

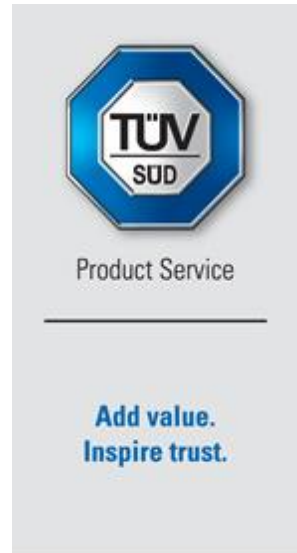
Report on the FCC and IC Testing of the BALTECH AG

Model: 10090-640

In accordance with FCC 47 CFR Part 15C and
ISED Canada RSS-210 and ISED Canada RSS-
GEN



Prepared for: BALTECH AG
Lilienthalstr. 27
85399 Hallbergmoos - Germany

FCC ID: OKY10090640A03B
IC: 7657A-10090640



COMMERCIAL-IN-CONFIDENCE


Date: 2022-05-18
Document Number: TR-713254909-04 (Revision 1)

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
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Authorized Signatory	Alex Fink	2022-05-18	 SIGN-ID 651759

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Product Service document control rules.

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15C and ISED Canada RSS-210 and ISED Canada RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Patrick Müller	2022-05-18	 SIGN-ID 651376 Patrick Müller

Laboratory Accreditation Laboratory recognition ISED Canada test site registration
DAkkS Reg. No. D-PL-11321-11-03 Registration No. BNetzA-CAB-16/21-15 3050A-2
DAkkS Reg. No. D-PL-11321-11-04

EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15C, ISED Canada RSS-210, Issue 10 (12-2019) and ISED Canada RSS-GEN, Issue 05 (03-2019).



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- TR-713254909-04 rev0 Annex A: Test setup Photos
- TR-713254909-04 rev0 Annex B: External Photos
- TR-713254909-04 rev0 Annex C: Internal Photos



Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
0	First Issue	2022-04-28
1	Added comments to parameters RBW and VBW in spurious emissions and measuring distance.	2022-05-18

Table 1

1.2 Introduction

Applicant	BALTECH AG
Manufacturer	BALTECH AG
Model Number(s)	10090-640
Serial Number(s)	15000176
Hardware Version(s)	---
Software Version(s)	---
Number of Samples Tested	1
Test Specification/Issue/Date	FCC 47 CFR Part 15C ISED Canada RSS-210, Issue 10 (12-2019) ISED Canada RSS-GEN, Issue 05 (03-2019), Amd.1, Amd.2: February 2021
Test Plan/Issue/Date	---
Order Number	5487175
Date of Receipt of EUT	2022-03-28
Start of Test	2022-04-07
Finish of Test	2022-04-27
Name of Engineer(s)	Patrick Müller
Related Document(s)	ANSI C63.10 (2013) ANSI C63.4 (2014)



1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15C and ISED Canada RSS-210 and ISED Canada RSS-GEN is shown below.

Section	Specification Clause	Test Description	Result	Comments/Base Standard
Configuration and Mode: 5V DC Powered – Continuous transmitting				
2.1	15.225 (a)(b)(c)(d), B.1 to B.9, 6.5 and 6.6.	Field Strength of any Emission	Pass	ANSI C63.10 (2013)
2.2	15.225 (e), B.1 to B.9 and 6.11.	Frequency Tolerance Under Temperature Variations	Pass	ANSI C63.10 (2013)
2.3	15.215 (c), N/A and 6.7	20 dB Bandwidth	Pass	ANSI C63.10 (2013)
2.4	15.205, 7.1 and 8.10	Restricted Band Edges	Pass	ANSI C63.10 (2013)
2.5	15.207 and 8.8	AC Power Line Conducted Emissions	Pass	ANSI C63.10 (2013)

Table 2



1.4 Product Information

1.4.1 Technical Description

Equipment characteristics	
Type designation:	10090-640
Type of equipment:	RFID Reader with BLE interface
Application ¹ :	Inductive Applications
Equipment class:	Equipment for fixed use
Kind of equipment	Transceiver
Operating Frequency:	13.56 MHz
Channel spacing:	Wideband
Number of RF channels:	1
Antenna:	Integrated Antenna
Type(s) of Modulation (e.g. BPSK, FSK, ASK, ...)	---
Power supply:	DC supplied (USB) Nominal: 5 V Minimum: 4.65 V Maximum: 5.35 V Nominal frequency: DC

1.5 Deviations from the Standard

None



1.6 EUT Modification Record

The table below details modifications made to the EUT during the test programme.
The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
0	As supplied by the customer	Not Applicable	Not Applicable

Table 3

1.7 Test Location

TÜV SÜD Product Service conducted the following tests at our Straubing Test Laboratory.

Test Name	Name of Engineer(s)
Configuration and Mode: 5V DC Powered – Continuously transmitting	
Field Strength of any Emission	Patrick Müller
Frequency Tolerance Under Temperature Variations	Patrick Müller
20 dB Bandwidth	Patrick Müller
Restricted Band Edges	Patrick Müller
AC Power Line Conducted Emissions	Patrick Müller

Table 4

Office Address:

Äußere Frühlingstraße 45
94315 Straubing
Germany

2 Test Details

2.1 Field Strength of any Emission

2.1.1 Specification Reference

FCC 47 CFR Part 15C, ISED Canada RSS-210 and ISED Canada RSS-GEN, Clause 15.225 (a)(b)(c)(d), B.1 to B.9, 6.5 and 6.6.

2.1.2 Equipment Under Test and Modification State

10090-640, S/N: 15000176 - Modification State 0

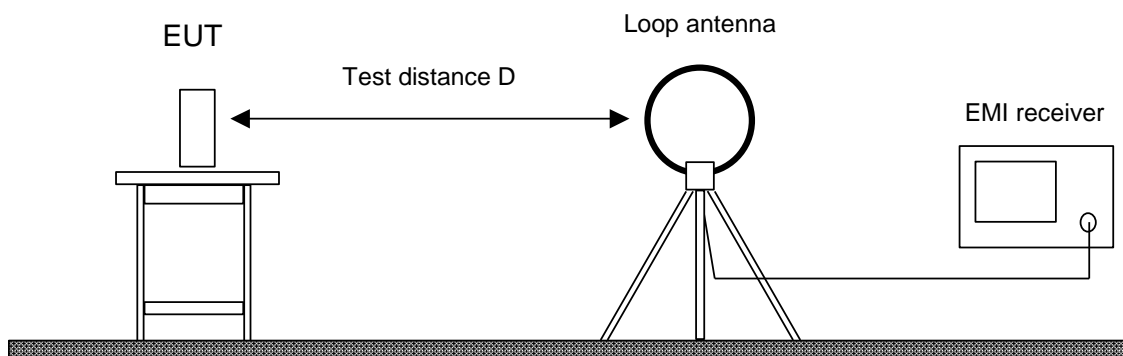
2.1.3 Date of Test

2022-04-07

2.1.4 Test Method

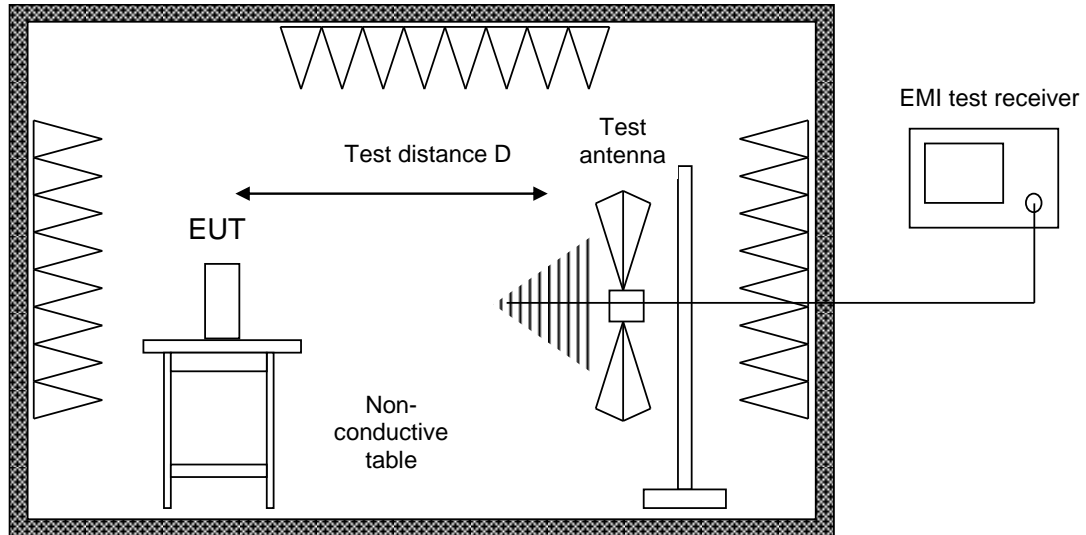
The test was performed in accordance with ANSI C63.10, clause 6.3, 6.4 and 6.5.

Frequency range 9 kHz – 30 MHz



The EUT was placed on a non-conductive table, 0.8 m above the ground. Radiated emissions in the frequency 9 kHz – 30 MHz is measured within a semi-anechoic room with an active loop antenna with the measurement detector set to peak. In addition in the frequency range 9 kHz to 490 kHz also an average detector was used. The measurement bandwidth of the receiver was set to 300 Hz in the frequency range 9 kHz to 150 kHz and 10 kHz in the frequency range 150 kHz to 30 MHz. Prescans were performed in six positions of the EUT. For final measurements the detector was set to CISPR quasi-peak and in addition to CISPR average in the frequency range 9 kHz to 490 kHz with a resolution bandwidth 200 Hz in the frequency range 9 kHz to 150 kHz and 9 kHz in the frequency range 150 kHz to 30 MHz. Final tests were performed immediately after a final frequency and zoom (for drifting disturbances) and maximum adjustment.

Frequency range 30 MHz – 1 GHz



Alternate test site (semi anechoic room)

The EUT was placed on a non-conductive table, 0.8 m above the ground plane. Radiated emissions in the frequency range 30 MHz – 1 GHz is measured within a semi-anechoic room with groundplane complying with the NSA requirements of ANSI C63.4. for alternative test sites. A linear polarised logarithmic periodic antenna combined with a 4:1 broadband dipole (“Trilog broadband antenna”) is used. For prescan tests the test receiver is set to peak-detector with a bandwidth of 120 kHz. With the measurement bandwidth of the test receiver set to 120 kHz CISPR quasi-peak detector is selected for final measurements following immediately after a final frequency zoom (for drifting disturbances) and maximum adjustment.

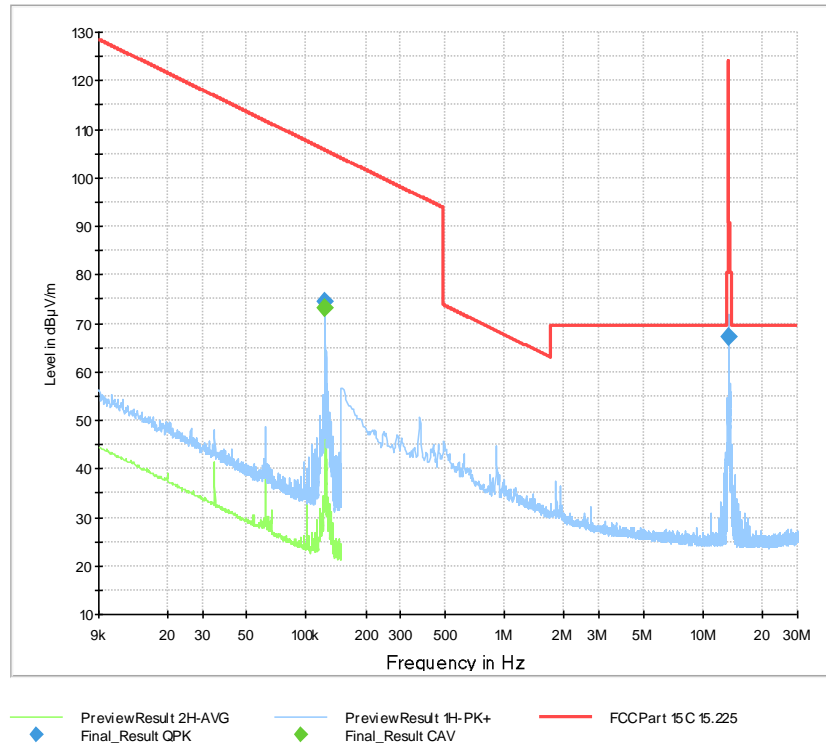
2.1.5 Environmental Conditions

Ambient Temperature 22.0 °C
Relative Humidity 35.0 %

2.1.6 Test Results

5V DC Powered – Continuously transmitting

Measuring distance was 3m.

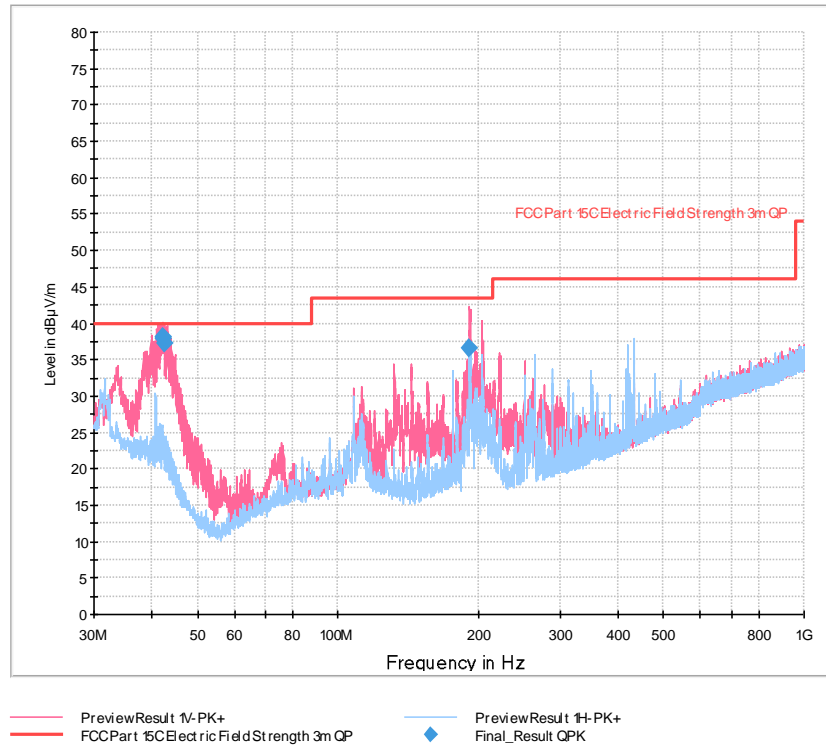


Final Results:

Frequency MHz	QuasiPeak dBµV/m	CAverage dBµV/m	Limit dBµV/m	Margi n dB	Meas. Time ms	Bandwid th (RBW) kHz	VB W kHz	Height cm	P ol	Azimat h deg	Corr. dB/m
0.125000	---	73.01	---	#1	1000.0	0.200	#2	100.0	H	0.0	19.3
0.125000	74.40	---	105.66	#1	1000.0	0.200	#2	100.0	H	0.0	19.3
13.560000	67.20	---	90.50	#1	1000.0	9.000	#2	100.0	H	3.0	18.9

#1: Intentional radiator

#2: default setting is active, that means the ratio resolution bandwidth/video bandwidth (RBW/VBW) is 0.33.



Final Results:

Frequency	QuasiPeak	Limit	Margin	Meas. Time	Bandwidth (RBW)	VBW	Height	Pol	Azimuth	Corr.
MHz	dBµV/m	dBµV/m	dB	ms	kHz	kHz	cm		deg	dB
42.000000	38.15	40.00	1.85	1000.0	120.000	#2	100.0	V	-79.0	18.4
42.240000	37.90	40.00	2.10	1000.0	120.000	#2	100.0	V	-7.0	18.2
42.510000	37.16	40.00	2.84	1000.0	120.000	#2	100.0	V	77.0	18.0
191.970000	36.48	43.50	7.02	1000.0	120.000	#2	100.0	V	-11.0	15.2

#2: default setting is active, that means the ratio resolution bandwidth/video bandwidth (RBW/VBW) is 0.33.



FCC 47 CFR Part 15, Limit Clause 15.225 (a)(b)(c)(d)

(a) The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/meter at 30 m.

(b) 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 m.

(c) 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 m.

(d) 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.

FCC 47 CFR Part 15, Limit Clause 15.209

Frequency (MHz)	Field Strength ($\mu\text{V}/\text{m}$)	Measurement Distance (m)
0.009 to 0.490	2400/F (kHz)	300
0.490 to 1.705	24000/F (kHz)	30
1705 to 30	30	30
30 to 88	100**	3
88 to 216	150**	3
216 to 960	200**	3
Above 960	500	5

Table 5 - FCC Radiated Emission Limit



ISED Canada RSS-210, Limit Clause B.6

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

- (a) 15.848 mW/m (84 dBµV/m) at 30 m, within the band 13.553 – 13.567 MHz.
- (b) 334 µV/m (50.5 dBµV/m) at 30 m, withing the bands 13.410 – 13.553 MHz and 13.567 – 13.710 MHz.
- (c) 106 µV/m (40.5 dBµV/m) at 30 m, within the bands 13.110 – 13.410 MHz and 13.710 – 14.010 MHz.
- (d) RSS-GEN general field strength limits for frequencies outside the band 13.110 – 14.010 MHz.

ISED Canada RSS-GEN, Limit Clause

Frequency	Electric Field Strength (µV/m)	Magnetic Field Strength (H-Field) (µA/m)	Measurement Distance (m)
9 - 490 kHz	2,400/F (F in kHz)	2,400/377F (F in kHz)	300
490 - 1,705 kHz	24,000/F (F in kHz)	24,000/377F (F in kHz)	30
1,705 kHz - 30 MHz	30	N/A	30

Table 6 - ISED Canada Radiated Emission Limit - Less than 30 MHz

Frequency (MHz)	Field Strength (µV/m at 3 m)
30 - 88	100
88 - 216	150
216 - 960	200
> 960	500

Table 7 - ISED Canada Radiated Emission Limit - 30 MHz to 1 GHz

2.1.7 Test Location and Test Equipment Used

This test was carried out in a Semi anechoic room - cabin no. 11.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
EMI test receiver	Rohde&Schwarz	ESU8	19904	12	2023-02-28
ULTRALOG antenna	Rohde&Schwarz	HL562E	39969	36	2025-03-31
Loop antenna	Schwarzbeck	FMZB 1519B	44334	36	2023-01-31
EMC measurement software	Rohde&Schwarz	EMC32 V10.60.20	42986	N/A	N/A

Table 8

TU - Traceability Unscheduled
 O/P Mon – Output Monitored using calibrated equipment
 N/A - Not Applicable



2.2 Frequency Tolerance Under Temperature Variations

2.2.1 Specification Reference

FCC 47 CFR Part 15C, ISED Canada RSS-210 and ISED Canada RSS-GEN, Clause 15.225 (e), B.1 to B.9 and 6.11.

2.2.2 Equipment Under Test and Modification State

10090-640, S/N: 15000176 - Modification State 0

2.2.3 Date of Test

2022-04-27

2.2.4 Test Method

The EUT is installed in an environmental test chamber, the carrier frequency and frequency stability is measured under temperatures and voltage variations.

2.2.5 Environmental Conditions

Ambient Temperature 21.0 °C
 Relative Humidity 40.0 %

2.2.6 Test Results

5V DC Powered – Continuous transmitting

Temperature	Voltage	Measured Frequency (MHz)	Frequency Deviation (%)	Frequency Error (ppm)
-20.0 °C	5.0V	13.560625	0.000457	4.572
-10.0 °C	5.0V	13.560687	0.000000	0.000
0.0 °C	5.0V	13.560687	0.000000	0.000
+10.0 °C	5.0V	13.560687	0.000000	0.000
+20.0 °C	5.0V	13.560687	0.000000	0.000
+30.0 °C	5.0V	13.560625	0.000457	4.572
+40.0 °C	5.0V	13.560625	0.000457	4.572
+50.0 °C	5.0V	13.560625	0.000457	4.572

Table 9 - Frequency Tolerance Under Temperature Variation

Temperature	Voltage	Measured Frequency (MHz)	Frequency Deviation (%)	Frequency Error (ppm)
+20.0 °C	4.65V	13.560687	0.000000	0.000
+20.0 °C	5.0V	13.560687	0.000000	0.000
+20.0 °C	5.35V	13.560687	0.000000	0.000

Table 10 - Frequency Tolerance Under Voltage Variation



FCC 47 CFR Part 15, Limit Clause 15.225 (e)

The frequency tolerance of the carrier signal shall be maintained within ± 0.01 % of the operating frequency.

ISED Canada RSS-210, Limit Clause B.6

Carrier frequency stability shall be maintained to $\pm 0.01\%$ (± 100 ppm)

2.2.7 Test Location and Test Equipment Used

This test was carried out in Non shielded room.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Spectrum Analyzer	Rohde & Schwarz	FSV40	20219	12	2024-02-29
Climatic test chamber	Feutron Klimasimulation	KPK200-2	19868	18	2023-01-31

Table 11

TU - Traceability Unscheduled

O/P Mon – Output Monitored using calibrated equipment

N/A - Not Applicable



2.3 20 dB Bandwidth

2.3.1 Specification Reference

FCC 47 CFR Part 15C, ISED Canada RSS-210 and ISED Canada RSS-GEN, Clause 15.215 (c), N/A and 6.7

2.3.2 Equipment Under Test and Modification State

10090-640, S/N: 15000176 - Modification State 0

2.3.3 Date of Test

2022-04-27

2.3.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 6.9.1.

2.3.5 Environmental Conditions

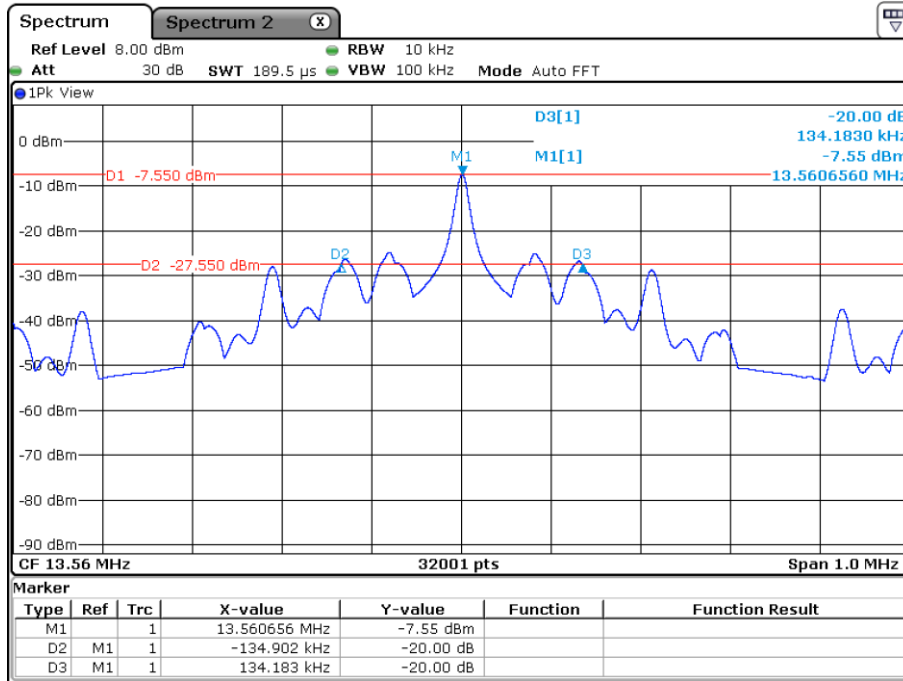
Ambient Temperature 21.0 °C
Relative Humidity 40.0 %

2.3.6 Test Results

5V DC Powered – Continuous transmitting

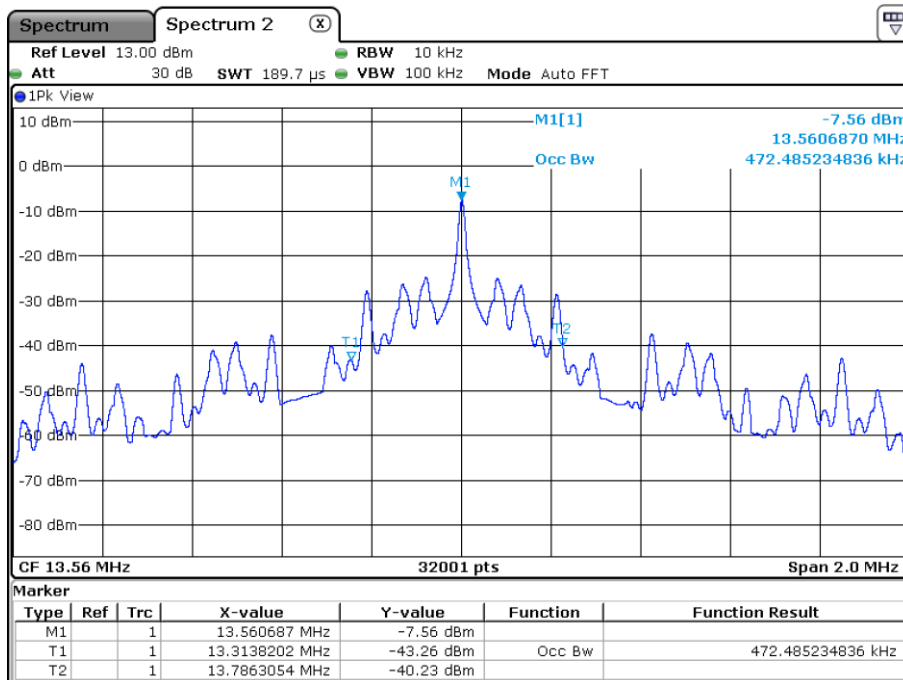
Frequency (MHz)	20 dB Bandwidth (Hz)	99% Occupied Bandwidth (Hz)	F _{LOWER} (MHz)	F _{UPPER} (MHz)
13.56	269085	472485	13.42575	13.69483

Table 12



Date: 27.APR.2022 08:54:45

Figure 1 - 20 dB Bandwidth



Date: 27.APR.2022 08:57:12

Figure 2 - 99% Occupied Bandwidth



FCC 47 CFR Part 15, Limit Clause 15.215 (c)

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.

ISED Canada RSS 210 and ISED Canada RSS GEN, Limit Clause

None specified.

2.3.7 Test Location and Test Equipment Used

This test was carried out in Non shielded room.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Spectrum Analyzer	Rohde & Schwarz	FSV40	20219	12	2024-02-29
Climatic test chamber	Feutron Klimasimulation	KPK200-2	19868	18	2023-01-31

Table 13

TU - Traceability Unscheduled

O/P Mon – Output Monitored using calibrated equipment

N/A - Not Applicable



2.4 Restricted Band Edges

2.4.1 Specification Reference

FCC 47 CFR Part 15C, ISED Canada RSS-210 and ISED Canada RSS-GEN, Clause 15.205, 7.1 and 8.10

2.4.2 Equipment Under Test and Modification State

10090-640, S/N: 15000176 - Modification State 0

2.4.3 Date of Test

2022-04-07

2.4.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 11.13.1.

Plots for average measurements were taken in accordance with ANSI C63.10 clause 4.1.4.2.3.

Final average measurements were taken in accordance with ANSI C63.10 clause 4.1.4.2.2.

2.4.5 Environmental Conditions

Ambient Temperature	22.0 °C
Relative Humidity	31.0 %

2.4.6 Test Results

No restricted band in the range



FCC 47 CFR Part 15, Limit Clause 15.205

	Peak (dB μ V/m)	Average (dB μ V/m)
Restricted Bands of Operation	74	54

Table 14

ISED Canada RSS-GEN, Limit Clause 8.9

Frequency (MHz)	Field Strength (μ V/m at 3 metres)
30-88	100
88-216	150
216-960	200
Above 960*	500

Table 15

*Unless otherwise specified, for all frequencies greater than 1 GHz, the radiated emission limits for licence-exempt radio apparatus stated in applicable RSSs (including RSS-Gen) are based on measurements using a linear average detector function having a minimum resolution bandwidth of 1 MHz. If an average limit is specified for the EUT, then the peak emission shall also be measured with instrumentation properly adjusted for such factors as pulse desensitization to ensure the peak emission is less than 20 dB above the average limit.

2.4.7 Test Location and Test Equipment Used

This test was carried out in a Semi anechoic room - cabin no. 11.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
EMI test receiver	Rohde&Schwarz	ESW44	39897	12	2023-04-30
ULTRALOG antenna	Rohde&Schwarz	HL562E	39969	36	2025-03-31
Loop antenna	Schwarzbeck	FMZB 1519B	44334	36	2023-01-31
EMC measurement software	Rohde&Schwarz	EMC32 V10.50.10	42986	N/A	N/A

Table 16

TU - Traceability Unscheduled
 O/P Mon – Output Monitored using calibrated equipment
 N/A - Not Applicable



2.5 AC Power Line Conducted Emissions

2.5.1 Specification Reference

FCC 47 CFR Part 15C, ISED Canada RSS-210 and ISED Canada RSS-GEN, Clause 15.207, N/A and 8.8

2.5.2 Equipment Under Test and Modification State

10090-640, S/N: 15000177 - Modification State 0

2.5.3 Date of Test

2022-04-27

2.5.4 Test Method

2.5.5 Environmental Conditions

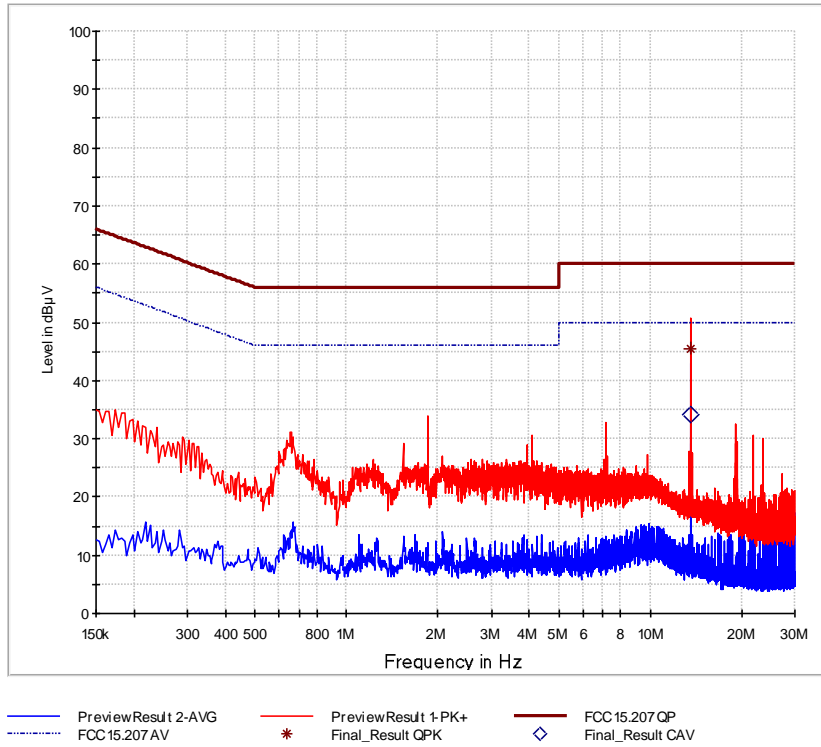
Ambient Temperature	23.0 °C
Relative Humidity	35.0 %

2.5.6 Test Results

5V DC Powered – Continuously transmitting



Line L1 - 150 kHz to 30 MHz

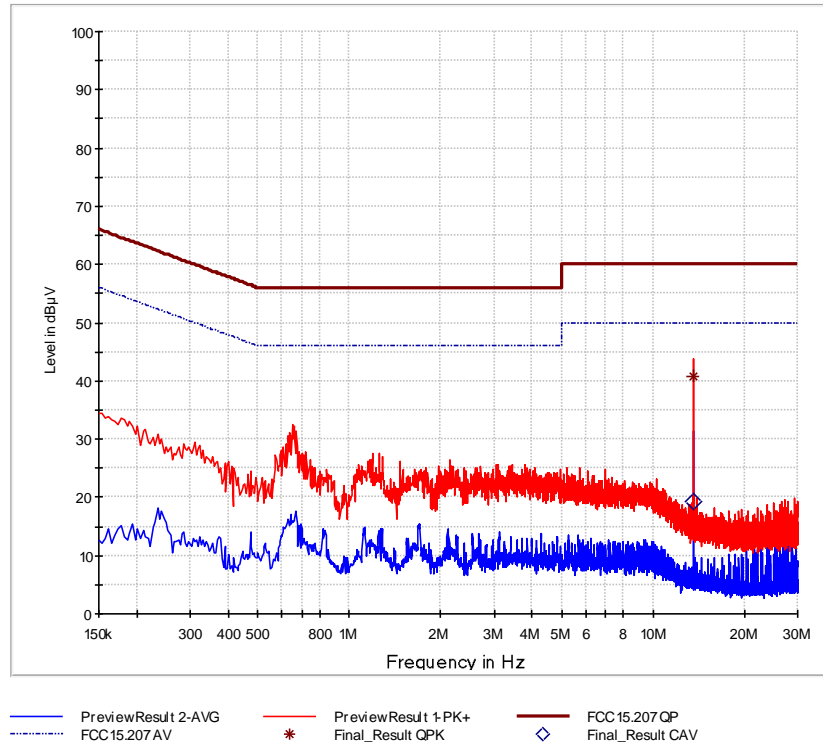


Final Results:

Frequency MHz	QuasiPeak dBµV	CAverage dBµV	Limit dBµV	Margin dB	Meas. Time ms	Bandwidth kHz	Line	Corr. dB
13.562000	---	34.14	50.00	15.86	1000.0	9.000	L1	10.2
13.562000	45.40	---	60.00	14.60	1000.0	9.000	L1	10.2



Line N - 150 kHz to 30 MHz



Final Results:

Frequency MHz	QuasiPeak dBµV	CAverage dBµV	Limit dBµV	Margin dB	Meas. Time ms	Bandwidth kHz	Line	Corr. dB
13.554000	---	19.32	50.00	30.68	1000.0	9.000	N	10.2
13.558000	40.87	---	60.00	19.13	1000.0	9.000	N	10.2



FCC 47 CFR Part 15, Limit Clause 15.207 and ISED Canada RSS-GEN, Limit Clause 8.8

Frequency of Emission (MHz)	Conducted Limit (dB μ V)	
	Quasi-Peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5	56	46
5 to 30	60	50

Table 17

*Decreases with the logarithm of the frequency.

2.5.7 Test Location and Test Equipment Used

This test was carried out in Shielded room - cabin no. 4.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
EMI test receiver	Rohde & Schwarz	ESCI3	19730	18	2022-05-31
V-network	Rohde & Schwarz	ENV216	39908	12	2023-03-31
EMC measurement software	Rohde & Schwarz	EMC32 V10.60.00	44377	N/A	N/A

Table 18

TU - Traceability Unscheduled
 O/P Mon – Output Monitored using calibrated equipment
 N/A - Not Applicable



3 Test Equipment Information

3.1 General Test Equipment Used

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
EMI test receiver	Rohde&Schwarz	ESW44	39897	12	2023-04-30
ULTRALOG antenna	Rohde&Schwarz	HL562E	39969	36	2025-03-31
Loop antenna	Schwarzbeck	FMZB 1519B	44334	36	2023-01-31
EMC measurement software	Rohde&Schwarz	EMC32 V10.50.10	42986	N/A	N/A
EMI test receiver	Rohde & Schwarz	ESCI3	19730	18	2022-05-31
V-network	Rohde & Schwarz	ENV216	39908	12	2023-03-31
EMC measurement software	Rohde & Schwarz	EMC32 V10.60.00	44377	N/A	N/A
Spectrum Analyzer	Rohde & Schwarz	FSV40	20219	12	2024-02-29
Climatic test chamber	Feutron Klimasimulation	KPK200-2	19868	18	2023-02-28

Table 19

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment
N/A - Not Applicable



4 Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

The measurement uncertainty in the laboratory is less than or equal to the maximum measurement uncertainty according to CISPR16-4-2: 2011 + A1 + A2 + Cor1 (U_{CISPR}). This normative regulation means that the measured value is also the value to be assessed in relation to the limit value.

Radio Testing			
Test Name	kp	Expanded Uncertainty	Note
Occupied Bandwidth	2.0	±1.14 %	2
RF-Frequency error	1.96	±1 · 10 ⁻⁷	7
RF-Power, conducted carrier	2	±0.079 dB	2
RF-Power uncertainty for given BER	1.96	+0.94 dB / -1.05	7
RF power, conducted, spurious emissions	1.96	+1.4 dB / -1.6 dB	7
RF power, radiated			
25 MHz – 4 GHz	1.96	+3.6 dB / -5.2 dB	8
1 GHz – 18 GHz	1.96	+3.8 dB / -5.6 dB	8
18 GHz – 26.5 GHz	1.96	+3.4 dB / -4.5 dB	8
40 GHz – 170 GHz	1.96	+4.2 dB / -7.1 dB	8
Spectral Power Density, conducted	2.0	±0.53 dB	2
Maximum frequency deviation			
300 Hz – 6 kHz	2	±2,89 %	2
6 kHz – 25 kHz	2	±0.2 dB	2
Maximum frequency deviation for FM	2	±2,89 %	2
Adjacent channel power 25 MHz – 1 GHz	2	±2.31 %	2
Temperature	2	±0.39 K	4
(Relative) Humidity	2	±2.28 %	2
DC- and low frequency AC voltage			
DC voltage	2	±0.01 %	2
AC voltage up to 1 kHz	2	±1.2 %	2
Time	2	±0.6 %	2

Table 20



Radio Interference Emission Testing			
Test Name	kp	Expanded Uncertainty	Note
Conducted Voltage Emission			
9 kHz to 150 kHz (50Ω/50μH AMN)	2	± 3.8 dB	1
150 kHz to 30 MHz (50Ω/50μH AMN)	2	± 3.4 dB	1
100 kHz to 200 MHz (50Ω/5μH AMN)	2	± 3.6 dB	1
Discontinuous Conducted Emission			
9 kHz to 150 kHz (50Ω/50μH AMN)	2	± 3.8 dB	1
150 kHz to 30 MHz (50Ω/50μH AMN)	2	± 3.4 dB	1
Conducted Current Emission			
9 kHz to 200 MHz	2	± 3.5 dB	1
Magnetic Fieldstrength			
9 kHz to 30 MHz (with loop antenna)	2	± 3.9 dB	1
9 kHz to 30 MHz (large-loop antenna 2 m)	2	± 3.5 dB	1
Radiated Emission			
Test distance 1 m (ALSE)			
9 kHz to 150 kHz	2	± 4.6 dB	1
150 kHz to 30 MHz	2	± 4.1 dB	1
30 MHz to 200 MHz	2	± 5.2 dB	1
200 MHz to 2 GHz	2	± 4.4 dB	1
2 GHz to 3 GHz	2	± 4.6 dB	1
Test distance 3 m			
30 MHz to 300 MHz	2	± 4.9 dB	1
300 MHz to 1 GHz	2	± 5.0 dB	1
1 GHz to 6 GHz	2	± 4.6 dB	1
Test distance 10 m			
30 MHz to 300 MHz	2	± 4.9 dB	1
300 MHz to 1 GHz	2	± 4.9 dB	1
Radio Interference Power			
30 MHz to 300 MHz	2	± 3.5 dB	1
Harmonic Current Emissions			
			4
Voltage Changes, Voltage Fluctuations and Flicker			
			4

Table 21



Immunity Testing			
Test Name	kp	Expanded Uncertainty	Note
Electrostatic Discharges			4
Radiated RF-Field			
Pre-calibrated field level	2	+32.2 / -24.3 %	5
Dynamic feedback field level	2.05	+21.2 / -17.5 %	3
Electrical Fast Transients (EFT) / Bursts			4
Surges			4
Conducted Disturbances, induced by RF-Fields			
via CDN	2	+15.1 / -13.1 %	6
via EM clamp	2	+42.6 / -29.9 %	6
via current clamp	2	+43.9 / -30.5 %	6
Power Frequency Magnetic Field	2	+20.7 / -17.1 %	2
Pulse Magnetic Field			4
Voltage Dips, Short Interruptions and Voltage Variations			4
Oscillatory Waves			4
Conducted Low Frequency Disturbances			
Voltage setting	2	± 0.9 %	2
Frequency setting	2	± 0.1 %	2
Electrical Transient Transmission in Road Vehicles			4

Table 22



Note 1:

The expanded uncertainty reported according to CISPR 16-4-2:2003-11 is based on a standard uncertainty multiplied by a coverage factor of $k_p = 2$, providing a level of confidence of $p = 95.45\%$

Note 2:

The expanded uncertainty reported according to UKAS Lab 34 (Edition 1, 2002-08) is based on a standard uncertainty multiplied by a coverage factor of $k_p = 2$, providing a level of confidence of $p = 95.45\%$

Note 3:

The expanded uncertainty reported according to UKAS Lab 34 (Edition 1, 2002-08) is based on a standard uncertainty multiplied by a coverage factor of $k_p = 2.05$, providing a level of confidence of $p = 95.45\%$

Note 4:

It has been demonstrated that the used test equipment meets the specified requirements in the standard with at least a 95% confidence.

Note 5:

The expanded uncertainty reported according to IEC 61000-4-3 is based on a standard uncertainty multiplied by a coverage factor of $k_p = 2$, providing a level of confidence of $p = 95.45\%$

Note 6:

The expanded uncertainty reported according to IEC 61000-4-6 is based on a standard uncertainty multiplied by a coverage factor of $k_p = 2$, providing a level of confidence of $p = 95.45\%$

Note 7:

The expanded uncertainty reported according to ETSI TR 100 028 V1.4.1 (all parts) is based on a standard uncertainty multiplied by a coverage factor of $k_p = 1.96$, providing a level of confidence of $p = 95.45\%$

Note 8:

The expanded uncertainty reported according to ETSI TR 102 273 V1.2.1 (all parts) is based on a standard uncertainty multiplied by a coverage factor of $k_p = 1.96$, providing a level of confidence of $p = 95.45\%$