SGS-CSTC Standards Technical Services Ltd.

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FEDERAL COMMUNICATIONS COMMISSION
Registration number: 282399

TEST REPORT

Application No. : SZEMO080904612TX

Applicant : Favour Glory Industries Ltd

Address of Applicant :Flat 3,8/F Yue Fung Industrial Bldg.,35-45 Chai Wan Kok St.,Tsuen Wan, N.T.Hong Kong

Manufacture : Favour Glory Electronic company Ltd

Address of Manufacture: XiaoBi Village ,XinXu Town ,HuiYang City ,GuangDong Province ,China

FCC ID : WPNRFWS405

Fundamental Frequency : 433.92MHz

Equipment under Test (EUT):

Name : Wireless weather station clock

Model : RFWS405 ,RFWS409

Standards : FCC PART 15, SUBPART C Section 15.231(e): 2008

Date of Receipt : 16 September 2008

Date of Test : 16 September 2008

Date of Issue : 16 September 2008

Test Result :	**PASS ***

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Robinson Lo
Laboratory Manager

2 Test Summary

Test	Test Requirement	Stanadard Paragraph	Result
Radiated Emission (30MHz to 5000MHz)	FCC PART 15 : 2008	Section 15.231(e)	PASS
Occupied Bandwidth	FCC PART 15 : 2008	Section 15.215	PASS
Dwell Time	FCC PART 15 : 2008	Section 15.231(e)	PASS
Conducted Emission (150KHz to 30MHz)	FCC PART 15: 2008	Section 15.207	N/A*

Remark:

*N/A: The EUT was supplied by batteries.

3 Contents

4 General Information

4.1 Details of E.U.T.

Power Supply: 3.0V DC (2 *1.5V “AAA” Size New Batteries) for Tx.

4.2 Description of Support Units

The EUT was tested as an independent unit: a 433.92MHz radio transmitter.

4.3 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory, No.198 Kezhu Road, Science Town Economic& Technology Development District Guangzhou, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.

4.4 Other Information Requested by the Customer

None.

4.5 Test Facility

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

- **NVLAP – Lab Code: 200611-0**
  SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0. Effective through December 31, 2006.
- **ACA**
  SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.
- **VCCI**
  The 3m Semi-anechoic chamber and Shielded Room (11.5m x 4m x 4m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-1599 and C-1706 respectively.
  Date of Registration:June 01, 2005. Valid until February 22, 2008
- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**
  Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.
- **CNAL – LAB Code: L0141**
  SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAL/AC01:2002 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of Testing Laboratories.
- **FCC – Registration No.: 282399**
  SGS-CSTC Standards Technical Services Co., Ltd., 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 282399, May 31, 2002. With the above and NVLAP's accreditation, SGS-CSTC is an authorised test laboratory for the DoC process.
- **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.: 5169.

5 Test Results

5.1 Test Instruments

RE in Chamber						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (dd-mm-yy)**	**Cal.Due date (dd-mm-yy)**
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	16-06-2007	15-06-2009
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	SEL0023	12-12-2007	11-12-2008
3	EMI Test software	AUDIX	E3	SEL0050	N/A	N/A
4	Coaxial cable	SGS	N/A	SEL0028	18-06-2008	17-06-2009
5	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0014	12-08-2008	11-08-2009
6	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	18-06-2008	17-06-2009
7	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0005	12-08-2008	11-08-2009
8	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEL0076	12-08-2008	11-08-2009
9	Pre-amplifier (1-18GHz)	Rohde & Schwarz	AFS42-00101 800-25-S-42	SEL0081	18-06-2008	17-06-2009
10	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002650-30-8P-44	SEL0080	18-06-2008	17-06-2009
11	Band filter	Amindeon	82346	SEL0094	18-06-2008	17-06-2009
12	Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	15-06-2008	14-06-2009

5.2 E.U.T. Operation

Operating Environment:

Temperature: 24.0 °C
Humidity: 50 % RH
Atmospheric Pressure: 1010 mbar

5.3 Test Procedure & Measurement Data

5.3.1 Radiated Emissions

Test Requirement: FCC Part15 C Section 15.231(e)

Test Method: ANSI C63.4

Measurement Distance: 3m (Semi-Anechoic Chamber and OATS)

Frequency range 30 MHz – 5.0GHz for transmitting mode.
30MHz to 1000MHz RBW=120kHz VBW=300KHz

Above 1GHz RBW=1MHz VBW=3MHz

Requirements:

Fundamental Frequency MHz	Field Strength of Fundamental (dBμV/m @ 3m)	Field Strength of Harmonics and Spurious Emissions (dBμV/m @ 3m)
40.66 to 40.70	67.04	47.04
70 to 130	61.94	41.94
130 to 174	61.94 to 71.48	41.94 to 51.48
174 to 260	71.48	51.48
260 to 470	71.48 to 81.94	51.48 to 61.94
470 and above	81.94	61.94

Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz, uV/m at 3 meters = 22.72727(F) -2454.545; for the band 260-470 MHz, uV/m at 3 meters = 16.6667(F) - 2833.3333. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.

The fundamental frequency of the EUT is 433.92MHz

The limit for field strength Average dBuv/m for the fundamental frequency= 72.86dBuv/m.

No fundamental is allowed in the restricted bands.

The limit for average field strength dBuv/m for the harmonics and spurious

frequencies = 52.86dBuv/m. Spurious in the restricted bands must be less than

54.0 dBuv/m or 15.209.

Test Procedure:

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.

7 The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

8 The Eut is pre-scan from 30MHz to 10th harmonics.

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

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

An initial pre-scan was performed in the 3m chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by Bilog antenna with 2 orthogonal polarities.

The following test results were performed on the EUT:
1. Fundamental emission

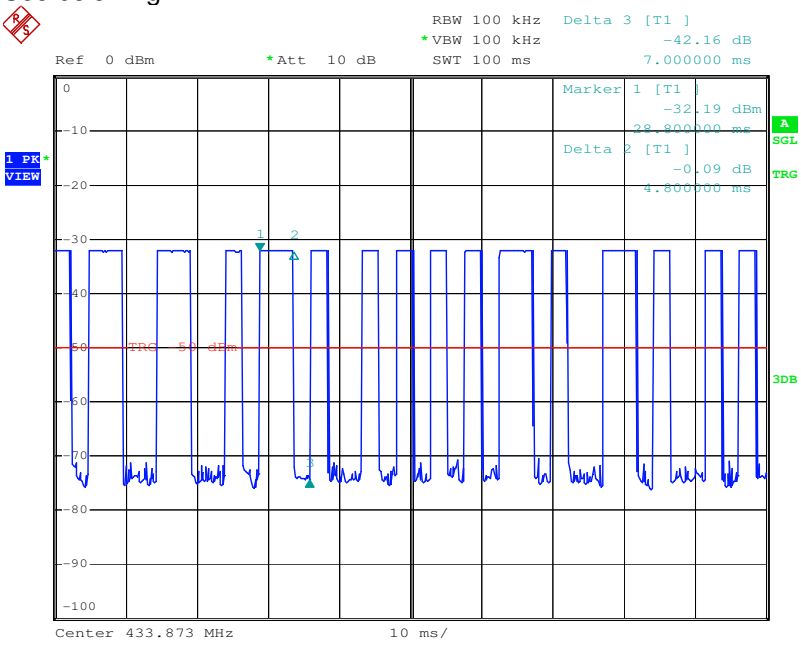
Test Frequency (MHz)	Peak (dBμV/m)		Limits (dBμV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
433.92	71.71	70.37	92.86	21.15	22.45
Test Frequency (MHz)	**AV (dBμV/m)**		**Limits (dBμV/m)**	**Margin (dB)**	
	Vertical	Horizontal		Vertical	Horizontal
433.92	69.41	68.07	72.86	3.46	4.79

Duty Cycle Calculation

Calculation according to RF burst Para 15.35(c)

20log*[16*4.8)msec/100 msec]=-2.3 dB

See below fig.



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Avergae data=Peak data + Duty cycle

Test range: 30MHz- 1GHz

Horizontal

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)	Detector
67.83	0.80	7.07	28.03	42.82	22.66	40	-17.34	QP
140.58	0.83	6.97	28.00	42.41	22.21	43.5	-21.29	QP
230.79	1.30	8.24	27.51	46.94	28.97	46	-17.03	QP
316.15	1.56	11.59	27.01	50.70	36.84	46	-9.16	QP
433.92	2.35	16.59	27.52	78.95	70.37			Peak
867.84	1.91	14.03	26.75	54.71	43.90	46	-2.10	QP

Vertical

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)	Detector
52.31	1.10	7.95	27.99	36.06	17.12	40	-22.88	QP
96.93	1.57	11.64	27.00	39.76	25.97	43.5	-17.53	QP
129.91	1.67	12.24	26.92	38.52	25.51	43.5	-17.99	QP
149.31	2.72	19.99	27.59	43.23	38.35	43.5	-5.15	QP
224.00	1.10	7.95	27.99	36.06	17.12	46	-22.88	QP
433.92	2.35	16.59	27.52	80.29	71.71			Peak
867.84	3.48	22.85	26.58	28.96	28.71	46	-17.29	QP

Test range: above 1GHz

Horizontal

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)	Detector
1260.00	1.25	27.63	44.76	33.87	17.99	54.00	-36.01	Peak
1640.00	1.54	29.10	44.71	33.66	19.59	54.00	-34.41	Peak
1868.00	1.68	30.99	44.68	30.51	18.50	54.00	-35.50	Peak
2164.00	1.84	32.11	44.70	29.11	18.36	54.00	-35.64	Peak
1272.00	1.26	27.64	44.76	33.96	18.10	54.00	-35.90	Peak
1652.00	1.55	29.23	44.71	32.81	18.88	54.00	-35.12	Peak
1888.00	1.69	31.16	44.68	31.49	19.66	54.00	-34.34	Peak
2184.00	1.85	32.12	44.71	27.80	17.06	54.00	-36.94	Peak

Vertical

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)	Detector
1256.00	1.25	27.63	44.76	33.91	18.03	54.00	-35.97	Peak
1572.00	1.49	28.51	44.72	32.52	17.80	54.00	-36.20	Peak
1844.00	1.66	30.82	44.68	31.97	19.77	54.00	-34.23	Peak
2084.00	1.80	32.05	44.68	29.51	18.68	54.00	-35.32	Peak
1276.00	1.26	27.64	44.76	33.12	17.26	54.00	-36.74	Peak
1588.00	1.50	28.64	44.72	31.77	17.19	54.00	-36.81	Peak
1856.00	1.67	30.91	44.68	30.59	18.49	54.00	-35.51	Peak
2096.00	1.80	32.06	44.68	30.39	19.57	54.00	-34.43	Peak

According to the standards used, Where limits are specified by agencies for both average and peak (or quasi-peak) detection ,if the peak (or quasi-peak) measured value complies with the average limit , it is unnecessary to perform an average measurement.

Remark:

According to 15.35 (b) When average radiated emission measurements are specified in the regulations, including emission measurements below 1000 MHz, there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules, e.g., see Section 15.255.

TEST RESULTS: The unit does meet the FCC Part 15 C Section 15.231(e) requirements.

5.3.2 Occupied Bandwidth

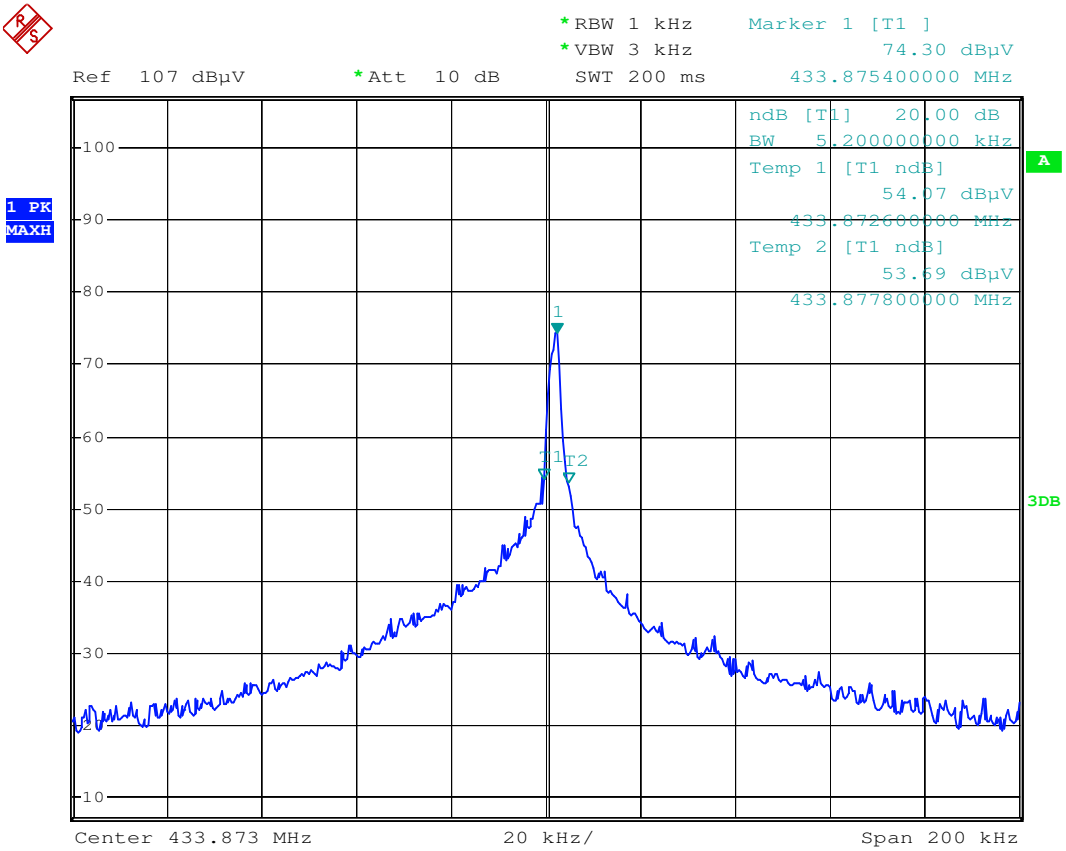
Test Requirement: FCC Part15 C

Test Method: ANSI C63.4 section 13 & FCC Part 2.1049

Requirements: 15.231 (c3) 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.

Method of measurement: A small sample of the transmitter output was fed into the Spectrum Analyzer and the attached plot was taken. The vertical is set to 10dB per division. The horizontal scale is set to 150KHz per division.

The graph as below, represents the emissions take for this device.



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The results: The unit does meet the FCC Part 15C Section 15.231(e) requirements.

5.3.3 Dwell Time:

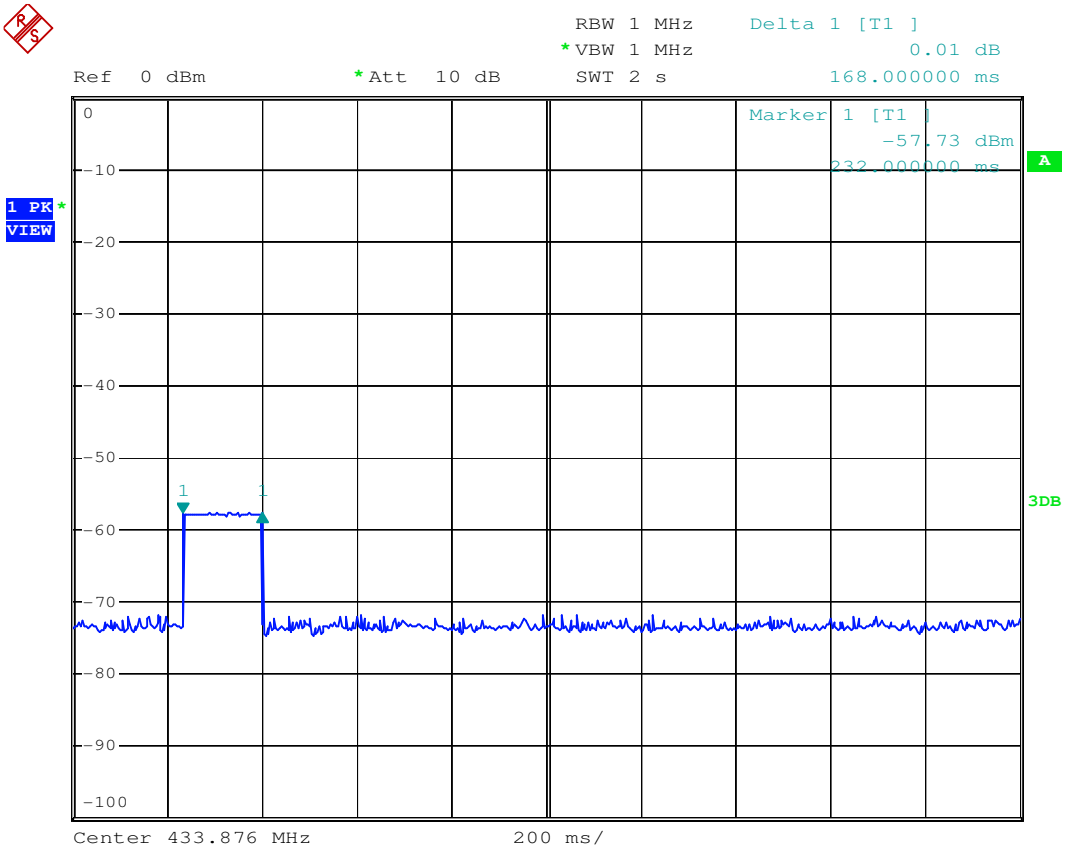
Test Requirement: FCC Part15.231(e)

Test Method: FCC Part15 C Section 15.231(e).

Requirements:

Regulation15.231
The EUT operatedunder 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.

Duration of transmission



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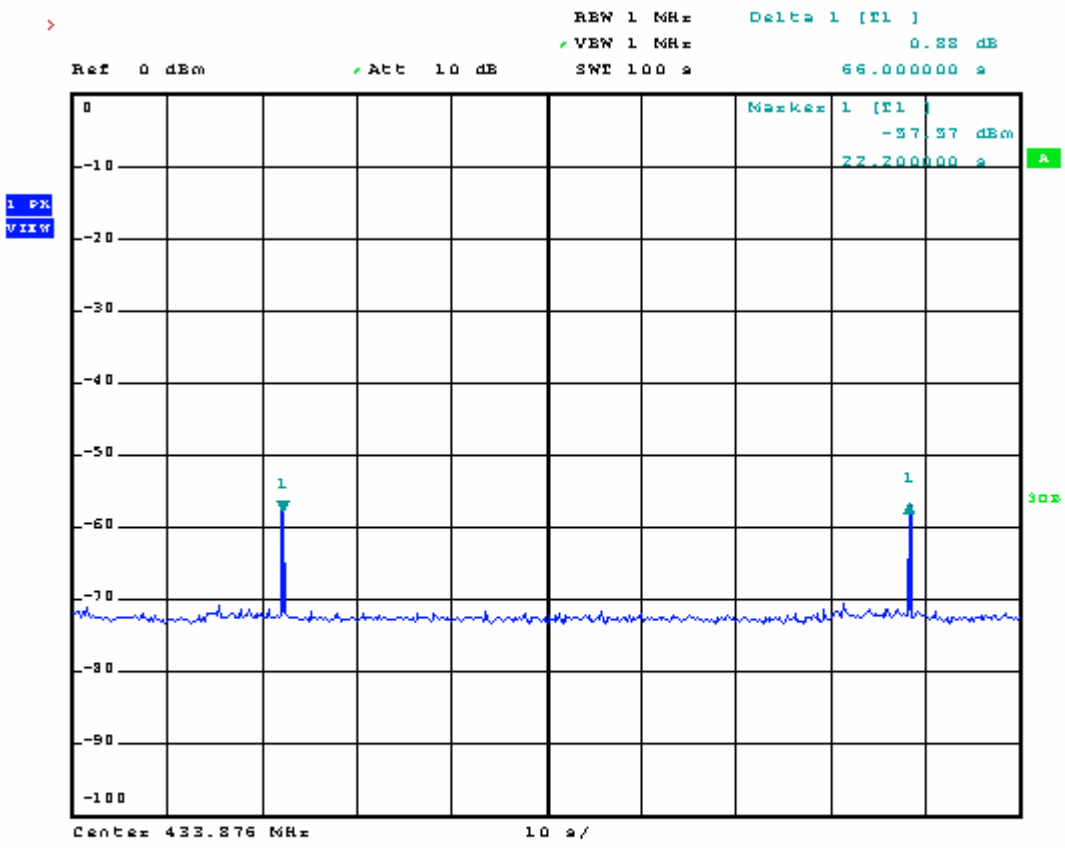
Duty cycle of transmission



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Result:

The results: The unit does meet the FCC Part 15C Section 15.231(e) requirements.