



EMC Test Report

Product Name: IP Phone

Product Model: eSpace 8950

Report Number: SYBH(E)01405908 EB

Reliability Laboratory of Huawei Technologies Co., Ltd.

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Notice

1. The laboratory has passed the accreditation by China National Accreditation Service for Conformity Assessment (CNAS). The accreditation number is L0310.
2. The laboratory has been listed by the US Federal Communications Commission to perform electromagnetic emission measurements. The site recognition number for the test site located in Shenzhen is 97456, and the recognition numbers for the test site located in Shanghai is 684868.
3. The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers are 6369A-1 for the 3m chamber test site located at G2 building and 6369A-3 for the 10m chamber test site located at K3 building in Shenzhen; the recognition numbers are 6369D-1 for the 3m chamber test site and 6369D-2 for the 10m chamber test site located in Shanghai.
4. The laboratory has been listed by the VCCI to perform EMC measurements. The accreditation numbers for the test site No.1 located at G2 building in Shenzhen are R-3892, G-415, C-4361, and T-1348, and the accreditation numbers for the test site No.2 located at K3 building in Shenzhen are R-3760, G-485, C-4210 and T-1237.
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6. The test report is invalid if there is any evidence of erasure and/or falsification.
7. The test report is only valid for the test samples.
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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
Product Name: IP Phone
Product Model: eSpace 8950

Date of Receipt Sample: 2014-06-16
Start Date of Test: 2014-06-17
End Date of Test: 2014-06-30

Test Result: Pass

Approved by Senior Engineer:	2014-07-08	Zhang Xinghai	<i>Zhang Xing hai</i>
	Date	Name	Signature

Prepared by:	2014-07-07	Wang Jia	<i>Wang Jia</i>
	Date	Name	Signature



Modification Record

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



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1 General Information

1.1 Applied Standard

Applied Product Standard: FCC CFR47 Part 15 Subpart B:2013
ICES-003 Issue 5:2012

Test Method: ANSI C63.4:2009

1.2 Test Location

Test Location 1: Reliability Laboratory of Huawei Technologies Co., Ltd.
Address: No.2222,Xin Jinqiao Road, Pudong New Area, Shanghai,
201206, P.R.C

1.3 Test Environment Condition

Ambient Temperature: 20-26°C
Relative Humidity: 45-55%
Atmospheric Pressure: 101kPa



2 Summary of Test Results

Table 1 Test summary

EUT Classification: Class B Digital Device				
Test Items	Test Configuration	Limit	Test Result	Location
<u>Radiated Emissions</u> Enclosure Port	TC1-TC3	Class B	Pass	Location1
<u>Conducted Emissions</u> AC Power Port	TC1, TC3	Class B	Pass	Location1

Note:
1, Measurement taken is within the uncertainty of measurement system.
2, TC = Test configuration



3 Equipment Specification

3.1 General Description

eSpace 8950 is a high-end video IP phone that features a sleek, elegant design. It delivers a revolutionary high-definition (HD) video calling and conferencing experience and is well-suited for senior executives, key decision-makers, and managing assistants.

eSpace 8950 has the following features:

- 8-inch multi-touch capacitive full-view in-plane switching (IPS) screen with a 1280 x 800 resolution
- Runs on the Android 4.2 operating system and supports a large variety of third-party applications
- Opus full-band audio codec and dual speakers provide high-fidelity audio
- Delivered with an external USB camera that supports up to 1080p at 30-fps
- High-performance audio and video engine with packet loss protection
- Simple and elegant user interface that provides an intuitive HD audio and video conferencing experience
- Dual-band 2.4 GHz/5 GHz WiFi, high-speed Bluetooth technology with ultra-low power consumption, 16 kbit/s wideband audio

The external USB camera is optional, which delivered with eSpace 8950.
All tests were performed on eSpace 8950 with the external USB camera.

3.2 Specification

Table 2 Main equipment specification

Adapter Input voltage	~ 100 V to 240 V (50/60 Hz)
Equipment Input voltage	=== 12V Power over Ethernet: === -48V
Rated Power (W)	18 W
Dimensions(W x D x H)	260 mm (W) × 72mm (D) × 236 mm (H)
Weight (kg)	With Camera Module: 1.3 kg Without Camera Module: 1.25 kg
Transmit frequency	WiFi: 2400 MHz - 2483.5MHz, 5150 MHz - 5850 MHz Bluetooth: 2400 MHz - 2483.5MHz
Receive frequency	WiFi: 2400 MHz - 2483.5MHz, 5150 MHz - 5850 MHz Bluetooth: 2400 MHz - 2483.5MHz
Frequency of the Internal Source (MHz)	24 MHz, 25 MHz, 26 MHz ,70 MHz, 74.25 MHz, 80 MHz, 125 MHz, 400 MHz, 440 MHz, 480 MHz, 800 MHz



Figure 1. EUT Appearance



Figure 2. Adapter appearance (HUNTKEY HW-120200Z1W)



Figure 3. Adapter appearance (FUHUA HW-120200B1W)



Figure 4. Adapter appearance (HUNTKEY HKA02412020-4K)



Figure 5. Adapter appearance (FUHUA HW-120200E1W)



Figure 6. Adapter appearance (HUNTKEY HKA02412020-3K)



Figure 7. Adapter appearance (FUHUA HW-120200C1W)



Figure 8. Adapter appearance (HUNTKEY HKA02412020-1K)



Figure 9. Adapter appearance (FUHUA HW-120200U1W)



Figure 10. Adapter appearance (HUNTKEY HW-120200U1W)



Figure 11. Adapter appearance (HUNTKEY HW-120200A1W)



3.3 Boards and Subassembly

Table 3 Board list

Board	
Board Name	Description
EP01MPUA	Main Board
EP01KEYA	KEY Board
EP01MHSA	Magnetic Induction Hook Board
EP01CAMA	USB Camera Board

Table 4 Subassembly list

Subassembly			
Subassembly Name	Model	Manufacturer	Description
AC/DC Adapter	HW-120200Z1W	HUNTKEY	Input: 100-240 VAC, 50/60 Hz, 0.8A; Output: +12 VDC, 2.0A, Brazil Plug
	HW-120200B1W	FUHUA	Input: 100-240 VAC, 50/60 Hz, 0.8A; Output: +12 VDC, 2.0A, UK Plug
	HKA02412020-4K	HUNTKEY	
	HW-120200E1W	FUHUA	Input: 100-240 VAC, 50/60 Hz, 0.8A; Output: +12 VDC, 2.0A, EU Plug
	HKA02412020-3K	HUNTKEY	
	HW-120200C1W	FUHUA	Input: 100-240 VAC, 50/60 Hz, 0.8A; Output: +12 VDC, 2.0A, China Plug
	HKA02412020-1K	HUNTKEY	
	HW-120200U1W	FUHUA	Input: 100-240 VAC, 50/60 Hz, 0.8A; Output: +12 VDC, 2.0A, USA Plug
	HW-120200U1W	HUNTKEY	
	HW-120200A1W	HUNTKEY	Input: 100-240 VAC, 50/60 Hz, 0.8A; Output: +12 VDC, 2.0A, Australia Plug



4 System Configuration during EMC Test

The Equipment under Test (EUT) functions correctly during all tests. The EUT was installed within the test site and was configured to simulate a typical configuration.

4.1 Ports and Cables

Table 5 Ports and cables

Port	Connector	Board	Length	Qty.	Type of Cable	Remark
Power Port	/	EP01MPUA	2m	1	Unshielded	/
LAN Port(PoE)	RJ45	EP01MPUA	10m	1	UTP	Indoor signal port
PC Port	RJ45	EP01MPUA	10m	1	UTP	Indoor signal port
Headset port	3.5mm	EP01MPUA	1.1m	1	/	/
USB	USB	EP01MPUA	/	2	/	/
USB Camera Port(Female)	USB	EP01MPUA	/	1	/	/
USB Camera Port(Male)	USB	EP01CAMA	/	1	/	/
HDMI	Type A	EP01MPUA	1.5m	1	Shielding cable	/
Mirco SD	Mirco SD	EP01MPUA	/	1	/	/
Handset port	RJ9	EP01MPUA	0.5m	1	4-core telephone Unshielded Cable	/

4.2 Auxiliary Equipment

Table 6 Auxiliary equipment

Name	Model	Manufacturer	S/N	Calibration Date	Cal Interval (month)	Remark
Switch	S5352C-PWR-SI	Huawei	210235183010 AA000009	N/A	N/A	N/A
Enterprise Gateway	EGW 1500E	Huawei	N/A	N/A	N/A	N/A
Personal Computer	HP EliteBook 8440P	HP	CND0360QK3	N/A	N/A	N/A
U Disk	/	Kingston	N/A	N/A	N/A	N/A
TF Card	/	Kingston	N/A	N/A	N/A	N/A
Earphone	AM11	Huawei	N/A	N/A	N/A	N/A
Bluetooth headset	OTE8	Jabra	N/A	N/A	N/A	N/A
Mouse	/	Lenovo	N/A	N/A	N/A	N/A
Monitor	SMT-2231P	SAMSUNG	YDQ03VDBB0 0685W	N/A	N/A	N/A
IP Phone	eSpace 8950	Huawei	210235945010 E6000010	N/A	N/A	N/A

4.3 Test Configurations

The EUT was connected to auxiliary equipment in order to simulate normal operating conditions (with reference to the guidance given in the standard for this type of equipment).

There were three test configurations and four test modes. TC1~TC3 and TM1~TM4 were shown in the following tables and figures:

Table 7 Test configuration

Configuration	Configuration Description	Mode	Mode Description
TC1	eSpace 8950 was Powered by AC/DC adapter and communicated by Ethernet cable	TM1	Calling with handset
		TM2	Calling with handfree
		TM3	Calling with earphone
		TM4	Calling with bluetooth headset
TC2	eSpace 8950 was Powered over Ethernet and communicated by Ethernet cable	TM1	Calling with handset
		TM2	Calling with handfree
		TM3	Calling with earphone
		TM4	Calling with bluetooth headset
TC3	eSpace 8950 was Powered by AC/DC adapter and communicated by WiFi	TM1	Calling with handset
		TM2	Calling with handfree
		TM3	Calling with earphone
		TM4	Calling with bluetooth headset

Note: During the test, all the adapters with the different manufactures and models were used for TC1 and TC3, but the worst test result was supplied.

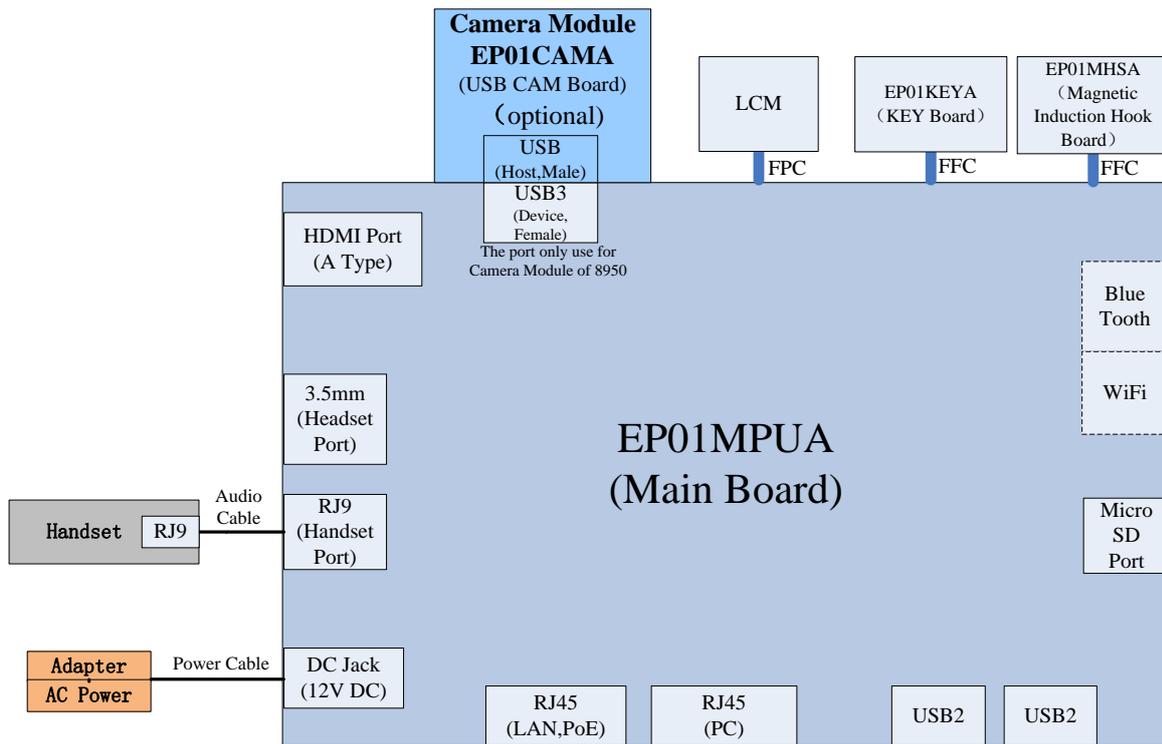


Figure 12. Test Configuration 1 & 3 (TC1 & TC3)

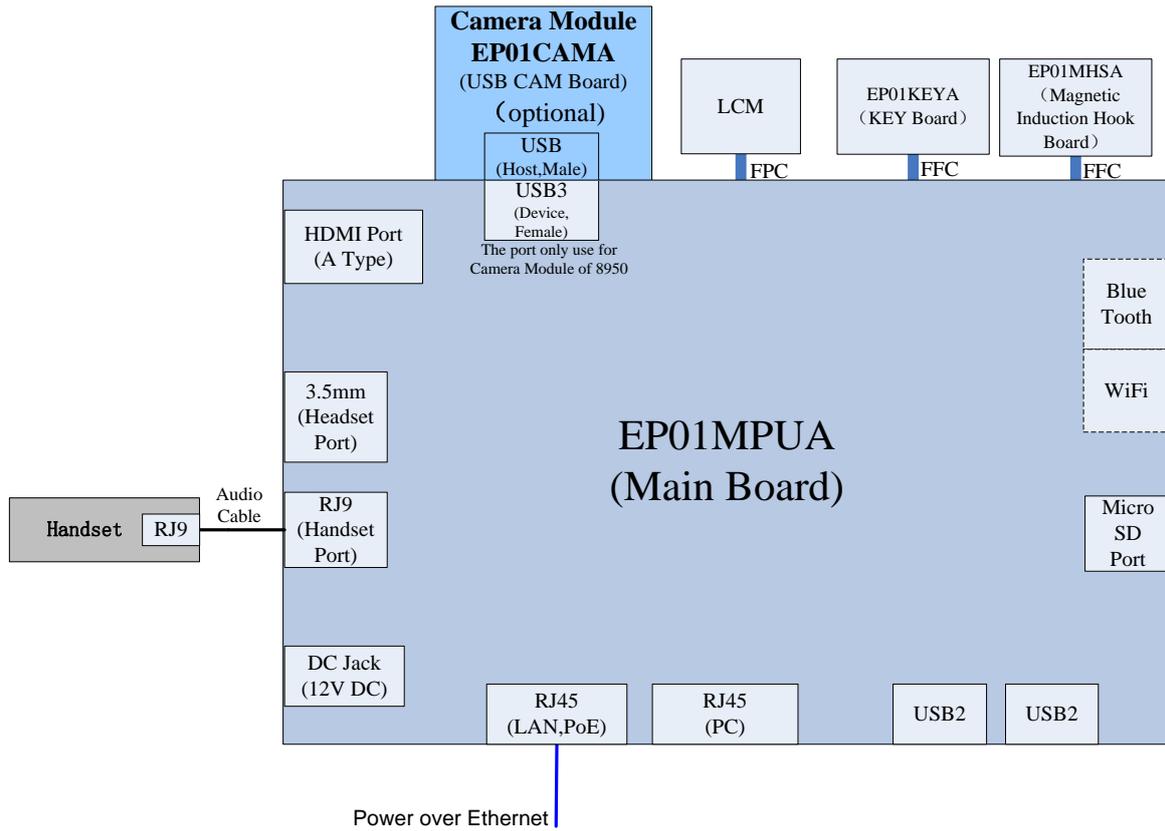


Figure 13. Test Configuration 2 (TC2)

4.4 Test conditions and connections

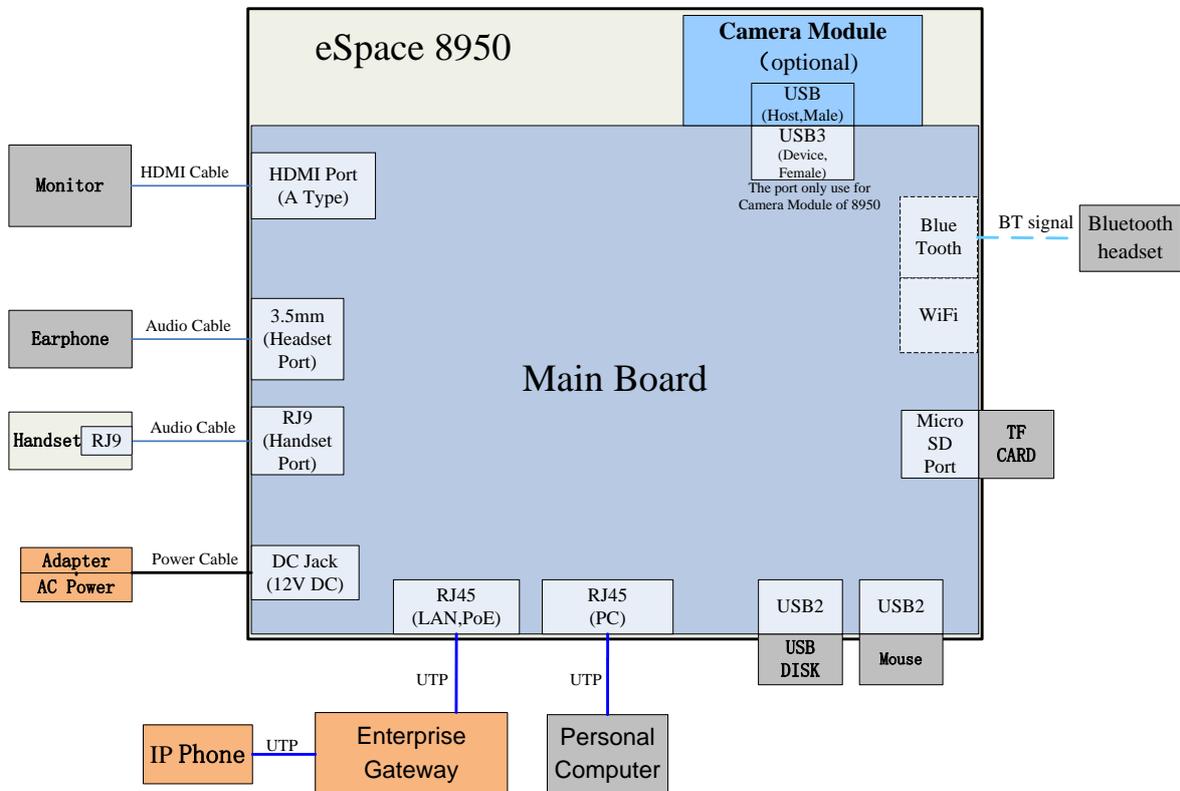


Figure 14. Test connection of TC1

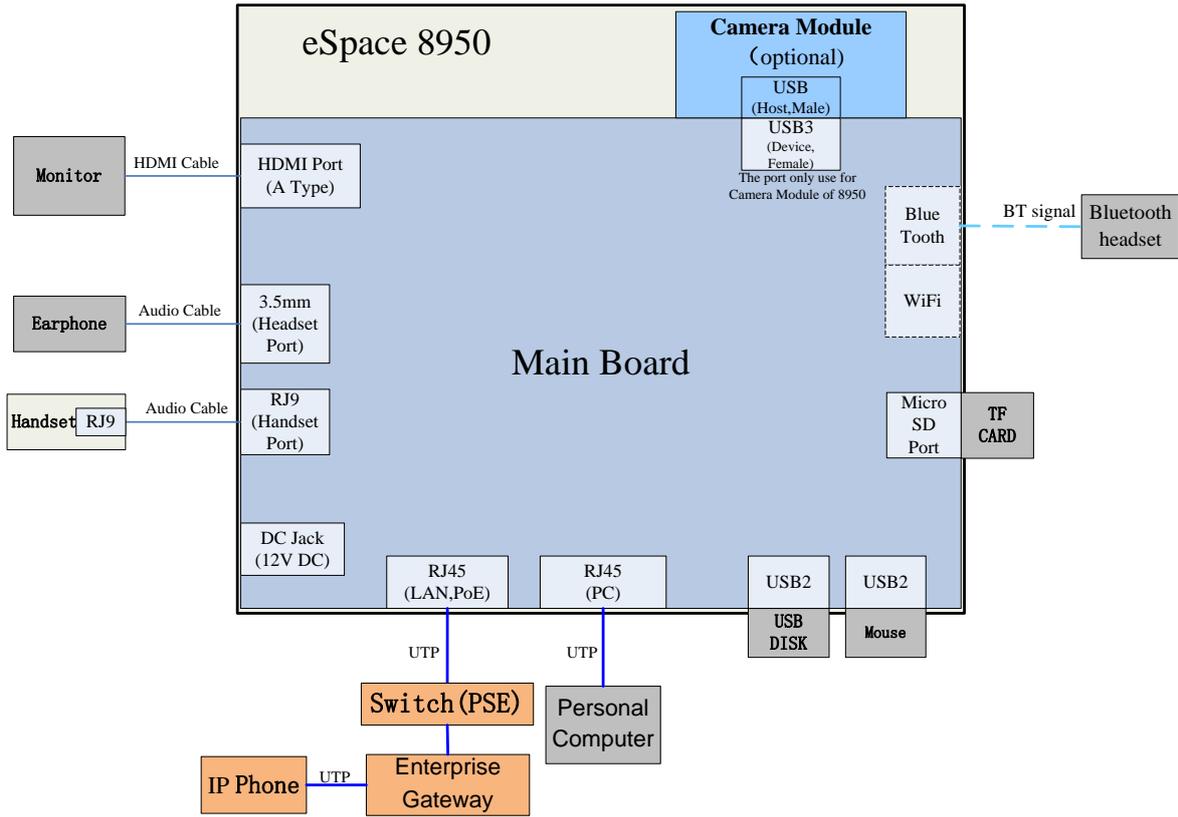


Figure 15. Test connection of TC2

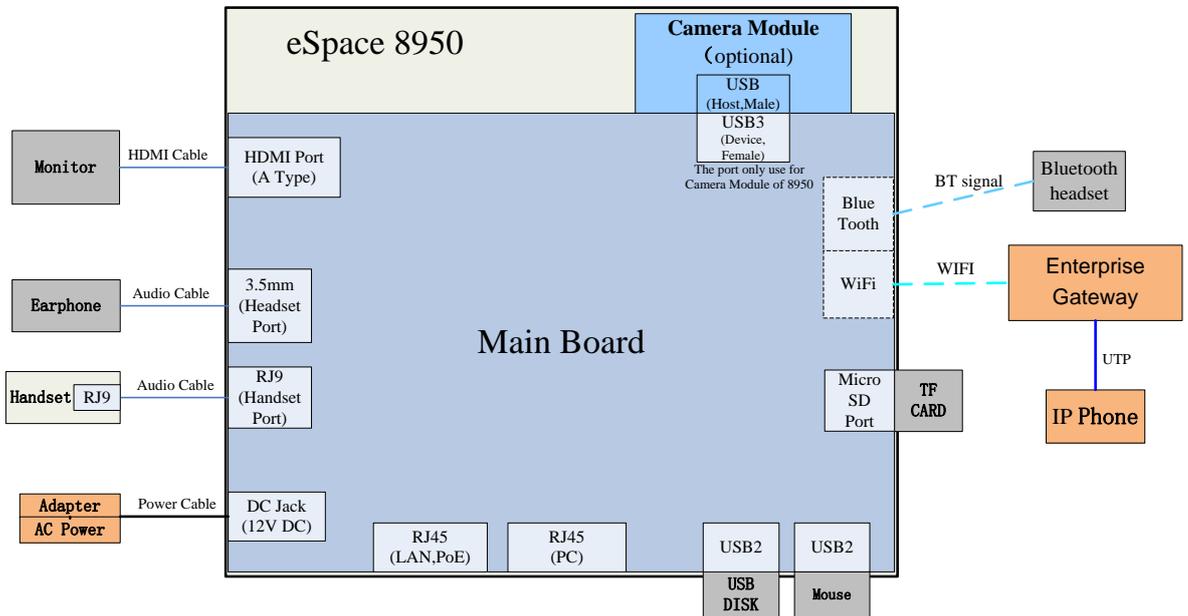


Figure 16. Test connection of TC3

5 Details of Test Items

5.1 Radiated Emission 30 MHz to 18 GHz

5.1.1 Test Procedure

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

The test site full-anechoic chamber for above 1GHz test has met the requirement of S_{VSWR} tolerance 6 dB in accordance with the standard ANSI C63.4. The test distance was 3 m for above 1GHz.

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 for 30 MHz to 1 GHz, Average and Peak detector for above 1 GHz. 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 1 m to 4 m, the azimuth range of turntable was 0° to 360°, The receive antenna has two polarizations V and H.

The test set-up is shown in diagram as below:

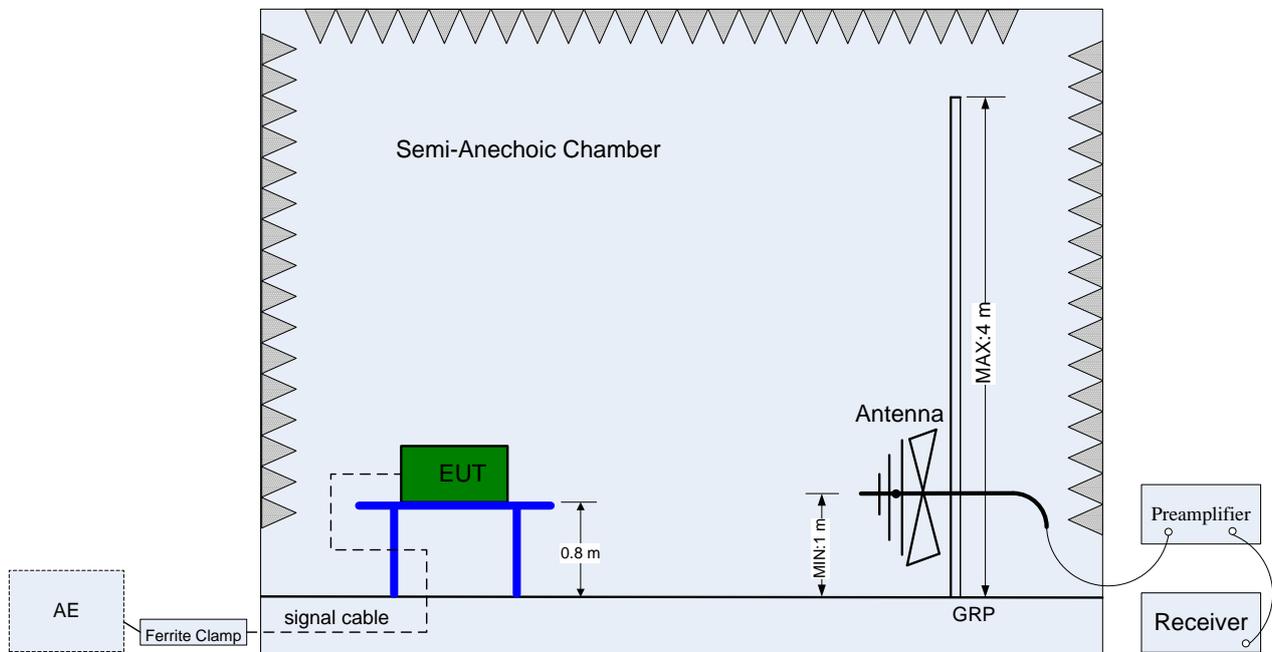


Figure 17. Test set-up of radiated disturbance (30 MHz-1 GHz)

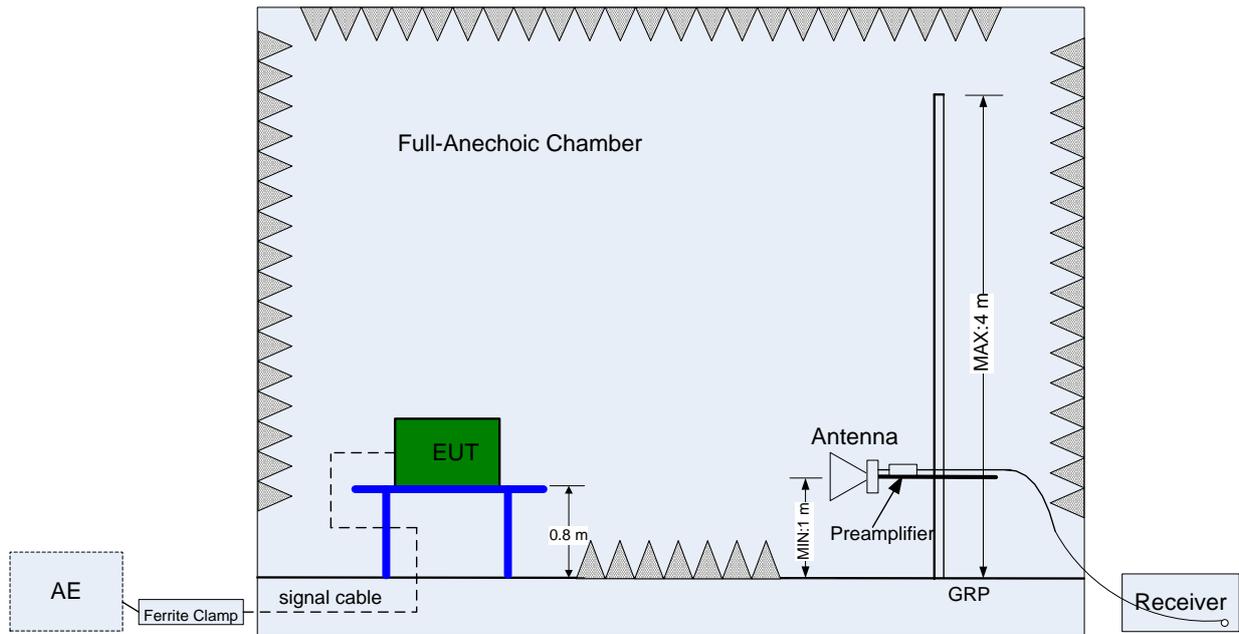


Figure 18. Test set-up of radiated disturbance (above 1 GHz)

5.1.2 Test Results

The EUT has met the requirements for radiated emission of enclosure port.
For the test data, see section 8.1.

Table 8 Test Limits for 30 MHz to 1 GHz at a measuring distance of 3m

Frequency range	30 MHz to 1 GHz	
Measuring distance	3 m	
Classification	Class B	
Limits(Class B)	30 MHz to 88 MHz	40.0 dB μ V/m
	88 MHz to 216 MHz	43.5 dB μ V/m
	216 MHz to 960 MHz	46.0 dB μ V/m
	960 MHz to 1 GHz	53.9 dB μ V/m

Table 9 Test Limits for 1 GHz to 18 GHz at a measuring distance of 3m

Frequency range	1 GHz to 40 GHz	
Measuring distance	3 m	
Classification	Class B	
Limits(Class B)	AV Detector	PK Detector
	53.9 dB μ V/m	73.9 dB μ V/m

Note: The highest frequency of the internal sources of the EUT is 800 MHz; the measurement was made up to 18GHz.

5.2 Conducted Disturbance 0.15 MHz to 30 MHz

5.2.1 Test Procedure

The EUT was configured as described in section 4. The mains cable of the EUT must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

The test set-up is shown in diagram as below:

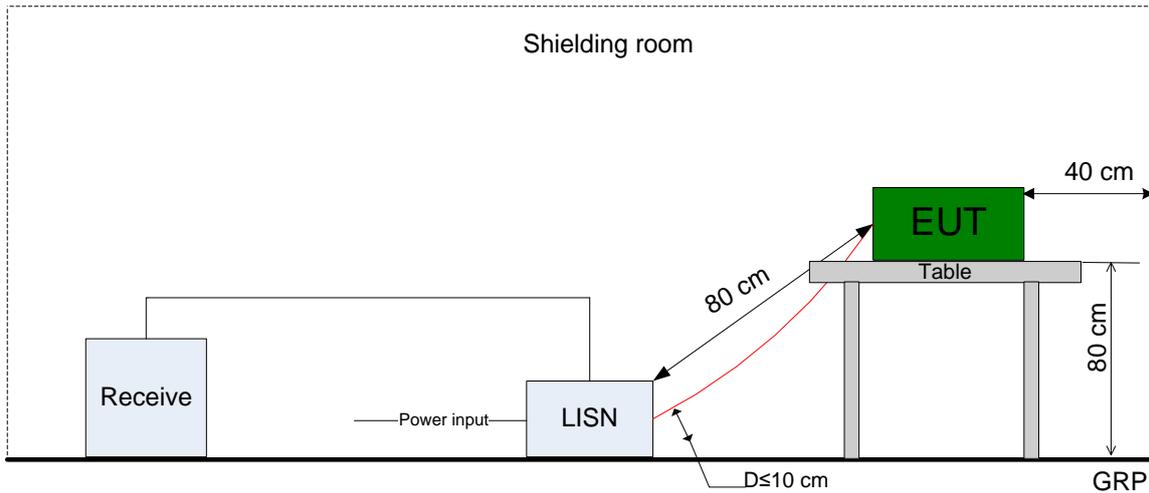


Figure 19. Test set-up of conducted disturbance for power port

5.2.2 Test Results

The EUT has met the requirements of FCC Part15 and ICES-003 for Conducted Disturbance of AC Power Port

For the test data, see section 8.2.

Table 10 Limits of AC power port

Frequency range	150 kHz to 30 MHz	
Classification	Class B	
Limit(Class B)	Voltage limits (dBμV)	
	QP	AV
0.15 to 0.5 MHz	66 to 56	56 to 46
0.5 to 5 MHz	56	46
5 to 30 MHz	60	50



6 Main Test Instruments

Table 11 Main test instrument

Test item	Test Instrument	Model	Manufacturer	Calibration Date	Calibration Interval (month)
Radiated Emission	EMI Test Receiver	ESU40 (100303)	R&S	2014-01-13	12
	Bilog antenna	VULB 9163 (480)	SCHWARZBECK	2013-05-11	24
	Horn antenna	9120D (878)	SCHWARZBECK	2013-03-21	24
	Chamber_NSA	3m chamber	Albatross	2011-12-02	36
	Chamber_S _{VSWR}	3m chamber	Albatross	2011-12-02	36
Conducted Emission	EMI test receiver	ESCI 3 (101619)	R&S	2014-01-13	12
	Artificial Mains Network	ENV4200 (100141)	R&S	2014-01-13	12
Software Information					
Test Item		Software Name	Manufacturer	Version	
Radiated emission		EMC32	R&S	V8.5.3	
Conducted emission		EMC32	R&S	V8.3	



7 System Measurement Uncertainty

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

Table 12 System measurement uncertainty

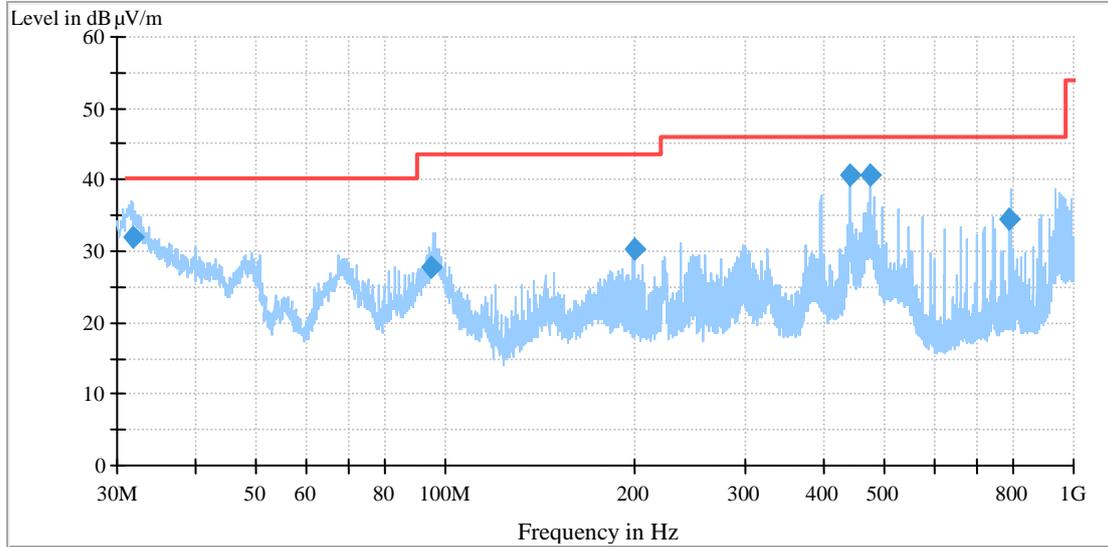
Items		Extended Uncertainty
Radiated emission	Field strength (dB μ V/m)	U=4.3 dB; k=2 (30 MHz - 1 GHz)
		U=4.20 dB; k=2 (1 GHz - 18 GHz)
Conducted emission	Disturbance voltage (dB μ V)	U=2.7dB; k=2



8 Graph and Data of Emission Test

8.1 Radiated Disturbance

8.1.1 Radiated Disturbance of TC1 (30 MHz to 1 GHz)



Measurement Result: QP Detector

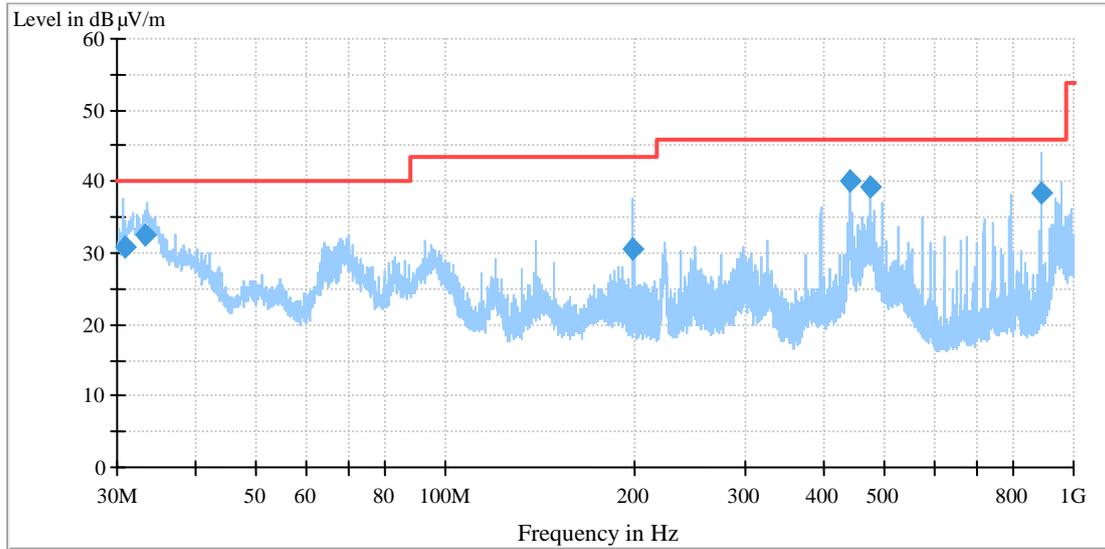
Frequency (MHz)	Level (dBµV/m)	Transd (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
31.800525	31.9	-27.4	40.0	8.1	100.0	272.0	V
95.108500	27.7	-26.0	43.5	15.8	189.0	198.0	H
199.972500	30.3	-27.6	43.5	13.2	138.0	27.0	H
439.999000	40.6	-21.0	46.0	5.4	100.0	172.0	V
474.977500	40.6	-20.2	46.0	5.4	100.0	3.0	V
792.009000	34.5	-14.1	46.0	11.5	100.0	37.0	H

Note:

1. Margin=Limit-Level. 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.
2. All the test modes TM1~TM4 were tested, but the worst result was supplied.



8.1.2 Radiated Disturbance of TC2 (30 MHz to 1 GHz)



Measurement Result: QP Detector

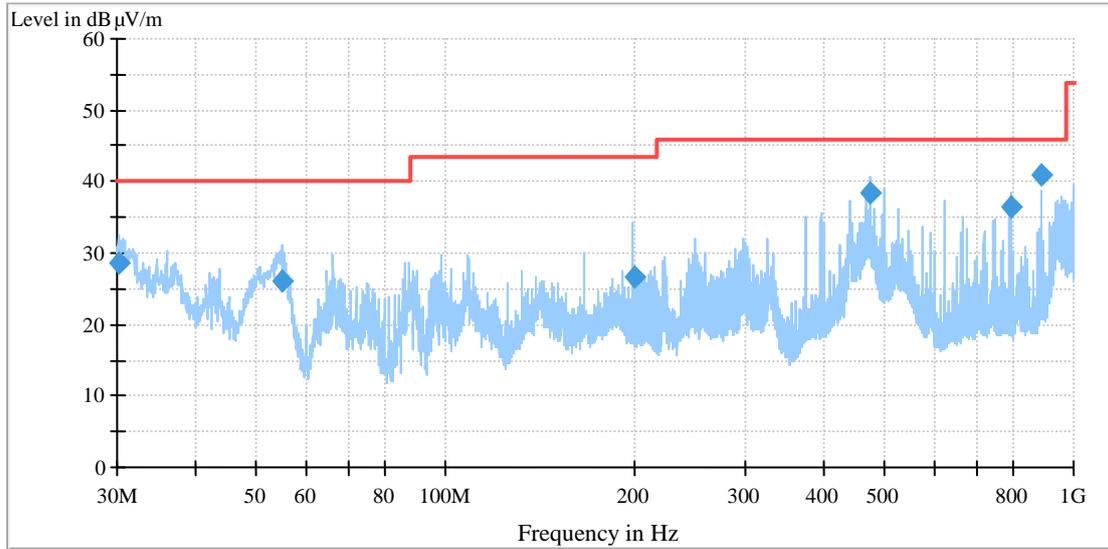
Frequency (MHz)	Level (dBµV/m)	Transd (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
30.852210	30.8	-27.4	40.0	9.2	100.0	212.0	V
33.277080	32.5	-27.4	40.0	7.5	100.0	91.0	V
197.944000	30.6	-27.2	43.5	12.9	218.0	109.0	V
440.011000	40.0	-21.0	46.0	6.0	100.0	291.0	V
474.977500	39.2	-20.2	46.0	6.8	100.0	5.0	V
890.930500	38.5	-12.7	46.0	7.5	100.0	251.0	H

Note:

1. Margin=Limit-Level. 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.
2. All the test modes TM1~TM4 were tested, but the worst result was supplied.



8.1.3 Radiated Disturbance of TC3 (30 MHz to 1 GHz)



Measurement Result: QP Detector

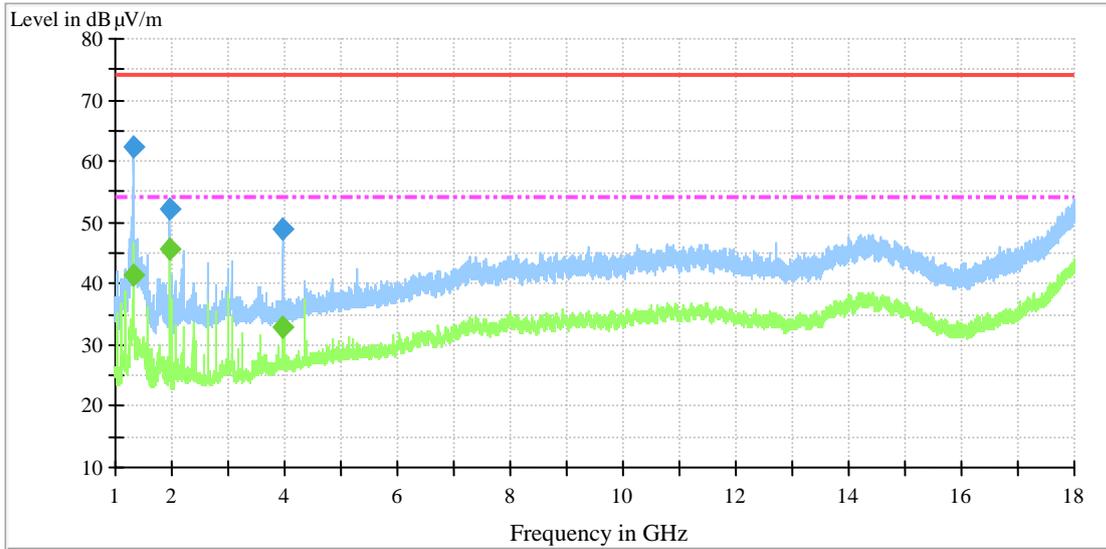
Frequency (MHz)	Level (dBµV/m)	Transd (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
30.300000	28.5	-27.4	40.0	11.5	100.0	294.0	V
54.775500	26.0	-26.7	40.0	14.0	100.0	106.0	V
199.935000	26.7	-27.6	43.5	16.8	127.0	358.0	H
474.977500	38.4	-20.2	46.0	7.6	100.0	10.0	V
795.489000	36.4	-14.1	46.0	9.6	100.0	53.0	H
890.942500	40.9	-12.7	46.0	5.1	100.0	83.0	H

Note:

1. Margin=Limit-Level. 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.
2. All the test modes TM1~TM4 were tested, but the worst result was supplied.



8.1.4 Radiated Disturbance of TC1~TC3 (1 GHz to 18 GHz)



Measurement Result: PK Detector

Frequency (MHz)	Level (dBμV/m)	Transd (dB)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
1320.202000	62.3	-11.5	73.9	11.6	100.0	108.0	V
1979.867667	52.1	-9.9	73.9	21.8	127.0	160.0	H
3959.829333	48.8	-4.4	73.9	25.1	119.0	183.0	V

Measurement Result: AV Detector

Frequency (MHz)	Level (dBμV/m)	Transd (dB)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Azimuth (deg)	Polarisation
1319.802000	41.5	-11.5	53.9	12.4	169.0	278.0	V
1979.867667	45.5	-9.9	53.9	8.4	100.0	159.0	H
3959.901500	32.8	-4.4	53.9	21.1	136.0	127.0	H

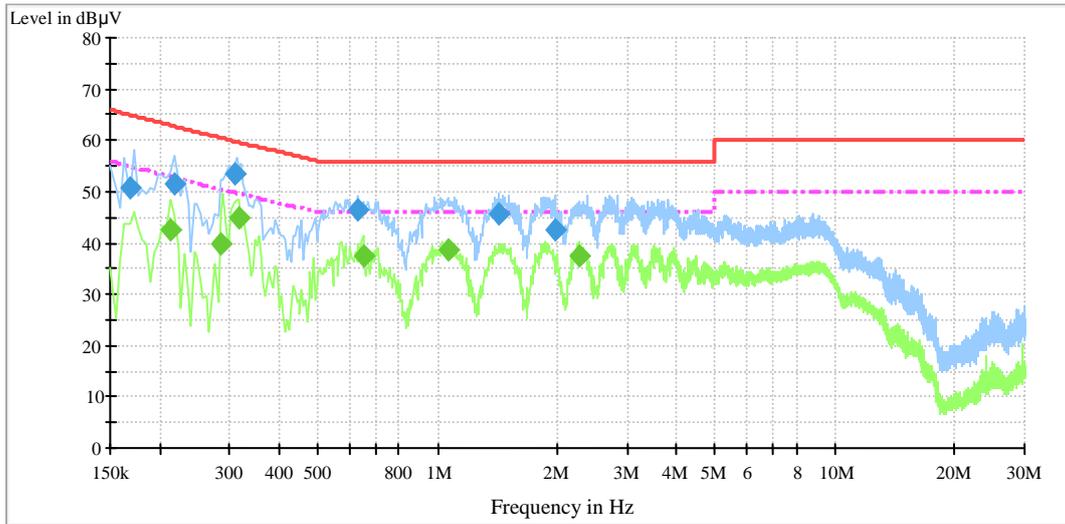
Note:

1. Margin=Limit-Level. 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.
2. All the test configurations TC1~TC3 and test modes TM1~TM4 were tested, but the worst result was supplied.



8.2 Conducted Disturbance

8.2.1 AC Power Port Test Data of TC1 and TC3



Measurement Result: QP Detector

Frequency (MHz)	Level (dBµV)	Transd (dB)	Limit (dBµV)	Margin (dB)	Line	PE
0.168000	50.6	10.1	65.0	14.4	N	GND
0.217500	51.6	10.3	62.7	11.1	L3	GND
0.307500	53.6	10.2	59.8	6.2	N	GND
0.631500	46.4	10.3	56.0	9.6	L3	GND
1.429860	45.5	10.4	56.0	10.5	N	GND
1.976138	42.4	10.3	56.0	13.6	N	GND

Measurement Result: AV Detector

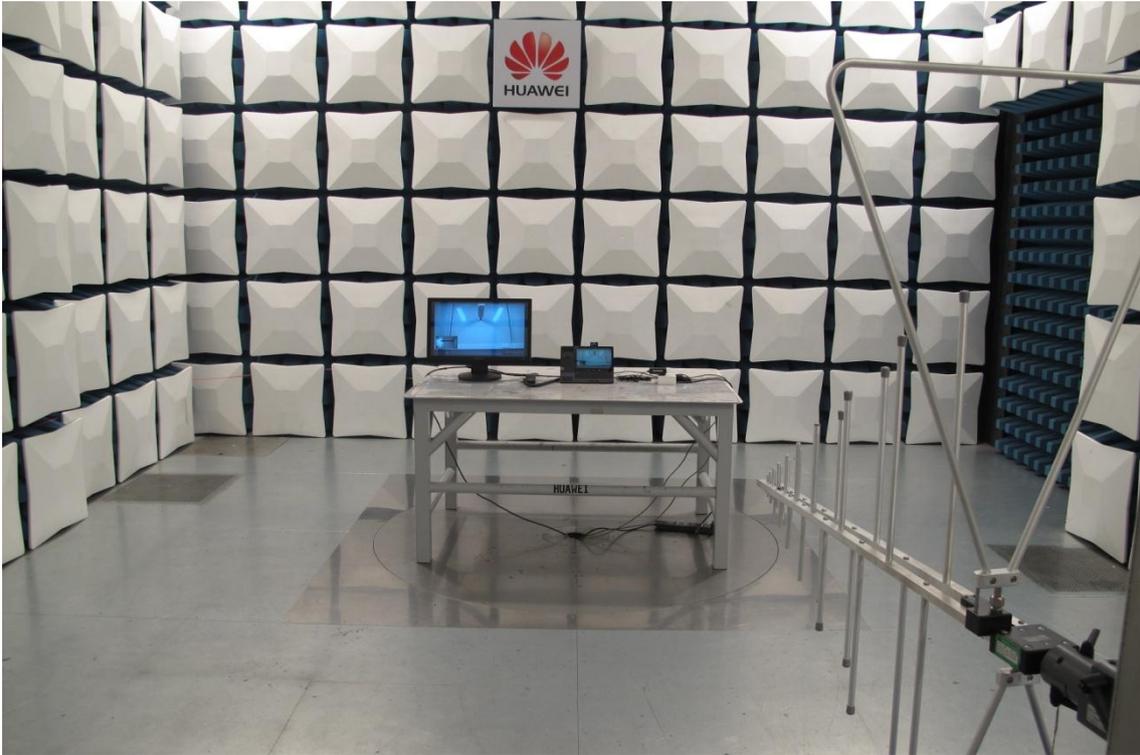
Frequency (MHz)	Level (dBµV)	Transd (dB)	Limit (dBµV)	Margin (dB)	Line	PE
0.213000	42.4	10.3	52.9	10.5	L3	GND
0.285000	39.8	10.2	50.4	10.6	N	GND
0.316500	44.8	10.2	49.6	4.8	N	GND
0.654001	37.7	10.3	46.0	8.3	L3	GND
1.062682	38.5	10.6	46.0	7.5	N	GND
2.285370	37.3	10.3	46.0	8.7	N	GND

Note:

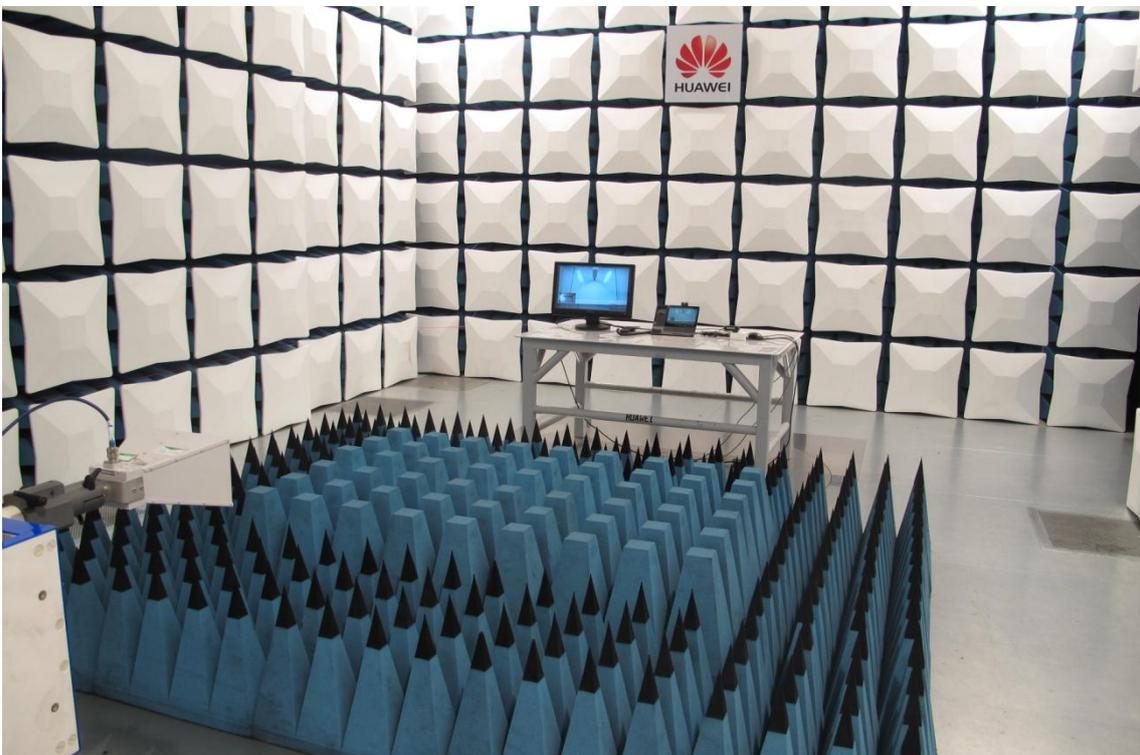
- Margin=Limit-Level. Level= Reading level+ Transd (cable loss + correction factor). The reading level is used to calculate by software which is not shown in the sheet.
- The test configurations TC1, TC3 and test modes TM1~TM4 were tested, but the worst result was supplied.

9 Photographs of Test Set-up

9.1 Radiated Emission



Radiated emission for 30 MHz to 1 GHz



Radiated emission for 1 GHz to 18 GHz



9.2 Conducted Emission



Conducted emissions of AC Power Port



Appendix: Abbreviation

Table 13 Abbreviation

Abbreviation	Full Name
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
EUT	Equipment Under Test
AE	Auxiliary Equipment
AC	Alternate Current
NSA	Normalized Site Attenuation
LISN	Line Impedance Stabilization Network
TC	Test configuration
NT	Not Test
N/A	Not Applicable

EN END