

TEST REPORT

Reference No..... : WTS17S1093645E
FCC ID : 2AC88-R1
Applicant..... : HONGKONG UCLOUDLINK NETWORK TECHNOLOGY LIMITED
Address..... : Suite 603, 6/F, Laws Commercial Plaza, 788 Cheung Sha Wan Road, Kowloon, HongKong
Manufacturer : Shenzhen uCloudlink Network Technology, Co., Ltd
Address..... : 3rd Floor, A Part of Building 1, Shenzhen Software Industry Base, nanshan district xuefu Road Post Code 518057, Shenzhen City, Guangdong Province P.R.China
Product..... : 4G modem
Model(s). : R1
Brand Name..... : GlocalMe
Standards : FCC PART15 SUBPART B: 2017
Date of Receipt sample : 2017-10-27
Date of Test : 2017-10-28 to 2017-11-29
Date of Issue..... : 2018-02-25
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) of USA, 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), IC(Industry 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	Accreditation Body	Scope	Note
USA	A2LA (Certificate No.: 4243.01)	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		International Services	WPC
Thailand	NTC		-
Singapore	IDA		-
Note:			
1. FCC Designation No.: CN1201. Test Firm Registration No.: 523476.			
2. IC 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
WTS17S10936 45E	2017-10-27	2017-10-28 to 2017-11- 29	2018-02-25	original	-	Valid

5 General Information

5.1 General Description of E.U.T.

Product:	4G modem
Model(s):	R1
Model Description:	N/A
GSM Band(s):	N/A
GPRS/EGPRS Class:	N/A
WCDMA Band(s):	FDD Band I/II/IV/V/VIII
LTE Band(s):	FDD Band 2/4/5/7/17 TDD Band 41
Wi-Fi Specification:	N/A
Bluetooth Version:	N/A
GPS:	N/A
NFC:	N/A
Hardware Version:	R1 MAIN VA
Software Version:	R1_HTSV1.1.005.007.1711130
Highest frequency (Exclude Radio):	580MHz
Storage Location:	Internal Storage

This EUT has two SIM card slots, and two RF module. We found that RF parameters are the same, when we insert the card 1 and card 2. So we usually performed the test under main card slot 1.

Main board (Modem 1):

Note: The EUT Main board support WCDMA Band I/II/IV/V/VIII, LTE Band 2/4/5/17/41 function. It is intended for speech, Multimedia Message Service (MMS) transmission and 4G free roaming hotspot. It is equipped with Wi-Fi functions. For more information see the following datasheet.

Vice board (Modem 2):

The EUT Vice board support WCDMA Band I/II/V/VIII, it is intended for system localization.

5.2 Details of E.U.T.

Ratings:	DC 12V, 2.0A, charging from adapter (Adapter Input: 100-240V~50/60Hz 0.6A)
Adapter:	Manufacture: Shenzhen Fu Jia Electronic Co., Ltd. Model No.: FJ-SW1202000C

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	2017-09-12	2018-09-11
2.	LISN	R&S	ENV216	101215	2017-09-12	2018-09-11
3.	Cable	Top	TYPE16(3.5M)	-	2017-09-12	2018-09-11
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	2017-09-12	2018-09-11
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	2017-09-12	2018-09-11
3.	Limiter	York	MTS-IMP-136	261115-001-0024	2017-09-12	2018-09-11
4.	Cable	LARGE	RF300	-	2017-09-12	2018-09-11
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	2017-04-29	2018-04-28
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	2017-04-09	2018-04-08
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	2017-04-09	2018-04-08
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	2017-09-12	2018-09-11
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	2017-04-09	2018-04-08
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	2017-04-09	2018-04-08
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	2017-04-13	2018-04-12
8	Coaxial Cable (above 1GHz)	Top	1GHz-25GHz	EW02014-7	2017-04-13	2018-04-12
9	Universal Radio Communication Tester	R&S	CMU 200	112461	2017-04-13	2018-04-12
10	Smart Antenna	SCHWARZBECK	HA08	-	2017-04-09	2018-04-08
11	Signal Generator	R&S	SMR20	100046	2017-09-12	2018-09-11
12.	Universal Radio Communication Tester	R&S	CMW 500	127818	2017-04-13	2018-04-12
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	2017-04-13	2018-04-12
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2017-04-09	2018-04-08
3	Amplifier	Compliance pirection systems inc	PAP-0203	22024	2017-04-13	2018-04-12
4	Cable	HUBER+SUHNER	CBL2	525178	2017-04-13	2018-04-12

7.2 Description of Support Units

Equipment	Manufacturer	Model No.	Series No.
MacBook Air	APPLE	A1465	C17KTQDNF5N7
Power Supply	LPS DELTA ELECTRONICS UIANG CO.,LTD	ADP-45GD	-

7.3 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conduction Emission	150kHz~30MHz	$\pm 3.64\text{dB}$	(1)
Radiation Emission	30MHz~1000MHz	$\pm 5.03\text{dB}$	(1)
	1GHz~18GHz	$\pm 5.47\text{dB}$	(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 B
 Limit :

Frequency (MHz)	Limit (dBμV)	
	Quasi-peak	Average
0.15 to 0.5	60 to 66*	56 to 46*
0.5 to 5	56	46
5 to 30	60	50

8.1.1 E.U.T. Operation

Operating Environment:

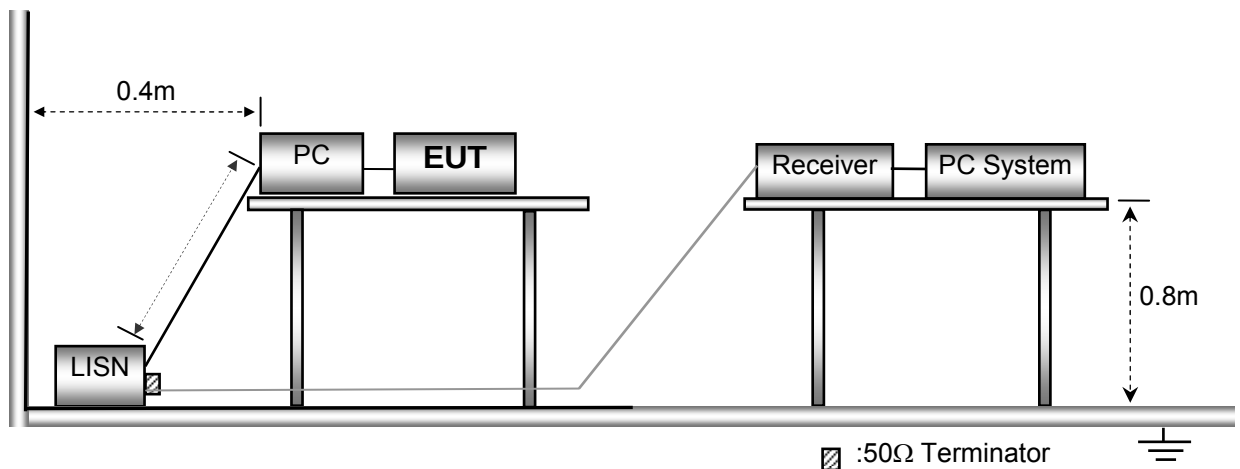
Temperature : 23°C
 Humidity : 53.6%RH
 Atmospheric Pressure : 101kPa

EUT Operation:

Input Voltage : DC 12V by Adapter
 Operating Mode : Data transmitting mode, Adapter mode
 Remark : The worse case Data transmitting mode is under the condition of AC 120V/60Hz adapter input 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.

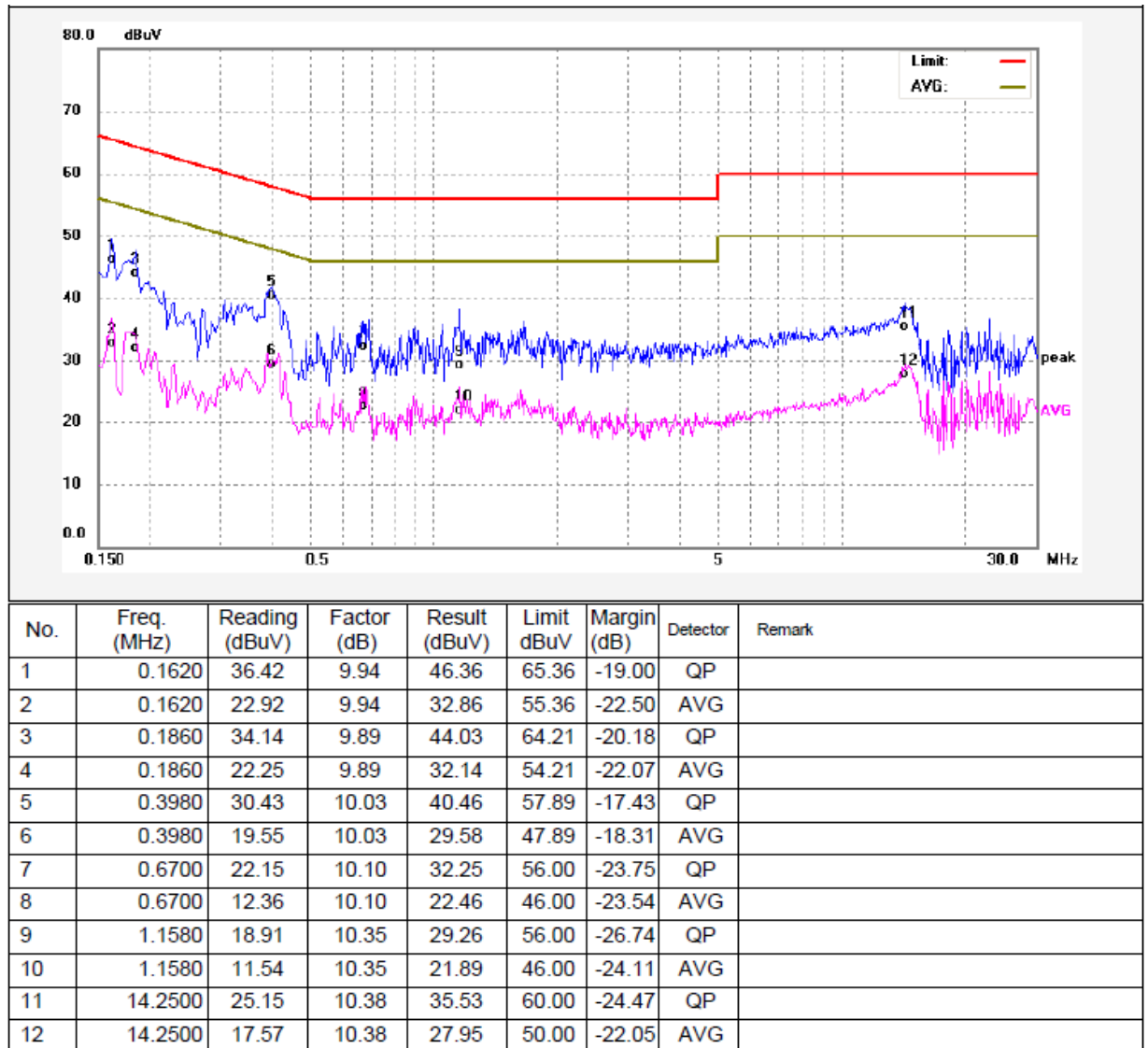


8.1.3 Measurement Data

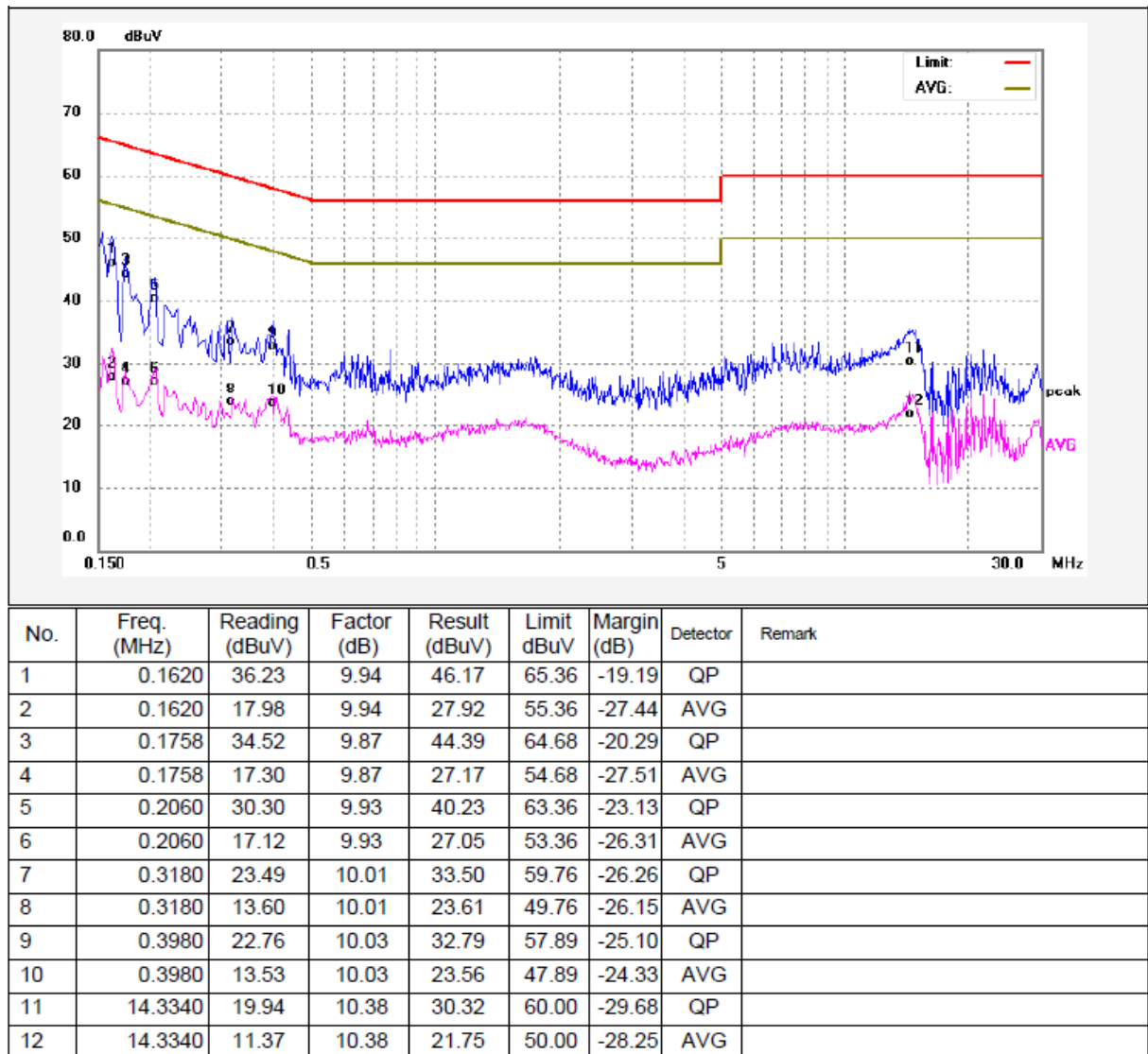
The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line. According to the data in below section, the EUT complied with the FCC PART 15, SUBPART B standards.

8.1.4 Power Line Conducted Emission Test Data

Live Line:



Neutral Line:



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 B
 Limit..... :

Frequency (MHz)	Distance (Meter)	Limit (dB μ V/m)
		Quasi-peak
30 to 88	3	40
88 to 216	3	43.5
216 to 960	3	46
960 to 1000	3	54

8.2.1 E.U.T. Operation

Operating Environment:

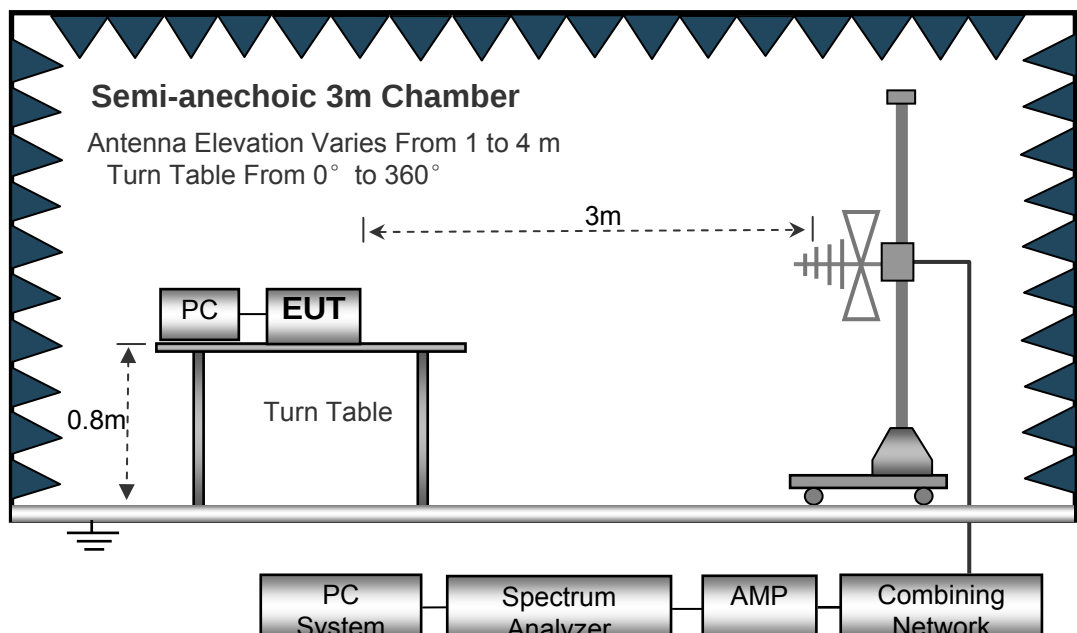
Temperature : 22.5°C
 Humidity : 52.6%RH
 Atmospheric Pressure : 101.2kPa

EUT Operation:

Input Voltage..... : DC 12V by Adapter
 Operating Mode : Data transmitting with PC mode, Adapter mode
 Remark : The worse case Data transmitting with PC mode is under the condition of AC 120V/60Hz adapter input 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.

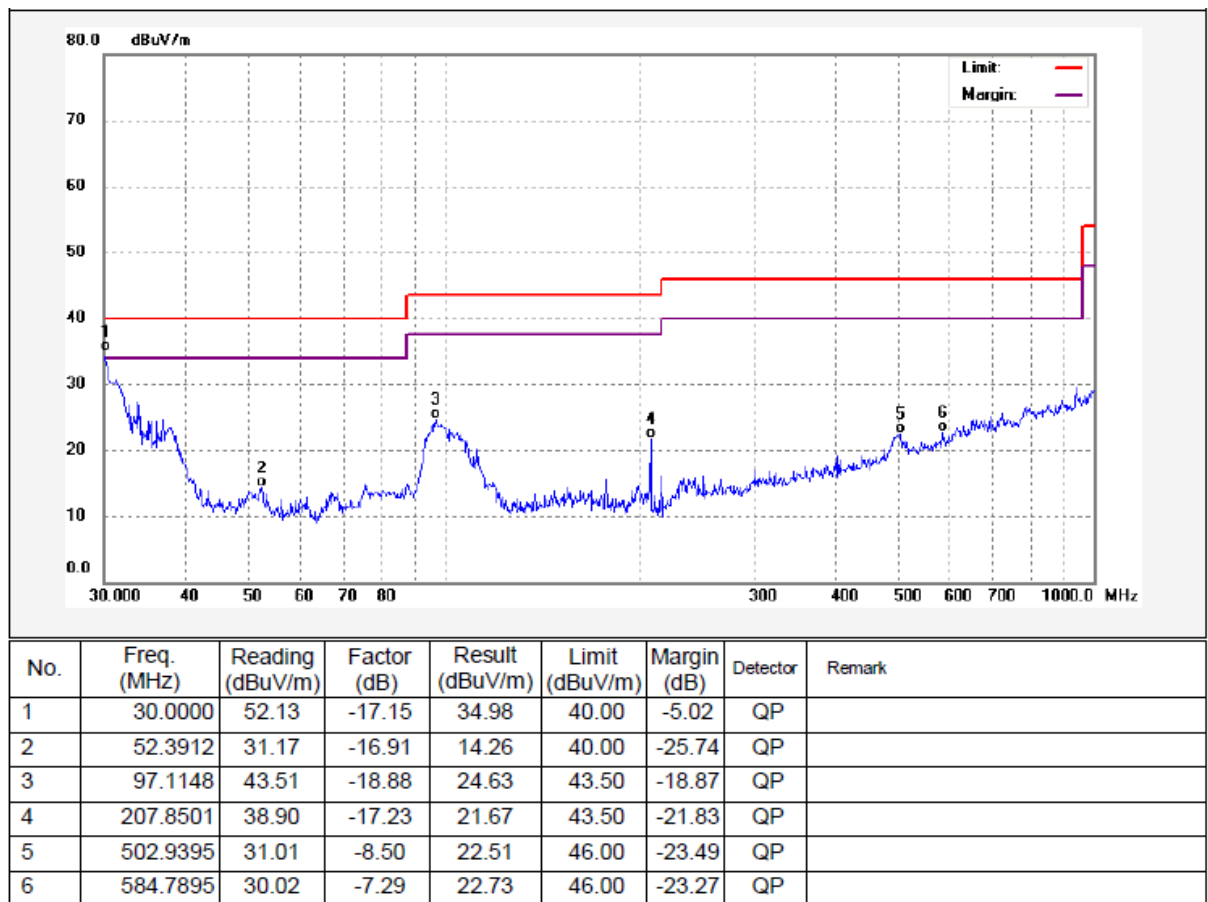


8.2.3 Measurement Data

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

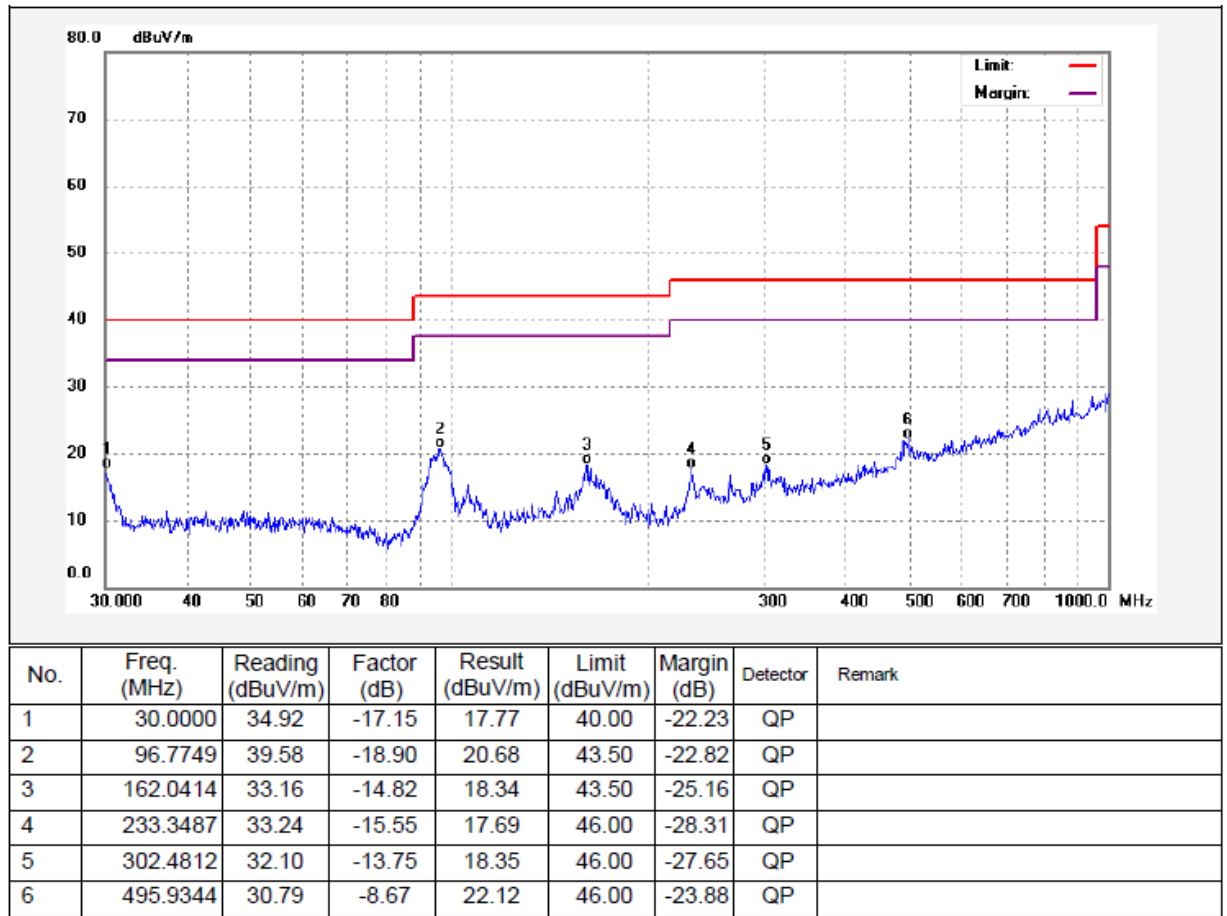
Antenna Polarization: Vertical



Factor= antenna factor + cable loss - preamplifier factor

Result = Reading + Factor

Antenna Polarization: Horizontal



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 B
 Limit. :

Frequency Range (MHz)	Distance (Meter)	Average Limit dB(uV/m)	Peak Limit (dBuV/m)
Above 1GHz	3	54	74

8.3.1 E.U.T. Operation

Operating Environment:

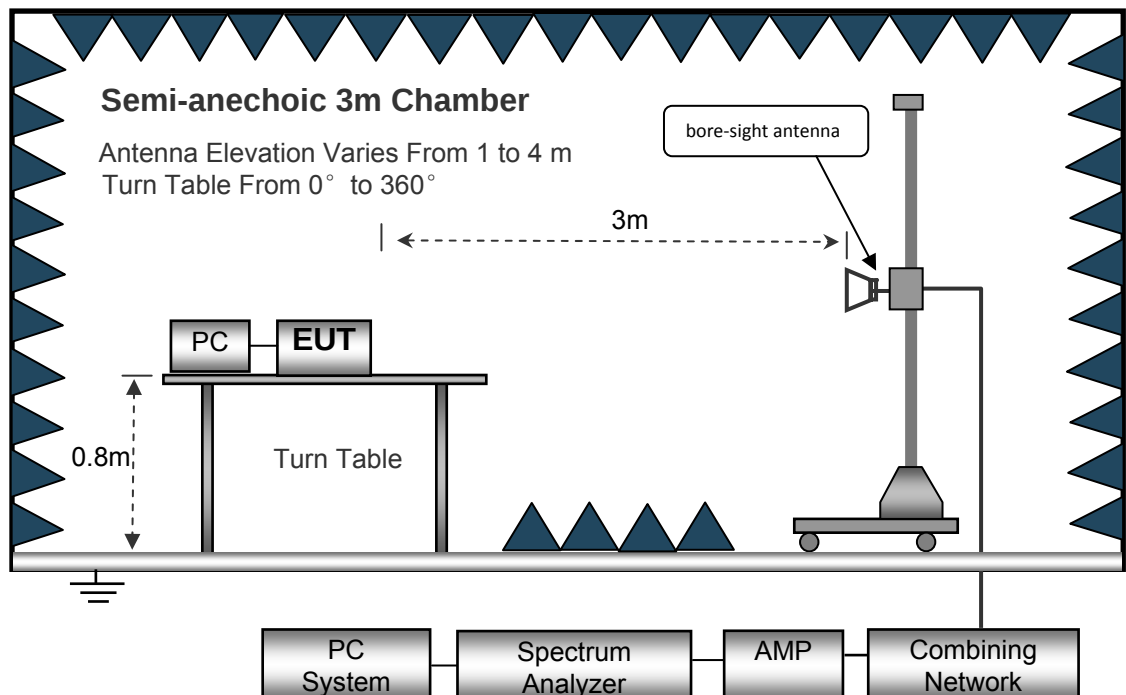
Temperature..... : 22.4°C
 Humidity : 52.3%RH
 Atmospheric Pressure..... : 101.3kPa

EUT Operation:

Input Voltage : DC 12V by Adapter
 Operating Mode : Data transmitting with PC mode, Adapter mode
 Remark..... : The worse case Data transmitting mode is under the condition of AC 120V/60Hz adapter input 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.

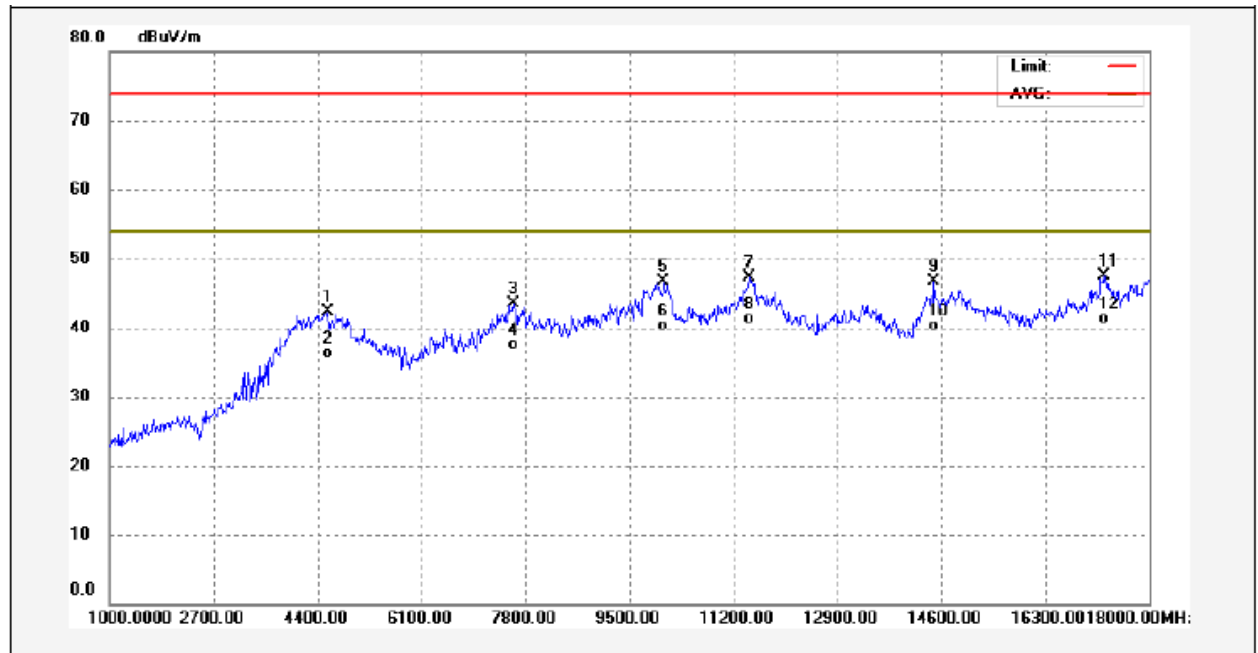


8.3.3 Measurement Data

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

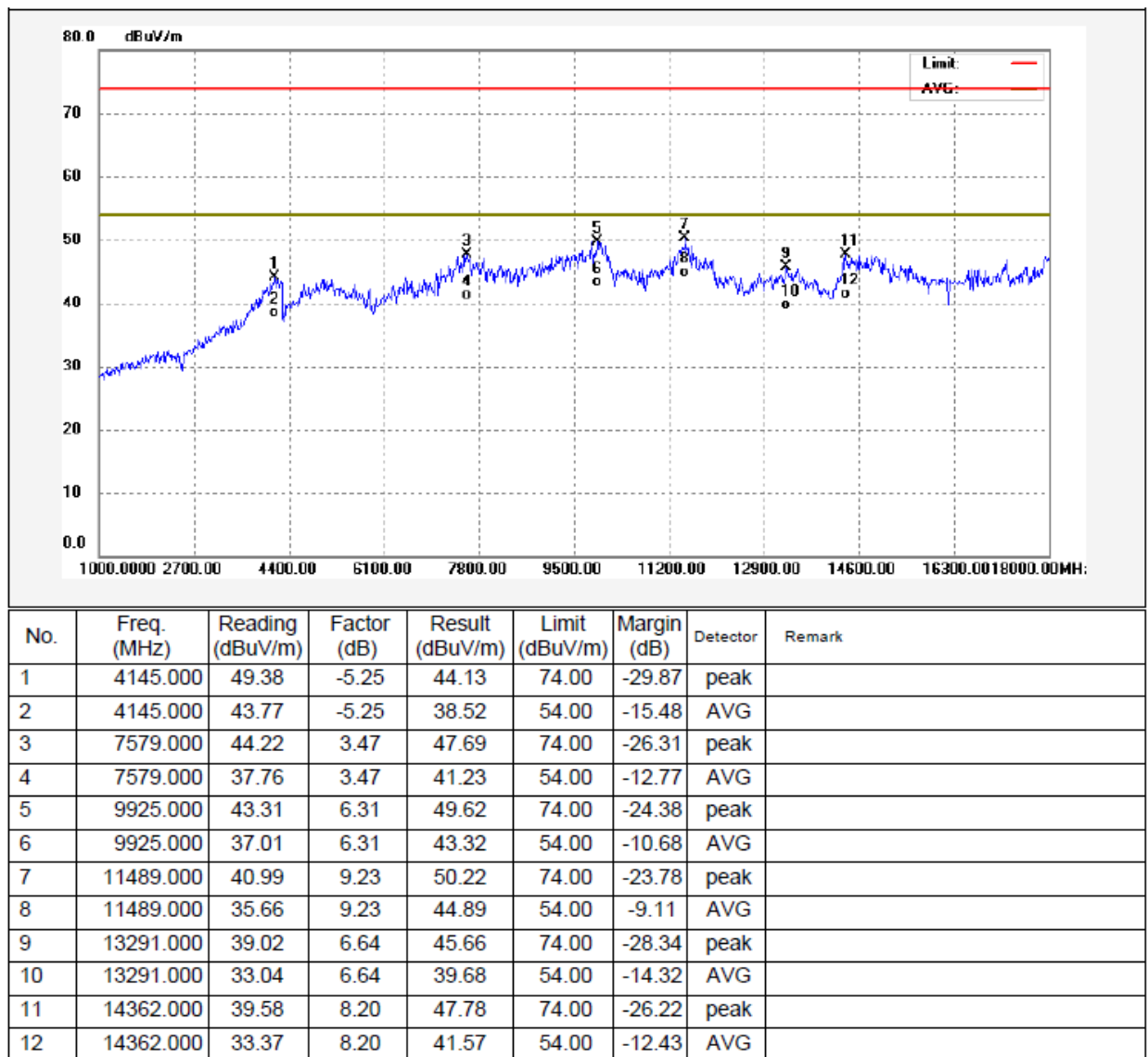


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	4570.000	45.08	-2.73	42.35	74.00	-31.65	peak	
2	4570.000	39.05	-2.73	36.32	54.00	-17.68	AVG	
3	7596.000	40.14	3.43	43.57	74.00	-30.43	peak	
4	7596.000	34.09	3.43	37.52	54.00	-16.48	AVG	
5	10061.000	40.05	6.61	46.66	74.00	-27.34	peak	
6	10061.000	33.60	6.61	40.21	54.00	-13.79	AVG	
7	11455.000	38.35	9.01	47.36	74.00	-26.64	peak	
8	11455.000	32.22	9.01	41.23	54.00	-12.77	AVG	
9	14481.000	37.19	9.47	46.66	74.00	-27.34	peak	
10	14481.000	30.89	9.47	40.36	54.00	-13.64	AVG	
11	17252.000	34.78	12.70	47.48	74.00	-26.52	peak	
12	17252.000	28.66	12.70	41.36	54.00	-12.64	AVG	

Factor= antenna factor + cable loss - preamplifier factor

Result = Reading + Factor

Antenna Polarization: Horizontal



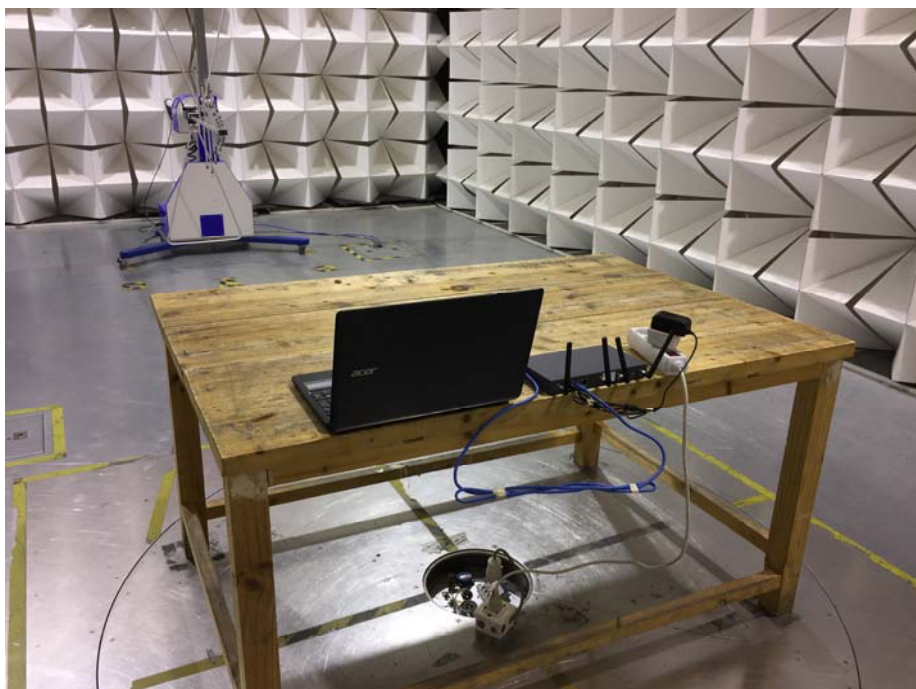
Factor= antenna factor + cable loss - preamplifier factor
 Result = Reading + Factor

9 Photographs – Test Setup FCC ID 2AC88-R1

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=====