EMC Test Report

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

Model Number: HUAWEI U8651S, U8651S, Summit

Report No:SYBH(Z-EMC)028082012-2
FCC ID: QISU8651S

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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 passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 2174.01.**
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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:	Feb.01, 2012
Start Date of Test:	Feb.01, 2012
End Date of Test:	Feb.10, 2012
Test Result:	Pass

Approved By (Lab Manager)	**2012-08-01**	**Liuchunlin**	Liu Chunlin
	Date	**Name**	**Signature**

Operator	**2012-08-01**	**Daniel**	Daniel
	Date	**Name**	**Signature**

Modification Record

No.	Last Report No.	Modification Description
1	SYBH(Z-EMC)028012012-2	The only difference between U8651S & U8651Tis the silkscreen on the back and TP. As to the test data of U8651S, it's quoted from that of U8651T.

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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 U8651S, U8651S, Summit
Serials Number	L7M7ND1270400042
TX Frequency	GSM850:824MHz To 849MHz; GSM1900:1850MHz To 1910MHz; WCDMA BAND II: 1850MHz To 1910MHz; WCDMA BAND V: 824MHz To 849MHz; WCDMA BAND Ⅳ: 1713MHz To 1753MHz Bluetooth: 2400MHz To 2483.5MHz; WIFI: 2400MHz To 2483.5MHz;
RX Frequency	GSM850:869MHz To 894MHz; GSM1900:1930MHz To 1990MHz WCDMA BAND II: 1930MHz To 1990MHz WCDMA BAND V: 869MHz To 894MHz; WCDMA BAND Ⅳ: 2113MHz To 2153MHz Bluetooth: 2400MHz To 2483.5MHz; WIFI: 2400MHz To 2483.5MHz; GPS: 1574.4 MHz To 1576.44MHz;
HW Version	HD4U865M
SW Version	U8651S100R001USAC85B29
EUT Accessory	
Data cable	Data Cable USB A Male to Micro USB, Black
Adapter	BRAND: HUAWEI Model: HW-050100U1W Input voltage: ~100-240V 50/60Hz 0.2A Output voltage: 5V ⎓ 1A Rated Power: 5W S/N: TPABB2348678
Rechargeable Li-ion	BRAND: HUAWEI Battery Model: HB5K1H Rated capacity: 1400mAh Nominal Voltage: ⎓ +3.7V Charging Voltage: ⎓ +4.2V S/N: WHCB304HI1030194

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 Differences Description

The mobile phone U8651S is a HSDPA/UMTS/GPRS/GSM/EDGE mobile phone with Bluetooth, which supports GMS850/900/1800/1900 and WCDMA850/AWS/1900
The mobile phone U8651T is a HSDPA/UMTS/GPRS/GSM/EDGE mobile phone with Bluetooth, which supports GMS850/900/1800/1900 and WCDMA/850/AWS/1900
The PCB of them is the same.

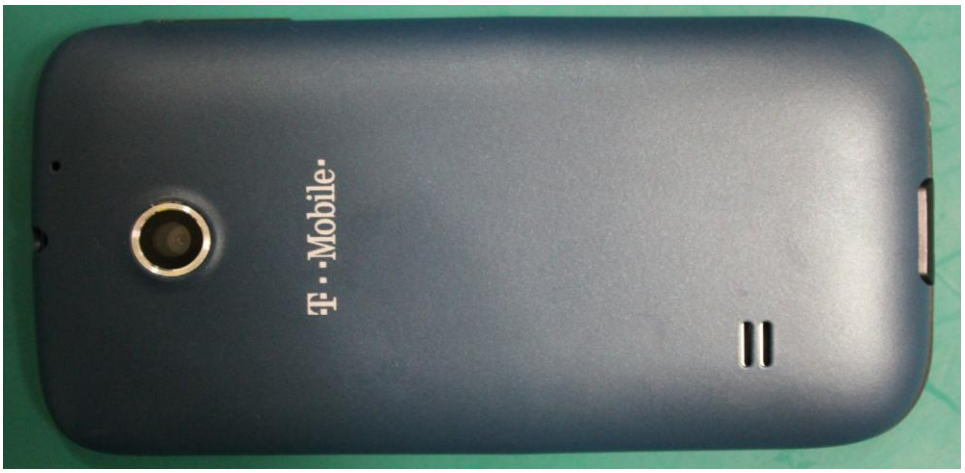
The only difference between U8651S & U8651Tis the silkscreen on the back and TP. As to the test data of U8651S, it's quoted from that of U8651T (with the report No. SYBH(Z-EMC)028012012-2).

The difference between U8651S and U8651T is showed in the following table.

	U8651S	U8651T
GSM four bands	the same	the same
WCDMA bands	WCDMA1900/AWS/850	WCDMA1900/AWS/850
FLASH	the same	the same
PCB	the same	the same
Appearance	the difference	the difference
Bluetooth mode	the same	the same
WLAN mode	the same	the same
BT/ WLAN antenna	the same	the same
GSM/WCDMA antenna	the same	the same
External camera	the same	the same
internal camera	the same	the same
Adapter	the same	the same
Battery	the same	the same
Chipset	the same	the same
Memory	the same	the same
Form factor	Bar type, Internal antenna	Bar type, Internal antenna
RF Parameter	The same RF Parameter in the same band	The same RF Parameter in the same band
BT RF Parameter	the same	the same
Dimension	the same	the same
Weight	the same	the same
Bluetooth	the same	the same
External camera	the same	the same
Main Frequency NV	The same NV in the same band	The same NV in the same band
BT conducted power	the same	the same
WIFI conducted power	the same	the same

The two model's appearance photo:

U8651S



U8651T


HUAWEI


U8651T
U8651S


U8651S
U8651T

1.3 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

1.4 Applied Standards

APPLIED STANDARD

47 CFR FCC Part 15:2011, Subpart B

2 Summary of Results

Summary of Results				
Test Items	**Test Mode**	**Performance Class & Required Performance Criteria**	**Result**	**Site**
Radiated Emissions Enclosure Port	Mode1~ Mode2 Mode4 Mode6 Mode8~ Mode10	CLASS B	Pass	Site1
Conducted Emissions ☒DC Power Port ☒AC Power Port ☐Telecommunication Ports	Mode1~ Mode5	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

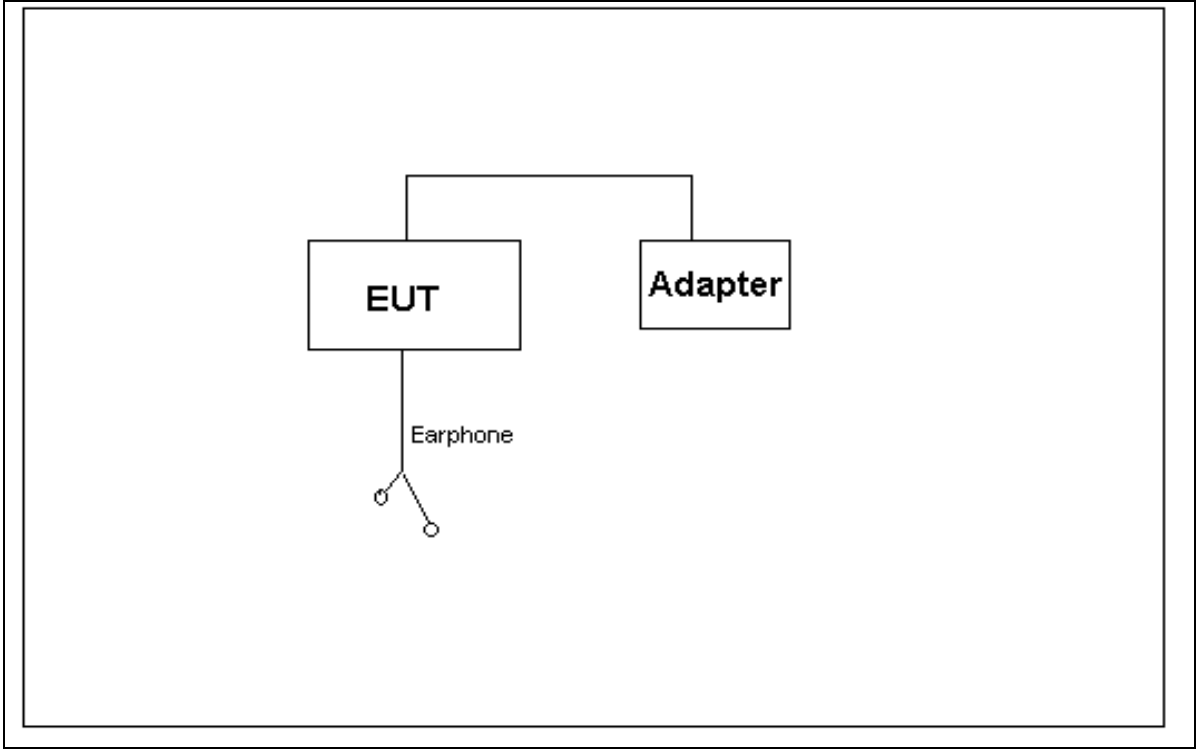
Huawei has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was in this test report and defined as:

Test Mode	
Mode 1:	Adapter + earphone + Camera On + Idle
Mode 2:	Adapter + earphone + MP3 + Idle
Mode 3:	Adapter + earphone +Traffic
Mode 4:	Adapter + earphone + FM + Idle
Mode 5:	Adapter +Traffic
Mode 6:	USB Copy(EUT with PC)+earphone +Idle
Mode 7:	Traffic
Mode 8:	Camera On + earphone + Idle
Mode 9:	earphone+MP3+Idle
Mode 10:	Earphone + FM + Idle

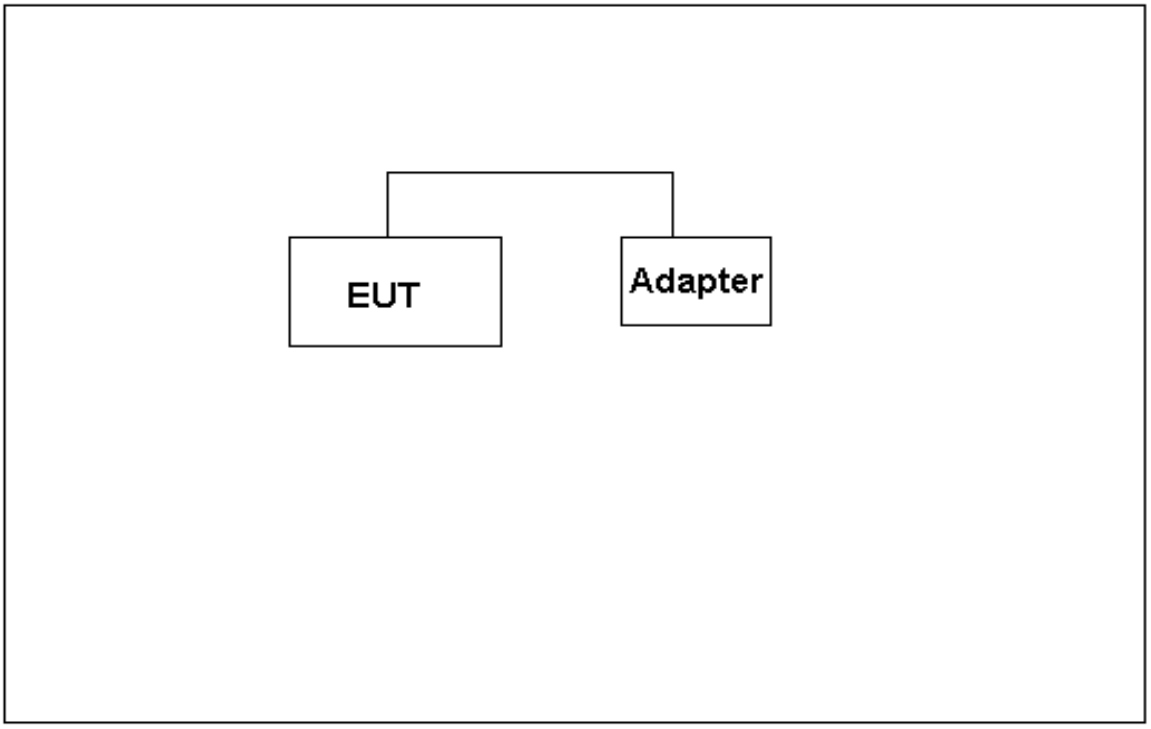
Remark: When the EUT have multiple adapters, need separate test with multiple adapters. All test modes are performed, only the worst cases are recorded in this report.

3.2 Test System Configuration

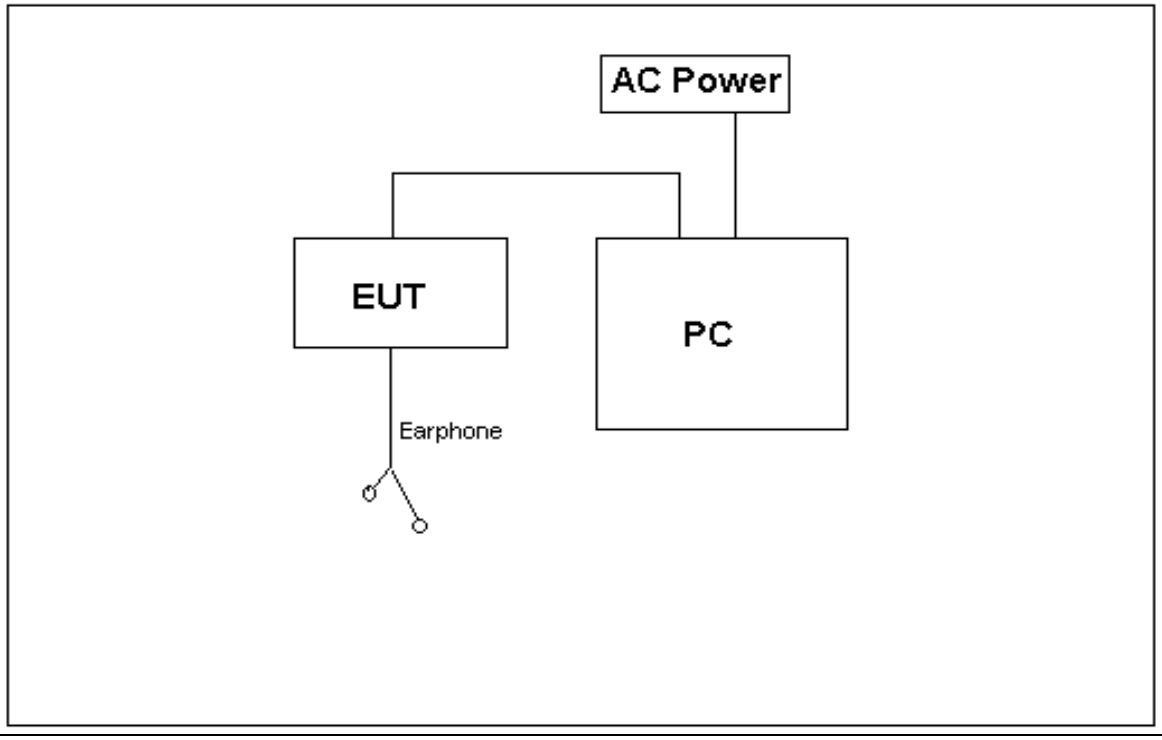
Connection Diagram (Mode 1~Mode 4)



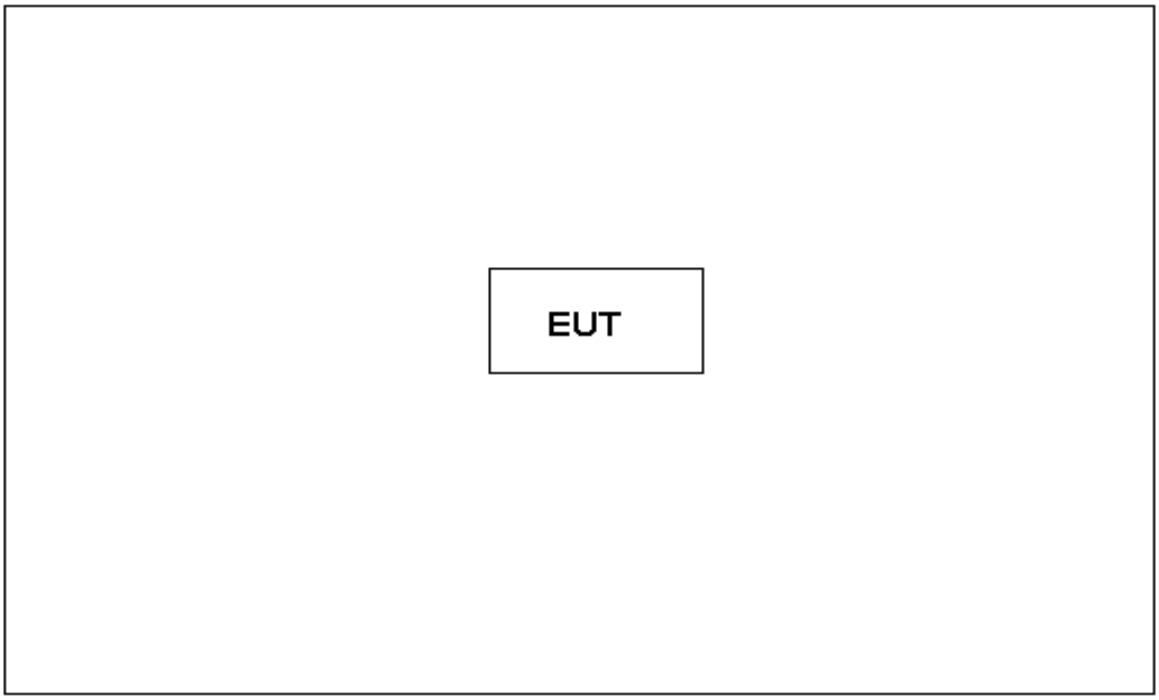
Connection Diagram (Mode 5)



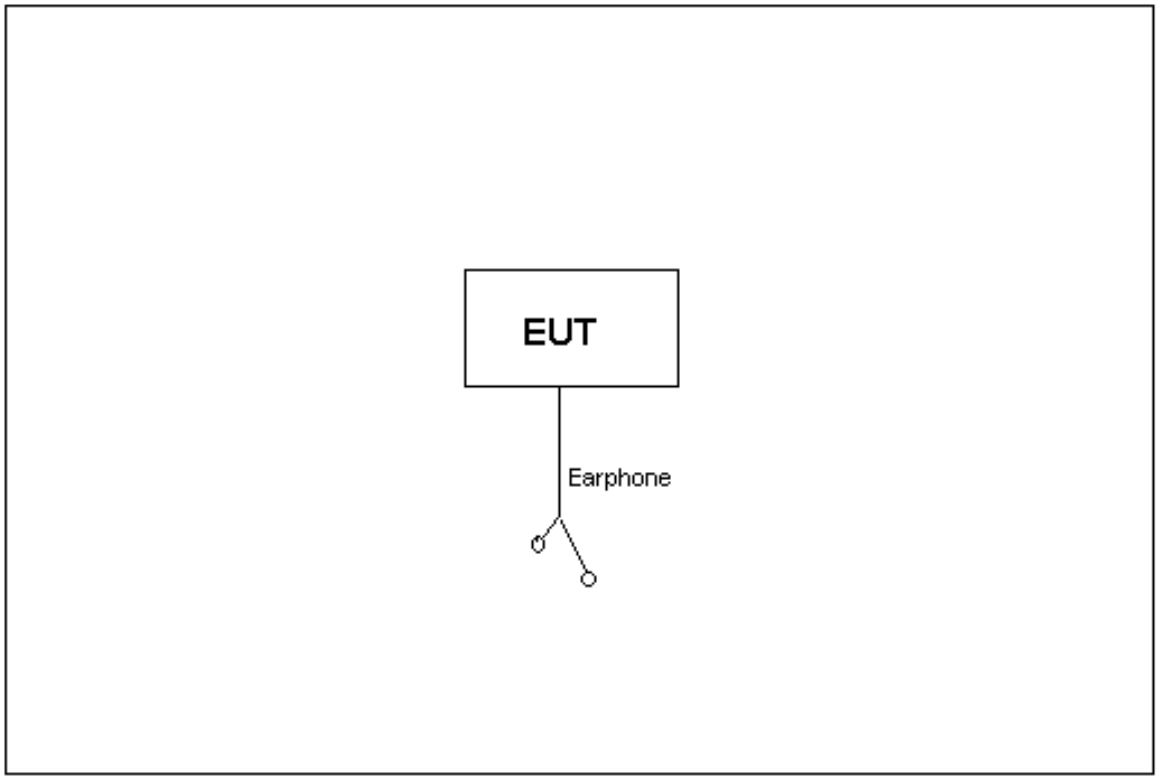
Connection Diagram (Mode 6)



Connection Diagram (Mode 7)



Connection Diagram (Mode 8~Mode 10)



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	Calibrated Deadline	Cal interval (month)
Radio Communication Tester	CMU200	R&S	3608105673	2012-11-06	12
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 C63.4-2003. The test distance was 3m.The set-up and test methods were according to ANSI C63.4-2003.

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 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.

Test setup

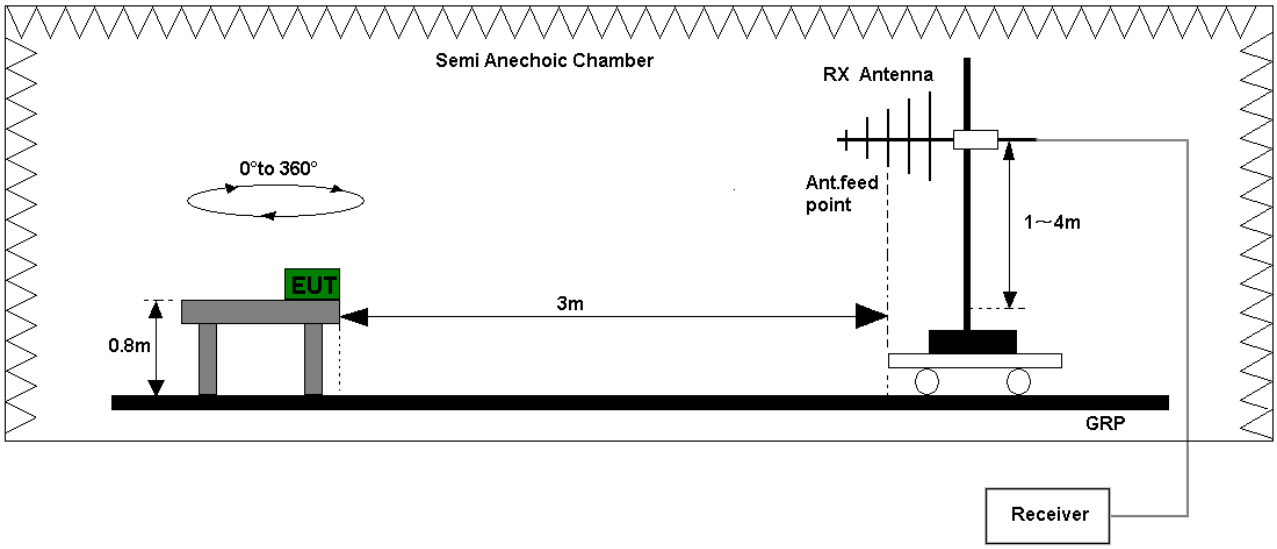


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

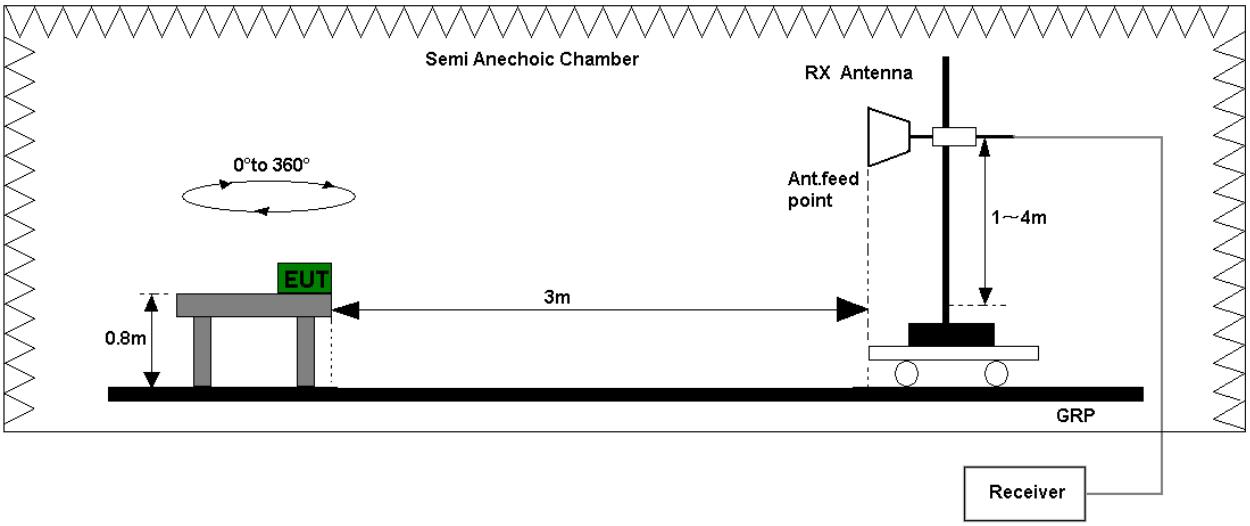


Figure 2. Test set-up of radiated disturbance(above 1GHz)

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	23.0°C
	Relative humidity	25%～75%	53.5%
	Atmospheric pressure	86 kPa～106kPa	101kPa

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 away from LISN. The set-up and test methods were according to ANSI C63.4-2009. 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 150 kHz to 30 MHz: 9 kHz;
The EUT was set in the shielded chamber and operated under nominal conditions.

Test Setup

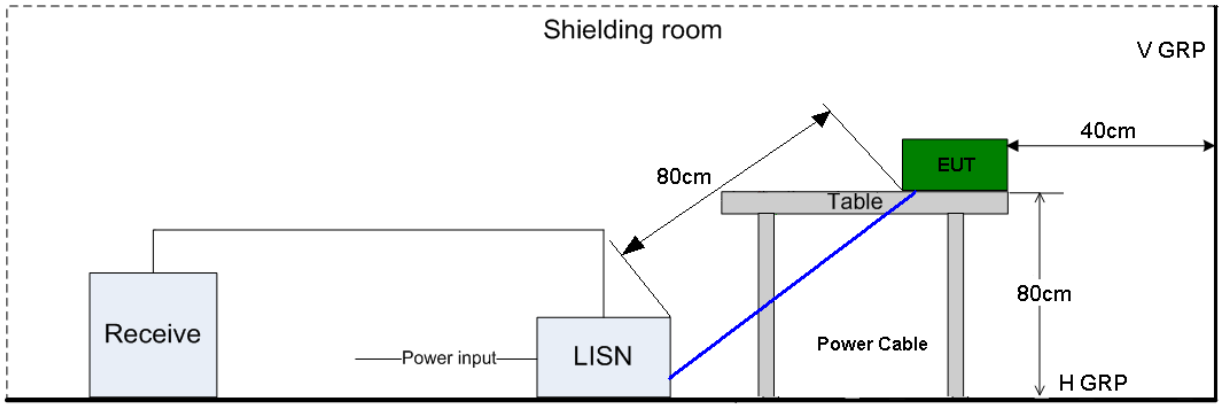


Figure 3. Test Set-up of conducted disturbance

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	23.0°C
	Relative humidity	25%～75%	53.5%
	Atmospheric pressure	86 kPa～106kPa	101kPa

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.27, 2013	12
	Broadband Antenna	VULB 9163	9163-941	SCHWARZBECK	Jul.07, 2013	24
	Horn Antenna	HF906	100683	R&S	May.15, 2013	24
CE	EMI Test receiver	ESCI	101163	R&S	Mar. 05, 2013	12
	Artificial Mains Network	ENV216	100382	R&S	Mar.21, 2013	12

Software Information			
Test Item	Software Name	Manufacturer	Version
RE	ES-K1	R&S	1.7.1
CE	EMC32	R&S	V8.52.0

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:

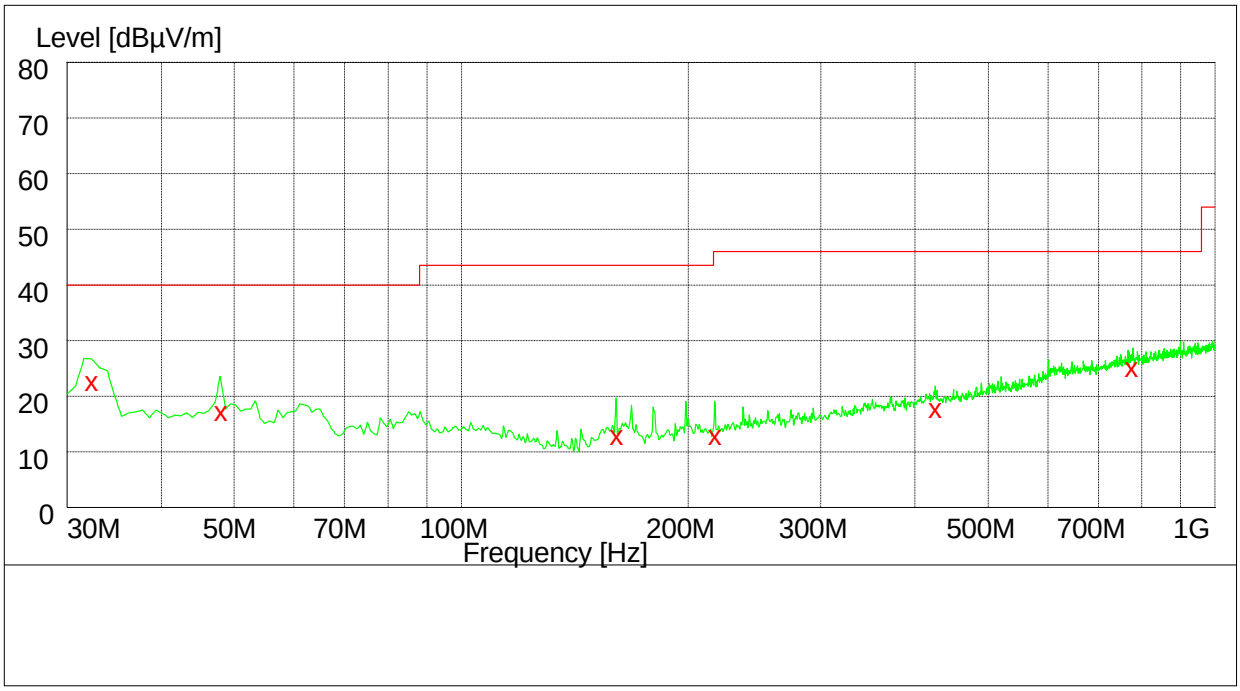
System Measurement Uncertainty		
Items		**Extended Uncertainty**
RE(30MHz-1GHz)	Field strength (dBμV/m)	U=4.1dB; k=2
RE(1GHz-18GHz)	Field strength (dBμV/m)	U=5.1dB; k=2
CE	Disturbance Voltage (dBμV)	U=2.6dB; k=2

7 Test Data and Graph

Only the worst test result was shown in this report.

7.1 Radiated Disturbance

30MHz~1GHz

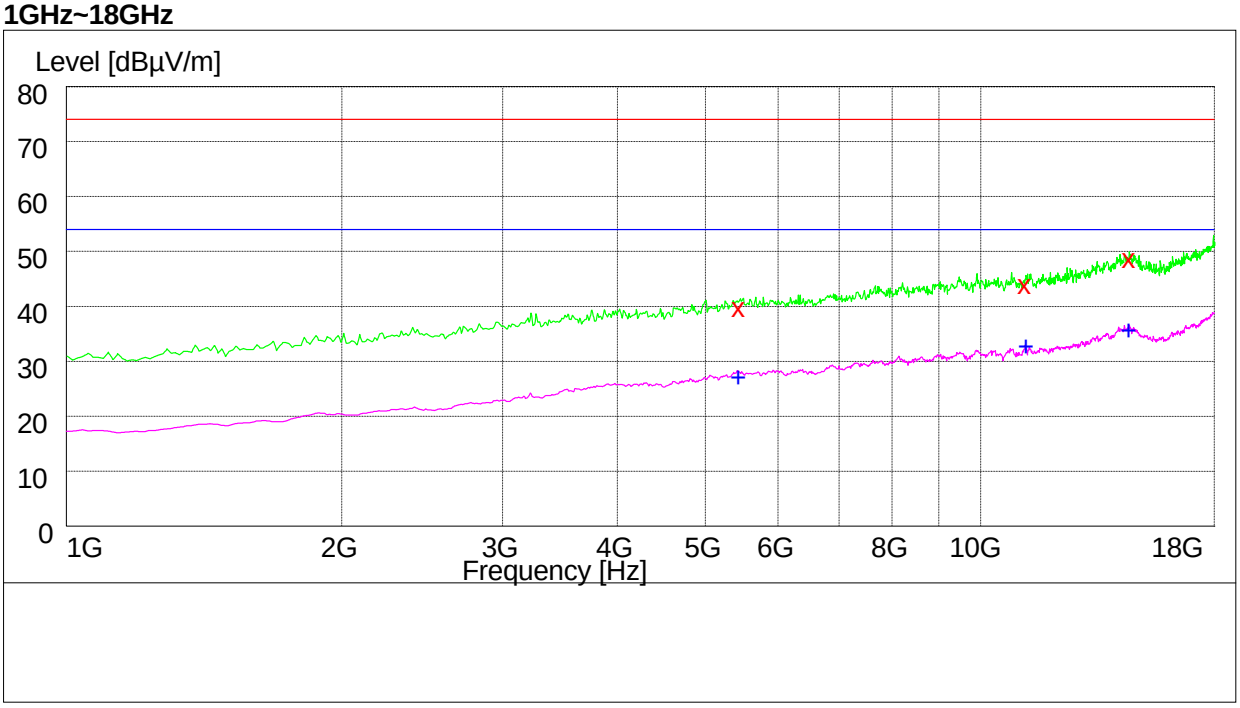


MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV/m	Transducer dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
32.400000	21.10	14.7	40.0	18.9	100.0	75.00	VERTICAL
48.120000	16.40	15.0	40.0	23.6	100.0	359.00	VERTICAL
160.980000	11.40	10.1	43.5	32.1	100.0	106.00	VERTICAL
217.560000	11.40	12.8	46.0	34.6	100.0	32.00	VERTICAL
426.420000	17.00	18.1	46.0	29.0	138.0	88.00	HORIZONTAL
777.720000	24.30	23.4	46.0	21.7	162.0	48.00	HORIZONTAL

Note:
Level =Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)
The reading level is used to calculate 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
5442.000000	39.60	-0.5	74.0	34.4	135.0	77.00	HORIZONTAL
11181.000000	43.90	10.0	74.0	30.1	114.0	105.00	VERTICAL
14524.500000	48.20	14.5	74.0	25.8	103.0	123.00	HORIZONTAL

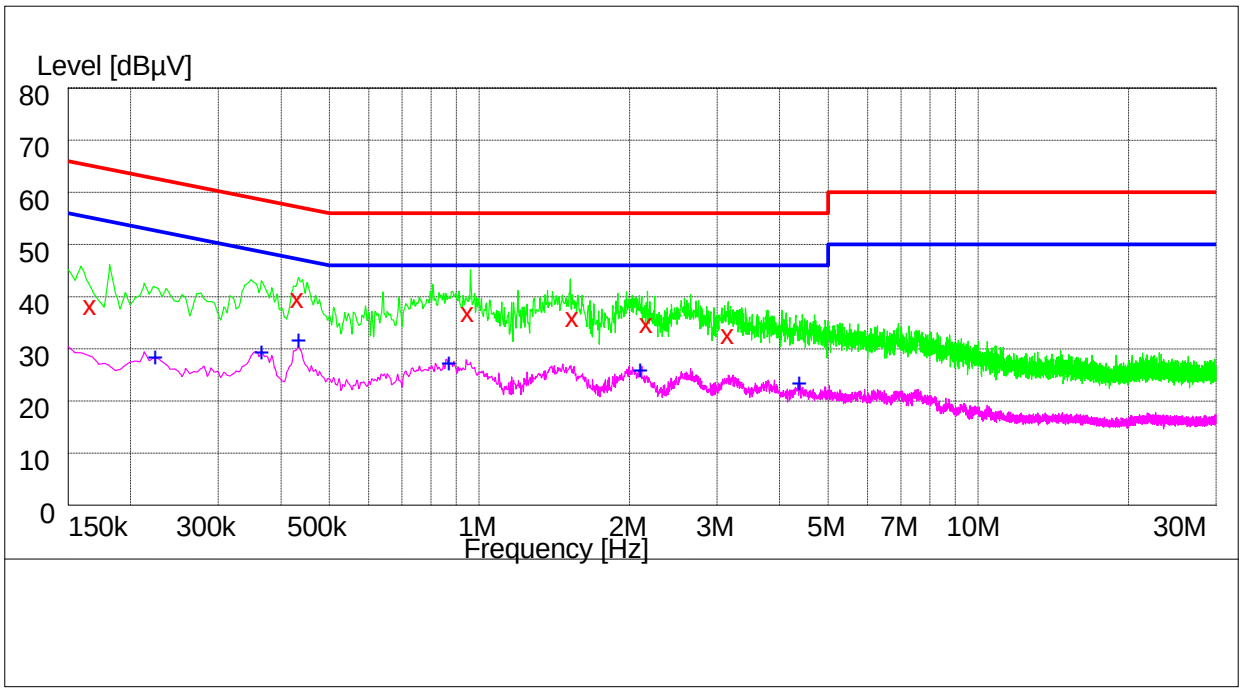
MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV/m	Transducer dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
5424.000000	26.90	-0.6	54.0	27.1	100.0	348.00	VERTICAL
11192.000000	31.50	10.1	54.0	22.5	100.0	134.00	VERTICAL
14517.000000	35.50	14.5	54.0	18.5	133.0	125.00	VERTICAL

Note:
Level =Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)
The reading level is used to calculate by software which is not shown in the sheet.

7.2 Conducted Disturbance

AC Port Test Data



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV	Transducer dB	Limit dBµV	Margin dB	Line	PE
0.166000	37.90	10.1	65	27.1	L1	FLO
0.432000	39.70	10.1	57	17.3	L1	FLO
0.950000	35.10	10.1	56	20.9	L1	FLO
1.540000	34.10	10.1	56	21.9	L1	FLO
2.166000	33.00	10.1	56	23.0	L1	FLO
3.156000	31.20	10.2	56	24.8	L1	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV	Transducer dB	Limit dBµV	Margin dB	Line	PE
0.224000	28.20	10.0	53	24.8	L1	FLO
0.366000	29.70	10.0	49	19.3	L1	FLO
0.434000	30.40	10.1	47	16.6	L1	FLO
0.870000	27.20	10.1	46	18.8	L1	FLO
2.100000	25.80	10.1	46	20.2	L1	FLO
4.380000	22.50	10.2	46	23.5	N	FLO

Note:
Level= Reading level+ Transd (cable loss + correction factor)
The reading level is used to calculate by software which is not shown in the sheet.

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