

FCC TEST REPORT

FCC ID : WSQMVSSERIES

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 : Switch video splitter

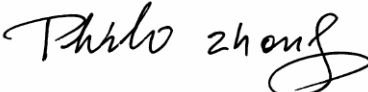
Model No : MVS-201, MVS-202, MVS-204, MVS-401, MVS-402

Standards : FCC Part 15 Subpart B :2009

Date of Test :January 10~23,2010

Date of Issue : January 25,2010

Prepared By : Zero Zhou

Reviewed By : 

| | |
|----------------------|---------------|
| Test Result : | PASS * |
|----------------------|---------------|

PERPARED BY:

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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: 2009 | ANSI C63.4: 2009 | FCC PART15.107 | PASS |
| Radiated Emission (30MHz to 1GHz) | FCC PART 15, SUBPART B: 2009 | ANSI C63.4: 2009 | FCC PART15.109 | PASS |

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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. : MVS-201, MVS-202, MVS-204, MVS-401, MVS-402
Model Difference: The PCB of all models are identical except for the number of VGA ports . MVS-402 and MVS-204 are the test samples. The worse sample is MVS-402,so the worst data of MVS-402 were shown as follow.

| Model name | Circuit schematic | Number of input port | Number of output port |
|------------|-------------------|----------------------|-----------------------|
| MVS-201 | identical | 2 | 1 |
| MVS-202 | identical | 2 | 2 |
| MVS-204 | identical | 2 | 4 |
| MVS-401 | identical | 4 | 1 |
| MVS-402 | identical | 4 | 2 |

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 Switch video splitter . The standards used were FCC Part 15 Subpart B :2009.

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. 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 No.:7760A, July 24, 2008.

3.7 Test Location

All Emission tests were performed at:-

1/F, Fukangtai Building, West Baima Rd., Songgang Street, Baoan District, Shenzhen
518105, China

4 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-09 | Aug-10 | Wws20081596 | ±1dB |
| Trilog Broadband Antenne 30-3000 MHz | SCHWARZB ECK MESS-ELEKTROM / VULB9163 | 336 | W2008002 | 30-3000 MHz | Aug-09 | Aug-10 | | ±1dB |
| Broad-band Horn Antenna 1-18 GHz | SCHWARZB ECK MESS-ELEKTROM / VULB9163 | 667 | W2008003 | 1-18GHz | Aug-09 | Aug-10 | | f<10 GHz: ±1dB 10GHz<f<18 GHz: ±1.5dB |
| Broadband Preamplifier 0.5-18 GHz | SCHWARZB ECK MESS-ELEKTROM / BBV 9718 | 9718-148 | W2008004 | 0.5-18GHz | Aug-09 | Aug-10 | | ±1.2dB |
| 10m Coaxial Cable with N-male Connectors usable up to 18GHz, | SCHWARZB ECK MESS-ELEKTROM / AK 9515 H | - | - | - | Aug-09 | Aug-10 | | - |
| 10m 50 Ohm Coaxial Cable with N-plug, individual length, usable up to 3(5)GHz, Connector | SCHWARZB ECK MESS-ELEKTROM / AK 9513 | | | | Aug-09 | Aug-10 | | |
| Positioning Controller | C&C LAB/ CC-C-IF | | | | N/A | N/A | | |
| Color Monitor | SUNSP0/ SP-14C | | | | N/A | N/A | | |
| Test Receiver | ROHDE&SCHWARZ/ ESPI | 101155 | W2005001 | 9k-3GHz | Aug-09 | Aug-10 | Wws20080942 | ±1dB |
| EMI Receiver | Beijingkehuan | KH3931 | | 9k-1GHz | Aug-09 | Aug-10 | | |
| Two-Line V-Network | ROHDE&SCHWARZ/ ENV216 | 100115 | W2005002 | 50Ω/50μH | Aug-09 | Aug-10 | Wws20080941 | ±10% |

| Equipment Name | Manufacturer Model | Equipment No | Internal No | Specification | Cal. Date | Due Date | Cert. No | Uncertainty |
|--|--|-----------------|-------------|--|-----------|----------|-----------------|---|
| Absorbing Clamp | ROHDE&SC HWAHZ/ MDS-21 | 100205 | W2005003 | impedance50 Ω loss : 17 dB | Aug-09 | Aug-10 | Wws200 80943 | ±1dB |
| 10m 50 Ohm Coaxial Cable with N- plug, indivi dual length, usab le up to 3(5)GHz, Connectors | SCHWARZB ECK MESS- ELEKTROM / AK 9514 | | | | Aug-09 | Aug-10 | | |
| Digital Power Analyzer | Em Test AG/Switzerla nd/ DPA 500 | V07451 03095 | W2008012 | Power: 2000VA Vol-range: 0- 300V Freq_range: 10-80Hz | Aug-09 | Aug-10 | Wwd200 81185 | Voltage distinguish:0 .025% Power_freq distinguish:0 .02Hz |
| Power Source | Em Test AG/Switzerla nd/ ACS 500 | V07451 03096 | W2008013 | Vol-range: 0- 300V Power_freq: 10-80Hz | | | | |
| Electrostatic Discharge Simulator | Em Test AG/Switzerla nd/DITO | V07451 03094 | W2008005 | Contact discharge: 500V-10KV Air diacharge: 500V-16.5KV | Aug-09 | Aug-10 | Wwc200 82400 | 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-09 | Aug-10 | Wws200 81890 | Power_freq distinguish0. 1Hz RFelectricity distinguish 0.1 B |
| CDN M- Type | TESEQ GmbH/ CDN M016 | 25112 | W2008009 | Voltage correct factor 9.5 dB | Aug-09 | Aug-10 | Wwc200 82396 | 150K- 80MHz: ±1dB 80- 230MHz:-2- +3dB |
| EM-Clamp | TESEQ GmbH/ KEMZ 801 | 25453 | W2008010 | Freq_range: 0.15-1000 MHz | Aug-09 | Aug-10 | Wwc200 82397 | 0.3-400 MHz: ±4dB Other freq: ±5dB |
| Attenuator 6dB | TESEQ GmbH/ ATN6050 | 25365 | | | Aug-09 | Aug-10 | Wws200 81597 | |

| Equipment Name | Manufacturer Model | Equipment No | Internal No | Specification | Cal. Date | Due Date | Cert. No | Uncertainty |
|---|--|--------------|-------------|---|-----------|----------|-------------|---|
| All Modules Generator | SCHAFFNER/6150 | 34579 | W2008006 | voltage:200V-4.4KV Pulse current: 100A-2.2KA | Aug-09 | Aug-10 | Wwc20082401 | voltage: $\pm 10\%$ Pulse current: $\pm 10\%$ |
| Capacitive Coupling Clamp | SCHAFFNER/CDN 8014 | 25311 | | | Aug-09 | Aug-10 | Wwc20082398 | - |
| Signal and Data Line Coupling Network | SCHAFFNER/CDN 117 | 25627 | W2008011 | 1.2/50 μ S | Aug-09 | Aug-10 | Wwc20082399 | - |
| AC Power Supply | TONGYUN/DTDGC-4 | | | | Aug-09 | Aug-10 | Wws20080944 | - |
| Exposure Level Tester ELT-400 | Narda Safety TEST Solutions/2304/03 | M-0155 | w2008022 | Test freq range: 1—400kHz | Aug-09 | Aug-10 | Wwd20081191 | Test uncertainty : 1—120kHz: $\pm 1.83\%$, 120 kHz-400 kHz: $\pm 4.06\%$ |
| Magnetic Field Probe 100cm ² | Narda Safety TEST Solutions/2300/90.10 | M-1070 | w2008021 | Test freq range: 1—400kHz | | | | Test uncertainty : 1Hz-10Hz: $\pm 16.2\%$, 10Hz - 120kHz: $\pm 2.2\%$, 120 kHz-400 kHz: $\pm 4.7\%$ |
| Active Loop Antenna Charger 10kHz-30MHz | Beijing Dazhi / ZN30900A | - | - | 10kHz-30MHz | Aug-09 | Aug-10 | | $\pm 1\text{dB}$ |
| Other | | | | | | | | |
| Notebook | IBM | X31 | / | / | Aug-09 | Aug-10 | | $\pm 1\text{dB}$ |
| PC | acer | AG1720 | / | / | Aug-09 | Aug-10 | | $\pm 1\text{dB}$ |
| Display1 | viewsonic | S27996-1W | / | / | Aug-09 | Aug-10 | | $\pm 0.5\text{dB}$ |
| K/B | DELL | L100 | / | / | Aug-09 | Aug-10 | | $\pm 0.5\text{dB}$ |
| Mouse | acer | M-UVACR1 | / | / | Aug-09 | Aug-10 | | $\pm 0.5\text{dB}$ |
| Display2 | viewsonic | S27889 | / | / | Aug-09 | Aug-10 | | $\pm 0.5\text{dB}$ |

5 Emissions Test Results

5.1 Conducted Emission Data

| | |
|-------------------|--|
| Test Requirement: | FCC Part15.107 |
| Test Method: | ANSI C63.4:2009 |
| Test Result: | PASS |
| Frequency Range: | 150kHz to 30MHz |
| Limit: | 66-56 dB μ V between 0.15MHz & 0.5MHz 56 dB μ V between 0.5MHz & 5MHz 60 dB μ V between 5MHz & 30MHz |
| Detector: | Peak for pre-scan (9kHz Resolution Bandwidth) Quasi-Peak & Average if maximised peak within 6dB of Average Limit |

5.1.1 E.U.T. Operation

| | |
|------------------------|-----------|
| Operating Environment: | |
| Temperature: | 25.5°C |
| Humidity: | 51 % RH |
| Atmospheric Pressure: | 1012 mbar |
| EUT Operation : | |

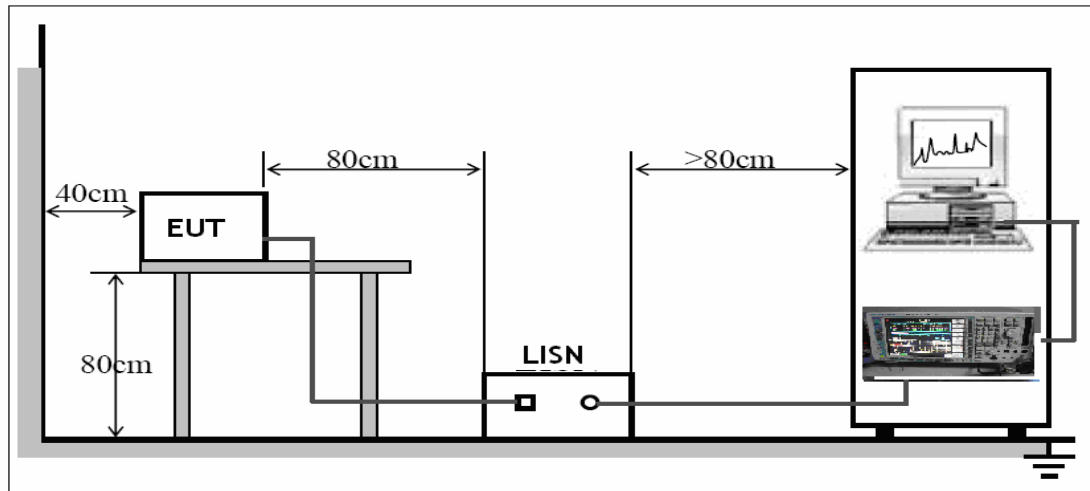
The EUT was tested according to ANSI C63.4:2009. The frequency spectrum from 150kHz to 30MHz was investigated.

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.

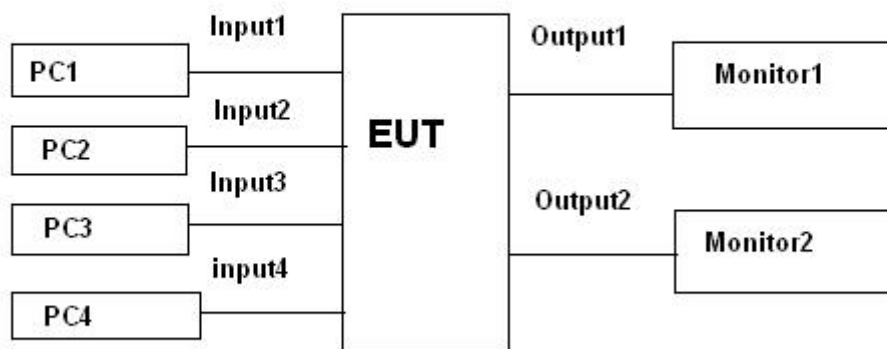
5.1.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.4:2009, The specification used in this report was the FCC Part15.107 Class B limits.

Picture1



Picture2

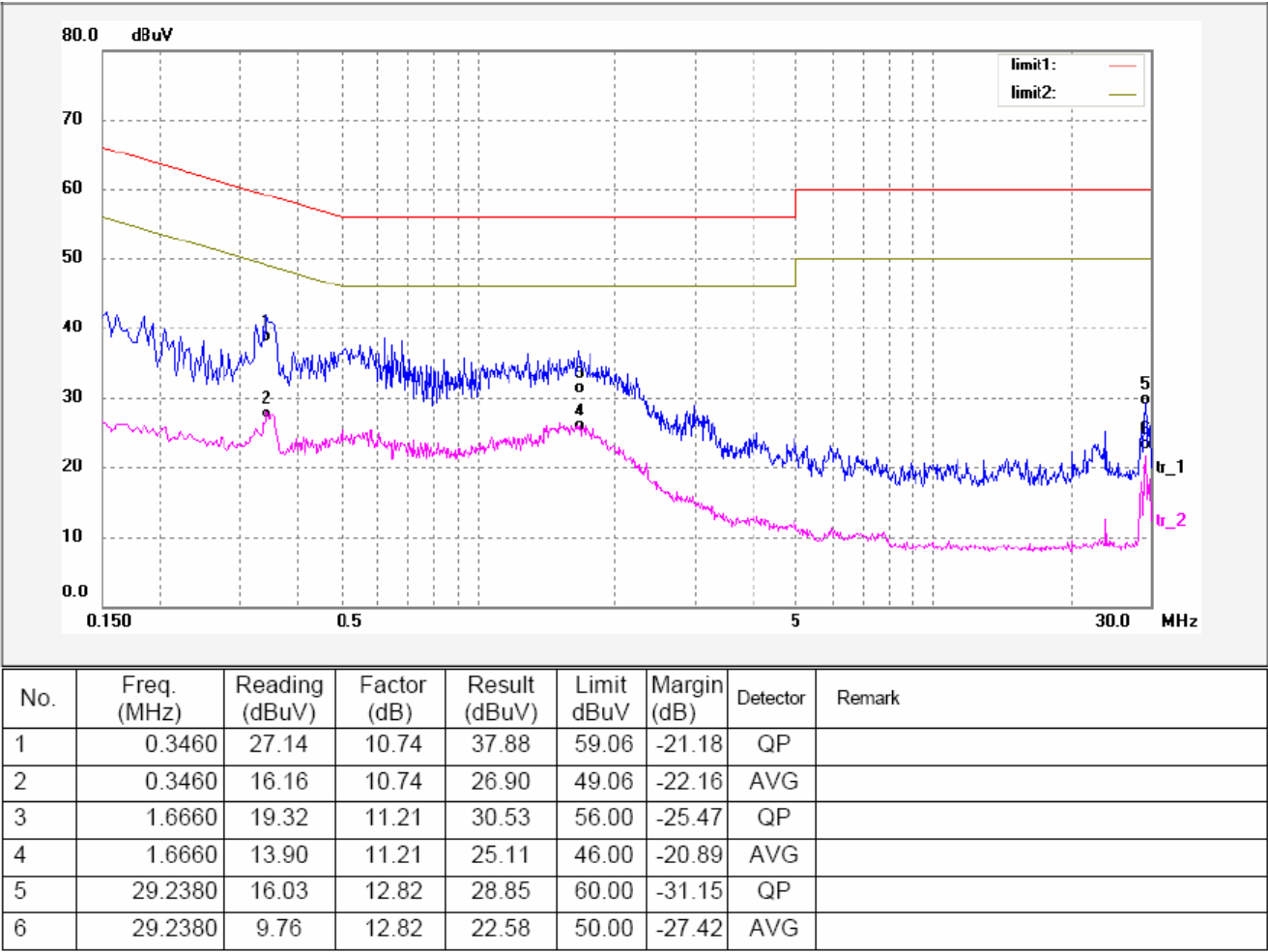


Remark: All the VGA cables are unshielded and the length equal to or less than 1.5m.

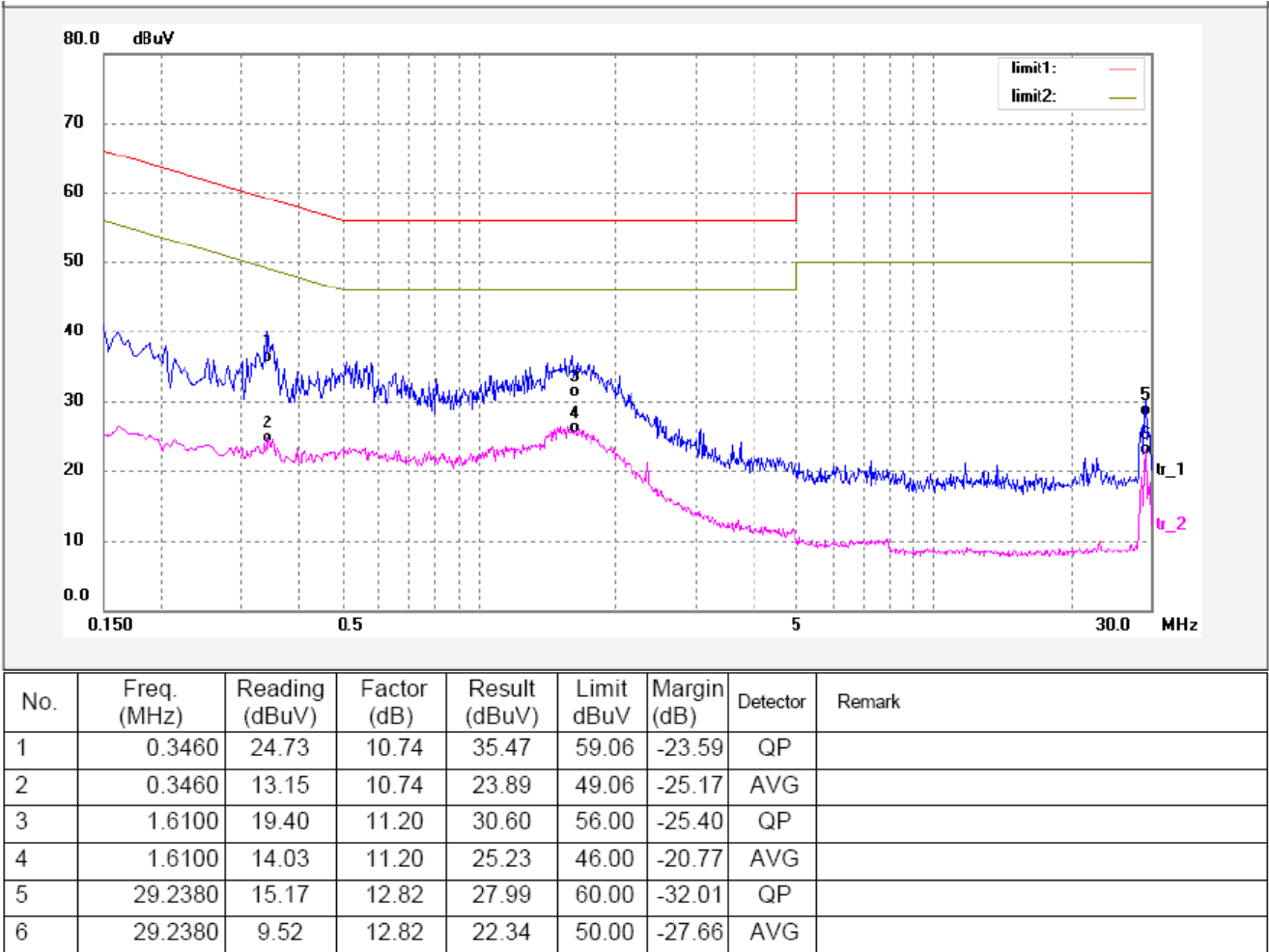
The EUT was pretested in working mode connected with the PC and displays, and found that the worst sample was MVS-402 working in connected with two displays mode, and scrolling the “H” letter in full screen, the resolution was 1024*768, 60Hz the worst data were shown as follow.

5.1.3 Conducted Emission Test Data

Live Line :



Neutral Line :



5.1.4 Photograph – Conducted Emission Test Setup



5.2 Radiation Emission Data

| | |
|-----------------------|--|
| Test Requirement: | FCC Part15.109 |
| Test Method: | Based on ANSI C63.4:2009 |
| Test Result: | PASS |
| Frequency Range: | 30MHz to 1GHz |
| Measurement Distance: | 3m |
| Limit: | 40.0 dB μ V/m between 30MHz & 88MHz 43.5 dB μ V/m between 88MHz & 216MHz 46.0 dB μ V/m between 216MHz & 960MHz 54.0 dB μ V/m zbove 960MHz |
| Detector: | Peak for pre-scan (120kHz resolution bandwidth) Quasi-Peak if maximised peak within 6dB of limit |

5.2.1 Measurement Uncertainty

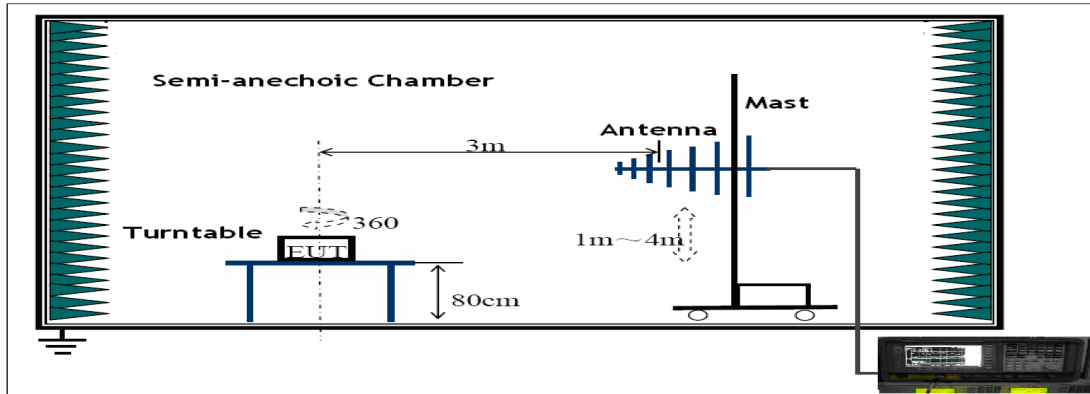
All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor 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 ± 5.03 dB.

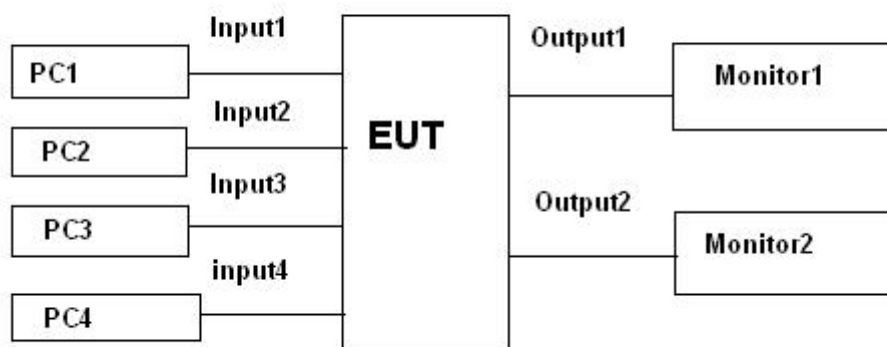
5.2.2 EUT Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4:2009, 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 MVS-402 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.

5.2.3 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

5.2.4 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 four displayers mode, the worse was connected four displayers mode,so the data was shown connected four displayers mode only.

5.2.5 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:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

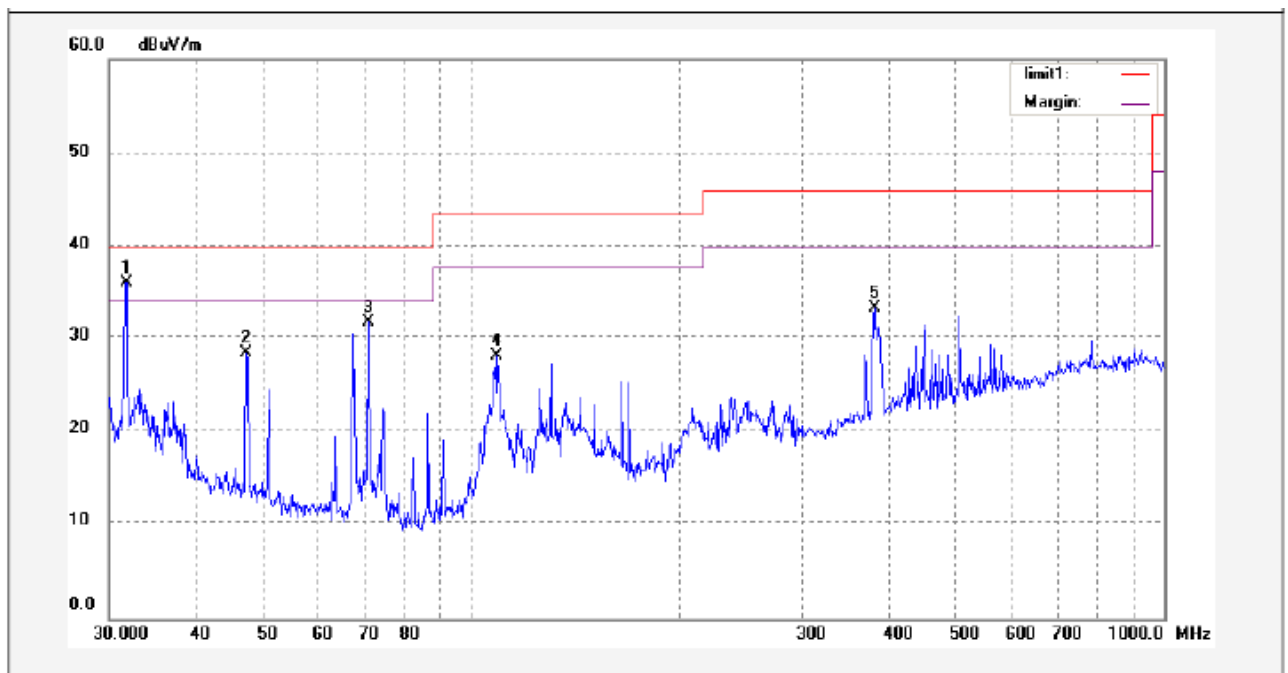
The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dBμV means the emission is 7dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Class B Limit}$$

5.2.6 Summary of Test Results

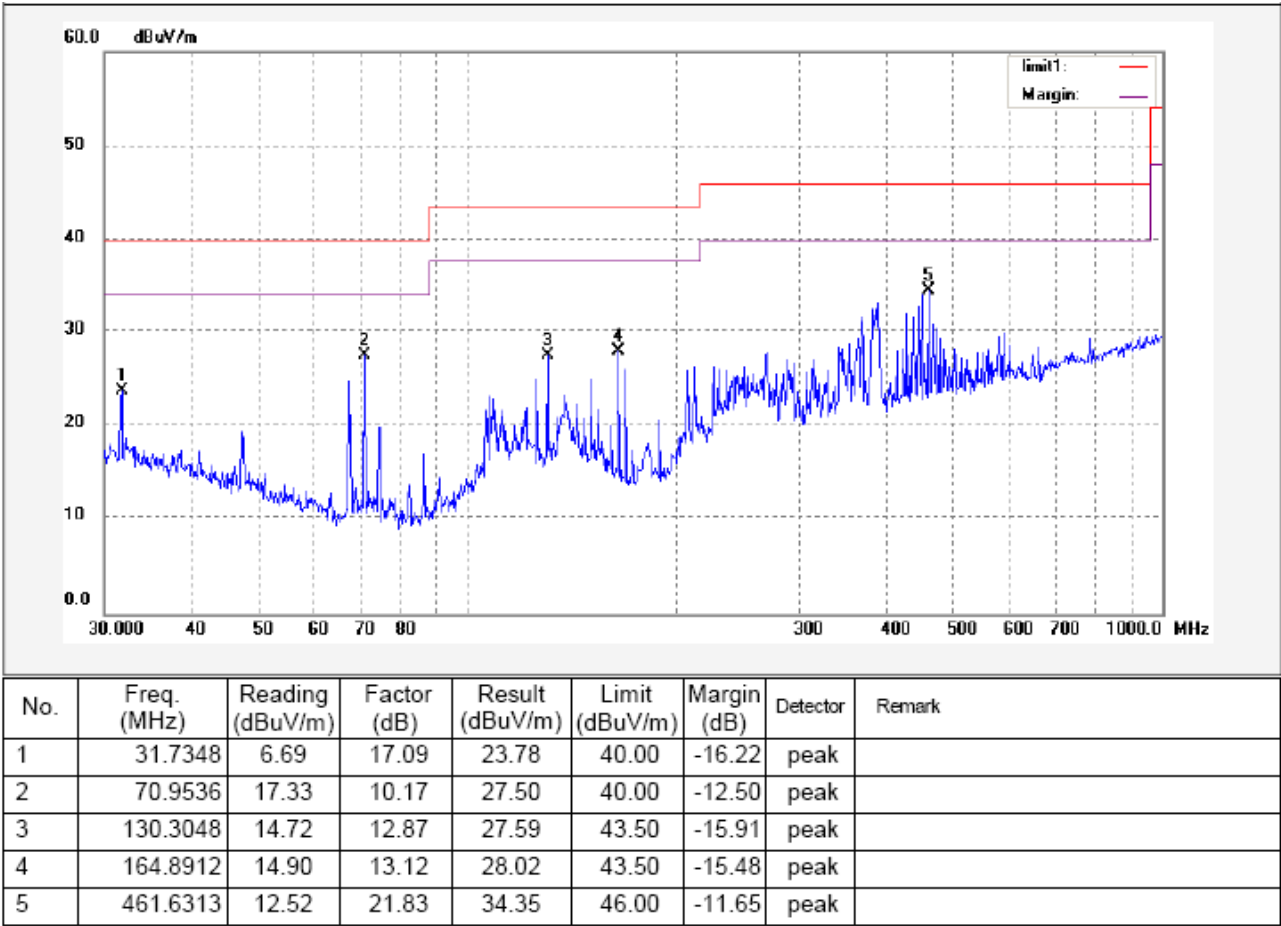
According to the data in this section, the EUT complied with the FCC Part15 B standards.

Antenna Polarization: Horizontal



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1 | 31.7348 | 18.82 | 17.09 | 35.91 | 40.00 | -4.09 | peak | |
| 2 | 47.3688 | 14.28 | 14.22 | 28.50 | 40.00 | -11.50 | peak | |
| 3 | 70.9536 | 21.60 | 10.15 | 31.75 | 40.00 | -8.25 | peak | |
| 4 | 108.5455 | 14.77 | 13.36 | 28.13 | 43.50 | -15.37 | peak | |
| 5 | 381.8520 | 12.73 | 20.43 | 33.16 | 46.00 | -12.84 | peak | |

Antenna Polarization: Vertical



5.2.7 Photograph – Radiation Emission Test Setup



6 Photographs - Constructional Details

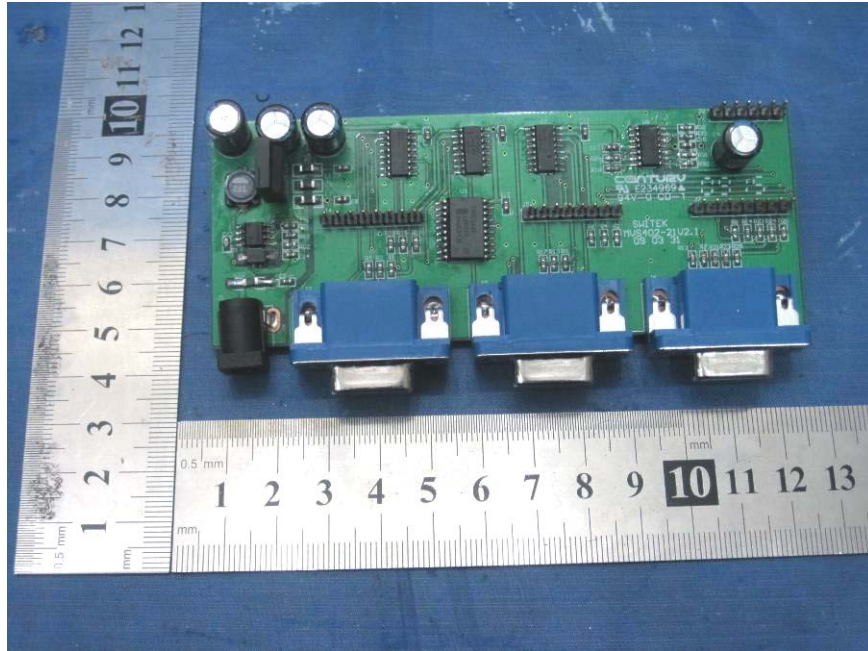
6.1 EUT(MVS-402) - Front View



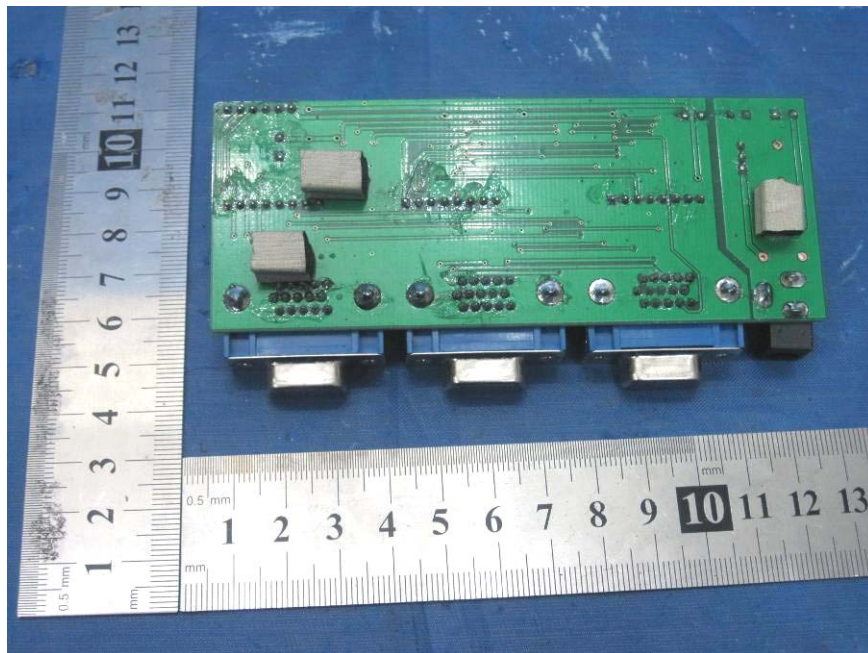
6.2 EUT(MVS-402) - Back View



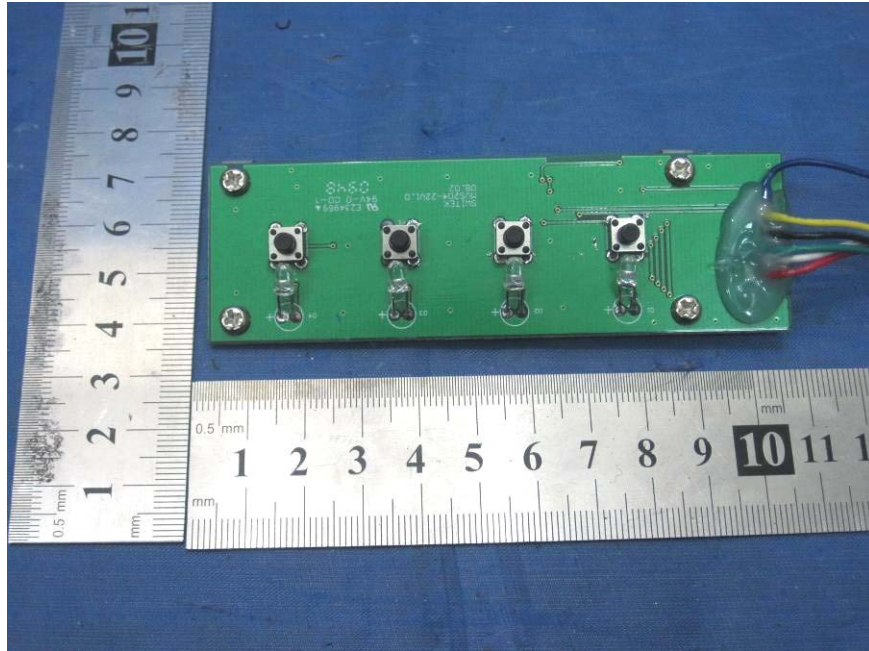
6.3 EUT(MVS-402)-PCB 1 -Front View



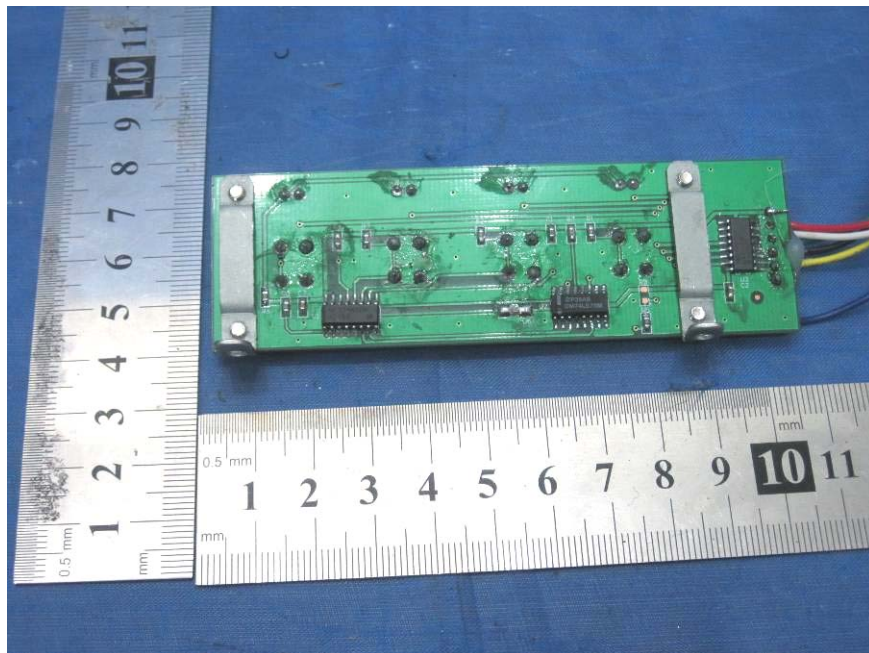
6.4 EUT(MVS-402)-PCB 1 - Back View



6.5 EUT(MVS-402)-PCB 2 -Front View



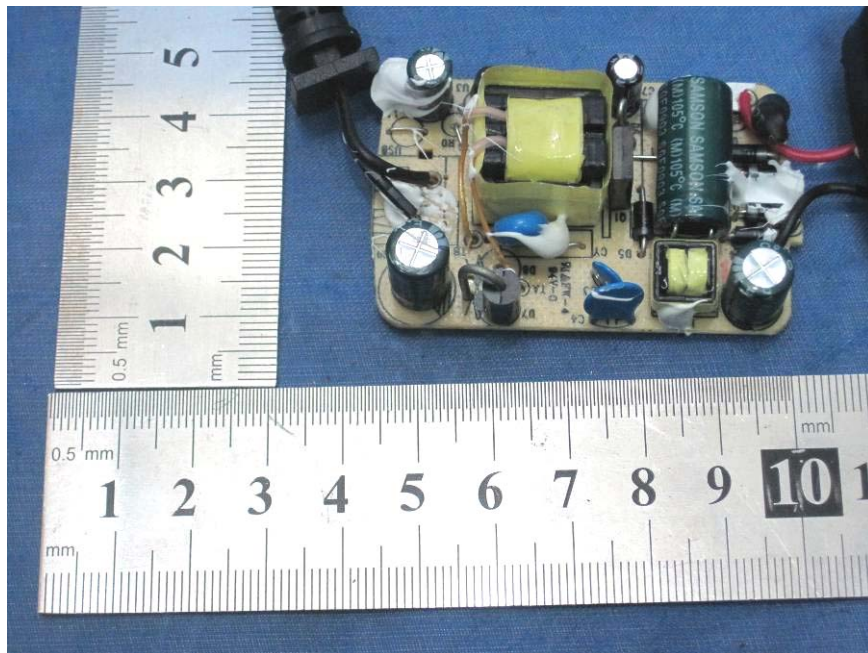
6.6 EUT(MVS-402)-PCB 2-Back View



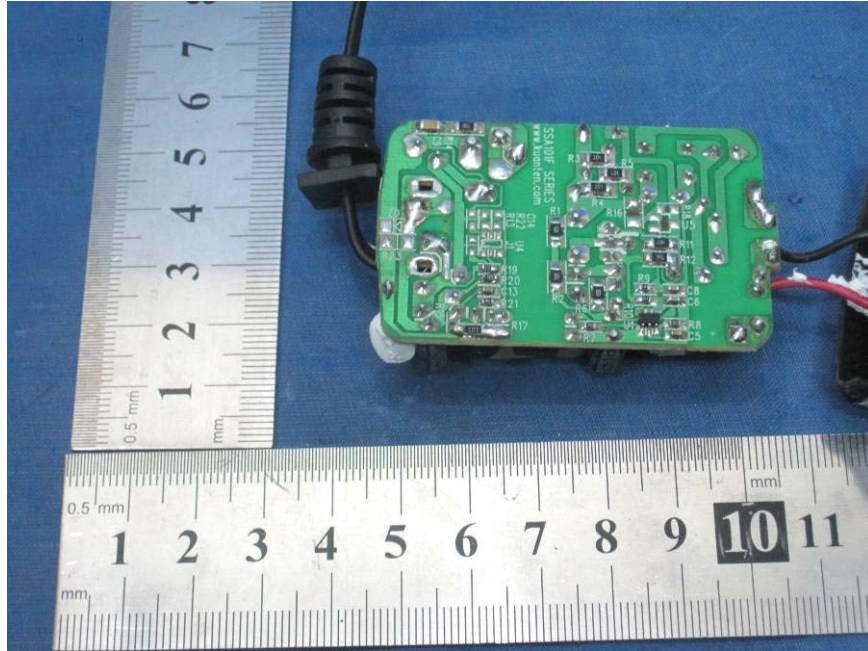
6.7 Adapter-Appearance View



6.8 Adapter-PCB -Front View



6.9 Adapter-PCB -Back View



7 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

