

# TEST REPORT

ACCORDING TO: FCC CFR 47 Part 15 subpart C, section 15.231 and subpart B,  
RSS-210 issue 10 Annex A, ICES-003 Issue 6:2019

FOR:

**Essence Smartcare Ltd.**

**Voice Panic Device**

**Model: ES700VPD2-US-M01**

**Part Number(s):**

**ES700VPD2-US-M01**

**ES700VPD2-US-M02**

**FCC ID: 2ARFP-VPD2**

**IC: 24417-VPD2**

This report is in conformity with ISO/IEC 17025. The "A2LA Accredited" symbol endorsement applies only to the tests and calibrations that are listed in the scope of Hermon Laboratories accreditation. The test results relate only to the items tested.  
This test report shall not be reproduced in any form except in full with the written approval of Hermon Laboratories Ltd.

## Table of contents

1	Applicant information .....	3
2	Equipment under test attributes .....	3
3	Manufacturer information .....	3
4	Test details .....	3
5	Tests summary .....	4
6	EUT description .....	5
6.1	General information .....	5
6.2	Test configuration .....	5
6.3	Changes made in EUT .....	5
6.4	EUT test positions .....	6
6.5	Transmitter characteristics .....	7
7	Transmitter tests according to 47CFR part 15 subpart C and RSS-210 requirements .....	8
7.1	Periodic operation requirements .....	8
7.2	Field strength of emissions .....	13
7.3	Occupied bandwidth test .....	27
7.4	Antenna requirements .....	30
8	Emissions tests according to FCC 47CFR part 15 subpart B and ICES-003 requirements .....	31
8.1	Radiated emission measurements .....	31
9	APPENDIX A Test equipment and ancillaries used for tests .....	36
10	APPENDIX B Measurement uncertainties .....	37
11	APPENDIX C Test laboratory description .....	38
12	APPENDIX D Specification references .....	38
13	APPENDIX E Test equipment correction factors .....	39
14	APPENDIX F Abbreviations and acronyms .....	45
15	APPENDIX G Manufacturer's Declaration of Identity .....	46

## 1 Applicant information

**Client name:** Essence Smartcare Ltd.  
**Address:** 12 Abba Eban avenue, Ackerstein Tower Bldg. D, P.O.Box 2073, Herzliya 4612001, Israel  
**Telephone:** +972 732 447 735  
**Fax:** +972 9772 9962  
**E-mail:** israelgo@essence-grp.com  
**Contact name:** Mr. Israel Gottesman

## 2 Equipment under test attributes

**Product name:** Voice panic device  
**Product type:** Transceiver  
**Model(s):** ES700VPD2-US-M01  
**Part Number(s):** ES700VPD2-US-M01, ES700VPD2-US-M02  
**Serial number:** 002  
**Hardware version:** 3.D  
**Software release:** 11.02  
**Receipt date:** 13-Jun-21

## 3 Manufacturer information

**Manufacturer name:** Essence Smartcare Ltd.  
**Address:** 12 Abba Eban avenue, Ackerstein Tower Bldg. D, P.O.Box 2073, Herzliya 4612001, Israel  
**Telephone:** +972 732 447 735  
**Fax:** +972 9772 9962  
**E-Mail:** israelgo@essence-grp.com  
**Contact name:** Mr. Israel Gottesman

## 4 Test details



**Project ID:** 37526  
**Location:** Hermon Laboratories Ltd. P.O. Box 23, Binyamina 3055001, Israel  
**Test started:** 13-Jun-21  
**Test completed:** 15-Jun-21  
**Test specification(s):** FCC 47CFR part 15, subpart C, §15.231 and subpart B;  
RSS-210 issue 10 Annex A, RSS-Gen issue 5 with Am.1, ICES-003 issue 6: 2019 (updated)

## 5 Tests summary

Test	Status
<b>Transmitter characteristics</b>	
FCC Part 15, Section 231(a) / RSS-210, Section A1.1, Periodic operation requirements	Pass
FCC Part 15, Section 231(a) / RSS-210, Section A1.2, Field strength of emissions	Pass
FCC Part 15, Section 231(c) / RSS-210, Section A1.3, Occupied bandwidth	Pass
FCC Part 15, Section 207 / RSS-Gen, Section 8.8, Conducted emission	Not required
FCC Part 15, Section 203 / RSS-Gen, Section 6.8, Antenna requirements	Pass
<b>Unintentional emissions</b>	
FCC Part 15, Section 107 / ICES-003, Section 6.1 class B, Conducted emission at AC power port	Not required
FCC Part 15, Section 109 / RSS-Gen, Section 7.3 / ICES-003, Section 6.2 class B, Radiated emission	Pass

Testing was completed against all relevant requirements of the test standard. The results obtained indicate that the product under test complies in full with the requirements tested.

The test results relate only to the items tested. Pass/ fail decision was based on nominal values.

	Name and Title	Date	Signature
<b>Tested by:</b>	Mr. H.N. Abayev, test engineer	June 15, 2021	
<b>Reviewed by:</b>	Mrs. M. Cherniavsky, certification engineer	June 28, 2021	
<b>Approved by:</b>	Mr. S. Samokha, Technical Manager, EMC & Radio	August 2, 2021	

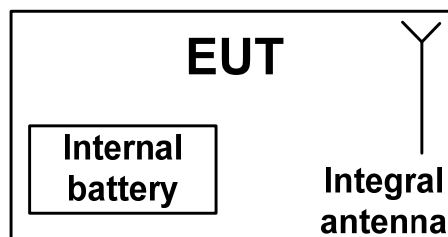
## 6 EUT description

Note: The following data in this clause is provided by the customer and represents his sole responsibility.

### 6.1 General information

The EUT is a battery fed panic device, comprises RF module operating at 916.5 MHz, GFSK type of modulation, powered by six 4.5V internal non-rechargeable AA batteries. The manufacturer's declaration of identity of two EUT part numbers ES700VPD2-US-M01 and ES700VPD2-US-M02 provided in Appendix G of the test report.

### 6.2 Test configuration



### 6.3 Changes made in EUT

No changes were implemented in the EUT during testing.

## 6.4 EUT test positions

Photograph 6.4.1 EUT in X-axis orthogonal position



Photograph 6.4.2 EUT in Y-axis orthogonal position



## 6.5 Transmitter characteristics

<b>Type of equipment</b>					
X	Stand-alone (Equipment with or without its own control provisions)				
	Combined equipment (Equipment where the radio part is fully integrated within another type of equipment)				
	Plug-in card (Equipment intended for a variety of host systems)				
<b>Operating frequency</b>		916.5 MHz			
<b>Maximum rated output power</b>		At transmitter 50 $\Omega$ RF output connector			
		Field strength at 3 m distance		101.01 dB( $\mu$ V/m) – peak 77.92 dB( $\mu$ V/m) -average	
<b>Is transmitter output power variable?</b>		X	No		
		Yes		continuous variable	
				stepped variable with stepsize	dB
			minimum RF power		dBm
		maximum RF power		dBm	
<b>Antenna connection</b>					
unique coupling	standard connector	X	integral	with temporary RF connector	
				X	without temporary RF connector
<b>Antenna/s technical characteristics</b>					
Type	Manufacturer	Model number		Gain	
Integral	Essence Security	printed		1 dBi	
<b>Transmitter aggregate data rate/s</b>		GFSK			
<b>Type of modulation</b>		38.4 kbps			
<b>Transmitter power source</b>					
X	Battery	<b>Nominal rated voltage</b>	4.5 VDC	Battery type	Alkaline
	DC	<b>Nominal rated voltage</b>	VDC		
	AC mains	<b>Nominal rated voltage</b>		Frequency	
<b>Common power source for transmitter and receiver</b>			X	yes	no

<b>Test specification:</b>		<b>FCC Part 15, Section 231(a) / RSS-210, Section A1.1, Periodic operation requirements</b>	
<b>Test procedure:</b>		Supplier declaration	
<b>Test mode:</b>		Compliance	<b>Verdict:</b> PASS
<b>Date(s):</b>		14-Jun-21	
<b>Temperature:</b> 24 °C	<b>Relative Humidity:</b> 49 %	<b>Air Pressure:</b> 1006 hPa	<b>Power:</b> 4.5 VDC
<b>Remarks:</b>			

## 7 Transmitter tests according to 47CFR part 15 subpart C and RSS-210 requirements

### 7.1 Periodic operation requirements

#### 7.1.1 General

The EUT was verified for compliance with periodic operation requirements listed below:

- Continuous transmissions such as voice, video and the radio control of toys are not permitted;
- A manually operated transmitter shall employ switch that will automatically deactivate the transmitter within not more than 5 seconds of being released;
- A transmitter activated automatically shall cease transmission within 5 seconds after activation;
- Periodic transmissions, excluding polling or supervision transmissions, at regular predetermined intervals are not permitted;
- Total duration of polling or supervision transmissions, including data, to determine system integrity in security or safety applications shall not exceed 2 seconds per hour;
- Transmission of set-up information for security systems may exceed the transmission duration limits of 5 seconds, provided such transmissions are under the control of a professional installer and do not exceed ten seconds after a manually operated switch is released or a transmitter is activated automatically. Such set-up information may include data.

The rationale for compliance with the above requirements was either test results or supplier declaration. The summary of results is provided in Table 7.1.1.

#### 7.1.2 Test procedure for transmitter shut down test

7.1.2.1 The EUT was set up as shown in Figure 7.1.1.

7.1.2.2 The spectrum analyzer center frequency was adjusted to the EUT carrier, span set to zero and video triggered for transmission.

7.1.2.3 The transmitter was activated either manually or automatically. Once manually operated transmitter was activated, the switch was immediately released.

7.1.2.4 The transmission time was captured and shown in Plot 7.1.1.

#### 7.1.3 Test procedure for measurements of polling / supervision transmission duration

7.1.3.1 The EUT was set up as shown in Figure 7.1.1.

7.1.3.2 The spectrum analyzer center frequency was adjusted to the EUT carrier, span set to zero and video triggered for transmission.

7.1.3.3 The transmission time was captured and shown in Plot 7.1.1, Plot 7.1.2.





Test specification:		FCC Part 15, Section 231(a) / RSS-210, Section A1.1, Periodic operation requirements	
Test procedure:		Supplier declaration	
Test mode:		Verdict: PASS	
Date(s):			
14-Jun-21			
Temperature: 24 °C	Relative Humidity: 49 %	Air Pressure: 1006 hPa	Power: 4.5 VDC
Remarks:			

Figure 7.1.1 Setup for transmitter shut down test

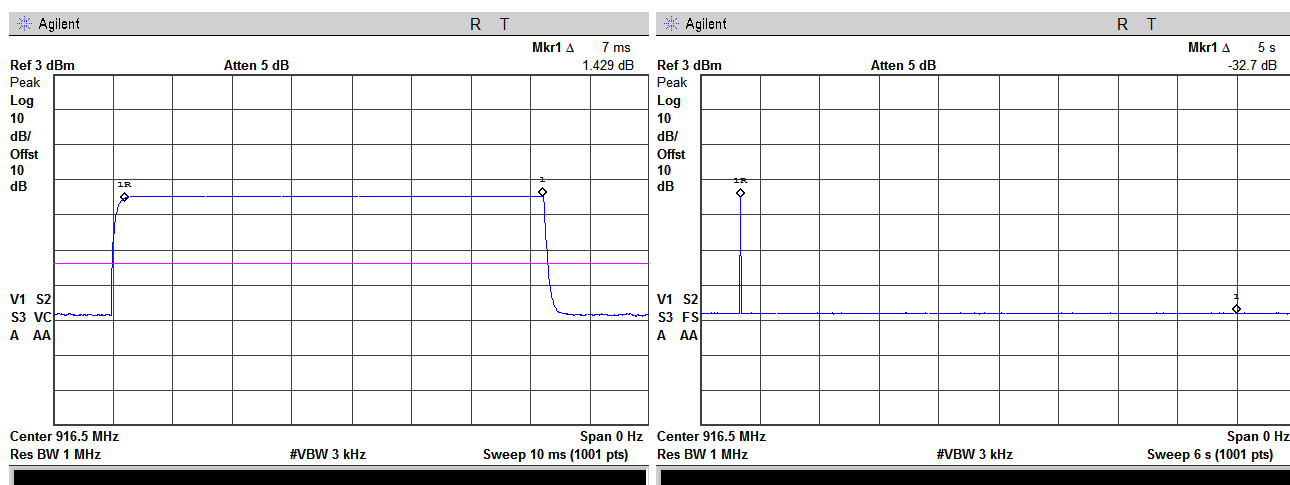


<b>Test specification:</b> FCC Part 15, Section 231(a) / RSS-210, Section A1.1, Periodic operation requirements			
<b>Test procedure:</b> Supplier declaration			
<b>Test mode:</b> Compliance		<b>Verdict:</b> PASS	
<b>Date(s):</b> 14-Jun-21			
<b>Temperature:</b> 24 °C	<b>Relative Humidity:</b> 49 %	<b>Air Pressure:</b> 1006 hPa	<b>Power:</b> 4.5 VDC
<b>Remarks:</b>			

Table 7.1.1 Periodic operation requirements

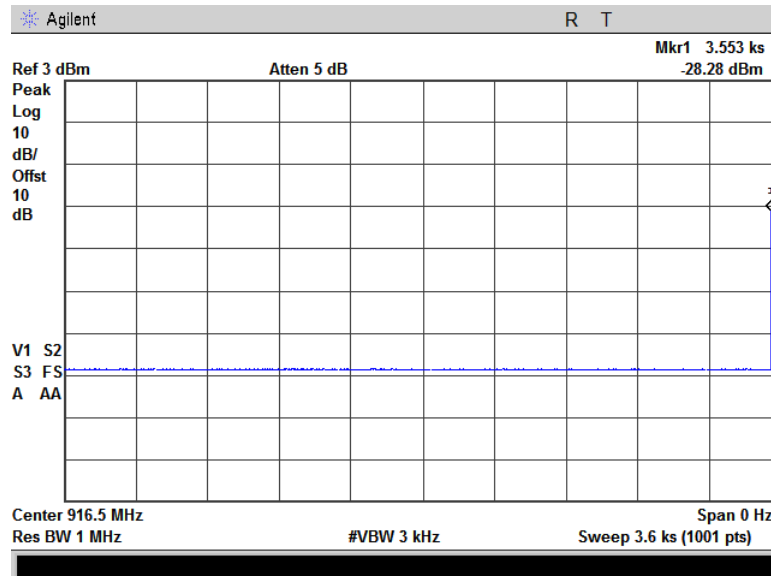
Requirement	Rationale	Verdict
Continuous transmissions are not permitted	Supplier declaration	Comply
A manually operated transmitter shall be deactivated within not more than 5 seconds of switch being released	Plot 7.1.1	Comply
Transmitter activated automatically shall cease transmission within 5 seconds	NA	NA
Periodic transmissions at regular predetermined intervals are not permitted	Supplier declaration	Comply
Total duration of polling or supervision transmissions shall not exceed 2 seconds per hour	Plot 7.1.1	Comply
Transmission of set-up information for security systems may exceed the transmission duration limits of 5 seconds, provided such transmissions are under the control of a professional installer and do not exceed ten seconds after a manually operated switch is released or a transmitter is activated automatically. Such set-up information may include data.	NA	NA

Plot 7.1.1 Transmitter shut down test result



<b>Test specification:</b> FCC Part 15, Section 231(a) / RSS-210, Section A1.1, Periodic operation requirements			
<b>Test procedure:</b> Supplier declaration			
<b>Test mode:</b> Compliance		<b>Verdict:</b> PASS	
<b>Date(s):</b> 14-Jun-21			
<b>Temperature:</b> 24 °C	<b>Relative Humidity:</b> 49 %	<b>Air Pressure:</b> 1006 hPa	<b>Power:</b> 4.5 VDC
<b>Remarks:</b>			

Plot 7.1.2 Transmitter pulse period test result





HERMON LABORATORIES

<b>Test specification:</b> FCC Part 15, Section 231(a) / RSS-210, Section A1.1, Periodic operation requirements			
<b>Test procedure:</b> Supplier declaration			
<b>Test mode:</b> Compliance		<b>Verdict:</b> PASS	
<b>Date(s):</b> 14-Jun-21			
<b>Temperature:</b> 24 °C	<b>Relative Humidity:</b> 49 %	<b>Air Pressure:</b> 1006 hPa	<b>Power:</b> 4.5 VDC
<b>Remarks:</b>			

Table 7.1.2 Total duration of polling / supervision transmissions

Duration, ms	Repetition period, ms	Maximum number of transmissions within 1 hour	Total duration within 1 hour, ms
7.0	NA	1	7.0

**Reference numbers of test equipment used**

HL 2909	HL 5410	HL 3785	HL 4135	HL 5397			
---------	---------	---------	---------	---------	--	--	--

Full description is given in Appendix A.

<b>Test specification:</b> FCC Part 15, Section 231(b) / RSS-210, Section A1.2, Field strength of emissions			
<b>Test procedure:</b> ANSI C63.10 sections 6.5, 6.6			
<b>Test mode:</b> Compliance		<b>Verdict:</b> PASS	
<b>Date(s):</b> 13-Jun-21 - 15-Jun-21			
<b>Temperature:</b> 25 °C	<b>Relative Humidity:</b> 55 %	<b>Air Pressure:</b> 1007 hPa	<b>Power:</b> 4.5 VDC
<b>Remarks:</b>			

## 7.2 Field strength of emissions

### 7.2.1 General

This test was performed to measure field strength of fundamental and spurious emissions from the EUT. Specification test limits are given in Table 7.2.1 and Table 7.2.2.

Table 7.2.1 Radiated fundamental emission limits

Fundamental frequency, MHz	Field strength at 3 m, dB(μV/m)	
	Peak	Average
916.5	102.0	82.0

Table 7.2.2 Radiated spurious emissions limits

Frequency, MHz	Field strength at 3 m, dB(μV/m)				
	Within restricted bands			Outside restricted bands	
	Peak	Quasi Peak	Average	Peak	Average
0.009 – 0.090	148.5 – 128.5	NA	128.5 – 108.5**	82.0	62.0
0.090 – 0.110	NA	108.5 – 106.8**	NA		
0.110 – 0.490	126.8 – 113.8	NA	106.8 – 93.8**		
0.490 – 1.705	NA	73.8 – 63.0**	NA		
1.705 – 30.0*		69.5			
30 – 88		40.0			
88 – 216		43.5			
216 – 960		46.0			
960 - 1000		54.0			
Above 1000	74.0	NA	54.0		

\*- The limit for 3 m test distance was calculated using the inverse square distance extrapolation factor as follows:

$$\text{Lim}_{S_2} = \text{Lim}_{S_1} + 40 \log (S_1/S_2),$$

where  $S_1$  and  $S_2$  – standard defined and test distance respectively in meters.

\*\* - The limit decreases linearly with the logarithm of frequency.

Note 1: The fundamental emission limit in dB(μV/m) was calculated as follows:

$$\text{Lim}_{AVR} = 20 \times \log(56.81818 \times F - 6136.3636) \text{ - within } 130 - 174 \text{ MHz band;}$$

$$\text{Lim}_{AVR} = 20 \times \log(41.6667 \times F - 7083.3333) \text{ - within } 260 - 470 \text{ MHz band,}$$

where  $F$  is the carrier frequency in MHz.

The limit for spurious emissions was 20 dB lower than fundamental emission limit.

The above limits provided in terms of average values, peak limit was 20 dB above the average limit.

Note 2: The above field strength limits applied from the lowest radio frequency generated in the device, without going below 9 kHz up to the tenth harmonic of the highest fundamental frequency.



<b>Test specification:</b> FCC Part 15, Section 231(b) / RSS-210, Section A1.2, Field strength of emissions			
<b>Test procedure:</b> ANSI C63.10 sections 6.5, 6.6			
<b>Test mode:</b> Compliance		<b>Verdict:</b> PASS	
<b>Date(s):</b> 13-Jun-21 - 15-Jun-21			
<b>Temperature:</b> 25 °C	<b>Relative Humidity:</b> 55 %	<b>Air Pressure:</b> 1007 hPa	<b>Power:</b> 4.5 VDC
<b>Remarks:</b>			

**7.2.2 Test procedure for spurious emission field strength measurements in 9 kHz to 30 MHz band**

**7.2.2.1** The EUT was set up as shown in Figure 7.2.1, energized and the performance check was conducted.

**7.2.2.2** The measurements were performed in two EUT orthogonal positions.

**7.2.2.3** The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360° and the measuring antenna was rotated around its vertical axis.

**7.2.2.4** The worst test results (the lowest margins) found in the EUT X-axis position, were recorded in Table 7.2.3, Table 7.2.5, Table 7.2.6 and shown in the associated plots.

**7.2.3 Test procedure for spurious emission field strength measurements above 30 MHz**

**7.2.3.1** The EUT was set up as shown in Figure 7.2.2, Figure 7.2.3, energized and the performance check was conducted.

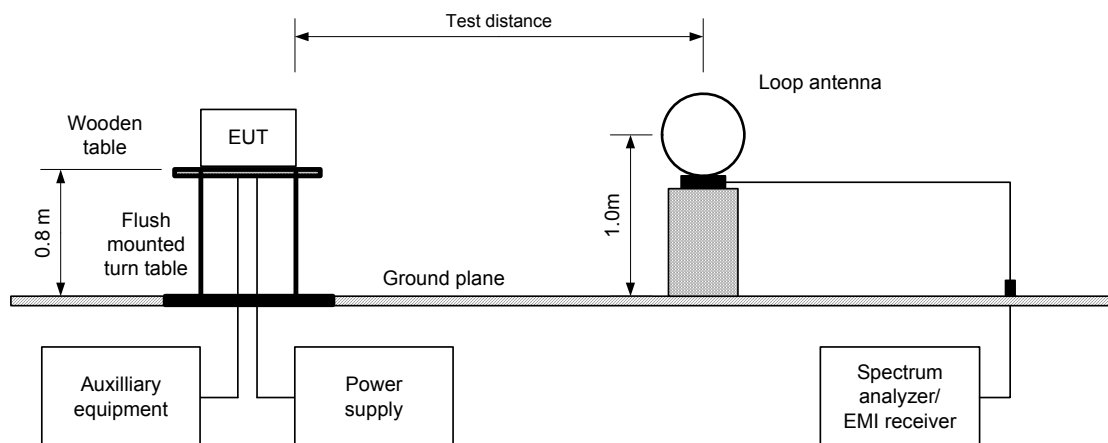
**7.2.3.2** The measurements were performed in two EUT orthogonal positions.

**7.2.3.3** The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360°, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal.

**7.2.3.4** The worst test results (the lowest margins) found in the EUT X-axis position, were recorded in Table 7.2.3, Table 7.2.5, Table 7.2.6 and shown in the associated plots.

<b>Test specification:</b> FCC Part 15, Section 231(b) / RSS-210, Section A1.2, Field strength of emissions			
<b>Test procedure:</b> ANSI C63.10 sections 6.5, 6.6			
<b>Test mode:</b> Compliance		<b>Verdict:</b> PASS	
<b>Date(s):</b> 13-Jun-21 - 15-Jun-21			
<b>Temperature:</b> 25 °C	<b>Relative Humidity:</b> 55 %	<b>Air Pressure:</b> 1007 hPa	<b>Power:</b> 4.5 VDC
<b>Remarks:</b>			

Figure 7.2.1 Setup for spurious emission field strength measurements below 30 MHz



<b>Test specification:</b> FCC Part 15, Section 231(b) / RSS-210, Section A1.2, Field strength of emissions			
<b>Test procedure:</b> ANSI C63.10 sections 6.5, 6.6			
<b>Test mode:</b> Compliance		<b>Verdict:</b> PASS	
<b>Date(s):</b> 13-Jun-21 - 15-Jun-21			
<b>Temperature:</b> 25 °C	<b>Relative Humidity:</b> 55 %	<b>Air Pressure:</b> 1007 hPa	<b>Power:</b> 4.5 VDC
<b>Remarks:</b>			

Figure 7.2.2 Setup for spurious emission field strength measurements in 30 -1000 MHz

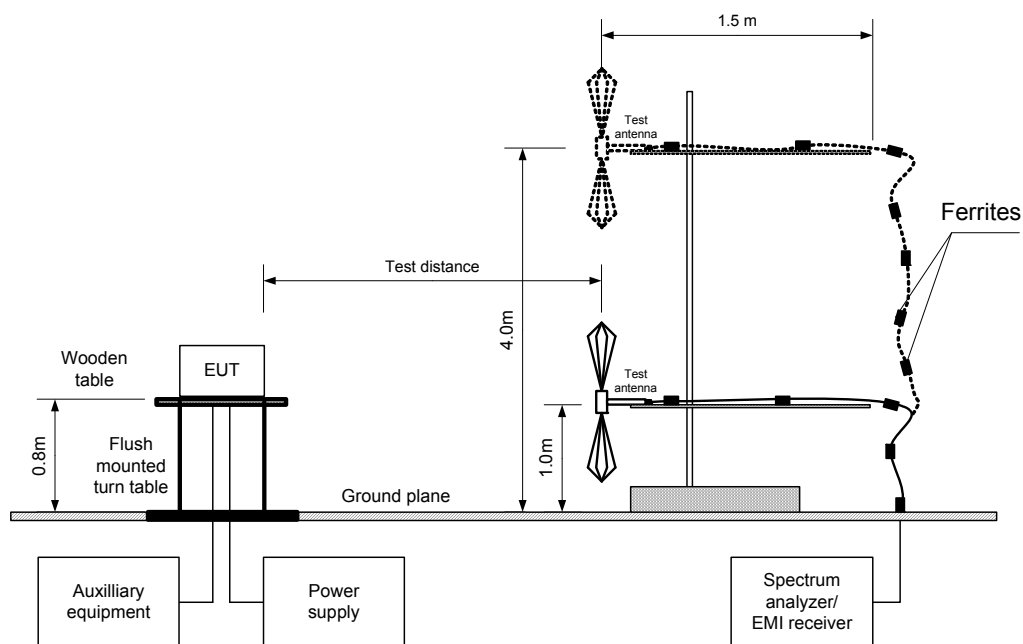
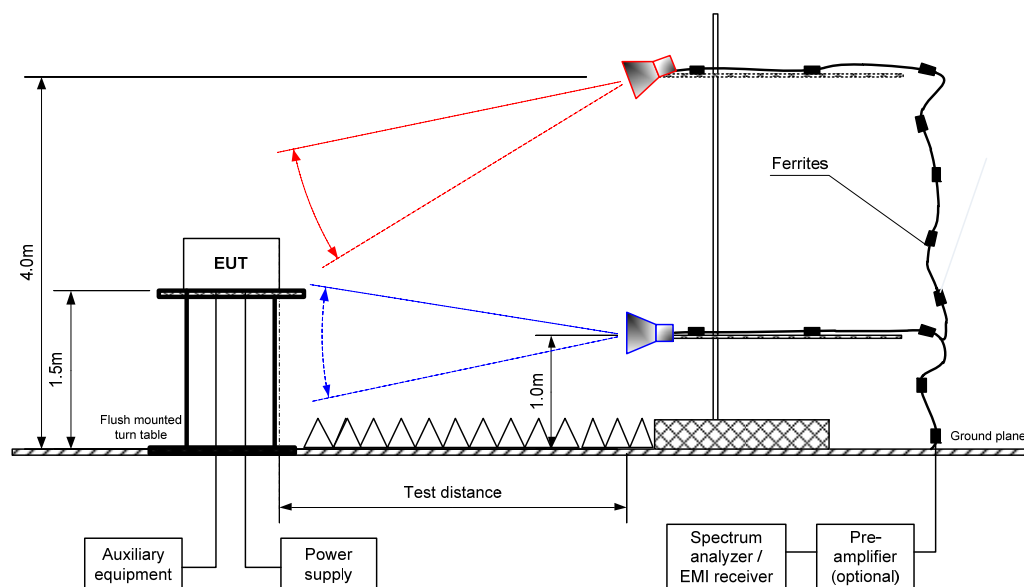


Figure 7.2.3 Setup for spurious emission field strength measurements above 1000 MHz





<b>Test specification:</b> FCC Part 15, Section 231(b) / RSS-210, Section A1.2, Field strength of emissions			
<b>Test procedure:</b> ANSI C63.10 sections 6.5, 6.6			
<b>Test mode:</b> Compliance		<b>Verdict:</b> PASS	
<b>Date(s):</b> 13-Jun-21 - 15-Jun-21			
<b>Temperature:</b> 25 °C	<b>Relative Humidity:</b> 55 %	<b>Air Pressure:</b> 1007 hPa	<b>Power:</b> 4.5 VDC
<b>Remarks:</b>			

**Table 7.2.3 Field strength of fundamental emission, spurious emissions within restricted bands at frequencies above 1 GHz**

TEST DISTANCE: 3 m  
 EUT POSITION: 2 orthogonal (X, Y)  
 MODULATION: GFSK  
 BIT RATE: 38.4 kbps  
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum  
 INVESTIGATED FREQUENCY RANGE: 1000 – 10000 MHz  
 DETECTOR USED: Peak  
 RESOLUTION BANDWIDTH: 1.0 MHz (above 1000 MHz)  
 VIDEO BANDWIDTH: ≥ Resolution bandwidth  
 TEST ANTENNA TYPE: Double ridged guide (above 1000 MHz)

Antenna			Azimuth, degrees*	Peak field strength			Average field strength				Verdict
F, MHz	Pol.	Height, m		Measured, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	Measured, dB(μV/m)	Calculated, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	
Fundamental emission***											
916.499867	H	1.02	180	101.01	102.0	-0.99	101.01	77.92	82.0	-4.08	Pass
Spurious emissions											
1012.500000	H	1.50	163	35.78	74.0	-38.22	30.52	30.52	54.0	-23.48	Pass

\*- EUT front panel refers to 0 degrees position of turntable.

\*\* - Margin, dB = Measured (calculated) value, dB(μV/m) - Limit, dB(μV/m)

\*\*\* Max value was obtained in X-axis orthogonal position and at Unom input power voltage.

**Table 7.2.4 Average factor calculation**

Transmission pulse		Transmission burst		Transmission train duration, ms	Average factor, dB
Duration, ms	Number of pulses in 100 ms	Duration, ms	Period, ms		
7.0	1	NA	NA	NA	-23.09

\*- Average factor was calculated as follows

for pulse train shorter than 100 ms:

$$\text{Average factor} = 20 \times \log_{10} \left( \frac{\text{Pulse duration}}{\text{Pulse period}} \times \frac{\text{Burst duration}}{\text{Train duration}} \times \text{Number of bursts within pulse train} \right)$$

for pulse train longer than 100 ms:

$$\text{Average factor} = 20 \times \log_{10} \left( \frac{\text{Pulse duration}}{\text{Pulse period}} \times \frac{\text{Burst duration}}{100 \text{ ms}} \times \text{Number of bursts within 100 ms} \right)$$

**Reference numbers of test equipment used**

HL 4360	HL 3903	HL 4933	HL 5311	HL 5309	HL 4339	HL 5902	
---------	---------	---------	---------	---------	---------	---------	--

Full description is given in Appendix A.



HERMON LABORATORIES

<b>Test specification:</b> FCC Part 15, Section 231(b) / RSS-210, Section A1.2, Field strength of emissions			
<b>Test procedure:</b> ANSI C63.10 sections 6.5, 6.6			
<b>Test mode:</b> Compliance		<b>Verdict:</b> PASS	
<b>Date(s):</b> 13-Jun-21 - 15-Jun-21			
<b>Temperature:</b> 25 °C	<b>Relative Humidity:</b> 55 %	<b>Air Pressure:</b> 1007 hPa	<b>Power:</b> 4.5 VDC
<b>Remarks:</b>			

**Table 7.2.5 Field strength of fundamental emission, spurious emissions within restricted bands at frequencies below 1 GHz**

TEST DISTANCE: 3 m  
EUT POSITION: 2 orthogonal (X, Y)  
MODULATION: GFSK  
BIT RATE: 38.4 kbps  
TRANSMITTER OUTPUT POWER SETTINGS: Maximum  
INVESTIGATED FREQUENCY RANGE: 0.009 – 1000 MHz  
DETECTOR USED: Peak  
RESOLUTION BANDWIDTH: 0.2 kHz (9 kHz – 150 kHz)  
9.0 kHz (150 kHz – 30 MHz)  
120 kHz (30 MHz – 1000 MHz)  
VIDEO BANDWIDTH: ≥ Resolution bandwidth  
TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)  
Biconilog (30 MHz – 1000 MHz)

F, MHz	Antenna		Azimuth, degrees*	Peak field strength			Quasi field strength			Verdict
	Pol.	Height, m		Measured, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	Measured, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	
Spurious emissions										
964.538371	H	1.36	164	44.02	74.0	-29.98	41.72	54.0	-12.28	Pass

\*- EUT front panel refers to 0 degrees position of turntable.

\*\* - Margin, dB = Measured (calculated) value, dB(μV/m) - Limit, dB(μV/m)

\*\*\* Max value was obtained in X-axis orthogonal position and at Unom input power voltage.

#### Reference numbers of test equipment used

HL 4360	HL 3903	HL 5311	HL 5309	HL 5288	HL 5902	HL 5085	HL 0446
---------	---------	---------	---------	---------	---------	---------	---------

Full description is given in Appendix A.

<b>Test specification:</b> FCC Part 15, Section 231(b) / RSS-210, Section A1.2, Field strength of emissions			
<b>Test procedure:</b> ANSI C63.10 sections 6.5, 6.6			
<b>Test mode:</b> Compliance		<b>Verdict:</b> PASS	
<b>Date(s):</b> 13-Jun-21 - 15-Jun-21			
<b>Temperature:</b> 25 °C	<b>Relative Humidity:</b> 55 %	<b>Air Pressure:</b> 1007 hPa	<b>Power:</b> 4.5 VDC
<b>Remarks:</b>			

**Table 7.2.6 Field strength of emissions outside restricted bands**

TEST DISTANCE: 3 m  
EUT POSITION: X  
MODULATION: GFSK  
BIT RATE: 38.4 kbps  
TRANSMITTER OUTPUT POWER SETTINGS: Maximum  
INVESTIGATED FREQUENCY RANGE: 0.009 - 10000 MHz  
DETECTOR USED: Peak  
RESOLUTION BANDWIDTH: 100 kHz  
VIDEO BANDWIDTH: 300 kHz  
TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)  
Biconilog (30 MHz – 1000 MHz)  
Double ridged guide (above 1000 MHz)

Frequency, MHz	Field strength of spurious, dB(μV/m)	Antenna polarization	Antenna height, m	Azimuth, degrees*	Field strength of carrier, dB(μV/m)	Attenuation below carrier, dBc	Limit, dBc	Margin, dB**	Verdict
820.498522	40.52	H	1.00	176	101.01	60.49	20.0	40.49	Pass
868.504676	40.14	H	1.00	165	101.01	60.87		40.87	
1832.980000	47.32	H	1.50	163	101.01	53.69		33.69	

\*- EUT front panel refers to 0 degrees position of turntable.

\*\* - Margin = Attenuation below carrier – specification limit.

**Reference numbers of test equipment used**

HL 4360	HL 3903	HL 4933	HL 5311	HL 5309	HL 5288	HL 5902	HL 5085
HL 0446	HL 4339						

Full description is given in Appendix A.



<b>Test specification:</b> FCC Part 15, Section 231(b) / RSS-210, Section A1.2, Field strength of emissions			
<b>Test procedure:</b> ANSI C63.10 sections 6.5, 6.6			
<b>Test mode:</b> Compliance		<b>Verdict:</b> PASS	
<b>Date(s):</b> 13-Jun-21 - 15-Jun-21			
<b>Temperature:</b> 25 °C	<b>Relative Humidity:</b> 55 %	<b>Air Pressure:</b> 1007 hPa	<b>Power:</b> 4.5 VDC
<b>Remarks:</b>			

Table 7.2.7 Restricted bands according to FCC 15, Section 205

MHz	MHz	MHz	MHz	MHz	GHz
0.09 - 0.11	8.37625 - 8.38675	73 - 74.6	399.9 - 410	2690 - 2900	10.6 - 12.7
0.495 - 0.505	8.41425 - 8.41475	74.8 - 75.2	608 - 614	3260 - 3267	13.25 - 13.4
2.1735 - 2.1905	12.290 - 12.293	108 - 121.94	960 - 1240	3332 - 3339	14.47 - 14.5
4.125 - 4.128	12.51975 - 12.52025	123 - 138	1300 - 1427	3345.8 - 3358	15.35 - 16.2
4.17725 - 4.17775	12.57675 - 12.57725	149.9 - 150.05	1435 - 1626.5	3600 - 4400	17.7 - 21.4
4.20725 - 4.20775	13.36 - 13.41	156.52475 - 156.52525	1645.5 - 1646.5	4500 - 5150	22.01 - 23.12
6.215 - 6.218	16.420 - 16.423	156.7 - 156.9	1660 - 1710	5350 - 5460	23.6 - 24
6.26775 - 6.26825	16.69475 - 16.69525	162.0125 - 167.17	1718.8 - 1722.2	7250 - 7750	31.2 - 31.8
6.31175 - 6.31225	16.80425 - 16.80475	167.72 - 173.2	2200 - 2300	8025 - 8500	36.43 - 36.5
8.291 - 8.294	25.5 - 25.67	240 - 285	2310 - 2390	9000 - 9200	Above 38.6
8.362 - 8.366	37.5 - 38.25	322 - 335.4	2483.5 - 2500	9300 - 9500	

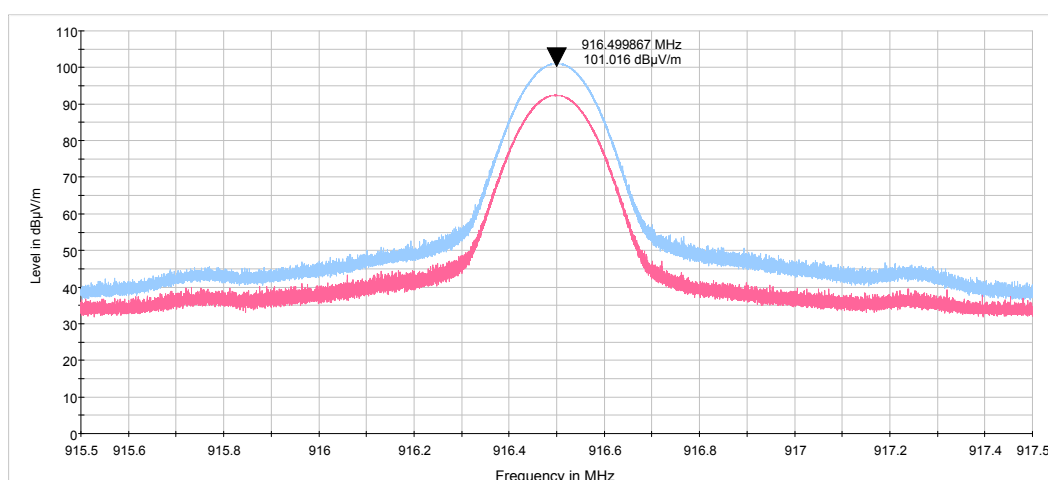
Table 7.2.8 Restricted bands according to RSS-Gen, Table 3

MHz	MHz	MHz	MHz	MHz	GHz
0.09 - 0.11	8.291 - 8.294	16.80425 - 16.80475	399.9 - 410	3260 - 3267	10.6 - 12.7
2.1735 - 2.190	8.362 - 8.366	25.5 - 25.67	608 - 614	3332 - 3339	13.25 - 13.4
3.020 - 3.026	8.37625 - 8.38675	37.5 - 38.25	960 - 1427	3345.8 - 3358	14.47 - 14.5
4.125 - 4.128	8.41425 - 8.41475	73 - 74.6	1435 - 1626.5	3500 - 4400	15.35 - 16.2
4.17725 - 4.17775	12.290 - 12.293	74.8 - 75.2	1645.5 - 1646.5	4500 - 5150	17.7 - 21.4
4.20725 - 4.20775	12.51975 - 12.52025	108 - 138	1660 - 1710	5350 - 5460	22.01 - 23.12
5.677 - 5.683	12.57675 - 12.57725	156.52475 - 156.52525	1718.8 - 1722.2	7250 - 7750	23.6 - 24.0
6.215 - 6.218	13.36 - 13.41	156.7 - 156.9	2200 - 2300	8025 - 8500	31.2 - 31.8
6.26775 - 6.26825	16.42 - 16.423	240 - 285	2310 - 2390	9000 - 9200	36.43 - 36.5
6.31175 - 6.31225	16.69475 - 16.69525	322 - 335.4	2655 - 2900	9300 - 9500	Above 38.6

<b>Test specification:</b> FCC Part 15, Section 231(b) / RSS-210, Section A1.2, Field strength of emissions			
<b>Test procedure:</b> ANSI C63.10 sections 6.5, 6.6			
<b>Test mode:</b> Compliance		<b>Verdict:</b> PASS	
<b>Date(s):</b> 13-Jun-21 - 15-Jun-21			
<b>Temperature:</b> 25 °C	<b>Relative Humidity:</b> 55 %	<b>Air Pressure:</b> 1007 hPa	<b>Power:</b> 4.5 VDC
<b>Remarks:</b>			

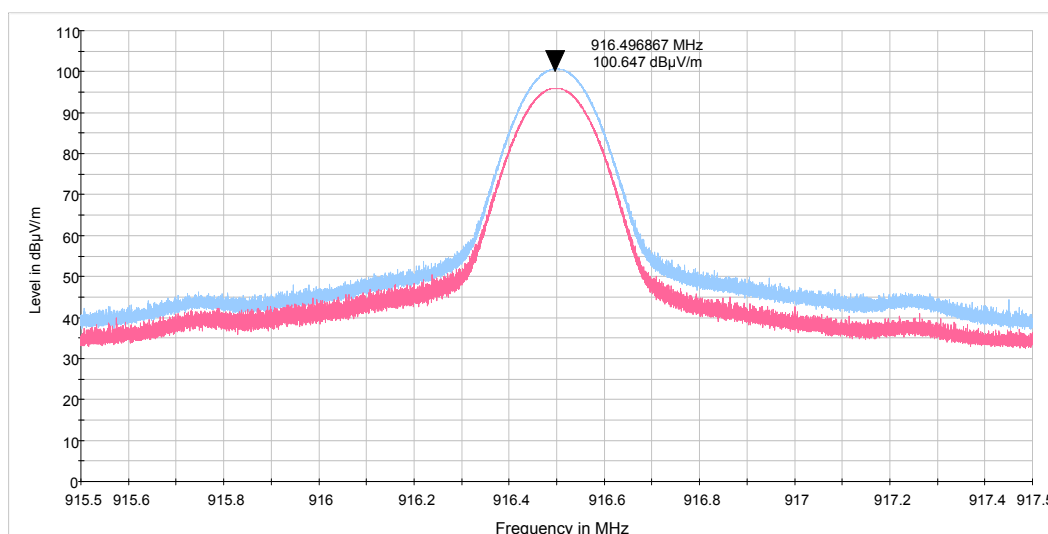
**Plot 7.2.1 Radiated emission measurements at the fundamental frequency**

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical and Horizontal  
EUT POSITION: X-axis



**Plot 7.2.2 Radiated emission measurements at the fundamental frequency**

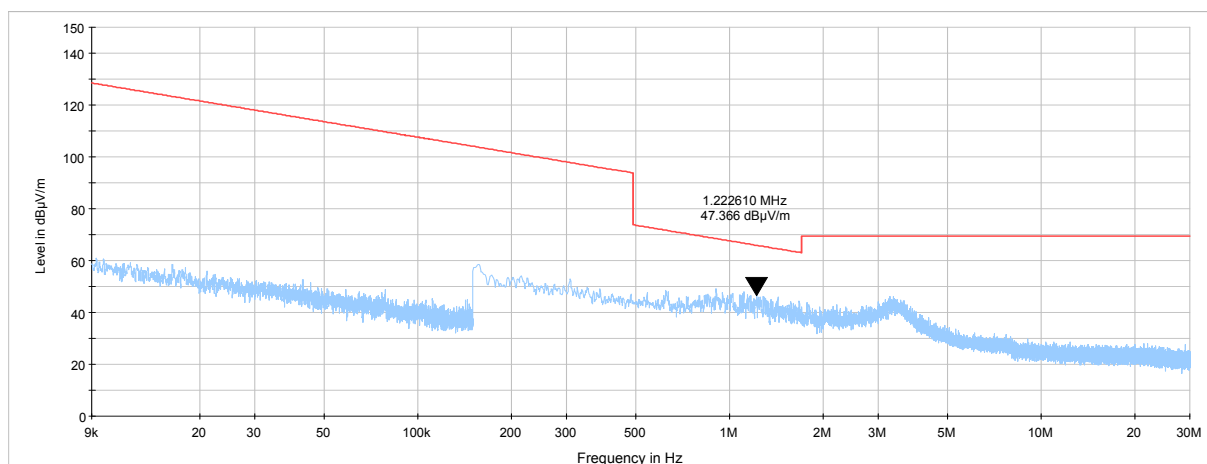
TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical and Horizontal  
EUT POSITION: Y-axis



<b>Test specification:</b> FCC Part 15, Section 231(b) / RSS-210, Section A1.2, Field strength of emissions			
<b>Test procedure:</b> ANSI C63.10 sections 6.5, 6.6			
<b>Test mode:</b> Compliance		<b>Verdict:</b> PASS	
<b>Date(s):</b> 13-Jun-21 - 15-Jun-21			
<b>Temperature:</b> 25 °C	<b>Relative Humidity:</b> 55 %	<b>Air Pressure:</b> 1007 hPa	<b>Power:</b> 4.5 VDC
<b>Remarks:</b>			

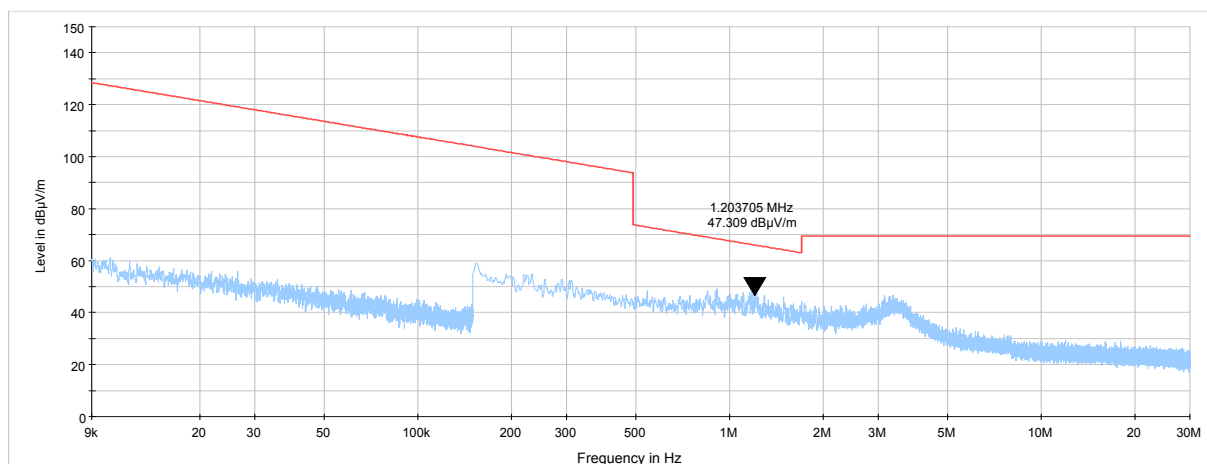
**Plot 7.2.3 Radiated emission measurements from 9 kHz to 30 MHz**

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical and Horizontal  
EUT POSITION: X-axis



**Plot 7.2.4 Radiated emission measurements from 9 kHz to 30 MHz**

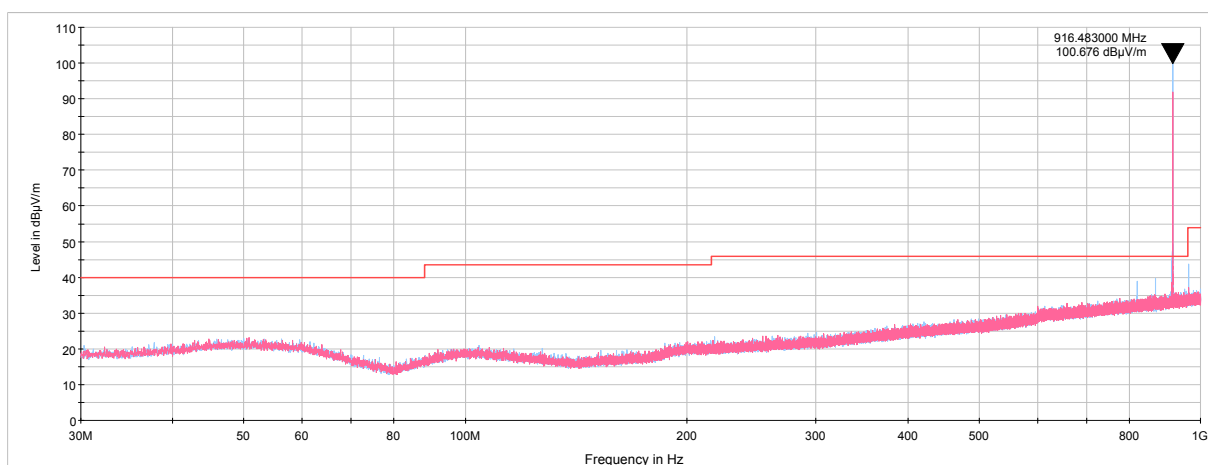
TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical and Horizontal  
EUT POSITION: Y-axis



<b>Test specification:</b> FCC Part 15, Section 231(b) / RSS-210, Section A1.2, Field strength of emissions			
<b>Test procedure:</b> ANSI C63.10 sections 6.5, 6.6			
<b>Test mode:</b> Compliance		<b>Verdict:</b> PASS	
<b>Date(s):</b> 13-Jun-21 - 15-Jun-21			
<b>Temperature:</b> 25 °C	<b>Relative Humidity:</b> 55 %	<b>Air Pressure:</b> 1007 hPa	<b>Power:</b> 4.5 VDC
<b>Remarks:</b>			

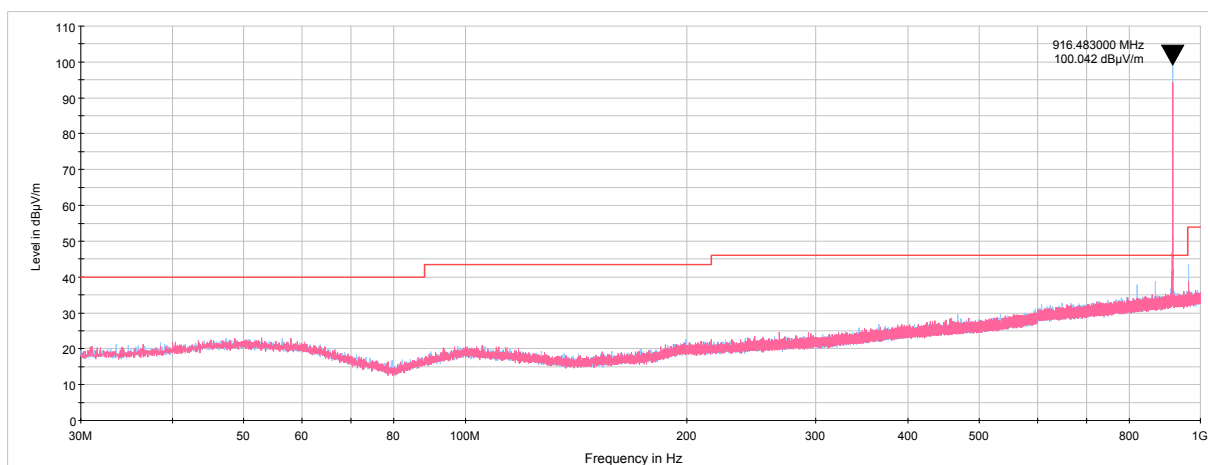
#### Plot 7.2.5 Radiated emission measurements from 30 to 1000 MHz

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical and Horizontal  
EUT POSITION: X-axis



#### Plot 7.2.6 Radiated emission measurements from 30 to 1000 MHz

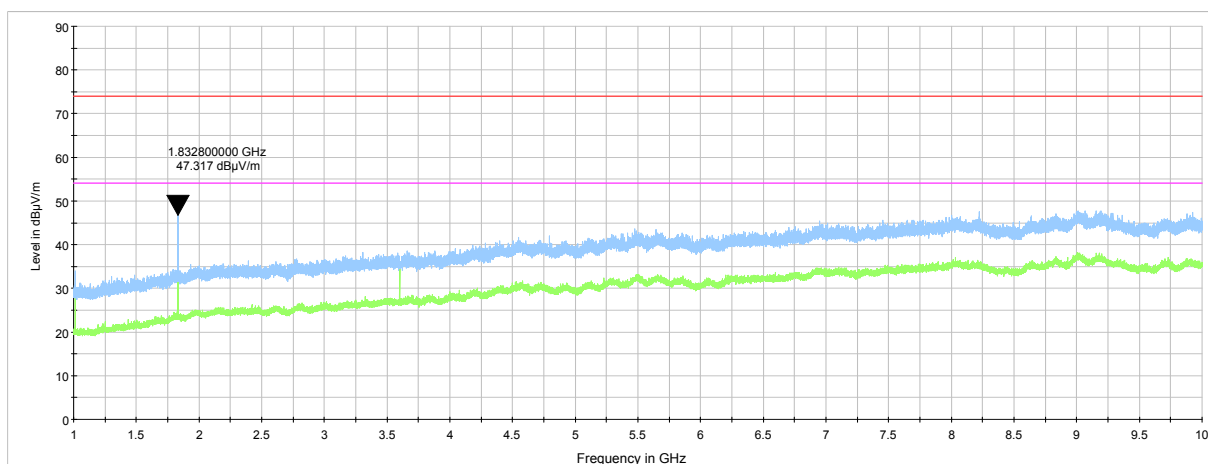
TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical and Horizontal  
EUT POSITION: Y-axis



<b>Test specification:</b> FCC Part 15, Section 231(b) / RSS-210, Section A1.2, Field strength of emissions			
<b>Test procedure:</b> ANSI C63.10 sections 6.5, 6.6			
<b>Test mode:</b> Compliance		<b>Verdict:</b> PASS	
<b>Date(s):</b> 13-Jun-21 - 15-Jun-21			
<b>Temperature:</b> 25 °C	<b>Relative Humidity:</b> 55 %	<b>Air Pressure:</b> 1007 hPa	<b>Power:</b> 4.5 VDC
<b>Remarks:</b>			

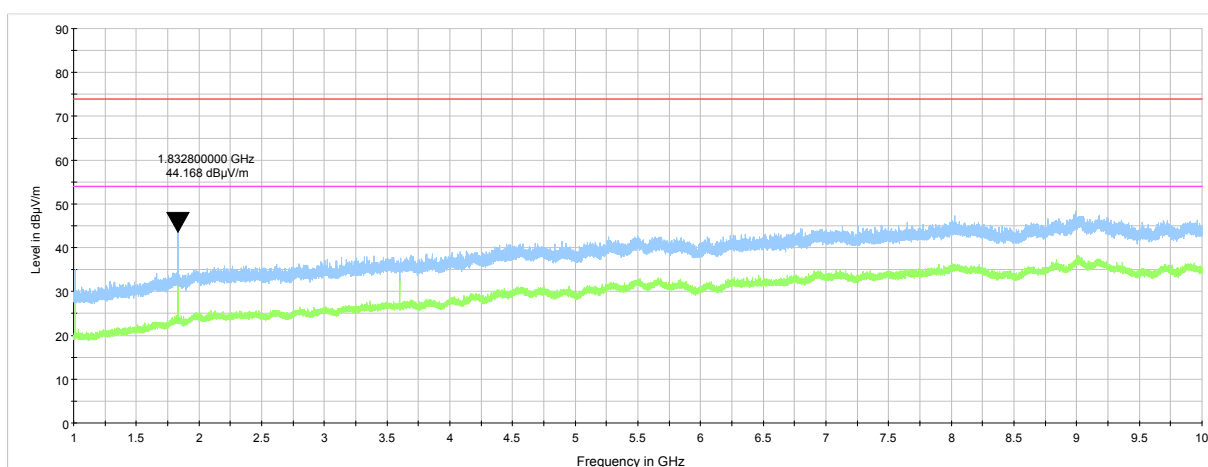
**Plot 7.2.7 Radiated emission measurements from 1 to 10 GHz**

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical and Horizontal  
EUT POSITION: X-axis



**Plot 7.2.8 Radiated emission measurements from 1 to 10 GHz**

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
ANTENNA POLARIZATION: Vertical and Horizontal  
EUT POSITION: Y-axis



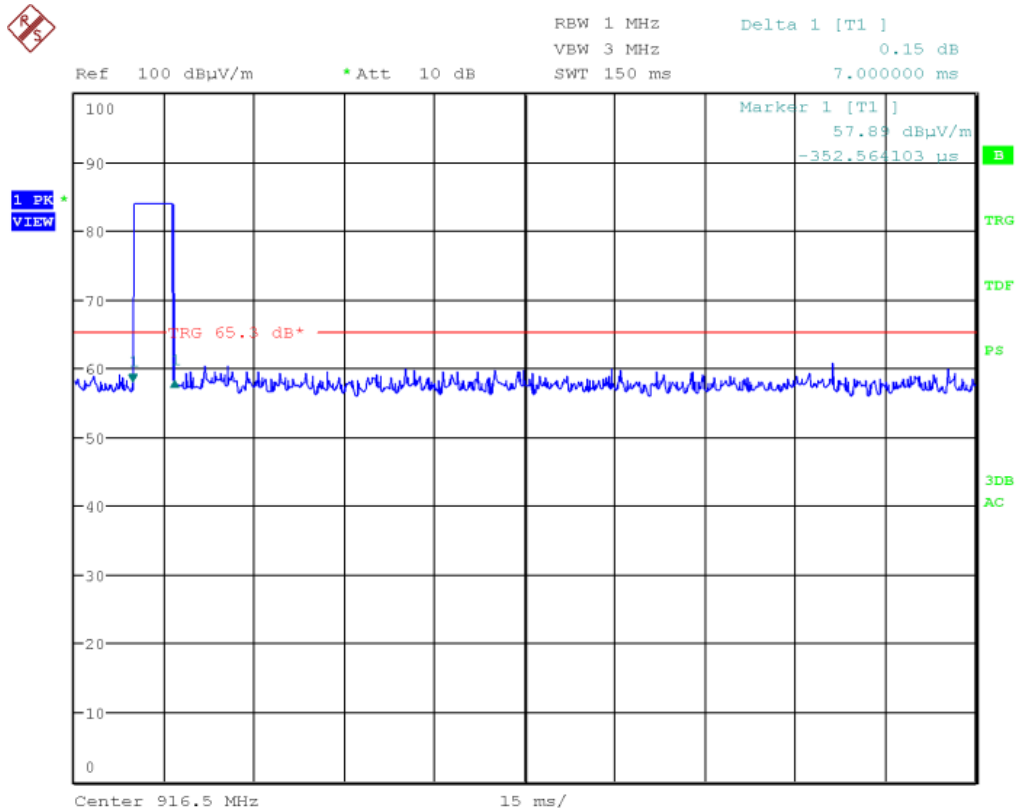




HERMON LABORATORIES

Test specification: FCC Part 15, Section 231(b) / RSS-210, Section A1.2, Field strength of emissions			
Test procedure: ANSI C63.10 sections 6.5, 6.6			
Test mode: Compliance		Verdict: PASS	
Date(s): 13-Jun-21 - 15-Jun-21			
Temperature: 25 °C	Relative Humidity: 55 %	Air Pressure: 1007 hPa	Power: 4.5 VDC
Remarks:			

Plot 7.2.9 Transmission pulse duration

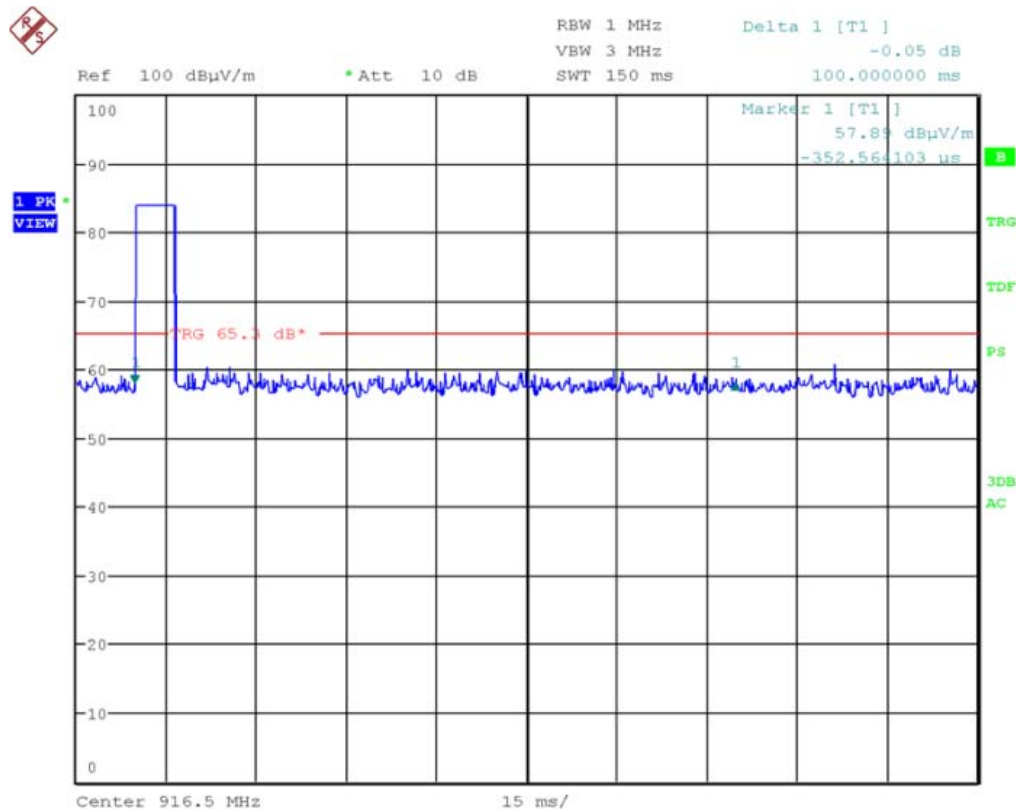




HERMON LABORATORIES

Test specification: FCC Part 15, Section 231(b) / RSS-210, Section A1.2, Field strength of emissions			
Test procedure: ANSI C63.10 sections 6.5, 6.6			
Test mode: Compliance		Verdict: PASS	
Date(s): 13-Jun-21 - 15-Jun-21			
Temperature: 25 °C	Relative Humidity: 55 %	Air Pressure: 1007 hPa	Power: 4.5 VDC
Remarks:			

Plot 7.2.10 Transmission pulse period



Date: 13.JUN.2021 12:51:51

<b>Test specification:</b> FCC Part 15, Section 231(c) / RSS-210, Section A1.3, Occupied bandwidth			
<b>Test procedure:</b> ANSI C63.10 section 6.9.2			
<b>Test mode:</b> Compliance		<b>Verdict:</b> PASS	
<b>Date(s):</b> 14-Jun-21			
<b>Temperature:</b> 24 °C	<b>Relative Humidity:</b> 49 %	<b>Air Pressure:</b> 1006 hPa	<b>Power:</b> 4.5 VDC
<b>Remarks:</b>			

## 7.3 Occupied bandwidth test

### 7.3.1 General

This test was performed to measure transmitter occupied bandwidth. Specification test limits are given in Table 7.3.1.

Table 7.3.1 Occupied bandwidth limits

Assigned frequency, MHz	Modulation envelope reference points*, dBc	Maximum allowed bandwidth, % of the carrier frequency
70 - 900	20.0	0.25
Above 900		0.50

\*- Modulation envelope reference points provided in terms of attenuation below modulated carrier.

### 7.3.2 Test procedure

7.3.2.1 The EUT was set up as shown in Figure 7.3.1, energized and its proper operation was checked.

7.3.2.2 The EUT was set to transmit modulated carrier.

7.3.2.3 The transmitter occupied bandwidth was measured with spectrum analyzer as frequency delta between reference points on modulation envelope and provided in Table 7.3.2 and associated plot.

7.3.2.4 The test results are provided in Table 7.3.2 and associated plots.

Figure 7.3.1 Occupied bandwidth test setup





<b>Test specification:</b> FCC Part 15, Section 231(c) / RSS-210, Section A1.3, Occupied bandwidth			
<b>Test procedure:</b> ANSI C63.10 section 6.9.2			
<b>Test mode:</b> Compliance		<b>Verdict:</b> PASS	
<b>Date(s):</b> 14-Jun-21			
<b>Temperature:</b> 24 °C	<b>Relative Humidity:</b> 49 %	<b>Air Pressure:</b> 1006 hPa	<b>Power:</b> 4.5 VDC
<b>Remarks:</b>			

Table 7.3.2 Occupied bandwidth test results

DETECTOR USED: Peak hold  
 RESOLUTION BANDWIDTH: 1 kHz  
 VIDEO BANDWIDTH: 3 kHz  
 MODULATION: GFSK  
 BIT RATE: 38.4 kbps

MODULATION ENVELOPE REFERENCE POINTS: 20 dBc

Carrier frequency, MHz	Occupied bandwidth, kHz	Limit		Margin, kHz	Verdict
		% of the carrier frequency	kHz		
916.5	80.182	0.5	4582.5	-4502.3	Pass

MODULATION ENVELOPE REFERENCE POINTS: 99%

Carrier frequency, MHz	Occupied bandwidth, kHz	Limit		Margin, kHz	Verdict
		% of the carrier frequency	kHz		
916.5	75.699	0.5	4582.5	-4506.8	Pass

## Reference numbers of test equipment used

HL 2909	HL 5410	HL 3785	HL 4135	HL 5397				
---------	---------	---------	---------	---------	--	--	--	--

Full description is given in Appendix A.

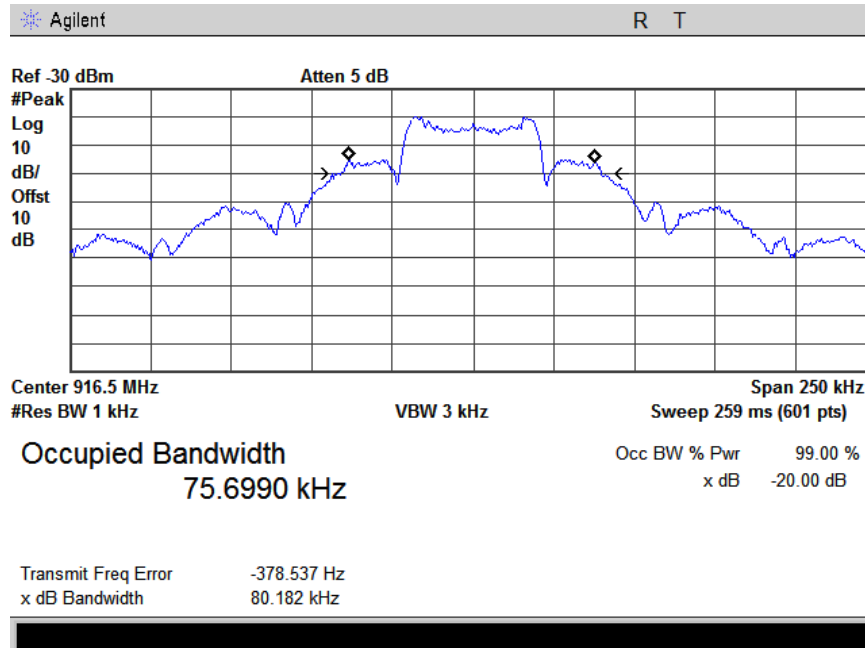


HERMON LABORATORIES

Report ID: ESSRAD\_FCC.37526.docx  
Date of Issue: 2-Aug-21

Test specification: FCC Part 15, Section 231(c) / RSS-210, Section A1.3, Occupied bandwidth			
Test procedure: ANSI C63.10 section 6.9.2			
Test mode: Compliance		Verdict: PASS	
Date(s): 14-Jun-21			
Temperature: 24 °C	Relative Humidity: 49 %	Air Pressure: 1006 hPa	Power: 4.5 VDC
Remarks:			

Plot 7.3.1 Occupied bandwidth test result





Test specification: FCC Part 15, Section 203 / RSS-Gen, Section 6.8, Antenna requirements			
Test procedure: Visual inspection / supplier declaration			
Test mode: Compliance		Verdict: PASS	
Date(s): 14-Jun-21			
Temperature: 24 °C	Relative Humidity: 49 %	Air Pressure: 1006 hPa	Power: 4.5 VDC
Remarks:			

## 7.4 Antenna requirements

The EUT was verified for compliance with antenna requirements. A transmitter shall be designed to ensure that no antenna other than that furnished by the responsible party will be used with the device. It may be either permanently attached or employs a unique antenna connector for every antenna proposed for use with the EUT. This requirement does not apply to professionally installed transmitters.

The rationale for compliance with the above requirements was either visual inspection results or supplier declaration. The summary of results is provided in Table 7.4.1.

**Table 7.4.1 Antenna requirements**

Requirement	Rationale	Verdict
The transmitter antenna is permanently attached	Visual inspection	Comply
The transmitter employs a unique antenna connector	NA	
The transmitter requires professional installation	NA	

<b>Test specification:</b> FCC Part 15, Section 109 / RSS-Gen, Section 7.3 / ICES-003, Section 6.2, Radiated emission			
<b>Test procedure:</b> ANSI C63.4, Sections 8.3 and 12.2.5			
<b>Test mode:</b> Compliance		<b>Verdict:</b> PASS	
<b>Date(s):</b> 13-Jun-21			
<b>Temperature:</b> 24 °C	<b>Relative Humidity:</b> 53 %	<b>Air Pressure:</b> 1007 hPa	<b>Power:</b> 4.5 VDC
<b>Remarks:</b>			

## 8 Emissions tests according to FCC 47CFR part 15 subpart B and ICES-003 requirements

### 8.1 Radiated emission measurements

#### 8.1.1 General

This test was performed to measure radiated emissions from the EUT enclosure. Specification test limits are given in Table 8.1.1, Table 8.1.2.

**Table 8.1.1 Radiated emission limits according to FCC Part 15, Section 109 and ICES-003, Section 6.2**

Frequency, MHz	Class B limit, dB(μV/m)		Class A limit, dB(μV/m)	
	10 m distance	3 m distance	10 m distance	3 m distance
30 - 88	29.5*	40.0	39.0	49.5*
88 - 216	33.0*	43.5	43.5	54.0*
216 - 960	35.5*	46.0	46.4	56.9*
960 - 5 <sup>th</sup> harmonic**	43.5*	54.0	49.5	60.0*

\* - The limit for test distance other than specified was calculated using the inverse linear distance extrapolation factor as follows:  $\text{Lim}_{S2} = \text{Lim}_{S1} + 20 \log(S_1/S_2)$ , where  $S_1$  and  $S_2$  – standard defined and test distance respectively in meters.

**Table 8.1.2 Radiated emission limits according to RSS-Gen, Section 7.3**

Frequency, MHz	Field strength limit at 3 m test distance, dB(μV/m)
30 - 88	40.0
88 - 216	43.5
216 - 960	46.0
960 - 5 <sup>th</sup> harmonic**	54.0

\*\* - harmonic of the highest frequency the EUT generates, uses, operates or tunes to.

#### 8.1.2 Test procedure

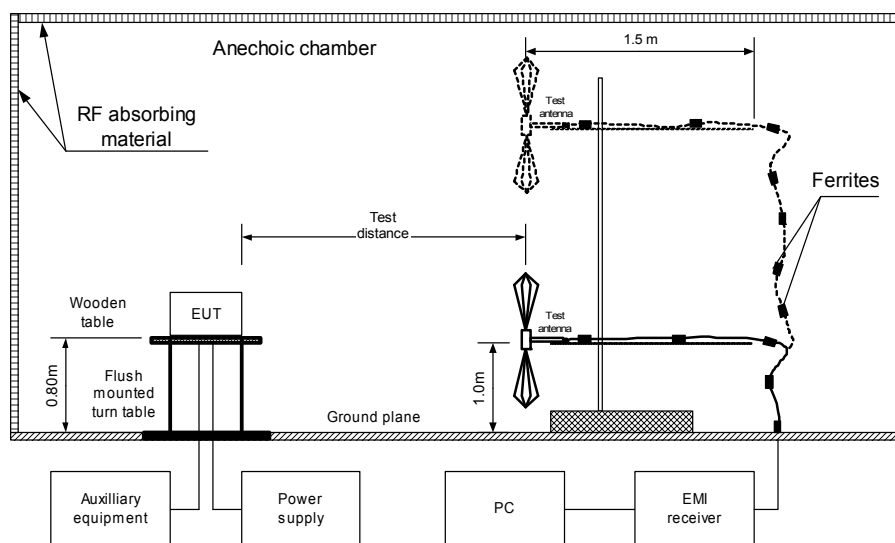
**8.1.2.1** The EUT was set up as shown in Figure 8.1.1 and associated photograph/s, energized and the performance check was conducted.

**8.1.2.2** The specified frequency range was investigated with biconilog antenna connected to EMI receiver. To find maximum radiation the turntable was rotated 360°, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal and the EUT cables position was varied.

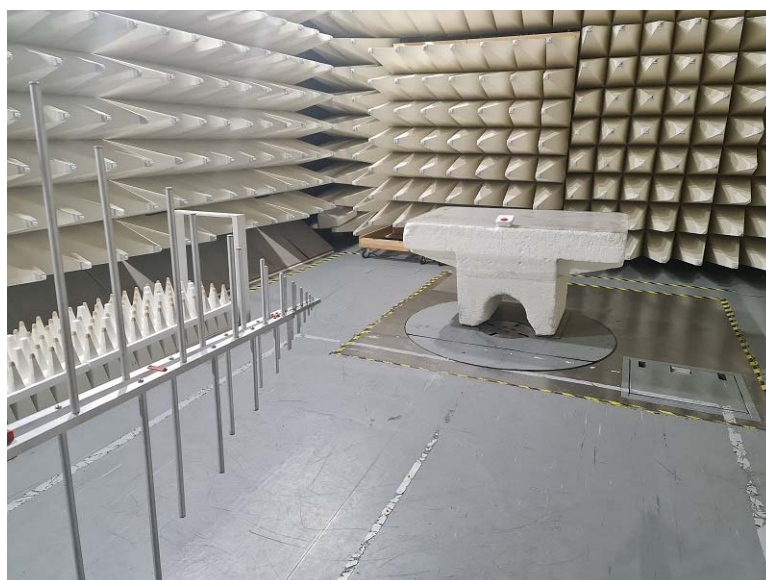
**8.1.2.3** The worst test results (the lowest margins) were provided in the associated tables and plots.

<b>Test specification:</b> FCC Part 15, Section 109 / RSS-Gen, Section 7.3 / ICES-003, Section 6.2, Radiated emission			
<b>Test procedure:</b> ANSI C63.4, Sections 8.3 and 12.2.5			
<b>Test mode:</b> Compliance		<b>Verdict:</b> PASS	
<b>Date(s):</b> 13-Jun-21			
<b>Temperature:</b> 24 °C	<b>Relative Humidity:</b> 53 %	<b>Air Pressure:</b> 1007 hPa	<b>Power:</b> 4.5 VDC
<b>Remarks:</b>			

Figure 8.1.1 Setup for radiated emission measurements in anechoic chamber, table-top equipment



Photograph 8.1.1 Setup for radiated emission measurements in 30-1000 MHz, general view





<b>Test specification:</b> FCC Part 15, Section 109 / RSS-Gen, Section 7.3 / ICES-003, Section 6.2, Radiated emission			
<b>Test procedure:</b> ANSI C63.4, Sections 8.3 and 12.2.5			
<b>Test mode:</b> Compliance		<b>Verdict:</b> PASS	
<b>Date(s):</b> 13-Jun-21			
<b>Temperature:</b> 24 °C	<b>Relative Humidity:</b> 53 %	<b>Air Pressure:</b> 1007 hPa	<b>Power:</b> 4.5 VDC
<b>Remarks:</b>			

Photograph 8.1.2 Setup for radiated emission measurements above 1 GHz, general view



Photograph 8.1.3 Setup for final radiated emission measurements, EUT close view





HERMON LABORATORIES

<b>Test specification:</b> FCC Part 15, Section 109 / RSS-Gen, Section 7.3 / ICES-003, Section 6.2, Radiated emission			
<b>Test procedure:</b> ANSI C63.4, Sections 8.3 and 12.2.5			
<b>Test mode:</b>	Compliance	<b>Verdict:</b> PASS	
<b>Date(s):</b>	13-Jun-21		
<b>Temperature:</b> 24 °C	<b>Relative Humidity:</b> 53 %	<b>Air Pressure:</b> 1007 hPa	<b>Power:</b> 4.5 VDC
<b>Remarks:</b>			

Table 8.1.3 Radiated emission test results

EUT SET UP: TABLE-TOP  
LIMIT: Class B  
EUT OPERATING MODE: Stand-by and Receive  
TEST SITE: SEMI ANECHOIC CHAMBER  
TEST DISTANCE: 3 m  
FREQUENCY RANGE: 30 MHz – 1000 MHz  
RESOLUTION BANDWIDTH: 120 kHz  
POSITION: X-axis

Frequency, MHz	Peak emission, dB(μV/m)	Quasi-peak			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
		Measured emission, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*				
No emissions were found								Pass

TEST SITE: SEMI ANECHOIC CHAMBER  
TEST DISTANCE: 3 m  
DETECTORS USED: PEAK / AVERAGE  
FREQUENCY RANGE: 1000 MHz - 5000 MHz  
RESOLUTION BANDWIDTH: 1000 kHz  
POSITION: X-axis

Peak				Average			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
Frequency, MHz	Measured emission, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*	Measured emission, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*				
No emissions were found										

\*- Margin = Measured emission - specification limit.

\*\* - EUT front panel refer to 0 degrees position of turntable.

**Reference numbers of test equipment used**

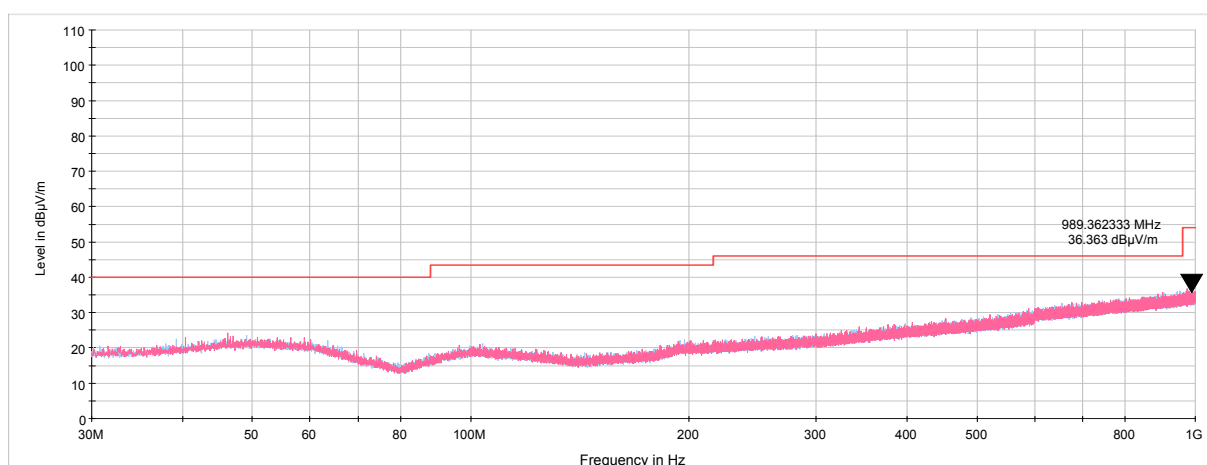
HL 4360	HL 5311	HL 3903	HL 5288	HL 5085	HL 5902	HL 4933	
---------	---------	---------	---------	---------	---------	---------	--

Full description is given in Appendix A.

<b>Test specification:</b> FCC Part 15, Section 109 / RSS-Gen, Section 7.3 / ICES-003, Section 6.2, Radiated emission			
<b>Test procedure:</b> ANSI C63.4, Sections 8.3 and 12.2.5			
<b>Test mode:</b> Compliance		<b>Verdict:</b> PASS	
<b>Date(s):</b> 13-Jun-21			
<b>Temperature:</b> 24 °C	<b>Relative Humidity:</b> 53 %	<b>Air Pressure:</b> 1007 hPa	<b>Power:</b> 4.5 VDC
<b>Remarks:</b>			

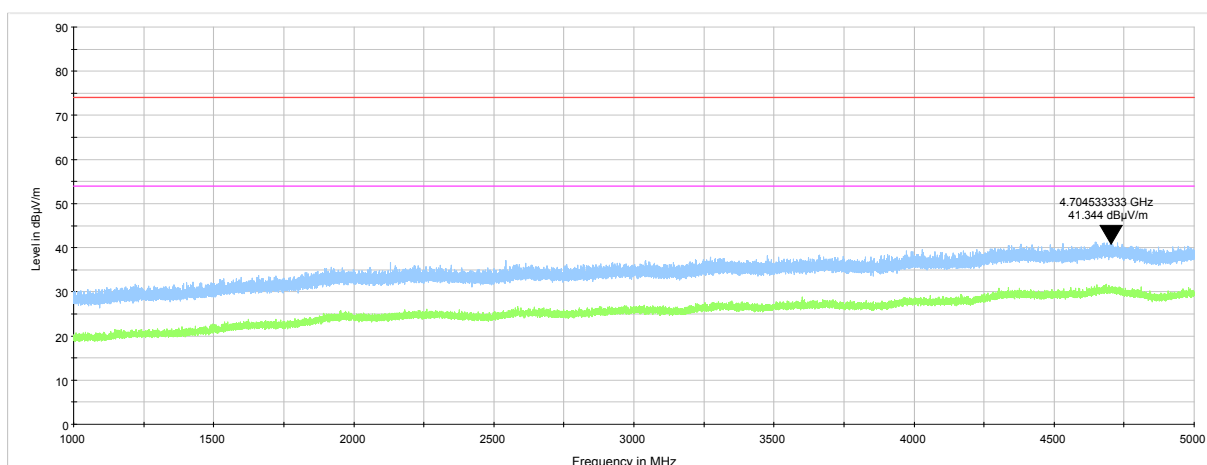
**Plot 8.1.1 Radiated emission measurements in 30 - 1000 MHz range, vertical and horizontal antenna polarization**

TEST SITE: Semi anechoic chamber  
LIMIT: Class B  
TEST DISTANCE: 3 m  
EUT OPERATING MODE: Receive



**Plot 8.1.2 Radiated emission measurements above 1000 MHz, vertical and horizontal antenna polarization**

TEST SITE: Semi anechoic chamber  
LIMIT: Class B  
TEST DISTANCE: 3 m  
EUT OPERATING MODE: Receive



## 9 APPENDIX A Test equipment and ancillaries used for tests

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal./ Check	Due Cal./ Check
0446	Antenna, Loop, Active, 10 (9) kHz - 30 MHz	EMCO	6502	2857	28-Feb-21	28-Feb-22
2909	Spectrum analyzer, ESA-E, 100 Hz to 26.5 GHz	Agilent Technologies	E4407B	MY414447 62	12-May-21	12-Jun-22
3785	Precision Fixed Attenuator, 50 Ohm, 5 W, 10 dB, DC to 18 GHz	Mini-Circuits	BW-S10W5+	NA	25-Feb-21	25-Feb-22
3903	Microwave Cable Assembly, 40.0 GHz, 1.5 m, SMA/SMA	Huber-Suhner	SUCOFLEX 102A	1226/2A	06-Apr-21	06-Apr-22
4135	Shield Box	TESCOM CO., LTD	TC-5916A	5916A000 136	25-Apr-21	25-Apr-22
4339	High pass Filter, 50 Ohm, 1000 to 18000 MHz, SMA-FM / SMA-M	Micro-Tronics	HPM5011 5-02	001	05-Jun-21	05-Jun-22
4360	EMI Test Receiver, 20 Hz to 40 GHz	Rohde & Schwarz	ESU40	100322	19-Jan-21	19-Jan-22
4933	Active Horn Antenna, 1 GHz to 18 GHz	Com-Power Corporation	AHA-118	701046	26-Jan-21	26-Jan-22
5085	Attenuator, 4 dB, DC - 6 GHz, 1 W	Mini-Circuits	UNAT-4+	NA	11-May-21	11-May-22
5288	Trilog Antenna, 25 MHz - 8 GHz, 100W	Frankonia	ALX-8000E	00809	08-Feb-19	08-Feb-22
5309	Antenna Mast, 1-4 meter, Pneumatic polarization	Frankonia	FMB 1-4	NA	25-Apr-21	25-Apr-22
5311	Controller	Dolev Ltd	FC-06	FC06.1-2016-024	25-Apr-21	25-Apr-22
5397	H-field near field probe, 3 cm	ETS Lindgren	7405-902	NA	16-Aug-20	16-Aug-22
5410	RF cable, 40 GHz, SMA-SMA, 5.5 m	Huber-Suhner	SF102EA/11SK/11SK/5500M M	503974/EA	03-Aug-20	03-Aug-21
5902	RF cable, 18 GHz, 6.0m, N-type	Huber-Suhner	SF126EA/11N/11N/6000	5902	01-Dec-20	01-Dec-21

## 10 APPENDIX B Measurement uncertainties

### Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements

Test description	Expanded uncertainty
Conducted emissions with LISN	9 kHz to 150 kHz: $\pm 3.9$ dB 150 kHz to 30 MHz: $\pm 3.8$ dB
Radiated emissions at 10 m measuring distance Horizontal polarization  Vertical polarization	Biconilog antenna: $\pm 5.0$ dB Biconical antenna: $\pm 5.0$ dB Log periodic antenna: $\pm 5.1$ dB Double ridged horn antenna: $\pm 5.3$ dB Biconilog antenna: $\pm 5.5$ dB Biconical antenna: $\pm 5.5$ dB Log periodic antenna: $\pm 5.6$ dB Double ridged horn antenna: $\pm 5.8$ dB
Radiated emissions at 3 m measuring distance Horizontal polarization  Vertical polarization	Biconilog antenna: $\pm 5.3$ dB Biconical antenna: $\pm 5.0$ dB Log periodic antenna: $\pm 5.3$ dB Double ridged horn antenna: $\pm 5.3$ dB Biconilog antenna: $\pm 6.0$ dB Biconical antenna: $\pm 5.7$ dB Log periodic antenna: $\pm 6.0$ dB Double ridged horn antenna: $\pm 6.0$ dB
Conducted emissions at RF antenna connector	9 kHz to 2.9 GHz: $\pm 2.6$ dB 2.9 GHz to 6.46 GHz: $\pm 3.5$ dB 6.46 GHz to 13.2 GHz: $\pm 4.3$ dB 13.2 GHz to 22.0 GHz: $\pm 5.0$ dB 22.0 GHz to 26.8 GHz: $\pm 5.5$ dB 26.8 GHz to 40.0 GHz: $\pm 4.8$ dB
Duty cycle, timing (Tx ON / OFF) and average factor measurements	$\pm 1.0$ %
Occupied bandwidth	$\pm 8.0$ %

Hermon Laboratories is accredited by A2LA for calibration according to present requirements of ISO/IEC 17025 and NCSL Z540-1. The accreditation is granted to perform calibration of parameters that are listed in the Scope of Hermon Laboratories Accreditation.

Hermon Laboratories calibrates its reference and transfer standards by calibration laboratories accredited to ISO/IEC 17025 by a mutually recognized Accreditation Body or by a recognized national metrology institute. All reference and transfer standards used in the calibration system are traceable to national or international standards.

In-house calibration of all test and measurement equipment is performed on a regular basis according to Hermon Laboratories calibration procedures, manufacturer calibration/verification procedures or procedures defined in the relevant standards. The Hermon Laboratories test and measurement equipment is calibrated within the tolerances specified by the manufacturers and/or by the relevant standards.

## 11 APPENDIX C Test laboratory description

Tests were performed at Hermon Laboratories Ltd., which is a fully independent, private, EMC, Radio, Safety, Environmental and Telecommunication testing facility.

Hermon Laboratories is recognized and accredited by the Federal Communications Commission (USA) for relevant parts of Code of Federal Regulations 47 (CFR 47), Test Firm Registration Number is 927748, Designation Number is IL1001; Recognized by Innovation, Science and Economic Development Canada for wireless and terminal testing (ISED), ISED #2186A, CAB identifier is IL1001; Certified by VCCI, Japan (the registration numbers for OATS are R-10808 for RE measurements below 1 GHz, G-20112 for RE measurements above 1 GHz, R-11082 for anechoic chamber for RE measurements below 1 GHz, G-10869 for RE measurements above 1 GHz, C-10845 for conducted emissions site and T-11606 for conducted emissions at telecommunication ports).

The laboratory is accredited by American Association for Laboratory Accreditation (USA) according to ISO/IEC 17025 for electromagnetic compatibility, product safety, telecommunications testing, environmental simulation and calibration (for exact scope please refer to Certificate No. 839.01, 839.03 and 839.04).

Address: P.O. Box 23, Binyamina 3055001, Israel.  
Telephone: +972 4628 8001  
Fax: +972 4628 8277  
e-mail: mail@hermonlabs.com  
website: www.hermonlabs.com

Person for contact: Mr. Michael Nikishin, EMC&Radio group manager

## 12 APPENDIX D Specification references

FCC 47CFR part 15: 2020	Radio Frequency Devices
ANSI C63.10: 2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
ANSI C63.4: 2014	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
RSS-210 Issue 10: 2019	Licence-Exempt Radio Apparatus:Category I Equipment
RSS-Gen Issue 5 with Am.1: 2019	General Requirements for Compliance of Radio Apparatus
ICES-003 Issue 6: 2019 (updated)	Information Technology Equipment (Including Digital Apparatus)— Limits and Methods of Measurement

### 13 APPENDIX E Test equipment correction factors

Antenna factor  
Active loop antenna  
Model 6502, S/N 2857, HL 0446

Frequency, MHz	Measured antenna factor, dBS/m
0.009	-32.5
0.010	-33.4
0.020	-37.9
0.050	-40.6
0.075	-41.0
0.100	-41.2
0.150	-41.2
0.250	-41.2
0.500	-41.3
0.750	-41.3
1.000	-41.4
2.000	-41.4
3.000	-41.4
4.000	-41.5
5.000	-41.5
10.000	-41.8
15.000	-42.2
20.000	-42.9
25.000	-43.9
30.000	-45.4

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB( $\mu$ V) to convert it into field strength in dB( $\mu$ V/m).

**Antenna factor**  
**Trilog antenna**  
**Model ALX-8000E, Frankonia, S/N 00809, HL 5288, 30-1000 MHz**

Frequency, MHz	Antenna factor, dB/m		
	Vert Up	Vert Down	Delta
30	-51.19	-51.28	0.09
35	-44.03	-44.12	0.09
40	-43.07	-43.12	0.05
45	-39.61	-39.79	0.18
50	-37.84	-38.14	0.3
60	-34.93	-34.9	0.03
70	-29.76	-29.66	0.1
80	-27.69	-27.82	0.13
90	-29.05	-29.07	0.02
100	-31.19	-31.19	0
120	-31.61	-31.6	0.01
140	-28.13	-28.06	0.07
160	-27.71	-27.75	0.04
180	-26.19	-26.15	0.04
200	-28.2	-28.15	0.05
250	-27.45	-27.47	0.02
300	-29.61	-29.63	0.02
400	-31.77	-31.78	0.01
500	-32.81	-32.81	0
600	-33.64	-33.61	0.03
700	-34.21	-34.21	0
800	-35.66	-35.66	0
900	-36.99	-36.91	0.08
1000	-38	-37.91	0.09

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB( $\mu$ V) to convert it into field intensity in dB( $\mu$ V/m).



**Antenna factor**  
**Active Horn Antenna,**  
**Com-Power Corporation, model: AHA-118, s/n 701046, HL 4933**

Frequency, MHz	Measured antenna factor (with preamplifier), dB/m
1000	-16.1
1500	-15.1
2000	-10.9
2500	-11.9
3000	-11.1
3500	-10.6
4000	-8.6
4500	-8.3
5000	-5.9
5500	-5.7
6000	-3.3
6500	-4.0
7000	-2.2
7500	-1.7
8000	1.1
8500	-0.8
9000	-1.5
9500	-0.2

Frequency, MHz	Measured antenna factor (with preamplifier), dB/m
10000	1.8
10500	1.0
11000	0.3
11500	-0.5
12000	3.1
12500	1.4
13000	-0.3
13500	-0.4
14000	2.5
14500	2.2
15000	1.9
15500	0.5
16000	2.1
16500	1.2
17000	0.6
17500	3.1
18000	4.2

The antenna factor shall be added to receiver reading in dB $\mu$ V to obtain field strength in dB $\mu$ V/m.

**Cable loss**  
**Microwave Cable Assembly, Huber-Suhner, 40 GHz, 1.5 m, SMA-SMA, S/N 1226/2A**  
**HL 3903**

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	-0.02	9500	1.84	21000	2.98
100	0.15	10000	1.86	22000	3.07
500	0.38	10500	1.93	23000	3.13
1000	0.56	11000	1.99	24000	3.21
1500	0.69	11500	2.04	25000	3.26
2000	0.82	12000	2.10	26000	3.48
2500	0.90	12500	2.15	27000	3.44
3000	0.98	13000	2.21	28000	3.53
3500	1.06	13500	2.25	29000	3.59
4000	1.11	14000	2.29	30000	3.66
4500	1.17	14500	2.34	31000	3.70
5000	1.24	15000	2.36	32000	3.79
5500	1.32	15500	2.40	33000	3.88
6000	1.40	16000	2.45	34000	3.94
6500	1.50	16500	2.48	35000	3.91
7000	1.56	17000	2.56	36000	4.05
7500	1.62	17500	2.58	37000	4.22
8000	1.68	18000	2.60	38000	4.25
8500	1.74	19000	2.84	39000	4.27
9000	1.78	20000	2.88	40000	4.33

**Cable loss**  
**RF Cable, Huber-Suhner, 40 GHz, 5.5 m, ,**  
**SF102EA/11SK/11SK/5500MM, S/N 503974/EA**  
**HL 5410**

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
100	0.70	20500	10.47
200	0.99	21000	10.62
300	1.21	21500	10.75
500	1.56	22000	10.87
1000	2.20	22500	10.98
1500	2.69	23000	11.11
2000	3.12	23500	11.24
2500	3.50	24000	11.37
3000	3.84	24500	11.52
3500	4.17	25000	11.65
4000	4.47	25500	11.74
4500	4.76	26000	11.89
5000	5.03	26500	12.04
5500	5.29	27000	12.14
6000	5.54	27500	12.27
6500	5.77	28000	12.38
7000	5.99	28500	12.48
7500	6.20	29000	12.61
8000	6.39	29500	12.73
8500	6.58	30000	12.83
9000	6.77	30500	12.92
9500	6.96	31000	13.03
10000	7.14	31500	13.18
10500	7.31	32000	13.32
11000	7.49	32500	13.45
11500	7.67	33000	13.57
12000	7.84	33500	13.68
12500	8.00	34000	13.80
13000	8.18	34500	13.91
13500	8.34	35000	14.01
14000	8.50	35500	14.15
14500	8.66	36000	14.29
15000	8.82	36500	14.39
15500	8.98	37000	14.49
16000	9.13	37500	14.63
16500	9.29	38000	14.76
17000	9.44	38500	14.87
17500	9.59	39000	14.93
18000	9.75	39500	15.03
18500	9.90	40000	15.13
19000	10.04		
19500	10.18		
20000	10.32		

**Cable loss**  
**RF cable, 18 GHz, 6.0m, N-type, Huber-Suhner, S/N 511435/126EA,**  
**SF126EA/11N/11N/6000, HL 5902**

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
0.1	0.00	4800	3.24	10000	4.82	15200	6.08
1	0.01	4900	3.30	10100	4.85	15300	6.11
10	0.07	5000	3.32	10200	4.87	15400	6.12
30	0.18	5100	3.37	10300	4.91	15500	6.14
50	0.25	5200	3.40	10400	4.93	15600	6.15
100	0.41	5300	3.42	10500	4.95	15700	6.18
200	0.56	5400	3.46	10600	4.99	15800	6.20
300	0.68	5500	3.50	10700	5.01	15900	6.23
400	0.76	5600	3.53	10800	5.03	16000	6.22
500	0.87	5700	3.56	10900	5.06	16100	6.26
600	1.03	5800	3.58	11000	5.08	16200	6.29
700	1.14	5900	3.63	11100	5.12	16300	6.30
800	1.23	6000	3.67	11200	5.13	16400	6.33
900	1.34	6100	3.69	11300	5.16	16500	6.35
1000	1.43	6200	3.73	11400	5.18	16600	6.37
1100	1.51	6300	3.76	11500	5.22	16700	6.40
1200	1.59	6400	3.80	11600	5.24	16800	6.43
1300	1.66	6500	3.81	11700	5.25	16900	6.46
1400	1.73	6600	3.83	11800	5.28	17000	6.47
1500	1.78	6700	3.87	11900	5.32	17100	6.49
1600	1.82	6800	3.91	12000	5.33	17200	6.51
1700	1.87	6900	3.91	12100	5.35	17300	6.53
1800	1.89	7000	3.93	12200	5.38	17400	6.56
1900	1.95	7100	3.95	12300	5.39	17500	6.60
2000	1.99	7200	3.98	12400	5.43	17600	6.62
2100	2.02	7300	4.02	12500	5.46	17700	6.60
2200	2.06	7400	4.04	12600	5.48	17800	6.63
2300	2.11	7500	4.07	12700	5.50	17900	6.64
2400	2.16	7600	4.11	12800	5.52	18000	6.66
2500	2.21	7700	4.15	12900	5.57		
2600	2.29	7800	4.17	13000	5.57		
2700	2.32	7900	4.20	13100	5.60		
2800	2.38	8000	4.22	13200	5.61		
2900	2.44	8100	4.26	13300	5.64		
3000	2.47	8200	4.30	13400	5.67		
3100	2.53	8300	4.32	13500	5.70		
3200	2.57	8400	4.35	13600	5.71		
3300	2.61	8500	4.39	13700	5.73		
3400	2.67	8600	4.43	13800	5.74		
3500	2.71	8700	4.45	13900	5.80		
3600	2.76	8800	4.47	14000	5.82		
3700	2.80	8900	4.49	14100	5.85		
3800	2.85	9000	4.53	14200	5.86		
3900	2.89	9100	4.55	14300	5.87		
4000	2.93	9200	4.57	14400	5.92		
4100	2.98	9300	4.61	14500	5.93		
4200	3.01	9400	4.64	14600	5.95		
4300	3.05	9500	4.68	14700	5.97		
4400	3.10	9600	4.70	14800	6.01		
4500	3.12	9700	4.73	14900	6.04		
4600	3.18	9800	4.78	15000	6.04		
4700	3.21	9900	4.80	15100	6.08		

## 14 APPENDIX F Abbreviations and acronyms

A	ampere
AC	alternating current
A/m	ampere per meter
AM	amplitude modulation
AVRG	average (detector)
cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
dB( $\mu$ V)	decibel referred to one microvolt
dB( $\mu$ V/m)	decibel referred to one microvolt per meter
dB( $\mu$ A)	decibel referred to one microampere
DC	direct current
EIRP	equivalent isotropically radiated power
ERP	effective radiated power
EUT	equipment under test
F	frequency
GHz	gigahertz
GND	ground
H	height
HL	Hermon laboratories
Hz	hertz
k	kilo
kHz	kilohertz
LO	local oscillator
m	meter
MHz	megahertz
min	minute
mm	millimeter
ms	millisecond
$\mu$ s	microsecond
NA	not applicable
NB	narrow band
OATS	open area test site
$\Omega$	Ohm
PM	pulse modulation
PS	power supply
ppm	part per million ( $10^{-6}$ )
QP	quasi-peak
RE	radiated emission
RF	radio frequency
rms	root mean square
Rx	receive
s	second
T	temperature
Tx	transmit
V	volt
WB	wideband

END OF TEST REPORT

## 15 APPENDIX G Manufacturer's Declaration of Identity



### Declaration:

We                                      Essence Smartcare Ltd.  
Name:                                Tal Cohen  
Address:                            12 Abba Eban Avenue, Ackerstein Towers Bldg. D, P.O. Box 2073  
City:                                 Herzliya 4612001  
Country:                          Israel.....

Declare that,

For "Voice Panic Detector" model ES700VPD2-US-M01, there are two identical P/N:  
- ES700VPD2-US-M01, which includes Pull Cord  
- ES700VPD2-US-M02, which without Pull Cord

The Voice Panic Detector functionality is identical in all two P/N.  
The 916.5 MHz RF modules are electrically/ electronically/ mechanically identical.

Name:                                Tal Cohen  
Date:                                 Jul-29, 2021  
Function:                          Technical Director of Regulatory, Certification and Reliability

Signature: 

END OF DOCUMENT