

FCC PART 15 CLASS B  
EMI MEASUREMENT AND TEST REPORT  
For

Shenzhen Smart-eye Digital Electronics Co.,Ltd.  
#6 Northern Zone, Shangxue S&T City, Bantian,Longgang District,Shenzhen,China

**FCC ID: ZCBHYIPC-532**

November 21, 2012

This Report Concerns: Original Report	Equipment Type: IP Camera
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Report No.:	BST12092034Y
Receive EUT Date/Test Date:	October 25, 2012/ October 25, 2012- November 21, 2012
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## 1. GENERAL INFORMATION

### 1.1. Report information

1.1.1. This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that Shenzhen Smart-eye Digital Electronics Co.,Ltd. approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that Shenzhen Smart-eye Digital Electronics Co.,Ltd. in any way guarantees the later performance of the product/equipment.

1.1.2. The sample/s mentioned in this report is/are supplied by Applicant, Shenzhen Smart-eye Digital Electronics Co.,Ltd. therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through Shenzhen Smart-eye Digital Electronics Co.,Ltd., unless the applicant has authorized Shenzhen Smart-eye Digital Electronics Co.,Ltd. in writing to do so.

#### Test Facility -

The test site used to collect the radiated data is located on the address of Shenzhen Certification Technology Service Co., Ltd (FCC Registered Test Site Number: 197647) on 2F, Building B, East Area of Nanchang Second Industrial Zone, Gushu 2nd Road, Bao'an District, shenzhen 518126, China

The Test Site is constructed and calibrated to meet the FCC requirements.

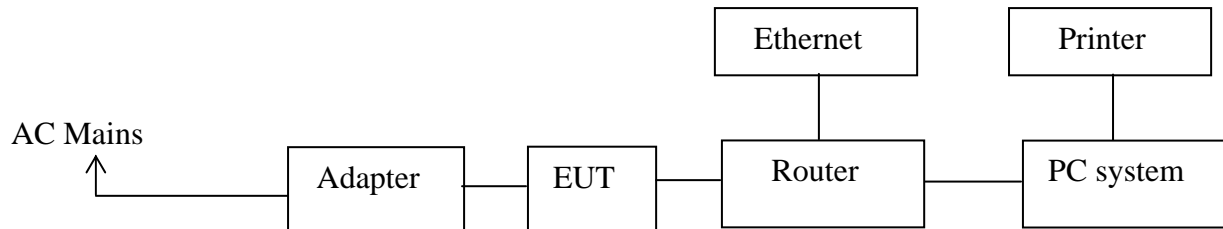
## 2. PRODUCT DESCRIPTION

### 2.1. EUT Description

Applicant : Shenzhen Smart-eye Digital Electronics Co.,Ltd.  
 Address : #6 Northern Zone, Shangxue S&T City, Bantian,Longgang District,Shenzhen,China  
 Manufacturer : Shenzhen Smart-eye Digital Electronics Co.,Ltd.  
 Address : #6 Northern Zone, Shangxue S&T City, Bantian,Longgang District,Shenzhen,China  
 EUT Description : IP Camera  
 Trade Name : wansview  
 Model Number : NCH532MW, NCH531MW, NCH532MKW, NCH532MJW  
 Power Supply : DC 12V (Powered by Adapter)

The series products, model name: NCH532MW, NCH531MW, NCH532MKW, NCH532MJW have the same circuit diagram,PCB layout, software, RF Module, Features and functionality. The differences are the model name, so, we select NCH532MW to test.

### 2.2. Block Diagram of EUT Configuration



### 2.3. Support Equipment List

Name	Model No	S/N	Manufacturer	Used (Y/N)
Adapter Input: AC 100-240V, 50-60Hz Output: DC 12V, 2A	SUN-1200200	--	SHENZHEN SUNUP ELECTRONI CS CO.,LTD.	Y
PC system	AM1830	N/A	Acer	Y
Printer	HP1020	N/A	HP	Y
Router	PL-R860	N/A	TP-LINK	Y

## 2.4. Test Conditions

Temperature: 23~27°C

Relative Humidity: 50~63 %

### 3. TEST RESULTS SUMMARY

**Table 1 Test Results Summary**

Test Items	Test Results
Conducted disturbance	Pass
Radiated disturbance	Pass

Remark: "N/A" means "Not applicable."

#### 4. TEST EQUIPMENT USED

EQUIPMENT/FACILITIES	MANUFACTURER	MODEL	SERIAL NO.	DATE OF CAL.	CAL. INTERVAL
3m Semi-Anechoic Chamber	Changzhou Chengyu	EC3048	N/A	May 5, 2012	1 Year
Broadband antenna	SCHWARZBECK	VULB 9168	VULB9168-438	Aug. 14, 2012	1 Year
Horn antenna	R&S	HF906	10027	Aug. 14, 2012	1 Year
ETS Horn Antenna	ETS	3160	SEL0076	May 8, 2012	1 Year
Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	Apr. 6, 2012	1 Year
Spectrum analyzer	Agilent	E4443A	MY46185649	Apr. 6, 2012	1 Year
Spectrum analyzer	Agilent	E4440A	MY46187335	Apr. 6, 2012	1 Year
Spectrum analyzer	Agilent	E4446A	MY45300103	Apr. 6, 2012	1 Year
Test receiver	R&S	ESCI	100492	Apr. 6, 2012	1 Year
Test receiver	R&S	ESCI	101202	Apr. 6, 2012	1 Year
L.I.S.N.	SCHWARZBECK	NSLK8126	8126466	Apr. 6, 2012	1 Year
L.I.S.N.	SCHWARZBECK	NSLK8126	8126487	Apr. 6, 2012	1 Year
Cable	Resenberger	N/A	NO.1	Apr. 6, 2012	1 Year
Cable	SCHWARZBECK	N/A	NO.2	Apr. 6, 2012	1 Year
Cable	SCHWARZBECK	N/A	NO.3	Apr. 6, 2012	1 Year
Pre-amplifier	SCHWARZBECK	BBV9743	9743-019	Apr. 6, 2012	1 Year
Pre-amplifier	R&S	AFS33-1800 2650-30-8P-44	SEL0080	Apr. 6, 2012	1 Year

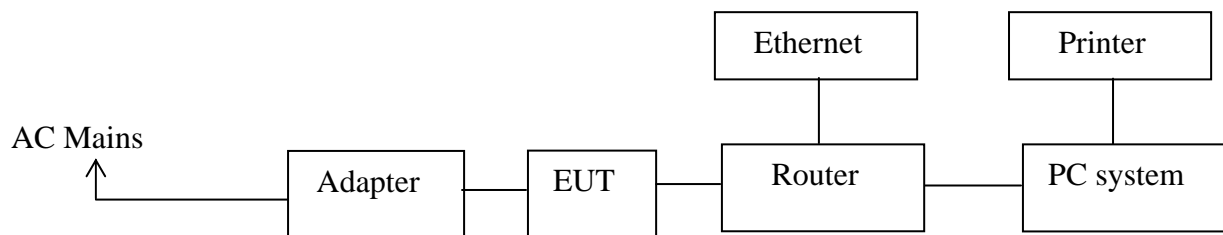
## 5. CONDUCTED EMISSION TEST

### 5.1. Measurement Uncertainty

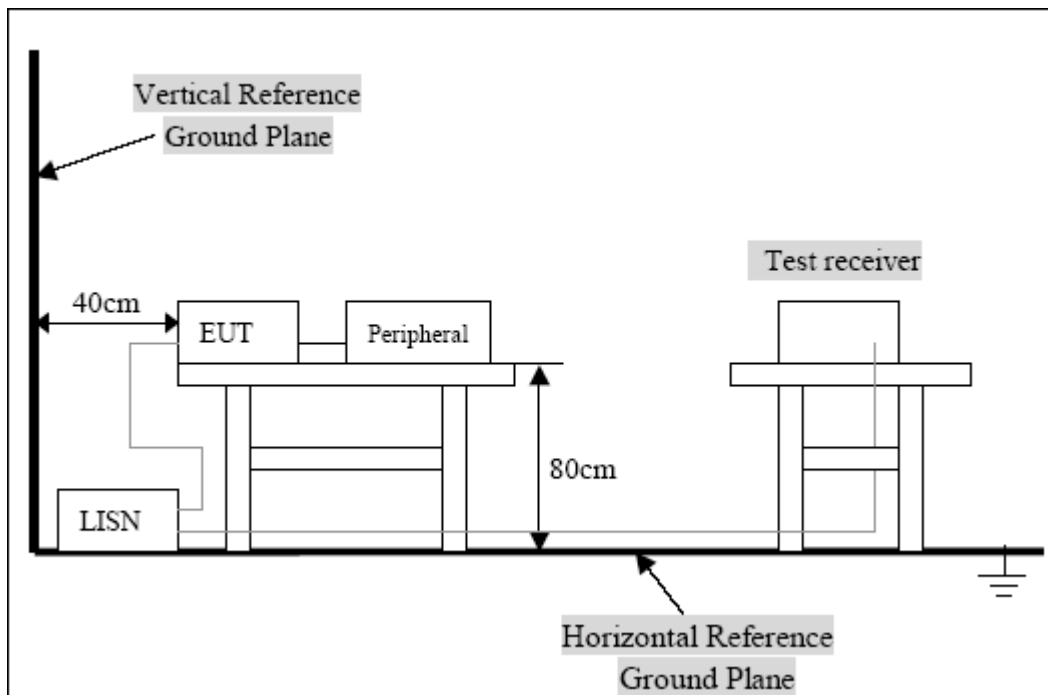
The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is + 2.88 dB.

### 5.2. Block Diagram of Test Setup

#### 5.2.1. Block Diagram of connection between the EUT and the simulators



#### 5.2.2. Test Setup Diagram



### 5.3. Test Standard

FCC Part 15 CLASS B

ANSI C63.4 2003



#### 5.4. Conducted Emission Limit(Class B)

Frequency MHz	Limits dB( $\mu$ V)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50

Notes: 1. \*Decreasing linearly with logarithm of frequency.

#### 5.5. EUT Configuration on Test

The following equipments are installed on conducted emission test to meet FCC Part 15 requirement and operating in a manner, which tends to maximize its emission characteristics in a normal application.

#### 5.6. Operating Condition of EUT

5.6.1. Setup the EUT and simulators as shown in Section 6.1.

5.6.2. Turn on the power of all equipments.

5.6.3. Let the EUT work in test mode (Connect to a router and the router attached to PC) and test it.

#### 5.7. Test Procedure

The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI test receiver is used to test the emissions form both sides of AC line. The bandwidth of EMI test receiver is set at 9kHz.

#### 5.8. Test Result

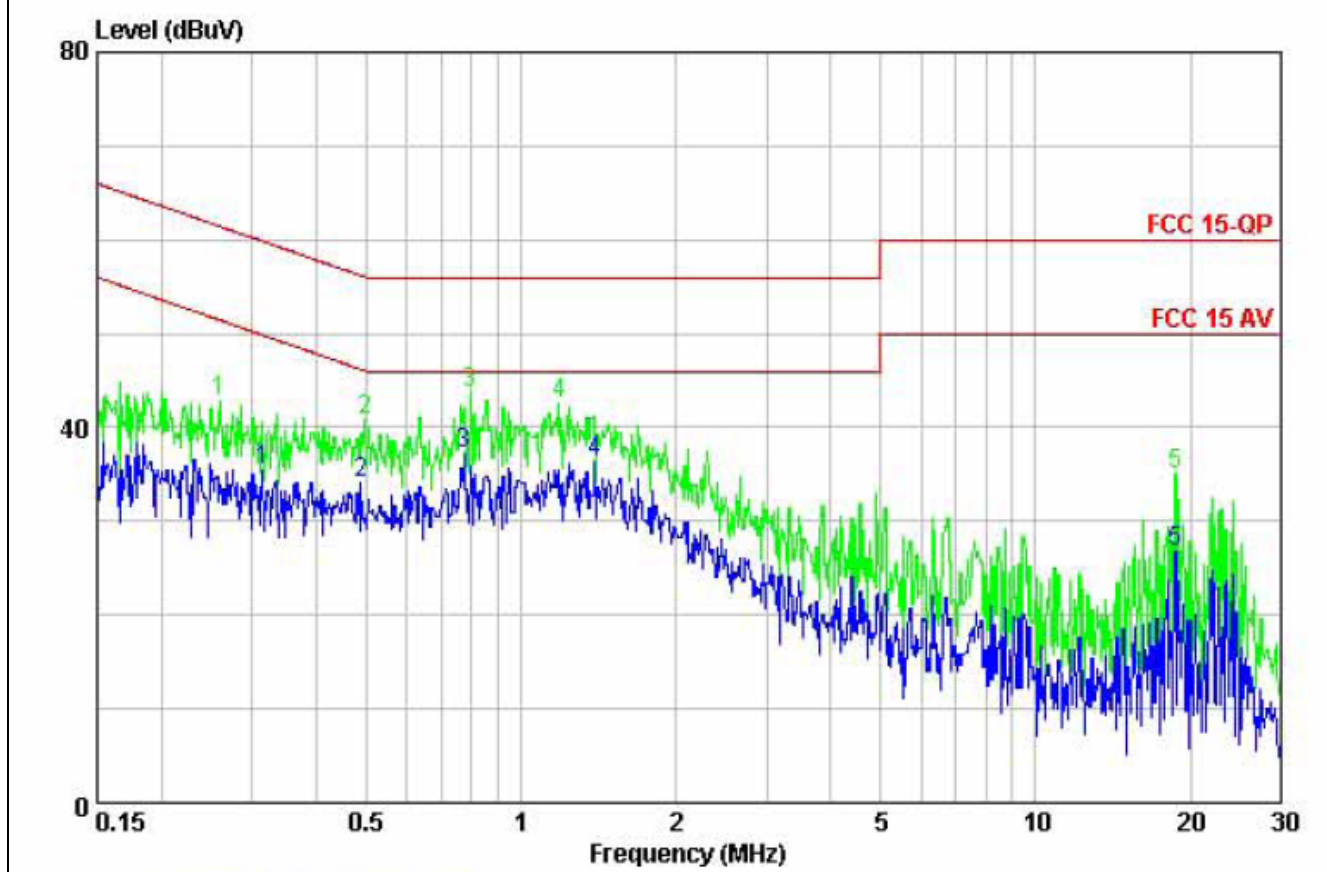
**Pass**

L Line

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.31	24.89	10.44	35.33	49.84	-14.51	AVG
0.78	26.83	10.43	37.26	46	-8.74	AVG
18.72	16.34	10.41	26.75	50	-23.25	AVG
0.26	32.29	10.41	42.70	61.42	-18.72	QP
0.80	33.14	10.53	43.67	56	-12.33	QP
18.72	24.38	10.6	34.98	60	-25.02	QP

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

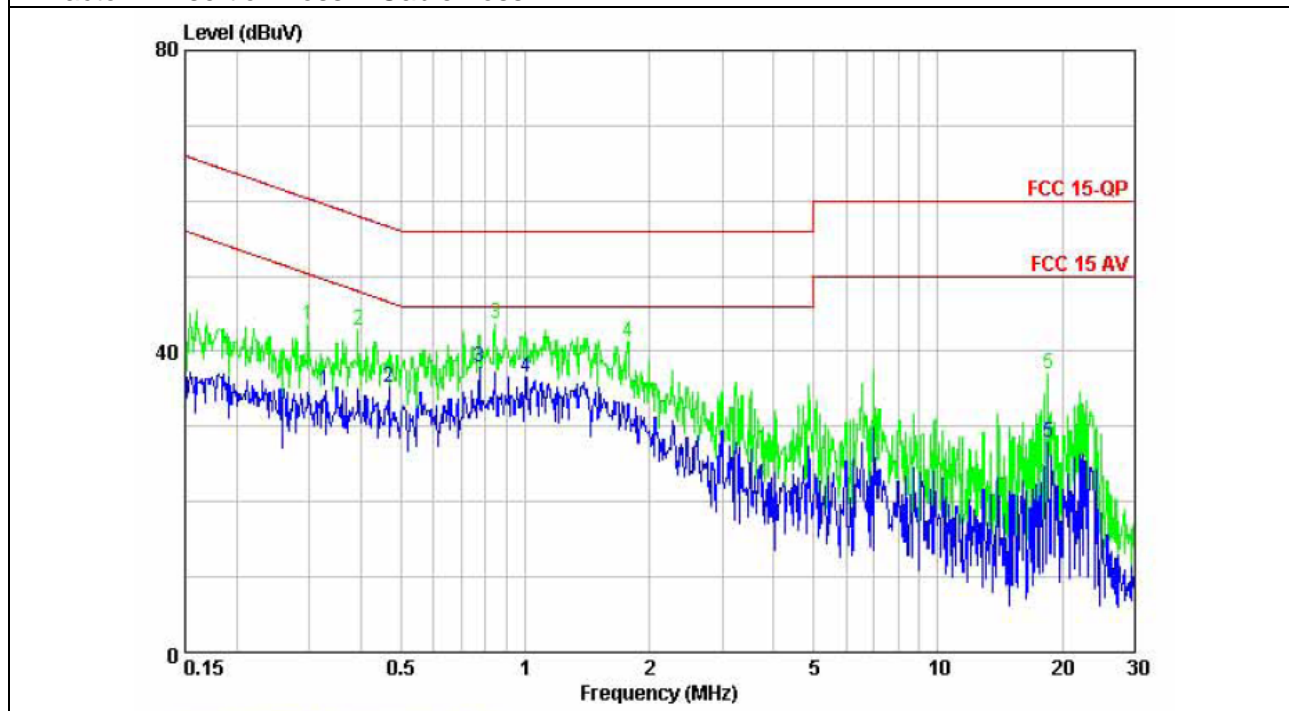


N Line

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.33	24.4	10.4	34.80	49.49	-14.69	AVG
0.78	27.37	10.41	37.78	46	-8.22	AVG
18.52	17.38	10.4	27.78	50	-22.22	AVG
0.30	33.01	10.41	43.42	60.32	-11.98	QP
0.85	32.97	10.67	43.64	56	-12.36	QP
18.52	26.34	10.67	37.01	60	-22.99	QP

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



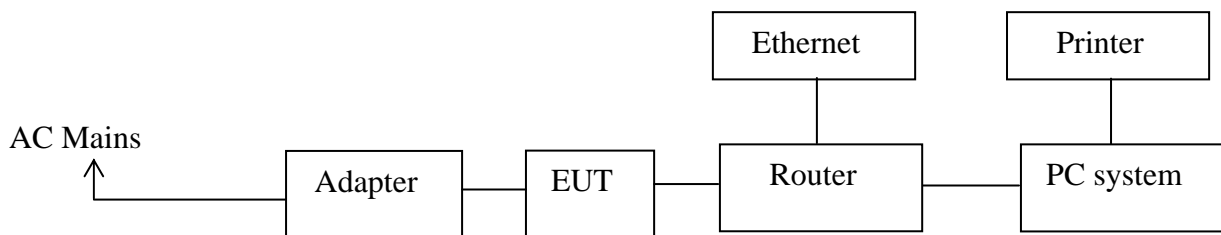
## 6. RADIATED EMISSION MEASUREMENT

### 6.1. Measurement Uncertainty

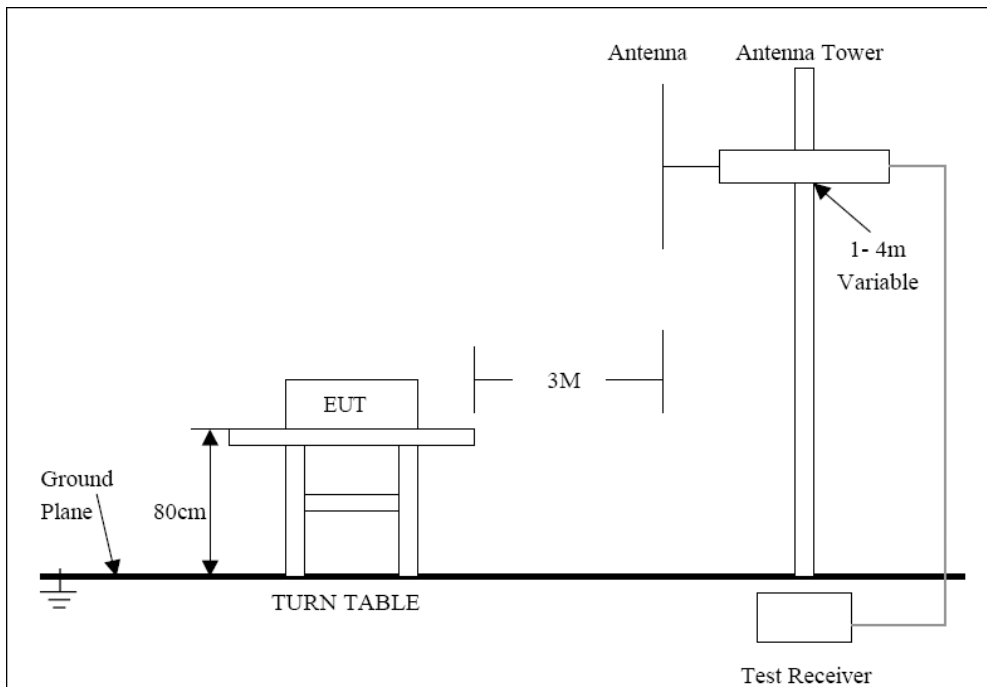
The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any radiation emissions measurement is + 5.10 dB.

### 6.2. Block Diagram of EUT Configuration

6.2.1. Block Diagram of connection between the EUT and the simulators



6.2.2. Semi-anechoic Chamber Test Setup Diagram



### 6.3. Test Standard

FCC Part 15 CLASS B  
ANSI C63.4 2003

**6.4. Radiated Emission Limit(Class B)**

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMITS (dB $\mu$ V/m)
30 ~ 88	3	40.0
88 ~ 216	3	43.5
216 ~ 960	3	46.0
Above 1000	3	54.0

Note:(1) The smaller limit shall apply at the edge between two frequency bands.

(2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT or system.

**6.5. EUT Configuration on Test**

The following equipment are installed on Radiated Emission Measurement to meet the Commission requirements and operating regulations in a manner which tends to maximize Its emission characteristics in normal application.

**6.6. Operating Condition of EUT**

6.6.1.Setup the EUT as shown on Section 7.1

6.6.2.Turn on the power of all equipments.

6.6.3.Let the EUT work in test mode (Connect to a router and the router attached to PC) and test it.

## 6.7. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Calibrated Loop antenna is used as receiving antenna for frequencies below 30MHz, Calibrated Bilog antenna is used as receiving antenna for frequencies between 30 MHz and 1 GHz, Calibrated Horn antenna is used as receiving antenna for frequencies above 1000MHz. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4: 2003 on radiated emission measurement.

The bandwidth of test receiver is set at 9kHz in below 30MHz. and set at 120kHz in 30-1000MHz.

The final measurement in band 9-90kHz, 110-490kHz and above 1000MHz is performed with Peak detector and Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector. The frequency range from 9kHz to 1000MHz is checked. All the test results are listed in Section 7.7. The measurements greater than 20dB below the limit are not report.

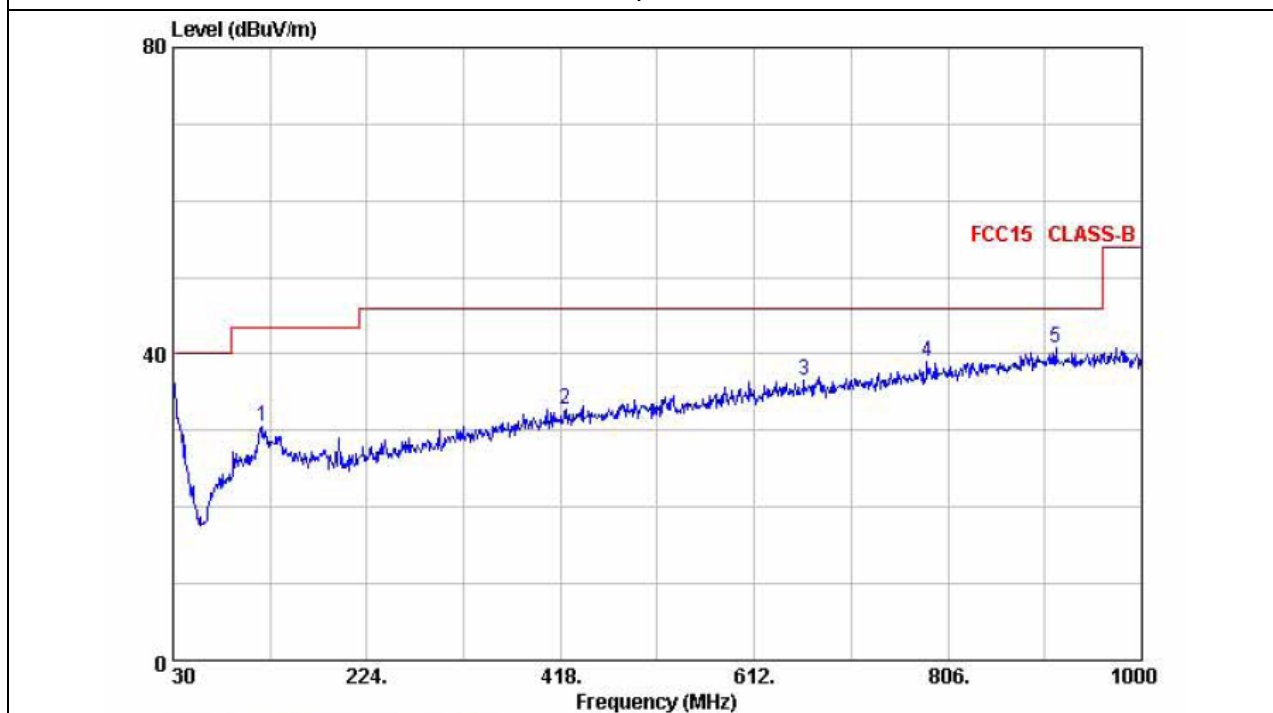
## 6.8. Test Result

**PASS**

**Horizontal**

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
119.24	18.56	11.93	30.49	43.5	-13.01	QP
913.67	32.13	8.72	40.85	46	-5.15	QP

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

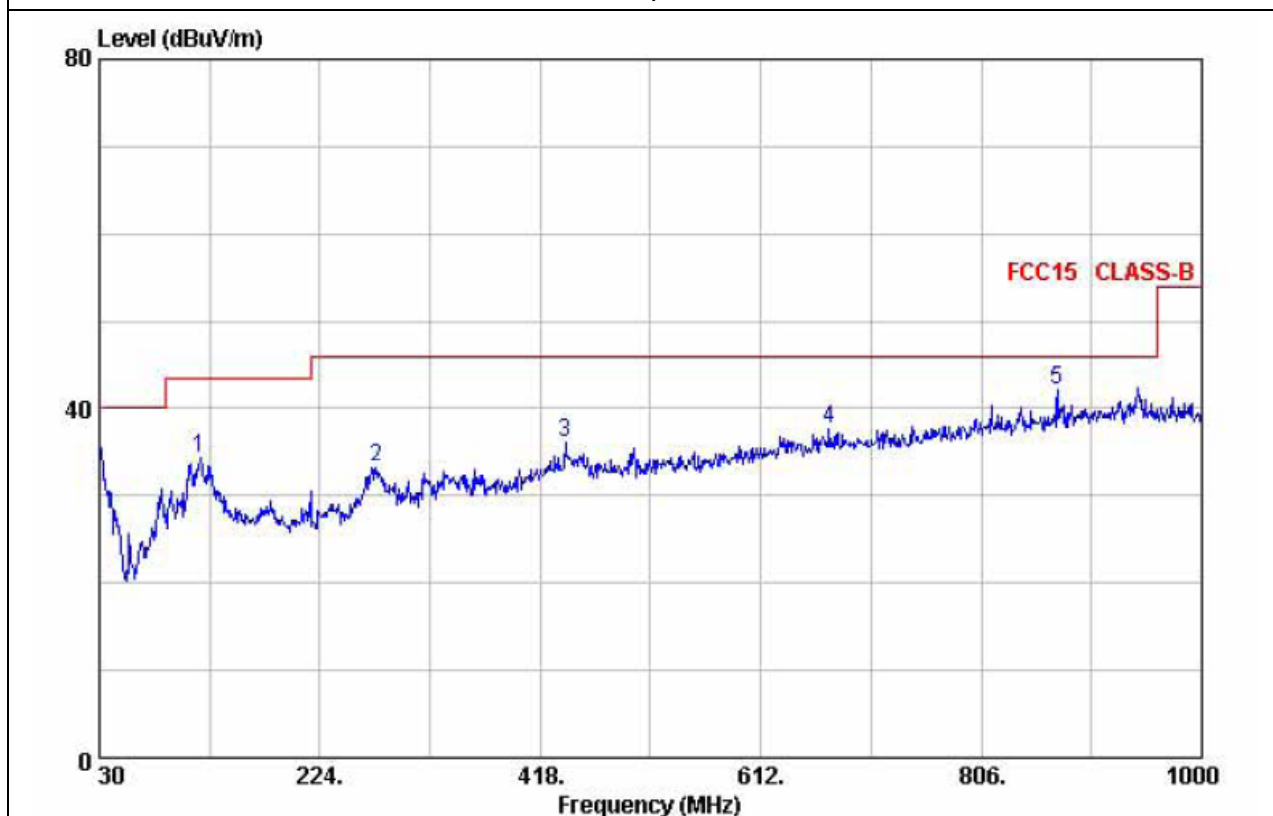


**Vertical**

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
118.27	25.67	8.72	34.39	43.5	-9.11	QP
872.93	28.05	13.99	42.04	46	-3.96	QP

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.





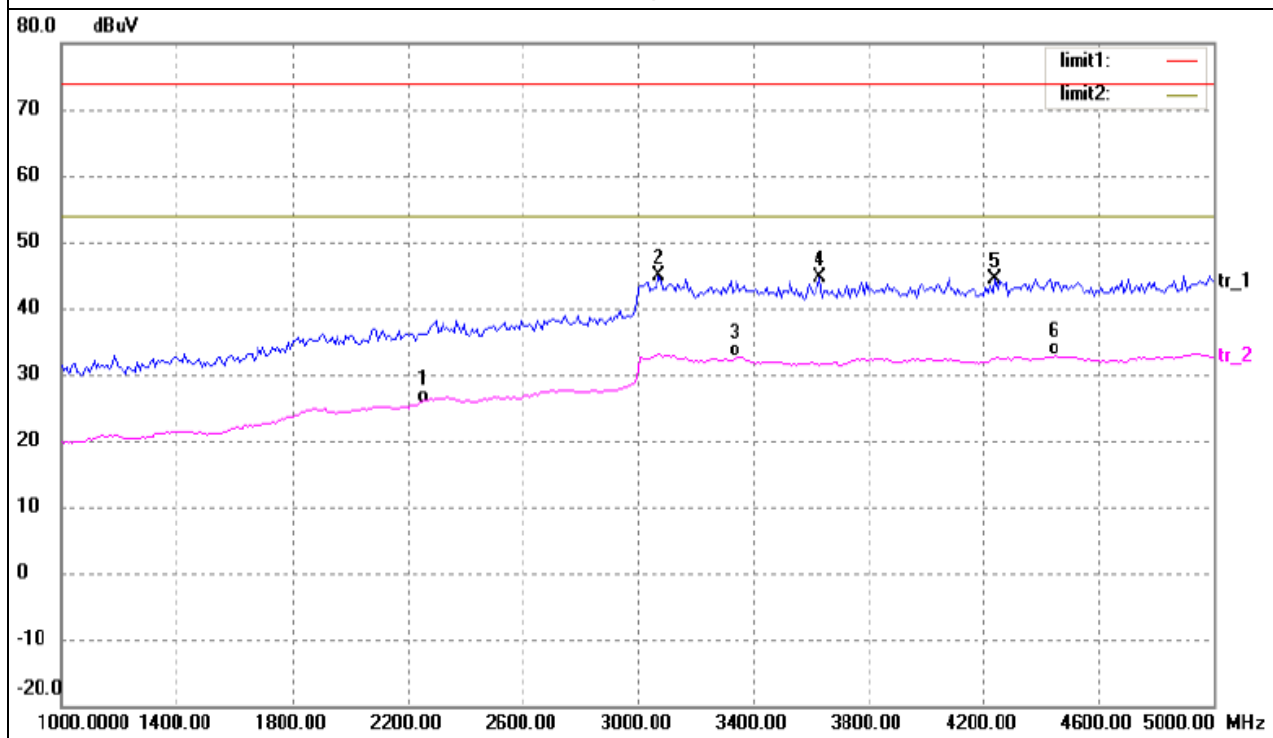
Plot of Radiation Emissions Test Data (Above 1GHz)

Horiyontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
2240	33,22	-7,68	25,54	54,00	-28,46	AV
3072	51,10	-6,20	44,90	74,00	-29,10	PK
3336	38,63	-6,01	32,62	54,00	-21,38	AV
3632	50,48	-5,76	44,72	74,00	-29,28	PK
4240	49,56	-5,14	44,42	74,00	-29,58	PK
4448	37,72	-4,96	32,76	54,00	-21,24	AV

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.



Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
3120	51,07	-6,17	44,90	74,00	-29,10	PK
3352	50,79	-6,00	44,79	74,00	-29,21	PK
3352	38,58	-6,00	32,58	54,00	-21,42	AV
3808	50,42	-5,57	44,85	74,00	-29,15	PK
3832	38,26	-5,54	32,72	54,00	-21,28	AV
4440	37,75	-4,97	32,78	54,00	-21,22	AV

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

