

# TEST REPORT

**Product Name** : Smart Automotive  
Diagnostic System  
**Model Number** : DS401

**Prepared for** : Topdon Technology Co., Ltd  
**Address** : 701, G Block, Intelligence Valley Technology Park, Yintian  
Road No.4, Xixiang, Bao' an, Shenzhen, 518129, China

**Prepared by** : EMTEK (SHENZHEN) CO., LTD.  
**Address** : Bldg 69, Majialong Industry Zone, Nanshan District,  
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**Report Number** : ES200528042E  
**Date(s) of Tests** : May 29, 2020 to Jun. 05, 2020  
**Date of issue** : Jun. 05, 2020

## TABLE OF CONTENT

Test Report Description	Page
<b>1. SUMMARY OF TEST RESULTS.....</b>	<b>5</b>
<b>2. GENERAL INFORMATION .....</b>	<b>6</b>
2.1. Description of Device (EUT) .....	6
2.2. Independent Operation Modes .....	6
2.3. Test Manner .....	6
2.4. Description of Test Facility .....	7
2.5. Test Software .....	7
2.6. Description of Support Device .....	7
2.7. Measurement Uncertainty.....	7
<b>3. MEASURING DEVICE AND TEST EQUIPMENT .....</b>	<b>8</b>
3.1. For Radiated Emission Measurement .....	8
<b>4. RADIATED EMISSION MEASUREMENT(UP TO 1GHz).....</b>	<b>9</b>
4.1. Block Diagram of Test Setup .....	9
4.2. Radiated Limit.....	9
4.3. Test Procedure.....	9
4.4. Measuring Results .....	10
<b>5. RADIATED EMISSION MEASUREMENT (ABOVE 1GHz).....</b>	<b>13</b>
5.1. Block Diagram of Test Setup .....	13
5.2. Radiated Limit.....	13
5.3. Test Procedure.....	13
5.4. Measuring Results .....	14
<b>6. PHOTOGRAPHS.....</b>	<b>17</b>
6.1. Photos of Radiation Emission Measurement .....	17
APPENDIX A: Label Requirements (1 Page)	
APPENDIX B: Warning Statement (1 Page)	
APPENDIX C: Photos of EUT (5 Pages)	

## TEST REPORT DESCRIPTION

Applicant : Topdon Technology Co., Ltd  
Manufacturer : Topdon Technology Co., Ltd  
Trade Mark : TOPDON  
EUT : Smart Automotive Diagnostic System  
Model No. : DS401  
Rating : DC 12V


### Measurement Procedure Used:


FCC CFR Title 47, Part 15, Subpart B, Class B  
ANSI C63.4-2014


The device described above is tested by EMTEK (SHENZHEN) CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and EMTEK (SHENZHEN) 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 requirements.


This report applies to above tested sample only and shall not be reproduced in part without written approval of EMTEK (SHENZHEN) CO., LTD.

Date of Test : May 29, 2020 to Jun. 05, 2020

Prepared by :   
Qiang Wang / Editor

Reviewer :   
Joe Xia / Supervisor

Approved & Authorized Signer :   
Lisa Wang / Manager



## Modified Information

Version	Report No.	Revision Data	Summary
Ver.1.0	ES200528042E	/	Original Version



## 1. SUMMARY OF TEST RESULTS

<b>EMISSION</b>		
Description of Test Item	Standard & Limits	Results
Conducted Emission at Mains Terminals	CFR 47, FCC Part 15, Subpart B, Class B ANSI C63.4-2014	N/A
Radiated Emission	CFR 47, FCC Part 15, Subpart B, Class B ANSI C63.4-2014	Pass
Note: N/A is an abbreviation for Not Applicable.		



## 2. GENERAL INFORMATION

### 2.1. Description of Device (EUT)

EUT : Smart Automotive Diagnostic System

Model Number : DS401

Applicant : Topdon Technology Co., Ltd

Address : 701, G Block, Intelligence Valley Technology Park, Yintian Road No.4, Xixiang, Bao' an, Shenzhen, 518129, China

Manufacturer : Topdon Technology Co., Ltd

Address : 701, G Block, Intelligence Valley Technology Park, Yintian Road No.4, Xixiang, Bao' an, Shenzhen, 518129, China

Date of Received : May 29, 2020

Date of Test : May 29, 2020 to Jun. 05, 2020

### 2.2. Independent Operation Modes

A: BT  
B: ON  
C Stand-By  
D Off

### 2.3. Test Manner

Test Items	Test Voltage	Operation Modes	Worst case
Radiated emissions(Up to 1 GHz)	DC 12V	Mode A	Mode A
Radiated emissions(Above 1 GHz)	DC 12V	Mode A	Mode A

## 2.4. Description of Test Facility

### Site Description

EMC Lab. : Accredited by CNAS, 2018.11.30  
The certificate is valid until 2022.10.28  
The Laboratory has been assessed and proved to be in compliance with  
CNAS-CL01:2006 (identical to ISO/IEC 17025:2017)  
The Certificate Registration Number is L2291.

Accredited by FCC, August 09, 2018  
Designation Number: CN1204  
Test Firm Registration Number: 882943

Accredited by A2LA, August 08, 2018  
The Certificate Number is 4321.01.

Accredited by Industry Canada, November 09, 2018  
The Conformity Assessment Body Identifier is CN0008

Name of Firm : EMTEK (SHENZHEN) CO., LTD.  
Site Location : Bldg 69, Majialong Industry Zone, Nanshan District, Shenzhen,  
Guangdong, China

## 2.5. Test Software

Item	Software
Conducted Emission	: EMTEK(Ver.CON-03A1)-Shenzhen
Radiated Emission	: EMTEK(Ver.RA-03A1)-Shenzhen

## 2.6. Description of Support Device

tablet PC : Manufacturer: /  
M/N: /  
CE, FCC

## 2.7. Measurement Uncertainty

Test Item	Uncertainty
Radiated Emission Uncertainty	: 4.46dB (30M~1GHz Polarize: H)
(3m 1# Chamber)	5.04dB (30M~1GHz Polarize: V)
	4.92dB (1~6GHz)

### 3. MEASURING DEVICE AND TEST EQUIPMENT

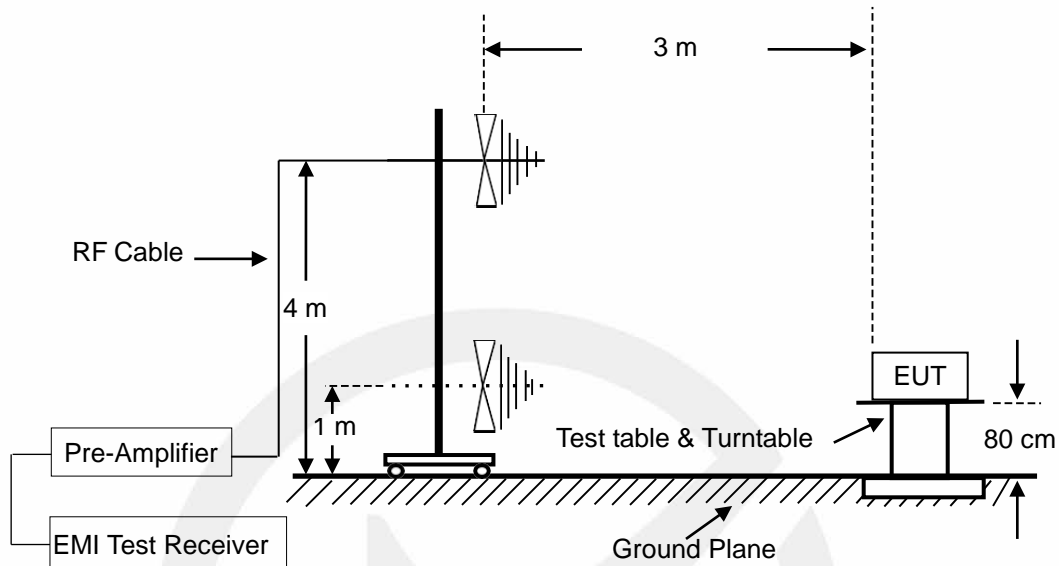
#### 3.1. For Radiated Emission Measurement

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	Pre-Amplifier	HP	8447F	2944A07999	May 17, 2020	1 Year
<input checked="" type="checkbox"/>	EMI Test Receiver	Rohde & Schwarz	ESCI	101414	May 17, 2020	1 Year
<input checked="" type="checkbox"/>	Bilog Antenna	Schwarzbeck	VULB9163	660	July 14, 2019	2 Year
<input checked="" type="checkbox"/>	Horn antenna	Schwarzbeck	BBHA9120D	9120D-1198	June 16, 2020	2 Year
<input checked="" type="checkbox"/>	Pre-Amplifie	Lunar EM	LNA1G18-48	J1011131010 001	May 16, 2020	1 Year



## 4. RADIATED EMISSION MEASUREMENT(UP TO 1GHz)

### 4.1. Block Diagram of Test Setup



### 4.2. Radiated Limit

CFR 47, FCC Part 15, Subpart B, Class B

Frequency MHz	Distance Meters	Field Strengths Limit	
		$\mu\text{V}/\text{m}$	$\text{dB}(\mu\text{V})/\text{m}$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0

### 4.3. Test Procedure

The EUT was placed on a non-conductive plank whose total height equaled 80cm. All units of equipment forming the system under test (includes the EUT as well as connected peripherals and associated equipment or devices) shall be arranged such that a nominal 0.1 m separation is achieved between the neighboring units.

The EUT was set 3 meters (or 10 meters) away from the receiving antenna that was mounted on a non-conductive mast. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level.

The turntable can rotate 360 degree to determine the position of the maximum emission level.

The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.

The identification of the frequency of highest emission with respect to the limit was found by

investigating emissions at a number of significant frequencies. The probable frequency of maximum emission had been found and that the associated cable and EUT configuration and mode of operation had been identified.

The bandwidth of the Receiver is set at 120 kHz.

Test results were obtained from the following equation:

Emission level (dB $\mu$ V/m) = Antenna Factor - Amp Factor + Cable Loss + Reading

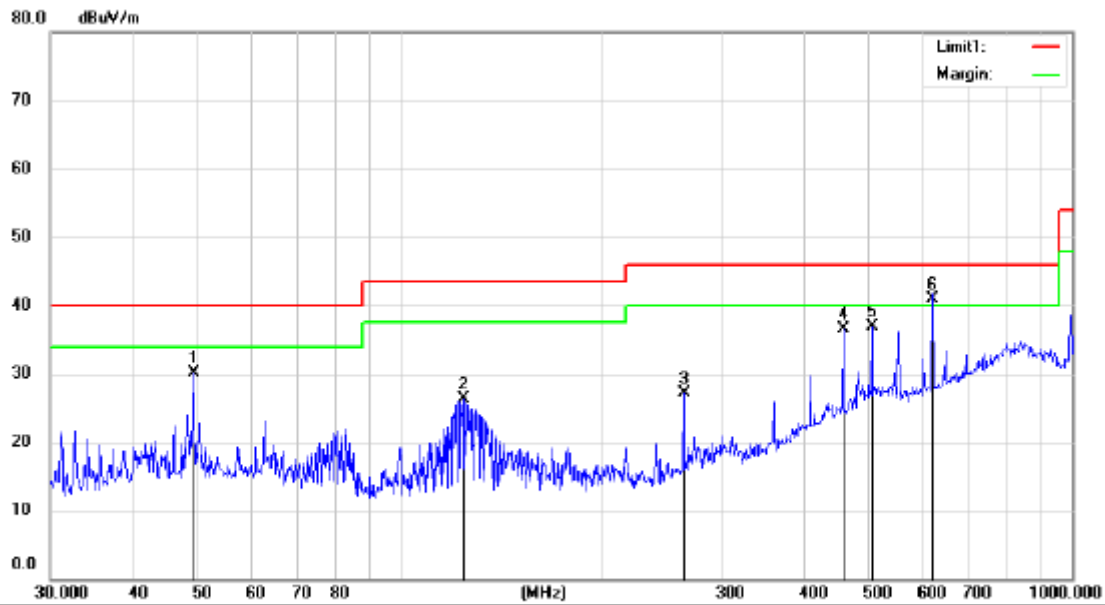
Margin (dB) = Emission Level (dB $\mu$ V/m) - Limit (dB $\mu$ V/m)

#### 4.4. Measuring Results

**PASS.**

All the modes were tested and the data of the worst modes are attached the following pages.





Site 3m Chamber #1

Polarization: **Vertical**

Temperature: 29.5 C

Limit: (RE)FCC PART 15 CLASS B

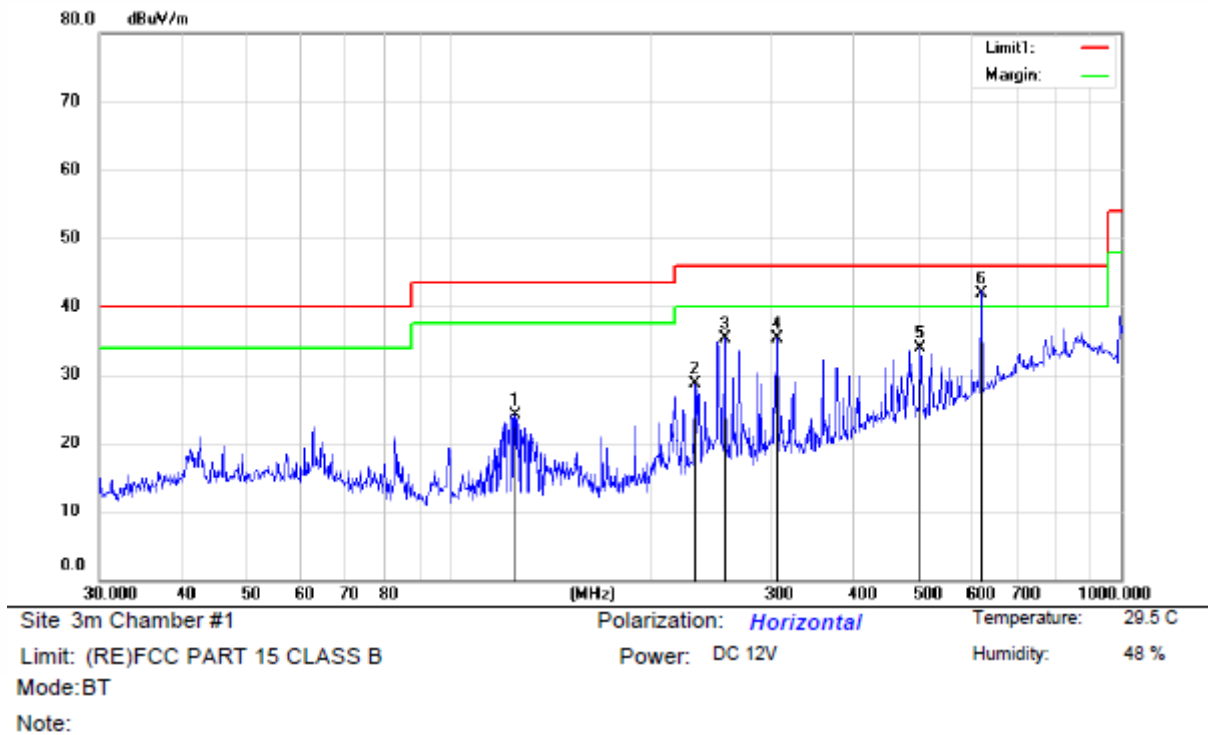
Power: DC 12V

Humidity: 48 %

Mode:BT

Note:

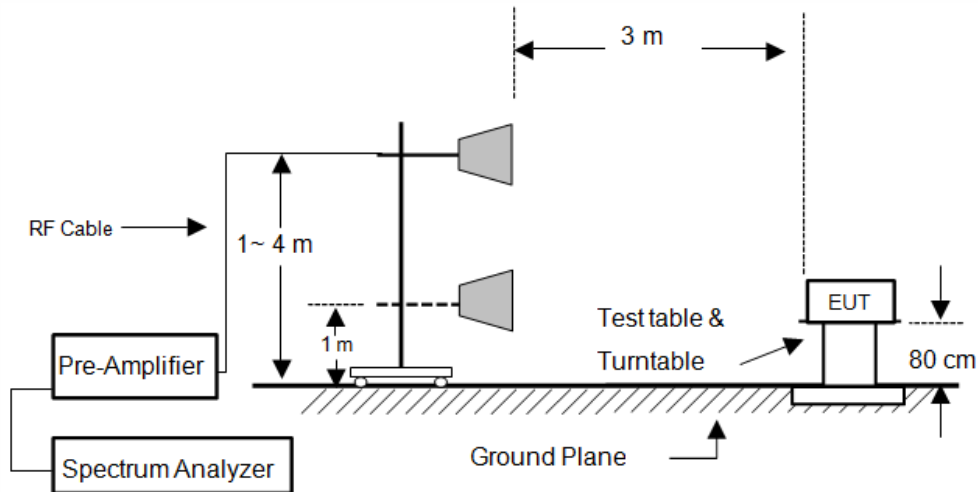
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		49.0790	41.99	-11.95	30.04	40.00	-9.96	QP		
2		123.8070	40.56	-14.21	26.35	43.50	-17.15	QP		
3		264.0504	38.73	-11.65	27.08	46.00	-18.92	QP		
4		456.1057	41.30	-4.78	36.52	46.00	-9.48	QP		
5		504.0430	40.37	-3.49	36.88	46.00	-9.12	QP		
6	*	619.3508	41.48	-0.48	41.00	46.00	-5.00	QP		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		125.0066	38.31	-14.22	24.09	43.50	-19.41	QP		
2		232.4300	41.69	-13.07	28.62	46.00	-17.38	QP		
3		257.0840	47.17	-11.87	35.30	46.00	-10.70	QP		
4		307.2920	45.51	-10.19	35.32	46.00	-10.68	QP		
5		502.0585	37.43	-3.47	33.96	46.00	-12.04	QP		
6	*	619.3508	42.48	-0.48	42.00	46.00	-4.00	QP		

## 5. RADIATED EMISSION MEASUREMENT (ABOVE 1GHz)

### 5.1. Block Diagram of Test Setup



### 5.2. Radiated Limit

CFR 47, FCC Part 15, Subpart B, Class B

Frequency range GHz	Average limit dB( $\mu$ V/m)	Peak limit dB( $\mu$ V/m)
Above 1000	54	74

Note: The highest internal source of an EUT is defined as the highest frequency generated or used in the device or on which the EUT operates or tunes. If the highest frequency of the internal sources of the EUT is less than 1.705 MHz, the measurement shall only be made up to 30 MHz. If the highest frequency of the internal sources of the EUT is between 1.705 MHz and 108 MHz, the measurement shall only be made up to 1 GHz. If the highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz the measurement shall only be made up to 2 GHz. If the highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz. If the highest frequency of the internal sources of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 40 GHz, whichever is less.

### 5.3. Test Procedure

The EUT was placed on a non-conductive plank whose total height equaled 80cm. All units of equipment forming the system under test (includes the EUT as well as connected peripherals and associated equipment or devices) shall be arranged such that a nominal 0.1 m separation is achieved between the neighboring units.

The EUT was set 3 meters (or 10 meters) away from the receiving antenna that was mounted on a non-conductive mast. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level.

The turntable can rotate 360 degree to determine the position of the maximum emission level.

The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.

The identification of the frequency of highest emission with respect to the limit was found by investigating emissions at a number of significant frequencies. The probable frequency of maximum emission had been found and that the associated cable and EUT configuration and mode of operation had been identified.

The frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with peak detector for peak values, and use RBW=1 MHz and VBW=10 Hz with peak detector for Average Values.

Test results were obtained from the following equation:

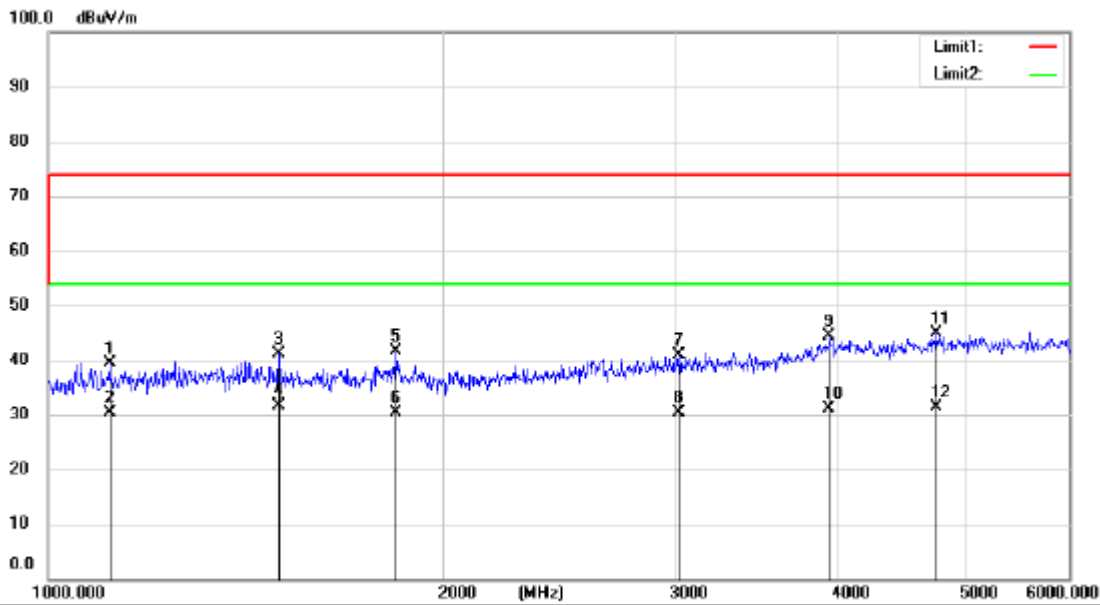
Emission level (dBμV/m) = Antenna Factor - Amp Factor + Cable Loss + Reading

Margin (dB) = Emission Level (dBμV/m) - Limit (dBμV/m)

#### 5.4. Measuring Results

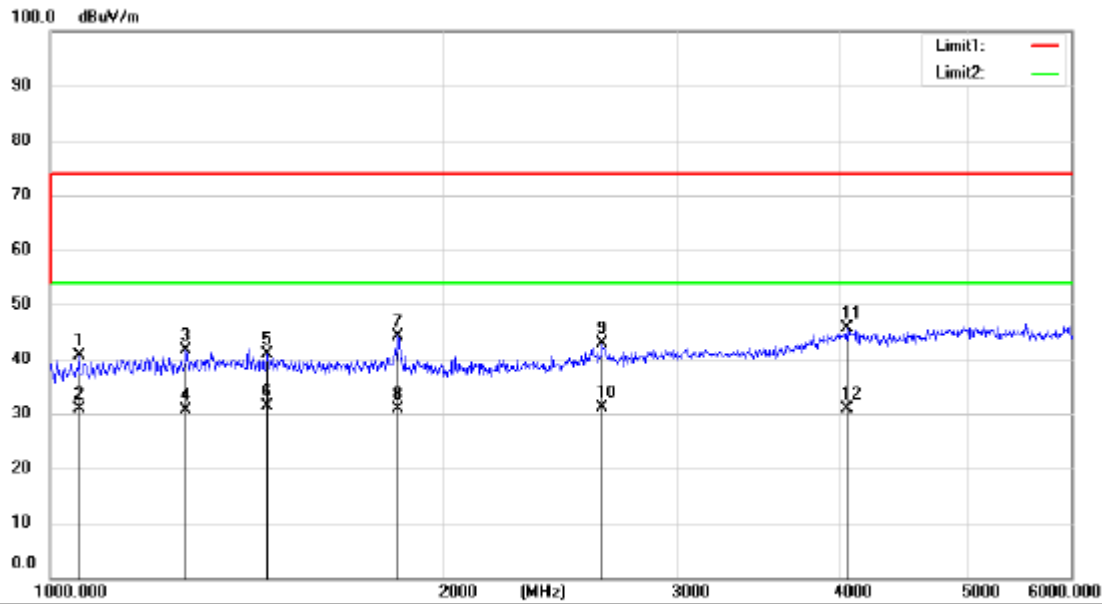
**PASS.**

All the modes were tested and the data of the worst modes are attached the following pages.



Site: 3m Chamber #1 Polarization: **Vertical** Temperature: 29.5 C  
 Limit: (RE)FCC PART 15 CLASS B Power: DC 12V Humidity: 48 %  
 Mode: BT  
 Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		1113.497	59.67	-20.19	39.48	74.00	-34.52	peak		
2		1113.497	50.49	-20.19	30.30	54.00	-23.70	AVG		
3		1500.553	62.65	-21.58	41.07	74.00	-32.93	peak		
4	*	1500.553	53.28	-21.58	31.70	54.00	-22.30	AVG		
5		1843.905	63.78	-22.22	41.56	74.00	-32.44	peak		
6		1843.905	52.72	-22.22	30.50	54.00	-23.50	AVG		
7		3028.911	59.69	-18.74	40.95	74.00	-33.05	peak		
8		3028.911	49.04	-18.74	30.30	54.00	-23.70	AVG		
9		3940.738	59.21	-14.89	44.32	74.00	-29.68	peak		
10		3940.738	46.09	-14.89	31.20	54.00	-22.80	AVG		
11		4756.455	58.44	-13.59	44.85	74.00	-29.15	peak		
12		4756.455	44.99	-13.59	31.40	54.00	-22.60	AVG		

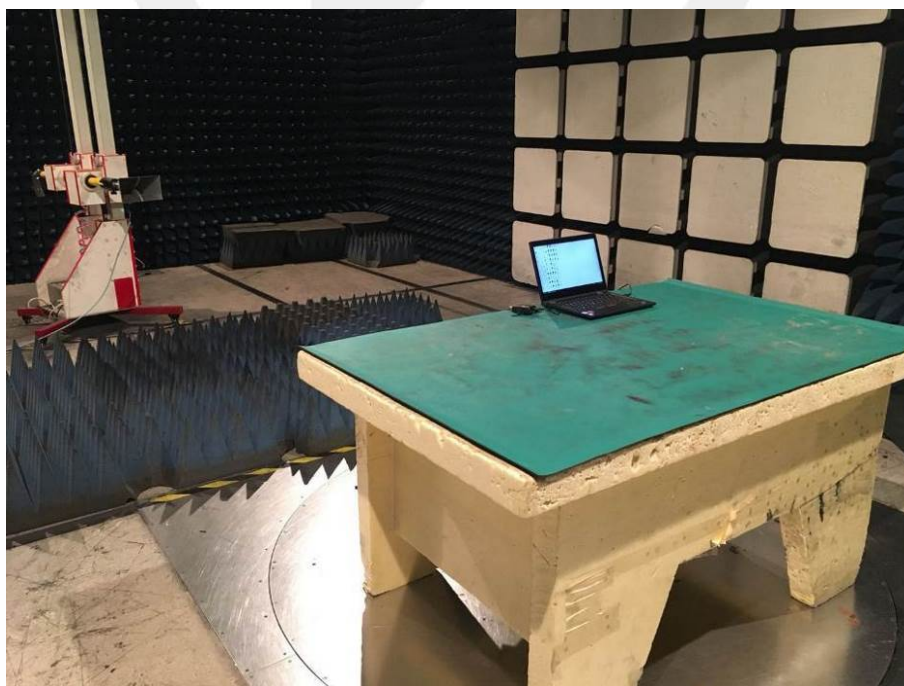
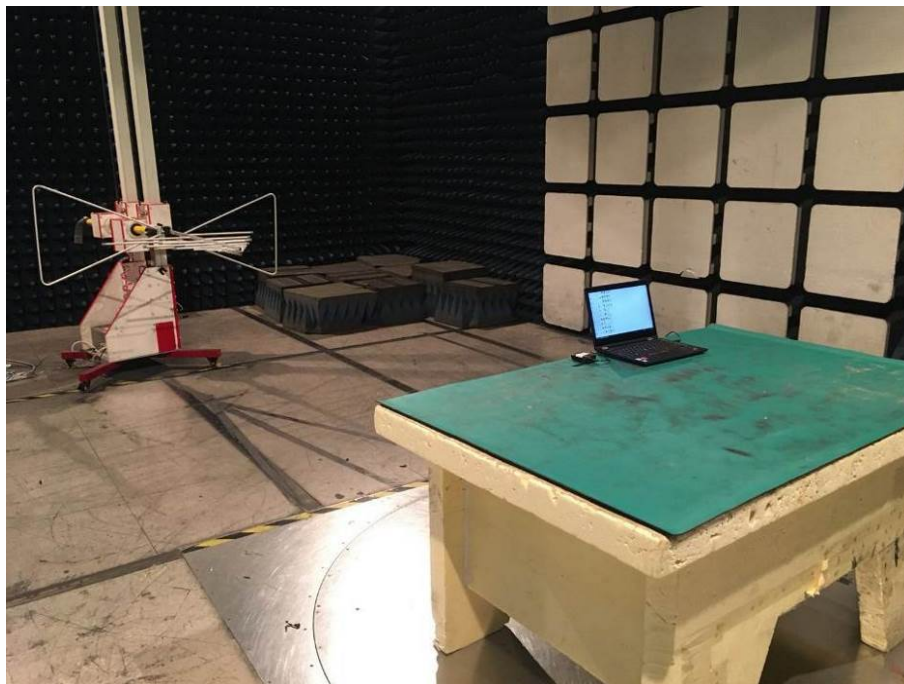


Site 3m Chamber #1 Polarization: *Horizontal* Temperature: 29.5 C  
 Limit: (RE)FCC PART 15 CLASS B Power: DC 12V Humidity: 48 %  
 Mode:BT  
 Note:

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		1051.449	60.60	-19.87	40.73	74.00	-33.27	peak		
2		1051.449	50.87	-19.87	31.00	54.00	-23.00	AVG		
3		1270.802	62.40	-20.85	41.55	74.00	-32.45	peak		
4		1270.802	51.45	-20.85	30.60	54.00	-23.40	AVG		
5		1464.364	62.21	-21.45	40.76	74.00	-33.24	peak		
6	*	1464.364	52.95	-21.45	31.50	54.00	-22.50	AVG		
7		1843.905	66.47	-22.22	44.25	74.00	-29.75	peak		
8		1843.905	53.02	-22.22	30.80	54.00	-23.20	AVG		
9		2639.163	63.00	-20.22	42.78	74.00	-31.22	peak		
10		2639.163	51.42	-20.22	31.20	54.00	-22.80	AVG		
11		4051.715	60.08	-14.49	45.59	74.00	-28.41	peak		
12		4051.715	45.29	-14.49	30.80	54.00	-23.20	AVG		

## 6. PHOTOGRAPHS

### 6.1. Photos of Radiation Emission Measurement



## APPENDIX A: Label Requirements

(1) Receivers associated with the operation of a licensed radio service, e.g., FM broadcast under part 73 of this chapter, land mobile operation under part 90 of this chapter, etc., shall bear the following statement in a conspicuous location on the device:

This device complies with part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

(2) A stand-alone cable input selector switch, shall bear the following statement in a conspicuous location on the device:

This device complies with part 15 of the FCC Rules for use with cable television service.

(3) All other devices shall bear the following statement in a conspicuous location on the device:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.



## APPENDIX B: Warning Statement

(a) For a Class A digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

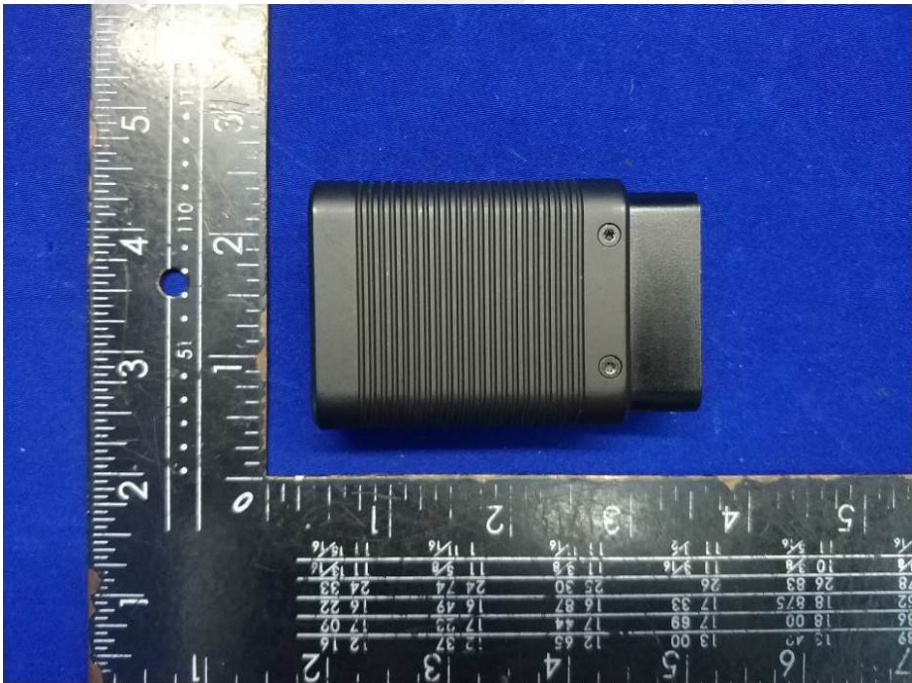
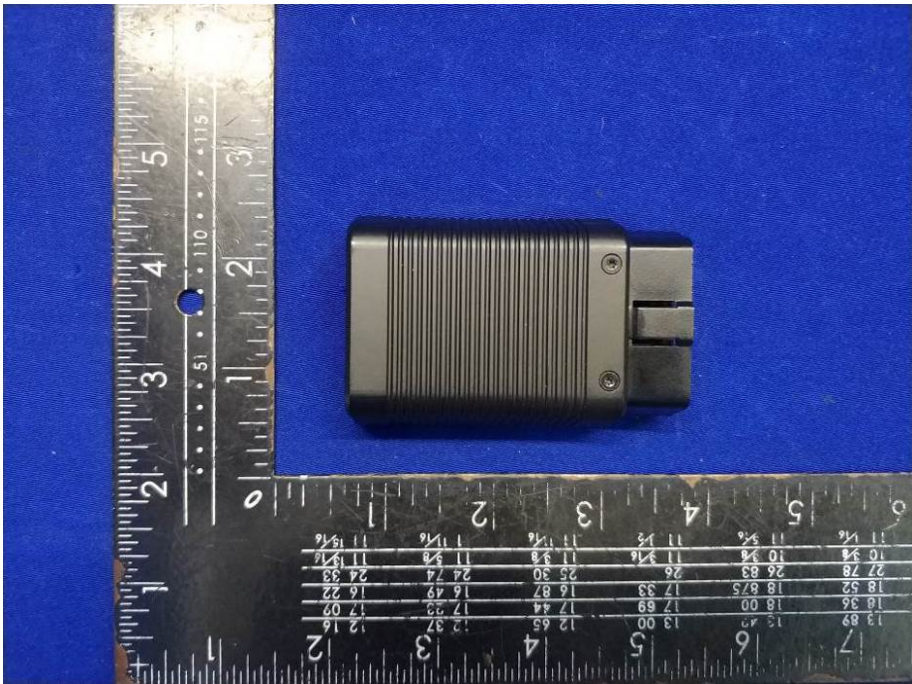
(b) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

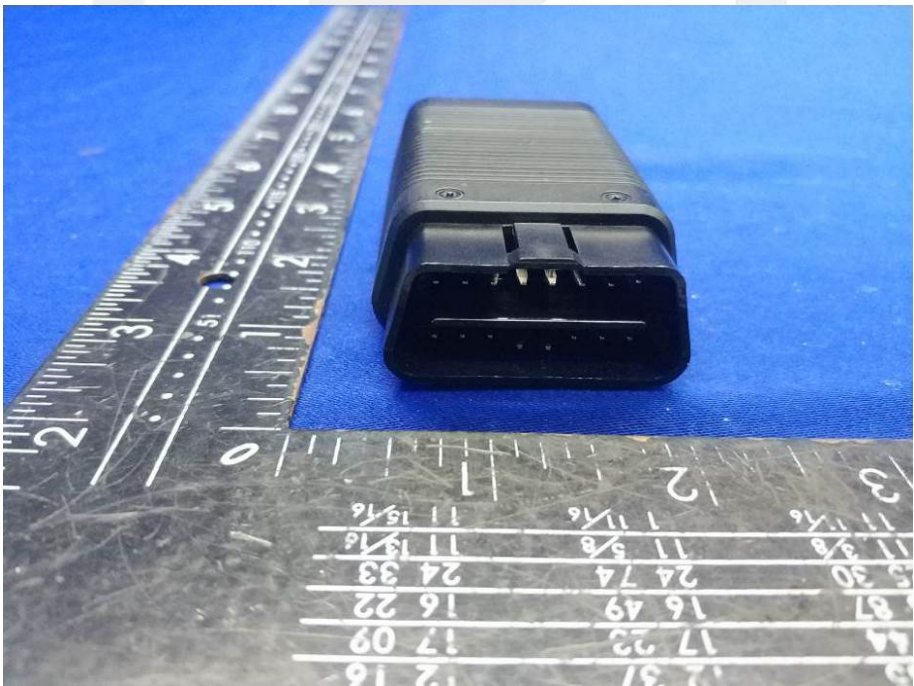
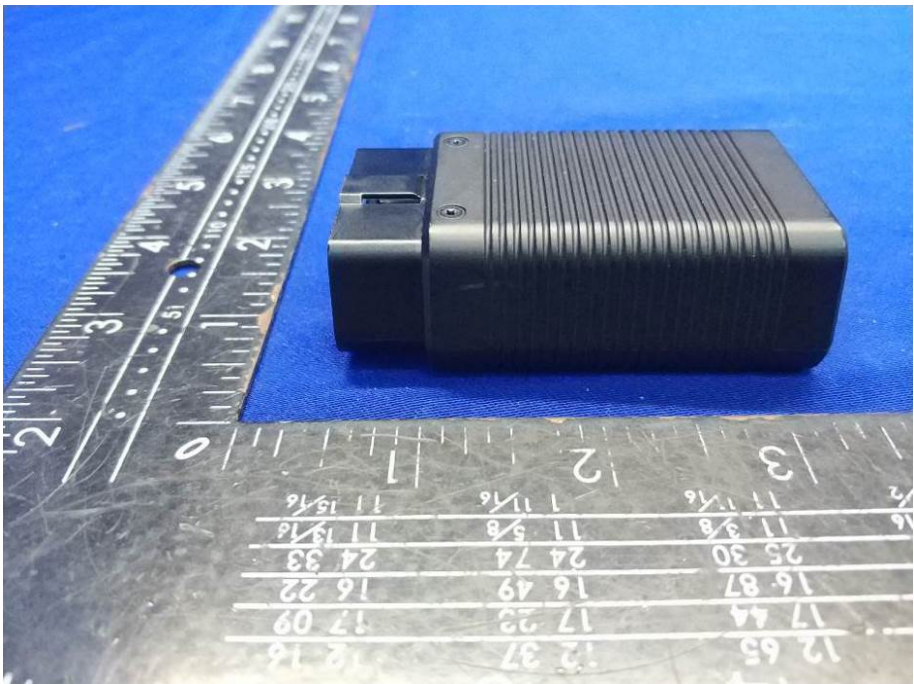
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

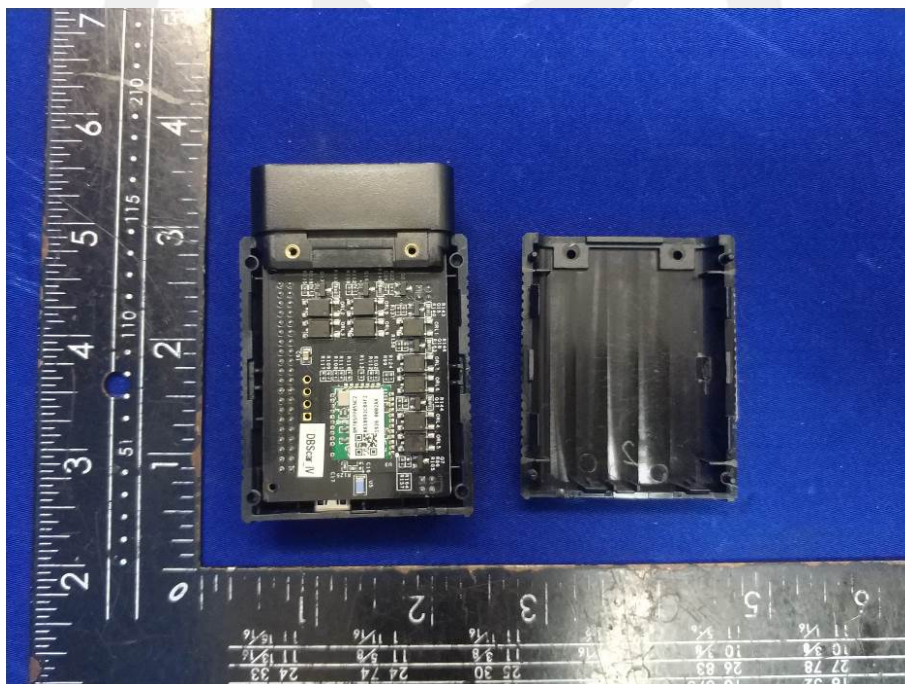
Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

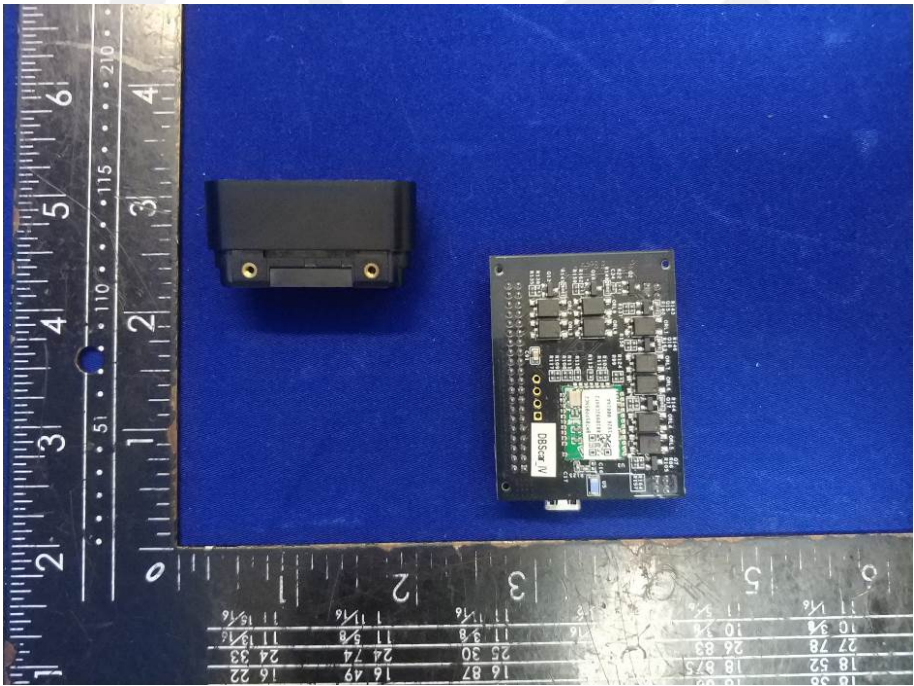
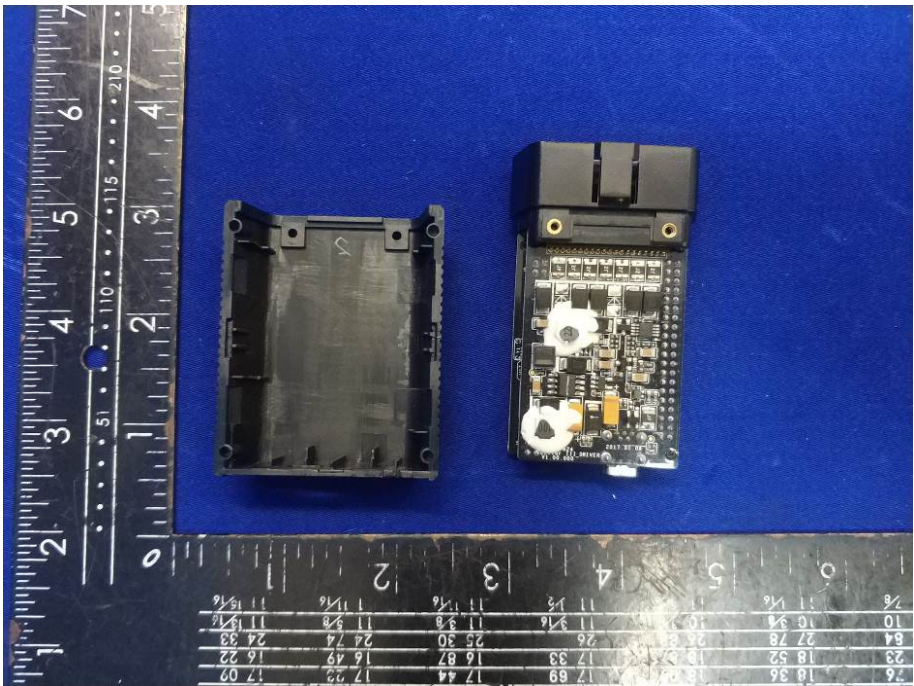
APPENDIX C: Photos of EUT

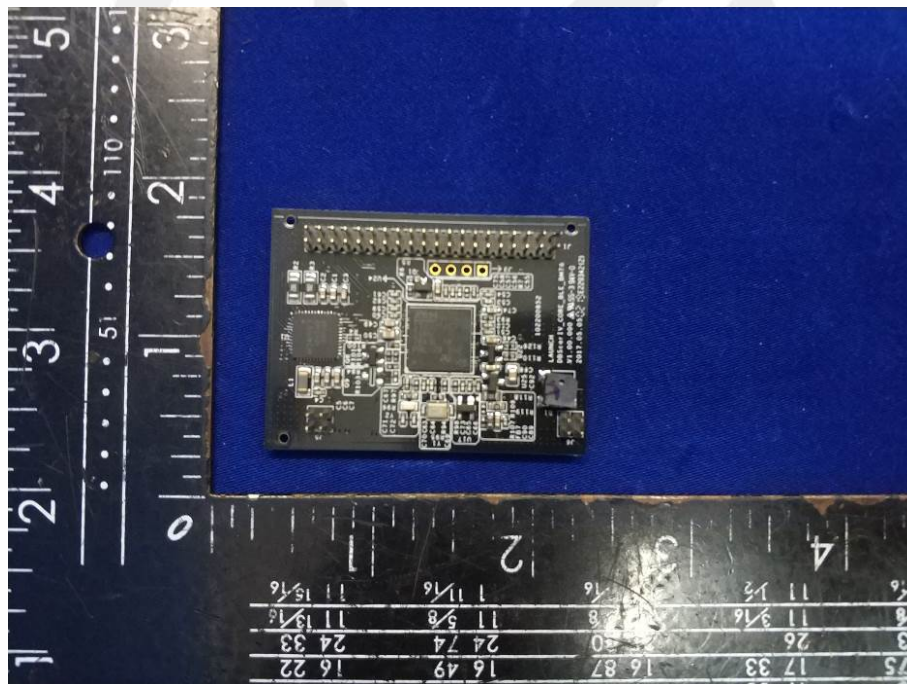
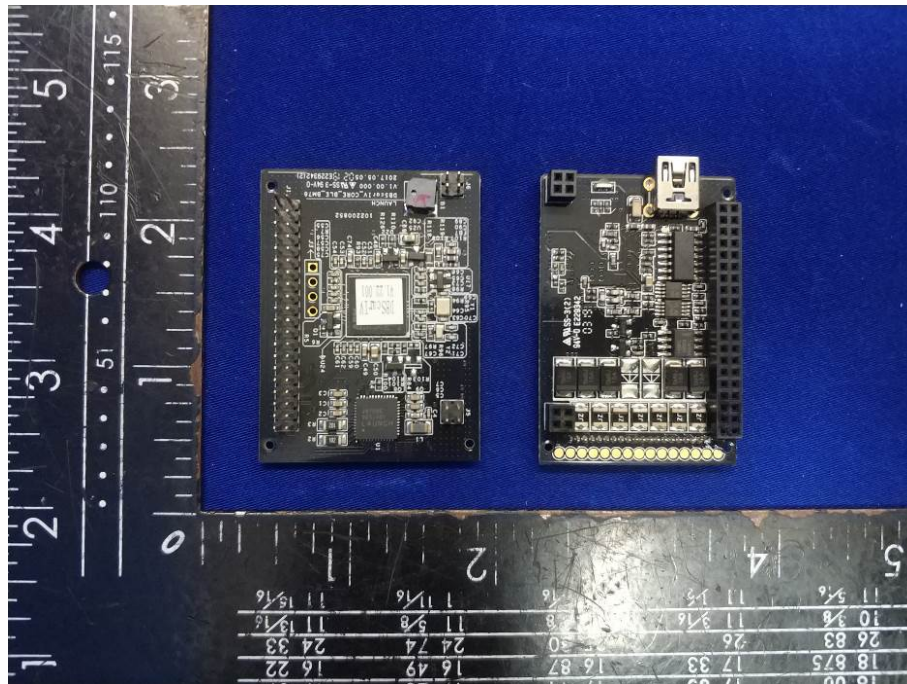


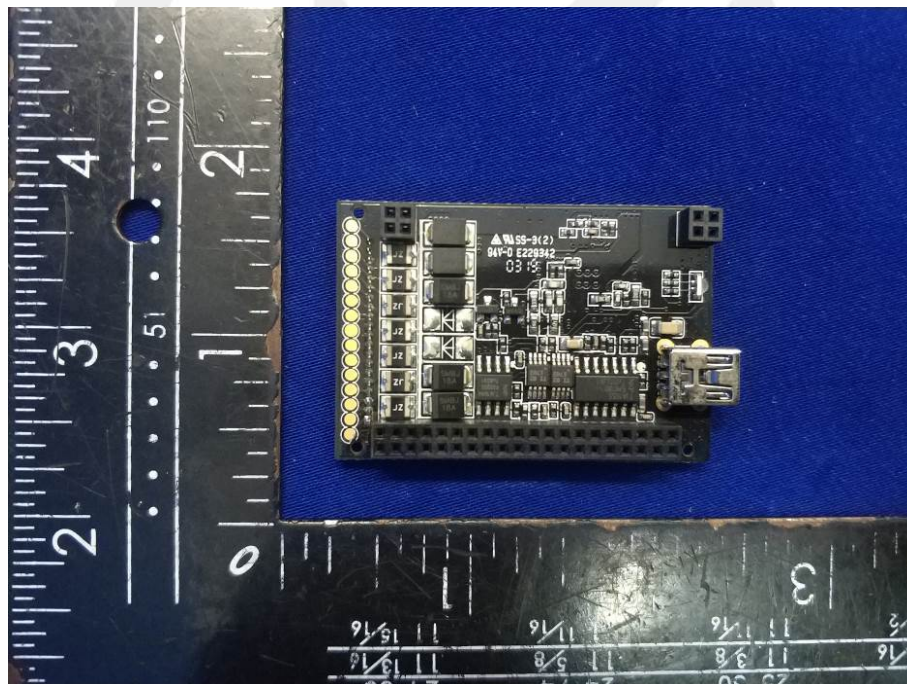
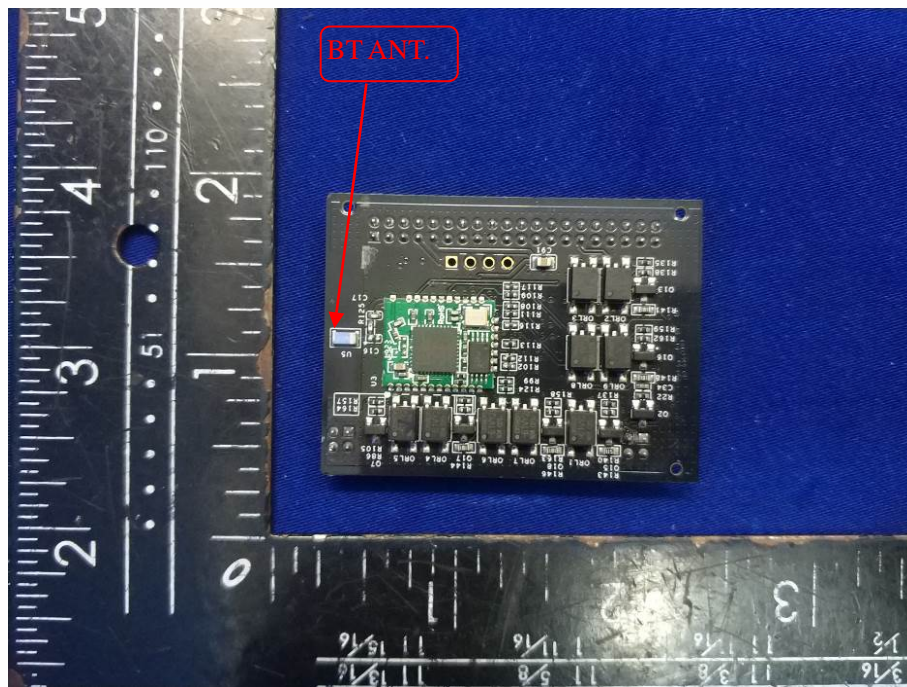


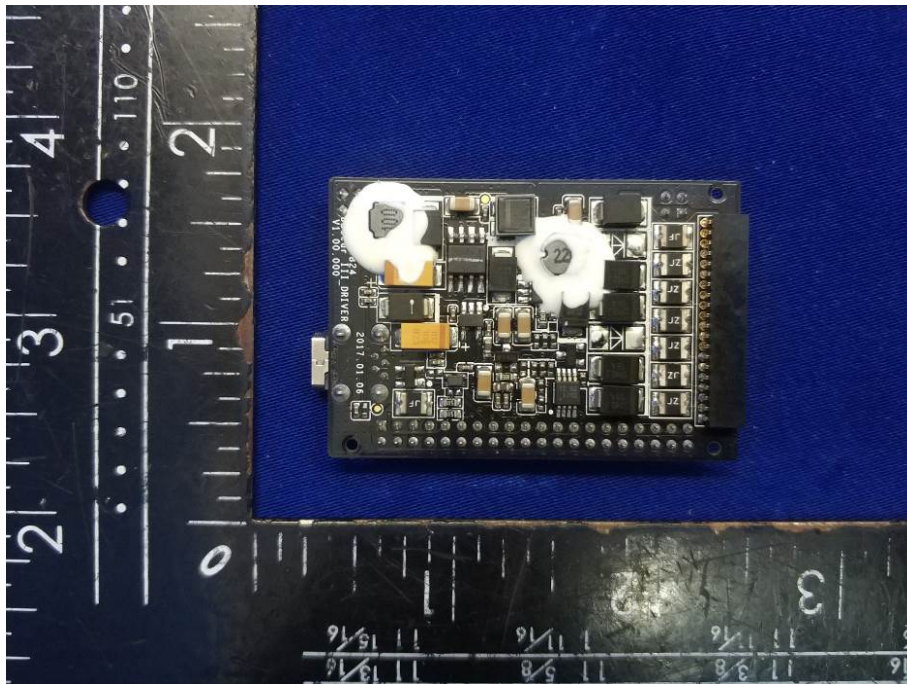












---The end---