

Report on the Testing of the

The coca Cola Company UHF RFID Reader Module/KO310

In accordance with:
FCC 47 CFR part 15.247
ISED RSS-247 Issue 3, August 2023

Prepared for: The Coca-Cola Company
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America

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NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Thierry Jean-Charles	Senior Engineer TUV SUD America Inc.	Authorized Signatory	10/24/2024

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD America, Inc. document control rules.

FCC Accreditation Designation Number US1233
FCC Test Site Registration Number 967699
Innovation, Science, and Economic Development Canada Lab Code 23932

EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with the standards listed above.



A2LA Cert. No. 2955.09

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1 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.

Table 1.1-1 – Modification Record

Issue	Description of Change	Date of Issue
0	First Issue	10/24/2024

1.2 Introduction

The purpose of this report is to demonstrate compliance with Part 15 Subpart C of the FCC's Code of Federal Regulations Section 15.247 and Innovation Science and Economic Development Canada's Radio Standards Specification RSS-247 for the tests documented herein.

Applicant	David Parker
Manufacturer	The Coca-Cola Company
Applicant's Email Address	Davidparker@coca-cola.com
Model Name(s)	UHF RFID Reader Module
Model Number(s)	KO310
Serial Number(s)	NA
FCC ID	2ADIR-KO310
ISED Certification Number	8593A-KO310
Hardware Version(s)	0024566
Software Version(s)	NA
Number of Samples Tested	1
Test Specification/Issue/Date	US Code of Federal Regulation (CFR): Title 47, Part 15, Subpart C: Radio Frequency Devices, Intentional Radiators, 2024 ISED Canada Radio Standards Specification: RSS-247 – Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSs) and License-Exempt Local Area Network (LE-LAN) Devices, Issue 3, August 2023.
Order Number	721003386
Date of Receipt of EUT	8/12/2024
Start of Test	8/12/2024
Finish of Test	9/11/2024



Related Document(s)

ANSI C63.10-2013: American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Device.

FCC OET KDB 558074 D01 15.247 Meas Guidance v05r02: Guidance for Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid System Devices Operating under Section 15.247 of the FCC Rules, April 2, 2019

US Code of Federal Regulations (CFR): Title 47, Part 2, Subpart J: Equipment Authorization Procedures, 2024.

ISED Canada Radio Standards Specification: RSS-GEN – General Requirements for Compliance of Radio Apparatus, Issue 5, Amendment 1 (March 2019), Amendment 2 (February 2021)



1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC Part 15.247 and ISED Canada's RSS-247 is shown below.

Table 1.3-1: Test Result Summary

Test Parameter	Test Plan (Yes/No)	Test Result	FCC 47 CFR Rule Part	ISED Canada's RSS	Test Report Page No
Antenna Requirement	Yes	Pass	15.203, 15.204	-----	13
Carrier Frequency Separation	Yes	Pass	15.247(a)(1)	RSS-247 5.1(b)	19
Number of Hopping Channels	Yes	Pass	15.247(a)(1)(i)	RSS-247 5.1(c)	21
Channel Dwell Time	No	Not Tested	15.247(a)(1)(i)	RSS-247 5.1(c)	24
20 dB Bandwidth	Yes	Pass	15.247(a)(1)(i)	RSS-247 5.1(c)	25
99% Bandwidth	Yes	Pass	-----	RSS-GEN 6.7	25
Peak Output Power	Yes	Pass	15.247(b)(2)	RSS-247 5.4(a)	17
Band-Edge Compliance of RF Conducted Emissions	Yes	Pass	15.247(d)	RSS-247 5.5	31
RF Conducted Spurious Emissions	Yes	Pass	15.247(d)	RSS-247 5.5	36
Radiated Spurious Emissions into Restricted Frequency Bands	Yes	Pass	15.205, 15.209	RSS-GEN 8.9, 8.10	39
Power Line Conducted Emissions	Yes	Pass	15.207	RSS-GEN 8.8	14

1.4 Product Information

1.4.1 Technical Description

KO310 27dBm UHF RFID Reader Module

Table 1.4-1 – Wireless Technical Information

Detail	Description
FCC ID	2ADIR-KO310
ISED Certification Number	8593A-KO310
Model Name/Number(s)	UHF RFID Reader Module/KO310
Frequency Range	902.75-927.25 MHz
Modulation Format	PR-ASK
Antenna Type / Gain:	Antenna 1: Trace/ -33.02 dBi Antenna 2: Trace / -33.02 dBi Antenna 3: Trace / -31.16 dBi Antenna 4: Trace / 0.41 dBi Antenna 5: Trace / -36.98 dBi Antenna 6: Trace / -36.53 dBi

A full description and detailed product specification details are available from the manufacturer.

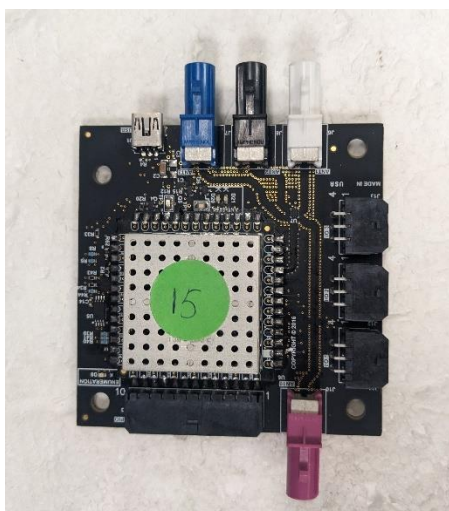


Figure 1.4.1-1: Front View of the EUT

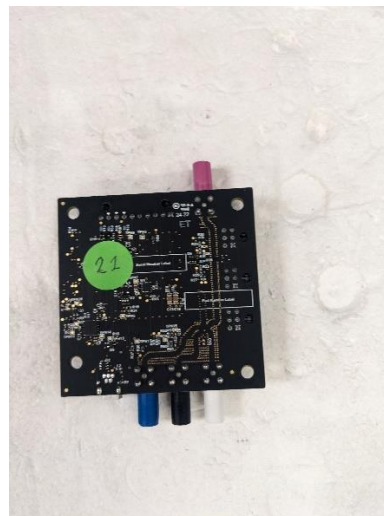


Figure 1.4.1-2: Rear View of the EUT

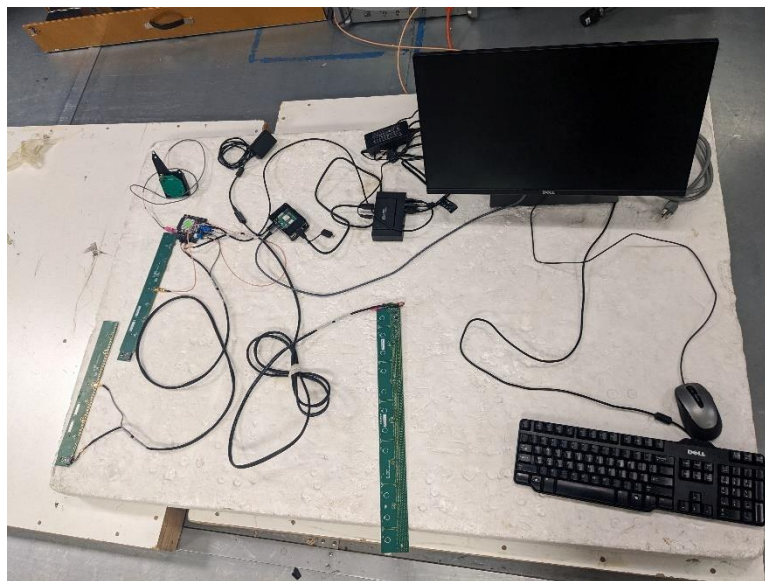


Figure 1.4.1-3: EUT with Support Equipment & Antennas

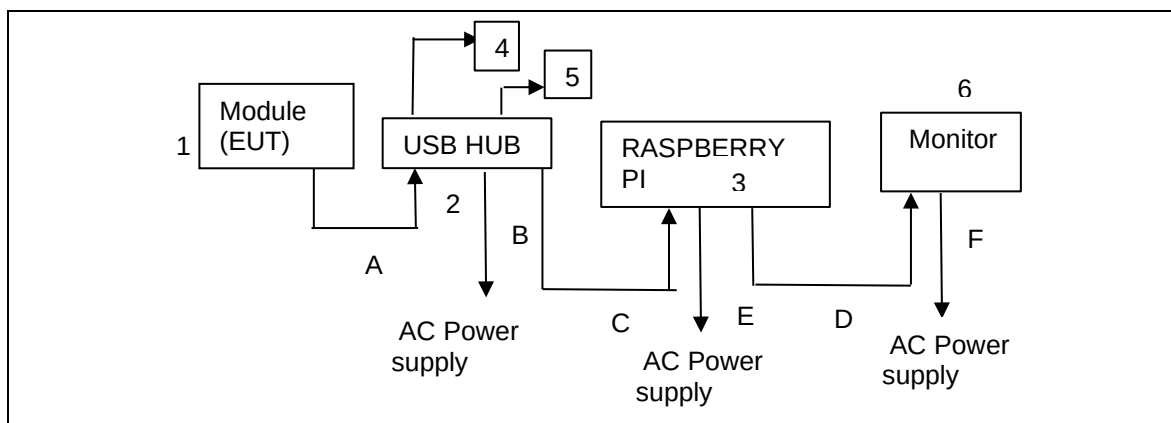


Figure 1.4.1-4 – Test Setup Block Diagram

Table 1.4.1-1 – Cable Descriptions

Item	Cable/Port	Description
A	USB Cable	Cable connected to USBC Hub
B	Power Supply	ULL AC Power Supply Cable
C	USB Cable	Cable connected from USB Hub to Raspberry Pi
D	HDMI	Raspberry PI – Monitor HDMI Cable
E	AC Adapter Cable	Canakit AC Power Adapter Cable
F	AC Power Source	Power Supply Cable

**Table 1.4.1-2 – Equipment Descriptions**

Item	Make/Model	Description
1	EUT	UHF RFID Reader Module
2	USBC-HUB7BC	USBC HUB
3	Canakit	Raspberry PI
4	Dell	Keyboard
5	Microsoft	Mouse
6	DELL	Monitor

1.4.2 Modes of Operation

KO310 is a UHF RFID Reader Module which supports 902.75 – 927.25 MHz frequency range.

This test report documents the compliance of the 900 MHz Frequency Hopping Spread Spectrum transceiver mode of operation. This model contains 4 ports with six trace type of antennas.

1.4.3 Monitoring of Performance

For radiated emissions, the EUT was evaluated in its worst-case orientation, as well as the worst-case orientation for all 6 antennas specified by the client. See test setup photos for more information. The EUT was programmed to generate a continuously modulated signal on each channel evaluated.

For Radiated Spurious Emission, duty cycle correction factor is considered to the average measurements for above 1 GHz measurements.

Duty Cycle: 2% (Declared by the client)

Duty Cycle Correction Factor = $20 * \text{LOG}(0.02)$

= -33.98 dB

For RF conducted measurements, the EUT was connected to the test equipment with a Fakra PCB Mount connector to SMA connector and evaluated all the 4 ports.



The worst-case mode for all parameters measured is listed below:

Antenna	Port	Classification	20dB/99% Bandwidth	Number of Hopping Channels	Carrier Frequency Separation	Peak Output Power	RF Conducted Spurious Emissions	Band-Edge RF Conducted Emissions	RSE into Restricted Frequency Bands
1	1	FHSS	*	*	*	*	*	*	**
2	2	FHSS	*	*	*	*	*	*	*
3	3	FHSS	*	*	*	*	*	*	*
4	0	FHSS	*	*	*	*	*	*	*
5	1	FHSS	***	***	***	***	***	***	*
6	3	FHSS	***	***	***	***	***	***	*

* Evaluated for all the ports & Antennas

**Addressed by Antenna Port 2

***Addressed by Antenna Port 1 & 3

Power setting during test: Power Setting : 27dBm

1.4.4 Antennas Information

Antenna (EUT)	Antenna Type	Antenna Port	Image
*1	Trace	1	
*2	Trace	2	
3	Trace	3	
4	Trace	0	
5	Trace	1	

6	Trace	3	
---	-------	---	--

Note: “*” - Antennas 1 and 2 are identical. Therefore, RSE pre-scans were performed to determine the worst-case antenna. Based on the pre-scan results, Antenna 2 is the worst case for RSE evaluation.



1.5 Deviations from the Standard

No deviations from the applicable test standard were made during testing.

1.6 EUT Modification Record

The table below details modifications made to the EUT during the test program. 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	Initial State		

The equipment was tested as provided without any modifications.

1.7 Test Location

TÜV SÜD conducted the following tests at our Alpharetta, GA test laboratory.

Test Name	Name of Engineer(s)	Accreditation
Antenna Requirement	Divya Adusumilli	A2LA
Power Line Conducted Emissions	Divya Adusumilli	A2LA
Peak Output Power	Divya Adusumilli	A2LA
Carrier Frequency Separation	Divya Adusumilli	A2LA
Number of Hopping Channels	Divya Adusumilli	A2LA
20dB / 99% Bandwidth	Divya Adusumilli	A2LA
Band-Edge Compliance of RF Conducted Emissions	Divya Adusumilli	A2LA
RF Conducted Spurious Emissions	Divya Adusumilli	A2LA
Radiated Spurious Emissions into Restricted Frequency Bands	Bhagyashree Chaudhary	A2LA

Office address:
TÜV SÜD America
5945 Cabot Parkway, Suite 100
Alpharetta, GA 30005, USA



2 Test Details

2.1 Antenna Requirement

2.1.1 Specification Reference

FCC Section: 15.203, 15.204

2.1.2 Equipment Under Test and Modification State

As shown in §1.4 with modification state "0", as noted in §1.6.

2.1.3 Date of Observation

8/27/2024

2.1.4 Test Method

N/A

2.1.5 Environmental Conditions

N/A

2.1.6 Observation

The EUT is designed to be affixed to a PCB substrate that provides connectivity to one or more antennas. All PCB traces between the module and antenna(s) shall be accomplished via a microstrip or stripline transmission lines with characteristic impedance of 50 ohms +/- 10%. The antennas connect to the PCB using 50 ohm Fakra connectors having a maximum antenna gain of less than 0.41 dBi, therefore satisfying the requirements of Section 15.203.



2.2 Power Line Conducted Emissions

2.2.1 Specification Reference

FCC Section: 15.207
ISED Canada: RSS-Gen 8.8

2.2.2 Equipment Under Test and Modification State

As shown in §1.4 with modification state “0”, as noted in §1.6.

2.2.3 Date of Test

9/11/2024

2.2.4 Test Method

ANSI C63.10 section 6 was the guiding document for this evaluation. Conducted emissions were performed from 150kHz to 30MHz with the spectrum analyzer's resolution bandwidth set to 9kHz and the video bandwidth set to 30kHz. The calculation for the conducted emissions is as follows:

Corrected Reading = Analyzer Reading + LISN Loss + Cable Loss
Margin = Corrected Reading - Applicable Limit

2.2.5 Environmental Conditions

The EUT was evaluated within the temperature, humidity and pressure range of the EUT as specified by the standard. The laboratory shall have an ambient temperature range of 15°C to 35°C, relative humidity range of 30% to 60% and atmospheric pressure range of 86 kPa to 106 kPa.

Ambient Temperature	23 °C
Relative Humidity	48 %
Atmospheric Pressure	972.2 mbar



2.2.6 Test Results

TUV SUD America

Conducted RF Emissions, 150 kHz to 30 MHz

Line Under Test Number 1 Results

EUT Name - 721003386 - Coca-Cola

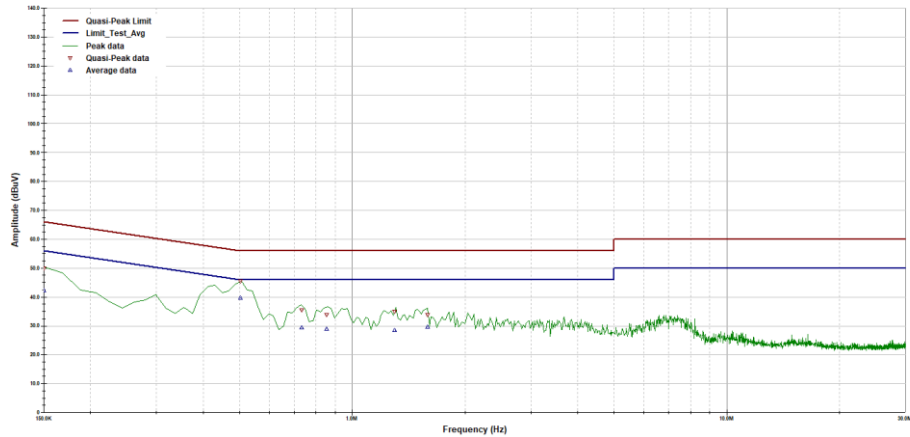
Model Number - CCI

Part Number - N/A

Serial Number - N/A

Voltage - FCC/IC Class B; 120Vac/60Hz

Operating Mode - 907.25MHz Ant Port 0.TX ON



Operator: Diviya

AC Mains Class B All ports terminated Port 0.ill

Last Data Update 12:10:34 PM, Wednesday, September 11, 2024

Temperature = 25C

Relative Humidity = 47%

RF Bandwidth: 9kHz

VBW if Analyzer: 30kHz

Figure 2.2.6-1: Conducted Emission Plot – Line 1

TUV SUD America

Conducted RF Emissions, 150 kHz to 30 MHz

Line Under Test Number 2 Results

EUT Name - 721003386 - Coca-Cola

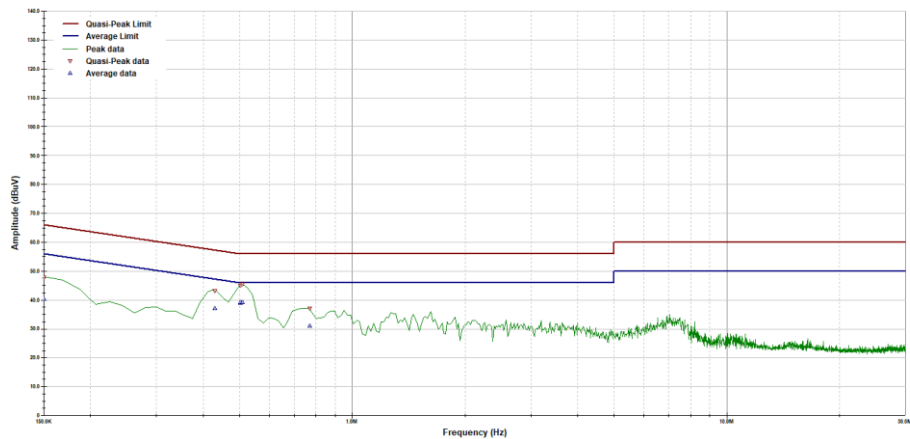
Model Number - CCI

Part Number - N/A

Serial Number - N/A

Voltage - FCC/IC Class B; 120Vac/60Hz

Operating Mode - 907.25MHz Ant Port 0.TX ON



Operator: Diviya

AC Mains Class B All ports terminated Port 0.ill

Last Data Update 12:17:53 PM, Wednesday, September 11, 2024

Temperature = 25C

Relative Humidity = 47%

RF Bandwidth: 9kHz

VBW if Analyzer: 30kHz

Figure 2.2.6-2: Conducted Emission Plot – Neutral

**Table 2.2.6-1: Conducted EMI Results-Avg – Line 1**

Frequency	Avg Limit	Avg Level Corr	Avg Level	CF	Avg Margin	Result
MHz	dBuV	dBuV	dBuV	dB	dB	
0.15	56	42.1	32.5	9.629	-13.9	PASS
0.5	46	39.7	30	9.647	-6.3	PASS
0.73	46	29.5	19.8	9.657	-16.5	PASS
0.85	46	28.9	19.3	9.661	-17.1	PASS
1.3	46	28.5	18.8	9.667	-17.5	PASS
1.59	46	29.7	20	9.672	-16.3	PASS

Table 2.2.6-2: Conducted EMI Results-QP – Line 1

Frequency	QP Limit	QP Level Corr	QP Level	CF	QP Margin	Result
MHz	dBuV	dBuV	dBuV	dB	dB	
0.15	66	50	40.3	9.629	-16	PASS
0.5	56	45.6	36	9.647	-10.4	PASS
0.73	56	35.4	25.7	9.657	-20.6	PASS
0.85	56	33.7	24.1	9.661	-22.3	PASS
1.3	56	35	25.4	9.667	-21	PASS
1.59	56	33.8	24.1	9.672	-22.2	PASS

Table 2.2.6-3: Conducted EMI Results-Avg – Neutral

Frequency	Avg Limit	Avg Level Corr	Avg Level	CF	Avg Margin	Result
MHz	dBuV	dBuV	dBuV	dB	dB	
0.15	56	40.3	30.7	9.626	-15.7	PASS
0.43	48	37.1	27.5	9.626	-10.9	PASS
0.5	46	39	29.4	9.627	-7	PASS
0.5	46	39.1	29.4	9.627	-6.9	PASS
0.51	46	39.3	29.6	9.628	-6.7	PASS
0.77	46	31.1	21.4	9.639	-14.9	PASS

Table 2.2.6-4: Conducted EMI Results-QP – Neutral

Frequency	QP Limit	QP Level Corr	QP Level	CF	QP Margin	Result
MHz	dBuV	dBuV	dBuV	dB	dB	
0.15	66	47.9	38.2	9.626	-18.1	PASS
0.43	58	43.1	33.5	9.626	-14.9	PASS
0.5	56	44.9	35.3	9.627	-11.1	PASS
0.5	56	44.9	35.3	9.627	-11.1	PASS
0.51	56	45.4	35.8	9.628	-10.6	PASS
0.77	56	37	27.4	9.639	-19	PASS



2.3 Peak Output Power

2.3.1 Specification Reference

FCC Sections: 15.247(b)(2)
ISED Canada: RSS-247 5.4(a)

2.3.2 Equipment Under Test and Modification State

As shown in §1.4 with modification state "0", as noted in §1.6.

2.3.3 Date of Test

08/12/2024

2.3.4 Test Method

The maximum conducted peak output power was measured in accordance with ANSI C63.10 Subclause 7.8.5 Method PKPM (Peak Power meter). The RF output port of the EUT was directly connected to the input of a peak power meter. The resulting peak value was recorded.

2.3.5 Environmental Conditions

The EUT was evaluated within the temperature, humidity and pressure range of the EUT as specified by the standard. The laboratory shall have an ambient temperature range of 15°C to 35°C, relative humidity range of 30% to 60% and atmospheric pressure range of 86 kPa to 106 kPa.

Ambient Temperature	22.3 °C
Relative Humidity	53.8 %
Atmospheric Pressure	972.2 mbar

2.3.6 Test Results

Test Summary: EUT was set to transmit mode as per sections 1.4.2 / 1.4.3.

Test Results: Pass

See data below for detailed results.



Table 2.3.6-1: RF Output Power

Frequency [MHz]	Peak Output Power (dBm)	E.I.R.P (dBm)	Antenna Port
902.75	26.57	26.98	0
914.75	26.46	26.87	0
927.25	26.48	26.89	0
902.75	26.73	27.14	1
914.75	26.63	27.04	1
927.25	26.61	27.02	1
902.75	26.82	27.23	2
914.75	26.77	27.18	2
927.25	26.62	27.03	2
902.75	26.76	27.17	3
914.75	26.68	27.09	3
927.25	26.52	26.93	3



2.4 Carrier Frequency Separation

2.4.1 Specification Reference

FCC Sections: 15.247(a)(1)
ISED Canada: RSS-247 5.1(b)

2.4.2 Equipment Under Test and Modification State

As shown in §1.4 with modification state “0”, as noted in §1.6.

2.4.3 Date of Test

08/12/2024

2.4.4 Test Method

The RF output port of the EUT was directly connected to the input of the spectrum analyzer with suitable attenuation. The span of the spectrum analyzer was set wide enough to capture two adjacent peaks and the RBW started at approximately 30% of the channel spacing and adjusted as necessary to best identify the center of each individual channel. The VBW was set to $\geq$ RBW.

2.4.5 Environmental Conditions

The EUT was evaluated within the temperature, humidity and pressure range of the EUT as specified by the standard. The laboratory shall have an ambient temperature range of 15°C to 35°C, relative humidity range of 30% to 60% and atmospheric pressure range of 86 kPa to 106 kPa.

Ambient Temperature	22.3 °C
Relative Humidity	53.8 %
Atmospheric Pressure	972.2 mbar

2.4.6 Test Results

Test Summary: EUT was set to transmit mode as per sections 1.4.2 / 1.4.3.

Test Results: Pass

See below plots for detailed results.

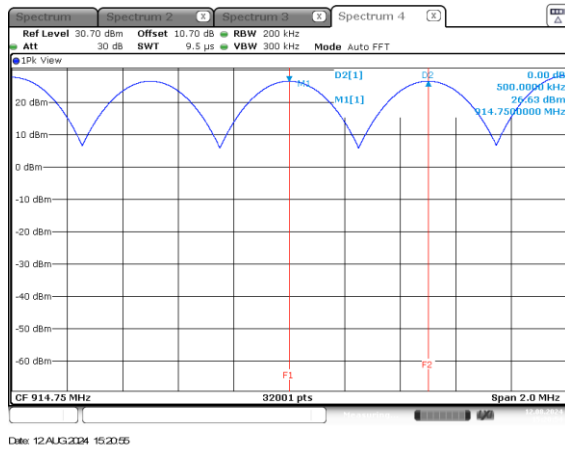


Figure 2.4.6-1: Channel Separation – Port 0

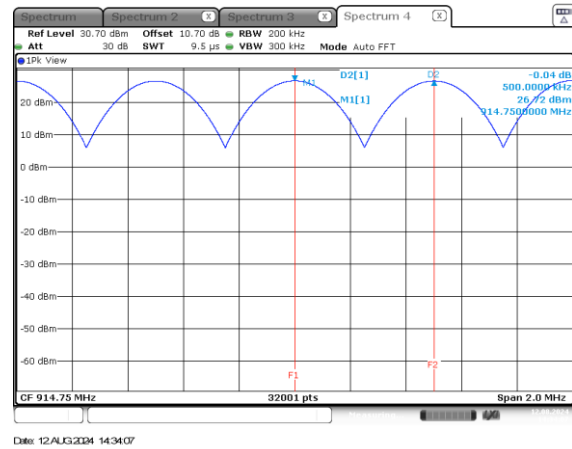


Figure 2.4.6-2: Channel Separation – Port 1

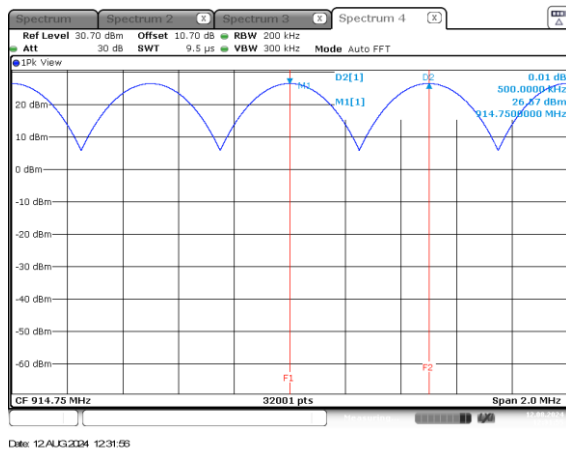


Figure 2.4.6-3: Channel Separation – Port 2

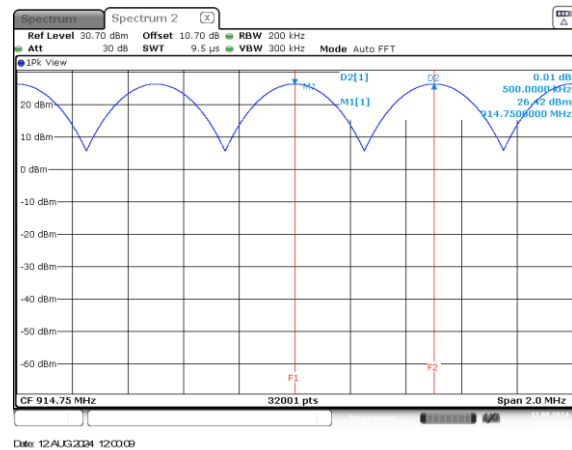


Figure 2.4.6-4: Channel Separation – Port 3



2.5 Number of Hopping Channels

2.5.1 Specification Reference

FCC Sections: 15.247(a)(1)(i)
ISED Canada: RSS 247 5.1 (c)

2.5.2 Equipment Under Test and Modification State

As shown in §1.4 with modification state “0”, as noted in §1.6.

2.5.3 Date of Test

08/12/2024

2.5.4 Test Method

The RF output port of the EUT was directly connected to the input of the spectrum analyzer with suitable attenuation. The span of the spectrum analyzer was set wide enough to capture the frequency band of operation. The RBW was set to less than 30% of the channel spacing or the 20dB bandwidth, whichever is smaller. The VBW was set to $\geq$ RBW.

2.5.5 Environmental Conditions

The EUT was evaluated within the temperature, humidity and pressure range of the EUT as specified by the standard. The laboratory shall have an ambient temperature range of 15°C to 35°C, relative humidity range of 30% to 60% and atmospheric pressure range of 86 kPa to 106 kPa.

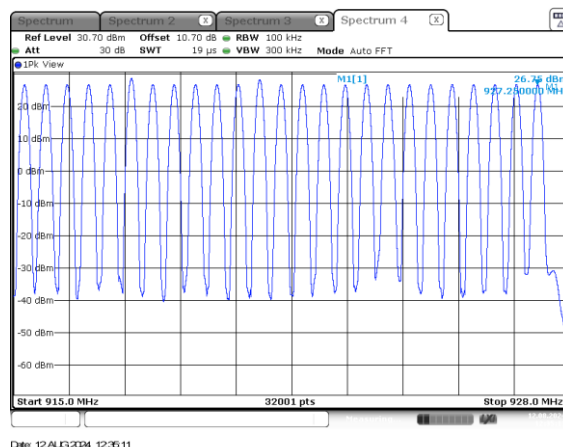
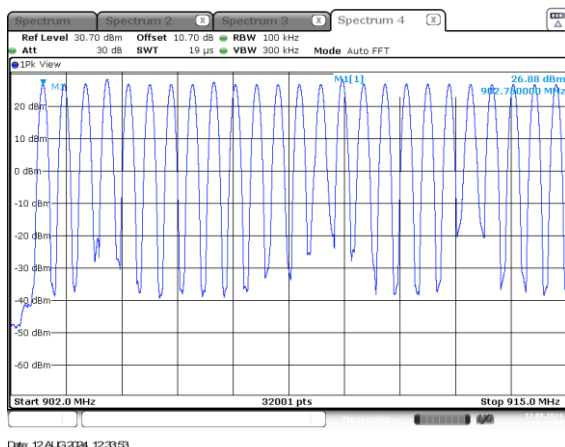
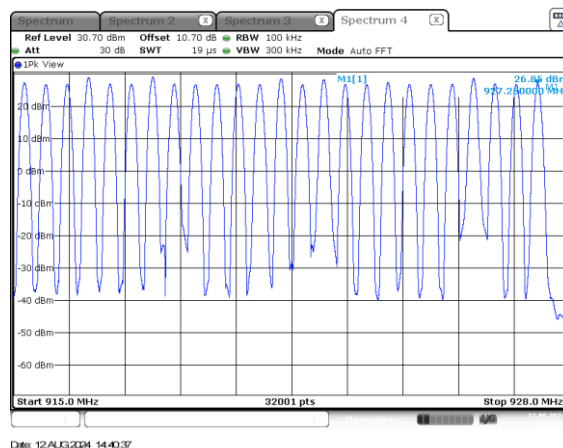
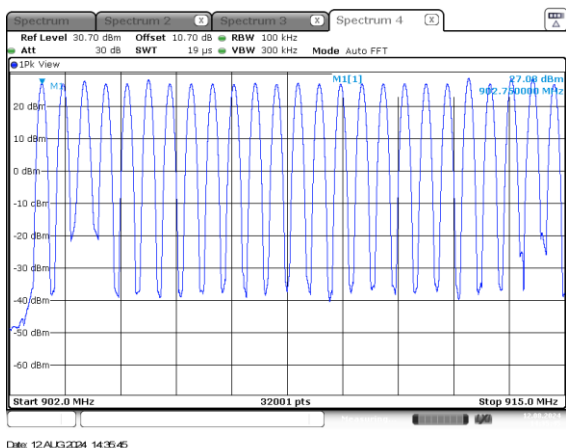
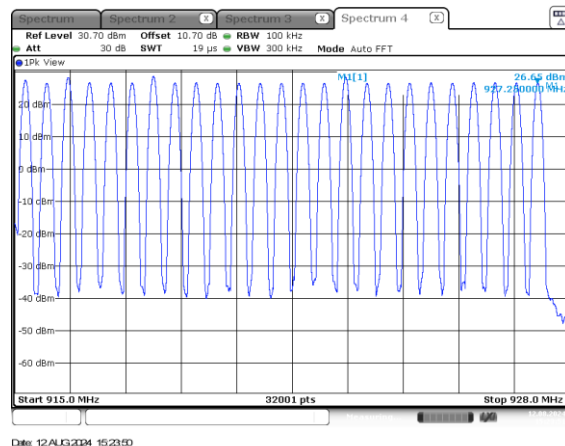
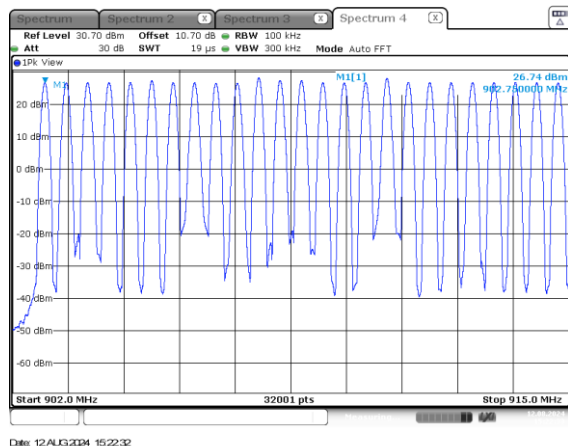
Ambient Temperature	22.3 °C
Relative Humidity	53.8 %
Atmospheric Pressure	972.2 mbar

2.5.6 Test Results

Test Summary: EUT was set to transmit mode as per sections 1.4.2 / 1.4.3.

Test Results: Pass

See below plots for detailed results.



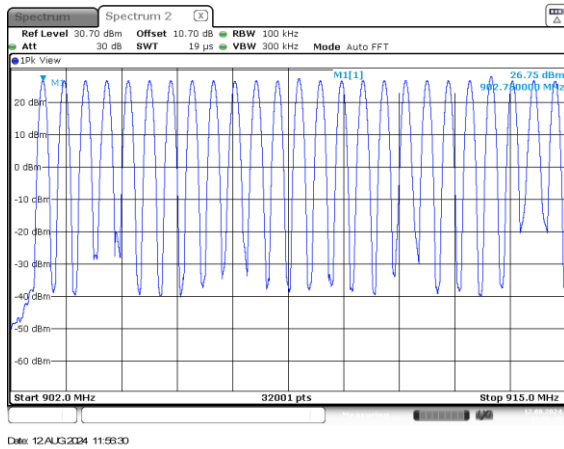


Figure 2.5.6-7: Port 3 (50 Channels)

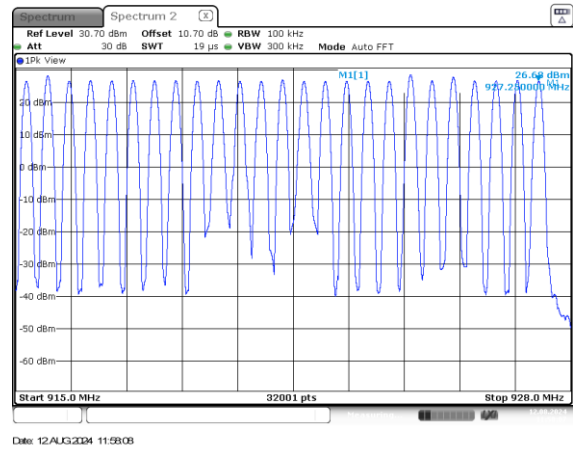


Figure 2.5.6-8: Port 3 (50 Channels)



2.6 Channel Dwell Time

2.6.1 Specification Reference

FCC Sections: 15.247(a)(1)(i)
ISED: RSS-247 5.1(c)

2.6.2 Equipment Under Test and Modification State

As shown in §1.4 with modification state "0", as noted in §1.6.

2.6.3 Date of Test

Not Tested

2.6.4 Test Method

N/A

2.6.5 Environmental Conditions

N/A

2.6.6 Test Results

The EUT test mode does not generate a worst-case channel dwell time therefore a detailed engineering analysis is provided by the client in the theory of operation for FHSS mode of operation.



2.7 20dB / 99% Bandwidth

2.7.1 Specification Reference

FCC Sections: 15.247(a)(1)(i)
ISED Canada: RSS-247 5.1(c), RSS-GEN 6.7

2.7.2 Equipment Under Test and Modification State

As shown in §1.4 with modification state "0", as noted in §1.6.

2.7.3 Date of Test

08/12/2024

2.7.4 Test Method

The RF output port of the EUT was directly connected to the input of the spectrum analyzer with suitable attenuation. The span of the spectrum analyzer display was set between two times and five times the occupied bandwidth (OBW) of the emission. The RBW of the spectrum analyzer was set to approximately 1 % to 5 % of the OBW. The trace was set to max hold with a peak detector active. The Delta and ndB down functions of the analyzer were utilized to determine the 20 dB bandwidth of the emission.

The occupied bandwidth measurement function of the spectrum analyzer was used to measure the 99% bandwidth. The span of the analyzer was set to capture all products of the modulation process, including the emission sidebands. The resolution bandwidth was set to 1% to 5% of the occupied bandwidth. The video bandwidth was set to 3 times the resolution bandwidth. A peak detector was used.

2.7.5 Environmental Conditions

The EUT was evaluated within the temperature, humidity and pressure range of the EUT as specified by the standard. The laboratory shall have an ambient temperature range of 15°C to 35°C, relative humidity range of 30% to 60% and atmospheric pressure range of 86 kPa to 106 kPa.

Ambient Temperature	22.3 °C
Relative Humidity	53.8 %
Atmospheric Pressure	972.2 mbar

2.7.6 Test Results

Test Summary: EUT was set to transmit mode as per sections 1.4.2 / 1.4.3.

Test Results: Pass

See data below for detailed results.

Table 2.7.6-1: 20dB / 99% Bandwidth

Frequency [MHz]	20dB Bandwidth (kHz)	99% Bandwidth (kHz)	Antenna Port
902.75	106.7	101.2	0
914.75	106.4	100.6	0
927.25	107.0	100.8	0
902.75	107.0	100.6	1
914.75	107.0	100.3	1
927.25	106.9	100.4	1
902.75	107.0	101.0	2
914.75	106.8	100.1	2
927.25	107.0	100.4	2
902.75	107.0	100.9	3
914.75	106.8	100.5	3
927.25	107.0	100.7	3

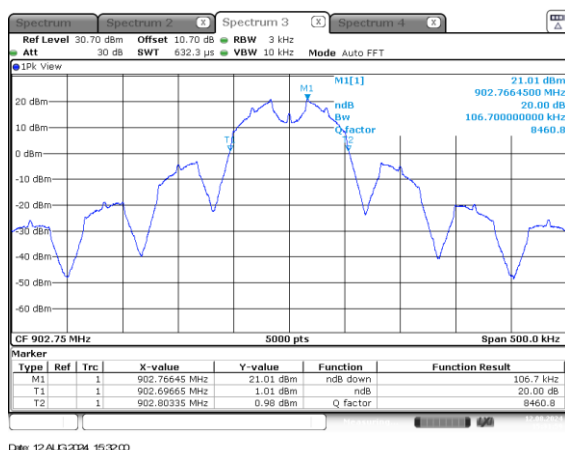


Figure 2.7.6-1: 20 dB BW – LCH – Port 0

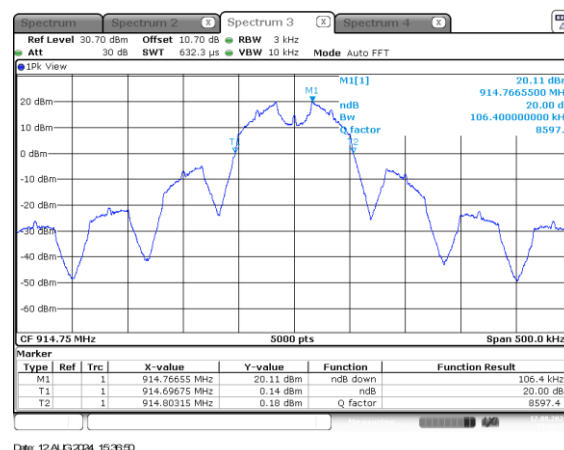
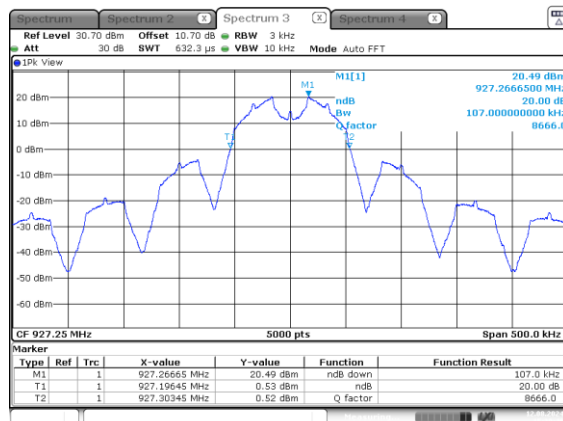
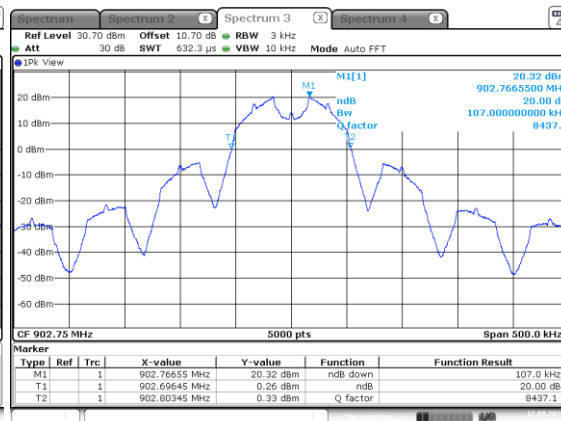


Figure 2.7.6-2: 20 dB BW – MCH – Port 0



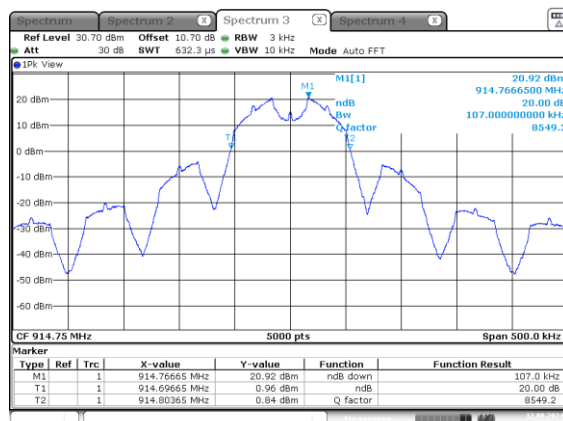
Date: 12.AUG.2024 15:39:45

Figure 2.7.6-3: 20 dB BW – HCH – Port 0



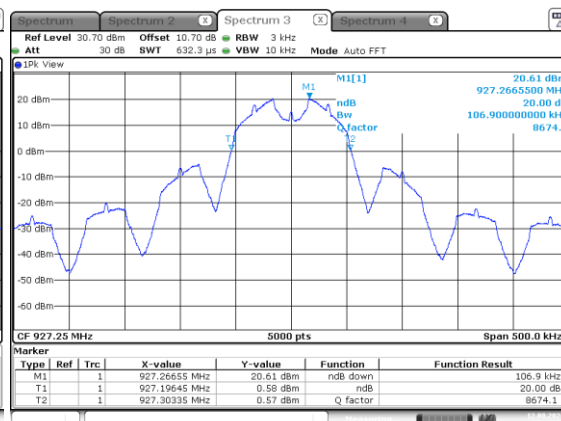
Date: 12.AUG.2024 14:47:45

Figure 2.7.6-4: 20 dB BW – LCH – Port 1



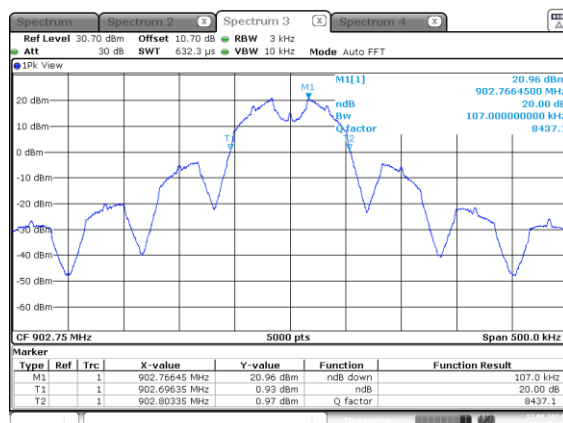
Date: 12.AUG.2024 14:53:37

Figure 2.7.6-5: 20 dB BW – MCH – Port 1



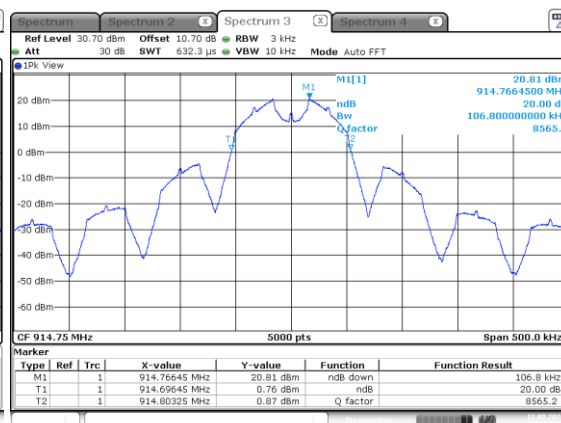
Date: 12.AUG.2024 15:18:21

Figure 2.7.6-6: 20 dB BW – HCH – Port 1



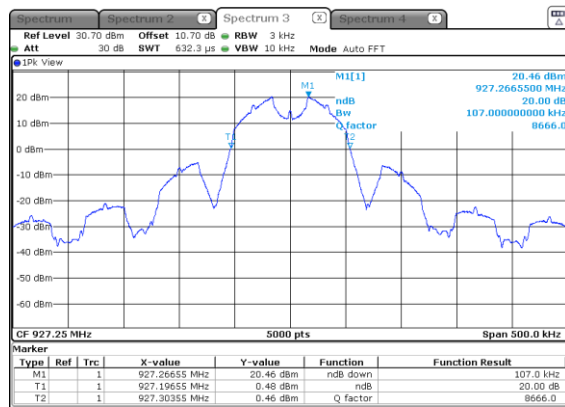
Date: 12.AUG.2024 12:40:42

Figure 2.7.6-7: 20 dB BW – LCH – Port 2



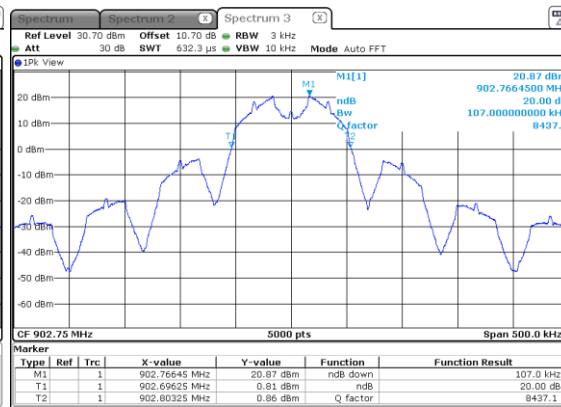
Date: 12.AUG.2024 13:48:02

Figure 2.7.6-8: 20 dB BW – MCH – Port 2



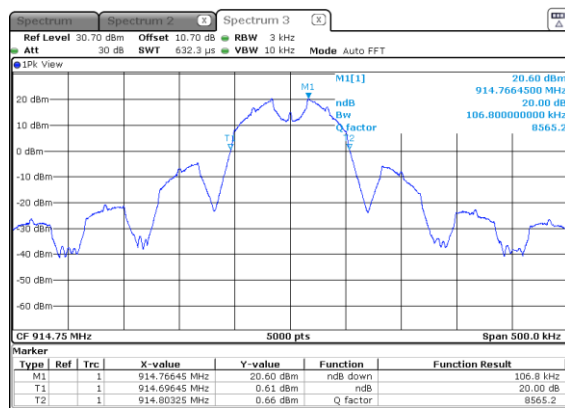
Date: 12.AUG.2024 14:30:52

Figure 2.7.6-9: 20 dB BW – HCH – Port 2



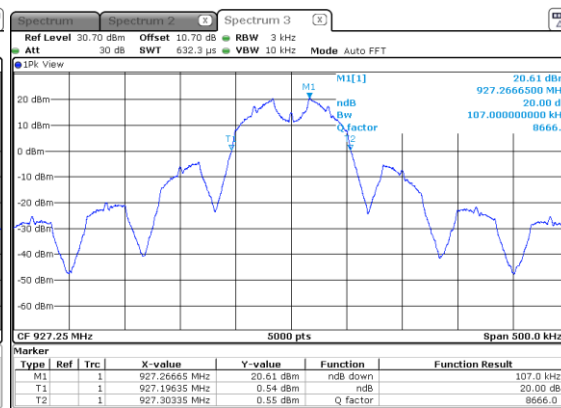
Date: 12.AUG.2024 12:16:00

Figure 2.7.6-10: 20 dB BW – LCH – Port 3



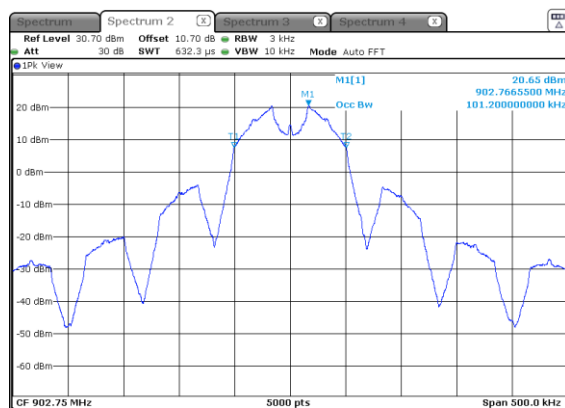
Date: 12.AUG.2024 12:21:32

Figure 2.7.6-11: 20 dB BW – MCH – Port 3



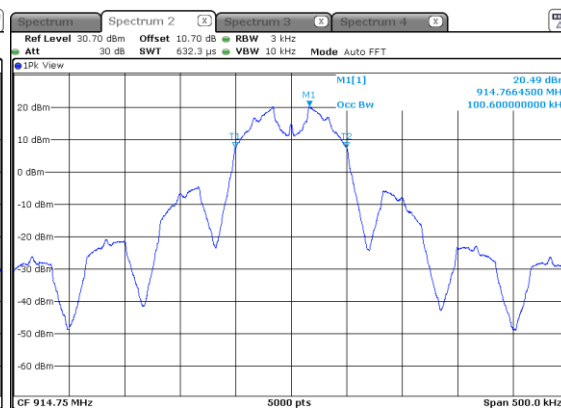
Date: 12.AUG.2024 12:25:05

Figure 2.7.6-12: 20 dB BW – HCH – Port 3



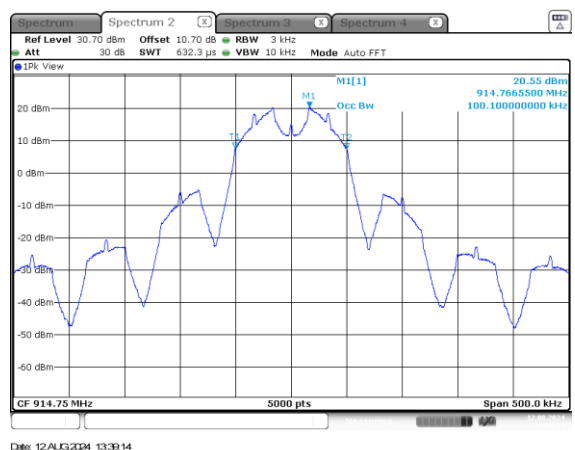
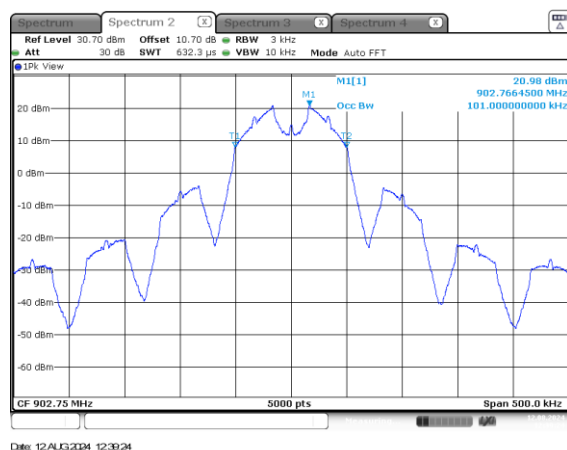
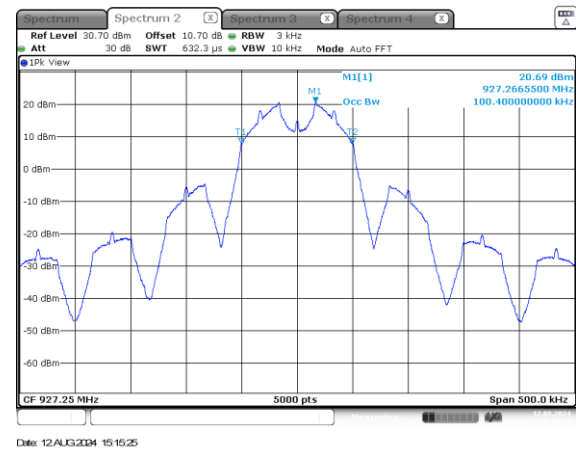
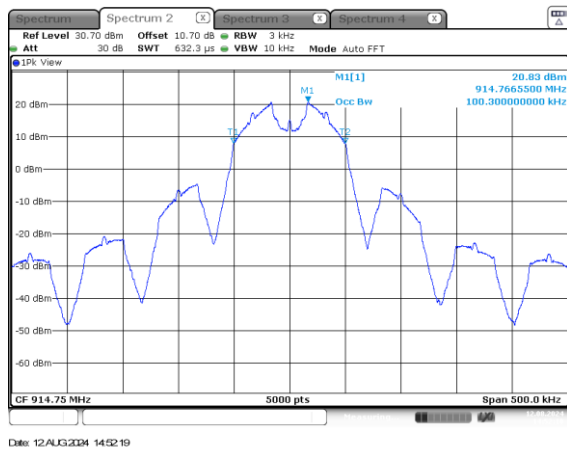
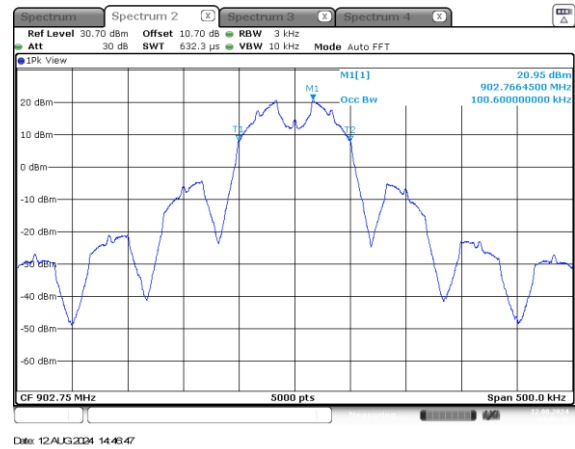
Date: 12.AUG.2024 15:27:08

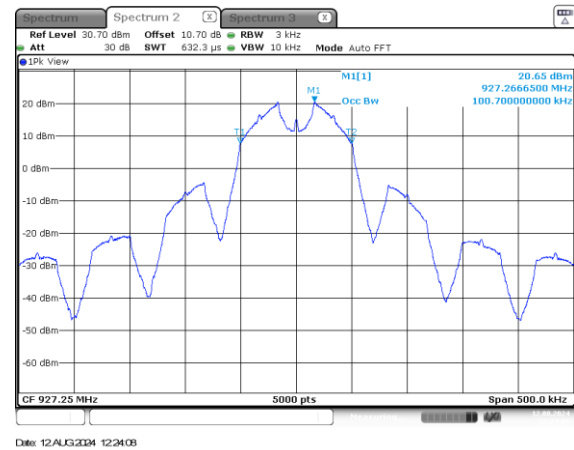
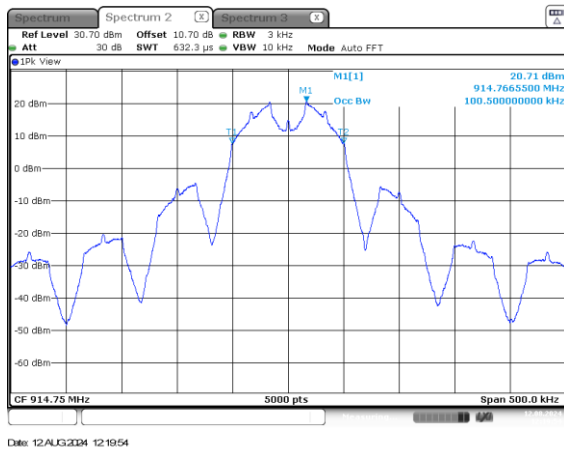
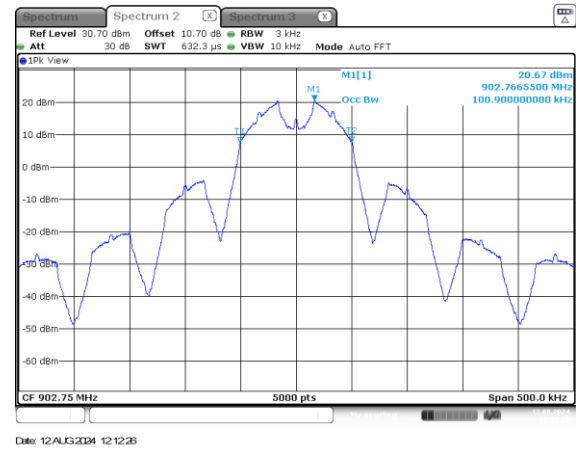
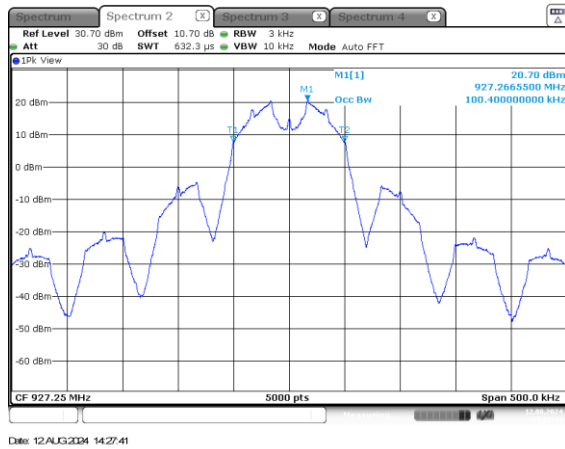
Figure 2.7.6-13: 99% OBW – LCH – Port 0



Date: 12.AUG.2024 15:35:52

Figure 2.7.6-14: 99% OBW – MCH – Port 0







2.8 Band-Edge Compliance of RF Conducted Emissions

2.8.1 Specification Reference

FCC Sections: 15.247(d)
ISED Canada: RSS-247 5.5

2.8.2 Equipment Under Test and Modification State

As shown in §1.4 with modification state "0", as noted in §1.6.

2.8.3 Date of Test

08/12/2024

2.8.4 Test Method

The RF output port of the EUT was directly connected to the input of the spectrum analyzer with suitable attenuation. The EUT was investigated at the lowest and highest channel available to determine band-edge compliance. For each measurement, the spectrum analyzer's RBW was set to 100kHz and the VBW was set to 300kHz.

If the maximum peak conducted output power procedure was used to determine compliance, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 20 dBc).

2.8.5 Environmental Conditions

The EUT was evaluated within the temperature, humidity and pressure range of the EUT as specified by the standard. The laboratory shall have an ambient temperature range of 15°C to 35°C, relative humidity range of 30% to 60% and atmospheric pressure range of 86 kPa to 106 kPa.

Ambient Temperature	22.3 °C
Relative Humidity	53.8 %
Atmospheric Pressure	972.2 mbar

2.8.6 Test Results

Test Summary: EUT was set to transmit mode as per sections 1.4.2 / 1.4.3.

Test Results: Pass

See data below for detailed results.



HOPPING MODE:

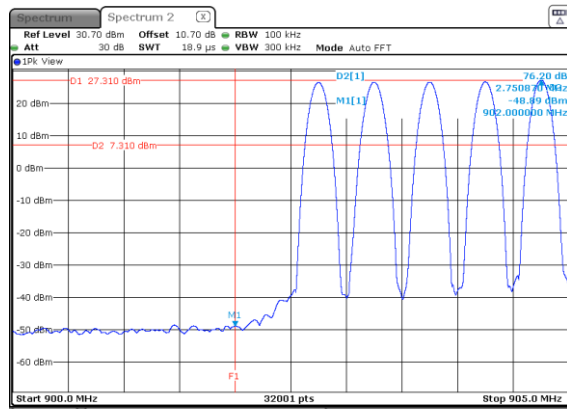


Figure 2.8.6-1: Lower Band edge – Port 0

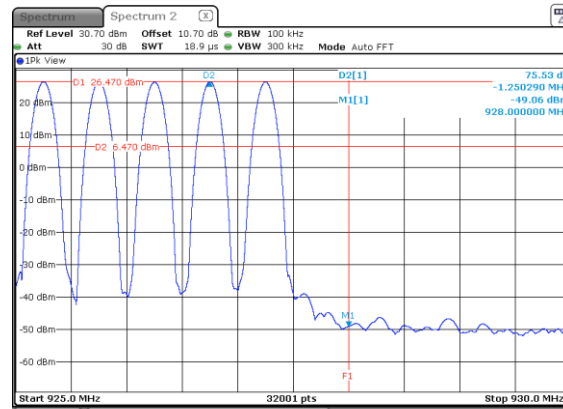


Figure 2.8.6-2: Upper Band edge – Port 0

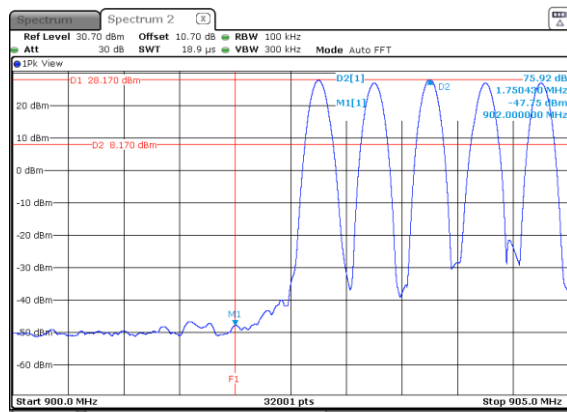


Figure 2.8.6-3: Lower Band edge – Port 1

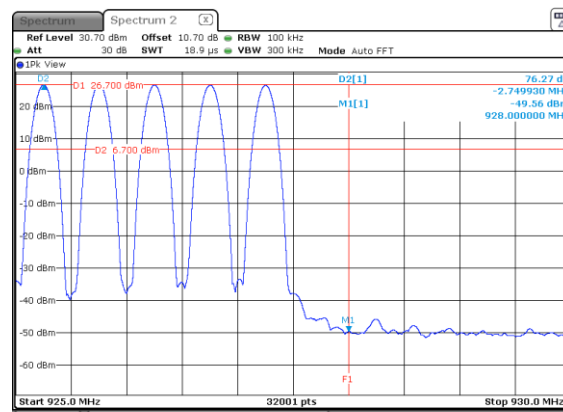
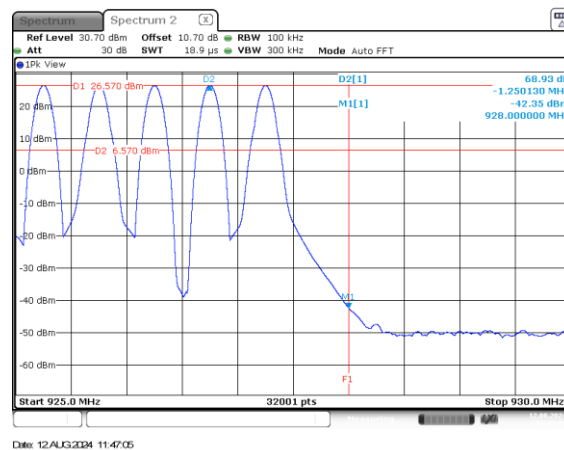
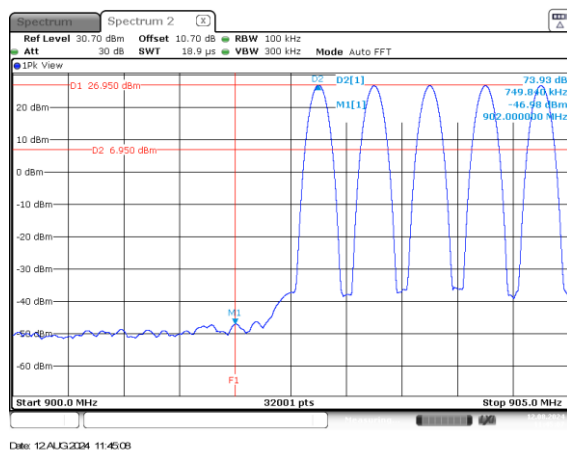
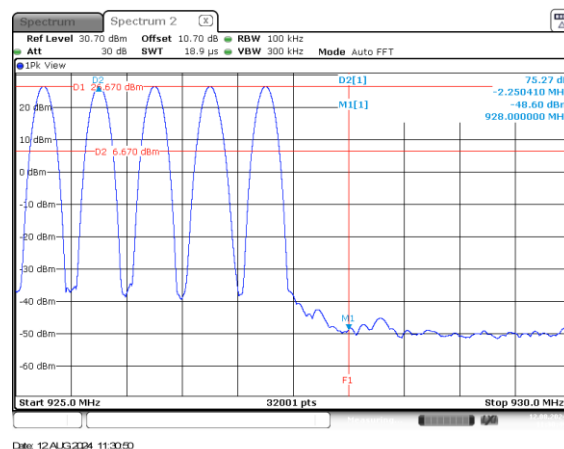
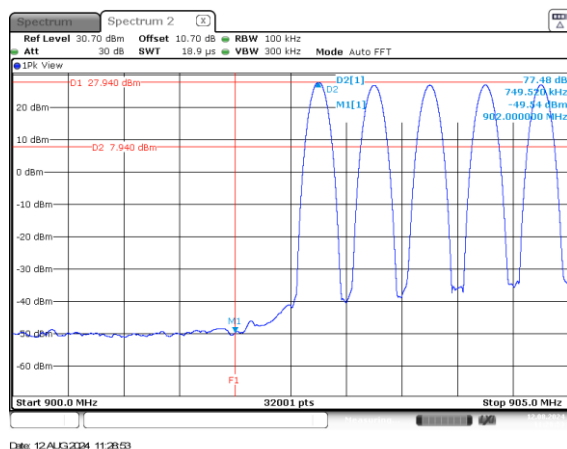


Figure 2.8.6-4: Upper Band edge – Port 1



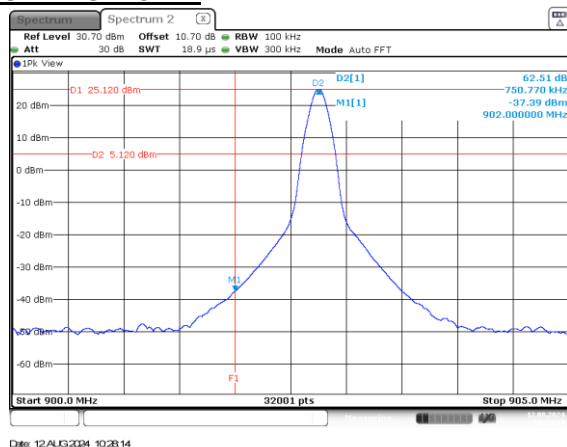
**NON-HOPPING MODE:**

Figure 2.8.6-9: Lower Band edge – Port 0

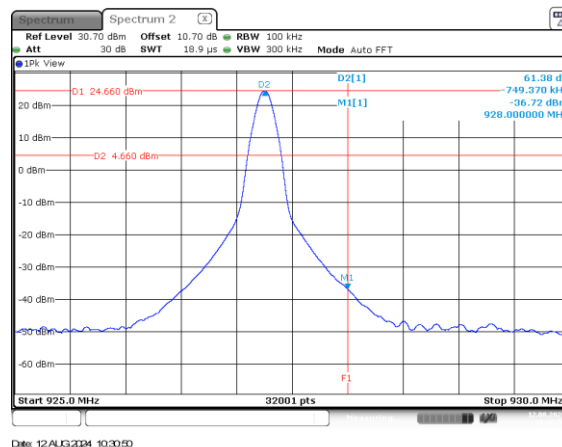


Figure 2.8.6-10: Upper Band edge – Port 0

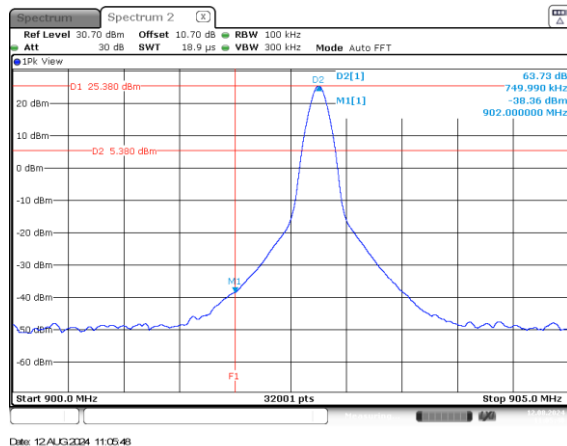


Figure 2.8.6-11: Lower Band edge – Port 1

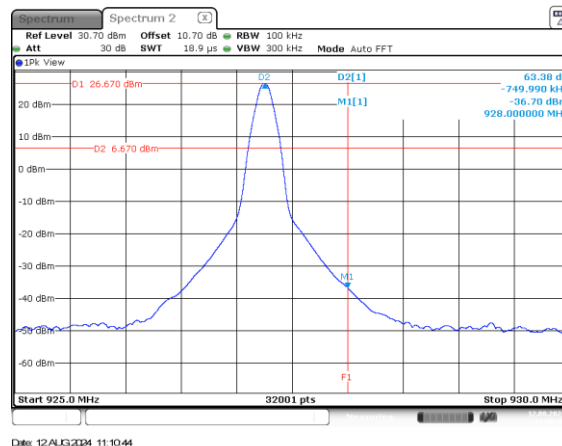


Figure 2.8.6-12: Upper Band edge – Port 1

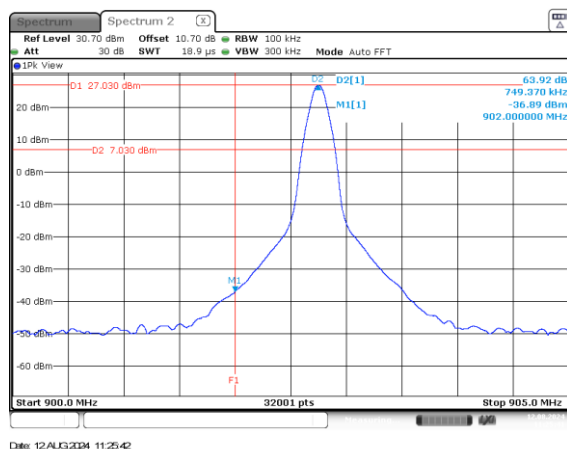


Figure 2.8.6-13: Lower Band edge – Port 2

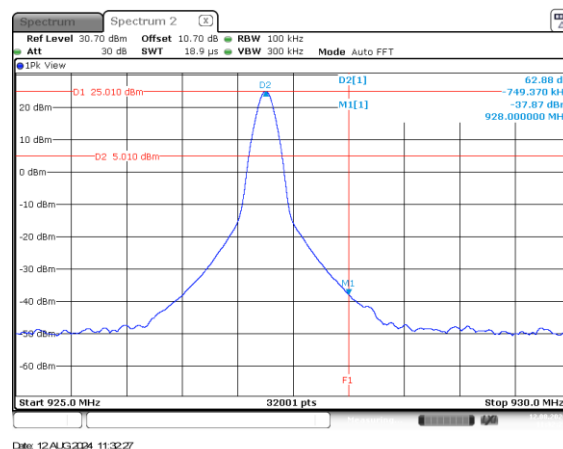


Figure 2.8.6-14: Upper Band edge – Port 2

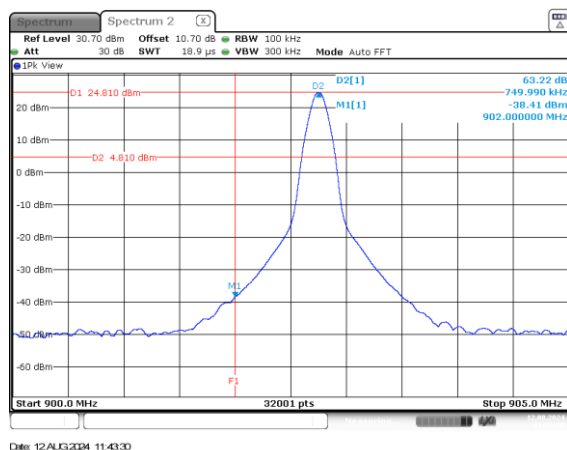


Figure 2.8.6-15: Lower Band edge – Port 3

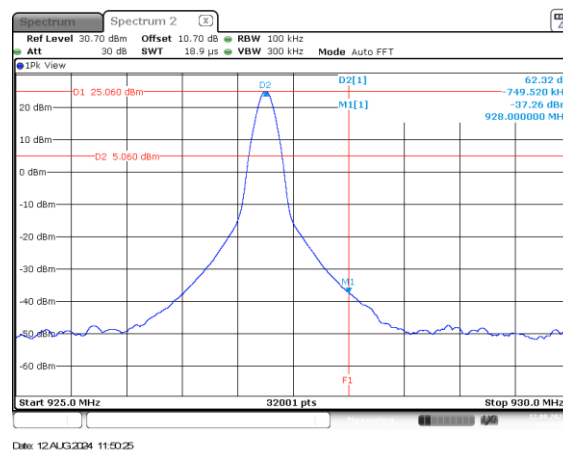


Figure 2.8.6-16: Upper Band edge – Port 3



2.9 RF Conducted Spurious Emissions

2.9.1 Specification Reference

FCC Sections: 15.247(d)
ISED Canada: RSS-247 5.5

2.9.2 Equipment Under Test and Modification State

As shown in §1.4 with modification state "0", as noted in §1.6.

2.9.3 Date of Test

08/12/2024

2.9.4 Test Method

The RF output port of the EUT was directly connected to the input of the spectrum analyzer. The EUT was investigated for conducted spurious emissions from 30MHz to 10 GHz, 10 times the highest fundamental frequency. Measurements were made at the low, center, and high channels of the EUT. For each measurement, the spectrum analyzer's RBW was set to 100kHz. A peak detector function was used with the trace set to max hold.

If the maximum peak conducted output power procedure was used to determine compliance, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 20 dBc).

2.9.5 Environmental Conditions

The EUT was evaluated within the temperature, humidity and pressure range of the EUT as specified by the standard. The laboratory shall have an ambient temperature range of 15°C to 35°C, relative humidity range of 30% to 60% and atmospheric pressure range of 86 kPa to 106 kPa.

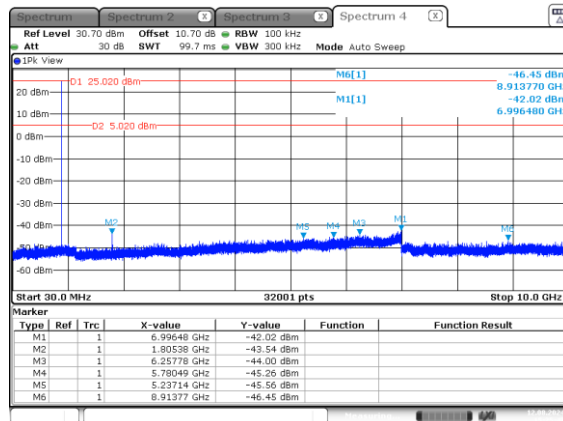
Ambient Temperature	22.3 °C
Relative Humidity	53.8 %
Atmospheric Pressure	972.2 mbar

2.9.6 Test Results

Test Summary: EUT was set to transmit mode as per sections 1.4.2 / 1.4.3.

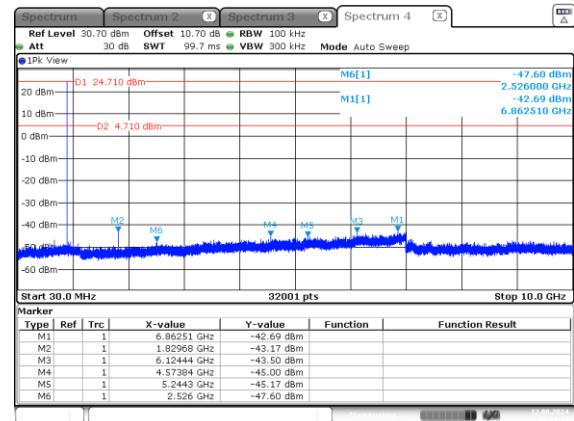
Test Results: Pass

See data below for detailed results.



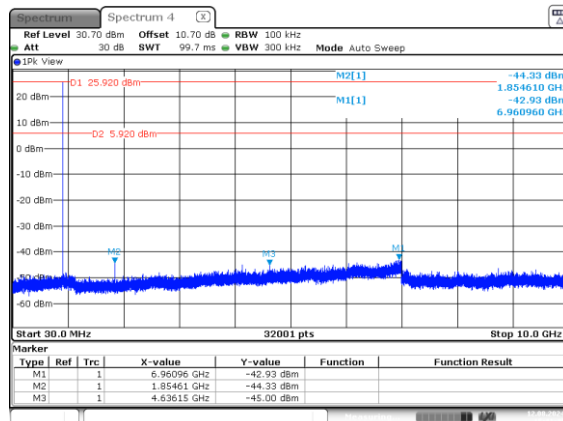
Date: 12.AUG.2024 15:25:47

Figure 2.9.6-1: 30MHz - 10GHz - LCH - Port 0



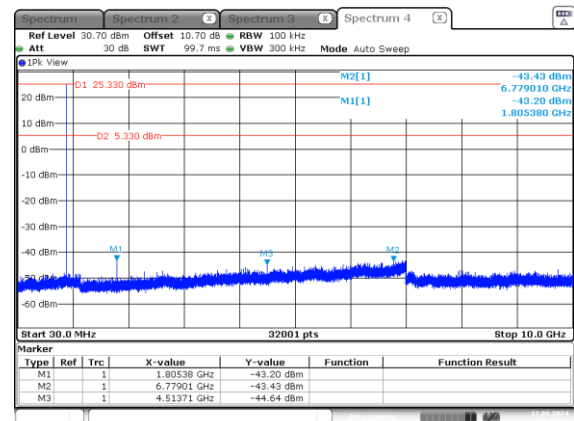
Date: 12.AUG.2024 15:34:34

Figure 2.9.6-2: 30MHz - 10GHz - MCH - Port 0



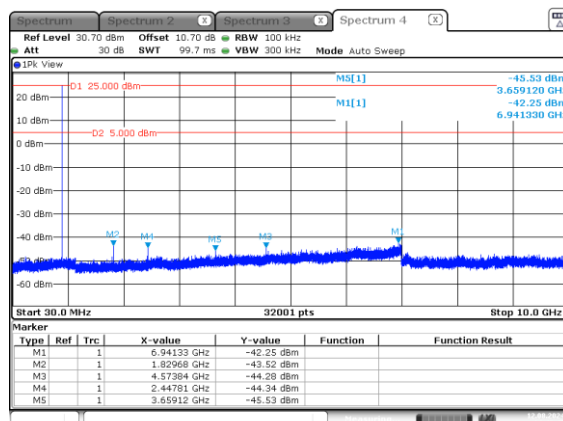
Date: 12.AUG.2024 15:41:43

Figure 2.9.6-3: 30MHz - 10GHz - HCH - Port 0



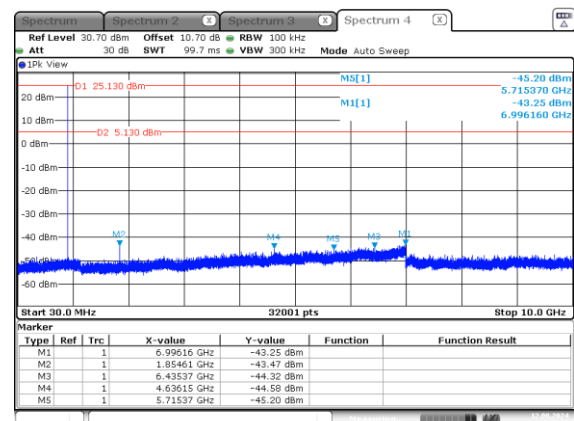
Date: 12.AUG.2024 14:42:54

Figure 2.9.6-4: 30MHz - 10GHz - LCH - Port 1



Date: 12.AUG.2024 14:49:43

Figure 2.9.6-5: 30MHz - 10GHz - MCH - Port 1



Date: 12.AUG.2024 14:55:53

Figure 2.9.6-6: 30MHz - 10GHz - HCH - Port 1

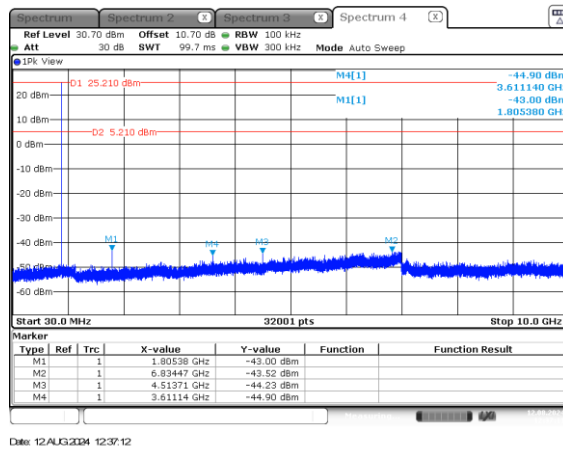


Figure 2.9.6-7:30MHz – 10GHz – LCH – Port 2

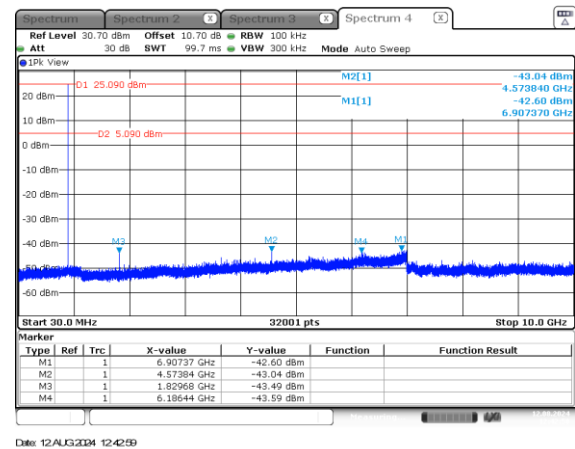


Figure 2.9.6-8:30MHz – 10GHz – MCH – Port 2

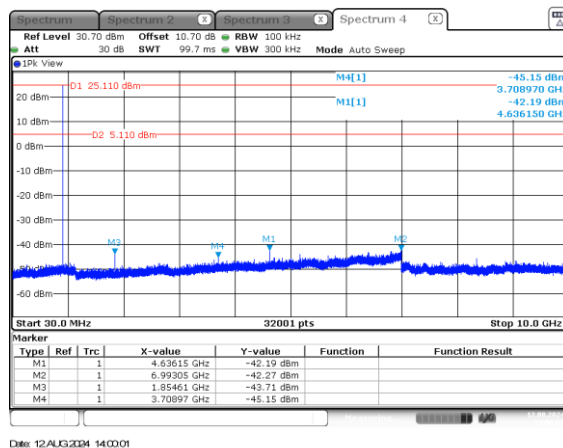


Figure 2.9.6-9:30MHz – 10GHz – HCH – Port 2

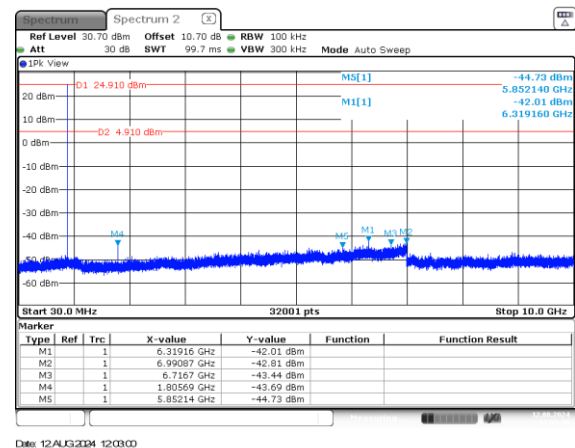


Figure 2.9.6-10:30MHz – 10GHz – LCH – Port 3

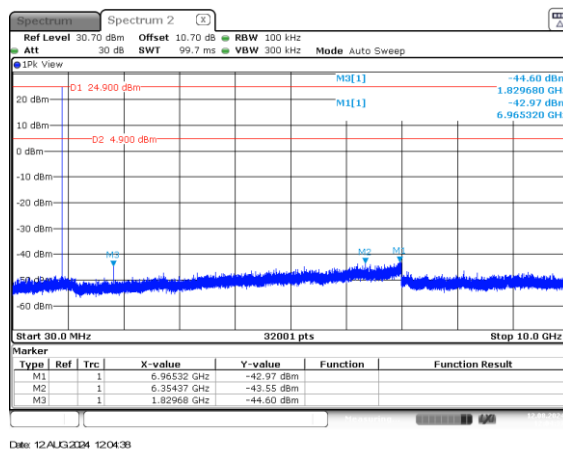


Figure 2.9.6-11:30MHz – 10GHz – MCH – Port 3

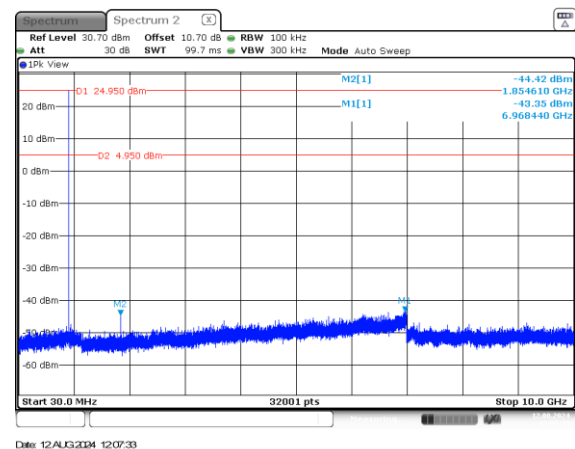


Figure 2.9.6-12:30MHz – 10GHz – HCH – Port 3



2.10 Radiated Spurious Emissions into Restricted Frequency Bands

2.10.1 Specification Reference

FCC Sections: 15.205, 15.209.
ISED Canada: RSS – Gen 8.9/8.10

2.10.2 Equipment Under Test and Modification State

As shown in §1.4 with modification state “0”, as noted in §1.6.

2.10.3 Date of Test

08/13/2024 to 08/21/2024

2.10.4 Test Method

Radiated emissions tests were made over the frequency range of 9 kHz to 10 GHz, 10 times the highest fundamental frequency of 900 MHz. Each emission found to be in a restricted band as defined by section 15.205, including any emission at the operational band-edge, was compared to the radiated emission limits as defined in Section 15.209.

The EUT was rotated through 360° and the receive antenna height was varied from 1m to 4m so that the maximum radiated emissions level would be detected. For frequencies below 150 kHz, quasi-peak measurements were made using a resolution bandwidth RBW of 300 Hz and a video bandwidth VBW of 1 kHz and frequencies between 150 kHz and 30MHz, quasi-peak measurements were made using a resolution bandwidth RBW of 10 kHz and a video bandwidth VBW of 30 kHz. For frequencies between 30 MHz and 1000 MHz, quasi-peak measurements were made using a resolution bandwidth RBW of 100 kHz and a video bandwidth VBW of 300 kHz. For frequencies above 1000 MHz, peak and average measurements were made with RBW of 1 MHz and VBW of 3 MHz.

2.10.5 Environmental Conditions

The EUT was evaluated within the temperature, humidity and pressure range of the EUT as specified by the standard. The laboratory shall have an ambient temperature range of 15°C to 35°C, relative humidity range of 30% to 60% and atmospheric pressure range of 86 kPa to 106 kPa.

Ambient Temperature	22.3 °C
Relative Humidity	53.8 %
Atmospheric Pressure	972.2 mbar



2.10.6 Test Results

Test Summary: EUT was set to transmit mode as per sections 1.4.2 / 1.4.3.

Test Results: Pass

See data below for detailed results.

Note: Antennas at Port 1 & 2 are identical. Therefore, performed pre-scans on both the antennas and evaluated the worst-case antenna only.

**Table 2.10.6-1: Radiated Spurious Emissions Tabulated Data – Antenna Port 0(Antenna 4):
30MHz – 1 GHz**

Frequency	Peak Value	QP/Avg Value	Peak Limit	QP/Avg Limit	Peak Margin	QP/Avg Margin	Polarity	Peak Limit Results	QP/Avg Limit Results
MHz	dBμV/m	dBμV/m	dBμV/m	dBμV/m	dB	dB	H/V	Pass/Fail	Pass/Fail
LCH - 902.75 MHz									
107.868	----	25.992	----	43.5	----	17.51	H	----	PASS
658.003	----	16.682	----	46	----	29.32	H	----	PASS
108.013	----	30.819	----	43.5	----	12.68	V	----	PASS
254.677	----	15.978	----	46	----	30.02	V	----	PASS
MCH – 914.75 MHz									
108.183	----	22.76	----	43.5	----	20.74	H	----	PASS
291.124	----	12.953	----	46	----	33.05	H	----	PASS
107.791	----	20.342	----	43.5	----	23.16	V	----	PASS
279.555	----	17.53	----	46	----	28.47	V	----	PASS
291.631	----	18.976	----	46	----	27.02	V	----	PASS
308.29	----	18.862	----	46	----	27.14	V	----	PASS
350.195	----	12.887	----	46	----	33.11	V	----	PASS
626.577	----	15.423	----	46	----	30.58	V	----	PASS
HCH – 927.25 MHz									
107.913	----	26.961	----	43.5	----	16.54	H	----	PASS
192.015	----	30.411	----	43.5	----	13.09	H	----	PASS
333.346	----	14.377	----	46	----	31.62	H	----	PASS
348.254	----	14.385	----	46	----	31.61	H	----	PASS
30.849	----	31.097	----	40	----	8.9	V	----	PASS
78.234	----	30.124	----	40	----	9.88	V	----	PASS
107.963	----	30.233	----	43.5	----	13.27	V	----	PASS
319.013	----	13.619	----	46	----	32.38	V	----	PASS



**Table 2.10.6-2: Radiated Spurious Emissions Tabulated Data – Antenna Port 0 ((Antenna 4):
1 GHz – 10 GHz**

Frequency	Peak Value	Avg Value	DCCF	Avg corrected level	Peak Limit	Avg Limit	Peak Margin	Avg Margin	Peak/Avg Limit Results	Antenna Polarity
MHz	dBµV/m	dBµV/m	dB	dBµV/m	dBµV/m	Limit_Avg	dB	dB	Pass/Fail	H/V
LCH										
1150.025	46.534	40.954	-33.98	6.974	74	54	27.466	47.026	PASS	H
1250.025	46.026	39.93	-33.98	5.95	74	54	27.974	48.05	PASS	H
1350.025	45.527	35.88	-33.98	1.9	74	54	28.473	52.1	PASS	H
1450.025	43.41	32.75	-33.98	-1.23	74	54	30.59	55.23	PASS	H
1050	41.787	31.545	-33.98	-2.435	74	54	32.213	56.435	PASS	V
1150	43.118	35.359	-33.98	1.379	74	54	30.882	52.621	PASS	V
1166.95	38.837	23.985	-33.98	-9.995	74	54	35.163	63.995	PASS	V
1250.025	41.888	30.433	-33.98	-3.547	74	54	32.112	57.547	PASS	V
1350.025	44.906	35.395	-33.98	1.415	74	54	29.094	52.585	PASS	V
1805.4	48.619	40.331	-33.98	6.351	74	54	25.381	47.649	PASS	H
2708.25	67.958	64.882	-33.98	30.902	74	54	6.042	23.098	PASS	H
3611.025	51.548	40.768	-33.98	6.788	74	54	22.452	47.212	PASS	H
4513.75	72.514	68.443	-33.98	34.463	74	54	1.486	19.537	PASS	H
6319.25	55.558	46.376	-33.98	12.396	74	54	18.442	41.604	PASS	H
8124.75	55.214	43.357	-33.98	9.377	74	54	18.786	44.623	PASS	H
1805.4	50.342	43.496	-33.98	9.516	74	54	23.658	44.484	PASS	V
2708.25	63.317	59.835	-33.98	25.855	74	54	10.683	28.145	PASS	V
3611	51.924	42.118	-33.98	8.138	74	54	22.076	45.862	PASS	V
4513.75	62.144	57.283	-33.98	23.303	74	54	11.856	30.697	PASS	V
6319.25	56.105	46.538	-33.98	12.558	74	54	17.895	41.442	PASS	V
8124.75	54.084	42.729	-33.98	8.749	74	54	19.916	45.251	PASS	V
MCH										
1050.025	43.119	34.127	-33.98	0.147	74	54	30.881	53.853	PASS	H
1100.025	42.715	32.363	-33.98	-1.617	74	54	31.285	55.617	PASS	H
1150.025	45.656	39.034	-33.98	5.054	74	54	28.344	48.946	PASS	H
1200.025	43.006	32.687	-33.98	-1.293	74	54	30.994	55.293	PASS	H
1250.025	45.748	39.687	-33.98	5.707	74	54	28.252	48.293	PASS	H
1350.025	42.845	31.172	-33.98	-2.808	74	54	31.155	56.808	PASS	H
1450.025	44.178	34.084	-33.98	0.104	74	54	29.822	53.896	PASS	H
1050	41.976	31.614	-33.98	-2.366	74	54	32.024	56.366	PASS	V
1150.025	43.09	34.181	-33.98	0.201	74	54	30.91	53.799	PASS	V
1250.025	44.894	37.751	-33.98	3.771	74	54	29.106	50.229	PASS	V
1350	43.46	33.578	-33.98	-0.402	74	54	30.54	54.402	PASS	V
1350.025	43.928	34.861	-33.98	0.881	74	54	30.072	53.119	PASS	V



1829.5	51.231	45.458	-33.98	11.478	74	54	22.769	42.522	PASS	H
2744.225	68.951	66.017	-33.98	32.037	74	54	5.049	21.963	PASS	H
3659	51.864	43.867	-33.98	9.887	74	54	22.136	44.113	PASS	H
4573.75	72.495	68.934	-33.98	34.954	74	54	1.505	19.046	PASS	H
5488.5	53.104	42.925	-33.98	8.945	74	54	20.896	45.055	PASS	H
6403.25	58.439	52.223	-33.98	18.243	74	54	15.561	35.757	PASS	H
8232.75	55.11	44.834	-33.98	10.854	74	54	18.89	43.146	PASS	H
1829.5	51.489	45.628	-33.98	11.648	74	54	22.511	42.352	PASS	V
2744.225	66.752	63.727	-33.98	29.747	74	54	7.248	24.253	PASS	V
3659	54.394	47.03	-33.98	13.05	74	54	19.606	40.95	PASS	V
4573.75	60.941	55.967	-33.98	21.987	74	54	13.059	32.013	PASS	V
5488.5	53.311	43.906	-33.98	9.926	74	54	20.689	44.074	PASS	V
6403.25	59.611	53.783	-33.98	19.803	74	54	14.389	34.197	PASS	V
8232.75	56.214	46.983	-33.98	13.003	74	54	17.786	40.997	PASS	V
HCH										
1050.025	41.74	32.184	-33.98	-1.796	74	54	32.26	55.796	PASS	H
1150	44.957	37.644	-33.98	3.664	74	54	29.043	50.336	PASS	H
1200.025	42.396	30.967	-33.98	-3.013	74	54	31.604	57.013	PASS	H
1250	44.198	36.971	-33.98	2.991	74	54	29.802	51.009	PASS	H
1350.025	44.775	36.204	-33.98	2.224	74	54	29.225	51.776	PASS	H
1450.025	43.053	32.846	-33.98	-1.134	74	54	30.947	55.134	PASS	H
1050.025	41.255	30.256	-33.98	-3.724	74	54	32.745	57.724	PASS	V
1140.25	38.531	23.862	-33.98	-10.118	74	54	35.469	64.118	PASS	V
1250.025	44.092	36.718	-33.98	2.738	74	54	29.908	51.262	PASS	V
1350	44.251	33.691	-33.98	-0.289	74	54	29.749	54.289	PASS	V
1854.2	43.801	28.742	-33.98	-5.238	74	54	30.199	59.238	PASS	H
2781.55	44.923	30.077	-33.98	-3.903	74	54	29.077	57.903	PASS	H
3708.525	47.63	33.179	-33.98	-0.801	74	54	26.37	54.801	PASS	H
4635.85	47.703	33.643	-33.98	-0.337	74	54	26.297	54.337	PASS	H
5563.65	49.181	34.5	-33.98	0.52	74	54	24.819	53.48	PASS	H
6490.525	49.836	35.93	-33.98	1.95	74	54	24.164	52.05	PASS	H
8345.725	51.334	37.778	-33.98	3.798	74	54	22.666	50.202	PASS	H
1854.5	50.766	44.303	-33.98	10.323	74	54	23.234	43.677	PASS	V
2781.75	65.136	62.173	-33.98	28.193	74	54	8.864	25.807	PASS	V
3708.975	48.268	33.256	-33.98	-0.724	74	54	25.732	54.724	PASS	V
4635.95	48.032	33.682	-33.98	-0.298	74	54	25.968	54.298	PASS	V
5563.45	49.173	34.53	-33.98	0.55	74	54	24.827	53.45	PASS	V
6490.6	51.23	35.989	-33.98	2.009	74	54	22.77	51.991	PASS	V
8345.375	51.494	37.782	-33.98	3.802	74	54	22.506	50.198	PASS	V



**Table 2.10.6-3: Radiated Spurious Emissions Tabulated Data – Antenna Port 2 (Antenna 2):
30MHz – 1 GHz**

Frequency	Peak Value	QP/Avg Value	Peak Limit	QP/Avg Limit	Peak Margin	QP/Avg Margin	Polarity	Peak Limit Results	QP/Avg Limit Results
MHz	dBµV/m	dBµV/m	dBµV/m	dBµV/m	dB	dB	H/V	Pass/Fail	Pass/Fail
LCH - 902.75 MHz									
107.965	----	30.655	----	43.5	----	12.85	H	----	PASS
125.813	----	25.969	----	43.5	----	17.53	H	----	PASS
192.015	----	28.073	----	43.5	----	15.43	H	----	PASS
41.274	----	26.272	----	40	----	13.73	V	----	PASS
114.296	----	25.849	----	43.5	----	17.65	V	----	PASS
644.107	----	15.386	----	46	----	30.61	V	----	PASS
MCH – 914.75 MHz									
108.085	----	28.885	----	43.5	----	14.61	H	----	PASS
215.998	----	31.235	----	43.5	----	12.27	H	----	PASS
42.369	----	25.793	----	40	----	14.21	V	----	PASS
78.234	----	30.828	----	40	----	9.17	V	----	PASS
126.201	----	28.208	----	43.5	----	15.29	V	----	PASS
HCH – 927.25 MHz									
65.693	----	19.622	----	40	----	20.38	H	----	PASS
107.913	----	28.962	----	43.5	----	14.54	H	----	PASS
264.039	----	28.411	----	46	----	17.59	H	----	PASS
439.877	----	28.547	----	46	----	17.45	H	----	PASS
42.903	----	25.933	----	40	----	14.07	V	----	PASS
107.936	----	26.179	----	43.5	----	17.32	V	----	PASS
126.275	----	25.917	----	43.5	----	17.58	V	----	PASS
204.018	----	27.714	----	43.5	----	15.79	V	----	PASS



**Table 2.10.6-4: Radiated Spurious Emissions Tabulated Data – Antenna Port 2 (Antenna 2):
1 GHz – 10 GHz**

Frequency	Peak Value	Avg Value	DCCF	Avg corrected level	Peak Limit	Avg Limit	Peak Margin	Avg Margin	Peak/Avg Limit Results	Antenna Polarity
MHz	dBµV/m	dBµV/m	dB	dBµV/m	dBµV/m	Limit_Avg	dB	dB	Pass/Fail	H/V
LCH										
1100.025	43.68	35.893	-33.98	1.913	74	54	30.32	52.087	PASS	H
1150.025	43.919	34.481	-33.98	0.501	74	54	30.081	53.499	PASS	H
1200.025	45.858	38.812	-33.98	4.832	74	54	28.142	49.168	PASS	H
1250	42.753	33.803	-33.98	-0.177	74	54	31.247	54.177	PASS	H
1300.025	44.413	36.326	-33.98	2.346	74	54	29.587	51.654	PASS	H
1350.025	45.152	36.25	-33.98	2.27	74	54	28.848	51.73	PASS	H
1450.05	43.434	32.633	-33.98	-1.347	74	54	30.566	55.347	PASS	H
1100.025	41.508	30.819	-33.98	-3.161	74	54	32.492	57.161	PASS	V
1200.025	43.708	34.496	-33.98	0.516	74	54	30.292	53.484	PASS	V
1250.025	43.05	32.844	-33.98	-1.136	74	54	30.95	55.136	PASS	V
1300.025	43.23	32.382	-33.98	-1.598	74	54	30.77	55.598	PASS	V
1350	43.478	32.442	-33.98	-1.538	74	54	30.522	55.538	PASS	V
1805.4	49.382	38.864	-33.98	4.884	74	54	24.618	49.116	PASS	H
2708.25	70.124	64.203	-33.98	30.223	74	54	3.876	23.777	PASS	H
3611	62.559	56.811	-33.98	22.831	74	54	11.441	31.169	PASS	H
4513.75	66.644	61.577	-33.98	27.597	74	54	7.356	26.403	PASS	H
5416.5	59.331	50.125	-33.98	16.145	74	54	14.669	37.855	PASS	H
6319.25	59.504	50.783	-33.98	16.803	74	54	14.496	37.197	PASS	H
7222	59.132	51.713	-33.98	17.733	74	54	14.868	36.267	PASS	H
8124.725	57.966	48.612	-33.98	14.632	74	54	16.034	39.368	PASS	H
9027.5	59.002	47.705	-33.98	13.725	74	54	14.998	40.275	PASS	H
9930.225	58.968	45.551	-33.98	11.571	74	54	15.032	42.429	PASS	H
1805.4	59.582	53.295	-33.98	19.315	74	54	14.418	34.685	PASS	V
2708.25	69.862	64.12	-33.98	30.14	74	54	4.138	23.86	PASS	V
3611	62.391	56.774	-33.98	22.794	74	54	11.609	31.206	PASS	V
4513.75	66.739	61.649	-33.98	27.669	74	54	7.261	26.331	PASS	V
5416.5	65.201	57.034	-33.98	23.054	74	54	8.799	30.946	PASS	V
6319.25	54.251	42.605	-33.98	8.625	74	54	19.749	45.375	PASS	V
7222	60.06	52.706	-33.98	18.726	74	54	13.94	35.274	PASS	V
8124.75	55.89	45.407	-33.98	11.427	74	54	18.11	42.573	PASS	V
9027.5	55.28	42.295	-33.98	8.315	74	54	18.72	45.685	PASS	V
MCH										
1100.025	41.694	32.046	-33.98	-1.934	74	54	32.306	55.934	PASS	H
1150.025	41.62	29.825	-33.98	-4.155	74	54	32.38	58.155	PASS	H
1200.025	44.584	35.585	-33.98	1.605	74	54	29.416	52.395	PASS	H
1250	40.514	26.355	-33.98	-7.625	74	54	33.486	61.625	PASS	H
1300.025	43.298	34.497	-33.98	0.517	74	54	30.702	53.483	PASS	H
1350.025	44.161	34.165	-33.98	0.185	74	54	29.839	53.815	PASS	H
1450.025	43.665	33.637	-33.98	-0.343	74	54	30.335	54.343	PASS	H
1100	41.267	30.203	-33.98	-3.777	74	54	32.733	57.777	PASS	V
1200.025	43.651	33.557	-33.98	-0.423	74	54	30.349	54.423	PASS	V
1250	42.87	32.963	-33.98	-1.017	74	54	31.13	55.017	PASS	V
1300.025	42.451	31.771	-33.98	-2.209	74	54	31.549	56.209	PASS	V
1350	43.96	32.571	-33.98	-1.409	74	54	30.04	55.409	PASS	V
1400	39.908	25.598	-33.98	-8.382	74	54	34.092	62.382	PASS	V



1829.5	52.362	43.064	-33.98	9.084	74	54	21.638	44.916	PASS	H
2744.225	65.282	58.215	-33.98	24.235	74	54	8.718	29.765	PASS	H
3659	60.555	53.466	-33.98	19.486	74	54	13.445	34.514	PASS	H
4573.75	66.202	59.974	-33.98	25.994	74	54	7.798	28.006	PASS	H
6403.25	57.548	49.564	-33.98	15.584	74	54	16.452	38.416	PASS	H
7318	60.377	51.488	-33.98	17.508	74	54	13.623	36.492	PASS	H
8232.775	58.673	48.975	-33.98	14.995	74	54	15.327	39.005	PASS	H
1829.5	58.667	50.979	-33.98	16.999	74	54	15.333	37.001	PASS	V
2744.225	67.65	60.7	-33.98	26.72	74	54	6.35	27.28	PASS	V
3659	60.202	53.286	-33.98	19.306	74	54	13.798	34.694	PASS	V
4573.75	63.182	56.777	-33.98	22.797	74	54	10.818	31.203	PASS	V
5488.5	58.922	47.722	-33.98	13.742	74	54	15.078	40.258	PASS	V
6403.25	57.426	48.687	-33.98	14.707	74	54	16.574	39.293	PASS	V
7318	58.976	50.054	-33.98	16.074	74	54	15.024	37.926	PASS	V
8232.725	55.829	44.162	-33.98	10.182	74	54	18.171	43.818	PASS	V
9147.65	54.315	40.802	-33.98	6.822	74	54	19.685	47.178	PASS	V
HCH										
1100	41.563	31.676	-33.98	-2.304	74	54	32.437	56.304	PASS	H
1150.025	41.919	31.655	-33.98	-2.325	74	54	32.081	56.325	PASS	H
1200.025	44.436	35.337	-33.98	1.357	74	54	29.564	52.643	PASS	H
1250.025	40.51	27.834	-33.98	-6.146	74	54	33.49	60.146	PASS	H
1300.025	43.823	34.544	-33.98	0.564	74	54	30.177	53.436	PASS	H
1350.025	44.433	33.736	-33.98	-0.244	74	54	29.567	54.244	PASS	H
1450.025	42.977	31.133	-33.98	-2.847	74	54	31.023	56.847	PASS	H
1050.05	39.901	26.223	-33.98	-7.757	74	54	34.099	61.757	PASS	V
1100.025	41.393	30.062	-33.98	-3.918	74	54	32.607	57.918	PASS	V
1200.025	43.573	34.192	-33.98	0.212	74	54	30.427	53.788	PASS	V
1250.025	42.241	31.992	-33.98	-1.988	74	54	31.759	55.988	PASS	V
1300.025	41.014	26.804	-33.98	-7.176	74	54	32.986	61.176	PASS	V
1350	42.651	30.477	-33.98	-3.503	74	54	31.349	57.503	PASS	V
1854.5	51.034	41.128	-33.98	7.148	74	54	22.966	46.852	PASS	H
2781.75	57.553	48.909	-33.98	14.929	74	54	16.447	39.071	PASS	H
3708.975	56.74	47.639	-33.98	13.659	74	54	17.26	40.341	PASS	H
4636.25	64.937	56.826	-33.98	22.846	74	54	9.063	31.154	PASS	H
5563.5	55.859	47.776	-33.98	13.796	74	54	18.141	40.204	PASS	H
6490.75	57.628	49.5	-33.98	15.52	74	54	16.372	38.48	PASS	H
7417.95	52.319	39.067	-33.98	5.087	74	54	21.681	48.913	PASS	H
8345.25	55.521	44.466	-33.98	10.486	74	54	18.479	43.514	PASS	H
1854.5	53.391	45.037	-33.98	11.057	74	54	20.609	42.943	PASS	V
2781.75	60.254	51.765	-33.98	17.785	74	54	13.746	36.215	PASS	V
3708.975	55.654	46.058	-33.98	12.078	74	54	18.346	41.922	PASS	V
4636.25	64.368	56.933	-33.98	22.953	74	54	9.632	31.047	PASS	V
5563.5	59.604	52.585	-33.98	18.605	74	54	14.396	35.395	PASS	V
6490.75	58.038	51.536	-33.98	17.556	74	54	15.962	36.444	PASS	V
7417.975	55.691	42.223	-33.98	8.243	74	54	18.309	45.757	PASS	V
8345.25	54.614	44.451	-33.98	10.471	74	54	19.386	43.529	PASS	V



**Table 2.10.6-5: Radiated Spurious Emissions Tabulated Data – Antenna Port 3 (Antenna 3):
30MHz – 1 GHz**

Frequency	Peak Value	QP/Avg Value	Peak Limit	QP/Avg Limit	Peak Margin	QP/Avg Margin	Polarity	Peak Limit Results	QP/Avg Limit Results
MHz	dBµV/m	dBµV/m	dBµV/m	dBµV/m	dB	dB	H/V	Pass/Fail	Pass/Fail
LCH - 902.75 MHz									
78.234	-----	28.75	-----	40	-----	11.25	H	-----	PASS
147.952	-----	24.344	-----	43.5	-----	19.16	H	-----	PASS
42.08	-----	26.812	-----	40	-----	13.19	V	-----	PASS
79.376	-----	27.781	-----	40	-----	12.22	V	-----	PASS
107.988	-----	27.868	-----	43.5	-----	15.63	V	-----	PASS
MCH – 914.75 MHz									
126.202	-----	22.154	-----	43.5	-----	21.35	H	-----	PASS
341.129	-----	30.522	-----	46	-----	15.48	H	-----	PASS
32.353	-----	23.944	-----	40	-----	16.06	V	-----	PASS
79.54	-----	27.468	-----	40	-----	12.53	V	-----	PASS
102.242	-----	23.655	-----	43.5	-----	19.84	V	-----	PASS
HCH – 927.25 MHz									
107.988	-----	34.461	-----	43.5	-----	9.04	H	-----	PASS
192.015	-----	27.96	-----	43.5	-----	15.54	H	-----	PASS
42.2	-----	26.377	-----	40	-----	13.62	V	-----	PASS
78.209	-----	30.893	-----	40	-----	9.11	V	-----	PASS
108.082	-----	31.857	-----	43.5	-----	11.64	V	-----	PASS
484.226	-----	24.95	-----	46	-----	21.05	V	-----	PASS



**Table 2.10.6-6: Radiated Spurious Emissions Tabulated Data – Antenna Port 3 (Antenna 3):
1 GHz – 10 GHz**

Frequency	Peak Value	Avg Value	DCCF	Avg corrected level	Peak Limit	Avg Limit	Peak Margin	Avg Margin	Peak/Avg Limit Results	Antenna Polarity
MHz	dBμV/m	dBμV/m	dB	dBμV/m	dBμV/m	Limit_Avg	dB	dB	Pass/Fail	H/V
LCH										
1050	42.213	32.554	-33.98	-1.426	74	54	31.787	55.426	PASS	H
1150	44.878	38.475	-33.98	4.495	74	54	29.122	49.505	PASS	H
1200.025	43.074	32.446	-33.98	-1.534	74	54	30.926	55.534	PASS	H
1250.025	45.603	39.78	-33.98	5.8	74	54	28.397	48.2	PASS	H
1350.025	45.5	37.543	-33.98	3.563	74	54	28.5	50.437	PASS	H
1450.025	44.484	33.741	-33.98	-0.239	74	54	29.516	54.239	PASS	H
1050.025	41.475	30.572	-33.98	-3.408	74	54	32.525	57.408	PASS	V
1150.025	42.625	34.912	-33.98	0.932	74	54	31.375	53.068	PASS	V
1250.025	44.48	36.89	-33.98	2.91	74	54	29.52	51.09	PASS	V
1350.025	43.982	34.352	-33.98	0.372	74	54	30.018	53.628	PASS	V
1805.4	44.201	33.626	-33.98	-0.354	74	54	29.799	54.354	PASS	H
2708.25	47.59	36.037	-33.98	2.057	74	54	26.41	51.943	PASS	H
3611	49.445	38.354	-33.98	4.374	74	54	24.555	49.626	PASS	H
6319.25	55.066	45.282	-33.98	11.302	74	54	18.934	42.698	PASS	H
1805.4	46.723	37.278	-33.98	3.298	74	54	27.277	50.702	PASS	V
2708.275	48.575	37.804	-33.98	3.824	74	54	25.425	50.176	PASS	V
3611	49.576	37.703	-33.98	3.723	74	54	24.424	50.277	PASS	V
4513.9	48.987	34.622	-33.98	0.642	74	54	25.013	53.358	PASS	V
5416.475	49.681	35.732	-33.98	1.752	74	54	24.319	52.248	PASS	V
6319.25	54.07	45.14	-33.98	11.16	74	54	19.93	42.84	PASS	V
MCH										
1050.025	41.736	31.268	-33.98	-2.712	74	54	32.264	56.712	PASS	H
1150.025	44.379	37.279	-33.98	3.299	74	54	29.621	50.701	PASS	H
1200.025	43.389	32.21	-33.98	-1.77	74	54	30.611	55.77	PASS	H
1250.025	46.165	40.051	-33.98	6.071	74	54	27.835	47.929	PASS	H
1350.025	45.059	36.696	-33.98	2.716	74	54	28.941	51.284	PASS	H
1450.025	42.139	27.607	-33.98	-6.373	74	54	31.861	60.373	PASS	H
1050	42.159	30.494	-33.98	-3.486	74	54	31.841	57.486	PASS	V
1150	42.657	32.688	-33.98	-1.292	74	54	31.343	55.292	PASS	V
1250	44.453	37.33	-33.98	3.35	74	54	29.547	50.65	PASS	V
1350.025	44.275	34.204	-33.98	0.224	74	54	29.725	53.776	PASS	V
1829.5	48.005	37.391	-33.98	3.411	74	54	25.995	50.589	PASS	H
2744.225	49.322	39.794	-33.98	5.814	74	54	24.678	48.186	PASS	H
6403.25	56.252	47.257	-33.98	13.277	74	54	17.748	40.723	PASS	H
1829.5	47.13	38.182	-33.98	4.202	74	54	26.87	49.798	PASS	V



2744.225	49.678	39.747	-33.98	5.767	74	54	24.322	48.233	PASS	V
3659.025	49.034	36.979	-33.98	2.999	74	54	24.966	51.001	PASS	V
4573.65	48.825	34.553	-33.98	0.573	74	54	25.175	53.427	PASS	V
5488.5	49.23	35.619	-33.98	1.639	74	54	24.77	52.361	PASS	V
6403.25	56.384	48.953	-33.98	14.973	74	54	17.616	39.027	PASS	V
8233.015	53.887	40.149	-33.98	6.169	74	54	20.113	47.831	PASS	V
HCH										
1100.025	42.897	34.652	-33.98	0.672	74	54	31.103	53.328	PASS	H
1150.025	42.25	32.43	-33.98	-1.55	74	54	31.75	55.55	PASS	H
1200.025	46.149	39.299	-33.98	5.319	74	54	27.851	48.681	PASS	H
1250.025	43.698	35.056	-33.98	1.076	74	54	30.302	52.924	PASS	H
1300.025	44.963	36.798	-33.98	2.818	74	54	29.037	51.182	PASS	H
1350.025	44.342	34.569	-33.98	0.589	74	54	29.658	53.411	PASS	H
1450.025	42.868	31.027	-33.98	-2.953	74	54	31.132	56.953	PASS	H
1100.025	41.952	32.199	-33.98	-1.781	74	54	32.048	55.781	PASS	V
1200.025	45.519	34.964	-33.98	0.984	74	54	28.481	53.016	PASS	V
1250.025	43.58	34.046	-33.98	0.066	74	54	30.42	53.934	PASS	V
1300.025	42.861	31.683	-33.98	-2.297	74	54	31.139	56.297	PASS	V
1350	42.756	30.963	-33.98	-3.017	74	54	31.244	57.017	PASS	V
1854.5	49.658	40.436	-33.98	6.456	74	54	24.342	47.544	PASS	H
2781.75	67.013	57.482	-33.98	23.502	74	54	6.987	30.498	PASS	H
3708.975	63.217	53.768	-33.98	19.788	74	54	10.783	34.212	PASS	H
4636.25	68.861	59.672	-33.98	25.692	74	54	5.139	28.308	PASS	H
5563.5	60.328	51.303	-33.98	17.323	74	54	13.672	36.677	PASS	H
6490.75	55.334	47.764	-33.98	13.784	74	54	18.666	40.216	PASS	H
7418	54.872	43.288	-33.98	9.308	74	54	19.128	44.692	PASS	H
8345.25	56.106	48.001	-33.98	14.021	74	54	17.894	39.979	PASS	H
1854.5	51.903	43.256	-33.98	9.276	74	54	22.097	44.724	PASS	V
2781.75	62.946	53.445	-33.98	19.465	74	54	11.054	34.535	PASS	V
3708.975	59.446	49.473	-33.98	15.493	74	54	14.554	38.507	PASS	V
4636.25	64.995	55.52	-33.98	21.54	74	54	9.005	32.46	PASS	V
5563.5	56.268	45.859	-33.98	11.879	74	54	17.732	42.121	PASS	V
6490.75	56.45	48.704	-33.98	14.724	74	54	17.55	39.276	PASS	V
7417.975	53.355	41.538	-33.98	7.558	74	54	20.645	46.442	PASS	V
8345.25	56.276	47.289	-33.98	13.309	74	54	17.724	40.691	PASS	V
9272.575	56.346	43.76	-33.98	9.78	74	54	17.654	44.22	PASS	V



Table 2.10.6-7: Radiated Spurious Emissions Tabulated Data – Antenna Port 1 (Antenna 5): 30MHz – 1 GHz

Frequency	Peak Value	QP/Avg Value	Peak Limit	QP/Avg Limit	Peak Margin	QP/Avg Margin	Polarity	Peak Limit Results	QP/Avg Limit Results
MHz	dBµV/m	dBµV/m	dBµV/m	dBµV/m	dB	dB	H/V	Pass/Fail	Pass/Fail
LCH - 902.75 MHz									
119.966	----	29.33	----	43.5	----	14.17	H	----	PASS
132.02	----	31.518	----	43.5	----	11.98	H	----	PASS
204.018	----	31.955	----	43.5	----	11.54	H	----	PASS
47.947	----	28.043	----	40	----	11.96	V	----	PASS
120.017	----	32.256	----	43.5	----	11.24	V	----	PASS
MCH – 914.75 MHz									
48.045	----	24.206	----	40	----	15.79	H	----	PASS
107.965	----	26.962	----	43.5	----	16.54	H	----	PASS
143.875	----	22.988	----	43.5	----	20.51	H	----	PASS
203.994	----	29.684	----	43.5	----	13.82	H	----	PASS
47.993	----	30.562	----	40	----	9.44	V	----	PASS
108.038	----	26.954	----	43.5	----	16.55	V	----	PASS
120.016	----	30.507	----	43.5	----	12.99	V	----	PASS
701.965	----	15.597	----	46	----	30.4	V	----	PASS
HCH – 927.25 MHz									
107.938	----	30.118	----	43.5	----	13.38	H	----	PASS
131.895	----	24.285	----	43.5	----	19.21	H	----	PASS
192.015	----	33.123	----	43.5	----	10.38	H	----	PASS
47.87	----	23.488	----	40	----	16.51	V	----	PASS
119.942	----	27.315	----	43.5	----	16.19	V	----	PASS
204.019	----	25.366	----	43.5	----	18.13	V	----	PASS
496.497	----	30.931	----	46	----	15.07	V	----	PASS



**Table 2.10.6-8: Radiated Spurious Emissions Tabulated Data – Antenna Port 1 (Antenna 5):
1 GHz – 10 GHz**

Frequency	Peak Value	Avg Value	DCCF	Avg corrected level	Peak Limit	Avg Limit	Peak Margin	Avg Margin	Peak/Avg Limit Results	Antenna Polarity
MHz	dBμV/m	dBμV/m	dB	dBμV/m	dBμV/m	Limit_Avg	dB	dB	Pass/Fail	H/V
LCH										
1050.025	41.869	30.993	-33.98	-2.99	74	54	32.131	56.986	PASS	H
1100	42.101	31.378	-33.98	-2.60	74	54	31.899	56.601	PASS	H
1150.025	44.529	37.803	-33.98	3.82	74	54	29.471	50.176	PASS	H
1250.025	46.258	39.45	-33.98	5.47	74	54	27.742	48.529	PASS	H
1350.025	43.649	32.868	-33.98	-1.11	74	54	30.351	55.111	PASS	H
1050.2	39.54	25.482	-33.98	-8.50	74	54	34.46	62.497	PASS	V
1150	42.309	31.033	-33.98	-2.95	74	54	31.691	56.946	PASS	V
1250.025	43.302	34.982	-33.98	1.00	74	54	30.698	52.997	PASS	V
1350.025	44.695	35.045	-33.98	1.07	74	54	29.305	52.934	PASS	V
1805.4	51.267	41.535	-33.98	7.56	74	54	22.733	46.444	PASS	H
2708.25	73.42	67.525	-33.98	33.55	74	54	0.58	20.454	PASS	H
3611	62.009	55.906	-33.98	21.93	74	54	11.991	32.073	PASS	H
4513.75	64.99	59.323	-33.98	25.34	74	54	9.01	28.656	PASS	H
5416.475	51.963	38.203	-33.98	4.22	74	54	22.037	49.776	PASS	H
6319.25	53.828	41.874	-33.98	7.89	74	54	20.172	46.105	PASS	H
7222	59.374	51.027	-33.98	17.05	74	54	14.626	36.952	PASS	H
8124.75	61.291	53.217	-33.98	19.24	74	54	12.709	34.762	PASS	H
9930.25	60.059	46.527	-33.98	12.55	74	54	13.941	41.452	PASS	H
1805.4	60.339	54.007	-33.98	20.03	74	54	13.661	33.972	PASS	V
2708.25	73.548	67.749	-33.98	33.77	74	54	0.452	20.230	PASS	V
3611	61.534	55.352	-33.98	21.37	74	54	12.466	32.627	PASS	V
4513.75	65.386	60.201	-33.98	26.22	74	54	8.614	27.778	PASS	V
5416.5	53.614	41.209	-33.98	7.23	74	54	20.386	46.770	PASS	V
6319.2	54.513	43.149	-33.98	9.17	74	54	19.487	44.830	PASS	V
7222	60.374	52.392	-33.98	18.41	74	54	13.626	35.587	PASS	V
8124.75	58.012	48.87	-33.98	14.89	74	54	15.988	39.109	PASS	V
9930.25	60.862	47.953	-33.98	13.97	74	54	13.138	40.026	PASS	V
MCH										
1050	41.511	30.26	-33.98	-3.72	74	54	32.489	57.719	PASS	H



1100	40.524	28.635	-33.98	-5.34	74	54	33.476	59.344	PASS	H
1150.025	44.178	37.203	-33.98	3.22	74	54	29.822	50.776	PASS	H
1250.025	46.037	40.085	-33.98	6.11	74	54	27.963	47.894	PASS	H
1350.025	45.15	37.06	-33.98	3.08	74	54	28.85	50.919	PASS	H
1450.05	42.684	30.073	-33.98	-3.91	74	54	31.316	57.906	PASS	H
1050.025	40.541	28.741	-33.98	-5.24	74	54	33.459	59.238	PASS	V
1150.025	42.383	33.898	-33.98	-0.08	74	54	31.617	54.081	PASS	V
1250.025	43.451	35.438	-33.98	1.46	74	54	30.549	52.541	PASS	V
1350.025	44.263	35.244	-33.98	1.26	74	54	29.737	52.735	PASS	V
1829.5	46.642	34.874	-33.98	0.89	74	54	27.358	53.105	PASS	H
2744.225	58.627	47.477	-33.98	13.50	74	54	15.373	40.502	PASS	H
3659	51.492	39.398	-33.98	5.42	74	54	22.508	48.581	PASS	H
4573.75	55.42	43.686	-33.98	9.71	74	54	18.58	44.293	PASS	H
5488.525	51.701	38.799	-33.98	4.82	74	54	22.299	49.180	PASS	H
6403.25	55.394	43.426	-33.98	9.45	74	54	18.606	44.553	PASS	H
1829.5	48.576	39.308	-33.98	5.33	74	54	25.424	48.671	PASS	V
2744.225	60.341	50.7	-33.98	16.72	74	54	13.659	37.279	PASS	V
3659	50.885	39.059	-33.98	5.08	74	54	23.115	48.920	PASS	V
4573.75	57.324	46.49	-33.98	12.51	74	54	16.676	41.489	PASS	V
5488.5	52.952	39.998	-33.98	6.02	74	54	21.048	47.981	PASS	V
6403.2	57.782	49.487	-33.98	15.51	74	54	16.218	38.492	PASS	V
HCH										
1050.025	41.846	32.346	-33.98	-1.63	74	54	32.154	55.633	PASS	H
1150.025	44.144	37.415	-33.98	3.44	74	54	29.856	50.564	PASS	H
1200	41.554	28.205	-33.98	-5.77	74	54	32.446	59.774	PASS	H
1250.025	44.56	37.472	-33.98	3.49	74	54	29.44	50.507	PASS	H
1350.025	44.584	34.932	-33.98	0.95	74	54	29.416	53.047	PASS	H
1050.025	42.028	31.264	-33.98	-2.72	74	54	31.972	56.715	PASS	V
1100.025	39.345	25.763	-33.98	-8.22	74	54	34.655	62.216	PASS	V
1150.025	40.165	27.307	-33.98	-6.67	74	54	33.835	60.672	PASS	V
1250.025	44.03	35.062	-33.98	1.08	74	54	29.97	52.917	PASS	V
1350.025	44.192	33.071	-33.98	-0.91	74	54	29.808	54.908	PASS	V
1450	43.555	30.894	-33.98	-3.09	74	54	30.445	57.085	PASS	V
1854.5	48.262	38.084	-33.98	4.10	74	54	25.738	49.895	PASS	H



2781.75	64.648	55.432	-33.98	21.45	74	54	9.352	32.547	PASS	H
3708.975	55.54	45.841	-33.98	11.86	74	54	18.46	42.138	PASS	H
4636.25	60.375	51.151	-33.98	17.17	74	54	13.625	36.828	PASS	H
5563.5	54.385	44.489	-33.98	10.51	74	54	19.615	43.490	PASS	H
6490.75	54.059	44.647	-33.98	10.67	74	54	19.941	43.332	PASS	H
8345.25	55.991	45.351	-33.98	11.37	74	54	18.009	42.628	PASS	H
1854.5	51.319	42.657	-33.98	8.68	74	54	22.681	45.322	PASS	V
2781.75	65.514	56.587	-33.98	22.61	74	54	8.486	31.392	PASS	V
3708.975	56.636	46.73	-33.98	12.75	74	54	17.364	41.249	PASS	V
4636.25	62.36	53.85	-33.98	19.87	74	54	11.64	34.129	PASS	V
5563.5	54.582	44.872	-33.98	10.89	74	54	19.418	43.107	PASS	V
6490.75	55.31	46.138	-33.98	12.16	74	54	18.69	41.841	PASS	V
7418	52.638	38.743	-33.98	4.76	74	54	21.362	49.236	PASS	V
8345.25	55.675	44.513	-33.98	10.53	74	54	18.325	43.466	PASS	V



**Table 2.10.6-9: Radiated Spurious Emissions Tabulated Data – Antenna Port 3 (Antenna 6):
30MHz – 1 GHz**

Frequency	Peak Value	QP/Avg Value	Peak Limit	QP/Avg Limit	Peak Margin	QP/Avg Margin	Polarity	Peak Limit Results	QP/Avg Limit Results
MHz	dBμV/m	dBμV/m	dBμV/m	dBμV/m	dB	dB	H/V	Pass/Fail	Pass/Fail
LCH - 902.75 MHz									
107.99	----	32.646	----	43.5	----	10.85	H	----	PASS
119.993	----	32.179	----	43.5	----	11.32	H	----	PASS
131.997	----	30.55	----	43.5	----	12.95	H	----	PASS
144.022	----	28.992	----	43.5	----	14.51	H	----	PASS
47.971	----	31.706	----	40	----	8.29	V	----	PASS
107.816	----	22.048	----	43.5	----	21.45	V	----	PASS
119.968	----	28.972	----	43.5	----	14.53	V	----	PASS
700.03	----	21.297	----	46	----	24.7	V	----	PASS
MCH – 914.75 MHz									
47.897	----	22.857	----	40	----	17.14	H	----	PASS
107.99	----	32.443	----	43.5	----	11.06	H	----	PASS
132.019	----	30.793	----	43.5	----	12.71	H	----	PASS
203.943	----	30.087	----	43.5	----	13.41	H	----	PASS
324.855	----	30.513	----	46	----	15.49	H	----	PASS
482.361	----	30.756	----	46	----	15.24	H	----	PASS
47.995	----	30.241	----	40	----	9.76	V	----	PASS
107.888	----	23.182	----	43.5	----	20.32	V	----	PASS
120.013	----	30.595	----	43.5	----	12.91	V	----	PASS
HCH – 927.25 MHz									
48.02	----	25.609	----	40	----	14.39	H	----	PASS
120.016	----	31.184	----	43.5	----	12.32	H	----	PASS
131.923	----	27.011	----	43.5	----	16.49	H	----	PASS
191.94	----	29.146	----	43.5	----	14.35	H	----	PASS
203.943	----	29.831	----	43.5	----	13.67	H	----	PASS
702.941	----	16.224	----	46	----	29.78	H	----	PASS
47.996	----	32.069	----	40	----	7.93	V	----	PASS
120	----	32.847	----	43.5	----	10.65	V	----	PASS
341.126	----	28.129	----	46	----	17.87	V	----	PASS



**Table 2.10.6-10: Radiated Spurious Emissions Tabulated Data – Antenna Port 3 (Antenna 6):
1 GHz – 10 GHz**

Frequency	Peak Value	Avg Value	DCCF	Avg corrected level	Peak Limit	Avg Limit	Peak Margin	Avg Margin	Peak/Avg Limit Results	Antenna Polarity
MHz	dBμV/m	dBμV/m	dB	dBμV/m	dBμV/m	Limit_Avg	dB	dB	Pass/Fail	H/V
LCH										
1100.025	41.64	31.51	-33.98	-2.47	74	54	32.36	56.47	PASS	H
1150.025	44.181	36.825	-33.98	2.85	74	54	29.819	51.15	PASS	H
1250.025	44.285	36.153	-33.98	2.17	74	54	29.715	51.83	PASS	H
1350.025	44.998	35.831	-33.98	1.85	74	54	29.002	52.15	PASS	H
1450.025	42.565	30.803	-33.98	-3.18	74	54	31.435	57.18	PASS	H
1050	41.36	30.471	-33.98	-3.51	74	54	32.64	57.51	PASS	V
1150	42.538	33.951	-33.98	-0.03	74	54	31.462	54.03	PASS	V
1250	43.338	34.219	-33.98	0.24	74	54	30.662	53.76	PASS	V
1350.025	44.338	35.616	-33.98	1.64	74	54	29.662	52.36	PASS	V
1805.4	50.42	43.255	-33.98	9.28	74	54	23.58	44.72	PASS	H
2708.25	47.505	35.159	-33.98	1.18	74	54	26.495	52.82	PASS	H
3610.975	50.679	40.578	-33.98	6.60	74	54	23.321	47.40	PASS	H
6319.25	54.546	44.967	-33.98	10.99	74	54	19.454	43.01	PASS	H
1805.4	46.425	36.381	-33.98	2.40	74	54	27.575	51.60	PASS	V
2708.25	47.346	34.898	-33.98	0.92	74	54	26.654	53.08	PASS	V
3611	50.778	40.697	-33.98	6.72	74	54	23.222	47.28	PASS	V
6319.25	55.274	45.669	-33.98	11.69	74	54	18.726	42.31	PASS	V
9930.225	57.495	44.238	-33.98	10.26	74	54	16.505	43.74	PASS	V
MCH										
1050.025	41.32	30.82	-33.98	-3.16	74	54	32.68	57.16	PASS	H
1100.025	41.288	30.944	-33.98	-3.04	74	54	32.712	57.04	PASS	H
1150.025	43.521	35.442	-33.98	1.46	74	54	30.479	52.54	PASS	H
1250.025	44.33	36.18	-33.98	2.20	74	54	29.67	51.80	PASS	H
1350.025	44.353	34.016	-33.98	0.04	74	54	29.647	53.96	PASS	H
1050.025	41.202	27.553	-33.98	-6.43	74	54	32.798	60.43	PASS	V
1100.025	41.047	29.774	-33.98	-4.21	74	54	32.953	58.21	PASS	V
1150.025	39.4	25.189	-33.98	-8.79	74	54	34.6	62.79	PASS	V
1250.025	44.193	36.579	-33.98	2.60	74	54	29.807	51.40	PASS	V
1350.025	42.184	28.943	-33.98	-5.04	74	54	31.816	59.04	PASS	V
1829.3	43.435	29.261	-33.98	-4.72	74	54	30.565	58.72	PASS	H
2744.125	45.79	30.739	-33.98	-3.24	74	54	28.21	57.24	PASS	H
3659.15	47.338	32.751	-33.98	-1.23	74	54	26.662	55.23	PASS	H
5488.625	49.529	34.463	-33.98	0.48	74	54	24.471	53.52	PASS	H
6403.25	50.601	36.174	-33.98	2.19	74	54	23.399	51.81	PASS	H



1829.5	49.547	42.207	-33.98	8.23	74	54	24.453	45.77	PASS	V
2744.225	49.953	41.374	-33.98	7.39	74	54	24.047	46.61	PASS	V
3659	50.502	41.139	-33.98	7.16	74	54	23.498	46.84	PASS	V
4573.75	49.726	36.426	-33.98	2.45	74	54	24.274	51.55	PASS	V
5488.475	49.698	37.126	-33.98	3.15	74	54	24.302	50.85	PASS	V
6403.25	50.997	36.195	-33.98	2.22	74	54	23.003	51.78	PASS	V
8232.8	52.181	38.247	-33.98	4.27	74	54	21.819	49.73	PASS	V
HCH										
1100	41.753	30.01	-33.98	-3.97	74	54	32.247	57.97	PASS	H
1150.025	43.524	34.845	-33.98	0.87	74	54	30.476	53.13	PASS	H
1250.025	43.837	34.956	-33.98	0.98	74	54	30.163	53.02	PASS	H
1350.025	42.548	29.512	-33.98	-4.47	74	54	31.452	58.47	PASS	H
1450.025	42.569	30.391	-33.98	-3.59	74	54	31.431	57.59	PASS	H
1050.025	41.665	30.703	-33.98	-3.28	74	54	32.335	57.28	PASS	V
1100	41.34	30.092	-33.98	-3.89	74	54	32.66	57.89	PASS	V
1150.025	42.67	33.517	-33.98	-0.46	74	54	31.33	54.46	PASS	V
1250.025	44.37	36.828	-33.98	2.85	74	54	29.63	51.15	PASS	V
1350.025	45.226	34.19	-33.98	0.21	74	54	28.774	53.79	PASS	V
1854.5	45.07	30.243	-33.98	-3.74	74	54	28.93	57.74	PASS	H
2781.925	44.781	30.199	-33.98	-3.78	74	54	29.219	57.78	PASS	H
3708.8	47.769	32.954	-33.98	-1.03	74	54	26.231	55.03	PASS	H
6490.825	50.054	36.085	-33.98	2.11	74	54	23.946	51.89	PASS	H
1854.5	44.569	30.247	-33.98	-3.73	74	54	29.431	57.73	PASS	V
2781.975	45.707	30.191	-33.98	-3.79	74	54	28.293	57.79	PASS	V
3708.6	46.968	32.923	-33.98	-1.06	74	54	27.032	55.06	PASS	V
6490.85	50.199	36.097	-33.98	2.12	74	54	23.801	51.88	PASS	V
8345.675	51.53	37.906	-33.98	3.93	74	54	22.47	50.07	PASS	V



TUV EMC Lab

Radiated Emissions, Under 1GHz

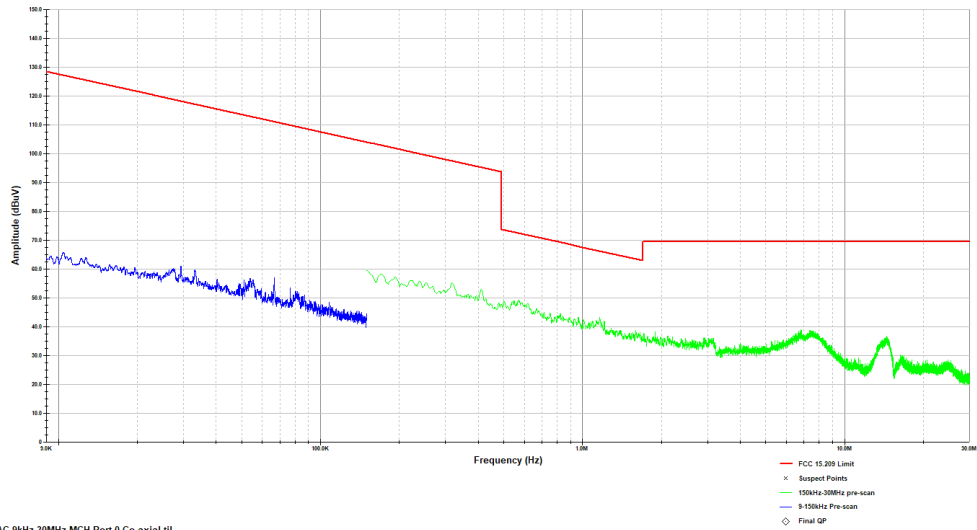
HV Graph

Company - Tier One

Model - K0310 4-Port reader

Config - MCH 914.75 MHz Port 0

Operator - Shree



FCC 15.209 BSAC 9kHz-30MHz MCH Port 0 Co-axial.ttl

Last Data Update 02:53:28 PM, Tuesday, August 13, 2024

Figure 1: Reference plot for Radiated Spurious Emissions – 9 kHz – 30 MHz – Antenna Port 0 – Co-axial

TUV EMC Lab

Radiated Emissions, Under 1GHz

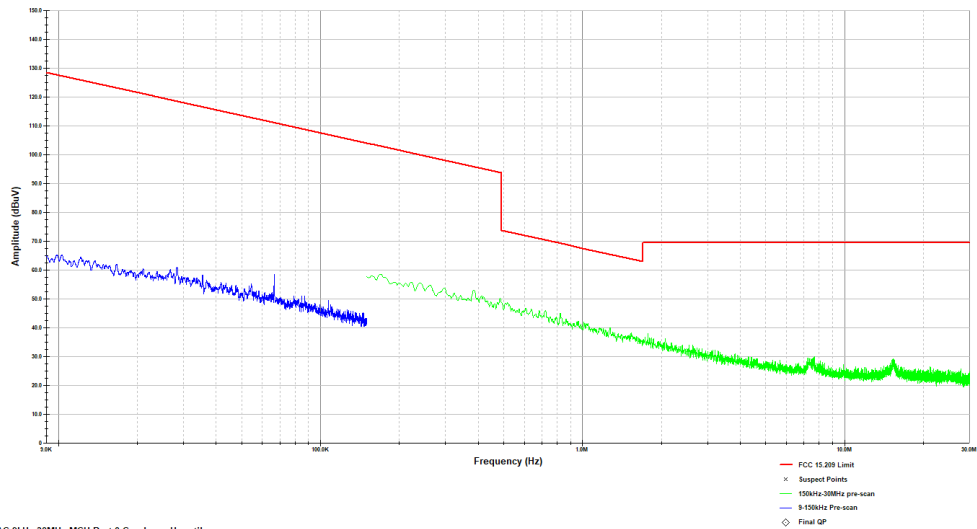
HV Graph

Company - Tier One

Model - K0310 4-Port reader

Config - MCH 914.75 MHz Port 0

Operator - Shree



FCC 15.209 BSAC 9kHz-30MHz MCH Port 0 Co-planar Horiz.ttl

Last Data Update 03:00:03 PM, Tuesday, August 13, 2024

Figure 2: Reference plot for Radiated Spurious Emissions – 9 kHz – 30 MHz – Antenna Port 0 – Co-Planar Horizontal



TUV EMC Lab

Radiated Emissions, Under 1GHz

HV Graph

Company - Tier One

Model - K0310 4-Port reader

Config - MCH 914.75 MHz Port 0

Operator - Shree

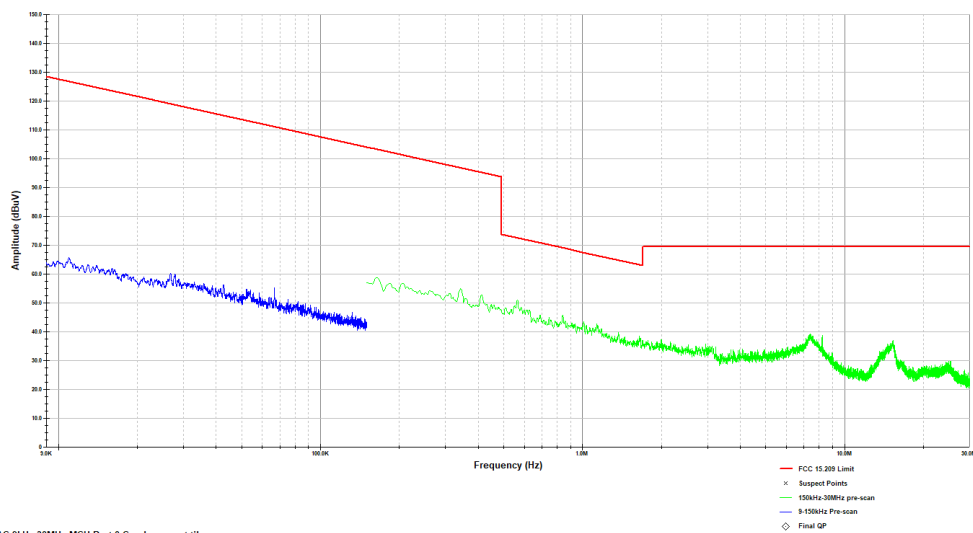


Figure 3: Reference plot for Radiated Spurious Emissions – 9 kHz – 30 MHz – Antenna Port 0 – Co-Planar Vertical

TUV EMC Lab

Radiated Emissions, Under 1GHz

HV Graph

Company - Tier One

Model - K0310 4-port reader

Config - LCH 902.75 MHz Port 0

Operator - Shree

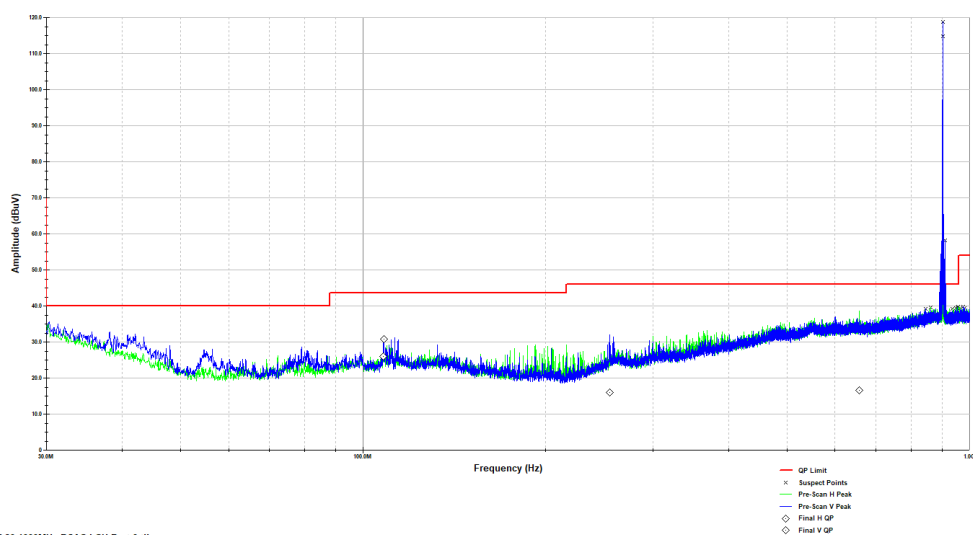


Figure 4: Reference plot for Radiated Spurious Emissions – 30 MHz – 1 GHz – Antenna Port 0

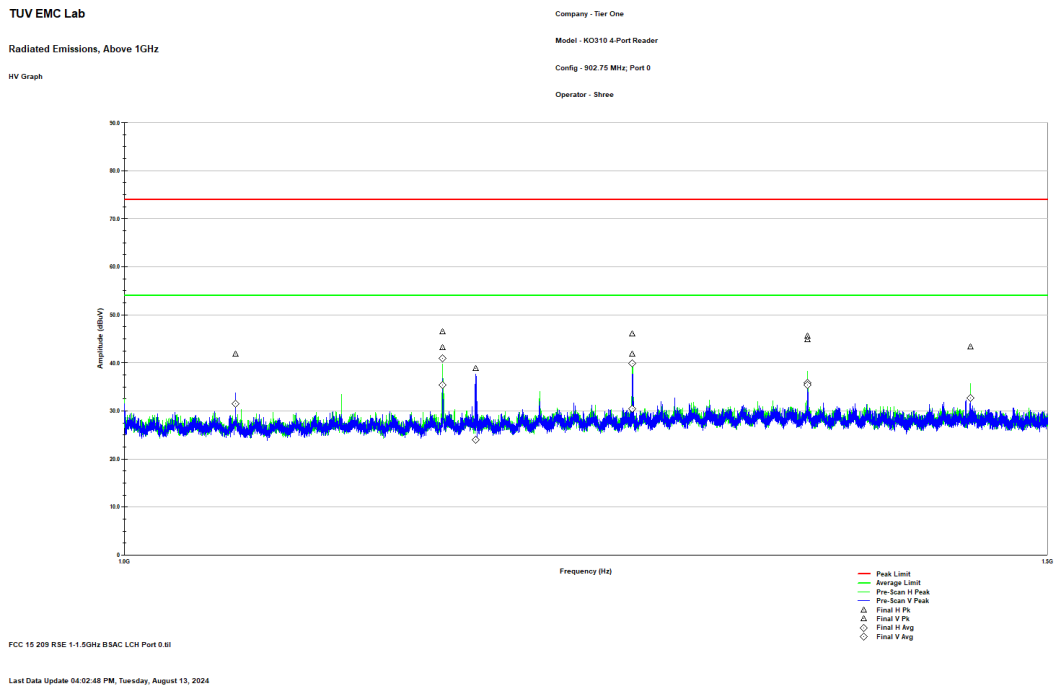


Figure 5: Reference plot for Radiated Spurious Emissions – 1 GHz – 1.5 GHz – Antenna Port 0

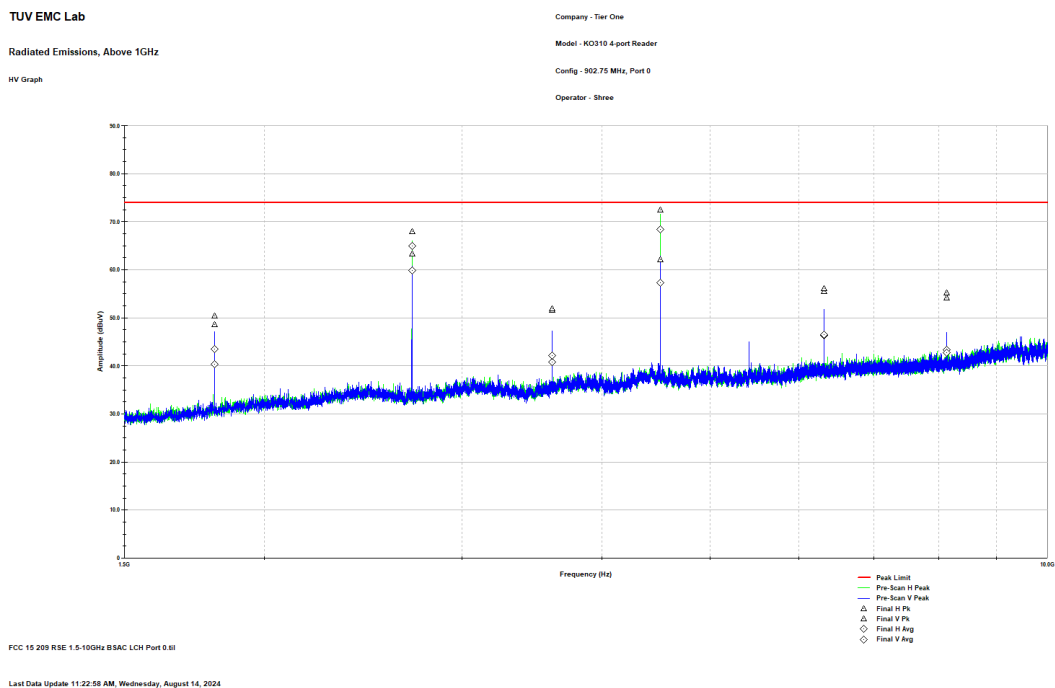


Figure 6: Reference plot for Radiated Spurious Emissions – 1.5 GHz – 10 GHz – Antenna Port 0



2.11 Test Equipment Used

Table 2.11-1 –Equipment List

Asset ID	Manufacturer	Model	Equipment Type	Serial Number	Last Calibration Date	Calibration Due Date
628	EMCO	6502	Active Loop Antenna 10kHz-30MHz	9407-2877	06/20/2023	06/20/2025
853	Teseq	CBL6112D	BiLog Antenna	51616	7/26/2023	7/26/2025
884	ETS Lindgren (EMCO)	3117	DOUBLE-RIDGED GUIDE ANTENNA	240106	5/16/2023	5/16/2025
889	Com Power	PAM 103	Pre-amplifier	18020215	10/02/2023	10/02/2024
338	Hewlett Packard	8449B	High Frequency Pre-Amp	3008A01111	6/18/2024	6/18/2026
882	Rohde & Schwarz	ESW44	ESW44 EMI TEST RECEIVER	101961	6/18/2024	6/18/2025
22	Teledyne Storm Microwave	90-195-456	BSAC Cable	N/A	07/15/2024	07/15/2025
20	Teledyne Storm Microwave	R-90-195-036	BSAC Cable	N/A	07/15/2024	07/15/2025
21	Teledyne Storm Microwave	R-90-195-072	BSAC Cable	N/A	07/15/2024	07/15/2025
337	Microwave Circuits	H1G513G1	Microwave filter	282706	06/03/2024	06/03/2025
827	Rohde & Schwarz	RF Cable set	TS8997 Rack cable set	N/A	01/02/2024	01/02/2025
622	Rohde & Schwarz	FSV40 (v3.40)	FSV Signal Analyzer 10Hz to 40GHz	101338	12/06/2023	12/06/2024
267	Hewlett Packard	N1911A	Power Meter	MY45100129	06/22/2023	06/22/2025
268	Hewlett Packard	N1921A	Power Sensor	MY45240184	08/22/2023	08/22/2025
346	Aero flex /Weinschel	54A-10	10dB Attenuator	T1362	06/20/2024	06/20/2025
872	HP	E7402A	EMI Receiver	US40240258	6/20/2024	6/20/2025
871	ACS	n/a	Conducted EMI Cable	871	03/22/2024	03/22/2025
3010	Rohde & Schwarz	ENV216	Two-Line V-Network	3010	6/18/2024	6/18/2025

N/A – Not Applicable

3 Diagram of Test Set-ups

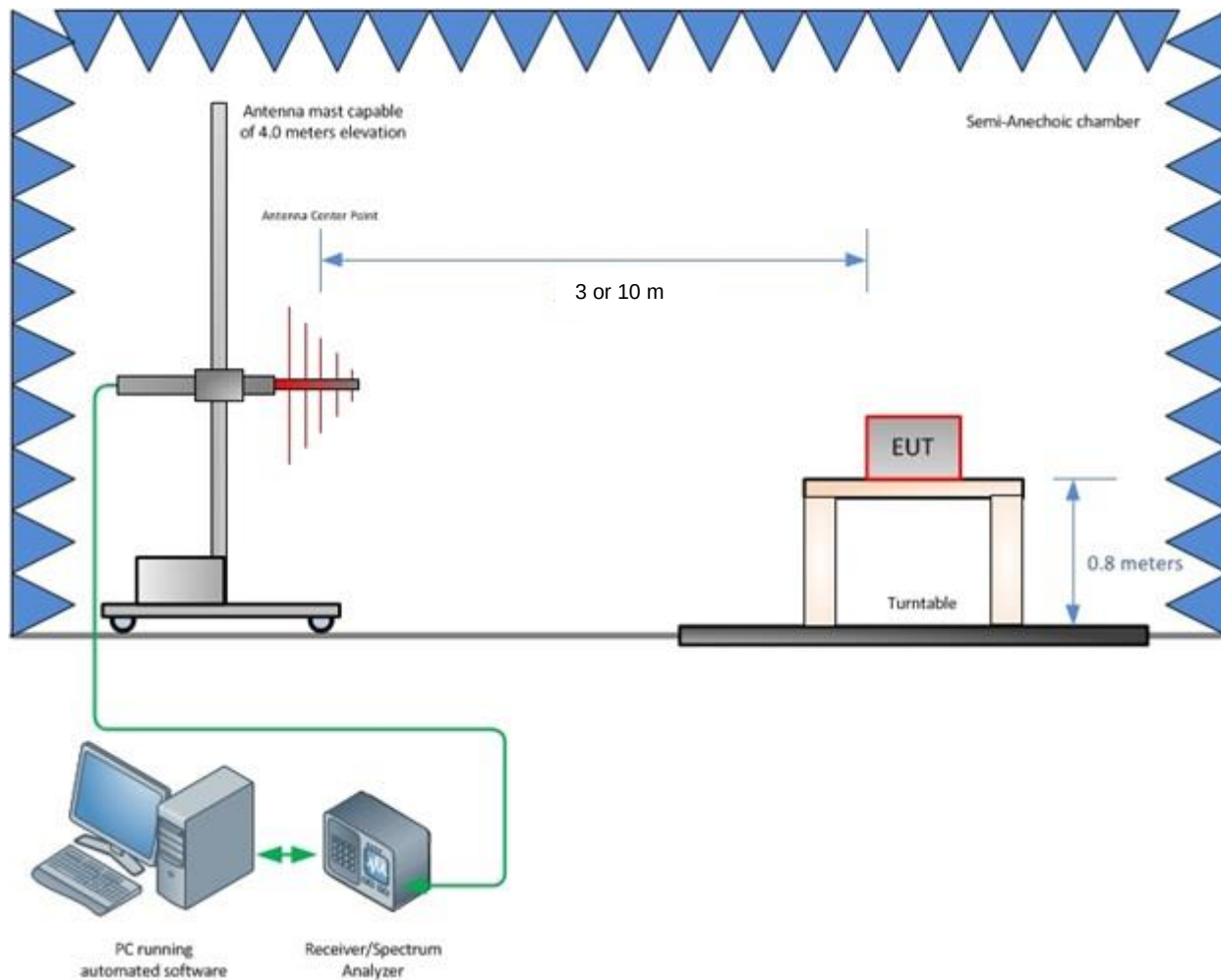


Figure 3-1 – Radiated Emissions Test Setup up to 1 GHz

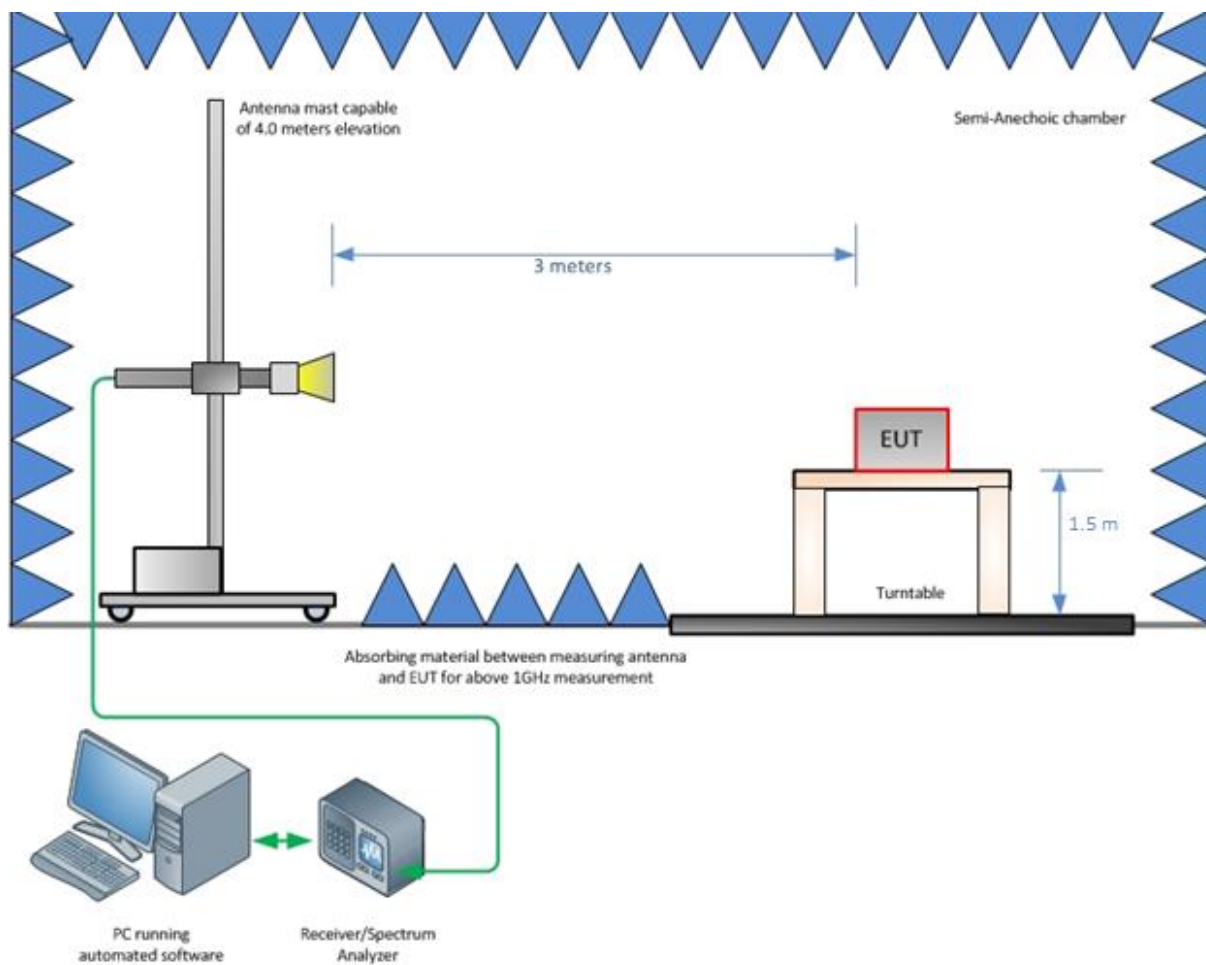


Figure 3-2 – Radiated Emissions Test Setup above 1 GHz

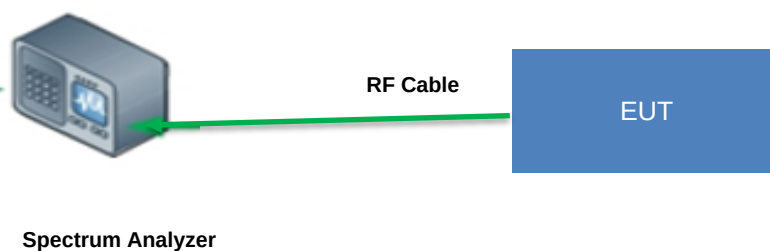


Figure 3-3 – Conducted Test Setup: Antenna Port measurement



4 Accreditation, Disclaimers and Copyright

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STATEMENT OF MEASUREMENT UNCERTAINTY

The expanded laboratory measurement uncertainty figures (U_{Lab}) provided below correspond to an expansion factor (coverage factor) $k = 1.96$ which provide confidence levels of 95%.

Table 4-1: Estimation of Measurement Uncertainty

Parameter	U_{lab}
Occupied Channel Bandwidth	$\pm 0.009 \%$
RF Conducted Output Power	$\pm 0.349 \text{ dB}$
Power Spectral Density	$\pm 0.372 \text{ dB}$
Antenna Port Conducted Emissions	$\pm 1.264 \text{ dB}$
Radiated Emissions $\leq 1 \text{ GHz}$	$\pm 5.814 \text{ dB}$
Radiated Emissions $> 1 \text{ GHz}$	$\pm 4.318 \text{ dB}$
Temperature	$\pm 0.860 \text{ }^{\circ}\text{C}$
Radio Frequency	$\pm 2.832 \times 10^{-8}$
AC Power Line Conducted Emissions	$\pm 3.360 \text{ dB}$

TEST EQUIPMENT

All measurement instrumentation is traceable to the National Institute of Standards and Technology and is calibrated to meet test method standard requirements and/or manufacturer's specifications.