

<b>Prüfbericht-Nr.:</b> Test report no.:	<b>CN24DP76 001</b>	<b>Auftrags-Nr.:</b> Order no.:	326050137	Seite 1 von 39 Page 1 of 39
<b>Kunden-Referenz-Nr.:</b> Client reference no.:	1288983	<b>Auftragsdatum:</b> Order date:	2024-09-03	
<b>Auftraggeber:</b> Client:	<b>IKEA of Sweden AB</b> Box 702, SE-343 81 Älmhult, Sweden			
<b>Prüfgegenstand:</b> Test item:	Remote Control (Scroll Wheel)			
<b>Bezeichnung / Typ-Nr.:</b> Identification / Type no.:	E2490			
<b>Auftrags-Inhalt:</b> Order content:	Test Report			
<b>Prüfgrundlage:</b> 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			
<b>Wareneingangsdatum:</b> Date of sample receipt:	2024-09-09	Refer to photo document.		
<b>Prüfmuster-Nr.:</b> Test sample no.:	A003813660-006~007			
<b>Prüfzeitraum:</b> Testing period:	2024-11-08 ~ 2024-11-13			
<b>Ort der Prüfung:</b> Place of testing:	TÜV Rheinland (Shanghai) Co., Ltd.			
<b>Prüflaboratorium:</b> Testing laboratory:	TÜV Rheinland (Shanghai) Co., Ltd.			
<b>Prüfergebnis*:</b> Test result*:	Pass			
<b>geprüft von:</b> tested by:	<input checked="" type="checkbox"/> <u>Hongfei Wu</u>	<b>genehmigt von:</b> authorized by:	<input checked="" type="checkbox"/> <u>Elliot Zhang</u>	
<b>Datum:</b> Date:	2025-07-17 <small>Signed by: Hongfei Wu</small>	<b>Datum:</b> Date:	2025-07-17 <small>Signed by: Elliot Zhang</small>	
<b>Stellung / Position:</b>	Sachverständige(r)/Expert	<b>Stellung / Position:</b>	Sachverständige(r)/Expert	
<b>Sonstiges / Other:</b>	FCC ID: FHO-E2490 IC: 10912A-E2490 HVIN: E2490 PMN: BILRESA			
<b>Zustand des Prüfgegenstandes bei Anlieferung:</b> Condition of the test item at delivery:	Prüfmuster vollständig und unbeschädigt Test item complete and undamaged			
* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
* 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
<b>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.</b> <i>This test report only relates to the a. m. 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.</i>				

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Test report no.:

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**Anmerkungen**  
*Remarks*

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<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.  
No.14 building and north half of No.10 workshop building, No.525, Yuewang Lingang South Road, Pingqian (Taicang) Modern Industrial Park, Shaxi Town, Taicang City, Jiangsu Province, P.R. 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	03.12.2026
G1811391	EMI test receiver	ESCI	Rohde&Schwarz	16.10.2024
G1811425	Bilog antenna	CBL 6112D	Teseq	20.04.2026
G1825371	Preamplifier	EMC051845SE	Taiwan EMCI	24.07.2025
G1822694	Double ridged broadband horn antenna	BBHA 9120 D	Schwarzbeck	24.03.2026
G1825372	Preamplifier	EMC184045SE	Taiwan EMCI	24.07.2025
G1831065	Broadband horn antenna	BBHA 9170	Schwarzbeck	18.06.2028
G1822702	Spectrum analyser	FSV40	Rohde&Schwarz	15.07.2025
9053477	OSP	OSP-B157W8	Rohde & Schwarz	15.12.2024
9053474	Signal generator	SMB100B (6 GHz)	Rohde & Schwarz	15.12.2024
9053476	Vector Signal generator	SMW200A	Rohde & Schwarz	15.12.2024
9047770	Wireless connectivity tester	CMW270	Rohde & Schwarz	23.08.2025
software				
EMC-S-036	RF measurement software	WMS32-WB (11.40.00)	Rohde & Schwarz	NA
9062745	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	±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 remote control and which support Bluetooth, Zigbee and Thread function.

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:	Remote Control (Scroll Wheel)
Model No.:	E2490
Operation Voltage:	DC 3V (2*AAA battery)
RF Technical:	1) BLE 2) Zigbee 3) Thread
Technical Specification of Thread	
Frequency Range:	2405~2480MHz
Modulation Type:	OQPSK
Antenna Type:	Stamping Antenna
Antenna Gain:	2.45 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. On, Thread transmitting mode
- B. Off

### **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	3 dBm

### 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.

## 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 stamping antenna, the directional gain of antenna is 2.45 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: Stamping 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 stamping 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

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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:	Stamping Antenna
b) Manufacture:	N/A
c) Model No.:	N/A
d) Gain with reference to an isotropic radiator:	2.45 dBi

Verdict: **PASS**

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

Date of testing : 2024-11-08  
Ambient temperature : 20.1°C  
Relative humidity : 51.3%  
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

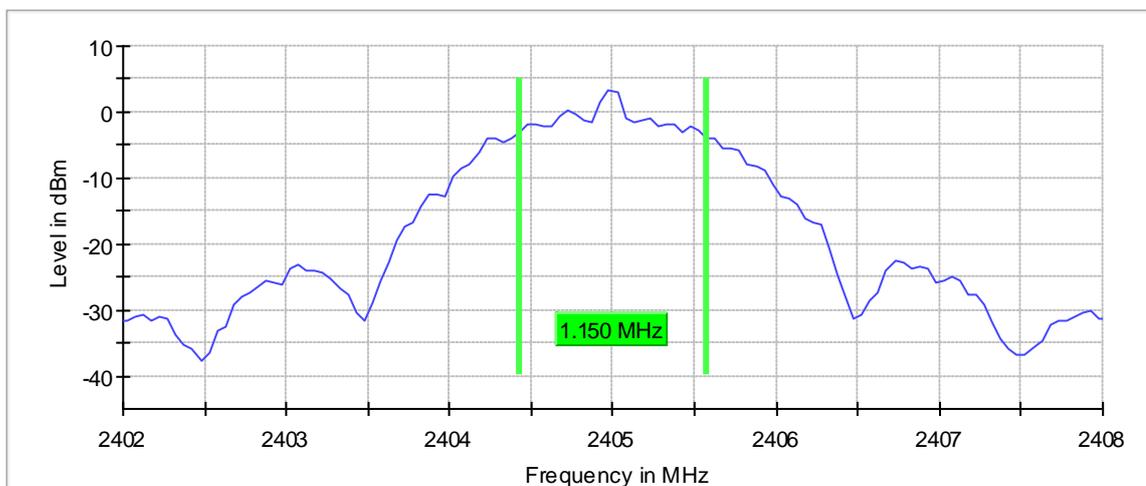
**6dB Bandwidth, 2405MHz**

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2405.000000	1.150000	0.500000	---	2404.425000	2405.575000

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

DUT Frequency (MHz)	Max Level (dBm)	Result
2405.000000	3.3	PASS

6 dB Bandwidth


**Measurement**

Setting	Instrument Value	Target Value
Start Frequency	2.40200 GHz	2.40200 GHz
Stop Frequency	2.40800 GHz	2.40800 GHz
Span	6.000 MHz	6.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	120	~ 120
SweepTime	18.984 1/4 s	AUTO
Reference Level	20.000 dBm	20.000 dBm
Attenuation	40.000 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	35 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.00 dB	0.50 dB

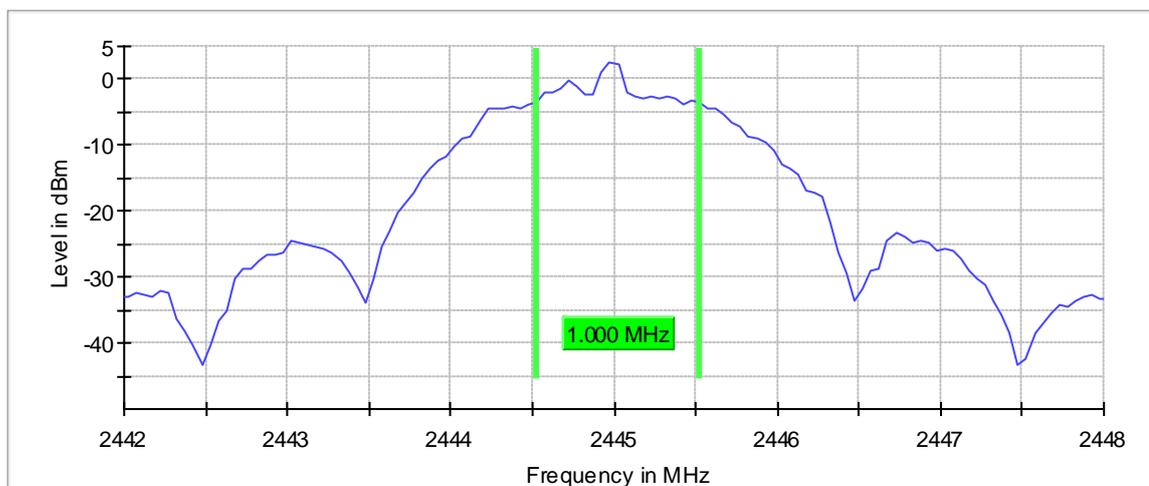
**6dB Bandwidth, 2445MHz**

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2445.000000	1.000000	0.500000	---	2444.525000	2445.525000

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

DUT Frequency (MHz)	Max Level (dBm)	Result
2445.000000	2.7	PASS

6 dB Bandwidth


**Measurement**

Setting	Instrument Value	Target Value
Start Frequency	2.44200 GHz	2.44200 GHz
Stop Frequency	2.44800 GHz	2.44800 GHz
Span	6.000 MHz	6.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	120	~ 120
SweepTime	18.984 1/4 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	22 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.27 dB	0.50 dB

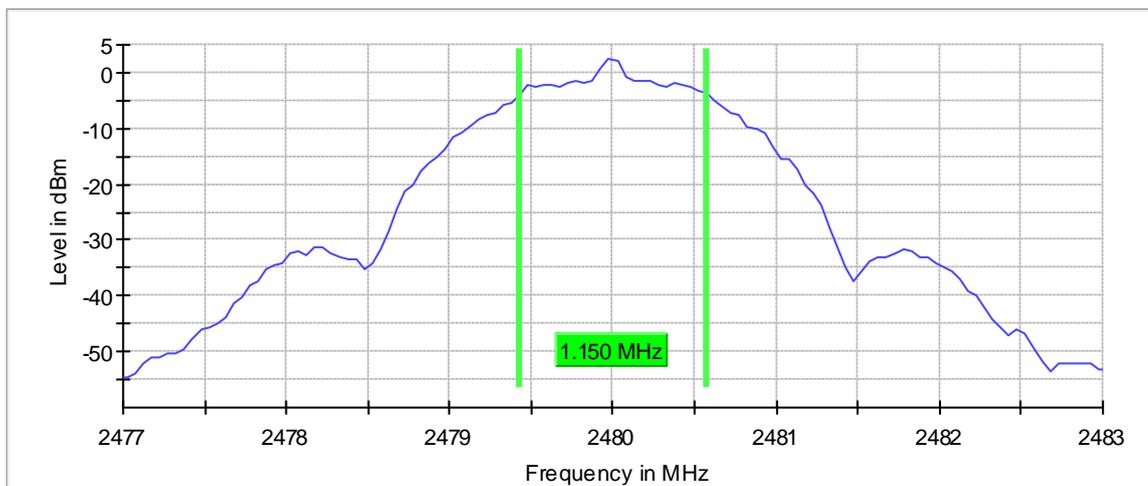
**6dB Bandwidth, 2480MHz**

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2480.000000	1.150000	0.500000	---	2479.425000	2480.575000

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

DUT Frequency (MHz)	Max Level (dBm)	Result
2480.000000	2.4	PASS

6 dB Bandwidth


**Measurement**

Setting	Instrument Value	Target Value
Start Frequency	2.47700 GHz	2.47700 GHz
Stop Frequency	2.48300 GHz	2.48300 GHz
Span	6.000 MHz	6.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	120	~ 120
Sweeptime	18.984 1/4 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	29 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.15 dB	0.50 dB

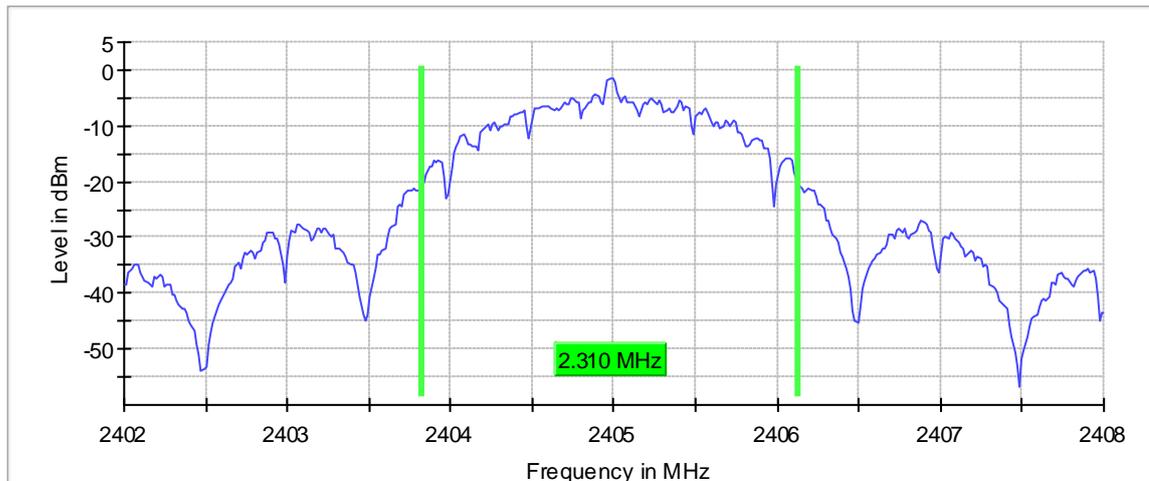
**99% Occupied Channel Bandwidth, 2405MHz**

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2405.000000	2.310000	---	---	2403.822500	2406.132500

(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	2.40200 GHz	2.40200 GHz
Stop Frequency	2.40800 GHz	2.40800 GHz
Span	6.000 MHz	6.000 MHz
RBW	30.000 kHz	>= 30.000 kHz
VBW	100.000 kHz	>= 90.000 kHz
SweepPoints	400	~ 400
Sweeptime	63.216 $\hat{1}$ / <sub>s</sub>	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	35 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.30 dB

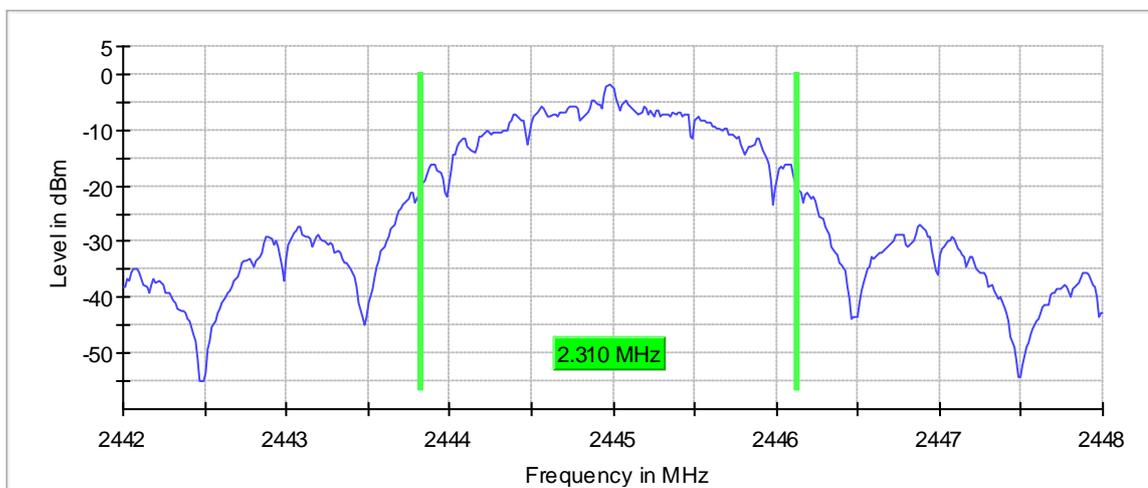
**99% Occupied Channel Bandwidth, 2445MHz**

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2445.000000	2.310000	---	---	2443.822500	2446.132500

(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	2.44200 GHz	2.44200 GHz
Stop Frequency	2.44800 GHz	2.44800 GHz
Span	6.000 MHz	6.000 MHz
RBW	30.000 kHz	>= 30.000 kHz
VBW	100.000 kHz	>= 90.000 kHz
SweepPoints	400	~ 400
SweepTime	63.216 1/4 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	0.30 dB	0.30 dB
Run	55 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.21 dB	0.30 dB

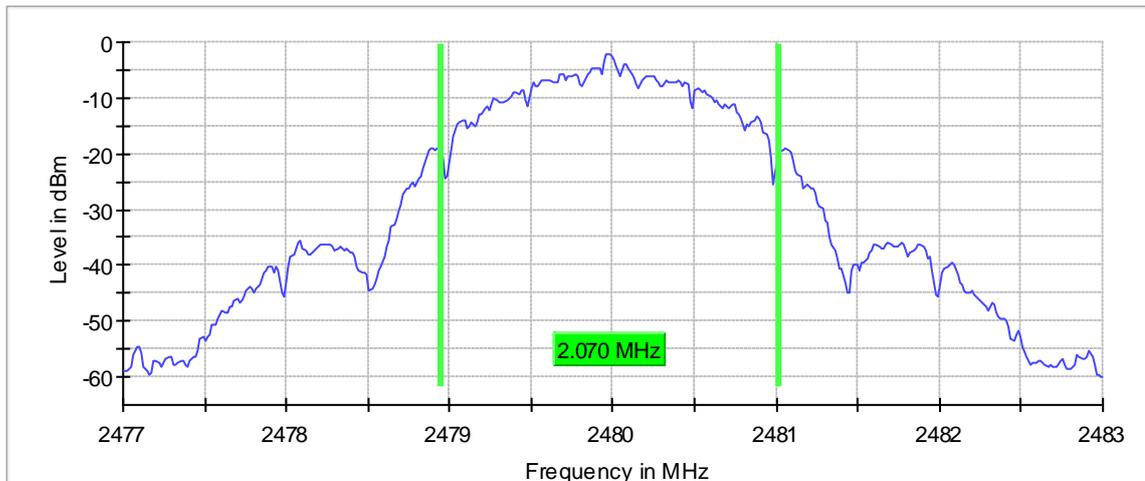
**99% Occupied Channel Bandwidth, 2480MHz**

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2480.000000	2.070000	---	---	2478.942500	2481.012500

(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	2.47700 GHz	2.47700 GHz
Stop Frequency	2.48300 GHz	2.48300 GHz
Span	6.000 MHz	6.000 MHz
RBW	30.000 kHz	>= 30.000 kHz
VBW	100.000 kHz	>= 90.000 kHz
SweepPoints	400	~ 400
Sweeptime	63.216 $\frac{1}{4}$ 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	0.30 dB	0.30 dB
Run	38 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.14 dB	0.30 dB



### 5.1.4 Power Spectral Density

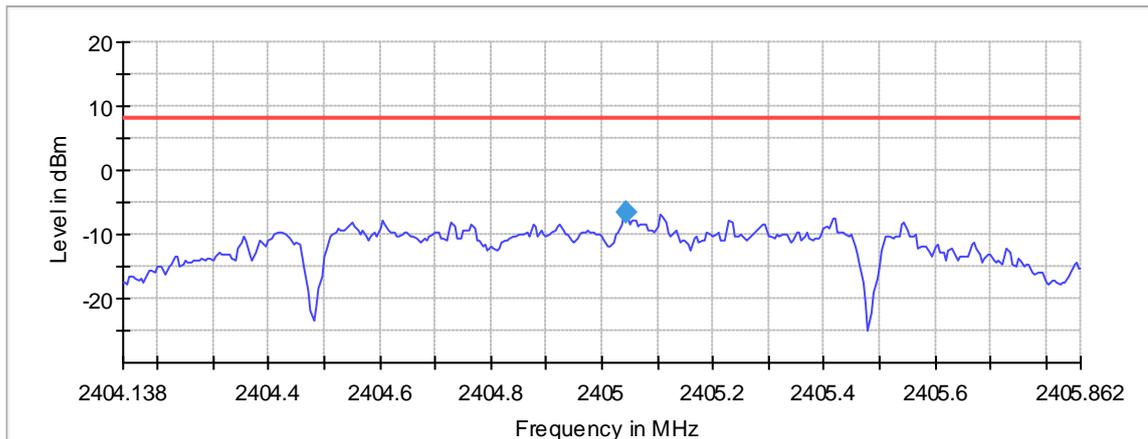
**RESULT:****Pass**

Date of testing : 2024-11-08  
Ambient temperature : 20.1°C  
Relative humidity : 51.3%  
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	2405.045000	-6.519	8.0	PASS

Peak Power Spectral Density



— Limit    — Sum Level    ◆ PSD

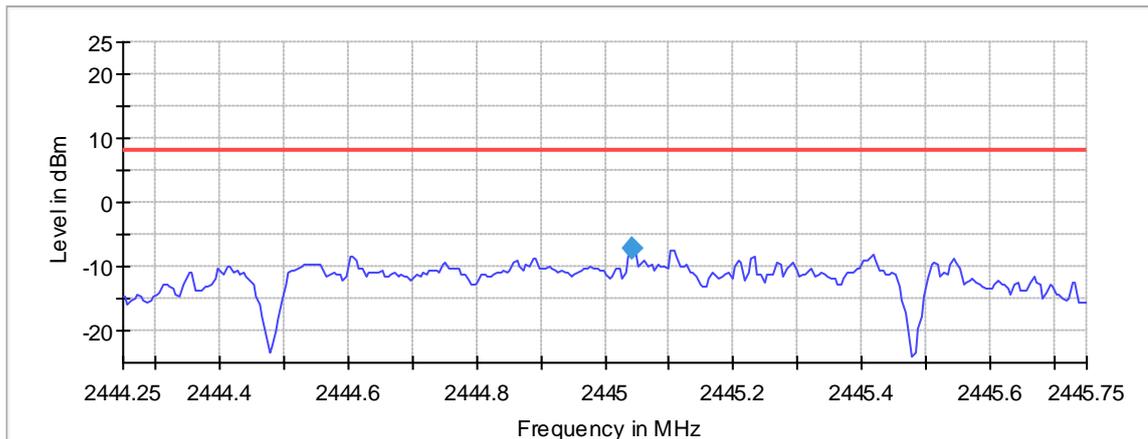
**Measurement**

Setting	Instrument Value	Target Value
Start Frequency	2.40414 GHz	2.40414 GHz
Stop Frequency	2.40586 GHz	2.40586 GHz
Span	1.725 MHz	1.725 MHz
RBW	10.000 kHz	<= 10.000 kHz
VBW	30.000 kHz	>= 30.000 kHz
SweepPoints	345	~ 345
SweepTime	1.730 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	39 / max. 150	max. 150
Stable	2 / 2	2
Max Stable Difference	0.45 dB	0.50 dB

**Power Spectral Density, 2445MHz**

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2445.000000	2445.042500	-7.233	8.0	PASS

Peak Power Spectral Density



— Limit   
 — Sum Level   
 ◆ PSD

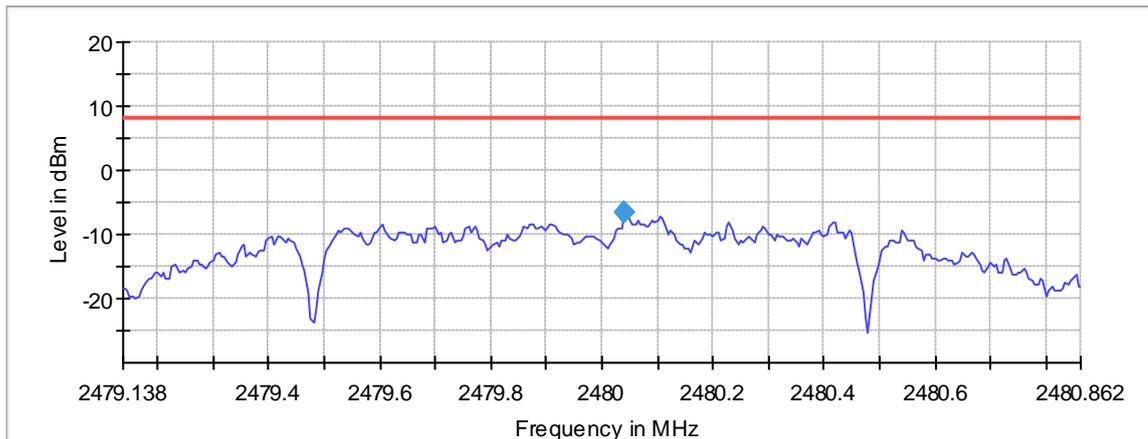
**Measurement**

Setting	Instrument Value	Target Value
Start Frequency	2.44425 GHz	2.44425 GHz
Stop Frequency	2.44575 GHz	2.44575 GHz
Span	1.500 MHz	1.500 MHz
RBW	10.000 kHz	<= 10.000 kHz
VBW	30.000 kHz	>= 30.000 kHz
SweepPoints	300	~ 300
Sweeptime	1.500 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	34 / max. 150	max. 150
Stable	2 / 2	2
Max Stable Difference	0.44 dB	0.50 dB

**Power Spectral Density, 2480MHz**

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2480.000000	2480.040000	-6.415	8.0	PASS

Peak Power Spectral Density

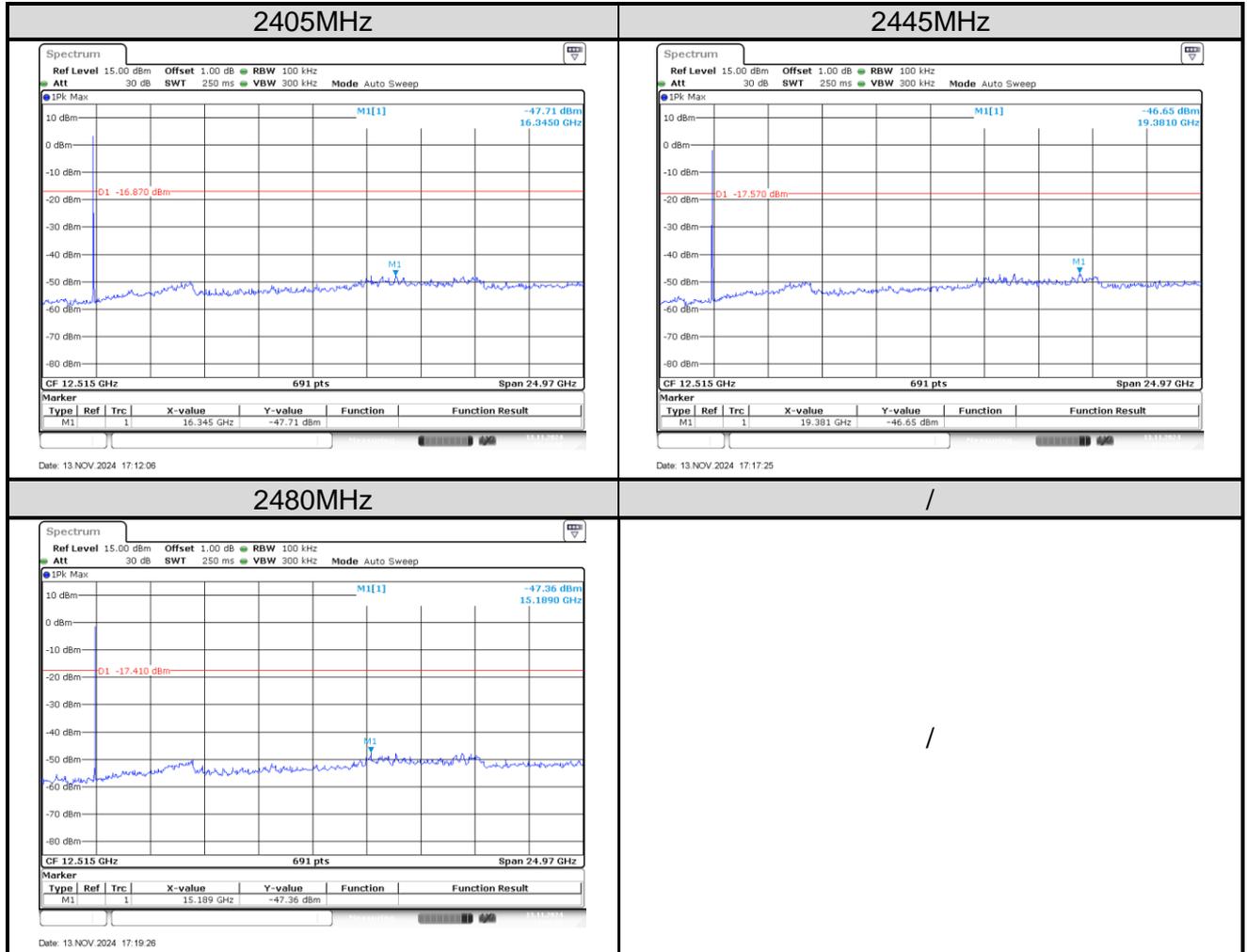
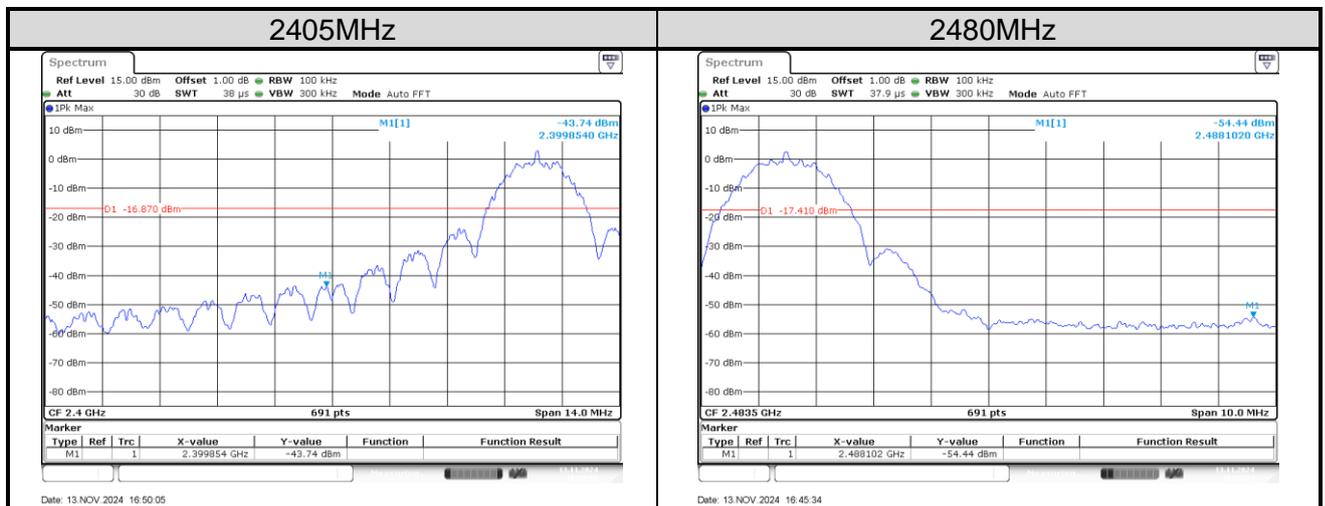


— Limit    — Sum Level    ◆ PSD

**Measurement**

Setting	Instrument Value	Target Value
Start Frequency	2.47914 GHz	2.47914 GHz
Stop Frequency	2.48086 GHz	2.48086 GHz
Span	1.725 MHz	1.725 MHz
RBW	10.000 kHz	<= 10.000 kHz
VBW	30.000 kHz	>= 30.000 kHz
SweepPoints	345	~ 345
Sweeptime	1.730 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	46 / max. 150	max. 150
Stable	2 / 2	2
Max Stable Difference	0.43 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

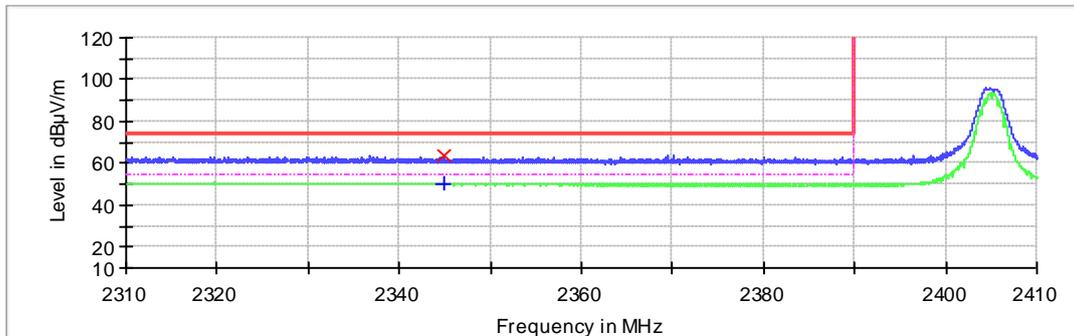
### 5.3.1 Radiated Band-Edge

**RESULT:****Pass**

Date of testing	:	2024-11-08
Ambient temperature	:	20.1°C
Relative humidity	:	51.3%
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


**PK**

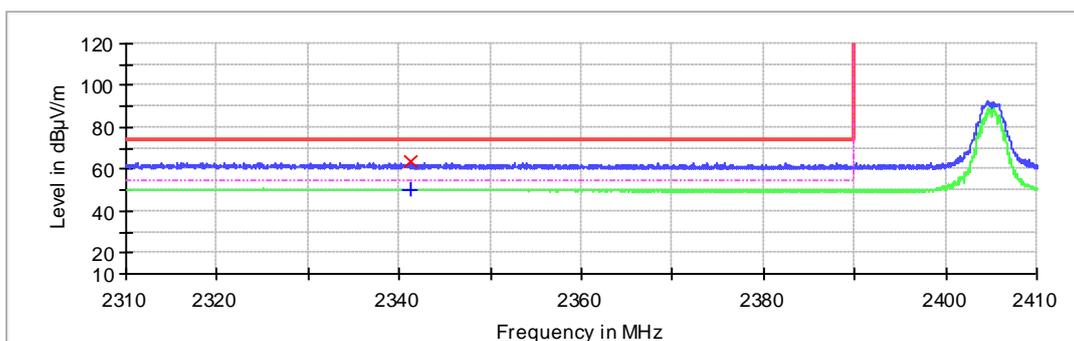
Frequency (MHz)	MaxPeak (dBµV/m)	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
2344.900000	63.6	32.7	10.4	74.0

**AV**

Frequency (MHz)	Average (dBµV/m)	Corr. (dB/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
2344.900000	50.0	32.7	4.0	54.0

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

Copy of 2310~ 2410 BE 1-18GHz\_HL050\_FSV40\_Pre


**PK**

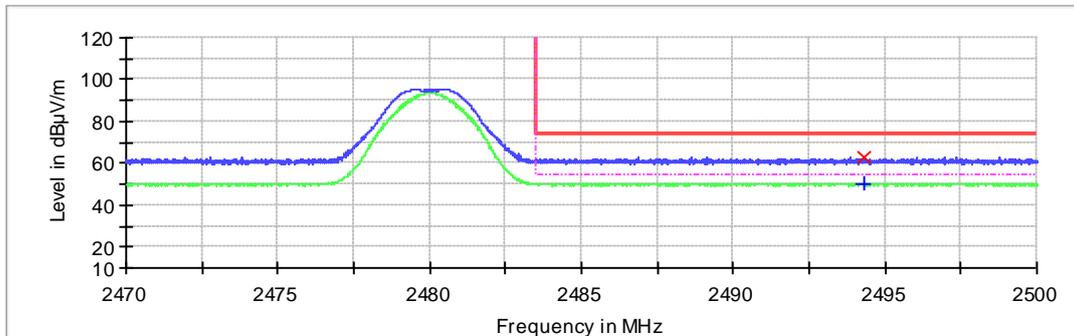
Frequency (MHz)	MaxPeak (dBµV/m)	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
2341.300000	63.3	32.7	10.7	74.0

**AV**

Frequency (MHz)	Average (dBµV/m)	Corr. (dB/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
2341.300000	49.9	32.7	4.1	54.0

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

Copy of 2470~ 2500 BE\_1-18GHz\_HL050\_FSV40\_Pre


**PK**

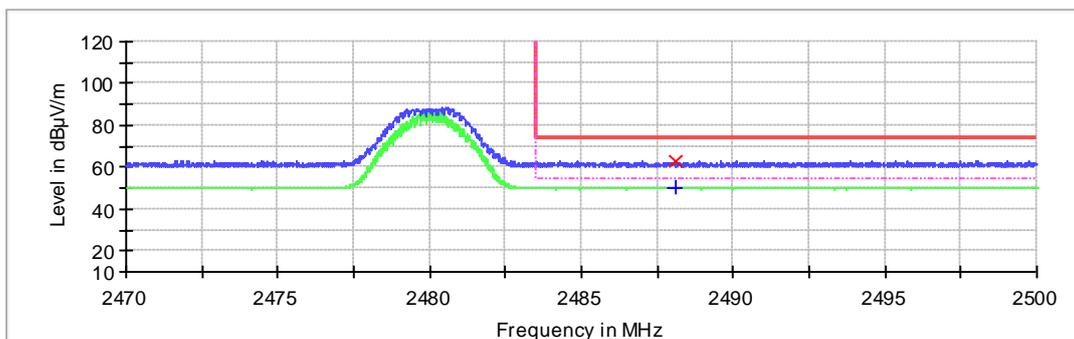
Frequency (MHz)	MaxPeak (dBµV/m)	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
2494.307500	62.8	32.5	11.2	74.0

**AV**

Frequency (MHz)	Average (dBµV/m)	Corr. (dB/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
2494.307500	49.8	32.5	4.2	54.0

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

Copy of 2470~ 2500 BE\_1-18GHz\_HL050\_FSV40\_Pre


**PK**

Frequency (MHz)	MaxPeak (dBµV/m)	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
2488.120000	62.9	32.5	11.1	74.0

**AV**

Frequency (MHz)	Average (dBµV/m)	Corr. (dB/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
2488.120000	49.7	32.5	4.3	54.0

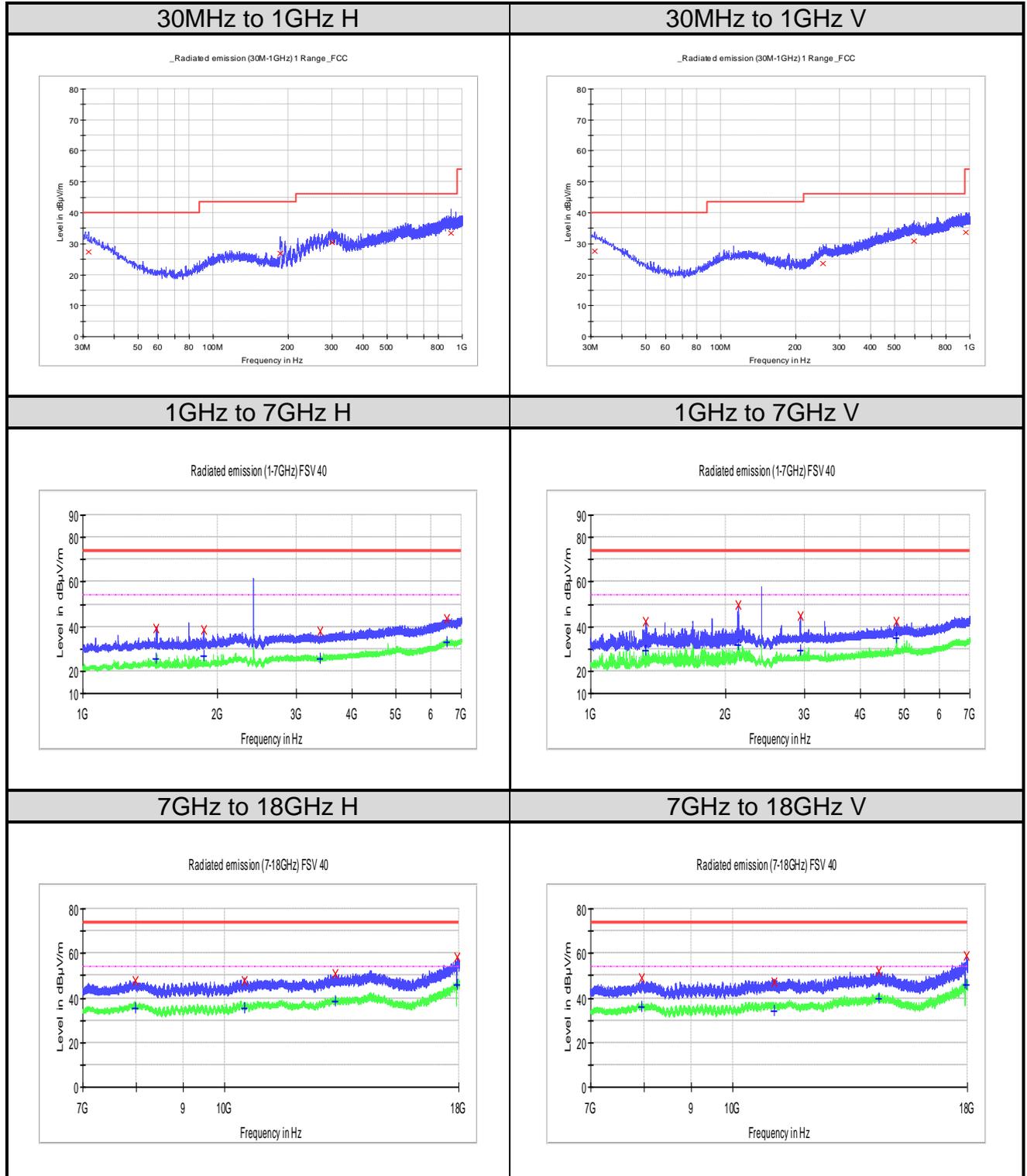
### 5.3.2 Radiated Spurious Emission

**RESULT:****Pass**

Date of testing : 2024-11-08  
Ambient temperature : 20.9°C  
Relative humidity : 52.2%  
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**

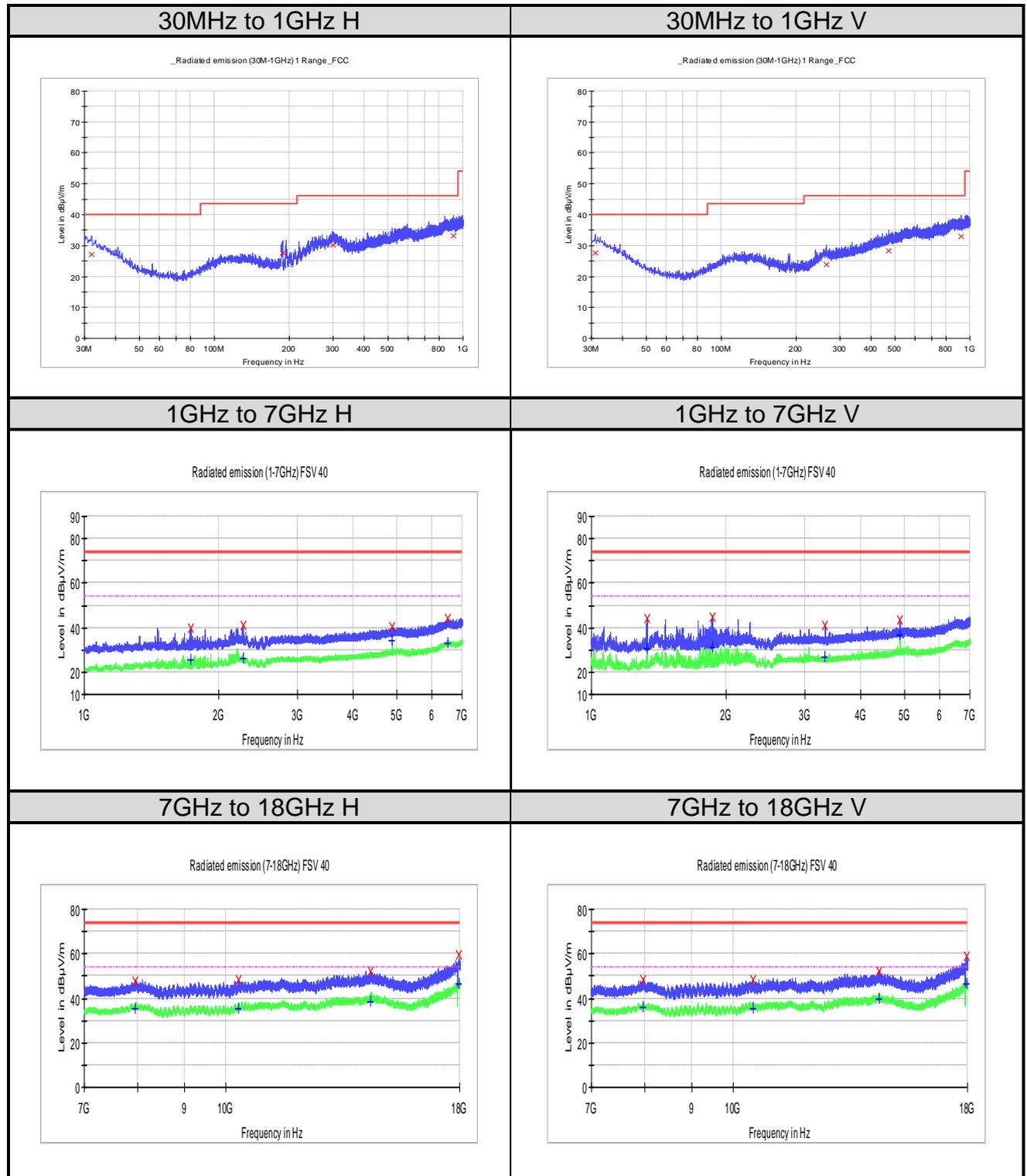
Frequency (MHz)	QuasiPeak (dBµV/m)	Pol	Corr. (dB/m)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
31.697500	27.3	H	24.0	12.7	40.0
185.806250	26.9	H	15.9	16.6	43.5
301.236250	30.4	H	20.2	15.6	46.0
903.848750	33.4	H	28.9	12.6	46.0
31.091250	27.6	V	24.3	12.4	40.0
257.465000	23.5	V	20.5	22.5	46.0
595.752500	30.8	V	26.9	15.2	46.0
965.807500	33.8	V	29.5	20.2	54.0

**PK**

Frequency (MHz)	MaxPeak (dBµV/m)	Pol	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
1460.200000	39.2	H	-18.4	34.8	74.0
1865.800000	38.3	H	-18.1	35.7	74.0
3386.800000	37.6	H	-14.5	36.4	74.0
6503.200000	43.3	H	-7.0	30.7	74.0
7995.843750	47.8	H	-2.8	26.2	74.0
10510.031250	47.9	H	-1.7	26.1	74.0
13203.656250	50.9	H	1.0	23.1	74.0
17932.281250	58.4	H	12.1	15.6	74.0
1327.600000	42.2	V	-18.6	31.8	74.0
2133.100000	49.9	V	-16.2	24.1	74.0
2931.700000	45.0	V	-14.7	29.1	74.0
4809.100000	42.3	V	-10.8	31.7	74.0
7963.875000	49.2	V	-2.9	24.8	74.0
11101.625000	47.2	V	-1.9	26.8	74.0
14414.000000	52.4	V	3.4	21.6	74.0
17960.125000	59.1	V	12.7	14.9	74.0

**AV**

Frequency (MHz)	Average (dBµV/m)	Pol	Corr. (dB/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1460.200000	25.8	H	-18.4	28.2	54.0
1865.800000	26.5	H	-18.1	27.5	54.0
3386.800000	25.8	H	-14.5	28.2	54.0
6503.200000	32.7	H	-7.0	21.3	54.0
7995.843750	35.1	H	-2.8	18.9	54.0
10510.031250	35.2	H	-1.7	18.8	54.0
13203.656250	38.2	H	1.0	15.8	54.0
17932.281250	45.8	H	12.1	8.2	54.0
1327.600000	29.5	V	-18.6	24.5	54.0
2133.100000	31.4	V	-16.2	22.6	54.0
2931.700000	29.0	V	-14.7	25.0	54.0
4809.100000	34.8	V	-10.8	19.2	54.0
7963.875000	35.9	V	-2.9	18.1	54.0
11101.625000	34.2	V	-1.9	19.8	54.0
14414.000000	39.4	V	3.4	14.6	54.0
17960.125000	46.0	V	12.7	8.0	54.0

**Figure 9: Radiated Spurious Emission, 2445MHz**


**Limit and Margin**  
**QP**

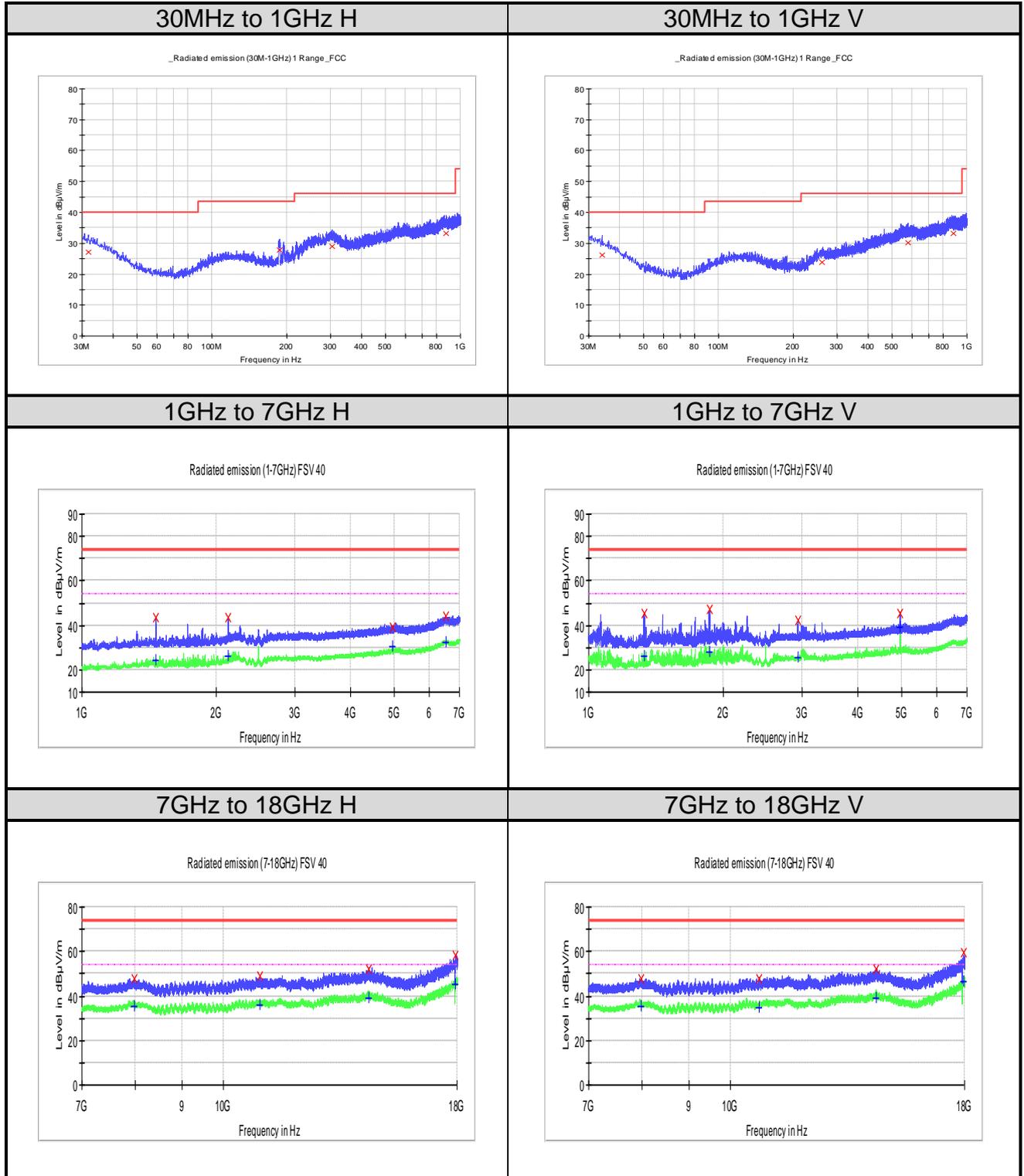
Frequency (MHz)	QuasiPeak (dBµV/m)	Pol	Corr. (dB/m)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
32.061250	27.1	H	23.8	12.9	40.0
187.867500	27.7	H	15.8	15.8	43.5
299.781250	30.1	H	20.2	15.9	46.0
912.093750	33.2	H	28.8	12.8	46.0
31.091250	27.6	V	24.3	12.4	40.0
264.255000	23.8	V	20.8	22.2	46.0
471.835000	28.2	V	24.9	17.8	46.0
919.732500	33.1	V	28.7	12.9	46.0

**PK**

Frequency (MHz)	MaxPeak (dBµV/m)	Pol	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
1730.500000	39.8	H	-18.5	34.2	74.0
2265.700000	41.0	H	-15.3	33.0	74.0
4891.000000	40.6	H	-10.7	33.4	74.0
6496.600000	43.8	H	-7.0	30.2	74.0
7964.218750	47.9	H	-2.9	26.1	74.0
10315.125000	48.3	H	-2.0	25.7	74.0
14386.156250	52.1	H	3.3	21.9	74.0
17969.062500	59.3	H	12.8	14.7	74.0
1331.800000	43.8	V	-18.5	30.2	74.0
1864.900000	44.8	V	-18.1	29.2	74.0
3322.900000	41.1	V	-14.5	32.9	74.0
4891.000000	43.7	V	-10.7	30.3	74.0
7974.875000	48.3	V	-2.9	25.7	74.0
10507.281250	48.2	V	-1.7	25.8	74.0
14414.000000	52.3	V	3.4	21.7	74.0
17973.875000	59.0	V	12.9	15.0	74.0

**AV**

Frequency (MHz)	Average (dBµV/m)	Pol	Corr. (dB/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1730.500000	25.3	H	-18.5	28.7	54.0
2265.700000	26.2	H	-15.3	27.8	54.0
4891.000000	33.9	H	-10.7	20.1	54.0
6496.600000	32.8	H	-7.0	21.2	54.0
7964.218750	35.6	H	-2.9	18.4	54.0
10315.125000	35.4	H	-2.0	18.6	54.0
14386.156250	38.7	H	3.3	15.3	54.0
17969.062500	46.6	H	12.8	7.4	54.0
1331.800000	30.6	V	-18.5	23.4	54.0
1864.900000	31.2	V	-18.1	22.8	54.0
3322.900000	26.6	V	-14.5	27.4	54.0
4891.000000	36.4	V	-10.7	17.6	54.0
7974.875000	35.9	V	-2.9	18.1	54.0
10507.281250	35.6	V	-1.7	18.4	54.0
14414.000000	39.4	V	3.4	14.6	54.0
17973.875000	46.6	V	12.9	7.4	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)
31.818750	27.2	H	23.9	12.8	40.0
187.018750	27.8	H	15.8	15.7	43.5
303.782500	29.0	H	20.3	17.0	46.0
877.901250	33.3	H	28.7	12.7	46.0
34.001250	26.2	V	23.0	13.8	40.0
260.253750	23.9	V	20.8	22.1	46.0
577.322500	30.2	V	26.4	15.8	46.0
882.630000	33.2	V	28.7	12.8	46.0

**PK**

Frequency (MHz)	MaxPeak (dBµV/m)	Pol	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
1461.100000	43.7	H	-18.4	30.3	74.0
2128.300000	43.6	H	-16.2	30.4	74.0
4960.900000	39.3	H	-10.6	34.7	74.0
6533.800000	43.8	H	-7.0	30.2	74.0
7983.468750	48.0	H	-2.9	26.0	74.0
10947.968750	49.3	H	-1.3	24.7	74.0
14426.375000	52.3	H	3.4	21.7	74.0
17939.500000	58.5	H	12.3	15.5	74.0
1329.700000	45.4	V	-18.6	28.6	74.0
1864.900000	47.3	V	-18.1	26.7	74.0
2932.600000	42.2	V	-14.7	31.8	74.0
4961.200000	45.2	V	-10.6	28.8	74.0
7987.250000	47.9	V	-2.9	26.1	74.0
10751.000000	47.9	V	-1.9	26.1	74.0
14426.031250	51.9	V	3.4	22.1	74.0
17963.906250	59.4	V	12.7	14.6	74.0

**AV**

Frequency (MHz)	Average (dBµV/m)	Pol	Corr. (dB/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1461.100000	24.5	H	-18.4	29.5	54.0
2128.300000	26.3	H	-16.2	27.7	54.0
4960.900000	30.4	H	-10.6	23.6	54.0
6533.800000	32.1	H	-7.0	21.9	54.0
7983.468750	35.6	H	-2.9	18.4	54.0
10947.968750	36.0	H	-1.3	18.0	54.0
14426.375000	39.1	H	3.4	14.9	54.0
17939.500000	45.3	H	12.3	8.7	54.0
1329.700000	25.9	V	-18.6	28.1	54.0
1864.900000	27.8	V	-18.1	26.2	54.0
2932.600000	25.8	V	-14.7	28.2	54.0
4961.200000	39.1	V	-10.6	14.9	54.0
7987.250000	35.6	V	-2.9	18.5	54.0
10751.000000	35.0	V	-1.9	19.0	54.0
14426.031250	39.1	V	3.4	14.9	54.0
17963.906250	46.2	V	12.7	7.8	54.0

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