FCC PART 15B

MEASUREMENT AND TEST REPORT

For

Shanghai Xiaoyi Technology Co., Ltd.

6F,Building E,No.2889,Jinke Road,Shanghai,China.

FCC ID: 2AFIB-YAS1616

Report Type:	**Product Type:**
Original Report	YI Action Camera 4K

Test Engineer:	Allen Tian
Report Number:	RKS151229001-00J
Report Date:	2016-01-15
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The Shanghai Xiaoyi Technology Co., Ltd.'s product, model number: YAS.1616.INT(FCC ID: 2AFIB-YAS1616) or the "EUT" in this report was a YI Action Camera 4K, was measured approximately: 65 mm (L) x43 mm (W) x 22 mm (H), related with input power: DC 5V, the highest operating frequency is 5825 MHz.

**All measurement and test data in this report was gathered from production sample serial number: 151229008 (Assigned by the BACL, Kunshan). The EUT supplied by the applicant was received on 2015-12-29.*

Objective

This report is prepared on behalf of Shanghai Xiaoyi Technology Co., Ltd., Ltd. in accordance with Part 2-Subpart J, and Part 15-Subparts A and B of the Federal Communication Commissions rules.

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

Related Submittal(s)/Grant(s)

No related submittal(s).

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. (Kunshan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the Chenghu Road, Kunshan Development Zone No.248, Kunshan, Jiangsu, China

Test site at Bay Area Compliance Laboratories Corp. (Kunshan) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 06, 2014. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 815570. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION (FCC §15.27)

Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

EUT Exercise Software

No exercise software was used.

Special Accessories

No special accessory was used.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

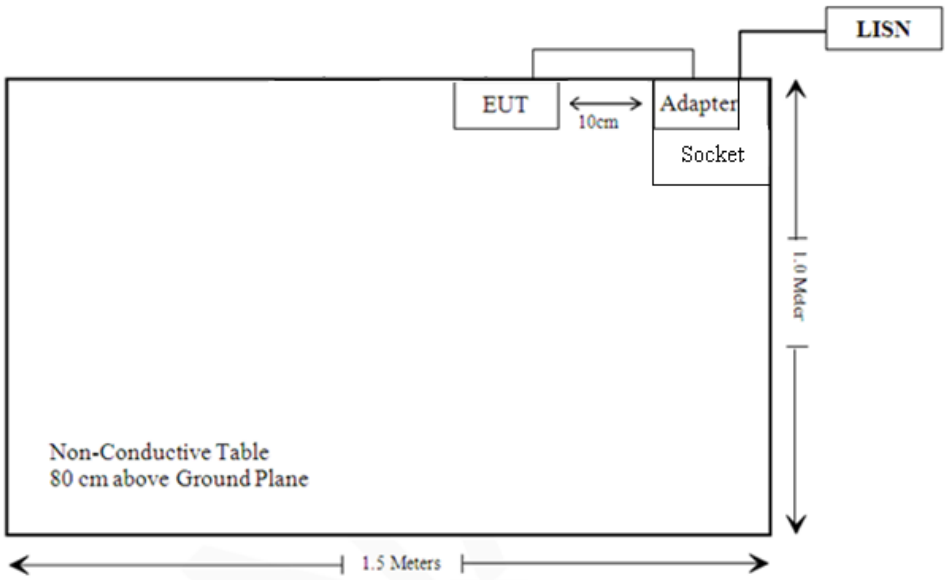
Manufacturer	Description	Model	Serial Number
YI	Adapter	A88-502000	N/A
Thinkpad	Notebook PC	T400	N/A
KYOCERA	Printer	FS-1125MFP	N/A
DELL	Keyboard	MB-BL919EB	N/A
DELL	Mouse	MO-1008BU	N/A

External I/O Cable

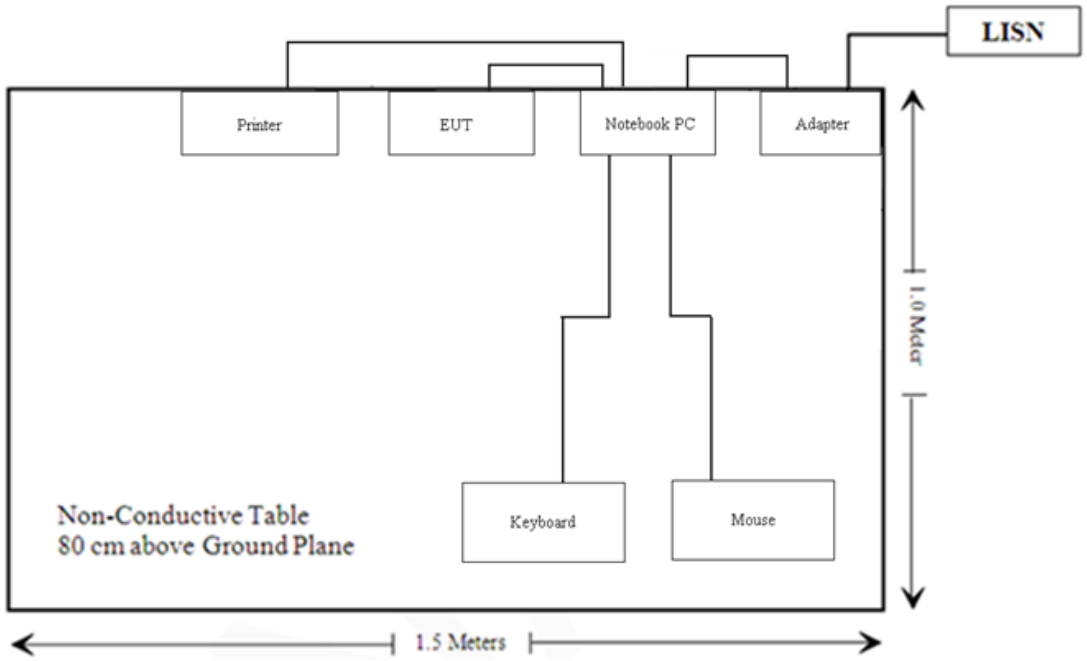
Cable Description	Length (m)	From/Port	To
Unshielding Detachable USB Cable	0.3	EUT	ADAPTER

Block Diagram of Test Setup

Mode 1:Operation



Mode 2: Data transfer



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§15.107	AC Line Conducted Emissions	Compliance
§15.109	Radiated Emissions	Compliance

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FCC §15.107 – AC LINE CONDUCTED EMISSIONS

Applicable Standard

According to FCC§15.107

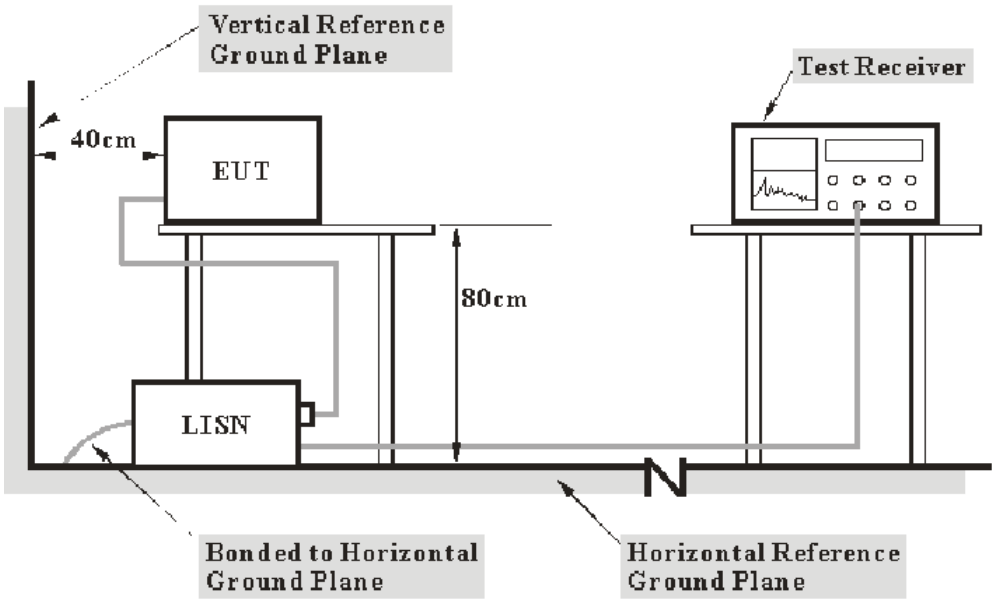
Measurement Uncertainty

Input quantities to be considered for conducted disturbance measurements maybe receiver reading, attenuation of the connection between LISN and receiver, LISN voltage division factor, LISN VDF frequency interpolation and receiver related input quantities, etc.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of conducted disturbance test at Bay Area Compliance Laboratories Corp. (Kunshan) is shown as below. And the uncertainty will not be taken into consideration for the test data recorded in the report.

Port	Expanded Measurement uncertainty
AC Mains	3.26 dB (k=2, 95% level of confidence)
CAT 3	3.70 dB (k=2, 95% level of confidence)
CAT 5	3.86 dB (k=2, 95% level of confidence)
CAT 6	4.64 dB (k=2, 95% level of confidence)

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 measurement procedure of EUT setup is according with ANSI C63.4-2014. The related limit was specified in FCC Part 15.107 Class B.

The EUT was connected to an AC 120V/60 Hz 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 Procedure

During the conducted emission test, the EUT was connected to the outlet of the LISN.

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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	934115/007	2015-11-4	2016-11-3
Rohde & Schwarz	LISN	ESH3-Z5	862770/011	2015-11-4	2016-11-3
Rohde & Schwarz	LISN	ESH3-Z5	12008	2015-06-23	2016-06-22
MICRO-COAX	Coaxial line	UFB-293B-1-0 480-50X50	97F0173	2015-10-1	2016-10-1
Rohde & Schwarz	Transient Limiter	ESH3Z2	DE25985	2015-09-16	2016-09-15
Rohde & Schwarz	CE Test software	EMC 32	V 09.10.0	--	--

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

Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

Correction Factor = LISN VDF + Cable Loss

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

Margin = Limit –(QuasiPeak &Average)

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.107 Class B, the worst margin reading as below:

11.94 dB at **0.175000 MHz** in the **Line** conducted mode for operation
9.86 dB at **0.155000 MHz** in the **Line** conducted mode for data transfer

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

In BACL, $U_{(Lm)}$ is less than U_{cispr}, if L_m is less than L_{lim}, it implies that the EUT complies with the limit.

Test Data

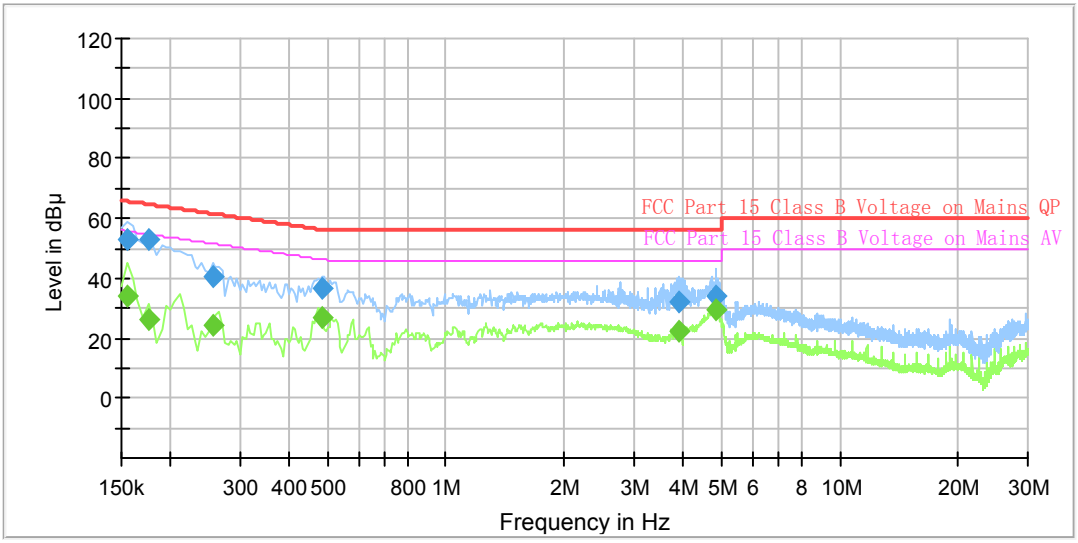
Environmental Conditions

Temperature:	25℃
Relative Humidity:	51 %
ATM Pressure:	101.0 kPa

The testing was performed by Allen Tian on 2016-01-05

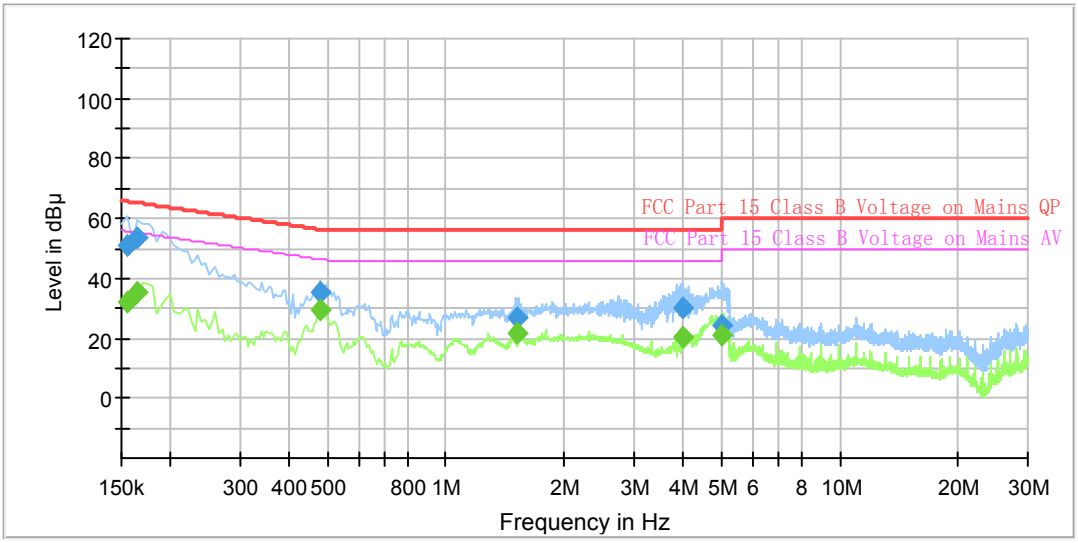
Test Mode: Operation

AC 120V/60 Hz, Line



Frequency (MHz)	QuasiPeak (dB µ V)	Average (dB µ V)	Limit (dB µ V)	Margin (dB)	Line	Corr. (dB)
0.155000	52.71	---	65.73	13.02	L1	11.0
0.155000	---	33.81	55.73	21.92	L1	11.0
0.175000	---	26.45	54.72	28.27	L1	11.0
0.175000	52.78	---	64.72	11.94	L1	11.0
0.255000	---	24.31	51.59	27.28	L1	11.0
0.255000	40.37	---	61.59	21.22	L1	11.0
0.485000	---	26.75	46.25	19.50	L1	11.0
0.485000	36.82	---	56.25	19.43	L1	11.0
3.885000	---	22.61	46.00	23.39	L1	11.3
3.885000	32.03	---	56.00	23.97	L1	11.3
4.860000	---	29.57	46.00	16.43	L1	11.3
4.860000	34.00	---	56.00	22.00	L1	11.3

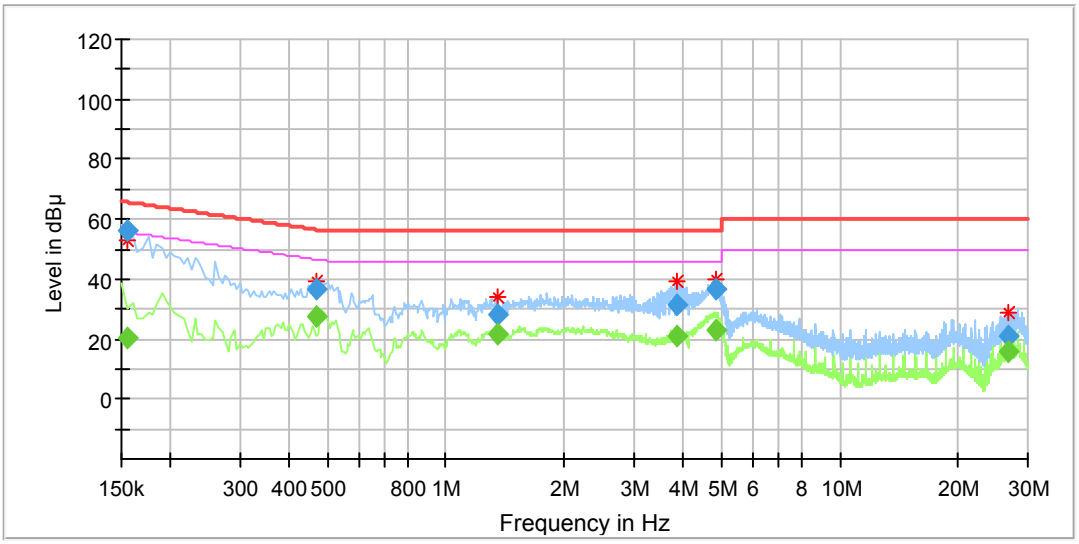
AC 120V/60 Hz, Neutral



Frequency (MHz)	QuasiPeak (dB µ V)	Average (dB µ V)	Limit (dB µ V)	Margin (dB)	Line	Corr. (dB)
0.155000	---	32.06	55.73	23.67	N	11.0
0.155000	51.27	---	65.73	14.46	N	11.0
0.165000	---	35.34	55.21	19.87	N	11.0
0.165000	53.27	---	65.21	11.94	N	11.0
0.480000	---	29.17	46.34	17.17	N	11.0
0.480000	35.61	---	56.34	20.73	N	11.0
1.510000	---	21.97	46.00	24.03	N	11.2
1.510000	27.09	---	56.00	28.91	N	11.2
3.985000	---	20.48	46.00	25.52	N	11.3
3.985000	30.06	---	56.00	25.94	N	11.3
5.040000	---	20.96	50.00	29.04	N	11.4
5.040000	24.18	---	60.00	35.82	N	11.4

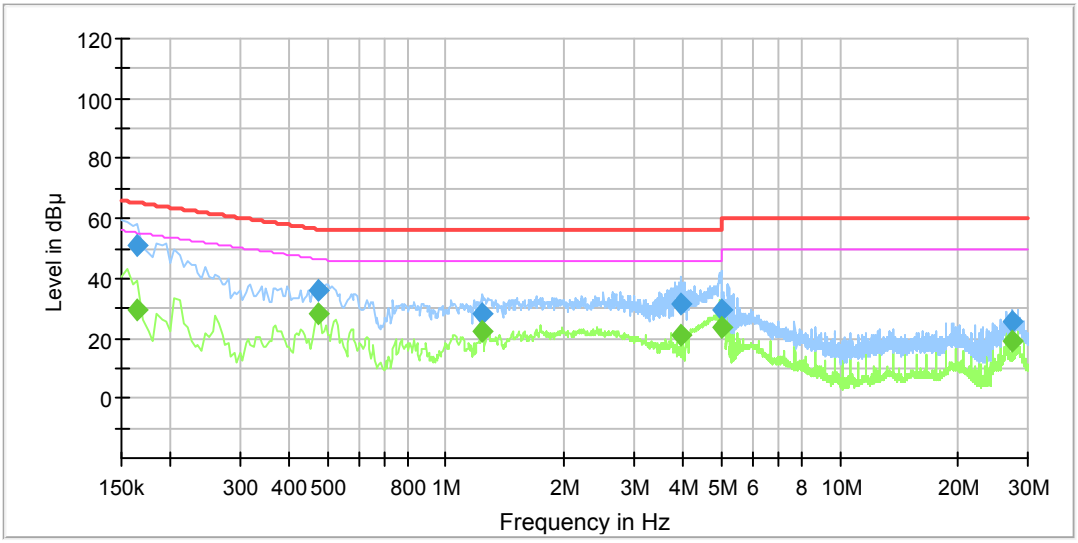
Test Mode: Data transfer

AC 120V/60 Hz, Line



Frequency (MHz)	QuasiPeak (dB µ V)	Average (dB µ V)	Limit (dB µ V)	Margin (dB)	Line	Corr. (dB)
0.155000	---	20.61	55.73	35.12	L1	11.0
0.155000	55.87	---	65.73	9.86	L1	11.0
0.470000	---	27.86	46.51	18.65	L1	11.0
0.470000	36.68	---	56.51	19.83	L1	11.0
1.350000	---	21.62	46.00	24.38	L1	11.1
1.350000	28.37	---	56.00	27.63	L1	11.1
3.880000	---	20.87	46.00	25.13	L1	11.3
3.880000	31.55	---	56.00	24.45	L1	11.3
4.865000	---	23.03	46.00	22.97	L1	11.3
4.865000	36.83	---	56.00	19.17	L1	11.3
26.790000	---	16.01	50.00	33.99	L1	11.4
26.790000	21.00	---	60.00	39.00	L1	11.4

AC 120V/60 Hz, Neutral



Frequency (MHz)	QuasiPeak (dB µ V)	Average (dB µ V)	Limit (dB µ V)	Margin (dB)	Line	Corr. (dB)
0.165000	---	29.70	55.21	25.51	N	11.0
0.165000	50.77	---	65.21	14.44	N	11.0
0.475000	---	28.06	46.43	18.37	N	11.0
0.475000	36.08	---	56.43	20.35	N	11.0
1.240000	---	22.53	46.00	23.47	N	11.1
1.240000	28.03	---	56.00	27.97	N	11.1
3.955000	---	20.77	46.00	25.23	N	11.3
3.955000	31.23	---	56.00	24.77	N	11.3
4.995000	---	23.68	46.00	22.32	N	11.4
4.995000	29.63	---	56.00	26.37	N	11.4
27.485000	---	19.10	50.00	30.90	N	11.4
27.485000	25.52	---	60.00	34.48	N	11.4

Note:
1) Corr.=LISN VDF (Voltage Division Factor) + Cable Loss
2) Corrected Amplitude = Reading + Corr.
3) Margin = Limit –Corrected Amplitude

FCC §15.109 - RADIATED EMISSIONS

Applicable Standard

FCC §15.109

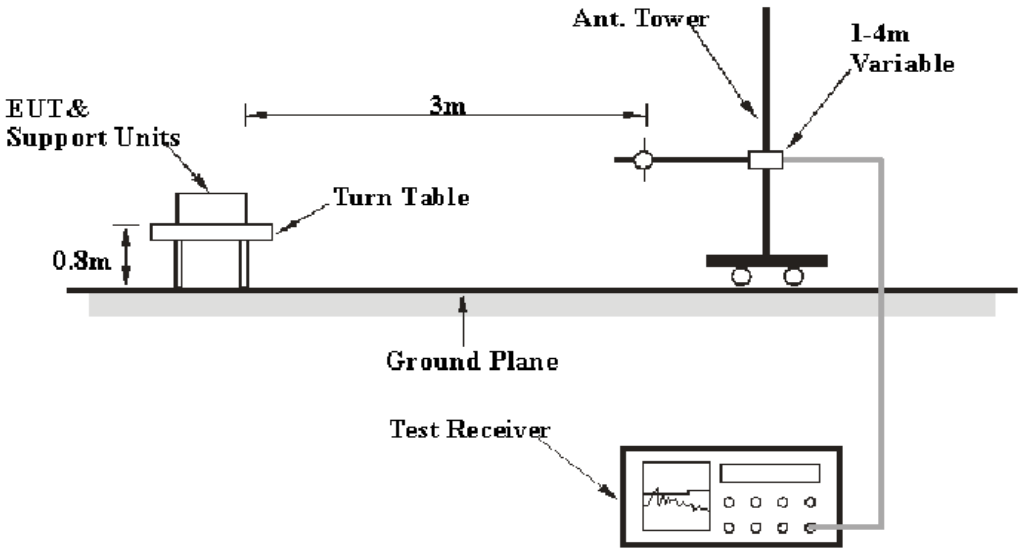
Measurement Uncertainty

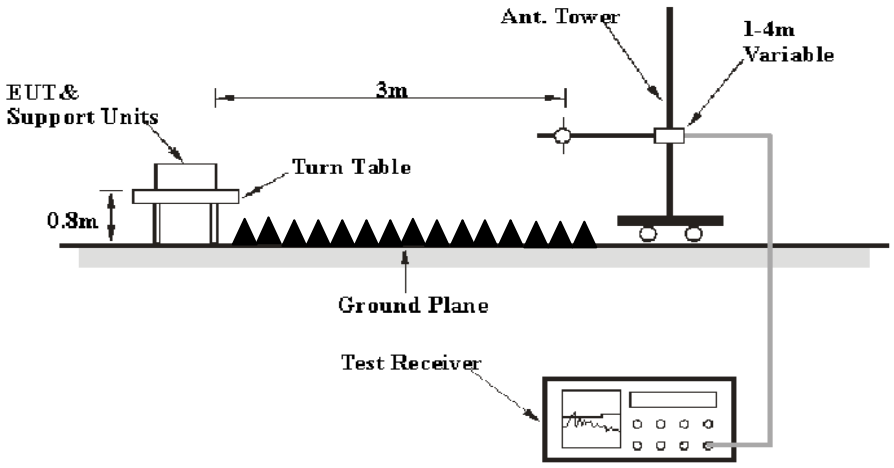
All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of radiation emissions at Bay Area Compliance Laboratories Corp. (Kunshan) is shown in below table. And the uncertainty will not be taken into consideration for the test data recorded in the report

Frequency	Polarity	Measurement uncertainty
30 MHz~200 MHz	Horizontal	4.62 dB (k=2, 95% level of confidence)
	Vertical	4.54 dB (k=2, 95% level of confidence)
200 MHz~1 GHz	Horizontal	4.84 dB (k=2, 95% level of confidence)
	Vertical	5.91 dB (k=2, 95% level of confidence)
1 GHz~6 GHz	Horizontal/Vertical	4.68 dB (k=2, 95% level of confidence)
Above 6 GHz	Horizontal/Vertical	4.92 dB (k=2, 95% level of confidence)

EUT Setup





The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2014. The specification used was the FCC Part 15.109 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 spacing between the peripherals was 10 cm.

The EUT was connected to an AC 120V/60 Hz power source.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 31 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	Detector
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	Ave.

Test Procedure

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

All data was recorded in the Quasi-peak detector mode from 30 MHz to 1 GHz and PK and average detector modes for frequencies above 1 GHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sonoma Instrunent	Amplifier	330	171377	2015-09-16	2016-09-15
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2015-05-20	2016-05-19
Sunol Sciences	Broadband Antenna	JB3	A090314-2	2015-11-07	2016-11-06
ETS	Horn Antenna	3115	6229	2015-11-07	2016-11-06
Rohde & Schwarz	Signal Analyzer	FSIQ26	100048	2015-11-04	2016-11-03
Mini	Pre-amplifier	ZVA-183-S+	857001418	2015-09-16	2016-09-15
R&S	Auto test Software	EMC32	V 09.10.0	-	-

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

Correction Factor & Margin Calculation

The Correction Factor is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain. The basic equation is as follows:

Correction Factor = Antenna Factor + Cable Loss - Amplifier Gain

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:

Margin = Limit –(QuasiPeak & Average)

Test Results Summary

According to the data in the following table, the EUT complied with the FCC §15.109 Class B, with the worst margin reading of:

4.15 dB at **839.999250 MHz** in the **Horizontal** polarization for operation

9.88 dB at **166.511900 MHz** in the **Horizontal** polarization for data transfer

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

In BACL, $U_{(Lm)}$ is less than U_{cispr}, if L_m is less than L_{lim}, it implies that the EUT complies with the limit.

Test Data

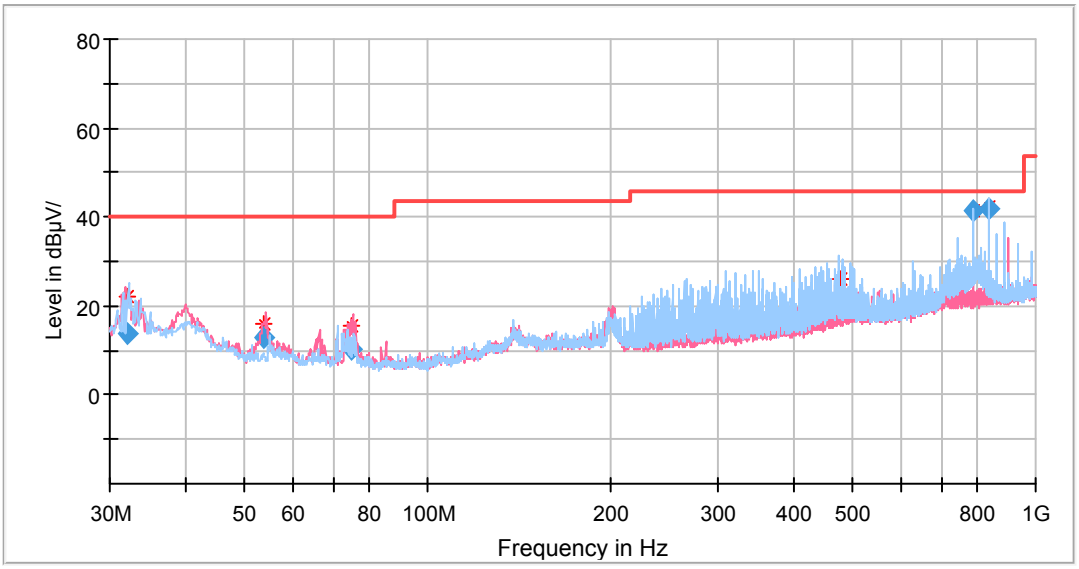
Environmental Conditions

Temperature:	25℃
Relative Humidity:	51 %
ATM Pressure:	101.0 kPa

The testing was performed by Allen Tian on 2016-01-11

Test Mode: Operation

30MHz ~ 1GHz



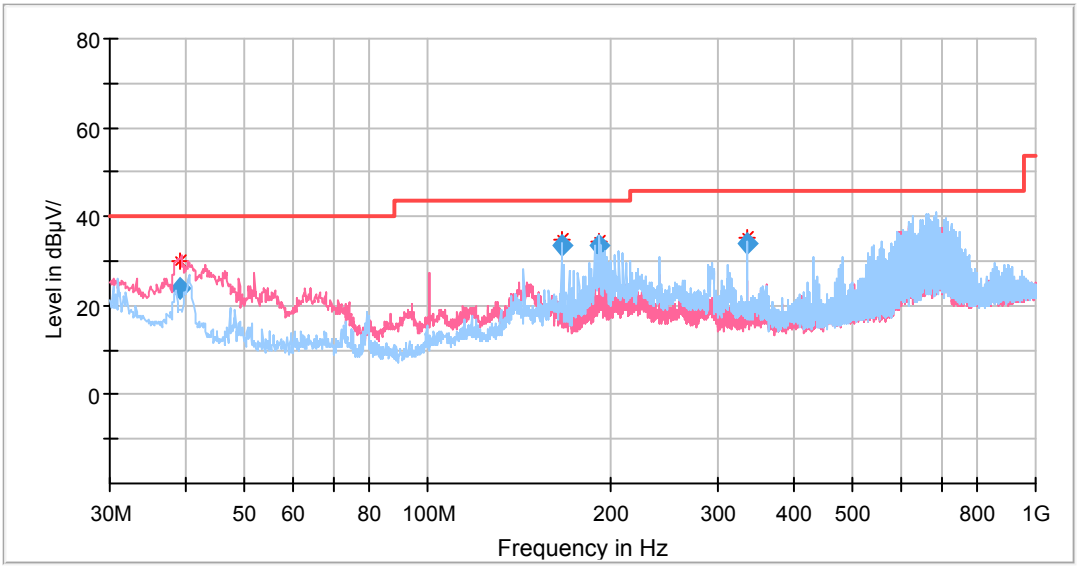
Frequency (MHz)	QuasiPeak (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
32.176200	13.97	40.00	26.03	100.0	H	173.0	-10.4
53.927600	12.95	40.00	27.05	100.0	V	330.0	-16.6
75.030150	10.14	40.00	29.86	199.0	V	0.0	-17.1
476.444100	21.77	46.00	24.23	100.0	H	269.0	-6.1
791.996850	41.56	46.00	4.44	100.0	H	169.0	-1.6
839.999250	41.85	46.00	4.15	100.0	H	178.0	-1.2

1 GHz ~ 31 GHz

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dBV/m)	Limit (dB µ V/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1079.943868	---	36.62	54.00	17.38	1000.000	100.0	H	110.0	-2.9
1079.943868	43.39	---	74.00	30.61	1000.000	100.0	H	110.0	-2.9
1794.481822	40.36	---	74.00	33.64	1000.000	200.0	H	211.0	1.9
1794.481822	---	27.44	54.00	26.56	1000.000	200.0	H	211.0	1.9
2383.508064	40.83	---	74.00	33.17	1000.000	200.0	H	211.0	4.1
2383.508064	---	27.81	54.00	26.19	1000.000	200.0	H	211.0	4.1
3174.279574	47.26	---	74.00	26.74	1000.000	200.0	H	281.0	9.2
3174.279574	---	33.15	54.00	20.85	1000.000	200.0	H	281.0	9.2
4471.333482	48.26	---	74.00	25.74	1000.000	100.0	H	119.0	13.0
4471.333482	---	34.69	54.00	19.31	1000.000	100.0	H	119.0	13.0
5887.981586	---	37.24	54.00	16.76	1000.000	100.0	V	301.0	16.8
5887.981586	50.58	---	74.00	23.42	1000.000	100.0	V	301.0	16.8

Test Mode: data transfer

30MHz ~ 1GHz



Frequency (MHz)	QuasiPeak (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
39.266850	24.02	40.00	15.98	100.0	V	103.0	-10.0
166.511900	33.62	43.50	9.88	200.0	H	187.0	-12.2
192.020100	33.32	43.50	10.18	200.0	H	187.0	-12.3
335.987550	34.07	46.00	11.93	100.0	H	140.0	-9.6
625.995300	28.86	46.00	17.14	200.0	H	216.0	-4.5
686.562050	32.23	46.00	13.77	200.0	H	44.0	-2.9

1 GHz ~ 31 GHz

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dBV/m)	Limit (dB µ V/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1329.844885	---	22.35	54.00	31.65	1000.000	100.0	H	51.0	1.9
1329.844885	35.65	---	74.00	38.35	1000.000	100.0	H	51.0	1.9
1755.752426	---	23.96	54.00	30.04	1000.000	100.0	V	21.0	3.5
1755.752426	47.04	---	74.00	26.96	1000.000	100.0	V	21.0	3.5
4006.722800	42.76	---	74.00	31.24	1000.000	100.0	V	318.0	10.0
4006.722800	---	29.56	54.00	24.44	1000.000	100.0	V	318.0	10.0
5900.405965	48.71	---	74.00	25.29	1000.000	100.0	V	70.0	15.3
5900.405965	---	35.27	54.00	18.73	1000.000	100.0	V	70.0	15.3
6650.638553	52.72	---	74.00	21.28	1000.000	100.0	V	170.0	17.8
6650.638553	---	39.46	54.00	14.54	1000.000	100.0	V	170.0	17.8
7546.856332	51.98	---	74.00	22.02	1000.000	100.0	V	207.0	20.7
7546.856332	---	38.08	54.00	15.92	1000.000	100.0	V	207.0	20.7

Note:
1) Correction Factor=Antenna factor (RX) + cable loss – amplifier factor
2) Margin = Limit - Limit – Corrected Amplitude

******* END OF REPORT *******