

## Test Report

<b>Product</b>	Radio module		
<b>Name and address of the applicant</b>	Anticimex Innovation Center A/S Skovgaardsvej 23E 3200 Helsinge, Denmark		
<b>Name and address of the manufacturer</b>	Anticimex Innovation Center A/S Skovgaardsvej 23E 3200 Helsinge, Denmark		
<b>Model</b>	E0058 meshboard		
<b>Rating</b>	Internal battery 3.6V / 2700 mAh		
<b>Trademark</b>	-		
<b>Additional information</b>	Frequency band: 917-926 MHz		
<b>Tested according to</b>	<b>FCC Part 15.247</b> Frequency Hopping Transmitters / Digital Transmission Systems <b>Industry Canada RSS-247, Issue 2</b> Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices		
<b>Order number</b>	PRJ0025914		
<b>Tested in period</b>	2023-02-01 to 2023-03-31		
<b>Issue date</b>	2023-07-18		
<b>Name and address of the testing laboratory</b>	  Nemko Scandinavia AS Instituttveien 6 2007 Kjeller, Norway www.nemko.com	CAB Number: FCC: NO0001 ISED: NO0470 ISED No: 2040D-1	 
An accredited technical test executed under the Norwegian accreditation scheme			
 Prepared by [Jan G Eriksen]		 Approved by [Frode Sveisen]	
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## Revision history

Revision	Date	Comment	Sign
A	2023-06-20	First edition	JGER
B	2023-07-12	Editorials concerning FCC measurements	JGER
C	2023-07-18	Editorials concerning FCC measurements	JGER

## GENERAL REMARKS

This report applies only to the sample(s) tested. It is the manufacturer's responsibility to ensure the additional production units of this product are manufactured with identical electrical and mechanical components. The manufacturer is solely responsible for any modifications to the product that could result in non-compliance with the relevant regulations.

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Opinions expressed within this report regarding general assessments and qualifications for PASS or FAIL to the standards limits and requirements, are not part of the current accreditation. Neither are opinions expressed regarding model variants covered by the testing of this report.

## CALIBRATION

All instruments used in the tests given in this test report are calibrated and traceable to national or international standards. Between calibrations all test set-ups are controlled and verified on a regular basis by periodic checks to ensure, with 95% confidence, that the instruments remain within the calibrated levels.

## MEASUREMENT UNCERTAINTY

Measurement uncertainties are calculated or considered for all instruments and instrument set-ups used during these tests. Uncertainty figures are found in a separate clause in this report.

## CONTENTS

<b>1</b>	<b>INFORMATION .....</b>	<b>4</b>
1.1	Test Item .....	4
1.2	Normal test condition .....	5
1.3	Test Engineer .....	5
1.4	Antenna Requirement .....	5
1.5	EUT Operating Modes .....	5
1.6	Comments .....	5
<b>2</b>	<b>TEST REPORT SUMMARY .....</b>	<b>6</b>
2.1	General .....	6
2.2	Test Summary .....	6
<b>3</b>	<b>TEST RESULTS.....</b>	<b>7</b>
3.1	Power Line Conducted Emissions .....	7
3.2	20dB Bandwidth .....	11
3.3	Occupied Bandwidth (99% BW).....	<b>Error! Bookmark not defined.</b>
3.4	Peak Power Output .....	13
3.5	Conducted Emissions at Antenna Connector .....	17
3.6	Restricted Bands of operation.....	19
3.7	Radiated Emission, 30 – 1000 MHz.....	20
3.8	Radiated Emissions, 1-10 GHz.....	23
<b>4</b>	<b>Measurement Uncertainty.....</b>	<b>34</b>
<b>5</b>	<b>LIST OF TEST EQUIPMENT.....</b>	<b>35</b>
<b>6</b>	<b>BLOCK DIAGRAM.....</b>	<b>36</b>
6.1	Power Line Conducted Emission .....	36
6.2	Test Site Radiated Emission.....	36

# 1 INFORMATION

## 1.1 Test Item

Name	Anticimex
Model/version	E0058 Meshboard
FCC ID	2A0FP-E0058
ISED ID	-
Serial number	-
Hardware identity and/or version	1.00
Software identity and/or version	SDK 3.2.3
Frequency Range	917 - 926 MHz
Number of Channels	50
Operating Modes	Transmission, Reception and IDLE/SLEEP
Type of Modulation	FSK
Conducted Output Power	Nominal 13.96 dBm (24.9 mW)
Antenna Connector	PCB Solder Pad
Number of Antennas	1
Diversity or Smart Antennas	No
Power Supply	DC 3.6 V battery
Desktop Charger	N/A

### Description of Test Item

The tested item is a wireless 917-926 MHz transmitter.

This device has been tested as a Digital Transmissions Systems device (DTS) and fulfils all requirements for DTS.

## 1.2 Normal test condition

Temperature:	20 - 24 °C
Relative humidity:	20 - 50 %
Normal test voltage:	3.6 V DC

The values are the limit registered during the test period.

## 1.3 Test Engineer

Jan G Eriksen

## 1.4 Antenna Requirement

Does the EUT have detachable antenna(s)?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
If detachable, is the antenna connector(s) non-standard?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
The tested equipment has external antenna(s).		

Requirement: FCC 15.203, 15.204

## 1.5 EUT Operating Modes

Description of operating modes	TX/RX/Idle
Additional information	The following settings were used for all tests: Power Setting: Maximum Power as preset by manufacturer.

## 1.6 Comments

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

## 2 TEST REPORT SUMMARY

### 2.1 General

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.

<input checked="" type="checkbox"/> New Submission	<input checked="" type="checkbox"/> Production Unit
<input type="checkbox"/> Class II Permissive Change	<input type="checkbox"/> Pre-production Unit
DSS Equipment Code	<input type="checkbox"/> Family Listing

### 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	PASS
Antenna Requirement	15.203	6.8 (RSS-GEN)	5.8	PASS
Power Line Conducted Emission	15.107(a) 15.207(a)	7.2 / 8.8 (RSS-GEN)	6.2	PASS
Occupied Bandwidth (99% BW)	N/A	6.7 (RSS-GEN)	6.9.3	*)
DTS Bandwidth	15.247(a)(2)	5.2 (1) (RSS-247)	11.8 Option 2	PASS
Peak Power Output	15.247(b)	5.4 (RSS-247)	11.9.1.1	PASS
Power Spectral Density	15.247(e)	5.2 (2) (RSS-247)	11.10.2 PKPSD (DTS)	PASS
Spurious Emissions (Antenna Conducted)	15.247(d)	5.5 (RSS-247)	6.7 11.11 (DTS) 7.8.6 (FHSS) 7.8.8 (FHSS)	PASS
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)	PASS

Note: \*) For information only

### 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  $\mu$ H/50 ohms LISN.

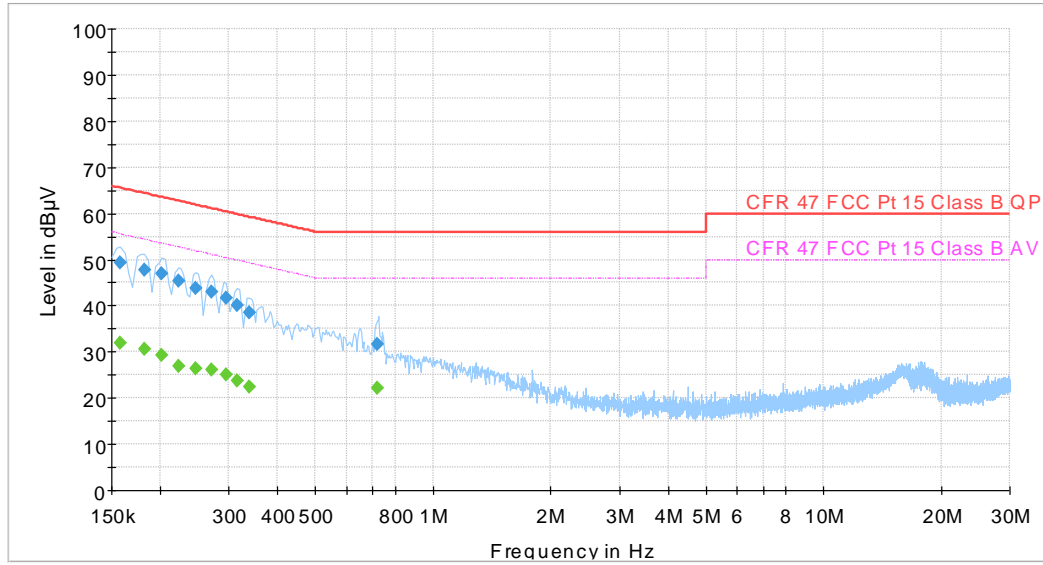
Test Results: Complies

Measurement Data: See attached plots.

Highest measured value (L1 and N):

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	CAverage (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.158000	---	32.01	55.57	23.56	15000.0	9.000	L1	OFF	9.7
0.158000	49.33	---	65.57	16.23	15000.0	9.000	L1	OFF	9.7
0.182000	47.76	---	64.39	16.63	15000.0	9.000	N	OFF	9.7
0.182000	---	30.59	54.39	23.80	15000.0	9.000	N	OFF	9.7
0.202000	46.85	---	63.53	16.68	15000.0	9.000	L1	OFF	9.7
0.202000	---	29.35	53.53	24.18	15000.0	9.000	L1	OFF	9.7
0.222000	---	26.83	52.74	25.92	15000.0	9.000	L1	OFF	9.7
0.222000	45.47	---	62.74	17.28	15000.0	9.000	L1	OFF	9.7
0.246000	43.89	---	61.89	18.01	15000.0	9.000	L1	OFF	9.7
0.246000	---	26.37	51.89	25.52	15000.0	9.000	L1	OFF	9.7
0.270000	---	26.16	51.12	24.96	15000.0	9.000	L1	OFF	9.7
0.270000	42.94	---	61.12	18.18	15000.0	9.000	L1	OFF	9.7
0.294000	41.65	---	60.41	18.76	15000.0	9.000	L1	OFF	9.7
0.294000	---	25.19	50.41	25.22	15000.0	9.000	L1	OFF	9.7
0.314000	40.16	---	59.86	19.70	15000.0	9.000	L1	OFF	9.7
0.314000	---	23.87	49.86	25.99	15000.0	9.000	L1	OFF	9.7
0.338000	---	22.42	49.25	26.83	15000.0	9.000	L1	OFF	9.7
0.338000	38.55	---	59.25	20.70	15000.0	9.000	L1	OFF	9.7
0.718000	31.70	---	56.00	24.30	15000.0	9.000	L1	OFF	9.6
0.718000	---	22.17	46.00	23.83	15000.0	9.000	L1	OFF	9.6

Full Spectrum



- Preview Result 1-PK+
- CFR 47 FCC Pt 15 Class B QP
- CFR 47 FCC Pt 15 Class B AV
- ◆ Final\_Result QPK
- ◆ Final\_Result CAV



### 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)
922 MHz Basic Rate	715.117 kHz

Occupied Bandwidth is similar for all channels.

See attached plots.

#### Requirements:

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



922 MHz: 99% Occupied BW, FSK

### 3.3 DTS Bandwidth

FCC Part 15.247(a)(2)

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

Measurement procedure: ANSI C63.10-2013 Clause 11.8

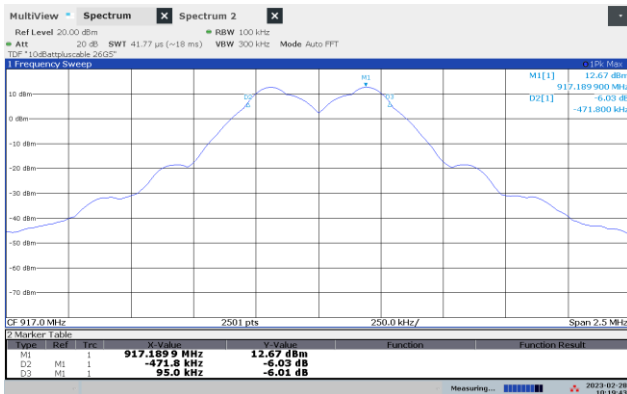
Test Results: Complies

Measurement Data:

Modulation	6dB Bandwidth		
	917 MHz	922 MHz	926 MHz
Basic Rate (FSK)	566.8	549.8	553.8

See attached plots

Frequency Band	Requirement for Digital Modulation
902-928 MHz	Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. <b>The minimum 6 dB bandwidth shall be at least 500 kHz.</b>
2400-2483.5 MHz	
5725-5850 MHz	



6dB Bandwidth 917 MHz, FSK



6dB Bandwidth 922 MHz, FSK



6dB Bandwidth 926 MHz, FSK

### 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)	Modulation Type	Conducted Power (dBm)	Conducted Power (mW)	Field Strength (dBµV/m)	ERP (mW)	Antenna gain (dBi)	Antenna gain (dBd)
917	FSK	13.96	24.89	111.70	44.373	2.51	0.36
922	FSK	13.82	24.10	111.94	46.894	2.89	0.74
926	FSK	13.89	24.49	111.96	47.111	2.84	0.67

Output Power reported is Maximum Peak Power.

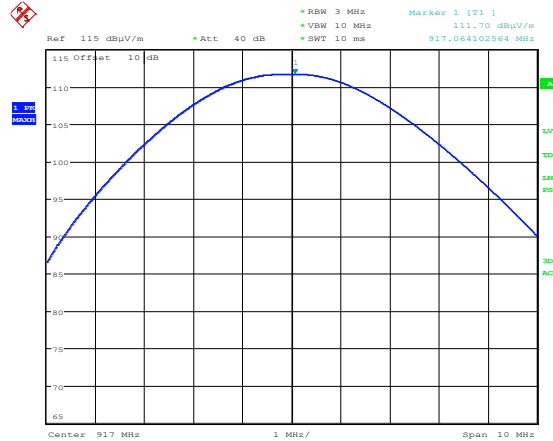
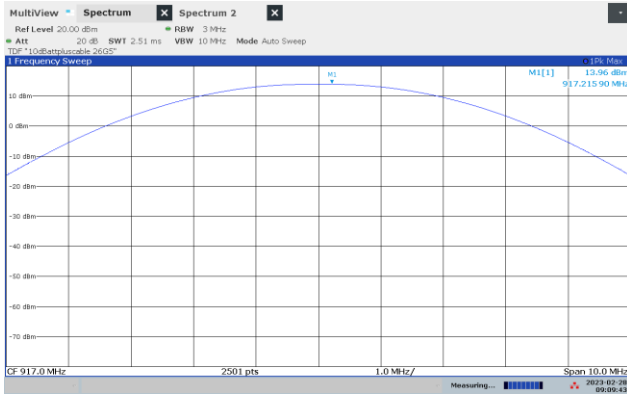
3 MHz RBW and marker peak function was used to measure Output Power

Radiated Power was calculated from measured Field Strength using the method described in FCC KDB 412172 D01.

Antenna Gain is less than 6 dBi.

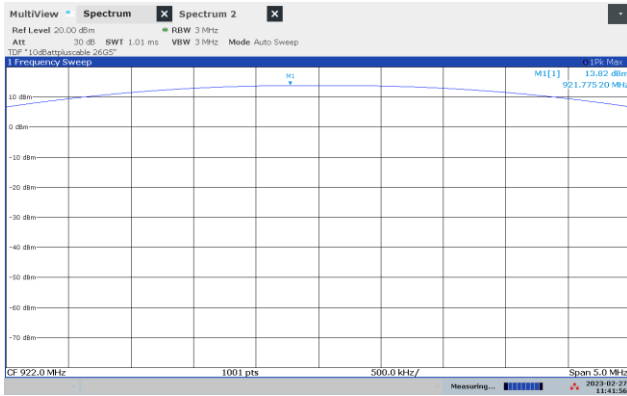
See attached plots.

Frequency Band	Requirements for Frequency Hopping systems
902-928 MHz	For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels
2400-2483.5 MHz	For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels: 1 watt For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts
5725-5850 MHz	For all frequency hopping systems in the 5725-5850 MHz band: 1 watt
Requirements for Digital Modulation systems	
For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the 1 Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the <i>maximum conducted output power</i> is the highest total transmit power occurring in any mode.	
Maximum allowed Antenna Gain	
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.	

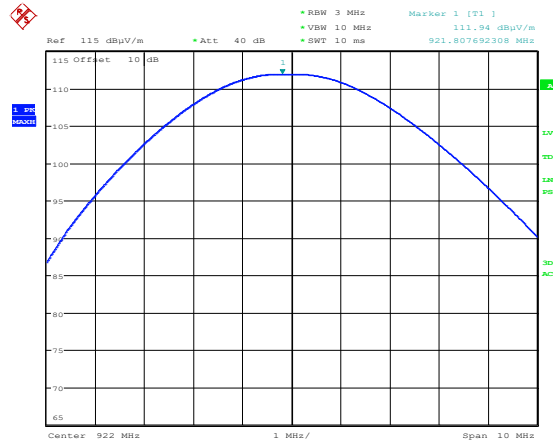


Date: 23.FEB.2023 09:53:03

**Conducted Peak Power, 917 MHz**

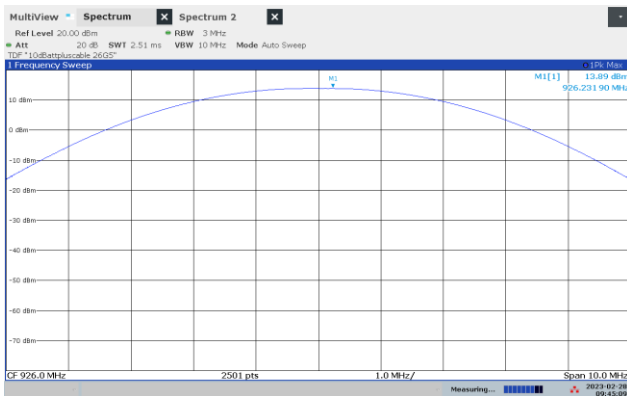


**Radiated Maximum Field Strength, 917 MHz, EUT Flat, HP**

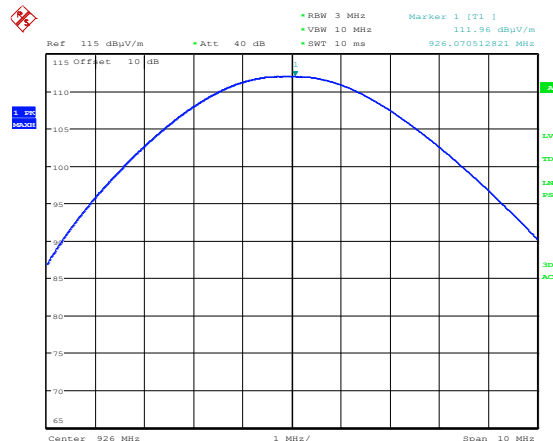


Date: 23.FEB.2023 09:46:52

**Conducted Peak Power, 922 MHz**



**Radiated Maximum Field Strength, 922 MHz, EUT Flat, HP**



Date: 23.FEB.2023 09:51:35

**Conducted Peak Power, 926 MHz**

**Radiated Maximum Field Strength, 926 MHz, EUT Flat, HP**

### 3.5 Power Spectral Density (PSD)

FCC part 15.247(e)

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

Measurement procedure: ANSI C63.10-2013 Clause 11.10

Test Results: Complies

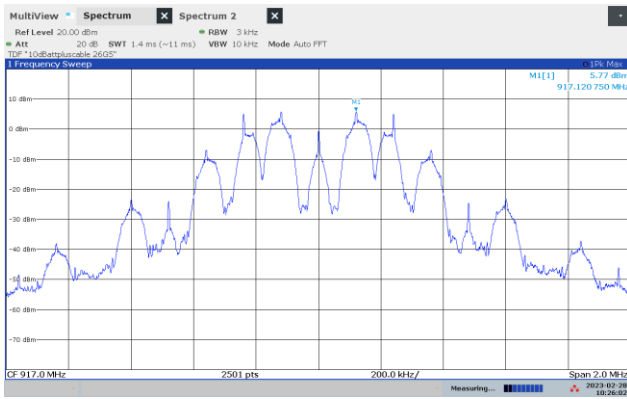
**Measurement Data:**

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

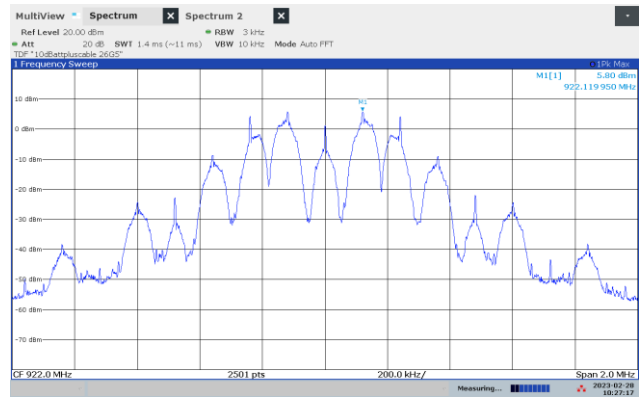
Modulation Type and Bitrate	Measured Power Spectral Density (dBm/3kHz)		
	917 MHz	922 MHz	926 MHz
FSK	5.77	5.80	6.05

The measured values with 3kHz RBW are corrected by a Bandwidth Correction Factor of 0 dB.

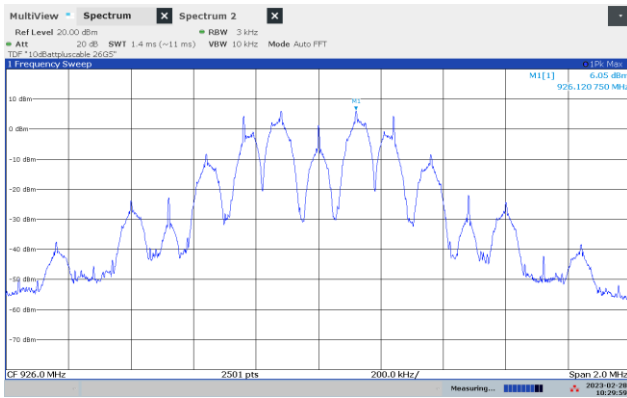
Requirement for systems using Digital Modulation
The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.
No requirements for Frequency Hopping Systems.



PSD, 917 MHz, FSK



PSD, 922 MHz, FSK



PSD, 926 MHz, FSK



### 3.6 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

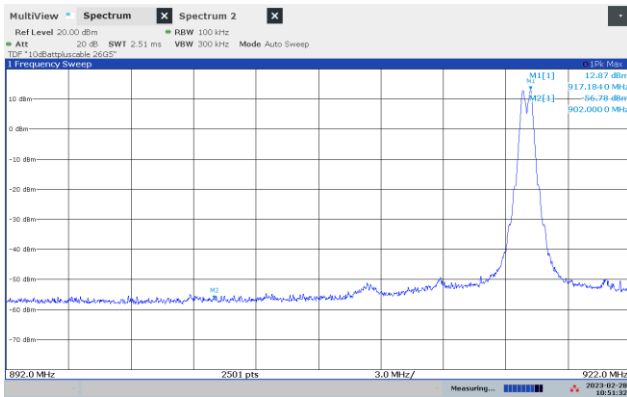
**Measurement Data:**

Carrier Frequency	Highest Value (dBc)	Margin (dB)	Verdict
917 MHz	> 40	> 20	Pass
922 MHz	> 40	> 20	Pass
926 MHz	> 40	> 20	Pass

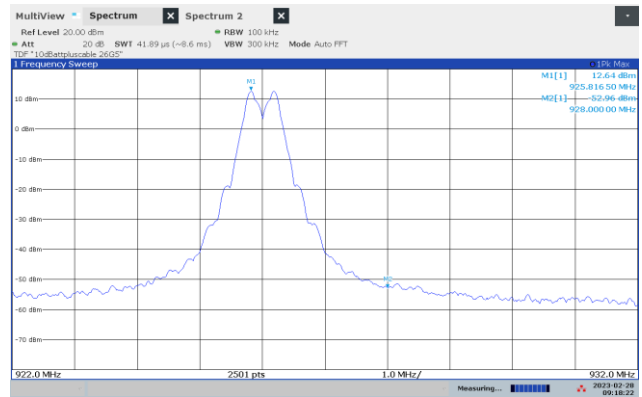
Measured with Peak Detector

RF conducted power to 10 GHz: see attached plots.

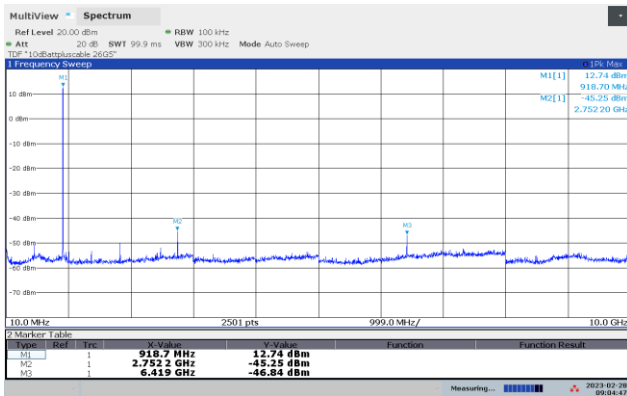
Requirements for all systems	
Peak measurement	RMS averaging (alternative measurement)
20 dB or more below carrier measured in 100 kHz bandwidth	30 dB or more below carrier measured in 100 kHz bandwidth
<p>In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.</p> <p>Attenuation below the general limits specified in § 15.209(a) is not required.</p>	



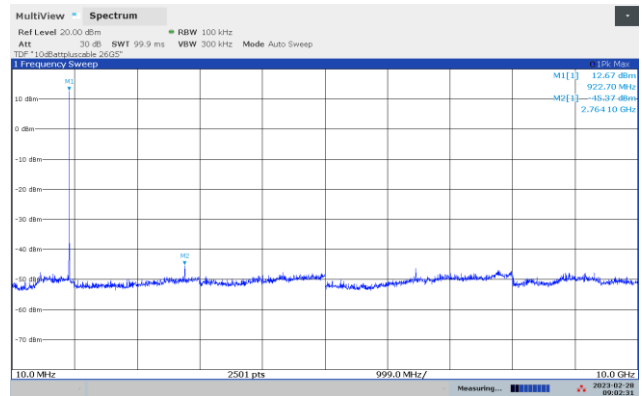
TX 917 MHz: Lower Band Edge, Peak



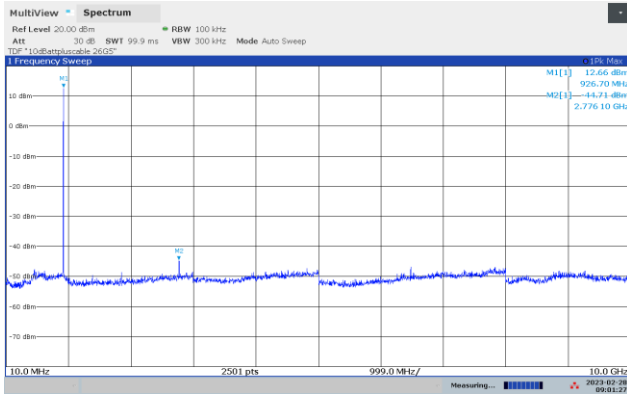
TX 926 MHz: Upper Band Edge, Peak



917 MHz: 10-10000 MHz



926 MHz: 10-10000 MHz



917 MHz: 10-10000 MHz



926 MHz: 10-10000 MHz

### 3.7 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		<b>0.96-1.24</b> <b>1.3-1.427</b>	<b>0.96-1.427</b>
0.495-0.505		1.435-1.6265	
2.1735-2.1905		1.6455-1.6465	
	<b>3.020-3.026</b>	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	
	<b>5.677-5.683</b>	2.4835-2.5	
6.215-6.218		<b>2.69-2.9</b>	<b>2.655-2.9</b>
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		<b>3.6-4.4</b>	<b>3.5-4.4</b>
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	
<b>108-121.94</b> <b>123-138</b>	<b>108-138</b>	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.

### 3.8 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 in restricted bands measured with QP-detector

Measuring distance 3 m. EUT orientations (see test setup document).

30-1000 MHz measured with EUT in “Vert” orientation. 890-1000 MHz measured with EUT in 3 orientations.

Tested in TX-mode with modulation.

A notch-filter with 3 dB bandwidth of < 5 MHz was tuned and used for the measurement of spurious of the three TX frequencies. This filter has a passband of “DC” to 2500 MHz (except for the notched-out frequencies).

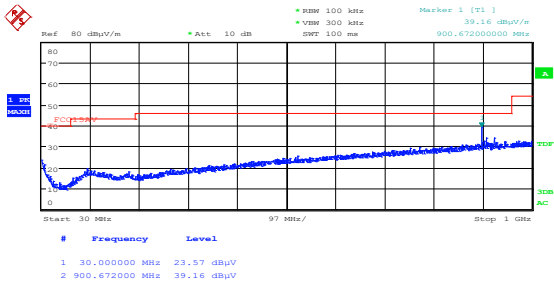
Measured Frequency (MHz)	Carrier Frequency (MHz)	Detector (PK/QP)	EUT Orient. Ver/Hor/Flat	MSM polarization	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
30 – 88	917	PK	V/H/F	HP/VP	< 30	40.0	> 10
30 – 88	922	PK	V/H/F	HP/VP	< 30	40.0	> 10
30 – 88	926	PK	V/H/F	HP/VP	< 30	40.0	> 10
88 – 216	917	PK	V/H/F	HP/VP	< 25	43.5	> 18
88 – 216	922	PK	V/H/F	HP/VP	< 25	43.5	> 18
88 – 216	926	PK	V/H/F	HP/VP	< 25	43.5	> 18
216 – 902	917	PK	V/H/F	HP/VP	< 35	46.0	> 10
216 – 902	922	PK	V/H/F	HP/VP	< 35	46.0	> 10
216 – 902	926	PK	V/H/F	HP/VP	< 35	46.0	> 10
965.196	917	PK	Hor	VP	39.7	54.0	> 14
969.816	922	PK	Ver	HP	37.3	54.0	> 14
974.216	926	PK	Hor	VP	39.2	54.0	> 14
Other 960 – 1000	903	PK	V/H/F	HP/VP	< 40	54.0	> 14
Other 960 – 1000	917	PK	V/H/F	HP/VP	< 40	54.0	> 14

Note \*) FCC Part §15.247 (d) – As the equipment complies with the requirements of this paragraph and because spurious is not in restricted bands, attenuation below the general limits specified in FCC Part §15.209 (a) does not apply.

See attached plots.

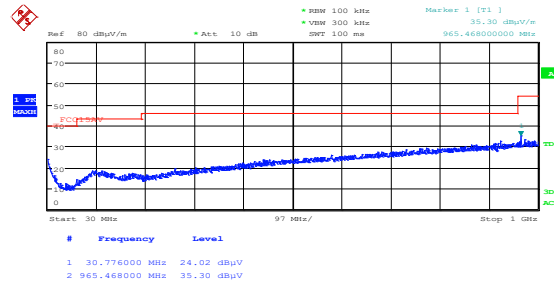
#### Requirements/Limit

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	



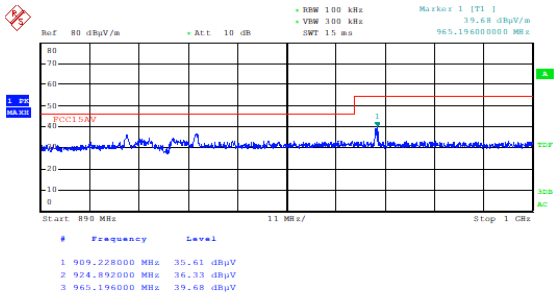
Date: 23.FEB.2023 11:48:56

**TX 917 MHz: Radiated Emissions 30 – 1000 MHz, VP**



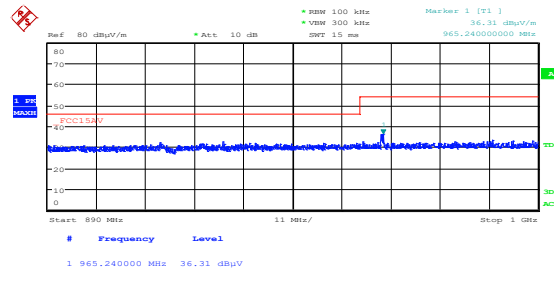
Date: 23.FEB.2023 11:50:53

**TX 917 MHz: Radiated Emissions 30 – 1000 MHz, HP**



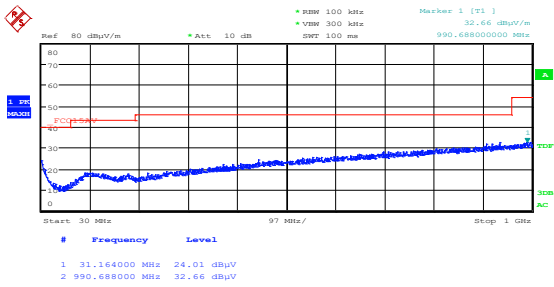
Date: 23.FEB.2023 12:00:48

**TX 917 MHz: Radiated Emissions 890-1000 MHz, EUT Ver, VP**



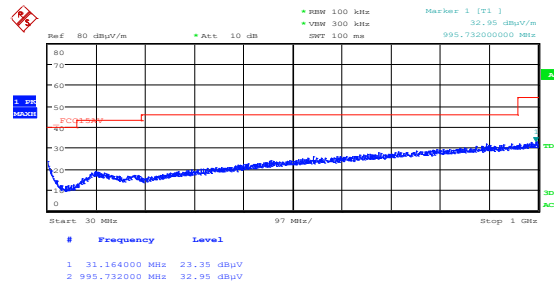
Date: 23.FEB.2023 11:56:22

**TX 917 MHz: Radiated Emissions 890-902 MHz, EUT Ver, HP**



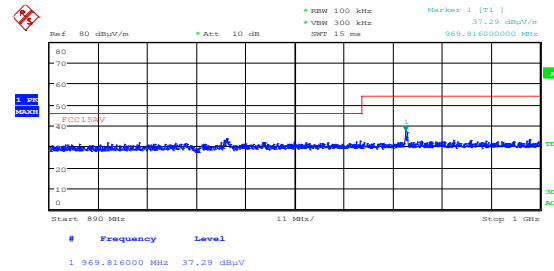
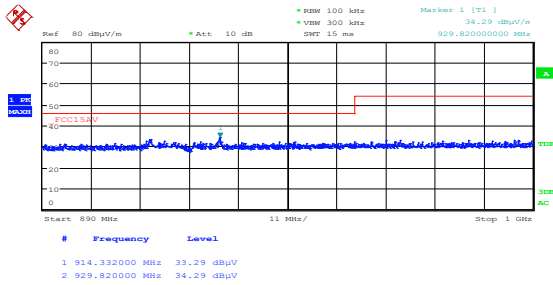
Date: 23.FEB.2023 12:34:00

**TX 922 MHz: Radiated Emissions 30 – 1000 MHz, VP**



Date: 23.FEB.2023 12:35:56

**TX 922 MHz: Radiated Emissions 30 – 1000 MHz, HP**

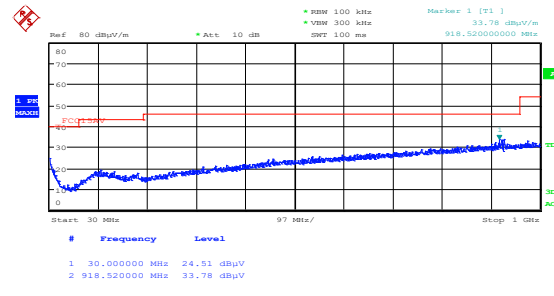
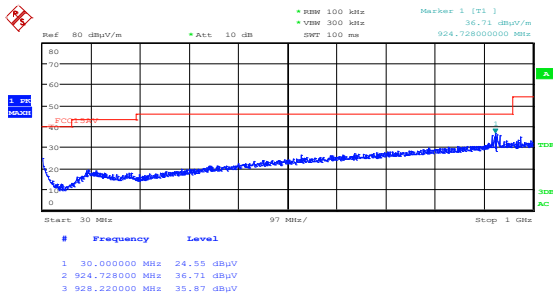


Date: 23.FEB.2023 10:33:55

Date: 23.FEB.2023 10:35:51

**TX 922 MHz: Radiated Emissions 890 – 1000 MHz, EUT Ver, VP**

**TX 922 MHz: Radiated Emissions 890 – 1000 MHz, EUT Ver, HP**

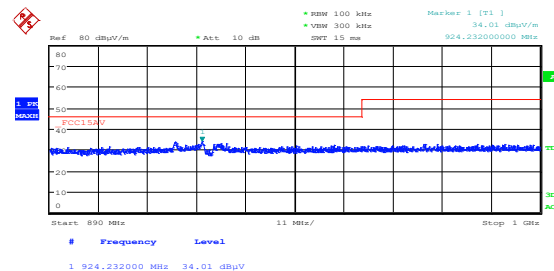
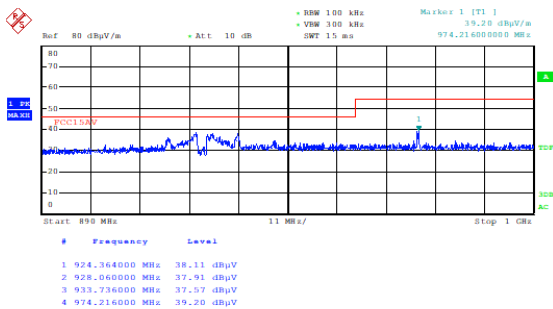


Date: 23.FEB.2023 10:53:14

Date: 23.FEB.2023 10:55:10

**TX 926 MHz: Radiated Emissions 30 – 1000 MHz, VP**

**TX 926 MHz: Radiated Emissions 30 – 1000 MHz, HP**



Date: 23.FEB.2023 11:05:22

Date: 23.FEB.2023 11:02:53

**TX 926 MHz: Radiated Emissions 890 – 1000 MHz, EUT Hor, VP**

**TX 926 MHz: Radiated Emissions 890 – 1000 MHz, EUT Hor, HP**

### 3.9 Radiated Emissions, 1-10 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 – 10 GHz).

Comment: EUT measured from 1000 to 1500 MHz in three orientations.  
 From 1500 to 10000 MHz in three orientations. Selected orientations with high spurious levels in restricted bands measured on spurious frequency with EUT in one or more orientations with azimuth and height scanning.

Peak Detector, RBW=1 MHz

Carrier freq. (MHz)	Measured Frequency (MHz)	EUT Orientation Ver/Hor/Flat	Antenna Pol VP/HP	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
917 / 922 / 926	1000 - 1500	V/H/F	VP/HP	< 50	74	> 20
917	2751	Ver	VP	49.7	74	> 20
917	4585	Ver	HP	49.1	74	> 20
917	6419 *)	Ver	HP	59.6	74	> 14
917	8253	Ver	VP	51.6	74	> 20
917	9170	Ver	VP	53.4	74	> 20
922	2766	Ver	VP	49.8	74	> 20
922	4610	Ver	HP	48.3	74	> 20
922	6454 *)	Hor	VP	53.0	74	> 20
922	8298	Flat	HP	52.2	74	> 20
926	2778	Ver	VP	49.8	74	> 20
926	4630	Ver	HP	48.7	74	> 20
926	6482 *)	Ver	HP	59.9	74	> 14
926	8334	Hor	VP	52.2		
917 / 922 / 926	Other freqs 1500 - 10000	V/H/F	VP/HP	< 50	74	> 24

Note \*) FCC Part §15.247 (d) – spurious is not in restricted bands, thus the attenuation requirements below the general limits specified in FCC Part §15.209 (a) does not apply.

Average Detector, RBW=1 MHz

Carrier freq. (MHz)	Measured Frequency (MHz)	EUT Orientation Ver/Hor/Flat	Antenna Pol VP/HP	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
917 / 922 / 926	1000 - 1500	V/H/F	VP/HP	< 50	54	> 4
917	2751	Ver	VP	34.3	54	19.7
917	4585	Ver	HP	33.7	54	20.3
917	6419 *)	Ver	HP	44.2	54	9.8
917	8253	Ver	VP	36.2	54	17.8
917	9170	Ver	VP	38.0	54	16.0
922	2766	Ver	VP	34.4	54	19.6
922	4610	Ver	HP	32.9	54	21.1
922	6454 *)	Hor	VP	37.6	54	16.4
922	8298	Flat	HP	36.8	54	17.2
926	2778	Ver	VP	34.4	54	19.6
926	4630	Ver	HP	33.3	54	20.7
926	6482 *)	Ver	HP	44.5	54	9.5
926	8334	Hor	VP	36.8	54	17.2
917 / 922 / 926	Other freqs 1500 - 10000	V/H/F	VP/HP	< 50	54	> 4

Note \*) FCC Part §15.247 (d) – As the equipment complies with the requirements of this paragraph and because spurious is not in restricted bands, attenuation below the general limits specified in FCC Part §15.209 (a) does not apply.

According to the manufacturer the maximum transmitted burst is 16.93 ms.

Average Detector values are calculated from Peak values by Duty Cycle Correction Factor (maximum 20 dB correction allowed). Actual permissible correction factor:  $20 * \log ( 16.93 / 100 ) = -15.4 \text{ dB}$ .

A Band Reject Filter was used for measurements from 1500 MHz to 10 GHz

Antenna factor, amplifier gain and cable loss are included in spectrum analyzer "Transducer factor"

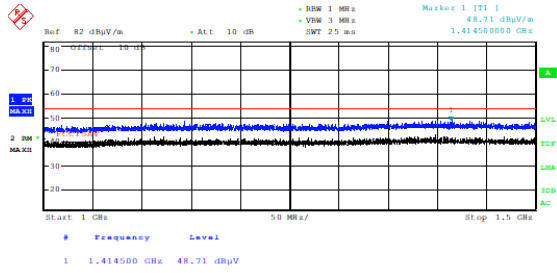
See plots below

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

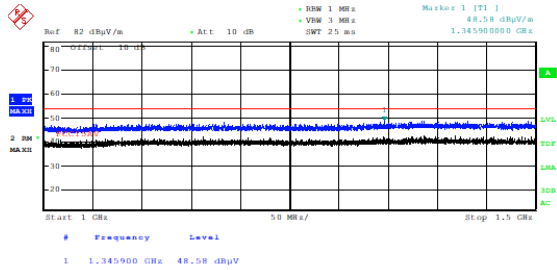


Range 1000-1500 with plots for EUT Flat – being the orientation giving the highest spurious (noise) levels



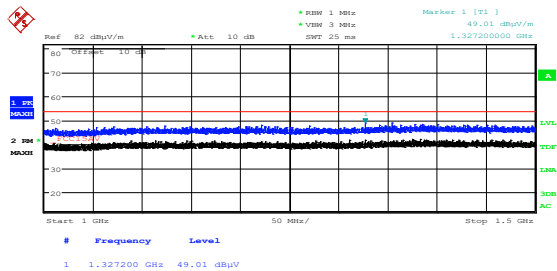
Date: 22.FEB.2023 18:45:20

917 MHz: Radiated Emissions 1000 – 1500 MHz, EUT Flat, VP



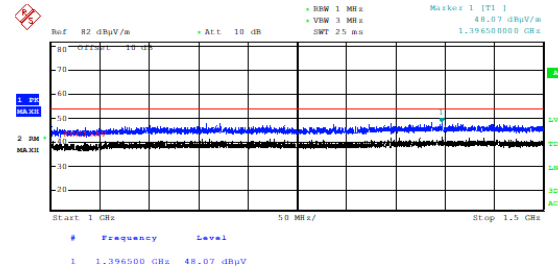
Date: 22.FEB.2023 18:50:21

922 MHz: Radiated Emissions 1000 – 1500 MHz, EUT Flat, VP



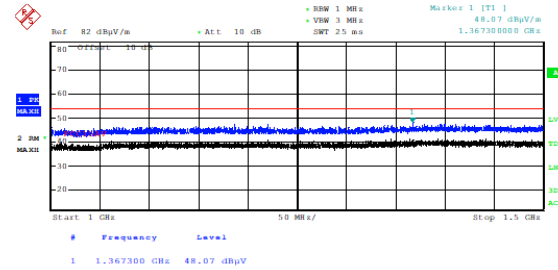
Date: 22.FEB.2023 13:56:01

926 MHz: Radiated Emissions 1000 – 1500 MHz, EUT Flat, VP



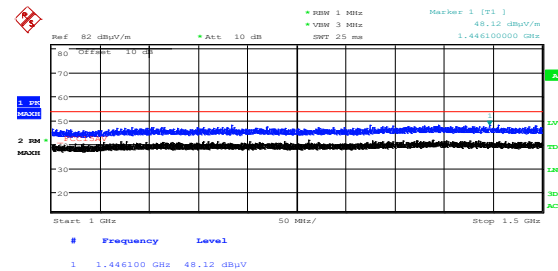
Date: 22.FEB.2023 13:47:16

917 MHz: Radiated Emissions 1000 – 1500 MHz, EUT Flat, HP



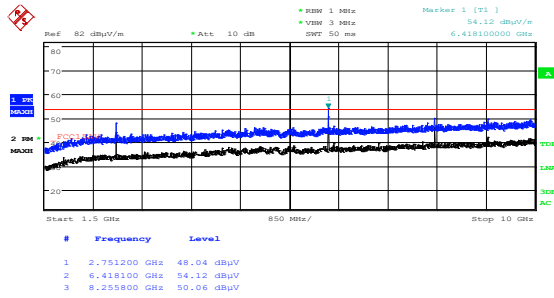
Date: 22.FEB.2023 13:52:28

922 MHz: Radiated Emissions 1000 – 1500 MHz, EUT Flat, HP



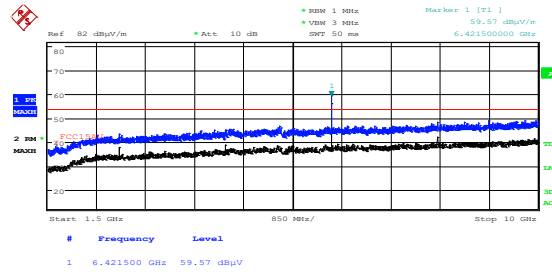
Date: 22.FEB.2023 13:34:26

926 MHz: Radiated Emissions 1000 – 1500 MHz, EUT Flat, HP



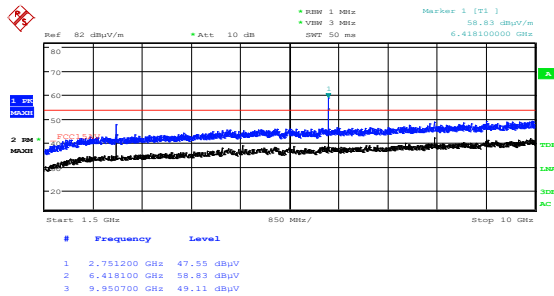
Date: 22.FEB.2023 10:56:03

917 MHz: Radiated Emissions 1500 - 10000 MHz, EUT Vert, VP



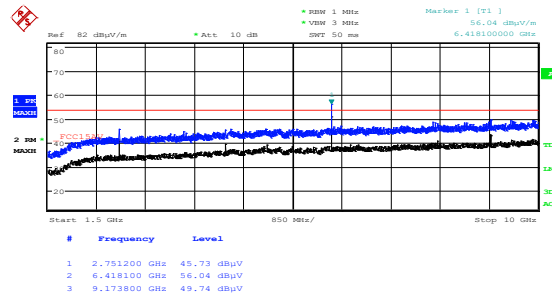
Date: 22.FEB.2023 10:57:59

917 MHz: Radiated Emissions 1500 - 10000 MHz, EUT Vert, HP



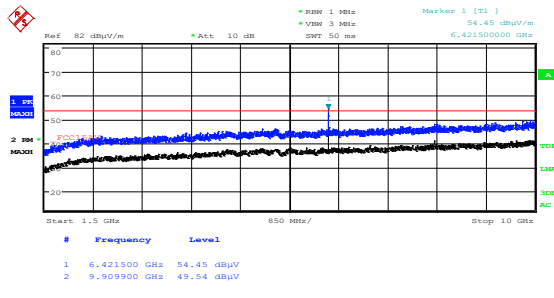
Date: 22.FEB.2023 11:01:16

917 MHz: Radiated Emissions 1500 - 10000 MHz, EUT Hor, VP



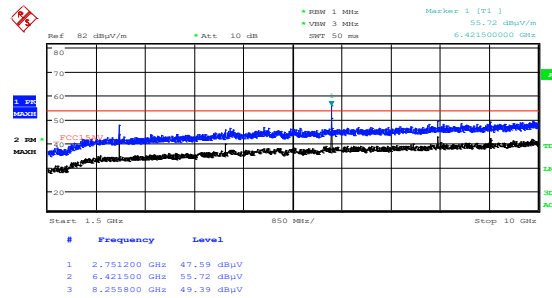
Date: 22.FEB.2023 11:03:12

917 MHz: Radiated Emissions 1500 - 10000 MHz, EUT Hor, HP



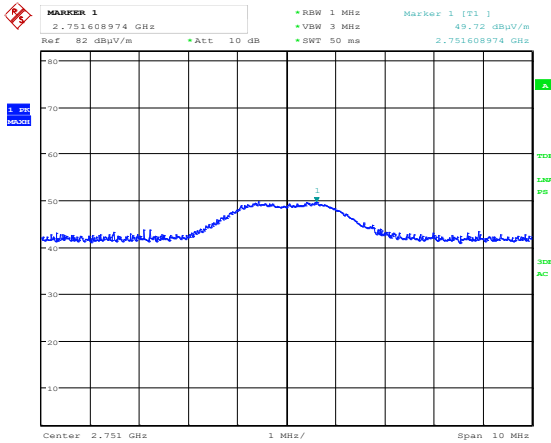
Date: 22.FEB.2023 11:05:56

917 MHz: Radiated Emissions 1500 - 10000 MHz, EUT Flat, VP



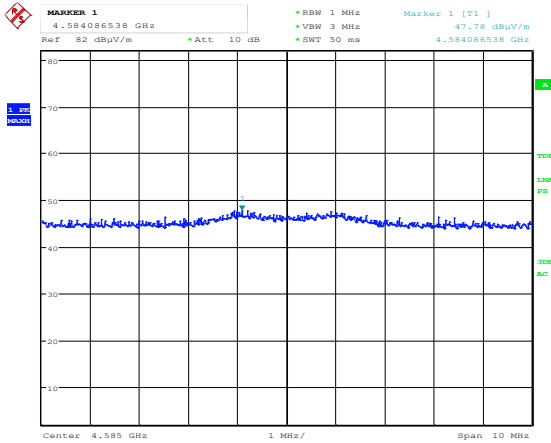
Date: 22.FEB.2023 11:07:52

917 MHz: Radiated Emissions 1500 - 10000 MHz, EUT Flat, HP



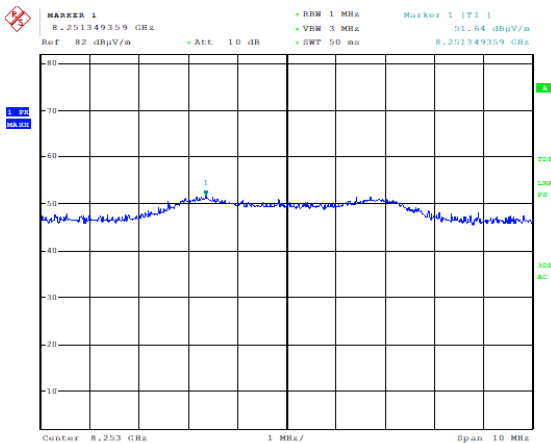
Date: 22.FEB.2023 09:58:30

917 MHz: Radiated Emissions 2751 MHz, EUT Vert, VP



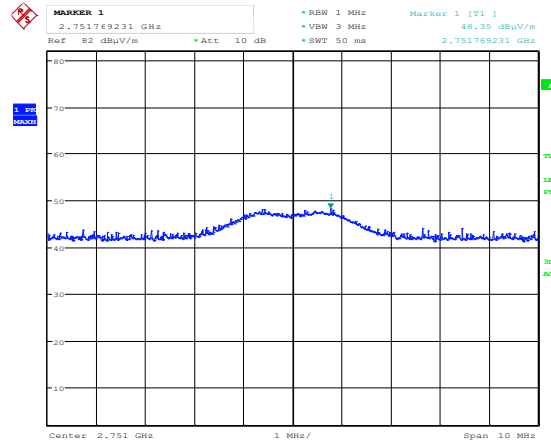
Date: 22.FEB.2023 09:46:24

917 MHz: Radiated Emissions 4585 MHz, EUT Vert, VP



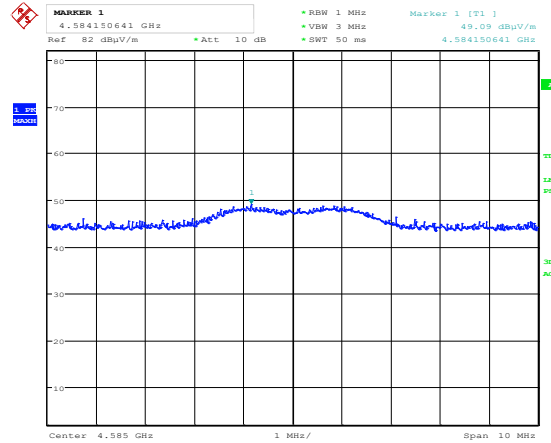
Date: 22.FEB.2023 10:22:48

917 MHz: Radiated Emissions 8253 MHz, EUT Vert, VP



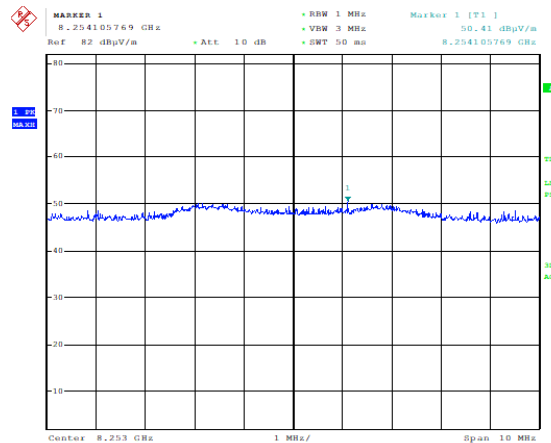
Date: 22.FEB.2023 10:00:25

917 MHz: Radiated Emissions 2751 MHz, EUT Vert, HP



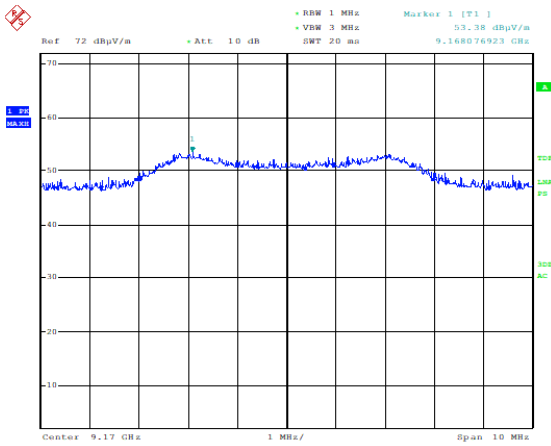
Date: 22.FEB.2023 09:43:12

917 MHz: Radiated Emissions 4585 MHz, EUT Vert, HP



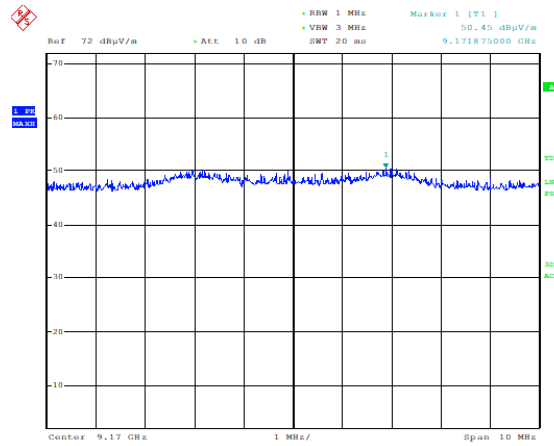
Date: 22.FEB.2023 10:24:49

917 MHz: Radiated Emissions 8253 MHz, EUT Vert, HP



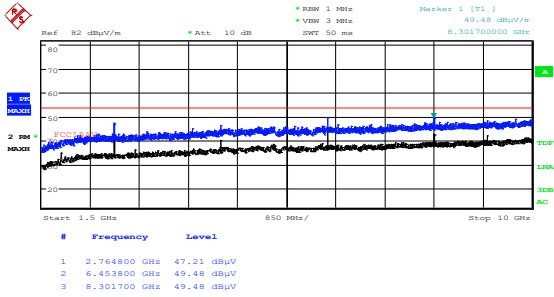
Date: 23.FEB.2023 07:19:30

917 MHz: Radiated Emissions 9170 MHz, EUT Vert, VP



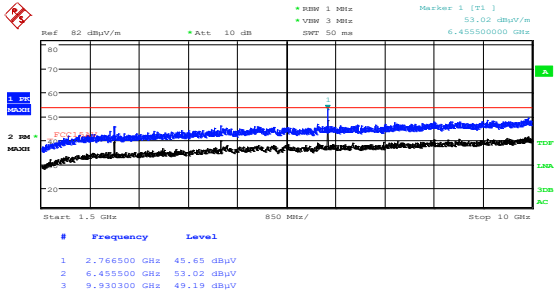
Date: 23.FEB.2023 07:20:47

917 MHz: Radiated Emissions 9170 MHz, EUT Vert, HP



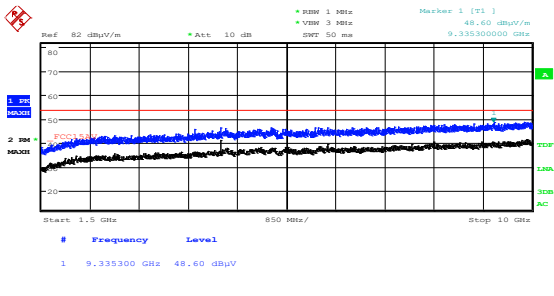
Date: 22.FEB.2023 09:08:02

922 MHz: Radiated Emissions 1500 – 10000 MHz, EUT Vert, VP



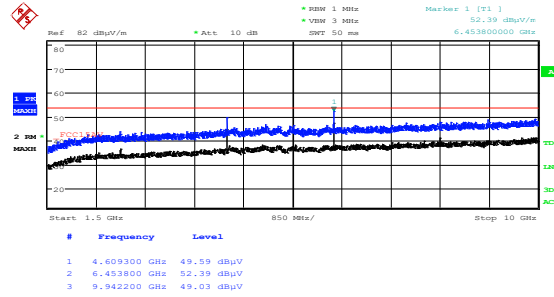
Date: 22.FEB.2023 09:02:07

922 MHz: Radiated Emissions 1500 – 10000 MHz, EUT Hor, VP



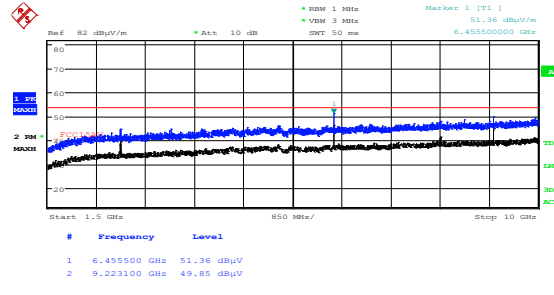
Date: 22.FEB.2023 09:12:36

922 MHz: Radiated Emissions 1500 – 10000 MHz, EUT Flat, VP



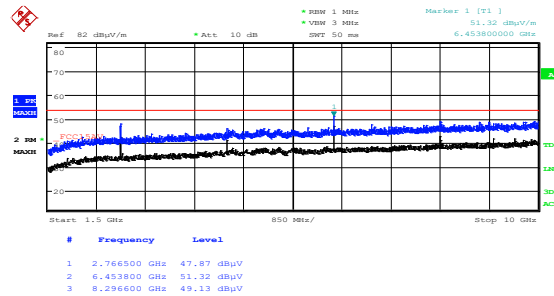
Date: 22.FEB.2023 09:09:58

922 MHz: Radiated Emissions 1500 – 10000 MHz, EUT Vert, HP



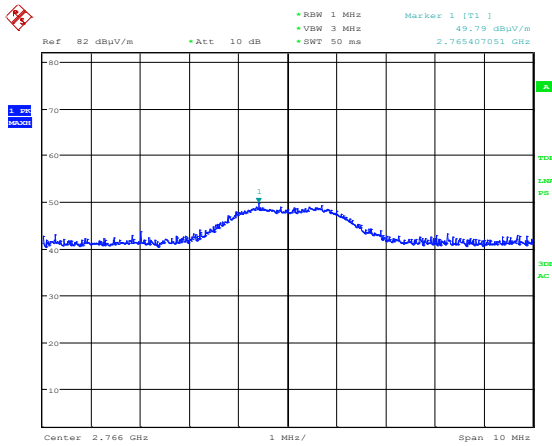
Date: 22.FEB.2023 09:04:03

922 MHz: Radiated Emissions 1500 – 10000 MHz, EUT Hor, HP



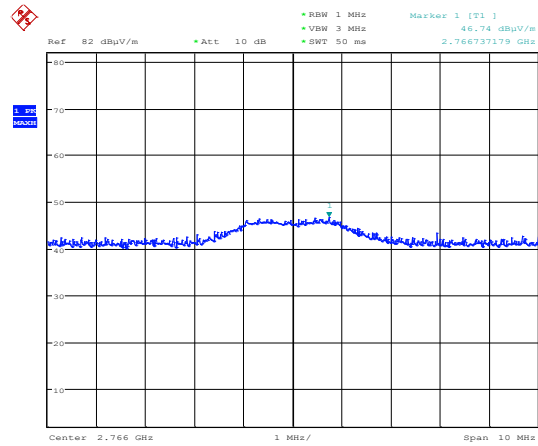
Date: 22.FEB.2023 09:14:32

922 MHz: Radiated Emissions 1500 – 10000 MHz, EUT Flat, HP



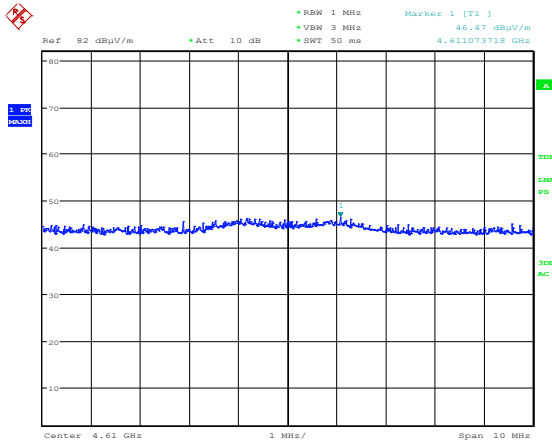
Date: 22.FEB.2023 09:24:02

922 MHz: Radiated Emissions 2766 MHz, EUT Vert, VP



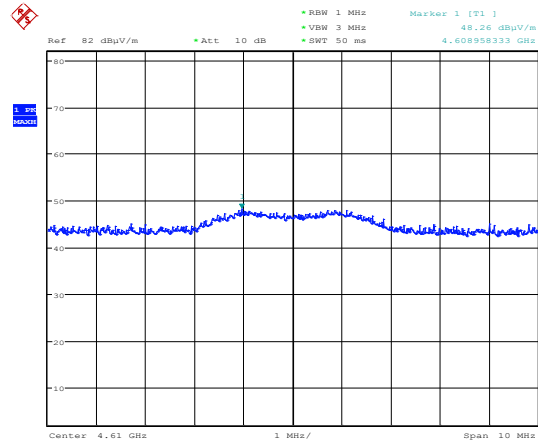
Date: 22.FEB.2023 09:25:07

922 MHz: Radiated Emissions 2766 MHz, EUT Vert, HP



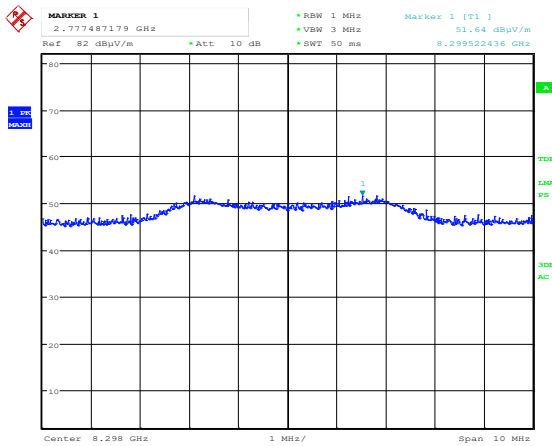
Date: 22.FEB.2023 09:35:19

922 MHz: Radiated Emissions 4610 MHz, Vertical, VP



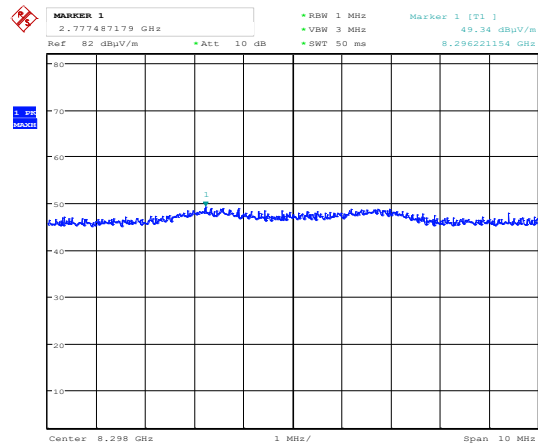
Date: 22.FEB.2023 09:36:49

922 MHz: Radiated Emissions 4610 MHz, Vertical, HP



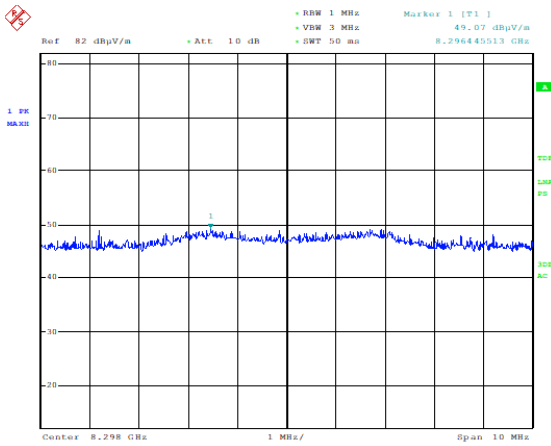
Date: 22.FEB.2023 10:16:27

922 MHz: Radiated Emissions 8298 MHz, EUT Vert, VP



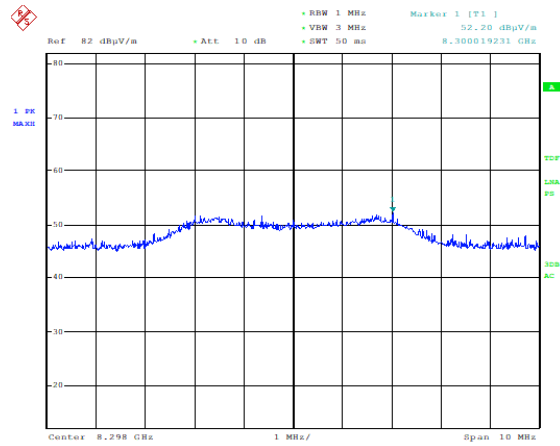
Date: 22.FEB.2023 10:18:15

922 MHz: Radiated Emissions 8298 MHz, EUT Vert, HP



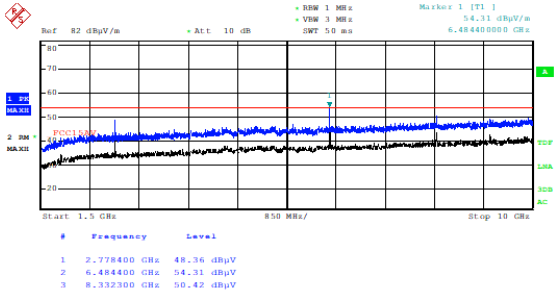
Date: 22.FEB.2023 10:48:32

922 MHz: Radiated Emissions 8298 MHz, EUT Flat, VP



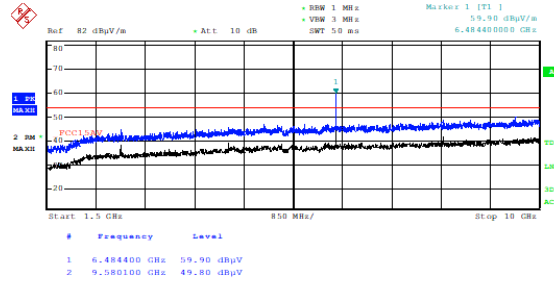
Date: 22.FEB.2023 10:42:11

922 MHz: Radiated Emissions 8298 MHz, EUT Flat, HP



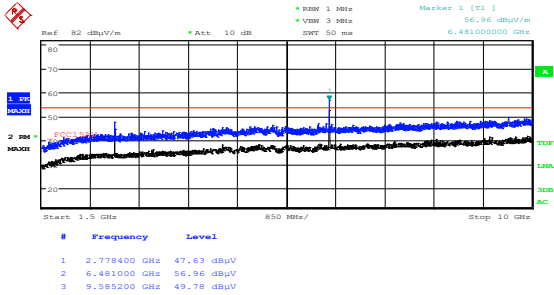
Date: 22.FEB.2023 11:11:03

926 MHz: Radiated Emissions 1500 – 10000 MHz, EUT Vert, VP



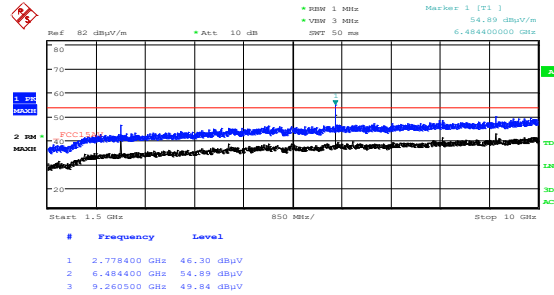
Date: 22.FEB.2023 11:12:59

926 MHz: Radiated Emissions 1500 – 10000 MHz, EUT Vert, HP



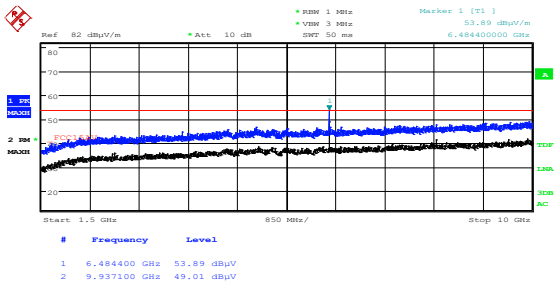
Date: 22.FEB.2023 11:15:43

926 MHz: Radiated Emissions 1500 – 10000 MHz, EUT Hor, VP



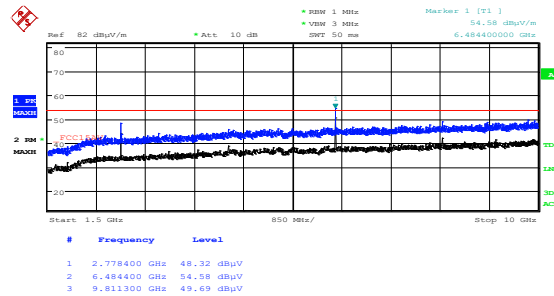
Date: 22.FEB.2023 11:17:40

926 MHz: Radiated Emissions 1500 – 10000 MHz, EUT Hor, HP



Date: 22.FEB.2023 11:20:32

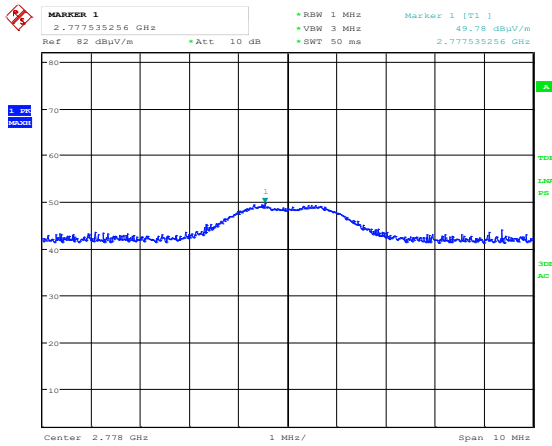
926 MHz: Radiated Emissions 1500 – 10000 MHz, EUT Flat, VP



Date: 22.FEB.2023 11:22:28

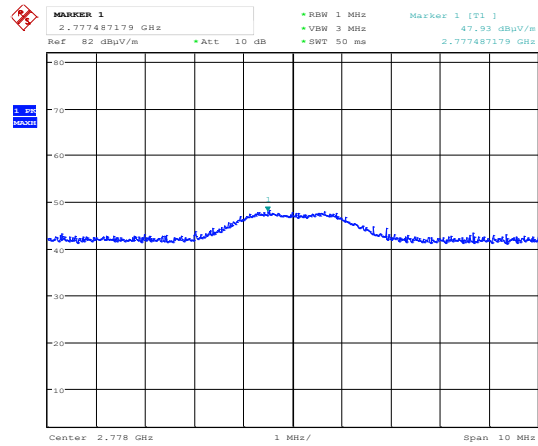
926 MHz: Radiated Emissions 1500 – 10000 MHz, EUT Flat, HP





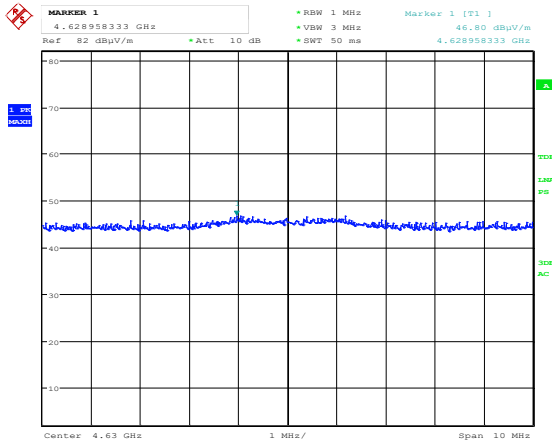
Date: 22.FEB.2023 09:57:07

926 MHz: Radiated Emissions 2778 MHz, Vertical, VP



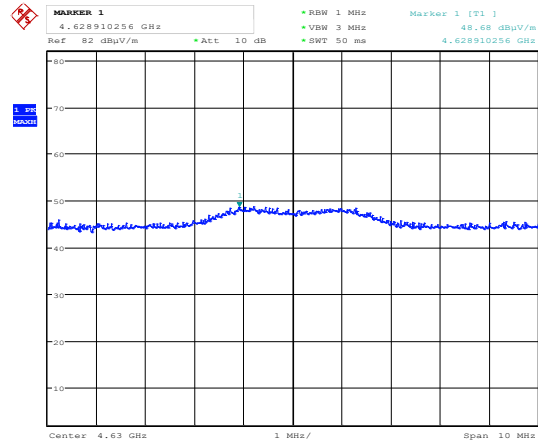
Date: 22.FEB.2023 10:02:08

926 MHz: Radiated Emissions 2778 MHz, Vertical, HP



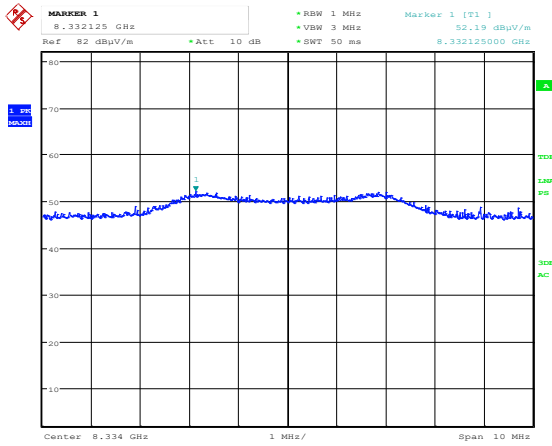
Date: 22.FEB.2023 09:48:04

926 MHz: Radiated Emissions 4630 MHz, Vertical, VP



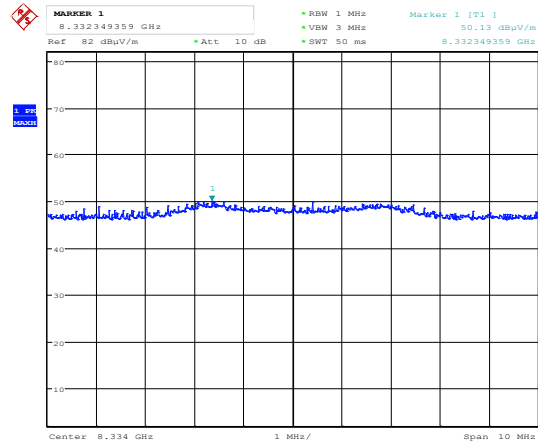
Date: 22.FEB.2023 09:41:26

926 MHz: Radiated Emissions 4630 MHz, Vertical, HP



Date: 22.FEB.2023 10:21:25

926 MHz: Radiated Emissions 8334 MHz, Horizontal, VP



Date: 22.FEB.2023 10:26:15

926 MHz: Radiated Emissions 8334 MHz, Horizontal, HP

## 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.

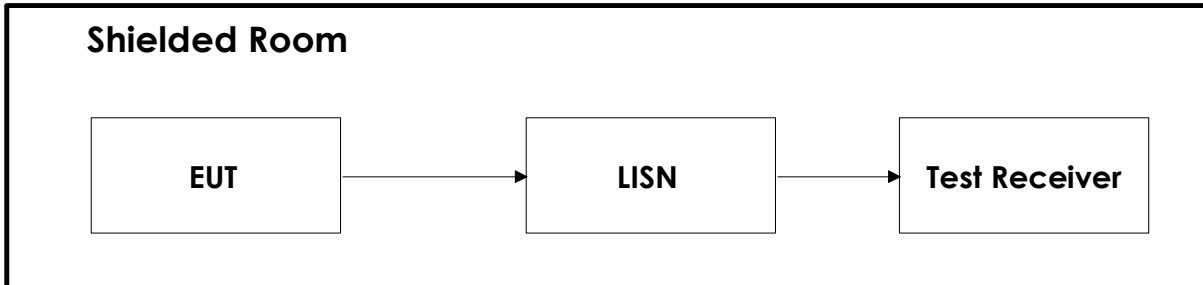
No.	Model number	Description	Manufacturer	Ref. no.	Cal. date	Cal. Due
1	FSW43	Spectrum Analyzer	Rohde & Schwarz	LR 1690	2023-02	2024-02
2	ESU40	Measuring Receiver	Rohde & Schwarz	LR 1639	2023-02	2024-02
3	6810.17B	Attenuator	Suhner	LR 1669	COU	
4	6HC1500/18000	Highpass Filter	Trilithic	LR 1612	COU	
5	VULB 9163	BiLog Antenna	Schwarzbech	LR 1616	2021-05	2023-05
6	310	Preamplifier	Sonoma	LR 1686	2022-08	2023-08
7	3115	Horn Antenna	EMCO	LR 1330	2023-01	2026-01
8	8449A	Pre-amplifier	Hewlett Packard	LR 1322	2022-08	2023-08
9	CPX 400S	Power Supply	Aim TTI	LR 1711	NA	NA
10	87 V	Multimeter	Fluke	LR 1597	2023-04	2024-04
11	ESCI	EMI Test Receiver	R&S	N 4259	2021-12	2023-12
12	ENV216	AMN	R&S	LR 1665	2021-12	2023-12

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

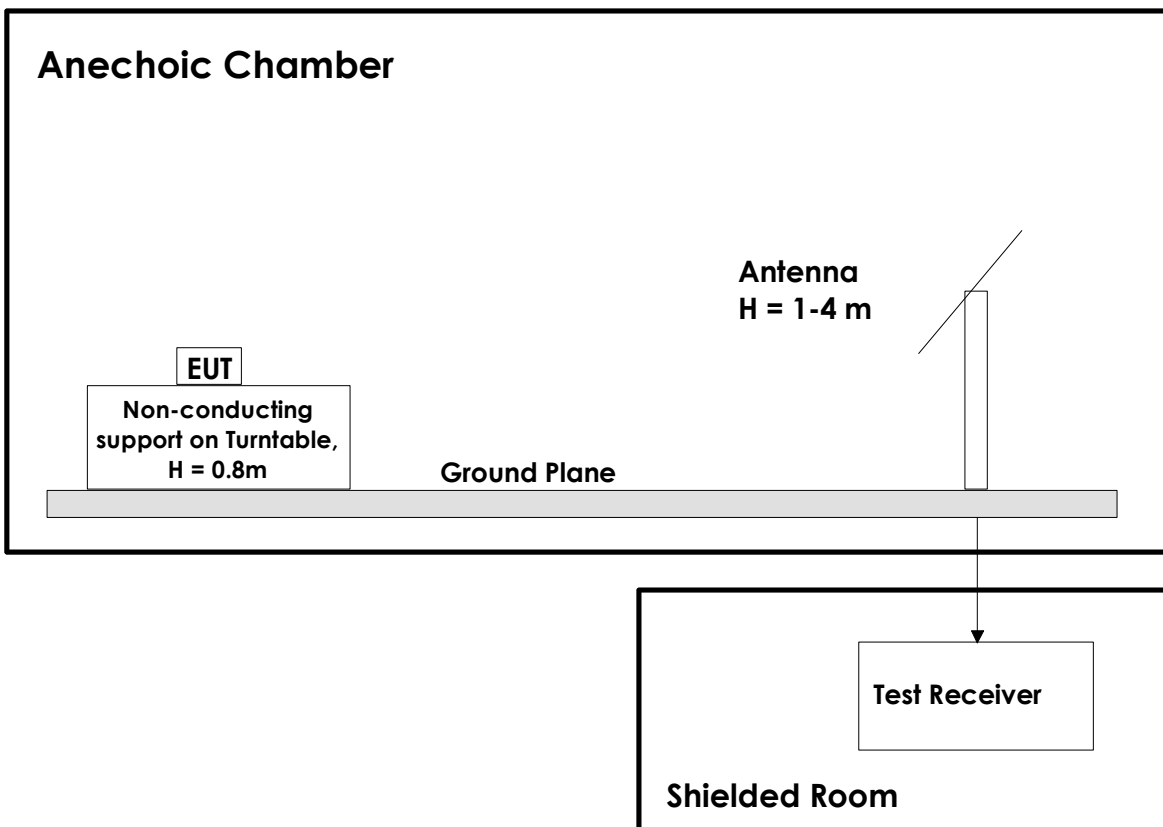
No.	Manufacturer	Name	Version	Comment
1	Rohde & Schwarz	EMC32	10.50.40	EMC test software
2	Nemko AS	RSPlot	1.0.8.0	Screen capture from R&S Spectrum Analyzers

## 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.