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Report ID: VISRAD_FCC.54928.docx

Date of Issue: 26-Mar-25

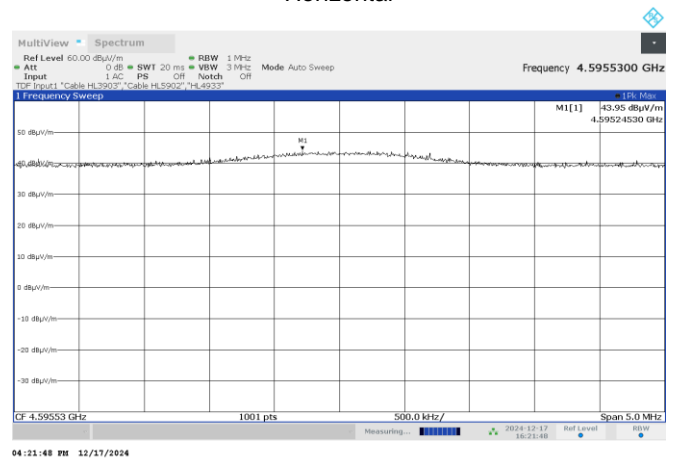
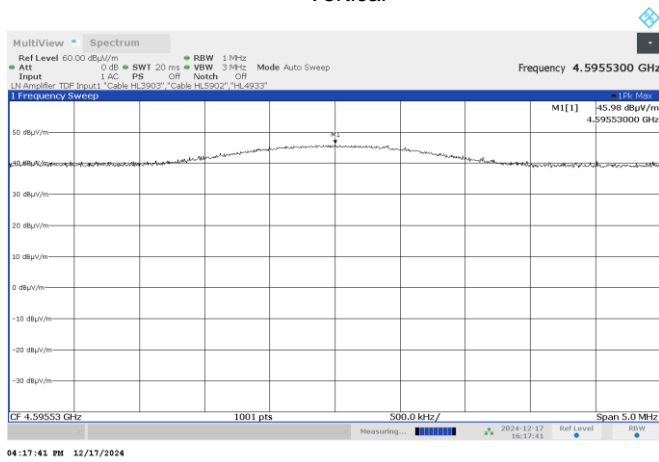
Test specification: Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions			
Test procedure: ANSI C63.10, sections 6.5, 6.6			
Test mode: Compliance		Verdict: PASS	
Date(s): 08-Oct-24 - 09-Oct-24			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1005 hPa	Power: 3 VDC
Remarks:			

Plot 7.6.21 Radiated emission measurements at the fifth harmonic of high carrier frequency

TEST SITE:
TEST DISTANCE:
Vertical

Semi anechoic chamber
3 m

Horizontal

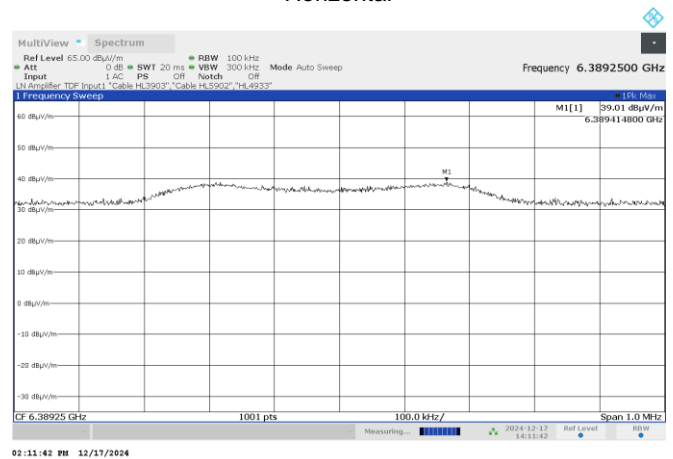
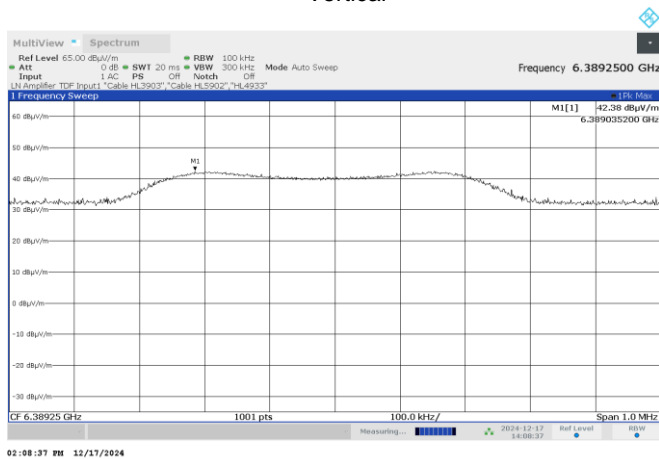


Plot 7.6.22 Radiated emission measurements at the seventh harmonic of low carrier frequency

TEST SITE:
TEST DISTANCE:
Vertical

Semi anechoic chamber
3 m

Horizontal





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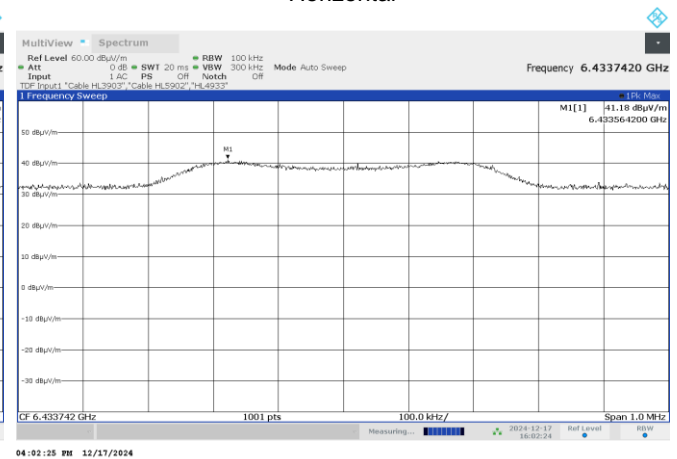
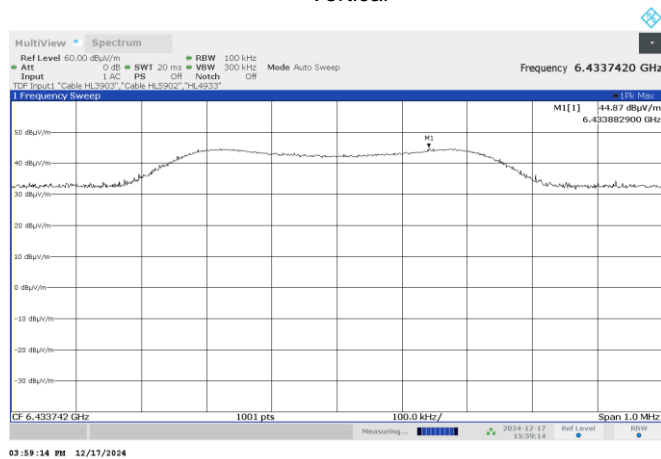
Test specification:		Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions	
Test procedure:		ANSI C63.10, sections 6.5, 6.6	
Test mode:		Compliance	Verdict: PASS
Date(s):		08-Oct-24 - 09-Oct-24	
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1005 hPa	Power: 3 VDC
Remarks:			

Plot 7.6.23 Radiated emission measurements at the seventh harmonic of high carrier frequency

TEST SITE:
TEST DISTANCE:
Vertical

Semi anechoic chamber
3 m

Horizontal





Test specification: Section 15.247(d), RSS-247 section 5.5, Emissions at band edges			
Test procedure: ANSI C63.10, section 7.8.6			
Test mode: Compliance		Verdict: PASS	
Date(s): 06-Oct-24			
Temperature: 234 °C	Relative Humidity: 45 %	Air Pressure: 1009 hPa	Power: 3.0 VDC
Remarks:			

7.7 Band edge radiated emissions

7.7.1 General

This test was performed to measure emissions, radiated from the EUT at the assigned frequency band edges. Specification test limits are given in Table 7.7.1.

Table 7.7.1 Band edge emission limits

Assigned frequency, MHz	Attenuation below carrier*, dBc	Field strength at 3 m within restricted bands, dB(μV/m)	
		Peak	Average
902.0 – 928.0	20.0	74.0	54.0
2400.0 – 2483.5			
5725.0 – 5850.0			

* - Band edge emission limit is provided in terms of attenuation below the peak of modulated carrier measured with the same resolution bandwidth.

7.7.2 Test procedure

- 7.7.2.1 The EUT was set up as shown in Figure 7.7.1 energized normally modulated at the maximum data rate with its hopping function disabled and its proper operation was checked.
- 7.7.2.2 The EUT was adjusted to produce maximum available to end user RF output power at the lowest carrier frequency.
- 7.7.2.3 The spectrum analyzer span was set to capture the carrier frequency and associated modulation products. The resolution bandwidth was set wider than 1 % of the frequency span.
- 7.7.2.4 The spectrum analyzer was set in max hold mode and allowed trace to stabilize. The highest emission level within the authorized band was measured.
- 7.7.2.5 The maximum band edge emission and modulation product outside of the band were measured as provided in Table 7.7.2 and associated plots and referenced to the highest emission level measured within the authorized band.
- 7.7.2.6 The above procedure was repeated with the EUT adjusted to produce maximum RF output power at the highest carrier frequency.
- 7.7.2.7 The above procedure was repeated with the frequency hopping function enabled.

Figure 7.7.1 Band edge emission test setup





Test specification:		Section 15.247(d), RSS-247 section 5.5, Emissions at band edges	
Test procedure:		ANSI C63.10, section 7.8.6	
Test mode:		Verdict: PASS	
Date(s):			
06-Oct-24			
Temperature: 234 °C	Relative Humidity: 45 %	Air Pressure: 1009 hPa	Power: 3.0 VDC
Remarks:			

Table 7.7.2 Band edge emission test results

ASSIGNED FREQUENCY RANGE: 902.0 – 928.0 MHz

DETECTOR USED: Peak

RESOLUTION BANDWIDTH: $\geq 1\%$ of the spanVIDEO BANDWIDTH: \geq RBW

Frequency, MHz	Band edge emission, dBm	Emission at carrier, dBm	Attenuation below carrier, dBc	Limit, dBc	Margin, dB*	Verdict
Frequency hopping disabled						
912.776	-92.54	-39.45	53.09	20.0	33.09	Pass
919.079	-91.89	-34.36	57.53		37.53	
Frequency hopping enabled						
912.775	-93.07	-39.76	53.31	20.0	33.31	Pass
919.083	-91.88	-37.61	54.27		34.27	

*- Margin = Attenuation below carrier – specification limit.

Reference numbers of test equipment used

HL 4135	HL 4275	HL 4355	HL 5838					
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Full description is given in Appendix A.



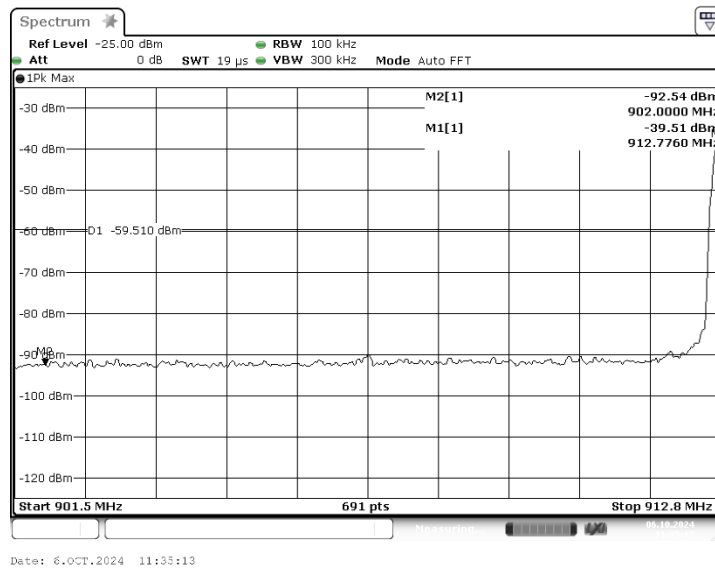
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Report ID: VISRAD_FCC.54928.docx

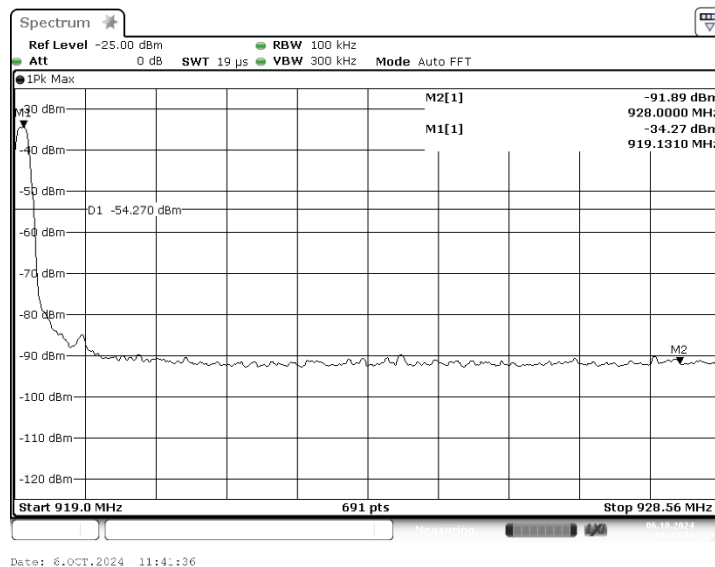
Date of Issue: 26-Mar-25

Test specification:		Section 15.247(d), RSS-247 section 5.5, Emissions at band edges	
Test procedure:		ANSI C63.10, section 7.8.6	
Test mode:		Verdict: PASS	
Date(s):			
06-Oct-24			
Temperature: 234 °C	Relative Humidity: 45 %	Air Pressure: 1009 hPa	Power: 3.0 VDC
Remarks:			

Plot 7.7.1 The highest band edge emission at low carrier frequency with hopping function disabled



Plot 7.7.2 The highest band edge emission at high carrier frequency with hopping function disabled





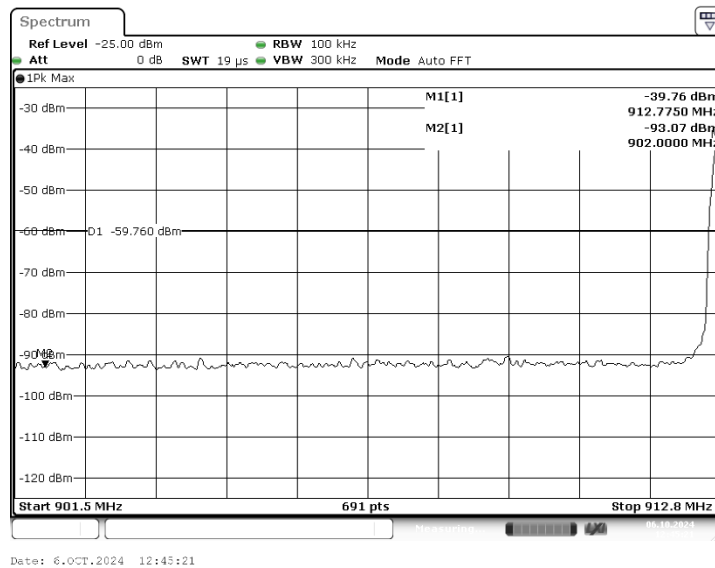
HERMON LABORATORIES

Report ID: VISRAD_FCC.54928.docx

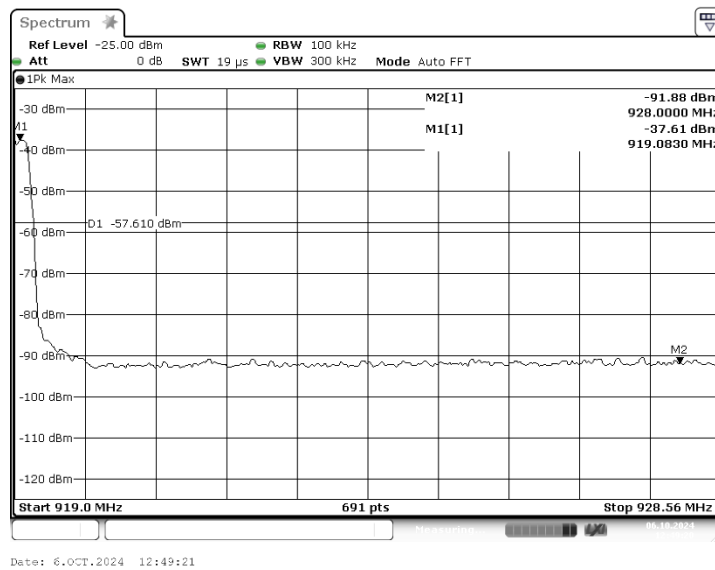
Date of Issue: 26-Mar-25

Test specification:		Section 15.247(d), RSS-247 section 5.5, Emissions at band edges	
Test procedure:		ANSI C63.10, section 7.8.6	
Test mode:		Verdict: PASS	
Date(s):			
06-Oct-24			
Temperature: 234 °C	Relative Humidity: 45 %	Air Pressure: 1009 hPa	Power: 3.0 VDC
Remarks:			

Plot 7.7.3 The highest band edge emission at low carrier frequency with hopping function enabled



Plot 7.7.4 The highest band edge emission at high carrier frequency with hopping function enabled





Test specification: Section 15.203, RSS-Gen, Section 7.1.4, Antenna requirements			
Test procedure: Visual inspection		Verdict: PASS	
Test mode: Compliance			
Date(s): 06-Oct-24			
Temperature: 23 °C	Relative Humidity: 45 %	Air Pressure: 1008 hPa	Power: 3.0 VDC
Remarks:			

7.8 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 7.8.1.

Table 7.8.1 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: Section 15.109, RSS-Gen, Section 7.1.2, ICES-003, Radiated emission			
Test procedure: ANSI C63.4, Section 12.2.5			
Test mode: Compliance		Verdict: PASS	
Date(s): 09-Oct-24			
Temperature: 24 °C	Relative Humidity: 48 %	Air Pressure: 1002 hPa	Power: 3 VDC
Remarks:			

8 Unintentional emissions

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 8.1.1 Radiated emission test limits

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
FCC 47 CFR, Section 15.109				
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*
Above 960	43.5*	54.0	49.5	60.0*
ICES-003, Section 3.2.2				
30 - 88	30.0	40.0	40.0	50.0
88 - 216	33.1	43.5	43.5	54.0
216 - 230	35.6	46.0	46.4	56.9
230 - 960	37.0	47.0	47.0	57.0
960 - 1000	43.5	54.0	49.5	60.0
1000 - 40000	---	74 (Peak) 54 (AVR)	---	80 (Peak) 60 (AVR)

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

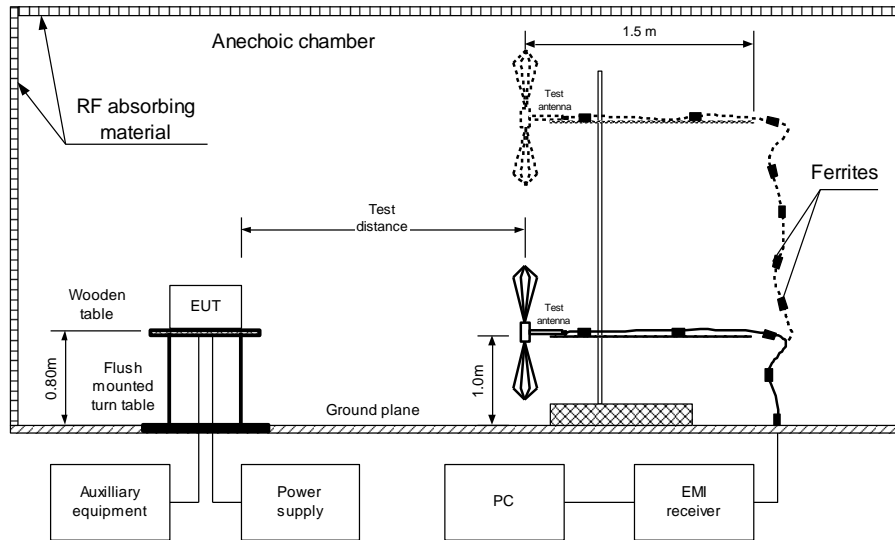
8.1.2 Test procedure for measurements in semi-anechoic chamber

- 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 recorded in Table 8.1.2 and shown in the associated plots.



Test specification: Section 15.109, RSS-Gen, Section 7.1.2, ICES-003, Radiated emission			
Test procedure: ANSI C63.4, Section 12.2.5			
Test mode: Compliance		Verdict: PASS	
Date(s): 09-Oct-24			
Temperature: 24 °C	Relative Humidity: 48 %	Air Pressure: 1002 hPa	Power: 3 VDC
Remarks:			

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





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Test specification: Section 15.109, RSS-Gen, Section 7.1.2, ICES-003, Radiated emission			
Test procedure: ANSI C63.4, Section 12.2.5			
Test mode: Compliance		Verdict: PASS	
Date(s): 09-Oct-24			
Temperature: 24 °C	Relative Humidity: 48 %	Air Pressure: 1002 hPa	Power: 3 VDC
Remarks:			

Table 8.1.2 Radiated emission test results

EUT SET UP: TABLE-TOP
LIMIT: Class B
EUT OPERATING MODE: Receive
TEST SITE: SEMI ANECHOIC CHAMBER
TEST DISTANCE: 3 m
DETECTORS USED: PEAK / QUASI-PEAK
FREQUENCY RANGE: 30 MHz – 1000 MHz
RESOLUTION BANDWIDTH: 100 kHz

Frequency, MHz		Quasi-peak			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
Peak emission, dB(μV/m)	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 – 9500 MHz
RESOLUTION BANDWIDTH: 1000 kHz

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										Pass

*- Margin = Measured emission - specification limit.

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

Reference numbers of test equipment used

HL 7585	HL 5288	HL 4933	HL 5902	HL 3903			
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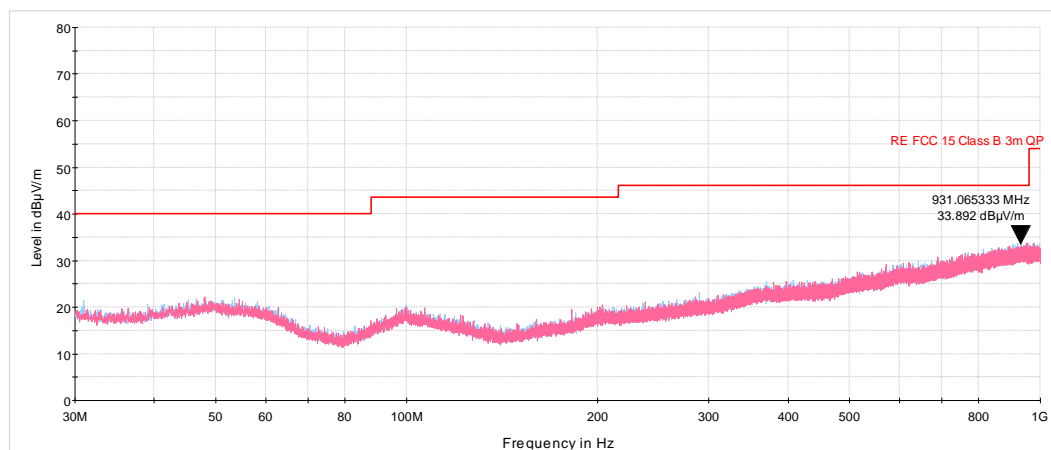
Full description is given in Appendix A.



Test specification: Section 15.109, RSS-Gen, Section 7.1.2, ICES-003, Radiated emission			
Test procedure: ANSI C63.4, Section 12.2.5			
Test mode: Compliance		Verdict: PASS	
Date(s): 09-Oct-24			
Temperature: 24 °C	Relative Humidity: 48 %	Air Pressure: 1002 hPa	Power: 3 VDC
Remarks:			

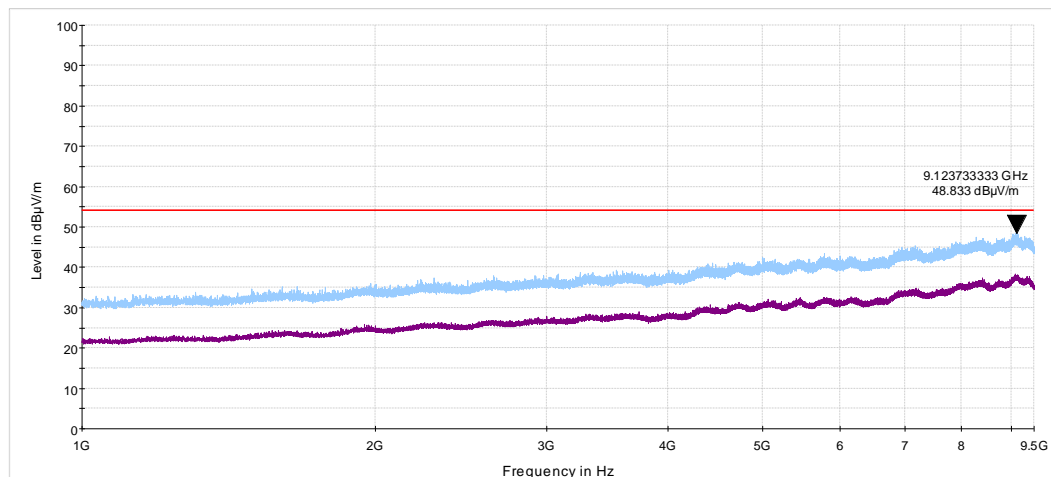
Plot 8.1.1 Radiated emission measurements in 30 - 1000 MHz range, vertical and horizontal antenna polarization

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	29-Feb-24	28-Feb-25
3903	Microwave Cable Assembly, 40.0 GHz, 1.5 m, SMA/SMA	Huber-Suhner	SUCOFL EX 102A	1226/2A	06-May-24	06-May-25
4135	Shield Box	TESCOM CO., LTD	TC-5916A	5916A000 136	20-May-24	20-May-25
4275	Test Cable , DC-18 GHz, 1.8 m, SMA/M - N/M	Mini-Circuits	CBL-6FT-SMNM+	70050	31-Oct-23	31-Oct-24
4339	High pass Filter, 50 Ohm, 1000 to 18000 MHz, SMA-FM / SMA-M	Micro-Tronics	HPM5011 5-02	001	21-Jun-23	21-Jun-25
4355	Signal and Spectrum Analyzer, 9 kHz to 7 GHz	Rohde & Schwarz	FSV 7	101630	19-Jun-24	19-Jun-25
4933	Active Horn Antenna, 1 GHz to 18 GHz	COM-POWER CORPORATI ON	AHA-118	701046	20-Feb-24	20-Feb-25
5288	Trilog Antenna, 25 MHz - 8 GHz, 100W	Frankonia	ALX-8000E	00809	24-Mar-22	24-Mar-25
5838	Set near field probes	COM-POWER CORPORATI ON	PS-400	151724	04-Jul-24	04-Jul-26
5902	RF cable, 18 GHz, 6.0m, N-type	Huber-Suhner	SF126EA/ 11N/11N/ 6000	NA	19-Nov-23	19-Nov-24
7585	EMI Test Receiver, 1 Hz to 44 GHz	Rohde & Schwarz	ESW44	103130	24-Sep-24	24-Sep-25

10 APPENDIX B Test equipment correction factors

HL 5288: Trilog Antenna
Frankonia, model: ALX-8000E, s/n: 00809
30-1000 MHz

Frequency, MHz	Antenna factor, dB/m
30	14.96
35	15.33
40	16.37
45	17.56
50	17.95
60	16.87
70	13.22
80	10.56
90	13.61
100	15.46
120	14.03
140	12.23

Frequency, MHz	Antenna factor, dB/m
160	12.67
180	13.34
200	15.40
250	16.42
300	17.28
400	19.98
500	21.11
600	22.90
700	24.13
800	25.25
900	26.35
1000	27.18

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

above 1000 MHz

Frequency, MHz	Antenna factor, dB/m
1000	26.9
1100	28.1
1200	28.4
1300	29.6
1400	29.1
1500	30.4
1600	30.7
1700	31.5
1800	32.3
1900	32.6
2000	32.5
2100	32.9
2200	33.5
2300	33.2
2400	33.7
2500	34.6
2600	34.7
2700	34.6
2800	35.0
2900	35.5
3000	36.2
3100	36.8
3200	36.8
3300	37.0
3400	37.5
3500	38.2

Frequency, MHz	Antenna factor, dB/m
3600	38.9
3700	39.4
3800	39.4
3900	39.6
4000	39.7
4100	39.8
4200	40.5
4300	40.9
4400	41.1
4500	41.4
4600	41.3
4700	41.6
4800	41.9
4900	42.3
5000	42.7
5100	43.0
5200	42.9
5300	43.5
5400	43.6
5500	44.3
5600	44.7
5700	45.0
5800	45.0
5900	45.3
6000	45.9

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

HL 0446: Active Loop Antenna
EMCO, model: 6502, s/n 2857

Frequency,	Measured antenna factor, dBS/m	Measurement uncertainty, dB
10	-33.4	±1.0
20	-37.8	±1.0
50	-40.5	±1.0
75	-41.0	±1.0
100	-41.2	±1.0
150	-41.2	±1.0
250	-41.1	±1.0
500	-41.2	±1.0
750	-41.3	±1.0
1000	-41.3	±1.0

Frequency,	Measured antenna factor, dBS/m	Measurement uncertainty, dB
2000	-41.4	±1.0
3000	-41.4	±1.0
4000	-41.5	±1.0
5000	-41.5	±1.0
10000	-41.7	±1.0
15000	-42.1	±1.0
20000	-42.7	±1.0
25000	-44.2	±1.0
30000	-45.8	±1.0

The antenna factor shall be added to receiver reading in dB μ V to obtain field strength in dB μ A/m.

HL 4933: Active Horn Antenna
COM-POWER CORPORATION, model: AHA-118, s/n 701046

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.

11 APPENDIX C Measurement uncertainties

Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements

Test description	Expanded uncertainty
Conducted carrier power at RF antenna connector	Below 12.4 GHz: ± 1.7 dB 12.4 GHz to 40 GHz: ± 2.3 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
Occupied bandwidth	± 8.0 %
Duty cycle, timing (Tx ON / OFF) and average factor measurements	± 1.0 %
Conducted emissions with LISN	9 kHz to 150 kHz: ± 3.9 dB 150 kHz to 30 MHz: ± 3.8 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

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.

12 APPENDIX D

Specification references

FCC 47CFR part 15: 2022

ANSI C63.10: 2013

RSS-247 Issue 3: 2023

RSS-Gen Issue 5
with_amendment_1_2: 2021

ANSI C63.4-2014

ICES-003: 2020, Issue 7

Radio Frequency Devices

American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence- Exempt Local Area Network (LE-LAN) Devices

General Requirements and Information for the Certification of Radiocommunication Equipment

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.
Information Technology Equipment (Including Digital Apparatus)

13 APPENDIX E 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

14 APPENDIX G Manufacturer's declaration



Visonic Ltd.
13 Zarhin Street
P.O.Box 4228
Raanana, 4366241, Israel

Tele: +972 3 645 6789
Fax: +972 3 645 6788
www.visonic.com

Declaration of Identity

We, the undersigned,

Company: Visonic Ltd
Address: 13 Zarhin Street, Raanana
Country: Israel
Telephone number: +972 3 6456 789
Fax number: +972 3 6456 788

Declare under our sole responsibility that the following equipment:

Brand/Item	Type/Model	Short Product description
Visonic	SMD-979 PGP	Wireless Heat Detector, 915 MHz

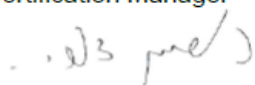
Is electronically/electrically/mechanically identical to the following equipment and RF module location is the same (pin to pin):

Brand/Item	Type/Model	Short Product description
Visonic	SMD-976 PGP	Wireless Smoke and Heat Detector, 915 MHz

13/03/2025

Zuri Rubin

Certification Manager - Visonic



END OF DOCUMENT