

FCC PART 15 B TEST REPORT

For

SHENZHEN CYX TECHNOLOGY CO.,LTD

2F,6 Bldg.,Guangxi Industrial Z.,Longsheng,Longhua Shenzhen, China

FCC ID: 2AHTK-A00

Report Type: Original Report	Product Type: AK1
Report Number:	RDG180403004-00
Report Date:	2018-05-14
Reviewed By:	Jerry Zhang EMC Manager 
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan).
This report must not be used by the customer to claim product certification, approval, or endorsement by A2LA* or any agency of the Federal Government. * This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk “*”

TABLE OF CONTENTS

GENERAL INFORMATION.....	3
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	3
OBJECTIVE	3
RELATED SUBMITTAL(S)/GRANT(S).....	3
TEST METHODOLOGY	3
MEASUREMENT UNCERTAINTY.....	4
TEST FACILITY	4
SYSTEM TEST CONFIGURATION.....	5
DESCRIPTION OF TEST CONFIGURATION	5
EUT EXERCISE SOFTWARE	5
EQUIPMENT MODIFICATIONS	5
LOCAL SUPPORT EQUIPMENT LIST AND DETAILS	5
SUPPORT CABLE LIST AND DETAILS	5
CONFIGURATION OF TEST SETUP	6
SUMMARY OF TEST RESULTS	7
FCC§15.107 - CONDUCTED EMISSIONS.....	8
EUT SETUP.....	8
EMI TEST RECEIVER SETUP.....	8
TEST EQUIPMENT LIST AND DETAILS.....	9
TEST PROCEDURE	9
CORRECTED AMPLITUDE & MARGIN CALCULATION	9
TEST RESULTS SUMMARY	9
TEST DATA	10
FCC §15.109 - RADIATED SPURIOUS EMISSIONS	12
EUT SETUP.....	12
EMI TEST RECEIVER SETUP.....	13
TEST PROCEDURE	13
CORRECTED AMPLITUDE & MARGIN CALCULATION	13
TEST EQUIPMENT LIST AND DETAILS.....	14
TEST DATA	14

GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

EUT Name:		AK1
EUT Model:		AK1
Multiple Model:		AK2, AK3, AK5, AK6, AK7, AK8, CK2, GK1, GK2, GK3, GK5
FCC ID:		2AHTK-A00
Rated Input Voltage:		DC 12V from adapter
Adapter Information	Model:	CW1202500US
	Input:	100-240V~ 50/60Hz 0.8A MAX
	Output:	12V , 2500mA
The Highest Operation Frequency:		5825MHz
External Dimension:		Length (129 mm)*Width (129 mm)*High (54 mm)
Serial Number:		180403004
EUT Received Date:		2018.04.03

Note: The series product, models AK1, AK2, AK3, AK5, AK6, AK7, AK8, CK2, GK1, GK2, GK3, GK5 are electrically identical, The difference between them please refer to the declaration letter for details. For marketing purpose, we selected AK1 for fully test.

Objective

This test report is prepared on behalf of **SHENZHEN CYX TECHNOLOGY CO.,LTD** in accordance with Part 2, Subpart J, and Part 15-Subparts A and B of the Federal Communications Commission's rules.

The objective of the manufacturer is to determine the compliance of EUT with FCC Part 15 B Class B.

Related Submittal(s)/Grant(s)

N/A

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Dongguan).

Measurement Uncertainty

Parameter	Measurement Uncertainty
Unwanted Emissions, radiated	30M~200MHz: 4.55 dB, 200M~1GHz: 5.92 dB, 1G~6GHz: 4.98 dB, 6G~18GHz: 5.89 dB, 18G~26.5G: 5.47 dB, 26.5G~40G: 5.63 dB
Temperature	±1 °C
Humidity	±5%
AC Power Lines Conducted Emission	3.12 dB (150 kHz to 30 MHz)

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218, the FCC Designation No. : CN1220.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062D.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in operating mode.

In this mode, the device transmitting data between the USB HDD, SATA HDD, TF Card, downloading data form network and playing video.

EUT Exercise Software

The software “winthrax.exe” was used during test.

Equipment Modifications

No modification was made to the EUT tested.

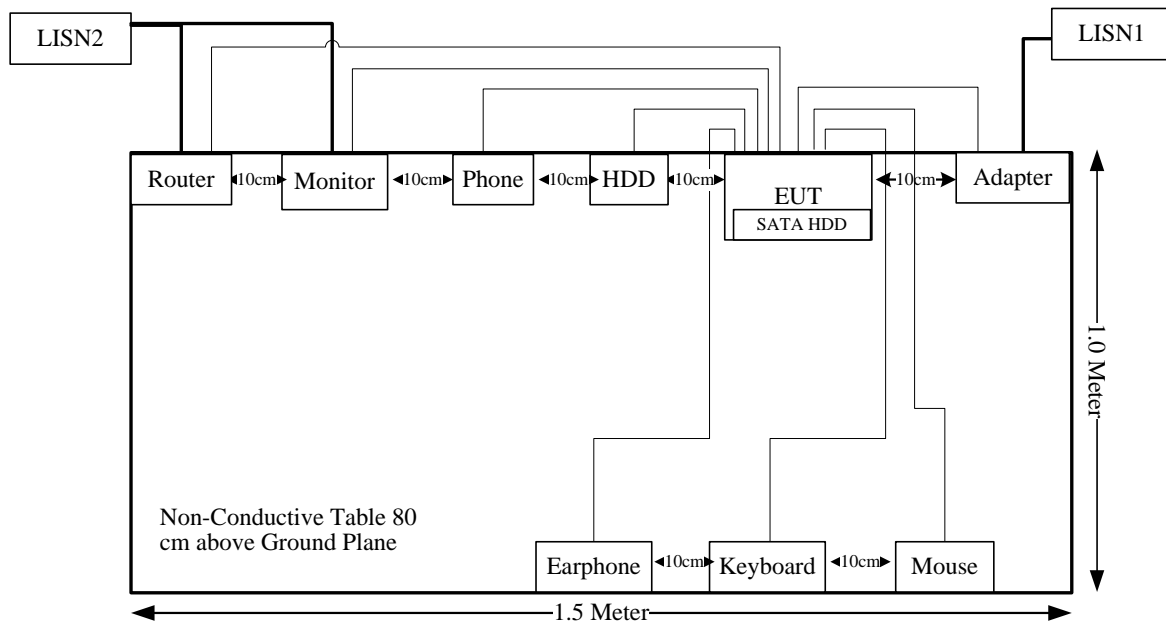
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
SAMSUNG	Monitor	S22C330H	ZXDCHTHD10149K
HUAWEI	router	HQ8245W	N/A
TOSHIBA	USB HDD	v63700-A	7283TCUTSJ2
BARRACUDA	SATA HDD	N/A	N/A
DELL	Keyboard	SK-8115	CN-0J4628-71616-52H-0RT6
DELL	Mouse	MO56UOA	F0Y02P7Y
oppo	Phone	R9	884762286
oppo	earphone	N/A	N/A

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
HDMI Cable	Yes	Yes	1.5	EUT	Monitor
USB Cable	Yes	No	0.5	EUT	USB HDD
RJ45	No	No	1.0	EUT	Router
USB Cable	Yes	No	1.2	EUT	Keyboard
USB Cable	Yes	No	1.2	EUT	Mouse
USB Cable	Yes	No	1.2	EUT	Phone
DC Power Cable	No	No	1.29	Adapter	EUT

Configuration of Test Setup

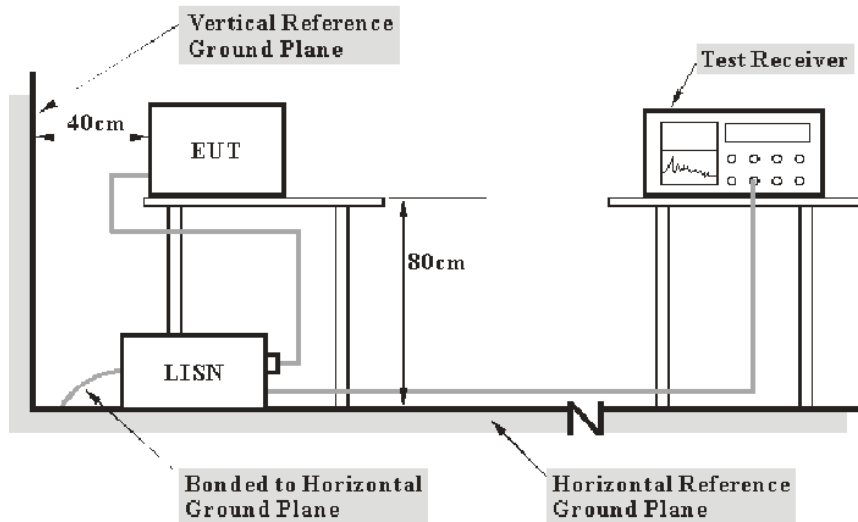


SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§15.107	Conducted Emissions	Compliant
§15.109	Radiated Emissions	Compliant

FCC§15.107 - CONDUCTED EMISSIONS

EUT Setup



Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15 B Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The adapter was connected to the Main LISN with 120V/60Hz AC power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCS 30	830245/006	2017-12-11	2018-12-11
R&S	Two-line V-network	ENV 216	101614	2017-12-08	2018-12-08
R&S	L.I.S.N	ESH2-Z5	892107/021	2017-09-25	2018-09-25
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-01	2017-09-05	2018-09-05
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed traceable to National Primary Standards and International System of Units (SI).

Test Procedure

During the conducted emission test, the adapter of laptop was connected to the outlet of the first LISN and the other support equipments were connected to the outlet of the second LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$V_C = V_R + A_C + VDF$$

Herein,

V_C : corrected voltage amplitude

V_R : reading voltage amplitude

A_C : attenuation caused by cable loss

VDF: voltage division factor of AMN or ISN

The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15 B Class B.

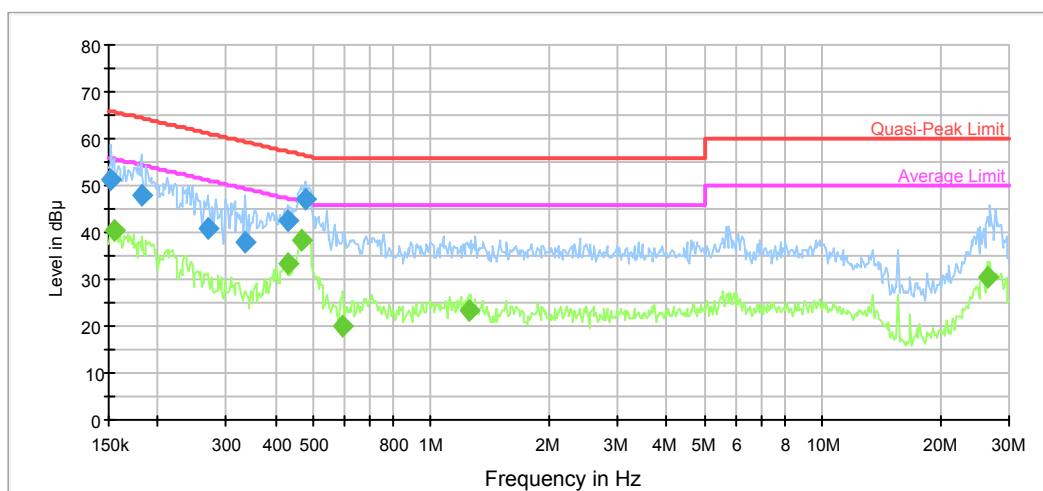
Test Data**Environmental Conditions**

Temperature:	27.9 °C
Relative Humidity:	57 %
ATM Pressure:	101.9 kPa

The testing was performed by Sider Huang on 2018-05-03.

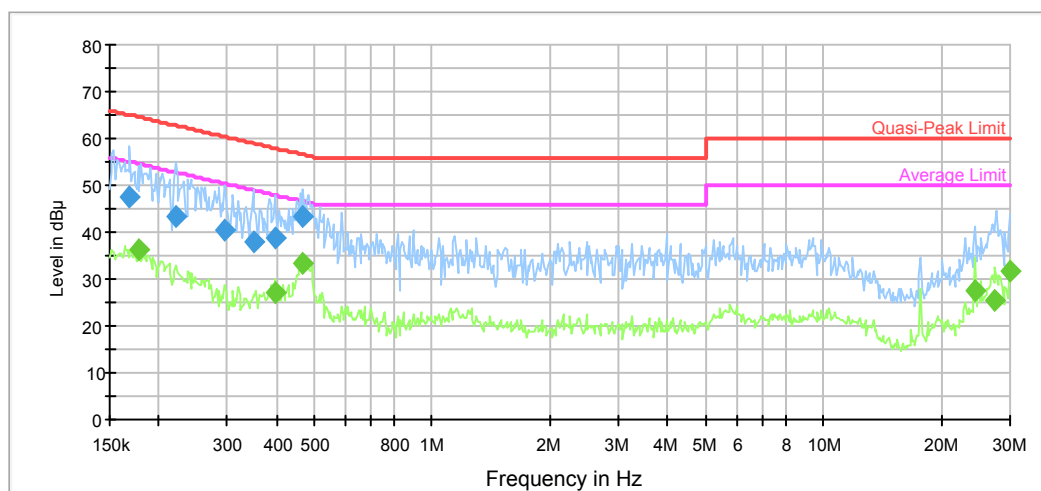
Test Mode: Operating

AC120V, 60Hz, Line:



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.152410	51.1	9.000	L1	11.2	14.8	65.9	Compliance
0.181612	47.8	9.000	L1	10.8	16.6	64.4	Compliance
0.268355	40.9	9.000	L1	10.3	20.3	61.2	Compliance
0.335433	38.1	9.000	L1	10.1	21.2	59.3	Compliance
0.429420	42.4	9.000	L1	9.9	14.9	57.3	Compliance
0.476287	47.1	9.000	L1	9.9	9.3	56.4	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.154858	40.4	9.000	L1	11.1	15.3	55.7	Compliance
0.429420	33.4	9.000	L1	9.9	13.9	47.3	Compliance
0.468757	38.5	9.000	L1	9.9	8.0	46.5	Compliance
0.595338	20.0	9.000	L1	9.8	26.0	46.0	Compliance
1.249088	23.3	9.000	L1	9.8	22.7	46.0	Compliance
26.422681	30.6	9.000	L1	10.2	19.4	50.0	Compliance

AC120V, 60Hz, Neutral:

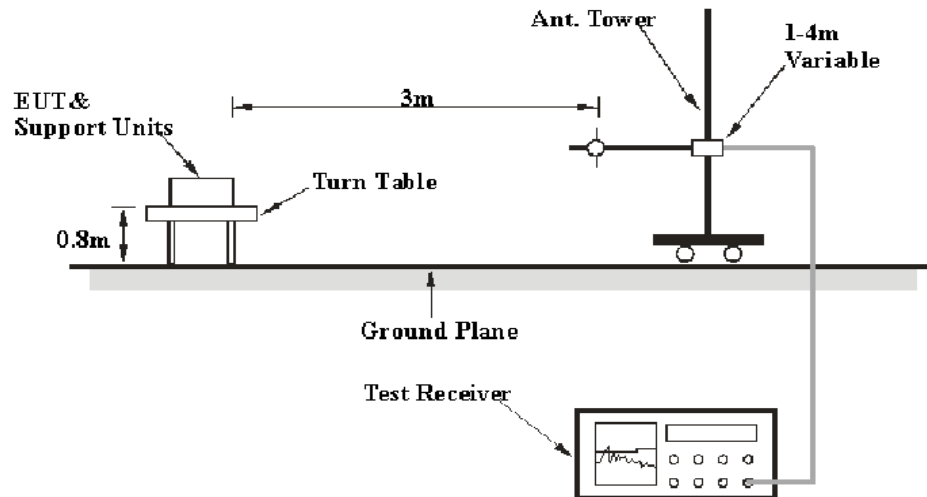
Frequency (MHz)	QuasiPeak (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)	Comment
0.169044	47.4	9.000	N	10.9	17.6	65.0	Compliance
0.221645	43.4	9.000	N	10.5	19.4	62.8	Compliance
0.295282	40.2	9.000	N	10.2	20.2	60.4	Compliance
0.349066	38.1	9.000	N	10.0	20.9	59.0	Compliance
0.396530	38.7	9.000	N	10.0	19.2	57.9	Compliance
0.468757	43.2	9.000	N	9.9	13.3	56.5	Compliance

Frequency (MHz)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)	Comment
0.177322	36.1	9.000	N	10.8	18.5	54.6	Compliance
0.396530	27.0	9.000	N	10.0	20.9	47.9	Compliance
0.468757	33.4	9.000	N	9.9	13.1	46.5	Compliance
24.398974	27.7	9.000	N	10.1	22.3	50.0	Compliance
27.496635	25.4	9.000	N	10.1	24.6	50.0	Compliance
30.000000	31.8	9.000	N	10.2	18.2	50.0	Compliance

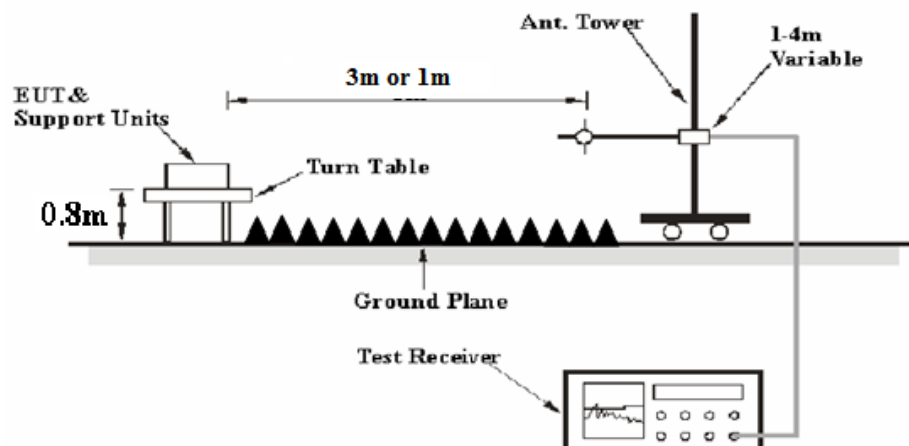
FCC §15.109 - RADIATED SPURIOUS EMISSIONS

EUT Setup

Below 1GHz:



1-40GHz:



The radiated emission Below 1GHz tests were performed in the 3 meters chamber test site A, above 1GHz tests were performed in the 3 meters chamber test site B, using the setup accordance with the ANSI C63.4-2014. The specification used was the FCC Part 15.109 Class B limits.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 40 GHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	Peak
	1 MHz	10 Hz	/	AVG

Test Procedure

During the radiated emissions, the adapter of laptop was connected to the first AC floor outlet and the other support equipments were connected to the second AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The data was recorded in the Quasi-peak detection mode for below 1 GHz, peak and average detection mode above 1 GHz.

According to C63.4, the above 26.5GHz test result shall be extrapolated to the specified distance using an extrapolation factor of 20dB/decade from 3m to 1m

Distance extrapolation factor = $20 \log (\text{specific distance [3m]}/\text{test distance [1m]})$ dB = 9.54 dB

Emissions under the average limit and under the noise floor have not recorded in the report.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

Or

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain- Distance extrapolation factor

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Antenna	JB3	A060611-1	2017-11-10	2020-11-10
R&S	EMI Test Receiver	ESCI	100224	2017-12-11	2018-12-11
HP	Amplifier	8447D	2727A05902	2017-09-05	2018-09-05
Agilent	Spectrum Analyzer	E4440A	SG43360054	2018-01-04	2019-01-04
ETS-Lindgren	Horn Antenna	3115	000 527 35	2016-01-05	2019-01-04
MITEQ	Amplifier	AFS42-00101800-2 5-S-42	2001271	2017-09-05	2018-09-05
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-02 1304	2016-11-18	2019-11-18
Ducommun Technologies	Horn Antenna	ARH-2823-02	1007726-01 1302	2016-11-18	2019-11-18
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2017-06-27	2018-06-27
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2017-09-05	2018-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2017-09-05	2018-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2017-09-05	2018-09-05
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2017-09-05	2018-09-05
R&S	Spectrum Analyzer	FSP 38	100478	2017-12-08	2018-12-08
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data**Environmental Conditions**

Temperature:	25.7~26.6 °C
Relative Humidity:	52~54 %
ATM Pressure:	100.8~101 kPa

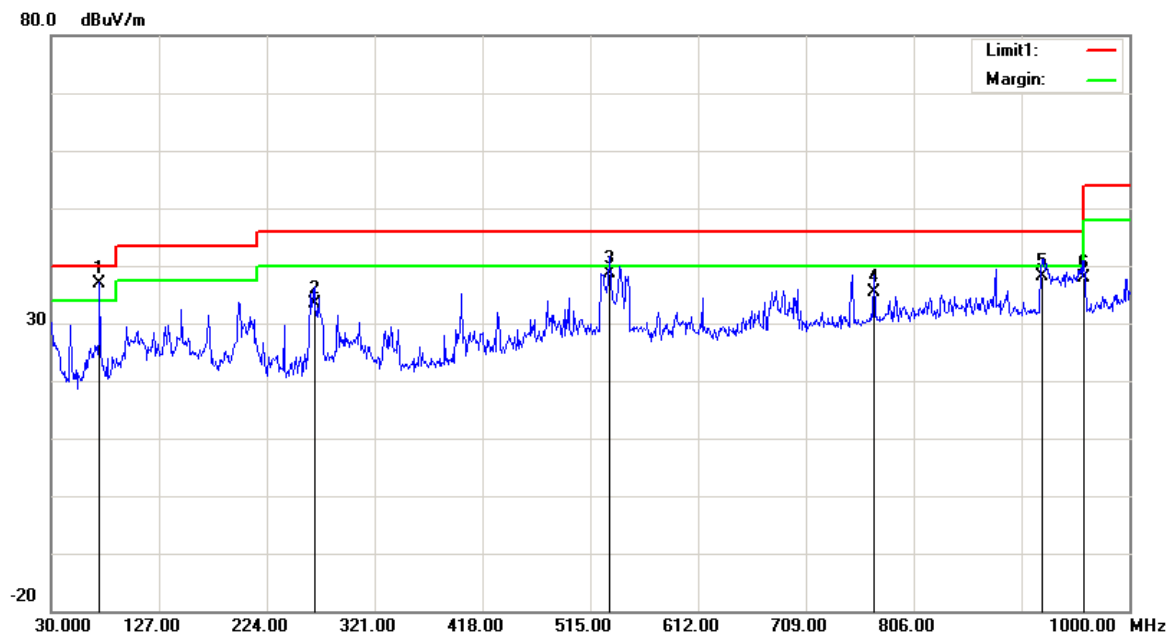
* The testing was performed by Blake Yang & Vern Shen on 2018-05-04 and 2018-05-06.

Test Result: Compliance

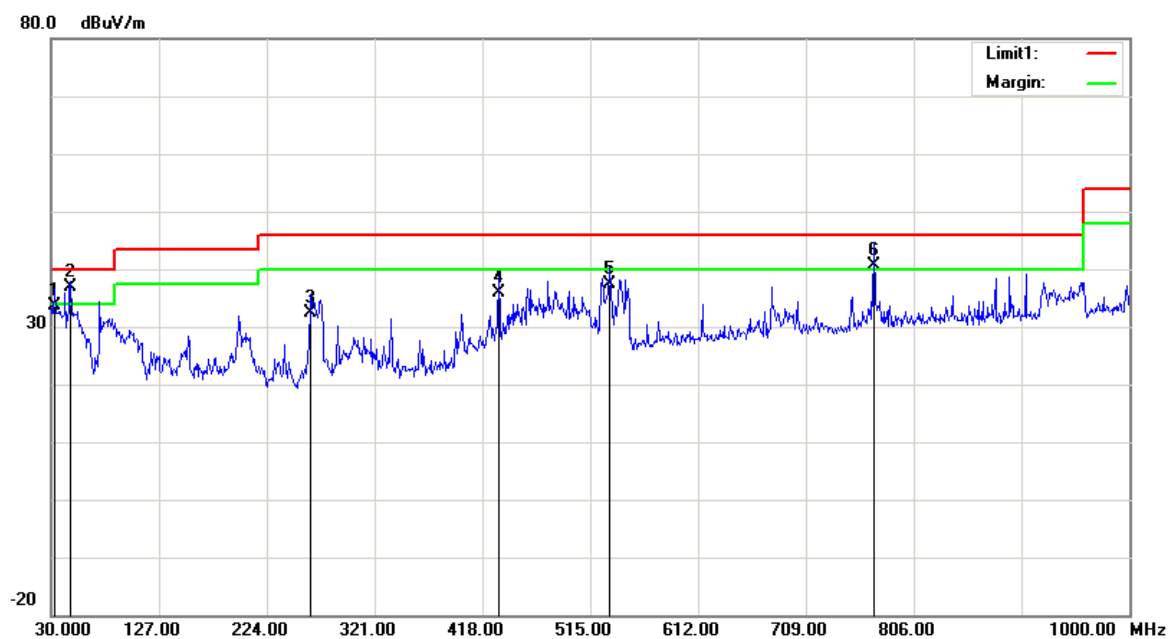
Test Mode: Operating

1) Below 1GHz:

Horizontal



Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
73.6500	48.08	QP	-11.18	36.90	40.00	3.10
266.6800	37.88	QP	-4.48	33.40	46.00	12.60
532.4600	38.30	QP	0.30	38.60	46.00	7.40
770.1100	31.12	QP	4.28	35.40	46.00	10.60
921.4300	31.68	QP	6.42	38.10	46.00	7.90
959.2600	8.80	QP	29.10	37.90	46.00	8.10

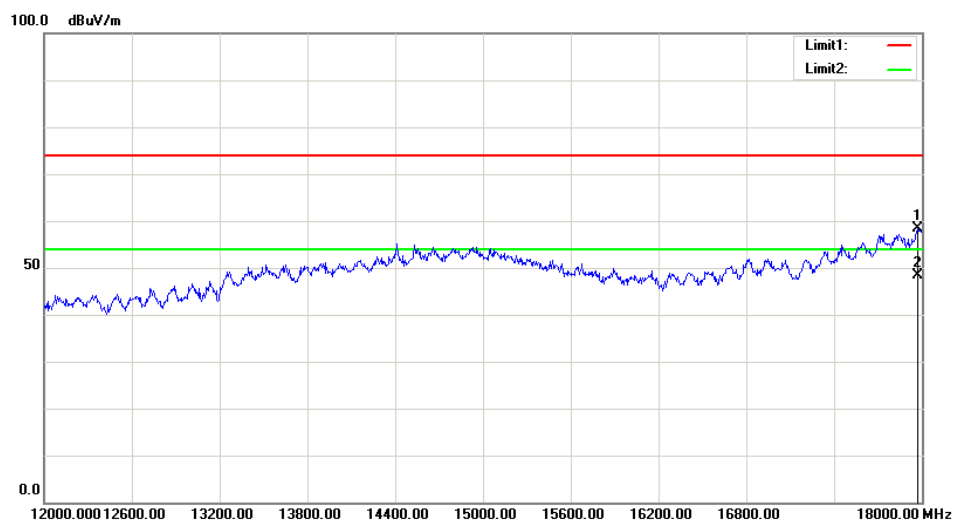
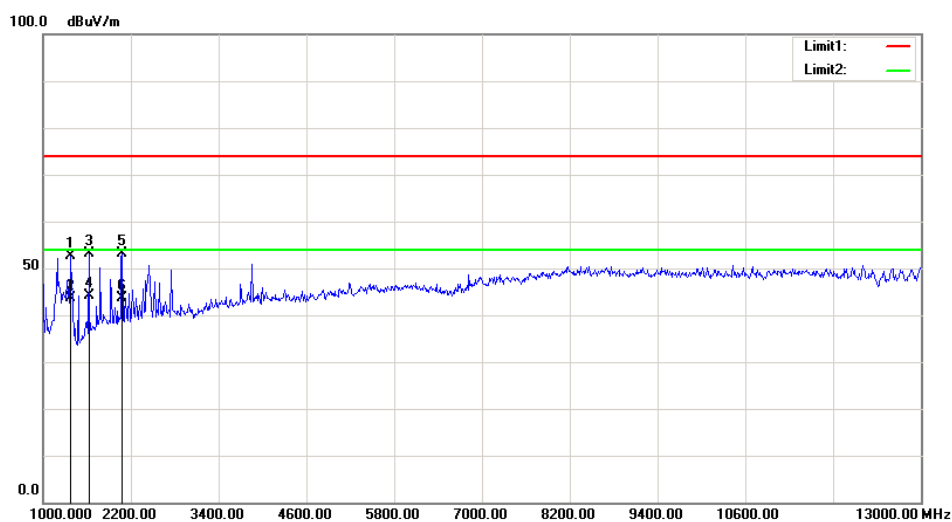
Vertical

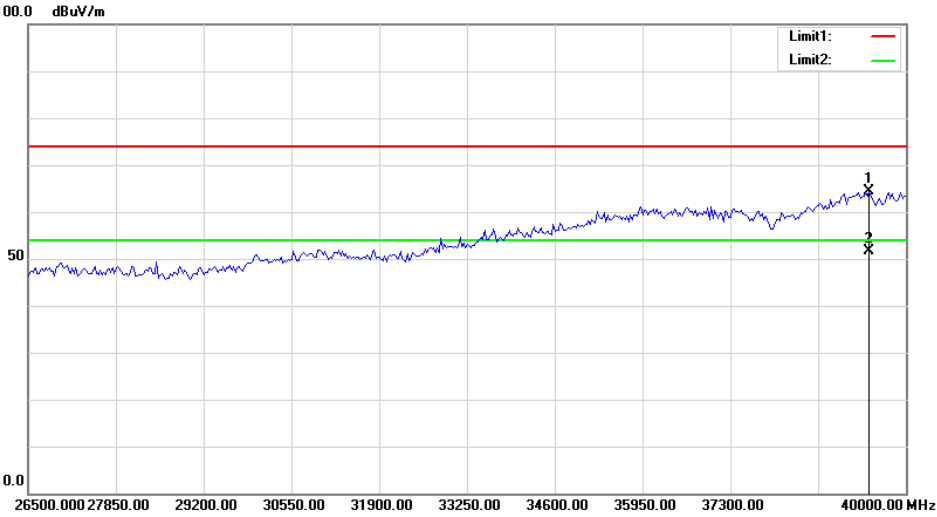
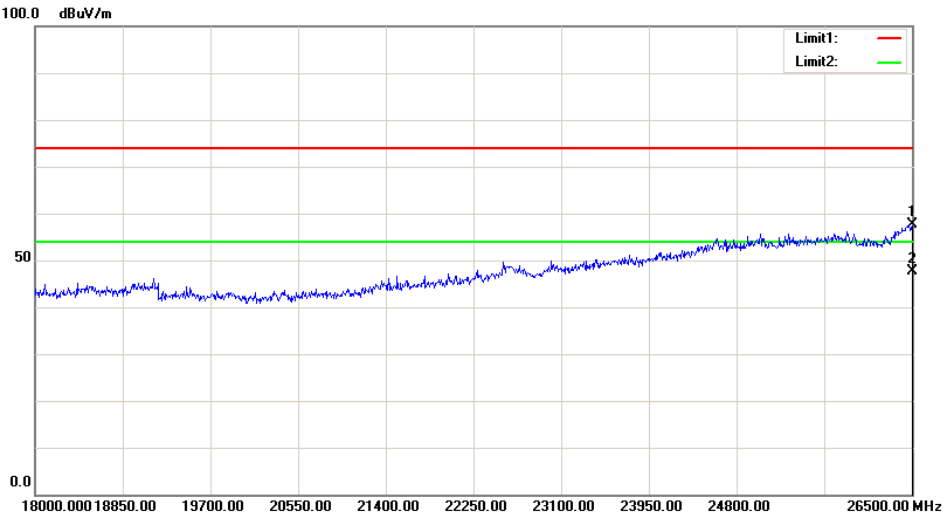
Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
32.9100	34.26	QP	-0.66	33.60	40.00	6.40
47.4600	47.20	QP	-10.40	36.80	40.00	3.20
263.7700	37.11	QP	-4.61	32.50	46.00	13.50
432.5500	37.29	QP	-1.39	35.90	46.00	10.10
532.4600	37.10	QP	0.30	37.40	46.00	8.60
770.1100	36.32	QP	4.28	40.60	46.00	5.40

2) Above 1GHz:

Horizontal

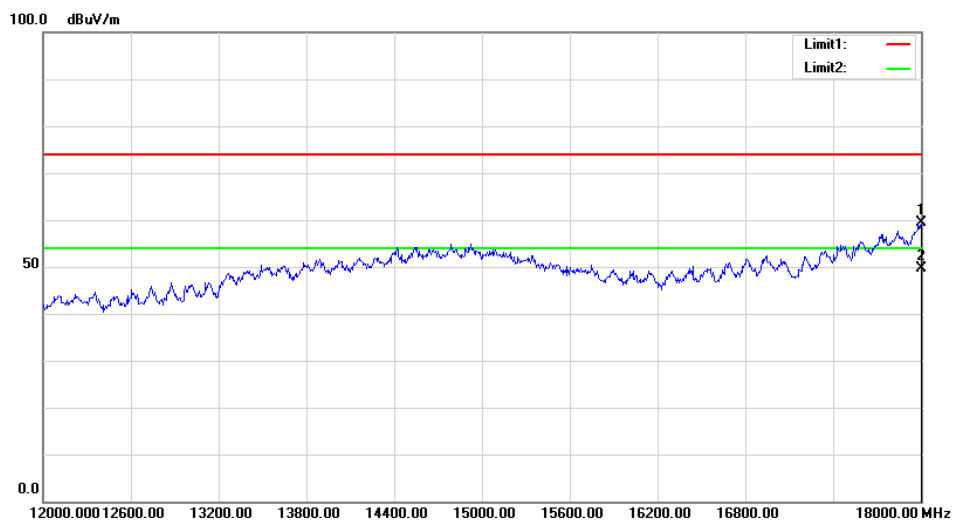
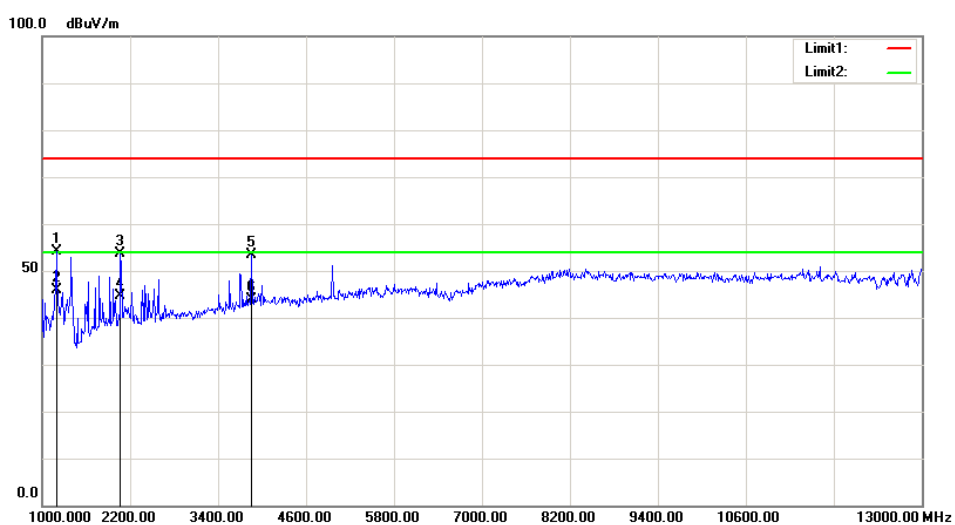
Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1378.000	62.34	peak	-9.59	52.75	74.00	21.25
1378.000	53.17	AVG	-9.59	43.58	54.00	10.42
1630.000	61.70	peak	-8.64	53.06	74.00	20.94
1630.000	52.76	AVG	-8.64	44.12	54.00	9.88
2080.000	60.12	peak	-7.06	53.06	74.00	20.94
2080.000	50.71	AVG	-7.06	43.65	54.00	10.35

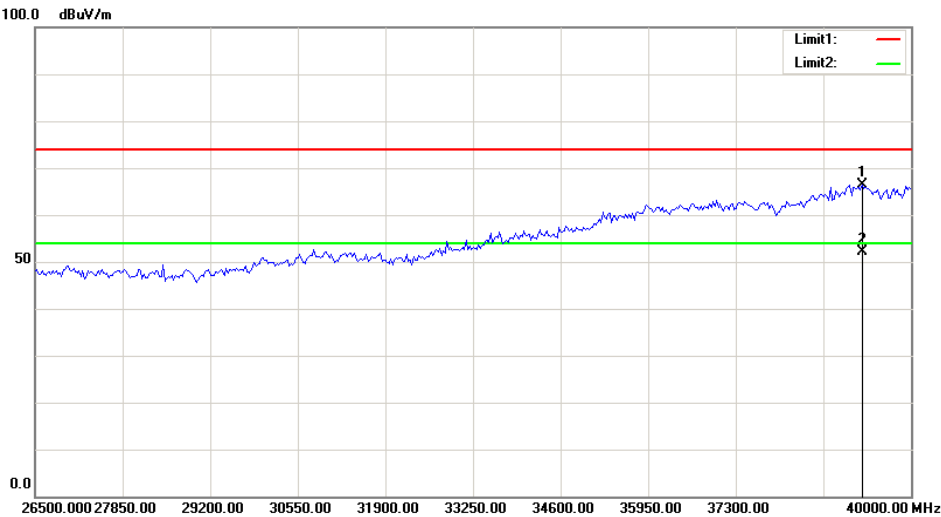
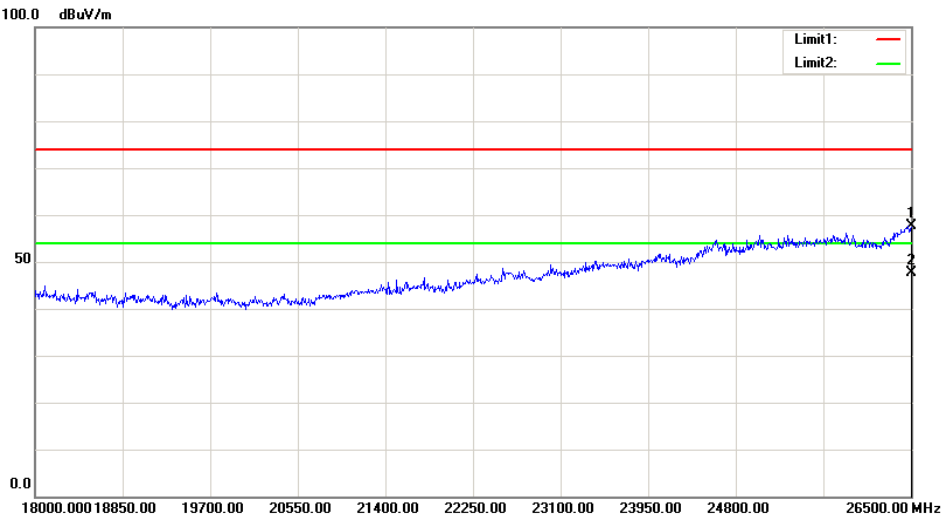




Vertical

Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1192.000	64.04	peak	-9.99	54.05	74.00	19.95
1192.000	55.86	AVG	-9.99	45.87	54.00	8.13
2074.000	60.56	peak	-7.05	53.51	74.00	20.49
2074.000	51.67	AVG	-7.05	44.62	54.00	9.38
3856.000	55.73	peak	-2.35	53.38	74.00	20.62
3856.000	46.12	AVG	-2.35	43.77	54.00	10.23





END OF REPORT