Prüfbericht-Nr.: *Test report no.:*	**CN24HHLR 001**	**Auftrags-Nr.:** *Order no.*:	326050127	Seite 1 von 39 *Page 1 of 39*
Kunden-Referenz-Nr.: *Client reference no.:*	1288983	**Auftragsdatum:** *Order date:*	2024-09-03	
Auftraggeber: *Client:*	**IKEA of Sweden AB** Box 702, SE-343 81 Älmhult, Sweden			
Prüfgegenstand: *Test item:*	Remote Control (Dual Button)			
Bezeichnung / Typ-Nr.: *Identification / Type no.:*	E2489			
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:*	2024-09-09	Refer to photo document.		
Prüfmuster-Nr.: *Test sample no:*	A003812960-006~007			
Prüfzeitraum: *Testing period:*	2024-11-02 ~ 2024-11-14			
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:	x Hongfei Wu Signed by: Hongfei Wu	**genehmigt von:** authorized by:	x Elliot Zhang Signed by: Elliot Zhang
Datum: *Date:* 2025-07-17		**Datum:** *Date:* 2025-07-17	
Stellung / *Position:*	Sachverständige(r)/Expert	**Stellung** / *Position:*	Sachverständige(r)/Expert

Sonstiges / *Other:*	FCC ID: FHO-E2489 IC: 10912A-E2489 HVIN: E2489 PMN: BILRESA
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)	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*

Anmerkungen
Remarks

1	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. *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.*
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3	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. *Test clauses with remark of * are subcontracted to qualified subcontractors and descripted 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.*
4	Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnisen 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 bezueglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019. *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.*

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

Contents

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 basics 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 BLE of the EUT.

3.2 Ratings and System Details

Table 3: Technical Specification of EUT

General Description of EUT	
Product Name:	Remote Control (Dual Button)
Model No.:	E2489
Operation Voltage:	DC 3V (2*AAA battery)
RF Technical:	1) BLE 2) Zigbee 3) Thread
Technical Specification of BLE	
Frequency Range:	2402~2480MHz
Modulation Type:	GFSK
Data Rate:	1Mbps
Antenna Type:	Stamping Antenna
Antenna Gain:	-0.15 dBi (declared by client)

Table 4: Operation Channel List

RF Channel	Frequency [MHz]	RF Channel	Frequency [MHz]	RF Channel	Frequency [MHz]	RF Channel	Frequency [MHz]
00	**2402**	10	2422	20	2442	30	2462
01	2404	11	2424	21	2444	31	2464
02	2406	12	2426	22	2446	32	2466
03	2408	13	2428	23	2448	33	2468
04	2410	14	2430	24	2450	34	2470
05	2412	15	2432	25	2452	35	2472
06	2414	16	2434	26	2454	36	2474
07	2416	17	2436	27	2456	37	2476
08	2418	18	2438	28	2458	38	2478
09	2420	**19**	**2440**	29	2460	**39**	**2480**

3.3 Independent Operation Modes

Test frequencies are lowest channel: 2402 MHz, middle channel: 2440 MHz and highest channel:2480 MHz

The basic operation modes are:
A. On, BLE 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: sscom 5.13.1

Table 5: Power parameter value

Mode	Power Parameter Setting Value
BLE	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 -0.15 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

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:	-0.15 dBi
Verdict:	PASS	

5.1.2 6dB & 99% Bandwidth

RESULT: **Pass**

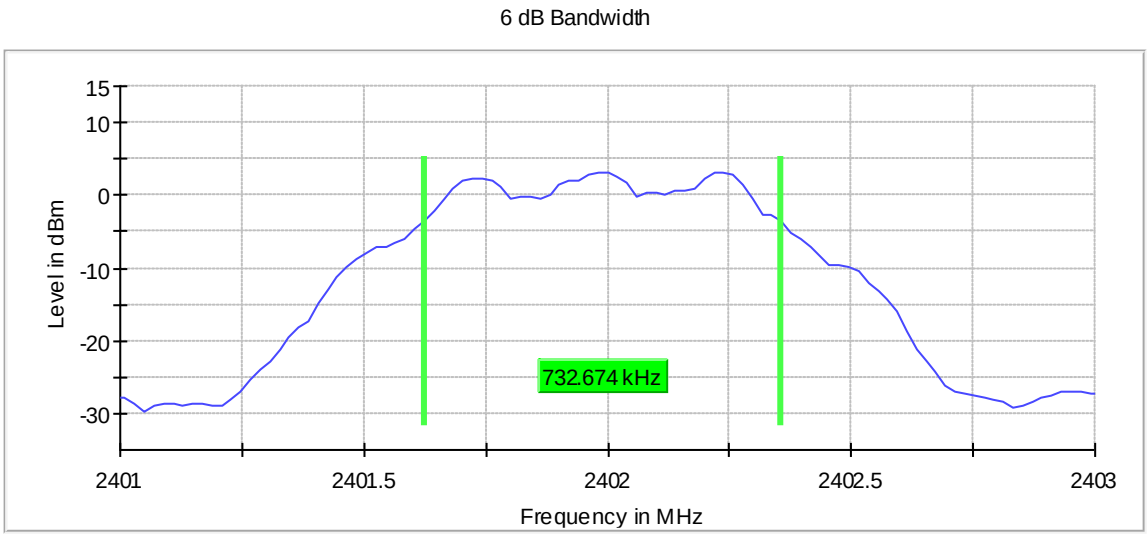
Date of testing	:	2024-11-05
Ambient temperature	:	22.4°C
Relative humidity	:	50.2%
Atmospheric pressure	:	101kPa
Test requirement	:	FCC Part 15.247(a)(2) RSS-247 Issue 3, August 2023, Clause 5.2(a)
Test procedure	:	ANSI C63.10: 2013
Test voltage	:	DC 3V
Test modes applied	:	A

6dB Bandwidth, 2402MHz

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2402.000000	0.732674	0.500000	---	2401.623762	2402.356436

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

DUT Frequency (MHz)	Max Level (dBm)	Result
2402.000000	3.2	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.40100 GHz	2.40100 GHz
Stop Frequency	2.40300 GHz	2.40300 GHz
Span	2.000 MHz	2.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	101	~ 40
Sweeptime	18.938 Î¼s	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	9 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.03 dB	0.50 dB

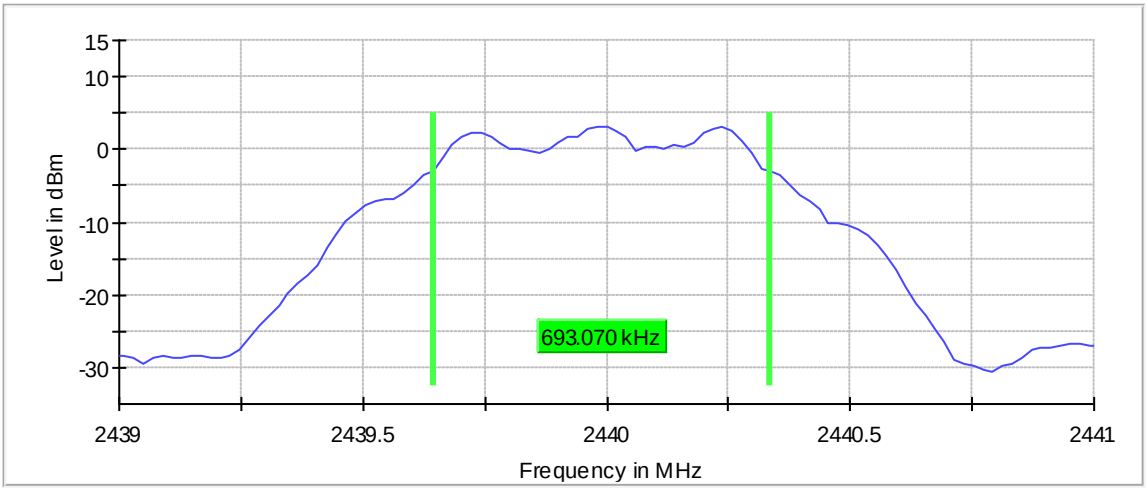
6dB Bandwidth, 2440MHz

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2440.000000	0.693070	0.500000	---	2439.643564	2440.336634

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

DUT Frequency (MHz)	Max Level (dBm)	Result
2440.000000	3.0	PASS

6 dB Bandwidth



Measurement

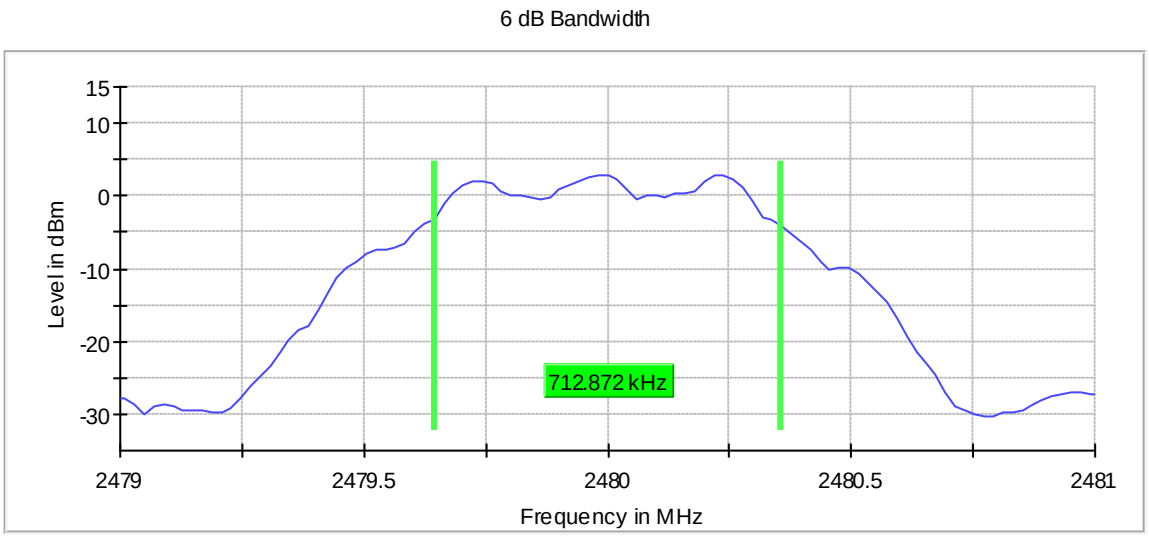
Setting	Instrument Value	Target Value
Start Frequency	2.43900 GHz	2.43900 GHz
Stop Frequency	2.44100 GHz	2.44100 GHz
Span	2.000 MHz	2.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	101	~ 40
Sweeptime	18.938 Î¼s	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 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	8 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.14 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	0.712872	0.500000	---	2479.643564	2480.356436

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

DUT Frequency (MHz)	Max Level (dBm)	Result
2480.000000	2.8	PASS



Measurement

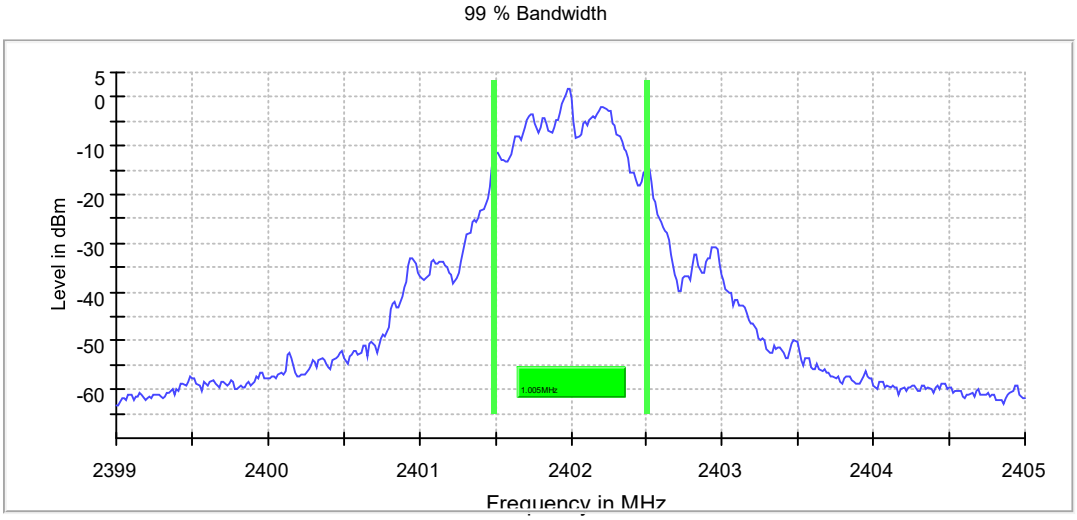
Setting	Instrument Value	Target Value
Start Frequency	2.47900 GHz	2.47900 GHz
Stop Frequency	2.48100 GHz	2.48100 GHz
Span	2.000 MHz	2.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	101	~ 40
Sweeptime	18.938 Î¼s	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 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	10 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.00 dB	0.50 dB

99% Occupied Channel Bandwidth, 2402MHz

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2402.000000	1.005000	---	---	2401.497500	2402.502500

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

DUT Frequency (MHz)	Result
2402.000000	PASS



Measurement

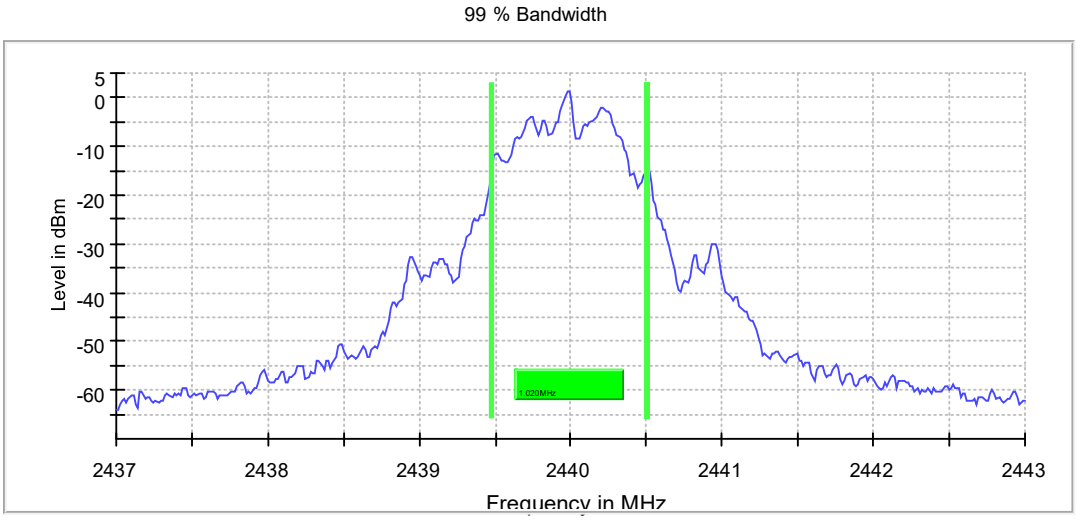
Setting	Instrument Value	Target Value
Start Frequency	2.39900 GHz	2.39900 GHz
Stop Frequency	2.40500 GHz	2.40500 GHz
Span	6.000 MHz	6.000 MHz
RBW	30.000 kHz	>= 30.000 kHz
VBW	100.000 kHz	>= 90.000 kHz
SweepPoints	400	~ 400
Sweeptime	63.216 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 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	12 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.09 dB	0.30 dB

99% Occupied Channel Bandwidth, 2440MHz

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2440.000000	1.020000	---	---	2439.482500	2440.502500

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

DUT Frequency (MHz)	Result
2440.000000	PASS



Measurement

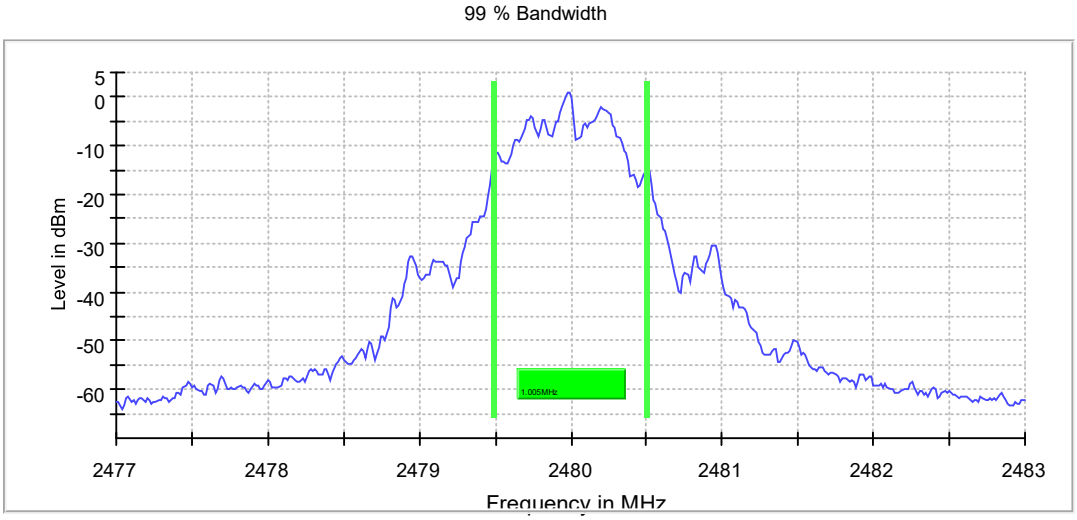
Setting	Instrument Value	Target Value
Start Frequency	2.43700 GHz	2.43700 GHz
Stop Frequency	2.44300 GHz	2.44300 GHz
Span	6.000 MHz	6.000 MHz
RBW	30.000 kHz	>= 30.000 kHz
VBW	100.000 kHz	>= 90.000 kHz
SweepPoints	400	~ 400
Sweeptime	63.216 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 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	11 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.23 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	1.005000	---	---	2479.497500	2480.502500

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

DUT Frequency (MHz)	Result
2480.000000	PASS



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 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	10 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.13 dB	0.30 dB

5.1.3 Output Power

RESULT: **Pass**

Date of testing	:	2024-11-05
Ambient temperature	:	22.4°C
Relative humidity	:	50.2%
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 3V
Test modes applied	:	A

Table 8: Peak Output Power

Frequency [MHz]	Peak Conducted Output Power [dBm]	Limit [dBm]
2402	3.5	30
2440	3.4	30
2480	3.3	30

Note:
1. The cable loss is taken into account in results.
2. EIRP=Conducted Output Power + Antenna Gain (-0.15dBi), which is far below the 4 W (36dBm).

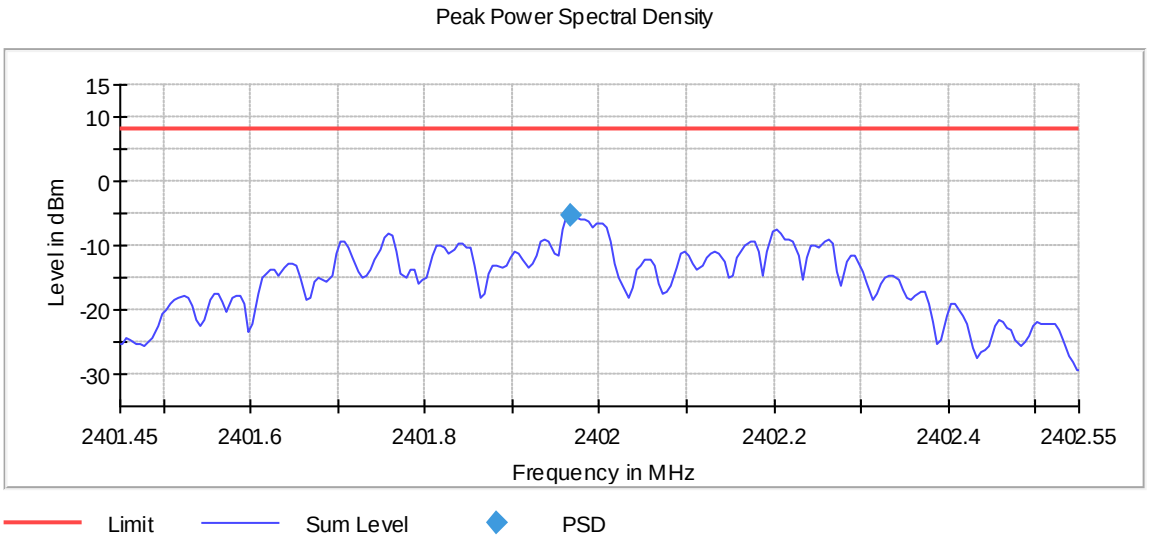
5.1.4 Power Spectral Density

RESULT: **Pass**

Date of testing	:	2024-11-05
Ambient temperature	:	22.4°C
Relative humidity	:	50.2%
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 3V
Test modes applied	:	A

Power Spectral Density, 2402MHz

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2402.000000	2401.967529	-5.235	8.0	PASS

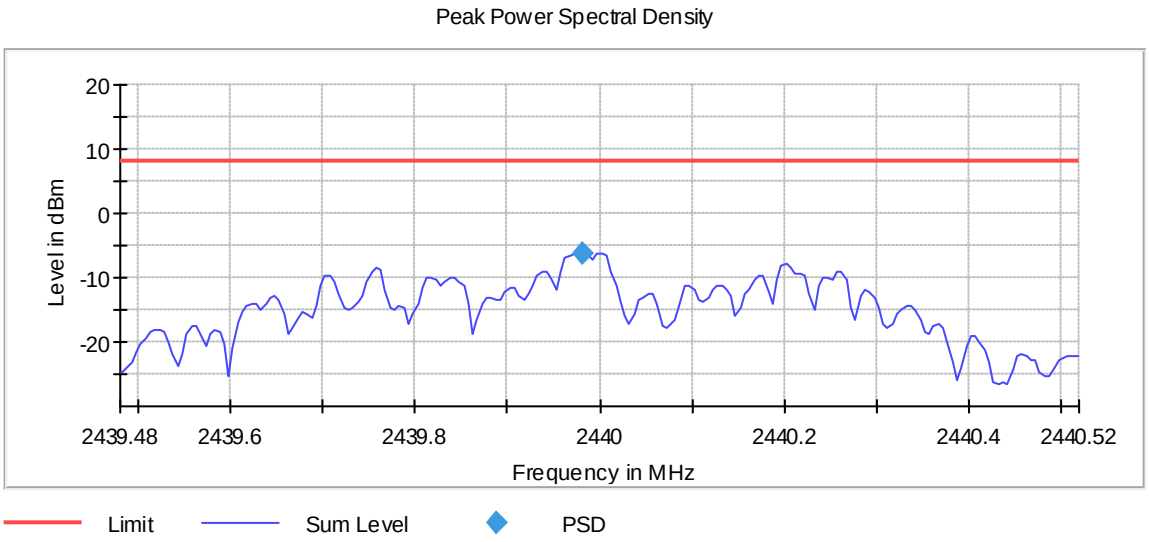


Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.40145 GHz	2.40145 GHz
Stop Frequency	2.40255 GHz	2.40255 GHz
Span	1.099 MHz	1.099 MHz
RBW	10.000 kHz	<= 10.000 kHz
VBW	30.000 kHz	>= 30.000 kHz
SweepPoints	220	~ 220
Sweeptime	1.100 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	5 / max. 150	max. 150
Stable	2 / 2	2
Max Stable Difference	0.18 dB	0.50 dB

Power Spectral Density, 2440MHz

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2440.000000	2439.982507	-6.136	8.0	PASS

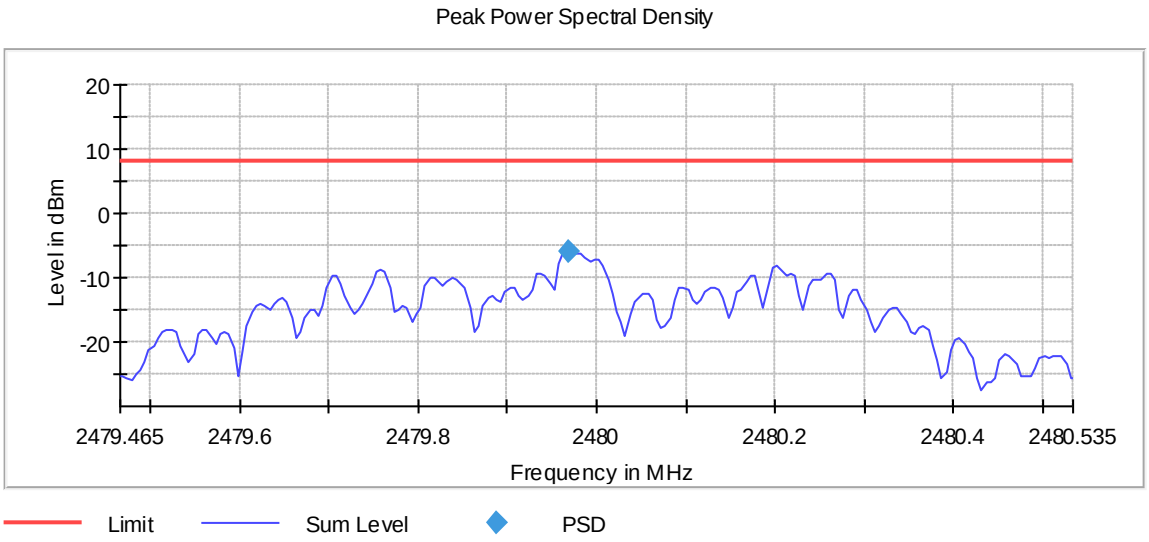


Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.43948 GHz	2.43948 GHz
Stop Frequency	2.44052 GHz	2.44052 GHz
Span	1.040 MHz	1.040 MHz
RBW	10.000 kHz	<= 10.000 kHz
VBW	30.000 kHz	>= 30.000 kHz
SweepPoints	208	~ 208
Sweeptime	1.040 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	5 / max. 150	max. 150
Stable	2 / 2	2
Max Stable Difference	0.32 dB	0.50 dB

Power Spectral Density, 2480MHz

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2480.000000	2479.967521	-5.910	8.0	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.47947 GHz	2.47947 GHz
Stop Frequency	2.48053 GHz	2.48053 GHz
Span	1.069 MHz	1.069 MHz
RBW	10.000 kHz	<= 10.000 kHz
VBW	30.000 kHz	>= 30.000 kHz
SweepPoints	214	~ 214
Sweeptime	1.070 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	7 / max. 150	max. 150
Stable	2 / 2	2
Max Stable Difference	0.18 dB	0.50 dB

5.1.5 Conducted Band Edge and out-of Band Emissions

RESULT: **Pass**

Date of testing	:	2024-11-13~2024-11-14
Ambient temperature	:	21.8~22.0°C
Relative humidity	:	52.6~55.3%
Atmospheric pressure	:	101kPa
Test requirement	:	FCC Part 15.247(d) RSS-247 Issue 3, August 2023, Clause 5.5
Test procedure	:	ANSI C63.10: 2013
Test voltage	:	DC 3V
Test modes applied	:	A

Figure 1: Reference level

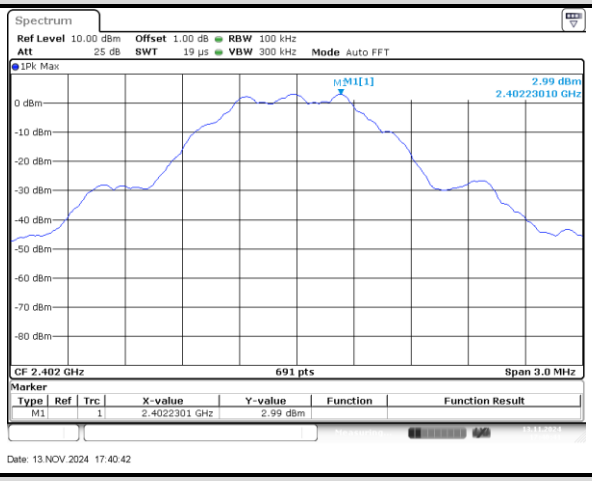
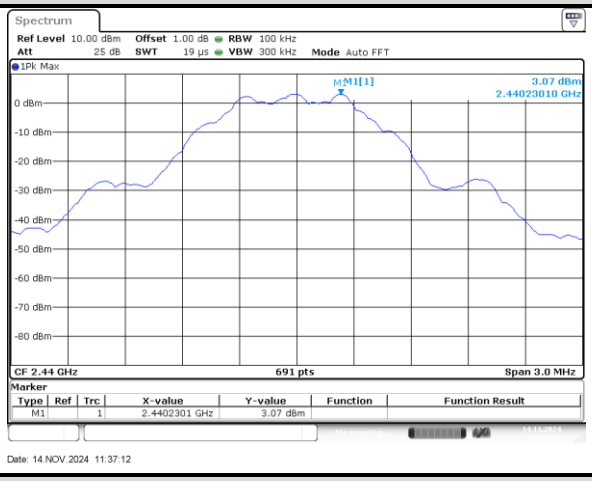
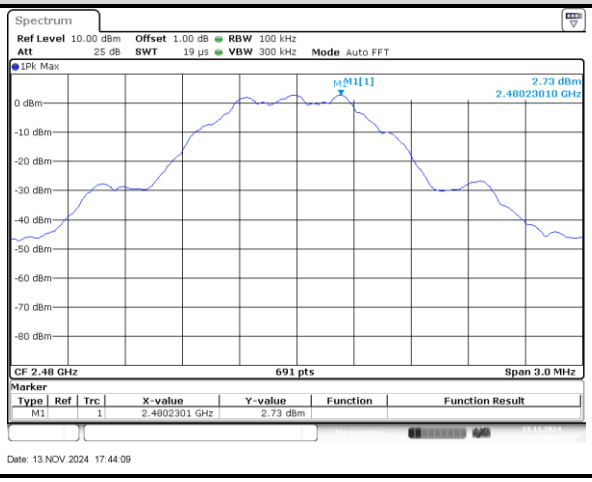
<table>
<tr><th>2402MHz</th><th>2440MHz</th></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><th>2480MHz</th><th>/</th></tr>
<tr><td> 
</td><td>/</td></tr>
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Figure 2: Conducted Spurious Emission

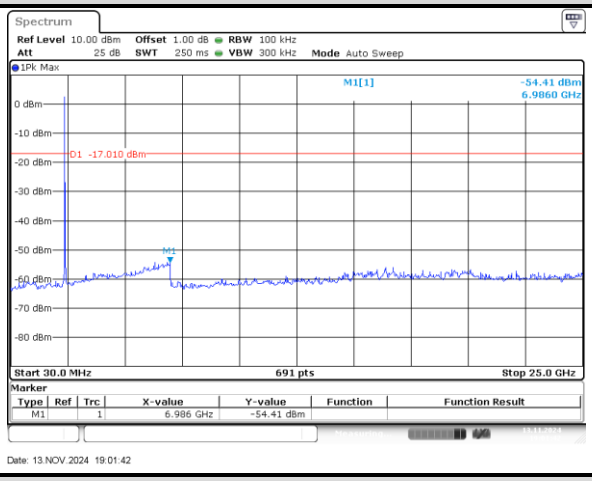
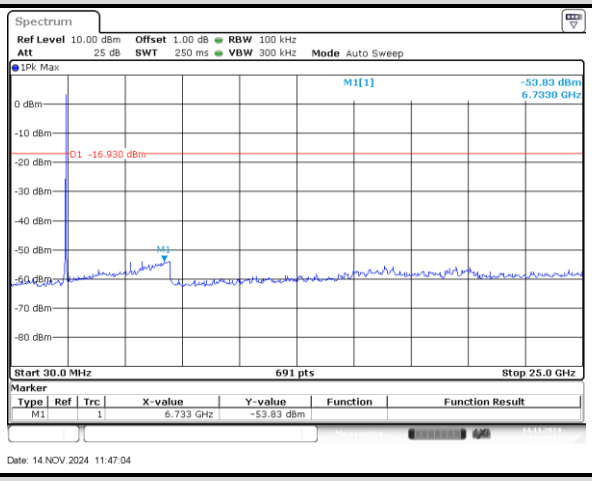
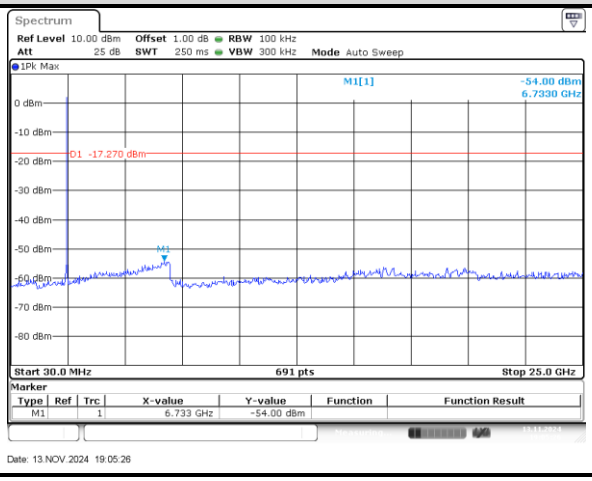
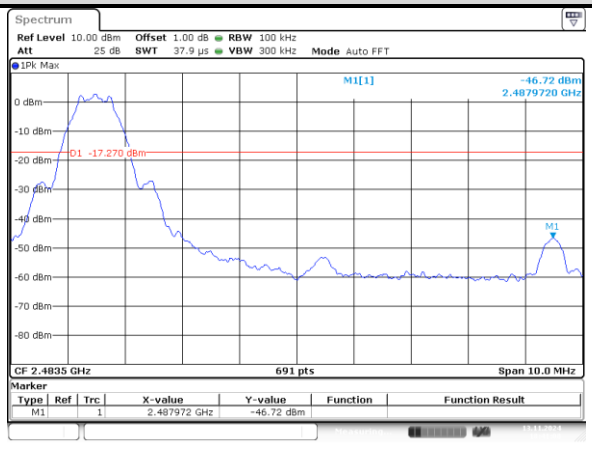
2402MHz	2440MHz
	
2480MHz	**/**
	/

Figure 3: Conducted Band Edge

2402MHz	2480MHz
	

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.

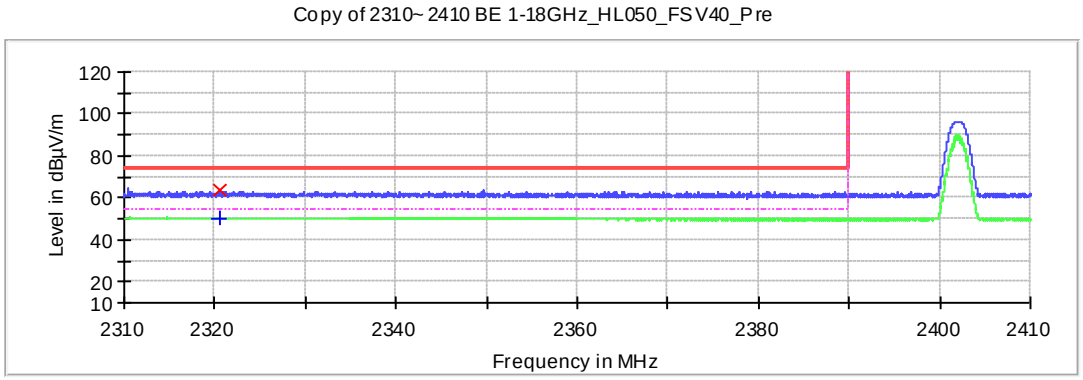
5.3 Emission in the Frequency Range above 30MHz

5.3.1 Radiated Band-Edge

RESULT: **Pass**

Date of testing	:	2024-11-05
Ambient temperature	:	22.4°C
Relative humidity	:	50.2%
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, 2402MHz, H



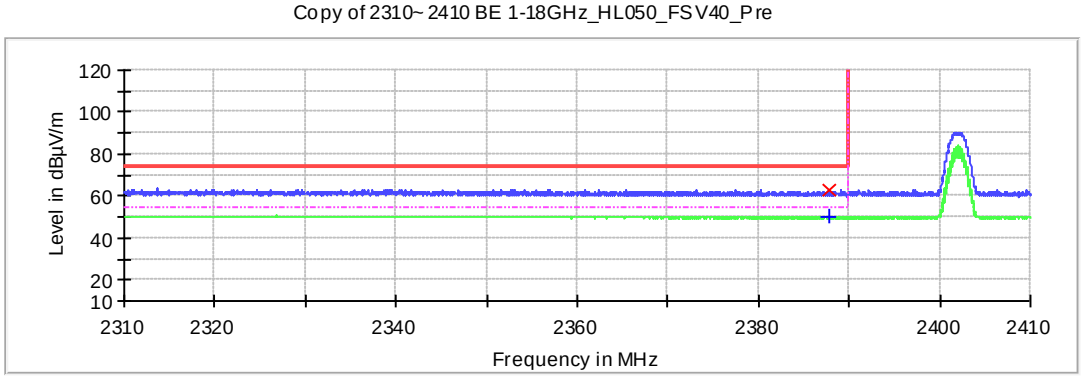
PK

Frequency (MHz)	MaxPeak (dBµV/m)	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
2320.475000	63.8	32.8	10.2	74.0

AV

Frequency (MHz)	Average (dBµV/m)	Corr. (dB/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
2320.475000	50.1	32.8	3.9	54.0

Figure 5: Radiated Band-Edge, 2402MHz, V



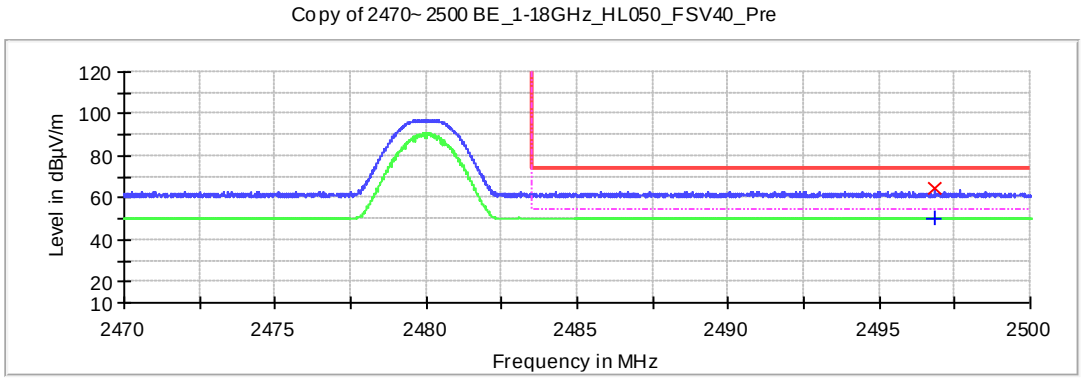
PK

Frequency (MHz)	MaxPeak (dBµV/m)	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
2387.700000	63.2	32.6	10.8	74.0

AV

Frequency (MHz)	Average (dBµV/m)	Corr. (dB/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
2387.700000	49.7	32.6	4.3	54.0

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



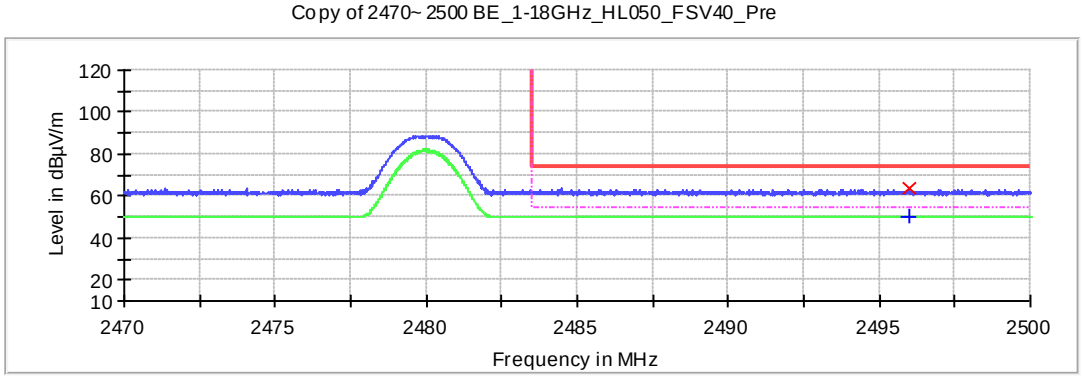
PK

Frequency (MHz)	MaxPeak (dBµV/m)	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
2496.842500	64.3	32.5	9.7	74.0

AV

Frequency (MHz)	Average (dBµV/m)	Corr. (dB/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
2496.842500	49.8	32.5	4.2	54.0

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



PK

Frequency (MHz)	MaxPeak (dBµV/m)	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
2495.987500	64.1	32.5	9.9	74.0

AV

Frequency (MHz)	Average (dBµV/m)	Corr. (dB/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
2495.987500	50.2	32.5	3.8	54.0

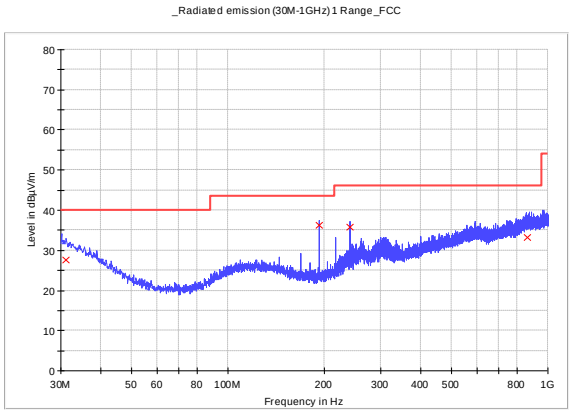
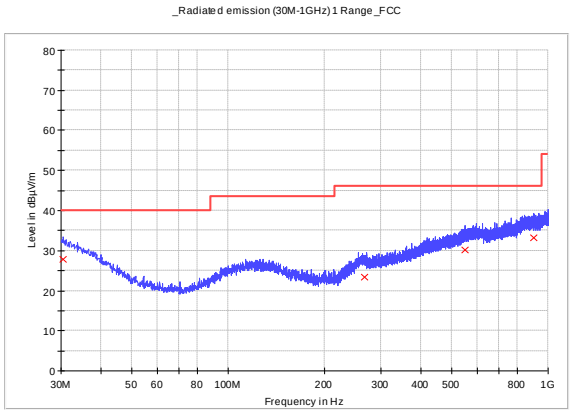
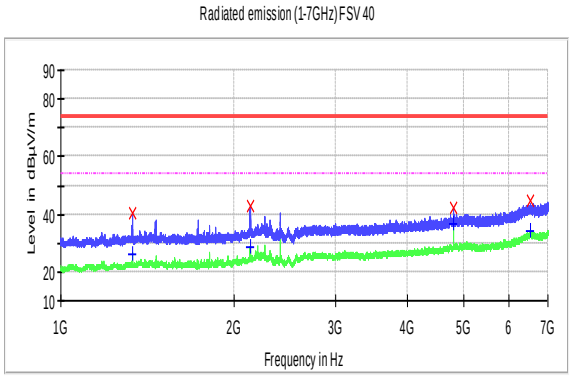
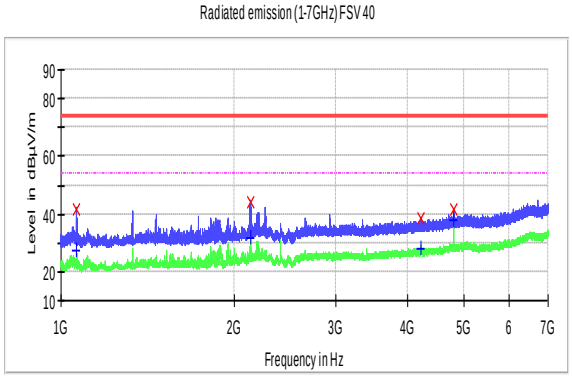
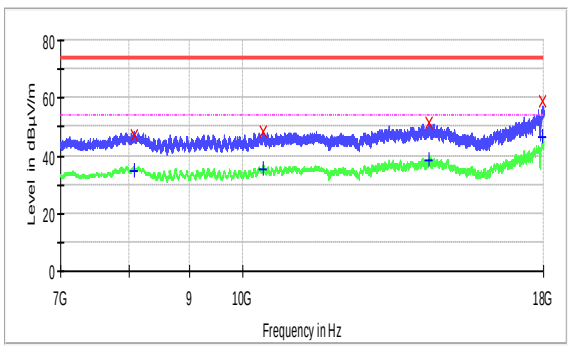
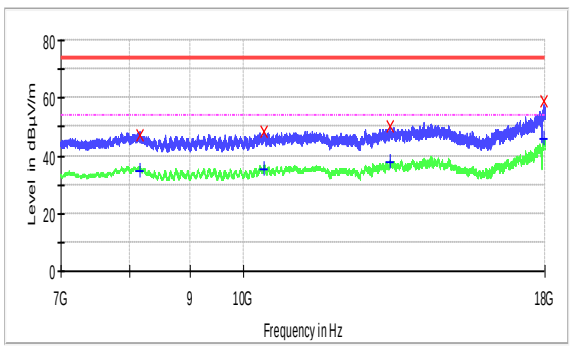
5.3.2 Radiated Spurious Emission

RESULT: **Pass**

Date of testing	:	2024-11-02
Ambient temperature	:	21.3°C
Relative humidity	:	59.2%
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, 2402MHz

30MHz to 1GHz H	30MHz to 1GHz V
	
1GHz to 7GHz H	**1GHz to 7GHz V**
	
7GHz to 18GHz H	**7GHz to 18GHz V**
	

Limit and Margin

QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Pol	Corr. (dB/m)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
31.212500	27.5	H	24.3	12.5	40.0
192.717500	36.3	H	15.9	7.2	43.5
240.975000	35.8	H	18.5	10.2	46.0
864.806250	33.3	H	28.8	12.7	46.0
30.485000	27.9	V	24.6	12.1	40.0
267.165000	23.5	V	20.4	22.5	46.0
548.222500	30.2	V	26.7	15.8	46.0
899.241250	33.3	V	28.8	12.7	46.0

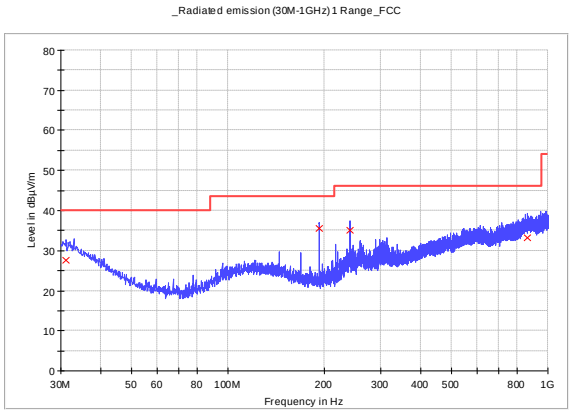
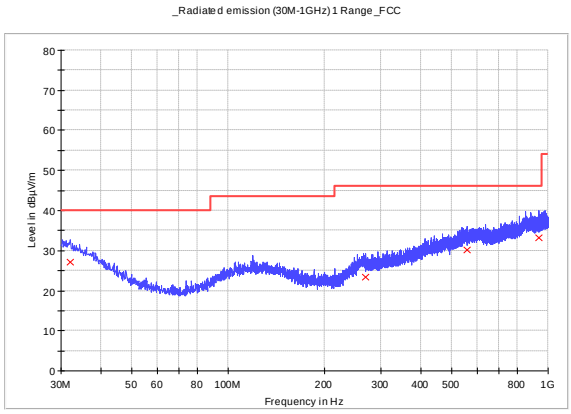
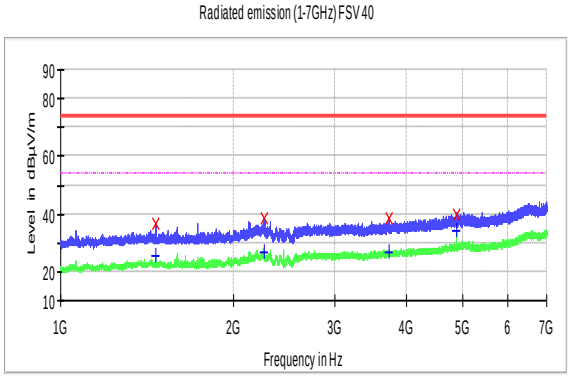
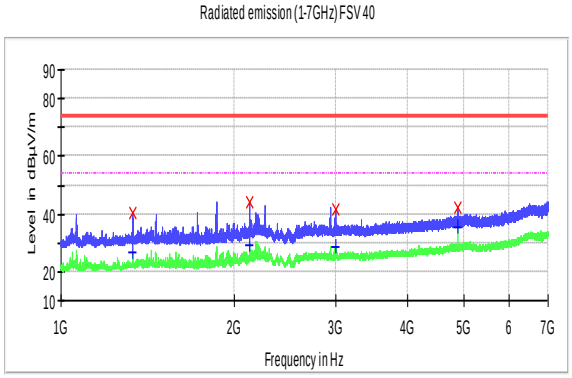
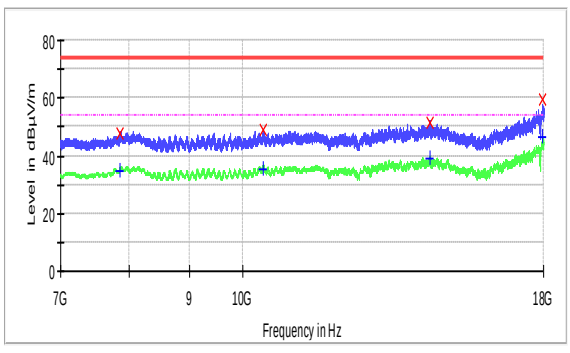
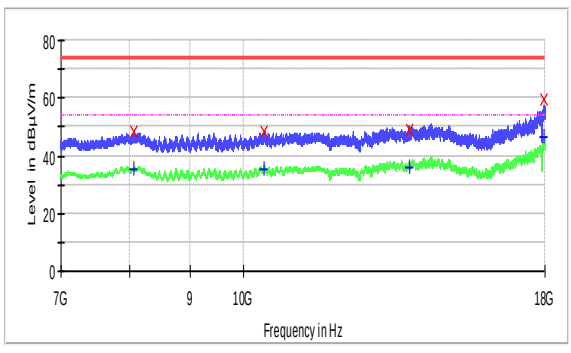
PK

Frequency (MHz)	MaxPeak (dBµV/m)	Pol	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
1330.300000	40.2	H	-18.6	33.8	74.0
2132.800000	43.0	H	-16.2	31.0	74.0
4803.700000	42.3	H	-10.8	31.7	74.0
6532.900000	44.5	H	-7.0	29.5	74.0
8082.400000	47.3	H	-3.2	26.7	74.0
10405.050000	48.4	H	-1.8	25.6	74.0
14397.500000	51.7	H	3.3	22.3	74.0
17976.350000	58.8	H	13.0	15.2	74.0
1064.200000	41.5	V	-19.9	32.5	74.0
2132.500000	44.4	V	-16.2	29.6	74.0
4211.200000	38.5	V	-12.4	35.5	74.0
4804.600000	41.9	V	-10.8	32.1	74.0
8167.650000	47.4	V	-3.8	26.6	74.0
10412.750000	48.5	V	-1.8	25.5	74.0
13301.900000	50.4	V	1.0	23.6	74.0
17962.600000	59.0	V	12.7	15.0	74.0

AV

Frequency (MHz)	Average (dBµV/m)	Pol	Corr. (dB/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1330.300000	26.4	H	-18.6	27.6	54.0
2132.800000	28.5	H	-16.2	25.5	54.0
4803.700000	36.9	H	-10.8	17.1	54.0
6532.900000	33.9	H	-7.0	20.1	54.0
8082.400000	34.7	H	-3.2	19.3	54.0
10405.050000	35.5	H	-1.8	18.5	54.0
14397.500000	38.7	H	3.3	15.3	54.0
17976.350000	46.6	H	13.0	7.4	54.0
1064.200000	27.4	V	-19.9	26.6	54.0
2132.500000	31.5	V	-16.2	22.5	54.0
4211.200000	28.1	V	-12.4	25.9	54.0
4804.600000	37.9	V	-10.8	16.1	54.0
8167.650000	34.5	V	-3.8	19.5	54.0
10412.750000	35.6	V	-1.8	18.4	54.0
13301.900000	38.0	V	1.0	16.0	54.0
17962.600000	45.9	V	12.7	8.1	54.0

Figure 9: Radiated Spurious Emission, 2440MHz

30MHz to 1GHz H	30MHz to 1GHz V
	
1GHz to 7GHz H	**1GHz to 7GHz V**
	
7GHz to 18GHz H	**7GHz to 18GHz V**
	

Limit and Margin

QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Pol	Corr. (dB/m)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
31.212500	27.5	H	24.3	12.5	40.0
192.475000	35.6	H	15.9	7.9	43.5
240.975000	35.0	H	18.5	11.0	46.0
860.562500	33.3	H	28.9	12.7	46.0
32.061250	27.1	V	23.8	12.9	40.0
268.377500	23.4	V	20.3	22.6	46.0
556.952500	30.2	V	26.7	15.8	46.0
937.798750	33.2	V	28.9	12.8	46.0

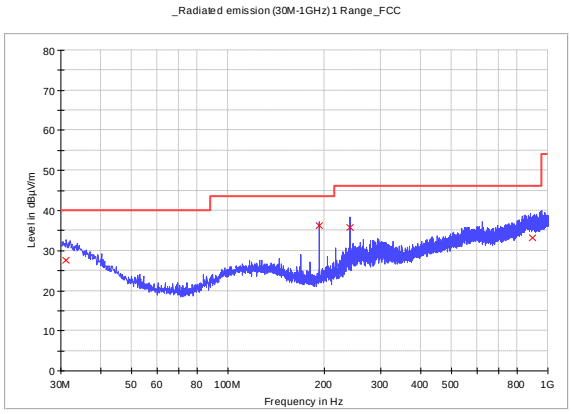
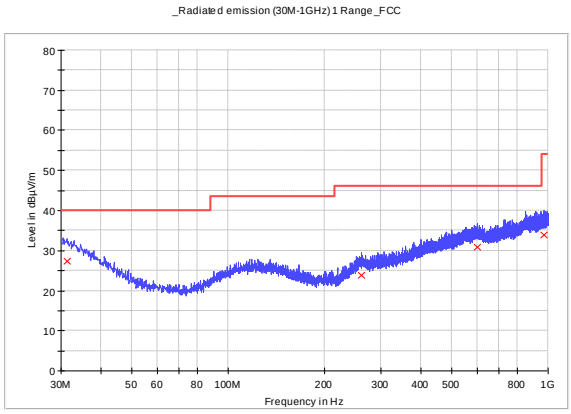
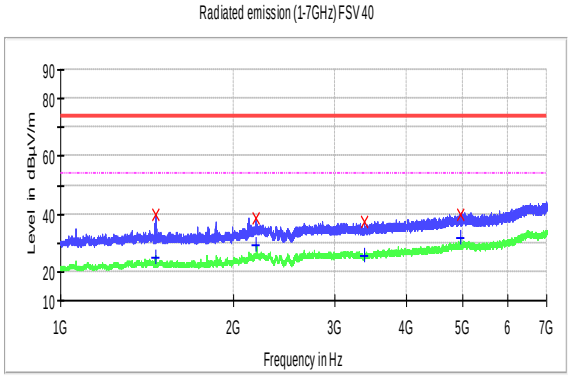
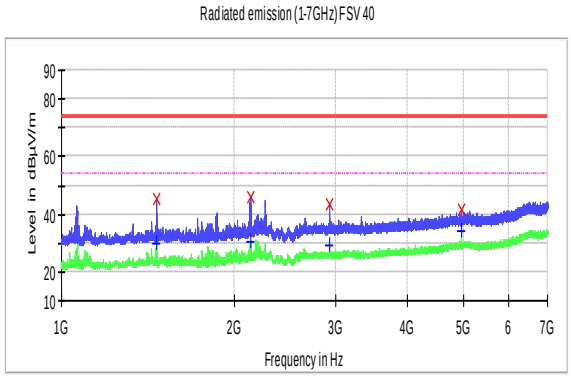
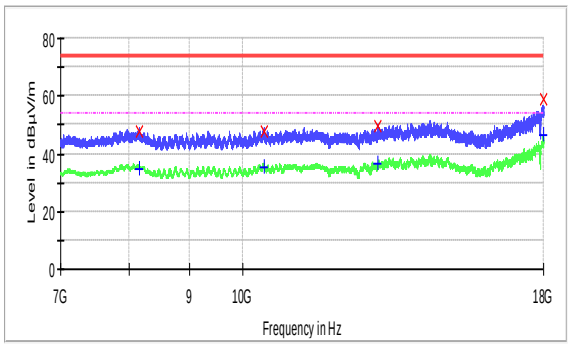
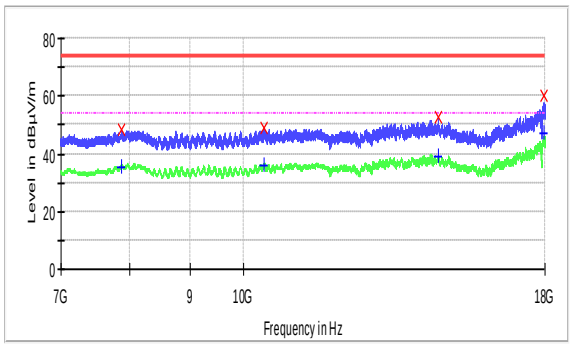
PK

Frequency (MHz)	MaxPeak (dBµV/m)	Pol	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
1461.400000	36.5	H	-18.4	37.5	74.0
2261.800000	38.6	H	-15.3	35.4	74.0
3730.600000	38.4	H	-13.4	35.6	74.0
4879.300000	39.9	H	-10.7	34.1	74.0
7869.000000	47.6	H	-3.6	26.4	74.0
10407.800000	48.8	H	-1.8	25.2	74.0
14401.350000	51.7	H	3.3	22.3	74.0
17979.650000	59.4	H	13.0	14.6	74.0
1330.000000	40.3	V	-18.6	33.7	74.0
2125.600000	44.2	V	-16.3	29.8	74.0
2992.900000	41.6	V	-14.6	32.4	74.0
4880.500000	42.3	V	-10.7	31.7	74.0
8068.650000	48.6	V	-3.1	25.4	74.0
10411.650000	48.7	V	-1.8	25.3	74.0
13823.300000	48.7	V	0.8	25.3	74.0
17981.850000	59.5	V	13.1	14.5	74.0

AV

Frequency (MHz)	Average (dBµV/m)	Pol	Corr. (dB/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1461.400000	25.5	H	-18.4	28.5	54.0
2261.800000	26.6	H	-15.3	27.4	54.0
3730.600000	26.9	H	-13.4	27.1	54.0
4879.300000	34.0	H	-10.7	20.0	54.0
7869.000000	35.0	H	-3.6	19.0	54.0
10407.800000	35.5	H	-1.8	18.5	54.0
14401.350000	39.0	H	3.3	15.0	54.0
17979.650000	46.6	H	13.0	7.4	54.0
1330.000000	26.5	V	-18.6	27.5	54.0
2125.600000	29.5	V	-16.3	24.5	54.0
2992.900000	28.5	V	-14.6	25.5	54.0
4880.500000	35.7	V	-10.7	18.3	54.0
8068.650000	35.3	V	-3.1	18.7	54.0
10411.650000	35.6	V	-1.8	18.4	54.0
13823.300000	36.3	V	0.8	17.7	54.0
17981.850000	46.6	V	13.1	7.4	54.0

Figure 10: Radiated Spurious Emission, 2480MHz

30MHz to 1GHz H	30MHz to 1GHz V
	
1GHz to 7GHz H	**1GHz to 7GHz V**
	
7GHz to 18GHz H	**7GHz to 18GHz V**
	

Limit and Margin

QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Pol	Corr. (dB/m)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
31.212500	27.6	H	24.3	12.4	40.0
192.596250	36.3	H	15.9	7.2	43.5
240.853750	35.7	H	18.5	10.3	46.0
892.451250	33.3	H	28.7	12.7	46.0
31.333750	27.5	V	24.2	12.5	40.0
260.738750	23.8	V	20.8	22.2	46.0
599.147500	30.9	V	26.9	15.1	46.0
970.900000	33.8	V	29.6	20.2	54.0

PK

Frequency (MHz)	MaxPeak (dBµV/m)	Pol	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
1463.200000	39.6	H	-18.4	34.4	74.0
2190.100000	38.4	H	-15.5	35.6	74.0
3371.800000	37.1	H	-14.6	36.9	74.0
4960.000000	39.5	H	-10.6	34.5	74.0
8162.150000	47.7	H	-3.7	26.3	74.0
10423.200000	47.7	H	-1.8	26.3	74.0
13028.000000	49.5	H	0.4	24.5	74.0
17984.600000	59.1	H	13.1	14.9	74.0
1464.400000	45.2	V	-18.4	28.8	74.0
2131.300000	45.7	V	-16.2	28.3	74.0
2923.900000	43.6	V	-14.7	30.4	74.0
4960.300000	41.5	V	-10.6	32.5	74.0
7871.750000	48.1	V	-3.6	25.9	74.0
10408.900000	48.8	V	-1.8	25.2	74.0
14618.600000	52.9	V	3.1	21.1	74.0
17980.750000	60.3	V	13.0	13.7	74.0

AV

Frequency (MHz)	Average (dBµV/m)	Pol	Corr. (dB/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1463.200000	24.8	H	-18.4	29.2	54.0
2190.100000	29.3	H	-15.5	24.7	54.0
3371.800000	25.8	H	-14.6	28.2	54.0
4960.000000	31.8	H	-10.6	22.2	54.0
8162.150000	34.8	H	-3.7	19.2	54.0
10423.200000	35.2	H	-1.8	18.8	54.0
13028.000000	36.4	H	0.4	17.6	54.0
17984.600000	46.6	H	13.1	7.4	54.0
1464.400000	29.9	V	-18.4	24.1	54.0
2131.300000	30.3	V	-16.2	23.7	54.0
2923.900000	29.5	V	-14.7	24.5	54.0
4960.300000	34.2	V	-10.6	19.8	54.0
7871.750000	35.3	V	-3.6	18.7	54.0
10408.900000	35.8	V	-1.8	18.2	54.0
14618.600000	39.2	V	3.1	14.8	54.0
17980.750000	46.9	V	13.0	7.1	54.0

6. List of Tables

7. List of Figures