Report No. 430662-06-R01

Test Report

Product	DECT Handset with Bluetooth Low Energy
Name and address of the applicant	Ascom Sweden AB Grimbodalen 2 40276 Gothenburg, Sweden
Name and address of the manufacturer	Ascom Sweden AB Grimbodalen 2 40276 Gothenburg, Sweden
Model	See clause 1.1
Rating	3.7V_{dc} (Secondary Battery, Li-Ion)
Trademark	ASCOM
Serial number	See clause 1.1
Additional information	DECT, BLE, BT Classic
Tested according to	**FCC Part 15.247** Frequency Hopping Transmitters / Digital Transmission Systems **Industry Canada RSS-247, Issue 2** Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices
Order number	430662
Tested in period	2021-04-09 to 2021-05-28
Issue date	2021-08-03
Name and address of the testing laboratory	Nemko Instituttveien 6 Kjeller, Norway www.nemko.com CAB Number: FCC: NO0001 ISED: NO0470 TEL: +47 22 96 03 30 FAX: +47 22 96 05 50 ilac-MRA NORWEGIAN ACCREDITATION TEST 033 **An accredited technical test executed under the Norwegian accreditation scheme**

Prepared by [Frode Sveinsen]	Approved by [G.Suhanthakumar]

Nemko Norway
Nemko AS, Instituttveien 6, P.O. Box 96 Kjeller, 2027 Kjeller, Norway
TEL +47 22 96 03 30 FAX +47 22 96 05 50 EMAIL info@nemko.com
ENTERPRISE NUMBER NO974404532

CONTENTS

1 INFORMATION

1.1 Test Item

Name	**ASCOM**
Model/version	**DH8-AAAA** **DH8-ABAA** **DH8-ACAA** **DH8-ABAB** **DH8-ACAB** **DH8-CEAA** **DH8-CEAB** **DH8-DDAA** **DH8-DEAB**
FCC ID	**BXZDH8**
ISED ID	**3724B-DH8**
Serial number	**Conducted Sample: T26107D4JV** **Radiated Sample: T26107D2WF**
Hardware identity and/or version	**PD**
Software identity and/or version	**1.0.8**
Frequency Range	**2402–2480 MHz**
Number of Channels	**40**
Operating Modes	**Bluetooth Low Energy**
Type of Modulation	**GFSK**
Conducted Output Power	**0.0024**
Antenna Connector	**None**
Number of Antennas	**1**
Diversity or Smart Antennas	**No**
Power Supply	**Secondary Battery (3.7V Li-Ion, 910mAh)**
Desktop Charger	**Ascom DC3-AAD with AC Adaptor DSA-6PFG-05**

Description of Test Item

The EUT is a DECT Handset with Bluetooth FHSS and Bluetooth Low Energy.

Bluetooth Low Energy part has been tested as a Digital Modulation system.

All models listed above have identical RF part and the main PCB and physical properties are identical. See model differences letter for description of differences.

All tests were performed on model DH8-ACAA, this model contains all options.

1.2 Normal test condition

Temperature:	**20 - 24 °C**
Relative humidity:	**20 - 50 %**
Normal test voltage:	**3.7 VDC (Nominal Battery Voltage)**

The values are the limit registered during the test period.

All tests were performed with a fully charged battery.

1.3 Test Engineer(s)

Frode Sveinsen

1.4 Antenna Requirement

Does the EUT have detachable antenna(s)?	☐ **YES**	☒ **NO**
If detachable, is the antenna connector(s) non-standard?	☐ **YES**	☐ **NO**
The tested equipment has only integral antennas. Conducted tests were performed with a temporary antenna connector.		

Requirement: FCC 15.203, 15.204

1.5 EUT Operating Modes

Description of operating modes	Continuous TX on single channel.
Additional information	The following settings were used for all tests: Power Setting: Full power Bit Pattern: PSRB9 Frame Type: Fixed Bit rate: 1Mb and 2Mb

1.6 Comments

The EUT uses Bluetooth Low Energy protocol with 40 hopping channels and control channels.

All measurements were done with the EUT powered by a fully charged battery.

2 TEST REPORT SUMMARY

2.1 General

All measurements are tracable to national standards.

The tests were conducted for demonstrating compliance with FCC CFR 47 Part 15, paragraph 15.247 and Industry Canada RSS-247 Issue 2 and RSS-GEN Issue 5.

Tests were performed in accordance with ANSI C63.4-2014 and and ANSI C63.10-2013.

Radiated tests were made in a semi-anechoic chamber at measuring distance of 3m.

A description of the test facility is on file with FCC and ISED.

☒ New Submission ☒ Production Unit

☐ Class II Permissive Change ☐ Pre-production Unit

DTS Equipment Code ☐ Family Listing

THIS TEST REPORT APPLIES ONLY TO THE ITEM(S) AND CONFIGURATIONS TESTED.

Deviations from, additions to, or exclusions from the test specifications are described in “Summary of Test Data”.

2.2 Test Summary

Name of test	FCC Part 15 reference	RSS-247 Issue 2, RSS-GEN Issue 5 reference	ANSI C63.10-2013 Reference	Result
Supply Voltage Variations	15.31(e)	6.11 (RSS-GEN)	5.13	Complies
Antenna Requirement	15.203	6.8 (RSS-GEN)	5.8	Complies
Power Line Conducted Emission	15.107(a) 15.207(a)	7.2 / 8.8 (RSS-GEN)	6.2	Complies
Occupied Bandwidth (99% BW)	N/A	6.7 (RSS-GEN)	6.9.3	Complies
DTS Bandwidth	15.247(a)(2)	5.2 (1) (RSS-247)	11.8 Option 2	Complies
Peak Power Output	15.247(b)	5.4 (RSS-247)	11.9.1.1	Complies
Power Spectral Density	15.247(d)	5.2 (2) (RSS-247)	11.10.2 PKPSD (DTS)	Complies
Spurious Emissions (Antenna Conducted)	15.247(c)	5.5 (RSS-247)	6.7 11.11 (DTS)	Complies
Spurious Emissions (Radiated)	15.247(c) 15.109(a) 15.209(a)	5.5 (RSS-247) 7.3 (RSS-GEN) 8.9 (RSS-GEN)	6.3, 6.5, 6.6, 6.10 11.12, 11.13 (DTS)	Complies

Revision history

Revision	Date	Comment	Sign
00	2021-07-05	First edition	FS
01	2021-08-03	Updated model numbers	FS

3 TEST RESULTS

3.1 Power Line Conducted Emissions

FCC Part 15.107 (a)

ISED RSS-GEN Issue 5, Clause 7.2/8.8

Measurement procedure: **ANSI C63.4-2014 using 50 µH/50 ohms LISN.**

Test Results: **Complies**

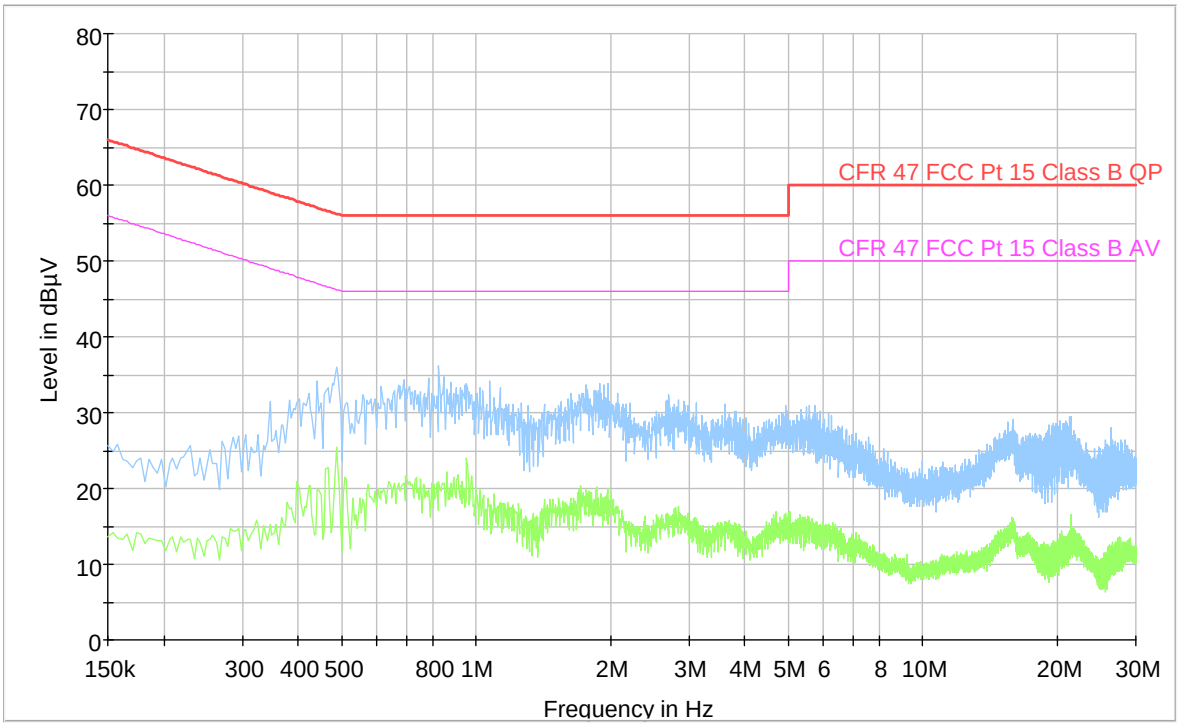
Measurement Data: **See attached plots.**

Highest measured value (L1 and N):

Handset in Charger, 120V 60Hz:

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter
---	---	---	---	---	---	---		

Full Spectrum



3.2 Occupied Bandwidth (99% BW)

FCC Part 15.247 (a)(1)(iii)

ISED Canada RSS-247 Issue 2, Clause 5.1

ISED Canada RSS-GEN Issue 5, Clause 6.7

Measurement procedure: ANSI C63.10-2013 Clause 6.9.3 / 7.8.3

Test Results: Complies

Measurement Data:

Carrier Frequency and Data Rate	Occupied Bandwidth (99% BW)
2440MHz, 1Mb	1.11 MHz
2440MHz, 2Mb	2.07 MHz

Occupied Bandwidth is the same for all channels.

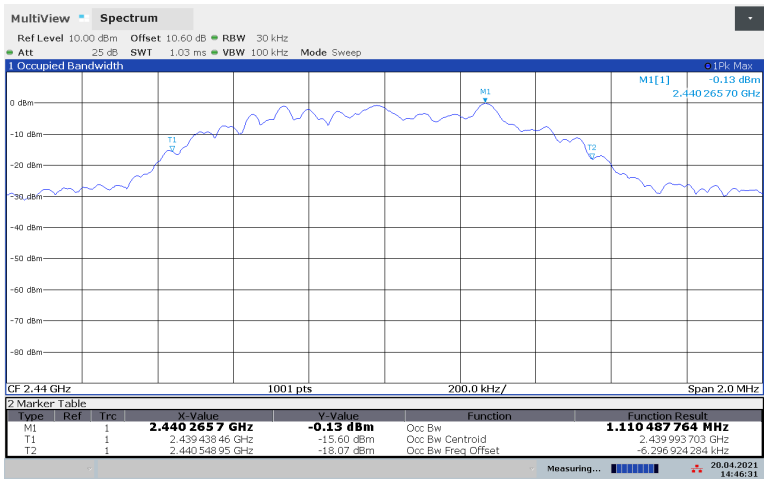
See attached plots.

Requirements:

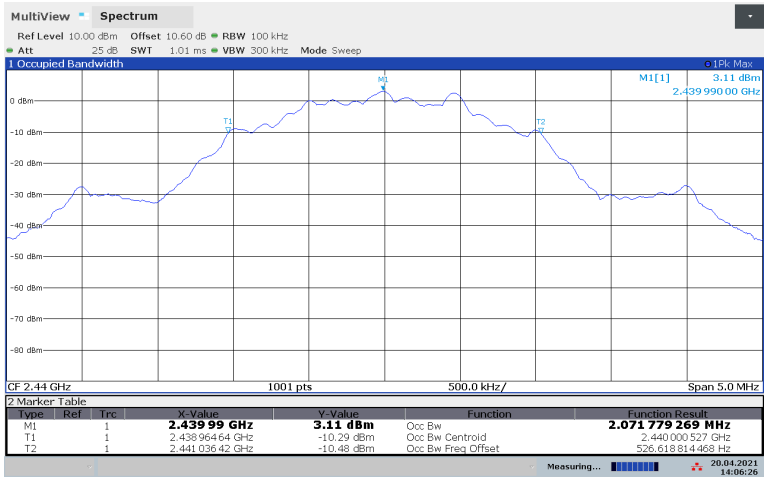
Frequency hopping systems in the 2400 - 2483.5 MHz band shall use at least 15 non-overlapping channels. No requirements for bandwidth for this frequency band.

No requirements for Digital Transmission Systems.

No requirement for 99% BW, reported for information only.



99% Occupied BW, 1Mb



99% Occupied BW, 2Mb

3.3 DTS Bandwidth

FCC Part 15.247 (a)(2)

ISED Canada RSS-247 Issue 2, Clause 5.2 (a)

Measurement procedure: **ANSI C63.10-2013 Clause 11.8**

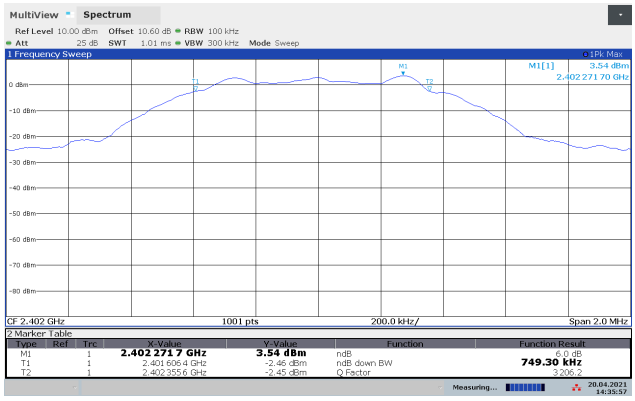
Test Results: **Complies**

Measurement Data:

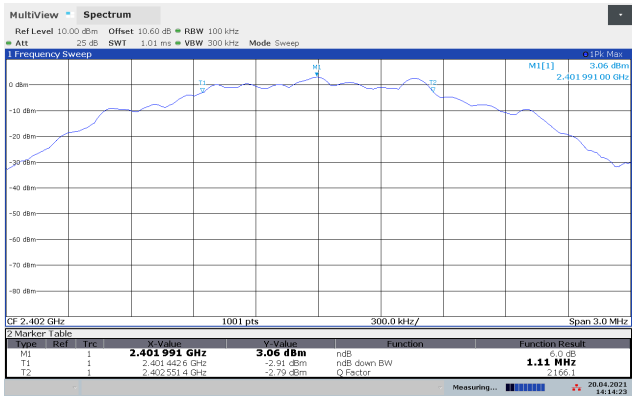
Operating Mode	DTS Bandwidth (6dB BW) (kHz)		
	2402 MHz	2440 MHz	2480 MHz
BLE 1Mb	749	755	749
BLE 2Mb	1110	1110	1110

Requirements:

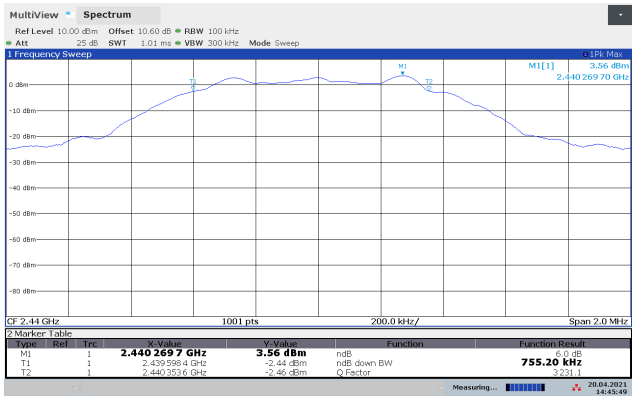
For Digital Transmission Systems in the 2400-2483.5 MHz band the minimum 6 dB bandwidth shall be at least 500 KHz.



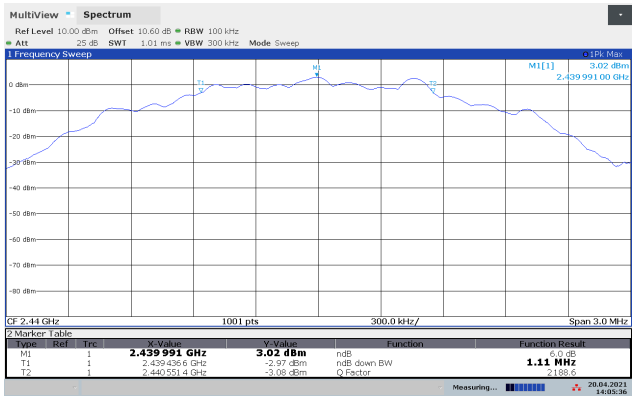
DTS BW, 2402 MHz, 1Mb



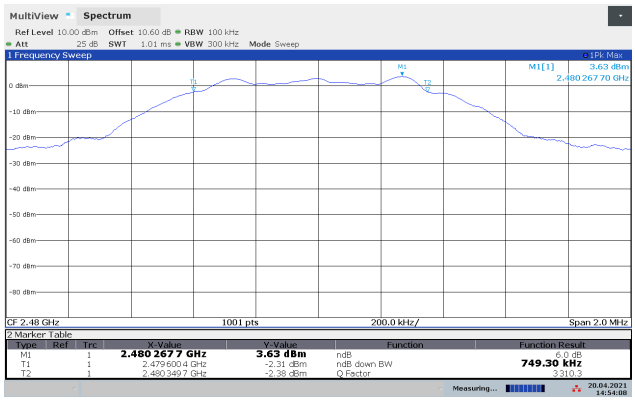
DTS BW, 2402 MHz, 2Mb



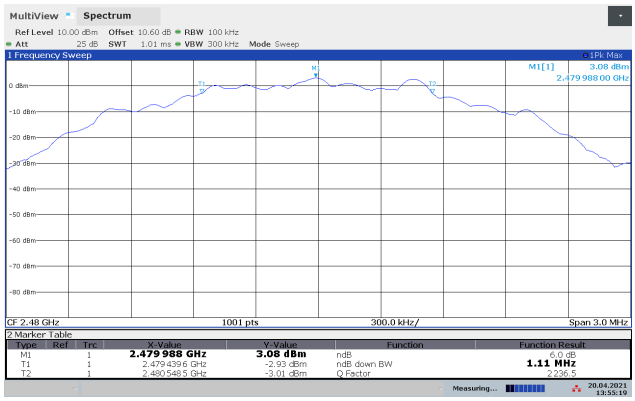
DTS BW, 2440 MHz, 1Mb



DTS BW, 2440 MHz, 2Mb



DTS BW, 2480 MHz, 1Mb



DTS BW, 2480 MHz, 2Mb

3.4 Peak Power Output

FCC Part 15.247 (b)

ISED Canada RSS-247 Issue 2, Clause 5.4

Measurement procedure: ANSI C63.10-2013 Clause 11.9.1.2

Test Results: Complies

Measurement Data:

Carrier Frequency (MHz)	Operating Mode	Conducted Power (dBm)	Conducted Power (mW)
2402	1Mb	3.7	2.3
	2Mb	3.7	2.3
2440	1Mb	3.7	2.3
	2Mb	3.7	2.3
2480	1Mb	3.7	2.4
	2Mb	3.7	2.4

Manufacturer specified antenna gain is less than 3 dBi.

Output Power reported is Maximum Peak Power.

Antenna Gain is less than 6 dBi.

See attached plots.

Requirements:

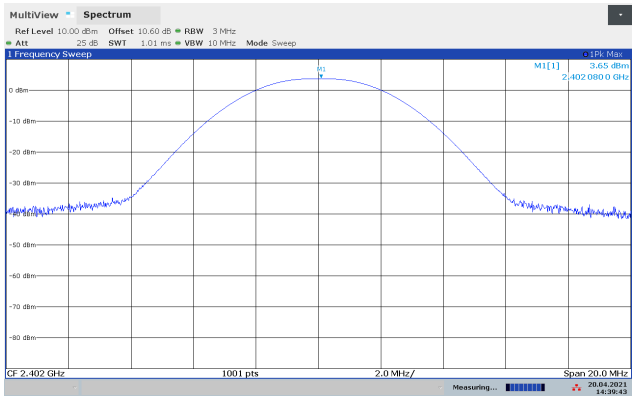
The maximum peak output power shall not exceed the following limits:

For frequency hopping systems employing at least 75 hopping channels: 1 Watt

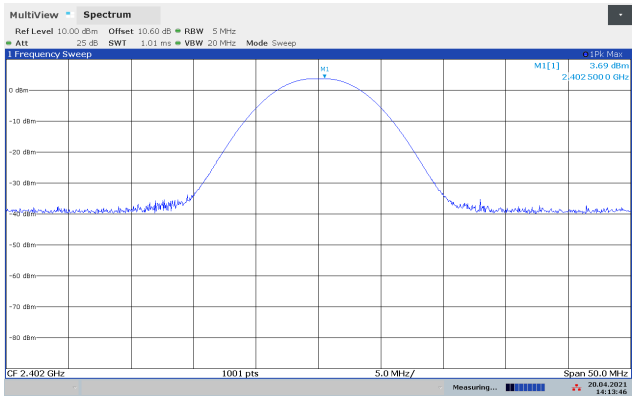
For all other frequency hopping systems in the 2400 - 2483.5 MHz band: 0.125 Watts

For Digital Transmission Systems in the 2400 - 2483.5 MHz band: 1 Watt

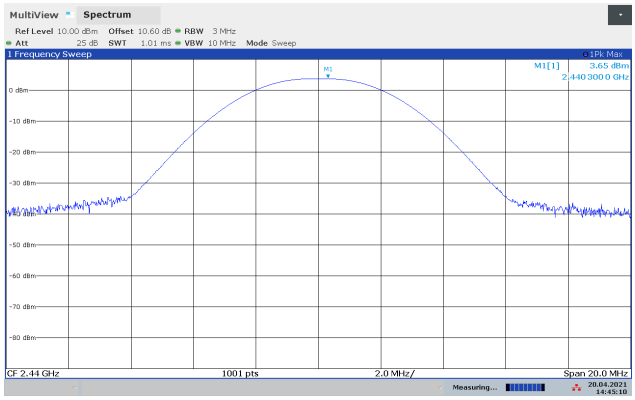
If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power from the intentional radiator shall be reduced below the stated value above by the amount in dB that the directional gain of the antenna exceeds 6 dBi.



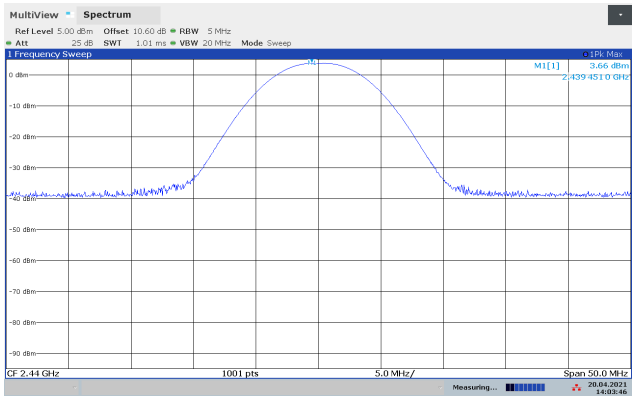
Peak Power, 2402 MHz, 1Mb



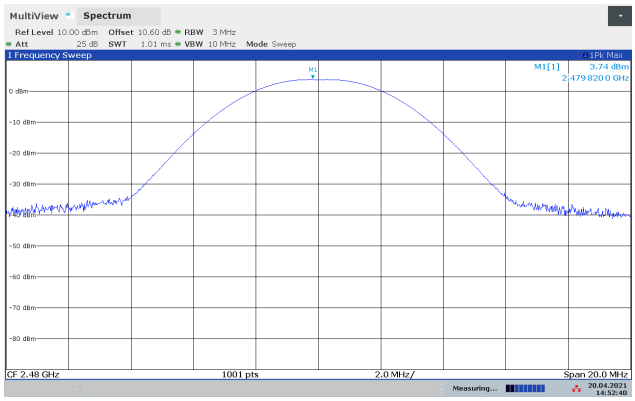
Peak Power, 2402 MHz, 2Mb



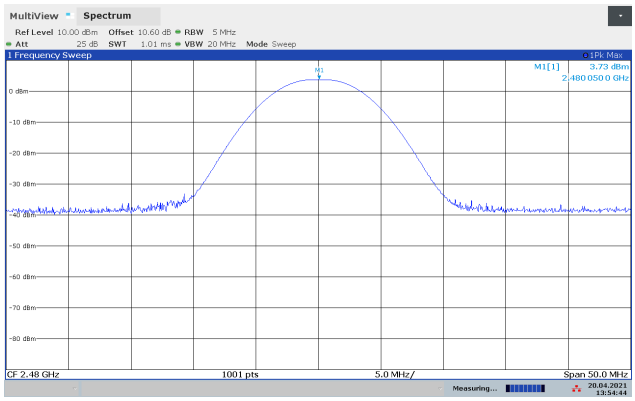
Peak Power, 2440 MHz, 1Mb



Peak Power, 2440 MHz, 2Mb



Peak Power, 2480 MHz, 1Mb



Peak Power, 2480 MHz, 2Mb

3.5 Conducted Emissions at Antenna Connector

FCC Part 15.247 (d)

ISED Canada RSS-247 Issue 2, Clause 5.5

Measurement procedure: ANSI C63.10-2013 Clause 11.11

Test Results: Complies

Measurement Data:

Carrier Frequency	Highest Value (dBc)	Margin (dB)	Verdict
2402 MHz	> 50	> 30	Pass
2440 MHz	> 50	> 30	Pass
2480 MHz	> 50	> 30	Pass

Measured with Peak Detector

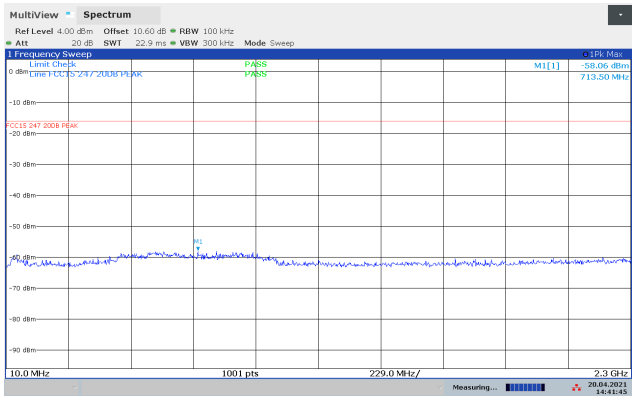
RF conducted power to 25 GHz: see attached plots.

Limit

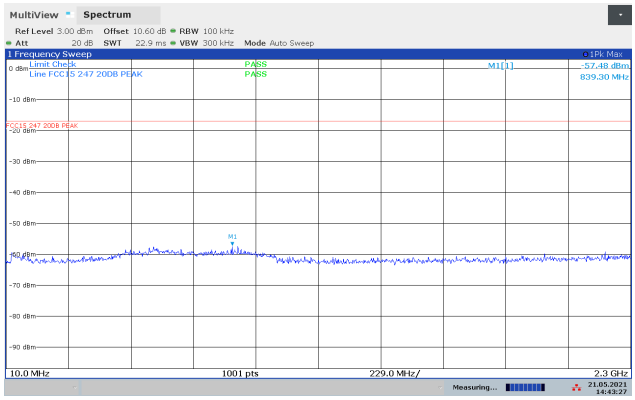
Peak measurement	RMS averaging
20 dBc or more in 100 kHz bandwidth	30 dBc or more in 100 kHz bandwidth

Detector type shall be the same as used for measuring Output Power.

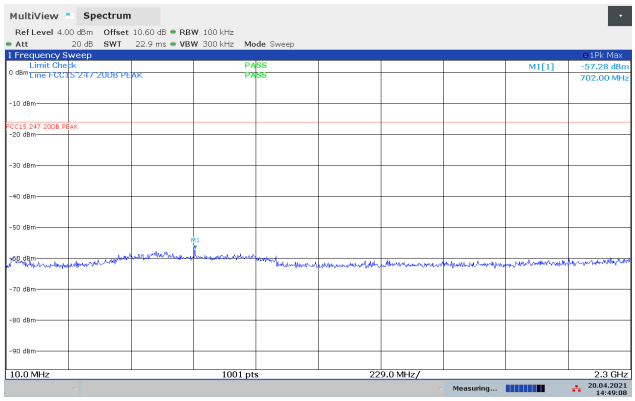
Attenuation below the general limits specified in part 15.209(a) is not required.



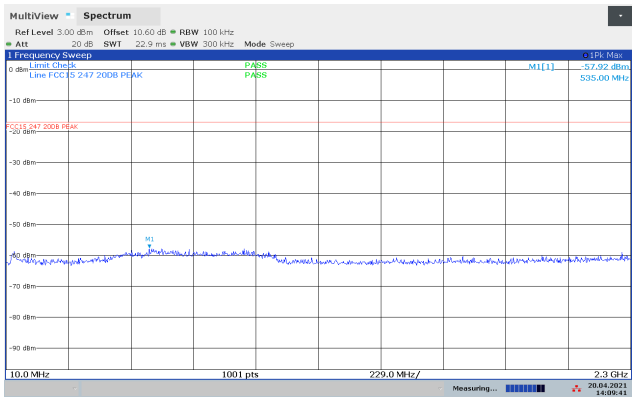
Conducted Emissions 10-2300 MHz, 2402 MHz, 1Mb



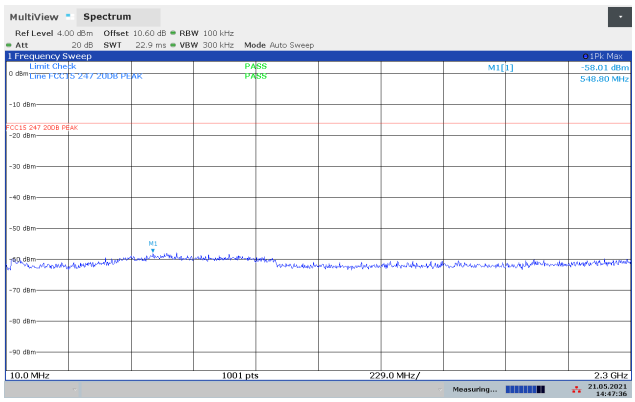
Conducted Emissions 10-2300 MHz, 2402 MHz, 2Mb



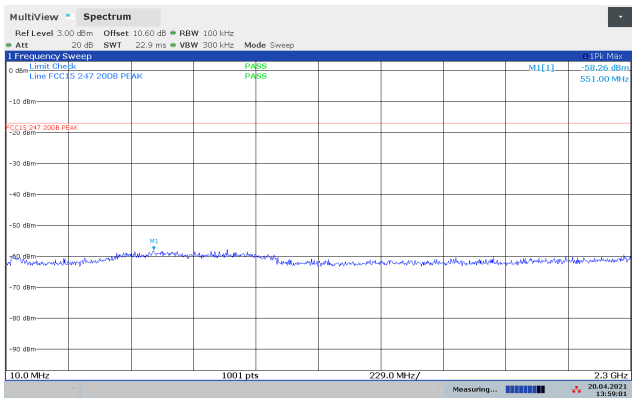
Conducted Emissions 10-2300 MHz, 2440 MHz, 1Mb



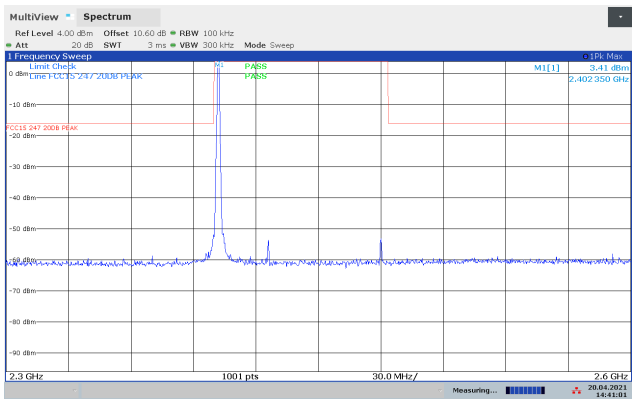
Conducted Emissions 10-2300 MHz, 2440 MHz, 2Mb



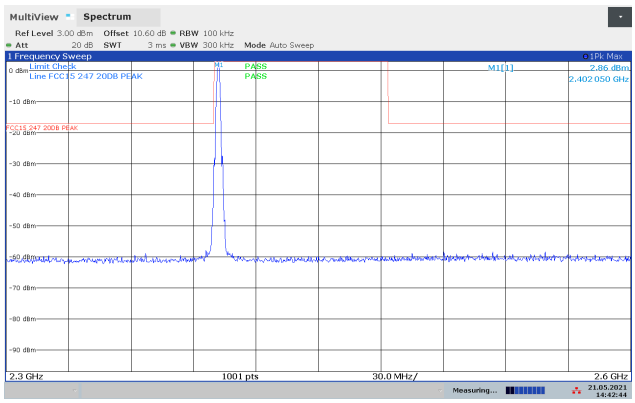
Conducted Emissions 10-2300 MHz, 2480 MHz, 1Mb



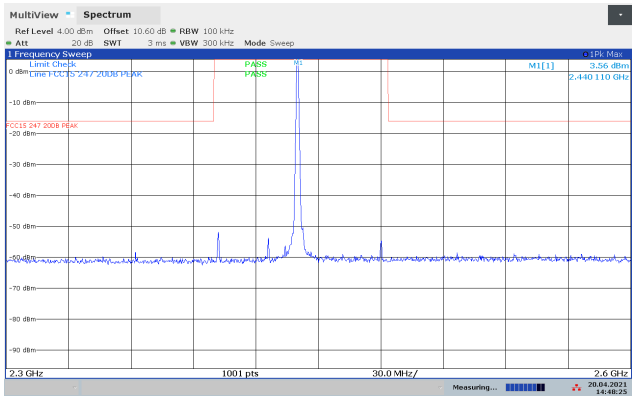
Conducted Emissions 10-2300 MHz, 2480 MHz, 2Mb



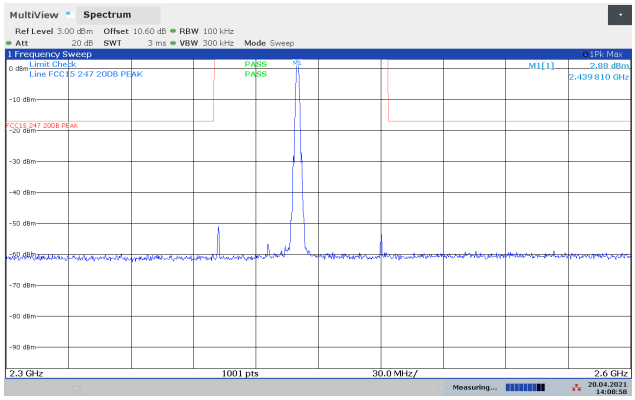
Conducted Emissions 2300-2600 MHz, 2402 MHz, 1Mb



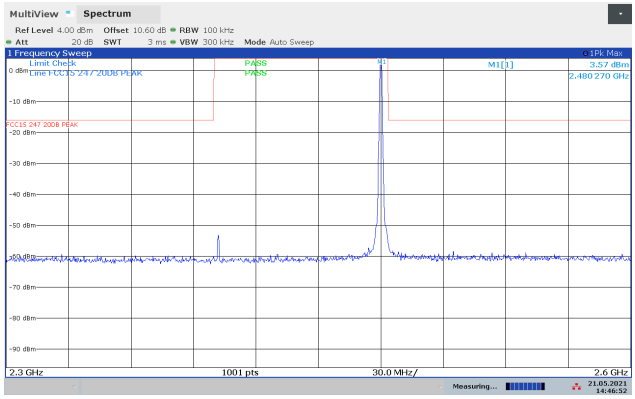
Conducted Emissions 2300-2600 MHz, 2402 MHz, 2Mb



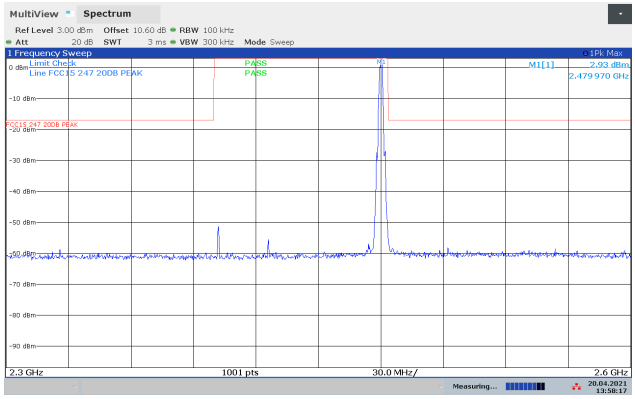
Conducted Emissions 2300-2600 MHz, 2440 MHz, 1Mb



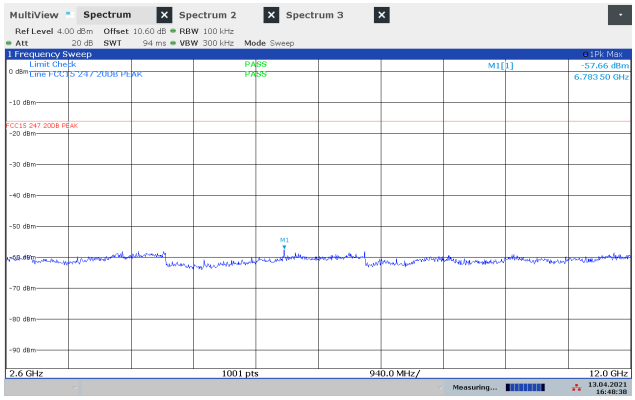
Conducted Emissions 2300-2600 MHz, 2440 MHz, 2Mb



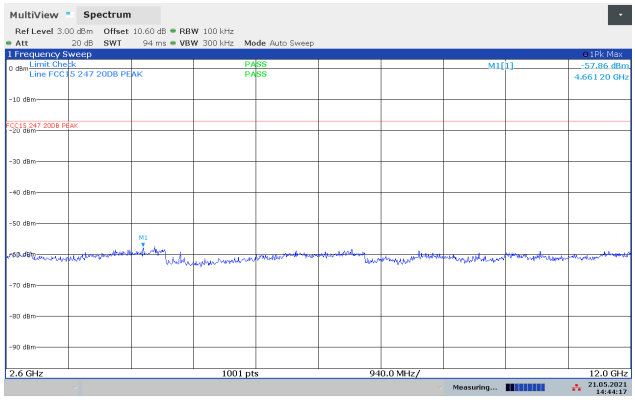
Conducted Emissions 2300-2600 MHz, 2480 MHz, 1Mb



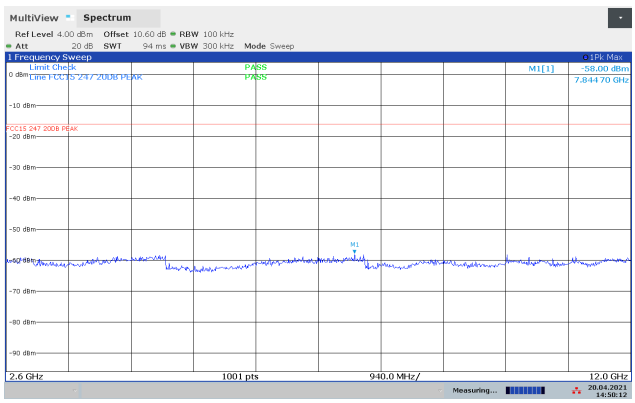
Conducted Emissions 2300-2600 MHz, 2480 MHz, 2Mb



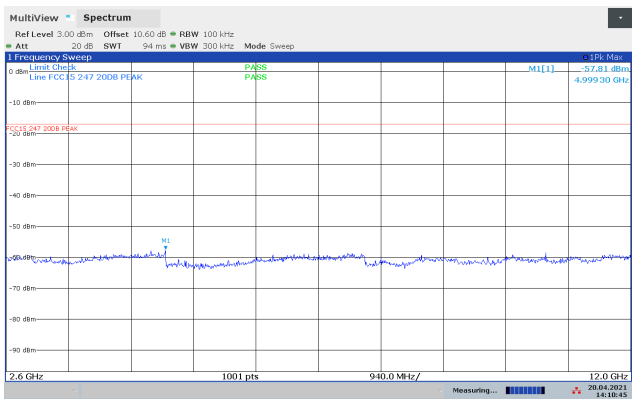
Conducted Emissions 2600-12000 MHz, 2402 MHz, 1Mb



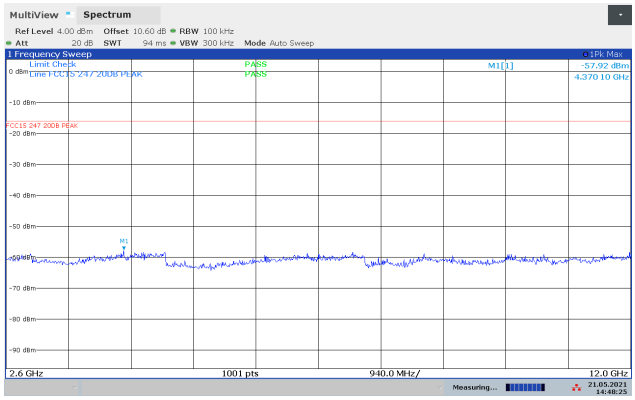
Conducted Emissions 2600-12000 MHz, 2402 MHz, 2Mb



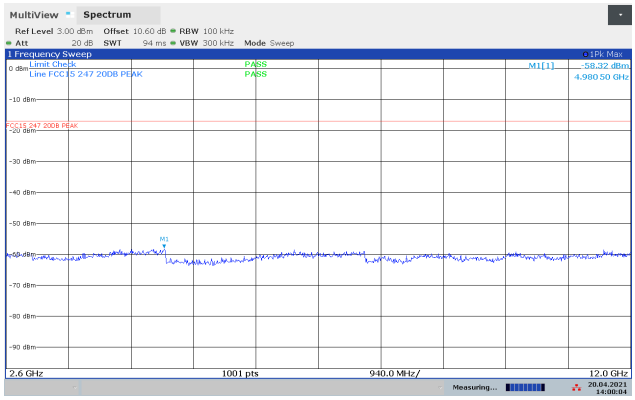
Conducted Emissions 2600-12000 MHz, 2440 MHz, 1Mb



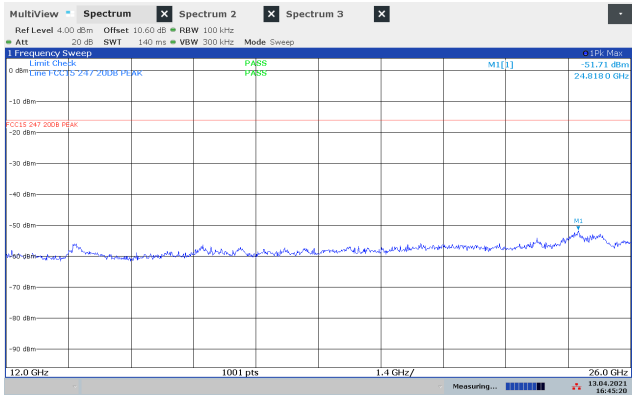
Conducted Emissions 2600-12000 MHz, 2440 MHz, 2Mb



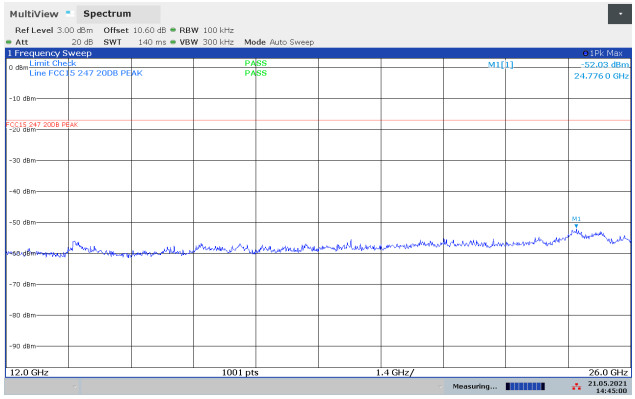
Conducted Emissions 2600-12000 MHz, 2480 MHz, 1Mb



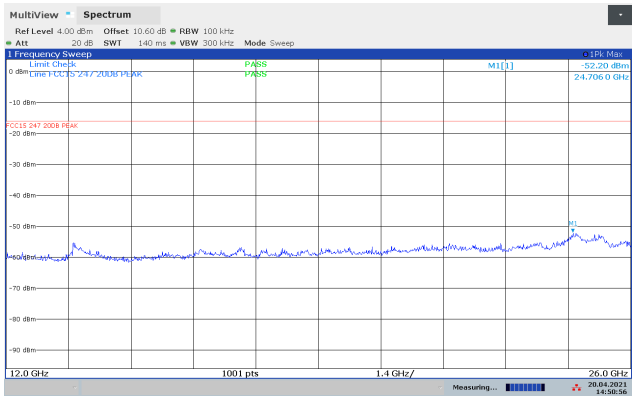
Conducted Emissions 2600-12000 MHz, 2480 MHz, 2Mb



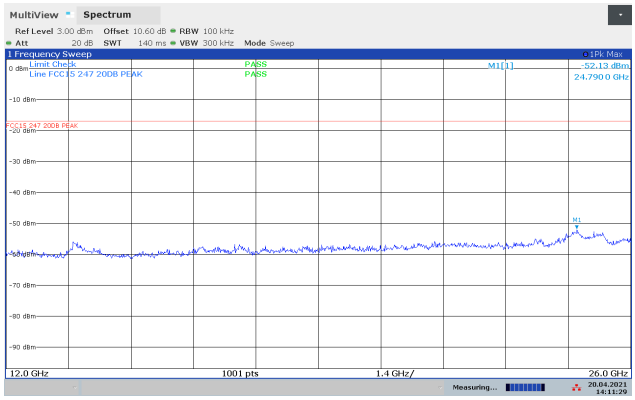
Conducted Emissions 12000-26000 MHz, 2402 MHz, 1Mb



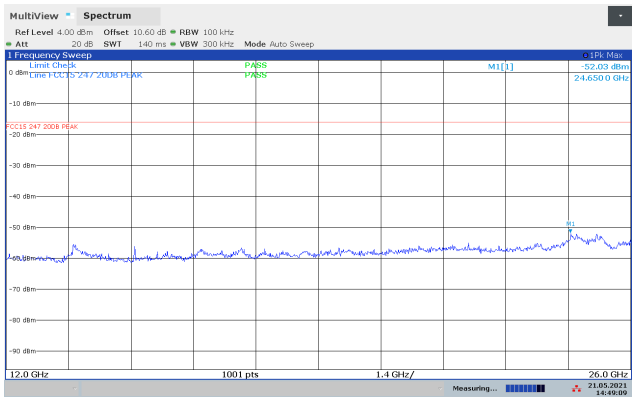
Conducted Emissions 12000-26000 MHz, 2402 MHz, 2Mb



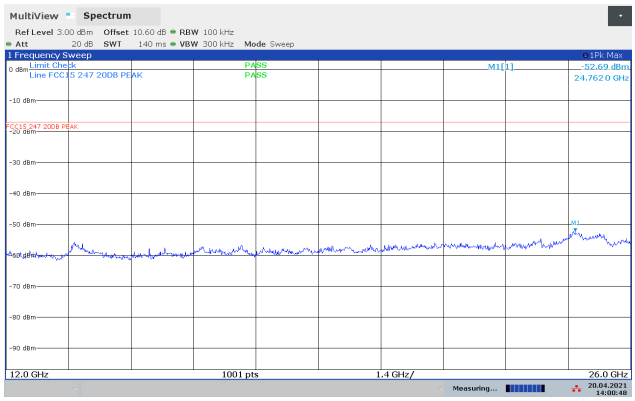
Conducted Emissions 12000-26000 MHz, 2440 MHz, 1Mb



Conducted Emissions 12000-26000 MHz, 2440 MHz, 2Mb



Conducted Emissions 12000-26000 MHz, 2480 MHz, 1Mb



Conducted Emissions 12000-26000 MHz, 2480 MHz, 2Mb

3.6 Restricted Bands of operation

Restricted Bands of operation for FCC and ISED are defined in FCC Part 15.205 and ISED RSS-GEN, Issue 5 clause 8.10.

Generally, no fundamentals are allowed in the restricted bands and all emissions must comply with the limits in FCC 15.209 or RSS-GEN, Issue 5, clause 8.9.

FCC (MHz)	ISED Canada (MHz)	FCC (GHz)	ISED Canada (GHz)
0.090-0.110		**0.96-1.24** **1.3-1.427**	**0.96-1.427**
0.495-0.505		1.435-1.6265	
2.1735-2.1905		1.6455-1.6465	
	3.020-3.026	1.660-1.710	
4.125-4.128		1.7188-1.7222	
4.17725-4.17775		2.2-2.3	
4.20725-4.20775		2.31-2.39	
	5.677-5.683	2.4835-2.5	
6.215-6.218		**2.69-2.9**	**2.655-2.9**
6.26775-6.26825		3.26-3.267	
6.31175-6.31225		3.332-3.339	
8.291-8.294		3.3458-3.358	
8.362-8.366		**3.6-4.4**	**3.5-4.4**
8.37625-8.38675		4.5-5.15	
8.41425-8.41475		5.35-5.46	
12.29-12.293		7.25-7.75	
12.51975-12.52025		8.025-8.5	
12.57675-12.57725		9.0-9.2	
13.36-13.41		9.3-9.5	
16.42-16.423		10.6-12.7	
16.69475-16.69525		13.25-13.4	
16.80425-16.80475		14.47-14.5	
25.5-25.67		15.35-16.2	
37.5-38.25		17.7-21.4	
73-74.6		22.01-23.12	
74.8-75.2		23.6-24.0	
108-121.94 **123-138**	**108-138**	31.2-31.8	
149.9-150.05		36.43-36.5	
156.52475-156.52525		Above 38.6	
156.7-156.9			
162.0125-167.17			
167.72-173.2			
240-285			
322-335.4			
399.9-410			
608-614			

Frequencies in **Bold** text are specific for FCC or ISED, all other frequencies are common.

3.7 Radiated Emissions, Band Edge

FCC Part 15.209 (a)

ISED Canada RSS-GEN Issue 5, Clause 7.3 / 8.9

Measurement procedure: **ANSI C63.10-2013 Clause 11.12**

Test Results: Complies

Measurement Data:

Carrier Frequency and Data Rate	Band Edge Frequency	Measured Field Strength (dBµV/m)		Limit (dBµV/m)		Margin (dB)	
		Peak Detector	Average Detector	Peak Det	Average Det	Peak Det	Average Det
2402 MHz 1Mb	2390 MHz	52.0	/	74	54	22.0	/
2480 MHz 1Mb	2483.5 MHz	54.5	48.5			19.5	5.5
2402 MHz 2Mb	2390 MHz	53.4	/			20.6	/
2480 MHz 2Mb	2483.5 MHz	55.5	49.5			18.5	4.5

Average Detector values are measured with Peak Detector and corrected for Duty Cycle.

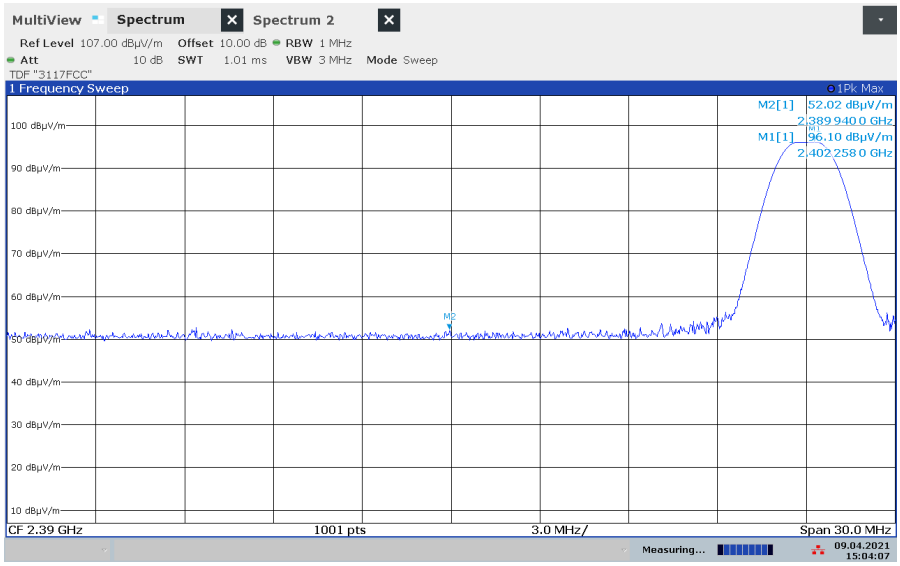
Average Detector values are not reported when Peak Detector values are below Average limit.

See attached plots.

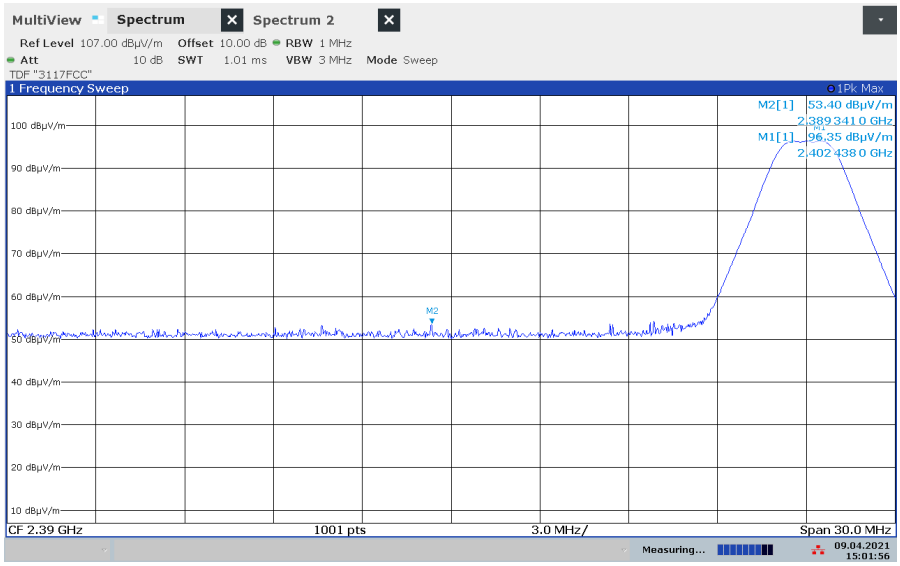
Duty Cycle Calculation:

Maximum Duty Cycle according to applicant: 50% within any 100ms period.

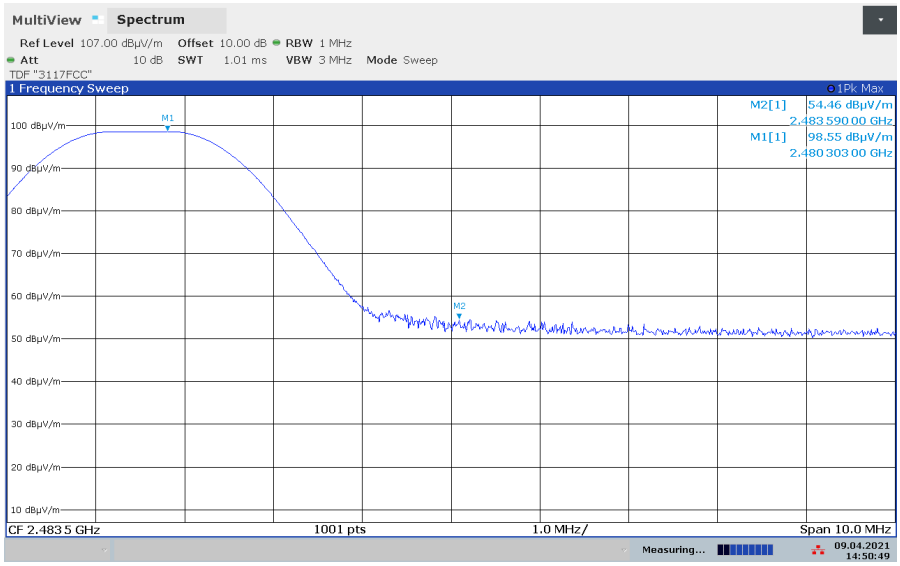
Duty Cycle Correction Factor: -20 x log (50/100) = 6.0 dB



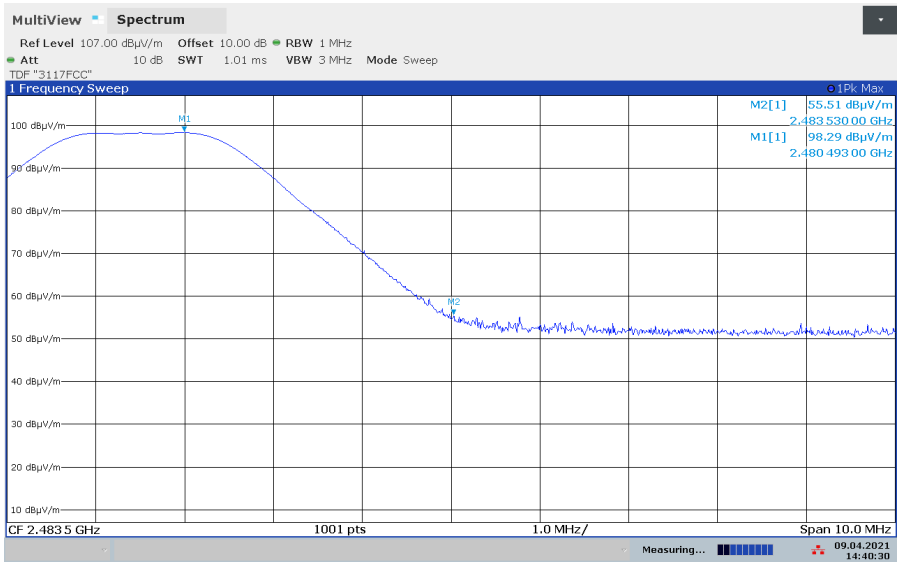
Lower Band Edge 2402 MHz, 1Mb, Peak



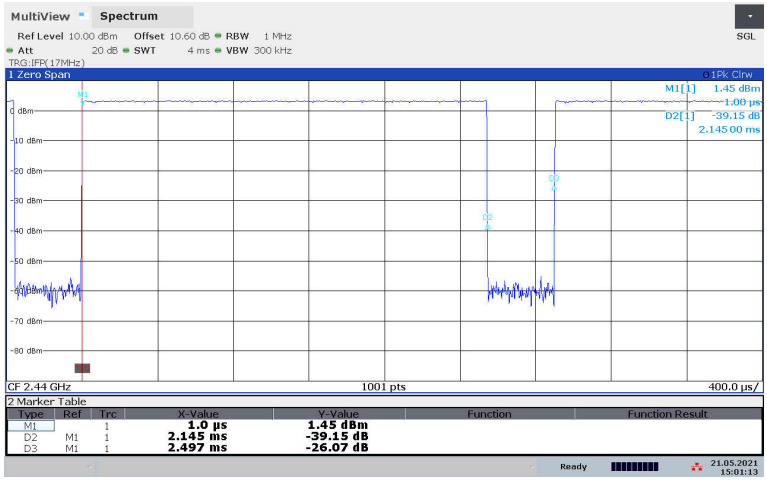
Lower Band Edge 2402 MHz, 2Mb, Peak



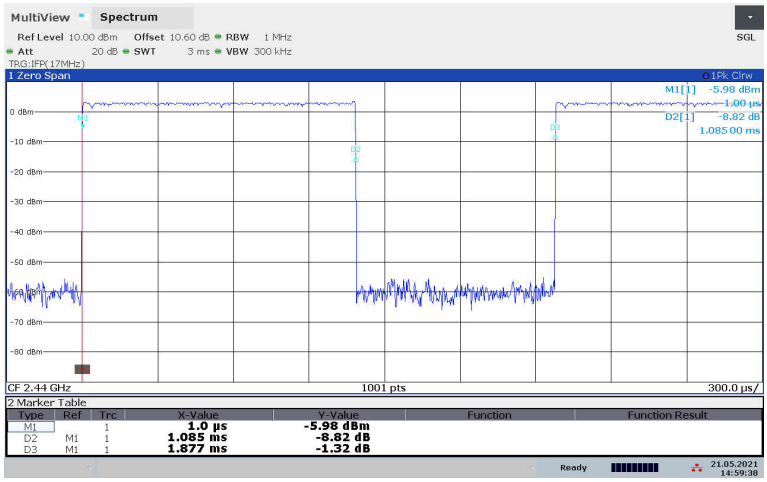
Upper Band Edge 2480 MHz, 1Mb, Peak



Upper Band Edge 2480 MHz, 2Mb, Peak



Frame Length, 1Mb



Frame Length, 2Mb

3.8 Radiated Emission, 30 – 1000 MHz.

FCC Part 15.209 (a)

ISED Canada RSS-GEN Issue 5, Clause 7.3/8.9

Measurement procedure: ANSI C63.10-2013 Clause 11.12

Test Results: Complies

Measurement Data:

Detector: Peak (found frequencies were measured with Quasi-Peak Detector)

Measuring distance 3 m

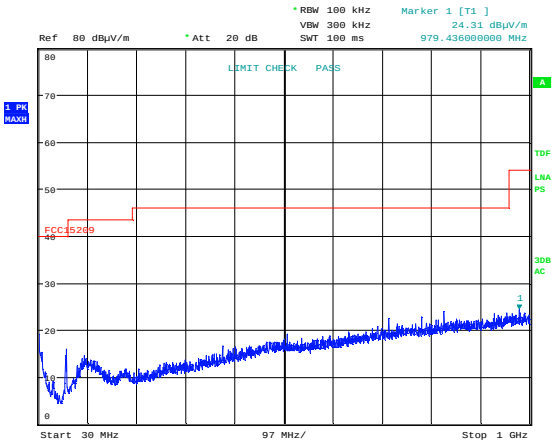
Tested in test mode

Measured Frequency (MHz)	Carrier Frequency (MHz)	Modulation	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
30 – 88	2440	GFSK	< 20	40.0	> 20
88 – 216	2440	GFSK	< 20	43.5	> 23.5
216 – 960	2440	GFSK	< 20	46.0	> 26
960 – 1000	2440	GFSK	< 20	54.0	> 34

See attached plots

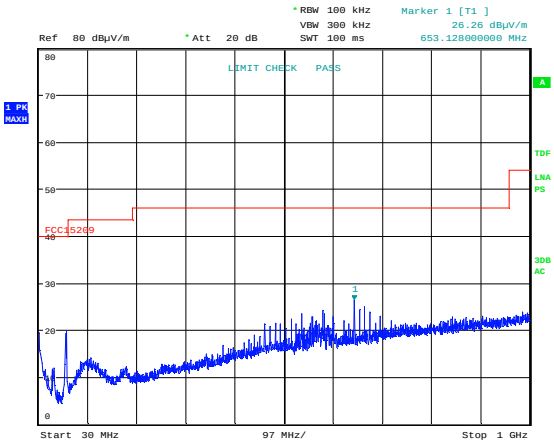
Requirements/Limit

FCC	Part 15.209 @ frequencies defined in §15.205	
ISED	RSS-GEN Issue 5, Clause 8.9 @ frequencies defined in clause 8.10	
Frequency	Radiated emission limit @3 meters	
30 – 88 MHz	100 µV/m	40.0 dBµV/m
88 – 216 MHz	150 µV/m	43.5 dBµV/m
216 – 960 MHz	200 µV/m	46.0 dBµV/m
960 – 1000 MHz	500 µV/m	54.0 dBµV/m
	Limits above are with Quasi Peak Detector	



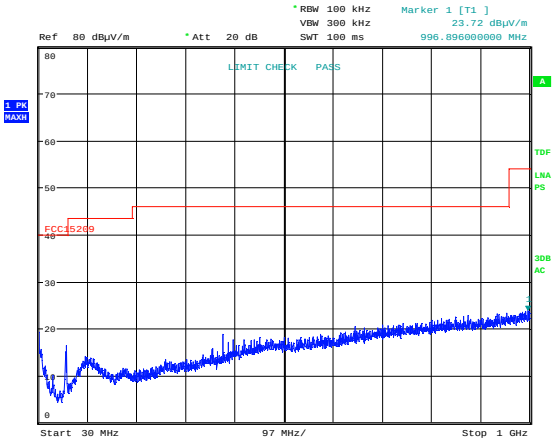
Date: 12.APR.2021 09:20:31

Radiated Emissions 30 - 1000 MHz, 1Mb, HP



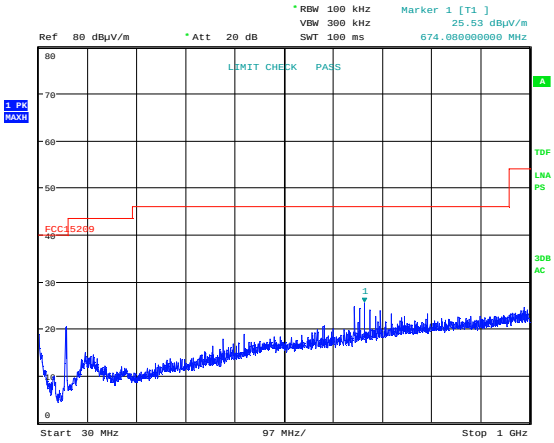
Date: 12.APR.2021 09:16:30

Radiated Emissions 30 - 1000 MHz, 1Mb, VP



Date: 12.APR.2021 09:28:01

Radiated Emissions 30 - 1000 MHz, 2Mb, HP



Date: 12.APR.2021 09:25:59

Radiated Emissions 30 - 1000 MHz, 2Mb, VP

3.9 Radiated Emissions, 1-26 GHz

FCC Part 15.209 (a)

ISED Canada RSS-GEN Issue 5, Clause 7.3/8.9

Measurement procedure: **ANSI C63.10-2013 Clause 11.12**

Test Results: Complies

Measurement Data:

Measuring distance: 3m (1 – 18 GHz)

A pre-scan was performed above 18 GHz and no spurious emissions were detected.

RBW=1 MHz

Carrier freq. (MHz)	Measured Frequency (GHz)	Bit rate	Measured Emission (dBµV/m)		Limit (dBµV/m)		Margin (dB)	
			Pk	Av	Pk	Av	Pk	Av
2440	4880	1Mb	53.0	/	74	54	21.0	/
2440	4880	2Mb	53.1	/	74	54	20.9	/
2440	7320	1Mb	56.9	50.9	74	54	17.1	3.1
2440	7320	2Mb	56.3	50.3	74	54	17.7	3.7
2440	9760	1Mb	53.0	/	74	54	21.0	/
2440	9760	2Mb	52.6	/	74	54	21.4	/

Average Detector values are not reported when Peak Detector values are below Average limit.

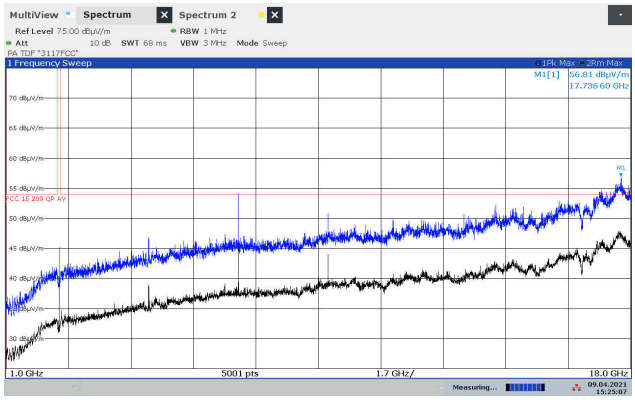
A Band Reject Filter was used for measurements from 1 GHz to 18 GHz.

Antenna factor, amplifier gain and cable loss are included in spectrum analyzer “Transducer factor”.

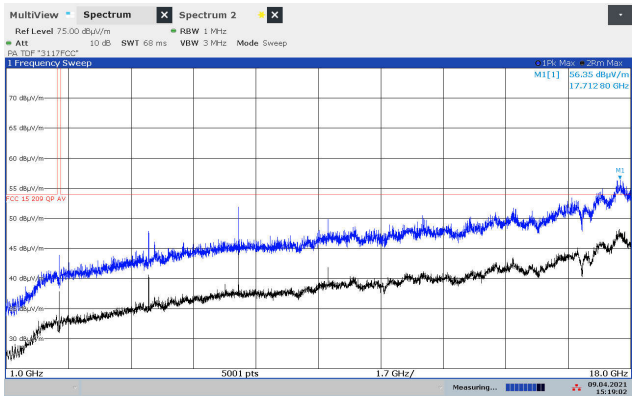
See plots.

Requirements/Limit

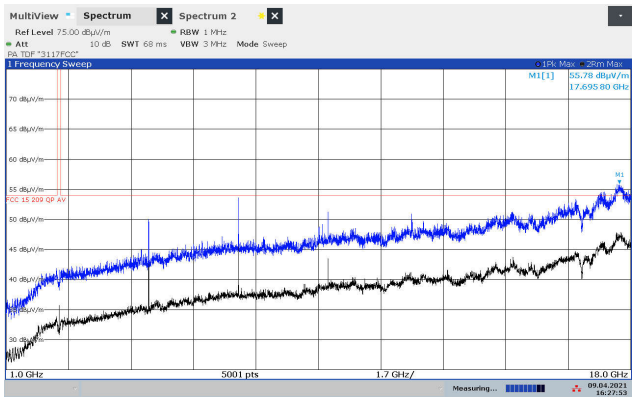
FCC	Part 15.209 @ frequencies defined in §15.205	
ISED	RSS-GEN Issue 5, clause 8.9 @ frequencies defined in clause 8.10	
	Radiated emission limit @3 meters	
Frequency	Average Detector	Peak Detector
1 – 26 GHz	54.0 dBµV/m	74.0 dBµV/m



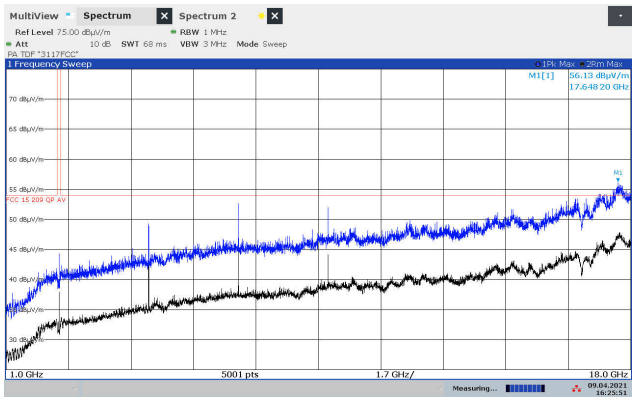
Radiated Emissions 1 - 18 GHz, 2440 MHz, 1Mb, HP



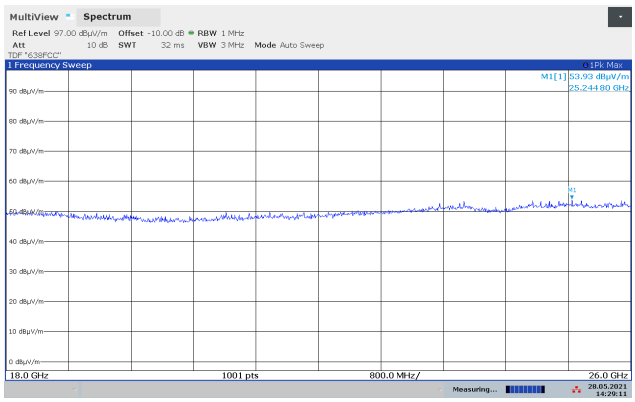
Radiated Emissions 1 - 18 GHz, 2440 MHz, 1Mb, VP



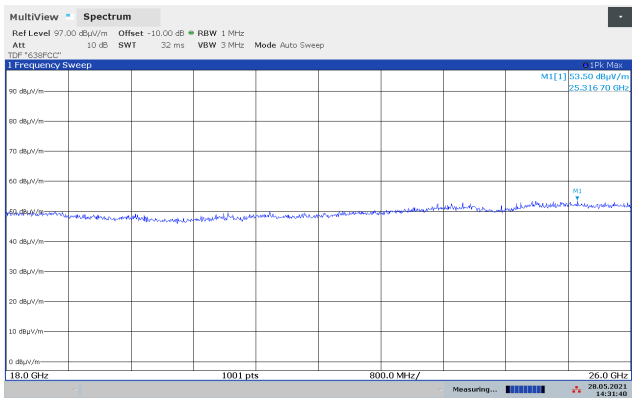
Radiated Emissions 1 - 18 GHz, 2440 MHz, 2Mb, HP



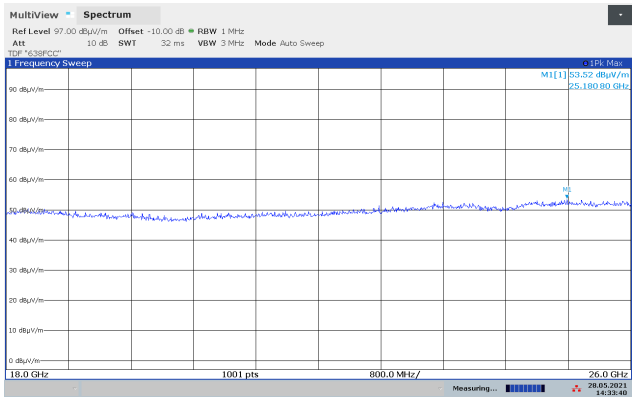
Radiated Emissions 1 - 18 GHz, 2440 MHz, 2Mb, VP



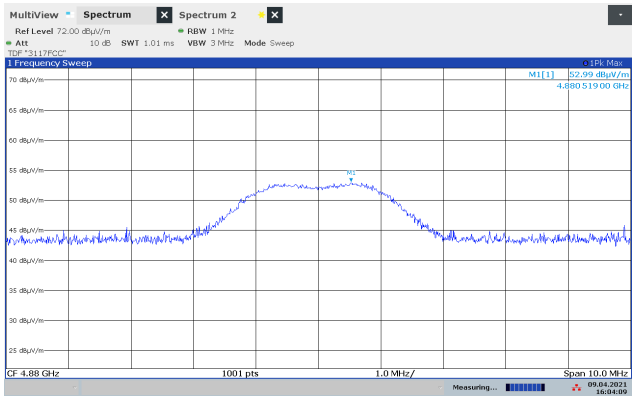
Pre-scan 18 - 26 GHz, 2402 MHz, 1Mb, @approx 10cm



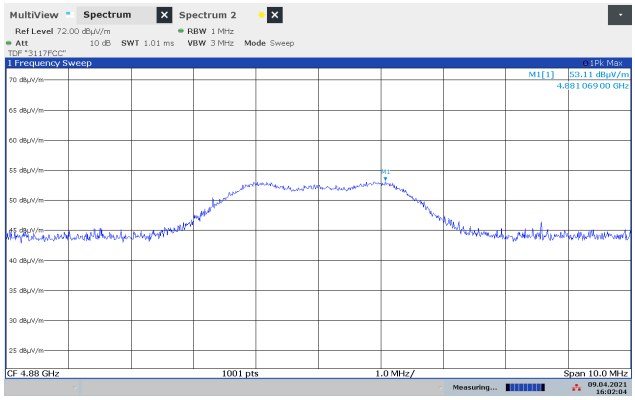
Pre-scan 18 - 26 GHz, 2440 MHz, 1Mb, @approx 10cm



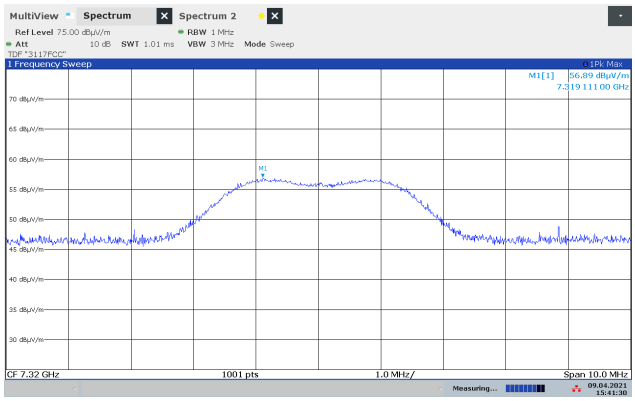
Pre-scan 18 - 26 GHz, 2480 MHz, 1Mb, @approx 10cm



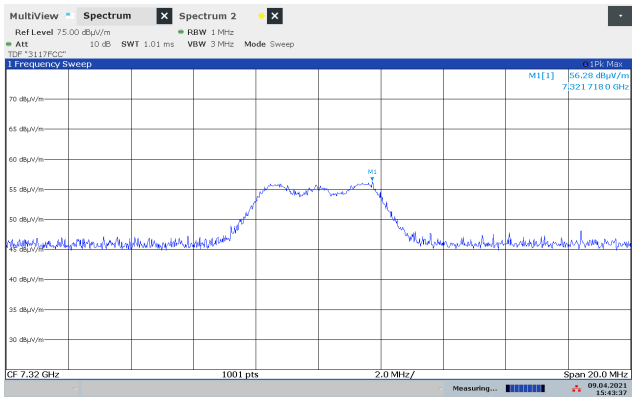
Radiated Emissions 4880 MHz, 2440 MHz, 1Mb, HP, Peak



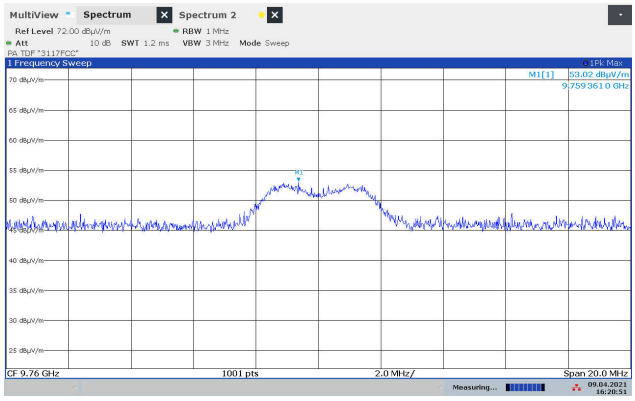
Radiated Emissions 4880 MHz, 2440 MHz, 2Mb, HP, Peak



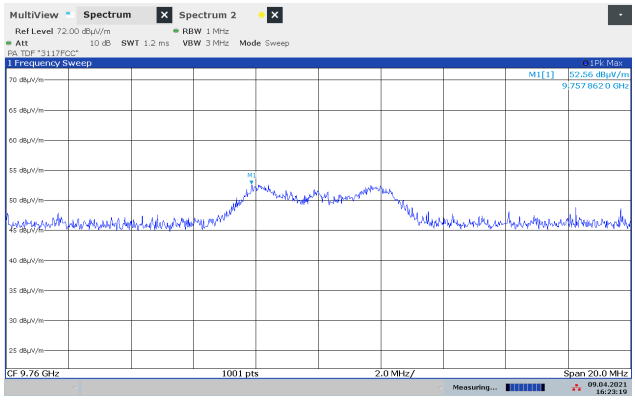
Radiated Emissions 7320 MHz, 2440 MHz, 1Mb, HP, Peak



Radiated Emissions 7320 MHz, 2440 MHz, 2Mb, HP, Peak



Radiated Emissions 9760 MHz, 2440 MHz, 1Mb, VP, Peak



Radiated Emissions 9760 MHz, 2440 MHz, 2Mb, VP, Peak

3.10 Power Spectral Density (PSD)

FCC part 15.247(d)

ISED Canada RSS-247 Issue 2, Clause 5.2 (2)

Measurement procedure: ANSI C63.10-2013 Clause 11.10

Test Results: Complies

Measurement Data:

The measurement procedure PKPSD described in ANSI C63.10-2013 was used.

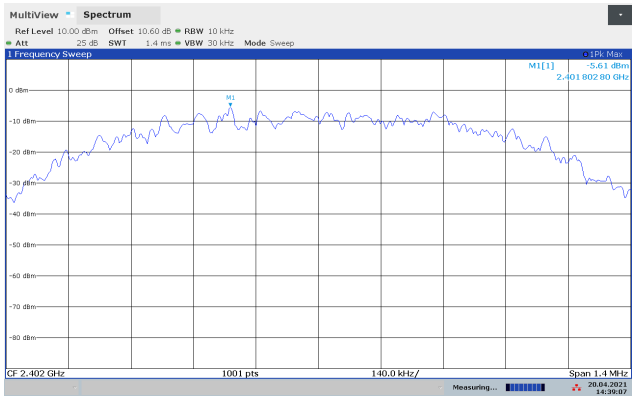
Bit rate	Measured Power Spectral Density (dBm/3kHz)		
	2402 MHz	2440 MHz	2480 MHz
1Mb	-10.8	-10.8	-10.7
2Mb	-14.5	-14.7	-14.6

The measured values with 10kHz RBW are corrected by a Bandwidth Correction Factor of -5.2 dB.

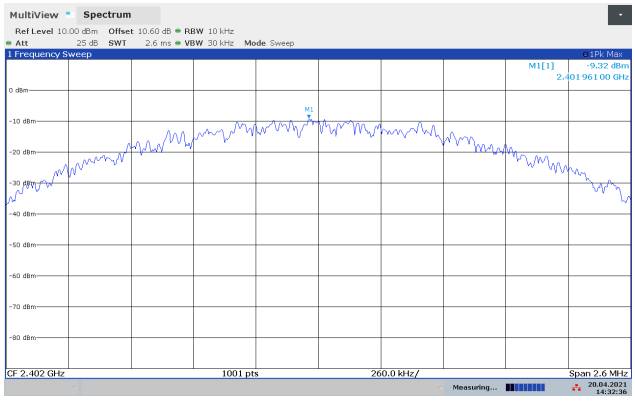
Requirements:

The Power Spectral Density of a Digital Transmission System shall be no greater than +8 dBm in any 3 kHz band

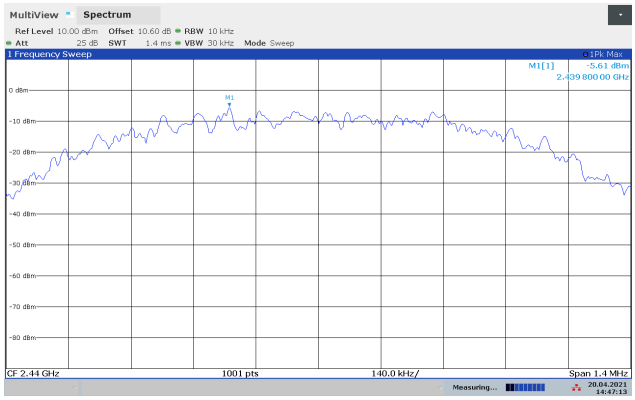
No requirements for Frequency Hopping Systems.



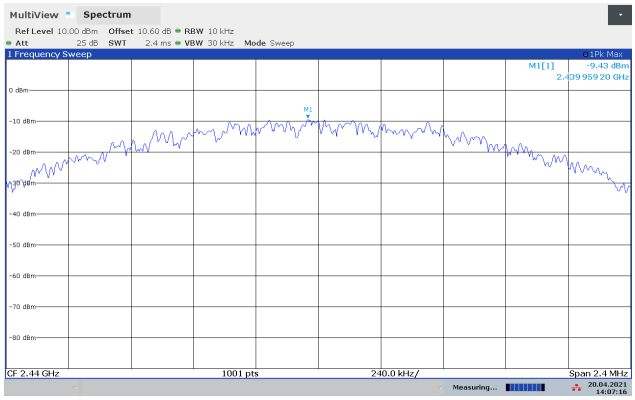
PSD, 2402 MHz, 1Mb



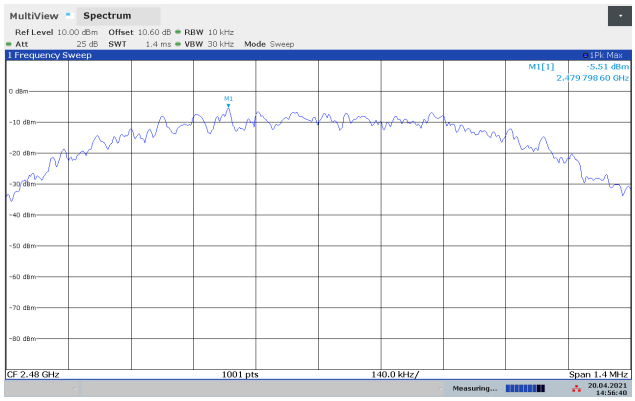
PSD, 2402 MHz, 2Mb



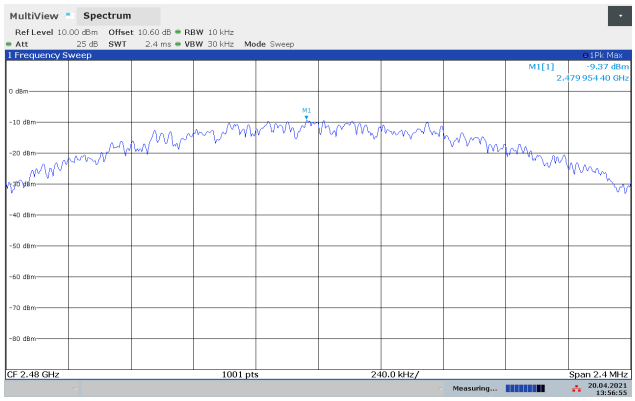
PSD, 2440 MHz, 1Mb



PSD, 2440 MHz, 2Mb



PSD, 2480 MHz, 1Mb



PSD, 2480 MHz, 2Mb

4 Measurement Uncertainty

Measurement Uncertainty Values		
Test Item		**Uncertainty**
Output Power		±0.5 dB
Power Spectral Density		±0.5 dB
Out of Band Emissions, Conducted	**< 3.6 GHz**	±0.6 dB
	> 3.6 GHz	±0.9 dB
Spurious Emissions, Radiated	**< 1 GHz**	±2.5 dB
	> 1 GHz	±2.2 dB
Emission Bandwidth		±4 %
Power Line Conducted Emissions		+2.9 / -4.1 dB
Spectrum Mask Measurements	**Frequency**	±5 %
	Amplitude	±1.0 dB
Frequency Error		±0.6 ppm
Temperature Uncertainty		±1 °C

All uncertainty values are expanded standard uncertainty to give a confidence level of 95%, based on coverage factor k=2

5 LIST OF TEST EQUIPMENT

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment and ancillaries are identified (numbered) by the Test Laboratory.

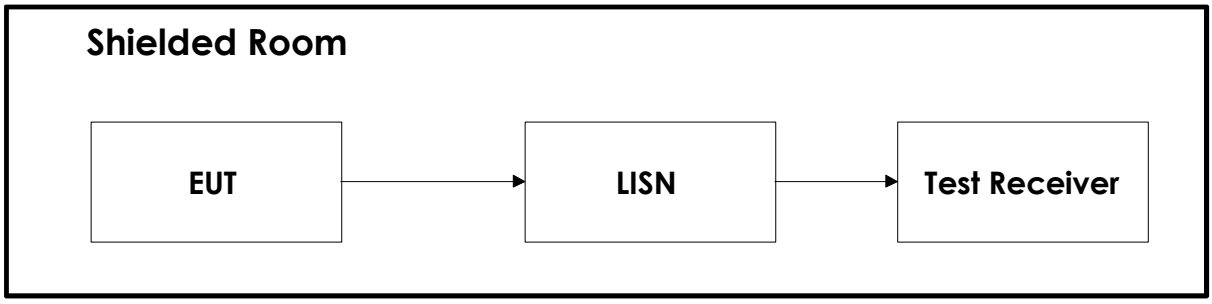
No.	Model number	Description	Manufacturer	Ref. no.	Cal. date	Cal. Due
1	FSW43	Spectrum Analyzer	Rohde & Schwarz	LR 1690	2020-10	2021-10
2	ESU40	Measuring Receiver	Rohde & Schwarz	LR 1639	2021-02	2022-02
3	6810.17B	Attenuator	Suhner	LR 1669	2020-08	2021-08
4	NO324415	Band Reject Filter	Microwave Circuits	LR 1760	2020-08	2021-08
5	JB3	BiLog Antenna	Sunol	N 4525	2020-03	2023-03
6	317	Preamplifier	Sonoma Inst.	LR 1687	2020-08	2021-08
7	3117-PA	Horn Antenna +PreAmp	EMCO	LR 1717	2020-08	2021-08
8	8449A	Pre-amplifier	Hewlett Packard	LR 1322	2020-08	2021-08
9	638	Antenna Horn	Narda	LR 1480	N/A	
10	Model 87V	Multimeter	Fluke	LR 1599	2021.01	2023.01
11	ENV21	Two Line V-Network	Rohde & Schwarz	LR 1665	2019-11	2021-11
12	6812B	AC Power Source	Agilent	LR 1515	2020-04	2022-04
13	ESCI3	Measuring Receiver	Rohde & Schwarz	N-4259	2019.10	2021.10
14	ST18/SMA/N/36	RF Cable	Suhner	LR 1627	2020-08	2021-08

The software listed below has been used for one or more tests.

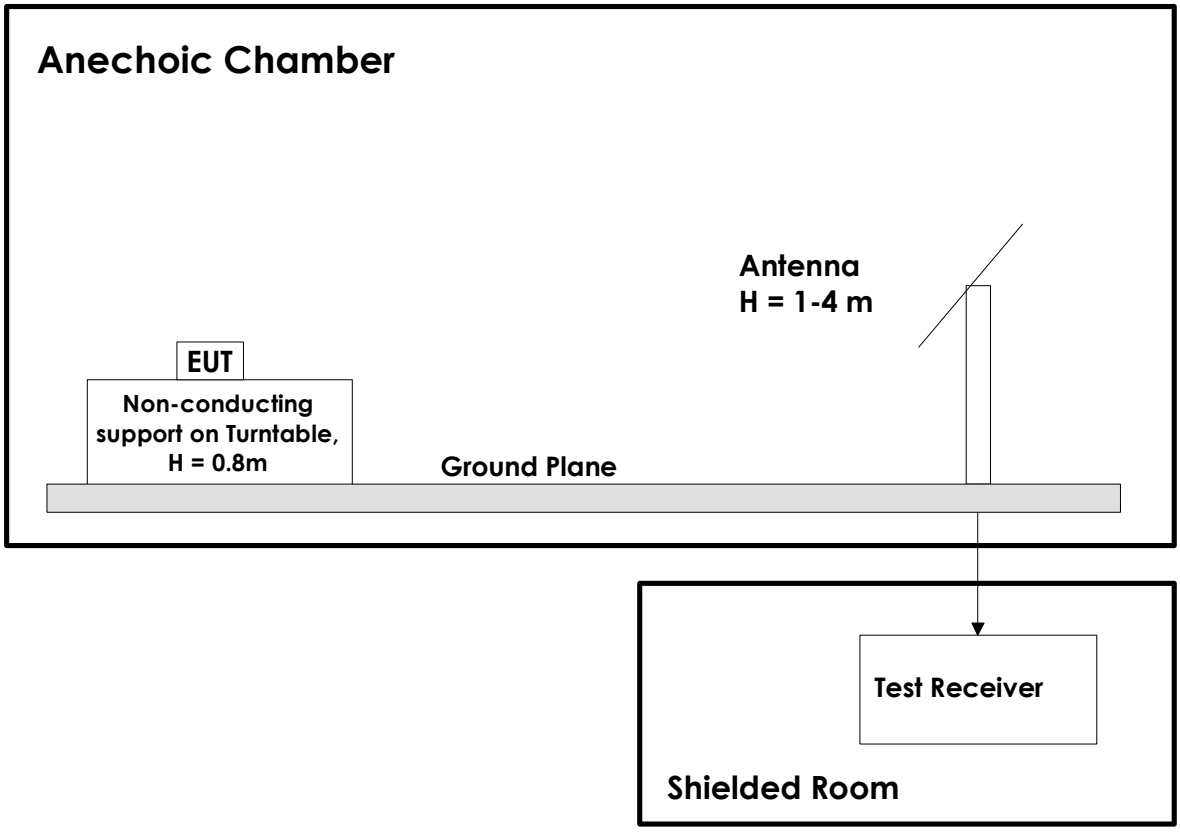
No.	Manufacturer	Name	Version	Comment
1	Rohde & Schwarz	EMC32	10.50.10	Power Line Conducted test software
2	Rohde & Schwarz	EMC32	10.50.10	Radiated Emission test software
3	Nemko AS	RSPlot	1.0.8.0	Screenshots from R&S Spectrum Analyzers

6 BLOCK DIAGRAM

6.1 Power Line Conducted Emission



6.2 Test Site Radiated Emission



This test setup is used for all radiated emissions tests. For frequencies below 30 MHz the measuring distance is 10m, for all other frequencies it is 3m or 1m. Emissions above 1 GHz are measured with a Spectrum Analyzer and Horn Antenna. For measurements above 18 GHz the test receiver is moved inside the anechoic chamber and located next to the antenna to minimize the cable loss. All measurements at 1GHz and above were performed with turntable height 1.5m and with the ground plane covered by absorbers. A pre-amplifier is used for all measurements above 30 MHz, and High-Pass or Band-Pass filter is used for all harmonics.