

TEST REPORT

On Behalf of

Standard Motor Products, Inc.

Key Fob 315 MHz

Model No.: NI1-001

FCC ID: XVB-NI10012

Prepared for : Standard Motor Products, Inc.
Address : 37-18 Northern Boulevard, Long Island City, NY 11101, United States

Prepared By : Global United Technology Services Co., Ltd.
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518102

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TEST REPORT DECLARATION

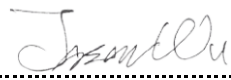
Applicant : Standard Motor Products, Inc.
Address : 37-18 Northern Boulevard, Long Island City, NY 11101, United States
Manufacturer : Qinuo Electronics Co.,LTD
Address : 3/F,Bldg.A, Yucheng Base, Keji Rd., High-tech Industrial Park, Fengze, Quanzhou, Fujian 362000, P.R.China
EUT Description : Key Fob 315 MHz
(A) Model No. : NI1-001
(B) Trademark : N/A

Measurement Standard Used:

FCC CFR 47 PART 15 Subpart C (15.231)

The device described above is tested by Global United Technology Services Co., Ltd. The measurement results are contained in this test report and Global United Technology Services Co., Ltd. is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC CFR 47 PART 15 Subpart C (15.231) requirements.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Global United Technology Services Co., Ltd.

Tested by (name + signature).....: Project Engineer 

Approved by (name + signature).....: Project Manager 

Date of issue.....: April 15, 2018

Revision History

Revision	Issue Date	Revisions	Revised By
00	April 16, 2018	Initial released Issue	Andy Wu

1. General Information

1.1. Description of Device (EUT)

EUT : Key Fob 315 MHz

Model No. : NI1-001
DIFF. : N/A

Trade mark : N/A

Power supply : DC 3V from Button battery

Operation : 315MHz
frequency
Modulation : FSK

Antenna Type : Internal antenna, max gain 0dBi.

1.2. Accessories of Device (EUT)

Accessories1 : /
Manufacturer : /
Model : /
Input : /
Output : /

1.3. Ancillary Equipment Details

No.	Description	Manufacturer	Model	Serial Number	Certification or DOC
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1.4. Test Lab Information

Global United Technology Services Co., Ltd.
No. 301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

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

FCC —Registration No.: 381383

2. Summary of test

2.1. Summary of test result

Description of Test Item	Standard	Results
Spurious Emission	Section 15.231&15.209	PASS
Conduction Emission	Section 15.207	N/A
Occupied bandwidth	Section 15.231	PASS
Transmission time	Section 15.231	PASS
Band Edge	Section 15.231	N/A
Antenna Requirement	Section 15.203	PASS
Note : Test according to ANSI C63.4-2014 and ANSI C63.10-2013		

2.2. Block Diagram

- For radiated emissions test: EUT was placed on a turn table, which is 0.8 meter high above ground. EUT was set into test mode before test. New battery is used during all test



2.3. Test mode

EUT work in Continuous TX mode, and select test channel, wireless mode

Tested mode, channel, and data rate information		
Mode	Channel	Frequency (MHz)
FSK	CH1	315

2.4. Test Conditions

Temperature range	21-25 °C
Humidity range	40-75%
Pressure range	86-106kPa

2.5. Measurement Uncertainty (95% confidence levels, k=2)

Item	MU	Remark
Uncertainty for Conducted Emission Test	2.74dB	
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.77dB	Polarize: V
	3.80dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	4.16dB	Polarize: H
	4.13dB	Polarize: V
Uncertainty for radio frequency	5.4×10^{-8}	
Uncertainty for conducted RF Power	0.37dB	

2.6. Test Equipment

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi-anechoic Chamber	ZhongYu Electron	9.0(L)*6.0(W)*6.0(H)	GTS250	July. 03 2015	July. 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)*2.4(H)	GTS251	N/A	N/A
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June 28 2017	June 27 2018
4	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June 28 2017	June 27 2018
5	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June 28 2017	June 27 2018
6	Double-ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June 28 2017	June 27 2018
7	Horn Antenna	ETS-LINDGREN	3160	GTS217	June 28 2017	June 27 2018
8	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
9	Coaxial Cable	GTS	N/A	GTS213	June 28 2017	June 27 2018
10	Coaxial Cable	GTS	N/A	GTS211	June 28 2017	June 27 2018
11	Coaxial cable	GTS	N/A	GTS210	June 28 2017	June 27 2018
12	Coaxial Cable	GTS	N/A	GTS212	June 28 2017	June 27 2018
13	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June 28 2017	June 27 2018
14	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	June 28 2017	June 27 2018
15	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 28 2017	June 27 2018
16	Band filter	Amindeon	82346	GTS219	June 28 2017	June 27 2018

3.

Conducted Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.16 2014	May.15 2019
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June 28 2017	June 27 2018
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June 28 2017	June 27 2018
4	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June 28 2017	June 27 2018
5	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	June 28 2017	June 27 2018

4.

General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Barometer	ChangChun	DYM3	GTS257	June 28 2017	June 27 2018

3. Radiation Emission

3.1. Radiation Emission Limits(15.209&231)

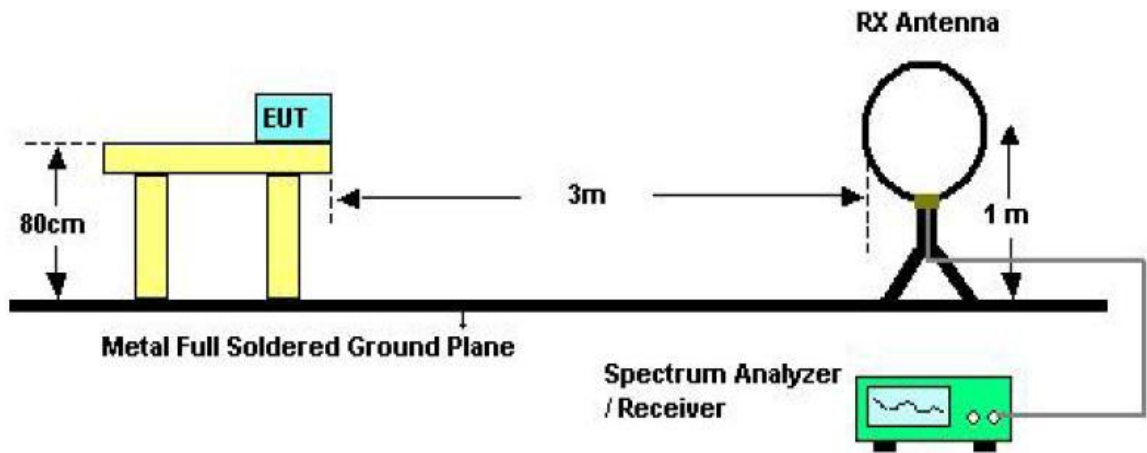
Frequency (MHz)	Field Strength Limits at 3 metres (watts, e.i.r.p.)		
	uV/m	dB uV/m	Measurement distance(m)
0.009-0.490	2400/F(kHz)	XX	300
0.490-1.705	24000/F(kHz)	XX	30
1.705-30	30	29.5	30
30~88	100(3nW)	40	3
88~216	150(6.8nW)	43.5	3
216~960	200(12nW)	46	3
Above960	500(75nW)	54	3
Carrier frequency		80.8(AV)	3
Carrier frequency		100.8(PK)	3

NOTE:

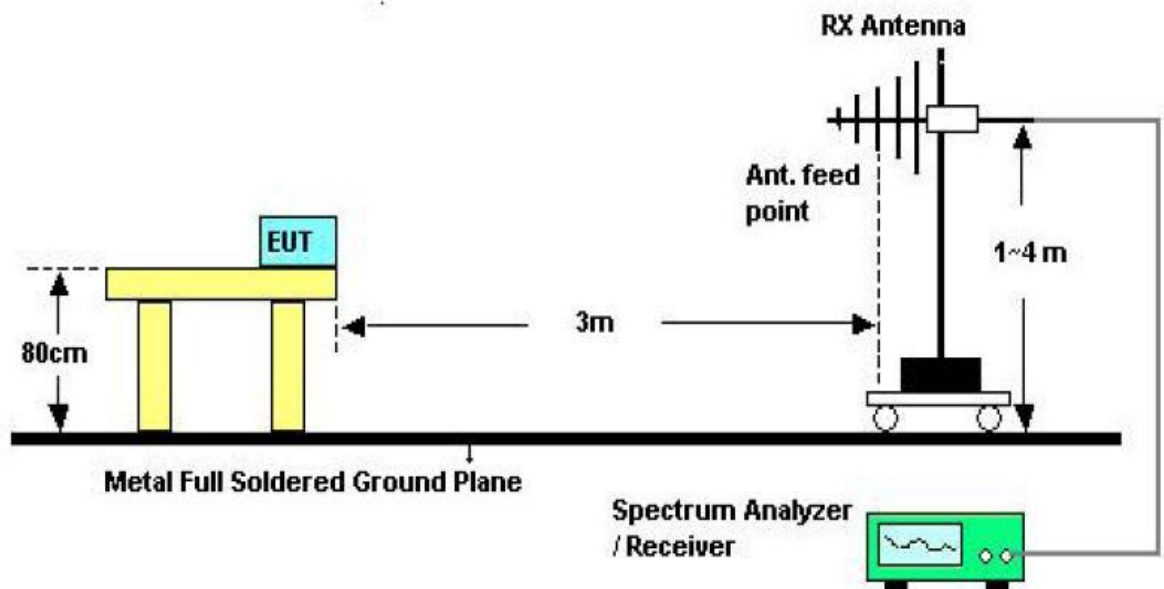
- a) The tighter limit applies at the band edges.
- b) Emission Level(dB uV/m)=20log Emission Level(Uv/m)

3.2. Test Setup

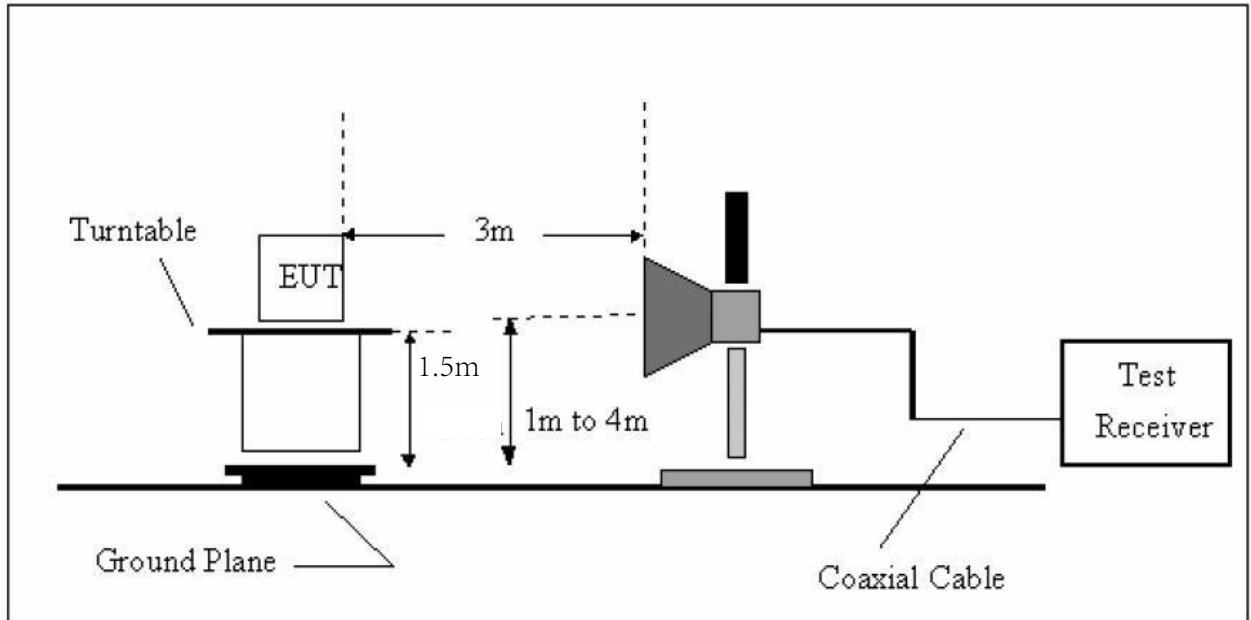
See the next page.



Below 30MHz Test Setup



Above 30MHz Test Setup



Above 1GHz Test Setup

3.3. Test Procedure

- a) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1GHz, The EUT was placed on a rotating 0.8 m high above ground, The table was rotated 360 degrees to determine the position of the highest radiation
- b) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- c) 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 remeasured
- d) If Peak value comply with QP limit Below 1GHz. The EUT deemed to comply with QP limit. But the Peak value and average value both need to comply with applicable limit above 1GHz.
- e) For the actual test configuration, please see the test setup photo.

3.4. Test Equipment Setting For emission test.

9KHz~150KHz	RBW 200Hz	VBW1KHz
150KHz~30MHz	RBW 9KHz	VBW 30KHz
30MHz~1GHz	RBW 120KHz	VBW 300KHz
Above 1GHz	RBW 1MHz	VBW 3MHz

3.5. Test Condition

Continual Transmitting in maximum power(The new battery be used during Test)

3.6. Test Result

We have scanned the 10th harmonic from 9KHz to the EUT.
Detailed information please see the following page.

From 9KHz to 30MHz: Conclusion: **PASS**

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Notes: 1 --Means other frequency and mode comply with standard requirements and at least have 20dB margin.

Correct Factor=Cable Loss+Antenna Factor-Amplifier Gain

Measurement Result=Reading + Correct Factor

Margin=Measurement Result-Limit

2 –Spectrum setting:

a. Peak setting 30MHz-1GHz, RBW=100KHz, VBW=300KHz.

3- PK measure result values is less than the AVG limit values, so AV measure result values test not applicable.

Radiated Emissions Result of Inside band

EUT	Key Fob 315 MHz		Model Name	NI1-001					
Temperature	25°C		Relative Humidity	56%					
Pressure	960hPa		Test voltage	DC 3V from Button battery					
Test Mode	TX CH1		Test by	Eric					
Channel (315MHz Below 1GHz)									
Fre.	Plority	Reading	Antenna	Cable	Amplifier	Correct	Measure	Limit	Margin
MHz	H/V	dBuV	Factor	Loss	Gain	Factor	Result	dBuV/m	dB
315	H	85.49	13.19	0.67	27.22	-13.36	72.13	75.60	-3.47
630	H	38.14	18.12	0.67	27.22	-8.43	29.71	55.60	-25.89
945	H	45.36	22.1	0.67	27.22	-4.45	40.91	55.60	-14.69
315	V	81.07	13.19	0.67	27.22	-13.36	67.71	75.60	-7.89
630	V	39.10	18.12	0.67	27.22	-8.43	30.67	55.60	-24.93
945	V	45.55	22.1	0.67	27.22	-4.45	41.10	55.60	-14.50

Note: Test from 30MHz to 3.15GHz , for Above 1GHz, no emission found.
So only report worse case .

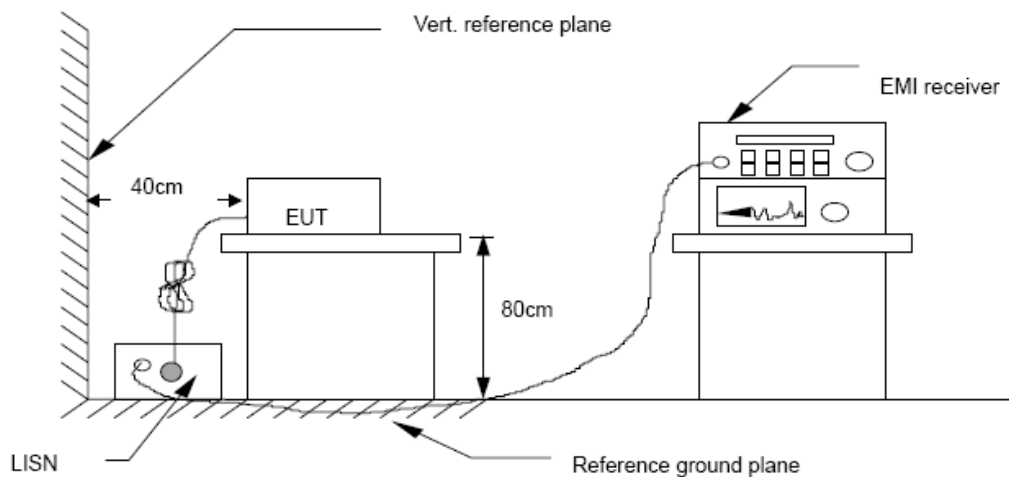
4. POWER LINE CONDUCTED EMISSION

4.1. Conducted Emission Limits (15.209)

Frequency MHz	Limits dB(μ V)	
	Quasi-peak Level	Average Level
0.15 -0.50	66 -56*	56 - 46*
0.50 -5.00	56	46
5.00 -30.00	60	50

- Notes: 1. *Decreasing linearly with logarithm of frequency.
 2. The lower limit shall apply at the transition frequencies.
 3. The limit decreases in line with the logarithm of the frequency in the rang of 0.15 to 0.50 MHz.

4.2. Test Setup



4.3. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.4-2003 on Conducted Emission Measurement.

The bandwidth of test receiver (R & S ESCS30) is set at 9 kHz.

4.4. Test Results

EUT power supply by battery, so the test not applicable.

5. Occupied bandwidth

5.1. Test limit

Please refer section 15.231

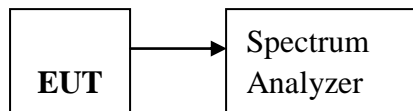
According to §15.231(C), The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz.

5.2. Method of measurement

a) The bandwidth is measured at an amplitude level reduced 20dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

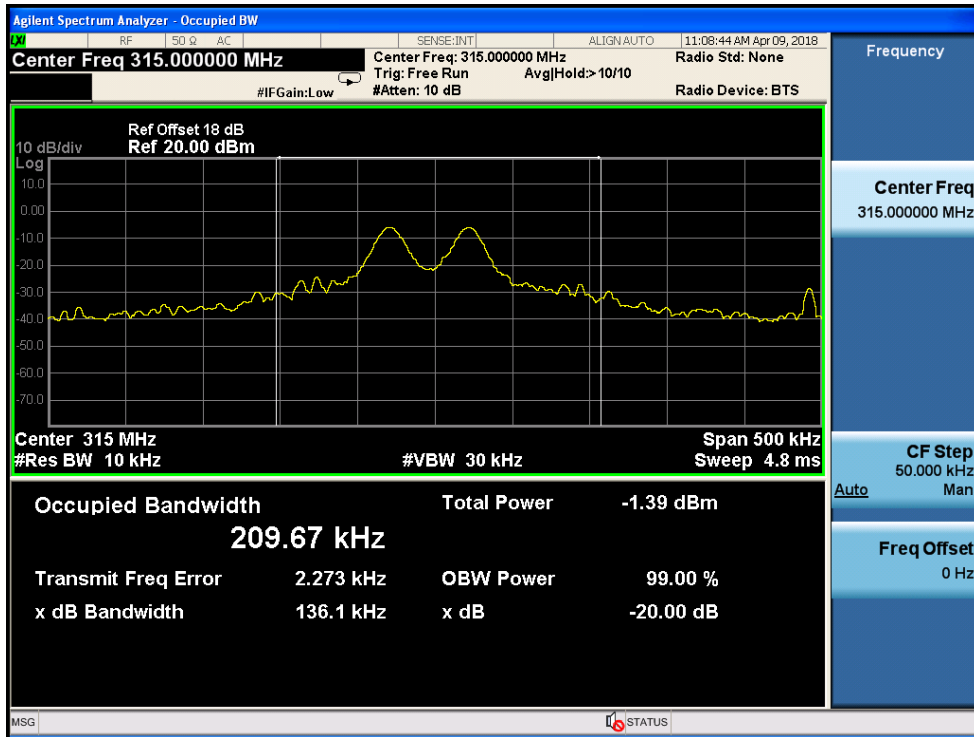
b) The test receiver RBW set 30KHz, VBW set 30KHz, Sweep time set auto.

5.3. Test Setup



5.4. Test Results

EUT: Key Fob 315 MHz				
M/N: NI1-001				
Test Mode: Keeping TX mode				
Test site: RF site		Tested by: Eric		
Mode	Freq (MHz)	20dB Bandwidth (KHz)	Limit (kHz)	Conclusion
FSK	315	136.1	/	PASS



6. Transmission time

6.1. Test limit

Please refer section 15.231

According to §15.231(a)(1), A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

According to §15.231(a)(2), A transmitter activated automatically shall cease transmission within 5 seconds after activation.

6.2. Method of measurement

6.2.1. Place the EUT on the table and set it in transmitting mode.

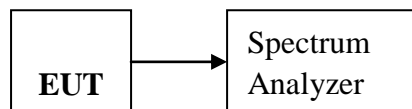
6.2.2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

6.2.3. Set spectrum analyzer Center=434MHz, Span = 0MHz, Sweep = 200ms.

6.2.4. Set the spectrum analyzer as RBW, VBW=1MHz,

6.2.5. Max hold, view and count how many channel in the band.

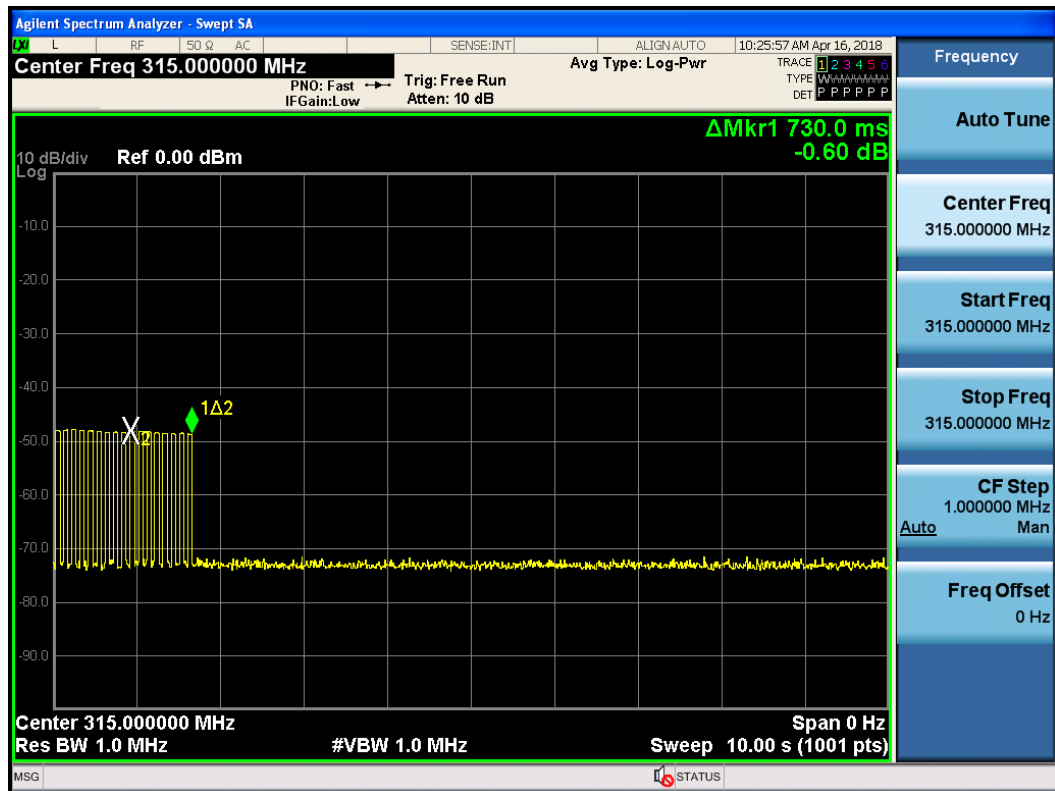
6.3. Test Setup



6.4. Test Results

EUT: Key Fob 315 MHz			
M/N: NI1-001			
Test Mode: Keeping TX mode			
Test site: RF site		Tested by: Eric	
Freq (MHz)	Test Result(s)	Limit (s)	Conclusion
315	0.73	< 5s	PASS

EUT After Release the button, EUT emission Continue 1 seconds, Compliance with 15.231 a(1) section.



7. Antenna Requirement

7.1. Standard 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 shall be considered sufficient to comply with the provisions of this Section. 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.

7.2. Antenna Connected Construction

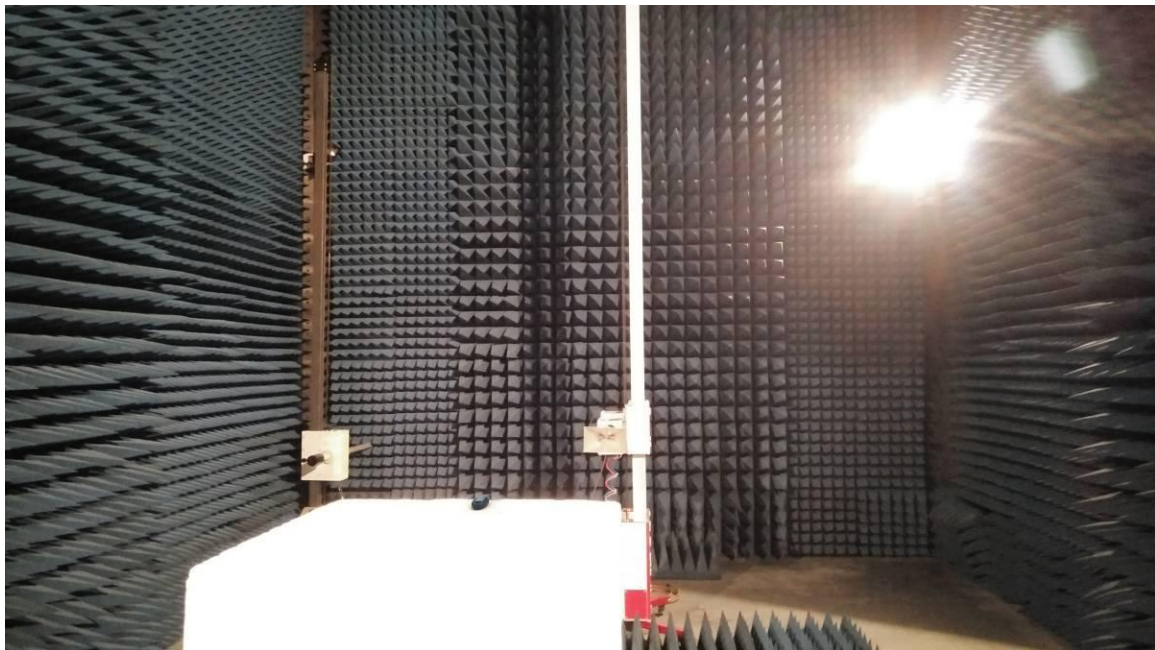
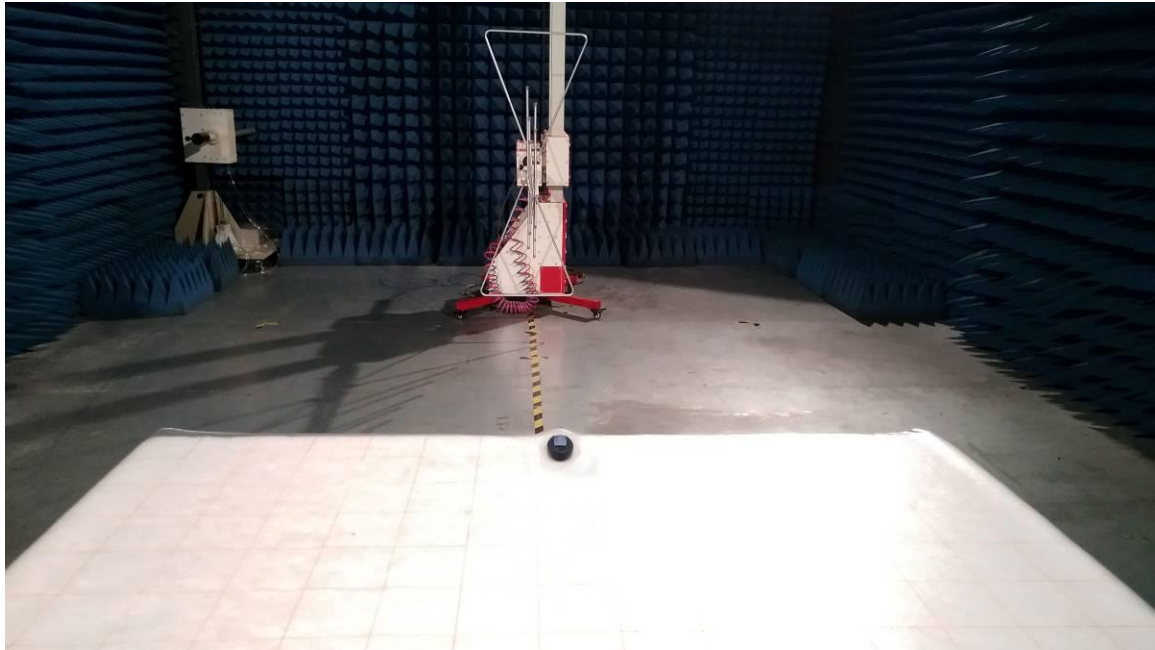
The directional gains of antenna used for transmitting is 0 dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Please see EUT photo for details.

7.3. Result

The EUT antenna is PCB antenna. It comply with the standard requirement.

8. Test setup photo

Photos of Radiated emission



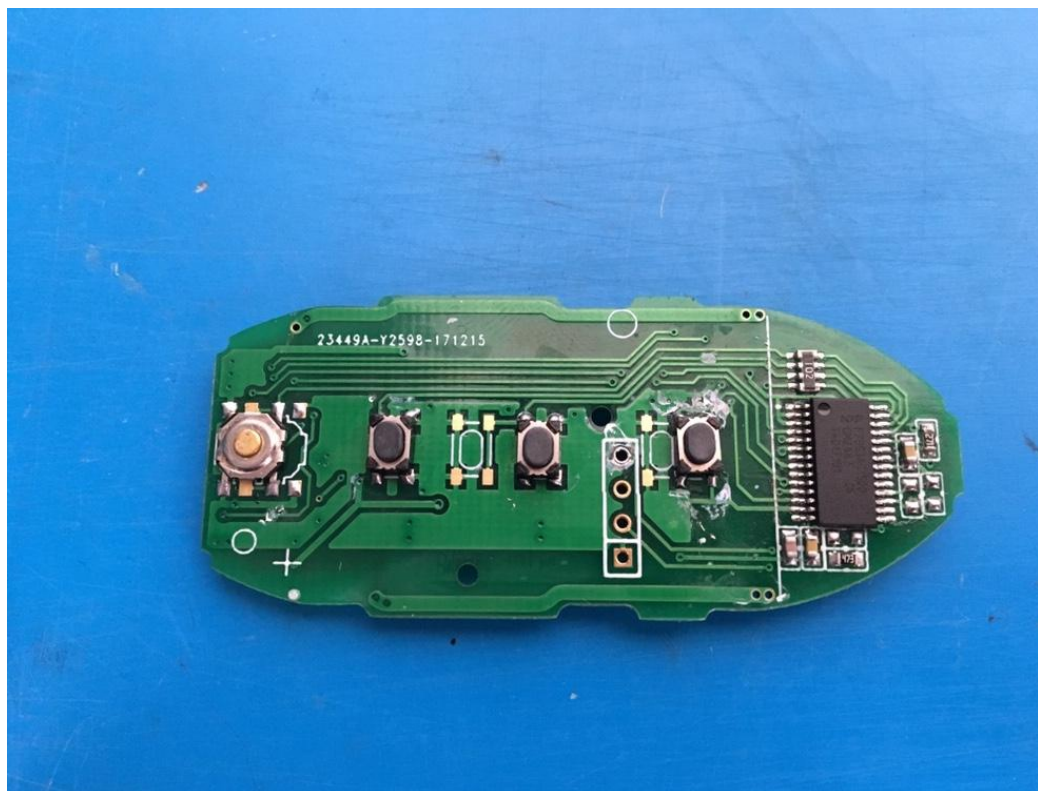
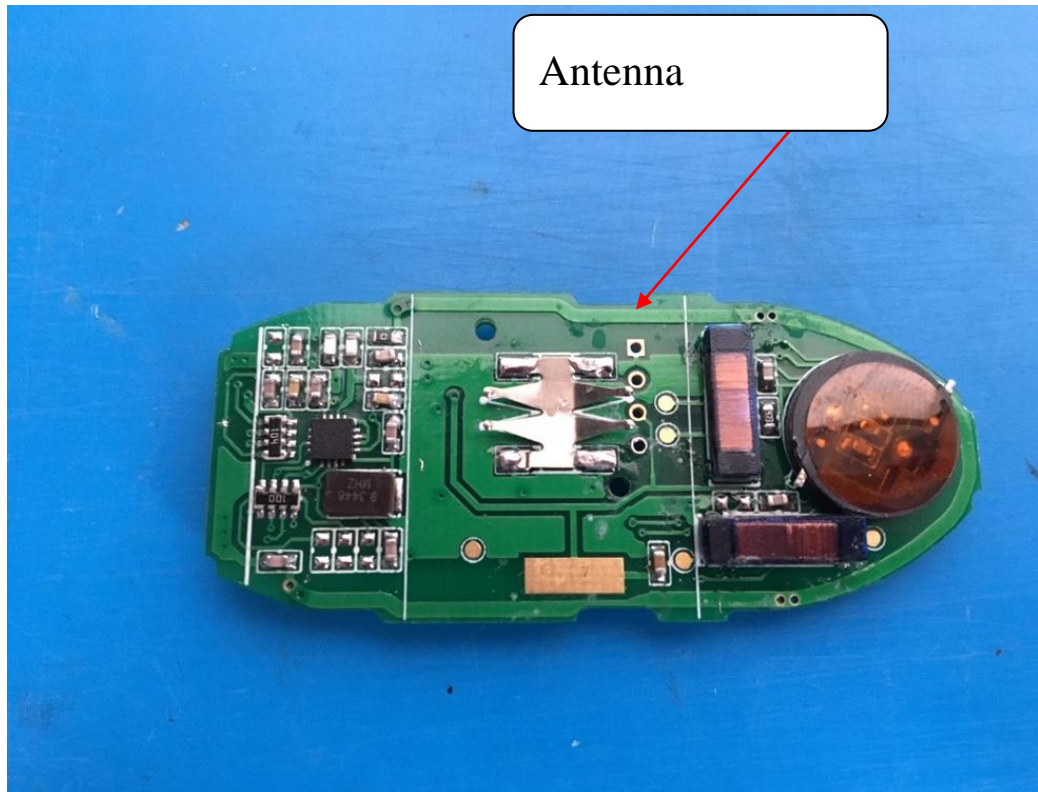
9. Photos of EUT













-----END OF THE REPORT-----