

# FCC TEST REPORT

**Reference No.**..... : WTU14U1019496E  
**Applicant**..... : Suzhou Switek Electronics&Technology Co, Ltd.  
**Address**..... : No.86, South WuSong Road, Luzhi Town, Wuzhong District, Suzhou  
City Jiangsu China.  
**Manufacturer** ..... : The same as above  
**Address**..... : The same as above  
**Product Name**..... : DVI switcher  
**Model No**..... : AS-41DA ,AS-21DA  
**FCC ID**..... : ZQXAS-41DA  
**Standards** ..... : FCC PART15 SUBPART B 2013  
**Date of Receipt sample** .... : October 22, 2014  
**Date of Test** ..... : December 02, 2014 ~ December 26, 2014  
**Date of Issue**..... : December 30, 2014  
**Test Report Form No.**..... : FCC 15-2A  
**Test Result**..... : **Pass \***

**Remarks:**

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company.

The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

**Prepared By:**

**Waltek Services (Shenzhen) Co., Ltd.**

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Testing location: The same as above

Tel :+86-755-83551033

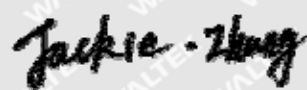
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Compiled by:



Fish.Yu / Project Engineer

Approved by:



Jackie.Zhang / Manager

## 1 Test Summary

Test Item	Test Requirement	Class	Test Method	Test Result
Conducted Emission (150KHz to 30MHz)	FCC PART 15, SUBPART B: 2013	Class B	ANSI C63.4: 2003	Pass
Radiated Emission (30MHz to 1GHz)	FCC PART 15, SUBPART B: 2013	Class B	ANSI C63.4: 2003	Pass

Remark:

Pass

Test item meets the requirement

Fail

Test item does not meet the requirement

N/A

Test case does not apply to the test object



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### 3 General Information

#### 3.1 General Description of E.U.T.

**Product Name** ..... : DVI switcher  
**Model No.** ..... : AS-41DA ,AS-21DA  
**Remark** ..... : The model difference is only output port number.

#### 3.2 Details of E.U.T.

**Technical Data** ..... : DC 9V, rated power 9W  
**The Highest Operation Frequency**.... : 24MHz

#### 3.3 Description of Support Units

The EUT has been tested as an independent unit. AS-41DA is the test sample.

#### 3.4 Standards Applicable for Testing

The tests were performed according to following standards:

FCC PART 15, SUBPART      Electronic Code of Federal Regulations- Unintentional Radiators  
B: 2013



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### 3.5 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, July 12, 2012.

- **FCC – Registration No.: 880581**

Waltek Services (Shenzhen) Co., Ltd. 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, April 29, 2014.

- **FCC – Registration No.: 800392**

QuieTek Technology (Suzhou) Co., Ltd. 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 800392, May 31, 2013.

### 3.6 Subcontracted

Whether parts of tests for the product have been subcontracted to other labs:

Yes       No

If Yes, list the related test items and lab information:

Test Lab:      QuieTek Technology(Suzhou) Co.,Ltd.

Lab address:    No.99 Hongye Rd.,Suzhou Industrial Park Loufeng  
Hi-New-Tech Development Area,Suzhou,China

Test items:      10M Radiation Emission

### 3.7 Abnormalities from Standard Conditions

None.

#### 4 Equipment Used during Test

Conducted Emissions 1#(Test Lab: Waltek Services (Shenzhen) Co., Ltd.)						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMI Test Receiver	R&S	ESCI	100947	Sep.15, 2014	Sep.14, 2015
2.	LISN	R&S	ENV216	100115	Apr.10, 2014	Apr.09, 2015
3.	Cable	Top	TYPE16(3.5 M)	-	Sep.15, 2014	Sep.14, 2015
10m Radiated Emission(Test Lab: QuieTek Technology (Suzhou) Co., Ltd.)						
Item	Equipment	Specification	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMI Test Receiver	Range:9kHz-3GHz	ESCI	100175	Sep.16, 2014	Sep.16, 2015
2.	EMI Test Receiver	Range:9kHz-3GHz	ESCI	100726	Mar.28, 2014	Mar.28, 2015
3.	Antenna	Range : 10MHz-2.5GHz Gain : 20 dB	AP-025C	CHM-0602008	Apr.11, 2014	Apr.11, 2015
4.	Antenna	Range : 10MHz-2.5GHz Gain : 20 dB	AP-025C	CHM-0602006	Apr.11, 2014	Apr.11, 2015
5.	CBL6112B	Range:30MHz-2GHz	CBL6112B	2933	Otc.10, 2014	Otc.10, 2015
6.	CBL6112B	Range:30MHz-2GHz	CBL6112B	2931	Otc.10, 2014	Otc.10, 2015
7.	Antenna	Range:30MHz-1GHz	RG 214_U	AC1-L	Otc.10, 2014	Otc.10, 2015
8.	Antenna	Range:30MHz-1GHz	RG 214_U	AC1-R	Otc.10, 2014	Otc.10, 2015
9.	ZC1-2	T:-40~50; H:0-100%	ZC1-2	AC1-TH	Jan.07, 2015	Jan.07, 2016

#### 4.1 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conducted Emission	150kHz~30MHz	±2.66dB	(1)
Radiated Emission	30MHz~1GHz	±4.28dB	(1)
Remark: (1)This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.			

#### 4.2 Description of Assistant Device

Equipment	Manufacturer	Model No.	Series No.
PC	Lenovo	T4900V	0100640332
LCD	View Sonic	VA521	922050101551
Keyboard	Shuangfeiyan	KB-3	-
Mouse	JEEJA	M-01	-

## 5 Emission Test Results

### 5.1 Mains Terminals Disturbance Voltage, 150kHz to 30MHz

Test Requirement.....	: FCC PART 15, SUBPART B
Test Method.....	: ANSI C63.4
Test Result.....	: Pass
Test Limit.....	: FCC PART 15, SUBPART B Section 15.107
Frequency Range.....	: 150kHz to 30MHz
Class.....	: Class B

#### 5.1.1 E.U.T. Operation

##### Operating Environment:

Temperature.....	: 23°C
Humidity.....	: 33%RH
Atmospheric Pressure.....	: 101Kbar

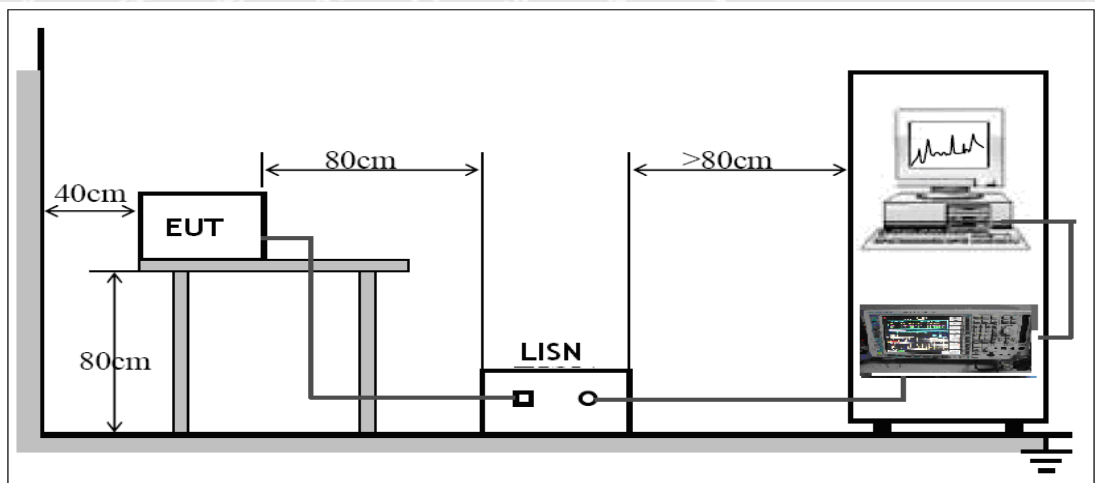
##### EUT Operation:

Input Voltage.....	: DC9V
Operating Mode.....	: Full load mode(the worst case)

Remark: Every I/O port has been connected with an appropriate load and running software that scrolling "H letter" in full screen and set the resolution at 1080P.

#### 5.1.2 Block Diagram of Test Setup

The Mains Terminals Disturbance Voltage tests were performed in accordance with the FCC PART 15, SUBPART B .



### 5.1.3 Measurement Data

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. According to the data in section 5.1.4, the EUT complied with the FCC PART 15, SUBPART B standards.

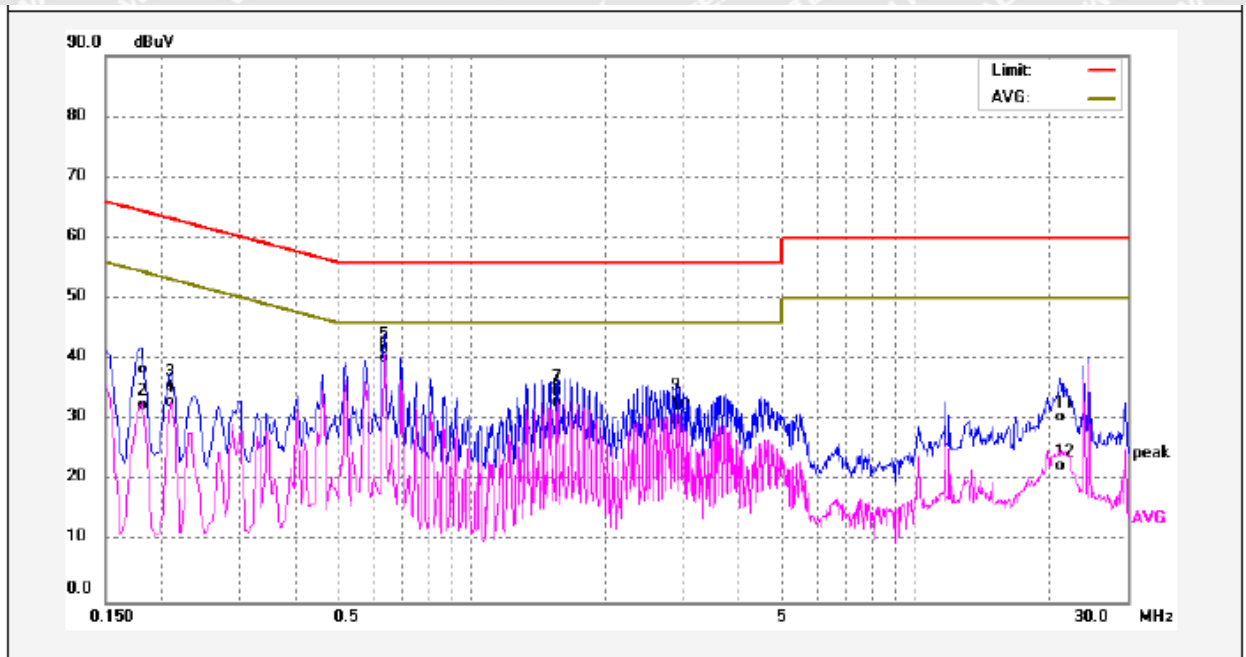
Remark: Test Limit

Frequency of emission (MHz)	Conducted limit (dB $\mu$ V)	
	Quasi-peak	Average
0 15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50



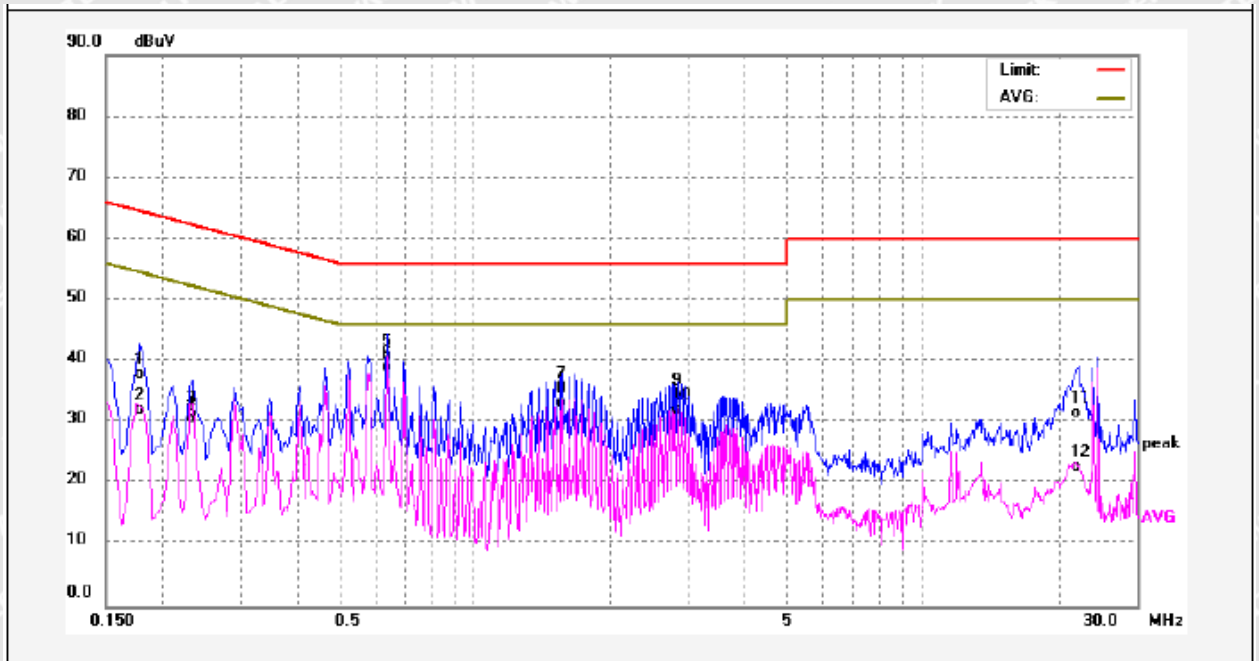


### 5.1.4 Mains Terminals Disturbance Voltage Test Data Live Line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1819	28.64	9.74	38.38	64.39	-26.01	QP	
2	0.1819	22.68	9.74	32.42	54.39	-21.97	AVG	
3	0.2100	25.95	9.73	35.68	63.20	-27.52	QP	
4	0.2100	23.24	9.73	32.97	53.20	-20.23	AVG	
5	0.6380	32.15	9.67	41.82	56.00	-14.18	QP	
6	0.6380	30.43	9.67	40.10	46.00	-5.90	AVG	
7	1.5620	25.09	9.70	34.79	56.00	-21.21	QP	
8	1.5620	23.26	9.70	32.96	46.00	-13.04	AVG	
9	2.8940	23.68	9.73	33.41	56.00	-22.59	QP	
10	2.8940	20.37	9.73	30.10	46.00	-15.90	AVG	
11	21.2460	20.56	9.97	30.53	60.00	-29.47	QP	
12	21.2460	12.43	9.97	22.40	50.00	-27.60	AVG	

**Neutral Line:**



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Remark
1	0.1789	28.24	9.63	37.87	64.53	-26.66	QP	
2	0.1789	22.48	9.63	32.11	54.53	-22.42	AVG	
3	0.2349	22.01	9.64	31.65	62.27	-30.62	QP	
4	0.2349	21.01	9.64	30.65	52.27	-21.62	AVG	
5	0.6388	31.25	9.68	40.93	56.00	-15.07	QP	
6	0.6388	29.33	9.68	39.01	46.00	-6.99	AVG	
7	1.5629	25.91	9.69	35.60	56.00	-20.40	QP	
8	1.5629	23.51	9.69	33.20	46.00	-12.80	AVG	
9	2.8349	24.85	9.71	34.56	56.00	-21.44	QP	
10	2.8349	22.40	9.71	32.11	46.00	-13.89	AVG	
11	22.2029	21.53	10.00	31.53	60.00	-28.47	QP	
12	22.2029	12.73	10.00	22.73	50.00	-27.27	AVG	

## 5.2 Radiation Emission Data For 30MHz to 1000MHz

Test Requirement.....	: FCC PART 15, SUBPART B
Test Method.....	: ANSI C63.4
Test Limit.....	: FCC PART 15, SUBPART B Section 15.109
Test Result.....	: Pass
Frequency Range.....	: 30MHz to 1000MHz
Class.....	: Class B

### 5.2.1 E.U.T. Operation

#### Operating Environment:

Temperature.....	: 23°C
Humidity.....	: 33%RH
Atmospheric Pressure.....	: 101Kbar

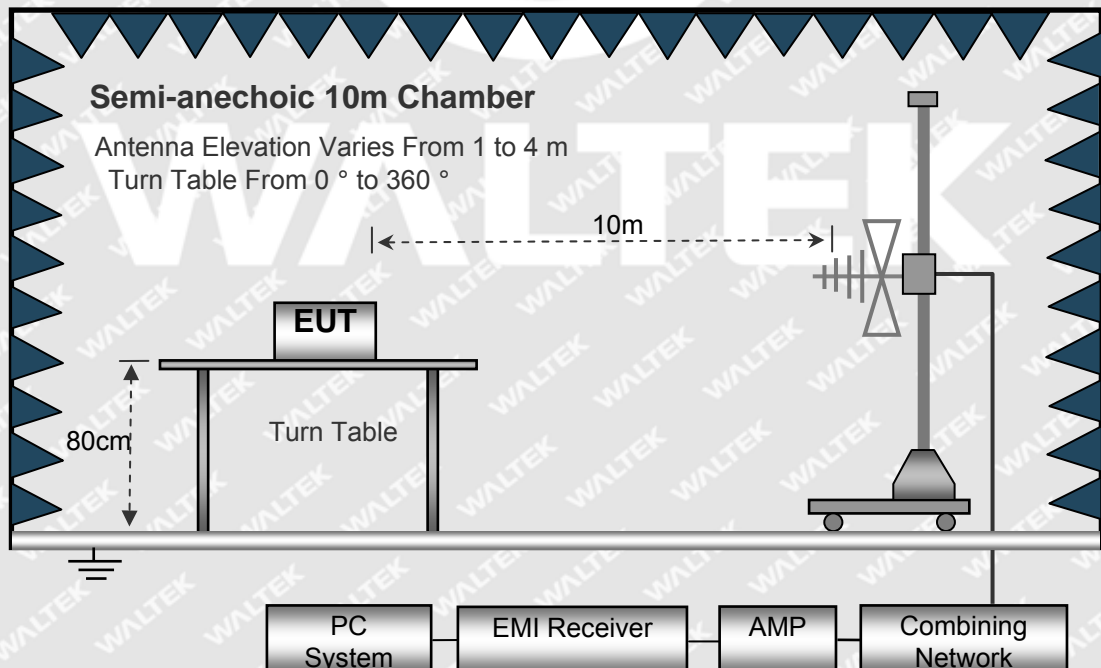
#### EUT Operation:

Input Voltage.....	: DC9V
Operating Mode.....	: Full load mode (the worst case)

Remark: Every I/O port has been connected with an appropriate load and running software that scrolling "H letter" in full screen and set the resolution at 1080P.

### 5.2.2 Block Diagram of Test Setup

The radiated emission tests were performed in the 10m Semi- Anechoic Chamber test site, using the setup accordance with the FCC PART 15, SUBPART B.



### 5.2.3 Measurement Data

According to the data in section 5.2.4, the EUT complied with the FCC PART 15, SUBPART B standards.

Remark :

(1)The test Frequency range judgment basis:

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30.
1.705–108	1000.
108–500	2000.
500–1000	5000.
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower.

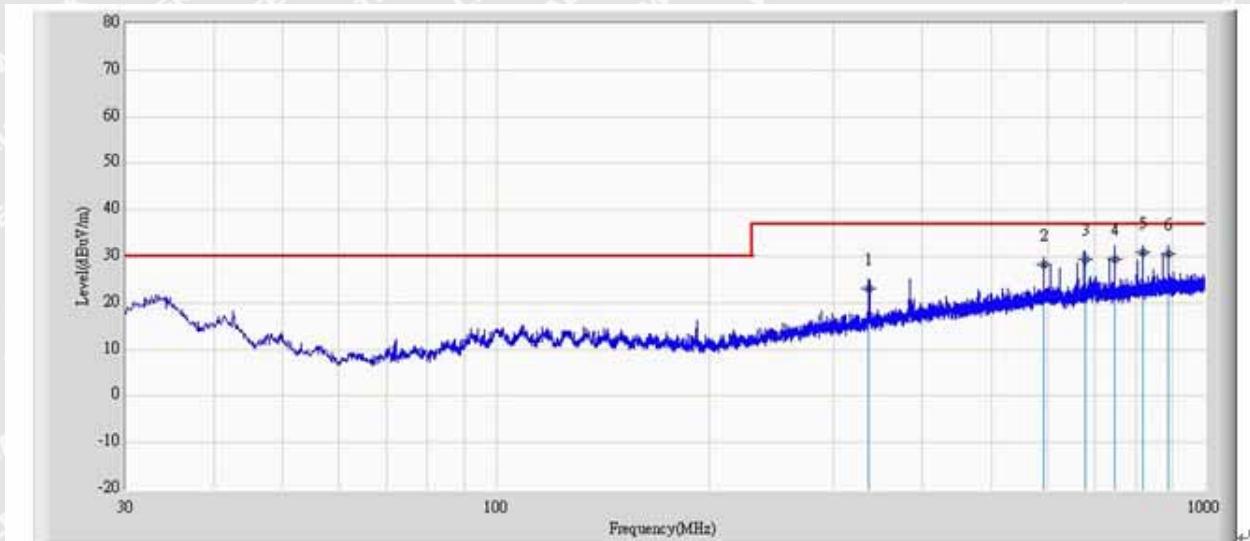
(2) The test Limit :

Frequency of emission (MHz)	Field strength (microvolts/meter)
30–88	90
88–216	150
216–960	210
Above 960	300

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### 5.2.4 Radiated Emission test datas,30MHz to 1000MHz

Antenna Horizontal



No.	Mark.	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dBm)	Cable (dB)	Amp (dB)	Ant Pos (cm)	Table Pos (deg)	Type
1		335.821	22.984	27.245	-14.016	37.000	14.047	3.723	22.031	100	8	QP
2		592.088	28.188	25.671	-8.812	37.000	18.632	5.235	21.350	200	233	QP
3		677.585	29.407	25.980	-7.593	37.000	18.852	5.699	21.123	400	287	QP
4		747.539	29.547	24.960	-7.453	37.000	19.466	6.053	20.932	300	309	QP
5	*	818.069	30.922	25.297	-6.078	37.000	20.130	6.399	20.904	400	118	QP
6		888.573	30.653	24.334	-6.347	37.000	20.481	6.741	20.903	400	193	QP

Remark: According to CISPR 22 Clause 10.8(a)

Perform measurements at close-in distances and determine the limit L2 corresponding to the close-in distance d2 by applying the following relation:

$$L2 = L1 (d1/d2)$$

where L1 is the specified limit in microvolts per metre ( $\mu$  V/m) at the distance d1.

Determine the possible environmental and compliance test conditions stipulated in Clause 8 using L2 as the new limit for distance d2.

So, we result in a 10m to 3m calculated formula as follow:

$$V_{3m} = V_{10m} + 20 \log_{10}(10/3) = V_{10m} + 10.5$$

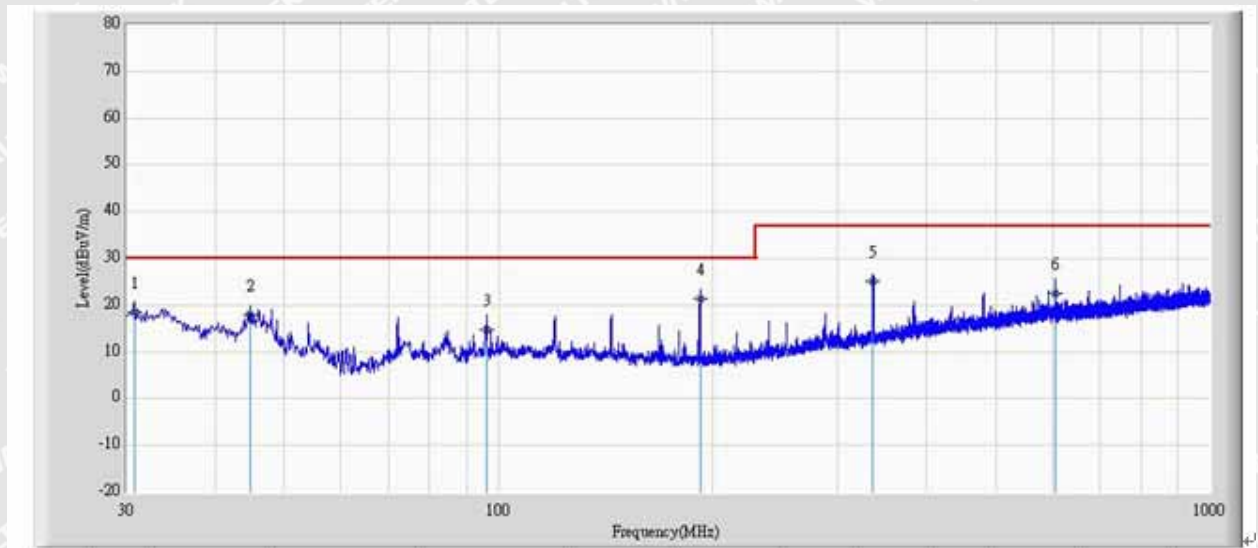
$V_{3m}$  is calculated field strength(dBuV/m)

$V_{10m}$  is measured Level(dBuV/m)

Frequency (MHz)	Measure Lvevl(dBuV/m) at 10m	Limit(dBuV/m) at 10m	Measure Lvevl(dBuV/m) at 3m	Limit(dBuV/m) at 3m
335.821	22.984	37.00	33.484	47.50
592.088	28.188	37.00	38.688	47.50
677.585	29.407	37.00	39.907	47.50
747.539	29.547	37.00	40.047	47.50
818.069	30.922	37.00	41.422	47.50
888.573	30.653	37.00	41.153	47.50



## Antenna Vertical



No.	Mark.	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dBm)	Cable (dB)	Amp (dB)	Ant Pos (cm)	Table Pos (deg)	Type
1		30.805	18.538	23.246	-11.462	30.000	17.537	1.092	23.337	100	177	QP
2		44.826	17.794	29.650	-12.206	30.000	10.184	1.341	23.381	100	129	QP
3		96.065	14.713	26.228	-15.287	30.000	9.852	2.031	23.397	100	338	QP
4	*	192.047	21.454	33.025	-8.546	30.000	8.823	3.004	23.398	100	52	QP
5		335.682	25.175	30.260	-11.825	37.000	13.975	4.175	23.235	200	187	QP
6		606.235	22.549	20.678	-14.451	37.000	18.727	5.978	22.833	100	112	QP

Frequency (MHz)	Measure Lvevl(dBuV/m) at 10m	Limit(dBuV/m) at 10m	Measure Lvevl(dBuV/m) at 3m	Limit(dBuV/m) at 3m
30.805	18.538	30	29.038	40.5
44.826	17.794	30	28.294	40.5
96.065	14.713	30	25.213	40.5
192.047	21.454	30	31.954	40.5
335.682	25.175	37	35.675	47.5
606.235	22.549	37	33.049	47.5

## 6 Photographs – Test Setup

### 6.1 Photograph –Disturbance Voltage Test Setup

Test Lab: Waltek Services (Shenzhen) Co., Ltd.



### 6.2 Photograph –Radiated Emission Test Setup

Test Lab: QuieTek Technology (Suzhou) Co., Ltd.







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## 7 Photographs – Constructional Details

### 7.1 EUT – Front View



### 7.2 EUT – Back View



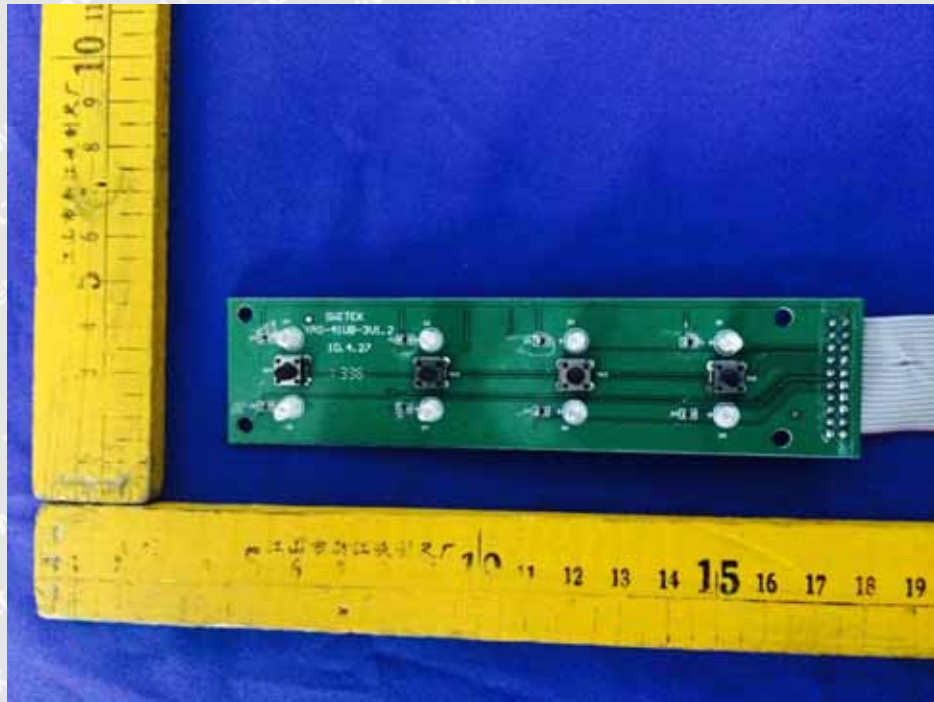
### 7.3 EUT – left Side View

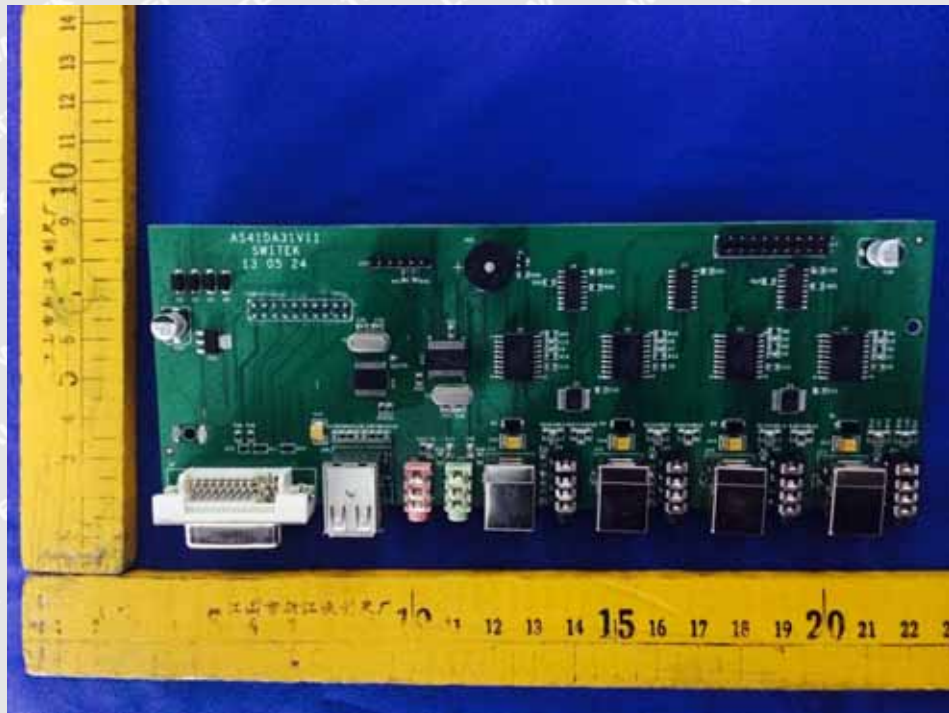


### 7.4 EUT – Right Side View

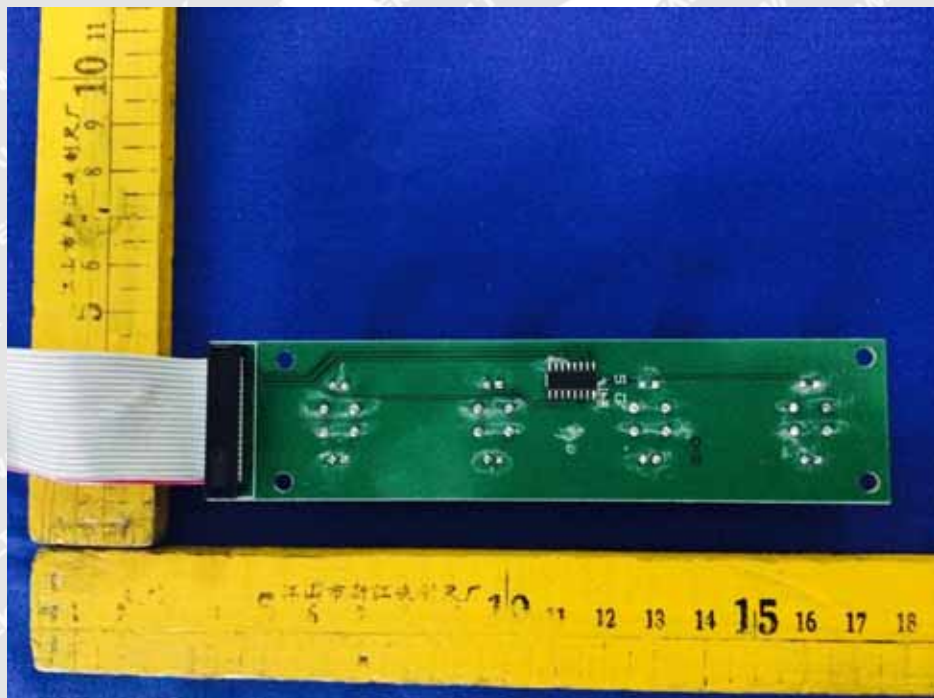


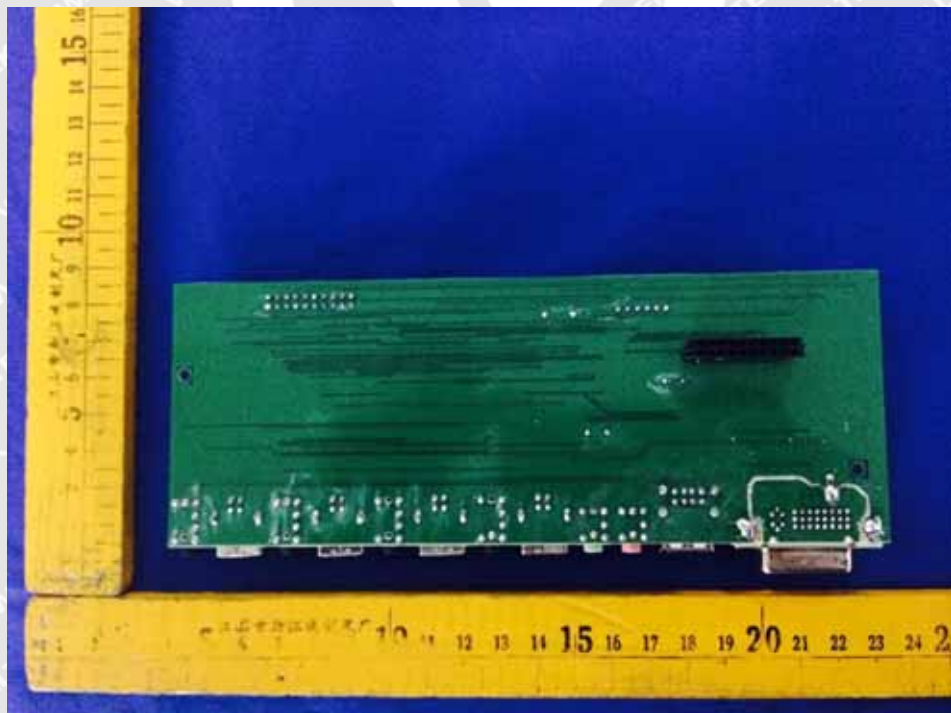
### 7.5 EUT – PCB-Front View





### 7.6 EUT – PCB- Back View





=====**End of Test Report**=====