FCC REPORT

Applicant:	Hall Logic
Address of Applicant:	3000 Sierra Vista Way, Provo, UT 84606 USA
Manufacturer/Factory:	Shenzhen Auto Creacle Technology Co., Ltd.
Address of Manufacturer/Factory:	Rm. 519, Block C, Mingyou Industrial Product Display Procurement Center, Baoyuan Road, Xixiang Street, Bao'an Dist.Shenzhen, China

Equipment Under Test (EUT)

Product Name:	Car diagnostic tool
Model No.:	HG1-OBD
Trade Mark:	HaulGauge
FCC ID:	2AR48-HG1-OBD
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.249
Date of sample receipt:	December 10, 2018
Date of Test:	December 10-December 17, 2018
Date of report issued:	December 17, 2018
Test Result :	PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Robinson Lo
Laboratory Manager

This 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.

2 Version

Version No.	Date	Description
00	*December 17, 2018*	*Original*

Prepared By: ***Date:*** *December 17, 2018*

Project Engineer

Check By: ***Date:*** *December 17, 2018*

Reviewer

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
AC Power Line Conducted Emission	15.207	Pass
Field strength of the fundamental signal	15.249 (a)	Pass
Spurious emissions	15.249 (a) (d)/15.209	Pass
Band edge	15.249 (d)/15.205	Pass
20dB Occupied Bandwidth	15.215 (c)	Pass

Pass: The EUT complies with the essential requirements in the standard.

Remark：Test according to ANSI C63.4:2014 and ANSI C63.10:2013.

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz ~ 30MHz	± 4.34dB	(1)
Radiated Emission	30MHz ~ 1000MHz	± 4.24dB	(1)
Radiated Emission	1GHz ~ 26.5GHz	± 4.68dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	± 3.45dB	(1)
Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.			

5 General Information

5.1 General Description of EUT

Product Name:	Car diagnostic tool
Model No.:	HG1-OBD
Serial No.:	DCH5025
Test sample(s) ID:	GTS20181200021
Sample(s) Status	Engineered sample
Hardware Version:	HV1.0
Software Version:	SV1.0
Operation Frequency:	2402MHz~2480MHz
Channel numbers:	40
Channel separation:	2MHz
Modulation type:	GFSK
Antenna Type:	PCB antenna
Antenna gain:	0dBi(declare by applicant)
Power supply:	DC 9-16V
Test Voltage：	DC 12V

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402MHz	11	2422MHz	21	2442MHz	31	2462MHz
2	2404MHz	12	2424MHz	22	2444MHz	32	2464MHz
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
9	2418MHz	19	2438MHz	29	2458MHz	39	2478MHz
10	2420MHz	20	2440MHz	30	2460MHz	40	2480MHz

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The lowest channel	2402MHz
The middle channel	2440MHz
The Highest channel	2480MHz

5.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode.
Remark: During the test, the dutycycle >98%, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.	

Pre-test mode.

We have verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:

Axis	X	Y	Z
Field Strength(dBuV/m)	95.11	96.96	96.42

Final Test Mode:

According to ANSI C63.4 standards, the test results are both the "worst case" and "worst setup":

Y axis (see the test setup photo)

5.3 Description of Support Units

None.

5.4 Test Facility

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

● **FCC —Registration No.: 381383**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 381383, January 08, 2018.

● **Industry Canada (IC) —Registration No.: 9079A-2**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, August 15, 2016

5.5 Test Location

All tests were performed at:

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

Tel: 0755-27798480

Fax: 0755-27798960

5.6 Additional instructions

Software (Used for test) from client

Mode	Special test SW was built-in by manufacturer.
Power set	Default

6 Test Instruments list

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	9.2(L)*6.2(W)* 6.4(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 2018	June 27 2019
4	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June 28 2018	June 27 2019
5	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June 28 2018	June 27 2019
6	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June 28 2018	June 27 2019
7	Horn Antenna	ETS-LINDGREN	3160	GTS217	June 28 2018	June 27 2019
8	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
9	Coaxial Cable	GTS	N/A	GTS213	June 28 2018	June 27 2019
10	Coaxial Cable	GTS	N/A	GTS211	June 28 2018	June 27 2019
11	Coaxial cable	GTS	N/A	GTS210	June 28 2018	June 27 2019
12	Coaxial Cable	GTS	N/A	GTS212	June 28 2018	June 27 2019
13	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June 28 2018	June 27 2019
14	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	June 28 2018	June 27 2019
15	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 28 2018	June 27 2019
16	Band filter	Amindeon	82346	GTS219	June 28 2018	June 27 2019
17	Power Meter	Anritsu	ML2495A	GTS540	June 28 2018	June 27 2019
18	Power Sensor	Anritsu	MA2411B	GTS541	June 28 2018	June 27 2019
19	Loop Antenna	Zhinan	ZN30900A	GTS215	June 28 2018	June 27 2019

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 2018	June 27 2019
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June 28 2018	June 27 2019
4	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June 28 2018	June 27 2019
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 2018	June 27 2019

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 2018	June 27 2019

7 Test results and Measurement Data

7.1 Antenna requirement

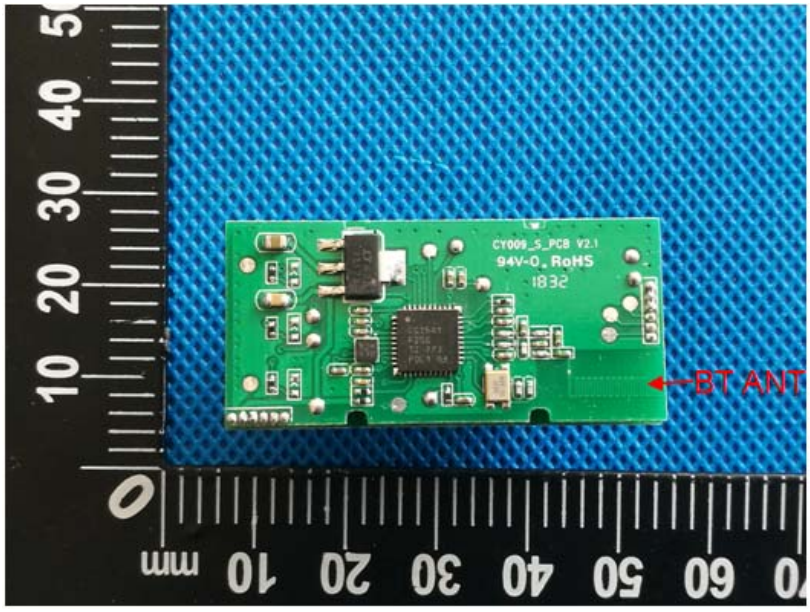
Standard requirement:	FCC Part15 C Section 15.203

15.203 requirement:

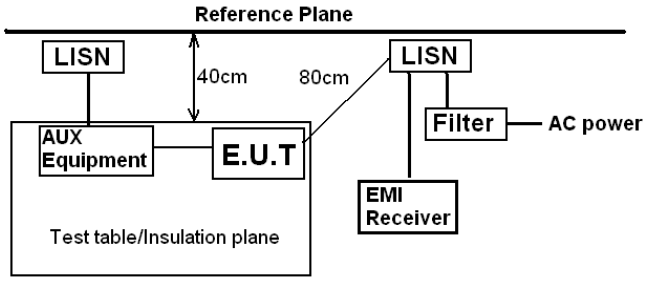
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is PCB antenna, the best case gain of the antenna is 0dBi.



7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207
Test Method:	ANSI C63.10:2013
Test Frequency Range:	150KHz to 30MHz
Class / Severity:	Class B
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto
Limit:	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 * Decreases with the logarithm of the frequency.
Test setup:	 *Remark:* *E.U.T: Equipment Under Test* *LISN: Line Impedence Stabilization Network* *Test table height=0.8m*
Test procedure:	1. The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 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). 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.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	N/A, Because the EUT employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Measurements to demonstrate compliance with the conducted limits are not required for devices.

7.3 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209
Test Method:	ANSI C63.10:2013
Test Frequency Range:	9kHz to 25GHz
Test site:	Measurement Distance: 3m

Receiver setup:

Frequency	Detector	RBW	VBW	Remark
9kHz-150kHz	Quasi-peak	200Hz	300Hz	Quasi-peak Value
150kHz-30MHz	Quasi-peak	9kHz	10kHz	Quasi-peak Value
30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value
Above 1GHz	Peak	1MHz	3MHz	Peak Value
	Peak	1MHz	10Hz	Average Value

Limit:
(Field strength of the fundamental signal)

Frequency	Limit (dBuV/m @3m)	Remark
2400MHz-2483.5MHz	94.00	Average Value
	114.00	Peak Value

Limit:
(Spurious Emissions)

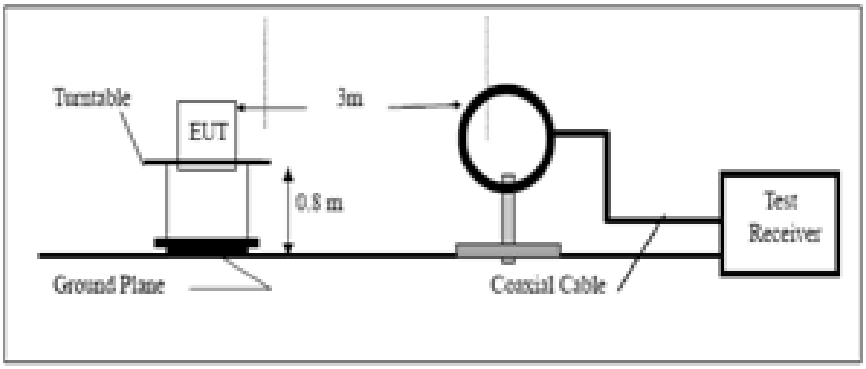
Frequency	Limit (uV/m)	Remark
0.009MHz-0.490MHz	2400/F(kHz) @300m	Quasi-peak Value
0.490MHz-1.705MHz	24000/F(kHz) @30m	Quasi-peak Value
1.705MHz-30.0MHz	30 @30m	Quasi-peak Value
30MHz-88MHz	100 @3m	Quasi-peak Value
88MHz-216MHz	150 @3m	Quasi-peak Value
216MHz-960MHz	200 @3m	Quasi-peak Value
960MHz-1GHz	500 @3m	Quasi-peak Value
Above 1GHz	500 @3m	Average Value
	5000 @3m	Peak Value

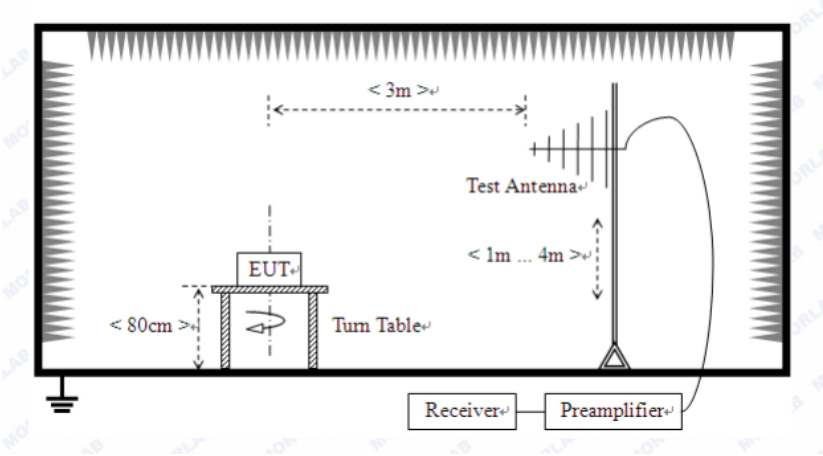
Limit:
(band edge)

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

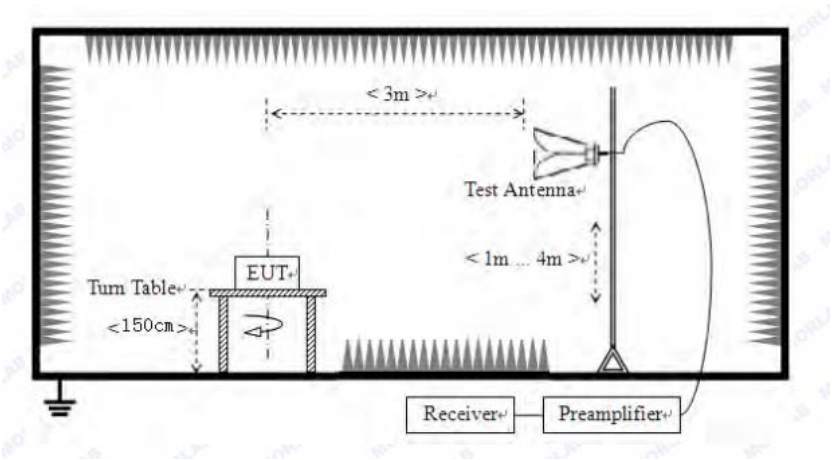
Test setup:

Below 1GHz





Above 1GHz



Test Procedure:

1. The EUT was placed on the top of a rotating table (0.8m for below 1G and 1.5m for above 1G) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement data:

7.3.1 Field Strength of The Fundamental Signal

GFSK

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2402.00	94.15	27.58	5.39	30.18	96.94	114.00	-17.06	Vertical
2402.00	93.48	27.58	5.39	30.18	96.27	114.00	-17.73	Horizontal
2440.00	92.27	27.55	5.43	30.06	95.19	114.00	-18.81	Vertical
2440.00	86.39	27.55	5.43	30.06	89.31	114.00	-24.69	Horizontal
2480.00	93.40	27.52	5.47	29.93	96.46	114.00	-17.54	Vertical
2480.00	90.22	27.52	5.47	29.93	93.28	114.00	-20.72	Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2402.00	83.06	27.58	5.39	30.18	85.85	94.00	-8.15	Vertical
2402.00	81.29	27.58	5.39	30.18	84.08	94.00	-9.92	Horizontal
2440.00	80.15	27.55	5.43	30.06	83.07	94.00	-10.93	Vertical
2440.00	76.29	27.55	5.43	30.06	79.21	94.00	-14.79	Horizontal
2480.00	83.72	27.52	5.47	29.93	86.78	94.00	-7.22	Vertical
2480.00	80.61	27.52	5.47	29.93	83.67	94.00	-10.33	Horizontal

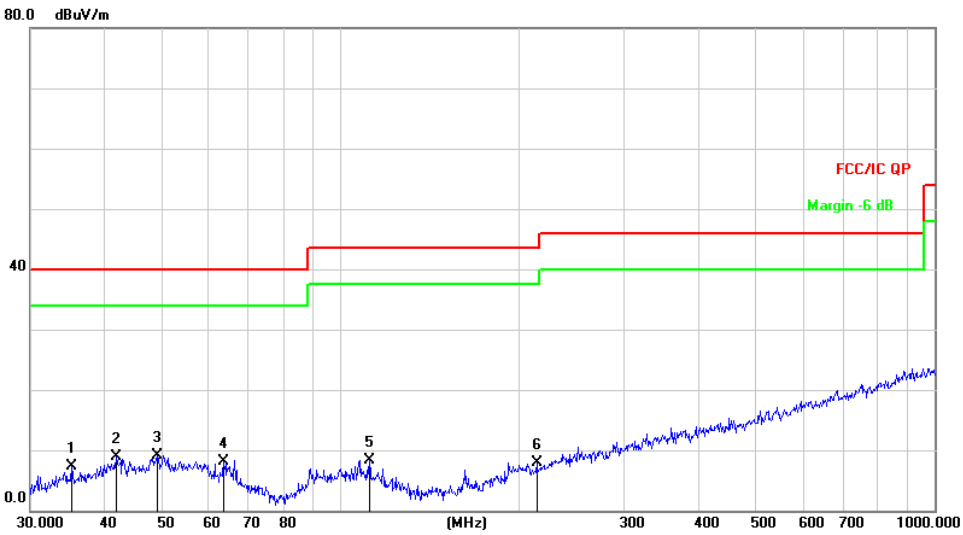
7.3.2 Spurious emissions

■ Below 30MHz

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o), the test result no need to reported.

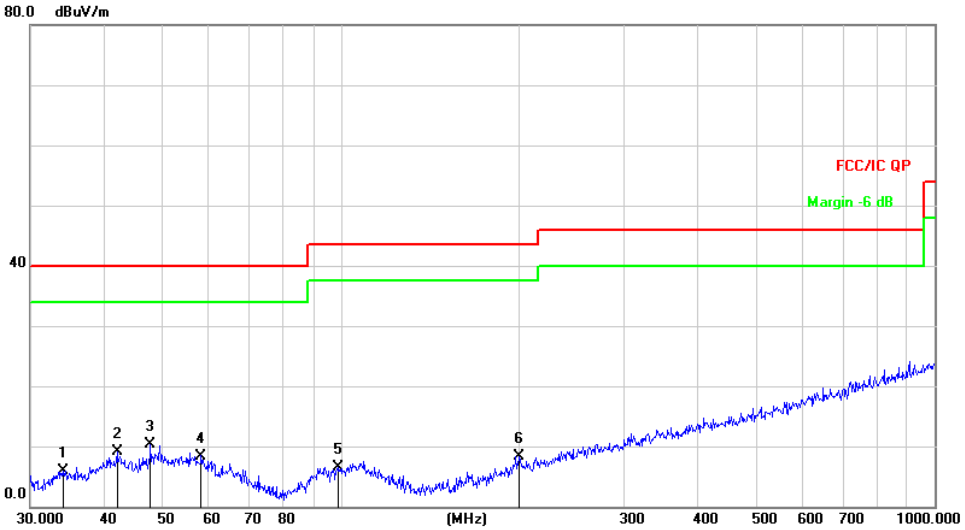
■ Below 1GHz

EUT：	Car diagnostic tool	Model Name. ：	HG1-OBD
Temperature：	24 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Polarization：	Horizontal
Test Voltage ：	DC 12V	Test Mode：	Worst mode-GFSK



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		35.2512	24.64	-17.36	7.28	40.00	-32.72	QP
2		41.8596	24.03	-15.14	8.89	40.00	-31.11	QP
3	*	49.0145	23.80	-14.65	9.15	40.00	-30.85	QP
4		63.5356	24.69	-16.59	8.10	40.00	-31.90	QP
5		111.7380	25.02	-16.73	8.29	43.50	-35.21	QP
6		213.7634	23.61	-15.73	7.88	43.50	-35.62	QP

EUT：	Car diagnostic tool	Model Name. ：	HG1-OBD
Temperature：	24 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Polarization：	Vertical
Test Voltage ：	DC 12V	Test Mode：	Worst mode-GFSK



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		34.0365	23.54	-17.69	5.85	40.00	-34.15	QP
2		42.0066	24.11	-15.09	9.02	40.00	-30.98	QP
3	*	47.8260	25.00	-14.73	10.27	40.00	-29.73	QP
4		58.2030	24.39	-15.99	8.40	40.00	-31.60	QP
5		99.1797	23.25	-16.72	6.53	43.50	-36.97	QP
6		199.9856	24.01	-15.63	8.38	43.50	-35.12	QP

■ Above 1GHz

Test channel:	Lowest channel

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4804.00	40.93	31.78	8.60	32.09	49.22	74.00	-24.78	Vertical
7206.00	32.97	36.15	11.65	32.00	48.77	74.00	-25.23	Vertical
9608.00	31.62	37.95	14.14	31.62	52.09	74.00	-21.91	Vertical
12010.00	*					74.00		Vertical
14412.00	*					74.00		Vertical
4804.00	45.46	31.78	8.60	32.09	53.75	74.00	-20.25	Horizontal
7206.00	38.67	36.15	11.65	32.00	54.47	74.00	-19.53	Horizontal
9608.00	35.08	37.95	14.14	31.62	55.55	74.00	-18.45	Horizontal
12010.00	*					74.00		Horizontal
14412.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4804.00	29.84	31.78	8.60	32.09	38.13	54.00	-15.87	Vertical
7206.00	24.25	36.15	11.65	32.00	40.05	54.00	-13.95	Vertical
9608.00	24.36	37.95	14.14	31.62	44.83	54.00	-9.17	Vertical
12010.00	*					54.00		Vertical
14412.00	*					54.00		Vertical
4804.00	32.23	31.78	8.60	32.09	40.52	54.00	-13.48	Horizontal
7206.00	23.90	36.15	11.65	32.00	39.70	54.00	-14.30	Horizontal
9608.00	23.71	37.95	14.14	31.62	44.18	54.00	-9.82	Horizontal
12010.00	*					54.00		Horizontal
14412.00	*					54.00		Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *"*", means this data is the too weak instrument of signal is unable to test.*

Test channel:	Middle channel

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4880.00	39.03	31.85	8.67	32.12	47.43	74.00	-26.57	Vertical
7320.00	31.97	36.37	11.72	31.89	48.17	74.00	-25.83	Vertical
9760.00	30.62	38.35	14.25	31.62	51.60	74.00	-22.40	Vertical
12200.00	*					74.00		Vertical
14640.00	*					74.00		Vertical
4880.00	41.70	31.85	8.67	32.12	50.10	74.00	-23.90	Horizontal
7320.00	32.24	36.37	11.72	31.89	48.44	74.00	-25.56	Horizontal
9760.00	30.82	38.35	14.25	31.62	51.80	74.00	-22.20	Horizontal
12200.00	*					74.00		Horizontal
14640.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4880.00	27.66	31.85	8.67	32.12	36.06	54.00	-17.94	Vertical
7320.00	23.40	36.37	11.72	31.89	39.60	54.00	-14.40	Vertical
9760.00	20.78	38.35	14.25	31.62	41.76	54.00	-12.24	Vertical
12200.00	*					54.00		Vertical
14640.00	*					54.00		Vertical
4880.00	35.32	31.85	8.67	32.12	43.72	54.00	-10.28	Horizontal
7320.00	26.10	36.37	11.72	31.89	42.30	54.00	-11.70	Horizontal
9760.00	24.31	38.35	14.25	31.62	45.29	54.00	-8.71	Horizontal
12200.00	*					54.00		Horizontal
14640.00	*					54.00		Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *"*", means this data is the too weak instrument of signal is unable to test.*

Test channel:	Highest channel

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4960.00	38.25	31.93	8.73	32.16	46.75	74.00	-27.25	Vertical
7440.00	33.91	36.59	11.79	31.78	50.51	74.00	-23.49	Vertical
9920.00	30.94	38.81	14.38	31.88	52.25	74.00	-21.75	Vertical
12400.00	*					74.00		Vertical
14880.00	*					74.00		Vertical
4960.00	41.79	31.93	8.73	32.16	50.29	74.00	-23.71	Horizontal
7440.00	33.41	36.59	11.79	31.78	50.01	74.00	-23.99	Horizontal
9920.00	33.03	38.81	14.38	31.88	54.34	74.00	-19.66	Horizontal
12400.00	*					74.00		Horizontal
14880.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4960.00	29.28	31.93	8.73	32.16	37.78	54.00	-16.22	Vertical
7440.00	25.15	36.59	11.79	31.78	41.75	54.00	-12.25	Vertical
9920.00	22.52	38.81	14.38	31.88	43.83	54.00	-10.17	Vertical
12400.00	*					54.00		Vertical
14880.00	*					54.00		Vertical
4960.00	32.62	31.93	8.73	32.16	41.12	54.00	-12.88	Horizontal
7440.00	25.13	36.59	11.79	31.78	41.73	54.00	-12.27	Horizontal
9920.00	24.47	38.81	14.38	31.88	45.78	54.00	-8.22	Horizontal
12400.00	*					54.00		Horizontal
14880.00	*					54.00		Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *"*", means this data is the too weak instrument of signal is unable to test.*

7.3.3 Bandedge emissions

Test channel:	Lowest channel

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	42.48	27.59	5.38	30.18	45.27	74.00	-28.73	Horizontal
2400.00	54.29	27.58	5.39	30.18	57.08	74.00	-16.92	Horizontal
2390.00	44.52	27.59	5.38	30.18	47.31	74.00	-26.69	Vertical
2400.00	43.60	27.58	5.39	30.18	46.39	74.00	-27.61	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	32.19	27.59	5.38	30.18	34.98	54.00	-19.02	Horizontal
2400.00	32.50	27.58	5.39	30.18	35.29	54.00	-18.71	Horizontal
2390.00	32.68	27.59	5.38	30.18	35.47	54.00	-18.53	Vertical
2400.00	35.36	27.58	5.39	30.18	38.15	54.00	-15.85	Vertical

Test channel:	Highest channel

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	45.00	27.53	5.47	29.93	48.07	74.00	-25.93	Horizontal
2500.00	43.05	27.55	5.49	29.93	46.16	74.00	-27.84	Horizontal
2483.50	44.37	27.53	5.47	29.93	47.44	74.00	-26.56	Vertical
2500.00	45.74	27.55	5.49	29.93	48.85	74.00	-25.15	Vertical

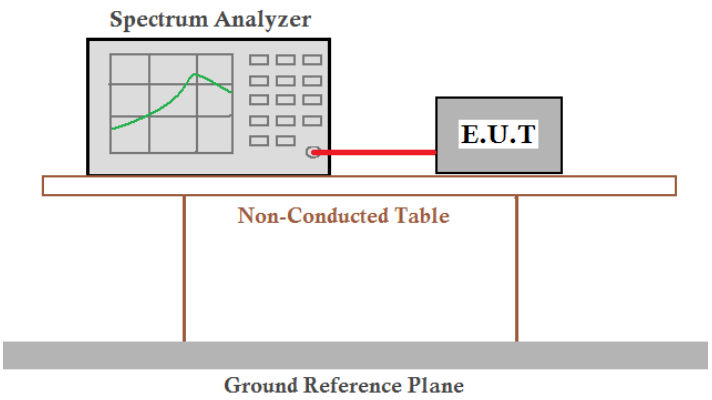
Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	33.64	27.53	5.47	29.93	36.71	54.00	-17.29	Horizontal
2500.00	34.92	27.55	5.49	29.93	38.03	54.00	-15.97	Horizontal
2483.50	34.08	27.53	5.47	29.93	37.15	54.00	-16.85	Vertical
2500.00	34.71	27.55	5.49	29.93	37.82	54.00	-16.18	Vertical

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*

7.4 20dB Occupy Bandwidth

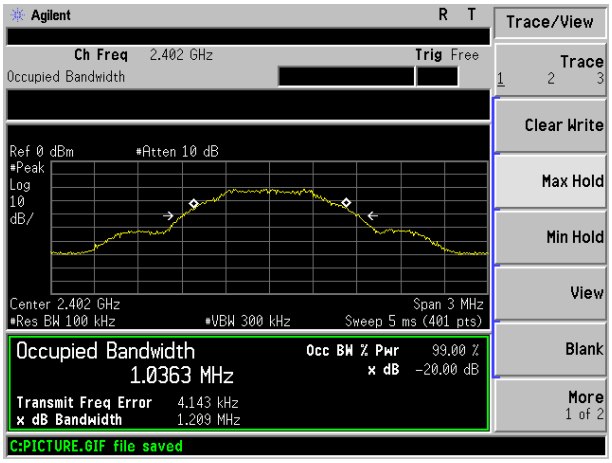
Test Requirement:	FCC Part15 C Section 15.249/15.215
Test Method:	ANSI C63.10:2013
Limit:	Operation Frequency range 2400MHz~2483.5MHz
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

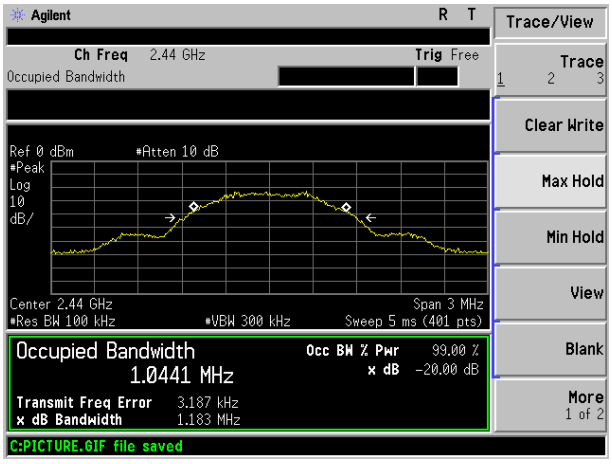
EUT：	Car diagnostic tool	Model Name. ：	HG1-OBD
Temperature：	26 ℃	Relative Humidity：	54%
Test Voltage ：	DC 12V	Pressure：	1010hPa
Test Mode：	Transmitting mode		

Test channel	20dB bandwidth(MHz)	Result
Lowest	1.209	Pass
Middle	1.183	Pass
Highest	1.21	Pass

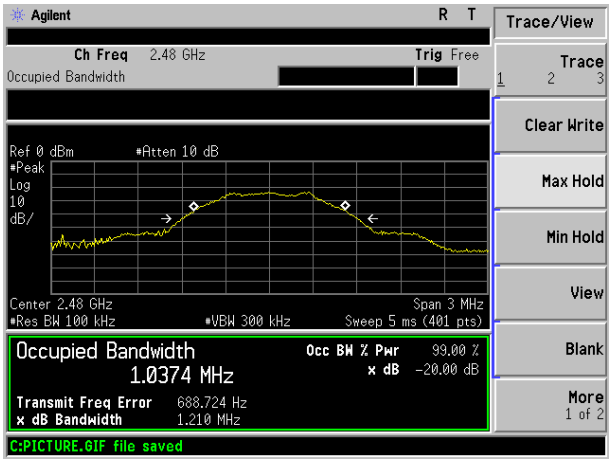
Test plot as follows:



Lowest channel



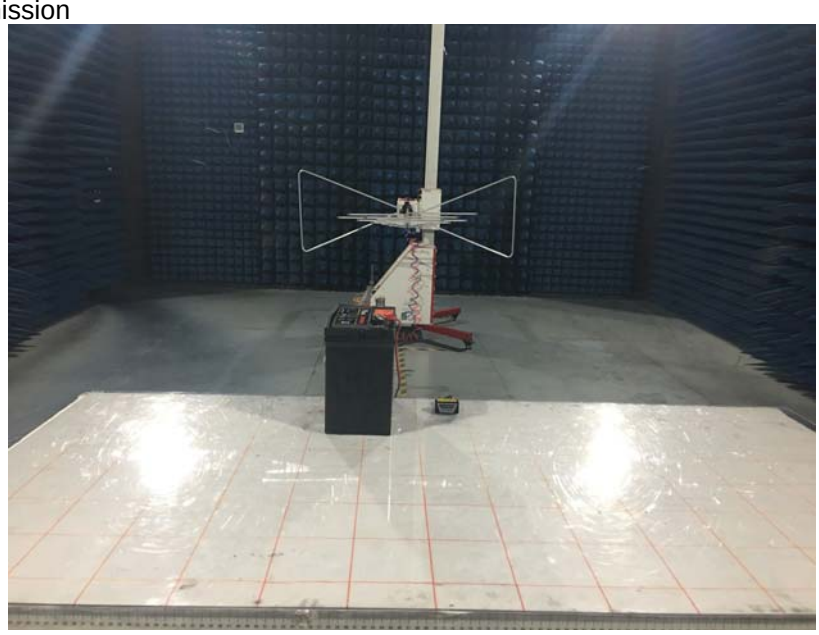
Middle channel

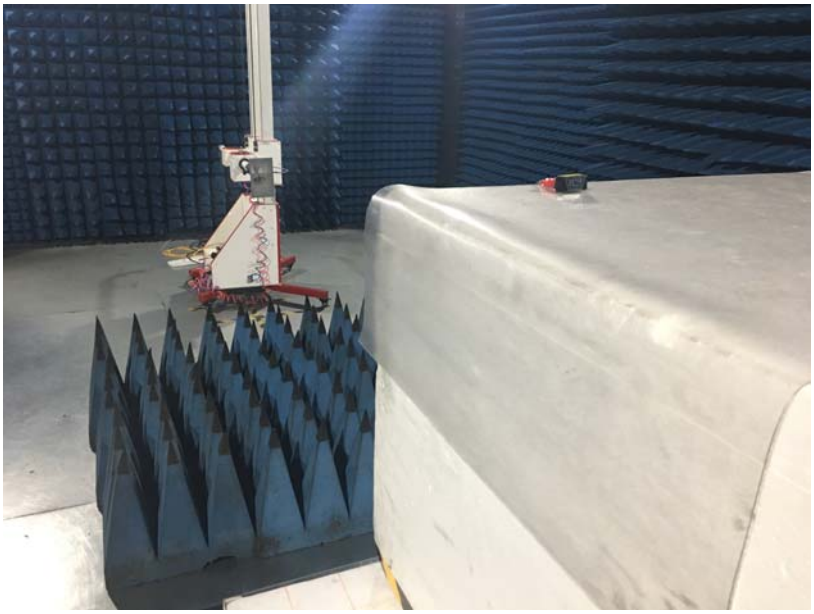


Highest channel

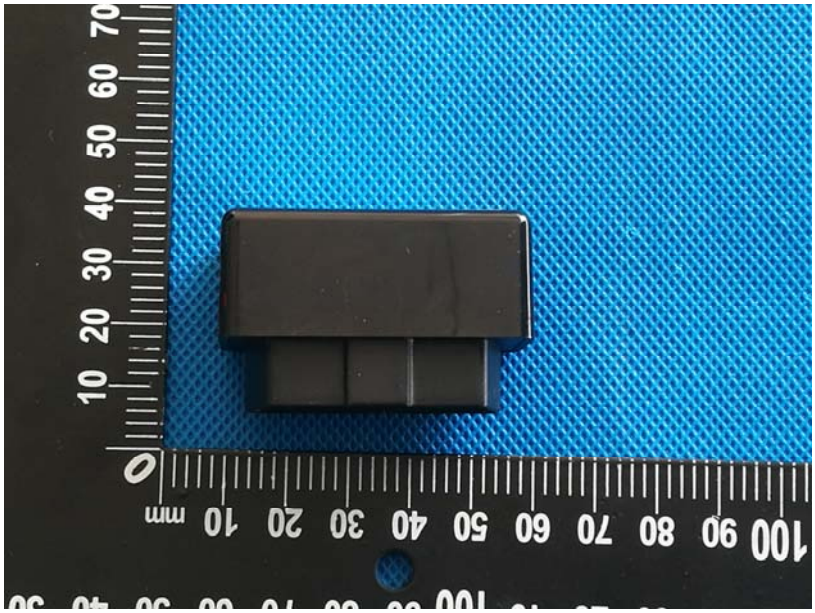
8 Test Setup Photo

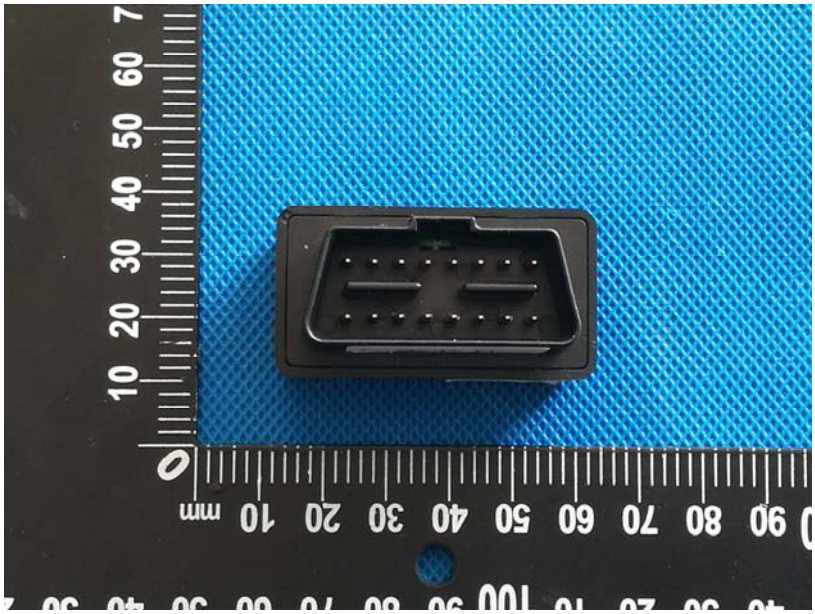
Radiated Emission

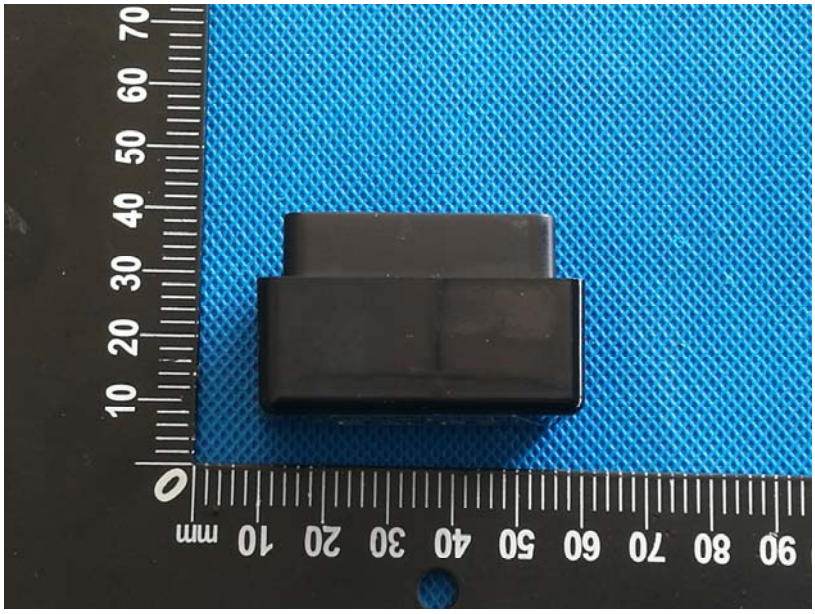


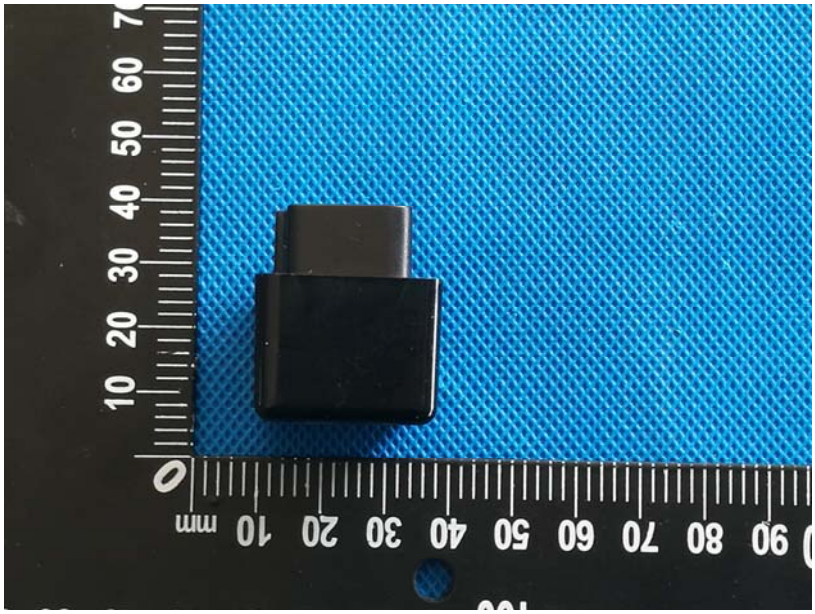


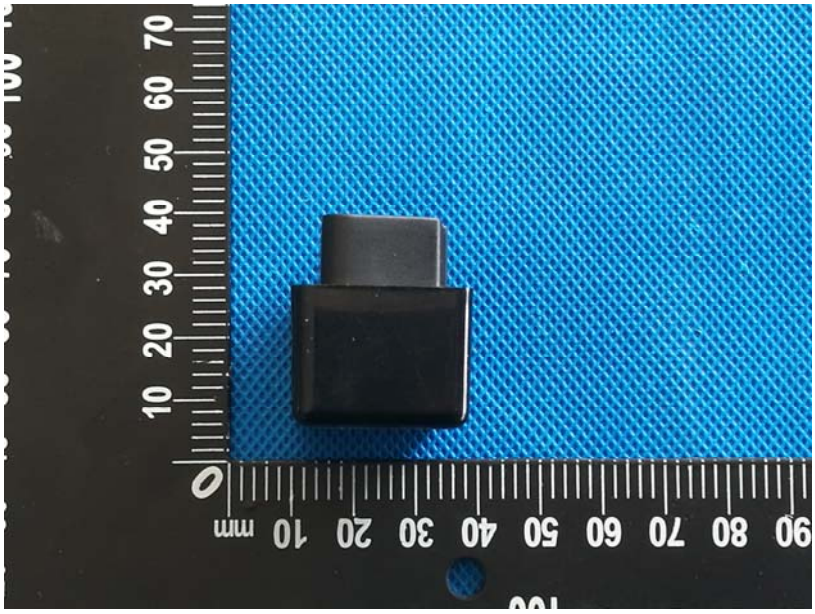
9 EUT Constructional Details

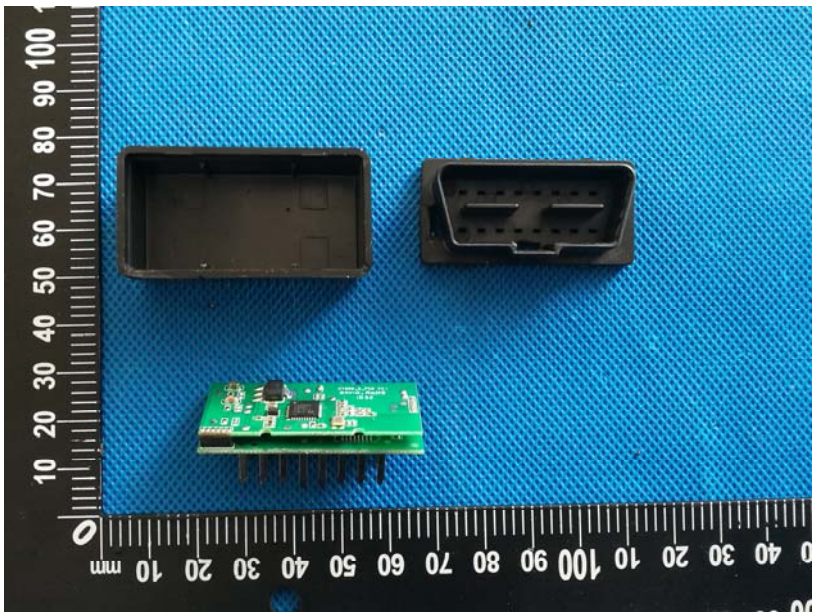


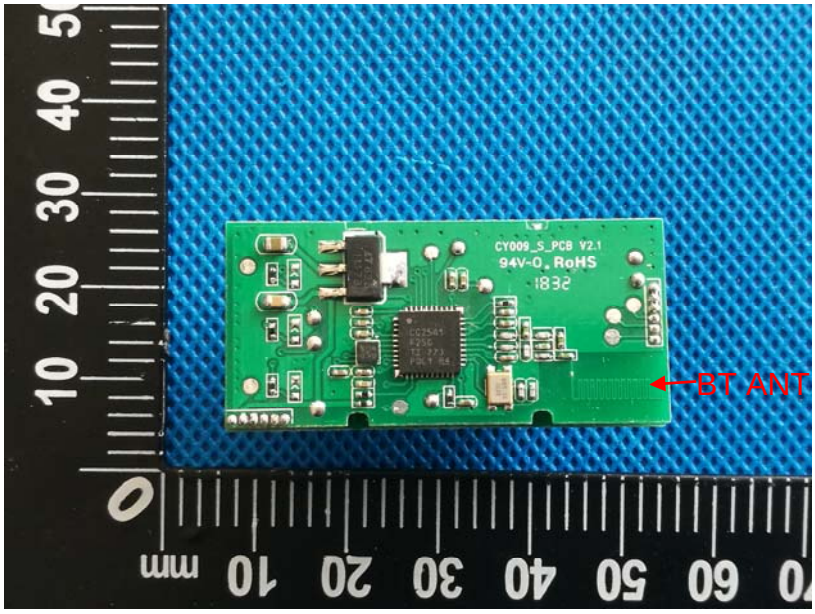








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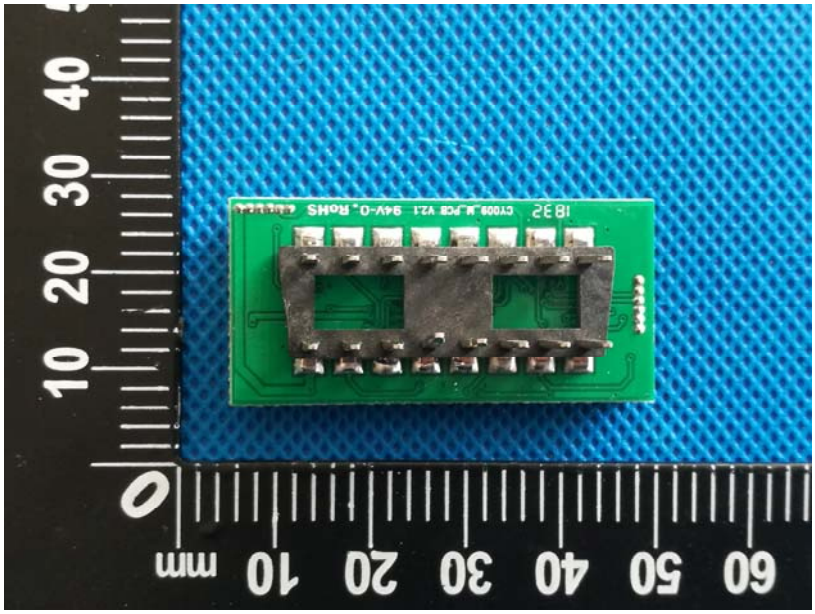
94V-0, RoHS
1832
BT ANT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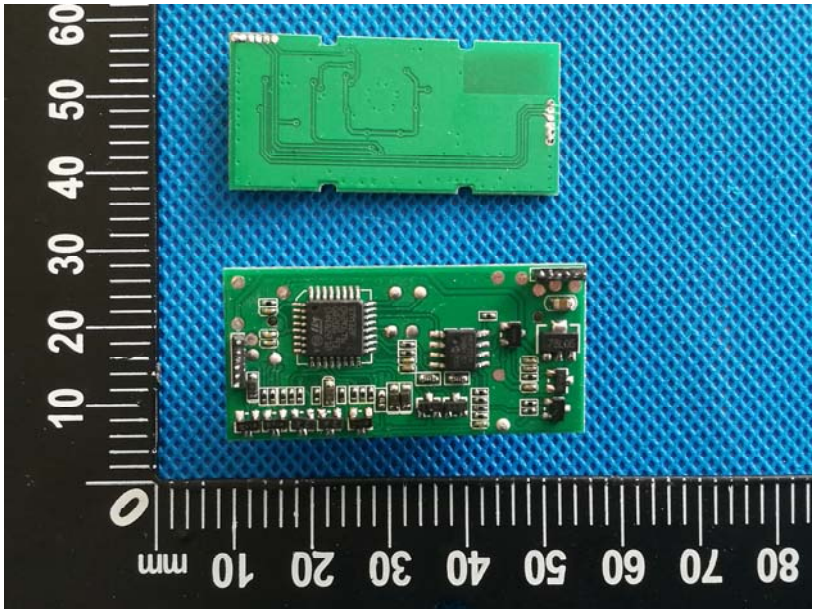
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------End------