Nemko USA, Inc.
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San Diego, CA 92121-1024
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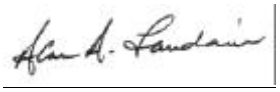
Test Report:	2008 0412205 Westhold FCC
Project number:	12205-2
Applicant:	Westhold Corporation 680 Washington St. #7 Santa Clara, CA 95050
Equipment Under Test (EUT):	Rechargeable Transmitter
Model:	WH-RMS-2180-001
FCC ID:	NKBTXLI-02
IC Number:	6677A-TXLI02
In Accordance With:	FCC Part 15 Subpart C, 15.209 CANADA, IC RSS-Gen, IC RSS 210
Tested By:	Nemko USA Inc. 11696 Sorrento Valley Road, Suite F San Diego, CA 92121
Authorized By:	 Alan Laudani, RF/EMC Test Engineer
Date:	June 12, 2008
Total Number of Pages:	21

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Section 1. Summary of Test Results

General

All measurements are traceable to national standards

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15; Subpart C. Radiated tests were conducted is accordance with ANSI C63.4-2003. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

This Radio Standards Specification (RSS) sets out the requirements for license exempt low-power intentional radiators. The applicable standard for low-power intentional radiators in Canada, corresponding to FCC Part 15 Subpart C, is RSS-210. The two are very closely harmonized in terms of permitted frequencies, types of operation, and other technical requirements. The test results reported in this report are deemed satisfactory evidence of compliance with Industry Canada Standard RSS-210.

The assessment summary is as follows:

Apparatus Assessed: Rechargeable Transmitter

Specification: FCC Part 15 Subpart C, 15.209
IC RSS-Gen, IC RSS 210

Compliance Status: Complies

Exclusions: None

Non-compliances: None

Report Release History:

REVISION	DATE	COMMENTS
-	06-12-2008	Prepared By: Ferdinand S. Custodio
-	06-12-2008	Initial Release: Alan Laudani

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

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This test report has been completed in accordance with the requirements of ISO/IEC 17025.

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TESTED BY: _____ Date: June 12, 2008
Ferdinand S. Custodio, EMC Test Engineer

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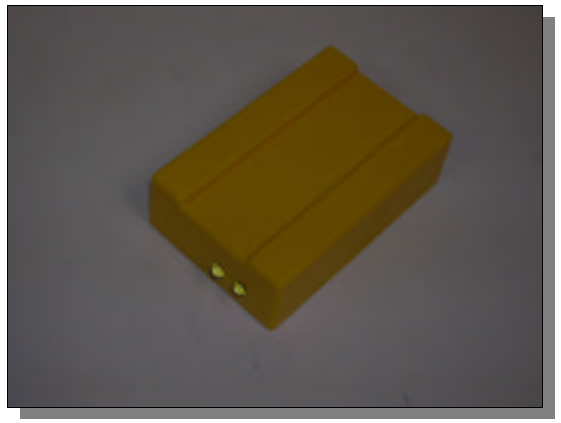
Section 2: Equipment Under Test

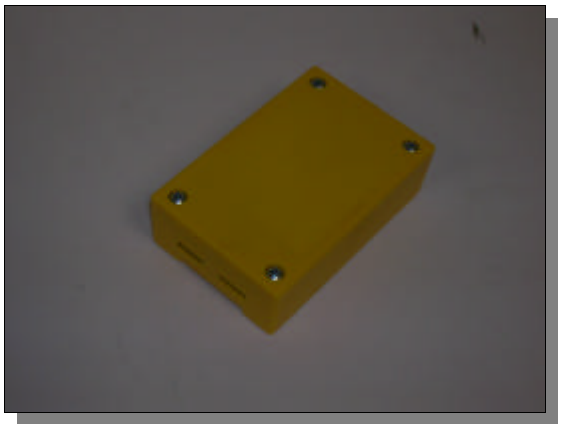
2.1 Product Identification

The Equipment Under Test was identified as follows:

Rechargeable Transmitter

Engineering sample, serial number not available during assessment





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2.2 Samples Submitted for Assessment

The following samples of the apparatus have been submitted for type assessment:

Sample No.	Description	Serial No.
001	Rechargeable Transmitter	NA

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2.3 Theory of Operation

The EUT is part of a sophisticated electronic timing and scoring system for motor sports racing events. The EUT operates on a non-removable, rechargeable 3.7V Lithium-Ion battery. A rapid green LED flash every 3 seconds indicates proper EUT operation.

2.4 Technical Specifications of the EUT

Manufacturer:	Westhold Corporation
Operating Frequency:	10.775MHz Only
Emission Designator	3M00G1D
Rated Power:	48.4 dBµV/m
Modulation:	BPSK
Type of Receiver:	None
Antenna Data:	Integral
Power Source:	3.7VDC Lithium Ion Battery

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Section 3: Test Conditions

3.1 Specifications

The apparatus was assessed against the following specifications:

FCC Part 15 Subpart C, 15.209
Radiated emission limits; general requirements.

RSS-Gen General Requirements and Information for the Certification of Radiocommunication Equipment

RSS-210 Low-power License–exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

3.2 Deviations From Laboratory Test Procedures

No deviations from Laboratory Test Procedure

3.3 Test Environment

All tests were performed under the following environmental conditions:

Temperature range	:	19.8 – 22.1 ^{o}C
Humidity range	:	38 % - 54%
Pressure range	:	86 - 106 kPa
Voltage	:	LiOn battery: 3.7VDC

3.4 Test Equipment

Nemko ID	Device	Manufacturer	Model	Serial Number	Cal Date	Cal Due Date
133	Antenna, loop	Electro-Metrics	ALR-25M	678	02-Apr-08	02-Apr-09
116	Antenna, Bicon	EMCO	3110	1267	02-Nov-07	02-Nov-08
110	Antenna, LPA	Electrometrics	LPA-25	1217	10-Jan-08	10-Jan-09
847	Preamp	Com-Power	PA-103	161070	05-Sep-07	05-Sep-08
674	Spectrum Analyzer	HP	8568B	2007A00910	11-Apr-08	11-Apr-09
675	Spectrum Analyzer Display	HP	85662A	2005A01282	11-Apr-08	11-Apr-09
676	Quasi-Peak Adapter	HP	85650A	2430A00576	11-Apr-08	11-Apr-09
835	Spectrum Analyzer	Rohde & Schwarz	RHDFSEK	829058/005	20-Jun-07	20-Jun-08

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Section 4: Observations

4.1 Modifications Performed During Assessment

No modifications performed during the assessment.

4.2 Record Of Technical Judgements

No technical judgements were made during the assessment.

4.3 EUT Parameters Affecting Compliance

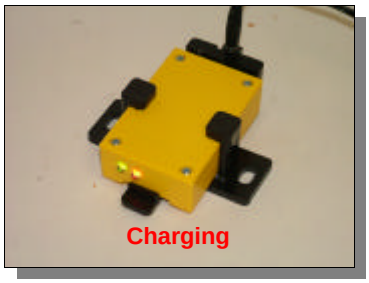
The user of the apparatus could not alter parameters that would affect compliance.

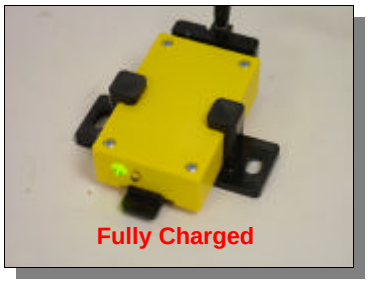
4.4 Test Deleted

No Tests were deleted from this assessment.

4.5 Additional Observations

- All testing were done with fully charged batteries. Before each test, the EUT was placed into the charger until fully charged (charging time observed during test verification is less than 30 minutes).





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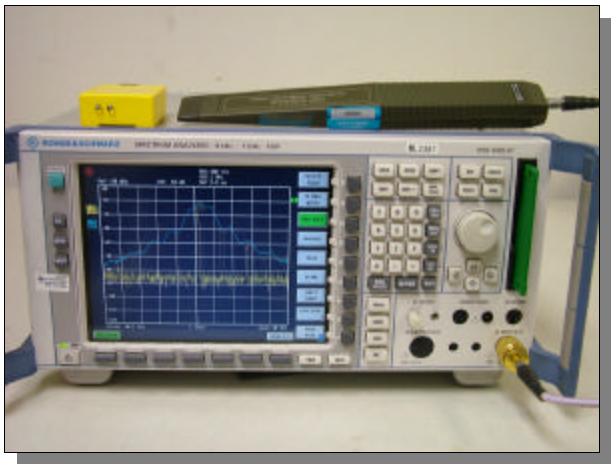
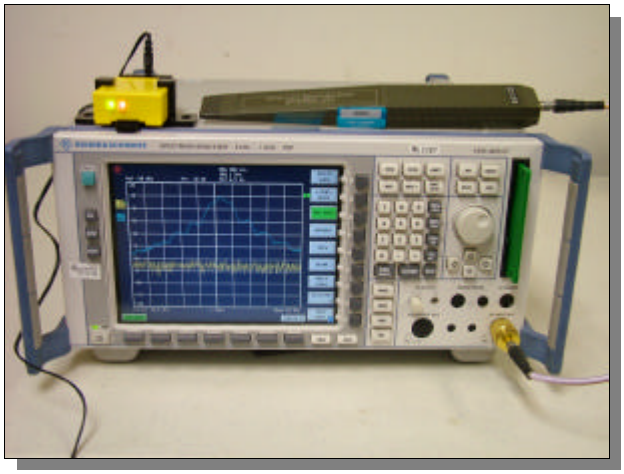
- EUT was verified to cease transmission once connected to the charger:



EUT Transmitting



EUT stops transmitting when connected to the charger

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Section 5: Results Summary

This section contains the following:

FCC Part 15 Subpart C: Test Results and corresponding IC RSS-210 equivalent.

The column headed "Required" indicates whether the associated clauses were invoked for the apparatus under test. The following abbreviations are used:

N No: not applicable / not relevant
Y Yes: Mandatory i.e. the apparatus shall conform to these test.
N/T Not Tested, mandatory but not assessed. (See section 4.4 Test deleted)

The results contained in this section are representative of the operation of the apparatus as originally submitted.

5.1 FCC Part 15 Subpart C and IC RSS-210 Equivalent: Test Results

Part 15	Test Description	Required	Result
15.207 (a)	Powerline Conducted Emissions	N[1]	
15.205 (a) *IC RS-210 2.2*	Radiated Emissions within Restricted Bands	Y	Pass
15.215 (c) *IC RS-Gen 4.6.1*	Occupied Bandwidth	Y	Pass
15.209 (a) *IC RS-210 2.6*	Radiated Emissions not in Restricted Bands	Y	Pass

Notes:

[1]EUT is a device which only employs battery power for operation and does not operate from the AC power lines or contain provisions for operation while being charged and connected to the AC power lines (charger).

EUT is a transmitter only and does not have a receiver component. Receiver requirements not required.

Appendix A: Test Results

Clause 15.205(a) Restricted Bands of Operation

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090–0.110	16.42–16.423	399.9–410	4.5–5.15
[1]0.495–0.505	16.69475–16.69525	608–614	5.35–5.46
2.1735–2.1905	16.80425–16.80475	960–1240	7.25–7.75
4.125–4.128	25.5–25.67	1300–1427	8.025–8.5
4.17725–4.17775	37.5–38.25	1435–1626.5	9.0–9.2
4.20725–4.20775	73–74.6	1645.5–1646.5	9.3–9.5
6.215–6.218	74.8–75.2	1660–1710	10.6–12.7
6.26775–6.26825	108–121.94	1718.8–1722.2	13.25–13.4
6.31175–6.31225	123–138	2200–2300	14.47–14.5
8.291–8.294	149.9–150.05	2310–2390	15.35–16.2
8.362–8.366	156.52475–156.52525	2483.5–2500	17.7–21.4
8.37625–8.38675	156.7–156.9	2690–2900	22.01–23.12
8.41425–8.41475	162.0125–167.17	3260–3267	23.6–24.0
12.29–12.293	167.72–173.2	3332–3339	31.2–31.8
12.51975–12.52025	240–285	3345.8–3358	36.43–36.5
12.57675–12.57725	322–335.4	3600–4400	([2])
13.36–13.41			

Test Conditions:

Sample Number:	001	**Temperature:**	22.1
Date:	04/18/2008	**Humidity:**	38
Modification State:	Transmit	**Tester:**	Ferdinand Custodio
		Laboratory:	SOATS

Test Results:

See Attached Plots.

Additional Observations:

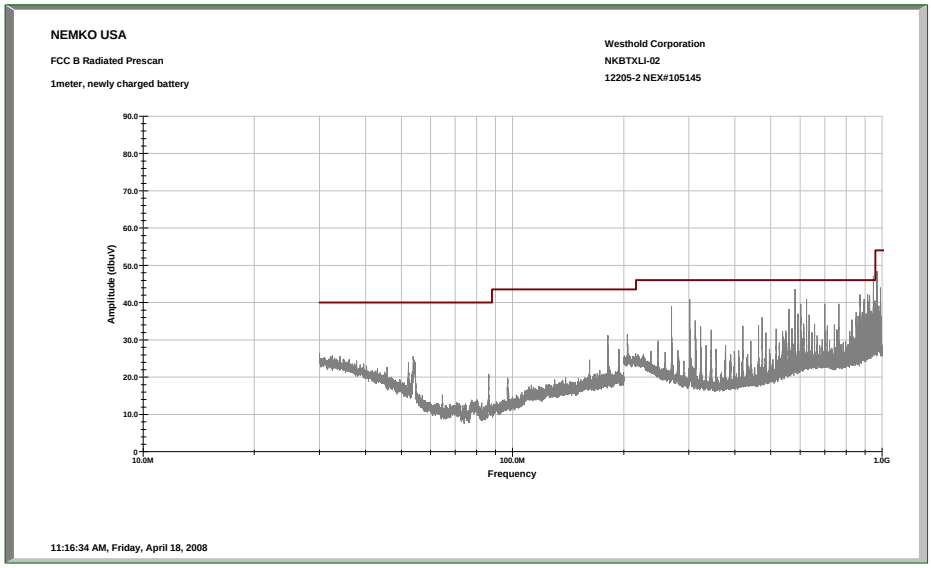
The Spectrum was searched from the lowest frequency generated by the EUT up to 1 GHz.

These results apply to emissions found in the restricted bands defined in FCC Part 15 Subpart C, 15.205.

The EUT was measured on three orthogonal axes. The EUT was tested with freshly charged battery.

All Measurements were performed at 3m with a Quasi Peak detector.

The frequencies measured were evident during initial prescan inside a shield room. These frequencies however did not show up during OATS testing. See attached prescan plots:



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Radiated Emissions Data

Job # :	12205-1	Date :	4/18/2008	Page	1 of 1
NEX #:	105145	Time :	2:30PM		
		Staff :	FSC		

Client Name :	Westhold Corporation	EUT Voltage :	N/A
EUT Name :	10.775 MHz Race Car Transmitter	EUT Frequency :	N/A
EUT Model # :	NKBTXLI-02	Phase:	N/A
EUT Serial # :	N/A	NOATS	
EUT Config. :	Transmit	SOATS	X
		Distance < 1000 MHz:	3 m
		Distance > 1000 MHz:	3 m

Specification :	CFR47 Part 15, Subpart B, Class B		
Loop Ant. #:	133		
Bicon Ant.#:	116	Temp. (°C) :	22.1
Log Ant.#:	110	Humidity (%) :	38
DRG Ant. #		Spec An.#:	674
Cable LF#:	SOATS	Spec An. Display #:	675
Cable HF#:		QP #:	676
Preamp LF#:	847	PreSelect#:	NA
Preamp HF#			

Quasi-Peak	RBW: 120 kHz
	Video Bandwidth 300 kHz
Peak	RBW: 1 MHz
	Video Bandwidth 3 MHz
Average	RBW: 1 MHz
	Video Bandwidth 10 Hz

Measurements below 1 GHz are Quasi-Peak values, unless otherwise stated.
Measurements above 1 GHz are Average values, unless otherwise stated.

Meas. Freq. (MHz)	Meter Reading **Vertical**	Meter Reading **Horizontal**	Det.	EUT Side F/L/R/B	Ant. Height m	Max. Reading (dBµV)	Corrected Reading (dBµV/m)	Spec. limit (dBµV/m)	CR/SL Diff. (dB)	Pass Fail	Comment
269.1	29.3	29.3	Q		1.0	29.3	10.6	46.0	-35.4	Pass	Noise floor
969.9	30.1	29.9	Q		1.0	30.1	24.9	54.0	-29.1	Pass	Noise floor

Clause 15.215(c) Occupied Bandwidth

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in Sec. Sec. 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

Test Conditions:

Sample Number:	001	**Temperature:**	22.1
Date:	06/12/2008	**Humidity:**	38
Modification State:	Transmit	**Tester:**	Ferdinand Custodio
		Laboratory:	Shield Room #1

Test Results:

See Attached Plots.

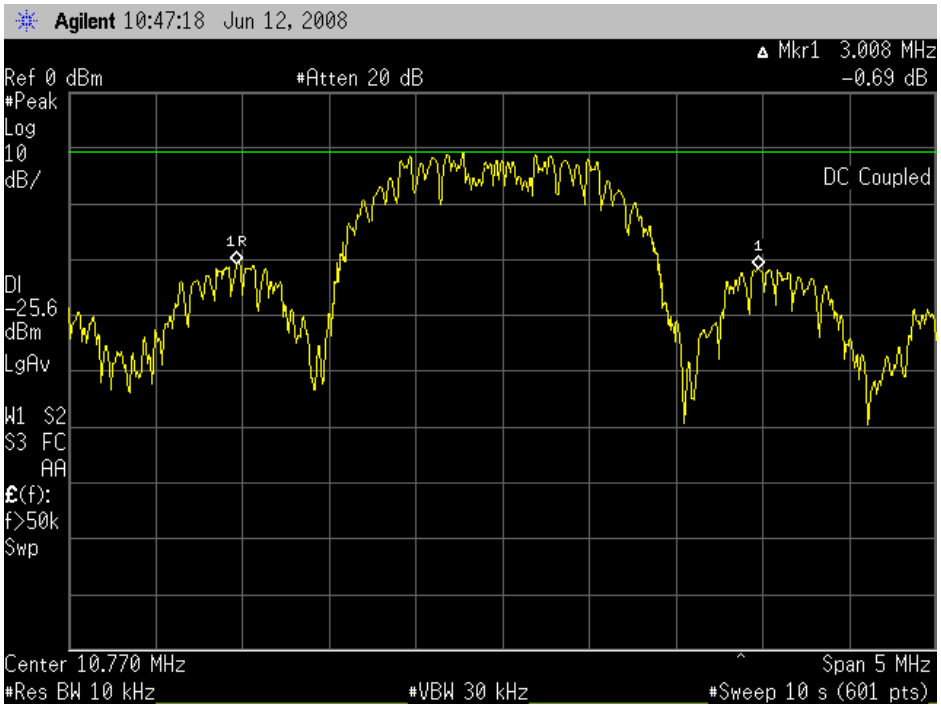
Additional Observations:

Frequency span set to capture all products of the modulation process including the emission skirts.

Resolution bandwidth set to 10kHz.

Video bandwidth set to 3 times the resolution bandwidth.

Peak detector with 10 seconds sweep utilized.



Measured Occupied Bandwidth is **3.0MHz.** The EUT is single frequency and does not operate in any particular frequency band. The closest restricted band is below 8.41475 MHz and above 12.29 MHz.

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Clause 15.209(a) Radiated Emissions not in Restricted Bands

(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009–0.490	2400/F(kHz)	300
0.490–1.705	24000/F(kHz)	30
1.705–30.0	30	30
30–88	100**	3
88–216	150**	3
216–960	200**	3
Above 960	500	3

(d) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

Test Conditions:

Sample Number:	001	**Temperature:**	19.8
Date:	05/30/2008	**Humidity:**	54
Modification State:	Transmit	**Tester:**	Ferdinand Custodio
		Laboratory:	SOATS

Test Results:

See Attached Plots.

Additional Observations:

The Spectrum was searched from the lowest frequency generated by the EUT up to 1GHz.

The EUT was measured on three orthogonal axes. The EUT was tested with freshly charged battery.

Fundamental frequency was measured at 10m while all other measurements were performed at 3m with a Quasi Peak detector.

Fundamental frequency was measured in the near-field and an extrapolation factor of 40 dB per decade is used to determine the 10m limit.

10m limit: 20 log (30) - (40 log 10/30) = **48.6dBuV/m**

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Radiated Emissions Data

Job # :	12205-1	Date :	5/30/2008	Page	1 of 1
NEX #:	105145	Time :	4:00PM		
		Staff :	FSC		

Client Name :	Westhold Corporation	EUT Voltage :	N/A
EUT Name :	10.775 MHz Race Car Transmitter	EUT Frequency :	N/A
EUT Model # :	NKBTXLI-02	Phase:	N/A
EUT Serial # :	N/A	NOATS	
EUT Config. :	Transmit	SOATS	X
		Distance < 1000 MHz:	3 and 10 m
		Distance > 1000 MHz:	3 m

Specification :	CFR47 Part 15, Subpart B, Class B		
Loop Ant. #:	133		
Bicon Ant.#:	116	Temp. (°C) :	19.8
Log Ant.#:	110	Humidity (%) :	54
DRG Ant. #		Spec An.#:	674
Cable LF#:	SOATS	Spec An. Display #:	675
Cable HF#:		QP #:	676
Preamp LF#:	847	PreSelect#:	NA
Preamp HF#			

Quasi-Peak	RBW:	120 kHz
	Video Bandwidth	300 kHz
Peak	RBW:	1 MHz
	Video Bandwidth	3 MHz
Average	RBW:	1 MHz
	Video Bandwidth	10 Hz

Measurements below 1 GHz are Quasi-Peak values, unless otherwise stated.
Measurements above 1 GHz are Average values, unless otherwise stated.

Meas. Freq. (MHz)	Meter Reading **Vertical**	Meter Reading **Horizontal**	Det.	EUT Side F/L/R/B	Ant. Height m	Max. Reading (dBµV)	Corrected Reading (dBµV/m)	Spec. limit (dBµV/m)	CR/SL Diff. (dB)	Pass Fail	Comment
10.8	39.5	28.7	Q		1.0	39.5	48.4	48.6	-0.2	Pass	10 meters
269.1	29.3	29.3	Q		1.0	29.3	10.6	46.0	-35.4	Pass	Noise Floor
301.8	28.8	28.8	Q		1.0	28.8	11.7	46.0	-34.3	Pass	Noise Floor
581.7	42.8	45.0	Q		1.0	45	33.7	46.0	-12.3	Pass	Ambient Noise
872.4	48.6	49.1	Q		1.0	49.1	42.9	46.0	-3.2	Pass	Ambient Noise
948.0	30.1	29.9	Q		1.0	30.1	25.5	46.0	-20.5	Pass	Noise Floor
969.9	30.1	29.9	Q		1.0	30.1	24.9	54.0	-29.1	Pass	Noise Floor