FCC RADIO TEST REPORT
FCC ID: 2ADJ2TX05

Product :	BAND WIRELESS
Trade Name :	N/A
Model Name :	Wireless transmit
Serial Model :	N/A

Prepared for

Rolling Code Limited

21/F C C WU BLDG, 302-308 HENNESSY RD WANCHAI, HONG KONG

Prepared by

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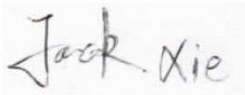
TEST RESULT CERTIFICATION

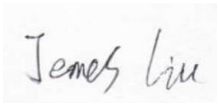
Applicant's name	:	Rolling Code Limited
Address	:	21/F C C WU BLDG, 302-308 HENNESSY RD WANCHAI, HONG KONG
Manufacture's Name	:	Rolling Code Limited
Address	:	21/F C C WU BLDG, 302-308 HENNESSY RD WANCHAI, HONG KONG
Product description		
Product Name	:	BAND WIRELESS
Model and/or type reference	:	Wireless transmit
Serial Model	:	N/A
Standards	:	FCC Part15.231:2016
Test procedure		ANSI C63.10-2013

This device described above has been tested by AIT, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

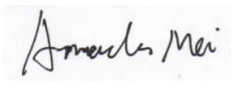
Date of Test	:	
Date (s) of performance of tests	:	Apr. 17 2016 ~Apr. 27 2016
Date of Issue	:	Apr. 27 2016
Test Result	:	**Pass**

Testing Engineer: 

(Jack xie)

Technical Manager : 

(Jemes liu)

Authorized Signatory : 

(Amanda mei)

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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15, Subpart C (15.231)			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	N/A	
15.203	Antenna Requirement	Pass	
15.231	Radiated Spurious Emission	Pass	
15.231	Occupied Bandwidth	Pass	
15.231	Transmitter Timeout	Pass	

NOTE:
(1) ” N/A” denotes test is not applicable in this Test Report.

1.1 TEST FACILITY

DongGuan Yaxu(AiT) Technology Limited
No. 22,JinQianLing Street 3, JiTiGang Village, Huang-Jiang Town, DongGuan, Guangdong, 523757 China.
FCC Registration No.: 248337

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **U**，where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95** %。

No.	Item	Uncertainty
1	Conducted Emission Test	±1.38dB
2	RF power,conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

<table>
<tr><td>Equipment</td><td>BAND WIRELESS</td></tr>
<tr><td>Trade Name</td><td>N/A</td></tr>
<tr><td>Model Name</td><td>Wireless transmit</td></tr>
<tr><td>Serial Model</td><td>N/A</td></tr>
<tr><td>Model Difference</td><td>N/A</td></tr>
<tr><td>Product Description</td><td>The EUT is a BAND WIRELESS

<table><tr><td>Product Type</td><td>BAND WIRELESS</td></tr><tr><td>Operation Frequency:</td><td>433.92MHz</td></tr><tr><td>Modulation Type:</td><td>FSK</td></tr><tr><td>Number Of Channel</td><td>1CH.</td></tr><tr><td>Antenna Designation:</td><td>extension cord antenna</td></tr><tr><td>Antenna Gain(Peak)</td><td>0 dBi</td></tr><tr><td>Field strength:</td><td>78.64 dBuV/m (PK Max.)</td></tr></table></td></tr>
<tr><td>Channel List</td><td>N/A</td></tr>
<tr><td>Adapter</td><td>N/A</td></tr>
<tr><td>HW</td><td>ADIO_BAND_TX_20150815</td></tr>
<tr><td>SW</td><td>V1.0</td></tr>
<tr><td>Battery</td><td>DC 3V</td></tr>
</table>

Note:

1. For a more detailed features description, please refer to the manufacturer’s specifications or the User's Manual.

2. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	N/A	extension cord	N/A	0	Antenna

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2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	TX

For Conducted Emission	
Final Test Mode	Description
Mode 1	N/A

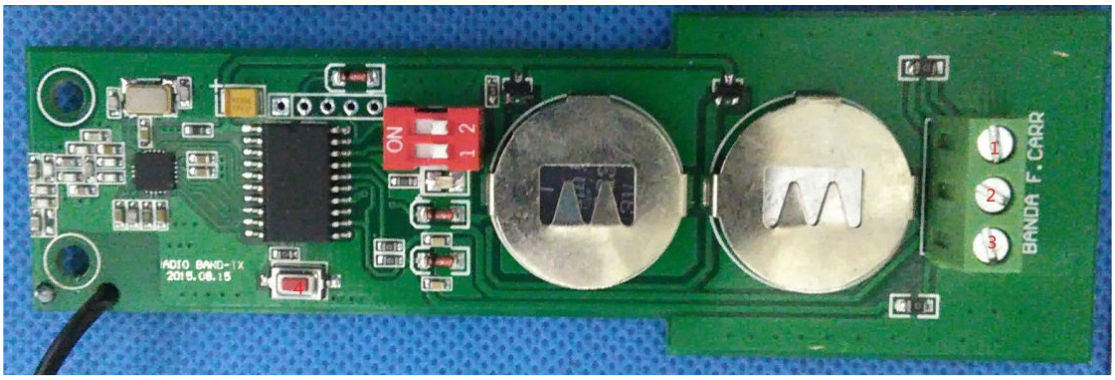
For Radiated Emission	
Final Test Mode	Description
Mode 1	TX

Note：

(1) The EUT used new battery during the measurement.

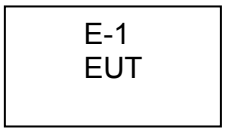
(2) EUT continuous transmission during the test.

(3) All operating mode(short circuit 1-2, Short circuit 3-2, pair with receiver) has been tested, only the worst case(short circuit 1-2) reported.



2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test



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2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	BAND WIRELESS	N/A	Wireless transmit	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

Note:

(1) The support equipment was authorized by Declaration of Confirmation.

(2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

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2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	Spectrum Analyzer	ADVANTEST	R3182	150900201	2015.06.29	2016.06.28
2	EMI Measuring Receiver	R&S	ESR	101660	2015.12.12	2016.12.11
3	Low Noise Pre Amplifier	Tsj	MLA-10K01-B01-27	1205323	2015.06.29	2016.06.28
4	Low Noise Pre Amplifier	Tsj	MLA-0120-A02-34	2648A04738	2015.12.02	2016.12.01
5	TRILOG Super Broadband test Antenna	SCHWARZBECK	VULB9160	9160-3206	2015.12.03	2016.12.02
6	Broadband Horn Antenna	SCHWARZBECK	BBHA9120D	452	2015.12.03	2016.12.02
7	Loop Antenna	ARA	PLA-1030/B	1029	2015.03.20	2016.03.19
8	Radiated Cable 1# (30MHz-1GHz)	FUJIKURA	5D-2W	01	2016.01.04	2017.01.03
9	Radiated Cable 2# (1GHz -25GHz)	FUJIKURA	10D2W	02	2015.12.25	2016.12.24
10	Conducted Cable 1#(9KHz-30MHz)	FUJIKURA	1D-2W	01	2016.01.04	2017.01.03
11	SMA Antenna connector	Dosin	Dosin-SMA	N/A	N/A	N/A
Note: The SMA antenna connector is soldered on the PCB board in order to perform conducted tests and this SMA antenna connector is listed in the equipment list.						

3. ANTENNA REQUIREMENT

3.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 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.

3.2 EUT ANTENNA

The EUT antenna is soldered on the PCB board extension cord Antenna. It comply with the standard requirement.

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3.3 CONDUCTED EMISSION MEASUREMENT

3.3.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5			66 - 56 *	56 - 46 *	CISPR
0.50 -5.0			56.00	46.00	CISPR
5.0 -30.0			60.00	50.00	CISPR

0.15 -0.5			66 - 56 *	56 - 46 *	LP002.
0.50 -5.0			56.00	46.00	LP002.
5.0 -30.0			60.00	50.00	LP002.

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

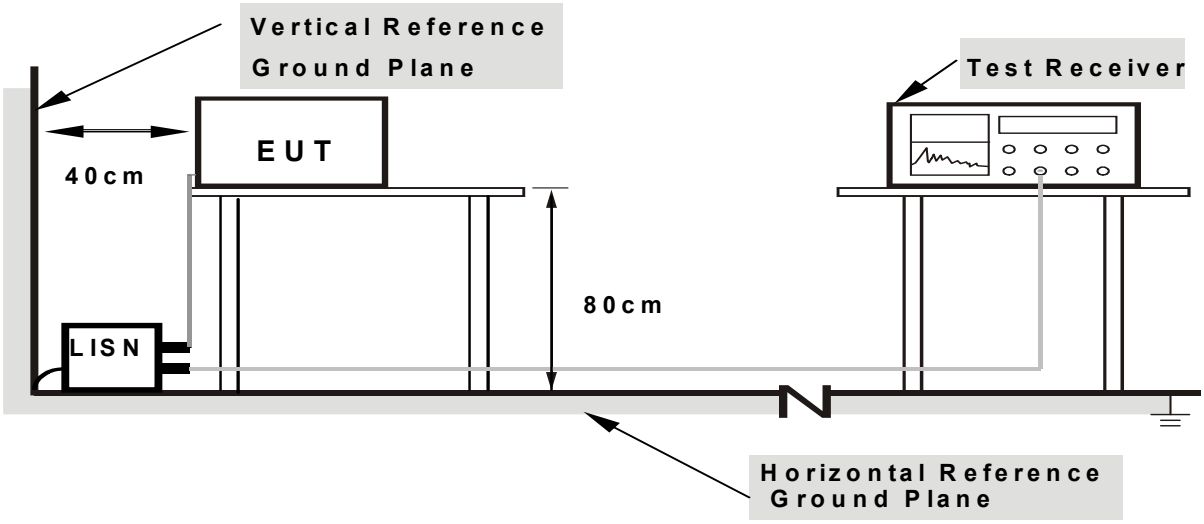
3.3.2 TEST PROCEDURE

a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.3.3 DEVIATION FROM TEST STANDARD

No deviation

3.3.4 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.2.5 TEST RESULT

N/A

Note : Due to this EUT is powered by batteries only, this test item is not applicable.

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3.4 RADIATED EMISSION MEASUREMENT

3.4.1 Radiated Emission Limits (FCC 15.209)

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Note:

(1) The tighter limit applies at the band edges.

(2) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC 15.231)

Fundamental Frequency (MHz)	Field Strength of fundamental (microvolts/meter)	Field Strength of Unwanted Emissions (microvolts/meter)
40.66 - 40.70	2250.00	225.00
70 - 130	1250.00	125.00
130 - 174	1,250 to 3,750 **	125 to 375 **
174 - 260	3750.00	375.00
260 - 470	3,750 to 12,500 **	375 to 1,250 **
Above 470	12500.00	1250.00

Notes:

(1) ** linear interpolations

[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 = 56.81818(F) - 6136.3636; for the band 260-470 MHz, uV/m at 3 meters = 41.6667(F) - 7083.3333. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

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 (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in 93 Section 15.209, whichever limit permits a higher field strength.

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Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1MHz / 1MHz for Peak

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.4.2 TEST PROCEDURE

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note: Fro radiated meissiont test above 1GHz

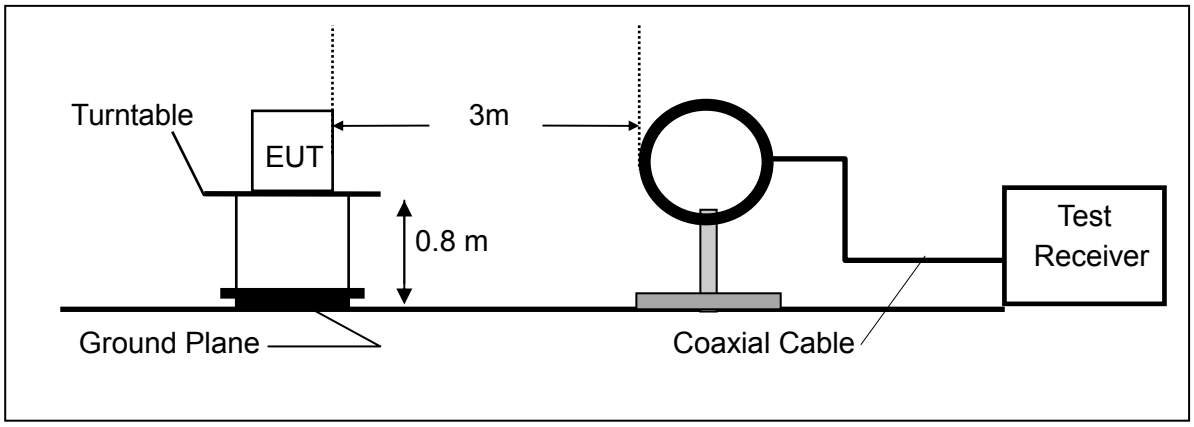
EUT was placed upon a wooden test table which was placed on the turn table 1.5m above the horizontal metal ground plane, and operating in the mode as mentioned above
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

3.4.3 DEVIATION FROM TEST STANDARD

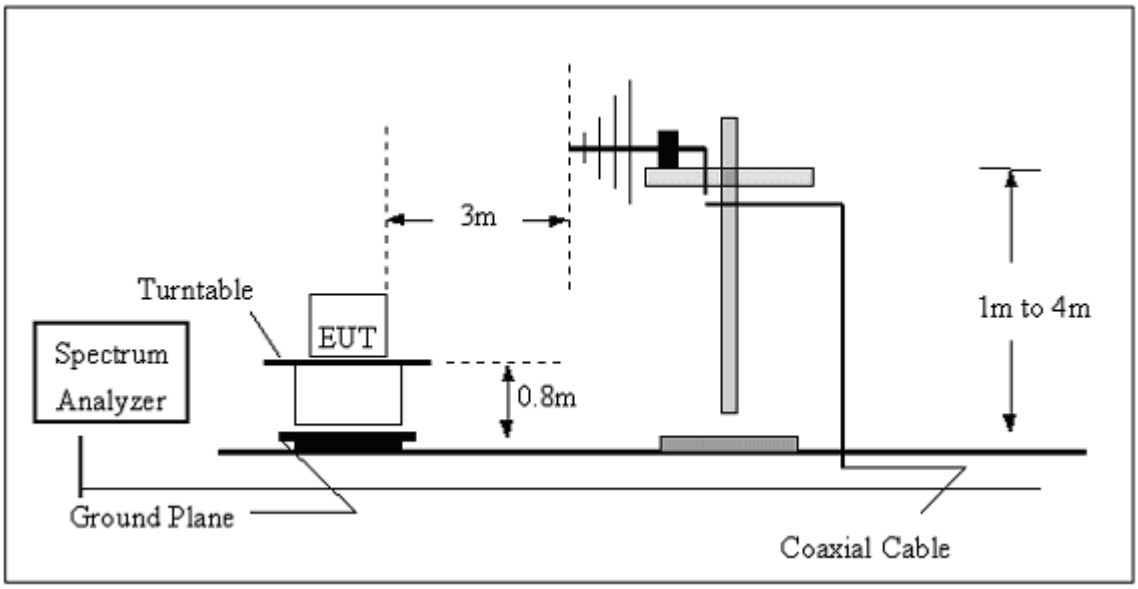
No deviation

3.4.4 TEST SETUP

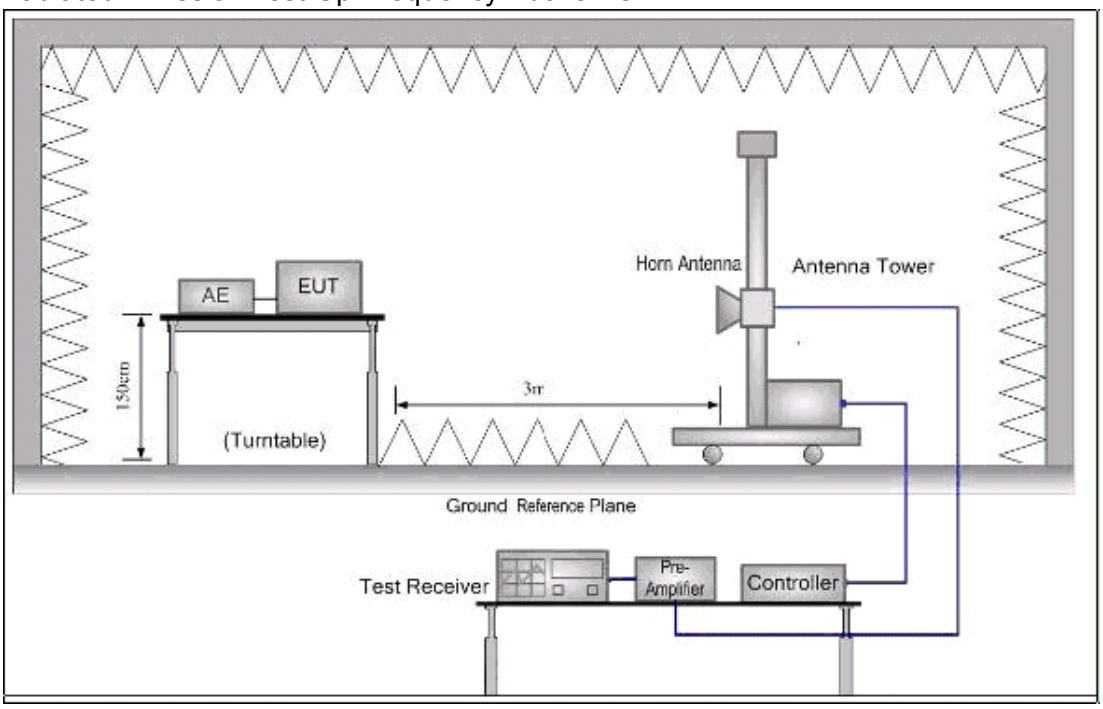
（A）Radiated Emission Test-Up Frequency Below 30MHz



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



（C）Radiated Emission Test-Up Frequency Above 1GHz



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3.4.5 TEST RESULTS (BELOW 30MHz)

EUT：	BAND WIRELESS	Model Name. ：	Wireless transmit
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3V
Test Mode ：	TX	Polarization：	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

NOTE:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

3.4.6 TEST RESULTS (BETWEEN 30 – 5000 MHZ)

Operation Mode:	433.92MHz	Test Date :	Apr. 26, 2016
Frequency Range:	30~5000MHz	Temperature :	24℃
Test Result:	PASS	Humidity :	55 %
Measured Distance:	3m	Test By:	Jack

Frequency	Ant.Pol.	Field Strength	Limit(PK)	Limit(AV)	State
MHz	H/V	dBuV/m (PK)	dBuV/m	dBuV/m	
433.92	H	78.64	100.82	80.82	pass
867.84	H	56.19	80.82	60.82	pass
1301.76	H	50.34	74.00	54.00	pass
1735.68	H	47.62	74.00	54.00	pass
2169.60	H	42.18	74.00	54.00	pass
--	H	--	74.00	54.00	pass
433.92	V	78.52	100.82	80.82	pass
867.84	V	57.44	80.82	60.82	pass
1301.76*	V	51.27	74.00	54.00	pass
1735.68	V	47.36	74.00	54.00	pass
2169.60	V	44.18	74.00	54.00	pass
--	V	--	74.00	54.00	pass

NoTE:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. *: Denotes restricted band of operation.

Measurements were made using a peak detector and average detector. Any emission falling within the restricted bands of FCC Part 15 Section 15.205 were compliance with the emission limit of FCC Part 15 Section 15.209.

3. FCC Limit for Average Measurement = 41.6667(433.92)-7083.3333=80.82dBuV/m
4. 1/PW =1/1.64ms=0.61<RBW(120KHz),PDCF is not needed

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4. BANDWIDTH TEST

4.1 TEST PROCEDURE

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.
Limit: 433.92MHz*0.25%=1084.8KHz

4.2 DEVIATION FROM STANDARD

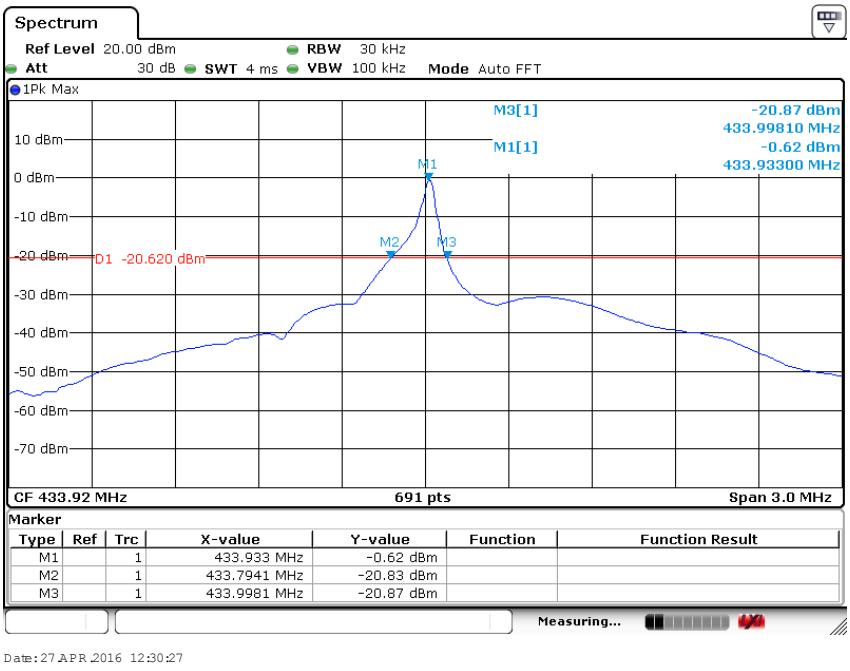
No deviation.

4.3 TEST SETUP

4.4 TEST RESULTS

EUT :	BAND WIRELESS	Model Name :	Wireless transmit
Temperature :	26 ℃	Relative Humidity :	53%
Pressure :	1020 hPa	Test Power :	DC 3V
Test Mode :	TX		

Test Channel	Frequency (MHz)	20 dBc Bandwidth (kHz)	Limit (kHz)
CH01	433.92	204	1084.8



5. TRANSMITTER TIMEOUT

5.1 REQUIREMENTS

1 A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

Result: The EUT is a manually operated transmitter. please refer to below detail data.

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

Result: The EUT does not have a automatically activated transmitter.

Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour

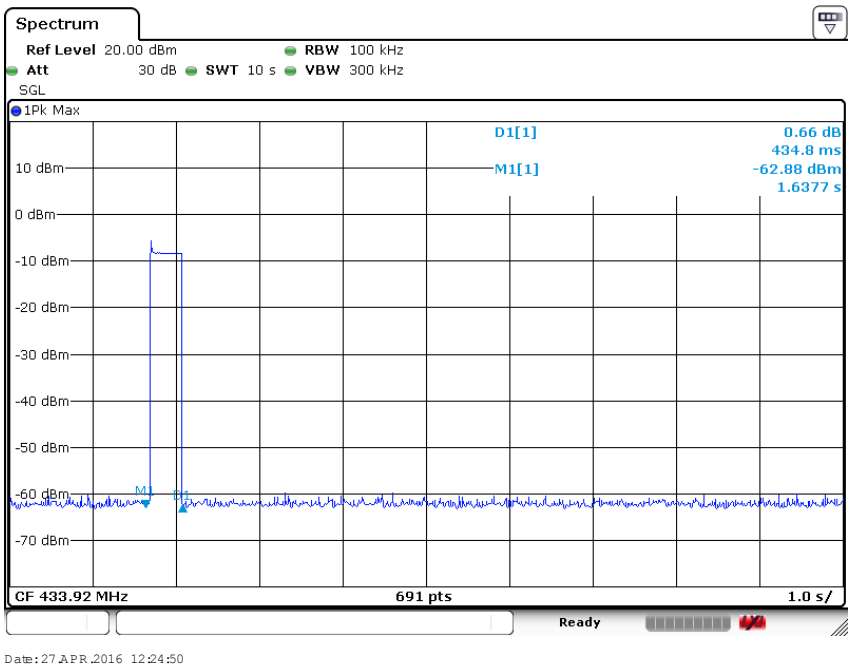
Result: The EUT does not employ periodic transmission.

4 Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition.

Result: The section is not applicable to EUT.

Note：The transmission time of signal will not be affected no matter which condition.

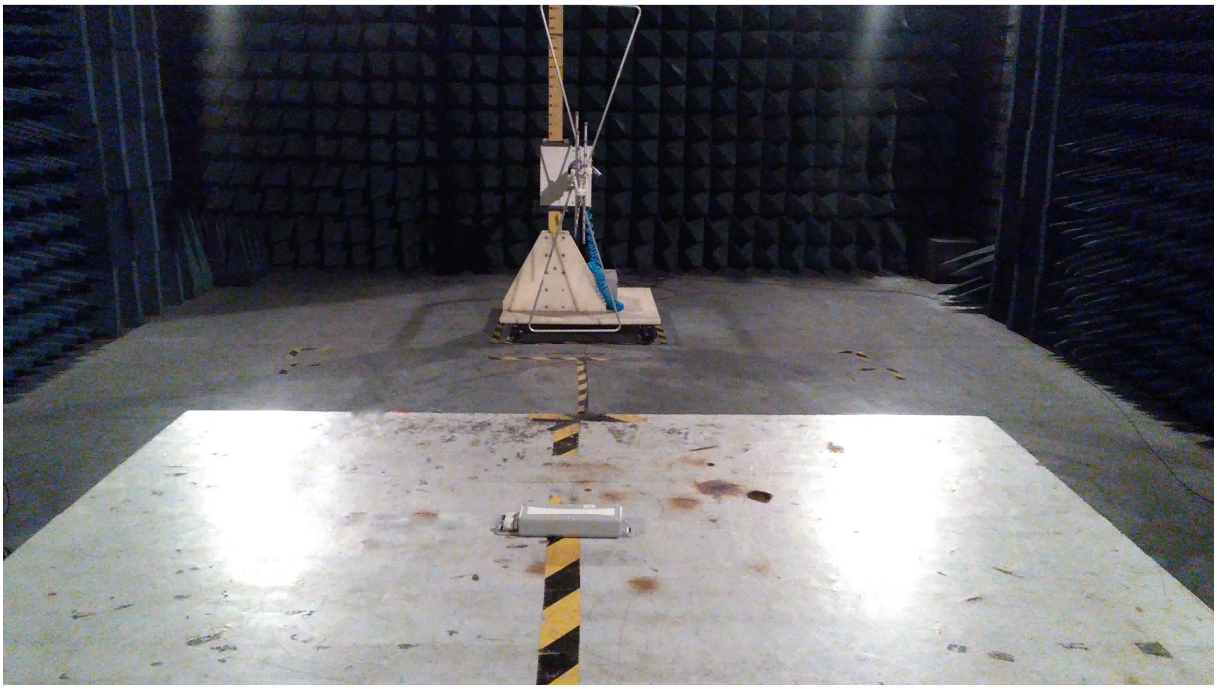
Test data

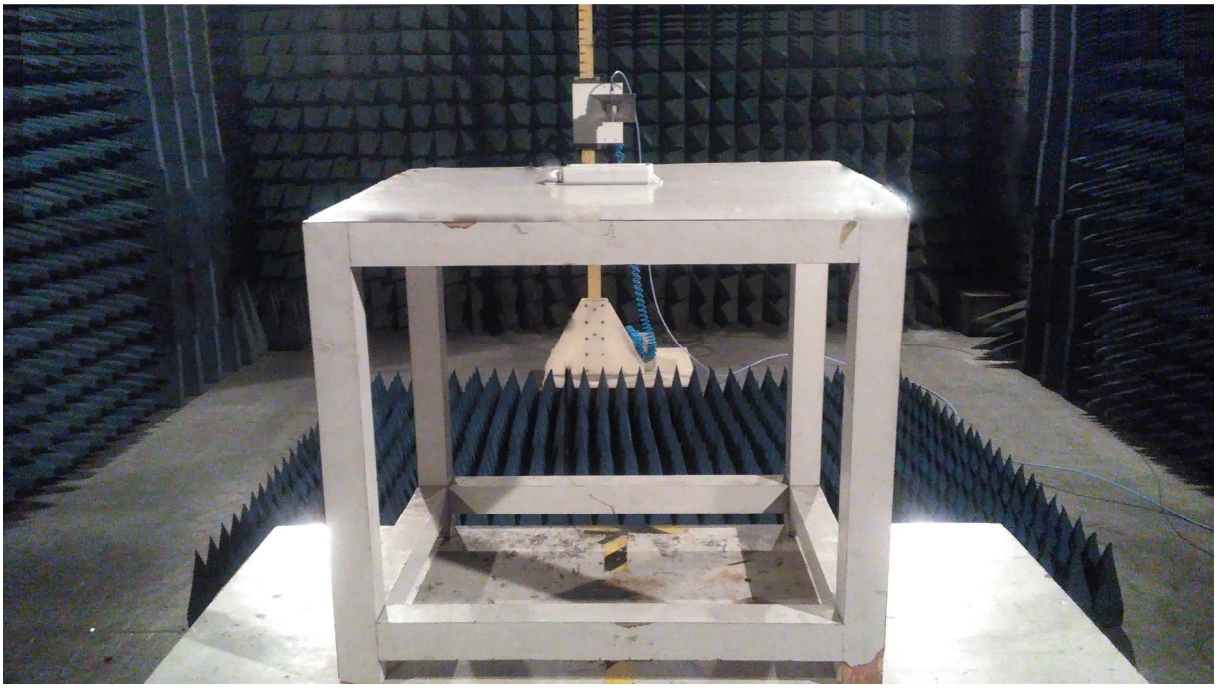


THE DURATION OF EACH TRANSMISSION	LIMIT	RESULT
1.6377s	<5s	PASS

6. EUT TEST PHOTO

Radiated Measurement Photos





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