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Report No.: SZEM110800327301

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FCC REPORT

Application No. : SZEM1108003273RF

Applicant: Honwell Products (HK) LTD

Product Name: Atomic Wall Clock with Wireless Indoor/Outdoor Temperature

Operation Frequency: 915.2MHz

FCC ID: VDHSPC1005

Standards: FCC CFR Title 47 Part 15 Subpart C Section 15.249: 2010

Date of Receipt 2011-08-26

Date of Test 2011-08-29 to 2011-09-26

Date of Issue 2011-10-17

Test Result :	PASS *
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* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Jack Zhang
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

This Test Report is issued by the Company subject to its General Conditions of Service printed overleaf. Attention is drawn to the limitations of liability, indemnification and jurisdictional issues defined therein. The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This Test Report cannot be reproduced, except in full, without prior written permission of the Company.

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3 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
Field strength of the fundamental signal	15.249 (a)	Pass
Spurious emissions	15.249 (a)/15.209	Pass
Band edge (Radiated Emission)	15.249(a)/15.205	Pass
20dB Occupied Bandwidth	15.215 (c)	Pass

Remark: Pass: The EUT complies with the essential requirements in the standard.

Fail: The EUT does not comply with the essential requirements in the standard.

4 General Information

4.1 Client Information

Applicant:	Honwell Products (HK) LTD
Address of Applicant:	UNIT A, 12/F, WAYLEE INDUSTRIAL CENTRE, 30-38 TSUEN KING CIRCUIT, TSUEN WAN, N.T. HONG KONG

4.2 General Description of E.U.T.

Product Name:	Atomic Wall Clock with Wireless Indoor/Outdoor Temperature
Model No.:	SPC1005
Operation Frequency:	915.2MHz
Modulation type:	FSK
Antenna Type:	Integral
Power supply:	3.0V DC (2 x 1.5V "AA" Size Batteries)

4.3 E.U.T Operation mode

Operating Environment:

Temperature: 24.0 °C
Humidity: 51 % RH
Atmospheric Pressure: 1004 mbar

Test mode:

Transmitting mode: Keep the EUT in Transmitting mode.

4.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **VCCI**

The 3m Semi-anechoic chamber and Shielded Room (7.5m x 4.0m x 3.0m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2197 and C-2383 respectively.

Date of Registration: September 29, 2008. Valid until September 28, 2011.

- **FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 556682, March 16, 2011

- **Industry Canada (IC)**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1.

4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch E&E Lab

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China
518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

4.6 Other Information Requested by the Customer

None.

4.7 Test Instruments list:

RE in Chamber					
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Due date (yyyy-mm-dd)
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	2012-06-10
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	SEL0023	2012-05-26
3	EMI Test software	AUDIX	E3	SEL0050	N/A
4	Coaxial cable	SGS	N/A	SEL0028	2012-05-29
5	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0015	2011-11-09
6	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0006	2011-11-09
7	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEL0076	2011-11-09
8	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	2012-05-26
9	Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEL0168	2011-10-27
11	Band filter	Amindeon	82346	SEL0094	2012-05-26

General used equipment					
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Due date (yyyy-mm-dd)
1	Humidity/ Temperature Indicator	Shanghai	ZJ1-2B	SEL0102 to SEL0103	2011-11-04
2	Humidity/ Temperature Indicator	Shanghai	ZJ1-2B	SEL0101	2012-03-10
3	Barometer	ChangChun	DYM3	SEL0088	2012-05-18

5 Test results and Measurement Data

5.1 Antenna requirement:

Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement: <i>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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.</i>	
E.U.T Antenna:	

5.2 Radiated Emission

Test Requirement:	FCC Part15 C Section 15.249 and 15.209																								
Test Method:	ANSI C63.10: 2009																								
Test Frequency Range:	30MHz to 10000MHz																								
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)																								
Receiver setup:	<table border="1"> <thead> <tr> <th>Frequency</th> <th>Detector</th> <th>RBW</th> <th>VBW</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>30MHz-1GHz</td> <td>Quasi-peak</td> <td>100kHz</td> <td>300kHz</td> <td>Quasi-peak Value</td> </tr> <tr> <td>Above 1GHz</td> <td>Peak</td> <td>1MHz</td> <td>3MHz</td> <td>Peak Value</td> </tr> <tr> <td></td> <td>Peak</td> <td>1MHz</td> <td>10Hz</td> <td>Average Value</td> </tr> </tbody> </table>					Frequency	Detector	RBW	VBW	Remark	30MHz-1GHz	Quasi-peak	100kHz	300kHz	Quasi-peak Value	Above 1GHz	Peak	1MHz	3MHz	Peak Value		Peak	1MHz	10Hz	Average Value
Frequency	Detector	RBW	VBW	Remark																					
30MHz-1GHz	Quasi-peak	100kHz	300kHz	Quasi-peak Value																					
Above 1GHz	Peak	1MHz	3MHz	Peak Value																					
	Peak	1MHz	10Hz	Average Value																					
Limit: (Field strength of the fundamental signal)	Frequency	Limit (dBuV/m @3m)		Remark																					
	902MHz-928MHz	94.0		Quasi-peak Value																					
Limit: (Spurious Emissions)	Frequency	Limit (dBuV/m @3m)		Remark																					
	30MHz-88MHz	40.0		Quasi-peak Value																					
	88MHz-216MHz	43.5		Quasi-peak Value																					
	216MHz-960MHz	46.0		Quasi-peak Value																					
	960MHz-1GHz	54.0		Quasi-peak Value																					
	Above 1GHz	54.0		Average Value																					
		74.0		Peak Value																					
Limit: (band edge)	Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.																								
Test Procedure:	<ol style="list-style-type: none"> The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report. 																								

Test Instruments:	Refer to section 4.7 for details.
Test setup:	<p>Below 1GHz</p> <p>Above 1GHz</p>
Test mode:	<p>Transmitting mode</p> <p>Pre-scan was performed at the EUT in CH1,CH2,CH3, and then found the CH1 was the worst case. Only the worst case data was displayed.</p>
Test results:	Pass

Note:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

Measurement Data**5.2.1 Field Strength Of The Fundamental Signal**

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
915.200	3.62	23.26	26.71	72.29	72.46	94.00	-21.54	Horizontal
915.200	3.62	23.26	26.71	81.89	82.06	94.00	-11.94	Vertical

Remark: Quasi-peak Value

Note:

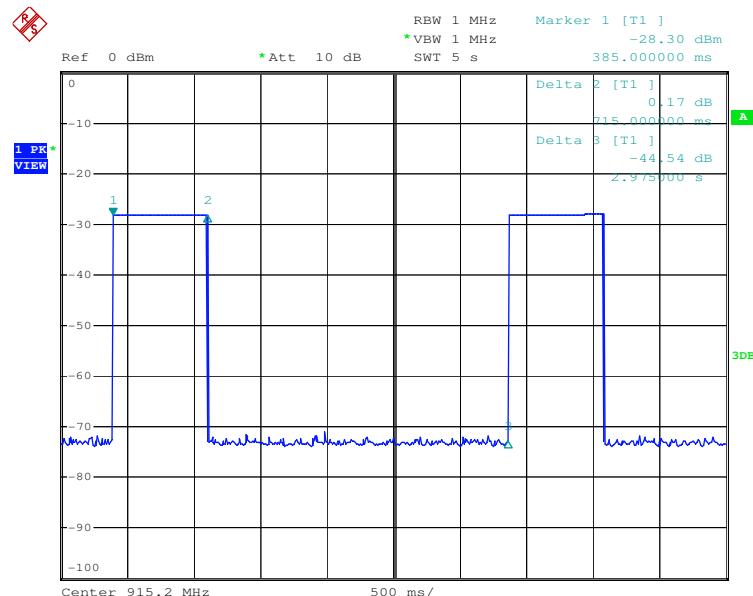
Final Level= Reading Level + Antenna Factor + Cable Loss - Preamp Factor



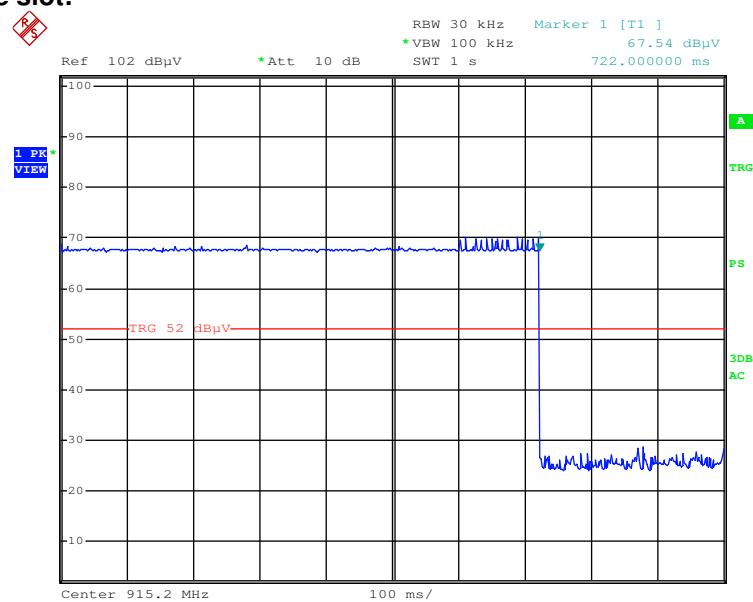
One On time=722ms > 100ms

Duty cycle=100% in the period 100ms

Single Touch slot

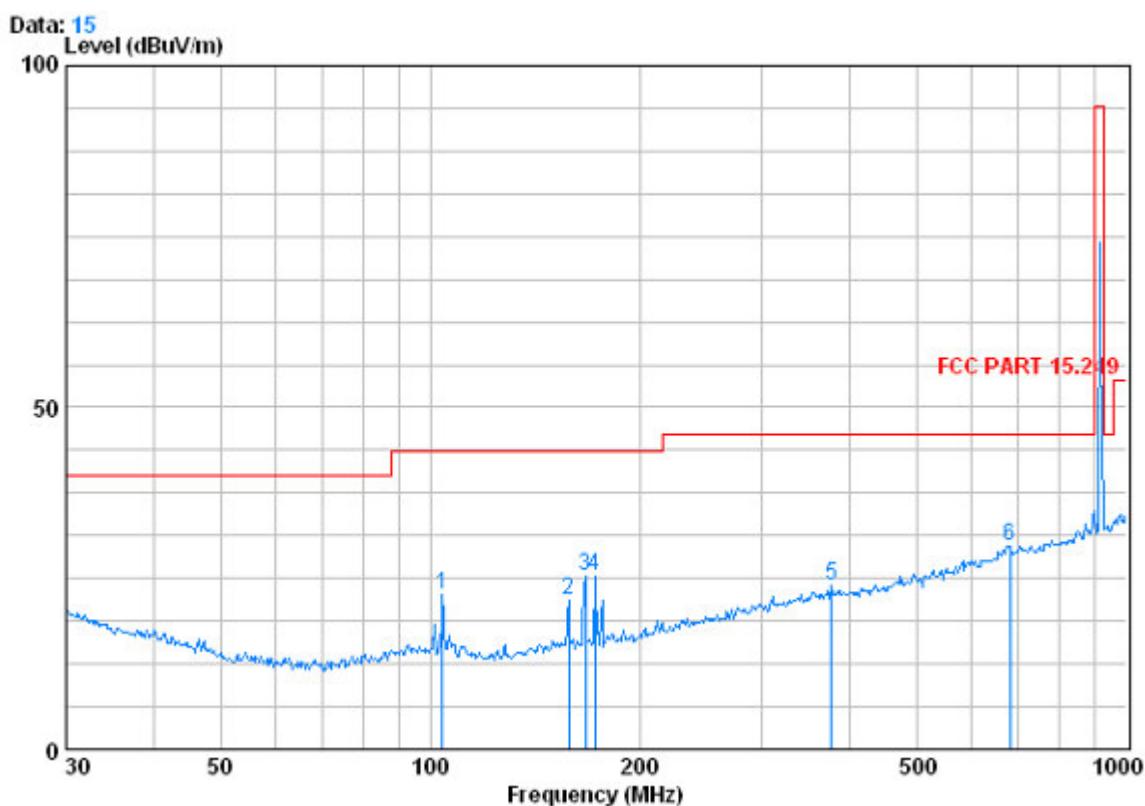


One On Time slot:



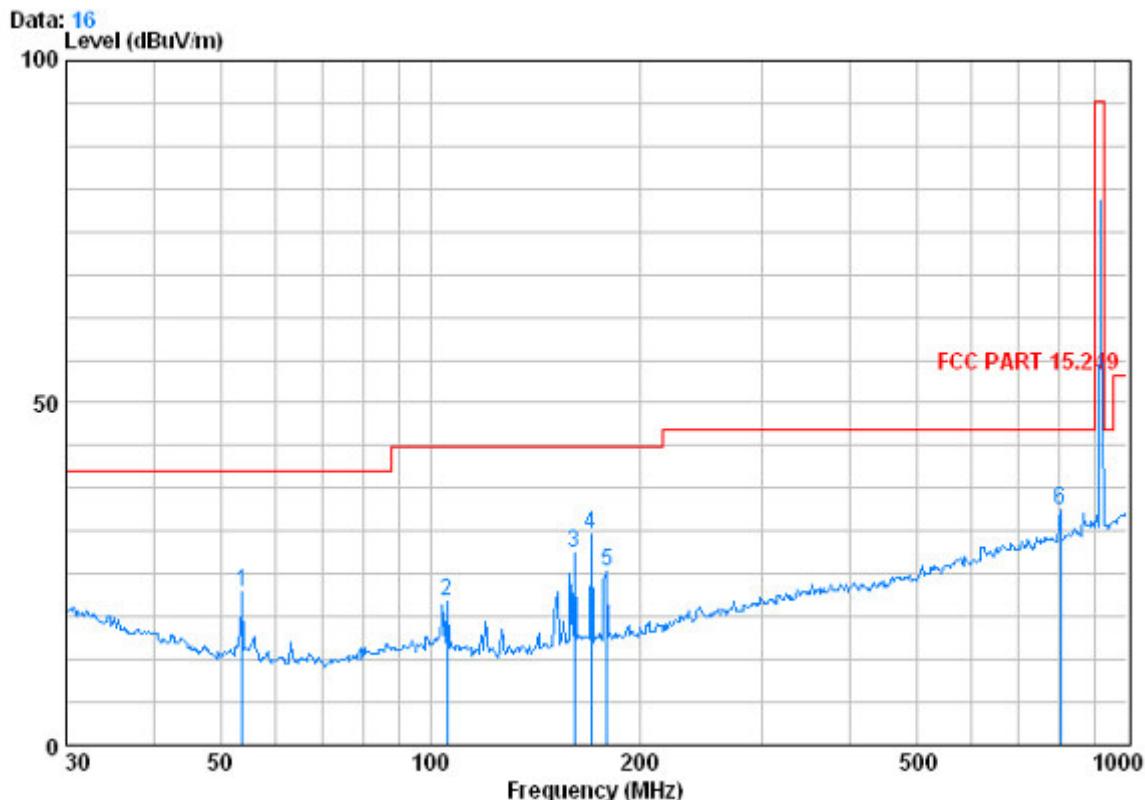
5.2.2 Spurious Emissions**30MHz~1GHz**

Horizontal:



Freq	Cable Loss		Antenna Factor		Preamp Factor		Read Level	Limit Level	Over Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m			
1	104.170	1.21	8.89	27.17	39.58	22.51	43.50	-20.99		
2	158.112	1.33	9.49	26.87	37.92	21.88	43.50	-21.62		
3	167.237	1.35	9.53	26.83	41.41	25.46	43.50	-18.04		
4	172.599	1.36	9.61	26.81	41.26	25.42	43.50	-18.08		
5	377.259	2.14	16.03	26.99	32.69	23.88	46.00	-22.12		
6	679.960	2.86	21.44	27.43	32.83	29.70	46.00	-16.30		

Vertical:



Freq	Cable		Antenna	Preamp	Read	Limit	Over	
	Loss	Factor	Factor	Level	Level			
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	53.693	0.80	7.69	27.28	41.24	22.45	40.00	-17.55
2	105.642	1.22	8.81	27.16	38.21	21.08	43.50	-22.42
3	160.909	1.34	9.59	26.86	43.97	28.04	43.50	-15.46
4	170.195	1.35	9.50	26.82	46.87	30.91	43.50	-12.59
5	179.386	1.37	9.87	26.78	40.96	25.42	43.50	-18.08
6 @	804.603	3.23	22.14	27.27	36.28	34.38	46.00	-11.62



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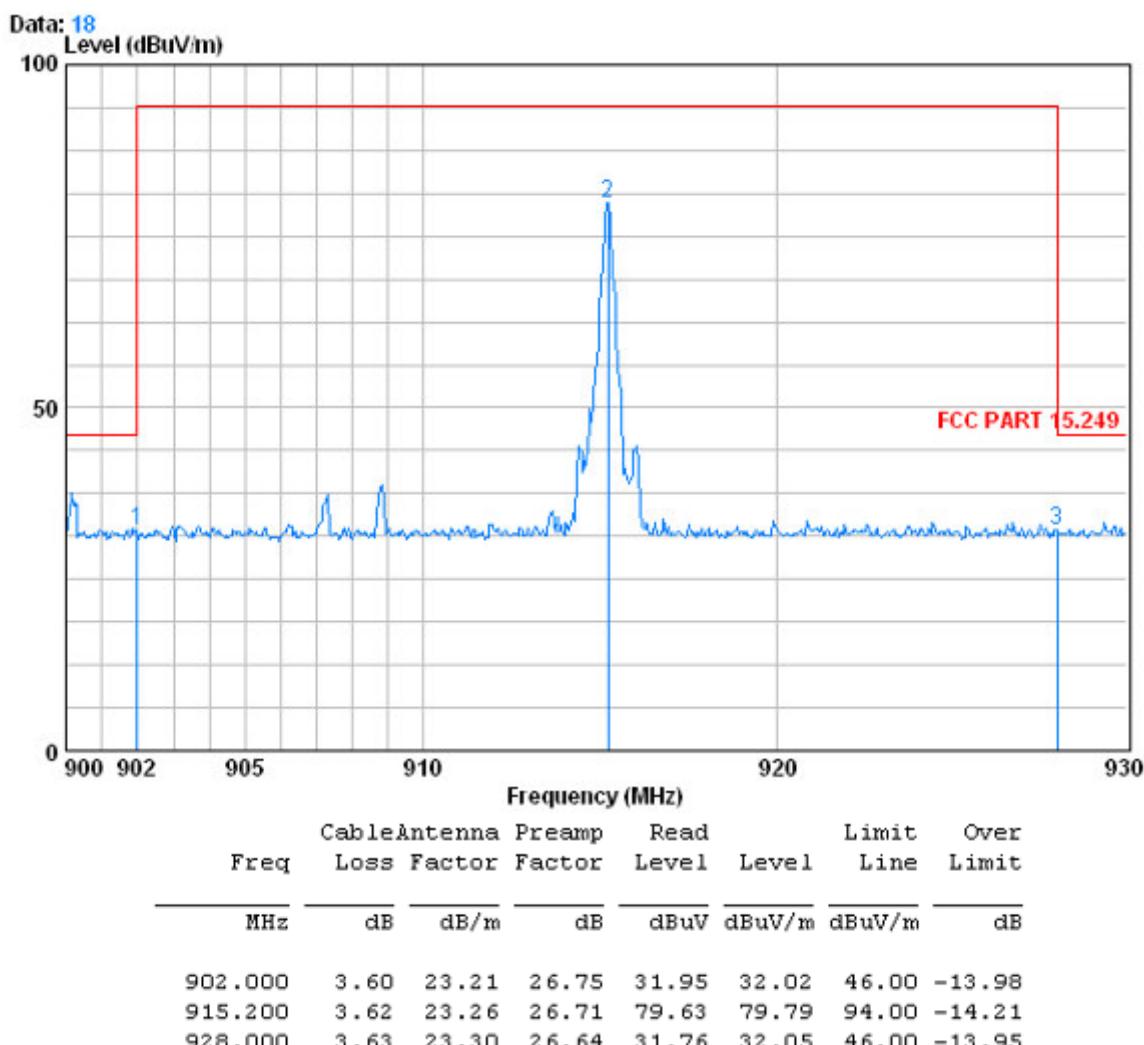
Above 1GHz

Test mode:	Transmitting			Remark:	Peak			
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1830.400	2.73	30.57	39.50	56.07	49.87	74.00	-24.13	Vertical
2745.600	3.18	33.05	40.12	61.91	58.02	74.00	-15.98	Vertical
3660.800	3.87	33.41	40.79	56.63	53.12	74.00	-20.88	Vertical
4576.000	4.54	35.09	41.46	51.62	49.79	74.00	-24.21	Vertical
6406.400	5.23	36.18	40.56	49.99	50.84	74.00	-23.16	Vertical
7321.600	5.92	35.93	39.77	49.45	51.53	74.00	-22.47	Vertical
1830.400	2.73	30.57	39.50	56.46	50.26	74.00	-23.74	Horizontal
2745.600	3.18	33.05	40.12	57.44	53.55	74.00	-20.45	Horizontal
3660.800	3.87	33.41	40.79	55.14	51.63	74.00	-22.37	Horizontal
4576.000	4.54	35.09	41.46	49.86	48.03	74.00	-25.97	Horizontal
5491.200	4.95	34.88	41.37	51.17	49.63	74.00	-24.37	Horizontal
6406.400	5.23	36.18	40.56	50.65	51.50	74.00	-22.50	Horizontal

Test mode:	Transmitting			Remark:	Average			
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1830.400	2.73	30.57	39.50	48.15	41.95	54.00	-12.05	Vertical
2745.600	3.18	33.05	40.12	53.92	50.03	54.00	-3.97	Vertical
3660.800	3.87	33.41	40.79	52.53	49.02	54.00	-4.98	Vertical
4576.000	4.54	35.09	41.46	48.23	46.40	54.00	-7.60	Vertical
6406.400	5.23	36.18	40.56	37.17	38.02	54.00	-15.98	Vertical
7321.600	5.92	35.93	39.77	36.06	38.14	54.00	-15.86	Vertical
1830.400	2.73	30.57	39.50	53.98	47.78	54.00	-6.22	Horizontal
2745.600	3.18	33.05	40.12	54.76	50.87	54.00	-3.13	Horizontal
3660.800	3.87	33.41	40.79	53.03	49.52	54.00	-4.48	Horizontal
4576.000	4.54	35.09	41.46	40.39	38.56	54.00	-15.44	Horizontal
5491.200	4.95	34.88	41.37	44.46	42.92	54.00	-11.08	Horizontal
6406.400	5.23	36.18	40.56	37.75	38.60	54.00	-15.40	Horizontal

5.2.3 Band edge (Radiated Emission)

Vertical:



Horizontal:

Data: 17

Level (dBuV/m)

100

50

0

900 902 905 910 915 920 930

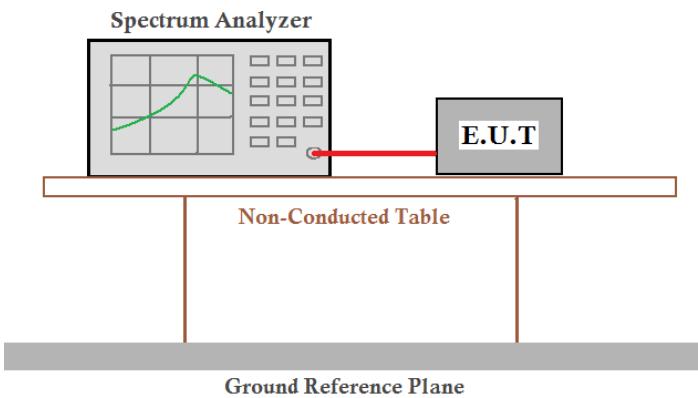
Frequency (MHz)

FCC PART 15.249

3 months

Freq	Cable	Antenna	Preamp	Read	Limit	Over	Limit
	MHz	Loss	Factor	Level	Level	Line	
1	902.000	3.60	23.21	26.75	31.38	31.45	46.00 -14.55
2	915.200	3.62	23.26	26.71	72.32	72.49	94.00 -21.51
3	928.000	3.63	23.30	26.64	31.78	32.07	46.00 -13.93

5.3 20dB Bandwidth

Test Requirement:	FCC Part15 C Section 15.249/15.215
Test Method:	ANSI C63.10: 2009
Receiver setup:	RBW=100kHz, VBW=300kHz, detector: Peak
Limit:	Operation Frequency range 902MHz-928MHz
Test Procedure:	<ol style="list-style-type: none"> 1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. 2. Set the EUT to proper test channel. 3. Max hold the radiated emissions, mark the peak power frequency point and the -20dB upper and lower frequency points. 4. Read 20dB bandwidth.
Test setup:	
Test Instruments:	Refer to section 4.7 for details.
Test mode:	Transmitting mode
Test results:	---

Measurement Data

Test channel	20dB bandwidth (kHz)	Results
915.2MHz	498	---

Test plot as follows:

