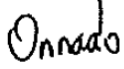


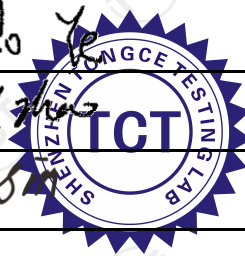


# TEST REPORT

FCC ID. .... :	2AXCX-TS2X	
Test Report No..... :	TCT220411E024	
Date of issue..... :	May 05, 2022	
Testing laboratory .....	SHENZHEN TONGCE TESTING LAB	
Testing location/ address:	TCT Testing Industrial Park Fuqiao 5th Industrial Zone, Fuhai Street, Bao'an District Shenzhen, Guangdong, 518103, People's Republic of China	
Applicant's name..... :	Shenzhen Foxwell Technology Co., Ltd	
Address..... :	5/F, Plant C, Baocheng 71st Zone, Xin'an Street, Baoan District, Shenzhen, 518106 China	
Manufacturer's name ... :	Shenzhen Foxwell Technology Co., Ltd	
Address..... :	5/F, Plant C, Baocheng 71st Zone, Xin'an Street, Baoan District, Shenzhen, 518106 China	
Standard(s) .....	FCC CFR Title 47 Part 15 Subpart C	
Product Name..... :	Automotive Diagnostic Tool	
Trade Mark .....	FOXWELL	
Model/Type reference..... :	PTS1000, GT75TS, i80 II, i80TS, i80 Plus, i80 Ele, i80 Ultra, F90, F90S, F90 Pro	
Rating(s)..... :	DC 9V	
Date of receipt of test item .....	Apr. 11, 2022	
Date (s) of performance of test..... :	Apr. 11, 2022 ~ May 05, 2022	
Tested by (+signature) ... :	Onnado YE	
Check by (+signature)..... :	Beryl ZHAO	
Approved by (+signature):	Tomsin	



## General disclaimer:

This report shall not be reproduced except in full, without the written approval of SHENZHEN TONGCE TESTING LAB. This document may be altered or revised by SHENZHEN TONGCE TESTING LAB personnel only, and shall be noted in the revision section of the document. The test results in the report only apply to the tested sample.

## Table of Contents

<b>1. General Product Information .....</b>	<b>3</b>
1.1. EUT description .....	3
1.2. Model(s) list.....	3
<b>2. Test Result Summary .....</b>	<b>4</b>
<b>3. General Information.....</b>	<b>5</b>
3.1. Test environment and mode.....	5
3.2. Description of Support Units.....	5
<b>4. Facilities and Accreditations .....</b>	<b>6</b>
4.1. Facilities .....	6
4.2. Location .....	6
4.3. Measurement Uncertainty.....	6
<b>5. Test Results and Measurement Data .....</b>	<b>7</b>
5.1. Antenna requirement .....	7
5.2. Conducted Emission.....	8
5.3. Radiated Spurious Emission Measurement.....	9
<b>Appendix A: Photographs of Test Setup</b>	
<b>Appendix B: Photographs of EUT</b>	

## 1. General Product Information

### 1.1.EUT description

Product Name.....:	Automotive Diagnostic Tool
Model/Type reference.....:	PTS1000
Sample Number.....:	TCT220411E024-0101
Operation Frequency .....	125kHz
Modulation Technology .....	ASK
Antenna Type.....:	Loop Antenna
Rating(s).....:	DC 9V

Note: The antenna gain listed in this report is provided by applicant, and the test laboratory is not responsible for this parameter.

### 1.2.Model(s) list

No.	Model No.	Tested with
1	PTS1000	<input checked="" type="checkbox"/>
Other models	GT75TS, i80 II, i80TS, i80 Plus, i80 Ele, i80 Ultra, F90, F90S, F90 Pro	<input type="checkbox"/>

Note: PTS1000 is tested model, other models are derivative models. The models are identical in circuit and PCB layout, only different on the model names. So the test data of PTS1000 can represent the remaining models.

## 2. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna requirement	§15.203	PASS
AC Power Line Conducted Emission	§15.207	N/A
Spurious Emission	§15.209(a)(f)	PASS

**Note:**

1. PASS: Test item meets the requirement.
2. Fail: Test item does not meet the requirement.
3. N/A: Test case does not apply to the test object.
4. The test result judgment is decided by the limit of test standard.

### 3. General Information

#### 3.1. Test environment and mode

Operating Environment:	
Condition	Radiated Emission
Temperature:	22.6 °C
Humidity:	48 % RH
Atmospheric Pressure:	1010 mbar
Test Mode:	
Engineering mode:	Keep the EUT in continuous transmitting.
The sample was placed 0.8m for the measurement below above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case(Z axis) are shown in Test Results of the following pages.	

#### 3.2. Description of Support Units

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.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
/	/	/	/	/

**Note:**

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

## 4. Facilities and Accreditations

### 4.1. Facilities

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

- FCC - Registration No.: 645098

SHENZHEN TONGCE TESTING LAB

Designation Number: CN1205

The testing lab has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A-1

SHENZHEN TONGCE TESTING LAB

CAB identifier: CN0031

The testing lab has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

### 4.2. Location

SHENZHEN TONGCE TESTING LAB

Address: TCT Testing Industrial Park Fuqiao 5th Industrial Zone, Fuhai Street, Bao'an District Shenzhen, Guangdong, 518103, People's Republic of China

TEL: +86-755-27673339

### 4.3. Measurement Uncertainty

The reported uncertainty of measurement  $y \pm U$ , where expanded 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	MU
1	Conducted Emission	$\pm 3.10$ dB
2	RF power, conducted	$\pm 0.12$ dB
3	Spurious emissions, conducted	$\pm 0.11$ dB
4	All emissions, radiated(<1 GHz)	$\pm 4.56$ dB
5	All emissions, radiated(1 GHz - 18 GHz)	$\pm 4.22$ dB
6	All emissions, radiated(18 GHz- 40 GHz)	$\pm 4.36$ dB



## 5. Test Results and Measurement Data

### 5.1. Antenna requirement

**Standard requirement:**

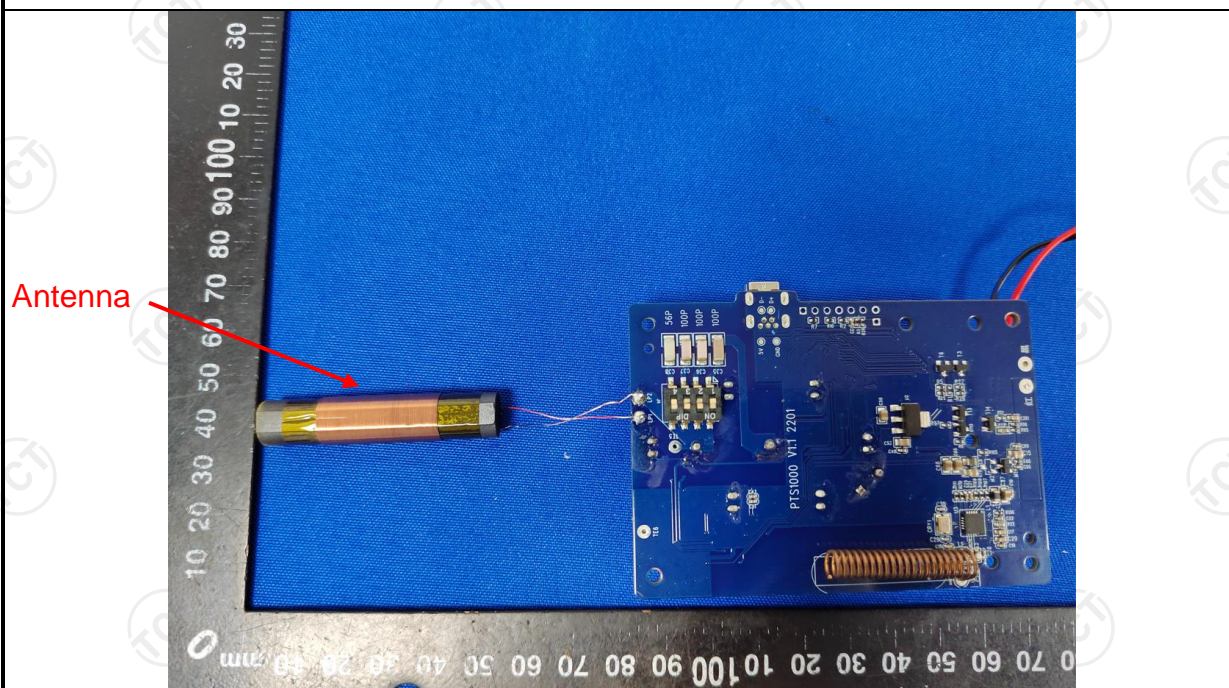
FCC Part15 C Section 15.203

**15.203 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, 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.

**E.U.T Antenna:**

The antenna is loop antenna which permanently attached.



## 5.2. Conducted Emission

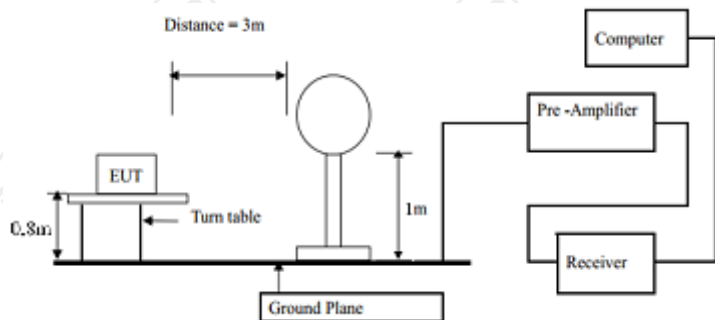
### 5.2.1. Test Specification

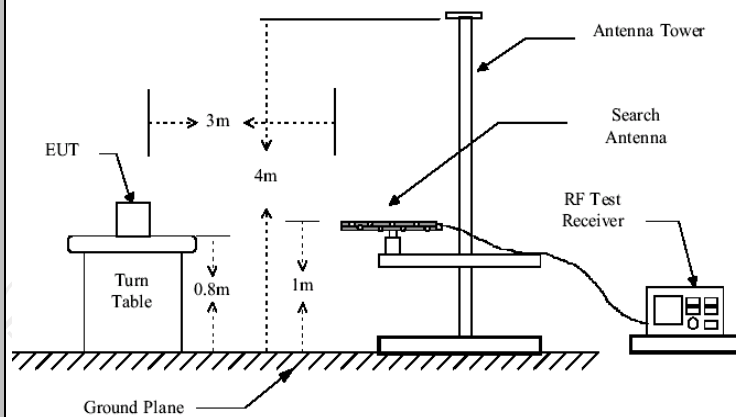
Test Requirement:	FCC Part15 C Section 15.207														
Test Method:	ANSI C63.10: 2013														
Frequency Range:	150 kHz to 30 MHz														
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto														
Limits:	<table><tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBuV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr><tr><td>0.5-5</td><td>56</td><td>46</td></tr><tr><td>5-30</td><td>60</td><td>50</td></tr></table>	Frequency range (MHz)	Limit (dBuV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dBuV)														
	Quasi-peak	Average													
0.15-0.5	66 to 56*	56 to 46*													
0.5-5	56	46													
5-30	60	50													
Test Setup:	<div><p style="text-align: center;"><b>Reference Plane</b></p><p><i>Remark:</i> E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p></div>														
Test Mode:	Charging +Transmitting Mode														
Test Procedure:	<div><div>1. The E.U.T is connected to an adapter through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.</div><div>2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).</div><div>3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.</div></div>														
Test Result:	N/A; Because the EUT is powered by the battery, so the item is not applicable.														



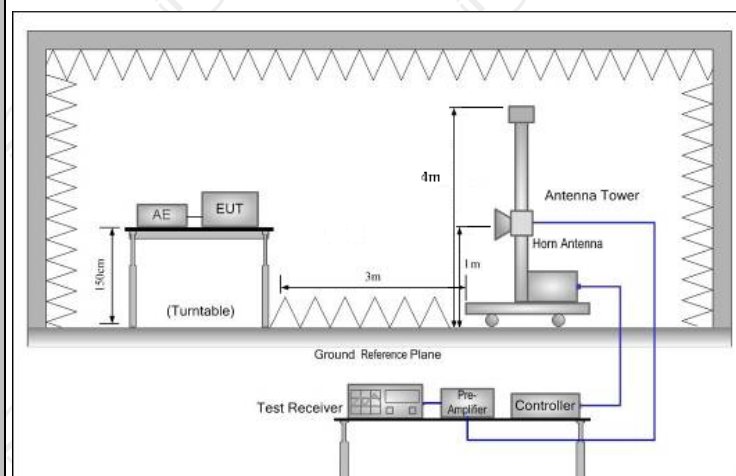
## 5.3. Radiated Spurious Emission Measurement

### 5.3.1. Test Specification

<b>Test Requirement:</b>	FCC Part15 C Section 15.209				
<b>Test Method:</b>	ANSI C63.10: 2013				
<b>Frequency Range:</b>	9 kHz to 25 GHz				
<b>Measurement Distance:</b>	3 m				
<b>Antenna Polarization:</b>	Horizontal & Vertical				
<b>Operation mode:</b>	Refer to item 3.1				
<b>Receiver Setup:</b>	Frequency	Detector	RBW	VBW	Remark
	9kHz- 150kHz	Quasi-peak	200Hz	1kHz	Quasi-peak Value
	150kHz- 30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		Peak	1MHz	10Hz	Average Value
<b>Limit:</b>	Frequency		Field Strength (microvolts/meter)		Measurement Distance (meters)
	0.009-0.490		2400/F(KHz)		300
	0.490-1.705		24000/F(KHz)		30
	1.705-30		30		30
	30-88		100		3
	88-216		150		3
	216-960		200		3
	Above 960		500		3
	Frequency		Field Strength (microvolts/meter)	Measurement Distance (meters)	Detector
	Above 1GHz		500	3	Average
			5000	3	Peak
	For radiated emissions below 30MHz				
					
	30MHz to 1GHz				



Above 1GHz



### Test Procedure:

- For the radiated emission test below 1GHz:  
The EUT was placed on a turntable with 0.8 meter above ground. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high PASS filter are used for the test in order to get better signal level.
- For the radiated emission test above 1GHz:  
Place the measurement antenna on a turntable with 1.5 meter above ground, which is 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

	<p>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.</p> <p>2. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level</p> <p>3. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.</p> <p>4. Use the following spectrum analyzer settings:</p> <p>(1) Span shall wide enough to fully capture the emission being measured;</p> <p>(2) Set RBW=120 kHz for <math>f &lt; 1</math> GHz; VBW <math>\geq</math> RBW; Sweep = auto; Detector function = peak; Trace = max hold;</p> <p>(3) Set RBW = 1 MHz, VBW= 3MHz for <math>f \square 1</math> GHz for peak measurement.</p> <p>For average measurement: VBW = 10 Hz, when duty cycle is no less than 98 percent. VBW <math>\geq 1/T</math>, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.</p>
<b>Test mode:</b>	Refer to section 3.1 for details
<b>Test results:</b>	PASS

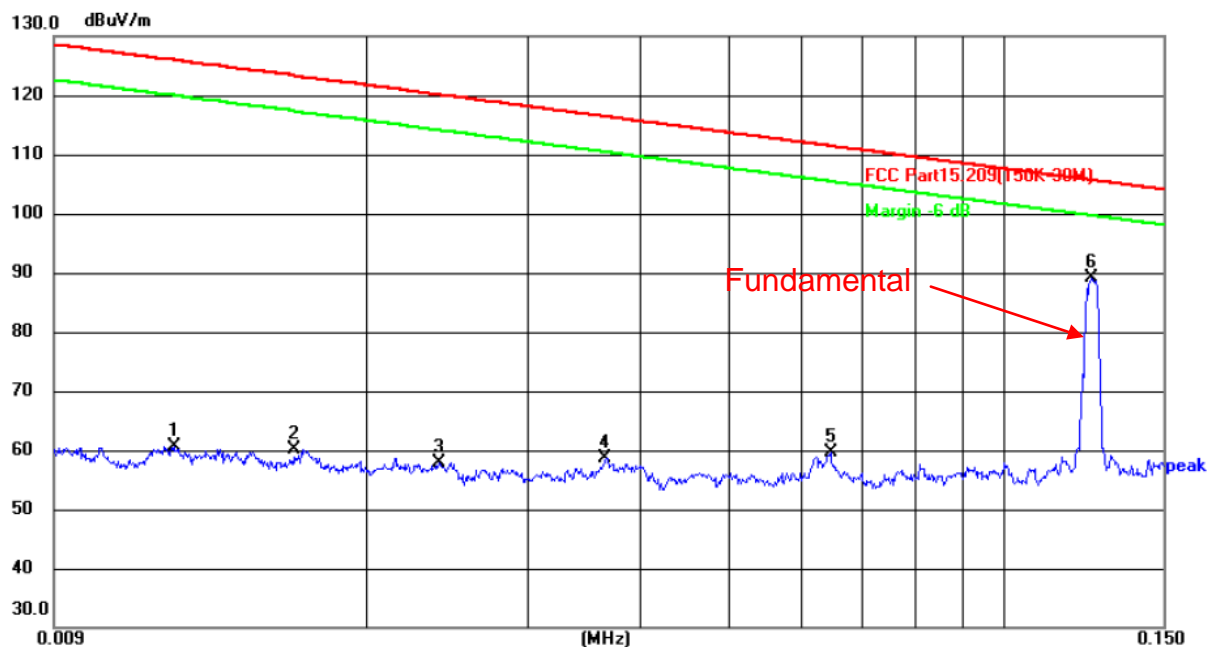
### 5.3.2. Test Instruments

Radiated Emission Test Site (966)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESIB7	100197	Jul. 07, 2022
Spectrum Analyzer	R&S	FSQ40	200061	Jul. 07, 2022
Pre-amplifier	SKET	LNPA_0118G-45	SK2021012102	Feb. 24, 2023
Pre-amplifier	SKET	LNPA_1840G-50	SK202109203500	Feb. 24, 2023
Pre-amplifier	HP	8447D	2727A05017	Jul. 07, 2022
Loop antenna	ZHINAN	ZN30900A	12024	Sep. 05, 2022
Broadband Antenna	Schwarzbeck	VULB9163	340	Sep. 04, 2022
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Sep. 04, 2022
Horn Antenna	Schwarzbeck	BBHA 9170	00956	Apr. 10, 2023
Antenna Mast	Keleto	RE-AM	N/A	N/A
Coaxial cable	SKET	RC_DC18G-N	N/A	Feb. 24, 2023
Coaxial cable	SKET	RC-DC18G-N	N/A	Feb. 24, 2023
Coaxial cable	SKET	RC-DC40G-N	N/A	Jul. 07, 2022
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

## 5.3.3. Test Data

Please refer to following diagram for individual  
9KHz-30MHz

9KHz-150KHz:



Site

Polarization: **Vertical**

Temperature: 25(°C)

Limit: FCC Part15.209(150K-30M)

Power: DC 9 V

Humidity: 55 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	0.0122	40.57	20.07	60.64	125.88	-65.24	peak	P	
2	0.0165	40.03	20.09	60.12	123.26	-63.14	peak	P	
3	0.0239	37.81	20.13	57.94	120.04	-62.10	peak	P	
4	0.0364	38.57	20.10	58.67	116.38	-57.71	peak	P	
5	0.0645	39.42	20.27	59.69	111.41	-51.72	peak	P	
6 *	0.1250	68.16	20.85	89.01	105.67	-16.66	peak	P	

150KHz-30MHz:



Site

Polarization: **Vertical**

Temperature: 25(°C)

Limit: FCC Part15.209(150K-30M)

Power: DC 9 V

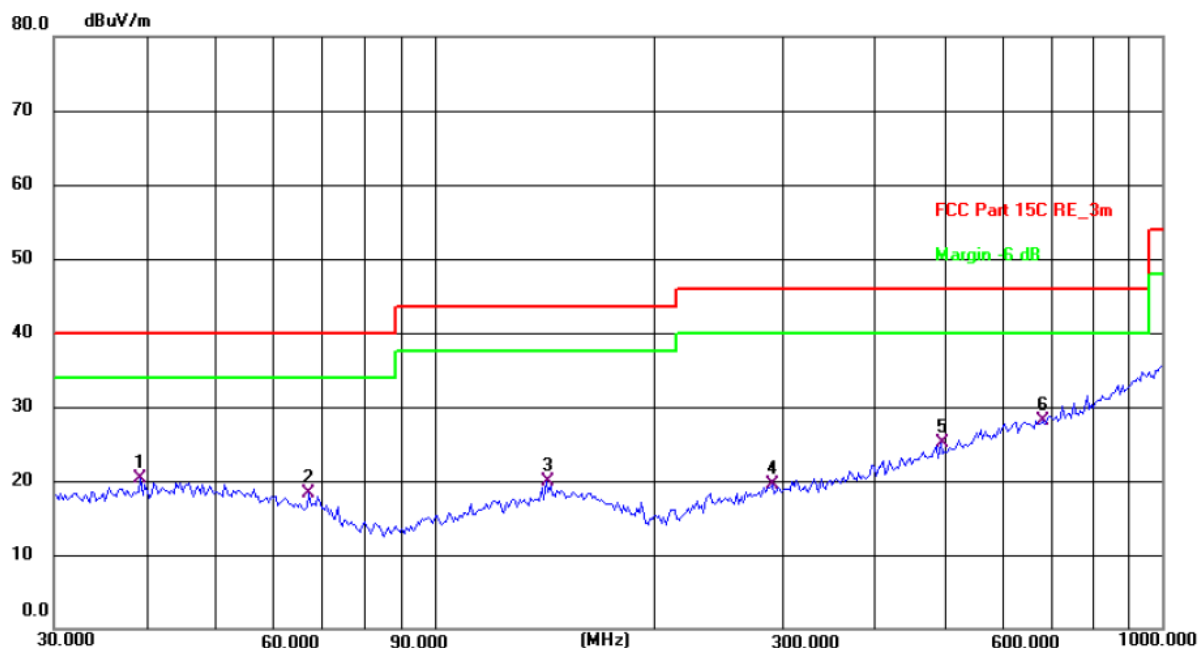
Humidity: 55 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	0.2514	42.57	21.04	63.61	99.60	-35.99	peak	P	
2	0.4773	37.63	21.15	58.78	94.03	-35.25	peak	P	
3 *	1.0020	32.41	22.59	55.00	67.60	-12.60	peak	P	
4	2.2724	27.89	25.00	52.89	69.50	-16.61	peak	P	
5	3.9117	24.81	28.26	53.07	69.50	-16.43	peak	P	
6	12.3178	32.04	20.63	52.67	69.50	-16.83	peak	P	



## 30MHz-1GHz

Horizontal:



Site #1 3m Anechoic Chamber

Polarization: **Horizontal**

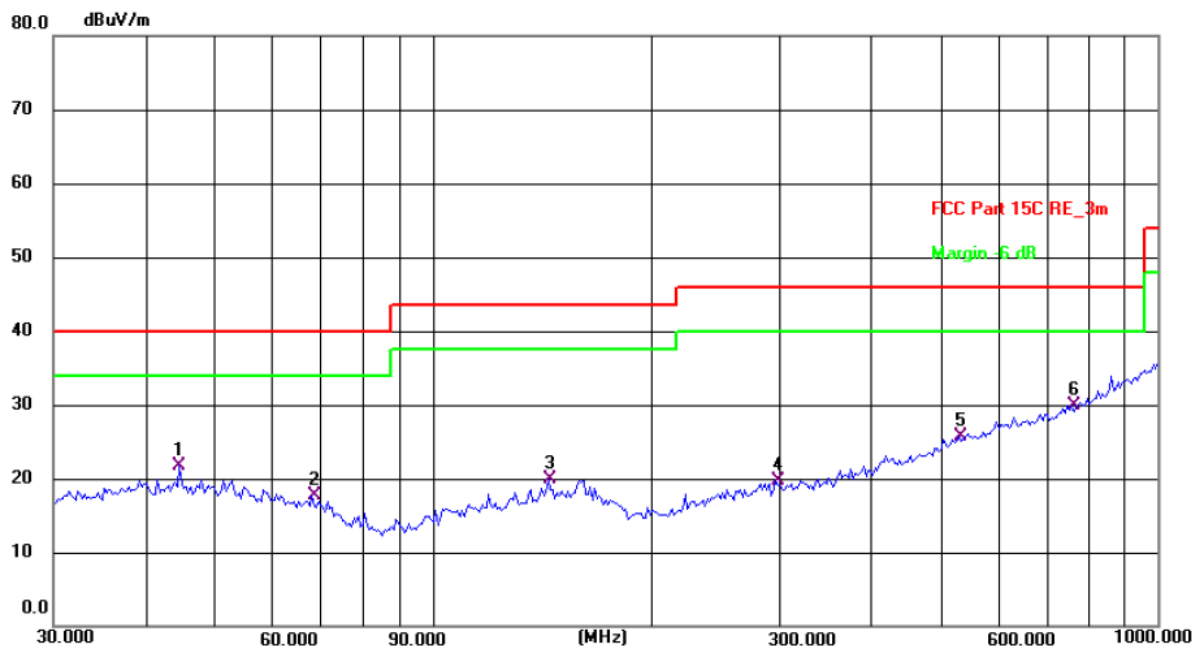
Temperature: 22.6(C) Humidity: 48 %

Limit: FCC Part 15C RE\_3m

Power: DC 9V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	39.4371	6.62	13.67	20.29	40.00	-19.71	QP	P	
2	67.2021	7.02	11.26	18.28	40.00	-21.72	QP	P	
3	142.3243	7.12	12.73	19.85	43.50	-23.65	QP	P	
4	291.0358	6.17	13.31	19.48	46.00	-26.52	QP	P	
5	495.9344	6.67	18.40	25.07	46.00	-20.93	QP	P	
6 *	684.7453	6.50	21.66	28.16	46.00	-17.84	QP	P	

Vertical:



Site #1 3m Anechoic Chamber

Polarization: **Vertical**

Temperature: 22.6(C)

Humidity: 48 %

Limit: FCC Part 15C RE\_3m

Power: DC 9V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	44.7433	8.09	13.60	21.69	40.00	-18.31	QP	P	
2	68.1514	6.62	11.14	17.76	40.00	-22.24	QP	P	
3	144.3348	7.02	12.80	19.82	43.50	-23.68	QP	P	
4	297.2241	6.31	13.44	19.75	46.00	-26.25	QP	P	
5	531.9635	6.37	19.24	25.61	46.00	-20.39	QP	P	
6 *	760.7036	7.12	22.86	29.98	46.00	-16.02	QP	P	

**Note:**

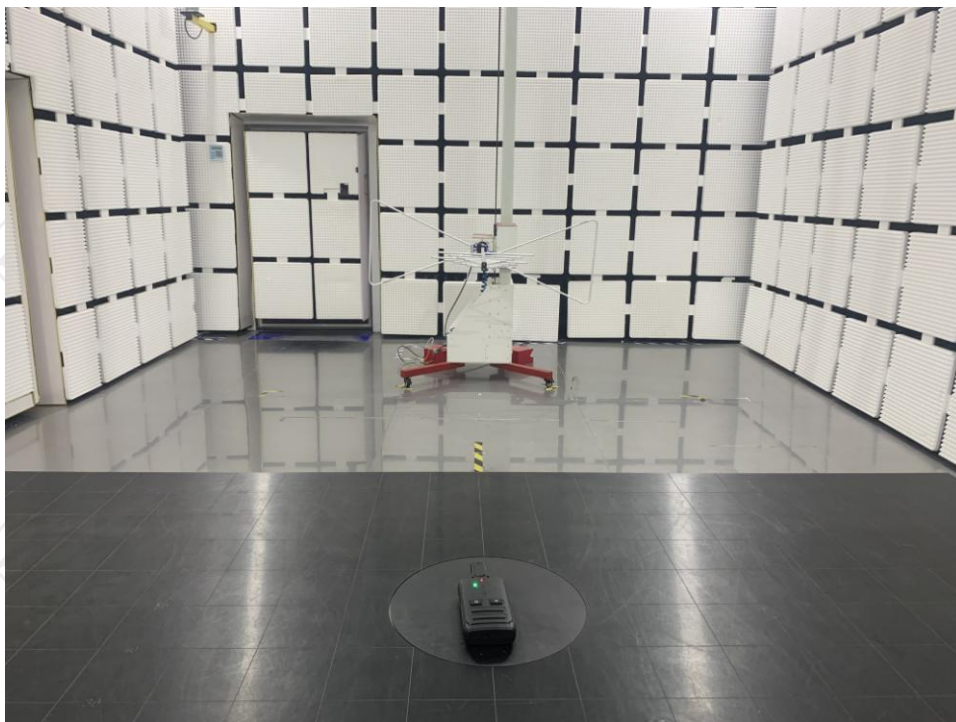
Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss – Pre-amplifier

## Appendix A: Photographs of Test Setup

Product: Automotive Diagnostic Tool

Model: PTS1000

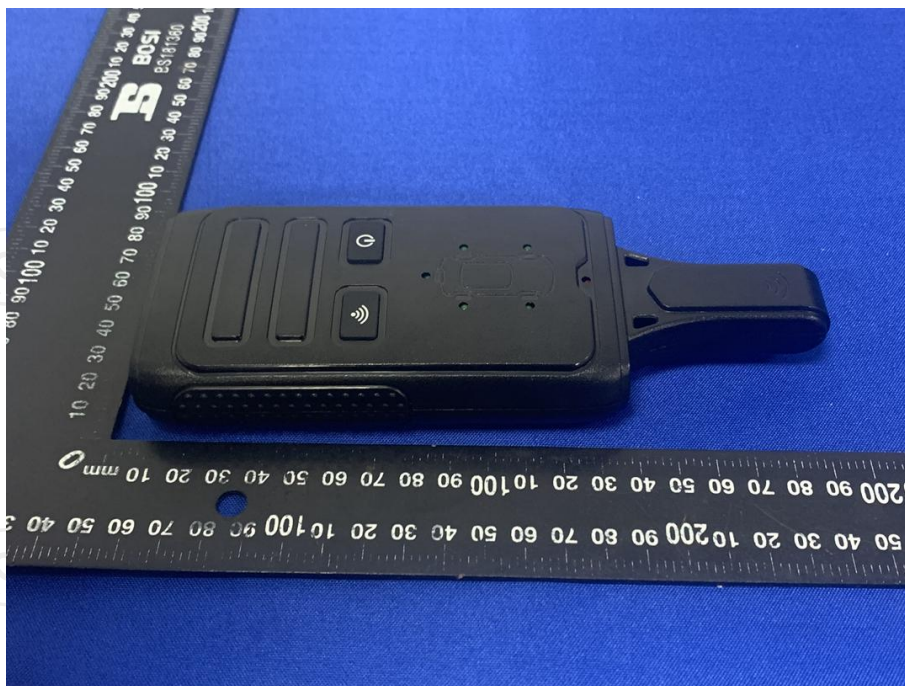
Radiated Emission



**Appendix B: Photographs of EUT**  
**Product: Automotive Diagnostic Tool**  
**Model: PTS1000**  
**External Photos**



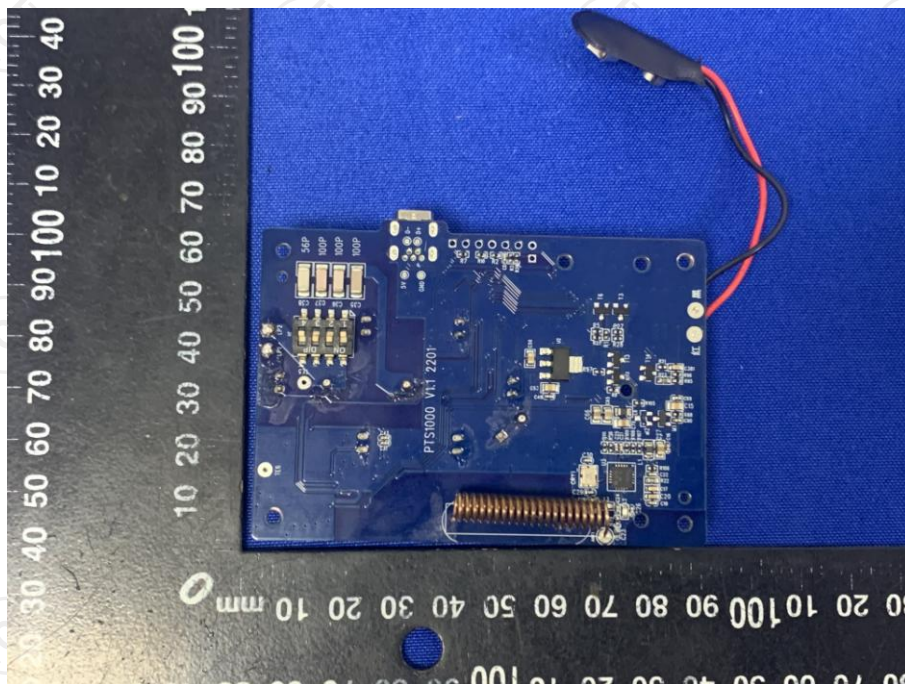


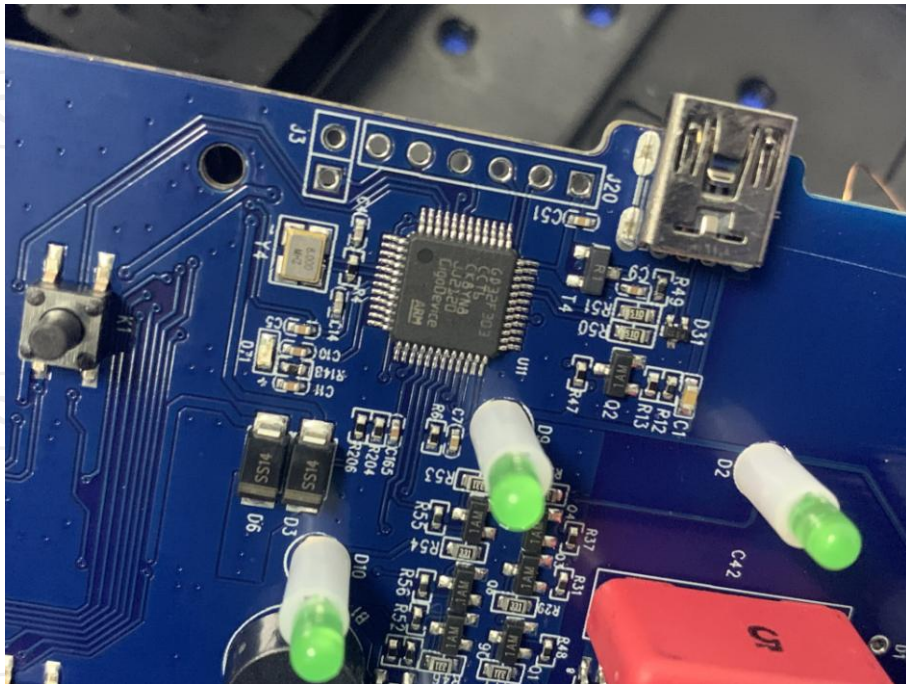
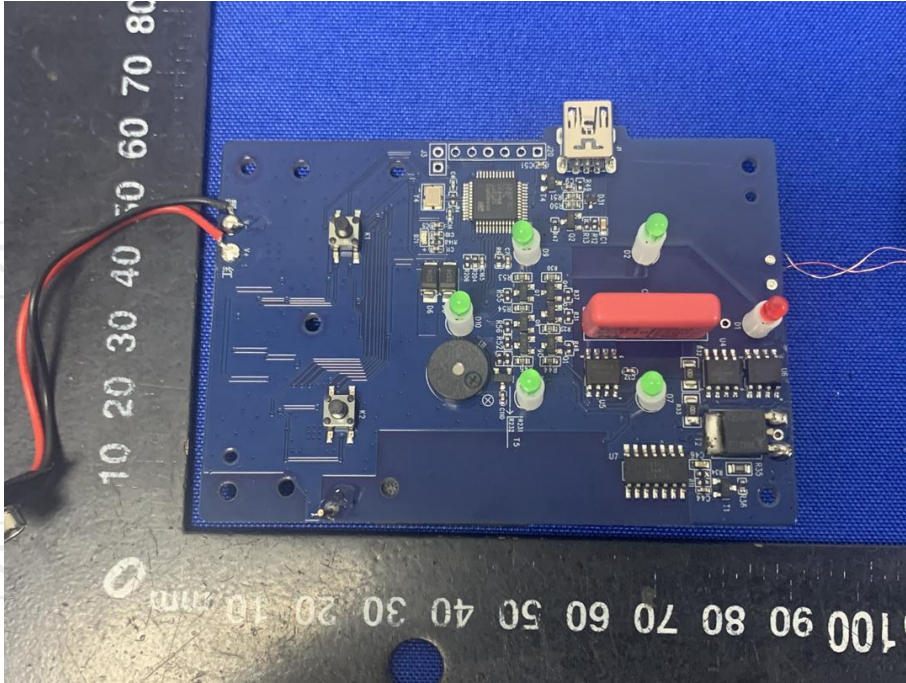




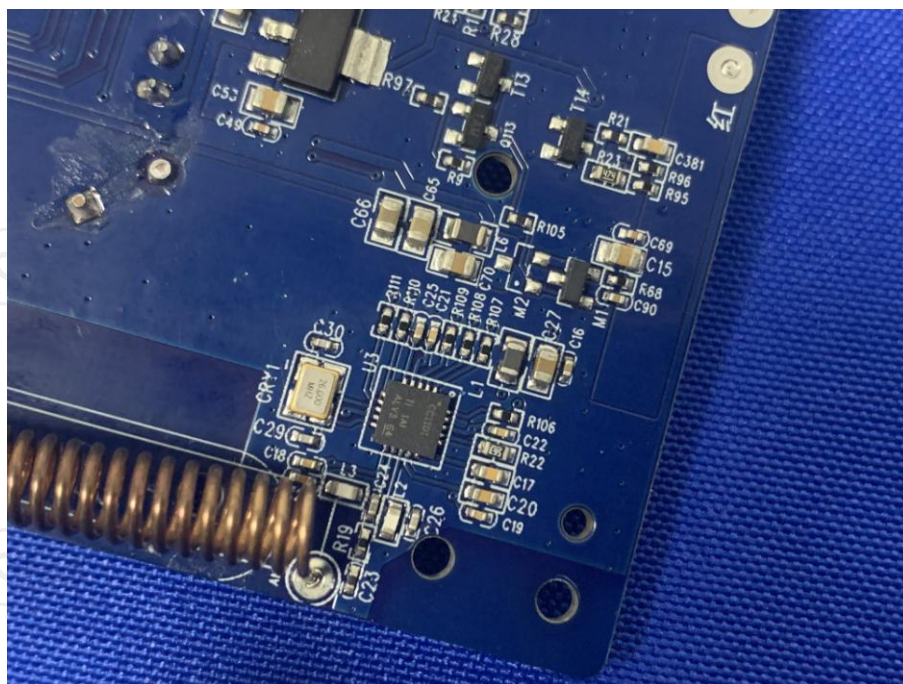


**Product: Automotive Diagnostic Tool**  
**Model: PTS1000**  
**Internal Photos**









**\*\*\*\*\*END OF REPORT\*\*\*\*\***