FCC TEST REPORT

FCC ID	: ZQXAS-X1XXULG
Applicant	: Suzhou Switek Electronics & Technology Co., Ltd.
Address	: No.5 Linggang Industry Zone, Luzhi Town, Wuzhong District, Suzhou City, Jiangsu, China

Equipment Under Test (EUT) :

Product Name	: LCD Console
Model No.	: AS-3100ULG, AS-3104ULG, AS-3108ULG, AS-3116ULG, AS-7100ULG, AS-7104ULG, AS-7108ULG, AS-7116ULG, AS-9100ULG, AS-9104ULG, AS-9108ULG, AS-9116ULG

Standards	: FCC CFR47 Part 15 Section 15.109:2009
Date of Test	: August 6, 2011 ~ August 19, 2011
Date of Issue	: August 26, 2011
Test Engineer	: Hunk yan
Reviewed By	: Philo zhong

Test Result	**: PASS**

Prepared By:
Waltek Services (Shenzhen) Co., Ltd.
1/F, Fukangtai Building, West Baima Rd., Songgang Street, Baoan District,
Shenzhen 518105, China

Tel :+86-755-27553488
Fax:+86-755-27553868

✧ The sample detailed above has been tested to the requirements of Council Directives ANSI C63.4:2003. The test results have been reviewed against the Directives above and found to meet their essential requirements.

2 Test Summary

Test Item	Test Requirement	Test Method	Class / Severity	Result
Radiated Emission (30MHz to 1GHz)	FCC Part 15.109	ANSI C63.4: 2003	Class B	PASS
Conducted Emission (150KHz to 30MHz)	FCC Part 15.107	ANSI C63.4: 2003	Class B	PASS

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4 General Information

4.1 Client Information

Applicant : Suzhou Switek Electronics & Technology Co., Ltd.

Address of Applicant : No.5 Linggang Industry Zone, Luzhi Town, Wuzhong District, Suzhou City, Jiangsu, China

Manufacturer : Suzhou Switek Electronics & Technology Co., Ltd.

Address of Manufacturer : No.5 Linggang Industry Zone, Luzhi Town, Wuzhong District, Suzhou City, Jiangsu, China

4.2 General Description of E.U.T.

Product Name : LCD Console

Model No. : AS-3100ULG, AS-3104ULG, AS-3108ULG, AS-3116ULG, AS-7100ULG, AS-7104ULG, AS-7108ULG, AS-7116ULG, AS-9100ULG, AS-9104ULG, AS-9108ULG, AS-9116ULG

Difference Description : All the models have the same controller circuit and similar appearance, only the size of LCD and the number of VGA port are different. On the basis of these we choose the model AS-3116ULG, AS-7116ULG, AS-9116ULG as the test sample.

Please refer to the table below for more information.

In order to match with the differenct PC's mouse and keyboard interface, there are two type of VGA cable you could choose. One is with USB interface and another is with PS/2 interface.

Model No.	Number of VGA port	Size of LCD
AS-3100ULG	1	15''
AS-3104ULG	4	
AS-3108ULG	8	
AS-3116ULG	16	
AS-7100ULG	1	17''
AS-7104ULG	4	
AS-7108ULG	8	
AS-7116ULG	16	
AS-9100ULG	1	19''
AS-9104ULG	4	
AS-9108ULG	8	
AS-9116ULG	16	

4.3 Details of E.U.T.

Technical Data : Powered by PC VGA port

4.4 Description of Support Units

The EUT has been tested as an independent unit.

4.5 Standards Applicable for Testing

The customer requested FCC tests for a LCD Console. The standards used were FCC CFR47 Part 15 Section 15.107 and Section 15.109.

4.6 Test Facility

The test facility has a test site registered with the following organizations:

- **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 7760A, August 3, 2010.

- **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, May 26, 2011.

4.7 Test Location

All the tests were performed at:
Waltek Services(Shenzhen) Co., Ltd. at 1/F, Fukangtai Building, West Baima Rd.,Songgang Street, Baoan District, Shenzhen, China

5 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.2, 2011	Aug.1, 2012	Wws200815 96	±1dB
Trilog Broadband Antenne 30-3000 MHz	SCHWARZBECK MESS-ELEKTROM / VULB9163	336	W2008002	30-3000 MHz	Aug.2, 2011	Aug.1, 2012	-	±1dB
Broad-band Horn Antenna 1-18 GHz	SCHWARZBECK MESS-ELEKTROM / BBHA9120D	667	W2008003	1-18GHz	Aug.2, 2011	Aug.1, 2012	-	f＜10 GHz：±1dB 10GHz＜f＜18 GHz：±1.5dB
Broadband Preamplifier 0.5-18 GHz	SCHWARZBECK MESS-ELEKTROM / BBV 9718	9718-148	W2008004	0.5-18GHz	Aug.2, 2011	Aug.1, 2012	-	±1.2dB
10m Coaxial Cable with N-male Connectors usable up to 18GHz,	SCHWARZBECK MESS-ELEKTROM /AK 9515 H	-	-	-	Aug.2, 2011	Aug.1, 2012	-	-
10m 50 Ohm Coaxial Cable with N-plug, individual length, usable up to 3(5)GHz, Connector	SCHWARZBECK MESS-ELEKTROM /AK 9513	-	-	-	Aug.2, 2011	Aug.1, 2012	-	-
Positioning Controller	C&C LAB/ CC-C-IF	-	-	-	N/A	N/A	-	-
Color Monitor	SUNSPO/ SP-14C	-	-	-	N/A	N/A	-	-
Test Receiver	ROHDE&SCHWARZ/ ESPI	101155	W2005001	9k-3GHz	Aug.2, 2011	Aug.1, 2012	Wws200809 42	±1dB
EMI Receiver	Beijingkehuan	KH3931	-	9k-1GHz	Aug.2, 2011	Aug.1, 2012	-	-
Two-Line V-Network	ROHDE&SCHWARZ/ ENV216	100115	W2005002	50Ω/50μH	Aug.2, 2011	Aug.1, 2012	Wws200809 41	±10%

Equipment Name	Manufacturer Model	Equipment No.	Internal No.	Specification	Cal. Date	Due Date	Cert. No.	Uncertainty
V－LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8128	8128-259	9k-30MHz	Aug.2, 2011	Aug.1, 2012	-	-
PC1	Lenovo	T2900D	-	-	Aug.2, 2011	Aug.1, 2012	-	±1dB
PC2	Acer	Aspire AG1720	-	-	Aug.2, 2011	Aug.1, 2012	-	±1dB
Display1	ViewSonic	S27996-1W	-	-	Aug.2, 2011	Aug.1, 2012	-	±0.5dB
Display2	Lenovo	9227-AC6	-	-	Aug.2, 2011	Aug.1, 2012	-	±0.5dB
K/B	Dell	L100	-	-	Aug.2, 2011	Aug.1, 2012	-	±0.5dB
Mouse	Acer	M-UVACR1	-	-	Aug.2, 2011	Aug.1, 2012	-	±0.5dB

6 Conducted Emission Data

Test Requirement:	FCC CFR 47 Part 15 Section 15.107
Test Method:	ANSI C63.4:2003
Test Result:	PASS
Frequency Range:	150kHz to 30MHz
Class:	Class B
Limit:	66-56 dBμV between 0.15MHz & 0.5MHz 56 dBμV between 0.5MHz & 5MHz 60 dBμV between 5MHz & 30MHz
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth) Quasi-Peak & Average if maximised peak within 6dB of Average Limit

6.1 E.U.T. Operation

Operating Environment:

Temperature: 25.5 °C
Humidity: 51 % RH
Atmospheric Pressure: 1012 mbar

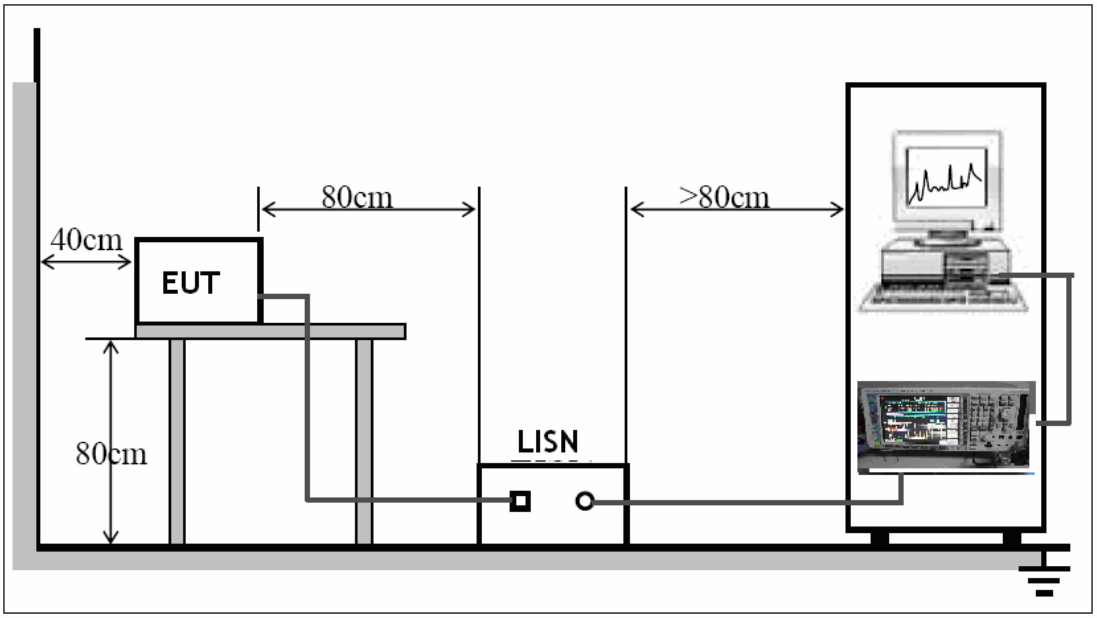
EUT Operation:

The EUT was tested according to ANSI C63.4:2003. 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.

6.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.4:2003, The specification used in this report was the FCC Part15 B 15.107 limits.



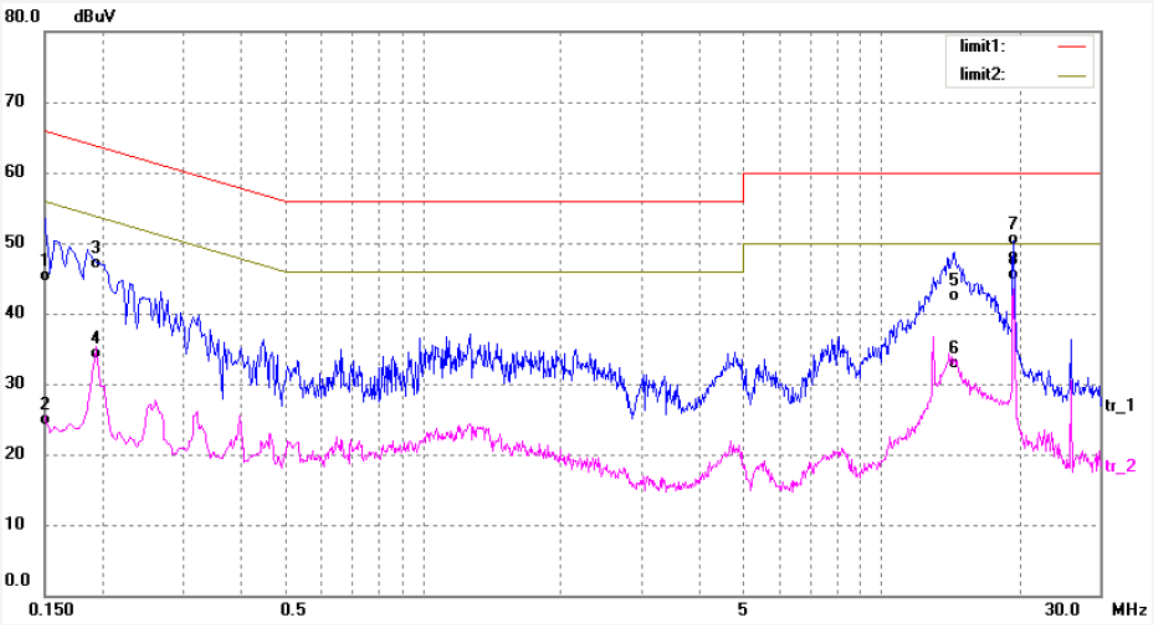
The EUT was placed on the test table in shielding room

6.3 Conducted Emission Test Result

An initial pre-scan was performed on the live and neutral lines.

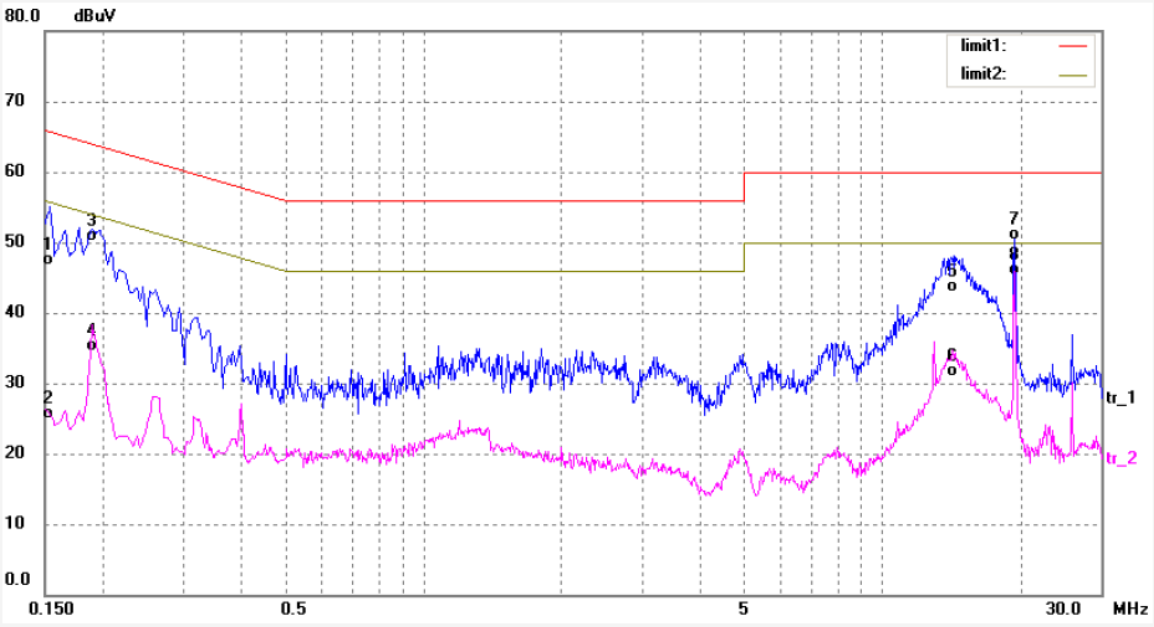
Remark: The pre-test was performance in three models AS-3116ULG, AS-7116ULG, AS-9116ULG, and the worst is AS-9116ULG, when it connected to two PC via the VGA cable with USB interface and scrolled the “H” letter in full screen with 1280*1024 resolution and 60Hz refresh rate. So the data show is that mode’s only.

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1500	33.92	10.67	44.59	65.99	-21.40	QP	
2	0.1500	13.48	10.67	24.15	55.99	-31.84	AVG	
3	0.1945	35.59	10.67	46.26	63.84	-17.58	QP	
4	0.1945	22.93	10.67	33.60	53.84	-20.24	AVG	
5	14.4860	29.57	12.04	41.61	60.00	-18.39	QP	
6	14.4860	20.09	12.04	32.13	50.00	-17.87	AVG	
7	19.4300	37.38	12.27	49.65	60.00	-10.35	QP	
8	19.4300	32.45	12.27	44.72	50.00	-5.28	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1539	36.13	10.64	46.77	65.78	-19.01	QP	
2	0.1539	14.20	10.64	24.84	55.78	-30.94	AVG	
3	0.1900	39.38	10.67	50.05	64.03	-13.98	QP	
4	0.1900	23.78	10.67	34.45	54.03	-19.58	AVG	
5	14.2940	30.83	12.02	42.85	60.00	-17.15	QP	
6	14.2940	18.83	12.02	30.85	50.00	-19.15	AVG	
7	19.4300	37.96	12.27	50.23	60.00	-9.77	QP	
8	19.4300	33.07	12.27	45.34	50.00	-4.66	AVG	

6.4 Photograph – Conducted Emission Test Setup

Front View

Back View

7 Radiation Emission Data

Test Requirement:	FCC CFR 47 Part 15 Section 15.109
Test Method:	ANSI C63.4:2003
Test Result:	PASS
Frequency Range:	30MHz to 1GHz
Measurement Distance:	3m
Class:	Class B
Limit:	40.0 dBμV/m between 30MHz & 88MHz
	43.5 dBμV/m between 88MHz & 216MHz
	46.0 dBμV/m between 216MHz & 960MHz
	54.0 dBμV/m above 960MHz
Detector:	Peak for pre-scan (120kHz resolution bandwidth)

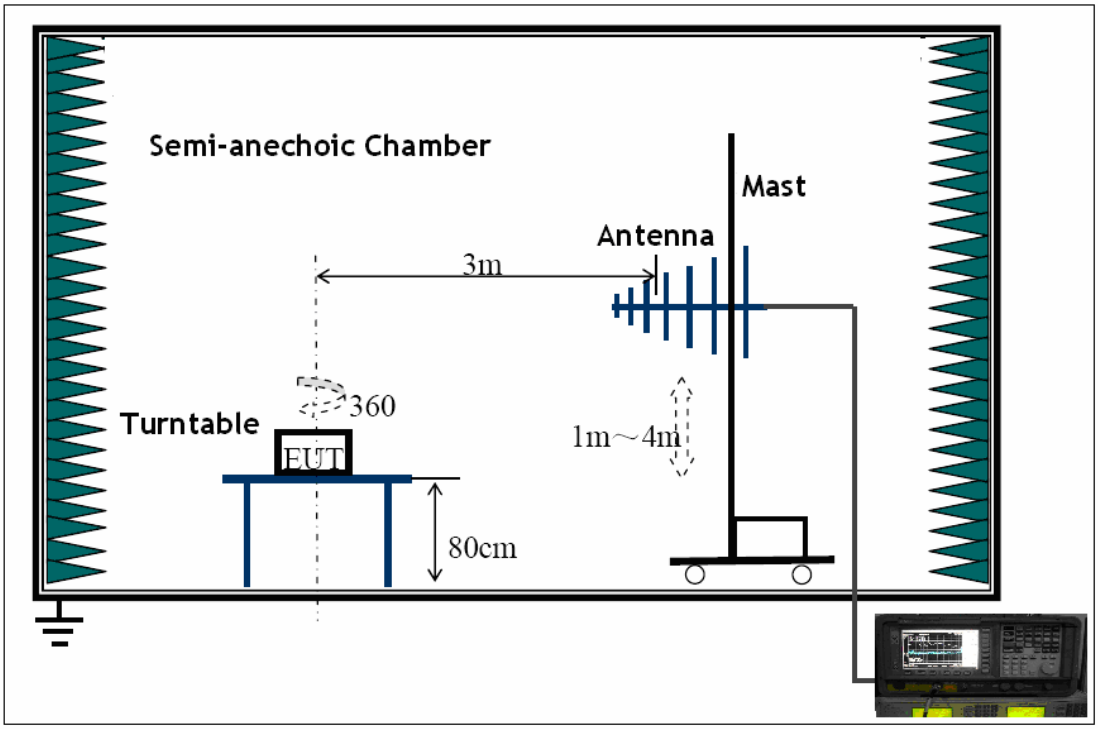
7.1 Measurement Uncertainty

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 $\pm$5.03dB.

7.2 EUT Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4:2003, The specification used in this report was the FCC CFR 47 Part 15 Section 15.109 limits.



The EUT was placed on the test table in shielding room.

7.3 Spectrum Analyzer Setup

According to FCC Part15 B Rules, the system was tested 30 to 1000MHz.

Start Frequency ..... 30 MHz
Stop Frequency 1000MHz
Sweep Speed..... Auto
IF Bandwidth..... 120 KHz
Video Bandwidth..... 100KHz
Quasi-Peak Adapter Bandwidth ..... 120 KHz
Quasi-Peak Adapter Mode ..... Normal
Resolution Bandwidth 100KHz

7.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

7.5 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:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - 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:

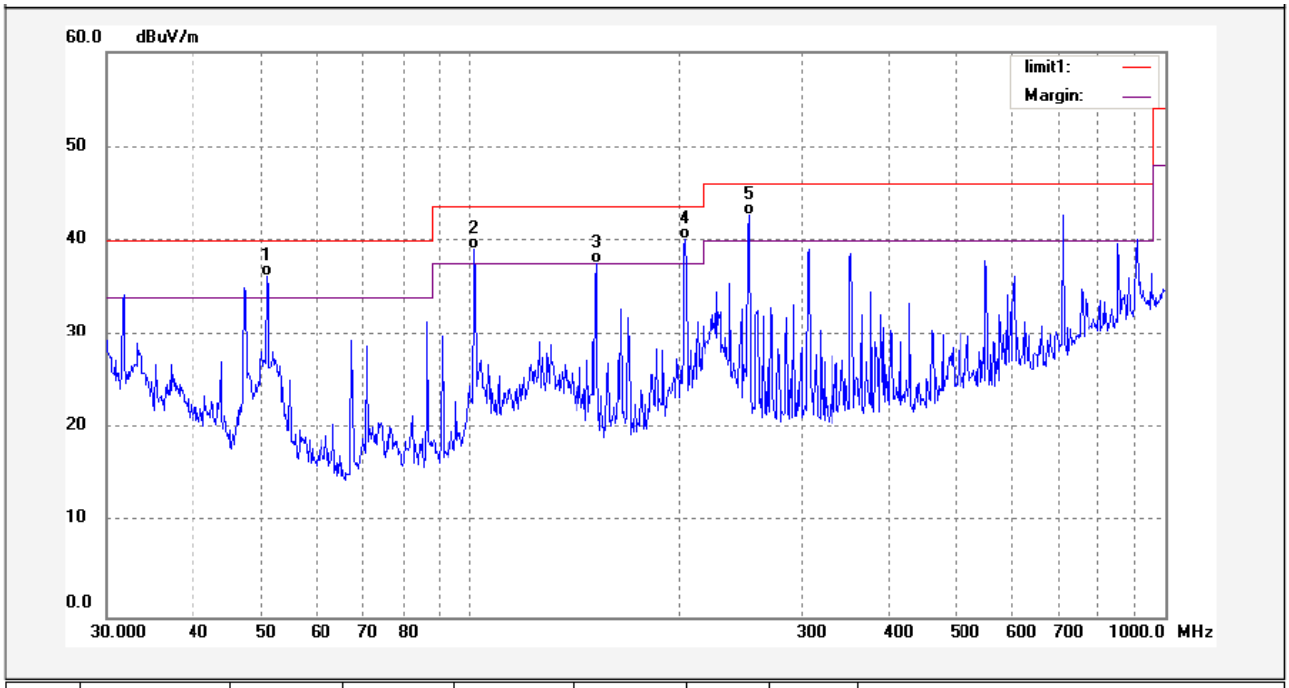
Margin = Corr. Ampl. – Class B Limit

7.6 Summary of Test Results

According to the data in this section, the EUT complied with the FCC CFR47 Part 15 Section 15.109 standards.

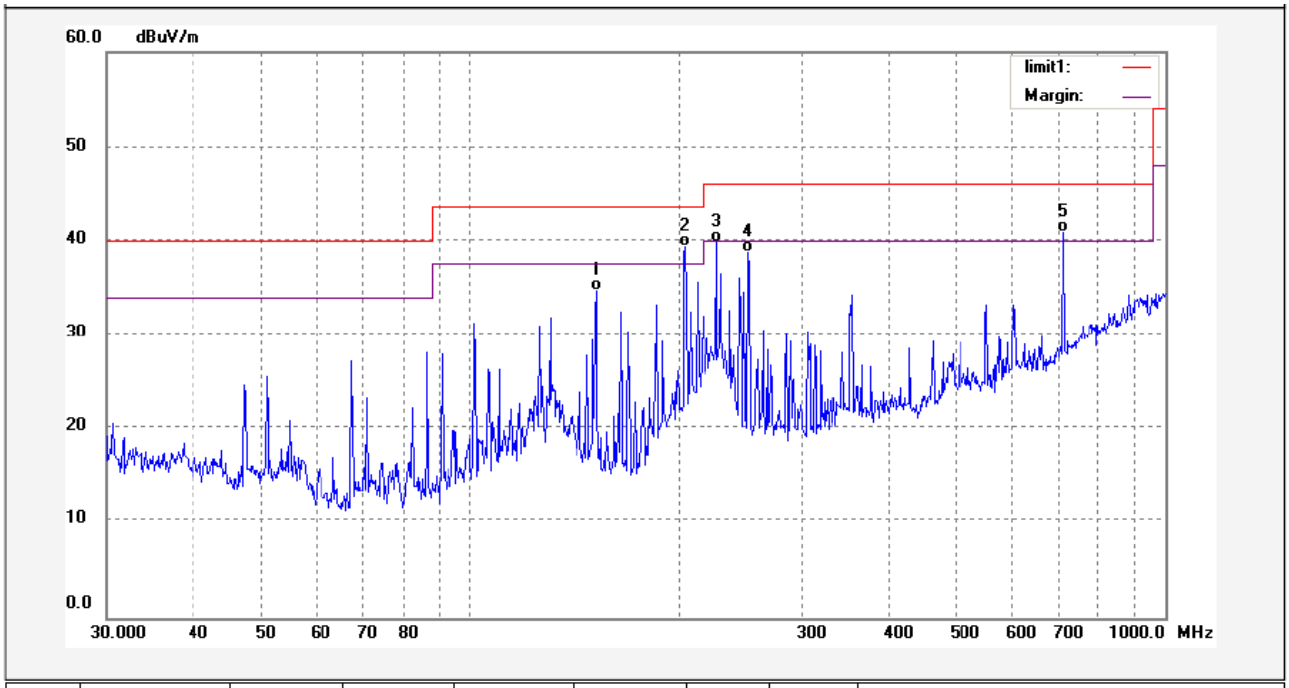
Remark: The pre-test was performance in three models AS-3116ULG, AS-7116ULG, AS-9116ULG, and the worst is AS-9116ULG, when it connected to two PC via the VGA cable with USB interface and scrolled the "H" letter in full screen with 1280*1024 resolution and 60Hz refresh rate. So the data show is that mode's only.

Frequency Range: 30MHz ~ 1000MHz
Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	50.9960	21.65	14.54	36.19	40.00	-3.81	QP	
2	101.5357	24.95	14.06	39.01	43.50	-4.49	QP	
3	152.0901	26.66	10.97	37.63	43.50	-5.87	QP	
4	203.5885	25.12	15.01	40.13	43.50	-3.37	QP	
5	252.2522	26.85	15.80	42.65	46.00	-3.35	QP	

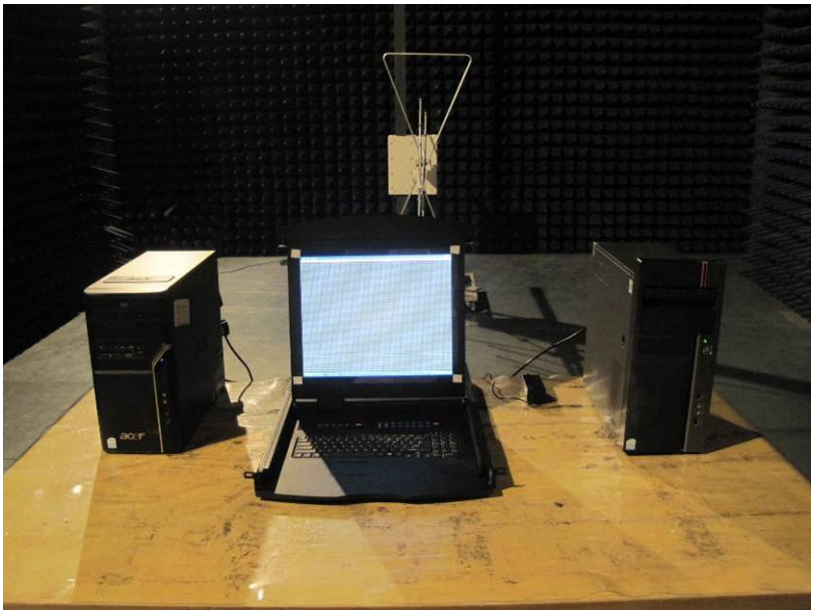
Antenna polarization: Horizontal



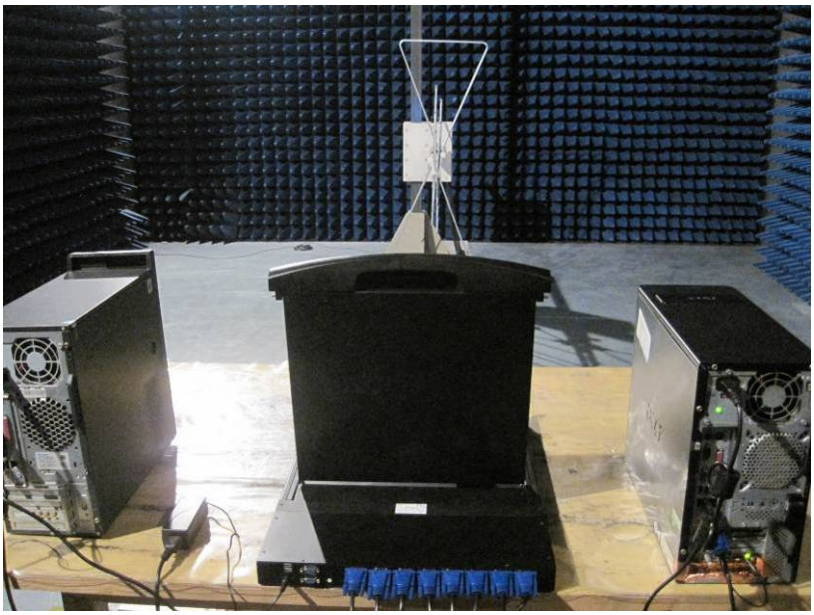
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	152.0902	23.71	10.97	34.68	43.50	-8.82	QP	
2	203.5886	24.39	15.01	39.40	43.50	-4.10	QP	
3	226.2202	23.51	16.31	39.82	46.00	-6.18	QP	
4	251.3675	23.10	15.75	38.85	46.00	-7.15	QP	
5	713.6917	14.42	26.52	40.94	46.00	-5.06	QP	

7.7 Photograph – Radiation Emission Test Setup

Front View



Back View



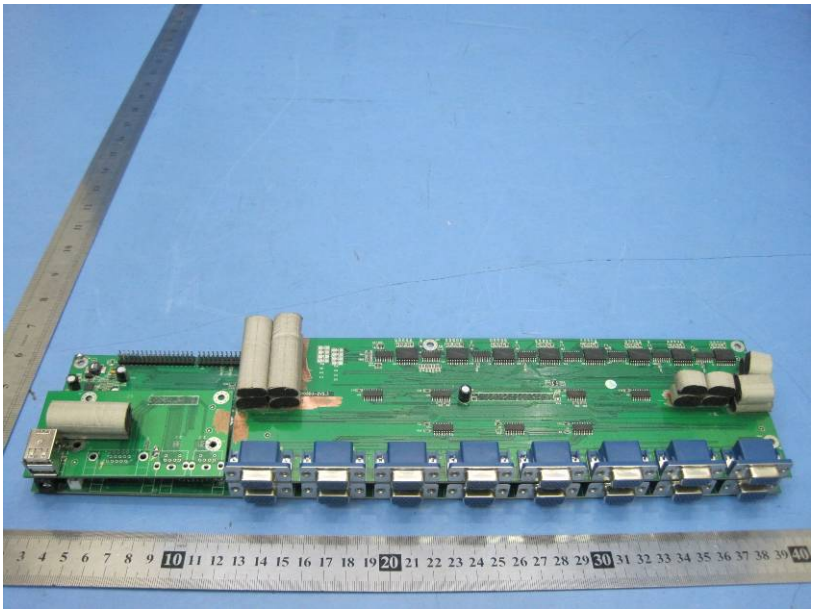
8 Photographs - Constructional Details

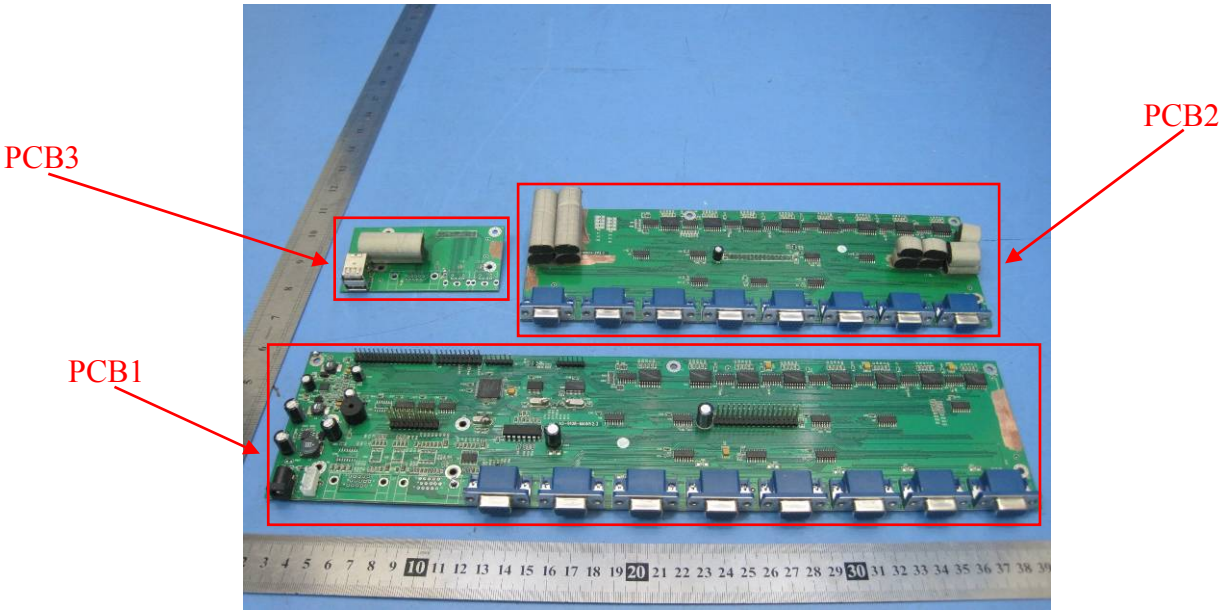
8.1 Product View

8.2 EUT - Front View

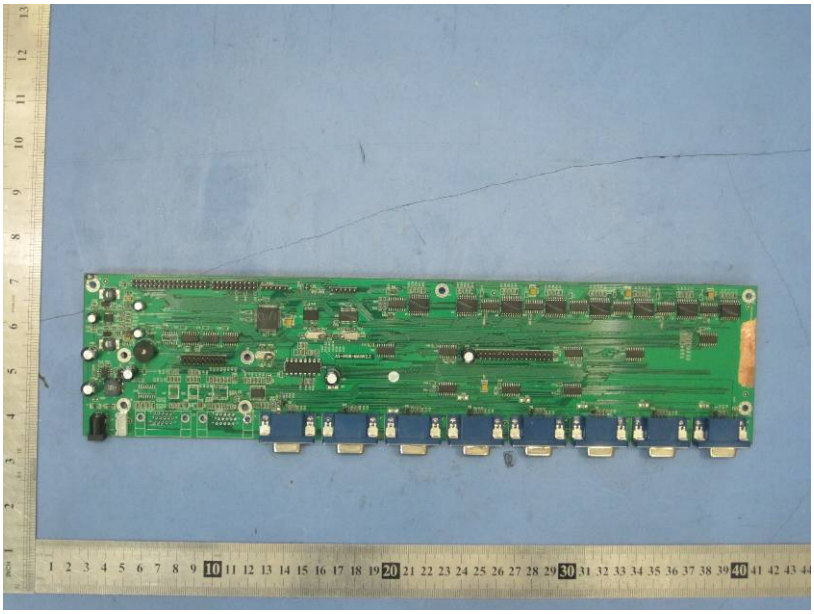
8.3 EUT - Back View

8.4 EUT - Open View 1

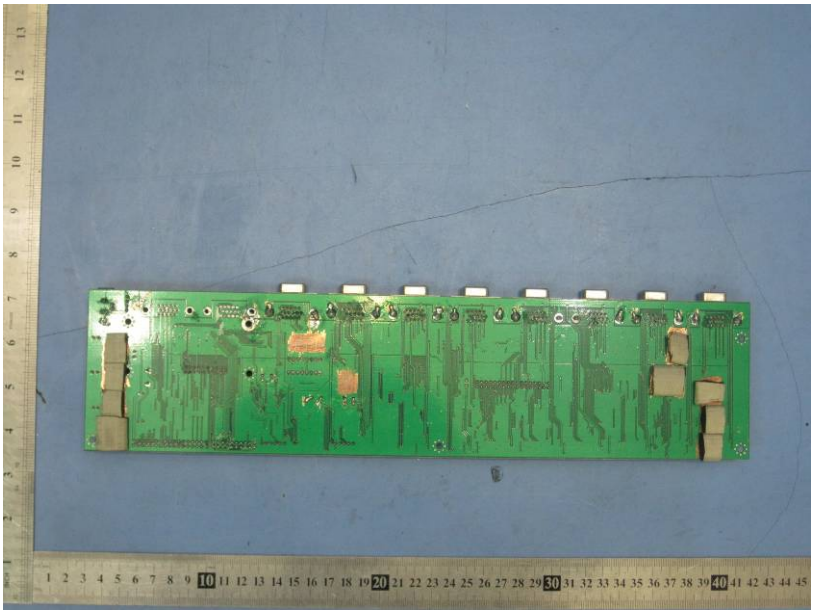



PCB3
PCB2
PCB1

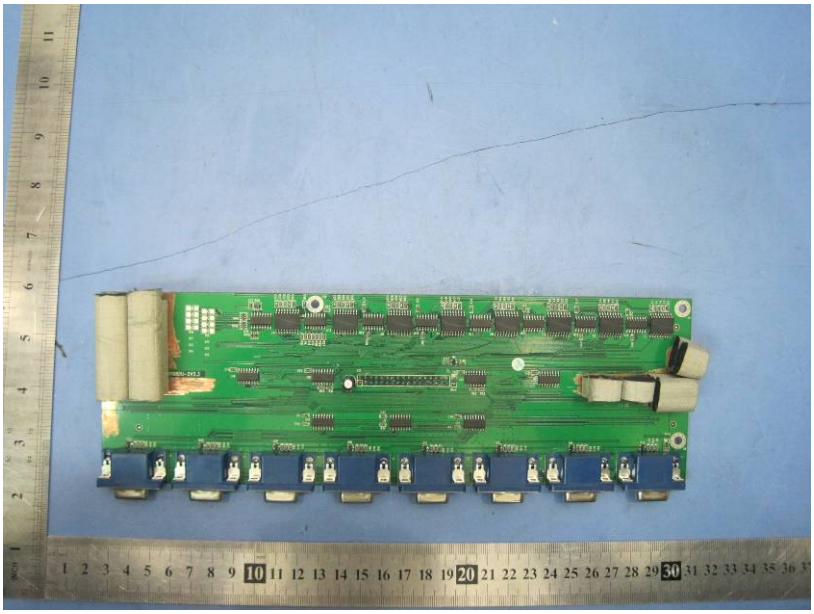
8.5 PCB1 - Front View



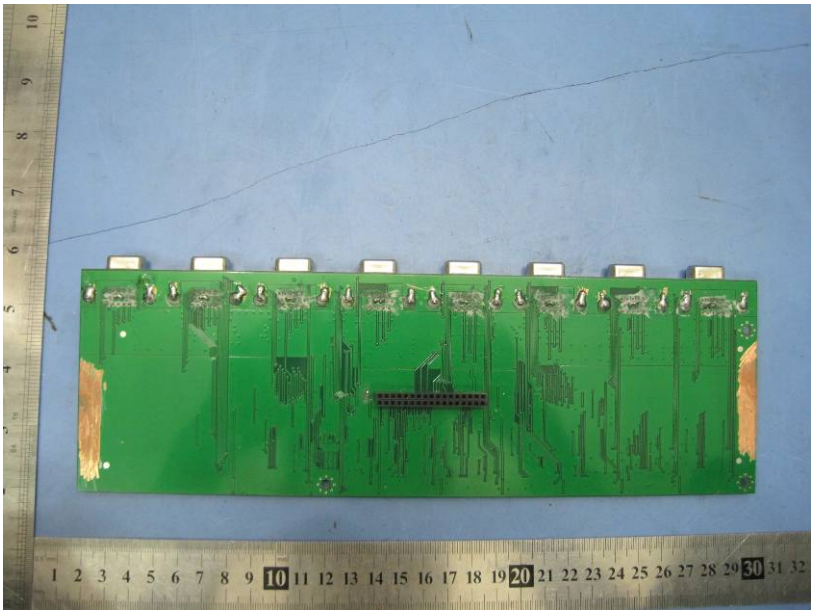
8.6 PCB1 - Back View



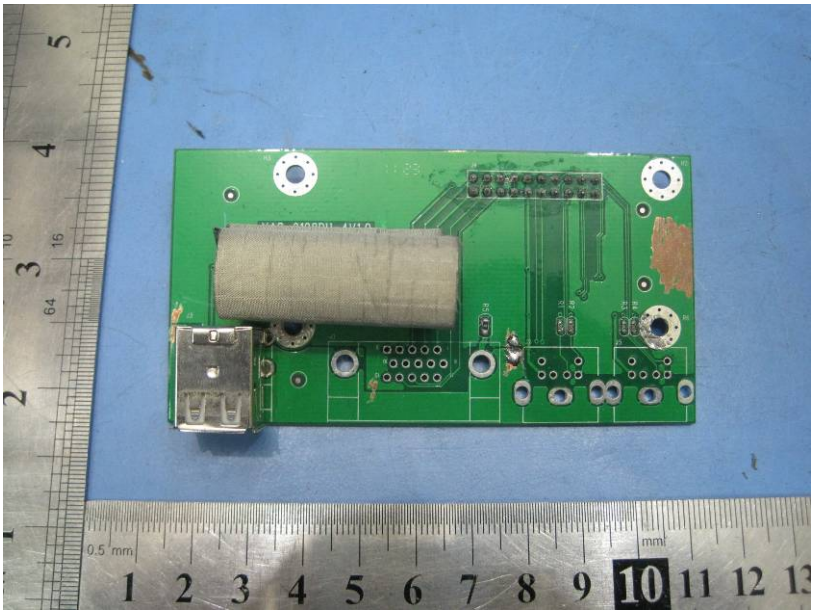
8.7 PCB2 - Front View



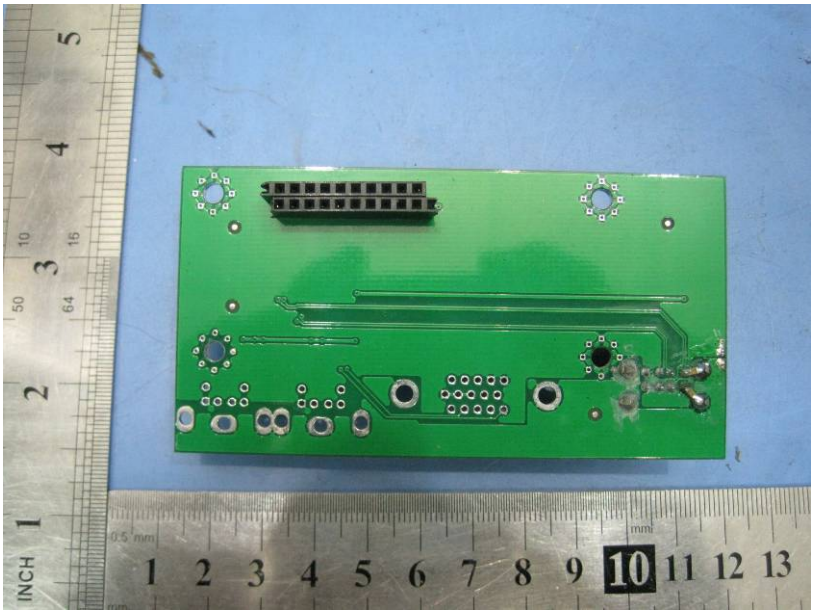
8.8 PCB2 - Back View



8.9 PCB3 - Front View

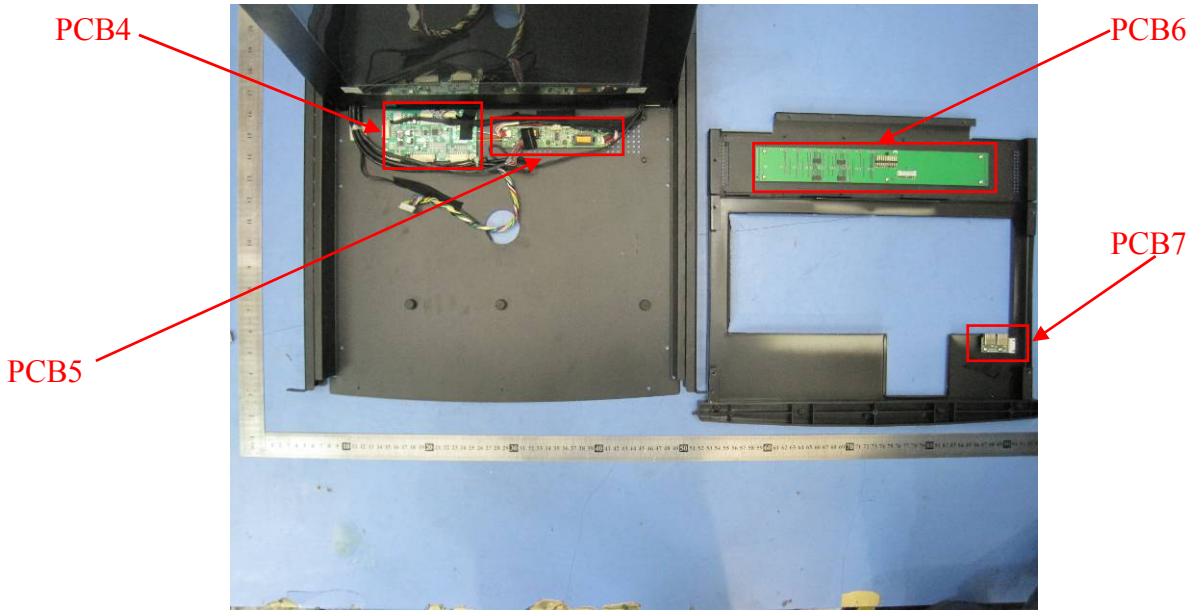


8.10 PCB3 - Back View

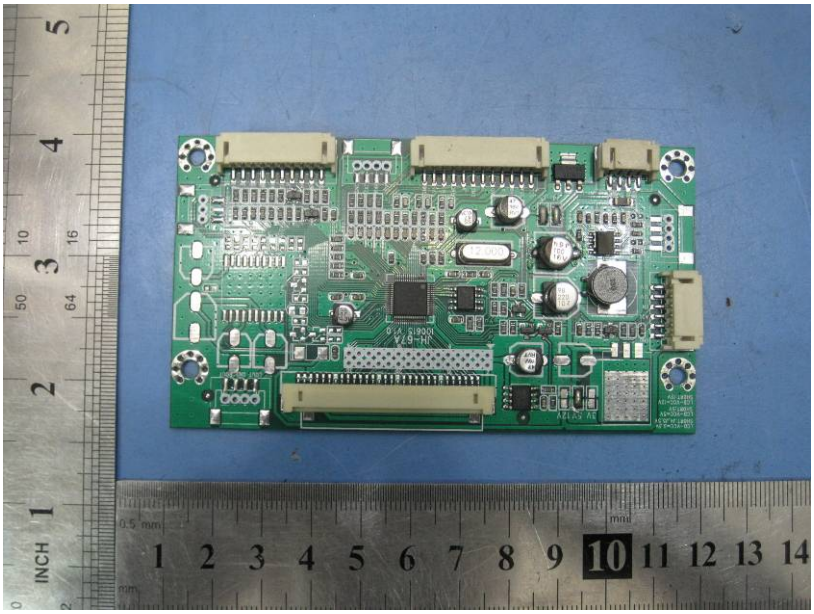


8.11 EUT - Open View 2

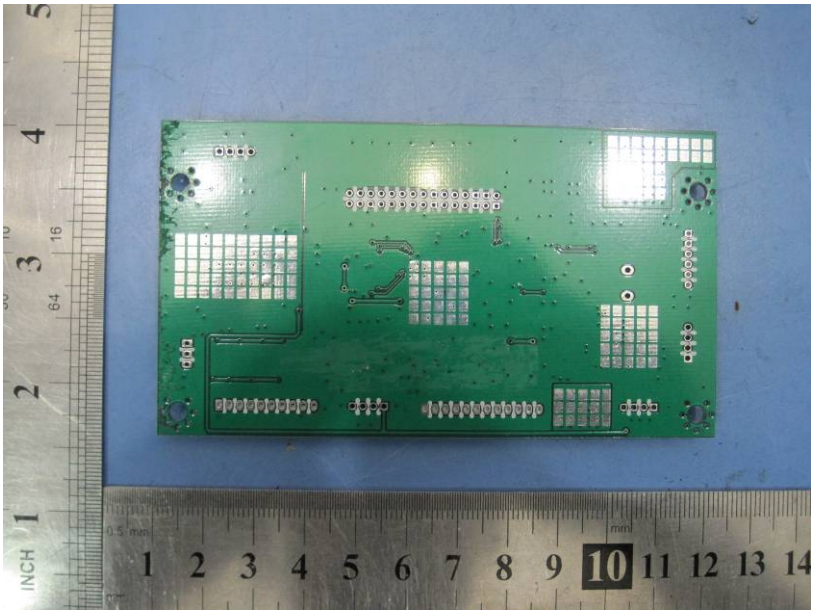
8.12 EUT - Open View 3



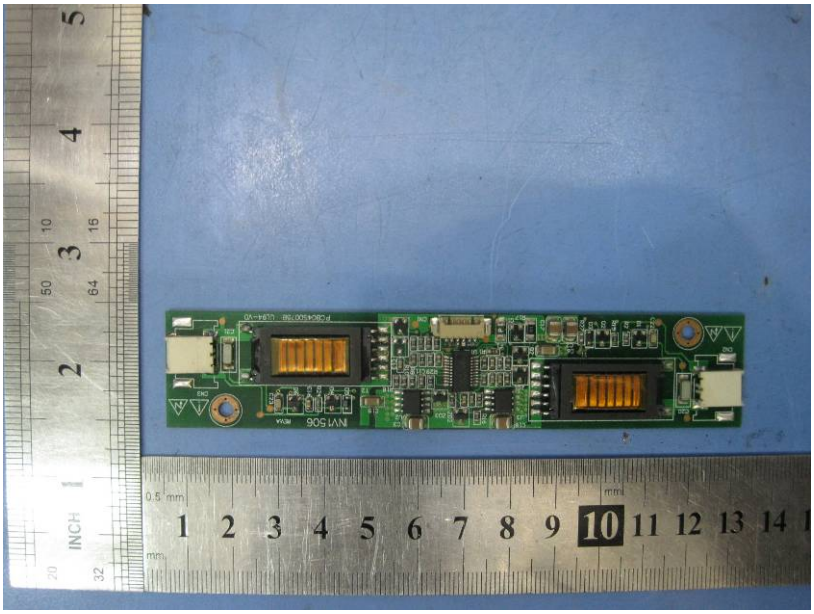
8.13 PCB4 - Front View



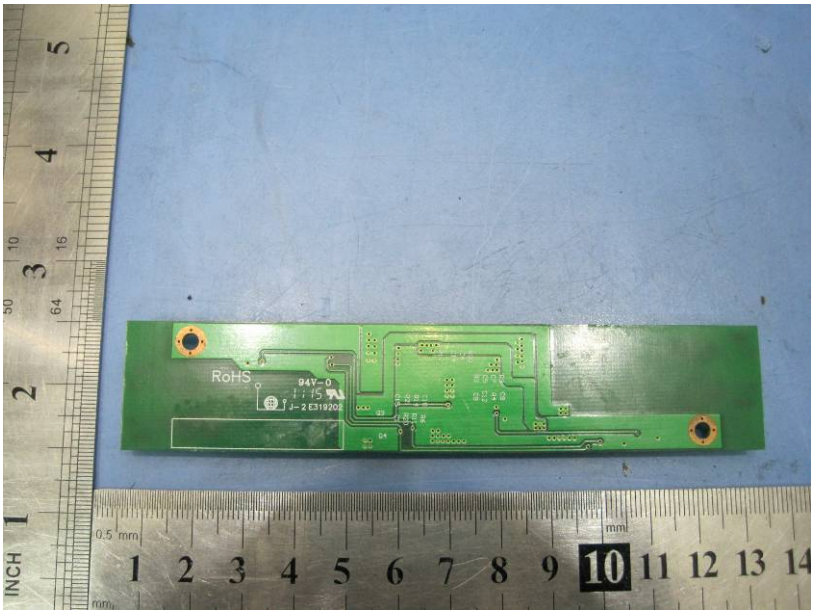
8.14 PCB4 - Back View



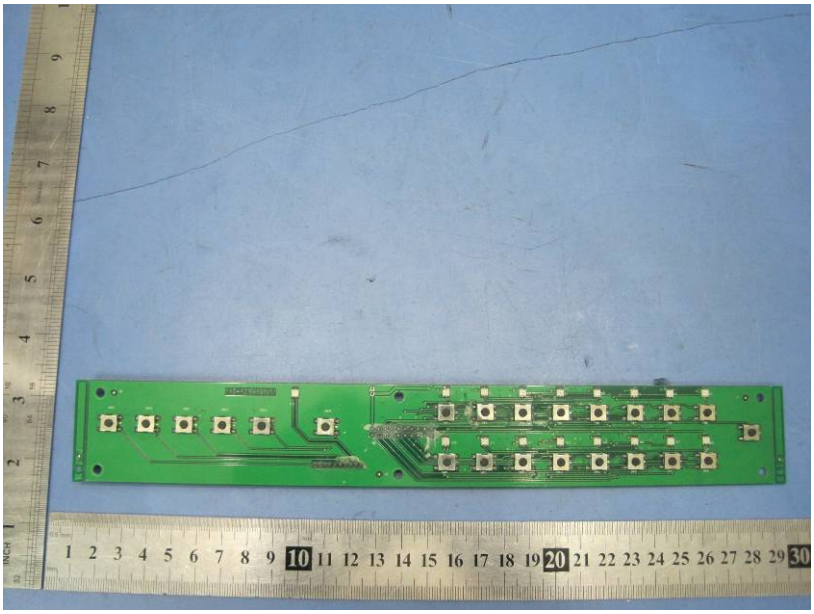
8.15 PCB5 - Front View



8.16 PCB5 - Back View

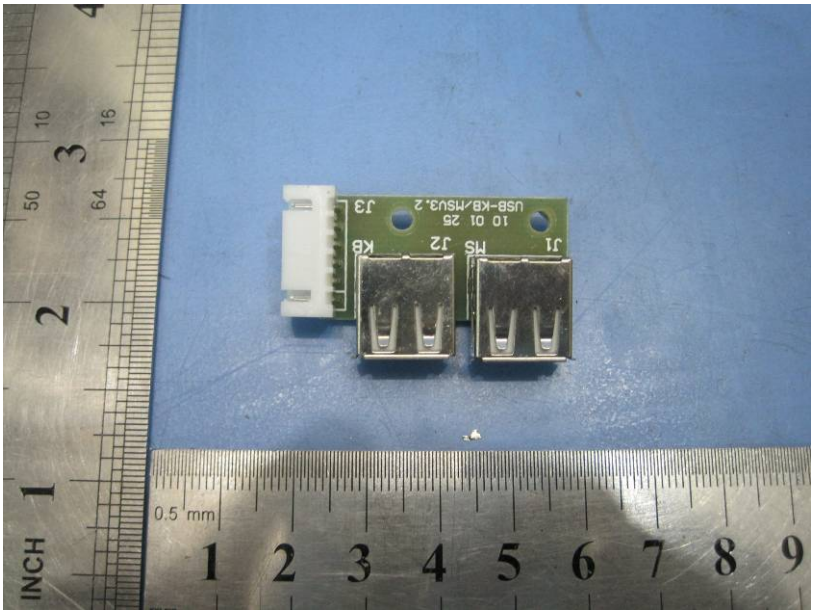


8.17 PCB6 - Front View

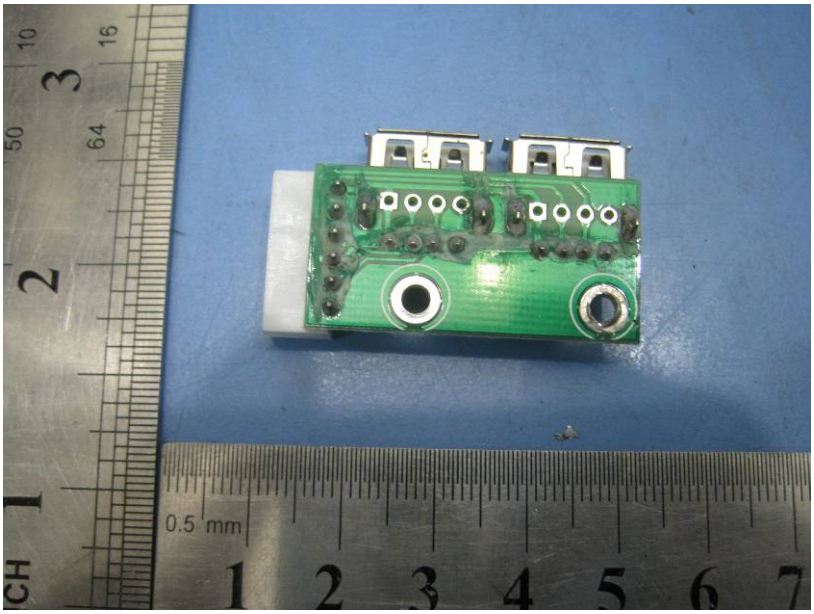


8.18 PCB6 - Back View

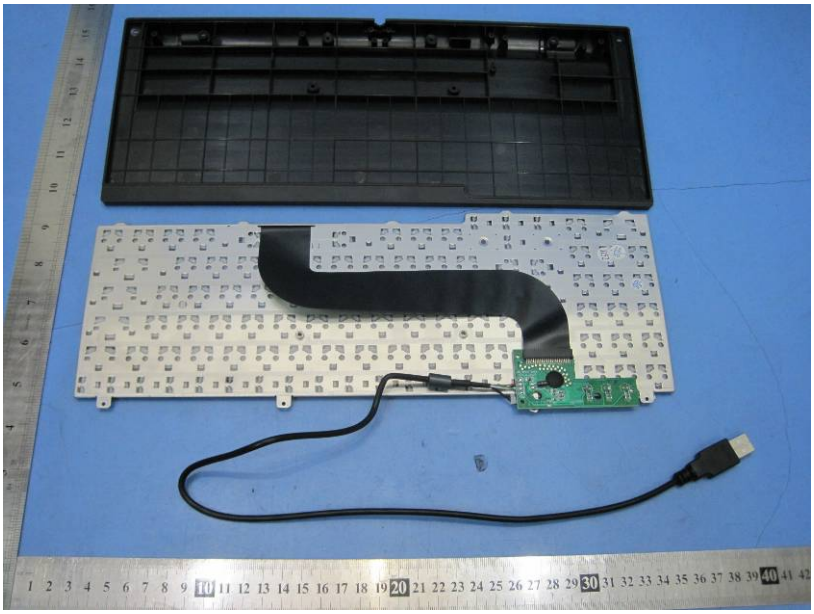
8.19 PCB7 - Front View



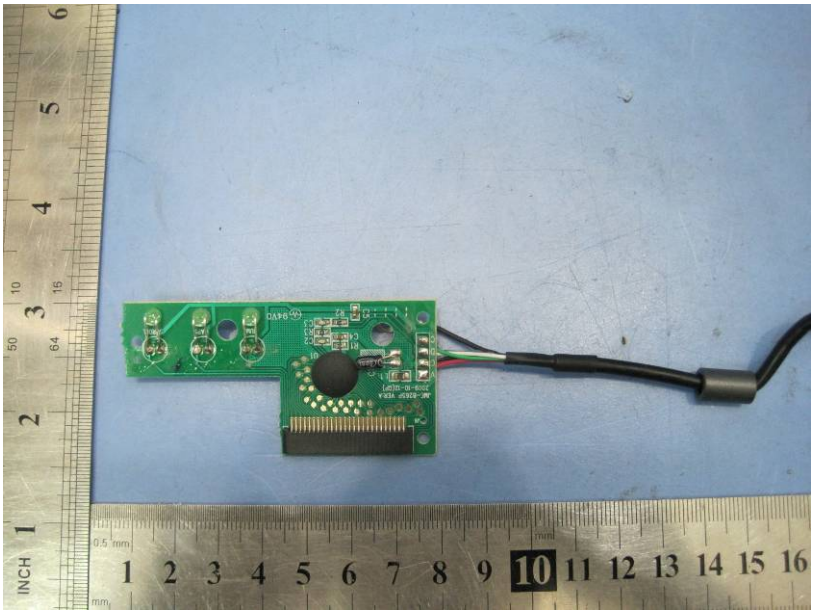
8.20 PCB7 - Back View



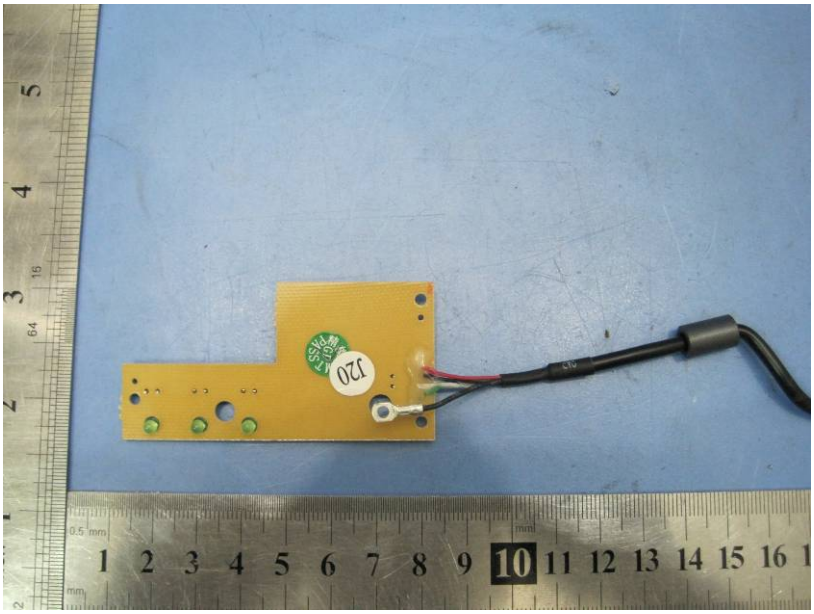
8.21 Keyboard - Open View



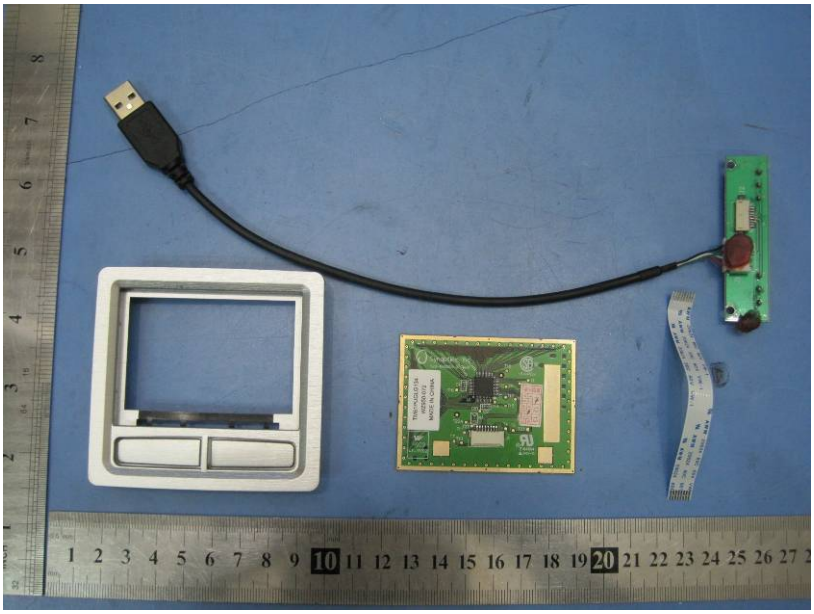
8.22 PCB of Keyboard - Front View



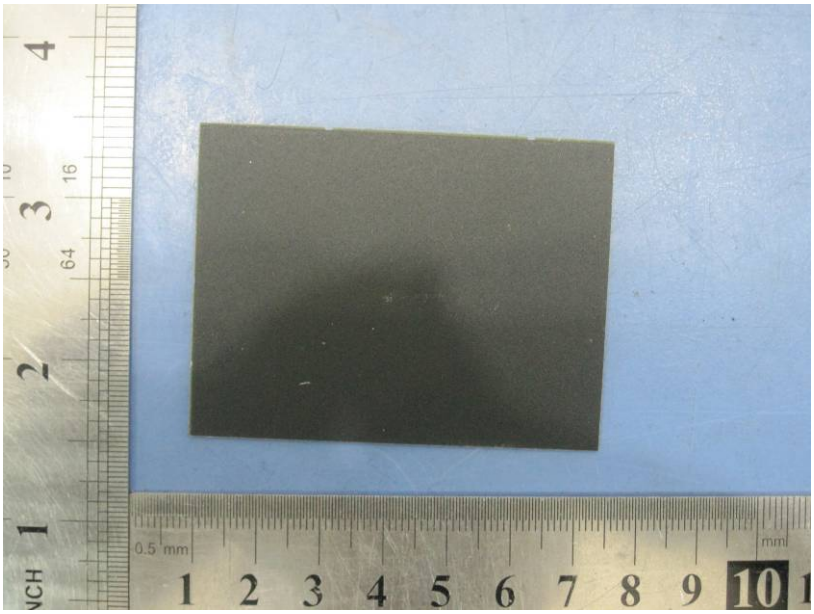
8.23 PCB of Keyboard - Back View



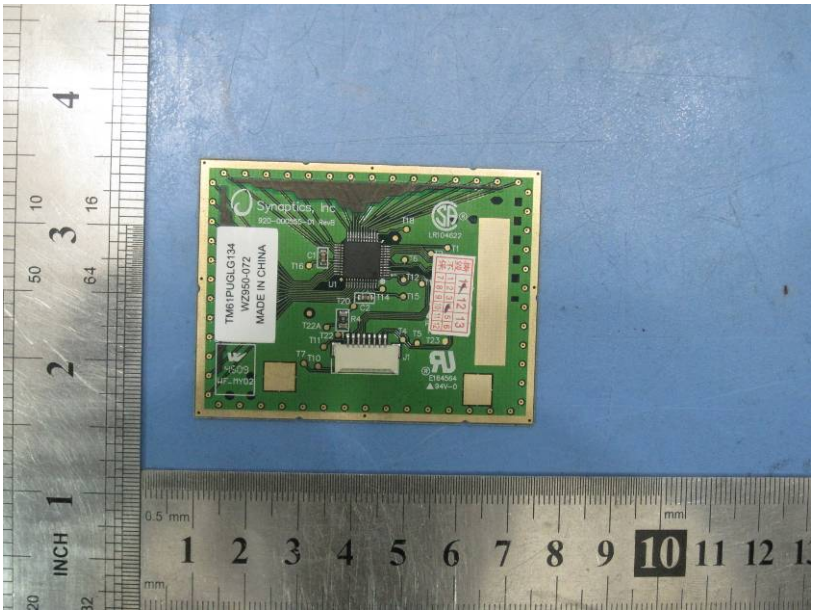
8.24 TouchPad - Open View



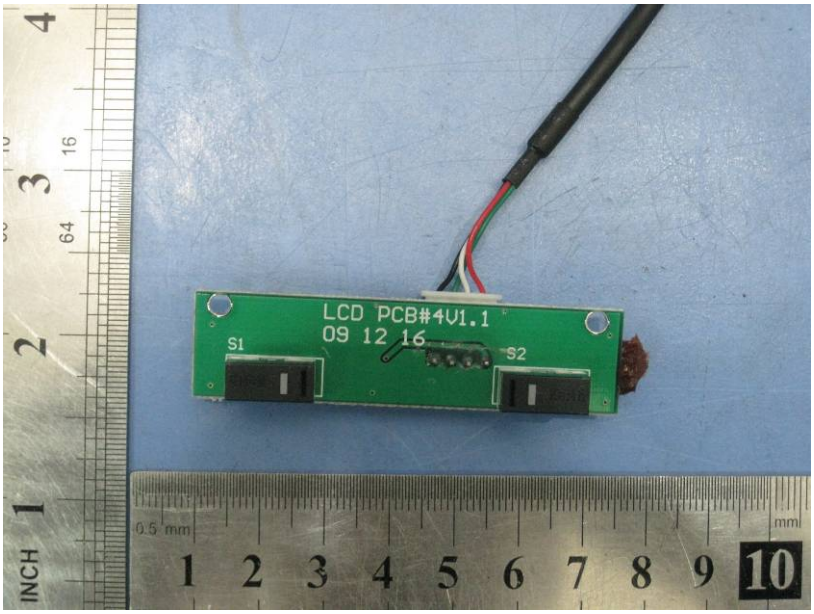
8.25 PCB1 of TouchPad - Front View



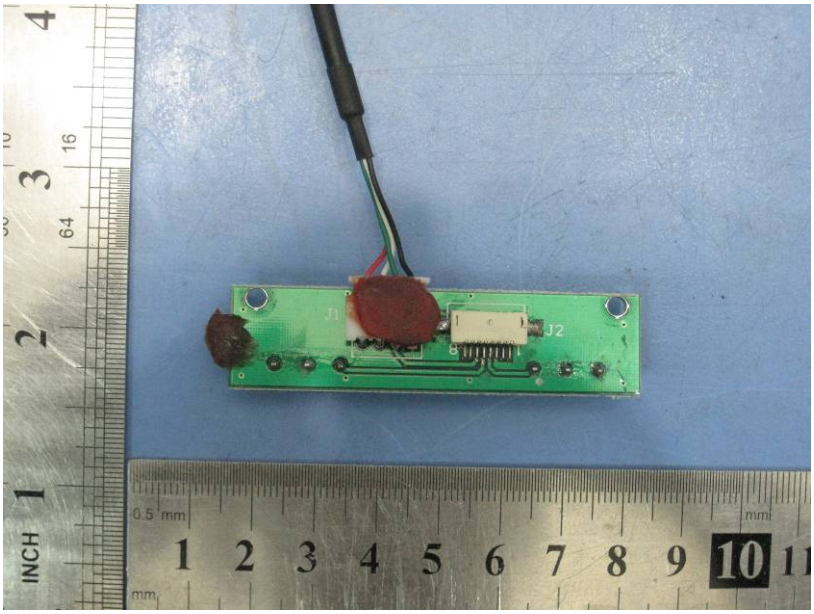
8.26 PCB1 of TouchPad - Back View



8.27 PCB2 of TouchPad - Front View



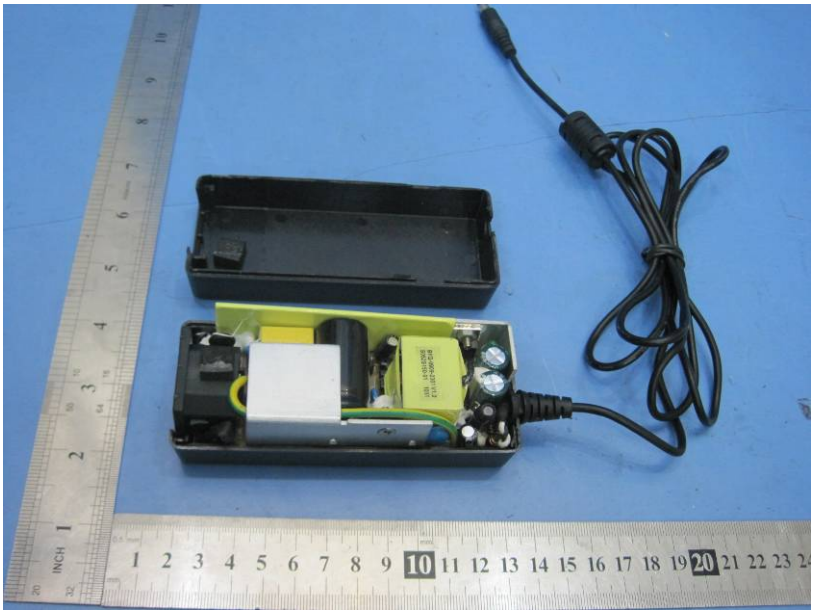
8.28 PCB2 of TouchPad - Back View



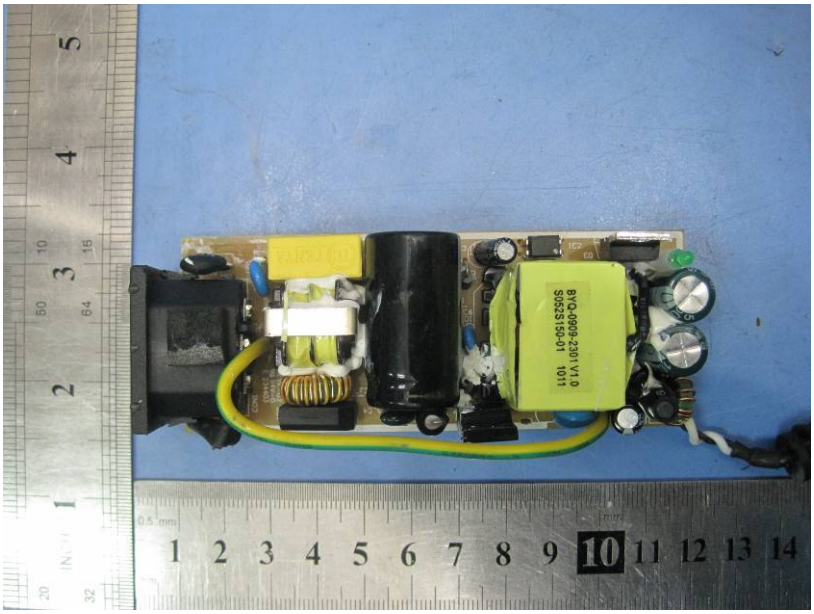
8.29 Adapter - Front View

8.30 Adapter - Back View

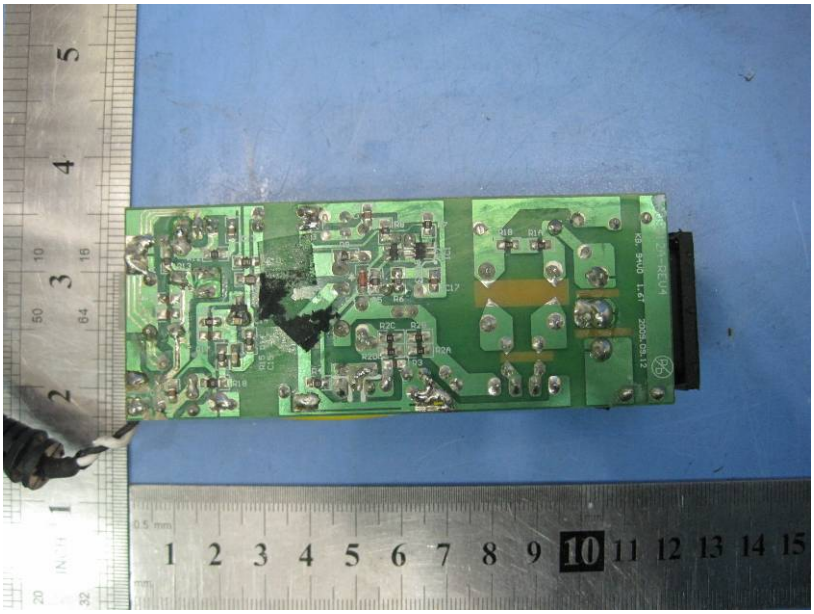
8.31 Adapter - Open View



8.32 PCB of Adapter - Front View



8.33 PCB of Adapter - Back View



9 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. 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.