IC: 10912A-E2493 HVIN: E2493 PMN: KLIPPBOK			
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>			
<small>* Legende: P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet</small>				
<small>* Legend: P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested</small>				
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Anmerkungen
Remarks

<p>1</p>	<p>Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden.</p> <p><i>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i></p>
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<p>3</p>	<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.</i> <i>Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i></p>
<p>4</p>	<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 115:2023, 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 115:2023, 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: N/A***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
G1811378	3m semi-anechoic chamber	SAC3	Frankonia	03.12.2028
G1811425	Bilog antenna	CBL 6112D	Teseq	20.04.2026
G1825371	Preamplifier	EMC051845SE	Taiwan EMCI	24.07.2025
G1825372	Preamplifier	EMC184045SE	Taiwan EMCI	24.07.2025
9059157	Double ridged broadband horn antenna	BBHA 9120 D	Schwarzbeck	16.03.2025
G1831065	Broadband horn antenna	BBHA 9170	Schwarzbeck	18.06.2028
G1822702	Spectrum analyser	FSV40	Rohde&Schwarz	15.07.2025
9053474	Signal generator	SMB100B (6 GHz)	Rohde & Schwarz	10.12.2025
9053476	Vector Signal generator	SMW200A	Rohde & Schwarz	10.12.2025
9053477	OSP	OSP-B157W8	Rohde & Schwarz	10.12.2025
9047770	Wireless connectivity tester	CMW270	Rohde & Schwarz	23.08.2025
G1811391	EMI test receiver	ESCI	Rohde&Schwarz	27.10.2025
software				
	EMC measurement software	EMC32 (Ver 10.60.20)	Rohde&Schwarz	NA
	EMC measurement software	EMC32 (Ver 11.40.00)	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	±3.39dB
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 water leakage sensor which supports Bluetooth and Thread.

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

3.2 Ratings and System Details

Table 3: Technical Specification of EUT

General Description of EUT	
Product Name:	Water Leakage Sensor
Model No.:	E2493
Operation Voltage:	DC 3V (2*AAA battery)
RF Technical:	1) BLE 2) Thread
Technical Specification of Thread	
Frequency Range:	2405~2480MHz
Modulation Type:	OQPSK
Antenna Type:	PCB Antenna
Antenna Gain:	-0.01 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. Thread transmitting 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
Thread	30

4.3 Special Accessories and Auxiliary Equipment

Table 6: Auxiliary Equipment

Equipment	Manufacturer	Model
Laptop	Lenovo	21AJ-S57N0J

4.4 Countermeasures to achieve EMC Compliance

Null.

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Page 13 of 39**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:	PCB Antenna
b) Manufacture:	N/A
c) Model No.:	N/A
d) Gain with reference to an isotropic radiator:	-0.01 dBi

Verdict: Pass

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

Date of testing : 2024-12-11
Ambient temperature : 21.6°C
Relative humidity : 51.6%
Atmospheric pressure : 101kPa
Test requirement : FCC Part 15.247(a)(2)
RSS-247 Issue 3, August 2023, Clause 5.2(a)
Test procedure : ANSI C63.10: 2013
Test voltage : DC 3V
Test modes applied : A

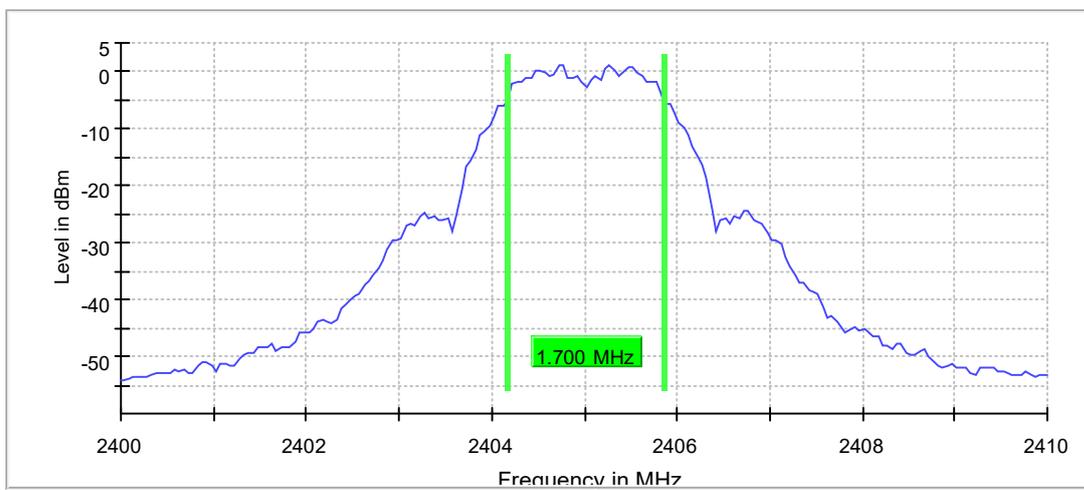
6dB Bandwidth, 2405MHz

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	---	2404.175000	2405.875000

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

DUT Frequency (MHz)	Max Level (dBm)	Result
2405.000000	1.1	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
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	0.02 dB	0.50 dB

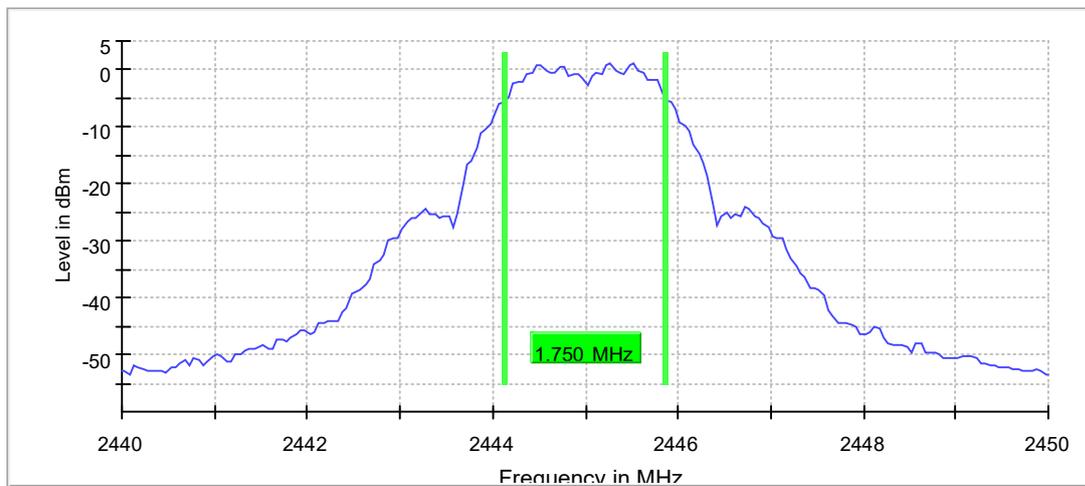
6dB Bandwidth, 2445MHz

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2445.000000	1.750000	0.500000	---	2444.125000	2445.875000

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

DUT Frequency (MHz)	Max Level (dBm)	Result
2445.000000	1.2	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 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	27 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.22 dB	0.50 dB

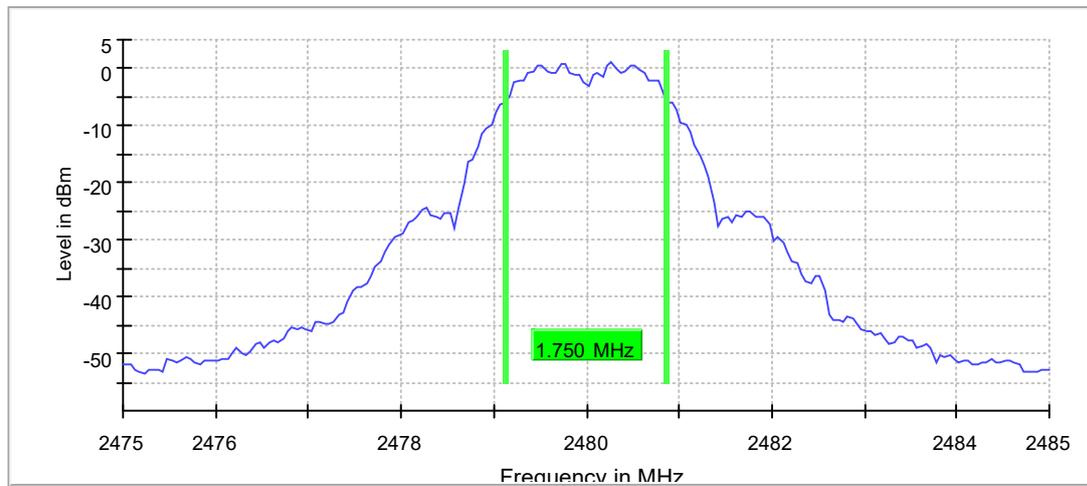
6dB Bandwidth, 2480MHz

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	1.0	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
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	28 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.00 dB	0.50 dB

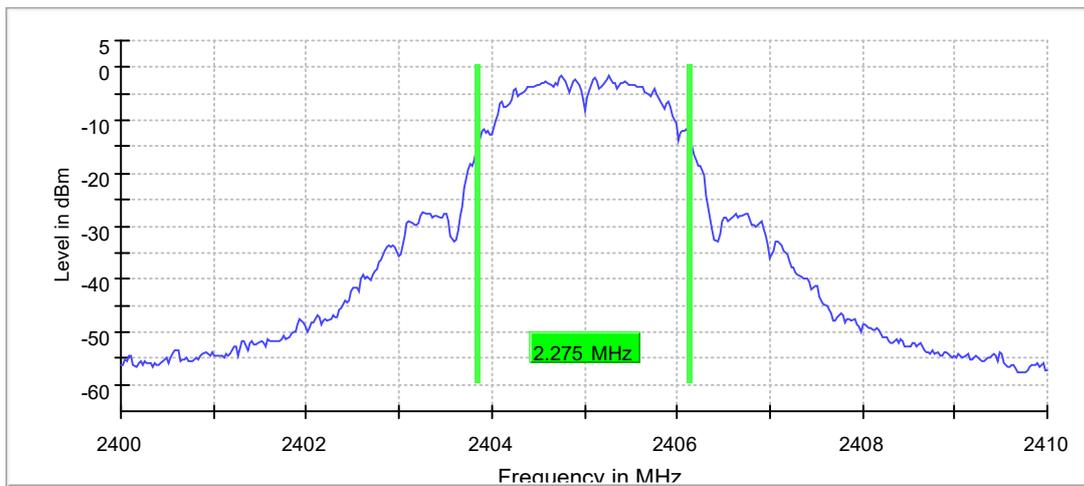
99% Occupied Channel Bandwidth, 2405MHz

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2405.000000	2.275000	---	---	2403.862500	2406.137500

(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	18 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.14 dB	0.30 dB

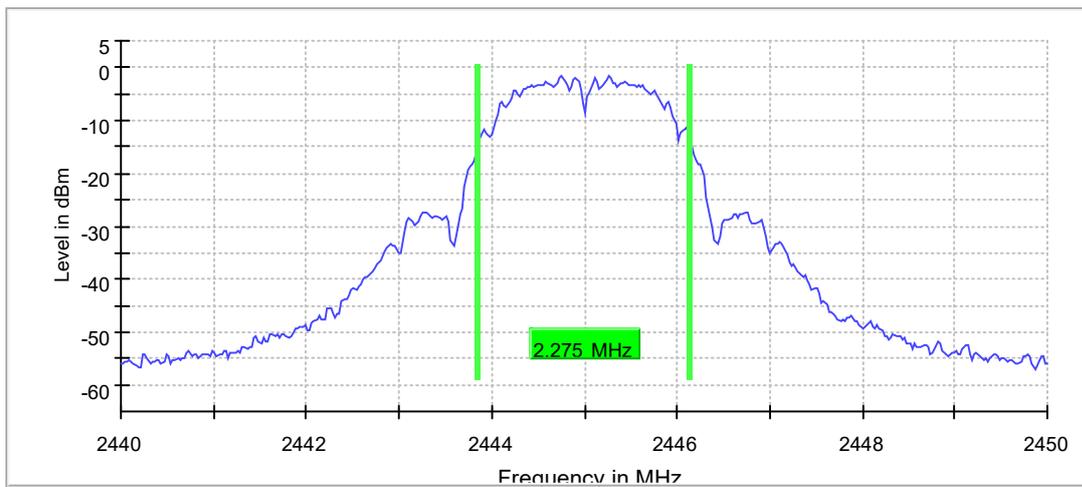
99% Occupied Channel Bandwidth, 2445MHz

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2445.000000	2.275000	---	---	2443.862500	2446.137500

(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	0.01 dB	0.30 dB

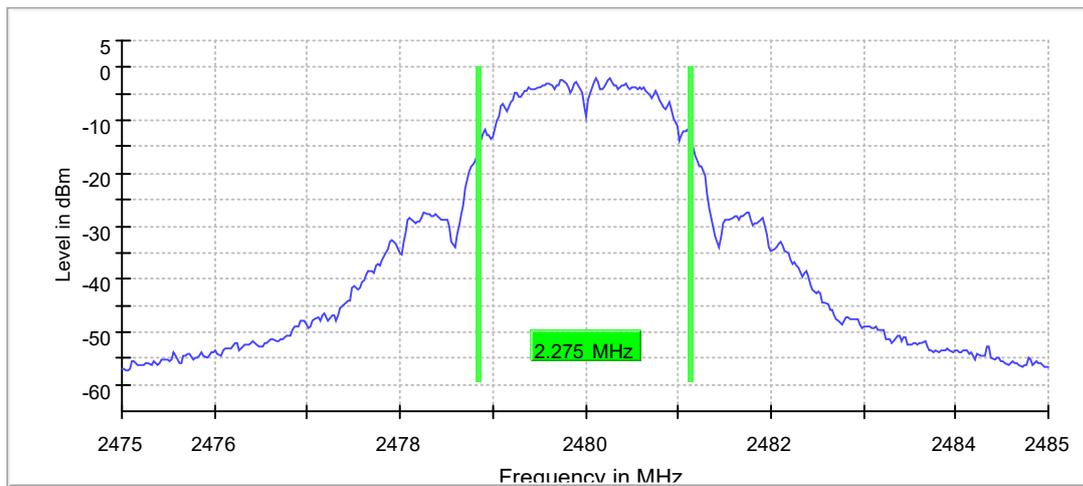
99% Occupied Channel Bandwidth, 2480MHz

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2480.000000	2.275000	---	---	2478.862500	2481.137500

(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	25 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.01 dB	0.30 dB

5.1.3 Output Power

RESULT:**Pass**

Date of testing : 2024-12-11
Ambient temperature : 21.6°C
Relative humidity : 51.6%
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 3V
Test modes applied : A

Table 8: Peak Output Power

Frequency [MHz]	Peak Conducted Output Power [dBm]	Limit [dBm]
2405	5.1	30
2445	4.9	30
2480	4.6	30

Note:

1. The cable loss is taken into account in results.
2. EIRP=Conducted Output Power + Antenna Gain (-0.01dBi), which is far below the 4 W (36dBm).

5.1.4 Power Spectral Density

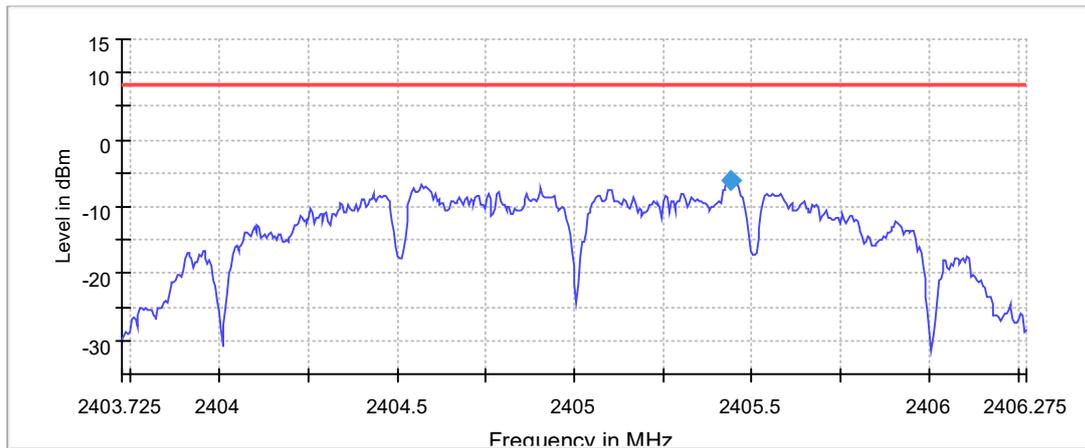
RESULT:**Pass**

Date of testing : 2024-12-11
Ambient temperature : 21.6°C
Relative humidity : 51.6%
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 3V
Test modes applied : A

Power Spectral Density, 2405MHz

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2405.000000	2405.442500	-6.225	8.0	PASS

Peak Power Spectral Density



— Limit — Sum Level ◆ PSD

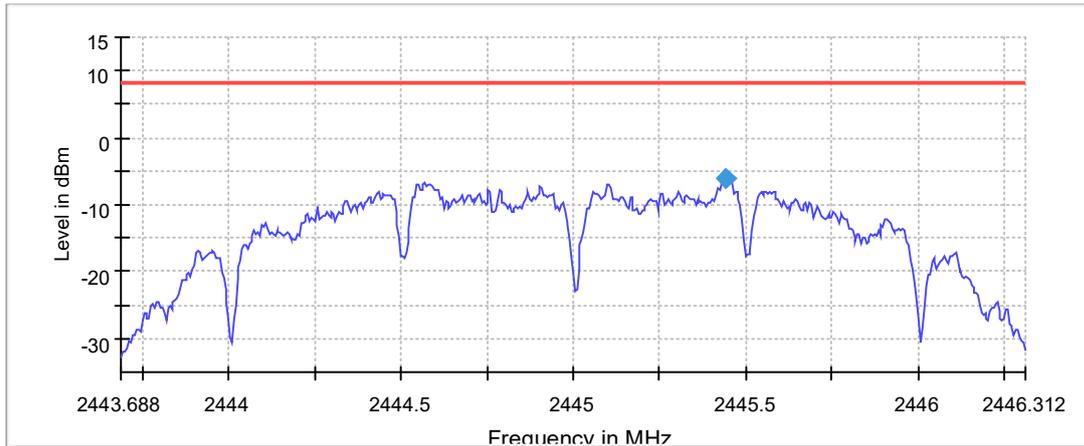
Measurement

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	10 / max. 150	max. 150
Stable	2 / 2	2
Max Stable Difference	0.50 dB	0.50 dB

Power Spectral Density, 2445MHz

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2445.000000	2445.445000	-6.115	8.0	PASS

Peak Power Spectral Density



— Limit — Sum Level ◆ PSD

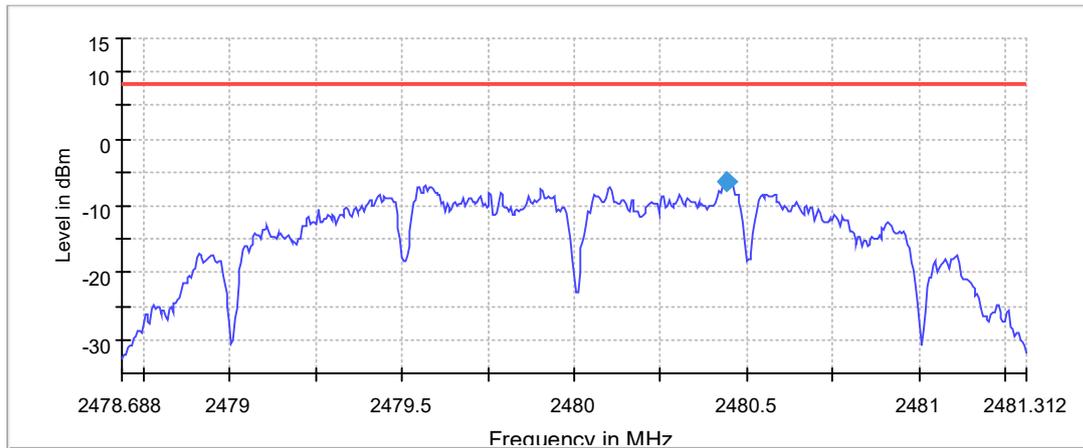
Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.44369 GHz	2.44369 GHz
Stop Frequency	2.44631 GHz	2.44631 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	13 / max. 150	max. 150
Stable	2 / 2	2
Max Stable Difference	0.20 dB	0.50 dB

Power Spectral Density, 2480MHz

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2480.000000	2480.445000	-6.430	8.0	PASS

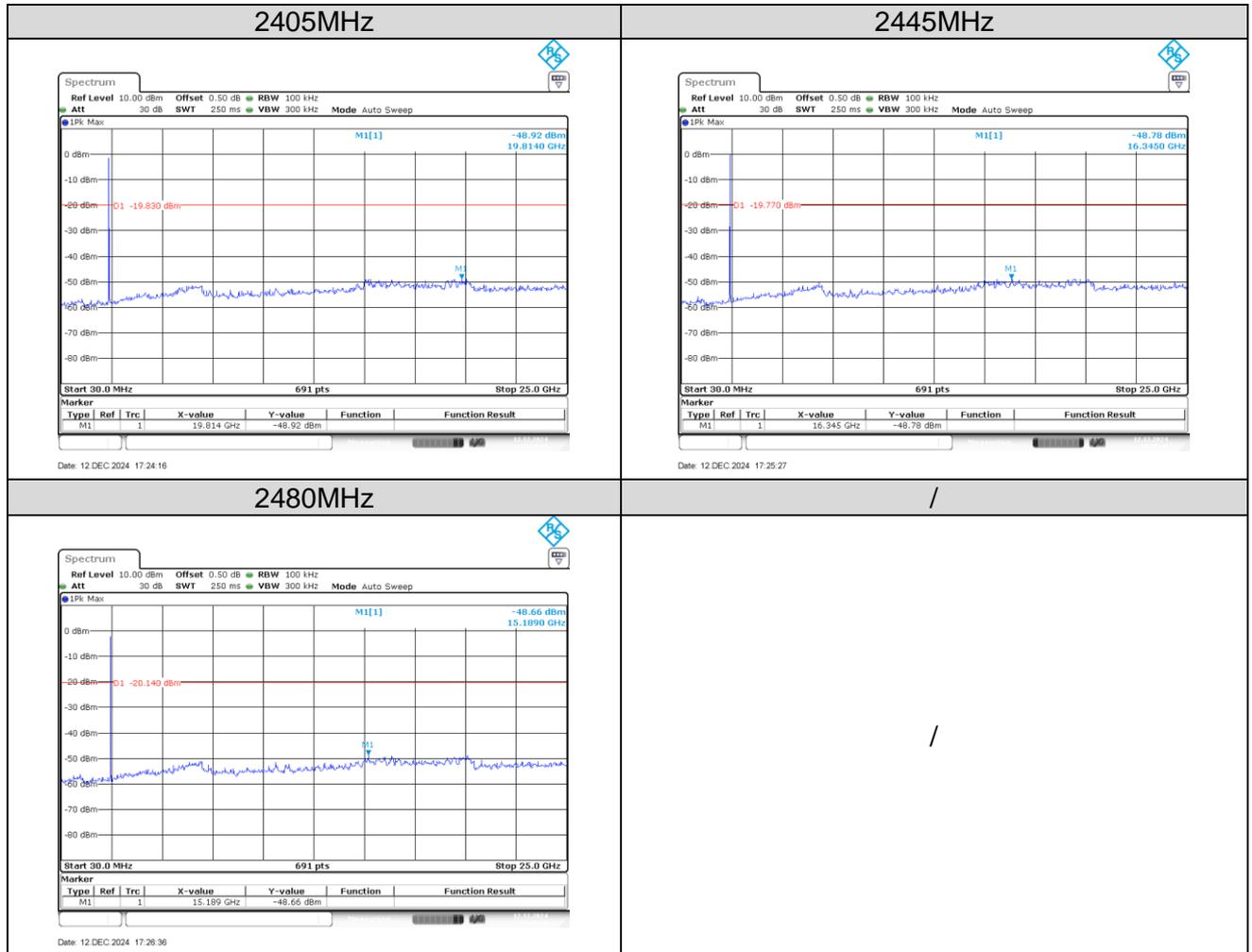
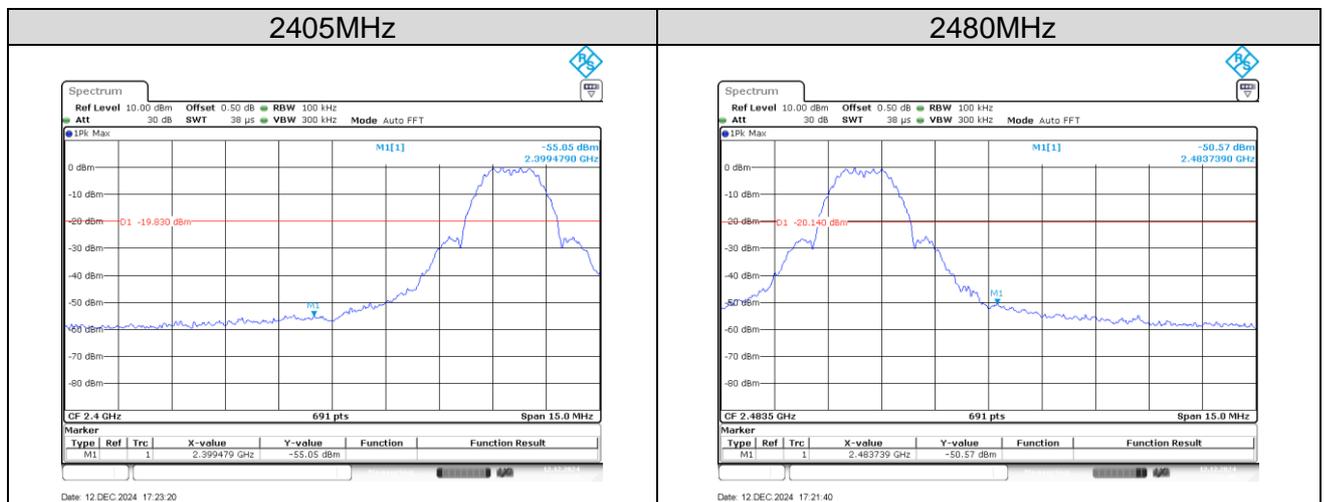
Peak Power Spectral Density



— 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
Sweptime	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	14 / max. 150	max. 150
Stable	2 / 2	2
Max Stable Difference	0.21 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:**N/A**

Date of testing : /
Ambient temperature : /
Relative humidity : /
Atmospheric pressure : /
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 : /
Test modes applied : /

Note: This product is power by battery, so it is not applicable for this test.

5.3 Emission in the Frequency Range above 30MHz

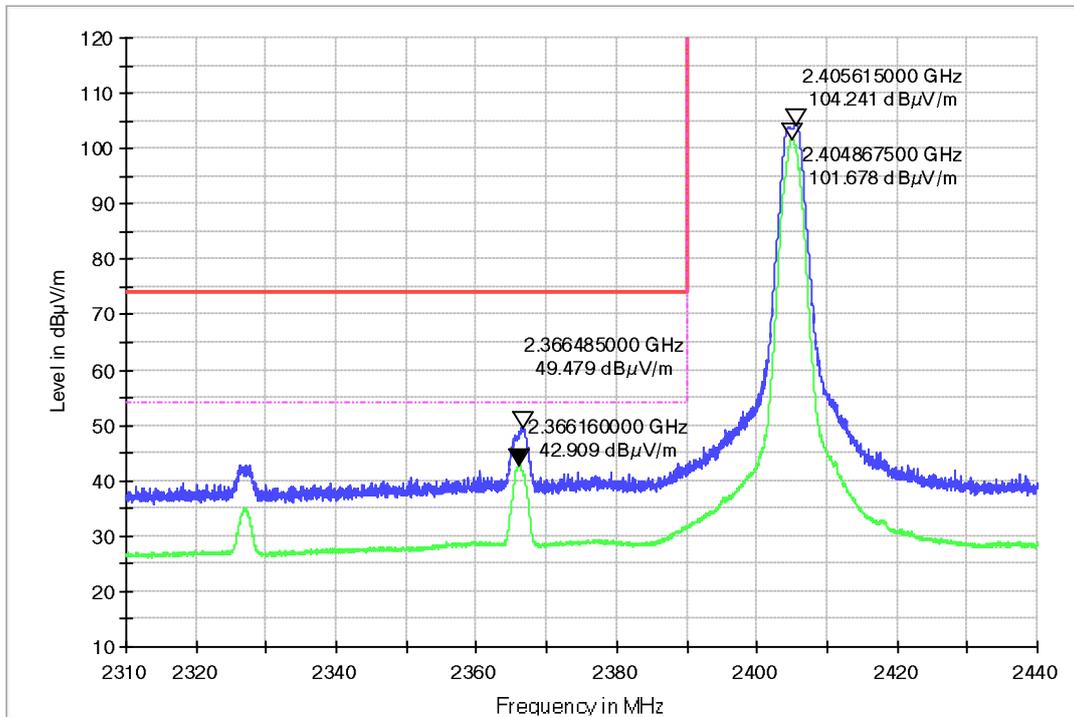
5.3.1 Radiated Band-Edge

RESULT:**Pass**

Date of testing	:	2024-12-09~2025-02-10
Ambient temperature	:	21.7~22.6°C
Relative humidity	:	52.1~54.3%
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 3V
Test modes applied	:	A

Figure 4: Radiated Band-Edge, 2405MHz, H

Copy of 2310` 2410 BE 1-18GHz_HL050_FSV40_Pre


Figure 5: Radiated Band-Edge, 2405MHz, V

Copy of 2310` 2410 BE 1-18GHz_HL050_FSV40_Pre

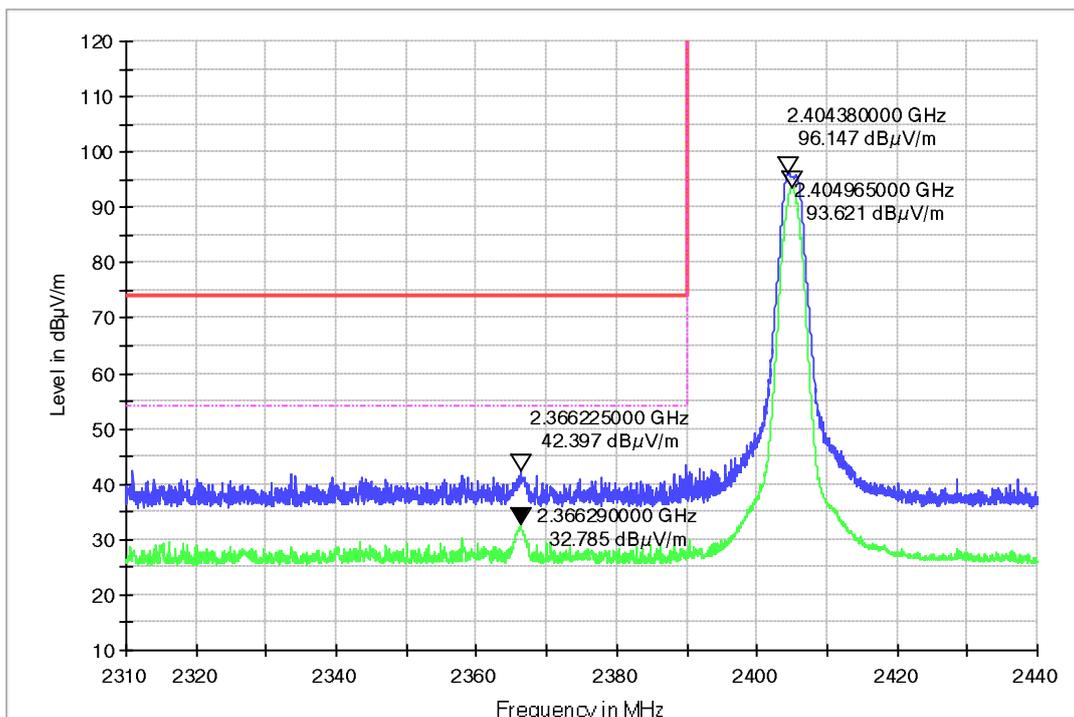
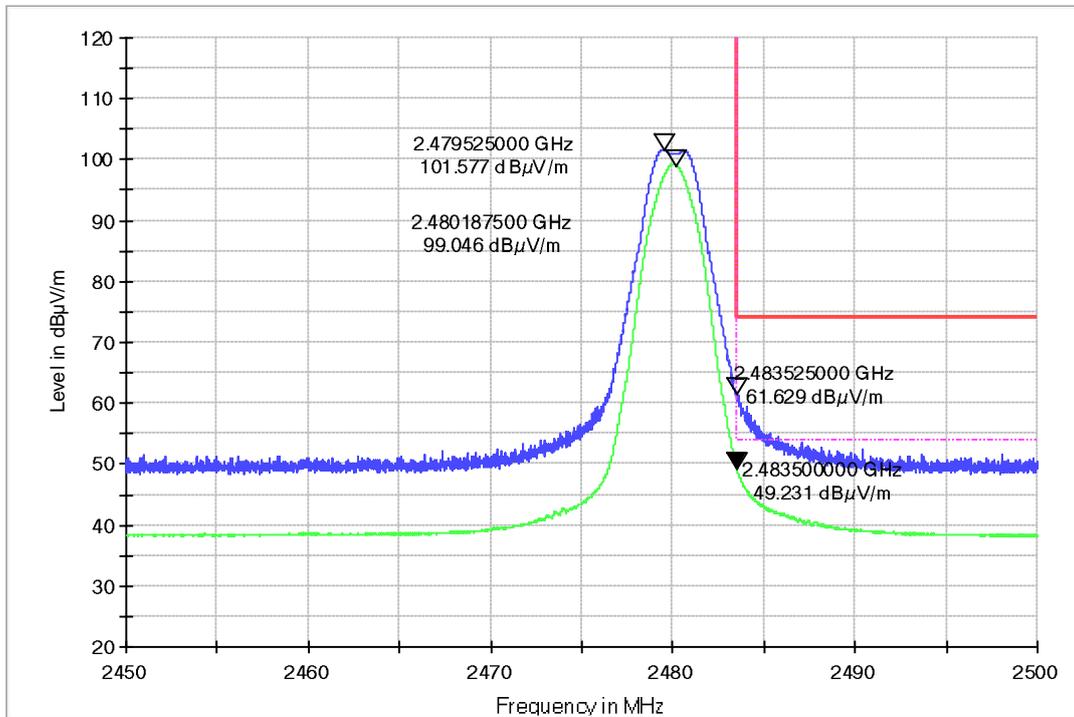
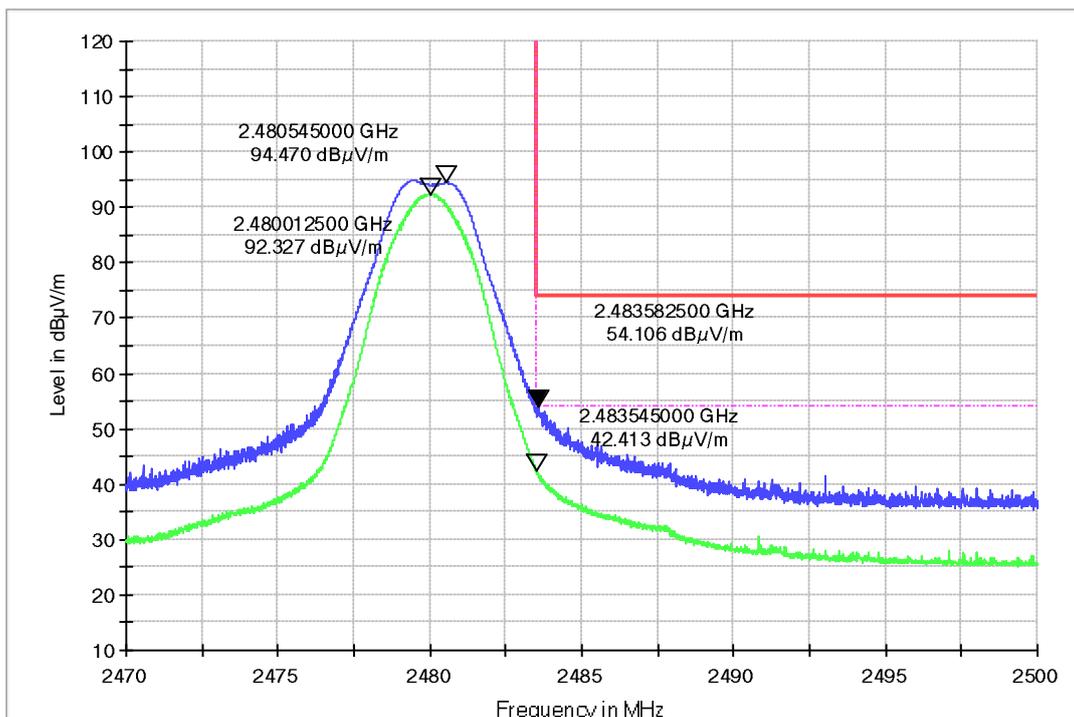


Figure 6: Radiated Band-Edge, 2480MHz, H

2470° 2500 BE_1-18GHz_HL050_FSV40_Pre


Figure 7: Radiated Band-Edge, 2480MHz, V

Copy of 2470° 2500 BE_1-18GHz_HL050_FSV40_Pre



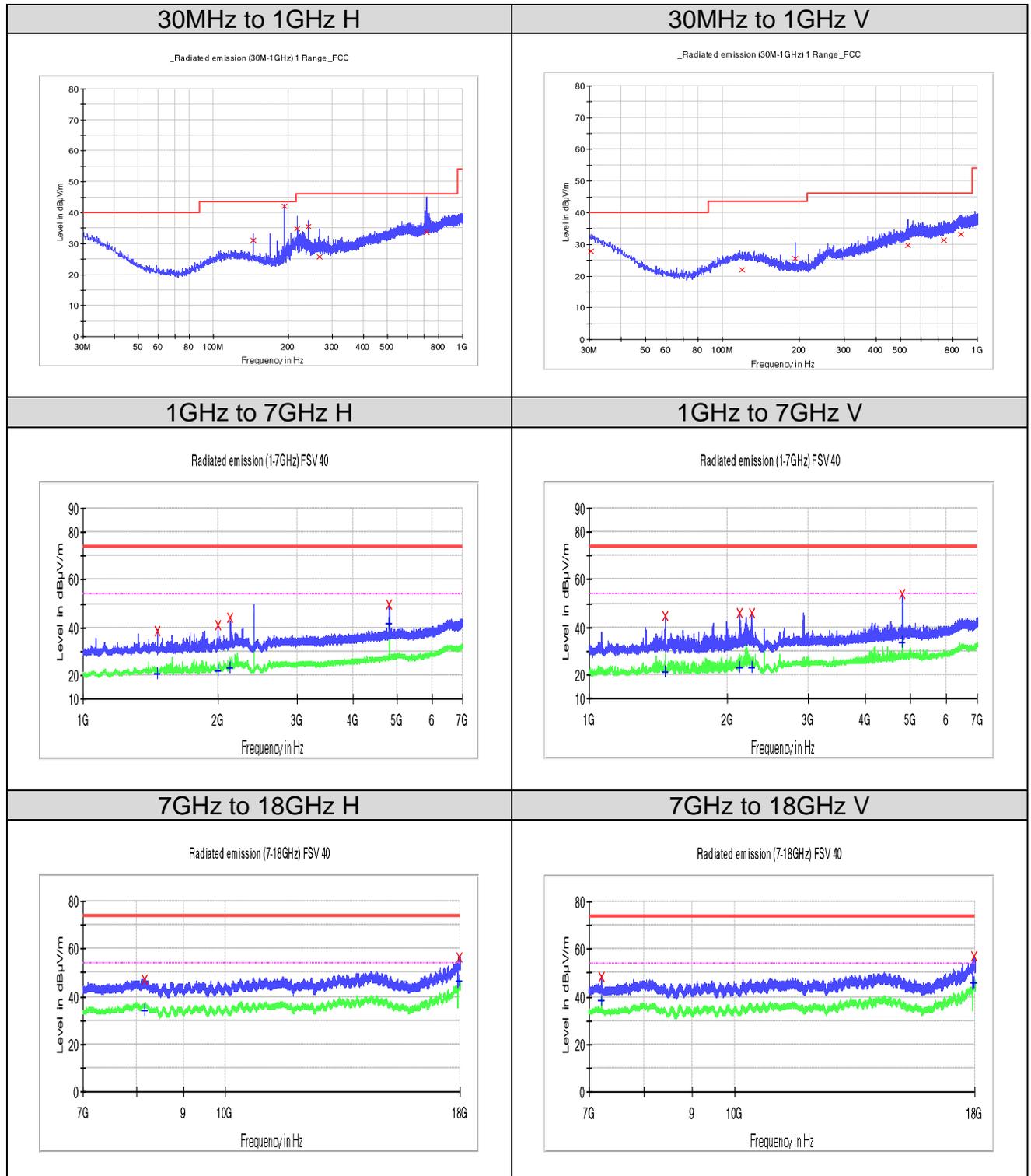
5.3.2 Radiated Spurious Emission

RESULT:**Pass**

Date of testing : 2024-12-09
Ambient temperature : 21.7°C
Relative humidity : 52.1%
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 3V
Test modes applied : A

Note:

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

Figure 8: Radiated Spurious Emission, 2405MHz


Limit and Margin
QP

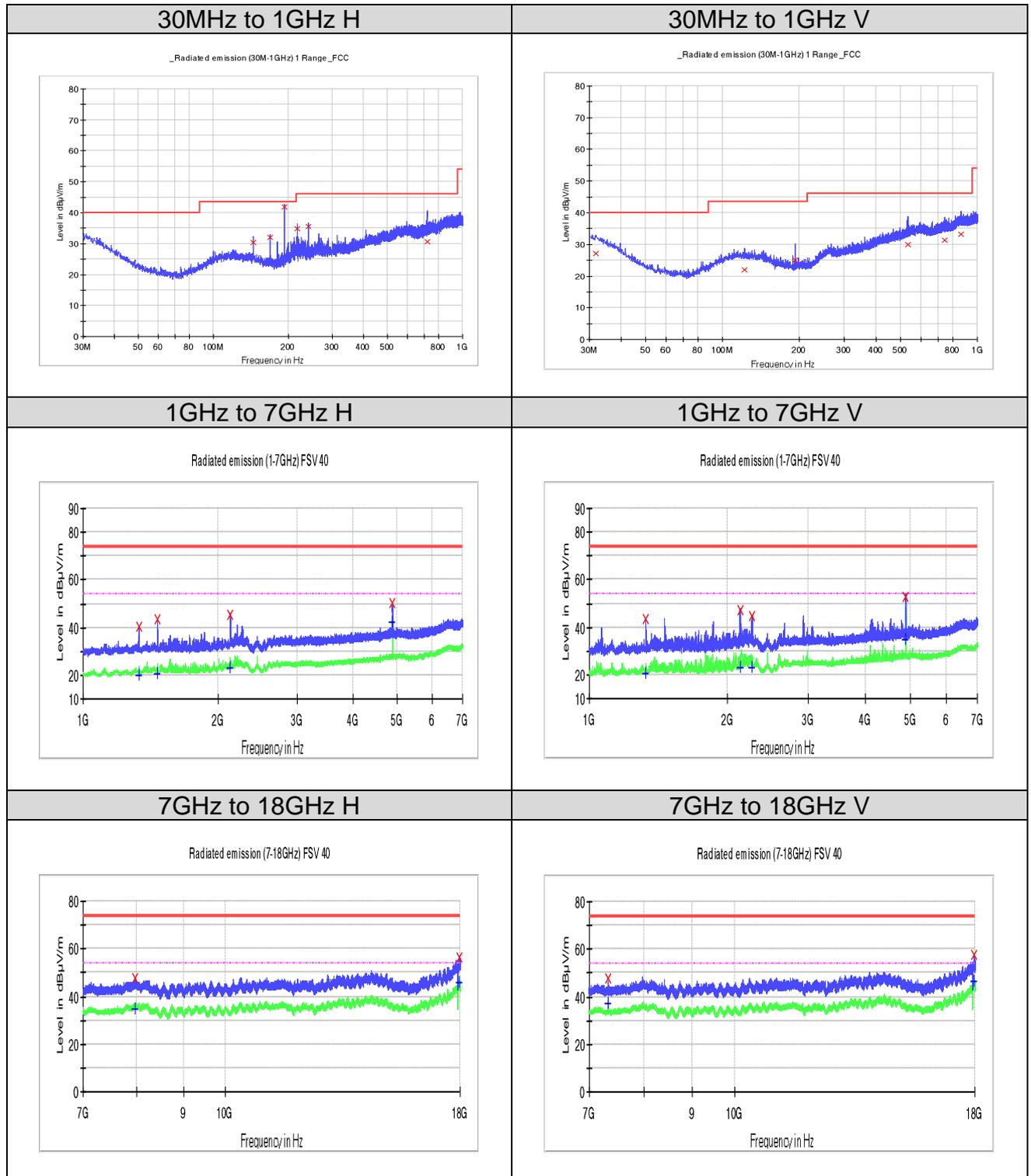
Frequency (MHz)	QuasiPeak (dBµV/m)	Pol	Corr. (dB/m)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
144.460000	31.0	H	17.9	12.5	43.5
192.717500	42.0	H	15.9	1.5	43.5
216.846250	35.0	H	16.0	11.0	46.0
240.732500	35.4	H	18.5	10.6	46.0
266.437500	25.7	H	20.5	20.3	46.0
718.093750	33.6	H	27.2	12.4	46.0
30.363750	27.9	V	24.6	12.1	40.0
119.118750	21.9	V	18.9	21.6	43.5
192.596250	25.6	V	15.9	17.9	43.5
532.702500	29.8	V	25.9	16.2	46.0
738.463750	31.2	V	27.6	14.8	46.0
864.078750	33.3	V	28.8	12.7	46.0

PK

Frequency (MHz)	MaxPeak (dBµV/m)	Pol	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
1465.000000	38.5	H	-18.7	35.5	74.0
1998.100000	40.7	H	-17.8	33.3	74.0
2124.400000	44.0	H	-16.6	30.0	74.0
4810.900000	49.6	H	-11.3	24.4	74.0
8171.843750	47.3	H	-4.5	26.7	74.0
17978.687500	56.7	H	12.0	17.3	74.0
1466.200000	45.0	V	-18.7	29.0	74.0
2123.800000	46.1	V	-16.6	27.9	74.0
2260.600000	45.7	V	-15.6	28.3	74.0
4810.900000	53.9	V	-11.3	20.1	74.0
7213.468750	48.5	V	-6.2	25.5	74.0
17963.906250	56.8	V	11.7	17.2	74.0

AV

Frequency (MHz)	Average (dBµV/m)	Pol	Corr. (dB/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1465.000000	20.7	H	-18.7	33.3	54.0
1998.100000	21.9	H	-17.8	32.1	54.0
2124.400000	23.0	H	-16.6	31.0	54.0
4810.900000	41.8	H	-11.3	12.2	54.0
8171.843750	34.3	H	-4.5	19.7	54.0
17978.687500	46.3	H	12.0	7.7	54.0
1466.200000	21.0	V	-18.7	33.0	54.0
2123.800000	22.9	V	-16.6	31.1	54.0
2260.600000	23.3	V	-15.6	30.7	54.0
4810.900000	33.6	V	-11.3	20.4	54.0
7213.468750	38.1	V	-6.2	15.9	54.0
17963.906250	46.0	V	11.7	8.0	54.0

Figure 9: Radiated Spurious Emission, 2445MHz


Limit and Margin
QP

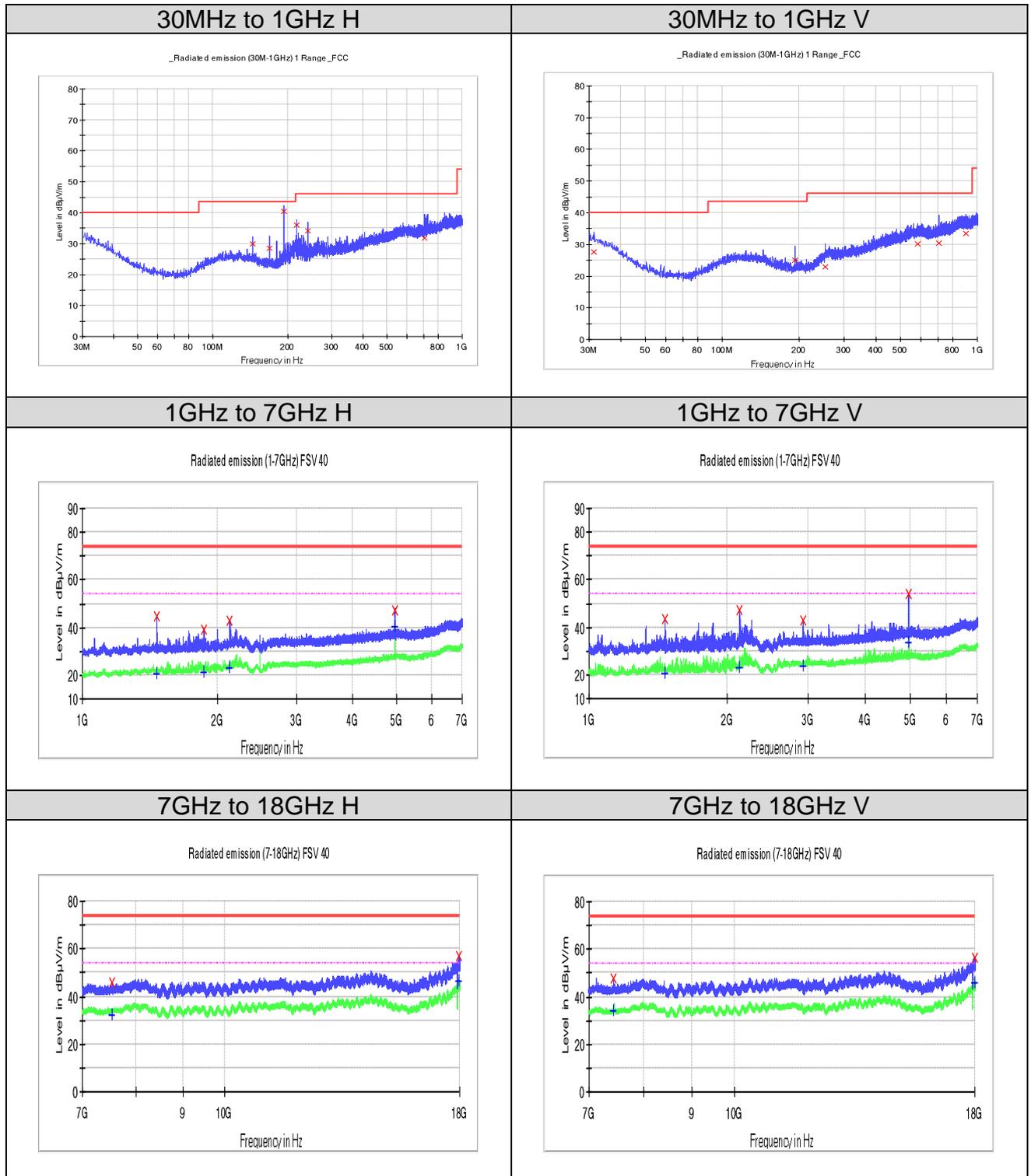
Frequency (MHz)	QuasiPeak (dBµV/m)	Pol	Corr. (dB/m)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
144.581250	30.4	H	17.9	13.1	43.5
168.467500	32.1	H	16.6	11.4	43.5
192.596250	42.0	H	15.9	1.5	43.5
216.603750	34.8	H	16.0	11.2	46.0
240.732500	35.5	H	18.5	10.5	46.0
720.155000	30.8	H	27.2	15.2	46.0
31.940000	27.2	V	23.9	12.8	40.0
121.907500	21.9	V	18.8	21.6	43.5
192.717500	25.1	V	15.9	18.4	43.5
533.187500	30.0	V	25.9	16.0	46.0
742.950000	31.3	V	27.7	14.7	46.0
865.170000	33.3	V	28.8	12.7	46.0

PK

Frequency (MHz)	MaxPeak (dBµV/m)	Pol	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
1332.100000	40.6	H	-18.8	33.4	74.0
1466.200000	43.8	H	-18.7	30.3	74.0
2123.200000	45.5	H	-16.7	28.5	74.0
4888.900000	50.1	H	-11.3	23.9	74.0
7977.625000	47.8	H	-3.6	26.3	74.0
17963.562500	56.3	H	11.7	17.7	74.0
1329.100000	43.4	V	-18.8	30.6	74.0
2130.700000	47.4	V	-16.5	26.6	74.0
2257.000000	44.9	V	-15.6	29.1	74.0
4888.900000	53.1	V	-11.3	20.9	74.0
7336.531250	47.7	V	-6.5	26.3	74.0
17973.531250	57.8	V	11.9	16.2	74.0

AV

Frequency (MHz)	Average (dBµV/m)	Pol	Corr. (dB/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1332.100000	20.0	H	-18.8	34.0	54.0
1466.200000	20.6	H	-18.7	33.4	54.0
2123.200000	22.8	H	-16.7	31.2	54.0
4888.900000	42.1	H	-11.3	11.9	54.0
7977.625000	35.0	H	-3.6	19.0	54.0
17963.562500	45.7	H	11.7	8.3	54.0
1329.100000	20.4	V	-18.8	33.6	54.0
2130.700000	23.0	V	-16.5	31.0	54.0
2257.000000	23.2	V	-15.6	30.8	54.0
4888.900000	35.1	V	-11.3	18.9	54.0
7336.531250	37.0	V	-6.5	17.0	54.0
17973.531250	46.4	V	11.9	7.7	54.0

Figure 10: Radiated Spurious Emission, 2480MHz


Limit and Margin
QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Pol	Corr. (dB/m)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
144.460000	30.0	H	17.9	13.5	43.5
168.467500	28.5	H	16.6	15.0	43.5
192.596250	40.4	H	15.9	3.1	43.5
216.846250	36.0	H	16.0	10.0	46.0
240.732500	34.2	H	18.5	11.8	46.0
707.545000	31.9	H	26.9	14.1	46.0
31.455000	27.5	V	24.1	12.5	40.0
192.596250	25.0	V	15.9	18.5	43.5
253.463750	22.9	V	19.9	23.1	46.0
581.566250	30.2	V	26.5	15.8	46.0
705.605000	30.5	V	26.9	15.5	46.0
901.545000	33.4	V	28.9	12.6	46.0

PK

Frequency (MHz)	MaxPeak (dBµV/m)	Pol	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
1462.600000	44.8	H	-18.7	29.2	74.0
1865.800000	39.1	H	-18.4	34.9	74.0
2127.400000	42.8	H	-16.6	31.2	74.0
4958.800000	47.0	H	-11.2	27.0	74.0
7545.187500	45.8	H	-5.9	28.2	74.0
17974.562500	57.0	H	11.9	17.0	74.0
1465.900000	43.7	V	-18.7	30.3	74.0
2127.100000	47.1	V	-16.6	26.9	74.0
2925.100000	43.2	V	-15.1	30.9	74.0
4958.800000	53.9	V	-11.2	20.1	74.0
7437.937500	47.8	V	-6.1	26.2	74.0
17986.593750	56.5	V	12.1	17.5	74.0

AV

Frequency (MHz)	Average (dBµV/m)	Pol	Corr. (dB/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1462.600000	20.8	H	-18.7	33.2	54.0
1865.800000	21.0	H	-18.4	33.0	54.0
2127.400000	23.0	H	-16.6	31.0	54.0
4958.800000	40.5	H	-11.2	13.5	54.0
7545.187500	32.2	H	-5.9	21.8	54.0
17974.562500	46.4	H	11.9	7.7	54.0
1465.900000	20.5	V	-18.7	33.5	54.0
2127.100000	23.0	V	-16.6	31.0	54.0
2925.100000	23.5	V	-15.1	30.5	54.0
4958.800000	33.9	V	-11.2	20.1	54.0
7437.937500	34.0	V	-6.1	20.1	54.0
17986.593750	45.8	V	12.1	8.2	54.0

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