FCC TEST REPORT

FCC ID : WSQKSSERIES

Applicant : Beijing Lanbe Tianhe Technologies&Develop CO., Ltd.
Address : Room 508,Guoxin Building,SHOUT:Nan Rd. NO.20,
Haidian District,Beijing,China

Equipment Under Test (EUT) :

Product Name : KVM SWITCH
Model No : KS-3116 (KT-150); KS-3116 (KT-250); KS-3108 (KT-150);
KS-3108 (KT-250); KS-3104 (KT-150); KS-3104（KT-250)

Standards : FCC Part 15 Subpart B

Date of Test : Mar.10~19,2011
Date of Issue : Mar.21,2011

Test Engineer : **Olic Huang /Engineer**

Reviewed By : **Philo Zhong /Manager**

Test Result :	**PASS ***

PERPARED BY:
Waltek Services (Shenzhen) Co., Ltd.
1/F, Fukangtai Building,West Baima Rd.,Songgang Street, Baoan District, Shenzhen
518105,China
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1 Test Summary

Test	Test Requirement	Test Method	Class / Severity	Result
Conducted Emission (150KHz to 30MHz)	FCC PART 15, SUBPART B	ANSI C63.4: 2003	FCC PART15.107	PASS
Radiated Emission (30MHz to 1GHz)	FCC PART 15, SUBPART B	ANSI C63.4: 2003	FCC PART15.109	PASS

2 Contents

3 General Information

3.1 Client Information

Applicant:	Beijing Lanbe Tianhe Technologies&Develop CO., Ltd.
Address of Applicant:	Room 508,Guoxin Building, SHOUT:Nan Rd. NO.20,Haidian District,Beijing,China
Manufacturer:	Suzhou Switek Electronics&Technology CO., Ltd.
Address of manufacturer:	No.5 Linggang Industry Zone,Luzhi Town, Wuzhong District,Suzhou City

3.2 General Description of E.U.T.

Product description:	Switch video splitter
Model No. :	KS-3116 (KT-150); KS-3116 (KT-250); KS-3108 (KT-150); KS-3108 (KT-250); KS-3104 (KT-150); KS-3104（KT-250)
Model Difference:	The PCB of all models are identical except for the number of connect cable . KS-3116-KT-150 and KS-3104-KT-250 are the test samples.The worse sample is KS-3104-KT-250,so the worst data of KS-3104-KT-250 was shown.

3.3 Details of E.U.T.

Power Supply:	Adapter input: 100V-240VAC, 50/60Hz Adapter Output: 9VDC, 1000mA

3.4 Description of Support Units

The EUT has been tested as an independent unit.

3.5 Standards Applicable for Testing

The customer requested FCC tests for a KVM SWITCH. The standards used was FCC Part 15 Subpart B.

3.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC – Registration No.: 880581**

  Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 880581,June 24，2008.

- **IC – Registration No.: 7760A**

  Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration 7760A, Aug 03, 2010.

3.7 Test Location

All Emissions testswere performed at:-
1/F, Fukangtai Building,West Baima Rd.,Songgang Street, Baoan District, Shenzhen 518105, Guangdong,China.

Remark : All the test results of the peripherals were conformed to the Fcc Verification requirements.

3.8 Equipment Used during Test

Equipment Name	Manufacturer Model	Equipment No	Internal No	Specification	Cal. Date	Due Date	Cert. No	Uncertainty
EMC Analyzer	Agilent/ E7405A	MY45114943	W2008001	9k-26.5GHz	Aug-03-10	Aug-02-11	Wws20081596	±1dB
Trilog Broadband Antenne	SCHWARZBECK MESS-ELEKTROM / VULB9163	336	W2008002	30-3000 MHz	Aug-03-10	Aug-02-11		±1dB
Broad-band Horn Antenna	SCHWARZBECK MESS-ELEKTROM / BBHA 9120D(1201)	667	W2008003	1-18GHz	Aug-03-10	Aug-02-11		f＜10 GHz：±1dB 10GHz＜f＜18 GHz：±1.5dB
Broadband Preamplifier	SCHWARZBECK MESS-ELEKTROM / BBV 9718	9718-148	W2008004	0.5-18GHz	Aug-03-10	Aug-02-11		±1.2dB
10m Coaxial Cable with N-male Connectors	SCHWARZBECK MESS-ELEKTROM / AK 9515 H	-	-	-	Aug-03-10	Aug-02-11		-
10m 50 Ohm Coaxial Cable with N-plug,individual length	SCHWARZBECK MESS-ELEKTROM / AK 9513				Aug-03-10	Aug-02-11		
Positioning Controller	C&C LAB/ CC-C-IF				N/A	N/A		
Color Monitor	SUNSPO/ SP-14C				N/A	N/A		
Test Receiver	ROHDE&SCHWARZ/ ESPI	101155	W2005001	9k-3GHz	Aug-03-10	Aug-02-11	Wws20080942	±1dB
EMI Receiver	Beijingkehuan	KH3931		9k-1GHz	Aug-03-10	Aug-02-11		
Two-Line V-Network	ROHDE&SCHWARZ/ ENV216	100115	W2005002	50Ω/50μH	Aug-03-10	Aug-02-11	Wws20080941	±10%
Absorbing Clamp	ROHDE&SCHWARZ/ MDS-21	100205	W2005003	impandance50 Ω loss ： 17 dB	Aug-03-10	Aug-02-11	Wws20080943	±1dB
10m 50	SCHWARZB				Aug-	Aug-		

Equipment Name	Manufacturer Model	Equipment No	Internal No	Specification	Cal. Date	Due Date	Cert. No	Uncertainty
Ohm Coaxial Cable with N-plug,individual length	ECK MESS-ELEKTROM / AK 9514				03-10	02-11		
Digital Power Analyzer	Em Test AG/Switzerland/ DPA 500	V07451 03095	W2008012	Power：2000VA Vol-range：0-300V Freq_range：10-80Hz	Aug-03-10	Aug-02-11	Wwd20081185	Voltage distinguish:0.025% Power_freq distinguish:0.02Hz
Power Source	Em Test AG/Switzerland/ ACS 500	V07451 03096	W2008013	Vol-range：0-300V Power_freq：10-80Hz				
Electrostatic Discharge Simulator	Em Test AG/Switzerland/DITO	V07451 03094	W2008005	Contact discharge：500V-10KV Air diacharge：500V-16.5KV	Aug-03-10	Aug-02-11	Wwc20082400	7.5A current will be changed in V_m=1.5V
RF Generator	TESEQ GmbH/ NSG4070	25781	W2008008	Fraq-range：9K-1GHz RF voltage：-60 dBm-+10dBm	Aug-03-10	Aug-02-11	Wws20081890	Power_freq distinguish0.1Hz RFeletricity distinguish 0.1 B
CDN M-Type	TESEQ GmbH/ CDN M016	25112	W2008009	Voltage correct factor 9.5 dB	Aug-03-10	Aug-02-11	Wwc20082396	150K-80MHz：±1dB 80-230MHz:-2-+3dB
EM-Clamp	TESEQ GmbH/ KEMZ 801	25453	W2008010	Freq_range：0.15-1000 MHz	Aug-03-10	Aug-02-11	Wwc20082397	0.3-400 MHz：±4dB Other freq：±5dB
Attenuator 6dB	TESEQ GmbH/ ATN6050	25365			Aug-03-10	Aug-02-11	Wws20081597	
All Modules Generator	SCHAFFNER/6150	34579	W2008006	voltage:200V-4.4KV Pulse current：100A-2.2KA	Aug-03-10	Aug-02-11	Wwc20082401	voltage: ±10% Pulse current：±10%
Capacitive Coupling Clamp	SCHAFFNER/ CDN 8014	25311			Aug-03-10	Aug-02-11	Wwc20082398	-

Equipment Name	Manufacturer Model	Equipment No	Internal No	Specification	Cal. Date	Due Date	Cert. No	Uncertainty
Signal and Data Line Coupling Network	SCHAFFNER/ CDN 117	25627	W2008011	1.2/50μS	Aug-03-10	Aug-02-11	Wwc20082399	-
AC Power Supply	TONGYUN/ DTDGC-4				Aug-03-10	Aug-02-11	Wws20080944	-
Exposure Level Tester ELT-400	Narda Safety TEST Solutions/2304/03	M-0155	w2008022	Test freq range：1—400kHz	Aug-03-10	Aug-02-11	Wwd20081191	Test uncertainly：1—120kHz:±1.83%, 120 kHz-400 kHz: ±4.06%
Magnetic Field Probe 100cm^2	Narda Safety TEST Solutions/2300/90.10	M-1070	w2008021	Test freq range：1—400kHz				Test uncertainly：1Hz-10Hz: ±16.2%, 10Hz - 120kHz:±2.2%, 120 kHz-400 kHz: ±4.7%
Active Loop Antenna 10kHz-30MHz	Beijing Dazhi / ZN30900A	-	-	10kHz-30MHz	Aug-03-10	Aug-02-11		±1dB
Other								
Notebook	IBM	X31	/	/	Aug-03-10	Aug-02-11		±1dB
PC	acer	AG1720	/	/	Aug-03-10	Aug-02-11		±1dB
Display1	viewsonic	S27996-1W	/	/	Aug-03-10	Aug-02-11		±0.5dB
K/B	DELL	L100	/	/	Aug-03-10	Aug-02-11		±0.5dB
Mouse	acer	M-UVACR1	/	/	Aug-03-10	Aug-02-11		±0.5dB
Display2	viewsonic	S27889	/	/	Aug-03-10	Aug-02-11		±0.5dB

4 Emissions Test Results

4.1 Conducted Emission Data

Test Requirement:	FCC Part15.107
Test Method:	ANSI C63.4: 2003
Test Result:	PASS
Frequency Range:	150kHz to 30MHz
Limit:	66-56 dBμV between 0.15MHz & 0.5MHz
	56 dBμV between 0.5MHz & 5MHz
	60 dBμV between 5MHz & 30MHz
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth)
	Quasi-Peak & Average if maximised peak within 6dB of Average Limit

4.1.1 E.U.T. Operation

Operating Environment:

Temperature:	25.5°C
Humidity:	51 % RH
Atmospheric Pressure:	1012 mbar

EUT Operation :

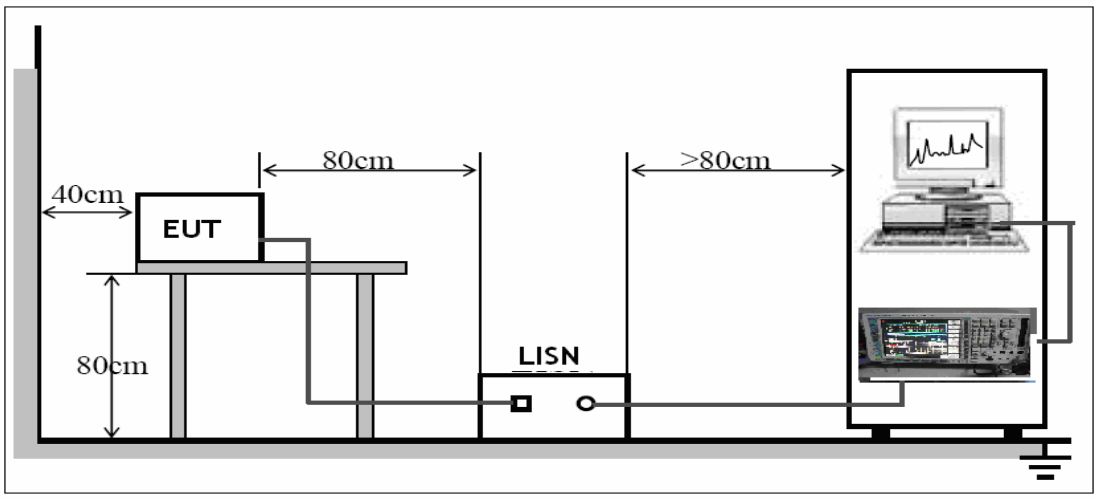
The EUT was tested according to ANSI C63.4: 2003. The frequency spectrum from 150kHz to 30MHz was investigated.

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

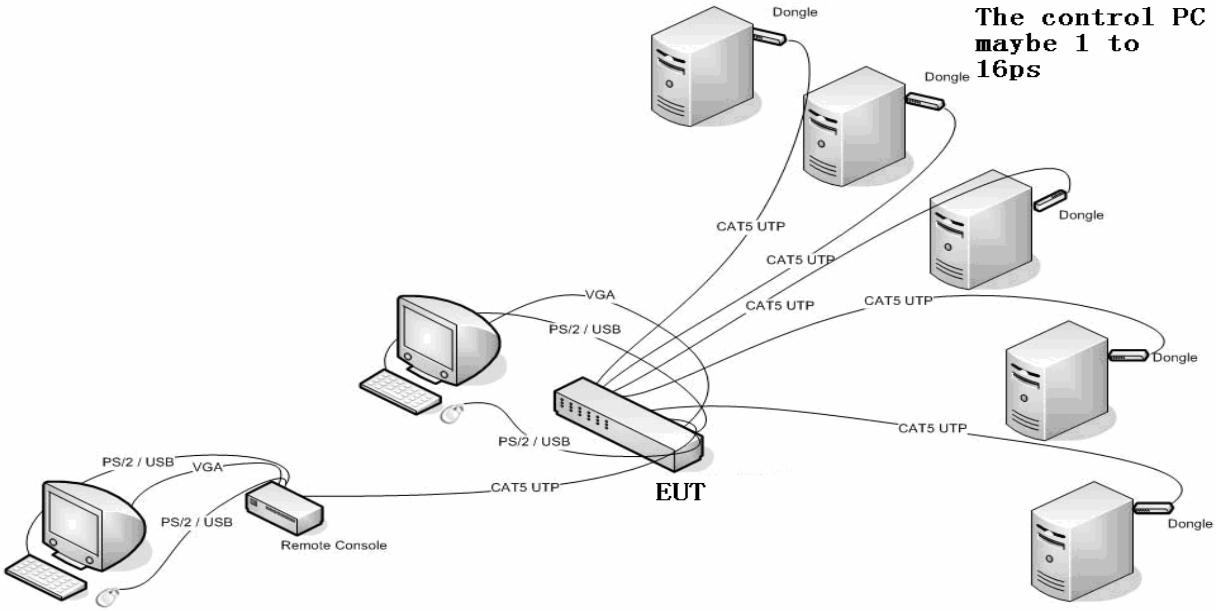
4.1.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.4: 2003, The specification used in this report was the FCC Part15.107 Class B limits.

Picture1



Picture2

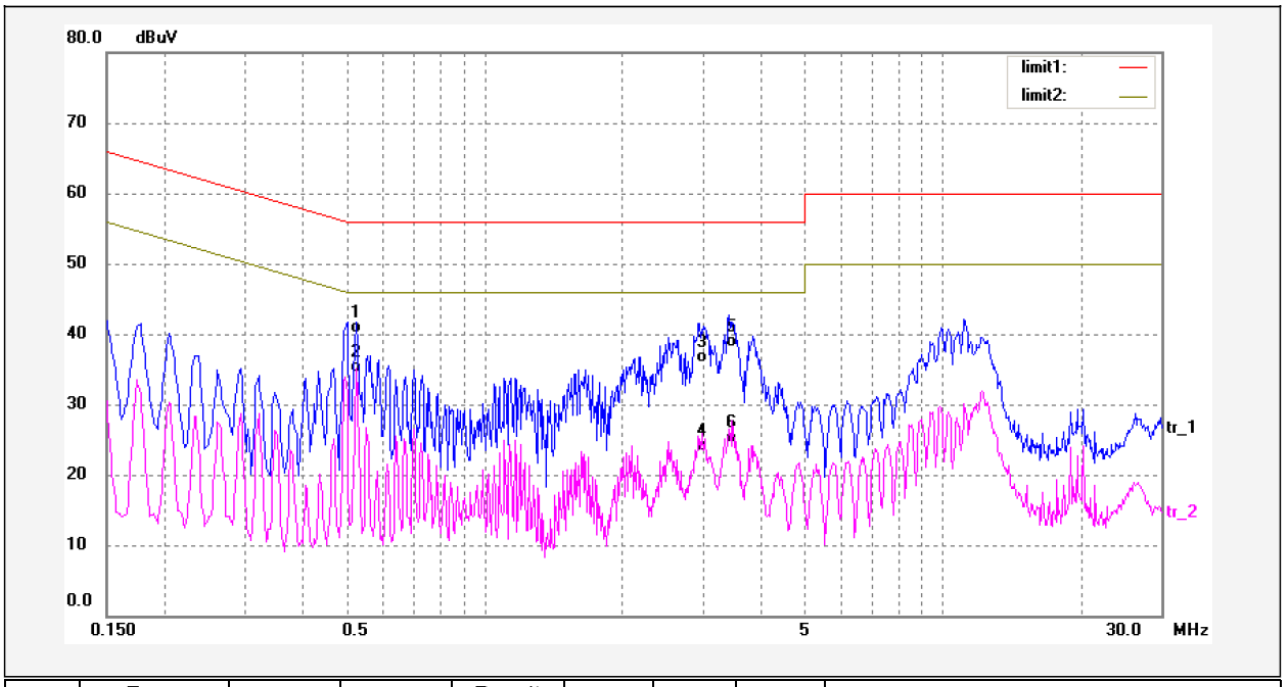


Remark:All the VGA cables are unshielded and the length equal to or less than 1.5m.

The EUT was pretested in working mode connected with the PC and displays,and found that the worst sample was KS-3104-KT-250 working in connected with two displays mode, and scrolling the “H” letter in full screen , the resolution was 1024*768,60Hz the worst data were shown as follow.

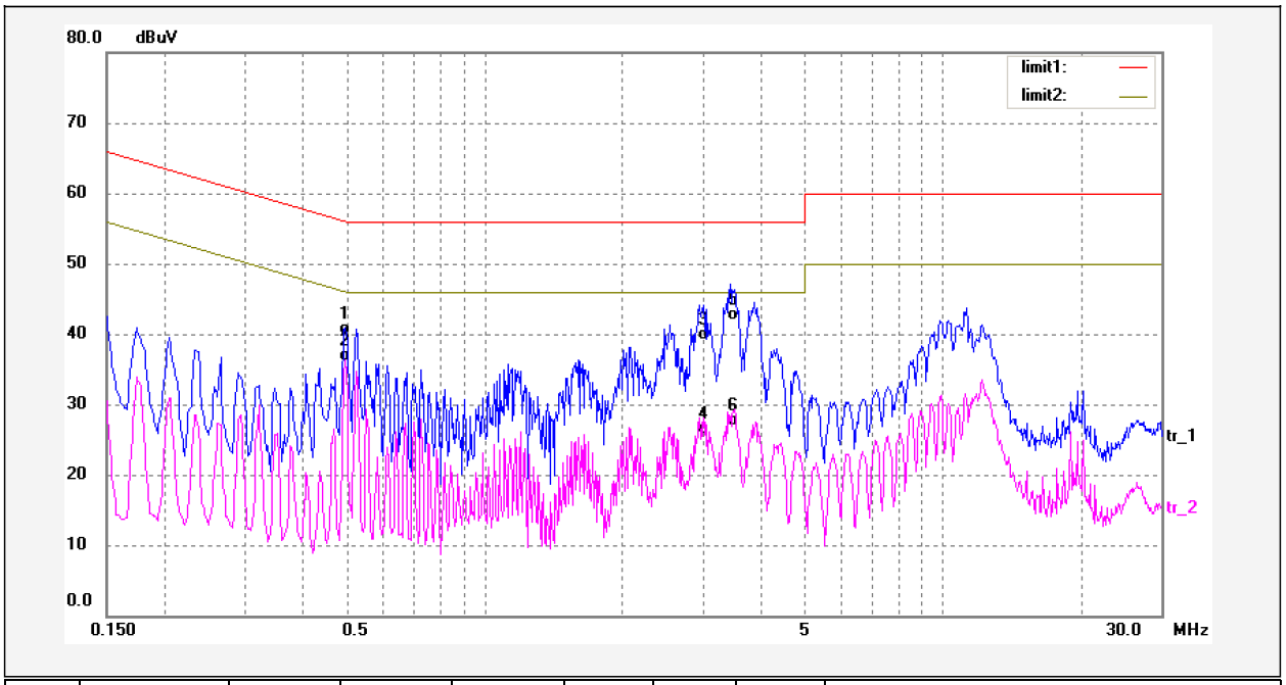
4.1.3 Conducted Emission Test Data

Live Line :



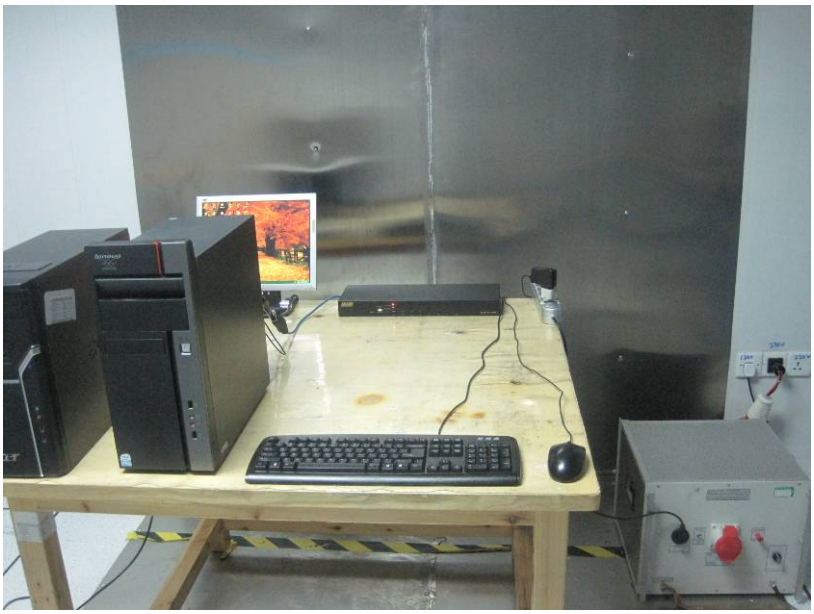
No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.5260	29.82	10.35	40.17	56.00	-15.83	QP	
2	0.5260	24.19	10.35	34.54	46.00	-11.46	AVG	
3	2.9460	25.59	10.38	35.97	56.00	-20.03	QP	
4	2.9460	12.86	10.38	23.24	46.00	-22.76	AVG	
5	3.4180	27.76	10.39	38.15	56.00	-17.85	QP	
6	3.4180	14.02	10.39	24.41	46.00	-21.59	AVG	

Neutral Line :



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.4980	29.59	10.35	39.94	56.03	-16.09	QP	
2	0.4980	25.73	10.35	36.08	46.03	-9.95	AVG	
3	3.0100	28.66	10.38	39.04	56.00	-16.96	QP	
4	3.0100	15.42	10.38	25.80	46.00	-20.20	AVG	
5	3.4500	31.58	10.39	41.97	56.00	-14.03	QP	
6	3.4500	16.60	10.39	26.99	46.00	-19.01	AVG	

4.1.4 Photograph – Conducted Emission Test Setup



4.2 Radiation Emission Data

Test Requirement:	FCC Part15.109
Test Method:	Based on ANSI C63.4: 2003
Test Result:	PASS
Frequency Range:	30MHz to 1GHz
Measurement Distance:	3m
Limit:	40.0 dBμV/m between 30MHz & 88MHz
	43.5 dBμV/m between 88MHz & 216MHz
	46.0 dBμV/m between 216MHz & 960MHz
	54.0 dBμV/m zbove 960MHz
Detector:	Peak for pre-scan (120kHz resolution bandwidth)
	Quasi-Peak if maximised peak within 6dB of limit

4.2.1 Measurement Uncertainty

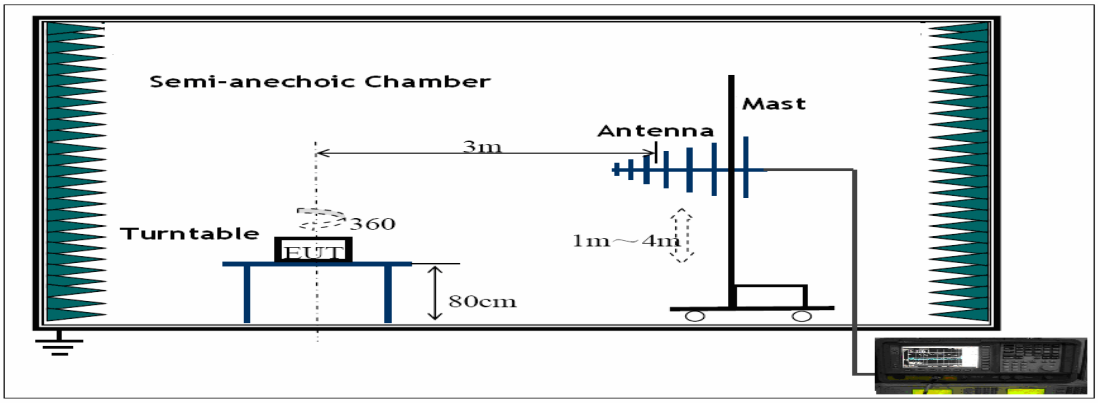
All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Waltek EMC lab is $\pm$5.03 dB.

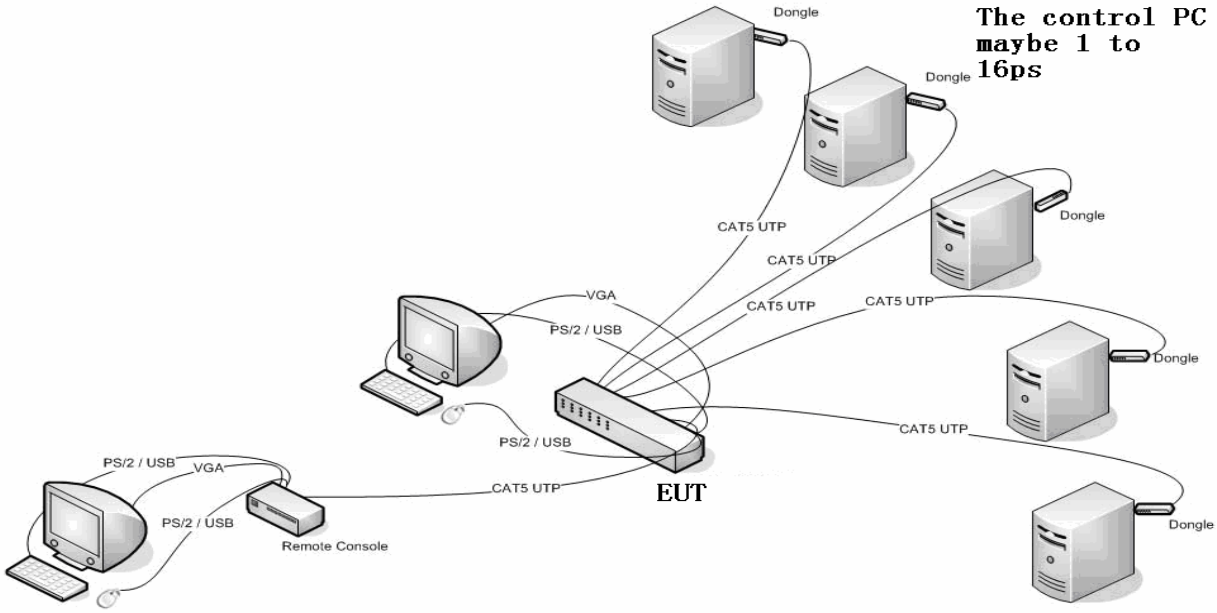
4.2.2 EUT Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4: 2003, The specification used in this report was the FCC Part15 B limits.

Picture1



Picture2



Remark:All the VGA cables are unshielded and the length equal to or less than 1.5m.

The EUT was pretested in working mode connected with the PC

and displays,and found that the worst sample was KS-3104-KT-250 working in connected with two displays mode,and scrolling the “H” letter in full screen , the resolution was 1024*768,60Hz ,the worst data were shown as follow.

4.2.3 Spectrum Analyzer Setup

According to FCC Part15 B Rules, the system was tested 30 to 1GHz.

Below 1GHz

Start Frequency..... 30 MHz
Stop Frequency..... 1 GHz
Sweep Speed Auto
IF Bandwidth..... 120 kHz
Video Bandwidth..... 100 kHz
Quasi-Peak Adapter Bandwidth ..... 120 kHz
Quasi-Peak Adapter Mode ..... Normal
Resolution Bandwidth ..... 100 kHz

4.2.4 Test Procedure

The radiated emissions test.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combinations.

All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dBμV of specification limits), and are distinguished with a "**Qp**" in the data table.

The EUT was tested in working mode with the PC and displayer, It was pre-tested in

connected with one displayer mode and sixteen displayers mode, the worse was connected sixteen displayers mode,so the data was shown connected sixteen displayers mode only.

4.2.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

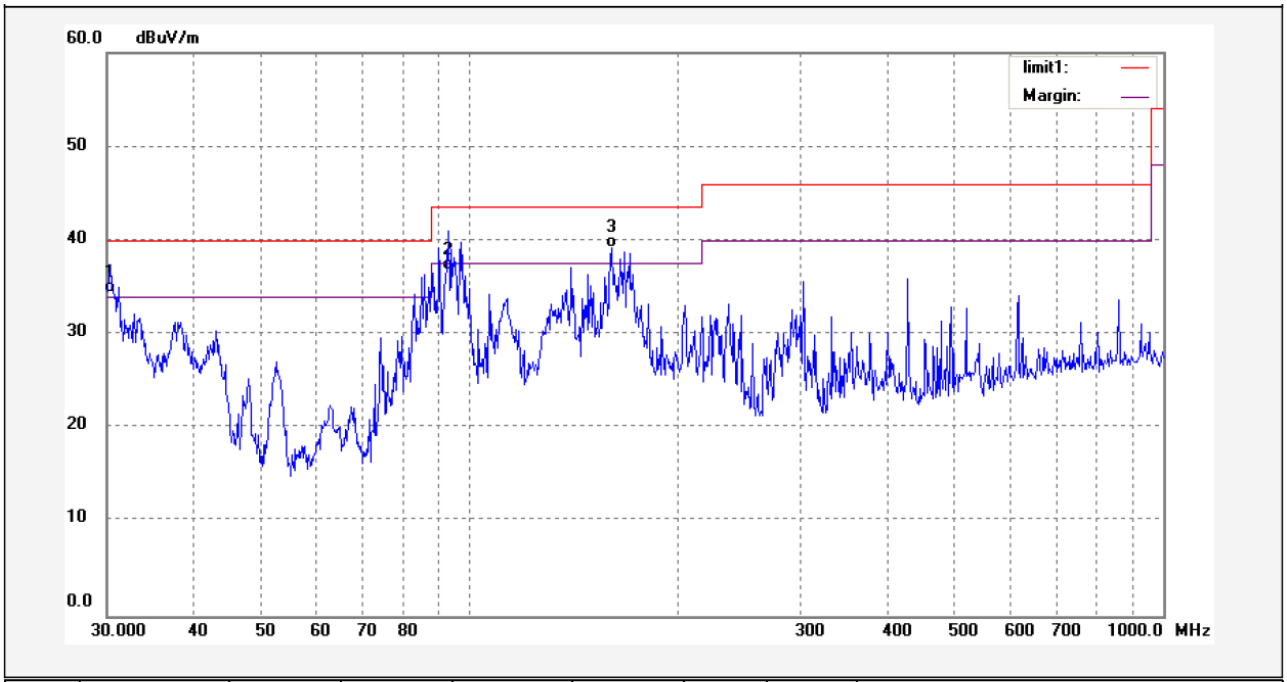
Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dBμV means the emission is 7dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:
Margin = Corr. Ampl. – Class B Limit

4.2.6 Summary of Test Results

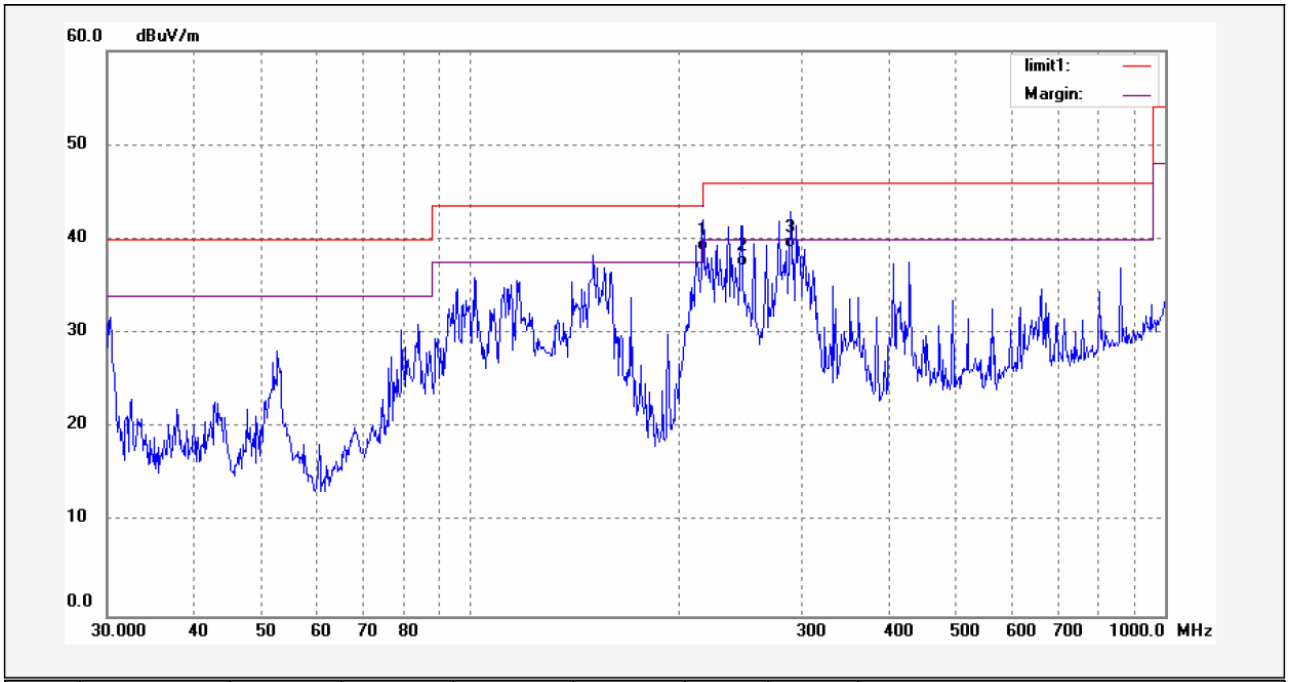
According to the data in this section, the EUT complied with the FCC Part15 B standards.

Antenna Polarization: Horizontal



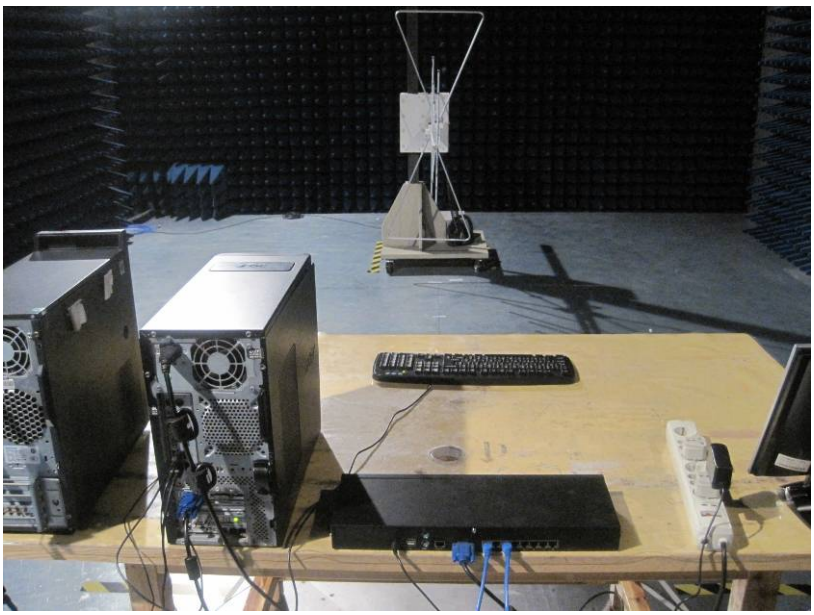
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	30.3179	18.00	16.47	34.47	40.00	-5.53	QP	
2	93.3248	25.33	11.43	36.76	43.50	-6.74	QP	
3	160.3209	25.24	14.04	39.28	43.50	-4.22	QP	

Antenna Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	216.1197	22.00	16.81	38.81	46.00	-7.19	QP	
2	246.1238	20.00	17.06	37.06	46.00	-8.94	QP	
3	289.2987	21.36	17.68	39.04	46.00	-6.96	QP	

4.2.7 Photograph – Radiation Emission Test Setup



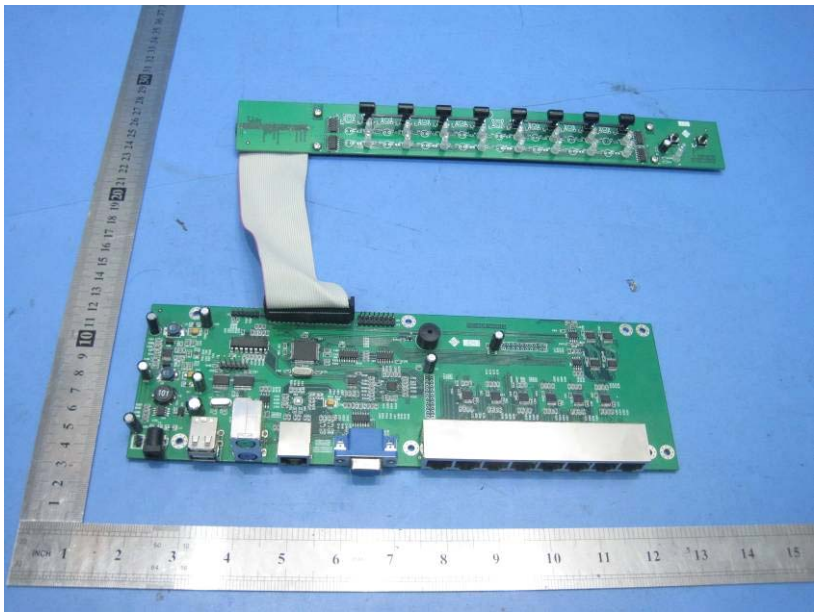
5 Photographs - Constructional Details

5.1 EUT - Appearance View

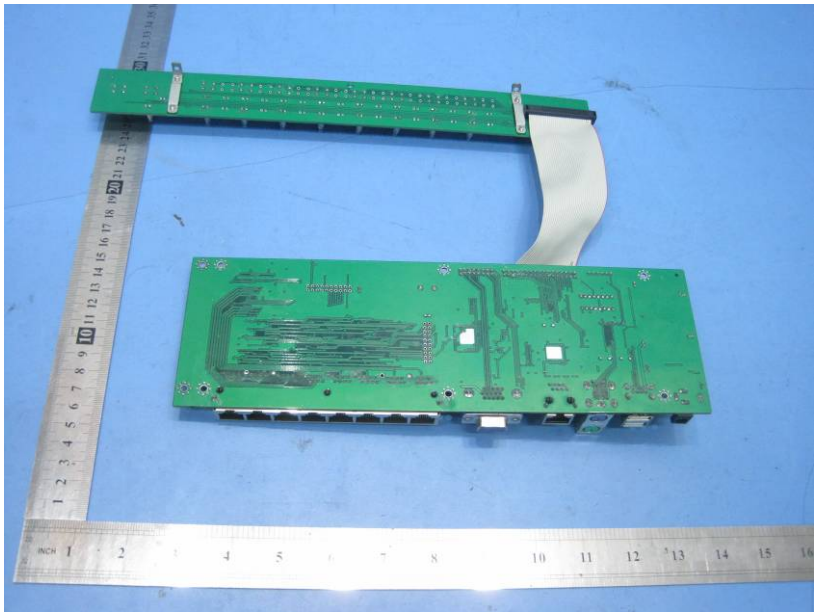
5.2 EUT - Front View

5.3 EUT - Back View

5.4 EUT-PCB -Front View

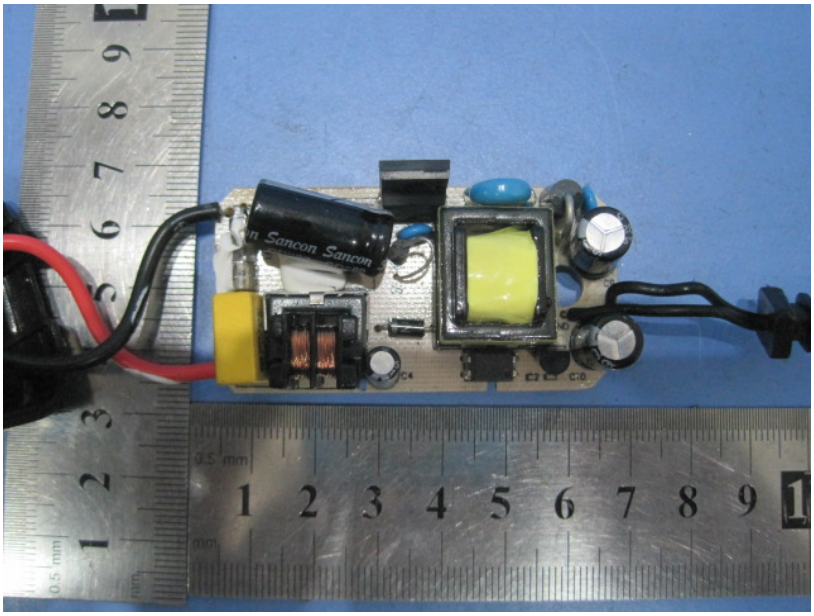


5.5 EUT-PCB - Back View

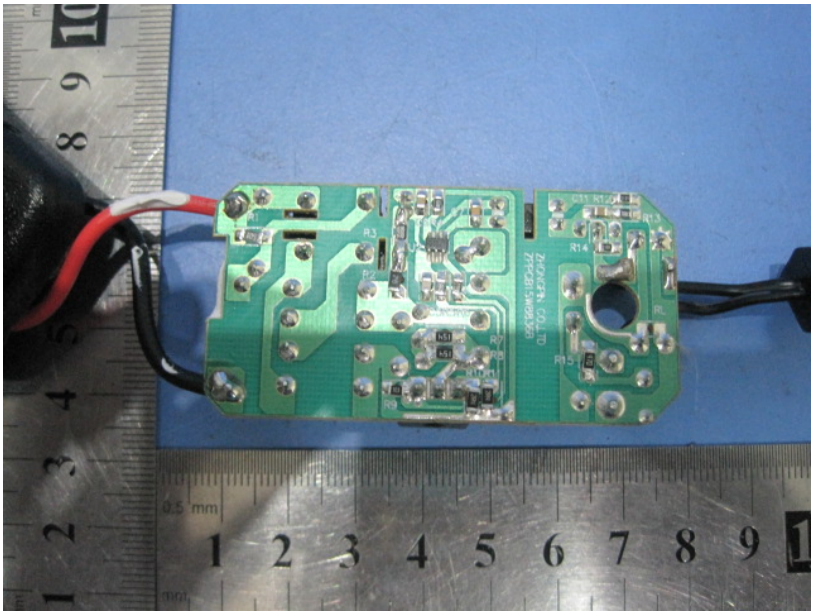


5.6 Adapter-Appearance View

5.7 Adapter-PCB -Front View



5.8 Adapter-PCB -Back View



6 FCC ID Label

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:(1)this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The Label must not be a stick-on paper. The Label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Proposed Label Location on EUT

EUT Top View/ proposed FCC Label Location