

TEST REPORT

ACCORDING TO: FCC 47CFR part 15, subpart E, §15.407, sec.15.407(b)

FOR:

NoTraffic Ltd.

Sensor Unit

Models: SU0001

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	Ports and lines	5
6.3	Operating frequencies	5
6.4	Changes made in the EUT	5
7	Transmitter test	6
7.1	Field strength of undesirable emissions	6
8	APPENDIX A Test equipment and ancillaries used for tests.....	18
9	APPENDIX B Measurement uncertainties.....	19
10	APPENDIX C Test facility description	20
11	APPENDIX D Specification references	20
12	APPENDIX E Test equipment correction factors.....	21
13	APPENDIX F Abbreviations and acronyms.....	26

1 Applicant information

Client name: NOTRAFFIC LTD.
Address: Yigal Alon 53, Building B, 6nd floor, Tel Aviv 6744332, Israel
Telephone: +972 54 6312104
Fax: NA
E-mail: Ofer@notraffic.tech
Contact name: Ofer Itshakey

2 Equipment under test attributes

Product name: Sensor Unit
Model(s): SU0001
Serial number: Prototype
Hardware version: 2.x
Software release: 2.x
Receipt date 06-Feb-24

3 Manufacturer information

Manufacturer name: NOTRAFFIC LTD.
Address: Yigal Alon 53, Building B, 6nd floor, Tel Aviv 6744332, Israel
Telephone: +972 54 6312104
Fax: NA
E-Mail: Ofer@notraffic.tech
Contact name: Ofer Itshakey

4 Test details

Project ID: 53223
Location: Hermon Laboratories Ltd. P.O. Box 23, Binyamina 3055001, Israel
Test started: 23-May-24
Test completed: 23-May-24
Test specification(s): FCC 47CFR part 15:2022, subpart E, §15.407, sec.15.407(b)

5 Tests summary

Test	Status
Transmitter characteristics	
FCC section 15.407(b), Field strength of undesirable emissions	Pass

This test report supersedes the previously issued test report identified by Doc ID: NOTRAD_FCC.53223

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

	Name and Title	Date	Signature
Tested by:	Mrs. N. Lenkina, test engineer, EMC & Radio	23-May-24	
Reviewed by:	Mrs. S. Peysahov Sheynin, certification specialist, EMC & Radio	10-Oct-24	
Approved by:	Mr. M. Nikishin, group leader, EMC & Radio	10-Oct-24	

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, Sensor Unit (SU) is installed on a regular, 4 direction intersection Installation, is outdoor, on a traffic pole. In a Sensor Unit there are 4 types of radio transceivers, as follows:

1) Radar, model RM68-NT, from SRS (Smart Radar System, Ltd). Its function is to complement the camera in identifying all road users, especially in bad weather conditions. Frequency range: 61.0-61.5 GHz.

FCC ID: 2AVKZRM68-NTA;

2) Wi-Fi module, model AEX-AR9590-NI, from Voxmicro. Its function is to communicate and pass the data from the Sensor Unit, to the traffic cabinet. Operates according to standard IEEE 802.11 a/b/g/n Wi-Fi at 5 GHz bands.

FCC ID: 2AE3B-AEX-AR95X;

3) V2X/DSRC module (optional assembly not in use), model SOM-301U, from Unex Technology. Its function is to allow future 2-way communication with V2X and DSRC technologies enabled devices of road users, such as connected vehicles, emergency vehicles, or even pedestrians with mobile devices. Frequency Range: 5860.0 -- 5920.0 GHz.

FCC ID: NUK-VTX3012;

4) ESP32 module, model ESP-WROOM-32U, from Espressif Systems. Its function is to allow maintenance Wi-Fi access to the Sensor Unit, in case its onboard computer is stuck, or another failure prevents communicating with it. This module never operates concurrently with the other 3 modules, as it is used for maintenance only, in case of an issue with other modules. It is used mainly for remotely restarting the Sensor Unit.

Frequency Range: 2.412-2.462 GHz (Wi-Fi b/g/n 2.4 GHz).

FCC ID: 2AC7Z-ESP32WROOM32U.

The Sensor Unit allows simultaneous operations of the above modules 1 – 3.

6.2 Ports and lines

Port type	Port description	Connected from	Connected to	Qty.	Cable type	Cable length, m
Power	AC	mains	AC	1	Unshielded	20 m

6.3 Operating frequencies

Source	Frequency, MHz		
Tx/Rx	5180-5825	61000-61500	2412-2462*

*Only for allowing maintenance Wi-Fi access to the Sensor Unit

6.4 Changes made in the EUT

No changes were performed in the EUT during testing.



Test specification: FCC section 15.407(b), Field strength of undesirable emissions			
Test procedure: ANSI C63.10, section 12.7.6 & 12.7.7			
Test mode: Compliance		Verdict: PASS	
Date(s): 24-May-24			
Temperature: 24.2 °C	Relative Humidity: 49 %	Air Pressure: 1009 hPa	Power: 120 VAC, 50 Hz
Remarks:			

7 Transmitter test

7.1 Field strength of undesirable emissions

7.1.1 General

This test was performed to measure field strength of spurious emissions from the EUT. Specification test limits are given in Table 7.1.1, Table 7.1.2.

Table 7.1.1 Unwanted emissions limits below 1 GHz and within restricted bands above 1 GHz

Frequency, MHz	Field strength at 3 m, dB(μV/m)*		
	Peak	Quasi Peak	Average
0.009 – 0.090	148.5 – 128.5	NA	128.5 – 108.5**
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	
1000 – 40000	74.0	NA	54.0

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

$$\text{Lims}_2 = \text{Lims}_1 + 40 \log (S_1/S_2),$$

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

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



Test specification: FCC section 15.407(b), Field strength of undesirable emissions			
Test procedure: ANSI C63.10, section 12.7.6 & 12.7.7			
Test mode: Compliance		Verdict: PASS	
Date(s): 24-May-24			
Temperature: 24.2 °C	Relative Humidity: 49 %	Air Pressure: 1009 hPa	Power: 120 VAC, 50 Hz
Remarks:			

Table 7.1.2 EIRP of undesirable emission limits outside restricted bands (above 1 GHz)

Operating frequency band, GHz	EIRP of spurious, dBm/MHz	Field strength at 3 m, dB(μV/m)
5.150 – 5.250	-27	68.23
5.250 – 5.350	-27	68.23
5.470 – 5.725	-27	68.23
5.725 – 5.850	-27 (below 5.650 GHz and above 5.925 GHz)	68.23
	-27 increasing linearly to 10 (in 5.650 - 5.700 GHz and 5.875 - 5.925 GHz)	68.23 - 105.23
	10 increasing linearly to 15.6 (in 5.700 - 5.720 GHz and 5.855 - 5.875 GHz)	105.23 - 110.83
	15.6 increasing linearly to 27 (in 5.720 - 5.725 GHz and 5.850 - 5.855 GHz)	110.83 - 122.23

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

7.1.2.1 The EUT was set up as shown in Figure 7.1.1, energized and the performance check was conducted.

7.1.2.2 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.

7.1.2.3 The worst test results (the lowest margins) were recorded and shown in the associated plots.

7.1.3 Test procedure for spurious emission field strength measurements above 30 MHz

7.1.3.1 The EUT was set up as shown in Figure 7.1.2, Figure 7.1.3, energized and the performance check was conducted.

7.1.3.2 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.

7.1.3.3 The worst test results (the lowest margins) were recorded and shown in the associated plots.



Test specification: FCC section 15.407(b), Field strength of undesirable emissions			
Test procedure: ANSI C63.10, section 12.7.6 & 12.7.7			
Test mode: Compliance		Verdict: PASS	
Date(s): 24-May-24			
Temperature: 24.2 °C	Relative Humidity: 49 %	Air Pressure: 1009 hPa	Power: 120 VAC, 50 Hz
Remarks:			

Figure 7.1.1 Setup for spurious emission field strength measurements below 30 MHz

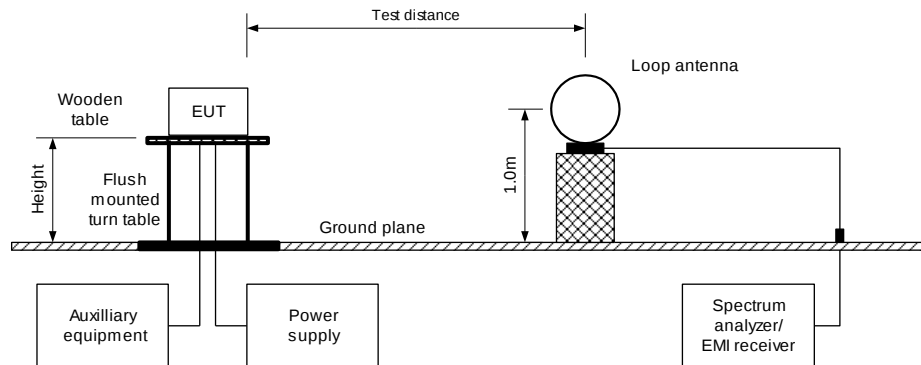
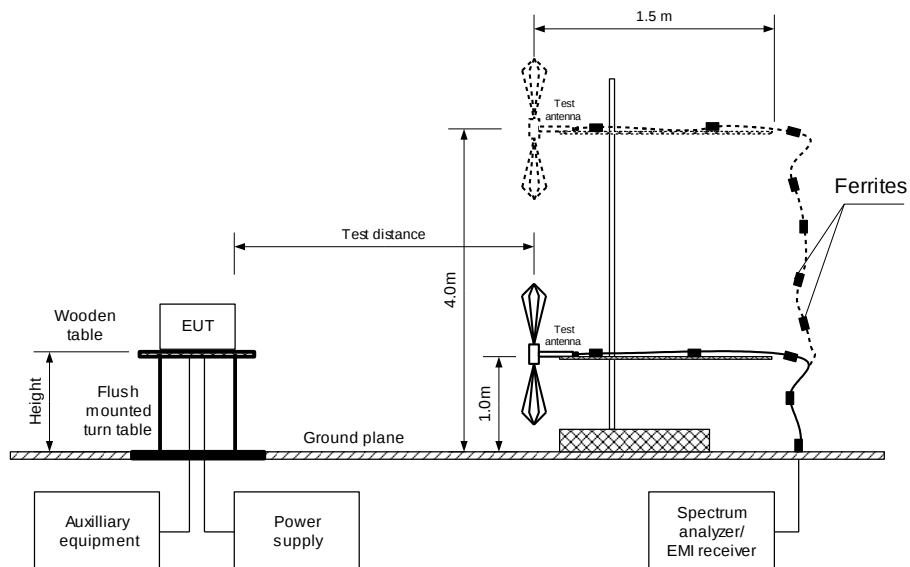


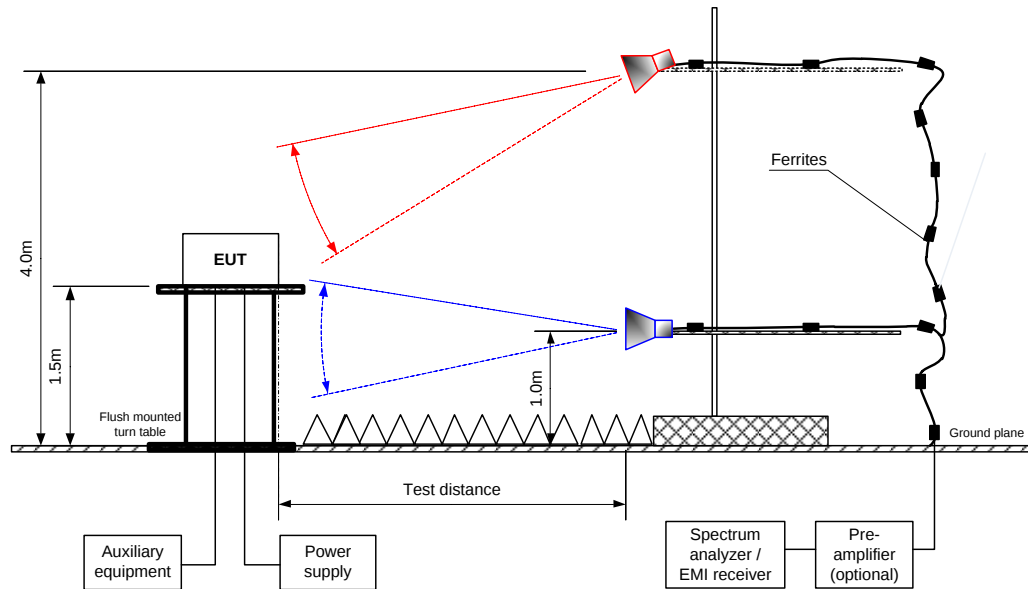
Figure 7.1.2 Setup for spurious emission field strength measurements from 30 to 1000 MHz





Test specification: FCC section 15.407(b), Field strength of undesirable emissions			
Test procedure: ANSI C63.10, section 12.7.6 & 12.7.7			
Test mode: Compliance		Verdict: PASS	
Date(s): 24-May-24			
Temperature: 24.2 °C	Relative Humidity: 49 %	Air Pressure: 1009 hPa	Power: 120 VAC, 50 Hz
Remarks:			

Figure 7.1.3 Setup for spurious emission field strength measurements above 1000 MHz



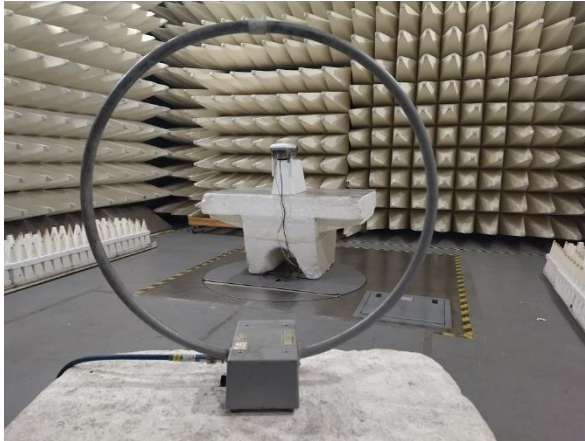


HERMON LABORATORIES

Report ID: NOTRAD_FCC.53223_Rev1.docx
Date of Issue: 10-Oct-24

Test specification: FCC section 15.407(b), Field strength of undesirable emissions			
Test procedure: ANSI C63.10, section 12.7.6 & 12.7.7			
Test mode: Compliance		Verdict: PASS	
Date(s): 24-May-24			
Temperature: 24.2 °C	Relative Humidity: 49 %	Air Pressure: 1009 hPa	Power: 120 VAC, 50 Hz
Remarks:			

Photograph 7.1.1 Setup for spurious emission field strength measurements below 1000 MHz





HERMON LABORATORIES

Report ID: NOTRAD_FCC.53223_Rev1.docx
Date of Issue: 10-Oct-24

Test specification: FCC section 15.407(b), Field strength of undesirable emissions			
Test procedure: ANSI C63.10, section 12.7.6 & 12.7.7			
Test mode: Compliance		Verdict: PASS	
Date(s): 24-May-24			
Temperature: 24.2 °C	Relative Humidity: 49 %	Air Pressure: 1009 hPa	Power: 120 VAC, 50 Hz
Remarks:			

Photograph 7.1.2 Setup for spurious emission field strength measurements above 1000 MHz





Test specification: FCC section 15.407(b), Field strength of undesirable emissions			
Test procedure: ANSI C63.10, section 12.7.6 & 12.7.7			
Test mode: Compliance		Verdict: PASS	
Date(s): 24-May-24			
Temperature: 24.2 °C	Relative Humidity: 49 %	Air Pressure: 1009 hPa	Power: 120 VAC, 50 Hz
Remarks:			

Table 7.1.3 Field strength of spurious emissions below 1 GHz

ASSIGNED FREQUENCY BAND:	Tx #1:5150 - 5250 MHz Tx #2:61000-61500 MHz
INVESTIGATED FREQUENCY RANGE:	0.009 – 1000 MHz
TEST DISTANCE:	3 m
MODULATION:	QPSK
TRANSMITTER OUTPUT POWER:	Maximum
RESOLUTION BANDWIDTH:	1 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)

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*				
111.386	33.57	29.68	43.50	-13.82	Vertical	1.00	-171	Pass
230.061	37.27	34.11	46.00	-11.89	Horizontal	1.00	-86	
320.085	45.96	40.29	46.00	-5.71	Horizontal	2.21	80	
441.420	43.78	38.02	46.00	-7.98	Horizontal	1.41	-62	
633.588	40.60	31.19	46.00	-14.81	Horizontal	1.00	31	
807.133	45.80	32.20	46.00	-13.80	Horizontal	1.21	180	

*- Margin = Measured emission - specification limit.

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

Table 7.1.4 Field strength of emissions outside restricted bands

ASSIGNED FREQUENCY BAND:	Tx #1:5150 - 5250 MHz Tx #2:61000-61500 MHz
INVESTIGATED FREQUENCY RANGE:	1000 – 40000 MHz
TEST DISTANCE:	3 m
MODULATION:	QPSK
TRANSMITTER OUTPUT POWER:	Maximum
DETECTOR USED:	Peak
RESOLUTION BANDWIDTH:	1000 kHz
TEST ANTENNA TYPE:	Biconilog (30 MHz – 1000 MHz) Double ridged guide (above 1000 MHz)

Frequency, MHz	Antenna polarization	Antenna height, m	Azimuth, degrees*	Field strength of spurious, dB(μV/m)	Limit, dBμV/m	Margin, dB**	Verdict
1920.200	Vertical	1.93	-89	40.45	68.23	-27.78	Pass
6906.750	Horizontal	1.00	-140	54.95	68.23	-13.28	

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

**- Margin = Measured emission - specification limit.



HERMON LABORATORIES

Test specification: FCC section 15.407(b), Field strength of undesirable emissions			
Test procedure: ANSI C63.10, section 12.7.6 & 12.7.7			
Test mode: Compliance		Verdict: PASS	
Date(s): 24-May-24			
Temperature: 24.2 °C	Relative Humidity: 49 %	Air Pressure: 1009 hPa	Power: 120 VAC, 50 Hz
Remarks:			

Table 7.1.5 Field strength of spurious emissions above 1 GHz within restricted bands

ASSIGNED FREQUENCY: Tx #1:5150 - 5250 MHz
Tx #2:61000-61500 MHz
INVESTIGATED FREQUENCY RANGE: 1000 - 40000 MHz
TEST DISTANCE: 3 m
MODULATION: QPSK
MODULATING SIGNAL: PRBS
DUTY CYCLE: 100 %
TRANSMITTER OUTPUT POWER: Maximum
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 1000 kHz
TEST ANTENNA TYPE: Double ridged guide

Frequency, MHz	Antenna		Azimuth, degrees*	Peak field strength(VBW=3 MHz)			Average field strength(VBW=1 kHz)				Verdict
	Polarization	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***	
1040.120	Horizontal	2.30	13	40.76	74.00	-33.24	31.57	NA	54.00	-22.43	Pass
1599.620	Vertical	1.93	98	44.11	74.00	-29.89	21.67	NA	54.00	-32.33	Pass
12061.100	Horizontal	2.16	97	47.91	74.00	-26.09	36.40	NA	54.00	-17.60	Pass
17979.700	Vertical	2.29	4	51.47	74.00	-22.53	40.21	NA	54.00	-13.79	Pass
38717.800	Vertical	2.34	-180	58.63	74.00	-15.37	44.84	NA	54.00	-9.16	Pass

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

** - Margin, dB = Measured, dB(μV/m) – Limit, dB(μV/m)

*** - Margin, dB = Calculated, dB(μV/m) – Limit, dB(μV/m)

Reference numbers of test equipment used

HL 7585	HL 3903	HL 5902	HL 4933	HL 4956	HL 3047	HL 4378	
---------	---------	---------	---------	---------	---------	---------	--

Full description is given in Appendix A.



Test specification: FCC section 15.407(b), Field strength of undesirable emissions			
Test procedure: ANSI C63.10, section 12.7.6 & 12.7.7			
Test mode: Compliance		Verdict: PASS	
Date(s): 24-May-24			
Temperature: 24.2 °C	Relative Humidity: 49 %	Air Pressure: 1009 hPa	Power: 120 VAC, 50 Hz
Remarks:			

Table 7.1.6 Restricted bands according to FCC section 15.205

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	12.29 - 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	16.42 - 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	

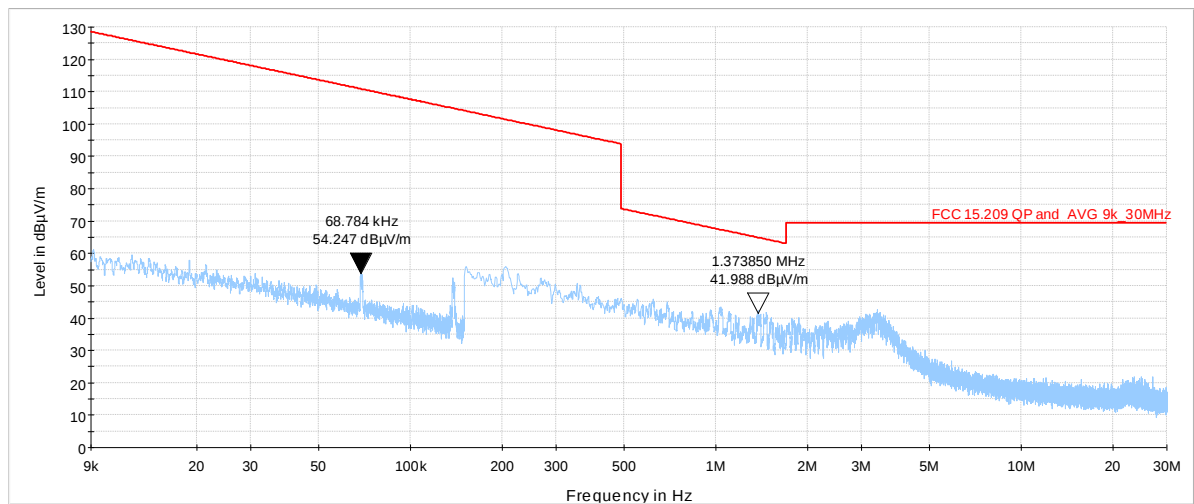


HERMON LABORATORIES

Test specification: FCC section 15.407(b), Field strength of undesirable emissions			
Test procedure: ANSI C63.10, section 12.7.6 & 12.7.7			
Test mode: Compliance		Verdict: PASS	
Date(s): 24-May-24			
Temperature: 24.2 °C	Relative Humidity: 49 %	Air Pressure: 1009 hPa	Power: 120 VAC, 50 Hz
Remarks:			

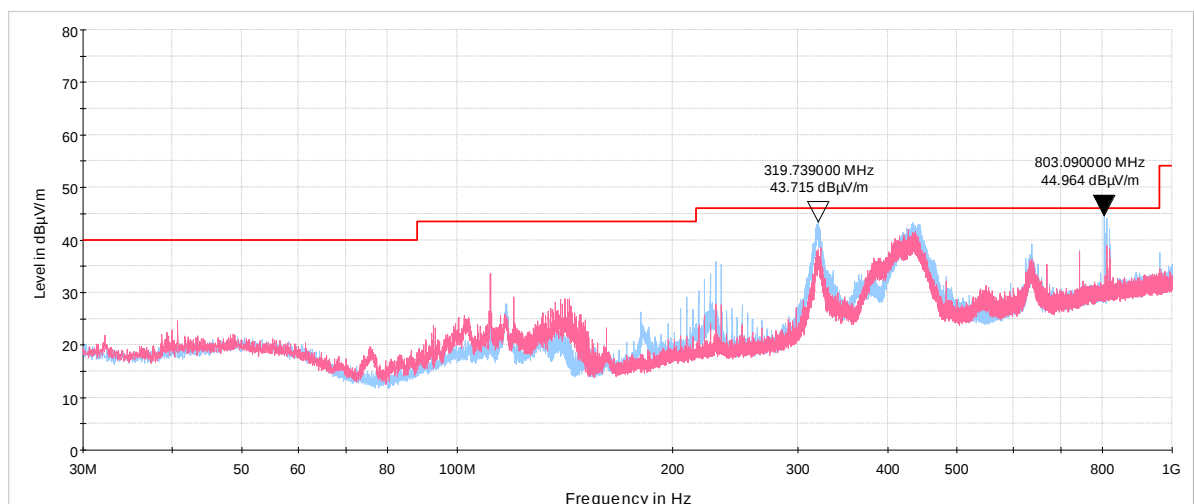
Plot 7.1.1 Radiated emission measurements from 9 kHz to 30 MHz

TEST SITE: Semi Anechoic chamber
TEST DISTANCE: 3 m



Plot 7.1.2 Radiated emission measurements from 30 MHz to 1000 MHz

TEST SITE: Semi Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



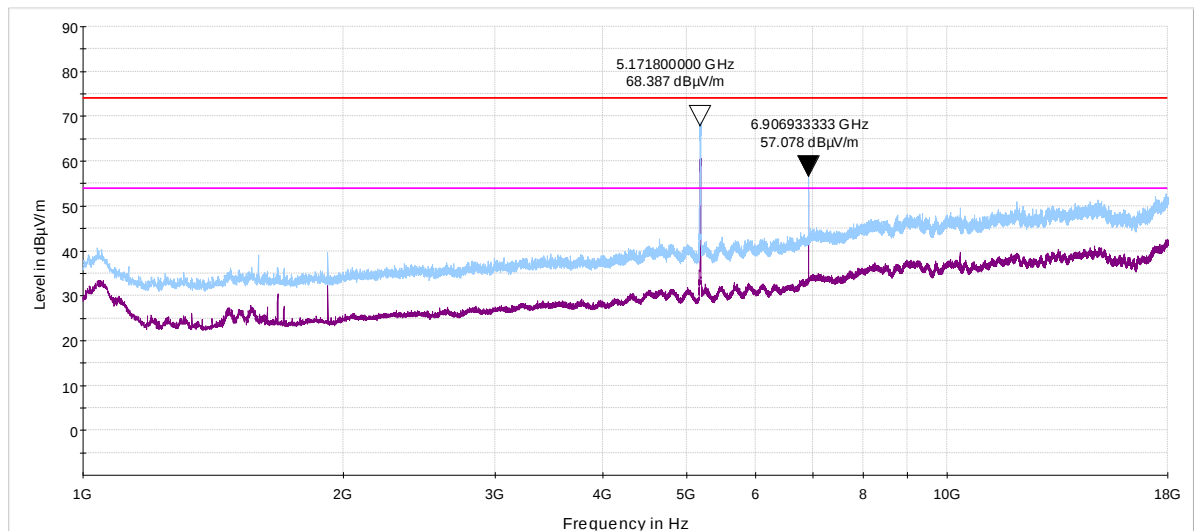


HERMON LABORATORIES

Test specification: FCC section 15.407(b), Field strength of undesirable emissions			
Test procedure: ANSI C63.10, section 12.7.6 & 12.7.7			
Test mode: Compliance		Verdict: PASS	
Date(s): 24-May-24			
Temperature: 24.2 °C	Relative Humidity: 49 %	Air Pressure: 1009 hPa	Power: 120 VAC, 50 Hz
Remarks:			

Plot 7.1.3 Radiated emission measurements from 1 to 18 GHz

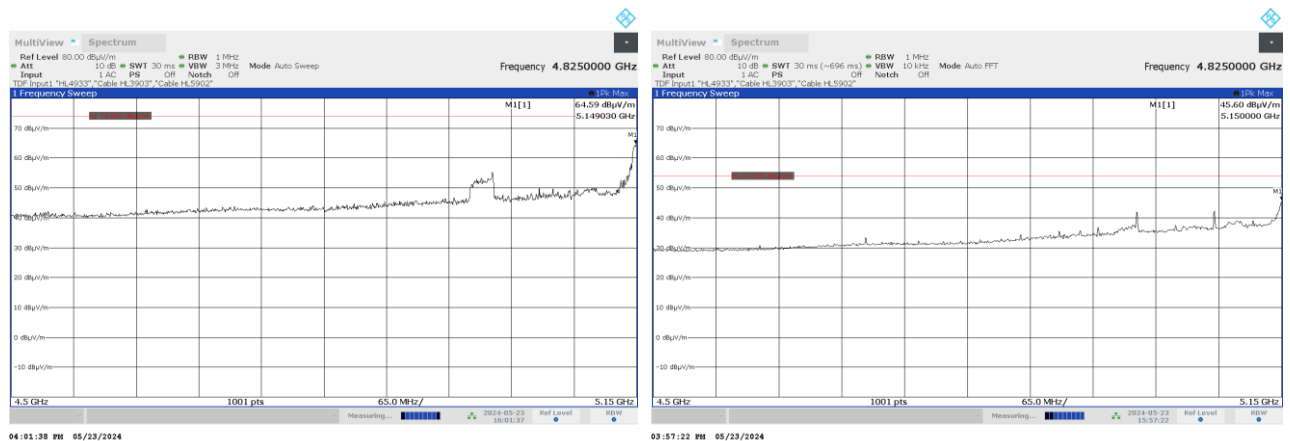
TEST SITE: Semi Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Note: The measurement was performed with stop-reject filter 4.5-6.4 GHz

Plot 7.1.4 Radiated emission measurements from 4.5 to 5.15 GHz at the carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



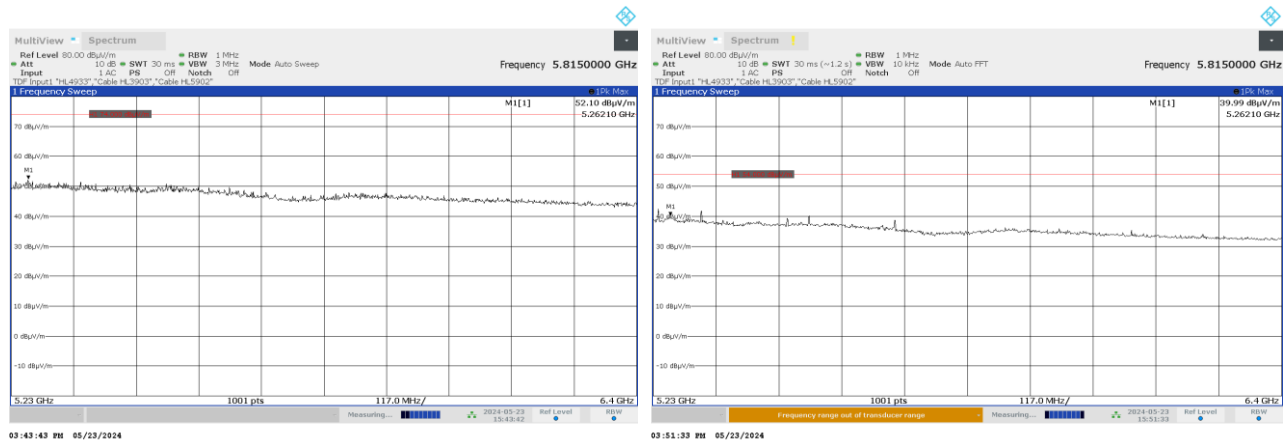


HERMON LABORATORIES

Test specification: FCC section 15.407(b), Field strength of undesirable emissions			
Test procedure: ANSI C63.10, section 12.7.6 & 12.7.7			
Test mode: Compliance		Verdict: PASS	
Date(s): 24-May-24			
Temperature: 24.2 °C	Relative Humidity: 49 %	Air Pressure: 1009 hPa	Power: 120 VAC, 50 Hz
Remarks:			

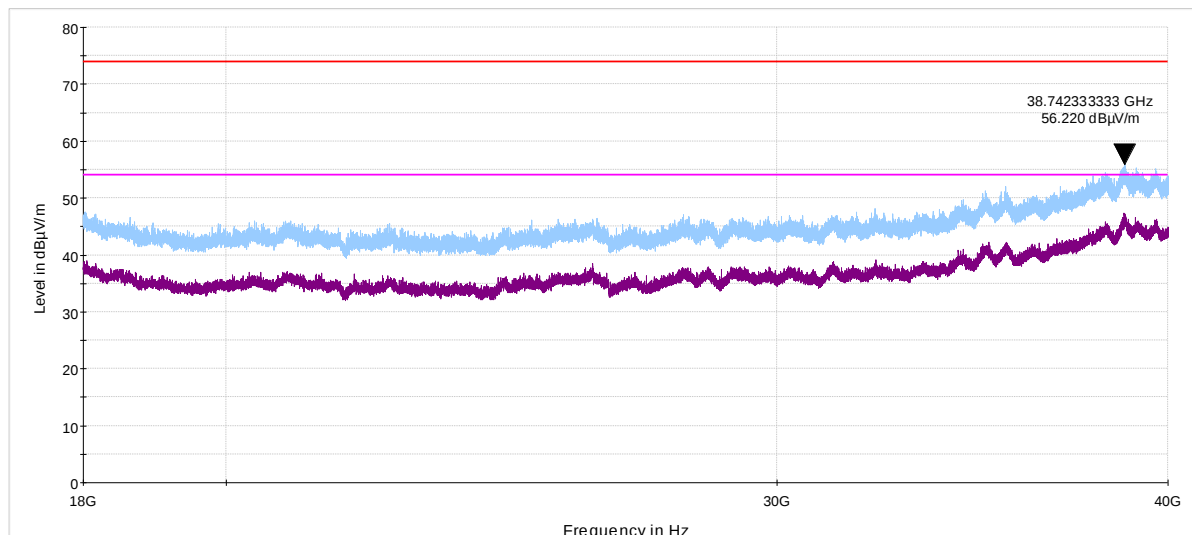
Plot 7.1.5 Radiated emission measurements from 5.23 to 6.4 GHz at the carrier frequency

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 7.1.6 Radiated emission measurements from 18 to 40 GHz at the carrier frequency

TEST SITE: SAC
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Peak



8 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
3047	AC Power Supply, 0 - 130 & 260v, 45 - 2000 Hz	BEHLMAN	150-C-202	5033	19-Nov-23	19-Nov-24
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
4378	Reject Band Filter. Pass band from 0 to 4550 and from 6400 to 18000 MHz, SMA-FM / SMA-M	Micro-Tronics	BRM5071 6-02	001	20-Jun-23	20-Jun-25
4933	Active Horn Antenna, 1 GHz to 18 GHz	COM-POWER CORPORATION	AHA-118	701046	20-Feb-24	20-Feb-25
4956	Active horn antenna, 18 to 40 GHz	COM-POWER CORPORATION	AHA-840	105004	03-Mar-24	03-Mar-25
5288	Trilog Antenna, 25 MHz - 8 GHz, 100W	Frankonia	ALX-8000E	00809	24-Mar-22	24-Mar-25
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	21-Sep-23	21-Sep-24

9 APPENDIX B Measurement uncertainties

Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements

Test description	Expanded uncertainty
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

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.

10 APPENDIX C Test facility 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

11 APPENDIX D Specification references

FCC 47CFR part 15:2022	Radio Frequency Devices.
ANSI C63.10:2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

12 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.

Antenna factor
Active Horn Antenna,
Com-Power Corporation, model: AHA-840, s/n 105004, HL 4956

Frequency, MHz	Measured antenna factor (with preamplifier), dB/m
18000	2.5
18500	0.5
19000	-1.0
19500	-2.4
20000	-2.5
20500	-2.2
21000	-2.0
21500	-2.7
22000	-3.7
22500	-3.8
23000	-3.7
23500	-5.0
24000	-4.5
24500	-5.0
25000	-4.7
25500	-4.4
26000	-4.3
26500	-5.6
27000	-4.3
27500	-4.9
28000	-5.2
28500	-4.4

Frequency, MHz	Measured antenna factor (with preamplifier), dB/m
29000	-2.7
29500	-2.6
30000	-1.4
30500	-1.5
31000	-1.0
31500	-2.6
32000	-3.3
32500	-3.3
33000	-5.1
33500	-5.2
34000	-1.5
34500	-5.4
35000	-3.3
35500	-4.2
36000	-2.8
36500	-2.6
37000	-1.0
38000	1.8
38500	2.8
39000	1.3
39500	1.3
40000	0.3

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

13 APPENDIX F Abbreviations and acronyms

A	ampere
AC	alternating current
AM	amplitude modulation
AVRG	average (detector)
BB	broad band
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
QP	quasi-peak
RE	radiated emission
RF	radio frequency
rms	root mean square
Rx	receive
s	second
T	temperature
Tx	transmit
V	volt

END OF DOCUMENT