



EMC Test Report

Product Name: OBD BOX

Model Number: DA3100

Report No: SYBH(Z-EMC) 088072013-2

FCC ID: QISDA3100

Reliability Laboratory of Huawei Technologies Co., Ltd.

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Notice

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2. The laboratory has passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 2174.01.
3. The laboratory has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements. The site recognition number is 97456.
4. The laboratory has been listed by industry Canada to perform electromagnetic emission measurement. The site recognition number is 6369A-2.
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Applicant: Huawei Technologies Co., Ltd.
Address: Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C
Date of Receipt Test Item: July.22, 2013
Start Date of Test: July.29, 2013
End Date of Test: Aug.01, 2013
Test Result: Pass

Approved By (Lab Manager)	2013-08-07	Liu Chunlin	
	Date	Name	Signature

Operator (Test Engineer)	2013-08-07	Zheng Ke	
	Date	Name	Signature



Modification Record

No.	Last Report No.	Modification Description
1	NA	First report



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1 General Information

1.1 EUT Description

EUT Description	
Product Name	OBD BOX
Model Number	DA3100
Input voltage	DC 12V
TX Frequency	GSM 850:824 MHz To 849 MHz GSM1900:1850MHz To 1910MHz WCDMA BAND II:1850 MHz To 1910 MHz WCDMA BAND V: 824 MHz To 849 MHz Bluetooth: 2400MHz to 2483.5MHz
RX Frequency	GSM850:869MHz To 894MHz GSM1900:1930MHz To 1990MHz WCDMA BAND II:1930 MHz To 1990 MHz WCDMA BAND V: 869MHz To 894MHz GPS: 1575.42MHz; Bluetooth: 2400MHz to 2483.5MHz
S/N	S9Y01B9371500012
HW Version	CD0DA31M
SW Version	11.815.00.74.00

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.



1.2 Test Site Information

Site 1:	RELIABILITY LABORATORY OF HUAWEI TECHNOLOGIES CO., LTD.
Test Site Location:	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

1.3 Applied Standards

APPLIED STANDARD

47 CFR FCC Part 15:2012, Subpart B



2 Summary of Results

Summary of Results				
Test Items	Test Mode	Performance Class & Required Performance Criteria	Result	Site
<u>Radiated Emissions</u> Enclosure Port	Mode 1	CLASS B	Pass	Site1
Note: 1, Measurement taken is within the measurement uncertainty of measurement system. 2, ☒ The item has been tested; ☐ The item has not been tested.				

During the measurement, the environmental conditions complied with the range listed as below.

Item	Required
Ambient temperature	15°C ~ 35°C
Relative humidity	25% ~ 75%
Atmospheric pressure	86kPa ~ 106kPa

3 System Configuration during EMC Test

3.1 Test Mode

Huawei has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was in this test report and defined as below:

Test Mode	
Mode 1:	Idle

Traffic Mode:

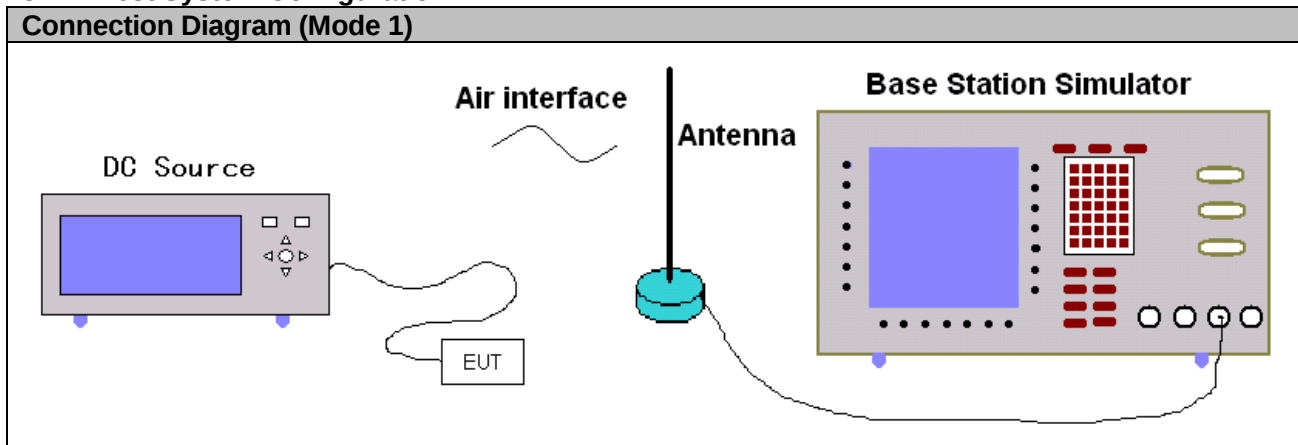
State of EUT when switched on and with Radio Resource Control (RRC) connection established

Idle Mode:

State of EUT when switched on but with no Radio Resource Control (RRC) connection

3.2 Test System Configuration

Connection Diagram (Mode 1)





3.3 Cables Used during Test

Cable	Quantity	Length	Type of Cable
USB	1	<3m	Shielded

3.4 Associated Equipment Used during Test

Name	Model	Manufacturer	S/N	Calibrated Deadline	Cal interval (month)
Radio Communication Tester	CMU200	R&S	117057	2013-09-22	12
DC Source	2303	KEITHLEY	1288003	2014-11-18	24

4 Electromagnetic Interference (EMI)

4.1 Radiated Disturbance 30MHz to 18GHz

4.1.1 Test Procedure

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.4-2009. The test distance was 3m. The set-up and test methods were according to ANSI C63.4-2009.

A preliminary scan and a final scan of the emissions were made from 30 MHz to 18 GHz by using test script of software; The emissions were measured using Quasi-Peak Detector (30MHz~1GHz) and AV/PK detector (above 1GHz). The maximal emission value was acquired by adjusting the antenna height, polarisation and turntable azimuth in accordance with the software setup. Normally, the height range of antenna was 1m to 4m. The azimuth range of turntable was 0° to 360°. The receiving antenna has two polarizations V and H.

Measurement bandwidth (RBW) for 30MHz to 1000 MHz: 120 kHz;

Measurement bandwidth (RBW) for 1000MHz to 18000 MHz: 1MHz;

EUT was configured in idle mode and the test performed at worst emission state.

4.1.2 Test setup

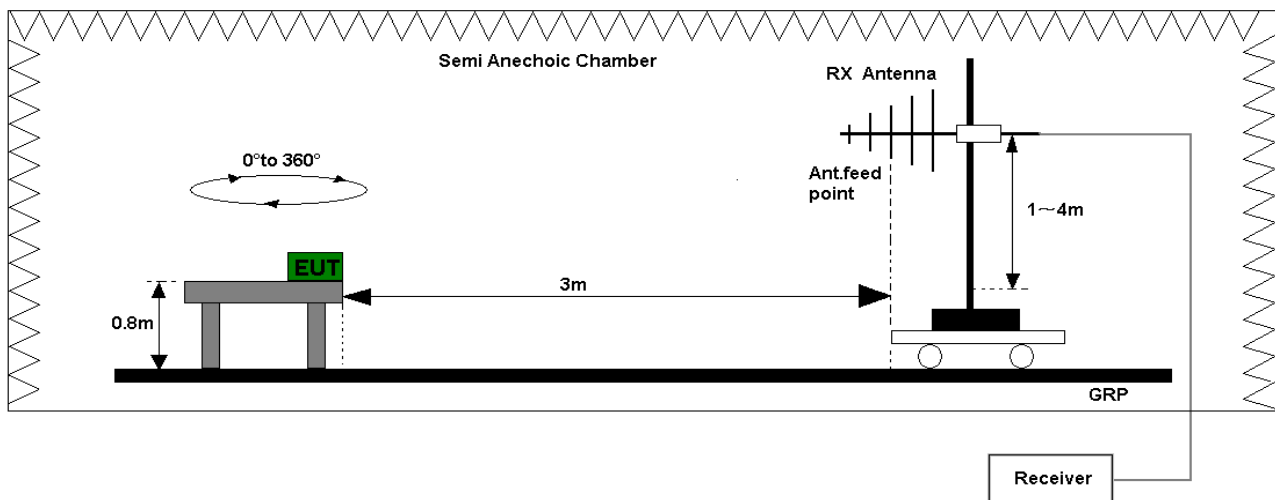


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

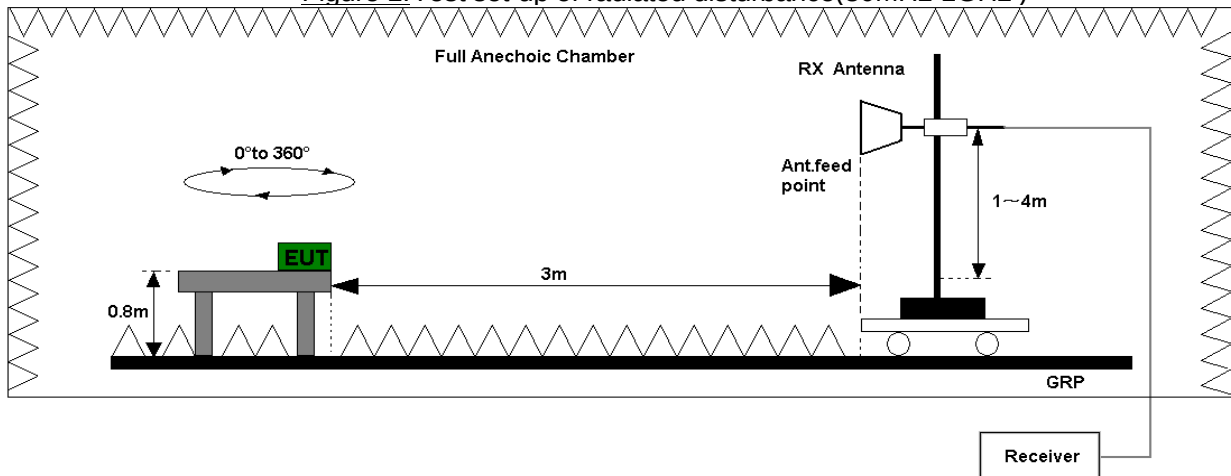


Figure 2. Test set-up of radiated disturbance(above 1GHz)



4.1.3 Test Results

The EUT has met the requirements for Radiated Emission of enclosure port.
The test data see section 7.1 of this report.

Test Limits				
Frequency of Emission (MHz)	Radiated Limit			
	Unit(μ V/m)		Unit(dB μ V/m)	
30-88	100		40	
88-216	150		43.5	
216-960	200		46	
Above 960	500		54	
Above 1000	AV	PK	AV	PK
	500	5000	54	74



5 Main Test Instruments

Main Test Equipments						
Test item	Test Instrument	Model	S/N	Manufacturer	Calibrated Deadline	Cal interval (month)
RE	EMI Test receiver	ESU26	100150	R&S	May.14, 2014	12
	Broadband Antenna	VULB 9163	9163-356	SCHWARZ BECK	May.27, 2014	24
	Horn Antenna	HF906	100683	R&S	Feb.01, 2015	24
Software Information						
Test Item	Software Name	Manufacturer		Version		
RE	ES-K1	R&S		1.7.1		

6 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty		
Items		Extended Uncertainty
RE(30MHz-1GHz)	Field strength (dB μ V/m)	U=4.1dB; k=2
RE(1GHz-18GHz)	Field strength (dB μ V/m)	U=5.1dB; k=2

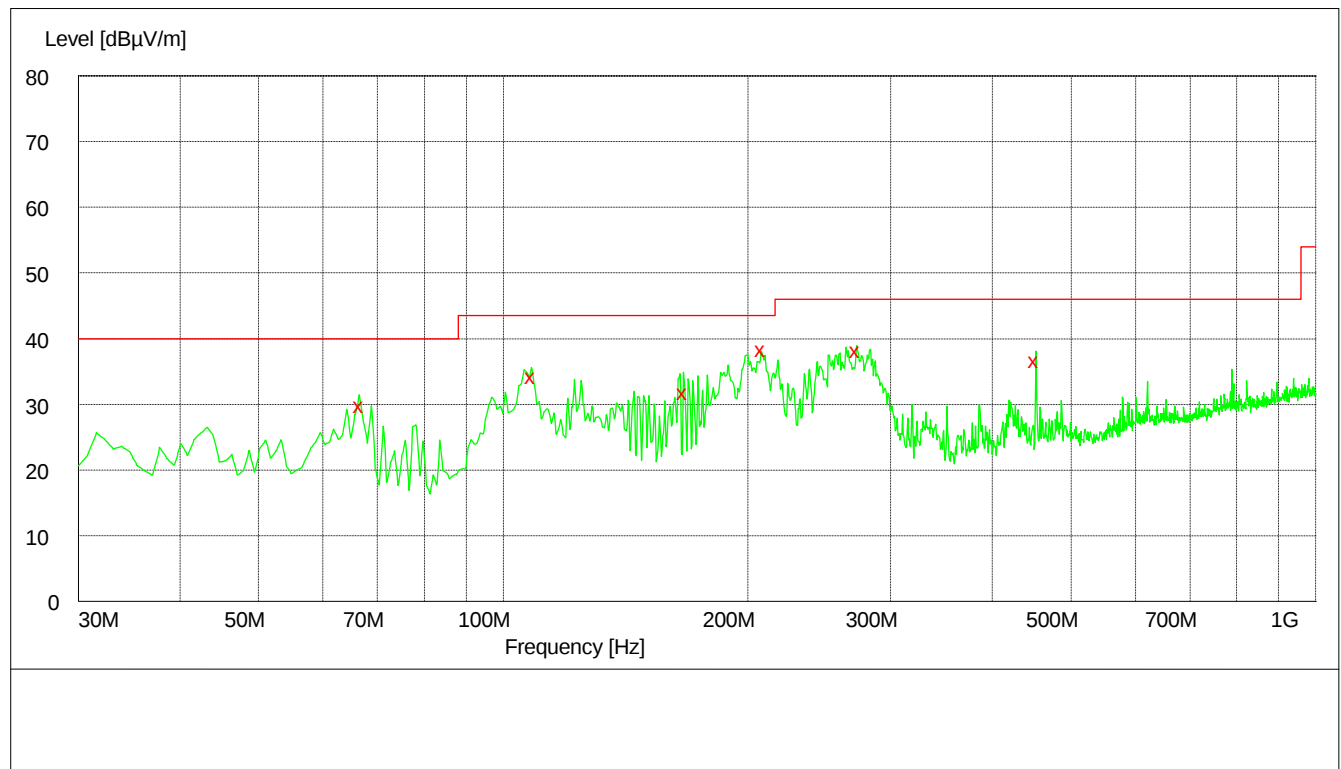


7 Test Data and Graph

Only the worst test result was shown in this report.

7.1 Radiated Disturbance

30MHz~1GHz



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBμV/m	Transducer dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
66.840000	30.10	9.7	40.0	9.9	112.0	218.00	VERTICAL
108.660000	34.40	12.4	43.5	9.1	100.0	241.00	VERTICAL
167.160000	32.00	10.0	43.5	11.5	100.0	190.00	VERTICAL
208.440000	38.60	12.5	43.5	4.9	147.0	106.00	HORIZONTAL
272.640000	38.50	14.8	46.0	7.5	100.0	187.00	HORIZONTAL
453.000000	36.90	19.1	46.0	9.1	100.0	121.00	HORIZONTAL

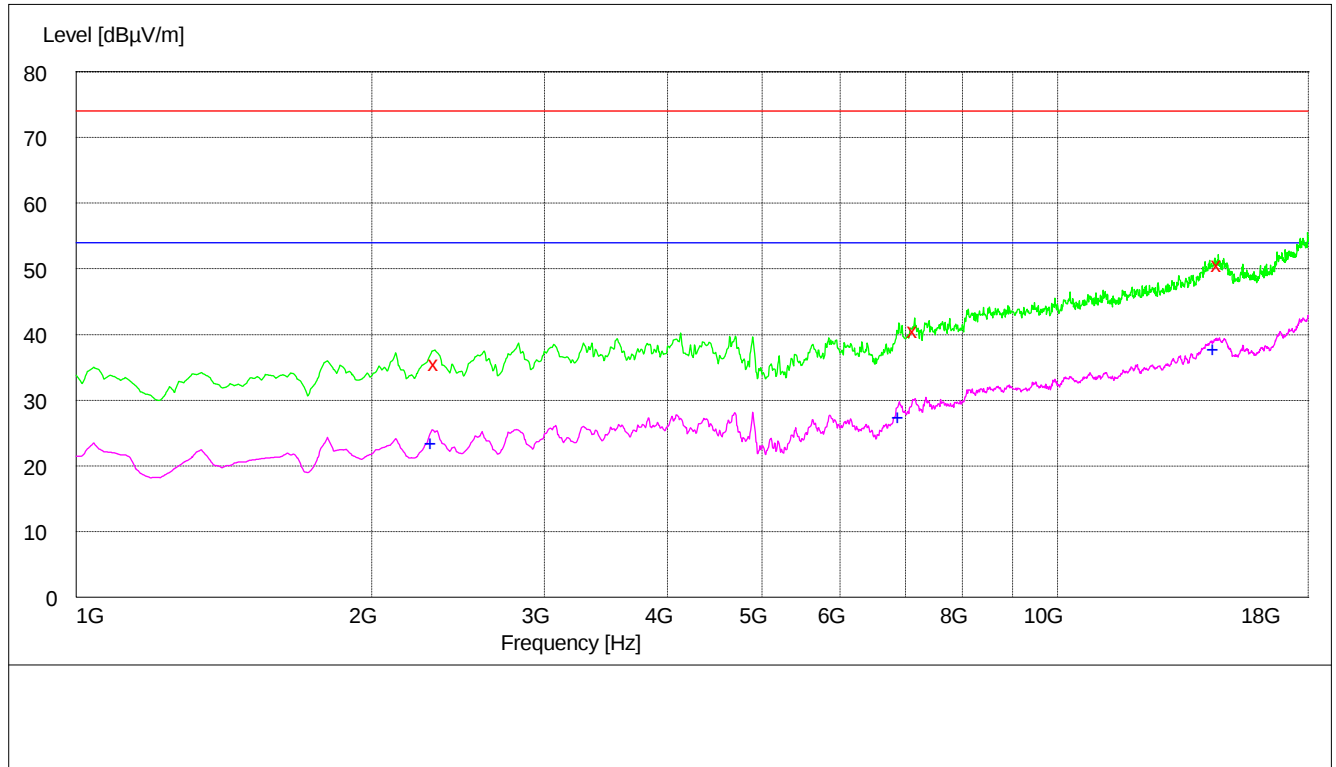
Note:

Level = Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)

The reading level is calculated by software which is not shown in the sheet.



1GHz~18GHz



MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBμV/m	Transducer dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
2324.700000	35.90	-9.5	74.0	38.1	135.0	234.00	VERTICAL
7148.700000	40.80	2.5	74.0	33.2	150.0	132.00	HORIZONTAL
14591.900000	50.90	16.5	74.0	23.1	127.0	10.00	HORIZONTAL

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBμV/m	Transducer dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
2304.600000	23.60	-9.6	54.0	30.4	101.0	289.00	HORIZONTAL
6902.900000	27.60	1.9	54.0	26.4	148.0	251.00	VERTICAL
14442.900000	37.90	16.6	54.0	16.1	100.0	136.00	VERTICAL

Note:

Level = Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)

The reading level is calculated by software which is not shown in the sheet.

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