



TESTING LABORATORY
CERTIFICATE#4323.01



FCC PART 15.247

TEST REPORT

For

ZHEJIANG EBOY TECHNOLOGY CO., LTD.

No.568 Huabao Street, Deqing County, Huzhou City, 313200 China

FCC ID: 2AJ3WEBEQPW92

Report Type: CIIPC Report	Product Type: LED lamp
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Report Number:	RSHB200723001-00A
Report Date:	2020-08-13
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant	ZHEJIANG EBOY TECHNOLOGY CO., LTD.
Tested Model	EBE-QPW92-B
Series Model	BW904, BW914, BW924, BW944, BW210, BW010, BW310, BW410
Model Difference	See Declaration letter
Product Type	LED lamp
Power Supply	AC 120 V
RF Function:	2.4G Wi-Fi
Operating Band/Frequency:	802.11b/g/n-HT20: 2412-2462MHz; 802.11n-HT40: 2422-2452MHz
Channel Number:	802.11b/g/n-HT20: 11 channels; 802.11n-HT40: 7 channels
Channel Separation:	5 MHz
Antenna Type:	PCB antenna
Maximum Antenna Gain:	2.0 dBi

**All measurement and test data in this report was gathered from production sample serial number: 20200723001.
(Assigned by the BACL. The EUT supplied by the applicant was received on 2020-07-23.*

Objective

This report is prepared on behalf of *Zhejiang Eboy Technology Co.,Ltd.* in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commissions' rules.

The tests were performed in order to determine Compliant with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

This is a CIIPC report base on the original report RSHB200117001-00A with FCC ID: 2AJ3WEBEQPW92 which was granted on 2020-04-01, the differences between the original device and the current one are as follows:

The PCB of power board has been changed.

This change will affect conducted emissions and radiation spurious (below 1G) testing, other data were referred to the original report.

Related Submittal(s)/Grant(s)

No related submittal/grant.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliant Testing of Unlicensed Wireless Devices and FCC 558074 D01 15.247 Meas Guidance v05r02.

All emissions measurement was performed at Bay Area Compliant Laboratories Corp. (Kunshan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Item		Uncertainty
AC Power Lines Conducted Emissions		3.19dB
RF conducted test with spectrum		0.9dB
RF Output Power with Power meter		0.5dB
Radiated emission	30MHz~1GHz	6.11dB
	1GHz~6GHz	4.45dB
	6GHz~18GHz	5.23dB
	18GHz~40GHz	5.65dB
Occupied Bandwidth		0.5kHz
Temperature		1.0°C
Humidity		6%

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.

Bay Area Compliance Laboratories Corp. (Kunshan) Lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4323.01) and the FCC designation No. CN1185 under the FCC KDB 974614 D01 and CAB identifier CN0004 under the ISED requirement. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

Test channel list is as below:

For 802.11b, 802.11g and 802.11n-HT20 mode, EUT was tested with Channel 1, 6 and 11;

For 802.11n-HT40 mode, EUT was tested with Channel 3, 6 and 9.

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437	/	/

Equipment Modifications

No modification was made to the EUT tested.

EUT Exercise Software

RF test tool: Esp 32

Pre-scan with all the data rates, and the worst case was performed as below:

Mode	Data Rate	Channel	Power Level Setting
802.11b	1 Mbps	Low	7
		Middle	7
		High	7
802.11g	6 Mbps	Low	7
		Middle	7
		High	7
802.11n-HT20	MCS0	Low	8
		Middle	8
		High	8
802.11n-HT40	MCS0	Low	8
		Middle	8
		High	8

Support Equipment List and Details

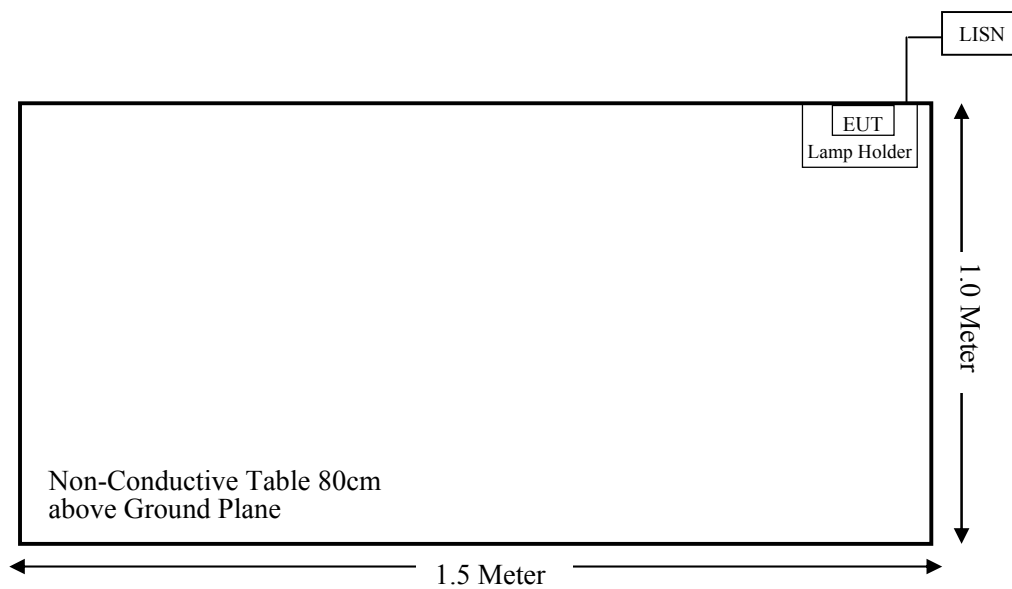
Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

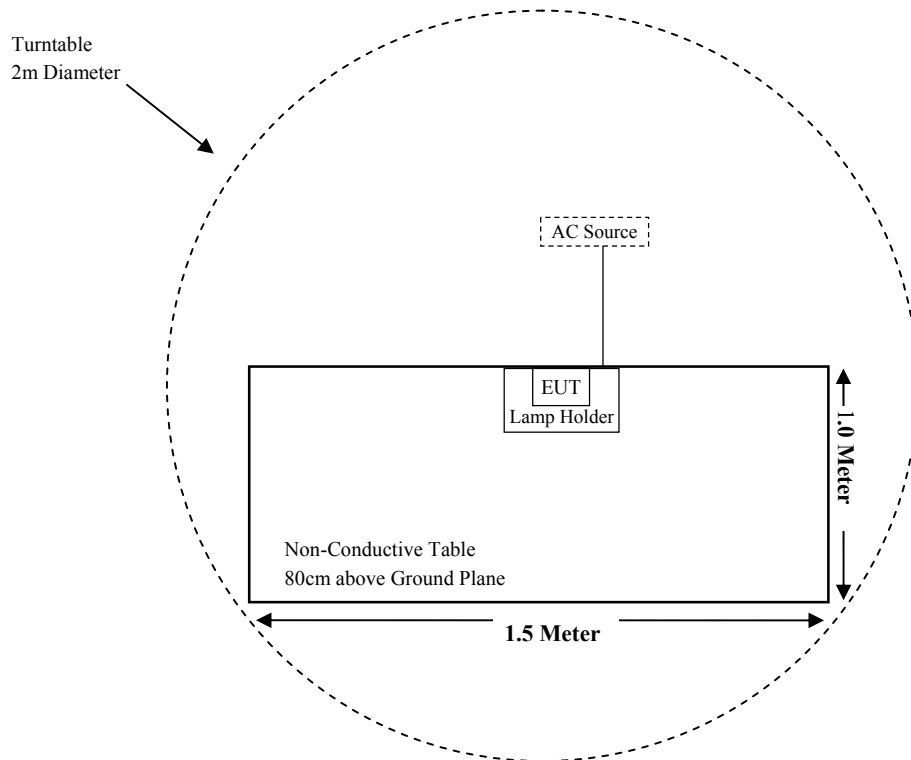
Cable Description	Length(m)	From Port	To
Power Cable	0.8	Lamp Holder	AC Source

Block Diagram of Test Setup

For Conducted Emissions:



For Radiated Emissions(Below 1GHz):



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.207 (a)	AC Line Conducted Emissions	Compliant
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliant

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test (Chamber 1#)					
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2019-11-30	2020-11-29
Sunol Sciences	Broadband Antenna	JB3	A090413-1	2019-12-26	2020-12-25
Sonoma Instrument	Pre-amplifier	310N	171205	2019-08-14	2020-08-13
Rohde & Schwarz	Auto test Software	EMC32	100361	N/A	N/A
MICRO-COAX	Coaxial Cable	Cable-8	008	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-9	009	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-10	010	2019-08-15	2020-08-14
Conducted Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESR	1316.3003K03-101746-zn	2019-08-05	2020-08-04
Rohde & Schwarz	LISN	ENV216	3560655016	2019-11-30	2020-11-29
Audix	Test Software	e3	V9	N/A	N/A
Rohde & Schwarz	Pulse limiter	ESH3-Z2	357.8810.52	2020-01-10	2021-01-09
MICRO-COAX	Coaxial Cable	Cable-15	015	2019-08-15	2020-08-14

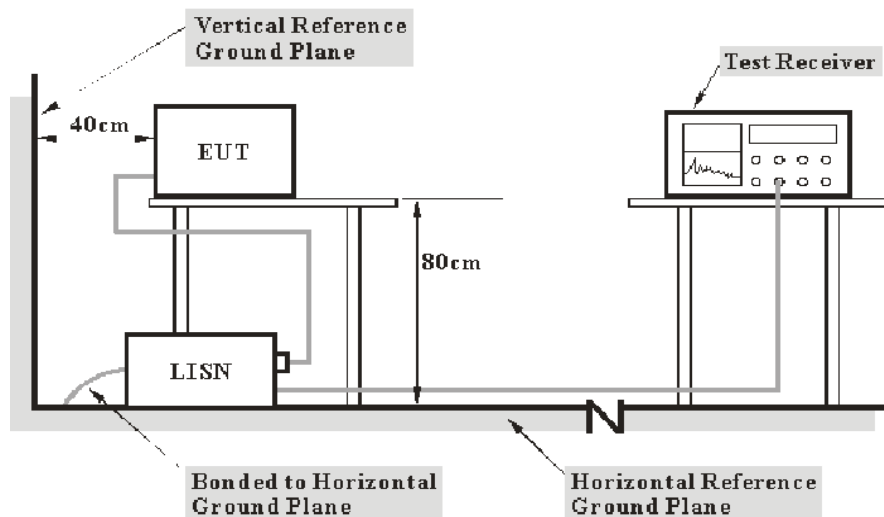
* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §15.207 (a) - AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207(a)

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 C63.10-2013. The related limit was specified in FCC Part 15.207.

The spacing between the peripherals was 10 cm.

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

ANSI C63.10-2013 clause 6.2

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.

Factor & Over Limit Calculation

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

$$\text{Factor (dB)} = \text{LISN VDF (dB)} + \text{Cable Loss (dB)} + \text{Transient Limiter Attenuation (dB)}$$

The “**Over Limit**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, an Over Limit of 7 dB means the emission is 7 dB above the limit. The equation for Over Limit calculation is as follows:

$$\text{Over Limit (dB)} = \text{Read level (dB}\mu\text{V)} + \text{Factor (dB)} - \text{Limit (dB}\mu\text{V)}$$

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207.

Test Data

Environmental Conditions

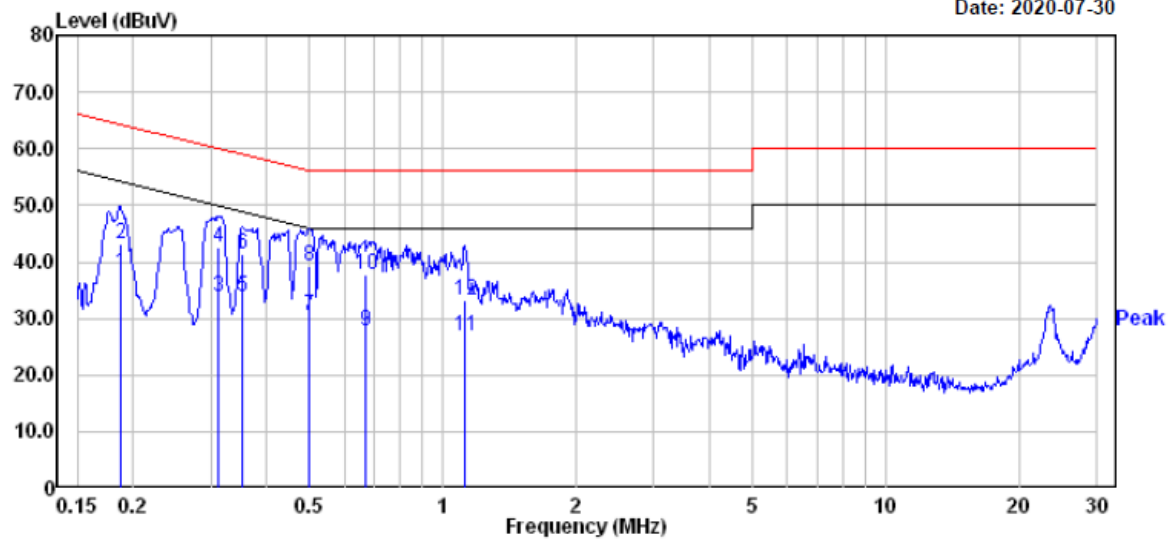
Temperature:	19.2 °C
Relative Humidity:	52 %
ATM Pressure:	101.7 kPa

The testing was performed by Chao Gao on 2020-07-30.

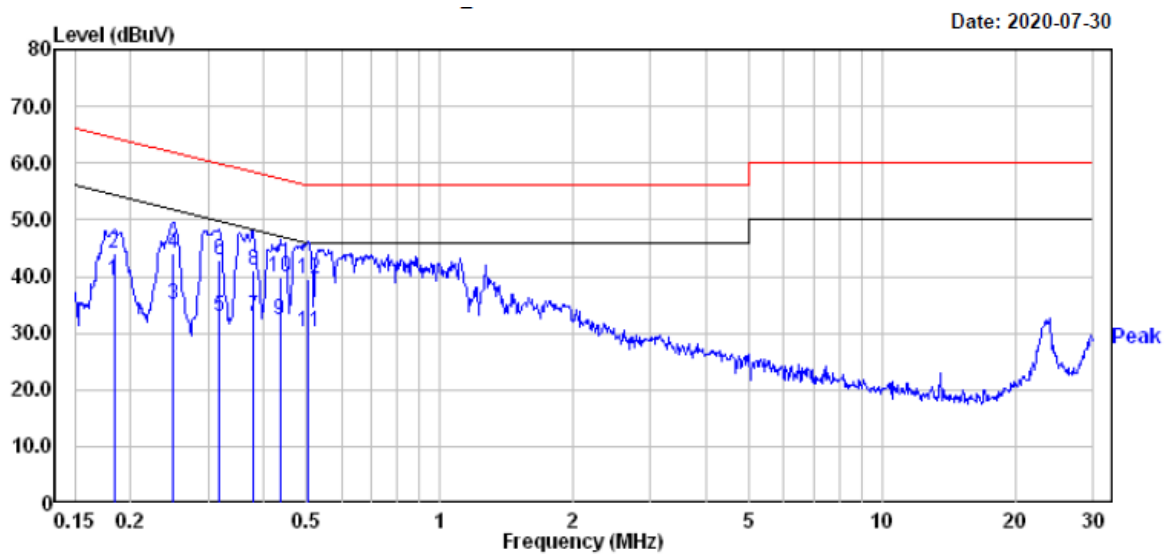
EUT operation mode: Transmitting in 802.11n-H20 mode middle channel (worst case)

AC 120V/60 Hz, Line

Date: 2020-07-30



	Freq	Read		Limit	Over	
	MHz	Level	Factor	Line	Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB
1	0.187	18.11	19.82	37.93	54.15	-16.22 Average
2	0.187	23.31	19.82	43.13	64.15	-21.02 QP
3	0.312	13.89	19.83	33.72	49.93	-16.21 Average
4	0.312	22.79	19.83	42.62	59.93	-17.31 QP
5	0.354	14.00	19.80	33.80	48.87	-15.07 Average
6	0.354	21.70	19.80	41.50	58.87	-17.37 QP
7	0.499	10.70	19.76	30.46	46.01	-15.55 Average
8	0.499	19.50	19.76	39.26	56.01	-16.75 QP
9	0.668	7.90	19.75	27.65	46.00	-18.35 Average
10	0.668	17.90	19.75	37.65	56.00	-18.35 QP
11	1.123	7.00	19.81	26.81	46.00	-19.19 Average
12	1.123	13.30	19.81	33.11	56.00	-22.89 QP

AC 120V/60 Hz, Neutral

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.183	19.30	19.83	39.13	54.33	-15.20	Average
2	0.183	24.10	19.83	43.93	64.33	-20.40	QP
3	0.249	15.10	19.82	34.92	51.78	-16.86	Average
4	0.249	24.30	19.82	44.12	61.78	-17.66	QP
5	0.317	13.10	19.82	32.92	49.79	-16.87	Average
6	0.317	22.90	19.82	42.72	59.79	-17.07	QP
7	0.379	13.00	19.77	32.77	48.30	-15.53	Average
8	0.379	21.20	19.77	40.97	58.30	-17.33	QP
9	0.435	12.50	19.75	32.25	47.15	-14.90	Average
10	0.435	20.00	19.75	39.75	57.15	-17.40	QP
11	0.505	10.40	19.76	30.16	46.00	-15.84	Average
12	0.505	19.70	19.76	39.46	56.00	-16.54	QP

Note:

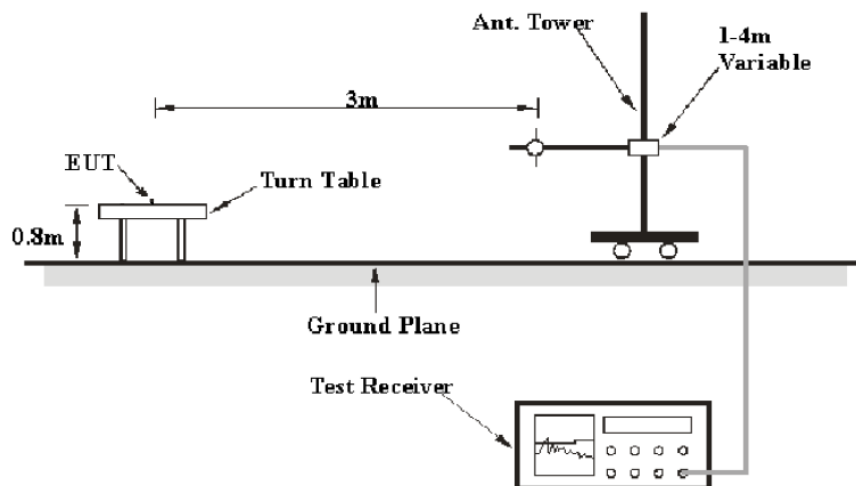
- 1) Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)
- 2) Over Limit (dB) = Read level (dBuV) + Factor (dB) - Limit (dBuV)

FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS**Applicable Standard**

FCC §15.247 (d); §15.209; §15.205;

EUT Setup

Below 1 GHz:



The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.247 limits.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 1 GHz.

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

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP

Test Procedure

According to ANSI C63.10-2013 clause 6.5, 6.6 and 6.7.

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 30MHz - 1GHz.

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:

$$\text{Corrected Amplitude (dB}\mu\text{V /m)} = \text{Meter Reading (dB}\mu\text{V)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Amplifier Gain (dB)}$$

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 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin (dB)} = \text{Limit (dB}\mu\text{V/m)} - \text{Corrected Amplitude (dB}\mu\text{V /m)}$$

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205, 15.209 and 15.247.

Test Data**Environmental Conditions**

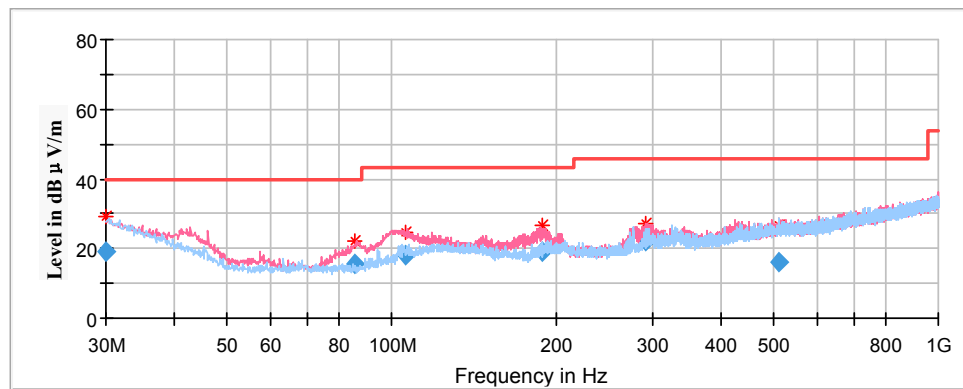
Temperature:	19.2~20°C
Relative Humidity:	49-53 %
ATM Pressure:	100.7-102.5 kPa

The testing was performed by Chao Gao on 2020-07-27.

EUT operation mode: Transmitting

Spurious Emission Test:**30MHz-1GHz:**

Pre-Scan with 802.11b, 802.11g, 802.11n-HT20 and 802.11n-HT40 modes of operation in the X,Y and Z axes of orientation, the worst case **low channel of 802.11b Mode in Y-axis of orientation** was recorded



Frequency (MHz)	Corrected Amplitude	Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	Quasi-peak (dBμV/m)	Height (cm)	Polar (H/V)				
30.08	18.91	200.0	H	132.0	-4.4	40.00	21.09
85.77	15.63	100.0	V	203.0	-18.0	40.00	24.37
106.28	18.08	100.0	V	240.0	-14.2	43.50	25.42
188.47	19.11	100.0	V	219.0	-13.5	43.50	24.39
290.85	21.95	200.0	V	352.0	-11.3	46.00	24.05
510.93	16.10	100.0	H	336.0	-6.0	46.00	29.90

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