



Test report

REP107834-1R1TRFWL

Date of issue: November 10, 2025

Applicant:

HeartBeam, Inc.

Product description:

HeartBeam ECG Device

Model:

2002A

Product marketing name(s):

None

FCC ID:

2BQ5Z-HBM2002A

Specifications:

- ◆ **FCC 47 CFR Part 15, Subpart C – §15.247**

Operation within the bands 902 – 928 MHz, 2400 – 2483.5 MHz, 5727 – 5850 MHz

Lab and test locations

Company name	Nemko USA Inc.
Address	2210 Faraday Ave, Suite 150
City	Carlsbad
State	California
Postal code	92008
Country	USA
Telephone	+1 760 444 3500
Website	www.nemko.com
FCC Site Number	Test Firm Registration Number: 392943; Designation Number: US5058
ISED Test Site	2040B-3
Tested by	Lan Sayasane, Sr. EMC Test Engineer
Reviewed by	James Cunningham, EMC/WL Manager
Review date	November 10, 2025
Reviewer signature	James Cunningham Digitally signed by James Cunningham DN: cn=James Cunningham, c=US, o=Nemko, ou=EMC/WL, email=james.cunningham@nemko.com Reason: I am approving this document Date: 2025.11.10 13:07:56 -08'00'

Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko USA's ISO/IEC 17025 accreditation.

This report must not be used by the client to claim product certification, approval, or endorsement by ANAB, NIST, or any agency of the U.S. Government.

Copyright notification

Nemko USA Inc. authorizes the applicant to reproduce this report provided it is reproduced in its entirety and for use by the company's employees only. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties.

Nemko USA Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

© Nemko USA Inc.

Table of Contents

Table of Contents	3
Section 1 Report summary	4
1.1 Test specifications	4
1.2 Exclusions	4
1.3 Statement of compliance.....	4
1.4 Test report revision history.....	4
Section 2 Summary of test results	5
2.1 Sample information	5
2.2 Testing period.....	5
2.3 Test results	5
Section 3 Equipment under test (EUT) details	7
3.1 Disclaimer	7
3.2 Applicant.....	7
3.3 Manufacturer.....	7
3.4 EUT information	7
3.5 Transmitter Information	7
3.6 EUT setup details	8
Section 4 Engineering considerations	9
4.1 Modifications incorporated in the EUT.....	9
4.2 Technical judgement	9
4.3 Deviations from laboratory test procedures.....	9
Section 5 Test conditions	10
5.1 Atmospheric conditions.....	10
5.2 Power supply range	10
Section 6 Measurement uncertainty	11
6.1 Uncertainty of measurement	11
Section 7 Test equipment.....	12
7.1 Test equipment list	12
7.2 Test software list	12
Section 8 Testing data	13
8.1 Variation of power source	13
8.2 Antenna requirement	14
8.3 Minimum 6 dB bandwidth	15
8.4 Maximum peak output power	18
8.5 Spurious emissions	21
8.6 Power spectral density	50
8.7 99% occupied bandwidth	53

Section 1 Report summary

1.1 Test specifications

FCC 47 CFR Part 15, Subpart C – §15.247

Operation within the bands 902 – 928 MHz, 2400 – 2483.5 MHz, 5727 – 5850 MHz

1.2 Exclusions

None.

1.3 Statement of compliance

Testing was performed against all relevant requirements of the test standard(s).

Results obtained indicate that the product under test complies in full with the tested requirements.

The test results relate only to the item(s) tested.

See “Section 2 Summary of test results” for full details.

1.4 Test report revision history

Table 1.4-1: Test report revision history

Revision #	Issue Date	Details of changes made to test report
REP107834-1TRFWL	August 27, 2025	Original report issued
REP107834-1R1TRFWL	November 10, 2025	Minor edits following TCB feedback

Section 2 Summary of test results

2.1 Sample information

Receipt date	28-Jul-25
Nemko sample ID number	

2.2 Testing period

Test start date	29-Jul-25
Test end date	06-Aug-25

2.3 Test results

Table 2.3-1: FCC 47 CFR Part 15, Subpart B & C, general requirements

Part	Test description	Verdict
§15.207(a)	Conducted limits	Not applicable ¹
§15.31(e)	Variation of power source	Pass
§15.203	Antenna requirement	Pass

Notes: ¹ EUT is DC powered from dedicated DC source or battery powered

Table 2.3-2: FCC 47 CFR Part 15, Subpart C, §15.247 requirements

Part	Test description	Verdict
§15.247(a)(1)(i)	Frequency hopping systems operating in the 902–928 MHz band	Not applicable
§15.247(a)(1)(ii)	Frequency hopping systems operating in the 5725–5850 MHz band	Not applicable
§15.247(a)(1)(iii)	Frequency hopping systems operating in the 2400–2483.5 MHz band	Not applicable
§15.247(a)(2)	Minimum 6 dB bandwidth for systems using digital modulation techniques	Pass
§15.247(b)(1)	Maximum peak output power of frequency hopping systems operating in the 2400–2483.5 MHz band and 5725–5850 MHz band	Not applicable
§15.247(b)(2)	Maximum peak output power of Frequency hopping systems operating in the 902–928 MHz band	Not applicable
§15.247(b)(3)	Maximum peak output power of systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands	Pass
§15.247(b)(4)	Transmitting antennas of directional gain greater than 6 dBi	Not applicable
§15.247(c)(1)	Fixed point-to-point operation with directional antenna gains greater than 6 dBi	Not applicable
§15.247(c)(2)	Transmitters operating in the 2400–2483.5 MHz band that emit multiple directional beams	Not applicable
§15.247(d)	Spurious emissions	Pass
§15.247(e)	Power spectral density for digitally modulated devices	Pass
§15.247(f)	Time of occupancy for hybrid systems	Not applicable

Table 2.3-3: ISSED RSS-247 requirements

Part	Test description	Verdict
5.1 (a)	Bandwidth of a frequency hopping channel	Not applicable
5.1 (b)	Minimum channel spacing for frequency hopping systems	Not applicable
5.1 (c)	Frequency hopping systems operating in the 902–928 MHz band	Not applicable
5.1 (d)	Frequency hopping systems operating in the 2400–2483.5 MHz band	Not applicable
5.1 (e)	Frequency hopping systems operating in the 5725–5850 MHz band	Not applicable
5.2 (a)	Minimum 6 dB bandwidth	Pass
5.2 (b)	Maximum power spectral density	Pass
5.3 (a)	Digital modulation turned off	Not applicable
5.3 (b)	Frequency hopping turned off	Not applicable
5.4 (a)	Frequency hopping systems operating in the 902–928 MHz band	Not applicable
5.4 (b)	Frequency hopping systems operating in the 2400–2483.5 MHz band	Not applicable
5.4 (c)	Frequency hopping systems operating in the 5725–5850 MHz	Not applicable
5.4 (d)	Systems employing digital modulation techniques	Not applicable
5.4 (e)	Point-to-point systems in 2400–2483.5 MHz and 5725–5850 MHz band	Not applicable
5.4 (f)	Transmitters which operate in the 2400–2483.5 MHz band with multiple directional beams	Not applicable
5.5	Out-of-band emissions	Pass

Table 2.3-4: ISSED RSS-GEN requirements

Part	Test description	Verdict
6.7	Occupied bandwidth (99%)	Pass
7.3	Receiver radiated emission limits	Not applicable ¹
7.4	Receiver conducted emission limits	Not applicable ¹
8.8	Power Line Conducted Emissions Limits for Licence-Exempt Radio Apparatus	Not applicable

Notes: ¹ Only applicable to scanner receivers or stand-alone receivers operating in the band 30-960 MHz

Section 3 Equipment under test (EUT) details

3.1 Disclaimer

This section contains information provided by the applicant and has been utilized to support the test plan. Inaccurate information provided by the applicant can affect the validity of the results within this test report. Nemko accepts no responsibility for the information contained within this section and the impact it may have on the test plan and resulting measurements.

3.2 Applicant

Company name	HeartBeam, Inc.
Address	2118 Walsh Ave., Ste. 210
City	Santa Clara
State	CA
Postal/Zip code	95050
Country	USA

3.3 Manufacturer

Company name	HeartBeam, Inc.
Address	2118 Walsh Ave., Ste. 210
City	Santa Clara
State	CA
Postal/Zip code	95050
Country	USA

3.4 EUT information

Product name	HeartBeam ECG Device
Model	2002A
Variant(s)	None
Serial number	Radiated: (6) HeartBeam ECG Device: CH00(1Mbps): A000116, CH19(1Mbps): A000101, CH39(1Mbps): A000111, CH00(2Mbps): A000118, CH19(2Mbps): A000110, CH39(2Mbps): A000117 / Conducted: A000107
Part number	2002A
Power requirements	Battery Powered
Description/theory of operation	The HeartBeam AIMiGo device is a handheld, battery powered ECG recording device. The device is a hand held to the chest during the recording sessions. The recording sessions last for 30-seconds and the ECG data is transmitted to a companion device (tablet) via Bluetooth. The AIMiGo device does not analyze or store ECG data.
Operational frequencies	2400-2483.5 MHz
Software details	STM 32 HW/SW

3.5 Transmitter Information

Frequency band	2400 – 2483.5 MHz
Transmitter type	☐ Frequency hopping spread spectrum (FHSS) ☒ Digital transmission system (DTS) ☐ Hybrid FHSS / DTS
Minimum frequency (MHz)	2402
Maximum frequency (MHz)	2480
Type of modulation	GFSK
Data rate	☐ 125 kbps operation ☐ 500 kbps operation ☒ 1 Mbps operation ☒ 2 Mbps operation
Tested frequencies	2402 MHz (low), 2440 MHz (middle), and 2480 MHz (high)
Antenna type	Integrated monopole
Antenna peak gain	3.8 dBi

3.6 EUT setup details

Table 3.6-1: EUT sub assemblies

Description	Brand name	Model/Part number	Serial number	Rev.
None	N/A	N/A	N/A	N/A

Table 3.6-2: EUT interface ports

Description	Qty.
None	N/A

Table 3.6-3: Support equipment

Description	Brand name	Model/Part number	Serial number	Rev.
Wireless Charging Dock	HeartBeam, Inc.	3002A	078	--
AC/DC Power Adapter	GlobTek, Inc.	GTM86100-1005-W2-USB/WR9HA2000USBFMR6B	N/A	--

Table 3.6-4: Inter-connection cables

Cable description	From	To	Length (m)
USB cable (Type A to C)	AC/DC Power Adapter	Wireless Charging Dock	1

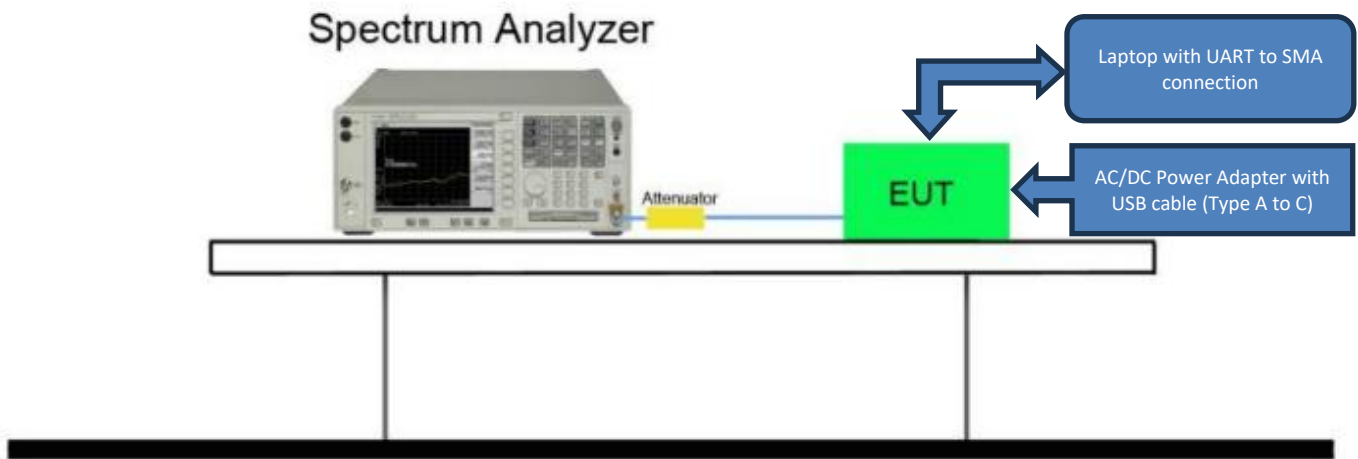


Figure 3.6-1: Test setup diagram

Section 4 Engineering considerations

4.1 Modifications incorporated in the EUT

None.

4.2 Technical judgement

None.

4.3 Deviations from laboratory test procedures

None.

Section 5 Test conditions

5.1 Atmospheric conditions

Temperature	15–30 °C
Relative humidity	20–75 %
Air pressure	86–106 kPa

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

5.2 Power supply range

The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages ± 5 %, for which the equipment was designed.

Section 6 Measurement uncertainty

6.1 Uncertainty of measurement

Nemko USA Inc. has calculated measurement uncertainty and is documented in EMC/MUC/001 “Uncertainty in EMC measurements.” Measurement uncertainty was calculated using the methods described in CISPR 16-4-2 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-2: Uncertainties, statistics, and limit modelling – Measurement instrumentation uncertainty. The expression of Uncertainty in EMC testing. Measurement uncertainty calculations assume a coverage factor of K=2 with 95% certainty.

Table 6.1-1: Measurement uncertainty calculations

Measurement		U_{cispr} dB	U_{lab} dB
Conducted disturbance at AC mains and other port power using a V-AMN	9 kHz to 150 kHz	3.8	2.9
	150 kHz to 30 MHz	3.4	2.3
Conducted disturbance at telecommunication port using AAN	150 kHz to 30 MHz	5.0	4.3
Conducted disturbance at telecommunication port using CVP	150 kHz to 30 MHz	3.9	2.9
Conducted disturbance at telecommunication port using CP	150 kHz to 30 MHz	2.9	1.4
Conducted disturbance at telecommunication port using CP and CVP	150 kHz to 30 MHz	4.0	3.1
Radiated disturbance (electric field strength in a SAC)	30 MHz to 1 GHz	6.3	5.5
Radiated disturbance (electric field strength in a FAR)	1 GHz to 6 GHz	5.2	4.7
Radiated disturbance (electric field strength in a FAR)	6 GHz to 18 GHz	5.5	5.0

- Notes: Compliance assessment:
- If U_{lab} is less than or equal to U_{cispr} then:
- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
 - non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit
- If U_{lab} is greater than U_{cispr} then:
- compliance is deemed to occur if no measured disturbance level, increased by $(U_{\text{lab}} - U_{\text{cispr}})$, exceeds the disturbance limit;
 - non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{\text{lab}} - U_{\text{cispr}})$, exceeds the disturbance limit

V-AMN: V type artificial mains network
 AAN: Asymmetric artificial network
 CP: Current probe
 CVP: Capacitive voltage probe
 SAC: Semi-anechoic chamber
 FAR: Fully anechoic room

Section 7 Test equipment

7.1 Test equipment list

Table 7.1-1: Test Equipment List

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
Signal & Spectrum Analyzer	Rohde & Schwarz	FSW43	E1302	1 year	19-Mar-2026
Attenuator, 20dB	Centric RF	C407-20	N/A	VOU	VOU
EMI Test Receiver	Rohde & Schwarz	ESU26	E1353	1 year	13-Nov-2025
Preamplifier	Sonoma	310N	E1155	1 year	18-Jun-2026
System Controller	Sunol Sciences	SC104V	E1129	NCR	NCR
Antenna, Biconilog	ETS Lindgren	3142E	E1371	2 years	20-Aug-2026
Antenna, DRG Horn	ETS Lindgren	3117-PA	E1139	2 years	11-Jan-2026
Standard Gain Horn Antenna	Eravant	SAZ-2410-42-S1	EW107	1 year	11-Feb-2026
Waveguide to Coax Adapter Ka Band Right Angle	Eravant	SWC-28KM-R1	EW101	NCR	NCR
Low Noise Amplifier	Eravant	SBL-1834034038-KFKF	EW111	NCR	NCR
Notch Filter, 2.4 GHz	Micro-Tonics	BRM50702-02	E1142	NCR	NCR

Notes: NCR: no calibration required
VBU: verify before use

7.2 Test software list

Table 7.2-1: Test Software

Manufacturer	Details
Rohde & Schwarz	EMC 32 V10.60.15 (AC conducted emissions and radiated emissions)

Section 8 Testing data

8.1 Variation of power source

8.1.1 References and limits

- FCC 47 CFR Part 15, Subpart A: §15.31(e)
- Test method: ANSI C63.10-2020 §5.13

§15.31(e):

For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

8.1.2 Test summary

Verdict	Pass	Temperature	22 °C
Test date	August 6, 2025	Air pressure	1007.0 mbar
Test engineer	Lan Sayasane, Sr. EMC Test Engineer	Relative humidity	56 %
Test location	☒ Wireless bench ☐ Other:		

8.1.3 Notes

Testing was performed with the transmitter operating on a fixed channel (middle) at maximum output power.

8.1.4 Setup details

EUT power input during test	Battery powered
-----------------------------	-----------------

8.1.5 Test data

☒	EUT is battery operated. Therefore, all tests performed with a new fully charged battery
☐	EUT power supply voltage varied across supported range. No variation in transmitter output power observed therefore all tests performed at nominal power supply voltage.
☐	EUT power supply voltage varied across supported range. Transmitter output power variation was observed. All tests performed with the EUT operated at the worst-case operating voltage with respect to transmitter output power: V.

8.2 Antenna requirement

8.2.1 References and limits

- FCC 47 CFR Part 15, Subpart C: §15.203

§15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. Test summary

Verdict	Pass		
Test date	August 6, 2025	Temperature	22 °C
Test engineer	Lan Sayasane, Sr. EMC Test Engineer	Air pressure	1007.0 mbar
Test location	☒ Wireless bench ☐ Other:	Relative humidity	56 %

8.2.2 Notes

None

8.2.3 Test data

Antenna part number:	Not provided
Technical description:	Integrated monopole
Peak gain (dBi):	3.8 dBi
	☐ Declared by client
Source of gain data:	☐ Antenna data sheet or specification. Document name:
	☒ Antenna gain test report. Document name: Heartbeam BLE - Antenna Gain and Verification Report, ID: SCDC-1050199185-132322, 2025-08-15

8.3 Minimum 6 dB bandwidth

8.3.1 References and limits

- FCC 47 CFR Part 15, Subpart C: §15.247(a)(2)
- ISED: RSS-247 5.2(a)
- Test method: ANSI C63.10-2020 §11.8.1

§15.247:

- (a) Operation under the provisions of this Section is limited to frequency hopping and digitally modulated intentional radiators that comply with the following provisions:
- (2) Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

RSS-247:

- 5.2 DTSs include systems that employ digital modulation techniques resulting in spectral characteristics similar to direct sequence systems. The following applies to the bands 902-928 MHz and 2400-2483.5 MHz:
- (a) The minimum 6 dB bandwidth shall be 500 kHz.

8.3.2 Test summary

Verdict	Pass		
Test date	August 6, 2025	Temperature	22 °C
Test engineer	Lan Sayasane, Sr. EMC Test Engineer	Air pressure	1007.0 mbar
Test location	☒ Wireless bench ☐ Other:	Relative humidity	56 %

8.3.3 Notes

Testing was performed with the transmitter operating on a fixed channel (lowest, middle, and highest) at maximum output power.

The spectral plots within this section have been corrected with all relevant transducer factors.

8.3.4 Setup details

EUT power input during test	Battery powered
EUT setup configuration	☒ Table-top ☐ Floor standing ☐ Other:

Receiver/spectrum analyzer settings:

Resolution bandwidth	100 kHz
Video bandwidth	300 kHz
Detector mode	Peak
Trace mode	Max Hold
Measurement time	Long enough for trace to stabilize

8.3.5 Test data

Table 8.3-1: Minimum 6 dB bandwidth test data

Test Frequency (MHz)	Modulation	DTS Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
2402	GFSK, 1 Mbps	685.5	≥ 500	185.5
2440	GFSK, 1 Mbps	681.0	≥ 500	181.0
2480	GFSK, 1 Mbps	694.5	≥ 500	194.5
2402	GFSK, 2 Mbps	1101.0	≥ 500	601.0
2440	GFSK, 2 Mbps	1137.0	≥ 500	637.0
2480	GFSK, 2 Mbps	1140.0	≥ 500	640.0

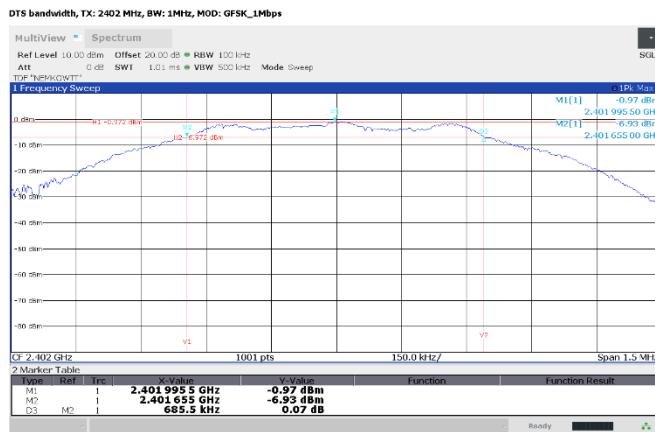


Figure 8.3-1: Minimum 6 dB bandwidth, GFSK, 1 Mbps, 2402 MHz

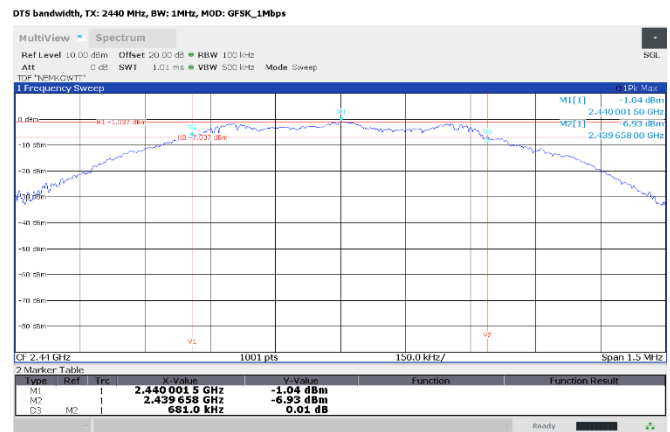


Figure 8.3-2: Minimum 6 dB bandwidth, GFSK, 1 Mbps, 2440 MHz

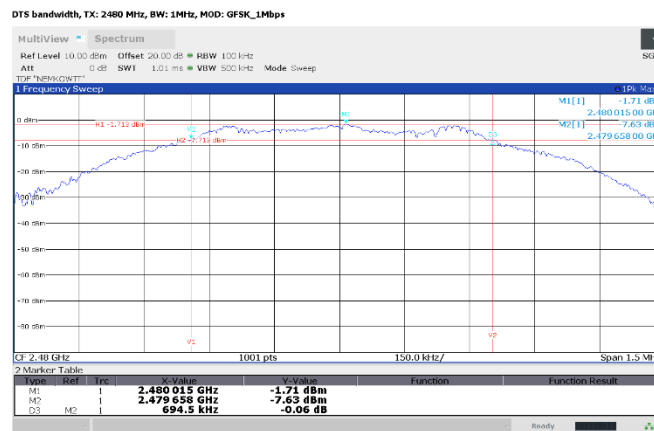


Figure 8.3-3: Minimum 6 dB bandwidth, GFSK, 1 Mbps, 2480 MHz

Section 8
Test name
Specification(s)

Testing data
 Minimum 6 dB bandwidth
 FCC 15.247 & RSS-247

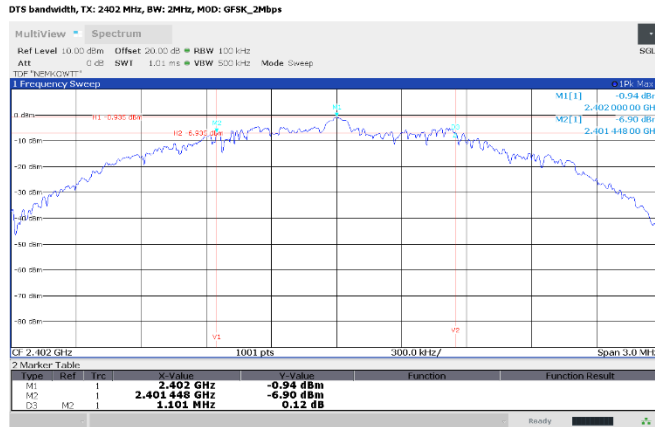


Figure 8.3-4: Minimum 6 dB bandwidth, GFSK, 2 Mbps, 2402 MHz

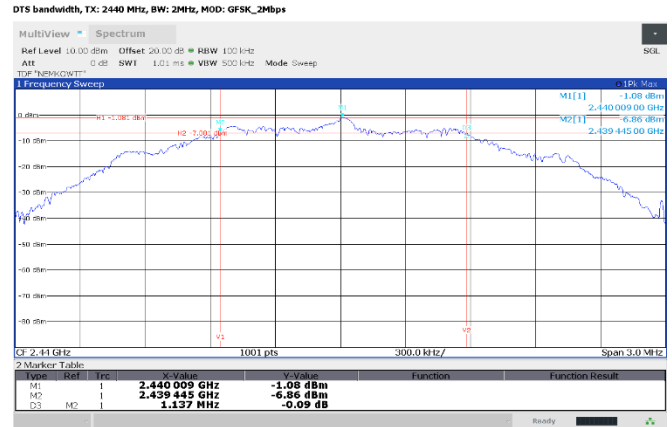


Figure 8.3-5: Minimum 6 dB bandwidth, GFSK, 2 Mbps, 2440 MHz

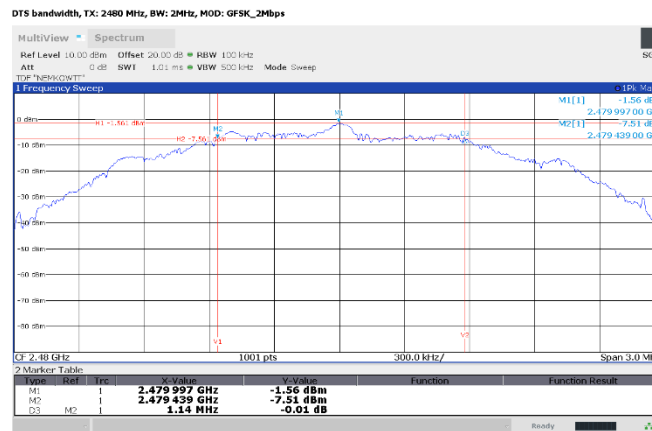


Figure 8.3-6: Minimum 6 dB bandwidth, GFSK, 2 Mbps, 2480 MHz

8.4 Maximum peak output power

8.4.1 References and limits

- FCC 47 CFR Part 15, Subpart C: §15.247(b)(3)
- ISSED: RSS-247 5.4(d)
- Test method: ANSI C63.10-2020 §11.9.1.1 (RBW ≥ DTS BW)

§15.247:

- (b) Operation under the provisions of this Section is limited to frequency hopping and digitally modulated intentional radiators that comply with the following provisions:
- (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

RSS-247:

5.4 Devices shall comply with the following requirements, where applicable:

- (d) For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1 W. The EIRP shall not exceed 4 W, except as provided in RSS 247 section 5.4(e).

As an alternative to a peak power measurement, compliance can be based on a measurement of the maximum conducted output power. The maximum conducted output power is the total transmit power delivered to all antennas and antenna elements, averaged across all symbols in the signalling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or transmitting at a reduced power level. If multiple modes of operation are implemented, the maximum conducted output power is the highest total transmit power occurring in any mode.

8.4.2 Test summary

Verdict	Pass		
Test date	August 6, 2025	Temperature	22 °C
Test engineer	Lan Sayasane, Sr. EMC Test Engineer	Air pressure	1007.0 mbar
Test location	☒ Wireless bench ☐ Other:	Relative humidity	56 %

8.4.3 Notes

Testing was performed with the transmitter operating on a fixed channel (lowest, middle, and highest) at maximum output power.

The spectral plots within this section have been corrected with all relevant transducer factors.

8.4.4 Setup details

EUT power input during test	Batter powered
EUT setup configuration	☒ Table-top ☐ Floor standing ☐ Other:

Receiver/spectrum analyzer settings:

Resolution bandwidth	1 MHz (1 Mbps operation) and 2 MHz (2 Mbps operation)
Video bandwidth	3 MHz (1 Mbps operation) and 10 MHz (2 Mbps operation)
Detector mode	Peak
Trace mode	Max Hold
Measurement time	Long enough for trace to stabilize

8.4.5 Test data

Table 8.4-1: Maximum peak output power test data

Test Frequency (MHz)	Modulation	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	EIRP (dBm) (ISED)
2402	GFSK, 1 Mbps	-0.84	≤ 30	30.84	2.96
2440	GFSK, 1 Mbps	-0.98	≤ 30	30.98	2.82
2480	GFSK, 1 Mbps	-1.47	≤ 30	31.47	2.33
2402	GFSK, 2 Mbps	-0.81	≤ 30	30.81	2.99
2440	GFSK, 2 Mbps	-0.95	≤ 30	30.95	2.85
2480	GFSK, 2 Mbps	-1.44	≤ 30	31.44	2.36

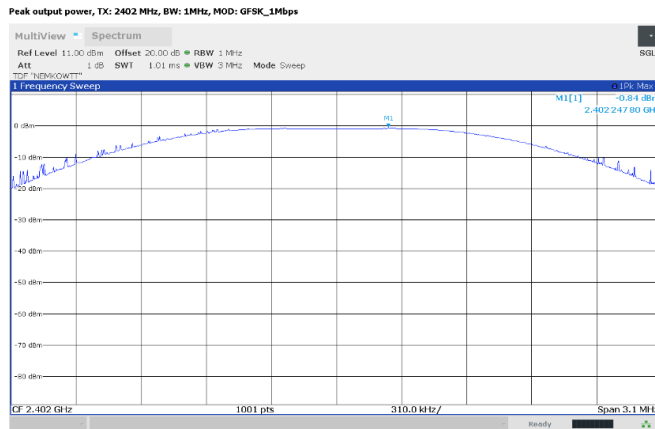


Figure 8.4-1: Maximum peak output power, GFSK, 1 Mbps, 2402 MHz

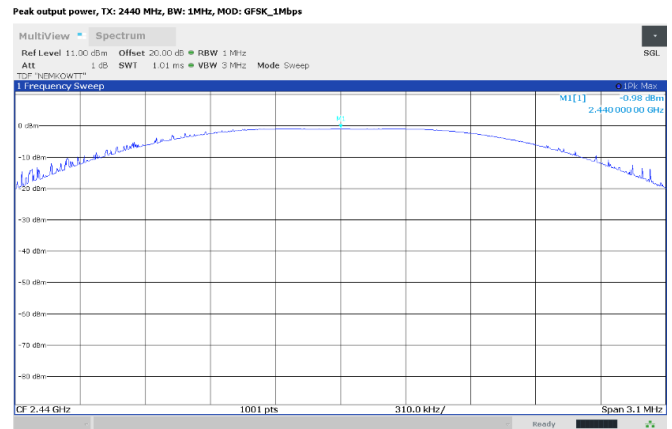


Figure 8.4-2: Maximum peak output power, GFSK, 1 Mbps, 2440 MHz



Figure 8.4-3: Maximum peak output power, GFSK, 1 Mbps, 2480 MHz

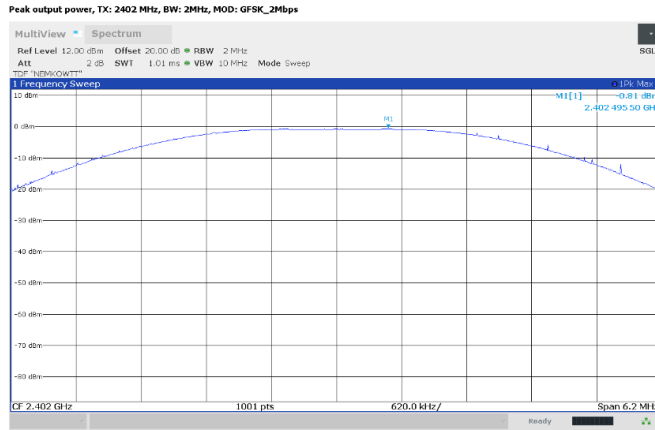


Figure 8.4-4: Maximum peak output power, GFSK, 2 Mbps, 2402 MHz

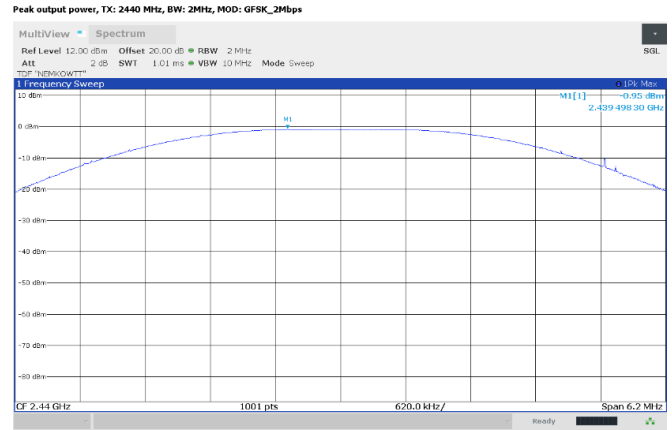


Figure 8.4-5: Maximum peak output power, GFSK, 2 Mbps, 2440 MHz

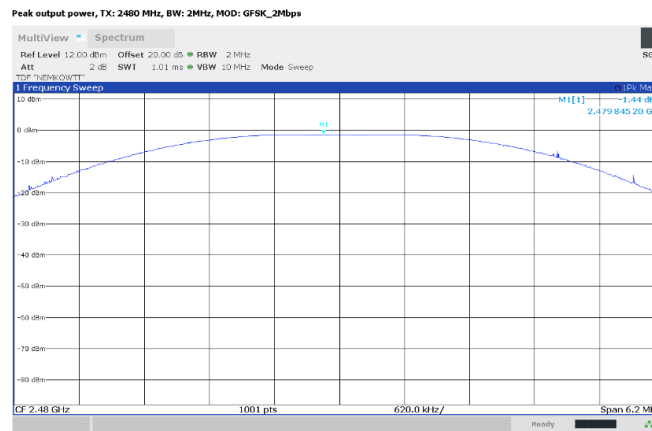


Figure 8.4-6: Maximum peak output power, GFSK, 2 Mbps, 2480 MHz

8.5 Spurious emissions

8.5.1 References and limits

- FCC 47 CFR Part 15, Subpart C: §15.247(d)
- RSS-247: §5.5
- Test method: ANSI C63.10-2020 §6.10.4 (authorized band edge)
- Test method: ANSI C63.10-2020 §11.11 (antenna port conducted spurious emissions)
- Test method: ANSI C63.10-2020 §11.12.3 (radiated restricted band edge)
- Test method: ANSI C63.10-2020 §6.5, 6.6 (radiated emissions in restricted bands)

§15.247:

- (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

RSS-247:

- 5.5 In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

Table 8.5-1: FCC §15.209 / RSS-GEN §8.9– Radiated emission limits

Frequency, MHz	Field strength of emissions		Measurement distance, m
	μV/m	dBμV/m	
0.009–0.490	2400/F	$67.6 - 20 \times \log_{10}(F)$	300
0.490–1.705	24000/F	$87.6 - 20 \times \log_{10}(F)$	30
1.705–30.0	30	29.5	30
30–88	100	40.0	3
88–216	150	43.5	3
216–960	200	46.0	3
above 960	500	54.0	3

Notes: In the emission table above, the tighter limit applies at the band edges.

For frequencies above 1 GHz the limit on peak RF emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.

Table 8.5-2: FCC restricted frequency bands

MHz	MHz	MHz	GHz
0.090–0.110	16.42–16.423	399.9–410	4.5–5.15
0.495–0.505	16.69475–16.69525	608–614	5.35–5.46
2.1735–2.1905	16.80425–16.80475	960–1240	7.25–7.75
4.125–4.128	25.5–25.67	1300–1427	8.025–8.5
4.17725–4.17775	37.5–38.25	1435–1626.5	9.0–9.2
4.20725–4.20775	73–74.6	1645.5–1646.5	9.3–9.5
6.215–6.218	74.8–75.2	1660–1710	10.6–12.7
6.26775–6.26825	108–121.94	1718.8–1722.2	13.25–13.4
6.31175–6.31225	123–138	2200–2300	14.47–14.5
8.291–8.294	149.9–150.05	2310–2390	15.35–16.2
8.362–8.366	156.52475–156.52525	2483.5–2500	17.7–21.4
8.37625–8.38675	156.7–156.9	2690–2900	22.01–23.12
8.41425–8.41475	162.0125–167.17	3260–3267	23.6–24.0
12.29–12.293	167.72–173.2	3332–3339	31.2–31.8
12.51975–12.52025	240–285	3345.8–3358	36.43–36.5
12.57675–12.57725	322–335.4	3600–4400	Above 38.6
13.36–13.41			

Table 8.5-3: ISSED RSS-GEN restricted frequency bands

MHz	MHz	GHz
090 - 0.110	149.9 - 150.05	9.0 - 9.2
0.495 - 0.505	156.52475 - 156.52525	9.3 - 9.5
2.1735 - 2.1905	156.7 - 156.9	10.6 - 12.7
3.020 - 3.026	162.0125 - 167.17	13.25 - 13.4
4.125 - 4.128	167.72 - 173.2	14.47 - 14.5
4.17725 - 4.17775	240 - 285	15.35 - 16.2
4.20725 - 4.20775	322 - 335.4	17.7 - 21.4
5.677 - 5.683	399.9 - 410	22.01 - 23.12
6.215 - 6.218	608 - 614	23.6 - 24.0
6.26775 - 6.26825	960 - 1427	31.2 - 31.8
6.31175 - 6.31225	1435 - 1626.5	36.43 - 36.5
8.291 - 8.294	1645.5 - 1646.5	Above 38.6
8.362 - 8.366	1660 - 1710	
8.37625 - 8.38675	1718.8 - 1722.2	
8.41425 - 8.41475	2200 - 2300	
12.29 - 12.293	2310 - 2390	
12.51975 - 12.52025	2483.5 - 2500	
12.57675 - 12.57725	2655 - 2900	
13.36 - 13.41	3260 - 3267	
16.42 - 16.423	3332 - 3339	
16.69475 - 16.69525	3345.8 - 3358	
16.80425 - 16.80475	3500 - 4400	
25.5 - 25.67	4500 - 5150	
37.5 - 38.25	5350 - 5460	
73 - 74.6	7250 - 7750	
74.8 - 75.2	8025 - 8500	
108 - 138		

8.5.2 Test summary

Verdict	Pass		
Test date	July 29, 2025	Temperature	22 °C
Test engineer	Lan Sayasane, Sr. EMC Test Engineer	Air pressure	1009.0 mbar
Test location	☒ Wireless bench (conducted tests) ☒ 10 m semi-anechoic chamber (radiated tests) ☐ 3 m semi-anechoic chamber (radiated tests) ☐ Other:	Relative humidity	52 %

8.5.3 Notes

Testing was performed with the transmitter operating on a fixed channel at full power. Low, middle, and high channels were tested. The spectrum was searched from 30 MHz to 26 GHz (above the 10th harmonic of the highest transmit frequency).

For radiated measurements, the EUT was investigated to identify the worst case orientation with respect to the fundamental transmitter power. All measurements were performed with the EUT in that worst-case orientation.

The spectral plots within this section have been corrected with all relevant transducer factors.

Radiated emissions are reported for the modulation / data rate settings that produced the highest transmitter output power as a worst-case. For this EUT, the worst case modulation / data rate setting used was: GFSK, 1Mbps.

8.5.4 Setup details

EUT power input during test	Battery powered
EUT setup configuration	☒ Table-top ☐ Floor standing ☐ Other:

Spectrum analyzer settings (conducted emissions):

Resolution bandwidth	100 kHz
Video bandwidth	300 kHz
Detector mode	Peak
Trace mode	Max Hold
Measurement time	Long enough for trace to stabilize

Receiver settings for radiated measurements within restricted bands below 1 GHz:

Resolution bandwidth	120 kHz
Video bandwidth	300 kHz
Detector mode	Peak (preview measurements) Quasi-Peak (final measurements)

Receiver settings for radiated measurements within restricted bands above 1 GHz:

Resolution bandwidth	1 MHz
Video bandwidth	3 MHz
Detector mode	Peak (preview measurements) Peak and average (final measurements)

8.5.5 Test data

Antenna port conducted spurious emissions:

- Authorized band edge:

Table 8.5-4: Authorized band edge conducted emissions (antenna port)

Test Frequency (MHz)	Modulation	Frequency of highest emission (MHz)	Amplitude (dBm)	Limit (dBm)	Margin (dB)
2402	GFSK, 1 Mbps	2400.001	-45.61	-21.75	23.86
2480	GFSK, 1 Mbps	2483.767	-56.27	-21.75	34.70
2402	GFSK, 2 Mbps	2400.001	-33.81	-21.02	12.79
2480	GFSK, 2 Mbps	2483.505	-53.64	-21.54	32.10

Spurious emission reference level, TX: 2402 MHz, BW: 1MHz, MOD: GFSK_1Mbps

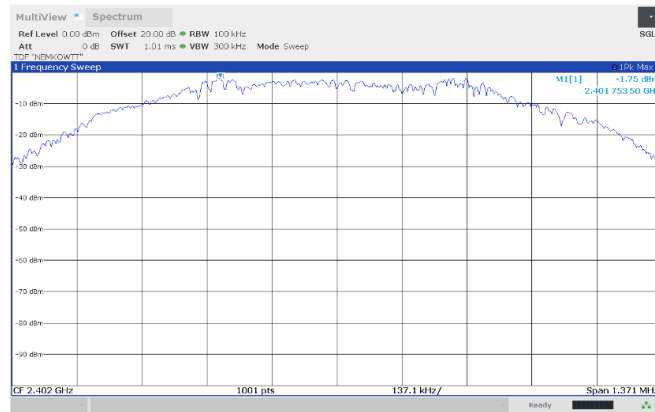


Figure 8.5-1: Authorized band-edge emissions, reference level, GFSK, 1 Mbps, 2402 MHz

Authorized band edge, TX: 2402 MHz, BW: 1MHz, MOD: GFSK_1Mbps

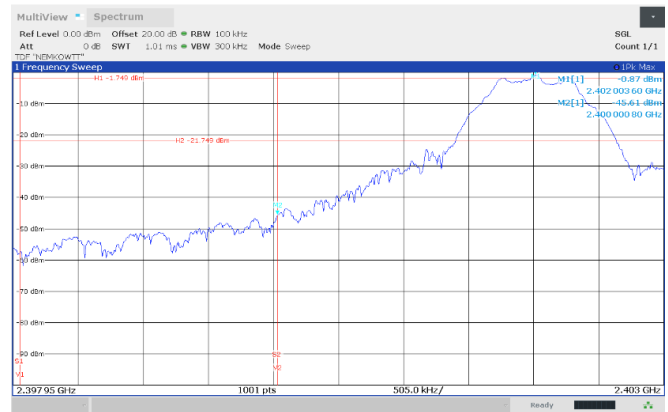


Figure 8.5-2: Authorized band-edge emissions, GFSK, 1 Mbps, 2402 MHz

Spurious emission reference level, TX: 2480 MHz, BW: 1MHz, MOD: GFSK_1Mbps

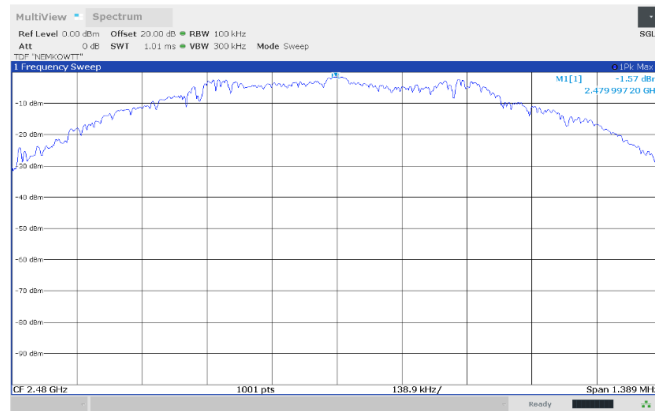


Figure 8.5-3: Authorized band-edge emissions, reference level, GFSK, 1 Mbps, 2480 MHz

Authorized band edge, TX: 2480 MHz, BW: 1MHz, MOD: GFSK_1Mbps

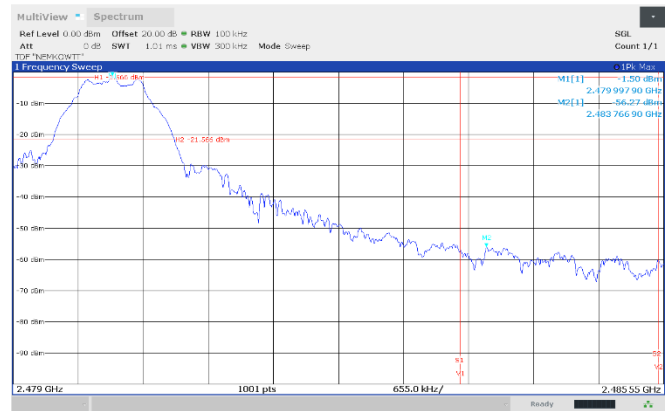


Figure 8.5-4: Authorized band-edge emissions, GFSK, 1 Mbps, 2480 MHz

Spurious emission reference level, TX: 2402 MHz, BW: 2MHz, MOD: GFSK_2Mbps

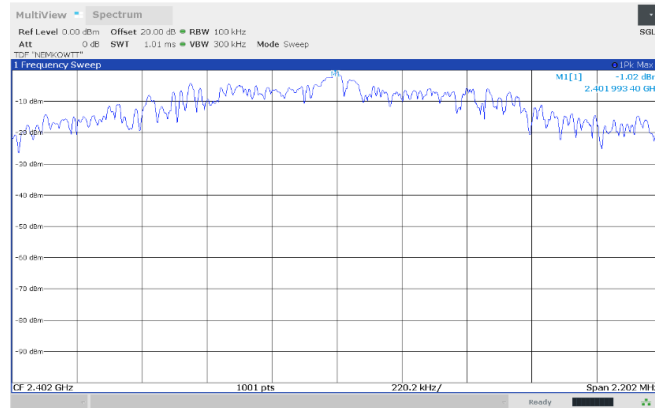


Figure 8.5-5: Authorized band-edge emissions, reference level, GFSK 2 Mbps, 2402 MHz

Authorized band edge, TX: 2402 MHz, BW: 2MHz, MOD: GFSK_2Mbps

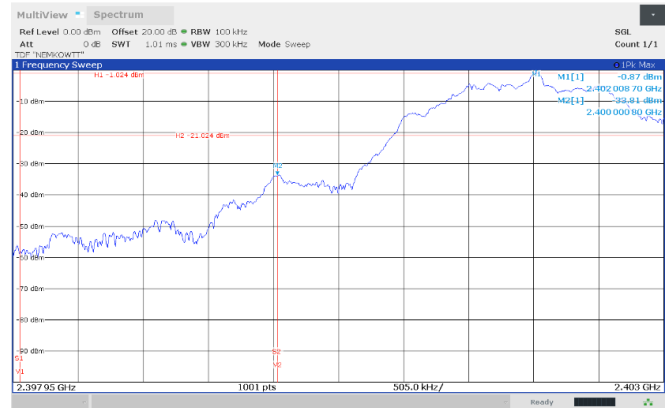


Figure 8.5-6: Authorized band-edge emissions, GFSK, 2 Mbps, 2402 MHz

Spurious emission reference level, TX: 2480 MHz, BW: 2MHz, MOD: GFSK_2Mbps

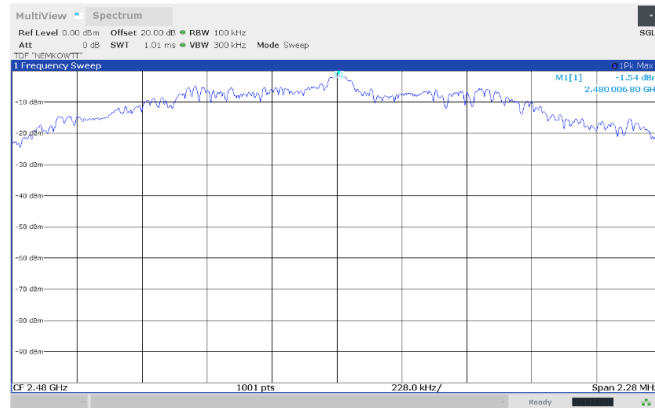


Figure 8.5-7: Authorized band-edge emissions, reference level, GFSK, 2 Mbps, 2480 MHz

Authorized band edge, TX: 2480 MHz, BW: 2MHz, MOD: GFSK_2Mbps

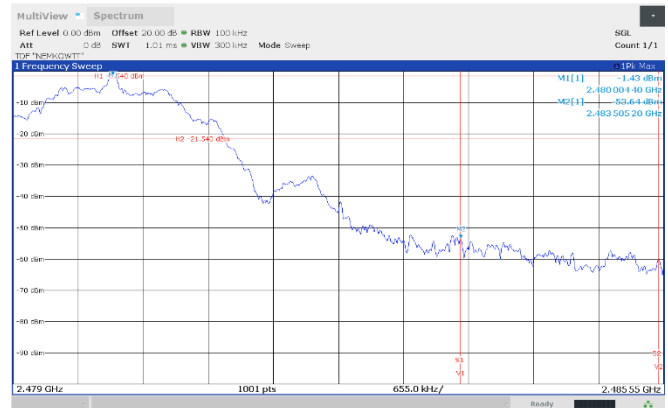


Figure 8.5-8: Authorized band-edge emissions, GFSK, 2 Mbps, 2480 MHz

Antenna port conducted spurious emissions:

Table 8.5-5: Antenna port conducted spurious emissions

Test Frequency (MHz)	Modulation	Frequency of highest emission (MHz)	Amplitude (dBm)	Limit (dBm)	Margin (dB)
2402	GFSK, 1 Mbps	2399.625	-47.01	-20.93	26.08
2440	GFSK, 1 Mbps	4879.975	-59.10	-21.27	37.83
2480	GFSK, 1 Mbps	2484.374	-60.16	-21.52	38.64
2402	GFSK, 2 Mbps	2399.875	-36.30	-20.89	15.41
2440	GFSK, 2 Mbps	4880.973	-60.55	-20.99	39.56
2480	GFSK, 2 Mbps	2483.875	-57.24	-21.73	35.51

Section 8
Test name
Specification(s)

Testing data
Spurious emissions
FCC 15.247 & RSS-247



Spurious emission reference level, TX: 2402 MHz, BW: 1MHz, MOD: GFSK_1Mbps

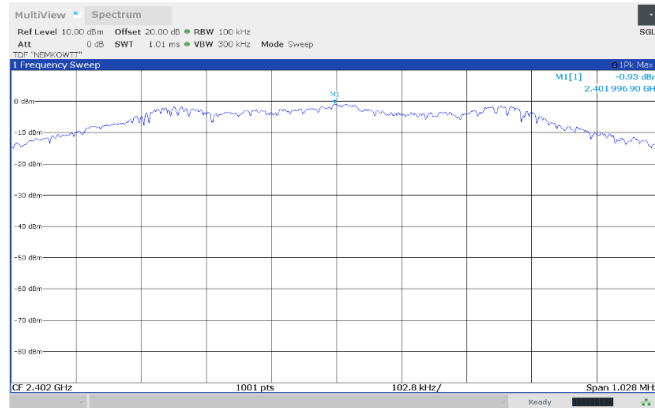


Figure 8.5-9: Antenna port conducted spurious emissions, reference level, GFSK, 1 Mbps, 2402 MHz

Spurious emissions, TX: 2402 MHz, BW: 1MHz, MOD: GFSK_1Mbps

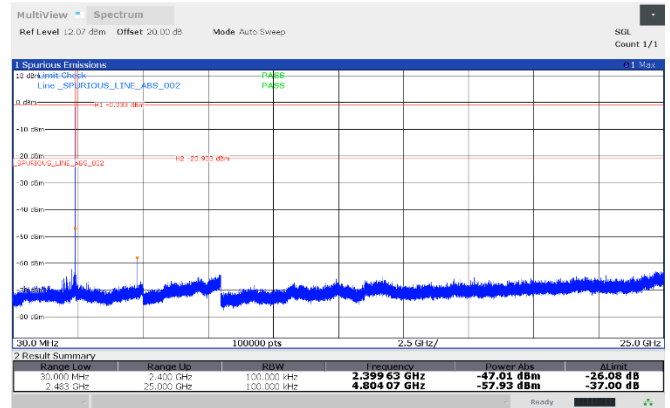


Figure 8.5-10: Antenna port conducted spurious emissions, GFSK, 1 Mbps, 2402 MHz

Spurious emission reference level, TX: 2440 MHz, BW: 1MHz, MOD: GFSK_1Mbps

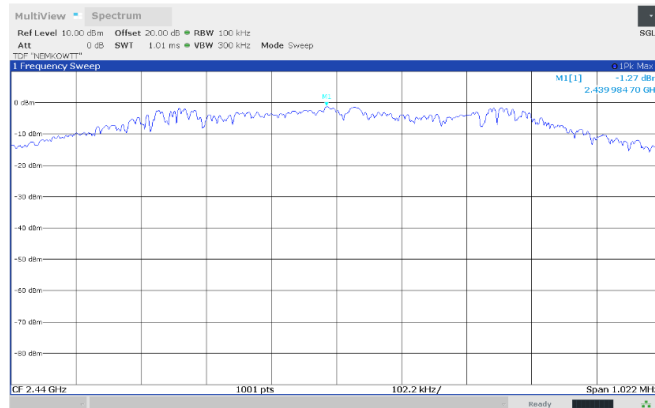


Figure 8.5-11: Antenna port conducted spurious emissions, reference level, GFSK, 1 Mbps, 2440 MHz

Spurious emissions, TX: 2440 MHz, BW: 1MHz, MOD: GFSK_1Mbps

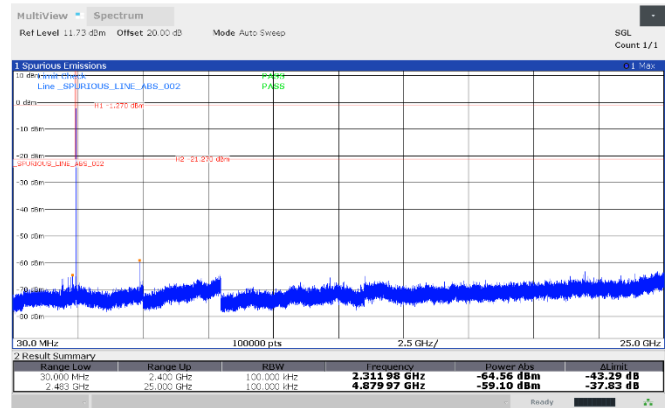


Figure 8.5-12: Antenna port conducted spurious emissions, GFSK, 1 Mbps, 2440 MHz

Spurious emission reference level, TX: 2480 MHz, BW: 1MHz, MOD: GFSK_1Mbps

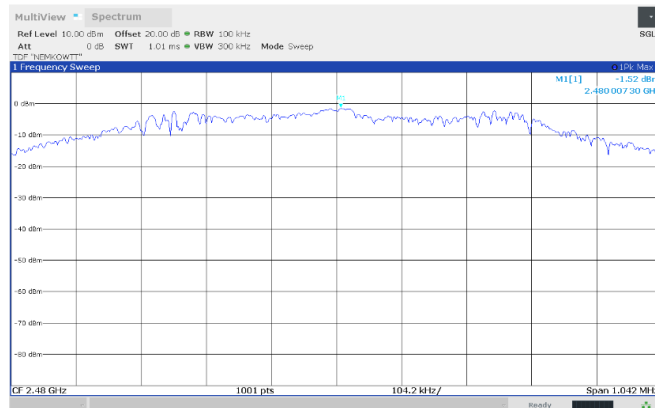


Figure 8.5-13: Antenna port conducted spurious emissions, reference level, GFSK, 1 Mbps, 2480 MHz

Spurious emissions, TX: 2480 MHz, BW: 1MHz, MOD: GFSK_1Mbps

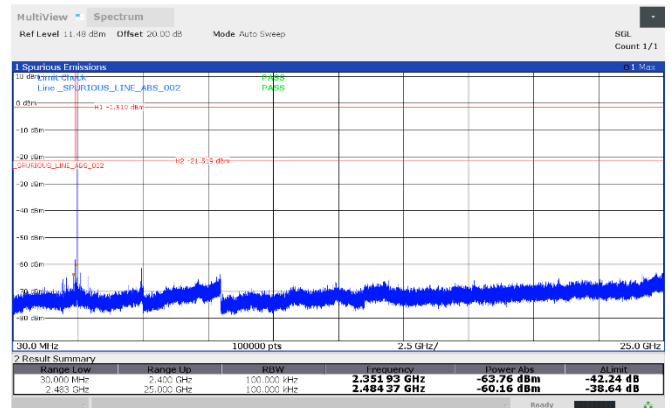


Figure 8.5-14: Antenna port conducted spurious emissions, GFSK, 1 Mbps, 2480 MHz

Section 8
Test name
Specification(s)

Testing data
Spurious emissions
FCC 15.247 & RSS-247

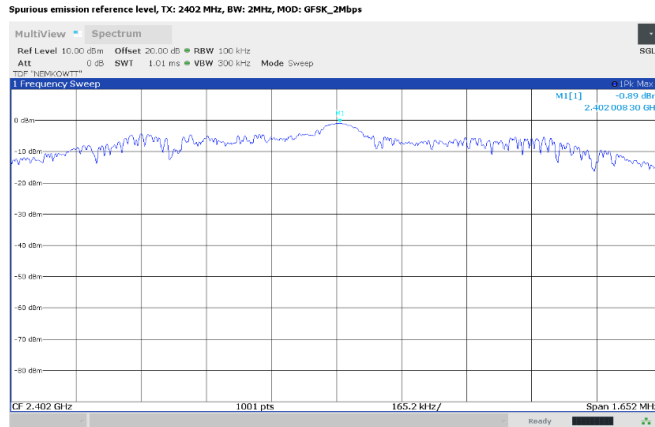


Figure 8.5-15: Antenna port conducted spurious emissions, reference level, GFSK, 2 Mbps, 2402 MHz

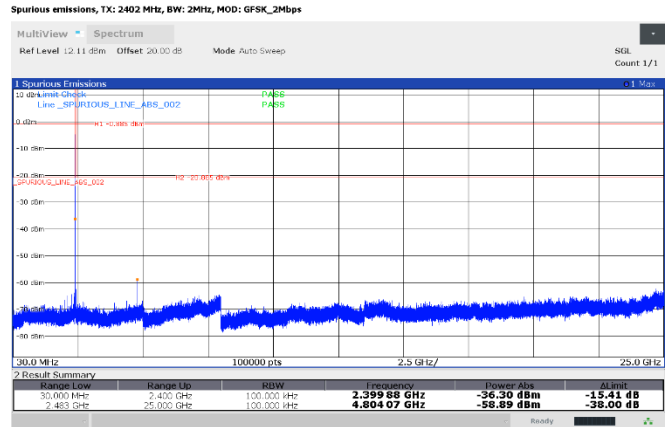


Figure 8.5-16: Antenna port conducted spurious emissions, GFSK, 2 Mbps, 2402 MHz

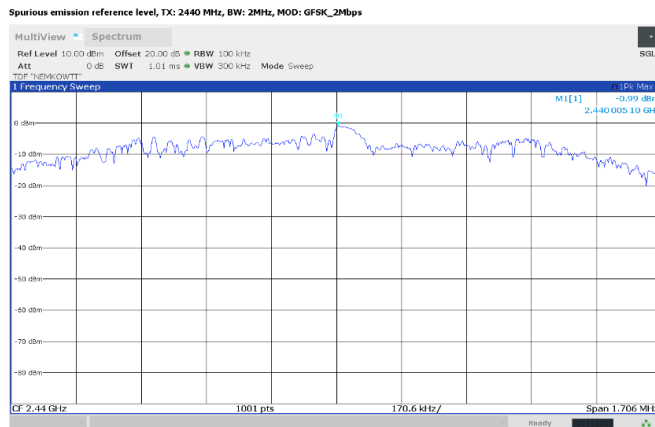


Figure 8.5-17: Antenna port conducted spurious emissions, reference level, GFSK, 2 Mbps, 2440 MHz

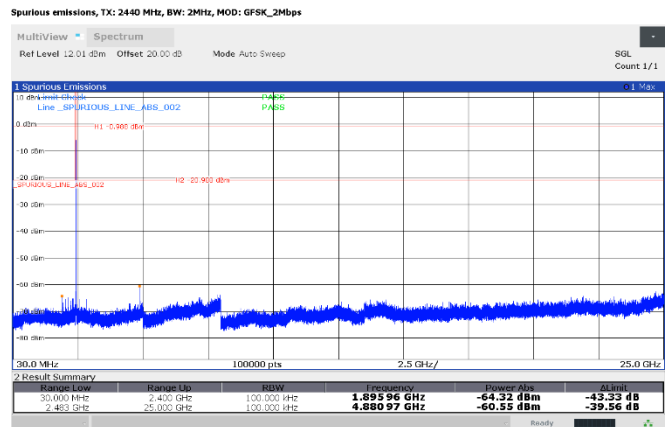


Figure 8.5-18: Antenna port conducted spurious emissions, GFSK, 2 Mbps, 2440 MHz

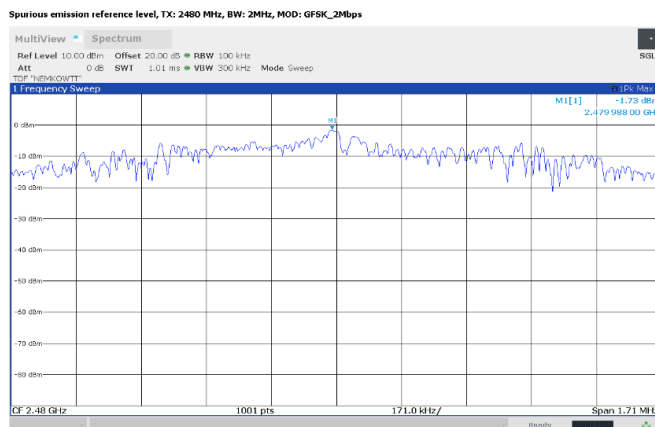


Figure 8.5-19: Antenna port conducted spurious emissions, reference level, GFSK, 2 Mbps, 2480 MHz

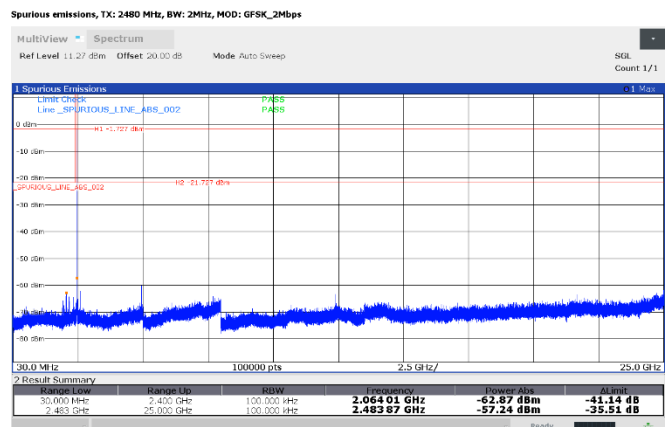


Figure 8.5-20: Antenna port conducted spurious emissions, GFSK, 2 Mbps, 2480 MHz

Radiated spurious emissions:

- Restricted band edge:

Full Spectrum

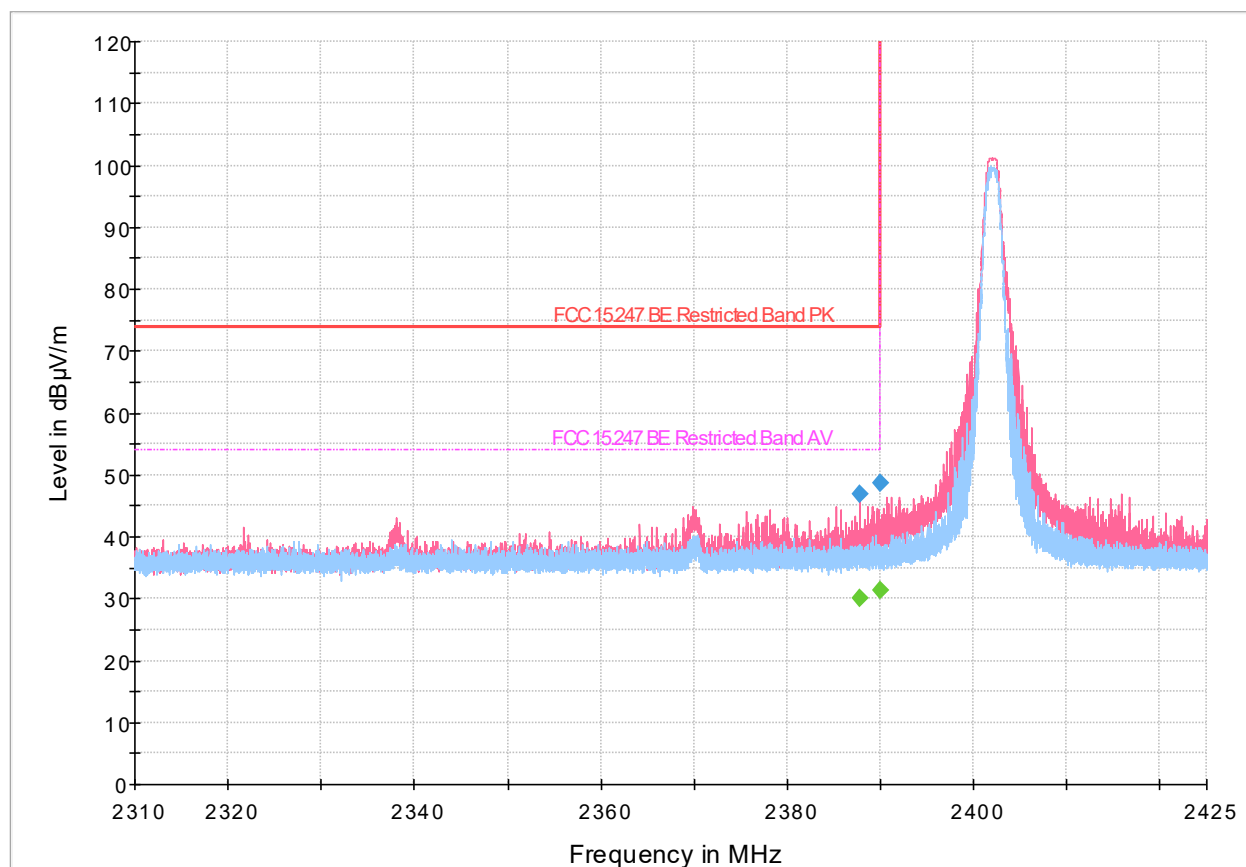


Figure 8.5-21: Radiated emissions spectral plot (2.31 GHz - 2.425 GHz) – 2402 MHz_1 Mbps

Table 8.5-6: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2387.826250	46.87	---	73.90	27.03	5000.0	1000.000	118.0	V	136.0	-9.8
2387.826250	---	29.99	53.90	23.91	5000.0	1000.000	118.0	V	136.0	-9.8
2390.000000	48.57	---	73.90	25.33	5000.0	1000.000	113.0	V	118.0	-9.8
2390.000000	---	31.29	53.90	22.61	5000.0	1000.000	113.0	V	118.0	-9.8

Notes: ¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

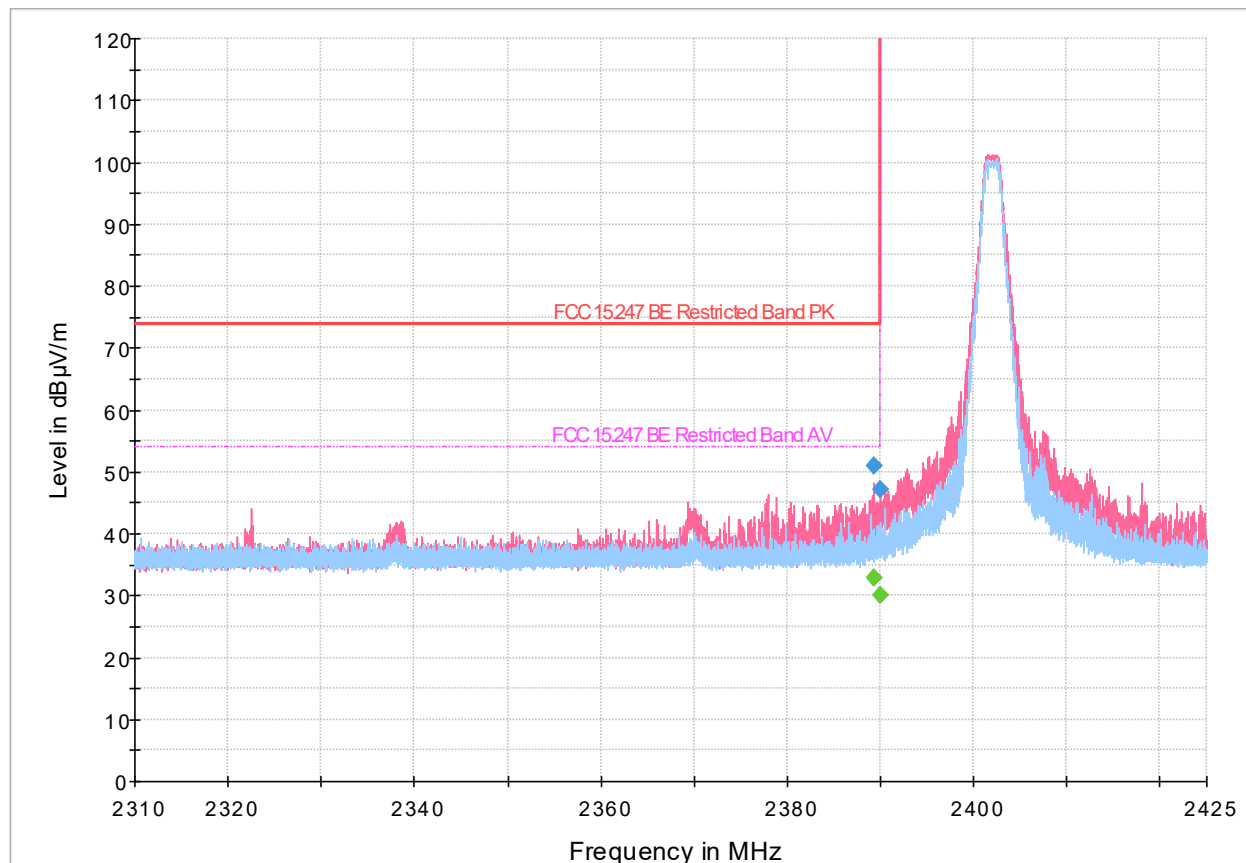


Figure 8.5-22: Radiated emissions spectral plot (2.31 GHz - 2.425 GHz) – 2402 MHz_2 Mbps

Table 8.5-7: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2389.378750	50.89	---	73.90	23.01	5000.0	1000.000	98.0	V	322.0	-9.8
2389.378750	---	32.80	53.90	21.10	5000.0	1000.000	98.0	V	322.0	-9.8
2390.000000	47.25	---	73.90	26.65	5000.0	1000.000	288.0	H	0.0	-9.8
2390.000000	---	30.02	53.90	23.88	5000.0	1000.000	288.0	H	0.0	-9.8

Notes: ¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

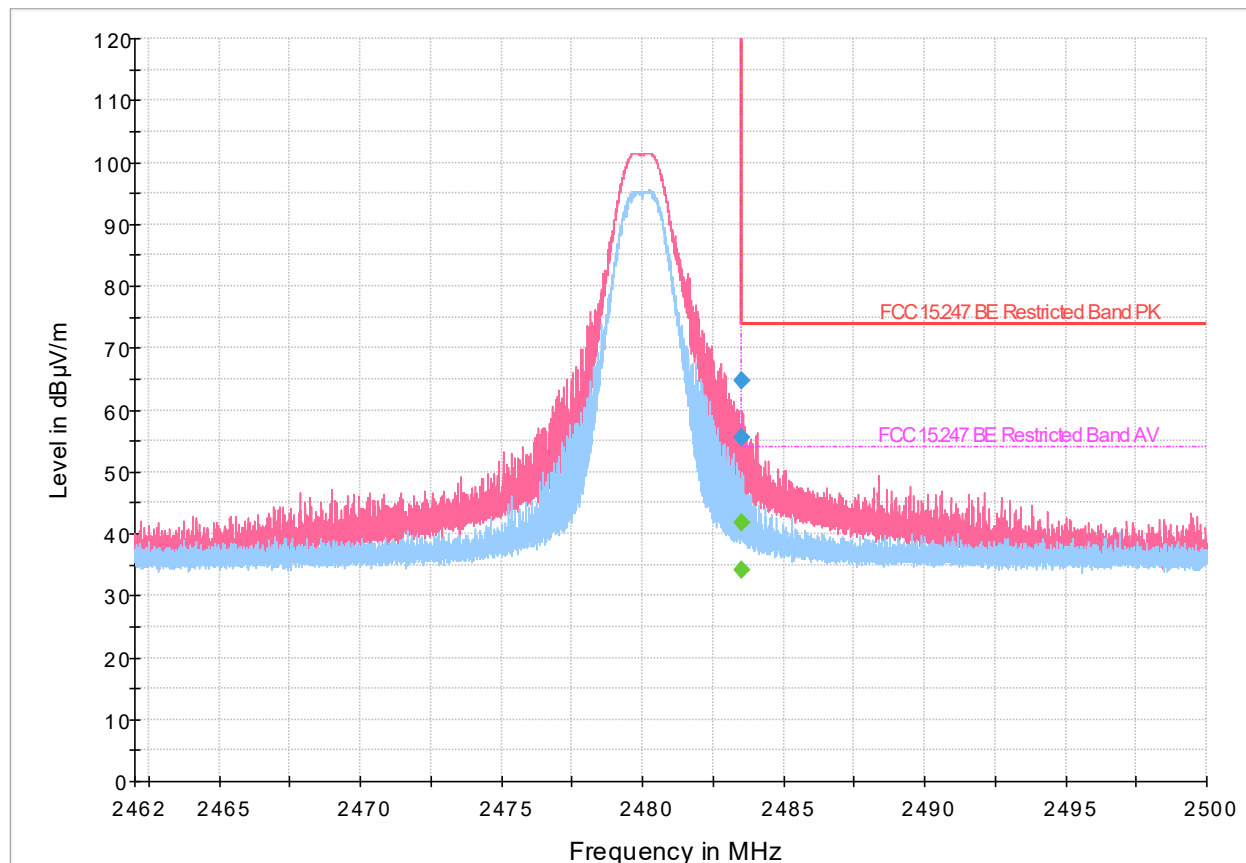


Figure 8.5-23: Radiated emissions spectral plot (2.462 GHz - 2.5 GHz) – 2480 MHz_1 Mbps

Table 8.5-8: Radiated emissions results

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.494700	---	41.89	53.90	12.01	5000.0	1000.000	114.0	V	138.0	-9.5
2483.494700	64.68	---	73.90	9.22	5000.0	1000.000	114.0	V	138.0	-9.5
2483.500000	---	34.06	53.90	19.84	5000.0	1000.000	251.0	H	156.0	-9.5
2483.500000	55.44	---	73.90	18.46	5000.0	1000.000	251.0	H	156.0	-9.5

Notes: ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

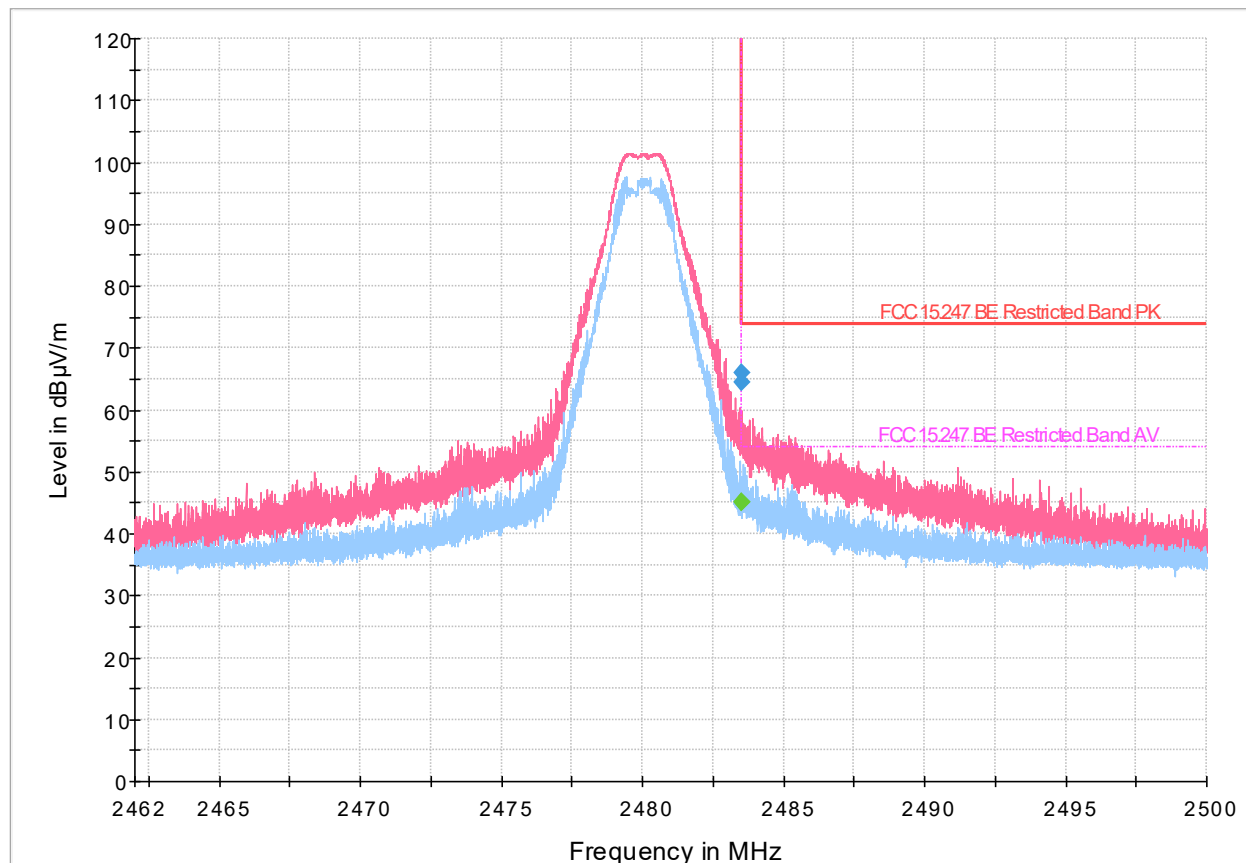


Figure 8.5-24: Radiated emissions spectral plot (2.462 GHz - 2.5 GHz) – 2480 MHz_2 Mbps

Table 8.5-9: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.500000	---	45.12	53.90	8.78	5000.0	1000.000	113.0	V	132.0	-9.5
2483.500000	65.95	---	73.90	7.95	5000.0	1000.000	113.0	V	132.0	-9.5
2483.513700	---	45.03	53.90	8.87	5000.0	1000.000	114.0	V	128.0	-9.5
2483.513700	64.36	---	73.90	9.55	5000.0	1000.000	114.0	V	128.0	-9.5

Notes: ¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

- Radiated spurious emissions, restricted bands:

Full Spectrum

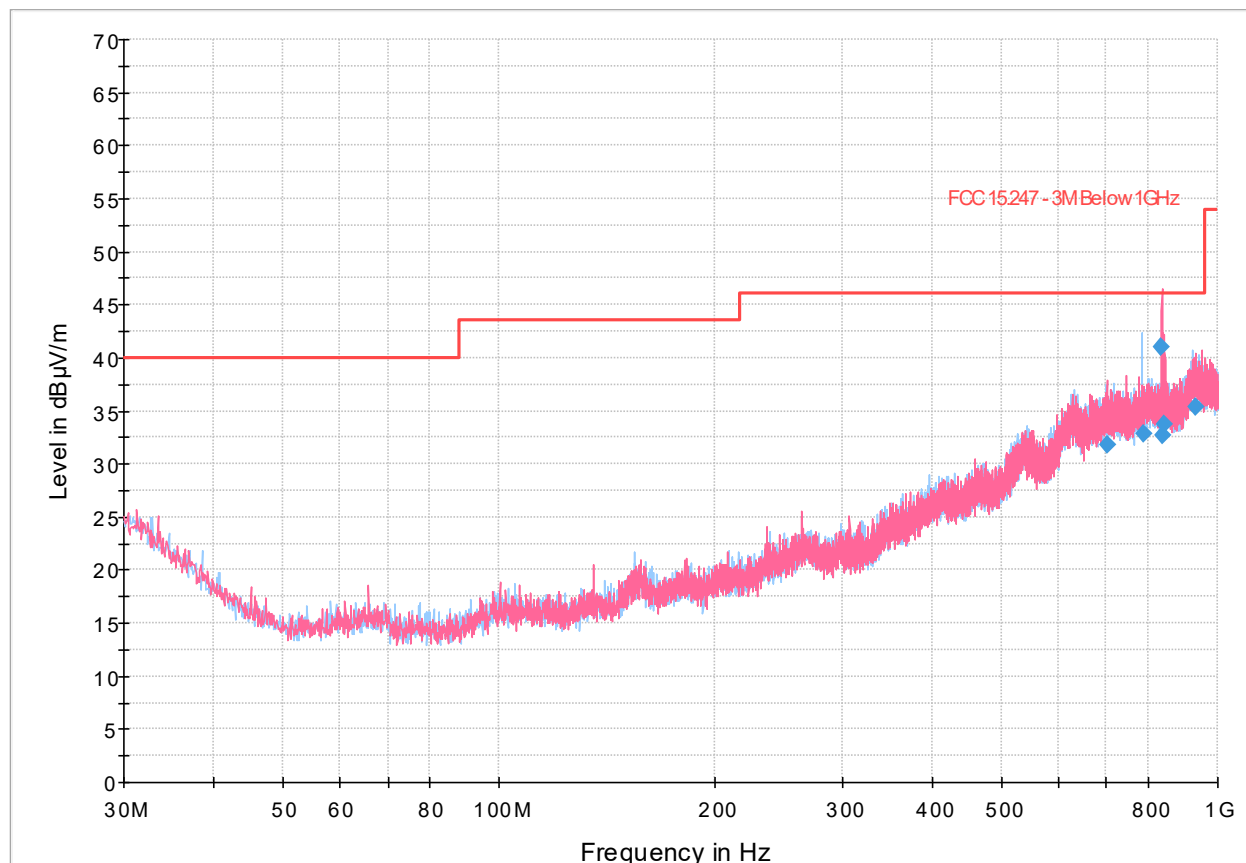


Figure 8.5-25: Radiated emissions spectral plot (30 MHz - 1 GHz) – 2402 MHz_1 Mbps

Table 8.5-10: Radiated emissions results

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
700.807000	31.77	46.00	14.23	5000.0	120.000	374.0	V	35.0	31.8
786.755000	32.79	46.00	13.21	5000.0	120.000	172.0	H	318.0	32.8
835.636000	40.99	46.00	5.01	5000.0	120.000	159.0	V	58.0	32.8
837.136000	32.65	46.00	13.35	5000.0	120.000	112.0	V	46.0	32.8
842.637000	33.70	46.00	12.30	5000.0	120.000	343.0	V	160.0	32.9
933.037000	35.42	46.00	10.58	5000.0	120.000	193.0	H	98.0	35.4

Notes: ¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

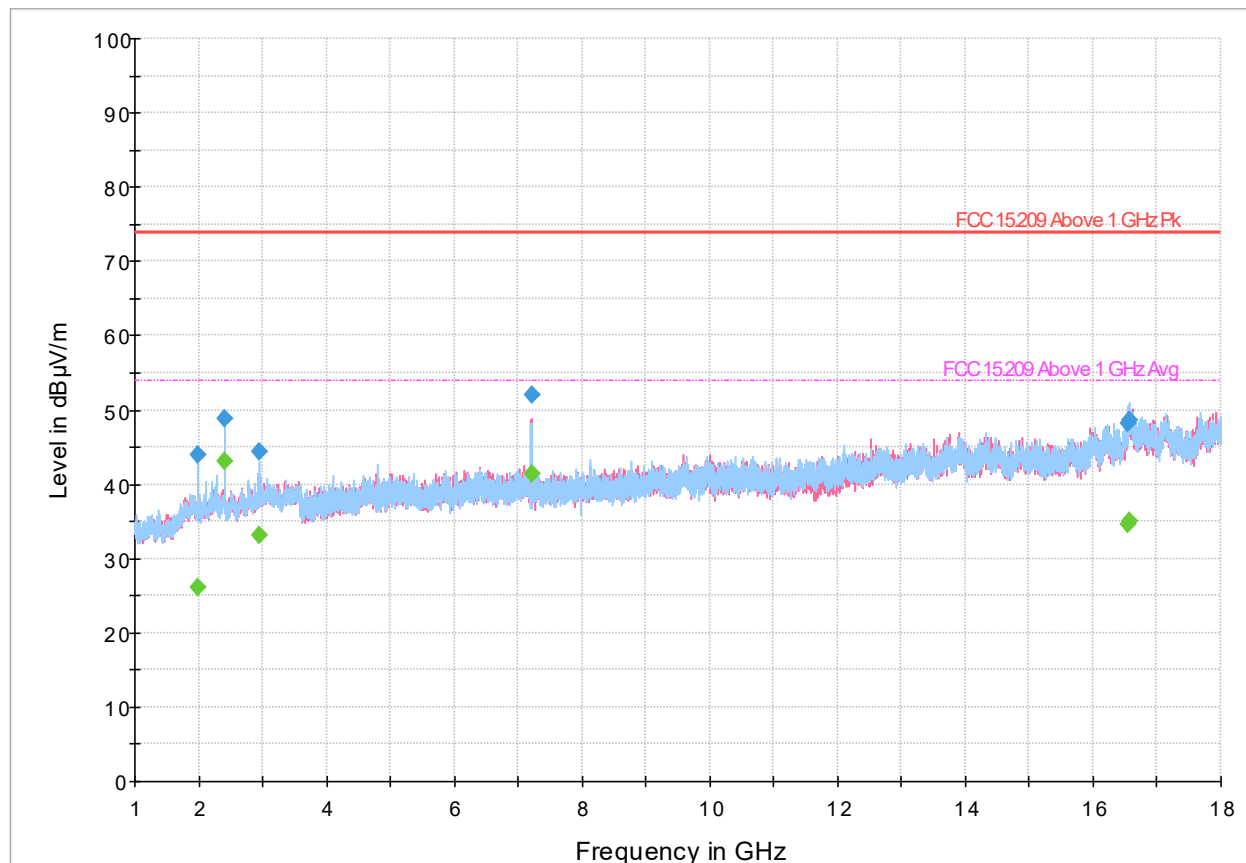


Figure 8.5-26: Radiated emissions spectral plot (1 GHz - 18 GHz) – 2402 MHz_1 Mbps

Table 8.5-11: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1985.750000	44.01	---	73.90	29.89	5000.0	1000.000	108.0	H	110.0	-11.9
1985.750000	---	26.04	53.90	27.86	5000.0	1000.000	108.0	H	110.0	-11.9
2402.250000	---	43.10	53.90	10.80	5000.0	1000.000	144.0	H	223.0	-9.8
2402.250000	48.88	---	73.90	25.02	5000.0	1000.000	144.0	H	223.0	-9.8
2945.850000	44.39	---	73.90	29.51	5000.0	1000.000	127.0	H	310.0	-8.2
2945.850000	---	33.17	53.90	20.73	5000.0	1000.000	127.0	H	310.0	-8.2
7206.050000	---	41.46	53.90	12.44	5000.0	1000.000	100.0	V	161.0	-1.1
7206.050000	51.92	---	73.90	21.98	5000.0	1000.000	100.0	V	161.0	-1.1
16541.300000	48.27	---	73.90	25.63	5000.0	1000.000	365.0	H	240.0	12.2
16541.300000	---	34.51	53.90	19.39	5000.0	1000.000	365.0	H	240.0	12.2
16559.850000	48.71	---	73.90	25.19	5000.0	1000.000	373.0	H	263.0	12.6
16559.850000	---	35.09	53.90	18.81	5000.0	1000.000	373.0	H	263.0	12.6

Notes: ¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

A notch filter was used to suppress the fundamental emission.

Full Spectrum

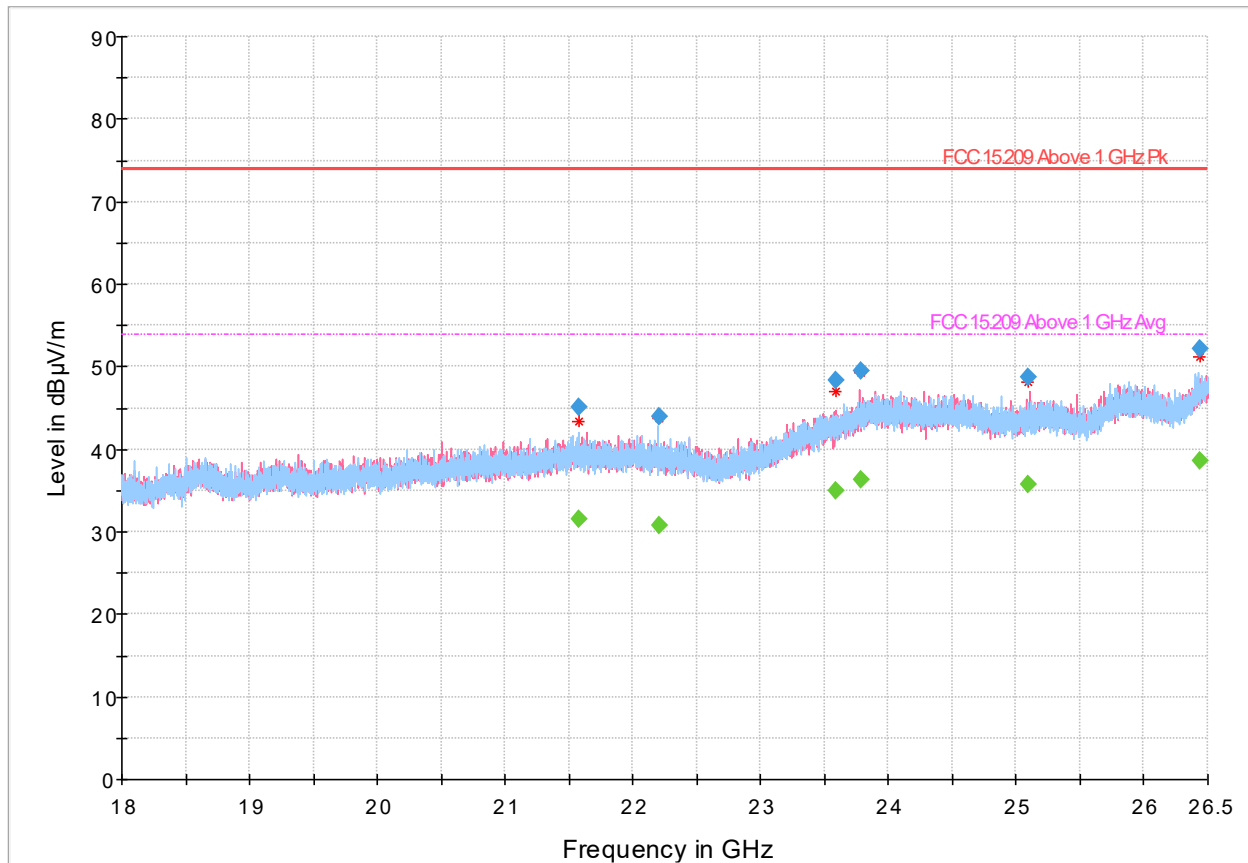


Figure 8.5-27: Radiated emissions spectral plot (18 GHz - 26.5 GHz) – 2402 MHz_1 Mbps

Table 8.5-12: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
21581.250000	45.01	---	73.90	28.89	5000.0	1000.000	124.0	H	56.0	13.6
21581.250000	---	31.47	53.90	22.43	5000.0	1000.000	124.0	H	56.0	13.6
22200.700000	---	30.72	53.90	23.18	5000.0	1000.000	345.0	H	219.0	12.6
22200.700000	43.95	---	73.90	29.95	5000.0	1000.000	345.0	H	219.0	12.6
23593.850000	48.42	---	73.90	25.48	5000.0	1000.000	402.0	V	314.0	17.2
23593.850000	---	34.97	53.90	18.93	5000.0	1000.000	402.0	V	314.0	17.2
23783.800000	49.54	---	73.90	24.36	5000.0	1000.000	156.0	V	219.0	18.5
23783.800000	---	36.26	53.90	17.64	5000.0	1000.000	156.0	V	219.0	18.5
25096.300000	---	35.67	53.90	18.23	5000.0	1000.000	402.0	V	166.0	16.9
25096.300000	48.81	---	73.90	25.09	5000.0	1000.000	402.0	V	166.0	16.9
26434.850000	52.14	---	73.90	21.76	5000.0	1000.000	402.0	H	11.0	19.8
26434.850000	---	38.61	53.90	15.29	5000.0	1000.000	402.0	H	11.0	19.8

Notes: ¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

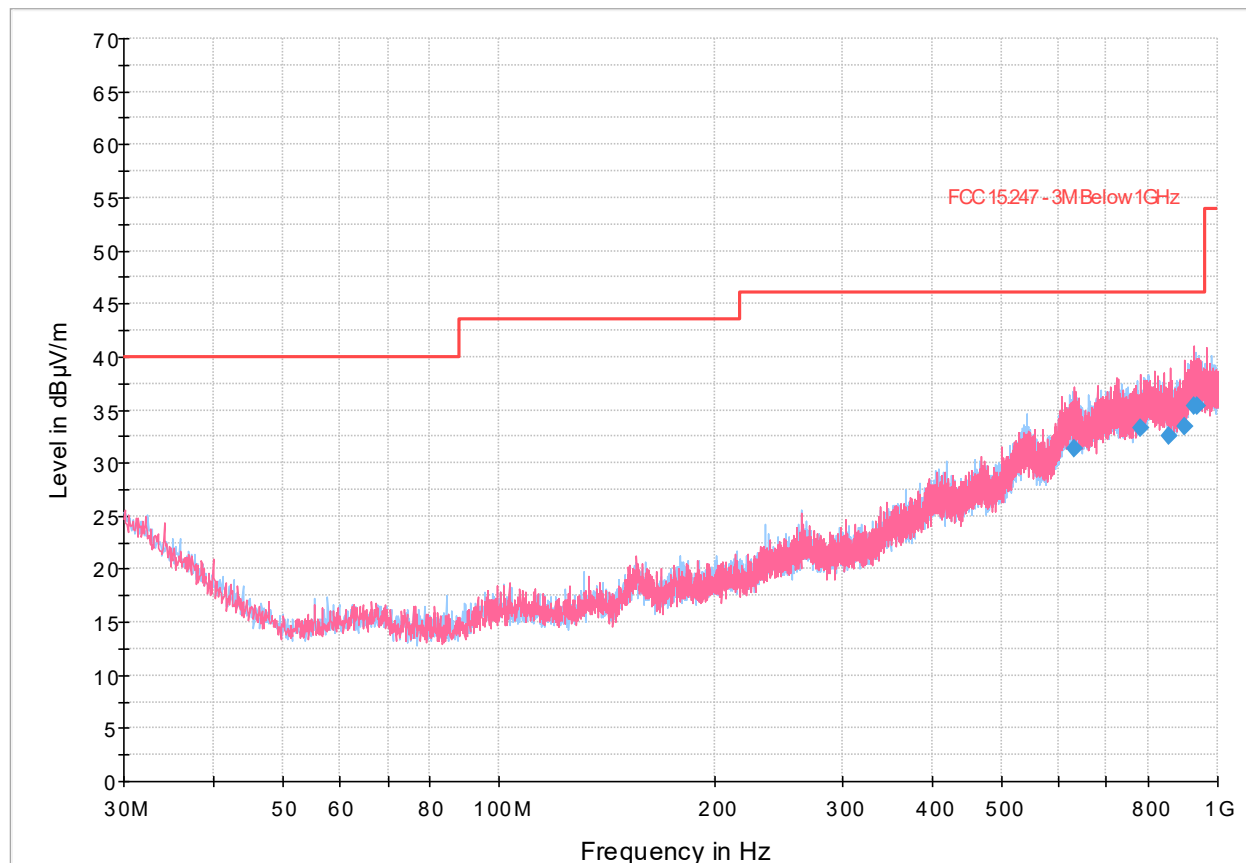


Figure 8.5-28: Radiated emissions spectral plot (30 MHz - 1 GHz) – 2402 MHz_2 Mbps

Table 8.5-13: Radiated emissions results

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
631.759000	31.33	46.00	14.67	5000.0	120.000	279.0	V	110.0	31.3
780.837000	33.23	46.00	12.77	5000.0	120.000	263.0	V	169.0	32.4
857.009000	32.55	46.00	13.45	5000.0	120.000	353.0	V	212.0	32.7
901.032000	33.51	46.00	12.49	5000.0	120.000	172.0	V	301.0	33.6
927.479000	35.38	46.00	10.62	5000.0	120.000	402.0	V	108.0	35.4
935.443000	35.34	46.00	10.66	5000.0	120.000	275.0	V	11.0	35.3

Notes: ¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
² Correction factors = antenna factor ACF (dB) + cable loss (dB)
³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

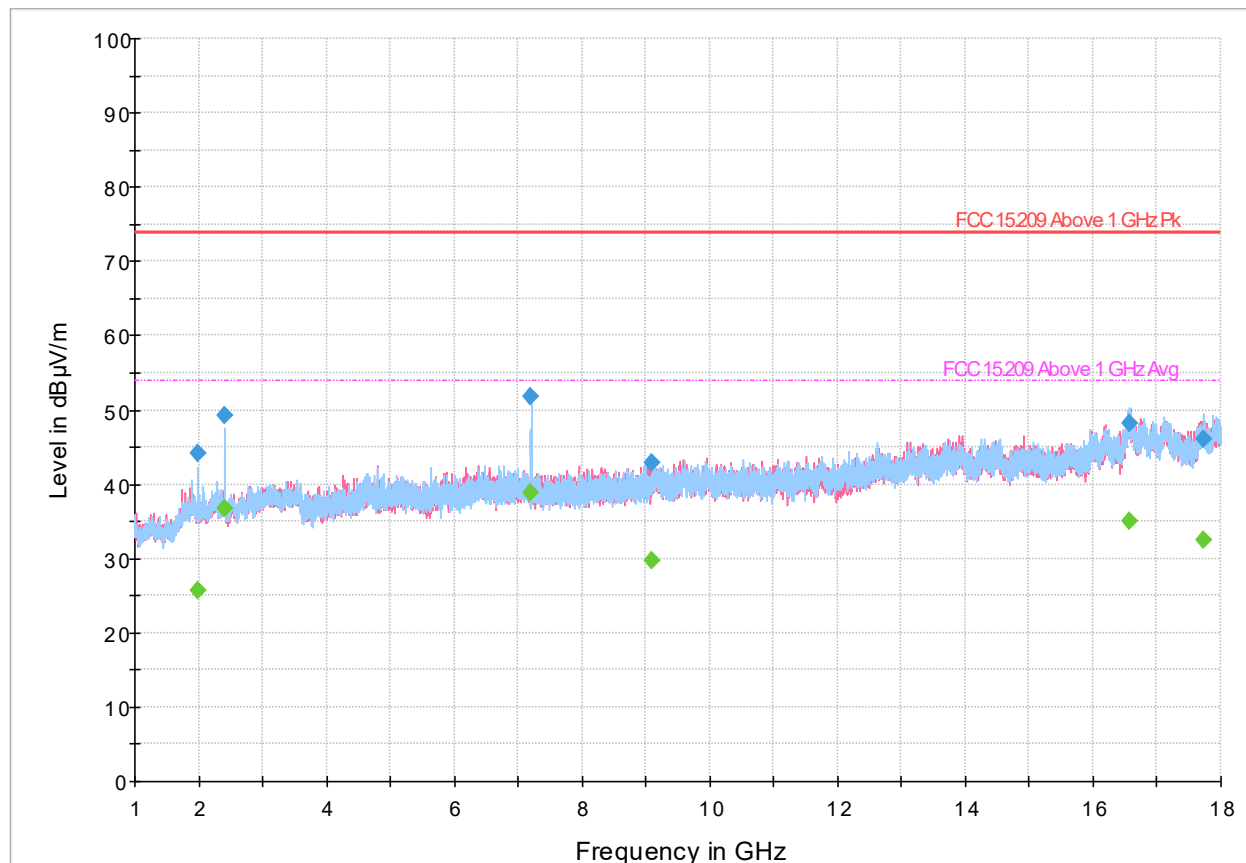


Figure 8.5-29: Radiated emissions spectral plot (1 GHz - 18 GHz) – 2402 MHz_2 Mbps

Table 8.5-14: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1986.200000	44.15	---	73.90	29.75	5000.0	1000.000	156.0	H	88.0	-11.9
1986.200000	---	25.72	53.90	28.18	5000.0	1000.000	156.0	H	88.0	-11.9
2401.400000	---	36.72	53.90	17.18	5000.0	1000.000	121.0	H	126.0	-9.8
2401.400000	49.16	---	73.90	24.74	5000.0	1000.000	121.0	H	126.0	-9.8
7204.500000	---	38.80	53.90	15.10	5000.0	1000.000	98.0	H	33.0	-1.1
7204.500000	51.88	---	73.90	22.02	5000.0	1000.000	98.0	H	33.0	-1.1
9083.800000	---	29.65	53.90	24.25	5000.0	1000.000	270.0	V	148.0	1.4
9083.800000	42.99	---	73.90	30.91	5000.0	1000.000	270.0	V	148.0	1.4
16572.950000	48.15	---	73.90	25.75	5000.0	1000.000	308.0	H	252.0	12.7
16572.950000	---	34.98	53.90	18.92	5000.0	1000.000	308.0	H	252.0	12.7
17734.500000	---	32.58	53.90	21.32	5000.0	1000.000	309.0	H	59.0	11.7
17734.500000	46.13	---	73.90	27.77	5000.0	1000.000	309.0	H	59.0	11.7

Notes: ¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

A notch filter was used to suppress the fundamental emission.

Full Spectrum

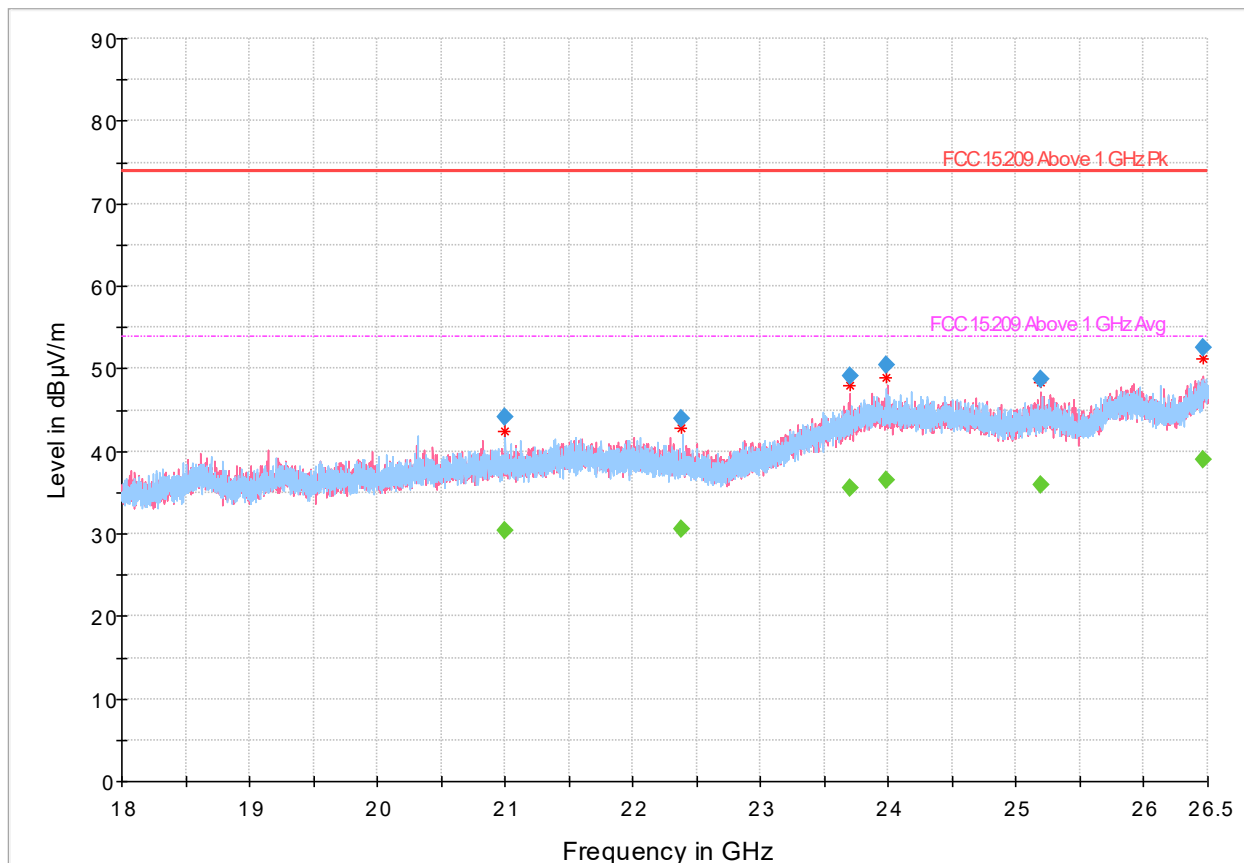


Figure 8.5-30: Radiated emissions spectral plot (18 GHz - 26.5 GHz) – 2402 MHz_2 Mbps

Table 8.5-15: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
21003.700000	44.07	---	73.90	29.83	5000.0	1000.000	256.0	H	324.0	12.4
21003.700000	---	30.40	53.90	23.50	5000.0	1000.000	256.0	H	324.0	12.4
22376.300000	43.90	---	73.90	30.00	5000.0	1000.000	285.0	H	68.0	12.6
22376.300000	---	30.61	53.90	23.29	5000.0	1000.000	285.0	H	68.0	12.6
23695.950000	49.08	---	73.90	24.82	5000.0	1000.000	349.0	V	0.0	17.9
23695.950000	---	35.53	53.90	18.37	5000.0	1000.000	349.0	V	0.0	17.9
23988.400000	50.41	---	73.90	23.49	5000.0	1000.000	206.0	V	162.0	18.8
23988.400000	---	36.57	53.90	17.33	5000.0	1000.000	206.0	V	162.0	18.8
25196.400000	48.69	---	73.90	25.21	5000.0	1000.000	218.0	V	80.0	17.1
25196.400000	---	35.88	53.90	18.02	5000.0	1000.000	218.0	V	80.0	17.1
26465.150000	52.62	---	73.90	21.28	5000.0	1000.000	211.0	V	66.0	20.1
26465.150000	---	38.98	53.90	14.92	5000.0	1000.000	211.0	V	66.0	20.1

Notes: ¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

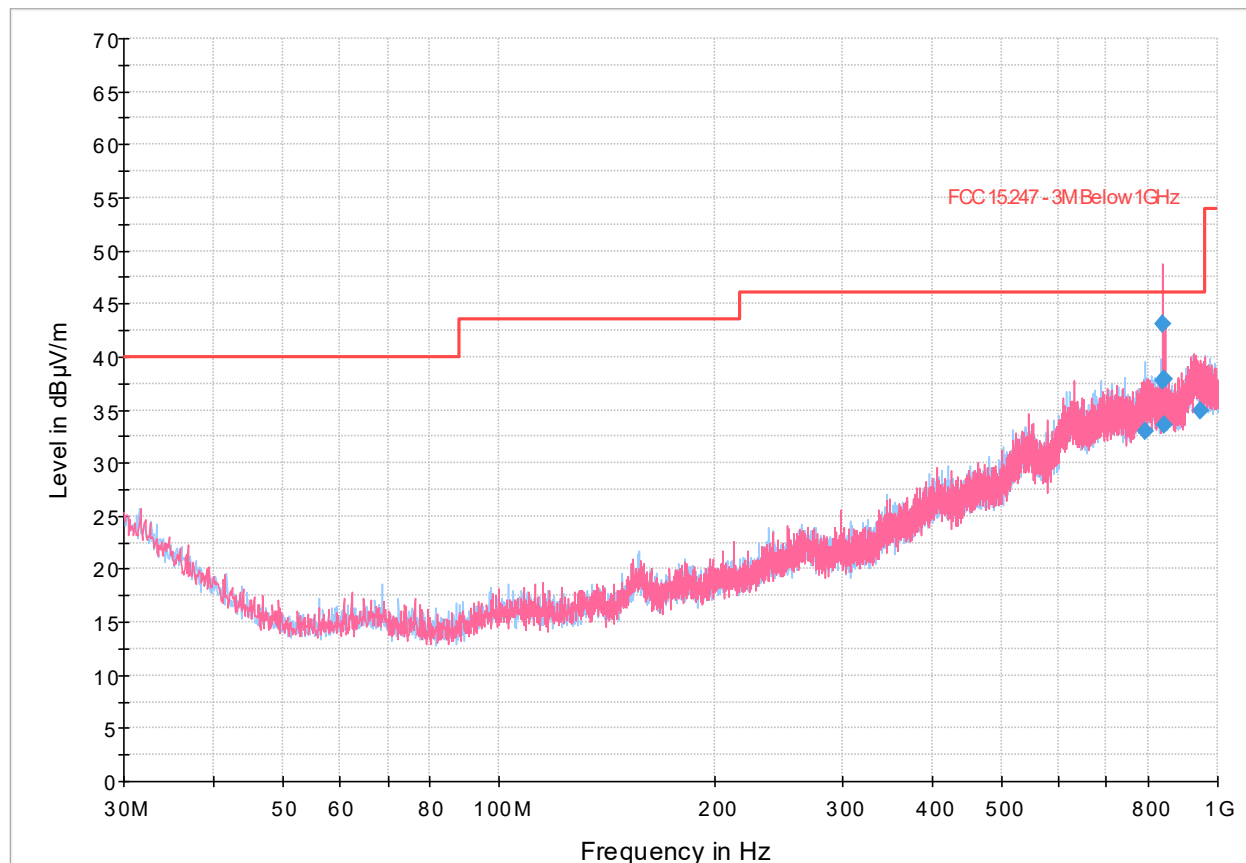


Figure 8.5-31: Radiated emissions spectral plot (30 MHz - 1 GHz) – 2440 MHz_1 Mbps

Table 8.5-16: Radiated emissions results

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
791.734000	33.01	46.00	12.99	5000.0	120.000	288.0	H	192.0	33.1
835.819000	43.12	46.00	2.88	5000.0	120.000	98.0	H	11.0	32.8
836.828000	37.77	46.00	8.23	5000.0	120.000	127.0	V	205.0	32.8
842.162000	33.59	46.00	12.41	5000.0	120.000	174.0	H	72.0	32.9
844.075000	37.93	46.00	8.07	5000.0	120.000	402.0	V	329.0	32.9
946.387000	34.91	46.00	11.09	5000.0	120.000	386.0	V	256.0	34.8

Notes: ¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
² Correction factors = antenna factor ACF (dB) + cable loss (dB)
³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

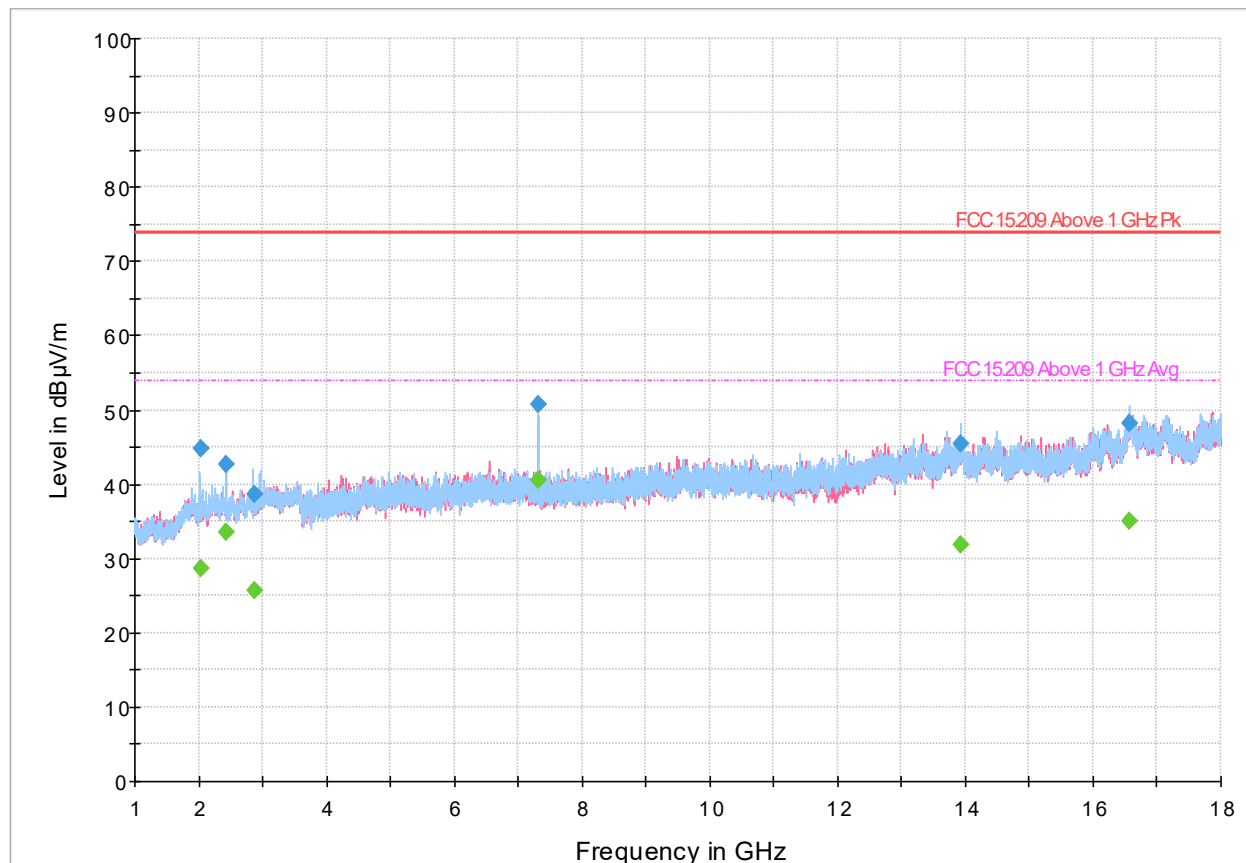


Figure 8.5-32: Radiated emissions spectral plot (1 GHz - 18 GHz) – 2440 MHz_1 Mbps

Table 8.5-17: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2024.400000	---	28.57	53.90	25.33	5000.0	1000.000	98.0	H	71.0	-11.8
2024.400000	44.71	---	73.90	29.19	5000.0	1000.000	98.0	H	71.0	-11.8
2439.650000	---	33.65	53.90	20.25	5000.0	1000.000	362.0	H	110.0	-9.5
2439.650000	42.73	---	73.90	31.17	5000.0	1000.000	362.0	H	110.0	-9.5
2866.550000	---	25.69	53.90	28.21	5000.0	1000.000	127.0	H	262.0	-9.0
2866.550000	38.61	---	73.90	35.29	5000.0	1000.000	127.0	H	262.0	-9.0
7319.150000	---	40.54	53.90	13.36	5000.0	1000.000	207.0	H	33.0	-0.9
7319.150000	50.84	---	73.90	23.06	5000.0	1000.000	207.0	H	33.0	-0.9
13932.900000	45.38	---	73.90	28.52	5000.0	1000.000	134.0	H	136.0	8.3
13932.900000	---	31.87	53.90	22.03	5000.0	1000.000	134.0	H	136.0	8.3
16575.900000	48.21	---	73.90	25.69	5000.0	1000.000	186.0	H	21.0	12.7
16575.900000	---	35.03	53.90	18.87	5000.0	1000.000	186.0	H	21.0	12.7

Notes: ¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

A notch filter was used to suppress the fundamental emission.

Full Spectrum

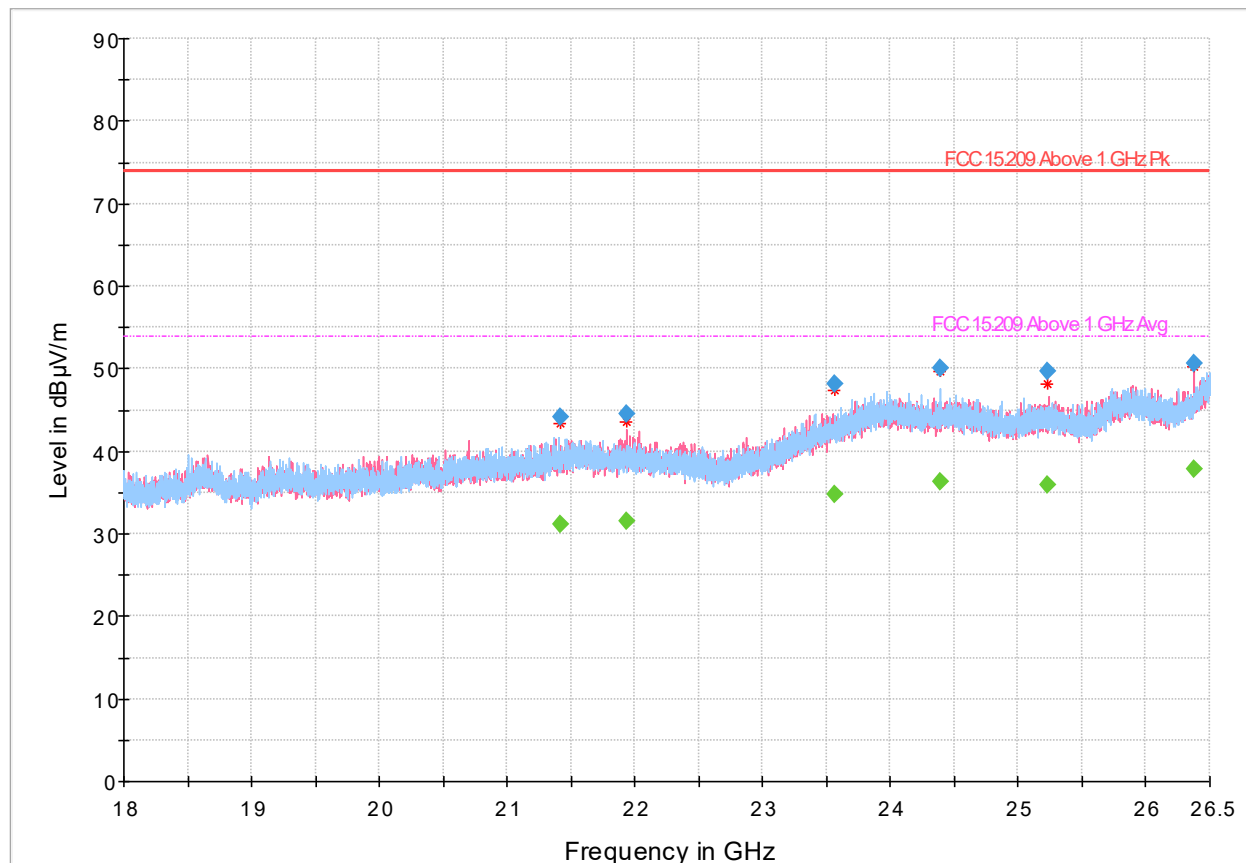


Figure 8.5-33: Radiated emissions spectral plot (18 GHz - 26.5 GHz) – 2440 MHz_1 Mbps

Table 8.5-18: Radiated emissions results

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
21412.950000	44.08	---	73.90	29.82	5000.0	1000.000	208.0	H	138.0	13.3
21412.950000	---	31.18	53.90	22.72	5000.0	1000.000	208.0	H	138.0	13.3
21934.450000	44.47	---	73.90	29.43	5000.0	1000.000	321.0	V	248.0	13.2
21934.450000	---	31.46	53.90	22.44	5000.0	1000.000	321.0	V	248.0	13.2
23567.450000	---	34.86	53.90	19.04	5000.0	1000.000	290.0	V	11.0	17.1
23567.450000	48.16	---	73.90	25.74	5000.0	1000.000	290.0	V	11.0	17.1
24393.900000	---	36.32	53.90	17.58	5000.0	1000.000	217.0	H	169.0	18.1
24393.900000	50.15	---	73.90	23.75	5000.0	1000.000	217.0	H	169.0	18.1
25234.350000	49.77	---	73.90	24.13	5000.0	1000.000	217.0	V	32.0	17.1
25234.350000	---	35.88	53.90	18.02	5000.0	1000.000	217.0	V	32.0	17.1
26371.700000	50.65	---	73.90	23.25	5000.0	1000.000	295.0	V	166.0	19.1
26371.700000	---	37.79	53.90	16.11	5000.0	1000.000	295.0	V	166.0	19.1

Notes:

¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

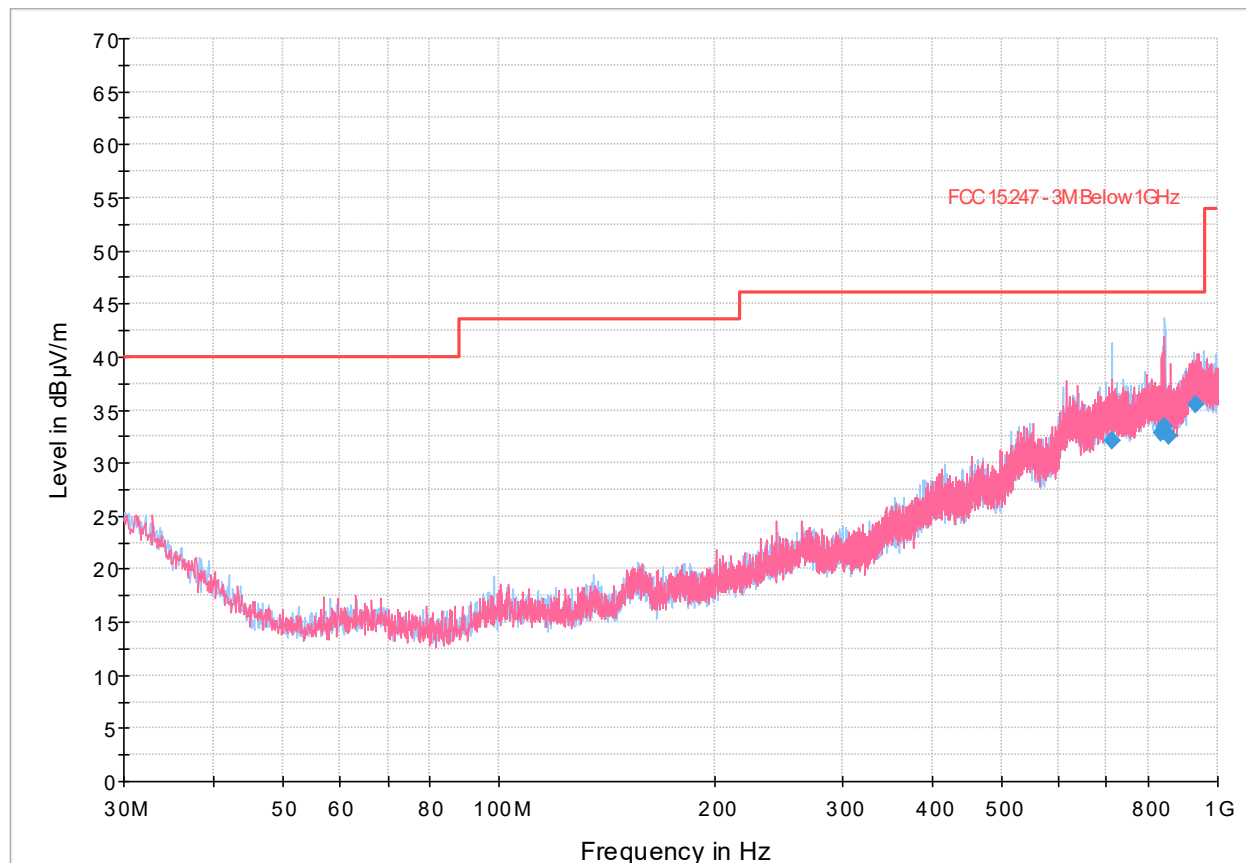


Figure 8.5-34: Radiated emissions spectral plot (30 MHz - 1 GHz) – 2440 MHz_2 Mbps

Table 8.5-19: Radiated emissions results

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
713.966000	32.07	46.00	13.93	5000.0	120.000	106.0	H	35.0	32.2
835.476000	32.81	46.00	13.19	5000.0	120.000	132.0	V	22.0	32.8
840.149000	32.93	46.00	13.07	5000.0	120.000	282.0	V	86.0	32.8
844.258000	33.41	46.00	12.59	5000.0	120.000	178.0	H	187.0	32.9
856.432000	32.55	46.00	13.45	5000.0	120.000	242.0	V	0.0	32.7
929.557000	35.46	46.00	10.54	5000.0	120.000	261.0	H	60.0	35.5

Notes: ¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
² Correction factors = antenna factor ACF (dB) + cable loss (dB)
³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

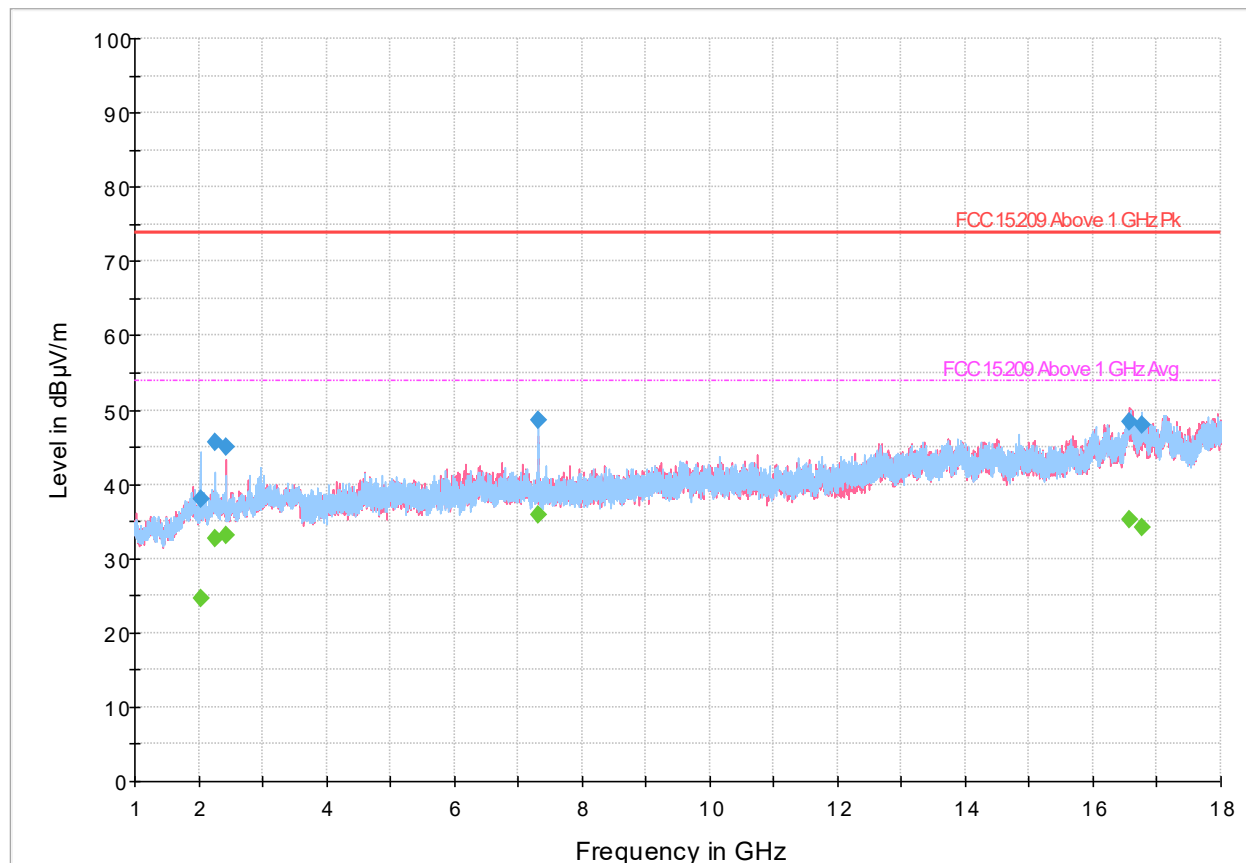


Figure 8.5-35: Radiated emissions spectral plot (1 GHz - 18 GHz) – 2440 MHz_2 Mbps

Table 8.5-20: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2032.450000	37.96	---	73.90	35.94	5000.0	1000.000	284.0	H	46.0	-11.7
2032.450000	---	24.65	53.90	29.25	5000.0	1000.000	284.0	H	46.0	-11.7
2248.000000	---	32.68	53.90	21.22	5000.0	1000.000	121.0	H	124.0	-10.4
2248.000000	45.65	---	73.90	28.25	5000.0	1000.000	121.0	H	124.0	-10.4
2440.450000	---	33.14	53.90	20.76	5000.0	1000.000	106.0	V	126.0	-9.5
2440.450000	44.93	---	73.90	28.97	5000.0	1000.000	106.0	V	126.0	-9.5
7318.650000	---	35.91	53.90	17.99	5000.0	1000.000	106.0	H	33.0	-0.9
7318.650000	48.65	---	73.90	25.25	5000.0	1000.000	106.0	H	33.0	-0.9
16574.650000	---	35.25	53.90	18.65	5000.0	1000.000	312.0	V	84.0	12.7
16574.650000	48.44	---	73.90	25.46	5000.0	1000.000	312.0	V	84.0	12.7
16755.650000	47.93	---	73.90	25.97	5000.0	1000.000	345.0	H	218.0	11.8
16755.650000	---	34.27	53.90	19.63	5000.0	1000.000	345.0	H	218.0	11.8

Notes: ¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

A notch filter was used to suppress the fundamental emission.

Full Spectrum

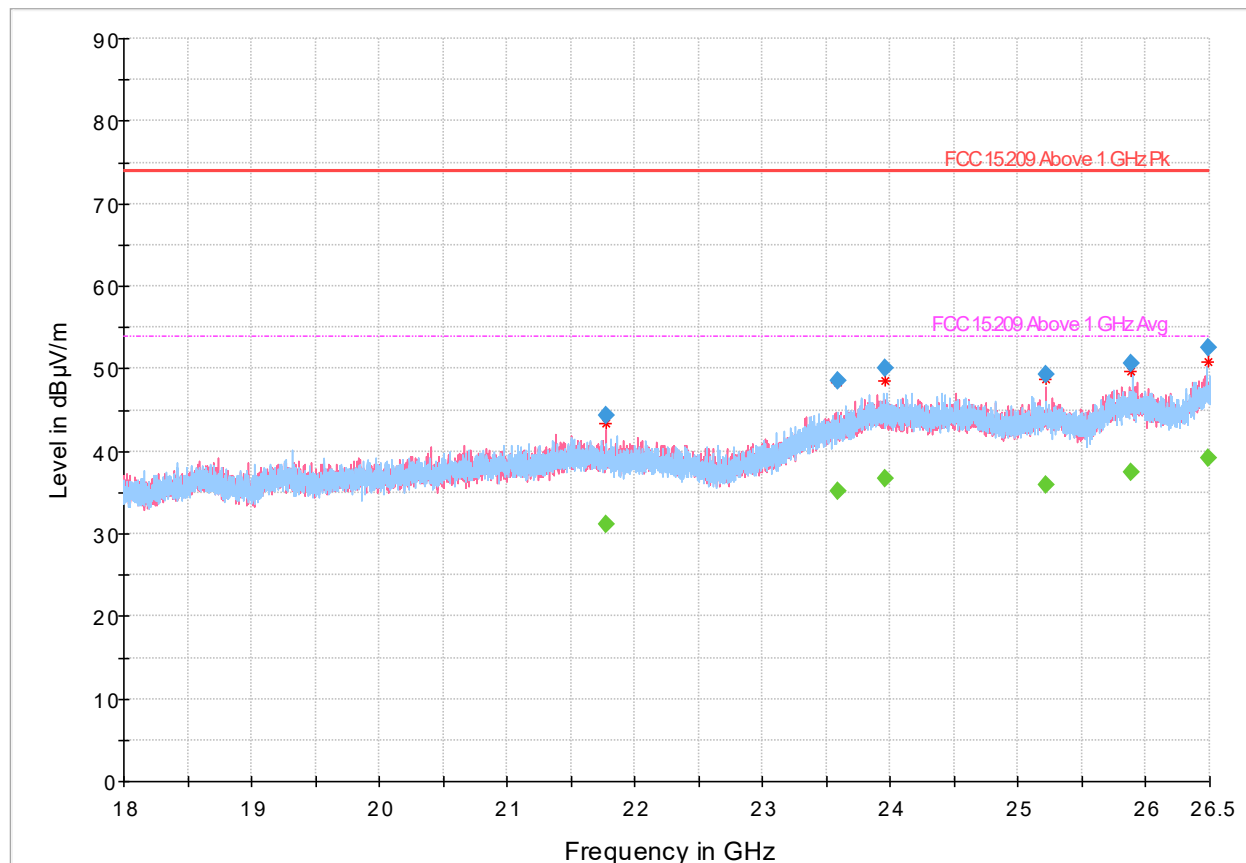


Figure 8.5-36: Radiated emissions spectral plot (18 GHz - 26.5 GHz) – 2440 MHz_2 Mbps

Table 8.5-21: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
21774.700000	---	31.18	53.90	22.72	5000.0	1000.000	292.0	V	162.0	13.1
21774.700000	44.42	---	73.90	29.48	5000.0	1000.000	292.0	V	162.0	13.1
23594.600000	---	35.07	53.90	18.83	5000.0	1000.000	399.0	H	252.0	17.2
23594.600000	48.61	---	73.90	25.29	5000.0	1000.000	399.0	H	252.0	17.2
23953.700000	50.05	---	73.90	23.85	5000.0	1000.000	307.0	H	68.0	18.8
23953.700000	---	36.70	53.90	17.20	5000.0	1000.000	307.0	H	68.0	18.8
25213.050000	49.25	---	73.90	24.65	5000.0	1000.000	195.0	V	31.0	17.1
25213.050000	---	35.95	53.90	17.95	5000.0	1000.000	195.0	V	31.0	17.1
25881.950000	50.66	---	73.90	23.24	5000.0	1000.000	179.0	H	20.0	18.2
25881.950000	---	37.44	53.90	16.46	5000.0	1000.000	179.0	H	20.0	18.2
26485.400000	52.49	---	73.90	21.41	5000.0	1000.000	290.0	H	342.0	20.3
26485.400000	---	39.21	53.90	14.69	5000.0	1000.000	290.0	H	342.0	20.3

Notes: ¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

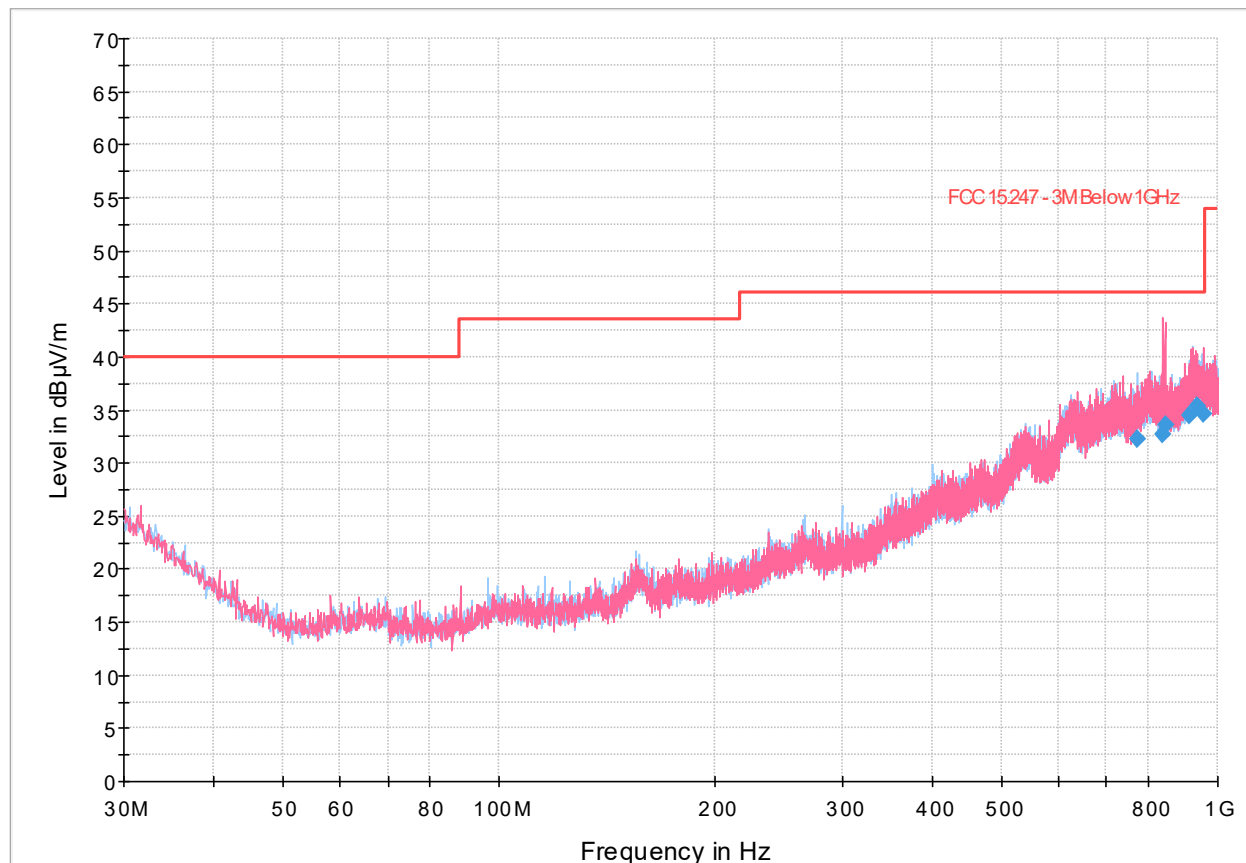


Figure 8.5-37: Radiated emissions spectral plot (30 MHz - 1 GHz) – 2480 MHz_1 Mbps

Table 8.5-22: Radiated emissions results

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
772.238000	32.27	46.00	13.73	5000.0	120.000	129.0	H	299.0	32.2
836.532000	32.64	46.00	13.36	5000.0	120.000	249.0	V	164.0	32.8
844.435000	33.55	46.00	12.45	5000.0	120.000	402.0	V	0.0	32.9
911.941000	34.44	46.00	11.56	5000.0	120.000	396.0	H	163.0	34.5
934.154000	35.40	46.00	10.60	5000.0	120.000	266.0	V	22.0	35.4
956.954000	34.66	46.00	11.34	5000.0	120.000	340.0	V	316.0	34.6

Notes: ¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
² Correction factors = antenna factor ACF (dB) + cable loss (dB)
³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

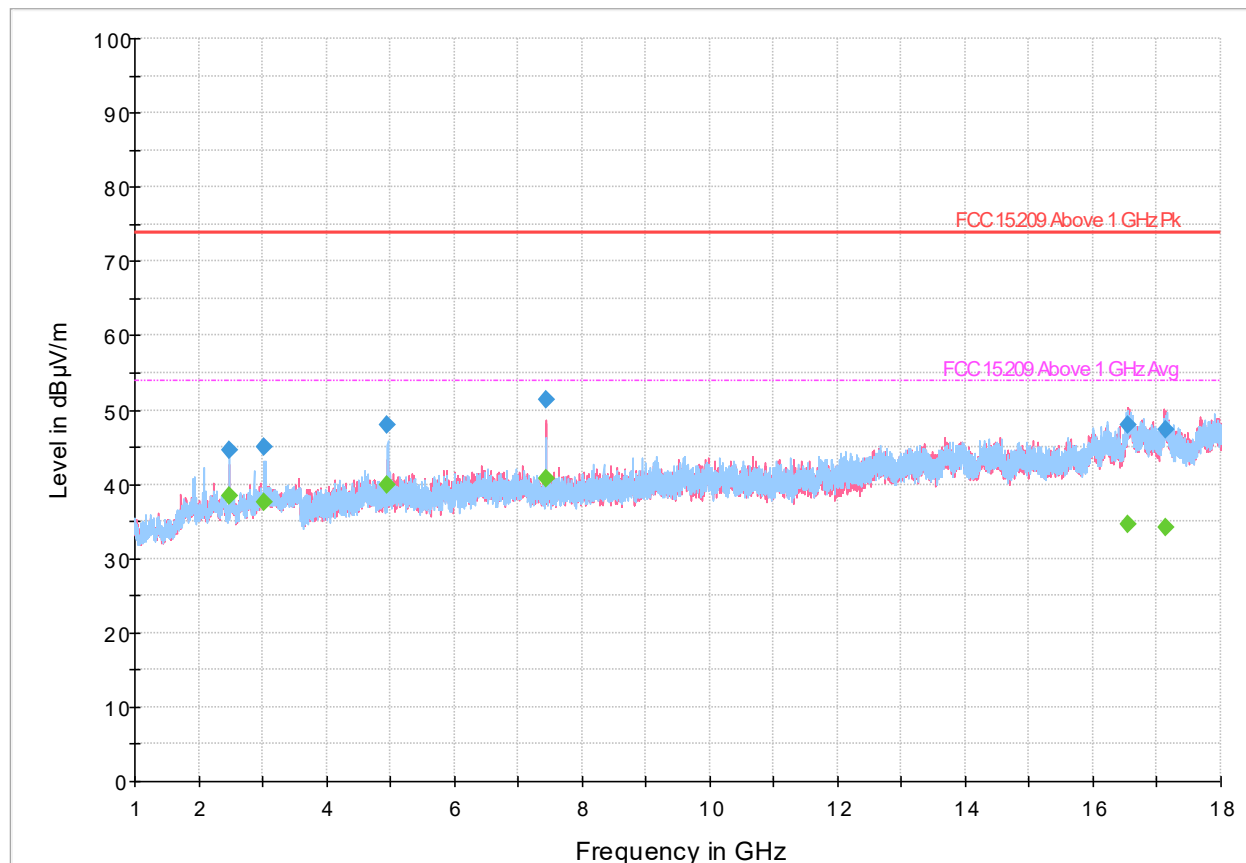


Figure 8.5-38: Radiated emissions spectral plot (1 GHz - 18 GHz) – 2480 MHz_1 Mbps

Table 8.5-23: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2480.000000	44.64	---	73.90	29.26	5000.0	1000.000	293.0	H	124.0	-9.5
2480.000000	---	38.50	53.90	15.40	5000.0	1000.000	293.0	H	124.0	-9.5
3024.050000	---	37.51	53.90	16.39	5000.0	1000.000	118.0	H	311.0	-7.8
3024.050000	44.97	---	73.90	28.93	5000.0	1000.000	118.0	H	311.0	-7.8
4959.950000	48.04	---	73.90	25.86	5000.0	1000.000	140.0	H	128.0	-3.1
4959.950000	---	39.96	53.90	13.94	5000.0	1000.000	140.0	H	128.0	-3.1
7439.050000	---	40.75	53.90	13.15	5000.0	1000.000	112.0	V	165.0	-0.9
7439.050000	51.31	---	73.90	22.59	5000.0	1000.000	112.0	V	165.0	-0.9
16543.850000	48.01	---	73.90	25.89	5000.0	1000.000	354.0	V	315.0	12.3
16543.850000	---	34.58	53.90	19.32	5000.0	1000.000	354.0	V	315.0	12.3
17141.100000	47.38	---	73.90	26.52	5000.0	1000.000	146.0	V	0.0	12.4
17141.100000	---	34.18	53.90	19.72	5000.0	1000.000	146.0	V	0.0	12.4

Notes: ¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

A notch filter was used to suppress the fundamental emission.

Full Spectrum

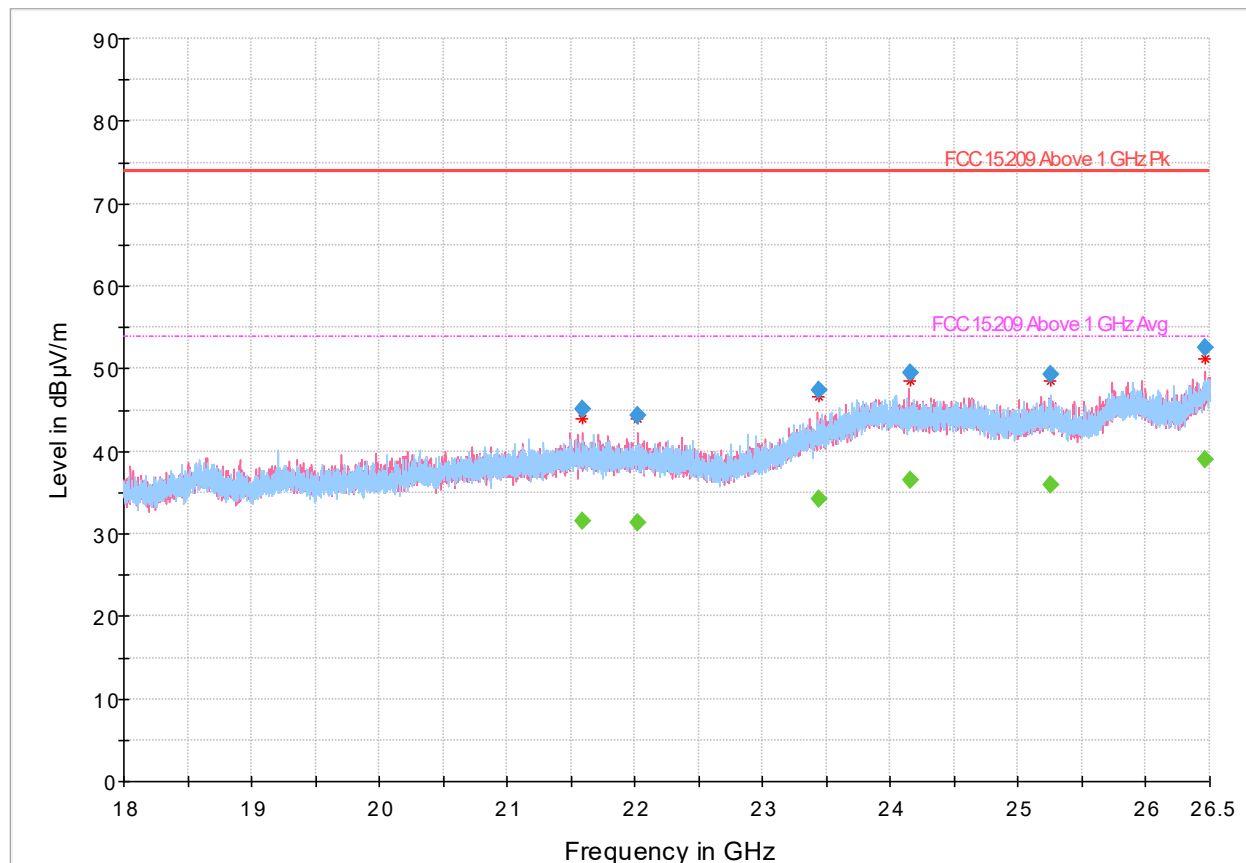


Figure 8.5-39: Radiated emissions spectral plot (18 GHz - 26.5 GHz) – 2480 MHz_1 Mbps

Table 8.5-24: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
21593.600000	45.08	---	73.90	28.82	5000.0	1000.000	190.0	V	334.0	13.6
21593.600000	---	31.55	53.90	22.35	5000.0	1000.000	190.0	V	334.0	13.6
22016.100000	---	31.33	53.90	22.57	5000.0	1000.000	302.0	V	341.0	13.1
22016.100000	44.33	---	73.90	29.57	5000.0	1000.000	302.0	V	341.0	13.1
23436.350000	47.40	---	73.90	26.50	5000.0	1000.000	148.0	V	153.0	16.5
23436.350000	---	34.19	53.90	19.71	5000.0	1000.000	148.0	V	153.0	16.5
24152.550000	---	36.46	53.90	17.44	5000.0	1000.000	198.0	V	56.0	18.5
24152.550000	49.54	---	73.90	24.36	5000.0	1000.000	198.0	V	56.0	18.5
25259.400000	---	35.89	53.90	18.01	5000.0	1000.000	172.0	H	102.0	17.1
25259.400000	49.28	---	73.90	24.62	5000.0	1000.000	172.0	H	102.0	17.1
26468.900000	---	39.06	53.90	14.84	5000.0	1000.000	187.0	V	54.0	20.1
26468.900000	52.60	---	73.90	21.30	5000.0	1000.000	187.0	V	54.0	20.1

Notes: ¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

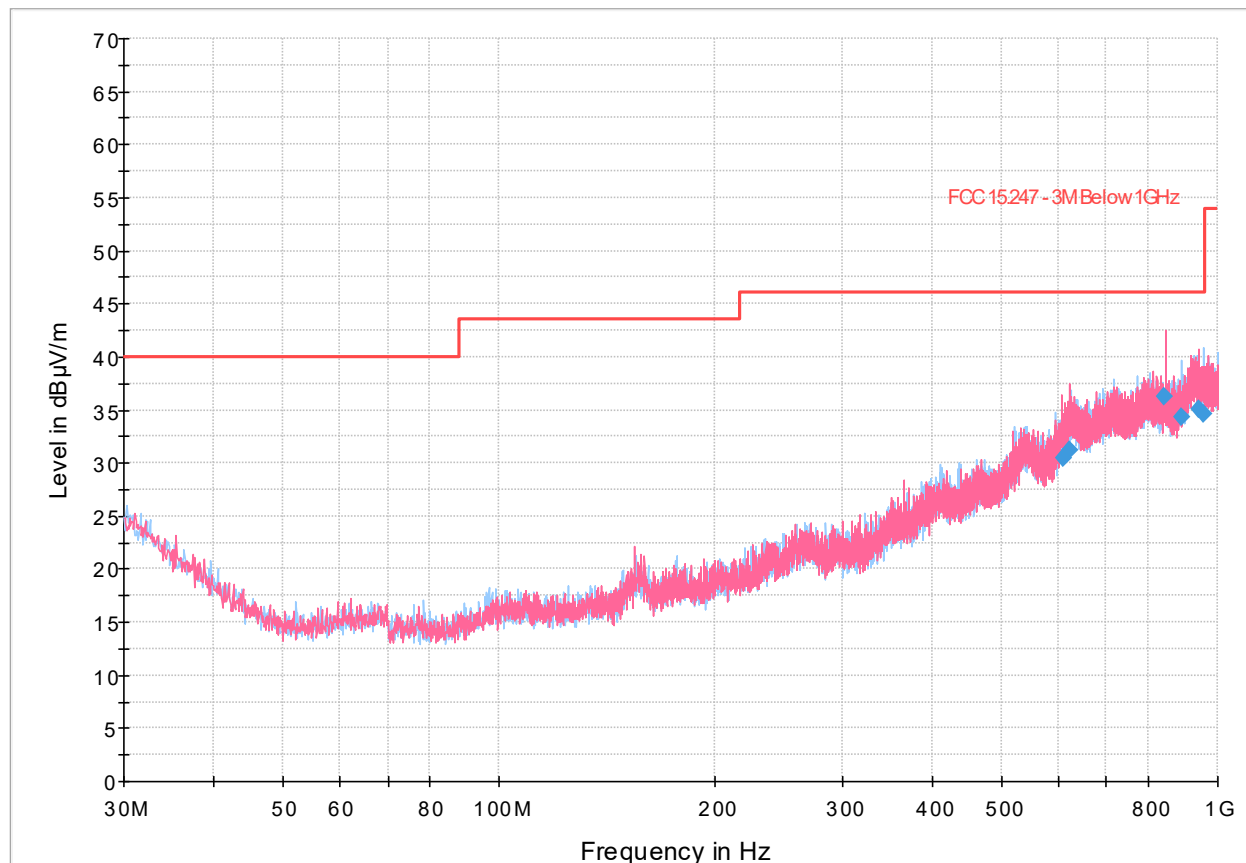


Figure 8.5-40: Radiated emissions spectral plot (30 MHz - 1 GHz) – 2480 MHz_2 Mbps

Table 8.5-25: Radiated emissions results

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
608.332000	30.44	46.00	15.56	5000.0	120.000	294.0	V	245.0	30.3
620.819000	31.18	46.00	14.82	5000.0	120.000	267.0	V	21.0	31.1
843.749000	36.25	46.00	9.75	5000.0	120.000	315.0	V	0.0	32.9
890.989000	34.29	46.00	11.71	5000.0	120.000	259.0	H	335.0	32.9
939.884000	35.12	46.00	10.88	5000.0	120.000	329.0	V	183.0	35.1
957.257000	34.70	46.00	11.30	5000.0	120.000	98.0	H	237.0	34.6

Notes: ¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
² Correction factors = antenna factor ACF (dB) + cable loss (dB)
³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

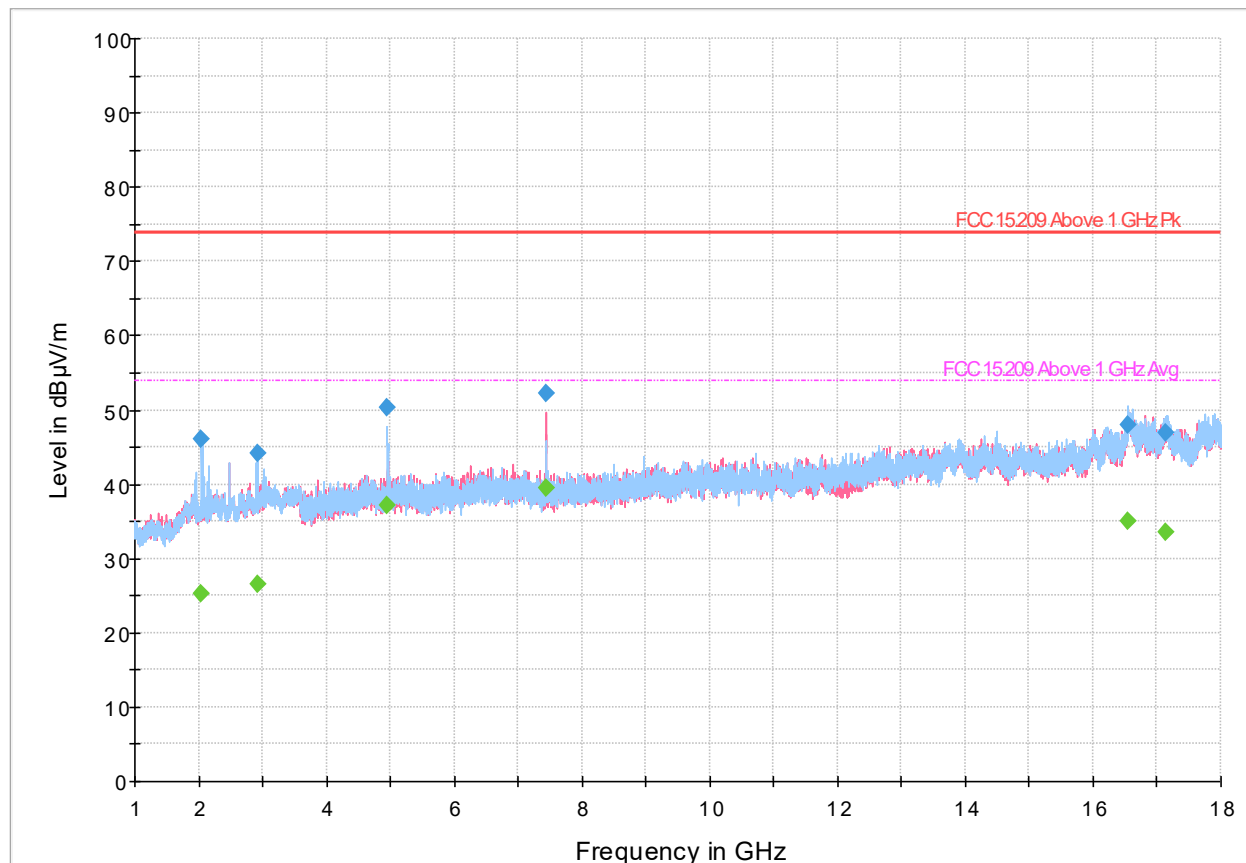


Figure 8.5-41: Radiated emissions spectral plot (1 GHz - 18 GHz) – 2480 MHz_2 Mbps

Table 8.5-26: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2047.850000	---	25.26	53.90	28.64	5000.0	1000.000	120.0	H	86.0	-11.6
2047.850000	46.13	---	73.90	27.77	5000.0	1000.000	120.0	H	86.0	-11.6
2928.800000	---	26.54	53.90	27.36	5000.0	1000.000	132.0	H	316.0	-8.5
2928.800000	44.07	---	73.90	29.83	5000.0	1000.000	132.0	H	316.0	-8.5
4959.050000	50.28	---	73.90	23.62	5000.0	1000.000	106.0	H	126.0	-3.1
4959.050000	---	37.15	53.90	16.75	5000.0	1000.000	106.0	H	126.0	-3.1
7441.500000	---	39.48	53.90	14.42	5000.0	1000.000	113.0	V	161.0	-0.9
7441.500000	52.22	---	73.90	21.68	5000.0	1000.000	113.0	V	161.0	-0.9
16555.450000	48.03	---	73.90	25.87	5000.0	1000.000	199.0	H	349.0	12.6
16555.450000	---	34.94	53.90	18.96	5000.0	1000.000	199.0	H	349.0	12.6
17139.250000	---	33.53	53.90	20.37	5000.0	1000.000	152.0	V	160.0	12.3
17139.250000	46.83	---	73.90	27.07	5000.0	1000.000	152.0	V	160.0	12.3

Notes: ¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

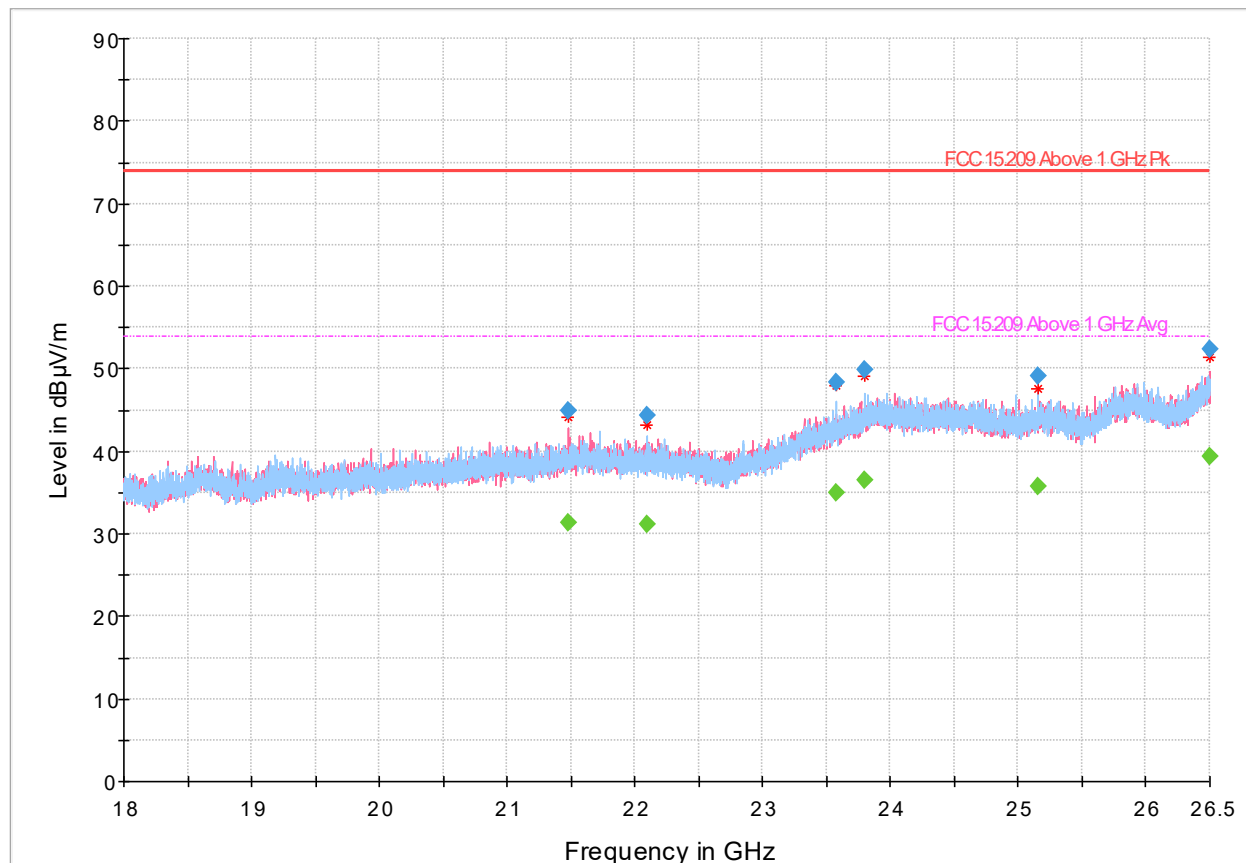


Figure 8.5-42: Radiated emissions spectral plot (18 GHz - 26.5 GHz) – 2480 MHz_2 Mbps

Table 8.5-27: Radiated emissions results

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
21481.950000	44.89	---	73.90	29.01	5000.0	1000.000	399.0	V	126.0	13.5
21481.950000	---	31.43	53.90	22.47	5000.0	1000.000	399.0	V	126.0	13.5
22094.950000	---	31.06	53.90	22.84	5000.0	1000.000	236.0	H	174.0	12.9
22094.950000	44.34	---	73.90	29.56	5000.0	1000.000	236.0	H	174.0	12.9
23570.800000	---	34.95	53.90	18.95	5000.0	1000.000	186.0	H	357.0	17.1
23570.800000	48.33	---	73.90	25.57	5000.0	1000.000	186.0	H	357.0	17.1
23800.750000	---	36.53	53.90	17.37	5000.0	1000.000	331.0	H	0.0	18.6
23800.750000	49.84	---	73.90	24.06	5000.0	1000.000	331.0	H	0.0	18.6
25154.000000	49.10	---	73.90	24.80	5000.0	1000.000	192.0	H	20.0	17.0
25154.000000	---	35.80	53.90	18.10	5000.0	1000.000	192.0	H	20.0	17.0
26500.000000	---	39.37	53.90	14.53	5000.0	1000.000	106.0	V	320.0	20.4
26500.000000	52.43	---	73.90	21.47	5000.0	1000.000	106.0	V	320.0	20.4

Notes: ¹ Field strength (dBμV/m) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

8.6 Power spectral density

8.6.1 References and limits

- FCC 47 CFR Part 15, Subpart C: §15.247(e)
- ISSED: RSS-247: §5.2(b)
- Test method: ANSI C63.10-2020 §11.10.2.1 (Method PKPSD)

§15.247:

- (e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

RSS-247:

- 5.2 DTSs include systems that employ digital modulation techniques resulting in spectral characteristics similar to direct sequence systems. The following applies to the bands 902-928 MHz and 2400-2483.5 MHz:

- (b) The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of section 5.4(d), (i.e., the power spectral density shall be determined using the same method as is used to determine the conducted output power).

8.6.2 Test summary

Verdict	Pass		
Test date	August 6, 2025	Temperature	22 °C
Test engineer	Lan Sayasane, Sr. EMC Test Engineer	Air pressure	1007.0 mbar
Test location	☒ Wireless bench ☐ Other:	Relative humidity	56 %

8.6.3 Notes

Testing was performed with the transmitter operating on a fixed channel (lowest, middle, and highest) at maximum output power.

The spectral plots within this section have been corrected with all relevant transducer factors.

8.6.4 Setup details

EUT power input during test	Battery powered
EUT setup configuration	☒ Table-top ☐ Floor standing ☐ Other:

Spectrum analyzer settings:

Resolution bandwidth	3 kHz
Video bandwidth	10 kHz
Detector mode	Peak
Trace mode	Max Hold
Measurement time	Long enough for trace to stabilize

8.6.5 Test data

Table 8.6-1: Power spectral density test data

Test Frequency (MHz)	Modulation	Power Density (dBm/3 kHz)	Limit (dBm)	Margin (dB)
2402	GFSK, 1 Mbps	-15.94	≤ 8	23.94
2440	GFSK, 1 Mbps	-16.05	≤ 8	24.05
2480	GFSK, 1 Mbps	-16.46	≤ 8	24.46
2402	GFSK, 2 Mbps	-18.68	≤ 8	26.68
2440	GFSK, 2 Mbps	-18.82	≤ 8	26.82
2480	GFSK, 2 Mbps	-19.29	≤ 8	27.29

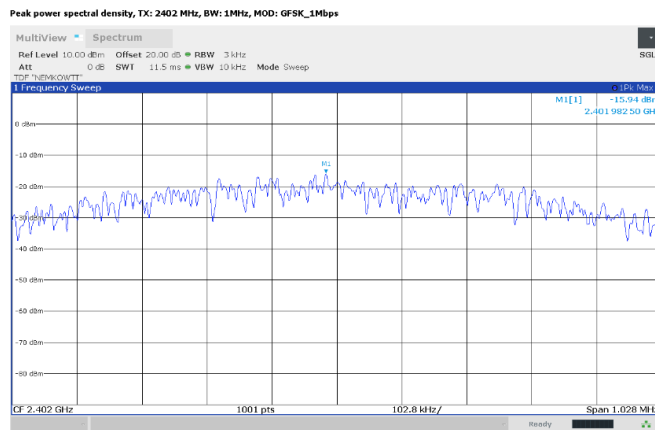


Figure 8.6-1: Power spectral density, GFSK, 1 Mbps, 2402 MHz

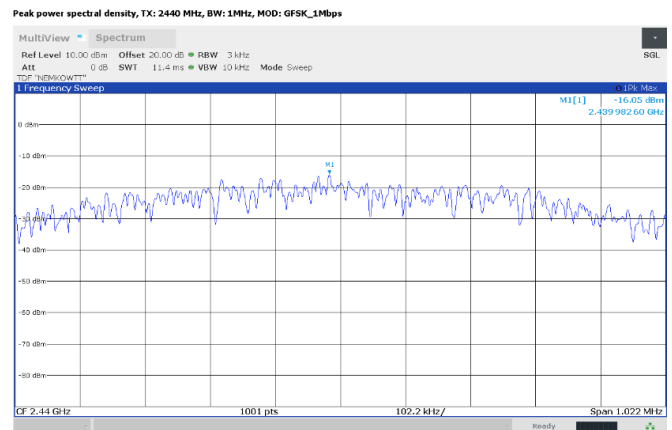


Figure 8.6-2: Power spectral density, GFSK, 1 Mbps, 2440 MHz

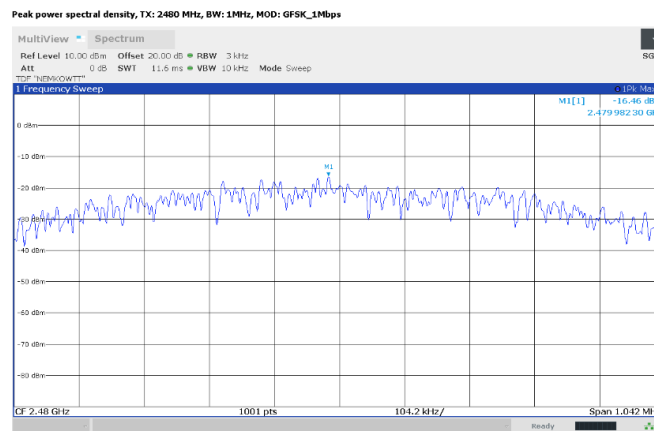


Figure 8.6-3: Power spectral density, GFSK, 1 Mbps, 2480 MHz

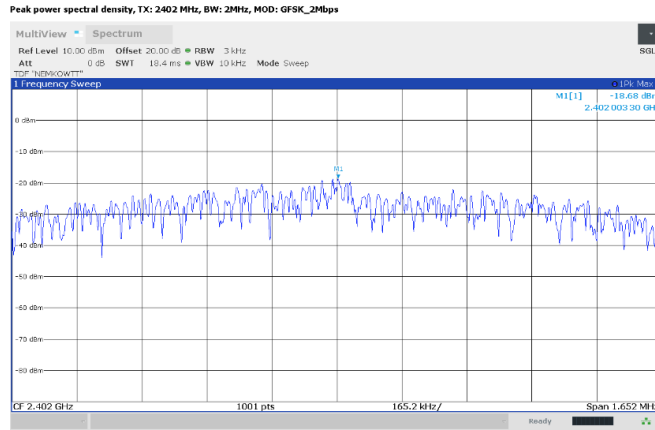


Figure 8.6-4: Power spectral density, GFSK, 2 Mbps, 2402 MHz

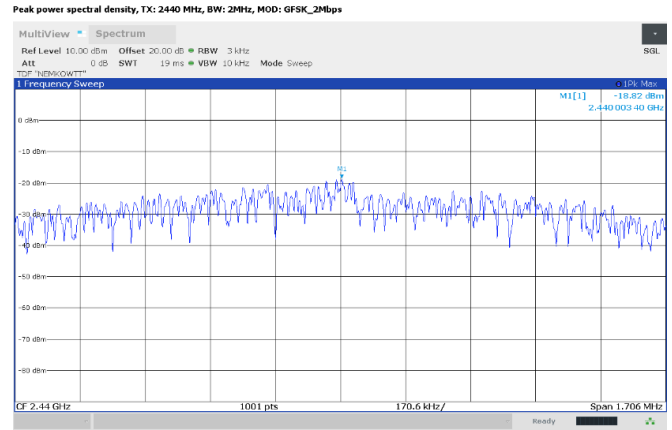


Figure 8.6-5: Power spectral density, GFSK, 2 Mbps, 2440 MHz

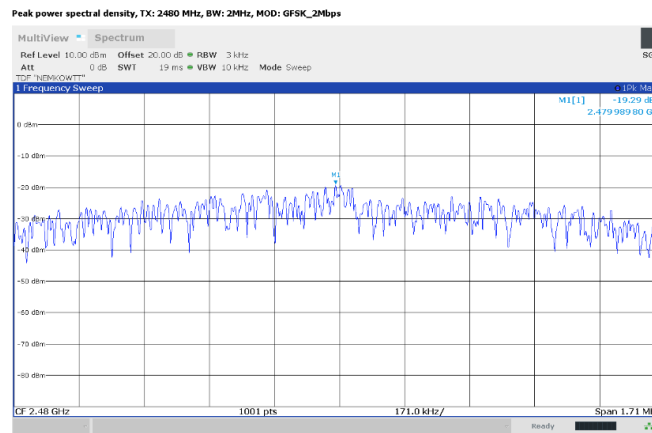


Figure 8.6-6: Power spectral density, GFSK, 2 Mbps, 2480 MHz

8.7 99% occupied bandwidth

8.7.1 References and limits

- ISED: RSS-Gen: §6.7
- Test method: ANSI C63.4-2020: §6.9.2

RSS-GEN:

6.7 The occupied bandwidth or the “99% emission bandwidth” is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

8.7.2 Test summary

Verdict	Pass		
Test date	August 6, 2025	Temperature	22 °C
Test engineer	Lan Sayasane, Sr. EMC Test Engineer	Air pressure	1007.0 mbar
Test location	☒ Wireless bench ☐ Other:	Relative humidity	56 %

8.7.3 Notes

Testing was performed with the transmitter operating on a fixed channel (lowest, middle, and highest) at maximum output power.

The spectral plots within this section have been corrected with all relevant transducer factors.

8.7.4 Setup details

EUT power input during test	Battery powered
EUT setup configuration	☒ Table-top ☐ Floor standing ☐ Other:

Receiver settings:

Resolution bandwidth	20 kHz
Video bandwidth	100 kHz
Detector mode	Peak
Trace mode	Max Hold
Measurement time	Long enough for trace to stabilize

Section 8

Test name

Specification(s)

Testing data

99% occupied bandwidth

FCC 15.247 & RSS-247



8.7.5 Test data

Table 8.7-1: 99% occupied bandwidth test data

Test Frequency (MHz)	Modulation	99% BW (MHz)	f _l (MHz)	f _h (MHz)	Limit	Verdict
2402	GFSK, 1 Mbps	1.051	2401.485	2402.535	f _H and f _L within 2400 – 2483.5 MHz	PASS
2440	GFSK, 1 Mbps	1.046	2439.489	2440.535	f _H and f _L within 2400 – 2483.5 MHz	PASS
2480	GFSK, 1 Mbps	1.056	2479.481	2480.537	f _H and f _L within 2400 – 2483.5 MHz	PASS
2402	GFSK, 2 Mbps	2.032	2401.008	2403.040	f _H and f _L within 2400 – 2483.5 MHz	PASS
2440	GFSK, 2 Mbps	2.032	2439.008	2441.040	f _H and f _L within 2400 – 2483.5 MHz	PASS
2480	GFSK, 2 Mbps	2.023	2479.015	2481.038	f _H and f _L within 2400 – 2483.5 MHz	PASS

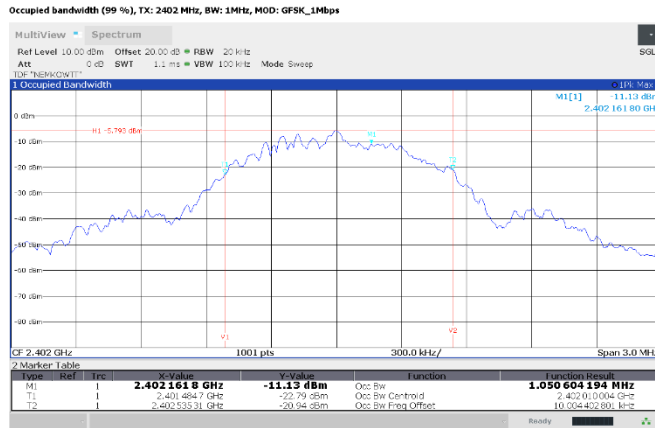


Figure 8.7-1: 99% occupied bandwidth, GFSK, 1 Mbps, 2402 MHz

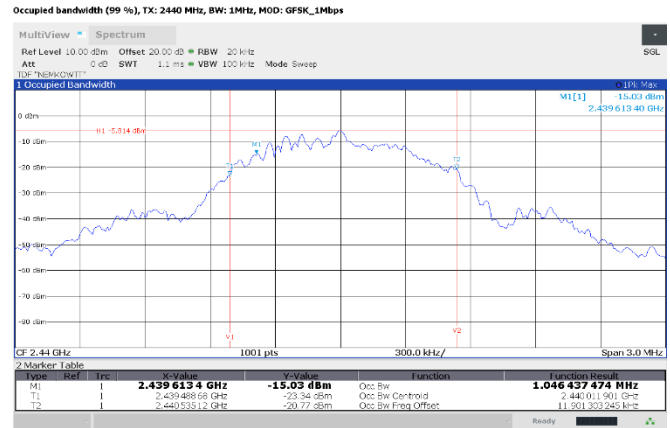


Figure 8.7-2: 99% occupied bandwidth, GFSK, 1 Mbps, 2440 MHz

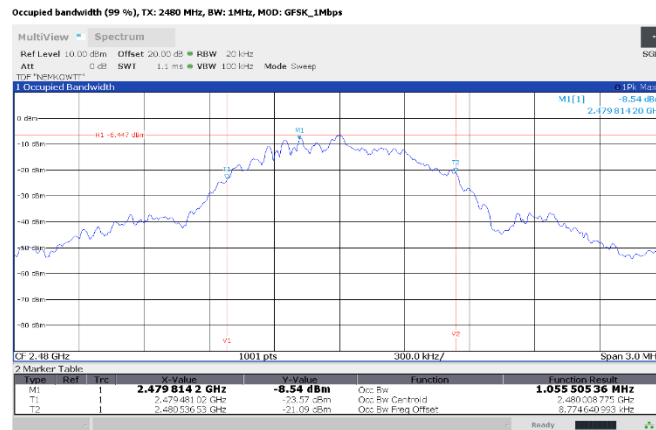


Figure 8.7-3: 99% occupied bandwidth, GFSK, 1 Mbps, 2480 MHz

Section 8
Test name
Specification(s)

Testing data
 99% occupied bandwidth
 FCC 15.247 & RSS-247

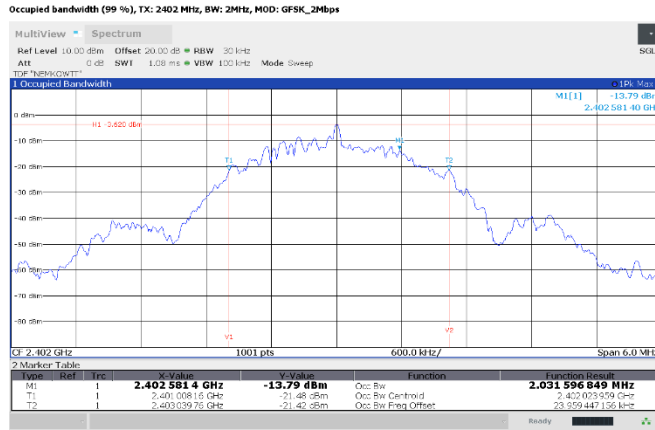


Figure 8.7-4: 99% occupied bandwidth, GFSK, 2 Mbps, 2402 MHz



Figure 8.7-5: 99% occupied bandwidth, GFSK, 2 Mbps, 2440 MHz

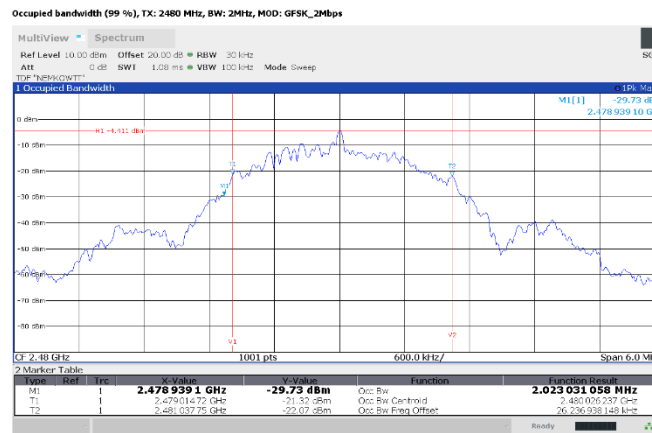


Figure 8.7-6: 99% occupied bandwidth, GFSK, 2 Mbps, 2480 MHz

End of test report