

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Nanshan

District, Shenzhen, Guangdong, China 518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594 Report No.: SZEM140700365501

Email: ee.shenzhen@sgs.com Page: 1 of 19

1 Cover Page

FCC REPORT

Application No.: SZEM1407003655RF

Applicant:Oregon Scientific Global Distribution LimitedManufacturer:Oregon Scientific Global Distribution LimitedFactory:Oregon Scientific Global Distribution Limited

Product Name: jumbo wall clock with remote sensor

Model No.(EUT): SE11

Trade Mark: Oregon Scientific

FCC ID: YPG-SE11-01

Standards: 47 CFR Part 15, Subpart C (2013)

Date of Receipt: 2014-07-15

Date of Test: 2014-07-17 to 2014-07-25

Date of Issue: 2014-08-19

Test Result: PASS *

* 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.



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2 Version

Revision Record								
Version	Chapter	Date	Modifier	Remark				
00		2014-08-19		Original				

Authorized for issue by:		
Tested By	Frank. Harry	2014-07-25
	(Back Huang) /Project Engineer	Date
Prepared By	Cintin Lv	2014-08-19
	(Linlin Lv) /Clerk	Date
Checked By	Emen-Li	2014-08-19
	(Emen Li) /Reviewer	Date



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3 Test Summary

Test Item	Test Requirement	Test method	Result	
Antenna Requirement	47 CFR Part 15, Subpart C	ANSI C63.10(2009)	PASS	
Antenna nequirement	Section 15.203	ANSI Cos. 10(2009)	PA55	
Spurious Emissions	47 CFR Part 15, Subpart C	ANCI (C62 10/2000)	DACC	
Spurious Emissions	Section 15.231 (b)/15.209	ANSI C63.10(2009)	PASS	
20dB Bandwidth	47 CFR Part 15, Subpart C	ANCI (C62 10/2000)	DACC	
2006 Balluwidili	Section 15.231 (c)	ANSI C63.10(2009)	PASS	
Dwell Time	47 CFR Part 15, Subpart C	ANCI (C62 10/2000)	DACC	
Dwell Tillle	Section 15.231 (e)	ANSI C63.10(2009)	PASS	



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5 General Information

5.1 Client Information

Applicant:	Oregon Scientific Global Distribution Limited
Address of Applicant:	Block C, 9/F., Kaiser Estate, Phase 1, 41 Man Yue Street, Hunghom, Kowloon, Hong Kong
Manufacturer:	Oregon Scientific Global Distribution Limited
Address of Manufacturer:	Block C, 9/F., Kaiser Estate, Phase 1, 41 Man Yue Street, Hunghom, Kowloon, Hong Kong
Factory:	Oregon Scientific Global Distribution Limited
Address of Factory:	Block C, 9/F., Kaiser Estate, Phase 1, 41 Man Yue Street, Hunghom, Kowloon, Hong Kong

5.2 General Description of EUT

Product Name:	jumbo wall clock with remote sensor
Model No.:	SE11
Trade Mark:	Oregon Scientific
Sample Type:	Fixed production
Carrier Frequency:	433.9MHz
Channel Numbers:	1
Modulation Type:	ASK
Antenna Gain:	2dBi
Antenna Type:	Integral
Power Supply:	3.0V DC (1.5V X2 "AAA" size Batteries)
Test Voltage:	DC 3.0V new batteries

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5.3 Test Environment and Mode

Operating Environment:				
Temperature:	24.0 °C			
Humidity:	52 % RH			
Atmospheric Pressure:	1008 mbar			
Test mode:				
Transmitting mode:	Keep transmitter at operation mode.			

5.4 Description of Support Units

The EUT has been tested independent.

5.5 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.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.



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5.6 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, Full-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, G-416, T-1153 and C-2383 respectively.

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 No.: 556682.

Industry Canada (IC)

Two 3m Semi-anechoic chambers of SGS-CSTC Standards Technical Services Co., Ltd. have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1 & 4620C-2.

5.7 Deviation from Standards

None.

5.8 Abnormalities from Standard Conditions

None.

5.9 Other Information Requested by the Customer

None.



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6 Equipment 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	2015-06-10				
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	SEL0023	2015-05-16				
3	EMI Test software	AUDIX	E3	SEL0050	N/A				
4	Coaxial cable	SGS	N/A	SEL0027	2015-05-29				
5	Coaxial cable	SGS	N/A	SEL0189	2015-05-29				
6	Coaxial cable	SGS	N/A	SEL0121	2015-05-29				
7	Coaxial cable	SGS	N/A	SEL0178	2015-05-29				
8	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0015	2014-10-24				
9	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0006	2014-10-24				
10	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	2015-05-16				
11	Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEL0168	2014-10-24				
12	Barometer	ChangChun	DYM3	SEL0088	2015-05-16				
13	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2014-10-24				
14	Humidity/ Temperature Indicator	Shanhai Qixiang	ZJ1-2B	SEL0103	2014-10-24				
15	Signal Generator	Rohde & Schwarz	SMY01	SEL0155	2014-10-24				
16	Signal Generator (10M-27GHz)	Rohde & Schwarz	SMR27	SEL0067	2015-05-16				
17	Loop Antenna	Beijing Daze	ZN30401	SEL0203	2015-06-04				

Note: The calibration interval is one year, all the instruments are valid.



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7 Test results and Measurement Data

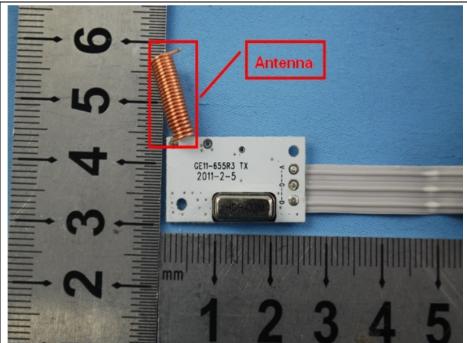
7.1 Antenna Requirement

Standard requirement: 47 CFR Part 15C Section 15.203

15.203 requirement:

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.

EUT Antenna:



The antenna is fixed on the main PCB and no consideration of replacement. The best case gain of the antenna is 2dBi.

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7.2 Spurious Emissions

7.2.1 Spurious Emissions

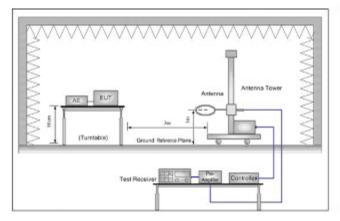
Test Requirement:	47 CFR Part 15C Section 15.231(e) and 15.209						
Test Method:	ANSI C63.10: 2009						
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)						
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark		
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak		
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average		
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak		
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak		
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average		
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak		
	30MHz-1GHz	Quasi-peak	100 kHz	300kHz	Quasi-peak		
	Above 1GHz	Peak	1MHz	3MHz	Peak		
	Above Idiiz	Peak	1MHz	10Hz	Average		
Limit: (Spurious Emissions)	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)		
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300		
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30		
	1.705MHz-30MHz	30	-	-	30		
	30MHz-88MHz	100	40.0	Quasi- peak	3		
	88MHz-216MHz	150	43.5	Quasi- peak	3		
	216MHz-960MHz	200	46.0	Quasi- peak	3		
	960MHz-1GHz	500	54.0	Quasi- peak	3		
	Above 1GHz	500	54.0	Average	3		
	Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions						
	is 20dB above the maximum permitted average emission limit applicable to the						
	equipment under te	est. This peak limit	applies to the	e total peak e	mission level		
	radiated by the device.						



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Test Procedure: Frequency Limit (dBuV/m @3m) Remark 433.9MHz 72.87 Average Value 92.87 Peak Value 92.87 Peak Value 92.87 Peak Value Peak Value 92.87 Peak Value Peak Value 92.87 Peak Value Peak Value Peak Value 92.87 Peak Value Pea					
the fundamental signal) Test Procedure: a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. 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. d. 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(for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. 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 retested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. g. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, Only the test worst case mode is recorded in the report.	Limit:		Frequency	Limit (dBuV/m @3m)	Remark
Test Procedure: a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. 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. d. 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(for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. 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 retested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. g. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, Only the test worst case mode is recorded in the report.	(Field strength of		400 OMLI-	72.87	Average Value
a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. 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. d. 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(for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. 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 retested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. g. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, Only the test worst case mode is recorded in the report.	the fundamental		433.91/1172	92.87	Peak Value
ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. 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. d. 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(for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. 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 retested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. g. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, Only the test worst case mode is recorded in the report.	signal)				
	Test Procedure:	b c rd. If the control of the	ground at a 3 meter semi-and degrees to determine the positive the EUT was set 3 meters as which was mounted on the to the antenna height is varied ground to determine the max horizontal and vertical polarization easurement. For each suspected emission the antenna was tuned to height below 30MHz, the antenna table was turned from 0 degreated the test-receiver system was Bandwidth with Maximum Holf the emission level of the EU specified, then testing could be reported. Otherwise the entested one by one using peak then reported in a data sheet. The radiation measurements the X axis positioning which it	echoic camber. The table sition of the highest radiation of the highest radiation of the highest radiation of the highest radiation of the interference-poof a variable-height anterform one meter to four medimum value of the field strations of the antenna are stations to 4 medians to 4 medians to 9 me	was rotated 360 on. receiving antenna, enna tower. eters above the rength. Both set to make the o its worst case and then ters(for the test frequency eter) and the rotatable the maximum reading. ion and Specified B lower than the limit alues of the EUT would 10dB margin would be re- nethod as specified and exis positioning. And found
	Test Setup:		ecorded in the report.		





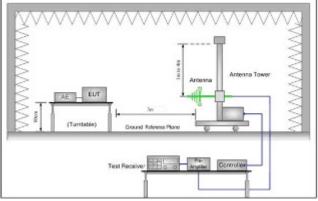


Figure 2. 30MHz to 1GHz

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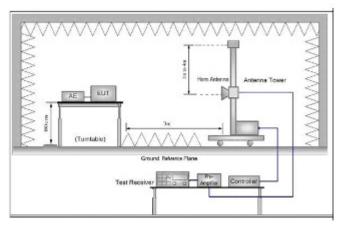


Figure 3. Above 1 GHz

Test Mode: Transmitting mode	
Instruments Used:	Refer to section 6 for details
Test Results:	Pass

Measurement Data

7.2.1.1 Field Strength Of The Fundamental Signal

			· · · · · · · · · · · · · · · · · · ·							
Peak value:										
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization			
433.90	2.35	12.10	87.44	74.56	92.87	-18.31	Horizontal			
433.90	2.35	12.10	86.12	73.24	92.87	-19.63	Vertical			

Average value:									
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization		
433.90	2.35	12.10	87.44	69.13	72.87	-3.74	Horizontal		
433.90	2.35	12.10	86.12	67.78	72.87	-5.09	Vertical		

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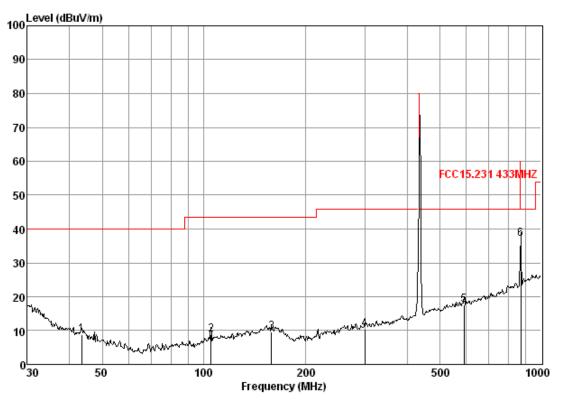
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7.2.1.2 Spurious Emissions

Below 1GHz

Vertical



Condition: FCC15.231 433MHZ 3m 3142C VERTICAL

Job No. : 3655RF Mode : Tx mode

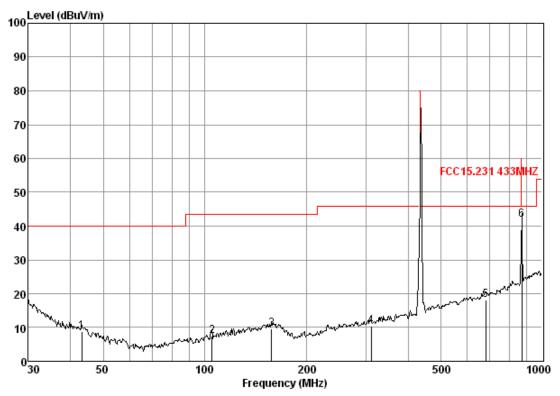
oue	. 1 X III	oue						
		CableA	ntenna	Preamp	Read		Limit	0ver
	E							
	Freq	Loss	ractor	Factor	rever	rever	Line	Limit
	\mathtt{MHz}	dB	dB/m	dВ	dBuV	dBuV/m	dBuV/m	d₿
			,					
4	49 E1	0.60	10.40	07 21	04.07	0.74	40.00	21 06
Τ	43.51	0.68	10.40	27.31	24.97	8.74	40.00	-31.26
2	104.90	1.21	6.90	27.17	27.89	8.83	43.50	-34.67
3	158.67	1 33	9.52	26, 86	25, 54	9.53	43 50	-33.97
4	300.37	1.90	9.70	26.40	25.09	10.29	46.00	-35.71
5	590.97	2.69	15.50	27.55	27.01	17.65	46.00	-28.35
6	869.13	3.49	19.60	26.92	40.77	36.94	46.00	-9.06
~	000.10	0. 10	10.00	50.00	70.11	00.01	10.00	J. 00



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Horizontal



Condition: FCC15.231 433MHZ 3m 3142C HORIZONTAL

Job No. : 3655RF Mode : Tx mode

Juc	. 1 % 10							
		Cable/	Antenna	Preamp	Read		Limit	Over
	Frea			Factor	Level	Level	line	Limit
	1104	2000	1 40 (01	1 40 (01	20,01	20,01		Limit
	3577					ID 77./	ID 77./	
	\mathtt{MHz}	d₿	dB/m	d₿	abuv	dBuV/m	abuv/m	d₿
1	43.20	0.68	10.47	27.31	24.90	8.74	40.00	-31.26
2	104.90	1.21	6.90	27.17	26, 45	7.39	43, 50	-36.11
3	157.56		9.55		25.67	9.68		-33. 82
4	311.09	1.94	9.90	26.48	25.01	10.37	46.00	-35.63
5	679.96	2.86	16.40	27.43	26.38	18.21	46.00	-27.79
6	869.13	3, 49	19,60	26, 92	45, 64	41.81	46, 00	-4.19
6	869.13	3.49	19.60	26.92	45.64	41.81	46.00	-4.1



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Above 1GHz

Peak value:

Peak value:								
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
1301.342	3.72	27.76	39.27	52.45	44.66	74	-29.34	Vertical
1755.644	4.13	29.95	39.46	46.26	40.88	74	-33.12	Vertical
2167.452	4.44	32.11	39.68	46.67	43.54	74	-30.46	Vertical
2812.786	4.91	33.14	40.16	46.75	44.64	74	-29.36	Vertical
3217.634	5.37	33.32	40.47	47.22	45.44	74	-28.56	Vertical
3752.885	6.11	33.51	40.86	47.65	46.41	74	-27.59	Vertical
1147.107	3.59	27.48	39.20	45.67	37.54	74	-36.46	Horizontal
1698.193	4.07	29.58	39.44	46	38.31	74	-35.69	Horizontal
2158.457	4.44	32.08	39.68	45.03	41.87	74	-32.13	Horizontal
2743.467	4.85	33.05	40.12	45.21	42.99	74	-31.01	Horizontal
3231.043	5.40	33.31	40.47	46.09	44.33	74	-29.67	Horizontal
3821.132	6.21	33.59	40.90	46.95	45.85	74	-28.15	Horizontal

Remark:

- 1) 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
- 2) The disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.
- 3) As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.



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7.3 20dB Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.231 (c)			
Test Method:	ANSI C63.10:2009			
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. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.			
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane			
Test Mode:	Transmitting mode			
Instruments Used:	Refer to section 6 for details			
Test Results:	Pass			

Measurement Data

20dB bandwidth (MHz)	Limit (MHz)	Results
0.144	1.0848	Pass

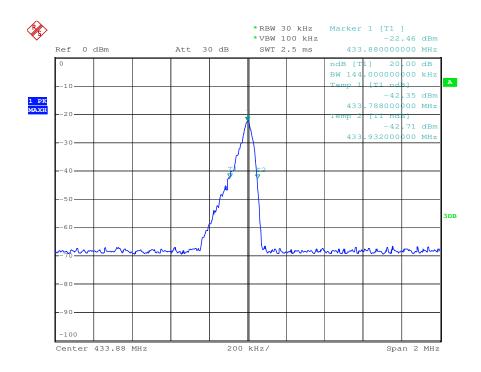
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Test plot as follows:



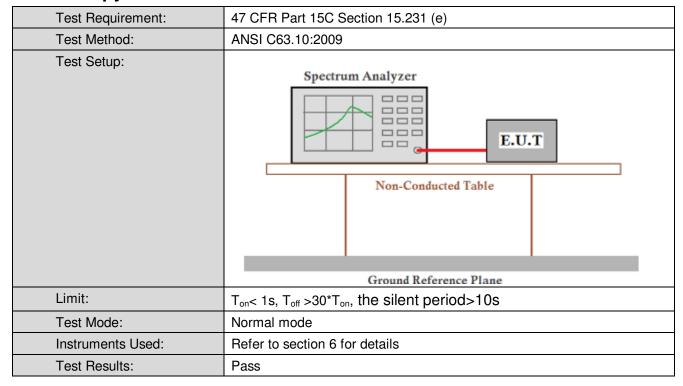
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7.4 Occupy time



Measurement Data

Test item	Limit	Results	
Ton	1s	Pass	
the silent period	>10s	Pass	

Remark:

 $T_{on} = 0.096s < 1s$

 $T_{\text{off}} > 30 \text{*} Ton = 30 \text{*} 0.0962 = 2.886 \text{s}$



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Test plot as follows:

