

TEST REPORT

ACCORDING TO: FCC Part 90 Subpart I, Part 15 subpart B class B;
RSS-137 Issue 2, ICES-003 class B

FOR:

ST Engineering Telematics Wireless Ltd

Mobile transponder

Model: FP101TC

FCC ID: NTAFP101TC

IC: 4732A-FP101TC

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	EUT configuration.....	5
6.3	Transmitter characteristics	6
7	Transmitter tests according to 47CFR part 90 and RSS-137 requirements	7
7.1	Effective radiated power of carrier	7
7.2	Occupied bandwidth test	10
7.3	Emission mask test	13
7.4	Radiated spurious emission measurements.....	16
7.5	Frequency stability test.....	24
8	Unintentional emissions tests	26
8.1	Radiated emission measurements	26
9	APPENDIX A Test equipment and ancillaries used for tests	30
10	APPENDIX B Test equipment correction factors.....	31
11	APPENDIX C Measurement uncertainties	33
12	APPENDIX D Test laboratory description	34
13	APPENDIX E Specification references.....	35
14	APPENDIX F Abbreviations and acronyms.....	36

1 Applicant information

Client name: ST Engineering Telematics Wireless Ltd
Address: 26 Hamelaha street, POB 1911, Holon 5811801, Israel
Telephone: +972 3557 5700
Fax: +972 3557 5703
E-mail: itsikk@tlmw.com
Contact name: Mr. Itsik Kanner

2 Equipment under test attributes

Product name: Mobile transponder
Product type: Transceiver
Model(s): FP101TC
Serial Number: 210605364227
Hardware version: 0400
Software release: 18.24
Receipt date 04-Jun-25

3 Manufacturer information

Manufacturer name: ST Engineering Telematics Wireless Ltd
Address: 26 Hamelaha street, POB 1911, Holon 5811801, Israel
Telephone: +972 3557 5700
Fax: +972 3557 5703
E-Mail: itsikk@tlmw.com
Contact name: Mr. Itsik Kanner

4 Test details

Project ID: 144334
Location: Hermon Laboratories Ltd. 66 HaTachana str., P.O. Box 23, Binyamina 3055001, Israel
Test started: 27-Jul-25
Test completed: 30-Jul-25
Test specification(s): FCC part 90 subpart I, part 15 subpart B class B;
RSS-137 issue 2, ICES_003 class B

5 Tests summary

Test	Status
Transmitter characteristics	
FCC Section 90.205/ RSS-137 Section 6.4, Maximum output power	Pass
FCC Section 90.209/ RSS-137 Section 6.1.2, Occupied bandwidth	Pass
FCC Section 90.210/RSS-137 Section 6.5.3, Emission mask	Pass
FCC Section 90.210/RSS-137 Section 6.5, Radiated spurious emissions	Pass
FCC Section 90.213/RSS-137 Section 6.3, Frequency stability	Tested without limit
FCC Section 90.214, Transient frequency behaviour	Not required
Unintentional emissions	
FCC Section 15.107/ ICES-003 Section 5.3 Class B, Conducted emission at AC power port	Not required
FCC Section 15.109/ RSS-137 Section 6.6/ ICES-003 Section 5.5 Class B, Radiated emission	Pass
FCC Section 15.111/ ICES-003, Conducted emission at receiver antenna port	Not required

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. S. Sugatov, test engineer, EMC & Radio	27-Jul-25 – 30-Jul-25	
Reviewed by:	Mrs. S. Peysahov Sheynin, certification engineer, EMC & Radio	20-Sep-25	
Approved by:	Mr. M. Nikishin, group leader, EMC & Radio	15-Dec-25	

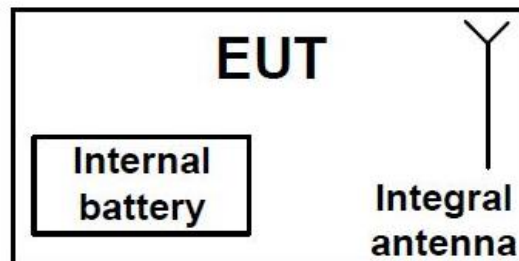
6 EUT description

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 small mobile transponder, operating at 915 MHz and powered by 3.6V Battery.

6.2 EUT configuration



6.3 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)				
Intended use		Condition of use			
	fixed	Always at a distance more than 2 m from all people			
X	mobile	Always at a distance more than 20 cm from all people			
	portable	May operate at a distance closer than 20 cm to human body			
Assigned frequency range		902-928 MHz			
Operating frequency range		915 MHz			
Maximum rated output power		At transmitter 50 Ω RF output connector			6.33 dBm
		Effective radiated power (for equipment with no RF connector)			NA
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
				X	with temporary RF connector without temporary RF connector
Antenna/s technical characteristics					
Type		Manufacturer		Model number	
Integral		Telematics Wireless Ltd.		NA	
Transmitter aggregate data rate/s		1 Mbps			
Transmitter aggregate symbol (baud) rate/s		NA			
Type of modulation		ASK			
Maximum transmitter duty cycle in normal use		15%			
Transmitter duty cycle supplied for test		100%	Tx ON time	Period	
Transmitter power source					
X	Battery	Nominal rated voltage	3.6VDC	Battery type	Lithium
	DC	Nominal rated voltage	VDC		
	AC mains	Nominal rated voltage	VAC	Frequency	Hz
Common power source for transmitter and receiver			X	yes	no

Test specification:		FCC Section 90.205/ RSS-137 Section 6.4, Maximum output power	
Test procedure:		47 CFR, Section 2.1046; TIA/EIA-603-C, Section 2.2.1	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jul-25	
Temperature: 21°C	Air Pressure: 1018 hPa	Relative Humidity: 50 %	Power: 3.6 VDC
Remarks:			

7 Transmitter tests according to 47CFR part 90 and RSS-137 requirements

7.1 Effective radiated power of carrier

7.1.1 General

This test was performed to measure effective radiated power emanated by transmitter at carrier frequency. Specification test limits are given in Table 7.1.1.

Table 7.1.1 Effective radiated power limit

Assigned frequency band, MHz	ERP	
	W	dBm
902.0 – 928.0	30	44.7

* - Equivalent field strength limit was calculated from maximum allowed ERP as follows: $E = \sqrt{30 \times P \times 1.64} / r$, where P is ERP in Watts, 1.64 is numeric gain of ideal dipole and r is antenna to EUT distance in meters

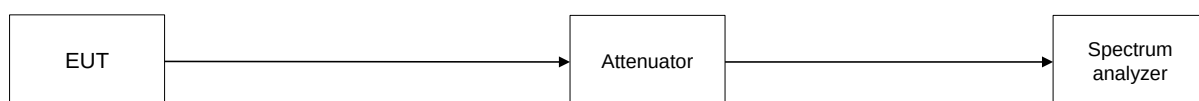
7.1.2 Test procedure

7.1.2.1 The EUT was set up as shown in Figure 7.1.1, energized and its proper operation was checked.

7.1.2.2 The EUT was adjusted to produce maximum available to the end user RF output power.

7.1.2.3 The peak output power was measured with spectrum analyzer as provided in Table 7.1.2 and associated plots.

Figure 7.1.1 Peak output power test setup





Test specification:		FCC Section 90.205/ RSS-137 Section 6.4, Maximum output power	
Test procedure:		47 CFR, Section 2.1046; TIA/EIA-603-C, Section 2.2.1	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jul-25	
Temperature: 21°C	Air Pressure: 1018 hPa	Relative Humidity: 50 %	Power: 3.6 VDC
Remarks:			

Table 7.1.2 Transmitter carrier ERP

OPERATING FREQUENCY RANGE: 902-928 MHz
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 8 MHz
 VIDEO BANDWIDTH: 50 MHz
 MODULATION: ASK
 BIT RATE: 1 Mbps

Carrier frequency, MHz	Spectrum analyzer reading*, dBm	External attenuation, dB	Cable loss, dB	EUT Ant gain, dBd	ERP, dBm	Limit, dBm	Margin, dB	Verdict
915.00	6.33	Included	Included	-2.15	4.18	44.70	-40.52	Pass

*- the maximum test result was obtained in the EUT typical configuration in 0° orientation

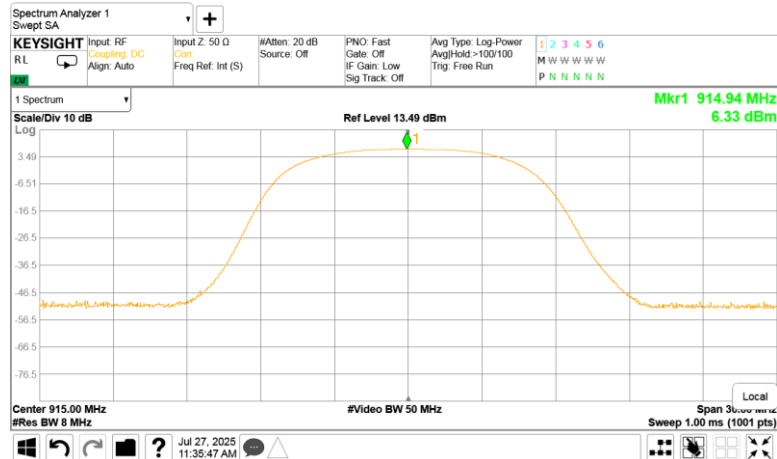
Reference numbers of test equipment used

HL 5376	HL 4136	HL 5644	HL 7546	HL 3230			
---------	---------	---------	---------	---------	--	--	--

Full description is given in Appendix A.

Test specification:		FCC Section 90.205/ RSS-137 Section 6.4, Maximum output power	
Test procedure:		47 CFR, Section 2.1046; TIA/EIA-603-C, Section 2.2.1	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jul-25	
Temperature: 21°C	Air Pressure: 1018 hPa	Relative Humidity: 50 %	Power: 3.6 VDC
Remarks:			

Plot 7.1.1 Transmitter carrier ERP at carrier frequency



Test specification:		FCC Section 90.209/ RSS-137 Section 6.1.2, Occupied bandwidth	
Test procedure:		47 CFR, Section 2.1049	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jul-25	
Temperature: 21°C	Air Pressure: 1018 hPa	Relative Humidity: 50 %	Power: 3.6 VDC
Remarks:			

7.2 Occupied bandwidth test

7.2.1 General

This test was performed to measure transmitter occupied bandwidth. Specification test limits are given in Table 7.2.1.

Table 7.2.1 Occupied bandwidth limits

Assigned frequency, MHz	Modulation envelope reference points*, dBc	Maximum allowed bandwidth, MHz
902.0 – 928.0	26	12.0

* - Modulation envelope reference points are provided in terms of attenuation below the unmodulated carrier.

7.2.2 Test procedure

7.2.2.1 The EUT was set up as shown in Figure 7.2.1, energized and its proper operation was checked.

7.2.2.2 The EUT was set to transmit the unmodulated carrier and the reference peak power level was measured.

7.2.2.3 The EUT was set to transmit the normally modulated carrier.

7.2.2.4 The transmitter occupied bandwidth was measured with spectrum analyzer as a frequency delta between the reference points on modulation envelope and provided in Table 7.2.2 and the associated plots.

Figure 7.2.1 Occupied bandwidth test setup





HERMON LABORATORIES

Test specification:		FCC Section 90.209/ RSS-137 Section 6.1.2, Occupied bandwidth	
Test procedure:		47 CFR, Section 2.1049	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jul-25	
Temperature: 21°C	Air Pressure: 1018 hPa	Relative Humidity: 50 %	Power: 3.6 VDC
Remarks:			

Table 7.2.2 Occupied bandwidth test results

DETECTOR USED: Peak hold
 RESOLUTION BANDWIDTH: 100 kHz
 VIDEO BANDWIDTH: 300 KHz
 MODULATION ENVELOPE REFERENCE POINTS: 26 dBc
 MODULATION: ASK
 BIT RATE: 1 Mbps

Carrier frequency, MHz	Occupied bandwidth, MHz	Limit, MHz	Margin, MHz	Verdict
915.0	5.08	12.00	-6.92	Pass

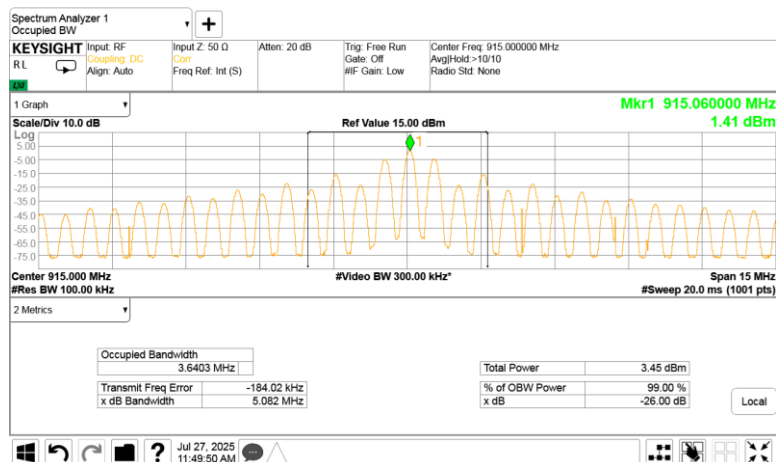
Reference numbers of test equipment used

HL 5376	HL 4136	HL 5644	HL 7546	HL 3230			
---------	---------	---------	---------	---------	--	--	--

Full description is given in Appendix A.

Test specification:		FCC Section 90.209/ RSS-137 Section 6.1.2, Occupied bandwidth	
Test procedure:		47 CFR, Section 2.1049	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jul-25	
Temperature: 21°C	Air Pressure: 1018 hPa	Relative Humidity: 50 %	Power: 3.6 VDC
Remarks:			

Plot 7.2.1 Occupied bandwidth test result at carrier frequency



Test specification:		FCC Section 90.210/RSS-137 Section 6.5.3, Emission mask	
Test procedure:		47 CFR, Sections 2.1051, 2.1047 and 90.210(m); TIA/EIA-603-A, Section 2.2.13	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jul-25	
Temperature: 21°C	Air Pressure: 1018 hPa	Relative Humidity: 50 %	Power: 3.6 VDC
Remarks:			

7.3 Emission mask test

7.3.1 General

This test was performed to measure emission mask at RF antenna connector. Specification test limits are given in Table 7.3.1. The test results are provided in the associated plots.

Table 7.3.1 Emission mask limits

Frequency displacement from carrier	Attenuation below carrier, dBc
FCC section 90.210 emission mask K/RSS-137 section 6.5.3 emission mask C	
909.75 – 921.75 MHz	0
Below 909.75 MHz	55+10logP(W)
Above 921.75 MHz	55+10logP(W)

* - linearly increase with frequency

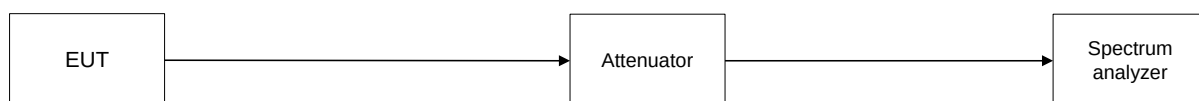
** - emission mask includes carrier modulation envelope within ± 250 % of the authorized bandwidth; the frequency range removed beyond ± 250 % of the authorized bandwidth from carrier was investigated as spurious emission

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 emission mask was measured with spectrum analyzer as provided in the associated plots.

Figure 7.3.1 Emission mask test setup





Test specification:	FCC Section 90.210/RSS-137 Section 6.5.3, Emission mask		
Test procedure:	47 CFR, Sections 2.1051, 2.1047 and 90.210(m); TIA/EIA-603-A, Section 2.2.13		
Test mode:	Compliance	Verdict: PASS	
Date(s):	27-Jul-25		
Temperature: 21°C	Air Pressure: 1018 hPa	Relative Humidity: 50 %	Power: 3.6 VDC
Remarks:			

Table 7.3.2 Emission mask test results

ASSIGNED FREQUENCY RANGE: 902.0 – 928.0 MHz
 DETECTOR USED: Peak
 MODULATION: ASK
 BIT RATE: 1 Mbps
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum

Frequency, MHz	Emission level, dBm	Limit, dBm	Margin, dB*	RBW, kHz	Verdict
Carrier frequency 915.00 MHz					
909.681	-39.18	-25.0	-14.18	100	Pass
922.055	-44.56	-25.0	-15.56	100	Pass

*- Margin = Emission level – limit.

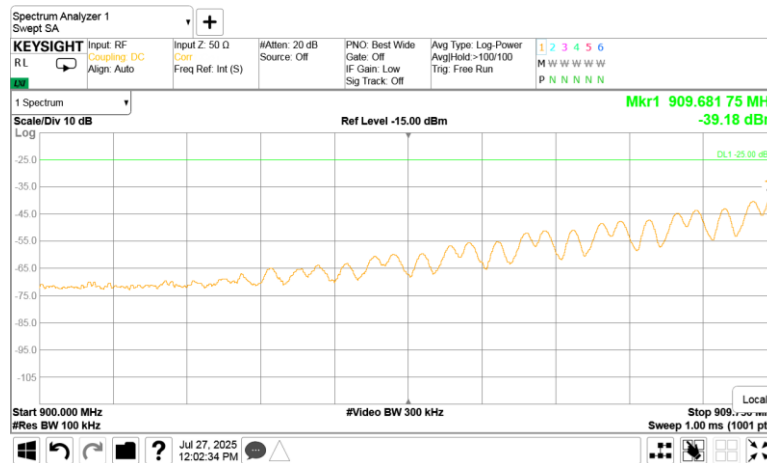
Reference numbers of test equipment used

HL 5376	HL 4136	HL 5644	HL 7546	HL 3230			
---------	---------	---------	---------	---------	--	--	--

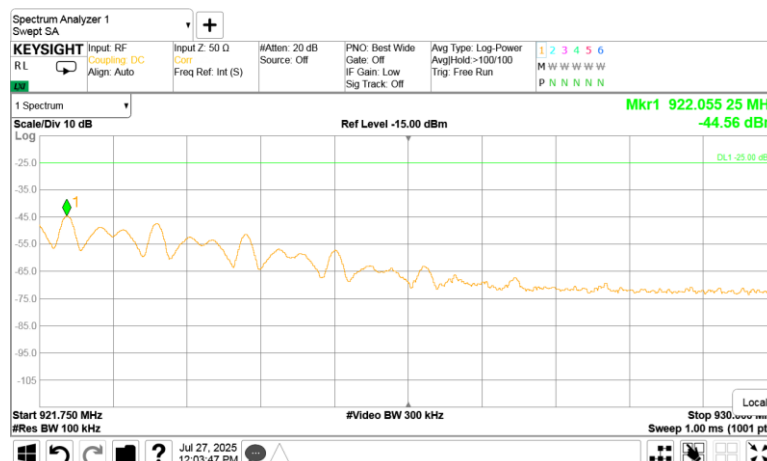
Full description is given in Appendix A.

Test specification:		FCC Section 90.210/RSS-137 Section 6.5.3, Emission mask	
Test procedure:		47 CFR, Sections 2.1051, 2.1047 and 90.210(m); TIA/EIA-603-A, Section 2.2.13	
Test mode:		Compliance	Verdict: PASS
Date(s):		27-Jul-25	
Temperature: 21°C	Air Pressure: 1018 hPa	Relative Humidity: 50 %	Power: 3.6 VDC
Remarks:			

Plot 7.3.1 Band edge emission test results at carrier frequency, low band edge



Plot 7.3.2 Band edge emission test results at carrier frequency, high band edge



Test specification:		FCC Section 90.210/RSS-137 Section 6.5, Radiated spurious emissions	
Test procedure:		47 CFR, Sections 2.1053 and 90.210(m); TIA/EIA-603-A, Section 2.2.12	
Test mode:		Compliance	Verdict: PASS
Date(s):		29-Jul-25	
Temperature: 21°C	Air Pressure: 1018 hPa	Relative Humidity: 50 %	Power: 3.6 VDC
Remarks:			

7.4 Radiated spurious emission measurements

7.4.1 General

This test was performed to measure radiated spurious emissions from the EUT. Specification test limits are given in Table 7.4.1.

Table 7.4.1 Radiated spurious emission test limits

Frequency, MHz	Attenuation below carrier, dBc	ERP of spurious, dBm	Equivalent field strength limit @ 3m, dB(μV/m)**
0.009 – 10th harmonic*	55+10logP**	-25	72.4

* - Excluding the in band emission within ± 250 % of the authorized bandwidth from the carrier

** - P is transmitter output power in Watts

*** - Equivalent field strength limit was calculated from maximum allowed ERP of spurious as follows:
 $E = \sqrt{30 \times P \times 1.64} / r$, where P is ERP in Watts, 1.64 is numeric gain of ideal dipole and r is antenna to EUT distance in meters

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

7.4.2.1 The EUT was set up as shown in Figure 7.4.1, energized and the performance check was conducted.

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

7.4.2.3 The worst test results (the lowest margins) were recorded in Table 7.4.2 and shown in the associated plots.

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

7.4.3.1 The EUT was set up as shown in Figure 7.4.2, energized and the performance check was conducted.

7.4.3.2 The specified frequency range was investigated with antenna connected to spectrum analyzer. To find maximum radiation the turntable was rotated 360° and the measuring antenna height was swept from 1 to 4 m in both, vertical and horizontal, polarizations.

7.4.3.3 The worst test results (the lowest margins) were recorded in Table 7.4.2 and shown in the associated plots.

7.4.4 Test procedure for substitution ERP measurements of spurious

7.4.4.1 The test equipment was set up as shown in Figure 7.4.3 and energized.

7.4.4.2 RF signal generator was set to the frequency of investigated spurious emission and the RF output level was preliminary adjusted to produce the same field strength as it was measured from the EUT.

7.4.4.3 The test antenna height was swept from 1 to 4 m to find maximum emission from substitution antenna and RF signal generator output was fine adjusted to produce the same field strength as it was measured from the EUT.

7.4.4.4 The above procedure was performed in both, horizontal and vertical, polarizations of the test and substitution antennas.

7.4.4.5 The ERP of spurious emissions was calculated as a sum of signal generator output power in dBm and antenna gain in dBd reduced by cable loss in dB.

7.4.4.6 The above procedure was repeated at the rest of investigated frequencies.

7.4.4.7 The worst test results (the lowest margins) were recorded in Table 7.4.3 and shown in the associated plots.

Test specification:		FCC Section 90.210/RSS-137 Section 6.5, Radiated spurious emissions	
Test procedure:		47 CFR, Sections 2.1053 and 90.210(m); TIA/EIA-603-A, Section 2.2.12	
Test mode:		Compliance	Verdict: PASS
Date(s):		29-Jul-25	
Temperature: 21°C	Air Pressure: 1018 hPa	Relative Humidity: 50 %	Power: 3.6 VDC
Remarks:			

Figure 7.4.1 Setup for spurious emission field strength measurements in 9 kHz to 30 MHz band

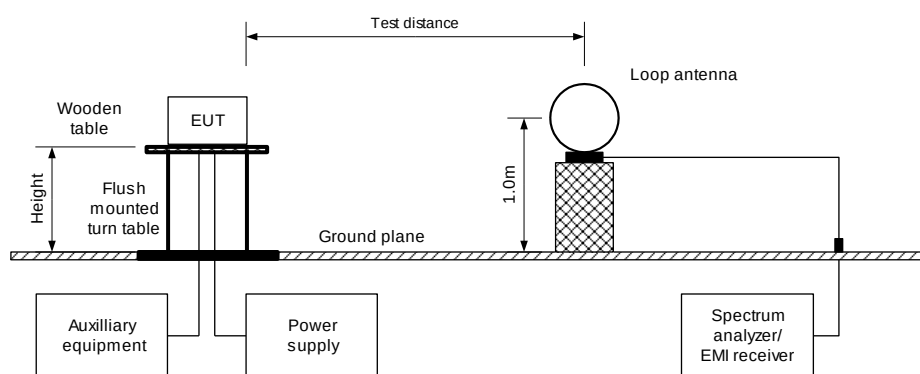
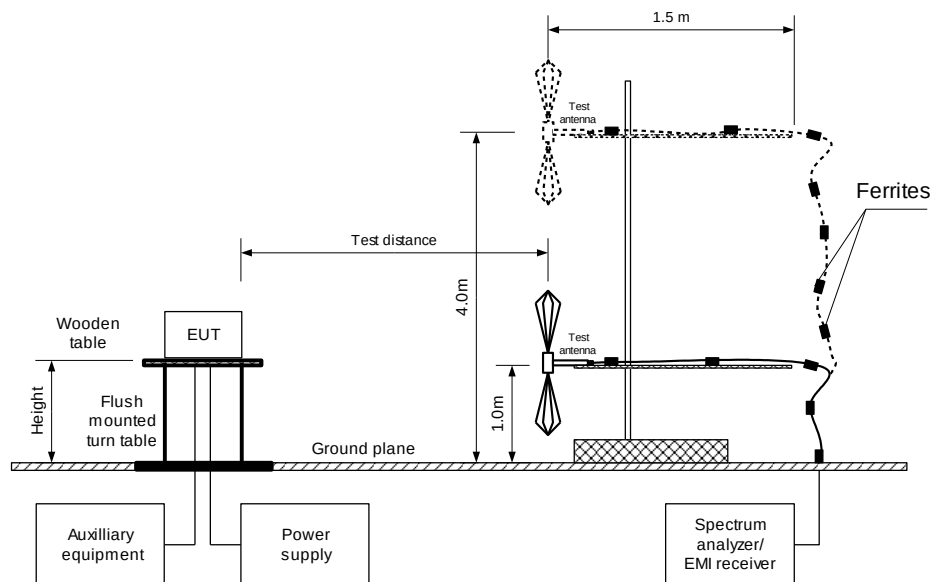
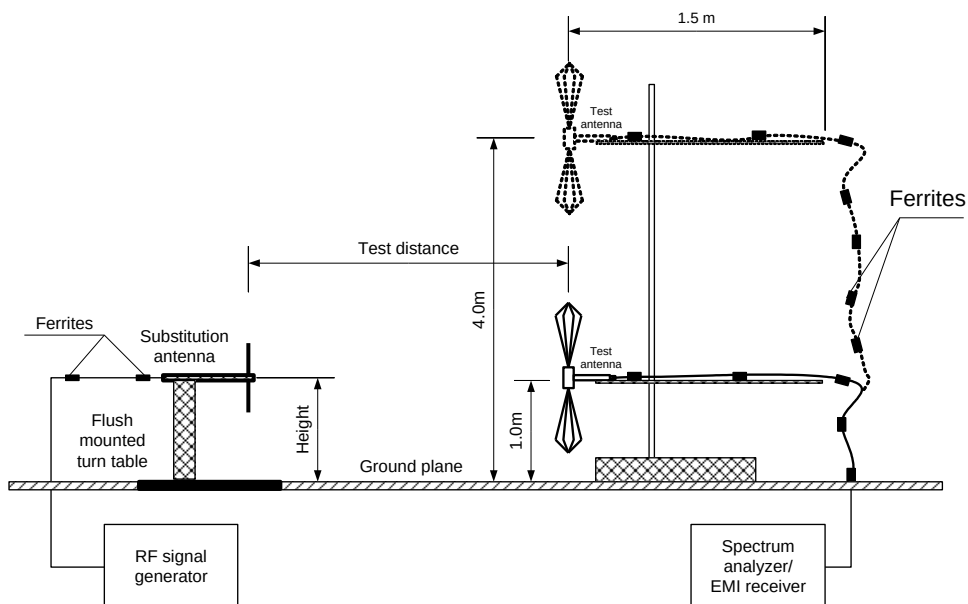


Figure 7.4.2 Setup for spurious emission field strength measurements above 30 MHz



Test specification:	FCC Section 90.210/RSS-137 Section 6.5, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053 and 90.210(m); TIA/EIA-603-A, Section 2.2.12		
Test mode:	Compliance	Verdict: PASS	
Date(s):	29-Jul-25		
Temperature: 21°C	Air Pressure: 1018 hPa	Relative Humidity: 50 %	Power: 3.6 VDC
Remarks:			

Figure 7.4.3 Setup for substitution ERP measurements of spurious





Test specification: FCC Section 90.210/RSS-137 Section 6.5, Radiated spurious emissions			
Test procedure: 47 CFR, Sections 2.1053 and 90.210(m); TIA/EIA-603-A, Section 2.2.12			
Test mode:	Compliance	Verdict: PASS	
Date(s):	29-Jul-25		
Temperature: 21°C	Air Pressure: 1018 hPa	Relative Humidity: 50 %	Power: 3.6 VDC
Remarks:			

Table 7.4.2 Spurious emission field strength test results

ASSIGNED FREQUENCY RANGE: 902.0 – 928.0 MHz
 TEST DISTANCE: 3 m
 TEST SITE: Semi anechoic chamber
 EUT HEIGHT: 1.5 m
 INVESTIGATED FREQUENCY RANGE: 0.009 – 9500 MHz
 DETECTOR USED: Peak
 VIDEO BANDWIDTH: > Resolution bandwidth
 TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)
 Biconilog (30 MHz – 1000 MHz)
 Double ridged guide (above 1000 MHz)
 MODULATION: ASK
 BIT RATE: 1 Mbps
 TRANSMITTER OUTPUT POWER: Maximum

Frequency, MHz	Field strength, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*	RBW, kHz	Antenna polarization	Antenna height, m	Turn-table position**, degrees
Carrier frequency 915.0 MHz							
1830.070	59.70	72.38	-12.68	1000	Vertical	1.95	-163
2745.228	61.03	72.38	-11.35	1000	Vertical	1.73	-100
5490.017	56.24	72.38	-16.14	1000	Horizontal	1.35	18
6405.282	51.60	72.38	-20.78	1000	Horizontal	1.39	50

*- Margin = Field strength of spurious – calculated field strength limit.

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

Table 7.4.3 Substitution ERP of spurious test results

ASSIGNED FREQUENCY RANGE: 902.0 – 928.0 MHz
 TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 SUBSTITUTION ANTENNA HEIGHT: 1.5 m
 DETECTOR USED: Peak
 VIDEO BANDWIDTH: > Resolution bandwidth
 SUBSTITUTION ANTENNA TYPE: Double ridged guide (above 1000 MHz)

Frequency, MHz	Field strength, dB(μV/m)	RBW, kHz	Antenna polarization	RF generator output, dBm	Ant gain, dBd	Cable loss, dB	ERP, dBm	Limit, dBm	Margin, dB*	Verdict
1830.070	59.70	1000	Vertical	-55.35	7.52	1.93	-49.76	-25.00	-24.76	Pass
2745.228	61.03	1000	Vertical	-53.75	8.35	2.50	-47.90	-25.00	-22.90	Pass
5490.017	56.24	1000	Horizontal	-46.75	8.27	3.39	-41.87	-25.00	-16.87	Pass
6405.282	51.60	1000	Horizontal	-48.95	8.21	3.49	-44.23	-25.00	-19.23	Pass

*- Margin = Spurious emission – specification limit.

Reference numbers of test equipment used

HL 7585	HL 5288	HL3903	HL5902	HL4933	HL0446	HL4339	HL4474
HL5673	HL5371						

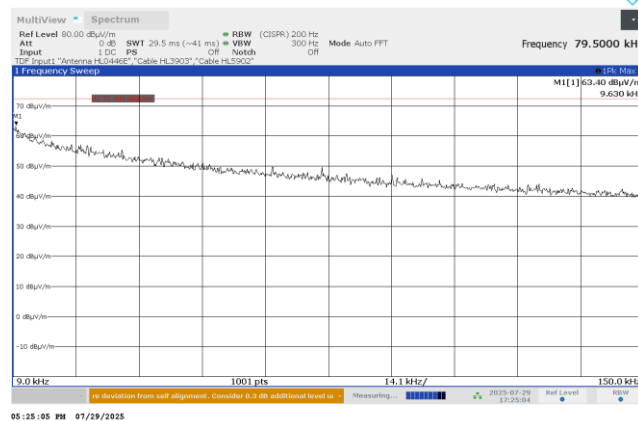
Full description is given in Appendix A.

Test specification:		FCC Section 90.210/RSS-137 Section 6.5, Radiated spurious emissions	
Test procedure:		47 CFR, Sections 2.1053 and 90.210(m); TIA/EIA-603-A, Section 2.2.12	
Test mode:		Compliance	Verdict: PASS
Date(s):		29-Jul-25	
Temperature: 21°C	Air Pressure: 1018 hPa	Relative Humidity: 50 %	Power: 3.6 VDC
Remarks:			

Plot 7.4.1 Radiated emission measurements in 9 - 150 kHz range

TEST SITE:
TEST DISTANCE:

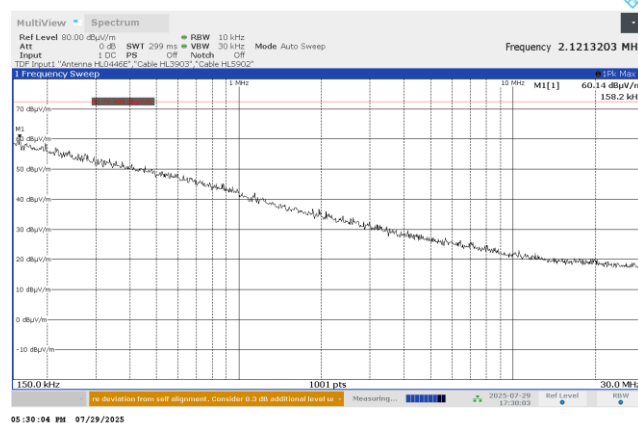
Semi anechoic chamber
3 m



Plot 7.4.2 Radiated emission measurements in 0.15 - 30 MHz range

TEST SITE:
TEST DISTANCE:

Semi anechoic chamber
3 m



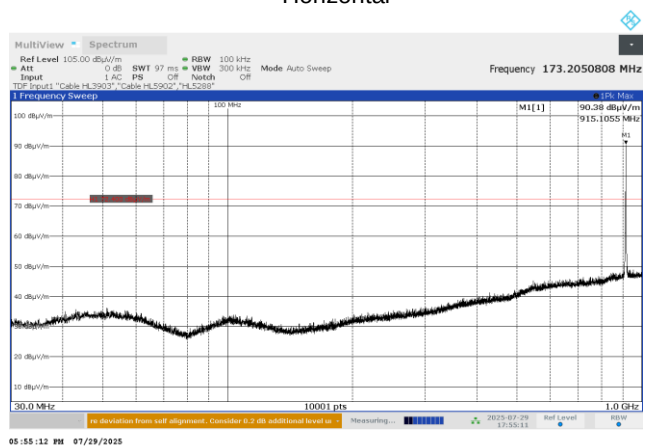
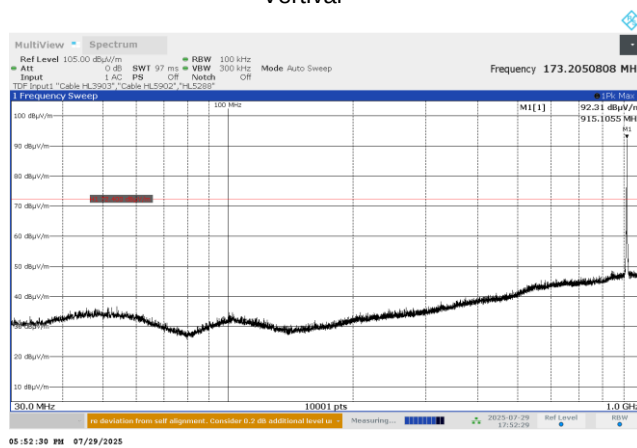
Test specification: FCC Section 90.210/RSS-137 Section 6.5, Radiated spurious emissions	
Test procedure: 47 CFR, Sections 2.1053 and 90.210(m); TIA/EIA-603-A, Section 2.2.12	
Test mode: Compliance	Verdict: PASS
Date(s): 29-Jul-25	
Temperature: 21°C	Air Pressure: 1018 hPa
	Relative Humidity: 50 %
	Power: 3.6 VDC
Remarks:	

Plot 7.4.3 Radiated emission measurements in 30 - 1000 MHz range

TEST SITE:
ANTENNA POLARIZATION:
TEST DISTANCE:
Vertical

Semi anechoic chamber
Vertical and Horizontal
3 m

Horizontal



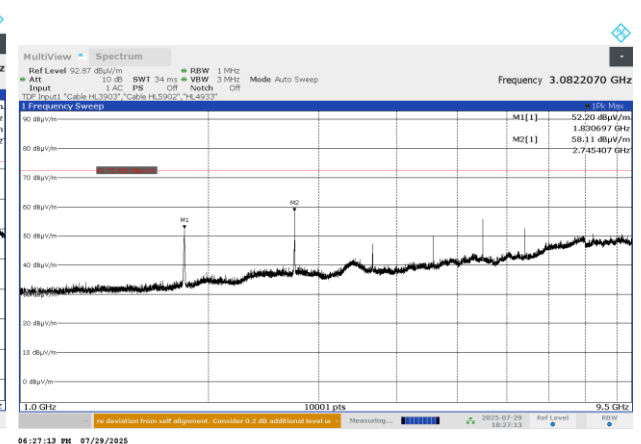
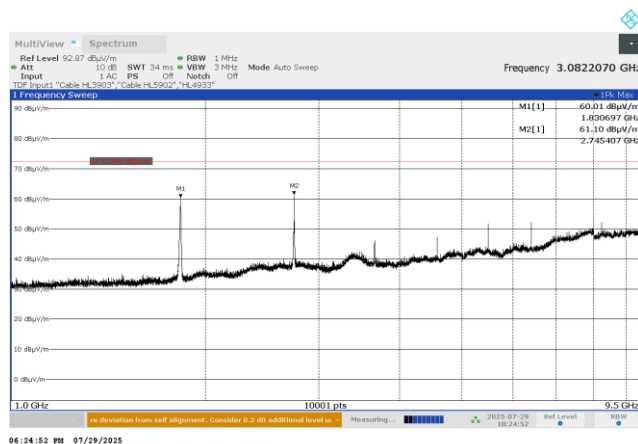
Marker M1 is the carrier.

Plot 7.4.4 Radiated emission measurements in 1000 – 9500 MHz range

TEST SITE:
ANTENNA POLARIZATION:
TEST DISTANCE:
Vertical

Semi anechoic chamber
Vertical and Horizontal
3 m

Horizontal



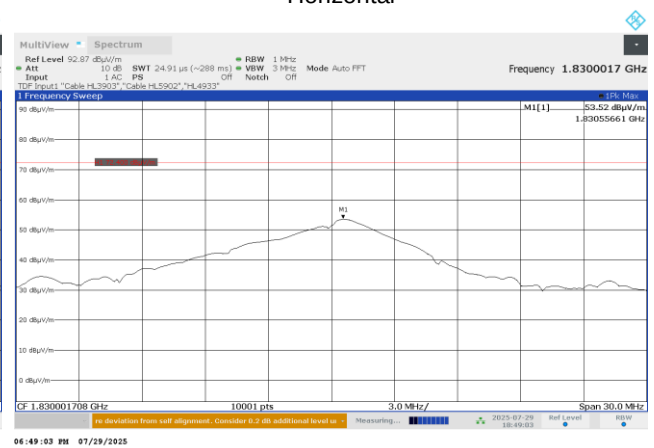
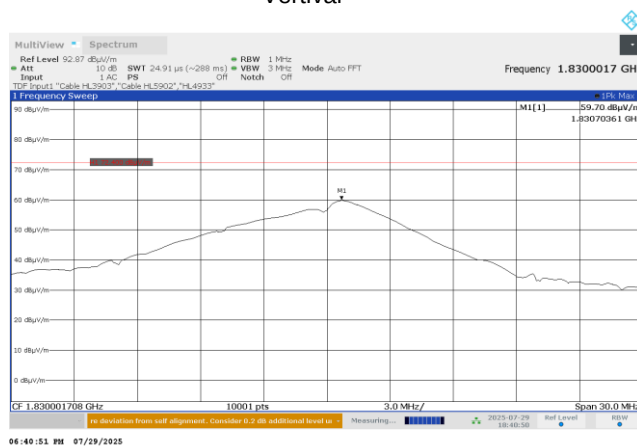
Test specification: FCC Section 90.210/RSS-137 Section 6.5, Radiated spurious emissions	
Test procedure: 47 CFR, Sections 2.1053 and 90.210(m); TIA/EIA-603-A, Section 2.2.12	
Test mode: Compliance	Verdict: PASS
Date(s): 29-Jul-25	
Temperature: 21°C	Air Pressure: 1018 hPa
	Relative Humidity: 50 %
	Power: 3.6 VDC
Remarks:	

Plot 7.4.5 Radiated emission measurements at the 2nd harmonic

TEST SITE:
ANTENNA POLARIZATION:
TEST DISTANCE:
Vertical

Semi anechoic chamber
Vertical and Horizontal
3 m

Horizontal

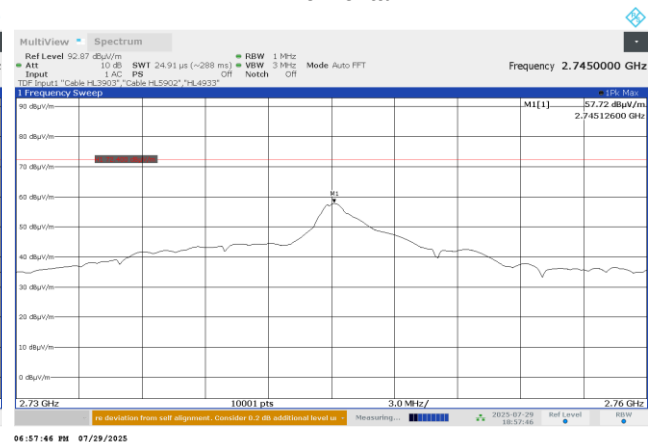
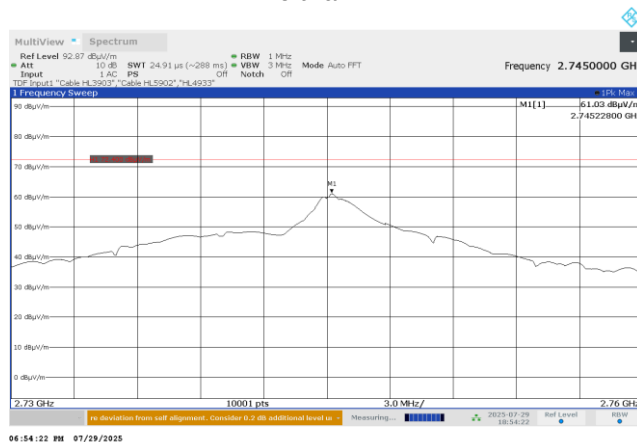


Plot 7.4.6 Radiated emission measurements at the 3rd harmonic

TEST SITE:
ANTENNA POLARIZATION:
TEST DISTANCE:
Vertical

Semi anechoic chamber
Vertical and horizontal
3 m

Horizontal



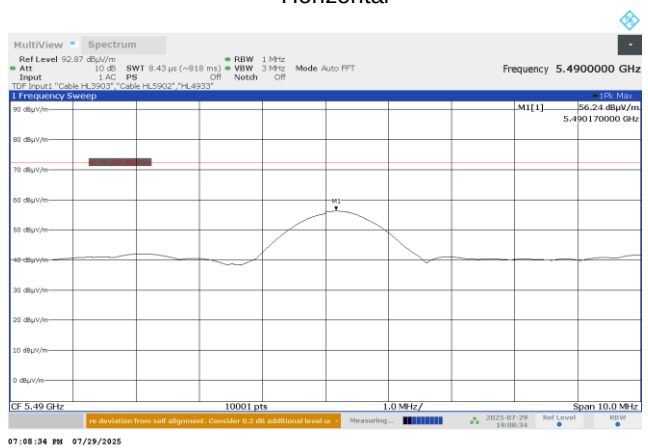
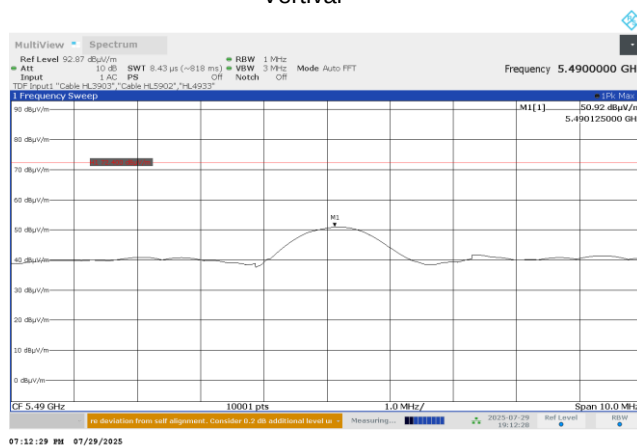
Test specification:		FCC Section 90.210/RSS-137 Section 6.5, Radiated spurious emissions	
Test procedure:		47 CFR, Sections 2.1053 and 90.210(m); TIA/EIA-603-A, Section 2.2.12	
Test mode:		Compliance	Verdict: PASS
Date(s):		29-Jul-25	
Temperature: 21°C	Air Pressure: 1018 hPa	Relative Humidity: 50 %	Power: 3.6 VDC
Remarks:			

Plot 7.4.7 Radiated emission measurements at the 6th harmonic

TEST SITE:
ANTENNA POLARIZATION:
TEST DISTANCE:
Vertical

Semi anechoic chamber
Vertical and Horizontal
3 m

Horizontal

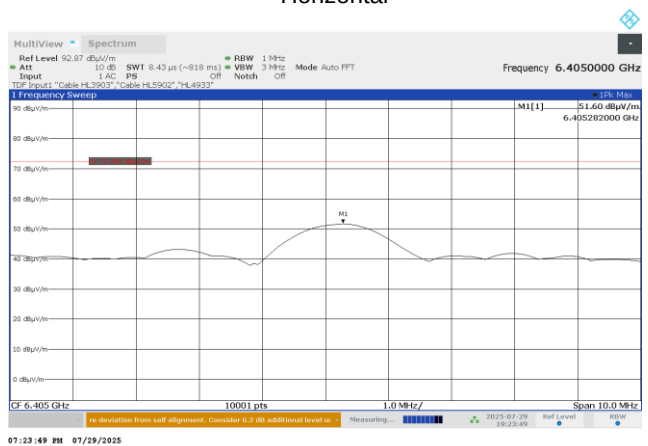
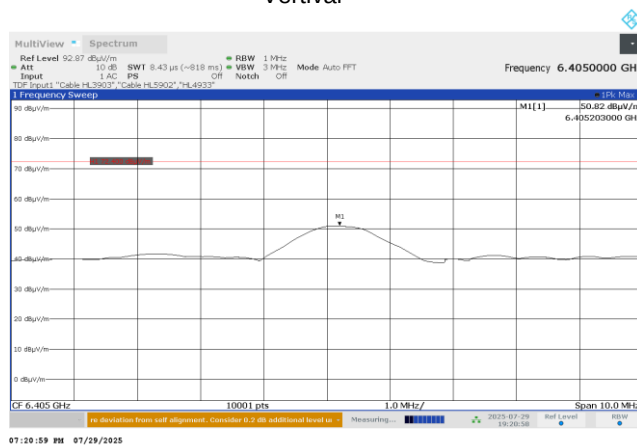


Plot 7.4.8 Radiated emission measurements at the 7th harmonic

TEST SITE:
ANTENNA POLARIZATION:
TEST DISTANCE:
Vertical

Semi anechoic chamber
Vertical and Horizontal
3 m

Horizontal



Test specification:	FCC Section 90.213/RSS-137 Section 6.3, Frequency stability		
Test procedure:	47 CFR, Section 2.1055; TIA/EIA-603-A Section 2.2.2		
Test mode:	Compliance	Verdict: PASS	
Date(s):	28-Jul-25		
Temperature: 21°C	Air Pressure: 1018 hPa	Relative Humidity: 50 %	Power: 3.6 VDC
Remarks:			

7.5 Frequency stability test

7.5.1 General

This test was performed to measure frequency stability of transmitter RF carrier. Specification test limits are given in Table 7.5.1. The test results are provided in Table 7.5.2.

Table 7.5.1 Frequency stability limits

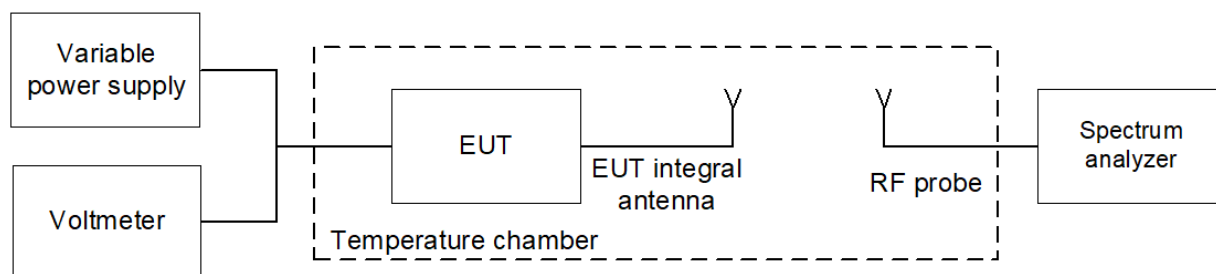
Assigned frequency, MHz	Maximum allowed frequency displacement	
	ppm	Hz
915	2.5	2287.5*

* - Limit for information only, the EUT is a mobile transponder.

7.5.2 Test procedure

- 7.5.2.1** The EUT was set up as shown in Figure 7.5.1, energized and its proper operation was checked.
- 7.5.2.2** The EUT power was turned off. Temperature within test chamber was set to +30°C and a period of time sufficient to stabilize all of the oscillator circuit components was allowed.
- 7.5.2.3** The EUT was powered on and carrier frequency was measured at start up moment and then every minute until frequency had been stabilized or 10 minutes elapsed whichever reached the last. The EUT was powered off.
- 7.5.2.4** The above procedure was repeated at 0°C and at the lowest test temperature.
- 7.5.2.5** The EUT was powered on and carrier frequency was measured at start up moment and at the end of stabilization period at the rest of test temperatures and voltages. The EUT was powered off.
- 7.5.2.6** Frequency displacement was calculated and compared with the limit as provided in Table 7.5.2.

Figure 7.5.1 Frequency stability test setup





Test specification:	FCC Section 90.213/RSS-137 Section 6.3, Frequency stability		
Test procedure:	47 CFR, Section 2.1055; TIA/EIA-603-A Section 2.2.2		
Test mode:	Compliance	Verdict: PASS	
Date(s):	28-Jul-25		
Temperature: 21°C	Air Pressure: 1018 hPa	Relative Humidity: 50 %	Power: 3.6 VDC
Remarks:			

Table 7.5.2 Frequency stability test results

OPERATING FREQUENCY: 915 MHz
 NOMINAL POWER VOLTAGE: 3.6 VDC
 TEMPERATURE STABILIZATION PERIOD: 20 min
 POWER DURING TEMPERATURE TRANSITION: Off
 SPECTRUM ANALYZER MODE: Counter
 RESOLUTION BANDWIDTH: 100Hz
 VIDEO BANDWIDTH: 100Hz
 MODULATION: Unmodulated

Temp., °C	Voltage, V	Frequency, MHz							Max frequency drift, Hz		Limit, Hz	Margin, Hz
		Start up	1 st min	2 nd min	3 rd min	4 th min	5 th min	10 th min	Positive	Negative		
-30	nominal	914.914218	914.918929	914.918787	914.919555	914.919893	914.919851	914.919934	NA	135.00	2287.5**	NA
-20	nominal	914.955282	NA	NA	NA	NA	NA	914.960749	NA	98.50		NA
-10	nominal	914.990937	NA	NA	NA	NA	NA	914.996113	NA	62.85		NA
0	nominal	915.019502	915.021341	915.021973	915.022362	915.022627	915.022826	915.023340	NA	32.44		NA
10	nominal	915.041292	NA	NA	NA	NA	NA	915.043633	NA	12.49		NA
20	+15%***	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
20	nominal	915.055694	NA	NA	NA	NA	NA	915.053784*	1.91	NA		NA
20	-15%	915.037952	NA	NA	NA	NA	NA	915.037431	NA	16.35		NA
30	nominal	915.055632	915.055584	915.055584	915.055618	915.055669	915.055716	915.055898	2.11	NA		NA
40	nominal	915.051421	NA	NA	NA	NA	NA	915.049312	NA	4.47		NA
50	nominal	915.036239	NA	NA	NA	NA	NA	915.032001	NA	21.78		NA

* - Reference frequency.

** - Limit for information only, the EUT is a mobile transponder.

*** - Voltage level +15% is not acceptable because the battery isn't rechargeable. Voltage 3.6V is maximal voltage for this device as declared by client.

Reference numbers of test equipment used

HL 5376	HL 7546	HL 5933	HL 5391	HL 3230			
---------	---------	---------	---------	---------	--	--	--

Full description is given in Appendix A.

Test specification:		ICES-003, Section 5.5 Class B, Radiated disturbance measurements	
Test procedure:		CAN/CSA-CEI/IEC CISPR 22, Section 6	
Test mode:		Compliance	Verdict: PASS
Date & Time:		29-Jul-25	
Temperature: 21°C	Air Pressure: 1018 hPa	Relative Humidity: 50 %	Power Supply: Battery
Remarks:			

8 Unintentional emissions tests

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: $\text{Lim}_{S2} = \text{Lim}_{S1} + 20 \log(S1/S2)$, where $S1$ and $S2$ – standard defined and test distance respectively in meters.

8.1.2 Test procedure for measurements in semi-anechoic chamber

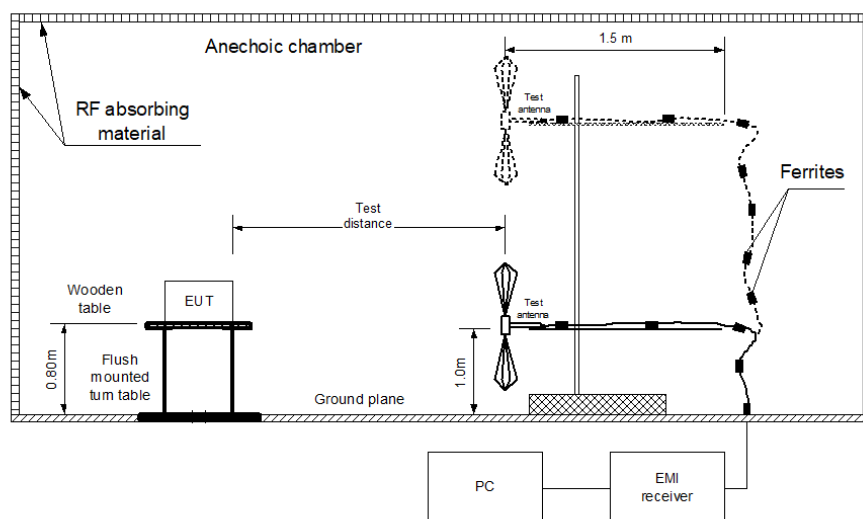
8.1.2.1 The EUT was set up as shown in Figure 8.1.1 and associated photograph/s, energized and the performance check was conducted.

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:		ICES-003, Section 5.5 Class B, Radiated disturbance measurements	
Test procedure:		CAN/CSA-CEI/IEC CISPR 22, Section 6	
Test mode:		Compliance	Verdict: PASS
Date & Time:		29-Jul-25	
Temperature: 21°C	Air Pressure: 1018 hPa	Relative Humidity: 50 %	Power Supply: Battery
Remarks:			

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





Test specification:		ICES-003, Section 5.5 Class B, Radiated disturbance measurements	
Test procedure:		CAN/CSA-CEI/IEC CISPR 22, Section 6	
Test mode:		Compliance	Verdict: PASS
Date & Time:		29-Jul-25	
Temperature: 21°C	Air Pressure: 1018 hPa	Relative Humidity: 50 %	Power Supply: Battery
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: 120 kHz

Resolution Bandwidth:					120 kHz			
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								

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

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										

*- Margin = Measured emission - specification limit.

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

Reference numbers of test equipment used

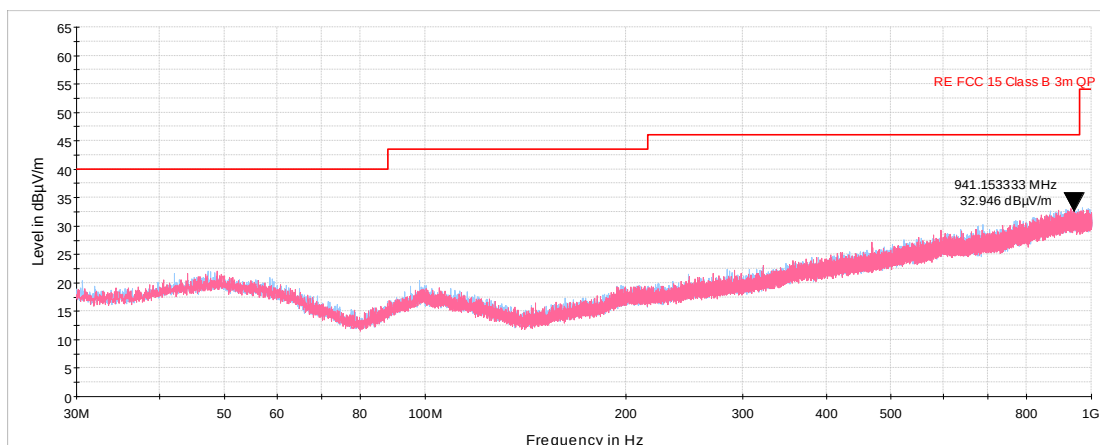
HL7585	HL5288	HL3903	HL5902	HL4933			
--------	--------	--------	--------	--------	--	--	--

Full description is given in Appendix A.

Test specification: ICES-003, Section 5.5 Class B, Radiated disturbance measurements			
Test procedure: CAN/CSA-CEI/IEC CISPR 22, Section 6			
Test mode: Compliance		Verdict: PASS	
Date & Time: 29-Jul-25			
Temperature: 21°C	Air Pressure: 1018 hPa	Relative Humidity: 50 %	Power Supply: Battery
Remarks:			

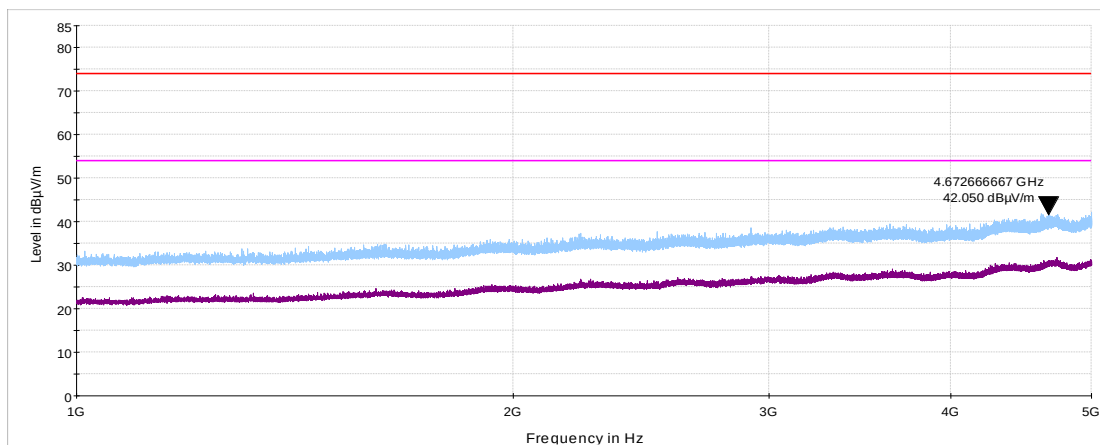
Plot 8.1.1 Radiated emission measurements in 30 - 1000 MHz range, vertical and horizontal antenna polarization

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



Plot 8.1.2 Radiated emission measurements in 1000 MHz – 5000 MHz, vertical and horizontal antenna polarization

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



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	18-Feb-25	18-Feb-26
3230	Multimeter	Fluke	115C	94173028	14-Aug-24	14-Aug-25
3903	Microwave Cable Assembly, 40.0 GHz, 1.5 m, SMA/SMA	Huber-Suhner	SUCOFLE X 102A	1226/2A	10-Jun-25	10-Jun-26
4136	Shield Box	TESCOM CO., LTD	TC-5916A	5916A000 137	18-May-25	18-May-26
4339	High pass Filter, 50 Ohm, 1000 to 18000 MHz, SMA-FM / SMA-M	Micro-Tronics	HPM5011 5-02	001	05-Jun-25	05-Jun-27
4474	Double Ridged Waveguide Antenna, 0.8 to 18 GHz	FT-RT Antenna, Inc.	HA-08M18G-NF	201206090 1	27-Oct-24	27-Oct-25
4933	Active Horn Antenna, 1 GHz to 18 GHz	COM-POWER CORPORATION	AHA-118	701046	19-Feb-25	19-Feb-26
5288	Trilog Antenna, 25 MHz - 8 GHz, 100W	Frankonia	ALX-8000E	00809	08-Apr-25	08-Apr-27
5371	EXG Analog Signal Generator, 9 kHz - 40 GHz	Keysight Technologies	N5173B	MY572805 40	18-May-25	18-May-26
5376	EXA Signal Analyzer, 10 Hz - 32 GHz	Keysight Technologies	N9010B	MY574704 04	17-Mar-25	17-Mar-26
5644	Cable, 50 Ohm, DC to 18 GHz, 1.8 m, SMA/SMA	Mini Circuits	CBL-6FT-SMSM+	NA	15-May-25	15-May-26
5673	Cable SF126EA/11N(x2)/2M, 18GHz	Huber-Suhner	SF126EA	506756/12 6EA	25-May-25	25-May-26
5902	RF cable, 18 GHz, 6.0m, N-type	Huber-Suhner	SF126EA/ 11N/11N/ 6000	NA	24-Apr-25	24-Apr-26
5933	Thermometer Hygrometer , (0 to +50) deg., (20-95) % RH	Kkmoon	Dyimore	NA	23-Apr-25	23-Apr-26
7546	Power supply 60VDC/12.5A	Agilent Technologies	N5747A	US25F676 2C	29-May-24	29-Sep-25
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 4933: Active Horn Antenna
COM-POWER CORPORATION, model: AHA-118, s/n 701046

Frequency, MHz	Measured antenna factor (with preamplifier), dB/m	Frequency, MHz	Measured antenna factor (with preamplifier), dB/m
1000	-16.1	10000	1.8
1500	-15.1	10500	1.0
2000	-10.9	11000	0.3
2500	-11.9	11500	-0.5
3000	-11.1	12000	3.1
3500	-10.6	12500	1.4
4000	-8.6	13000	-0.3
4500	-8.3	13500	-0.4
5000	-5.9	14000	2.5
5500	-5.7	14500	2.2
6000	-3.3	15000	1.9
6500	-4.0	15500	0.5
7000	-2.2	16000	2.1
7500	-1.7	16500	1.2
8000	1.1	17000	0.6
8500	-0.8	17500	3.1
9000	-1.5	18000	4.2
9500	-0.2		

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

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.

11 APPENDIX C Measurement uncertainties

Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements

Test description	Expanded uncertainty
Transmitter tests	
Carrier power conducted at antenna connector	± 1.7 dB
Carrier power radiated (substitution method)	± 4.5 dB
Occupied bandwidth	$\pm 8\%$
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
Spurious emissions radiated 30 MHz – 40 GHz (substitution method)	± 4.5 dB
Frequency error	30 – 300 MHz: ± 50.5 Hz (1.68 ppm) 300 – 1000 MHz: ± 168 Hz (0.56 ppm)
Transient frequency behaviour	187 Hz $\pm 13.9\%$
Duty cycle, timing (Tx ON / OFF) and average factor measurements	$\pm 1.0\%$
Unintentional radiator tests	
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	Biconilog antenna: ± 5.3 dB Biconical antenna: ± 5.0 dB Log periodic antenna: ± 5.3 dB Double ridged horn antenna: ± 5.3 dB
Vertical polarization	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 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 are R-10808 for OATS, R-1082 for anechoic chamber, 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

13 APPENDIX E Specification references

FCC 47CFR part 90: 2024	Private land mobile radio services
FCC 47CFR part 2: 2024	Frequency allocations and radio treaty matters; general rules and regulations
ANSI/TIA/EIA-603-C:2016	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
RSS-137 Issue 2:2009	Location and monitoring services (902-928 MHz)

14 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