Limited Test report

REP032968-4R1TRFWL

Date of issue: June 24, 2024

Applicant:

Canary Medical

Product description:

Commnication Module

Model:

43-5570-001-15

FCC ID:

2AYAJ-WF1

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

Company name	Nemko USA Inc.
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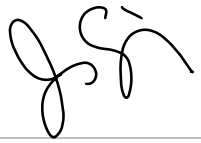
State	California
Postal code	92008
Country	USA
Telephone	+1 760 444 3500
Website	www.nemko.com
FCC Site Number	Test Firm Registration Number: 392943; Designation Number: US5058
ISED Test Site	2040B-3

Tested by	Martha Espinoza, Wireless Test Engineer
Reviewed by	James Cunningham, EMC/WL Manager
Review date	June 24, 2024
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 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

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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

The purpose of this testing was to spot-check the compliance the radio module while installed in a test jig. Testing was limited to partial peak output power and spurious emissions measurements.

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
REP032968-4TRFEMC	05-April-2024	Original report issued
REP032968-4R1TRFEMC	24-June-2024	Updated to reflect module-level testing

Section 2 Summary of test results

2.1 Sample information

Receipt date	25-Mar-24
Nemko sample ID number	REP032968

2.2 Testing period

Test start date	26-Mar-24
Test end date	01-Apr-24

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 tested
§15.31(e)	Variation of power source	Not tested
§15.203	Antenna requirement	Not tested
§15.231(c)	20 dB bandwidth	Not tested

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	Not tested
§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	Not tested
§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	Not tested
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 tested
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%)	Not tested
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 tested

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	Canary Medical
Address	2710 Loker Ave West, Suite 350
City	Carlsbad
State	CA
Postal/Zip code	92010
Country	United States

3.3 Manufacturer

Company name	Canary Medical
Address	2710 Loker Ave West, Suite 350
City	Carlsbad
State	CA
Postal/Zip code	92010
Country	United States

3.4 EUT information

Product name	Commnication Module
Model	43-5570-001-15
Variant(s)	N/A
Serial number	01-00000023
Part number	N/A
Power requirements	5 VDC 0.1 A Max.
Description/theory of operation	W-Fi (IEEE 802.11x) communication module
Operational frequencies	2400 - 2483.5 MHz
Software details	N/A

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)	2412
Maximum frequency (MHz)	2462
Type of modulation	IEEE 802.11b: DSSS-BPSK, DSSS-DQPSK, CCK-DQPSK, CCK-DQPSK IEEE 802.11g: OFDM-BPSK, OFDM-QPSK, OFDM-16QAM, OFDM-64QAM IEEE 802.11n: OFDM-BPSK, OFDM-QPSK, OFDM-16QAM, OFDM-64QAM
Data rate	IEEE 802.11b: Up to 11 Mbps IEEE 802.11g: Up to 54 Mbps IEEE 802.11n (HT20): Up to 195 Mbps IEEE 802.11n (HT40): Up to 405 Mbps
Antenna information	EUT includes 1 antenna port. Maximum gain in the operating band: ANT: 3.0 dBi
Number of channels:	IEEE 802.11b, IEEE 802.11g, IEEE 802.11n (HT20): 11 IEEE 802.11n (HT40): 7
MIMO operation	IEEE 802.11n (HT20) and (HT40) support beamforming and cyclic delay diversity (CDD) modes of operation IEEE 802.11b and g only support CDD mode

3.6 Channel list

11 channels are available for IEEE 802.11b, IEEE 802.11g and IEEE 802.11n (HT20) operational modes:

Channel	Frequency	Channel	Frequency
1	2412 MHz	7	2442 MHz
2	2417 MHz	8	2447 MHz
3	2422 MHz	9	2452 MHz
4	2427 MHz	10	2457 MHz
5	2432MHz	11	2462 MHz
6	2437 MHz		

7 channels are available for IEEE 802.11n (HT40) operational mode:

Channel	Frequency	Channel	Frequency
3	2422 MHz	7	2442 MHz
4	2427 MHz	8	2447 MHz
5	2432 MHz	9	2452 MHz
6	2437 MHz		

3.7 EUT setup details

Table 3.7-1: *EUT sub assemblies*

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

Table 3.7-2: *EUT interface ports*

Description	Qty.
USB Port	1

Table 3.7-3: *Support equipment*

Description	Brand name	Model/Part number	Serial number	Rev.
AC1200 Dual Band Wi-Fi Router	Tp-link	Archer 454(US)	Y2350K9003926	---
Medical AC/DC Adapter	CUI INC	SWM6-5-NH-I38	190400831	---

Table 3.7-4: *Inter-connection cables*

Cable description	From	To	Length (m)
USB Cable	EUT	AC/DC Adapter	0.5

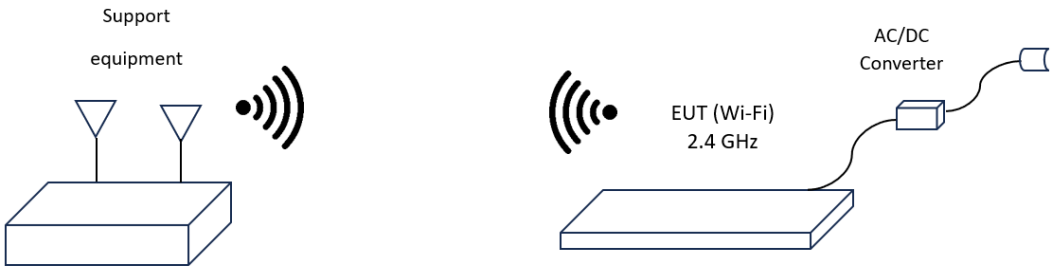

Figure 3.7-1: Test setup diagram.

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 is 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 is 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.
EMI Receiver	Rohde & Schwarz	ESU 40	E1121	1 year	Aug 23, 2024
System Controller	Sunol Systems	SC104V	E1191	NCR	NCR
Bilog Antenna	Schaffner	CBL 6111D	1763	2 years	April 02, 2024
Antenna, DRWG	EMCO	3115	0529	NCR	NCR
Horn Antenna	ETS Lindgren	3117 PA	E1139	2 years	Jan 11, 2026
Standard gain horn antenna	Eravant	SAZ-2410-42-S1	EW107	1 year	Dec-05-2024
Low Noise Amplifier	Sage Millimeter	SBL-1834034030-KFKF-	E1228	NCR	NCR

Notes: NCR: no calibration required

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 Maximum peak output power

8.1.1 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 §11.9.1.1 (RBW ≥ DTS BW)

§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:

(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.

8.1.2 Test summary

Verdict	Pass		
Test date	March 26, 2024	Temperature	20°C
Test engineer	Martha Espinoza, Wireless Test Engineer	Air pressure	1001mbar
Test location	☐ Wireless bench ☒ Other: 3M Chamber	Relative humidity	58%

8.1.3 Notes

No testing was performed. Rather, the conducted output power of the module, as described in it's initial certification filing, was combined with the new antenna gain to calculate EIRP. This calculated EIRP is then compared against the permitted limit to ensure compliance of the module with the intended antenna.

8.1.4 Setup details

None – calculation only.

8.1.5 Test data

The maximum peak conducted power data is extracted from the FCC grant for the original module having FCC ID: VPYLB1GC. The reported power in the FCC grant is 132 mW, corresponding to 21.21 dBm.

The antenna gain of the intended antenna is a balanced diploe with gain of 3.0 dBi in the 2.4 GHz operating band. EIRP = conducted power + antenna gain.

Table 8.1-1: *Maximum peak output power results.*

Test Frequency (MHz)	Bandwidth (MHz)	Max peak conducted power (dBm)	Antenna gain (dBi)	Calculated EIRP (dBm)	Max Radiated Limit (dBm)
2412 – 2462 MHz	20	21.21	3.0	24.21	36

8.2 Spurious emissions

8.2.1 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 8.3-1: *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 8.3-2: *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			

Table8.3-3: *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		

8.2.2 Test summary

Verdict	Pass		
Test date	March 26, 2024; March 27, 2024; March 28, 2024	Temperature	20°C; 19°C; 19°C
Test engineer	Martha Espinoza, Wireless Test Engineer	Air pressure	1001 mbar; 1003 mbar; 1005 mbar
Test location	☐ Wireless bench (conducted tests) ☐ 10 m semi-anechoic chamber (radiated tests) ☒ 3 m semi-anechoic chamber (radiated tests) ☐ Other:	Relative humidity	58 %; 56 %; 55 %

8.2.3 Notes

Testing was performed with the transmitter operating on a fixed channel (lowest, middle, and highest) at maximum output power. This is a radiated test. There is no access to the conducted port.

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

The spectrum was searched from 30 MHz to 26 GHz (above the 10th harmonic of the highest transmit frequency).

Only one channel was selected for this test. Middle channel was the chosen for showing the highest power (section 8.2.5 of this document), except for band edges, where the low and high channel were used for this testing.

8.2.4 Setup details

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

Receiver/spectrum analyzer settings for frequencies below 1 GHz:

Resolution bandwidth	120 kHz
Detector mode	Peak (preview measurements) Quasi-Peak (final measurements)
Trace mode	Max Hold
Measurement time	– 100 ms (Peak preview measurement) – 5000 ms (Peak and Average final measurement)

Receiver/spectrum analyzer settings for frequencies above 1 GHz:

Resolution bandwidth	1 MHz
Detector mode	Peak (Preview measurement) Peak and Average (Final measurement)
Trace mode	Max Hold
Measurement time	– 100 ms (Peak preview measurement) – 5000 ms (Peak and Average final measurement)

8.2.5 Test data

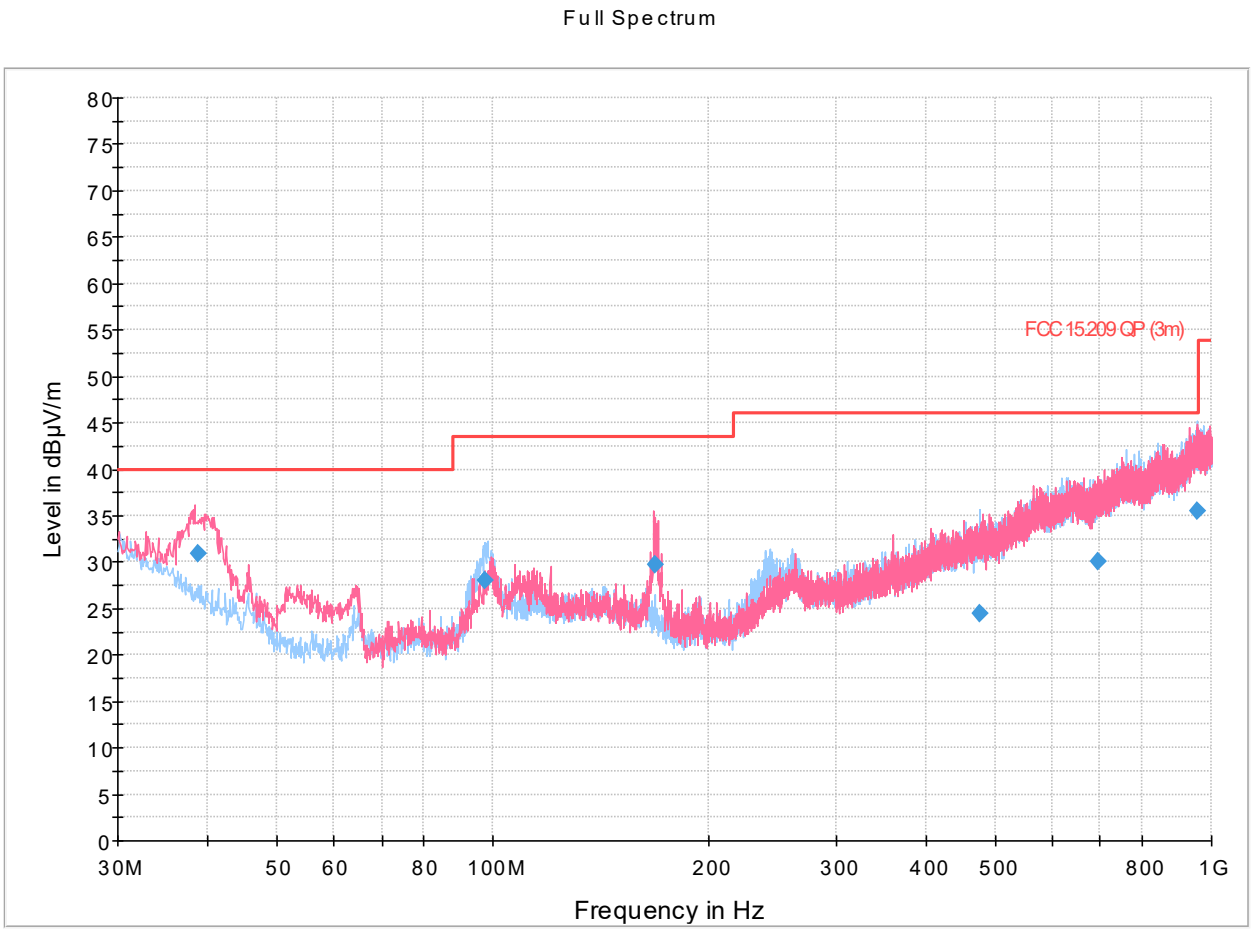

Figure 8.2-1: *Radiated emissions spectral plot (30 MHz - 1 GHz).*

Table 8.2-4*: 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)
38.862000	30.97	40.00	9.03	5000.0	120.000	100.0	V	102.0	19.9
97.518000	28.04	43.50	15.46	5000.0	120.000	159.0	H	98.0	16.4
167.935000	29.76	43.50	13.74	5000.0	120.000	127.0	V	225.0	16.9
476.052000	24.46	46.00	21.54	5000.0	120.000	276.0	H	124.0	26.2
694.040000	29.98	46.00	16.02	5000.0	120.000	241.0	V	0.0	30.4
956.045000	35.54	46.00	10.46	5000.0	120.000	276.0	H	156.0	35.8

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

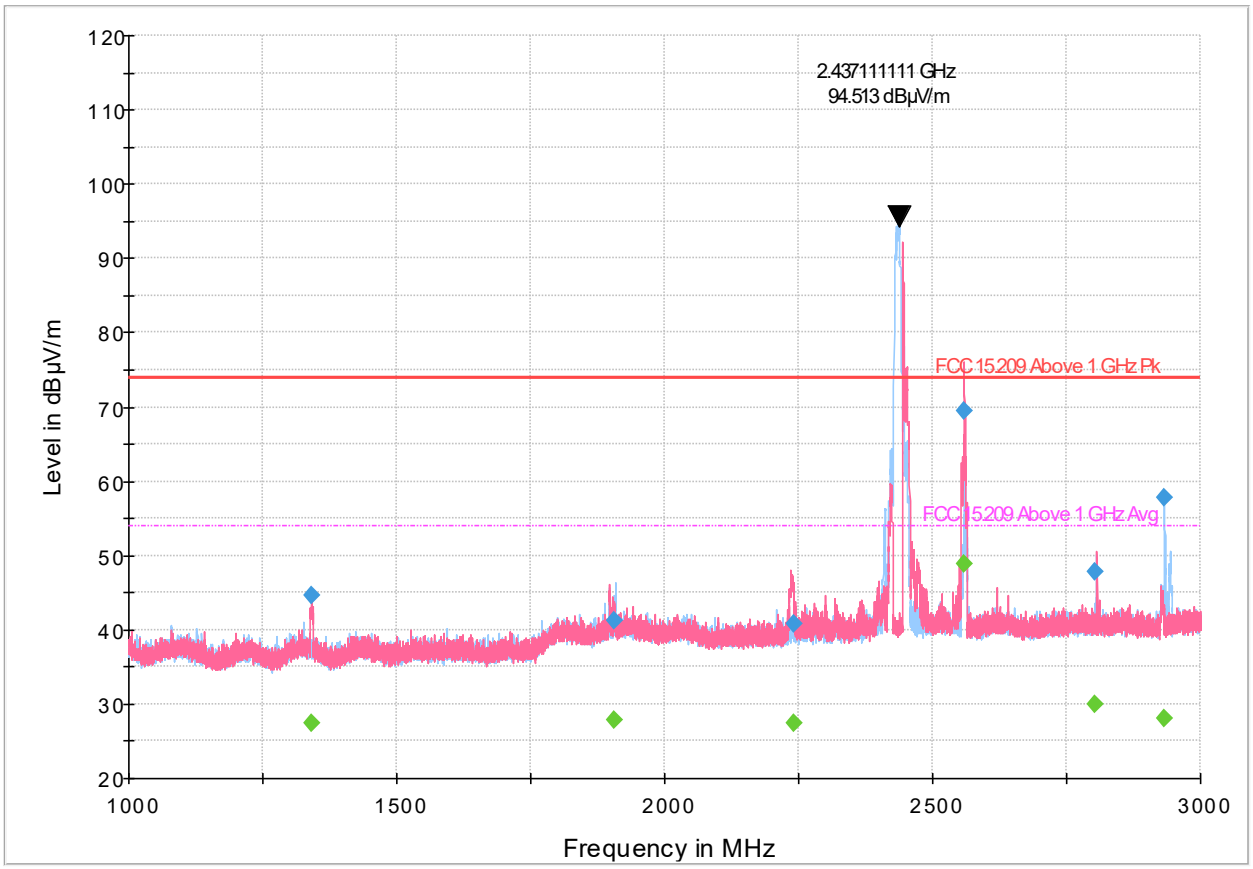

Figure 8.2-2: *Radiated emissions spectral plot (1 GHz - 3 GHz).*

Table 8.2-5*: 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)
1341.466667	44.70	---	73.90	29.20	5000.0	1000.000	175.0	V	0.0	-10.0
1341.466667	---	27.51	53.90	26.39	5000.0	1000.000	175.0	V	0.0	-10.0
1906.466667	41.24	---	73.90	32.66	5000.0	1000.000	273.0	H	0.0	-5.9
1906.466667	---	27.94	53.90	25.96	5000.0	1000.000	273.0	H	0.0	-5.9
2241.155556	---	27.33	53.90	26.57	5000.0	1000.000	371.0	V	249.0	-5.4
2241.155556	40.80	---	73.90	33.10	5000.0	1000.000	371.0	V	249.0	-5.4
2559.666667	---	48.87	53.90	5.03	5000.0	1000.000	111.0	V	180.0	-3.8
2559.666667	69.56	---	73.90	4.34	5000.0	1000.000	111.0	V	180.0	-3.8
2803.444444	---	30.00	53.90	23.90	5000.0	1000.000	100.0	H	274.0	-3.1
2803.444444	47.75	---	73.90	26.15	5000.0	1000.000	100.0	H	274.0	-3.1
2933.000000	---	28.03	53.90	25.87	5000.0	1000.000	137.0	H	251.0	-3.1
2933.000000	57.79	---	73.90	16.11	5000.0	1000.000	137.0	H	251.0	-3.1

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

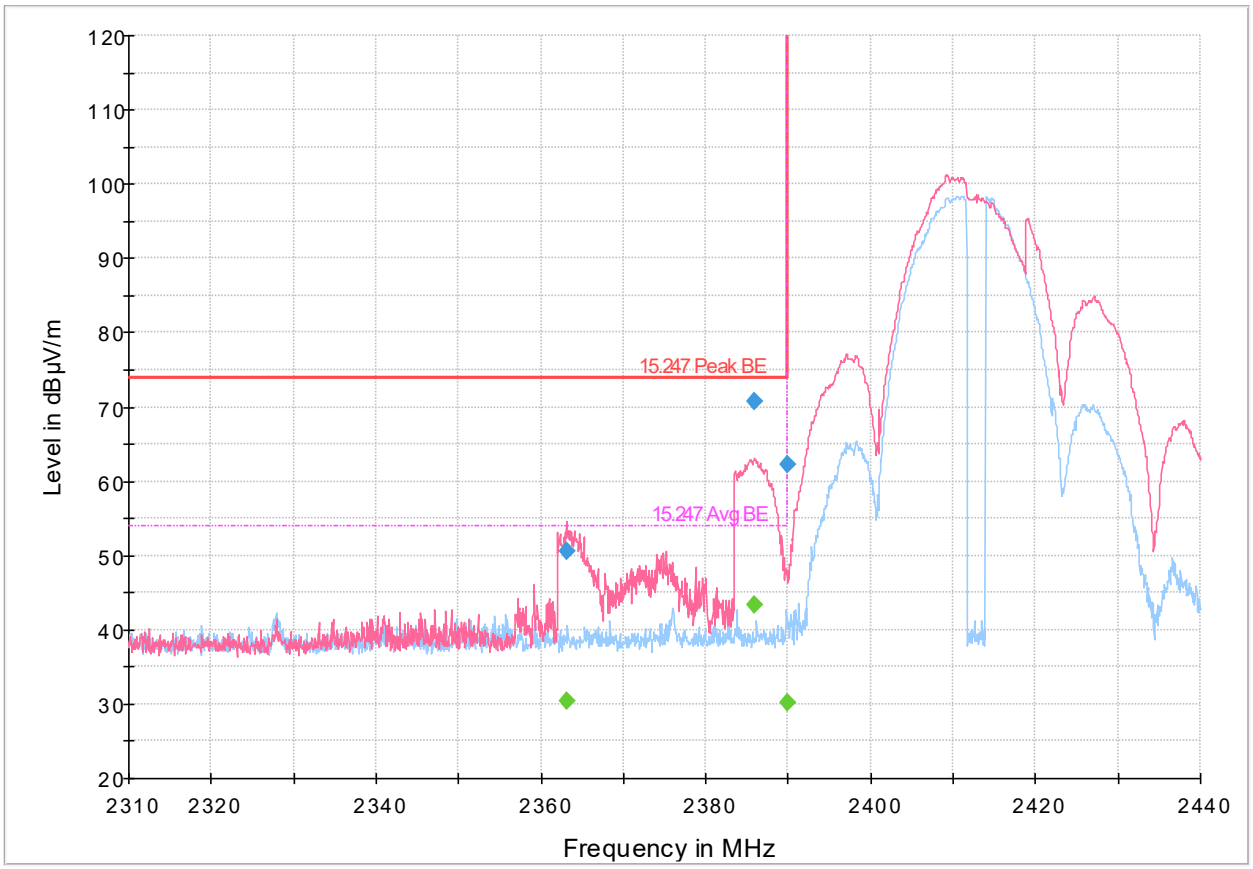

Figure 8.2-3: *Radiated emissions spectral plot (2.31 GHz - 2.44 GHz), 2412 MHz operation*

Table 8.2-6*: 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)
2363.105000	---	30.40	53.90	23.50	5000.0	1000.000	138.0	V	353.0	-4.7
2363.105000	50.62	---	73.90	23.28	5000.0	1000.000	138.0	V	353.0	-4.7
2385.920000	---	43.31	53.90	10.59	5000.0	1000.000	136.0	V	0.0	-4.4
2385.920000	70.75	---	73.90	3.15	5000.0	1000.000	136.0	V	0.0	-4.4
2390.000000	---	30.15	53.90	23.75	5000.0	1000.000	126.0	V	7.0	-4.4
2390.000000	62.22	---	73.90	11.68	5000.0	1000.000	126.0	V	7.0	-4.4

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

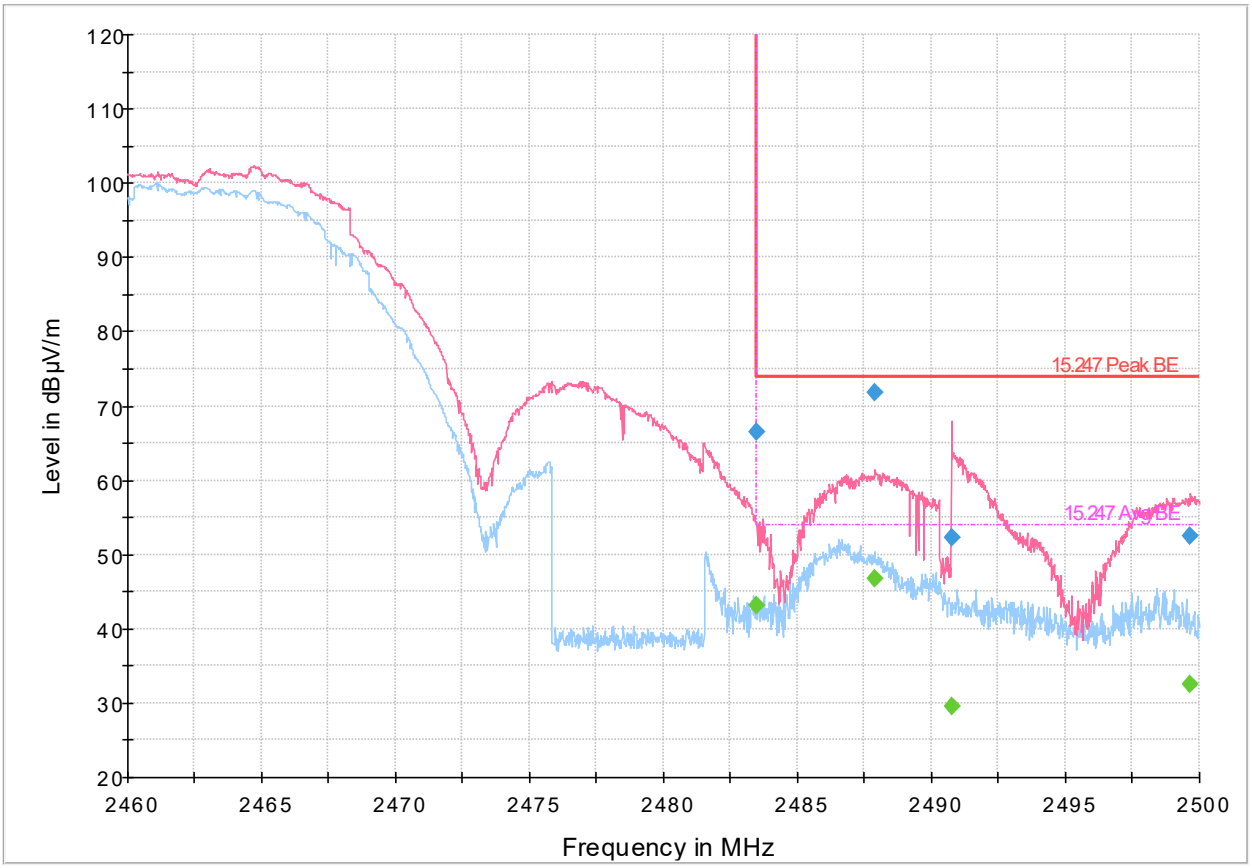

Figure 8.2-4: *Radiated emissions spectral plot (2.46 GHz - 2.5 GHz), 2462 MHz operation*

Table 8.2-7*: 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)
2483.500000	66.49	---	73.90	7.41	5000.0	1000.000	137.0	V	0.0	-4.0
2483.500000	---	43.22	53.90	10.68	5000.0	1000.000	137.0	V	0.0	-4.0
2487.880000	71.76	---	73.90	2.14	5000.0	1000.000	137.0	V	0.0	-4.0
2487.880000	---	46.82	53.90	7.08	5000.0	1000.000	137.0	V	0.0	-4.0
2490.740000	---	29.57	53.90	24.33	5000.0	1000.000	120.0	H	272.0	-4.0
2490.740000	52.26	---	73.90	21.64	5000.0	1000.000	120.0	H	272.0	-4.0
2499.660000	---	32.58	53.90	21.32	5000.0	1000.000	130.0	V	353.0	-4.0
2499.660000	52.52	---	73.90	21.38	5000.0	1000.000	130.0	V	353.0	-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

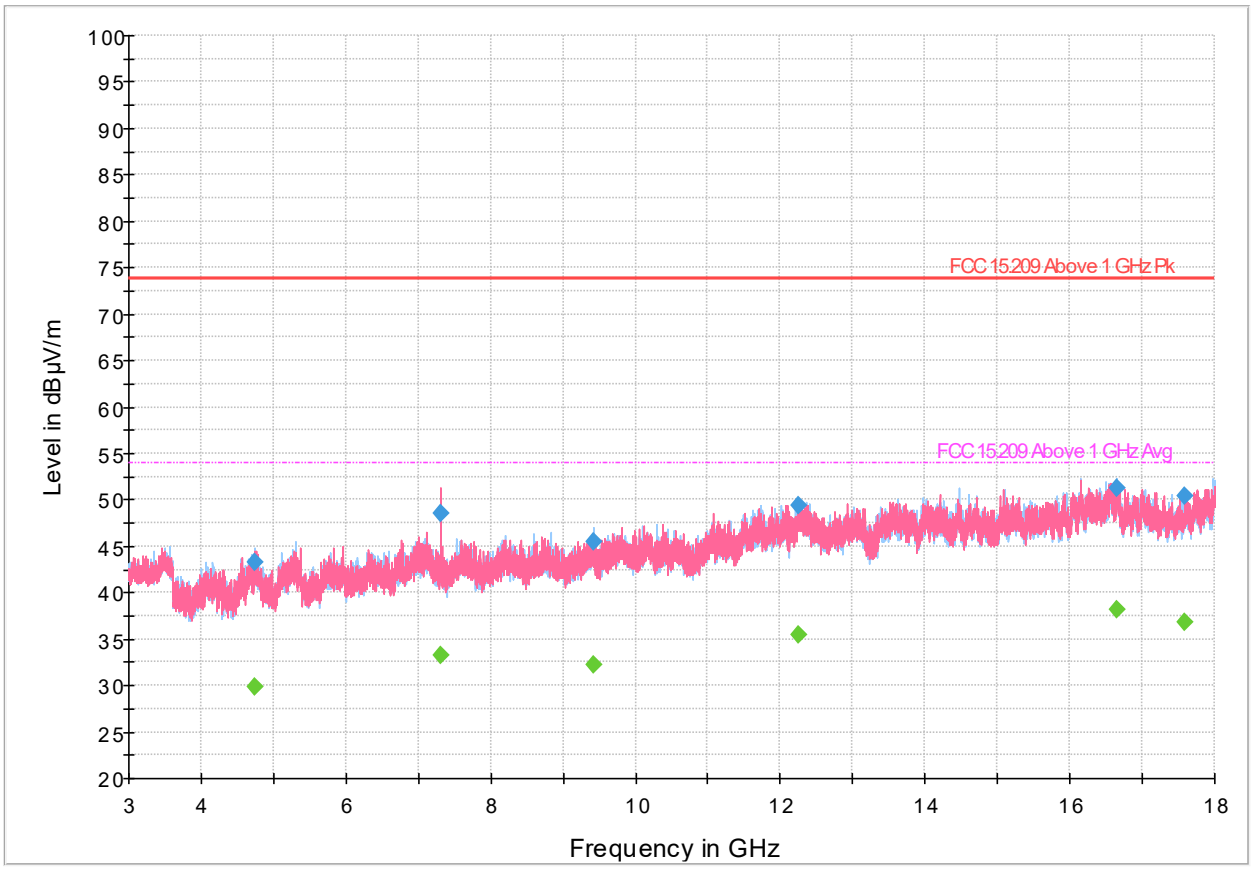

Figure 8.2-5: *Radiated emissions spectral plot (3 GHz - 18 GHz).*

Table 8.2-8*: 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)
4746.800000	43.25	---	73.90	30.65	5000.0	1000.000	400.0	H	116.0	1.8
4746.800000	---	29.93	53.90	23.97	5000.0	1000.000	400.0	H	116.0	1.8
7310.866667	---	33.18	53.90	20.72	5000.0	1000.000	104.0	V	45.0	5.5
7310.866667	48.49	---	73.90	25.41	5000.0	1000.000	104.0	V	45.0	5.5
9418.933333	45.44	---	73.90	28.46	5000.0	1000.000	312.0	H	123.0	9.4
9418.933333	---	32.22	53.90	21.68	5000.0	1000.000	312.0	H	123.0	9.4
12244.300000	---	35.53	53.90	18.37	5000.0	1000.000	137.0	H	158.0	15.6
12244.300000	49.36	---	73.90	24.54	5000.0	1000.000	137.0	H	158.0	15.6
16655.733333	51.18	---	73.90	22.72	5000.0	1000.000	360.0	H	211.0	23.2
16655.733333	---	38.17	53.90	15.73	5000.0	1000.000	360.0	H	211.0	23.2
17588.733333	---	36.87	53.90	17.03	5000.0	1000.000	167.0	V	172.0	18.6
17588.733333	50.47	---	73.90	23.43	5000.0	1000.000	167.0	V	172.0	18.6

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.
[4] A highpass filter was used for this test range.

Full Spectrum

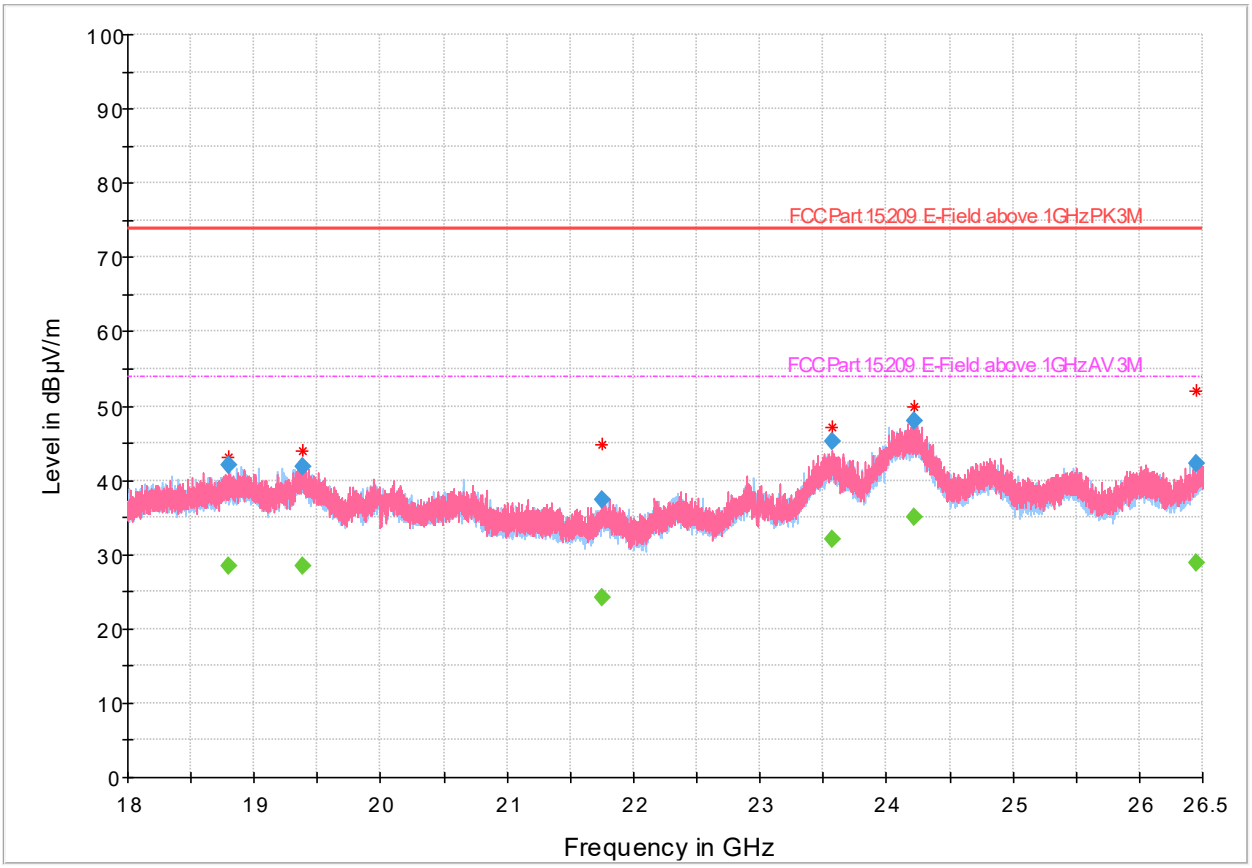

Figure 8.2-6: *Radiated emissions spectral plot (18 GHz - 26.5 GHz).*

Table 8.2-9*: 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)
18801.512500	42.04	---	73.90	31.86	5000.0	1000.000	265.0	V	101.0	15.9
18801.512500	---	28.49	53.90	25.41	5000.0	1000.000	265.0	V	101.0	15.9
19384.918750	---	28.54	53.90	25.36	5000.0	1000.000	242.0	V	56.0	16.6
19384.918750	41.88	---	73.90	32.02	5000.0	1000.000	242.0	V	56.0	16.6
21752.512500	37.39	---	73.90	36.51	5000.0	1000.000	359.0	H	69.0	17.5
21752.512500	---	24.21	53.90	29.69	5000.0	1000.000	359.0	H	69.0	17.5
23573.087500	---	32.09	53.90	21.81	5000.0	1000.000	341.0	V	22.0	23.9
23573.087500	45.23	---	73.90	28.67	5000.0	1000.000	341.0	V	22.0	23.9
24217.843750	48.01	---	73.90	25.89	5000.0	1000.000	193.0	V	166.0	27.0
24217.843750	---	34.98	53.90	18.92	5000.0	1000.000	193.0	V	166.0	27.0
26450.975000	42.23	---	73.90	31.67	5000.0	1000.000	238.0	H	0.0	23.2
26450.975000	---	28.84	53.90	25.06	5000.0	1000.000	238.0	H	0.0	23.2

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.

Section 9 Photos

9.1 Test setup photos

Refer to separate test setup photograph report.

End of test report