EMC TEST REPORT

For

Weather Station Transmitter

Model Number: WS2000WWVB

FCC ID: WLSWS2000WWVB

Report Number **:** WT088001521

Test Laboratory	:	Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory Guangdong EMC Compliance Test Center
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TEST REPORT DECLARATION

Applicant	:	OneWorld GMS
Address	:	1601-03 Enterprise Square Two, 3 Sheung Yuet Road, Kowloon Bay, Hong Kong,
Manufacturer	:	OneWorld GMS
Address	:	1601-03 Enterprise Square Two, 3 Sheung Yuet Road, Kowloon Bay, Hong Kong,
EUT Description	:	Weather Station Transmitter
Model Number	:	WS2000WWVB
FCC ID	:	WLSWS2000WWVB

Test Standards:

FCC Part 15 15.209, 15.231

The EUT described above is tested by Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory to determine the maximum emissions from the EUT. Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory is assumed full responsibility for the accuracy of the test results. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with FCC Rules Part 15.209, 15.249.

The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Tested by:	(Ryan Chen)	Date:	Aug.06,2008
Checked by:	(Dewelly Yang)	Date:	Aug.06,2008
Approved by:	(Peter Lin)	Date:	Aug.06,2008

1. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	FCC Rules	Test Results
Conducted Disturbance	15.207	N/A
Radiated Disturbance	15.209, 15.231	Pass
Occupied Bandwidth	15.231	Pass
Deactivation time	15.231	Pass
Antenna Requirement	15.203	Pass

N/A is not applicable

2. GENERAL INFORMATION

2.1. Report information

2.1.1.This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that SMQ approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that SMQ in any way guarantees the later performance of the product/equipment.

2.1.2.The sample/s mentioned in this report is/are supplied by Applicant, SMQ therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

2.1.3.Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through SMQ, unless the applicant has authorized SMQ in writing to do so.

2.2. Laboratory Accreditation and Relationship to Customer

The testing report were performed by the Shenzhen Academy of Metrology and quality Inspection EMC Laboratory (Guangdong EMC compliance testing center), in their facilities located at Bldg. of Metrology & Quality Inspection, Longzhu Road, Nanshan District, Shenzhen, Guangdong, China. At the time of testing, Laboratory is accredited by the following organizations:

China National Accreditation Committee for Laboratories (**CNAL**) accredits the Laboratory for conformance to FCC standards, EMC international standards and EN standards. The Registration Number is L0579.

The Laboratory is listed in the United States of American Federal Communications Commission (**FCC**), and the registration number are **97379**(open area test site) and **274801**(semi anechoic chamber).

The Laboratory is listed in Voluntary Control Council for Interference by Information Technology Equipment (**VCCI**), and the registration number are **R-1974**(open area test site) , **R-1966**(semi anechoic chamber),**C-2117**(mains ports conducted interference measurement) and **T-180**(telecommunication ports conducted interference measurement).

The Laboratory is registered to perform emission tests with Industry Canada (**IC**), and the registration number is **IC4174**.

TUV Rhineland accredits the Laboratory for conformance to IEC and EN standards, the registration number is **E2024086Z02**.

Measurement Uncertainty

2.3. Measurement Uncertainty

Radiated Disturbance: 30MHz~1000MHz 4.5dB
1GHz~18GHz 4.6dB

3. PRODUCT DESCRIPTION

3.1. EUT Description

Description	:	Weather Station Transmitter
Manufacturer	:	OneWorld GMS
Model Number	:	WS2000WWVB
Operate Frequency	:	433.9MHZ
Modulation Type	:	ASK
Power	:	3.0V (2XAAA battery)
Antenna Designation	:	Integrated

3.2. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: WLSWS2000WWVB filing to comply with Section 15.209, 15.231 of the FCC Part 15, Subpart C Rules.

3.3. Block Diagram of EUT Configuration

Figure 1 EUT setup 1

3.4. Operating Condition of EUT

Mode 1: Transmitting at 433.9MHz

3.5. Test voltage

Battery: DC3.0V (new battery)

3.6. Special Accessories

Not available for this EUT intended for grant.

3.7. Equipment Modifications

Not available for this EUT intended for grant.

3.8. Support Equipment List

Table 2 Support Equipment

Name	Model Number	S/N	Manufacture
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3.9. Test Conditions

Date of test：Jul.28-Aug.06,2008
Date of EUT Receive：Jul.28,2008
Temperature: 22-23 ℃
Relative Humidity: 65-67%

4. TEST EQUIPMENT USED

Table 3 Test Equipment

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
SB3436	EMI Test Receiver	Rohde & Schwarz	ESI26	Jan.24, 2008	1 Year
SB3440	Bilog Antenna	Chase	CBL6112B	Jan.24, 2008	1 Year
SB3435	Horn Antenna	Rohde & Schwarz	HF906	Jan.24, 2008	1 Year
SB3435/01	Amplifier(1-18GHz)	Rohde & Schwarz	---	Jan.24, 2008	1 Year
SB3450/01	3m Semi-anechoic chamber	Albatross Projects	9X6X6	Jan.24, 2008	1 Year

5. CONDUCTED DISTURBANCE TEST

5.1. Test Standard and Limit

5.1.1.Test Standard

FCC Part 15 15.207

5.1.2.Test Limit

Table 4 Conducted Disturbance Test Limit (Class B)

Frequency	Maximum RF Line Voltage (dBμV)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

- Decreasing linearly with logarithm of the frequency
- The lower limit shall apply at the transition frequency.

5.2. Test Procedure

The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI test receiver (R&S Test Receiver ESCS30) is used to test the emissions form both sides of AC line. According to the requirements in Section 7 and 13 of ANSI C63.4-2003.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9kHz.

5.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

5.4. Test Data

The device is powered by battery, the test don’t need.

6. RADIATED DISTURBANCE TEST

6.1. Test Standard and Limit

6.1.1.Test Standard

FCC Part 15 15.231, 15.209

6.1.2.Test Limit

Table 5 Radiated Disturbance Test Limit (15.209)

FREQUENCY MHz	FIELD STRENGTHS LIMITS （μV/m)	FIELD STRENGTHS LIMITS dB (μV/m)
Fundamental	50000	94.0
Harmonics	500	54.0
30 ~ 88	100	40.0
88 ~ 216	150	43.5
216 ~ 960	200	46.0
960 ~	500	54.0

* The lower limit shall apply at the transition frequency.
* The test distance is 3m.

Table 6 Radiated Disturbance Test Limit (15.231)

Fundamental Frequency (MHz)	Field Strength of Fundamental （μV/m)	Field Strength of Spurious Emissions (μV/m)
40.66 ~ 40.70	1000	100
70 ~ 130	500	50
130 ~ 174	500 to 1500**	50 to 150**
174 ~ 260	1500	150
260 470	1500 to 5000**	150 to 500**
Above 470	5000	500

** linear interpolations

6.2. Test Procedure

The EUT is placed on a turntable, which is 0.8 meter above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 8 and13 of ANSI C63.4-2003.

Radiated test was performed on the frequency range from 30MHz to 25GHz. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz，VBW ≥RBW. All readings above 1 GHz are AV and PK values。RBW=1MHz and VBW=10Hz for AV value，RBW=1MHz and VBW≥RBW for peak value.
Measurements were made at 3 meters

6.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.
The EUT shall be measured in the XYZ three position, and the test data which was shown in the follow was the worst case.

6.4. Test Data

Table 7 Radiated Disturbance Test Data

Model number: WS2000WWVB

Mode:1

Frequency (MHz)	Polarization	Reading Value (dBμV)	Correction Factor (dB)	Antenna Factor (dB/m)	Emission Level (dBμV/m)	Limits dB (μV/m)	Test voltage	Note
433.934	H	34.5	3.3	16.8	56.6	72.9	DC3.0V	QP
433.934	V	47.4	3.3	16.8	69.5	72.8	DC3.0V	QP

Note: 1. Emission level(dBuV/m)=Reading Value(dBuV) + Correction Factor(dB)+Antenna Factor (dB/m)
2. Correction Factor(dB) = Cable Factor (dB)+Amplifier Factor(dB)
3. The other emission levels were less than the limit 20dB

Radiated Emission

EUT: WS2000WWVB TX
Operating Condition: TX
Test Site: SMQ EMC lab SAC
Operator:
Test Specification: horizontal&vertical

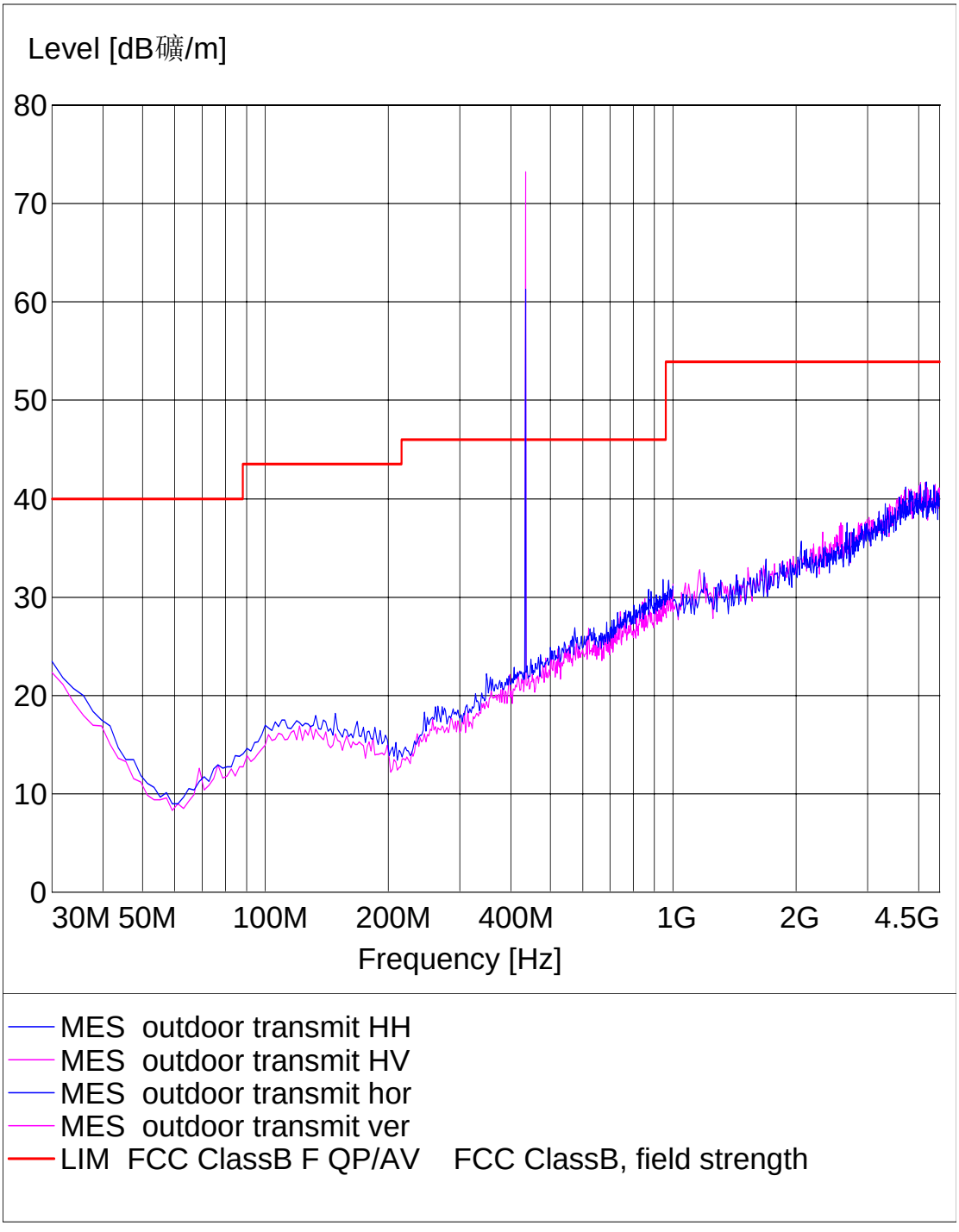


Table 8 Restricted Band Radiated Emission Data

MHz	MHz	MHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410
0.495 - 0.505	16.69475 - 16.69525	608 - 614
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240
4.125 - 4.128	25.5 - 25.67	1300 - 1427
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2
6.31175 - 6.31225	123 - 138	2200 - 2300
8.291 - 8.294	149.9 - 150.05	2310 - 2390
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267
12.29 - 12.293	167.72 - 173.2	3332 - 3339
12.51975 - 12.52025	240 - 285	3345.8 - 3358
12.57675 - 12.57725	322 - 335.4	3600 - 4400
13.36 - 13.41		

All the emissions of the above band are 20dB less than the limit.

7. OCCUPIED BANDWIDTH

7.1. Test Standard and Limit

7.1.1.Test Standard

FCC Part 15 15.231

7.1.2.Test Limit

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz

7.2. Test Procedure

1. Set EUT as normal operation
2. Set EMI test receiver (ESIB26) Center Frequency = fundamental frequency,
3. RBW≥1% bandwidth, VBW≥RBW.
4. Set EMI test receiver (ESIB26) to maxhold mode, mark the points 20dB down from the modulated carrier

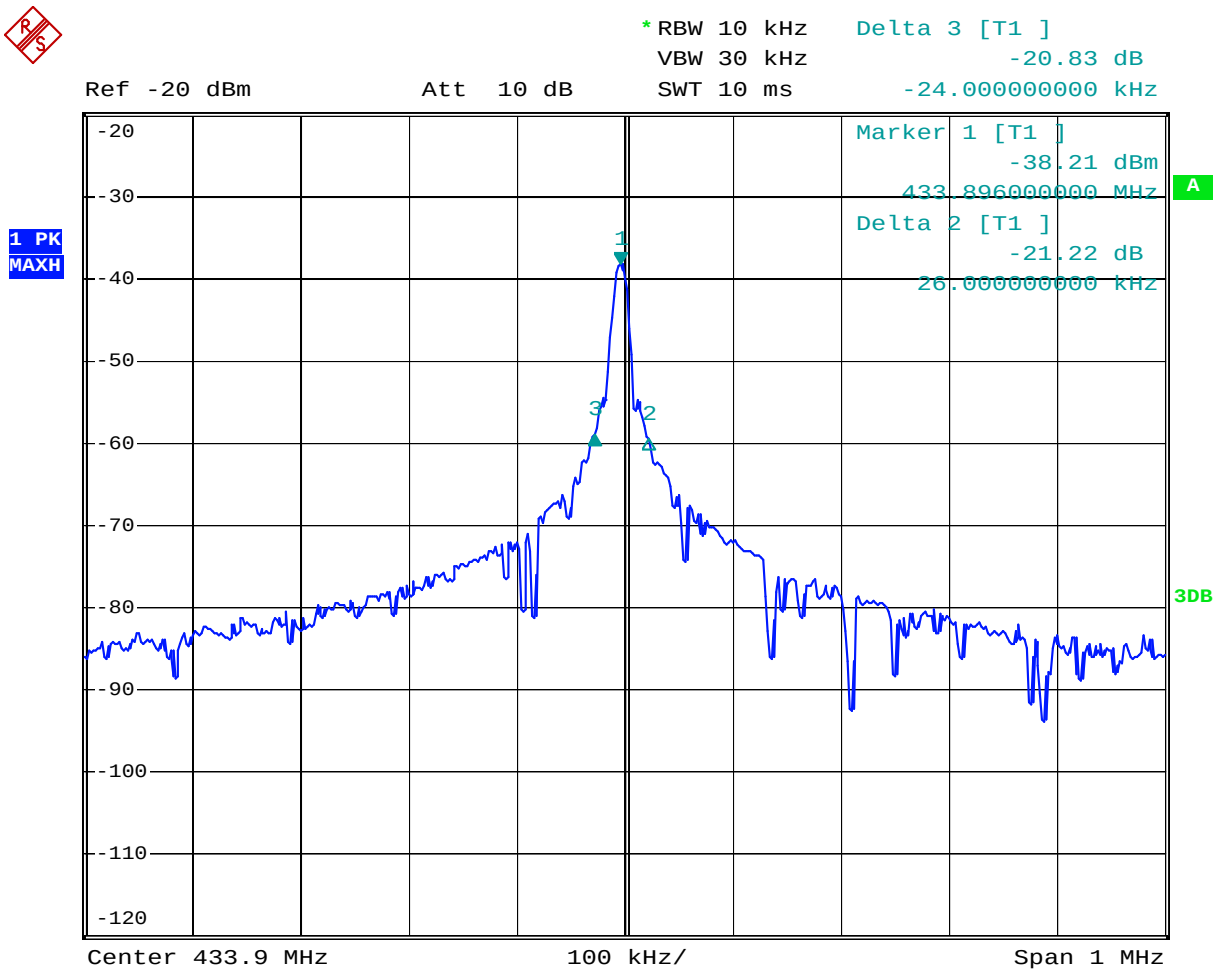
7.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

7.4. Test Data

20dB bandwidth is 50.0 kHz

Limit=433.9*0.25%=1.08MHz



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8. DEACTIVATION TIME

8.1. Test Standard and Limit

8.1.1.Test Standard

FCC Part 15 15.231

8.1.2.Test Limit

devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

8.2. Test Procedure

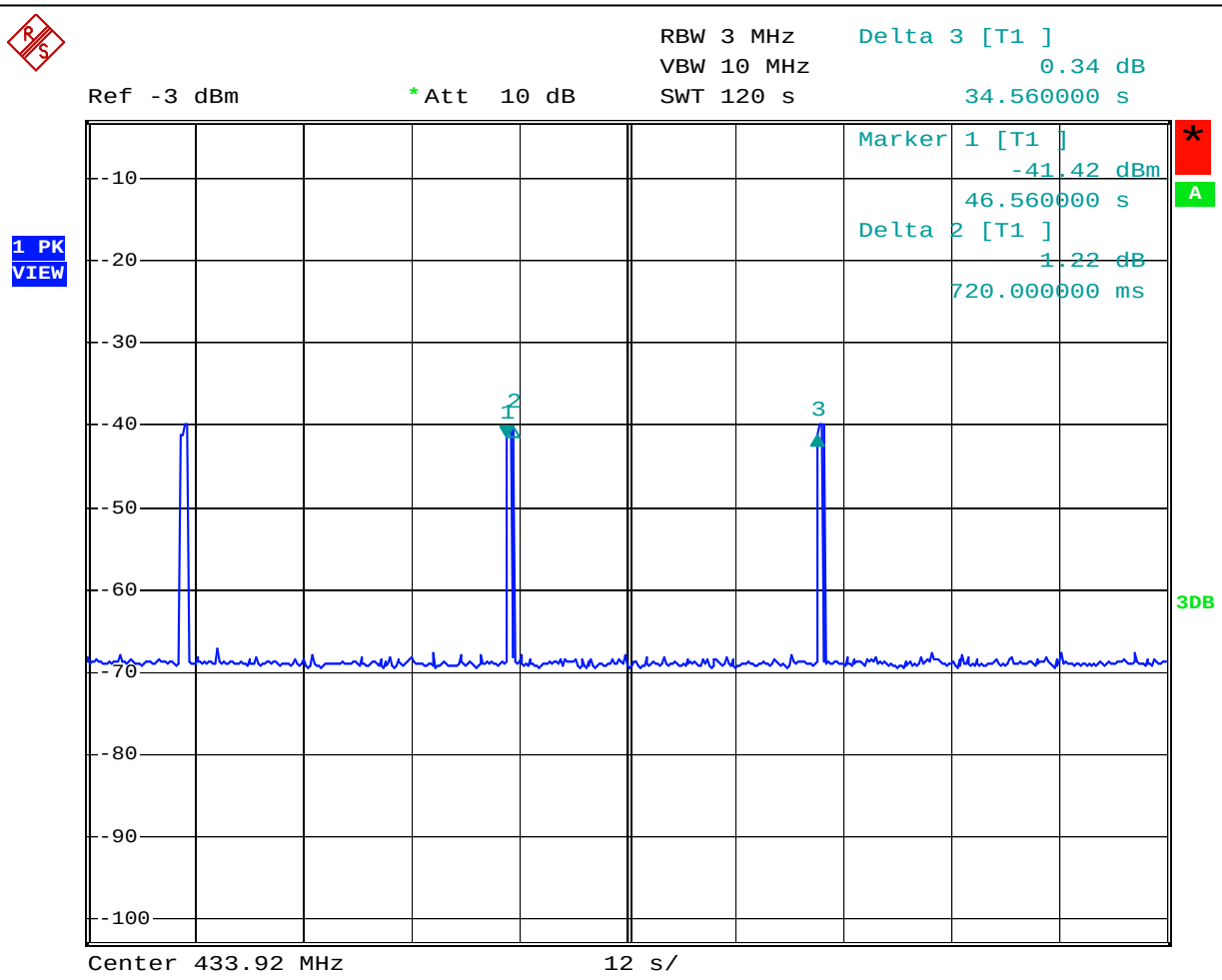
1. Set EUT as normal operation
2. Set EMI test receiver (ESIB26) Center Frequency to fundamental frequency, span to zero
3. Set EMI test receiver (ESIB26) sweep time =120second
4. Set EMI test receiver (ESIB26) Max hold.
5. Record the time EUT start transmitting and stop transmitting.

8.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

8.4. Test Data

operation duration is 720ms
silent period is 46.56s



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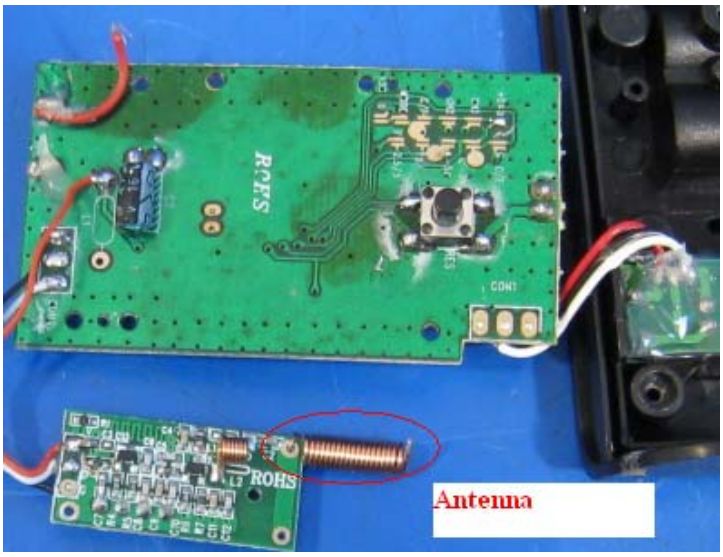
9. ANTENNA REQUIREMENT

9.1. STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

9.2. ANTENNA CONNECTED CONSTRUCTION

The EUT has a built in antenna which is soldered on the PCB, this is permanently attached antenna and meets the requirements of this section.



APPENDIX I TEST SETUP PHOTOS

Photo 1 Radiated Emission Test

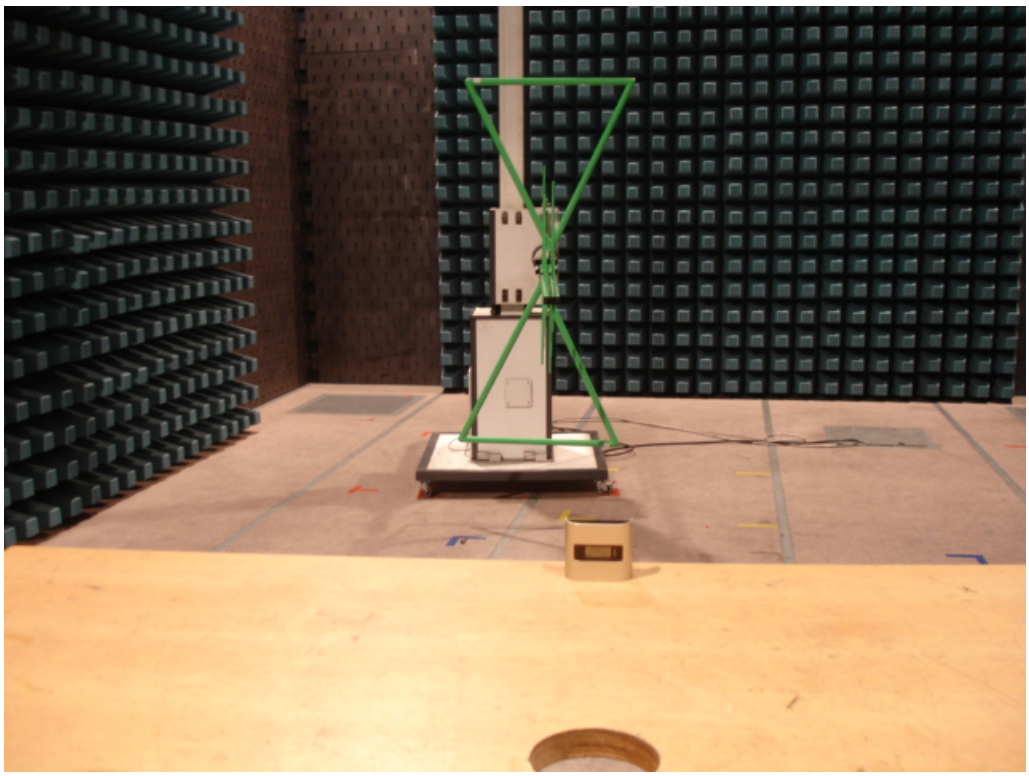
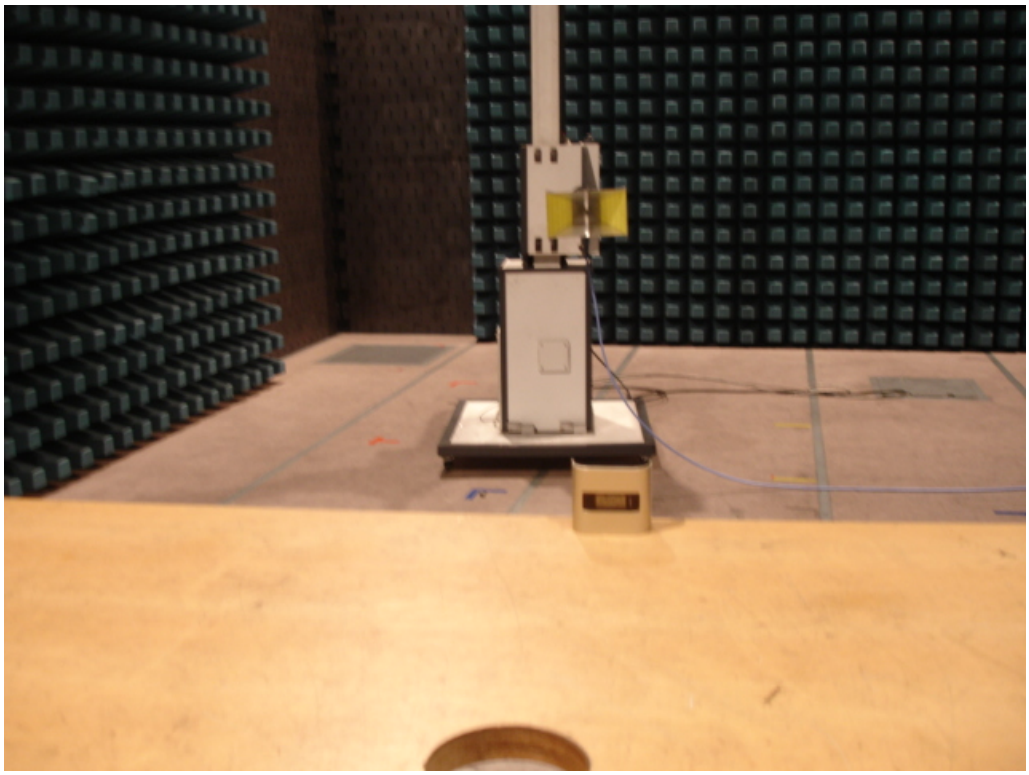


Photo 2 Radiated Emission Test



APPENDIX II EUT PHOTOS

Photo 1 Appearance of EUT

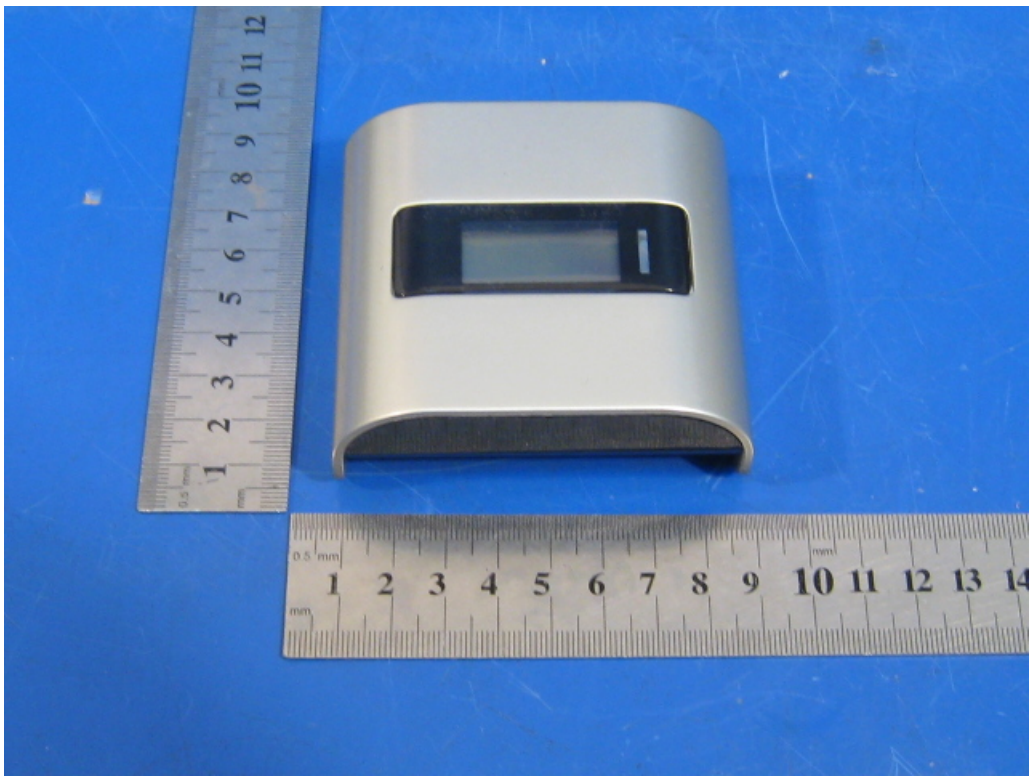


Photo 2 Appearance of EUT

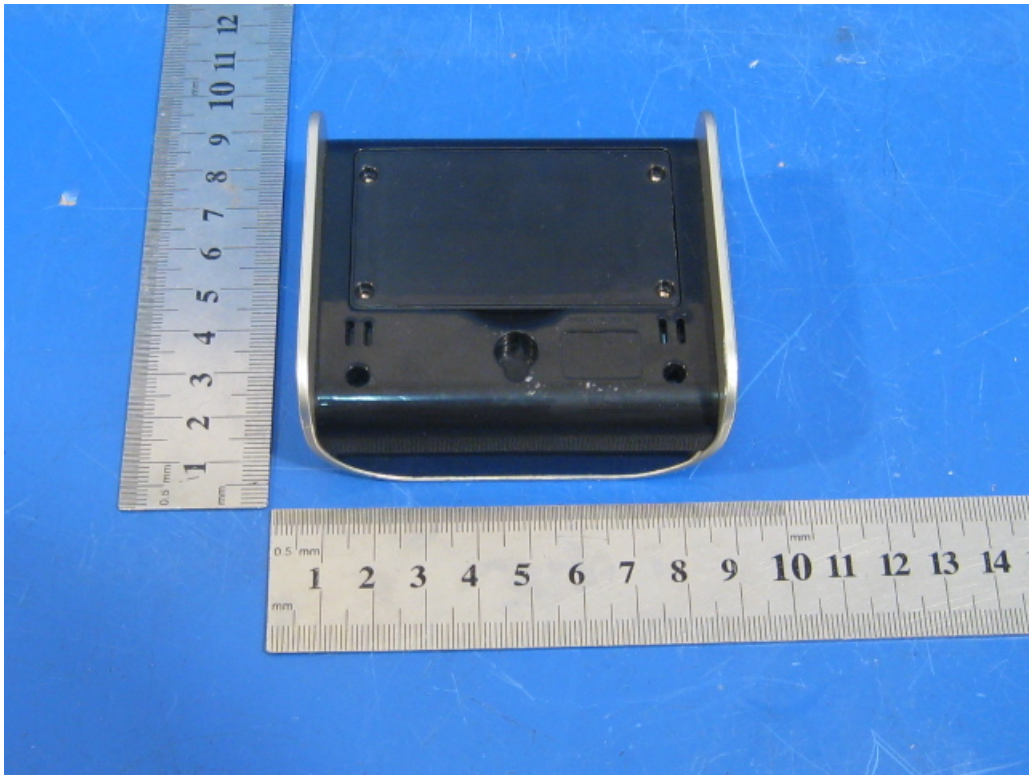


Photo 3 Inside of EUT

Photo 4 Inside of EUT

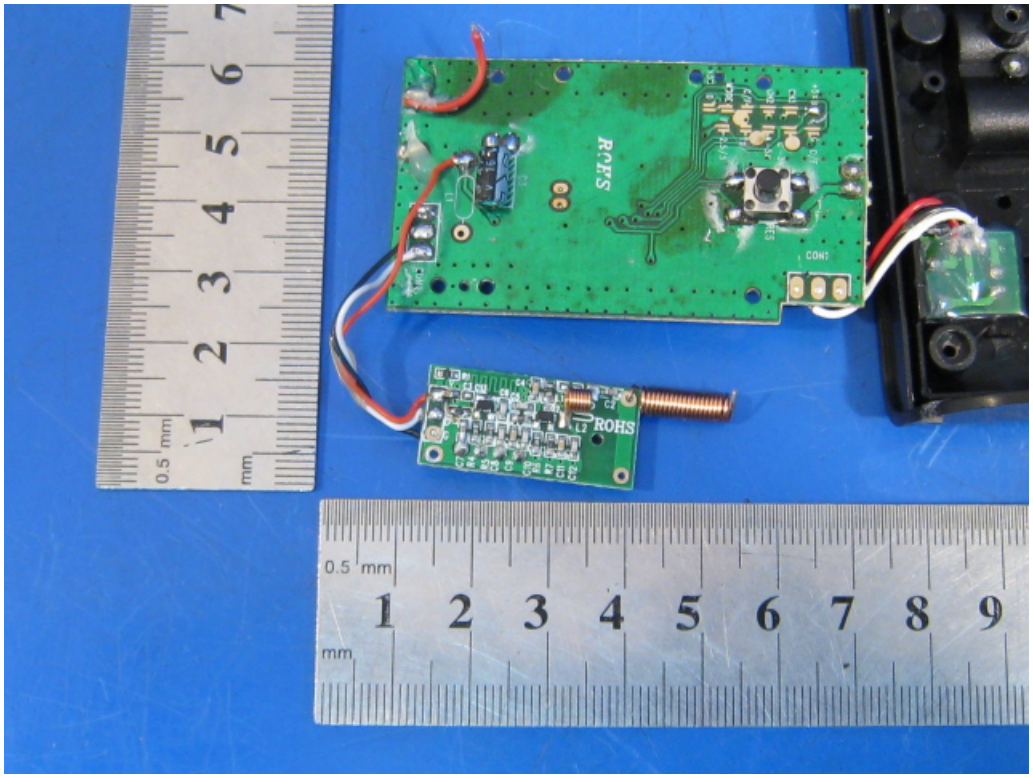


Photo 5 Inside of EUT