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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

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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


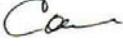
4 Test details

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
Transmitter characteristics	
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
Unintentional emissions	
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
Tested by:	Mr. H.N. Abayev, test engineer	June 15, 2021	
Reviewed by:	Mrs. M. Cherniavsky, certification engineer	June 28, 2021	
Approved by:	Mr. S. Samokha, Technical Manager, EMC & Radio	August 2, 2021	

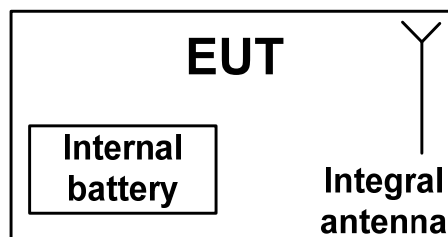
6 EUT description

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

Type of equipment						
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)					
Operating frequency		916.5 MHz				
Maximum rated output power		At transmitter 50 Ω RF output connector				
		Field strength at 3 m distance			101.01 dB(μV/m) – peak 77.92 dB(μV/m) -average	
Is transmitter output power variable?		X	No			
			Yes	continuous variable		
				stepped variable with stepsize		dB
				minimum RF power		dBm
		maximum RF power		dBm		
Antenna connection						
unique coupling	standard connector	X	integral	with temporary RF connector		
				X	without temporary RF connector	
Antenna/s technical characteristics						
Type	Manufacturer	Model number		Gain		
Integral	Essence Security	printed		1 dBi		
Transmitter aggregate data rate/s		GFSK				
Type of modulation		38.4 kbps				
Transmitter power source						
X	Battery	Nominal rated voltage	4.5 VDC	Battery type	Alkaline	
	DC	Nominal rated voltage	VDC			
	AC mains	Nominal rated voltage		Frequency		
Common power source for transmitter and receiver			X	yes	no	



Test specification: FCC Part 15, Section 231(a) / RSS-210, Section A1.1, Periodic operation requirements			
Test procedure: 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 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:	Compliance	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



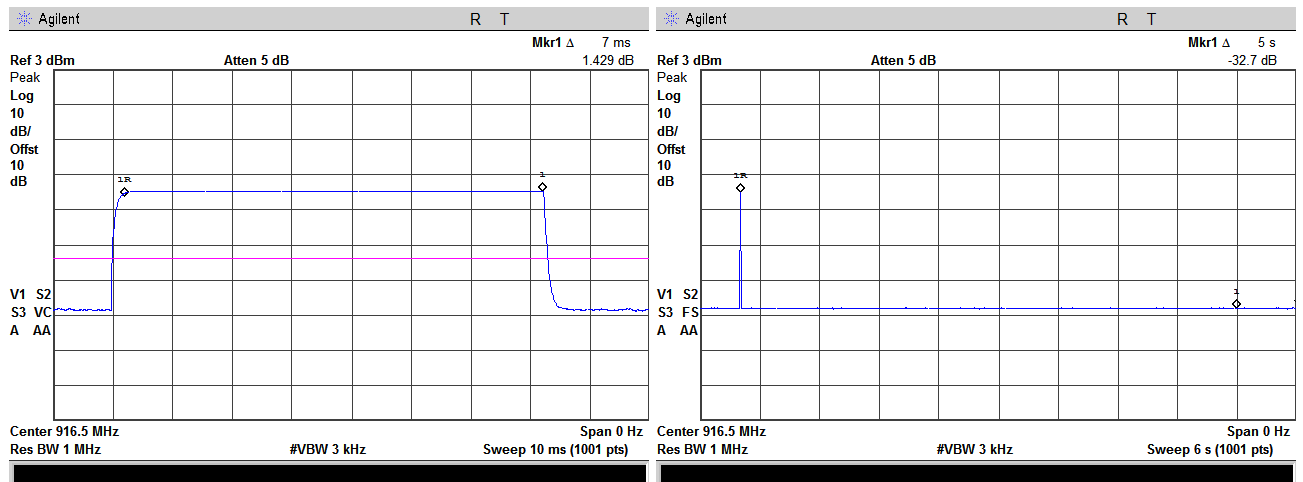


Test specification: FCC Part 15, Section 231(a) / RSS-210, Section A1.1, Periodic operation requirements			
Test procedure: Supplier declaration			
Test mode: Compliance		Verdict: PASS	
Date(s): 14-Jun-21			
Temperature: 24 °C	Relative Humidity: 49 %	Air Pressure: 1006 hPa	Power: 4.5 VDC
Remarks:			

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

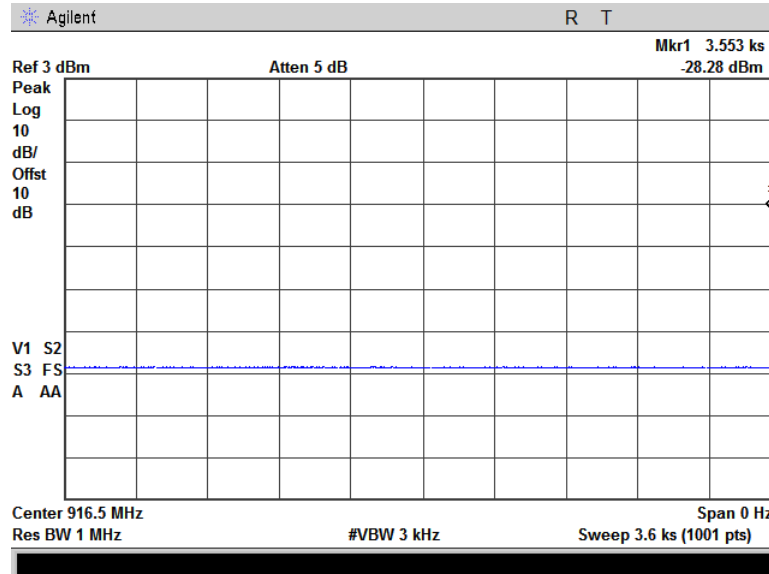
Plot 7.1.1 Transmitter shut down test result





Test specification: FCC Part 15, Section 231(a) / RSS-210, Section A1.1, Periodic operation requirements			
Test procedure: 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:			

Plot 7.1.2 Transmitter pulse period test result





Test specification: FCC Part 15, Section 231(a) / RSS-210, Section A1.1, Periodic operation requirements			
Test procedure: 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:			

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			
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Full description is given in Appendix A.



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:			

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:

$$Lim_{S_2} = Lim_{S_1} + 40 \log(S_1/S_2),$$

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:

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

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

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.



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:			

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.

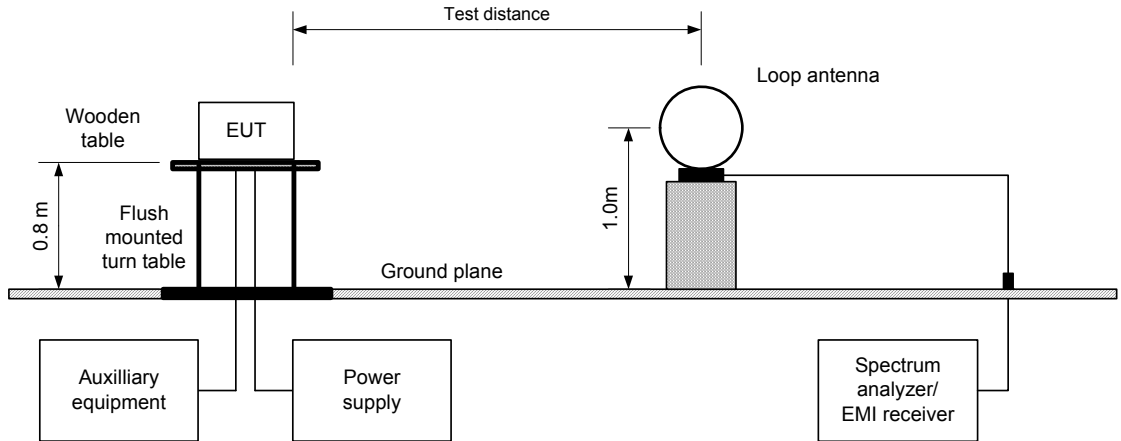
7.2.3.3 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360°, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal.

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.



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:			

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





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:			

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

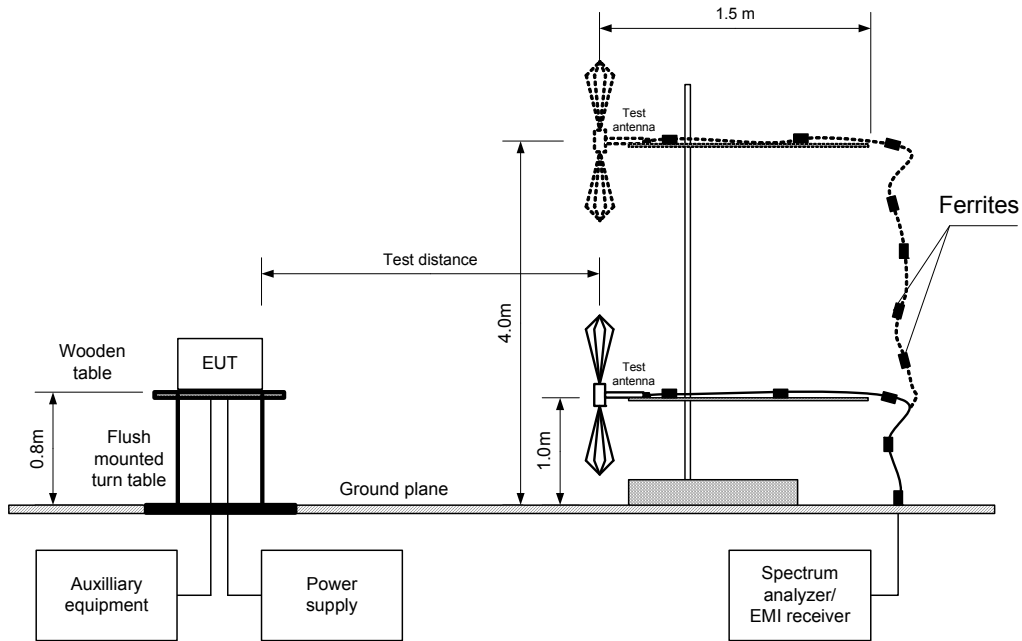
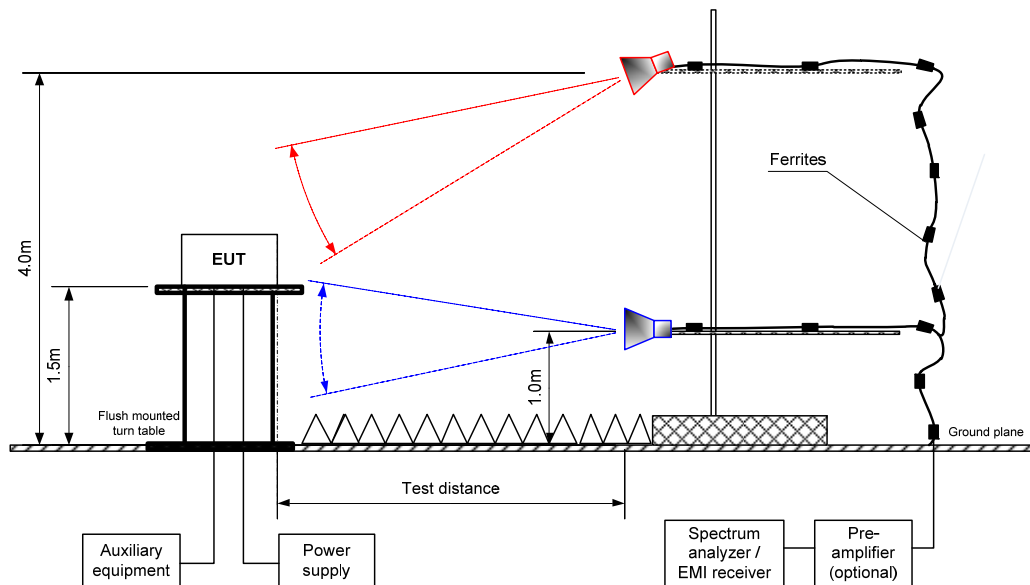


Figure 7.2.3 Setup for spurious emission field strength measurements above 1000 MHz





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:			

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)

F, MHz	Antenna		Azimuth, degrees*	Peak field strength			Average field strength				Verdict
	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: $Average\ factor = 20 \times \log_{10} \left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{Train\ duration} \times Number\ of\ bursts\ within\ pulse\ train \right)$
 for pulse train longer than 100 ms: $Average\ factor = 20 \times \log_{10} \left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{100\ ms} \times Number\ of\ bursts\ within\ 100\ ms \right)$

Reference numbers of test equipment used

HL 4360	HL 3903	HL 4933	HL 5311	HL 5309	HL 4339	HL 5902	
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Full description is given in Appendix A.



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:			

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
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Full description is given in Appendix A.



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:			

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(μ V/m)	Antenna polarization	Antenna height, m	Azimuth, degrees*	Field strength of carrier, dB(μ V/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.



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:			

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

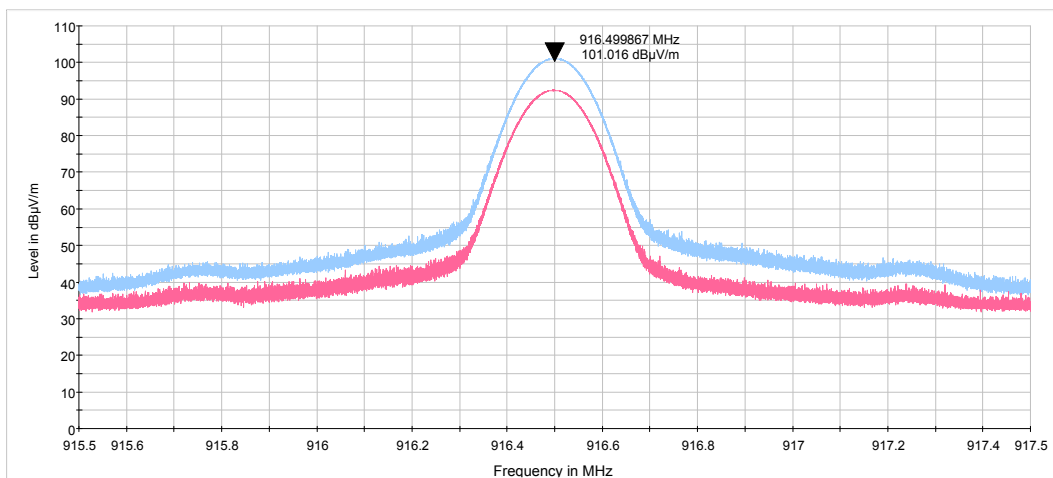
MHz	MHz	MHz	MHz	MHz	GHz
0.09 - 0.11	8.291 - 8.294	16.80425 - 16.80475	399.9 - 410	3260 - 3267	10.6 - 12.7
2.1735 - 2.190	8.362 - 8.366	25.5 - 25.67	608 - 614	3332 - 3339	13.25 - 13.4
3.020 - 3.026	8.37625 - 8.38675	37.5 - 38.25	960 - 1427	3345.8 - 3358	14.47 - 14.5
4.125 - 4.128	8.41425 - 8.41475	73 - 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



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:			

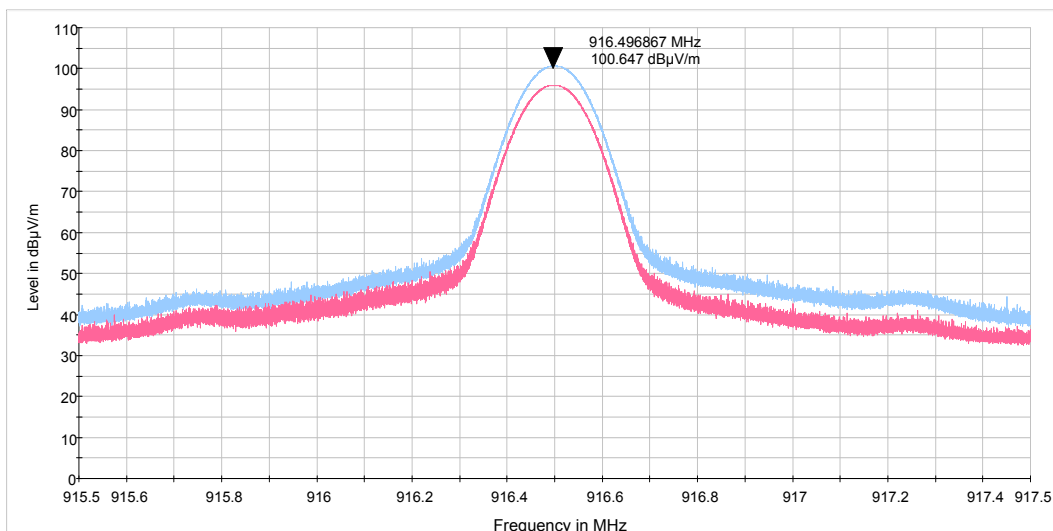
Plot 7.2.1 Radiated emission measurements at the fundamental frequency

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

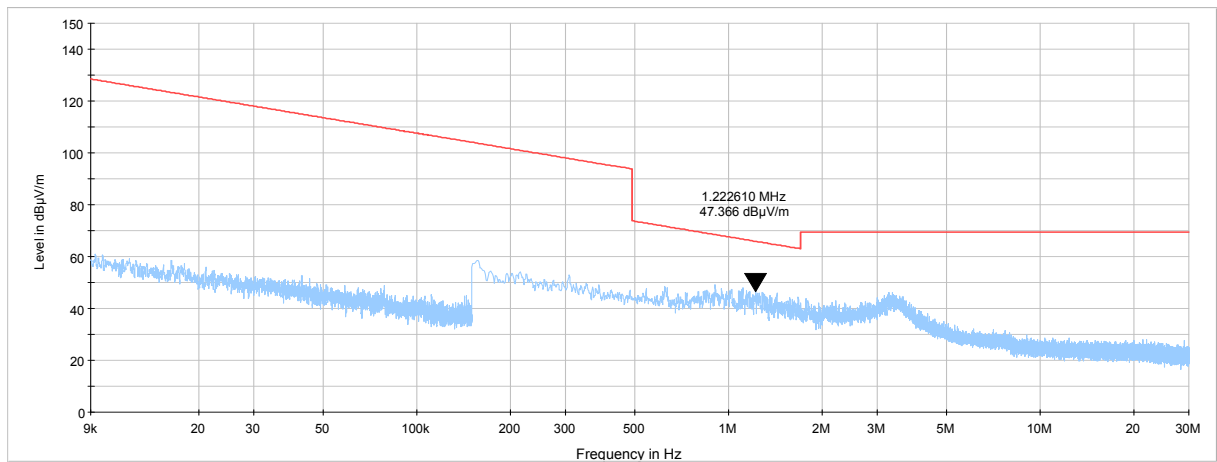




Test specification: FCC Part 15, Section 231(b) / RSS-210, Section A1.2, Field strength of emissions			
Test procedure: ANSI C63.10 sections 6.5, 6.6			
Test mode: Compliance		Verdict: PASS	
Date(s): 13-Jun-21 - 15-Jun-21			
Temperature: 25 °C	Relative Humidity: 55 %	Air Pressure: 1007 hPa	Power: 4.5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

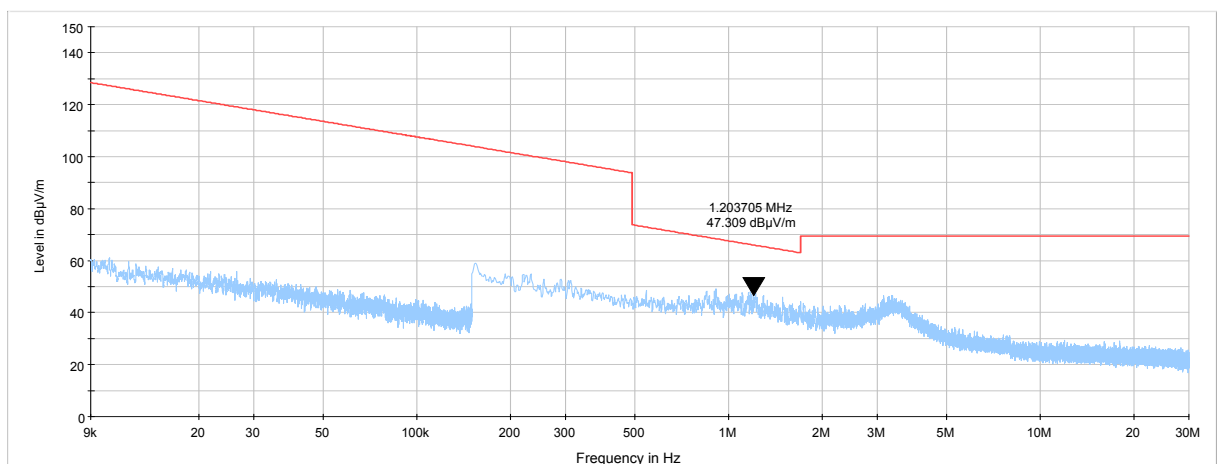
Plot 7.2.3 Radiated emission measurements from 9 kHz to 30 MHz

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

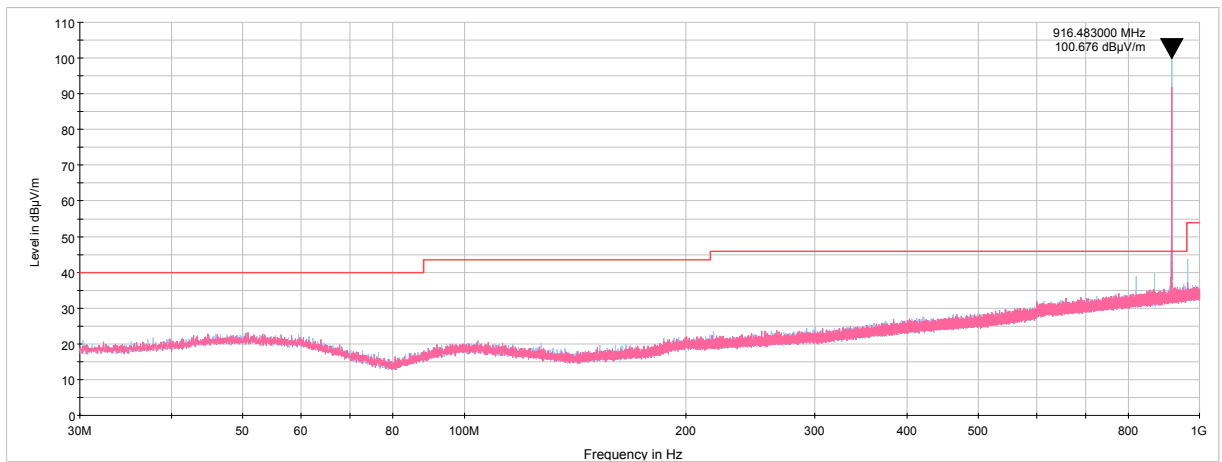




Test specification: FCC Part 15, Section 231(b) / RSS-210, Section A1.2, Field strength of emissions			
Test procedure: ANSI C63.10 sections 6.5, 6.6			
Test mode: Compliance		Verdict: PASS	
Date(s): 13-Jun-21 - 15-Jun-21			
Temperature: 25 °C	Relative Humidity: 55 %	Air Pressure: 1007 hPa	Power: 4.5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

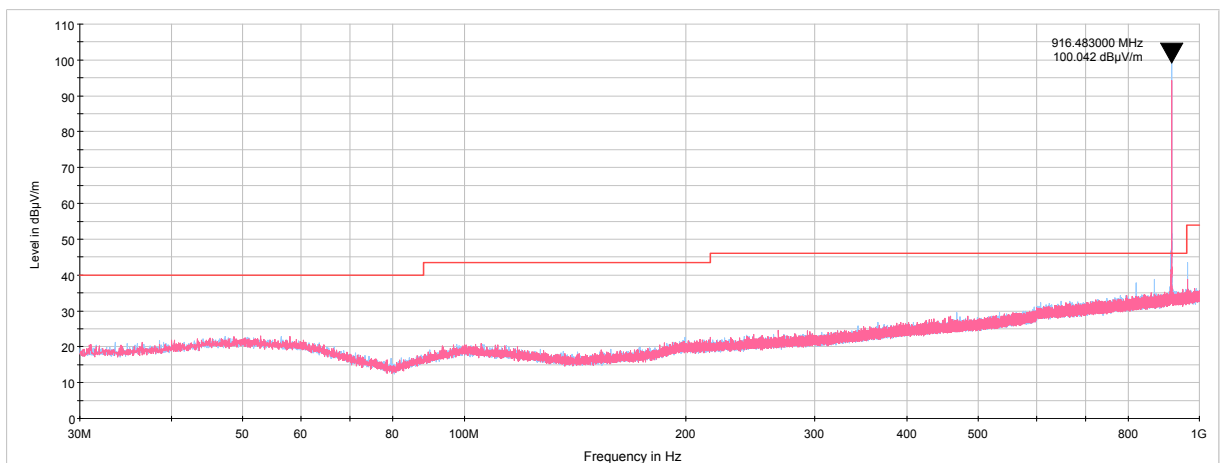
Plot 7.2.5 Radiated emission measurements from 30 to 1000 MHz

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

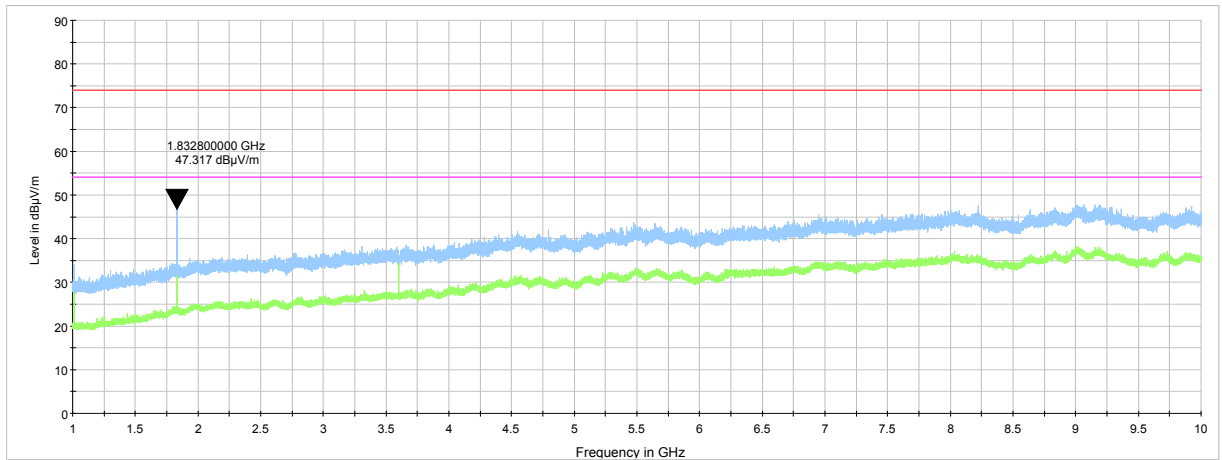




Test specification: FCC Part 15, Section 231(b) / RSS-210, Section A1.2, Field strength of emissions			
Test procedure: ANSI C63.10 sections 6.5, 6.6			
Test mode: Compliance		Verdict: PASS	
Date(s): 13-Jun-21 - 15-Jun-21			
Temperature: 25 °C	Relative Humidity: 55 %	Air Pressure: 1007 hPa	Power: 4.5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

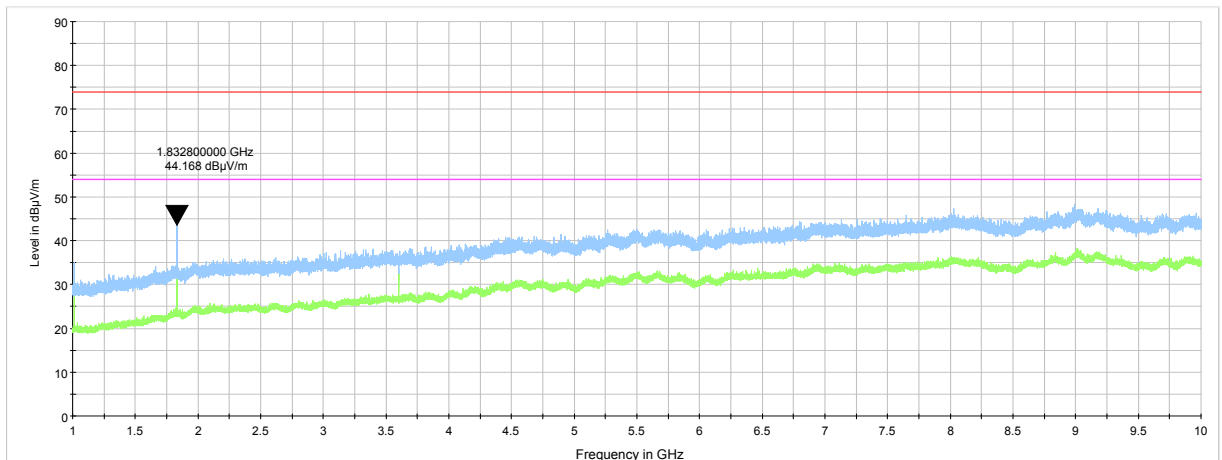
Plot 7.2.7 Radiated emission measurements from 1 to 10 GHz

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

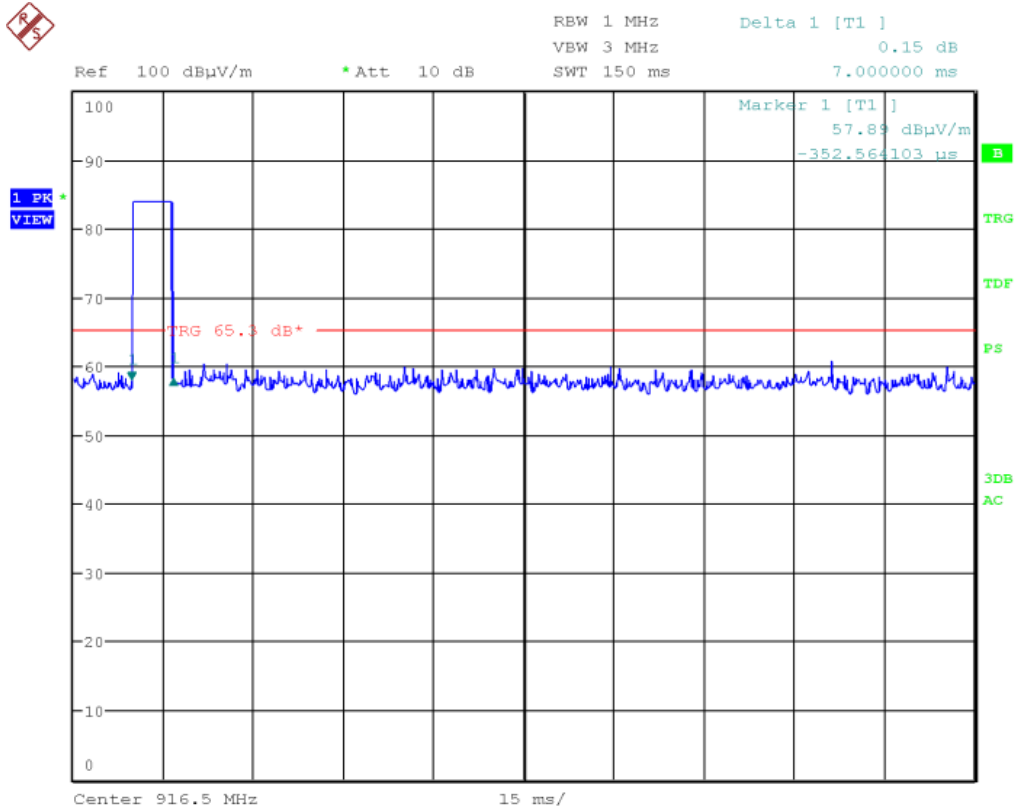




HERMON LABORATORIES

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

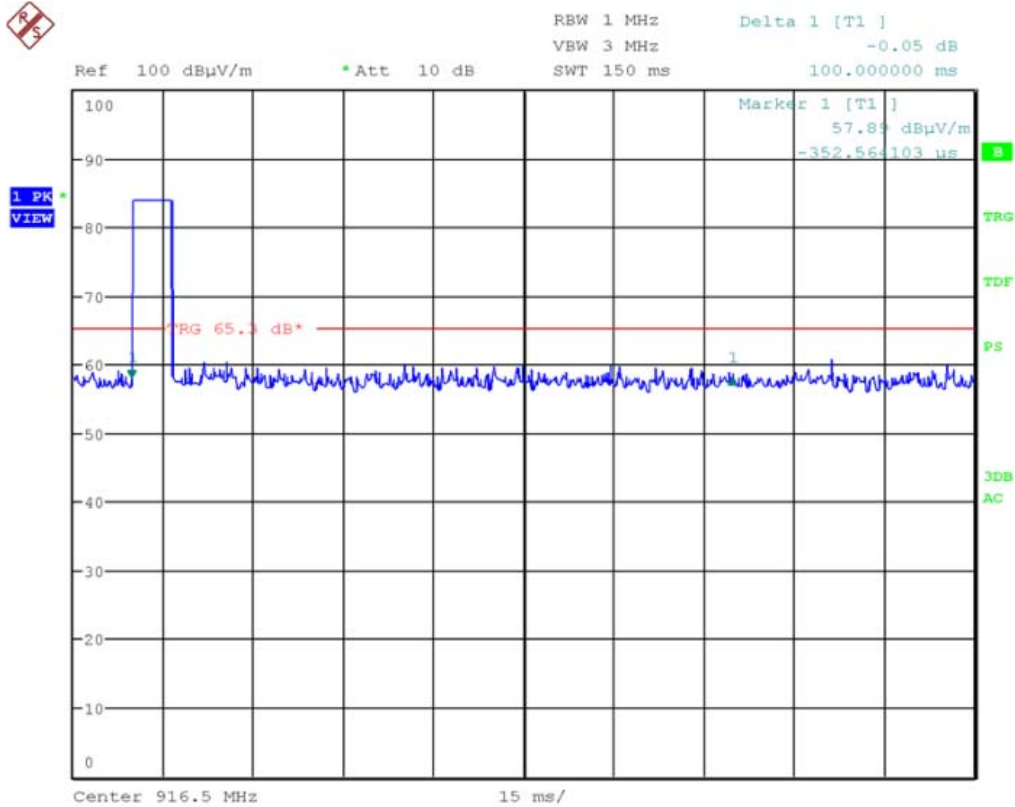




HERMON LABORATORIES

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



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:			

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





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:			

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

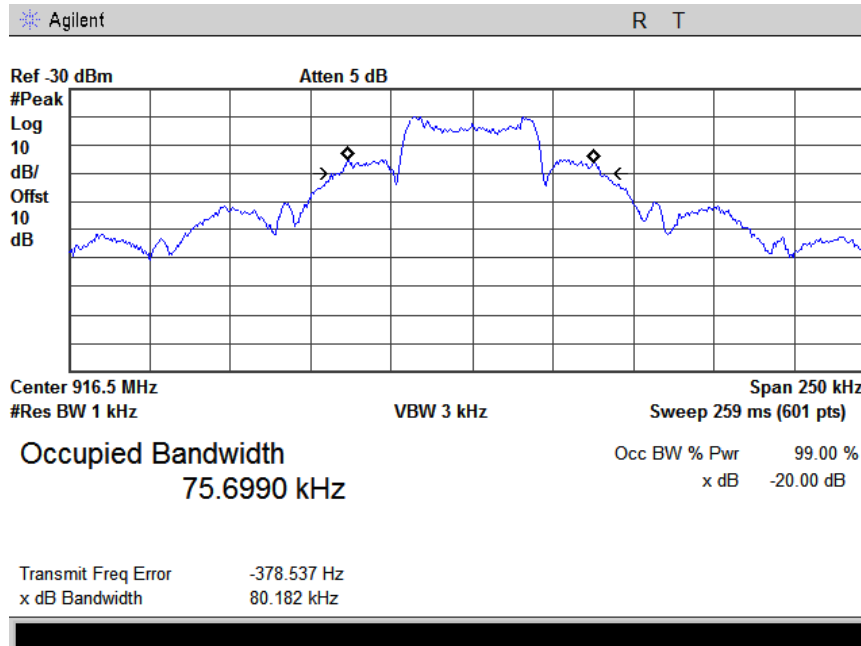
HL 2909	HL 5410	HL 3785	HL 4135	HL 5397				
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Full description is given in Appendix A.



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	



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

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 th 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: $Lim_{S_2} = Lim_{S_1} + 20 \log(S_1/S_2)$, 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 th harmonic**	54.0

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

8.1.2 Test procedure

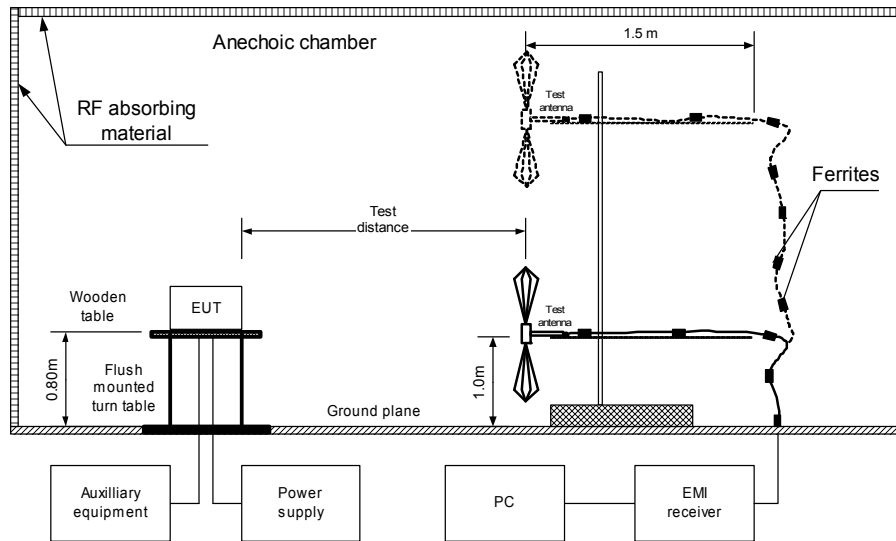
8.1.2.1 The EUT was set up as shown in Figure 8.1.1 and associated photograph/s, energized and the performance check was conducted.

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.

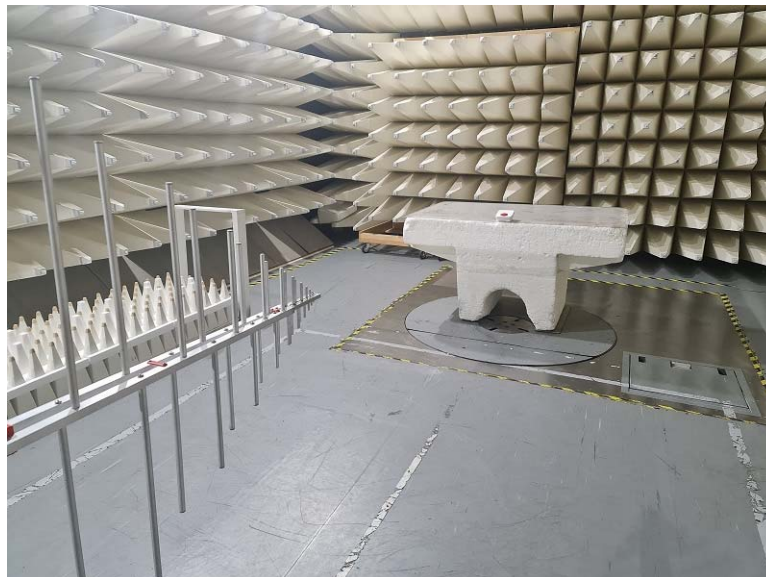
8.1.2.3 The worst test results (the lowest margins) were provided in the associated tables and plots.

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

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





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

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





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

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

Frequency, MHz	Peak			Average			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
	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										Pass

*- 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	
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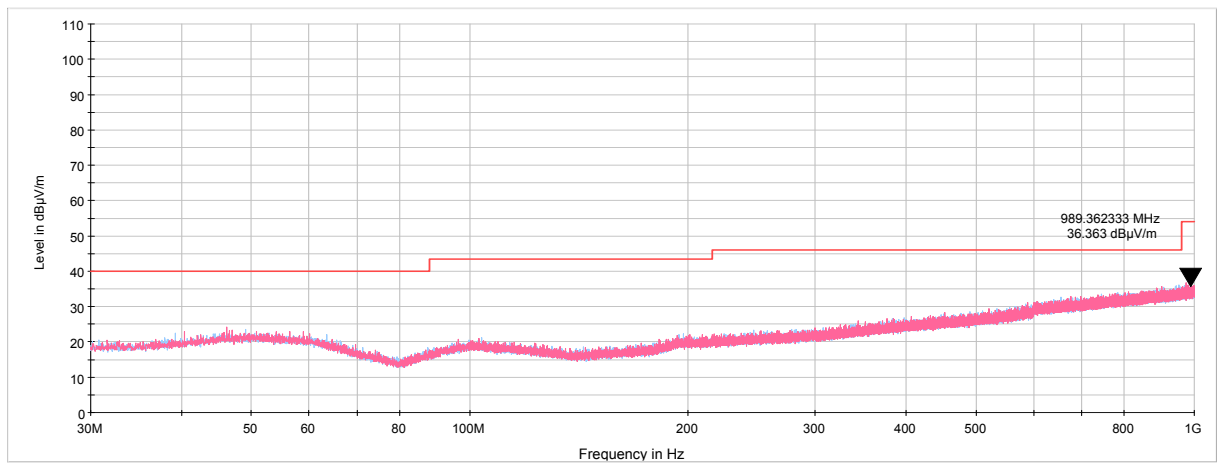
Full description is given in Appendix A.



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

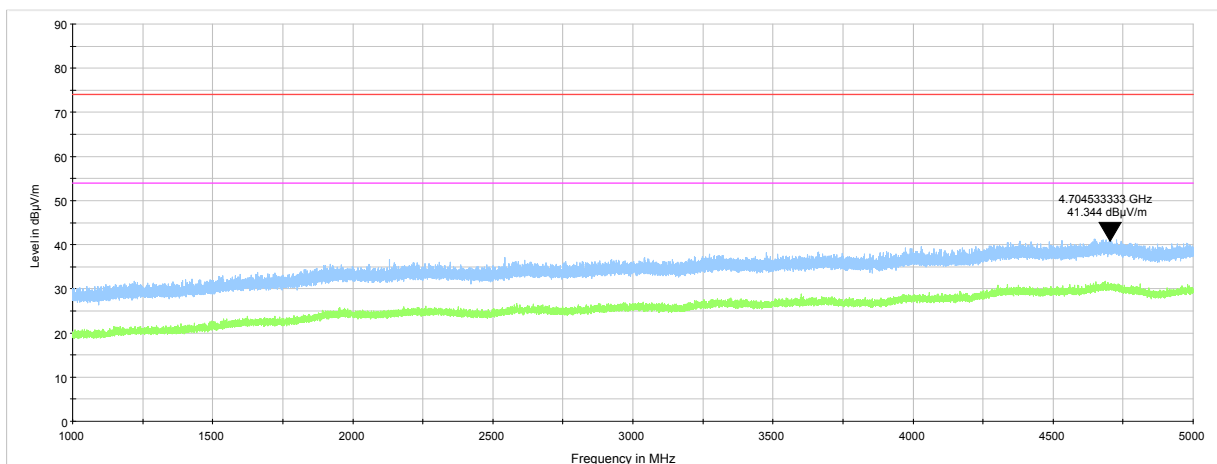
Plot 8.1.1 Radiated emission measurements in 30 - 1000 MHz range, vertical and horizontal antenna polarization

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

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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(μ V) to convert it into field strength in dB(μ 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(μ V) to convert it into field intensity in dB(μ 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 μ V to obtain field strength in dB μ 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(μ V)	decibel referred to one microvolt
dB(μ V/m)	decibel referred to one microvolt per meter
dB(μ 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
μ s	microsecond
NA	not applicable
NB	narrow band
OATS	open area test site
Ω	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