FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

Applicant：	**FUZHOU EMAX ELECTRONIC CO., LTD**
Address：	**Building #12-#16, CangShan Industrial Area, JuYuanZhou JinShan District, FuZhou, China.**
Product Name：	**Outdoor Remote Sensor**
Model Name：	**TX05**
Brand Name：	**TAYLOR**
FCC ID：	**WEC-1502**
Report No.：	**MTE/DYY/A15080987**
Date of Issue：	**Aug. 10, 2015**

Issued by：	**Most Technology Service Co., Ltd.**
Address：	**No.5, Langshan 2nd Road, North District, Hi-tech Industrial Park, Nanshan, Shenzhen, Guangdong, China**
Tel：	**86-755-86026850**
Fax：	**86-755-26013350**

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1. VERIFICATION OF CONFORMITY

Equipment Under Test:	Outdoor Remote Sensor
Brand Name:	TAYLOR
Model Number:	TX05
FCC ID:	WEC-1502
Applicant:	FUZHOU EMAX ELECTRONIC CO., LTD
	Building #12-#16, CangShan Industrial Area, JuYuanZhou JinShan District, FuZhou, China.
Manufacturer:	FUZHOU EMAX ELECTRONIC CO., LTD
	Building #12-#16, CangShan Industrial Area, JuYuanZhou JinShan District, FuZhou, China.
Technical Standards:	47 CFR Part 15 Subpart C
File Number:	MTE/DYY/A15080987
Date of test:	Jul. 31-Aug. 05, 2015
Deviation:	None
Condition of Test Sample:	Normal
Test Result:	PASS

The above equipment was tested by Most Technology Service Co., Ltd. for compliance with the requirements set forth in FCC rules and the Technical Standards mentioned above. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment and the level of the immunity endurance of the equipment are within the compliance requirements.

The test results of this report relate only to the tested sample identified in this report.

Tested by (+ signature): Daisy

Daisy Yu Jul. 31-Aug. 05, 2015

Review by (+ signature): Henry

MOST TECHNOLOGY SERVICE CO., LTD. APPROVED EMC & SAFETY

Henry Chen Aug. 10, 2015

Approved by (+ signature):

Mark Wen(Manager) Aug. 10, 2015

2. GENERAL INFORMATION

2.1 Product Information

Product	Outdoor Remote Sensor
Brand Name	TAYLOR
Model Number	TX05
Series Model Name:	Nil
Difference description:	Nil
Power Supply	TX: DC 3V by batteries
Frequency Range	433.92 MHz
Channel Number:	1
Modulation Technique	ASK
Temperature Range	0℃- 45℃

NOTE:

1. For a more detailed features description about the EUT, please refer to User's Manual.

2.2 Objective

Perform FCC Part 15 Subpart C tests for FCC Marking.

2.3 Test Standards and Results

Test items and the results are as bellow:

No.	Section	Description	Result	Date of Test
1	15.231(b)	Radiated Emission	PASS	2015-07-31
2	15.231	20dB Bandwidth	PASS	2015-07-31
3	15.231	Transmission Cease Time	PASS	2015-08-05
4	15.203	Antenna Requirement	PASS	2015-08-05

Note: 1. The test result judgment is decided by the limit of measurement standard
2. The information of measurement uncertainty is available upon the customer's request.

2.4 Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

- Temperature: 15-35ºC
- Humidity: 30-60 %
- Atmospheric pressure: 86-106 kPa

3. TEST METHODOLOGY

3.1 TEST FACILITY

Test Site:	Most Technology Service Co., Ltd.
Location:	No.5, Langshan 2nd Rd., North Hi-Tech Industrial park, Nanshan, Shenzhen, Guangdong ,China
Description:	There is one 3m semi-anechoic an area test sites and two line conducted labs for final test. The Open Area Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4:2009 and CISPR 16 requirements. The FCC Registration Number is **490827.** The **IC** Registration Number is **7103A-1.** The **CNAS** Registration Number is **CNAS L3573.**
Site Filing:	The site description is on file with the Federal Communications Commission, 7435 Oakland Mills Road, Columbia, MD 21046.
Instrument Tolerance:	All measuring equipment is in accord with ANSI C63.4:2009 and CISPR 16 requirements that meet industry regulatory agency and accreditation agency requirement.
Ground Plane:	Two conductive reference ground planes were used during the Line Conducted Emission, one in vertical and the other in horizontal. The dimensions of these ground planes are as below. The vertical ground plane was placed distancing 40 cm to the rear of the wooden test table on where the EUT and the support equipment were placed during test. The horizontal ground plane projected 50 cm beyond the footprint of the EUT system and distanced 80 cm to the wooden test table. For Radiated Emission Test, one horizontal conductive ground plane extended at least 1m beyond the periphery of the EUT and the largest measuring antenna, and covered the entire area between the EUT and the antenna.

3.2 GENERAL TEST PROCEDURES

EUT Function and Test Mode

The EUT has been tested under normal operating（TX）and standby（RX）condition.

The field strength of radiation emission was measured in the following position: EUT lie-down position (Y axis), stand-up position (X, Z axis).

The following data show only with the worst case setup.

The worst case of Y axis was reported.

Based on client request, all normal using modes of the normal function were tested but only the worst test data of the worst mode is reported by this report.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 8.3.1 of ANSI C63.4:2009.

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 7.3 of ANSI C63.4:2009,Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

4 SETUP OF EQUIPMENT UNDER TEST

4.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

4.2 SUPPORT EQUIPMENT

Device Type	Brand	Model	FCC ID	Series No.	Audio Cable	Power Cord
--	--	--	--	--	--	--

Remark:

All buttons of the EUT have been tested and only worst case reported. The EUT has been tested as an independent unit. And Continual Transmitting in maximum power (The new battery be used during Test) Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.3 TEST EQUIPMENT LIST

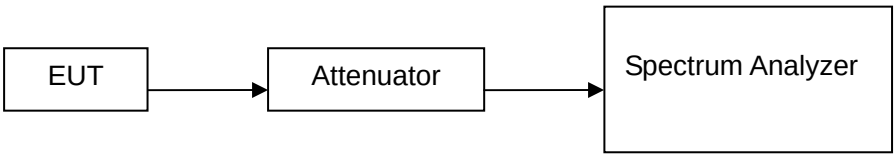
Instrumentation: The following list contains equipment used at Most for testing. The equipment conforms to the CISPR 16-1 / ANSI C63.2 Specifications for Electromagnetic Interference and Field Strength Instrumentation from 10 kHz to 1.0 GHz or above.

No.	Equipment	Manufacturer	Model No.	S/N	Calibration date	Calibration Interval
1	Test Receiver	Rohde & Schwarz	ESCI	100492	2015/03/10	1 Year
2	Spectrum Analyzer	Agilent	E7405A	US44210471	2015/03/14	1 Year
3	L.I.S.N.	Rohde & Schwarz	ENV216	100093	2015/03/10	1 Year
4	Coaxial Switch	Anritsu Corp	MP59B	6200283933	2015/03/07	1 Year
5	Terminator	Hubersuhner	50Ω	No.1	2015/03/07	1 Year
6	RF Cable	SchwarzBeck	N/A	No.1	2015/03/07	1 Year
7	Test Receiver	Rohde & Schwarz	ESPI	101202	2015/03/10	1 Year
8	Bilog Antenna	Sunol	JB3	A121206	2015/03/14	1 Year
9	Horn Antenna	SCHWARZBECK	BBHA9120D	756	2015/03/14	1 Year
10	Horn Antenna	Penn Engineering	9034	8376	2015/03/14	1 Year
11	Cable	Resenberger	N/A	NO.1	2015/03/07	1 Year
12	Cable	SchwarzBeck	N/A	NO.2	2015/03/07	1 Year
13	Cable	SchwarzBeck	N/A	NO.3	2015/03/07	1 Year
14	Single Phase Power Line Filter	DuoJi	FNF 202B30	N/A	2015/03/07	1 Year
15	Test Receiver	Rohde & Schwarz	ESCI	100492	2015/03/10	1 Year
16	Loop antenna	ARA	PLA-1030/B	1039	2015/03/14	1 Year

NOTE: *Equipments listed above have been calibrated and are in the period of validation.*

5. 47 CFR Part 15 C Requirements
5.1 DUTY CYCLE
5.1.1 LIMIT
Nil (No dedicated limit specified in the Rules)

5.1.2Test Configuration



5.1.3TEST PROCEDURE
1. Place the EUT on the table and set it in transmitting mode.

2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

3. Set center frequency of spectrum analyzer = operating frequency.

4. Set the spectrum analyzer as RBW, VBW=100KHz, Span = 0Hz, Adjust Sweep = 100ms

5. Repeat above procedures until all frequency measured were completed.

5.1.4 Teat Data

Ton1=1.08 *10=10.8 (ms)

Ton2=1.11*2= 2.22(ms)

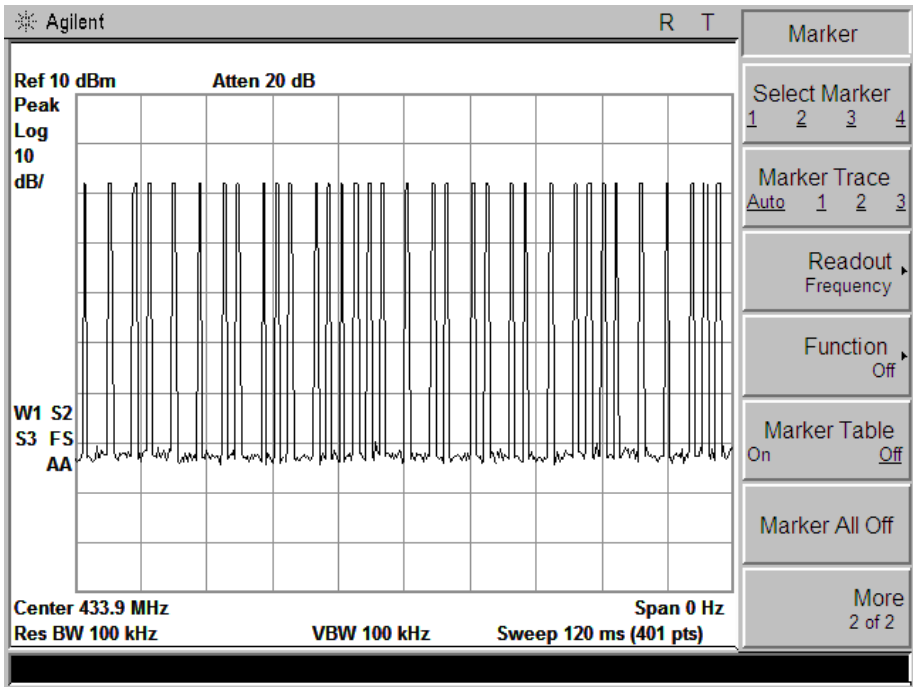
Ton3=0.63*17= 10.71 (ms)

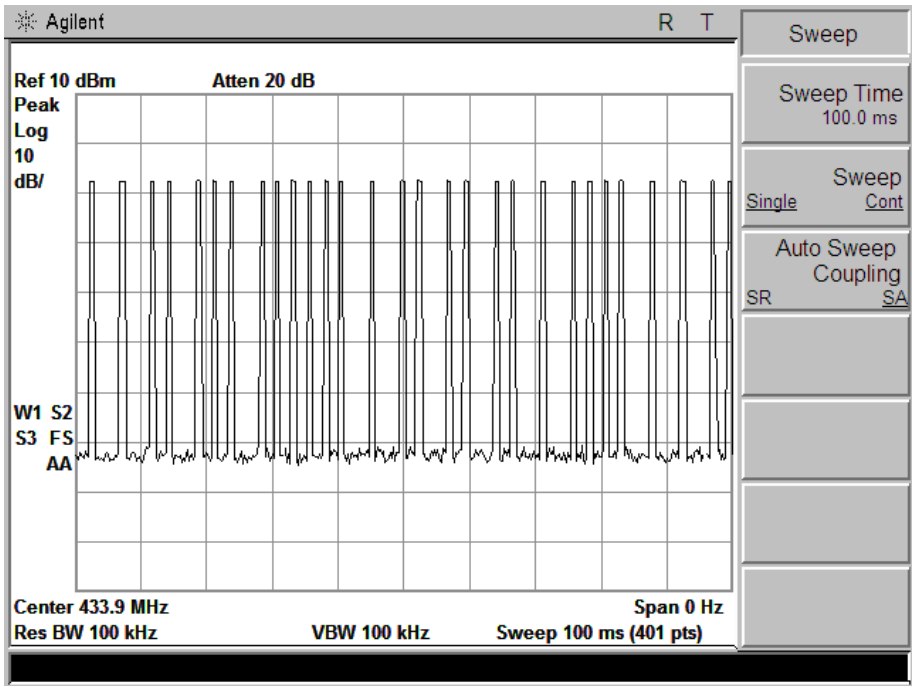
Ton=Ton1+Ton2+ Ton3=23.73(ms)

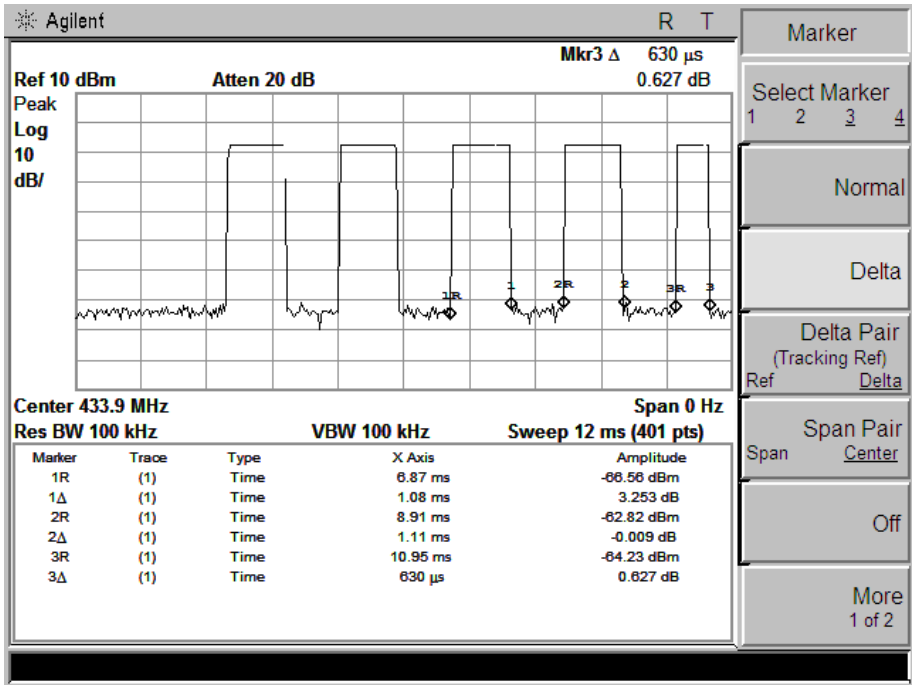
Duty Cycle Correction Factor=20*log(Ton/Tp)= 20*log (23.73/100) = -12.49dB

Remark:
1. Based on 15.35(c), the pulse train is more than 100ms, so the value of Tp is100ms.

5.1.5Test Plot






Agilent
R T
Mkr3 Δ 630 µs
0.627 dB
Ref 10 dBm
Atten 20 dB
Peak
Log
10
dB/
Center 433.9 MHz
Res BW 100 kHz
VBW 100 kHz
Span 0 Hz
Sweep 12 ms (401 pts)
Marker Trace Type X Axis Amplitude
1R (1) Time 6.87 ms -66.56 dBm
1Δ (1) Time 1.08 ms 3.253 dB
2R (1) Time 8.91 ms -62.82 dBm
2Δ (1) Time 1.11 ms -0.009 dB
3R (1) Time 10.95 ms -64.23 dBm
3Δ (1) Time 630 µs 0.627 dB
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

5.2 Radiated Emission
5.2.1 Definition

According to FCC Part 15 Section 15.231(b), the field strength of fundamental shall not exceed 10997 μ V/m (80.8 dB μ V/m) at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in section 15.35 for limiting peak emissions apply.

1. The limits on the field strength of the spurious emissions in the above table are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average limits shown in this table or to the general limits shown in 15.209, whichever limit permits a higher field strength.

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

Remark: *Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.*

2. In addition to the provisions of 15.205, the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

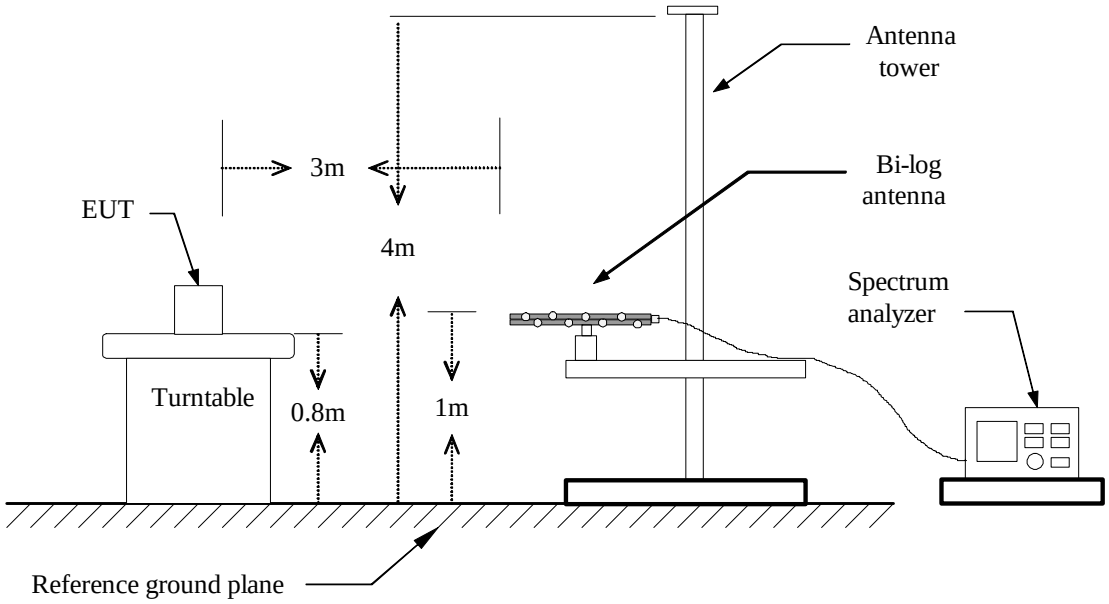
Fundamental Frequency (MHz)	Field Strength of fundamental(microvolts/m)	Field strength of spurious emissions(microvolts/m)
40.66-40.70	2250	225
70-130	1250	125
130-174	1250 to 3750	125 to 375
174-260	3750	375
260-470	3750 to 12500	375 to 1250
Above 470	12500	1250

The above field strength limits are specified at a distance of 3 meters, the tighter limit applies at the band edges.

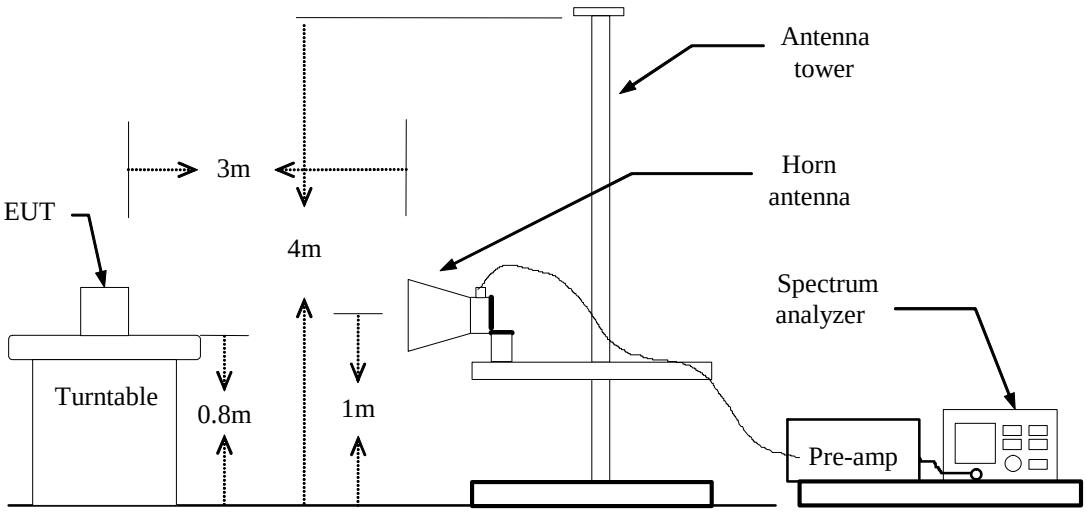
5.2.2 Test Configuration

Test Setup:

Below 1GHz:



Above 1GHz:



5.2.3 Test Description

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. Set the spectrum analyzer in the following setting as:

   Below 1GHz: 1: RBW=100 kHz / VBW=300 kHz / Sweep=AUTO（For spurious emissions）

   2: RBW=1 MHz / VBW=1 MHz / Sweep=AUTO（For fundamental）

   Above 1GHz :(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
   (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
7. Repeat above procedures until the measurements for all frequencies are complete.

5.2.4 Test Result

Operation Mode:	TX mode	**Test Date:**	2015-07-31
Temperature:	21°C	**Tested by:**	John
Humidity:	60 % RH	**Polarity:**	Ver. / Hor.

Form 9 KHz to 30MHz:

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	AV Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)			
N/A	H								>20
N/A	V								>20

Notes:

Data of measurement within this frequency range shown "--- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

From 30MHz to 1GHz

Fundamental & harmonic frequency measurement：

Freq. (MHz)	Detector	Ant. Pol. H/V	Reading [Peak] (dBuV/m)	Factor (dB)	Actual FS [Peak] (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
433.92	Peak	H	61.21	20.30	81.51	100.80	19.29
433.92	Peak	V	23.31	20.30	43.61	100.80	57.19
867.84	Peak	H	10.16	27.00	37.16	80.80	43.64
867.84	Peak	V	8.13	27.00	35.13	80.80	45.67

Freq. (MHz)	Detector	Ant. Pol. H/V	Actual FS [Peak] (dBuV/m)	Correction Factor (dB)	Actual FS [AV] (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
433.92	Peak	H	81.51	-12.49	69.02	80.80	11.78
433.92	Peak	V	43.61	-12.49	31.12	80.80	49.68
867.84	Peak	H	37.16	-12.49	24.67	60.80	36.13
867.84	Peak	V	35.13	-12.49	22.64	60.80	38.16

Spurious measurement (other than Fundamental & harmonic frequency)：

Freq. (MHz)	Detector	Ant. Pol. H/V	Reading (dBuV/m)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
30.62	QP	H	---	---	---	60.80	>20
47.31	QP	V	---	---	---	60.80	>20
89.51	QP	H	---	---	---	60.80	>20
124.60	QP	V	---	---	---	60.80	>20
453.75	QP	H	---	---	---	60.80	>20
489.52	QP	V	---	---	---	60.80	>20

Above 1GHz

Harmonic frequency measurement：

Freq. (MHz)	Detector	Ant. Pol. H/V	Reading [Peak] (dBuV/m)	Factor (dB)	Actual FS [Peak] (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
1301.76	Peak	H	13.47	27.32	40.80	80.80	40.00
1301.76	Peak	V	11.63	27.32	38.95	80.80	41.85
1735.68	Peak	H	---	---	---	---	>20
1735.68	Peak	V	---	---	---	---	>20
2169.6	Peak	H	---	---	---	---	>20
2169.6	Peak	V	---	---	---	---	>20

Freq. (MHz)	Detector	Ant. Pol. H/V	Actual FS [Peak] (dBuV/m)	Factor (dB)	Actual FS [AV] (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
1301.76	AV	H	40.80	-12.49	28.31	60.80	32.49
1301.76	AV	V	38.95	-12.49	26.46	60.80	34.34
1735.68	AV	H	---	---	---	---	>20
1735.68	AV	V	---	---	---	---	>20
2169.6	AV	H	---	---	---	---	>20
2169.6	AV	V	---	---	---	---	>20

Note: **1:** *Actual FS [Peak] = Reading [Peak] + Factor;*

2: *Actual FS [AV] = actual FS [Peak] +Duty Cycle Correction Factor（-12.49dB）*

3: *For frequency above 1GHz, no other spurious emission could be detected except harmonic frequency;*

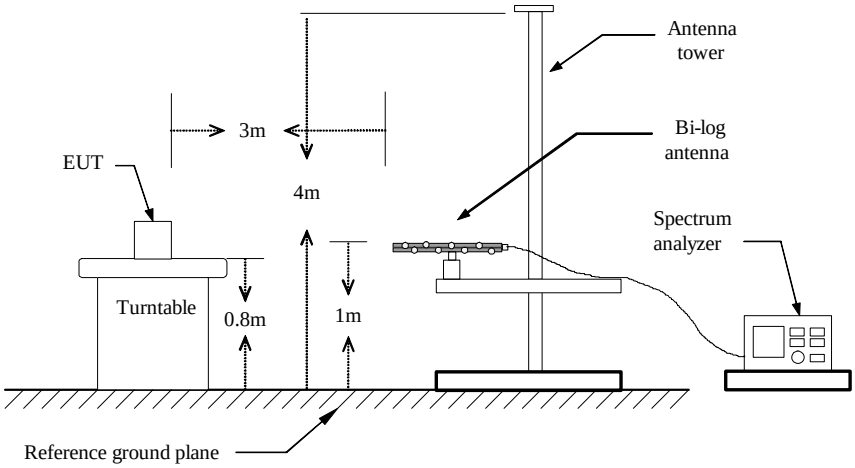
4: *Data of measurement within this frequency range shown "--- " in the table above means the reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.*

5.3 20dB Bandwidth

5.3.1 Requirement

According to FCC section 15.231(c), 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.

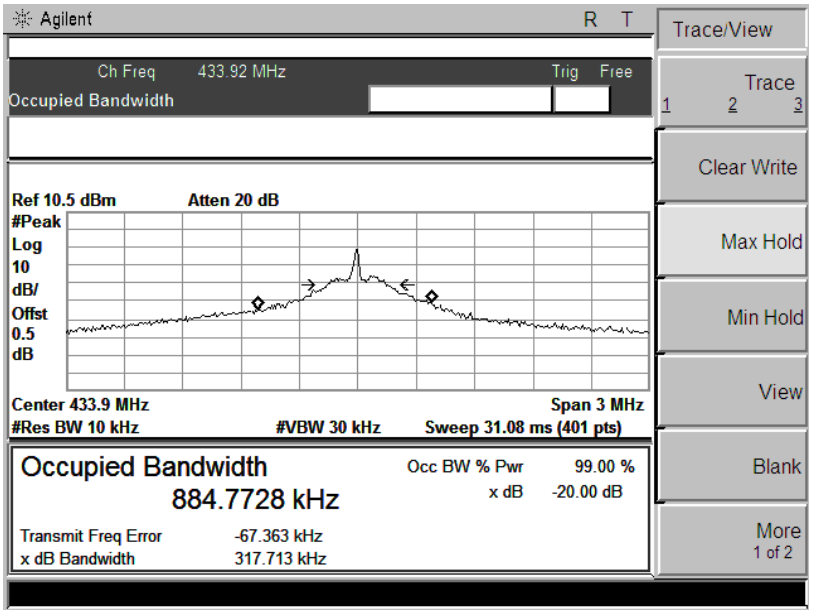
5.3.2 Test Description



5.2.3 Test Result

Frequency	20dB Bandwidth	Limit	Result
433.92MHz	317.713kHz	1.0848MHz	PASS

Test Plot:



5.4 Transmission Cease Time

5.4.1 Requirement

According to FCC section 15.231(a):

(2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.

5.4.2 Test Description

EUT fulfills the requirement of FCC section 15.231(a)(2);

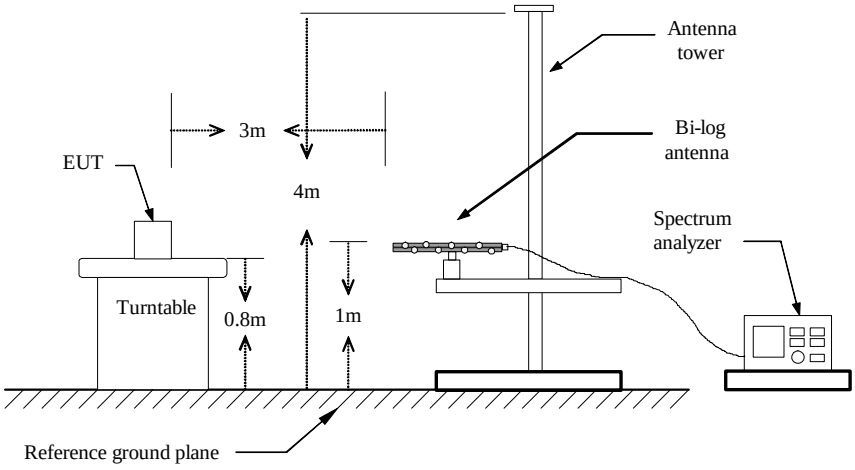
1：The EUT is placed on a turntable, which is 0.8m above ground plane；

2：Set the spectrum analyzer in the following setting as:

RBW=1MHz / VBW=1MHz / Sweep=10s；

3：Press the button of EUT and then release；

Remark: EUT would be triggered when pressing the button.

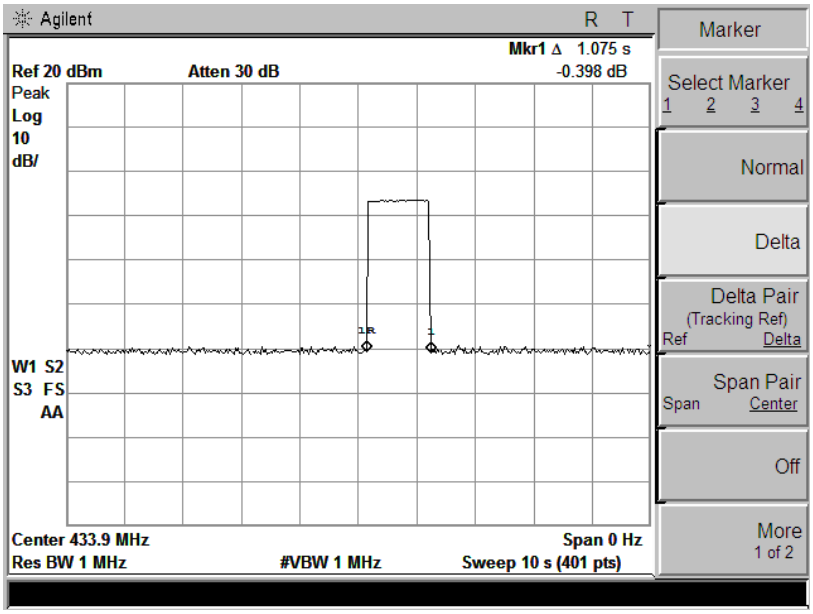


5.4.3 Test Result

This time complies with the FCC requirement. The Stop Transmitting Time is 1.075 second. The limit of the Stop Transmitting Time is 5 second, thus the time complies with the Stop Transmitting Time of limit.

Frequency	Test Result	Limit	Result
433.92MHz	1.075s	＜5s	PASS

Test Plot:


Agilent
R T
Mkr1 Δ 1.075 s
-0.398 dB
Ref 20 dBm
Atten 30 dB
Peak
Log
10
dB/
W1 S2
S3 FS
AA
Center 433.9 MHz
Res BW 1 MHz
#VBW 1 MHz
Span 0 Hz
Sweep 10 s (401 pts)
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

5.5 Antenna Requirement

5.5.1 Definition

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, An analysis of the EUT was performed to determine compliance with FCC Section 15.203. This section requires specific handling and control of antennas used for devices subject to regulations.

5.5.2 Evaluation Criteria

Section 15.203 of the rules states that the subject device must meet at least one of the following criteria:

(a) Antenna must be permanently attached to the unit.

(b) Antenna must use a unique type of connector to attach to the EUT.

(c) Unit must be professionally installed. Installer shall be responsible for verifying that the correct antenna is employed with the unit.

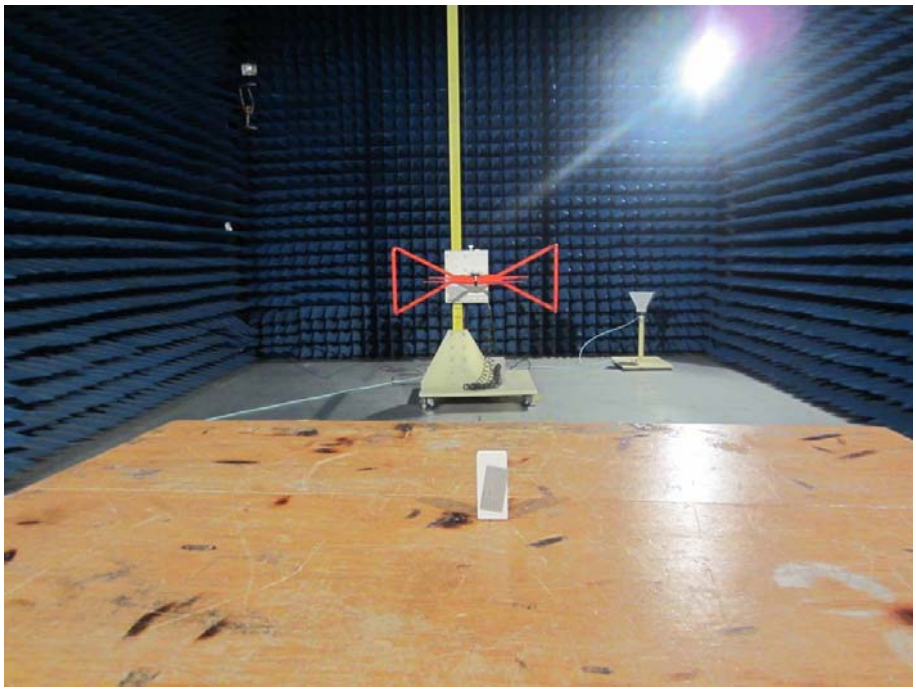
5.5.3 Evaluation Results

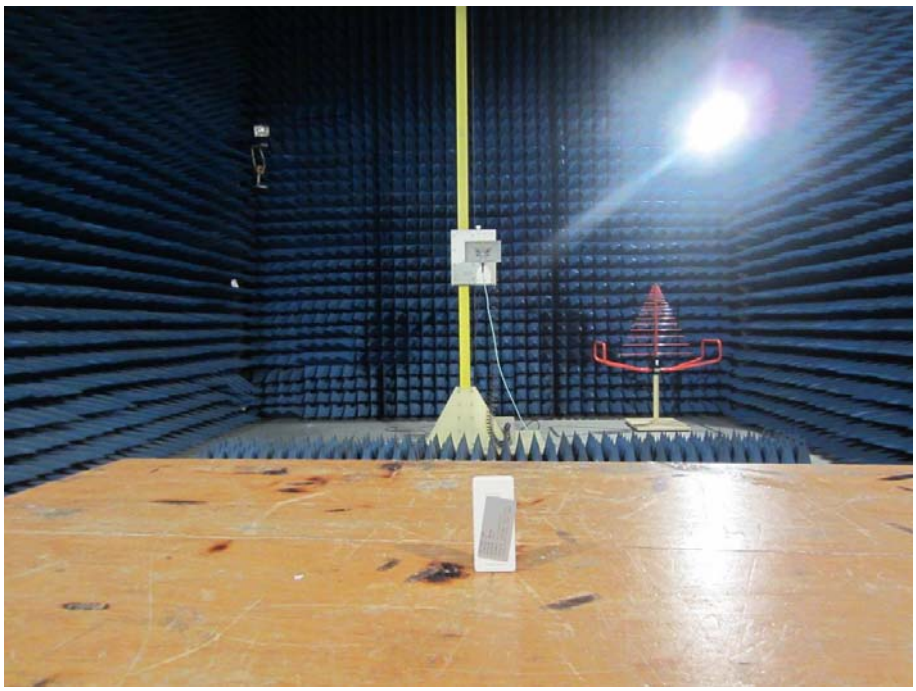
The Antenna is Coil antenna, it is inaccessible to the user.

The EUT is therefore compliant with the regulation.

APPENDIX 1
PHOTOGRAPHS OF TEST SETUP

Radiated Emission Test Setup





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