Ke Mei Ou Laboratory Co., Ltd.

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FCC TEST REPORT

Certification

Under:
FCC Part 15, Class B

Prepared For:

Grandstream Networks, Inc.

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

FCC ID: YZZGXV3611IR-HD
EUT: IP Camera
Model: GXV3611IR_HD

October 31, 2014 **Issue Date:**
Original Report **Report Type:**
Eric Guo **Test Engineer:** Eric Guo
 **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

Ke Mei Ou Laboratory Co., Ltd.

ANSI-ASQ National Accreditation Board/ACLASS ISO/IEC 17025 Accredited Lab for telecommunication standards. The Registration Number is AT-1532. The testing quality system meets with ISO/IEC-17025 requirements, This approval results is accepted by MRA of ILAC.
FCC Test Site Registration Number: 962205
IC Test Site Registration Number: 4986A-2
Email: kmo@kmolab.com
Internet: www.kmolab.com

1. 3 Details of Applicant

Name : Grandstream Networks, Inc.
Address : 5F, Bldg #1, No.2 Kefa Rd., Science & Technology Park, Shenzhen, China

1. 4 Application Details

Date of Receipt of Application	: October 16, 2014
Date of Receipt of Test Item	: October 16, 2014
Date of Test	: October 21, ~October 31, 2014

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)	: GXV3611IR_HD
Model No.(Extension)	: N/A
Description	: IP Camera

Additional Information

Frequency	: N/A
Number of Channels	: N/A
Power Supply	: 1#MODEL:WCF1200050A1BA INPUT:AC 100-240V 50/60Hz,0.15A OUTPUT:DC 12.0V/0.5A 2#MODEL:UE06L8-120050SPAU INPUT: AC 100-240V 50/60Hz,0.2A OUTPUT:DC 12.0V/0.5A
Operation Distance	: N/A
Resolution	: N/A

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: 2013, Class B

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

3. EUT Modifications

No modification by test lab.

4. Conducted Power Line Test

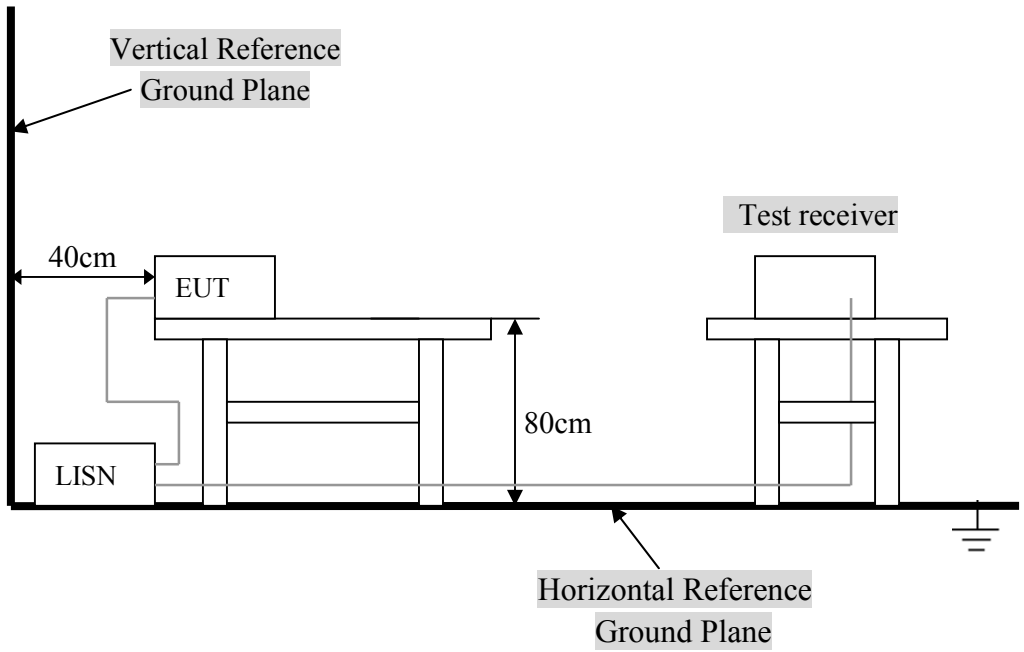
4. 1 Test Equipment

Please refer to Section 8 this report.

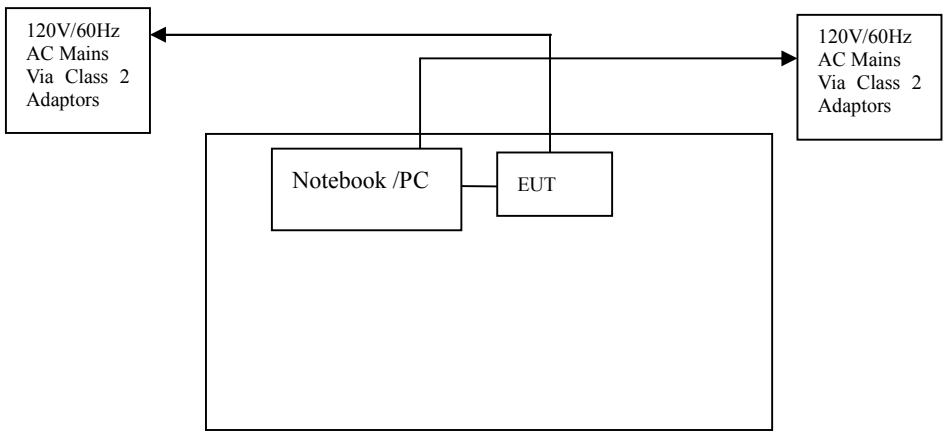
4. 2 Test Procedure

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 #	Type
IP Camera	Grandstream Networks, Inc.	GXV3611IR_HD	YZZ GXV3611IR-HD

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

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 ℃
- Humidity ： 53 % RH
- Result ： **PASSED**

Power Adapter Model: WCF1200050A1BA

FCC Part 15 Paragraph 15.107							
Frequency (MHz)	Emission (dBuV) QP	AV	LINE/ NEUTRAL	Limit (dBuV) QP	AV	Margin (dB) QP	AV
0.374	42.82	34.56	Line	58.41	48.41	-15.59	-13.85
0.374	42.26	31.57	Neutral	58.41	48.41	-16.15	-16.84
0.394	41.92	32.56	Line	57.98	47.98	-16.06	-15.42
0.390	40.16	32.46	Neutral	58.06	48.06	-17.90	-15.60
10.730	34.85	24.76	Line	60.00	50.00	-25.15	-25.24
15.466	48.74	38.29	Neutral	60.00	50.00	-11.26	-11.71

Note: NF = No Significant Peak was Found.

Power Adapter Model: UE06L8-120050SPAU

FCC Part 15 Paragraph 15.107							
Frequency (MHz)	Emission (dBuV) QP	AV	LINE/ NEUTRAL	Limit (dBuV) QP	AV	Margin (dB) QP	AV
0.338	42.56	36.15	Line	59.25	49.25	-16.69	-13.10
0.162	38.64	29.16	Neutral	65.36	55.36	-26.72	-26.20
0.354	40.57	32.94	Line	58.87	48.87	-18.30	-15.93
0.338	38.59	30.54	Neutral	59.25	49.25	-20.66	-18.71
1.118	34.39	26.08	Line	56.00	46.00	-21.61	-19.92
0.654	31.48	25.47	Neutral	56.00	46.00	-24.52	-20.53

Note: NF = No Significant Peak was Found

POE

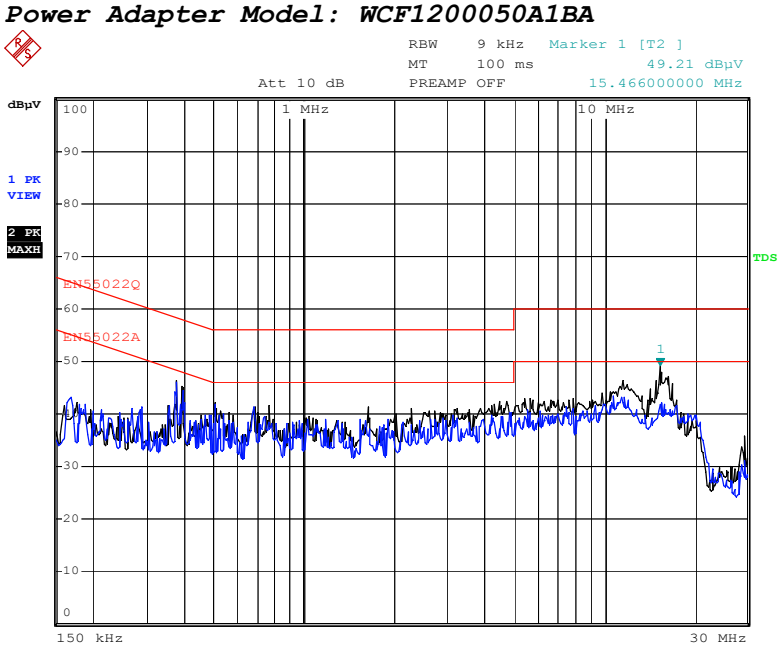
FCC Part 15 Paragraph 15.107							
Frequency (MHz)	Emission (dBuV) QP	AV	LINE/ NEUTRAL	Limit (dBuV) QP	AV	Margin (dB) QP	AV
0.158	50.94	37.46	Line	65.57	55.57	-14.63	-18.11
0.154	49.56	36.27	Neutral	65.78	55.78	-16.22	-19.51
0.17	44.76	30.48	Line	64.96	54.96	-20.20	-24.48
0.182	46.76	33.74	Neutral	64.39	54.39	-17.63	-20.65
1.094	42.67	40.16	Line	56.00	46.00	-13.33	-5.84
1.094	42.37	40.18	Neutral	56.00	46.00	-13.63	-5.82

Note: NF = No Significant Peak was Found

Remarks：

1.Uncertainty in conducted emission measured is <+/ -2dB.
2.QP and AV are abbreviations of quasi-peak and average individually.
3.The emission levels of other frequencies were very low against the limit.
4.The Quasi-peak emission level also meets average limit and measurement with the average detector is unnecessary.
5.Margin Value= Emission Level – Limit Value

Conducted Emission
FCC15.107
EUT: IP Camera
M/N: GXV3611IR_HD
Manufacturer: Grandstream Networks, Inc.
Operating Condition: Normal
Test Site: Ke Mei Ou Lab
Operator:
Test Specification: LINE&NEUTRAL
Comment:
Power Adapter Model: WCF1200050A1BA



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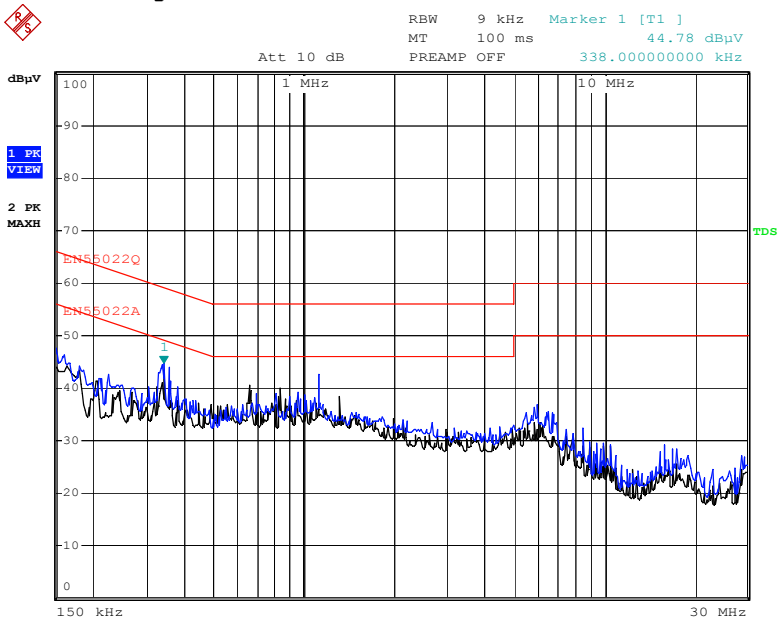
Power Adapter Model: UE06L8-120050SPAU



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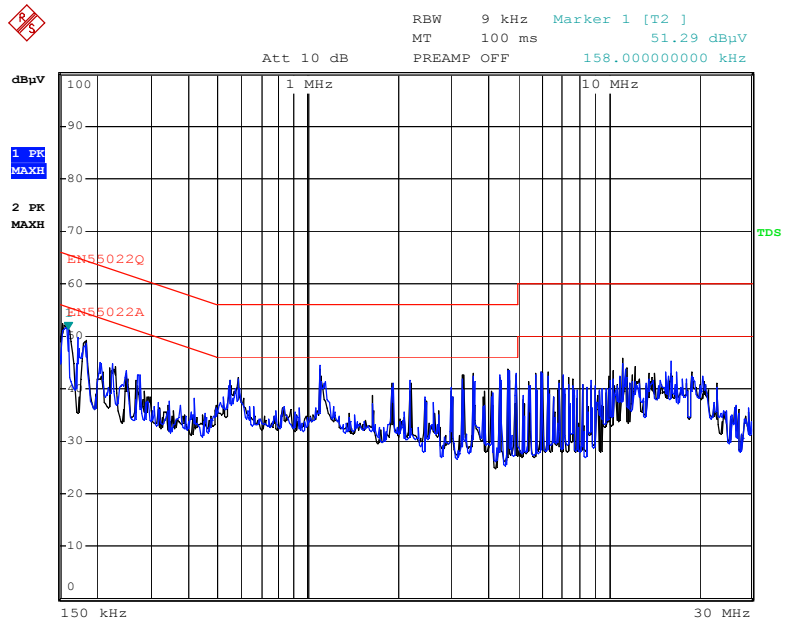
POE


RBW 9 kHz
Marker 1 [T2]
MT 100 ms
51.29 dBµV
Att 10 dB
PREAMP OFF
158.000000000 kHz
dBµV
1 MHz
10 MHz
1 PK MAXH
2 PK MAXH
EN55022Q
EN55022A
TDS
150 kHz
30 MHz
Date: 22.OCT.2014 15:39:05

5. Radiated Emission Test

5. 1 Test Equipment

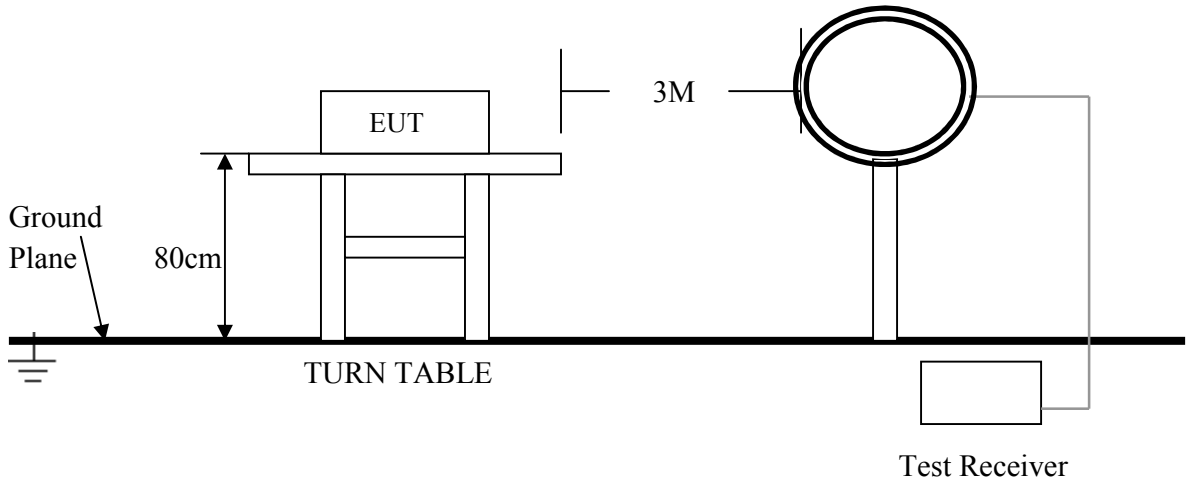
Please refer to Section 8 this report.

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 9 kHz to 25 GHz was investigated. All readings from 9 kHz to 150 kHz are quasi-peak values with a resolution bandwidth of 200 Hz. All readings from 150 kHz to 30 MHz are quasi-peak values with a resolution bandwidth of 9 KHz. 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 emissions from the EUT were measured continuously at every azimuth by rotating the turntable. The Receiving antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency. Emissions below 30MHz were measured with a loop antenna while emission above 30MHz were measured using a broadband E-field antenna.
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. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 8 and 13 of ANSI C63.4 - 2003.

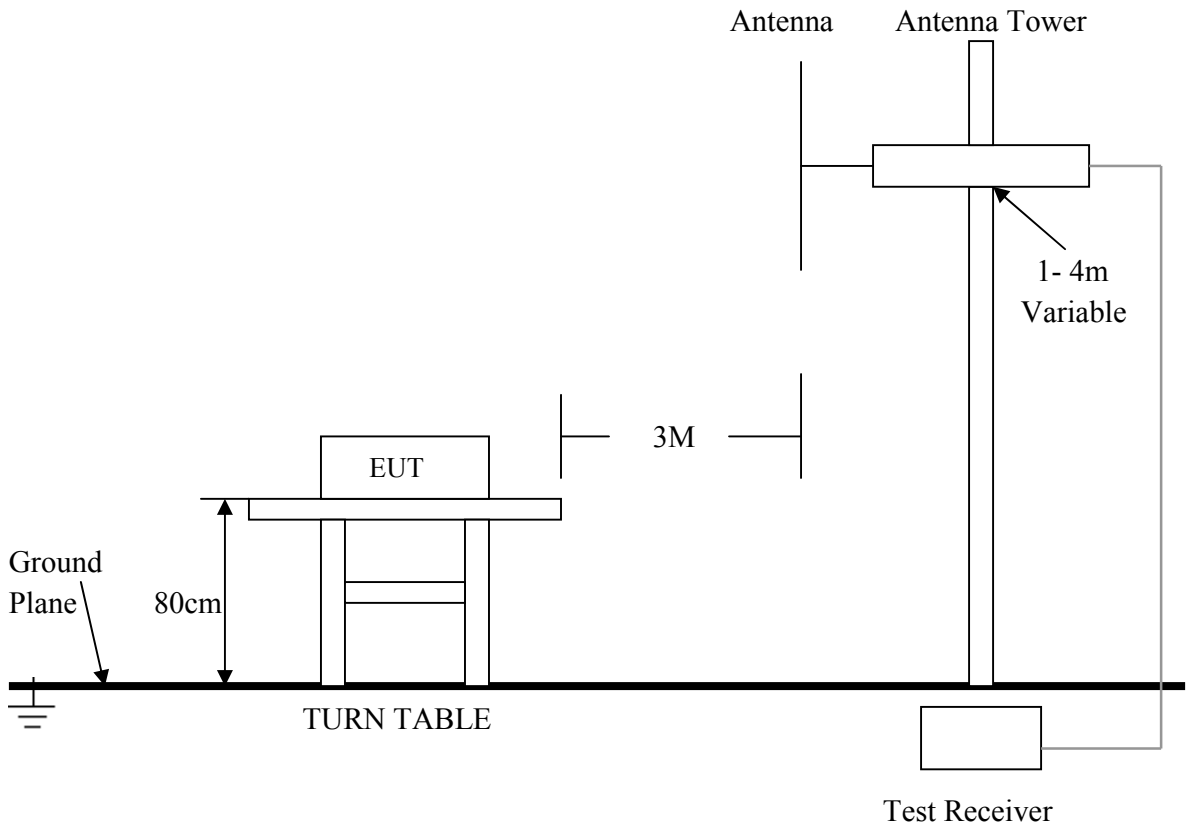
5. 3 Radiated Test Setup

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

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.

- Temperature： 24 ℃
- Humidity ： 56 %RH
- Result ： **PASSED**

For Frequency Below 30MHz

Power Adapter Model:

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

Power Adapter Model: WCF1200050A1BA

FCC Part 15 Paragraph 15.109				
Freq. (MHz)	**Emission (dBuV/m)**	**HORIZ / VERT**	**Limits (dBuV/m)**	**Margin (dB)**
360.680	39.28	Horiz./	46.0	-6.72
39.640	34.49	Vert.	40.0	-5.51
383.480	40.29	Horiz./	46.0	-5.71
466.320	43.42	Vert.	46.0	-2.58
730.760	37.83	Horiz./	46.0	-8.17
662.680	42.37	Vert.	46.0	-3.63

Note: NF = No Significant Peak was Found.

Power Adapter Model: UE06L8-120050SPAU

FCC Part 15 Paragraph 15.109				
Freq. (MHz)	**Emission (dBuV/m)**	**HORIZ / VERT**	**Limits (dBuV/m)**	**Margin (dB)**
398.000	32.06	Horiz./	46.0	-13.94
47.800	34.57	Vert.	40.0	-5.43
610.840	35.42	Horiz./	46.0	-10.58
466.360	44.06	Vert.	46.0	-1.94
687.360	36.63	Horiz./	46.0	-9.37
662.680	43.01	Vert.	46.0	-2.99

Note: NF = No Significant Peak was Found.

POE

FCC Part 15 Paragraph 15.109				
Freq. (MHz)	**Emission (dBuV/m)**	**HORIZ / VERT**	**Limits (dBuV/m)**	**Margin (dB)**
250.000	39.72	Horiz./	46.0	-6.28
148.120	39.58	Vert.	43.5	-3.92
625.040	42.35	Horiz./	46.0	-3.65
250.000	44.25	Vert.	46.0	-1.75
875.040	42.03	Horiz./	46.0	-3.97
466.320	43.86	Vert.	46.0	-2.14

Note: NF = No Significant Peak was Found.

For Frequency Above 1GHz
Power Adapter_Model: WCF1200050A1BA

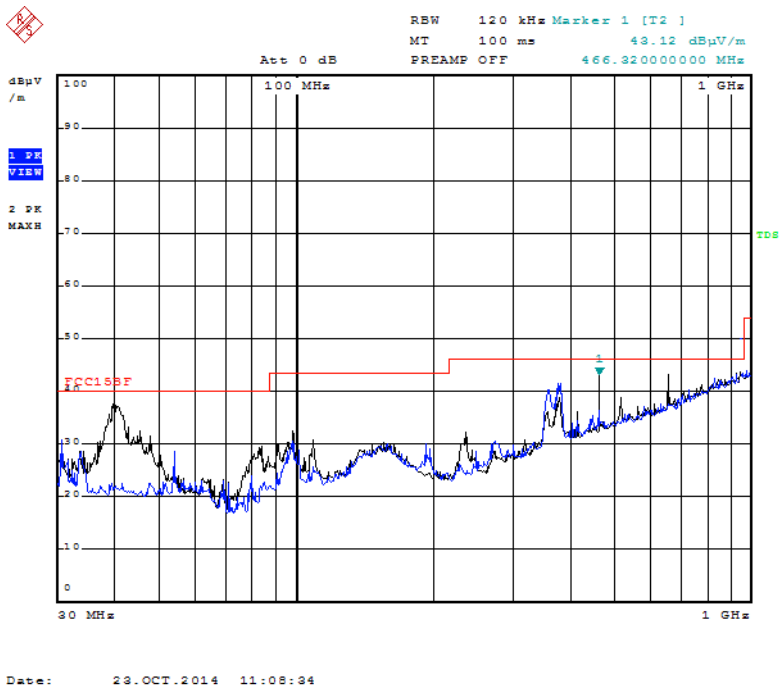
FCC15 Class B							
Frequency (GHz)	**Emission (dBuV) PK**	**AV**	**Telecom Ports**	**Limit (dBuV) PK**	**AV**	**Margin (dB) PK**	**AV**
2.0128	50.43	-	Horiz./	74	54	-23.57	-
2.0132	48.62	-	Vert.	74	54	-25.38	-
2.1508	45.72	-	Horiz./	74	54	-28.28	-
2.2808	46.36	-	Vert.	74	54	-27.64	-
2.3540	50.32	-	Horiz./	74	54	-23.68	-
2.3556	48.96	-	Vert.	74	54	-25.04	-

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.

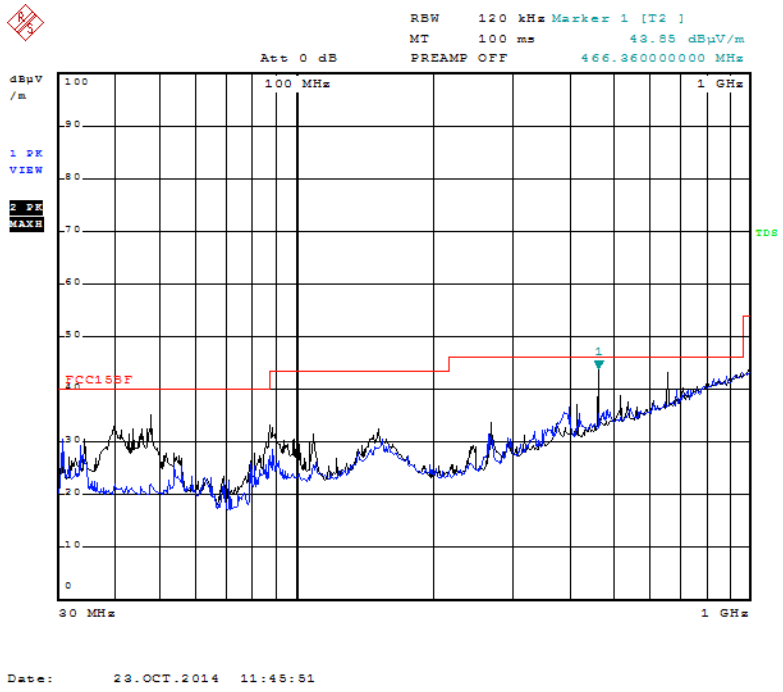
Radiated Emission

Comment: Above 30MHz

Power Adapter_Model: WCF1200050A1BA



Power Adapter Model: UE06L8-120050SPAU



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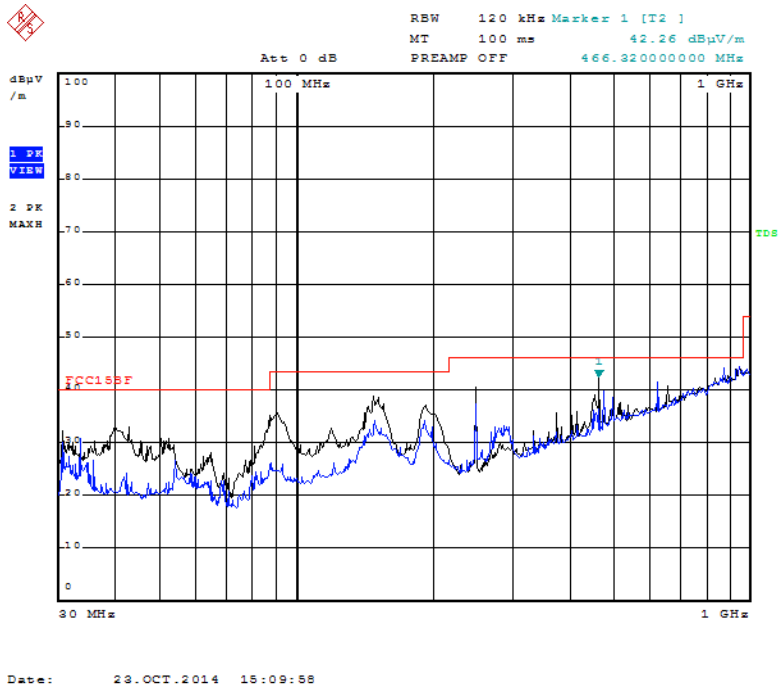
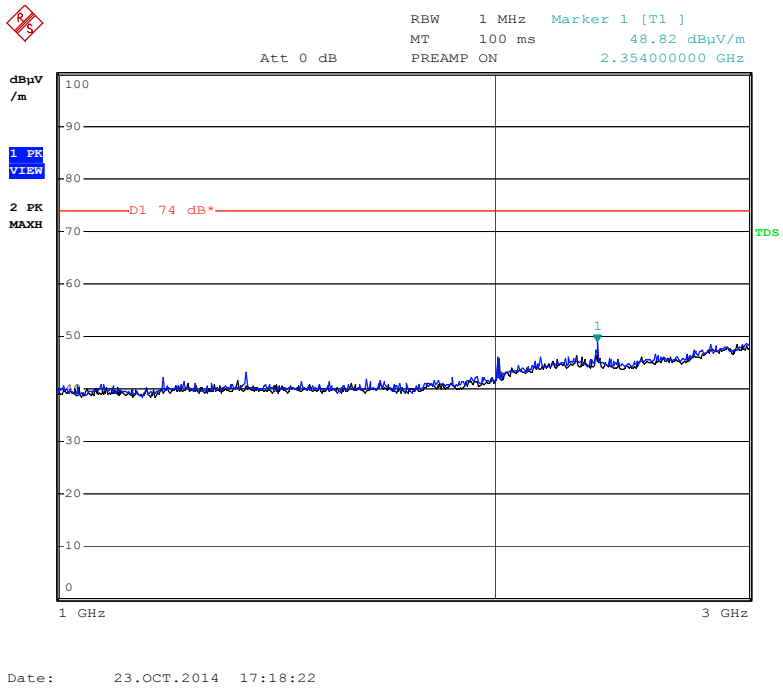


Radiated Emission

Comment: Above 1GHz

Power Adapter_Model: WCF1200050A1BA

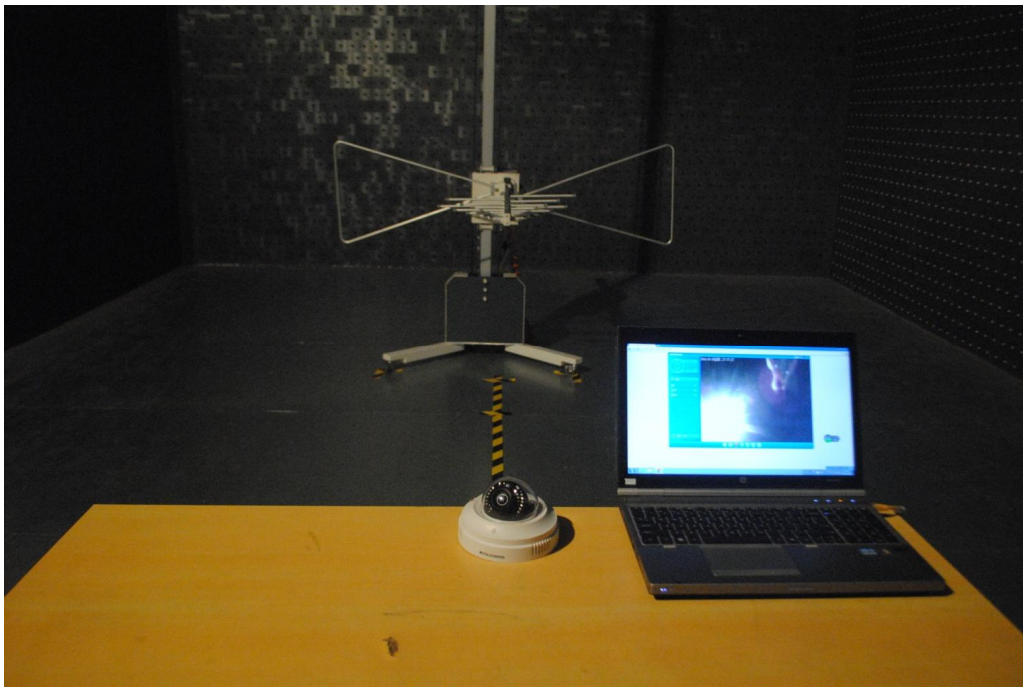


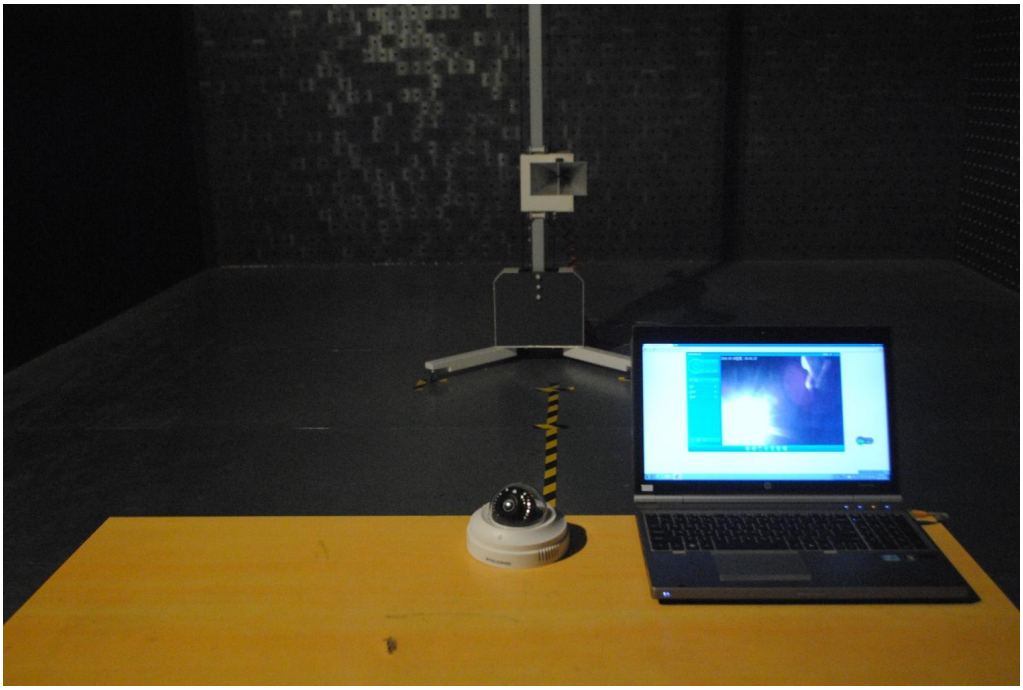
6. Photo of Testing

6.1 Emission test view

Conducted Emission

Radiated Emission

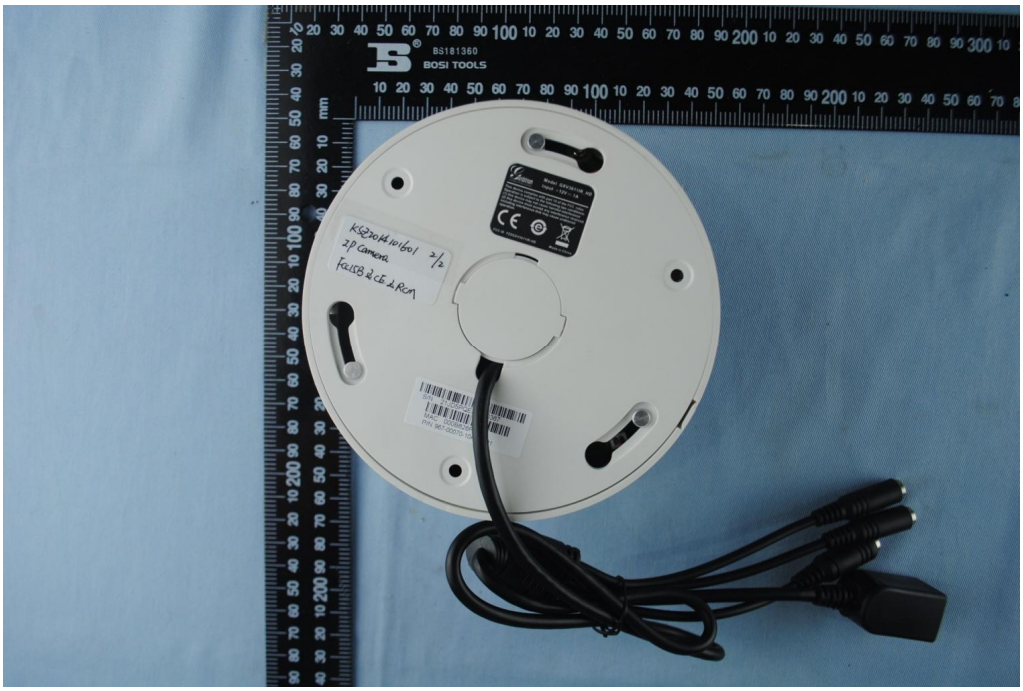




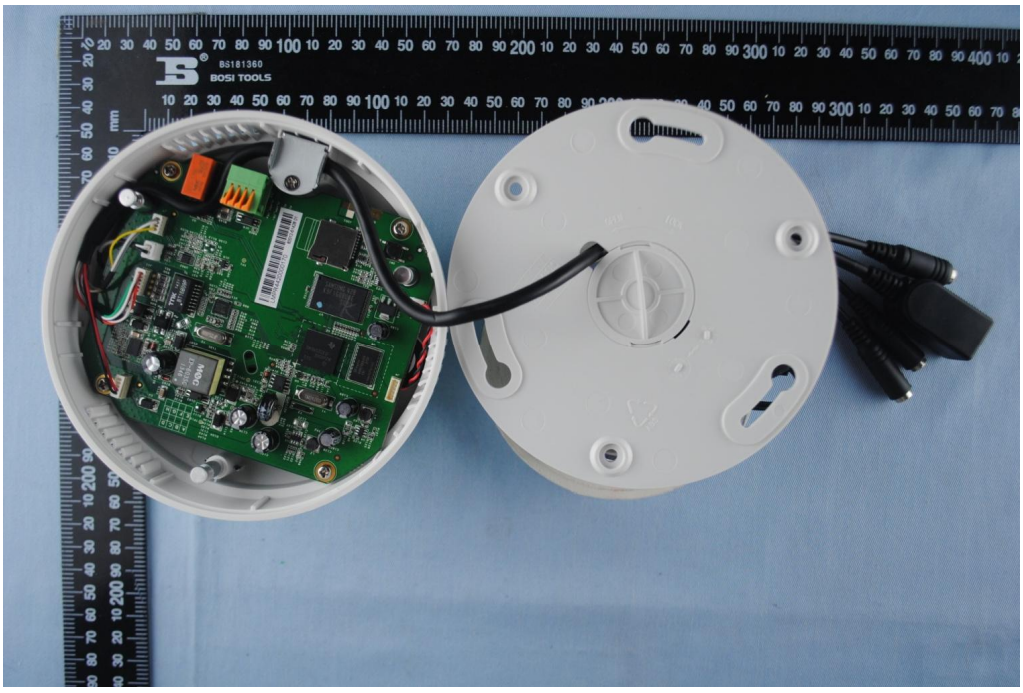
6.2 Photograph - EUT

EUT top view

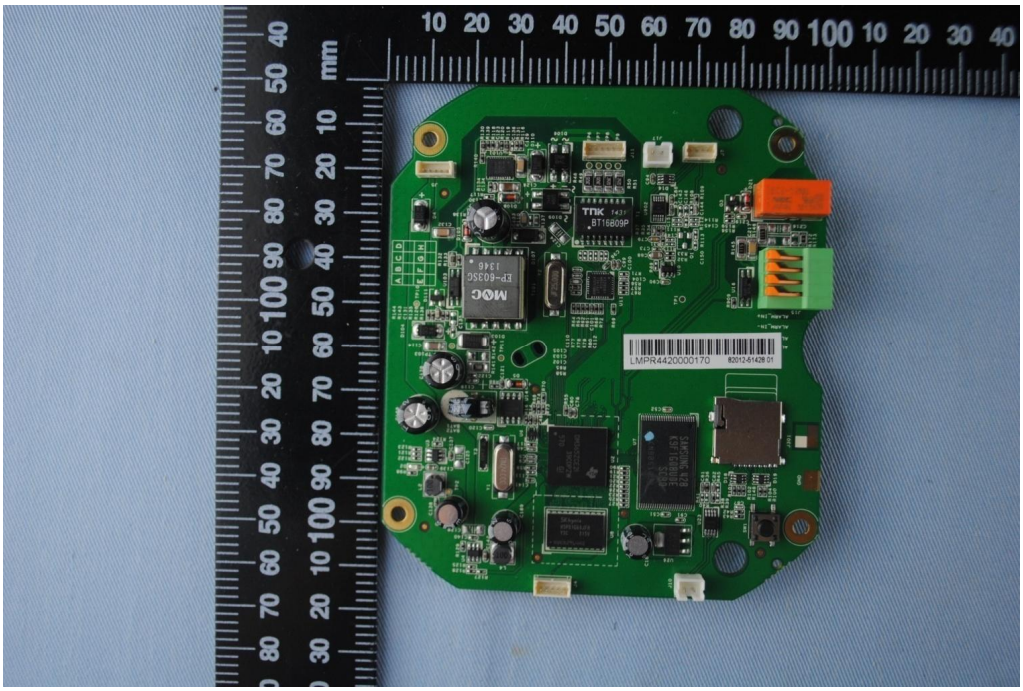
EUT bottom view



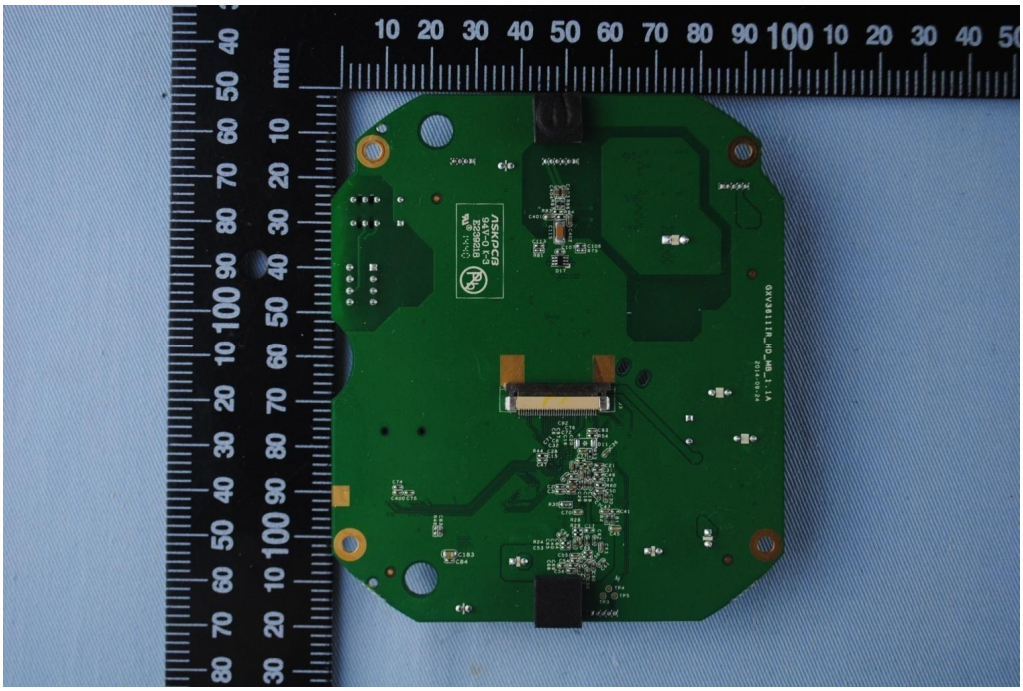
EUT inside whole view



Main board component side

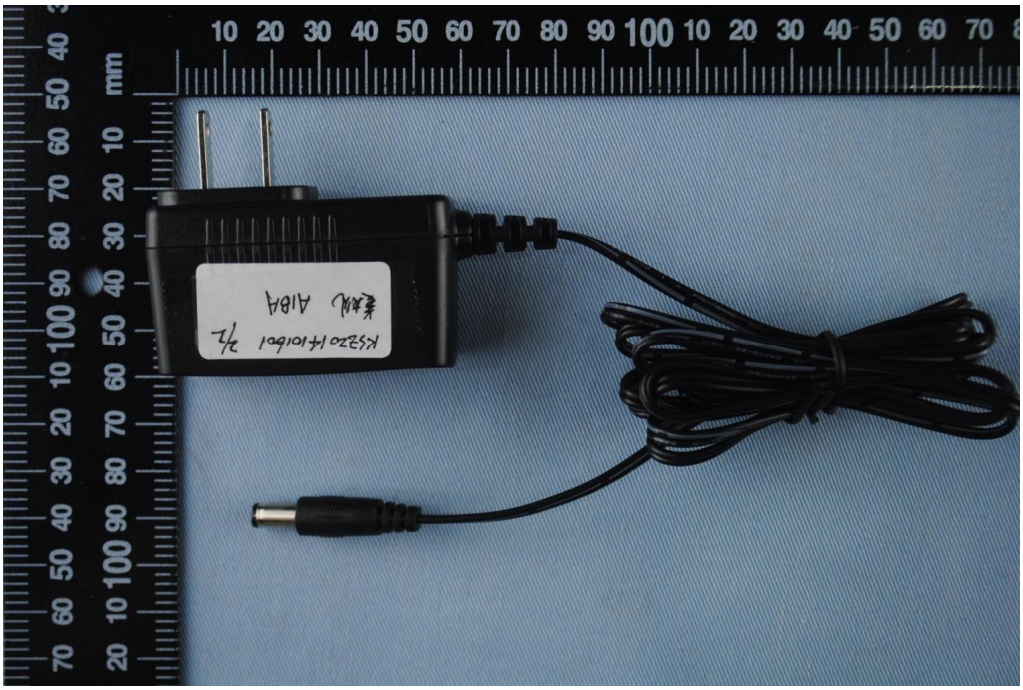


Main board solder side

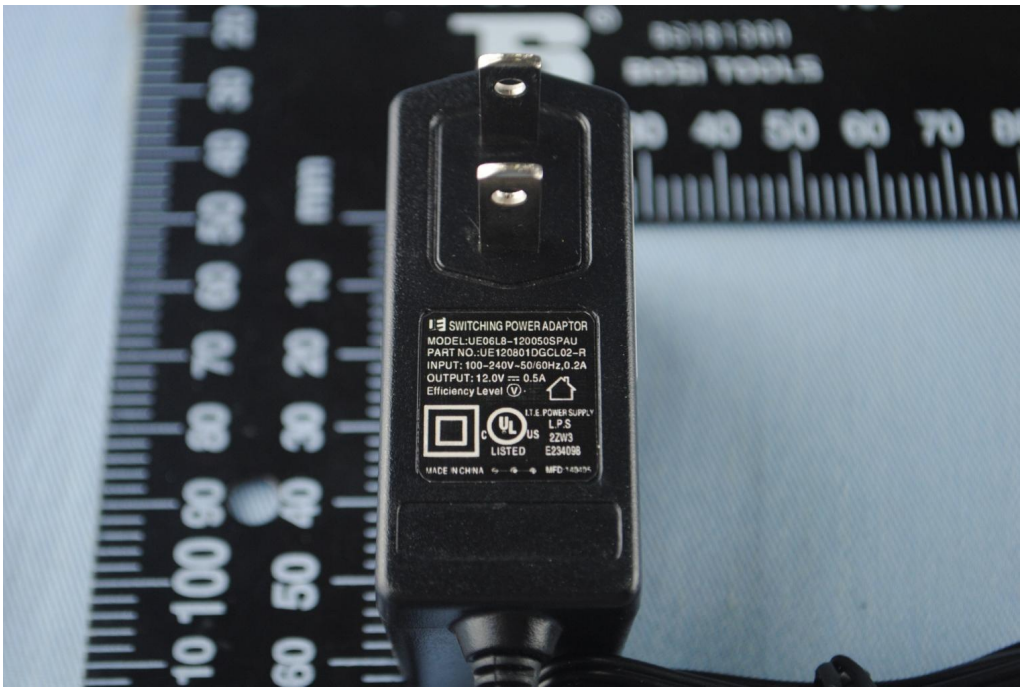


Adapter top view (WCF1200050A1BA)

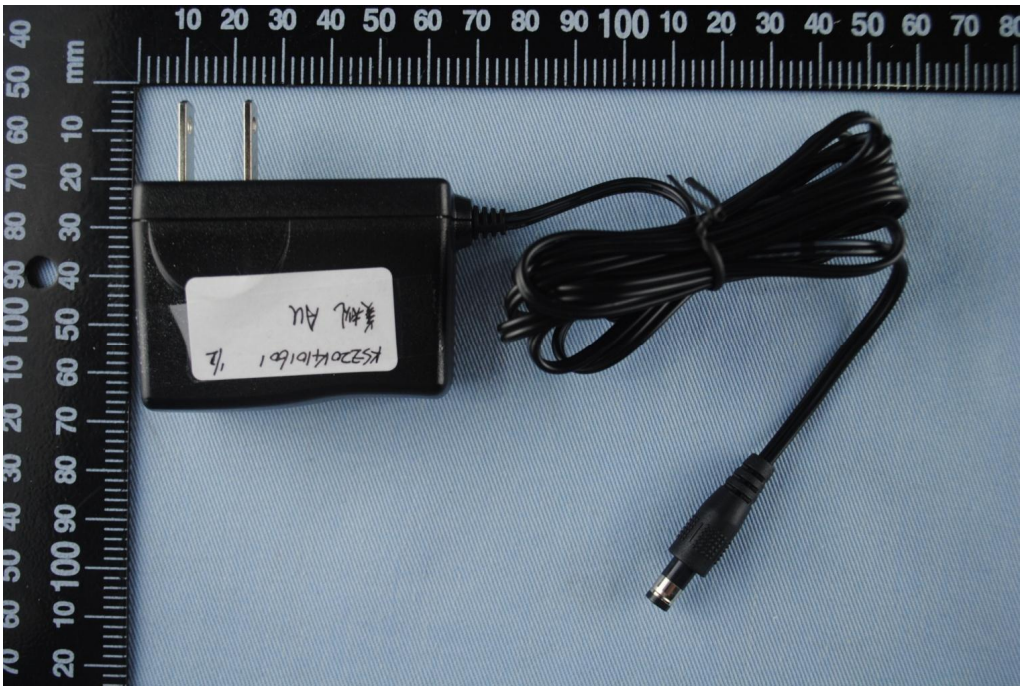
Adapter side view



Adapter top view (UE06L8-120050SPAU)



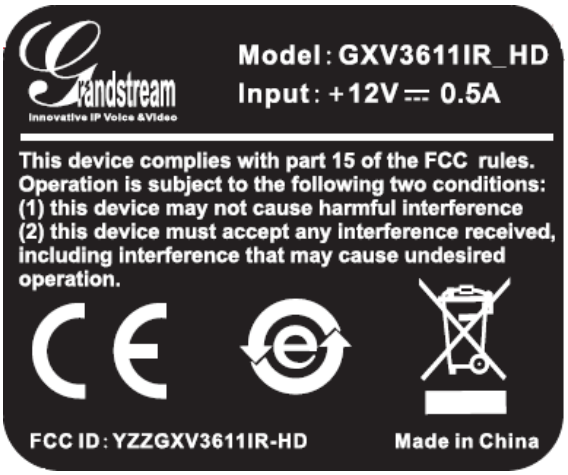
Adapter side view (UE Power Supply-USA)



7. FCC 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	Innco systems GmbH	CT-0801	KMO-SZ114	NCR
Antenna Tower	Innco systems GmbH	MM4000-PP	KMO-SZ115	NCR
Controller	Innco systems GmbH	CO2000	KMO-SZ116	NCR
Pre-Amplifier	Agilent	87405C	KMO-SZ155	Dec.6, 2014
Pre-Amplifier	Com-Power	PAM-840	KMO-SZ156	Dec.6, 2014
Horn Antenna	Com-Power	AH-840	KMO-SZ157	Dec.6, 2014
EMI Test Receiver	Rohde & Schwarz	ESPI7	KMO-SZ002	June 27, 2015
Spectrum Analyzer	Rohde & Schwarz	FSP40	KMO-SZ003	June 27, 2015
Signal Generator	FLUKE	PM5418+Y/C	KMO-SZ020	May 27, 2015
Loop Antenna	Rohde & Schwarz	HFH2-Z2	KMO-SZ004	Jan. 30, 2015
Trilog-Super Broadband Antenna	SCHWARZBECK	VULB9161	KMO-SZ005	Sep.18, 2015
Trilog-Super Broadband Antenna	SCHWARZBECK	VULB9161	KMO-SZ006	Sep.18, 2015
Broad-Band Horn Antenna	SCHWARZBECK	BBHA 9120D	KMO-SZ007	Sep.18, 2015
Broad-Band Horn Antenna	SCHWARZBECK	BBHA 9120D	KMO-SZ008	Sep.18, 2015
AMN	Rohde & Schwarz	ESH3-Z5	KMO-SZ009	June 27, 2015
Pulse Limiter	SCHWARZBECK	VTSD 9561-F	KMO-SZ077	Nov.29, 2014
ISN	SCHWARZBECK	NTFM 8158 CAT3	KMO-SZ070	Nov.19, 2014
ISN	SCHWARZBECK	NTFM 8158 CAT5	KMO-SZ071	Nov.19, 2014
ISN	SCHWARZBECK	NTFM 8158 CAT6	KMO-SZ072	Nov.19, 2014
KMO Shielded Room	KMO	KMO-001	KMO-SZ036	NCR
Coaxial Cable with N-Connectors	SCHWARZBECK	AK9515H	KMO-SZ037	Sep.18, 2015
AC Power Source / Analyzer	Agilent	6813B	KMO-SZ166	July 22, 2015
Digital Radio Communication Tester	Rohde & Schwarz	CMD60	KMO-SZ169	April 10, 2015
Universal Radio Communication Tester	Rohde & Schwarz	CMU200	KMO-SZ170	April 10, 2015
Program Control Telephone Exchanger	Excelltel	CDX8000-M	KMO-SZ221	NCR
3m Anechoic Chamber	KMO	KMO-3AC	KMO-3AC-1	Nov.12, 2016
Temperature Chamber	TABAI	PSL-4GTW	N/A	Feb.10, 2015