



Test report

REP109818-2R1TRFWL

Date of issue: August 28, 2025

Applicant:

Bright Uro, Inc.

Product description:

Abdominal Sensor

Model:

GUS-1000-A

Product marketing name(s):

N/A

FCC ID:

2BHMUGUS1000A

Specifications:

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

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

◆ **Industry Canada RSS-247, Issue 3**

Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

Lab and test locations

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FCC Site Number	Test Firm Registration Number: 392943; Designation Number: US5058
ISED Test Site	2040B-3
Tested by	Martha Espinoza, Wireless Test Engineer
Reviewed by	James Cunningham, EMC/WL Manager
Review date	August 28, 2025
Reviewer signature	

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 contained in this report are within Nemko USA's ISO/IEC 17025 accreditation.

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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
Industry Canada RSS-247, Issue 3	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

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
REP109818-2TRFWL	August 27, 2025	Original report issued
REP109818-2R1TRFWL	August 28, 2025	Updated following TCB feedback

Section 2 Summary of test results

2.1 Sample information

Receipt date	11-Aug-25
Nemko sample ID number	REP109818

2.2 Testing period

Test start date	11-Aug-25
Test end date	12-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	Not applicable ¹
§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: ISED 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	
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: ISED 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 ²

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

²EUT is DC powered from dedicated DC source or battery powered

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	Bright Uro, Inc.
Address	3 Goddard
City	Irvine
State	CA
Postal/Zip code	92618
Country	United States of America

3.3 Manufacturer

Company name	Bright Uro, Inc.
Address	3 Goddard
City	Irvine
State	CA
Postal/Zip code	92618
Country	United States of America

3.4 EUT information

Product name	Abdominal Sensor
Model	GUS-1000-A
Variant(s)	N/A
Serial number	250701003
Part number	N/A
Power requirements	3V Battery Power
Description/theory of operation	Bright Uro Abdominal Sensor is part of the Glean Urodynamics Systems and is used to diagnosis bladder function dysfunctions by measuring abdominal pressure. This data is uploaded to the BU cloud and provided to the clinician through our mobile and web apps for review.
Operational frequencies	2400-2483.5 MHz
Software details	N/A

3.5 Transmitter Information

Frequency band	2400 – 2483.5 MHz
Transmitter type	<input type="checkbox"/> Frequency hopping spread spectrum (FHSS) <input checked="" type="checkbox"/> Digital transmission system (DTS) <input type="checkbox"/> Hybrid FHSS / DTS
Minimum frequency (MHz)	2402
Maximum frequency (MHz)	2480
Type of modulation	GFSK
Data rate	<input type="checkbox"/> 125 kbps operation <input type="checkbox"/> 500 kbps operation <input checked="" type="checkbox"/> 1 Mbps operation <input type="checkbox"/> 2 Mbps operation
Tested frequencies	2402 MHz (low), 2440 MHz (middle), and 2480 MHz (high)
Antenna type	Chip antenna
Antenna peak gain	0.5 dBi

3.6 EUT setup details

Table 3.6-1: EUT sub assemblies

Description	Brand name	Model/Part number	Serial number	Rev.
N/A	N/A	N/A	N/A	N/A

Table 3.6-2: EUT interface ports

Description	Qty.
DC Port	1

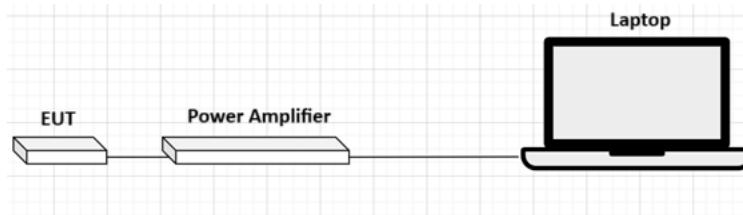
Table 3.6-3: Support equipment

Description	Brand name	Model/Part number	Serial number	Rev.
Power amplifier	Nordic Semiconductor	N/A	N/A	N/A
Laptop	Lenovo	ThinkPad	N/A	N/A

Table 3.6-4: Inter-connection cables

Cable description	From	To	Length (m)
DC Cable	EUT	Power Amplifier	0.20
USB Cable	Power Amplifier	Laptop	0.50

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 $\pm 5\%$, 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 $(U_{lab} - U_{cispr})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cispr})$, 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.
Biconilog Antenna	ETS Lindgren	3142E	E1371	2 Years	20-Aug-2026
DRG Horn (medium)	ETS Lindgren	3117-PA	E1139	2 Years	11-Jan-2026
DRG Horn (medium)	ETS Lindgren	3117-PA	E1160	2 Years	17-May-2026
Standard Gain Horn Antenna	Eravant	SAZ-2410-42-S1	EW107	2 Years	11-Feb-2026
Low Noise Amplifier	Eravant	SBL-1834034038-KFKF	EW111	NCR	NCR
Power Sensor	ETS Lindgren	7002-006	E1062	VBU	VBU
Signal and Spectrum Analyzer	R&S	FSV40	E1120	2 Years	14-Dec-2025
EMI Test Receiver	R&S	ESU26	E1353	1 Year	13-Nov-2025
EMI Test Receiver	R&S	ESU40	E1121	1 Year	03-Oct-2025

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 (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	19°C
Test date	August 11, 2025	Air pressure	1003 mbar
Test engineer	Martha Espinoza, Wireless Test Engineer	Relative humidity	55%
Test location	<input checked="" type="checkbox"/> Wireless bench <input type="checkbox"/> 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 3 VDC

8.1.5 Test data

<input checked="" type="checkbox"/>	EUT is battery operated. Therefore, all tests performed with a new fully charged battery
<input type="checkbox"/>	EUT power supply voltage varied across supported range. No variation in transmitter output power observed therefore all tests performed at nominal power supply voltage.
<input type="checkbox"/>	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 11, 2025	Temperature	19°C
Test engineer	Martha Espinoza, Wireless Test Engineer	Air pressure	1003 mbar
Test location	<input checked="" type="checkbox"/> Wireless bench <input type="checkbox"/> Other:	Relative humidity	55%

8.2.2 Notes

None

8.2.3 Test data

Antenna part number:	2450AT18B100
Technical description:	2.4 GHz Mini Antenna, SMT
Peak gain (dBi):	0.5
Source of gain data:	<input type="checkbox"/> Declared by client <input checked="" type="checkbox"/> Antenna data sheet or specification. Document name: High Frequency Ceramic Solutions: 2450AT18B100 <input type="checkbox"/> Antenna gain test report. Document name:

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 11, 2025; August 15, 2025;	Temperature	19°C; 19°C
Test engineer	Martha Espinoza, Wireless Test Engineer	Air pressure	1003 mbar; 1001 mbar
Test location	<input checked="" type="checkbox"/> Wireless bench <input type="checkbox"/> Other:	Relative humidity	55%; 52%

8.3.3 Notes

Testing was performed with the transmitter operating on a fixed channel (lowest, middle, and highest) at maximum output power. Two cases, corresponding to two data rates were tested: 1 MBPS and 2 MBPS.

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

8.3.4 Setup details

EUT power input during test	3 VDC
EUT setup configuration	<input checked="" type="checkbox"/> Table-top <input type="checkbox"/> Floor standing <input type="checkbox"/> 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	720.7	≥ 500	220.7
2440	GFSK, 1 Mbps	712.0	≥ 500	212.0
2480	GFSK, 1 Mbps	725.0	≥ 500	225.0
2402	GFSK, 2 Mbps	1186.7	≥ 500	686.7
2440	GFSK, 2 Mbps	1186.7	≥ 500	686.7
2480	GFSK, 2 Mbps	1107.1	≥ 500	607.1

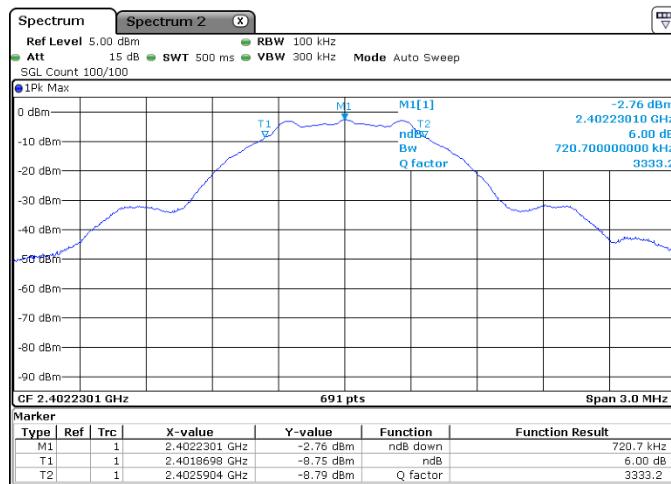


Figure 8.3-1: Minimum 6 dB bandwidth, GFSK, 1 Mbps, 2402 MHz.

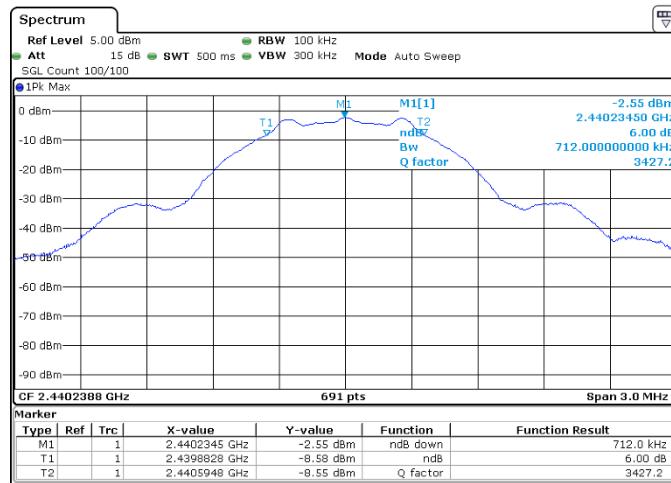


Figure 8.3-2: Minimum 6 dB bandwidth, GFSK, 1 Mbps, 2440 MHz.

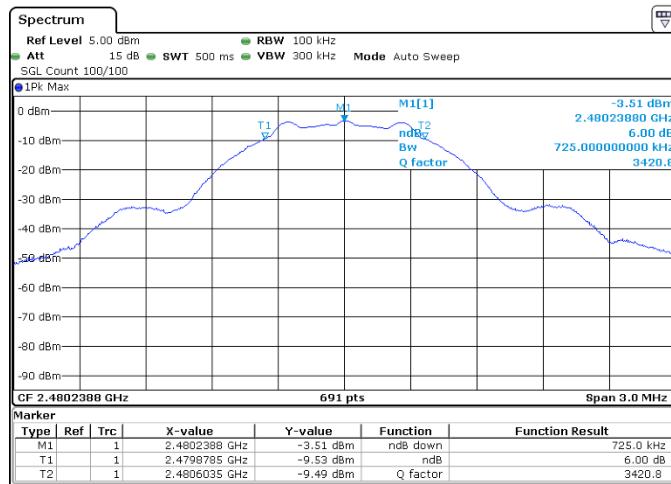


Figure 8.3-3: Minimum 6 dB bandwidth, GFSK, 1 Mbps, 2480 MHz.

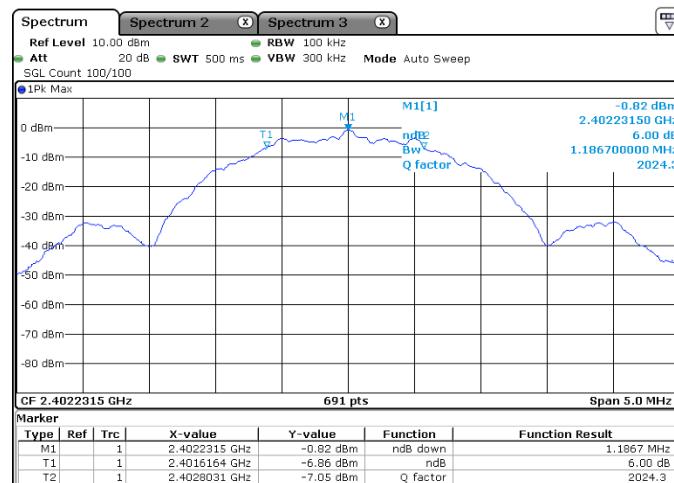


Figure 8.3-4: Minimum 6 dB bandwidth, GFSK, 2 Mbps, 2402 MHz.

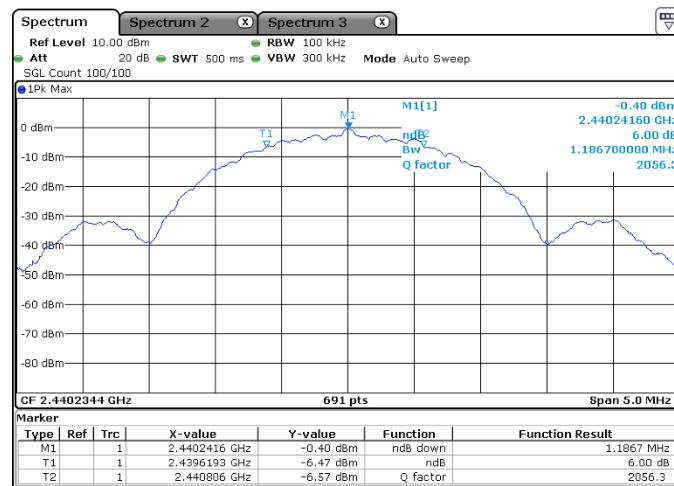


Figure 8.3-5: Minimum 6 dB bandwidth, GFSK, 2 Mbps, 2440 MHz.

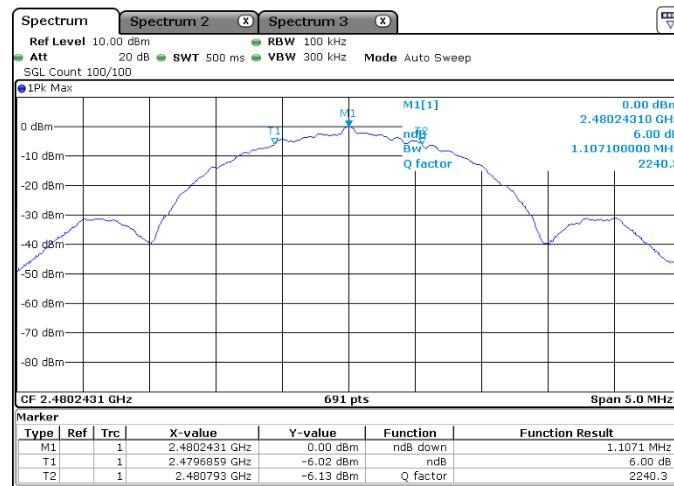


Figure 8.3-6: Minimum 6 dB bandwidth, GFSK, 2 Mbps, 2480 MHz.

8.4 Maximum peak output power

8.4.1 References and limits

- FCC 47 CFR Part 15, Subpart C: §15.247(b)(3)
- ISED: RSS-247 5.4(d)
- Test method: ANSI C63.10-2020 §11.9.1.2 (PKPM1 – Peak power meter method)

§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 transmitted 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 transmitted 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 11, 2025; August 15, 2025	Temperature	19°C; 19°C
Test engineer	Martha Espinoza, Wireless Test Engineer	Air pressure	1003 mbar; 1001 mbar
Test location	<input checked="" type="checkbox"/> Wireless bench <input type="checkbox"/> Other:	Relative humidity	55%; 52%

8.4.3 Notes

Testing was performed with the transmitter operating on a fixed channel (lowest, middle, and highest) at maximum output power. Maximum antenna gain = 0.5 dBi. Two cases, corresponding to two data rates, were tested: 1 MBPS and 2 MBPS.

The spectral plots within this section have been corrected with all relevant transducer factors. A sensor power was used for this testing.

8.4.4 Setup details

EUT power input during test	3 VDC
EUT setup configuration	<input checked="" type="checkbox"/> Table-top <input type="checkbox"/> Floor standing <input type="checkbox"/> Other:

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	-1.40	≤ 30	-31.40	-0.90
2440	GFSK, 1 Mbps	-1.38	≤ 30	-31.38	-0.88
2480	GFSK, 1 Mbps	-0.47	≤ 30	-30.47	0.03
2402	GFSK, 2 Mbps	-1.43	≤ 30	-31.43	-0.93
2440	GFSK, 2 Mbps	-1.41	≤ 30	-31.41	-0.91
2480	GFSK, 2 Mbps	-0.50	≤ 30	-30.50	0.00

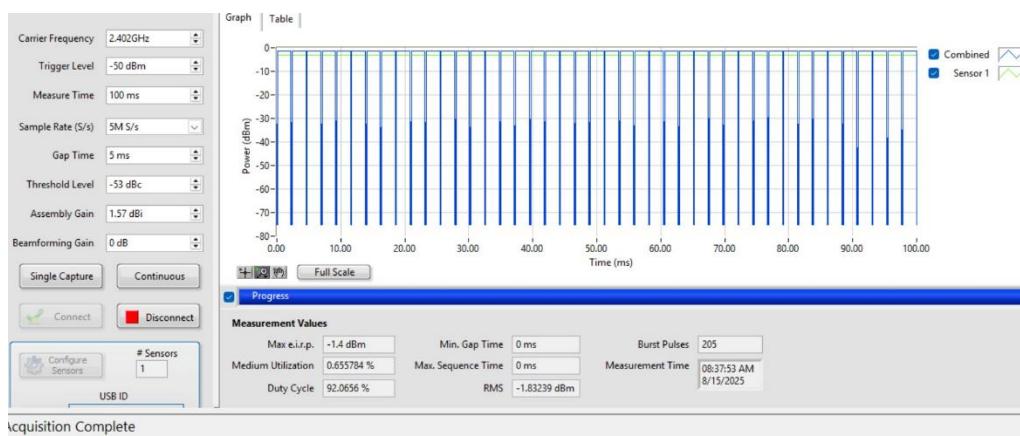


Figure 8.4-1: Maximum peak output power, GFSK, 1 Mbps, 2402 MHz.

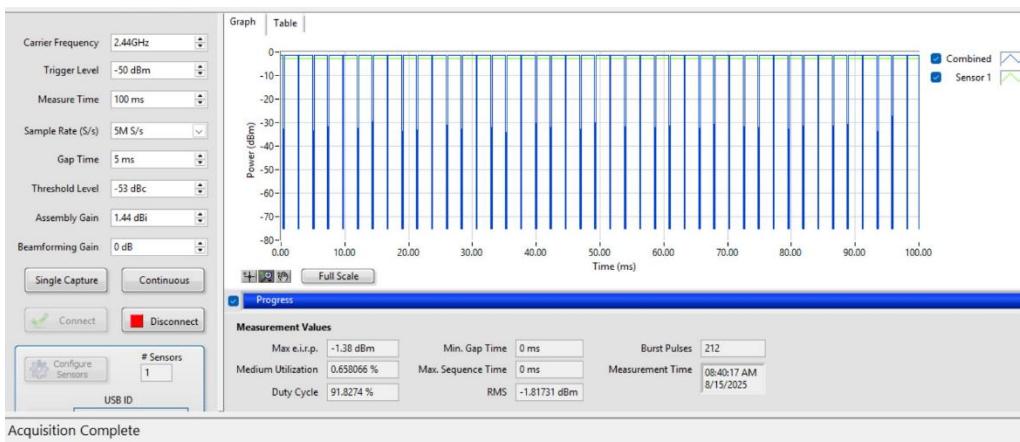


Figure 8.4-2: Maximum peak output power, GFSK, 1 Mbps, 2440 MHz.

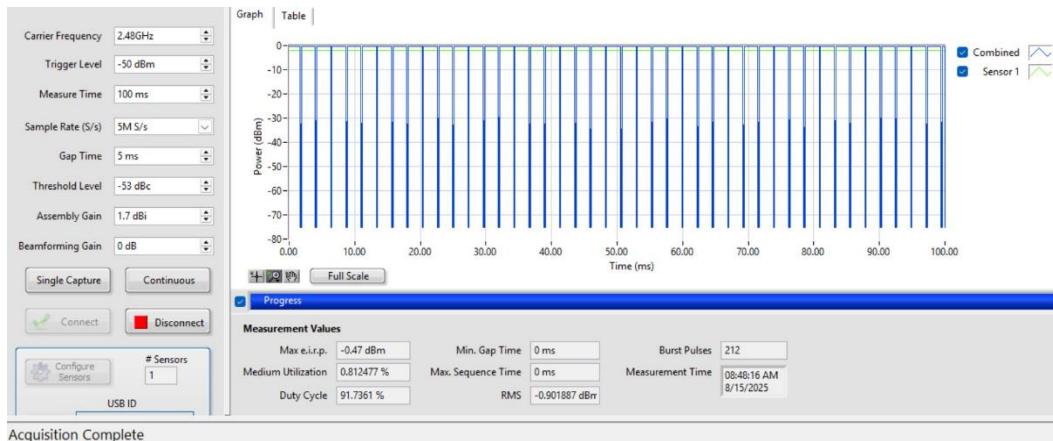


Figure 8.4-3: Maximum peak output power, GFSK, 1 Mbps, 2480 MHz.

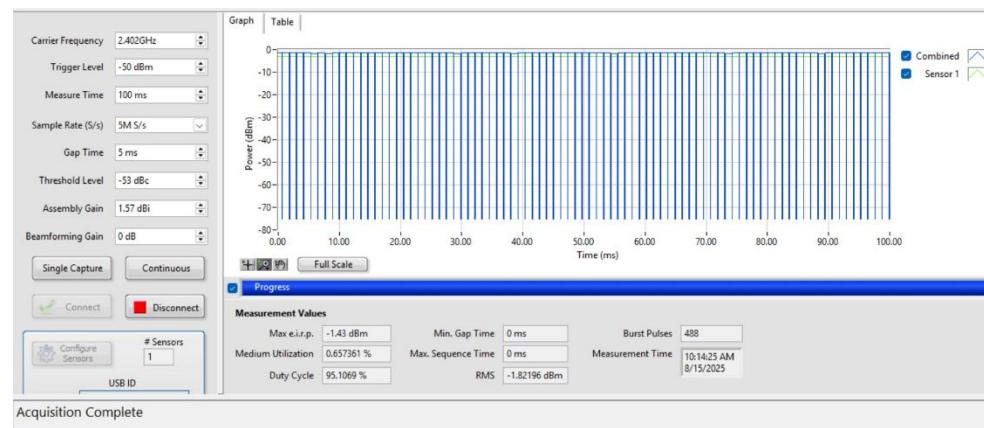


Figure 8.4-4: Maximum peak output power, GFSK, 2 Mbps, 2402 MHz.

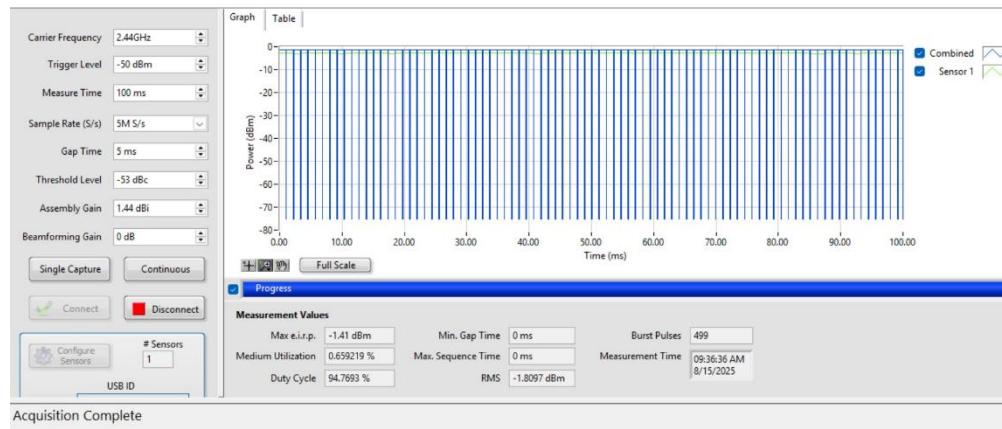


Figure 8.4-5: Maximum peak output power, GFSK, 2 Mbps, 2440 MHz.

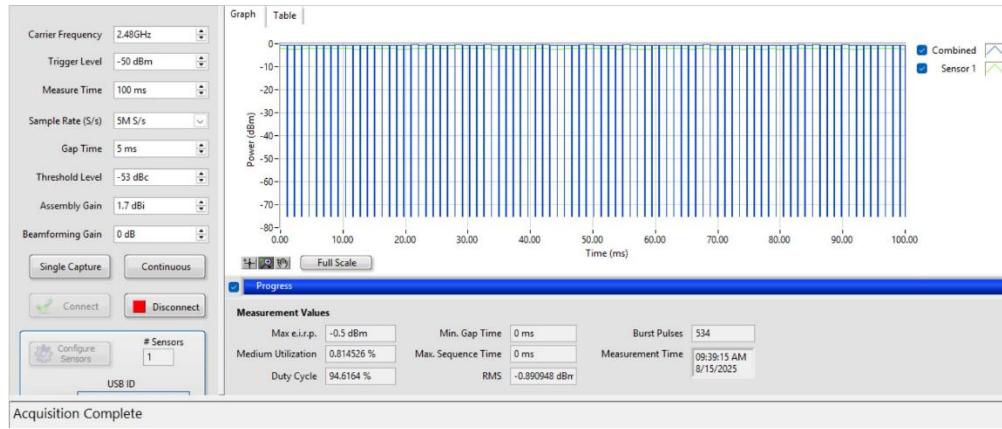


Figure 8.4-6: Maximum peak output power, GFSK, 2 Mbps, 2480 MHz.

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 × log ₁₀ (F)	300
0.490–1.705	24000/F	87.6 – 20 × 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: ISED 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	August 11, 2025 ; August 12, 2025; August 15, 2025	Temperature	19°C; 19°C; 19°C
Test engineer	Martha Espinoza, Wireless Test Engineer	Air pressure	1003 mbar; 1004 mbar; 1001 mbar
Test location	<input type="checkbox"/> Wireless bench (conducted tests) <input checked="" type="checkbox"/> 10 m semi-anechoic chamber (radiated tests) <input checked="" type="checkbox"/> 3 m semi-anechoic chamber (radiated tests) <input type="checkbox"/> Other:	Relative humidity	55%; 53%; 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 spurious 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: 1 MBPS data rate – GFSK Modulation.

For all the conducted testing and except the radiated emission testing corresponding to the band edges, the two cases, corresponding to two data rates were tested: 1 MBPS and 2 MBPS were tested.

8.5.4 Setup details

EUT power input during test	3 VDC
EUT setup configuration	<input checked="" type="checkbox"/> Table-top <input type="checkbox"/> Floor standing <input type="checkbox"/> 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 (dBc)	Limit (dBc)	Margin (dB)
2402	GFSK, 1 Mbps	2399.83688	-49.29	-20	29.29
2480	GFSK, 1 Mbps	2483.69207	-51.93	-20	31.93
2402	GFSK, 2 Mbps	2399.99475	-37.68	-20	17.68
2480	GFSK, 2 Mbps	2483.64457	-48.98	-20	28.98

Note: Amplitude (dBc) = Peak spurious emission (dBm) – Peak fundamental emission (dBm)

For example, for 2402 MHz, 1 Mbps operation:

$$\begin{aligned}
 \text{Peak spurious emission} &= -49.47 \text{ dBm} \\
 \text{Peak fundamental emission} &= -0.18 \text{ dBm} \\
 \text{Amplitude (dBc)} &= -49.47 - (-0.18) = 49.29 \text{ dBc}
 \end{aligned}$$

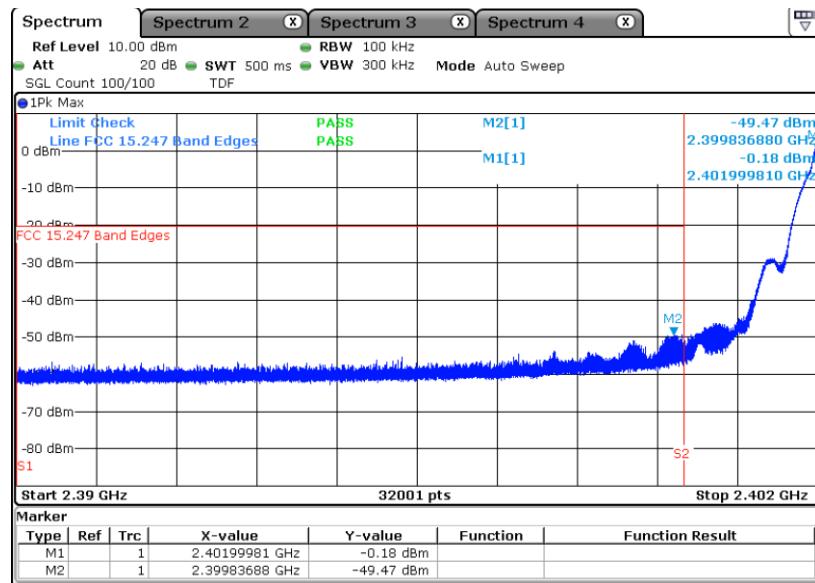


Figure 8.5-1: Authorized band-edge emissions, GFSK, 1 Mbps, 2402 MHz.

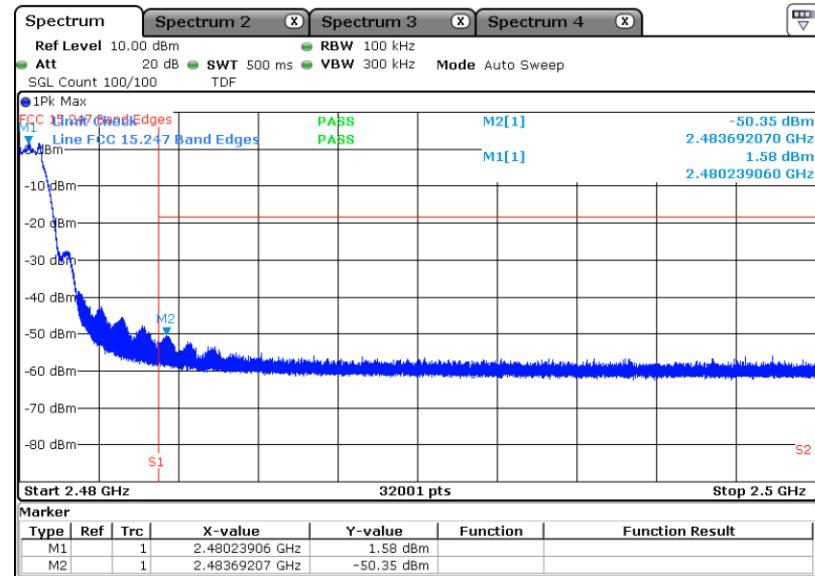


Figure 8.5-2: Authorized band-edge emissions, GFSK, 1 Mbps, 2480 MHz.

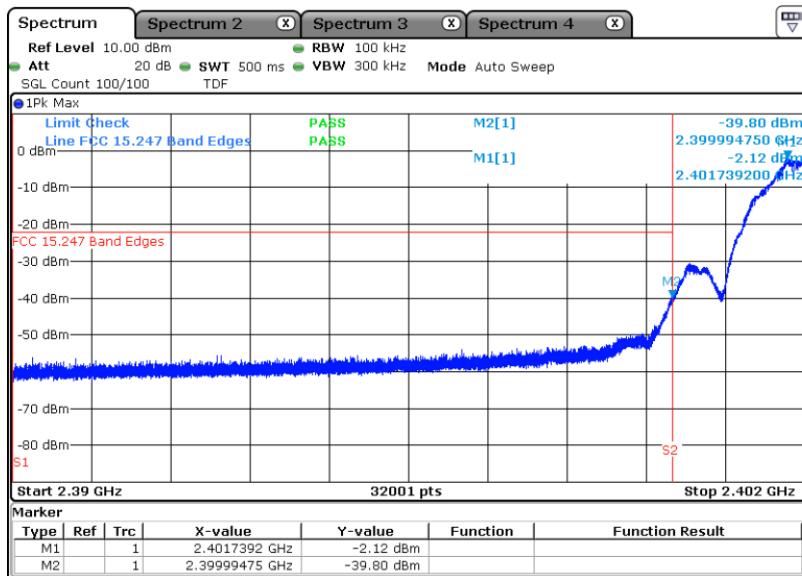


Figure 8.5-3: Authorized band-edge emissions, GFSK, 2 Mbps, 2402 MHz.

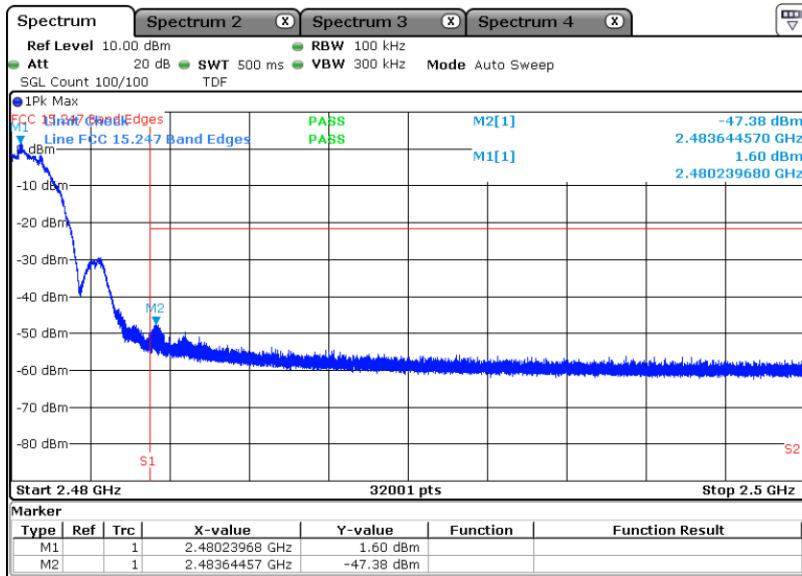


Figure 8.5-4: Authorized band-edge emissions, GFSK, 2 Mbps, 2480 MHz.

- 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	2.94	-44.78	-21.49	23.29
2440	GFSK, 1 Mbps	2.13	-43.97	-22.01	21.96
2480	GFSK, 1 Mbps	1880.057	-39.45	-21.41	18.04
2402	GFSK, 2 Mbps	843.850	-41.82	-21.23	20.59
2440	GFSK, 2 Mbps	3.76	-45.52	-21.03	24.49
2480	GFSK, 2 Mbps	1871.63	-37.46	-21.17	16.29

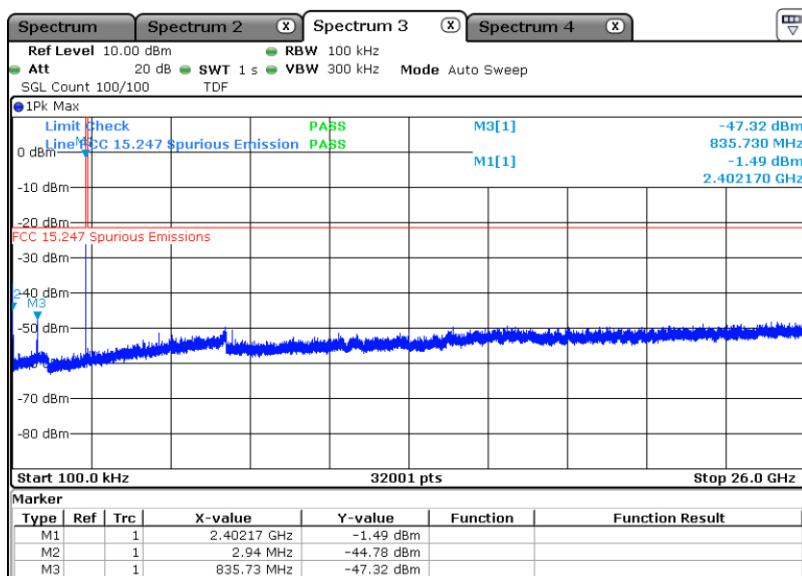


Figure 8.5-5: Antenna port conducted spurious emissions, GFSK, 1 Mbps, 2402 MHz.

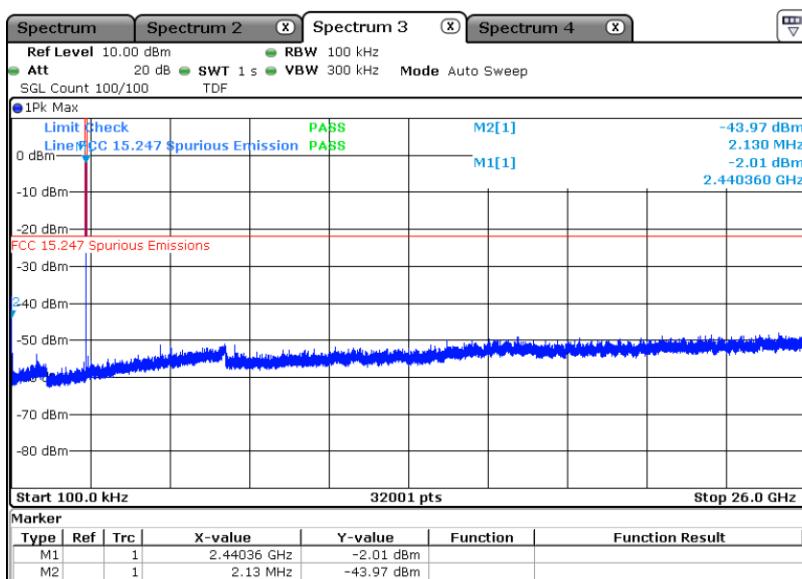


Figure 8.5-6: Antenna port conducted spurious emissions, GFSK, 1 Mbps, 2440 MHz.

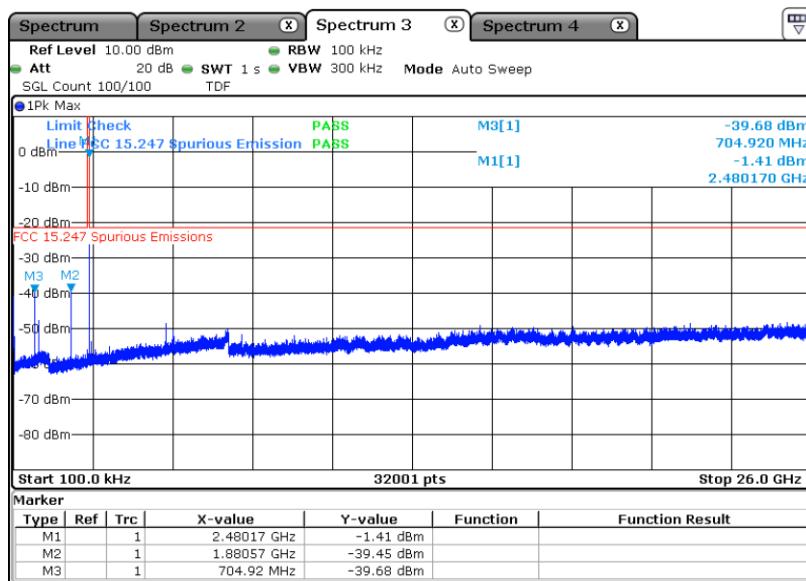


Figure 8.5-7: Antenna port conducted spurious emissions, GFSK, 1 Mbps, 2480 MHz.

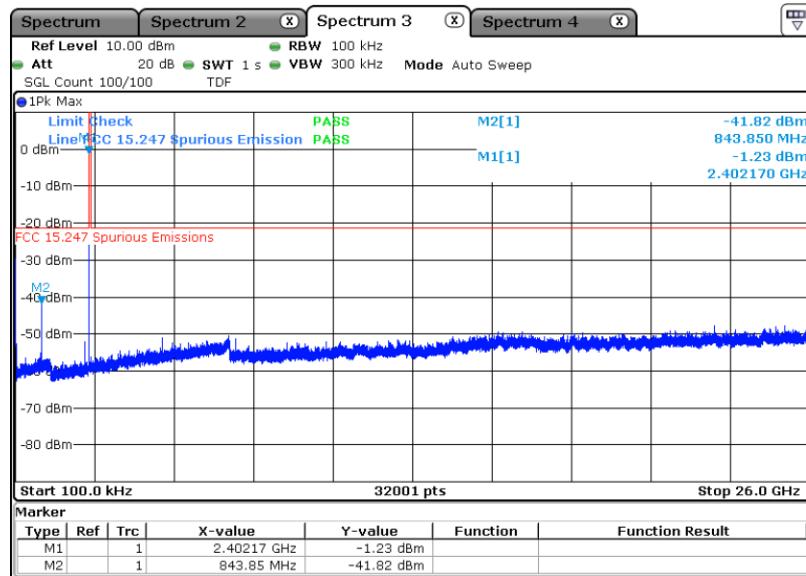


Figure 8.5-8: Antenna port conducted spurious emissions, GFSK, 2 Mbps, 2402 MHz.

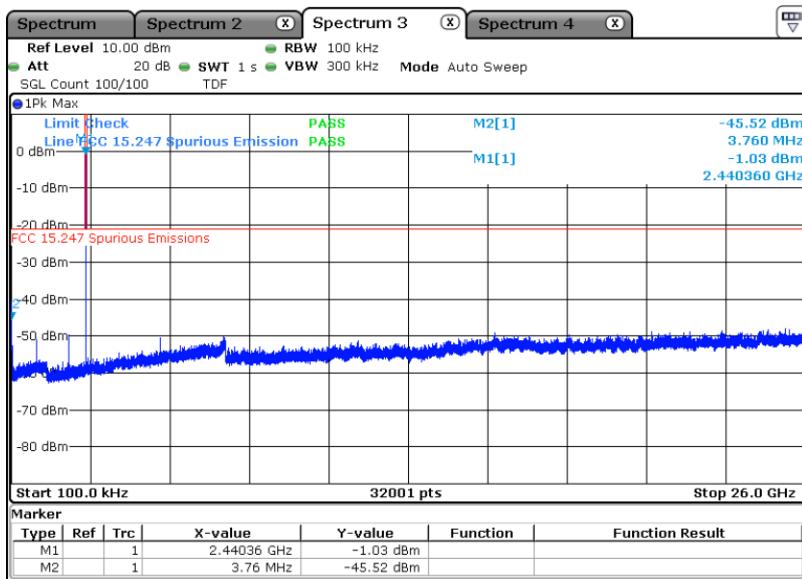


Figure 8.5-9: Antenna port conducted spurious emissions, GFSK, 2 Mbps, 2440 MHz.

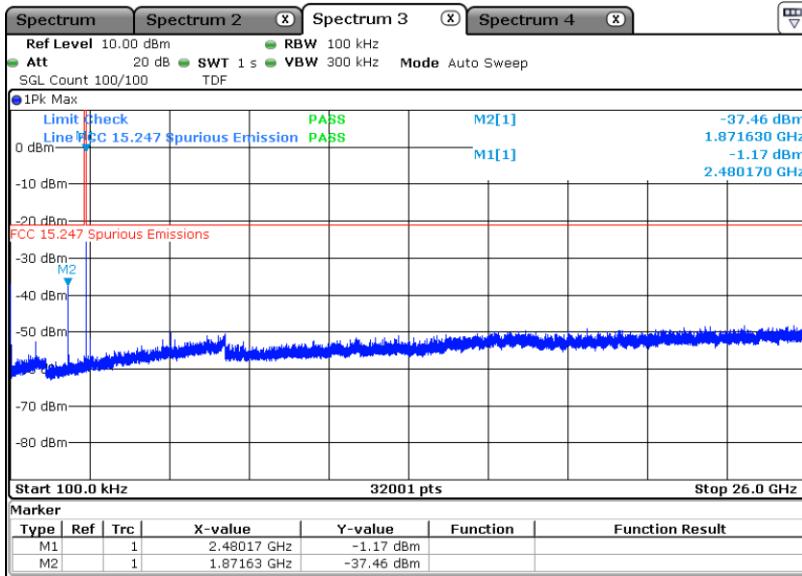


Figure 8.5-10: Antenna port conducted spurious emissions, GFSK, 2 Mbps, 2480 MHz.

Radiated spurious emissions:

- **Restricted band edge:**

Full Spectrum

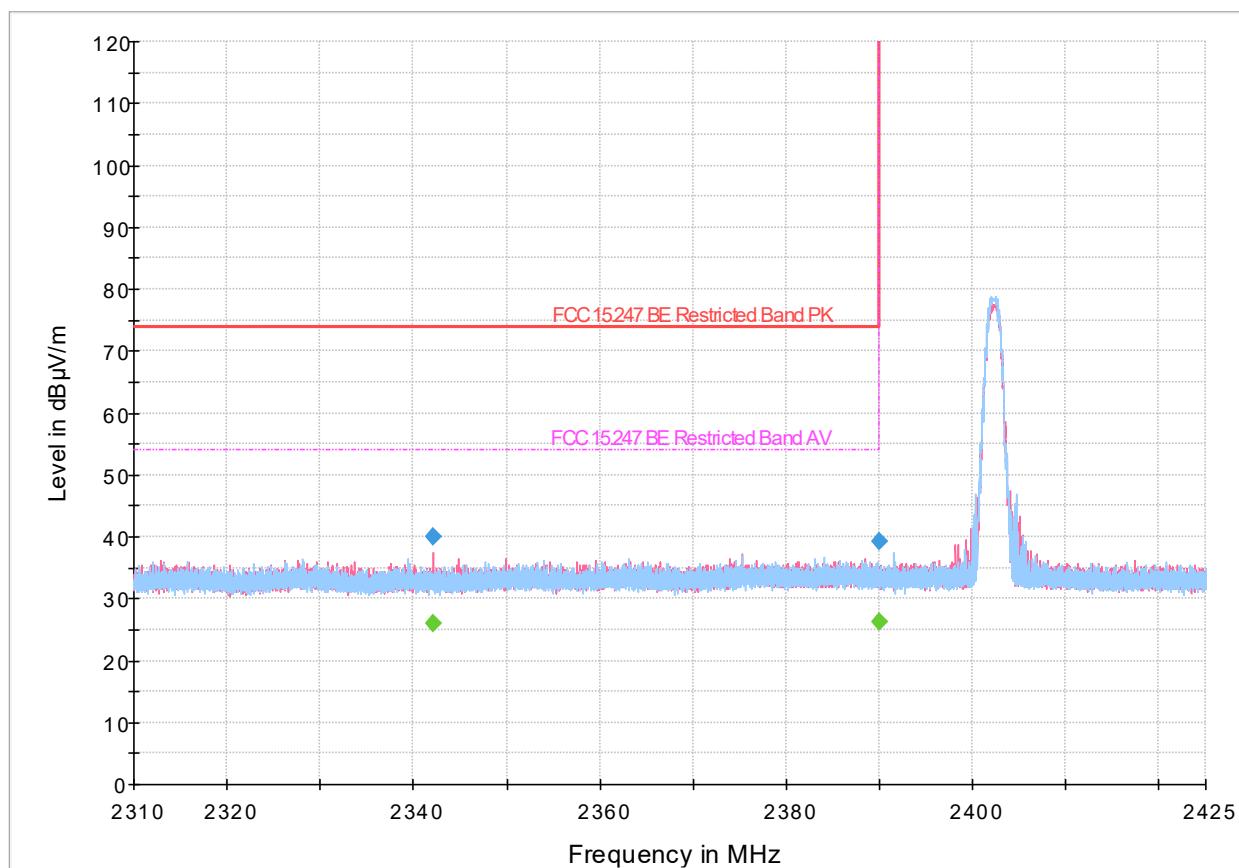


Figure 8.5-11: Radiated emissions spectral plot (2.31 GHz - 2.425 GHz). Low channel: 2402 MHz (1 Mbps).

Table 8.5-6: Radiated emissions results. Low channel: 2402 MHz (1 Mbps).

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)
2342.119500	40.11	---	73.90	33.79	5000.0	1000.000	396.0	H	32.0	-10.1
2342.119500	---	26.04	53.90	27.86	5000.0	1000.000	396.0	H	32.0	-10.1
2390.000000	39.26	---	73.90	34.64	5000.0	1000.000	402.0	H	211.0	-9.8
2390.000000	---	26.25	53.90	27.65	5000.0	1000.000	402.0	H	211.0	-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

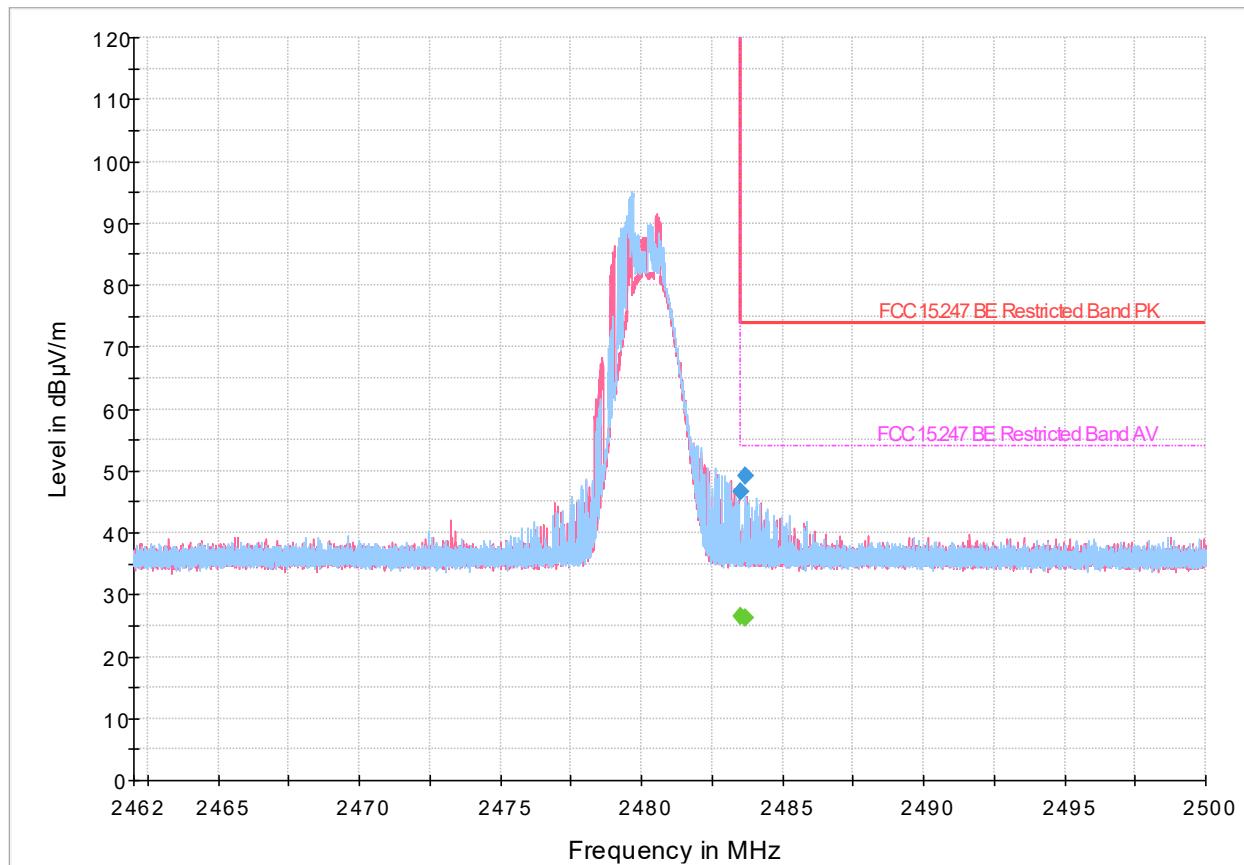


Figure 8.5-12: Radiated emissions spectral plot (2.462 GHz - 2.5 GHz). High channel: 2480 MHz (1 Mbps).

Table 8.5-7: Radiated emissions results. High channel: 2480 MHz (1 Mbps).

Frequency (MHz)	MaxPeak (dB μ V/m)	CAverage (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.500000	---	26.49	53.90	27.41	5000.0	1000.000	111.0	H	134.0	-9.5
2483.500000	46.56	---	73.90	27.34	5000.0	1000.000	111.0	H	134.0	-9.5
2483.661900	---	26.33	53.90	27.57	5000.0	1000.000	304.0	H	350.0	-9.5
2483.661900	49.15	---	73.90	24.75	5000.0	1000.000	304.0	H	350.0	-9.5

Notes:

¹ Field strength (dB μ V/m) = receiver/spectrum analyzer value (dB μ V) + 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

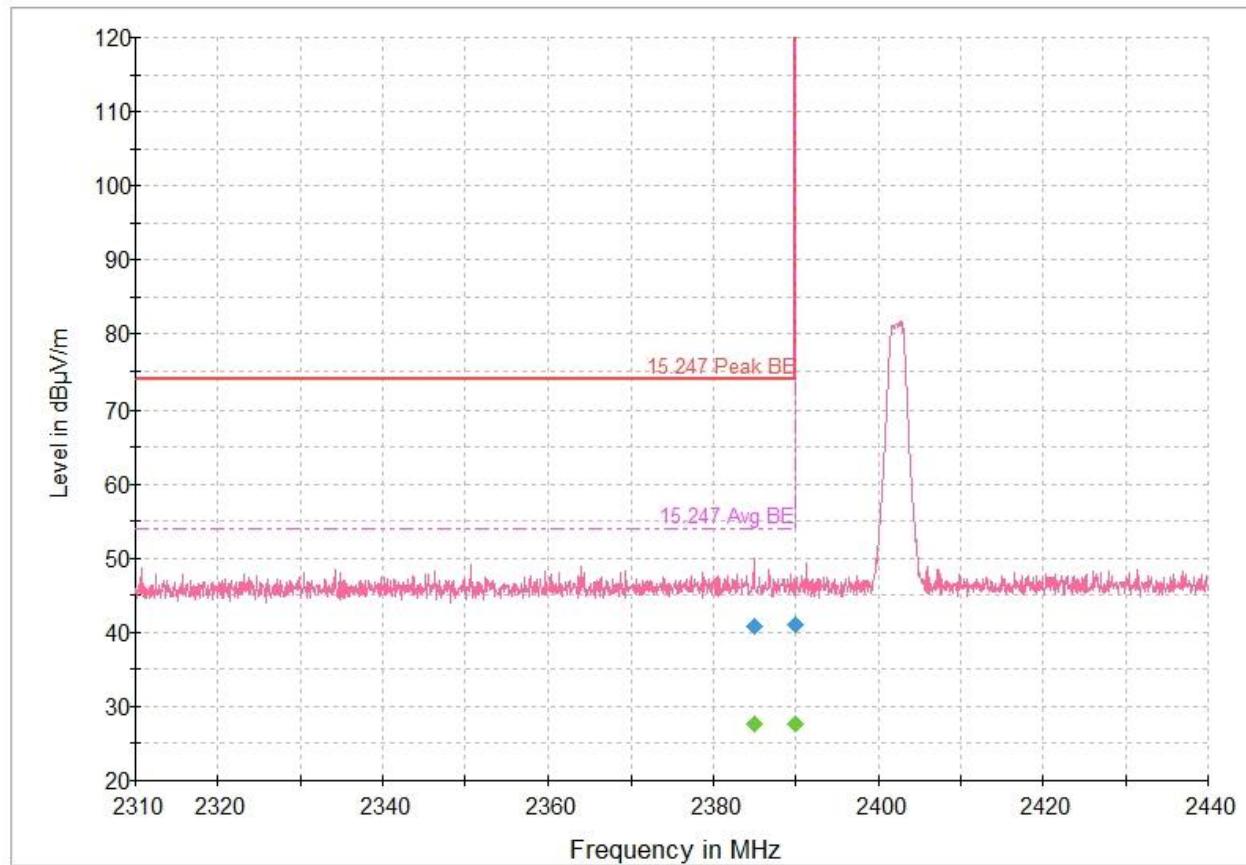


Figure 8.5-13: Radiated emissions spectral plot (2.31 GHz - 2.44 GHz). Low channel: 2402 MHz (2 Mbps). Horizontal polarization.

Table 8.5-8: Radiated emissions results. Low channel: 2402 MHz (2 Mbps). Horizontal polarization.

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)
2384.880000	40.70	---	73.90	33.20	5000.0	1000.000	336.0	H	294.0	-4.0
2384.880000	---	27.56	53.90	26.34	5000.0	1000.000	336.0	H	294.0	-4.0
2390.000000	40.94	---	73.90	32.96	5000.0	1000.000	331.0	H	104.0	-4.0
2390.000000	---	27.57	53.90	26.33	5000.0	1000.000	331.0	H	104.0	-4.0

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

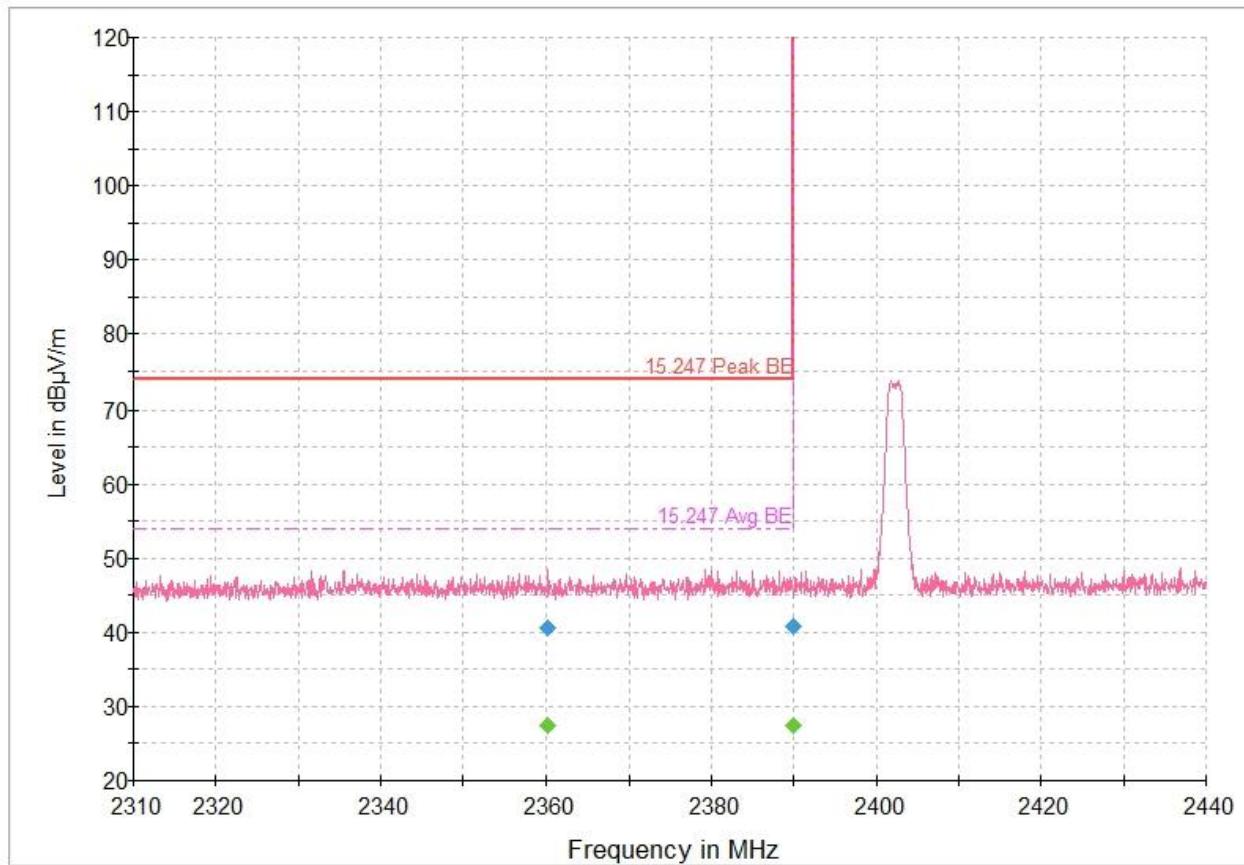


Figure 8.5-14: Radiated emissions spectral plot (2.31 GHz - 2.44 GHz). Low channel: 2402 MHz (2 Mbps). Vertical polarization.

Table 8.5-9: Radiated emissions results. Low channel: 2402 MHz (2 Mbps). Vertical polarization.

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)
2360.310000	---	27.38	53.90	26.52	5000.0	1000.000	323.0	V	274.0	-4.1
2360.310000	40.67	---	73.90	33.23	5000.0	1000.000	323.0	V	274.0	-4.1
2390.000000	---	27.54	53.90	26.36	5000.0	1000.000	105.0	V	336.0	-4.0
2390.000000	40.76	---	73.90	33.14	5000.0	1000.000	105.0	V	336.0	-4.0

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

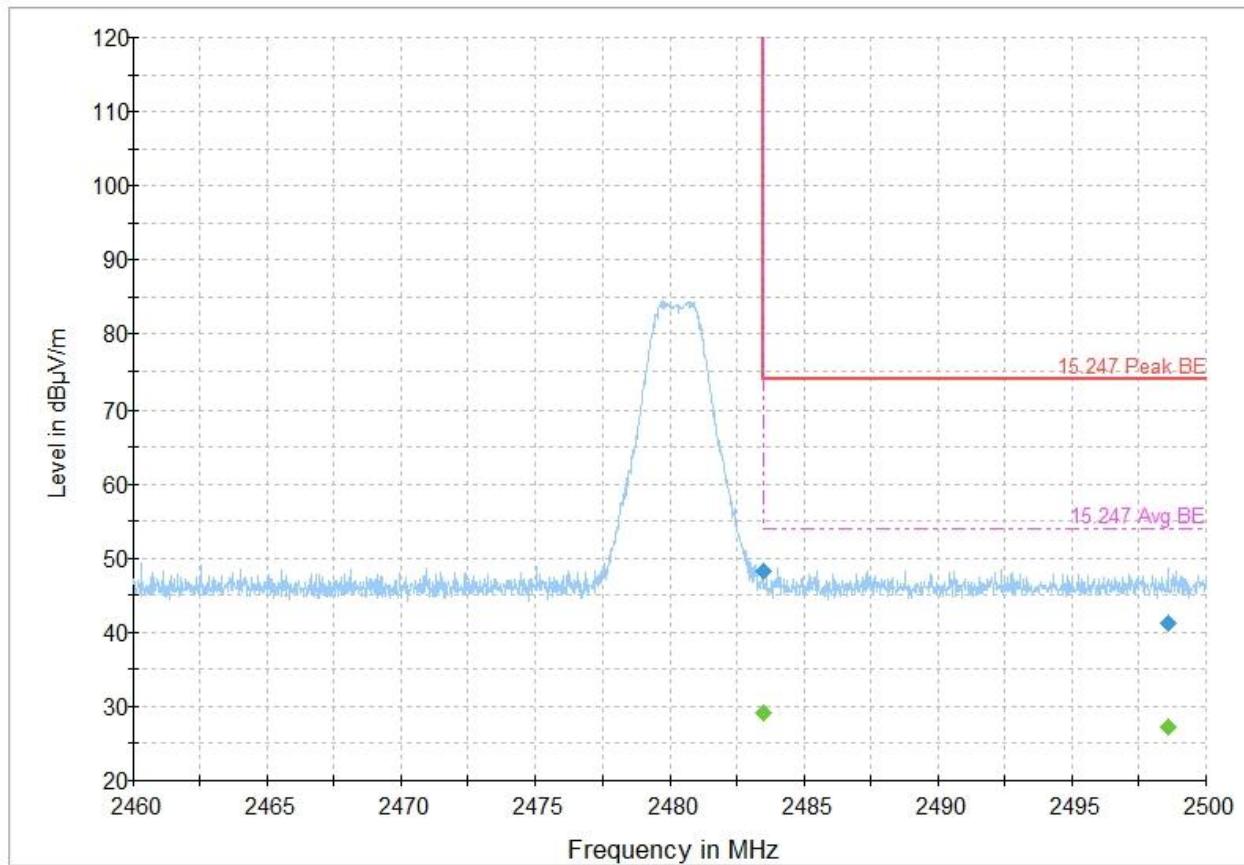


Figure 8.5-15: Radiated emissions spectral plot (2.46 GHz - 2.5 GHz). High channel: 2480 MHz (2 Mbps). Horizontal polarization.

Table 8.5-10: Radiated emissions results. High channel: 2480 MHz (2 Mbps). Horizontal polarization.

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)
2483.50000	---	29.20	53.90	24.70	5000.0	1000.000	115.0	H	134.0	-3.8
2483.50000	48.34	---	73.90	25.56	5000.0	1000.000	115.0	H	134.0	-3.8
2498.56000	---	27.24	53.90	26.66	5000.0	1000.000	195.0	H	348.0	-3.7
2498.56000	41.32	---	73.90	32.58	5000.0	1000.000	195.0	H	348.0	-3.7

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.

Full Spectrum

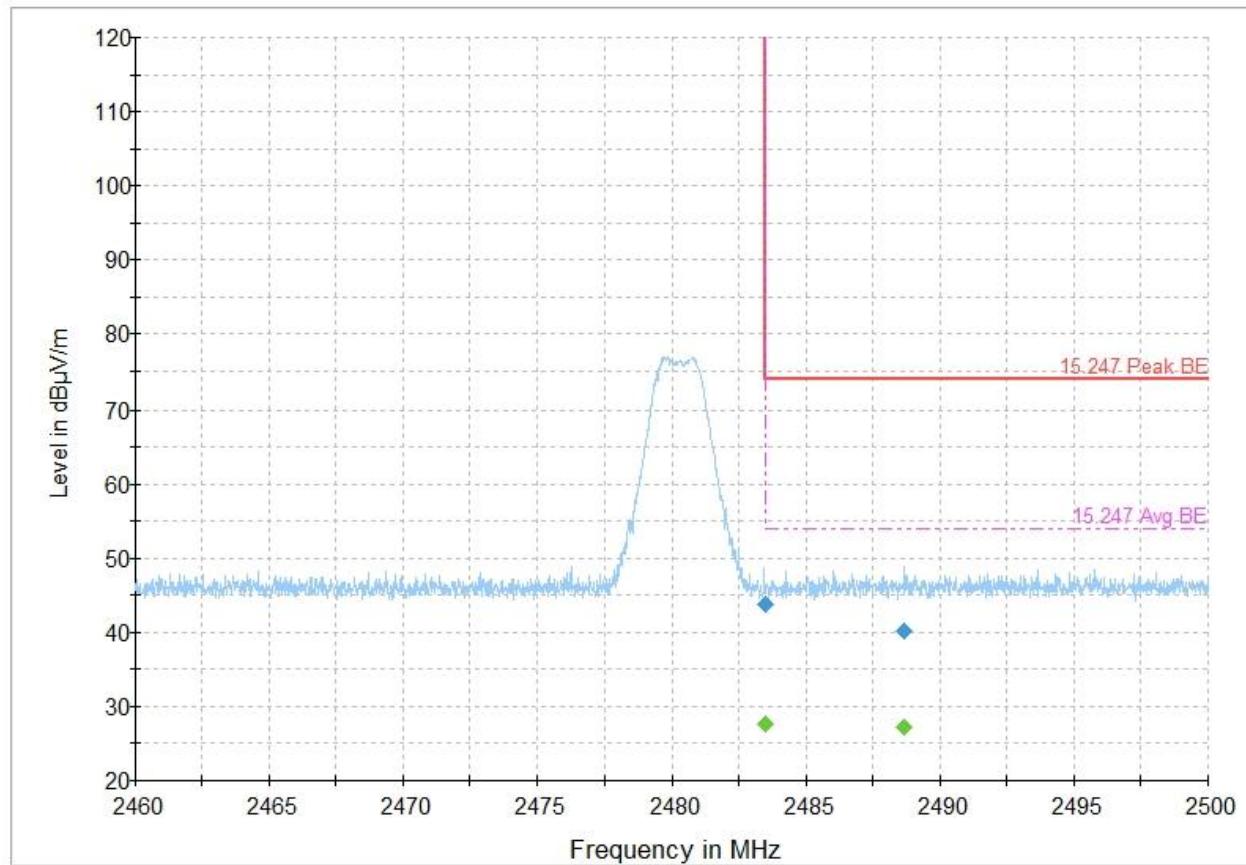


Figure 8.5-16: Radiated emissions spectral plot (2.46 GHz - 2.5 GHz). High channel: 2480 MHz (2 Mbps). Vertical polarization.

Table 8.5-11: Radiated emissions results. High channel: 2480 MHz (2 Mbps). Vertical polarization.

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	---	27.58	53.90	26.32	5000.0	1000.000	303.0	V	170.0	-3.8
2483.500000	43.70	---	73.90	30.20	5000.0	1000.000	303.0	V	170.0	-3.8
2488.660000	---	27.21	53.90	26.69	5000.0	1000.000	126.0	V	0.0	-3.8
2488.660000	40.19	---	73.90	33.71	5000.0	1000.000	126.0	V	0.0	-3.8

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.

- Radiated spurious emissions, restricted bands:

Full Spectrum

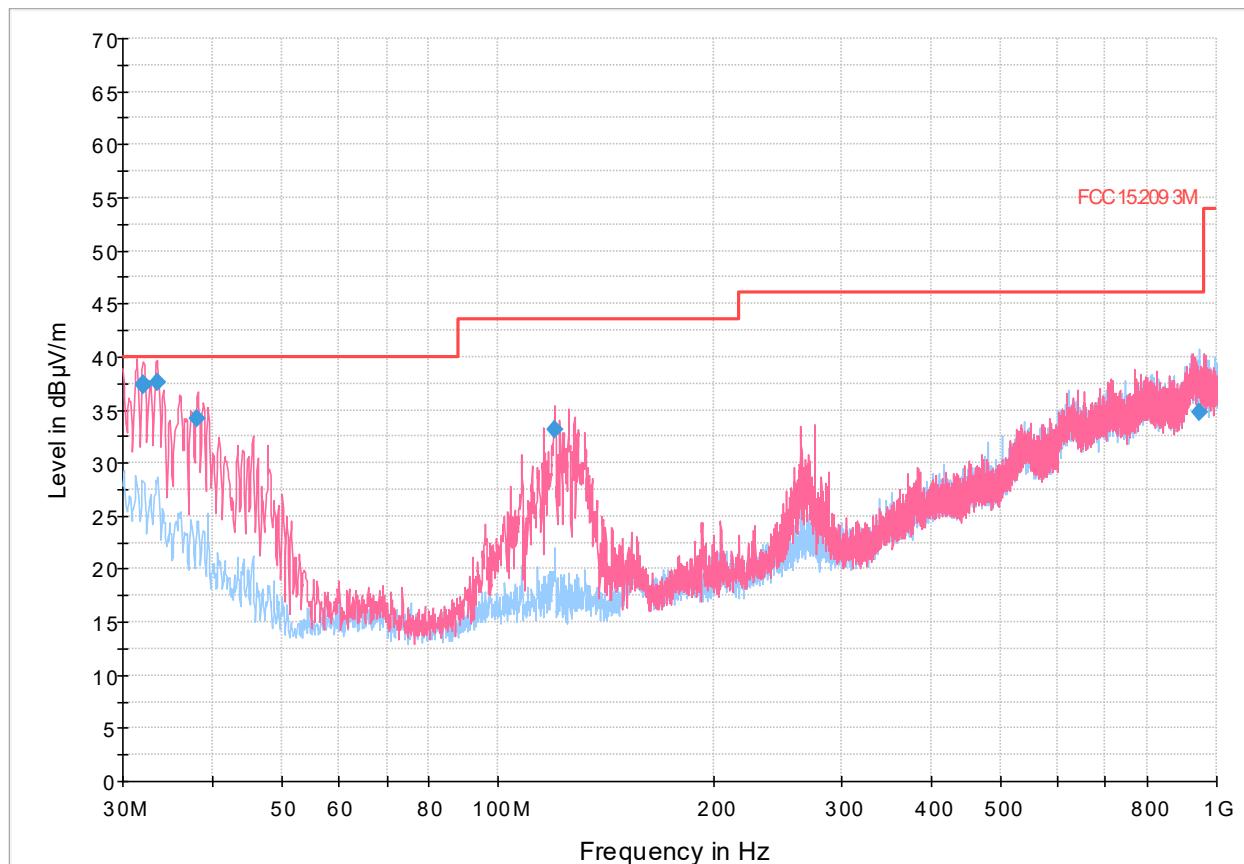


Figure 8.5-17: Radiated emissions spectral plot (30 MHz - 1 GHz). Low channel 2402 MHz.

Table 8.5-12: Radiated emissions results. Low channel 2402 MHz.

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
32.055000	37.33	40.00	2.67	5000.0	120.000	100.0	V	60.0	21.9
32.077000	37.48	40.00	2.52	5000.0	120.000	100.0	V	0.0	21.9
33.572000	37.64	40.00	2.36	5000.0	120.000	100.0	V	0.0	20.9
38.068000	34.20	40.00	5.80	5000.0	120.000	100.0	V	35.0	18.2
119.856000	33.15	43.50	10.35	5000.0	120.000	100.0	V	124.0	15.3
947.963000	34.84	46.00	11.16	5000.0	120.000	334.0	H	0.0	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

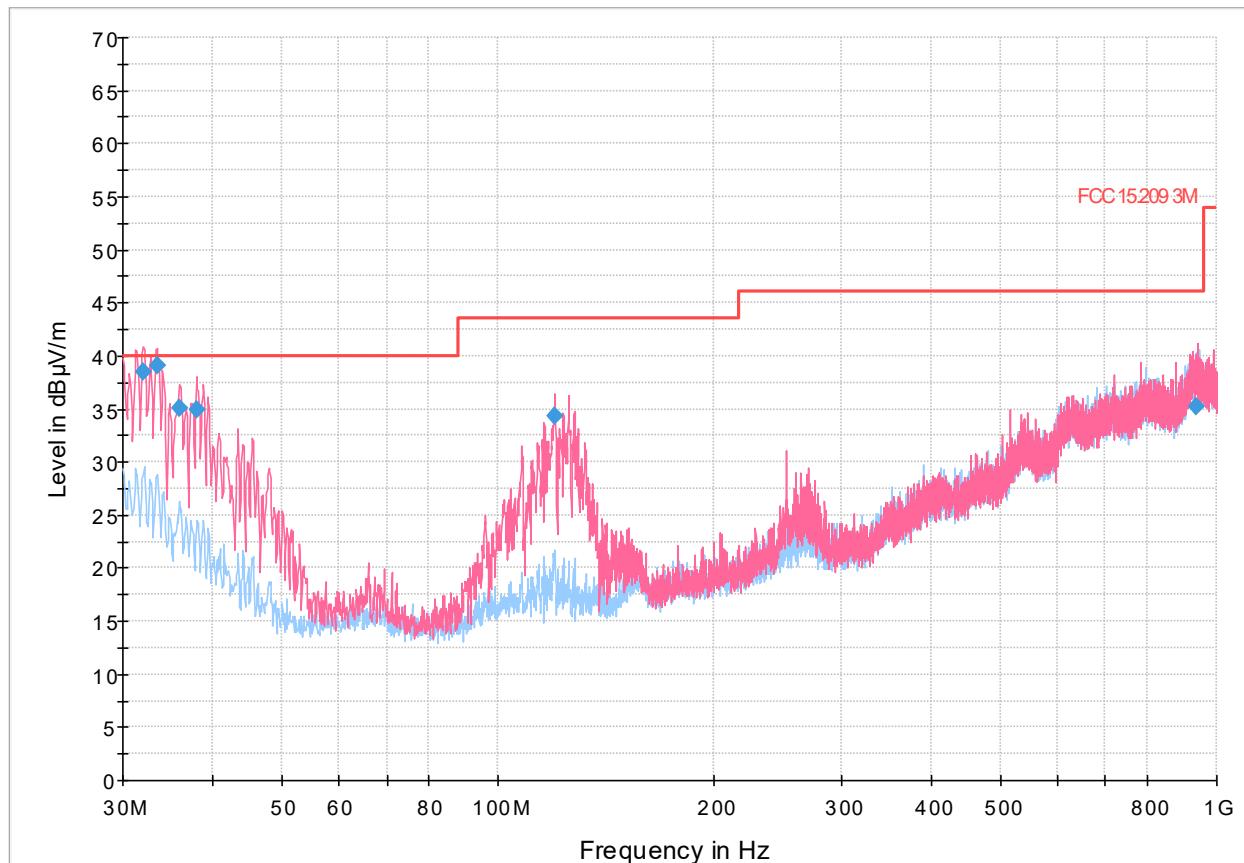


Figure 8.5-18: Radiated emissions spectral plot (30 MHz - 1 GHz). Middle channel 2440 MHz.

Table 8.5-13: Radiated emissions results. Middle channel 2440 MHz.

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
32.077000	38.54	40.00	1.46	5000.0	120.000	108.0	V	0.0	21.9
33.532000	39.11	40.00	0.89	5000.0	120.000	100.0	V	11.0	20.9
36.014000	35.11	40.00	4.89	5000.0	120.000	100.0	V	21.0	19.6
38.074000	34.89	40.00	5.11	5000.0	120.000	100.0	V	-1.0	18.2
119.799000	34.36	43.50	9.14	5000.0	120.000	100.0	V	151.0	15.3
936.129000	35.28	46.00	10.72	5000.0	120.000	106.0	V	356.0	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

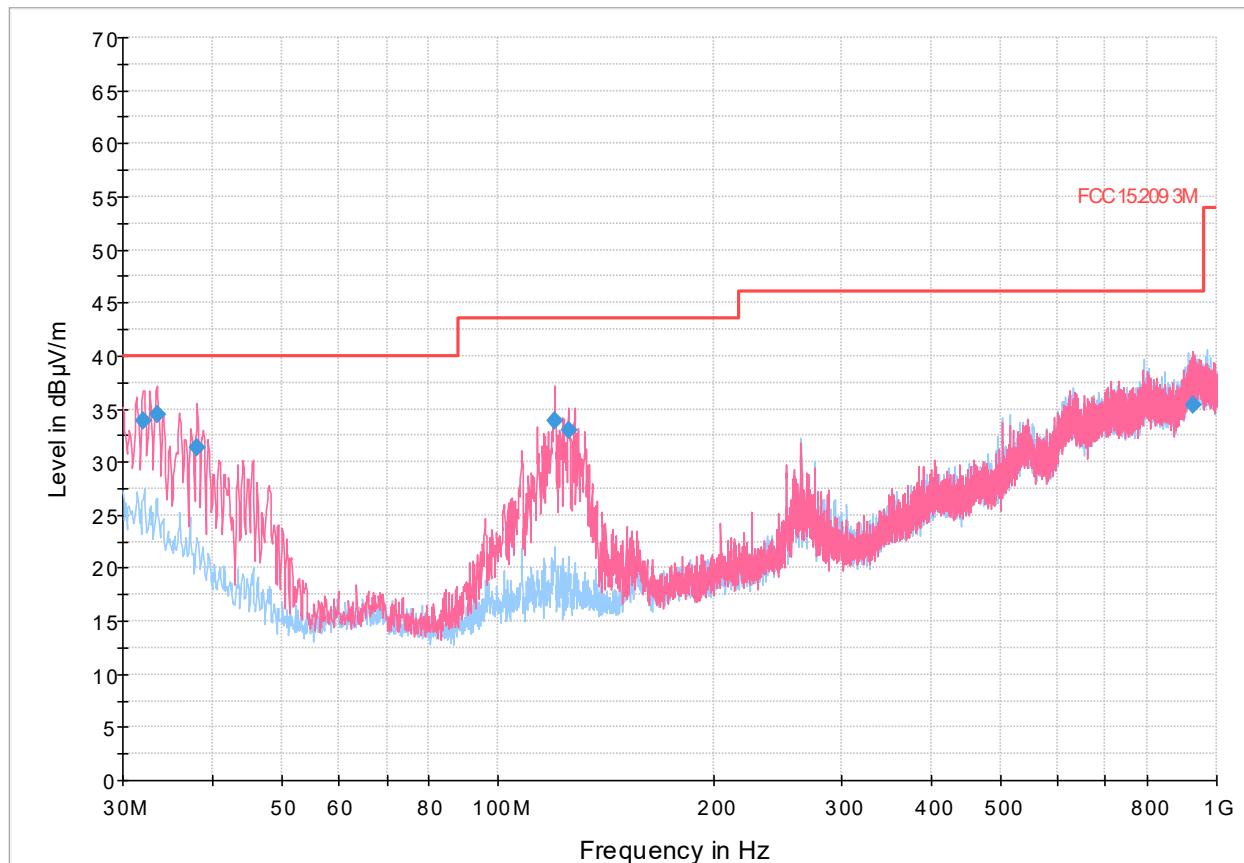


Figure 8.5-19: Radiated emissions spectral plot (30 MHz - 1 GHz). High channel 2480 MHz.

Table 8.5-14: Radiated emissions results. High channel 2480 MHz.

Frequency (MHz)	QuasiPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
32.077000	33.89	40.00	6.11	5000.0	120.000	98.0	V	123.0	21.9
33.572000	34.44	40.00	5.56	5000.0	120.000	100.0	V	314.0	20.9
38.051000	31.29	40.00	8.71	5000.0	120.000	100.0	V	86.0	18.2
119.799000	33.90	43.50	9.60	5000.0	120.000	100.0	V	357.0	15.3
125.237000	33.02	43.50	10.48	5000.0	120.000	114.0	V	149.0	15.2
929.021000	35.41	46.00	10.59	5000.0	120.000	321.0	V	112.0	35.4

Notes:

¹ Field strength (dB μ V/m) = receiver/spectrum analyzer value (dB μ V) + 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

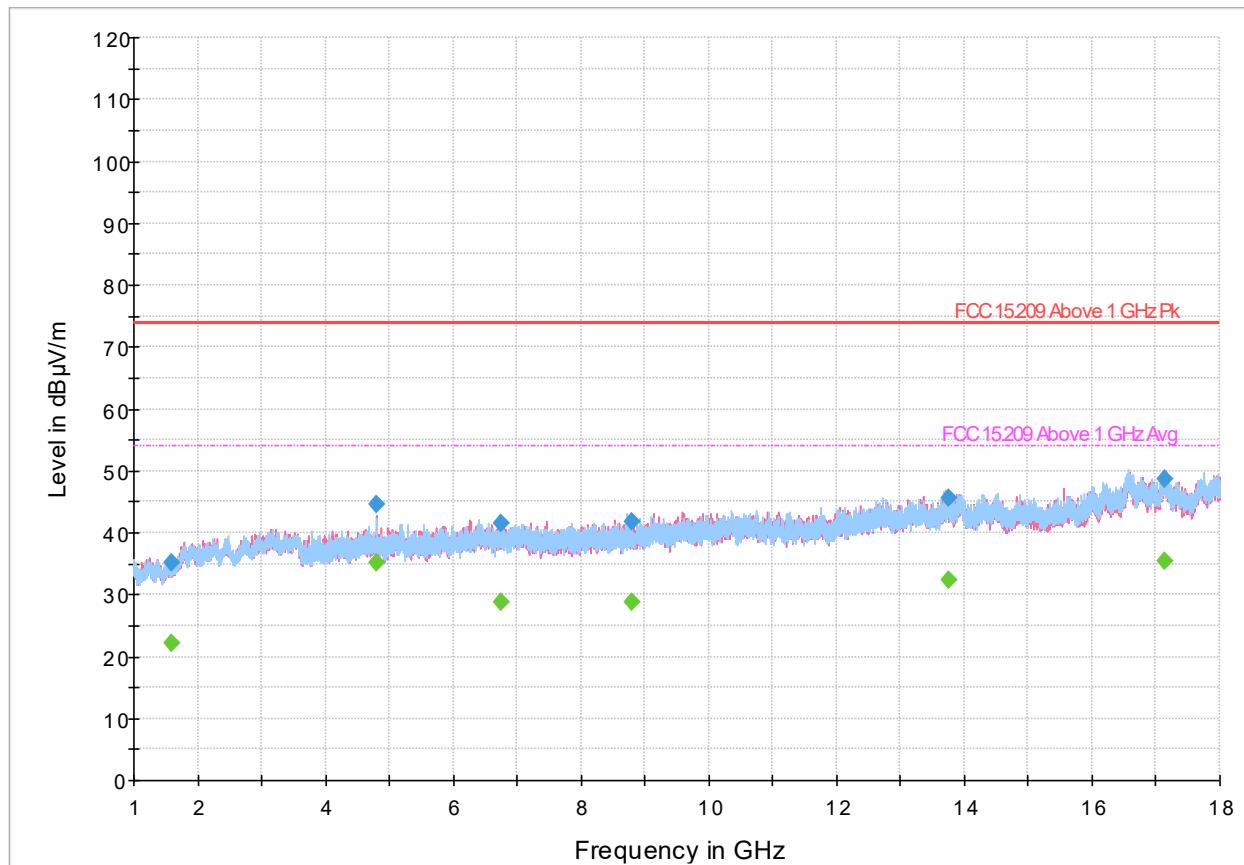


Figure 8.5-20: Radiated emissions spectral plot (1 GHz - 18 GHz). Low channel 2402 MHz.

Table 8.5-15: Radiated emissions results. Low channel 2402 MHz.

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)
1585.800000	---	22.20	53.90	31.70	5000.0	1000.000	190.0	V	0.0	-14.4
1585.800000	35.27	---	73.90	38.63	5000.0	1000.000	190.0	V	0.0	-14.4
4804.400000	---	35.17	53.90	18.73	5000.0	1000.000	224.0	H	276.0	-2.5
4804.400000	44.66	---	73.90	29.24	5000.0	1000.000	224.0	H	276.0	-2.5
6744.900000	---	28.69	53.90	25.21	5000.0	1000.000	131.0	V	146.0	-0.5
6744.900000	41.50	---	73.90	32.40	5000.0	1000.000	131.0	V	146.0	-0.5
8798.550000	---	28.88	53.90	25.02	5000.0	1000.000	226.0	H	0.0	0.8
8798.550000	41.87	---	73.90	32.03	5000.0	1000.000	226.0	H	0.0	0.8
13755.600000	45.65	---	73.90	28.25	5000.0	1000.000	289.0	V	357.0	7.9
13755.600000	---	32.46	53.90	21.44	5000.0	1000.000	289.0	V	357.0	7.9
17146.250000	48.69	---	73.90	25.21	5000.0	1000.000	377.0	H	264.0	12.4
17146.250000	---	35.49	53.90	18.41	5000.0	1000.000	377.0	H	264.0	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

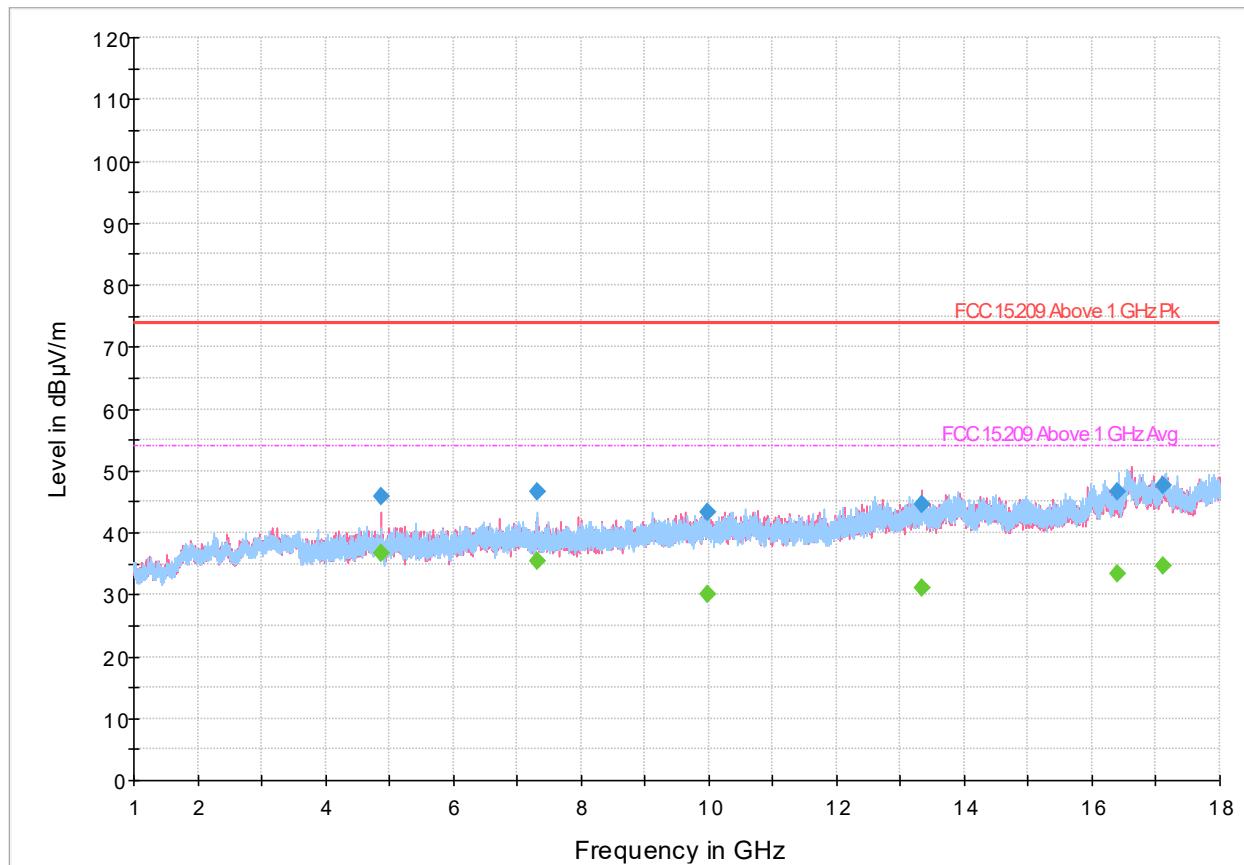


Figure 8.5-21: Radiated emissions spectral plot (1 GHz - 18 GHz). Middle channel 2440 MHz.

Table 8.5-16: Radiated emissions results. Middle channel 2440 MHz.

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)
4880.800000	45.85	---	73.90	28.05	5000.0	1000.000	112.0	V	286.0	-3.0
4880.800000	---	36.73	53.90	17.17	5000.0	1000.000	112.0	V	286.0	-3.0
7320.000000	---	35.54	53.90	18.36	5000.0	1000.000	245.0	H	139.0	-0.9
7320.000000	46.50	---	73.90	27.40	5000.0	1000.000	245.0	H	139.0	-0.9
9986.700000	---	30.06	53.90	23.84	5000.0	1000.000	265.0	V	22.0	2.4
9986.700000	43.24	---	73.90	30.66	5000.0	1000.000	265.0	V	22.0	2.4
13332.300000	44.57	---	73.90	29.33	5000.0	1000.000	330.0	V	211.0	7.4
13332.300000	---	31.19	53.90	22.71	5000.0	1000.000	330.0	V	211.0	7.4
16407.050000	46.56	---	73.90	27.34	5000.0	1000.000	296.0	H	46.0	9.5
16407.050000	---	33.39	53.90	20.51	5000.0	1000.000	296.0	H	46.0	9.5
17105.600000	47.61	---	73.90	26.29	5000.0	1000.000	385.0	V	0.0	12.0
17105.600000	---	34.58	53.90	19.32	5000.0	1000.000	385.0	V	0.0	12.0

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

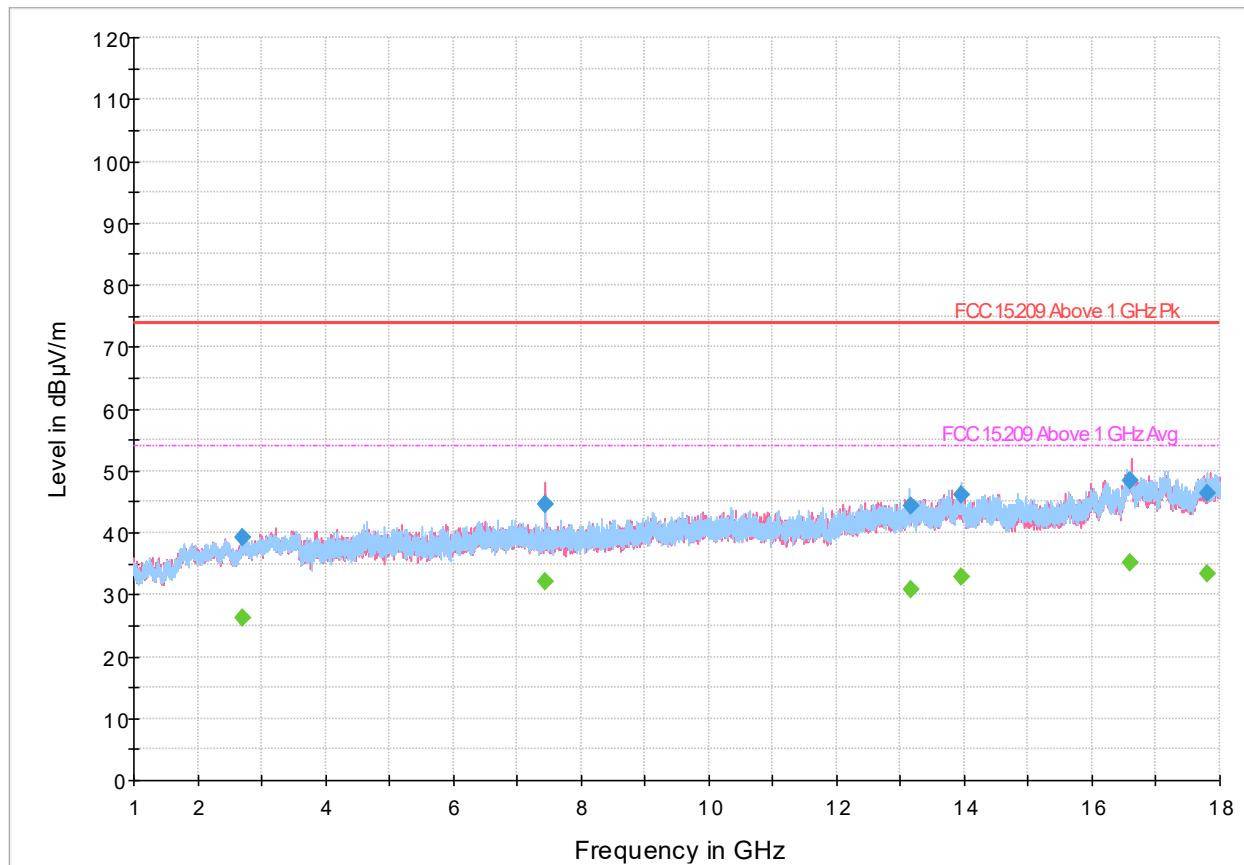


Figure 8.5-22: Radiated emissions spectral plot (1 GHz - 18 GHz). High channel 2480 MHz.

Table 8.5-17: Radiated emissions results. High channel 2480 MHz.

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)
2711.900000	39.34	---	73.90	34.56	5000.0	1000.000	106.0	V	0.0	-9.2
2711.900000	---	26.27	53.90	27.63	5000.0	1000.000	106.0	V	0.0	-9.2
7441.400000	---	32.15	53.90	21.75	5000.0	1000.000	292.0	V	266.0	-0.9
7441.400000	44.48	---	73.90	29.42	5000.0	1000.000	292.0	V	266.0	-0.9
13154.950000	44.31	---	73.90	29.59	5000.0	1000.000	307.0	H	198.0	7.1
13154.950000	---	30.91	53.90	22.99	5000.0	1000.000	307.0	H	198.0	7.1
13946.450000	46.22	---	73.90	27.68	5000.0	1000.000	371.0	H	281.0	8.2
13946.450000	---	32.81	53.90	21.09	5000.0	1000.000	371.0	H	281.0	8.2
16603.500000	48.41	---	73.90	25.49	5000.0	1000.000	348.0	V	324.0	12.7
16603.500000	---	35.26	53.90	18.64	5000.0	1000.000	348.0	V	324.0	12.7
17810.500000	---	33.38	53.90	20.52	5000.0	1000.000	232.0	H	11.0	11.4
17810.500000	46.44	---	73.90	27.46	5000.0	1000.000	232.0	H	11.0	11.4

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

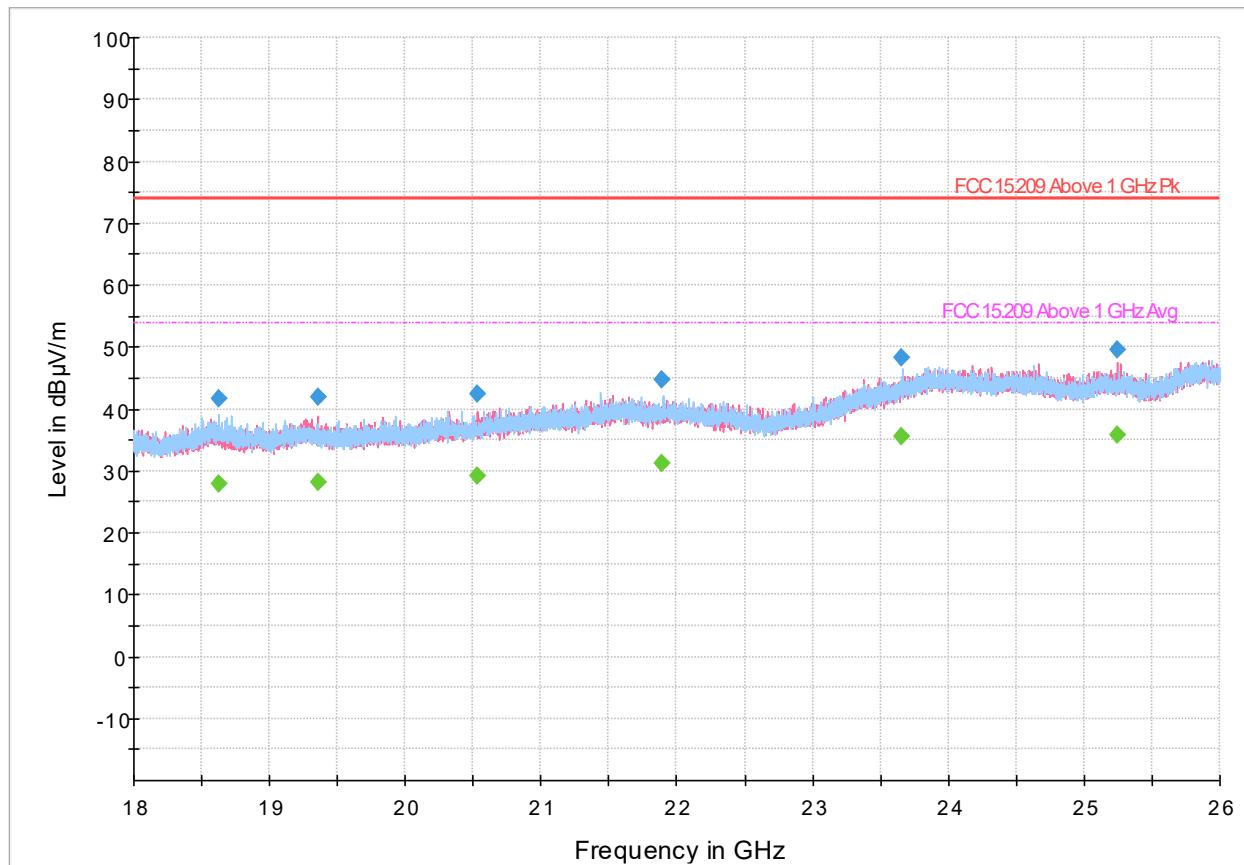


Figure 8.5-23: Radiated emissions spectral plot (18 GHz - 26 GHz). Low channel 2402 MHz.

Table 8.5-18: Radiated emissions results. Low channel 2402 MHz.

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)
18625.400000	41.57	---	73.90	32.33	5000.0	1000.000	300.0	H	335.0	8.9
18625.400000	---	27.98	53.90	25.92	5000.0	1000.000	300.0	H	335.0	8.9
19355.800000	41.90	---	73.90	32.00	5000.0	1000.000	100.0	V	0.0	10.1
19355.800000	---	28.16	53.90	25.74	5000.0	1000.000	100.0	V	0.0	10.1
20530.600000	42.46	---	73.90	31.44	5000.0	1000.000	100.0	V	350.0	11.2
20530.600000	---	29.23	53.90	24.67	5000.0	1000.000	100.0	V	350.0	11.2
21893.000000	44.78	---	73.90	29.12	5000.0	1000.000	400.0	H	316.0	13.2
21893.000000	---	31.08	53.90	22.82	5000.0	1000.000	400.0	H	316.0	13.2
23657.800000	48.33	---	73.90	25.57	5000.0	1000.000	100.0	H	78.0	17.6
23657.800000	---	35.47	53.90	18.43	5000.0	1000.000	100.0	H	78.0	17.6
25244.200000	49.44	---	73.90	24.46	5000.0	1000.000	200.0	V	107.0	17.1
25244.200000	---	35.83	53.90	18.07	5000.0	1000.000	200.0	V	107.0	17.1

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

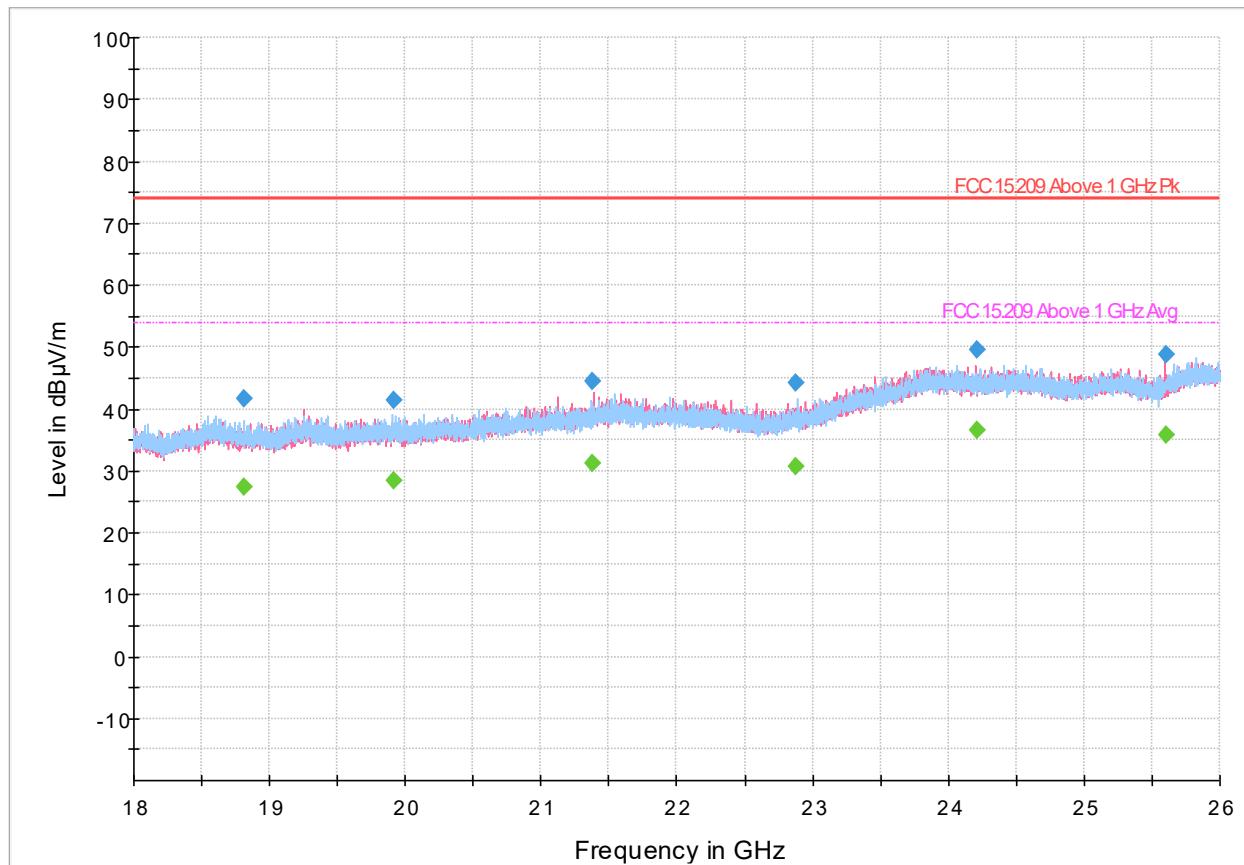


Figure 8.5-24: Radiated emissions spectral plot (18 GHz - 26 GHz). Middle channel 2440 MHz.

Table 8.5-19: Radiated emissions results. Middle channel 2440 MHz.

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)
18813.400000	41.62	---	73.90	32.28	5000.0	1000.000	100.0	H	60.0	9.1
18813.400000	---	27.51	53.90	26.39	5000.0	1000.000	100.0	H	60.0	9.1
19910.600000	---	28.50	53.90	25.40	5000.0	1000.000	100.0	H	350.0	10.3
19910.600000	41.29	---	73.90	32.61	5000.0	1000.000	100.0	H	350.0	10.3
21384.200000	---	31.18	53.90	22.72	5000.0	1000.000	200.0	V	350.0	13.2
21384.200000	44.41	---	73.90	29.49	5000.0	1000.000	200.0	V	350.0	13.2
22878.600000	---	30.77	53.90	23.13	5000.0	1000.000	300.0	H	0.0	13.1
22878.600000	44.18	---	73.90	29.72	5000.0	1000.000	300.0	H	0.0	13.1
24211.000000	---	36.51	53.90	17.39	5000.0	1000.000	300.0	V	76.0	18.4
24211.000000	49.59	---	73.90	24.31	5000.0	1000.000	300.0	V	76.0	18.4
25602.200000	48.81	---	73.90	25.09	5000.0	1000.000	300.0	V	234.0	17.5
25602.200000	---	35.67	53.90	18.23	5000.0	1000.000	300.0	V	234.0	17.5

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

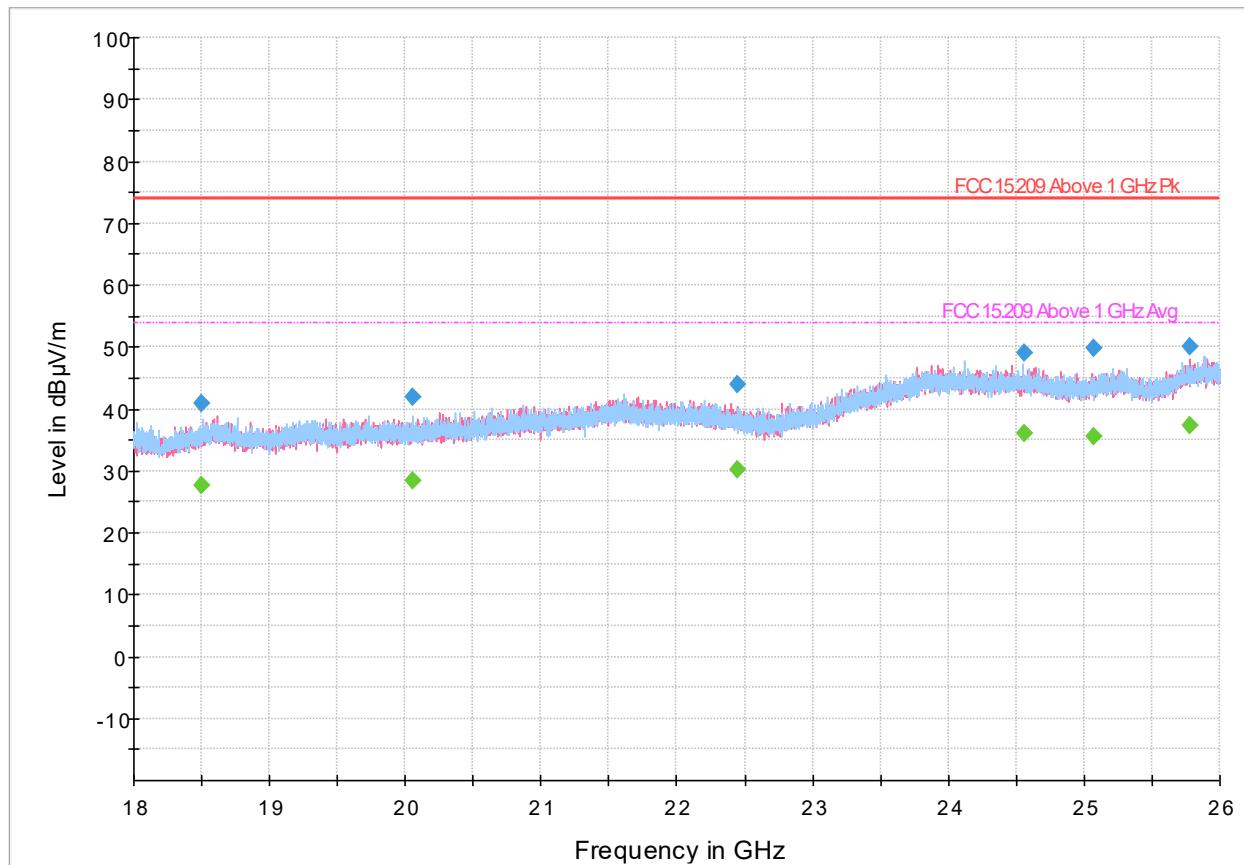


Figure 8.5-25: Radiated emissions spectral plot (18 GHz - 26 GHz). High channel 2480 MHz.

Table 8.5-20: Radiated emissions results. High channel 2480 MHz.

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)
18497.400000	---	27.64	53.90	26.26	5000.0	1000.000	400.0	H	0.0	8.8
18497.400000	40.83	---	73.90	33.07	5000.0	1000.000	400.0	H	0.0	8.8
20050.600000	---	28.34	53.90	25.56	5000.0	1000.000	400.0	H	206.0	10.3
20050.600000	42.01	---	73.90	31.89	5000.0	1000.000	400.0	H	206.0	10.3
22444.200000	44.00	---	73.90	29.90	5000.0	1000.000	300.0	V	303.0	12.4
22444.200000	---	30.32	53.90	23.58	5000.0	1000.000	300.0	V	303.0	12.4
24554.600000	---	36.13	53.90	17.77	5000.0	1000.000	300.0	H	317.0	17.8
24554.600000	49.12	---	73.90	24.78	5000.0	1000.000	300.0	H	317.0	17.8
25073.000000	49.86	---	73.90	24.04	5000.0	1000.000	300.0	V	335.0	16.9
25073.000000	---	35.49	53.90	18.41	5000.0	1000.000	300.0	V	335.0	16.9
25773.800000	---	37.28	53.90	16.62	5000.0	1000.000	100.0	V	237.0	18.1
25773.800000	50.04	---	73.90	23.86	5000.0	1000.000	100.0	V	237.0	18.1

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.

8.6 Power spectral density

8.6.1 References and limits

- FCC 47 CFR Part 15, Subpart C: §15.247(e)
- ISED: 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 11, 2025; August 15, 2025	Temperature	19°C; 19°C
Test engineer	Martha Espinoza, Wireless Test Engineer	Air pressure	1003 mbar; 1001 mbar
Test location	<input checked="" type="checkbox"/> Wireless bench <input type="checkbox"/> Other:	Relative humidity	55%; 52%

8.6.3 Notes

Testing was performed with the transmitter operating on a fixed channel (lowest, middle, and highest) at maximum output power. Two cases, corresponding to two data rates, were tested: 1 MBPS and 2 MBPS.

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

8.6.4 Setup details

EUT power input during test	3 VDC
EUT setup configuration	<input checked="" type="checkbox"/> Table-top <input type="checkbox"/> Floor standing <input type="checkbox"/> 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	-15.09	≤ 8	23.09
2440	GFSK, 1 Mbps	-14.76	≤ 8	22.76
2480	GFSK, 1 Mbps	-13.84	≤ 8	21.84
2402	GFSK, 2 Mbps	-17.05	≤ 8	25.05
2440	GFSK, 2 Mbps	-17.30	≤ 8	25.30
2480	GFSK, 2 Mbps	-17.30	≤ 8	25.30

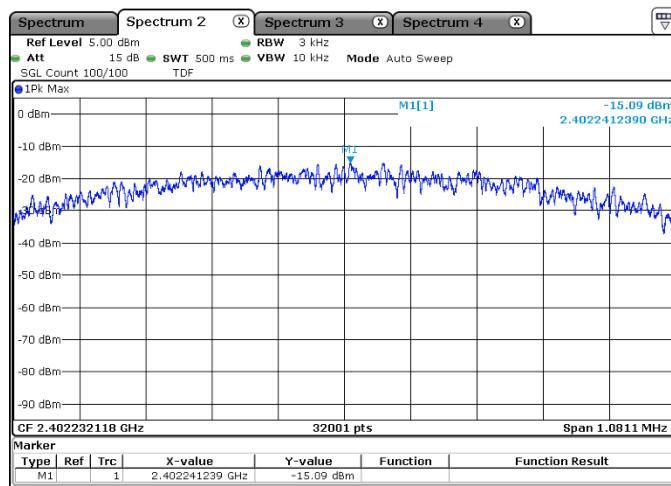


Figure 8.6-1: Power spectral density, GFSK, 1 Mbps, 2402 MHz.

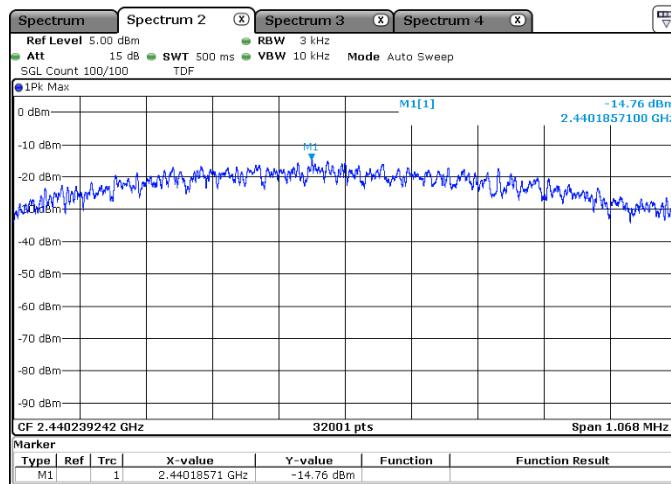


Figure 8.6-2: Power spectral density, GFSK, 1 Mbps, 2440 MHz.

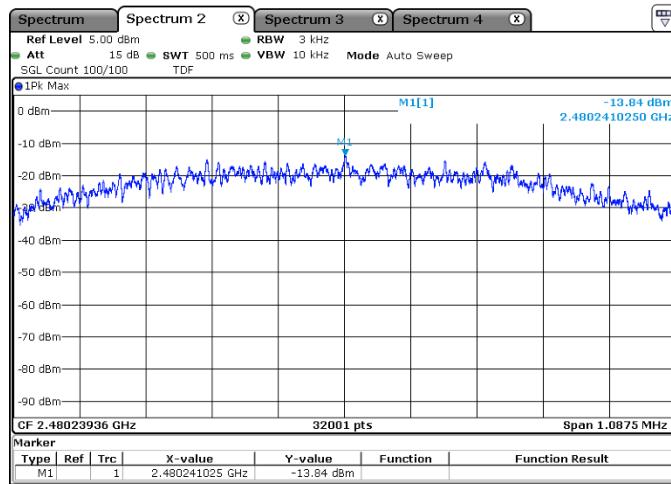


Figure 8.6-3: Power spectral density, GFSK, 1 Mbps, 2480 MHz.

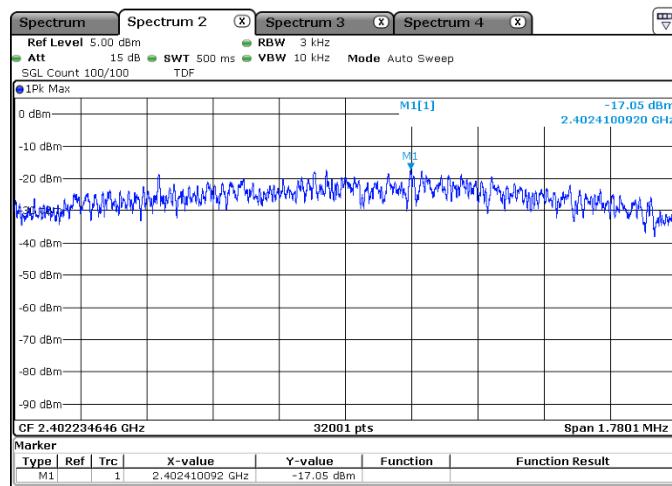


Figure 8.6-4: Power spectral density, GFSK, 2 Mbps, 2402 MHz.

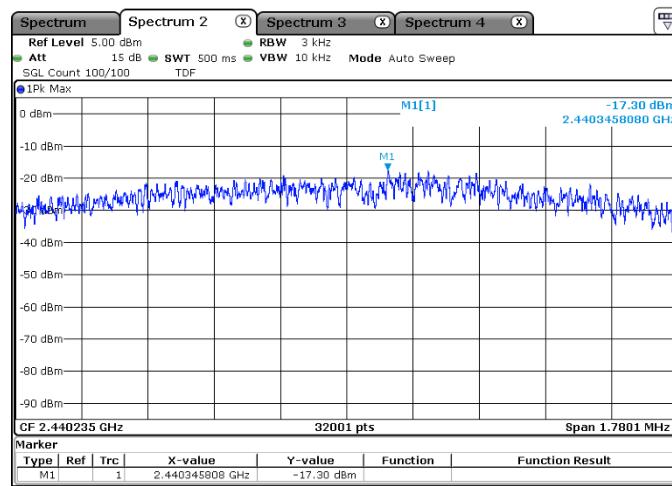


Figure 8.6-5: Power spectral density, GFSK, 2 Mbps, 2440 MHz.

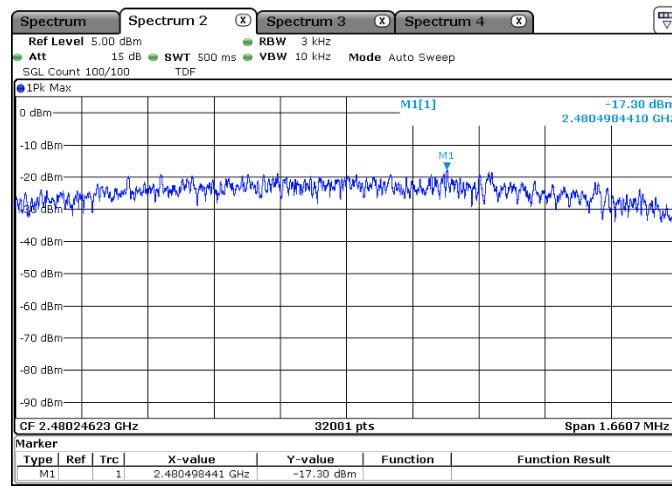


Figure 8.6-6: Power spectral density, GFSK, 2 Mbps, 2480 MHz.

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 11, 2025; August 15, 2025	Temperature	19°C; 19°C
Test engineer	Martha Espinoza, Wireless Test Engineer	Air pressure	1003 mbar; 1001 mbar
Test location	<input checked="" type="checkbox"/> Wireless bench <input type="checkbox"/> Other:	Relative humidity	55%; 52%

8.7.3 Notes

Testing was performed with the transmitter operating on a fixed channel (lowest, middle, and highest) at maximum output power. Two cases, corresponding to two data rates, were tested: 1 MBPS and 2 MBPS.

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

8.7.4 Setup details

EUT power input during test	3 VDC
EUT setup configuration	<input checked="" type="checkbox"/> Table-top <input type="checkbox"/> Floor standing <input type="checkbox"/> Other:

Receiver settings:

Resolution bandwidth	1-5% OBW
Video bandwidth	3* RBW
Detector mode	Peak
Trace mode	Max Hold
Measurement time	Long enough for trace to stabilize

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	1.054992764	2401.69609	2402.75108	f _h and f _l within 2400 – 2483.5 MHz	Within the range
2440	GFSK, 1 Mbps	1.063675832	2439.70039	2440.76407	f _h and f _l within 2400 – 2483.5 MHz	Within the range
2480	GFSK, 1 Mbps	1.072358900	2479.69758	2480.76994	f _h and f _l within 2400 – 2483.5 MHz	Within the range
2402	GFSK, 2 Mbps	2.098408104	2401.17509	2403.27350	f _h and f _l within 2400 – 2483.5 MHz	Within the range
2440	GFSK, 2 Mbps	2.083936324	2439.19243	2441.27637	f _h and f _l within 2400 – 2483.5 MHz	Within the range
2480	GFSK, 2 Mbps	2.091172214	2479.18232	2481.27350	f _h and f _l within 2400 – 2483.5 MHz	Within the range

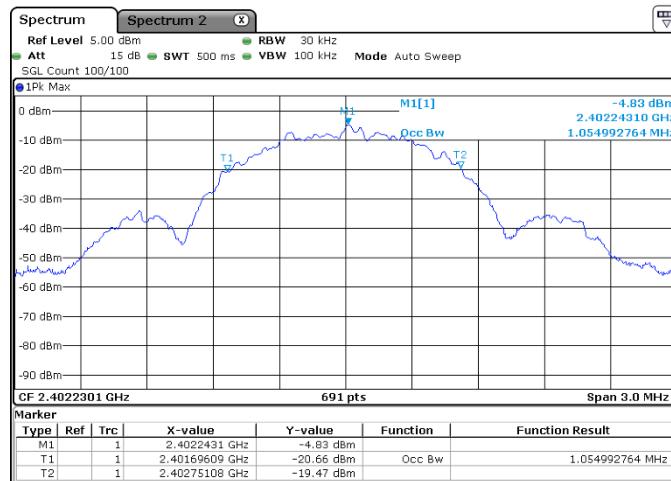


Figure 8.7-1: 99% occupied bandwidth, GFSK, 1 Mbps, 2402 MHz.

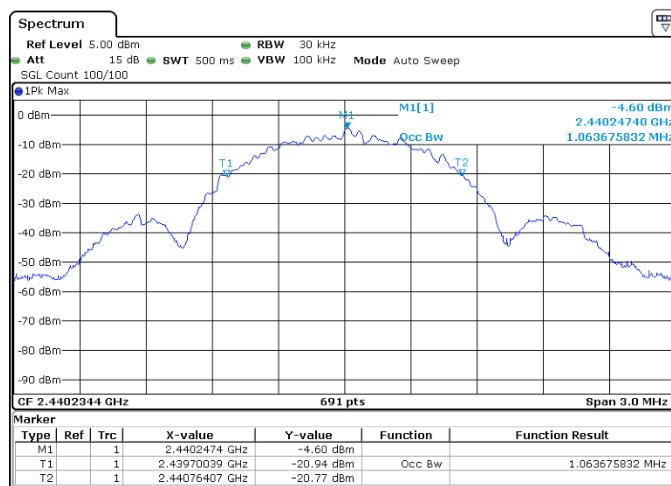


Figure 8.7-2: 99% occupied bandwidth, GFSK, 1 Mbps, 2440 MHz.

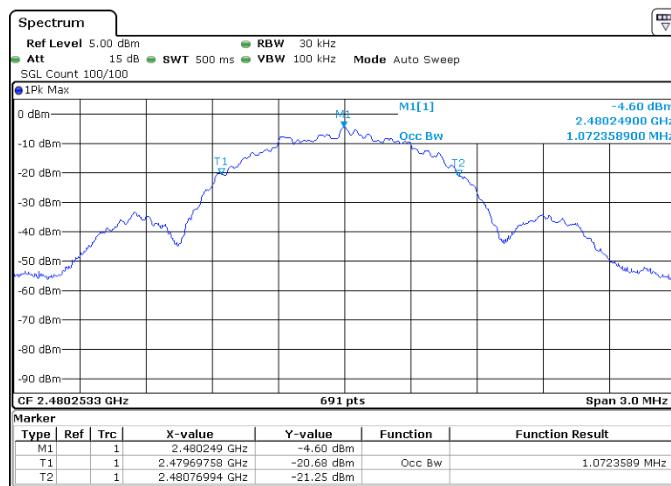


Figure 8.7-3: 99% occupied bandwidth, GFSK, 1 Mbps, 2480 MHz.

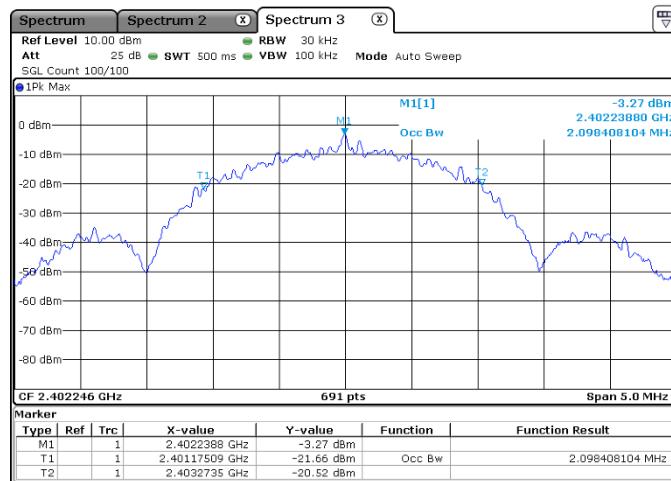


Figure 8.7-4: 99% occupied bandwidth, GFSK, 2 Mbps, 2402 MHz.

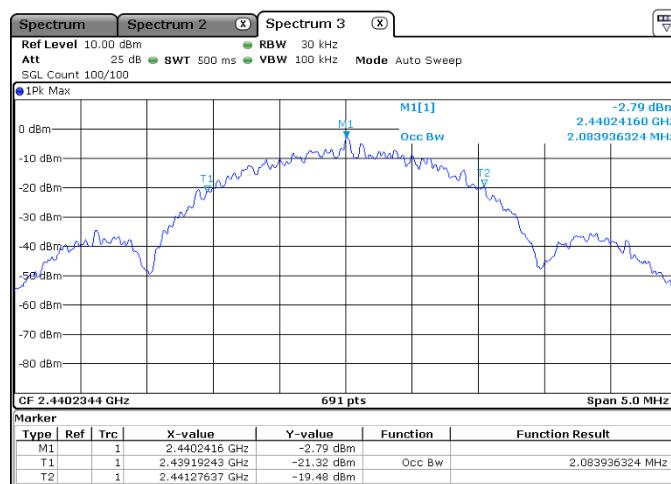


Figure 8.7-5: 99% occupied bandwidth, GFSK, 2 Mbps, 2440 MHz.

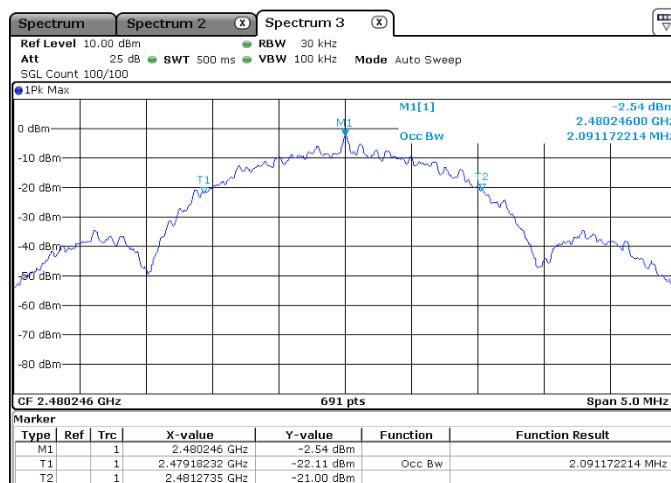


Figure 8.7-6: 99% occupied bandwidth, GFSK, 2 Mbps, 2480 MHz.

End of test report