



# EMC Test Report

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

**Model Number:U2801-5**

**Report No:SYBH(Z-EMC)099022012-2  
FCC ID: QISU2801-5**

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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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**Applicant:** Huawei Technologies Co., Ltd.  
**Address:** Huawei Base, Bantian, Longgang District, Shenzhen  
518129, P.R. China

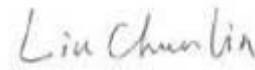
**Date of Receipt Test Item:** Feb.21, 2012  
**Start Date of Test:** Feb.21, 2012  
**End Date of Test:** Mar.07, 2012

**Test Result:** Pass

**Approved By  
(Lab Manager)**

2012-03-07  
Date

Liuchunlin  
Name



Signature

**Operator**

2012-03-07  
Date

Xuchang  
Name



Signature

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# 1 General Information

## 1.1 EUT Description

EUT Description	
Product Name	UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth
Model Number	U2801-5
Serials Number	F7F01A11B3000087
Working Voltage	120V/60Hz
TX Frequency	GSM850:824MHz To 849MHz; PCS1900:1850MHz To 1910MHz; WCDMA 850:824MHz To 849MHz; WCDMA 1900:1850MHz To 1910MHz; Bluetooth: 2400MHz To 2483.5MHz;
RX Frequency	GSM850:869MHz To 894MHz; PCS1900:1930MHz To 1990MHz; WCDMA 850:869MHz To 894MHz; WCDMA 1900:1930MHz To 1990MHz; Bluetooth: 2400MHz To 2483.5MHz;
HW Version	Ver.C
SW Version	U2801C32B102
EUT Accessory	
Data cable	Data Cable USB A Male to Micro Usb, Black
Adapter	Manufacturer: Huawei Technologies Co., Ltd. Model: HS-050040U6 Input voltage: ~100-240V 50/60Hz 0.2A Output voltage: 5V  400mA Rated Power: 2W S/N:BYAB92829500 S/N:HKAB91199902
Rechargeable Li-ion	Manufacturer: Huawei Technologies Co., Ltd. Battery Model: HB5A2 Rated capacity: 1000mAh Nominal Voltage:  +3.7V Charging Voltage:  +4.2V S/N:GAGB711XC27C3516

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 Standards

APPLIED STANDARD

47 CFR FCC Part 15:2010, 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	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.				

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

Item	Required
Ambient temperature	15°C ~ 35°C
Relative humidity	30% ~ 60%
Atmospheric pressure	86kPa ~ 106kPa

### 3 System Configuration during EMC Test

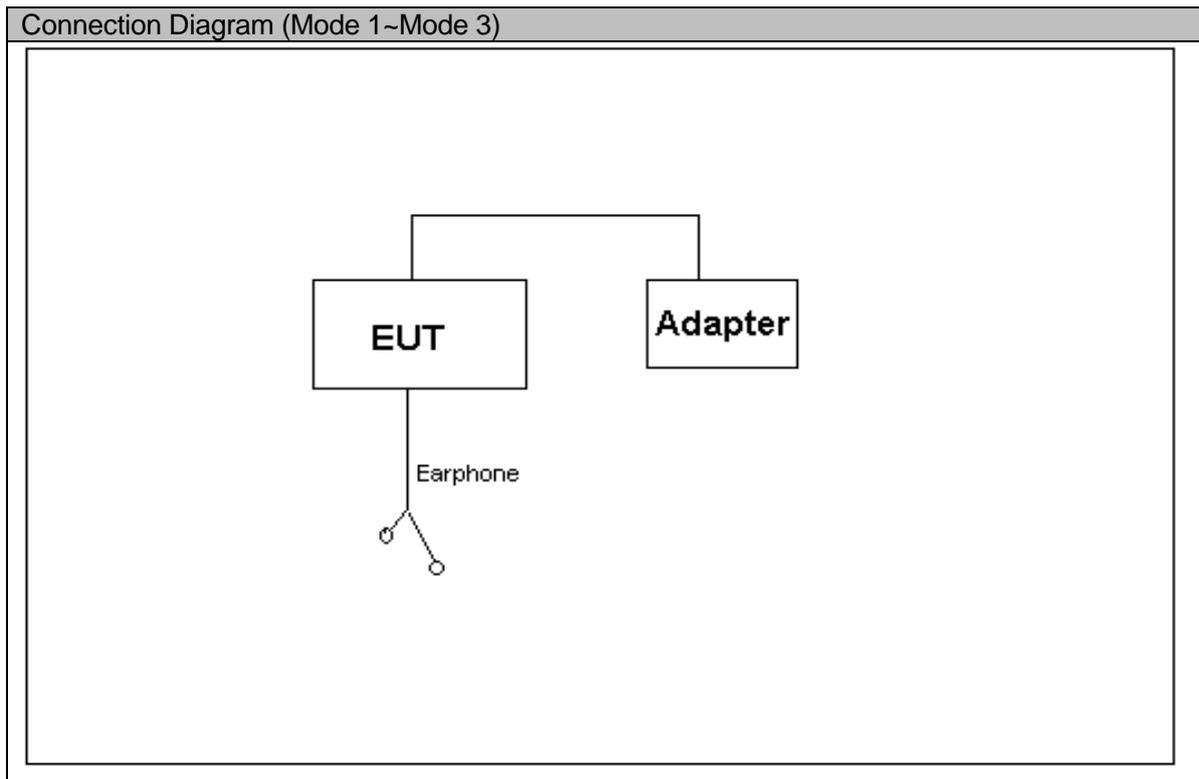
#### 3.1 Test Mode

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:

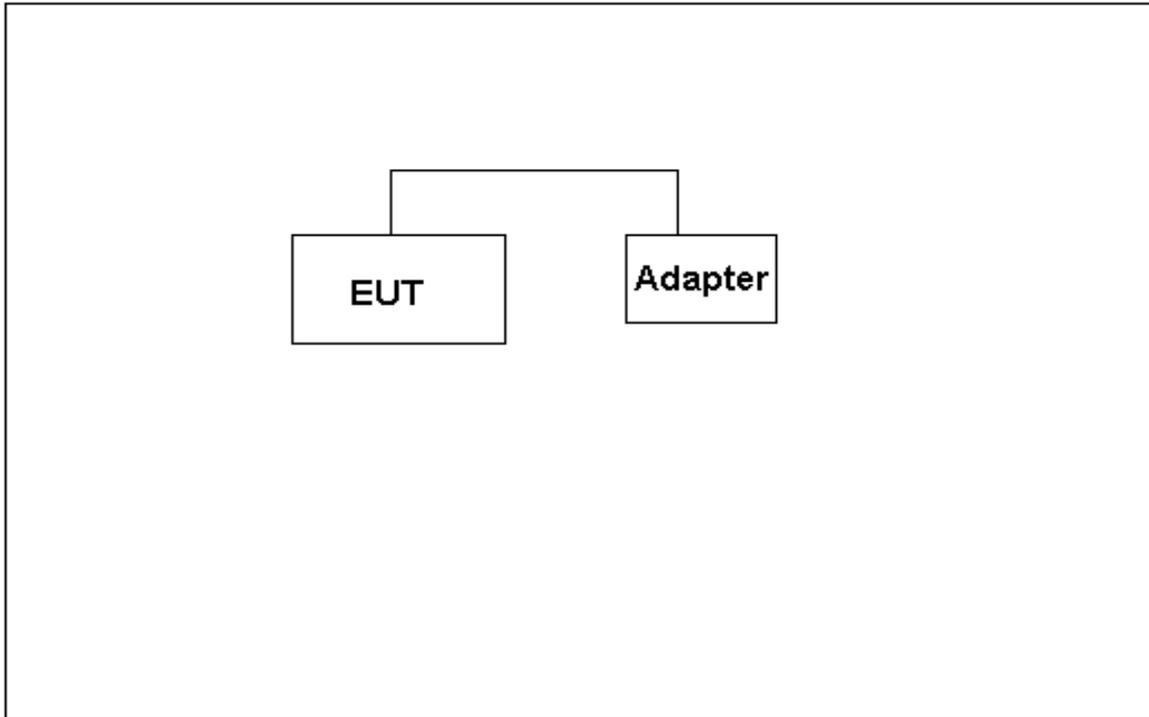
Test Mode	
Mode 1:	adapter+earphone+Camera On +Idle
Mode 2:	adapter+earphone+MP3 +Idle
Mode 3:	adapter+earphone+Traffic
Mode 4:	adapter+Traffic
Mode 5:	USB Copy(EUT with PC)+earphone +Idle
Mode 6:	Traffic
Mode 7:	Camera On+earphone+Idle
Mode 8:	earphone+MP3+Idle

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.

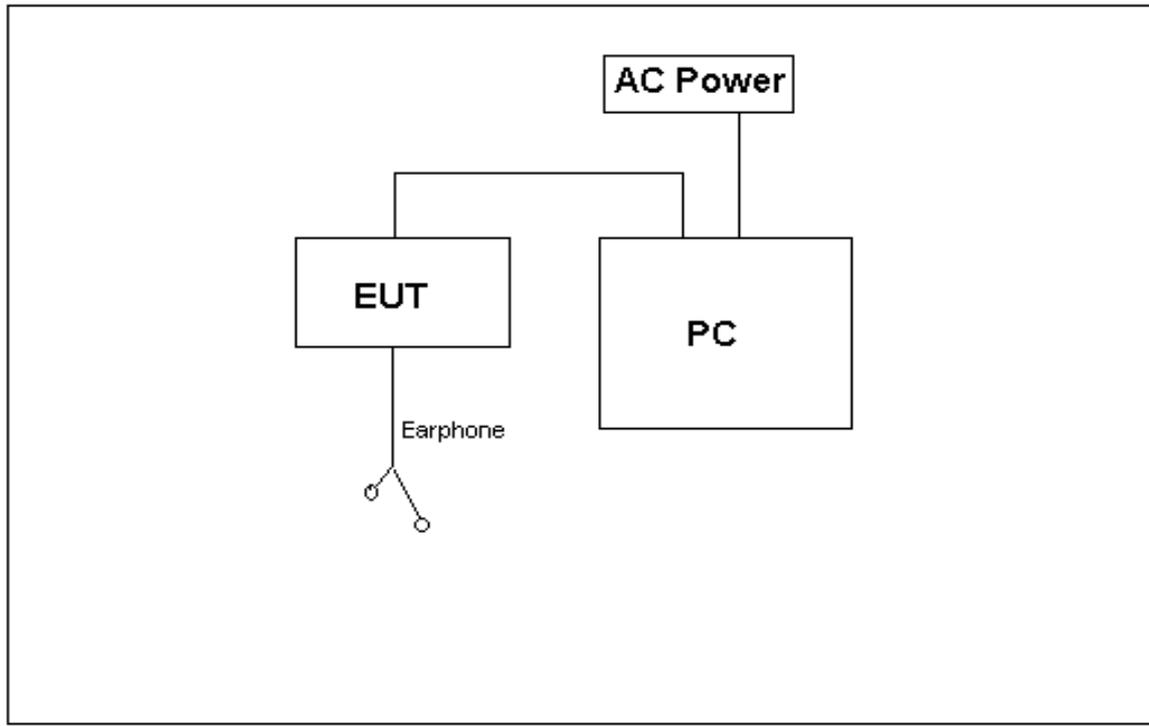
#### 3.2 Configurations of Test System



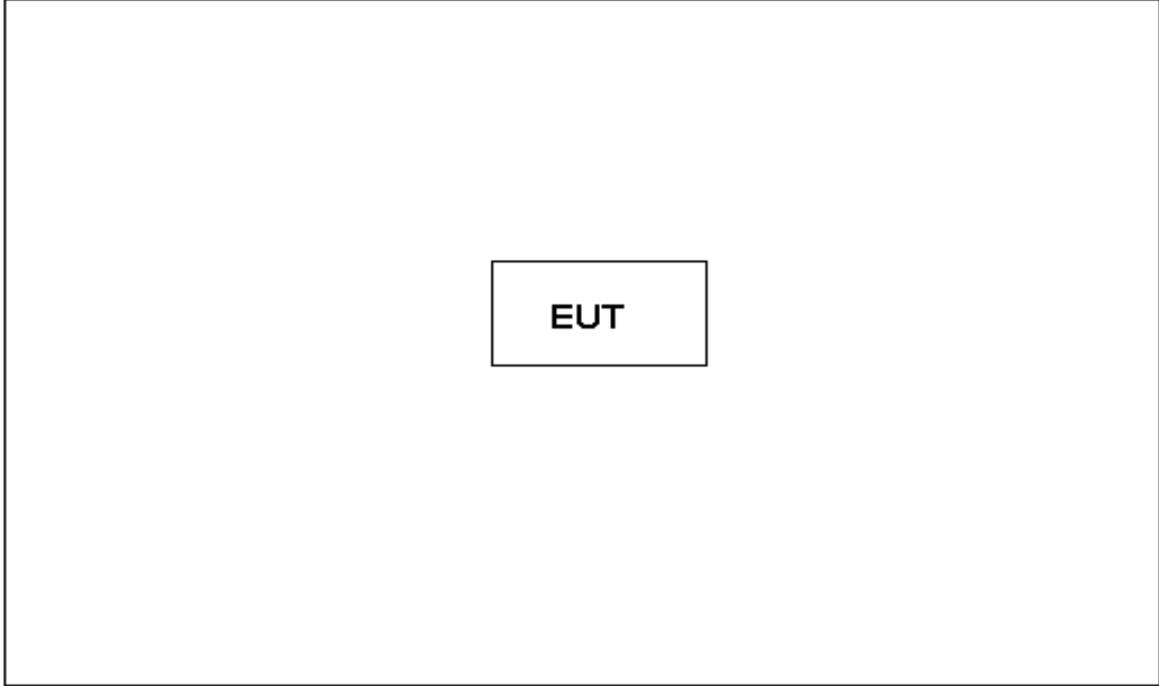
Connection Diagram (Mode 4)



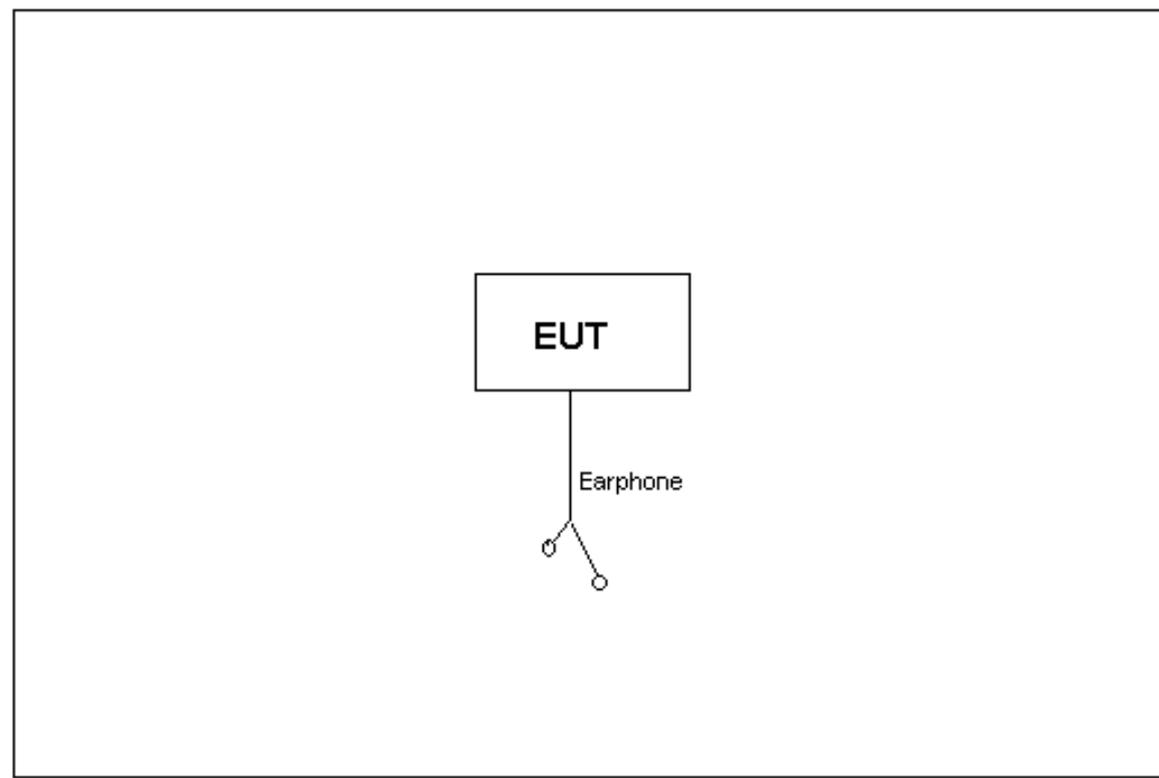
Connection Diagram (Mode 5)



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

## 4 Electromagnetic Interference (EMI)

### 4.1 Radiated Disturbance 30MHz to 18GHz

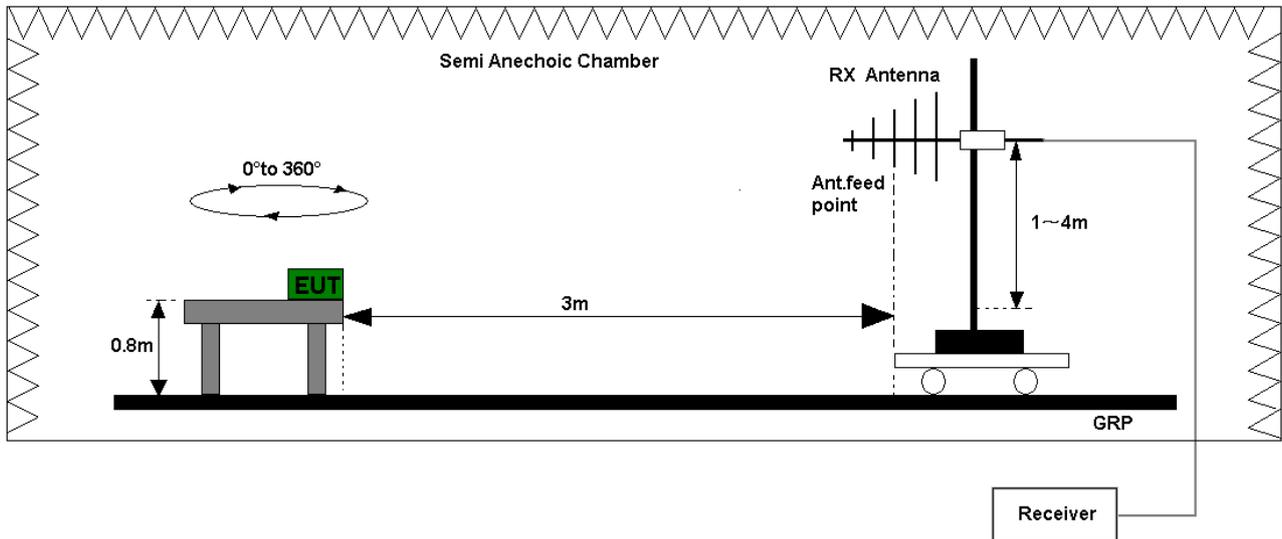
#### Test Procedure

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.

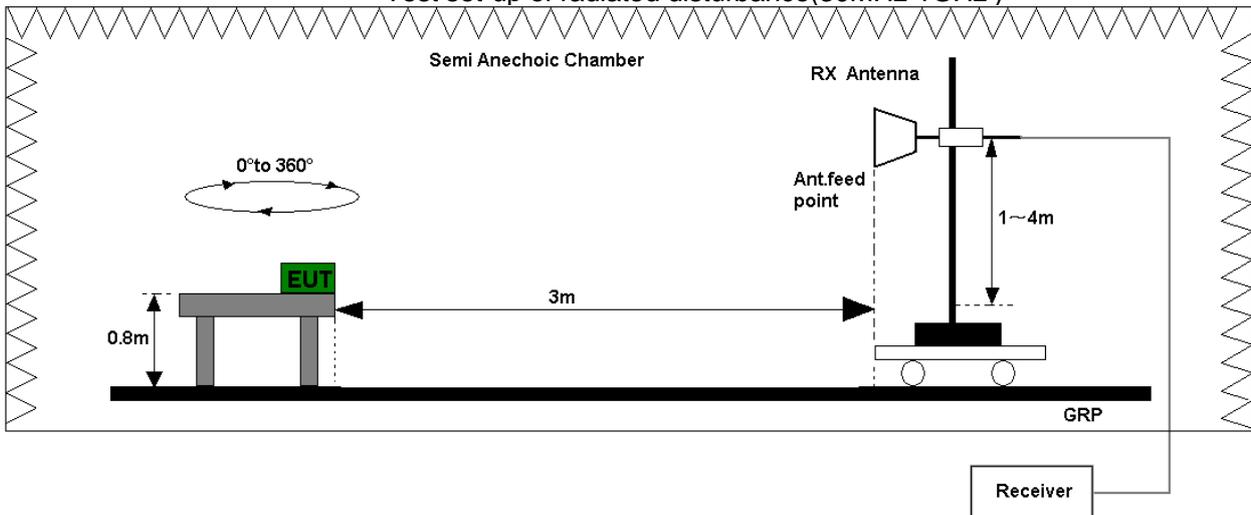
A preliminary scan and a final scan of the emissions were made from 30 MHz to 18 GHz by using test script of software; the emissions were measured using Quasi-Peak Detector (30MHz~1GHz) and AV/PK detector (above 1GHz). The maximal emission value was acquired by adjusting the antenna height, polarisation 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 set-up of radiated disturbance(30MHz-1GHz )



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.

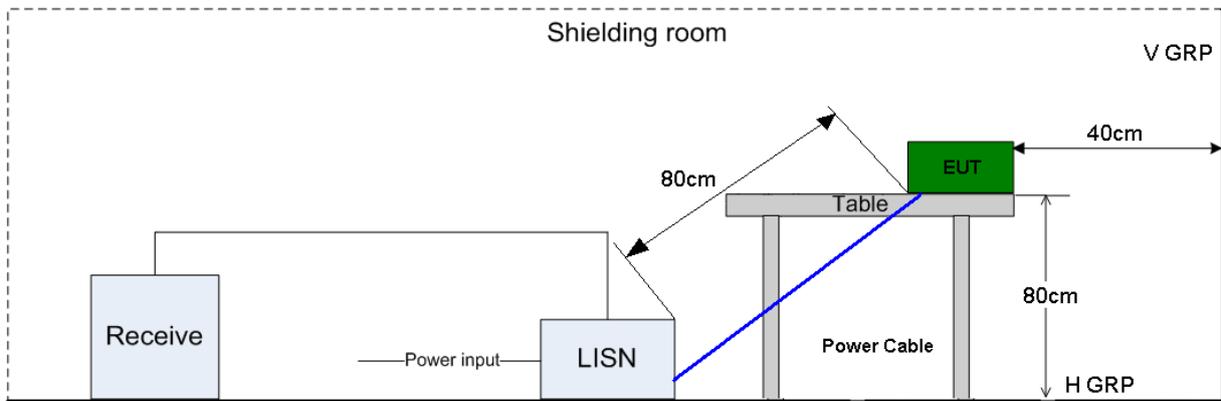
Test Limits				
Frequency of Emission (MHz)	Radiated Limit			
	Unit( $\mu$ V/m)		Unit(dB $\mu$ V/m)	
30-88	100		40	
88-216	150		43.5	
216-960	200		46	
Above 960	500		54	
Above 1000	AV	PK	AV	PK
	500	5000	54	74

## 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. EUT was communicated with the simulator through Air interface, the simulator controls the EUT to transmitter the maximum power which defined in specification of product. The EUT operated on the typical channel. Measurement bandwidth (RBW) for 150kHz to 30 MHz: 9 kHz; The EUT was setup in the screened chamber and operated under nominal conditions.

### Test Setup



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

## 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:

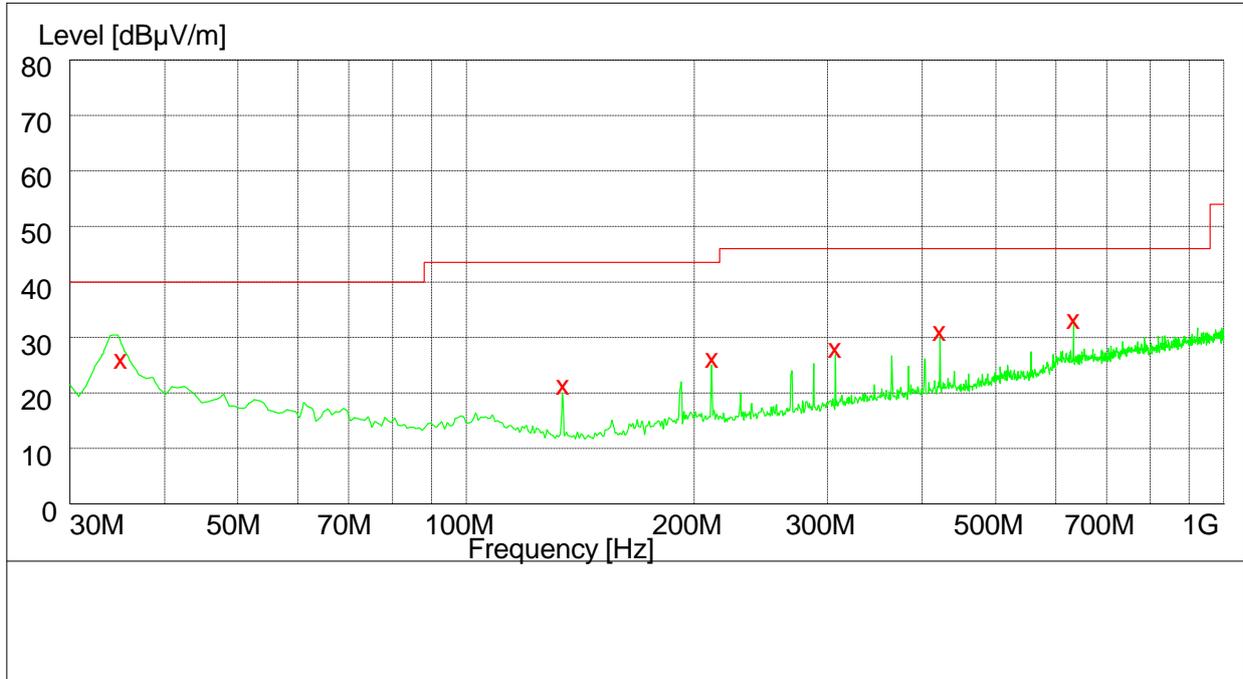
System Measurement Uncertainty		
Items		Extended Uncertainty
RE(30MHz-1GHz)	Field strength (dB $\mu$ V/m)	U=4.1dB; k=2
RE(1GHz-18GHz)	Field strength (dB $\mu$ V/m)	U=5.0dB; k=2
CE	Disturbance Voltage (dB $\mu$ V)	U=2.5dB; k=2

## 7 Graph and Data of Test

Only the worst test result was shown in this report.

### 7.1 Radiated Disturbance

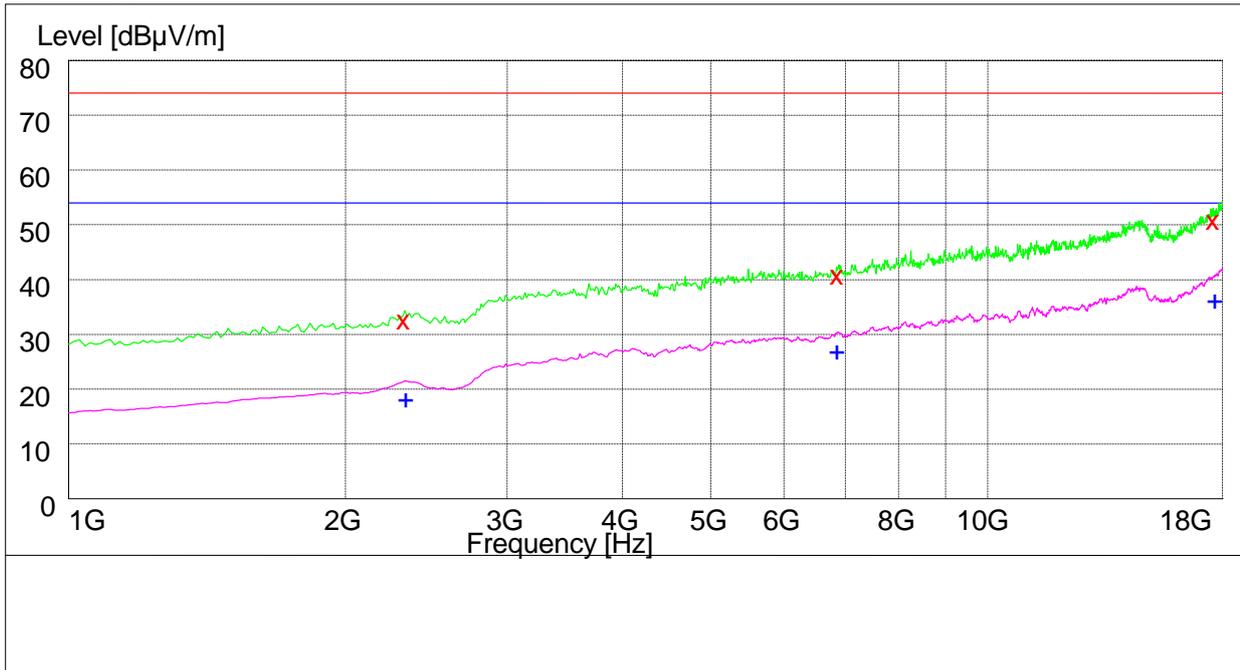
#### 30MHz~1GHz



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV/m	Transducer dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
35.100000	26.70	15.0	40.0	13.3	100.0	164.00	VERTICAL
134.400000	22.10	10.2	43.5	21.4	100.0	132.00	VERTICAL
211.200000	26.80	12.5	43.5	16.7	163.0	28.00	HORIZONTAL
307.200000	28.70	15.2	46.0	17.3	100.0	312.00	HORIZONTAL
422.400000	31.80	18.0	46.0	14.2	100.0	131.00	HORIZONTAL
633.600000	33.90	21.6	46.0	12.1	100.0	0.00	VERTICAL

**1GHz~18GHz**



**MEASUREMENT RESULT: PK Detector**

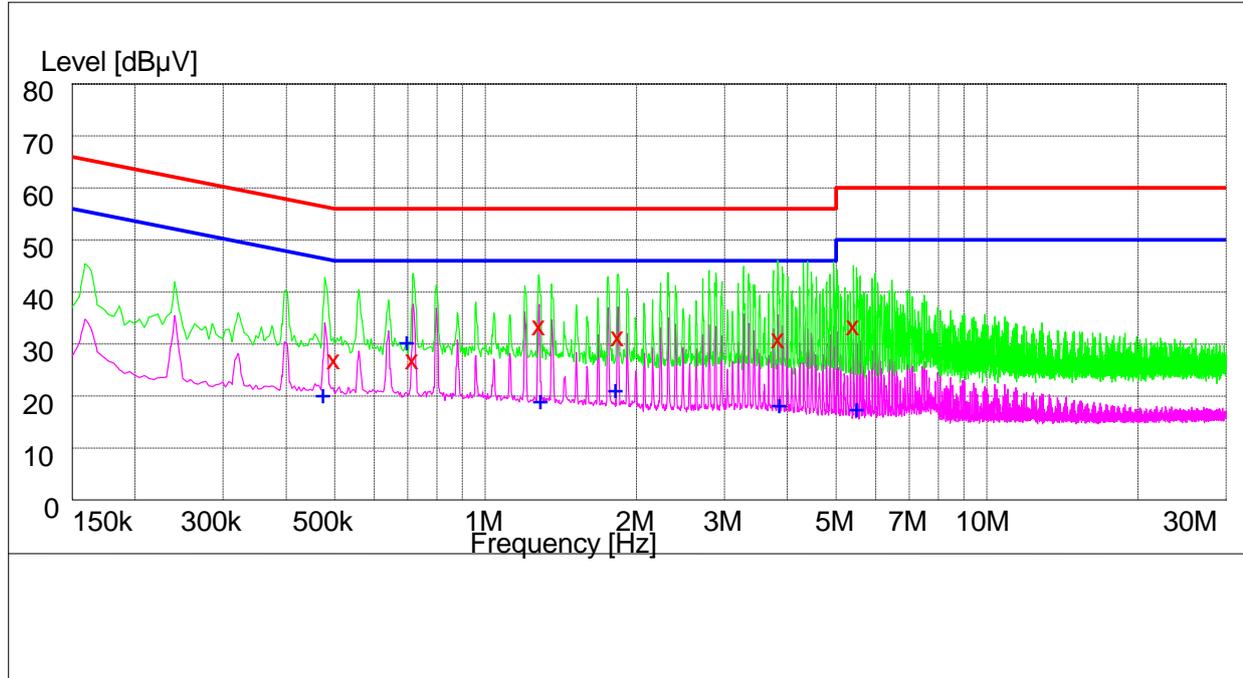
Frequency MHz	Level dBµV/m	Transducer dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
2315.000000	32.50	-10.8	74.0	41.5	179.0	33.00	VERTICAL
6855.000000	40.80	2.1	74.0	33.2	132.0	246.00	HORIZONTAL
17584.000000	50.50	17.5	74.0	23.5	114.0	166.00	HORIZONTAL

**MEASUREMENT RESULT: AV Detector**

Frequency MHz	Level dBµV/m	Transducer dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
2326.500000	19.60	-10.8	54.0	34.4	199.0	33.00	VERTICAL
6848.500000	28.40	2.1	54.0	25.6	200.0	356.00	HORIZONTAL
17632.000000	37.60	17.8	54.0	16.4	124.0	354.00	VERTICAL

## 7.2 Conducted Disturbance

### AC Port Test Data



#### MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV	Transducer dB	Limit dBµV	Margin dB	Line	PE
0.500000	28.50	10.1	56	27.5	N	FLO
0.716000	28.50	10.1	56	27.5	L1	FLO
1.280000	35.00	10.1	56	21.0	N	FLO
1.836000	32.90	10.1	56	23.1	L1	FLO
3.836000	32.50	10.2	56	23.5	N	FLO
5.426000	35.00	10.2	60	25.0	N	FLO

#### MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV	Transducer dB	Limit dBµV	Margin dB	Line	PE
0.474000	21.80	10.1	46	24.6	L1	FLO
0.696000	31.90	10.1	46	14.1	L1	FLO
1.286000	20.70	10.1	46	25.3	L1	FLO
1.816000	22.70	10.1	46	23.3	L1	FLO
3.852000	20.00	10.2	46	26.0	L1	FLO
5.498000	19.10	10.2	50	30.9	L1	FLO

-----END-----