

# Ke Mei Ou Laboratory Co., Ltd.

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## FCC TEST REPORT

Under:  
FCC Part 15, Class B

Prepared For:

### Grandstream Networks, INC

5F, Bldg #1, No.2 Kefa Rd., Science & Technology Park, Shenzhen, China

**EUT: IP Camera**

**Model:**

**GXV3672\_HD\_36, GXV3672\_FHD\_36,  
GXV3672\_HD\_80 , GXV3672\_FHD\_80,  
GXV3672\_FHD, GXV3672\_HD**

August 21, 2013

**Issue Date:**

Original Report

**Report Type:**

*Eric Guo*

**Test Engineer:** Eric Guo

*Apollo Liu*

**Review By:** Apollo Liu / Manager

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## 1. General Information

### 1. 1 Notes

The test results of this report relate exclusively to the test item specified in 1.5. The KMO Lab does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the KMO Lab.

### 1. 2 Testing Laboratory

SinTek Laboratory Co., Ltd.  
No.7, Xinshidai Industrial, Guantian Village,,Shiyan Town, Bao'an District, Shenzhen, Guangdong, 518108 China  
Site on File with the Federal Communications Commission – United States  
Registration Number: 963441

### 1. 3 Details of Applicant

Name : Grandstream Networks, INC  
Address : 5F, Bldg #1, No.2 Kefa Rd., Science & Technology Park, Shenzhen, China  
Contact : Ning Wei  
Tel : 0755-26014600  
Fax : 0755-26014601

### 1. 4 Application Details

Date of Receipt of Application : June 25, 2013  
Date of Receipt of Test Item : June 25, 2013  
Date of Test : July 8~August 15, 2013

### 1. 5 Test Item

Manufacturer : Grandstream Networks, INC  
Address : 5F, Bldg #1, No.2 Kefa Rd., Science & Technology Park, Shenzhen, China  
Trade Name : Grandstream  
Model No.(Base) : GXV3672\_FHD\_80  
Model No.(Extension) : GXV3672\_HD\_36,GXV3672\_FHD\_36,GXV3672\_HD\_80,GXV3672\_FHD,  
GXV3672\_HD  
Description : IP Camera

Note: The one sample for testing only.

### Additional Information

Frequency : N/A  
Number of Channels : N/A  
Power Supply : DC 12.0V/1.0A(Adapter model:SEF1200100E1BB)  
DC 12.0V/1.0A(Adapter model:WEF1200100E1BA)  
POE 48Vpower (Output DC12V)  
Operation Distance : N/A  
Resolution : N/A

Remark: The Applicant's statement is as follows:

IP CAMERA, the series products have six models GXV3672\_FHD\_36 , GXV3672\_HD\_36,GXV3672\_FHD and GXV3672\_HD and GXV3672\_FHD\_80 , GXV3672\_HD\_80. The differences between them are as follows:

1. GXV3672\_HD\_36&GXV3672\_HD and GXV3672\_HD\_80 is HD digital which use the DSP of DM365-300 and the Sensor of AR0130.

GXV3672\_FHD\_36& GXV3672\_FHD and GXV3672\_FHD\_80 is Full HD digital which use the DSP of DM368-400 and the Sensor of AR0331.

2. GXV3672\_HD\_36&GXV3672\_FHD\_36 are 3.6mm fixed lens

GXV3672\_HD and GXV3672\_HD\_80&GXV3672\_FHD and GXV3672\_FHD\_80 are 8.0mm fixed lens

3. GXV3672\_FHD, GXV3672\_HD and GXV3672\_FHD\_80 GXV3672\_HD\_80 design is the same, just different model name.

### 1. 6 Test Standards

FCC 15 Subpart B

Note: All radiated measurements were made in all three orthogonal planes. The values reported are the maximum values.

## 2. Technical Test

### 2. 1 Summary of Test Results

The EUT has been tested according to the following specifications:

FCC 15 Subpart B: 2007, Class B

Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.107	Conducted Test	<b>PASS</b>	Complies
FCC Part 15, Paragraph 15.109	Radiated Test	<b>PASS</b>	Complies

## 3. EUT Modifications

No modification by test lab.

## 4. Conducted Power Line Test

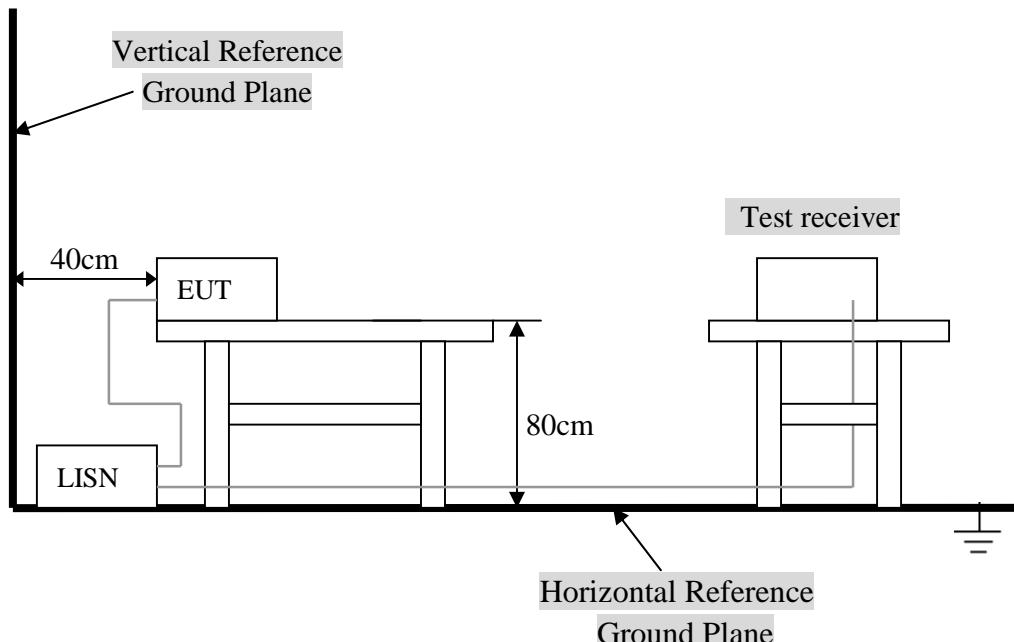
### 4. 1 Test Equipment

Please refer to Section 8 this report.

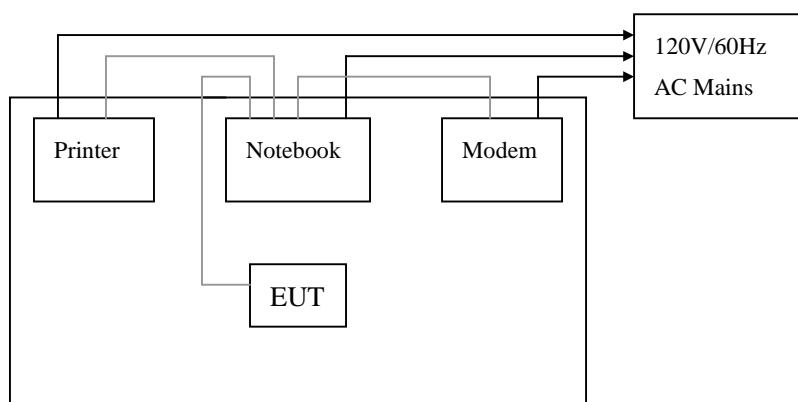
### 4. 2 Test Procedure

The EUT was tested according to ANSI C63.4 - 2003. The frequency spectrum from 0.15 MHz to 30 MHz was investigated. The LISN used was 50 ohm / 50 u-Henry as specified by section 5.1 OF ANSI C63.4 - 2003. cables and peripherals were moved to find the maximum emission levels for each frequency.

### 4. 3 Test Setup



For the actual test configuration, Please refer to the related items – Photos of Testing.



#### 4.4 Configuration of The EUT

The EUT was configured according to ANSI C63.4-2003. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

##### A. EUT

Device	Manufacturer	Model #	FCC ID
IP Camera	Grandstream Networks, INC	GXV3672_FHD_80,GXV3672_HD_36,GXV3672_FHD_36, GXV3672_HD_80,GXV3672_FHD, GXV3672_HD	YZZGXF3672

##### B. Internal Devices

Device	Manufacturer	Model #	FCCID / DoC
N/A			

##### C. Peripherals

Device	Manufacturer	Model # Serial #	FCC ID/ DoC	Cable
Printer	HP	HP930C	DoC	1.5m unshielded power cord 1.2m unshielded data cable.
Modem	GVC	N/A	DoC	1.5m unshielded power cord 1.2m unshielded data cable.
Notebook	DELL	PP10L	DoC	1.5m unshielded power cord
PC	Dell	2400n	DoC	1.5m unshielded power cord

#### 4.5 EUT Operating Condition

The EUT was configured according to ANSI C63.4-2003. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

#### 4.6 Conducted Power Line Emission Limits

Frequency Range (MHz)	Class A QP/AV (dBuV)	Class B QP/AV (dBuV)
0.15 – 0.5	79/66	66 – 56/56 – 46
0.5 – 5.0	73/60	56/46
5.0 – 30	73/60	60/50

**Note:** In the above table, the tighter limit applies at the band edges.

#### 4.7 Conducted Power Line Test Result

Product	: IP Camera	Test Mode	: Normal Link / Auto
Test Item	: Conducted Emission Data	Temperature	: 25 °C
Test Voltage	: DC 12V	Humidity	: 56%RH
Test Result	: <b>PASS</b>	Adapter Model	:

The frequency spectrum from 0.15 MHz to 30 MHz was investigated. All readings are quasi -peak values with a resolution bandwidth of 9 KHz.

- Temperature : 26 °C
- Humidity : 53 % RH

*Adapter model: SEF1200100A1BB*

FCC Part 15 Paragraph 15.207							
Frequency (MHz)	Emission (dBuV)		LINE/NEUTRAL	Limit (dBuV)		Margin (dB)	
	QP	AV		QP	AV	QP	AV
0.374	48.67	38.32	Line	58.41	48.41	-9.74	-10.09
0.154	43.29	28.12	Neutral	65.78	55.78	-22.49	-27.66
0.394	52.78	41.01	Line	57.98	47.98	-5.20	-6.97
0.226	41.67	32.28	Neutral	62.60	52.60	-20.93	-20.32
0.426	53.77	43.39	Line	57.33	47.33	-3.56	-3.94
0.422	47.38	36.52	Neutral	57.41	47.41	-10.03	-10.89

**Note: NF = No Significant Peak was Found.**

*Adapter model: WEF1200100A1BA*

FCC Part 15 Paragraph 15.207							
Frequency (MHz)	Emission (dBuV)		LINE/NEUTRAL	Limit (dBuV)		Margin (dB)	
	QP	AV		QP	AV	QP	AV
0.158	56.78	49.43	Line	65.57	55.57	-8.79	-6.14
0.158	57.01	48.11	Neutral	65.57	55.57	-8.56	-7.46
0.210	52.43	45.61	Line	63.21	53.21	-10.78	-7.60
0.218	54.20	47.51	Neutral	62.89	52.89	-8.69	-5.38
0.370	50.66	41.81	Line	58.50	48.50	-7.84	-6.69
0.262	54.78	47.62	Neutral	61.37	51.37	-6.59	-3.75

**Note: NF = No Significant Peak was Found.**

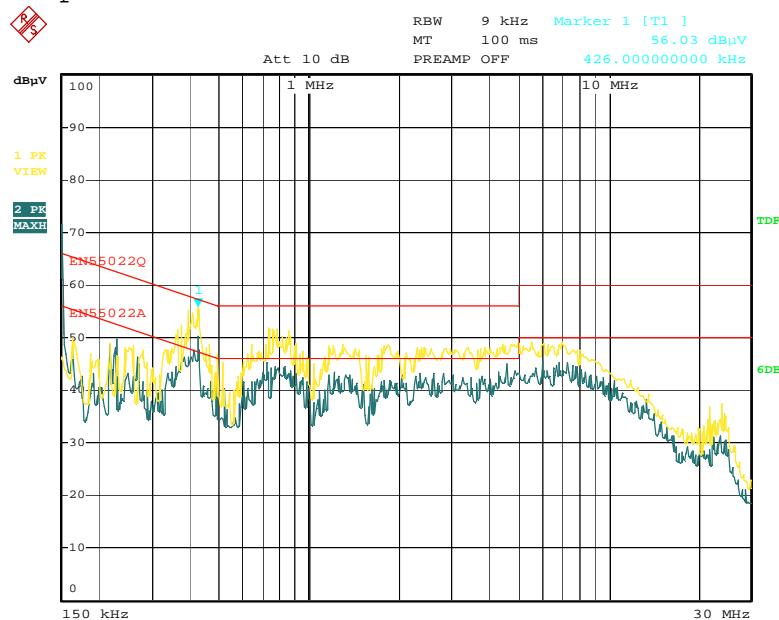
*POE*

FCC Part 15 Paragraph 15.207							
Frequency (MHz)	Emission (dBuV)		LINE/NEUTRAL	Limit (dBuV)		Margin (dB)	
	QP	AV		QP	AV	QP	AV
0.242	44.18	42.31	Line	62.03	52.03	-17.85	-9.72
0.246	49.91	40.98	Neutral	61.89	51.89	-11.98	-10.91
0.306	43.11	41.02	Line	60.08	50.08	-16.97	-9.06
0.302	43.78	41.91	Neutral	60.19	50.19	-16.41	-8.28
0.666	41.93	39.94	Line	56.00	46.00	-14.07	-6.06
0.670	43.21	41.44	Neutral	56.00	46.00	-12.79	-4.56

**Note: NF = No Significant Peak was Found.**

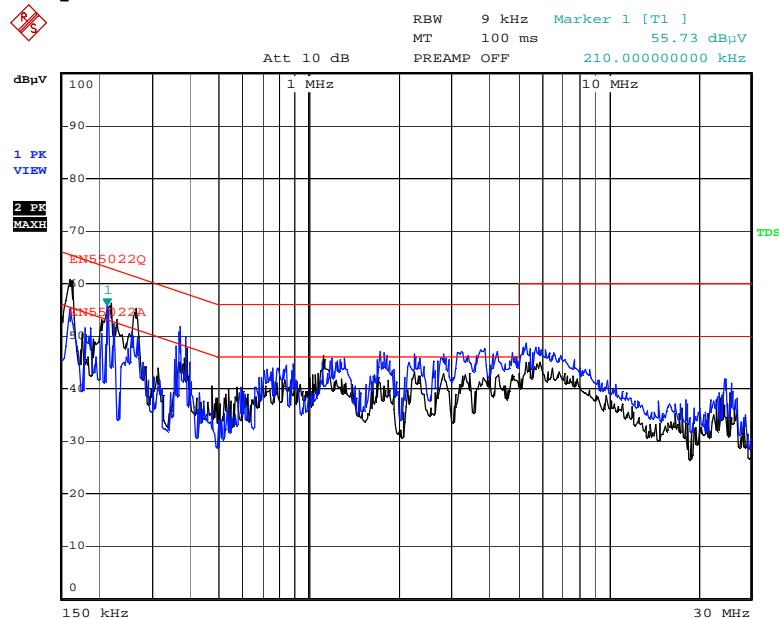
**Note:**

- 1.Uncertainty in conducted emission measured is <+/-2dB.
- 2.The emission levels of other frequencies were very low against the limit.
- 3.All Reading Levels are Quasi-Peak and Average value.
- 4.Emission = Meter Reading + Factor; Factor = Insertion Loss + Cable Loss.
- 5.Margin Value = Emission Level - Limit Value.

**Conducted Emission****FCC15.207***EUT: IP Camera**M/N: GXV3672\_FHD\_80**Manufacturer: Grandstream Networks, INC**Operating Condition: Transmitter**Test Site: Normal**Operator: Eric**Test Specification: LINE&NEUTRAL**Comment:**Adapter model: SEF1200100A1BB*

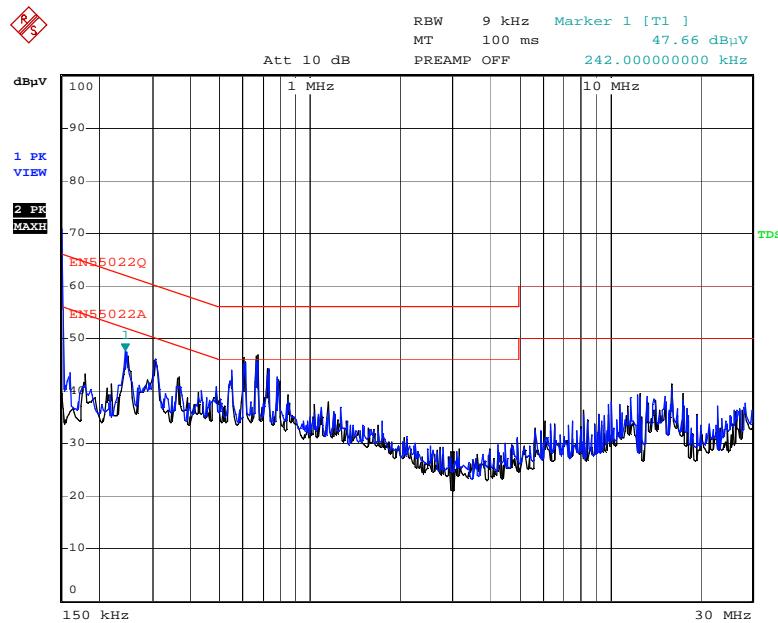
Date: 9.JUL.2013 17:04:55

Adapter model: WEF1200100A1BA



Date: 2.AUG.2013 14:44:55

POE



Date: 15.AUG.2013 17:01:02

## 5. Radiated Emission Test

### 5. 1 Test Equipment

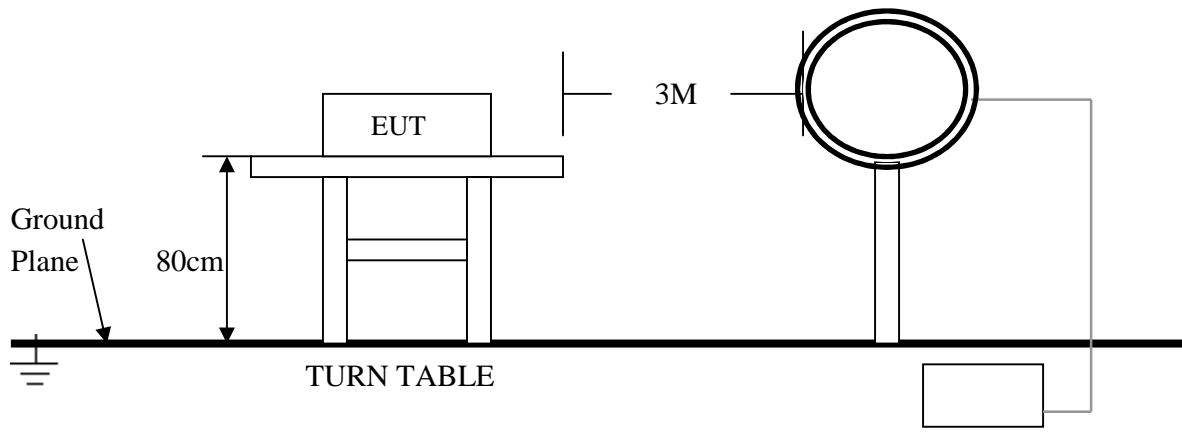
Please refer to Section 8 this report.

### 5. 2 Test Procedure

1. The EUT was tested according to ANSI C63.4 - 2003.
2. The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-2003.
3. The frequency spectrum from 30 MHz to 1 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 KHz. All readings are above 1 GHz , peak values with a resolution bandwidth of 1 MHz . Measurements were made at 3 meters.
4. The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
5. Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is 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 dB of specification limit), and are distinguished with a "QP" in the data table.
6. The antenna polarization : Vertical polarization and Horizontal polarization.

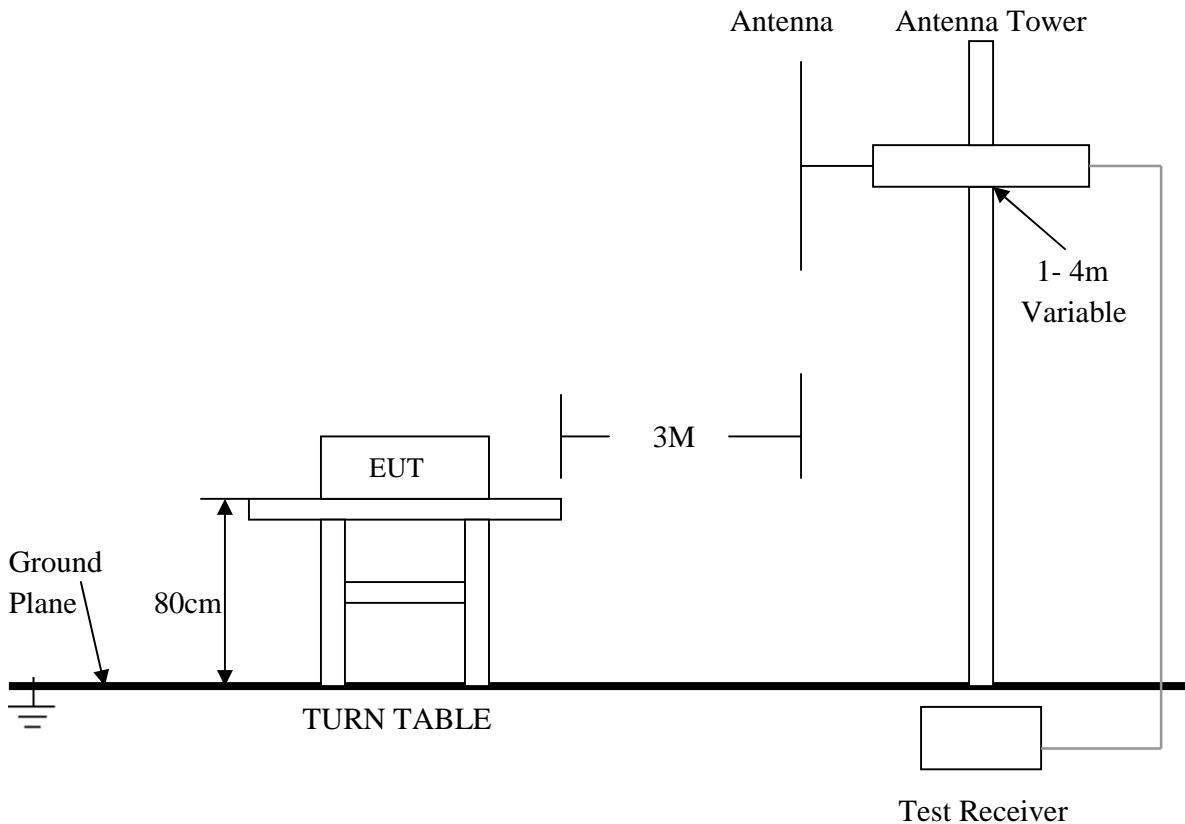
### 5. 3 Radiated Test Setup

#### For Frequencies below 30 MHz



For the actual test configuration , please refer to the related items – Photos of Testing

### For Frequencies above 30 MHz



For the actual test configuration , please refer to the related items – Photos of Testing.

### 5.4 Configuration of The EUT

Same as section 4.4 of this report

### 5.5 EUT Operating Condition

Same as section 4.5 of this report

### 5.6 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

Frequencies in restricted band are complied to limit on Paragraph 15.109.

Frequency (MHz)	Distance (m)	Field Strength (dBuV/m)
30 - 88	3	40.0
88 - 216	3	43.5
216 - 960	3	46.0
Above 960	3	54.0

#### Note:

1. In the emission tables above, the tighter limit applies at the band edges.
2. Distance refers to the distance between measuring instrument, antenna, and the closest point of any part of the device or system.
3. The lower limit shall apply at the transition frequencies.

## 5.7 Radiated Emission Test Result

Product	: Tablet PC	Test Mode	: Normal Link / Auto
Test Item	: Fundamental Radiated Emission Data	Temperature	: 25 °C
Test Voltage	: DC 12V/POE	Humidity	: 56%RH
Test Result	: PASS	Model	:

### For Frequency Below 30MHz

Freq. (MHz)	Emission (dBuV/m) QP Detector	HORIZ / VERT	Limits (dBuV/m)	Margin (dB)
N/A	N/A	N/A	N/A	N/A

**Note:**

- (1) All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
- (2) "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
- (3) Emission Level = Reading Level + Probe Factor + Cable Loss.

### For Frequency Above 30MHz

Adapter model: SEF1200100A1BB

Freq. (MHz)	Emission (dBuV/m) QP Detector	HORIZ / VERT	Limits (dBuV/m)	Margin (dB)
139.200	28.67	HORZ	43.5	-14.83
30.680	36.28	VERT	40.0	-3.72
148.480	35.34	HORZ	43.5	-8.16
86.040	35.93	VERT	40.0	-4.07
468.720	25.73	HORZ	46.0	-20.27
106.680	35.55	VERT	43.5	-7.95

Adapter model: WEF1200100A1BA

Freq. (MHz)	Emission (dBuV/m) QP Detector	HORIZ / VERT	Limits (dBuV/m)	Margin (dB)
63.200	22.62	HORZ	40.0	-17.38
33.200	37.52	VERT	40.0	-2.48
143.320	26.73	HORZ	43.5	-16.77
109.520	29.11	VERT	43.5	-14.39
148.480	28.51	HORZ	43.5	-14.99
375.000	36.67	VERT	46.0	-9.33

### POE

Freq. (MHz)	Emission (dBuV/m) QP Detector	HORIZ / VERT	Limits (dBuV/m)	Margin (dB)
106.720	26.76	HORZ	43.5	-16.74
33.440	37.81	VERT	40.0	-2.19
148.480	37.94	HORZ	43.5	-5.56
148.480	42.49	VERT	43.5	-1.01
250.000	31.57	HORZ	46.0	-14.43
185.680	31.61	VERT	43.5	-11.89

**Note:**

- (1) All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
- (2) Emission Level = Reading Level + Probe Factor + Cable Loss.

## 6. Photo of Testing

### 6.1 Emission test view

Conducted emission test view



Radiated emission test view





## 6.2 Photograph - EUT

EUT top view



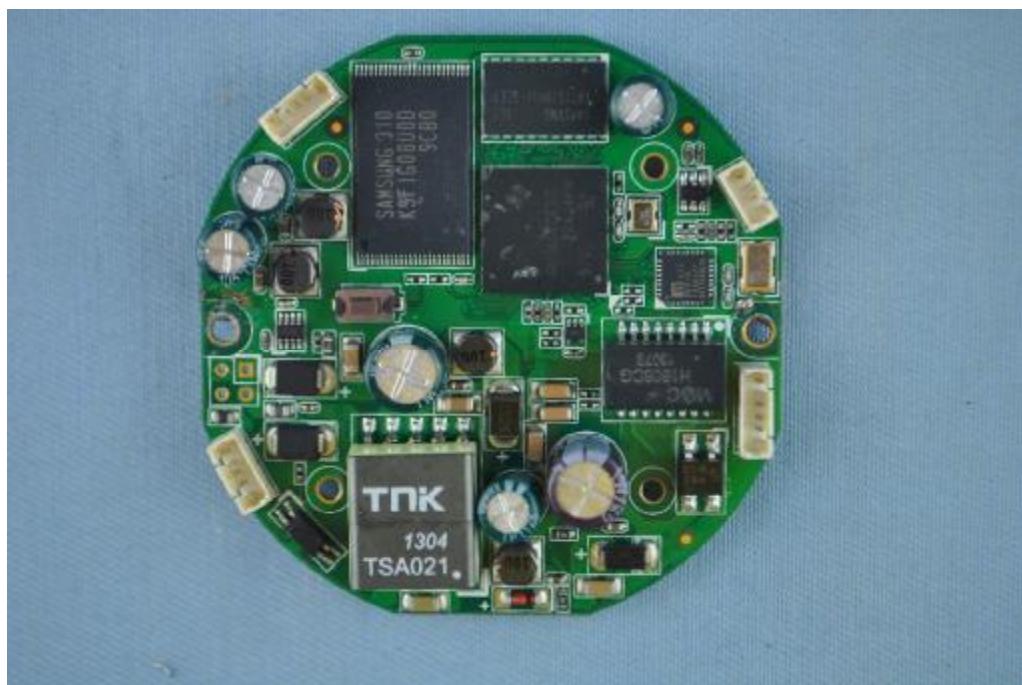
EUT bottom view

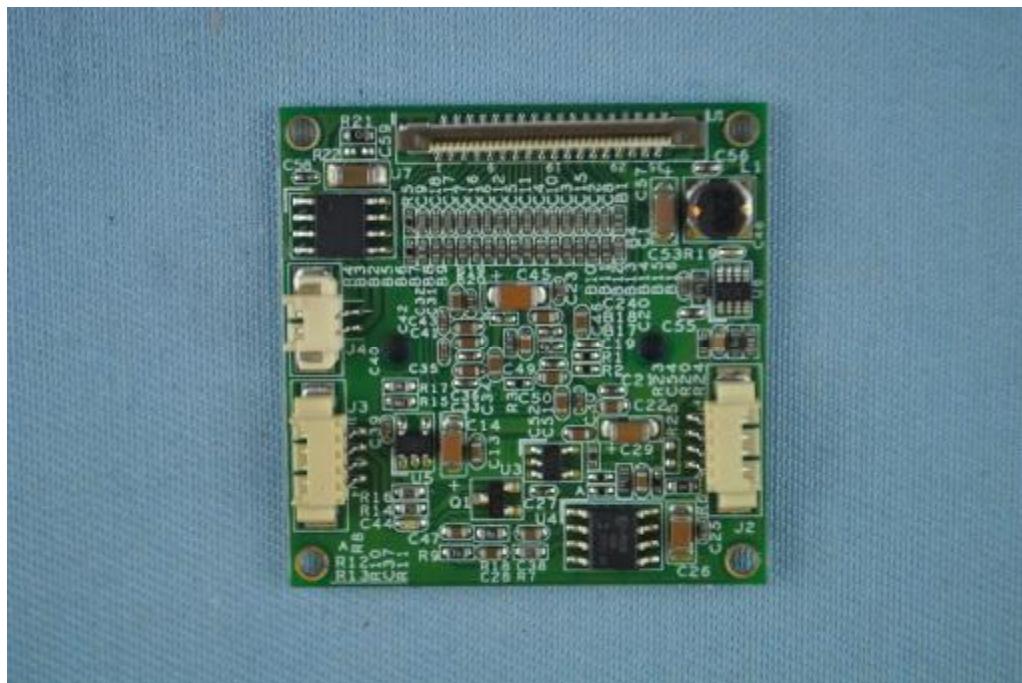


EUT inside whole view



Main & RF board component side





### Main & RF board solder side





Adapter top view





Adapter side view



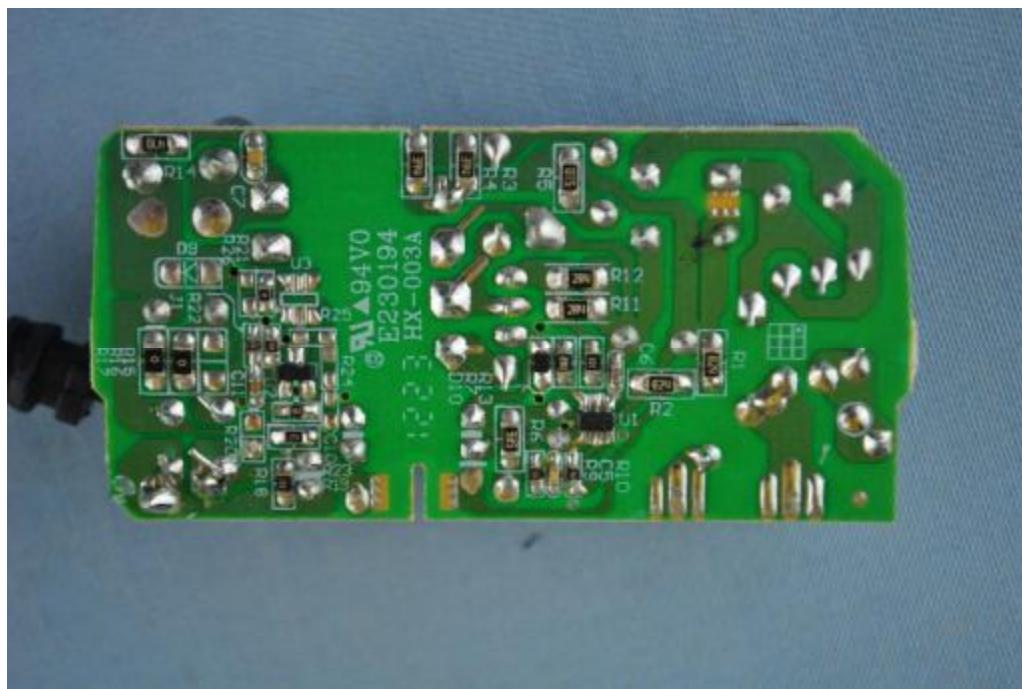


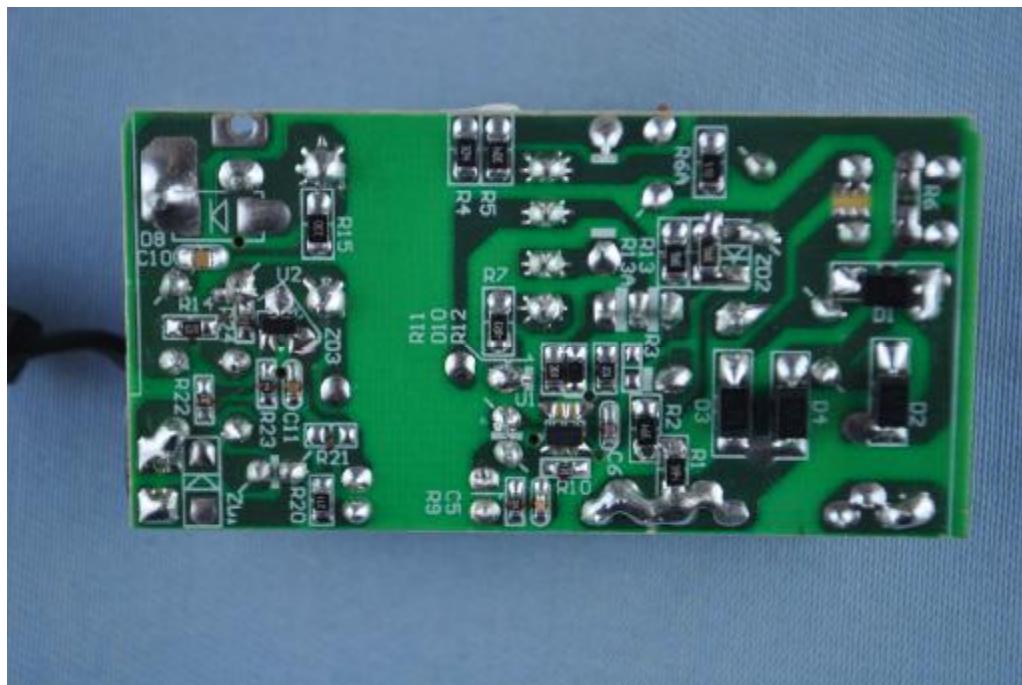
Adapter inside whole view



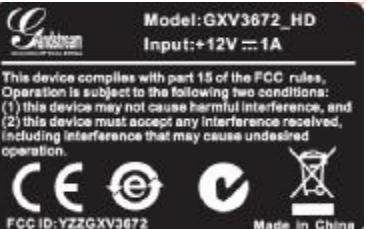
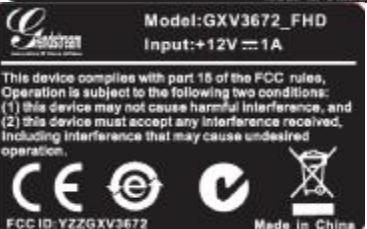
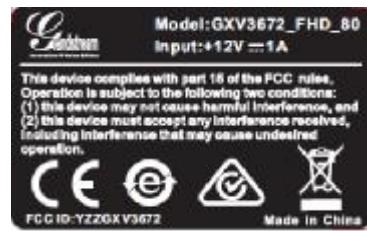
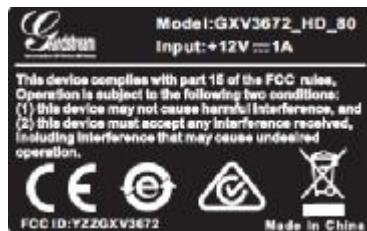
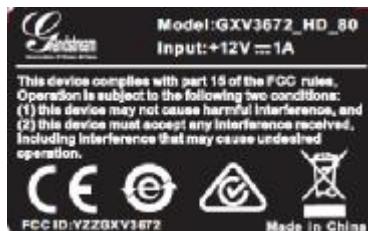


Adapter PCB rear view





## 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 label. 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 Bottom View/Proposed FCC Mark Location



## 8. Test Equipment

The following test equipments were used during the radiated & conducted emission test:

Equipment/ Facilities	Manufacturer	Model #	Serial No.	Due Date
Turntable	SinTek	N/A	N/A	NCR
Antenna Tower	SinTek	N/A	N/A	NCR
OATS	SinTek	N/A	N/A	Sep.28, 2013
Pre-Amplifier	Agilent	87405C	KMO-SZ155	Dec.6, 2013
Pre-Amplifier	Com-Power	PAM-840	KMO-SZ156	Dec.6, 2013
Horn Antenna	Com-Power	AH-840	KMO-SZ157	Dec.6, 2013
EMI Test Receiver	Rohde & Schwarz	ESPI7	KMO-SZ002	June 01, 2014
Spectrum Analyzer	Rohde & Schwarz	FSP40	KMO-SZ003	May 27, 2014
Signal Generator	FLUKE	PM5418+Y/C	KMO-SZ020	May 27, 2014
Loop Antenna	Rohde & Schwarz	HFH2-Z2	KMO-SZ004	Jan. 30, 2014
Trilog-Super Broadband Antenna	SCHWARZBECK	VULB9161	KMO-SZ005	Sep.18, 2013
Trilog-Super Broadband Antenna	SCHWARZBECK	VULB9161	KMO-SZ006	Sep.18, 2013
Broad-Band Horn Antenna	SCHWARZBECK	BBHA 9120D	KMO-SZ007	Sep.18, 2013
Broad-Band Horn Antenna	SCHWARZBECK	BBHA 9120D	KMO-SZ008	Sep.18, 2013
AMN	Rohde & Schwarz	ESH3-Z5	KMO-SZ009	May 27, 2014
Pulse Limiter	SCHWARZBECK	VTSD 9561-F	KMO-SZ077	Nov.29, 2013
ISN	SCHWARZBECK	NTFM 8158 CAT3	KMO-SZ070	Nov.19, 2013
ISN	SCHWARZBECK	NTFM 8158 CAT5	KMO-SZ071	Nov.19, 2013
ISN	SCHWARZBECK	NTFM 8158 CAT6	KMO-SZ072	Nov.19, 2013
KMO Shielded Room	KMO	KMO-001	N/A	N/A
Coaxial Cable with N-Connectors	SCHWARZBECK	AK9515H	KMO-SZ037	Sep.18, 2013
SOHO Telephone Switching System	IKE	2000-108C	N/A	NCR
3m Anechoic Chamber	KMO	KMO-3AC	KMO-3AC-1	May 29, 2014
Temperature Chamber	TABAI	PSL-4GTW	N/A	Feb.10, 2014