TEST REPORT

Reference No.	:	WTS18S10125723E V1
FCC ID	:	2ADCSIFC6309X
Applicant	:	Inforce Computing, Inc.
Address	:	48820 Kato Road, Ste 600B, Fremont, California 94538, United States
Manufacturer	:	The same as above
Address	:	The same as above
Product	:	Micro Single Board Computer
Model(s)	:	IFC6309X-01-P2, IFC6309X-11-P2, IFC6309X-00-P2, IFC6309X-10-P2, IFC6309X-20-P2, IMP6309X-10-P2, RPT6309X-10-P2, IFC6309-01-P2, IFC6309-11-P2,IFC6309-00-P2, IFC6309-10-P2, IFC6309-06-P2, IFC6309-16-P2, IFC6309-20-P2, IFC6309L-00-P2, IFC6309L-10-P2
Brand Name	:	INFORCE
Standards	:	FCC PART15 SUBPART B: 2017
Date of Receipt sample	:	2018-10-10
Date of Test	:	2018-10-11 to 2018-10-21
Date of Issue	:	2018-11-10
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.

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2 Laboratories Introduction

Waltek Services (Shenzhen) Co., Ltd is a professional third-party testing and certification laboratory with multi-year product testing and certification experience, established strictly in accordance with ISO/IEC 17025 requirements, and accredited by ILAC (International Laboratory Accreditation Cooperation) member. A2LA (American Association for Laboratory Accreditation, the certification number is 4243.01) of USA, CNAS (China National Accreditation Service for Conformity Assessment, the registration number is L3110) of China. Meanwhile, Waltek has got recognition as registration and accreditation laboratory from EMSD (Electrical and Mechanical Services Department), and American Energy star, FCC (The Federal Communications Commission), CEC (California energy efficiency), ISED (Innovation, Science and Economic Development Canada). It's the strategic partner and data recognition laboratory of international authoritative organizations, such as Intertek (ETL-SEMKO), TÜV Rheinland, TÜV SÜD, etc.

Waltek Services (Shenzhen) Co., Ltd is one of the largest and the most comprehensive third party testing laboratory in China. Our test capability covered four large fields: safety test. Electro Magnetic Compatibility (EMC), and energy performance, wireless radio. As a professional, comprehensive, justice international test organization, we still keep the scientific and rigorous work attitude to help each client satisfy the international standards and assist their product enter into globe market smoothly.

Test Facility:

A. Accreditations for Conformity Assessment (International)

Country/Region	Scope Covered By	Scope	Note
USA	ISO/IEC 17025	FCC ID \ DOC \ VOC	1
Canada		IC ID \ VOC	2
Japan		MIC-T \ MIC-R	-
Europe		EMCD \ RED	-
Taiwan		NCC	-
Hong Kong		OFCA	-
Australia		RCM	-
India		WPC	-
Thailand		NTC	-
Singapore		IDA	-
Note: 1. FCC Designation No.: CN1201. Test Firm Registration No.: 523476. 2. ISED Canada Registration No.: 7760A			

B. TCBs and Notify Bodies Recognized Testing Laboratory.

Recognized Testing Laboratory of …	Notify body number
TUV Rheinland	Optional.
Intertek	
TUV SUD	
SGS	
Phoenix Testlab GmbH	0700
Element Materials Technology Warwick Ltd	0891
Timco Engineering, Inc.	1177
Eurofins Product Service GmbH	0681

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4 Revision History

Test report No.	Date of Receipt sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTS18S10125723E	2018-10-10	2018-10-11 to 2018-10-21	2018-10-22	original	-	Replaced
WTS18S10125723E V1	2018-10-10	2018-10-11 to 2018-10-21	2018-11-10	Version 1	Updated	Valid

5 General Information

5.1 General Description of E.U.T.

Product:	Micro Single Board Computer
Model(s):	IFC6309X-01-P2, IFC6309X-11-P2, IFC6309X-00-P2, IFC6309X-10-P2, IFC6309X-20-P2, IMP6309X-10-P2, RPT6309X-10-P2, IFC6309-01-P2, IFC6309-11-P2,IFC6309-00-P2, IFC6309-10-P2, IFC6309-06-P2, IFC6309-16-P2, IFC6309-20-P2, IFC6309L-00-P2, IFC6309L-10-P2
Model Description:	please refer to declaration of similarity file.

5.2 Details of E.U.T.

Ratings:	DC 12V, 2.5A (Adapter Input: AC100-240V, 50/60Hz 1.2A)
Adapter:	Manufacturer: SL POWER ELECTRONICS Model No.: TE30A1202F01 Sale without adapter.

5.3 Standards Applicable for Testing

The tests were performed according to following standards:

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

5.4 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: N/A

Lab address: N/A

Test items: N/A

5.5 Abnormalities from Standard Conditions

None.

6 Test Summary

Test Items	Test Requirement	Test Method	Test Result
Power Line Conducted Emission (150kHz to 30MHz)	FCC PART 15, SUBPART B	ANSI C63.4: 2014	Pass
Radiated Emission 30MHz to 1GHz)	FCC PART 15, SUBPART B	ANSI C63.4: 2014	Pass
Radiated Emission (Above 1GHz)	FCC PART 15, SUBPART B	ANSI C63.4: 2014	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

7 Equipment Used during Test

7.1 Equipment List

Conducted Emissions Test Site 1#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMI Test Receiver	R&S	ESCI	100947	2018-09-12	2019-09-11
2.	LISN	R&S	ENV216	101215	2018-09-12	2019-09-11
3.	Cable	Top	TYPE16(3.5M)	-	2018-09-12	2019-09-11
Conducted Emissions Test Site 2#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMI Test Receiver	R&S	ESCI	101155	2018-09-12	2019-09-11
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	2018-09-12	2019-09-11
3.	Limiter	York	MTS-IMP-136	261115-001-0024	2018-09-12	2019-09-11
4.	Cable	LARGE	RF300	-	2018-09-12	2019-09-11
3m Semi-anechoic Chamber for Radiation Emissions Test site 1#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1	Spectrum Analyzer	R&S	FSP	100091	2018-04-29	2019-04-28
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	2018-04-09	2019-04-08
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	2018-04-09	2019-04-08
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	2018-09-12	2019-09-11
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	2018-04-09	2019-04-08
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	2018-04-09	2019-04-08
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	2018-04-13	2019-04-12
8	Coaxial Cable (above 1GHz)	Top	1GHz-25GHz	EW02014-7	2018-04-13	2019-04-12
9	Universal Radio Communication Tester	R&S	CMU 200	112461	2018-04-13	2019-04-12
10	Smart Antenna	SCHWARZBECK	HA08	-	2018-04-09	2019-04-08
11	Signal Generator	R&S	SMR20	100046	2018-09-12	2019-09-11
12.	Universal Radio Communication Tester	R&S	CMW 500	127818	2018-04-13	2019-04-12
3m Semi-anechoic Chamber for Radiation Emissions Test site 2#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No**	**Last**	**Calibration**

					Calibration Date	Due Date
1	Test Receiver	R&S	ESCI	101296	2018-04-13	2019-04-12
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2018-04-09	2019-04-08
3	Amplifier	Compliance pirection systems inc	PAP-0203	22024	2018-04-13	2019-04-12
4	Cable	HUBER+SUHNER	CBL2	525178	2018-04-13	2019-04-12

7.2 Description of Support Units

Equipment	Manufacturer	Model No.	Series No.
MacBook Air	APPLE	A1465	C17KTQDNF5N7
Power Supply	LPS DELTA ELECTRNICS UIANG CO,.LTD	ADP-45GD	-
TV	KONKA	TV3655	KTV50221235
Mouse	LOGIC	LBUNMS16	1645029050
Earphone	YUNJI	K7 Power	-

7.3 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conduction Emission	150kHz~30MHz	±3.64dB	(1)
Radiation Emission	30MHz~1000MHz	±5.08dB	(1)
	1GHz~18GHz	±4.99dB	(1)
Confidence interval：95%. Confidence factor:k=2			

8 Emission Test Results

8.1 Power Line Conducted Emission, 150kHz to 30MHz

Test Requirement ..... : FCC PART 15, SUBPART B

Test Method ..... : ANSI C63.4: 2014

Test Result ..... : Pass

Frequency Range ..... : 150kHz to 30MHz

Class ..... : Class A

Limit ..... :

Frequency (MHz)	Limit (dBμV)	
	Quasi-peak	Average
0.15 to 0.5	79	66
0.5 to 30	73	60

8.1.1 E.U.T. Operation

Operating Environment:

Temperature ..... : 23°C

Humidity ..... : 53.6%RH

Atmospheric Pressure ..... : 101kPa

EUT Operation:

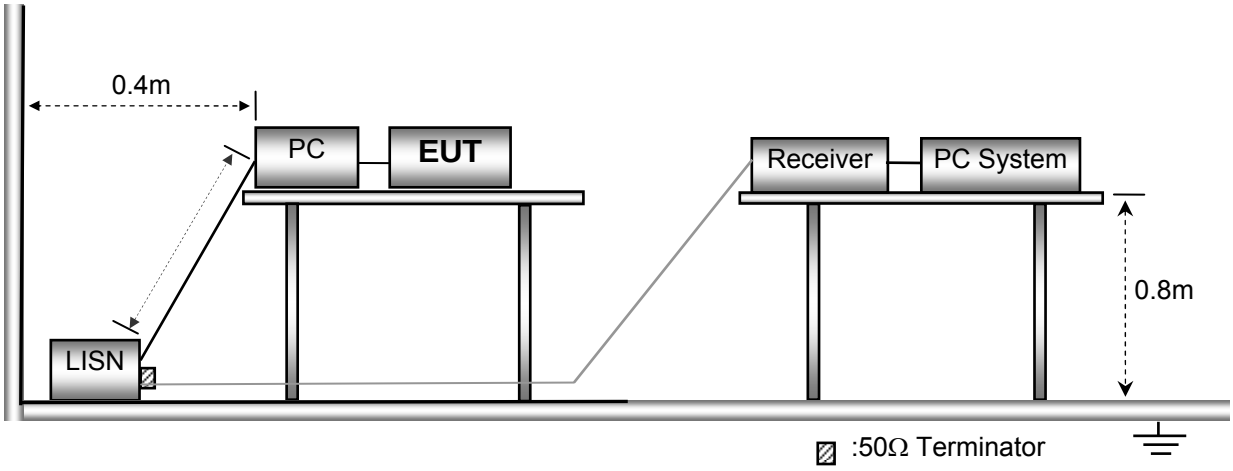
Input Voltage ..... : DC 12V, 2.5A

Operating Mode ..... : Telecommunication + HDMI + Adapter， USB + HDMI + Adapter

Remark ..... : The worse case Working mode mode is USB + HDMI + Adapter and the data is shown as follow.

8.1.2 Block Diagram of Test Setup

The Mains Terminals Disturbance Voltage tests were performed in accordance with ANSI C63.4:2014.

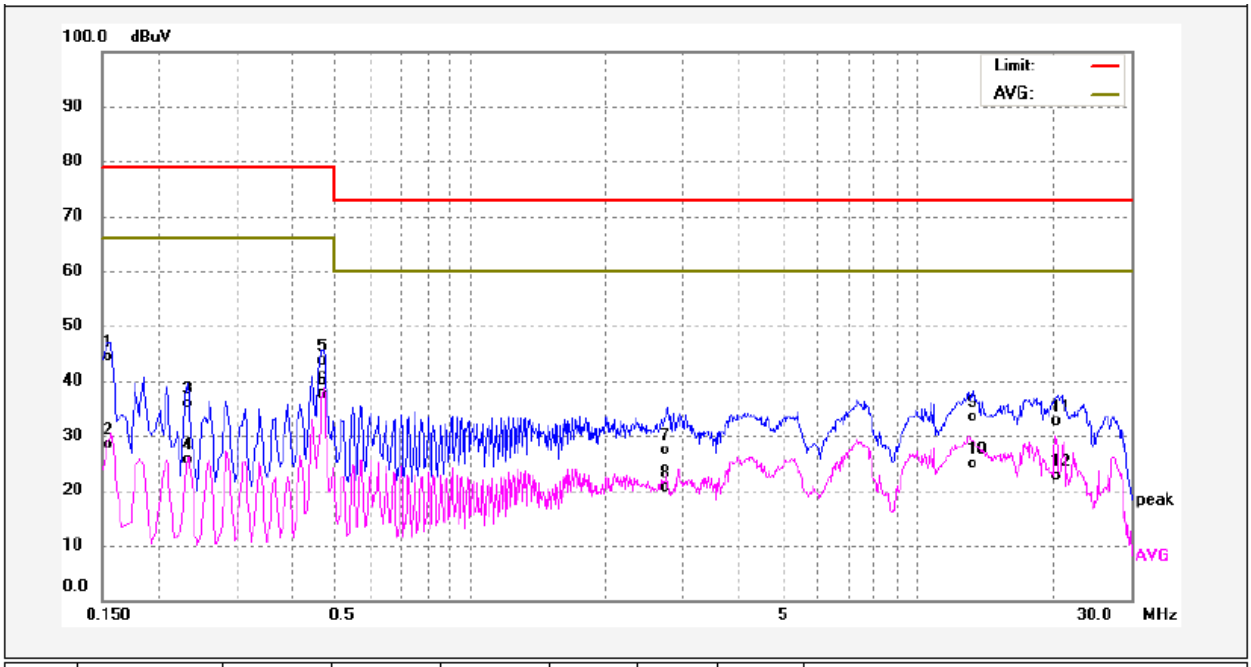


8.1.3 Measurement Data

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 below section, the EUT complied with the FCC PART 15, SUBPART B standards.

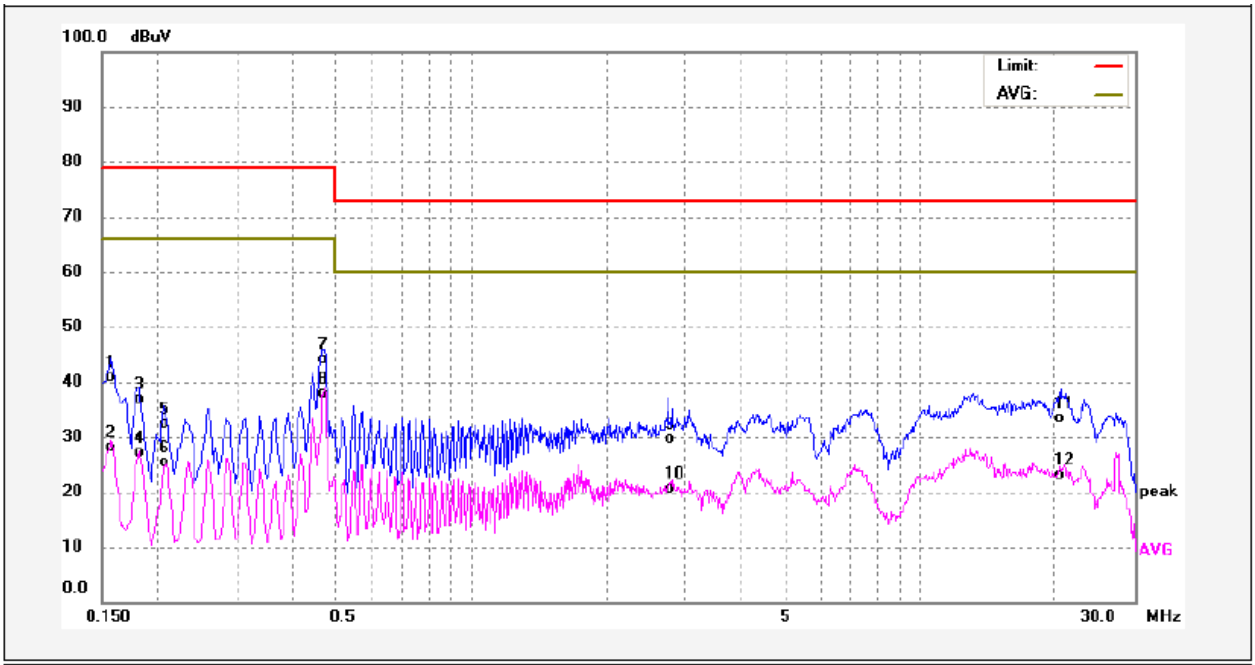
8.1.4 Power Line Conducted Emission Test Data

Live Line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1539	34.79	9.64	44.43	79.00	-34.57	QP	
2	0.1539	18.74	9.64	28.38	66.00	-37.62	AVG	
3	0.2340	26.18	9.63	35.81	79.00	-43.19	QP	
4	0.2340	16.03	9.63	25.66	66.00	-40.34	AVG	
5	0.4660	34.07	9.65	43.72	79.00	-35.28	QP	
6	0.4660	27.95	9.65	37.60	66.00	-28.40	AVG	
7	2.7740	17.40	9.93	27.33	73.00	-45.67	QP	
8	2.7740	10.79	9.93	20.72	60.00	-39.28	AVG	
9	13.2900	23.22	10.21	33.43	73.00	-39.57	QP	
10	13.2900	14.69	10.21	24.90	60.00	-35.10	AVG	
11	20.6180	22.31	10.35	32.66	73.00	-40.34	QP	
12	20.6180	12.16	10.35	22.51	60.00	-37.49	AVG	

Neutral Line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1580	31.35	9.64	40.99	79.00	-38.01	QP	
2	0.1580	18.40	9.64	28.04	66.00	-37.96	AVG	
3	0.1819	27.36	9.63	36.99	79.00	-42.01	QP	
4	0.1819	17.59	9.63	27.22	66.00	-38.78	AVG	
5	0.2060	22.65	9.62	32.27	79.00	-46.73	QP	
6	0.2060	15.72	9.62	25.34	66.00	-40.66	AVG	
7	0.4660	34.47	9.65	44.12	79.00	-34.88	QP	
8	0.4660	28.29	9.65	37.94	66.00	-28.06	AVG	
9	2.7380	19.75	9.94	29.69	73.00	-43.31	QP	
10	2.7380	10.71	9.94	20.65	60.00	-39.35	AVG	
11	20.5780	22.99	10.35	33.34	73.00	-39.66	QP	
12	20.5780	12.76	10.35	23.11	60.00	-36.89	AVG	

8.2 Radiation Emission, 30MHz to 1000MHz

Test Requirement ..... : FCC PART 15, SUBPART B

Test Method ..... : ANSI C63.4: 2014

Test Result ..... : Pass

Frequency Range ..... : 30MHz to 1000MHz

Class. : Class A

Limit..... :

Frequency (MHz)	Distance (Meter)	Limit (dBμV/m)
		Quasi-peak
30 to 88	3	49.5
88 to 216	3	54
216 to 960	3	56
960 to 1000	3	59.5

8.2.1 E.U.T. Operation

Operating Environment:

Temperature ..... : 22.5°C

Humidity ..... : 52.6%RH

Atmospheric Pressure ..... : 101.2kPa

EUT Operation:

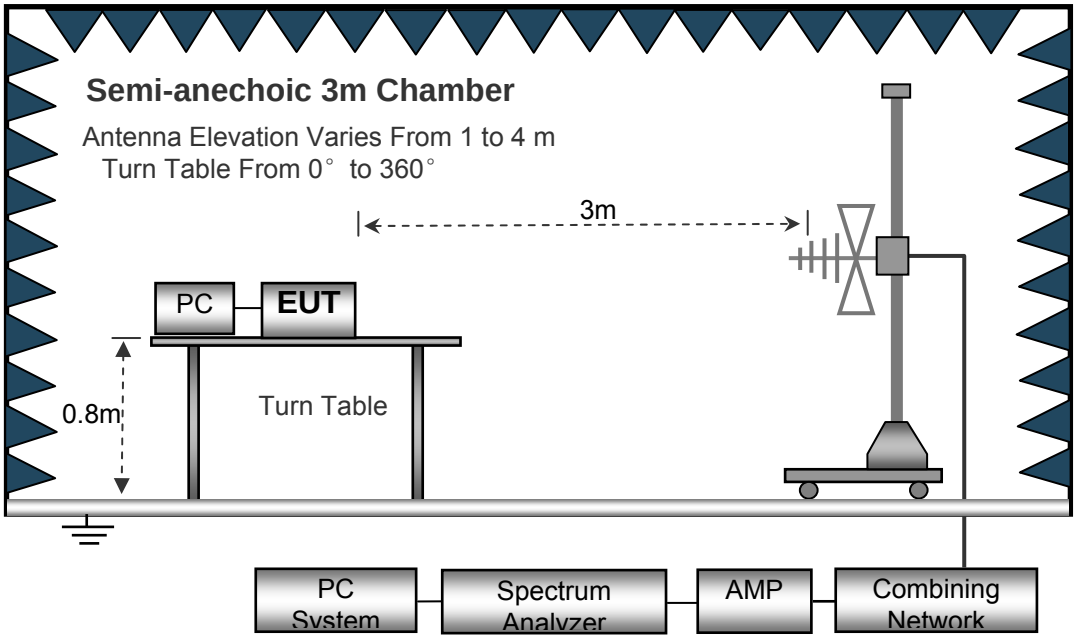
Input Voltage..... : DC 12V, 2.5A

Operating Mode ..... : Telecommunication + HDMI + Adapter， USB + HDMI + Adapter

Remark ..... : The worse case Working mode mode is USB + HDMI + Adapter and the data is shown as follow.

8.2.2 Block Diagram of Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4: 2014.

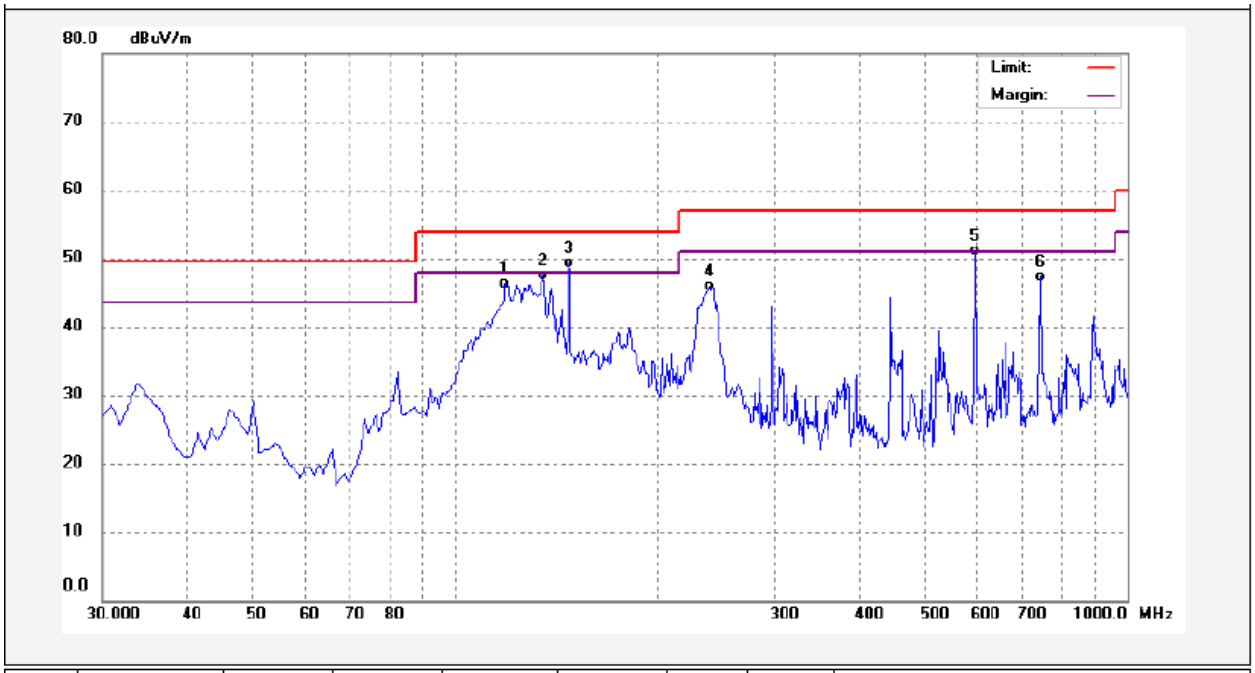


8.2.3 Measurement Data

The maximised peak emissions from the EUT was scanned and measured for both the Antenna Vertical Polarization and Antenna Horizontal Polarization. Quasi-peak measurements were performed if peak emissions were within 6dB of the Quasi-peak limit line.

8.2.4 Radiated Emission Test Data, 30MHz to 1000MHz

Antenna Polarization: Vertical

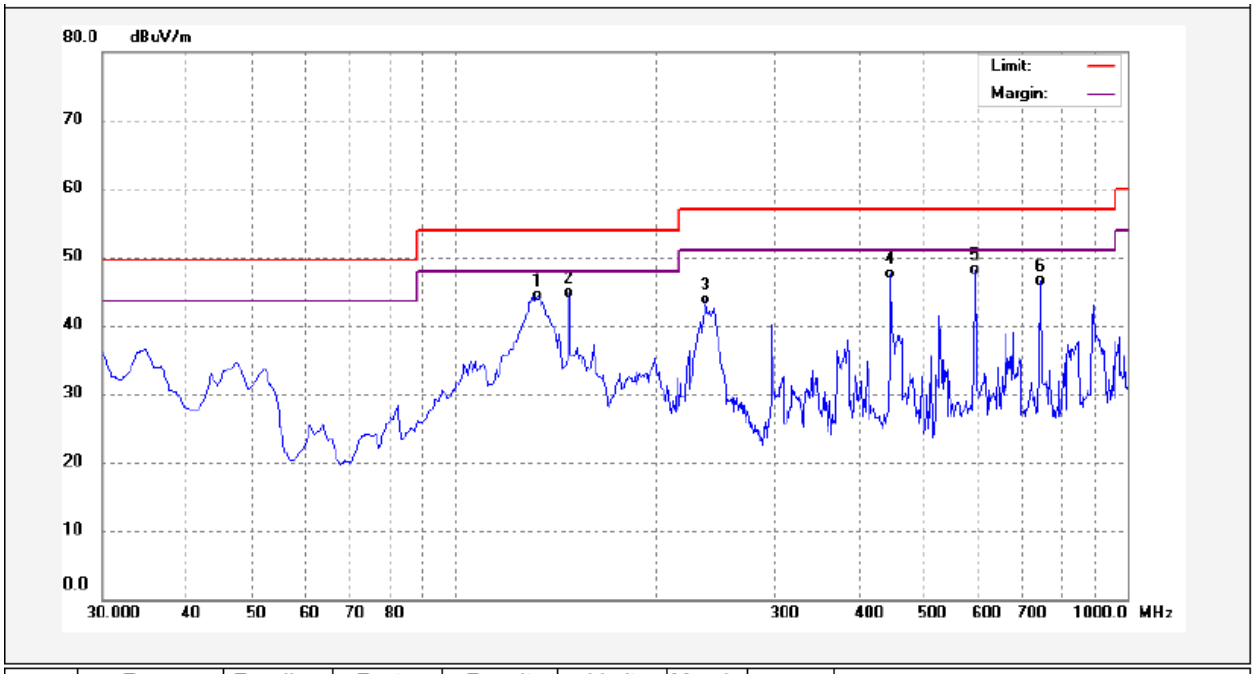


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	119.2400	59.85	-13.53	46.32	54.00	-7.68	QP	
2	135.7300	61.64	-14.16	47.48	54.00	-6.52	QP	
3	148.3400	66.34	-16.96	49.38	54.00	-4.62	QP	
4	239.5200	57.69	-11.88	45.81	56.90	-11.09	QP	
5	594.5400	54.61	-3.55	51.06	56.90	-5.84	QP	
6	742.9500	48.73	-1.35	47.38	56.90	-9.52	QP	

Factor= antenna factor + cable loss - preamplifier factor

Result = Reading + Factor

Antenna Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	132.8200	58.61	-14.31	44.30	54.00	-9.70	QP	
2	148.3400	61.54	-16.83	44.71	54.00	-9.29	QP	
3	236.6100	55.88	-12.12	43.76	56.90	-13.14	QP	
4	445.1600	54.24	-6.75	47.49	56.90	-9.41	QP	
5	594.5400	51.67	-3.60	48.07	56.90	-8.83	QP	
6	742.9500	47.96	-1.39	46.57	56.90	-10.33	QP	

Factor= antenna factor + cable loss - preamplifier factor

Result = Reading + Factor

8.3 Radiation Emission, Above 1000MHz

Test Requirement ..... : FCC PART 15, SUBPART B

Test Method ..... : ANSI C63.4: 2014

Test Result..... : Pass

Frequency Range ..... : 1GHz~18GHz

Class. : Class A

Limit. ..... :

Frequency Range (MHz)	Distance (Meter)	Average Limit dB(uV/m)	Peak Limit (dBuV/m)
Above 1GHz	3	59	79

8.3.1 E.U.T. Operation

Operating Environment:

Temperature..... : 22.4°C

Humidity ..... : 52.3%RH

Atmospheric Pressure..... : 101.3kPa

EUT Operation:

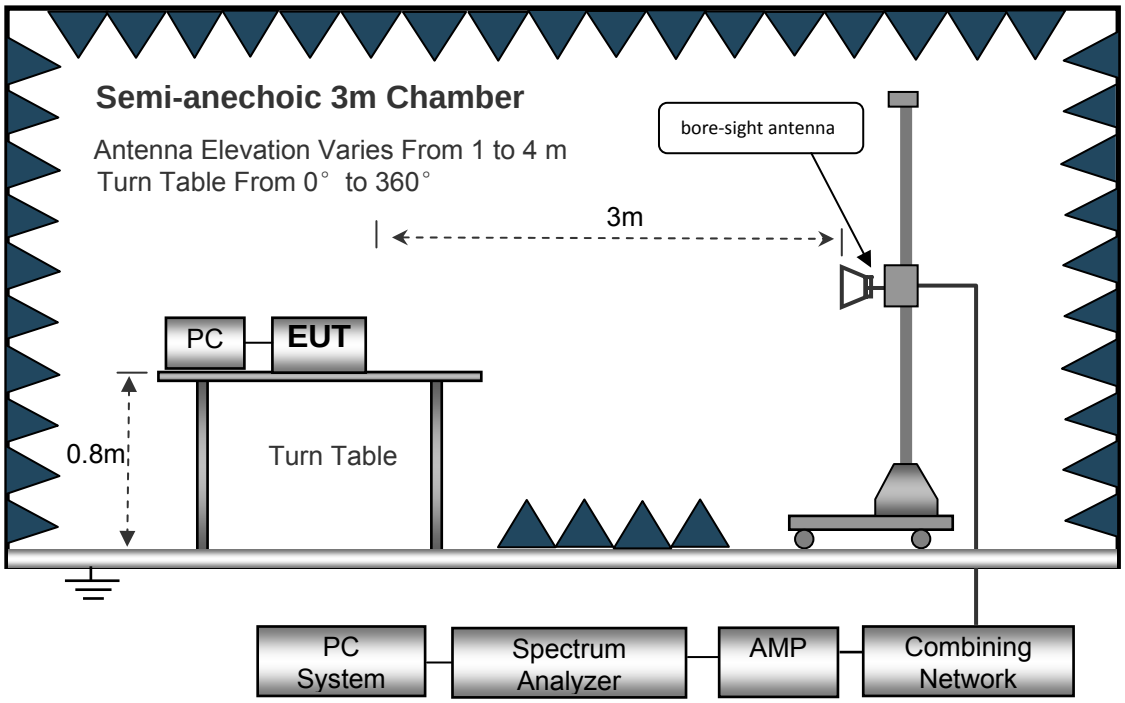
Input Voltage ..... : DC 12V, 2.5A

Operating Mode ..... : Telecommunication + HDMI + Adapter， USB + HDMI + Adapter

Remark..... : The worse case Working mode mode is USB + HDMI + Adapter and the data is shown as follow.

8.3.2 Block Diagram of Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4:2014.

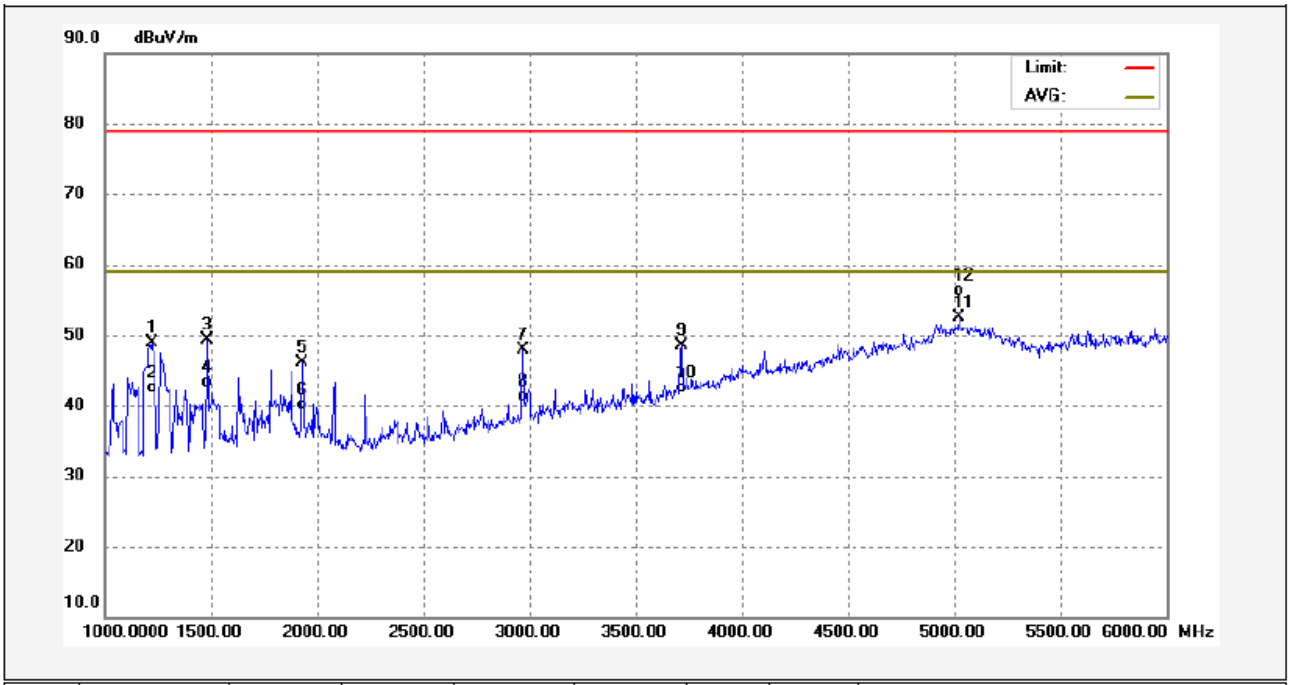


8.3.3 Measurement Data

The maximised peak emissions from the EUT was scanned and measured for both the Antenna Vertical Polarization and Antenna Horizontal Polarization. Average measurements were performed if peak emissions were within 6dB of the average limit line

8.3.4 Radiated Emission Test Data, Above 1000MHz

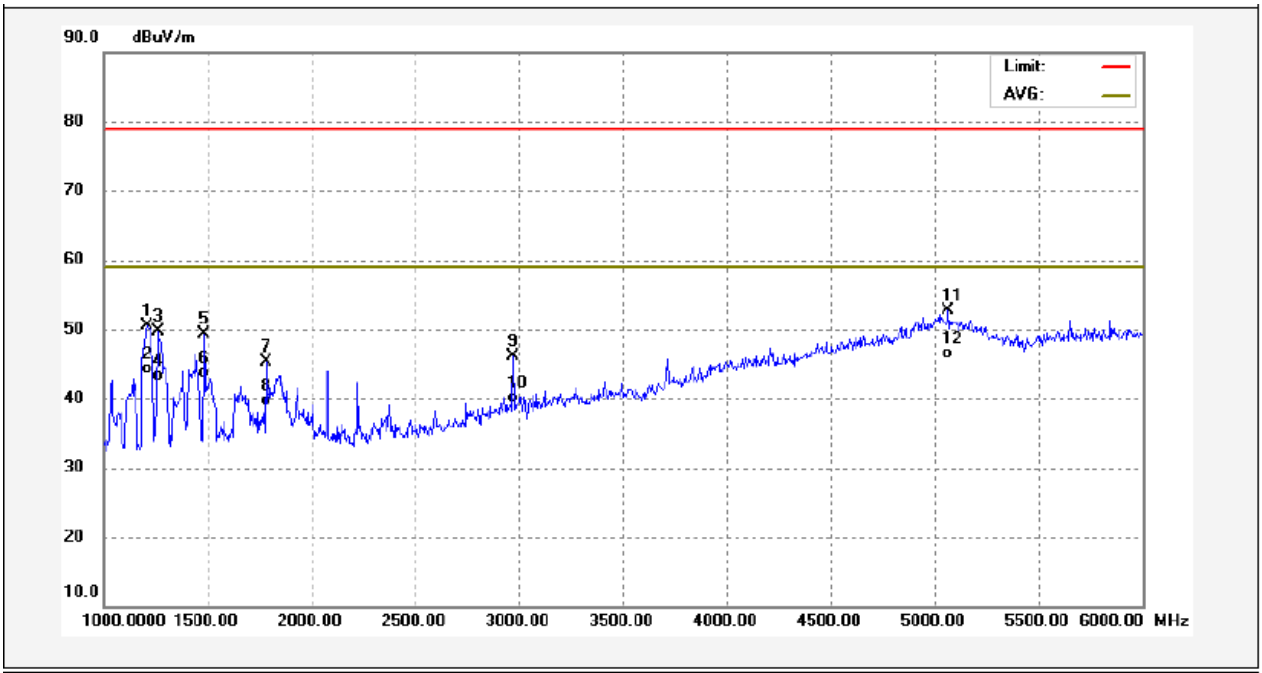
Antenna Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1220.000	64.16	-15.27	48.89	79.00	-30.11	peak	
2	1220.000	57.83	-15.27	42.56	59.00	-16.44	AVG	
3	1485.000	63.51	-14.14	49.37	79.00	-29.63	peak	
4	1485.000	57.40	-14.14	43.26	59.00	-15.74	AVG	
5	1930.000	59.08	-13.07	46.01	79.00	-32.99	peak	
6	1930.000	53.19	-13.07	40.12	59.00	-18.88	AVG	
7	2970.000	58.01	-10.17	47.84	79.00	-31.16	peak	
8	2970.000	51.53	-10.17	41.36	59.00	-17.64	AVG	
9	3715.000	54.89	-6.29	48.60	79.00	-30.40	peak	
10	3715.000	48.83	-6.29	42.54	59.00	-16.46	AVG	
11	5020.000	49.66	2.92	52.58	79.00	-26.42	peak	
12	5020.000	53.41	2.92	56.33	59.00	-2.67	AVG	

Factor= antenna factor + cable loss - preamplifier factor
Result = Reading + Factor

Antenna Polarization: Horizontal



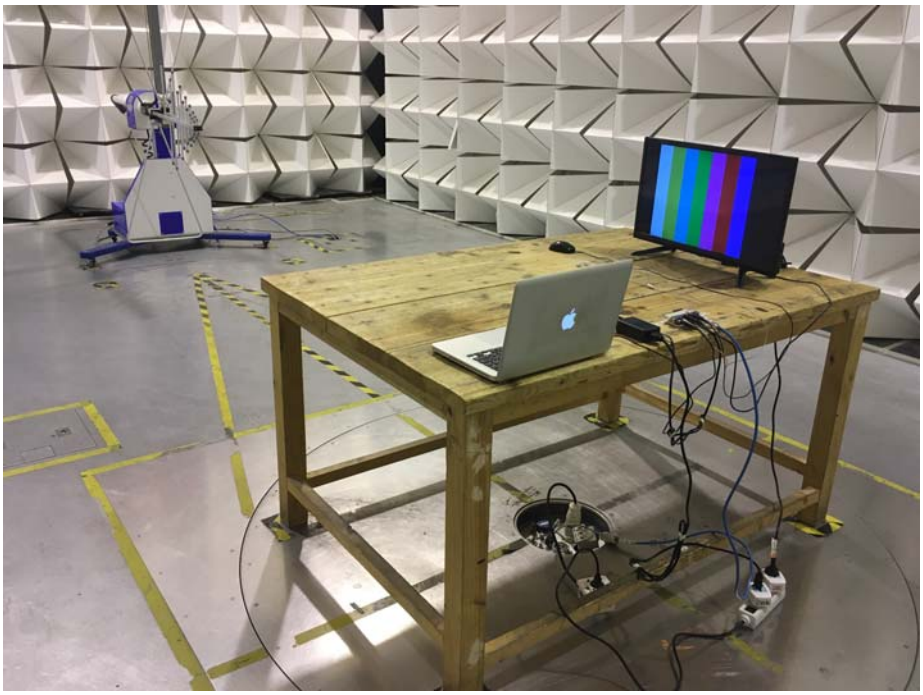
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1210.000	65.83	-15.32	50.51	79.00	-28.49	peak	
2	1210.000	59.64	-15.32	44.32	59.00	-14.68	AVG	
3	1260.000	64.69	-15.08	49.61	79.00	-29.39	peak	
4	1260.000	58.33	-15.08	43.25	59.00	-15.75	AVG	
5	1485.000	63.36	-14.14	49.22	79.00	-29.78	peak	
6	1485.000	57.79	-14.14	43.65	59.00	-15.35	AVG	
7	1780.000	58.41	-13.06	45.35	79.00	-33.65	peak	
8	1780.000	52.74	-13.06	39.68	59.00	-19.32	AVG	
9	2970.000	56.29	-10.17	46.12	79.00	-32.88	peak	
10	2970.000	50.32	-10.17	40.15	59.00	-18.85	AVG	
11	5065.000	49.96	2.68	52.64	79.00	-26.36	peak	
12	5065.000	43.89	2.68	46.57	59.00	-12.43	AVG	

Factor= antenna factor + cable loss - preamplifier factor
Result = Reading + Factor

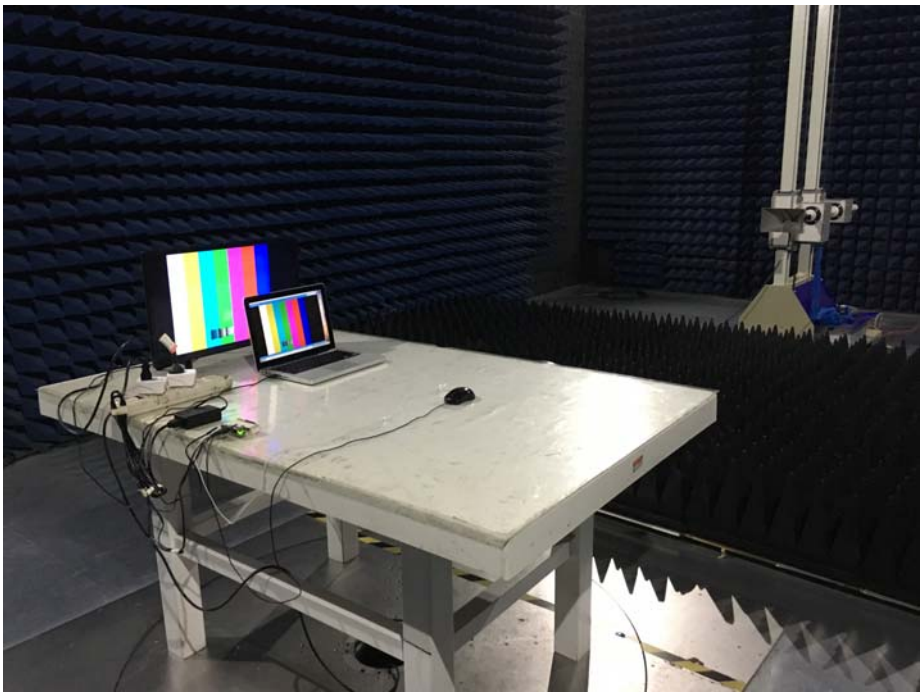
9 Photographs – Test Setup

9.1 Photograph –Power Line Conducted Emission Test Setup at Test Site 1#

9.2 Photograph – Radiated Emission Test Setup for 30~1000MHz at Test Site 2#



9.3 Photograph – Radiated Emission Test Setup for Above 1GHz at Test Site 1#



======End of Report======