



# EMC Test Report

**Product Name: LTE/CDMA 1X/EVDO Mobile Phone with Bluetooth**

**Model Number: HUAWEI M920**

**Report No:SYBH(Z-EMC)037112011-2**

**FCC ID:QISM920**

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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.
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## 1 General Information

### 1.1 EUT Description

EUT Description	
Product Name	LTE/CDMA 1X/EVDO Mobile Phone with Bluetooth
Model Number	HUAWEI M920
Serials Number	B7PIEC11A2600084
Working Voltage	120V/60Hz
TX Frequency	CDMA800:824MHz-849MHz; CDMA AWS:1710MHz-1755MHz CDMA1900:1850MHz-1910MHz LTE BAND 2:1850MHz-1910MHz LTE BAND 4:1710MHz-1755MHz Bluetooth: 2400MHz To 2483.5MHz WIFI: 2400MHz To 2483.5MHz
RX Frequency	CDMA800:869MHz-894MHz; CDMA AWS: 2110MHz-2155MHz CDMA1900:1930MHz-1990MHz LTE BAND 2: 1930MHz-1990MHz LTE BAND 4: 2110MHz-2155MHz Bluetooth: 2400MHz To 2483.5MHz WIFI: 2400MHz To 2483.5MHz GPS: 1575.42MHz
HW Version	Ver.A
SW Version	M920V100R001C177B202SP08
EUT Accessory	
Data cable	Data Cable USB A Male to Micro Usb ,Black,
Adapter	Manufacturer: Huawei Technologies Co., Ltd. Model: HW-050100U1W Input voltage: ~100-240V 50/60Hz Output voltage:  5.0 V Rated Power: 5W S/N: HKAB51867174 S/N: TPAA15000008
Li-ion	Manufacturer: Huawei Technologies Co., Ltd. Battery Model: HB5F1H Rated capacity: 1880mAh Nominal Voltage:  +3.7V Charging Voltage:  +4.2V S/N:LKCB8166I32D0763

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:	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
<u>Radiated Emissions</u> Enclosure Port	Mode1~ Mode2 Mode5 Mode7~ Mode8	CLASS B	Pass	Site1
<u>Conducted Emissions</u> <input type="checkbox"/> DC Power Port <input checked="" type="checkbox"/> AC Power Port <input type="checkbox"/> Telecommunication Ports	Mode1~ Mode4	CLASS B	Pass	Site1
Note: 1, Measurement taken is within the measurement uncertainty of measurement system. 2, <input checked="" type="checkbox"/> The item has been tested; <input type="checkbox"/> The item has not been tested.				

### 3 System Configuration during EMC Test

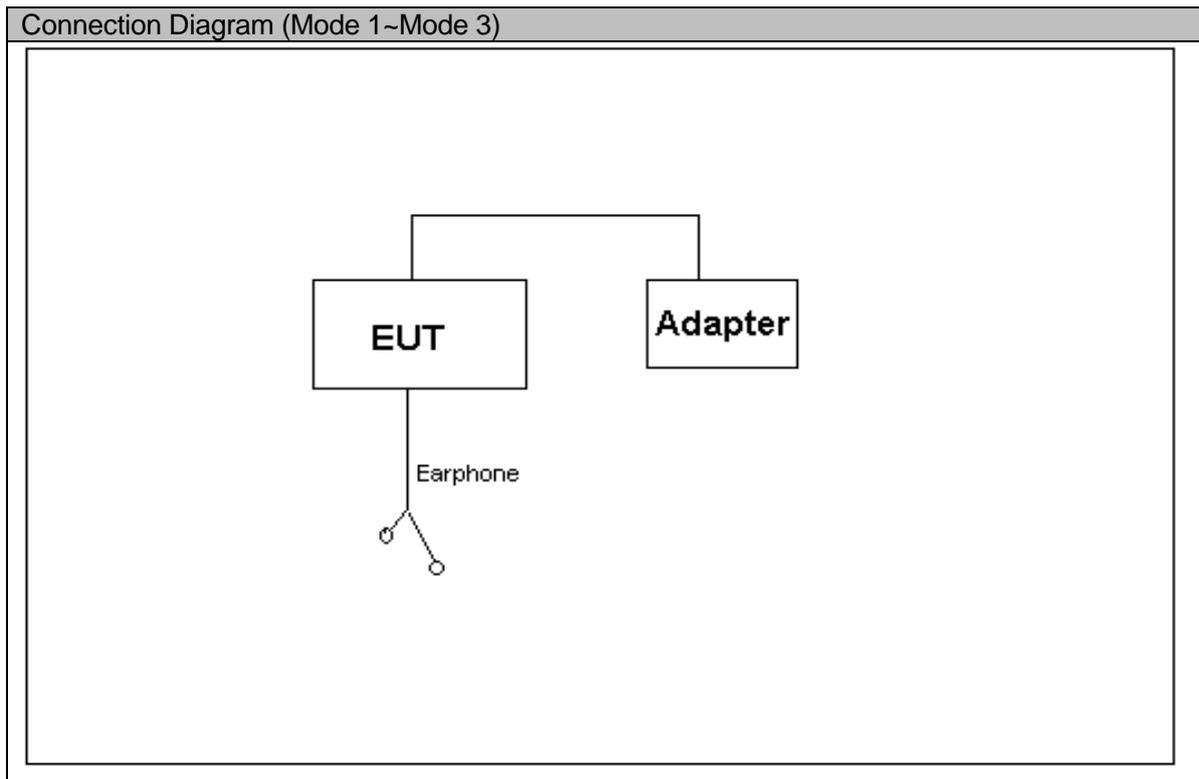
#### 3.1 Test Mode

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:

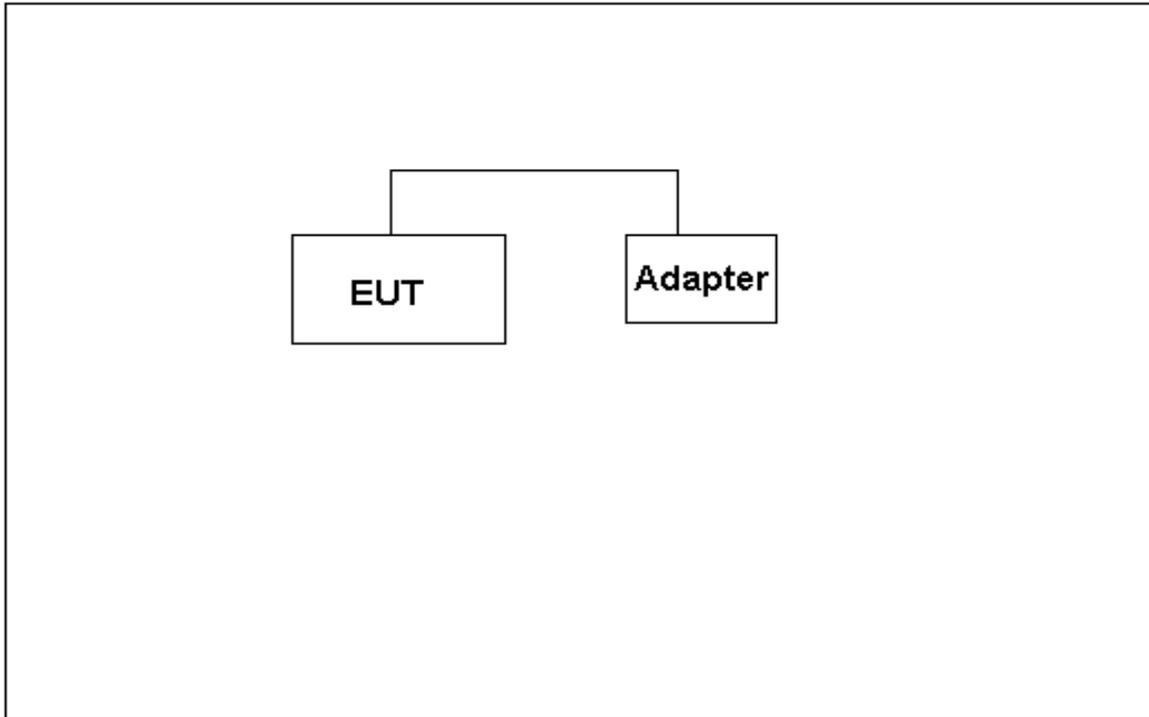
Test Mode	
Mode 1:	adapter+earphone+Camera On +Idle
Mode 2:	adapter+earphone+MP3 +Idle
Mode 3:	adapter+earphone+Traffic
Mode 4:	adapter+Traffic
Mode 5:	USB Copy(EUT with PC)+earphone +Idle
Mode 6:	Traffic
Mode 7:	Camera On+earphone+Idle
Mode 8:	earphone+MP3+Idle

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.

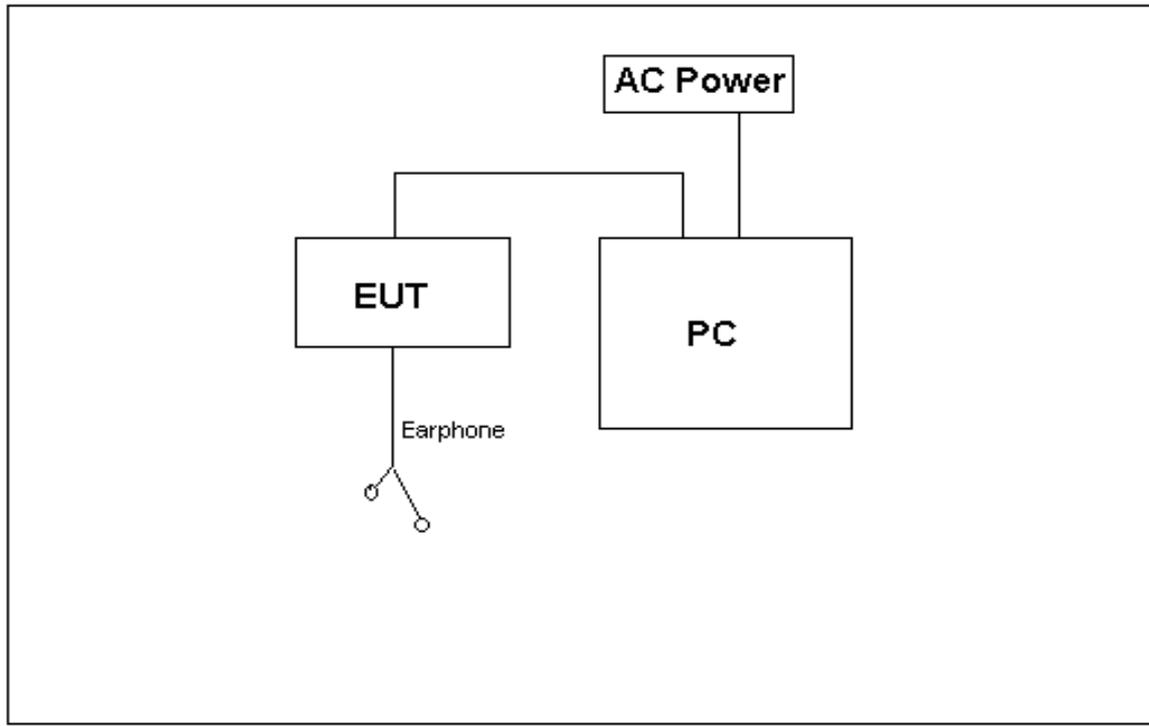
#### 3.2 Configurations of Test System



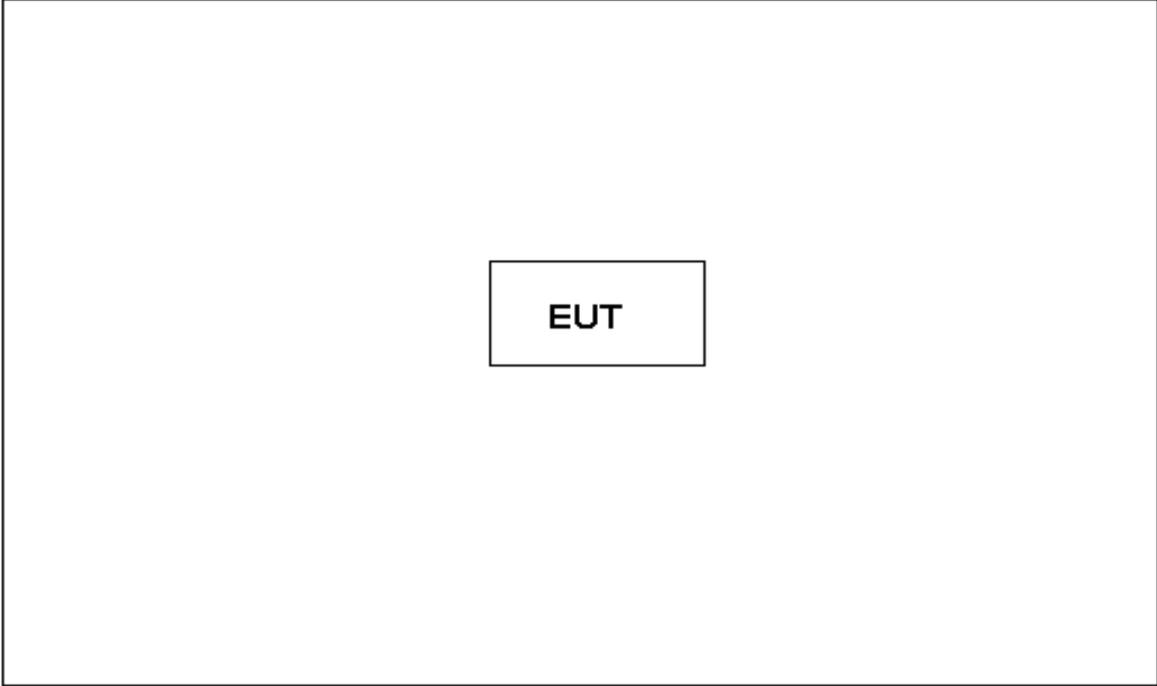
Connection Diagram (Mode 4)



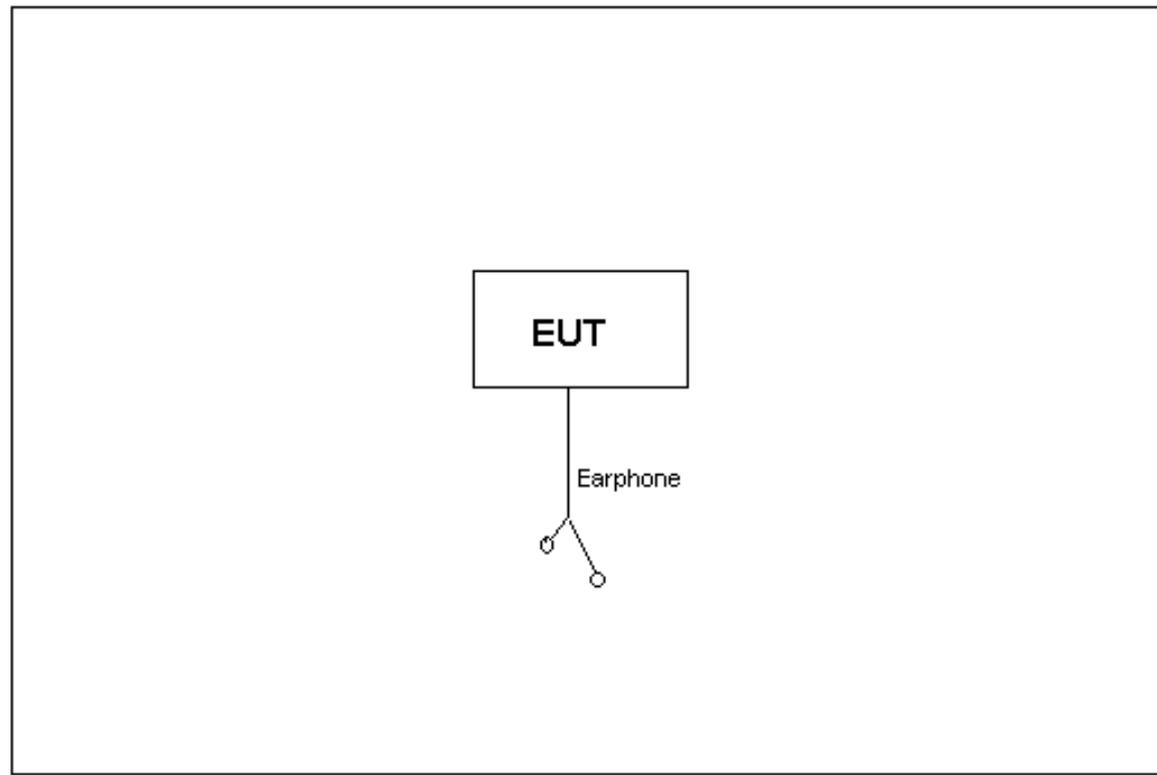
Connection Diagram (Mode 5)



Connection Diagram (Mode 6)



Connection Diagram (Mode 7-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	3607033573	2011.03.17
Notebook	T61	IBM	3108052508	N/A
Printer	C4200	HP	MY83CQP08P	N/A

## 4 Electromagnetic Interference (EMI)

### 4.1 Radiated Disturbance 30MHz to 18GHz

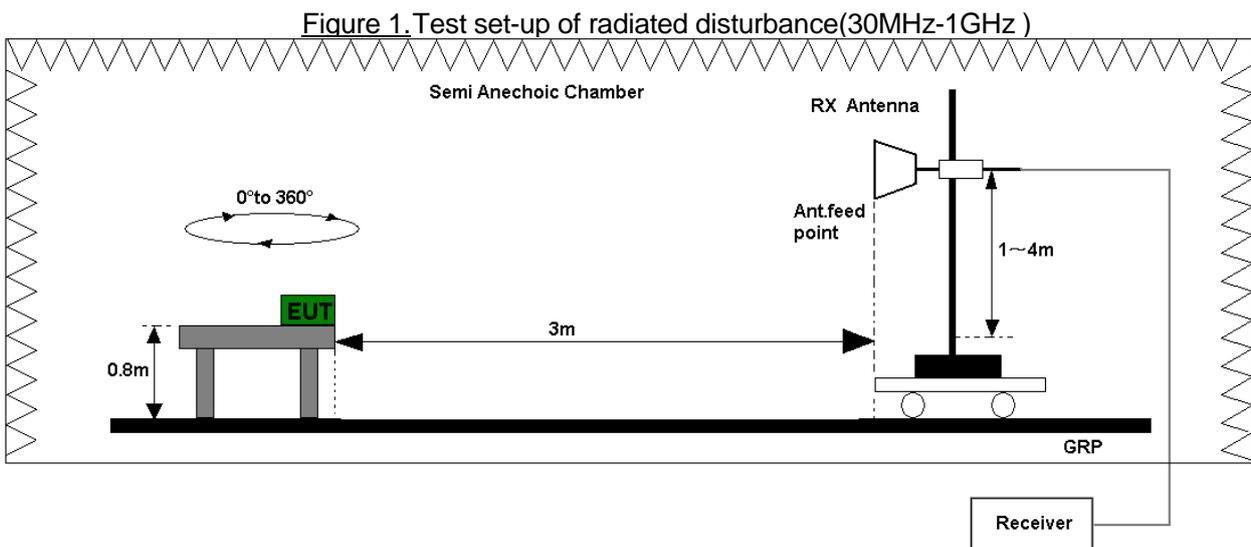
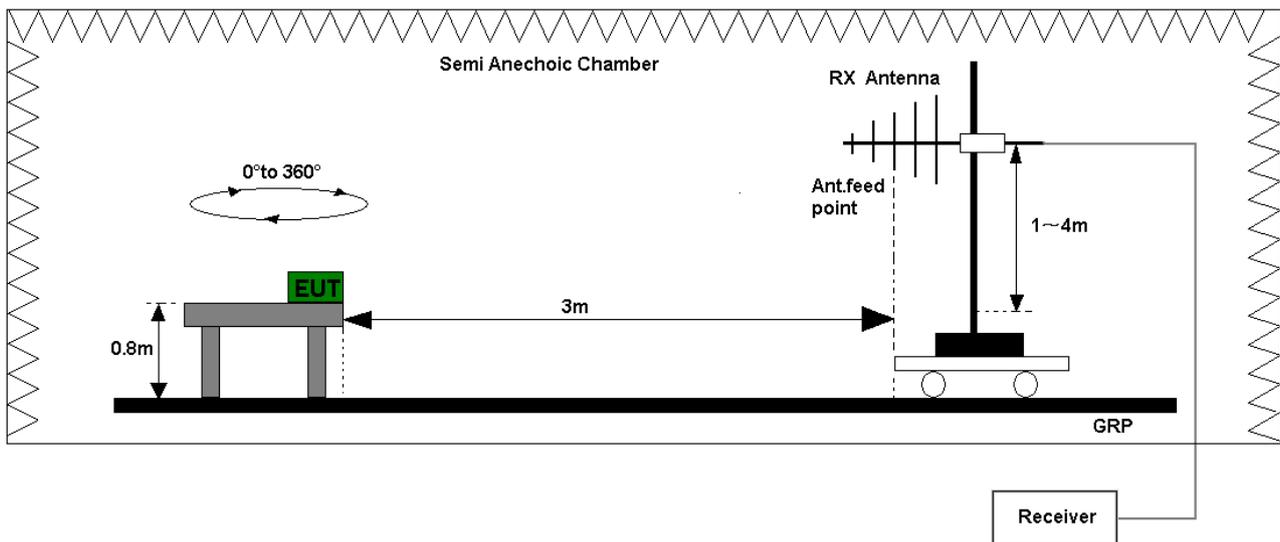
#### Test Procedure

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 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 receive antenna has two polarizations V and H.

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

#### Test setup



## 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( $\mu$ V/m)		Unit(dB $\mu$ 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

Test environment condition:

Performed Item	Item	Required	Actual
Radiated Emission	Ambient temperature	15°C~35°C	21.3°C
	Relative humidity	25%~75%	50.5%
	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 150kHz to 30 MHz: 9 kHz;

The Mobile Station was setup in the shielded chamber and operated under nominal conditions.

### Test Setup

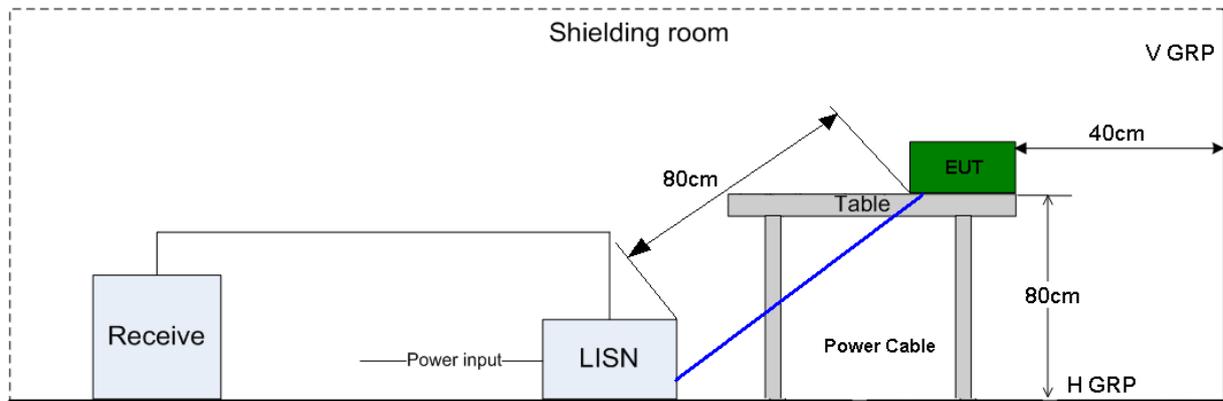


Figure 3. Test Set-up of conducted disturbance

### 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	20.5°C
	Relative humidity	25%~75%	50.5%
	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

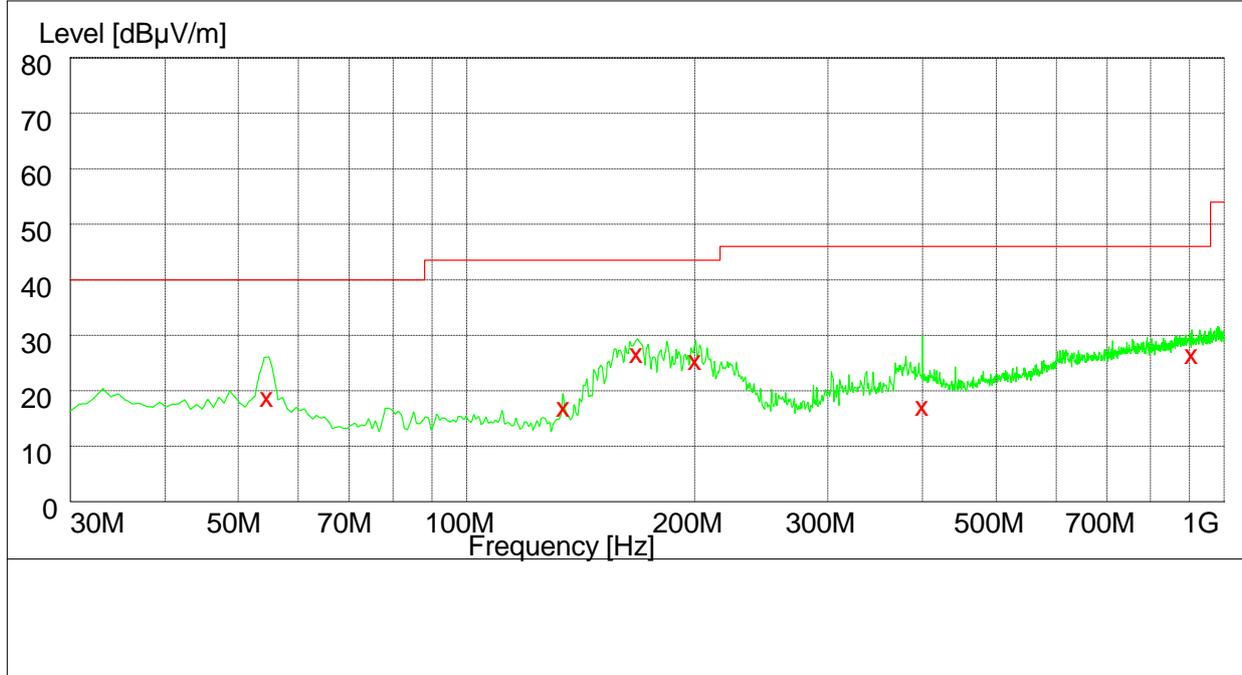
For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

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

## 7 Graph and Data of Emission Test

### 7.1 Radiated Disturbance

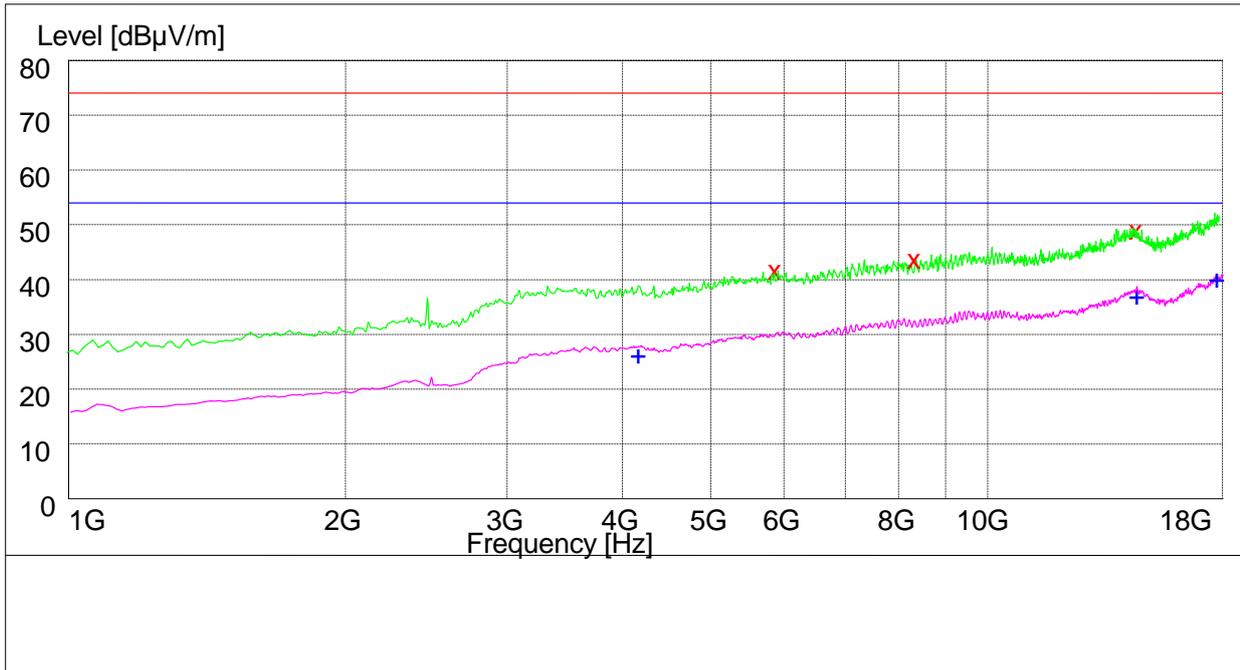
#### 30MHz~1GHz



#### MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV/m	Transducer dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
54.600000	19.10	12.7	40.0	20.9	100.0	253.00	HORIZONTAL L
134.400000	17.30	9.0	43.5	26.2	145.0	80.00	HORIZONTAL L
167.880000	26.20	9.9	43.5	17.3	137.0	244.00	HORIZONTAL L
200.460000	25.40	12.1	43.5	18.1	138.0	236.00	HORIZONTAL L
400.020000	17.20	18.2	46.0	28.8	103.0	37.00	HORIZONTAL L
906.540000	26.80	26.2	46.0	19.2	193.0	360.00	HORIZONTAL L

**1GHz~18GHz**



**MEASUREMENT RESULT: PK Detector**

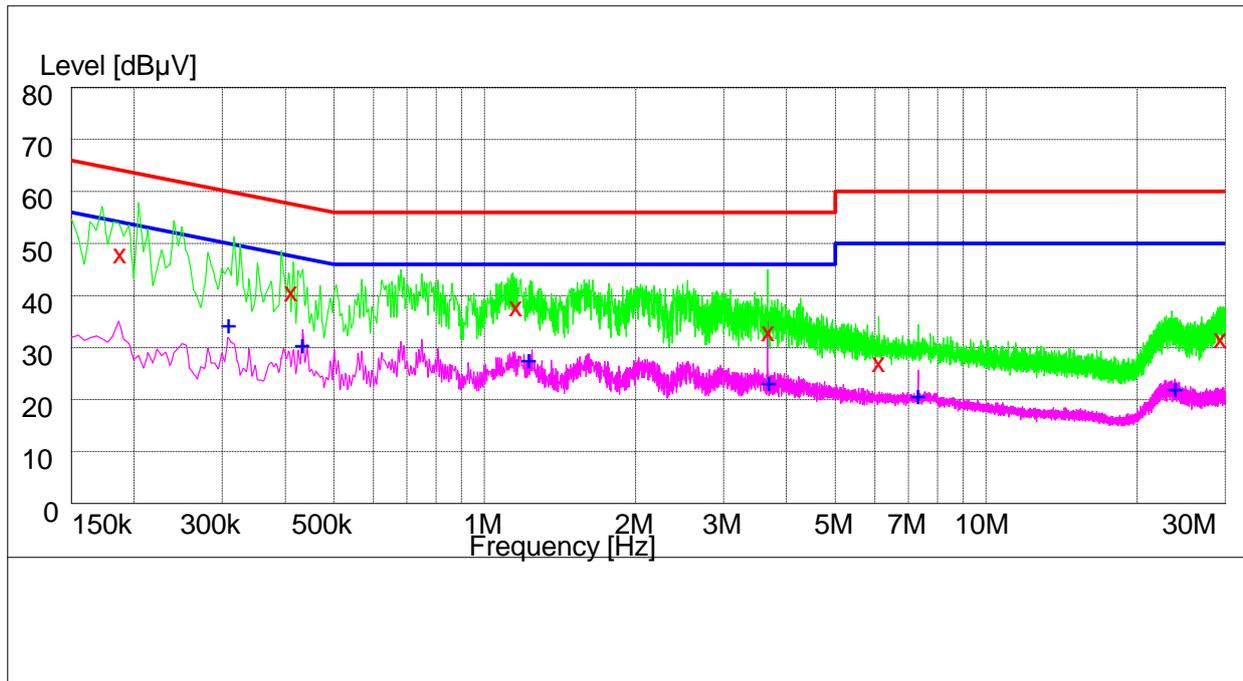
Frequency MHz	Level dBµV/m	Transducer dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
5874.500000	41.90	-1.0	74.0	32.1	123.0	254.00	HORIZONTAL
8418.500000	44.50	4.0	74.0	29.5	112.0	222.00	VERTICAL
14503.000000	49.20	14.6	74.0	24.8	104.0	237.00	HORIZONTAL

**MEASUREMENT RESULT: AV Detector**

Frequency MHz	Level dBµV/m	Transducer dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
4162.500000	25.90	-5.0	54.0	28.1	114.0	250.00	HORIZONTAL
14519.500000	36.60	14.9	54.0	17.4	144.0	120.00	HORIZONTAL
17997.500000	39.50	19.5	54.0	14.5	107.0	268.00	HORIZONTAL

## 7.2 Conducted Disturbance

### AC Port Test Data



#### MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV	Transducer dB	Limit dBµV	Margin dB	Line	PE
0.188000	47.20	10.1	64	16.8	N	FLO
0.412000	40.30	10.0	58	17.7	N	FLO
1.160000	39.40	10.1	56	16.6	N	FLO
3.686000	32.40	10.2	56	23.6	N	FLO
6.124000	27.40	10.2	60	32.6	N	FLO
29.384000	31.70	10.4	60	28.3	L1	FLO

#### MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV	Transducer dB	Limit dBµV	Margin dB	Line	PE
0.308000	33.70	10.0	50	16.3	N	FLO
0.432000	30.90	10.1	47	16.1	N	FLO
1.222000	28.10	10.1	46	17.9	N	FLO
3.686000	23.40	10.2	46	22.6	N	FLO
7.312000	21.20	10.2	50	28.8	N	FLO
23.808000	22.50	10.4	50	27.5	L1	FLO

-----END-----