

TEST REPORT

Reference No...... : WTS19S07051106W
FCC ID : XUJXPROG
Applicant..... : Launch Tech Co., Ltd.
Address..... : Launch Industrial Park, North of Wuhe Rd. Banxuegang, Longgang, Shenzhen, China
Manufacturer : Launch Tech Co., Ltd.
Address..... : Launch Industrial Park, North of Wuhe Rd. Banxuegang, Longgang, Shenzhen, China
Product..... : Immobilizer Programmer
Model(s) : X-PROG
Brand Name..... : **LAUNCH**
Standards..... : FCC CFR47 Part 15.209:2019
Date of Receipt sample : 2019-07-26
Date of Test : 2019-07-26 to 2019-08-15
Date of Issue..... : 2019-08-16
Test Result..... : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:

Waltek Services (Shenzhen) Co., Ltd.

Address: 1/F., Fukangtai Building, West Baima Road, Songgang Street, Baoan District, Shenzhen, Guangdong, China

Test Site/Test Location:

Waltek Services (Shenzhen) Co., Ltd.

Address: 1/F., Fukangtai Building, West Baima Road, Songgang Street, Baoan District, Shenzhen, Guangdong, China

Tel :+86-755-83551033

Fax:+86-755-83552400

Compiled by:

Robin Zhou

Robin Zhou / Test Engineer

Approved by:

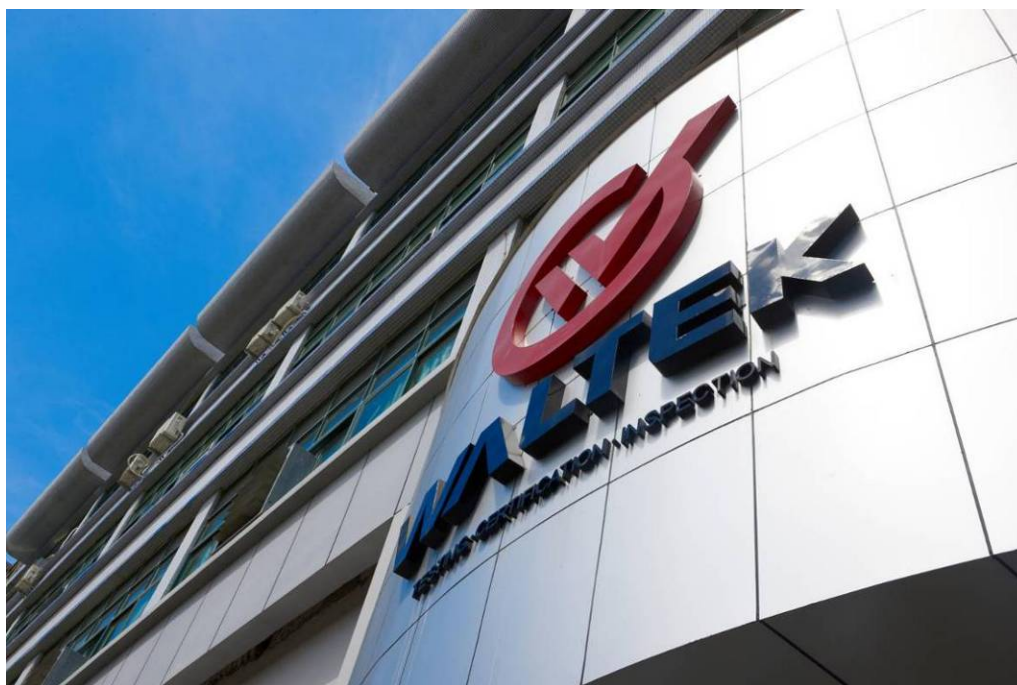


Philo Zhong

Philo Zhong / Manager

1 Laboratories Introduction

Waltek Services (Shenzhen) Co., Ltd is a professional third-party testing and certification laboratory with multi-year product testing and certification experience, established strictly in accordance with ISO/IEC 17025 requirements, and accredited by ILAC (International Laboratory Accreditation Cooperation) member. A2LA (American Association for Laboratory Accreditation, the certification number is 4243.01) of USA, CNAS (China National Accreditation Service for Conformity Assessment, the registration number is L3110) of China. Meanwhile, Waltek has got recognition as registration and accreditation laboratory from EMSD (Electrical and Mechanical Services Department), and American Energy star, FCC(The Federal Communications Commission), CEC(California energy efficiency), ISED (Innovation, Science and Economic Development Canada). It's the strategic partner and data recognition laboratory of international authoritative organizations, such as Intertek(ETL-SEMKO), TÜV Rheinland, TÜV SÜD, etc.



Waltek Services (Shenzhen) Co., Ltd is one of the largest and the most comprehensive third party testing laboratory in China. Our test capability covered four large fields: safety test. ElectroMagnetic Compatibility(EMC), and energy performance, wireless radio. As a professional, comprehensive, justice international test organization, we still keep the scientific and rigorous work attitude to help each client satisfy the international standards and assist their product enter into globe market smoothly.

1.1 Test Facility

A. Accreditations for Conformity Assessment (International)

Country/Region	Scope Covered By	Scope	Note
USA	ISO/IEC 17025	FCC ID \ SDoC	1
Canada		IC ID \ VOC	2
Japan		MIC-T \ MIC-R	-
Europe		EMCD \ RED	-
Taiwan		NCC	-
Hong Kong		OFCA	-
Australia		RCM	-
India		WPC	-
Thailand		NTC	-
Singapore		IDA	-
Note:			
1. FCC Designation No.: CN1201. Test Firm Registration No.: 523476.			
2. ISED CAB identifier: CN0013. Test Firm Registration No.: 7760A.			

B.TCBs and Notify Bodies Recognized Testing Laboratory.

Recognized Testing Laboratory of ...	Notify body number
TUV Rheinland	Optional.
Intertek	
TUV SUD	
SGS	
Phoenix Testlab GmbH	0700
Element Materials Technology Warwick Ltd.	0891
Timco Engineering, Inc.	1177
Eurofins Product Service GmbH	0681

2 Contents

	Page
COVER PAGE.....	1
1 LABORATORIES INTRODUCTION.....	2
1.1 TEST FACILITY	3
2 CONTENTS	4
3 REVISION HISTORY	5
4 GENERAL INFORMATION.....	6
4.1 GENERAL DESCRIPTION OF E.U.T.	6
4.2 DETAILS OF E.U.T.	6
4.3 TEST MODE	6
5 EQUIPMENT USED DURING TEST	7
5.1 EQUIPMENT LIST	7
5.2 MEASUREMENT UNCERTAINTY	7
5.3 TEST EQUIPMENT CALIBRATION	7
6 TEST SUMMARY	8
7 RADIATED SPURIOUS EMISSIONS.....	9
7.1 EUT OPERATION	9
7.2 TEST SETUP	10
7.3 SPECTRUM ANALYZER SETUP	11
7.4 TEST PROCEDURE	11
7.5 CORRECTED AMPLITUDE & MARGIN CALCULATION	11
7.6 SUMMARY OF TEST RESULTS	12
8 BANDWIDTH MEASUREMENT.....	13
8.1 TEST PROCEDURE	13
8.2 TEST RESULT	13
9 ANTENNA REQUIREMENT	14
10 PHOTOGRAPHS – MODEL X-PROG TEST SETUP PHOTOS.....	15
10.1 PHOTOGRAPH – RADIATION SPURIOUS EMISSION TEST SETUP PHOTOS.....	15
11 PHOTOGRAPHS - CONSTRUCTIONAL DETAILS	16
11.1 MODEL X-PROG – EXTERNAL PHOTOS	16
11.2 MODEL X-PROG – INTERNAL PHOTOS	20

3 Revision History

Test report No.	Date of Receipt sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTS19S07051106W	2019-07-26	2019-07-26 to 2019-08-15	2019-08-16	original	-	Valid

4 General Information

4.1 General Description of E.U.T.

Product: Immobilizer Programmer
Model(s): X-PROG
Hardware Version: V1.01.000
Software Version: VW/Audi V28.55

4.2 Details of E.U.T.

Operation Frequency: 125kHz
Type of Modulation: ASK
Antenna installation: Internal Integrated Loop Antenna
Antenna Gain: N/A
Ratings: Input:12V === 200mA

4.3 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

Test mode	Test channel
Transmitting	125kHz

5 Equipment Used during Test

5.1 Equipment List

3m Semi-anechoic Chamber for Radiation Emissions						
Item	Equipment	Manufacturer	Model No.	Serial No	Last Calibration Date	Calibration Due Date
1	Test Receiver	R&S	ESCI	101296	2019-04-20	2020-04-19
2	Spectrum Analyzer	R&S	FSL6	100959	2018-11-18	2019-11-17
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2019-05-24	2020-05-23
4	Active Loop Antenna	Com-power	AL-130R	10160007	2019-04-28	2020-04-27
5	Amplifier	ANRITSU	MH648A	M43381	2019-04-19	2020-04-18
6	Cable	HUBER+SUHNER	CBL2	525178	2019-04-20	2020-04-19
7	Coaxial Cable (below 1GHz)	Top	TYPE16 (13M)	-	2018-10-15	2019-10-14

5.2 Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-6}$
RF Power	± 1.0 dB
Radiated Spurious Emissions test	± 3.03 dB (Loop antenna 9k~30MHz)
	± 5.03 dB (Bilog antenna 30M~1000MHz)
Confidence interval: 95%. Confidence factor:k=2	

5.3 Test Equipment Calibration

All the test equipments used are valid and calibrated by GUANG ZHOU GRG METROLOGY & TEST CO., LTD. address is No.163, Pingyun Rd. West of Huangpu Ave, Tianhe District, Guangzhou, Guangdong, China.

6 Test Summary

Test Items	Test Requirement	Result
Conduct Emission	15.207	N/A*
Radiated Spurious Emissions	15.205(a) 15.209	Pass
Bandwidth Measurement	15.205(a) 15.215(c)	Pass
Antenna Requirement	15.203	Pass
Note: Pass =Compliance; NC=Not Compliance; NT=Not Tested; N/A=Not Applicable. *: This requirement does not apply for device powered by battery.		

7 Radiated Spurious Emissions

Test Requirement: FCC Part15 Paragraph 15.209, 15.205(a)

Test Method: ANSI C63.10:2013

Test Result: PASS

Measurement Distance: 3m

Limit:

FCC Part15 Paragraph 15.209

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	$2400/F(\text{kHz})$	300	$10000 * 2400/F(\text{kHz})$	$20\log^{(2400/F(\text{kHz}))} + 80$
0.490 ~ 1.705	$24000/F(\text{kHz})$	30	$100 * 24000/F(\text{kHz})$	$20\log^{(24000/F(\text{kHz}))} + 40$
1.705 ~ 30	30	30	$100 * 30$	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

7.1 EUT Operation

Operating Environment :

Temperature: 23.5 °C

Humidity: 54.2 % RH

Atmospheric Pressure: 101.9kPa

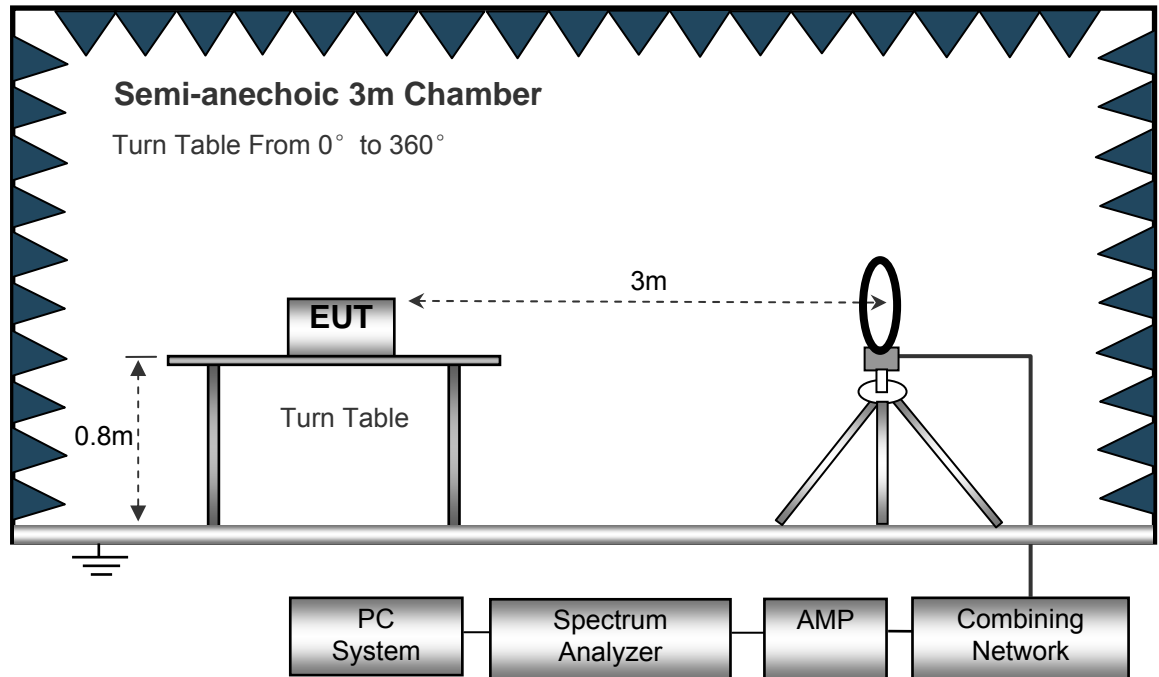
EUT Operation :

The test was performed in Transmitting mode, the test data were shown in the report.

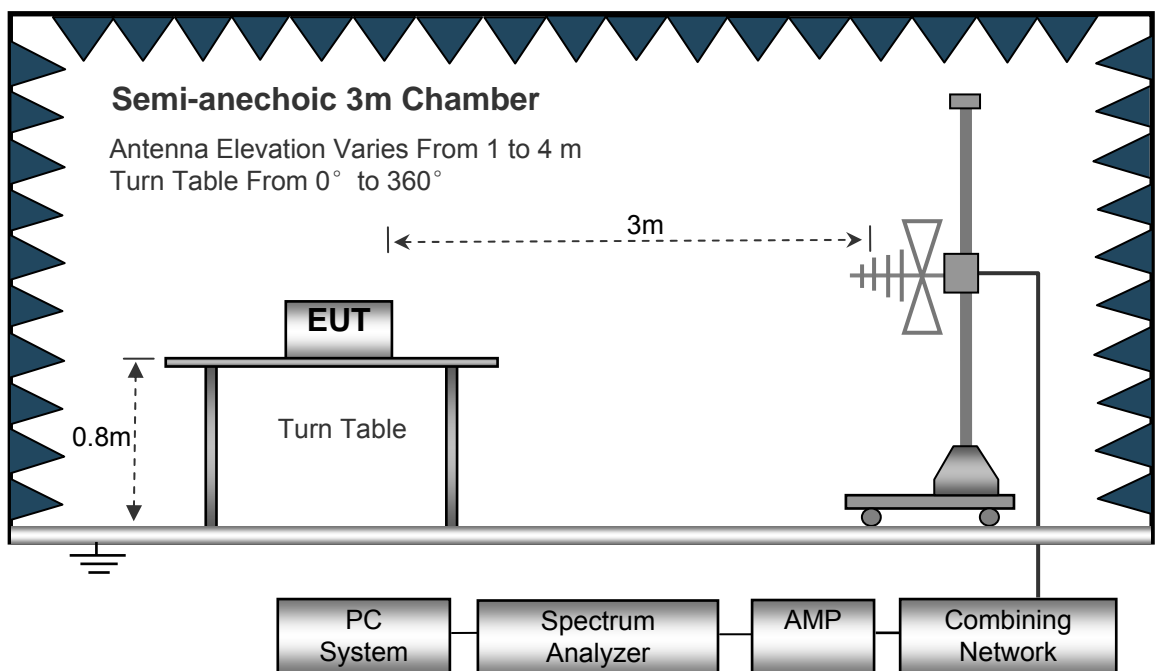
7.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10:2013

The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



7.3 Spectrum Analyzer Setup

Below 30MHz

Sweep SpeedAuto
 IF Bandwidth..... 10kHz
 Video Bandwidth..... 10kHz
 Resolution Bandwidth..... 10kHz

30MHz ~ 1GHz

Sweep SpeedAuto
 DetectorPK
 Resolution Bandwidth..... 100kHz
 Video Bandwidth..... 300kHz

7.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane for below 1GHz and 1.5m for above 1GHz.
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 moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
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 tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the Z position. So the data shown was the Z position only.

7.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Limit}$$

7.6 Summary of Test Results

Test Frequency: 9 kHz ~ 30 MHz

Frequency	Receiver Reading (AV)	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude (AV)	FCC Part 15.209	
			Height	Polar			Limit	Margin
(kHz)	(dBμV @3m)	Degree	(m)	(H/V)	(dB/m)	(dBμV/m @3m)	(dBμV/m @3m)	(dB)
125.00	60.57	345	1.3	H	18.65	79.22	105.67	-26.45
125.00	49.69	225	1.2	V	18.65	68.34	105.67	-37.33
404.03	28.38	30	1.1	H	19.99	48.37	95.48	-47.11
916.80	19.07	199	1.2	V	20.78	39.85	68.36	-28.51
1918.12	15.28	343	1.1	V	20.52	35.80	69.54	-33.74

Test Frequency: 30 MHz ~ 1 GHz

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.209	
				Height	Polar			Limit	Margin
(MHz)	(dBμV @3m)	QP	Degree	(m)	(H/V)	(dB/m)	(dBμV/m @3m)	(dBμV/m @3m)	(dB)
53.51	32.77	QP	178	1.4	H	-14.30	18.47	40.00	-21.53
53.51	38.84	QP	32	1.0	V	-14.30	24.54	40.00	-15.46
162.04	31.27	QP	242	1.5	H	-13.58	17.69	43.50	-25.81
162.04	32.99	QP	56	1.7	V	-13.58	19.41	43.50	-24.09
455.91	32.63	QP	28	1.2	H	-5.63	27.00	46.00	-19.00
455.91	33.01	QP	125	1.2	V	-5.63	27.38	46.00	-18.62

Note: Correct factor = Cable loss + Antenna factor

8 Bandwidth Measurement

Test Requirement: FCC Part15.215(C), Part15.205 (a)

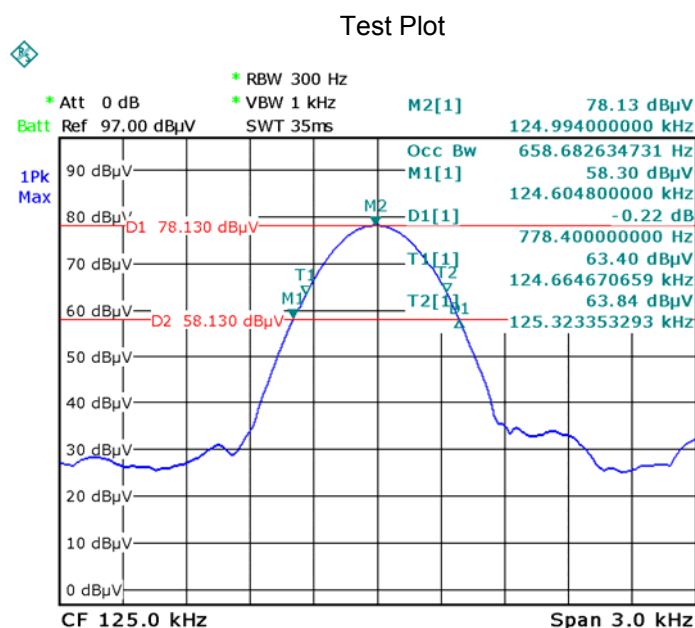
Test Method: ANSI C63.10: 2013

8.1 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 moved from 1m to 4m to find out the maximum 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. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the Z position. So the data shown was the Z position only.
7. Bandwidth Measure the resolution bandwidth of 300 Hz and the video bandwidth of 1 kHz were used.
8. Measured the spectrum width with power higher than 20dB below carrier and 99% Bandwidth.

8.2 Test Result

Frequency(kHz)	20dB Bandwidth Emission(kHz)	99% Bandwidth Emission(kHz)
125.0	0.778	0.659



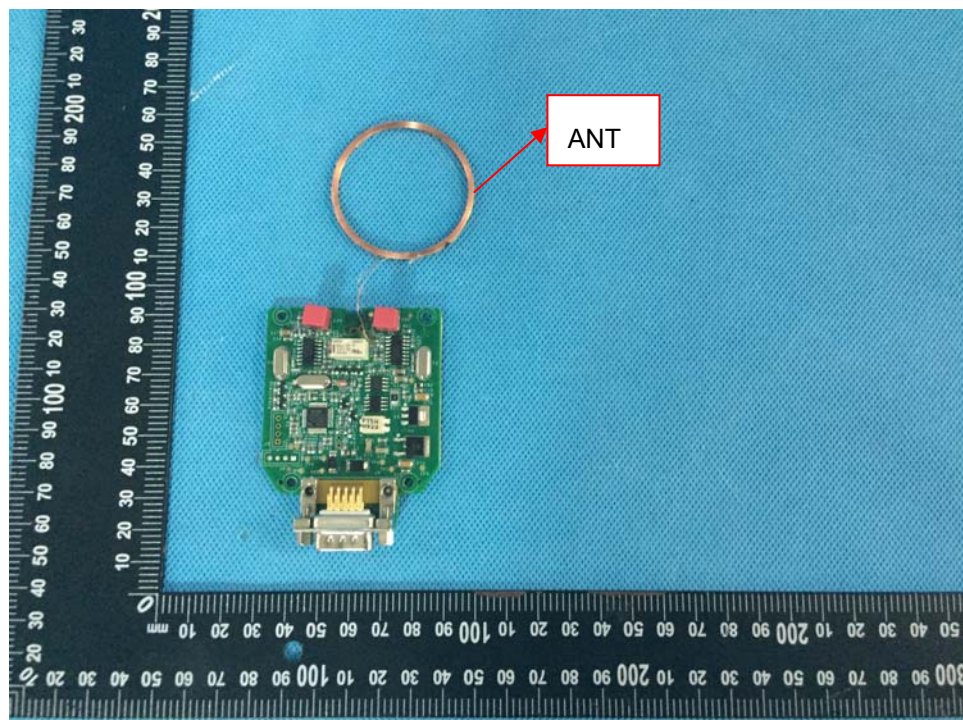
9 Antenna Requirement

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. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

For intentional device, according to FCC 15 CFR Section 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.

Result:

The EUT has one Internal Integrated Loop Antenna, Meets the requirements of FCC 15.203.



10 Photographs – Model X-PROG Test Setup Photos

10.1 Photograph – Radiation Spurious Emission Test Setup Photos

9 kHz to 30 MHz



From 30 MHz to 1GHz



11 Photographs - Constructional Details

11.1 Model X-PROG – External Photos

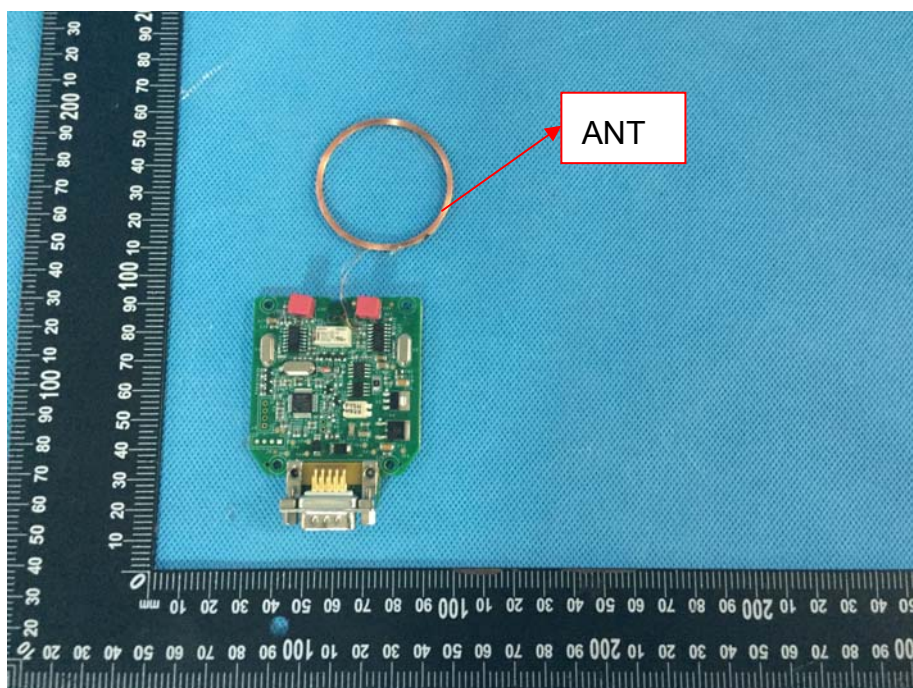
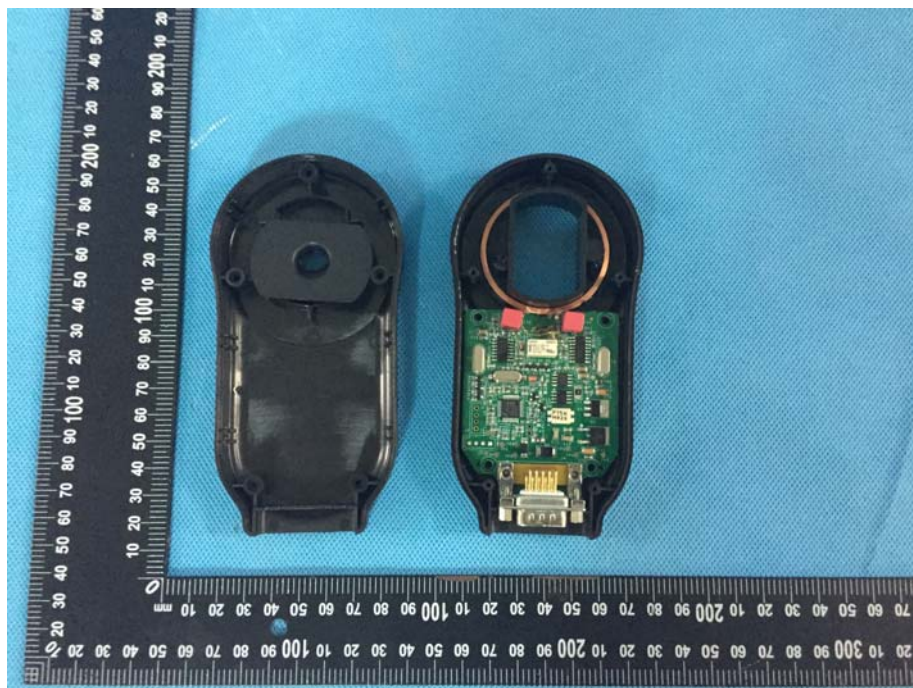


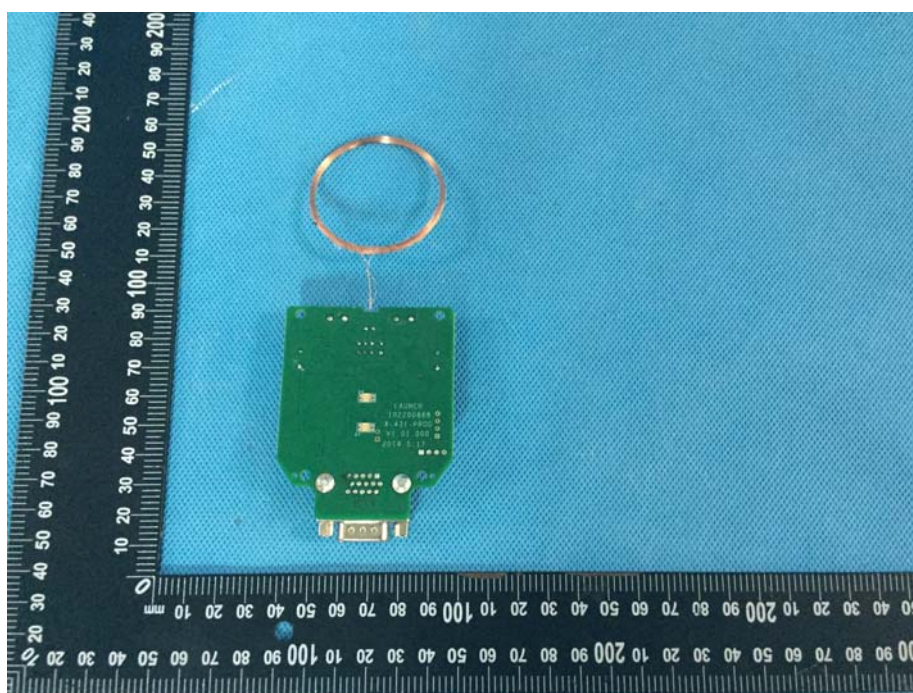
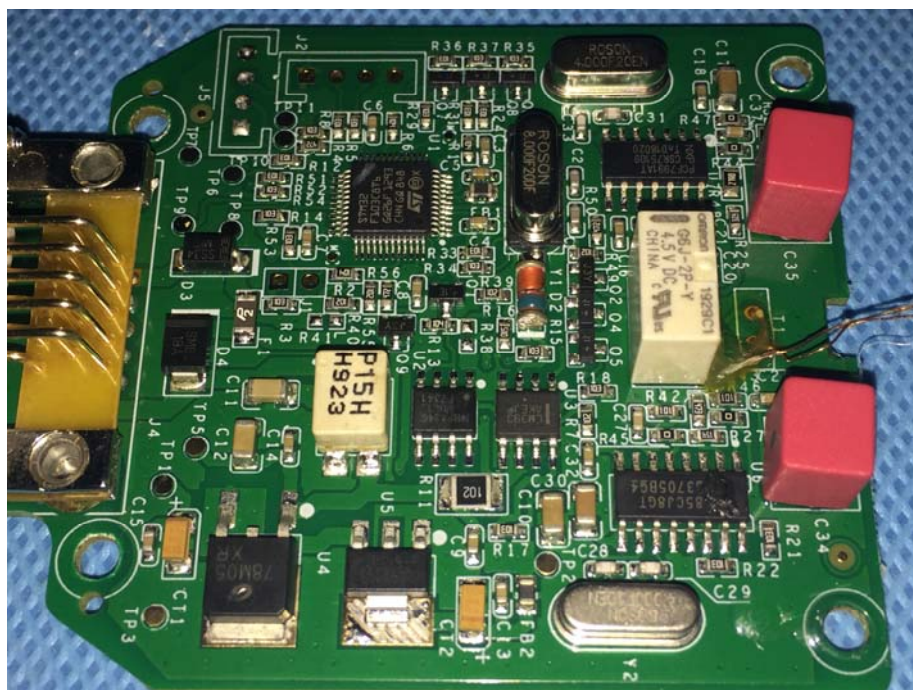






11.2 Model X-PROG – Internal Photos





=====End of Report=====