FCC 47 CFR PART 15 SUBPART B

TEST report

For

Guangzhou Shiyuan Electronics Co., Ltd.

Android Box

Model : A71A

Issued to

Guangzhou Shiyuan Electronics Co., Ltd.
No.192, Kezhu Road, Science Park, Guangzhou, Guangdong,China

Issued by

PEP Certification Corp.

Open Site		**No.120, Ln. 5, Hudong St., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)**
EMC Test Site	**Xizhi Office and Lab**	**12F.-3, No.27-1, Ln. 169, Kangning St., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)**

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1. GENERAL INFORMATION

Applicant : Guangzhou Shiyuan Electronics Co., Ltd.

Address : No.192 Kezhu Road, Science Park, Guangzhou, Guangdong, China

Manufacturer : Guangzhou Shiyuan Electronics Co., Ltd.

Address : No.192 Kezhu Road, Science Park, Guangzhou, Guangdong, China

EUT : Android Box

Model Name : A71A

Is herewith confirmed to comply with the requirements set out in the FCC Rules and Regulations Part 15 Subpart B and CISPR PUB. 22 and the measurement procedures were according to ANSI C63.4-2009. The said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment are within the compliance requirements.

FCC part 15 subpart B	**Class B**
ICES-003 Issue 5:2012	**Class B**

Receipt Date : Jan.2, 2014 Final Test Date : Jan.07-08, 2014

Tested By: **Reviewed by:**

Jan. 09, 2014 S.k chang Jan.09, 2014 Alex Chou

Date S.K./ Engineer **Date** Alex Chou / Manager

Designation Number: TW1075

1.1 DESCRIPTION OF THE TESTED SAMPLES

EUT

EUT Type	:	☑ Engineer Type
Condition when received	:	☑ Good
EUT Name	:	Android Box
Applicant	:	Guangzhou Shiyuan Electronics Co., Ltd.
Manufacturer	:	Guangzhou Shiyuan Electronics Co., Ltd.
Model Number	:	A71A
Receipt Date	:	Jan.02, 2014
Used Power	:	☑ AC POWER
Power Supply Type	:	☑ Adapter
Power Cord (Input)	:	☑ AC 100-240 V 50/60 Hz 500 mA 2 Pin
Power Cord (Output)	:	☑ DC 12V, 1500mA from adapter
Power From	:	AC Power Source
Test Power	:	☑ AC POWER 120 V 60 Hz 2 Pin
I/O Port of EUT	:	USB Port, AV Port, HDMI Port, LAN Port, DC IN, MICRO SD

1.2 SUMMARY OF TEST RESULT

Emission		
Test Standard	**Test Item**	**Test Result**
FCC PART 15B Class B	Conducted Emission	Pass
FCC PART 15B Class B	Radiated Emission	Pass

1.3 TEST METHODOLOGY

EUT SYSTEM OPERATION

1. The EUT was configured according to ANSI C63.4 - 2009 Section 5.2, 7.1, 7.2 && FCC PART 15B.
2. All I/O ports are connected to the appropriate peripherals.
3. Photos of test configuration please refer to appendix 1.
4. Perform the EMC testing procedures, and measure the maximum emission noise.

1.4 DESCRIPTION OF THE SUPPORT EQUIPMENTS

Setup Diagram

See test photographs attached in appendix I for the actual connections between EUT and support equipment.

Support Equipment

Peripherals Devices:

Equipment	Model	Serial No.
LCD TV	22S11HR	-
Mouse	M-01	-
USB Disk	4GB	-
SD Disk	4GB	-

Note: All the above equipment /cable were placed in worse case position to maximize emission signals during emission test.

Grounding: Grounding was in accordance with the manufacturer's requirement and conditions for the intended use.

1.5 FEATURES OF EUT: PLEASE REFER TO USER MANUAL OR PRODUCT SPECIFICATION.

2. INSTRUMENT AND CALIBRATION

2.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in the report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

2.2 TEST AND MEASUREMENT EQUIPMENT

The following list contains measurement equipment used for testing. The equipment conforms to the requirement of CISPR 16-1, ANSI C63.2 and. Other required standards.

Calibration of all test and measurement, including any accessories that may effect such calibration, is checked frequently to ensure the accuracy. Adjustments are made and correction factors are applied in accordance with the instructions contained in the respective.

TABLE LIST OF TEST AND MEASUREMENT EQUIPMENT

Test Site	Instrument	Manufacturer	Model No.	S/N	Next Cal. Date	Cal. Interval
Conduction	Test Receiver	Rohde & Schwarz	ESCS30	100018	May 18, 2014	1 Year
	L.I.S.N	Rohde & Schwarz	ENV216	100017	May 18, 2014	1 Year
	RF switching Unit	CDS	RUS-M2	38401	May 18, 2014	1 Year
Radiation	Test Receiver	Rohde & Schwarz	ESCI	100137	May 18, 2014	1 Year
	Bilog Antenna	Schwarzbeck	VULB9163	000141	May 11, 2014	1 Year
	Power Amplifier	CDS	RSU-M352	818	May 28, 2014	1 Year
	Power Amplifier	HP	8447F	OPT H64	May 28, 2014	1 Year
	Color Monitor	SUNSPO	SP-140A	N/A	May 18, 2014	1 Year
	Single Line Filter	JIANLI	XL-3	N/A	May 29, 2014	1 Year
	Single Phase Power Line Filter	JIANLI	DL-2X100B	N/A	May 29, 2014	1 Year
	3 Phase Power Line Filter	JIANLI	DL-4X100B	N/A	May 29, 2014	1 Year
	DC Power Filter	JIANLI	DL-2X50B	N/A	May 29, 2014	1 Year
	Cable	Schwarzbeck	PLF-100	519489	May 18, 2014	1 Year

2.3 TEST PERFORMED

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver which bandwidth is set at 9 kHz.

Radiated emissions were invested over the frequency range from 30MHz to 6GHz using a receiver which bandwidth is set at 120KHz(below 1GHz) and 1MHz (above 1GHz). Radiated measurement was performed at distance that from an antenna to EUT is 3 meters.

2.4 APPENDIX

Appendix A: Measurement Procedure for Main Power Port Conducted Emissions

The measurements are performed in a PEP lab's room; The EUT was placed on non-conductive 1.0m x 1.5m table, which is 0.8 meters above an earth-grounded.

Power to the EUT was provided through the LISN which has the Impedance (50ohm/50uH) vs. Frequency Characteristic in accordance with the standard. Powers to the LISN were filtered to eliminate ambient signal interference and these filters were bonded to the ground plane. Peripheral equipment required to provide a functional system (support equipment) for EUT testing was powered from the second LISN through a ganged, metal power outlet box which is bonded to the ground plane at the LISN.

If the EUT is supplied with a flexible power cord, the power cord length in excess of the distance separating the EUT from the LISN shall be folded back and forth at the center of the lead so as to form a bundle not exceeding 40cm in length. If the EUT is provided with a permanently coiled power cord, bundling of the cord is not required. If the EUT is supplied without a power cord, the EUT shall be connected to the LISN by a power cord of the type specified by the manufacturer which shall not be longer than 1 meter. The excess power cord shall be bundled as described above. If a non-flexible power cord is provided with the EUT, it shall be cut to the length necessary to attach the EUT to the LISN and shall not be bundled.

The interconnecting cables were arranged and moved to get the maximum measurement. Both the lines of power cord, live and neutral, were measured.

The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.

Appendix B: Test Procedure for Radiated Emissions

Preliminary Measurements in the Anechoic Chamber

The radiated emissions are initially measured in the anechoic chamber at a measurement distance of 3 meters. Desktop EUT are placed on a wooden stand 0.8 meter in height. The measurement antenna is 3 meters from the EUT. The test setup in anechoic chamber is the same as open site. The turntable rotated 360°. The antenna height is 1m. The primary objective of the radiated measurements in the anechoic chamber is to identify the frequency spectrum in the absence of the electromagnetic environment existing on the open test site. The frequencies can then be pre-selected on the open test site to obtain the corresponding amplitude. The initial scan is made with the spectrum analyzer in automatic sweep mode. The spectrum peaks are then measured manually to determine the exact frequencies.

Measurements on the Chamber

The radiated emissions test will then be repeated on the chamber to measure the amplitudes accurately and without the multiple reflections existing in the shielded room. The EUT and support equipments are set up on the turntable. Desktop EUT are set up on a wooden stand 0.8 meter above the ground.

For the initial measurements, the receiving antenna is varied from 1-4 meter height and is changed in the vertical plane from vertical to horizontal polarization at each frequency. Both reading are recorded with the quasi-peak detector with 120 kHz bandwidth. For frequency between 30 MHz and 1000 MHz, the reading is recorded with peak detector or quasi-peak detector.

At the highest amplitudes observed, the EUT is rotated in the horizontal plane while changing the antenna polarization in the vertical plane to maximize the reading. The interconnecting cables were arranged and moved to get the maximum measurement. Once the maximum reading is obtained, the antenna elevation and polarization will be varied between specified limits to maximize the readings.

Appendix C: Warning Statement

Statement Requirements

The operator's manual for a Class B digital device shall contain the following statements or their equivalent:

*****W A R N I N G*****

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and uses in accordance with the instruction manual, may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.
-- Increase the separation between the equipment and receiver.
-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-- Consult the dealer or an experienced radio/TV technician for help.

Notice: The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equivalent.

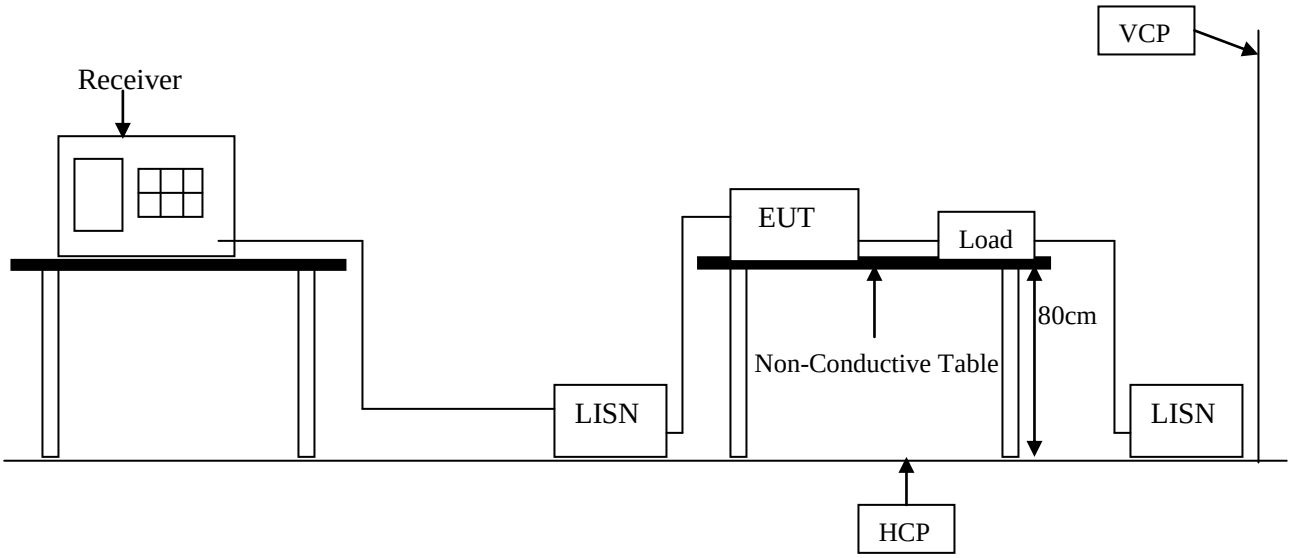
* * * * * * * * * *

If the EUT was tested with special shielded cables the operator's manual for such product shall also contain the following statements or their equivalent:

Shielded interface cables and/or AC power cord, if any, must be used in order to comply with the emission limits.

3. CONDUCTED EMISSION MEASUREMENT

3.1 TEST SET-UP (PLEASE REFER TO APPENDIX 1)



3.2 LIMIT

For power Line

Frequency range (MHz)	CLASS B	
	QP dB(uV)	Average dB(uV)
0.15-0.5	66 - 56 dBuV	56 - 46 dBuV
0.5-5.0	56 dBuV	46 dBuV
5.0-30.0	60 dBuV	50 dBuV

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

3.3 TEST PROCEDURE

The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). It provides a 50 ohm / 50 μH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50 ohm / 50 μH coupling impedance with 50 ohm termination. (Please refer to the block diagram of the test setup and photograph.)

Both sides of AC line are checked for the maximum conducted emission interference. In order to find the maximum emissions, the relating positions of equipment and all of the interference cables must be changed according to FCC regulation: The measurement procedure on conducted emission interference.

The resolution bandwidth of the field strength meter is set at 9 kHz

3.4 TEST SPECIFICATION

ANSI C63.4 – 2009 Section 5.2, 7.1, 7.2

3.5 EUT OPERATION

The EUT was tested in HDMI & LAN mode, HDMI & SD mode, HDMI & USB mode, the worst case is HDMI & LAN mode, and the data is shown in appendix 2.

3.6 RESULT: PASSED

EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range:	150kHz--30MHz
Detector Function:	Quasi-Peak / Average Mode
Resolution Bandwidth:	9kHz

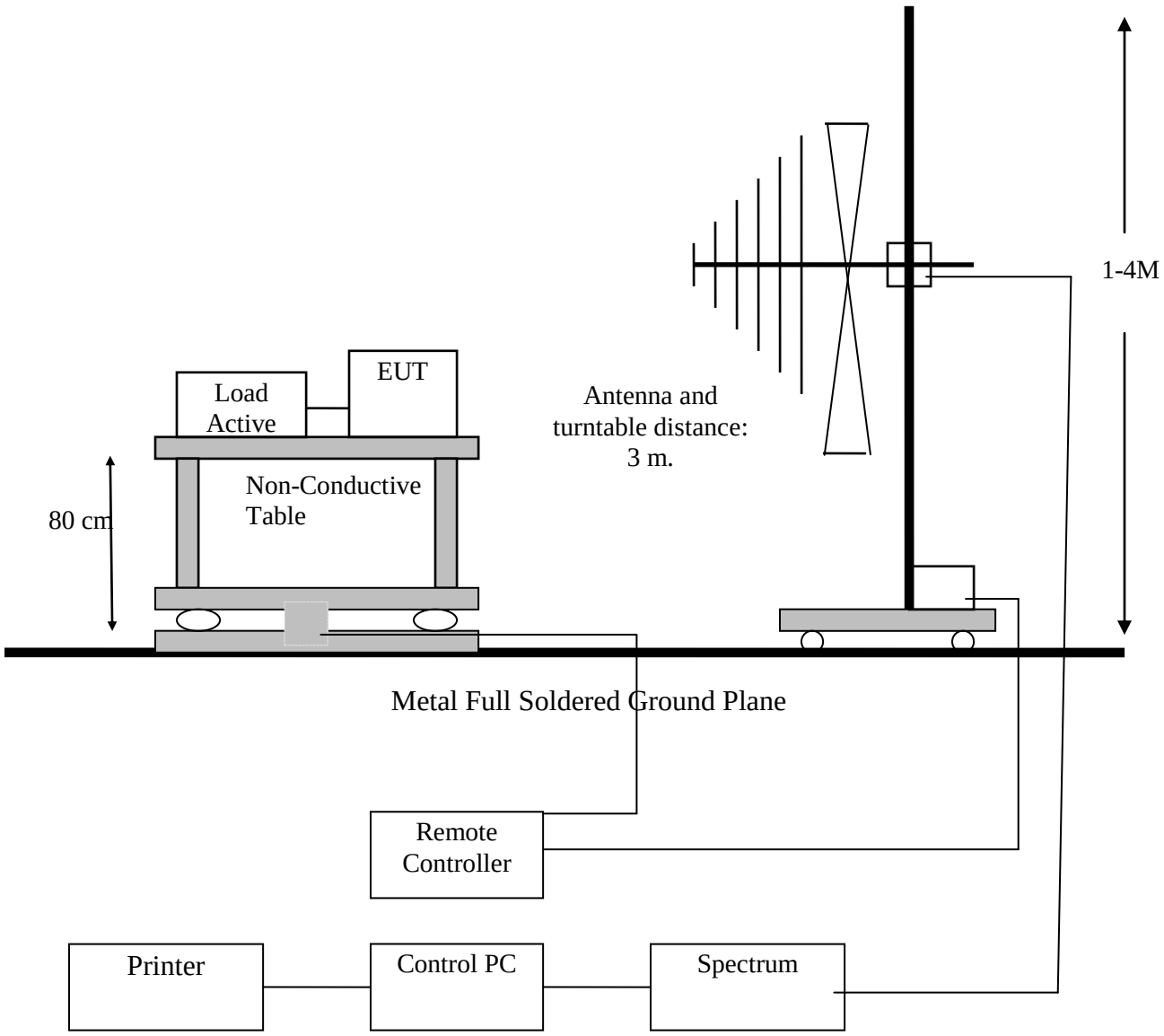
3.7 TEST DATA:

Please refer to appendix 2.

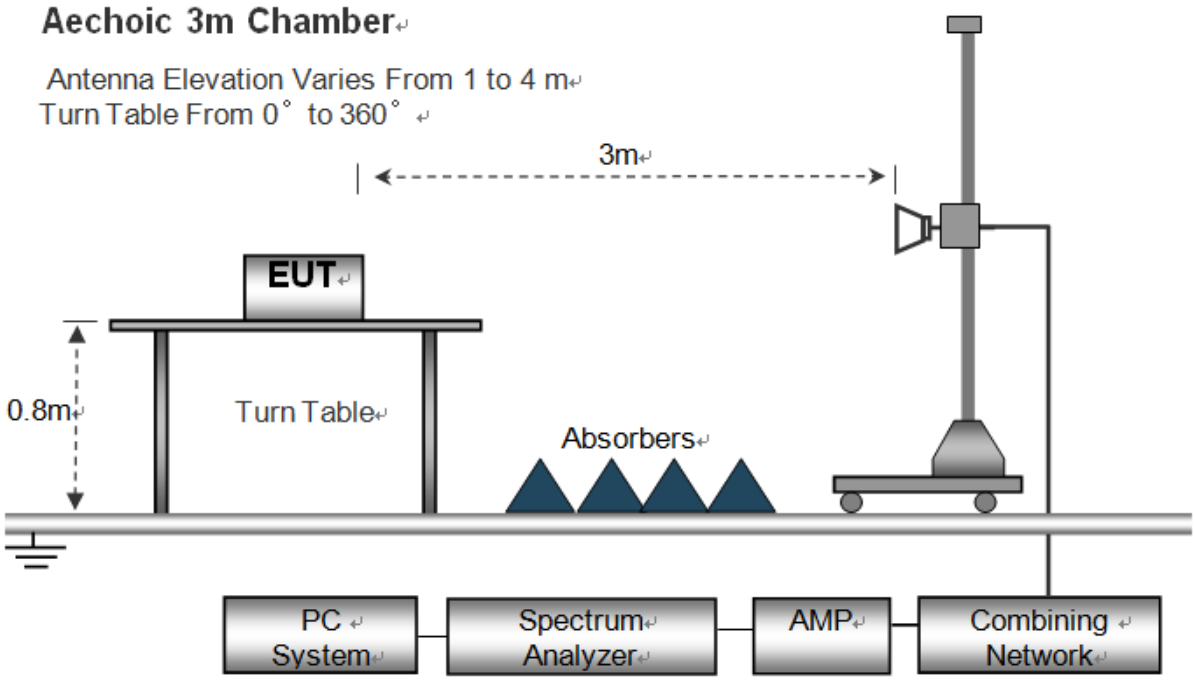
4. RADIATED EMISSION MEASUREMENT

4.1 TEST SETUP (PLEASE REFER TO APPENDIX 1)

The test setup for emission measurement from 30 MHz to 1 GHz



The test setup for emission measurement above 1 GHz



4.2 LIMIT

Frequency	Class B	
MHz	Distance (Meter)	Limit dBμV/m
30 ~ 88	3	40 (Qp)
88 ~ 216	3	43.5(Qp)
216~960	3	46 (Qp)
960~1000	3	54 (Qp)
Above 1000	3	54 (Average)
		74 (Peak)

Remark: In the above table, the tighter limit applies at the band edges

4.3 TEST PROCEDURE

The EUT and its simulators are placed on turn table, non-conductive and wooden table, which is 0.8 meter above ground. The turn table rotates 360 degree to determine the position of the maximum emission level. The EUT was positioned such that distance from antenna to the EUT is 3 meters.

The antenna is moved up and down between 1 meter and 4 meter to receive the maximum emission level.

Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission, all of the interference cables must be manipulated according to CISPR regulation: the test procedure of the radiated emission measurement.

The bandwidth set on the field strength is 120 kHz (The frequency range is below 1GHz) and 1MHz (The frequency range is above 1GHz).

4.4 TEST SPECIFICATION

ANSI C63.4 – 2009 Section 5.2, 7.1, 7.2 & FCC PART 15B CLASS B

4.5 EUT OPERATION

The EUT below 1GHz was tested in HDMI & LAN mode, HDMI & SD mode, HDMI & USB mode, the worst case is HDMI & LAN mode, and the data is shown in appendix 2.

The EUT above 1GHz was tested in HDMI & LAN mode, HDMI & SD mode, HDMI & USB mode, the worst case is HDMI & SD mode, and the data is shown in appendix 2.

4.6 RESULT: PASSED

The radiated mission below 1GHz test was passed at minimum margin: Vertical 517.248 MHz/ 42.89 dBuV/m, Antenna Height 2.2 Meter, Turn Table 120 degree.
The radiated mission 1GHz to 6GHz test was passed at minimum margin: Vertical 2730.000 MHz/ 45.87 dBuV/m, Antenna Height 1.5 Meter, Turn Table 135 degree

4.7 TEST DATA:

Please refer to appendix 2.

5. MEASUREMENT UNCERTAINTY

Measurement Item	Measurement Frequency	Polarization	Uncertainty
Conducted Emission	9 kHz ~ 30. MHz	LINE/NEUTRAL	1.78 dB
Radiated Emission	30 MHz ~ 1,000 MHz	Vertical / Horizontal	1.96 dB
	1,000 MHz ~ 6,000 MHz	Vertical / Horizontal	3.00 dB

SAMPLE OF FCC VERIFICATION LABEL 1

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.

SAMPLE OF FCC DoC LABEL 2

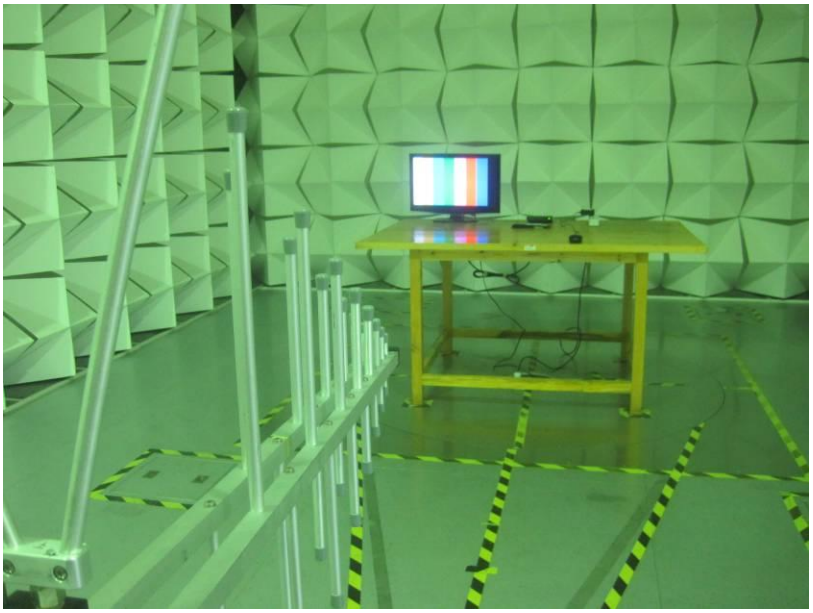
FC

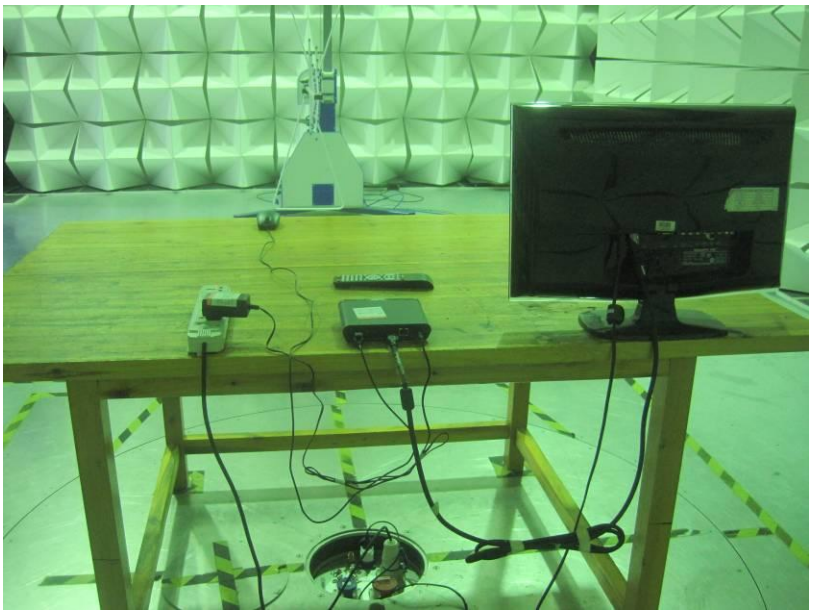
Trade Name
Model Number

Appendix 1
PHOTOS OF TEST CONFIGURATION

Conducted Emission Test

Radiated Emission Test below 1GHz

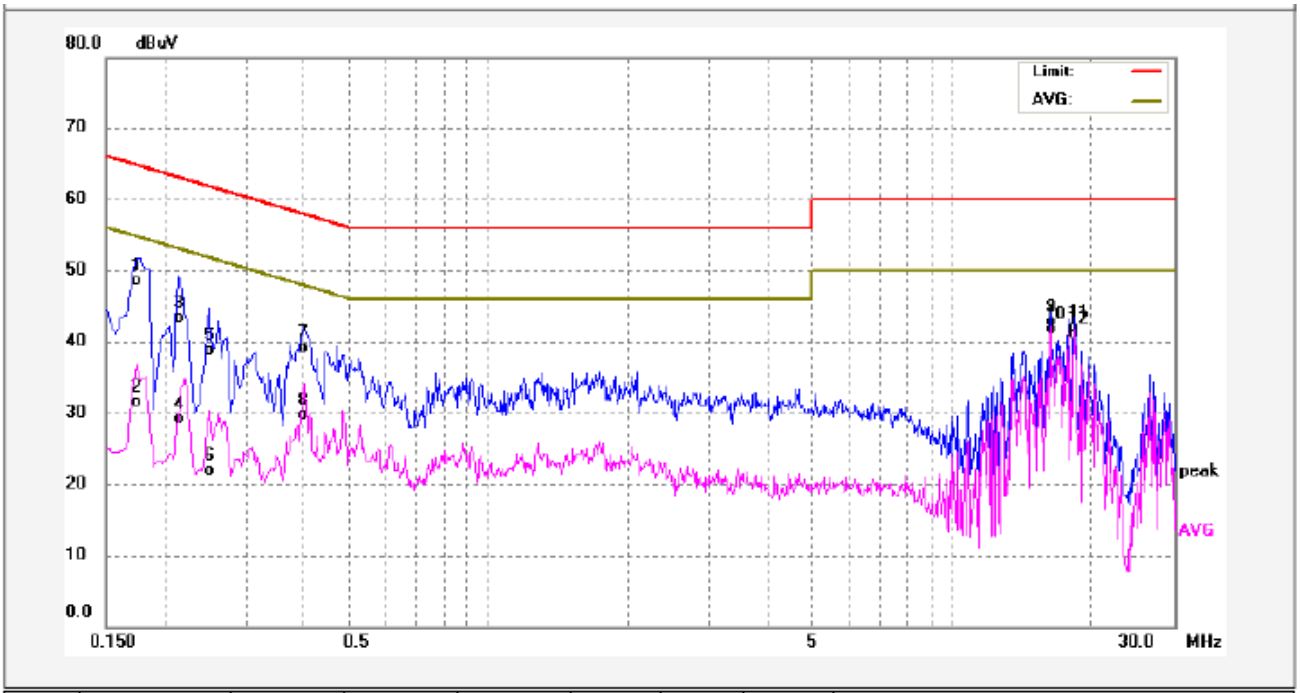




Radiated Emission Test 1GHz to 6GHz

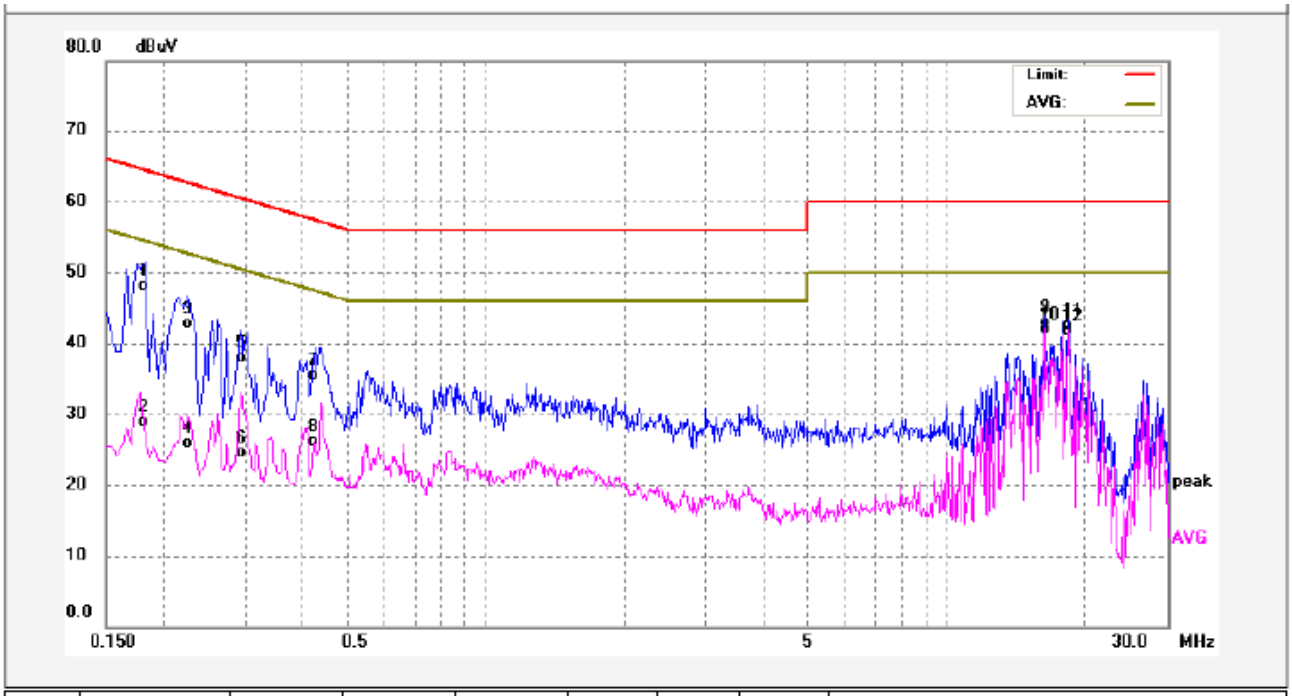
Appendix 2
TEST DATA

Conducted Emission Data:
Worst case: HDMI & LAN mode
Phase: Live line



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1740	37.25	11.23	48.48	64.76	-16.28	QP	
2	0.1740	20.27	11.23	31.50	54.76	-23.26	AVG	
3	0.2140	31.94	11.30	43.24	63.04	-19.80	QP	
4	0.2140	17.71	11.30	29.01	53.04	-24.03	AVG	
5	0.2500	27.45	11.30	38.75	61.75	-23.00	QP	
6	0.2500	10.67	11.30	21.97	51.75	-29.78	AVG	
7	0.3980	27.89	11.31	39.20	57.89	-18.69	QP	
8	0.3980	18.40	11.31	29.71	47.89	-18.18	AVG	
9	16.2260	31.31	11.47	42.78	60.00	-17.22	QP	
10	16.2260	30.33	11.47	41.80	50.00	-8.20	AVG	
11	18.2420	30.50	11.48	41.98	60.00	-18.02	QP	
12	18.2420	29.71	11.48	41.19	50.00	-8.81	AVG	

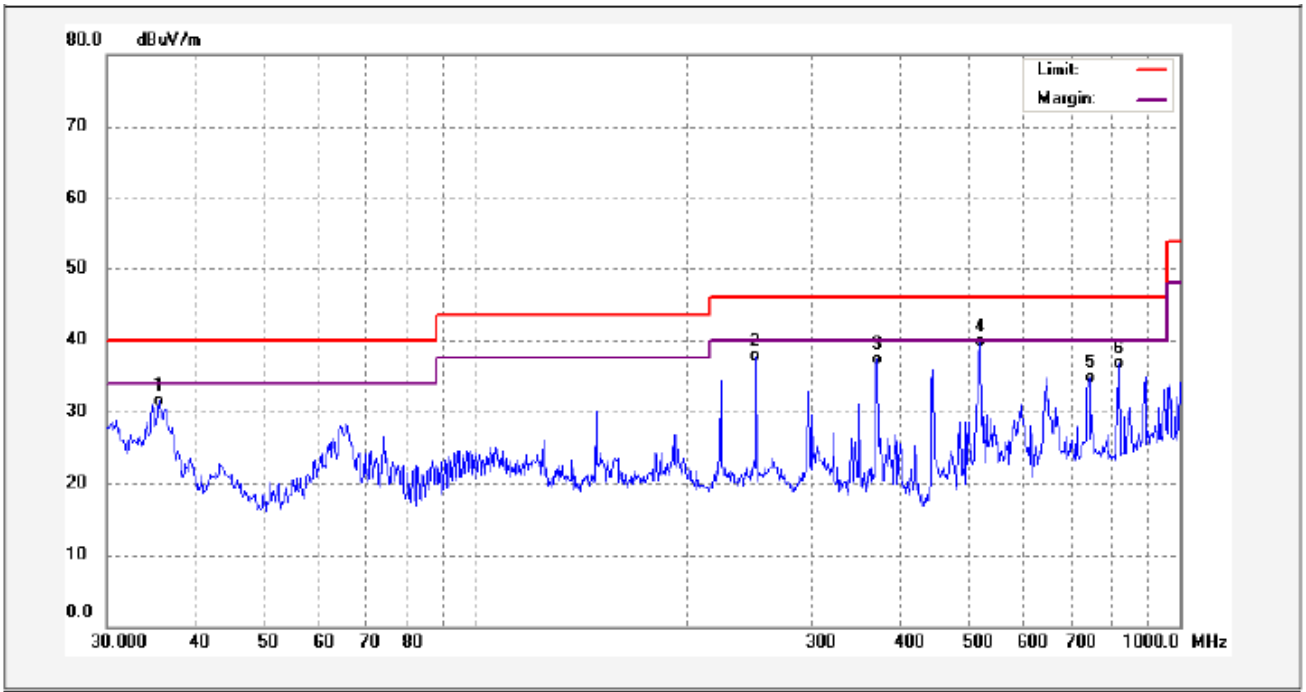
Phase: Neutral line



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1819	36.94	11.25	48.19	64.39	-16.20	QP	
2	0.1819	17.72	11.25	28.97	54.39	-25.42	AVG	
3	0.2260	31.50	11.30	42.80	62.59	-19.79	QP	
4	0.2260	14.69	11.30	25.99	52.59	-26.60	AVG	
5	0.2940	26.53	11.30	37.83	60.41	-22.58	QP	
6	0.2940	13.26	11.30	24.56	50.41	-25.85	AVG	
7	0.4260	24.27	11.31	35.58	57.33	-21.75	QP	
8	0.4260	14.85	11.31	26.16	47.33	-21.17	AVG	
9	16.2260	31.35	11.47	42.82	60.00	-17.18	QP	
10	16.2260	30.40	11.47	41.87	50.00	-8.13	AVG	
11	18.2420	31.07	11.48	42.55	60.00	-17.45	QP	
12	18.2420	30.30	11.48	41.78	50.00	-8.22	AVG	

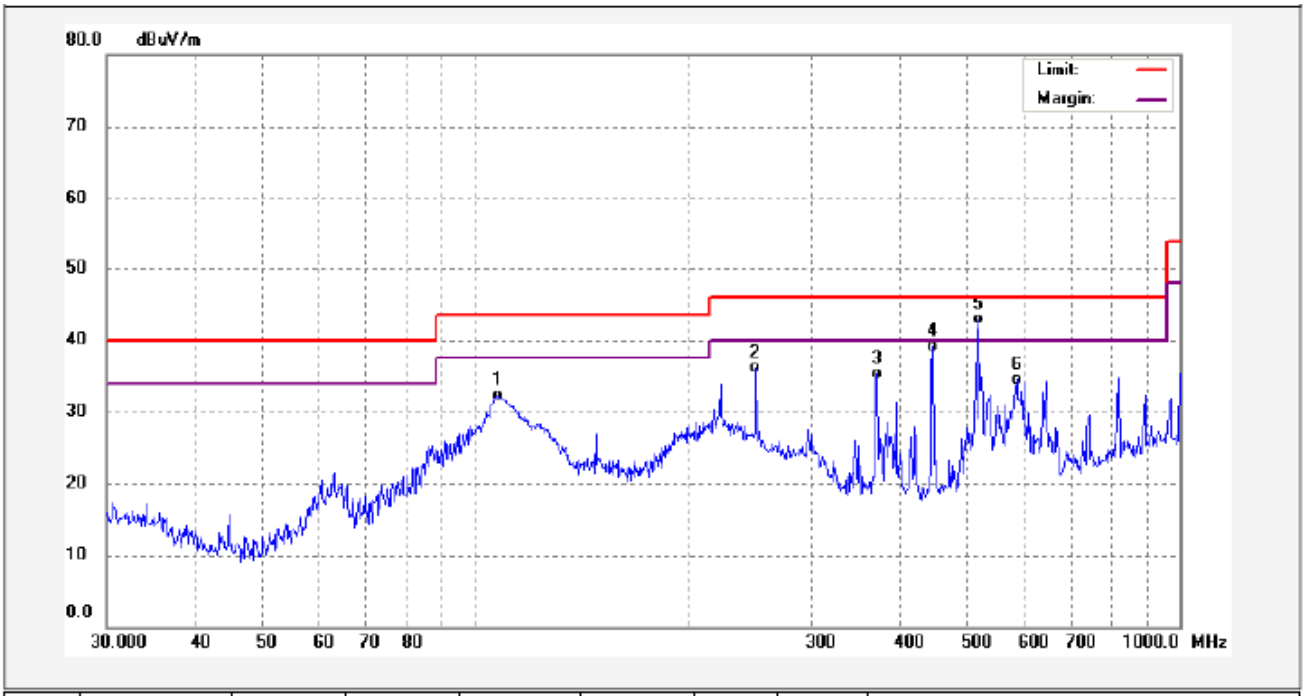
Radiated Emission Data

Below 1GHz
Worst case: HDMI & LAN mode
Polarization: Vertical



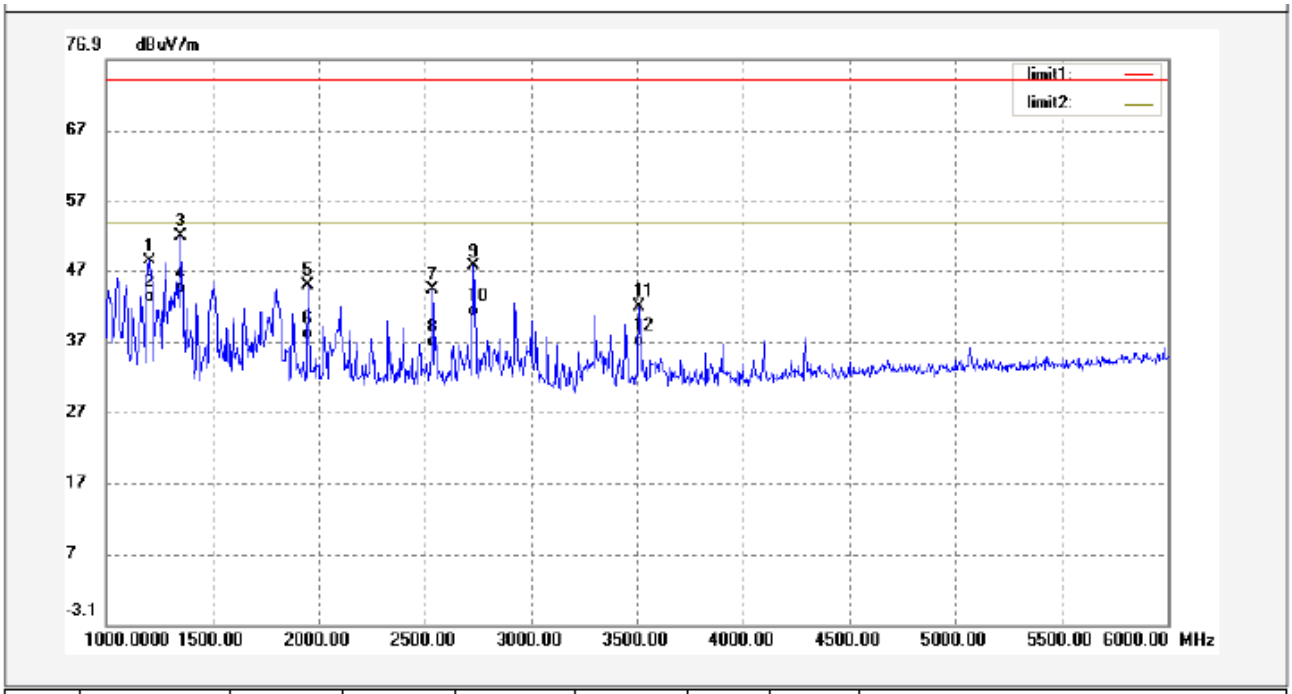
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	35.4993	56.17	-24.68	31.49	40.00	-8.51	QP	
2	250.3012	59.37	-21.63	37.74	46.00	-8.26	QP	
3	372.0045	54.76	-17.55	37.21	46.00	-8.79	QP	
4	520.8882	53.42	-13.75	39.67	46.00	-6.33	QP	
5	744.8661	43.34	-8.61	34.73	46.00	-11.27	QP	
6	818.8341	43.77	-7.07	36.70	46.00	-9.30	QP	

Polarization: Horizontal



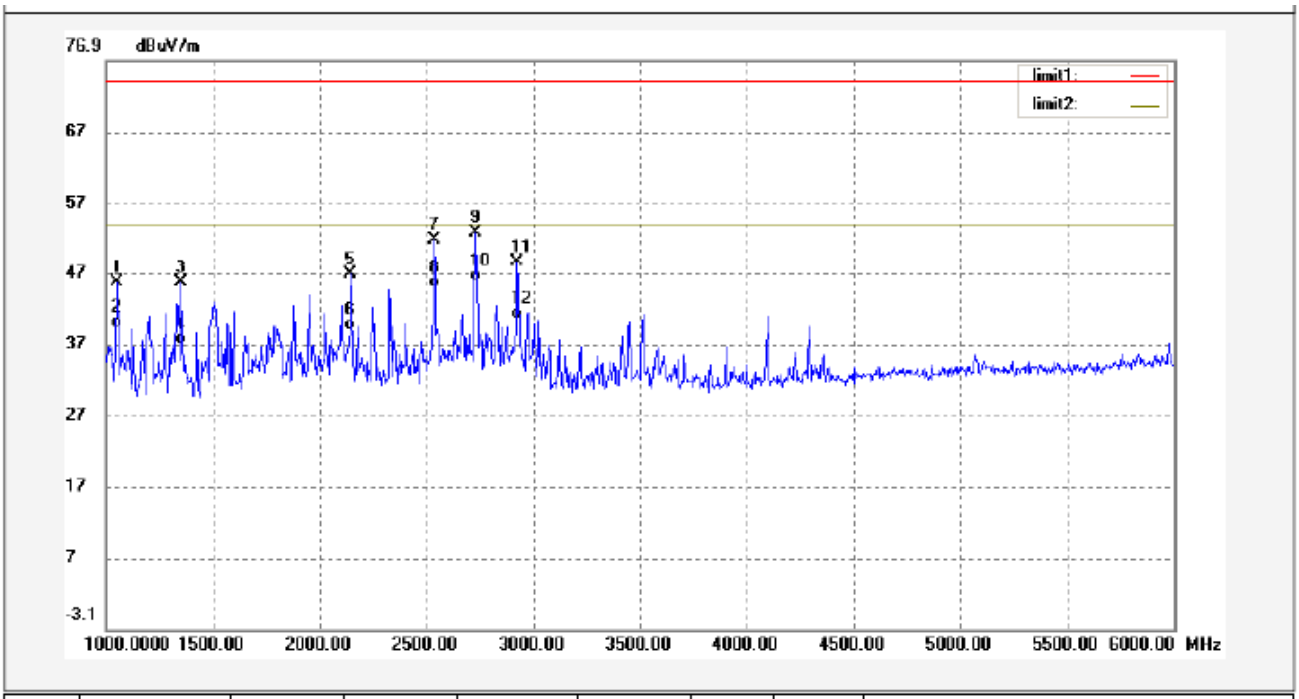
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	107.8877	56.20	-23.99	32.21	43.50	-11.29	QP	
2	250.3012	57.60	-21.53	36.07	46.00	-9.93	QP	
3	372.0045	52.79	-17.58	35.21	46.00	-10.79	QP	
4	446.4141	54.52	-15.39	39.13	46.00	-6.87	QP	
5	517.2480	56.85	-13.96	42.89	46.00	-3.11	QP	
6	586.8437	46.38	-11.90	34.48	46.00	-11.52	QP	

1GHz to 6GHz:
Worse case: HDMI & SD mode
Polarization: Vertical



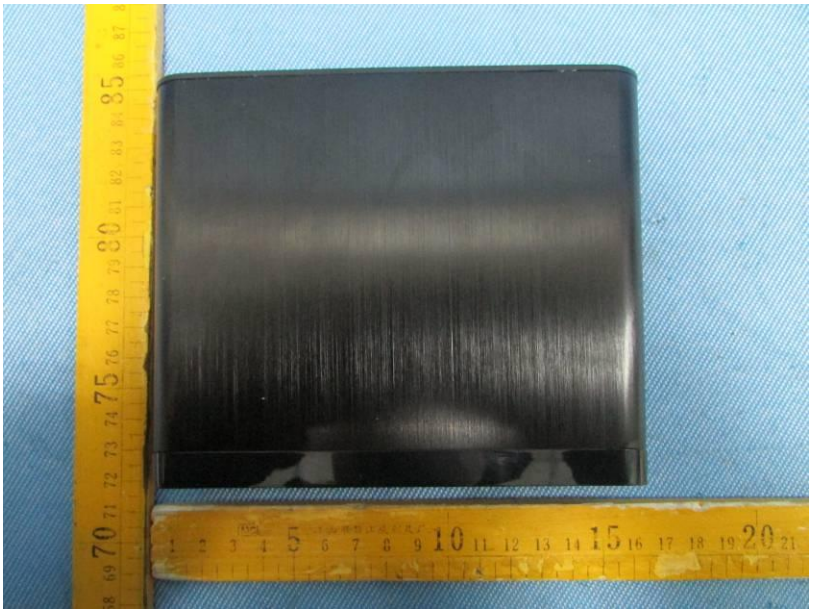
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1200.000	66.02	-17.66	48.36	74.00	-25.64	peak	
2	1200.000	60.02	-17.66	42.36	54.00	-11.64	AVG	
3	1350.000	68.97	-17.03	51.94	74.00	-22.06	peak	
4	1350.000	60.69	-17.03	43.66	54.00	-10.34	AVG	
5	1950.000	61.83	-17.05	44.78	74.00	-29.22	peak	
6	1950.000	54.26	-17.05	37.21	54.00	-16.79	AVG	
7	2535.000	59.82	-15.60	44.22	74.00	-29.78	peak	
8	2535.000	51.65	-15.60	36.05	54.00	-17.95	AVG	
9	2730.000	62.58	-14.98	47.60	74.00	-26.40	peak	
10	2730.000	55.45	-14.98	40.47	54.00	-13.53	AVG	
11	3510.000	56.07	-14.32	41.75	74.00	-32.25	peak	
12	3510.000	50.54	-14.32	36.22	54.00	-17.78	AVG	

Polarization: Horizontal

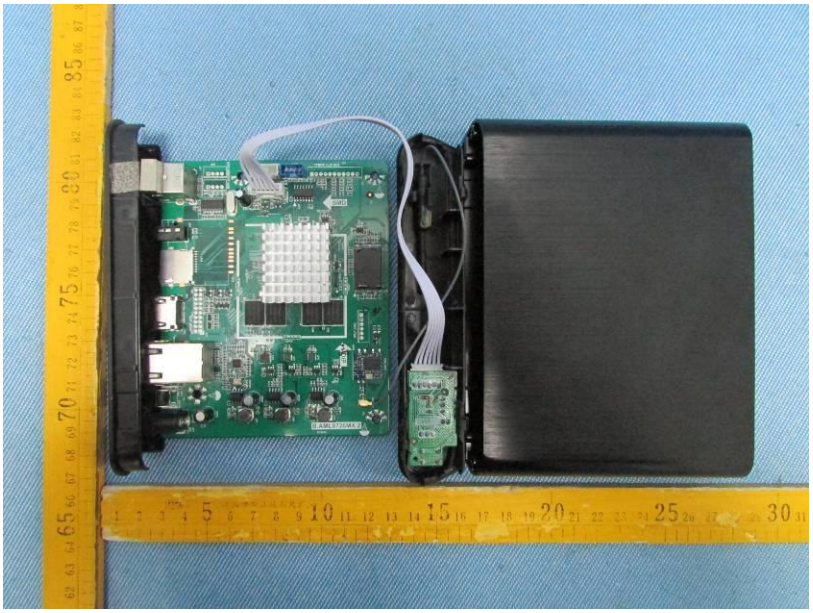


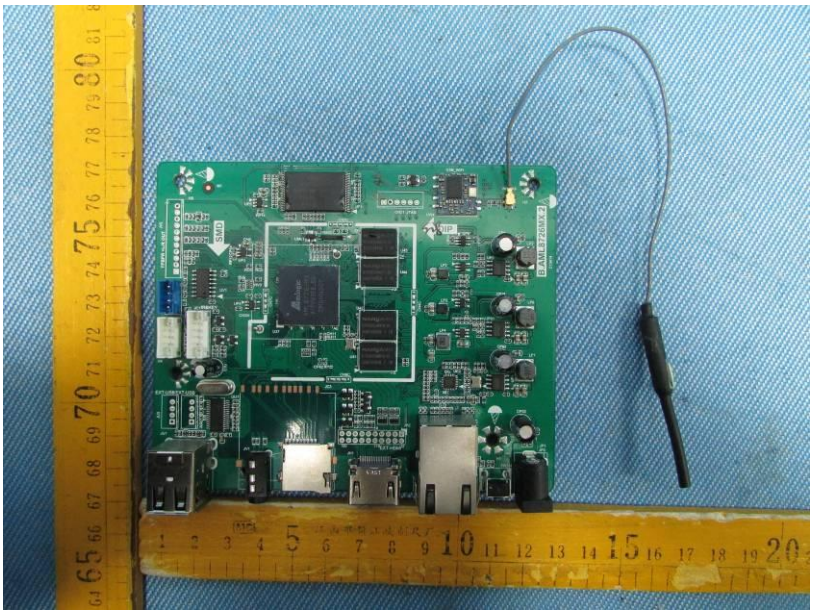
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1050.000	64.01	-18.35	45.66	74.00	-28.34	peak	
2	1050.000	57.58	-18.35	39.23	54.00	-14.77	AVG	
3	1350.000	62.67	-17.03	45.64	74.00	-28.36	peak	
4	1350.000	53.86	-17.03	36.83	54.00	-17.17	AVG	
5	2145.000	62.22	-15.39	46.83	74.00	-27.17	peak	
6	2145.000	54.14	-15.39	38.75	54.00	-15.25	AVG	
7	2535.000	67.43	-15.60	51.83	74.00	-22.17	peak	
8	2535.000	60.36	-15.60	44.76	54.00	-9.24	AVG	
9	2730.000	67.83	-14.98	52.85	74.00	-21.15	peak	
10	2730.000	60.85	-14.98	45.87	54.00	-8.13	AVG	
11	2925.000	63.31	-14.77	48.54	74.00	-25.46	peak	
12	2925.000	55.21	-14.77	40.44	54.00	-13.56	AVG	

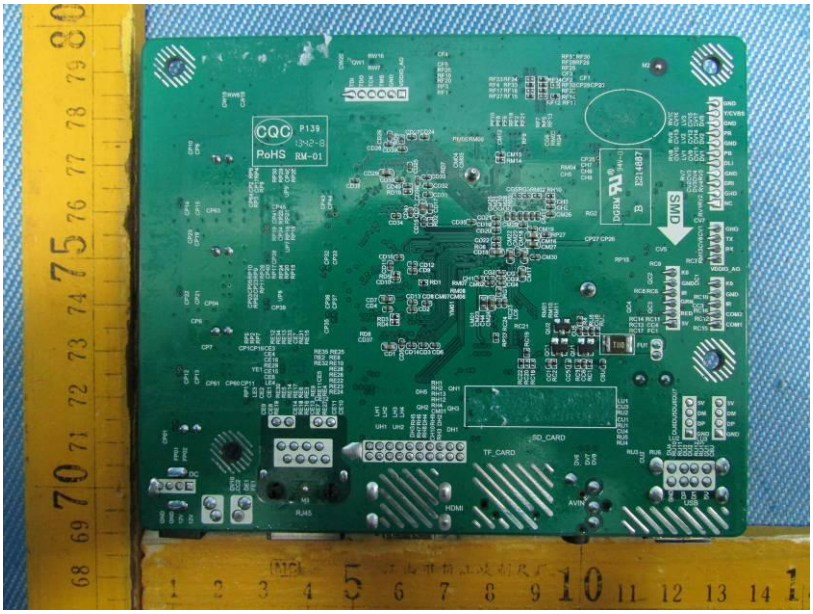
APPENDIX 3
PHOTOS OF EUT




USB
AV
MICRO SD
HDMI
LAN
RECOVERY
DC IN 12V



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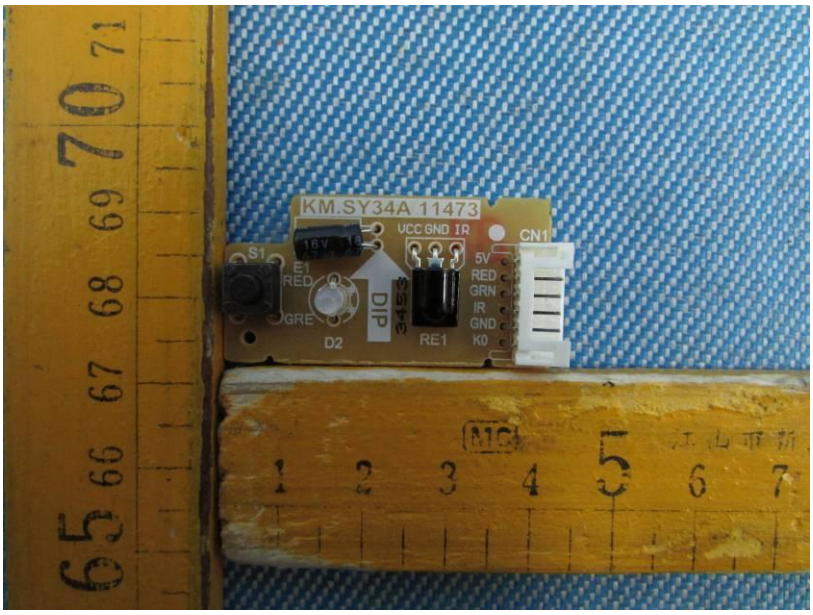
PoHS
SMD
TF_CARD
SD_CARD
HDMI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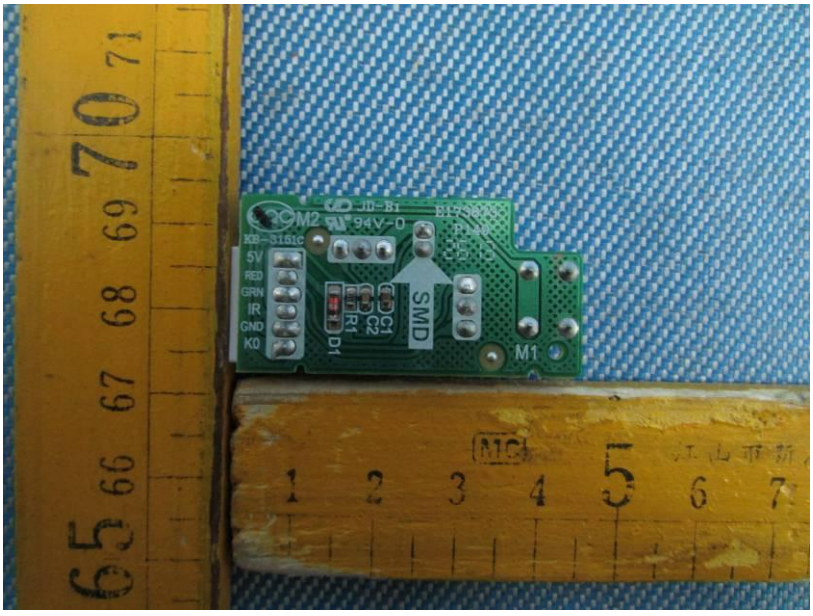
5V
RED
GRN
IR
GND
K0
DIP
RE1
D2


SMD
M1
M2
C1
C2
R1
D1

END