EMC Test Report

Product Name: HSDPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth

Model Number: HUAWEI Discovery/D51/D51-5

Report No: SYBH(Z-EMC)028082011-2

FCC ID: QISD51-5

Reliability Laboratory of Huawei Technologies Co., Ltd.

Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R. China

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Notice

1. **The laboratory has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS), and accreditation number: L0310.**
2. **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.**
3. **The laboratory has been listed by industry Canada to perform electromagnetic emission measurement. The site recognition number is 6369A-2.**
4. **The test report is invalid if not marked with "exclusive stamp for the test report".**
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6. **The test report is invalid if there is any evidence of erasure and/or falsification.**
7. **If there is any dissidence for the test report, please file objection to the test centre within 15 days from the date of receiving the test report.**
8. **Normally, the test report is only responsible for the samples that have undergone the test.**
9. **Context of the test report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of the laboratory.**

Applicant:	Huawei Technologies Co., Ltd.
Address:	Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R. China
Date of Receipt Test Item:	Aug.07, 2011
Start Date of Test:	Aug.08, 2011
End Date of Test:	Aug.18, 2011
Test Result:	Pass

	Date	Name	Signature
Approved By	2010-08-19	Liuchunlin	
Reviewed By	2010-08-19	Dailinjun	
Operator	2010-08-19	Xuchang	

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1 General Information

1.1 EUT Description

EUT Description	
Product Name	HSDPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth
Model Number	HUAWEI Discovery/D51/D51-5
Serials Number	L2P2B11162200168
Working Voltage	120V/60Hz
TX Frequency	GSM850: 824MHz To 849MHz PCS1900: 1850MHz To 1910MHz WCDMA 850: 827MHz To 847MHz WCDMA1900: 1853MHz To 1908MHz Bluetooth: 2400MHz To 2483.5MHz
RX Frequency	GSM850: 869MHz To 894MHz PCS1900: 1930MHz To 1990MHz WCDMA 850: 872MHz To 892MHz WCDMA1900: 1933MHz To 1988MHz Bluetooth: 2400MHz To 2483.5MHz
HW Version	Ver.A
SW Version	D51C17B103
EUT Accessory	
Data cable	Data Cable USB A Male to Micro Usb ,Black,
Adapter	Manufacture: Huawei Technologies Co., Ltd. Model: HW-050040U6 Input voltage: ~100-240V 50/60Hz 0.2A Output voltage: +5V ⎓ 400mA S/N:HKAAC1454909
Adapter	Manufacture: Huawei Technologies Co., Ltd. Model: HW-050040U6 Input voltage: ~100-240V 50/60Hz 0.2A Output voltage: +5V ⎓ 400mA S/N:BYAA42103742
Adapter	Manufacture: Huawei Technologies Co., Ltd. Model: HW-050040U5 Input voltage: ~100-240V 50/60Hz 0.2A Output voltage: +5V ⎓ 400mA S/N:TPAB62902498
Adapter	Manufacture: Huawei Technologies Co., Ltd. Model: HW-050100E1W Input voltage: ~100-240V 50/60Hz 0.2A Output voltage: +5V ⎓ 400mA S/N:TPAB22405809
Adapter	Manufacture: Huawei Technologies Co., Ltd. Model: HW-050100B1W Input voltage: ~100-240V 50/60Hz 0.2A Output voltage: +5V ⎓ 400mA S/N:BYAA92802238
Adapter	Manufacture: Huawei Technologies Co., Ltd. Model: HW-050040E5

	Input voltage: ~100-240V 50/60Hz 0.2A Output voltage: +5V ⎓ 400mA S/N:HKAB52658958
Li-ion	Battery Model: HB5A2 Rated capacity: 1000mAh Nominal Voltage: ⎓ +3.7V Charging Voltage: ⎓ +4.2V S/N: GAG9825XC3508426

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

Test Site 1:	RELIABILITY LABORATORY OF HUAWEI TECHNOLOGIES CO., LTD.
Test Site Location:	Bantian Longgang District Shenzhen, P.R. China

1.3 Applied Standard

APPLIED STANDARD

FCC 47 CFR FCC Part 15 SubpartB

2 Summary of Results

Summary of Results				
Test Items	**Test Mode**	**Performance Class & Required Performance Criteria**	**Result**	**Site**
Radiated Emissions Enclosure Port	Mode1~ Mode2 Mode5 Mode7~ Mode8	CLASS B	Pass	Site1
Conducted Emissions ☐DC Power Port ☒AC Power Port ☐Telecommunication Ports	Mode1~ Mode4	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.				

3 System Configuration during EMC Test

3.1 Test Mode

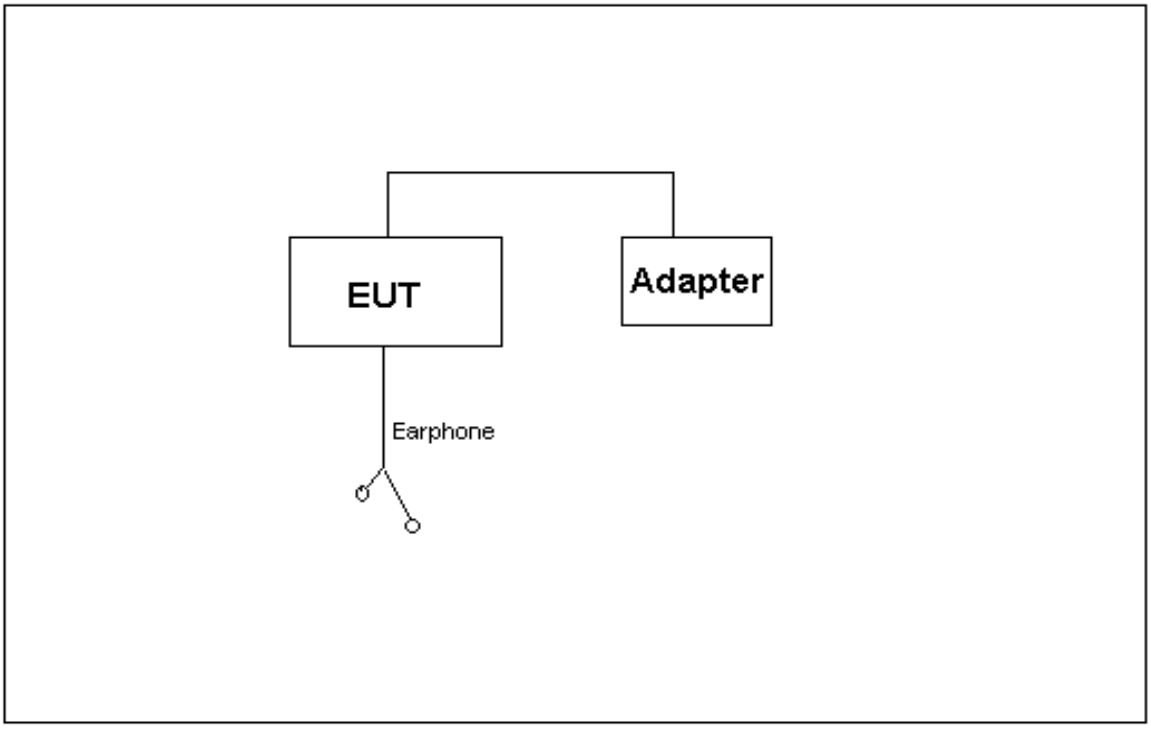
Huawei has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was in this test report and defined as:

Test Mode	
Mode 1:	adapter+earphone+Camera On +Idle
Mode 2:	adapter+earphone+MP3 +Idle
Mode 3:	adapter+earphone+Traffic
Mode 4:	adapter+Traffic
Mode 5:	USB Copy(EUT with PC)+earphone +Idle
Mode 6:	Traffic
Mode 7:	Camera On+earphone+Idle
Mode 8:	earphone+MP3+Idle

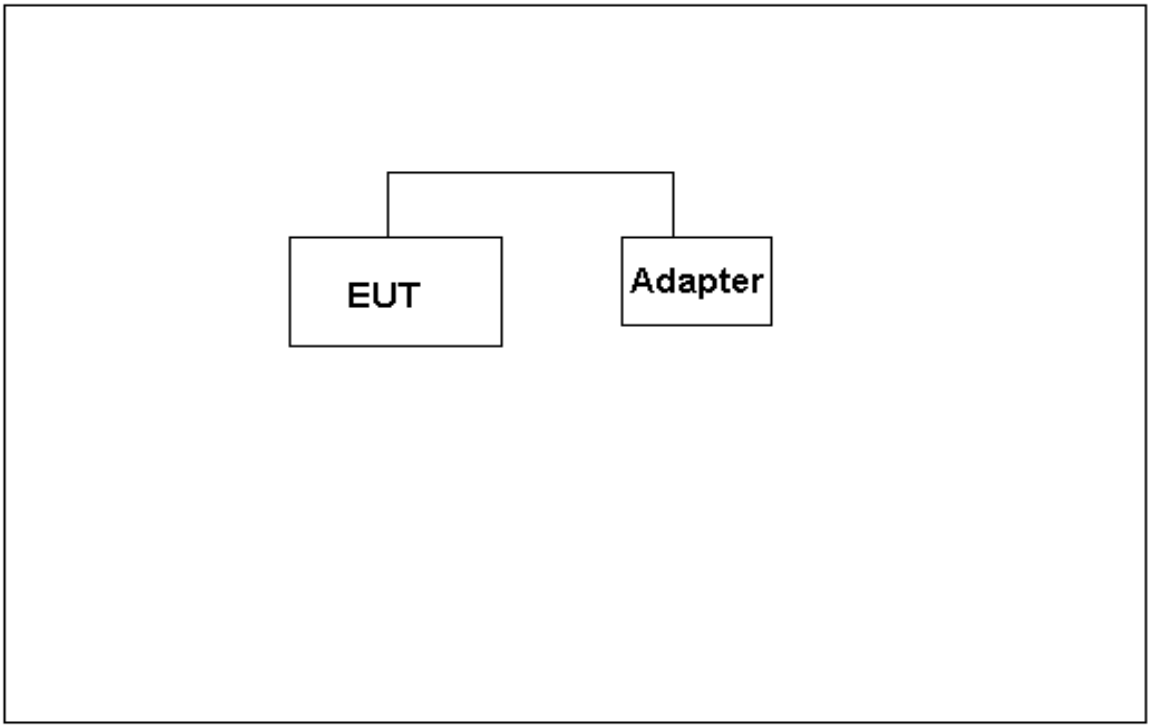
Remark：When the EUT have multiple adapters, need separate test with multiple adapters . All test modes are performed, only the worst cases are recorded in this report.

3.2 Configurations of Test System

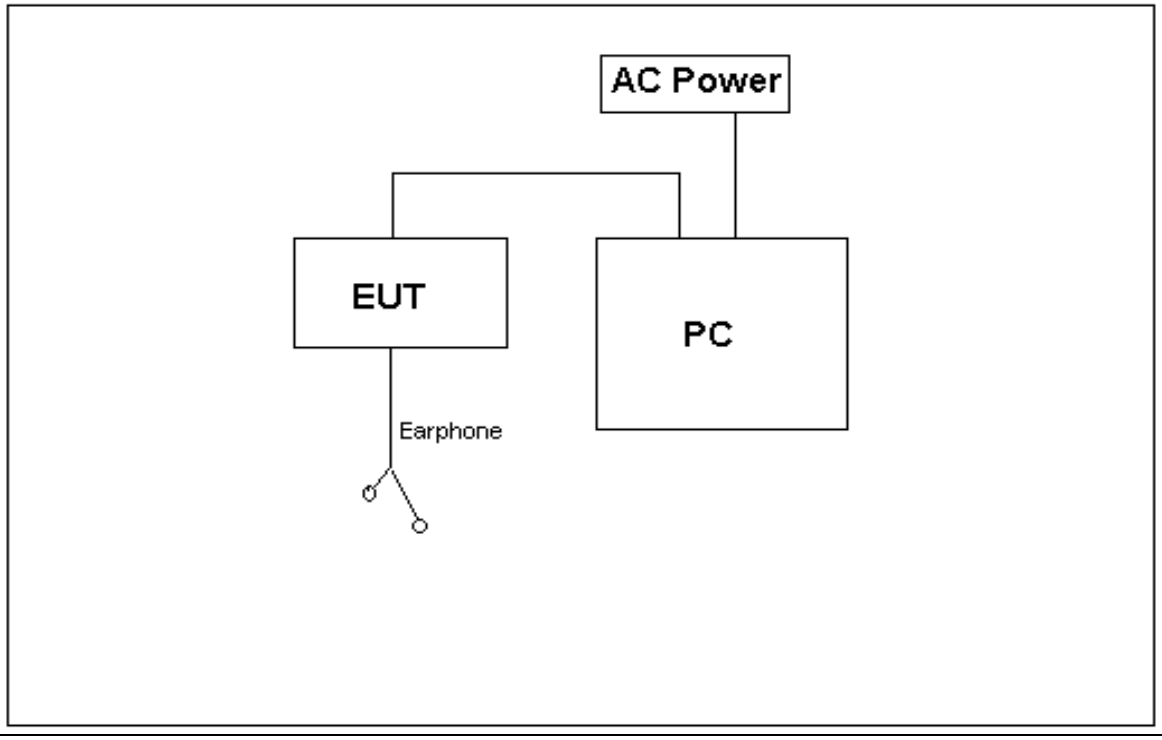
Connection Diagram (Mode 1~Mode 3)



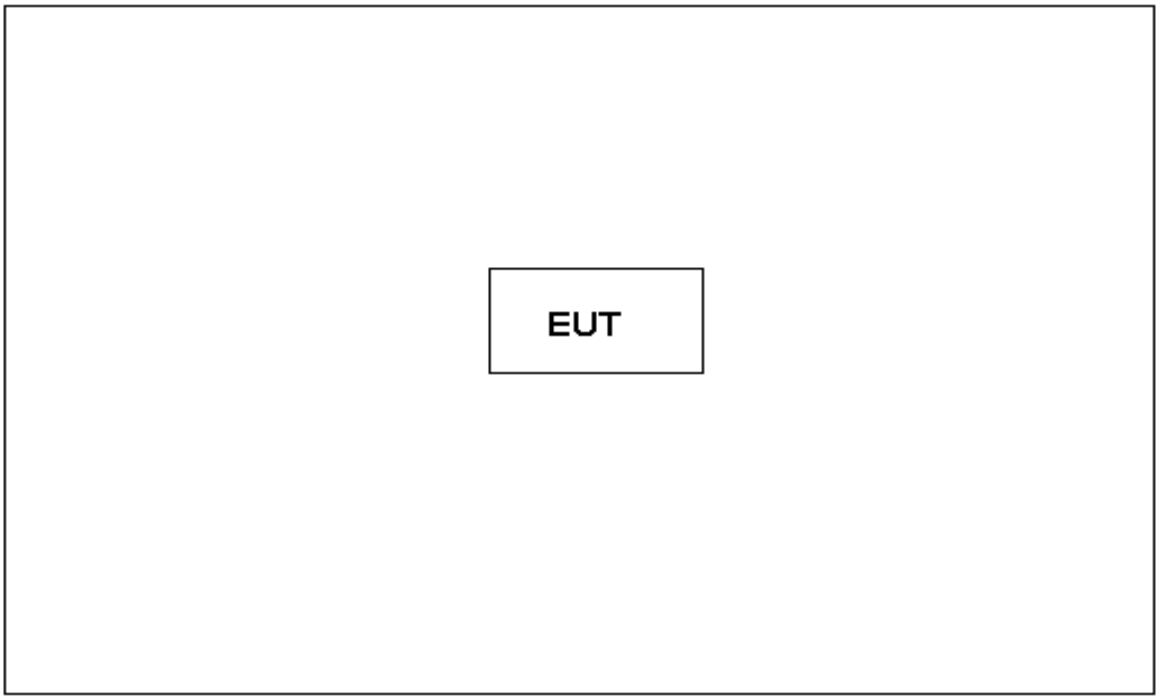
Connection Diagram (Mode 4)



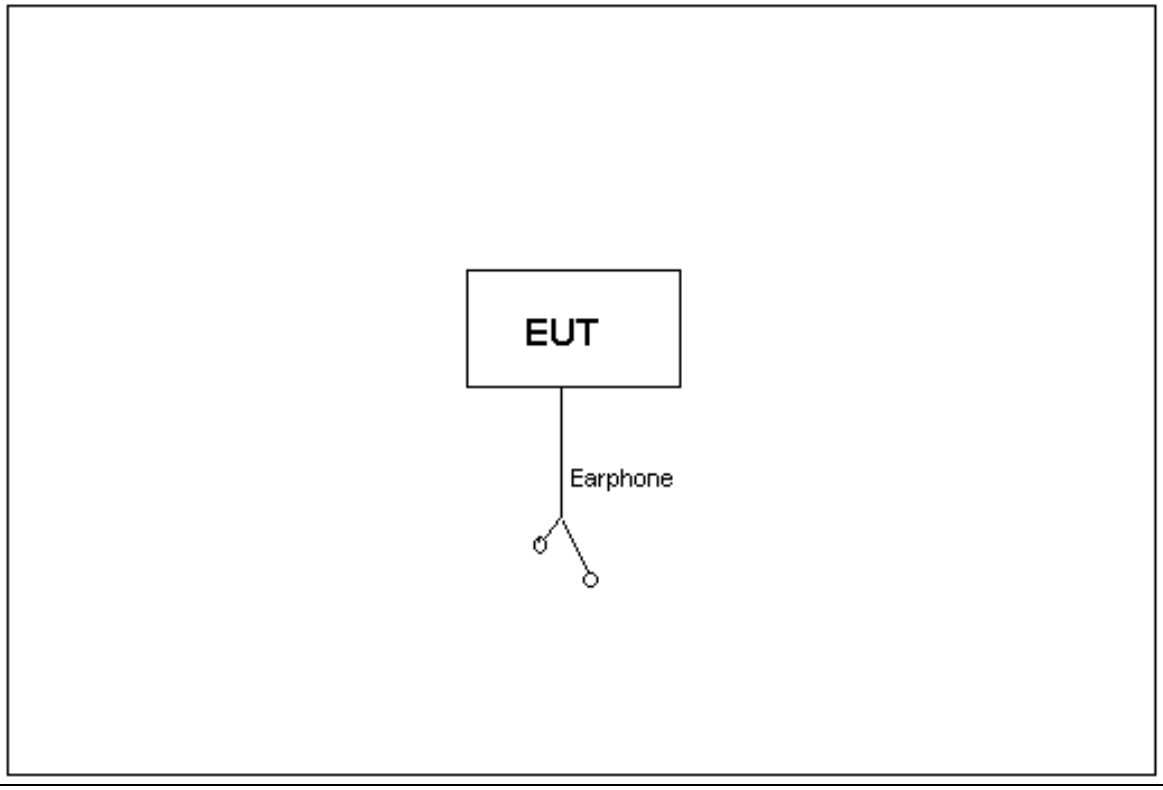
Connection Diagram (Mode 5)



Connection Diagram (Mode 6~ Mode 7)



Connection Diagram (Mode 8)



3.3 Cables Used during Test

Cable	Quantity	Length	Type of Cable
USB	1	<3m	shielded
Earphone	1	<3m	Unshielded

3.4 Associated Equipment Used during Test

Name	Model	Manufacturer	S/N	Cal Date
Radio Communication Tester	CMU200	R&S	3608105673	2010-10-24
Notebook	D81	IBM	3108055478	N/A

4 Electromagnetic Interference (EMI)

4.1 Radiated Disturbance 30MHz to 18GHz

Test Procedure

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

A preliminary scan and a final scan of the emissions were made from 30 MHz to18 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 receive antenna has two polarizations V and H.

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

Test setup

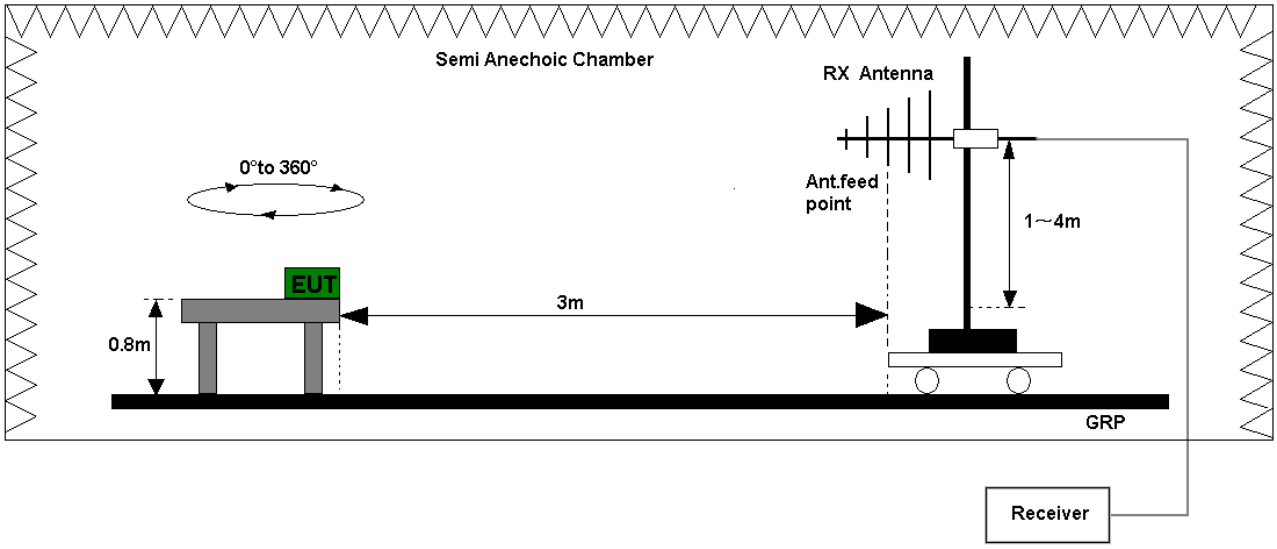


Figure 1.Test set-up of radiated disturbance(30MHz-1GHz)

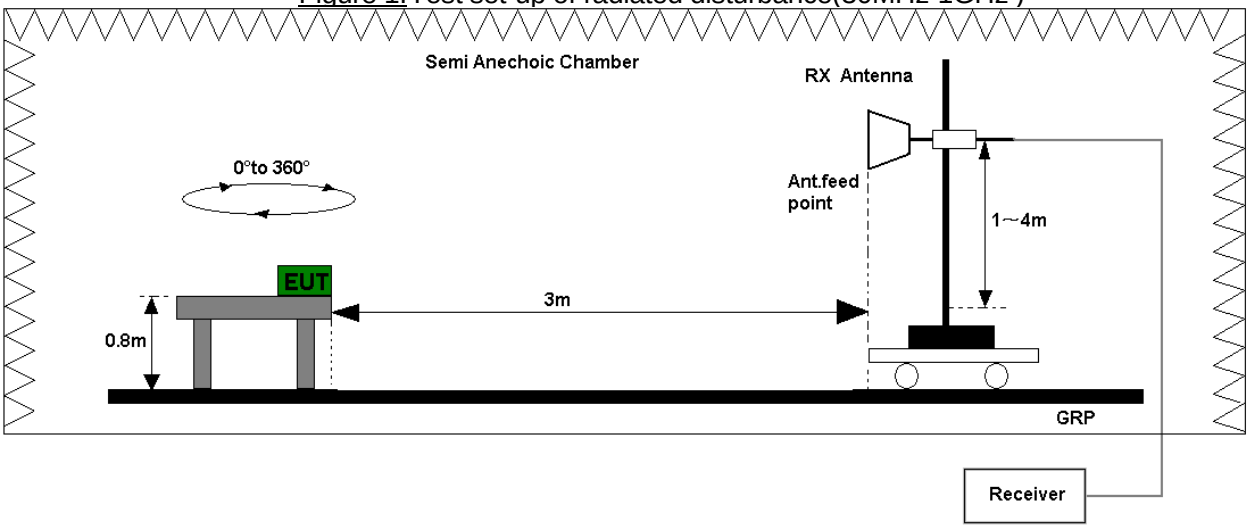


Figure 2.Test set-up of radiated disturbance(above 1GHz)

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(μV/m)		Unit(dBμV/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

Test environment condition:

Performed Item	Item	Required	Actual
Radiated Emission	Ambient temperature	15°C～35°C	23.4°C
	Relative humidity	25%～75%	54.5%
	Atmospheric pressure	86 kPa～106kPa	100kPa

4.2 Conducted Disturbance 0.15 MHz to 30MHz

Test Procedure

The Table-top EUT was placed upon a non-metallic table 0.8 m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.4.
Conducted Disturbance at AC Port measurements were undertaken on the L and N Lines. The emissions were measured using a Quasi-Peak Detector and Average Detector.
Huawei Mobile Station was communicated with the BTS simulator through Air interface, the BTS simulator controls the Mobile Station to transmitter the maximum power which defined in specification of product. The Mobile Station operated on the typical channel.
Measurement bandwidth (RBW) for 150kz to 30 MHz: 9 kHz;
The Mobile Station was setup in the screened chamber and operated under nominal conditions.

Test Setup

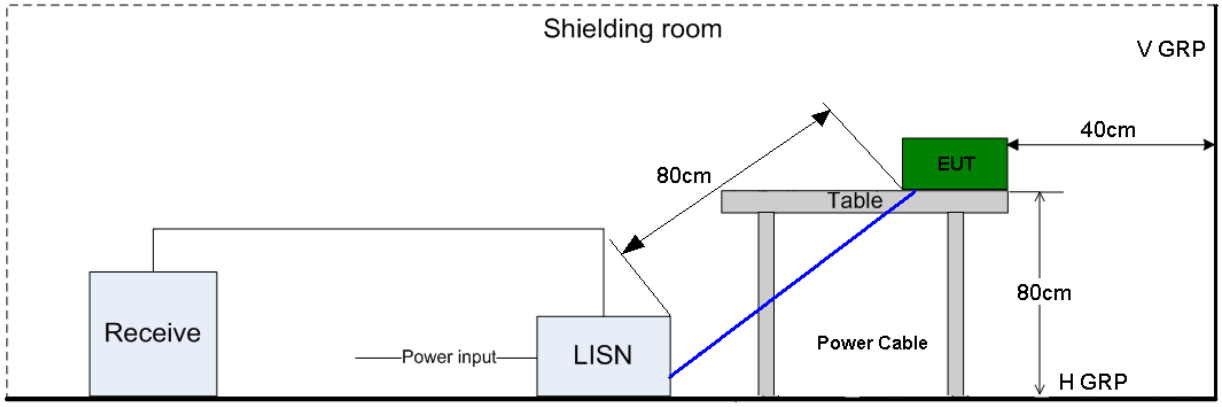


Figure 3. Test Set-up of conducted disturbance

Test Results

The EUT has met requirements for Conducted disturbance of power lines.
The test data see section 7.2 of this report.

Test Limit of AC Power Port		
Frequency range	150kHz ~ 30MHz	
Frequency	Voltage limits	
	QP	AV
0.15MHz~0.5MHz	66-56dBμV	56-46 dBμV
0.5MHz-5MHz	56dBμV	46 dBμV
5MHz~30MHz	60dBμV	50 dBμV

Test environment condition:

Performed Item	Item	Required	Actual
Conducted Disturbance	Ambient temperature	15°C～35°C	23.4°C
	Relative humidity	25%～75%	54.5%
	Atmospheric pressure	86 kPa～106kPa	100kPa

5 Main Test Instruments

Main Test Equipments					
Test item	**Test Instrument**	**Model**	**Manufacturer**	**Cal-Date**	**Cal Interval (month)**
RE/CE	EMI Test receiver	ESU26	R&S	May.30, 2011	12
	Broadband Antenna	VULB 9163	SCHWARZBECK	May.16,2011	12
	Horn Antenna	HF906	R&S	May.16,2011	12
	Artificial Mains Network	ENV216	R&S	May.30, 2011	12

Software Information			
Test Item	Software Name	Manufacturer	Version
RE/CE	ES-K1	R&S	1.7.1

6 System Measurement Uncertainty

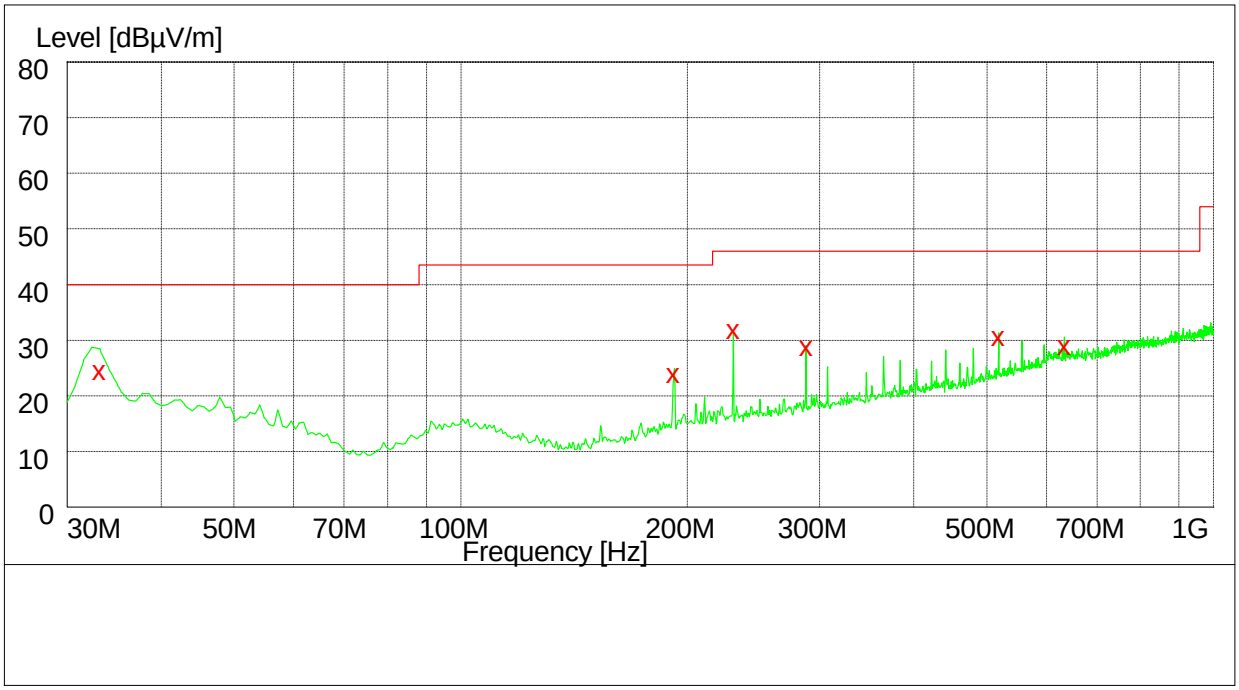
For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty		
Items		**Extended Uncertainty**
RE(30MHz-1GHz,)	Field strength (dBμV/m)	U=4.1dB; k=2
RE(1GHz-18GHz)	Field strength (dBμV/m)	U=4.1dB; k=2
CE	Disturbance Voltage (dBμV)	U=3.4dB; k=2

7 Graph and Data of Emission Test

7.1 Radiated Disturbance

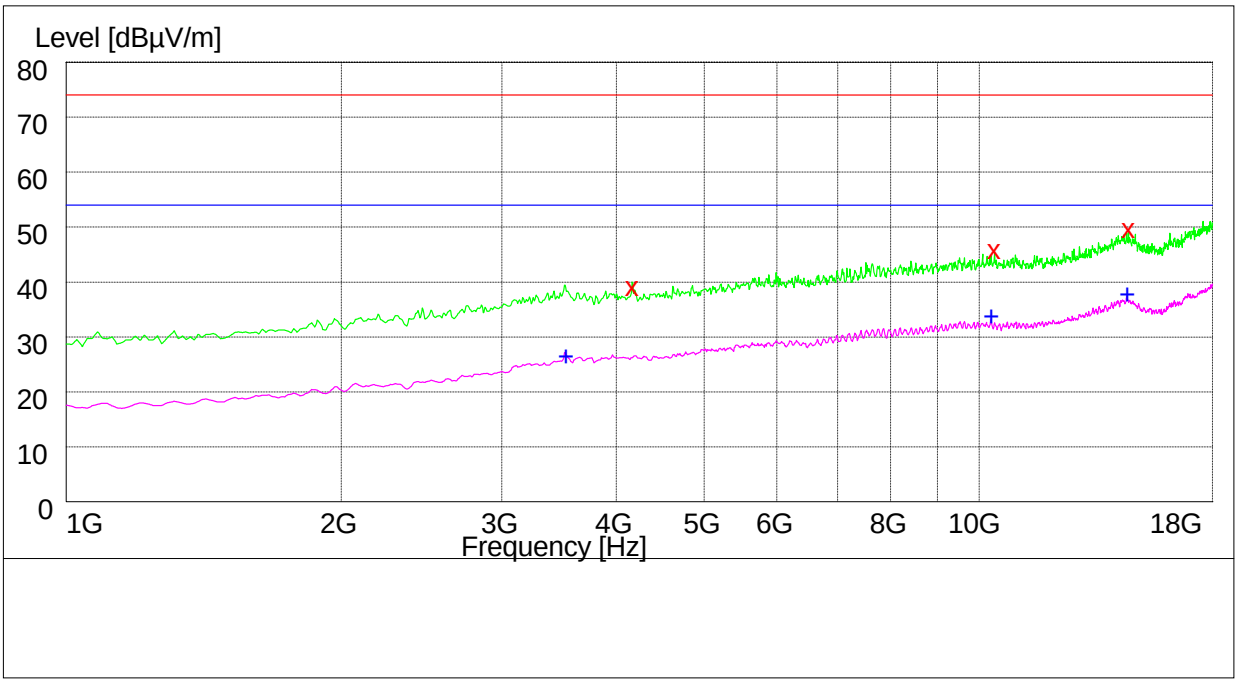
30MHz~1GHz



MEASUREMENT RESULT: QP Detector

Frequency	Level	Transd	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBµV/m	dB	dBµV/m	dB	cm	deg	
33.120000	24.20	11.7	40.0	15.8	100.0	108.00	VERTICAL
192.000000	24.30	11.9	43.5	19.2	100.0	306.00	VERTICAL
230.400000	32.00	13.5	46.0	14.0	127.0	246.00	HORIZONTAL
288.000000	29.00	15.2	46.0	17.0	112.0	93.00	HORIZONTAL
518.400000	30.80	20.6	46.0	15.2	107.0	178.00	HORIZONTAL
633.600000	28.70	22.8	46.0	17.3	100.0	244.00	VERTICAL

1GHz~18GHz



MEASUREMENT RESULT: PK Detector

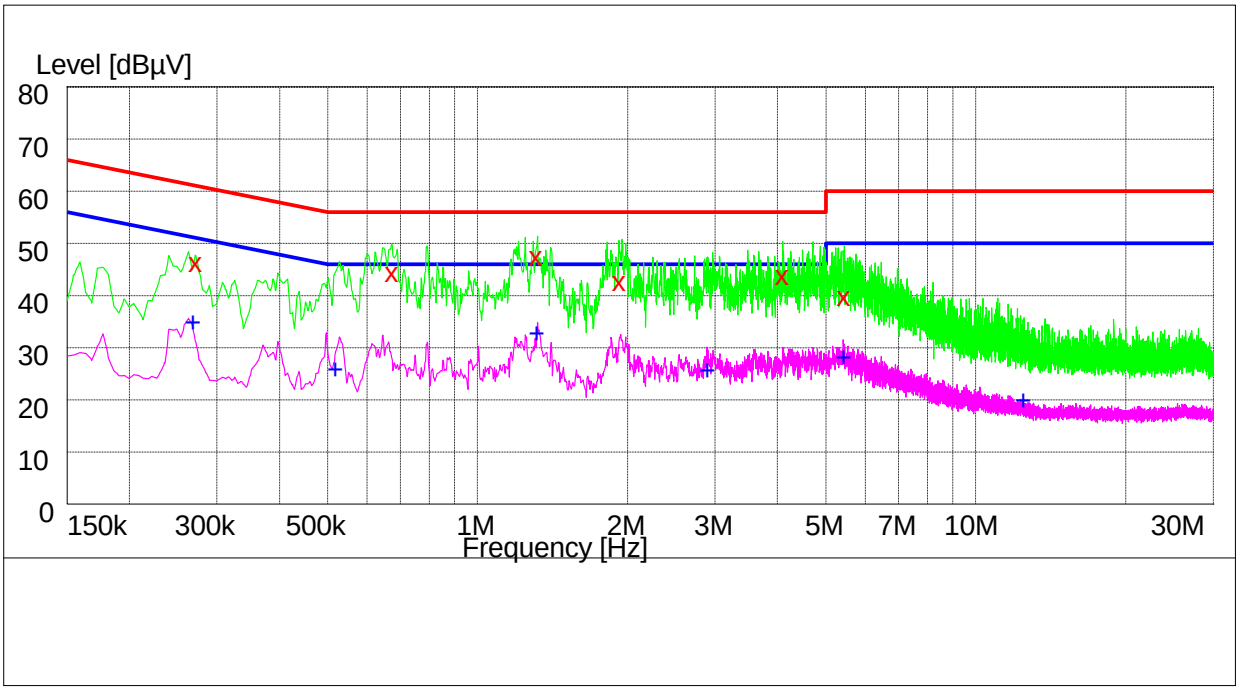
Frequency	Level	Transd	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBµV/m	dB	dBµV/m	dB	cm	deg	
4173.500000	38.90	-5.1	74.0	35.1	102.0	241.00	HORIZONTAL
10397.600000	45.10	6.6	74.0	28.9	133.0	156.00	VERTICAL
14572.800000	49.00	14.3	74.0	25.0	172.0	100.00	VERTICAL

MEASUREMENT RESULT: AV Detector

Frequency	Level	Transd	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBµV/m	dB	dBµV/m	dB	cm	deg	
3523.000000	26.20	-5.2	54.0	27.8	200.0	322.00	HORIZONTAL
10302.400000	33.00	6.6	54.0	21.0	100.0	86.00	VERTICAL
14518.400000	37.40	14.9	54.0	16.6	128.0	250.00	VERTICAL

7.2 Conducted Disturbance

AC Port Test Data



MEASUREMENT RESULT: QP Detector

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
0.272000	45.70	10.0	61	15.3	N	FLO
0.674000	44.70	10.1	56	11.3	N	FLO
1.314000	46.80	10.1	56	9.2	N	FLO
1.928000	44.30	10.1	56	11.7	N	FLO
4.104000	43.60	10.2	56	12.4	N	FLO
5.450000	40.00	10.2	60	20.0	N	FLO

MEASUREMENT RESULT: AV Detector

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
0.268000	34.70	10.0	51	16.3	N	FLO
0.518000	25.60	10.1	46	20.4	N	FLO
1.314000	34.20	10.1	46	11.8	N	FLO
2.890000	27.20	10.2	46	18.8	N	FLO
5.426000	29.60	10.2	50	20.4	N	FLO
12.430000	19.60	10.3	50	30.4	N	FLO

----------END----------