

FCC PART 15B

MEASUREMENT AND TEST REPORT

For

NINGBO BAIHUANG ELECTRIC APPLIANCES CO., LTD.

NO. 180, YANSHAN RD, HUXIMEN, HENGHE TOWN, CIXI, NINGBO, China

FCC ID: Q92- BH9912U

Report Type: Original Report	Product Type: Remote Control Socket
Test Engineer: Phil Zhu	<i>Phil Zhu</i>
Report Number: RKS161125001-00B	
Report Date: 2016-11-29 Jesse huang	
Reviewed By: EMC Manager	<i>Jesse Huang</i>
Prepared By: Bay Area Compliance Laboratories Corp. (Kunshan) No.248 Chenghu Road, Kunshan, Jiangsu province, China Tel: +86-0512-86175000 Fax: +86-0512-88934268 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. This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

TABLE OF CONTENTS

GENERAL INFORMATION.....	3
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	3
OBJECTIVE	3
RELATED SUBMITTAL(S)/GRANT(S).....	4
TEST METHODOLOGY	4
TEST FACILITY	4
SYSTEM TEST CONFIGURATION (FCC §15.27)	5
JUSTIFICATION	5
EUT EXERCISE SOFTWARE	5
SPECIAL ACCESSORIES.....	5
EQUIPMENT MODIFICATIONS	5
SUPPORT EQUIPMENT LIST AND DETAILS	5
EXTERNAL I/O CABLE.....	5
BLOCK DIAGRAM OF RADIATED TEST SETUP.....	6
SUMMARY OF TEST RESULTS	7
FCC §15.107 –CONDUCTED EMISSIONS	8
APPLICABLE STANDARD	8
MEASUREMENT UNCERTAINTY	8
EUT SETUP	8
EMI TEST RECEIVER SETUP.....	9
TEST PROCEDURE	9
TEST EQUIPMENT LIST AND DETAILS.....	9
CORRECTED FACTOR & MARGIN CALCULATION	9
TEST RESULTS SUMMARY	10
TEST DATA	10
FCC §15.109 - RADIATED EMISSIONS	13
APPLICABLE STANDARD	13
MEASUREMENT UNCERTAINTY	13
EUT SETUP	13
EMI TEST RECEIVER SETUP.....	14
TEST PROCEDURE	14
TEST EQUIPMENT LIST AND DETAILS.....	14
CORRECTED AMPLITUDE & MARGIN CALCULATION	15
TEST RESULTS SUMMARY	15
TEST DATA	15

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Manufacturer	NINGBO BAIHUANG ELECTRIC APPLIANCES CO., LTD.
Model	BH9912U (FCC ID: Q92- BH9912U)
Product	Remote Control Socket
Dimension	94.7mm×54.5mm×5.6mm
Operation frequency	433.92MHz
Power input	AC 120V, rated power :1200W, rated current:10A

Note: The product's series model number: BHC9912U. The difference between them was explained in the attached declaration letter.

**All measurement and test data in this report was gathered from production sample serial number: 20161121003 (Assigned by BACL, Kunshan). The EUT was received on 2016-11-21.*

Objective

This report is prepared on behalf of NINGBO BAIHUANG ELECTRIC APPLIANCES CO., 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 15, Class B.

Related Submittal(s)/Grant(s)

FCC Part 15.231 submission with FCC ID: Q92-BH-V.

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 No.248 Chenghu Road, Kunshan, Jiangsu province, 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

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

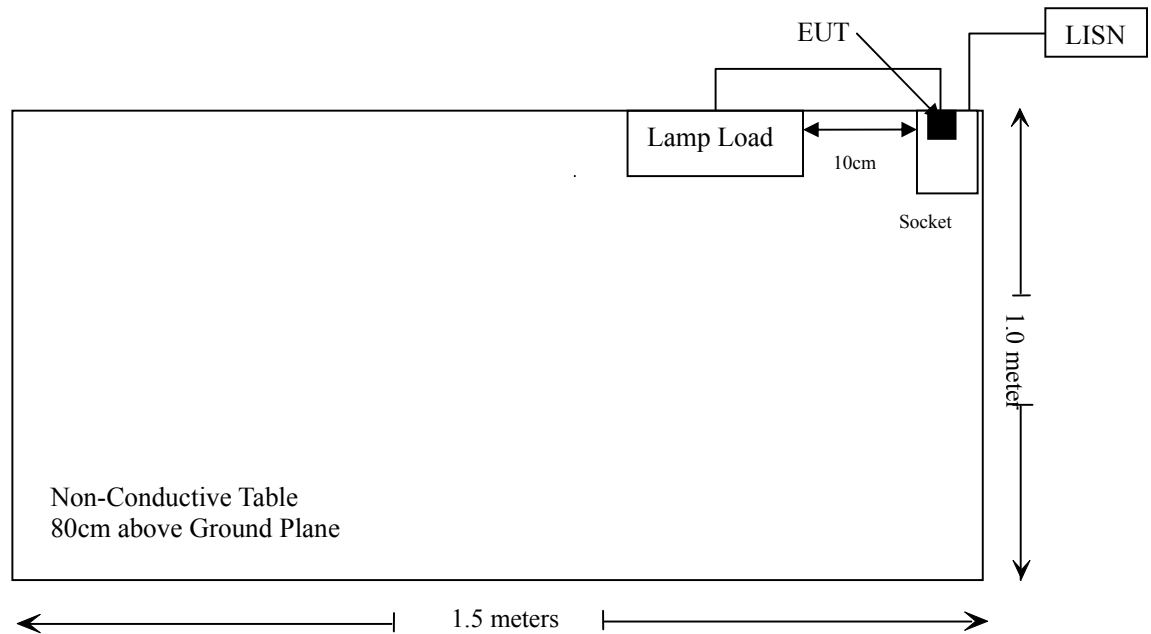
Manufacturer	Description	Model	Serial Number
Ningbo Baihuang	Remote controller	BH-V	NA

External I/O Cable

Cable Description	Length (m)	From/Port	To
Power Cable	0.5	EUT	Lamp Load

Block Diagram of Radiated Test Setup

Conducted Emissions



SUMMARY OF TEST RESULTS

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

FCC §15.107 –CONDUCTED EMISSIONS

Applicable Standard

According to FCC§15.107

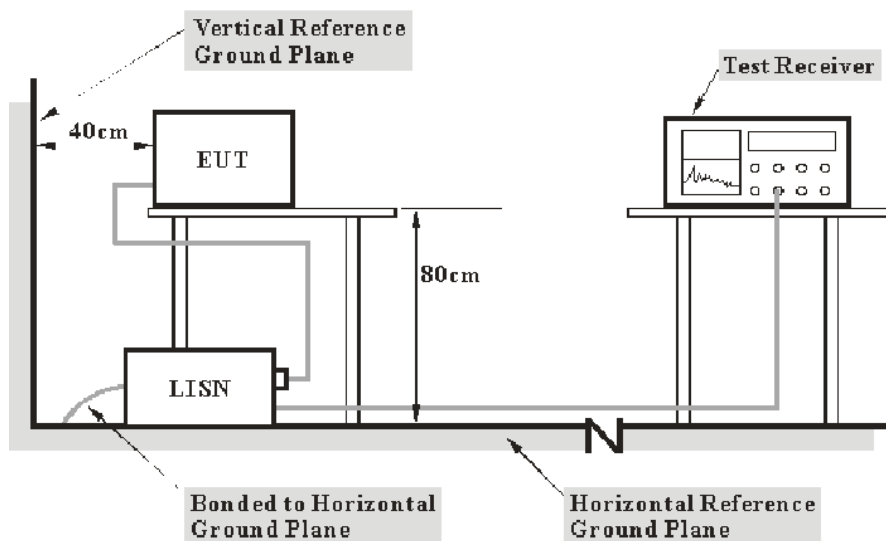
Measurement Uncertainty

Input quantities to be considered for conducted disturbance measurements may be 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+A1-2014, the expanded 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)

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.

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	2015-11-30	2016-11-29
Rohde & Schwarz	LISN	ESH3-Z5	862770/011	2016-10-10	2017-10-09
Rohde & Schwarz	LISN	ENV216	3560655016	2015-11-25	2016-11-24
Rohde & Schwarz	CE Test software	EMC 32	100357	--	--
MICRO-COAX	Coaxial Cable	Cable-6	006	2016-09-08	2017-09-07

* **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:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

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:

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

Test Results Summary

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

23.77 dB at 28.780000 MHz in the **Line** conducted mode

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

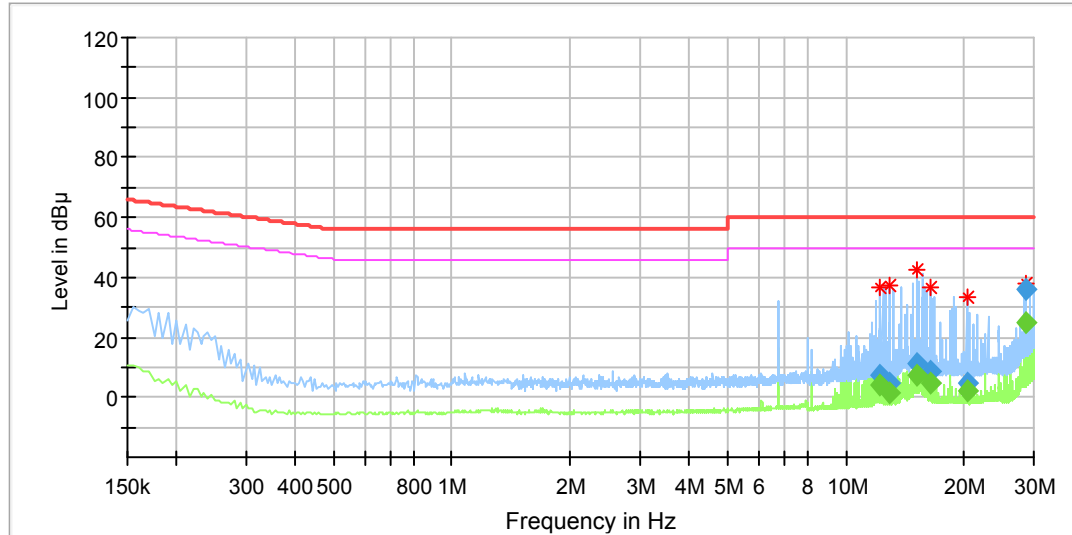
Environmental Conditions

Temperature:	22 °C
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Phil Zhu on 2016-11-22.

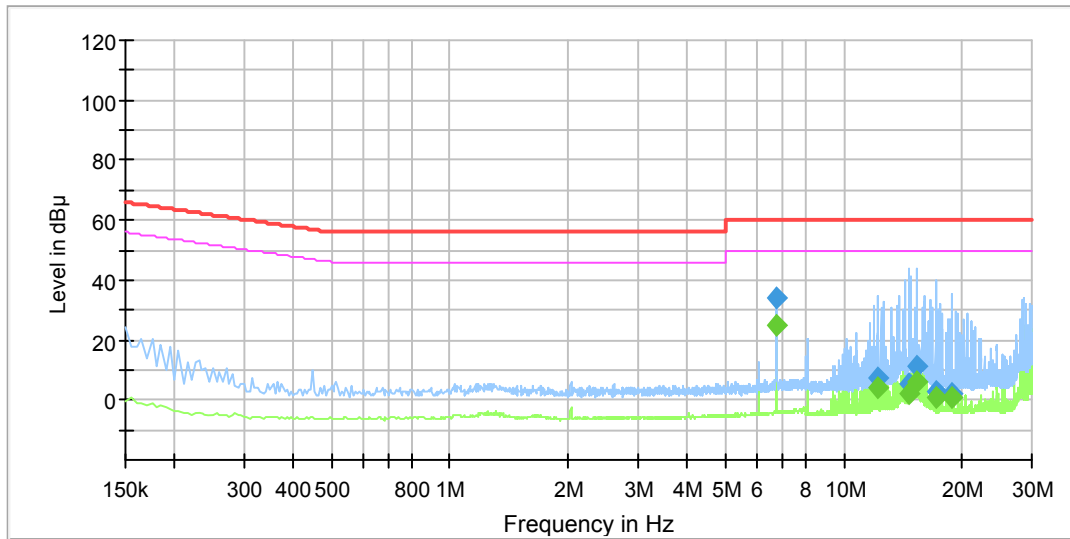
Test Model: Normal operation & Lamp load

Line:



Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Margin (dB)	Line	Corr. (dB)
12.170000	---	4.11	50.00	45.89	L1	10.4
12.170000	7.36	---	60.00	52.64	L1	10.4
12.910000	---	1.68	50.00	48.32	L1	10.4
12.910000	4.64	---	60.00	55.36	L1	10.4
15.105000	---	7.34	50.00	42.66	L1	10.4
15.105000	11.44	---	60.00	48.56	L1	10.4
16.385000	---	4.95	50.00	45.05	L1	10.5
16.385000	8.76	---	60.00	51.24	L1	10.5
20.250000	---	2.00	50.00	48.00	L1	10.5
20.250000	4.91	---	60.00	55.09	L1	10.5
28.780000	---	24.85	50.00	25.15	L1	10.6
28.780000	36.23	---	60.00	23.77	L1	10.6

Neutral:



Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Margin (dB)	Line	Corr. (dB)
6.745000	---	24.90	50.00	25.10	N	10.6
6.745000	33.93	---	60.00	26.07	N	10.6
12.165000	---	4.06	50.00	45.94	N	10.5
12.165000	7.41	---	60.00	52.59	N	10.5
14.620000	---	2.38	50.00	47.62	N	10.5
14.620000	5.58	---	60.00	54.42	N	10.5
15.355000	---	5.77	50.00	44.23	N	10.5
15.355000	11.22	---	60.00	48.78	N	10.5
17.075000	---	1.01	50.00	48.99	N	10.5
17.075000	3.10	---	60.00	56.90	N	10.5
18.780000	---	0.69	50.00	49.31	N	10.5
18.780000	2.29	---	60.00	57.71	N	10.5

FCC §15.109 - RADIATED EMISSIONS

Applicable Standard

FCC §15.109

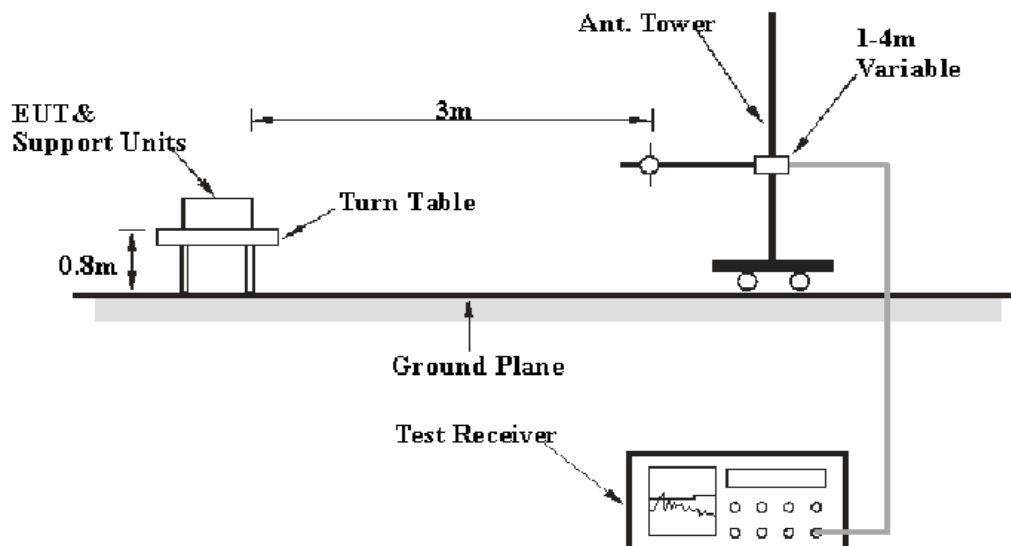
Measurement Uncertainty

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+A1-2014, the expanded 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.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 3GHz.

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
1GHz-3GHz	1MHz	3MHz	-	PK
	1MHz	1Hz	-	AV

Test Procedure

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

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1 GHz, peak and average detection modes for frequencies above 1 GHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sonoma Instrument	Amplifier	330	171377	2016-06-16	2017-06-15
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2016-05-20	2017-05-19
Sunol Sciences	Broadband Antenna	JB3	A090314-2	2016-11-07	2017-11-06
ETS	Horn Antenna	3115	6229	2016-11-04	2017-11-03
Rohde & Schwarz	Signal Analyzer	FSIQ26	100048	2016-11-04	2017-11-03
F-KS-EMC066	Pre-amplifier	AFS42-00101800	2001270	2016-09-08	2017-09-07
R&S	Auto test Software	EMC32	100361	-	-
haojintech	Coaxial Cable	Cable-1	001	2016-09-08	2017-09-07
haojintech	Coaxial Cable	Cable-2	002	2016-09-08	2017-09-07
haojintech	Coaxial Cable	Cable-3	003	2016-09-08	2017-09-07
MICRO-COAX	Coaxial Cable	Cable-4	004	2016-11-18	2017-11-17
MICRO-COAX	Coaxial Cable	Cable-5	005	2016-11-18	2017-11-17

* **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 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:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

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:

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

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:

23.29 dB at 40.121500 MHz in the Vertical polarization mode

Refer to CISPR16-4-2:2011+A1-2014 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

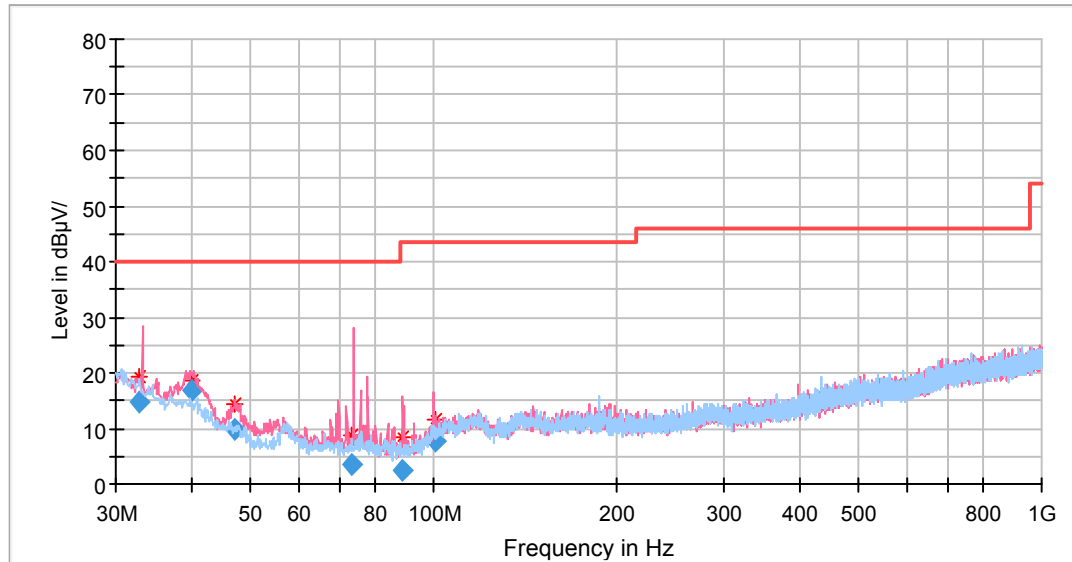
Environmental Conditions

Temperature:	27 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Phil Zhu on 2016-11-22

Test Model: Normal operation & Lamp load

1) 30MHz ~ 1GHz



Frequency (MHz)	QuasiPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
32.843900	14.89	40.00	25.11	101.0	V	121.0	-6.6
40.121500	16.71	40.00	23.29	101.0	V	289.0	-10.3
47.215750	9.78	40.00	30.22	101.0	V	249.0	-14.8
73.260600	3.65	40.00	36.35	101.0	V	323.0	-17.1
88.930650	2.59	43.50	40.91	101.0	V	107.0	-17.0
100.631800	7.78	43.50	35.72	101.0	V	101.0	-13.6

2) Above 1GHz

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB /m)
1000.619238	33.92	---	74.00	40.08	149.0	V	213.0	-11.3
1000.619238	---	19.86	54.00	34.14	149.0	V	213.0	-11.3
1294.609619	34.76	---	74.00	39.24	149.0	V	133.0	-9.0
1294.609619	---	20.05	54.00	33.95	149.0	V	133.0	-9.0
1365.451503	35.86	---	74.00	38.14	149.0	V	224.0	-8.5
1365.451503	---	21.13	54.00	32.87	149.0	V	224.0	-8.5
1719.139880	37.79	---	74.00	36.21	149.0	H	312.0	-6.4
1719.139880	---	23.86	54.00	30.14	149.0	H	312.0	-6.4
1999.887375	39.32	---	74.00	34.68	149.0	H	36.0	-4.9
1999.887375	---	26.17	54.00	27.83	149.0	H	36.0	-4.9
2446.581363	41.52	---	74.00	32.48	149.0	V	234.0	-3.3
2446.581363	---	28.38	54.00	25.62	149.0	V	234.0	-3.3

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