



Test report

REP108758-2R1TRFWL

Date of issue: September 9, 2025

Applicant:

WaveLynx Technologies Corporation

Product:

Wavelynx APEX Module

Model:

AX-01, AX-02, AX-05

Variant(s):

None

FCC ID:

2AEI3WLTC-AXM-125

IC ID:

20063-WLTAXM0125

Specifications:

- ◆ FCC 47 CFR § 15.225 - Operation within the band 13.110-14.010 MHz
- ◆ RSS-210 — Licence-Exempt Radio Apparatus: Category I Equipment, Issue 11 (June 2024), Annex B.6

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	Lan Sayasane, Sr. EMC Test Engineer
Reviewed by	James Cunningham, EMC/WL Manager
Review date	September 10, 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 contain in this report are within Nemko USA's ISO/IEC 17025 accreditation.

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Table of Contents

Table of Contents	3
Section 1 Report summary	4
1.1 Test specifications	4
1.2 Test methods	4
1.3 Exclusions	4
1.4 Statement of compliance	4
1.5 Test report revision history	4
Section 2 Summary of test results	5
2.1 Sample information	5
2.2 Testing period	5
2.3 Test results	5
Section 3 Equipment under test (EUT) details	6
3.1 Disclaimer	6
3.2 Applicant	6
3.3 Manufacturer	6
3.4 EUT information	6
3.5 EUT exercise and monitoring details	7
3.6 EUT setup details	7
Section 4 Engineering considerations	8
4.1 Modifications incorporated in the EUT	8
4.2 Technical judgement	8
4.3 Deviations from laboratory test procedures	8
Section 5 Test conditions	9
5.1 Atmospheric conditions	9
5.2 Power supply range	9
Section 6 Measurement uncertainty	10
6.1 Uncertainty of measurement	10
Section 7 Test equipment	11
7.1 Test equipment list	11
Section 8 Testing data	12
8.1 20 dB bandwidth	12
8.2 99 % occupied bandwidth	14
8.3 Radiated emissions	16
8.4 Frequency stability	23

Section 1 Report summary

1.1 Test specifications

FCC 47 CFR § 15.225
RSS-210 Issue 11 (June 2024)

Operation within the band 13.110-14.010 MHz
Licence-Exempt Radio Apparatus: Category I Equipment, Annex B.6

1.2 Test methods

ANSI C63.10: 2020

American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

1.3 Exclusions

None.

1.4 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.

1.5 Test report revision history

Table 1.5-1: Test report revision history

Revision #	Issue Date	Details of changes made to test report
REP108758-2TRFWL	September 9, 2025	Original report issued
REP108758-2R1TRFWL	September 10, 2025	Updated following TCB initial review

Section 2 Summary of test results

2.1 Sample information

Receipt date	01-Aug-25
Nemko sample ID number	PRL0062926

2.2 Testing period

Test start date	01-Aug-25
Test end date	01-Aug-25

2.3 Test results

Table 2.3-1: Summary of results

FCC Clause	IC Clause	Test description	Verdict
§15.207(a)	RSS-Gen 8.8	Conducted limits	Not applicable ¹
§15.31(e)		Variation of power source	Pass
§15.203		Antenna requirement	Pass ²
§15.215(c)	RSS-Gen 6.6	20 dB bandwidth	Pass
		Occupied bandwidth	Pass
		RSS-Gen 7.3 Receiver radiated emission limits	Not applicable ³
	RSS-Gen 7.4	Receiver conducted emission limits	Not applicable ³
§15.225(a)	B.6(a)(i)	Field strength within 13.553–13.567 MHz band	Pass
§15.225(b)	B.6(a)(ii)	The field strength within the bands 13.410–13.553 MHz and 13.567–13.710 MHz	Pass
§15.225(c)	B.6(a)(iii)	The field strength within the bands 13.110–13.410 MHz and 13.710–14.010 MHz.	Pass
§15.225(d)	B.6(a)(iv)	The field strength outside the band 13.110–14.010 MHz.	Pass
§15.225(e)	B6(b)	Frequency tolerance of carrier signals	Pass

Note 1: The EUT is DC powered

Note 2: The antenna is integral to the EUT and cannot be removed

Note 3: According to sections 5.2 and 5.3 of RSS-Gen, the EUT does not have a stand-alone receiver nor is it a scanning receiver and is therefore exempt from receiver requirements.

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	WaveLynx Technologies Corporation
Address	100 Technology Drive
City	Broomfield
State	CO
Postal/Zip code	80021
Country	USA

3.3 Manufacturer

Company name	WaveLynx Technologies Corporation
Address	100 Technology Drive
City	Broomfield
State	CO
Postal/Zip code	80021
Country	USA

3.4 EUT information

Product name	Wavelynx APEX Module
Model	AX-01, AX-02, AX-05
Variant(s)	None
Serial number	EUT #2
Part number	N/A
Frequency band(s)	13.110 – 14.010 MHz
Fundamental frequency	13.56 MHz
Type of modulation	AFSK
Power requirements	5 VDC
Description/theory of operation	The equipment under test is a DC powered RFID Module, communicating with a remote tag and outputting the tag information through a Wiegand or Serial interface. The module is a single PCB which comprises a microcontroller, beeper, green, and red LED's for audio/visual feedback, drive circuitry for communication to a host device, and transceivers to communicate with a remote tag or mobile device.
Antenna information	Integrated antenna
Software details	None

3.5 EUT exercise and monitoring details

EUT description of the methods used to exercise the EUT and all relevant ports:

- When powered, the EUT will broadcast 125kHz and 13.56MHz in a round robin fashion, and will not advertise any BLE. To enable 13.56MHz only, power cycle and scan ID card #5.

EUT setup/configuration rationale:

- The EUT setup in a configuration that was expected to produce the highest amplitude emissions relative to the limit and that satisfy normal operation/installation practice by the end user.
- The type and construction of cables used in the measurement set-up were consistent with normal or typical use. Cables with mitigation features (for example, screening, tighter/more twists per length, ferrite beads) have been noted below:
 - None
- The EUT was setup in a manner that was consistent with its typical arrangement and use. The measurement arrangement of the EUT, local ancillary equipment and associated cabling was representative of normal practice. Any deviations from typical arrangements have been noted below:
 - None

3.6 EUT setup details

Table 3.6-1: EUT sub assemblies

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

Table 3.6-2: EUT interface ports

Description	Qty.
AX-05 connector – J301 (Power Input)	1
AX-05 connector – J302 (Not Used)	1
Micro USB (Not Used)	1

Table 3.6-3: Support equipment

Description	Brand name	Model/Part number	Serial number	Rev.
DC Power Supply	Topward	3303D	736346	--

Table 3.6-4: Inter-connection cables

Cable description	From	To	Length (m)
Power cable	AX-05 connector – J301 (Power Input)	DC Power Supply	1

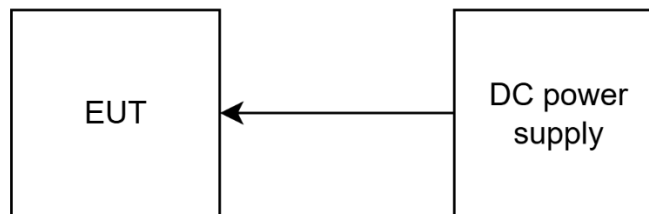


Figure 3.6-1: Test setup diagram

Section 4 Engineering considerations

4.1 Modifications incorporated in the EUT

None.

4.2 Technical judgement

None.

4.3 Deviations from laboratory test procedures

None.

Section 5 Test conditions

5.1 Atmospheric conditions

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

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

5.2 Power supply range

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

Section 6 Measurement uncertainty

6.1 Uncertainty of measurement

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

Table 6.1-1: Measurement uncertainty calculations

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

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

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

Section 7 Test equipment

7.1 Test equipment list

Table 7.1-1: Test equipment list

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
EMI Test Receiver	Rohde & Schwarz	ESU26.5	E1353	1 year	13-Nov-2025
Preamplifier	Sonoma	310N	E1155	1 year	18-Jun-2026
System Controller	Sunol Sciences	SC104V	E1129	NCR	NCR
Antenna, Biconilog	ETS Lindgren	3142E	E1371	2 years	20-Aug-2026
EMI Test Receiver	Rohde & Schwarz	ESU40	E1121	1 year	03-Oct-2025
System Controller	Sunol Sciences	SC104V	E1191	NCR	NCR
Antenna, Loop	EMCO	11966A	E1267	1 year	08-Aug-2026
Signal and Spectrum Analyzer	Rohde & Schwarz	FSV40	E1120	2 years	14-Dec-2025
Close-Field Probe, 9kHz-30MHz	Hewlett Packard	HP11941A	850	VOU	VOU
DC Power Supply	Hewlett Packard	6235A	D1000	NCR	NCR
True RMS Multimeter	Fluke	175	4041	NCR	NCR
Temperature Chamber	Test Equity	115A	E1162	1 year	25-Aug-2026

Notes: N/A – not applicable
NCR – no calibration required
VOU – verify on use

Table 7.1-2: Test software details

Manufacturer of Software	Details
Rohde & Schwarz	EMC 32 V10.60.15

Notes: None

Section 8 Testing data

8.1 20 dB bandwidth

8.1.1 References and limits

- FCC 47 CFR Part 15, Subpart B: §15.215(c)
- Test method: ANSI C63.4-2014: §6.9.2

§15.215:

- (c) Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

8.1.2 Test summary

Verdict	Pass		
Test date	August 21, 2025	Temperature	22 °C
Test engineer	Lan Sayasane, Sr. EMC Test Engineer	Air pressure	1002.0 mbar
Test location	<input checked="" type="checkbox"/> Wireless bench <input type="checkbox"/> Other:	Relative humidity	58 %

8.1.3 Notes

Testing was performed with the transmitter operating on a fixed channel at full power. Low, middle, and high channels were tested if supported by the EUT.

8.1.4 Setup details

EUT power input during test	5 VDC
EUT setup configuration	<input checked="" type="checkbox"/> Table-top <input type="checkbox"/> Floor standing <input type="checkbox"/> Other:

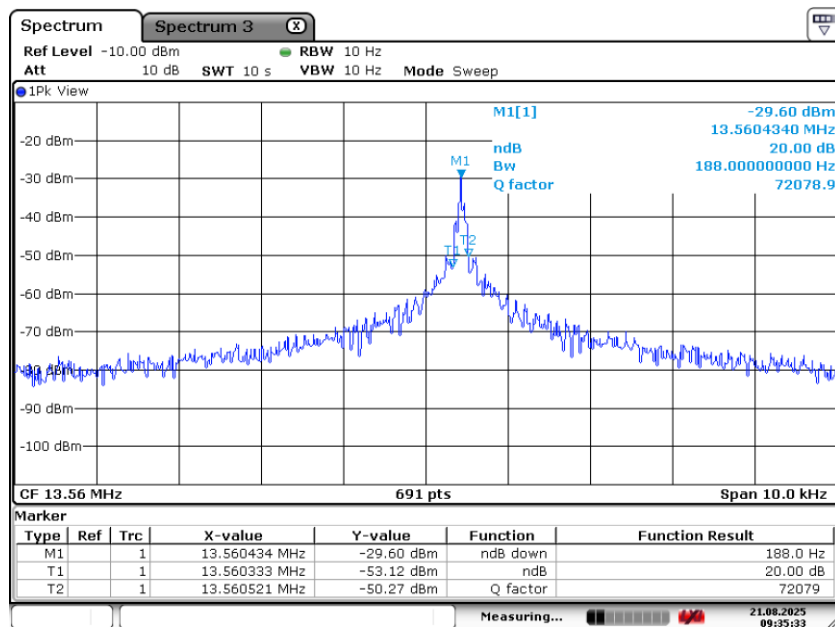
Receiver settings:

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

8.1.5 Test data

Table 8.1-1: 20 dB occupied bandwidth test data

Test frequency (MHz)	Bandwidth (Hz)	Measured f_c (MHz)	Measured f_l (MHz)	Measured f_H (MHz)	Limit
13.56	188.0	13.560333	13.560521	13.560434	f_H and f_l within 13.110 – 14.010MHz



Date: 21.AUG.2025 09:35:34

Figure 8.1-1: 20 dB occupied bandwidth, 13.56 MHz

8.2 99 % occupied bandwidth

8.2.1 References and limits

- RSS-Gen: §6.7
- Test method: ANSI C63.4-2014: §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.

8.2.2 Test summary

Verdict	Pass		
Test date	August 21, 2025	Temperature	22 °C
Test engineer	Lan Sayasane, Sr. EMC Test Engineer	Air pressure	1002.0 mbar
Test location	<input checked="" type="checkbox"/> Wireless bench <input type="checkbox"/> Other:	Relative humidity	58 %

8.2.3 Notes

Testing was performed with the transmitter operating on a fixed channel at full power. Low, middle, and high channels were tested if supported by the EUT.

8.2.4 Setup details

EUT power input during test	5 VDC
EUT setup configuration	<input checked="" type="checkbox"/> Table-top <input type="checkbox"/> Floor standing <input type="checkbox"/> Other:

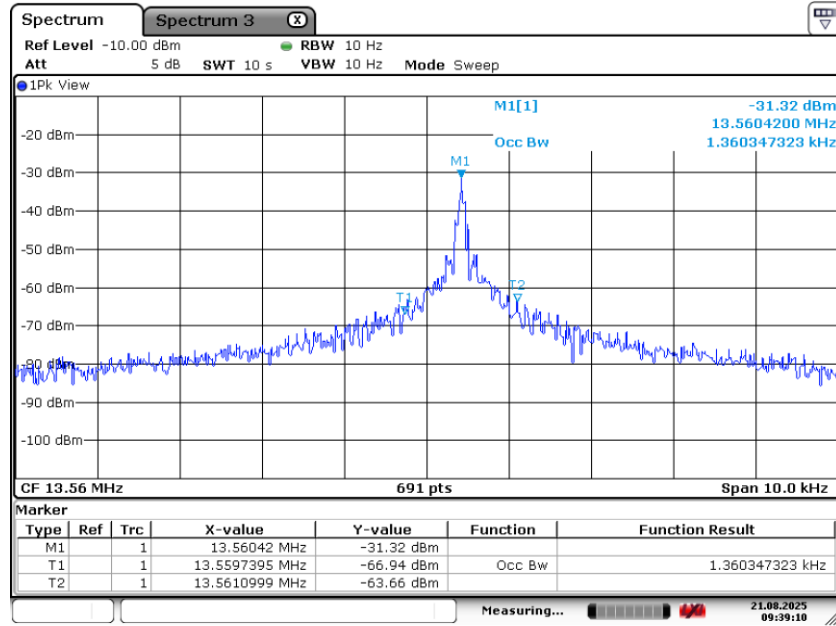
Receiver settings:

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

8.2.5 Test data

Table 8.2-1: 99 % occupied bandwidth test data

Test frequency (MHz)	Bandwidth (kHz)	Measured f_c (MHz)	Measured f_l (MHz)	Measured f_h (MHz)	Limit
13.56	1.360	13.5597395	13.5610999	13.56042	f_H and f_L within 13.110 – 14.010MHz



Date: 21.AUG.2025 09:39:10

Figure 8.2-1: 99 % occupied bandwidth, 13.56 MHz

8.3 Radiated emissions

8.3.1 References and limits

- FCC §15.225(a)-(d)
- RSS-210 §B.6(a)
- Test method: ANSI C63.10 §6.4, 6.5

FCC §15.225(a)-(d):

- The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.
- Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
- Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
- The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

RSS-210 §B.6(a):

The field strength of any emission shall not exceed the following limits:

- 15.848 mV/m (84 dBμV/m) at 30m, within the band 13.553-13.567 MHz;
- 334 μV/m (50.5 dBμV/m) at 30m, within the bands 13.410-13.553 MHz and 13.567-13.710 MHz;
- 106 μV/m (40.5 dBμV/m) at 30m, within the bands 13.110-13.410 MHz and 13.710-14.010 MHz; and
- RSS-Gen general field strength limits for frequencies outside the band 13.110-14.010 MHz.

Table 8.3-1: FCC §15.209 and RSS-Gen – 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: IC restricted frequency bands

MHz	MHz	MHz	GHz
0.090–0.110	12.51975–12.52025	399.9–410	5.35–5.46
2.1735–2.1905	12.57675–12.57725	608–614	7.25–7.75
3.020–3.026	13.36–13.41	960–1427	8.025–8.5
4.125–4.128	16.42–16.423	1435–1626.5	9.0–9.2
4.17725–4.17775	16.69475–16.69525	1645.5–1646.5	9.3–9.5
4.20725–4.20775	16.80425–16.80475	1660–1710	10.6–12.7
5.677–5.683	25.5–25.67	1718.8–1722.2	13.25–13.4
6.215–6.218	37.5–38.25	2200–2300	14.47–14.5
6.26775–6.26825	73–74.6	2310–2390	15.35–16.2
6.31175–6.31225	74.8–75.2	2655–2900	17.7–21.4
8.291–8.294	108–138	3260–3267	22.01–23.12
8.362–8.366	156.52475–156.52525	3332–3339	23.6–24.0
8.37625–8.38675	156.7–156.9	3345.8–3358	31.2–31.8
8.41425–8.41475	240–285	3500–4400	36.43–36.5
12.29–12.293	322–335.4	4500–5150	Above 38.6

Table 8.3-3: 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			

8.3.2 Test summary

Verdict	Pass		
Test date	August 5, 2025	Temperature	22 °C
Test engineer	Lan Sayasane, Sr. EMC Test Engineer	Air pressure	1007.0 mbar
Test location	<input checked="" type="checkbox"/> 10m semi anechoic chamber <input checked="" type="checkbox"/> 3m semi anechoic chamber <input type="checkbox"/> Wireless bench <input type="checkbox"/> Other:	Relative humidity	53 %

8.3.3 Notes

The limits were adjusted to 3m measurement distance using a correction factor of $40 \times \log_{10}(30/3)$.

For example, 106 $\mu\text{V/m}$ (40.5 dB $\mu\text{V/m}$) at 30m corresponds to a limit at 3m of $40.5 + 40 \log_{10}(30/3) = 40.5 + 40 = 80.5$ dB $\mu\text{V/m}$.

8.3.4 Setup details

EUT power input during test	5 VDC
EUT setup configuration	<input checked="" type="checkbox"/> Table-top <input type="checkbox"/> Floor standing <input type="checkbox"/> Other:
Measurement details	A preview measurement was generated with the receiver in continuous scan mode. Selected emissions were re-measured with the appropriate detector(s) against the correlating limit(s) and recorded as the final measurement.

Receiver settings; 9 kHz to 30 MHz:

Resolution bandwidth	200 Hz from 9 – 150 kHz 9 kHz from 150 kHz – 30 MHz
Detector mode	– Peak (Preview measurement) – Quasi-peak (Final measurement)
Measurement time	– 100 ms (Peak preview measurement) – 15000 ms (Quasi-peak final measurement)

Receiver settings; 30 – 1000 MHz:

Resolution bandwidth	120 kHz
Detector mode	– Peak (Preview measurement) – Quasi-peak (Final measurement)
Measurement time	– 100 ms (Peak preview measurement) – 5000 ms (Quasi-peak final measurement)

8.3.5 Test data

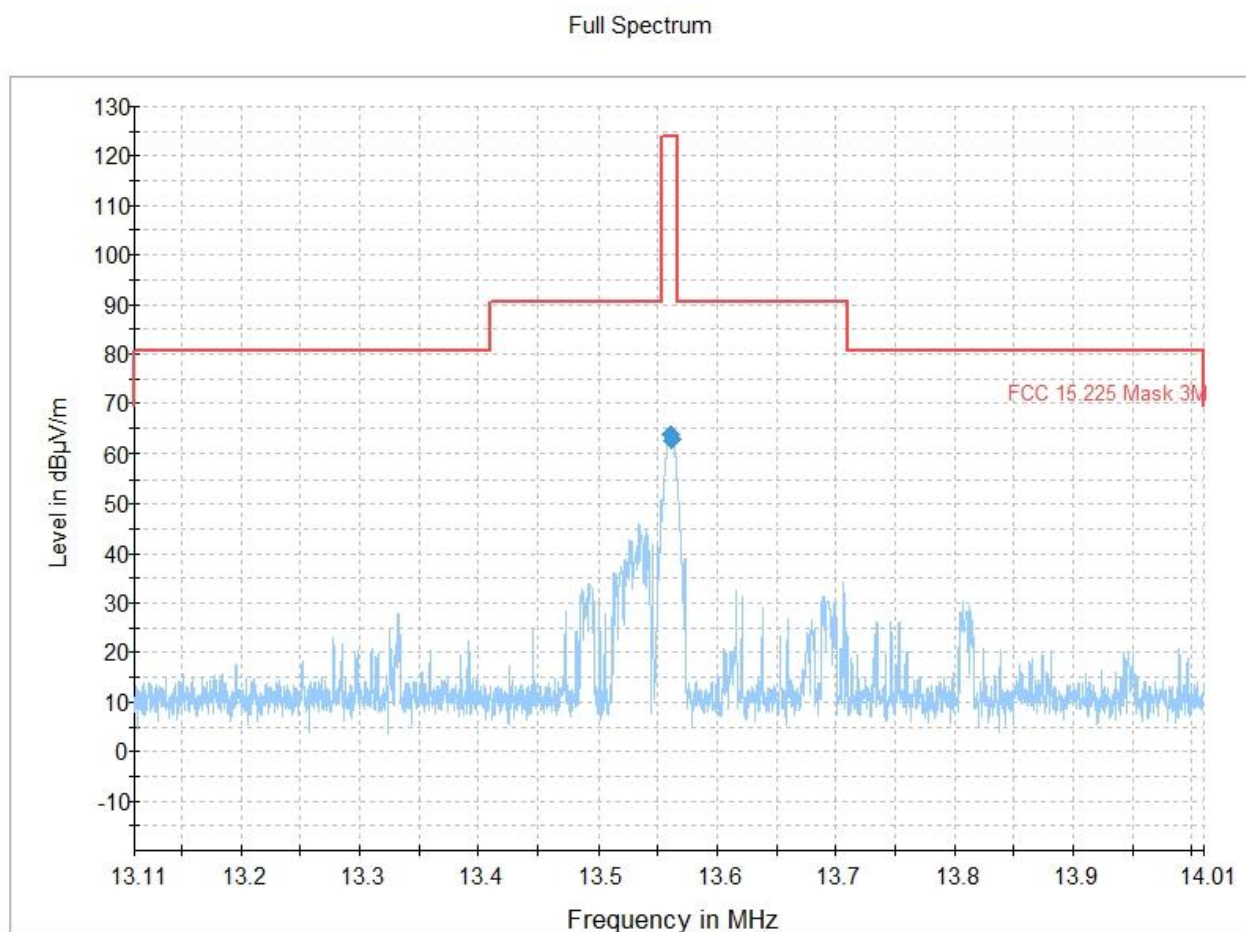


Figure 8.3-1: Radiated emissions spectral plot (13.11 MHz - 14.01 MHz) – 0 Degree

Table 8.3-4: Radiated emissions results

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)
13.559770	63.85	124.00	60.15	15000.0	9.000	H	0.0	9.0
13.559790	63.67	124.00	60.33	15000.0	9.000	H	345.0	9.0
13.560020	63.91	124.00	60.09	15000.0	9.000	H	0.0	9.0
13.560990	63.83	124.00	60.17	15000.0	9.000	H	0.0	9.0
13.561620	62.46	124.00	61.54	15000.0	9.000	H	329.0	9.0
13.562210	62.93	124.00	61.07	15000.0	9.000	H	0.0	9.0

Notes: ¹ Field strength (dB V/m) = receiver/spectrum analyzer value (dB 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.

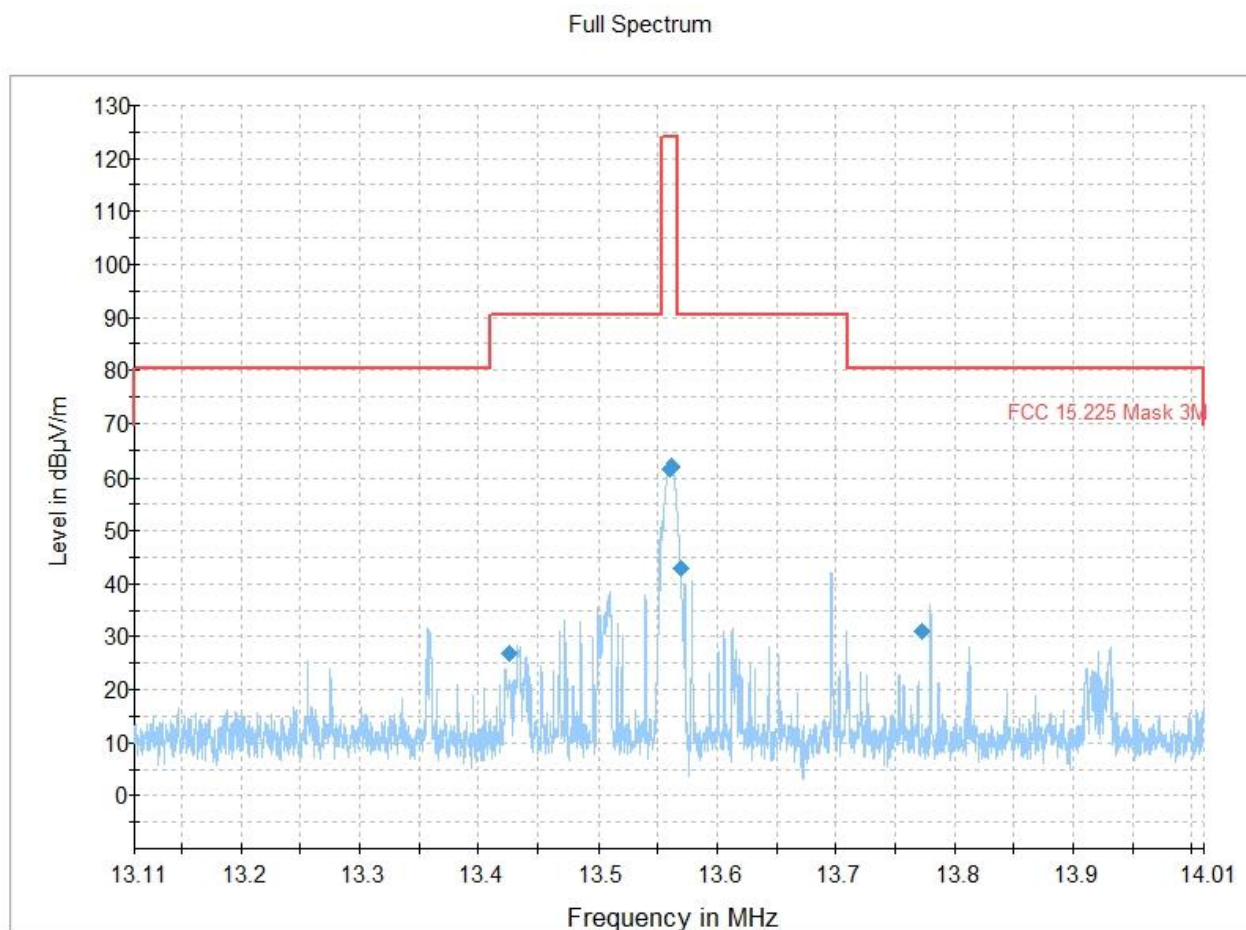


Figure 8.3-2: Radiated emissions spectral plot (13.11 MHz - 14.01 MHz) – 90 Degrees

Table 8.3-5: Radiated emissions results

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)
13.426530	26.89	90.48	63.58	15000.0	9.000	H	83.0	9.0
13.560000	61.58	124.00	62.42	15000.0	9.000	H	59.0	9.0
13.560020	61.49	124.00	62.51	15000.0	9.000	H	58.0	9.0
13.561830	61.83	124.00	62.17	15000.0	9.000	H	71.0	9.0
13.569050	42.91	90.48	47.57	15000.0	9.000	H	77.0	9.0
13.772450	30.98	80.51	49.53	15000.0	9.000	H	82.0	8.9

Notes: ¹ Field strength (dB V/m) = receiver/spectrum analyzer value (dB 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

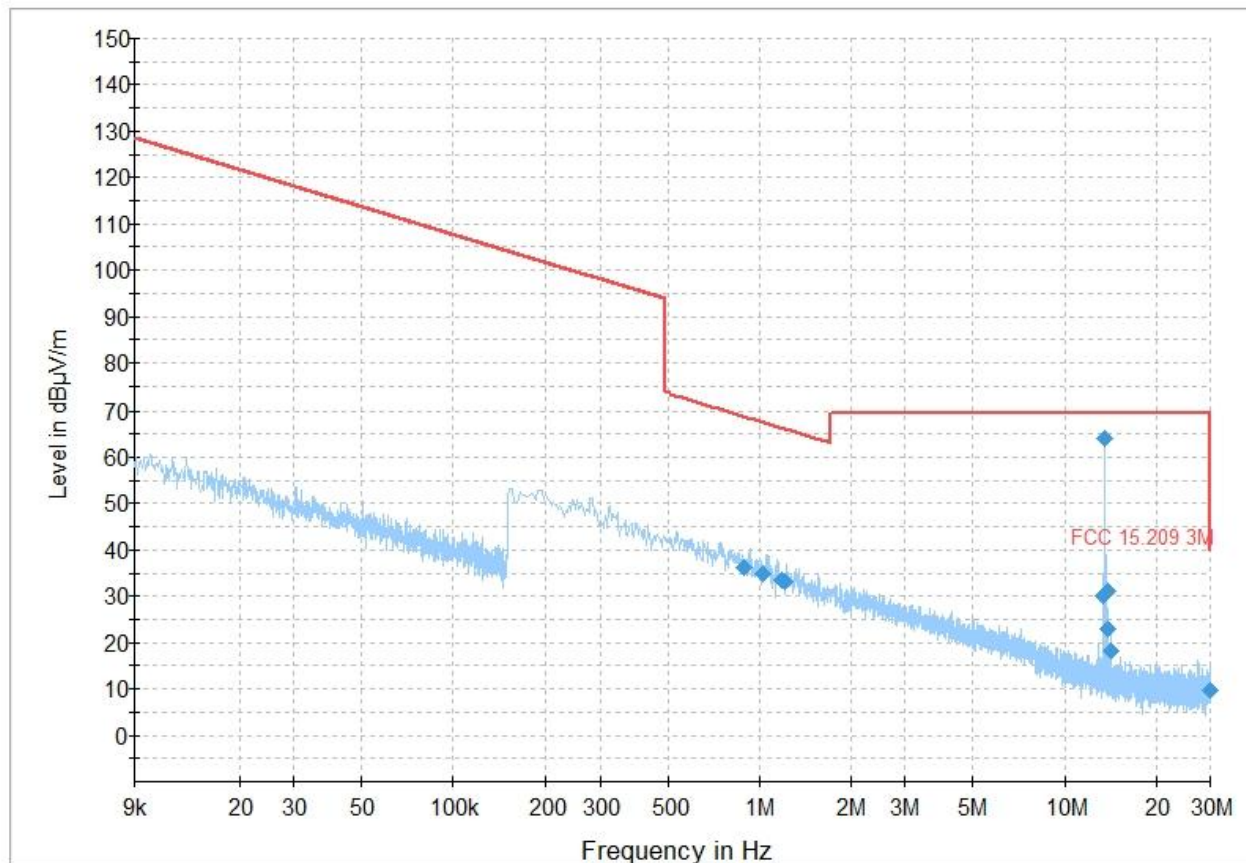


Figure 8.3-3: Radiated emissions spectral plot (9 kHz - 30 MHz) – 0 Degree

Table 8.3-6: Radiated emissions results

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)
0.887070	36.37	68.66	32.29	15000.0	9.000	H	25.0	10.2
1.021455	34.81	67.44	32.63	15000.0	9.000	H	121.0	10.2
1.178050	33.32	66.20	32.89	15000.0	9.000	H	206.0	10.2
1.207570	33.08	65.99	32.90	15000.0	9.000	H	8.0	10.2
13.348640	30.03	69.50	39.47	15000.0	9.000	H	352.0	9.0
13.560605	63.97	69.50	5.53	15000.0	9.000	H	0.0	9.0
13.770450	31.26	69.50	38.24	15000.0	9.000	H	0.0	8.9
13.849940	22.88	69.50	46.62	15000.0	9.000	H	0.0	8.9
14.118680	18.16	69.50	51.34	15000.0	9.000	H	0.0	8.9
29.983000	9.74	69.50	59.76	15000.0	9.000	H	242.0	6.3

Notes: ¹ Field strength (dB V/m) = receiver/spectrum analyzer value (dB 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

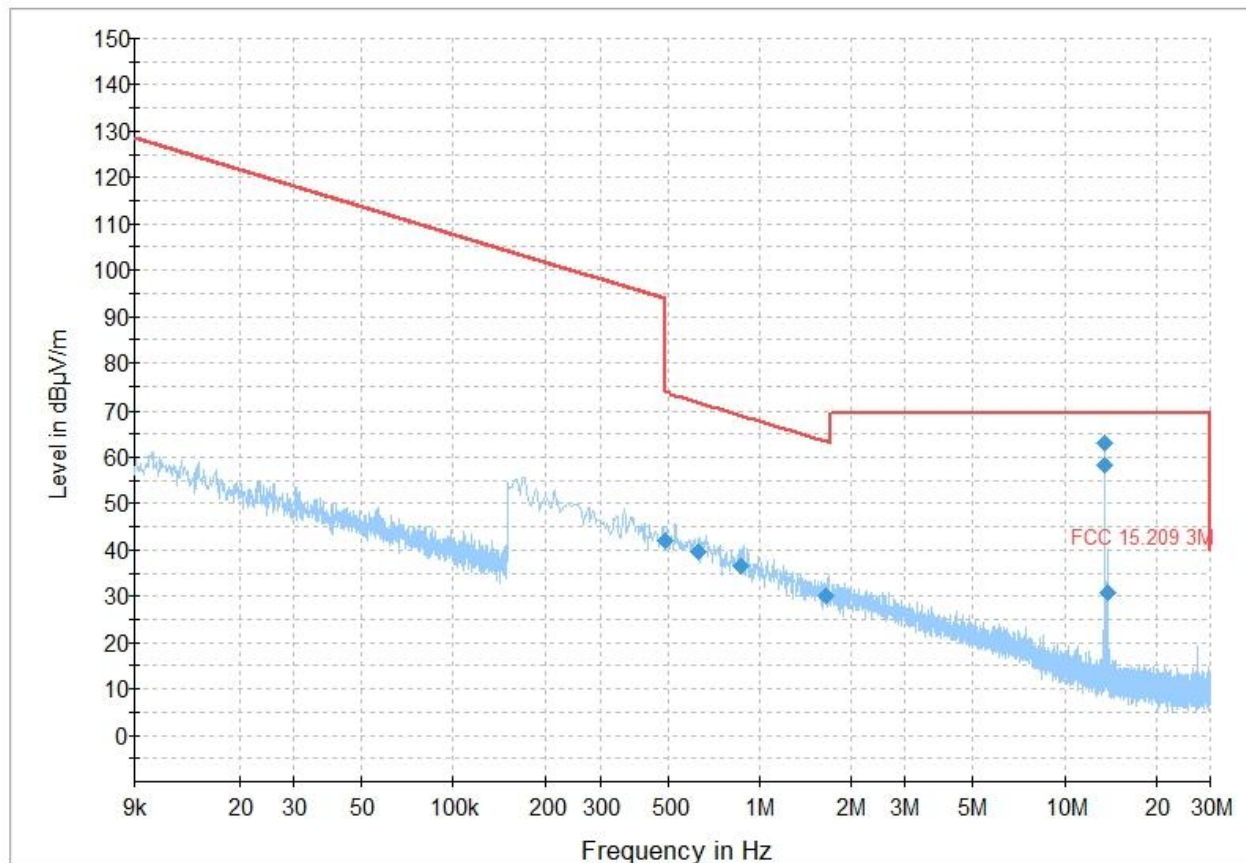


Figure 8.3-4: Radiated emissions spectral plot (9 kHz - 30 MHz) – 90 Degrees

Table 8.3-7: Radiated emissions results

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)
0.491110	41.90	73.78	31.89	15000.0	9.000	H	107.0	10.2
0.626390	39.73	71.67	31.95	15000.0	9.000	H	148.0	10.2
0.865310	36.55	68.87	32.32	15000.0	9.000	H	194.0	10.2
0.871160	36.46	68.82	32.35	15000.0	9.000	H	137.0	10.2
1.641290	29.94	63.33	33.39	15000.0	9.000	H	160.0	10.2
13.560605	63.08	69.50	6.42	15000.0	9.000	H	88.0	9.0
13.564365	58.32	69.50	11.18	15000.0	9.000	H	86.0	9.0
13.770540	30.62	69.50	38.88	15000.0	9.000	H	89.0	8.9

Notes: ¹ Field strength (dB V/m) = receiver/spectrum analyzer value (dB 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

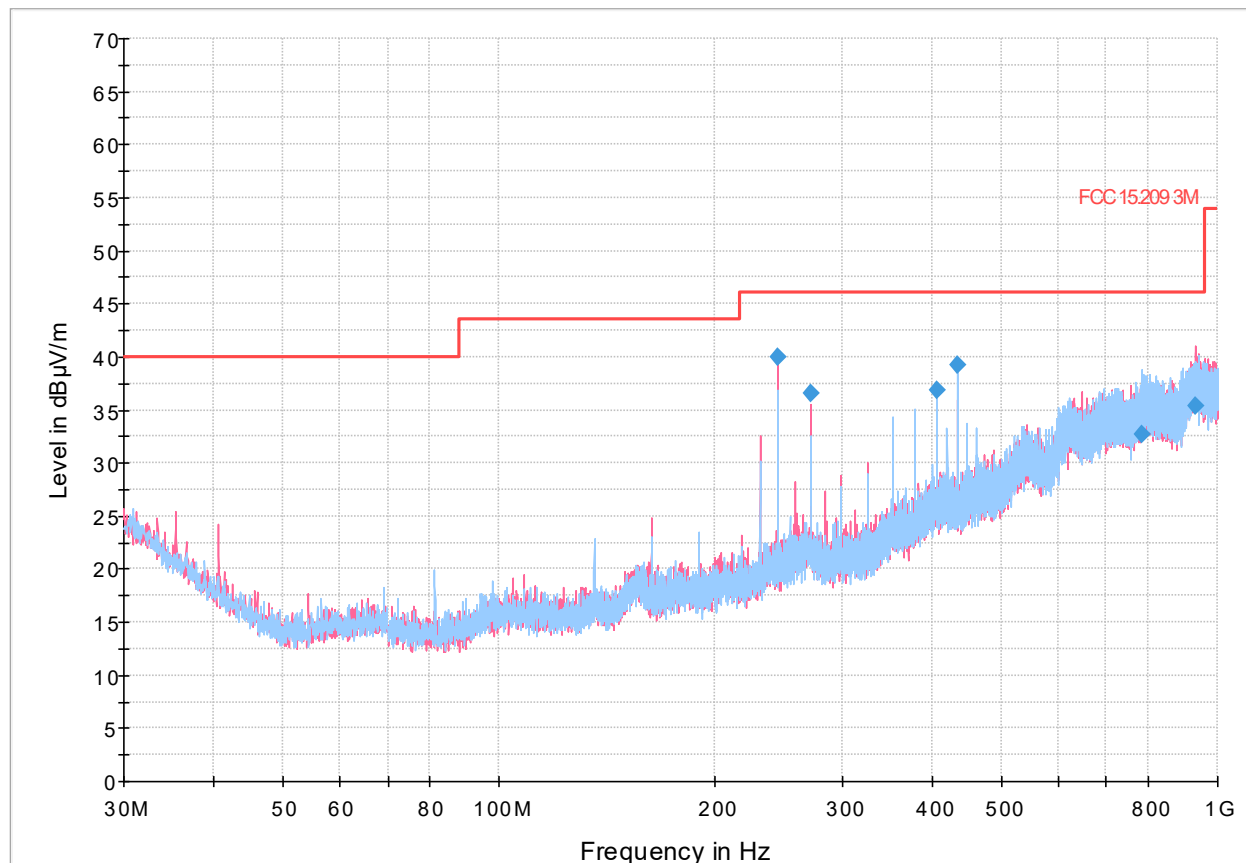


Figure 8.3-5: Radiated emissions spectral plot (30 MHz - 1 GHz)

Table 8.3-8: 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)
244.099000	40.00	46.00	6.00	5000.0	120.000	100.0	V	214.0	20.0
271.210500	36.51	46.00	9.49	5000.0	120.000	98.0	V	217.0	21.4
406.816500	36.83	46.00	9.17	5000.0	120.000	100.0	H	227.0	26.1
433.936500	39.19	46.00	6.81	5000.0	120.000	100.0	H	227.0	25.7
784.293000	32.67	46.00	13.33	5000.0	120.000	112.0	H	112.0	32.7
931.654500	35.36	46.00	10.64	5000.0	120.000	167.0	V	318.0	35.4

Notes: ¹ Field strength (dB V/m) = receiver/spectrum analyzer value (dB 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.

8.4 Frequency stability

8.4.1 References and limits

- FCC §15.225(e)
- RSS-210 §B.6(b)
- Test method: ANSI C63.26, §6.8

FCC §15.225(e)

- e) The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20 degrees to $+50$ degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

RSS-210 §B.6(b):

- b) The carrier frequency stability shall not exceed ± 100 ppm.

8.4.2 Test summary

Verdict	Pass		
Test date	September 4, 2025	Temperature	20 °C
Test engineer	Lan Sayasane, Sr. EMC Test Engineer	Air pressure	1004.0 mbar
Test location	<input checked="" type="checkbox"/> Wireless bench <input type="checkbox"/> Other:	Relative humidity	60 %

8.4.3 Notes

The carrier frequency f_c (MHz) was measured at each temperature and supply voltage using the spectrum analyzer Signal Count marker function. The variation in ppm and % were calculated as follows:

$$Variation (ppm) = \left(\left(\frac{f_{expected} - f_{measured}}{f_{expected}} \right) \times 1000000 \right)$$

$$Variation (\%) = \left(\left(\frac{f_{expected} - f_{measured}}{f_{expected}} \right) \times 100 \right)$$

8.4.4 Setup details

EUT power input during test	5 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: Frequency stability with respect to ambient temperature results

Temp. (°C)	0 minutes			2 minutes			5 minutes			10 minutes		
	f _c (MHz)	Drift (%) (FCC)	Drift (ppm) (RSS)	f _c (MHz)	Drift (%) (FCC)	Drift (ppm) (RSS)	f _c (MHz)	Drift (%) (FCC)	Drift (ppm) (RSS)	f _c (MHz)	Drift (%) (FCC)	Drift (ppm) (RSS)
50	13.5601308	-0.000964602	-9.646	13.5603307	-0.002438791	-24.388	13.5603278	-0.002417404	-24.174	13.5602375	-0.001751475	-17.515
40	13.5603738	-0.002756637	-27.566	13.5601697	-0.001251475	-12.515	13.5601676	-0.001235988	-12.360	13.5603509	-0.002587758	-25.878
30	13.5602398	-0.001768437	-17.684	13.5601942	-0.001432153	-14.322	13.5600938	-0.00069174	-6.917	13.5600455	-0.000335546	-3.355
20	13.5600769	-0.000567109	-5.671	13.5600111	-8.18584E-05	-0.819	13.5600466	-0.000343658	-3.437	13.5600271	-0.000199853	-1.999
10	13.5603204	-0.002362832	-23.628	13.5603975	-0.002931416	-29.314	13.5603474	-0.002561947	-25.619	13.5603136	-0.002312684	-23.127
0	13.5601035	-0.000763274	-7.633	13.5601979	-0.00145944	-14.594	13.5602203	-0.001624631	-16.246	13.5602854	-0.00210472	-21.047
-10	13.5601756	-0.001294985	-12.950	13.5601148	-0.000846608	-8.466	13.5603923	-0.002893068	-28.931	13.5603743	-0.002760324	-27.603
-20	13.5602936	-0.002165192	-21.652	13.5601316	-0.000970501	-9.705	13.5601252	-0.000923304	-9.233	13.5602621	-0.001932891	-19.329

Table 8.4-2: Frequency stability with respect to supply voltage results

Voltage (V)	0 minutes			2 minutes			5 minutes			10 minutes		
	f _c (MHz)	Drift (%) (FCC)	Drift (ppm) (RSS)	f _c (MHz)	Drift (%) (FCC)	Drift (ppm) (RSS)	f _c (MHz)	Drift (%) (FCC)	Drift (ppm) (RSS)	f _c (MHz)	Drift (%) (FCC)	Drift (ppm) (RSS)
85%	13.5602807	-0.002070059	-20.701	13.5601442	-0.001063422	-10.634	13.5601901	-0.001401917	-14.019	13.5602156	-0.001589971	-15.900
Nominal	13.5601539	-0.001134956	-11.350	13.5602216	-0.001634218	-16.342	13.5602014	-0.001485251	-14.853	13.5602652	-0.001955752	-19.558
115%	13.5602449	-0.001806047	-18.060	13.560159	-0.001172566	-11.726	13.5602187	-0.001612832	-16.128	13.5602893	-0.002133481	-21.335

Nominal voltage: 5 VDC
85 % voltage: 9.25 VDC
115 % voltage: 10.75 VDC

End of test report